HENSALL

FINAL ISSUE, ALL INFORMATION RECEIVED

OPERATION & MAINTENANCE MANUAL

Elmwood Leisure Centre

Decarbonisation and refurbishment: air source heat pumps, LTHW plant, air handling units, air conditioning and domestic water services Mechanical Services

Volume 4 of 9: Manufacturers' literature

Documents 8.82 to 8.103

Revision	Issue date	Practical completion	Job reference
A	**9th of October 2026**	**2nd of June 2026**	**HEN0203**

Prepared for Hensall Mechanical Services Ltd · Westgate Leisure Services Ltd (for the London Borough of Elmwood; operated by FitLife Active)

Compiled by OnTrack O&M

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SECTION 8

8

Manufacturers' literature

Documents 8.82 to 8.103 are in this volume, each exactly as received and checked.

8.82

Sauermann pump

The following 2 pages are the document exactly as received and checked. It is bookmarked in the PDF.

Reference	
Asset	General
Provided by	Not recorded
Source file	`Sauermann pump.pdf`
Pages	2

Sauermann® part #: DP10CE05UN23

DELTA PACK 80x60

PISTON PUMP - CONDENSATE REMOVAL SYSTEM



Ensures quick and easy installation and maintenance

Delta Pack 80x60 includes a new elbow design that can be easily opened by hand by a simple finger push -- no tool is needed. Its streamlined design complements wall mounted air conditioning units. It includes the Si-10 UNIVERS'L pump which incorporates the latest in piston pump technology.

BENEFITS



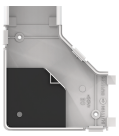
• Easy installation and maintenance

- New quick fit and release corner piece.
- Simple finger push-in technology: no tools needed. Can be opened by hand.
- One piece pump for easy installation.
- The kit content allows for versatility of installation, matching real needs on the field.
- Transparent and removable reservoir.
- Translucent hose: easy to track waterflow, build-up, etc.



• Improved design

- Compact elbow and trunking design that can be easily opened and maintained.
-Improved internal space design with increased space for pipework.
- No connection piece where elbow meets the straight length of duct
- Colour: RAL 9003 (Signal white – Brilliant white).
- Flush fitting of all parts.
- Complements and sits flush to the A/C unit using a rubber gasket.



• Quiet

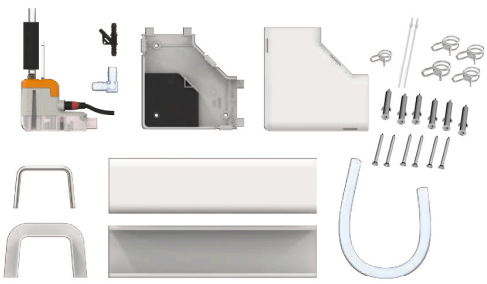
- Quiet pump operation: 22 dBA at full power – independently tested.
- Elbow includes 'High Energy Absorbing Foam' to absorb vibration and sound.
- Anti-vibration and condensate insulation included on discharge line.



• Proven reliability

- Patented pump technology.
- No connection piece connecting the elbow and the straight length of duct.
- High flow rate - Up to 20 ltr/hr = Less run time.
- The Drain Safe Device prolongs the pump life.
- Lockable plug-in power cable to avoid unintended disconnection.

KIT CONTENT



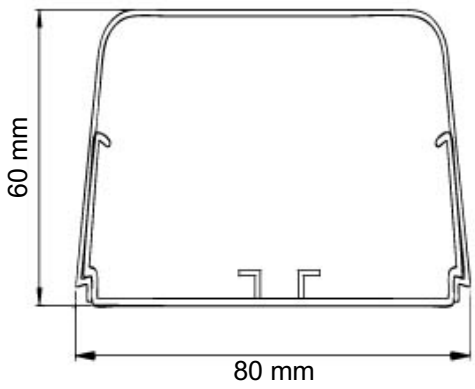
- Si-10 UNIVERS'**L** piston pump with:
  - Integrated condensate detector.
  - Clear PVC tube int. Ø 6mm – L: 1 m, foam-insulated over 800 mm, fitted with a "Drain Safe Device" pre-mounted.
  - 1.5 m lockable plug-in power cable: 2 power wires, 2 safety contact wires.
- 2-part elbow (base and cover).
- Ceiling duct (covers hole in false ceiling).
- Rubber Elbow/Split gasket.
- 650 mm flexible hose - int. Ø 15 mm (connects to split).
- Vent pipe.
- Six screws and plugs for fixing duct and elbow.
- 4 double wire clamps Ø 16 mm, 1 double wire clamps Ø 6 mm
- 750 mm duct 80x60 mm

APPLICATIONS

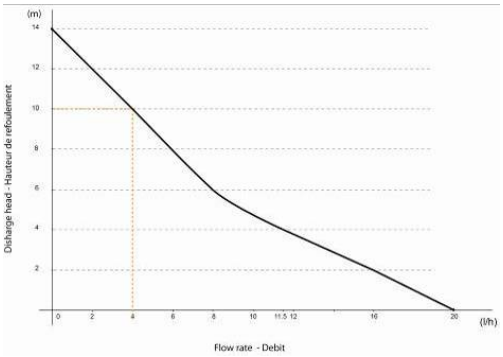
Air-conditioning wall mounted units up to 20 kW
(connection pipes Ø max 3/8" – 5/8" insulated)



TECHNICAL SPECIFICATION	
Max. flow rate	**20 l/h**
Max. discharge head	10 m (Flow rate=4l/h)
Max pressure	14 m (Flow rate =0l/h)
Sound level at 1m according to EN ISO 3744 (Measured at LNE lab, pump operating with water, out of application)	**22 dBA**
Mains supply	230V~ 50/60Hz - 14 W
Isolation class	⧈ (double insulation)
Detection levels	ON : 18mm, OFF : 13mm, Safety : 21mm
Safety switch	NC 8 A résistive – 250V
Thermal protection (overheating)	115°C (Auto reset)
Operating conditions	100% - Continuous duty
Protection	IPX4
Colour	RAL 9003 – signal white (brilliant white)
Elbow dimensions (LxWxH)	130 x 130 x 60 mm
Duct dimensions (LxWxH)	750 x 80 x 60 mm
Lineset	Ø max : 3/8" – 5/8" isolated *(Up to 13 kW)*
Safety standards	CE & EAC
RoHS directive	Compliant
WEEE directive	Compliant
Packaging	1.55kg – L763 x W225 x H62 mm
Masterpack	5 pieces



ACTUAL FLOW RATES (l/h)					
		Total tube length using (Ø Int 6 mm, *1/4"*)			
	Discharge head	5 m	10 m	20 m	30 m
	0 m	20	19	18	17
	2 m	16	15	14	13,5
	4 m	11,5	11	10,5	10
	6 m		8,5	7,5	6,5
	8 m		6	5	4
	10 m		4	3,5	2,5



RECOMMENDED ACCESSORIES



Clear PVC hose Ø int. 6 mm (1/4")
ACC00909 : 5 m
ACC 00910 : 50 m



6 Self-sealing fittings
for hose Ø int. 6 mm (1/4")
ACC 00919

Non contractual document. We reserve the right to modify the characteristics of our products without prior notice.

8.83

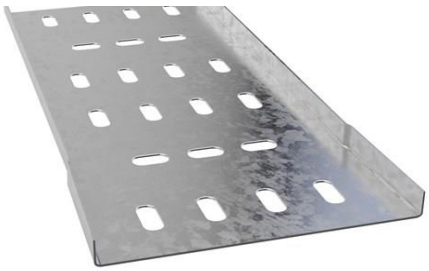
TRENCH_PRE_GALV_CABLE_TRAY_LENGTHS_V5.1_1

The following 5 pages are the document exactly as received and checked. It is bookmarked in the PDF.

Reference	
Asset	General
Provided by	Not recorded
Source file	TRENCH_PRE_GALV_CABLE_TRAY_LENGTHS_V5.1_1.pdf
Pages	5

Technical Data Sheet

Light Duty



Medium Duty



Heavy Duty



British Standard:

BS EN 61537: 2007

Material Specification:

British Standard: BS EN 10346:2015.

Finish:

Pre Galvanised

Ordering Information:

- Please refer to the following pages or alternatively visit our website below:

http://www.trenchltd.com

Product Information:

- Supplied in 3m lengths

Packing Detail:

1 x 3m body

Other Options Available:

- Post Galvanised
- Powder Coated
- Cable Tray Cover
- Alternative Width/Height/Material Thickness/Length (<3m)

Technical Data Sheet

Cable Tray / Pre Galvanised / Lengths / Ordering Information / Page 2 of 5

Powder Coated
Please ensure that when requesting a quotation for any powder coated products that you have the correct quantities, RAL number and finish (i.e. matt or gloss) in order for us to quote accordingly. Product codes for powder coated items are non-standard, however, dimensions and weights listed in the table on Page 3 are still applicable.

Light Duty Cable Tray Only - Swaged End.
Light Duty Cable Tray does not have a rolled top side, this only applies to Medium and Heavy Duty.
Light Duty Cable Tray lengths have one swaged end to allow male-female connection up to and including 300mm.
Light Duty Cable Tray 450mm and above would require couplers the code is **LDTSC**.

Cut Lengths
Trench Cable Tray lengths are all supplied in 3m as standard, however, we can produce in shorter lengths if required - please contact our internal sales team for more information.

Non Standard Sizes
Sizes shown on page 3 are our standard sizes, however, we can produce other widths/heights/gauges to your requirements - please contact our sales department for more information.

Cable Tray Cover
If you require a cover please use the codes in the chart on page 3 suffixed with **-CVR.** For example if you require a cover for a medium duty 300mm cable tray the correct code would be **MDT300TR-CVR.** Tray Cover is supplied as standard in 3m lengths with a 10mm return.

We recommend 8 cover clips (sold as each) to attach the cover to the tray - these need to be ordered separately they are not supplied with the tray cover. We offer both closed and ventilated versions, all codes are listed below:

Ventilated	Closed	Tray Range
LDT-VCVR-CLIPS	LDT-CVR-CLIPS	Light Duty
MDT-VCVR-CLIPS	MDT-CVR-CLIPS	Medium Duty
HDT-VCVR-CLIPS	HDT-CVR-CLIPS	Heavy Duty



* Number of clips recommended per 3m length of cable tray **8**



Technical Data Sheet

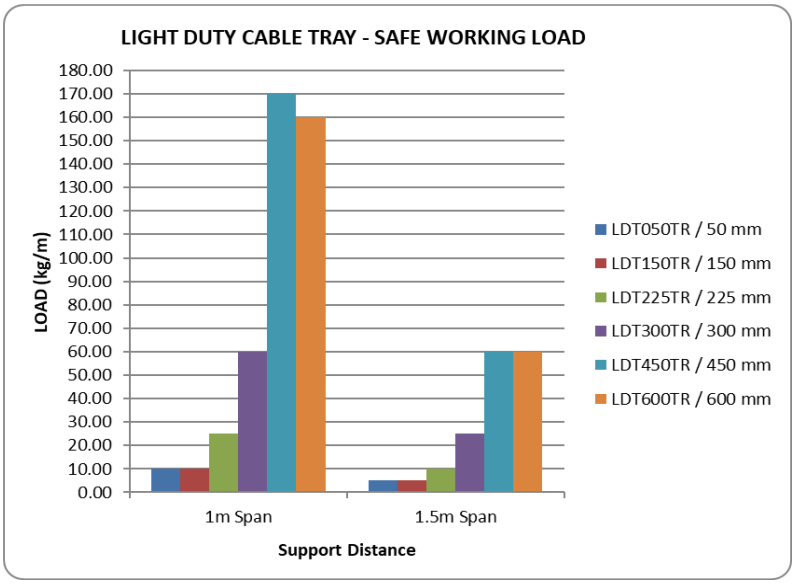
Cable Tray / Pre Galvanised / Lengths / Dimensions & Weights Table / Page 3 of 5

Product Code	Width (mm)	Height (mm)	Length (m)	Weight (kg) Per 3m
LDT050TR	50	12.5	3	1.39
LDT075TR	75	12.5	3	1.86
LDT100TR	100	12.5	3	2.34
LDT150TR	150	12.5	3	3.29
LDT225TR	225	12.5	3	4.70
LDT300TR	300	20	3	6.56
LDT450TR	450	20	3	11.89
LDT600TR	600	20	3	20.26
MDT050TR	50	25	3	2.34
MDT075TR	75	25	3	2.82
MDT100TR	100	25	3	3.29
MDT150TR	150	25	3	4.24
MDT225TR	225	25	3	5.66
MDT300TR	300	25	3	7.09
MDT450TR	450	25	3	12.63
MDT600TR	600	25	3	21.22
MDT750TR	750	25	3	25.97
MDT900TR	900	25	3	30.71
HDT050TR	50	50	3	3.38
HDT075TR	75	50	3	3.95
HDT100TR	100	50	3	4.33
HDT150TR	150	50	3	5.28
HDT225TR	225	50	3	6.72
HDT300TR	300	50	3	8.14
HDT450TR	450	50	3	18.25
HDT600TR	600	50	3	22.99
HDT750TR	750	50	3	27.73
HDT900TR	900	50	3	43.06
Approximate weights shown are a nominal value due to material thickness and tolerance .				

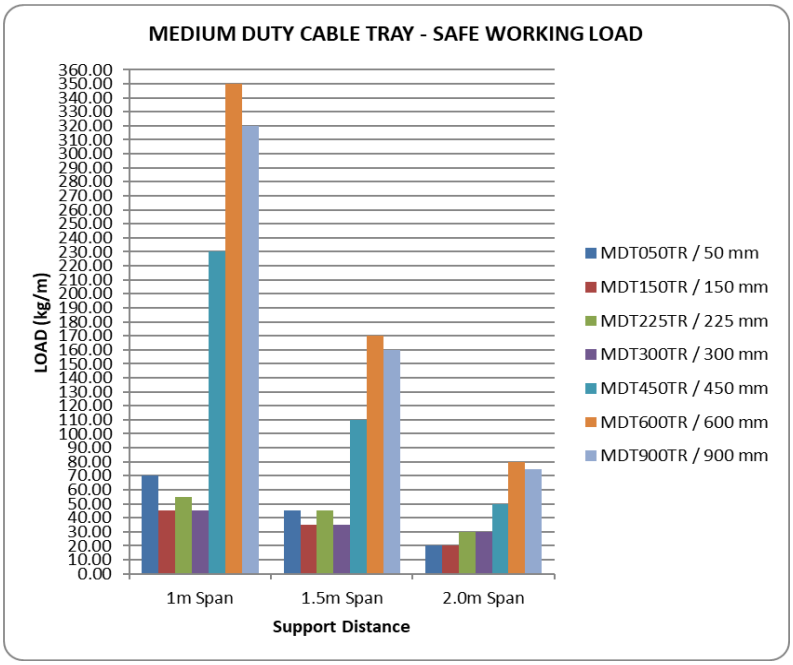
Technical Data Sheet

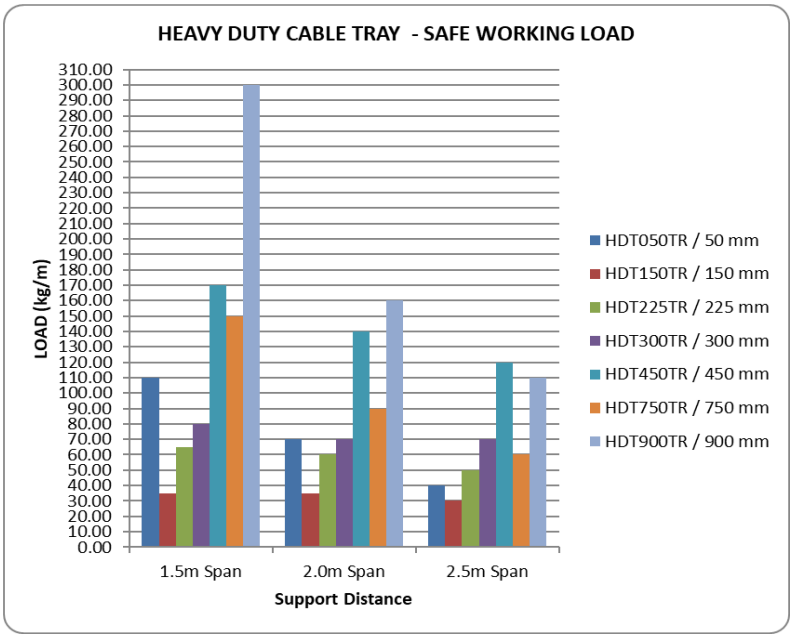
Cable Tray / Pre Galvanised / Lengths / Test Results / Page 4 of 5

- Cable Trays were tested and classified as Type 2
- Recommended tightening torque for couplings is 3.9Nm
- Widths between 50mm and 150mm were not tested as these represent the best and worse mechanical case scenario for those particular sizes as the manufacturing methods and materials are similar
- These are maximum safe loadings and do not allow for any other extra loading or forces such as snow or the effect of wind etc.
- The loadings are given in good faith and are from results from tested components and are dependent on the correct installation of the system and as such Trench Ltd strongly advise that a cable tray system should **NOT** be used as a walkway or supporting feature for climbing apparatus/activity.
- All tests were carried out applying a load of 1.7 times the stated S.W.L.
- Tray widths of 450mm and greater require the use of a fish plate base coupler at each joint (length to length) in addition to the side wrap around couplers to maintain the tray performance as shown in the below loading graphs.



Technical Data Sheet





8.84

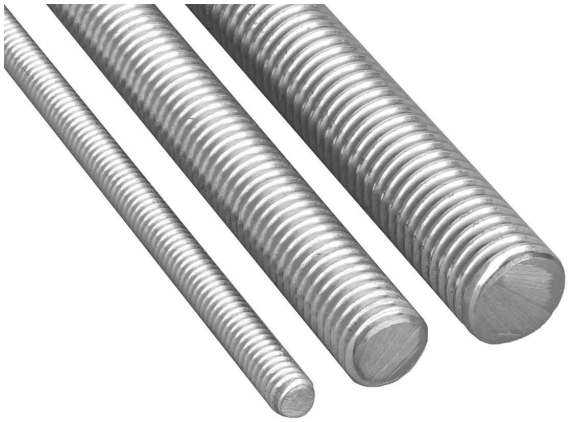
Threaded Rod (1)

The following 2 pages are the document exactly as received and checked. It is bookmarked in the PDF.

Reference	
Asset	General
Provided by	Not recorded
Source file	`Threaded Rod (1).pdf`
Pages	2

Product Data Sheet

Part Number - THREADED ROD



Part No	Thread	Bundle	Weight / Mtr
RODM6	M6	50	0.18kgs
RODM8	M8	25	0.32Kgs
RODM10	M10	20	0.51kgs
RODM12	M12	10	0.74kgs
RODM16	M16	5	1.35kgs
RODM20	M20	5	2.11kgs
RODM24	M24	5	3.04kgs

Grade

Threaded Rods in 3 Metre Lengths Grade 4.8

DIN 976-1

Also available in other lengths.

Finishes

ZP	Zinc Plated - Zinc Electroplated to BS EN 15048
HDG	Hot Dip Spun Galvanising – BS EN ISO 1461
SS	Stainless Steel – Self Colour A4 (316)

Application

Suitable for a number of applications.

Nominal dimension indications are subject to manufacturing tolerances

Kindly refer to our Catalogue and Terms and Conditions for further details

CSS Support Systems (Warrington)
Sales, Marketing, Accounts
16 Bridge Road
Warrington
WA1 4AT, United Kingdom
Tel: +44(0) 1925 850333 Fax: +44(0) 1925 850532

ISO 9001 Quality Management Certification

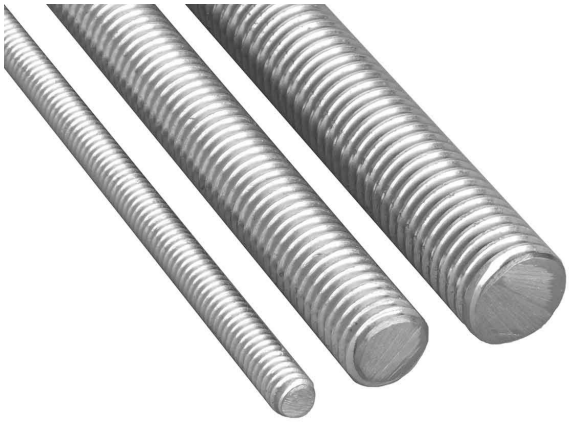
ISSUE DATE—14.12.2023

Approved JAH

E&OE

Product Data Sheet

Part Number - THREADED ROD



Proof Loads

Part No	Thread	Stress Area (mm^2)	Minimum Proof Load (kg)
RODM6	M6	20.1	459
RODM8	M8	36.6	836
RODM10	M10	58	1335
RODM12	M12	84.3	1937
RODM16	M16	157	3598
RODM20	M20	245	5617

Grade

Threaded Rods in 3 Metre Lengths Grade 4.8

DIN 976-1

Also available in other lengths.

Finishes

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16 Bridge Road
Warrington
WA1 4AT, United Kingdom
Tel: +44(0) 1925 850333 Fax: +44(0) 1925 850532

ISO 9001 Quality Management Certification

ISSUE DATE—14.12.2023

Approved JAH

E&OE

8.85

UVH30.fm

The following 2 pages are the document exactly as received and checked. It is bookmarked in the PDF.

Reference	
Asset	General
Provided by	Not recorded
Source file	UVH30.fm.pdf
Pages	2

Suspension rings

UVH30

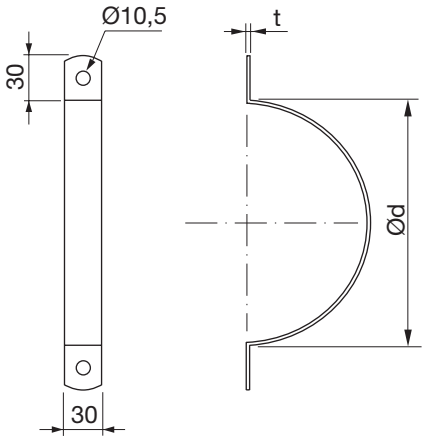


Description

For suspension of circular ducting. For insulated duct it is recommended that the suspension ring is mounted inside the insulation.

UVH30 is sold in pairs.
The weight in the table are per pair.
The European test standard EN 1366-1, for fire resistance tests on horizontal ventilation systems, will not allow that the tensile stress of the vertical suspension components exceed the values in the table below:

Dimensions



Ordering example

	UVH30	200
Product		
Dimension Ød		

Dimensions

Ød nom	t [mm]	m [kg]
63	1,25	0,09
80	1,25	0,10
100 [2]	1,25	0,12
112	1,25	0,14
125 [2]	1,25	0,16
140	1,50	0,18
150	1,50	0,20
160 [2]	1,50	0,22
180	1,50	0,24
200 [1] [2]	1,50	0,26
224	1,50	0,28
250 [1] [2]	1,50	0,30
280	1,50	0,33
300	1,50	0,36
315 [1] [2]	1,50	0,38
355	2,00	0,57
400 [1] [2]	2,00	0,64
450	2,00	0,72
500 [1] [2]	2,00	0,80
560	2,00	0,88
600	2,00	0,94
630 [1] [2]	2,00	0,98
710	3,00	1,63
800 [1] [2]	3,00	1,84
900	3,00	2,07
1000 [1] [2]	3,00	2,30
1120	3,00	2,56
1250 [1] [2]	3,00	2,84
1400	3,00	3,20
1500	3,00	3,42
1600	3,00	3,65

[1] Can also be delivered in stainless steel 4404
[2] Can also be delivered in zincmagnesium

Suspension rings UVH30

Technical data

The European test standard EN 1366-1, for fire resistance tests on horizontal ventilation systems, will not allow that the tensile stress of the vertical suspension components exceed the values in the table below:

Type of load	Maximum stresses [N/mm^2]		
	t - 60 min	60 < t - 120 min	120 min < t - 240 min
Tensile stress in all vertically oriented components	9	6	3

According to the rules in the test standards, EN 1366-1, the supporting components can maximum be loaded with the following tensile stress:
Note! The components in the table needs to be tested and certified to be used in a fire rated ventilation duct system. This table only estimates the maximum load for the components.

Type	No fire rating	Fire rated systems		
	t = 0 min [kg]	t 60 min [kg]	60 min < t 120 min [kg]	120 min < t 240 min [kg]
63-125	200	44,7	29,8	14,9
160-315	200	53,7	35,8	17,9
400-630	200	71,6	47,7	23,9
800-1600	200	107,3	71,6	35,8

8.86

Universal-All-Surface-Paint-Aerosol-gb

The following 19 pages are the document exactly as received and checked. It is bookmarked in the PDF.

Reference	
Asset	General
Provided by	Not recorded
Source file	`Universal-All-Surface-Paint-Aerosol-gb.pdf`
Pages	19

•TRUSTED QUALITY SINCE 1921•
RUST-OLEUM®

SAFETY DATA SHEET

Universal All-Surface Paint

SECTION 1: Identification of the substance/mixture and of the company/ undertaking

1.1 Product identifier

Product name : Universal All-Surface Paint

Product description : Aerosol. Paint.

Product type : Aerosol.

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses
Industrial uses Consumer uses Professional uses

Uses advised against	Reason
None identified.	-

1.3 Details of the supplier of the safety data sheet

Rust-Oleum Corporation
Portobello Industrial Estate
Birtley
County Durham
United Kingdom
DH3 2RE
Telephone no.: +44 (0) 191 4106611
Fax no.: +44 (0) 191 4920125

e-mail address of person responsible for this SDS : rpmeurohas@ro-m.com

1.4 Emergency telephone number

Supplier

Telephone number : +44 (0) 207 858 1228

Hours of operation : 24 / 7

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

Product definition : Mixture

Classification according to Regulation (EC) No. 1272/2008 [CLP/GHS]

Aerosol 1, H222, H229
Eye Irrit. 2, H319
STOT SE 3, H336
STOT RE 2, H373
Aquatic Chronic 3, H412

The product is classified as hazardous according to Regulation (EC) 1272/2008 as amended.

See Section 16 for the full text of the H statements declared above.

See Section 11 for more detailed information on health effects and symptoms.

2.2 Label elements

SECTION 2: Hazards identification

Hazard pictograms :



Signal word : Danger

Hazard statements : Extremely flammable aerosol.
Pressurised container: May burst if heated.
Causes serious eye irritation.
May cause drowsiness or dizziness.
May cause damage to organs through prolonged or repeated exposure.
Harmful to aquatic life with long lasting effects.

Precautionary statements

General : P103 - Read label before use.
P102 - Keep out of reach of children.
P101 - If medical advice is needed: Have product container or label at hand.

Prevention : P211 - Do not spray on an open flame or other ignition source.
P271 - Use only outdoors or in a well-ventilated area.
P261 - Avoid breathing vapour or spray.
P210 - Keep away from heat, sparks, open flames and hot surfaces. - No smoking.
P280 - Wear protective gloves and eye protection:
- gloves neoprene safety glasses with side-shields.
P273 - Avoid release to the environment.
P251 - Do not pierce or burn, even after use.

Response : P305 - IF IN EYES:
P351 - Rinse cautiously with water for several minutes.
P338 - Remove contact lenses, if present and easy to do. Continue rinsing.
P337 - If eye irritation persists:
P313 - Get medical attention.
P302 - IF ON SKIN:
P352 - Wash with plenty of soap and water.

Storage : P410 + P412 - Protect from sunlight. Do not expose to temperatures exceeding 50 °C.

Disposal : P501 - Dispose of contents and container in accordance with all local, regional, national and international regulations.

Hazardous ingredients : acetone
hydrocarbons, C9-C12, n-/ iso-/ cyclo-alkanes, aromatics (2-25%)

Supplemental label elements : Repeated exposure may cause skin dryness or cracking.

Annex XVII - Restrictions on the manufacture, placing on the market and use of certain dangerous substances, mixtures and articles : Not applicable.

Special packaging requirements

Containers to be fitted with child-resistant fastenings : Not applicable.

Tactile warning of danger : Yes, applicable.

2.3 Other hazards

Other hazards which do not result in classification : None known.

SECTION 3: Composition/information on ingredients

3.2 Mixtures : Mixture

Product/ingredient name	Identifiers	%	Classification Regulation (EC) No. 1272/2008 [CLP]	Type
liquefied petroleum gas	EC: 270-704-2 CAS: 68476-85-7 Index: 649-202-00-6	≥25 - ≤50	Flam. Gas 1, H220	[2]
acetone	REACH #: 01-2119471330-49 EC: 200-662-2 CAS: 67-64-1 Index: 606-001-00-8	≥10 - ≤25	Flam. Liq. 2, H225 Eye Irrit. 2, H319 STOT SE 3, H336 EUH066	[1] [2]
xylene (mixture of isomeres)	REACH #: 01-2119488216-32 EC: 215-535-7 CAS: 1330-20-7	≤10	Flam. Liq. 3, H226 Acute Tox. 4, H312 Acute Tox. 4, H332 Skin Irrit. 2, H315 Eye Irrit. 2, H319 STOT SE 3, H335 STOT RE 2, H373 Asp. Tox. 1, H304	[1] [2]
hydrocarbons, C9-C12, n-/ iso-/ cyclo-alkanes, aromatics (2-25%)	REACH #: 01-2119458049-33 EC: 919-446-0 CAS: 64742-88-7 Index: 649-330-00-2	≤5	Flam. Liq. 3, H226 STOT SE 3, H336 STOT RE 1, H372 Asp. Tox. 1, H304 Aquatic Chronic 2, H411 EUH066	[1] [2]
n-butyl acetate	REACH #: 01-2119485493-29 EC: 204-658-1 CAS: 123-86-4 Index: 607-025-00-1	≤5	Flam. Liq. 3, H226 STOT SE 3, H336 EUH066	[1] [2]
ethylbenzene	REACH #: 01-2119489370-35 EC: 202-849-4 CAS: 100-41-4 Index: 601-023-00-4	≤3	Flam. Liq. 2, H225 Acute Tox. 4, H332 STOT RE 2, H373 (hearing organs) Asp. Tox. 1, H304 **See Section 16 for the full text of the H statements declared above.**	[1] [2]

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment, are PBTs, vPvBs or Substances of equivalent concern, or have been assigned a workplace exposure limit and hence require reporting in this section.

Type

[1] Substance classified with a health or environmental hazard
[2] Substance with a workplace exposure limit
[3] Substance meets the criteria for PBT according to Regulation (EC) No. 1907/2006, Annex XIII
[4] Substance meets the criteria for vPvB according to Regulation (EC) No. 1907/2006, Annex XIII
[5] Substance of equivalent concern

Occupational exposure limits, if available, are listed in Section 8.

SECTION 4: First aid measures

4.1 Description of first aid measures

General : In all cases of doubt, or when symptoms persist, seek medical attention. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and seek medical advice.

Eye contact : Remove contact lenses, irrigate copiously with clean, fresh water, holding the eyelids apart for at least 10 minutes and seek immediate medical advice.

SECTION 4: First aid measures

Inhalation : Remove to fresh air. Keep person warm and at rest. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel.

Skin contact : Remove contaminated clothing and shoes. Wash skin thoroughly with soap and water or use recognised skin cleanser. Do NOT use solvents or thinners.

Ingestion : If swallowed, seek medical advice immediately and show the container or label. Keep person warm and at rest. Do NOT induce vomiting.

Protection of first-aiders : No action shall be taken involving any personal risk or without suitable training. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation.

4.2 Most important symptoms and effects, both acute and delayed

There are no data available on the mixture itself. The mixture has been assessed following the conventional method of the CLP Regulation (EC) No 1272/2008 and is classified for toxicological properties accordingly. See Sections 2 and 3 for details.

Exposure to component solvent vapour concentrations in excess of the stated occupational exposure limit may result in adverse health effects such as mucous membrane and respiratory system irritation and adverse effects on the kidneys, liver and central nervous system. Symptoms and signs include headache, dizziness, fatigue, muscular weakness, drowsiness and, in extreme cases, loss of consciousness.
Solvents may cause some of the above effects by absorption through the skin. Repeated or prolonged contact with the mixture may cause removal of natural fat from the skin, resulting in non-allergic contact dermatitis and absorption through the skin.
If splashed in the eyes, the liquid may cause irritation and reversible damage.
Ingestion may cause nausea, diarrhea and vomiting.
This takes into account, where known, delayed and immediate effects and also chronic effects of components from short-term and long-term exposure by oral, inhalation and dermal routes of exposure and eye contact.

Over-exposure signs/symptoms

Eye contact : Adverse symptoms may include the following:
pain or irritation
watering
redness

Inhalation : Adverse symptoms may include the following:
respiratory tract irritation
coughing
nausea or vomiting
headache
drowsiness/fatigue
dizziness/vertigo
unconsciousness

Skin contact : Adverse symptoms may include the following:
irritation
dryness
cracking

Ingestion : No specific data.

4.3 Indication of any immediate medical attention and special treatment needed

Notes to physician : Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.

Specific treatments : No specific treatment.

See toxicological information (Section 11)

SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media : Recommended: alcohol-resistant foam, CO_2, powders, water spray.

Unsuitable extinguishing media : Do not use water jet.

5.2 Special hazards arising from the substance or mixture

Hazards from the substance or mixture : Extremely flammable aerosol. In a fire or if heated, a pressure increase will occur and the container may burst, with the risk of a subsequent explosion. Gas may accumulate in low or confined areas or travel a considerable distance to a source of ignition and flash back, causing fire or explosion. Bursting aerosol containers may be propelled from a fire at high speed. Runoff to sewer may create fire or explosion hazard. This material is harmful to aquatic life with long lasting effects. Fire water contaminated with this material must be contained and prevented from being discharged to any waterway, sewer or drain.

Hazardous thermal decomposition products : Decomposition products may include the following materials:
carbon dioxide
carbon monoxide
nitrogen oxides
metal oxide/oxides

5.3 Advice for firefighters

Special protective actions for fire-fighters : Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training. Move containers from fire area if this can be done without risk. Use water spray to keep fire-exposed containers cool.

Special protective equipment for fire-fighters : Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode. Clothing for fire-fighters (including helmets, protective boots and gloves) conforming to European standard EN 469 will provide a basic level of protection for chemical incidents.

Additional information : Pressurised container: May burst if heated. Bursting aerosol containers may be propelled from a fire at high speed. Do not puncture, incinerate or store the container at temperatures above 49°C (120°F) or in direct sunlight.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

For non-emergency personnel : No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. In the case of aerosols being ruptured, care should be taken due to the rapid escape of the pressurised contents and propellant. If a large number of containers are ruptured, treat as a bulk material spillage according to the instructions in the clean-up section. Do not touch or walk through spilt material. Shut off all ignition sources. No flares, smoking or flames in hazard area. Avoid breathing vapour or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.

For emergency responders : If specialised clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".

6.2 Environmental precautions : Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air). Water polluting material. May be harmful to the environment if released in large quantities.

6.3 Methods and material for containment and cleaning up

SECTION 6: Accidental release measures

Small spill : Stop leak if without risk. Move containers from spill area. Use spark-proof tools and explosion-proof equipment. Dilute with water and mop up if water-soluble. Alternatively, or if water-insoluble, absorb with an inert dry material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.

Large spill : Stop leak if without risk. Move containers from spill area. Use spark-proof tools and explosion-proof equipment. Approach the release from upwind. Prevent entry into sewers, water courses, basements or confined areas. Wash spillages into an effluent treatment plant or proceed as follows. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations. Dispose of via a licensed waste disposal contractor. Contaminated absorbent material may pose the same hazard as the spilt product.

6.4 Reference to other sections : See Section 1 for emergency contact information.
See Section 8 for information on appropriate personal protective equipment.
See Section 13 for additional waste treatment information.

SECTION 7: Handling and storage

The information in this section contains generic advice and guidance.

7.1 Precautions for safe handling : Prevent the creation of flammable or explosive concentrations of vapours in air and avoid vapour concentrations higher than the occupational exposure limits.
In addition, the product should only be used in areas from which all naked lights and other sources of ignition have been excluded. Electrical equipment should be protected to the appropriate standard.
Mixture may charge electrostatically: always use earthing leads when transferring from one container to another.
Operators should wear antistatic footwear and clothing and floors should be of the conducting type.
Keep away from heat, sparks and flame. No sparking tools should be used.
Avoid contact with skin and eyes. Avoid the inhalation of dust, particulates, spray or mist arising from the application of this mixture. Avoid inhalation of dust from sanding.
Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed.
Put on appropriate personal protective equipment (see Section 8).
Never use pressure to empty. Container is not a pressure vessel.
Always keep in containers made from the same material as the original one.
Comply with the health and safety at work laws.
Do not allow to enter drains or watercourses.
Information on fire and explosion protection
Vapours are heavier than air and may spread along floors. Vapours may form explosive mixtures with air.

When operators, whether spraying or not, have to work inside the spray booth, ventilation is unlikely to be sufficient to control particulates and solvent vapour in all cases. In such circumstances they should wear a compressed air-fed respirator during the spraying process and until such time as the particulates and solvent vapour concentration has fallen below the exposure limits.

7.2 Conditions for safe storage, including any incompatibilities

Store in accordance with local regulations.
Notes on joint storage
Keep away from: oxidising agents, strong alkalis, strong acids.
Additional information on storage conditions
Observe label precautions. Do not store above the following temperature: 35°C (95°F). Store in a dry, cool and well-ventilated area. Keep away from heat and direct sunlight. Keep away from sources of ignition. No smoking. Prevent unauthorised access. Containers that have been opened must be carefully resealed and kept upright to prevent

SECTION 7: Handling and storage

leakage.

Seveso Directive - Reporting thresholds (in tonnes)

Named substances

Name	Notification and MAPP threshold	Safety report threshold
Liquefied flammable gases, Category 1 or 2 (including LPG) and natural gas	50	200

Danger criteria

Category	Notification and MAPP threshold	Safety report threshold
P3a: Flammable aerosols containing flammable gases or flammable liquids	150	500

7.3 Specific end use(s)

Recommendations : Not available.

Industrial sector specific solutions : Not available.

SECTION 8: Exposure controls/personal protection

The information in this section contains generic advice and guidance. Information is provided based on typical anticipated uses of the product. Additional measures might be required for bulk handling or other uses that could significantly increase worker exposure or environmental releases.

8.1 Control parameters

Occupational exposure limits

Product/ingredient name	Exposure limit values
liquefied petroleum gas	**EH40/2005 WELs (United Kingdom (UK), 12/2011).** STEL: 2180 mg/m³ 15 minutes. STEL: 1250 ppm 15 minutes. TWA: 1750 mg/m³ 8 hours. TWA: 1000 ppm 8 hours.
acetone	**EH40/2005 WELs (United Kingdom (UK), 12/2011).** STEL: 3620 mg/m³ 15 minutes. STEL: 1500 ppm 15 minutes. TWA: 500 ppm 8 hours. TWA: 1210 mg/m³ 8 hours.
xylene (mixture of isomeres)	**EH40/2005 WELs (United Kingdom (UK), 12/2011). Absorbed through skin.** STEL: 441 mg/m³ 15 minutes. STEL: 100 ppm 15 minutes. TWA: 220 mg/m³ 8 hours. TWA: 50 ppm 8 hours.
hydrocarbons, C9-C12, n-/ iso-/ cyclo-alkanes, aromatics (2-25%)	**CEFIC-ESIG (Europe, 1/2011). Notes: Recommended by manufacturer** TWA: 300 mg/m³, ((52 ppm)) 8 hours. Form: Vapour
n-butyl acetate	**EH40/2005 WELs (United Kingdom (UK), 12/2011).** STEL: 966 mg/m³ 15 minutes. STEL: 200 ppm 15 minutes. TWA: 724 mg/m³ 8 hours. TWA: 150 ppm 8 hours.
ethylbenzene	**EH40/2005 WELs (United Kingdom (UK), 12/2011). Absorbed through skin.** STEL: 552 mg/m³ 15 minutes. STEL: 125 ppm 15 minutes. TWA: 441 mg/m³ 8 hours.

SECTION 8: Exposure controls/personal protection

	TWA: 100 ppm 8 hours.

Recommended monitoring procedures : If this product contains ingredients with exposure limits, personal, workplace atmosphere or biological monitoring may be required to determine the effectiveness of the ventilation or other control measures and/or the necessity to use respiratory protective equipment. Reference should be made to monitoring standards, such as the following: European Standard EN 689 (Workplace atmospheres - Guidance for the assessment of exposure by inhalation to chemical agents for comparison with limit values and measurement strategy) European Standard EN 14042 (Workplace atmospheres - Guide for the application and use of procedures for the assessment of exposure to chemical and biological agents) European Standard EN 482 (Workplace atmospheres - General requirements for the performance of procedures for the measurement of chemical agents) Reference to national guidance documents for methods for the determination of hazardous substances will also be required.

DNELs/DMELs

Product/ingredient name	Type	Exposure	Value	Population	Effects
hydrocarbons, C9-C12, n-/ iso-/ cyclo-alkanes, aromatics (2-25%)	DNEL	Long term Dermal	44 mg/kg bw/day	Workers	Systemic
	DNEL	Long term Inhalation	330 mg/m³	Workers	Systemic
	DNEL	Long term Inhalation	71 mg/m³	Consumers	Systemic
	DNEL	Long term Oral, Dermal	26 mg/kg bw/day	Consumers	Systemic
n-butyl acetate	DNEL	Long term Dermal	7 mg/kg bw/day	Workers	Systemic
	DNEL	Long term Oral, Dermal	3,4 mg/kg bw/day	Consumers	Systemic
	DNEL	Short term Inhalation	960 mg/m³	Workers	Systemic
	DNEL	Short term Inhalation	960 mg/m³	Workers	Local
	DNEL	Long term Inhalation	480 mg/m³	Workers	Systemic
	DNEL	Long term Inhalation	480 mg/m³	Workers	Local
	DNEL	Short term Inhalation	859,7 mg/m³	Consumers	Systemic
	DNEL	Short term Inhalation	859,7 mg/m³	Consumers	Local
	DNEL	Long term Inhalation	102,34 mg/m³	Consumers	Systemic
	DNEL	Long term Inhalation	102,34 mg/m³	Consumers	Local

PNECs

Product/ingredient name	Compartment Detail	Value	Method Detail
n-butyl acetate	Fresh water	0,18 mg/l	-
	Marine	0,018 mg/l	-
	Fresh water sediment	0,981 mg/kg	-
	Marine water sediment	0,0981 mg/kg	-
	Soil	0,0903 mg/kg	-
	Sewage Treatment Plant	35,6 mg/l	-

8.2 Exposure controls

SECTION 8: Exposure controls/personal protection

Appropriate engineering controls : Provide adequate ventilation. Where reasonably practicable, this should be achieved by the use of local exhaust ventilation and good general extraction. If these are not sufficient to maintain concentrations of particulates and solvent vapours below the OEL, suitable respiratory protection must be worn.

Individual protection measures

Hygiene measures : Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

Eye/face protection : Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists, gases or dusts. If contact is possible, the following protection should be worn, unless the assessment indicates a higher degree of protection: chemical splash goggles. Recommended: safety glasses with side-shields (EN 166)

Skin protection

Hand protection

There is no one glove material or combination of materials that will give unlimited resistance to any individual or combination of chemicals.
The breakthrough time must be greater than the end use time of the product.
The instructions and information provided by the glove manufacturer on use, storage, maintenance and replacement must be followed.
Gloves should be replaced regularly and if there is any sign of damage to the glove material.
Always ensure that gloves are free from defects and that they are stored and used correctly.
The performance or effectiveness of the glove may be reduced by physical/chemical damage and poor maintenance.
Barrier creams may help to protect the exposed areas of the skin but should not be applied once exposure has occurred.

Gloves : For prolonged or repeated handling, use the following type of gloves:

Recommended: > 8 hours (breakthrough time): neoprene (0.65mm)

The recommendation for the type or types of glove to use when handling this product is based on information from the following source:

EN 374-3 : 2003

The user must check that the final choice of type of glove selected for handling this product is the most appropriate and takes into account the particular conditions of use, as included in the user's risk assessment.

Body protection : Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product. When there is a risk of ignition from static electricity, wear anti-static protective clothing. For the greatest protection from static discharges, clothing should include anti-static overalls, boots and gloves. Refer to European Standard EN 1149 for further information on material and design requirements and test methods. Recommended: disposable overall (EN 1149-1) .

Other skin protection : Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Respiratory protection : Based on the hazard and potential for exposure, select a respirator that meets the appropriate standard or certification. Respirators must be used according to a respiratory protection program to ensure proper fitting, training, and other important aspects of use. Recommended: organic vapour (Type A) and particulate filter (as filter combination A-P2). (EN 140)

Environmental exposure controls : Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

Appearance

Physical state	:	Liquid. [Aerosol.]
Colour	:	Various
Odour	:	Solvent-like [Slight]
Odour threshold	:	Not available.
pH	:	Not available.
Melting point/freezing point	:	Not available.
Initial boiling point and boiling range	:	Not available.
Flash point	:	Closed cup: -70°C
Evaporation rate	:	Not available.
Flammability (solid, gas)	:	Highly flammable in the presence of the following materials or conditions: open flames, sparks and static discharge and heat. Slightly flammable in the presence of the following materials or conditions: shocks and mechanical impacts. In use, may form flammable/explosive vapour-air mixture. Vapour may travel a considerable distance to source of ignition and flash back.
Upper/lower flammability or explosive limits	:	Lower: 0,8% Upper: 13%
Vapour pressure	:	400 kPa [room temperature]
Vapour density	:	>1 [Air = 1]
Relative density	:	0,72 to 0,82
Solubility(ies)	:	Not available.
Partition coefficient: n-octanol/water	:	Not available.
Auto-ignition temperature	:	350°C
Decomposition temperature	:	Not available.
Viscosity	:	Not available.
Explosive properties	:	Highly explosive in the presence of the following materials or conditions: open flames, sparks and static discharge, heat and shocks and mechanical impacts. Pressurised container: protect from sunlight and do not expose to temperature exceeding 50°C. Do not pierce or burn, even after use. Do not puncture, incinerate or store the container at temperatures above 49°C (120°F) or in direct sunlight. Container explosion may occur under fire conditions or when heated. Bursting aerosol containers may be propelled from a fire at high speed.
Oxidising properties	:	Not available.

9.2 Other information

Type of aerosol	:	Spray
Heat of combustion	:	9,746 kJ/g

No additional information.

SECTION 10: Stability and reactivity

10.1 Reactivity : No specific test data related to reactivity available for this product or its ingredients.

10.2 Chemical stability : Stable under recommended storage and handling conditions (see Section 7).

10.3 Possibility of hazardous reactions : Under normal conditions of storage and use, hazardous reactions will not occur.

SECTION 10: Stability and reactivity

10.4 Conditions to avoid : When exposed to high temperatures may produce hazardous decomposition products.

10.5 Incompatible materials : Keep away from the following materials to prevent strong exothermic reactions: oxidising agents, strong alkalis, strong acids.

10.6 Hazardous decomposition products : Under normal conditions of storage and use, hazardous decomposition products should not be produced. If involved in a fire, toxic gases including CO, CO2 and smoke can be generated.

SECTION 11: Toxicological information

11.1 Information on toxicological effects

Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure
acetone	LD50 Oral	Rat	5800 mg/kg	-
xylene (mixture of isomeres)	LC50 Inhalation Gas.	Rat	5000 ppm	4 hours
	LC50 Inhalation Gas.	Rat	6670 ppm	4 hours
	LD50 Oral	Rat	4300 mg/kg	-
	TDLo Dermal	Rabbit	4300 mg/kg	-
hydrocarbons, C9-C12, n-/ iso-/ cyclo-alkanes, aromatics (2-25%)	LC50 Inhalation Vapour	Rat	13,1 mg/l	4 hours
	LD50 Dermal	Rabbit	>3200 mg/kg	-
	LD50 Dermal	Rat	>3400 mg/kg	-
	LD50 Oral	Rat	>5000 mg/kg	-
n-butyl acetate	LC50 Inhalation Vapour	Rat	>21 mg/l	4 hours
	LC50 Inhalation Vapour	Rat	9700 mg/m³	4 hours
	LD50 Dermal	Rabbit	>17600 mg/kg	-
	LD50 Oral	Rat	14000 mg/kg	-
ethylbenzene	LC50 Inhalation Vapour	Rat	50000 mg/m³	2 hours
	LCLo Inhalation Vapour	Rat	4000 ppm	4 hours
	LD50 Oral	Rat	3500 mg/kg	-

Conclusion/Summary : Based on available data, the classification criteria are not met.

Acute toxicity estimates

Not available.

Irritation/Corrosion

Product/ingredient name	Result	Species	Score	Exposure	Observation
acetone	Eyes - Mild irritant	Human	-	186300 parts per million	-
	Eyes - Mild irritant	Rabbit	-	10 microliters	-
	Eyes - Moderate irritant	Rabbit	-	24 hours 20 milligrams	-
	Eyes - Severe irritant	Rabbit	-	20 milligrams	-
	Skin - Mild irritant	Rabbit	-	24 hours 500 milligrams	-
	Skin - Mild irritant	Rabbit	-	395 milligrams	-
xylene (mixture of isomeres)	Eyes - Mild irritant	Rabbit	-	87 milligrams	-
	Eyes - Severe irritant	Rabbit	-	24 hours 5 milligrams	-
	Skin - Mild irritant	Rat	-	8 hours 60 microliters	-
	Skin - Moderate irritant	Rabbit	-	24 hours 500 milligrams	-
	Skin - Moderate irritant	Rabbit	-	100 Percent	-
hydrocarbons, C9-C12, n-/	Skin - Erythema/Eschar	Rabbit	1	-	-

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iso-/ cyclo-alkanes, aromatics (2-25%)					
	Eyes - Cornea opacity	Rabbit	1	-	-
n-butyl acetate	Eyes - Moderate irritant	Rabbit	-	100 milligrams	-
	Skin - Moderate irritant	Rabbit	-	24 hours 500 milligrams	-
	Skin - Primary dermal irritation index (PDII)	Rabbit	0	-	-
	Eyes - Cornea opacity	Rabbit	1	-	-
ethylbenzene	Eyes - Severe irritant	Rabbit	-	500 milligrams	-
	Skin - Mild irritant	Rabbit	-	24 hours 15 milligrams	-

Conclusion/Summary

Skin : Based on available data, the classification criteria are not met.

Eyes : Causes serious eye irritation.

Respiratory : May cause drowsiness or dizziness.
May cause damage to organs through prolonged or repeated exposure if inhaled.

Sensitisation

Product/ingredient name	Route of exposure	Species	Result
hydrocarbons, C9-C12, n-/ iso-/ cyclo-alkanes, aromatics (2-25%)	skin	Rabbit	Not sensitizing

Conclusion/Summary

Skin : Based on available data, the classification criteria are not met.

Respiratory : Based on available data, the classification criteria are not met.

Mutagenicity

Product/ingredient name	Test	Experiment	Result
hydrocarbons, C9-C12, n-/ iso-/ cyclo-alkanes, aromatics (2-25%)	OECD 471,473,474, 475,479	Subject: Bacteria	Negative

Conclusion/Summary : Based on available data, the classification criteria are not met.

Carcinogenicity

Conclusion/Summary : Based on available data, the classification criteria are not met.

Reproductive toxicity

Conclusion/Summary : Based on available data, the classification criteria are not met.

Teratogenicity

Conclusion/Summary : Based on available data, the classification criteria are not met.

Specific target organ toxicity (single exposure)

Product/ingredient name	Category	Route of exposure	Target organs
acetone	Category 3	Not applicable.	Narcotic effects
xylene (mixture of isomeres)	Category 3	Not applicable.	Respiratory tract irritation
hydrocarbons, C9-C12, n-/ iso-/ cyclo-alkanes, aromatics (2-25%)	Category 3	Not applicable.	Narcotic effects
n-butyl acetate	Category 3	Not applicable.	Narcotic effects

Specific target organ toxicity (repeated exposure)

SECTION 11: Toxicological information

Product/ingredient name	Category	Route of exposure	Target organs
xylene (mixture of isomeres)	Category 2	Not determined	Not determined
hydrocarbons, C9-C12, n-/ iso-/ cyclo-alkanes, aromatics (2-25%)	Category 1	Not determined	Not determined
ethylbenzene	Category 2	Not determined	hearing organs

Aspiration hazard

Product/ingredient name	Result
xylene (mixture of isomeres)	ASPIRATION HAZARD - Category 1
hydrocarbons, C9-C12, n-/ iso-/ cyclo-alkanes, aromatics (2-25%)	ASPIRATION HAZARD - Category 1
ethylbenzene	ASPIRATION HAZARD - Category 1

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Short term exposure

Potential immediate effects : Not available.

Potential delayed effects : Not available.

Long term exposure

Potential immediate effects : Not available.

Potential delayed effects : Not available.

Potential chronic health effects

Not available.

Conclusion/Summary : Based on available data, the classification criteria are not met.

General : May cause damage to organs through prolonged or repeated exposure. Prolonged or repeated contact can defat the skin and lead to irritation, cracking and/or dermatitis.

Carcinogenicity : No known significant effects or critical hazards.

Mutagenicity : No known significant effects or critical hazards.

Teratogenicity : No known significant effects or critical hazards.

Developmental effects : No known significant effects or critical hazards.

Fertility effects : No known significant effects or critical hazards.

Other information : Not available.

SECTION 12: Ecological information

12.1 Toxicity

There are no data available on the mixture itself.
Do not allow to enter drains or watercourses.

The mixture has been assessed following the summation method of the CLP Regulation (EC) No 1272/2008 and is classified for eco-toxicological properties accordingly. See Sections 2 and 3 for details.

Product/ingredient name	Result	Species	Exposure
acetone	Acute LC50 8,64 to 8098 mg/l Fresh water	Crustaceans - Ceriodaphnia dubia - Neonate	48 hours
	Acute LC50 7,88 to 7280 mg/l Fresh water	Fish - Pimephales promelas	96 hours
hydrocarbons, C9-C12, n-/ iso-/ cyclo-alkanes, aromatics (2-25%)	Acute EC50 10 to 22 mg/l	Daphnia spec.	48 hours
	Acute IC50 4,6 to 10 mg/l	Algae - Pseudokirchneriella subcapitata	72 hours

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	Acute LC50 10 to 30 mg/l	Fish	96 hours
	Acute NOEC 1 mg/l	Algae - Pseudokirchneriella subcapitata	72 hours
n-butyl acetate	Acute EC10 956 mg/l	Bacteria - Pseudomonas putida	18 hours
	Acute EC50 648 mg/l	Algae - Desmodesmus subspicatus	72 hours
	Acute LC50 32 mg/l Marine water	Crustaceans - Artemia salina - Nauplii	48 hours
	Acute LC50 18 mg/l Fresh water	Fish - Pimephales promelas	96 hours
	Acute LC50 62 mg/l	Fish - Danio rerio	96 hours
ethylbenzene	Acute EC50 3600 µg/l Fresh water	Algae - Pseudokirchneriella subcapitata	96 hours
	Acute EC50 9,46 to 6530 µg/l Fresh water	Crustaceans - Artemia sp. - Nauplii	48 hours
	Acute EC50 4,4 to 2970 µg/l Fresh water	Daphnia spec. - Daphnia magna - Neonate	48 hours
	Acute LC50 13,7 to 8780 µg/l Fresh water	Crustaceans - Artemia sp. - Nauplii	48 hours
	Acute LC50 5200 µg/l Marine water	Crustaceans - Americamysis bahia	48 hours
	Acute LC50 11 to 9090 µg/l Fresh water	Fish - Pimephales promelas	96 hours
	Acute LC50 4200 µg/l Fresh water	Fish - Oncorhynchus mykiss	96 hours
	Chronic NOEC 1000 µg/l Fresh water	Algae - Pseudokirchneriella subcapitata	96 hours

Conclusion/Summary : Harmful to aquatic life with long lasting effects.

12.2 Persistence and degradability

Product/ingredient name	Test	Result	Dose	Inoculum
xylene (mixture of isomeres)	-	90 % - Readily - 5 days	-	-
hydrocarbons, C9-C12, n-/iso-/ cyclo-alkanes, aromatics (2-25%)	-	74,7 % - Readily - 28 days	-	-
n-butyl acetate	-	90 % - Readily - 28 days	-	-

Conclusion/Summary : This product has not been tested for biodegradation. Based on available data, the classification criteria are not met.

Product/ingredient name	Aquatic half-life	Photolysis	Biodegradability
acetone	-	-	Readily
xylene (mixture of isomeres)	-	-	Readily
hydrocarbons, C9-C12, n-/iso-/ cyclo-alkanes, aromatics (2-25%)	-	-	Readily
n-butyl acetate	-	-	Readily
ethylbenzene	-	-	Readily

12.3 Bioaccumulative potential

Product/ingredient name	$LogP_{ow}$	BCF	Potential
acetone	-0,23	-	low
xylene (mixture of isomeres)	3,12	8.1 to 25.9	low
n-butyl acetate	2,3	10	low
ethylbenzene	3,6	-	low

12.4 Mobility in soil

Soil/water partition coefficient (K_{OC}) : Not available.

SECTION 12: Ecological information

Mobility : Volatile. This product is likely to volatilise rapidly into the air because of its high vapour pressure.

12.5 Results of PBT and vPvB assessment

PBT : Not applicable.

vPvB : Not applicable.

12.6 Other adverse effects : No known significant effects or critical hazards.

SECTION 13: Disposal considerations

The information in this section contains generic advice and guidance.

13.1 Waste treatment methods

Product

Methods of disposal : The generation of waste should be avoided or minimised wherever possible. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction.

Hazardous waste : Yes.

Disposal considerations : Do not allow to enter drains or watercourses.
Dispose of according to all federal, state and local applicable regulations.
If this product is mixed with other wastes, the original waste product code may no longer apply and the appropriate code should be assigned.
For further information, contact your local waste authority.

European waste catalogue (EWC)

The European Waste Catalogue classification of this product, when disposed of as waste, is:

Waste code	Waste designation
20 01 27*	paint, inks, adhesives and resins containing hazardous substances

Packaging

Methods of disposal : The generation of waste should be avoided or minimised wherever possible. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible.

Disposal considerations : Using information provided in this safety data sheet, advice should be obtained from the relevant waste authority on the classification of empty containers.
Empty containers must be scrapped or reconditioned.
Dispose of containers contaminated by the product in accordance with local or national legal provisions.

Special precautions : This material and its container must be disposed of in a safe way. Care should be taken when handling emptied containers that have not been cleaned or rinsed out. Empty containers or liners may retain some product residues. Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers.

SECTION 14: Transport information

SECTION 14: Transport information

	ADR/RID	ADN	IMDG	IATA
14.1 UN number	UN1950	UN1950	UN1950	UN1950
14.2 UN proper shipping name	AEROSOLS, Flammable [Limited quantity]	AEROSOLS, Flammable [Limited quantity]	AEROSOLS, Flammable [Limited quantity]	AEROSOLS, Flammable
14.3 Transport hazard class(es)	2	2	2.1	2.1 
14.4 Packing group	-	-	-	-
14.5 Environmental hazards	No.	No.	No.	No.
Additional information	**Limited quantity:** LQ2 **Remarks:** (≤ 1L:) Limited Quantity - ADR/IMDG 3.4 ADR Tunnel code: (D)	-	**Emergency schedules (EmS):** F-D + S-U **Remarks:** Limited Quantity - ADR/IMDG 3.4	**Passenger and Cargo Aircraft** Quantity limitation: 75 kg Packaging instructions: 203 **Cargo Aircraft Only** Quantity limitation: 150 kg Packaging instructions: 203 **Limited Quantities - Passenger Aircraft** Quantity limitation: 30 kg Packaging instructions: Y 203

14.6 Special precautions for user : **Transport within user's premises:** always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.

SECTION 15: Regulatory information

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture

EU Regulation (EC) No. 1907/2006 (REACH)

Annex XIV - List of substances subject to authorisation

Annex XIV

None of the components are listed.

Substances of very high concern

None of the components are listed.

Annex XVII - Restrictions on the manufacture, placing on the market and use of certain dangerous substances, mixtures and articles : Not applicable.

SECTION 15: Regulatory information

Other EU regulations

VOC for Ready-for-Use Mixture : Not applicable.

Europe inventory : All components are listed or exempted.

Industrial emissions (integrated pollution prevention and control) - Air : Listed

Ozone depleting substances (1005/2009/EU)

Not listed.

Prior Informed Consent (PIC) (649/2012/EU)

Not listed.

Aerosol dispensers :

3



Extremely flammable

Seveso Directive

This product is controlled under the Seveso Directive.

Named substances

Name
Liquefied flammable gases, Category 1 or 2 (including LPG) and natural gas

Danger criteria

Category
P3a: Flammable aerosols containing flammable gases or flammable liquids

National regulations

The information contained in this safety data sheet does not constitute the user's own assessment of workplace risks, as required by other health and safety legislation. The provisions of the national health and safety at work regulations apply to the use of this product at work.

Product/ingredient name	List name	Name on list	Classification	Notes
liquefied petroleum gas	UK Occupational Exposure Limits EH40 - WEL	liquefied petroleum gas; LPG	Carc.	-

References : EH40/2005 Workplace exposure limits
Conforms to Regulation (EC) No. 1907/2006 (REACH), Annex II, as amended by Regulation (EU) No. 2015/830

International regulations

Chemical Weapon Convention List Schedules I, II & III Chemicals

Not listed.

Montreal Protocol (Annexes A, B, C, E)

Not listed.

Stockholm Convention on Persistent Organic Pollutants

SECTION 15: Regulatory information

Not listed.

Rotterdam Convention on Prior Informed Consent (PIC)

Not listed.

UNECE Aarhus Protocol on POPs and Heavy Metals

Not listed.

CN code : 3208 10 90

UFI Code : MS00-E0WD-E00R-CMA7

International lists

National inventory

Australia	: Not determined.
Canada	: Not determined.
China	: At least one component is not listed.
Japan	: **Japan inventory (ENCS)**: Not determined. **Japan inventory (ISHL)**: Not determined.
Malaysia	: Not determined.
New Zealand	: Not determined.
Philippines	: At least one component is not listed.
Republic of Korea	: At least one component is not listed.
Taiwan	: Not determined.
Turkey	: Not determined.
United States	: Not determined.

15.2 Chemical safety assessment : No Chemical Safety Assessment has been carried out.

SECTION 16: Other information

Indicates information that has changed from previously issued version.

Abbreviations and acronyms : ATE = Acute Toxicity Estimate
CLP = Classification, Labelling and Packaging Regulation [Regulation (EC) No. 1272/2008]
DMEL = Derived Minimal Effect Level
DNEL = Derived No Effect Level
EUH statement = CLP-specific Hazard statement
PBT = Persistent, Bioaccumulative and Toxic
PNEC = Predicted No Effect Concentration
RRN = REACH Registration Number
vPvB = Very Persistent and Very Bioaccumulative

Procedure used to derive the classification according to Regulation (EC) No. 1272/2008 [CLP/GHS]

Classification	Justification
Aerosol 1, H222, H229	Expert judgment
Eye Irrit. 2, H319	Expert judgment
STOT SE 3, H336	Expert judgment
STOT RE 2, H373	Expert judgment
Aquatic Chronic 3, H412	Expert judgment

Full text of H-phrases referred to in sections 2 and 3

SECTION 16: Other information

Full text of abbreviated H statements :

H220	Extremely flammable gas.
H222, H229	Extremely flammable aerosol. Pressurised container: May burst if heated.
H225	Highly flammable liquid and vapour.
H226	Flammable liquid and vapour.
H304	May be fatal if swallowed and enters airways.
H312	Harmful in contact with skin.
H315	Causes skin irritation.
H319	Causes serious eye irritation.
H332	Harmful if inhaled.
H335	May cause respiratory irritation.
H336	May cause drowsiness or dizziness.
H372	Causes damage to organs through prolonged or repeated exposure.
H373	May cause damage to organs through prolonged or repeated exposure.
H411	Toxic to aquatic life with long lasting effects.
H412	Harmful to aquatic life with long lasting effects.

Full text of classifications [CLP/GHS] :

Acute Tox. 4, H312	ACUTE TOXICITY (dermal) - Category 4
Acute Tox. 4, H332	ACUTE TOXICITY (inhalation) - Category 4
Aerosol 1, H222, H229	AEROSOLS - Category 1
Aquatic Chronic 2, H411	LONG-TERM AQUATIC HAZARD - Category 2
Aquatic Chronic 3, H412	LONG-TERM AQUATIC HAZARD - Category 3
Asp. Tox. 1, H304	ASPIRATION HAZARD - Category 1
EUH066	Repeated exposure may cause skin dryness or cracking.
Eye Irrit. 2, H319	SERIOUS EYE DAMAGE/EYE IRRITATION - Category 2
Flam. Gas 1, H220	FLAMMABLE GASES - Category 1
Flam. Liq. 2, H225	FLAMMABLE LIQUIDS - Category 2
Flam. Liq. 3, H226	FLAMMABLE LIQUIDS - Category 3
Skin Irrit. 2, H315	SKIN CORROSION/IRRITATION - Category 2
STOT RE 1, H372	SPECIFIC TARGET ORGAN TOXICITY - REPEATED EXPOSURE - Category 1
STOT RE 2, H373	SPECIFIC TARGET ORGAN TOXICITY - REPEATED EXPOSURE - Category 2
STOT SE 3, H335	SPECIFIC TARGET ORGAN TOXICITY - SINGLE EXPOSURE (Respiratory tract irritation) - Category 3
STOT SE 3, H336	SPECIFIC TARGET ORGAN TOXICITY - SINGLE EXPOSURE (Narcotic effects) - Category 3

Date of printing : 28/11/2017

Date of issue/ Date of revision : 23/11/2017

Date of previous issue : 23/11/2017

Version : 4

Notice to reader

The information in this Safety Data Sheet is based on the present state of knowledge and current legislation. It provides guidance on health, safety and environmental aspects of the product and should not be construed as any guarantee of technical performance or suitability for particular applications. The product should not be used for purposes other than those shown in Section 1 without first referring to the supplier and obtaining written handling instructions. As the specific conditions of use of the product are outside the supplier's control, the user is responsible for ensuring that the requirements of relevant legislation are complied with. The information contained in this safety data sheet does not constitute the user's own assessment of workplace risks, as required by other health and safety legislation.

8.87

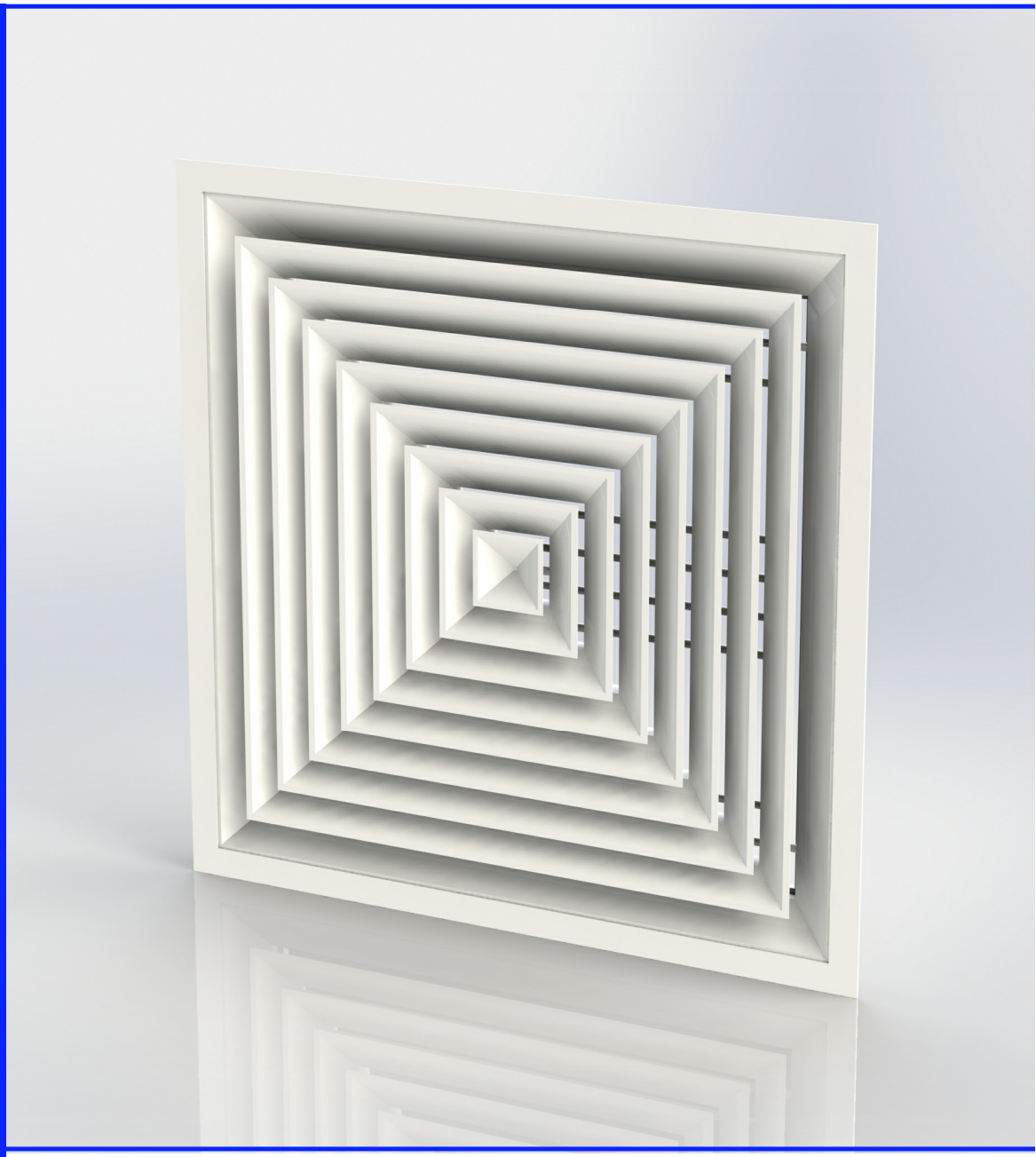
SG-TYPE B product datasheet

The following 20 pages are the document exactly as received and checked. It is bookmarked in the PDF.

Reference	HEN0203-SGTYPEB-DS
Asset	SG-TYPE B
Provided by	Ventilation Direct Ltd
Source file	Vent Direct - CD - February 2017.pdf
Pages	20

Series CD
Louvre faced ceiling diffusers

- Consistently popular diffuser used in countless installations worldwide
- Effective diffusion characteristics for maximum mixing of resident and supplied air
- High quality extruded aluminium construction
- Popular sizes held in stock for immediate despatch



CD: February 2017

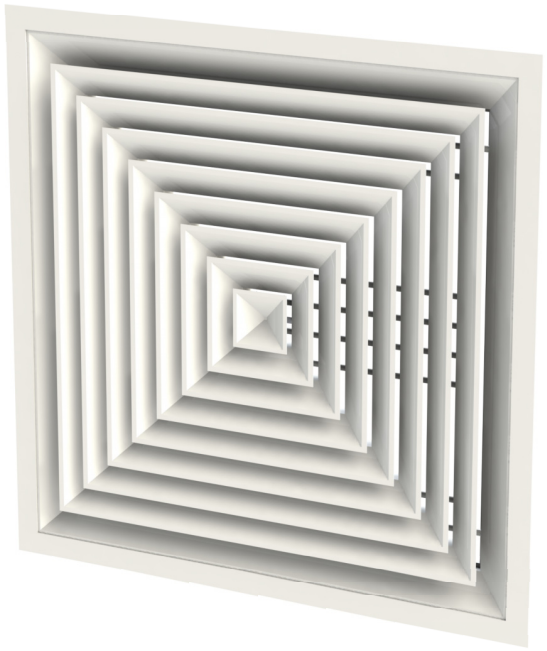
Series CD

Used in countless installations throughout the world, louvre faced ceiling diffusers are a consistently popular product, well regarded due to their architectural appearance and high performance diffusion characteristics.

Vent Direct Series CD ceiling diffusers make use of lightweight aluminium extrusions with fully mitred corners, and are of a higher quality than many cheaper pressed units.

We hold large quantities of popular sizes of CD4 in stock, giving us the capability to supply even the largest orders on a next day basis.

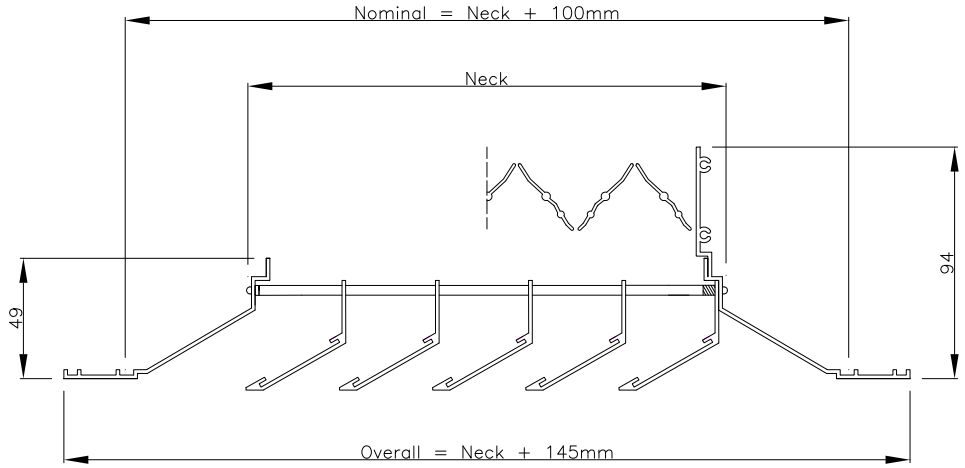
For non standard sizes, units are manufactured to order in any size and with any blow pattern.

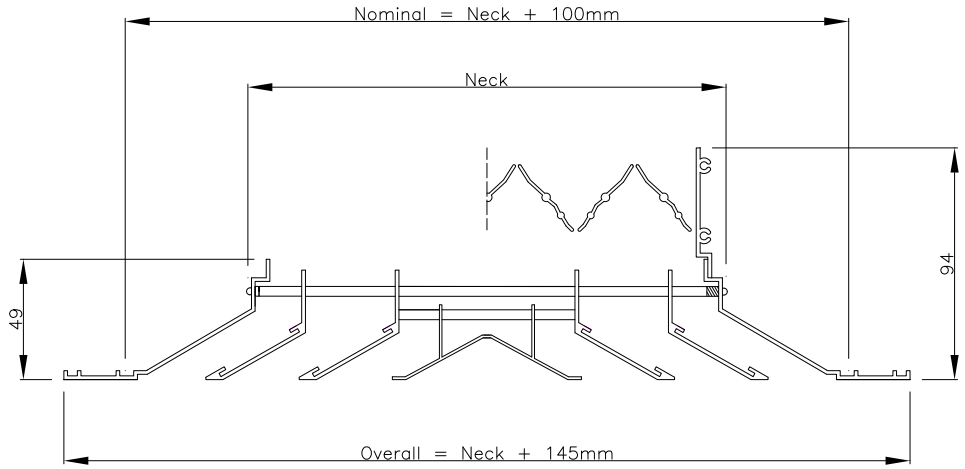


Design features

Material	Extruded aluminium frame and blades
Construction	Fully welded with pressed in corners in frames
	Blade rings crimped onto aluminium tubes
Sizes	Minimum: 150mm x 150mm
	Maximum single unit: 2900mm x 2900mm
	Important note: Unless stated Series CD diffuser sizes relate to the diffuser neck, not the nominal. Please see page 3 for more details.
Fixings	Standard: None
	Optional: Countersunk face fixing holes
Finish	Standard: Mill aluminium
	Optional: See page 18
	Stock units are powder coated RAL9010
Mass/m² face area	8.5 kg
	16 kg including opposed blade damper

Technical drawings



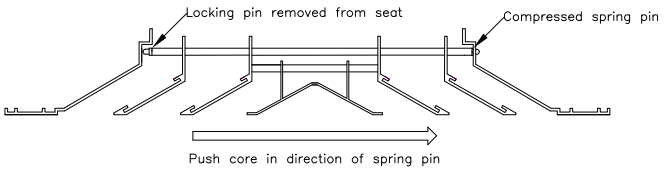


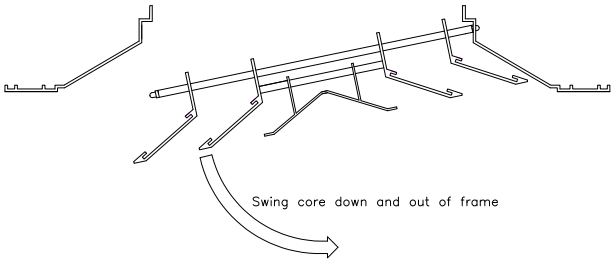
Removable cores

Series CD louvre faced diffusers are equipped with removable cores on all units below or equal to 650mm x 650mm neck size. Cores are removable by pushing the core to one side to compress spring pins.

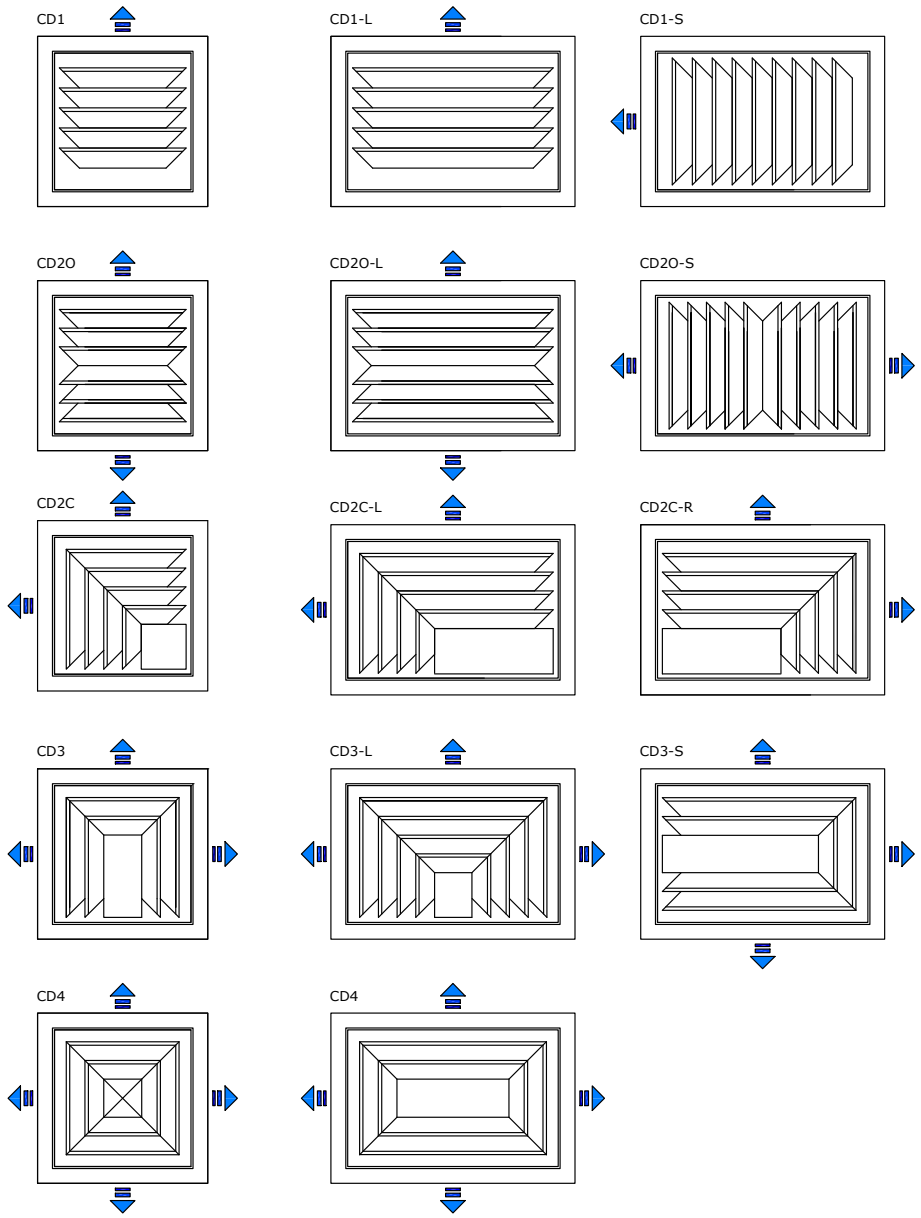
Above this size, cores will be fixed into the outer frame for safety.

All removable cores are equipped with safety wire to prevent the core being able to fall away from the outer frame entirely.





Core formats



Stocked sizes

The following sizes of Series CD4 louvre faced diffusers are held in stock, with and without fitted opposed blade dampers, and in RAL9010 finish, available for immediate despatch.

150mm²
200mm²
225mm²
250mm²
300mm²
350mm² (495mm² overall face size tile replacer)
375mm²
450mm² (595mm² overall face size tile replacer)

All sizes are neck unless stated.

Product codes: CD4 - RAL9010
(diffuser only)

CD4 - D - RAL9010
(diffuser complete with fitted opposed blade damper)

Options

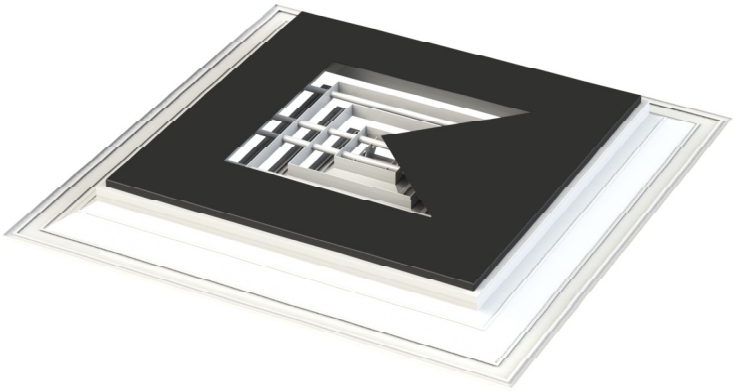
Neck reducer / blanking plates

Neck reducer / blanking plates are required when the necessary size and design of a unit does not match the required performance.

For example:

An installation demands the use of tile replacer (595mm x 595mm overall) size CD4 diffusers, but the actual required performance is closer to that of a 250mm x 250mm CD3 (3 way blow).

A blanking plate as shown here will be manufactured to the required size and pattern and will be factory fitted to the rear of the diffuser, giving both the required appearance and performance.



Fixings

Countersunk face fixing holes - FH

5.7mm countersunk fixing holes will be punched into the diffuser frame before powder coating, allowing quick and easy fitting on site.

Number and layout of fixing holes will be appropriate to diffuser size. Arrangements can be specified.

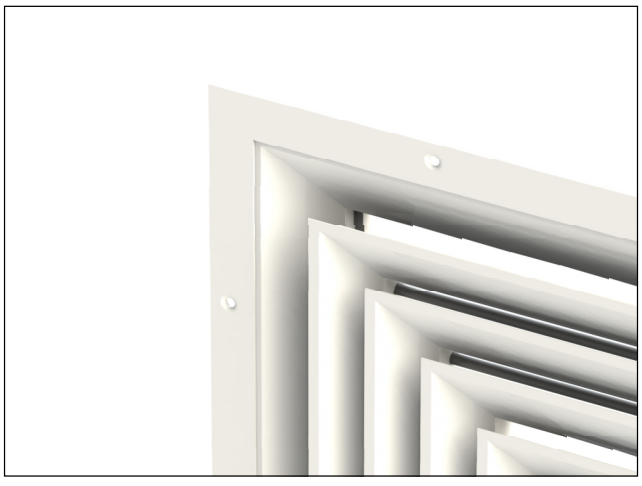
Supplied with pozidrive self tapping screws in the same finish as the diffuser.

Burgess tile - BT

The diffuser will be factory fitted into a burgess tile.

Fitting involves clipping the tile into place in a prefitted burgess clip system.

CD diffusers can be fitted into other ceiling tile systems. Please contact us for more information and to discuss your requirements.





Selection data - CD1 and CD1-S

CD1							
SIZE(w x h)	**AK m sq.**	**NECK VELOCITY m/s**	**1.5**	**2**	**2.5**	**3**	**3.5**
		Total Pd mm w.g.	**0.9**	**1.5**	**2.3**	**3.3**	**4.3**
150 x 150	0.0097	m cub/sec	0.0361	0.0472	0.0597	0.0708	0.0833
		Throw min-max (m)	0.9 - 2.4	1.2 - 2.8	1.5 - 3.0	2.2 - 3.4	2.5 - 3.7
		Noise (dB)			20	24	28
225 x 225	0.0219	m cub/sec	0.0805	0.1069	0.1319	0.1611	0.1861
		Throw min-max (m)	1.5 - 3.7	2.1 - 4.3	2.4 - 4.6	3.1 - 5.2	3.7 - 5.5
		Noise (dB)		20	25	29	32
300 x 300	0.039	m cub/sec	0.1416	0.1888	0.2361	0.2833	0.3305
		Throw min-max (m)	2.2 - 4.9	2.8 - 5.5	3.4 - 6.4	4.0 - 6.7	4.6 - 7.3
		Noise (dB)		23	28	32	35
375 x 375	0.0609	m cub/sec	0.2222	0.2958	0.368	0.4444	0.5166
		Throw min-max (m)	2.5 - 6.1	3.4 - 7.0	4.3 - 8.0	4.9 - 8.6	5.8 - 9.2
		Noise (dB)		25	30	34	37

CD1-S							
SIZE(w x h)	**AK m sq.**	**NECK VELOCITY m/s**	**1.5**	**2**	**2.5**	**3**	**3.5**
		Total Pd mm w.g.	**0.9**	**1.5**	**2.3**	**3.3**	**4.3**
225 x 150	0.0147	m cub./sec.	0.0541	0.0708	0.0902	0.1069	0.125
		Throw min-max (m)	1.8 - 4.3	2.4 - 4.9	3.0 - 5.5	3.3 - 5.8	3.9 - 6.4
		Noise (dB)			23	27	30
300 x 225	0.0292	m cub./sec.	0.1083	0.1416	0.1791	0.2125	0.25
		Throw min-max (m)	2.4 - 5.8	3.3 - 6.7	3.9 - 7.6	4.9 - 8.6	5.8 - 9.2
		Noise (dB)		22	27	30	34
375 x 300	0.0487	m cub/sec	0.1777	0.2361	0.2958	0.3541	0.4138
		Throw min-max (m)	3.1 - 7.6	4.3 - 8.8	5.2 - 9.8	6.4 - 10.9	7.3 - 11.6
		Noise (dB)		24	29	33	36

Selection data - CD1-L

CD1-L							
SIZE(w x h)	**AK m sq.**	**NECK VELOCITY m/s**	**1.5**	**2**	**2.5**	**3**	**3.5**
		Total Pd mm wg	**0.9**	**1.5**	**2.3**	**3.3**	**4.3**
225 x 150	0.0147	m cub/sec	0.0541	0.0708	0.0902	0.1069	0.125
		Throw min-max (m)	1.8 - 4.3	2.4 - 4.9	3.0 - 5.5	3.3 - 5.8	4.0 - 6.4
		Noise (dB)			23	27	30
300 x 150	0.0195	m cub/sec	0.0708	0.0944	0.118	0.1416	0.1652
		Throw min-max (m)	2.2 - 4.9	2.8 - 5.5	3.4 - 6.4	4.0 - 6.7	4.6 - 7.3
		Noise (dB)			24	28	32
375 x 150	0.0244	m cub/sec	0.0902	0.118	0.1486	0.1777	0.2083
		Throw min-max (m)	2.2 - 5.5	3.0 - 6.4	3.7 - 7.0	4.6 - 7.6	5.2 - 8.3
		Noise (dB)		20	26	29	33
450 x 150	0.0292	m cub/sec	0.1083	0.1416	0.1791	0.2125	0.25
		Throw min-max (m)	2.5 - 5.8	3.4 - 6.7	4.0 - 7.6	4.9 - 8.6	5.8 - 9.2
		Noise (dB)		22	27	30	34
300 x 225	**0.0292**	**m cub/sec**	0.1083	0.1416	0.1791	0.2125	0.25
		Throw min-max (m)	2.5 - 5.8	3.4 - 6.7	4.0 - 7.6	4.9 - 8.6	5.8 - 9.2
		Noise (dB)		22	27	30	34
375 x 225	**0.0367**	**m cub/sec**	0.1319	0.1763	0.2222	0.2666	0.3125
		Throw min-max (m)	2.8 - 6.7	3.7 - 7.6	4.6 - 8.6	5.5 - 9.5	6.4 - 10.0
		Noise (dB)		22	27	32	35
525 x 225	**0.0511**	**m cub/sec**	0.1861	0.2486	0.3097	0.3708	0.4319
		Throw min-max (m)	3.4 - 8.0	4.3 - 9.2	5.5 - 10.0	6.4 - 11.0	7.7 - 11.9
		Noise (dB)		24	29	33	37
375 x 300	**0.0487**	**m cub/sec**	0.1777	0.2361	0.2958	0.3541	0.4138
		Throw min-max (m)	3.1 - 7.6	4.3 - 8.9	5.2 - 9.8	6.4 - 11.0	7.3 - 11.6
		Noise (dB)		24	29	33	36
450 x 300	**0.0585**	**m cub/sec**	0.2125	0.2833	0.3541	0.425	0.4958
		Throw min-max (m)	3.4 - 8.6	4.6 - 9.8	5.8 - 11.0	7.1 - 11.9	8.0 - 12.8
		Noise (dB)		25	30	33	37
525 x 300	**0.0683**	**m cub/sec**	0.2486	0.3305	0.4138	0.4958	0.5791
		Throw min-max (m)	3.7 - 9.2	4.9 - 10.4	6.1 - 11.6	7.4 - 12.8	8.9 - 13.7
		Noise (dB)	20	26	30	34	37

Selection data - CD2O and CD2O-S

CD2O							
SIZE	**AK m sq.**	**NECK VELOCITYm/s**	**1.5**	**2**	**2.5**	**3**	**3.5**
		Total Pd mm wg	**0.9**	**1.5**	**2.3**	**3.3**	**4.3**
150 x 150	**0.0097**	**m cub/sec**	0.0361	0.0472	0.0597	0.0708	0.0833
		Throw min-max (m)	0.9 - 2.4	1.2 - 2.8	1.5 - 3.0	2.2 - 3.4	2.5 - 3.7
		Noise (dB)			20	24	28
225 x 225	**0.0219**	**m cub/sec**	0.0805	0.1069	0.1319	0.1611	0.1861
		Throw min-max (m)	1.5 - 3.7	2.1 - 4.3	2.4 - 4.6	3.1 - 5.2	3.7 - 5.5
		Noise (dB)		20	25	29	32
300 x 300	**0.039**	**m cub/sec**	0.1416	0.1888	0.2361	0.2833	0.3305
		Throw min-max (m)	2.2 - 4.9	2.8 - 5.5	3.4 - 6.4	4.0 - 6.7	4.6 - 7.3
		Noise (dB)		23	28	32	35
375 x 375	**0.0609**	**m cub/sec**	0.2222	0.2958	0.368	0.4444	0.5166
		Throw min-max (m)	2.5 - 6.1	3.4 - 7.0	4.3 - 8.0	4.9 - 8.6	5.8 - 9.2
		Noise (dB)		25	30	34	37
450 x 450	**0.0878**	**m cub./sec.**	0.3194	0.425	0.5319	0.6375	0.7444
		Throw min-max (m)	3.1 - 7.3	4.0 - 8.6	4.9 - 9.5	6.1	7.1 - 11.0
		Noise (dB)	21	27	32	35	39
525 x 525	**0.12**	**m cub./sec.**	0.4347	0.5791	0.7222	0.8694	1.0138
		Throw min-max (m)	3.4 - 8.6	4.6 - 9.8	5.8 - 11.0	7.1 - 11.9	8.3 - 12.8
		Noise (dB)	22	28	34	37	41

CD2O-S							
SIZE	**AK m sq.**	**NECK VELOCITYm/s**	**1.5**	**2**	**2.5**	**3**	**3.5**
		Total Pd mm wg	**0.9**	**1.5**	**2.3**	**3.3**	**4.3**
225 x 150	**0.0097**	**m cub/sec**	0.0361	0.0472	0.0597	0.0708	0.0833
		Throw min-max (m)	0.9 - 2.4	1.2 - 2.8	1.5 - 3.0	2.2 - 3.4	2.5 - 3.7
		Noise (dB)			20	24	28
300 x 150	**0.0195**	**m cub/sec**	0.0708	0.0944	0.118	0.1416	0.1652
		Throw min-max (m)	1.5 - 4.3	1.8 - 4.0	2.4 - 4.3	2.7 - 4.9	3.3 - 5.2
		Noise (dB)			24	28	32
300 x 225	**0.0292**	**m cub/sec**	0.1083	0.1416	0.1791	0.2125	0.25
		Throw min-max (m)	1.8 - 4.3	2.4 - 4.9	3.0 - 5.5	3.3 - 5.8	3.9 - 6.4
		Noise (dB)		22	27	30	34
375 x 225	**0.0367**	**m cub/sec**	0.1319	0.1777	0.2222	0.2666	0.3125
		Throw min-max (m)	1.8 - 4.6	2.4 - 5.5	3.3 - 6.1	3.9 - 6.7	4.5 - 7.3
		Noise (dB)		22	27	32	35
375 x 300	**0.0487**	**m cub./sec.**	0.1777	0.2361	0.2958	0.3541	0.4138
		Throw min-max (m)	2.8 - 5.5	3.2 - 6.4	4.0 - 7.0	4.6 - 8.0	5.2 - 8.6
		Noise (dB)		24	29	33	36

Selection data - CD2O-L

CD2O-L							
SIZE	**AK m sq.**	**NECK VELOCITY m/s**	**1.5**	**2**	**2.5**	**3**	**3.5**
		Total Pd mm wg	**0.9**	**1.5**	**2.3**	**3.3**	**4.3**
225 x 150	**0.0147**	**m cub/sec**	0.0541	0.0708	0.0902	0.1069	0.125
		Throw min-max (m)	1.2 - 3.1	1.5 - 3.4	2.1 - 4.0	2.4 - 4.2	2.7 - 4.6
		Noise (dB)			23	27	30
300 x 150	**0.0195**	**m cub/sec**	0.0708	0.0944	0.118	0.1416	0.1652
		Throw min-max (m)	1.5 - 3.4	1.8 - 4.0	2.4 - 4.3	2.7 - 4.9	3.3 - 5.2
		Noise (dB)			24	28	32
375 x 150	**0.0244**	**m cub/sec**	0.0902	0.118	0.1486	0.1777	0.2083
		Throw min-max (m)	1.5 - 4.3	2.1 - 4.9	2.7 - 5.2	3.0 - 5.8	3.6 - 6.4
		Noise (dB)		20	26	29	33
450 x 150	**0.0292**	**m cub/sec**	0.1083	0.1416	0.1791	0.2125	0.25
		Throw min-max (m)	1.8 - 4.3	2.4 - 4.9	3.0 - 5.5	3.3 - 5.8	4.0 - 6.4
		Noise (dB)		22	27	30	34
300 x 225	**0.0292**	**m cub./sec.**	0.1083	0.1416	0.1791	0.2125	0.25
		Throw min-max (m)	1.8 - 4.3	2.4 - 4.9	3.0 - 5.5	3.3 - 5.8	4.0 - 6.4
		Noise (dB)		22	27	30	34
375 x 225	**0.0367**	**m cub./sec.**	0.1319	0.1763	0.2222	0.2666	0.3125
		Throw min-max (m)	1.8 - 4.6	2.4 - 5.5	3.4 - 6.1	4.0 - 6.7	4.6 - 7.4
		Noise (dB)		22	27	32	35
525 x 225	**0.0511**	**m cub./sec.**	0.1861	0.2486	0.3097	0.3708	0.4319
		Throw min-max (m)	2.8 - 5.5	3.1 - 6.4	4.0 - 7.0	4.6 - 8.0	5.2 - 8.6
		Noise (dB)		24	29	33	37
375 x 300	**0.0487**	**m cub./sec.**	0.1777	0.2361	0.2958	0.3541	0.4138
		Throw min-max (m)	2.8 - 5.5	3.1 - 6.4	4.0 - 7.0	4.6 - 8.0	5.2 - 8.6
		Noise (dB)		24	29	33	36
450 x 300	**0.0585**	**m cub./sec.**	0.2125	0.2833	0.3541	0.425	0.4958
		Throw min-max (m)	2.5 - 5.8	3.4 - 6.7	4.0 - 7.6	4.9 - 8.6	5.8 - 9.2
		Noise (dB)		25	30	33	37
525 x 300	**0.0683**	**m cub./sec.**	0.2486	0.3305	0.4138	0.4958	0.5791
		Throw min-max (m)	2.7 - 6.4	3.7 - 7.3	4.3 - 8.3	5.2 - 9.2	6.1 - 9.8
		Noise (dB)	20	26	30	34	37
450 x 375	**0.0732**	**m cub./sec.**	0.2666	0.3451	0.4444	0.5336	0.6208
		Throw min-max (m)	2.8 - 6.7	3.7 - 7.7	4.6 - 8.6	5.5 - 9.5	6.4 - 10.1
		Noise (dB)	20	26	31	35	38

Selection data - CD2C

CD2C							
SIZE	**AK m sq.**	**NECK VELOCITY m/s**	**1.5**	**2**	**2.5**	**3**	**3.5**
		Total Pd mm wg	**0.9**	**1.5**	**2.3**	**3.3**	**4.3**
150 x 150	**0.0097**	**m cub/sec**	0.0361	0.0472	0.0597	0.0708	0.0833
		Throw min-max (m)	0.9 - 2.5	1.2 - 2.8	1.6 - 3.0	2.2 - 3.4	2.5 - 3.7
		Noise (dB)			20	24	28
225 x 225	**0.0219**	**m cub/sec**	0.0805	0.1069	0.1319	0.1611	0.1875
		Throw min-max (m)	1.6 - 3.7	2.2 - 4.3	2.5 - 4.6	3.0 - 5.2	3.4 - 5.5
		Noise (dB)		20	25	29	32
300 x 300	**0.039**	**m cub/sec**	0.1416	0.1888	0.2361	0.2833	0.3305
		Throw min-max (m)	2.2 - 4.9	2.8 - 5.5	3.4 - 6.4	4.0 - 6.7	4.6 - 7.4
		Noise (dB)		23	28	32	35
375 x 375	**0.0609**	**m cub/sec**	0.2222	0.2958	0.3694	0.4444	0.518
		Throw min-max (m)	2.5 - 6.1	3.4 - 7.1	4.3 - 8.0	4.9 - 8.6	5.8 - 9.2
		Noise (dB)		25	30	34	37
450 x 450	**0.0878**	**m cub./sec.**	0.3194	0.425	0.5319	0.6375	0.7444
		Throw min-max (m)	3.1 - 7.4	4.0 - 8.6	4.9 - 9.5	6.1 - 10.4	7.1 - 11.0
		Noise (dB)	21	27	32	35	39

Selection data - CD2C-L and CD2C-R

CD2C-L / CD2C-R							
SIZE	**AK m sq.**	**NECK VELOCITY m/s**	**1.5**	**2**	**2.5**	**3**	**3.5**
		Total Pd mm wg	**0.9**	**1.5**	**2.3**	**3.3**	**4.3**
225 x 150	**0.0147**	**m cub./sec.**	0.0541	0.0708	0.0902	0.1069	0.125
		Throw min-max (m) Shorter side	0.9 - 2.5	1.3 - 2.8	1.9 - 3.1	2.2 - 3.4	2.5 - 3.7
		Throw min-max (m) Longer side	1.6 - 3.4	1.9 - 4.0	2.5 - 4.3	2.8 - 4.9	3.4
		Noise (dB)			23	27	30
300 x 150	**0.0195**	**m cub./sec.**	0.0708	0.0944	0.118	0.1416	0.1652
		Throw min-max (m) Shorter side	0.9 - 2.5	1.3 - 2.8	1.9 - 3.1	2.2 - 3.4	2.5 - 3.7
		Throw min-max (m) Longer side	1.9 - 4.3	2.5 - 4.9	2.8 - 5.5	3.4 - 5.8	4.0 - 6.4
		Noise (dB)			24	28	32
375 x 150	**0.0244**	**m cub./sec.**	0.0902	0.118	0.1486	0.1777	0.2083
		Throw min-max (m) Shorter side	0.9 - 2.5	1.3 - 2.8	1.9 - 3.1	2.2 - 3.4	2.5 - 3.7
		Throw min-max (m) Longer side	2.2 - 4.9	2.8 - 5.5	3.4 - 6.4	4.0 - 6.7	4.6 - 7.4
		Noise (dB)		20	26	29	33
300 x 225	**0.0292**	**m cub./sec.**	0.1083	0.1416	0.1791	0.2125	0.25
		Throw min-max (m) Shorter side	1.6 - 3.7	1.9 - 4.3	2.5 - 4.6	3.1 - 5.2	3.4 - 5.5
		Throw min-max (m) Longer side	2.2 - 4.6	2.8 - 5.5	3.4 - 6.1	4.0 - 6.7	4.6 - 7.3
		Noise (dB)		22	27	30	34
375 x 225	**0.0367**	**m cub./sec.**	0.1319	0.1777	0.2222	0.2666	0.3125
		Throw min-max (m) Shorter side	1.6 - 3.7	1.9 - 4.3	2.5 - 4.6	3.1 - 5.2	3.4 - 5.5
		Throw min-max (m) Longer side	2.2 - 5.5	3.1 - 6.4	3.7 - 7.0	4.6 - 8.0	5.5 - 8.6
		Noise (dB)		22	27	32	35
375 x 300	**0.0487**	**m cub./sec.**	0.1777	0.2361	0.2958	0.3541	0.4138
		Throw min-max (m) Shorter side	2.2 - 4.9	2.8 - 5.5	3.4 - 6.4	4.0 - 6.7	4.6 - 7.4
		Throw min-max (m) Longer side	2.5 - 5.8	3.4 - 6.7	4.0 - 7.6	4.9 - 8.6	5.8 - 9.2
		Noise (dB)		24	29	33	36
450 x 300	**0.0585**	**m cub./sec.**	0.2125	0.2833	0.3541	0.425	0.4958
		Throw min-max (m) Shorter side	2.2 - 4.9	2.8 - 5.5	3.4 - 6.4	4.0 - 6.7	4.6 - 7.3
		Throw min-max (m) Longer side	2.8 - 6.7	3.7 - 8.0	4.6 - 8.9	5.8 - 9.8	6.7 - 10.4
		Noise (dB)		25	30	33	37
450 x 375	**0.0732**	**m cub./sec.**	0.2666	0.3451	0.4444	0.5333	0.6208
		Throw min-max (m) Shorter side	2.5 - 6.1	3.4 - 7.0	4.3 - 8.0	4.9 - 8.6	5.8 - 9.2
		Throw min-max (m) Longer side	3.1 - 7.0	4.0 - 8.3	4.9 - 9.2	5.8 - 10.1	7.0 - 11.0
		Noise (dB)	20	26	31	35	38

Selection data - CD3 and CD3-S

CD3							
SIZE	**AK m sq.**	**NECK VELOCITY m/s**	**1.5**	**2**	**2.5**	**3**	**3.5**
		Total Pd mm wg	**0.9**	**1.5**	**2.3**	**3.3**	**4.3**
150 x 150	**0.0097**	**m cub/sec**	0.0361	0.0472	0.0597	0.0708	0.0833
		Throw min-max (m)	0.7 - 1.6	0.9 - 1.9	1.3 - 2.2	1.6 - 2.5	1.6 - 2.8
		Noise (dB)					19
225 x 225	**0.0219**	**m cub/sec**	0.0805	0.1069	0.1319	0.1611	0.1861
		Throw min-max (m)	1.3 - 2.5	1.6 - 3.1	1.9 - 3.4	2.2 - 3.7	2.5 - 4.0
		Noise (dB)				23	27
300 x 300	**0.039**	**m cub/sec**	0.1416	0.1888	0.2361	0.2833	0.3305
		Throw min-max (m)	1.6 -3.4	1.9 - 4.0	2.5 - 4.3	2.9 - 4.9	3.4 - 5.2
		Noise (dB)		20	25	29	32
375 x 375	**0.0609**	**m cub/sec**	0.2222	0.2958	0.368	0.4444	0.5166
		Throw min-max (m)	1.9 -4.3	2.2 - 4.9	3.1 - 5.5	3.7 - 6.1	4.3 - 6.4
		Noise (dB)		24	29	33	37
450 x 450	**0.0878**	**m cub./sec.**	0.3194	0.425	0.5319	0.6375	0.7444
		Throw min-max (m)	2.2 - 5.2	2.8 - 5.8	3.7 - 6.7	4.3 - 7.4	4.9 - 8.0
		Noise (dB)	22	28	33	36	40
525 x 525	**0.12**	**m cub./sec.**	0.4347	0.5791	0.7222	0.8694	1.0138
		Throw min-max (m)	2.5 - 6.1	3.4 - 7.1	4.3 - 7.7	4.9 - 8.6	5.8 - 9.2
		Noise (dB)	25	31	36	39	43
600 x 600	**0.156**	**m cub./sec.**	0.5666	0.7555	0.9444	11.333	13.222
		Throw min-max (m)	2.8 - .7	4.0 - 8.0	4.6 - 4.9	5.8 - 9.8	6.7 - 10.4
		Noise (dB)	27	33	38	43	46

CD3-S							
SIZE	**AK m sq.**	**NECK VELOCITY m/s**	**1.5**	**2**	**2.5**	**3**	**3.5**
		Total Pd mm wg	**0.9**	**1.5**	**2.3**	**3.3**	**4.3**
225 x 150	**0.0147**	**m cub/sec**	0.0541	0.0708	0.0902	0.1069	0.125
		Throw min-max (m) -Front	1.2 - 2.5	1.9 - 4.0	1.9 - 3.4	2.2 - 3.7	3.4 - 5.2
		Throw min-max (m) -Sides	0.9 - 2.5	1.3 - 2.8	1.6 - 3.1	1.9 - 3.4	2.2 - 3.7
		Noise (dB)			23	27	30
300 x 150	**0.0195**	**m cub/sec**	0.0708	0.0944	0.118	0.1416	0.1652
		Throw min-max (m) -Front	1.6 - 6.4	1.9 - 4.0	2.5 - 4.3	2.8 - 4.9	3.4 - 5.2
		Throw min-max (H6m) -Sides	0.9 - 2.5	1.3 - 2.8	1.6 - 3.1	1.9 - 3.4	2.2 - 3.7
		Noise (dB)			24	28	32
375 x 150	**0.0244**	**m cub/sec**	0.0902	0.118	0.1486	0.1777	0.2083
		Throw min-max (m) -Front	1.9 - 4.3	2.5 - 4.9	3.1 - 5.5	3.4 - 5.8	4.0 - 6.4
		Throw min-max (m) -Sides	0.9 - 2.5	1.3 - 2.8	1.9 - 3.1	1.9 - 3.4	2.2 - 3.7
		Noise (dB)		20	26	29	33

Selection data - CD3-S continued

CD3-S							
SIZE	**AK m sq.**	**NECK VELOCITY m/s**	**1.5**	**2**	**2.5**	**3**	**3.5**
		Total Pd mm wg	**0.9**	**1.5**	**2.3**	**3.3**	**4.3**
450 x 150	**0.0292**	**m cub/sec**	0.1083	0.1416	0.1791	0.2125	0.25
		Throw min-max (m) -Front	2.2 - 4.9	2.8 - 5.5	3.4 - 6.4	4.0 - 6.7	4.6 - 7.3
		Throw min-max (m) -Sides	0.9 - 2.5	1.3 - 2.8	1.9 - 3.1	1.9 - 3.4	2.2 - 3.7
		Noise (dB)		22	27	30	34
300 x 225	**0.0292**	**m cub/sec**	0.1083	0.1416	0.1791	0.2125	0.25
		Throw min-max (m) -Front	16 - 3.4	1.9 - 4.0	2.5 - 4.3	2.8 - 4.9	3.4 - 5.2
		Throw min-max (m) -Sides	1.6 - 3.4	1.9 - 4.0	2.5 - 4.3	2.8 - 4.9	3.4 - 5.2
		Noise (dB)		22	27	30	34
375 x 225	**0.0367**	**m cub/sec**	0.1319	0.1777	0.2222	0.2666	0.3125
		Throw min-max (m) -Front	1.9 - 4.3	2.5 - 4.9	3.1 - 5.5	3.7 - 6.1	4.3 - 6.4
		Throw min-max (m) -Sides	1.6 - 3.7	1.9 - 4.3	2.5 - 4.6	3.1 - 5.2	3.4 - 5.5
		Noise (dB)		22	27	32	35
525 x 225	**0.0511**	**m cub/sec**	0.1861	0.2486	0.3097	0.3708	0.4319
		Throw min-max (m) -Front	2.5 - 5.8	3.4 - 6.7	4.0 - 7.7	4.9 - 8.6	5.8 - 6.1
		Throw min-max (m) -Sides	1.6 - 3.7	2.2 - 4.3	2.5 - 4.6	3.1 - 5.2	3.4 - 5.5
		Noise (dB)		24	29	33	37
375 x 300	**0.0487**	**m cub/sec**	0.1777	0.2361	0.2958	0.3541	0.4138
		Throw min-max (m) -Front	1.9 - 4.3	2.5 - 4.9	3.1 - 5.5	3.7 - 6.1	4.3 - 6.4
		Throw min-max (m) -Sides	1.9 - 3.4	2.5 - 4.0	3.1 - 4.6	3.7 - 4.9	4.3 - 5.2
		Noise (dB)		24	29	33	36
450 x 300	**0.0585**	**m cub/sec**	0.2125	0.2833	0.3541	0.425	0.4958
		Throw min-max (m) -Front	2.2 - 5.2	2.8 - 5.8	3.7 - 6.7	4.3 - 7.3	4.9 - 8.0
		Throw min-max (m) -Sides	1.9 - 4.6	2.5 - 5.5	3.4 - 6.1	4.0 - 6.7	4.6 - 7.4
		Noise (dB)		25	30	33	37
450 x 375	**0.0732**	**m cub/sec**	0.2666	0.3541	0.4444	0.5333	0.6208
		Throw min-max (m) -Front	2.5 - 5.5	3.1 - 6.4	4.0 - 7.1	4.6 - 8.0	5.5 - 8.6
		Throw min-max (m) -Sides	2.2 - 5.2	2.8 - 5.8	3.7 - 6.7	4.3 - 7.3	4.9 - 8.0
		Noise (dB)	20	26	31	35	38
525 x 450	**0.102**	**m cub/sec**	0.3736	0.4958	0.6208	0.7458	0.8694
		Throw min-max (m) -Front	2.8 - 6.7	3.7 - 7.7	4.6 - 8.6	5.5 - 9.5	6.4 - 10.1
		Throw min-max (m) -Sides	2.5 - 6.1	3.4 - 7.1	4.3 - 7.7	4.9 - 8.6	5.8 - 9.2
		Noise (dB)	22	28	34	37	40

Selection data - CD3-L

CD3-L							
SIZE	**AK m sq.**	**NECK VELOCITY m/s**	**1.5**	**2**	**2.5**	**3**	**3.5**
		Total Pd mm wg	**0.9**	**1.5**	**2.3**	**3.3**	**4.3**
225 x 150	**0.0147**	**m cub/sec**	0.0541	0.0708	0.0902	0.1069	0.125
		Throw min-max (m) -Front	0.7 - 1.9	0.9 - 1.9	1.9 - 3.4	2.2 - 4.0	2.8 - 4.3
		Throw min-max (m) -Sides	1.3 - 2.8	1.6 - 3.1	1.9 - 3.4	2.2 - 4.0	2.8 - 4.3
		Noise (dB)			23	27	30
300 x 150	**0.0195**	**m cub/sec**	0.0708	0.0944	0.118	0.1486	0.1652
		Throw min-max (m) -Front	0.7 - 1.9	0.9 - 1.9	1.3 - 2.2	1.6 - 2.5	1.6 - 2.8
		Throw min-max (m) -Sides	1.3 - 3.4	1.9 - 3.7	2.2 - 4.3	2.8 - 4.6	3.2 - 4.9
		Noise (dB)			24	28	32
375 x 150	**0.0244**	**m cub/sec**	0.0902	0.118	0.1486	0.1777	0.2083
		Throw min-max (m) -Front	0.6 - 1.9	0.9 - 1.9	1.3 - 2.2	1.6 - 2.5	1.6 - 2.8
		Throw min-max (m) -Sides	1.6 - 3.7	2.2 - 4.3	2.5 - 4.6	3.1 - 5.2	3.7 - 5.5
		Noise (dB)		20	26	29	33
300 x 225	**0.0292**	**m cub/sec**	0.1083	0.1416	0.1791	0.2125	0.25
		Throw min-max (m) -Front	0.9 - 2.5	1.6 - 3.1	1.9 - 3.4	2.2 - 3.7	2.5 - 4.0
		Throw min-max (m) -Sides	1.6 - 3.7	2.2 - 4.3	2.8 - 4.9	3.1 - 5.5	3.7 - 5.8
		Noise (dB)		22	27	30	34
375 x 225	**0.0367**	**m cub/sec**	0.1319	0.1777	0.2222	0.2666	0.3125
		Throw min-max (m) -Front	0.9 - 2.5	1.6 - 3.1	1.9 - 3.4	2.2 - 3.7	
		Throw min-max (m) -Sides	1.9 - 4.3	2.5 - 4.9	3.1 - 5.5	3.6 - 6.1	4.3 - 6.7
		Noise (dB)		22	27	32	35
525 x 225	**0.0511**	**m cub/sec**	0.1861	0.2486	0.3097	0.3708	0.4319
		Throw min-max (m) -Front	1.3 - 2.5	1.6 - 3.1	1.9 - 3.4	2.3 - 3.7	2.5 - 4.0
		Throw min-max (m) -Sides	2.2 - 5.2	2.8 - 6.1	3.7 - 6.7	4.3 - 7.4	5.2 - 8.0
		Noise (dB)		24	29	33	37
375 x 300	**0.0487**	**m cub/sec**	0.1777	0.2361	0.2958	0.3541	0.4138
		Throw min-max (m) -Front	1.6 - 3.4	1.9 - 4.0	2.5 - 4.3	2.8 - 4.9	3.4 - 5.2
		Throw min-max (m) -Sides	2.2 - 4.9	2.8 - 5.8	3.4 - 6.4	4.0 - 6.7	4.6 - 7.4
		Noise (dB)					
450 x 300	**0.0585**	**m cub/sec**	0.2125	0.2833	0.3541	0.425	0.4958
		Throw min-max (m) -Front	1.6 - 3.4	1.9 - 4.0	2.5 - 4.3	2.8 - 4.9	3.4 - 5.2
		Throw min-max (m) -Sides	2.2 - 5.5	3.1 - 6.4	3.7 - 7.1	4.6 - 8.0	5.2 - 8.3
		Noise (dB)		25	30	33	37
450 x 375	**0.0732**	**m cub/sec**	0.2666	0.3541	0.4444	0.5333	0.6208
		Throw min-max (m) -Front	1.9 - 4.3	2.5 - 4.9	3.1 - 5.5	3.7 - 6.1	4.3 - 6.4
		Throw min-max (m) -Sides	2.5 - 5.8	3.4 - 6.7	4.0 - 7.7	4.9 - 8.3	5.8 - 9.2
		Noise (dB)	20	26	31	35	38
525 x 450	**0.102**	**m cub/sec**	0.3736	0.4958	0.6208	0.7458	0.8694
		Throw min-max (m) -Front	2.2 - 5.2	2.8 - 5.8	3.7 - 6.7	4.3 - 7.4	4.9 - 8.0
		Throw min-max (m) -Sides	2.8 - 7.1	4.0 - 8.0	4.9 - 8.9	5.8 - 9.8	6.7 - 10.7
		Noise (dB)	22	28	32	37	40

Selection data - CD4

CD4 - Square sizes							
SIZE	**AK m sq.**	**NECK VELOCITY m/s**	**1.5**	**2**	**2.5**	**3**	**3.5**
		Total Pd mm wg	**0.9**	**1.5**	**2.3**	**3.3**	**4.3**
150 x 150	**0.0097**	**m cub/sec**	0.0361	0.0472	0.0597	0.0708	0.0833
		Throw min-max (m)	0.7 - 1.6	0.9 - 1.9	1.3 -2.2	1.6 - 2.5	1.6 - 2.8
		Noise (dB)					19
225 x 225	**0.0219**	**m cub/sec**	0.0805	0.1069	0.1319	0.1611	0.1861
		Throw min-max (m)	1.3 - 2.5	1.6 - 3.1	1.9 - 3.4	2.2 - 3.7	2.5 - 4.0
		Noise (dB)				23	27
300 x 300	**0.039**	**m cub/sec**	0.1416	0.1888	0.2361	0.2833	0.3305
		Throw min-max (m)	1.6 - 3.4	1.9 - 4.0	2.5 - 4.3	2.9 - 4.9	3.4 - 5.2
		Noise (dB)		20	25	29	32
375 x 375	**0.0609**	**m cub/sec**	0.2222	0.2958	0.368	0.4444	0.5166
		Throw min-max (m)	1.9 - 4.3	2.2 - 4.9	3.1 - 5.5	3.7 - 6.1	4.3 - 6.4
		Noise (dB)		24	29	33	37
450 x 450	**0.0878**	**m cub./sec.**	0.3194	0.425	0.5319	0.6375	0.7444
		Throw min-max (m)	2.2 - 5.2	2.8 - 5.8	3.7 - 6.7	4.3 - 7.4	4.9 - 8.0
		Noise (dB)	22	28	33	36	40
525 x 525	**0.12**	**m cub./sec.**	0.4347	0.5791	0.7222	0.8694	1.0138
		Throw min-max (m)	2.5 - 6.1	3.4 - 7.1	4.3 - 7.7	4.9 - 8.6	5.8 - 9.2
		Noise (dB)	25	31	36	39	43
600 x 600	**0.156**	**m cub./sec.**	0.5666	0.7555	0.9444	1.1333	1.3222
		Throw min-max (m)	2.8 - 6.7	4.0 - 8.0	4.6 - 8.9	5.8 - 9.8	6.7 - 10.4
		Noise (dB)	27	33	38	43	46

Selection data - CD4 continued

CD4							
SIZE	**AK m sq.**	**NECK VELOCITY m/s**	**1.5**	**2**	**2.5**	**3**	**3.5**
		Total Pd mm wg	**0.9**	**1.5**	**2.3**	**3.3**	**4.3**
225 x 600	**0.0367**	**m cub/sec**	0.0541	0.0708	0.0902	0.1069	0.125
		Throw min-max (m) Shorter side	0.6 - 1.9	0.9 - 1.9	1.3 - 2.2	1.6 - 2.5	1.6 - 2.8
		Throw min-max (m) Longer side	0.9 - 2.5	1.3 - 2.8	1.3 - 2.8	2.2 - 3.4	2.5 - 3.7
		Noise (dB)					23
300 x 150	**0.0195**	**m cub/sec**	0.0708	0.0944	0.118	0.1416	0.1652
		Throw min-max (m) Shorter side	0.6 - 1.9	0.9 - 1.9	1.3 - 2.2	1.6 - 2.5	1.6 - 2.8
		Throw min-max (m) Longer side	1.3 - 3.1	1.6 - 3.4	2.2	2.5 - 4.3	3.1 - 4.6
		Noise (dB)				23	27
375 x 150	**0.0244**	**m cub/sec**	0.0902	0.118	0.1486	0.1777	0.2083
		Throw min-max (m) Shorter side	0.6 - 1.9	0.9 - 1.9	1.3 - 2.2	1.6 - 2.5	1.6 - 2.8
		Throw min-max (m) Longer side	1.6 - 3.4	1.9 - 4.0	2.5 - 4.3	2.8 - 4.9	3.4 - 5.2
		Noise (dB)			20	24	28
450 x 150	**0.0292**	**m cub/sec**	0.1083	0.1416	0.1791	0.2125	0.25
		Throw min-max (m) Shorter side	0.6 - 1.9	0.9 - 1.9	1.3 - 2.2	1.6 - 2.5	1.6 - 2.8
		Throw min-max (m) Longer side	1.6 - 4.0	2.2 - 4.6	2.8 - 4.9	3.1 - 5.5	3.7 - 5.8
		Noise (dB)			22	26	30
300 x 225	**0.0292**	**m cub/sec**	0.1083	0.1416	0.1791	0.2125	0.25
		Throw min-max (m) Shorter side	0.9 - 2.5	1.6 - 3.1	1.9 - 3.4	2.2 - 3.7	2.5 - 4.0
		Throw min-max (m) Longer side	1.6 - 3.4	1.9 - 4.0	2.5 - 4.3	2.8 - 4.6	3.1 - 5.2
		Noise (dB)			22	26	30
375 x 225	**0.0367**	**m cub/sec**	0.1319	0.1777	0.2222	0.2666	0.3111
		Throw min-max (m) Shorter side	0.9 - 2.5	1.6 - 3.1	1.9 - 3.4	2.2 - 3.7	2.5 - 4.0
		Throw min-max (m) Longer side	1.6 - 4.0	2.2 - 4.6	2.8 - 5.2	3.4 - 5.5	3.7 - 6.1
		Noise (dB)		20	24	28	32
600 x 225	**0.0585**	**m cub/sec**	0.2125	0.2833	0.3541	0.425	0.4958
		Throw min-max (m) Shorter side	0.9 - 2.5	1.6 - 3.1	1.9 - 3.4	2.2 - 3.7	2.5 - 4.0
		Throw min-max (m) Longer side	2.2 - 5.5	3.1 - 6.1	3.7 - 7.1	4.3 - 7.7	5.2 - 8.3
		Noise (dB)		24	28	33	33
375 x 300	**0.0489**	**m cub/sec**	0.1777	0.2361	0.2958	0.3541	0.4138
		Throw min-max (m) Shorter side	1.6 - 3.4	1.9 - 4.0	2.5 - 4.3	2.8 - 4.9	3.4 - 5.2
		Throw min-max (m) Longer side	1.9 - 4.3	2.5 - 4.9	3.1 - 5.5	3.4 - 5.8	4.0 - 6.1
		Noise (dB)		22	27	31	34

Selection data - CD4 continued

450 x 300	**0.0585**	**m cub/sec**	0.2125	0.2833	0.3541	0.425	0.4958
		Throw min-max (m) Shorter side	1.6 - 3.4	1.9 - 4.0	2.5 - 4.3	2.8 - 4.9	3.4 - 5.2
		Throw min-max (m) Longer side	2.2 - 4.9	2.8 - 5.5	3.4 - 6.4	4.0 - 6.7	4.6 - 7.4
		Noise (dB)		24	28	33	36
525 x 300	**0.0683**	**m cub/sec**	0.2486	0.3305	0.4138	0.4958	0.5791
		Throw min-max (m) Shorter side	1.6 - 3.4	1.9 - 4.0	2.5 - 4.3	2.8 - 4.9	3.4 - 5.2
		Throw min-max (m) Longer side	2.2 - 5.5	3.1 - 6.4	6.7 - 7.1	4.6 - 7.7	5.2 - 8.3
		Noise (dB)		25	30	34	37
600 x 300	**0.078**	**m cub/sec**	0.2833	0.3777	0.4722	0.5666	0.6611
		Throw min-max (m) Shorter side	1.9 - 3.4	1.9 - 4.0	2.5 - 4.3	2.8 - 4.9	3.4 - 5.2
		Throw min-max (m) Longer side	2.5 - 5.8	3.4 - 6.7	4.0 - 7.7	4.9 - 8.6	5.8 - 9.2
		Noise (dB)	21	27	32	35	38
450 x 375	**0.0732**	**m cub/sec**	0.2666	0.3541	0.4444	0.5333	0.6208
		Throw min-max (m) Shorter side	1.9 - 4.3	2.5 - 4.9	3.1 - 5.5	3.7 - 6.1	4.3 - 6.4
		Throw min-max (m) Longer side	2.2 - 5.2	2.8 - 5.8	3.7 - 6.4	4.3 - 7.1	4.9 - 7.7
		Noise (dB)	20	26	31	35	38
525 x 375	**0.0854**	**m cub/sec**	0.3097	0.4138	0.5166	0.6208	0.7222
		Throw min-max (m) Shorter side	1.9 - 4.3	2.5 - 4.9	3.1 - 5.5	3.7 - 6.1	4.3 - 6.4
		Throw min-max (m) Longer side	2.5 - 5.8	3.1 - 6.7	4.0 - 7.4	4.9 - 8.3	5.5 - 8.9
		Noise (dB)	21	27	32	36	40
600 x 375	**0.0975**	**m cub/sec**	0.3541	0.4722	0.5902	0.7083	0.8263
		Throw min-max (m) Shorter side	1.9 - 4.3	2.5 - 4.9	3.1 - 5.5	3.7 - 6.1	4.3 - 6.4
		Throw min-max (m) Longer side	2.8 - 6.4	3.4 - 7.4	4.3 - 8.3	5.2 - 8.9	6.1 - 9.8
		Noise (dB)	22	29	33	37	41
525 x 450	**0.102**	**m cub/sec**	0.3736	0.4958	0.6208	0.7458	0.8694
		Throw min-max (m) Shorter side	2.2 - 5.2	2.8 - 5.8	3.4 - 6.7	4.3 - 7.4	4.9 - 8.0
		Throw min-max (m) Longer side	2.5 - 5.8	3.4 - 6.7	4.0 - 7.7	4.9 - 8.6	5.8 - 9.2
		Noise (dB)	23	29	34	38	41
600 x 450	**0.117**	**m cub/sec**	0.425	0.5666	0.7083	0.85	0.9916
		Throw min-max (m) Shorter side	2.2 - 5.2	2.8 - 5.8	3.4 - 6.7	4.3 - 7.4	4.9 - 8.0
		Throw min-max (m) Longer side	2.8 - 6.4	3.7 - 7.7	4.6 - 8.6	5.5 - 9.5	6.4 - 10.1
		Noise (dB)	24	31	36	39	43
600 x 525	**0.136**	**m cub/sec**	0.4958	0.6611	0.8263	0.9916	1.1569
		Throw min-max (m) Shorter side	2.5 - 6.1	3.4 - 7.1	4.3 - 7.7	4.9 - 8.6	5.8 - 9.2
		Throw min-max (m) Longer side	2.8 - 6.7	3.7 - 8.0	4.6 - 8.9	5.5 - 9.8	6.4 - 10.4
		Noise (dB)	26	32	37	41	44

Finish

Mill aluminium

Polyester powder coating to any RAL or BS colour



Ordering codes

Example

1 - 595 x 595 O/A - CD4 - D - RAL9010

Codes

1)	**Quantity**		
2)	**Size (mm)**	(Width x height)	Neck size Use O/A suffix for overall face size
3)	**Series**	CD1 CD2O CD2C CD3 CD4	Louvre faced ceiling diffuser - 1 way blow Louvre faced ceiling diffuser - 2 way opposed blow Louvre faced ceiling diffuser - 2 way corner blow Louvre faced ceiling diffuser - 3 way blow Louvre faced ceiling diffuser - 4 way blow
		If size is not square and series is not CD4, please ensure S/L/R suffix is included, see page 4 for more details.	
4)	**Damper**	D	Opposed blade damper fitted
5)	**Fixings**	**nothing**	No fixings, suitable for lay-in ceiling systems
		FH	Countersunk fixing holes (screws supplied in same finish)
		BT	Factory fitted into Burgess tile For other tile systems please contact us
6)	**Blanking plates**	BP…	Required blow pattern *e.g. 'BP 3' to modify a diffuser to create a 3 way throw* *Required number of blow directions must be less than that given by the diffuser itself*
7)	**Neck reducer plate**	NRP…	Required reduced neck size *e.g. 'NRP 225mm' to reduce the active neck size of a larger diffuser to 225mm x 225mm*
8)	**Finish**	Mill	Mill aluminium
		RAL...	Polyester powder coated to RAL...
		BS...	Polyester powder coated to BS...

Leave code section blank if no option is required.

Important note: Sizes given for Series CD diffusers are taken to be neck size (not nominal) unless stated.

Notes

Ventilation Direct Ltd
Unit 10
Vantage Park
Vantage Close
Sheffield
S9 1BG

Tel: 0114 350 3535

info@ventdirect.co.uk

www.ventdirect.co.uk

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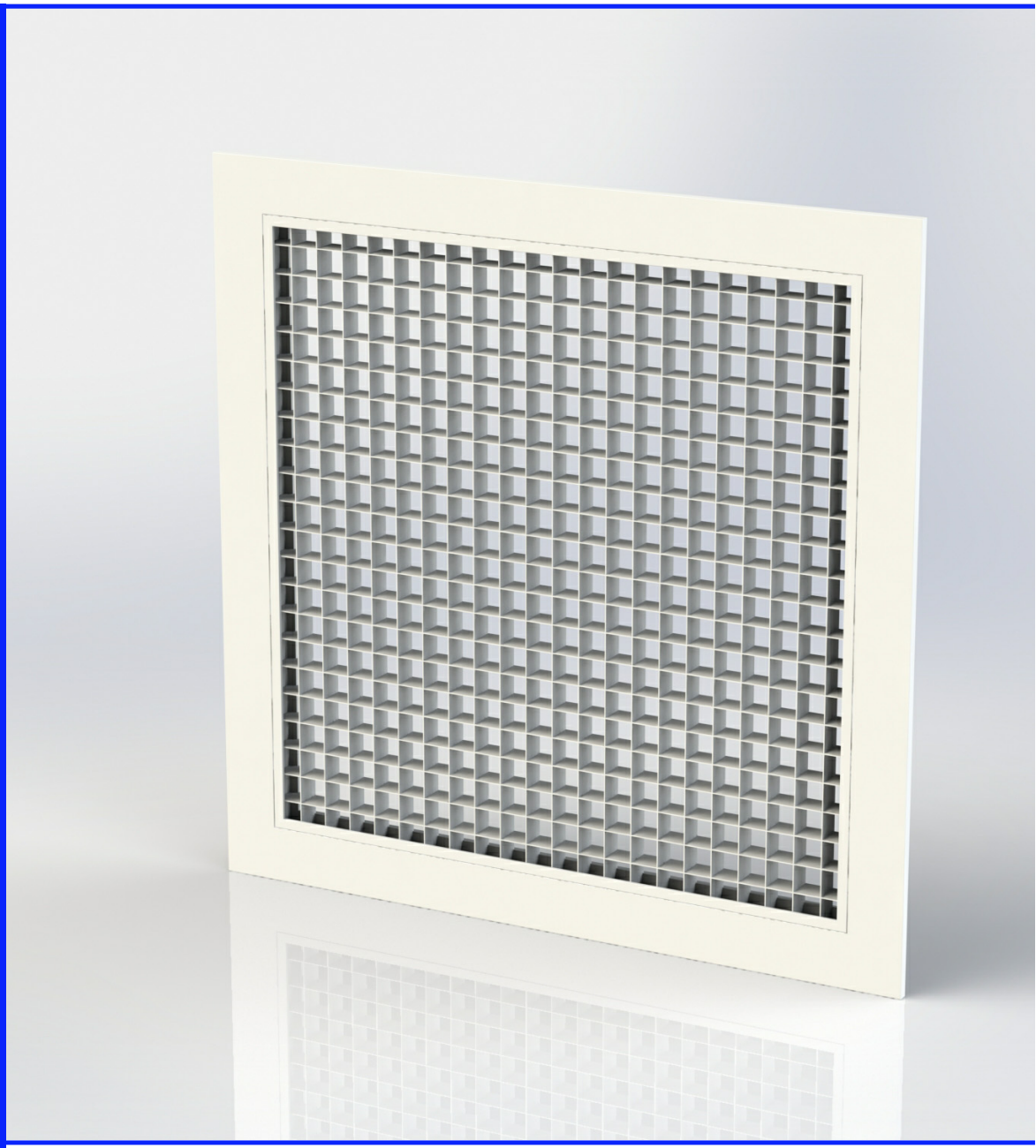
EG-TYPE A product datasheet

The following 10 pages are the document exactly as received and checked. It is bookmarked in the PDF.

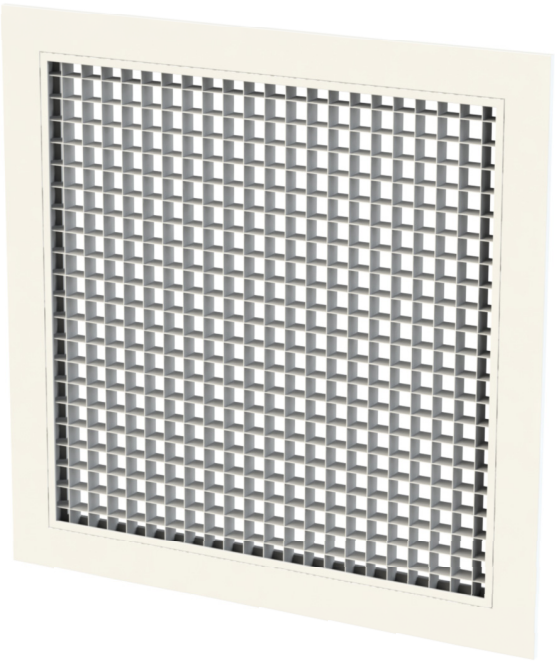
Reference	HEN0203-EGTYPEA-DS
Asset	EG-TYPE A
Provided by	Ventilation Direct Ltd
Source file	Vent Direct - ECG - February 2017.pdf
Pages	10

Series ECG/ECG45
Egg crate grilles

- Industry standard extract grille
- Standard 0° core or optional 45°
- High performance with minimum pressure drops and noise generation
- Hinged and removable cores
- Popular sizes held in stock for immediate despatch



Series ECG/ECG45



Series ECG egg crate grilles are the industry standard extract grille.

Comprising a core with over 90% free area with vanes parallel to airflow, egg crate grilles are capable of handling huge air volumes with minimal noise generation or pressure drop. Ideal for areas requiring high changeover rates like restaurant kitchens, painting booths etc.

A 45° core is also available, with a similar high free area, but introducing non vision properties from certain angles, or giving an angled throw if used for supply.

We hold large quantities of popular sizes of ECG in stock, giving us the capability to supply even the largest orders on a next day basis.

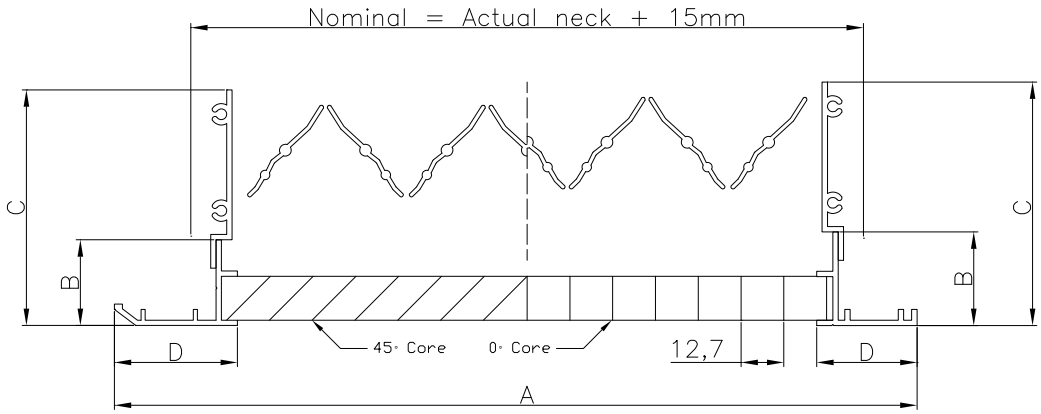
For non standard sizes, units are manufactured to order.

Design features

Material	Aluminium frame and core
Frame	Standard: 30FE - 30mm flat
	Optional: 37BE - 37mm bevelled
	SMS - Surface mounted small
Sizes	Minimum: 100mm x 50mm
	Maximum: 2900mm x 2900mm
	Maximum core size is 1300mm x 1300mm, above this mullions will be used
Fixings	Standard: None
	Optional: See page 6
Finish	Standard: Satin anodised (AA5) frame, mill aluminium core
	Optional: See page 8
	Stock units are powder coated RAL9010
Mass/m² face area	4 kg
	12 kg including opposed blade damper
Free area	Approx 90%

Technical drawings

Standard

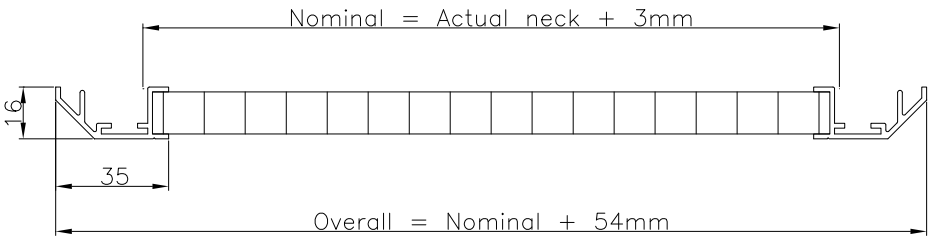


	37BE: 37mm bevelled (optional)
A	Nominal + 45mm
B	25mm
C	70mm
D	37mm

	30FE: 30mm flat (standard)
A	Nominal + 30mm
B	28mm
C	72mm
D	30mm

Please note: If a tile replacer size is required, for example 595mm x 595mm or 1195mm x 595mm, a 30FE 30mm flat frame should be specified.

Surface mounted



Stocked sizes

The following sizes of Series ECG egg crate grilles are held in stock, with and without fitted opposed blade dampers, in RAL9010 finish and with prepunched fixing holes, available for immediate despatch.

150mm²
200mm²
250mm²
300mm²
350mm²
400mm²
450mm²
500mm²
565mm² (595mm² overall face size tile replacer, no fixing holes)

All sizes are nominal unless stated.

Product codes: ECG - 30FE - (FH) - RAL9010
(grille only)

ECG - 30FE - (FH) - D - RAL9010
(grille complete with fitted opposed blade damper)

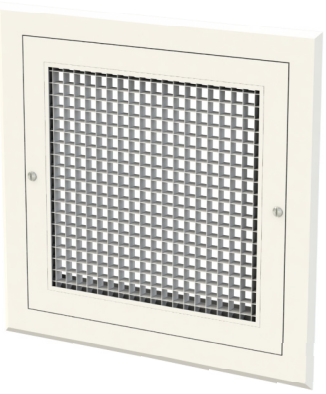
Removable core

Fitted with spring loaded quarter turn fasteners, the outer frame has angle brackets fixed to the inside of the neck.

The inner removable frame holds the chrome plated, slotted head studs, for removal with a flathead screwdriver.

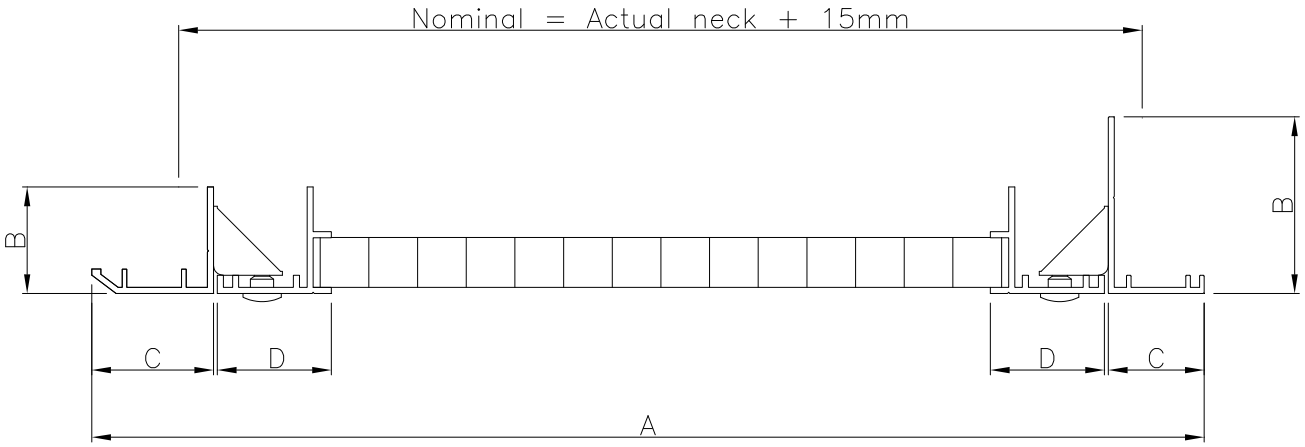
Other stud types are available for use with allen keys, or with a larger head for removal by hand.

Please note: Images show grille with the optional 32BS frame.





Ordering code for type shown here: RC-QT



	32BS: 32mm bevelled (optional)
A	Nominal + 45mm
B	28mm
C	32mm
D	30mm

	25F: 25mm flat (standard)
A	Nominal + 30mm
B	46mm
C	25mm
D	30mm

Hinged core

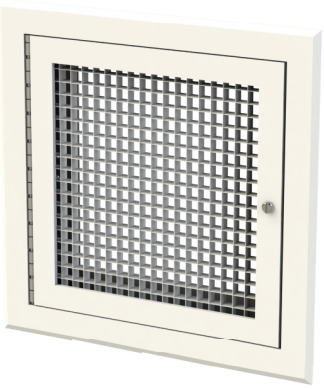
Enabling the core to hinge outwards may be preferable to it being fully removable.

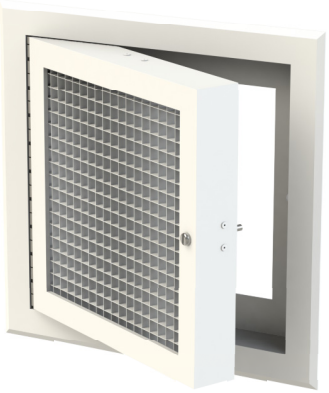
The full length piano hinge at one side is discreet, and gives minimal loss of core area.

The inner core is held in place by one or more M6 panhead bolts mating with nutserts mounted to a concealed rear frame extension.

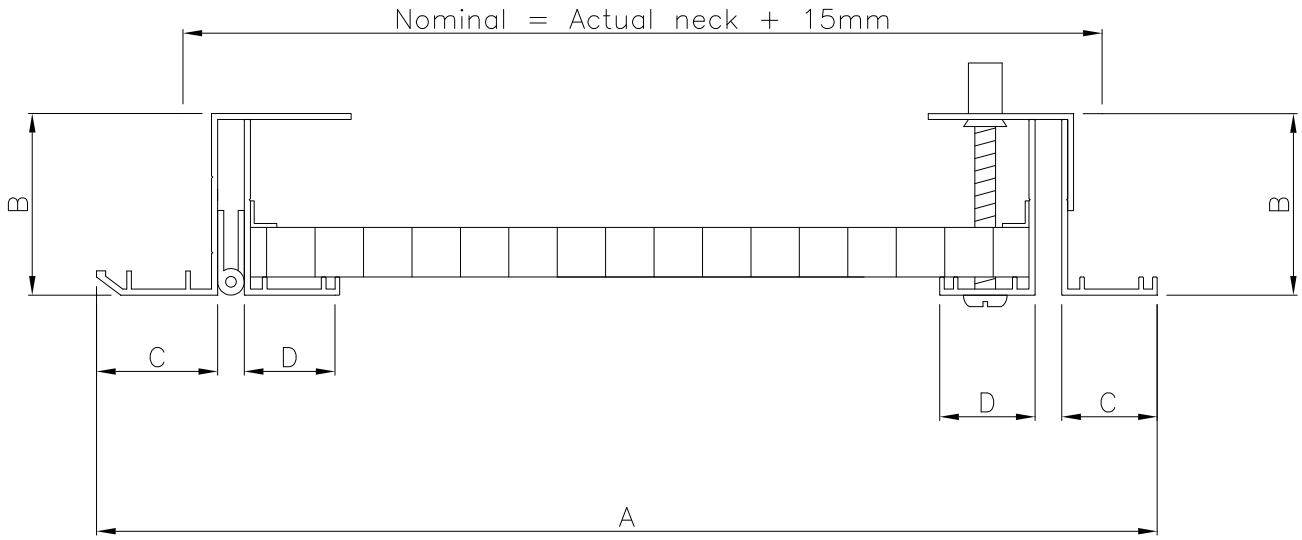
Chrome plated cam fasteners are optional instead of bolts.

Please note: Images show grille with the optional 32BZ frame.





Ordering code for type shown here: HC-BLT



	32BZ: 32mm bevelled Z (optional)
A	Nominal + 45mm
B	48mm
C	32mm
D	25mm

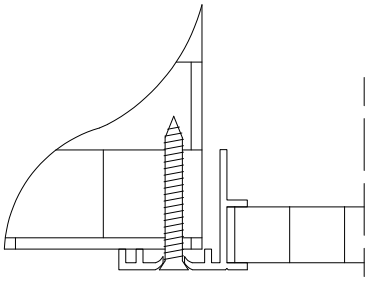
	25F: 25mm flat (standard)
A	Nominal + 30mm
B	48mm
C	25mm
D	25mm

Fixings

Countersunk fixing holes: Code suffix FH

For extremely simple fitting, countersunk fixing holes can be punched into the outer frame.

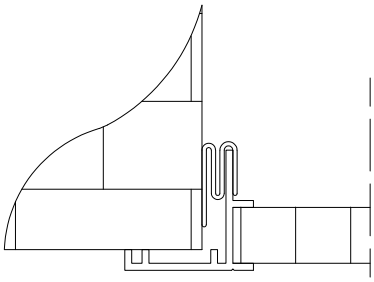
Self tapping screws in the same finish as the grille are provided as standard.



Push-in clip method: Code suffix PC

These sprung clips are compressed when the grille is pushed into place. The outward force provided then holds the grille securely in place.

This fixing method is not suitable for use in ceilings.

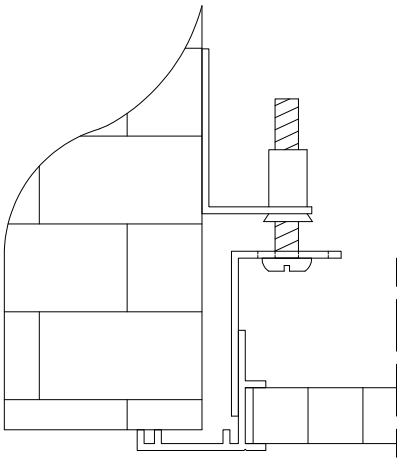


Concealed fixings: Code suffix CF

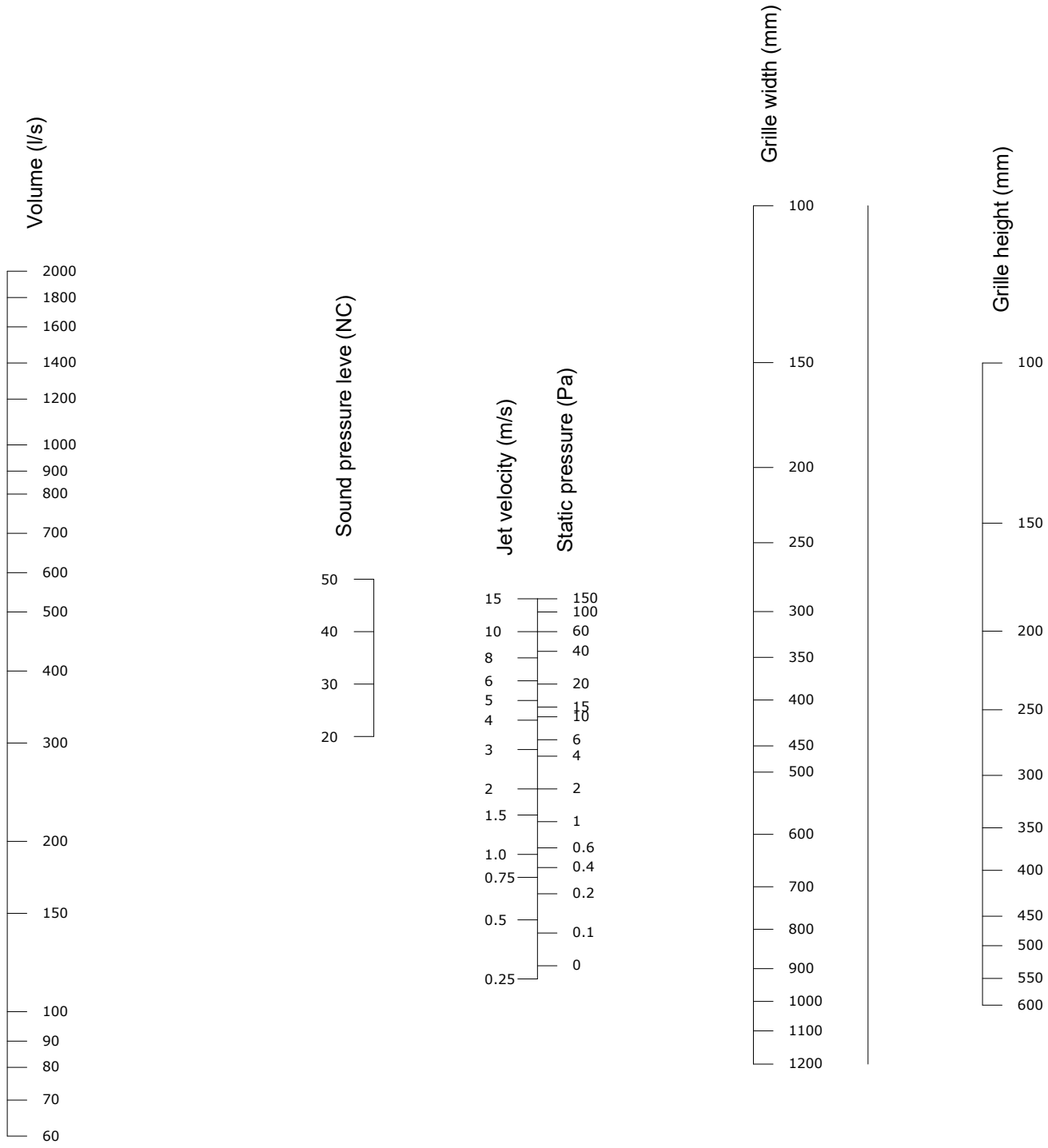
Recently redesigned, concealed fixings comprise two small lengths of aluminium angle, one with a punched slot, the other with a factory fitted nutsert.

The punched bracket should be fitted to the grille neck, and the bracket with nutsert fixed to the inside of the plenum, duct or builderswork opening.

Factory supplied bolts can then be used to pull the grille securely into place.



Selection data



Finishes

Mill aluminium

Satin anodised aluminium (frame only, core mill)

Polyester powder coating to any RAL or BS colour



Ordering codes

Example

1 - 400 x 400 - ECG - D - 30FE - FH - RAL9010

Codes

1)	**Quantity**		
2)	**Size (mm)**	(Width x height)	
3)	**Series**	ECG ECG45	Egg crate grille Egg crate grille 45° core (specify blow direction if not a square size)
4)	**Damper**	D	Opposed blade damper fitted
5)	**Frame**	30FE 37BE SMS	30mm flat frame (standard, recommended for tile replacer sizes) 37mm bevelled frame Surface mounted
6)	**Fixings**	FH CF PC	Countersunk fixing holes (screws supplied in same finish) Concealed fixings (not suitable for grilles with 'SMS' frame) Push-in clips (not for use in ceilings, not suitable for grilles with 'SMS' frame)
7)	**Core type**	RC-QT HC-BLT HC-CAM	Removable core - Quarter turn type (standard method) Hinged core - Bolt type (standard method) Hinged core - Cam fastener (optional)
8)	**Finish**	SAA Mill RAL... BS...	Satin anodised frame, mill finish core (standard) Mill aluminium Polyester powder coated to RAL... Polyester powder coated to BS...

Important: Size will be taken to be nominal (hole internal) unless stated otherwise.

Leave code section blank if no option is required.

Specification of a hinged or removable core will mean 30FE and 37BE frames cannot be used.
In this instance a standard 25mm flat frame or optional 32mm bevelled frame will be substituted.

Notes

Ventilation Direct Ltd
Unit 10
Vantage Park
Vantage Close
Sheffield
S9 1BG

Tel: 0114 350 3535

info@ventdirect.co.uk

www.ventdirect.co.uk

8.89

SG-TYPE D product datasheet

The following 16 pages are the document exactly as received and checked. It is bookmarked in the PDF.

Reference	HEN0203-SGTYPED-DS
Asset	SG-TYPE D
Provided by	Ventilation Direct Ltd
Source file	Vent Direct - LG - February 2017.pdf
Pages	16

Series LG
Linear grilles

- Our most versatile grille series, with a wealth of options available
- Dedicated frames for a strong blade pack with no bowing
- 0°, 15° and 45° blade profiles
- 85% maximum free area
- Hinged and removable cores



Series LG



Series LG linear grilles are the most versatile series of grille available from Vent Direct.

Available with different blade profiles and spacings, a variety of hinged and removable core methods, and a comprehensive range of finishes.

If required for extract, specify your linear grille with 3mm thick, 0° blades, on a 20mm pitch. With a free area around 85%, this is a more robust alternative to Series ECG egg crate grilles, with very similar performance.

For supply applications, you can choose from 0°, 15° or 45° blade profiles, and 12.5mm or 20mm blade pitches, giving you full control over throw direction, free area and appearance.

Design features

Material	Extruded aluminium
Frame	Standard: 36B - 36mm bevelled
	Optional: 31F - 31mm flat
	TF - Tray frame
	SML - Surface mounted large
Sizes	Minimum: 100mm x 50mm
	Maximum: 2900mm x 2900mm
Fixings	Standard: None
	Optional: See page 11
Finish	Standard: Satin anodised (AA5)
	Optional: See page 14
Mass/m² face area	See technical specifcations on next page
Free area	See technical specifcations on next page

Technical specifications

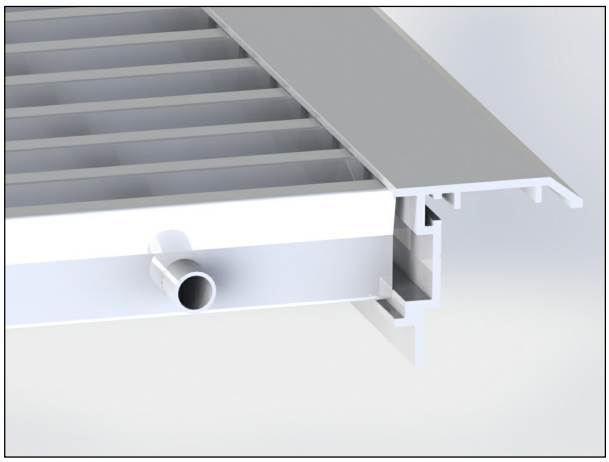
Series	Free area (approx.)	Mass/m² face area (approx.)
LG0 - 3 - 12.5	76%	10.0 kg
LG0 - 3 - 20	85%	7.2 kg
LG0 - 6 - 12.5	52%	14.1 kg
LG0 - 6 - 20	70%	9.6 kg
LG15 - 12.5	74%	10.1 kg
LG15 - 20	83%	7.3 kg
LG45 - 12.5	54%	10.5 kg
LG45 - 20	63%	7.4 kg

Dedicated frame design

As part of our continual drive to improve quality, linear grilles now use a dedicated frame design, rather than the standard frames used widely within the range of Vent Direct grilles.

Offering the significant advantage of supporting the blade ends, this gives a much stronger design, which is less prone to bowing. The blade and tube ends are also concealed giving a seamless design.

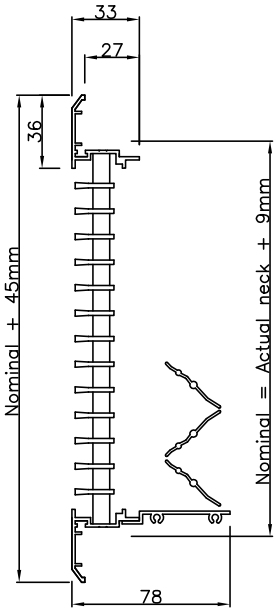
These frames, denoted the 36B (bevelled) and 31F (flat) are standard with all blade types (various options will require the use of other frames).



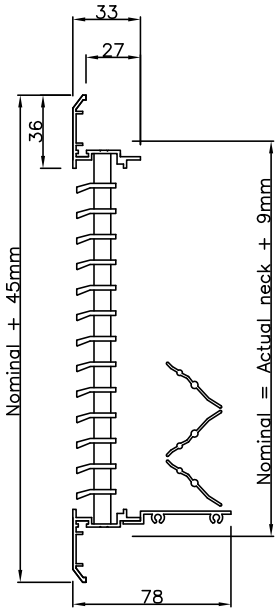
Technical drawings - 36B frame

Grilles only

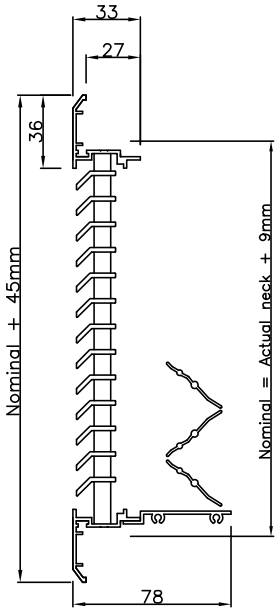
LG0 - 3 - 12.5 - 36B



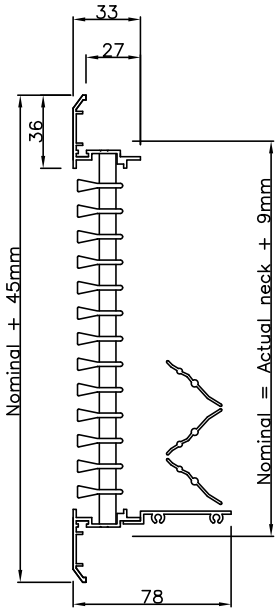
LG15 - 12.5 - 36B



LG45 - 12.5 - 36B



LG0 - 6 - 12.5 - 36B



Grilles c/w opposed blade dampers

LG0 - 3 - 12.5 - D - 36B

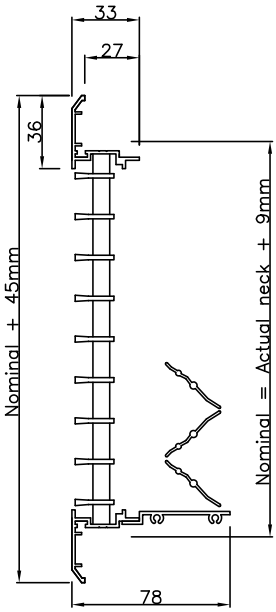
LG15 - 12.5 - D - 36B

LG45 - 12.5 - D - 36B

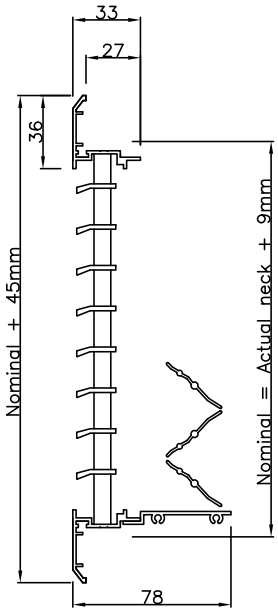
LG0 - 6 - 12.5 - D - 36B

Grilles only

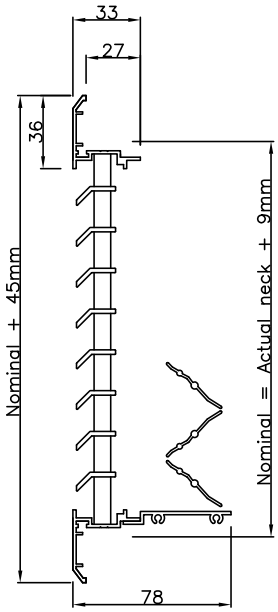
LG0 - 3 - 20 - 36B



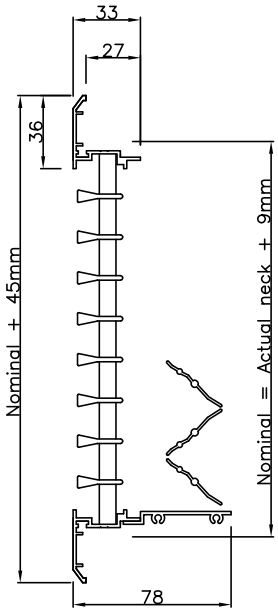
LG15 - 20 - 36B



LG45 - 20 - 36B



LG0 - 6 - 20 - 36B



Grilles c/w opposed blade dampers

LG0 - 3 - 20 - D - 36B

LG15 - 20 - D - 36B

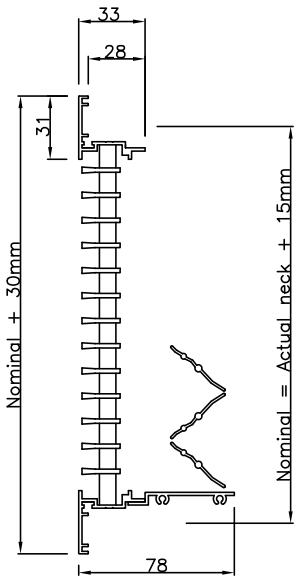
LG45 - 20 - D - 36B

LG0 - 6 - 20 - D - 36B

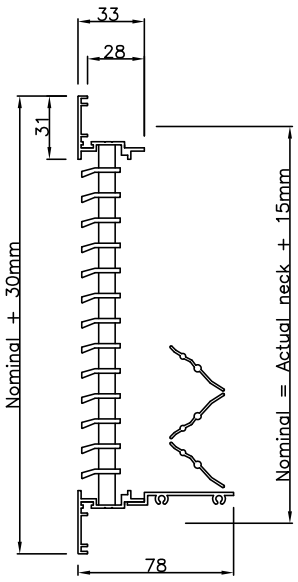
Technical drawings - 31F frame

Grilles only

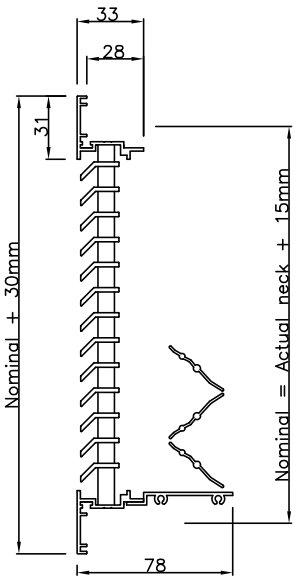
LG0 - 3 - 12.5 - 31F



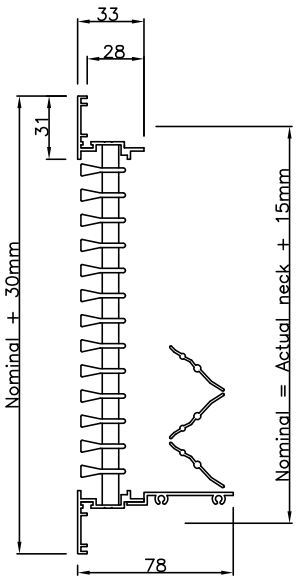
LG15 - 12.5 - 31F



LG45 - 12.5 - 31F



LG0 - 6 - 12.5 - 31F



Grilles c/w opposed blade dampers

LG0 - 3 - 12.5 - D - 31F

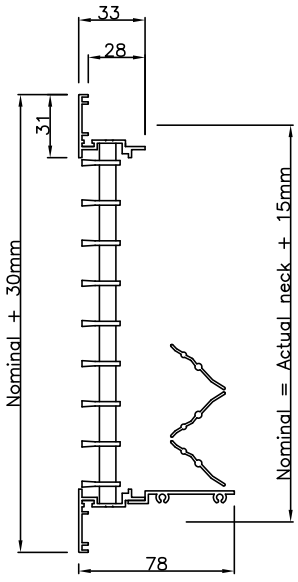
LG15 - 12.5 - D - 31F

LG45 - 12.5 - D - 31F

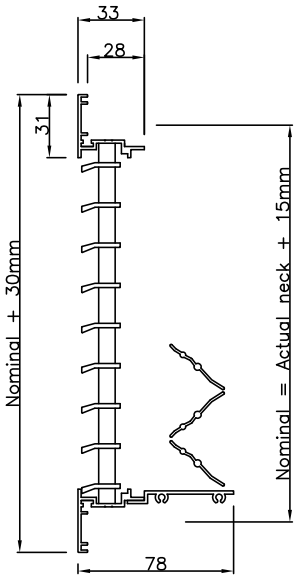
LG0 - 6 - 12.5 - D - 31F

Grilles only

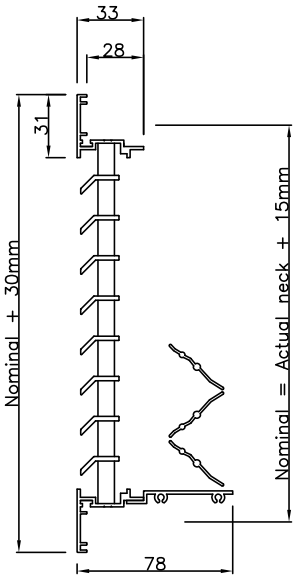
LG0 - 3 - 20 - 31F



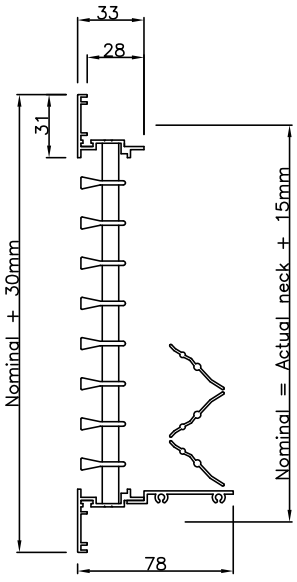
LG15 - 20 - 31F



LG45 - 20 - 31F



LG0 - 6 - 20 - 31F



Grilles c/w opposed blade dampers

LG0 - 3 - 20 - D - 31F

LG15 - 20 - D - 31F

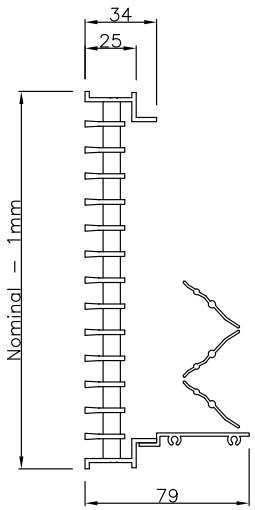
LG45 - 20 - D - 31F

LG0 - 6 - 20 - D - 31F

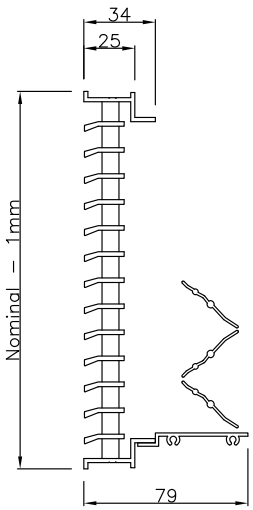
Technical drawings - TF (tray frame)

Grilles only

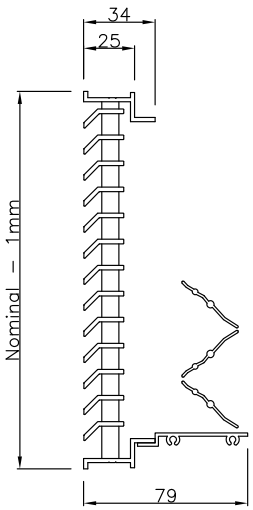
LG0 - 3 - 12.5 - TF



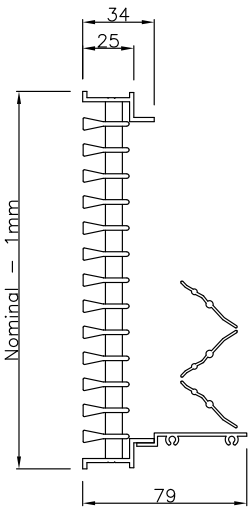
LG15 - 12.5 - TF



LG45 - 12.5 - TF



LG0 - 6 - 12.5 - TF



Grilles c/w opposed blade dampers

LG0 - 3 - 12.5 - D - TF

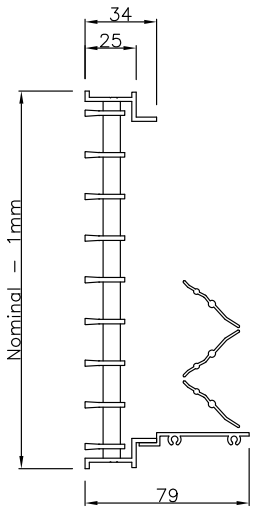
LG15 - 12.5 - D - TF

LG45 - 12.5 - D - TF

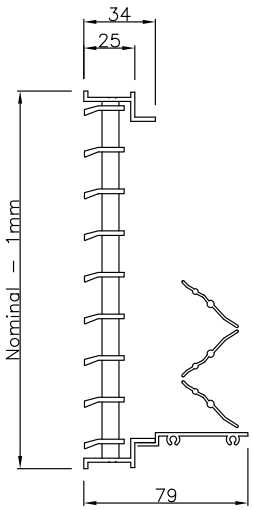
LG0 - 6 - 12.5 - D - TF

Grilles only

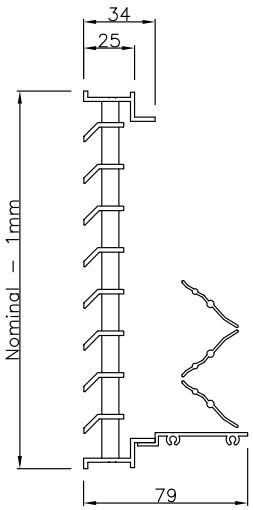
LG0 - 3 - 20 - TF



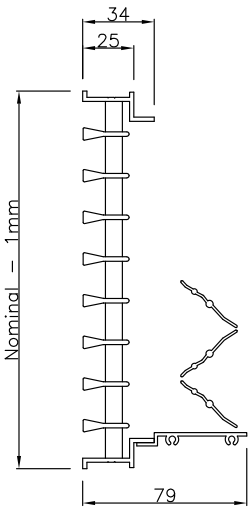
LG15 - 20 - TF



LG45 - 20 - TF



LG0 - 6 - 20 - TF



Grilles c/w opposed blade dampers

LG0 - 3 - 20 - D - TF

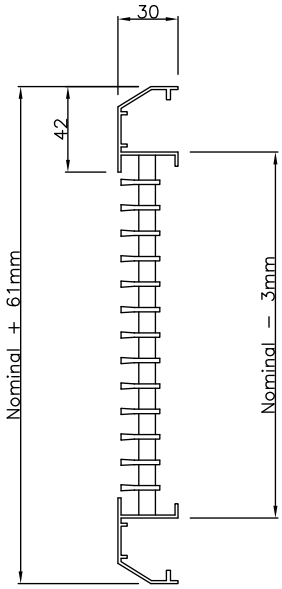
LG15 - 20 - D - TF

LG45 - 20 - D - TF

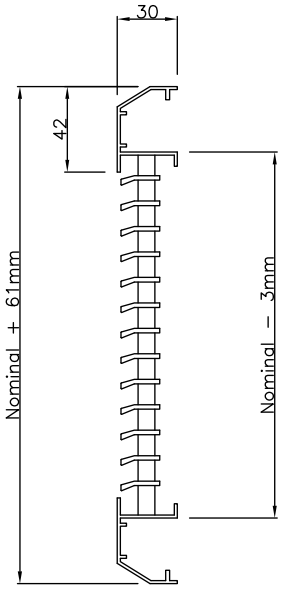
LG0 - 6 - 20 - D - TF

Technical drawings - SML (surface mounted frame)

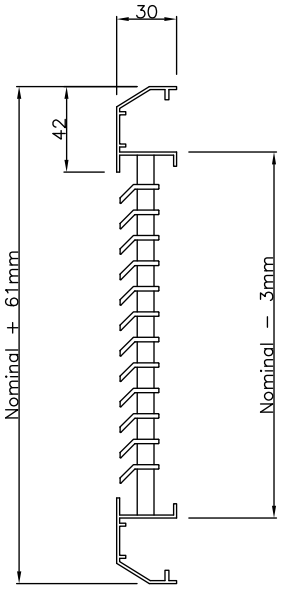
LG0 - 3 - 12.5 - SML



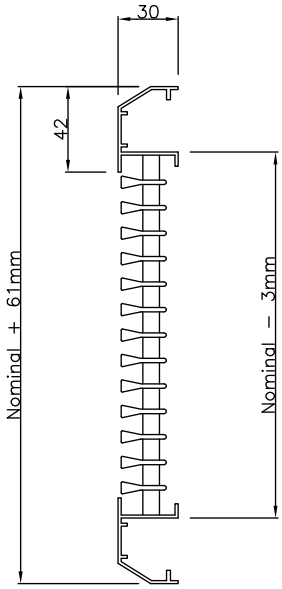
LG15 - 12.5 - SML



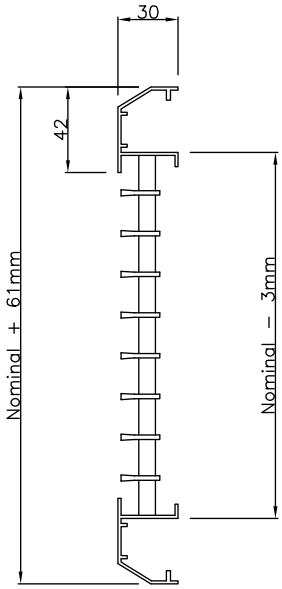
LG45 - 12.5 - SML



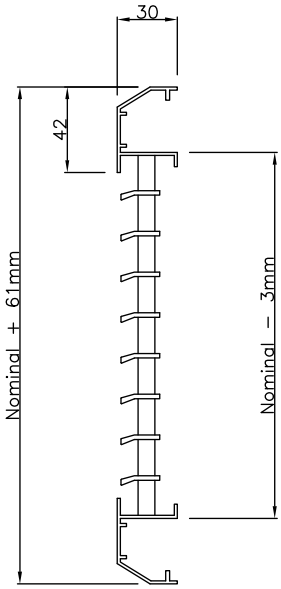
LG0 - 6 - 12.5 - SML



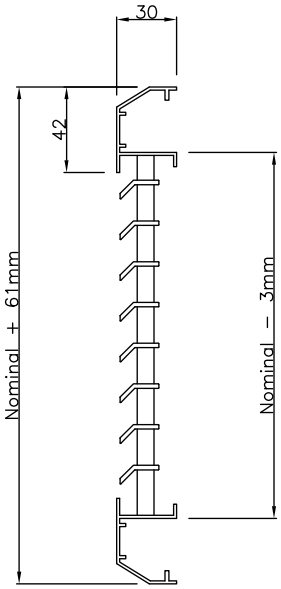
LG0 - 3 - 20 - SML



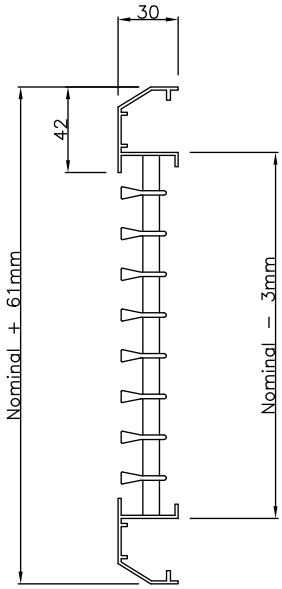
LG15 - 20 - SML



LG45 - 20 - SML



LG0 - 6 - 20 - SML



Removable core - Twin frame

Fitted with spring loaded quarter turn fasteners, the outer frame has angle brackets fixed to the inside of the neck.

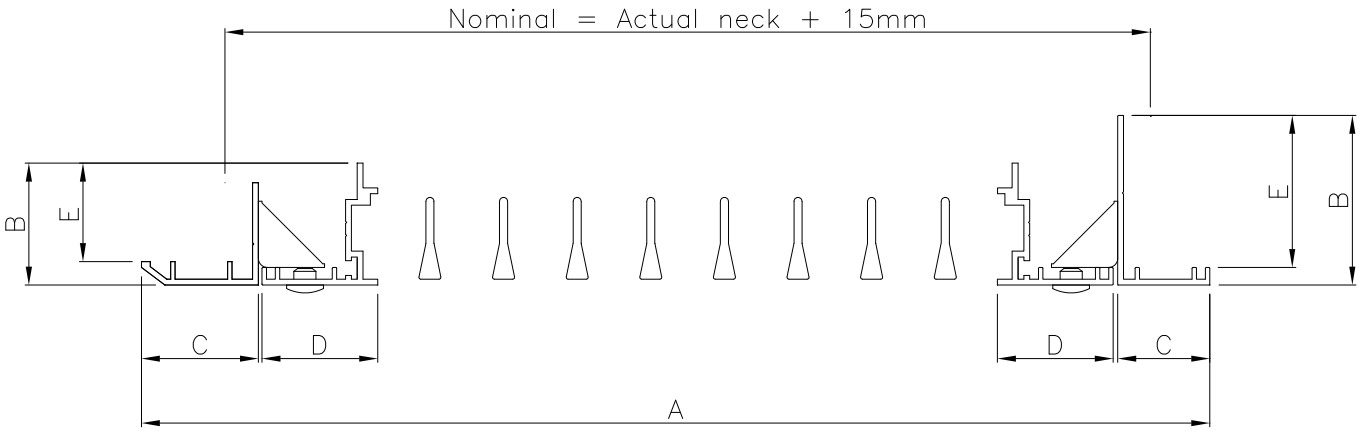
The inner removable frame holds the chrome plated slotted head studs, which are easily removed with a flathead screwdriver.

Other stud types are available for use with allen keys, or with a larger head for removal by hand.

Outer frame will be either 32BS 32mm bevelled frame or 25F 25mm flat, inner frame will be 31F 31mm flat.



Ordering code for type shown here: RC-QT



	32BS: 32mm bevelled (standard)
A	Nominal + 45mm
B	33mm
C	32mm
D	31mm
E	27mm

	25F: 25mm flat (optional)
A	Nominal + 30mm
B	46mm
C	25mm
D	31mm
E	41mm

Removable core - Tube clips

Sprung tube clips are mounted on mullions running behind the blade pack.

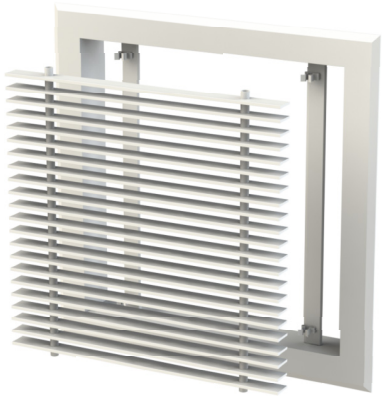
To install the core, align the blade tubes with the clips and push the core into place.

32BD 32mm bevelled frame or 25F 25mm flat frames only.

For wall mounting use only.
Not recommended for use in ceilings.

Ordering code for type shown here: RC-TC





Removable core - Quick release

Quick release removable core grilles have spring loaded pins in one end of the core tubes, with a locator pin at the other end.

While fitted the springs force the pins into locating holes in the frame, holding the core in place.

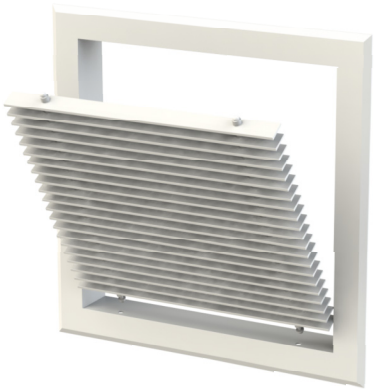
To remove the core, compress the springs, pulling the locator pins out of the holes, and pull the core away.

32BD 32mm bevelled frame or 25F 25mm flat frames only.

Safety cord fitted as standard.

Ordering code for type shown here: RC-QR





Hinged core

Enabling the core to hinge outwards may be preferable to it being fully removable.

The full length piano hinge at one side is discreet, and gives minimal loss of core area.

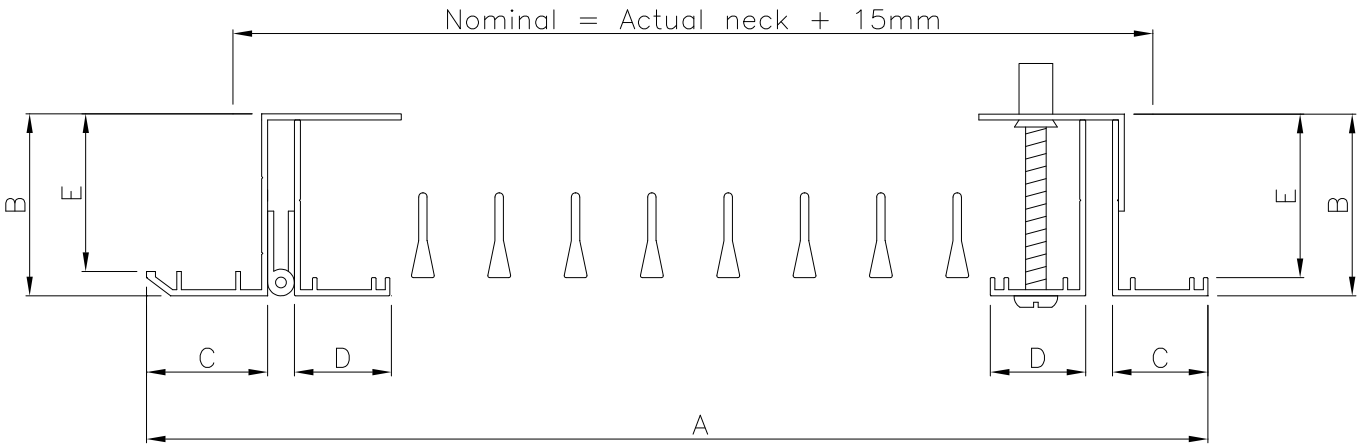
The inner core is held in place by one or more M6 panhead bolts mating with nutserts mounted to a concealed rear frame extension.

Chrome plated cam fasteners are optional instead of bolts.





Ordering code for type shown here: HC-BLT



	32BZ: 32mm bevelled Z (standard)
A	Nominal + 45mm
B	48mm
C	32mm
D	30mm
E	41mm

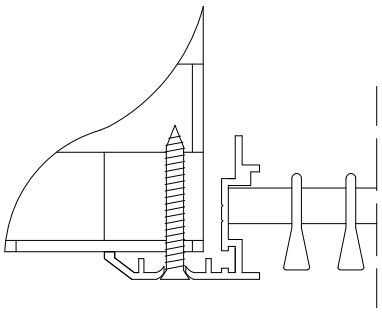
	25F: 25mm flat (optional)
A	Nominal + 30mm
B	48mm
C	25mm
D	30mm
E	43mm

Fixings

Countersunk fixing holes: Code suffix FH

For extremely simple fitting, countersunk fixing holes can be punched into the outer frame.

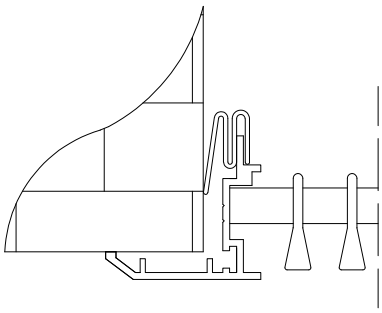
Self tapping screws in the same finish as the grille are provided as standard.



Push-in clip method: Code suffix PC

These sprung clips are compressed when the grille is pushed into place. The outward force provided then holds the grille securely in place.

This fixing method is not suitable for use in ceilings.



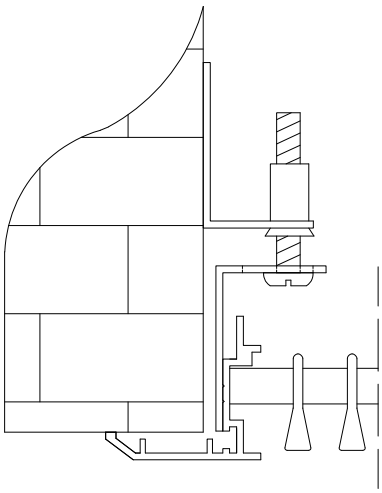
Concealed fixings: Code suffix CF

Recently redesigned, concealed fixings comprise two small lengths of aluminium angle, one with a punched slot, the other with a factory fitted nutsert.

The punched bracket should be fitted to the grille neck, and the bracket with nutsert fixed to the inside of the plenum, duct or builderswork opening.

Factory supplied bolts can then be used to pull the grille securely into place.

Please note: A removable core should be specified if concealed fixings are required with an LG45-12.5 (45 degree blades on 12.5mm pitch)



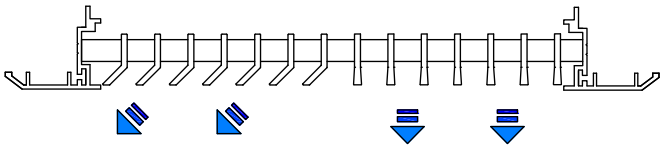
Customisations

Multiple way blows

To increase functionality, all three 3mm blade types can be used in a single grille.

For example: When used just inside an entrance, 50% of the grille can be used with 0° blade to provide an air curtain, and the rest can use either 15° or 45° blade to direct air into the room.

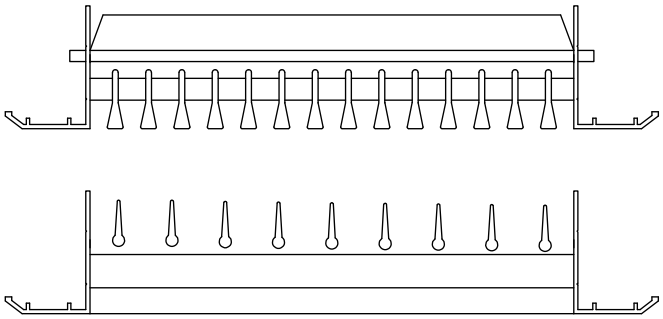
Please discuss any requirements for this option with Vent Direct.



Single deflection blades: Code suffix RSD

A bank of single deflection type blades can be mounted behind the LG grille blades. Enabling throw adjustment in one plane.

Please note: Selection of this option will mean standard 36B or 31F frames cannot be used. 25mm flat (25F) or 32mm bevelled (32BD) will be substituted. Surface mounted grilles cannot use this option.

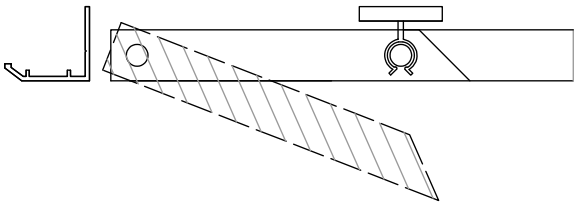


Hinged access blades / panels

To allow access through the grille face, without having to opt for a fully removable core or removing the whole grille, blades or a panel can be hinged enabling access through the core.

The section swings out to 90°, and integrated tube clips prevent the panel swinging out unexpectedly if mounted in a wall or ceiling.

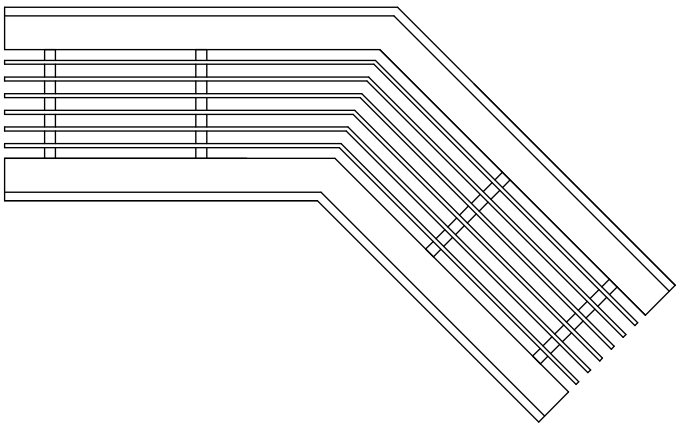
Please discuss any requirements for this option with Vent Direct.



Mitred sections

For truly bespoke installations, mitred sections can be made to suit corners. Whether these are a standard 90° corner for ceiling fitting, or an internal or external corner for sidewall fitting at an angle other than 90° we can manufacture them.

Please discuss any requirements for this option with Vent Direct.



Selection data

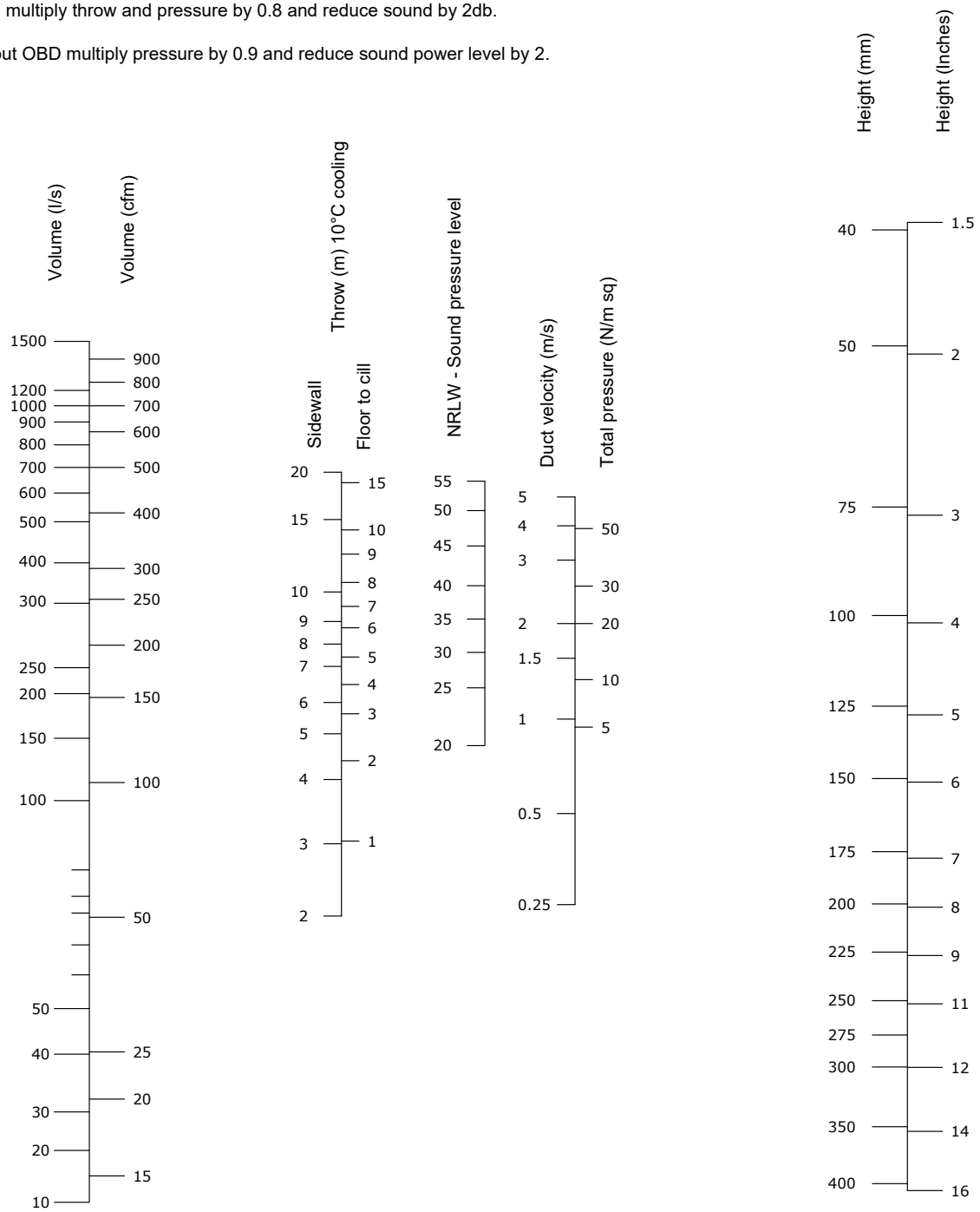
Figures based on 1m wide LG0-3-12.5 fitted with OBD.

10°C cooling application with grille not more than 0.5m below ceiling.

For 6mm blade multiply throw and pressure by 1.2 and increase sound by 2db.

For 20mm pitch multiply throw and pressure by 0.8 and reduce sound by 2db.

For grilles without OBD multiply pressure by 0.9 and reduce sound power level by 2.



Finishes

Mill aluminium

Linished (brushed) aluminium (frame face and blade tops only)

Satin anodised aluminium

Polyester powder coating to any RAL or BS colour



Ordering codes

Example

1 - 400 x 400 - LG0 - 6 - 20 - D - 36B - FH - RAL9010 - 1S

1)	**Quantity**		
2)	**Size (mm)**	(Width x height)	
3)	**Series**	LG0 LG15 LG45	Linear grille, 0° blades Linear grille, 15° blades Linear grille, 45° blades
4)	**Blade thickness**	3 6	3mm blade 6mm blade (only available with LG0)
5)	**Blade pitch**	12.5 20	12.5mm blade pitch 20mm blade pitch
6)	**Damper**	D	Opposed blade damper fitted
7)	**Frame**	36B 31F TF SML	36mm bevelled frame (standard) 31mm flat frame Tray frame Surface mounted
8)	**Fixings**	FH CF PC	Countersunk fixing holes (screws supplied in same finish) Concealed fixings Push-in clips (not for use in ceilings)
9)	**Core type**	RC-QT RC-QR RC-TC HC-BLT HC-CAM	Removable core - Twin frame type (standard method, not avaiable if frame is ‘TF’) Removable core - Quick release type (optional) Removable core - Tube clip type (optional, not recommended for use in ceilings) Hinged core - Bolt type (standard method, not available if frame is ‘TF’ or ‘SML’) Hinged core - Cam fastener (optional, not available if frame is ‘TF’ or ‘SML’)
10)	**Deflection blades**	RSD	Rear mounted single deflection blades
11)	**Finish**	SAA Mill Linished RAL... BS...	Satin anodised (standard, not available with tray frame) Mill aluminium (standard on tray frame) Linished (brushed) aluminium (only frame and blade tops) Polyester powder coated to RAL... Polyester powder coated to BS...
12)	**Sections**	_S	Number of sections required. If left blank this will be confirmed on order acknowledgment.

Important: Size will be taken to be nominal (hole internal) unless stated otherwise.

Leave code section blank if no option is required.

Notes

Ventilation Direct Ltd
Unit 10
Vantage Park
Vantage Close
Sheffield
S9 1BG

Tel: 0114 350 3535

info@ventdirect.co.uk

www.ventdirect.co.uk

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SG-TYPE A product datasheet

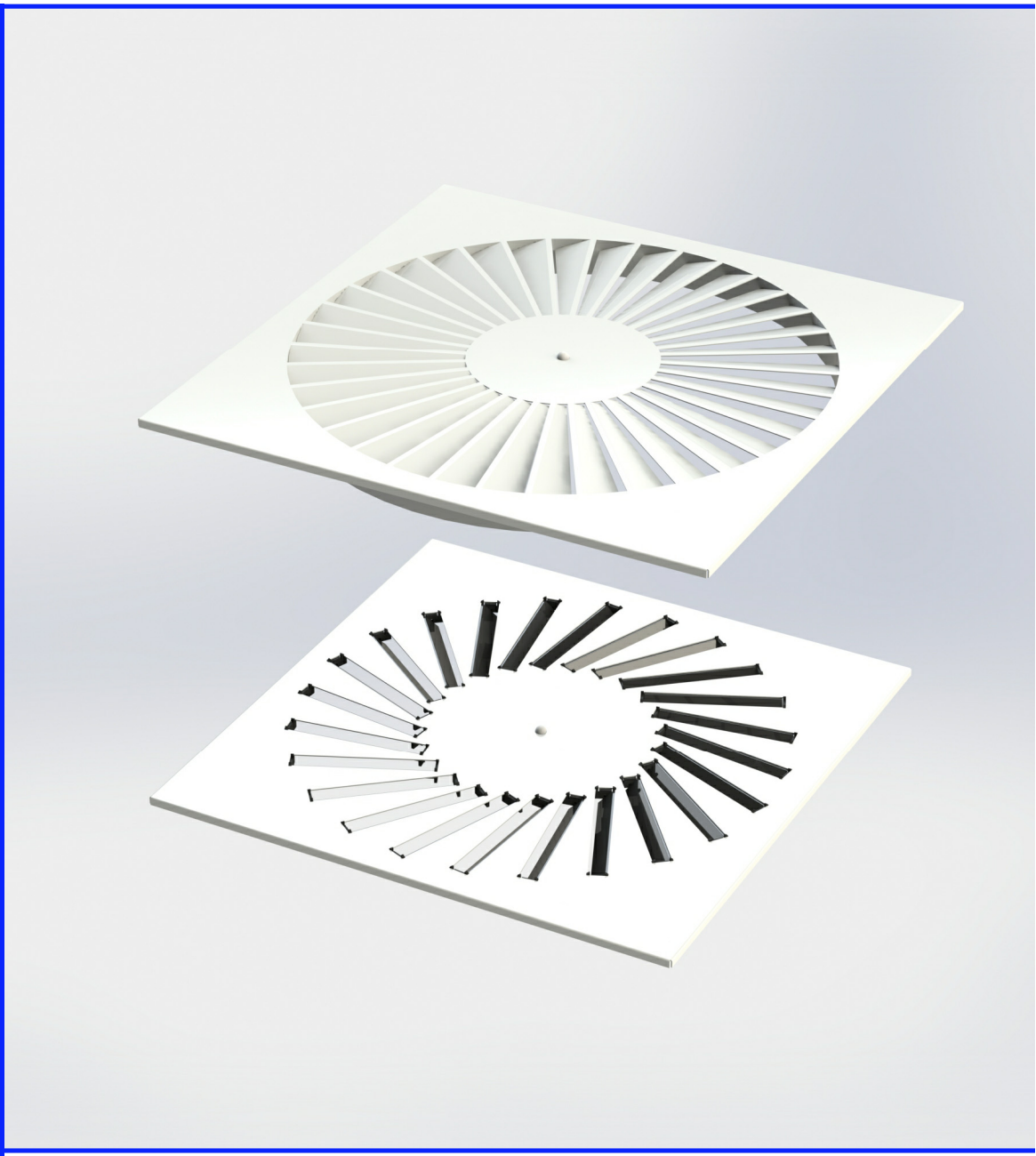
The following 8 pages are the document exactly as received and checked. It is bookmarked in the PDF.

Reference	HEN0203-SGTYPEA-DS
Asset	SG-TYPE A
Provided by	Ventilation Direct Ltd
Source file	Vent Direct - SW - February 2017.pdf
Pages	8

Series SWF / SWA

Swirl diffusers - Fixed / Adjustable

- Fixed and adjustable models
- All in 595mm x 595mm tile replacer plate
- Stock product
- 360° throw to ensure good mix of supplied and resident air
- Factory fitted plenums with a range of options



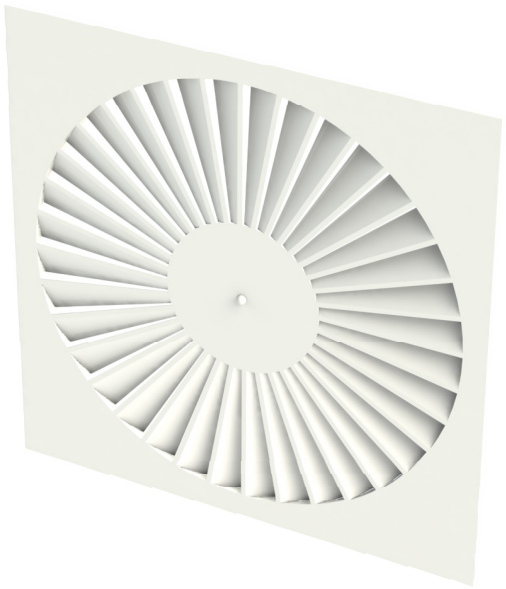
Series SWF / SWA

Series SW swirl diffusers are very effective supply units, designed to be mounted into a lay-in grid system.

SWF fixed blade swirls are manufactured from a single sheet of steel, sized 595mm x 595mm overall, with four different core sizes to suit most airflow requirements.

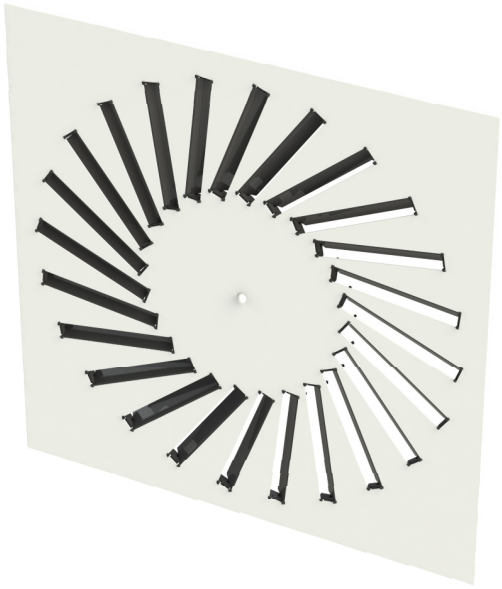
SWA adjustable blade swirls have a fascia formed from a single sheet of steel, but also use individually adjustable blades mounted on moulded plastic holders to allow throw adjustment.

Both types can be factory fitted with plenum boxes, which also have a range of options including acoustic/thermal lining and spigot mounted single blade volume control dampers.



SWF design features

Material	Steel
Blades	Straight edge, fixed
Overall size	595mm x 595mm Suitable for lay in ceilings
Core diameters	254, 356, 457 and 535mm
Mass/unit	3.5kg

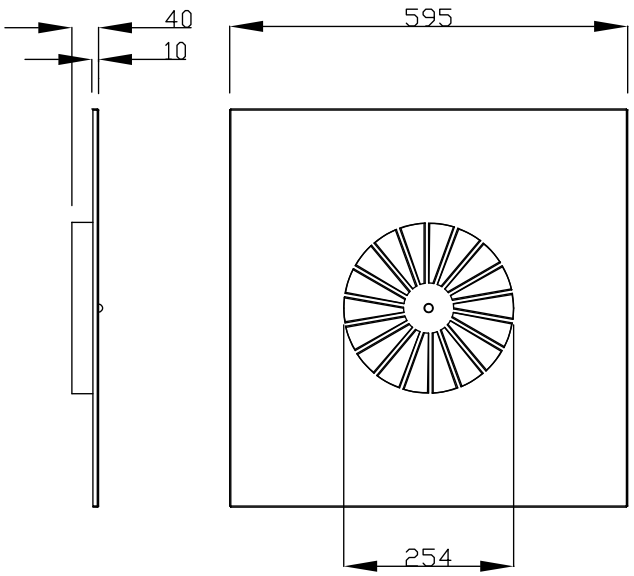


SWA design features

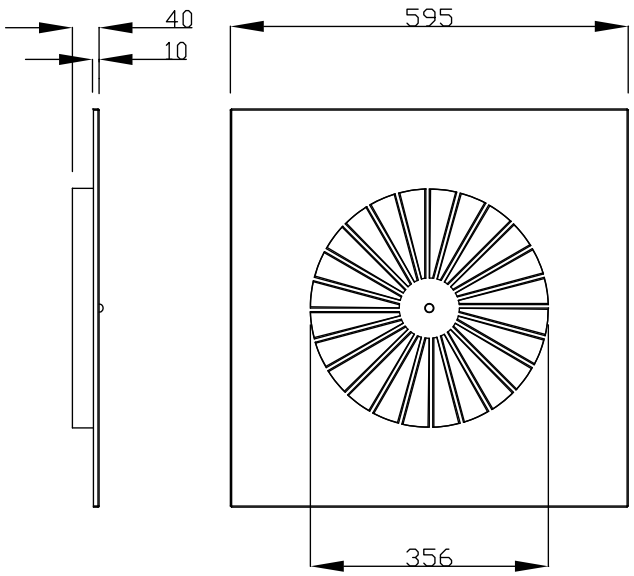
Material	Steel fascia and blades
	Moulded plastic blade mounts
Blades	Black, individually adjustable
Overall size	595mm x 595mm
Core	12, 24 and 36 slot variants
Mass/unit	3.5kg

Technical drawings - SWF

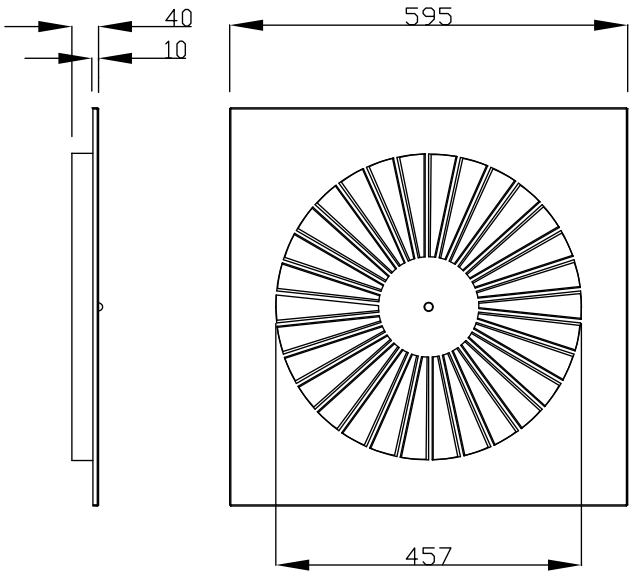
SWF 254 Ø



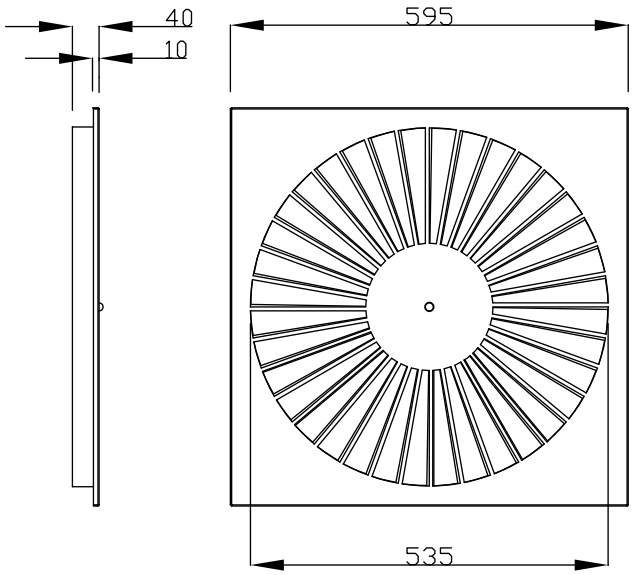
SWF 356 Ø



SWF 456 Ø

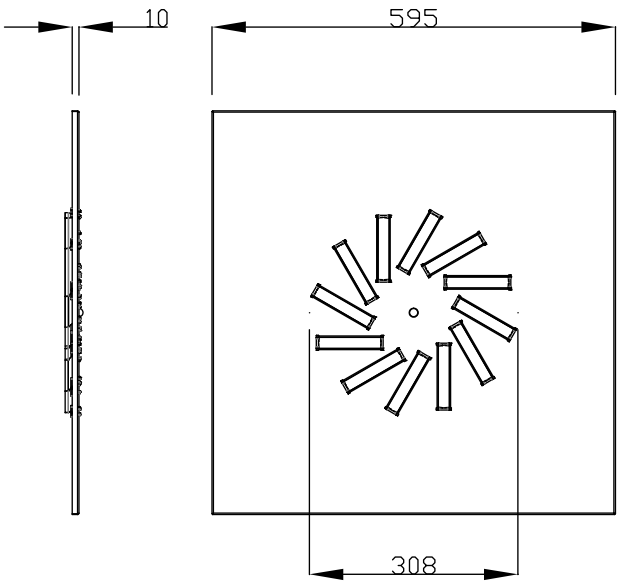


SWF 535 Ø

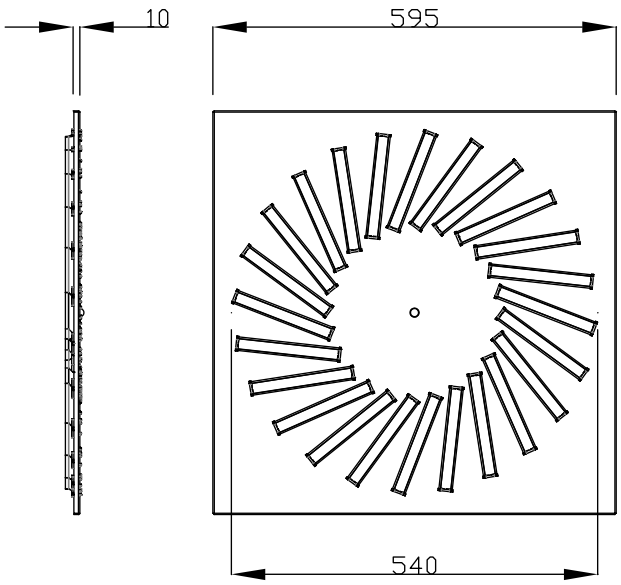


Technical drawings - SWA

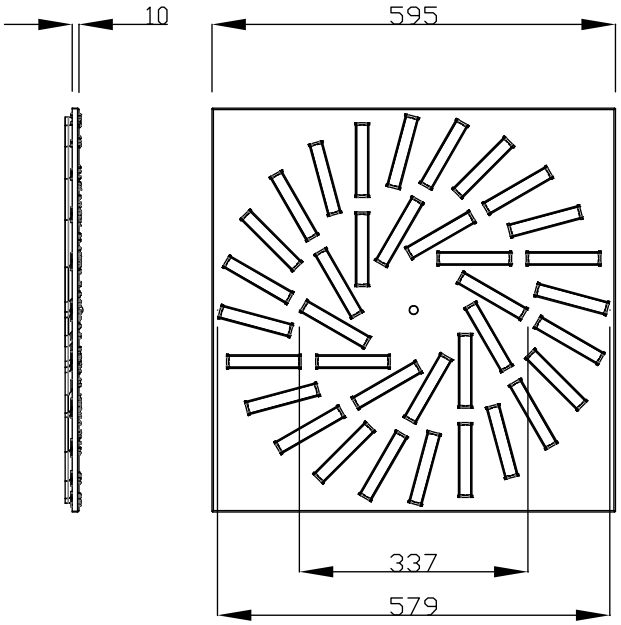
SWA 12 slot



SWA 24 slot



SWA 36 slot



Plenums

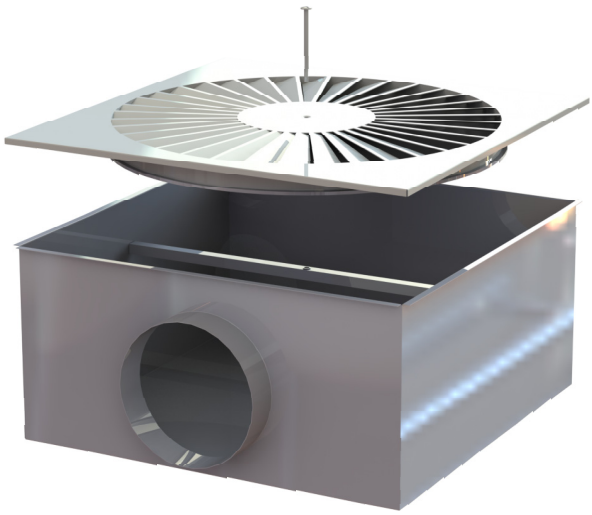
Swirl diffusers are normally supplied factory fitted with plenum boxes to facilitate connection to ductwork.

Boxes are fitted with an internal runner holding a nutsert, a long bolt (supplied by Vent Direct) is fitted through a hole in the centre of the swirl diffuser, and screwed into the nutsert.

By tightening the bolt, the swirl is pulled up securely to the box.

Plenums are available with the following range of options:

- Series SBD single blade volume control dampers mounted in the box spigot.
- Internal acoustic lining.
- Matt black internals.



Important note: Swirl diffuser plenum boxes are manufactured with side entry spigots as standard. Models with top entry spigots can be manufactured on request.

Finish

RAL9010 held in stock

Polyester powder coating to any RAL or BS colour



Ordering codes

Example

1 - SWF - 254 Ø - RAL9010 complete with SWB - 200 Ø - INS - SBD

Swirl diffuser ordering codes

1)	**Quantity**		
2)	**Series**	SWF SWA	Fixed swirl diffuser Adjustable swirl diffuser
3)	**Core diameter / slots**	254 Ø 356 Ø 457 Ø 535 Ø	SWF: 254mm core diameter 356mm core diameter 457mm core diameter 535mm core diameter
		12 slot 24 slot 36 slot	SWA: 12 slot core 24 slot core 36 slot core
4)	**Finish**	RAL... BS...	Polyester powder coated to RAL... Polyester powder coated to BS…

Plenum box ordering codes

1)	**Series**	SWB TE-SWB	Side entry plenum box to suit swirl diffusers Top entry plenum box to suit swirl diffusers
2)	**Spigot size**	(diameter / width x height)	
3)	**Spigot arrangement**	*(nothing)* 2OP 2C	Single spigot Two spigots mounted on opposite sides Two spigots mounted on adjacent sides
4)	**Acoustic insulation**	INS	Internally lined
5)	**Internal finish**	IN-BLACK	Internally painted RAL9005, matt black
6)	**Spigot damper**	SBD	Single blade damper in spigot

Important note: Swirl diffuser plenum boxes are manufactured with side entry spigots as standard.
Models with top entry spigots can be manufactured on request.

Notes

Ventilation Direct Ltd
Unit 10
Vantage Park
Vantage Close
Sheffield
S9 1BG

Tel: 0114 350 3535

info@ventdirect.co.uk

www.ventdirect.co.uk

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CU 2.01 operation and maintenance manual

The following 26 pages are the document exactly as received and checked. It is bookmarked in the PDF.

Reference	HEN0203-CU201-OM
Asset	CU 2.01
Provided by	Frost Air Conditioning
Source file	Toshiba air conditioning data sheets.pdf
Pages	26

Standard High Wall



TOSHIBA

PRODUCT SPECIFICATION

VRF STANDARD HIGH WALL: MMK - UP0151HP-E

- Special fin coating for healthy & fresh air.
- New appearance, simple, elegant with led display.
- Perfect for limited spaces, such as offices or small shops.
- Filters for dust collection can be easily removed and easily cleaned.
- New compact design (only 293 x 1050 x 250 mm) and lightweight (16 kg).



Hi - Res Image

Performance Data			
Capacity Code		HP	1.7
Nominal	Cooling Capacity	kW	4.5
	Heating Capacity	kW	5.0
UK	Cooling Total/Sensible	kW	4.1/3.0
	Heating	kW	3.4
Electrical	Power Input	kW	0.028
	Run Current	Amps	0.26
	Start Current	Amps	0.35

Indoor Data			
Airflow	High - Medium - Low	l/s	233 - 192 - 153
	High - Medium - Low	m3/h	840 - 690 - 550
Sound	Pressure High - Medium - Low	dB(A)	40 - 36 - 32
	Power High - Medium - Low	dB(A)	55 - 51 - 47
Unit	Height x Width x Depth	mm	293 x1050 x 250
	Weight	kg	16
Pipe Connection	Flare Connections (gas - liquid)	inch	1/2 - 1/4
	Drain Pipe Connection OD/ID	mm	16/14
Power Supply	Suggested Fuse Size	V/ph/Hz-A	220-240/1/50-5
Remote Controller	WH-TA09NE (Infra-Red)		

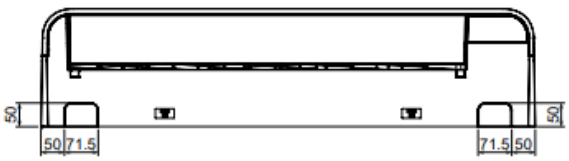
Accessories	
RBC-AMTU31-E	Standard Remote Controller - Full control including service functions
RBC-ASCU11-E	Compact Remote Controller - Includes timer off, back light display, multilingual
RBC-AMSU51-E	Standard Remote Controller - Includes timer, back light display, power-save functions, multilingual
RBC-AWSU52-E	Premium Controller - Includes timer and back light display, multilingual (inc. Bluetooth)
RBC-MTSC1	Mini Touch Screen Controller - with configurable icons for indoor units
RBC-MTSC2	Mini Touch Screen Controller - with Schedule Timer, configurable icons for indoor units

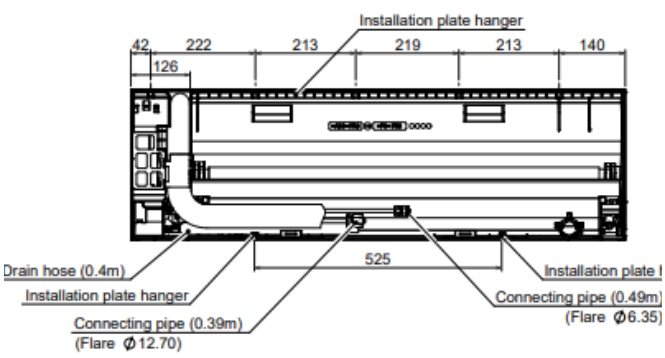
*All Accessories / Controls

Compatible R410a outdoor condensers:
Mini SMMS-e, SMMS-u, SHRM-e

Compatible R32 outdoor condensers:
Mini SMMS, SHRM-a

Related items:
- Full specification
- BIM files
- CAD files
- Airflow/ fan curve
- Dimensional drawing
- Wiring diagram
- Noise curve data
- Installation manual





TOSHIBA

PRODUCT SPECIFICATION

VRF STANDARD HIGH WALL: MMK - UP0361HP-E

- Special fin coating for healthy & fresh air.
- New appearance, simple, elegant with led display.
- Perfect for limited spaces, such as offices or small shops.
- Filters for dust collection can be easily removed and easily cleaned.
- New compact design (only 348 x 1200 x 280 mm) and lightweight (21 kg).



Hi - Res Image

Performance Data			
Capacity Code		HP	4.0
Nominal	Cooling Capacity	kW	10
	Heating Capacity	kW	11.2
UK	Cooling Total/Sensible	kW	10.0/7.8
	Heating	kW	8.5
Electrical	Power Input	kW	0.066
	Run Current	Amps	0.06
	Start Current	Amps	0.6

Indoor Data			
Airflow	High - Medium - Low	l/s	458 - 375 - 347
	High - Medium - Low	m3/h	1650 - 1350 - 1250
Sound	Pressure High - Medium - Low	dB(A)	50 - 45 - 43
	Power High - Medium - Low	dB(A)	65 - 60 - 58
Unit	Height x Width x Depth	mm	348 x 1200 x 280
	Weight	kg	21
Pipe Connection	Flare Connections (gas - liquid)	inch	5/8 - 3/8
	Drain Pipe Connection OD/ID	mm	16/14
Power Supply	Suggested Fuse Size	V/ph/Hz-A	220-240/1/50-5
Remote Controller	WH-TA09NE (Infra-Red)		

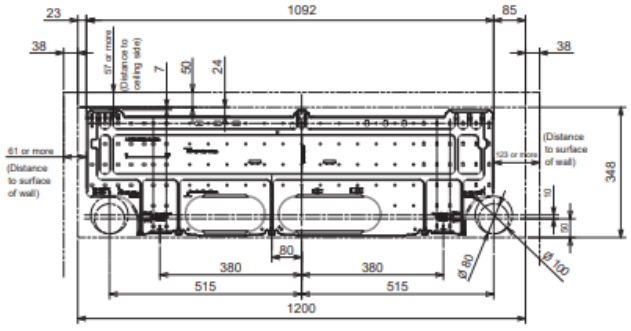
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*All Accessories / Controls

Compatible R410a outdoor condensers:
Mini SMMS-e, SMMS-u, SHRM-e

Compatible R32 outdoor condensers:
Mini SMMS, SHRM-a

Related items:
- Full specification
- CAD files
- Airflow/ fan curve
- Dimensional drawing
- Wiring diagram
- Noise curve data
- Installation manual



Toshiba Air Conditioning Data Sheet

Wall Mounted
RAV-HM561KRTP-E

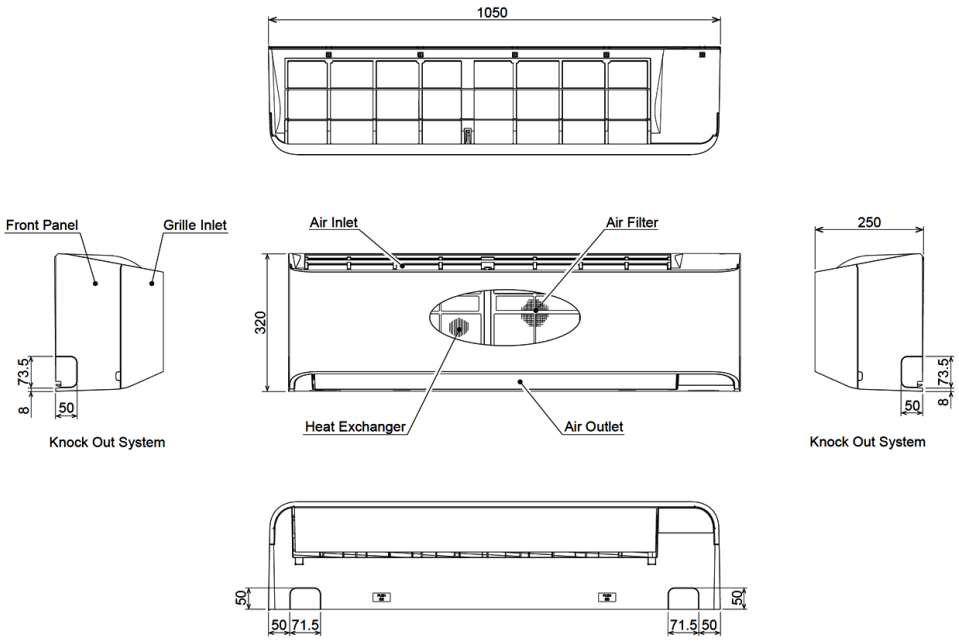
Features



- Run/Standby available with U series remote control (rotation/backup)
- Self-cleaning feature to prevent mould formation on the heat exchanger coils
- Suitable for single/twin/triple/quad connections
- Uses Toshiba TU2C-Link control platform (backward compatible)
- R32 Refrigerant
- Auto louver mode allows optimum and uniform air distribution
- Wireless remote control with pre-set functions; hi-power mode, quiet mode, comfort sleep, eco-mode
- Replacement technology' enabling the re-use of existing R410A, R22 or R407C pipework
- Power to outdoor, please see condensing unit sheet for supply requirements

Model Reference			RAV-HM561KRTP-E
Cooling	Nominal Cooling Capacity	kW	5.0
	UK Cooling Total/Sensible	kW	4.75/3.61
	Power Input (rated)	kW	1.66
Energy Efficiency Class (connected to standard DI outdoor)	SEER/Energy Efficiency Class		6.19/A++
Heating	Nominal Heating Capacity	kW	5.3
	UK Heating	kW	3.79
	Power Input	kW	1.55
Energy Efficiency Class (connected to standard DI outdoor)	SCOP/Energy Efficiency Class		4.0 / A+
Air Flow	High - Medium - Low	l/s	267 - 231 - 189
	High - Medium - Low	m3/h	960 - 830 - 680
Sound	Pressure High - Medium - Low	dB(A)	42 - 39 - 36
	Power High - Medium - Low	dB(A)	57 - 54 - 51
Unit	Height x Width x Depth	mm	320 - 1050 - 250
	Weight	kg	14
Pipe Connection	Flare Connections (gas - liquid)	inch	1/2 -1/4

The electrical installation needs to meet current UK electrical regulations BS7671:2018+A2:2022 the 18th Edition of the IET regulations.
Fuse sizes shown are for guidance only, cables and protective devices should be calculated using the MCA/MOCP details provided



Rated conditions: Cooling : Indoor 27 degC Dry Bulb /19 degC Wet Bulb , Outdoor 35 degC Dry Bulb. Heating : Indoor 20 degC Dry Bulb, Outdoor 7 degC Dry Bulb / 6 deg
Based on equivalent piping length of 7.5m and piping height difference of 0m. Data from Toshiba Air Conditioning 2022

4-Way Compact Cassette



VRF 4-WAY COMPACT CASSETTE: MMU - UP0071MH-E

- 5-step flow with individual louvre swing control.
- Fit within the T-bar of grid ceiling: 620mm X 620mm.
- Lightweight unit, for easy and quick installation with built in high lift drain pump.
- At only 256mm height, this compact chassis is perfectly suited to confined spaces.
- Smart flat panel design with clean lines that will complement any decorative style.



Hi - Res Image

Performance Data			
Capacity Code		HP	0.8
Nominal	Cooling Capacity	kW	2.2
	Heating Capacity	kW	2.5
UK	Cooling Total/Sensible	kW	2.0/1.7
	Heating	kW	1.3
Electrical	Power Input	kW	0.023
	Run Current	Amps	0.23
	Start Current	Amps	0.41

Indoor Data			
Airflow	High - Medium - Low	l/s	153 - 128 - 105
	High - Medium - Low	m3/h	552 - 462 - 378
Sound	Pressure High - Medium - Low	dB(A)	37 - 33 - 29
	Power High - Medium - Low	dB(A)	52 - 48 - 44
Unit	Height x Width x Depth	mm	256 x 575 x 575
	Weight	kg	15
Panel	Height x Width x Depth	mm	12 x 620 x 620
	Weight RBC-UM21PG(W)-E	kg	2.5
Pipe Connection	Flare Connections (gas - liquid)	inch	3/8 - 1/4
	Drain Pipe Connection ID	mm	VP20
Power Supply	Suggested Fuse Size	V/ph/Hz-A	220-240/1/50-3

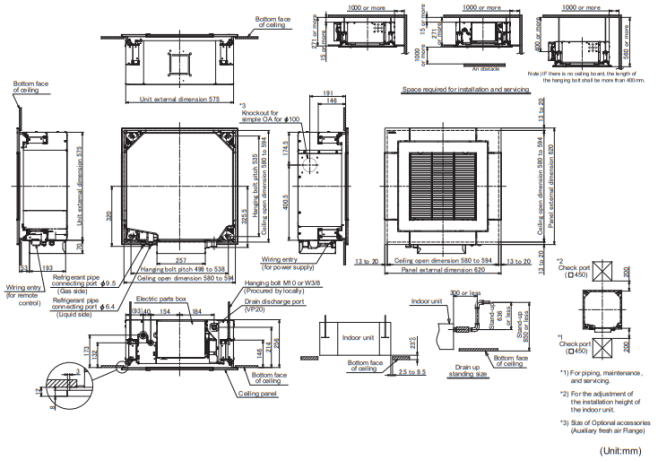
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RBC-ASCU11-E	Compact Remote Controller - Includes timer off, back light display, multilingual
RBC-AWSU52-E	Premium Controller - Includes timer and back light display, multilingual (inc. Bluetooth)
RBC-MTSC1	Mini Touch Screen Controller - with configurable icons for indoor units
RBC-MTSC2	Mini Touch Screen Controller - with Schedule Timer, configurable icons for indoor units
TCB-SIR41UM-E	Occupancy sensor - Cannot be used with wireless remote control kit
RBC-AXU31UM-E	Wireless Remote Control kit - Cannot be used with Occupancy sensor
TCB-FF101URE2	Auxiliary fresh air flange - For easy fresh air intake by using knock out hole of indoor

*All Accessories / Controls

Compatible R410a outdoor condensers:
Mini SMMS-e, SMMS-u, SHRM-e

Compatible R32 outdoor condensers:
Mini SMMS, SHRM-a

Related items:
- Full specification
- BIM files
- Airflow/ fan curve
- Dimensional drawing
- Wiring diagram
- Noise curve data
- Installation manual



TOSHIBA

PRODUCT SPECIFICATION

VRF 4-WAY COMPACT CASSETTE: MMU - UP0091MH-E

- 5-step flow with individual louvre swing control.
- Fit within the T-bar of grid ceiling: 620mm X 620mm.
- Lightweight unit, for easy and quick installation with built in high lift drain pump.
- At only 256mm height, this compact chassis is perfectly suited to confined spaces.
- Smart flat panel design with clean lines that will complement any decorative style.



Hi - Res Image

Performance Data			
Capacity Code		HP	1.0
Nominal	Cooling Capacity	kW	2.8
	Heating Capacity	kW	3.2
UK	Cooling Total/Sensible	kW	2.5/2.1
	Heating	kW	1.7
Electrical	Power Input	kW	0.025
	Run Current	Amps	0.24
	Start Current	Amps	0.43

Indoor Data			
Airflow	High - Medium - Low	l/s	158 - 130 - 105
	High - Medium - Low	m3/h	570 - 468 - 378
Sound	Pressure High - Medium - Low	dB(A)	38 - 33 - 29
	Power High - Medium - Low	dB(A)	53 - 48 - 44
Unit	Height x Width x Depth	mm	256 x 575 x 575
	Weight	kg	15
Panel	Height x Width x Depth	mm	12 x 620 x 620
	Weight RBC-UM21PG(W)-E	kg	2.5
Pipe Connection	Flare Connections (gas - liquid)	inch	3/8 - 1/4
	Drain Pipe Connection ID	mm	VP20
Power Supply	Suggested Fuse Size	V/ph/Hz-A	220-240/1/50-3

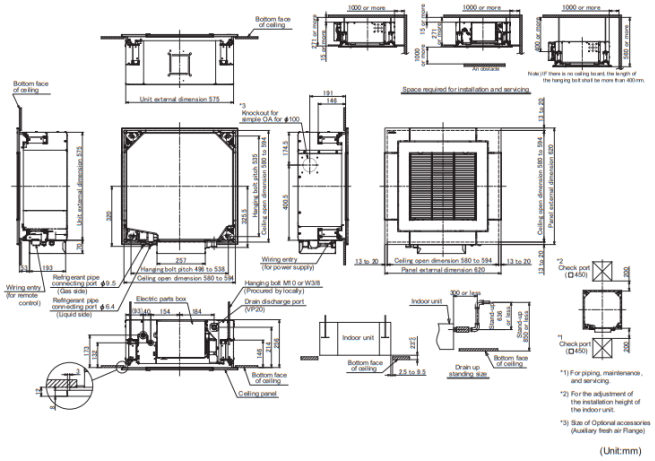
Accessories	
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RBC-ASCU11-E	Compact Remote Controller - Includes timer off, back light display, multilingual
RBC-AWSU52-E	Premium Controller - Includes timer and back light display, multilingual (inc. Bluetooth)
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TCB-FF101URE2	Auxiliary fresh air flange - For easy fresh air intake by using knock out hole of indoor

*All Accessories / Controls

Compatible R410a outdoor condensers:
Mini SMMS-e, SMMS-u, SHRM-e

Compatible R32 outdoor condensers:
Mini SMMS, SHRM-a

Related items:
- Full specification
- BIM files
- Airflow/ fan curve
- Dimensional drawing
- Wiring diagram
- Noise curve data
- Installation manual



4-Way Standard Cassette



TOSHIBA

PRODUCT SPECIFICATION

VRF 4-WAY STANDARD CASSETTE: MMU - UP0121HP-E

- Possible to set three different swing modes.
- Optimal air diffusion up to 4.6m ceiling height.
- Lightweight unit, for easy and quick installation.
- Compact chassis with only 256mm height (up to size 30).
- Self-cleaning function and Ag-ion tip for anti-mould in drain cap.



Hi - Res Image

Performance Data			
Capacity Code		HP	1.3
Nominal	Cooling Capacity	kW	3.6
	Heating Capacity	kW	4.0
UK	Cooling Total/Sensible	kW	3.3/2.5
	Heating	kW	2.7
Electrical	Power Input	kW	0.021
	Run Current	Amps	0.23
	Start Current	Amps	0.30

Indoor Data			
Airflow	High - Medium - Low	l/s	222 - 203 - 188
	High - Medium - Low	m3/h	800 - 730 - 680
Sound	Pressure High - Medium - Low	dB(A)	30 - 29 - 27
	Power High - Medium - Low	dB(A)	45 - 44 - 42
Unit	Height x Width x Depth	mm	256 x 840 x 840
	Weight	kg	20
Panel	Height x Width x Depth	mm	30 x 950 x 950
	Weight RBC-U32PGP-E	kg	4
Pipe Connection	Flare Connections (gas - liquid)	inch	3/8 - 1/4
	Drain Pipe Connection OD/ID	mm	32/25
Power Supply	Suggested Fuse Size	V/ph/Hz-A	220-240/1/50-5

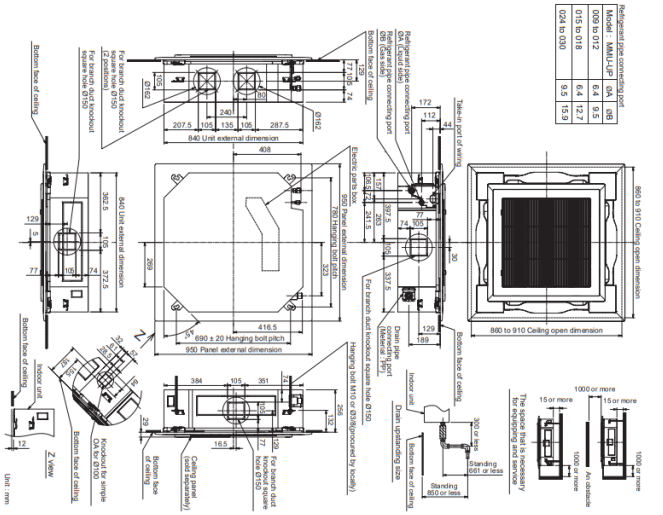
Accessories	
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RBC-ASCU11-E	Compact Remote Controller - Includes timer off, back light display, multilingual
RBC-AWSU52-E	Premium Controller - Includes timer and back light display, multilingual (inc. Bluetooth)
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RBC-MTSC2	Mini Touch Screen Controller - with Schedule Timer, configurable icons for indoor units
TCB-GFC1603U-E	Fresh Air Chamber - Fresh Air chamber for use with TCB-GB1602UE
TCB-BC1602UE	Air discharge direction kit - Air Discharge kit - With 6-direction patterns
TCB-FF101URE2	Auxiliary fresh air flange - For easy fresh air intake by using knock out hole of indoor.

*All Accessories / Controls

Compatible R410a outdoor condensers:
Mini SMMS-e, SMMS-u, SHRM-e

Compatible R32 outdoor condensers:
Mini SMMS, SHRM-a

Related items:
- Full specification
- BIM files
- Airflow/ fan curve
- Dimensional drawing
- Wiring diagram
- Noise curve data
- Installation manual



TOSHIBA

PRODUCT SPECIFICATION

VRF 4-WAY STANDARD CASSETTE: MMU - UP0181HP-E

- Possible to set three different swing modes.
- Optimal air diffusion up to 4.6m ceiling height.
- Lightweight unit, for easy and quick installation.
- Compact chassis with only 256mm height (up to size 30).
- Self-cleaning function and Ag-ion tip for anti-mould in drain cap.



Hi - Res Image

Performance Data			
Capacity Code		HP	2.0
Nominal	Cooling Capacity	kW	5.6
	Heating Capacity	kW	6.3
UK	Cooling Total/Sensible	kW	5.1/3.8
	Heating	kW	4.3
Electrical	Power Input	kW	0.026
	Run Current	Amps	0.29
	Start Current	Amps	0.36

Indoor Data			
Airflow	High - Medium - Low	l/s	292 - 255 - 222
	High - Medium - Low	m3/h	1050 - 920 - 800
Sound	Pressure High - Medium - Low	dB(A)	32 - 29 - 27
	Power High - Medium - Low	dB(A)	47 - 44 - 42
Unit	Height x Width x Depth	mm	256 x 840 x 840
	Weight	kg	20
Panel	Height x Width x Depth	mm	30 x 950 x 950
	Weight RBC-U32PGP-E	kg	4
Pipe Connection	Flare Connections (gas - liquid)	inch	1/2 - 1/4
	Drain Pipe Connection OD/ID	mm	32/25
Power Supply	Suggested Fuse Size	V/ph/Hz-A	220-240/1/50-5

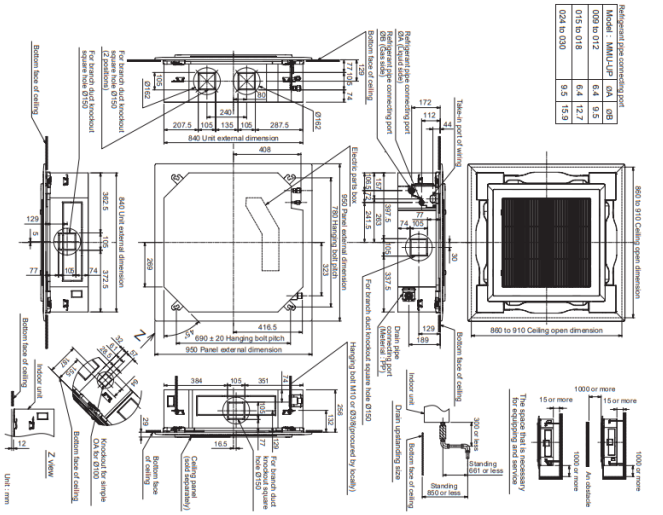
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RBC-MTSC2	Mini Touch Screen Controller - with Schedule Timer, configurable icons for indoor units
TCB-GFC1603U-E	Fresh Air Chamber - Fresh Air chamber for use with TCB-GB1602UE
TCB-BC1602UE	Air discharge direction kit - Air Discharge kit - With 6-direction patterns
TCB-FF101URE2	Auxiliary fresh air flange - For easy fresh air intake by using knock out hole of indoor.

*All Accessories / Controls

Compatible R410a outdoor condensers:
Mini SMMS-e, SMMS-u, SHRM-e

Compatible R32 outdoor condensers:
Mini SMMS, SHRM-a

Related items:
- Full specification
- BIM files
- Airflow/ fan curve
- Dimensional drawing
- Wiring diagram
- Noise curve data
- Installation manual



VRF 4-WAY STANDARD CASSETTE: MMU - UP0241HP-E

- Possible to set three different swing modes.
- Optimal air diffusion up to 4.6m ceiling height.
- Lightweight unit, for easy and quick installation.
- Compact chassis with only 256mm height (up to size 30).
- Self-cleaning function and Ag-ion tip for anti-mould in drain cap.



Hi - Res Image

Performance Data			
Capacity Code		HP	2.5
Nominal	Cooling Capacity	kW	7.1
	Heating Capacity	kW	8.0
UK	Cooling Total/Sensible	kW	6.4/4.6
	Heating	kW	5.4
Electrical	Power Input	kW	0.036
	Run Current	Amps	0.38
	Start Current	Amps	0.42

Indoor Data			
Airflow	High - Medium - Low	l/s	358 - 255 - 222
	High - Medium - Low	m3/h	1290 - 920 - 800
Sound	Pressure High - Medium - Low	dB(A)	35 - 31 - 28
	Power High - Medium - Low	dB(A)	50 - 46 - 43
Unit	Height x Width x Depth	mm	256 x 840 x 840
	Weight	kg	20
Panel	Height x Width x Depth	mm	30 x 950 x 950
	Weight RBC-U32PGP-E	kg	4
Pipe Connection	Flare Connections (gas - liquid)	inch	5/8 - 3/8
	Drain Pipe Connection OD/ID	mm	32/25
Power Supply	Suggested Fuse Size	V/ph/Hz-A	220-240/1/50-5

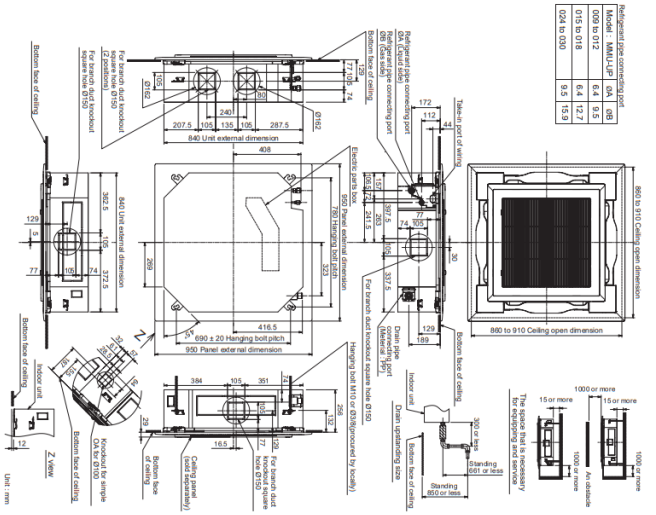
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RBC-ASCU11-E	Compact Remote Controller - Includes timer off, back light display, multilingual
RBC-AWSU52-E	Premium Controller - Includes timer and back light display, multilingual (inc. Bluetooth)
RBC-MTSC1	Mini Touch Screen Controller - with configurable icons for indoor units
RBC-MTSC2	Mini Touch Screen Controller - with Schedule Timer, configurable icons for indoor units
TCB-GFC1603U-E	Fresh Air Chamber - Fresh Air chamber for use with TCB-GB1602UE
TCB-BC1602UE	Air discharge direction kit - Air Discharge kit - With 6-direction patterns
TCB-FF101URE2	Auxiliary fresh air flange - For easy fresh air intake by using knock out hole of indoor.

*All Accessories / Controls

Compatible R410a outdoor condensers:
Mini SMMS-e, SMMS-u, SHRM-e

Compatible R32 outdoor condensers:
Mini SMMS, SHRM-a

Related items:
- Full specification
- BIM files
- Airflow/ fan curve
- Dimensional drawing
- Wiring diagram
- Noise curve data
- Installation manual



TOSHIBA

PRODUCT SPECIFICATION

VRF 4-WAY STANDARD CASSETTE: MMU - UP0481HP-E

- Possible to set three different swing modes.
- Optimal air diffusion up to 4.6m ceiling height.
- Lightweight unit, for easy and quick installation.
- Compact chassis with only 319mm height (up to size 56).
- Self-cleaning function and Ag-ion tip for anti-mould in drain cap.



Hi - Res Image

Performance Data			
Capacity Code		HP	5.0
Nominal	Cooling Capacity	kW	14.0
	Heating Capacity	kW	16.0
UK	Cooling Total/Sensible	kW	12.7/9.3
	Heating	kW	10.9
Electrical	Power Input	kW	0.112
	Run Current	Amps	0.88
	Start Current	Amps	1.23

Indoor Data			
Airflow	High - Medium - Low	l/s	592 - 397 - 313
	High - Medium - Low	m3/h	2130 - 1430 - 1130
Sound	Pressure High - Medium - Low	dB(A)	46 - 38 - 33
	Power High - Medium - Low	dB(A)	61 - 53 - 48
Unit	Height x Width x Depth	mm	319 x 840 x 840
	Weight	kg	25
Panel	Height x Width x Depth	mm	30 x 950 x 950
	Weight RBC-U32PGP-E	kg	4
Pipe Connection	Flare Connections (gas - liquid)	inch	5/8 - 3/8
	Drain Pipe Connection OD/ID	mm	32/25
Power Supply	Suggested Fuse Size	V/ph/Hz-A	220-240/1/50-5

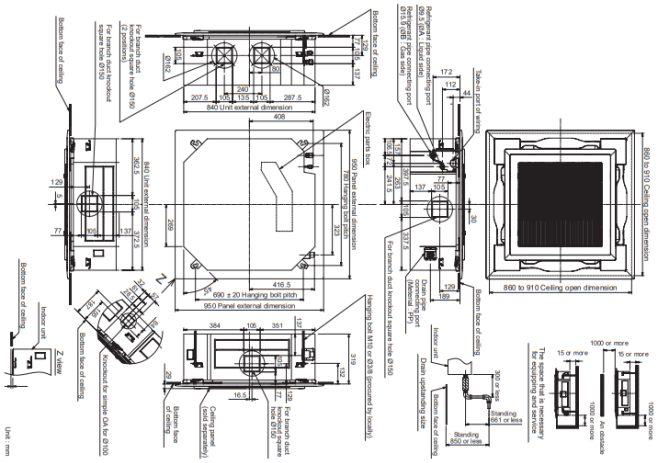
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RBC-AWSU52-E	Premium Controller - Includes timer and back light display, multilingual (inc. Bluetooth)
RBC-MTSC1	Mini Touch Screen Controller - with configurable icons for indoor units
RBC-MTSC2	Mini Touch Screen Controller - with Schedule Timer, configurable icons for indoor units
TCB-GFC1603U-E	Fresh Air Chamber - Fresh Air chamber for use with TCB-GB1602UE
TCB-BC1602UE	Air discharge direction kit - Air Discharge kit - With 6-direction patterns
TCB-FF101URE2	Auxiliary fresh air flange - For easy fresh air intake by using knock out hole of indoor.

*All Accessories / Controls

Compatible R410a outdoor condensers:
Mini SMMS-e, SMMS-u, SHRM-e

Compatible R32 outdoor condensers:
Mini SMMS, SHRM-a

Related items:
- Full specification
- BIM files
- Airflow/ fan curve
- Dimensional drawing
- Wiring diagram
- Noise curve data
- Installation manual



VRF 4-WAY STANDARD CASSETTE: MMU - UP0561HP-E

- Possible to set three different swing modes.
- Optimal air diffusion up to 4.6m ceiling height.
- Lightweight unit, for easy and quick installation.
- Compact chassis with only 319mm height (up to size 56).
- Self-cleaning function and Ag-ion tip for anti-mould in drain cap.



Hi - Res Image

Performance Data			
Capacity Code		HP	6.0
Nominal	Cooling Capacity	kW	16.0
	Heating Capacity	kW	18.0
UK	Cooling Total/Sensible	kW	14.5/10.4
	Heating	kW	12.2
Electrical	Power Input	kW	0.112
	Run Current	Amps	0.88
	Start Current	Amps	1.26

Indoor Data			
Airflow	High - Medium - Low	l/s	592 - 422 - 342
	High - Medium - Low	m3/h	2130 - 1520 - 1230
Sound	Pressure High - Medium - Low	dB(A)	46 - 40 - 33
	Power High - Medium - Low	dB(A)	61 - 55 - 48
Unit	Height x Width x Depth	mm	319 x 840 x 840
	Weight	kg	25
Panel	Height x Width x Depth	mm	30 x 950 x 950
	Weight RBC-U32PGP-E	kg	4
Pipe Connection	Flare Connections (gas - liquid)	inch	5/8 - 3/8
	Drain Pipe Connection OD/ID	mm	32/25
Power Supply	Suggested Fuse Size	V/ph/Hz-A	220-240/1/50-5

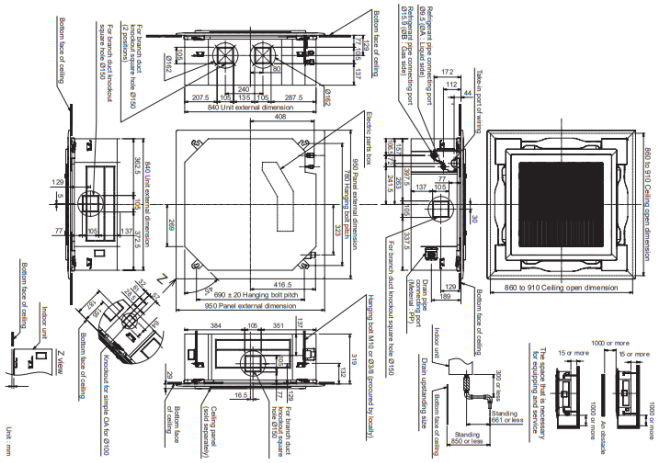
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RBC-ASCU11-E	Compact Remote Controller - Includes timer off, back light display, multilingual
RBC-AWSU52-E	Premium Controller - Includes timer and back light display, multilingual (inc. Bluetooth)
RBC-MTSC1	Mini Touch Screen Controller - with configurable icons for indoor units
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TCB-GFC1603U-E	Fresh Air Chamber - Fresh Air chamber for use with TCB-GB1602UE
TCB-BC1602UE	Air discharge direction kit - Air Discharge kit - With 6-direction patterns
TCB-FF101URE2	Auxiliary fresh air flange - For easy fresh air intake by using knock out hole of indoor.

*All Accessories / Controls

Compatible R410a outdoor condensers:
Mini SMMS-e, SMMS-u, SHRM-e

Compatible R32 outdoor condensers:
Mini SMMS, SHRM-a

Related items:
- Full specification
- BIM files
- Airflow/ fan curve
- Dimensional drawing
- Wiring diagram
- Noise curve data
- Installation manual



Toshiba Air Conditioning Data Sheet

4-Way Cassette
RAV-HM561UTP-E

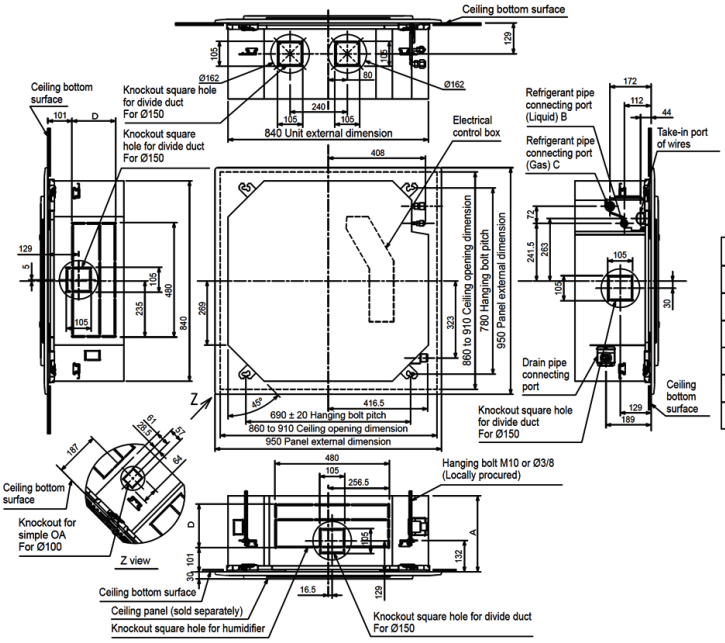
Features

- Run/Standby available with U series remote control (rotation/backup)
- Suitable for single/twin/triple/quad connections
- Uses Toshiba TU2C-Link control platform (backward compatible)
- R32 Refrigerant
- Self-cleaning function and Ag-ion tip for anti-mould in drain cap
- Detachable louvre and grille for easy cleaning
- 'Replacement technology' enabling the re-use of existing R410A, R22 or R407C pipework
- Power to outdoor, please see condensing unit sheet for supply requirements



Model Reference			RAV-HM561UTP-E
Cooling	Nominal Cooling Capacity	kW	5.0
	UK Cooling Total/Sensible	kW	4.80/4.10
	Power Input (rated)	kW	1.56
Energy Efficiency Class	SEER/Energy Efficiency Class		6.34/A++
Heating	Nominal Heating Capacity	kW	5.3
	UK Heating	kW	2.92
	Power Input	kW	1.36
Energy Efficiency Class	SCOP/Energy Efficiency Class		4.6 / A++
Air Flow	High - Medium - Low	l/s	292 - 242 - 217
	High - Medium - Low	m3/h	1050 - 870 - 780
Sound	Pressure High - Medium - Low	dB(A)	32 - 29 - 28
	Power High - Medium - Low	dB(A)	47 - 44 - 43
Unit	Height x Width x Depth	mm	256 x 840 x 840
	Weight	kg	20
Panel	Height x Width x Depth	mm	30 x 950 x 950
	Weight RBC-U32PGP(W)-E	kg	4.2
Pipe Connection	Flare Connections (gas - liquid)	inch	1/2 -1/4

The electrical installation needs to meet current UK electrical regulations BS7671:2018+A2:2022 the 18th Edition of the IET regulations.
Fuse sizes shown are for guidance only, cables and protective devices should be calculated using the MCA/MOCP details provided



(mm)

Model	A	B	C	D
HM56 Type	256	Ø6.4	Ø12.7	120
HM80 Type	256	Ø9.5	Ø15.9	120
HM90 Type	319	Ø9.5	Ø15.9	183
HM110 Type	319	Ø9.5	Ø15.9	183
HM140 Type	319	Ø9.5	Ø15.9	183
HM160 Type	319	Ø9.5	Ø15.9	183

Rated conditions: Cooling : Indoor 27 degC Dry Bulb /19 degC Wet Bulb , Outdoor 35 degC Dry Bulb. Heating : Indoor 20 degC Dry Bulb, Outdoor 7 degC Dry Bulb / 6 deg
Based on equivalent piping length of 7.5m and piping height difference of 0m. Data from Toshiba Air Conditioning 2022

R410A
REFRIGERANT

SHRMe



VRF SHRMe R410a: AP2816FT8P-UK

COMBINATIONS

- SHRM-e can reach up to 1,000 meters maximum piping length.
- Surface area increased by 13% with 3-row heat exchanger enhancing efficiency.
- Toshiba's unique combination of twin rotary compressors and inverter driven control.
- Emphasis on driving excellence in energy savings and enhancement in applications.
- Unique Diamond Like Carbon Coating technology offers outstanding wear resistance.

R410A REFRIGERANT

SHRM e SUPER HEAT RECOVERY MULTI



Hi - Res Image

Performance & Outdoor Data			
Model & Combination		**AP2816FT8P-UK** MAP1406FT8P-UK x 2	
Capacity Range		HP	28
Maximum Number of Indoor Units		QTY	63
Cooling Capacity		kW	80.0
Heating Capacity		kW	90.0
Operating Range	Cooling	°C	-10.0 to 46.0
	Heating		-25.0 to 15.5
Cooling	Power Consumption	kW	25.40
	EER/SEER/Energy Efficiency Class (or nsc %)		3.15/5.67/223.8
Heating	Power Consumption	kW	21.00
	COP/SCOP/Energy Efficiency Class (or nsc(A) %)		3.81/3.57/139.8
Fan(s)	Standard Air Flow H	l/s	6778*
	Standard Air Flow H	m3/h	24400*
	External Static Pressure	Pa	40
Sound	Pressure Level C/H	dB(A)	65.5/67.5
	Power Level C/H	dB(A)	84.5/86.5
Unit(s)	Height x Width x Depth	mm	1830 x 2440 x 780
	Weight	kg	632
	Refrigerant Base Charge	kg	11 x2
Pipe Connections	Suction Gas Pipe Brazing	inch	1-3/8
	Discharge Pipe Brazing	inch	1-1/8
	Liquid Pipe Flare	inch	7/8
	Balance Pipe Flare	inch	3/8
Maximum	Equivalent Length	m	200
	Real Length	m	180
	Total Pipe Length (Liquid Line Real Length)	m	300
	Length To First Branch Height Difference Between Indoor Units ≤ 3 m	m	100
	Length To First Branch Height Difference Between Indoor Units > 3 m	m	85
	Equivalent Length Of Outdoor Unit Connecting Pipe	m	10
	Equivalent Length Between Branches	m	50
	Height Difference Outdoor Higher Than Indoor Units	m	70
	Height Difference Outdoor Lower Than Indoor Units	m	30
Electrical	Electrical Characteristic Running Current Cooling/Heating	A	39.85/32.95
	Power Supply	V/ph/Hz	380-415/3/50
	Suggested Fused Supply(s)	A	32 x 2

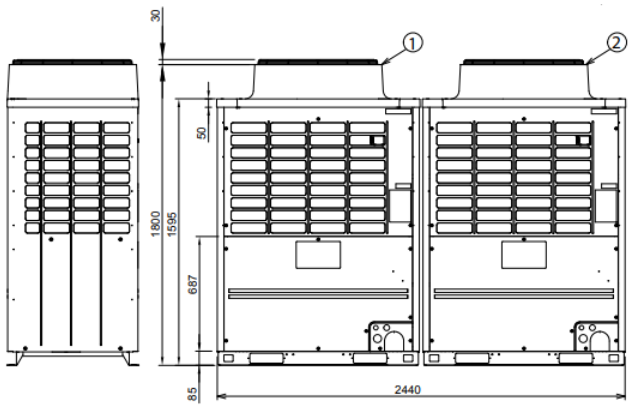
*Combination combined value, see stand alone for individual data

*All Accessories / Controls

Related items:

- Full specification
- Dimensional drawing
- Connection diagram
- Noise curve data

*For further information see stand alone data



VRF SHRMe R410a: AP3016FT8P-UK

COMBINATIONS

- SHRM-e can reach up to 1,000 meters maximum piping length.
- Surface area increased by 13% with 3-row heat exchanger enhancing efficiency.
- Toshiba's unique combination of twin rotary compressors and inverter driven control.
- Emphasis on driving excellence in energy savings and enhancement in applications.
- Unique Diamond Like Carbon Coating technology offers outstanding wear resistance.

R410A REFRIGERANT

SHRM SUPER HEAT RECOVERY MULTI



Hi - Res Image

Performance & Outdoor Data

Model & Combination			AP3016FT8P-UK MAP1606FT8P-UK MAP1406FT8P-UK
Capacity Range		HP	30
Maximum Number of Indoor Units		QTY	64
Cooling Capacity		kW	85.0
Heating Capacity		kW	95.0
Operating Range	Cooling	°C	-10.0 to 46.0
	Heating		-25.0 to 15.5
Cooling	Power Consumption	kW	26.60
	EER/SEER/Energy Efficiency Class (or nsc %)		3.20/5.72/225.8
Heating	Power Consumption	kW	22.70
	COP/SCOP/Energy Efficiency Class (or nsc(A) %)		3.74/3.54/138.6
Fan(s)	Standard Air Flow H	l/s	8195*
	Standard Air Flow H	m3/h	29500*
	External Static Pressure	Pa	40
Sound	Pressure Level C/H	dB(A)	65/66.5
	Power Level C/H	dB(A)	85.5/87
Unit(s)	Height x Width x Depth	mm	1830 x 2830 x 780
	Weight	kg	693
	Refrigerant Base Charge	kg	11 x2
Pipe Connections	Suction Gas Pipe Brazing	inch	1-3/8
	Discharge Pipe Brazing	inch	1-1/8
	Liquid Pipe Flare	inch	7/8
	Balance Pipe Flare	inch	3/8
Maximum	Equivalent Length	m	200
	Real Length	m	180
	Total Pipe Length (Liquid Line Real Length)	m	300
	Length To First Branch Height Difference Between Indoor Units ≤ 3 m	m	100
	Length To First Branch Height Difference Between Indoor Units > 3 m	m	85
	Equivalent Length Of Outdoor Unit Connecting Pipe	m	10
	Equivalent Length Between Branches	m	50
	Height Difference Outdoor Higher Than Indoor Units	m	70
	Height Difference Outdoor Lower Than Indoor Units	m	30
Electrical	Electrical Characteristic Running Current Cooling/Heating	A	41.73/35.61
	Power Supply	V/ph/Hz	380-415/3/50
	Suggested Fused Supply(s)	A	40 + 32

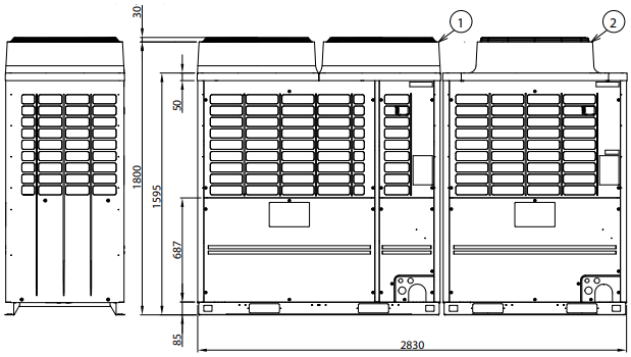
*Combination combined value, see stand alone for individual data

*All Accessories / Controls

Related items:

- Full specification
- Dimensional drawing
- Connection diagram
- Noise curve data

*For further information see stand alone data



R410A
REFRIGERANT

SMMSu



VRF SMMSu R410a: MMY - MUP2001HT8P-E

STAND ALONE

- Single module from 8 to 24HP.
- Operating conditions from -25°C to +52°C.
- Up to 128 indoor units connected per system.
- New A3 twin rotary compressor and a totally redesigned chassis.
- Up to 500m total piping length with 100m from outdoor to the farthest indoor unit.

R410A REFRIGERANT

SMMSu SUPER MODULAR MULTI SYSTEM



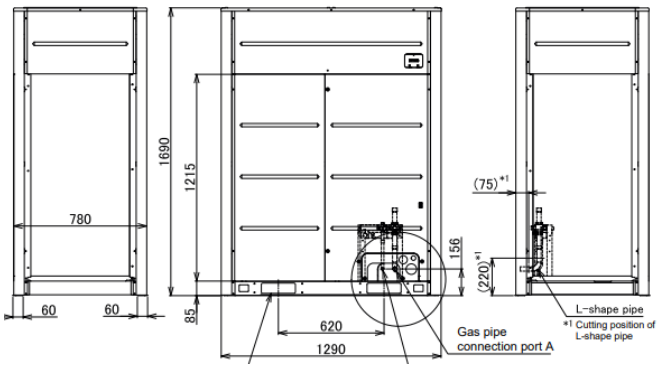
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Performance & Outdoor Data			
Capacity Range		HP	20
Maximum Number of Indoor Units		QTY	45
Cooling Capacity		kW	56.0
Heating Capacity		kW	56.0
Operating Range	Cooling	°C	-10.0 to 52.0
	Heating		-25.0 to 15.5
Cooling	Power Consumption	kW	18.01
	EER/SEER/Energy Efficiency Class (or nsc %)		3.11/7.62/301.8
Heating	Power Consumption	kW	14.93
	COP/SCOP/Energy Efficiency Class (or nsc(A) %)		3.75/4.43/174.2
Fan(s)	Standard Air Flow H	l/s	4417
	Standard Air Flow H	m3/h	15900
	External Static Pressure	Pa	80
Sound	Pressure Level C/H	dB(A)	63/67
	Power Level C/H	dB(A)	86/90
Unit(s)	Height x Width x Depth	mm	1690 x 1290 x 780
	Weight	kg	334
	Refrigerant Base Charge	kg	9
Pipe Connections	Suction Gas Pipe Brazing	inch	1 1/8
	Liquid Pipe Flare	inch	5/8
Maximum	Equivalent Length	m	210
	Real Length	m	170
	Total Pipe Length (Liquid Line Real Length)	m	500
	Length To First Branch	m	100
	Equivalent Length Of Outdoor Unit Connecting Pipe	m	10
	Real Length Of Indoor Unit Connecting Piping	m	30
	Equivalent Length Between Branches	m	50
	Height Difference Outdoor Higher Than Indoor Units	m	70 (110*)
	Height Difference Outdoor Lower Than Indoor Units	m	40 (110*)
	Height Difference Between Indoor Units	m	40
	Height Difference Between Outdoor Units	m	5
Electrical	Voltage Range Minimum/Maximum	V	342/456
	Electrical Characteristic Running Current Cooling/Heating	A	27.70/22.90
	Power Supply Wiring Starting Current	A	Soft Start
	Power Supply	V/ph/Hz	380-415/3/50
	Suggested Fused Supply(s)	A	40

*All Accessories / Controls

Related items:

- Full specification
- BIM files
- CAD files
- Refrigerant cycle
- Dimensional drawing
- Wiring diagram
- Noise curve data
- Installation manual



VRF SMMSu R410a: MMY - MUP2201HT8P-E

STAND ALONE

- Single module from 8 to 24HP.
- Operating conditions from -25°C to +52°C.
- Up to 128 indoor units connected per system.
- New A3 twin rotary compressor and a totally redesigned chassis.
- Up to 500m total piping length with 100m from outdoor to the farthest indoor unit.

R410A REFRIGERANT

SMMSu SUPER MODULAR MULTI SYSTEM



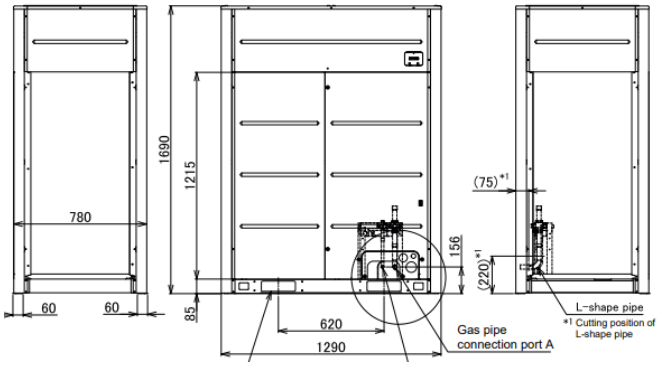
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Performance & Outdoor Data			
Capacity Range		HP	22
Maximum Number of Indoor Units		QTY	49
Cooling Capacity		kW	61.5
Heating Capacity		kW	61.5
Operating Range	Cooling	°C	-10.0 to 52.0
	Heating		-25.0 to 15.5
Cooling	Power Consumption	kW	20.43
	EER/SEER/Energy Efficiency Class (or nsc %)		3.01/7.23/286.2
Heating	Power Consumption	kW	16.18
	COP/SCOP/Energy Efficiency Class (or nsc(A) %)		3.80/4.44/174.6
Fan(s)	Standard Air Flow H	l/s	4583
	Standard Air Flow H	m3/h	16500
	External Static Pressure	Pa	80
Sound	Pressure Level C/H	dB(A)	63/67
	Power Level C/H	dB(A)	86/90
Unit(s)	Height x Width x Depth	mm	1690 x 1290 x 780
	Weight	kg	356
	Refrigerant Base Charge	kg	9
Pipe Connections	Suction Gas Pipe Brazing	inch	1 1/8
	Liquid Pipe Flare	inch	3/4
Maximum	Equivalent Length	m	210
	Real Length	m	170
	Total Pipe Length (Liquid Line Real Length)	m	500
	Length To First Branch	m	100
	Equivalent Length Of Outdoor Unit Connecting Pipe	m	10
	Real Length Of Indoor Unit Connecting Piping	m	30
	Equivalent Length Between Branches	m	50
	Height Difference Outdoor Higher Than Indoor Units	m	70 (110*)
	Height Difference Outdoor Lower Than Indoor Units	m	40 (110*)
	Height Difference Between Indoor Units	m	40
	Height Difference Between Outdoor Units	m	5
Electrical	Voltage Range Minimum/Maximum	V	342/456
	Electrical Characteristic Running Current Cooling/Heating	A	31.40/24.80
	Power Supply Wiring Starting Current	A	Soft Start
	Power Supply	V/ph/Hz	380-415/3/50
	Suggested Fused Supply(s)	A	50

*All Accessories / Controls

Related items:

- Full specification
- BIM files
- CAD files
- Refrigerant cycle
- Dimensional drawing
- Wiring diagram
- Noise curve data
- Installation manual



VRF SMMSu R410a: UP3411HT8P-E

COMBINATIONS

- Operating conditions from -25°C to +52°C.
- Up to 128 indoor units connected per system.
- Possibility to combine up to 5 outdoor units to achieve 120HP.
- Unique Triple Rotary Compressor and a totally redesigned chassis.
- Up to 1,200m total piping length with 250m from outdoor to the farthest indoor unit.

R410A REFRIGERANT

SMMSu SUPER MODULAR MULTI SYSTEM



Hi - Res Image

Performance & Outdoor Data

Model & Combination			UP3411HT8P-E MUP2001HT8P-E MUP1401HT8P-E
Capacity Range		HP	34
Maximum Number of Indoor Units		QTY	66
Cooling Capacity		kW	96.0
Heating Capacity		kW	96.0
Operating Range	Cooling	°C	-5.0 to 52.0
	Heating		-25.0 to 15.5
Cooling	Power Consumption	kW	32.56
	EER/SEER/Energy Efficiency Class (or nsc %)		2.95/7.38/292.2
Heating	Power Consumption	kW	24.93
	COP/SCOP/Energy Efficiency Class (or nsc(A) %)		3.85/4.50/177.0
Fan(s)	Standard Air Flow H	l/s	7717*
	Standard Air Flow H	m3/h	27780*
	External Static Pressure	Pa	80
Sound	Pressure Level C/H	dB(A)	64.5/68.5
	Power Level C/H	dB(A)	87/91
Unit(s)	Height x Width x Depth	mm	1690 x 2300 x 780
	Weight	kg	562
	Refrigerant Base Charge	kg	9 + 6
Pipe Connections	Suction Gas Pipe Brazing	inch	1 3/8
	Liquid Pipe Flare	inch	3/4
Maximum	Equivalent Length	m	220
	Real Length	m	180
	Total Pipe Length (Liquid Line Real Length)	m	1200
	Length To First Branch	m	100
	Equivalent Length Of Outdoor Unit Connecting Pipe	m	10
	Real Length Of Indoor Unit Connecting Piping	m	30
	Equivalent Length Between Branches	m	50
	Height Difference Outdoor Higher Than Indoor Units	m	70 (110*)
	Height Difference Outdoor Lower Than Indoor Units	m	40 (110*)
	Height Difference Between Indoor Units	m	40
	Height Difference Between Outdoor Units	m	5
Electrical	Voltage Range Minimum/Maximum	V	342/456
	Electrical Characteristic Running Current Cooling/Heating	A	50.30/38.40
	Power Supply Wiring Starting Current	A	Soft Start
	Power Supply	V/ph/Hz	380-415/3/50
	Suggested Fused Supply(s)	A	40 x 2

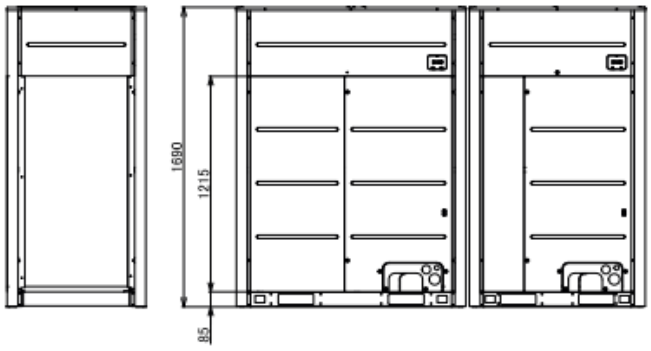
*Combination combined value, see stand alone for individual data

*All Accessories / Controls

Related items:

- Full specification
- CAD files
- Dimensional drawing
- Connection diagram
- Noise curve data

*For further information see stand alone data



VRF SMMSu R410a: UP3811HT8P-E

COMBINATIONS

- Operating conditions from -25°C to +52°C.
- Up to 128 indoor units connected per system.
- Possibility to combine up to 5 outdoor units to achieve 120HP.
- Unique Triple Rotary Compressor and a totally redesigned chassis.
- Up to 1,200m total piping length with 250m from outdoor to the farthest indoor unit.

R410A REFRIGERANT

SMMSu SUPER MODULAR MULTI SYSTEM



Hi - Res Image

Performance & Outdoor Data

Model & Combination			UP3811HT8P-E MUP2401HT8P-E MUP1401HT8P-E
Capacity Range		HP	38
Maximum Number of Indoor Units		QTY	68
Cooling Capacity		kW	107.0
Heating Capacity		kW	107.0
Operating Range	Cooling	°C	-5.0 to 52.0
	Heating		-25.0 to 15.5
Cooling	Power Consumption	kW	38.74
	EER/SEER/Energy Efficiency Class (or nsc %)		2.76/6.93/274.2
Heating	Power Consumption	kW	28.98
	COP/SCOP/Energy Efficiency Class (or nsc(A) %)		3.69/4.33/170.2
Fan(s)	Standard Air Flow H	l/s	7883*
	Standard Air Flow H	m3/h	28380*
	External Static Pressure	Pa	80
Sound	Pressure Level C/H	dB(A)	64.5/68.5
	Power Level C/H	dB(A)	87/91
Unit(s)	Height x Width x Depth	mm	1690 x 2300 x 780
	Weight	kg	584*
	Refrigerant Base Charge	kg	9 + 6
Pipe Connections	Suction Gas Pipe Brazing	inch	1 5/8
	Liquid Pipe Flare	inch	7/8
Maximum	Equivalent Length	m	220
	Real Length	m	180
	Total Pipe Length (Liquid Line Real Length)	m	1200
	Length To First Branch	m	100
	Equivalent Length Of Outdoor Unit Connecting Pipe	m	10
	Real Length Of Indoor Unit Connecting Piping	m	30
	Equivalent Length Between Branches	m	50
	Height Difference Outdoor Higher Than Indoor Units	m	70 (110*)
	Height Difference Outdoor Lower Than Indoor Units	m	40 (110*)
	Height Difference Between Indoor Units	m	40
	Height Difference Between Outdoor Units	m	5
Electrical	Voltage Range Minimum/Maximum	V	342/456
	Electrical Characteristic Running Current Cooling/Heating	A	59.70/44.60
	Power Supply Wiring Starting Current	A	Soft Start
	Power Supply	V/ph/Hz	380-415/3/50
	Suggested Fused Supply(s)	A	63 + 40

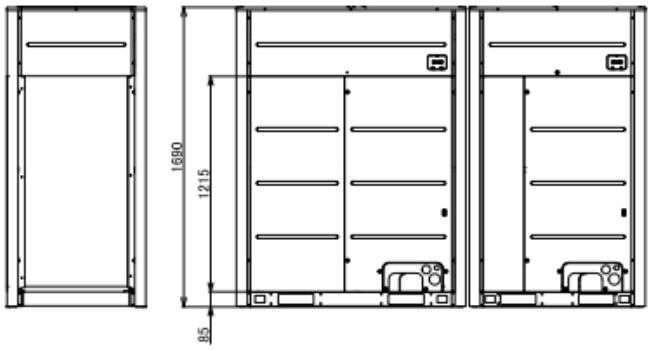
*Combination combined value, see stand alone for individual data

*All Accessories / Controls

Related items:

- Full specification
- CAD files
- Dimensional drawing
- Connection diagram
- Noise curve data

*For further information see stand alone data



TOSHIBA

PRODUCT SPECIFICATION

VRF SMMSu R410a: UP6411HT8P-E

COMBINATIONS

- Operating conditions from -25°C to +52°C.
- Up to 128 indoor units connected per system.
- Possibility to combine up to 5 outdoor units to achieve 120HP.
- Unique Triple Rotary Compressor and a totally redesigned chassis.
- Up to 1,200m total piping length with 250m from outdoor to the farthest indoor unit.

R410A REFRIGERANT

SMMSu SUPER MODULAR MULTI SYSTEM



Hi - Res Image

Performance & Outdoor Data

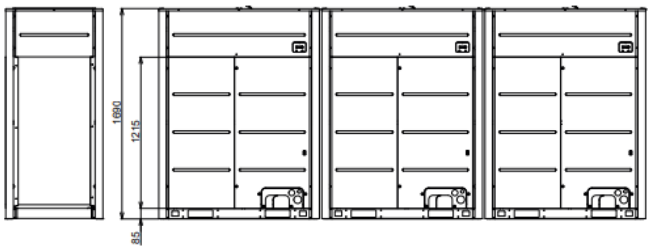
Model & Combination		UP6411HT8P-E MUP2401HT8P-E MUP2001HT8P-E x 2	
Capacity Range		HP	64
Maximum Number of Indoor Units		QTY	81
Cooling Capacity		kW	179.0
Heating Capacity		kW	179.0
Operating Range	Cooling	°C	-5.0 to 52.0
	Heating		-25.0 to 15.5
Cooling	Power Consumption	kW	60.21
	EER/SEER/Energy Efficiency Class (or nsc %)		2.97/7.34/290.6
Heating	Power Consumption	kW	48.84
	COP/SCOP/Energy Efficiency Class (or nsc(A) %)		3.67/4.34/170.6
Fan(s)	Standard Air Flow H	l/s	13417*
	Standard Air Flow H	m3/h	48300*
	External Static Pressure	Pa	80
Sound	Pressure Level C/H	dB(A)	68/72
	Power Level C/H	dB(A)	91/95
Unit(s)	Height x Width x Depth	mm	1690 x 3910 x 780
	Weight	kg	1024
	Refrigerant Base Charge	kg	9 x3
Pipe Connections	Suction Gas Pipe Brazing	inch	1 5/8
	Liquid Pipe Flare	inch	7/8
Maximum	Equivalent Length	m	200
	Real Length	m	160
	Total Pipe Length (Liquid Line Real Length)	m	1200
	Length To First Branch	m	100
	Equivalent Length Of Outdoor Unit Connecting Pipe	m	10
	Real Length Of Indoor Unit Connecting Piping	m	30
	Equivalent Length Between Branches	m	50
	Height Difference Outdoor Higher Than Indoor Units	m	70 (110*)
	Height Difference Outdoor Lower Than Indoor Units	m	40 (110*)
	Height Difference Between Indoor Units	m	40
	Height Difference Between Outdoor Units	m	5
Electrical	Voltage Range Minimum/Maximum	V	342/456
	Electrical Characteristic Running Current Cooling/Heating	A	92.50/74.90
	Power Supply Wiring Starting Current	A	Soft Start
	Power Supply	V/ph/Hz	380-415/3/50
	Suggested Fused Supply(s)	A	63 + 40 x 2

*Combination combined value, see stand alone for individual data

*All Accessories / Controls

Related items:

- Full specification
- CAD files
- Dimensional drawing
- Connection diagram
- Noise curve data



*For further information see stand alone data

VRF SMMSu R410a: UP6611HT8P-E

COMBINATIONS

- Operating conditions from -25°C to +52°C.
- Up to 128 indoor units connected per system.
- Possibility to combine up to 5 outdoor units to achieve 120HP.
- Unique Triple Rotary Compressor and a totally redesigned chassis.
- Up to 1,200m total piping length with 250m from outdoor to the farthest indoor unit.

R410A REFRIGERANT

SMMSu SUPER MODULAR MULTI SYSTEM



Hi - Res Image

Performance & Outdoor Data

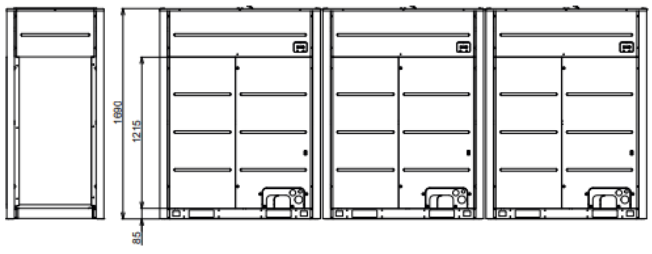
Model & Combination			UP6611HT8P-E MUP2401HT8P-E MUP2201HT8P-E MUP2001HT8P-E
Capacity Range		HP	66
Maximum Number of Indoor Units		QTY	82
Cooling Capacity		kW	184.5
Heating Capacity		kW	184.5
Operating Range	Cooling	°C	-5.0 to 52.0
	Heating		-25.0 to 15.5
Cooling	Power Consumption	kW	62.63
	EER/SEER/Energy Efficiency Class (or nsc %)		2.95/7.21/285.4
Heating	Power Consumption	kW	50.09
	COP/SCOP/Energy Efficiency Class (or nsc(A) %)		3.68/4.35/171.0
Fan(s)	Standard Air Flow H	l/s	13583*
	Standard Air Flow H	m3/h	48900*
	External Static Pressure	Pa	80
Sound	Pressure Level C/H	dB(A)	68/72
	Power Level C/H	dB(A)	91/95
Unit(s)	Height x Width x Depth	mm	1690 x 3910 x 780
	Weight	kg	1046
	Refrigerant Base Charge	kg	9 x 3
Pipe Connections	Suction Gas Pipe Brazing	inch	1 5/8
	Liquid Pipe Flare	inch	7/8
Maximum	Equivalent Length	m	200
	Real Length	m	160
	Total Pipe Length (Liquid Line Real Length)	m	1200
	Length To First Branch	m	100
	Equivalent Length Of Outdoor Unit Connecting Pipe	m	10
	Real Length Of Indoor Unit Connecting Piping	m	30
	Equivalent Length Between Branches	m	50
	Height Difference Outdoor Higher Than Indoor Units	m	70 (110*)
	Height Difference Outdoor Lower Than Indoor Units	m	40 (110*)
	Height Difference Between Indoor Units	m	40
	Height Difference Between Outdoor Units	m	5
Electrical	Voltage Range Minimum/Maximum	V	342/456
	Electrical Characteristic Running Current Cooling/Heating	A	96.20/76.80
	Power Supply Wiring Starting Current	A	Soft Start
	Power Supply	V/ph/Hz	380-415/3/50
	Suggested Fused Supply(s)	A	63 + 50 + 40

*Combination combined value, see stand alone for individual data

*All Accessories / Controls

Related items:

- Full specification
- CAD files
- Dimensional drawing
- Connection diagram
- Noise curve data



*For further information see stand alone data

VRF SHRMe R410a: AP3416FT8P-UK

COMBINATIONS

- SHRM-e can reach up to 1,000 meters maximum piping length.
- Surface area increased by 13% with 3-row heat exchanger enhancing efficiency.
- Toshiba's unique combination of twin rotary compressors and inverter driven control.
- Emphasis on driving excellence in energy savings and enhancement in applications.
- Unique Diamond Like Carbon Coating technology offers outstanding wear resistance.

R410A REFRIGERANT

SHRM e SUPER HEAT RECOVERY MULTI



Hi - Res Image

Performance & Outdoor Data				
Model & Combination			AP3416FT8P-UK MAP1806FT8P-UK MAP1606FT8P-UK	
Capacity Range			HP	34
Maximum Number of Indoor Units			QTY	64
Cooling Capacity			kW	95.4
Heating Capacity			kW	106.5
Operating Range		Cooling	°C	-10.0 to 46.0
		Heating		-25.0 to 15.5
Cooling		Power Consumption	kW	29.90
		EER/SEER/Energy Efficiency Class (or nsc %)		3.19/5.86/231.4
Heating		Power Consumption	kW	25.90
		COP/SCOP/Energy Efficiency Class (or nsc(A) %)		3.68/3.55/139.0
Fan(s)		Standard Air Flow H	l/s	9612*
		Standard Air Flow H	m3/h	34600*
		External Static Pressure	Pa	40
Sound		Pressure Level C/H	dB(A)	64.5/65.5
		Power Level C/H	dB(A)	86.5/87.5
Unit(s)		Height x Width x Depth	mm	1830 x 3220 x 780
		Weight	kg	754
		Refrigerant Base Charge	kg	11 x2
Pipe Connections		Suction Gas Pipe Brazing	inch	1-3/8
		Discharge Pipe Brazing	inch	1-1/8
		Liquid Pipe Flare	inch	7/8
		Balance Pipe Flare	inch	3/8
Maximum		Equivalent Length	m	200
		Real Length	m	180
		Total Pipe Length (Liquid Line Real Length)	m	300
		Length To First Branch Height Difference Between Indoor Units ≤ 3 m	m	100
		Length To First Branch Height Difference Between Indoor Units > 3 m	m	85
		Equivalent Length Of Outdoor Unit Connecting Pipe	m	10
		Equivalent Length Between Branches	m	50
		Height Difference Outdoor Higher Than Indoor Units	m	70
		Height Difference Outdoor Lower Than Indoor Units	m	30
		Electrical Characteristic Running Current Cooling/Heating	A	46.91/40.63
		Power Supply	V/ph/Hz	380-415/3/50
		Suggested Fused Supply(s)	A	40 x2

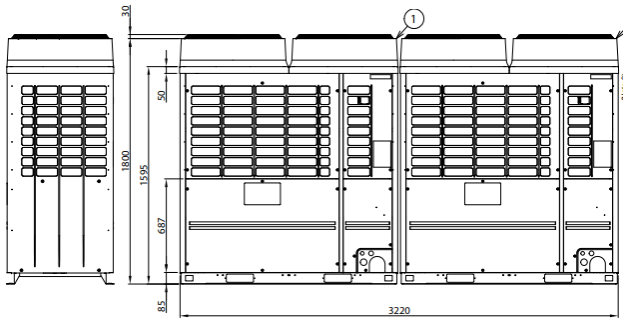
*Combination combined value, see stand alone for individual data

*All Accessories / Controls

Related items:

- Full specification
- Dimensional drawing
- Connection diagram
- Noise curve data

*For further information see stand alone data



TOSHIBA Leading Innovation

Toshiba Air Conditioning - RAV-GP Data Sheet

RAV-GP561ATP-E
Outdoor Unit



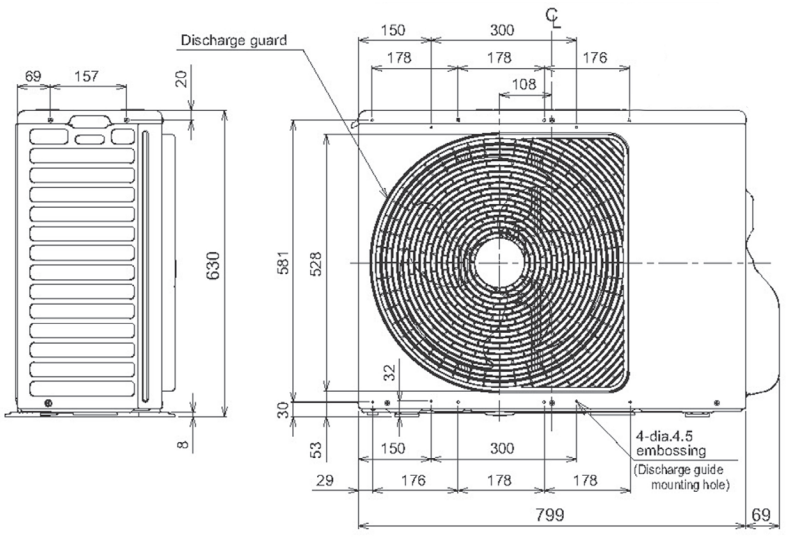
Features

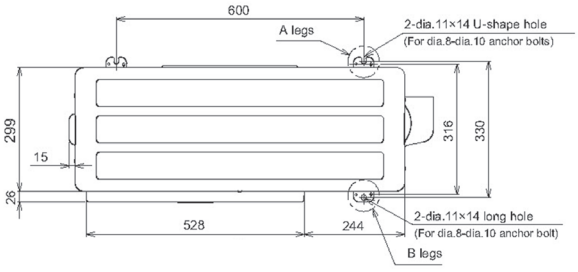
- Redesigned for use with refrigerant R32
- Wide operating range (cooling mode -15°C to +52°C)
- Auto-diagnostic function
- Flexible, can be utilised for single, twin, triple indoor applications
- Compact size

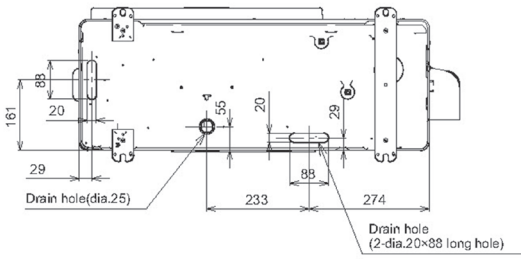
Technical Data

Model reference			RAV-GP561ATP-E
Nominal	Cooling Capacity	kW	5.0
	Heating Capacity	kW	5.6
Operating Range	Cooling/Heating	°C	-15 to 52/-27 to 15
Air Flow	High	m^3/h - l/s	2250 - 625
Sound	Pressure High Cooling/Heating	dB(A)	46/48
	Power High Cooling/Heating	dB(A)	63/65
Unit	Height x Width x Depth	mm	630 x 799 x 299
	Weight	kg	45
Pipe Connection	Flare Connections (gas - liquid)	inch	1/2 - 1/4
	Min.-Max. Length	m	3-50
	Maximum Height Difference	m	±30
	Drain Port Connection	mm	16
Refrigerant R32	Base Charge/Chargeless Length	kg/m	1.35/20
	Additional Charge Liquid Side	g/m	20
Run Current	Maximum	A	7.66
Power Cable	Outdoor to Indoor		3 core + earth
Power Supply	Suggested Fuse Size	V/ph/Hz-A	220-240/1/50-16

Dimensional Drawings







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All UK duties are based on Cooling Indoor air temperature 22°C DB/16°C WB Outdoor air temperature 28°C DB 50% RH, high fan speed, 5 m pipe run.
Heating Indoor air temperature 20°C DB Outdoor air temperature -5°C DB 100% RH, high fan speed, 5 m pipe run. Values are based on the maximum compressor output.
Data obtained from Toshiba Air Conditioning Published Data July 2018.

8.92

Trane heat pump sequencer description of operation Rev B

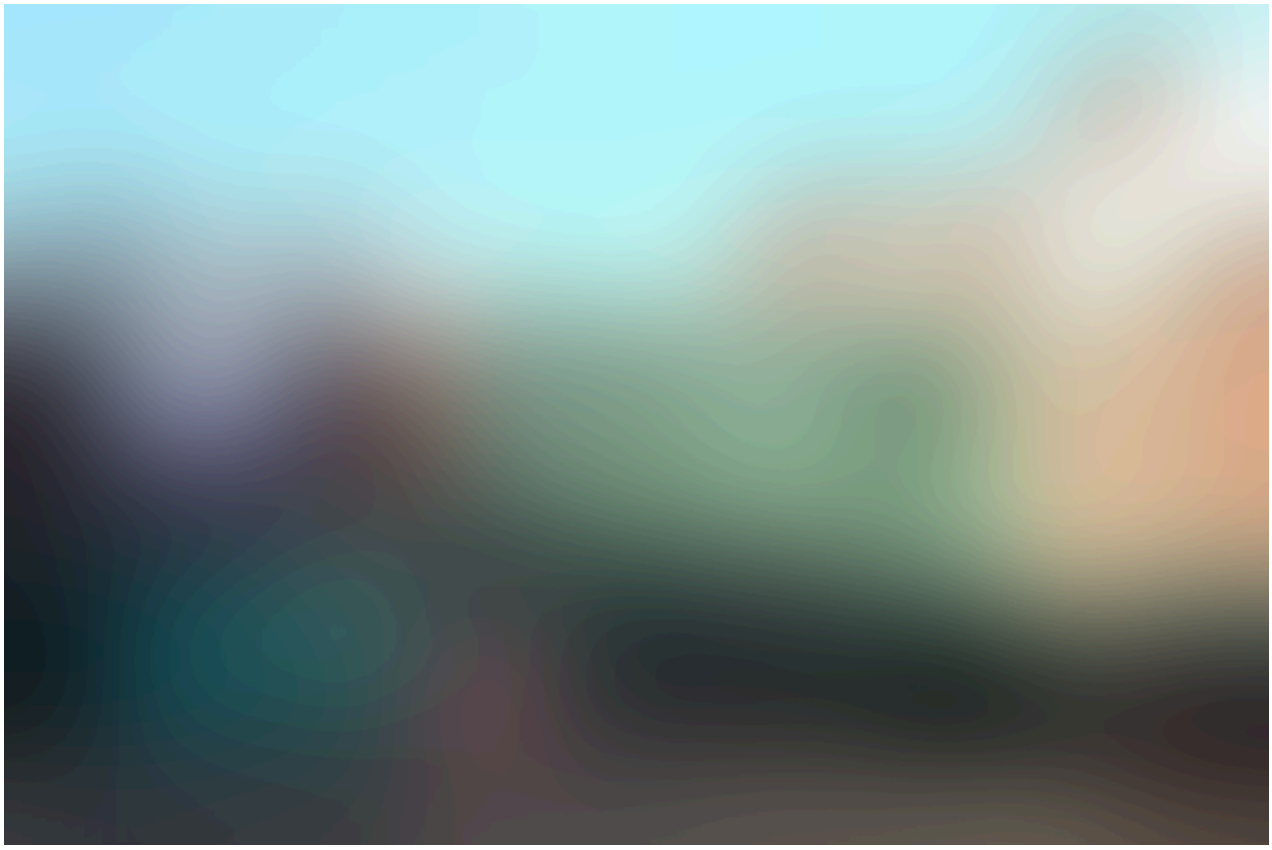
The following 17 pages are the document exactly as received and checked. It is bookmarked in the PDF.

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Asset	General
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Sequence of Operations

Elmwood Leisure Centre

Prepared by Rose Denholm



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Document Review

Checked By	Job Function	Name	Signed	Date
CF	Field Controls Representative	Carlos Filho	CF	02/10/25

Document Revision History

Document Revision	Description	Revised By	Date modified
A	Initial Issue	RD	09/09/25
B	Updated Controls Strategy for Heat Pump Sequencing	CF	02/10/25

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1. System Description Introduction

1.1.1. The Trane heating system at Elmwood Leisure Centre consists of:

- 1 x CXAX 035 HE (High Efficiency) LN (Low Noise) Air Sourced Heat Pump (ASHP) – Swing
- 2 X CXAF 150 HE (High Efficiency) XLN (Extra Low Noise) Air Sourced Heat Pumps (ASHPs) – Normal

1.1.2. The 'normal' type of heating control configuration will be used, where the heat pumps are of same type and capacity and follow a scheduled rotational sequence.

1.1.3. The "swing" type of heating configuration will be used for the CXAX heat pump – it will be the first heat pump to be enabled and then alternates (enabled / disabled) with the remaining heat pumps in the plant. The purpose of a swing heat pump is to more closely match the heating capacity generated by the LTHW plant to the heating load.

1.1.4. Each of the CXAX and CXAF heat pumps has its own primary water pump set installed integral to the heat pump and controlled directly by the heat pumps packaged control system.

1.1.5. The ASHPs will command their respective LTHW mixing valves to the applicable position during system operation to ensure correct outlet temperatures at all times.

1.1.6. The units maintain the header with 45°C low grade heat, the water pumps for this circuit are integral to the heat pumps and controlled by the heat pumps packaged control system.

1.1.7. Each of the heat pumps comes equipped with a BACnet-IP interface.

1.1.8. CXAX and CXAF units provide LTHW only. The Thermal Management System (TMS) will operate the units to achieve the desired flow temperatures in each circuit and duty share between the units.

1.2. Trane TMS

1.2.1. The TMS consists of the following Trane hardware housed within a control panel:

Note: The TMS control panel is external to the heat pumps and requires single phase connection.

- Trane Tracer System Plus Controller (Tracer SC+)
- Trane Tracer I/O Expansion Module (XM90)
- Panel Mounted human machine interface (HMI) Touch Screen Display
- Ethernet Switch
- 4G Router

1.2.2. The Trane Tracer SC+ is the global controller that allows the I/O module to communicate and houses the applications for system operation including heat sequencing control strategy. It also commands the local controllers to operate where required in parallel with required heat pump operation. The Trane SC+ is supplied with a graphical web-interface and is easy to access from anywhere on the network.

1.2.3. The Thermal Management System application runs within the Trane Tracer SC+ which carries out the actual sequencing of the heat pumps based upon the configured parameters and system information analysed.

1.2.4. The Trane expansion module XM90 provide modular input / output expansion to the system.

1.2.5. The Panel mounted touch screen display shall provide system operating information on a graphical user interface as well as trending, alarming, and system override / setpoint adjustment functionality.

1.2.6. The 4G Router allows remote access and system monitoring.

1.2.7. The TMS communicates with the on-site BMS to provide the customer with operational information regarding the TMS which can be displayed on the site BMS front end workstation, this is done

using a combination of hard-wired volt free contacts and the BACnet/IP protocol.

1.2.8. Each heat pump has its own on-board control system, which will control the heat pump leaving water temperature to the set point received from Tracer SC+. The Tracer SC+ communicates with the heat pumps using the BACnet/IP protocol through the panel installed ethernet switch.

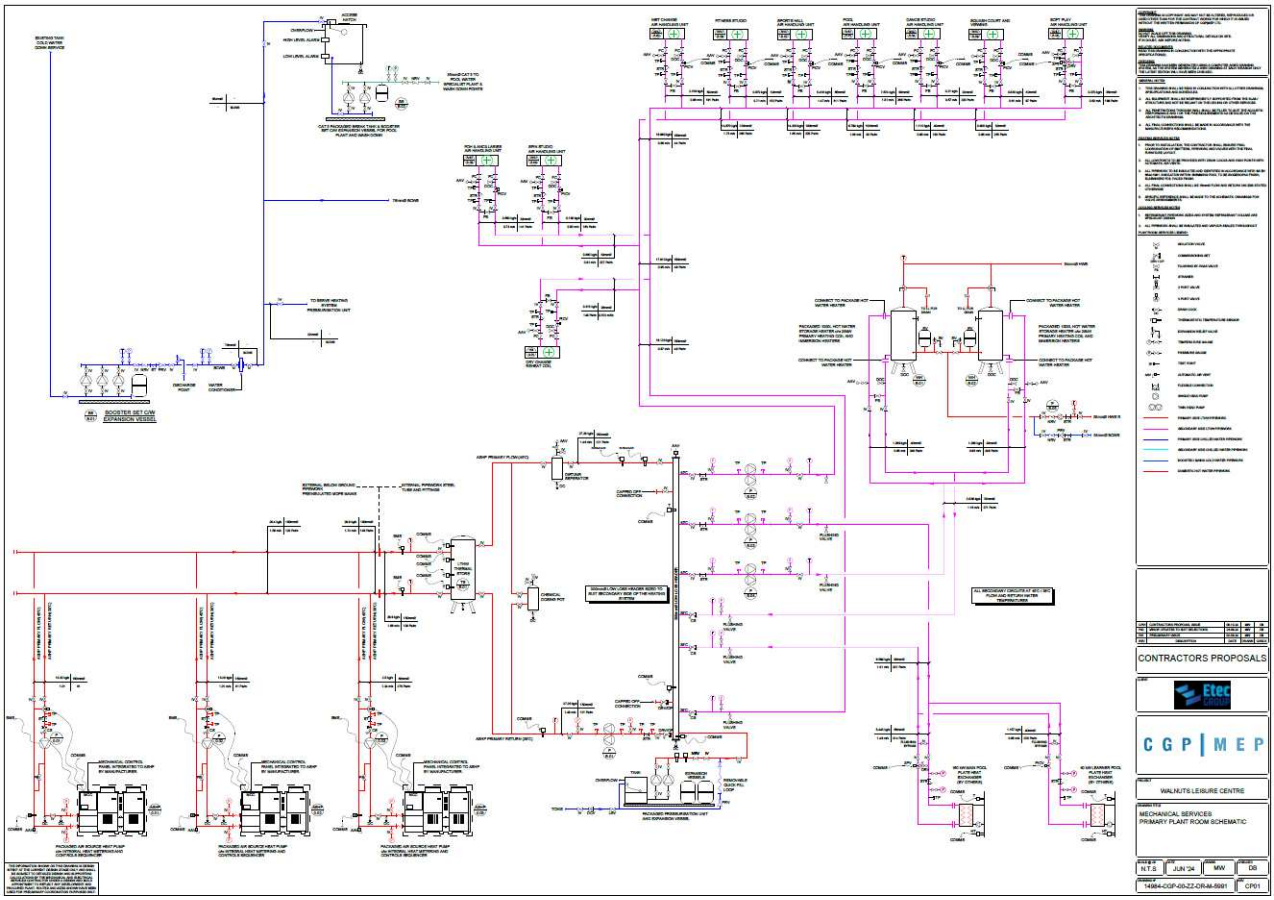
1.2.9. All heat pumps also have their own water flow switches, internal temperature, and pressure sensors to protect against no or low flow. These are integral to the units.

2. Hydraulic Layout

2.1. Schematic

2.1.1. MECHANICAL SERVICES
PRIMARY PLANT ROOM

2.1.2. Drawing no. 14984-HDN-00-ZZ-DR-M-5991, CP01



Note: If the schematic does not match your installation, we will be obliged to revise our study.

3. Heat Pump Operation & Sequencing

3.1. System Start

3.1.1. The system shall start based upon the feedback received from the hardwired signal between the Trane control system and the onsite BMS and the position of the Hand / Off / Auto switch mounted on the front of the Trane control panel.

3.1.2. The System has two modes of enable operation from the switch mounted on the front of the control panel and the onsite BMS:

- Hand – When in the ‘Hand’ position, the TMS is enabled permanently regardless of the onsite BMS command status. The TMS will remain enabled until the switch is placed into either the ‘Off’ or ‘Auto’ position.

- Auto – When in the ‘Auto’ position, the TMS will operate dependent on the hardwired enable signal from the onsite BMS system.

3.1.3. There is a ten minutes minimum on / off timer built into the Trane TMS application. Therefore, whenever the system first transitions to ‘on’ condition, it will run for a minimum of ten minutes regardless of the status of the hardwired signal between the Trane control system, onsite BMS and position of the Hand / Off / Auto switch.

3.1.4. Similarly, when the system first transitions to ‘off’ condition it will remain off for ten minutes regardless of the status of the hardwired signal between the Trane control system, onsite BMS and position of the Hand / Off / Auto switch.

3.1.5. This is designed to stop the system being cycled on/off for short periods of time.

3.2. System stop

3.2.1. The system shall stop based upon the feedback received from the hardwired signal between the Trane control system, onsite BMS and position of the Hand / Off / Auto switch mounted on the front of the control panel.

3.2.2. Once disabled the TMS system shall continue to run for a period of up to 10 minutes to allow the heat pumps to unload.

3.2.3. The System has two modes of disabled operation from the switch mounted on the front of the control panel and the onsite BMS:

- Off – When in the 'Off' position, the Heating plant manager will be disabled permanently regardless of the onsite BMS command status.
- Auto – When in the 'Auto' position, the Heating plant manager will operate dependent on the hardwired command signal from the onsite BMS system.

3.2.4. If the sequencer develops a fault, an alarm signal is sent to site BMS over BACnet. Hardwired alarms have been allowed for at the main panel.

3.3. Adding ASHP - Temperature

3.3.1. The first unit to be enabled will always be the CXAX 035 as it is configured as the "swing" heat pump (please see 1.1.3).

3.3.2. The temperature add logic of the TMS compares the unit's low grade heating water temperature leaving the header with the low-grade heating system set point subtracting a dead band of 4°C (to be confirmed during commissioning).

Note: 4°C is a standard temperature, during commissioning this will be adjusted accordingly to suit the system.

3.3.3. If the unit's low grade heating temperature leaving the header is lower than the set point, minus the dead band, a heat pump add request will be generated.

3.3.4. If this request is active for more than the add delay timer (provisional value 10 minutes, to be confirmed during commissioning), the next heat pump will be added (CXAF 135) and the swing heat pump will be disabled (CXAX 035).

3.3.5. The supply water temperature must stay below the system setpoint minus dead band for the entire duration of the add delay timer, if not the timer is reset.

3.3.6. For the next stage, steps 3.3.2 and 3.3.3 will be repeated and if more heating capacity is required the swing heat pump will be enabled.

3.3.7. If one CXAF 135 and the swing heat pump do not meet required system heating demand, the swing heat pump will be disabled and the two CXAF 135 will be enabled.

3.3.8. Finally, the system will run steps 3.3.2 and 3.3.3 once again until all available units are enabled.

3.3.9. The supply water temperature must stay below the system setpoint minus dead band for the entire duration of the add delay timer, if not the timer is reset.

3.4. Subtract logic

3.4.1. The system is set to subtract on capacity which is based on the TMS application calculating the capacity of the heat pumps that are currently running and comparing it to the capacity after the next heat pump would be subtracted.

3.4.2. When the Estimated Plant Capacity after Subtraction ≤ Subtract RLA Setpoint (provisional value 65%) a subtract request is generated.

3.4.3. Please note the swing heat pump will always be the first one to be disabled.

3.4.4. Estimated Plant Capacity after Subtraction is the estimated average load of the remaining heat pumps after the next heat pump is subtracted.

Note The Subtract Timer Has Been Set To 15 Minutes (Provisional Value, To Be Confirmed During Commissioning).

3.4.5. The subtract algorithm of a Heating is based on:

- Conserve the minimum heat pumps in operation (Energy efficiency, reduce the operating time and general wear and tear to units and pumps),

- Avoid sudden reoperation of a heat pump to avoid the short operation cycles.

3.5. Sequencing ASHPs

3.5.1. To equalise wear on the heat pumps, the sequencer recalculates the sequence numbers of the two CXAF 150 heat pumps every week, or if the force rotate point is enabled.

3.5.2. If a different rotation method is required, please enter the required details in the table below.

Check	Rotation type	Time
☐	Weekly rotation	Day: _____ Time: _____
☐	Interval based rotation	Interval: _____Day(s) (between 1 to 14 days)
☐	Time based rotation	Operating hours: ____hours
☐	No rotation	Nil
☑	Default selection: Weekly rotation	every Monday at 10:00 am

3.5.3. The ASHP rotates the lead compressor independently via its own onboard controller.

3.5.4. The heat pumps on board controls package handles the pump enable signal, hours run pump rotation and pump fail rotation.

3.5.5. If the maintenance mode has been enabled on one of the ASHP by the local touch screen, it will be made unavailable & left out of the sequence.

3.6. Sequencer failures

3.6.1. If a unit develops a fault, alarm or fails when enabled by the plant manager within a pre-set amount of time (Provisional value 10 minutes, to be confirmed during commissioning) it will be marked as

failed and will be left out of the sequence, an alarm will be generated onto the panel mounted touch screen display and made available over the BACnet IP interface.

3.6.2. If the heat pump develops a fault or has been designated as unavailable by the TMS, it will be disabled and the next heat pump in the sequence will be enabled.

3.6.3. A heat pump will be marked as failed because of the following:

- Communication to the heat pump is lost. (Automatic reset)
- Water pump failure. (Automatic reset)
- LTHW 3-port valves fails to modulate. (Automatic reset)
- A heat pump develops a general manual reset alarm. (Manual reset)
- A heat pump develops manual reset alarms on both circuits. (Manual reset)
- A heat pump fails to run when instructed. (Manual reset)
- A heat pump placed into maintenance mode from the panel mounted touch screen display. (Manual reset)

3.6.4. For manual reset alarms:

If a heat pump has a manual reset fault present, then the fault must first be rectified and reset at the respective heat pump's controller before the sequencer alarm can be reset.

3.6.5. For automatic reset alarms:

The system will automatically reset the alarm when the point returns to heathy state.

3.6.6. A heat pump can be made unavailable from the panel mounted touch screen display for maintenance purposes.

3.6.7. Once the heat pump has been overridden into maintenance, the heat pump will remain in this mode until the override is released.

4. Setpoint Source and Control Values

4.1. Setpoint source options & adjustment

4.1.1. The low temperature hot water setpoint shall be communicated to the TMS from the on-site BMS using the BACnet over IP protocol when operating in fully automatic mode.

4.1.2. In the event of a communications failure between systems, the TMS will retain the last value sent from the site BMS.

4.1.3. If the setpoint needs to be adjusted during a communications failure or locally from the TMS this can be done using the touch screen display.

4.1.4. When in fully automatic mode the TMS setpoint source should be set to ‘Remote’ meaning that the active system setpoint will be received from the site BMS, if the setpoint source is changed to ‘local’ the active system setpoint will be taken from the local user adjustable setpoint within the touch screen display.

5. Pump Operation

5.1. Primary pump operation

5.1.1. Each heat pump has its own primary water pump set installed integral to the heat pump and controlled directly by the heat pumps packaged control system,

5.1.2. Whenever the circulation pumps are required to run, whether this is due to frost conditions or the need to produce LTHW the following sequence of events will occur:

- Trane Thermal Management System (TMS) requested to start
- ASHP (*) allocated to start by TMS
- ASHP opens 3 port valve
- ASHP (*) starts its own on-board pump
- Water flow is detected by ASHP’s own flow proving device

- ASHP will start if leaving water temperature meets heating.

5.1.3. Each of the air sourced heat pumps comes equipped with its own hydraulic module which consists of duty standby pumps and inverter.

5.1.4. The heat pumps on board controls package handles the pump enable signal, hours run pump rotation and pump fail rotation. Rotation occurs every Monday at 10am unless otherwise specified.

5.1.5. Heat pump water flow is achieved whenever a heat pump is required to run, whether this is due to frost conditions or the need to produce heating water, the sequence shall be as follows:

- Heat pump (*) allocated to start by HPM
- Heat pump commands water pump to start
- Water flow is detected by the heat pumps own flow proving device
- Heat pump will start if leaving water temperature is less than the setpoint plus the start differential set on the Heating (provisional value 3°C to be confirmed during commissioning) and water flow is proven

5.1.6. All ASHP also have their own water flow sensors, internal temperature and pressure sensors to protect against no or low flow (located on the return to the units).

5.2. Secondary pump operation

5.2.1. The secondary pumps are not controlled by the Trane TMS, the control of these is carried out by the site BMS. For further information consult the site BMS documentation.

6. LTHW Mixing Valves

6.1.1. Each ASHP will control its own mixing valve to ensure the outlet LTHW temperature matches the system setpoint.

6.1.2. If a mixing valve feedback position does not align with the command signal an alarm will be generated and the valve will be forced to full flow position until the alarm is automatically cleared.

7. Frost Protection

7.1. Unit frost protection

7.1.1. The pumps are integral to the ASHP units, and the onboard microprocessor initiates frost protection mode using their own on-board ambient sensor.

7.1.2. Frost protection mode will be initiated when ambient conditions are such that a freeze up is possible, and the sequence of operation will be as follows:

- Heat pump (1) enters frost protection mode
- 3 port valves open
- Heat pump (2) starts duty on board pump
- Pump will run at constant speed until there is no risk of freeze up, at this point the unit will disable its pump.

7.1.3. When the valve is open, the pumps run at minimum flow until temperature increases above 5°C, once achieved, the valves close.

8. Pressurisation Unit

8.1.1. The Trane control system monitors the low-pressure alarm status of the pressurisation unit via a hardwired signal.

8.1.2. In the event of an alarm, the heating system will be shut down in its entirety inclusive of all heat pumps and water pumps.

9. Fire Alarm

9.1.1. In the event of an alarm the heating system will remain operational.

10. System Manual Operation

10.1.1. In the event of a complete failure of the Trane TMS, each ASHP can be put into local operation mode in three steps.

- 1: Select **Settings** on TD7 home screen.
- 2: Select **Unit Settings**.
- 3: Change **Setpoint Source** from **BAS/EXT/FP** to **Front Panel**, telling the ASHP controller to ignore or BACnet commands & run in standalone mode.

11. Local User Interfacing

11.1.1. The Trane control system communicates with the onsite BMS to provide the customer with operational information regarding the TMS and heat pumps.

11.1.2. Information can be displayed on the BMS front end workstation, using a combination of hard-wired volt free contacts and the BACnet over IP protocol.

8.93

Elmwood Peglar Press Fit

The following 148 pages are the document exactly as received and checked. It is bookmarked in the PDF.

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Pages	148

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XPress

CONNECT ✚ CONTROL

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The UK Copper Board

Heating and Ventilating Contractors Association

The Brass Page for specifiers, designers, engineers and manufacturers

British Plumbing Employers Council

British Electrotechnical Allied Manufacturers Association

Construction Products Association

The Copper Development Association

Scottish and Northern Ireland Plumbing Employers Federation

Builders Merchants Federation

Institute of Plumbing

The UK District Energy Association

The Chartered Institution of Building Services Engineers

British Automatic Fire Sprinkler Association

Bundesverband Technischer Brandschutz e.V.

European Fire Sprinkler Network

XPress





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XPress fittings from Pegler Yorkshire make jointing easier, faster and more cost effective than other jointing methods - a fittings system which simply presses together in seconds to create a perfect joint, every time.

XPRESS PRESS-FIT: COST-EFFECTIVE JOINTING SOLUTIONS FOR SO MANY APPLICATIONS

Pegler Yorkshire's innovative and comprehensive XPress range delivers all the benefits of a heat-free, press-fit jointing system to a wide variety of domestic, commercial and industrial applications.

XPress also lives up to the promise of its name in every respect: a method which is easy, fast and highly cost-effective, simply pressing together in seconds to create a perfect joint every time, with the guarantee of an uncontaminated installation.

XPress Sprinkler complements the range, and has a dedicated data book. For more information visit www.pegleryorkshire.co.uk

SO MANY XPRESS BENEFITS, AND SO MUCH CHOICE

- Major savings in installation time and cost compared with traditional jointing methods
- A completely heat-free jointing system that requires no additional solders, adhesives, compounds, gas, hotworks permits or costly insurance
- Clean, rapid, heat-free jointing: no complicated clamping techniques, long preparation procedures or waiting for adhesive to dry
- Safety: no naked flames
- Perfectly clean internal bore - less finishing or cleaning required
- No localised annealing from high-temperature working
- No carbon deposits, internal solder runs or flux residue - reduced risk of corrosion
- System does not need to be 'dry' for effective jointing
- XPress fittings have a wide range of approvals including Kitemark, WRAS and DVGW
- Electrical continuity assured when the XPress jointing process is complete
- Ideal for diverse applications such as domestic maintenance and refurbishment, new build and large-scale public sector projects

XPRESS RANGE AT A GLANCE

- XPress Copper: for hot and cold water services, closed circuit heating, chilled water and oil-free compressed air applications. Incorporating a unique and time-saving Leak Before Press (LBP) design to instantly identify unpressed joints, in 12 to 108mm sizes
- XPress Carbon: for closed circuit heating and chilled water applications, with LBP feature in 12 to 108mm sizes
- XPress Stainless: the perfect solution where water quality and hygiene are crucial in food, pharmaceutical and healthcare environments. Also offers LBP in 12 to 108mm sizes
- XPress Copper Gas: for internal and external above-ground 2nd- and 3rd-family gas services, in 15 to 108mm sizes.
- XPress Stainless Gas: for use with XPress Stainless System and other stainless steel tubes on above-ground 2nd- and 3rd-family gas pipelines, including applications where high levels of hydrogen sulphide make copper unsuitable. Available in 15 to 108mm sizes.
- XPress Solar: delivers all the benefits of a heat-free, press-fit jointing system for solar applications. Available in 15 to 54mm sizes.





PRODUCT OVERVIEW

XPRESS COPPER

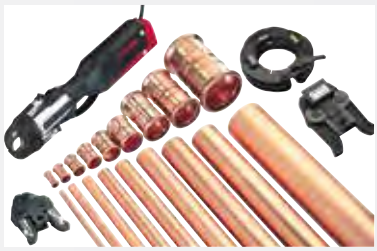
XPress Copper fittings are manufactured from copper and copper alloy, incorporating a black EPDM Ethylene Propylene Diene Monomer O ring and a unique "Leak Before Press" (LBP) design. LBP has been developed to provide instant identification of joints that have been assembled correctly but mistakenly left unpressed. This feature saves time, money and potentially expensive callbacks.

Ideal for fast, efficient jointing of copper tube to BS EN 1057 R250 and R290 in sizes 12 to 108mm. XPress fittings are designed for use on hot and cold water services, vented and unvented closed circuit heating, chilled water and oil-free compressed air applications within permissible pressure and temperature limits.

XPress Copper fittings are approved to the new Kitemark certification BS 8537:2010 for use with copper tube as specified above.

FEATURES

- Manufactured from copper/copper alloy
- Available in sizes 12 to 108mm
- Leak Before Press
- Electrical continuity assured when XPress joint complete
- Clean, heat free jointing
- Safety, no naked flames, no hotwork permits or costly insurance
- Chromium plated range
- Temperature rating from -20 to 110°C
- Pressure rating 16bar throughout the temperature range
- Wide range of approvals
- BSI tested and approved (previously GL, formerly British Gas) for Gas in 15mm to 108mm sizes
- BSI Kitemark approved for Type 1 fittings (water) in sizes 12 to 108mm





XPRESS STAINLESS

XPress Stainless Steel is optimised for use as a system and fittings are manufactured from 316L (1.4404) stainless steel.

316 System tube is available in straight 6m lengths. 12 to 54mm tube is manufactured from BS 316 831/DIN 1.4401 stainless steel strips conforming to BS 10088 Part 2. Above 54mm the tube conforms to DVGW W541. The fittings incorporate a black EPDM (Ethylene Propylene Diene Monomer) O ring and a unique "Leak Before Press" (LBP) design. LBP has been developed as a final check to the system to provide instant identification of joints that have been assembled correctly but mistakenly left unpressed. This feature saves time, money and potentially expensive call backs.

Designed for potable water applications where water quality and hygiene are crucial, particularly in the food, pharmaceutical and healthcare environments and chilled water applications. Water purified by Reverse Osmosis (RO) is likely to have a low pH and an extremely low dissolved solid content. XPress Stainless provides resistance to RO purified water.

FEATURES

- Fittings are manufactured from 316L stainless steel
- Tube is manufactured from 316 stainless steel
- Available in sizes 12 to 108mm
- Leak Before Press
- Clean, heat free jointing
- Safety - no naked flames, no hotwork permits or costly insurance
- Wide range of approvals
- Temperature range -35 to 135°C
- Pressure rating 16bar throughout the temperature range
- Light weight, easy to handle
- Suitable for use on XPress Sprinkler stainless steel tubes (LPCB Approved)
- Socket Depth Marking on popular drum ended fittings whilst identifying material type. (Green for Stainless)





XPress





PRODUCT OVERVIEW

XPRESS CARBON

XPress Carbon Steel is optimised for use as a system. XPress Carbon Steel fittings are now manufactured from EN 100-27-1S205G2T (formerly known as Rst 34-2) carbon steel.

The fittings incorporate a black EPDM (Ethylene Propylene Diene Monomer) O ring and a unique "Leak Before Press" (LBP) design. LBP has been developed as a final check to the system to provide instant identification of joints that have been assembled correctly but mistakenly left unpresssed. This feature saves time, money and potentially expensive call backs.

Each fitting is individually marked indicating material. (Red for Carbon)

XPress Carbon is designed for vented and unvented closed circuit heating and chilled water applications.

FEATURES

- Manufactured from carbon steel
- Galvanised carbon system tube available in 12 to 108mm
- Plastic coated carbon system tube available in 12 to 54mm
- Leak Before Press
- Temperature rating from -35 to 135°C
- Pressure rating 16bar throughout the temperature range
- Clean, heat free jointing
- Safety - no naked flames, no hotwork permits or costly insurance
- Suitable for use on XPress Sprinkler galvanised tube (SC645) LPCB Approved
- Socket Depth Marking on popular drum ended fittings whilst identifying material type. (Red for Carbon)





XPRESS COPPER GAS

XPress Copper Gas fittings are manufactured from copper or copper alloy (typically gunmetal) and incorporate a yellow (HNBR) Hydrogenated Acrylonitrite Butadiene Rubber O ring.

Designed specifically for use with copper tube to BS EN 1057 on internal and external above ground 2nd and 3rd family gas services and available in sizes 12 to 108mm.

XPress Copper Gas performance, when correctly assembled with copper tube to BS EN 1057 R250 and R290 (for above ground use only), has a minimum operating temperature range of between -20 and 70°C. The maximum working pressure inside buildings is 1bar and maximum working pressure outside buildings is 5bar (maximum test pressure 7.5bar).

XPress Copper Gas fittings are permanently marked with a highly visible yellow marking stating Gas/PN5 GT1 on each fitting.

XPress Copper Gas fittings are approved to the new Kitemark certification BS 8537:2010 for use with copper tube as specified above. As part of the BSI/DVGW testing and approvals process (previously GL, formerly British Gas), XPress Copper Gas fittings have passed the High Temperature Leakage Rate test at 650°C for 30 minutes.

FEATURES

- Manufactured from copper/copper alloy
- Available in sizes 15mm to 108mm
- For use in internal and external above ground 2nd and 3rd family gas services (see page 136) – where we locate the gas families
- Clean, heat free jointing
- Safety - no naked flames, no hot work permits or costly insurance
- BSI Kitemark approved for Type 2 fittings (Gas) in sizes 15mm to 108mm





15mm to 54mm 66.7mm to 108mm





XPRESS STAINLESS GAS

XPress Stainless Steel Gas is optimised for use as a system. Fittings are manufactured from 316 (BS 316S31/DIN 1.4401) or 316 Ti (BS 320531/DIN 1.4571). The fittings incorporate a yellow HNBR (Hydrogenated Acrylonitrite Butadiene Rubber) O ring. XPress Stainless Steel Gas fittings do not have the LBP feature for safety reasons.

Designed for use with 316 System tube or stainless steel tube for BS 4127:1994 and DVGW W541 on internal and external above ground 2nd and 3rd family gas services and available in sizes from 15 to 108mm.

XPress Stainless Gas fittings are approved for use at temperatures from -20 to 70°C. The maximum working pressure inside buildings is 1bar and maximum working pressure outside buildings is 5bar (maximum test pressure 7.5bar).

XPress Stainless Steel Gas fittings are marked with a highly visible yellow label stating Gas on each fitting.

As part of the DVGW/BSI (formerly GL, British Gas) approvals process, XPress Stainless Gas fittings have passed the High Temperature Leakage Rate test at 650°C for 30 minutes at PN5/GT1.

FEATURES

- Manufactured from 316 stainless steel
- Available in sizes 15 to 108mm
- Designed for use with XPress stainless steel system tube
- For use in internal and external above ground 2nd and 3rd family gas services (see page 136) – where we locate the gas families
- Clean, heat free jointing
- Safety - no naked flames, no hotwork permits or costly insurance
- BSI verified





XPRESS SOLAR

XPress Copper Solar fittings are manufactured from copper and copper alloy and incorporate a green FPM (Fluorocarbon rubber/FPM Viton™) O ring and incorporate the unique "Leak Before Press" (LBP) design. This feature means that any assembled joints inadvertently left unpressed will exhibit a leak during system testing. This enables contractors to easily identify unpressed fittings before commissioning.

XPress Copper Solar fittings are available in sizes 15 to 54mm and are marked with a highly visible label stating Solar on each fitting, to confirm that solar fittings have been installed once crimped.

Designed for use in solar applications and for use with most proprietary ethylene glycol and propylene glycol heat transfer fluids in concentrations of up to 40%.

FEATURES

- Manufactured from copper/copper alloy
- Available in sizes 15 to 54mm
- Leak Before Press
- Suitable for high temperature solar applications
- Electrical continuity assured when XPress joint complete
- Clean, heat free jointing
- Safety - no naked flames, no hotwork permits or costly insurance
- Temperature rating -20 to 200°C
- Pressure rating 10bar maximum working pressure





XPress





STANDARDS AND APPROVALS

It is Pegler Yorkshire's policy to provide a range of products and services which meet, or exceed, the requirements of our customers in respect of quality, cost and delivery.

CURRENT AND FUTURE STANDARDS

We at Pegler Yorkshire are dedicated to designing, developing and manufacturing products of the highest quality. It is on this basis that you can trust the XPress range to achieve all relevant British, European and International standards.

It is a sign of our standing in the industry that we at Pegler Yorkshire are helping to draft this and other new European standards, assisted by our fellow members on the various European standards committees.

So, you can rest assured that whatever developments arise, our products will always meet the latest standards.

Over recent years, tube and fittings for plumbing and heating systems have been subject to a gradual harmonisation of standards. The harmonisation was set to incorporate copper and copper alloy press fittings within pr EN 1254 under Part 7, and more recently, the new British Standard BS 8357:2010.

bsi. BS 8537 Cert No: 586758

Independent and robust auditing ensures an excellent high quality standard every time.

BS 8537:2010 - Copper and copper alloys. Plumbing fittings. Specification for press ends of plumbing fittings for use with metallic tubes. Pegler Yorkshire's XPress copper range of press fittings is suitable for use with half-hard and hard copper tube R250 and R290 to BS EN1057.

Kitemark: XPress Copper press fittings: water (Type 1 fittings) in sizes 12 to 108mm and gas (Type 2 fittings) in sizes 12 to 108mm have received the BS 8537:2010 certification.

XPress Stainless Gas is BSI verified in sizes 12 to 108mm in respect of FprEN10352:2012 : Stainless Steel plumbing fittings and fittings with press ends for metallic tubes.

WRAS APPROVED MATERIAL

XPress Copper and XPress Stainless Steel fittings are tested and comply with the requirements of the United Kingdom Water Regulations Byelaws (Scotland). The XPress stainless steel system has been designed to provide optimum performance and cost saving benefits for commercial and industrial potable water applications.

XPress Copper Gas fittings have been tested by the GWI and verified by GL (formerly Advantica/British Gas).

LPCB LOSS PREVENTION CERTIFICATION BOARD
LPS 1234: Issue 1
Cert No. 1033a & 1033b

The XPress Sprinkler system has been tested and certified in accordance with the LPCB guidelines (TS1599 draft 5) for both the galvanized and stainless steel system for use in fixed sprinkler systems for above ground applications.

For XPress Sprinkler installations according to LPCB, allowed hazard classes range from LH up to 0H3.

FM APPROVED

The XPress Sprinkler Stainless system has a FM certification for fittings and tubes according FM approval standard 1630 and 1920 for application in wet and dry sprinkler system, with a maximum pressure of 175 psi (12.1 bar).

Accordingly the FM system is certified for using XPress stainless steel tubes with material code 1.4401 (AISI 316), 1.4520 (AISI 439) and 1.4521 (AISI 444).

ISO

ISO is achieved through the continuous improvement of our Quality Management System in line with the requirements of BS EN ISO 9001: 2008.

PRODUCT APPROVALS

Approval	Country	XPress Copper (water)	XPress Copper (gas)	XPress Stainless	XPress Stainless (gas)	XPress Carbon
UL/CUL	Canada & USA	-	-	✓	-	✓
DNV	Denmark	✓	-	✓	-	✓
DVGW	Germany	✓	✓	✓	✓	-
Emi	Hungary	✓	-	✓	-	-
ETA	Denmark	✓	-	✓	-	-
FM	USA	-	-	✓	-	✓
GASTEC	Netherlands	-	✓	-	-	-
G-LLOYDS	Germany	-	-	✓	-	✓
GOST-R	Russia	✓	-	-	-	-
KIWA	Netherlands	✓	-	✓	-	-
Kiwa Gastec	Netherlands	-	✓	-	-	-
KVGB	Belgium	-	✓	-	-	-
LPCB	UK	-	-	✓	-	✓
RINA	Italy	-	-	✓	-	✓
SBSC	Sweden	-	-	-	-	✓
Sintef	Norway	✓	-	✓	-	-
SITAC	Sweden	✓	-	✓	-	-
SVGW	Switzerland	-	-	✓	✓	-
TA-Luft	Germany	-	-	✓	-	-
VdS	Germany	-	-	✓	-	✓
WRAS	UK	✓	-	✓	-	-





GUARANTEES

XPRESS GAS APPROVALS										
Approval	Sizes mm	BSI	BSI Kitemark	DG	DVGW	KIWA GASTEC	KVGB	OVGW	CSN	EMI
Certificate/ Registration number	15, 22 and 28	Test Report TR/11/180	Cert No. KM 586758	Cert No. TV-00129	Cert No. DG 4550BL0160	Cert No. Q09-002	Cert No. 3142	Cert No. G2.909	B-30-00391-11	Approved
	35 - 54	Test Report TR/11/180	Cert No. KM 586758	-	Cert No. DG 4550BL0160	Cert No. Q09-002	-	Cert No. G2.909	B-30-00391-11	Approved
	66.7 - 108	Test Report TR/11/180	Cert No. KM 586758	-	-	-	-	-	-	-

Information correct at time of print. Visit www.pegleryorkshire.co.uk

XPRESS FITTINGS AND TUBE			
Range	Fittings	10 Years	25 Years
XPRESS COPPER	Fittings with copper tube to BS EN 1057 (R250/R290)	-	✓
XPRESS COPPER GAS	Fittings with copper tube to BS EN 1057 (R250/R290)	-	✓
XPRESS STAINLESS	Fittings with XPress Stainless Steel System tube	-	✓
XPRESS CARBON	Fittings with XPress Carbon Steel System tube	✓	-
	Fittings with XPress plastic coated carbon steel System tube	✓	-
XPRESS STAINLESS GAS	Fittings with XPress Stainless Steel System tube	-	✓
XPRESS SOLAR	Fittings with copper tube capable of 200°C temperatures	-	-

To qualify for guarantees, all products must be installed in accordance with our instructions on specified applications.

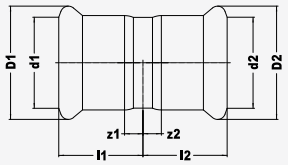


Please visit the PY website for full dimensional data and drawings

S1/7270
Straight coupling

Connection: Press x press



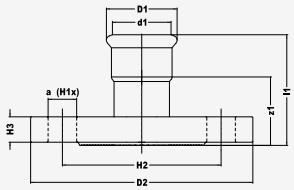


Size	l1	d1	D1	z1	l2	d2	D2	z2	DN1	DN2	Code
12mm	21	12	19	4	21	12	19	4	DN10	DN10	38009
15mm	22	15	23	2	22	15	23	2	DN12	DN12	38010
18mm	22	18	26	2	22	18	26	2	DN15	DN15	38011
22mm	23	22	31	2	23	22	31	2	DN20	DN20	38020
28mm	25	28	37	2	25	28	37	2	DN25	DN25	38030
35mm	28	35	44	2	28	35	44	2	DN32	DN32	38032
42mm	36	42	53	4	36	42	53	4	DN40	DN40	38034
54mm	42	54	65	5	42	54	65	5	DN50	DN50	38035
66.7mm	55	67	83	5	55	67	83	5	DN65	DN65	38036
76.1mm	55	76	94	5	55	76	94	5	DN65	DN65	38037
88.9mm	66	89	108	8	132	89	108	8	DN80	DN80	38039
108mm	72	108	132	5	72	108	132	5	DN100	DN100	38038

S1FMF/7520
Composite female metric flange PN16

Connection: Press x powder coated steel flange to EN1092-1:1997 (BS4504)



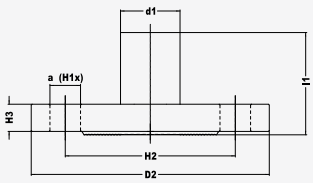


Size	H1	H2	H3	a	l1	d1	D1	z1	D2	DN1	Code
66.7mm DN65 (2 1/2")	4	145	20	18	103	67	83	53	185	DN65	38364
76.1mm DN65 (3")	4	145	20	18	103	76	94	53	-	DN65	38369
76.1mm DN80 (3")	8	160	20	18	103	76	94	53	200	DN80	38365
88.9mm DN80 (3")	8	160	20	18	113	89	108	51	200	DN80	38366
108mm DN100 (4")	8	180	20	18	126	108	132	59	220	DN100	38367

S1FMM/7520
Composite female metric flange PN16

Male end for insertion into fitting x powder coated steel flange to EN1092-1:1997 (BS4504)





Size	H1	H2	H3	a	l1	d1	DN1	Code
66.7mm DN65 (2 1/2")	4	145	20	18	112	67	DN65	38359
76.1mm DN80 (3")	8	160	20	18	113	76	DN65	38360
108mm DN100 (4")	8	180	20	18	141	108	DN100	38362



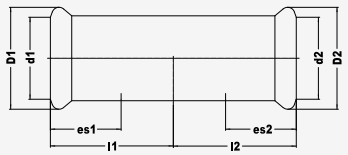
FEATURES

- Leak Before Press (LBP) technology identifies joints that have not been pressed correctly in sizes 15mm-54mm
- Designed for use in hot and cold water services, closed circuit heating, chilled water and oil free compressed air applications
- Heat free jointing provides time and cost saving benefits to contractors/installers

S1Slip/7270S
Straight coupling slip patterning

Connection: Press x press (without tube stop)



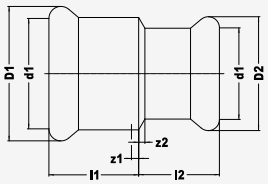


Size	l1	d1	D1	l2	d2	D2	DN1	DN2	Code
15mm	40	15	23	40	15	23	DN12	DN12	38044
18mm	40	18	26	40	18	26	DN15	DN15	38054
22mm	42	22	31	42	22	31	DN20	DN20	38045
28mm	46	28	37	46	28	37	DN25	DN25	38046
35mm	50	35	44	50	35	44	DN32	DN32	38047
42mm	60	42	53	60	42	53	DN40	DN40	38048
54mm	71	54	65	71	54	65	DN50	DN50	38049
66.7mm	55	67	83	55	67	83	DN65	DN65	38040
76.1mm	55	67	83	55	67	83	DN65	DN65	38041
88.9mm	66	76	94	55	76	94	DN65	DN65	38042
108mm	72	108	132	72	108	132	DN100	DN100	38043

S1R/7240
Straight Reducing Coupling

Press x press





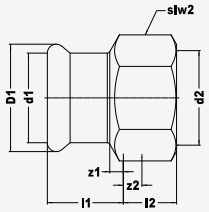
Size	l1	d1	D1	z1	l2	d2	D2	z2	DN1	DN2	Code
15 x 12mm	23	15	23	3	22	12	19	5	DN12	DN10	38063
16 x 15mm	42	16	24	2	-	15	23	-	DN15	DN12	38061
22 x 15mm	28	22	31	7	25	15	23	5	DN20	DN12	38064
28 x 15mm	35	28	37	12	23	15	23	3	DN25	DN12	38065
28 x 22mm	29	28	37	6	26	22	31	5	DN25	DN20	38066
35 x 28mm	33	35	44	7	28	28	37	5	DN32	DN25	38067
42 x 35mm	37	42	53	7	31	35	44	5	DN40	DN32	38068
54 x 42mm	46	54	65	11	34	42	53	4	DN50	DN40	38069



S2/6270G
Straight female connector

Press x BSP parallel female thread





Size	l1	d1	D1	z1	l2	z2	slw2	sks2	DN1	DN2	Code
12mm x Rp3/8"	17	12	19	0	14	6	20	21	DN10	3/8" (DN10)	38082
12mm x Rp1/2"	18	12	19	0	17	8	22	26	DN10	1/2" (DN15)	38081
15mm x Rp3/8"	20	15	23	2	14	6	20	21	DN12	3/4" (DN20)	38083
15mm x Rp1/2"	20	15	23	3	18	8	25	29	DN12	1/2" (DN15)	38090
15mm x Rp3/4"	21	15	23	5	19	8	30	32	DN12	3/8" (DN10)	38091
18mm x Rp1/2"	19	18	26	2	18	8	25	27	DN15	1/2" (DN15)	38084
18mm x Rp3/4"	20	18	26	2	19	9	30	32	DN15	3/4" (DN20)	38085
22mm x Rp1/2"	20	22	31	1	17	7	30	32	DN20	3/4" (DN20)	38086
22mm x Rp3/4"	20	22	31	0	19	9	30	32	DN20	1" (DN25)	38092
22mm x Rp1"	21	22	31	3	22	11	37	39	DN20	1/2" (DN15)	38087
28mm x Rp3/4"	23	28	37	3	17	7	37	39	DN25	1 1/4" (DN32)	38088
28mm x Rp1"	23	28	37	3	22	10	37	39	DN25	3/4" (DN20)	38093
28mm x Rp1 1/4"	24	28	37	2	24	10	46	49	DN25	1" (DN25)	38103
35mm x Rp3/4"	29	35	44	4	15	4	30	32	DN32	1 1/4" (DN32)	38080
35mm x Rp1"	24	35	44	5	22	10	42	44	DN32	3/4" (DN20)	38089
35mm x Rp1 1/4"	25	35	44	3	25	11	46	49	DN32	1" (DN25)	38094
42mm x Rp1 1/4"	30	42	53	0	22	8	46	49	DN40	1 1/2" (DN40)	38101
42mm x Rp1 1/2"	29	42	53	3	25	11	48	56	DN40	1 1/4" (DN32)	38095
54mm x Rp2"	34	54	65	3	25	11	48	56	DN50	1 1/4" (DN32)	38096
64mm x Rp2 1/2"	49	64	80	1	40	9	82	85	DN60	2 1/2" (DN65)	38954

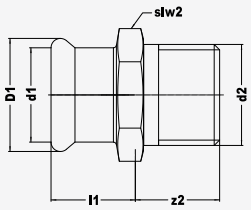




S3/6243G
Straight male connector

Press x BSP male taper thread





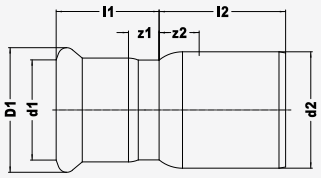
Size	l1	d1	D1	z2	slw2	sks2	DN1	DN2	Code
12mm x R3/8"	17	12	19	9	19	21	DN10	3/8" (DN10)	38105
12mm x R1/2"	17	12	19	11	19	21	DN10	1/2" (DN15)	38106
15mm x R3/8"	20	15	23	7	21	24	DN12	1/2" (DN15)	38107
15mm x R1/2"	20	15	23	8	21	24	DN12	1/2" (DN15)	38114
15mm x R3/4"	20	15	23	10	25	27	DN12	1/2" (DN15)	38115
18mm x R1/2"	20	18	26	9	25	27	DN15	1/2" (DN15)	38108
18mm x R3/4"	20	18	26	10	25	27	DN15	3/4" (DN20)	38109
22mm x R1/2"	21	22	31	9	30	32	DN20	3/4" (DN20)	38110
22mm x R3/4"	21	22	31	10	30	32	DN20	3/4" (DN20)	38116
22mm x R1"	21	22	31	11	32	34	DN20	3/4" (DN20)	38117
28mm x R3/4"	23	28	37	10	36	38	DN25	3/4" (DN20)	38111
28mm x R1"	23	28	37	11	36	38	DN25	1" (DN25)	38118
28mm x R1 1/4"	23	28	37	12	36	42	DN25	1 1/4" (DN32)	38127
35mm x R1"	26	35	44	12	41	44	DN32	1 1/4" (DN32)	38112
35mm x R1 1/4"	26	35	44	15	41	44	DN32	1 1/4" (DN32)	38119
42mm x R1 1/4"	30	42	53	16	51	54	DN40	1 1/4" (DN32)	38113
42mm x R1 1/2"	30	42	53	16	51	53	DN40	1 1/2" (DN40)	38120
54mm x R2"	35	54	65	12	-	66	DN50	2" (DN50)	38121
64mm x R2 1/2"	50	64	80	34	66	76	DN60	2 1/2" (DN65)	38956
66.7mm x R2 1/2"	50	67	83	25	74	82	DN65	2 1/2" (DN65)	38122
76.1mm x R2 1/2"	50	76	94	31	76	88	DN65	2 1/2" (DN65)	38126
76.1mm x R3"	50	76	94	39	77	89	DN65	3" (DN80)	38123
88.9mm x R3"	62	89	108	30	100	105	DN80	3" (DN80)	38125
108mm x R4"	68	108	132	38	107	124	DN100	4" (DN100)	38124



S6/7243
Reducer

Larger end male for insertion into fitting x press





Size	l1	d1	D1	z1	l2	d2	z2	DN1	DN2	Code
15 x 12mm	21	12	19	4	23	15	3	DN10	DN12	38193
18 x 12mm	21	12	19	4	26	18	6	DN10	DN15	38196
18 x 15mm	24	15	23	4	23	18	3	DN12	DN15	38197
22 x 15mm	24	15	23	4	28	22	7	DN12	DN20	38200
22 x 18mm	24	18	26	4	26	22	5	DN15	DN20	38201
28 x 15mm	25	15	23	4	3	28	14	DN12	DN25	38202
28 x 18mm	26	18	26	4	35	28	12	DN15	DN25	38203
28 x 22mm	25	22	31	4	30	28	7	DN20	DN25	38204
35 x 22mm	29	22	31	9	39	35	13	DN20	DN32	38207
35 x 28mm	28	28	37	5	35	35	9	DN25	DN32	38208
42 x 22mm	25	22	31	4	49	42	19	DN20	DN40	38210
42 x 28mm	27	28	37	4	44	42	14	DN25	DN40	38211
42 x 35mm	35	35	44	8	38	42	8	DN32	DN40	38212
54 x 28mm	27	28	37	4	59	54	24	DN25	DN50	38215
54 x 35mm	35	35	44	9	53	54	18	DN32	DN50	38216
54 x 42mm	40	42	53	9	47	54	12	DN40	DN50	38217
66.7 x 28mm	37	28	37	14	72	67	22	DN25	DN65	38218
66.7 x 35mm	40	35	44	14	69	67	19	DN32	DN65	38219
66.7 x 42mm	43	42	53	13	67	67	17	DN40	DN65	38220
66.7 x 54mm	49	54	65	14	63	67	13	DN50	DN65	38221
76.1 x 35mm	39	35	44	13	74	76	24	DN32	DN65	38222
76.1 x 42mm	43	42	53	13	70	76	20	DN40	DN65	38223
76.1 x 54mm	52	54	65	17	64	76	14	DN50	DN65	38224
76.1 x 66.7mm	66	67	83	16	60	76	10	DN65	DN65	38225
108 x 42mm	47	42	53	17	106	108	39	DN40	DN100	38228
108 x 54mm	54	54	65	20	102	108	35	DN50	DN100	38229
108 x 66.7mm	70	67	83	20	96	108	29	DN65	DN100	38230
108 x 76.1mm	70	76	94	20	92	108	25	DN65	DN100	38231
108 x 88.9mm	82	88.9	108	20	84	108	17	DN80	DN100	38232
88.9 x 42mm	46	42	53	16	89	88.9	27	DN40	DN80	38233

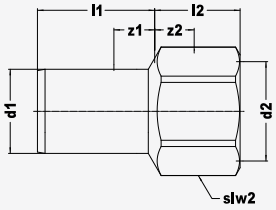




S7/6246G
Female adaptor

Male copper for insertion into a fitting x BSP parallel female thread



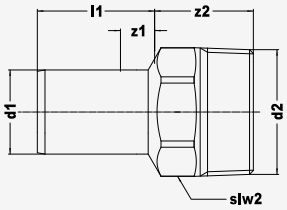


Size	l1	d1	z1	l2	z2	slw2	sks2	DN1	DN2	Code
15mm x 1/2"	30	15	10	18	3	22	26	DN12	1/2" (DN15)	38160
18mm x 1/2"	30	18	10	17	3	33	26	DN15	1/2" (DN15)	38157
18mm x 3/4"	30	18	10	20	3	30	32	DN15	3/4" (DN20)	38158
22mm x 1/2"	30	22	9	17	2	22	26	DN20	1/2" (DN15)	38159
22mm x 3/4"	30	22	9	19	3	30	32	DN20	3/4" (DN20)	38161
28mm x 3/4"	32	28	9	18	2	30	32	DN25	1" (DN25)	38166
28mm x 1"	32	28	9	22	3	37	39	DN25	3/4" (DN20)	38162
35mm x 1"	35	35	9	21	2	37	39	DN32	1" (DN25)	38167
35mm x 1 1/4"	35	35	9	25	4	46	49	DN32	1 1/4" (DN32)	38163
42mm x 1 1/2"	51	42	21	25	4	48	56	DN40	1 1/4" (DN32)	38164
54mm x 2"	56	54	21	30	4	65	70	DN50	2" (DN50)	38165

S8/6280G
Male adaptor

Male copper for insertion into a fitting x BSP male taper thread





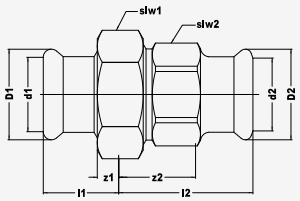
Size	l1	d1	z1	l2	z2	slw2	sks2	DN1	DN2	Code
15mm x 1/2"	30	15	10	21	12	19	21	DN12	1/2" (DN15)	38170
18mm x 1/2"	30	18	10	20	12	19	21	DN15	1/2" (DN15)	38173
18mm x 3/4"	30	18	10	23	14	25	27	DN15	3/4" (DN20)	38174
22mm x 1/2"	30	22	9	21	13	25	27	DN20	1/2" (DN15)	38175
22mm x 3/4"	30	22	9	23	13	25	27	DN20	3/4" (DN20)	38171
28mm x 1"	32	28	9	26	15	32	34	DN25	1" (DN25)	38172
35mm x 1 1/4"	35	35	9	29	16	36	42	DN32	1 1/4" (DN32)	38176
42mm x 1 1/2"	51	42	21	29	16	46	49	DN40	1 1/2" (DN40)	38177



S11/6330
Union coupling

Press x press





Size	l1	d1	D1	z1	slw1	sks1	l2	d2	D2	z2	slw2	sks2	DN1	DN2	Code
15mm	27	15	23	7	30	34	33	15	23	13	25	27	DN12	DN12	38180
18mm	29	18	26	9	30	34	33	18	26	13	25	27	DN15	DN15	38179
22mm	31	22	31	10	36	41	37	22	31	16	32	34	DN20	DN20	38181
28mm	33	28	37	10	46	49	41	28	37	17	40	42	DN25	DN25	38182
35mm	33	35	44	7	52	56	38	35	44	14	46	46	DN32	DN32	38183
42mm	41	42	53	11	58	61	50	42	53	20	51	54	DN40	DN40	38184
54mm	48	54	65	13	75	79	51	54	65	16	65	70	DN50	DN50	38185

S12/7002A
Elbow

Press x press

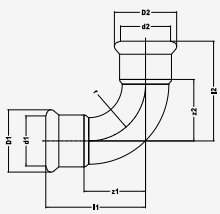


Size	l1	d1	D1	z1	l2	d2	D2	z2	DN1	DN2	Code
12mm	31	12	19	14	31	12	19	14	DN10	DN10	38279
15mm	38	15	23	17	38	15	23	17	DN12	DN12	38280
18mm	42	18	26	22	42	18	26	22	DN15	DN15	38282
22mm	47	22	31	26	47	22	31	26	DN20	DN20	38290
28mm	56	28	37	34	56	28	37	34	DN25	DN25	38300
35mm	68	35	44	42	68	35	44	42	DN32	DN32	38302
42mm	80	42	53	50	80	42	53	50	DN40	DN40	38304
54mm	100	54	65	65	100	54	65	65	DN50	DN50	38306
66.7mm	132	67	83	87	132	67	83	87	DN65	DN65	38307
76.1mm	142	76	94	92	142	76	94	92	DN65	DN65	38308
88.9mm	170	89	108	106	170	89	108	106	DN80	DN80	38309
108mm	201	108	132	135	201	108	132	135	DN100	DN100	38310

S12R/7002A
Reduced Elbow

Press x press





Size	l1	d1	D1	z1	l2	d2	D2	z2	DN1	DN2	Code
22 x 15mm	48	22	31	27	53	15	23	33	DN20	DN15	38311

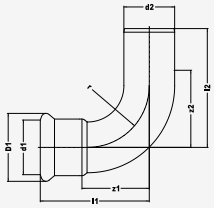




S12S/7001A
Street Elbow

Press x male end for insertion into an XPress fitting



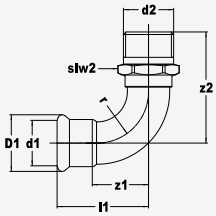


Size	l1	d1	D1	z1	l2	d2	z2	DN1	DN2	Code
12mm	31	12	19	14	45	12	28	DN10	DN10	38317
15mm	36	15	23	16	50	15	30	DN12	DN12	38318
18mm	42	18	26	22	53	18	33	DN15	DN15	38319
22mm	47	22	31	27	58	22	37	DN20	DN20	38320
28mm	58	28	37	34	64	28	41	DN25	DN25	38322
35mm	69	35	44	44	82	35	56	DN32	DN32	38324
42mm	81	42	53	52	101	42	71	DN40	DN40	38325
54mm	100	54	65	66	120	54	85	DN50	DN50	38326
66.7mm	130	67	83	93	175	67	125	DN65	DN65	38327A
76.1mm	143	76	94	93	150	76	100	DN65	DN65	38328
88.9mm	170	89	108	112	178	89	114	DN80	DN80	38329
108mm	197	108	133	130	208	108	144	DN100	DN100	38330A

S13/6092G
Male elbow

Press x BSP male taper thread





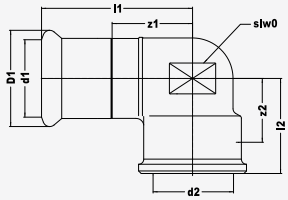
Size	l1	d1	D1	z1	l2	z2	DN1	DN2	Code
12mm x 3/8"	36	12	19	19	25	19	DN10	3/8" (DN10)	38371
12mm x 1/2"	40	12	19	23	26	18	DN10	1/2" (DN15)	38370
15mm x 3/8"	43	15	23	12	24	18	DN12	3/8" (DN10)	38339
15mm x 1/2"	38	15	23	19	34	26	DN12	1/2" (DN15)	38333
18mm x 1/2"	42	18	26	15	37	29	DN15	1/2" (DN15)	38340
18mm x 3/4"	47	18	26	18	31	22	DN15	3/4" (DN20)	38372
22mm x 3/4"	47	22	31	28	43	34	DN20	3/4" (DN20)	38334
28mm x 1"	58	28	37	36	53	43	DN25	1" (DN25)	38335
35mm x 1 1/4"	55	35	44	30	47	35	DN25	1 1/4" (DN32)	38336
42mm x 1 1/2"	62	42	53	32	51	38	DN40	1 1/2" (DN40)	38337
54mm x 2"	70	54	65	35	63	47	DN80	2" (DN50)	38338



S14/6090G
Female elbow

Connection: Press x BSP parallel female thread



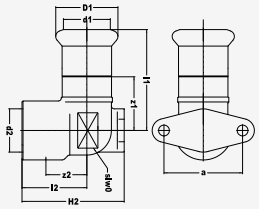


Size	l1	d1	D1	z1	slw0	l2	z2	DN1	DN2	Code
12mm x Rp3/8"	39	12	19	22	15	18	10	DN10	3/8" (DN10)	38346
12mm x Rp1/2"	39	12	19	22	26	20	7	DN10	1/2" (DN15)	38345
15mm x Rp3/8"	43	15	23	23	18	18	11	DN12	3/8" (DN10)	38347
15mm x Rp1/2"	41	15	23	21	18	23	12	DN12	1/2" (DN15)	38351
15mm x Rp3/4"	36	15	23	16	31	29	13	DN12	3/4" (DN20)	38344
18mm x Rp1/2"	41	18	26	21	21	24	14	DN15	1/2" (DN15)	38348
18mm x Rp3/4"	52	18	26	32	21	25	12	DN15	3/4" (DN20)	38349
22mm x Rp1/2"	37	22	31	16	25	32	13	DN20	1/2" (DN15)	38350
22mm x Rp3/4"	45	22	31	24	25	27	11	DN20	3/4" (DN20)	38353
28mm x Rp1"	51	28	37	28	33	33	14	DN25	1" (DN25)	38354
35mm x Rp1 1/4"	55	35	44	29	46	45	21	DN32	1 1/4" (DN32)	38355
42mm x Rp1 1/2"	63	42	53	35	53	52	26	DN40	1 1/2" (DN40)	38356
54mm x Rp2"	74	54	65	42	65	60	33	DN50	2" (DN50)	38357

S15/6472G
Backplate elbow

Connection: Press x BSP parallel female thread



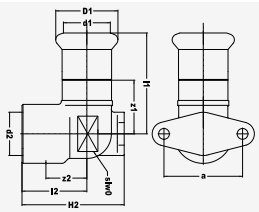


Size	l1	d1	D1	z1	l2	z2	DN1	DN2	Code
12mm x 1/2"	63	12	19	46	25	10	DN10	1/2" (DN15)	38397
15mm x 3/8"	42	15	23	22	38	16	DN12	3/8" (DN10)	38396
15mm x 1/2"	42	15	23	22	20	9	DN12	1/2" (DN15)	38400
18mm x 1/2"	43	18	26	23	24	9	DN15	1/2" (DN15)	38398
22mm x 3/4"	45	22	31	24	27	11	DN20	3/4" (DN20)	38401

S15L/6472L
Backplate elbow

Connection: Press x parallel female thread





Size	l1	d1	D1	z1	l2	z2	DN1	DN2	Code
15mm x 1/2"	47	15	23	27	48	8	DN12	1/2" (DN15)	38399

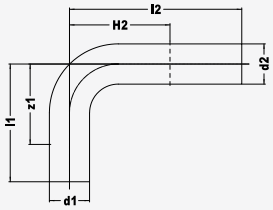




S19/7005
90° bend

Both ends male for insertion into an XPress fitting



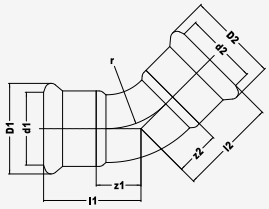


Size	l1	d1	z1	l2	d2	z2	DN1	DN2	Code
15mm	70	15	50	120	15	100	DN12	DN12	38390
18mm	70	18	50	120	18	100	DN15	DN15	38391
22mm	70	22	49	120	22	99	DN20	DN20	38392
28mm	80	28	57	120	28	97	DN25	DN25	38393

S21/7041
Obtuse Elbow

Press x press





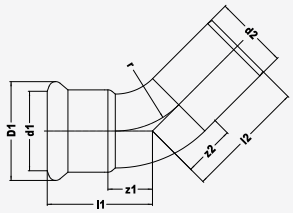
Size	l1	d1	D1	z1	l2	d2	D2	z2	DN1	DN2	Code
12mm	23	12	19	6	23	12	19	6	DN10	DN10	38411
15mm	28	15	23	8	28	15	23	8	DN12	DN12	38410
18mm	29	18	26	9	29	18	26	9	DN15	DN15	38413
22mm	31	22	31	12	31	22	31	12	DN20	DN20	38412
28mm	37	28	37	16	37	28	37	16	DN25	DN25	38414
35mm	44	35	44	18	44	35	44	18	DN32	DN32	38416
42mm	51	42	53	21	51	42	53	21	DN40	DN40	38417
54mm	62	54	65	27	62	54	65	27	DN50	DN50	38418
66.7mm	85	67	83	35	85	67	83	35	DN65	DN65	38419
76.1mm	91	76	94	45	91	76	94	45	DN65	DN65	38420
88.9mm	109	89	108	46	109	89	108	46	DN80	DN80	38422
108mm	125	108	132	59	125	108	132	59	DN100	DN100	38421



S21S/7040
Obtuse street elbow

Press x male end for insertion into an XPress fitting



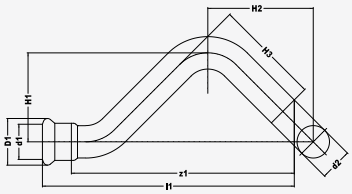


Size	l1	d1	D1	z1	l2	d2	z2	DN1	DN2	Code
12mm	23	12	19	6	32	12	15	DN10	DN10	38402
15mm	28	15	23	8	37	15	17	DN12	DN12	38404
18mm	29	18	26	9	39	18	19	DN15	DN15	38403
22mm	32	22	31	11	44	22	23	DN20	DN20	38405
28mm	37	28	37	14	47	28	24	DN25	DN25	38406
35mm	43	35	44	17	58	35	32	DN32	DN32	38407
42mm	51	42	53	21	71	42	41	DN40	DN40	38408
54mm	62	54	65	27	82	54	47	DN50	DN50	38409
66.7mm	85	67	83	35	88	67	38	DN65	DN65	38430
76.1mm	90	76	94	40	97	76	54	DN65	DN65	38431
88.9mm	109	89	108	47	116	89	54	DN80	DN80	38433
108mm	115	108	133	48	136	108	69	DN100	DN100	38432A

S22/7086
Partial crossover

Press x male end for insertion into an XPress fitting



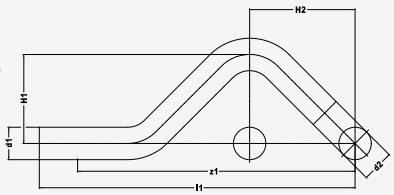


Size	l1	d1	D1	z1	d2	DN1	DN2	Code
15mm	110	15	23	90	15	DN12	DN12	38435
18mm	120	18	26	100	18	DN15	DN15	38437
22mm	134	22	31	113	22	DN20	DN20	38436

S22S/7087
Street crossover

Both ends male for insertion into an XPress fitting





Size	l1	d1	d2	DN1	DN2	Code
15mm	118	15	15	DN12	DN12	38438
18mm	128	18	18	DN15	DN15	38434
22mm	142	22	22	DN20	DN20	38439

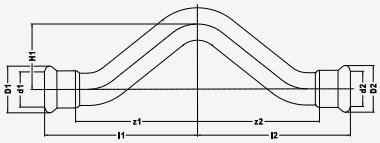




S23/7085
Full crossover

Press x press

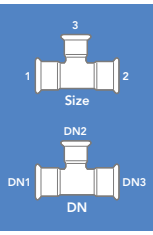




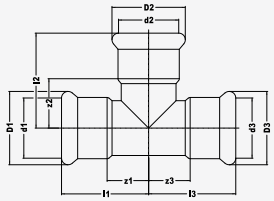
Size	l1	d1	D1	z1	l2	d2	D2	z2	DN1	DN2	Code
15mm	70	15	23	50	70	15	23	50	DN12	DN12	38440
18mm	76	18	26	56	76	18	26	56	DN15	DN15	38442
22mm	85	22	31	64	85	22	31	64	DN20	DN20	38441

S24/7130
Equal tee

Press x press





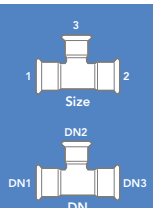


Size	l1	d1	D1	z1	l2	d2	D2	z2	l3	d3	D3	z3	DN1	DN2	DN3	Code
12mm	28	12	19	11	28	12	19	11	28	12	19	11	DN10	DN10	DN10	38472
15mm	32	15	23	12	32	15	23	12	32	15	23	12	DN12	DN12	DN12	38450
18mm	34	18	26	14	34	18	26	14	34	18	26	14	DN15	DN15	DN15	38451
22mm	37	22	31	16	37	22	31	16	37	22	31	16	DN20	DN20	DN20	38460
28mm	42	28	37	19	42	28	37	19	42	28	37	19	DN25	DN25	DN25	38462
35mm	50	35	44	24	50	35	44	24	50	35	44	24	DN32	DN32	DN32	38464
42mm	58	42	53	28	58	42	53	28	58	42	53	28	DN40	DN40	DN40	38466
54mm	69	54	65	34	69	54	65	34	69	54	65	34	DN50	DN50	DN50	38467
66.7mm	95	67	83	45	111	67	83	61	95	67	83	45	DN65	DN65	DN65	38468A
76.1mm	101	76	94	51	119	76	94	69	101	76	94	51	DN65	DN65	DN65	38469A
88.9mm	162	-	-	100	162	-	-	100	162	-	-	100	DN80	DN80	DN80	38470A
108mm	136	108	133	69	154	108	133	87	136	108	133	69	DN100	DN100	DN100	38471A

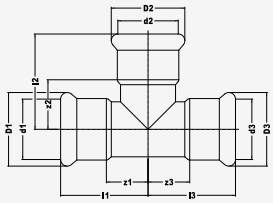


S25/7130
Tee, reduced branch

Press on all ends







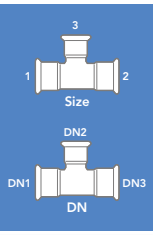
Size	l1	d1	D1	z1	l2	d2	D2	z2	l3	d3	D3	z3	DN1	DN2	DN3	Code
15 x 15 x 12mm	32	15	23	12	32	12	19	15	32	15	23	12	DN12	DN10	DN12	38488
18 x 18 x 12mm	34	18	26	14	35	12	19	15	34	18	26	14	DN15	DN10	DN15	38452
18 x 18 x 15mm	34	18	26	14	35	15	23	15	34	18	26	14	DN15	DN12	DN15	38454
22 x 22 x 12mm	37	22	31	16	34	12	19	17	37	22	31	16	DN20	DN10	DN20	38491
22 x 22 x 15mm	37	22	31	16	38	15	23	18	37	22	31	16	DN20	DN12	DN20	38490
22 x 22 x 18mm	37	22	31	16	38	18	26	18	37	22	31	16	DN20	DN15	DN20	38535
28 x 28 x 12mm	42	28	37	19	37	12	19	20	42	28	37	19	DN25	DN10	DN25	38493
28 x 28 x 15mm	42	28	37	19	41	15	23	21	42	28	37	19	DN25	DN12	DN25	38492
28 x 28 x 18mm	42	28	37	19	41	18	26	21	42	28	37	19	DN25	DN15	DN25	38538
28 x 28 x 22mm	42	28	37	19	41	22	31	20	42	28	37	19	DN25	DN20	DN25	38494
35 x 35 x 15mm	45	35	44	19	44	15	23	24	45	35	44	19	DN32	DN12	DN32	38496
35 x 35 x 22mm	45	35	44	19	45	22	31	24	45	35	44	19	DN32	DN20	DN32	38497
35 x 35 x 28mm	50	35	44	24	44	28	37	21	50	35	44	24	DN32	DN25	DN32	38498
42 x 42 x 15mm	50	42	53	20	48	15	23	28	50	42	53	20	DN40	DN12	DN40	38499
42 x 42 x 22mm	50	42	53	20	48	22	31	27	50	42	53	20	DN40	DN20	DN40	38500
42 x 42 x 28mm	56	42	53	26	49	28	37	26	56	42	53	26	DN40	DN25	DN40	38501
42 x 42 x 35mm	56	42	53	26	50	35	44	24	56	42	53	26	DN40	DN32	DN40	38502
54 x 54 x 22mm	60	54	65	25	54	22	31	33	60	54	65	25	DN50	DN20	DN50	38504
54 x 54 x 28mm	60	54	65	25	55	28	37	32	60	54	65	25	DN50	DN25	DN50	38505
54 x 54 x 35mm	61	54	65	24	55	35	44	29	61	54	65	24	DN50	DN32	DN50	38506
54 x 54 x 42mm	69	54	65	34	64	42	53	34	69	54	65	34	DN50	DN40	DN50	38507
66.7 x 66.7 x 28mm	76	67	83	26	67	28	37	43	76	67	83	26	DN65	DN25	DN65	38550
66.7 x 66.7 x 35mm	80	67	83	29	70	35	44	43	80	67	83	29	DN65	DN32	DN65	38560
66.7 x 66.7 x 42mm	82	67	83	32	76	42	53	41	82	67	83	32	DN65	DN40	DN65	38561
66.7 x 66.7 x 54mm	88	67	83	47	78	54	65	43	88	67	83	47	DN65	DN50	DN65	38562
76.1 x 76.1 x 22mm	73	76	94	22	73	22	31	50	73	76	94	22	DN65	DN20	DN65	38563
76.1 x 76.1 x 28mm	77	76	94	26	73	28	37	50	77	76	94	26	DN65	DN25	DN65	38564
76.1 x 76.1 x 35mm	80	76	94	30	78	35	44	53	80	76	94	30	DN65	DN32	DN65	38553
76.1 x 76.1 x 42mm	103	76	94	55	106	42	53	70	103	76	94	55	DN65	DN40	DN65	38551
76.1 x 76.1 x 54mm	93	76	94	41	85	54	65	50	93	76	94	60	DN65	DN50	DN65	38552
88.9 x 88.9 x 54mm	136	88.9	108	77	119	54	65	77	136	88.9	108	77	DN80	DN50	DN80	38554A
108 x 108 x 54mm	109	108	133	125	125	54	65	91	109	108	133	125	DN100	DN54	DN100	38555A
88.9 x 88.9 x 76mm	151	88.9	108	91	146	76.1	94	96	151	88.9	108	91	DN80	DN65	DN80	38556A
108 x 108 x 66.7mm	117	108	133	46	141	67	83	96	117	108	133	50	DN100	DN65	DN100	38565A
108 x 108 x 76.1mm	120	108	133	52	139	76	94	52	120	108	133	53	DN100	DN80	DN100	38557A
108 x 108 x 88.9mm	126	108	133	59	151	89	108	89	126	108	133	59	DN100	DN80	DN100	38558A



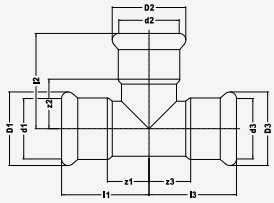


S26/7130
Tee, one end reduced

Press on all ends



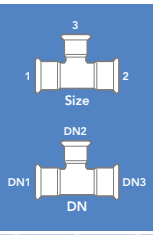




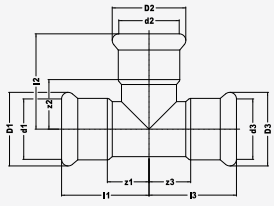
Size	l1	d1	D1	z1	l2	d2	D2	z2	l3	d3	D3	z3	DN1	DN2	DN3	Code
15 x 12 x 15mm	32	15	23	12	32	15	23	12	36	12	19	19	DN12	DN12	DN10	38508
18 x 15 x 18mm	34	18	26	14	34	18	26	14	42	15	23	22	DN15	DN15	DN12	38455
22 x 15 x 22mm	37	22	31	16	37	22	31	16	46	15	23	26	DN20	DN20	DN12	38510
22 x 18 x 22mm	37	22	31	16	37	22	31	16	43	18	26	23	DN20	DN20	DN15	38511
28 x 15 x 28mm	42	28	37	19	42	28	37	19	55	15	23	35	DN25	DN25	DN12	38512
28 x 22 x 28mm	42	35	44	19	42	35	44	19	52	22	31	31	DN32	DN32	DN20	38514
35 x 22 x 35mm	51	35	44	25	50	35	44	24	72	22	31	51	DN32	DN32	DN20	38517
35 x 28 x 35mm	51	35	44	25	50	35	44	24	67	28	37	41	DN32	DN32	DN25	38518

S27/7130
Tee, one end and branch reduced

Press on all ends





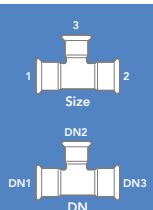


Size	l1	d1	D1	z1	l2	d2	D2	z2	l3	d3	D3	z3	DN1	DN2	DN3	Code
15 x 12 x 12mm	32	15	23	12	32	12	19	15	32	12	19	15	DN12	DN10	DN10	38527
18 x 15 x 15mm	34	18	26	14	35	15	23	15	40	15	23	20	DN15	DN12	DN12	38453
22 x 15 x 15mm	37	22	31	16	44	15	23	18	43	15	23	23	DN20	DN12	DN12	38530
22 x 18 x 15mm	37	22	31	16	44	15	23	18	34	18	26	14	DN20	DN12	DN15	38531
22 x 15 x 18mm	37	22	31	16	38	18	26	18	44	15	23	24	DN20	DN15	DN12	38533
22 x 18 x 18mm	37	22	31	16	38	18	26	18	41	18	26	21	DN20	DN15	DN15	38534
28 x 22 x 18mm	42	28	37	19	41	18	26	21	47	22	31	26	DN25	DN15	DN20	38529
28 x 22 x 15mm	42	28	37	19	41	15	23	21	46	22	31	25	DN25	DN12	DN20	38536
28 x 22 x 22mm	42	28	37	19	41	22	31	20	49	22	31	28	DN25	DN20	DN20	38532
35 x 22 x 22mm	51	35	44	25	44	22	31	23	67	22	31	45	DN32	DN20	DN20	38539
35 x 28 x 22mm	51	35	44	25	44	22	31	23	63	28	37	40	DN32	DN20	DN25	38541
35 x 28 x 28mm	51	35	44	25	44	28	37	21	67	28	37	44	DN32	DN25	DN25	38542
42 x 35 x 35mm	56	42	53	26	50	35	44	24	74	35	44	48	DN40	DN32	DN32	38546
54 x 42 x 42mm	69	54	65	34	64	42	53	34	83	42	53	53	DN50	DN40	DN40	38566

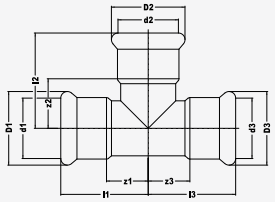


S28/7130
Tee, both ends reduced

Press on all ends



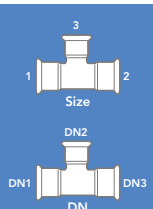




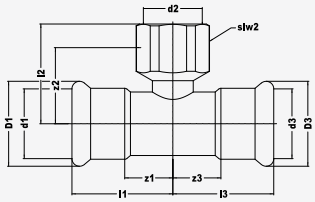
Size	l1	d1	D1	z1	l2	d2	D2	z2	l3	d3	D3	z3	DN1	DN2	DN3	Code
12 x 12 x 15mm	36	12	19	19	32	12	19	15	36	12	19	15	DN10	DN10	DN10	38447
15 x 15 x 18mm	35	15	23	15	32	18	26	12	23	15	23	35	DN12	DN15	DN12	38547
15 x 15 x 22mm	38	15	23	18	34	22	31	13	23	15	23	38	DN12	DN20	DN12	38545
22 x 22 x 28mm	52	22	31	31	42	22	31	19	52	22	31	31	DN20	DN20	DN20	38548
28 x 28 x 35mm	68	28	37	45	50	28	37	24	37	28	37	68	DN25	DN25	DN25	38549

S30/6130G
Female branch tee

Press x BSP parallel female branch







Size	l1	d1	D1	z1	l2	z2	slw2	sks2	l3	d3	D3	z3	DN1	DN2	DN3	Code
12 x 12mm x Rp1/2"	34	12	19	14	26	10	26	28	34	12	19	14	DN10	1/2" (DN15)	DN10	38584
15 x 15mm x Rp1/2"	34	15	23	14	25	13	26	28	34	15	23	14	DN12	1/2" (DN15)	DN12	38585
18 x 18mm x Rp1/2"	42	18	26	22	24	8	26	28	42	18	26	22	DN15	1/2" (DN15)	DN15	38586
22 x 22mm x Rp1/2"	42	22	31	21	26	11	26	28	42	22	31	21	DN20	1/2" (DN15)	DN20	38591
22 x 22mm x Rp3/4"	45	22	31	24	27	11	32	34	45	22	31	24	DN20	3/4" (DN20)	DN20	38587
28 x 28mm x Rp1/2"	44	28	37	21	29	14	26	28	44	28	37	21	DN25	1/2" (DN15)	DN25	38592
28 x 28mm x Rp3/4"	42	28	37	19	35	14	32	34	42	28	37	19	DN25	3/4" (DN20)	DN25	38593
35 x 35mm x Rp1/2"	50	35	44	24	34	19	26	28	50	35	44	24	DN32	1/2" (DN15)	DN32	38594
42 x 42mm x Rp1/2"	57	42	53	27	38	23	26	28	57	42	53	27	DN40	1/2" (DN15)	DN40	38596
54 x 54mm x Rp1/2"	69	54	65	34	44	29	26	28	69	54	65	34	DN50	1/2" (DN15)	DN50	38597
76.1 x 76.1mm x Rp1/2"	65	76	94	15	48	30	N/A	N/A	65	76	94	15	DN65	1/2" (DN15)	DN65	38190
108 x 108mm x Rp1/2"	82	108	132	15	65	53	N/A	N/A	82	108	132	15	DN100	1/2" (DN15)	DN100	38191

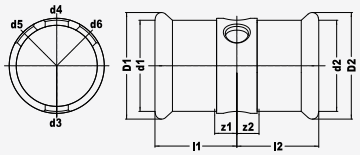




S32/6131G
Female branch tee with multi ports

Press x press



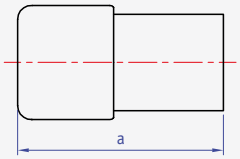


Size	l1	d1	D1	es1	z1	l2	d2	D2	es2	z2	DN1	DN2	DN3	DN4	DN5	DN6	Code
66.7mm x 1/2"	65	67	83	65	15	65	67	83	51	15	DN65	DN65	1/2" (DN15)	1/2" (DN15)	N/A	N/A	38189
76.1mm x 1/2"	65	76	94	65	14	65	76	94	51	14	DN65	DN65	1/2" (DN15)	1/2" (DN15)	N/A	N/A	38188
88.9mm x 3/4"	80	89	108	80	18	80	89	108	62	18	DN80	DN80	3/4" (DN20)	3/4" (DN20)	3/4" (DN20)	N/A	38192
108mm x 3/4"	85	108	132	85	18	85	108	132	68	18	DN100	DN100	3/4" (DN20)	3/4" (DN20)	3/4" (DN20)	3/4" (DN20)	38206

S60
Stop end

Male end for insertion into an XPress fitting

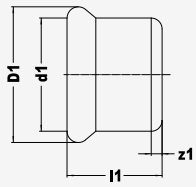




Size	l1	d1	es1	z1	DN1	Code
35mm	96	35	26	70	DN32	38686
42mm	108	42	32	76	DN40	38688
54mm	125	54	37	89	DN50	38690

S61/7301
Stop end





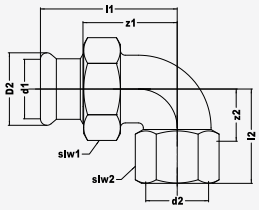
Size	l1	d1	D1	z1	DN1	Code
12mm	17	12	19	2	DN10	38702
15mm	20	15	23	2	DN12	38695
18mm	20	18	26	2	DN15	38696
22mm	21	22	31	2	DN20	38697
28mm	23	28	37	2	DN25	38698
35mm	26	35	44	2	DN32	38699
42mm	30	42	53	2	DN40	38700
54mm	35	54	65	2	DN50	38701
66.7mm	50	67	83	2	DN65	38691
76.1mm	50	76	94	2	DN65	38692
108mm	67	108	132	2	DN100	38694



S65F/6096G
Bent female union connector

Press x parallel female end



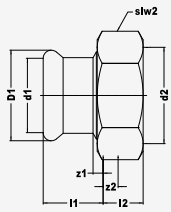


Size	l1	d1	D1	z1	slw1	sks1	l2	z2	slw2	sks2	DN1	DN2	Code
12mm x 1/2"	49	12	19	32	30	34	32	15	27	30	DN10	1/2" (DN15)	38790
15mm x 1/2"	53	15	23	33	30	34	32	17	27	30	DN12	1/2" (DN15)	38791
18mm x 1/2"	55	18	26	35	30	34	32	17	27	30	DN15	1/2" (DN15)	38792
18mm x 3/4"	61	18	26	41	36	41	36	20	33	36	DN15	3/4" (DN20)	38793
22mm x 3/4"	66	22	31	45	36	41	40	21	40	43	DN20	1" (DN25)	38794
22mm x 1"	62	22	31	41	36	41	36	20	33	36	DN20	3/4" (DN20)	38795
28mm x 1"	68	28	37	45	46	50	44	25	40	43	DN25	1" (DN25)	38796

S68FF/6359
Union

Press x female union end





Size	l1	d1	D1	z1	slw1	sks1	l2	z2	DN1	DN2	Code
15mm x G3/4"	30	15	23	10	30	34	11	3	DN12	3/4" (DN20)	38235
18mm x G3/4"	28	18	26	8	30	34	11	3	DN15	3/4" (DN20)	38237
22mm x G1"	36	22	31	15	36	41	13	3	DN20	1" (DN25)	38238
28mm x G1 1/4"	36	28	44	13	46	50	14	4	DN25	1 1/4" (DN32)	38239
35mm x G1 1/2"	36	35	44	10	52	56	15	4	DN32	1 1/2" (DN40)	38242
42mm x G1 3/4"	44	42	53	14	58	61	17	4	DN40	1 3/4"	38243

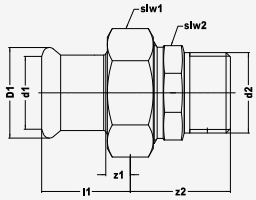




S69/6331G
Straight male union connector

Press x BSP taper male thread



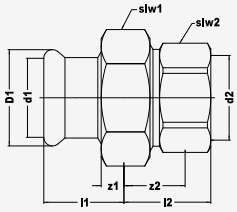


Size	l1	d1	D1	z1	slw1	sks1	l2	z2	slw2	sks2	DN1	DN2	Code
12mm x R3/8"	21	12	19	3	24	25	27	21	19	21	DN10	3/8" (DN10)	38807
12mm x R1/2"	22	12	19	5	27	28	32	23	25	27	DN10	1/2" (DN15)	38808
15mm x R1/2"	30	15	23	10	30	34	32	24	25	27	DN12	1/2" (DN15)	38813
15mm x R3/4"	25	15	23	5	30	34	33	23	25	27	DN12	3/4" (DN20)	38809
18mm x R1/2"	28	18	26	8	30	34	31	23	25	27	DN15	1/2" (DN15)	38810
18mm x R3/4"	28	18	26	8	30	34	33	24	25	27	DN15	3/4" (DN20)	38811
22mm x R1/2"	29	22	31	8	36	41	37	28	32	34	DN20	1/2" (DN15)	38812
22mm x R3/4"	36	22	31	15	36	41	38	28	32	34	DN20	3/4" (DN20)	38814
22mm x R1"	29	22	31	8	36	41	39	28	32	34	DN20	1" (DN25)	38815
28mm x R3/4"	36	28	37	13	46	50	39	30	40	42	DN25	3/4" (DN20)	38820
28mm x R1"	36	28	37	13	46	50	40	30	40	42	DN25	1" (DN25)	38816
35mm x R1 1/4"	36	35	44	10	52	56	43	24	46	48	DN32	1 1/4" (DN32)	38817
42mm x R1 1/2"	44	42	53	14	58	61	44	31	51	54	DN40	1 1/2" (DN40)	38818
54mm x R2"	52	54	65	17	75	79	49	33	65	70	DN50	2" (DN50)	38819

S69F/6330G
Straight female union connector

Press x BSP parallel female thread





Size	l1	d1	D1	z1	slw1	sks1	l2	z2	slw2	sks2	DN1	DN2	Code
12mm x Rp1/2"	22	12	19	5	27	28	20	5	26	27	DN10	1/2" (DN15)	38828
15mm x Rp1/2"	30	15	23	10	30	34	22	7	26	27	DN12	1/2" (DN15)	38833
15mm x Rp3/4"	25	15	23	5	30	34	30	13	32	34	DN12	3/4" (DN20)	38829
18mm x Rp1/2"	28	18	23	8	30	34	20	5	26	27	DN15	1/2" (DN15)	38830
18mm x Rp3/4"	28	18	23	8	30	34	29	13	32	34	DN15	3/4" (DN20)	38831
22mm x Rp3/4"	36	22	31	14	36	41	32	15	39	40	DN20	1" (DN25)	38834
22mm x Rp1"	29	22	31	8	36	41	36	17	32	34	DN20	3/4" (DN20)	38832
28mm x Rp3/4"	36	28	37	13	46	50	32	16	32	34	DN25	3/4" (DN20)	38827
28mm x Rp1"	36	28	37	13	46	50	29	10	43	45	DN25	1" (DN25)	38835
35mm x Rp1 1/4"	36	35	44	9	52	56	38	17	48	50	DN32	1 1/4" (DN32)	38836
42mm x 1 1/2"	44	42	53	14	58	61	39	18	55	57	DN40	1 1/2" (DN40)	38837
54mm x 2"	52	54	65	17	75	79	38	12	65	70	DN50	2" (DN50)	38838

CHROMIUM PLATED PRESS FITTINGS FOR JOINTING CHROMIUM PLATED COPPER TUBE

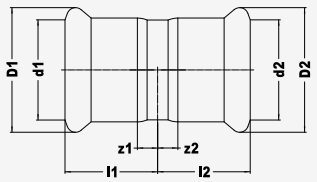


Please visit the PY website for full dimensional data and drawings

S1CP/7270
Straight coupling

Press x press



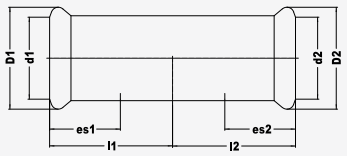


Size	l1	d1	D1	z1	l2	d2	D2	z2	DN1	DN2	Code
12mm	21	12	19	4	21	12	19	4	DN10	DN12	38610
15mm	22	15	23	2	22	15	23	2	DN12	DN12	38611
22mm	23	22	31	2	23	22	31	2	DN20	DN20	38612

S1SCP/7270S
Slip straight coupling slip pattern

Press x press (without tube stop)



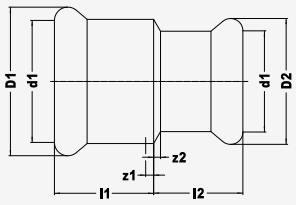


Size	l1	d1	D1	z1	l2	d2	D2	DN1	DN2	Code
15mm	40	15	23	20	40	15	23	DN12	DN12	38614

S1RCP/7240S
Straight reducing coupling

Press x press



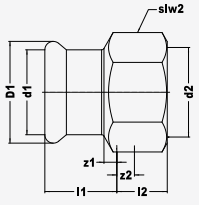


Size	l1	d1	D1	z1	l2	d2	D2	z2	DN1	DN2	Code
15 x 12mm	23	15	23	3	22	12	19	5	DN12	DN10	38616
22 x 15mm	28	22	31	7	25	15	23	5	DN20	DN12	38617

S2CP/6270G
Straight female connector

Press x BSP parallel female thread





Size	l1	d1	D1	z1	l2	z2	slw2	sks2	DN1	DN2	Code
12mm x Rp3/8"	17	12	19	0	14	6	20	21	DN10	3/8" (DN10)	38619
12mm x Rp1/2"	18	12	19	0	17	8	22	26	DN10	1/2" (DN15)	38620
15mm x Rp3/8"	20	15	23	2	14	6	20	21	DN12	3/4" (DN20)	38621
15mm x Rp1/2"	20	15	23	3	18	8	25	29	DN12	1/2" (DN15)	38622



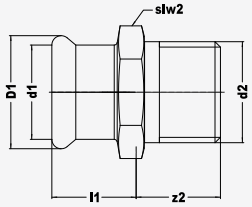
FEATURES

- Leak Before Press (LBP) technology identifies joints that have not been pressed correctly
- Suitable for connecting to copper tube to BS EN 1057 (R250/R290)
- Designed with a chromium plate finish to complement any room design where exposed pipework is a feature

S3CP/6243G
Straight male connector

Press x BSP taper male thread



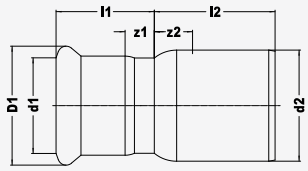


Size	l1	d1	D1	z2	slw2	sks2	DN1	DN2	Code
12mm x R3/8"	17	12	19	9	19	21	DN10	3/8" (DN10)	38627
12mm x R1/2"	17	12	19	11	19	21	DN10	1/2" (DN15)	38628
15mm x R3/8"	20	15	23	7	21	24	DN12	1/2" (DN15)	38629
15mm x R1/2"	20	15	23	8	21	24	DN12	1/2" (DN15)	38630

S6CP/7243
Reducer

Larger end male for insertion into fitting x press



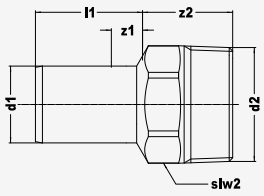


Size	l1	d1	D1	z1	l2	d2	z2	DN1	DN2	Code
15 x 12mm	21	12	19	4	23	15	3	DN10	DN12	38636
22 x 15mm	21	15	23	4	28	22	7	DN12	DN20	38639

S8CP/6280G
Male adaptor

Male end for insertion into a fitting with BSP male taper thread



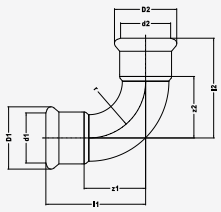


Size	l1	d1	z1	l2	z2	slw2	sks2	DN1	DN2	Code
15mm x 1/2"	30	15	10	21	12	19	21	DN12	1/2" (DN15)	38642

S12CP/7002A
Elbow

Press x press





Size	l1	d1	D1	z1	l2	d2	D2	z2	DN1	DN2	Code
12mm	31	12	19	14	31	12	19	14	DN10	DN10	38645
15mm	38	15	23	17	38	15	23	17	DN12	DN12	38646
22mm	47	22	31	26	47	22	31	26	DN20	DN20	38647

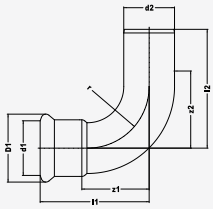
CHROMIUM PLATED PRESS FITTINGS FOR JOINTING CHROMIUM PLATED COPPER TUBE



S12SCP/7001A
Street elbow

Press x male end for insertion into an XPress fitting



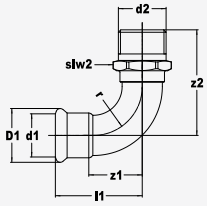


Size	l1	d1	D1	z1	l2	d2	z2	DN1	DN2	Code
12mm	31	12	19	14	45	12	28	DN10	DN10	38649
15mm	36	15	23	16	50	15	30	DN12	DN12	38650
22mm	47	22	31	27	58	22	33	DN20	DN20	38651

S13CP/6092G
Male elbow

Press x BSP taper male thread



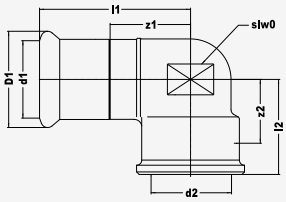


Size	l1	d1	D1	z1	l2	z2	DN1	DN2	Code
15mm x R1/2"	38	15	23	19	34	26	DN12	1/2" (DN15)	38655

S14CP/6090G
Female elbow

Press x BSP parallel female thread



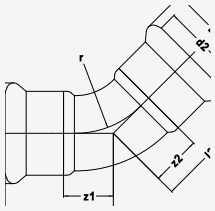


Size	l1	d1	D1	z1	slw0	l2	z2	DN1	DN2	Code
15mm x Rp1/2"	41	15	23	21	18	23	12	DN12	1/2" (DN15)	38660

S21CP/7041
Obtuse elbow

Press x press





Size	l1	d1	D1	z1	l2	d2	D2	z2	DN1	DN2	Code
12mm	23	12	19	6	23	12	19	6	DN10	DN10	38667
15mm	28	15	23	8	28	15	23	8	DN12	DN12	38668

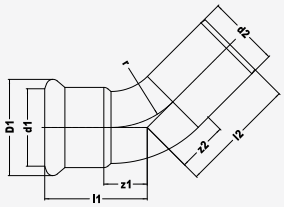




S21SCP/7040
Obtuse street elbow

Press x male end for insertion into a fitting



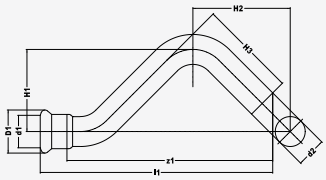


Size	l1	d1	D1	z1	l2	d2	z2	DN1	DN2	Code
12mm	23	12	19	6	32	12	15	DN10	DN10	38671
15mm	28	15	23	8	37	15	17	DN12	DN12	38672

S22CP/7086
Partial crossover

Press x male end for insertion into an XPress fitting

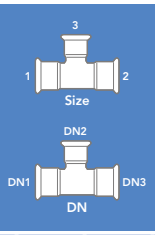




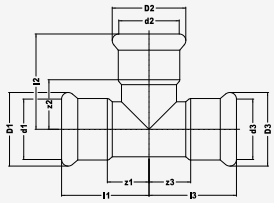
Size	l1	d1	D1	z1	d2	DN1	DN2	Code
15mm	110	15	23	90	15	DN12	DN12	38675

S24CP/7130
Equal tee

Press on all ends



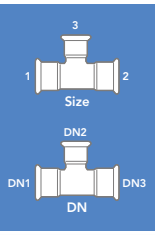




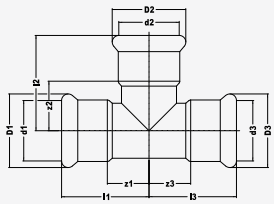
Size	l1	d1	D1	z1	l2	d2	D2	z2	l3	d3	D3	z3	DN1	DN2	DN3	Code
12mm	28	12	19	11	28	12	19	11	28	12	19	11	DN10	DN10	DN10	38710
15mm	32	15	23	12	32	15	23	12	32	15	23	12	DN12	DN12	DN12	38711
22mm	37	22	31	16	37	22	31	16	37	22	31	16	DN20	DN20	DN20	38712

S25CP/7130
Tee, reduced branch

Press on all ends





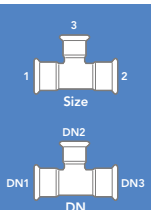


Size	l1	d1	D1	z1	l2	d2	D2	z2	l3	d3	D3	z3	DN1	DN2	DN3	Code
15 x 15 x 12mm	32	15	23	12	32	12	19	15	32	15	23	12	DN12	DN10	DN12	38714
22 x 22 x 15mm	37	22	31	16	38	15	23	18	37	22	31	16	DN20	DN12	DN20	38715

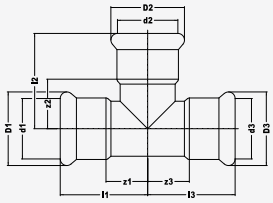


S26CP/7130
Tee, one end reduced

Press on all ends



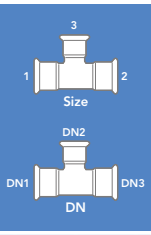




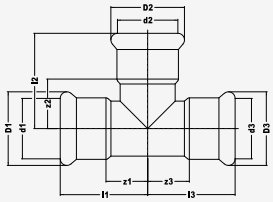
Size	l1	d1	D1	z1	l2	d2	D2	z2	l3	d3	D3	z3	DN1	DN2	DN3	Code
15 x 12 x 15mm	32	15	23	12	323	15	23	12	36	12	19	19	DN12	DN12	DN10	38719

S27CP/7130
Tee, one end and branch reduced

Press on all ends



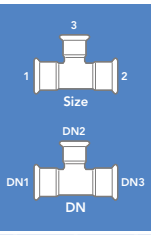




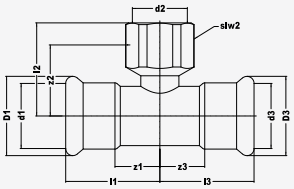
Size	l1	d1	D1	z1	l2	d2	D2	z2	l3	d3	D3	z3	DN1	DN2	DN3	Code
15 x 12 x 12mm	32	15	23	12	32	12	19	15	32	12	19	15	DN12	DN10	DN10	38723

S30CP/6130G
Female branch tee

Press x BSP parallel female thread





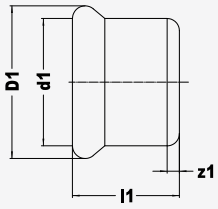


Size	l1	d1	D1	z1	l2	z2	slw2	sks2	l3	d3	D3	z3	DN1	DN2	DN3	Code
15 x 15mm x Rp1/2"	34	15	23	14	25	13	26	28	34	15	23	14	DN12	1/2" (DN15)	DN12	38733

S61CP/7301
Stop end

Press for use with copper tube





Size	l1	d1	D1	z1	DN1	Code
15mm	20	15	23	2	DN12	38739

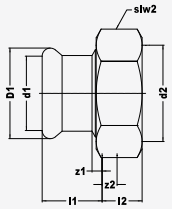




S68FFCP/6359
Flat faced union adaptor

Press x female union end





Size	l1	d1	D1	z1	slw1	sks1	l2	z2	slw2	sks2	DN1	DN2	Code
15mm x G3/4"	30	15	23	10	30	34	11	3	30	34	DN12	3/4" (DN20)	38742

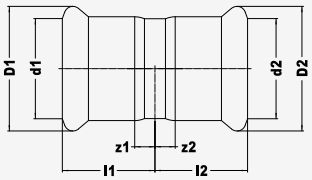


Please visit the PY website for full dimensional data and drawings

SS1
Straight coupling

Press x press



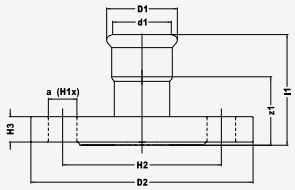


Size	l1	d1	D1	z1	l2	d2	D2	z2	DN1	DN2	Code
12mm	21	12	20	4	21	12	20	4	DN10	DN10	11530
15mm	25	15	23	5	25	15	23	5	DN12	DN12	11694
18mm	25	18	27	5	25	18	27	5	DN15	DN15	11695
22mm	26	22	32	5	26	22	32	5	DN20	DN20	11696
28mm	28	28	38	5	28	28	38	5	DN25	DN25	11697
35mm	31	35	45	5	31	35	45	5	DN32	DN32	11698
42mm	36	42	54	6	36	42	54	6	DN40	DN40	11699
54mm	41	54	65	6	41	54	65	6	DN50	DN50	11700
76.1mm	71	76	94	16	71	76	94	16	DN65	DN65	20415
88.9mm	82	89	109	19	82	89	109	19	DN80	DN80	20416
108mm	96	108	133	19	96	108	133	19	DN100	DN100	20417

SS1FMF
Female metric flange PN16

Press x steel flange to EN 1092-1:1997 (BS 4504)





Size	l1	d1	D1	z1	D2	DN1	DN2	Code
22mm x DN20 (3/4")	59	22	32	38	105	DN20	DN20	11570
28mm x DN25 (1")	65	28	38	42	115	DN25	DN25	11571
35mm x DN32 (1 1/4")	69	35	45	43	140	DN32	DN32	11572
42mm x DN40 (1 1/2")	77	42	54	47	150	DN40	DN40	11680
54mm x DN50 (2")	87	54	65	52	165	DN50	DN50	11681
76.1mm x DN65 (2 1/2")	126	76	94	71	185	DN65	DN65	20412
88.9mm x DN80 (3")	147	89	109	84	200	DN80	DN80	20413
108mm x DN100 (4")	167	108	133	90	220	DN100	DN100	20414



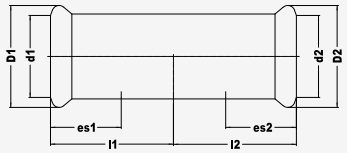
FEATURES

- Leak Before Press (LBP) technology identifies joints that have not been pressed correctly in sizes 15mm-54mm
- Designed for potable water applications where water quality and hygiene are crucial, particularly in the food, pharmaceutical and health care industries
- Heat-free jointing provides time and cost saving benefits to contractors/installers

SS1Slip
Straight coupling slip pattern

Press x press (without tube stop)



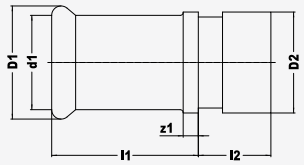


Size	l1	d1	D1	l2	d2	D2	DN1	DN2	Code
15mm	40	15	23	40	15	23	DN12	DN12	11728
18mm	40	18	27	40	18	27	DN15	DN15	11730
22mm	42	22	32	42	22	32	DN20	DN20	11729
28mm	46	28	38	46	28	38	DN25	DN25	11731
35mm	51	35	45	51	35	45	DN32	DN32	11732
42mm	60	42	54	60	42	54	DN40	DN40	11733
54mm	70	54	65	70	54	65	DN50	DN50	11734
76.1mm	115	76	94	115	76	94	DN65	DN65	20428
88.9mm	129	89	109	129	89	109	DN80	DN80	20429
108mm	153	108	133	152	108	133	DN100	DN100	20430

SS1V
Transition for grooved coupling

Press x groove





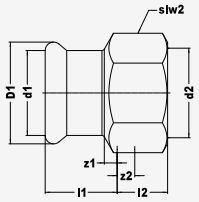
Size	l1	d1	D1	z1	l2	d2	DN1	DN2	Code
28 x 33.7mm	49	28	38	26	24	34	DN25	DN25	11675
35 x 42.4mm	54	35	45	28	24	42	DN32	DN40	11676
42 x 48.3mm	61	42	54	31	24	48	DN40	DN40	11677
54 x 60.3mm	73	54	65	38	24	60	DN50	DN50	11678
76.1 x 76.1mm	76	76	94	21	24	76	DN65	DN65	20461
88.9 x 88.9mm	86	89	109	23	24	89	DN80	DN80	20462
108 x 114mm	84	108	133	7	26	114	DN100	DN100	20463



SS2
Straight female connector

Press x BSP parallel female thread



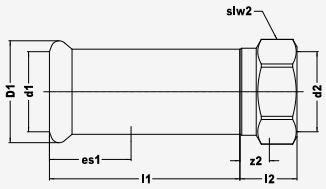


Size	l1	d1	D1	z1	l2	z2	slw2	sks2	DN1	DN2	Code
12mm x Rp3/8"	19	12	20	3	13	4	24	-	DN10	3/8" (DN10)	11531
12mm x Rp1/2"	19	12	20	2	15	4	24	-	DN10	1/2" (DN15)	11532
15mm x Rp1/2"	22	15	23	2	15	5	24	28	DN12	1/2" (DN15)	11641
18mm x Rp1/2"	22	18	26	2	15	5	27	31	DN15	1/2" (DN15)	11643
18mm x Rp3/4"	22	18	26	2	17	6	30	35	DN15	3/4" (DN20)	11644
22mm x Rp1/2"	21	22	32	3	15	7	32	37	DN20	1/2" (DN15)	11646
22mm x Rp3/4"	23	22	32	0	17	5	32	37	DN20	3/4" (DN20)	11647
22mm x Rp1"	24	22	32	2	20	6	38	44	DN20	1" (DN25)	11649
28mm x Rp1/2"	26	28	37	3	12	1	38	44	DN25	1/2" (DN15)	11631
28mm x Rp3/4"	23	28	37	0	17	6	38	38	DN25	3/4" (DN20)	11650
28mm x Rp1"	25	28	37	2	20	7	38	44	DN25	1" (DN25)	11648
28mm x Rp1 1/4"	25	28	37	2	22	7	46	53	DN25	1 1/4" (DN32)	11651
35mm x Rp1"	27	35	44	1	20	7	46	53	DN32	1" (DN25)	11652
35mm x Rp1 1/4"	28	35	44	2	22	8	46	53	DN32	1 1/4" (DN32)	11653
35mm x Rp1 1/2"	28	35	44	2	22	7	54	62	DN32	1 1/2" (DN40)	11632
42mm x Rp1 1/4"	30	42	54	2	22	8	54	62	DN40	1 1/4" (DN32)	11655
42mm x Rp1 1/2"	32	42	54	0	22	0	54	62	DN40	1 1/2" (DN40)	11654
54mm x Rp1 1/2"	36	54	65	1	22	8	67	77	DN50	1 1/2" (DN40)	11633
54mm x Rp2"	37	54	65	2	26	8	67	77	DN50	2" (DN50)	11657

SS2LC
Slip long connector

Press x BSP parallel female thread





Size	l1	d1	D1	z1	l2	z2	slw2	sks2	DN1	DN2	Code
22mm x Rp1/2"	70	22	32	68	19	15	28	32	DN20	1/2" (DN15)	11590
22mm x Rp3/4"	70	22	32	73	24	17	32	37	DN20	3/4" (DN20)	11591
28mm x Rp1/2"	70	28	38	68	21	15	34	39	DN25	1/2" (DN15)	11592
28mm x Rp3/4"	70	28	38	68	21	17	34	39	DN25	3/4" (DN20)	11593

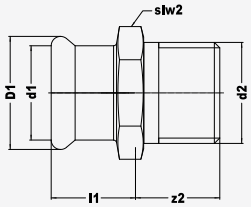




SS3
Straight male connector

Press x BSP taper male thread





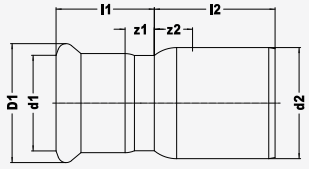
Size	l1	d1	D1	z2	slw2	sks2	DN1	DN2	Code
12mm x R1/2"	17	12	20	15	22	-	DN10	3/8" (DN10)	11533
12mm x R1/2"	17	12	20	18	24	-	DN10	1/2" (DN15)	11534
15mm x R1/2"	20	15	23	18	24	28	DN12	1/2" (DN15)	11658
18mm x R1/2"	20	18	27	18	27	31	DN15	1/2" (DN15)	11660
18mm x R3/4"	20	18	27	21	27	31	DN15	3/4" (DN20)	11661
22mm x R1/2"	21	22	32	21	32	37	DN20	1/2" (DN15)	11662
22mm x R3/4"	21	22	32	22	32	37	DN20	3/4" (DN20)	11664
22mm x R1"	21	22	32	28	34	39	DN20	1" (DN25)	11663
28mm x R3/4"	23	28	38	22	38	44	DN25	3/4" (DN20)	11642
28mm x R1"	23	28	38	25	38	44	DN25	1" (DN25)	11665
28mm x R1 1/4"	23	28	38	29	43	50	DN25	1 1/4" (DN32)	11666
35mm x R1"	26	35	45	27	54	52	DN32	1" (DN25)	11667
35mm x R1 1/4"	26	35	45	29	54	52	DN32	1 1/4" (DN32)	11670
35mm x R1 1/2"	26	35	45	30	49	57	DN32	1 1/2" (DN40)	11645
42mm x R1 1/4"	30	42	54	29	54	62	DN40	1 1/4" (DN32)	11668
42mm x R1 1/2"	30	42	54	29	54	62	DN40	1 1/2" (DN40)	11671
54mm x R1 1/2"	35	54	65	30	67	77	DN50	1 1/2" (DN40)	11656
54mm x R2"	35	54	65	34	67	77	DN50	2" (DN50)	11674
76.1mm x R2 1/2"	56	76	94	75	80	92	DN65	2 1/2" (DN65)	20458
88.9mm x R3"	63	89	109	74	95	109	DN80	3" (DN80)	20459



SS6
Reducer

Larger end male for insertion into a fitting x press



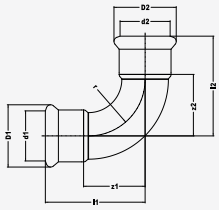


Size	l1	d1	D1	z1	l2	d2	z2	DN1	DN2	Code
15 x 12mm	23	12	20	6	27	15	7	DN10	DN12	11535
18 x 15mm	27	15	23	7	33	18	13	DN12	DN15	11712
22 x 15mm	28	15	23	8	33	22	12	DN12	DN20	11713
22 x 18mm	28	18	27	8	30	22	9	DN15	DN20	11714
28 x 15mm	28	15	23	8	40	28	17	DN12	DN25	11715
28 x 18mm	28	18	27	8	38	28	15	DN15	DN25	11716
28 x 22mm	29	22	32	8	34	28	11	DN20	DN25	11717
35 x 18mm	32	18	27	12	46	35	20	DN15	DN32	11718
35 x 22mm	29	22	32	8	42	35	16	DN20	DN32	11719
35 x 28mm	31	28	38	8	38	35	12	DN25	DN32	11720
42 x 22mm	33	22	32	12	53	42	23	DN20	DN40	11659
42 x 28mm	31	28	38	8	51	42	21	DN25	DN40	11722
42 x 35mm	34	35	45	8	42	42	12	DN32	DN40	11723
54 x 22mm	33	22	32	12	66	54	31	DN20	DN50	11724
54 x 28mm	34	28	38	11	62	54	27	DN25	DN50	11725
54 x 35mm	34	35	45	8	60	54	25	DN32	DN50	11726
54 x 42mm	40	42	54	10	55	54	20	DN40	DN50	11727
76.1 x 42mm	79	42	54	49	72	76	17	DN40	DN65	20460
76.1 x 54mm	42	54	65	7	98	76	43	DN50	DN65	20422
88.9 x 54mm	42	54	65	7	114	89	51	DN50	DN80	20423
88.9 x 76.1mm	68	76	94	13	88	89	25	DN65	DN80	20424
108 x 54mm	66	54	65	31	138	108	61	DN50	DN100	20425
108 x 76.1mm	69	76	94	14	127	108	50	DN65	DN100	20426
108 x 88.9mm	77	89	109	14	113	108	36	DN80	DN100	20427

SS12
Elbow

Press x press





Size	l1	d1	D1	z1	l2	d2	D2	z2	DN1	DN2	Code
12mm	37	12	20	20	37	12	20	20	DN10	DN10	11536
15mm	41	15	23	21	41	15	23	21	DN12	DN12	11620
18mm	45	18	27	25	45	18	27	25	DN15	DN15	11621
22mm	51	22	32	30	51	22	32	30	DN20	DN20	11622



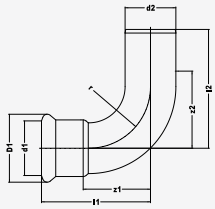


Size	l1	d1	D1	z1	l2	d2	D2	z2	DN1	DN2	Code
28mm	60	28	38	37	60	28	38	37	DN25	DN25	11623
35mm	71	35	45	45	71	35	45	45	DN32	DN32	11624
42mm	86	42	54	56	86	42	54	56	DN40	DN40	11625
54mm	105	54	65	70	105	54	65	70	DN50	DN50	11626
76.1mm	150	76	94	95	150	76	94	95	DN65	DN65	20406
88.9mm	174	89	109	111	174	89	109	111	DN80	DN80	20407
108mm	215	108	133	138	215	108	133	138	DN100	DN100	20408

SS12S
Street elbow

Press x male end for insertion into a fitting



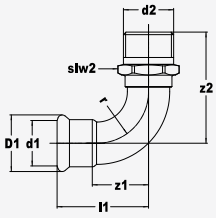


Size	l1	d1	D1	z1	l2	d2	z2	DN1	DN2	Code
12mm	37	12	20	20	48	12	31	DN10	DN10	11537
15mm	41	15	23	21	49	15	29	DN12	DN12	11634
18mm	45	18	27	25	51	18	31	DN15	DN15	11635
22mm	51	22	32	30	60	22	39	DN20	DN20	11636
28mm	60	28	38	37	66	28	43	DN25	DN25	11637
35mm	71	35	45	45	76	35	50	DN32	DN32	11638
42mm	86	42	54	56	93	42	63	DN40	DN40	11639
54mm	105	54	65	70	111	54	76	DN50	DN50	11640
76.1mm	150	76	94	95	165	76	110	DN65	DN65	20409
88.9mm	175	89	109	112	190	89	127	DN80	DN80	20410
108mm	216	108	133	139	238	108	161	DN100	DN100	20411

SS13
Male elbow

Press x BSP taper male thread





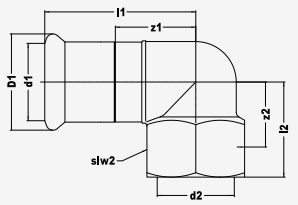
Size	l1	d1	D1	z1	l2	z2	slw2	sks2	DN1	DN2	Code
15mm x R1/2"	43	15	23	23	31	31	22	25	DN12	1/2" (DN15)	11687
22mm x R3/4"	49	22	32	28	39	39	30	35	DN20	3/4" (DN20)	11689
28mm x R1"	53	28	38	30	46	46	34	39	DN25	1" (DN25)	11690
35mm x R1 1/4"	60	35	45	34	52	52	43	50	DN32	1 1/4" (DN32)	11691
42mm x R1 1/2"	69	42	54	39	58	58	49	57	DN40	1 1/2" (DN40)	11692
54mm x R2"	82	54	65	47	68	68	62	72	DN50	2" (DN50)	11693



SS14
Female elbow

Press x BSP parallel female thread



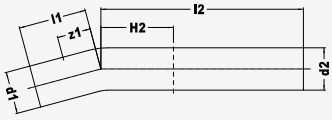


Size	l1	d1	D1	z1	l2	z2	slw2	sks2	DN1	DN2	Code
15mm x Rp1/2"	44	15	23	24	28	13	24	28	DN12	1/2" (DN15)	11682
22mm x Rp1/2"	45	22	32	24	31	16	24	28	DN20	1/2" (DN15)	11683
22mm x Rp3/4"	49	22	32	28	33	17	30	35	DN20	3/4" (DN20)	11684
28mm x Rp1/2"	48	28	38	25	35	20	24	28	DN25	1/2" (DN15)	11600
28mm x Rp1"	55	28	38	32	37	24	38	44	DN25	1" (DN25)	11685
35mm x Rp1/2"	56	35	45	30	35	20	24	28	DN32	1/2" (DN15)	11602
35mm x Rp1 1/4"	62	35	45	36	42	27	46	53	DN32	1 1/4" (DN32)	11686

SS19S
15° bend

Male x male



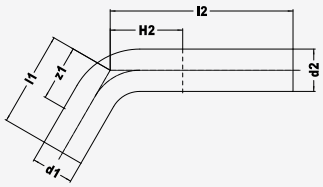


Size	l1	d1	z1	l2	d2	DN1	DN2	Code
28mm	45	28	22	134	28	DN25	DN25	11550
35mm	73	35	47	222	35	DN32	DN32	11551
42mm	89	42	59	280	42	DN40	DN40	11552
54mm	122	54	87	337	54	DN50	DN50	11553

SS19S
60° bend

Male x male





Size	l1	d1	z1	l2	d2	DN1	DN2	Code
28mm	63	28	40	121	28	DN25	DN25	11555
35mm	97	35	71	203	35	DN32	DN32	11556
42mm	102	42	72	256	42	DN40	DN40	11557
54mm	162	54	127	306	54	DN50	DN50	11558

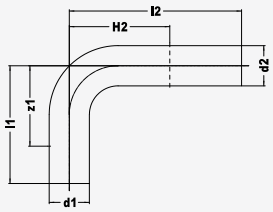




SS19S
90° bend

Male x male



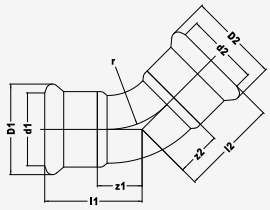


Size	l1	d1	z1	l2	d2	DN1	DN2	Code
22mm	72	22	51	120	22	DN20	DN20	11561
28mm	82	28	59	120	28	DN25	DN25	11562
35mm	120	35	94	200	35	DN32	DN32	11563
42mm	150	42	120	250	42	DN40	DN40	11564
54mm	200	54	165	300	54	DN50	DN50	11565

SS21
Obtuse elbow

Press x press





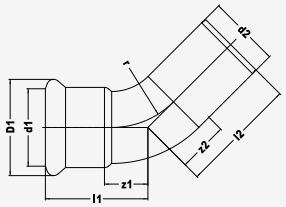
Size	l1	d1	D1	z1	l2	d2	D2	z2	DN1	DN2	Code
15mm	31	15	23	11	31	15	23	31	DN12	DN12	11604
18mm	32	18	27	12	32	18	27	32	DN15	DN15	11605
22mm	35	22	32	14	35	22	32	35	DN20	DN20	11606
28mm	40	28	38	17	40	28	38	40	DN25	DN25	11607
35mm	47	35	45	21	47	35	45	47	DN32	DN32	11608
42mm	56	42	54	26	56	42	54	56	DN40	DN40	11609
54mm	67	54	65	32	67	54	65	67	DN50	DN50	11610
76.1mm	98	76	94	43	98	76	94	43	DN65	DN65	20400
88.9mm	112	89	109	49	112	89	109	49	DN80	DN80	20401
108mm	138	108	133	61	138	108	133	61	DN100	DN100	20402



SS21S
Obtuse street elbow

Press x male end for insertion into a fitting

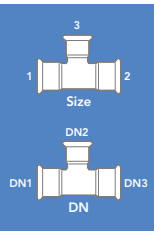




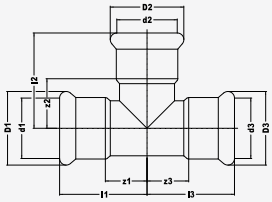
Size	l1	d1	D1	z1	l2	d2	z2	DN1	DN2	Code
15mm	30	15	23	10	38	15	18	DN12	DN12	11611
18mm	32	18	27	12	39	18	19	DN15	DN15	11612
22mm	35	22	32	14	42	22	21	DN20	DN20	11613
28mm	40	28	38	17	46	28	23	DN25	DN25	11614
35mm	46	35	45	20	51	35	25	DN32	DN32	11615
42mm	56	42	54	36	63	42	33	DN40	DN40	11616
54mm	65	54	65	30	73	54	38	DN50	DN50	11617
76.1mm	98	76	94	43	117	76	62	DN65	DN65	20403
88.9mm	112	89	109	49	131	89	68	DN80	DN80	20404
108mm	138	108	133	61	154	108	77	DN100	DN100	20405

SS24
Equal tee

Press on all ends







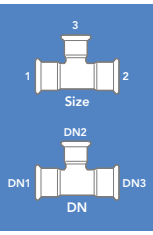
Size	l1	d1	D1	z1	l2	d2	D2	z2	l3	d3	D3	z3	DN1	DN2	DN3	Code
12mm	28	12	20	17	32	12	20	17	28	12	20	17	DN10	DN10	DN10	11538
15mm	35	15	23	15	39	15	23	19	35	15	23	15	DN12	DN12	DN12	11735
18mm	35	15	23	15	39	15	23	19	35	15	23	15	DN12	DN12	DN12	11737
22mm	40	22	32	19	44	22	32	23	40	22	32	19	DN20	DN20	DN20	11740
28mm	45	28	38	22	49	28	38	26	45	28	38	22	DN25	DN25	DN25	11744
35mm	51	35	45	25	55	35	45	29	51	35	45	25	DN32	DN32	DN32	11749
42mm	60	42	54	30	62	42	54	32	60	42	54	30	DN40	DN40	DN40	11753
54mm	71	54	65	36	72	54	65	37	71	54	65	36	DN50	DN50	DN50	11758
76.1mm	116	76	94	116	116	76	94	116	116	76	94	116	DN65	DN65	DN65	20431
88.9mm	231	89	109	231	231	89	109	231	231	89	95	231	DN80	DN80	DN80	20432
108mm	156	108	133	156	156	108	133	156	156	108	133	156	DN100	DN100	DN100	20433



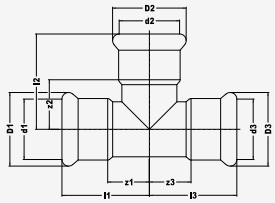


SS25
Tee, reduced branch

Press on all ends





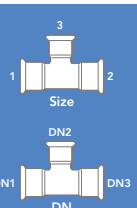


Size	l1	d1	D1	z1	l2	d2	D2	z2	l3	d3	D3	z3	DN1	DN2	DN3	Code
18 x 18 x 15mm	37	18	27	17	40	15	23	21	37	18	27	17	DN15	DN12	DN15	11736
22 x 22 x 15mm	40	22	32	19	43	15	23	23	40	22	32	19	DN20	DN12	DN20	11738
22 x 22 x 18mm	40	28	38	17	43	18	27	23	40	28	38	17	DN25	DN15	DN25	11739
28 x 28 x 15mm	45	28	38	22	46	15	23	26	45	28	38	22	DN25	DN12	DN25	11741
28 x 28 x 18mm	45	28	38	22	46	18	27	26	45	28	38	22	DN25	DN15	DN25	11742
28 x 28 x 22mm	45	28	38	22	47	22	32	26	45	28	38	22	DN25	DN20	DN25	11743
35 x 35 x 15mm	51	35	45	25	49	15	23	29	51	35	45	25	DN32	DN12	DN32	11745
35 x 35 x 18mm	51	35	45	25	49	18	27	29	51	35	45	25	DN32	DN15	DN32	11746
35 x 35 x 22mm	51	35	45	25	50	22	32	29	51	35	45	25	DN32	DN20	DN32	11747
35 x 35 x 28mm	51	35	45	25	52	28	38	29	51	35	45	25	DN32	DN25	DN32	11748
42 x 42 x 22mm	60	42	54	30	53	22	32	32	60	42	54	30	DN40	DN20	DN40	11750
42 x 42 x 28mm	60	42	54	30	55	28	38	32	60	42	54	30	DN40	DN25	DN40	11751
42 x 42 x 35mm	60	42	54	30	58	35	45	32	60	42	54	30	DN40	DN32	DN40	11752
54 x 54 x 22mm	71	54	65	36	59	22	32	38	71	54	65	36	DN50	DN20	DN50	11754
54 x 54 x 28mm	71	54	65	36	61	28	38	38	71	54	65	36	DN50	DN25	DN50	11755
54 x 54 x 35mm	71	54	65	36	64	35	45	38	71	54	65	36	DN50	DN32	DN50	11756
54 x 54 x 42mm	71	54	65	36	58	42	54	28	71	54	65	36	DN50	DN40	DN50	11757
76.1 x 76.1 x 22mm	116	76	94	61	68	22	32	45	116	76	94	61	DN65	DN20	DN65	20434
76.1 x 76.1 x 28mm	116	76	94	61	71	28	38	74	116	76	94	61	DN65	DN25	DN65	20435
76.1 x 76.1 x 35mm	116	76	94	61	75	35	45	48	116	76	94	61	DN65	DN32	DN65	20436
76.1 x 76.1 x 42mm	116	76	94	61	79	42	54	47	116	76	94	61	DN65	DN40	DN65	20437
76.1 x 76.1 x 54mm	116	76	94	61	80	54	65	43	116	76	94	61	DN65	DN50	DN65	20438
88.9 x 88.9 x 22mm	131	89	109	68	76	22	32	53	131	89	95	68	DN80	DN20	DN80	20439
88.9 x 88.9 x 28mm	131	89	109	68	76	28	38	52	131	89	95	68	DN80	DN25	DN80	20440
88.9 x 88.9 x 35mm	131	89	109	68	83	35	45	56	131	89	95	68	DN80	DN32	DN80	20441
88.9 x 88.9 x 42mm	131	89	109	68	85	42	54	53	131	89	95	68	DN80	DN40	DN80	20442
88.9 x 88.9 x 54mm	131	89	109	68	93	54	65	56	131	89	95	68	DN80	DN50	DN80	20443
88.9 x 88.9 x 76.1mm	131	89	109	68	116	76	94	61	131	89	95	68	DN80	DN65	DN80	20444
108 x 108 x 22mm	156	108	133	79	85	22	32	62	156	108	133	79	DN100	DN20	DN100	20445
108 x 108 x 28mm	156	108	133	79	88	28	38	64	156	108	133	79	DN100	DN25	DN100	20446
108 x 108 x 35mm	156	108	133	79	94	35	45	67	156	108	133	79	DN100	DN32	DN100	20447
108 x 108 x 42mm	156	108	133	79	96	42	54	64	156	108	133	79	DN100	DN40	DN100	20448
108 x 108 x 54mm	156	108	133	79	102	54	65	65	156	108	133	79	DN100	DN50	DN100	20449
108 x 108 x 76.1mm	156	108	133	79	125	76	94	70	156	108	133	79	DN100	DN65	DN100	20450
108 x 108 x 88.9mm	156	108	133	79	135	89	109	72	156	108	133	79	DN100	DN80	DN100	20451

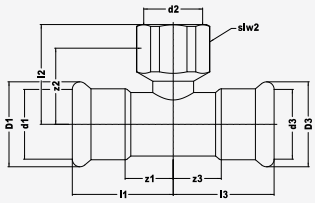


SS30
Female branch tee

Press x BSP parallel female branch







Size	l1	d1	D1	z1	l2	z2	slw2	sks2	l3	d3	D3	z3	DN1	DN2	DN3	Code
15 x 15mm x Rp1/2"	35	15	23	15	34	24	24	28	35	15	23	15	DN12	1/2" (DN15)	DN12	11759
18 x 18mm x Rp1/2"	37	18	27	17	35	25	24	28	37	18	27	17	DN15	1/2" (DN15)	DN15	11760
22 x 22mm x Rp1/2"	40	22	32	19	37	27	24	28	40	22	32	19	DN20	1/2" (DN15)	DN20	11762
22 x 22mm x Rp3/4"	40	22	32	19	39	28	30	35	40	22	32	19	DN20	3/4" (DN20)	DN20	11763
28 x 28mm x Rp1/2"	45	28	38	22	40	30	24	28	45	28	38	22	DN25	1/2" (DN15)	DN25	11765
28 x 28mm x Rp3/4"	45	28	38	22	42	31	30	35	45	28	38	22	DN25	3/4" (DN20)	DN25	11766
35 x 35mm x Rp1/2"	51	35	45	25	44	34	24	28	51	35	45	25	DN32	1/2" (DN15)	DN32	11767
35 x 35mm x Rp3/4"	51	35	45	25	46	35	30	35	51	35	45	25	DN32	3/4" (DN20)	DN32	11768
35 x 35mm x Rp1"	51	35	45	25	50	37	38	44	51	35	45	25	DN32	1" (DN25)	DN32	11628
42 x 42mm x Rp1/2"	60	42	54	30	46	36	24	28	60	42	54	30	DN40	1/2" (DN15)	DN40	11769
42 x 42mm x Rp3/4"	60	42	54	30	48	37	30	35	60	42	54	30	DN40	3/4" (DN20)	DN40	11770
54 x 54mm x Rp1/2"	71	54	65	36	52	42	24	28	71	54	65	36	DN50	1/2" (DN15)	DN50	11771
54 x 54mm x Rp3/4"	71	54	65	36	54	43	30	35	71	54	65	36	DN50	3/4" (DN20)	DN50	11773
54 x 54mm x Rp1"	71	54	65	36	58	45	38	44	71	54	65	36	DN50	1" (DN25)	DN50	11630
54 x 54mm x Rp2"	71	54	65	36	65	47	67	77	71	54	65	36	DN50	2" (DN50)	DN50	11772
76.1 x 76.1mm x Rp3/4"	116	76	94	61	68	55	30	35	116	76	94	61	DN65	3/4" (DN20)	DN65	20452
76.1 x 76.1mm x Rp2"	116	76	94	61	81	59	65	75	116	76	94	61	DN65	2" (DN50)	DN65	20453
88.9 x 88.9mm x Rp3/4"	131	89	109	68	87	74	30	35	131	89	95	68	DN80	3/4" (DN20)	DN80	20454
88.9 x 88.9mm x Rp2"	131	89	109	68	88	66	65	75	131	89	96	68	DN80	2" (DN50)	DN80	20455
108 x 108mm x Rp3/4"	156	108	133	79	86	73	30	35	156	108	134	79	DN100	3/4" (DN20)	DN100	20456
108 x 108mm x Rp2"	156	108	133	79	98	76	65	75	156	108	134	79	DN100	2" (DN50)	DN100	20457

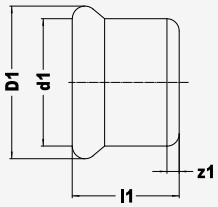




SS61
Stop end

Press, for use on stainless steel tube



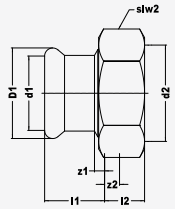


Size	l1	d1	D1	z1	DN1	Code
15mm	23	15	23	3	DN12	11701
18mm	23	18	27	3	DN15	11702
22mm	24	22	32	3	DN20	11703
28mm	26	28	38	3	DN25	11704
35mm	29	35	45	3	DN32	11705
42mm	37	42	54	7	DN40	11706
54mm	42	54	65	7	DN50	11707
76.1mm	95	76	94	40	DN65	20418
88.9mm	107	89	109	44	DN80	20419
108mm	127	108	133	50	DN100	20420

SS68FF
Flat faced union adaptor

Press x BSP female union end



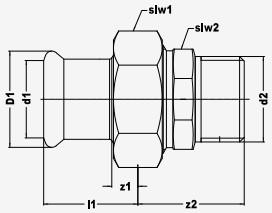


Size	l1	d1	D1	z1	l2	z2	slw2	sks2	DN1	DN2	Code
22mm x G1"	30	22	32	9	10	2	37	43	DN20	1" (DN25)	11891
28mm x G1 1/4"	31	28	38	8	10	2	46	53	DN25	1 1/4" (DN32)	11892
35mm x G1 1/2"	34	35	45	8	11	2	52	60	DN32	1 1/2" (DN40)	11893
42mm x G1 3/4"	41	42	54	11	11	2	58	67	DN40	1 3/4" (DN40)	11894
54mm x G2 3/8"	47	54	65	12	11	3	75	87	DN50	2 3/8" (DN50)	11895



SS69
Straight male union connector
Press x BSP taper male thread

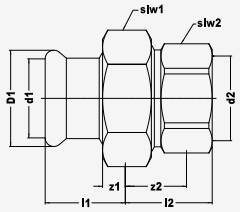




Size	l1	d1	D1	z1	slw1	sks1	l2	z2	slw2	sks2	DN1	DN2	Code
15mm x R1/2"	29	15	23	9	30	35	33	33	25	29	DN12	1/2" (DN15)	11774
18mm x R1/2"	29	18	26	9	30	35	33	33	25	29	DN15	1/2" (DN15)	11776
22mm x R1/2"	30	22	32	9	37	43	33	33	25	29	DN20	1/2" (DN15)	11721
22mm x R3/4"	30	22	32	9	37	43	29	29	32	37	DN20	3/4" (DN20)	11779
22mm x R1"	30	22	32	9	37	43	42	42	39	45	DN20	1" (DN25)	11764
28mm x R1"	31	28	37	8	46	53	42	42	39	45	DN25	1" (DN25)	11781
35mm x R1 1/4"	34	35	44	8	52	60	44	44	49	57	DN32	1 1/4" (DN32)	11782
42mm x R1 1/2"	41	42	54	11	58	67	44	44	51	59	DN40	1 1/2" (DN40)	11783
54mm x R2"	47	54	65	12	75	87	53	53	65	75	DN50	2" (DN50)	11784

SS69F
Straight female union connector
Press x BSP parallel female thread





Size	l1	d1	D1	z1	slw1	sks1	l2	z2	slw2	sks2	DN1	DN2	Code
15mm x Rp1/2"	29	15	23	9	30	35	28	18	24	28	DN12	1/2" (DN15)	11785
18mm x Rp1/2"	29	18	26	9	30	35	28	18	24	28	DN15	1/2" (DN15)	11787
22mm x Rp3/4"	30	22	32	9	37	43	33	22	30	35	DN20	3/4" (DN20)	11789
22mm x Rp1"	30	22	32	9	37	43	36	23	38	44	DN20	1" (DN25)	11798
28mm x Rp1"	31	28	37	8	46	53	34	21	38	44	DN25	1" (DN25)	11791
35mm x Rp1 1/4"	34	35	44	8	52	60	39	24	46	53	DN32	1 1/4" (DN32)	11792
42mm x Rp1 1/2"	41	42	54	11	58	67	41	27	54	62	DN40	1 1/2" (DN40)	11793
54mm x Rp2"	47	54	65	12	75	87	44	26	67	77	DN50	2" (DN50)	11794

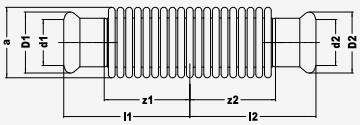




SS75
Expansion axial compensator

Press x press



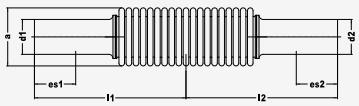


Size	l1	d1	D1	z1	l2	d2	D2	z2	DN1	DN2	Code
15mm	55	15	24	35	55	15	23	35	DN12	DN12	11540
18mm	53	18	27	33	53	18	27	33	DN15	DN15	11541
22mm	60	22	32	39	60	22	32	39	DN20	DN20	11542
28mm	65	28	38	42	65	28	38	42	DN25	DN25	11543
35mm	70	35	45	44	70	35	45	44	DN32	DN32	11544
42mm	77	42	54	47	77	42	54	47	DN40	DN40	11545
54mm	90	54	65	55	90	54	65	55	DN50	DN50	11546

SS76
Expansion axial compensator

Drum ends

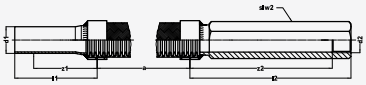




Size	l1	d1	z1	l2	d2	z2	DN1	DN2	Code
76.1mm	145	76	90	145	76	90	DN65	DN65	20465
88.9mm	173	89	110	173	89	110	DN80	DN80	20466
108mm	138	108	61	138	108	61	DN100	DN100	20467

SS80
Straight flexible hose



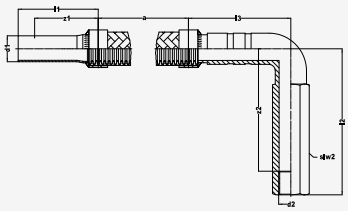


Size	l1	d1	z1	l2	z2	slw2	sks2	DN1	DN2	Code
22 x 1000mm	60	22	39	125	110	27	31	DN20	1/2" (DN15)	11575
22 x 1500mm	60	22	39	125	110	27	31	DN20	1/2" (DN15)	11576
22 x 2000mm	60	22	39	125	110	27	31	DN20	1/2" (DN15)	11577
28 x 1000mm	68	28	45	125	110	27	31	DN25	1/2" (DN15)	11578
28 x 1500mm	68	28	45	125	110	27	31	DN25	1/2" (DN15)	11579
28 x 2000mm	68	28	45	125	110	27	31	DN25	1/2" (DN15)	11580



SS82
Bent flexible hose





Size	l1	d1	z1	l2	z2	slw2	sks2	l3	DN1	DN2	Code
22 x 800mm	60	22	39	145	130	27	31	79	DN20	1/2" (DN15)	11581
22 x 1000mm	60	22	39	145	130	27	31	79	DN20	1/2" (DN15)	11582
22 x 1500mm	60	22	39	145	130	27	31	79	DN20	1/2" (DN15)	11583
28 x 800mm	68	28	45	145	130	27	31	79	DN25	1/2" (DN15)	11584
28 x 1000mm	68	28	45	145	130	27	31	79	DN25	1/2" (DN15)	11585
28 x 1500mm	68	28	45	145	130	27	31	79	DN25	1/2" (DN15)	11586

SS600
Stainless steel 316 HWG+S tube

1.4401



Size	d1	DN1	Code
15 x 1.0mm x 6.0m	15	DN12	25050
18 x 1.0mm x 6.0m	18	DN15	25051
22 x 1.2mm x 6.0m	22	DN20	25052
28 x 1.2mm x 6.0m	28	DN25	25053
35 x 1.5mm x 6.0m	35	DN32	25054
42 x 1.5mm x 6.0m	42	DN40	25055
54 x 1.5mm x 6.0m	54	DN50	25056



Key: HWG = Heating, Potable Water and Gas applications
HWG+S = All of the above plus XPress Stainless Sprinkler System



SS620
Stainless steel 316 HWG+S tube

1.4401



Size	d1	DN1	Code
76.1 x 2.0mm x 6.0m	76	DN65	25026
88.9 x 2.0mm x 6.0m	89	DN80	25028
108 x 2.0mm x 6.0m	108	DN100	25030

SS630
Stainless steel 444 sprinkler tube

1.4521



Size	d1	DN1	Code
15 x 1.0mm x 6.0m	15	DN12	24000
18 x 1.0mm x 6.0m	18	DN15	24001
22 x 1.2mm x 6.0m	22	DN20	25072
28 x 1.2mm x 6.0m	28	DN25	25073
35 x 1.5mm x 6.0m	35	DN32	25074
42 x 1.5mm x 6.0m	42	DN40	25075
54 x 1.5mm x 6.0m	54	DN50	25076

SS650
Stainless steel 439 sprinkler tube

1.4520



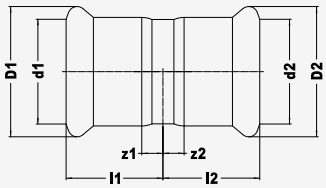
Size	d1	DN1	Code
76.1 x 2.0mm x 6.0m	76	DN65	24002
88.9 x 2.0mm x 6.0m	89	DN80	24003
108 x 2.0mm x 6.0m	108	DN100	24004



SC1
Straight coupling

Press x press



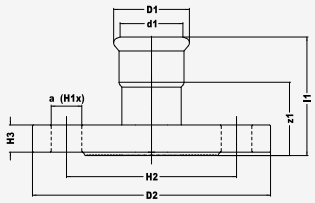


Size	l1	d1	D1	z1	l2	d2	D2	z2	DN1	DN2	Code
12mm	24	12	20	7	24	12	20	7	DN10	DN10	20560
15mm	27	15	23	7	27	15	23	7	DN12	DN12	20136
18mm	27	18	27	7	27	18	27	7	DN15	DN15	20137
22mm	28	22	32	7	28	22	32	7	DN20	DN20	20138
28mm	30	28	38	7	29	28	38	7	DN25	DN25	20139
35mm	33	35	45	7	33	35	45	7	DN32	DN32	20140
42mm	38	42	54	8	38	42	54	8	DN40	DN40	20141
54mm	43	54	65	8	43	54	65	8	DN50	DN50	20142
66.7mm	60	67	83	10	60	67	83	10	DN65	DN65	20662
76.1mm	63	76	95	8	63	76	95	8	DN65	DN65	20620
88.9mm	72	89	110	9	72	89	110	9	DN80	DN80	20621
108mm	86	108	133	9	86	108	133	9	DN100	DN100	20622

SC1FMF
Female metric flange PN16

Press x steel flange to EN 1092-1:1997 (BS 4504)





Size	l1	d1	D1	z1	D2	DN1	DN2	Code
35mm x DN32	70	35	45	44	140	DN32	DN32	20562
42mm x DN40	77	42	54	47	150	DN40	DN40	20563
54mm x DN50	87	54	65	52	165	DN50	DN50	20564
66.7mm x DN65 (2 1/2")	89	67	83	39	185	DN65	DN65	20685
76.1mm x DN65 (2 1/2")	112	76	95	57	185	DN65	DN65	20659
88.9mm x DN80 (3")	118	89	110	55	200	DN80	DN80	20660
108mm x DN100 (4")	114	108	133	37	220	DN100	DN100	20661



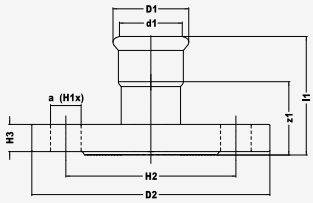
FEATURES

- Leak Before Press (LBP) technology identifies joints that have not been pressed correctly in sizes 15mm-54mm
- Designed for vented and unvented closed circuit heating and chilled water applications
- Heat-free jointing provides time and cost saving benefits to contractors/installers

SC1FMF6
Female metric flange PN6

Press x steel flange to EN 1092-1:1997 (BS 4504)



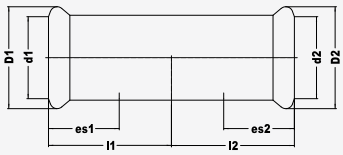


Size	l1	d1	D1	z1	D2	DN1	DN2	Code
66.7mm x DN65 (2 1/2")	89	67	83	39	185	DN65	DN65	20734
76.1mm x DN65 (2 1/2")	112	76	95	57	185	DN65	DN65	20735
88.9mm x DN80 (3")	118	89	110	55	200	DN80	DN80	20736
108mm x DN100 (4")	114	108	133	37	220	DN100	DN100	20737

SC1 Slip
Straight coupling slip pattern

Press x press (without tube stop)



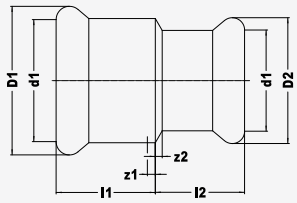


Size	l1	d1	D1	l2	d2	D2	DN1	DN2	Code
12mm	34	12	20	34	12	20	DN10	DN10	20561
15mm	40	15	23	40	15	23	DN12	DN12	20144
18mm	40	18	27	40	18	27	DN15	DN15	20145
22mm	42	22	32	42	22	32	DN20	DN20	20146
28mm	46	28	38	46	28	38	DN25	DN25	20147
35mm	52	35	45	52	35	45	DN32	DN32	20148
42mm	61	42	54	61	42	54	DN40	DN40	20149
54mm	70	54	65	70	54	65	DN50	DN50	20150
66.7mm	99	67	83	99	67	83	DN65	DN65	20663
76.1mm	115	76	95	115	76	95	DN65	DN65	20623
88.9mm	131	89	110	131	89	110	DN80	DN80	20624
108mm	151	108	133	151	108	133	DN100	DN100	20625

SC1R
Straight reduced coupling

Press x press





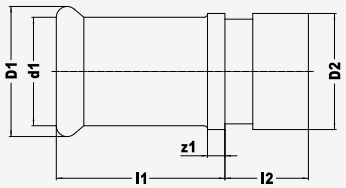
Size	l1	d1	D1	z1	l2	d2	D2	z2	DN1	DN2	Code
28 x 22mm	25	28	37	2	23	22	32	2	DN25	DN20	20154



SC1V
Transition for grooved coupling

Press x groove



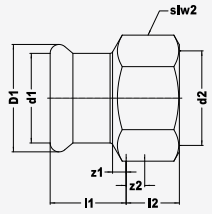


Size	l1	d1	D1	z1	l2	d2	DN1	DN2	Code
28 x 33.7mm	49	28	38	26	24	34	DN25	DN25	20187
35 x 42.4mm	54	35	45	28	24	42	DN32	DN40	20188
42 x 48.3mm	61	42	54	31	24	48	DN40	DN40	20189
54 x 60.3mm	73	54	65	38	24	60	DN50	DN50	20190
76.1 x 76.1mm	56	76	95	1	24	76	DN65	DN65	20731
88.9 x 88.9mm	76	89	110	13	24	89	DN80	DN780	20732
108 x 114mm	84	108	133	7	26	114	DN100	DN100	20733

SC2
Straight female connector

Press x BSP parallel female thread





Size	l1	d1	D1	z1	l2	z2	slw2	sks2	DN1	DN2	Code
12mm x Rp1/2"	20	12	20	3	19	4	24	28	DN10	1/2" (DN15)	20565
15mm x Rp1/2"	22	15	23	2	19	4	24	28	DN12	1/2" (DN15)	20237
18mm x Rp1/2"	21	18	26	1	19	4	27	31	DN15	1/2" (DN15)	20238
22mm x Rp1/2"	22	22	32	1	14	0	32	37	DN20	1/2" (DN15)	20245
22mm x Rp3/4"	23	22	32	2	20	4	32	37	DN20	3/4" (DN20)	20240
28mm x Rp1/2"	24	28	37	1	14	1	41	47	DN25	1/2" (DN15)	20244
28mm x Rp3/4"	24	28	38	1	17	0	38	44	DN25	3/4" (DN20)	20246
28mm x Rp1"	26	28	37	3	23	4	41	47	DN25	1" (DN25)	20241
35mm x Rp1/2"	30	35	44	4	12	1	46	53	DN32	1/2" (DN15)	20365
35mm x Rp3/4"	28	35	44	2	15	3	46	53	DN32	3/4" (DN20)	20366
35mm x Rp1"	33	35	44	7	13	0	46	53	DN32	1" (DN25)	20367
35mm x Rp1 1/4"	28	35	44	2	22	7	46	53	DN32	1 1/4" (DN32)	20247
42mm x Rp1 1/2"	32	42	54	2	22	6	54	62	DN40	1 1/2" (DN40)	20209
54mm x Rp2"	37	54	65	2	26	8	67	77	DN50	2" (DN50)	20210

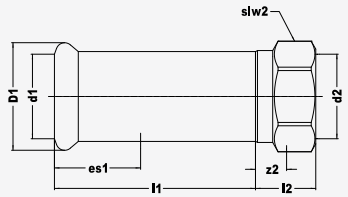




SC2LC
Slip long connector

Press x BSP parallel female thread



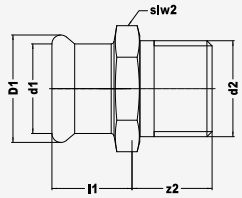


Size	l1	d1	D1	z1	l2	z2	slw2	sks2	DN1	DN2	Code
22mm x Rp1/2"	92	22	32	71	22	15	28	32	DN20	1/2" (DN15)	20323
22mm x Rp3/4"	97	22	32	76	27	17	32	37	DN20	3/4" (DN20)	20324
28mm x Rp1/2"	94	28	38	71	24	15	32	37	DN25	1/2" (DN15)	20325
28mm x Rp3/4"	93	28	38	70	23	17	32	37	DN25	3/4" (DN20)	20326

SC3
Straight male connector

Press x BSP taper male thread





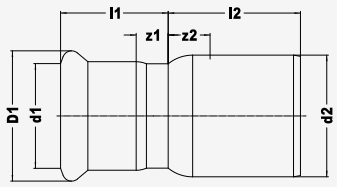
Size	l1	d1	D1	z2	slw2	sks2	DN1	DN2	Code
12mm x R3/8"	17	12	20	14	22	25	DN10	3/8" (DN10)	20566
15mm x R3/8"	20	15	23	15	24	28	DN12	3/8" (DN10)	20227
15mm x R1/2"	20	15	23	19	24	28	DN12	1/2" (DN15)	20228
18mm x R1/2"	20	18	27	19	27	31	DN15	1/2" (DN15)	20229
18mm x R3/4"	20	18	27	20	27	31	DN15	3/4" (DN20)	20230
22mm x R1/2"	21	22	32	22	32	37	DN20	1/2" (DN15)	20242
22mm x R3/4"	21	22	32	23	32	37	DN20	3/4" (DN20)	20231
22mm x R1"	21	22	32	29	34	39	DN20	1" (DN25)	20243
28mm x R3/4"	23	28	38	23	38	44	DN25	3/4" (DN20)	20236
28mm x R1"	23	28	38	25	41	47	DN25	1" (DN25)	20232
35mm x R1"	26	35	45	27	46	53	DN32	1" (DN25)	20567
35mm x R1 1/4"	26	35	45	29	46	53	DN32	1 1/4" (DN32)	20233
42mm x R1 1/2"	30	42	54	29	56	64	DN40	1 1/2" (DN40)	20234
54mm x R2"	35	54	65	34	70	81	DN50	2" (DN50)	20235
66.7mm x R2 1/2"	50	67	83	40	85	98	DN65	2 1/2" (DN65)	20664
76.1mm x R2 1/2"	55	76	95	42	80	92	DN65	2 1/2" (DN65)	20713
88.9mm x R3"	63	89	110	46	95	110	DN80	3" (DN80)	20714



SC6
Reducer

Large male end for insertion into a fitting x press





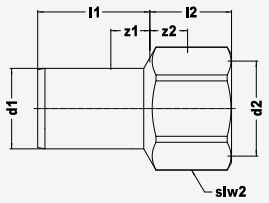
Size	l1	d1	D1	z1	l2	d2	z2	DN1	DN2	Code
15 x 12mm	29	12	20	12	27	15	7	DN10	DN12	20568
18 x 12mm	27	12	20	10	29	18	9	DN10	DN15	20569
22 x 12mm	27	12	20	10	33	22	12	DN10	DN20	20570
54 x 18mm	34	18	27	14	64	54	29	DN15	DN50	20571
18 x 15mm	31	15	23	11	27	18	7	DN12	DN15	20213
22 x 15mm	29	15	23	9	32	22	11	DN12	DN20	20215
22 x 18mm	32	18	27	12	29	22	8	DN15	DN20	20216
28 x 15mm	30	15	23	10	38	28	15	DN12	DN25	20217
28 x 18mm	30	18	27	10	36	28	13	DN15	DN25	20218
28 x 22mm	33	22	32	12	33	28	10	DN20	DN25	20219
35 x 22mm	30	22	32	9	41	35	15	DN20	DN32	20220
35 x 28mm	36	28	38	13	34	35	8	DN25	DN32	20221
42 x 22mm	32	22	32	11	51	42	21	DN20	DN40	20248
42 x 28mm	32	28	38	9	51	54	16	DN25	DN50	20212
42 x 35mm	39	35	45	13	41	42	11	DN32	DN40	20222
54 x 22mm	34	22	32	13	63	54	28	DN20	DN50	20223
54 x 28mm	33	28	38	10	58	54	23	DN25	DN50	20224
54 x 35mm	38	35	45	12	57	54	22	DN32	DN50	20226
54 x 42mm	44	42	54	14	52	54	17	DN40	DN50	20225
66.7 x 28mm	41	28	38	18	96	67	46	DN25	DN65	20665
66.7 x 35mm	38	35	45	12	84	67	34	DN32	DN65	20666
66.7 x 42mm	44	42	54	14	81	67	31	DN40	DN65	20667
66.7 x 54mm	48	54	65	13	72	67	22	DN50	DN65	20668
76.1 x 42mm	50	42	54	20	97	76	42	DN40	DN65	20715
76.1 x 54mm	55	54	65	20	86	76	31	DN50	DN65	20639
76.1 x 66.7mm	64	67	83	14	75	76	20	DN65	DN65	20669
88.9 x 54mm	54	54	65	19	101	89	38	DN50	DN80	20640
88.9 x 66.7mm	65	67	83	15	92	76	29	DN65	DN65	20670
88.9 x 76.1mm	68	76	95	13	90	89	27	DN65	DN80	20641
108 x 66.7mm	65	67	83	15	122	89	45	DN65	DN80	20671
108 x 76.1mm	68	76	95	13	120	108	43	DN65	DN100	20642
108 x 88.9mm	77	89	110	14	110	108	33	DN80	DN100	20643



SC7
Female adaptor

Male end for insertion into a fitting x BSP parallel female thread



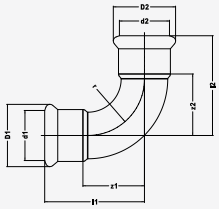


Size	l1	d1	z1	l2	z2	slw2	sks2	DN1	DN2	Code
12mm x Rp3/8"	25	12	8	17	6	19	-	DN10	3/8" (DN10)	20572
12mm x Rp1/2"	25	12	8	24	9	24	-	DN10	1/2" (DN15)	20573
15mm x Rp1/2"	28	15	8	23	8	24	-	DN12	1/2" (DN15)	20574
12mm x Rp1/2"	28	18	8	22	7	24	-	DN15	1/2" (DN15)	20575
12mm x Rp1/2"	28	18	8	25	9	30	-	DN15	3/4" (DN20)	20576
22mm x Rp1/2"	29	22	8	21	6	24	28	DN20	1/2" (DN15)	20256
22mm x Rp3/4"	29	22	8	24	8	30	35	DN20	3/4" (DN20)	20257

SC12
Elbow

Press x press





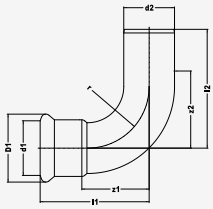
Size	l1	d1	D1	z1	l2	d2	D2	z2	DN1	DN2	Code
12mm	35	12	20	18	35	12	20	18	DN10	DN10	20577
15mm	41	15	23	21	41	15	23	21	DN12	DN12	20155
18mm	45	18	27	25	45	18	27	25	DN15	DN15	20156
22mm	51	22	32	30	51	22	32	30	DN20	DN20	20157
28mm	61	28	38	38	61	28	38	38	DN25	DN25	20158
35mm	72	35	45	46	72	35	45	46	DN32	DN32	20159
42mm	87	42	54	57	87	42	54	57	DN40	DN40	20160
54mm	105	54	65	70	105	54	65	70	DN50	DN50	20161
66.7mm	145	67	83	95	145	67	83	95	DN65	DN65	20672
76.1mm	155	76	95	100	155	76	95	100	DN65	DN65	20626
88.9mm	179	89	110	116	179	89	110	116	DN80	DN80	20627
108mm	216	108	133	139	216	108	133	139	DN100	DN100	20628



SC12S
Street elbow

Press x male end for insertion into a fitting



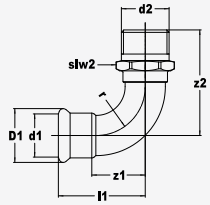


Size	l1	d1	D1	z1	l2	d2	z2	DN1	DN2	Code
12mm	35	12	20	18	42	12	25	DN10	DN10	20578
15mm	41	15	23	21	49	15	29	DN12	DN12	20163
18mm	45	18	27	25	51	18	31	DN15	DN15	20164
22mm	51	22	32	30	58	22	37	DN20	DN20	20165
28mm	61	28	38	38	66	28	43	DN25	DN25	20166
35mm	72	35	45	46	76	35	50	DN32	DN32	20167
42mm	87	42	54	57	93	42	63	DN40	DN40	20168
54mm	105	54	65	70	111	54	74	DN50	DN50	20169
66.7mm	145	67	83	95	157	67	107	DN65	DN65	20673
76.1mm	155	76	95	100	168	76	113	DN65	DN65	20629
88.9mm	179	89	110	116	193	89	130	DN80	DN80	20630
108mm	216	108	133	139	233	108	156	DN100	DN100	20631

SC13
Male elbow

Press x male BSP taper thread





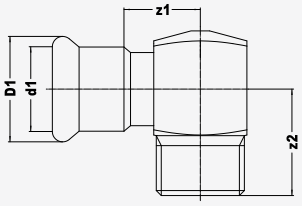
Size	l1	d1	D1	z1	l2	z2	slw2	sks2	DN1	DN2	Code
12mm x R3/8"	35	12	20	18	42	42	17	20	DN10	3/8" (DN10)	20579
15mm x R1/2"	41	15	24	21	50	50	22	25	DN12	1/2" (DN15)	20199
18mm x R1/2"	45	18	27	25	54	54	22	25	DN15	1/2" (DN15)	20200
22mm x R3/4"	51	22	32	30	62	62	30	35	DN20	3/4" (DN20)	20201
28mm x R1"	61	28	38	38	74	74	36	42	DN25	1" (DN25)	20202
35mm x R1 1/4"	72	35	45	46	86	86	46	53	DN32	1 1/4" (DN32)	20206
42mm x R1 1/2"	87	42	54	57	96	96	50	58	DN40	1 1/2" (DN40)	20204
54mm x R2"	105	54	65	70	116	116	60	69	DN50	2" (DN50)	20205



SC13A
Angle adaptor

Press x male BSP taper thread



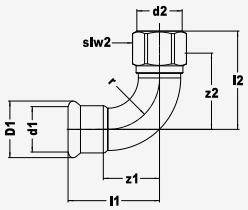


Size	l1	d1	D1	z1	l2	z2	slw2	sks2	DN1	DN2	Code
18mm x R1/2"	42	18	27	22	28	28	22	26	DN15	1/2" (DN15)	20207
22mm x R3/4"	45	22	32	24	32	32	28	33	DN20	3/4" (DN20)	20208

SC14
Elbow

Press x male BSP taper thread



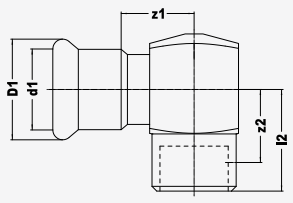


Size	l1	d1	D1	z1	l2	z2	slw2	sks2	DN1	DN2	Code
15mm x Rp3/8"	41	15	23	21	42	31	19	-	DN12	3/8" (DN10)	20580
15mm x Rp1/2"	41	15	23	21	48	33	24	-	DN12	1/2" (DN15)	20581
18mm x Rp1/2"	45	18	27	25	52	37	24	-	DN15	1/2" (DN15)	20582
22mm x Rp1/2"	51	22	32	30	59	44	27	31	DN20	1/2" (DN15)	20345
22mm x Rp3/4"	51	22	32	30	29	43	30	35	DN20	3/4" (DN20)	20346
28mm x Rp1/2"	61	28	38	38	65	50	32	37	DN25	1/2" (DN15)	20347
28mm x Rp3/4"	61	28	38	38	65	49	32	37	DN25	3/4" (DN20)	20348
28mm x Rp1"	61	28	38	38	70	51	41	47	DN25	1" (DN25)	20349
35mm x Rp1/2"	72	35	45	46	75	55	41	47	DN32	1/2" (DN15)	20350
35mm x Rp3/4"	72	35	45	46	75	54	41	47	DN32	3/4" (DN20)	20351
35mm x Rp1"	72	35	45	46	75	56	41	47	DN32	1" (DN25)	20352

SC14A
Angle adaptor

Press x female BSP pal thread





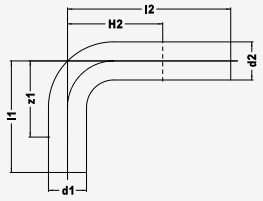
Size	l1	d1	D1	z1	l2	z2	slw2	sks2	DN1	DN2	Code
22mm x Rp1/2"	45	22	32	24	31	16	28	32	DN20	1/2" (DN15)	20355
28mm x Rp1/2"	51	28	38	28	35	20	36	42	DN25	1/2" (DN15)	20356
35mm x Rp1/2"	57	35	45	31	35	20	42	49	DN32	1/2" (DN15)	20357



SC19S
Elbow male x male

Both ends male for insertion into a fitting



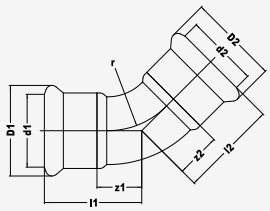


Size	l1	d1	z1	l2	d2	DN1	DN2	Code
12mm	72	12	55	122	12	DN10	DN10	20583
15mm	72	15	52	122	15	DN12	DN12	20584
18mm	72	18	52	122	18	DN15	DN15	20585
22mm	74	22	53	122	22	DN20	DN20	20370
28mm	84	28	61	122	28	DN25	DN25	20371
35mm	122	35	96	202	35	DN32	DN32	20372
42mm	152	42	122	252	42	DN40	DN40	20373
54mm	202	54	167	302	54	DN50	DN50	20374

SC21
Obtuse elbow

Press x press





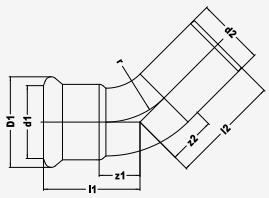
Size	l1	d1	D1	z1	l2	d2	D2	z2	DN1	DN2	Code
15mm	31	15	23	11	31	15	23	11	DN12	DN12	20170
18mm	32	18	27	12	32	18	27	12	DN15	DN15	20171
22mm	35	22	32	14	35	22	32	14	DN20	DN20	20172
28mm	40	28	38	17	40	28	38	17	DN25	DN25	20173
35mm	46	35	45	20	46	35	45	20	DN32	DN32	20174
42mm	56	42	54	26	56	42	54	26	DN40	DN40	20175
54mm	67	54	65	32	67	54	65	31	DN50	DN50	20176
66.7mm	98	67	83	48	98	67	83	48	DN65	DN65	20674
76.1mm	101	76	95	46	101	76	95	46	DN65	DN65	20632
88.9mm	116	89	110	53	116	89	110	53	DN80	DN80	20633
108mm	139	108	133	62	139	108	133	62	DN100	DN100	20634



SC21S
Obtuse street elbow

Press x male end for insertion into a fitting



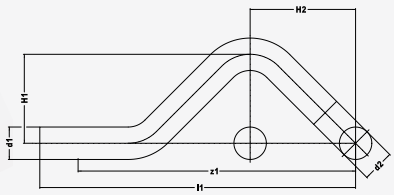


Size	l1	d1	D1	z1	l2	d2	z2	DN1	DN2	Code
15mm	31	15	23	11	38	15	18	DN12	DN12	20177
18mm	32	18	27	12	39	18	19	DN15	DN15	20178
22mm	35	22	32	14	42	22	21	DN20	DN20	20179
28mm	40	28	38	17	46	28	23	DN25	DN25	20180
35mm	46	35	45	20	51	35	25	DN32	DN32	20181
42mm	56	42	54	26	63	42	33	DN40	DN40	20182
54mm	67	54	65	32	73	54	38	DN50	DN50	20183
66.7mm	98	67	83	48	110	67	60	DN65	DN65	20675
76.1mm	101	76	95	46	114	76	59	DN65	DN65	20635
88.9mm	116	89	110	53	130	89	67	DN80	DN80	20636
108mm	139	108	133	62	157	108	80	DN100	DN100	20637

SC22S
Partial crossover

Both ends male for insertion into a fitting

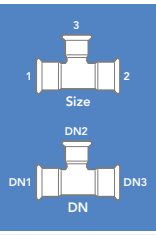




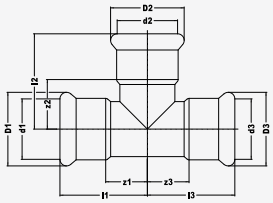
Size	l1	d1	z1	d2	DN1	DN2	Code
12mm	154	12	137	12	DN10	DN10	20586
15mm	158	15	138	15	DN12	DN12	20193
18mm	165	18	145	18	DN15	DN15	20194
22mm	178	22	157	22	DN20	DN20	20195
28mm	210	28	187	28	DN25	DN25	20196

SC24
Equal tee

Press on all ends







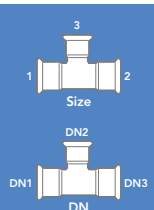
Size	l1	d1	D1	z1	l2	d2	D2	z2	l3	d3	D3	z3	DN1	DN2	DN3	Code
12mm	31	12	20	14	40	12	20	23	31	12	20	14	DN10	DN10	DN10	20587
15mm	35	15	23	15	44	15	23	24	35	15	23	15	DN12	DN12	DN12	20249
18mm	37	18	27	17	46	18	27	26	37	18	27	17	DN15	DN15	DN15	20250
22mm	40	22	32	19	49	22	32	28	40	22	32	19	DN20	DN20	DN20	20251



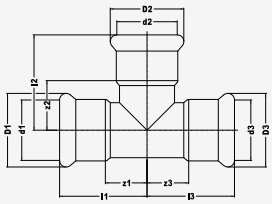
Size	l1	d1	D1	z1	l2	d2	D2	z2	l3	d3	D3	z3	DN1	DN2	DN3	Code
28mm	45	28	38	22	54	28	38	31	45	28	38	22	DN25	DN25	DN25	20252
35mm	52	35	45	26	60	35	45	34	52	35	45	26	DN32	DN32	DN32	20253
42mm	61	42	54	31	67	42	54	37	61	42	54	31	DN40	DN40	DN40	20254
54mm	71	54	65	36	78	54	65	43	71	54	65	36	DN50	DN50	DN50	20255
66.7mm	99	67	83	49	101	67	83	51	99	67	83	49	DN65	DN65	DN65	20676
76.1mm	115	76	95	60	110	76	95	55	115	76	95	60	DN65	DN65	DN65	20644
88.9mm	130	89	110	67	128	89	110	65	130	89	110	67	DN80	DN80	DN80	20645
108mm	155	108	133	78	153	108	133	76	155	108	133	78	DN100	DN100	DN100	20646

SC25
Tee, reduced branch

Press on all ends







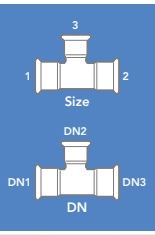
Size	l1	d1	D1	z1	l2	d2	D2	z2	l3	d3	D3	z3	DN1	DN2	DN3	Code
15 x 15 x 12mm	35	15	23	15	41	12	20	21	35	15	23	35	DN12	DN10	DN12	20588
18 x 18x 12mm	37	18	27	17	43	12	20	26	37	18	27	37	DN15	DN10	DN15	20589
22 x 22 x 12mm	40	22	32	19	45	12	20	24	40	22	32	40	DN20	DN10	DN20	20590
18 x 18 x 15mm	37	18	27	17	46	15	23	29	37	18	27	17	DN15	DN10	DN15	20258
22 x 22 x 15mm	40	22	32	19	48	15	23	27	40	22	32	19	DN20	DN20	DN20	20260
22 x 22 x 18mm	40	22	32	19	48	18	27	27	40	22	32	19	DN20	DN20	DN20	20261
28 x 28 x 15mm	45	28	38	22	51	15	23	31	45	28	38	22	DN25	DN12	DN25	20262
28 x 28 x 18mm	45	28	38	22	51	18	27	31	45	28	38	22	DN25	DN15	DN25	20263
28 x 28 x 22mm	45	28	38	22	52	22	32	31	45	28	38	22	DN25	DN20	DN25	20264
35 x 35 x 15mm	52	35	45	26	54	15	23	34	52	35	45	26	DN32	DN12	DN32	20265
35 x 35 x 18mm	52	35	45	26	54	18	27	34	52	35	45	26	DN32	DN15	DN32	20266
35 x 35 x 22mm	52	35	45	26	55	22	32	34	52	35	45	26	DN32	DN20	DN32	20267
35 x 35 x 28mm	52	35	45	26	57	28	38	34	52	35	45	26	DN32	DN25	DN32	20268
42 x 42 x 22mm	60	42	54	30	58	22	32	37	60	42	54	30	DN40	DN20	DN40	20269
42 x 42 x 28mm	60	42	54	30	60	28	38	37	60	42	54	30	DN40	DN25	DN40	20270
42 x 42 x 35mm	60	42	54	30	63	35	45	37	60	42	54	30	DN40	DN32	DN40	20271
54 x 54 x 22mm	71	54	65	36	64	22	32	43	71	54	65	36	DN50	DN20	DN50	20272
54 x 54 x 28mm	71	54	65	36	66	28	38	43	71	54	65	36	DN50	DN25	DN50	20273
54 x 54 x 35mm	71	54	65	36	69	35	45	43	71	54	65	36	DN50	DN32	DN50	20274
54 x 54 x 42mm	71	54	65	36	73	42	54	43	71	54	65	36	DN50	DN40	DN50	20275
66.7 x 66.7 x 28mm	99	67	83	49	70	28	38	47	99	67	83	49	DN65	DN25	DN65	20677
66.7 x 66.7 x 35mm	99	67	83	49	74	35	45	48	99	67	83	49	DN65	DN32	DN65	20678
66.7 x 66.7 x 42mm	99	67	83	49	80	42	54	50	99	67	83	49	DN65	DN40	DN65	20679
66.7 x 66.7 x 54mm	99	67	830	49	83	54	65	48	99	67	83	49	DN65	DN50	DN65	20680
76.1 x 76.1 x 22mm	115	76	95	60	68	22	32	47	115	76	95	60	DN65	DN20	DN65	20686
76.1 x 76.1 x 28mm	115	76	95	60	85	28	38	62	115	76	95	60	DN65	DN25	DN65	20687



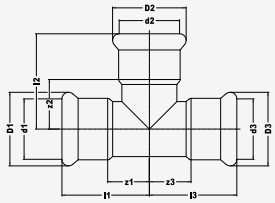
Size	l1	d1	D1	z1	l2	d2	D2	z2	l3	d3	D3	z3	DN1	DN2	DN3	Code
76.1 x 76.1 x 35mm	115	76	95	60	87	35	45	61	115	76	95	60	DN65	DN32	DN65	20688
76.1 x 76.1 x 42mm	115	76	95	60	97	42	54	67	115	76	95	60	DN65	DN40	DN65	20689
76.1 x 76.1 x 54mm	115	76	95	60	110	54	65	75	115	76	95	60	DN65	DN50	DN65	20647
76.1 x 76.1 x 66.7mm	126	76	95	71	105	67	83	55	126	76	95	71	DN65	DN65	DN65	20681
88.9 x 88.9 x 22mm	130	89	110	67	76	22	32	55	130	89	110	67	DN80	DN20	DN80	20690
88.9 x 88.9 x 28mm	130	89	110	67	92	28	38	69	130	89	110	67	DN80	DN25	DN80	20691
88.9 x 88.9 x 35mm	130	89	110	67	97	35	45	71	130	89	110	67	DN80	DN32	DN80	20692
88.9 x 88.9 x 42mm	130	89	110	67	105	42	54	75	130	89	110	67	DN80	DN40	DN80	20693
88.9 x 88.9 x 54mm	130	89	110	67	117	54	65	82	130	89	110	67	DN80	DN50	DN80	20694
88.9 x 88.9 x 66.7mm	128	89	110	65	112	67	83	62	128	89	110	65	DN80	DN65	DN80	20682
88.9 x 88.9 x 76.1mm	130	89	110	67	117	76	95	62	130	89	110	67	DN80	DN65	DN80	20648
108 x 108 x 22mm	155	108	133	78	85	22	32	64	155	108	133	78	DN100	DN20	DN100	20695
108 x 108 x 28mm	155	108	133	78	102	28	38	79	155	108	133	78	DN100	DN25	DN100	20696
108 x 108 x 35mm	155	108	133	78	107	35	45	81	155	108	133	78	DN100	DN32	DN100	20697
108 x 108 x 42mm	155	108	133	78	115	42	54	85	155	108	133	78	DN100	DN40	DN100	20698
108 x 108 x 54mm	155	108	133	78	128	54	65	93	155	108	133	78	DN100	DN50	DN100	20699
108 x 108 x 76.1mm	155	108	133	78	128	76	95	73	155	108	133	78	DN100	DN65	DN100	20700
108 x 108 x 88.9mm	155	108	133	78	137	89	110	82	155	108	133	78	DN100	DN65	DN100	20649

SC28
Tee, both ends reduced

Press on all ends





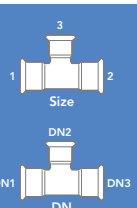


Size	l1	d1	D1	z1	l2	d2	D2	z2	l3	d3	D3	z3	DN1	DN2	DN3	Code
12 x 12 x 15mm	31	12	20	14	43	15	23	23	31	12	20	14	DN10	DN12	DN10	20591
15 x 15 x 18mm	35	15	23	15	44	18	27	24	35	15	23	15	DN12	DN15	DN12	20709
15 x 15 x 22mm	35	15	23	15	48	22	32	27	35	15	23	15	DN12	DN20	DN12	20710
22 x 22 x 28mm	40	22	32	19	52	28	38	29	40	22	32	19	DN20	DN25	DN20	20712

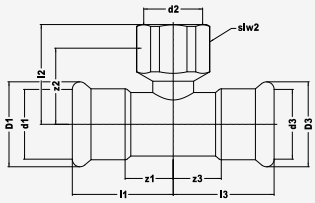


SC30
Female branch tee

Press x BSP parallel female branch



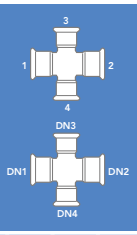




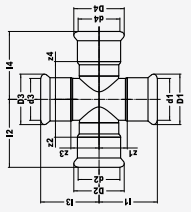
Size	l1	d1	D1	z1	l2	z2	slw2	sks2	l3	d3	D3	z3	DN1	DN2	DN3	Code
18 x 18mm x Rp3/4"	37	18	27	24	17	24	30	35	37	18	27	24	DN15	3/4" (DN20)	DN15	20592
15 x 15mm x Rp1/2"	35	15	23	15	37	22	24	28	35	15	23	15	DN12	1/2" (DN15)	DN12	20281
18 x 18mm x Rp1/2"	37	18	27	17	37	22	24	28	37	18	27	17	DN15	1/2" (DN15)	DN15	20282
22 x 22mm x Rp1/2"	40	22	32	19	39	24	24	28	40	22	32	19	DN20	1/2" (DN15)	DN20	20283
22 x 22mm x Rp3/4"	40	22	32	19	41	25	30	35	40	22	32	19	DN20	3/4" (DN20)	DN20	20288
28 x 28mm x Rp1/2"	45	28	38	22	42	27	24	28	45	28	38	22	DN25	1/2" (DN15)	DN25	20284
28 x 28mm x Rp3/4"	45	28	38	22	44	28	30	35	45	28	38	22	DN25	3/4" (DN20)	DN25	20289
28 x 28mm x Rp1"	45	28	38	22	48	25	41	47	45	28	38	22	DN25	1" (DN25)	DN25	20279
35 x 35mm x Rp1/2"	52	35	45	26	46	31	24	28	52	35	45	26	DN32	1/2" (DN15)	DN32	20285
35 x 35mm x Rp3/4"	52	35	45	26	48	31	30	35	52	35	45	26	DN32	3/4" (DN20)	DN32	20290
35 x 35mm x Rp1"	52	35	45	26	52	29	41	47	52	35	45	26	DN32	1" (DN25)	DN32	20280
42 x 42mm x Rp1/2"	61	42	54	31	48	33	24	28	61	42	54	31	DN40	1/2" (DN15)	DN40	20286
42 x 42mm x Rp3/4"	61	42	54	31	50	34	30	35	61	42	54	31	DN40	3/4" (DN20)	DN40	20291
42 x 42mm x Rp1"	61	42	54	31	54	31	41	47	61	42	54	31	DN40	1" (DN25)	DN40	20294
54 x 54mm x Rp1/2"	71	54	65	36	54	39	24	28	71	54	65	36	DN50	1/2" (DN15)	DN50	20287
54 x 54mm x Rp3/4"	71	54	65	36	56	40	30	35	71	54	65	36	DN50	3/4" (DN20)	DN50	20292
54 x 54mm x Rp1"	71	54	65	36	60	37	41	47	71	54	65	36	DN50	1" (DN25)	DN50	20293
66.7 x 66.7mm x Rp3/4"	99	67	83	49	65	62	30	35	99	67	83	49	DN65	3/4" (DN20)	DN65	20683
76.1 x 76.1mm x Rp3/4"	115	76	95	60	82	66	30	35	115	76	95	60	DN65	3/4" (DN20)	DN65	20650
88.9 x 88.9mm x Rp3/4"	130	89	110	67	84	68	30	35	130	89	110	67	DN80	3/4" (DN20)	DN80	20651
108 x 108mm x Rp3/4"	155	108	133	78	94	78	30	35	155	108	133	78	DN100	3/4" (DN20)	DN100	20652

SC50
Cross press all ends

Press on all ends







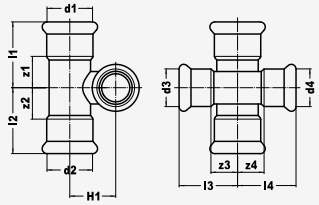
Size	l1	d1	D1	z1	l2	d2	D2	z2	l3	d3	D3	z3	l4	d4	D4	z4	DN1	DN2	DN3	DN4	Code
35mm	52	35	45	26	60	35	45	34	52	35	45	26	60	35	45	26	DN32	DN32	DN32	DN32	20327
42mm	61	42	54	31	67	42	54	37	61	42	54	31	67	42	54	31	DN40	DN40	DN40	DN40	20328
54mm	71	54	65	36	78	54	65	43	71	54	65	36	78	54	65	36	DN50	DN50	DN50	DN50	20329
35 x 28 x 35 x 28mm	52	35	45	26	57	28	38	34	52	35	45	26	57	28	38	34	DN32	DN25	DN32	DN25	20334
42 x 28 x 42 x 28mm	61	42	54	32	60	28	38	37	61	42	54	31	60	28	38	37	DN40	DN25	DN40	DN25	20335
54 x 28 x 54 x 28mm	71	54	65	36	66	28	38	43	71	54	65	36	66	28	38	43	DN50	DN25	DN50	DN25	20336



SC51
Pass press fit all ends

Press on all ends



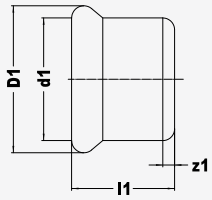


Size	l1/l3	d1/d3	D1/D3	z1/z3	l2/l4	d2/d4	D2/D4	z2/z4	H	DN1	DN2	DN3	DN4	Code
15mm	35	15	23	15	35	15	23	15	21	DN12	DN12	DN12	DN12	20593
18 x 15mm	37	18	27	17	35	15	23	15	23	DN15	DN12	DN15	DN12	20594
22 x 15mm	40	22	15	19	35	15	23	15	25	DN20	DN12	DN20	DN12	20595
22 x 18mm	40	22	18	19	37	18	27	17	26	DN20	DN15	DN20	DN15	20596
28 x 15mm	45	28	15	22	35	15	23	15	28	DN25	DN12	DN25	DN12	20597
28 x 18mm	45	28	18	22	37	18	27	17	29	DN25	DN15	DN25	DN15	20598
28 x 22mm	45	28	38	22	40	22	32	19	31	DN25	DN20	DN25	DN20	20333

SC61
Stop end

Press for use on carbon steel tube



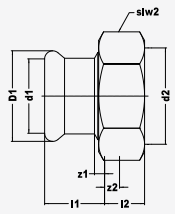


Size	l1	d1	D1	z1	DN1	Code
15mm	23	15	23	3	DN12	20295
18mm	23	18	27	3	DN15	20296
22mm	24	22	32	3	DN20	20297
28mm	26	28	38	3	DN25	20298
35mm	29	35	45	3	DN32	20299
42mm	37	42	54	7	DN40	20300
54mm	42	54	65	7	DN50	20301
66.7mm	60	67	83	10	DN65	20684
76.1mm	64	76	95	9	DN65	20656
88.9mm	72	89	110	9	DN80	20657
108mm	97	108	133	20	DN100	20658

SC68FF
Half union press x BSP female union end

Press BSP female union end





Size	l1	d1	D1	z1	l2	z2	slw2	sks2	DN1	DN2	Code
15 x G3/4"	29	15	23	9	8	2	30	-	DN12	3/4" (DN20)	20599
18 x G3/4"	29	18	27	9	8	2	30	-	DN15	3/4" (DN20)	20600

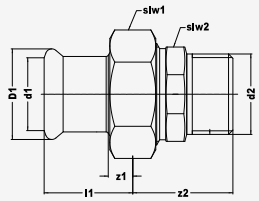


Size	l1	d1	D1	z1	l2	z2	slw2	sks2	DN1	DN2	Code
22mm x G1"	30	22	32	9	10	2	36	42	DN20	1" (DN25)	20337
28mm x G1 1/4"	31	28	38	8	10	2	46	53	DN25	1 1/4" (DN32)	20338
35mm x G1 1/2"	34	35	45	8	11	2	52	60	DN32	1 1/2" (DN40)	20339
42mm x G1 3/4"	41	42	54	11	11	2	52	60	DN40	1 3/4" (DN40)	20340
54mm x G2 3/8"	47	54	65	12	11	3	75	87	DN50	2 3/8" (DN50)	20341

SC69
Straight male union connector

Press x BSP taper male thread



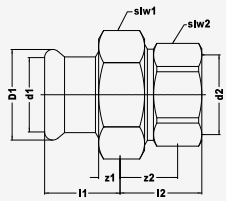


Size	l1	d1	D1	z1	slw1	sks1	l2	z2	slw2	sks2	DN1	DN2	Code
15mm x R1/2"	29	15	23	9	30	35	35	35	25	29	DN12	1/2" (DN15)	20302
18mm x R1/2"	29	18	26	9	30	35	35	35	25	29	DN15	1/2" (DN15)	20304
22mm x R3/4"	30	22	32	9	36	42	40	40	32	37	DN20	3/4" (DN20)	20307
28mm x R1"	31	28	37	8	46	53	44	44	39	45	DN25	1" (DN25)	20309
35mm x R1 1/4"	34	35	44	8	52	60	48	48	49	57	DN32	1 1/4" (DN32)	20310
42mm x R1 1/2"	41	42	54	11	58	67	47	47	51	59	DN40	1 1/2" (DN40)	20311
54mm x R2"	47	54	65	12	75	87	53	53	65	75	DN50	2" (DN50)	20312

SC69F
Straight female union connector

Press x BSP parallel female thread





Size	l1	d1	D1	z1	slw1	sks1	l2	z2	slw2	sks2	DN1	DN2	Code
15mm x Rp1/2"	29	15	23	9	30	35	30	15	27	31	DN12	1/2" (DN15)	20313
18mm x Rp1/2"	29	18	26	9	30	35	30	15	27	31	DN15	1/2" (DN15)	20315
22mm x Rp3/4"	30	22	32	9	36	42	33	17	34	39	DN20	3/4" (DN20)	20317
28mm x Rp1"	31	28	37	8	46	53	34	15	42	49	DN25	1" (DN25)	20319
35mm x Rp1 1/4"	34	35	44	8	52	60	42	20	5	58	DN32	1 1/4" (DN32)	20320
42mm x Rp1 1/2"	41	42	54	11	58	67	42	20	55	64	DN40	1 1/2" (DN40)	20321
54mm x Rp2"	47	54	65	12	75	87	46	20	70	81	DN50	2" (DN50)	20322



SC640
Carbon steel galvanised heating tube



Size	d1	DN1	Code
1.2mm x 3.0m	15	DN12	45080
1.2mm x 3.0m	18	DN15	45081
1.5mm x 3.0m	22	DN20	45082
1.5mm x 3.0m	28	DN25	45083
1.5mm x 3.0m	35	DN32	45084
1.5mm x 3.0m	42	DN40	45085
1.5mm x 3.0m	54	DN50	45086
1.2mm x 6.0m	15	DN12	25080
1.2mm x 6.0m	18	DN15	25081
1.5mm x 6.0m	22	DN20	25082
1.5mm x 6.0m	28	DN25	25083
1.5mm x 6.0m	35	DN32	25084
1.5mm x 6.0m	42	DN40	25085
1.5mm x 6.0m	54	DN50	25086
1.5mm x 6.0m	66.7	DN65	25090
2.0mm x 6.0m	76.1	DN65	25087
2.0mm x 6.0m	88.9	DN80	25088
2.0mm x 6.0m	108	DN100	25089

SC660
Plastic coated galvanised carbon steel heating tube



Size	d1	DN1	Code
15 x 2.2mm x 6.0m	15	DN12	25060
18 x 2.2mm x 6.0m	18	DN15	25061
22 x 2.5mm x 6.0m	22	DN20	25062
28 x 2.5mm x 6.0m	28	DN25	25063
35 x 2.5mm x 6.0m	35	DN32	25064
42 x 2.5mm x 6.0m	42	DN40	25065
54 x 2.5mm x 6.0m	54	DN50	25066



SC645
Galvanized sprinkler tube



Size	d1	DN1	Code
1.5mm x 3.0m	22	DN20	25102
1.5mm x 3.0m	28	DN25	25103
1.5mm x 3.0m	35	DN32	25104
1.5mm x 3.0m	42	DN40	25105
1.5mm x 3.0m	54	DN50	25106
1.5mm x 6.0m	22	DN20	25094
1.5mm x 6.0m	28	DN25	25095
1.5mm x 6.0m	35	DN32	25096
1.5mm x 6.0m	42	DN40	25097
1.5mm x 6.0m	54	DN50	25098
2.0mm x 6.0m	76.1	DN65	25099
2.0mm x 6.0m	88.9	DN80	25100
2.0mm x 6.0m	108	DN100	25101

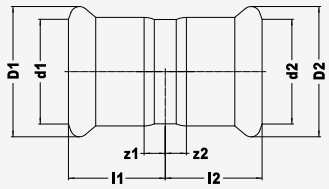


COPPER PRESS FITTINGS FOR GAS SERVICES

SG1/G7270
Straight coupling

Press x press



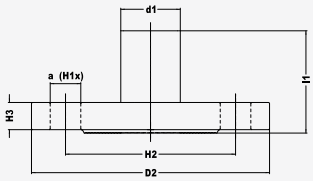


Size	l1	d1	D1	z1	l2	d2	D2	z2	DN1	DN2	Code
15mm	22	15	23	2	22	15	23	2	DN12	DN12	39700
18mm	22	18	26	2	22	18	26	2	DN15	DN15	39699
22mm	23	22	31	2	23	22	31	2	DN20	DN20	39701
28mm	25	28	37	2	25	28	37	2	DN25	DN25	39702
35mm	28	35	44	2	28	35	44	2	DN32	DN32	39703
42mm	36	42	53	4	36	42	53	4	DN40	DN40	39704
54mm	42	54	65	5	42	54	65	5	DN50	DN50	39705
66.7mm	55	67	83	5	55	67	83	5	DN65	DN65	39302
76.1mm	55	76	94	5	55	76	94	5	DN65	DN65	39303
108mm	66	89	108	8	132	89	108	8	DN100	DN100	39305

SG1FMF/G7510
Composite female metric flange PN16

Press x powder coated steel flange
to EN 1092-1:1997 (BS 4504)



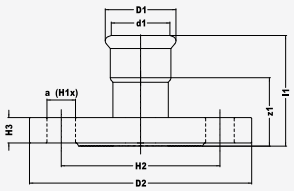


Size	H1	H2	H3	a	l1	d1	D1	z1	D2	DN1	Code
66.7mm DN65 (2 1/2")	4	145	20	18	103	67	83	53	185	DN65	39395
76.1mm DN80 (3")	8	160	20	18	103	76	94	53	200	DN65	39396
108mm DN100 (4")	8	180	20	18	126	108	132	59	220	DN100	39398

SG1FMM/7520
Composite male metric flange PN16

Male end for insertion into fitting x powder coated steel flange to EN 1092-1:1997 (BS 4504)





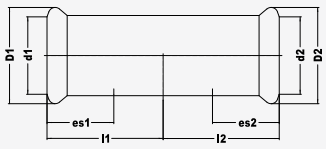
Size	H1	H2	H3	a	l1	d1	D2	DN1	Code
66.7mm DN65 (2 1/2")	4	145	20	18	112	67	185	DN65	39281
76.1mm DN80 (3")	8	160	20	18	113	76	200	DN65	39282
108mm DN100 (4")	8	180	20	18	141	108	220	DN100	39284



SG1S/G7270SG Slip
Straight coupling slip pattern

Press x press (without tube stop)



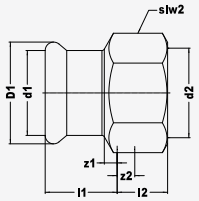


Size	l1	d1	D1	z1	l2	d2	D2	z2	DN1	DN2	Code
15mm	40	15	23	20	40	15	23	20	DN12	DN12	39710
18mm	40	18	26	20	40	18	26	20	DN15	DN15	39709
22mm	42	22	31	21	42	22	31	21	DN20	DN20	39711
28mm	46	28	37	23	46	28	37	23	DN25	DN25	39712
35mm	50	35	44	25	50	35	44	25	DN32	DN32	39713
42mm	60	42	53	30	60	42	53	30	DN40	DN40	39714
54mm	71	54	65	35	71	54	65	35	DN50	DN50	39715
66.7mm	55	67	83	5	55	67	83	5	DN65	DN65	39307
76.1mm	55	67	83	5	55	67	83	5	DN65	DN65	39308
108mm	72	108	132	5	72	108	132	5	DN100	DN100	39310

SG2/G6270G
Straight female connector

Press x BSP parallel female thread





Size	l1	d1	D1	z1	l2	z2	slw2	sks2	DN1	DN2	Code
15mm x Rp1/2"	19	15	23	2	18	8	25	29	DN12	1/2" (DN15)	39720
15mm x Rp3/4"	17	15	23	1	19	8	30	32	DN12	3/4" (DN20)	39721
18mm x Rp1/2"	19	18	26	1	18	8	25	27	DN15	1/2" (DN15)	39716
18mm x Rp3/4"	20	18	26	2	19	9	30	32	DN15	3/4" (DN20)	39717
22mm x Rp1/2"	19	22	31	1	17	7	30	32	DN20	3/4" (DN20)	39722
22mm x Rp3/4"	20	22	31	1	19	9	30	32	DN20	1" (DN25)	39723
28mm x Rp1"	23	28	37	1	22	10	37	39	DN25	3/4" (DN20)	39724
35mm x Rp1 1/4"	25	35	44	1	25	11	46	49	DN32	1" (DN25)	39725
42mm x Rp1 1/2"	27	42	53	1	25	11	48	56	DN40	1 1/4" (DN32)	39726
54mm x Rp2"	32	54	65	1	25	11	48	56	DN50	1 1/4" (DN32)	39727

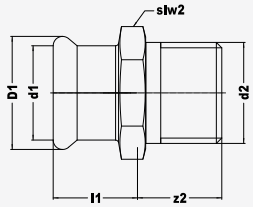




SG3/G6243G
Straight male connector

Press x BSP taper male thread



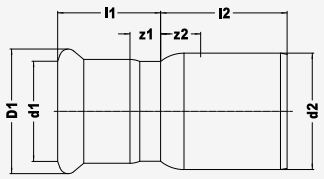


Size	l1	d1	D1	z2	slw2	sks2	DN1	DN2	Code
15mm x R1/2"	20	15	23	8	21	24	DN12	1/2" (DN15)	39730
15mm x R3/4"	20	15	23	10	25	27	DN12	3/4" (DN20)	39731
18mm x R1/2"	20	18	26	9	25	27	DN15	1/2" (DN15)	39728
18mm x R3/4"	20	18	26	10	25	27	DN15	3/4" (DN20)	39729
22mm x R1/2"	21	22	31	9	30	32	DN20	1/2" (DN15)	39732
22mm x R3/4"	21	22	31	10	30	32	DN20	3/4" (DN20)	39733
22mm x R1"	21	22	31	11	32	32	DN20	1" (DN25)	39734
28mm x R3/4"	23	28	37	10	36	38	DN25	3/4" (DN20)	39737
28mm x R1"	23	28	37	11	36	38	DN25	1" (DN25)	39735
28mm x R1 1/4"	23	28	37	12	40	42	DN25	1 1/4" (DN32)	39736
35mm x R1"	26	35	44	12	41	44	DN32	1" (DN25)	39738
35mm x R1 1/4"	26	35	44	15	41	44	DN32	1 1/4" (DN32)	39739
42mm x R1 1/4"	30	42	53	16	51	54	DN40	1 1/4" (DN32)	39741
42mm x R1 1/2"	30	42	53	16	51	53	DN40	1 1/2" (DN40)	39740
54mm x R2"	35	54	65	12	-	66	DN50	2" (DN50)	39742
66.7mm x R2 1/2"	50	67	83	25	74	82	DN65	2 1/2" (DN65)	39311
76.1mm x R3"	50	76	94	39	77	89	DN65	3" (DN80)	39313
108mm x R4"	68	108	132	38	107	124	DN100	4" (DN100)	39315

SG6/G7243
Reducer

Larger male end for insertion into a fitting x press





Size	l1	d1	D1	z1	l2	d2	z2	DN1	DN2	Code
18 x 15mm	24	15	23	4	23	18	3	DN12	DN15	39761
22 x 15mm	24	15	23	4	28	22	7	DN12	DN20	39750
22 x 18mm	24	18	26	4	26	22	5	DN15	DN20	39762
28 x 15mm	25	15	23	4	37	28	14	DN12	DN25	39751
28 x 18mm	24	18	26	4	26	28	5	DN15	DN25	39763
28 x 22mm	25	22	31	4	30	28	7	DN20	DN25	39752
35 x 22mm	29	22	31	9	39	35	13	DN20	DN32	39753
35 x 28mm	28	28	37	5	35	35	9	DN25	DN32	39754
42 x 22mm	25	22	31	4	49	42	19	DN20	DN40	39755
42 x 28mm	27	28	37	4	44	42	14	DN25	DN40	39756

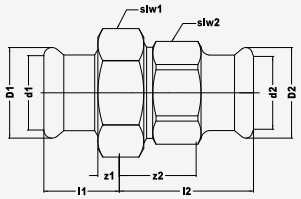


Size	l1	d1	D1	z1	l2	d2	z2	DN1	DN2	Code
42 x 35mm	35	35	44	8	38	42	8	DN32	DN40	39757
54 x 28mm	27	28	37	4	59	54	24	DN25	DN50	39760
54 x 35mm	35	35	44	9	53	54	18	DN32	DN50	39758
54 x 42mm	40	42	53	9	47	54	12	DN40	DN50	39759
66.7 x 28mm	37	28	37	14	72	67	22	DN25	DN65	39319
66.7 x 35mm	40	35	44	14	69	67	19	DN32	DN65	39320
66.7 x 42mm	43	42	53	13	67	67	17	DN40	DN65	39321
66.7 x 54mm	49	54	65	14	63	67	13	DN50	DN65	39322
76.1 x 35mm	39	35	44	13	74	76	24	DN32	DN65	39323
76.1 x 42mm	43	42	53	13	70	76	20	DN40	DN65	39324
76.1 x 54mm	52	54	65	17	64	76	14	DN50	DN65	39325
76.1 x 66.7mm	66	67	83	16	60	76	10	DN65	DN65	39327
108 x 42mm	47	42	53	17	106	108	39	DN40	DN100	39334
108 x 54mm	54	54	65	20	102	108	35	DN50	DN100	39335
108 x 66.7mm	70	67	83	20	96	108	29	DN65	DN100	39337
108 x 76.1mm	70	76	94	20	92	108	25	DN65	DN100	39338

SG11/G6330
Union coupling

Press x press





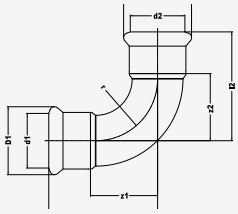
Size	l1	d1	D1	z1	slw1	sks1	l2	d2	D2	z2	slw2	sks2	DN1	DN2	Code
15mm	25	15	23	5	34	37	36	15	23	16	28	30	DN12	DN12	39770
18mm	29	18	26	9	41	44	38	18	26	18	36	38	DN15	DN15	39906
22mm	29	22	31	8	41	44	38	22	31	17	36	38	DN20	DN20	39771
28mm	34	28	37	11	48	52	41	28	37	18	41	44	DN25	DN25	39772
35mm	36	35	44	10	58	63	46	35	44	20	50	53	DN32	DN32	39773
42mm	46	42	53	16	65	70	51	42	53	21	55	58	DN40	DN40	39774
54mm	46	54	65	11	80	86	58	54	65	23	70	74	DN50	DN50	39775



SG12/G7002A
Elbow

Press x press



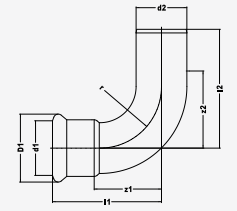


Size	l1	d1	D1	z1	l2	d2	D2	z2	DN1	DN2	Code
15mm	38	15	23	17	38	15	23	17	DN12	DN12	39780
18mm	42	18	26	22	42	18	26	22	DN15	DN15	39779
22mm	47	22	31	26	47	22	31	26	DN20	DN20	39781
28mm	56	28	37	34	56	28	37	34	DN25	DN25	39782
35mm	68	35	44	42	68	35	44	42	DN32	DN32	39783
42mm	80	42	53	50	80	42	53	50	DN40	DN40	39784
54mm	100	54	65	65	100	54	65	65	DN50	DN50	39785
66.7mm	132	67	83	87	132	67	83	87	DN65	DN65	39341
76.1mm	142	76	94	92	142	76	94	92	DN65	DN65	39342
108mm	201	108	131	135	201	108	131	140	DN100	DN100	39344

SG12S/G7001A
Street elbow

Press x male end for insertion into a fitting





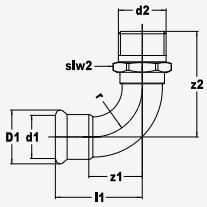
Size	l1	d1	D1	z1	l2	d2	z2	DN1	DN2	Code
15mm	36	15	23	16	50	15	30	DN12	DN12	39790
18mm	42	18	26	22	53	18	33	DN15	DN15	39789
22mm	47	22	31	27	58	22	38	DN20	DN20	39791
28mm	58	28	37	34	64	28	40	DN25	DN25	39792
35mm	69	35	44	44	82	35	57	DN32	DN32	39793
42mm	81	42	53	52	101	42	72	DN40	DN40	39794
54mm	100	54	65	66	120	54	86	DN50	DN50	39795
66.7mm	130	67	83	93	175	67	125	DN65	DN65	39346
76.1mm	143	76	94	93	150	76	-	DN65	DN65	39347
108mm	197	108	132	132	208	108	141	DN100	DN100	39349



SG13/G6092G
Male elbow

Press x BSP taper male thread



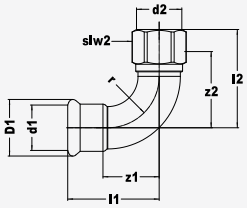


Size	l1	d1	D1	z1	l2	z2	DN1	DN2	Code
15mm x R1/2"	37	15	23	18	67	59	DN12	1/2" (DN15)	39800
18mm x R1/2"	64	18	26	35	34	26	DN15	1/2" (DN15)	39806
18mm x R3/4"	55	18	26	35	37	38	DN15	3/4" (DN20)	39807
22mm x R3/4"	48	22	31	27	79	70	DN20	3/4" (DN20)	39801
28mm x R1"	57	28	37	34	88	78	DN25	1" (DN25)	39802
35mm x R1 1/4"	78	35	44	53	60	60	DN32	1 1/4" (DN32)	39803
42mm x R1 1/2"	104	42	53	74	57	60	DN40	1 1/2" (DN40)	39804
54mm x R2"	112	54	65	77	80	80	DN50	2" (DN50)	39805

SG14/G6090G
Female elbow

Press x parallel female thread





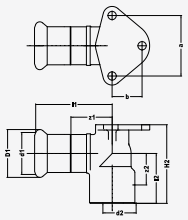
Size	l1	d1	D1	z1	l2	z2	DN1	DN2	Code
15mm x Rp1/2"	37	15	23	17	65	50	DN12	1/2" (DN15)	39810
15mm x Rp3/4"	58	15	23	38	30	15	DN12	3/4" (DN20)	39811
18mm x Rp1/2"	42	18	26	22	68	53	DN15	1/2" (DN15)	39808
18mm x Rp3/4"	52	18	26	32	30	15	DN15	3/4" (DN20)	39809
22mm x Rp1/2"	48	22	31	27	73	58	DN20	1/2" (DN15)	39813
22mm x Rp3/4"	48	22	31	27	77	62	DN20	3/4" (DN20)	39814
22mm x Rp1"	48	22	31	27	80	61	DN20	1" (DN25)	39812
28mm x Rp1"	58	28	37	37	89	70	DN25	1" (DN25)	39815
35mm x Rp1 1/4"	75	35	44	50	45	25	DN32	1 1/4" (DN32)	39816
42mm x Rp1 1/2"	80	42	53	60	128	107	DN40	1 1/2" (DN40)	39817
54mm x Rp2"	100	54	65	65	155	129	DN50	2" (DN50)	39818



SG15/G6471G
Backplate elbow

Press x BSP parallel female thread



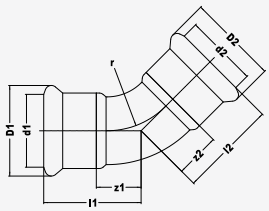


Size	l1	d1	D1	z1	l2	z2	DN1	DN2	Code
15mm x 1/2"	48	15	23	28	23	11	DN12	1/2" (DN15)	39820
18mm x 1/2"	50	18	26	30	24	12	DN15	1/2" (DN15)	39819
22mm x 3/4"	60	22	32	39	31	14	DN20	3/4" (DN20)	39821

SG21/G7041
Obtuse elbow

Press x press





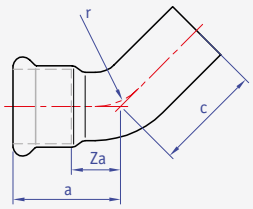
Size	l1	d1	D1	z1	l2	d2	D2	z2	DN1	DN2	Code
15mm	28	15	23	8	28	15	23	8	DN12	DN12	39825
18mm	29	18	26	9	29	18	26	9	DN15	DN15	39823
22mm	31	22	31	12	31	22	31	12	DN20	DN20	39826
28mm	37	28	37	16	37	28	37	16	DN25	DN25	39827
35mm	44	35	44	18	44	35	44	18	DN32	DN32	39828
42mm	51	42	53	21	51	42	53	21	DN40	DN40	39829
54mm	62	54	65	27	62	54	65	27	DN50	DN50	39830
66.7mm	85	67	83	35	85	67	83	35	DN65	DN65	39351
76.1mm	91	76	94	45	91	76	94	45	DN65	DN65	39352
108mm	125	108	132	59	125	108	132	59	DN100	DN100	39354



SG21S/G7040
Obtuse street elbow

Press x male end for insertion into a fitting



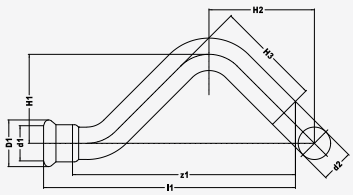


Size	l1	d1	D1	z1	l2	d2	z2	DN1	DN2	Code
15mm	28	15	23	8	37	15	17	DN12	DN12	39835
18mm	29	18	26	9	39	18	19	DN15	DN15	39833
22mm	32	22	31	11	44	22	23	DN20	DN20	39836
28mm	37	28	37	14	47	28	24	DN25	DN25	39837
35mm	43	35	44	17	58	35	32	DN32	DN32	39838
42mm	51	42	53	21	71	42	41	DN40	DN40	39839
54mm	62	54	65	27	82	54	47	DN50	DN50	39840
66.7mm	85	67	83	35	88	67	38	DN65	DN65	39356
76.1mm	90	76	94	40	97	76	54	DN65	DN65	39357
108mm	121	108	132	58	136	108	69	DN100	DN100	39359

SG22/G7086
Partial crossover

Press x male end for insertion into a fitting



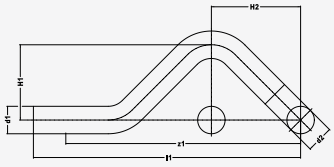


Size	l1	d1	D1	z1	d2	DN1	DN2	Code
15mm	110	15	23	90	15	DN12	DN12	39841
18mm	120	18	26	100	18	DN15	DN15	39842
22mm	135	22	31	114	22	DN20	DN20	39843

S22S/7087
Full crossover

Both ends male for insertion into a fitting





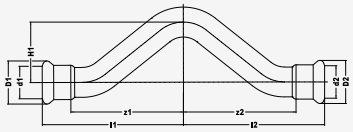
Size	l1	d1	d2	DN1	DN2	Code
15mm	118	15	15	DN12	DN12	38438
18mm	128	18	18	DN15	DN15	38434
22mm	142	22	22	DN20	DN20	38439



SG23/G7085
Full crossover

Press x press

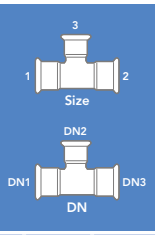




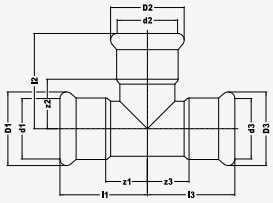
Size	l1	d1	D1	z1	l2	d2	D2	z2	DN1	DN2	Code
15mm	70	15	23	50	70	15	23	50	DN12	DN12	39844
18mm	76	18	26	56	76	18	26	56	DN15	DN15	39845
22mm	85	22	31	64	85	22	31	64	DN20	DN20	39846

SG24/G7130
Equal tee

Press on all ends





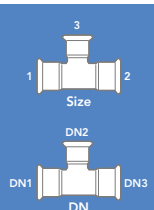


Size	l1	d1	D1	z1	l2	d2	D2	z2	l3	d3	D3	z3	DN1	DN2	DN3	Code
15mm	32	15	23	12	32	15	23	12	32	15	23	12	DN12	DN12	DN12	39850
18mm	34	18	26	14	34	18	26	14	34	18	26	14	DN15	DN15	DN15	39847
22mm	37	22	31	16	37	22	31	16	37	22	31	16	DN20	DN20	DN20	39851
28mm	42	28	37	19	42	28	37	19	42	28	37	19	DN25	DN25	DN25	39852
35mm	50	35	44	24	50	35	44	24	50	35	44	24	DN32	DN32	DN32	39853
42mm	58	42	53	28	58	42	53	28	58	42	53	28	DN40	DN40	DN40	39854
54mm	69	54	65	34	69	54	65	34	69	54	65	34	DN50	DN50	DN50	39855
66.7mm	95	67	83	45	111	67	83	62	95	67	83	45	DN65	DN65	DN65	39361
76.1mm	101	76	94	51	119	76	94	69	101	76	94	51	DN65	DN65	DN65	39362
108mm	159	108	132	92	159	108	132	92	159	108	132	92	DN100	DN100	DN100	39364

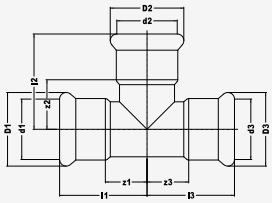


SG25/G7130
Tee, reduced branch

Press on all ends





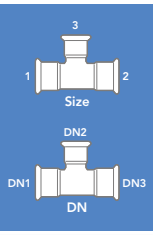


Size	l1	d1	D1	z1	l2	d2	D2	z2	l3	d3	D3	z3	DN1	DN2	DN3	Code
18 x 18 x 15mm	34	18	26	14	35	15	23	15	34	18	26	14	DN15	DN12	DN15	39856
22 x 22 x 15mm	37	22	31	16	38	15	23	18	37	22	31	16	DN20	DN12	DN20	39860
22 x 22 x 18mm	37	22	31	16	38	18	26	18	37	22	31	16	DN20	DN15	DN20	39868
28 x 28 x 15mm	42	28	37	19	41	15	23	21	42	28	37	19	DN25	DN12	DN25	39861
28 x 28 x 18mm	42	28	37	19	41	18	26	21	42	28	37	19	DN25	DN15	DN25	39857
28 x 28 x 22mm	42	28	37	19	41	22	31	20	42	28	37	19	DN25	DN20	DN25	39862
35 x 35 x 22mm	45	35	44	19	45	22	31	24	45	35	44	19	DN32	DN20	DN32	39863
35 x 35 x 28mm	50	35	44	24	44	28	37	21	50	35	44	24	DN32	DN25	DN32	39864
42 x 42 x 22mm	50	42	53	20	48	22	31	27	50	42	53	20	DN40	DN20	DN40	39869
42 x 42 x 28mm	56	42	53	26	49	28	37	26	56	42	53	26	DN40	DN25	DN40	39865
42 x 42 x 35mm	56	42	53	26	50	35	44	24	56	42	53	26	DN40	DN32	DN40	39866
54 x 54 x 22mm	60	54	65	25	54	22	31	33	60	54	65	25	DN50	DN20	DN50	39871
54 x 54 x 42mm	69	54	65	34	64	42	53	34	69	54	65	34	DN50	DN40	DN50	39867
66.7 x 66.7 x 28mm	76	67	83	26	67	28	37	43	76	67	83	26	DN65	DN25	DN65	39368
66.7 x 66.7 x 35mm	80	67	83	29	70	35	44	43	80	67	83	29	DN65	DN32	DN65	39369
66.7 x 66.7 x 42mm	82	67	83	32	76	42	53	41	82	67	83	32	DN65	DN40	DN65	39370
66.7 x 66.7 x 54mm	88	67	83	47	78	54	65	43	88	67	83	47	DN65	DN50	DN65	39371
76.1 x 76.1 x 22mm	73	76	94	22	73	22	31	50	73	76	94	22	DN65	DN20	DN65	39372
76.1 x 76.1 x 28mm	77	76	94	26	73	28	37	50	77	76	94	26	DN65	DN25	DN65	39373
76.1 x 76.1 x 35mm	80	76	94	30	78	35	44	53	80	76	94	30	DN65	DN32	DN65	39374
76.1 x 76.1 x 42mm	103	76	94	55	106	42	53	70	103	76	94	55	DN65	DN40	DN65	39375
76.1 x 76.1 x 54mm	93	76	94	41	85	54	65	50	93	76	94	60	DN65	DN50	DN65	39376
108 x 108 x 54mm	109	89	108	40	125	54	65	91	109	89	108	40	DN100	DN50	DN100	39382
108 x 108 x 66.7mm	117	108	133	50	136	67	83	86	117	108	133	50	DN100	DN65	DN100	39383
108 x 108 x 76.1mm	120	108	133	56	136	54	65	86	120	108	133	56	DN100	DN65	DN100	39384

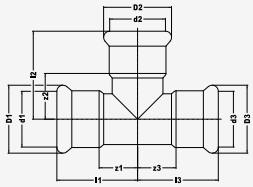


SG26/G7130
Tee, one end reduced

Press on all ends



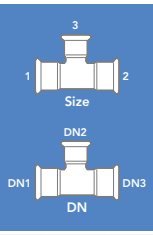




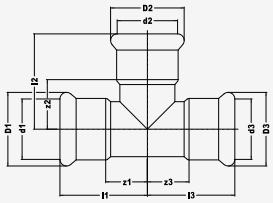
Size	l1	d1	D1	z1	l2	d2	D2	z2	l3	d3	D3	z3	DN1	DN2	DN3	Code
22 x 15 x 22mm	37	22	31	16	37	22	31	16	46	15	23	26	DN20	DN20	DN12	39870

SG27/G7130
Tee, one end and branch reduced

Press on all ends



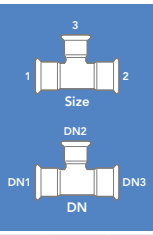




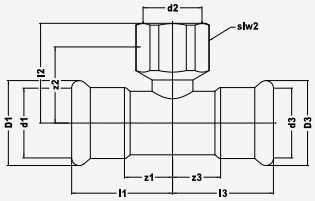
Size	l1	d1	D1	z1	l2	d2	D2	z2	l3	d3	D3	z3	DN1	DN2	DN3	Code
22 x 15 x 15mm	37	22	31	16	44	15	23	18	43	15	23	23	DN20	DN12	DN12	39875

SG30/G6130G
Female branch tee

Press x BSP parallel female branch







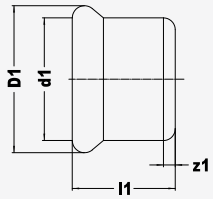
Size	l1	d1	D1	z1	l2	z2	l3	d3	D3	z3	slw2	DN1	DN2	DN3	Code
15 x 15mm x Rp1/2"	32	15	23	12	59	44	32	15	23	12	22	DN12	1/2" (DN15)	DN12	39890
18 x 18mm x Rp1/2"	34	18	26	14	24	47	34	18	26	14	22	DN15	1/2" (DN15)	DN15	39891
22 x 22mm x Rp1/2"	37	22	31	16	65	50	37	22	31	16	22	DN20	1/2" (DN15)	DN20	39892
22 x 22mm x Rp3/4"	37	22	31	16	67	51	37	22	31	16	30	DN20	3/4" (DN20)	DN20	39893
28 x 28mm x Rp1/2"	42	28	37	19	29	53	42	28	37	19	22	DN25	1/2" (DN15)	DN25	39894
28 x 28mm x Rp3/4"	42	28	37	19	34	52	42	28	37	19	30	DN25	3/4" (DN20)	DN25	39895
35 x 35mm x Rp1/2"	45	35	44	16	34	63	45	35	44	16	22	DN32	1/2" (DN15)	DN32	39896
35 x 35mm x Rp1"	50	35	44	24	34	14	50	35	44	24	46	DN32	3/4" (DN20)	DN32	38897
42 x 42mm x Rp1/2"	50	42	53	19	38	61	50	42	53	19	48	DN40	1/2" (DN15)	DN40	39898
54 x 54mm x Rp1/2"	60	54	65	26	44	70	60	54	65	26	65	DN50	1/2" (DN15)	DN50	39899
76.1 x 76.1mm x Rp1/2"	65	76	94	15	48	30	65	76	94	15	-	DN65	1/2" (DN15)	DN65	39386
108 x 108mm x Rp1/2"	82	108	133	16	63	-	82	108	133	16	-	DN100	1/2" (DN15)	DN100	39388



SG61/G7301
Stop end

Press for use on copper tube



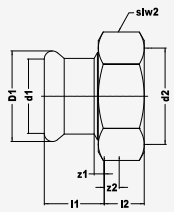


Size	l1	d1	D1	z1	DN1	Code
15mm	20	15	23	2	DN12	39880
18mm	20	18	26	2	DN15	39878
22mm	21	22	31	2	DN20	39881
28mm	23	28	37	2	DN25	39882
35mm	26	35	44	2	DN32	39883
42mm	30	42	53	2	DN40	39884
54mm	35	54	65	2	DN50	39885
66.7mm	89	67	83	1	DN65	39390
76.1mm	74	76	94	2	DN65	39391
108mm	95	1.8	132	2	DN80	39393

SG68FF/G6360
Union

Press x female union nut





Size	d1	D1	slw2	sks2	DN1	DN2	Code
15mm x G7/8"	15	23	34	39	DN12	7/8" (DN12)	39910
22mm x G1 1/8"	22	31	41	47	DN20	1 1/8" (DN20)	39911
28mm x G1 3/8"	28	37	48	55	DN25	1 3/8" (DN25)	39912

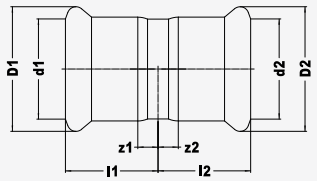


STAINLESS STEEL PRESS FITTINGS FOR GAS SERVICES

SSG1/7270
Straight coupling

Press x press

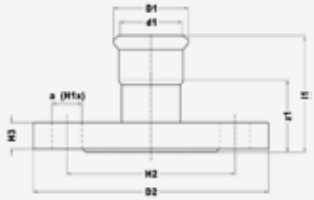




Size	l1	d1	D1	z1	l2	d2	D2	z2	DN1	DN2	Code
15mm	26	15	23	5	26	15	23	5	DN12	DN12	11800
22mm	30	22	32	7	30	22	32	7	DN20	DN20	11802
28mm	31	28	38	7	31	28	38	7	DN25	DN25	11803
35mm	36	35	45	9	36	35	45	9	DN32	DN32	11804
42mm	40	42	54	8	40	42	54	8	DN40	DN40	11805
54mm	45	54	65	8	45	54	65	8	DN50	DN50	11806
76.1mm	71	76	94	16	71	76	94	16	DN65	DN65	20481
88.9mm	82	89	109	19	82	89	109	19	DN80	DN80	20482
108mm	96	108	133	19	96	108	133	19	DN100	DN100	20483

SSG1 FMF
Composite flange



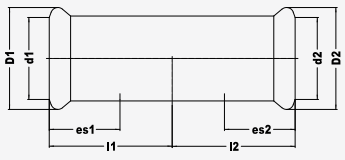


Size	l1	d1	D1	z1	D2	H2	H3	a	DN1	DN2	Code
76.1mm x DN65 (2 1/2")	126	76	94	71	185	145	18	18	DN65	DN65	20475
88.9mm x DN80 (3")	147	89	109	84	200	160	20	18	DN80	DN80	20476
108mm x DN100 (4")	167	108	133	90	220	180	20	18	DN100	DN100	20477

SSG1S/7270S
Straight coupling slip pattern

Press x press (without tube stop)





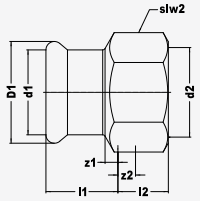
Size	l1	d1	D1	l2	d2	D2	DN1	DN2	Code
15mm	36	15	23	36	15	23	DN12	DN12	11808
22mm	41	22	32	41	22	32	DN20	DN20	11810
28mm	45	28	38	45	28	38	DN25	DN25	11811
35mm	50	35	45	50	35	45	DN32	DN32	11812
42mm	58	42	54	58	42	54	DN40	DN40	11813
54mm	70	54	65	70	54	65	DN50	DN50	11814



SSG2/6270G
Straight female connector

Press x BSP parallel female thread



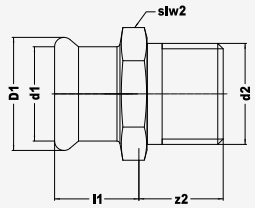


Size	l1	d1	D1	z1	l2	z2	skw2	sks2	DN1	DN2	Code
15mm x Rp1/2"	27	15	23	10	27	10	22	25	DN12	1/2" (DN15)	11928
22mm x Rp1/2"	28	22	32	10	28	10	22	25	DN20	1/2" (DN15)	11930
22mm x Rp3/4"	35	22	32	16	35	16	27	31	DN20	3/4" (DN20)	11931
28mm x Rp1"	31	28	38	11	31	11	36	40	DN25	1" (DN25)	11933
35mm x Rp1 1/4"	36	35	45	14	36	14	46	52	DN32	1 1/4" (DN32)	11934
42mm x Rp1 1/2"	37	42	54	13	37	13	50	56	DN40	1 1/2" (DN40)	11936
54mm x Rp2"	53	54	65	26	53	26	65	72	DN50	2" (DN50)	11937

SSG3/6243G
Straight male connector

Press x BSP parallel female thread



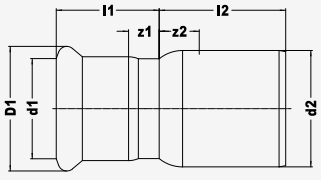


Size	l1	d1	D1	z1	l2	z2	slw2	sks2	DN1	DN2	Code
15mm x R1/2"	25	15	23	5	28	15	22	25	DN12	1/2" (DN15)	11914
22mm x R3/4"	29	22	32	8	30	16	27	31	DN20	3/4" (DN20)	11917
28mm x R1"	29	28	38	6	33	16	36	40	DN25	1" (DN25)	11919
35mm x R1 1/4"	34	35	45	8	36	17	46	52	DN32	1 1/4" (DN32)	11920
42mm x R1 1/2"	38	42	54	8	37	18	50	56	DN40	1 1/2" (DN40)	11923
54mm x R2"	44	54	65	9	43	20	65	72	DN50	2" (DN50)	11924
76.1mm x R2 1/2"	55	76	94	-	-	-	-	-	DN65	2 1/2" (DN65)	20485
88.9mm x R3"	63	89	109	-	-	-	-	-	DN80	3" (DN80)	20486

SSG6/7243
Reducer

Larger male end for insertion into a fitting x press





Size	l1	d1	D1	z1	l2	d2	z2	DN1	DN2	Code
22 x 15mm	26	15	23	6	34	-	22	DN12	DN20	11849
28 x 15mm	25	15	23	5	32	-	28	DN12	DN25	11851
28 x 22mm	29	22	32	8	38	-	35	DN20	DN32	11853
35 x 22mm	40	22	32	19	43	-	35	DN20	DN32	11854
35 x 28mm	30	28	38	7	43	-	35	DN25	DN32	11855



FEATURES

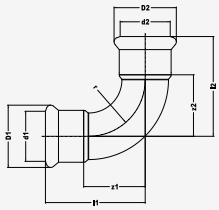
- Designed for use on above ground 2nd and 3rd family gas services
- Designed to suit applications where high levels of hydrogen sulphide lead to dust problems in copper pipelines
- Designed for use with XPress stainless steel system tube

Size	l1	d1	D1	z1	l2	d2	z2	DN1	DN2	Code
42 x 28mm	40	28	38	17	58	42	28	DN25	DN40	11856
42 x 35mm	40	35	45	17	59	42	24	DN32	DN40	11857
54 x 28mm	37	28	38	11	42	54	12	DN25	DN50	11858
54 x 35mm	50	35	45	24	78	54	43	DN32	DN50	11859
54 x 42mm	37	42	54	7	60	54	25	DN40	DN50	11860
76.1 x 42mm	50	42	54	20	101	76	46	DN40	DN65	20491
76.1 x 54mm	50	54	65	15	154	76	77	DN50	DN65	20492
88.9 x 54mm	50	54	65	15	90	89	35	DN50	DN80	20493
88.9 x 76.1mm	50	76	94	15	106	89	43	DN65	DN80	20494
108 x 54mm	65	54	65	10	131	108	54	DN50	DN100	20495
108 x 76.1mm	65	76	94	10	91	108	28	DN65	DN100	20496
108 x 88.9mm	78	89	109	15	112	108	35	DN80	DN100	20497

SSG12/7002A
Elbow

Press x press



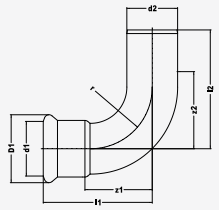


Size	l1	d1	D1	z1	l2	d2	D2	z2	DN1	DN2	Code
15mm	48	15	23	27	48	15	23	27	DN12	DN12	11816
22mm	60	22	32	37	60	22	32	37	DN20	DN20	11818
28mm	71	28	38	47	71	28	38	47	DN25	DN25	11819
35mm	87	35	45	60	87	35	45	60	DN32	DN32	11820
42mm	115	42	54	83	115	42	54	83	DN40	DN40	11821
54mm	142	54	65	105	142	54	65	105	DN50	DN50	11822
76.1mm	150	76	94	95	150	76	94	95	DN65	DN65	20501
88.9mm	174	89	109	111	174	89	109	111	DN80	DN80	20502
108mm	215	108	133	138	215	108	133	138	DN100	DN100	20503

SSG12S/7001A
Street elbow

Press x male end for insertion into a fitting





Size	l1	d1	D1	z1	l2	d2	z2	DN1	DN2	Code
15mm	48	15	23	27	56	15	56	DN12	DN12	11824
22mm	60	22	32	37	68	22	68	DN20	DN20	11826
28mm	71	28	38	47	80	28	80	DN25	DN25	11827
35mm	87	35	45	60	93	35	67	DN32	DN32	11828
42mm	115	42	54	83	125	42	95	DN40	DN40	11829

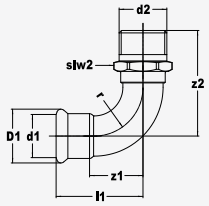


Size	l1	d1	D1	z1	l2	d2	z2	DN1	DN2	Code
54mm	142	54	65	105	149	54	114	DN50	DN50	11830
76.1mm	150	76	94	95	465	76	-	DN65	DN65	20505
88.9mm	175	89	109	112	190	89	-	DN80	DN80	20506
108mm	216	108	133	138	238	108	-	DN100	DN100	20507

SSG13/6092G
Male elbow

Press x BSP taper male thread



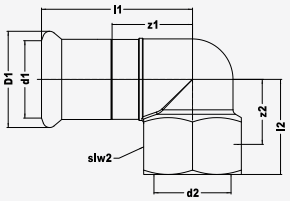


Size	d1	D1	z2	DN1	DN2	Code
15mm x R1/2"	15	23	14	DN12	1/2" (DN15)	11940
22mm x R3/4"	22	32	14	DN20	3/4" (DN20)	11942
28mm x R1"	28	38	15	DN25	1" (DN25)	11943
35mm x R1 1/4"	35	45	13	DN32	1 1/4" (DN32)	11944

SSG14/6090G
Female elbow

Press x BSP parallel female thread



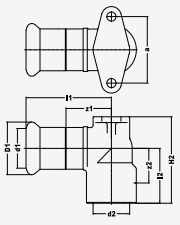


Size	l1	d1	D1	z1	l2	z2	DN1	DN2	Code
15mm x Rp1/2"	53	15	23	32	36	24	DN12	1/2" (DN15)	11950
22mm x Rp3/4"	57	22	32	34	46	33	DN20	3/4" (DN20)	11952
28mm x Rp1"	71	28	38	47	54	38	DN25	1" (DN25)	11953
35mm x Rp1 1/4"	72	35	45	45	62	45	DN32	1 1/4" (DN32)	11954

SSG15/6472G
Backplate elbow

Press x BSP parallel female thread





Size	d1	D1	DN1	DN2	Code
15mm x 1/2"	15	23	DN12	1/2" (DN15)	11957
22mm x 3/4"	22	32	DN20	3/4" (DN20)	11959

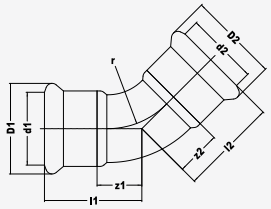




SSG21/7041
Obtuse elbow

Press x press



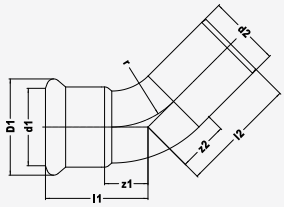


Size	l1	d1	D1	z1	l2	d2	D2	z2	DN1	DN2	Code
15mm	37	15	23	16	37	15	23	16	DN12	DN12	11832
22mm	44	22	32	21	44	22	32	21	DN20	DN20	11834
28mm	51	28	38	27	51	28	38	27	DN25	DN25	11835
35mm	59	35	45	32	59	35	45	32	DN32	DN32	11836
42mm	77	42	54	45	77	42	54	45	DN40	DN40	11837
54mm	88	54	65	51	88	54	65	51	DN50	DN50	11838
76.1mm	98	76	94	43	98	76	94	43	DN65	DN65	20511
88.9mm	112	89	109	49	112	89	109	49	DN80	DN80	20512
108mm	138	108	133	61	138	108	133	61	DN100	DN100	20513

SSG21S/7040
Obtuse street elbow

Press x male end for insertion into a fitting



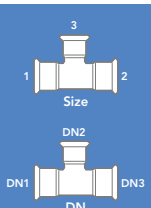


Size	l1	d1	D1	z1	l2	d2	z2	DN1	DN2	Code
15mm	37	15	23	16	48	15	28	DN12	DN12	11840
22mm	44	22	32	21	53	22	32	DN20	DN20	11842
28mm	51	28	38	27	60	28	37	DN25	DN25	11843
35mm	59	35	45	32	66	35	40	DN32	DN32	11844
42mm	77	42	54	45	80	42	50	DN40	DN40	11845
54mm	88	54	65	51	97	54	62	DN50	DN50	11846
76.1mm	98	76.1	94	43	117	76	62	DN65	DN65	20516
88.9mm	112	89	109	49	131	89	68	DN80	DN80	20517
108mm	138	108	133	61	154	108	77	DN100	DN100	20518

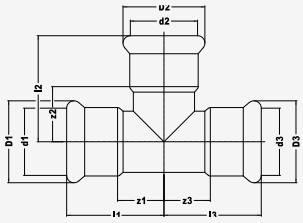


SSG24/7130
Equal tee

Press on all ends



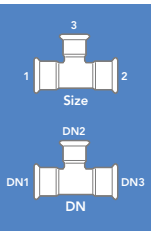




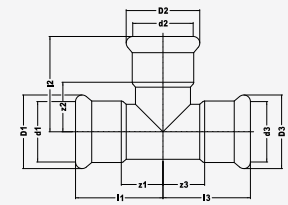
Size	l1	d1	D1	z1	l2	d2	D2	z2	l3	d3	D3	z3	DN1	DN2	DN3	Code
15mm	37	15	23	16	35	15	23	14	37	15	23	16	DN12	DN12	DN12	11865
22mm	41	22	32	18	40	22	32	17	41	22	32	18	DN20	DN20	DN20	11867
28mm	46	28	38	22	45	28	38	21	46	28	38	22	DN25	DN25	DN25	11868
35mm	51	35	45	24	55	35	45	28	51	35	45	24	DN32	DN32	DN32	11869
42mm	59	42	54	27	61	42	54	29	59	42	54	27	DN40	DN40	DN40	11870
54mm	71	54	65	34	72	54	65	35	71	54	65	34	DN50	DN50	DN50	11871
76.1mm	116	76	94	61	115	76	96	61	116	76	94	60	DN65	DN65	DN65	20521
88.9mm	156	89	109	68	156	89	109	68	156	89	109	68	DN80	DN80	DN80	20522
108mm	231	108	133	79	231	108	133	79	231	108	133	78	DN100	DN100	DN100	20523

SSG25/7130
Reduced branch tee

Press on all ends







Size	l1	d1	D1	z1	l2	d2	D2	z2	l3	d3	D3	z3	DN1	DN2	DN3	Code
22 x 22 x 15mm	41	22	32	18	39	15	23	18	41	22	32	18	DN20	DN12	DN20	11873
28 x 28 x 15mm	46	28	38	22	42	15	23	21	46	28	38	22	DN25	DN12	DN25	11875
28 x 28 x 22mm	46	28	38	22	45	22	32	22	46	28	38	22	DN25	DN20	DN25	11877
35 x 35 x 15mm	51	35	45	24	45	15	23	24	51	35	45	24	DN32	DN12	DN32	11878
35 x 35 x 22mm	51	35	45	24	46	22	32	23	51	35	45	24	DN32	DN20	DN32	11880
35 x 35 x 28mm	51	35	45	24	48	28	38	24	51	35	45	24	DN32	DN25	DN32	11881
42 x 42 x 22mm	59	42	54	27	51	22	32	28	59	42	54	27	DN40	DN20	DN40	11882
42 x 42 x 28mm	59	42	54	27	53	28	38	29	59	42	54	27	DN40	DN25	DN40	11883
42 x 42 x 35mm	59	42	54	27	60	35	45	33	59	42	54	27	DN40	DN32	DN40	11884
54 x 54 x 22mm	71	54	65	34	59	22	32	34	71	54	65	34	DN50	DN20	DN50	11885
54 x 54 x 28mm	71	54	65	34	60	28	38	36	71	54	65	34	DN50	DN25	DN50	11886
54 x 54 x 35mm	71	54	65	34	66	35	45	39	71	54	65	34	DN50	DN32	DN50	11887
54 x 54 x 42mm	71	54	65	34	64	42	54	32	71	54	65	34	DN50	DN40	DN50	11888
76.1 x 76.1 x 22mm	116	76	94	61	68	22	32	-	116	76	94	45	DN65	DN20	DN65	20528
76.1 x 76.1 x 28mm	116	76	94	61	71	28	38	-	116	76	94	47	DN65	DN25	DN65	20529
76.1 x 76.1 x 35mm	116	76	94	61	75	35	45	-	116	76	94	48	DN65	DN32	DN65	20530
76.1 x 76.1 x 42mm	116	76	94	61	79	42	54	-	116	76	94	47	DN65	DN40	DN65	20531
76.1 x 76.1 x 54mm	116	76	94	61	80	54	65	-	116	76	94	43	DN65	DN50	DN65	20532

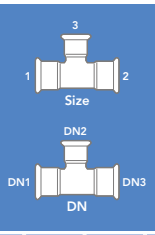




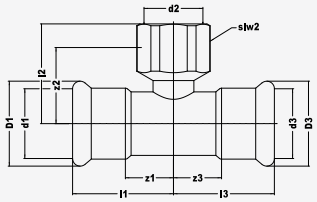
Size	l1	d1	D1	z1	l2	d2	D2	z2	l3	d3	D3	z3	DN1	DN2	DN3	Code
88.9 x 88.9 x 22mm	131	89	109	68	76	22	32	-	131	89	109	53	DN80	DN20	DN80	20533
88.9 x 88.9 x 28mm	131	89	109	68	76	28	38	-	131	89	109	52	DN80	DN25	DN80	20534
88.9 x 88.9 x 35mm	131	89	109	68	83	35	45	-	131	89	109	56	DN80	DN32	DN80	20535
88.9 x 88.9 x 42mm	131	89	109	68	85	42	54	-	131	89	109	53	DN80	DN40	DN80	20536
88.9 x 88.9 x 54mm	131	89	109	68	93	54	65	-	131	89	109	56	DN80	DN50	DN80	20537
108 x 108 x 22mm	156	108	133	79	85	22	32	-	156	108	133	62	DN100	DN20	DN100	20538
108 x 108 x 28mm	156	108	133	79	88	28	38	-	156	108	133	64	DN100	DN25	DN100	20539
108 x 108 x 35mm	156	108	133	79	94	35	45	-	156	108	133	67	DN100	DN32	DN100	20540
108 x 108 x 42mm	156	108	133	79	96	42	54	-	156	108	133	64	DN100	DN40	DN100	20541
108 x 108 x 54mm	156	108	133	79	102	54	65	-	156	108	133	65	DN100	DN50	DN100	20542

SSG30/6130G
Female branch tee

Press x BSP parallel female branch







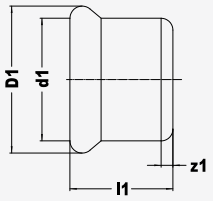
Size	l1	d1	D1	z1	l2	d2	z2	l3	d3	D3	z3	slw2	DN1	DN2	DN3	Code
15 x 15mm x Rp1/2"	37	15	23	16	37	1/2"	25	37	15	23	16	24	DN12	1/2" (DN15)	DN12	11900
22 x 22mm x Rp1/2"	41	22	32	18	41	1/2"	29	41	22	32	18	24	DN20	1/2" (DN15)	DN20	11903
22 x 22mm x Rp3/4"	41	22	32	18	41	3/4"	28	41	22	32	18	30	DN20	3/4" (DN20)	DN20	11904
28 x 28mm x Rp1/2"	46	28	38	22	44	1/2"	32	46	28	38	22	24	DN25	1/2" (DN15)	DN25	11905
28 x 28mm x Rp3/4"	46	28	38	22	45	3/4"	32	46	28	38	22	30	DN25	3/4" (DN20)	DN25	11906
35 x 35mm x Rp1/2"	46	28	38	22	44	1/2"	32	46	28	38	22	24	DN25	1/2" (DN15)	DN25	11907
35 x 35mm x Rp3/4"	51	35	45	24	48	3/4"	35	51	35	45	24	30	DN32	3/4" (DN20)	DN32	11908
42 x 42mm x Rp1/2"	59	42	54	27	46	1/2"	34	59	42	54	27	24	DN40	1/2" (DN15)	DN40	11909
54 x 54mm x Rp1/2"	71	54	65	34	55	1/2"	43	71	54	65	34	30	DN50	1/2" (DN15)	DN50	11910
54 x 54mm x Rp3/4"	71	54	65	34	69	3/4"	47	71	54	65	34	24	DN50	3/4" (DN20)	DN50	11911
54 x 54mm x Rp2"	71	54	65	34	58	2"	45	71	54	65	34	65	DN50	2" (DN50)	DN50	11912
76.1 x 76.1mm x Rp3/4"	116	76	94	61	81	3/4"	-	116	76	94	59	30	DN65	3/4" (DN20)	DN65	20551
76.1 x 76.1mm x Rp2"	116	76	94	61	68	2"	-	116	76	94	55	65	DN65	2" (DN50)	DN65	20552
88.9 x 88.9mm x Rp3/4"	131	89	109	68	88	3/4"	-	131	89	109	66	30	DN80	3/4" (DN20)	DN80	20553
88.9 x 88.9mm x Rp2"	131	89	109	68	87	2"	-	131	89	109	74	65	DN80	2" (DN50)	DN80	20554
108 x 108mm x Rp3/4"	156	108	133	79	86	3/4"	-	156	108	133	73	30	DN100	3/4" (DN20)	DN100	20555
108 x 108mm x Rp2"	156	108	133	79	98	2"	-	156	108	133	76	65	DN100	2" (DN50)	DN100	20556



SSG61/7301
Stop end

Press





Size	l1	d1	D1	z1	DN1	Code
15mm	37	15	23	16	DN12	11980
22mm	41	22	32	18	DN20	11982
28mm	46	28	38	22	DN25	11983
35mm	51	35	45	24	DN32	11984
42mm	59	42	54	27	DN40	11985
54mm	72	54	65	35	DN50	11986

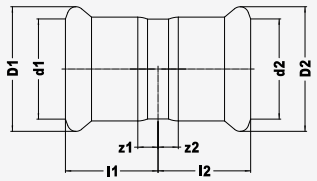


LBP COPPER PRESS JOINTING SYSTEM FOR SOLAR

SR1/7270
Straight coupling

Press x press



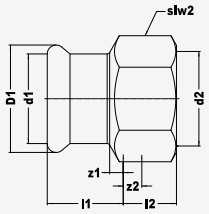


Size	l1	d1	D1	z1	l2	d2	D2	z2	DN1	DN2	Code
15mm	22	15	23	2	22	15	23	2	DN12	DN12	38010R
22mm	23	22	31	2	23	22	31	2	DN20	DN20	38020R
28mm	25	28	37	2	25	28	37	2	DN32	DN32	38030R
35mm	28	35	44	2	28	35	44	2	DN32	DN32	38032R
42mm	36	42	53	4	36	42	53	4	DN40	DN40	38034R
54mm	42	54	65	5	42	54	65	5	DN50	DN50	38035R

SR2/6270G
Straight female connector

Press x BSP parallel female thread



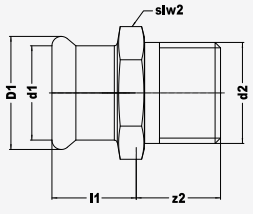


Size	l1	d1	D1	z1	l2	z2	slw2	sks2	DN1	DN2	Code
15mm x Rp1/2"	19	15	23	2	18	8	25	29	DN12	1/2" (DN15)	38090R
22mm x Rp3/4"	20	22	31	1	19	9	30	32	DN20	1" (DN25)	38092R
28mm x Rp1"	23	28	37	1	22	10	37	39	DN25	3/4" (DN20)	38093R
35mm x Rp1 1/4"	25	35	44	1	25	11	46	49	DN32	1" (DN25)	38094R
42mm x Rp1 1/2"	27	42	53	1	25	11	48	56	DN40	1 1/4" (DN32)	38095R
54mm x Rp2"	32	54	65	1	25	11	48	56	DN50	1 1/4" (DN32)	38096R

SR3/6243G
Straight male connector

Press x BSP taper male thread





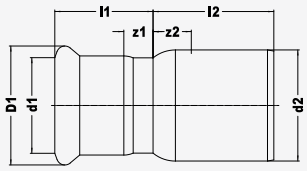
Size	l1	d1	D1	z1	l2	z2	slw2	sks2	DN1	DN2	Code
15mm x R1/2"	20	15	23	4	17	8	21	24	DN12	1/2" (DN15)	38114R
22mm x R3/4"	21	22	31	5	19	10	30	32	DN20	3/4" (DN20)	38116R
28mm x R1"	23	28	37	5	10	11	36	38	DN25	1" (DN25)	38118R
35mm x R1 1/4"	26	35	44	5	22	15	41	44	DN32	1 1/4" (DN32)	38119R
42mm x R1 1/2"	30	42	53	2	28	16	51	53	DN40	1 1/2" (DN40)	38120R
54mm x R2"	35	54	65	7	28	12	-	66	DN50	2" (DN50)	38121R



SR6/7243
Reducer

Larger male end for insertion into a fitting x press



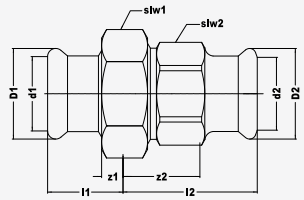


Size	l1	d1	D1	z1	l2	d2	z2	DN1	DN2	Code
22 x 15mm	24	15	23	4	23	22	3	DN12	DN20	38200R
28 x 15mm	25	15	23	4	37	28	14	DN12	DN25	38202R
28 x 22mm	25	22	31	4	30	28	7	DN20	DN25	38204R
35 x 22mm	29	22	31	9	39	35	13	DN20	DN32	38207R
35 x 28mm	28	28	37	5	35	35	9	DN25	DN32	38208R
42 x 22mm	25	22	31	4	49	42	19	DN20	DN40	38210R
42 x 28mm	27	28	37	4	44	42	14	DN25	DN40	38211R
42 x 35mm	35	35	44	8	38	42	8	DN32	DN40	38212R
54 x 28mm	27	28	37	4	59	54	24	DN25	DN50	38215R
54 x 35mm	35	35	44	9	53	54	18	DN32	DN50	38216R
54 x 42mm	40	42	53	9	47	54	12	DN40	DN50	38217R

SR11/S6330
Union coupling

Press x press



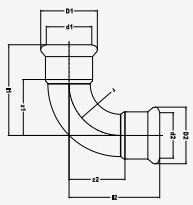


Size	l1	d1	D1	z1	slw1	sks1	l2	d2	D2	z2	slw2	sks2	DN1	DN2	Code
15mm	27	15	23	7	30	34	33	15	23	13	25	27	DN12	DN12	38180R
22mm	31	22	31	10	36	41	37	22	31	16	32	34	DN20	DN20	38181R
28mm	33	28	37	10	46	49	41	28	37	16	40	42	DN25	DN25	38182R

SR12/7002A
Elbow

Press x press





Size	l1	d1	D1	z1	l2	d2	D2	z2	DN1	DN2	Code
15mm	38	15	23	17	38	15	23	17	DN12	DN12	38280R
22mm	42	18	26	22	42	18	26	22	DN15	DN15	38290R
28mm	47	22	31	26	47	22	31	26	DN20	DN20	38300R
35mm	56	28	37	34	56	28	37	34	DN25	DN25	38302R
42mm	68	35	44	42	68	35	44	42	DN32	DN32	38304R
54mm	80	42	53	50	80	42	53	50	DN40	DN40	38306R



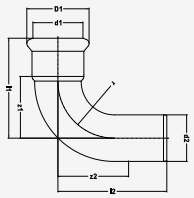
FEATURES

- Leak Before Press (LBP) technology identifies joints that have not been pressed correctly in sizes 15mm-54mm
- Designed for solar installations where extreme temperatures operate as low as -20°C to a maximum 200°C
- Heat free jointing provides time and cost saving benefits to contractors/installers

SR12S/7001A
Street elbow

Press x male end for insertion into a fitting



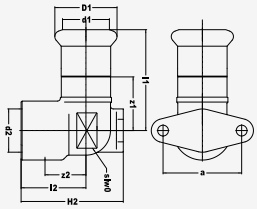


Size	l1	d1	D1	z1	l2	d2	DN1	DN2	Code
15mm	36	15	23	16	50	15	DN12	DN12	38318R
22mm	47	22	31	27	58	22	DN20	DN20	38320R
28mm	58	28	37	34	64	28	DN25	DN25	38322R

SR15/6472G
Backplate elbow

Press x BSP parallel female thread



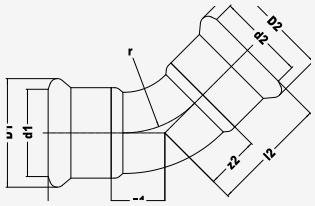


Size	l1	d1	D1	z1	l2	z2	DN1	DN2	Code
15mm x 1/2"	48	15	23	28	19	8	DN12	1/2" (DN15)	38400R

SR21/7041
Obtuse elbow

Press x press





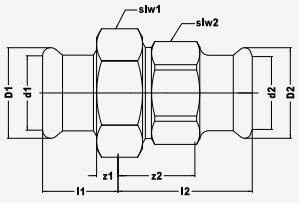
Size	l1	d1	D1	z1	l2	d2	D2	z2	DN1	DN2	Code
15mm	28	15	23	8	28	15	23	8	DN12	DN12	38410R
22mm	31	22	31	12	31	22	31	12	DN20	DN20	38412R
28mm	37	28	37	16	37	28	37	16	DN25	DN25	38414R
35mm	44	35	44	18	44	35	44	18	DN32	DN32	38416R
42mm	51	42	53	21	51	42	53	21	DN40	DN40	38417R
54mm	62	54	65	27	62	54	65	27	DN50	DN50	38418R



SR11/S6330
Union coupling

Press x press



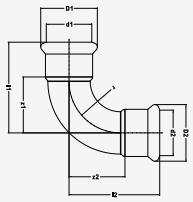


Size	l1	d1	D1	z1	slw1	sks1	l2	d2	D2	z2	slw2	sks2	DN1	DN2	Code
15mm	27	15	23	7	30	34	33	15	23	13	25	27	DN12	DN12	38180R
22mm	31	22	31	10	36	41	37	22	31	16	32	34	DN20	DN20	38181R
28mm	33	28	37	10	46	49	41	28	37	16	40	42	DN25	DN25	38182R

SR12/7002A
Elbow

Press x press



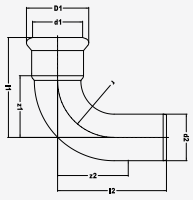


Size	l1	d1	D1	z1	l2	d2	D2	z2	DN1	DN2	Code
15mm	38	15	23	17	38	15	23	17	DN12	DN12	38280R
22mm	42	18	26	22	42	18	26	22	DN15	DN15	38290R
28mm	47	22	31	26	47	22	31	26	DN20	DN20	38300R
35mm	56	28	37	34	56	28	37	34	DN25	DN25	38302R
42mm	68	35	44	42	68	35	44	42	DN32	DN32	38304R
54mm	80	42	53	50	80	42	53	50	DN40	DN40	38306R

SR12S/7001A
Street elbow

Press x male end for insertion into a fitting





Size	l1	d1	D1	z1	l2	d2	DN1	DN2	Code
15mm	36	15	23	16	50	15	DN12	DN12	38318R
22mm	47	22	31	27	58	22	DN20	DN20	38320R
28mm	58	28	37	34	64	28	DN25	DN25	38322R

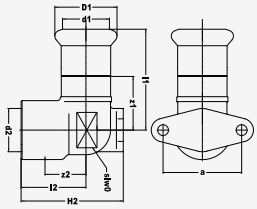




SR15/6472G
Backplate elbow

Press x BSP parallel female thread





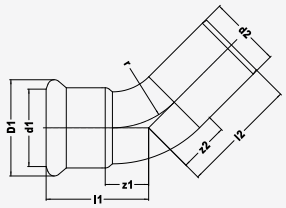
Size	l1	d1	D1	z1	l2	z2	DN1	DN2	Code
15mm x 1/2"	48	15	23	28	19	8	DN12	1/2" (DN15)	38400R



SR21S/7040
Obtuse street elbow

Press x male end for insertion into a fitting

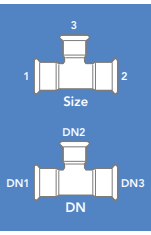




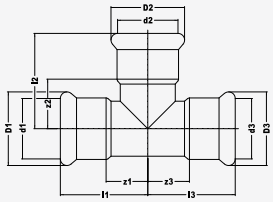
Size	l1	d1	D1	z1	l2	d2	z2	DN1	DN2	Code
15mm	28	15	23	8	37	15	17	DN12	DN12	38404R
22mm	32	22	31	11	44	22	23	DN20	DN20	38405R
28mm	37	28	37	14	47	28	24	DN25	DN25	38406R
42mm	51	42	53	21	71	42	41	DN40	DN40	38408R
54mm	62	54	65	27	82	54	47	DN50	DN50	38409R

SR24/7130
Equal tee

Press on all ends



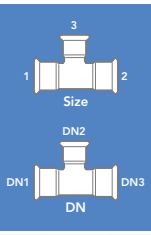




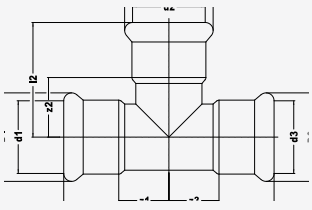
Size	l1	d1	D1	z1	l2	d2	D2	z2	l3	d3	D3	z3	DN1	DN2	Code
15mm	32	15	23	12	32	15	23	12	32	15	23	12	DN12	DN12	38450R
22mm	37	22	31	16	37	22	31	16	37	22	31	16	DN20	DN20	38460R
28mm	42	28	37	19	42	28	37	19	42	28	37	19	DN25	DN25	38462R
35mm	50	35	44	24	50	35	44	24	50	35	44	24	DN32	DN32	38464R
42mm	58	42	53	28	58	42	53	28	58	42	53	28	DN40	DN40	38466R
54mm	69	54	65	34	69	54	65	34	69	54	65	34	DN50	DN50	38467R

SR25/7130
Tee, reduced branch

Press on all ends







Size	l1	d1	D1	z1	l2	d2	D2	z2	l3	d3	D3	z3	DN1	DN2	DN3	Code
22 x 22 x 15mm	37	22	31	16	38	15	23	18	37	22	31	16	DN20	DN12	DN20	38490R
28 x 28 x 15mm	42	28	37	19	41	15	23	21	42	28	37	19	DN25	DN12	DN25	38492R
28 x 28 x 22mm	42	28	37	19	41	22	31	20	42	28	37	19	DN25	DN20	DN25	38494R
35 x 35 x 15mm	45	35	44	19	44	15	23	24	45	35	44	19	DN32	DN12	DN32	38496R
35 x 35 x 22mm	45	35	44	19	45	22	31	24	45	35	44	19	DN32	DN20	DN32	38497R
35 x 35 x 28mm	50	35	44	24	44	28	37	21	50	35	44	24	DN32	DN25	DN32	38498R
42 x 42 x 15mm	50	42	53	20	48	15	23	28	50	42	53	20	DN40	DN12	DN40	38499R
42 x 42 x 22mm	50	42	53	20	48	22	31	27	50	42	53	20	DN40	DN20	DN40	38500R
42 x 42 x 28mm	56	42	53	26	49	28	37	26	56	42	53	26	DN40	DN25	DN40	38501R

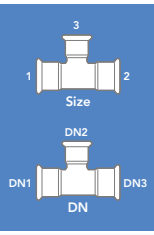




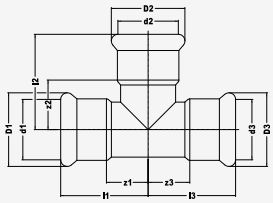
Size	l1	d1	D1	z1	l2	d2	D2	z2	l3	d3	D3	z3	DN1	DN2	DN3	Code
42 x 42 x 35mm	56	42	53	26	50	35	44	24	56	42	53	26	DN40	DN32	DN40	38502R
54 x 54 x 22mm	60	54	65	25	54	22	31	33	60	54	65	25	DN50	DN20	DN50	38504R
54 x 54 x 28mm	60	54	65	25	55	28	37	32	60	54	65	25	DN50	DN25	DN50	38505R

SR26/7130
Tee, one end reduced

Press on all ends



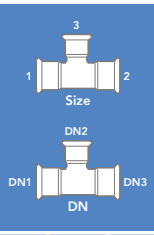




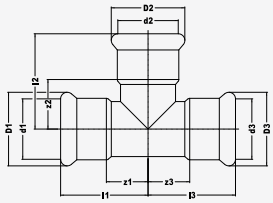
Size	l1	d1	D1	z1	l2	d2	D2	z2	l3	d3	D3	z3	DN1	DN2	DN3	Code
22 x 15 x 22mm	37	22	31	16	37	22	31	16	46	15	23	26	DN20	DN20	DN12	38510R
28 x 22 x 28mm	42	35	44	19	42	35	44	19	52	22	31	31	DN32	DN32	DN20	38514R
35 x 22 x 35mm	51	35	44	25	50	35	44	24	72	22	31	51	DN32	DN32	DN20	38517R

SR27/7130
Tee, one end and branch reduced

Press on all ends



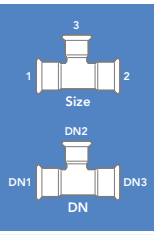




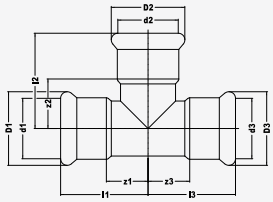
Size	l1	d1	D1	z1	l2	d2	D2	z2	l3	d3	D3	z3	DN1	DN2	DN3	Code
28 x 22 x 22mm	42	28	37	19	41	22	31	20	49	22	31	28	DN25	DN20	DN20	38532R
35 x 28 x 22mm	51	35	44	25	44	22	31	23	63	28	37	40	DN32	DN20	DN25	38541R
35 x 28 x 28mm	51	35	44	25	44	28	37	21	67	28	37	44	DN32	DN25	DN25	38542R

SR28/7130
Tee, both ends reduced

Press on all ends





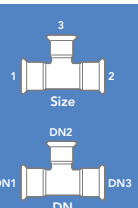


Size	l1	d1	D1	z1	l2	d2	D2	z2	l3	d3	D3	z3	DN1	DN2	DN3	Code
15 x 15 x 22mm	38	15	23	18	34	15	23	13	23	15	23	38	DN12	DN20	DN12	38545R

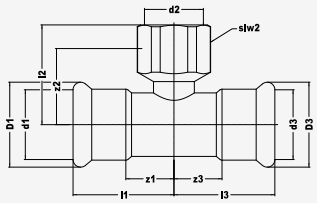


SR30/6130G
Female branch tee

Press x BSP parallel female branch





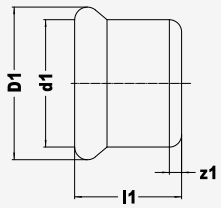


Size	l1	d1	D1	z1	l2	z2	slw2	sks2	l3	d3	D3	z3	DN1	DN2	DN3	Code
15 x 15mm x Rp1/2"	48	15	23	28	24	13	26	28	48	15	23	28	DN12	1/2" (DN15)	DN12	38585R
22 x 22mm x Rp1/2"	42	22	31	21	26	11	26	28	42	22	31	21	DN20	1/2" (DN15)	DN20	38591R
22 x 22mm x Rp3/4"	45	22	31	24	27	11	32	34	45	22	31	24	DN20	3/4" (DN20)	DN20	38587R
28 x 28mm x Rp1/2"	44	28	37	21	29	14	26	-	44	28	37	21	DN25	1/2" (DN15)	DN25	38592R
28 x 28mm x Rp3/4"	41	28	37	18	34	14	32	-	41	28	37	18	DN25	3/4" (DN20)	DN25	38593R
35 x 35mm x Rp1/2"	50	35	44	24	34	19	26	-	50	35	44	24	DN32	1/2" (DN15)	DN32	38594R
42 x 42mm x Rp1/2"	57	42	53	27	38	23	26	-	57	42	53	27	DN40	1/2" (DN15)	DN40	38596R

SR61/7301
Stop end

Press for copper tube



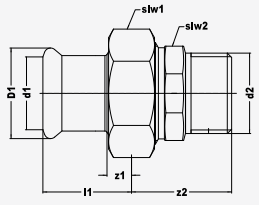


Size	l1	d1	D1	z1	DN1	Code
15mm	20	15	23	2	DN12	38695R
22mm	21	22	31	2	DN20	38697R

SR69/6331G
Straight male union connector

Press x BSP taper male thread





Size	l1	d1	D1	z1	slw1	sks1	l2	z2	slw2	sks2	DN1	DN2	Code
15mm x R1/2"	30	15	23	10	30	34	32	24	25	27	DN12	1/2" (DN15)	38813R
22mm x R3/4"	36	22	31	15	36	41	38	28	32	34	DN20	3/4" (DN20)	38814R
28mm x R1"	36	28	37	13	46	50	40	30	40	42	DN25	1" (DN25)	38816R
35mm x R1 1/4"	36	35	44	10	52	56	43	24	46	48	DN32	1 1/4" (DN32)	38817R
42mm x R1 1/2"	44	42	53	14	58	61	44	31	51	54	DN40	1 1/2" (DN40)	38818R

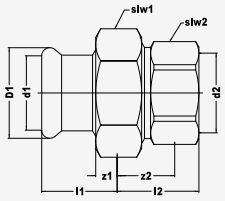




SR69F/6330G
Straight female union connector

Press x BSP parallel female thread





Size	l1	d1	D1	z1	slw1	sks1	l2	z2	slw2	sks2	DN1	DN2	Code
15mm x Rp1/2"	30	15	23	10	30	34	22	7	26	27	DN12	1/2" (DN15)	38833R
22mm x Rp3/4"	36	22	31	14	36	41	32	15	39	40	DN20	1" (DN25)	38834R
35mm x Rp1 1/4"	36	35	44	9	52	56	38	17	48	50	DN32	1 1/4" (DN32)	38836R
42mm x Rp1 1/2"	44	42	53	14	58	61	39	18	54	57	DN40	1 1/2" (DN40)	38837R



S105S Flat face union rubber washer (Mk1)

For use with XPress stainless and XPress carbon union fittings



Size	Code
2"	27044
2 1/2"	27045

SS106 Flat face union rubber washer (Mk2)

For use with XPress unions stainless and carbon steel only



Size	Code
15 - 18mm	27030
22mm	27031
28mm	27032
35mm	27033
42mm	27034
54mm	27035

S104 Flat face union fibre washer (Mk1)

For use with XPress unions (not suitable for stainless steel)



Size	Code
1/2"	38989
3/4"	38990
1"	38891
1 1/4"	38892
1 1/2"	38893
2"	38894
2 1/2"	38895

*If in doubt when ordering replacement washers, please contact the Pegler Yorkshire Sales Office.

S100 Replacement O rings

For use on XPress copper fittings only



Size	Code
12mm	39116
15mm	39115
18mm	39117
22mm	39122
28mm	39128
35mm	39135
42mm	39142
54mm	39154
66.7mm	39230
76.1mm	39231
108mm	39232

SS100 Replacement O rings

For use on XPress stainless and carbon fittings only



Size	Code
15mm	27000
18mm	27001
22mm	27002
28mm	27003
35mm	27004
42mm	27005
54mm	27006
76.1mm	27007
88.9mm	27008
108mm	27009

SV100 Viton O rings

For use on XPress copper and XPress solar fittings



Size	Code
12mm	39098
15mm	39100
18mm	39099
22mm	39101
28mm	39102
35mm	39103
42mm	39104
54mm	39105

SV105 Viton O rings

For use on XPress stainless and XPress carbon fittings only



Size	Code
15mm	27000
18mm	27001
22mm	27002
28mm	27003
35mm	27004
42mm	27005
54mm	27006
76.1mm	27007
88.9mm	27008
108mm	27009





SS110 Depth gauge

Suitable for copper



Size	Code
12 - 108mm	39173

S122 Copper tube preparation kit



Size	Code
35 - 54mm	39233

TC146 Rotodrive holder

For use with TC145/148



Size	Code
-	76203

SS111 Depth gauge

Suitable for carbon and stainless steel



Size	Code
12 - 108mm	39174

S135 Dri-slide lubricant

For use with jaws and slings only



Size	Code
115ml	39169

TC147 Noga 1000

For use with TC143/144



Size	Code
-	76208

S130 Silicone lubricant



Size	Code
100g tub	39219

TC143 Internal swivel blade

Cobalt - for use with TC147



Size	Code
All tube sizes	76200

TC148 Noga 3000

For use with TC145/146



Size	Code
-	76206

S115 Tube stripper

For use with SC660 tube



Size	Code
15mm	39260
18mm	39261
22mm	39262
28mm	39263
35 - 54mm	39264

TC144 Internal swivel blade

Carbide - BS 2015
For use with TC147



Size	Code
All tube sizes	76201

TC150 Noga deburring kit

Contains TC148/146/145



Size	Code
15 - 22mm	76207

TC145 External chamfer bit

For use with TC146/148



Size	Code
15 - 22mm	76202

S120 Deburring tool



Size	Code
12 - 54mm	39168

XPRESS PRESS POWER TOOLS



Pegler Yorkshire recommends the preferred XPress branded tooling for jointing XPress fitting Systems utilising the XPress Slings, Jaws and Tools. New and improved, they provide greater performance whilst being lighter and easier to handle. Incorporating an 'X' symbol, they provide an instant visual aid indicating the joint has been pressed using the preferred XPress tooling. The maintenance of tooling is critical to the joint integrity, therefore the installer should ensure the tools are maintained in accordance with the manufacturer's instructions and serviced by a recommended tool-hire service centre.

S210 ACO102 ▲



Power	Charging Time	Piston Force	Piston Stroke	Item Code
Battery 12V UPCR Li-Ion 1.5/3.0Ah	60 min	Max. 19kN	30mm	39195

Tube/Pipe: Copper	Tube/Pipe: Steel	Tool Dimensions	Other
12-35mm	15-35mm	350 x 62 x 80mm 1.7Kg	LED display for battery status and press error indicator

Compatible with XPress Systems	Contains
Copper, Carbon Steel, Stainless Steel, Copper Gas, Stainless Steel Gas and Solar	S210 ACO102, 2 x Batteries, Battery Charger Carry Case 480 x 350 x 110mm Total Weight: 4.1Kg

S225 ECO202 ■



Power	Piston Force	Piston Stroke	Item Code
Mains 110V, 450W	Max. 32kN	40mm	39244

Tube/Pipe: Copper	Tube/Pipe: Steel	Tool Dimensions	Other
12-54mm	15-54mm	430 x 75 x 111mm 3.9Kg	Visible electronic sensor for jaw locking bolt. Contains electronic log book for analysis

Compatible with XPress Systems	Contains
Copper, Carbon Steel, Stainless Steel, Copper Gas, Stainless Steel Gas and Solar	S225 ECO203 Carry Case 430 x 75 x 111mm Total Weight: 5.5Kg

S226 ACO203 ■



Power	Charging Time	Piston Force	Piston Stroke	Item Code
Battery 18V Li-Ion 1.5/3.0Ah	60 min	Max. 32kN	40mm	39201

Tube/Pipe: Copper	Tube/Pipe: Steel	Tool Dimensions	Other
12-54mm	15-54mm	408 x 80 x 125mm 3.3Kg	Visible electronic sensor for jaw locking bolt. Contains electronic log book for analysis

Compatible with XPress Systems	Contains
Copper, Carbon Steel, Stainless Steel, Copper Gas, Stainless Steel Gas and Solar	S226 ACO203, 1 x Battery, Battery Charger, Carry Case 557 x 422 x 132mm Total Weight: 7.9Kg





S230 ACO202XL +



Power	Charging Time	Piston Force	Piston Stroke	Item Code
Battery 18V Li-Ion 1.5/3.0Ah	60 min	Max. 32kN	40 or 80mm	39285
Tube/Pipe: Copper	**Tube/Pipe: Steel**	**Tool Dimensions**		**Other**
12-108mm	12-108mm	487 x 79 x 116mm 4.6Kg		Visible electronic sensor for jaw locking bolt. Contains electronic log book for analysis
Compatible with XPress Systems		**Contains**		
Copper, Carbon Steel, Stainless Steel, Copper Gas, Stainless Steel Gas and Solar		S230 ACO202XL, 2 x Batteries, Battery Charger, Carry Case 639 x 446 x 151mm Total Weight: 10.6Kg		

S303 ECO301 ◆



Power		Piston Force	Piston Stroke	Item Code
Mains 110V, 560W		Max. 45kN	45mm	39199
Tube/Pipe: Copper	**Tube/Pipe: Steel**	**Tool Dimensions**		**Other**
12-108mm	12-108mm	420 x 85 x 110mm 5.0Kg		Fast pressing cycle for quick installation. Microprocessor driven for constant optimisation of pressing performance
Compatible with XPress Systems		**Contains**		
Copper, Carbon Steel, Stainless Steel, Copper Gas, Stainless Steel Gas and Solar, Sprinkler ≤ 54mm Carbon Steel and Sprinkler ≤ 54mm Stainless Steel		S303 ECO301 Carry Case 639 x 466 x 151mm Total Weight: 12.3Kg		

S400 ACO401 ●



Power		Piston Force	Piston Stroke	Item Code
Battery 18V Li-Ion		Max. 100kN	60mm	39267
Tube/Pipe: Copper	**Tube/Pipe: Steel**	**Tool Dimensions**		**Other**
Not Compatible	76.1 - 108mm	660 x 100 x 250mm 13.0Kg		Microprocessor driven for constant optimisation of pressing performance
Compatible with XPress Systems		**Contains**		
Sprinkler; Carbon Steel and Sprinkler; Stainless Steel in sizes 76.1 – 108mm		S400 ACO401 Carry Case 630 x 130 x 465mm Total Weight: 25Kg		

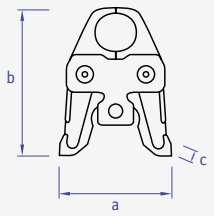


For Jaw and Sling compatibility, please refer to the symbols given with the tool above - to the Jaws and Slings in the following tables:

S211
PB1 Jaws

Compatibility: ▲



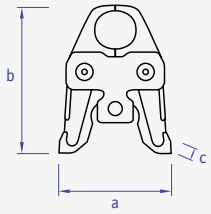


Size	a	b	c	Kg	Code
12mm	122	101	35	1	39191
15mm	122	101	35	1	39188
18mm	124	101	35	1	39189
22mm	126	101	35	1	39202
28mm	131	101	35	1	39203
35mm	143	101	35	1	39209

S227
ECOTEC PB2 Jaws

Compatibility: ■ +



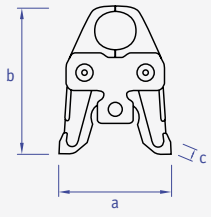


Size	a	b	c	Kg	Code
12mm	143	110	39	2	39179
15mm	143	110	39	2	39180
18mm	143	110	39	2	39181
22mm	147	110	39	2	39182
28mm	147	110	39	2	39183
35mm	154	110	39	2	39184

S327
ECO301 PB3 Jaws

Compatibility: ◆





Size	a	b	c	Kg	Code
12mm	150	128	39	2	39194
15mm	150	128	39	2	39204
18mm	150	128	39	2	39205
22mm	154	127	39	2	39206
28mm	154	127	39	2	39207
35mm	163	129	39	2	39208



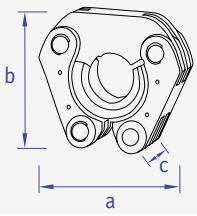
XPRESS PRESS SLINGS



S228
Snap on sling

Compatibility: ■ ◆ +





Size	a	b	c	Kg	Code
42mm	112	100	41	1	39186
54mm	124	112	41	2	39187

S330
Snap on sling

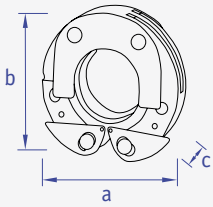
Compatibility: ◆ +



66.7 - 8.9mm



108mm



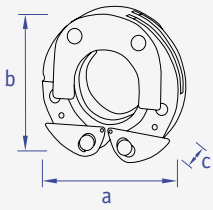
Size	a	b	c	Kg	Code
66.7mm	151	143	61	4	39220
76.1mm	164	155	61	4	39221
88.9mm	175	167	55	4	39224
108mm	209	205	77	6.3	39225

*S330 in size 108mm is not suitable for copper, use S322

S322
Sling (copper only)

Compatibility: ◆ +





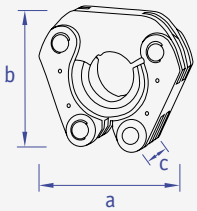
Size	a	b	c	Kg	Code
108mm	200	200	60	5	39222

S410 HP Snap on sling 35mm

Not suitable for copper

Compatibility: ■ ◆ +





Size	a	b	c	Kg	Code
35mm	112	100	41	2	39268
42mm	125	120	41	2	39269
54mm	125	122	41	2	39271

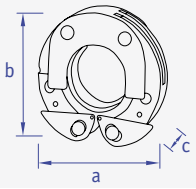


S411-HP401 Snap on sling

Carbon and stainless only

Compatibility: ●



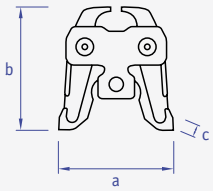


Size	a	b	c	Kg	Code
76.1mm	290	400	100	8	39273
88.9mm	290	400	100	8	39277
108mm	290	400	100	9	39279

S229 ZB203 Adaptor

Compatibility: ■



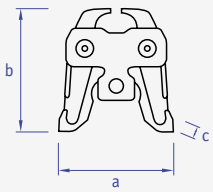


Size	a	b	c	Kg	Code
35-54mm	142	124	33	1	39190

S329 ZB303 Adaptor

Compatibility: ◆



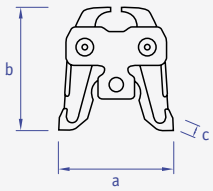


Size	a	b	c	Kg	Code
35-54mm	144	129	39	1	39227

S331 ZB323 Adaptor

Compatibility: ◆



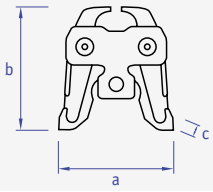


Size	a	b	c	Kg	Code
66.7-108mm	136	195	43	4	39213

S332 ZB324 Adaptor (2nd Press)

Compatibility: ◆





Size	a	b	c	Kg	Code
108mm	136	188	53	4	39214



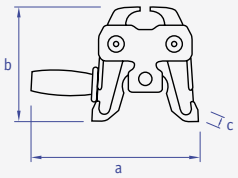
XPRESS PRESS ADAPTORS, BATTERIES AND CHARGERS



S231 ZB221 Adaptor

Compatibility: +



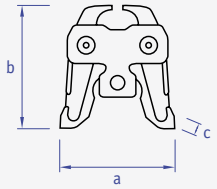


Size	a	b	c	Kg	Code
66.7-108mm	155	216	43	5	39286

S232 ZB222 Adaptor (2nd press)

Compatibility: +





Size	a	b	c	Kg	Code
108mm	155	216	43	5	39287

All 108mm fittings, regardless of material, require a 2nd press using the respective adaptor, with the exclusion of the S400 ACO401 as this is supplied with an internal adaptor.

BATTERIES

S340 ACO102 Battery

Compatibility: ▲

Size	Code
Li-Ion 12V 1.5Ah	39288
Li-Ion 12V 3Ah	39289

S342 ACO202 Battery

Compatibility: ■ (39292)

Compatibility: ■ ● (39293)

Size	Code
18V 1.5Ah	39292
18V 3Ah	39293

S344 AFP202 Battery

Novopress AFP202

Size	Code
Ni-Cd 14.4V 2Ah	39294
Li-Ion 18V 3Ah	39295

CHARGERS

S341 ACO102 Charger

Compatibility: ▲

Size	Code
12V (220-240v)	39290

S343 ACO202/401 Charger

Compatibility: ■ ●

Size	Code
230V	39291

S345 AFP202 Charger

Novopress AFP202

Size	Code
230V	39296

PRESS TOOLS AND JAWS



PRESS TOOLS APPROVED FOR PRESSING XPRESS						
Dimension (mm)	Manufacturer	Press Tool	Systems	Jaws (up to 35mm)	Sling Jaw adaptor (42mm and above)	Sling (Copper Stainless/Carbon)
12 - 35mm	REMS	REM-578012 Mini-Press ACC Battery powered (14.4V)	-	Mini M12 - M35*	-	-
1 - 54mm	REMS	REM-571013 Akku-Press Battery powered (14.4V)	-	M12 - M35*	Z2	M42 (PR-3S) M54 (PR-3S)
		REM-571014 Akku-Press ACC Battery powered (14.4V)	-	M12 - M35*	Z3	M42 (PR-3S) M54 (PR-3S)
		REM-577011 Power-Press	-	M12 - M35*	Z3	M42 (PR-3S) M54 (PR-3S)
		REM-572110 Power-Press E	-	M12 - M35*	Z3	M42 (PR-3S) M54 (PR-3S)
		REM-577010 Power-Press ACC	-	M12 - M35*	Z3	M42 (PR-3S) M54 (PR-3S)
12 - 28mm	Novopress	AFP101 Battery powered (9.6V)	-	PB1	-	-
		ACO102 Battery powered (12V)	-	PB1	-	-
12 - 54mm	Novopress	EFP2 (230V)	-	PB2 (ECOTEC)	ZB201/ZB203	35 (HP only) / 42 / 54**
		EFP201 / 202 / (230V)	-	PB2 (ECOTEC)	ZB201/ZB203	35 (HP only) / 42 / 54**
		AFP201 / 202 (14.4V)	-	PB2 (ECOTEC)	ZB201/ZB203	35 (HP only) / 42 / 54**
		ECO202	-	PB2 (ECOTEC)	ZB201/ZB203	35 (HP only) / 42 / 54**
		ACO202	-	PB2 (ECOTEC)	ZB201/ZB203	35 (HP only) / 42 / 54**
12 - 54mm	Novopress	ACO202XL	-	PB2 (ECOTEC)	ZB201/ZB203	35 (HP only) / 42 / 54**
		ECO301	-	PB3 (ECO301)	ZB303	35 (HP only) / 42 / 54**
66.7mm	Novopress	ACO202XL	-	-	ZB221	66.7mm Sling***
		ECO301	-	-	ZB323	66.7mm Sling***
76.1 - 108mm	Novopress	ACO202XL	-	-	ZB221	76.1 / 88.9 / 108
		ECO301	-	-	ZB323	76.1 / 88.9 / 108
108mm (2nd)	Novopress	ACO202XL	-	-	ZB222	Snap On Sling (Copper specific)
		ECO301	-	-	ZB324	Snap On Sling (Copper specific)
76.1 - 108mm	Novopress	ACO401	Carbon / Stainless / Sprinkler only	-	Integral adaptor on machine	HP401 Snap On Sling
15 - 54mm	Ridgid	RP 340	Not approved with Ridgid jaws - only with compatible Novopress / REMS jaws and slings			

*For 18 and 28mm, only use jaws with marking '108' (Q1,2008) or '208' (Q2 2008) and higher
**HP Snap On Sling for Stainless / Carbon applications only
***See page 105 for guidance on pressing 66.7mm fittings
All 108mm fittings require a 2nd press using the respective adaptor. Copper uses the S322 copper only sling.





*66.7mm (67mm) Sling (S330 Snap on sling)

Novopress offers alternative slings for use on different press systems. As such Pegler Yorkshire reinforces the following instruction.

Where 66.7mm slings are required for crimping XPress fittings, installers must only use the following XPress/Novopress slings and adaptors:

Novopress Reference	Sling Marking	Novopress Adaptor
36516-50	"Woeste" 67mm	ZB302 42-66.7mm
45184-50	"XPress" 66.7mm	ZB323 66.7-108mm





Under no circumstances should any other brand of sling be used with our 66.7mm fittings as these will lead to an incorrect crimp resulting in an immediate joint failure and invalidate the Pegler Yorkshire warranty.

XPress 66.7mm fittings that have inadvertently been crimped with the wrong brand of sling cannot be successfully re-crimped with the XPress 66.7 sling and will unfortunately have to be cut out and replaced with a new fitting using the correct sling.

Note: Pegler Yorkshire 66.7mm will be referred to as 66.7mm and/or 67mm.

POWER SUPPLY

It is essential when preparing to undertake an installation using XPress fittings and tools that a suitable constant power source is available. If the supply of power is not constant it may affect the performance of the joint.

Checking the power source is particularly important prior to joining with the ECO202 and ECO301 tool as it includes safety software, which detects the amount of power available to the machine. If there is not enough for the tool to initiate the pressing cycle and complete a sound joint the tool will not commence the pressing operation. This feature is particularly useful when installing large size press fittings, as the pressure required to press these fittings is significantly greater than for smaller fittings, hence the power supply to the tool must be guaranteed.

It is therefore recommended that when using a portable transformer to provide power to the press tool, the transformer should be a minimum of 3KVA rated in order that a continuous uninterrupted power supply is always available.

When a semi-permanent source of power such as a generator is being used it is essential the plant is well maintained. The maximum cable size from generator to outlet and the minimum length of cable between the power outlet and the tool should be used.





3.0 TECHNICAL DATA

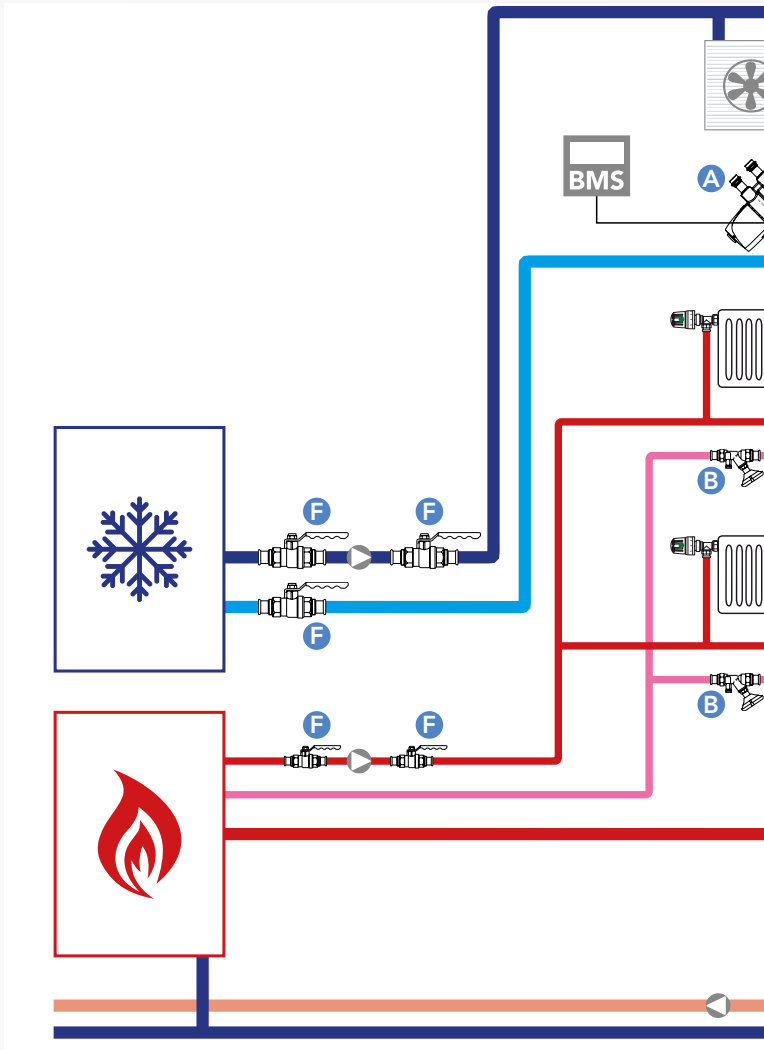
VALVES FOR THE XPRESS SYSTEM

The XPress range is supported by a comprehensive selection of adapted press-fit valves from Pegler Yorkshire's Ballorex and Pegler valve portfolios. The valves are available with standard XPress press-fit by XPress press-fit ends (PS) or XPress press-fit by XPress press union ends (PSU).

XPress press union ends provide an ideal break points that enables system maintenance and for equipment to be disconnected and reconnected for servicing.







BALLOREX
Dynamic Valve (PICV)

For automatic balancing of sections of pipe work and equipment in HVAC applications. Dynamic PICV (Pressure Independent Control Valve) with direct flow measuring. Available in sizes 15mm to 18mm (PS) and 35mm to 54mm (PSU).

A



BALLOREX
Fixed Orifice Commissioning Valve (FODRV)

For the isolation and balancing of sections of pipe work and equipment in HVAC applications. Valves can be double regulated and closed to a pre-selected value, set when commissioned. Available in sizes 15mm to 54mm (PS) and 15mm to 54mm (PSU) on both outlet or inlet.

Alternatively Ballorex Venturi Commissioning valve (FODRV) are also available for maximum accuracy of +/-3%.

B



BALLOREX
Circulation Valve

Enables the automatic thermal balancing and high temperature disinfection of hot water circulating systems, denying bacteria the optimum conditions for growth. Available in sizes 15mm to 28mm (PS and PSU).

C



PEGLER
Pressure Reducing Valve

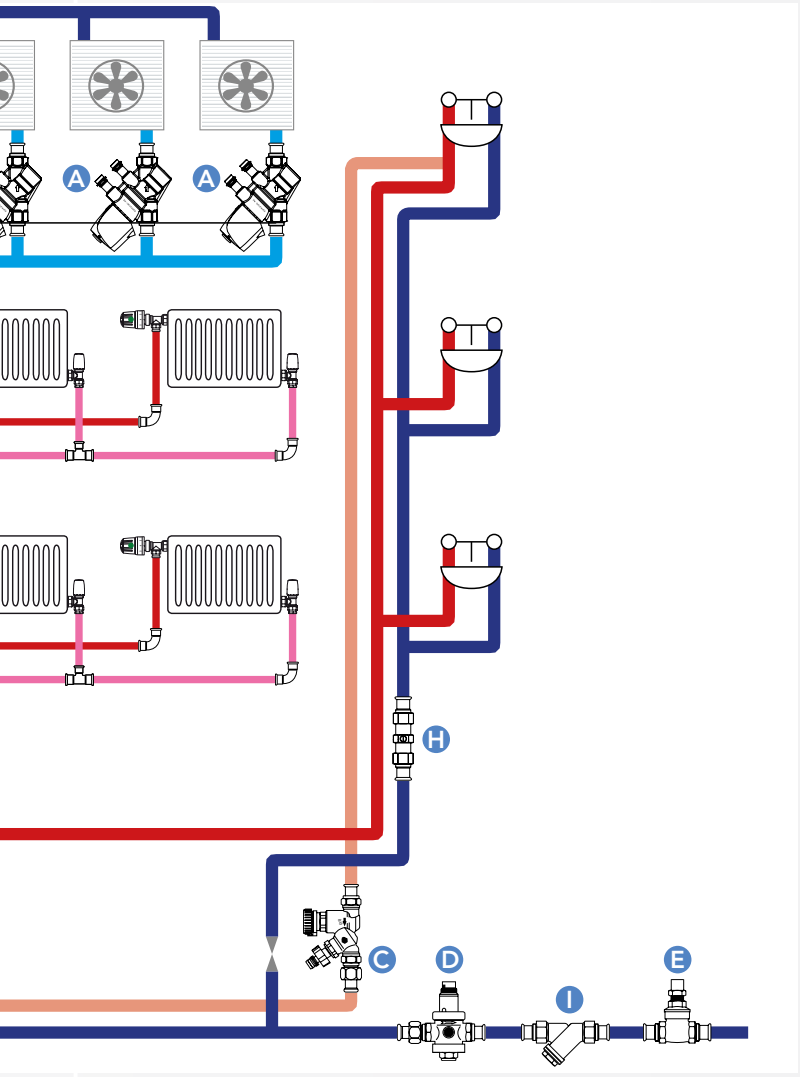
Enables potentially damaging water pressures to be reduced. Adjustable 0.5 to 6.0 bar. Available in sizes 15mm to 54mm (PS) and 15mm to 28mm (PSU).

D









PEGLER
Quarter Turn Ball Valve

Allow for the quick isolation of sections of pipe work and equipment. Available in Brass or DZR Brass in sizes 15mm to 54mm (PS and PSU).

The ball valve range are offered with lever, tee, extended stem and lockshield variations.

F



PEGLER
Bronze Y pattern strainer

For the protection of equipment in pipe work systems. Available in 15mm to 54mm (PS and PSU).

I



PEGLER
Double check valve

Prevent back flow and protect pipe work systems from contamination. Available in 15mm to 54mm (PS and PSU).

Pegler Bronze swing check valve are also available.

H



PEGLER
Gate Valve

Allow for the isolation of sections of pipe work and equipment. Available in a range of valve body materials including Brass, DZR Brass and Bronze, in sizes 15mm to 54mm (PS and PSU) with wheel head and lockshield versions.

E



XPress
Flange

A full range of XPress press-fit flanges provide compatibility to our range of large flanged valves that include Butterfly, Gate, Ball, Check valves and Strainers. Available in 66.7mm/DN65/2 ½" to 108mm/DN100/4".

G



XPress





3.0 TECHNICAL DATA

TUBE COMPATIBILITY AND APPLICATIONS

FITTING AND TUBE COMPATABILITY							
Tube/pipe type	XPress Copper	XPress Chromium Plated	XPress Stainless	XPress Carbon	XPress Copper Gas	XPress Stainless Gas	XPress Solar
Copper tube**	✓	-	-	-	✓	-	✓
Chromium plated copper tube	-	✓	-	-	-	-	-
Stainless steel tube	-	-	✓	-	-	✓	-
Carbon steel tube	-	-	✓*	✓	-	-	-
Plastic coated carbon steel tube	-	-	✓*	✓	-	-	-
It is advisable to make copper to steel connections via gunmetal/copper alloy fittings							

*Heating applications only. **For XPress solar, copper tube with a maximum temperature of 200°C.

TYPICAL APPLICATIONS					
XPRESS COPPER	XPRESS STAINLESS	XPRESS CARBON	XPRESS COPPER GAS	XPRESS STAINLESS GAS	XPRESS SOLAR
Hot and cold water services Vented and unvented closed circuit heating Chilled water and synthetic oil-free compressed air applications With chromium plated finish for surface mounted installations	Potable water applications where water quality and hygiene are crucial Pharmaceutical, food and health-care environments Chilled water applications Sprinkler System applications	Vented and unvented closed circuit heating Chilled water applications Synthetic oil-free compressed air Sprinkler System applications	Internal and external applications Above ground 2nd and 3rd family gas service pipeline	Above ground 2nd and 3rd family gas service pipelines, including instances where high levels of hydrogen sulphide make copper unsuitable	Solar water heating systems Synthetic oil-free compressed air

- For Fire Protection see XPress Sprinkler Data Book.
- Contact us for other applications.





MATERIALS SPECIFICATION AND MANUFACTURING STANDARDS

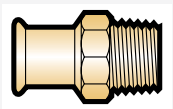
MATERIALS SPECIFICATION			
Component	Body	O Ring	O Ring bead
XPRESS COPPER	Copper/Copper Alloy or Gunmetal Alloy	EPDM*	Copper
XPRESS STAINLESS	Stainless Steel (316L)	EPDM*	-
XPRESS CARBON	Carbon Steel ST34-2 (Nickel Plated)	EPDM*	-
XPRESS COPPER GAS	Copper/Copper Alloy or Gunmetal Alloy	Yellow HNBR†	-
XPRESS STAINLESS GAS	Stainless Steel (316L)	Yellow HNBR†	-
XPRESS SOLAR	Copper/Copper Alloy or Gunmetal Alloy	Green (FPM) (Viton™)	Copper

NB. O rings are supplied lubricated for easy tube insertion. *Ethylene Propylene Diene Monomer. †Hydrogenated Aerylonitrile Butadiene Rubber.

MANUFACTURING STANDARDS								
Component	Standard	Summary	XPRESS COPPER	XPRESS STAINLESS	XPRESS CARBON	XPRESS COPPER GAS	XPRESS STAINLESS GAS	XPRESS SOLAR
Male end thread	ISO 7/EN10226-1 (formerly BS 21/ISO 7)	Pipe-threads, where pressure-tight joints are made on the threads (metric dimensions)	✓	✓	✓	✓	✓	✓
Female end thread	BS EN ISO 228:2003 (formerly BS 2779/ISO R228/1)	Pipe-threads, where pressure-tight joints are not made on the threads (metric dimensions)	✓	-	-	✓	-	✓
Female end thread	ISO 7/1 EN 10226-1	Pipe-threads, where pressure-tight joints are not made on the threads (metric dimensions)	-	✓	✓	-	✓	-

CONNECTORS

Male Connectors



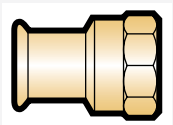
XPress male connectors have threads to BS 21/ISO 7 EN 10226-1. Inert jointing compounds or PTFE tape should be applied to taper threads.

PTFE tape should not be used in conjuction with stainless steel threads due to the water soluble chloride ions it contains.

XPress flat face unions are supplied with Fibre washer seals (XPress copper).

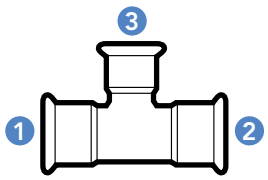
EPDM washer seals (XPress carbon and stainless).

Female Connectors



XPress female threaded connectors have internal parallel threads to ISO 7/EN 10226-1.

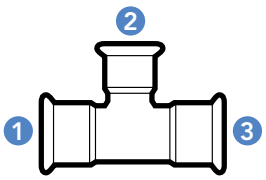
TEE SPECIFICATION



UK specification

First quote the ends on the run (larger end first) and then the branches

eg: 22 x 22 x 15



European specification

Quote the larger end first, then the branch, followed by the remaining end.

eg: 22 x 15 x 22

XPress





3.0 TECHNICAL DATA

WORKING TEMPERATURES AND PRESSURE TABLES

XPress Copper fittings have all been tested and are suitable for use with approved tubes at temperatures from -20 to 110°C at a maximum working pressure of 16bar throughout the temperature range.

XPress Solar is approved with tube meeting the temperature rates shown in the table below and operates from -20 to 200°C at a maximum working pressure of 16bar, see exposure table on page 135.

XPress Stainless and XPress Carbon fittings have been tested and are suitable for use with approved tubes at temperatures from -35 to 135°C at a maximum working pressure of 16bar throughout the temperature range. For high working pressure applications contact the Pegler Yorkshire technical help desk.

XPress Copper Gas fittings are approved for use with copper tubes to BS EN 1057 at temperatures from -20 to 70°C and a maximum working pressure of 5bar for outside above ground pipework and 1bar within buildings.

As part of the DVGW/ BSI approvals process, XPress Gas fittings have passed the High Temperature Test at 650°C for 30 minutes at PN1 (copper)/PN5 (stainless).

WET SYSTEM INSTALLATIONS

In wet system installations we recommend all systems be thoroughly tested upon completion. The installation may be tested to 1.5 times the working pressure of the system, up to a maximum of 16bar. If higher test pressures are required advice should be sought from Pegler Yorkshire.

ACHIEVING LOW TEMPERATURES

For products used in water systems, working temperatures of less then 4°C can only be achieved if antifreeze is added to the system.

LOCALISED ANNEALING OF COPPER TUBE

XPress Copper installation should not be carried out within 300mm of a brazed or soldered joint, as the high temperature required for capillary jointing anneals the copper tube rendering it too soft for press-fit jointing. In an existing XPress Copper installation, brazing or soldering should not be carried out within 300mm of an existing press joint as this may damage the O ring.

Do not braze or weld XPress carbon or XPress stainless steel tubes.

PRESSURE TESTING OF CARBON STEEL SYSTEMS

The following recommendations apply concerning the testing of XPress Carbon Steel.

Due to the potential for corrosion and perforation of carbon steel tube and fitting systems left partially drained for extended periods following hydraulic testing, it is recommended that XPress Carbon Steel systems be dry air/nitrogen tested, up to a maximum of 3bar.

If hydraulic testing must be undertaken the following should be considered.

A. The test water should contain anti-corrosion chemicals with the intention that post testing the system shall be left completely full of water (suitable protection against freezing will also have to be considered).

B. If leaving the system full of water is not practical then every effort shall be made to fully drain and dry the pipe work by purging with dry air.

Regarding the air/nitrogen testing of pipe work with XPress Carbon Steel crimped fittings the following points will need to be considered.

1. The air should be clean, dry and free from oil. Excessive oil carried over in compressed air may be detrimental to the EPDM seals. This is not a problem with nitrogen.

2. Air is many times more searching than water. Hence, if the purpose of the air test is only leak detection, then 0.5bar pressure will be more than sufficient. Higher pressures can in fact mask sealing issues that would be revealed by low-pressure tests.

3. The need for higher test pressures to prove the mechanical integrity of the joints brings with it serious safety issues. Testing for such a failure mode with high-pressure air/nitrogen is potentially very dangerous as the energy stored in 5bar air/nitrogen, when released suddenly, could lead to damage to equipment or more seriously, injury to personnel. HSE issue guidelines for such testing should be strictly adhered too.

4. It is therefore recommended that an initial low pressure test at 0.5bar is carried out, having put the necessary safety measures in place, to enable any leaks to be found. Significantly leaking, un-pressed or damaged joints shall be replaced, but those with low leakage rates should be identified for close inspection during the high-pressure test. The full loading of the O rings often resolve small leaks identified during the 0.5bar test. When satisfied that the system is sound and having the necessary safety measures in place a 1.5 times working pressure test can be carried out as per the Copper Development Association (CDA) Guidelines document 'Pressure Testing Piping Systems'. Leaking joints at this stage should be identified and marked for replacement. The system pressure should then be reduced to 0.5bar again to confirm that no persistent low-pressure leaks are present.

NOTE: The maximum temperature and pressure range in any system is dictated by the component with the lowest performance rating.





PRESSURE EQUIPMENT DIRECTIVE

From 30th May 2002 most pressure equipment and assemblies on the market in the United Kingdom must comply with the Pressure Equipment Directive (PED) 1999. Fittings are exempt from the PED unless they are incorporated into pressure equipment falling within its scope. XPress valves are also exempt.

For a detailed explanation please visit:

www.pegleryorkshire.co.uk/technical.cfm

CE marking

CE marking is a manufacturers' declaration that their product complies with the essential requirements of all relevant European Directives and Regulations.

From 1 July 2013 manufacturers in Europe must comply with the Construction Products Regulations (EU) 305/2011. This regulation requires manufacturers to apply CE marking if their product is covered by a harmonised European Standard (hEN) or a European Technical Assessment (ETA).

At the time of going to print, there are currently no hENs or ETAs which apply to XPRESS, TECTITE, HENCO, YORKSHIRE, ENDEX, KUTERLITE, tube or fitting product ranges and consequently no requirement for CE marking. For more updated information please visit

www.pegleryorkshire.co.uk or www.gov.uk/cemarking

EQUIPOTENTIAL BONDING

It is the installers duty to ensure that all metallic pipework systems should comply with the equipotential bonding requirements of the current edition of the IEE electrical wiring regulations (BS 7671 1992).

All XPress products (below) provide guaranteed electrical continuity once the joints are pressed.

After all plumbing work has been completed, always ensure continuity checks are conducted by a qualified electrician in accordance with regulations.

ELECTRICAL CONTINUITY	
XPRESS COPPER	✓
XPRESS STAINLESS	✓
XPRESS CARBON	✓
XPRESS COPPER GAS	✓
XPRESS STAINLESS GAS	✓
XPRESS SOLAR	✓



XPress fitting	Tube/pipe used with	Min. temperature and pressure	Max. temperature and pressure
XPRESS COPPER	Copper	-20°C / 16bar	110°C / 16bar
XPRESS COPPER CHROMIUM PLATED	Copper chromium plated copper	-20°C / 16bar	110°C / 16bar
XPRESS STAINLESS	Stainless steel	-35°C / 16bar	135°C / 16bar
XPRESS CARBON	Carbon steel	-35°C / 16bar	135°C / 16bar
	Plastic coated carbon steel	-35°C / 16bar	135°C / 16bar
XPRESS COPPER GAS	Copper	-20°C / 1bar*	70°C / 5bar**
XPRESS STAINLESS GAS	Stainless steel	-20°C / 1bar*	70°C / 5bar**
XPRESS SOLAR†	Copper	-20°C / 3bar	200°C / 10bar

All performance figures based on correct assembly of fittings and tube/pipe as detailed in installation instructions. *1bar inside. **5bar outside above ground.
†For solar application refer to the Solar Exposure table on page 135.





3.0 TECHNICAL DATA

TUBES, PIPE AND THEIR COMPATIBILITIES



COPPER TUBE

Compatible copper tube must meet the requirements of BS EN 1057 R250 and R290 for copper and copper alloy – seamless round copper tubes for water (and gas) in sanitary and heating applications.

The higher the number, the harder the material. As a result, tube diameter, wall thickness, length and the material temper must all be specified for full product designation.

All XPress Copper, Copper Gas and XPress Solar fittings can be used with copper tube, although in humid conditions some staining of the tube may be witnessed (see page 128 Phenolic foam section for details on moisture-proof insulation).

XPress Solar requires Copper tube capable of operating to higher temperature ratings (200°C) for Solar Application.

Copper tube BS EN 1057 Compatibility: XPress Copper, XPress Copper Gas fittings and XPress Solar. All tube tempers (R250 and R290) are available in all the designated wall thicknesses

Outside diameter	0.7mm	0.9mm	1.0mm	1.2mm	1.5mm	2.0mm	2.5mm
12mm	–	–	R290	–	–	–	–
15mm	R250 R290	–	R250 R290	–	–	–	–
22mm	–	R250 R290	R250 R290	R250 R290	–	–	–
28mm	–	R250 R290	R250 R290	R250 R290	R290	–	–
35mm	–	–	–	R250 R290	R290	–	–
42mm	–	–	–	R250 R290	R290	–	–
54mm	–	–	–	R250 R290	–	R290	–
66.7mm	–	–	–	R250	–	–	–
76.1mm	–	–	–	–	R250 R290	R290	–
88.9mm	–	–	–	–	–	R290	–
108mm	–	–	–	–	R250 R290	–	R290







STAINLESS STEEL 316 SYSTEM TUBE

Specially designed to be used with XPress stainless steel fittings, 316 System tube is available in 6m straight lengths in sizes from 15 to 108mm. The tube is manufactured from BS 316 S31/DIN 1.4401 stainless steel strip conforming to BS10088 Part 2 and thanks to its thin-walled geometry, is stiff, lightweight and easy to handle.

However, when bending 316 System tube we recommend the use of the Rothenberger Robend 3000 with rollers up to 28mm - with the exception of SS610.

XPress stainless gas fittings are also compatible with stainless steel tubes to BS EN 10312 (encompassing the former BS 4127) and DVGW GW541.

Stainless steel 316 System tube: Specification

Outside diameter	316 System tube SS610 (HWG) SS620 (HWG+S)	Wall thickness	
		EN 10312 Table 1 (formerly BS 4127) (Comparison)	EN 10312 Table 2 GW541 Table 3 (Comparison)
15mm	0.6mm	0.6mm	1.0mm
18mm	0.7mm	0.7mm	1.0mm
22mm	0.7mm	0.7mm	1.2mm
28mm	0.8mm	0.8mm	1.2mm
35mm	1.0mm	1.0mm	1.5mm
42mm	1.1mm	1.1mm	1.5mm
54mm	1.2mm	1.2mm	1.5mm
76.1mm	2.0mm	–	2.0mm
88.9mm	2.0mm	–	2.0mm
108mm	2.0mm	–	2.0mm





3.0 TECHNICAL DATA

TUBES, PIPE AND THEIR COMPATIBILITIES



XPRESS GALVANISED CARBON STEEL SYSTEM TUBE AND PLASTIC COATED CARBON STEEL SYSTEM TUBE

Carbon steel System tube is available in 3m straight lengths in sizes from 15 to 54mm, also available in 6m straight lengths in sizes from 15 to 108mm.

Plastic coated galvanised carbon steel tube is available in straight 6 metre lengths in sizes 15 to 54mm. Galvanised carbon steel System tube is manufactured in accordance with EN10305-3 from material with a very low carbon content and has a thin walled profile resulting in a lightweight easier to handle product.

The galvanised coating (external only) has a minimum thickness of 7 microns and is thermally applied which provides a superior bond to the tube and further resistance to corrosion.

XPress Carbon fittings can be used with our SC640 galvanised carbon steel System tube or our SC660 plastic coated carbon steel System tube.

Carbon tube and fittings should not be installed and exposed to the elements.

Prior to installation, XPress tube and fittings should be stored and protected under a protective cover. For exposed pipework consider XPress stainless steel.

XPress galvanised carbon steel tube: Specification

Outside diameter	Outside diameter including plastic coating	Wall thickness EN 10305-3 Table 1 GW541 Table 2 (formerly BS 4127)	
		Galvanised tube	Including plastic coating
15mm	17mm	1.2mm	2.2mm
18mm	19mm	1.2mm	2.2mm
22mm	24mm	1.5mm	2.5mm
28mm	30mm	1.5mm	2.5mm
35mm	37mm	1.5mm	2.5mm
42mm	44mm	1.5mm	2.5mm
54mm	56mm	1.5mm	2.5mm
66.7mm	–	1.5mm	–
76.1mm	–	2.0mm	–
88.9mm	–	2.0mm	–
108mm	–	2.0mm	–





XPRESS TUBE SPECIFICATIONS

SS600 Stainless Steel 316 Tube (HWG+S) 1.4401

Suitable for Heating, Potable Water, Gas and XPress Sprinkler Systems

LPCB Approved

Outer Size	Tube Length metre	Inner ø	Wall thickness	Specifications/ Table	Mass Kg/m	Tube Capacity L/m	Code
15mm	6	13.0	1.0	EN 10312 Table2	0.350	0.133	25050
18mm		16.0	1.0		0.425	0.201	25051
22mm		19.6	1.2		0.624	0.302	25052
28mm		25.6	1.2		0.804	0.515	25053
35mm		32.0	1.5		1.257	0.804	25054
42mm		39.0	1.5		1.519	1.195	25055
54mm		51.0	1.5		1.969	2.043	25056

SS610 Stainless Steel 316 Tube (HWG) 1.4401

Suitable for Heating, Potable Water, Gas. Not suitable for XPress Sprinkler Systems

Outer Size	Tube Length metre	Inner ø	Wall thickness	Specifications/ Table	Mass Kg/m	Tube Capacity L/m	Code
15mm	6	13.8	0.6	EN 10312 Table1	0.216	0.150	25010
18mm		16.6	0.7		0.303	0.216	25001
22mm		20.6	0.7		0.373	0.333	25002
28mm		26.4	0.8		0.544	0.547	25016
35mm		33.0	1.0		0.850	0.855	25018
42mm		39.8	1.1		1.125	1.244	25019
54mm		51.6	1.2		1.584	2.091	25021

SS620 Stainless Steel 316 Tube (HWG+S) 1.4401

Suitable for Heating, Potable Water, Gas and XPress Sprinkler Systems

LPCB Approved

Outer Size	Tube Length metre	Inner ø	Wall thickness	Specifications/ Table	Mass Kg/m	Tube Capacity L/m	Code
76.1mm	6	72.0	2.0	EN 10312 Table 2	3.701	4.072	25026
88.9mm		84.9	2.0		4.346	5.661	25028
108mm		104.0	2.0		5.302	8.495	25030

SS630 Stainless Steel AISI 444 Grade Sprinkler Tube 1.4521

Suitable for Heating and XPress Sprinkler Systems

LPCB Approved

Outer Size	Tube Length metre	Inner ø	Wall thickness	Specifications/ Table	Mass Kg/m	Tube Capacity L/m	Code
22mm	6	19.6	1.2	EN 10312	0.624	0.302	25072
28mm		25.6	1.2		0.804	0.515	25073
35mm		32.0	1.5		1.240	0.804	25074
42mm		39.0	1.5		1.519	1.195	25075
54mm		51.0	1.5		1.969	2.043	25076





3.0 TECHNICAL DATA

XPRESS TUBE SPECIFICATIONS

SS640 Stainless Steel AISI 439 Grade Sprinkler Tube 1.4520

Suitable for Heating and XPress Sprinkler Systems

LPCB Approved

Outer Size	Tube Length metre	Inner ø	Wall thickness	Specifications/ Table	Mass Kg/m	Tube Capacity L/m	Code
22mm	6	19.6	1.2	EN 10296-2	0.624	0.302	25067
28mm		25.6	1.2		0.804	0.515	25068
35mm		32.0	1.5		1.257	0.804	25069
42mm		39.0	1.5		1.519	1.195	25070
54mm		51.0	1.5		1.969	2.043	25071

SC640 Tectite / XPress Standard Carbon Galvanised Tube

Suitable for Heating/Chilled applications. Not suitable for XPress Carbon Sprinkler System

NEW 3m

Outer Size	Tube Length metre	Inner ø	Wall thickness	Specifications/ Table	Mass Kg/m	Tube Capacity L/m	Code
15mm	3	12.6	1.2	EN 10305-3 (previously DIN 2394)	0.408	0.125	45080
18mm		15.6	1.2		0.497	0.191	45081
22mm		19.0	1.5		0.758	0.284	45082
28mm		25.0	1.5		0.980	0.491	45083
35mm		32.0	1.5		1.239	0.804	45084
42mm		39.0	1.5		1.498	1.195	45085
54mm		51.0	1.5		1.942	2.043	45086

SC640 Tectite / XPress Standard Carbon Galvanised Tube

Suitable for Heating/Chilled applications. Not suitable for XPress Carbon Sprinkler System

6m

Outer Size	Tube Length metre	Inner ø	Wall thickness	Specifications/ Table	Mass Kg/m	Tube Capacity L/m	Code
15mm	6	12.6	1.2	EN 10305-3 (previously DIN 2394)	0.408	0.125	25080
18mm		15.6	1.2		0.497	0.191	25081
22mm		19.0	1.5		0.758	0.284	25082
28mm		25.0	1.5		0.980	0.491	25083
35mm		32.0	1.5		1.239	0.804	25084
42mm		39.0	1.5		1.498	1.195	25085
54mm		51.0	1.5		1.942	2.043	25086
66.7mm		63.7	1.5		2.412	3.187	25090
76.1mm		72.0	2.0		3.650	4.072	25087
88.9mm		84.9	2.0		4.286	5.661	25088
108mm		104.0	2.0		5.228	8.495	25089





SC645 XPress Sprinkler Carbon Galvanised Tube

Suitable XPress Carbon Sprinkler System only

LPCB Approved

Outer Size	Tube Length metre	Inner ø	Wall thickness	Specifications/ Table	Mass Kg/m	Tube Capacity L/m	Code
22mm	3	19.0	1.5	EN 10305-3 (previously DIN 2394)	0.758	0.284	25102
28mm		25.0	1.5		0.980	0.491	25103
35mm		32.0	1.5		1.239	0.804	25104
42mm		39.0	1.5		1.498	1.195	25105
54mm		51.0	1.5		1.942	2.043	25106

SC645 XPress Sprinkler Carbon Galvanised Tube

Suitable XPress Carbon Sprinkler System only

LPCB Approved

Outer Size	Tube Length metre	Inner ø	Wall thickness	Specifications/ Table	Mass Kg/m	Tube Capacity L/m	Code
22mm	6	19.0	1.5	EN 10305-3 (previously DIN 2394)	0.758	0.284	25094
28mm		25.0	1.5		0.980	0.491	25095
35mm		32.0	1.5		1.239	0.804	25096
42mm		39.0	1.5		1.498	1.195	25097
54mm		51.0	1.5		1.942	2.043	25098
76.1mm*		72.0	2.0		3.650	4.072	25099
88.9mm*		84.9	2.0		4.286	5.661	25100
108mm*		104.0	2.0		5.228	8.495	25101

* Not LPCB Approved

SC660 XPress Standard Carbon Tube with Plastic Coating

Suitable for Heating/Chilled applications. Not suitable for XPress Carbon Sprinkler System

Outer Size	Tube Length metre	Inner ø	Wall thickness	Specifications/ Table	Mass Kg/m	Tube Capacity L/m	Code
15mm	6	12.6	1.2	EN 10305-3 (previously DIN 2394)	0.408	0.125	25060
18mm		15.6	1.2		0.497	0.191	25061
22mm		19.0	1.5		0.758	0.284	25062
28mm		25.0	1.5		0.980	0.491	25063
35mm		32.0	1.5		1.239	0.804	25064
42mm		39.0	1.5		1.498	1.195	25065
54mm		51.0	1.5		1.942	2.043	25066

XPress





3.0 TECHNICAL DATA

XPRESS TUBE SPECIFICATIONS

XPRESS STAINLESS STEEL TUBE (SS610) 1.4401

The XPress /Tectite Stainless Steel Tube is available in sizes from 15 to 54mm and is ideal for potable and heating installations. When used in an XPress System, it is suitable for use with gas applications. As part of the BSI (formerly GL/British Gas) approvals process, XPress Stainless Gas System (tube and fittings) has passed the High Temperature Leakage Rate test at 650°C for 30minutes at PN5/GT1.

Lightweight and easy to handle XPress/ Tectite Stainless Steel Tube allows for ease of installation when used in straight lengths. We do not recommend tube bending for SS610, see table opposite.

APPLICATIONS

- Installations always have to comply with local regulations
- Suitable for a wide range of applications including (H.W) Heating and Water
- All potable water installations in accordance with international drinking water institutes, for example WRAS
- Potable water industrial applications e.g. Pharmaceutical, food and healthcare environments
- Water supply and rainwater installations
- Chilled water and heating applications
- Conditioned water such as decalcified/ softened water, partial and complete desalinated water, distilled water with glycol* (concentrations of up to 40%)
- Compressed air systems (see page 133)

*Further additives for antifreeze must be compatible with EPDM O Rings. Approval must be sought from Pegler Yorkshire prior to installation.

TECHNICAL CHARACTERISTICS	
Manufacturing specification	EN 10312 – Table1
Material	Stainless Steel Tube X5CrNiMo 17 12 2 material No. 1.4401 BS 316 S31/DIN 1,4401 Strips conforming to BS EN 1008-2; 2005
Manufacturing process	BS 316 S31/DIN 1,4401 Strips conforming to BS EN 1008-2; 2005 TIG weld 100% EDDY CURRENT tested according to BS EN 10246-2
Finish	As welded
Marking	Tectite/XPress Stainless System Tube SS610 [dimensions x wall thickness] mm 16 bar -20°C to 110°C [date/time] [batch number] [stock control code]
Surface finish	Matt silver coloured
Smallest bending radius	Bending is not recommended
Supply mode	Tubes are supplied in 6m lengths -0/+50mm with protective caps (Green)
Heat expansion	0.0160mm/m at ΔT = 1K
Max. operating pressure	16bar





XPRESS STAINLESS STEEL TUBE (SS600/SS620) 1.4401 (AISI 316)

The XPress stainless steel tube has been tested and approved for potable water installations by many international certification institutes including WRAS, LPCB, to DVGW/DIN and DVGW-Worksheet GW541.

As part of the DVGW/BSI (formerly GL,British Gas) approvals process, XPress Stainless Steel Gas fittings have passed the High Temperature Leakage Rate Test at 650°C for 30 minutes at PN5/GT1. The maximum working pressure inside buildings is 1bar and outside buildings is 5bar (maximum pressure test 7.5bar)

APPLICATIONS

- Installations always have to comply with local regulations
- Suitable for a wide range of applications including (H.W.G.S) Heating, Water, Gas & Stainless Sprinkler System
- All potable water installations in accordance with international drinking water institutes, for example, WRAS the German Potable Water Decree (TrinkwV) and EU council directive98/83/EC, DIN50930 Part 6 and in compliance with DIN 1988
- Water supply and rain water installations
- Potable water for industrial applications
- Wet and dry fire mains in accordance with DIN 1988 Part 6, VdS, FG, CNBOP, SBSC, FM, LPCB and UL/CUL
- Conditioned water such as decalcified/ softened water, partly and completely desalinated water, distilled water, water with glycol.*
- Compressed air (see page 133)

TECHNICAL CHARACTERISTICS	
Material	Stainless steel tube X5CrNiMo 17 12 2 Material no. 1.4401 according to DIN-EN 10088-2
Approvals	DVGW, SVGW, ETA, ÖVGW, BYGGFORSK, STF, PZH, SITAC, CSTBat, WRAS, VdS, FM, FG, CNBOP, SBSC, SETSCO, LPCB, DNV, GL, LR, UL, cUL
Tolerances	According to EN 10312 Table 2
Finishing	Annealed under a protective atmosphere W2R
Surface finish	Matt silver coloured
Marking	SudoXPress Stainless DN[ ]/[size x wall thickness]mm, Stainless steel/ Edelstahl-Sanitary/Sanitar –GAS, 1.4001/AISI316, EN10312, DVGW GW541 Reg. Nr. DW-7301BM5610, SVGW, ÖVGW W1.397 WRAS, ETA, BYGGFORSK, STF, PZH, SITAC 0168/04, CSTBat 116-1482, LPCB, VdS G4080007 [working pressureVdS] bar, <FM> [workingpressure FM] psi, C(UL)US Listed 4NB1 [working pressure UL] psi, DNV, GL, NDE, [batch number or production date], [supplier code] [max.every 60cm the model designation repeated]
Smallest bending radius	15mm to 28mm - 3.5 x external diameter of the tube. 35mm & above - bending is not recommended
Supply mode	Tubes, length of 6m +0/-50mm, with protective caps (Green)
Heat expansion coefficient	0.0160mm/m withΔT=1K
Max. operating pressure	16bar

- Conditioned installations for burnable gases: natural gases and liquid gases according to DVGW Worksheet G260 I/II. Installations of gas and liquid gas conducting tube installations according to DVGW – Worksheet G600, DVGW- TRGI 86/89 and TRF 1996.

*Further additives for antifreeze must be compatible with EPDM O Rings. Approval must be sought from Pegler Yorkshire prior to installation.





3.0 TECHNICAL DATA

XPRESS TUBE SPECIFICATIONS

XPRESS STAINLESS STEEL TUBE (SS630) 1.4521 (AISI 444)

XPress Nickel free stainless steel tube is ideal for heating applications and XPress Stainless Sprinkler System.

APPLICATIONS

- Wet and dry fire mains in accordance with DIN 1988 Part 6, or FM and LPCB
- Conditioned water such as decalcified/ softened water, partly and completely desalinated water, distilled water, water with glycol* (concentrations of up to 40%)
- Compressed air (see page 133)

*Further additives for antifreeze must be compatible with EPDM O Rings. Approval must be sought from Pegler Yorkshire prior to installation.

TECHNICAL CHARACTERISTICS	
Material	SudoXPress Stainless steel tube X2CrMoTi 18 2 Material no. 1.4521 according to DIN-EN 10088-2
Approvals	DVGW, SVGW, ETA, FM, ÖVGW, FG, LPCB, DNV, GL, LR, UL, cUL
Tolerances	According to EN 10312 Table 2
Finishing	Annealed under a protective atmosphere W2R
Surface finish	Matt silver coloured
Marking	SudoXPress Stainless DN[ ]/[size x wall thickness] mm, Edelstahl Stainless steel,1.4521/AISI444 W2R, EN 10312, DVGW GW541 Reg. Nr. DW-7301BP5610, SVGW, ÖVGW, ETA, LPCB, <FM> [working pressure FM] psi, C(UL)US Listed 4NB1 [working pressure UL] psi, DNV, GL, NDE, Tectite 316 [batch number or production date], [supplier code] [max.every 60cm the model designation repeated]
Smallest bending radius	3.5 x external diameter of the tube (max.28mm)
Supply mode	Tubes, length of 6m +0/-50mm, with protective caps (Green)
Heat expansion coefficient	0.0104mm/m withΔT=1K
Max. operating pressure	16bar

XPRESS STAINLESS STEEL TUBE (SS640) 1.4520 (AISI 439)

The 1.4520 stainless steel tube is AISI 439 stainless steel tube with no Nickel content, making it a cost effective alternative. The tube has been tested and approved by FM for use in dry and wet fixed XPress Stainless Sprinkler Systems.

APPLICATIONS

- Wet and dry fire mains in accordance with FM and LPCB
- Compressed air (see page 133)
- Solar installations
- Cooling installations
- Heating installations

TECHNICAL CHARACTERISTICS	
Material	SudoXPress Stainless steel tube X2CrTi17 Material no. 1.4520 according to DIN-EN 10088-2
Approvals	FM, FG, LPCB, UL, cUL
Tolerances	According to EN 10296-2
Finishing	Annealed under a protective atmosphere W2R
Surface finish	Matt silver coloured
Marking	Stainless DN[ ]/[size x wall thickness]mm , Stainless steel /Edelstahl 1.4520/AISI439, Heating/Compressed air-Heizung/Druckluft, LPCB, <FM> [working pressure FM] psi, C(UL)US Listed 4NB1 [working pressure UL] psi, NDE, [batch number or production date], [supplier code] [max.every 60cm the model designation repeated]
Smallest bending radius	3.5 x external diameter of the tube (max.28mm)
Supply mode	Tubes, length of 6m +0/-50mm, with protective caps (Black)
Heat expansion coefficient	0.0104mm/m withΔT=1K
Max. operating pressure	16bar





XPRESS CARBON STEEL TUBE (SC640)

XPress Carbon tubes are thin-walled precision tubes manufactured in accordance with EN 10305-3 (previously DIN 2394/NEN 1982) from a special kind of steel that has a very low carbon content. The resulting product is very easy to bend. The absence of leaks is also checked, in accordance with EN 10246-1, so that all tubes will be guaranteed leak free.

APPLICATIONS

- Closed loop heating installations according to DIN 4751
- Closed loop cooling installations with water/glycol mixture* concentrations of up to 40%
- Compressed air, dry or oil containing
- Solar applications (closed loop)
- Shipbuilding

*Further additives for antifreeze must be compatible with EPDM O Rings. Approval must be sought from Pegler Yorkshire prior to installation.

TECHNICAL CHARACTERISTICS	
Material	XPress Carbon Steel tube Unalloyed ULC (Ultra Light Carbon) Carbon steel, Rst 34-2 Mat. No. 1.0034 according to EN 10305-3
Approvals	CSTBat, DNV, GL, RINA
Tolerances	According to EN 10305-3
Finishing	Zinc coating of at least 8-15µm. The tube welding seam is subsequently galvanized on the outside. Inside of the tube is protected by a thermally applied oil film.
Surface finish	Silver coloured
Marking	Carbon Steel Tube Marking SC640 - SudoXPress galvanised DN[]/[size x wall thickness]mm, EN10305-3 CSTBat 116-1483,[batch number or production date],[supplier code],[model designation] SC660 – SudoXPress galvanised DN []/[size x wall thickness]mm, polypropylene coated, EN10305-3 CSTBat 116-1483,[batch number or production date],[supplier code],[model designation]
Smallest bending radius	3.5 x external diameter of the tube (max. 28mm)
Supply mode	Tubes, length 6m +0/-50mm, with protective caps (Red)
Heat expansion coefficient	0.0108mm/m at ΔT = 1K
Max. operating pressure	16bar





3.0 TECHNICAL DATA

XPRESS TUBE SPECIFICATIONS

XPRESS CARBON STEEL TUBE - PLASTIC COATED (SC660)

XPress Carbon tubes with polypropylene coating are used for the same applications and have the same technical characteristics as XPress Carbon tubes (polypropylene coated tubes are marked "Galvanized Polypropylene coated") and are coated with a layer of polypropylene (PP) for protection against outer corrosion. The PP has a smooth surface and good resistance to tearing and impact. For a safe press fitting connection, it is essential to remove the polypropylene coating with a jacket stripping unit along the insertion depth. The rigidity of the press connection is only achieved by maintaining the insertion depth.

TECHNICAL CHARACTERISTICS	
Material	XPress Carbon steel tube unalloyed ULC (Ultra Light Carbon) Carbon steel, Rst 34-2 part No. 1.0034 according to EN 10305-3
Approvals	CSTBat, DNV, GL, RINA
Tolerances	According to EN 10305-3
Finishing	Zinc coating of at least 8-15µm. The tube welding seam is subsequently galvanized on the outside. Inside of the tube is protected by a thermally applied oil film
Surface finish	High-heat stabilized polypropylene PP (B2) thickness ±1 mm, RAL 9001
Marking	SudoXPress DN (dimension x wall thickness mm) galvanized – Polypropylene coated EN10305-3 logo CSTBat 116-1483 DNV, GL, [batch numbers] [Supplier number]
Smallest bending radius	3.5 x external diameter of the tube (max.28mm)
Supply mode	Tubes, length of 6m +0/-50mm, with protective caps (Red)
Heat expansion coefficient	0.0108mm/m withΔT=1K
Max. operating pressure	16bar
Thermal load	120°C permanent load
Heat conductivity	0.22 W/mK





XPRESS SPRINKLER GALVANISED STEEL TUBES (SC645)

The XPress Sprinkler Galvanized tubes for wet sprinkler systems only. Thin-walled precision steel tubes, they are made from cold rolled steel that is galvanized using the Sendzimir process. During this process zinc is brought onto the metal strip, running through a zinc bath, covering both sides simultaneously. The tube is protected both on the inside and outside with a zinc layer, with a thickness of 15 to 27µm. After welding, the seam is additionally zinc plated. With the Sendzimir process a good adhesion of the zinc layer and corrosion resistance is achieved.

APPLICATIONS

- Wet fixed sprinkler installations in accordance with DIN 1988 Part 6, VdS, FM, FG, SBSC, CNBOP and LPCB

TECHNICAL CHARACTERISTICS	
Material	XPress Carbon Sprinkler tube unalloyed ULC (ultra light carbon) Carbon steel, E190 part No. 1.0031 according to EN 10305-3
Approvals	VdS, FM, FG, CNBOP, SBSC, SETSCO, UL, cUL
Tolerances	According to EN 10305-3
Finishing	Zinc coating of at least 20µm according steel grade ZNT275. The tube welding seam is subsequently galvanized on the outside.
Surface finish	Silver coloured
Marking	XPress galvanised, DN[ ]/[size x wall thickness mm], LPCB, VdS G4080007 [working pressureVdS] bar, <FM> [working pressure FM] psi, C(UL)US Listed 4NB1 [working pressure UL] psi, CRR UL [CRR UL] CRR cUL [CRR uL], DNV, GL,NDE, [batch number or production date], [supplier code] [max.every 60cm the model designation repeated]
Smallest bending radius	3.5 x external diameter of the tube (max.28mm)
Supply mode	Tubes, length of 3 and 6m +0/-50mm, with protective caps (Lilac)
Heat expansion coefficient	0.0108mm/m withΔT=1K
Max. operating pressure	16bar





3.0 TECHNICAL DATA

XPRESS TUBE MANUFACTURING SPECIFICATIONS

MANUFACTURING SPECIFICATIONS				
Product	Specification	Type of tubing	Welding deterioration reduction	Weld slag removal
SS600 (AISI 316) Stainless steel	EN 10312-DVGW worksheet GW541(2004) Table 2	TIG or laser welded	100% EDDY CURRENT tested according to SEP 1914/EN 10246-2	Outside
SS610 (AISI 316) Stainless steel	EN 10312 Table 1	TIG welded	100% EDDY CURRENT tested according to BS EN 10246-2	N/A
SS620 (AISI 316) Stainless steel	EN 10312-DVGW worksheet GW541(2004) Table 2	TIG or laser welded	100% EDDY CURRENT tested according to SEP 1914/EN 10246-2	Outside
SS630 (AISI 444) Stainless steel	EN 10312-DVGW worksheet GW541(2004) Table 2	Laser welded	100% EDDY CURRENT tested according to SEP 1914/EN 10246-2	Outside
SS640 (AISI 439) Stainless steel	EN 10296-2	Laser welded	100% EDDY CURRENT tested according to SEP 1914/EN 10246-2	Outside
SC640 Carbon steel	EN 10305-3	HF welded	100% EDDY CURRENT tested according to SEP 1914/EN 10246-2	Outside flat, inside raise max.0.5mm
SC645 Carbon steel	EN 10305-3	HF welded	100% EDDY CURRENT tested according to SEP-1925	Outside weld flat insight raising max.0.5mm for dimensions >54mm 0.8mm
SC660 Stainless steel	EN 10305-3 (previously DIN 2394)	Laser welded	100% EDDY CURRENT or tested according to SEP 1914/EN 10246-2	Outside

TRANSPORT AND STORAGE

We recommend that tube is not left exposed to the elements, and that end caps remain in place during storage.

During transport and storage of XPress Sprinkler tubes and press fittings it is important to avoid damage and soiling. The best storage temperature for fittings and tubes is between 10°C and 25°C and they should be stored in a dry area (maximum humidity 65%). The storage of tubes should be horizontal, separated by wooden blocks. Bundles should not be stacked higher than the recommended maximum height in order to prevent tubes from becoming oval (the maximum height should not exceed 6 bundles, when stacking stack in 2x2/3x3, etc.). Please ensure that carbon and stainless tubes are stored seperately.





SYSTEM DESIGN CONSIDERATIONS AND TUBE EXPANSION

The following are some of the specific design considerations which are important to take account of when designing and installing pipework systems containing XPress fittings.

THERMAL MOVEMENT

Thermal movement is a major consideration when designing plumbing and heating systems. Pipework systems expand and contract with changes in temperature. If they are fixed too rigidly and their movement restricted, the systems will be subject to stress which must be avoided. So it's important to take the effect of thermal movement into account when designing or installing a system.

It's especially important to avoid stress concentrations between fixed points typically found at radiators, valves and other fittings.

The following tables show thermal expansion details for a range of tube/pipe lengths and temperature changes.

XPRESS COPPER, XPRESS COPPER GAS AND XPRESS SOLAR: COPPER TUBE EXPANSION

Temperature change	Tube Length									
	3m	4m	5m	6m	7m	8m	9m	10m	12m	25m
10°C	0.5mm	0.7mm	0.9mm	1.0mm	1.2mm	1.4mm	1.5mm	1.7mm	2.0mm	4.3mm
20°C	1.0mm	1.4mm	1.7mm	2.0mm	2.4mm	2.7mm	3.0mm	3.4mm	4.0mm	8.5mm
30°C	1.5mm	2.0mm	2.6mm	3.1mm	3.6mm	4.1mm	4.6mm	5.1mm	6.1mm	13.0mm
40°C	2.0mm	2.7mm	3.4mm	4.1mm	4.8mm	5.4mm	6.1mm	6.8mm	8.2mm	17.0mm
50°C	2.6mm	3.4mm	4.3mm	5.1mm	6.0mm	6.8mm	7.7mm	8.5mm	10.2mm	21.0mm
60°C	3.1mm	4.1mm	5.1mm	6.1mm	7.1mm	8.2mm	9.2mm	10.2mm	12.2mm	26.0mm
70°C	3.6mm	4.8mm	6.0mm	7.1mm	8.3mm	9.5mm	10.7mm	11.9mm	14.3mm	30.0mm
80°C	4.1mm	5.4mm	6.8mm	8.2mm	9.5mm	10.9mm	12.2mm	13.6mm	16.3mm	34.0mm
90°C	4.6mm	6.1mm	7.7mm	9.2mm	10.7mm	12.2mm	13.8mm	15.3mm	18.4mm	38.0mm
100°C	5.1mm	6.8mm	8.5mm	10.2mm	11.9mm	13.6mm	15.3mm	17.0mm	20.4mm	43.0mm
150°C	7.7mm	10.2mm	12.8mm	15.3mm	17.9mm	20.4mm	23.0mm	25.5mm	30.6mm	63.8mm
200°C	10.2mm	13.6mm	17.0mm	20.4mm	23.8mm	27.2mm	30.6mm	34.0mm	40.8mm	85.0mm

XPRESS STAINLESS AND XPRESS STAINLESS GAS: STAINLESS STEEL SYSTEM TUBE EXPANSION

Temperature change	Tube Length									
	3m	4m	5m	6m	7m	8m	9m	10m	12m	25m
10°C	0.5mm	0.6mm	0.8mm	1.0mm	1.1mm	1.3mm	1.4mm	1.6mm	1.9mm	4.0mm
20°C	1.0mm	1.3mm	1.6mm	1.9mm	2.2mm	2.6mm	2.9mm	3.2mm	3.8mm	8.0mm
30°C	1.4mm	1.9mm	2.4mm	2.9mm	3.4mm	3.8mm	4.3mm	4.8mm	5.8mm	12.0mm
40°C	1.9mm	2.6mm	3.2mm	3.8mm	4.5mm	5.1mm	5.8mm	6.4mm	7.7mm	16.0mm
50°C	2.4mm	3.2mm	4.0mm	4.8mm	5.6mm	6.4mm	7.2mm	8.0mm	9.6mm	20.0mm
60°C	2.9mm	3.8mm	4.8mm	5.8mm	6.7mm	7.7mm	8.6mm	9.6mm	11.5mm	24.0mm
70°C	3.4mm	4.5mm	5.6mm	6.7mm	7.8mm	9.0mm	10.1mm	11.2mm	13.4mm	28.0mm
80°C	3.8mm	5.1mm	6.4mm	7.7mm	9.0mm	10.2mm	11.5mm	12.8mm	15.4mm	32.0mm
90°C	4.3mm	5.8mm	7.2mm	8.6mm	10.1mm	11.5mm	13.0mm	14.4mm	17.3mm	36.0mm
100°C	4.8mm	6.4mm	8.0mm	9.6mm	11.2mm	12.8mm	14.4mm	16.0mm	19.2mm	40.0mm

XPRESS CARBON: GALVANISED CARBON STEEL SYSTEM TUBE AND PLASTIC COATED CARBON STEEL SYSTEM TUBE EXPANSION**

Temperature change	Tube Length									
	3m	4m	5m	6m	7m	8m	9m	10m	12m	25m
10°C	0.3mm	0.4mm	0.5mm	0.7mm	0.8mm	0.9mm	1.0mm	1.1mm	1.3mm	2.7mm
20°C	0.7mm	0.9mm	1.1mm	1.3mm	1.5mm	1.7mm	1.9mm	2.2mm	2.6mm	5.4mm
30°C	1.0mm	1.3mm	1.6mm	1.9mm	2.3mm	2.6mm	2.9mm	3.2mm	3.9mm	8.1mm
40°C	1.3mm	1.7mm	2.2mm	2.6mm	3.0mm	3.5mm	3.9mm	4.3mm	5.2mm	10.8mm
50°C	1.6mm	2.2mm	2.7mm	3.2mm	3.8mm	4.3mm	4.9mm	5.4mm	6.5mm	13.5mm
60°C	1.9mm	2.6mm	3.2mm	3.9mm	4.5mm	5.2mm	5.8mm	6.5mm	7.8mm	16.2mm
70°C	2.3mm	3.0mm	3.8mm	4.5mm	5.3mm	6.1mm	6.8mm	7.6mm	9.1mm	18.9mm
80°C	2.6mm	3.5mm	4.3mm	5.2mm	6.1mm	6.9mm	7.8mm	8.6mm	10.4mm	21.6mm
90°C	2.9mm	3.9mm	4.9mm	5.8mm	6.8mm	7.8mm	8.8mm	9.7mm	11.7mm	24.3mm
100°C	3.2mm	4.3mm	5.4mm	6.5mm	7.6mm	8.6mm	9.7mm	10.8mm	13.0mm	27.0mm

** Closed circuit systems only.





SYSTEM DESIGN CONSIDERATIONS AND TUBE EXPANSION

CALCULATION OF THE EXPANSION COMPENSATION LENGTH

In case of greater expansion, expansion compensators or, in complicated cases Ω-shaped compensating loops will need to be fitted and calculated. The formula with which the expansion equaliser in mm is calculated is as follows:

B_d = k x √(d_e x Δl)

B_d = expansion compensation length (mm)

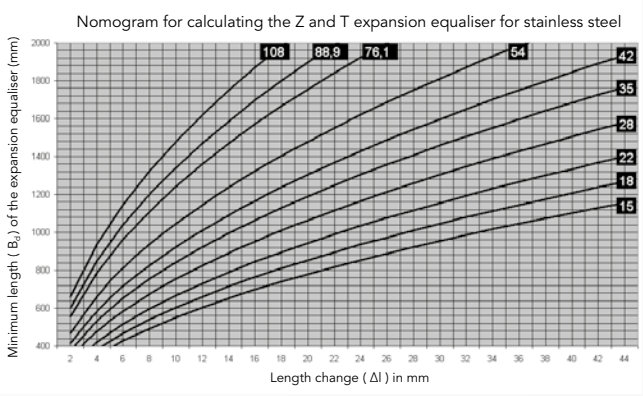
k = material constant

45 for XPress Stainless and Carbon tube,

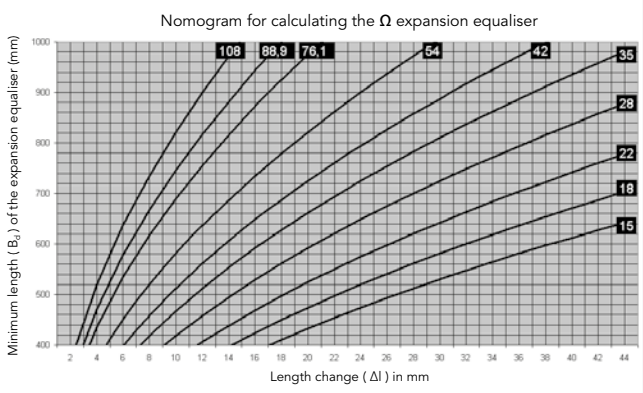
35 for copper tubes

d_e = outside diameter of the tube (mm)

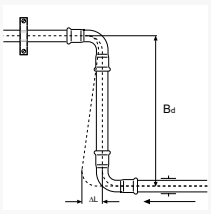
Δl = linear expansion that needs to be compensated (mm)



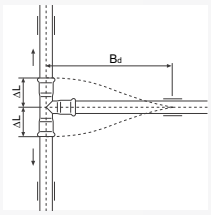
Graph 1: Nomogram (for XPress Stainless) for calculating the situation fig. 12 and 13. Expansion B_d (mm)



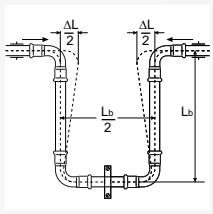
Graph 2: Nomogram for calculating the situation Fig. 14 Expansion compensator L_b (mm)



(Figure 12)



(Figure 13)



(Figure 14)

The nomogram in graph 1 enables the fast and accurate establishment of the expansion bend length (B_d) considering the respective tube types and the expansion to be compensated (Δ). Graph 2 shows the values (L_b) for the installation situation illustrated in figure 14.

The following is an example of an analytical calculation: A tube network with a length of 16m consisting of XPress Stainless tubing with a diameter of 22mm subject to a temperature difference of 60 K. When using the equation for calculating the expansion, the result is:

Δl = 16 x 0.0166 x 60 = 15.936

Without the requirement for the mathematical calculation, we would get the same result through interpolation of the data in table 20. With the expansion for the respective section of the pipeline, we need to calculate the length of the expansion compensator required for its compensation - see figures 12 and 13. Using the nomogram in graph 1, we get ca. 830mm. The analytical calculation shows:

B_d = 45 x √(22 x 15.936) = 827.2 mm

In case of an Ω-shaped expansion connection, the calculated value of the expansion equaliser also visible from figure 14 is to be halved as it is actually two expansion sections. The value (B_d) is not exactly divided by two, but should be divided by a factor of 1.8:

L_b = 25 x √(22 x 15.936) = 468.1 mm

or otherwise:

L_b = B_d / 1.8 = 842.58 / 1.8 = 468.1 mm

Graph 2 shows a value for L_b of ca. 468mm.

As can be seen in figures 12-14, a correct compensation of the expansion depends also on the placement of fixing devices such as saddles and clips. Never plan for or place tube saddles as a mounting device close to a tube connection. Clips should be positioned such that they do not behave as a fixed restraint. When there are straight segments of tube, without expansion compensation, use only one saddle to prevent possible deformation. Position it as close to the middle of the straight segment as possible: in this way, any expansion will be distributed in both directions and the length of the expansion equaliser required will be halved. It is recommended that tube saddles with a rubber inlay are used as this muffles any possible noise and vibration and provides a better distribution of the stresses.

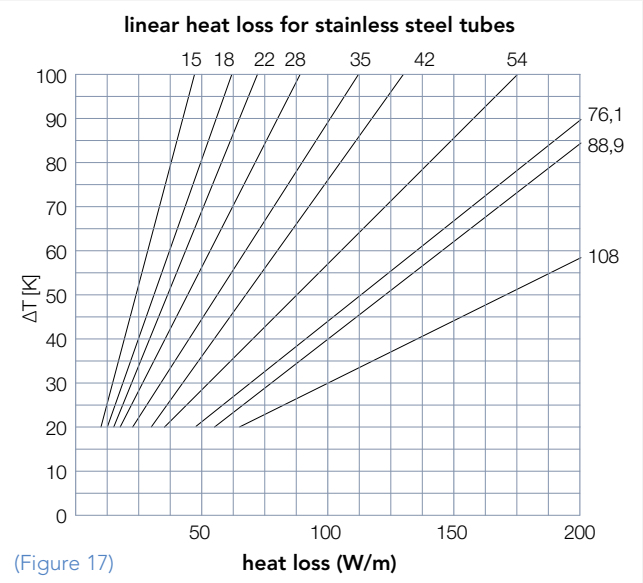




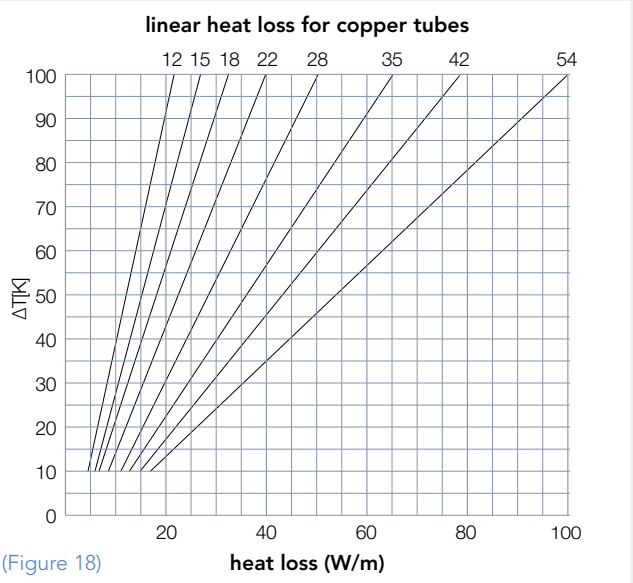
HEAT LOSSES

Repective insulation for limiting heat losses is also required for the tubes in the XPress system, not just to save energy but also based on current norms and legal provisions (for example German law of 10/91, DIN 1988, part 2, EnEV). We refer to these regulations and their implementation regulations and the respective tables showing the minimum insulation thickness.

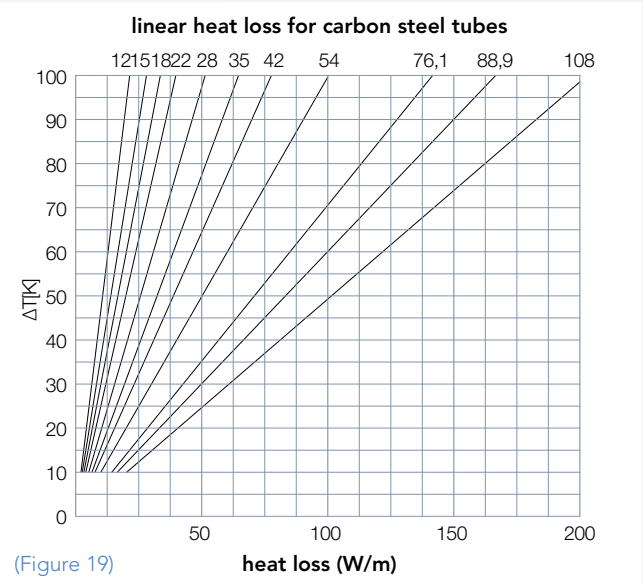
(Figures 17, 18, 19 and 20) show the linear heat losses of the tubes according to their diameter and temperature difference. The details in figures 17, 18 and 19 refer to bare tubes placed above screed. Figure 20 shows the heat loss for polypropylene coated tubes.



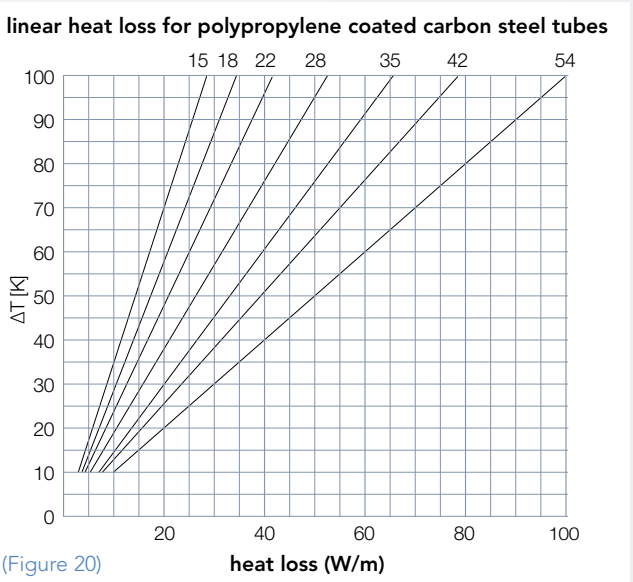
(Figure 17)



(Figure 18)



(Figure 19)



(Figure 20)





3.0 TECHNICAL DATA

SYSTEM DESIGN CONSIDERATIONS AND TUBE EXPANSION

EXPANSION AXIAL COMPENSATORS

The axial compensator is an expansion joint with a corrugated bellow in the centre and is supplied with press ends in sizes 15 to 54mm (SS75) or with male ends in sizes 76.1 to 108mm (SS76).

The axial compensator provides a solution for expansion and shrinking of your piping system whilst dampening vibrations and eliminating unwanted noise. Manufactured from stainless steel, they are suitable for a wide range of applications from ship building, chemical industry, and utility piping systems. The axial compensator provides flexibility where space is limited.



SS75 Expansion Axial Compensator



SS76 Expansion Axial Compensator Drum End

MATERIAL SPECIFICATION		
Component	Connections	Materials
SS75 15-54mm	Press Ends	Stainless Steel 1.4404 (AISI 316L)
SS76 76.1-108mm	Male Ends	Stainless Steel 1.4401 (AISI 316)
Bellows		Stainless Steel 1.4571 (AISI 316 Ti) Multi-Ply
O Ring		Ethylene Propylene Diene Monomer

INSULATION

For all XPress Systems, we recommend you adhere to the insulation requirements as specified by the Water Supply (Water Fittings) Regulations and Building Regulations 1999. These requirements are equally applicable to plastic pipe and stainless steel tube.

Pegler Yorkshire would always recommend that any insulation should be fitted in accordance with:

The Code of Practice BS5970:2012

- Thermal Insulation of Pipework, ductwork, associated equipment and other industrial installations in the temperature range of -100°C to +870° C.

Additional guidance can be found on an insulation manufacturer website.

We have the following specific recommendations for XPress systems:

Every effort should be made to ensure that the pipework and fittings are clean and dry prior to the fitment of insulation. To help to achieve this, the avoidance of water based media for leak detection should be considered.

Where Carbon Steel systems are used every effort should be made to protect the system from both internal and external corrosion. Both fittings and tubing should be stored undercover in a clean dry environment prior to installation.

Special consideration should be given to the effects of condensation on fittings and pipework. This may be caused by surrounding works during the construction cycle and not by the system itself.

The choice of insulation system should not be considered as the only means of preventing corrosion, the specifier must consider the whole process and the potential risk of corrosion taking place.

After initial installation, suitable vapour barriers need to be considered to ensure that NO WATER INGRESS is allowed to permeate the insulation.

Xpress Carbon and Tectite Carbon systems should not be installed in externally or exposed locations without due consideration to weathering protection. We would recommend that Stainless Steel or Xpress Copper be used for such applications.

PHENOLIC FOAM

When using rigid phenolic foam (or other thermal insulation) to lag pipework, always remember to refer to the lagging manufacturer's fixing instructions. To avoid the risk of external corrosion of copper pipework lagged with this foam, the European Phenolic Foam Association recommend that such insulation products be installed with a moisture barrier. As a precautionary measure, Pegler Yorkshire does not recommend any anti-corrosion materials containing a mineral oil base are applied around the mouth of the fitting and this should instead be protected using silicon grease (or similar) to form the atmospheric barrier between the metal and the foam insulation.

An alternative would be to use an impervious material, such as PVC tape. This needs to be applied to the mouth of the fitting before applying any mineral oil-based materials. If a grease-free installation is preferred then butyl tape can be used to provide a vapour barrier.

Some manufacturers of this type of lagging supply their products with an internal, factory-applied silicate barrier to prevent external corrosion problems. However, if you do need to add a barrier product, we recommend that all XPress fittings be fully installed before these are applied and that they are completely coated.





Maximum spacing of support brackets for 316 System tube, BS 4127 and W541 stainless steel tube and plastic coated and galvanised carbon steel tube		
Size	Horizontal pitch	Vertical pitch
15mm	1.80m	2.00m
18mm	2.10m	2.30m
22mm	2.40m	3.00m
28mm	2.40m	3.00m
35mm	2.70m	3.00m
42mm	3.00m	3.60m
54mm	3.00m	3.60m
76.1mm	3.00m	3.60m
88.9mm	3.60m	4.50m
108mm	3.60m	4.50m

Maximum spacing of support brackets for copper tube to BS EN 1057				
Size	Wall thickness	Temper	Horizontal pitch	Vertical pitch
12mm	0.7mm	R250/R290	1.00m	1.50m
15mm	0.7mm	R250/R290	1.20m	1.80m
15mm	1.0mm	R250/R290	1.20m	1.80m
22mm	0.9mm	R250/R290	1.80m	2.40m
22mm	1.0mm	R250/R290	1.80m	2.40m
22mm	1.2mm	R250/R290	1.80m	2.40m
28mm	0.9mm	R250/R290	1.80m	2.40m
28mm	1.0mm	R250/R290	1.80m	2.40m
28mm	1.2mm	R250/R290	1.80m	2.40m
28mm	1.5mm	R250/R290	1.80m	2.40m
35mm	1.0mm	R250/R290	2.40m	3.00m
35mm	1.2mm	R250/R290	2.40m	3.00m
35mm	1.5mm	R250/R290	2.40m	3.00m
42mm	1.0mm	R250/R290	2.40m	3.00m
42mm	1.2mm	R250/R290	2.40m	3.00m
42mm	1.5mm	R250/R290	2.40m	3.00m
54mm	1.0mm	R250/R290	2.70m	3.00m
54mm	1.2mm	R250/R290	2.70m	3.00m
54mm	2.0mm	R250/R290	2.70m	3.00m
64mm	2.0mm	R250/R290	3.00m	3.60m
66.7mm	1.2mm	R250/R290	3.00m	3.60m

Maximum spacing of support brackets for copper tube to BS EN 1057				
Size	Wall thickness	Temper	Horizontal pitch	Vertical pitch
66.7mm	1.2mm	R250/R290	3.00m	3.60m
66.7mm	2.0mm	R250/R290	3.00m	3.60m
76.1mm	1.5mm	R250/R290	3.00m	3.60m
76.1mm	2.0mm	R250/R290	3.00m	3.60m
88.9mm	2.0mm	R250/R290	3.00m	3.60m
108mm	1.5mm	R250/R290	3.00m	3.60m
108mm	2.5mm	R250/R290	3.00m	3.60m

THERMAL EXPANSION

When including expansion joints in a system take care not to introduce tensional stress when assembling and tightening threaded connections. The XPress range includes male and female connectors for the correct jointing of expansion joints.

CORRECT ANCHORING

Always ensure the spur used to anchor the branch of a tee or connecting a radiator is long enough to allow normal thermal movement. Forgetting to observe this simple rule can lead to a failure. Incorporating expansion loops or bellow devices into the system can help guard against such problems, whilst a horseshoe link or offset (see diagrams) is an ideal way to counteract continual thermal cycling.

PIPE RESTRAINT

In any installation, the system should be supported to ensure the minimum stress is imposed on the tube/pipe and joints. For the maximum spacing of supporting brackets for internal installations, please see the tables (opposite).

LOCAL WATER AUTHORITY

We recommend consulting the local water authority when it comes to pipework accessibility.

BUILDING IN DIMENSIONS

All building in dimensions are correct at the time of going to press. Pegler Yorkshire reserves the right to change these dimensions without prior notice, however to ensure you are using the most up to date information please refer to our web site www.pegleryorkshire.co.uk

COVERED PIPEWORK

Making provision for thermal movement is vital where pipework of any material is installed under screed or plaster or passes through brick or blockwork. The preferred practice is to use tubing with factory applied protective plastic covering incorporating air gaps to accommodate thermal movement or to pass tubes and pipes through sleeves or conduits or to lay them in ducts surrounded by loose, inert non-rigid material such as vermiculite or glass wool. For further information, consult the publication BS 66.700:2006 Design, installation, testing and maintenance of services supplying water for domestic use within buildings their curtilages.

FLUSHING

The main objective of the flushing process is to remove as much dirt and debris from the pipework system as possible in order to reduce the likelihood of system blockage and to create the best possible circumstances for a successful chemical clean and subsequent water treatment regime so that any hygiene problems and corrosion damage within a system are largely prevented.

The level of cleanliness achievable by system flushing is very much dependant on the adequacy of the system design and installation with regard to flushing. Provision should be included in the system for adequate air venting, draining and bypassing of equipment.

Consideration should be given to the 'Flushing Velocity' and should be based on the largest pipe size in the system section to be flushed.





SYSTEM DESIGN CONSIDERATIONS AND TUBE EXPANSION

The water velocity required for flushing must be sufficient to pick up and carry the majority of the dirt and debris from within the system.

The hot and cold water pipelines should be flushed separately.

For details, please refer to the BSRIA Guide BG29-2012 'Pre-Commissioning Cleaning of Pipework Systems'.

Some contracts may still require that proprietary chemicals are used to cleanse and flush pipework before full commissioning. XPress is compatible with a wide selection of products. To find out more contact us.

General Consideration

All items that are sensitive to sediment must remain valved off and by-passed throughout the flushing procedure. Care should be taken to ensure that pumps are not allowed to operate against a closed head for long periods. This situation should be avoided whenever possible.

CHEMICAL CLEANING

Chemical cleaning should always be carried out immediately after flushing.

Chemical cleaning of the system should always be the responsibility of the appointed chemical cleaning specialist and should be preceded by a properly executed clean water flushing as described in the previous section. This is an essential pre-requisite to any effective chemical cleaning programme.

There are many proprietary cleaning chemicals available for preparing the pipework for subsequent service. Some of these are acidic, others are neutral but all must be capable of effectively removing any rust and other debris that has formed in the pipework prior to commissioning, without damaging the various components in the system.

Strong acid cleaners that do not contain inhibitor must be avoided as severe internal wastage may occur, particularly at joints between tube and fitting.

Irrespective of whatever cleaner is chosen, the manufacturer's instructions must be followed exactly, taking particular care to ensure that cleaning agents are completely flushed out of the system before adding any protective inhibitors to the water.

Please refer to BSRIA BG29 2012
'Pre-Commission Cleaning of Pipework Systems'.

As this is specialist work, it should only be entrusted to an organisation that has the facilities, safety training and experience in dealing with the potentially hazardous chemicals involved. Suitably qualified personnel will have the knowledge to be able to offer advice on the selection and use of appropriate chemicals, as well as the safe disposal of waste material.

PRESSURE TESTING OF PIPEWORK SYSTEMS

It is recommended that completed pipework systems are pressure tested prior to being covered (insulation, or paint), and should be performed prior to commencing the cleaning procedure.

The entire system should be pressure tested in accordance of BSRIA and B&ES.

This pressure test can be both pneumatic and hydraulic and is determined by the installed and planned commissioning regime.

If the pipe system is to be left empty after the pressure test, then a pressure test with dry air and/or inert gas should be performed, (microbiological contamination through bacteria and corrosion of carbon steel systems has to be avoided).

The pressure test should consist of two steps;

- Leak test
- Tightness test

The leak test involves inspecting the system for joint integrity (tightness), the tightness test focuses on checking the system for strength.

The tightness test with water is described in the B&ES Guide to Good Practice TR/6, BS EN 806-4, BS6700.

If pre-fabricated pipework or equipment has been hydraulically pressure tested, off site prior to installation, this should be notified to the cleaning/chemical treatment specialist as these may have already developed an internal layer of corrosion, microbiological, biofilm build up etc.

Due to the inherent dangers associated with pneumatic testing using inert gas or dry air a responsible person must be in charge of this operation at all times.

The following must be understood as a recommendation only.

BASIC PROCEDURE

If the system is to be pressure tested (as recommended) then the following procedure applies to each section in turn.

1. Test Preparation

a. Check that all high points have suitable vents to facilitate removal of air during filling and that these are all closed.

b. Install suitable drainage facilities at all low points for drainage.

c. Blank plug or seal any open ends and close all valves at the limits of the test section of the piping

d. Remove, blank off all terminal units that may be damaged by the test pressure.

e. Open all valves within the enclosed test section.

f. Check that the test gauge is working correctly and has been calibrated, and has the correct range.

g. If the compressed dry air or inert gas is at a higher pressure than is required for the test (maximum 0.5bar pressure) a pressure reducing valve, pressure gauge and pressure relief valve set to open at the test pressure should be fitted to the connecting pipework.

h. If possible the compressed air supply should be outside the test area

i. Check that there is a suitable method for draining the system.

It is recommended that systems be tested with a nitrogen rich (90%)/ air mixture. If air is to be used it should be clean, dry and free from oil, the drying performance should conform to 'purity class 3 under the ISO 8573' for particulate contamination, water and oil content.

Guidance should be sought from the relevant compressor manufacturer.





Excessive oil carry over in compressed air may be detrimental to the EPDM seals as well as causing bacteriological issues. Pure Nitrogen is also acceptable but consideration should be taken of HSE guidelines or recommendations.

2. Pneumatic Pressure Testing

a. An initial low-pressure test at 0.5 bar is to be carried out, having put the necessary safety measures in place, to enable any leaks to be found.
Significantly leaking, un-pressed or damaged joints shall be replaced, but those with low leakage rates should be identified for close inspection during the high-pressure test.

b. This test pressure is to be maintained / pumped for a period of 30 minutes minimum.

c. The test is passed if the pressure in the system is maintained for one hour and there is no visible leakage throughout the test.

d. If required, a signature should be obtained on a test certificate.

e. After testing, safely release the pressure, if necessary ensure that all vents on cylinder tanks and pressure vessels are opened to atmosphere BEFORE draining down and refitting vulnerable items.

These test times may vary according to the pipework system (plastic pipe systems may take longer to achieve stable pressures).

Water Regulation 12 requires 'that the water system shall be capable of withstanding an internal water pressure not less than 1.5 times the maximum pressure to which the installation or relevant part is designed to be subjected to in operation'.

When hydraulic testing is undertaken then the following should be carried out.

The test water should contain anti-corrosion inhibitors / long lasting biocide chemicals with the intention that post testing the system shall be left completely full of the test water (suitable protection against freezing and the onset of biological growth will also have to be considered). Circulation of the system test is strongly recommended.

If leaving the system full of water is not practical then every effort shall be made to fully drain and dry the pipe work by purging with dry air/ nitrogen. If the system is to be left not in use for longer than 5 days, we recommend that the system be left charged with an inert gas to reduce the risk of onset corrosion and /or bacterial growth.

Do not leave a Carbon Steel system empty without drying as oxygen will begin to corrode the internal surface.

Inspection of the internal condition to the pipework is recommended so that the water treatment specialist understands the correct process required when cleaning.

3. Hydraulic Pressure Testing

a. Start to fill the system and 'walk' the route of the pipework being tested. Visually checking for leaks and listening for the sound of escaping air.

b. Release air from all the high points systematically through the system to ensure the system is completely filled with water. (The full loading of the o rings often resolves small leaks identified during the 0.5 bar test).

c. Turn the pump on to allow the system water to circulate to help reduce the risk of trapped air, bleed the system if necessary. Turn off the pump set when completed.

d. Check the system contains the correct amount of inhibitors and biocides.

e. Using an independent pump set, progressively increase the pressure until the system pressure achieves 1.5 times normal working pressure, (verifythat this pressure is within the capability of the system components), record the test pressure.

f. Leave the system for 30 minutes minimum.

g. The test is passed if the pressure in the system is maintained for the next one hour and there is no visible leakage throughout the test.

h. Leaking joints at this stage should be identified and marked for replacement.

i. The system pressure should then be reduced to 0.5 bar again to confirm that no persistent low-pressure leaks are present.

Further information can be found in;

Guides issued by BSRIA, B&ES, CIBSE, WRAS and the Copper Development Association (CDA) Guideline document 'Pressure Testing Piping Systems'.

PRESSURE TEST FOR NATURAL GAS SYSTEMS

Important: The pressure test for natural gas and liquid gas systems must be performed in accordance with local regulations.

PRESSURE TEST OF SPRINKLER SYSTEMS

The tubes of the sprinkler system must be subjected to a pressure test in accordance with valid guidelines, such as CEA 4001, no. 17.1.1. (VdS) for at least two hours. A pressure (measured at the alarm valves) corresponding to 1.5 times the permitted positive operating pressure – but of at least 15 bars – must be maintained during the test. This pressure test is a check of both the strength and tightness of the system. The system must be monitored for 24 hours for any pressure drop due, for example, to temperature changes. Dry sprinkler systems must also be tested pneumatically to a pressure of not less than 2.5 bars for at least 24 hours. Any leakage, which occurs and results in a pressure drop of more than 0.15 bar over the 24 h, must be corrected.

Any faults identified, such as permanent deformations, ruptures or leakages must be corrected and the pressure test repeated.

TUBE BENDING

Portable bending machines are ideal for bending tubes up to 28mm. Most machines bend the tube between matched formers and back guides that support the outside diameter (OD) of the tube. This eliminates the risk of the tube wall collapsing.

The point at which the bending pressure is exerted must be maintained at the correct distance in front of the former's point of support. It's also important to keep formers and guides well lubricated. Bending tubes correctly will avoid any wrinkling and flattening that can affect flow conditions.

Using adjustable bending machines (which allow the pressure on the back guide to be adjusted) will ensure perfect bends every time so long as the root (inside) bending radius is 3.5 times the outside diameter of the tube. Up to 28mm Carbon and Stainless and 54mm Copper.





3.0 TECHNICAL DATA

SYSTEM DESIGN CONSIDERATIONS AND TUBE EXPANSION

A wide range of tube is offered for use with the XPress System covering a wide range of applications.

NOTE: The bending of SS610 Stainless Steel tube manufactured to table 1, is not reommended.

However XPress Stainless tube, manufactured to table 2 shall be the preferred tube for bending in sizes up to 28mm.

With the bending of carbon tube it is important to ensure the weld seam is kept to the inside radius of the bend.

CARBON STEEL SYSTEM TUBE: BENDS	
Size	Minimum Radii
15mm	53mm
18mm	63mm
22mm	77mm
28mm	98mm

In sizes up to 28mm Carbon Steel System tube, is suitable for bending using proprietary bend formers.

Important:
XPress fittings must not come into contact with household cleaning products, paints, greases, fluxes, mineral oils, adhesives or other solvent based materials that may be used during installation, lagging or after installation. These materials may affect the O rings in XPress fittings. XPress fittings should not be painted.

XPRESS 'LEAK BEFORE PRESS'

XPress Copper, XPress Carbon, XPress Stainless and XPress Solar offer a unique 'Leak Before Press' feature (LBP) which enables any connections which haven't been pressed to be easily identified during pressure testing at pressures as low as 0.5bar.



XPRESS CARBON AND XPRESS STAINLESS

The LBP feature on both XPress Carbon and XPress Stainless (sizes 15mm-54mm) is created by the use of a specially profiled EPDM O ring.

The LBP O rings have been specially designed to incorporate a series of three grooves in its surface through which water will leak from any un-pressed fitting. When pressed, the O ring distorts, closing the grooves to create a fully water-tight and air-tight connection.

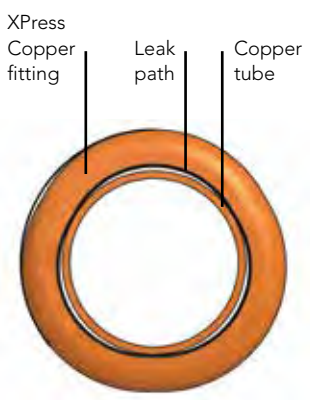


XPRESS COPPER / XPRESS SOLAR

Whilst the mechanical properties of XPress Copper with LBP are different, the benefits are the same. The softer nature of copper enables the LBP feature to be incorporated into the O ring bead in the fitting. The bead is slightly triangular in shape and this creates three spaces between the fitting and the tube through which water will leak if the fitting is not pressed. One additional advantage of this system is that there is still sufficient contact between the O ring and the tube to prevent it moving when inserted. When pressed the shape of the O ring bead is transformed from its triangular shape to a round shape which, once again, is perfectly water-tight and air-tight.

GAS O RINGS (AND O RINGS)

Pegler Yorkshire does not recommend O rings are removed from the standard product and replaced with a gas O ring. To prevent this gas O rings are not offered as spares within the XPress accessories range. We only recommend gas fittings are purchased as fully assembled products. We also do not recommend that gas O rings are removed and replaced with standard O rings.





Note: Contact between O ring and tube, to maintain tube grip

Contact between tube, O ring and fitting which fixates the tube





XPRESS COPPER AND CARBON / STAINLESS WHEN USED WITH COMPRESSED AIR

XPRESS COPPER (BLACK EPDM O-RINGS - S100)

Compressed air installation

XPress Copper fittings manufactured copper, copper alloys, which fulfill EN 1254 can be used for compressed air if the following conditions are observed:

Oil contents: Max. 25 mg/m^3, class 5, ISO 8573 part 1

O-rings: EPDM (black) can only be used for synthetic oil or dry compressed air (not exceeding 25 mg/m^3).

Operating temperature: -20 to +110°C

Operating pressure: Max. 16bar

XPress Copper fittings with copper tubes which fulfill EN 1057 R250/ R290.

XPRESS COPPER GREEN FPM (VITON® O-RINGS - SV100)

Compressed air installation

XPress Copper fittings manufactured copper, copper alloys, which fulfill EN 1254 can be used for compressed air if the following conditions are observed:

Oil contents: Greater than 25 mg/m^3, class 5, ISO 8573 part 1

O-rings: Viton (green) can only be used for synthetic oil or dry compressed air (exceeding 25 mg/m^3).

Operating temperature(*): -20 to +200°C

Operating pressure: Max. 16bar

(*) For short time exposure, refer to the exposure table page 135.

XPress Copper fittings with copper tubes which fulfill EN 1057 R250/ R290.

XPRESS CARBON AND STAINLESS STEEL (BLACK EPDM O-RINGS - SS100)

Compressed air installation

XPress Carbon fittings with zinc plated precision carbon steel tubes which fulfill EN 10305-3 or XPress Stainless fittings with stainless steel tube which fulfill EN10312 XPress Carbon fittings with zinc plated precision carbon steel tubes can be used for compressed air if following conditions are observed:

Water contents: Max. 880 mg/m^3, class 3, ISO 8573 part 1

Oil contents: Max. 25 mg/m^3, class 5, ISO 8573 part 1

When exceeding the maximum water content then copper or stainless steel should be used.

O-rings: EPDM (black) can only be used for synthetic oil or dry compressed air (not exceeding 25 mg/m^3).

Operating temperature: -35 to 135°C

Operating pressure: Max 16bar 12 to 54mm. Max 10bar 66.7 to 108mm.

XPress Carbon fittings with XPress carbon tubes which fulfill EN 10305-3.

XPress Steel fittings with XPress steel tubes which fulfill EN 10312.







SYSTEM DESIGN CONSIDERATIONS AND TUBE EXPANSION

XPRESS CARBON AND STAINLESS STEEL GREEN FPM (VITON® O-RINGS - SV105)

Compressed air installation
XPress Carbon fittings with zinc plated precision carbon steel tubes which fulfill EN 10305-3 or XPress Stainless fittings with stainless steel tube which fulfill EN10312 XPress Carbon fittings with zinc plated precision carbon steel tubes can be used for compressed air if following conditions are observed:

Water contents: Max. 880 mg/m³, class 3, ISO 8573 part 1

Oil contents: Greater than 25 mg/m³, class 5, ISO 8573 part 1

When exceeding the maximum water content then copper or stainless steel should be used.

O-rings: Viton (green) can only be used for synthetic oil or dry compressed air (exceeding 25 mg/m³).

Operating temperature(*): -20 to +200°C

Operating pressure: Max 16bar 12 to 54mm. Max 10bar 66.7 to 108mm.

(*) For short time exposure, refer to the exposure table page 135.

XPress Carbon fittings with XPress carbon tubes which fulfill EN 10305-3.

XPress stainless Steel fittings with XPress stainless steel tubes which fulfill EN 10312.

Important: On completion, compressed air pipeline systems must be properly tested. The system designer and installation contractor must ensure safe methods are selected for system testing which will comply with all current health and safety regulations. This may include testing compressed air lines with fluids or compressed air at a limited pressure, or a combination of both.

After the installation the compressed air installation should be pressure tested according the valid local guide lines. In any event we do not recommend the maximum working pressure of the product to be exceeded during this procedure.

O RING COMPATIBILITY CHART

XPress fittings use the same O Ring technology to provide the best and widest range of heat free jointing systems. It is important to check compatibility between the O Ring and the fluid in the system. The table below is a guide for the contractor, installer and specifier, and shows the compatibility of three O Ring materials with common fluid types and some gases.

EPDM - Ethylene Propylene Diene Monomer - This is the standard, black O Ring that is used in XPress ranges.

HNBR - Hydrogenated Nitrile Rubber - This is the yellow O Ring that is only used in XPress Gas.

FPM - Fluorocarbon Rubber - This is the green O Ring that is only used in XPress Solar.

These tables refer to room temperature test. The performance of O Rings is influenced by the type of system, transported medium, temperature range, pressure range and external factors. This table is provided as a general guide, however, for specific queries concerning compatibility we suggest you contact the Pegler Yorkshire technical department.

	Black	Yellow	Green
Designation	EPDM - XPress	HNBR Gas	FPM Solar
Maximum service temperature °C	180	100	230
Low service temperature °C	-50	-20	-20
Water/Steam Resistance			
Water/Steam resistance <40°C	✓ ✓ ✓	✓ ✓ ✓	✓ ✓ ✓
Water/Steam resistance <80°C	✓ ✓ ✓	✓ ✓	✓ ✓ ✓
Water/Steam resistance <150°C	✓ ✓	x	✓ ✓
Water/Steam resistance >150°C	✓	x	✓ ✓

	Black	Yellow	Green
Designation	EPDM - XPress	HNBR Gas	FPM Solar
Fluids Resistance			
Acid			
Acetic 10%	✓ ✓ ✓	✓	✓
Formic	✓ ✓ ✓	x	✓
Hydrochloric 20%	✓ ✓ ✓	✓	✓ ✓
Nitric 30%	✓ ✓ ✓	x	✓ ✓
Phosphoric 20% †	✓ ✓	✓	✓ ✓ ✓
Sulphuric 30% †	✓	x	✓ ✓
Alkalis			
Barium hydroxide	✓ ✓ ✓	✓ ✓	✓ ✓ ✓
Calcium hydroxide	✓ ✓ ✓	✓ ✓	✓ ✓ ✓
Sodium hydroxide	✓ ✓ ✓	✓ ✓	✓ ✓
Alcohols			
Butyl alcohol (Butanol)	✓ ✓	✓ ✓ ✓	✓ ✓ ✓
Ethyl alcohol (Ethanol)	✓ ✓ ✓	✓ ✓	✓
Methyl alcohol (Methanol)	✓ ✓ ✓	✓ ✓ ✓	
Amines			
Ethylene diamine	✓ ✓ ✓	✓ ✓	x
Ammonia – cold gas	✓ ✓ ✓	✓ ✓ ✓	x
Ammonia – hot gas	✓ ✓	x	x
Chlorides			
Ammonium chloride	✓ ✓ ✓	✓ ✓ ✓	✓ ✓ ✓
Calcium chloride solution	✓ ✓ ✓	✓ ✓ ✓	✓ ✓ ✓
Magnesium chloride	✓ ✓ ✓	✓ ✓ ✓	✓ ✓ ✓
Zinc chloride	✓ ✓ ✓	✓ ✓ ✓	✓ ✓ ✓





	Black	Yellow	Green
Designation	EPDM - Tectite / XPress	HNBR Gas	FPM Solar
Gases			
Butane	x	✓ ✓ ✓	✓ ✓ ✓
Carbon dioxide (dry)	✓ ✓	✓ ✓ ✓	✓ ✓ ✓
Chloride (wet)	✓	x	✓ ✓ ✓
Freon 12	✓ ✓	✓ ✓ ✓	✓ ✓
Freon 21	x	x	x
Freon 22	✓ ✓ ✓	x	x
Freon 134a	✓ ✓ ✓	•	x
Natural gas	x	✓ ✓ ✓	✓ ✓ ✓
Methane	x	✓ ✓ ✓	✓ ✓ ✓
Propane	x	✓ ✓ ✓	✓ ✓ ✓
Oils and Fuels			
ASTM No 1 oil	x	✓ ✓ ✓	✓ ✓ ✓
ASTM No 2 oil	x	✓ ✓ ✓	✓ ✓ ✓
ASTM No 3 oil	x	✓ ✓ ✓	✓ ✓ ✓
ASTM fuel A	x	✓ ✓ ✓	✓ ✓ ✓
ASTM fuel B	x	✓ ✓	✓ ✓ ✓
ASTM fuel C	x	✓	✓ ✓ ✓
Diesel oil	x	✓ ✓ ✓	✓ ✓ ✓
Diesel oil + RME (10%)	x	x	✓ ✓ ✓
Mineral oil (low aromatic)	x	✓ ✓ ✓	✓ ✓ ✓
Hydraulic oils (petroleum base)	x	✓ ✓ ✓	✓ ✓ ✓
Lubricating oils	x	✓ ✓ ✓	✓ ✓ ✓
Paraffin	x	✓ ✓ ✓	✓ ✓ ✓
Petrol	x	✓ ✓	✓ ✓ ✓
Silicone oil/grease	✓ ✓ ✓	✓ ✓ ✓	✓ ✓ ✓
Transformer oils	x	✓ ✓ ✓	✓ ✓ ✓
Vegetable oils	✓	✓ ✓ ✓	✓ ✓ ✓
Solvents◊			
Acetone	✓ ✓ ✓	x	x
Benzene	x	x	✓ ✓ ✓
Carbon tetrachloride	x	✓	✓ ✓ ✓
Dimethyl formamide	✓ ✓	✓	x
Ethyl acetate	✓ ✓	x	x
Methyl ethyl ketone	✓ ✓ ✓	x	x
Tetrachloroethylene	x	x	✓ ✓ ✓
Toluene	x	x	✓ ✓ ✓
Turpentine	x	✓ ✓ ✓	✓ ✓ ✓
Xylene	x	x	✓ ✓
Miscellaneous			
Ethylene glycol	✓ ✓ ✓	✓ ✓ ✓	✓ ✓ ✓
Detergents	✓ ✓ ✓	✓ ✓ ✓	✓ ✓ ✓
Dioctyl phthalate	✓ ✓	x	x
Formaldehyde	✓ ✓ ✓	✓	x
Hydrogen peroxide (90%)	✓ ✓	x	✓ ✓
Phosphate esters	✓ ✓ ✓	x	✓
Potassium nitrate	✓ ✓ ✓	✓ ✓ ✓	✓ ✓ ✓

KEY TO MEDIA TABLE	
✓ ✓ ✓	Excellent – Recommended
✓ ✓	Good – Minor to moderate effects
✓	Fair – Moderate to severe effects
x	Poor – Not recommended
•	Insufficient data available
† Conditions Apply	Temperature or other limitation affecting polymer choice

O RINGS - XPRESS COPPER		
EPDM S100 O Ring for use with XPress Copper fittings only	Temperature	Applications
XPress Copper Systems	-20 to 110˚C	Potable water, Heating, Cooling

SV100 Viton O Ring For use with XPress Copper fittings only	Temperature	Applications
XPress Copper Systems	-20 to 200˚C	Solar applications refer to exposure table*

O RINGS - XPRESS STAINLESS STEEL AND CARBON SYSTEMS		
EPDM S100 O Ring for use with XPress Copper fittings only	Temperature	Applications
XPress Stainless Systems	-35 to 135˚C	Potable water, Sprinkler
XPress Carbon Systems	-35 to 135˚C	Heating, Cooling, Sprinkler

SV100 Viton O Ring for use with XPress Stainless and Carbon fittings only	Temperature	Applications
XPress Carbon and Stainless Systems -20 to 200˚C	Solar applications refer to exposure table*	Solar applications refer to exposure table*

*SOLAR EXPOSURE TABLE	
Temperature	Durability
200˚C	Cumulative exposure 20hrs/year
180˚C	Cumulative exposure 60hrs/year
150˚C	Cumulative exposure 480hrs/year
90 - 130˚C	Normal working temperature
-20˚C	Winter temperature

Pressure	Working condition
3bar	Normal operating pressure
10bar	Maximum working pressure
16bar	Maximum test pressure
16bar	Maximum surge pressure

For more details on O ring compatibility visit:
www.pegleryorkshire.co.uk





3.0 TECHNICAL DATA

SYSTEM DESIGN CONSIDERATIONS AND TUBE EXPANSION

CONNECTING TUBES MADE FROM DISSIMILAR METAL

The UK Water Regulations recommend that tubes and fittings made from different types of metals shall not be connected directly together except where galvanic action is unlikely or where effective measures are taken to prevent it. Galvanic corrosion is a process whereby the materials that come in to contact with each other oxidises or corrodes. If you are in doubt, we recommend you refer to the full and detailed information provided in Water Regulations Guide (G2.11 and R3.2), or by contacting the Water Regulations Advisory Scheme info@wras.co.uk.

MIXED METAL INSTALLATIONS

If a transition should be made from one material to another, then contact corrosion must be avoided. It is not allowed to press different materials with each other (so only copper tube with copper or bronze fittings, stainless steel tube with stainless steel fittings, galvanized steel tube with steel galvanized fittings) unless stated otherwise. The advice is to make a detachable connection with a suitable material (e.g. of bronze or brass). We recommend to use bronze or brass fittings for the transition from copper/stainless steel to steel. For example, the package of transition threaded or union fittings in VSH XPress copper made of bronze can be considered. For gas installations, combinations must be avoided.



SPRINKLER SYSTEMS

LPS 1234: Issue 1
Cert No. 1033a & 1033b

XPRESS SPRINKLER STAINLESS LPCB

The XPress Sprinkler Stainless System (22-54mm) has approval for application in wet sprinkler systems with a maximum pressure of 16bar.

Accordingly LPCB system is certified for using XPress stainless steel tubes with material code 1.4401 (AISI 316), 1.4520 (AISI 439) and 1.4521 (AISI 444). XPress Sprinkler Stainless is WRAS approved in combination with 1.4401 tubes.

XPRESS SPRINKLER GALVANISED LPCB

The XPress Sprinkler Galvanized System (22-54mm) has approval for the application in wet sprinkler systems with a maximum working pressure of 16bar.

XPRESS SPRINKLER STAINLESS <FM>

The XPress Sprinkler Stainless System (22-54mm) has approval for application in wet and dry sprinkler system with a maximum pressure of 175 psi (12.1bar).

XPRESS SPRINKLER GALVANISED <FM>

The XPress Sprinkler Galvanized System has approval for application in wet sprinkler systems with a maximum pressure of 175 psi (12.1bar).

GAS FAMILIES

There are three gas families:

- 1st Family - manufactured gas
- 2nd Family - natural gas
- 3rd Family - LPG, compressed propane and butane gas

Stainless Gas does not have the LBP feature for safety reasons and are designed for use in internal and external above ground 2nd and 3rd family gas services.





INSTALLATION SPACING FOR 15MM TO 108MM SIZES

The XPress jointing system has been designed with easy, efficient installation in mind. XPress Copper, XPress Stainless, XPress Carbon, XPress Copper Gas, XPress Stainless Gas and XPress Solar have common installation instructions.

GUIDE TO INSTALLATION

Jointing procedures are almost identical for every type of XPress fitting and compatible tube material. This includes XPress fittings with 'Leak before Press' (LBP). Where there are variations these are shown on the following pages and in the fitting instructions.

To ensure the fittings stay clean and the O ring remains protected from damage, only remove the fitting from its packaging immediately prior to installation.

The tube can be fully inserted by hand. A damaged tube end will require excessive force to be used. If this is the case you should check the tube is round and deburred before continuing. Check the O ring is not damaged. XPress fittings with plain male ends must not be used directly with capillary fittings, since heating will damage the non-metallic parts.

Heat should not be applied to XPress fittings, directly or indirectly. They should be disconnected (where applicable) to avoid any possible damage to non-metallic parts if they are to be used on a system in conjunction with capillary fittings. Similarly, reconnection must not be considered until the heated tubes have been allowed to cool. Use pipe clips to secure finished installations and prevent vibration or movement.

SPACING

Allow sufficient clearance around each fitting to allow press jaws to be attached without hindrance.

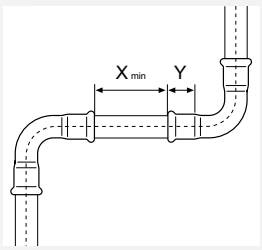
HEALTH AND SAFETY

1. We recommend that eye protection is worn when operating all pressing tools.

2. Do not activate a pressing tool without a fitting in the jaws.

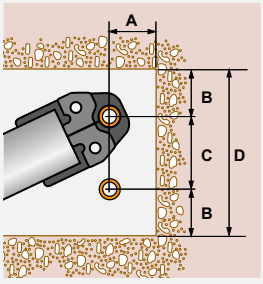
Note: When using power tools, great care must be taken at all times. Always refer to the manufacturers' instructions for all machines and tools you use.

Refer to the COSHH information for Dri-slide lubricants.
Both documents are available at www.pegleryorkshire.co.uk



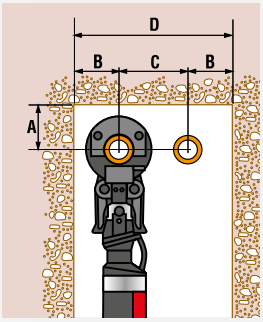
Minimum distances between pressings

Insertion depth				Minimum distance	Minimum tube length		
ø (mm)	Y (mm)			X min (mm)	2 x Y + X min (mm)		
	XPress Stainless (GAS)	XPress Carbon	XPress Copper (GAS)	XPress Stainless (GAS) Carbon, Copper	XPress Stainless (GAS)	XPress Carbon	XPress Copper (GAS)
12	17	17	17	10	44	44	44
15	20	20	20	10	50	50	50
18	20	20	20	10	50	50	50
22	21	21	21	10	52	52	52
28	23	23	23	10	56	56	56
35	26	26	26	10	62	62	62
42	30	30	30	20	80	80	80
54	35	35	35	20	90	90	90
64	-	-	50	30	-	-	130
66.7	-	50	50	30	-	-	130
76.1	55	55	50	55	165	165	140
88.9	63	63	64	65	186	186	193
108	77	77	64	80	234	234	208



Pipework clearance (mm)

Size	A	B	C	D
15mm	25	28	75	131
18mm	25	28	75	131
22mm	31	35	80	150
28mm	31	35	80	150
35mm	31	44	80	170



Pipework clearance (mm)

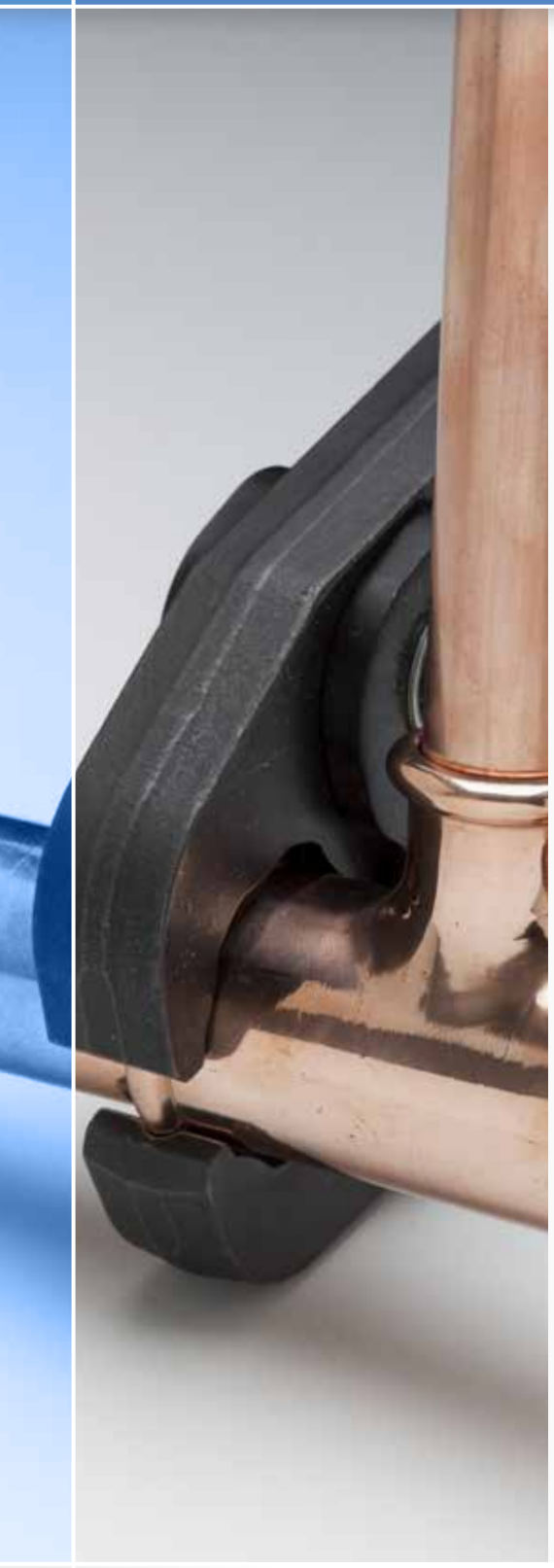
Size	A	B	C	D
42mm	75	75	115	265
54mm	85	85	120	290
66.7mm	100	100	145	345
76.1mm	115	115	165	395
88.9mm	125	125	185	435
108mm	135	135	200	470





4.0 INSTALLATION INSTRUCTIONS

XPRESS INSTALLATION INSTRUCTIONS



Select the correct size of tube and fitting for the job. Ensure that both are clean, in good condition and free from damage and imperfections.



1. CHECK THE FITTING

Keep all fittings in their bag prior to installation to ensure the lubrication does not dry out. Ensure the O ring is seated correctly within the fitting socket.

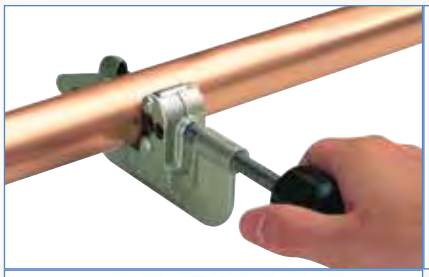
2. CUT THE TUBE SQUARE:

It is essential to cut the tube square using a rotary tube cutter. Pegler Yorkshire recommends using a Rems Cento with the correct cutter wheel for the specific material being cut.

NOTE: The tube must always be cut completely. Never partially cut and then broken as this could cause corrosion. Do not use a hacksaw, oil cooled saws, abrasive wheels or flame cutting.

ACCEPTABLE METHODS OF CUTTING TUBE INCLUDE:

Rotary tube cutter.



Rems Cento.





NOTE: Use TC155 for cutting carbon steel tube.





3. DEBURR AND CHECK THE TUBE ENDS:

Both the internal and external tube ends should be deburred then wiped clean of all swarf and debris to avoid damage to the O ring upon tube insertion. Also check that the tube end is clean and free from damage such as scores, tape, labels or adhesive residue.

ACCEPTABLE METHODS OF DEBURRING INCLUDE:

S120 - 15 to 54mm internal and external.

S122 - 15 to 54mm external only but can re-round damaged tube. Use on copper only.



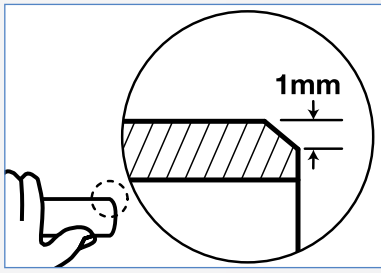
TC150: 15 - 22mm external only, very good for carbon steel tube. TC143 and TC147 internal only.

Hand file.

NOTE: If using plastic coated carbon steel system tube the plastic coating must be removed from the socket depth of the fitting using the S115 stripping tool from the XPress accessories range.

Use the S115 Tube Stripper for removing the plastic from plastic coated carbon steel tube.





✚ Having deburred as above you will be left with a 1mm chamfer on the outside of the tube as indicated in the diagram. Wipe clean the tube end of remove all swarf and debris.

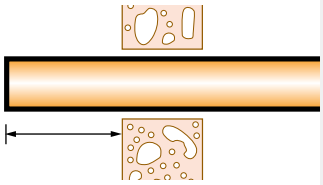
PIPEWORK CLEARANCE

When designing an XPress System, please take care to ensure all joints can be accessed easily. Observe minimum gaps and insertion distances to ensure sufficient access for the pressing tool, where applicable.

Important:
XPress galvanised Sprinkler system tube (SC645) can only be used in sprinkler installations and should not be used in a general plumbing application.

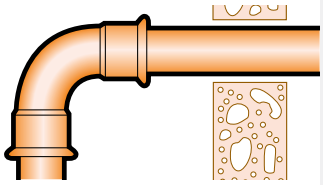
SPACING

Minimum projection



Similar consideration should be given to the distance pipe stubs project through walls or bulkheads. Refer to table on Page 137.

Good practice



Projection distances shown in the table below also ensure that the subsequent installation will be a convenient distance from the wall.

FITTING SPACING FOR XPRESS

Sizes	Min. gap between fittings	Min. tube projection
15mm	10mm	40mm
18mm	10mm	40mm
22mm	10mm	40mm
28mm	10mm	60mm
35mm	10mm	70mm
42mm	20mm	70mm
54mm	20mm	70mm
66.7mm	30mm	70mm
76.1mm	40mm	80mm
88.9mm	50mm	90mm
108mm	50mm	100mm





4.0 INSTALLATION INSTRUCTIONS

XPRESS INSTALLATION INSTRUCTIONS

4. MARK THE SOCKET DEPTH:

Ensuring full socket depth is achieved is vital for the integrity of the joint. To check that the tube and fitting remains in the correct position throughout the pressing process you must mark the socket depth with a 'V-Tail' mark.



S110 - Orange socket depth tool for Copper tube



S111 - Blue socket depth tool for Carbon and Stainless Steel tube



By hand	
Size	Depth
12mm	17mm
15mm	20mm
18mm	20mm
22mm	21mm
28mm	23mm
35mm	26mm
42mm	30mm
54mm	35mm
66.7mm	50mm
76.9mm (Copper)	50mm
76.9mm (Stainless/Carbon)	55mm
88.9mm	64mm
108mm (Copper)	64mm
108mm (Stainless/Carbon)	78mm

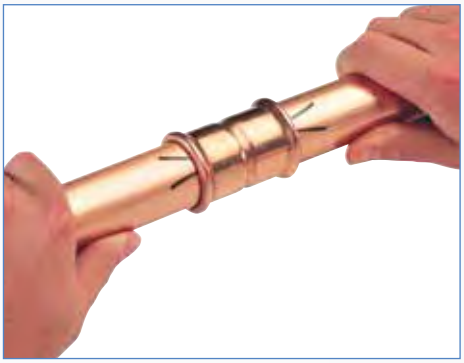




5. ASSEMBLE THE JOINT:

Insert the tube into the fitting until it meets the tube stop, using the insertion depth mark as a visual aid.

Only when the tube reaches the tube stop should the pressing operation be commenced.



6. PREPARE THE PRESS-FIT TOOL:

Select the correct combination of Press-tool, Jaws, Slings and adaptors for the joint being made.

See notes on page 105 regarding 67mm slings and Copper only slings at 108mm.

NOTE: Always refer to the manufacturer's instructions for detailed information on how to operate your press-tool safely.

NOTE: Check that the press tool and relevant jaws/slings have been maintained in accordance with their servicing/calibration schedule.

Make the tool safe by isolating it from the power supply. Select the correct jaws/sling jaws/sling jaw adaptor for the joint being made, checking that they are free from damage. Attach the jaws/sling jaws/sling jaw adaptor to your press-tool, following the instructions for your particular press-tool, and reconnect the power supply when ready.





7. DRI-SLIDE LUBRICANT

Use of S135 Dri-Slide lubricant is essential when jointing large sized fittings. The pressing profile groove of the sling jaws should be cleaned and lubricated after every 50 joints for 42mm to 76.1mm sizes, and every 5 joints for 108mm. Dri-Slide should also be applied between the main sling arms and the moving segments; and along the pivot pins between the arms. Wipe clean any excess lubricant so that it does not come into contact with the fitting O ring.

NOTE: Dri-Slide lubricant should never be used to lubricate the O ring.



8. PRESS THE JOINT:

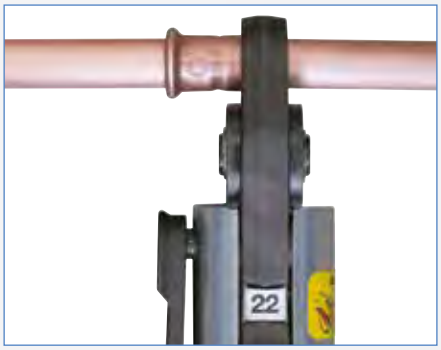
Mount the jaws/sling jaws over the bead at the mouth of the fitting. With the tool fully supported and not hanging from the pipework, and with your hands safely away from the joint, press the trigger or button to start the jointing cycle. When the jaws/sling jaws fully enclose the mouth of the fitting, the joint is complete. The jaw should then be released from around the fitting.



15 to 35mm.



Pegler Yorkshire recommend the use of Sling Jaws for sizes 42 to 108mm.



NOTE: The 108mm joint is not fully made until the fitting has been through two pressing operations.

NOTE: Maintain a 90° angle between the tube and jaws at all times, this is to ensure the integrity of the joint as well as protect the operator from 'kickback'.

NOTE: The pressing operation should only be carried out when the tube is adequately supported by brackets, not when the tube is suspended in the fitting socket alone.

NOTE: Allow press-fit jaws to be attached without hindrance.

9. CHECK THE JOINT:

Inspect the finished joint making sure all is in order, when satisfied the joint has been made correctly mark the joint as complete.

- The socket depth mark you made indicates that full socket depth has been maintained throughout the pressing cycle.
- The fitting and pipe bear the witness marks from your jaws/sling jaws.
- We recommend all systems are thoroughly pressure tested before hand over to end user. Refer to page 110 for detailed recommendations, particularly regarding Carbon Steel installations.



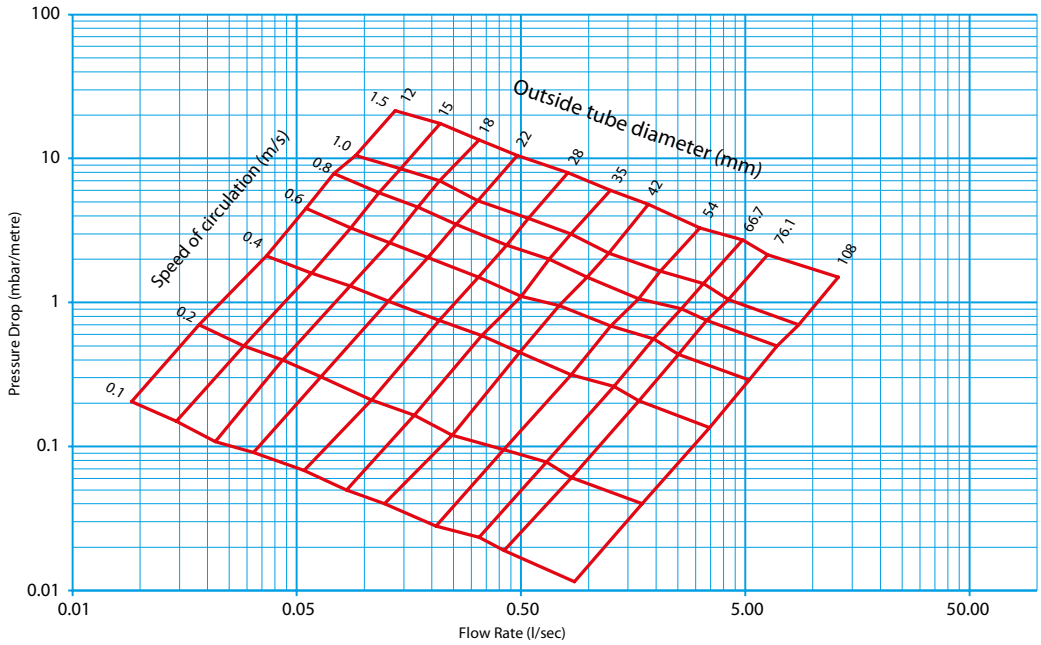


5.0

FLOW CHARTS

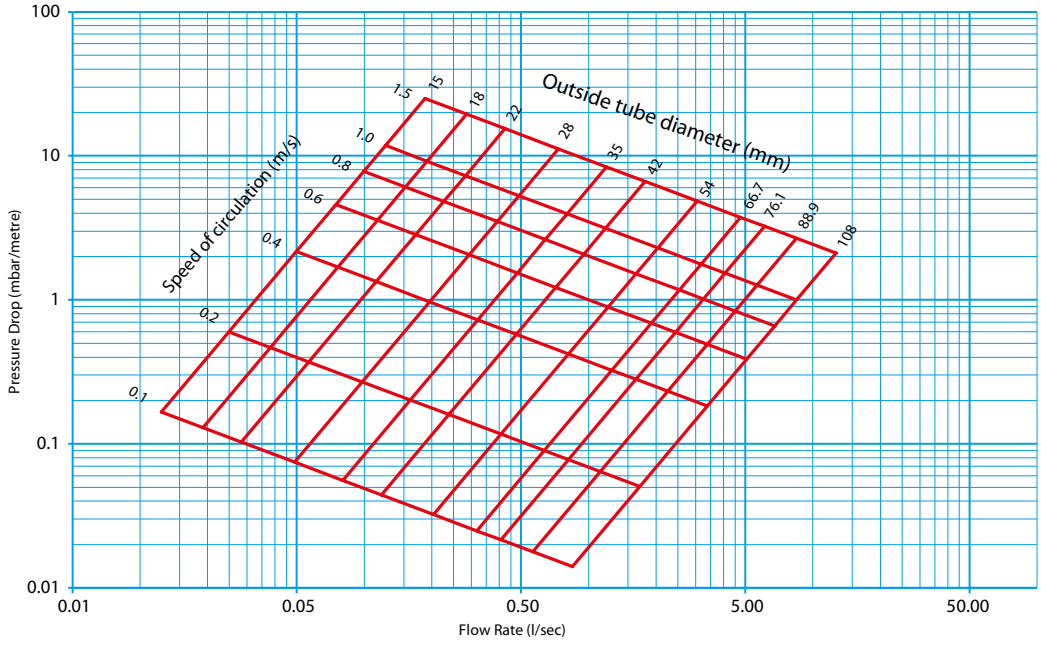
HEAD LOSS / PRESSURE LOSS DIAGRAM:

COPPER



HEAD LOSS / PRESSURE LOSS DIAGRAM:

CARBON STEEL

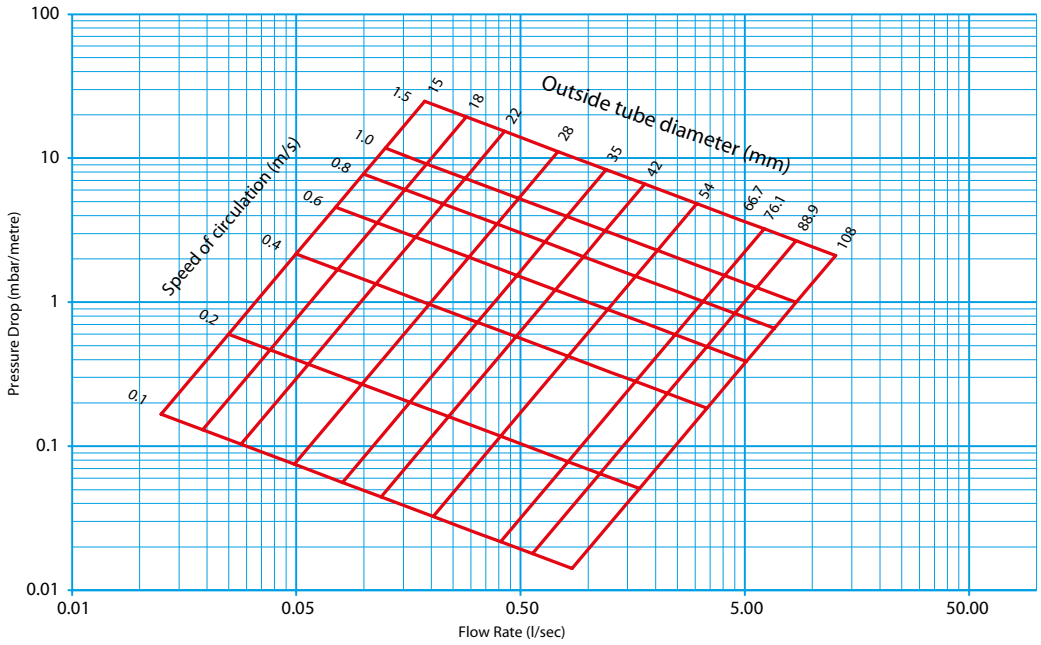






HEAD LOSS / PRESSURE LOSS DIAGRAM:

STAINLESS STEEL







NOTES





NOTES

PEGLER
Valve technology

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Email: uk.sales@aalberts-ips.com

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Free Phone: 0800 156 0050
Email: technical@aalberts-ips.com

INTERNATIONAL ENQUIRIES

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Email: export@aalberts-ips.com

Tectite
XPress
VSH Shurjoint
Terrier
Ballorex
Pegler
Prestex
Yorkshire
Endex
Kuterlite



HEAD OFFICE

Aalberts Integrated Piping Systems Ltd
St. Catherine's Avenue, Doncaster,
South Yorkshire DN4 8DF, England

Tel: +44 (0) 1302 560 560
Fax: +44 (0) 1302 560 203
Email: info@pegler.co.uk

www.pegler.co.uk

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aalberts

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Provided by	Not recorded
Source file	`Water King Specsheet_WK4-07.24.pdf`
Pages	1

SPECIFICATION



Model		Water-King WK4
Sizing	Maximum pipe diameter	108mm
	Maximum heat output	750kW gas/oil fired water heater
		100kW electric water heater
	Maximum flow rate	Water-King can treat any flow rate
Output	Aerial length	7.0m
	Aerial number	4
	Minimum aerial turns	15
	Frequency range	1–10kHz
	Peak to peak voltage	130V
Power	Supply Required	230V
	Consumption	2W
	Converter	Integral with external 5V USB plug
	Cable length	2.4m
	Fuse	2 Amp.T.
Enclosure	Dimensions (W x H x D)	298mm x 257mm x 95mm
	Weight (boxed)	4.20kg
	Ambient temp range	0–70C
	IP Rating	IP64
Features	Fault Monitoring	Integral fault monitoring system with LCD display, LED output monitoring indicators and battery back-up
	BMS	Yes (maximum rating is 24V and 100mA)
	Guard Chip	Monitors performance of program and auto-resets in the event of a malfunction, a system failure or if a power spike or outage occurs
Lifecycle	Design life	In excess of 25 years
	Maintenance	Back-up battery replacement every 5 years
	Running costs	Expected to be less than £10.00 per annum
Performance	Testing & Standards	UKCA marked
		Performance verified by IAPMO R&T Labs using IGC-335 Rapid Scaling Test
		Independent laboratory tests for effectiveness of partial softening carried out under regime specified by the ASA
		Third party performance tested by MCS (UK)

All information is correct as of date of publication: July 2024.

© 2019 Lifescience Products Ltd, Unit 19, Cheltenham Trade Park, Gloucestershire, GL51 8LZ
Tel: +44 (0)1608 811707 Fax: +44 (0)1608 819060
Email: info@lifescience.co.uk

Lifescience PRODUCTS LTD

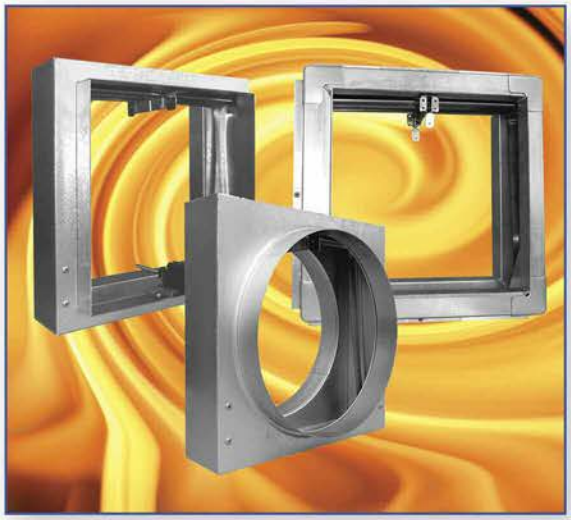
8.95

FD 0.02 product datasheet and installation instructions

The following 16 pages are the document exactly as received and checked. It is bookmarked in the PDF.

Reference	HEN0203-FD002-DS
Asset	FD 0.02
Provided by	BSB Engineering Services Ltd
Source file	BSB FD series fire damper brochure.pdf
Pages	16

FD Series



Fire Dampers

- LPCB certificated fire dampers (LPS 1162)
- Tested and assessed installation methods to BS EN 1366-2 and BS 476-20/22
- E classified fire dampers complying with BS EN 13501-3
- FD-AF has been tested both vertically and horizontally. It is installed using single side access without the need to provide fire rated infill material
- Galvanised and stainless steel blade options
- Microswitch option for remote indication
- Complies with the temperature/time curve as specified in ISO 834 and EN 1363-1

MADE IN BRITAIN

MANUFACTURERS OF AIR, FIRE AND SMOKE CONTROL PRODUCTS

FD Series
Fire Dampers – Introduction

Introduction

What is a fire damper and why might they be needed?

The FD Series Steel Curtain Fire Damper is designed to stop the spread of fire through ducts, walls, floors and ceilings.

The product range has many features and options to meet the requirements of specifiers, contractors, local and national authorities. Dampers are available to suit both low/medium and high velocity applications.

What is the 'E' classification?

To achieve the classifications to EN13501-3, fire dampers and fire and smoke dampers shall be tested to EN1366-2 and a 300Pa pressure difference is applied across the damper. During the fire test period, the integrity of the seal between the damper and the structure shall not have any gaps larger than 150mm x 6mm. There shall not be any sustained flaming. The largest size of damper to be manufactured for sale as a single section shall be fire tested.

E = Integrity

The maximum leakage permissible at 300Pa corrected to 20°C is 360m^3/hr/m^2 (100 l/s/m^2) throughout the fire test period.

Fire dampers should be installed as tested.

Test reports showing testing to EN 1366-2 should be acceptable to meet the requirements of BS 476-20/22, but the reverse is definitely not the case and no classifications are available.

Some applications (fan off) allow the use of tests undertaken to BS 476-20/22 and this is allowed worldwide in areas outside of the EU.

However, as a word of caution, in whichever case, the correct model must be selected, to match fire resistance time with installation method and with the supporting construction (wall or floor).

To ensure that all testing and assessments are traceable back to initial fire test reports, the BSB FD series is product certificated by the Loss Prevention Certification Board (LPCB). This means that in addition to normal BS EN ISO 9001 compliance, the product is also checked to ensure that same product is being manufactured that has been tested or assessed.

BSB have a policy of continued testing and product certification to try and provide as broad a number of installation methods as possible.

BSB also follow regulation and standards development very carefully to provide input on changes and to be able to pass on relevant information to designers, specifiers, building control authorities (BCA's) and installers.

The FD Series Range

The BSB FD series is available in a variety of vertical or horizontal mounting configurations from 100mm x 100mm to 1200mm wide x 1000mm high.

Type FD Rectangular Spigot

A - Blades in air stream on heights greater than 300mm.
B - Blades held clear of the air stream.

Type FD Circular Spigot

C - Blades held clear of the air stream.

Type FD In-Duct

I - Blades and case within air stream.

Type FD Flat Oval Spigot

O - Blades held clear of the air stream.



Testing and Conformities

See installations section for full details.

E Classification (BS EN 1366-2/BS EN 13501-3)

- BSB FD fitted with HEVAC frame
  - E 120 - Blockwork/masonry wall
  - E 120 - Concrete floor
- BSB FD fitted with cleats
  - E 120 - Dry partition wall
- BSB FD fitted with angle frame
  - E 120 - Dry partition wall
  - E 120 - Concrete floor

E Classification (BS ISO 10294-1/2)

- As BS EN 1366-2/BS EN 13501-3 above

Corrosion testing (ASTM B117)

- Tested and satisfies LPS 1162

FD Blade leakage (BS EN 1751)

- Class 2

FD Features and Benefits

- The majority of the FD product variants are covered by third party Loss Prevention Certification Board (LPCB) product certification. This represents both full BS EN ISO 9001 quality compliance and a guarantee that the products are fully representative of those actually tested.
- Tested and certified installation variants of the FD are available to cover masonry walls, dry walls, batt walls and floors. These cover the majority of applications/supporting constructions that are required to maintain compartmentation.
- All BSB tested installation methods give at least a E120 classification, usually only limited by the wall construction used.
- Sleeve and angle methods, HEVAC frame methods, cleat and drop rod methods and batt infill methods are available.
- Some rarer installation applications are covered by assessment/test information to BS 476-20/22.
- Minimum size 100mm x 100mm.
- Maximum single section size 1200mm x 1000mm, available from the smallest size up to this in millimetre increments.
- Multi-section configurations are available to specific customer requirements, but will be subject to BCA approval.
- Standard construction is a fully welded galvanised steel case, which gives a casing leakage that complies with Class C ductwork leakage specifications.
- Other combinations of galvanised mild steel, type 1.4016 (430) and 1.4401 (316) stainless steels for the blades and case are available to specific customer requirements.
- The BSB FD has a strong and robust design to both meet the exacting fire testing requirements and be resilient to site handling. This is supported by sound production techniques which result in a quality product.
- All the above, supported with BSB's enviable delivery performance, provide an unbeatable combination.

Regulations and Standards

Approved Document B: Fire safety (ADB)
ADB is the UK government's guide to fulfilling the Building Regulations in terms of fire safety. It is available as a free download from the planning portal website.

It gives clear guidance on where fire dampers are to be used and what their performance or classification shall be. The BSB FD fulfils the E classification and reference should be made to the installation method to confirm exact time periods. These will generally be 120 minutes, but may be up to 240 minutes (limited by wall construction).

Health Technical Memo 05/02 (HTM05/02)
HTM05/02 is the Department of Health Firecode - fire safety in the NHS: Guidance in support of functional provisions for healthcare premises.

It basically underlines the requirements stated in ADB, requiring fire damper testing to BS EN 1366-2 and classification to BS EN 13501-3.

It supersedes HTM81 and should be read in conjunction with HTM2025: Ventilation in healthcare premises, as it gives guidance on maintenance and testing.

Building Bulletin 100
BB100 is the Department for Children, Schools and Families document on Fire safety in schools.

It basically underlines the requirements stated in ADB, requiring fire damper testing to BS EN 1366-2 and classification to BS EN 13501-3.

It also states: "For property protection, fire dampers should also satisfy LPS 1162".

Regulatory Reform (Fire safety) Order (RRFSO)
This is the regulatory requirement that allows people to self fire certificate their buildings. There are requirements for keeping testing and maintenance records for all passive fire protection equipment, which includes fire dampers.

BS EN 1366-2
The fire resistance test standard for fire dampers.

BS EN 15650
Fire Damper product standard. Ventilation for Buildings.

BS EN 1751
The standard for aerodynamically testing dampers. This includes casing leakage.

Other publications

DW 144 (HVCA)
This states the general requirements for HVAC ductwork, including the use of fire dampers. It also states ductwork leakage limits. The BSB FD fulfils the requirements of classes A, B & C.

DW 145 (HVCA)
This document will give guidance on the whole process of the selection and installation of fire dampers, with responsibilities and project planning etc.

The Grey Book (ASFP)
This gives further guidance on the application and installation of fire dampers.

Scotland
These are technical standards (AMD's). They give similar guidance to ADB. They already include direct references to the application of European standards. They are obtainable as a free download from the Scottish Executive website.

FD Series

Fire Dampers – Product Specification

Fusible Link Bracket
The Fusible Link Bracket is manufactured from galvanised steel as standard.

Fusible Link
Blades are held in the open position by a straight bar link (fitted as standard) rated at 72°C (162°F) with a formed reinforcing swage and two location holes.

- BSB can supply the FD Series Fire Damper with the alternative rated fusible link for higher temperature applications as follows:

  95°C (202°F)

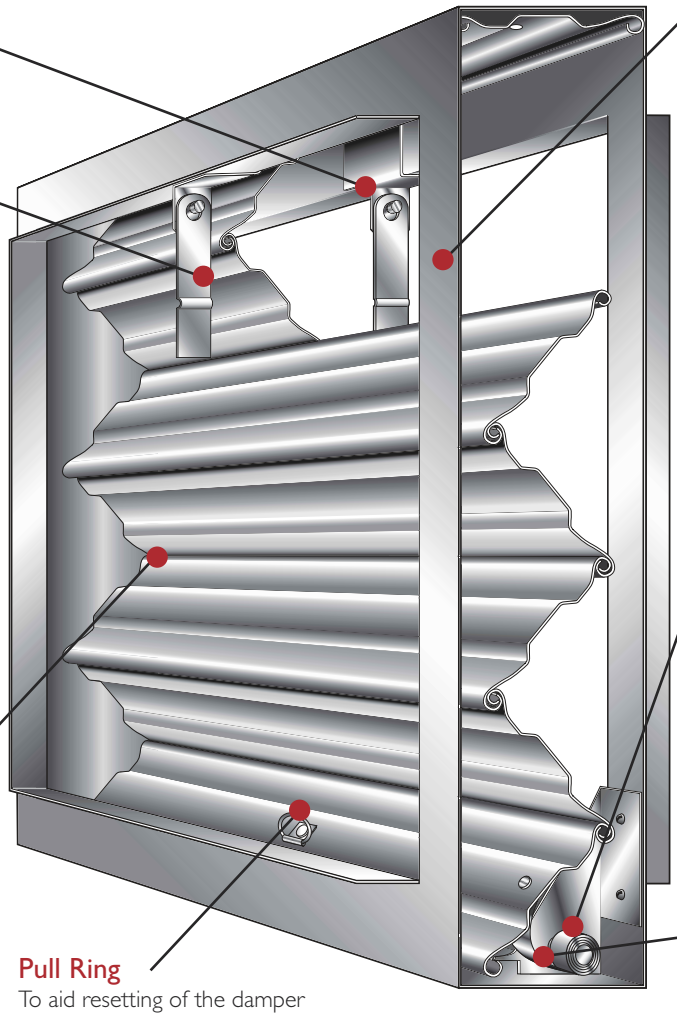
  124°C (260°F)

  145°C (286°F)

  182°C (360°F)

Blades
Formed to provide a continuous interlocking hinge extending the full length with dual swages providing maximum strength and rigidity. Nominally 0.7mm (22swg) thick cold reduced hot dipped galvanised mild steel to BS EN 10346 Grade DX51D + Z275.

Blade material options to order are Ferritic 430 type 1.4016 grade or Austenitic 316 type 1.4401 grade to BS EN 10088-2.



Casing
Formed to provide two continuous internal flanges not less than 30mm.
Casing and components not less than 1.2mm thick cold reduced hot dipped galvanised mild steel to BS EN 10346 Grade DX51D + Z275.

Casing material options to order are Ferritic 430 type 1.4016 grade or Austenitic 316 type 1.4401 grade to BS EN 10088-2.

Side Seals
0.20mm gauge 301 stainless steel to BS EN 10088-2, available to order.

Closure Springs
Dampers are supplied with two constant force coil springs exerting a pull of not less than 35N, with one end fixed to the leading blade by rivets and the coil fitted on the spindle of the locking ramp. The spring is manufactured from Grade 302 stainless steel to BS 5770, 4 hard.

Locking Ramps
Dual locking ramps ensure positive closing action of the blade pack in horizontal or vertical installations.

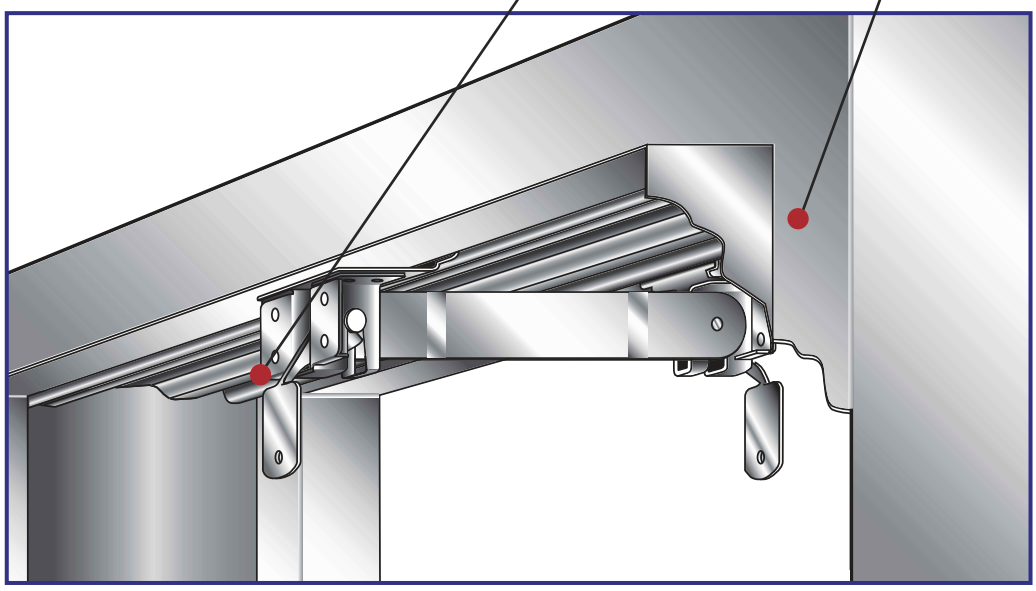
Pull Ring
To aid resetting of the damper blade pack, the bottom closing blade will be fitted with a single pull ring centrally to the width for dampers up to and including 500mm wide or 500mm diameter. For all dimensions above this, two equally spaced pull rings will be fitted.

Gate Latch Release
Optional mechanism for electrical release when required. Rated 72°C (162°F), alternative ratings available as per standard straight bar link.

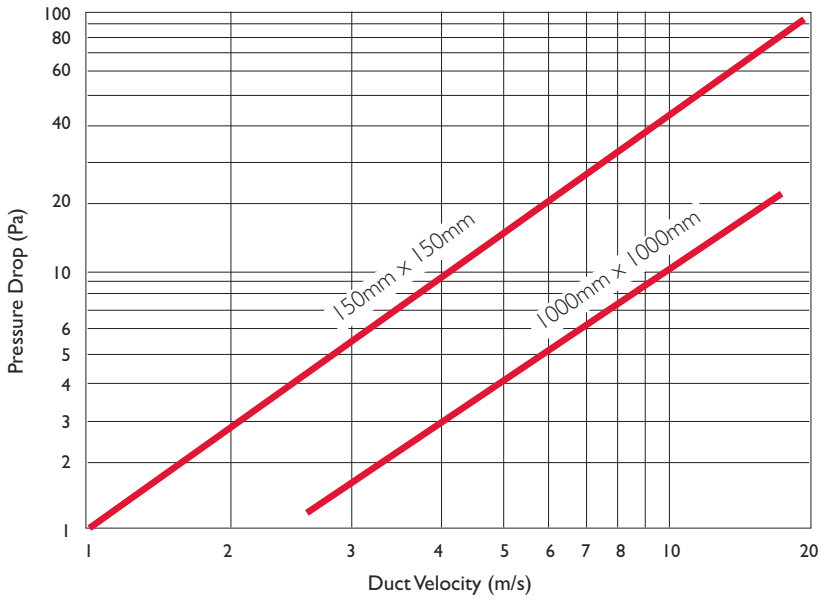
Paint
All welds, seams and joints are sprayed with commercial grade aluminium paint.

Microswitches
All BSB FD Fire Dampers are available with factory fitted single or double pole microswitches as optional extras. (See page 9)

Mechanical Visual Indicator
Local visual indication of the blade status is available as an optional extra. (See page 9)



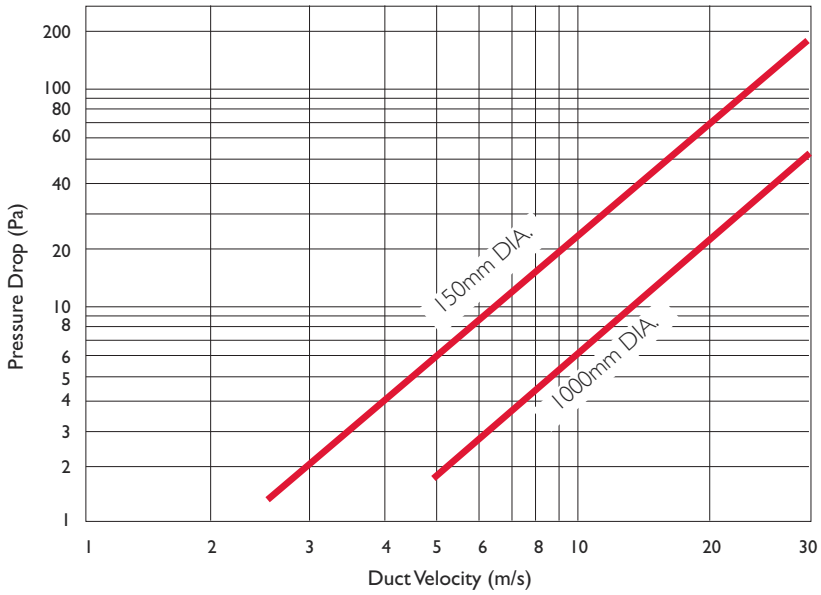
Performance Data



Pressure Drop Graph
Type A and Type I

Minimum free area = 91%

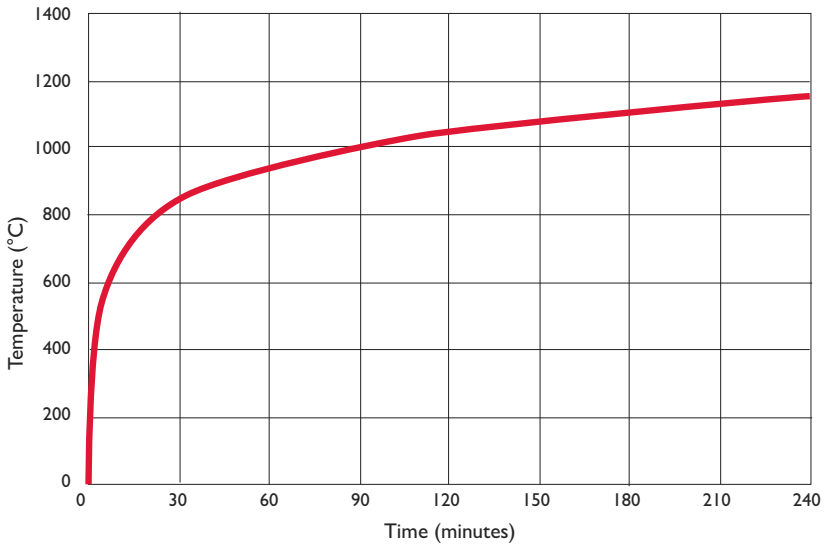
Velocity range 0 to 12.5 m/s



Pressure Drop Graph
Type B, Type C and Type O

Maximum unrestricted airflow

Velocity range 0 to 30 m/s



Standard Time/Temp. Curve (4 hours)
As specified in ISO 834

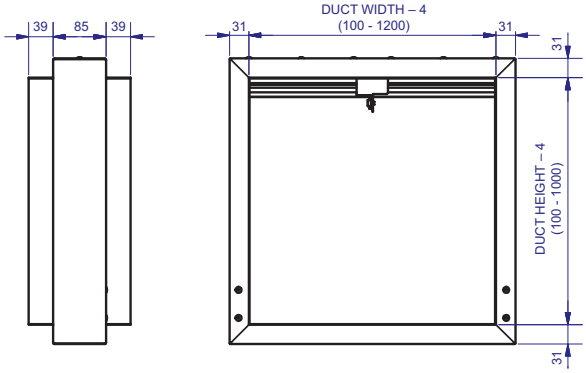
EN1366-2 Vertical Test Report TE201633

FD Series

Fire Dampers – Base Dimensions

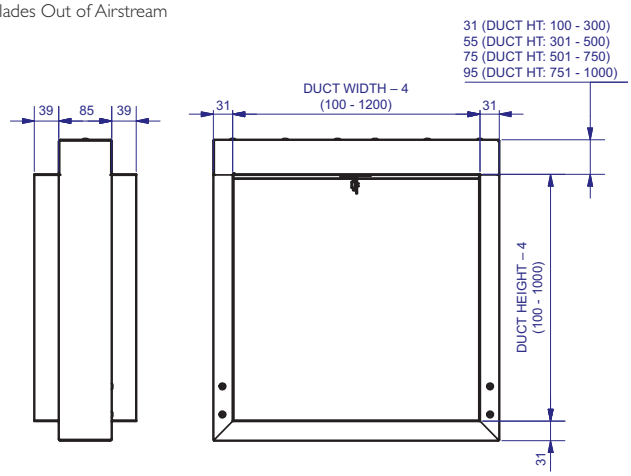
Type A

Square/Rectangular Spigot Connection
Blades Partially in Airstream
on heights greater than 300mm



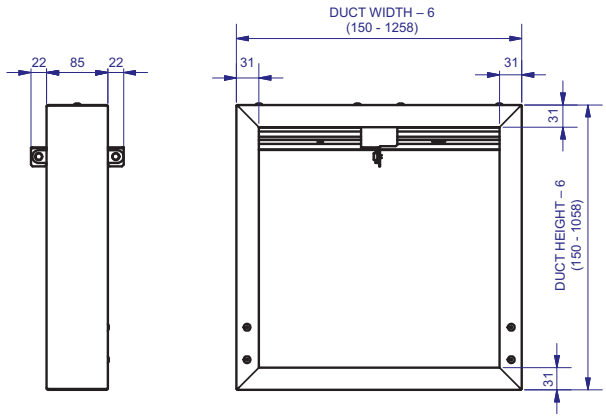
Type B

Square/Rectangular Spigot Connection
Blades Out of Airstream



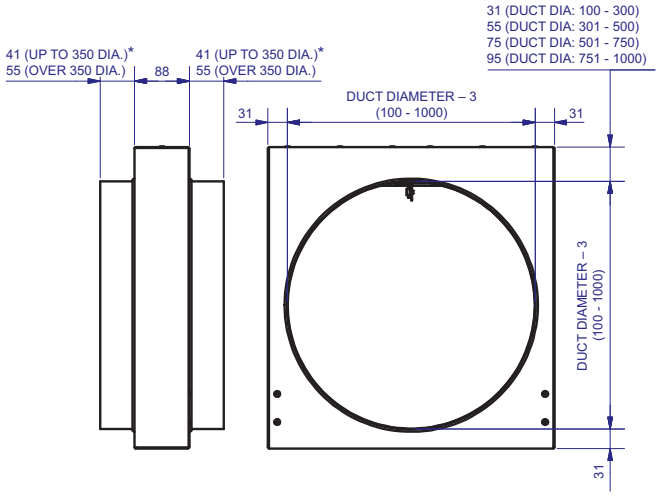
Type I

Square/Rectangular Case Induct Connection
Blades Partially in Airstream



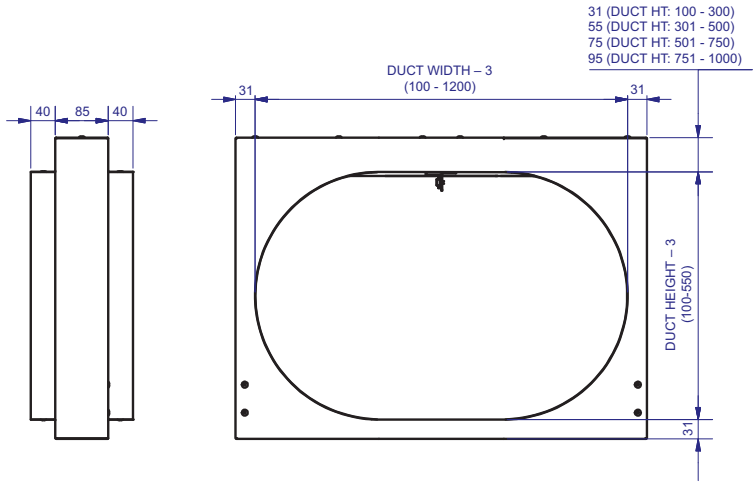
Type C

Circular Spigot Connection
Blades Out of Airstream



Type O

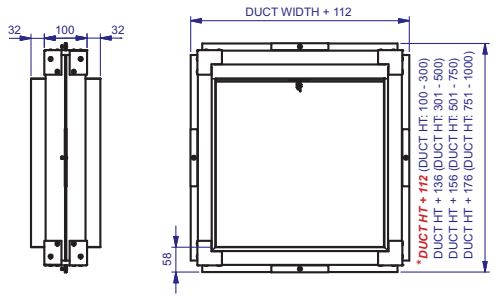
Flat/Oval Spigot Connection
Blades Out of Airstream



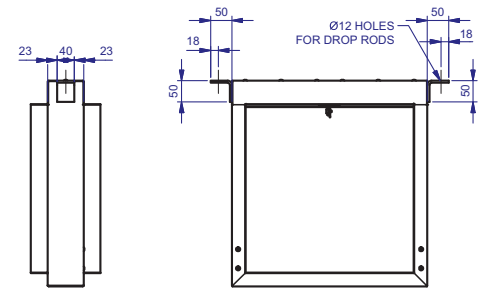
Notes:

1. All dimensions are in mm.
2. Rectangular spigoted models are supplied with actual spigot dimensions nominal less 4mm ± 1mm.
3. Circular and Flat Oval spigoted models are supplied with actual spigot dimensions nominal less 3mm ± 1mm.
4. For sizes greater than detailed maximum sizes, multiple section units will be supplied.
5. Where gate latches are fitted on dampers below 150mm in height or diameter release testing is only possible from opposite to ramp side. Please refer to our sales office.

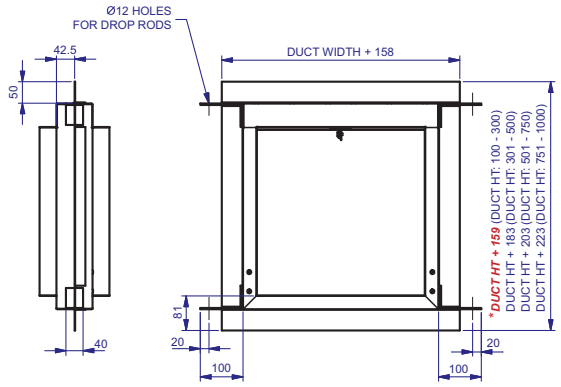
HEVAC Frame (HF)



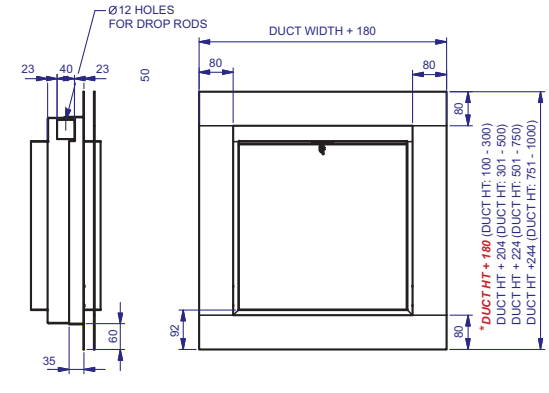
Cleats for Drop Rods (CL)



Batt Frame (BF)

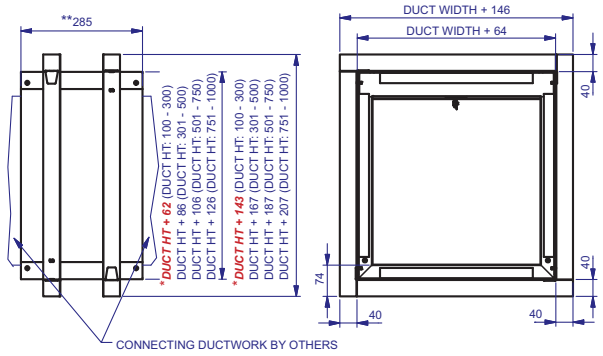


Fire Curtain (FC)

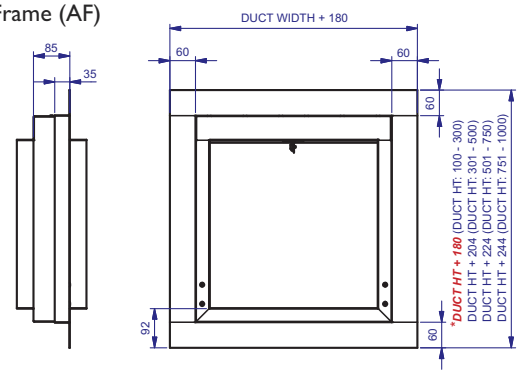


Sleeve and Angle (SA)

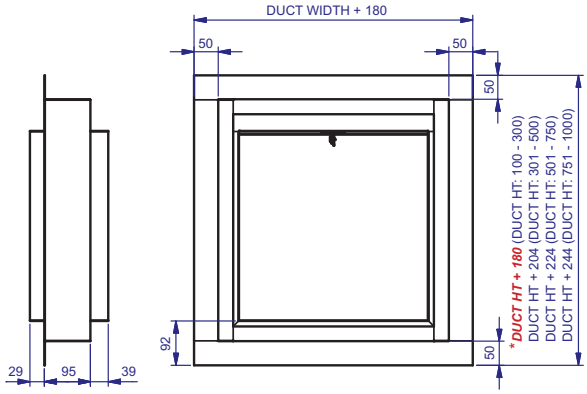
** Suitable for walls up to 200mm thick.
Above this width refer to our technical sales office.



Angle Frame (AF)



Z Frame (ZF)



Notes:

1. Dimensions with * apply for a type A damper at any height.

FD Series
Fire Dampers – Installation Notes

HEVAC/HVCA Frames

The HEVAC/HVCA approved factory fitted Installation Frame is designed to allow expansion of the damper under fire conditions, without affecting its integrity or the construction it is installed within.

Fixing Tie Tabs

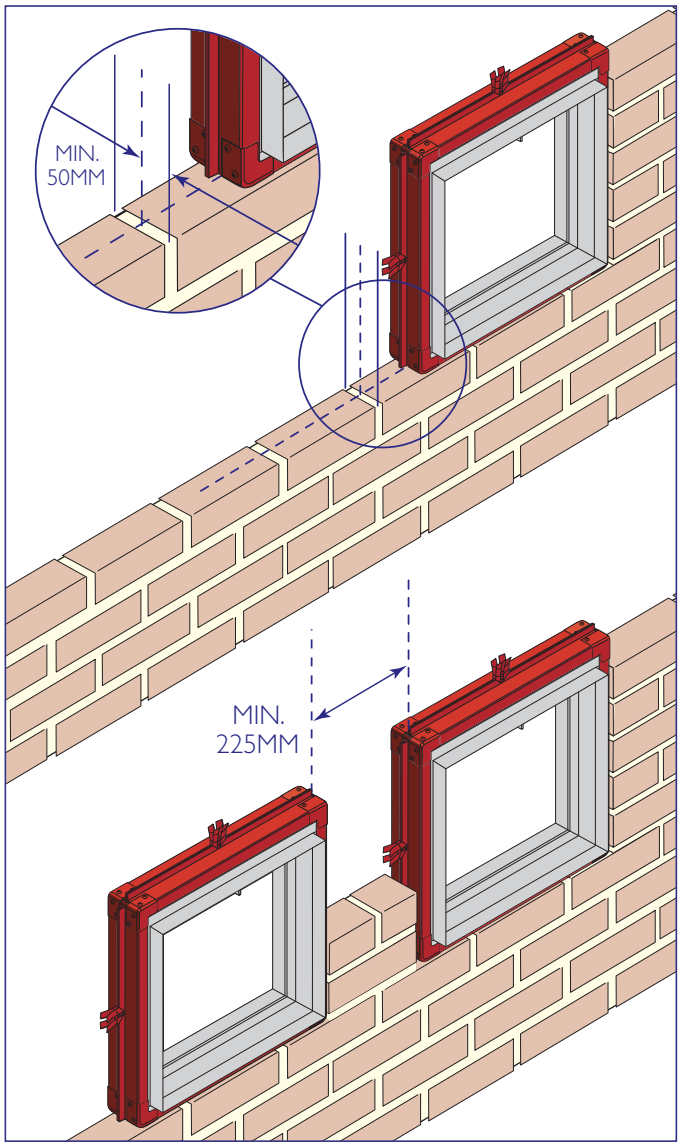
For securing the assembly into the builders work structure as specified by the specifying/authorising authority. In brick or Blockwork walls the fixing tie tabs must be bent out and be securely built into the mortar joints between the brick or Blockwork.
Installation within reinforced concrete walls and floors, the fixing tie tabs shall be bent out and tied back with stainless steel wire to the reinforcing bars that should be left protruding into the structural opening or to "eye bolts" but so as not to interfere with the installation of the damper. The gap between the installation frame and the builders work shall be backfilled with mortar or concrete on both sides of the upstand flange to the satisfactory requirements of the approving authoritative body.

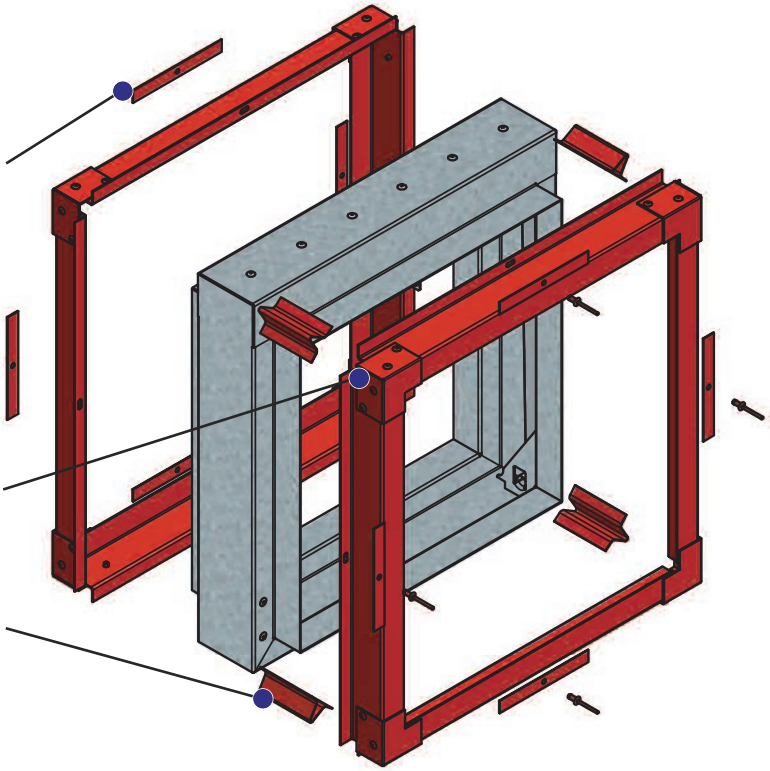
One Piece Corner Bracket

The one piece pressed corner bracket is rivetted (using aluminium rivets) to the "Z" Section which makes the frame. This bracket allows the frame to expand under fire conditions without affecting the integrity of the construction it is installed within.

Expansion Spacers

These pressed spacers are fitted into each corner to permit expansion of the fire damper within the construction of the frame.





Installation Codes of Practice

The frame should be installed centrally within the thickness of the surrounding wall or floor. Or, in the case of thick walls or floors, the centre line of the frame should be at least 50mm away from the nearest face.

Where more than one duct penetrates a wall or floor, adjacent fire damper assemblies should be separated by builder's work of a minimum thickness of 225mm. During installation, all fixing tabs should be bent out and built into the surrounding structure so as to ensure "positive fixing into the surrounding builder's work".

The illustrated detail on this page is BSB's interpretation of the HEVAC/HVCA Installation Frame specification. For additional details, contact our sales office.

Special Note:
All fire damper installations should be carried out to the satisfaction of the appropriate district surveyor, fire officer, building control authority and/or specifying authority as other approved methods of installation may well be used.

Installation Parameters

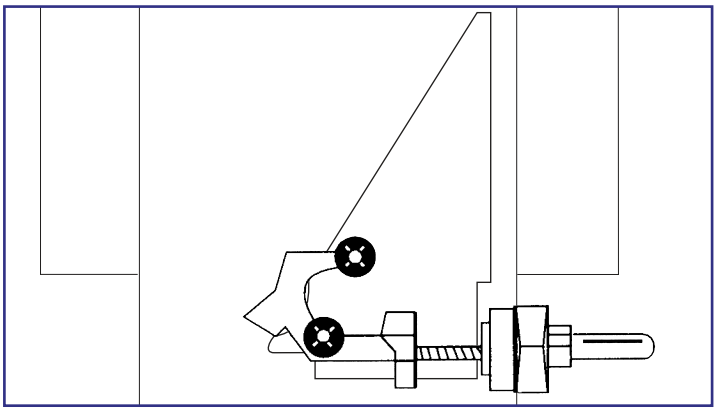
FD Series Fire Dampers are designed for application in normal dry filtered air systems. If exposed to fresh air intakes and/or inclement conditions the damper should be subject to a planned inspection programme.

Installations involving corrosive and/or aggressive hostile environmental conditions (e.g. swimming pools) may invalidate our warranty and should be referred to our Sales Office.

Mechanical Visual Indicator

To provide local indication of the blade status.

When the indicator appears in the bulb, this shows that the blades are closed.

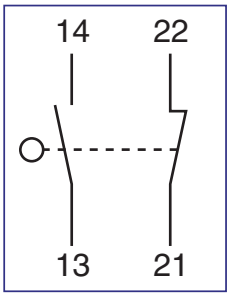


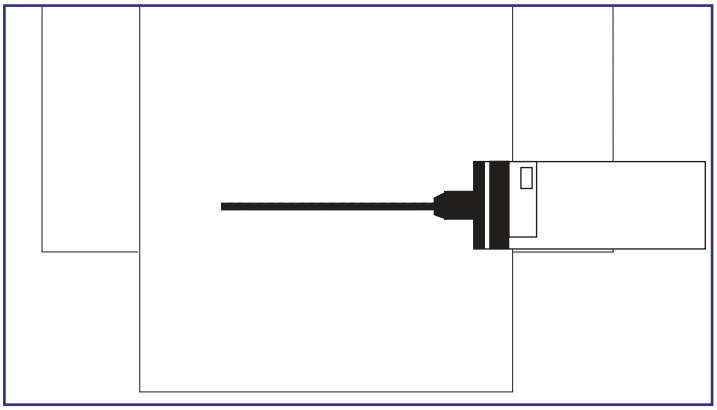
Single Pole Microswitch

To provide remote indication of the blade status. As the leading blade travels to the locking ramp, it contacts the arm and operates the switch. Factory Fitted.

The Single Pole Microswitch is supplied as a dependent snap action contact 1NO + 1NC.

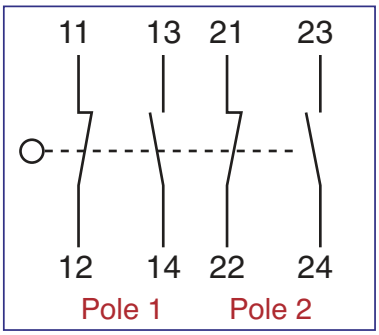
For indication of damper closed, terminals 13 and 14 should be used. Degree of protection: IP66.

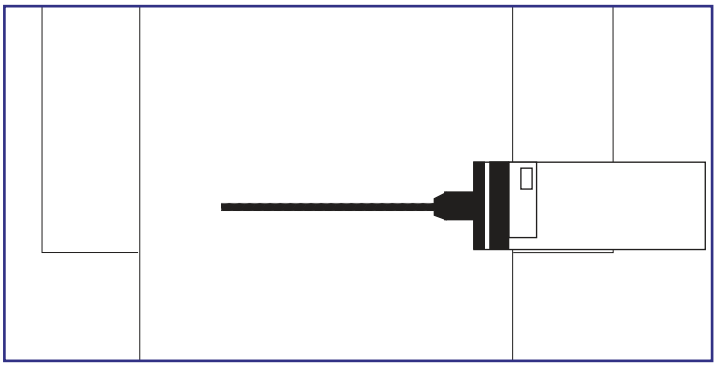




Double Pole Microswitch

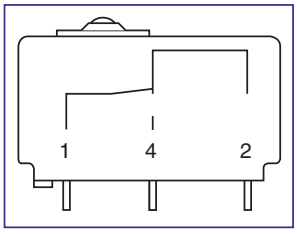
Operates as above but with two switches for double pole operation. Can also provide a signal to a control panel enabling isolation of plant in case of fire. Factory fitted.





V4 Sealed Microswitch

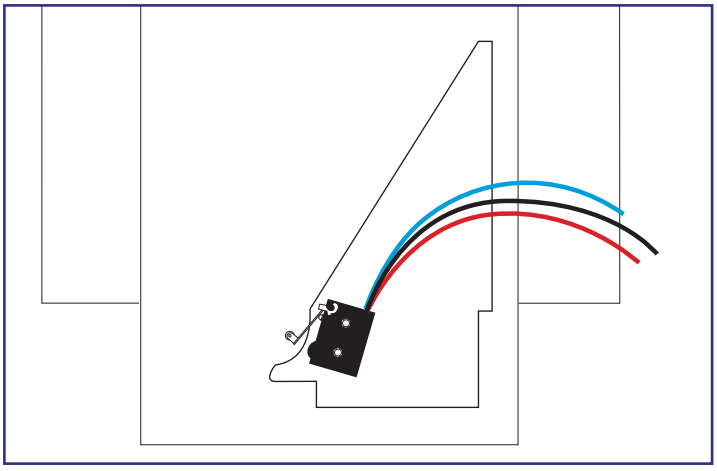
To provide remote indication of the blade status.
As the leading blade travels over the locking ramp, the lever is depressed and operates the switch. Factory fitted.



Degree of protection: Casing and Outlet IP67
Lead Length: 460mm

Connection details:

Common (1)	Black lead
Normally open (4)	Blue lead
Normally closed (2)	Brown lead

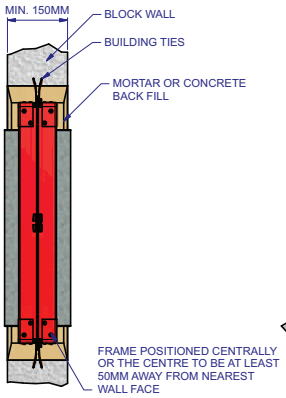


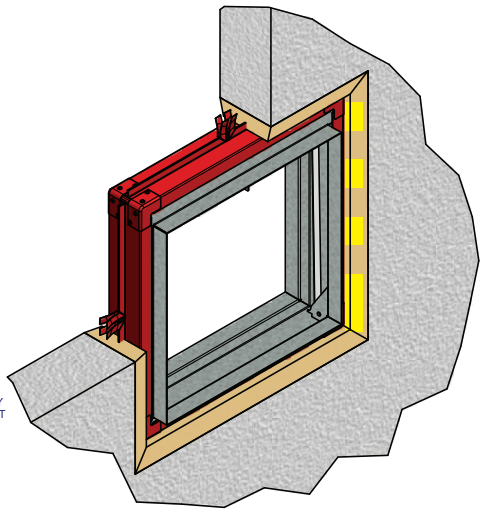
FD Series

Fire Dampers – Installation

BLOCK/MASONRY WALL - HEVAC FRAME Fitted

Single Section Sizes (mm)
100 x 100 to 1200 x 1000

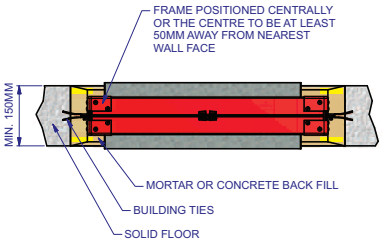


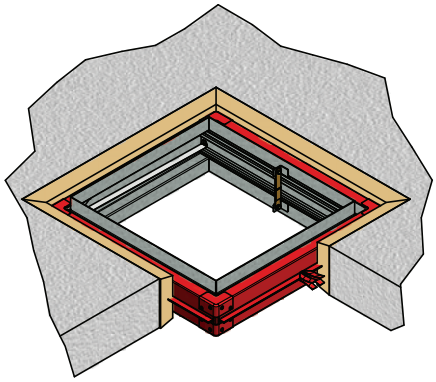


TESTED TO BS EN 1366-2 FOR 4 HOURS
BS EN 13501-3 CLASSIFICATION: E120
BRE GLOBAL CLASSIFICATION REPORT NO: 274347.2
MEETS THE REQUIREMENTS OF BS 476-20/22 - REFER TO BS 476-10.6.6.3

CONCRETE/MASONRY FLOOR - HEVAC FRAME Fitted

Single Section Sizes (mm)
100 x 100 to 1200 x 1000

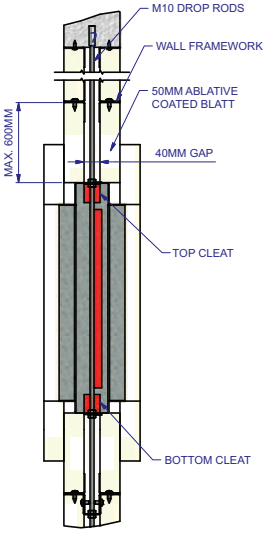


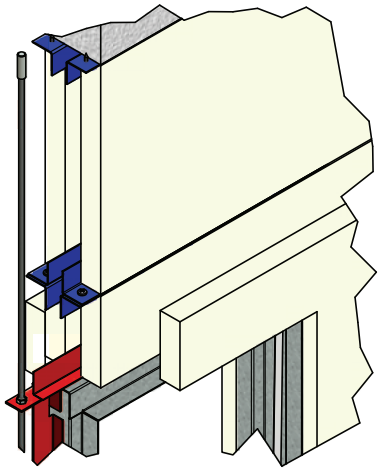


TESTED TO BS EN 1366-2 FOR 4 HOURS
BS EN 13501-3 CLASSIFICATION: E120
BRE GLOBAL CLASSIFICATION REPORT NO: 274347.2
MEETS THE REQUIREMENTS OF BS 476-20/22 - REFER TO BS 476-10.6.6.3

BATT WALL - BATT FRAME Fitted

Single Section Sizes (mm)
100 x 100 to 1200 x 1000



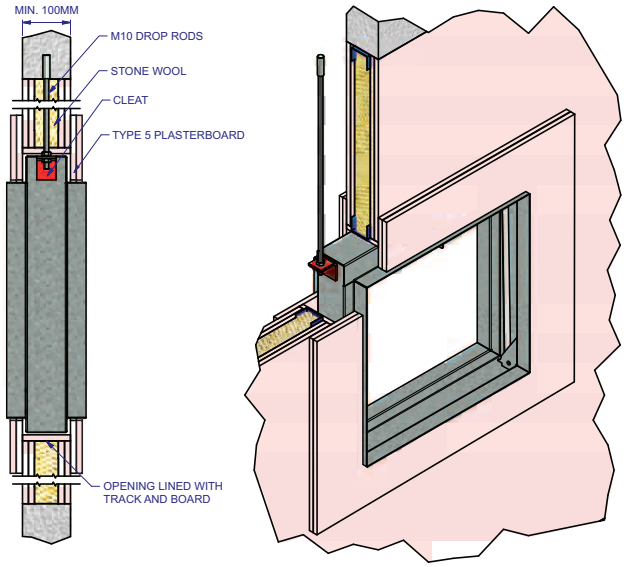


ASSESSED TO BS EN 1366-2 FOR 2 HOURS
BS EN 13501-3 CLASSIFICATION: E120
BS EN 1366-2 ASSESSMENT REFERENCES: CC 261451
MEETS THE REQUIREMENTS OF BS 476-20/22 - REFER TO BS 476-10.6.6.3

* If your proposed installation method has minor variations to that shown, please confirm acceptance with the local Building Control Authority (BCA) before proceeding. Manufacturers are not able to "approve" specific installation methods. It is generally accepted that EN 1366-2 tested installations will fulfil any requirements to BS 476-20/22 as the test method is much more severe.

DRY WALL - CLEATS Fitted

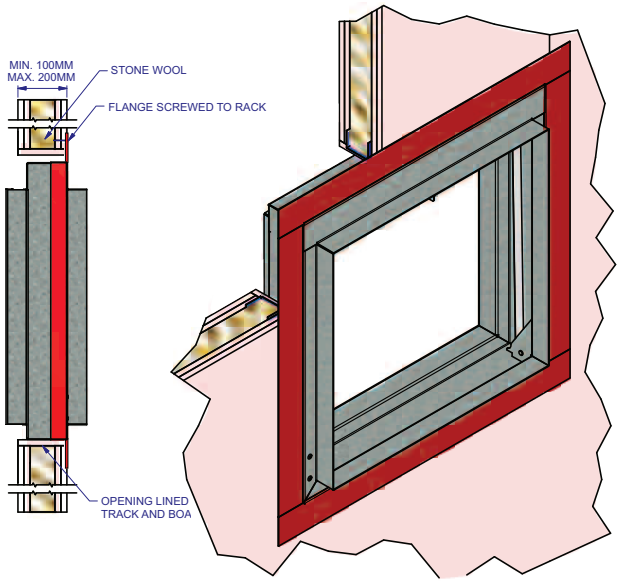
Single Section Sizes (mm)
100 x 100 to 1200 x 1000



TESTED TO BS EN 1366-2 FOR 2 HOURS
BS EN 13501-3 CLASSIFICATION: E120
BRE GLOBAL CLASSIFICATION REPORT NO: 287718C
MEETS THE REQUIREMENTS OF BS 476-20/22 - REFER TO BS 476-10.6.6.3

DRY WALL - ANGLE FRAME Fitted

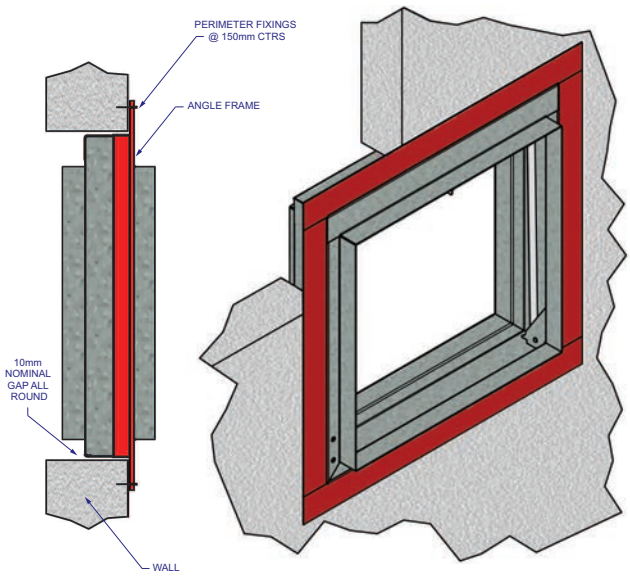
Single Section Sizes (mm)
100 x 100 to 1200 x 1000



TESTED TO BS EN 1366-2 FOR 2 HOURS
BS EN 13501-3 CLASSIFICATION: E120
BRE GLOBAL CLASSIFICATION REPORT NO: 287718A
MEETS THE REQUIREMENTS OF BS 476-20/22 - REFER TO BS 476-10.6.6.3

MASONRY WALL - ANGLE FRAME Fitted

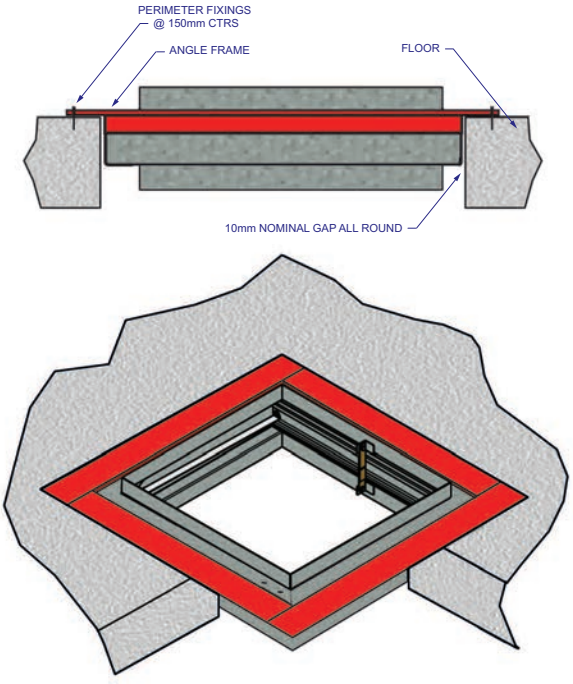
Vertical Application:
Single Section Sizes (mm) 100 x 100 to 1200 x 1000



TESTED TO BS EN 1366-2 FOR 4 HOURS
BS EN 13501-3 CLASSIFICATION: E120
MASONRY WALL BRE GLOBAL CLASSIFICATION REPORT NO: 287718A
MEETS THE REQUIREMENTS OF BS 476-20/22 - REFER TO BS 476-10.6.6.3

CONCRETE FLOOR - ANGLE FRAME Fitted

Horizontal Application:
Single Section Sizes (mm)100 x 100 to 1200 x 1000



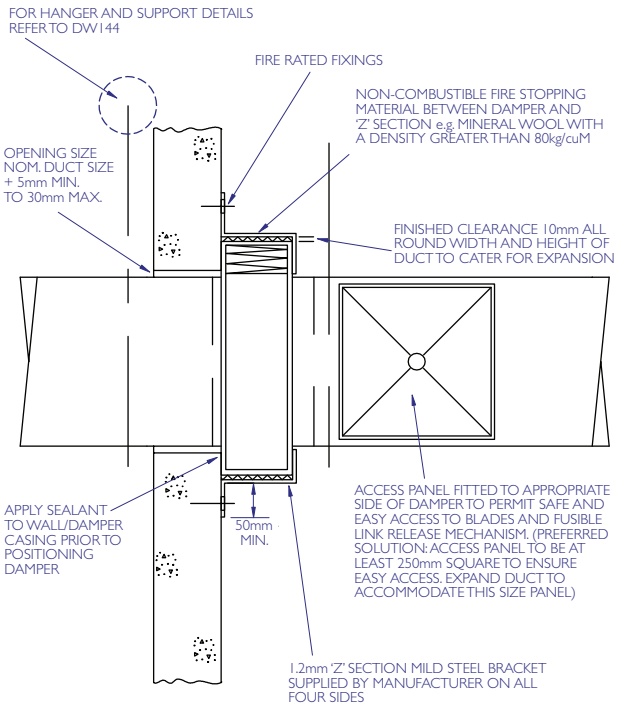
TESTED TO BS EN 1366-2 FOR 4 HOURS
BS EN 13501-3 CLASSIFICATION: E120
MASONRY WALL BRE GLOBAL CLASSIFICATION REPORT NO: 287718B
MEETS THE REQUIREMENTS OF BS 476-20/22 - REFER TO BS 476-10.6.6.3

Tested or assessed to BS 476-20/22 for up to 2 hours

CONCRETE/DRY WALL

FD ZF

Damper size:
Min. 100mm x 100mm.
Max. 1000mm x 1000mm

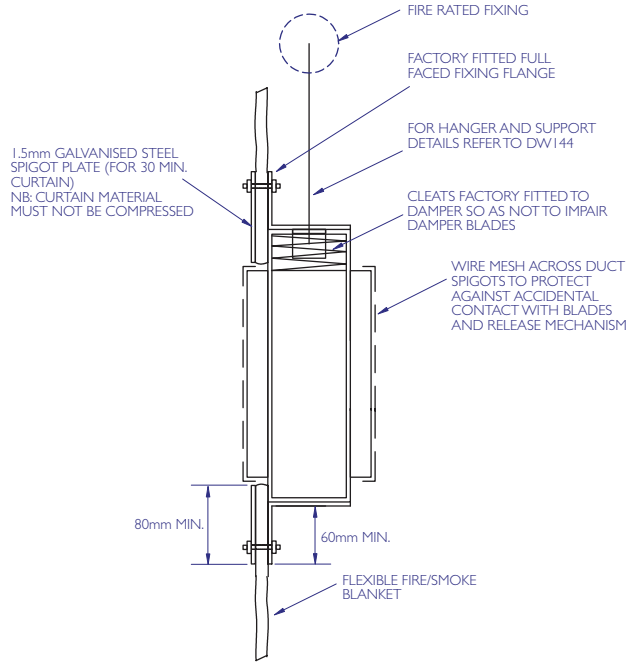


Assessment reference: CC256681
BS 476-20/22: 2 hours

FIRE CURTAIN - ANGLE FRAME AND CLEATS

FD FC

Damper size:
Min. 100mm x 100mm.
Max. 1000mm x 1000mm

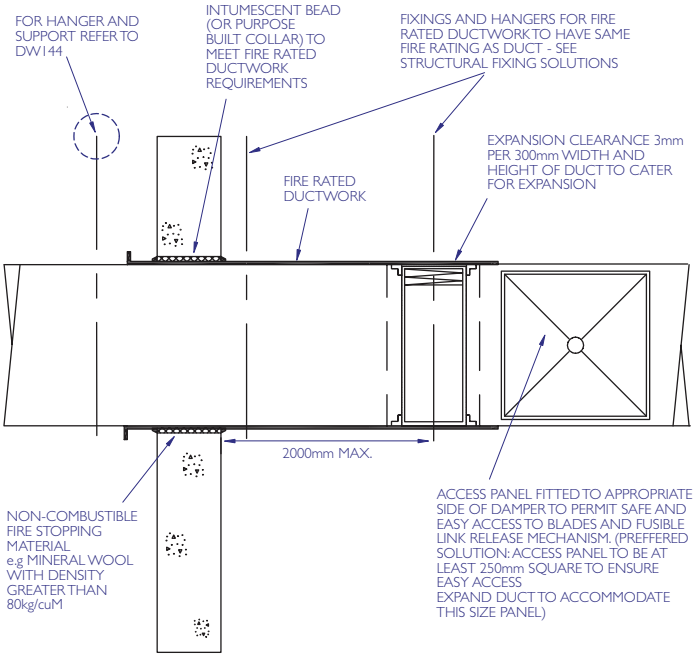


Assessment reference: CC256681
BS 476-20/22: 2 hours

REMOTE FROM WALL

FD I

Damper size:
Min. 100mm x 100mm.
Max. 1000mm x 1000mm



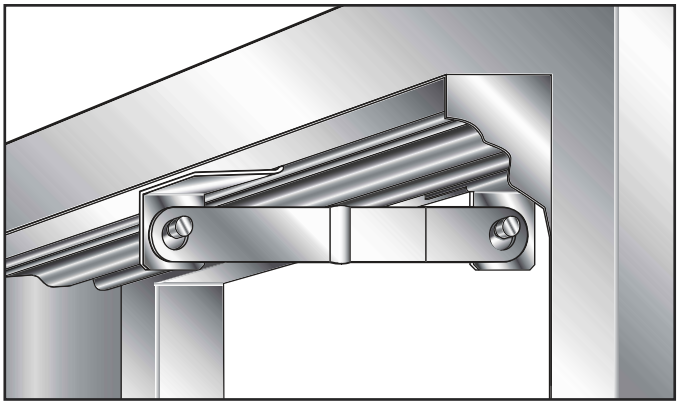
Assessment reference: CC256680
BS 476-20/22: 30 minutes

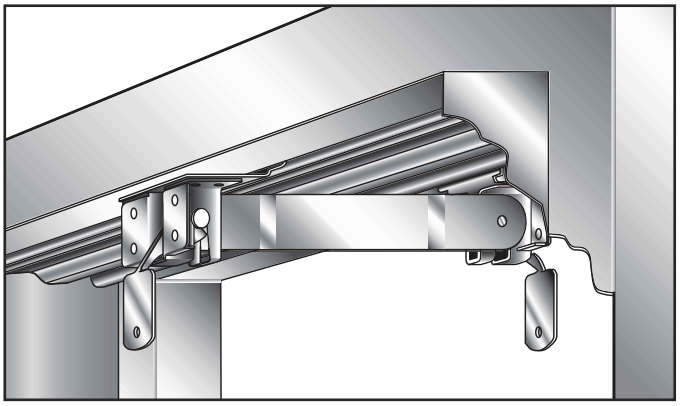
* If your proposed installation method has minor variations to that shown, please confirm acceptance with the local Building Control Authority (BCA) before proceeding. Manufacturers are not able to "approve" specific installation methods. It is generally accepted that EN 1366-2 tested installations will fulfil any requirements to BS 476-20/22 as the test method is much more severe.

Fusible Link Release

Straight Bar Fusible Link *(Standard)*
The standard fusible link will be supplied and rated at 72°C unless otherwise specified.

Gate Latch Link Option
Providing a trigger operation feature, this self-locating and easily resettable cassette can be used with either the solenoid or electro-magnet controls - or, as a standard component to assist the engineer in the resetting of the fire damper during regular inspection and maintenance procedures.
Below 150mm in height or diameter release testing only possible from opposite to ramp side.





Maintenance Notes

FD Series dampers are designed for normal dry filtered air systems. A programme of planned inspections should be carried out to include full operational checks, correct interface with, and function of, any control systems, cleaning and light lubrication.

As a guide, this should take place on a maximum of six months intervals.

Reference should be made to BS 5588-12 and BS 9999 for more information.
Records of damper installation and position shall be kept. Records of the condition of the dampers and their functionality/repair etc should be kept as these products come under the requirements of the Regulatory Reform (Fire safety) Order (RRFSO).

These inspection and maintenance programmes may need to be repeated more regularly if the dampers are exposed to inclement/dusty conditions or fresh air intakes and the frequency of such checks should be developed based on site experience.

Multiple Assemblies

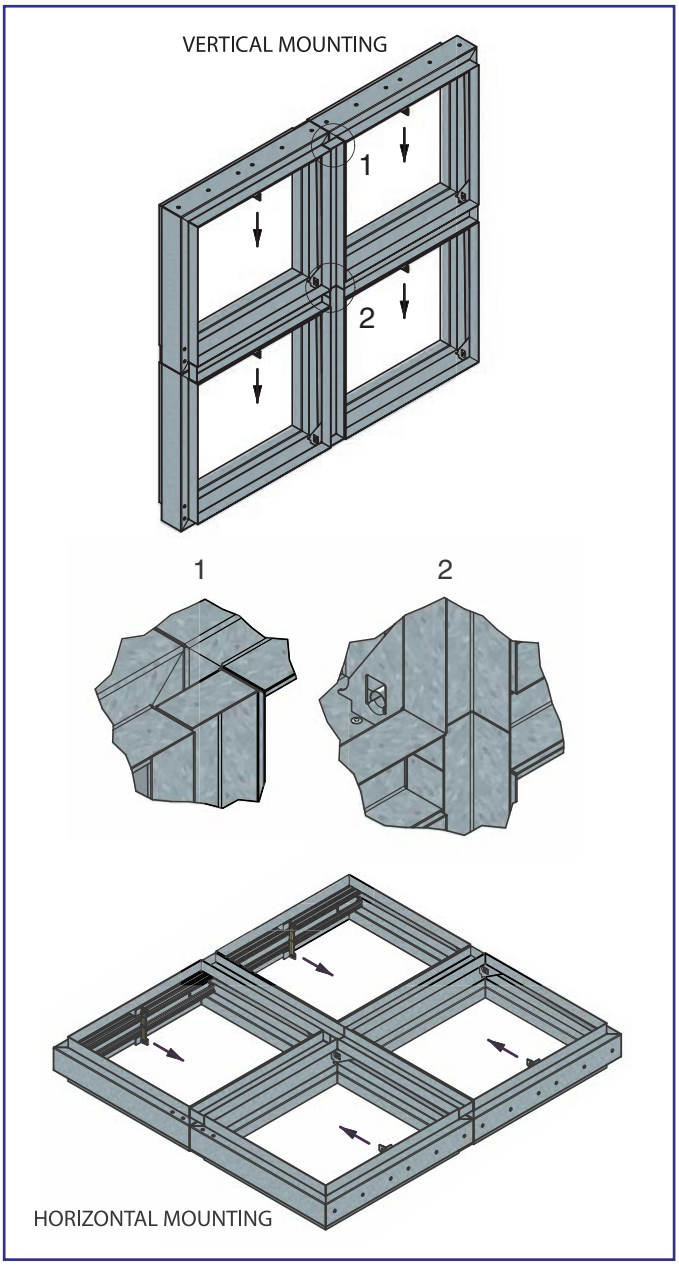
FD Series dampers can be supplied in multiple module sections to achieve requested sizes larger than the maximum manufactured single module units.

Such units and their installation method must be approved by the BCA before installation. For this, consideration must be given to additional structural steelwork that might be needed to support the weight of the damper. BSB cannot offer or approve supporting structures for multiple assemblies.

Illustrated are several variants of multiple module arrangements.

When there are transportation restrictions, large multiple units will be shipped in individual sections for site assembly by others. Joining strips are supplied un-drilled unless requested otherwise. Large multiple units required to be shipped fully assembled will incur additional packing/shipping costs. Please contact our sales office for further information.

BSB can manufacture to individual specifications and applications. Illustrated above are standard variants with other variants available to order.



FD Series

Fire Dampers – Weight Charts

Weight Chart (kg approx.)

Height (mm)	Width (mm)											
	100	200	300	400	500	600	700	800	900	1000	1100	1200
100	2.0	2.5	3.0	4.0	4.5	5.0	5.5	6.5	7.0	8.0	8.5	9.0
200	2.5	3.0	4.0	4.5	5.0	6.0	6.5	7.5	8.0	9.0	9.5	10.5
300	3.0	4.0	4.5	5.5	6.0	7.0	8.0	9.0	9.5	10.5	11.0	12.0
400	3.5	4.5	5.5	6.5	7.5	8.5	9.5	10.5	11.5	12.5	13.5	14.5
500	4.5	5.5	6.5	7.5	8.5	9.5	10.5	12.0	13.0	14.0	15.0	16.0
600	5.0	6.0	7.5	8.5	9.5	11.0	12.0	13.5	14.5	16.0	17.0	18.5
700	5.5	6.5	8.0	9.0	10.5	11.5	13.0	14.5	15.5	17.0	18.0	19.5
800	6.0	7.5	9.0	10.5	11.5	13.0	14.5	16.0	17.5	19.0	20.5	21.5
900	6.5	8.0	9.5	11.0	12.5	14.0	15.5	17.5	19.0	20.5	22.0	23.5
1000	7.0	9.0	10.5	12.0	13.5	15.0	17.0	18.5	20.5	22.0	23.5	25.0

Weight Chart + Hevac Frame (kg approx.)

Height (mm)	Width (mm)											
	100	200	300	400	500	600	700	800	900	1000	1100	1200
100	3.5	4.5	5.5	6.5	7.5	8.5	8.5	11.0	12.0	13.0	14.0	15.0
200	4.5	5.5	6.5	7.5	8.5	10.0	11.0	12.0	13.5	14.5	15.5	16.5
300	5.5	6.5	8.0	9.0	10.0	11.5	12.5	14.0	15.0	16.0	17.5	18.5
400	6.5	8.0	9.0	10.5	11.5	13.0	14.5	16.0	17.5	18.5	20.0	21.5
500	7.5	9.0	10.5	11.5	13.0	14.5	16.0	17.5	19.0	20.5	22.0	23.5
600	8.5	10.0	11.5	13.0	14.5	16.5	18.0	19.5	21.5	23.0	24.5	26.0
700	9.5	11.0	12.5	14.0	15.5	17.5	19.0	21.0	22.5	24.0	26.0	27.5
800	10.5	12.0	14.0	15.5	17.5	19.0	21.0	23.0	24.5	26.5	28.5	30.0
900	11.5	13.0	15.0	17.0	18.5	20.5	22.5	24.5	26.5	28.5	30.5	32.5
1000	12.0	14.0	16.0	18.0	20.0	22.0	24.0	26.0	28.5	30.5	32.5	34.5

Weight Chart + Angle Frame (kg approx.)

Height (mm)	Width (mm)											
	100	200	300	400	500	600	700	800	900	1000	1100	1200
100	2.5	3.5	4.5	5.0	6.0	6.5	7.5	8.5	9.5	10.0	11.0	12.0
200	3.5	4.5	5.0	6.0	7.0	7.5	8.5	9.5	10.5	11.5	12.5	13.0
300	4.0	5.0	6.0	7.0	8.0	9.0	10.0	11.0	12.0	13.0	14.0	15.0
400	5.0	6.0	7.5	8.5	9.5	10.5	11.5	13.0	14.0	15.5	16.5	17.5
500	6.0	7.0	8.5	9.5	10.5	12.0	13.0	14.5	16.0	17.0	18.5	19.5
600	6.5	8.0	9.5	11.0	12.0	13.5	15.0	16.5	18.0	19.5	20.5	22.0
700	7.5	9.0	10.0	11.5	13.0	14.5	16.0	17.5	19.0	20.5	22.0	23.5
800	8.0	10.0	11.5	13.0	14.5	16.0	17.5	19.5	21.0	22.5	24.0	26.0
900	9.0	10.5	12.5	14.0	15.5	17.5	19.0	21.0	22.5	24.5	26.0	27.5
1000	10.0	11.5	13.5	15.0	17.0	18.5	20.5	22.5	24.5	26.0	28.0	29.5

Weight Chart Circular (kg approx.)

Nom dia. (mm)	Width (mm)		
	FDC	FDC+HF	FDC+AF
100	1.5	3.5	3.0
150	2.5	4.5	4.0
200	3.0	5.5	4.0
250	3.5	6.5	5.0
300	4.5	7.5	6.0
350	6.5	10.0	8.0
400	8.0	11.5	10.0
450	9.0	13.5	11.0
500	10.5	15.0	13.0
550	12.0	17.0	15.0
600	13.5	19.0	16.0
650	15.0	21.0	18.0
700	16.5	22.5	20.0
750	18.0	24.5	22.0
800	20.5	27.5	24.0
850	22.5	29.5	26.0
900	24.5	32.0	28.0
950	26.5	34.5	31.0
1000	28.5	37.0	33.0

Damper Control Panels

BSB offer two alternative panels when monitoring and controlling dampers. the Electro Mechanical System and the fully Addressable System.

Electro mechanical panels are generally used for up to 30 dampers and where hard wiring costs are not an issue. The damper logic being hardwired and the facia being engraved, means that any changes will require physical alterations and additional costs.

The fully addressable panel is fully software programmable allowing for additional dampers or changes to the "cause and effect" being reprogrammed by an engineer on site.

For additional functions and options to meet all site and system requirements, please contact our sales office.



Standard Electro Mechanical Control and Monitoring System

Provides a straight forward control panel offering the most common features called for as standard.

Due to differing site control and monitoring properties, damper actuators will be connected to site wiring when installed by the contractor to provide the relevant functions.



Premier Electro Mechanical Control and Monitoring System

Controls and monitors a number of smoke/fire dampers hard wired individually or in groups, in a single or multiple zone arrangement.

Dampers can be individually or collectively controlled and are continuously monitored.

Due to differing site control and monitoring properties, damper actuators will be connected to site wiring when installed by the contractor to provide the relevant functions.



Fully Addressable Control and Monitoring System

Software driven panel simplified installation and commissioning. Utilises data wiring in a loop configuration.

Can be configured to suit all types of system. Fully integrated and secure network provides an intelligent interface for building control.

Touch screen options are available allowing system interrogation, Touch screen with Graphic CAD based floor plans, mimic style displays and optional BACnet interface complete the range. Please contact the BSB sales office for further information.

Access Doors

BSB offer a range of Access Doors designed to provide vital, quick and efficient access for inspection and cleaning of in-duct items such as control dampers, filters and fire dampers.

Suitably sized access panels should be provided adjacent to all dampers to permit safe and easy access for regular commissioning, servicing and inspection to ensure correct operation can be observed in accordance with DW145 G.3.1.5.

Dampers with multiple sections will require one access panel per section.

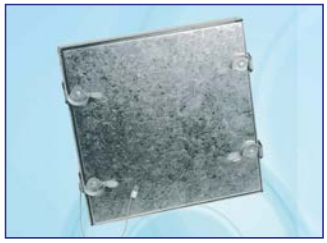
Access doors should comply with DW 144 leakage specification.

Consideration should be given to ensure that the installed access panels are not covered or obstructed by other surfaces or temporary/permanent structures.

Contact our sales office for details.



ADC Series
Duct Access Doors



ADF and ADF-F Series
Insulated Duct Access Doors



ADO Series
Duct Access Doors

Typical Tender/Specification Text

The BSB FD curtain bladed fire dampers shall be LPCB certificated and pass the test requirements stated in EN 1366-2.

For maintenance of the integrity of compartmentation the fire dampers shall have an E classification to EN 13501-3.

Curtain fire dampers shall not be used for protection of escape routes and areas with sleeping risk.

Refer to Approved Document B (ADB).

The interlocking ribbed blades shall be held out of the airstream against constant force springs by a fusible link.

The fusible link shall have a melting temperature of 72°C. The link melting shall allow the springs to close the damper.

The fusible link assembly shall be installed so that test release may be made safely from either side of the damper.

The fire damper case shall be fully welded to meet the air tightness test requirements of HVCA specification DW144 to classes A, B and C up to 1500 Pa.

The BSB FD fire damper shall have a tested installation method that matches the requirement of the supporting construction into which it is built.

(Tests or assessments of installation methods to BS 476-20/22 may be acceptable if the ventilation design causes the fans to be turned off in the event of a smoke or fire alarm and escape routes and areas of sleeping risk are not being protected).

FD Series

Fire Dampers – Ordering Codes

FD	A	G	HF	SS

FD Fire Damper

Case Type

- **A** Square/Rectangular - Low/Medium Velocity
- **B** Square/Rectangular - High Velocity
- **C** Circular - High Velocity
- **I** Square/Rectangular - Low/Medium Velocity
- **O** Flat Oval - High Velocity

Blade Material

- **G** Galvanised Mild Steel
- **S** 430 grade Stainless Steel
- ***** 316 grade Stainless Steel available on request

Installation Frame

- **HF** HEVAC/HVCA Installation Frame
- **AF** Angle Frame
- **FC** Fire Curtain Frame
- **ZF** Z-Frame
- **CL** Cleats
- **SA** Sleeve and Angles
- **BF** Batt Frame

Accessories

- **SS** Side Seal Gasket
- **VI** Visual Indicator
- **GL** Gate Latch Release Mechanism
- **MS** Microswitch Factory Fitted. Please state single or double pole

Air, Fire and Smoke Control Products in the BSB Range:



For full details of the complete BSB Product Range, please refer to our individual product brochures, sales office or website.

BSB Engineering Services Limited

Unit 56, Trinity Trade Centre, Mill Way, Sittingbourne, Kent ME10 2PD, UK • Tel: +44 (0)1795 422609 • Fax: +44 (0)1795 429543
For purchase orders and order related enquiries, please email: orders@bsb-dampers.co.uk
For pricing, technical and general enquiries, please email: enquiries@bsb-dampers.co.uk
Website: www.bsb-dampers.co.uk • A member of the Maico group

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ADCAS THE VOICE OF THE DUCTWORK INDUSTRY — Member of ADCAS Association
HEVAC — Member of HEVAC Association
bre — bre Testing facility
LPCB — Assessed to ISO 9001 Cert. No. 828
MADE IN BRITAIN
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8.96

iSMA-B-AAC20_DBL625en_V1.10

The following 5 pages are the document exactly as received and checked. It is bookmarked in the PDF.

Reference	
Asset	General
Provided by	Not recorded
Source file	`iSMA-B-AAC20_DBL625en_V1.10.pdf`
Pages	5

iSMA-B-AAC20

Advanced Application Controller

MODEL	DESCRIPTION
iSMA-B-AAC20	Advanced Application Controller
iSMA-B-AAC20-D	Advanced Application Controller with DALI protocol
iSMA-B-AAC20-M	Advanced Application Controller with M-Bus protocol
iSMA-B-AAC20-LCD	Advanced Application Controller with LCD display
iSMA-B-AAC20-LCD-D	Advanced Application Controller with LCD display and DALI protocol
iSMA-B-AAC20-LCD-M	Advanced Application Controller with LCD display and M-Bus protocol



APPLICATION AND USE

The iSMA-B-AAC20 is an advanced control device to building automation and HVAC systems. Using SVM (Sedona Virtual Machine) allows the user to quickly and easily program in real time. Large number of inputs and outputs allows to integrate with other devices and sensors (AAC20 provides 8 UI, 4 DI, 4/6 AO and 4 DO). Legible, fully programmable LCD, can be used as simple interface to local operation of system. Built-in RS485 can be used to expand number of I/O by connecting MINI or MIX series I/O modules using Modbus RTU/ASCII. In addition, to increase the versatility of the controller, it supports many open communications protocols: BACnet, Modbus, SOX, DALI, M-Bus, 1-Wire or oBIX.
The AAC20 is mounted in a housing adapted for DIN rail mounting or directly on a panel. Separate, easy to remove connectors allow quick wiring without removing the entire module.

FEATURES

- Sedona Framework 1.2 support
- Real-time clock (RTC)
- 2 Fast Ethernet with built-in switch
- RS485 port (Modbus or BACnet)
- Built-in LCD display (option)
- Micro SD card slot to log historical data and alarms
- Fast processor with ARM dual core 204 MHz
- Built-in Modbus gateway TCP/IP to RS485
- DALI interface: built-in power supply (option)
- M-Bus interface: up to 20 devices (option)
- 1-Wire interface
- iC Tool – free of charge programming soft
- Configuration via web
- Built-in visualization web server

TECHNICAL CHARACTERISTICS

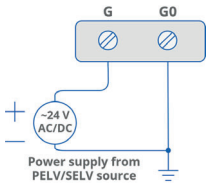
DESCRIPTION		AAC20
Power supply	Voltage	24 V AC/DC ± 20%
Universal inputs	Number of inputs	8
	Voltage input	Voltage measurement: 0-10 V DC Input impedance: 100 kΩ Measurement accuracy: ±0.1% Measurement resolution: 3 mV at 12-bit and 1 mV at 16-bit
	Current input	Current measurement: 0-20 mA Required external resistor: 200 Ω Measurement accuracy: ±1.1% Measurement resolution: 15 µA at 12-bit and 5 µA at 16-bit
	Digital input	Output current ~1 mA

The performances stated in this sheet can be modified without any prior notice.

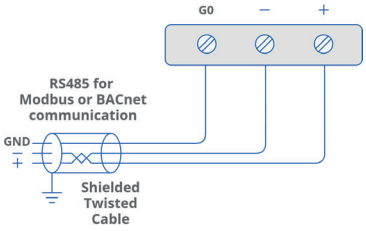
DESCRIPTION		AAC20
Universal inputs	Resistance input	Measurement of resistance: 0-1000 kΩ Measurement resolution for 20 kΩ load: 20 Ω at 12-bit and 1 Ω at 16-bit Measurement resolution for PT1000 and NI1000: 0.1 Ω at 16-bit Resistance measurement method: voltage divider
	Temperature input	Measurement with **attached** RTDs (resistance temperature detectors) Accuracy: ±0.1˚C The PT1000 and NI1000 sensors use 16-bit resolution
	Measurement resolution	12-bit (default), 16-bit
	Processing time	10 ms/channel at 12-bit 140 ms/channel at 16-bit
Digital inputs	Number of inputs	4
	Type	Dry contact or fast pulse counter
	Maximum input frequency	100 Hz saved in EEPROM memory
Analog outputs	Number of outputs	6
	Voltage range	0-10 V DC
	Maximum load current	20 mA (AO6 up to 5 mA)
	Resolution	12-bit
	Accuracy	±0.5%
Digital outputs	Number of outputs	4
	Resistive load (AC1)	3 A at 230 V AC or 3 A at 30 V DC
	Inductive load (AC3)	75 VA at 230 V AC or 30 W at 30 V DC
COM1	RS485 Interface	Up to 128 devices
		Half-duplex
	Communication protocol	Modbus RTU/ASCII (client)
	Port	RJ12
	Baud rate	2400-115200
	Power supply for external device	30 V DC
COM2	RS485 Interface	Up to 128 devices
		Half-duplex
	Communication protocol	Modbus RTU/ASCII (client/server) BACnet MS/TP (client/server)
	Port	Screw connector
	Baud rate	2400-115200
ETH1	Ethernet interface	2 ports, switch mode
	Baud rate	10/100 Mb/s
USB1	USB 2.0	USB type A
Ingress protection	IP rating	IP 40 for indoor installation
Temperature	Storage	-40°C to +85°C (-40°F to +185°F)
	Operating	-10°C to +50°C (14°F to 122°F)
Humidity	Relative	5 to 95% RH (without condensation)
Screw connectors	Type	Removable screw terminals
	Maximum cable size	2.5 mm^2 (18...12 AWG)
Housing	Material	Self-extinguishing plastic (PC/ABS)
	Mounting	DIN (DIN EN 50022 norm)
Dimensions	Width	106.30 mm/4.19 in
	Length	113.60 mm/4.47 in
	Height	62.00 mm/2.44 in

WIRING DIAGRAMS

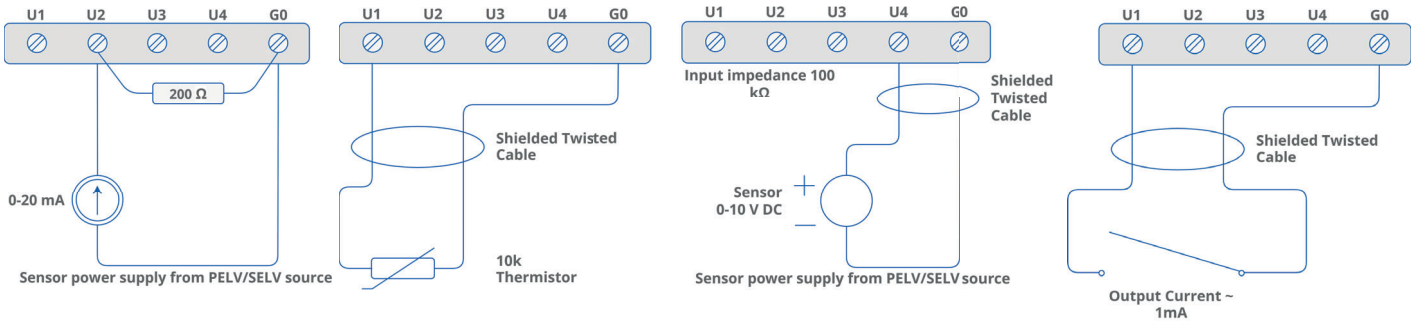
Power Supply



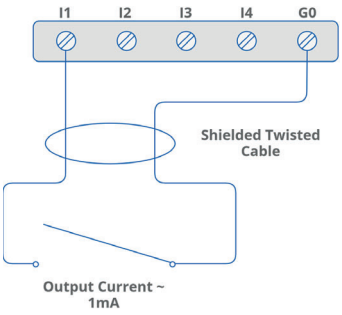
Communication



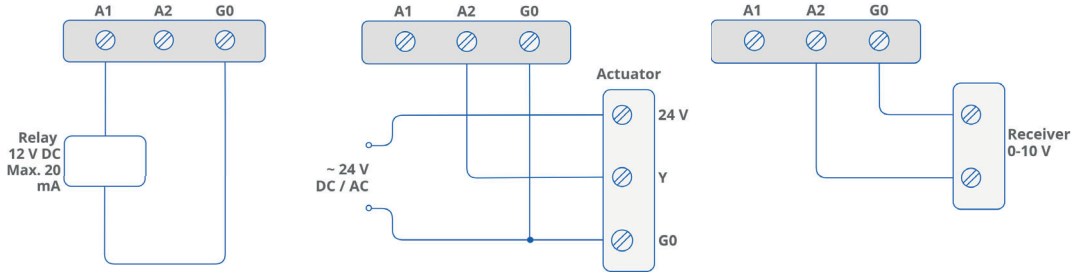
Universal Inputs



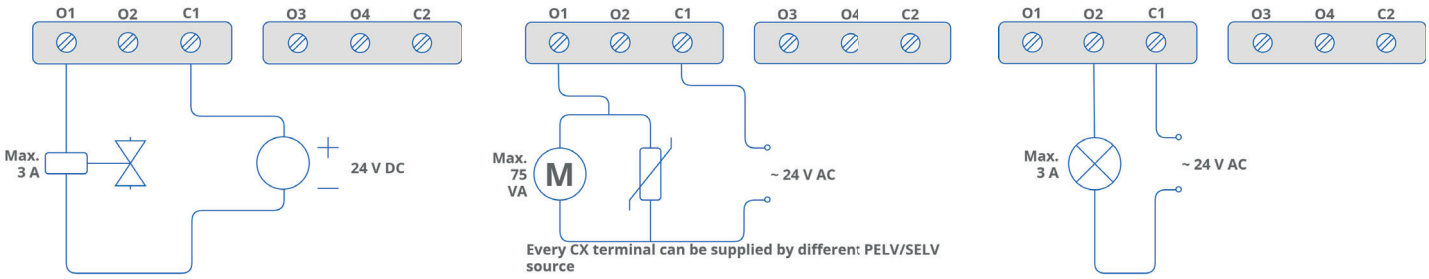
Digital Inputs



Analog Outputs



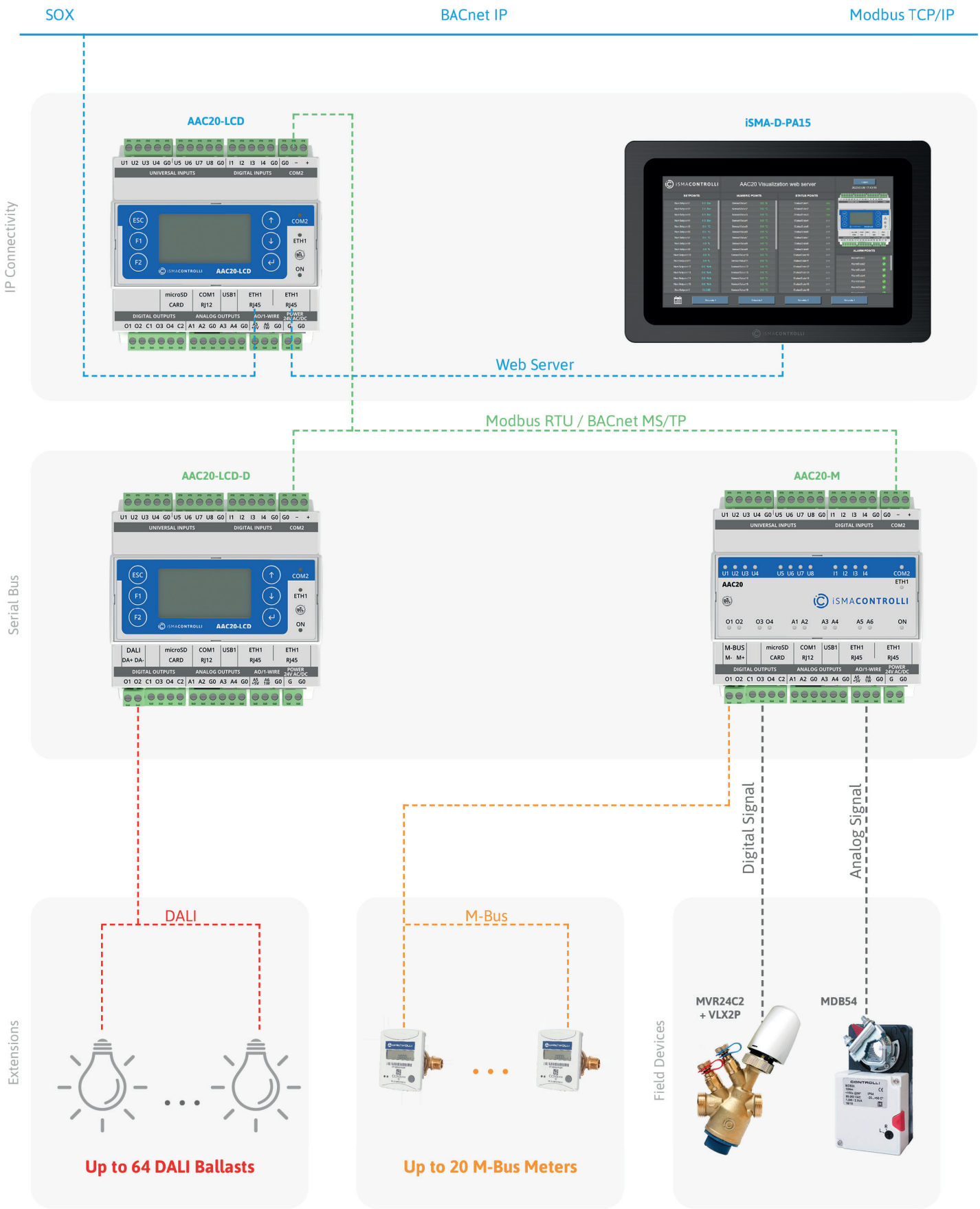
Digital Outputs



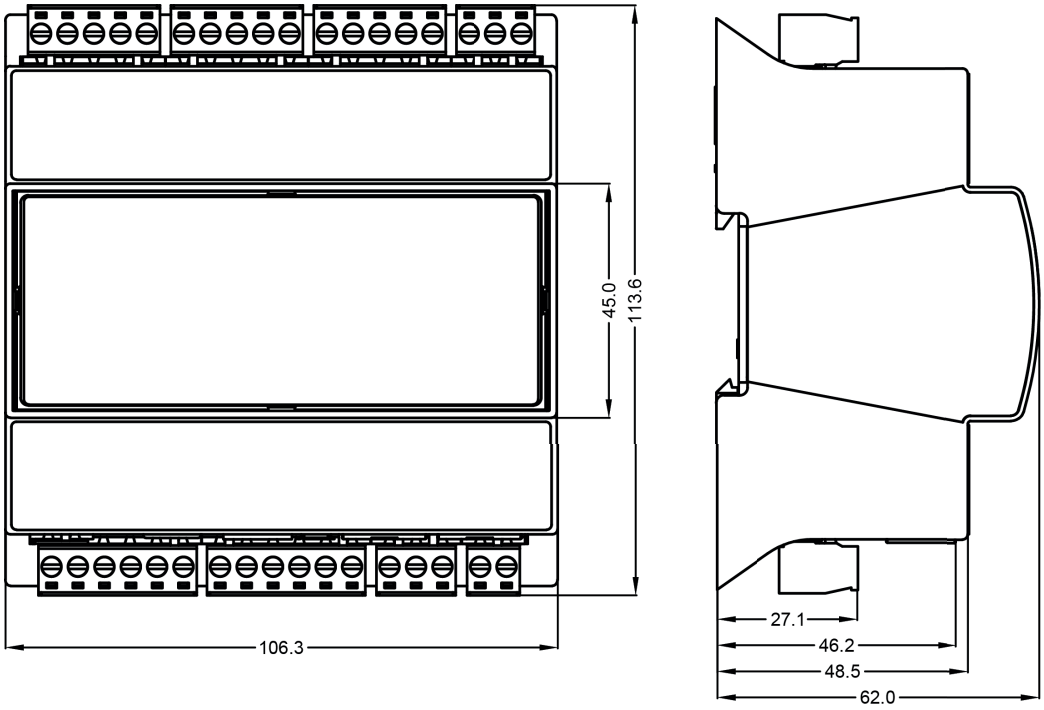
BUILT-IN VISUALIZATION WEB SERVER

The visualization web server allows for displaying the parameters and statuses, setting time schedules, and controlling the unit. Visualization can be fully customized to fit the user needs. The web server is based on HTML5, which enables the visualization to be displayed on our Android panel and any modern Internet browser.

APPLICATION EXAMPLE



DIMENSIONS [mm]



8.97

iSMA-B-MINI_Datasheet

The following 3 pages are the document exactly as received and checked. It is bookmarked in the PDF.

Reference	
Asset	General
Provided by	Not recorded
Source file	`iSMA-B-MINI_Datasheet.pdf`
Pages	3

Intelligent Solution Managing Automation

iSMA-B-MINI

The product group of **I/O modules MINI series** has been designed to complement the I/O modules of the MIX series.

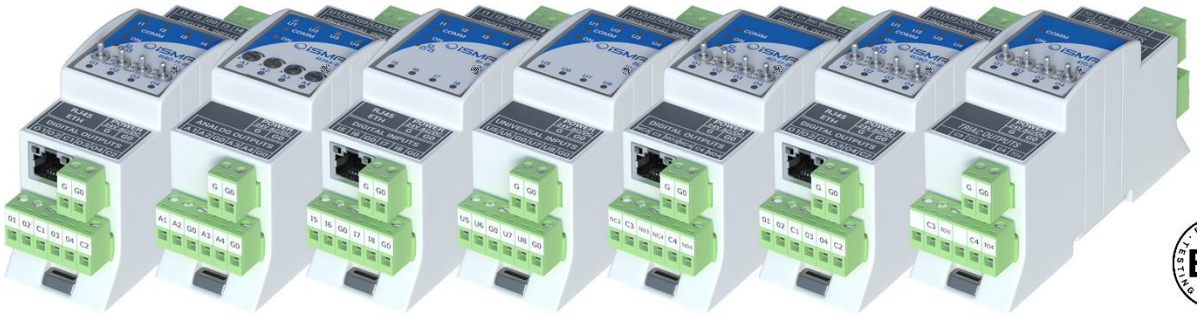
Unlike the MIX series, the MINI line is dedicated to all applications, where hand operating switches are required. The built-in light, cooling and heating algorithms make them applicable as the standalone controllers. Additionally, the modules support time relay modes dedicated to present detectors.

Like in case of the MIX series modules, MINI series is factory-equipped with the two most popular open communication protocols: **Modbus (ASCII, RTU, TCP/IP) and BACnet (MSTP, IP)**, which are selected using DIP switches. There are two versions of the modules: with RS485 interface and with Ethernet and RS485 interfaces. Devices with Ethernet and RS485 interfaces have the added functionality of "**Modbus Gateway** TCP/IP to Modbus ASCII/RTU", enabling for the connection of additional modules /devices which communicate via Modbus RS485. One major advantage of supporting the modules with open communication standards is the versatility to install them in both new and completed installations, as part of an existing BMS.

Addressing the modules takes place via rotary switches, which facilitates and accelerates the process of commissioning the system. Built-in mini USB allows for initial configuration of the unit without power supply.

Key Features

- 14 different types
- Small dimension
- Manual override switches
- Built-in light, cooling and heating control modes
- Present sensor support modes
- All Digital Inputs work as fast counters up to 100 Hz
- Universal Inputs have 16-bit resolution which increases the accuracy of measurement
- Wide range of supported temperature sensors in Celsius and Fahrenheit degrees (NTC, PT1000 etc.)
- Automatic detection of the signal type in the case of Universal Inputs
- Digital Outputs 230 V AC max. 3 A or 8 A allow for direct control without additional relays
- Triac Outputs: 0,5 A @ 24 V AC, 0,5 A @ 230 V AC
- Analog Output with max. 20 mA load allow direct control of relays (12 V DC) or SSR with PWM support
- LEDs indicate the status of inputs and outputs
- Supports open standards: BACnet or Modbus
- Built-in Modbus Gateway TCP/IP to RS485
- 1x Fast Ethernet
- Simple and fast addressing from 1 to 99



iSMA-B-MINI

Specification

Universal Inputs (UI)

All Universal Inputs have 16-bit resolution which supports the following types of inputs:

Temperature Input supports the following types of sensors:

1. In Celsius degrees: 10K3A1, 10K4A1, Carel 10K, 20K6A1, 2.2K3A1, 3K3A1, 30K6A1, SIE1, TAC1, SAT1, Pt1000, Ni1000 0C, Ni 1000 20C, Ni1000 LG
2. In Fahrenheit degrees: 10K Type2, 10K type3, 20K, 3K, PT 1000, Ni 1000 32F, Ni 1000 70F

For sensor Pt1000 and Ni1000 use only 16-bit resolution

- Voltage input 0-10 V DC: input resistance 100 kΩ accuracy ±0,1% measurement resolution 3 mV @ 12-bit and 1 mV @ 16-bit
- Current input 0-20 mA (external resistor 200 Ω required)
- Resistive input 0-1000 kΩ: measurement resolution for 20 kΩ load 20 Ω @ 12-bit and 1 Ω @ 16-bit
- Dry contact input

Digital Inputs (DI)

- Dry contact inputs
- Fast pulse counter up to 100 Hz save in EEPROM memory

Analog Outputs (AO)

All Analog Outputs are equipped with 12-bit ADC and provide 10 mV resolution and accuracy less than ±0,5%. They support the following output types:

- Output 0-10 V DC maximum load up to 20 mA
- PWM: 0,01 Hz, 0,1 Hz, 1 Hz, 10 Hz, 100 Hz

Digital Outputs (DO)

- Relay output (NO) max. 3 A @ 230 V AC/30 V DC
- Relay output (NC/NO) max. 8 A @ 230 V AC/30 V DC

Triac Outputs (TO)

- Triac Outputs: 0,5 A @ 24 V AC, 0,5 A @ 230 V AC

Platform

- ARM Cortex-M3

Communication

- Interface RS485 half-duplex
- 1x Fast Ethernet - only version IP
- Up to 99 devices on the bus
- Protocols: Modbus or BACnet
- Baud rate: 2400 to 115200 bps

Power supply

- 24 V AC/DC

Housing

- Dimension: 37x110x62 mm (1.457x4.331x2.441 in)
- Construction: UL approved, self-extinguishing plastic (PC/ABS)
- DIN rail mounting DIN (DIN EN 50022 norm)
- Cooling: internal air circulation

Environment

- Operating temperature: -10°C to 50°C (14°F to 122°F)
- Storage temperature: -40°C to 85°C (-40°F to 185°F)
- Relative humidity: 5% to 95%, no condensation
- Ingress Protection Rating: IP40 – for indoor installation

iSMA-B-MINI

Specification

	UI	DI	AO	DO	TO	Modbus RS485	Modbus TCP/IP	BACnet MSTP	BACnet IP
4I4O-H		4		4 *		✓		✓	
4I4O-H-IP		4		4 *		✓	✓		✓
4O-H				4 **		✓		✓	
4O-H-IP				4 **		✓	✓		✓
4TO-H					4	✓		✓	
4TO-H-IP					4	✓	✓		✓
4U4A-H	4		4			✓		✓	
4U4A-H-IP	4		4			✓	✓		✓
4U4O-H	4			4 *		✓		✓	
4U4O-H-IP	4			4 *		✓	✓		✓
8I		8				✓		✓	
8I-IP		8				✓	✓		✓
8U	8					✓		✓	
8U-IP	8					✓	✓		✓
	✓ Voltage ✓ Current ✓ Resistive ✓ Dry contact	✓ Dry contact ✓ Fast pulse counter up to 100 Hz	✓ Voltage ✓ PWM ✓ Max. load up to 20 mA	* (NO) 3 A @ 230 V AC ** (NC/NO) 8 A @ 230 V AC	✓ 0,5 A @ 24 V AC ✓ 0,5 A @ 230 V AC	✓ RTU ✓ ASCII	✓ Modbus Gateway IP/RS485	✓ Master ✓ Slave	

8.98

iSMA-B-MIX_Datasheet

The following 2 pages are the document exactly as received and checked. It is bookmarked in the PDF.

Reference	
Asset	General
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Source file	`iSMA-B-MIX_Datasheet.pdf`
Pages	2

Intelligent Solution Managing Automation

iSMA-B-MIX

The product group of **I/O modules of the MIX series** has been designed for building distributed control systems using JACE or AAC20 devices.
All the MIX Series modules have been equipped with the most commonly used types of I/O in building automation (MIX of all types of I/O in one unit).
The modules are factory-equipped with the two most popular open communication protocols: **Modbus (ASCII, RTU, TCP/IP) and BACnet (MSTP, IP)**, which are selected using DIP switches. There are two versions of the modules: modules with RS485 interface and with 2x Ethernet and RS485 interfaces. Devices with 2x Ethernet and RS485 interfaces have the added functionality of "Modbus Gateway TCP/IP to Modbus ASCII/RTU", enabling for the connection of additional modules/devices that communicate via Modbus RS485. One major advantage of supporting the modules with open communication standards is the versatility to install them in both new and completed installations, as part of an existing BMS.
Addressing the modules takes place via rotary switches, which facilitates and accelerates the process of commissioning the system. Built-in mini USB allows for initial configuration of the unit without power supply.

Key Features

- A large number of all types of I/O
- All Digital Inputs work as fast counters up to 100 Hz
- Universal Inputs have 16-bit resolution which increases the accuracy of measurement
- Wide range of supported temperature sensors in Celsius and Fahrenheit degrees (NTC, PT1000 etc.)
- Automatic detection of the signal type in the case of Universal Inputs
- Digital Outputs 230 V AC max. 3 A allow for direct control without additional relays
- Analog Output with max. 20 mA load allow direct control of relays (12 V DC) or SSR with PWM support
- LEDs indicate the status of inputs and outputs
- Supports open standards: BACnet or Modbus
- RS485 communication port, half-duplex
- 2x Fast Ethernet with built-in switch
- Built-in Modbus Gateway TCP/IP to RS485
- Simple and fast addressing from 1 to 99





iSMA-B-MIX

Specification

Universal Inputs (UI)

All Universal Inputs have 16-bit resolution which supports the following types of inputs:

Temperature input supports the following types of sensors:

1. In Celsius degrees: 10K3A1, 10K4A1, Carel 10K, 20K6A1, 2.2K3A1, 3K3A1, 30K6A1, SIE1, TAC1, SAT1, Pt1000, Ni1000 0C, Ni 1000 20C, Ni1000 LG
2. In Fahrenheit degrees: 10K Type2, 10K type3, 20K, 3K, PT 1000, Ni 1000 32F, Ni 1000 70F

For sensor Pt1000 and Ni1000 use only 16-bit resolution

- Voltage input 0-10 V DC: input resistance 100 kΩ accuracy ±0,1% measurement resolution 3 mV @ 12-bit and 1 mV @ 16-bit
- Current input 0-20 mA (external resistor 200 Ω required)
- Resistive input 0-1000 kΩ: measurement resolution for 20 kΩ load 20 Ω @ 12-bit and 1 Ω @ 16-bit
- Dry contact input

Digital Inputs (DI)

- Dry contact inputs
- Fast pulse counter up to 100 Hz save in EEPROM memory

Analog Outputs (AO)

All Analog Outputs are equipped with 12-bit ADC provides 10 mV resolution and accuracy less than ±0,5%. They support the following output types:

- Output 0-10 V DC maximum load up to 20 mA
- PWM: 0,01 Hz, 0,1 Hz, 1 Hz, 10 Hz, 100 Hz

Digital Outputs (DO)

- Relay Output (NO) max. 3 A @ 230 V AC/30 V DC

Platform

- ARM Cortex-M3

Communication

- Interface RS485 half-duplex
- 2x Ethernet with built-in switch- only version IP
- Up to 99 devices on the bus
- Protocols: Modbus or BACnet
- Baud rate: 2400 to 115200 bps

Power supply

- 24 V AC/DC

Housing

- Dimension MIX18: 88x110x62 mm (3.4646x4.331x2.441 in)
- Dimension MIX38: 160x110x62 mm (6.2993x4.331x2.441 in)
- Construction: UL approved, self-extinguishing plastic (PC/ABS)
- DIN rail mounting DIN (DIN EN 50022 norm)
- Cooling: internal air circulation

Environment

- Operating temperature: -10°C to 50°C (14°F to 122°F)
- Storage temperature: -40°C to 85°C (-40°F to 185°F)
- Relative humidity: 5% to 95%, no condensation
- Ingress Protection Rating: IP40 – for indoor installation

	UI	DI	AO	DO	Modbus RS485	Modbus TCP/IP	Bacnet MSTP	Bacnet IP
MIX18	5	5	4	4	✓		✓	
MIX18 -IP	5	5	4	4	✓	✓		✓
MIX38	8	12	6	12	✓		✓	
MIX38 -IP	8	12	6	12	✓	✓		✓
	✓ Voltage ✓ Current ✓ Resistive ✓ Dry contact	✓ Dry contact ✓ Fast pulse counter up to 100 Hz	✓ Voltage ✓ PWM ✓ Max. load up to 20 mA	✓ (NO) 3 A @ 230 V AC	✓ RTU ✓ ASCII	✓ Modbus Gateway IP/RS485	✓ Master ✓ Slave	

8.99

iSMA-D-PA15C-B1_Datasheet_DBL620en_V1.6

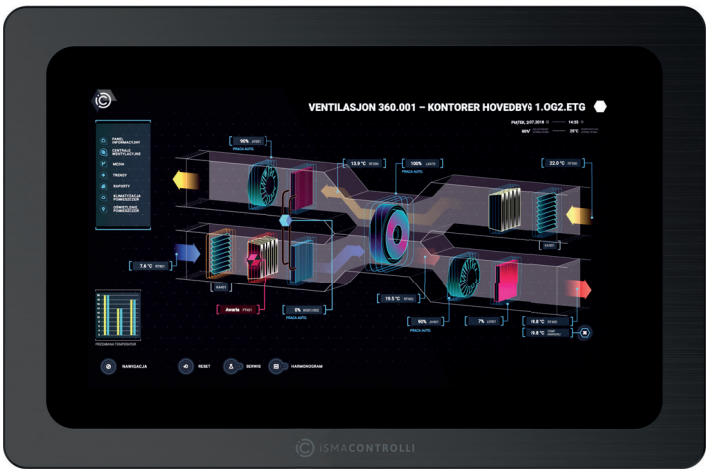
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Reference	
Asset	General
Provided by	Not recorded
Source file	`iSMA-D-PA15C-B1_Datasheet_DBL620en_V1.6.pdf`
Pages	3

HMI Panel

15.6” Industrial PC Panel

MODEL	DESCRIPTION
iSMA-D-PA15C-B1	15.6” industrial PC panel with Android 11 and iC SmartView platform for IP controllers equipped with a web server
With dedicated power adapters:	
iSMA-D-PA15C-B1-EU	includes 12 V DC/110-240 V AC EU plug power supply adapter
iSMA-D-PA15C-B1-UK	includes 12 V DC/110-240 V AC UK plug power supply adapter
iSMA-D-PA15C-B1-US	includes 12 V DC/110-240 V AC US plug power supply adapter



APPLICATION AND USE

The iSMA-D-PA15C-B1 is a 15.6” industrial PC panel with the Android 11. It has been designed to simplify connection and visualisation of any HTML5 web server-based controller. Devices such as the MAC36, JACE-9000, or Niagara-powered Supervisor can be connected over IP to the panel and display local visualization. Thanks to the iC SmartView platform dedicated for Android panels, the setup, visualization, and management is very easy and takes only a few moments. The platform is equipped with Kiosk mode, allows auto login to one or multiple stations, and allows selecting one device as a home station, which will always login to the panel after power cycle. The aspect ratio of 16:9 with the 1920x1080 resolution enables a clear display of graphics. The panel is VESA compliant and can be wall-mounted. It has an extensive menu in 7 languages, allowing easy customization of the displayed image. Available with EU, UK, or US power adapter.

FEATURES

- Android 11 operating system
- 15.6” display with capacitive touch screen
- Aspect ratio 16:9
- Resolution 1920x1080
- Response time 5 ms
- IP65 for front panel
- Aluminum alloy enclosure
- VESA compatible
- Available with EU, UK, or US power adapter

DEDICATED SOFTWARE

iC SmartView - app designed for iSMA CONTROLLI Android panels, HTML-based controllers managmenent platform for seamless device access throughout the building

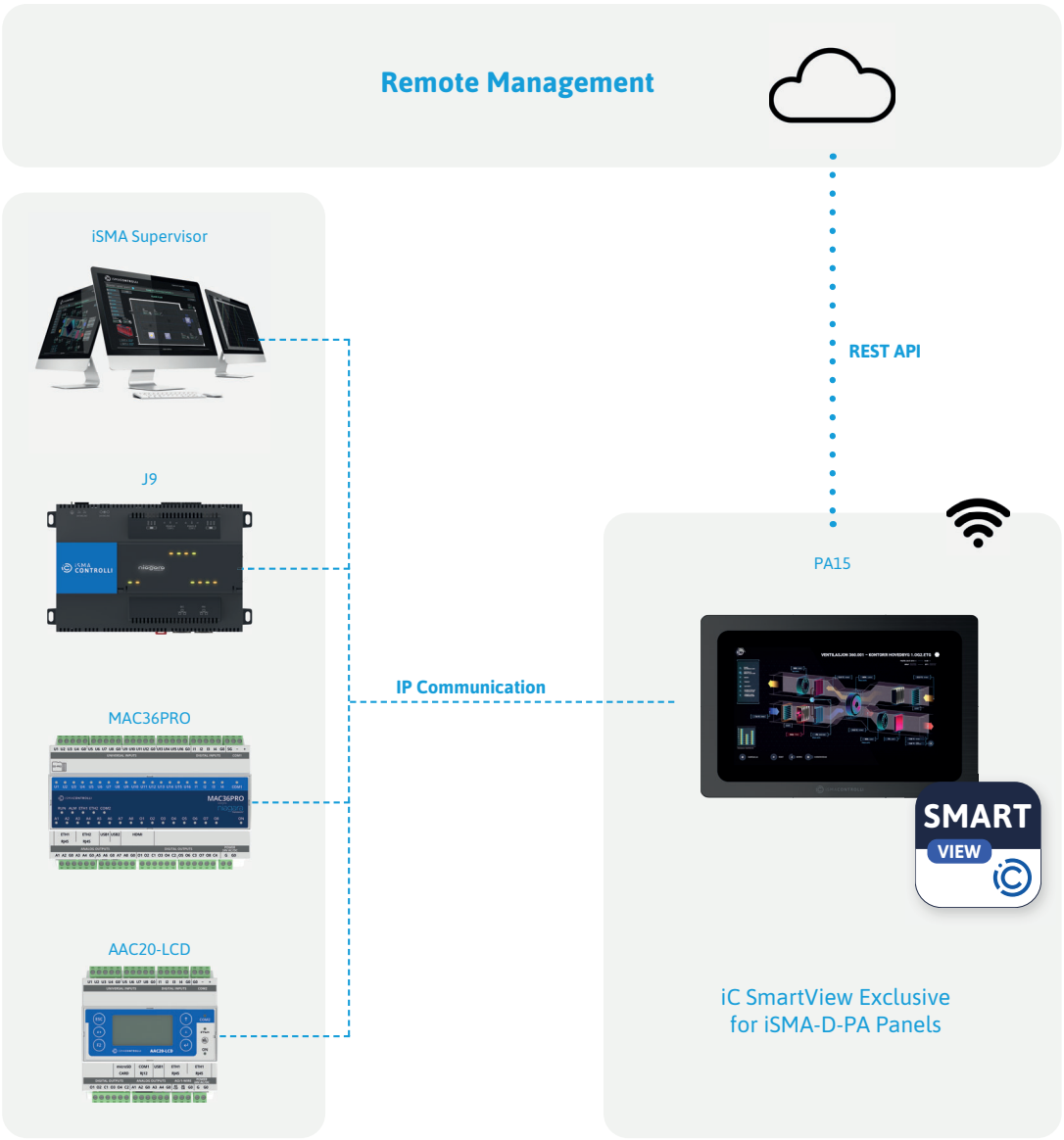
iC SmartView FEATURES

- Exclusive for iSMA CONTROLLI Android panels
- Support for multiple device views including Niagara stations and HTML5 web servers
- HTTPS support
- Autologin
- Home station that autostarts with the app
- Autoupdate
- Kiosk mode
- Quick start guide
- Screensaver
- PIN protection of each view
- Export settings to a file
- Import settings from a file
- Remote management using built-in web service, Niagara Service, and RESTful API

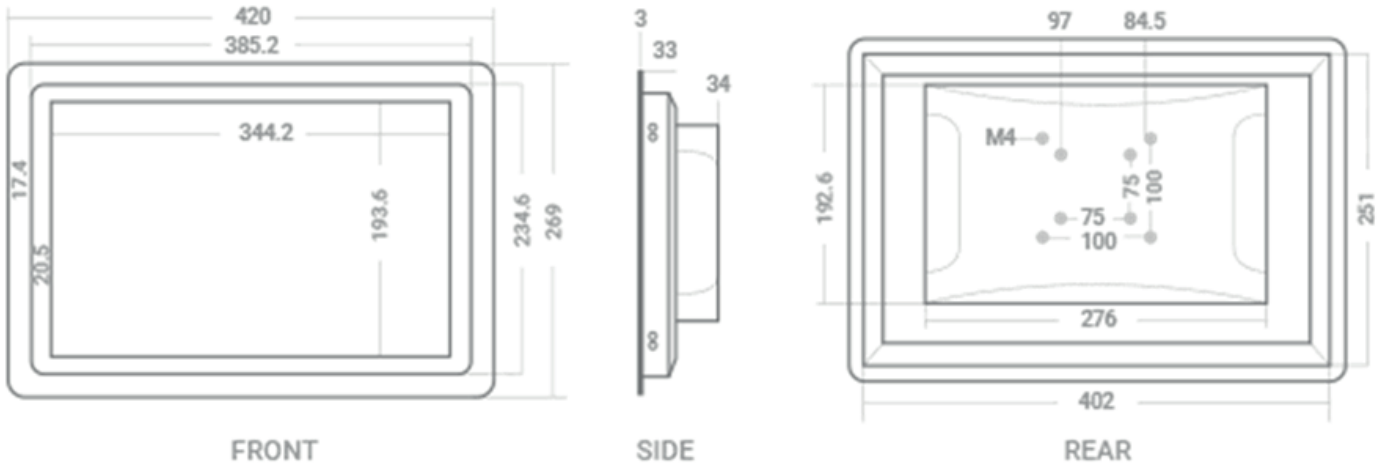
The performances stated in this sheet can be modified without any prior notice.

DESCRIPTION		15.6" PC PANEL
Power supply	Voltage	110-240 V AC, 50/60 Hz
	Power input	12 V DC
	Power adapter	EU, UK, or US
Display	Screen type	LCD, backlight lifetime ≥50000 h
	Touch type	10-point capacitive touch screen
	Size	15.6 in
	Aspect ratio	16:9
	Resolution	1920x1080
	Contrast	1000:1
	Luminance standard	300 nit, up tp 1000 nit
	Response time	5 ms
	Active area	344.20x193.60 mm/13.55x7.62 in
	Display colors	16.7 M
	View angle	80/80/80/80
Interfaces	COM1	RS232
	COM2	RS232
	Audio	Audio output
	ETH1	RJ45 port
	ETH2	RJ45 port
	USB1	USB C OTG
	USB2	USB 2.0
	USB3	USB 3.0
	HDMI	HDMI port
	TF/SD card	TF/SD card slot
	SIM	SIM card slot
Ingress protection	IP rating	IP 65 for front panel
Temperature	Storage	-10°C to 60°C (14°F to 140°F)
	Operating	0°C to 60°C (32°F to 140°F)
Humidity	Relative	10 to 80% RH
Housing	Material	Aluminum alloy enclosure
	Mounting	VESA compatibility, wall mounting
Dimensions	Width	420.00 mm/16.53 in
	Length	269.00 mm/10.59 in
	Height	70.00 mm/2.75 in

APPLICATION EXAMPLE



DIMENSIONS [mm]



8.100

lindabtscombinedsafetydatasheet

The following 72 pages are the document exactly as received and checked. It is bookmarked in the PDF.

Reference	
Asset	General
Provided by	Not recorded
Source file	`lindabtscombinedsafetydatasheet.pdf`
Pages	72

TECSEAL

SAFETY DATA SHEET

TS100 140CC

TS100 380CC

TS200 6KG

TS200FR 380CC

TS300 310CC

SAFETY DATA SHEET
TS100 140CC

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier

Product name LINDAB TECSEAL 100 140CC

Product number A03321, FP-000232, FP-000233, FP-000234, FP-000235

UFI UFI: 2469-R0VD-A00M-6EG8

1.2. Relevant identified uses of the substance or mixture and uses advised against

Identified uses Adhesive.

Uses advised against No specific uses advised against are identified.

1.3. Details of the supplier of the safety data sheet

Supplier

APOLLO CHEMICALS LTD
SANDY WAY
AMINGTON INDUSTRIAL ESTATE
TAMWORTH
STAFFS
B77 4DS
T: +44 (0) 1827 54281
F: +44 (0) 1827 53030
E: compliance@apollo.co.uk

1.4. Emergency telephone number

Emergency telephone +44 01827 69662 (NOT 24HRS - 8am-5pm mon-fri)

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

Classification (EC 1272/2008)

Physical hazards Flam. Liq. 2 - H225

Health hazards Skin Irrit. 2 - H315 Eye Irrit. 2 - H319 Skin Sens. 1 - H317 Repr. 2 - H361d STOT SE 3 - H336 STOT RE 2 - H373

Environmental hazards Aquatic Chronic 3 - H412

Physicochemical The product is highly flammable. Vapours may form explosive mixtures with air. Vapours are heavier than air and may travel along the floor and accumulate in the bottom of containers. Vapours may be ignited by a spark, a hot surface or an ember.

2.2. Label elements

Hazard pictograms



Signal word Danger

TS100 140CC

Hazard statements	H225 Highly flammable liquid and vapour. H315 Causes skin irritation. H319 Causes serious eye irritation. H317 May cause an allergic skin reaction. H361d Suspected of damaging the unborn child. H336 May cause drowsiness or dizziness. H373 May cause damage to organs through prolonged or repeated exposure. H412 Harmful to aquatic life with long lasting effects.
Precautionary statements	P210 Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. P260 Do not breathe vapour/ spray. P280 Wear protective gloves/ protective clothing/ eye protection/ face protection. P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. P308+P313 IF exposed or concerned: Get medical advice/ attention. P501 Dispose of contents/ container in accordance with national regulations.
Supplemental label information	EUH205 Contains epoxy constituents. May produce an allergic reaction. RCH002a Restricted to professional users.
Contains	TOLUENE, hydrocarbons, C6-C7,n-alkanes, isoalkanes, cyclics, <5% n-hexane, Formaldehyde, oligomeric reaction products with phenol., ACETONE, ROSIN, REACTION PRODUCT; BISPHENOL -A- (EPICHLOROHYDRIN) EPOXY RESIN (NUMBER AVERAGE MOLECULAR WEIGHT<=700)
Supplementary precautionary statements	P201 Obtain special instructions before use. P202 Do not handle until all safety precautions have been read and understood. P240 Ground and bond container and receiving equipment. P241 Use explosion-proof electrical equipment. P242 Use non-sparking tools. P243 Take action to prevent static discharges. P261 Avoid breathing vapour/ spray. P264 Wash contaminated skin thoroughly after handling. P271 Use only outdoors or in a well-ventilated area. P272 Contaminated work clothing should not be allowed out of the workplace. P273 Avoid release to the environment. P302+P352 IF ON SKIN: Wash with plenty of water. P303+P361+P353 IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water or shower. P304+P340 IF INHALED: Remove person to fresh air and keep comfortable for breathing. P312 Call a POISON CENTRE/doctor if you feel unwell. P314 Get medical advice/ attention if you feel unwell. P321 Specific treatment (see medical advice on this label). P332+P313 If skin irritation occurs: Get medical advice/ attention. P333+P313 If skin irritation or rash occurs: Get medical advice/ attention. P337+P313 If eye irritation persists: Get medical advice/ attention. P362+P364 Take off contaminated clothing and wash it before reuse. P370+P378 In case of fire: Use foam, carbon dioxide, dry powder or water fog to extinguish. P403+P233 Store in a well-ventilated place. Keep container tightly closed. P403+P235 Store in a well-ventilated place. Keep cool. P405 Store locked up.

2.3. Other hazards

This product does not contain any substances classified as PBT or vPvB.

SECTION 3: Composition/information on ingredients

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3.2. Mixtures

TOLUENE **10-30%**

CAS number: 108-88-3 EC number: 203-625-9 REACH registration number: 01-2119471310-51-0051

Classification
Flam. Liq. 2 - H225
Skin Irrit. 2 - H315
Repr. 2 - H361d
STOT SE 3 - H336
STOT RE 2 - H373
Asp. Tox. 1 - H304
Aquatic Chronic 3 - H412

hydrocarbons, C6-C7,n-alkanes, isoalkanes, cyclics, <5% n-hexane **10-30%**

CAS number: — EC number: 921-024-6 REACH registration number: 01-2119475514-35-0001

Classification
Flam. Liq. 2 - H225
Skin Irrit. 2 - H315
STOT SE 3 - H336
Asp. Tox. 1 - H304
Aquatic Chronic 2 - H411

CALOFORT S **10-30%**

CAS number: 471-34-1

Classification
Skin Irrit. 2 - H315
Eye Irrit. 2 - H319
STOT SE 3 - H335

Formaldehyde, oligomeric reaction products with phenol. **1-5%**

CAS number: 9003-35-4 EC number: 500-005-2 REACH registration number: 01-2120735197-51-0000

Classification
Eye Irrit. 2 - H319
Skin Sens. 1 - H317
Aquatic Chronic 3 - H412

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ACETONE		1-5%
CAS number: 67-64-1	EC number: 200-662-2	REACH registration number: 01-2119471330-49-0000

Classification
Flam. Liq. 2 - H225
Eye Irrit. 2 - H319
STOT SE 3 - H336

ANTIMONY TRIOXIDE		<1%
CAS number: 1309-64-4	EC number: 215-175-0	REACH registration number: 01-2119978287-20-0000

Classification
Carc. 2 - H351

ROSIN		<1%
CAS number: 8050-09-7	EC number: 232-475-7	REACH registration number: 01-2119480418-32-0036

Classification
Skin Sens. 1 - H317

HEXANE-norm		<1%
CAS number: 110-54-3	EC number: 203-777-6	REACH registration number: 01-2119480412-44-0009

Classification
Flam. Liq. 2 - H225
Skin Irrit. 2 - H315
Repr. 2 - H361f
STOT SE 3 - H336
STOT RE 2 - H373
Asp. Tox. 1 - H304
Aquatic Chronic 2 - H411

ZINC OXIDE		<1%
CAS number: 1314-13-2	EC number: 215-222-5	REACH registration number: 01-2119463881-32-0000
M factor (Acute) = 1	M factor (Chronic) = 1	

Classification
Aquatic Acute 1 - H400
Aquatic Chronic 1 - H410

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REACTION PRODUCT; BISPHENOL -A-(EPICHLOROHYDRIN) EPOXY RESIN (NUMBER AVERAGE MOLECULAR WEIGHT<=700)	**<1%**
CAS number: 25068-38-6	REACH registration number: 01-2119456619-26-0004
Classification Skin Irrit. 2 - H315 Eye Irrit. 2 - H319 Skin Sens. 1 - H317 Aquatic Chronic 2 - H411	

The full text for all hazard statements is displayed in Section 16.

SECTION 4: First aid measures

4.1. Description of first aid measures

General information Get medical attention if any discomfort continues.

Inhalation Remove affected person from source of contamination. Move affected person to fresh air and keep warm and at rest in a position comfortable for breathing.

Ingestion Rinse mouth thoroughly with water. Get medical attention.

Skin contact Remove contaminated clothing immediately and wash skin with soap and water.

Eye contact Rinse immediately with plenty of water. Remove any contact lenses and open eyelids wide apart. Continue to rinse for at least 15 minutes. Get medical attention immediately.

4.2. Most important symptoms and effects, both acute and delayed

General information The severity of the symptoms described will vary dependent on the concentration and the length of exposure.

Inhalation Vapours may cause headache, fatigue, dizziness and nausea.

Ingestion May cause discomfort if swallowed. May cause stomach pain or vomiting.

Skin contact Prolonged skin contact may cause redness and irritation.

Eye contact May cause temporary eye irritation.

4.3. Indication of any immediate medical attention and special treatment needed

Notes for the doctor No specific recommendations. If in doubt, get medical attention promptly.

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media Use fire-extinguishing media suitable for the surrounding fire. Extinguish with alcohol-resistant foam, carbon dioxide or dry powder.

Unsuitable extinguishing media Do not use water jet as an extinguisher, as this will spread the fire.

5.2. Special hazards arising from the substance or mixture

Specific hazards The product is flammable. Heating may generate flammable vapours. Protection against nuisance dust must be used when the airborne concentration exceeds 10 mg/m3. The product is highly flammable.

TS100 140CC

Hazardous combustion products Does not decompose when used and stored as recommended.

5.3. Advice for firefighters

Protective actions during firefighting Control run-off water by containing and keeping it out of sewers and watercourses. Avoid breathing fire gases or vapours. Keep up-wind to avoid fumes.

Special protective equipment for firefighters Wear chemical protective suit.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Personal precautions Wear protective clothing as described in Section 8 of this safety data sheet.

6.2. Environmental precautions

Environmental precautions Spillages or uncontrolled discharges into watercourses must be reported immediately to the Environmental Agency or other appropriate regulatory body. Do not discharge into drains or watercourses or onto the ground.

6.3. Methods and material for containment and cleaning up

Methods for cleaning up Eliminate all sources of ignition. No smoking, sparks, flames or other sources of ignition near spillage. Provide adequate ventilation. Absorb in vermiculite, dry sand or earth and place into containers.

6.4. Reference to other sections

Reference to other sections Wear protective clothing as described in Section 8 of this safety data sheet. For waste disposal, see section 13.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Usage precautions Keep away from heat, sparks and open flame. Static electricity and formation of sparks must be prevented. Good personal hygiene procedures should be implemented. Wash hands and any other contaminated areas of the body with soap and water before leaving the work site.

7.2. Conditions for safe storage, including any incompatibilities

Storage precautions Keep away from heat, sparks and open flame. Keep container tightly closed. Keep only in the original container.

Storage class Flammable liquid storage.

7.3. Specific end use(s)

Specific end use(s) The identified uses for this product are detailed in Section 1.2.

SECTION 8: Exposure controls/Personal protection

8.1. Control parameters

Occupational exposure limits

TOLUENE

Long-term exposure limit (8-hour TWA): WEL 50 ppm 191 mg/m³
Short-term exposure limit (15-minute): WEL 100 ppm 384 mg/m³
Sk

CALOFORT S

Long-term exposure limit (8-hour TWA): WEL 10 mg/m³

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ACETONE

Long-term exposure limit (8-hour TWA): WEL 500 ppm 1210 mg/m³
Short-term exposure limit (15-minute): WEL 1500 ppm 3620 mg/m³

ANTIMONY TRIOXIDE

Long-term exposure limit (8-hour TWA): 0.5 mg/m³

HEXANE-norm

Long-term exposure limit (8-hour TWA): WEL 20 ppm 72 mg/m³

WEL = Workplace Exposure Limit.
Sk = Can be absorbed through the skin.

Ingredient comments WEL = Workplace Exposure Limits

TOLUENE (CAS: 108-88-3)

DNEL
Workers - Inhalation; Long term systemic effects: 192 mg/m³
Workers - Inhalation; Long term local effects: 192 mg/m³
Workers - Inhalation; Short term systemic effects: 384 mg/m³
Workers - Inhalation; Short term local effects: 384 mg/m³
Workers - Dermal; Long term systemic effects: 384 mg/kg/day
Consumer - Inhalation; Long term systemic effects: 56.5 mg/m³
Consumer - Inhalation; Long term local effects: 56.5 mg/m³
Consumer - Inhalation; Short term systemic effects: 226 mg/m³
Consumer - Inhalation; Short term local effects: 226 mg/m³
Consumer - Dermal; Long term systemic effects: 226 mg/kg/day
Consumer - Oral; Long term systemic effects: 8.13 mg/kg/day

PNEC
Fresh water; 0.68 mg/l
marine water; 0.68 mg/l
Intermittent release; 0.68 mg/l
STP; 13.61 mg/l
Sediment (Freshwater); 16.39 mg/kg
Sediment (Marinewater); 16.39 mg/kg
Soil; 2.89 mg/kg

hydrocarbons, C6-C7,n-alkanes, isoalkanes, cyclics, <5% n-hexane

Ingredient comments WEL = Workplace Exposure Limits

DNEL
Consumer - Oral; Long term systemic effects: 699 mg/kg bw/day
Consumer - Dermal; Long term systemic effects: 699 mg/kg bw/day
Workers - Dermal; Long term systemic effects: 773 mg/kg bw/day
Consumer - Inhalation; Long term systemic effects: 608 mg/m³

ACETONE (CAS: 67-64-1)

Ingredient comments WEL = Workplace Exposure Limits

ANTIMONY TRIOXIDE (CAS: 1309-64-4)

DNEL
- Dermal; Long term systemic effects: 281 mg/kg/day
- Inhalation; Long term local effects: 0.5 mg/m³

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PNEC

- Fresh water; 0.113 mg/l
- marine water; 0.0113 mg/l
- Sediment (Freshwater); 7.8 mg/kg
- Soil; 37 mg/kg
- STP; 2.55 mg/l

ZINC OXIDE (CAS: 1314-13-2)

DNEL

Workers - Inhalation; Long term local effects: 0.5 mg/m³
General population - Oral; Long term systemic effects: 0.83 mg/kg bw/day
General population - Inhalation; Long term systemic effects: 2.5 mg/m³
Workers - Inhalation; Long term systemic effects: 5 mg/m³
General population - Dermal; Long term systemic effects: 83 mg/kg bw/day
Workers - Dermal; Long term systemic effects: 83 mg/kg bw/day

PNEC

Fresh water; 0.02036 mg/l
marine water; 0.0061 mg/l
Sediment (Freshwater); 117 mg/kg
STP; 0.052 mg/l
Sediment (Marinewater); 56.5 mg/kg
Soil; 35.6 mg/kg

8.2. Exposure controls

Protective equipment



Appropriate engineering controls

Provide adequate ventilation. Avoid inhalation of vapours. Observe any occupational exposure limits for the product or ingredients. As this product contains ingredients with exposure limits, process enclosures, local exhaust ventilation or other engineering controls should be used to keep worker exposure below any statutory or recommended limits, if use generates dust, fumes, gas, vapour or mist.

Eye/face protection

The following protection should be worn: Chemical splash goggles.

Hand protection

Chemical-resistant, impervious gloves complying with an approved standard should be worn if a risk assessment indicates skin contact is possible. It is recommended that gloves are made of the following material: Nitrile rubber. It should be noted that liquid may penetrate the gloves. Frequent changes are recommended.

Other skin and body protection

Wear appropriate clothing to prevent any possibility of liquid contact and repeated or prolonged vapour contact. Wear apron or protective clothing in case of contact.

Hygiene measures

Use engineering controls to reduce air contamination to permissible exposure level. Provide eyewash station. Wash contaminated clothing before reuse. Wash hands after handling. Eating, smoking and water fountains prohibited in immediate work area.

Respiratory protection

In confined or poorly-ventilated spaces, a supplied-air respirator must be worn. Wear a respirator fitted with the following cartridge: ABEK2-P3

Environmental exposure controls

Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

TS100 140CC

Appearance	Liquid.
Colour	Various colours.
Odour	Characteristic.
Odour threshold	Not available.
pH	Estimated value. pH (concentrated solution): 7-8
Melting point	Not available.
Initial boiling point and range	62-100°C @
Flash point	Estimated value. -35°C
Evaporation rate	Not determined.
Evaporation factor	Not available.
Flammability (solid, gas)	Not available.
Upper/lower flammability or explosive limits	: 0.6-13%
Other flammability	Not available.
Vapour pressure	Not available.
Vapour density	Not available.
Relative density	1.10
Bulk density	Not available.
Solubility(ies)	Insoluble in water.
Partition coefficient	Not available.
Auto-ignition temperature	200°C
Decomposition Temperature	Not available.
Viscosity	Kinematic viscosity > 20.5 mm²/s.
Explosive properties	Not available.
Explosive under the influence of a flame	Not considered to be explosive.
Oxidising properties	Not available.
Comments	Information given is applicable to the product as supplied.

9.2. Other information

Other information	No information required.
Refractive index	Not available.
Particle size	Not available.
Molecular weight	Not available.
Volatility	Not available.
Saturation concentration	Not available.
Critical temperature	Not available.

TS100 140CC

SECTION 10: Stability and reactivity

10.1. Reactivity

Reactivity There are no known reactivity hazards associated with this product.

10.2. Chemical stability

Stability No particular stability concerns. Stable at normal ambient temperatures and when used as recommended.

10.3. Possibility of hazardous reactions

Possibility of hazardous reactions Not applicable. Not relevant.

10.4. Conditions to avoid

Conditions to avoid Avoid heat, flames and other sources of ignition.

10.5. Incompatible materials

Materials to avoid Strong oxidising agents. Strong acids. Strong alkalis.

10.6. Hazardous decomposition products

Hazardous decomposition products Does not decompose when used and stored as recommended. Thermal decomposition or combustion may liberate carbon oxides and other toxic gases or vapours. Oxides of carbon. Oxides of nitrogen.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Toxicological information on ingredients.

TOLUENE

Acute toxicity - oral

Acute toxicity oral (LD_{50} mg/kg)	5,580.0
Species	Rat

Acute toxicity - dermal

Acute toxicity dermal (LD_{50} mg/kg)	5,000.0
Species	Rabbit

Acute toxicity - inhalation

Acute toxicity inhalation (LC_{50} vapours mg/l)	25.7
Species	Rat
ATE inhalation (vapours mg/l)	25.7

hydrocarbons, C6-C7,n-alkanes, isoalkanes, cyclics, <5% n-hexane

Toxicological effects No information available.

Acute toxicity - oral

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Acute toxicity oral (LD_{50} mg/kg)	5,840.0
Species	Rat
Notes (oral LD_{50})	Not known. Data lacking.
ATE oral (mg/kg)	5,840.0

Acute toxicity - dermal

Acute toxicity dermal (LD_{50} mg/kg)	2,920.0
Species	Rat
Notes (dermal LD_{50})	Data lacking.
ATE dermal (mg/kg)	2,920.0

Acute toxicity - inhalation

Acute toxicity inhalation (LC_{50} vapours mg/l)	25.2
Species	Rat
ATE inhalation (vapours mg/l)	25.2

Skin corrosion/irritation

Animal data	Data lacking.

Serious eye damage/irritation

Serious eye damage/irritation	Data lacking.

Aspiration hazard

Aspiration hazard	Kinematic viscosity > 20.5 mm^2/s.

Inhalation	May cause respiratory system irritation.
Ingestion	May cause stomach pain or vomiting.
Skin contact	Irritating to skin.
Eye contact	May cause severe eye irritation.
Acute and chronic health hazards	Vapour from this product may be hazardous by inhalation.
Route of exposure	Inhalation Skin absorption Ingestion. Skin and/or eye contact
Target organs	No specific target organs known.
Medical symptoms	Gas or vapour in high concentrations may irritate the respiratory system. Symptoms following overexposure may include the following: Headache. Fatigue. Nausea, vomiting.
Medical considerations	No information available.

ACETONE

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Other health effects	There is no evidence that the product can cause cancer.
Acute toxicity - oral	
Acute toxicity oral (LD_{50} mg/kg)	5,800.0
Species	Rat
ATE oral (mg/kg)	5,800.0
Acute toxicity - dermal	
Acute toxicity dermal (LD_{50} mg/kg)	7,426.0
Species	Rat
ATE dermal (mg/kg)	7,426.0
Acute toxicity - inhalation	
Acute toxicity inhalation (LC_{50} vapours mg/l)	50,100.0
Species	Rat
ATE inhalation (vapours mg/l)	50,100.0
Skin corrosion/irritation	
Extreme pH	Slightly irritating.
Serious eye damage/irritation	
Serious eye damage/irritation	Moderately irritating.
Respiratory sensitisation	
Respiratory sensitisation	Not sensitising.

ANTIMONY TRIOXIDE

Acute toxicity - oral	
Acute toxicity oral (LD_{50} mg/kg)	5,000.0
Species	Rat
ATE oral (mg/kg)	5,000.0

HEXANE-norm

Acute toxicity - oral	
Acute toxicity oral (LD_{50} mg/kg)	25,000.0
Species	Rat
ATE oral (mg/kg)	25,000.0
Acute toxicity - inhalation	

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Acute toxicity inhalation (LC_{50} gases ppmV)	48,000.0
Species	Rat
ATE inhalation (gases ppm)	48,000.0

ZINC OXIDE

Acute toxicity - oral

Acute toxicity oral (LD_{50} mg/kg)	5,010.0
Species	Rat
ATE oral (mg/kg)	5,010.0

Acute toxicity - dermal

Acute toxicity dermal (LD_{50} mg/kg)	2,010.0
Species	Mouse
ATE dermal (mg/kg)	2,010.0

Acute toxicity - inhalation

Acute toxicity inhalation (LC_{50} dust/mist mg/l)	5.701
Species	Rat

SECTION 12: Ecological information

Ecological information on ingredients.

hydrocarbons, C6-C7,n-alkanes, isoalkanes, cyclics, <5% n-hexane

Ecotoxicity	Dangerous for the environment.

12.1. Toxicity

Ecological information on ingredients.

TOLUENE

Acute aquatic toxicity

Acute toxicity - fish	, 48 hours: > 1-10 mg/l, Freshwater fish
Acute toxicity - aquatic invertebrates	EC_{50}, 48 hours: 11.5 mg/l, Daphnia magna
Acute toxicity - aquatic plants	IC_{50}, 72 hours: 100 mg/l, Algae

hydrocarbons, C6-C7,n-alkanes, isoalkanes, cyclics, <5% n-hexane

Acute aquatic toxicity

Acute toxicity - fish	LC_0, hours: >1-<10 mg/l, Fish

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Acute toxicity - aquatic invertebrates	EC_{50}, 48 hours: 3 mg/l, Daphnia magna
Acute toxicity - aquatic plants	LC_{0}, hours: >1-<10 mg/l, Algae

ACETONE

Toxicity	Not considered toxic to fish.

Acute aquatic toxicity

Acute toxicity - fish	LC50, 96 hours: 5540 mg/l, Freshwater fish , 96 hours: 11000 mg/l, Marinewater fish LC_{50}, 96 hours: 11000 mg/l, Fish
Acute toxicity - aquatic invertebrates	EC_{50}, 48 hours: 8800 mg/l, Daphnia magna EC_{50}, 48 hours: 8800 mg/l, Daphnia magna
Acute toxicity - aquatic plants	IC_{50}, 72 hours: 430 mg/l, Algae
Acute toxicity - microorganisms	, 30 minutes: 1000 mg/l, Activated sludge

HEXANE-norm

Acute aquatic toxicity

Acute toxicity - fish	LC_{50}, EC_{50}, IC_{50}, : 10 mg/l, Fish
Acute toxicity - aquatic invertebrates	LC_{50}, EC_{50}, IC_{50}, : 10 mg/l, Daphnia magna
Acute toxicity - aquatic plants	LC_{50}, EC_{50}, IC_{50}, : 10 mg/l, Algae

ZINC OXIDE

Acute aquatic toxicity

LE(C)$_{50}$	0.1 < L(E)C50 ≤ 1
M factor (Acute)	1
Acute toxicity - fish	LC_{50}, 96 hours: 1.1 mg/l, Oncorhynchus mykiss (Rainbow trout)
Acute toxicity - aquatic invertebrates	EC_{50}, 48 hours: 0.098 mg/l, Daphnia magna

Chronic aquatic toxicity

M factor (Chronic)	1

REACTION PRODUCT; BISPHENOL -A- (EPICHLOROHYDRIN) EPOXY RESIN (NUMBER AVERAGE MOLECULAR WEIGHT<=700)

Acute aquatic toxicity

Acute toxicity - fish	LC_{50}, 96 hours: 2 mg/l, Oncorhynchus mykiss (Rainbow trout)
Acute toxicity - aquatic invertebrates	EC_{50}, 48 hours: 1.8 mg/l, Daphnia magna

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Acute toxicity - aquatic plants	EC_{50}, 72 hours: 11 mg/l, Freshwater algae
Acute toxicity - microorganisms	IC_{50}, 18 hours: 42.6 mg/l, Bacteria
Chronic aquatic toxicity	
Chronic toxicity - aquatic invertebrates	NOEC, 21 days: 0.3 mg/l, Daphnia magna

12.2. Persistence and degradability

Ecological information on ingredients.

ACETONE

Persistence and degradability	The product is expected to be biodegradable.

12.3. Bioaccumulative potential

Partition coefficient Not available.

Ecological information on ingredients.

TOLUENE

Bioaccumulative potential	The product does not contain any substances expected to be bioaccumulating.
Partition coefficient	Not available.

ACETONE

Bioaccumulative potential	The product does not contain any substances expected to be bioaccumulating. BCF: 3,
Partition coefficient	Pow: < -0.24

REACTION PRODUCT; BISPHENOL -A- (EPICHLOROHYDRIN) EPOXY RESIN (NUMBER AVERAGE MOLECULAR WEIGHT<=700)

Partition coefficient	log Pow: 3.242

12.4. Mobility in soil

Mobility The product contains volatile organic compounds (VOCs) which will evaporate easily from all surfaces.

Ecological information on ingredients.

TOLUENE

Mobility	The product contains volatile organic compounds (VOCs) which will evaporate easily from all surfaces.

ACETONE

Mobility	The product is miscible with water and may spread in water systems.
Adsorption/desorption coefficient	Water - log Koc: 1.5 @ 20°C

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Henry's law constant 2929-3070 Pa m3/mol @ 25°C

REACTION PRODUCT; BISPHENOL -A- (EPICHLOROHYDRIN) EPOXY RESIN (NUMBER AVERAGE MOLECULAR WEIGHT<=700)

Henry's law constant 4.93E-05 Pa m³/mol @ 25°C

12.5. Results of PBT and vPvB assessment

Results of PBT and vPvB assessment This product does not contain any substances classified as PBT or vPvB.

Ecological information on ingredients.

TOLUENE

Results of PBT and vPvB assessment This product does not contain any substances classified as PBT or vPvB.

ACETONE

Results of PBT and vPvB assessment This product does not contain any substances classified as PBT or vPvB.

12.6. Other adverse effects

Other adverse effects None known.

Ecological information on ingredients.

TOLUENE

Other adverse effects Not known.

ACETONE

Other adverse effects Not applicable.

SECTION 13: Disposal considerations

13.1. Waste treatment methods

General information Waste should be treated as controlled waste. Dispose of waste to licensed waste disposal site in accordance with the requirements of the local Waste Disposal Authority.

Disposal methods Dispose of waste to licensed waste disposal site in accordance with the requirements of the local Waste Disposal Authority.

SECTION 14: Transport information

14.1. UN number

UN No. (ADR/RID) 1133

UN No. (IMDG) 1133

UN No. (ICAO) 1133

UN No. (ADN) 1133

14.2. UN proper shipping name

Proper shipping name (ADR/RID) ADHESIVES

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Proper shipping name (IMDG) ADHESIVES

Proper shipping name (ICAO) ADHESIVES

Proper shipping name (ADN) ADHESIVES

14.3. Transport hazard class(es)

ADR/RID class 3

ADR/RID classification code F1

ADR/RID label 3

IMDG class 3

ICAO class/division 3

ADN class 3

Transport labels



14.4. Packing group

ADR/RID packing group II

IMDG packing group II

ICAO packing group II

ADN packing group II

14.5. Environmental hazards

Environmentally hazardous substance/marine pollutant
No.

14.6. Special precautions for user

EmS F-E, S-D

ADR transport category 2

Hazard Identification Number (ADR/RID) 33

Tunnel restriction code (D/E)

14.7. Transport in bulk according to Annex II of MARPOL and the IBC Code

SECTION 15: Regulatory information

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture

National regulations Health and Safety at Work etc. Act 1974 (as amended).
The Control of Substances Hazardous to Health Regulations 2002 (SI 2002 No. 2677) (as amended).
The Chemicals (Hazard Information and Packaging for Supply) Regulations 2009 (SI 2009 No. 716).
Control of Substances Hazardous to Health Regulations 2002 (as amended).

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EU legislation	Commission Directive 91/322/EEC of 29 May 1991 on establishing indicative limit values by implementing Council Directive 80/1107/EEC on the protection of workers from the risks related to exposure to chemical, physical and biological agents at work. Regulation (EC) No 1907/2006 of the European Parliament and of the Council of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH) (as amended).
Authorisations (Annex XIV Regulation 1907/2006)	This product is/contains a substance that is included in REGULATION (EC) No 1907/2006 (REACH) ANNEX XVII - RESTRICTIONS ON THE MANUFACTURE, PLACING ON THE MARKET AND USE OF CERTAIN DANGEROUS SUBSTANCES, MIXTURES AND ARTICLES. Entry number: 48

15.2. Chemical safety assessment

No chemical safety assessment has been carried out.

SECTION 16: Other information

Issued by	Compliance
Revision date	19/10/2021
Revision	22
Supersedes date	29/09/2020
Hazard statements in full	H225 Highly flammable liquid and vapour. H304 May be fatal if swallowed and enters airways. H315 Causes skin irritation. H317 May cause an allergic skin reaction. H319 Causes serious eye irritation. H335 May cause respiratory irritation. H336 May cause drowsiness or dizziness. H351 Suspected of causing cancer. H361d Suspected of damaging the unborn child. H361f Suspected of damaging fertility. H373 May cause damage to organs through prolonged or repeated exposure. H400 Very toxic to aquatic life. H410 Very toxic to aquatic life with long lasting effects. H411 Toxic to aquatic life with long lasting effects. H412 Harmful to aquatic life with long lasting effects.
Store Between	Store Between 5°C-25°C

This information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process. Such information is, to the best of the company's knowledge and belief, accurate and reliable as of the date indicated. However, no warranty, guarantee or representation is made to its accuracy, reliability or completeness. It is the user's responsibility to satisfy himself as to the suitability of such information for his own particular use.

SAFETY DATA SHEET
TS100 380CC

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier

Product name LINDAB TECSEAL 100 380CC

Product number A00048, FP-000051, FP-000052, FP-000056, FP-000057

1.2. Relevant identified uses of the substance or mixture and uses advised against

Identified uses Adhesive.

Uses advised against No specific uses advised against are identified.

1.3. Details of the supplier of the safety data sheet

Supplier

APOLLO CHEMICALS LTD
SANDY WAY
AMINGTON INDUSTRIAL ESTATE
TAMWORTH
STAFFS
B77 4DS
T: +44 (0) 1827 54281
F: +44 (0) 1827 53030
E: compliance@apollo.co.uk

1.4. Emergency telephone number

Emergency telephone +44 01827 69662 (NOT 24HRS - 8am-5pm mon-fri)

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

Classification (EC 1272/2008)

Physical hazards Flam. Liq. 2 - H225

Health hazards Skin Irrit. 2 - H315 Skin Sens. 1 - H317 Repr. 2 - H361d STOT SE 3 - H336 STOT RE 2 - H373

Environmental hazards Aquatic Chronic 3 - H412

Physicochemical The product is highly flammable. Vapours may form explosive mixtures with air. Vapours are heavier than air and may travel along the floor and accumulate in the bottom of containers. Vapours may be ignited by a spark, a hot surface or an ember.

2.2. Label elements

Hazard pictograms



Signal word Danger

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Hazard statements	H225 Highly flammable liquid and vapour. H315 Causes skin irritation. H317 May cause an allergic skin reaction. H361d Suspected of damaging the unborn child. H336 May cause drowsiness or dizziness. H373 May cause damage to organs through prolonged or repeated exposure. H412 Harmful to aquatic life with long lasting effects.
Precautionary statements	P210 Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. P280 Wear protective gloves/ protective clothing/ eye protection/ face protection. P260 Do not breathe vapours. P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. P313 Get medical advice/ attention. P501 Dispose of contents/ container in accordance with national regulations.
Supplemental label information	EUH205 Contains epoxy constituents. May produce an allergic reaction. RCH002a Restricted to professional users.
Contains	TOLUENE, hydrocarbons, C6-C7,n-alkanes, isoalkanes, cyclics, <5% n-hexane, Formaldehyde, oligomeric reaction products with phenol., ACETONE, ROSIN, EPOXY RESIN (Number average MW <= 700)
Supplementary precautionary statements	P201 Obtain special instructions before use. P202 Do not handle until all safety precautions have been read and understood. P240 Ground and bond container and receiving equipment. P241 Use explosion-proof electrical equipment. P242 Use non-sparking tools. P243 Take action to prevent static discharges. P264 Wash contaminated skin thoroughly after handling. P271 Use only outdoors or in a well-ventilated area. P272 Contaminated work clothing should not be allowed out of the workplace. P273 Avoid release to the environment. P302+P352 IF ON SKIN: Wash with plenty of water. P303+P361+P353 IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water or shower. P304+P340 IF INHALED: Remove person to fresh air and keep comfortable for breathing. P308+P313 IF exposed or concerned: Get medical advice/ attention. P312 Call a POISON CENTRE/doctor if you feel unwell. P314 Get medical advice/ attention if you feel unwell. P321 Specific treatment (see medical advice on this label). P332+P313 If skin irritation occurs: Get medical advice/ attention. P333+P313 If skin irritation or rash occurs: Get medical advice/ attention. P362+P364 Take off contaminated clothing and wash it before reuse. P370+P378 In case of fire: Use foam, carbon dioxide, dry powder or water fog to extinguish. P403+P233 Store in a well-ventilated place. Keep container tightly closed. P403+P235 Store in a well-ventilated place. Keep cool. P405 Store locked up.

2.3. Other hazards

This product does not contain any substances classified as PBT or vPvB.

SECTION 3: Composition/information on ingredients

3.2. Mixtures

TS100 380CC

TOLUENE		**10-30%**
CAS number: 108-88-3	EC number: 203-625-9	REACH registration number: 01-2119471310-51-0051

Classification
Flam. Liq. 2 - H225
Skin Irrit. 2 - H315
Repr. 2 - H361d
STOT SE 3 - H336
STOT RE 2 - H373
Asp. Tox. 1 - H304
Aquatic Chronic 3 - H412

hydrocarbons, C6-C7,n-alkanes, isoalkanes, cyclics, <5% n-hexane		**10-30%**
CAS number: —	EC number: 921-024-6	REACH registration number: 01-2119475514-35-0001

Classification
Flam. Liq. 2 - H225
Skin Irrit. 2 - H315
STOT SE 3 - H336
Asp. Tox. 1 - H304
Aquatic Chronic 2 - H411

Formaldehyde, oligomeric reaction products with phenol.		**1-5%**
CAS number: 9003-35-4	EC number: 500-005-2	REACH registration number: 01-2120735197-51-0000

Classification
Eye Irrit. 2 - H319
Skin Sens. 1 - H317
Aquatic Chronic 3 - H412

ACETONE		**1-5%**
CAS number: 67-64-1	EC number: 200-662-2	REACH registration number: 01-2119471330-49-0000

Classification
Flam. Liq. 2 - H225
Eye Irrit. 2 - H319
STOT SE 3 - H336

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ZINC OXIDE **<1%**

CAS number: 1314-13-2 EC number: 215-222-5 REACH registration number: 01-2119463881-32-0000

M factor (Acute) = 1 M factor (Chronic) = 1

Classification
Aquatic Acute 1 - H400
Aquatic Chronic 1 - H410

ROSIN **<1%**

CAS number: 8050-09-7 EC number: 232-475-7 REACH registration number: 01-2119480418-32-0036

Classification
Skin Sens. 1 - H317

ANTIMONY TRIOXIDE **<1%**

CAS number: 1309-64-4 EC number: 215-175-0 REACH registration number: 01-2119978287-20-0000

Classification
Carc. 2 - H351

HEXANE-norm **<1%**

CAS number: 110-54-3 EC number: 203-777-6 REACH registration number: 01-2119480412-44-0009

Classification
Flam. Liq. 2 - H225
Skin Irrit. 2 - H315
Repr. 2 - H361f
STOT SE 3 - H336
STOT RE 2 - H373
Asp. Tox. 1 - H304
Aquatic Chronic 2 - H411

EPOXY RESIN (Number average MW <= 700) **<1%**

CAS number: 25068-38-6 EC number: 500-033-5 REACH registration number: 01-2119456619-26-0016

Classification
Skin Irrit. 2 - H315
Eye Irrit. 2 - H319
Skin Sens. 1 - H317
Aquatic Chronic 2 - H411

The full text for all hazard statements is displayed in Section 16.

SECTION 4: First aid measures

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4.1. Description of first aid measures

General information Get medical attention if any discomfort continues.

Inhalation Remove affected person from source of contamination. Move affected person to fresh air and keep warm and at rest in a position comfortable for breathing.

Ingestion Rinse mouth thoroughly with water. Get medical attention.

Skin contact Remove contaminated clothing immediately and wash skin with soap and water.

Eye contact Rinse immediately with plenty of water. Remove any contact lenses and open eyelids wide apart. Continue to rinse for at least 15 minutes. Get medical attention immediately.

4.2. Most important symptoms and effects, both acute and delayed

General information The severity of the symptoms described will vary dependent on the concentration and the length of exposure.

Inhalation Vapours may cause headache, fatigue, dizziness and nausea.

Ingestion May cause discomfort if swallowed. May cause stomach pain or vomiting.

Skin contact Prolonged skin contact may cause redness and irritation.

Eye contact May cause temporary eye irritation.

4.3. Indication of any immediate medical attention and special treatment needed

Notes for the doctor No specific recommendations. If in doubt, get medical attention promptly.

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media Use fire-extinguishing media suitable for the surrounding fire. Extinguish with alcohol-resistant foam, carbon dioxide or dry powder.

Unsuitable extinguishing media Do not use water jet as an extinguisher, as this will spread the fire.

5.2. Special hazards arising from the substance or mixture

Specific hazards Heating may generate flammable vapours. The product is highly flammable.

Hazardous combustion products Does not decompose when used and stored as recommended.

5.3. Advice for firefighters

Protective actions during firefighting Control run-off water by containing and keeping it out of sewers and watercourses. Avoid breathing fire gases or vapours. Keep up-wind to avoid fumes.

Special protective equipment for firefighters Wear chemical protective suit.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Personal precautions Wear protective clothing as described in Section 8 of this safety data sheet.

6.2. Environmental precautions

Environmental precautions Spillages or uncontrolled discharges into watercourses must be reported immediately to the Environmental Agency or other appropriate regulatory body. Do not discharge into drains or watercourses or onto the ground.

6.3. Methods and material for containment and cleaning up

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Methods for cleaning up Eliminate all sources of ignition. No smoking, sparks, flames or other sources of ignition near spillage. Provide adequate ventilation. Absorb in vermiculite, dry sand or earth and place into containers.

6.4. Reference to other sections

Reference to other sections Wear protective clothing as described in Section 8 of this safety data sheet. For waste disposal, see section 13.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Usage precautions Keep away from heat, sparks and open flame. Static electricity and formation of sparks must be prevented. Good personal hygiene procedures should be implemented. Wash hands and any other contaminated areas of the body with soap and water before leaving the work site.

7.2. Conditions for safe storage, including any incompatibilities

Storage precautions Keep away from heat, sparks and open flame. Keep container tightly closed. Keep only in the original container.

Storage class Flammable liquid storage.

7.3. Specific end use(s)

Specific end use(s) The identified uses for this product are detailed in Section 1.2.

SECTION 8: Exposure controls/Personal protection

8.1. Control parameters

Occupational exposure limits

TOLUENE

Long-term exposure limit (8-hour TWA): WEL 50 ppm 191 mg/m³
Short-term exposure limit (15-minute): WEL 100 ppm 384 mg/m³
Sk

ACETONE

Long-term exposure limit (8-hour TWA): WEL 500 ppm 1210 mg/m³
Short-term exposure limit (15-minute): WEL 1500 ppm 3620 mg/m³

ANTIMONY TRIOXIDE

Long-term exposure limit (8-hour TWA): 0.5 mg/m³

HEXANE-norm

Long-term exposure limit (8-hour TWA): WEL 20 ppm 72 mg/m³

WEL = Workplace Exposure Limit.
Sk = Can be absorbed through the skin.

Ingredient comments WEL = Workplace Exposure Limits

TOLUENE (CAS: 108-88-3)

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DNEL

Workers - Inhalation; Long term systemic effects: 192 mg/m³
Workers - Inhalation; Long term local effects: 192 mg/m³
Workers - Inhalation; Short term systemic effects: 384 mg/m³
Workers - Inhalation; Short term local effects: 384 mg/m³
Workers - Dermal; Long term systemic effects: 384 mg/kg/day
Consumer - Inhalation; Long term systemic effects: 56.5 mg/m³
Consumer - Inhalation; Long term local effects: 56.5 mg/m³
Consumer - Inhalation; Short term systemic effects: 226 mg/m³
Consumer - Inhalation; Short term local effects: 226 mg/m³
Consumer - Dermal; Long term systemic effects: 226 mg/kg/day
Consumer - Oral; Long term systemic effects: 8.13 mg/kg/day

PNEC

Fresh water; 0.68 mg/l
marine water; 0.68 mg/l
Intermittent release; 0.68 mg/l
STP; 13.61 mg/l
Sediment (Freshwater); 16.39 mg/kg
Sediment (Marinewater); 16.39 mg/kg
Soil; 2.89 mg/kg

hydrocarbons, C6-C7,n-alkanes, isoalkanes, cyclics, <5% n-hexane

Ingredient comments

WEL = Workplace Exposure Limits

DNEL

Consumer - Oral; Long term systemic effects: 699 mg/kg bw/day
Consumer - Dermal; Long term systemic effects: 699 mg/kg bw/day
Workers - Dermal; Long term systemic effects: 773 mg/kg bw/day
Consumer - Inhalation; Long term systemic effects: 608 mg/m³

ACETONE (CAS: 67-64-1)

Ingredient comments

WEL = Workplace Exposure Limits

ZINC OXIDE (CAS: 1314-13-2)

DNEL

Workers - Inhalation; Long term local effects: 0.5 mg/m³
General population - Oral; Long term systemic effects: 0.83 mg/kg bw/day
General population - Inhalation; Long term systemic effects: 2.5 mg/m³
Workers - Inhalation; Long term systemic effects: 5 mg/m³
General population - Dermal; Long term systemic effects: 83 mg/kg bw/day
Workers - Dermal; Long term systemic effects: 83 mg/kg bw/day

PNEC

Fresh water; 0.02036 mg/l
marine water; 0.0061 mg/l
Sediment (Freshwater); 117 mg/kg
STP; 0.052 mg/l
Sediment (Marinewater); 56.5 mg/kg
Soil; 35.6 mg/kg

ANTIMONY TRIOXIDE (CAS: 1309-64-4)

DNEL

- Dermal; Long term systemic effects: 281 mg/kg/day
- Inhalation; Long term local effects: 0.5 mg/m³

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PNEC	- Fresh water; 0.113 mg/l - marine water; 0.0113 mg/l - Sediment (Freshwater); 7.8 mg/kg - Soil; 37 mg/kg - STP; 2.55 mg/l

EPOXY RESIN (Number average MW <= 700) (CAS: 25068-38-6)

DNEL	Industry - Dermal; Short term systemic effects: 8.33 mg/kg/day Industry - Inhalation; Short term systemic effects: 12.25 mg/m³ Industry - Dermal; Long term systemic effects: 8.33 mg/kg/day Industry - Inhalation; Long term systemic effects: 12.25 mg/m³ Consumer - Dermal; Short term systemic effects: 3.571 mg/kg/day Consumer - Oral; Short term systemic effects: 0.75 mg/kg/day Consumer - Dermal; Long term systemic effects: 3.751 mg/kg/day Consumer - Oral; Long term systemic effects: 0.75 mg/kg/day
PNEC	- Fresh water; 0.006 mg/l - marine water; 0.0006 mg/l - Intermittent release; 0.018 mg/l - STP; 10 mg/l - Sediment (Freshwater); 0.996 mg/l - Sediment (Marinewater); 0.0996 mg/l - Soil; 0.196 mg/kg

8.2. Exposure controls

Protective equipment



Appropriate engineering controls	Provide adequate ventilation. Avoid inhalation of vapours. Observe any occupational exposure limits for the product or ingredients.
Eye/face protection	The following protection should be worn: Chemical splash goggles.
Hand protection	Chemical-resistant, impervious gloves complying with an approved standard should be worn if a risk assessment indicates skin contact is possible. It is recommended that gloves are made of the following material: Nitrile rubber. It should be noted that liquid may penetrate the gloves. Frequent changes are recommended.
Other skin and body protection	Wear appropriate clothing to prevent any possibility of liquid contact and repeated or prolonged vapour contact. Wear apron or protective clothing in case of contact.
Hygiene measures	Use engineering controls to reduce air contamination to permissible exposure level. Provide eyewash station. Wash contaminated clothing before reuse. Wash hands after handling. Eating, smoking and water fountains prohibited in immediate work area.
Respiratory protection	In confined or poorly-ventilated spaces, a supplied-air respirator must be worn. Wear a respirator fitted with the following cartridge: ABEK2-P3
Environmental exposure controls	Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

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Appearance	Paste.
Colour	Grey.
Odour	aromatic hydrocarbons
Odour threshold	Not available.
pH	Estimated value. pH (concentrated solution): 7-8
Melting point	Not available.
Initial boiling point and range	62-100°C @
Flash point	Estimated value. -35°C
Evaporation rate	Not determined.
Evaporation factor	Not available.
Flammability (solid, gas)	Not available.
Upper/lower flammability or explosive limits	: 0.6-13%
Other flammability	Not available.
Vapour pressure	Not available.
Vapour density	Not available.
Relative density	1.14 @ 20°C
Bulk density	Not available.
Solubility(ies)	Insoluble in water.
Partition coefficient	Not available.
Auto-ignition temperature	200°C
Decomposition Temperature	Not available.
Viscosity	Kinematic viscosity > 20.5 mm²/s.
Explosive properties	Not available.
Explosive under the influence of a flame	Not considered to be explosive.
Oxidising properties	Not available.
Comments	Information given is applicable to the product as supplied.

9.2. Other information

Other information	No information required.
Refractive index	Not available.
Particle size	Not available.
Molecular weight	Not available.
Volatility	Not available.
Saturation concentration	Not available.
Critical temperature	Not available.

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Volatile organic compound This product contains a maximum VOC content of 480 g/l.

SECTION 10: Stability and reactivity

10.1. Reactivity

Reactivity There are no known reactivity hazards associated with this product.

10.2. Chemical stability

Stability No particular stability concerns. Stable at normal ambient temperatures and when used as recommended.

10.3. Possibility of hazardous reactions

Possibility of hazardous reactions Not applicable. Not relevant.

10.4. Conditions to avoid

Conditions to avoid Avoid heat, flames and other sources of ignition.

10.5. Incompatible materials

Materials to avoid Strong oxidising agents. Strong acids. Strong alkalis.

10.6. Hazardous decomposition products

Hazardous decomposition products Does not decompose when used and stored as recommended. Thermal decomposition or combustion may liberate carbon oxides and other toxic gases or vapours. Oxides of carbon. Oxides of nitrogen.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Inhalation Harmful by inhalation.

Ingestion Harmful if swallowed.

Skin contact Harmful in contact with skin.

Toxicological information on ingredients.

TOLUENE

Acute toxicity - oral

Acute toxicity oral (LD_{50} mg/kg)	5,580.0
Species	Rat

Acute toxicity - dermal

Acute toxicity dermal (LD_{50} mg/kg)	5,000.0
Species	Rabbit

Acute toxicity - inhalation

Acute toxicity inhalation (LC_{50} vapours mg/l)	25.7
Species	Rat

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ATE inhalation (vapours mg/l)	25.7

hydrocarbons, C6-C7,n-alkanes, isoalkanes, cyclics, <5% n-hexane

Toxicological effects	No information available.
Acute toxicity - oral	
Acute toxicity oral (LD_{50} mg/kg)	5,840.0
Species	Rat
Notes (oral LD_{50})	Not known. Data lacking.
ATE oral (mg/kg)	5,840.0
Acute toxicity - dermal	
Acute toxicity dermal (LD_{50} mg/kg)	2,920.0
Species	Rat
Notes (dermal LD_{50})	Data lacking.
ATE dermal (mg/kg)	2,920.0
Acute toxicity - inhalation	
Acute toxicity inhalation (LC_{50} vapours mg/l)	25.2
Species	Rat
ATE inhalation (vapours mg/l)	25.2
Skin corrosion/irritation	
Animal data	Data lacking.
Serious eye damage/irritation	
Serious eye damage/irritation	Data lacking.
Aspiration hazard	
Aspiration hazard	Kinematic viscosity > 20.5 mm^2/s.

Inhalation	May cause respiratory system irritation.
Ingestion	May cause stomach pain or vomiting.
Skin contact	Irritating to skin.
Eye contact	May cause severe eye irritation.
Acute and chronic health hazards	Vapour from this product may be hazardous by inhalation.
Route of exposure	Inhalation Skin absorption Ingestion. Skin and/or eye contact

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Target organs	No specific target organs known.
Medical symptoms	Gas or vapour in high concentrations may irritate the respiratory system. Symptoms following overexposure may include the following: Headache. Fatigue. Nausea, vomiting.
Medical considerations	No information available.

ACETONE

Other health effects	There is no evidence that the product can cause cancer.
Acute toxicity - oral	
Acute toxicity oral (LD_{50} mg/kg)	5,800.0
Species	Rat
ATE oral (mg/kg)	5,800.0
Acute toxicity - dermal	
Acute toxicity dermal (LD_{50} mg/kg)	7,426.0
Species	Rat
ATE dermal (mg/kg)	7,426.0
Acute toxicity - inhalation	
Acute toxicity inhalation (LC_{50} vapours mg/l)	50,100.0
Species	Rat
ATE inhalation (vapours mg/l)	50,100.0
Skin corrosion/irritation	
Extreme pH	Slightly irritating.
Serious eye damage/irritation	
Serious eye damage/irritation	Moderately irritating.
Respiratory sensitisation	
Respiratory sensitisation	Not sensitising.

ZINC OXIDE

Acute toxicity - oral	
Acute toxicity oral (LD_{50} mg/kg)	5,010.0
Species	Rat
ATE oral (mg/kg)	5,010.0
Acute toxicity - dermal	

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Acute toxicity dermal (LD_{50} mg/kg)	2,010.0
Species	Mouse
ATE dermal (mg/kg)	2,010.0

Acute toxicity - inhalation

Acute toxicity inhalation (LC_{50} dust/mist mg/l)	5.701
Species	Rat

ANTIMONY TRIOXIDE

Acute toxicity - oral

Acute toxicity oral (LD_{50} mg/kg)	5,000.0
Species	Rat
ATE oral (mg/kg)	5,000.0

HEXANE-norm

Acute toxicity - oral

Acute toxicity oral (LD_{50} mg/kg)	25,000.0
Species	Rat
ATE oral (mg/kg)	25,000.0

Acute toxicity - inhalation

Acute toxicity inhalation (LC_{50} gases ppmV)	48,000.0
Species	Rat
ATE inhalation (gases ppm)	48,000.0

EPOXY RESIN (Number average MW <= 700)

Acute toxicity - oral

Acute toxicity oral (LD_{50} mg/kg)	15,000.0
Species	Rat
ATE oral (mg/kg)	15,000.0

Acute toxicity - dermal

Acute toxicity dermal (LD_{50} mg/kg)	23,000.0
Species	Rabbit
ATE dermal (mg/kg)	23,000.0

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SECTION 12: Ecological information

Ecological information on ingredients.

hydrocarbons, C6-C7,n-alkanes, isoalkanes, cyclics, <5% n-hexane

Ecotoxicity Dangerous for the environment.

12.1. Toxicity

Ecological information on ingredients.

TOLUENE

Acute aquatic toxicity

Acute toxicity - fish , 48 hours: > 1-10 mg/l, Freshwater fish

Acute toxicity - aquatic invertebrates EC_{50}, 48 hours: 11.5 mg/l, Daphnia magna

Acute toxicity - aquatic plants IC_{50}, 72 hours: 100 mg/l, Algae

hydrocarbons, C6-C7,n-alkanes, isoalkanes, cyclics, <5% n-hexane

Acute aquatic toxicity

Acute toxicity - fish LC_0, hours: >1-<10 mg/l, Fish

Acute toxicity - aquatic invertebrates EC_{50}, 48 hours: 3 mg/l, Daphnia magna

Acute toxicity - aquatic plants LC_0, hours: >1-<10 mg/l, Algae

ACETONE

Toxicity Not considered toxic to fish.

Acute aquatic toxicity

Acute toxicity - fish LC50, 96 hours: 5540 mg/l, Freshwater fish
, 96 hours: 11000 mg/l, Marinewater fish
LC_{50}, 96 hours: 11000 mg/l, Fish

Acute toxicity - aquatic invertebrates EC_{50}, 48 hours: 8800 mg/l, Daphnia magna
EC_{50}, 48 hours: 8800 mg/l, Daphnia magna

Acute toxicity - aquatic plants IC_{50}, 72 hours: 430 mg/l, Algae

Acute toxicity - microorganisms , 30 minutes: 1000 mg/l, Activated sludge

ZINC OXIDE

Acute aquatic toxicity

$LE(C)_{50}$ 0.1 < L(E)C50 ≤ 1

M factor (Acute) 1

Acute toxicity - fish LC_{50}, 96 hours: 1.1 mg/l, Oncorhynchus mykiss (Rainbow trout)

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Acute toxicity - aquatic invertebrates	EC_{50}, 48 hours: 0.098 mg/l, Daphnia magna

Chronic aquatic toxicity

M factor (Chronic)	1

HEXANE-norm

Acute aquatic toxicity

Acute toxicity - fish	LC_{50}, EC_{50}, IC_{50}, : 10 mg/l, Fish
Acute toxicity - aquatic invertebrates	LC_{50}, EC_{50}, IC_{50}, : 10 mg/l, Daphnia magna
Acute toxicity - aquatic plants	LC_{50}, EC_{50}, IC_{50}, : 10 mg/l, Algae

EPOXY RESIN (Number average MW <= 700)

Acute aquatic toxicity

Acute toxicity - fish	LC_{50}, 96 hours: 2 mg/l, Oncorhynchus mykiss (Rainbow trout)
Acute toxicity - aquatic invertebrates	EC_{50}, 48 hours: 1.8 mg/l,

Chronic aquatic toxicity

Chronic toxicity - aquatic invertebrates	NOEC, 21 days: 0.3 mg/l, Daphnia magna

12.2. Persistence and degradability

Ecological information on ingredients.

ACETONE

Persistence and degradability	The product is expected to be biodegradable.

12.3. Bioaccumulative potential

Partition coefficient Not available.

Ecological information on ingredients.

TOLUENE

Bioaccumulative potential	The product does not contain any substances expected to be bioaccumulating.
Partition coefficient	Not available.

ACETONE

Bioaccumulative potential	The product does not contain any substances expected to be bioaccumulating. BCF: 3,
Partition coefficient	Pow: < -0.24

EPOXY RESIN (Number average MW <= 700)

Bioaccumulative potential	BCF: 100,

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Partition coefficient log Pow: 3.242

12.4. Mobility in soil

Mobility The product contains volatile organic compounds (VOCs) which will evaporate easily from all surfaces.

Ecological information on ingredients.

TOLUENE

Mobility The product contains volatile organic compounds (VOCs) which will evaporate easily from all surfaces.

ACETONE

Mobility The product is miscible with water and may spread in water systems.

Adsorption/desorption coefficient Water - log Koc: 1.5 @ 20°C

Henry's law constant 2929-3070 Pa m3/mol @ 25°C

12.5. Results of PBT and vPvB assessment

Results of PBT and vPvB assessment This product does not contain any substances classified as PBT or vPvB.

Ecological information on ingredients.

TOLUENE

Results of PBT and vPvB assessment This product does not contain any substances classified as PBT or vPvB.

ACETONE

Results of PBT and vPvB assessment This product does not contain any substances classified as PBT or vPvB.

12.6. Other adverse effects

Other adverse effects None known.

Ecological information on ingredients.

TOLUENE

Other adverse effects Not known.

ACETONE

Other adverse effects Not applicable.

SECTION 13: Disposal considerations

13.1. Waste treatment methods

General information Waste should be treated as controlled waste. Dispose of waste to licensed waste disposal site in accordance with the requirements of the local Waste Disposal Authority.

Disposal methods Dispose of waste to licensed waste disposal site in accordance with the requirements of the local Waste Disposal Authority.

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SECTION 14: Transport information

14.1. UN number

UN No. (ADR/RID) 1133

UN No. (IMDG) 1133

UN No. (ICAO) 1133

14.2. UN proper shipping name

Proper shipping name (ADR/RID) ADHESIVES

Proper shipping name (IMDG) ADHESIVES

Proper shipping name (ICAO) ADHESIVES

Proper shipping name (ADN) ADHESIVES

14.3. Transport hazard class(es)

ADR/RID class 3

ADR/RID label 3

IMDG class 3

ICAO class/division 3

Transport labels



14.4. Packing group

ADR/RID packing group II

IMDG packing group II

ICAO packing group II

14.5. Environmental hazards

Environmentally hazardous substance/marine pollutant

No.

14.6. Special precautions for user

EmS F-E, S-D

Hazard Identification Number (ADR/RID) 33

Tunnel restriction code (D/E)

14.7. Transport in bulk according to Annex II of MARPOL and the IBC Code

SECTION 15: Regulatory information

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture

National regulations Control of Substances Hazardous to Health Regulations 2002 (as amended).

TS100 380CC

EU legislation	Regulation (EC) No 1907/2006 of the European Parliament and of the Council of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH) (as amended).
Authorisations (Annex XIV Regulation 1907/2006)	This product is/contains a substance that is included in REGULATION (EC) No 1907/2006 (REACH) ANNEX XVII - RESTRICTIONS ON THE MANUFACTURE, PLACING ON THE MARKET AND USE OF CERTAIN DANGEROUS SUBSTANCES, MIXTURES AND ARTICLES.
Restrictions (Annex XVII Regulation 1907/2006)	Entry number: 48

15.2. Chemical safety assessment

No chemical safety assessment has been carried out.

SECTION 16: Other information

Issued by	Compliance
Revision date	03/11/2021
Revision	21
Supersedes date	04/06/2021
Hazard statements in full	H225 Highly flammable liquid and vapour. H304 May be fatal if swallowed and enters airways. H315 Causes skin irritation. H317 May cause an allergic skin reaction. H319 Causes serious eye irritation. H336 May cause drowsiness or dizziness. H351 Suspected of causing cancer. H361d Suspected of damaging the unborn child. H361f Suspected of damaging fertility. H373 May cause damage to organs through prolonged or repeated exposure. H400 Very toxic to aquatic life. H410 Very toxic to aquatic life with long lasting effects. H411 Toxic to aquatic life with long lasting effects. H412 Harmful to aquatic life with long lasting effects.
Store Between	Store Between 5°C-25°C
Contains isocyanate	NO

This information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process. Such information is, to the best of the company's knowledge and belief, accurate and reliable as of the date indicated. However, no warranty, guarantee or representation is made to its accuracy, reliability or completeness. It is the user's responsibility to satisfy himself as to the suitability of such information for his own particular use.

SAFETY DATA SHEET

This safety data sheet was created pursuant to the requirements of: Regulation (EC) No. 1907/2006 and Regulation (EC) No. 1272/2008

LINDAB HIGH VELOCITY BRUSHABLE ACRYLIC DUCT SEALANT
Supercedes Date: 29-Sep-2020

Revision Date: 08-Oct-2020

Revision Number 1.02

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1. Product Identifier

Product Name LINDAB HIGH VELOCITY BRUSHABLE ACRYLIC DUCT SEALANT
Pure substance/mixture Mixture

1.2. Relevant identified uses of the substance or mixture and uses advised against

Recommended use Sealant.
Uses advised against Not to be used in production of toys or childcare articles

1.3. Details of the supplier of the safety data sheet

Company Name
Bostik Limited
Common Rd
ST16 3EH
Stafford UK
Tel: +44 (1785) 27 26 25
Fax: +44 (1785) 25 72 36

E-mail address SDS.box-EU@bostik.com

1.4. Emergency telephone number

United Kingdom +44 (1785) 272650
Ireland +353 (1) 8624900 (Monday- Friday 9am-5pm)

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

Regulation (EC) No 1272/2008

Not classified

2.2. Label Elements

Not classified

Signal word
None

Hazard statements
Not classified

EU Specific Hazard Statements
EUH208 - Contains reaction mass of 5-chloro-2-methyl-2H-isothiazol-3-one and 2-methyl-2H-isothiazol-3-one (3:1) [C(M)IT/MIT] & 1,2-benzisothiazol-3(2H)-one [BIT]. May produce an allergic reaction.
EUH210 - Safety data sheet available on request.

Precautionary statements
P101 - If medical advice is needed, have product container or label at hand.
P102 - Keep out of reach of children.
P280 - Wear protective gloves and eye/face protection.

2.3. Other Hazards

No information available

PBT & vPvB
This mixture contains no substance considered to be persistent, bioaccumulating or toxic (PBT) This mixture contains no substance considered to be very persistent nor very bioaccumulating (vPvB)

SECTION 3: Composition/information on ingredients

3.1 Substances

Not applicable

Mixtures

Chemical name	EC No	CAS No	Weight-%	Classification according to Regulation (EC) No. 1272/2008 [CLP]	Specific concentration limit (SCL)	REACH Registration Number
Titanium dioxide	236-675-5	13463-67-7	0.1 - <1	Carc. 2 (H351i)		01-2119489379-17-XXXX
1,2-benzisothiazol-3(2H)-one [BIT]	220-120-9	2634-33-5	0.0015 - <0.01	Acute Tox. 4 (H302) Skin Irrit. 2 (H315) Eye Dam. 1 (H318) Skin Sens. 1 (H317) Aquatic Acute 1 (H400) Acute Tox. 2 (H330) Aquatic Chronic 2 (H411) (M Factor Acute =1)	Skin Sens. 1 :: C>=0.05%	01-2120761540-60-XXXX
reaction mass of 5-chloro-2-methyl-2H-isothiazol-3-one and 2-methyl-2H-isothiazol-3-one (3:1) [C(M)IT/MIT]	611-341-5	55965-84-9	<0.0015	Acute Tox. 3 (H301) Acute Tox. 2 (H310) Acute Tox. 2 (H330) Skin Corr. 1C (H314) Eye Dam. 1 (H318) Skin Sens. 1A (H317) Aquatic Acute 1 (H400) Aquatic Chronic 1 (H410) M Factor Acute = 100 M Factor Chronic = 100	Eye Dam. 1 :: C>=0.6% Irrit. 2 :: 0.06%<=C<0.6% Skin Corr. 1C :: C>=0.6% Skin Irrit. 2 :: 0.06%<=C<0.6% Skin Sens. 1 :: C>=0.0015%	01-2120764691-48-XXXX

Full text of H- and EUH-phrases: see section 16

Note: ^ indicates not classified, however, the substance is listed in section 3 as it has an OEL

This product does not contain candidate substances of very high concern at a concentration >=0.1% (Regulation (EC) No. 1907/2006 (REACH), Article 59)

SECTION 4: First aid measures

4.1. Description of first aid measures

General advice If medical advice is needed, have product container or label at hand. Show this safety data sheet to the doctor in attendance.

Inhalation Remove to fresh air. IF exposed or concerned: Get medical advice/attention.

Eye contact Rinse thoroughly with plenty of water for at least 15 minutes, lifting lower and upper eyelids. Consult a doctor.

Skin contact Wash skin with soap and water. In the case of skin irritation or allergic reactions see a doctor.

Ingestion Clean mouth with water. Do NOT induce vomiting. Drink 1 or 2 glasses of water. Never give anything by mouth to an unconscious person.

4.2. Most important symptoms and effects, both acute and delayed

Symptoms No information available.

4.3. Indication of any immediate medical attention and special treatment needed

Note to doctors Treat symptomatically.

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

Unsuitable extinguishing media Full water jet. Do not scatter spilled material with high pressure water streams.

5.2. Special hazards arising from the substance or mixture

Specific hazards arising from the chemical Thermal decomposition can lead to release of toxic and corrosive gases/vapours.

Hazardous combustion products Carbon dioxide (CO2).

5.3. Advice for firefighters

Special protective equipment for fire-fighters Firefighters should wear self-contained breathing apparatus and full firefighting turnout gear. Use personal protection equipment.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Personal precautions Ensure adequate ventilation. Avoid contact with skin, eyes or clothing.

Other information Ventilate the area. Prevent further leakage or spillage if safe to do so.

For emergency responders Use personal protection recommended in Section 8.

6.2. Environmental precautions

Environmental precautions Do not flush into surface water or sanitary sewer system. Do not allow to enter into soil/subsoil. See Section 12 for additional Ecological Information.

6.3. Methods and material for containment and cleaning up

Methods for containment Use a non-combustible material like vermiculite, sand or earth to soak up the product and place into a container for later disposal.

Methods for cleaning up Take up mechanically, placing in appropriate containers for disposal.

6.4. Reference to other sections

Reference to other sections See section 8 for more information. See section 13 for more information.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Advice on safe handling Ensure adequate ventilation. Use personal protective equipment as required. Avoid contact with skin, eyes or clothing.

General hygiene considerations Handle in accordance with good industrial hygiene and safety practice. Do not eat, drink or smoke when using this product. Wash thoroughly after handling. Take off all contaminated clothing and wash it before reuse.

7.2. Conditions for safe storage, including any incompatibilities

Storage Conditions Keep container tightly closed in a dry and well-ventilated place. Keep away from food, drink and animal feedingstuffs.

7.3. Specific end use(s)

Specific Use(s)
Sealant.

Risk Management Methods (RMM) The information required is contained in this Safety Data Sheet.

Other information Observe technical data sheet.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Exposure Limits

Chemical name	European Union	Ireland	United Kingdom
Diisononyl phthalate 28553-12-0	-	TWA: 5 mg/m³ STEL: 15 mg/m³	TWA: 5 mg/m³ STEL: 15 mg/m³

Derived No Effect Level (DNEL) No information available

Derived No Effect Level (DNEL)

Titanium dioxide (13463-67-7)			
Type	Exposure route	Derived No Effect Level (DNEL)	Safety factor
worker Long term Local health effects	Inhalation	10 mg/m³	

1,2-benzisothiazol-3(2H)-one [BIT] (2634-33-5)			
Type	Exposure route	Derived No Effect Level (DNEL)	Safety factor
worker Long term Systemic health effects	Inhalation	6.81 mg/m³	
worker Long term Systemic health effects	Dermal	0.966 mg/kg bw/d	

Derived No Effect Level (DNEL)			
Titanium dioxide (13463-67-7)			
Type	Exposure route	Derived No Effect Level (DNEL)	Safety factor
Consumer Long term Systemic health effects	Oral	700 mg/kg bw/d	

1,2-benzisothiazol-3(2H)-one [BIT] (2634-33-5)			
Type	Exposure route	Derived No Effect Level (DNEL)	Safety factor
Consumer Long term Systemic health effects	Inhalation	1.2 mg/m³	
Consumer Long term Systemic health effects	Dermal	0.345 mg/kg bw/d	

Predicted No Effect Concentration (PNEC) No information available.

Predicted No Effect Concentration (PNEC)	
Titanium dioxide (13463-67-7)	
Environmental compartment	Predicted No Effect Concentration (PNEC)
Marine water	0.0184 mg/l
Freshwater sediment	1000 mg/kg
Freshwater	0.184 mg/l
Marine sediment	100 mg/kg
Soil	100 mg/kg
Microorganisms in sewage treatment	100 mg/l
Freshwater - intermittent	0.193 mg/l

1,2-benzisothiazol-3(2H)-one [BIT] (2634-33-5)	
Environmental compartment	Predicted No Effect Concentration (PNEC)
Freshwater	4.03 µg/l
Marine water	0.403 µg/l
Sewage treatment plant	1.03 mg/l
Freshwater sediment	49.9 µg/l
Marine sediment	4.99 µg/l
Soil	3 mg/kg dry weight

8.2. Exposure controls

Engineering controls Ensure adequate ventilation, especially in confined areas.

Personal Protective Equipment

Eye/face protection Tight sealing safety goggles.
Hand protection Wear protective gloves. Gloves must conform to standard EN 374. Ensure that the breakthrough time of the glove material is not exceeded. Refer to glove supplier for information on breakthrough time for specific gloves. The breakthrough time of the gloves depends on the material and the thickness as well as the temperature.
Skin and body protection Suitable protective clothing.

Environmental exposure controls No information available.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state Paste / Gel Liquid
Appearance Paste
Colour Multiple Colours
Odour Characteristic
Odour threshold No information available

Property	Values	Remarks • Method
pH	No data available	
Melting point / freezing point	No data available	
Boiling point / boiling range	100 °C	
Flash point	No data available	
Evaporation rate	No data available	
Flammability (solid, gas)	Not applicable for liquids .	
Flammability Limit in Air		
Upper flammability or explosive limits	No data available	
Lower flammability or explosive limits	No data available	
Vapour pressure	No data available	
Vapour density	No data available	
Relative density	No data available	
Water solubility	Immiscible in water	
Solubility(ies)	No data available	
Partition coefficient	No data available	
Autoignition temperature	No data available	
Decomposition temperature	No data available	
Kinematic viscosity	No data available	
Dynamic viscosity	No data available	
Explosive properties	No data available	
Oxidising properties	No data available	

9.2. Other information

Solid content (%) No information available
VOC Content (%) 6.3 g/L / 0.26 %
Density 1.64 g/cm³

SECTION 10: Stability and reactivity

10.1. Reactivity

Reactivity No information available.

10.2. Chemical stability

Stability Stable under normal conditions.

Explosion data
Sensitivity to mechanical impact None.
Sensitivity to static discharge None.

10.3. Possibility of hazardous reactions

Possibility of hazardous reactions None under normal processing.

10.4. Conditions to avoid

Conditions to avoid None known based on information supplied.

10.5. Incompatible materials

Incompatible materials None known based on information supplied.

10.6. Hazardous decomposition products

Hazardous decomposition products None under normal use conditions. Stable under recommended storage conditions.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Information on likely routes of exposure

Product Information .

Inhalation Based on available data, the classification criteria are not met.

Eye contact Based on available data, the classification criteria are not met.

Skin contact Based on available data, the classification criteria are not met.

Ingestion Based on available data, the classification criteria are not met.

Symptoms related to the physical, chemical and toxicological characteristics

Symptoms No information available.

Numerical measures of toxicity

Acute toxicity

Component Information

Chemical name	Oral LD50	Dermal LD50	Inhalation LC50
Titanium dioxide 13463-67-7	>10000 mg/kg (Rattus)	LD50 > 10000 mg/Kg	>5 mg/l
1,2-benzisothiazol-3(2H)-one [BIT] 2634-33-5	=670 mg/kg (Rattus)	LD50 > 2000 mg/kg (Rattus)	

reaction mass of 5-chloro-2-methyl-2H-isothiazol-3-one and 2-methyl-2H-isothiazol-3-one (3:1) [C(M)IT/MIT] 55965-84-9	=53 mg/kg (Rattus)	LD50 = 87.12 mg/kg (Oryctolagus cuniculus)	

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Skin corrosion/irritation Based on available data, the classification criteria are not met.

Serious eye damage/eye irritation Based on available data, the classification criteria are not met.

Respiratory or skin sensitisation Based on available data, the classification criteria are not met.

Germ cell mutagenicity Based on available data, the classification criteria are not met.

Carcinogenicity Based on available data, the classification criteria are not met.

Chemical name	European Union
Titanium dioxide 13463-67-7	Carc. 2

The table below indicates whether each agency has listed any ingredient as a carcinogen.

Reproductive toxicity Based on available data, the classification criteria are not met.

STOT - single exposure Based on available data, the classification criteria are not met.

STOT - repeated exposure Based on available data, the classification criteria are not met.

Aspiration hazard Based on available data, the classification criteria are not met.

SECTION 12: Ecological information

12.1. Toxicity

Ecotoxicity .

Chemical name	Algae/aquatic plants	Fish	Toxicity to microorganisms	Crustacea	M-Factor	M-Factor (long-term)
Titanium dioxide 13463-67-7	LC50 (96h) >10000 mg/l (Cyprinodon variegatus) OECD 203	-	-	-		
1,2-benzisothiazol-3(2H)-one [BIT] 2634-33-5	EC50 3Hr 13mg/l (activated sludge) (OECD 209)	LC50 (96hr) 2.15 mg/l Cyprinodon variegatus EPA 540/9-85-006	-	EC50(48hr) 2.94 mg/l (Daphnia Magna) OECD 202	1	1
reaction mass of	EC50 (72h)	EC50 (96h) =	-	EC50 (48h) =0.1	100	100

5-chloro-2-methyl-2H-isothiazol-3-one and 2-methyl-2H-isothiazol-3-one (3:1) [C(M)IT/MIT] 55965-84-9	=0.048 mg/L (Pseudokirchneriella subcapitata) (OECD 201)	0.22 mg/L (Oncorhynchus mykiss) (OECD 211)		mg/L (Daphnia magna) (OECD 202)		

12.2. Persistence and degradability

Persistence and degradability No information available.

12.3. Bioaccumulative potential

Bioaccumulation There is no data for this product.

Component Information

Chemical name	Partition coefficient	Bioconcentration factor (BCF)
1,2-benzisothiazol-3(2H)-one [BIT] 2634-33-5	0.7	6.95
reaction mass of 5-chloro-2-methyl-2H-isothiazol-3-one and 2-methyl-2H-isothiazol-3-one (3:1) [C(M)IT/MIT] 55965-84-9	-	3.16

12.4. Mobility in soil

Mobility in soil No information available.

12.5. Results of PBT and vPvB assessment

PBT and vPvB assessment The components in this formulation do not meet the criteria for classification as PBT or vPvB. .

Chemical name	PBT and vPvB assessment
Titanium dioxide 13463-67-7	The substance is not PBT / vPvB PBT assessment does not apply
1,2-benzisothiazol-3(2H)-one [BIT] 2634-33-5	The substance is not PBT / vPvB
reaction mass of 5-chloro-2-methyl-2H-isothiazol-3-one and 2-methyl-2H-isothiazol-3-one (3:1) [C(M)IT/MIT] 55965-84-9	The substance is not PBT / vPvB

12.6. Other adverse effects

Other adverse effects No information available.

.

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Waste from residues/unused products Dispose of contents/container in accordance with local, regional, national, and international regulations as applicable.

Contaminated packaging Do not reuse empty containers. Handle contaminated packages in the same way as the

product itself.

Other information Waste codes should be assigned by the user based on the application for which the product was used.

SECTION 14: Transport information

Note: Keep from freezing.

Land transport (ADR/RID)

14.1 UN number Not regulated
14.2 Proper Shipping Name Not regulated
14.3 Transport hazard class(es) Not regulated
14.4 Packing group Not regulated
14.5 Environmental hazards Not applicable
14.6 Special Provisions None

IMDG

14.1 UN number Not regulated
14.2 Proper Shipping Name Not regulated
14.3 Transport hazard class(es) Not regulated
14.4 Packing group Not regulated
14.5 Marine pollutant Np
14.6 Special Provisions None
14.7 Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code Not applicable

Air transport (ICAO-TI / IATA-DGR)

14.1 UN number Not regulated
14.2 Proper Shipping Name Not regulated
14.3 Transport hazard class(es) Not regulated
14.4 Packing group Not regulated
14.5 Environmental hazards Not applicable
14.6 Special Provisions None

Section 15: REGULATORY INFORMATION

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture

European Union

Registration, Evaluation, Authorization, and Restriction of Chemicals (REACh) Regulation (EC 1907/2006)

SVHC: Substances of Very High Concern for Authorisation:
This product does not contain candidate substances of very high concern at a concentration >=0.1% (Regulation (EC) No. 1907/2006 (REACH), Article 59)

Chemical name	CAS No
Dolomite (CaMg(CO3)2)	16389-88-1
Water	7732-18-5
Styrene acrylic co-polymer emulsion	UNKNOWN
Diisononyl phthalate	28553-12-0
Isotridecanol, ethoxylated	UNKNOWN
Titanium dioxide	13463-67-7
Ferric oxide black	1317-61-9
Polycarboxylate in aqueous solution	UNKNOWN
1,2-Propylene glycol	57-55-6
Sodium phosphate dibasic	7558-79-4
Thixol liquid acrylic thickener	UNKNOWN

Acrylic Latex thickener	UNKNOWN
Sodium hydroxide	1310-73-2
Iron oxide yellow	51274-00-1
1,2-benzisothiazol-3(2H)-one [BIT]	2634-33-5
2-Propenoic acid, sodium salt	7446-81-3
reaction mass of 5-chloro-2-methyl-2H-isothiazol-3-one and 2-methyl-2H-isothiazol-3-one (3:1) [C(M)IT/MIT]	55965-84-9
Sodium nitrate	7631-99-4

EU-REACH (1907/2006) - Annex XVII - Substances subject to Restriction
This product contains one or more substance(s) subject to restriction (Regulation (EC) No. 1907/2006 (REACH), Annex XVII).

Chemical name	CAS No	Restricted substance per REACH Annex XVII
Dolomite (CaMg(CO3)2)	16389-88-1	
Water	7732-18-5	
Styrene acrylic co-polymer emulsion	UNKNOWN	
Diisononyl phthalate	28553-12-0	52[a].
Isotridecanol, ethoxylated	UNKNOWN	
Titanium dioxide	13463-67-7	
Ferric oxide black	1317-61-9	
Polycarboxylate in aqueous solution	UNKNOWN	
1,2-Propylene glycol	57-55-6	
Sodium phosphate dibasic	7558-79-4	
Thixol liquid acrylic thickener	UNKNOWN	
Acrylic Latex thickener	UNKNOWN	
Sodium hydroxide	1310-73-2	
Iron oxide yellow	51274-00-1	
1,2-benzisothiazol-3(2H)-one [BIT]	2634-33-5	
2-Propenoic acid, sodium salt	7446-81-3	
reaction mass of 5-chloro-2-methyl-2H-isothiazol-3-one and 2-methyl-2H-isothiazol-3-one (3:1) [C(M)IT/MIT]	55965-84-9	
Sodium nitrate	7631-99-4	

52 . Not to be used in toys or childcare articles above 0.1% which can be placed in the mouth by children.

Substance subject to authorisation per REACH Annex XIV
This product does not contain substances subject to authorisation (Regulation (EC) No. 1907/2006 (REACH), Annex XIV)

Biocidal Products Regulation (EU) No 528/2012 (BPR)
Contains a biocide : Contains C(M)IT/MIT (3:1). May produce an allergic reaction

Ozone-depleting substances (ODS) regulation (EC) 1005/2009
Not applicable

Persistent Organic Pollutants
Not applicable

National regulations

15.2. Chemical safety assessment

Chemical Safety Assessments have been carried out by the Reach registrants for substances registered at >10 tpa. No Chemical Safety Assessment has been carried out for this mixture

SECTION 16: Other information

Key or legend to abbreviations and acronyms used in the safety data sheet

Full text of H-Statements referred to under section 3
H301 - Toxic if swallowed
H302 - Harmful if swallowed
H310 - Fatal in contact with skin
H314 - Causes severe skin burns and eye damage
H315 - Causes skin irritation
H317 - May cause an allergic skin reaction
H318 - Causes serious eye damage
H330 - Fatal if inhaled
H400 - Very toxic to aquatic life
H410 - Very toxic to aquatic life with long lasting effects
H411 - Toxic to aquatic life with long lasting effects

Legend

TWA	TWA (time-weighted average)
STEL	STEL (Short Term Exposure Limit)
Ceiling	Ceiling Limit Value
*	Skin designation
SVHC	Substance(s) of Very High Concern
PBT	Persistent, Bioaccumulative, and Toxic (PBT) Chemicals
vPvB	Very Persistent and very Bioaccumulative (vPvB) Chemicals
STOT RE	Specific target organ toxicity - Repeated exposure
STOT SE	Specific target organ toxicity - Single exposure
EWC	European Waste Catalogue

Key literature references and sources for data
No information available

Prepared By Product Safety & Regulatory Affairs

Revision Date: 08-Oct-2020

Indication of changes

Revision note Not applicable.

Training Advice No information available

Further information No information available

This material safety data sheet complies with the requirements of Regulation (EC) No. 1907/2006

Disclaimer
The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

End of Safety Data Sheet

SAFETY DATA SHEET

This safety data sheet was created pursuant to the requirements of: Regulation (EC) No. 1907/2006 and Regulation (EC) No. 1272/2008

LINDAB TECSEAL 200 FRA
Supercedes Date: 07-08-2025

Revision Date: 07-08-2025
Revision Number 1.03

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1. Product Identifier

Product Name LINDAB TECSEAL 200 FRA
Pure substance/mixture Mixture

1.2.1. Relevant identified uses

Main use category : Professional use
Use of the substance/mixture : Adhesives, sealants

1.2.2. Uses advised against No additional information available

1.3. Details of the supplier of the safety data sheet

BritChem Ltd
Unit 6 Beehive Business Park
Smithies Lane
Heckmondwike – West Yorkshire, WF16 0NF United Kingdom
T +44 (0) 1924 412000 -
F +44 (0) 1924 235444
info@britchem.co.uk

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

Classification according to Regulation (EC) No. 1272/2008 [CLP]

Hazardous to the aquatic environment — Chronic Hazard, Category 3
Full text of H- and EUH-statements: see section 16

Adverse physicochemical, human health and environmental effects

Harmful to aquatic life with long lasting effects.

2.2. Label Elements

Labelling according to Regulation (EC) No. 1272/2008 [CLP]

Signal word (CLP) : -
Hazard statements (CLP) : H412 - Harmful to aquatic life with long lasting effects.
EUH-statements : EUH208 - Contains 1,2-benzisothiazol-3(2H)-one; 1,2-benzisothiazolin-3-one(2634-33-5). May produce an allergic reaction.

2.3. Other Hazards

Contains no PBT/vPvB substances ≥ 0.1% assessed in accordance with REACH Annex XIII

The mixture does not contain substance(s) included in the list established in accordance with Article 59(1) of REACH for having endocrine disrupting properties, or is not identified as having endocrine disrupting properties in accordance with the criteria set out in Commission Delegated Regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605

3.1 Substances

Not applicable

Mixtures

Name	Product identifier	%	Classification according to Regulation (EC) No. 1272/2008 [CLP]
oxydipropyl dibenzoate	CAS-No.: 27138-31-4 EC-No.: 248-258-5	< 5	Aquatic Chronic 2, H411
1,2-benzisothiazol-3(2H)-one; 1,2-benzisothiazolin-3-one	CAS-No.: 2634-33-5 EC-No.: 220-120-9 EC Index-No.: 613-088-00-6	< 1	Acute Tox. 4 (Oral), H302 Skin Irrit. 2, H315 Eye Dam. 1, H318 Skin Sens. 1, H317 Aquatic Acute 1, H400
Zinc pyrithione	CAS-No.: 13463-41-7 EC-No.: 236-671-3	< 1	Acute Tox. 3 (Oral), H301 Acute Tox. 2 (Inhalation), H330 Eye Dam. 1, H318 Repr. 1B, H360D STOT RE 1, H372 Aquatic Acute 1, H400 (M=100) Aquatic Chronic 1, H410 (M=100)

Specific concentration limits:		
Name	**Product identifier**	**Specific concentration limits**
1,2-benzisothiazol-3(2H)-one; 1,2-benzisothiazolin-3-one	CAS-No.: 2634-33-5 EC-No.: 220-120-9 EC Index-No.: 613-088-00-6	(0.05 ≤C ≤ 100) Skin Sens. 1, H317

Full text of H- and EUH-statements: see section 16

Note: ^ indicates not classified, however, the substance is listed in section 3 as it has an OEL

This product does not contain candidate substances of very high concern at a concentration >=0.1% (Regulation (EC) No. 1907/2006 (REACH), Article 59)

SECTION 4: First aid measures

4.1. Description of first aid measures

First-aid measures after inhalation : Remove person to fresh air and keep comfortable for breathing.
First-aid measures after skin contact : Wash skin with plenty of water.
First-aid measures after eye contact : Rinse eyes with water as a precaution.
First-aid measures after ingestion : Call a poison center or a doctor if you feel unwell.

4.2. Most important symptoms and effects, both acute and delayed

Symptoms No information available.

4.3. Indication of any immediate medical attention and special treatment needed

Note to doctors Treat symptomatically.

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media Water spray. Dry powder. Foam. Carbon dioxide.

Unsuitable extinguishing media Hazardous decomposition products in case of fire : Toxic fumes may be released.

5.2. Special hazards arising from the substance or mixture

Specific hazards arising from the chemical Thermal decomposition can lead to release of toxic and corrosive gases/vapours.

Hazardous combustion products Carbon dioxide (CO2).

5.3. Advice for firefighters

Special protective equipment for fire-fighters Firefighters should wear self-contained breathing apparatus and full firefighting turnout gear. Use personal protection equipment.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Personal precautions Ensure adequate ventilation. Avoid contact with skin, eyes or clothing.

Other information Ventilate the area. Prevent further leakage or spillage if safe to do so.

For emergency responders : Do not attempt to take action without suitable protective equipment. For further information refer to section 8: "Exposure controls/personal protection".

6.2. Environmental precautions

Environmental precautions Avoid release to the environment.

6.3. Methods and material for containment and cleaning up

Methods for containment Take up liquid spill into absorbent material.

Methods for cleaning up Take up mechanically, placing in appropriate containers for disposal.

6.4. Reference to other sections For further information refer to section 13.

Reference to other sections

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Precautions for safe handling Ensure good ventilation of the work station. Wear personal protective equipment.

Hygiene measures Do not eat, drink or smoke when using this product. Always wash hands after handling the product.

7.2. Conditions for safe storage, including any incompatibilities

Storage Conditions Store in a well-ventilated place. Keep cool.

7.3. Specific end use(s)

No additional information available

Risk Management Methods (RMM) The information required is contained in this Safety Data

SECTION 8: Exposure controls/personal protection

8.1.1 National occupational exposure and biological limit values No additional information available

8.1.2. Recommended monitoring procedures

No additional information available

8.1.3. Air contaminants formed

No additional information available

8.1.4. DNEL and PNEC

No additional information available

8.2. Exposure controls

8.2.1. Appropriate engineering controls

Appropriate engineering controls: Ensure good ventilation of the work station.

8.2.2. Personal protection equipment

Personal protective equipment symbol(s):



8.2.2.1. Eye and face protection

Eye protection:
Safety glasses

8.2.2.2. Skin protection

Skin and body protection: Wear suitable protective clothing

Hand protection:
Protective gloves

8.2.2.3. Respiratory protection

Respiratory protection:
In case of insufficient ventilation, wear suitable respiratory equipment

8.2.2.4. Thermal hazards

No additional information available

8.2.3. Environmental exposure controls

Environmental exposure controls:
Avoid release to the environment.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state Colour	:	Liquid
Appearance	:	Not available
Odour	:	Paste.
Odour threshold	:	Not available
Melting point	:	Not available
Freezing point	:	Not applicable
Boiling point	:	Not available
Flammability	:	Not available
Explosive limits	:	Non flammable.
Lower explosion limit	:	Not available
Upper explosion limit	:	Not available
Flash point	:	Not available
Auto-ignition temperature	:	Not available
Decomposition temperature pH	:	Not available
Viscosity, kinematic	:	Not available
Solubility	:	Not available

Partition coefficient n-octanol/water (Log Kow)	
Vapour pressure	: Not available
Vapour pressure at 50 °C	: Not available
Density	: Not available
Relative density	: Not available
Relative vapour density at 20 °C	: Not available
Particle characteristics	: Not available
	: Not applicable

9.2.1. Information with regard to physical hazard classes

No additional information available

9.2.2. Other safety characteristics

No additional information available

SECTION 10: Stability and reactivity

10.1. Reactivity

The product is non-reactive under normal conditions of use, storage and transport.

10.2. Chemical stability

Stable under normal conditions.

10.3. Possibility of hazardous reactions

No dangerous reactions known under normal conditions of use.

10.4. Conditions to avoid

None under recommended storage and handling conditions (see section 7).

10.5. Incompatible materials

No additional information available

10.6. Hazardous decomposition products

Under normal conditions of storage and use, hazardous decomposition products should not be produced.

SECTION 11: Toxicological information

11.1. IInformation on hazard classes as defined in Regulation (EC) No 1272/2008

Acute toxicity (oral)	: Not classified
Acute toxicity (dermal)	: Not classified
Acute toxicity (inhalation)	: Not classified

Zinc pyrithione (13463-41-7)

LD50 dermal rat	
ATE CLP (oral)	100 mg/kg bodyweight
ATE CLP (gases)	100 ppmv/4h
ATE CLP (vapours)	0.5 mg/l/4h
ATE CLP (dust,mist)	0.05 mg/l/4h

1,2-benzisothiazol-3(2H)-one; 1,2-benzisothiazolin-3-one (2634-33-5)

ATE CLP (oral)	500 mg/kg bodyweight

oxydipropyl dibenzoate (27138-31-4)

LD50 dermal rat	> 2000 mg/kg bodyweight Animal: rat, Guideline: EPA OTS 798.1100 (Acute Dermal Toxicity), Guideline: EU Method B.3 (Acute Toxicity (Dermal)), Guideline: OECD Guideline 402 (Acute Dermal Toxicity), Guideline: other:
LC50 Inhalation - Rat	> 200 mg/l air Animal: rat, Remarks on results: other:

Skin corrosion/irritation	: Not classified
Serious eye damage/irritation	: Not classified
Respiratory or skin sensitisation	: Not classified
Germ cell mutagenicity	: Not classified
Carcinogenicity	: Not classified
Reproductive toxicity	: Not classified

Zinc pyrithione (13463-41-7)

LOAEL (animal/male, F1)	2.8 mg/kg bodyweight Animal: rat, Animal sex: male, Guideline: EPA OPPTS 870.3800 (Reproduction and Fertility Effects)
LOAEL (animal/female, F1)	1.4 mg/kg bodyweight Animal: rat, Animal sex: female, Guideline: EPA OPPTS 870.3800 (Reproduction and Fertility Effects)
NOAEL (animal/male, F1)	1.4 mg/kg bodyweight Animal: rat, Animal sex: male, Guideline: EPA OPPTS 870.3800 (Reproduction and Fertility Effects)
NOAEL (animal/female, F1)	0.7 mg/kg bodyweight Animal: rat, Animal sex: female, Guideline: EPA OPPTS 870.3800 (Reproduction and Fertility Effects)
STOT-single exposure	: Not classified
STOT-repeated exposure	: Not classified.

Zinc pyrithione (13463-41-7)

LOAEL (dermal, rat/rabbit, 90 days) -	1000 mg/kg bodyweight Animal: rat, Guideline: EPA OPP 82-3 (Subchronic Dermal Toxicity 90 Days)
NOAEL (oral, rat, 90 days) -	0.5 mg/kg bodyweight Animal: rat, Guideline: OECD Guideline 453 (Combined Chronic Toxicity / Carcinogenicity Studies)
NOAEL (dermal, rat/rabbit, 90 days)	100 mg/kg bodyweight Animal: rat, Guideline: EPA OPP 82-3 (Subchronic Dermal Toxicity 90 Days)
STOT-repeated exposure	Causes damage to organs through prolonged or repeated exposure.
Aspiration hazard	: Not classified

11.2. Information on other hazards

No additional information available

SECTION 12: Ecological information

12.1. Toxicity

Ecotoxicity .

Ecology - general	: Harmful to aquatic life with long lasting effects. : Not classified
Hazardous to the aquatic environment, short-term (acute)	
Hazardous to the aquatic environment, long-term (chronic)	: Harmful to aquatic life with long lasting effects.
Not rapidly degradable	

Zinc pyrithione (13463-41-7)

LC50 - Fish [1]	2.6 µg/l Test organisms (species): Pimephales promelas
LC50 - Fish [2]	0.4 mg/l Test organisms (species): Cyprinodon variegatus
EC50 - Crustacea [1]	8.2 µg/l Test organisms (species): Daphnia magna

oxydipropyl dibenzoate (27138-31-4)

LC50 - Fish [1] -	3.7 mg/l Test organisms (species): Pimephales promelas

12.2. Persistence and degradability

No additional information available

12.3. Bioaccumulative potential

No additional information available

12.4. Mobility in soil

No additional information available

12.5. Results of PBT and vPvB assessment

No additional information available

12.6. Endocrine disrupting properties

No additional information available

12.7. Other adverse effects

No additional information available

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Waste treatment methods : Dispose of contents/container in accordance with licensed collector’s sorting instructions.

SECTION 14: Transport information

In accordance with ADR / IMDG / IATA / ADN / RID

14.1. UN number or ID number

UN-No. (ADR)	: Not applicable
UN-No. (IMDG)	: Not applicable
UN-No. (IATA)	: Not applicable
UN-No. (ADN)	: Not applicable
UN-No. (RID)	: Not applicable

14.2. UN proper shipping name

Proper Shipping Name (ADR)	: Not applicable
Proper Shipping Name (IMDG)	: Not applicable
Proper Shipping Name (IATA)	: Not applicable
Proper Shipping Name (ADN)	: Not applicable
Proper Shipping Name (RID)	: Not applicable

14.3. Transport hazard class(es)

ADR
Transport hazard class(es) (ADR) : Not applicable

IMDG
Transport hazard class(es) (IMDG) : Not applicable

IATA
Transport hazard class(es) (IATA) : Not applicable

ADN
Transport hazard class(es) (ADN) : Not applicable

RID
Transport hazard class(es) (RID) : Not applicable

14.4. Packing group

Packing group (ADR)	: Not applicable
Packing group (IMDG)	: Not applicable
Packing group (IATA)	: Not applicable
Packing group (ADN)	: Not applicable
Packing group (RID)	: Not applicable

14.5. Environmental hazards

Dangerous for the environment	:No
Marine pollutant	:No
Other information	:No supplementary information available

14.6. Special precautions for user

Overland transport
Not applicable

Transport by sea
Not applicable

Air transport
Not applicable

Inland waterway transport
Not applicable

Rail
Not applicable

14.7. Maritime transport in bulk according to IMO instruments

Not applicable

Section 15: REGULATORY INFORMATION

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture

European Union

REACH Annex XVII (Restriction List)
Contains no REACH substances with Annex XVII restrictions

REACH Annex XIV (Authorisation List)
Contains no REACH Annex XIV substances

REACH Candidate List (SVHC)
Contains no substance on the REACH candidate list

PIC Regulation (Prior Informed Consent)
Contains no substance subject to Regulation (EU) No 649/2012 of the European Parliament and of the Council of 4 July 2012 concerning the export and import of hazardous chemicals.

POP Regulation (Persistent Organic Pollutants)
Contains no substance subject to Regulation (EU) No 2019/1021 of the European Parliament and of the Council of 20 June 2019 on persistent organic pollutants

Ozone Regulation (1005/2009)
Contains no substance subject to REGULATION (EU) No 1005/2009 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 16 September 2009 on substances that deplete the ozone layer.

Explosives Precursors Regulation (2019/1148)
Contains no substance subject to Regulation (EU) 2019/1148 of the European Parliament and of the Council of 20 June 2019 on the marketing and use of explosives precursors.

Drug Precursors Regulation (273/2004)
Contains no substance subject to Regulation (EC) 273/2004 of the European Parliament and of the Council of 11 February 2004 on the manufacture and the placing on market of certain substances used in the illicit manufacture of narcotic drugs and psychotropic substances.

15.1.2. National regulations
No additional information available

15.2. Chemical safety assessment

No chemical safety assessment has been carried out

SECTION 16: Other information

Abbreviations and acronyms:

ADN	European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways
ADR	European Agreement concerning the International Carriage of Dangerous Goods by Road
ATE	Acute Toxicity Estimate
BCF	Bioconcentration factor
BLV	Biological limit value
BOD	Biochemical oxygen demand (BOD)
COD	Chemical oxygen demand (COD)
DMEL	Derived Minimal Effect level
DNEL	Derived-No Effect Level
EC-No.	European Community number
EC50	Median effective concentration
EN	European Standard
IARC	International Agency for Research on Cancer
IATA	International Air Transport Association
IMDG	International Maritime Dangerous Goods
LC50	Median lethal concentration
LD50	Median lethal dose
LOAEL	Lowest Observed Adverse Effect Level
NOAEC	No-Observed Adverse Effect Concentration
NOAEL	No-Observed Adverse Effect Level
NOEC	No-Observed Effect Concentration
OECD	Organisation for Economic Co-operation and Development
OEL	Occupational Exposure Limit
PBT	Persistent Bioaccumulative Toxic
PNEC	Predicted No-Effect Concentration

Abbreviations and acronyms:

RID	Regulations concerning the International Carriage of Dangerous Goods by Rail
SDS	Safety Data Sheet
STP	Sewage treatment plant
ThOD	Theoretical oxygen demand (ThOD)
TLM	Median Tolerance Limit
VOC	Volatile Organic Compounds
CAS-No.	Chemical Abstract Service number
N.O.S.	Not Otherwise Specified
vPvB	Very Persistent and Very Bioaccumulative
ED	Endocrine disrupting properties

Full text of H- and EUH-statements:

Acute Tox. 2 (Inhalation)	Acute toxicity (inhal.), Category 2
Acute Tox. 3 (Oral)	Acute toxicity (oral), Category 3
Acute Tox. 4 (Oral)	Acute toxicity (oral), Category 4
Aquatic Acute 1	Hazardous to the aquatic environment — Acute Hazard, Category 1
Aquatic Chronic 1	Hazardous to the aquatic environment — Chronic Hazard, Category 1
Aquatic Chronic 2	Hazardous to the aquatic environment — Chronic Hazard, Category 2
Aquatic Chronic 3	Hazardous to the aquatic environment — Chronic Hazard, Category 3
EUH208	Contains 1,2-benzisothiazol-3(2H)-one; 1,2-benzisothiazolin-3-one(2634-33-5). May produce an allergic reaction.
Eye Dam. 1	Serious eye damage/eye irritation, Category 1
H301	Toxic if swallowed.
H302	Harmful if swallowed.
H315	Causes skin irritation.
H317	May cause an allergic skin reaction.
H318	Causes serious eye damage.
H330	Fatal if inhaled.
H360D	May damage the unborn child.
H372	Causes damage to organs through prolonged or repeated exposure.
H400	Very toxic to aquatic life.
H410	Very toxic to aquatic life with long lasting effects.
H411	Toxic to aquatic life with long lasting effects.
H412	Harmful to aquatic life with long lasting effects.
Repr. 1B	Reproductive toxicity, Category 1B
Skin Irrit. 2	Skin corrosion/irritation, Category 2
Skin Sens. 1	Skin sensitisation, Category 1
STOT RE 1	Specific target organ toxicity — Repeated exposure, Category 1

SAFETY DATA SHEET

This safety data sheet was created pursuant to the requirements of: Regulation (EC) No. 1907/2006 and Regulation (EC) No. 1272/2008

LINDAB TECSEAL 300 TRANSLUCENT
Supercedes Date: 19-Oct-2020

Revision date 20-Oct-2021
Revision Number 2

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier

Product Name LINDAB TECSEAL 300 TRANSLUCENT
Pure substance/mixture Mixture

1.2. Relevant identified uses of the substance or mixture and uses advised against

Recommended use Sealant.
Uses advised against None known

1.3. Details of the supplier of the safety data sheet

Company Name
Bostik Limited
Common Rd
ST16 3EH
Stafford UK
Tel: +44 (1785) 27 26 25
Fax: +44 (1785) 25 72 36

E-mail address SDS.box-EU@bostik.com

1.4. Emergency telephone number

United Kingdom +44 (1785) 272650
Ireland +353 (1) 8624900 (Monday- Friday 9am-5pm)

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

Regulation (EC) No 1272/2008

Chronic aquatic toxicity	Category 3 - (H412)

2.2. Label elements

Signal word
None

Hazard statements
H412 - Harmful to aquatic life with long lasting effects.

EU Specific Hazard Statements
EUH208 - Contains 4,5-dichloro-2-octyl-2H-isothiazol-3-one [DCOIT]. May produce an allergic reaction

Precautionary Statements - EU (§28, 1272/2008)
P101 - If medical advice is needed, have product container or label at hand
P102 - Keep out of reach of children
P273 - Avoid release to the environment
P501 - Dispose of contents/ container to an approved waste disposal plant

2.3. Other hazards

Small amounts of acetic acid (CAS 64-19-7) are formed by hydrolysis and released upon curing. Harmful to aquatic life.

PBT & vPvB
This mixture contains no substance considered to be persistent, bioaccumulating or toxic (PBT). This mixture contains no

substance considered to be very persistent nor very bioaccumulating (vPvB).

SECTION 3: Composition/information on ingredients

3.1 Substances

Not applicable

3.2 Mixtures

Chemical name	EC No	CAS No	Weight-%	Classification according to Regulation (EC) No. 1272/2008 [CLP]	Specific concentration limit (SCL)	REACH registration number
Hydrocarbons, C15-C20, n-alkanes, isoalkanes, cyclics, < 0.03% aromatics	934-956-3	RR-100252-4	40 - <80	Asp. Tox. 1 (H304)		01-2119827000-58-XXXX
Triacetoxy(propyl)silane	241-816-9	17865-07-5	1- <2.5	Skin Corr. 1B (H314) (EUH071)		01-2119966899-07-XXXX
4,5-dichloro-2-octyl-2H-isothiazol-3-one [DCOIT]	264-843-8	64359-81-5	0.01 - <0.05	Skin Corr. 1B (H314) Eye Dam. 1 (H318) Skin Sens. 1A (H317) Acute Tox. 4 (H302) Acute Tox. 2 (H330) Aquatic Acute 1 (H400) M=100 Aquatic Chronic 1 (H410) M=100 (EUH071)	Skin Irrit. 2 :: 0.025%<=C<5% Eye Irrit. 2 :: 0.025%<=C<3% Skin Sens. 1A :: C>=0.0015%	-

Full text of H- and EUH-phrases: see section 16
Note: ^ indicates not classified, however, the substance is listed in section 3 as it has an OEL

This product does not contain candidate substances of very high concern at a concentration >=0.1% (Regulation (EC) No. 1907/2006 (REACH), Article 59)

SECTION 4: First aid measures

4.1. Description of first aid measures

General advice Show this safety data sheet to the doctor in attendance. If medical advice is needed, have product container or label at hand.

Inhalation Remove to fresh air. If symptoms persist, call a doctor.

Eye contact Immediately flush with plenty of water. After initial flushing, remove any contact lenses and continue flushing for at least 15 minutes. Consult an ophthalmologist.

Skin contact	Wash skin with soap and water. In the case of skin irritation or allergic reactions see a doctor.
Ingestion	Never give anything by mouth to an unconscious person. Rinse mouth thoroughly with water. Drink 1 or 2 glasses of water. Do NOT induce vomiting.

4.2. Most important symptoms and effects, both acute and delayed

Symptoms	None known.

4.3. Indication of any immediate medical attention and special treatment needed

Note to doctors	Treat symptomatically.

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable Extinguishing Media	Water spray, carbon dioxide (CO2), dry chemical, alcohol-resistant foam.
Unsuitable extinguishing media	Full water jet.

5.2. Special hazards arising from the substance or mixture

Specific hazards arising from the chemical	Thermal decomposition can lead to release of irritating gases and vapours.
Hazardous combustion products	Carbon dioxide (CO2). Silicon dioxide. Thermal decomposition can lead to release of irritating and toxic gases and vapours.

5.3. Advice for firefighters

Special protective equipment and precautions for fire-fighters	Wear self contained breathing apparatus for fire fighting if necessary.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Personal precautions	Do not get in eyes, on skin, or on clothing. Use personal protective equipment as required. Ensure adequate ventilation.
For emergency responders	Use personal protection recommended in Section 8.

6.2. Environmental precautions

Environmental precautions	Prevent product from entering drains. Do not allow to enter into soil/subsoil. See Section 12 for additional Ecological Information.

6.3. Methods and material for containment and cleaning up

Methods for containment	Do not scatter spilled material with high pressure water streams.
Methods for cleaning up	Take up mechanically, placing in appropriate containers for disposal.
Prevention of secondary hazards	Clean contaminated objects and areas thoroughly observing environmental regulations.

6.4. Reference to other sections

Reference to other sections	See section 8 for more information. See section 13 for more information.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Advice on safe handling Ensure adequate ventilation.

General hygiene considerations Do not eat, drink or smoke when using this product. Wash hands before breaks and after work. Take off all contaminated clothing and wash it before reuse.

7.2. Conditions for safe storage, including any incompatibilities

Storage Conditions Protect from moisture. Keep away from food, drink and animal feedingstuffs.

Recommended storage temperature Keep at temperatures between 10 and 35 °C.

7.3. Specific end use(s)

Specific use(s)
Sealant.

Risk Management Methods (RMM) The information required is contained in this Safety Data Sheet.

Other information Observe technical data sheet.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Exposure Limits Small amounts of acetic acid (CAS 64-19-7) are formed by hydrolysis and released upon curing Small amounts of ethanol (CAS 64-17-5) are formed by hydrolysis and released upon curing

Chemical name	European Union	United Kingdom
Acetic acid 64-19-7	TWA: 25 mg/m³ TWA: 10 ppm STEL: 50 mg/m³ STEL: 20 ppm	TWA: 10 ppm TWA: 25 mg/m³ STEL: 20 ppm STEL: 50 mg/m³

Derived No Effect Level (DNEL) No information available

Predicted No Effect Concentration (PNEC) No information available.

8.2. Exposure controls

Engineering controls Ensure adequate ventilation, especially in confined areas.

Personal protective equipment

Eye/face protection Wear safety glasses with side shields (or goggles). Eye protection must conform to standard EN 166.

Hand protection Wear protective gloves. Gloves must conform to standard EN 374. Ensure that the breakthrough time of the glove material is not exceeded. Refer to glove supplier for information on breakthrough time for specific gloves. The breakthrough time of the gloves depends on the material and the thickness as well as the temperature. Gloves should be replaced regularly and if there is any sign of damage to the glove material.

Skin and body protection None under normal use conditions.

Respiratory protection In case of inadequate ventilation wear respiratory protection. Wear a respirator conforming to EN 140 with Type A/P2 filter or better. Ensure adequate ventilation,

especially in confined areas.

Recommended filter type: Organic gases and vapours filter conforming to EN 14387. White. Brown.

Environmental exposure controls Do not allow uncontrolled discharge of product into the environment.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state	Solid
Appearance	Paste
Colour	Clear, colourless
Odour	Acetic acid
Odour threshold	No information available

Property	**Values**	**Remarks • Method**
pH	No data available	Not applicable Insoluble in water
pH (as aqueous solution)	No data available	
Melting point / freezing point	No data available	
Initial boiling point and boiling range	No data available	
Flash point	> 100 °C	
Evaporation rate	No data available	
Flammability	Not applicable for liquids .	
Flammability Limit in Air		
Upper flammability or explosive limits	No data available	
Lower flammability or explosive limits	No data available	
Vapour pressure	No data available	
Relative vapour density	No data available	
Relative density	0.94	
Water solubility	Product cures with moisture	
Solubility(ies)	No data available	
Partition coefficient	No data available	
Autoignition temperature	No data available	
Decomposition temperature	No data available	
Kinematic viscosity	> 21 mm^2/s	@ 40°C
Dynamic viscosity	No data available	
Explosive properties	No data available	
Oxidising properties	No data available	

9.2. Other information

Solid content (%)	No information available
VOC Content (%)	
Density	0.94 g/cm^3

SECTION 10: Stability and reactivity

10.1. Reactivity

Reactivity Product cures with moisture.

10.2. Chemical stability

Stability Stable under normal conditions.

Explosion data

Sensitivity to mechanical impact	None.
Sensitivity to static discharge	None.

10.3. Possibility of hazardous reactions

Possibility of hazardous reactions None under normal processing.

10.4. Conditions to avoid

Conditions to avoid Product cures with moisture. Protect from moisture. Exposure to air or moisture over prolonged periods. Do not freeze. Keep away from open flames, hot surfaces and sources of ignition.

10.5. Incompatible materials

Incompatible materials Strong oxidising agents.

10.6. Hazardous decomposition products

Hazardous decomposition products None under normal use conditions. Stable under recommended storage conditions.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Information on likely routes of exposure

Product Information .

Inhalation Based on available data, the classification criteria are not met.

Eye contact Based on available data, the classification criteria are not met.

Skin contact Based on available data, the classification criteria are not met. May cause sensitisation in susceptible persons.

Ingestion Based on available data, the classification criteria are not met.

Symptoms related to the physical, chemical and toxicological characteristics

Symptoms No information available.

Numerical measures of toxicity

Acute toxicity

Component Information

Chemical name	Oral LD50	Dermal LD50	Inhalation LC50
Hydrocarbons, C15-C20, n-alkanes, isoalkanes, cyclics, < 0.03% aromatics RR-100252-4	LD50 > 5000 mg/kg (Rattus) OECD 401	LD50 > 3160 mg/kg (Oryctolagus cuniculus) OECD 402	LC50 Inhalation(4h) >5266 MG/M3 (Rattus)
4,5-dichloro-2-octyl-2H-isothiazol-3-one [DCOIT] 64359-81-5	=1636 mg/kg (Rattus)	> 2000 mg/kg (Oryctolagus cuniculus)	=0.26 mg/L (Rattus) 4 h

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Skin corrosion/irritation The assessment of the result of testing was done in accordance with the guideline of the Commission 92/ 69/ EEC.

Product Information					
Method	Species	Exposure route	Effective dose	Exposure time	Results
	Rabbit	Dermal		6 days	Product score <=1 Non-irritant

Serious eye damage/eye irritation By analogy to another tested similar product: No irritation after contact to the eyes. (H319 is void). The assessment of the result of testing was done in accordance with the guideline of the Commission 92/ 69/ EEC.

Product Information					
Method	Species	Exposure route	Effective dose	Exposure time	Results
	Rabbit	eye		6 days	Product score <=1 Non-irritant

Respiratory or skin sensitisation May produce an allergic reaction. No classification is proposed, based on conclusive negative data. OECD Test No. 406: Skin Sensitisation. May cause sensitisation in susceptible persons.

Product Information			
Method	Species	Exposure route	Results
OECD Test No. 406: Skin Sensitisation	Guinea pig	Dermal	No sensitisation responses were observed

Germ cell mutagenicity Based on available data, the classification criteria are not met.

Carcinogenicity Based on available data, the classification criteria are not met.

Reproductive toxicity Based on available data, the classification criteria are not met.

STOT - single exposure Based on available data, the classification criteria are not met.

STOT - repeated exposure Based on available data, the classification criteria are not met.

Aspiration hazard Based on available data, the classification criteria are not met.

11.2. Information on other hazards

11.2.1. Endocrine disrupting properties

Endocrine disrupting properties No information available.

11.2.2. Other information

Other adverse effects No information available.

SECTION 12: Ecological information

12.1. Toxicity

Ecotoxicity Harmful to aquatic life with long lasting effects.

Chemical name	Algae/aquatic plants	Fish	Toxicity to microorganisms	Crustacea	M-Factor	M-Factor (long-term)
Hydrocarbons, C15-C20, n-alkanes, isoalkanes, cyclics, < 0.03% aromatics RR-100252-4	EL50 (72h) >10,000 mg/L (Skeletonema costatum) ISO 10253	LL50 (96h) > 1028 mg/L (Scophthalmus maximus) OECD 203	-	LL50 (48h)> 3193 mg/l (Acartia tonsa)		
Triacetoxy(propyl)silane 17865-07-5	EC50 (72h): approx. 24 mg/l(Pseudokirchenriella subpicata)	LC50 (96h) = 108.89 mg/L	-	EC50 (48h) = 89.59 mg/L		
4,5-dichloro-2-octyl-2H-isothiazol-3-one [DCOIT] 64359-81-5	EC50 (72h) =0.025 mg/L Algae (Scenedesmus subspicatus)(OECD 201)	LC50 (96h) 0.0078 mg/L (Oncorhynchus mykiss)(OECD 203)	-	EC50 (48h) 0.0097 mg/L Daphnia magna (OECD 202)	100	100

12.2. Persistence and degradability

Persistence and degradability No information available.

Component Information			
4,5-dichloro-2-octyl-2H-isothiazol-3-one [DCOIT] (64359-81-5)			
Method	**Exposure time**	**Value**	**Results**
OECD Test No. 308: Aerobic and Anaerobic Transformation in Aquatic Sediment Systems		Half-life	1.1-1.3 days

12.3. Bioaccumulative potential

Bioaccumulation There is no data for this product.

Component Information

Chemical name	Partition coefficient	Bioconcentration factor (BCF)
Triacetoxy(propyl)silane 17865-07-5	1.23	-
4,5-dichloro-2-octyl-2H-isothiazol-3-one [DCOIT] 64359-81-5	4.4	13

12.4. Mobility in soil

Mobility in soil No information available.

12.5. Results of PBT and vPvB assessment

PBT and vPvB assessment The product contains substance(s) classified as PBT or vPvB.

Chemical name	PBT and vPvB assessment
Hydrocarbons, C15-C20, n-alkanes, isoalkanes, cyclics, < 0.03% aromatics RR-100252-4	The substance is not PBT / vPvB

Triacetoxy(propyl)silane 17865-07-5	The substance is not PBT / vPvB
4,5-dichloro-2-octyl-2H-isothiazol-3-one [DCOIT] 64359-81-5	The substance is not PBT / vPvB

12.6. Other adverse effects

Other adverse effects No information available.

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Waste from residues/unused products Uncured product should be disposed of as hazardous waste. Dispose of contents/container in accordance with local, regional, national, and international regulations as applicable.

Contaminated packaging Handle contaminated packages in the same way as the product itself.

European Waste Catalogue 08 04 09* waste adhesives and sealants containing organic solvents or other dangerous substances

Other information Waste codes should be assigned by the user based on the application for which the product was used.

SECTION 14: Transport information

Land transport (ADR/RID)

14.1 UN number or ID number Not regulated
14.2 Proper Shipping Name Not regulated
14.3 Transport hazard class(es) Not regulated
14.4 Packing group Not regulated
14.5 Environmental hazards Not applicable
14.6 Special Provisions None

IMDG

14.1 UN number or ID number Not regulated
14.2 Proper Shipping Name Not regulated
14.3 Transport hazard class(es) Not regulated
14.4 Packing group Not regulated
14.5 Marine pollutant NP
14.6 Special Provisions None
14.7 Transport in bulk according to Annex II of MARPOL and the IBC Code Not applicable

Air transport (ICAO-TI / IATA-DGR)

14.1 UN number or ID number Not regulated
14.2 Proper Shipping Name Not regulated
14.3 Transport hazard class(es) Not regulated
14.4 Packing group Not regulated
14.5 Environmental hazards Not applicable
14.6 Special Provisions None

Section 15: REGULATORY INFORMATION

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture

European Union

Registration, Evaluation, Authorization, and Restriction of Chemicals (REACh) Regulation (EC 1907/2006)

SVHC: Substances of Very High Concern for Authorisation:
This product does not contain candidate substances of very high concern at a concentration >=0.1% (Regulation (EC) No. 1907/2006 (REACH), Article 59)

EU-REACH (1907/2006) - Annex XVII - Substances subject to Restriction
This product does not contain substances subject to restriction (Regulation (EC) No. 1907/2006 (REACH), Annex XVII).

Substance subject to authorisation per REACH Annex XIV
This product does not contain substances subject to authorisation (Regulation (EC) No. 1907/2006 (REACH), Annex XIV)

Ozone-depleting substances (ODS) regulation (EC) 1005/2009
Not applicable

Persistent Organic Pollutants
Not applicable

National regulations

15.2. Chemical safety assessment

Chemical Safety Assessments have been carried out by the Reach registrants for substances registered at >10 tpa. No Chemical Safety Assessment has been carried out for this mixture

SECTION 16: Other information

Key or legend to abbreviations and acronyms used in the safety data sheet

Full text of H-Statements referred to under section 3
EUH071 - Corrosive to the respiratory tract
H302 - Harmful if swallowed
H304 - May be fatal if swallowed and enters airways
H314 - Causes severe skin burns and eye damage
H317 - May cause an allergic skin reaction
H318 - Causes serious eye damage
H330 - Fatal if inhaled
H400 - Very toxic to aquatic life
H410 - Very toxic to aquatic life with long lasting effects

Legend

TWA	TWA (time-weighted average)
STEL	STEL (Short Term Exposure Limit)
Ceiling	Ceiling Limit Value
*	Skin designation
SVHC	Substance(s) of Very High Concern
PBT	Persistent, Bioaccumulative, and Toxic (PBT) Chemicals
vPvB	Very Persistent and very Bioaccumulative (vPvB) Chemicals
STOT RE	Specific target organ toxicity - Repeated exposure
STOT SE	Specific target organ toxicity - Single exposure

EWC	European Waste Catalogue

Key literature references and sources for data
No information available

Prepared By	Product Safety & Regulatory Affairs
Revision date	20-Oct-2021

Indication of changes

Revision note	SDS sections updated, 2, 3, 11, 12, 13, 15, 16.
Training Advice	No information available
Further information	No information available

This material safety data sheet complies with the requirements of Regulation (EC) No. 1907/2006

Disclaimer
The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

End of Safety Data Sheet

8.101

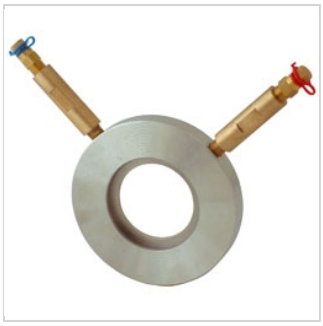
metering_station

The following 3 pages are the document exactly as received and checked. It is bookmarked in the PDF.

Reference	
Asset	General
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Source file	`metering_station.pdf`
Pages	3

integrated piping systems

Metering station



group: V953 **category: valves** **product line: Pegler ProFlow Static**

The Pegler Proflow V953 is a metering station too allow the measurement of the flow rate using a monometer/flowmeter and provides a fixed orifice too regulate the flow. It is designed to be use in series with the equivalent V952 Commissioning valve to enable a balancing, flow measurement and isolation solution. It is available in sizes DN50 too DN600.

- Stainless steel metering stations
- Fixed orifice
- Extended test points
- Flow direction indication on the valve edge
- PN16 rated Flanged to BSEN 1092-1 PN16.

applications

- heating
- cooling

segments

- commercial building
- industry

approvals

no approvals available

assortment

item number	size	dimensions	weight	packaging	gtin
15540	DN50	165x20x160 mm	1.38 kg	box (1 pce)	05022050216052
15541	DN65	165x20x160 mm	1.85 kg	box (1 pce)	05022050216151
15542	DN80	180x20x174 mm	2.17 kg	box (1 pce)	05022050216250
15543	DN100	180x20x174 mm	2.28 kg	box (1 pce)	05022050216366
15544	DN125	210x20x200 mm	2.9 kg	box (1 pce)	05022050216472
15545	DN150	245x20x222 mm	3.3 kg	box (1 pce)	05022050216571
15546	DN200	300x20x280 mm	4.52 kg	box (1 pce)	05022050216687
15547	DN250	355x20x340 mm	5.78 kg	box (1 pce)	05022050216793
15548	DN300	410x30x395 mm	7.3 kg	box (1 pce)	05022050216892
15549	DN350	446x24x446 mm	12 kg	box (1 pce)	05022050353962
15526	DN400	498x24x498 mm	25.3 kg	box (1 pce)	05022050353801
15527	DN450	558x30x558 mm	26 kg	box (1 pce)	05022050353849
15528	DN500	620x30x620 mm	31 kg	box (1 pce)	05022050353887
15529	DN600	737x30x737 mm	38 kg	box (1 pce)	05022050353924

aalberts integrated piping systems

specifications - characteristics

color	blue
materials	stainless steel (Stainless steel 304 (1.4301))
finishing	none
shape	straight (0°)
connection type	wafer type
pressure rating (PN)	PN 16
sealing	EPDM

specifications - general

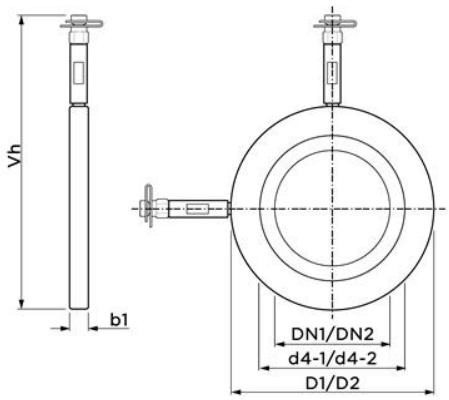
product group	valves (static balancing valves)
HS code	90261081
brand	Pegler
series	ProFlow Static
product type	V953
UNSPS	40141609

specifications - technical

max operating pressure liquid	16 bar
min. medium temperature	-10 °C
max medium temperature	105 °C
peak medium temperature	120 °C
Kvs-value	

dimensions

item number	size	DN1	l1	DN2	l2	H	D1
15540	DN50	DN50	10	DN50	10	148	109
15541	DN65	DN65	10	DN65	10	158	129
15542	DN80	DN80	10	DN80	10	166	144
15543	DN100	DN100	10	DN100	10	176	164
15544	DN125	DN125	10	DN125	10	191	194
15545	DN150	DN150	10	DN150	10	204	220
15546	DN200	DN200	10	DN200	10	232	275
15547	DN250	DN250	10	DN250	10	273	358
15548	DN300	DN300	10	DN300	10	287	386
15549	DN350	DN350	12	DN350	12	317	446
15526	DN400	DN400	12	DN400	12	342	498
15527	DN450	DN450	15	DN450	15	373	558
15528	DN500	DN500	15	DN500	15	404	620
15529	DN600	DN600	15	DN600	15	463	737



sustainability

item number	carbon footprint (A-C) embodied carbon	data source
15540	10.65kgCO2e	TM65
15541	0.4kgCO2e	TM65
15542	0.4kgCO2e	TM65
15543	0.4kgCO2e	TM65
15544	22.92kgCO2e	TM65
15545	24.93kgCO2e	TM65
15546	29.17kgCO2e	TM65
15547	30.88kgCO2e	TM65
15548	46.35kgCO2e	TM65
15549	82.78kgCO2e	TM65
15526	96.17kgCO2e	TM65
15527	183.91kgCO2e	TM65
15528	222.58kgCO2e	TM65
15529	301.4kgCO2e	TM65

downloads

V953 - jpg

Diagram - jpg

8.102

pegler_proflow_commissioning_valve_fodrv_2_x_flang (1)

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Reference	
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Source file	`pegler_proflow_commissioning_valve_fodrv_2_x_flange (1).pdf`
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integrated piping systems

Pegler ProFlow commissioning valve FODRV (2 x flange)



group: V955 **category: valves** **product line: Pegler Proflow Static**

The type V955 Pegler ProFlow balancing valve has flange connections and is a wide range balancing valve with shut off function and fixed orifice (FODRV). The fixed orifice allows fast and accurate flow measurements with fixed Kv-value while the robust grip handle provides easy control. The position indicator and memory stop assures optimal adjustment to the design flow. Type V955 valves are available in sizes DN15-DN300.

- fixed orifice
- includes test points
- easy turn grip handle with position indicator
- grip handle with memory stop
- compact design

note: The test points are delivered in a separate bag to avoid damage during transport and handling

applications

- potable water
- heating
- cooling

segments

- commercial building
- industry

approvals

WRAS

assortment

item number	size	dimensions	weight	packaging	gtin
150013	DN65	290x185x356 mm	17 kg	unpackaged (1 pce)	05022050474926
150014	DN80	310x200x368 mm	18.48 kg	unpackaged (1 pce)	05022050474933
150010	DN100	350x220x410 mm	29 kg	unpackaged (1 pce)	05022050474896
150011	DN125	400x250x453 mm	40 kg	unpackaged (1 pce)	05022050474902
150012	DN150	480x285x483 mm	52 kg	unpackaged (1 pce)	05022050474919
150015	DN200	600x340x695 mm	113 kg	unpackaged (1 pce)	05022050494573
150016	DN250	730x405x772 mm	185 kg	unpackaged (1 pce)	05022050494672
150017	DN300	850x460x914 mm	248 kg	unpackaged (1 pce)	05022050494689

integrated piping systems

specifications - characteristics

color	blue
materials	cast iron (ASTM A536 65-45-12)
finishing	primer/paint
shape	straight (0°)
connection type	flange
pressure rating (PN)	PN 16
sealing	EPDM

specifications - general

product group	valves (MRV, static balancing valves)
ETIM class	EC011463 Regulating valve
HS code	84818059
brand	Pegler
series	Proflow Static
product type	V955
UNSPS	40141609

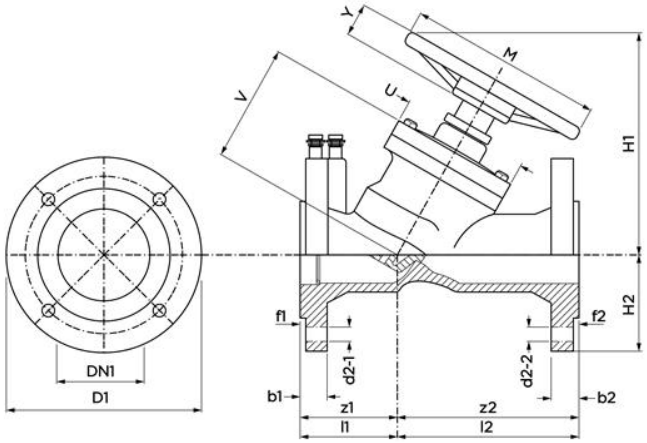
specifications - technical

max operating pressure liquid	16 bar
min. medium temperature	-10 °C
max medium temperature	120 °C
peak medium temperature	120 °C
Kvs-value	
Kv-value	

dimensions

item number	size	DN1	l1	DN2	l2	n2	k2	b2	d2-2	D2	H1	H2	M
150013	DN65	DN65	72	DN65	218	4	145	19	18	185	263	93	200
150014	DN80	DN80	84	DN80	226	8	160	19	18	200	268	100	200
150010	DN100	DN100	98	DN100	252	8	180	19	18	220	300	110	240
150011	DN125	DN125	114	DN125	286	8	210	19	18	250	328	125	290
150012	DN150	DN150	127	DN150	353	8	240	19	22	285	340	143	290
150015	DN200	DN200	160	DN200	440	12	295	20	22	340	525	170	350
150016	DN250	DN250	169	DN250	561	12	355	22	26	405	572	200	420
150017	DN300	DN300	199	DN300	651	12	410	24.5	26	460	686	228	420

item number	size	H	Y	V	U	D1	a
150013	DN65	263	15	192	122	185	60
150014	DN80	268	15	198	130	200	60
150010	DN100	300	15	223	141	220	60
150011	DN125	328	15	242	154	250	60
150012	DN150	340	15	255	167	295	60
150015	DN200	525	15	420	192	340	60



sustainability

item number	carbon footprint (A-C) embodied carbon	data source
150013	77.07kgCO2e	TM65
150014	93.4kgCO2e	TM65
150010	135.04kgCO2e	TM65
150011	194.76kgCO2e	TM65
150012	247.45kgCO2e	TM65
150015	509.93kgCO2e	TM65
150016	811.97kgCO2e	TM65
150017	1083.62kgCO2e	TM65

downloads

- V955 - jpg
- Diagram - jpg
- V955-DN100.dwg - dwg
- V955-DN125.dwg - dwg
- V955-DN150.dwg - dwg
- V955-DN200.dwg - dwg
- V955-DN250.dwg - dwg
- V955-DN300.dwg - dwg
- V955-DN65.dwg - dwg
- V955-DN80.dwg - dwg
- Apollo_ProFlow_statisch_1260-V955-prescription_text-EN - docx

8.103

pegler_proflow_static_balancing_valve

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Reference	
Asset	General
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Source file	`pegler_proflow_static_balancing_valve.pdf`
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integrated piping systems

Pegler ProFlow Static Balancing Valve



group: V952 **category: valves** **product line: Pegler ProFlow Static**

The Pegler ProFlow V952 is a wide range commissioning valve witch uses flanged connection technology, designed for the isolation and balancing of pipework and equipment in a HVAC and plumbing applications, the valve has the means too be double regulated and closed too a pre-selected value and set when commissioned, the valve can be used in series with a V953 measuring facility to be measured using manometer/flow meter too verify the flow rate enabling balancing, flow measurement and isolation solution by pairing the V952 with a V953 at its inlet. This valve is available in sizes DN65 too DN300.

- Ductile iron body with flanged ends
- non-rising stem
- Hand wheel and position indicator
- Double regulating feature
- PN16 rated
- Flanged to BSEN1092 – PN16.

applications

- heating
- cooling

segments

- commercial building
- industry

approvals

no approvals available

assortment

item number	size	dimensions	weight	packaging	gtin
15531	DN65	290x185x356 mm	17.7 kg	unpackaged (1 pce)	05022050215437
15532	DN80	310x200x368 mm	20 kg	unpackaged (1 pce)	05022050215543
15533	DN100	350x220x410 mm	29 kg	unpackaged (1 pce)	05022050215659
15534	DN125	400x250x453 mm	40 kg	unpackaged (1 pce)	05022050215758
15535	DN150	480x285x483 mm	52 kg	unpackaged (1 pce)	05022050215833
15536	DN200	600x340x695 mm	113 kg	unpackaged (1 pce)	05022050215949
15537	DN250	730x405x775 mm	185 kg	unpackaged (1 pce)	05022050465726
15538	DN300	850x460x916 mm	248 kg	unpackaged (1 pce)	05022050465733

integrated piping systems

specifications - characteristics

color	blue
materials	cast iron (ASTM A536 65-45-12)
finishing	primer/paint
shape	straight (0°)
connection type	flange
pressure rating (PN)	PN 16
sealing	EPDM

specifications - general

product group	valves (static balancing valves)
ETIM class	EC011463 Regulating valve
brand	Pegler
series	ProFlow Static
product type	V952
UNSPS	40141609

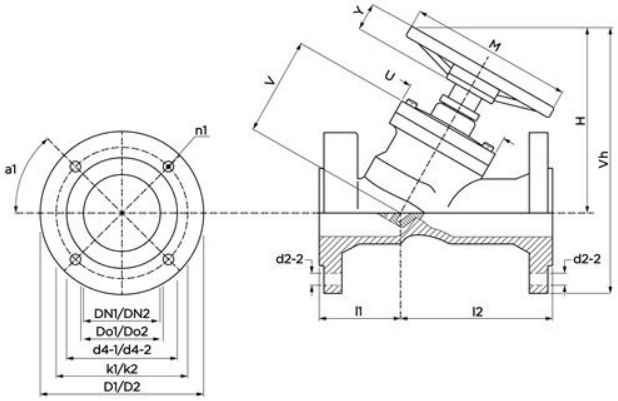
specifications - technical

max operating pressure liquid	16 bar
min. medium temperature	-10 °C
max medium temperature	
peak medium temperature	120 °C
Kvs-value	
Kv-value	

dimensions

item number	size	DN1	l1	DN2	l2	n2	k2	d2-2	D2	M	H	Y	V
15531	DN65	DN65	145	DN65	145	4	145	18	185	154	263	15	153
15532	DN80	DN80	155	DN80	155	8	160	18	200	173	268	15	174
15533	DN100	DN100	175	DN100	175	8	180	18	220	198	300	15	203
15534	DN125	DN125	200	DN125	200	8	210	18	250	229	328	15	238
15535	DN150	DN150	240	DN150	240	8	240	22	285	261	340	15	274
15536	DN200	DN200	300	DN200	300	12	295	22	340	324	525	15	345
15537	DN250	DN250	365	DN250	365	12	355	26	405	388	572	15	417
15538	DN300	DN300	425	DN300	425	12	410	26	460	451	686	15	488

item number	size	U	D1	a	b2
15531	DN65	124	185	45	
15532	DN80	143	200	45	
15533	DN100	168	220	45	
15534	DN125	199	250	45	
15535	DN150	231	285	45	
15536	DN200	294	340	45	



sustainability

item number	carbon footprint (A-C) embodied carbon	data source
15531	76.34kgCO2e	TM65
15532	93.4kgCO2e	TM65
15533	135.04kgCO2e	TM65
15534	194.76kgCO2e	TM65
15535	247.45kgCO2e	TM65
15536	509.93kgCO2e	TM65
15537	811.97kgCO2e	TM65
15538	1083.62kgCO2e	TM65

downloads

V952 - png

Diagram - jpg