Instantor®

MULTILAYER PIPE, PRESS FITTINGS & TOOLS

Technical Guide

Superior Plumbing Products
Since 1926

01.25

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KUKreg4 ATS 3

MULTILAYER PIPING SYSTEMS
I.S. EN ISO 21003-1:2008
NSAI Certified

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1. Introduction

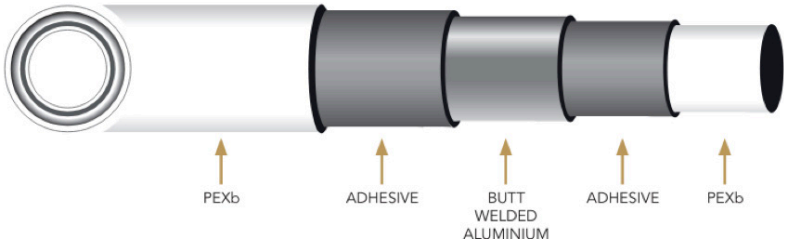
There are several ways to join tubes and fittings in plumbing installations, including threaded joints, welding and inseparable joints using press fittings (such as elbows, tees, couplings, etc).

The Instantor Press System consists of a range of multilayer Pex-Al-Pex pipe, press fittings and press fitting tools. Press fittings offer a quick, easy, safe and reliable solution that saves time and costs when compared to traditional plumbing methods.

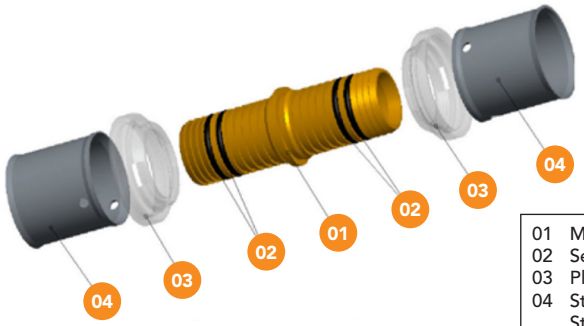
The Instantor Press System is designed for use in sanitary water supply and heating systems, with diameters ranging from 16mm to 63mm.

2. System Description

Instantor Multilayer Pex-Al-Pex Pipe consists of 5 layers. The inner and outer layers of Silane method crosslinked polyethylene PE-xB ensures total hygiene and high corrosion resistance when in contact with fluids. Both layers of PE-xB are then bound by quality adhesive to a longitudinally TIG butt welded 100% oxygen tight aluminium layer. This aluminium layer allows the pipe to be easily bent and maintain its shape after bending.



Instantor Press fittings are made using the same high-grade CW617N brass as Ireland's market leading Instantor Brass Compression Fittings range. Fittings feature two EPDM O-rings on each brass profile, delivering a water-tight seal when pressed correctly in seconds.



01	Main Body	CW617N
02	Sealing Ring	EPDM
03	Plastic Seat	PE
04	Stainless Steel Sleeve	AISI304

System Technical Specifications

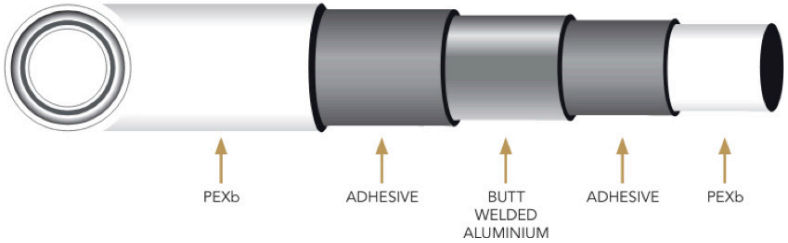
JOINT TYPE: Permanent type press fitting for joining Pex-Al-Pex pipe.

O-ring resistant to hot water, ageing and the additives commonly used in drinking water. Brass body made from high-grade CW617N brass to EN ISO 21003 and 304 Stainless Steel sleeve.

FEATURES:
- Operating temperatures 0°C to 110°C
- Max Operating Temperature: 95°C
- Max Peak Temperature (at 1 hour): 110°C
- Three viewing inspection windows per stainless steel sleeve to allow a visual check to ensure the pipe is fully and correctly inserted
- Application class: 2/6 bar, class 5/6 bar
- Max Operating Pressure @ 20°C: 10 bar
- Max Operating Pressure @ 95°C: 6 bar
- Sizes: 16, 20, 26, 32, 40, 50 & 63mm
- TH profile jaw for pressing

Note: Products produced from Brass are NOT suitable for use underground.

PIPE MATERIAL: Pex-Al-Pex – Double inner and outer layer of Silane method crosslinked polyethylene Pe-xB/ Adhesive / Longitudinally TIG butt welded 100% oxygen tight aluminium layer.



FEATURES:
- This is a more cost-effective pipe system when compared with conventional piping systems
- All the combined advantages of metal and plastic pipes – Lightweight, flexible and maintains its shape after bending
- Cost effective - requires less fittings than traditional methods
- Available in – Coils - 16mm x 100m, 16mm x 200m, 16mm x 500mm, 20mm x 100m, 26mm x 50m, 32mm x 50m
- Insulated Coils - 16mm x 100m, 20mm x 50m, 26mm x 25m, 32mm x 25m, 26mm x 50m - Insulated pipe available in Red, Blue and White
- Lengths – 16, 20, 26, 32, 40, 50 & 63mm x 4m
- Butt welded aluminum pipe is 100% oxygen & water vapor tight
- Excellent heat preservation
- Highly corrosion resistant
- Low factor of linear expansion
- Low noise emission due to plastic properties of pipe
- Highly temperature and pressure resistant
- Guarantee – 50 years on fittings and pipe

O-RING SEAL: EPDM (black) O-ring Ethylene-propylene-diene rubber
- Applications: Potable, Hot/Cold water, water base heating applications, and oil-free compressed air.
- Temperature: From -20°C to +110°C

3. Certificates

The Instantor Press System is NSAI Certified to EN ISO 21003 - Multilayer piping systems PEX for hot and cold water installations inside buildings, and WRAS & KIWA KUKReg4 approved.

Sanbra Fyffe Ltd T/A Instantor also holds ISO EN 9001 Quality Management and ISO EN 14001 Environment Management certifications.

MULTILAYER PIPING SYSTEMS
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4. Instantor Pex-Al-Pex Multilayer Pipe

PE-Xb/Al/-PE-xB Pipe Technical Specifications

PIPE GENERAL INFORMATION	
Product Code:	IPAP101, IPAP102, IPAP103, IPAP104, IPAP105 (Uninsulated Pipe coils) IPAP111, IPAP112, IPAP113, IPAP114, IPAP115, IPAP116, IPAP117 (uninsulated pipe lengths) IPAP201/301/401, IPAP202/302/402, IPAP203/303/403, IPAP204/304/404 (Insulated pipe) IPAP501, IPAP502, IPAP503. (Increased Insulated Pipe) IPAP601, IPAP602, IPAP603 (increased Insulation, BL-S1-d0 Fire rating) IPAP701, IPAP702, IPAP703 (increased Insulation for UK, BL-S1-d0 Fire rating)
Description:	Multilayer Composite pipe, constructed with an inner and outer layer of silane method crosslinked Polyethylene PE-xB, bonded to a longitudinally TIG Butt welded 100% oxygen tight Aluminium layer. Plain and Pre-insulated
Manufactured to:	IS EN ISO 21003 Series
Certification:	WRAS REG4UK Cert No #2304341 KIWA REG4Uk Cert No#2303773 NSAI ISEN ISO 21003 License No #1.153.001
Applications:	General Plumbing - Potable water & Hot water. General water-based heating systems. Radiant heating systems - Underfloor/wall, embedded.

PIPE TECHNICAL SPECIFICATION

Codes	UOM	IPAP101 IPAP111	IPAP102 IPAP112	IPAP103 IPAP113	IPAP104 IPAP114	IPAP105	IPAP107	IPAP115	IPAP116	IPAP117
Outer Diameter	mm	16	20	26	32	16	16	40	50	63
Inner Diameter	mm	12	16	20	26	12	12	32	41	51
Weight	kg/m	0.112	0.148	0.266	0.362	0.112	0.112	0.557	0.797	1.270
Thickness of Aluminium	mm	0.25	0.3	0.35	0.5	0.25	0.25	0.5	0.5	0.6
Total Thickness	mm	2	2	3	3	2	2	4	4.5	6
Coil Length	m	100	100	50	50	500	200	–	–	–
Straight Length	m	4	4	4	4	–	–	4	4	4
Volume of Water	l/m	0.113	0.201	0.314	0.532	0.113	0.113	0.803	1.319	2.014
Internal Roughness	µm	7								
Thermal Conductivity at 20˚C	W/mk	0.43								
Coefficient of Expansion	mm/m ˚C	0.025								
Degree of Crosslinking	%	≥65%								
Oxygen Permeability	mg/l	0								
Colour	–	White								
Type	–	PE-xB/Al/PE-xB multilayer pipe								
Field of Application	–	Plumbing in civil, industrial and commercial applications								
Fluid	–	Potable water, technical water,and water glycol (*)								
Max Peak Temperature	˚C	110 (for a maximum of 1 hour)								
Minimum Operating Temperature(*)	˚C	0								
Maximum Operating Pressure at 95˚C	bar	6								
Maximum Operating Pressure at 20˚C	bar	10								
Duration at 95˚C and 6 bar	–	Time duration to be determined by service conditions								
Storage	–	Avoid prolonged exposure to direct sunlight								
Minimum Bend Radius	–	5 times the diameter								
Fire Classification - Pipe Pex-Al-Pex	–	EL -(EN13501)								

(*) In the case of water glycol, in order to define the minimum operating temperature, it is necessary to know the elements of the mixture and the various concentrations.

Pex-Al-Pex with Insulation Technical Specification

PIPE WITH INSULATION GENERAL INFORMATION	
Description:	Instantor® Press System Pipe with a closed cell Polyethylene Foam (PEF) Sheath
Application:	General Plumbing – Potable Cold and Hot water distribution. General water-based heating systems. Reduces Heat transfer, Condensation, expansion and noise transmissions. NOT suitable on uncontrolled/solid fuel primary applications. NOT suitable for solar applications or Gas/LPG applications.
Size Range:	Ø16mm Ø20mm, Ø26mm Ø32mm
Short term Water Absorption: EN13472:2013 [TUV]:	WS05. 0.125Kg/m²
Trace Quantities of water-soluble Ions: EN13468:2001 [TUV]	Fluoride: Not Detected Chloride: Not Detected Silicate: Not Detected Sodium: Not Detected PH: 7.5
Water absorption by Vacuum [TUV]:	4.36%
Material Specification:	Instantor® Pexb/Al/Pexb Pipe and Polyethylene [PE-LD] Foam Sheath
Manufactured to:	IS EN ISO 21003:2008. NSAI License No#1.153.001 EN13501:2018 BS6920:2014 WRAS REG4UK Cert No#2304341 KIWA REG4UK Cert No#2303773

PIPE WITH INSULATION TECHNICAL SPECIFICATION

Codes	UOM	IPAP201 IPAP301 IPAP401	IPAP202 IPAP302 IPAP402	IPAP203 IPAP303 IPAP403	IPAP204 IPAP304 IPAP404	IPAP205	IPAP501	IPAP502	IPAP503	IPAP504	IPAP601	IPAP602	IPAP603
Outer Diameter	mm	16	20	26	32	26	16	20	26	32	16	20	26
Weight	kg/m	0.167	0.201	0.342	0.450	0.342	0.231	0.250	0.382	0.484	0.231	0.250	0.382
Insulation Thickness (round)	mm	6	6	8	8	8	9	13	13	13	9	13	13
Diameter Pipe + Sheath	mm	28	32	42	48	42	34	46	52	58	34	46	52
Thickness of Aluminium	mm	0.25	0.3	0.35	0.5	0.35	0.25	0.3	0.35	0.5	0.25	0.3	0.35
Coil Length	m	100	50	25	25	50	50	50	25	25	50	50	25
Volume of Water	l/m	0.113	0.201	0.314	0.532	0.314	0.113	0.201	0.314	0.531	0.113	0.201	0.314
Internal Roughness	µm	7											
Thermal Conductivity at 20°C - Insulation	W/mk	0.0397											
Coefficient of Expansion	mm/m °C	0.025											
Density - Foam	kg/m³	35-45											
Degree of Crosslinking	%	≥65%											
Oxygen Permeability	mg/l	0											
Colour	–	White/Red/Blue											
Pipe Material	–	PE-xB/Al/PE-xB multilayer pipe											
Sheath Material	–	Closed - Cell polyethylene Foam PE-LD											
Scratch-resistant Finishing Layer	–	Closed - Cell polyethylene Foam PE-LD											
Field of Application	–	Plumbing in civil, industrial and commercial applications											
Fluid	–	Potable water, technical water,and water glycol(*)											
Max Peak Temperature	°C	110											
Minimum Operating Temperature(*)	°C	0											
Maximum Operating Pressure at 95°C	bar	6											
Maximum Operating Pressure at 20°C	bar	10											

PIPE WITH INSULATION TECHNICAL SPECIFICATION

Codes	UOM	IPAP201 IPAP301 IPAP401	IPAP202 IPAP302 IPAP402	IPAP203 IPAP303 IPAP403	IPAP204 IPAP304 IPAP404	IPAP205	IPAP501	IPAP502	IPAP503	IPAP504	IPAP601	IPAP602	IPAP603
Duration at 95°C and 6 bar	–	Time duration to be determined by service conditions											
Storage	–	Avoid prolonged exposure to direct sunlight											
Minimum Bend Radius	Ø	5 times the diameter											
Fire Classification EN13501	–	B2 (DIN 4102) / EL (EN13501)									BL-S1-d0 (EN13501)		
Insulation Min/Max Service temperature	°C	ST(-20°C) - ST(+90°C)											
Determination of Trace Quantities of Soluble Ions per EN13468	mg/kg	Fluoride: Not Detected. Chloride: Not Detected . Silicate: Not Detected . Sodium: Not Detected											
Determination of PH per EN13468 (Insulation)	PH	7.5											
Water absorption per EN13472	kg/m²	0.125 - Classification 'W05'											
Regulation (EC) No.1005/2009 amending Regulation (EC) No.744/2010 Ozone Depletion Substances (ODS) Content / US EPA 5021A/8260C		CFCs Group I & II: Not Detected. Halon Group III : Not Detected. CCl4 Group IV : Not Detected Trichloroethane Group V : Not Detected Bromos group VI: Not Detected. HBFCs Group VII : Not Detected HCFCs Group VIII: Not Detected. Bromochloromethane Group IX: Not Detected											

PIPE WITH IPAP7 INSULATION TECHNICAL SPECIFICATION

Codes	UOM	IPAP701	IPAP702	IPAP703
Outer Diameter	mm	16	20	26
Insulation Thickness (round)	mm	17	17	19
Diameter Pipe + Sheath	mm	50	54	64
Thickness of Aluminium	mm	0.25	0.3	0.35
Coil Length	m	25	25	25
Volume of Water	l/m	0.113	0.201	0.314
Internal Roughness	µm	7		
Thermal Conductivity at 20°C - Insulation	W/mk	0.0397		
Coefficient of Expansion	mm/m °C	0.025		
Density - Foam	kg/m³	35-45		
Degree of Crosslinking	%	≥65%		
Oxygen Permeability	mg/l	0		
Colour	–	Mild Grey		
Pipe Material	–	PE-xB/Al/PE-xB multilayer pipe		
Sheath Material	–	Closed - Cell polyethylene Foam PE-LD		
Scratch-resistant Finishing Layer	–	Closed - Cell polyethylene Foam PE-LD		
Field of Application	–	Plumbing in civil, industrial and commercial applications		
Fluid	–	Potable water, technical water,and water glycol(*)		
Max Peak Temperature	°C	110		
Minimum Operating Temperature(*)	°C	0		
Maximum Operating Pressure at 95°C	bar	6		
Maximum Operating Pressure at 20°C	bar	10		

PIPE WITH IPAP7 INSULATION TECHNICAL SPECIFICATION

Codes	UOM	IPAP701	IPAP702	IPAP703
Duration at 95°C and 6 bar	–	Time duration to be determined by service conditions		
Storage	–	Avoid prolonged exposure to direct sunlight		
Minimum Bend Radius	Ø	5 times the diameter		
Fire Classification EN13501	–	BL-S1-d0 (EN13501)		
Insulation Min/Max Service temperature	°C	ST(-20°C) - ST(+90°C)		
Determination of Trace Quantities of Soluble Ions per EN13468	mg/kg	Fluoride: Not Detected. Chloride: Not Detected . Silicate: Not Detected . Sodium: Not Detected		
Determination of PH per EN13468 (Insulation)	PH	7.5		
Water absorption per EN13472	kg/m²	0.125 - Classification 'W05'		
Regulation (EC) No.1005/2009 amending Regulation (EC) No.744/2010 Ozone Depletion Substances (ODS) Content / US EPA 5021A/8260C		CFCs Group I & II: Not Detected. Halon Group III : Not Detected. CCl4 Group IV : Not Detected Trichloroethane Group V : Not Detected Bromos group VI: Not Detected. HBFCs Group VII : Not Detected HCFCs Group VIII: Not Detected. Bromochloromethane Group IX: Not Detected		

5. Instantor Press Tools

Revolutionary Press Tools offer a new way of plumbing in comparison to traditional methods. Instantor Press Tools are available with 19kN and 32kN output. The Instantor Press System range is suitable for use with TH profile jaws only.

Most of the press tools that exist in the market allow pressing Instantor Press System Fittings from a diameter of 16mm to a diameter of 63mm. Each diameter needs its own jaw or collar. The Instantor mini press gun will press 16mm to 32mm, and our large press gun will press 40mm to 63mm Pex-Al-Pex pipe.

For larger dimension pressing tools please contact our office.

TH profile jaws or collars should always be used. In case of doubt, please ask our technical department.

INSTANTOR PRESS TOOL KITS SUPPLIED WITH:

- Instantor Press Tool
- Heavy duty plastic protective case
- 2 x 18V 4Ah batteries
- Charger
- 19kN tool includes 16mm, 20mm, 26mm, 32mm TH profile jaws
- 32kN tool includes 40mm, 50mm, 63mm TH profile jaws and adaptor tongs required for 50mm & 63mm jaws

Calibration and Servicing

Instantor offers a calibration and servicing option for our Press Tools.

To discuss, please contact us on

Ireland
+353 (0) 1 842 6255 or email techsupport@instantor.ie

United Kingdom
+44 (0) 121 737 2515 or email techsupport@instantor.co.uk

6. Applications

The Instantor Press System is designed for sanitary water supply and heating systems.

Applications Pex-Al-Pex

- Pex–Al–Pex pipe is suitable for installations embedded in concrete / Screed for radiant heating applications, (note: that brass fittings are NOT suitable for direct embedment in concrete, gypsum or similar aggregates. A suitable protection measure is required - such as ducting/chase/sleeved/Denso tape or a similar type protective measure from direct contact)
- Pex-Al-Pex pipe can be installed outside, provided that it has an insulation sheath protecting the tube from excess UV ray exposure.
- Pex-Al-Pex pipe is suitable for installation underground provided that the installation conforms to the building regulations. (Note that Instantor Press - brass fittings are NOT suitable for use underground)
- Pex–Al–Pex pipe is prohibited to be installed on an uncontrolled solid fuel heating system primary line.
- Pex–Al–Pex pipe is prohibited to be installed in solar applications.
- Pex-Al–Pex pipe requires 1M of metallic pipe before connection to a high Heat source/Gas/Oil fired Boiler.

Note: Products produced from Brass are NOT suitable for use underground.

APPLICATION CLASS TABLE (ISO 21003-1)

Application Class	Design Tempera-ture TD [°C]	Time [b] AT TD [Years]	T max [°C]	Time at T max [Years]	T mal [°C]	Time at Tmal [h]	Typical Field of Application
1[a]	60	49	80	1	95	100	Hot Water Supply (60°C)
2[a]	70	49	80	1	95	100	Hot Water Supply (70°C)
4[b]	20 + Cumulative 40 + Cumulative 60	2.5 20 25	70	2.5	100	100	Underfloor Heating and Low Temperature radiators
5[b]	20 + Cumulative 60 + Cumulative 80	14 25 10	90	1	100	100	High Temperature radiators

a A country may select either class 1 or class 2 in conformity with its nation regulations.
b Where more than one design temperature for time and associated temperature appears for any class, they should be aggregated. "Plus cumulative" in the table implies a temperature profile of the mentioned temperature over time (e.g. the deign temperature profile for 50 years for class 5 is 20°C for 14 years followed by 60°C for 25 years, 80°C for 10 years, 90°C for 1 year and 100°C for 100h).

NOTE: For values of TD, T max and T mal in excess of those in the table, this International Standard does not apply. In the case of water glycol, in order to define the minimum operating temperature, it is necessary to know the elements of the mixture and the various concentrations.

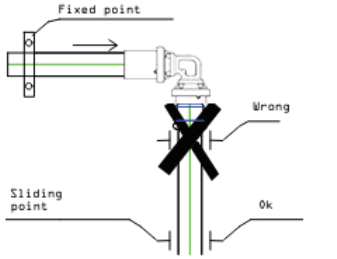
7. Fixing of Pipes

Fixed and Sliding Fasteners

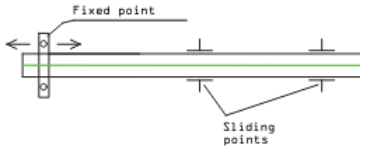
There are two purposes for fixing pipes. Firstly the fasteners support the pipe system; and secondly, they direct changes in the length of pipes resulting from temperature changes in the desired direction.

In pipe fixings we can distinguish between fixed (static) fasteners and sliding fasteners (enabling axial movement of the tube).

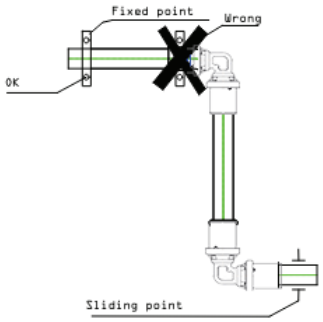
Fixed fastenings should not be used with accessories. Sliding fastenings should be fitted in such a way that they do not involuntarily become fixed fasteners in use. With pipe elongation, we should take into account the minimum distance to the first sliding fastening. A stretch of piping with no changes of direction and no elongation compensator should not have more than one fixed fastening.



Incorrect Fixing:
The horizontal pipe cannot extend freely.



Fixing in a continuous length with a fixed fastening

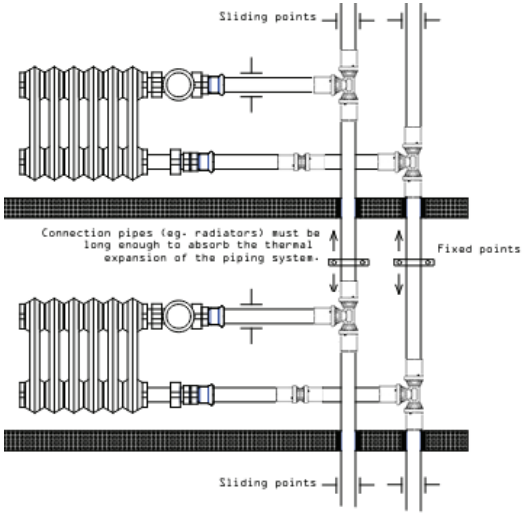


With long stretches, we recommend that the fixed fastening should be in the centre of the stretch in order to distribute the elongation in both directions. This occurs for example in vertical pipes between floors in a building when there is no elongation compensator.

As the ascending pipe is fixed in the centre (and not unilaterally to the building) the heat elongation is distributed in two directions, and this reduces the force of the deviation. For fixing of pipes use commercial fastenings. For applications including noise insulation use insulated brackets.

Piping does not usually produce noise, but it does transmit noise (from other equipment, etc.) and it should therefore be fitted in a way which provides insulation from noise pollution.

Diameter x Thickness	Support Distance (m)
16 x 2	0.8
20 x 2	1.2
26 x32	1.5
32 x 3	1.6
40 x 4	2.0
50 x 4.5	2.5
63 x 6	2.8



Thermal Elongation

Pipes are under thermal loads that expand the materials creating elongation. This elongation depends on the temperature differences. This expansion should be considered during installation by:

- Allowing space for longitudinal elongation
- Using expansion compensators
- Using the proper fastening method (fixed or sliding fasteners)

The flexion and torsion effects on a tube during use can easily be absorbed if these factors are taken into account during assembly (to offset the elongation).

Small longitudinal changes in tubes can be offset by expansion space or absorbed by the elasticity of the tube network.

Elongation compensators (such as flexible arms, expansion bends) should be used in large tube networks. The choice of compensator to be used depends on the material and characteristics of the construction and its service temperature.

The longitudinal thermal expansion is determined by: $\Delta l = l \cdot \alpha \cdot \Delta T$

The Coefficient of Expansion for the Pex-Al-Pex is α= 0.025 mm/m˚C. The table below summarises the longitudinal changes up in up to 10m pipe length.

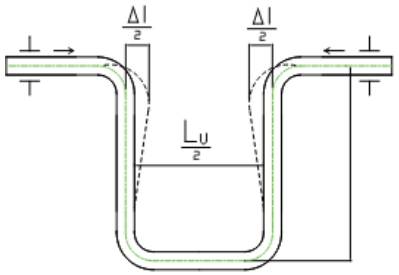
Δl (mm)

Tube Length (m)	Temperature difference - ΔT (°C)									
	10	20	30	40	50	60	70	80	90	100
1	0.25	0.50	0.75	1.00	1.25	1.50	1.75	2.00	2.25	2.50
2	0.50	1.00	1.50	2.00	2.50	3.00	3.50	4.00	4.50	5.00
3	0.75	1.50	2.25	3.00	3.75	4.50	5.25	6.00	6.75	7.50
4	1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
5	1.25	2.50	3.75	5.00	6.25	7.50	8.75	10.00	11.25	12.50
6	1.50	3.00	4.50	6.00	7.50	9.00	10.50	12.00	13.50	15.00
7	1.75	3.50	5.25	7.00	8.75	10.50	12.25	14.00	15.75	17.50
8	2.00	4.00	6.00	8.00	10.00	12.00	14.00	16.00	18.00	20.00
9	2.25	4.50	6.75	9.00	11.25	13.50	15.75	18.00	20.25	22.50
10	2.50	5.00	7.50	10.00	12.50	15.00	17.50	20.00	22.50	25.00

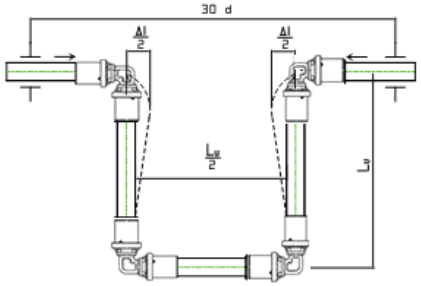
Bending Arm Calculation

To compensate thermal elongation, a bending arm can be used to absorb the effects of the elongation. If a bending arm cannot be installed, consider using expansion compensators.

For longitudinal expansion use U-bends.



Offsetting elongation using bend based on a curved pipe

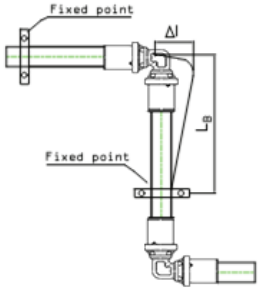


Offsetting elongation using bend made with accessories

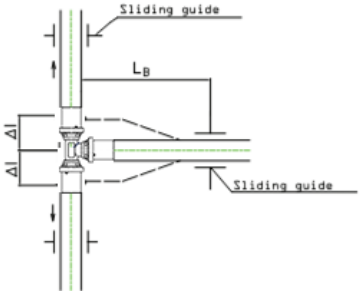
$$L_u = C_u \cdot \sqrt{d \cdot \Delta l}$$

The Material Constant for Pex-Al-Pex and expansion loops is C_u=19 and *d* the diameter of the pipe.

Similarly, for changes of direction in the pipe system, Material Constant is C_B=30 the deflection leg is:



Offsetting elongation using flexible arm



Offsetting elongation by derivation

$$L_B = C_B \cdot \sqrt{d \cdot \Delta l}$$

8. Installation Instructions

Storage and Transport

Appropriate care should be taken during transportation and storage to avoid damage and marking.

DURING TRANSPORT:
- Avoid throwing the pipes.
- Secure the pipes to avoid slipping.

Accessories are packed effectively in plastic bags to ensure that they are received by the warehouse or installer in perfect condition.

DURING STORAGE:
- Avoid placing the pipes in the ground or rough surfaces that can scratch or damage them.
- Store the pipes in a ventilated and dry area.
- Avoid exposure to direct sunlight.
- Store in racks to have a proper air flow and dry pipes. Use multiple contact points to avoid pipe sagging.
- If different diameter pipes are stored together, place smaller sizes on top.
- Fittings should be kept in original packaging to prevent O-ring lubrication drying out before use.

Bending

Instantor Pex-Al-Pex can be easily bent by hand or by using tools. The aluminium internal layer allows the multilayer pipe to retain its shape after bending.

Multilayer pipes can be bent with a r=5xOD by hand up to 32mm diameter pipe.

Diameter x Thickness	Bending Radius		
	By Hand 5 x OD (mm)	Bending Spring ~4 x OD (mm)	With Bending Tool
16 x 2	80	60	60
20 x 2	100	80	70
26 x 3	130	105	95
32 x 3	160	125	110
40 x 4	–	–	160
50 x 4.5	–	–	200
63 x 6	–	–	–

Recommendations:
- Bend the pipes before pressing or connecting them to the fittings. If not possible, keep the pipes and fittings free of stress. Fully support the pipe, leaving the fitting free.
- Do not apply heat to the pipes to bend them.
- Avoid compressing or kinking the pipe in the bend, if damage is observed replace section. The use of bending springs will avoid this from occurring.

Cutting

Once the pipes have been measured, they can be cut to the correct length using a pipe cutter.

Make sure the pipe is cut square (90°). For this, use the Pipe Cutter shoulder to square the pipe. Avoid cutting the pipe on a bent section.

After cutting the pipe, the inside and outside of the ends should be thoroughly deburred to avoid damaging the O-ring seal when the cut pipe is inserted into the fitting.

Preparation of the Joint

After cutting, the ends of the pipe should be deburred inside and outside prior to inserting into fitting. Visually inspect the O-ring is correctly seated before inserting pipe into fitting.

The zone of contact of the O-ring of the press fitting with the pipe has to be clean, smooth and free of dirt.

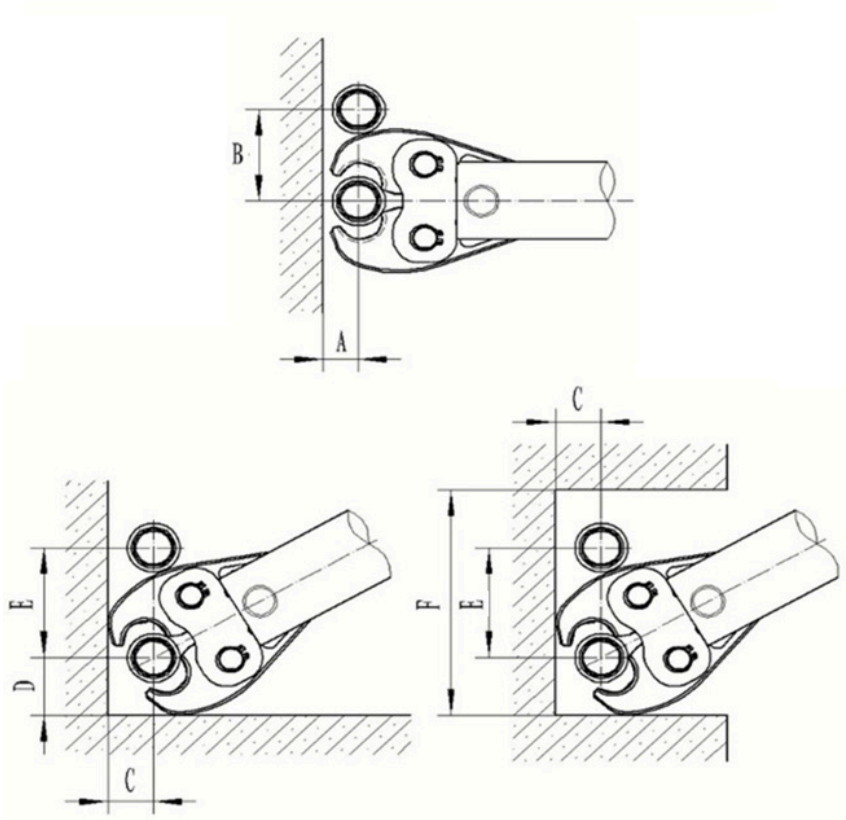
Prior to pressing, the pipe and the fitting are fitted together by gently rotating and pressing in the direction of the inspection windows. Use the inspection windows to ensure the pipe is fully inserted. If resistance is encountered, water can be used as effective lubricant.

The fittings are pressfitted using a press tool. An interchangable TH Profile jaw should be used for each pipe diameter. Pressfitting can only be carried out using the correct pressfitting jaw.

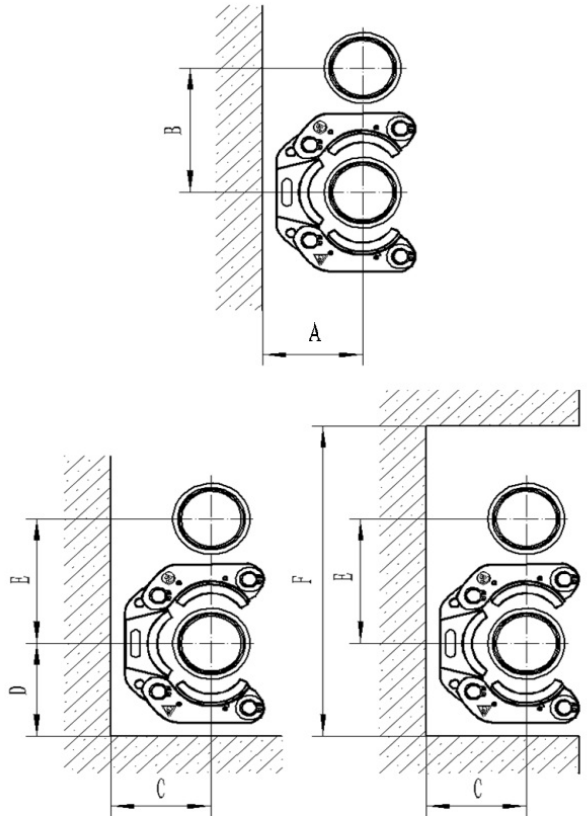
Where pipework needs to be altered after press fittings have been used, the same section of pipework cannot be reused where there was a press joint previously used. Movement in the pipes, which often occurs when they are raised to be installed or removed, is acceptable.

Fittings should be kept in original packaging to prevent O-ring lubrication drying out before use.

Space Required and Minimum Distances



Space Required and Minimum Distances for IT2020/IT2040 Press Tool						
Diameter (mm)	A (cm)	B (cm)	C (cm)	D (cm)	E (cm)	F (cm)
16	3.0	6.5	4.0	4.0	9.0	17.0
20	3.0	6.5	4.0	4.0	9.0	17.0
26	3.0	7.5	4.5	4.5	11.0	20.0
32	3.5	7.5	5.0	5.0	11.0	21.0
40	4.0	9.0	5.5	5.5	13.0	24.0



Space Required and Minimum Distances for IT2040 (for adaptors)						
Diameter (mm)	A (cm)	B (cm)	C (cm)	D (cm)	E (cm)	F (cm)
50	7.5	11.0	7.5	7.5	11.0	26.0
63	8.0	13.0	8.0	8.0	13.0	29.0

9. Press Fitting

Instantor Press Tools are for diameters from 16mm to 63mm.

Consideration should be given to minimum space required to successfully press the fittings.

A range of jaws and collars with adaptors are available which can be changed quickly and easily depending on the external diameter of the pipes.

Only the appropriate jaws, collars and adaptors should be used with the press tool.

The internal slot in the jaws or collars should enclose the edge of the accessory in order to produce an adequate join. The Instantor Press System uses a TH profile jaw.

1. Cut the pipe squarely to desired length using an appropriate cutting tool.

2. Insert the reamer into the cut pipe and rotate, pushing slightly to remove all burrs and rough edges.
NOTE - A poorly calibrated pipe could damage the O-Rings on insertion.

3. Connect the pipe and fittings and check pipe is fully inserted in the inspection windows. The white of the pipe must be viewable through these holes. DO NOT USE SEALING AGENTS SUCH AS PTFE TAPE OR JOINTING COMPOUND. Use TH Profile Jaws to press.

ASSEMBLY SEQUENCE:

1. Cut the pipe squarely to desired length using an appropriate cutting tool.
2. Calibrate – Insert the reamer into the cut pipe and rotate, pushing slightly to remove all burrs and rough edges. NOTE, a poorly calibrated pipe could damage the O rings on insertion.
3. Inspect the seals are properly placed. The fittings are designed for the O-ring to make a perfect seal, DO NOT use any sealing agent.
4. Rotate the pipe slowly as you insert it in the joint until the limit.
5. Use the three viewing inspection windows per stainless steel sleeve to allow a visual check so as to ensure the pipe is correctly inserted
6. Place the pressfitting jaw in the machine and insert the fastening bolt until it fits. Use TH Profile Jaws to press.
7. Open the jaw, place at a right angle and carry out the pressfitting.
8. Press fittings should not be pressed more than once.

10. General Technical Information

Electrical Conductivity

Instantor Pex-Al-Pex is not conductive pipe by nature, therefore it does not require, nor should it be used for equipotential bonding (earthing).

The pipe can interfere with electrical protection or equipotential bonding. A certified electrician must check if the multilayer pipe installation affects the electrical protection.

Rainwater

Instantor Pex-Al-Pex pipe is suitable for installations that use rainwater. Make sure the pH value of the water is between 6.5 and 8.

Water Heater Connections

Pex-Al-Pex can be connected to flow heaters or heated storage tanks if the water temperature is below 95°C. Consider using metal connections as intermediary when temperatures are above the recommended value. Recommended length 1m of metallic pipe.

Frost Protection and Trace Heater

Protect multilayer pipes from freezing in sections where frost can take place like building structures (including cold bridges) where the temperature can be below 0°C.

For frost protection and temperature maintenance, a self-regulating trace heater at 55°C can be utilised. The aluminium layer in the multilayer pipe provides an even heat transfer in the pipe, making the Pex-Al-Pex suitable for trace heating.

Fire Classification

Local regulations and requirements regarding Fire Protection should be considered.

Instantor Pex-Al-Pex pipe has a B2 "normal combustible" classification according to DIN 4102 / EL (EN 13501-1:2007 A1:2009) and for the insulation is

EL (EN 13501-1:2007 A1:2009) & BL-S1-d0 according to European Standard EN13501.

The Increased insulation IPAP6 & IPAP7 range are designed to the Euroclass Fire Rating 'BL-S1-d0' under EN13501. This system classifies fire-rated insulation based on its reaction to fire, with ratings from A1 (Non-combustible), A2 (Limited combustibility) and B to F (Combustible) . Where B offers low or very limited contribution to fire with F indicating the highest combustibility. Each classification is also specified by additional indices - S1,S2,S3 for Smoke production: (S1 meaning very little to no smoke) & d0,d1,d2 for Flaming droplets/particles:(d0 meaning little to no flaming droplets or particles).

The S1 rating provides additional escape time due to little or no contribution to smoke production, d0 rating provides further safety by little to no formation of Buring droplets which contribute to the spread of a fire.

Legionella

Some measures can be taken prevent the growth of legionella:

- Storage of hot water at 60°C or higher
- Cold water below 25°C
- Avoidance of aerosol formation, stagnation or dead sections in the system
- Avoidance of non-circulating installations without trace heating

Corrosion

The PE-xB layer in the pipe has good resistance to corrosion and protects the pipe. However, corrosion can still occur if the pipe is in an aggressive environment for instance storage areas for chemicals, areas with acids or alkalis, animal and dairy facilities.

If pipe is installed with concrete and screed, ensure pH values are below 12.5 and there is no permanent moisture penetration.

Wet environments can also produce corrosion in the brass fittings if uncontrolled. Typically, swimming pools, spa/sauna areas, large kitchens, washing plants and cleaning rooms are environments with constant moisture penetration.

Direct contact must be avoided between brass fittings and embedment in concrete, gypsum or similar. To avoid direct contact, protection measures such as ducting, chase, sleeved, Denso tape or similar can be considered.

– Dissimilar metal corrosion:

Dissimilar metals have the potential to react with each other when they are in contact directly or indirectly in the presence of an electrolyte.

Type	Instantor® Electro-potential Difference Compatibility			
Application	Instantor® Copper Press	Instantor® Stainless Press	Instantor® Pex-Al-Pex	Instantor® Brass
Instantor® Copper Press	0	(0.05 – 0.36 =) 0.31 (0.05-0.29=) 0.24*	0	(-0.29-0.36=) 0.07
Instantor® Stainless Press	(0.05 – 0.36 =) 0.31 (0.05-0.29=) 0.24*	0	0	(-0.05-0.29=) 0.24
Instantor® Pex-Al-Pex	0	0	0	0
Instantor® Brass	(-0.29-0.36=) 0.07	(-0.05-0.29=) 0.24	0	0

Note: *Due to dissimilar metals compatibility, Instantor® have designed the cross over fittings with Brass alloy having an anodic index value of

-0.29. Both threaded ends X Copper Press & Compression ends X Copper Press fittings are constructed from Brass alloys and not from copper - this keeping below the maximum voltage potential difference of <0.25 for full compatibility of the Instantor® Press Systems.

Outdoor Installations

Installations outdoor are possible with the Pex-Al-Pex pipe and Press System.

FOLLOW THESE RECOMMENDATIONS:

- Avoid materials with coarse grain or sharp edges, as they can damage the pipe
- Use corrosion protection for the fittings that are in contact with the soil
- Protect from frost, consider the installation depth
- Protect from sunlight / UV light. Use Instantor Press System Pipe with Insulation, periodically check the insulation and replace if necessary.

11. Technical Information

Instantor Pex-Al-Pex Press System is a complete solution for potable water and heating applications in residential or commercial buildings.

Easily connect the pipes and fittings by radially pressing them together with the right tool to create a leak proof inseparable joint.

Reduce installation time with the Instantor Press System and forget the welding, soldering, gluing and thread cutting process.

Pipe Friction Resistance

Friction between the working fluid and the wall of the pipe causes loss of energy. This is manifested in pressure loss and is shown in the next table for different water flows and pipe diameters, for 10°C and 65°C.

Flow rate		Pipe specification - Pressure loss at 10°C													
		16mm		20mm		26mm		32mm		40mm		50mm		63mm	
L/s	[m^3/h]	Velocity [m/s]	P.loss [Pa/m]	Velocity [m/s]	P.loss [Pa/m]	Velocity [m/s]	P.loss [Pa/m]	Velocity [m/s]	P.loss [Pa/m]	Velocity [m/s]	P.loss [Pa/m]	Velocity [m/s]	P.loss [Pa/m]	Velocity [m/s]	P.loss [Pa/m]
0.02	0.072	0.171	65.3												
0.03	0.108	0.257	134.0	0.155	40.2										
0.04	0.144	0.342	232.2	0.207	66.9	0.130	22.1								
0.05	0.180	0.428	331.7	0.258	99.4	0.162	32.9								
0.06	0.216	0.513	458.2	0.310	137.4	0.195	45.4								
0.07	0.252	0.599	602.4	0.362	180.7	0.227	59.6	0.139	18.6						
0.08	0.288	0.684	763.4	0.413	229.1	0.260	75.6	0.159	23.4						
0.09	0.324	0.770	940.9	0.465	282.2	0.292	93.3	0.179	28.9						
0.10	0.360	0.855	1134.3	0.517	340.3	0.325	112.4	0.199	34.9	0.131	12.8				
0.12	0.432	1.027	1567.3	0.620	470.1	0.390	155.3	0.239	48.2	0.157	17.7				
0.14	0.504	1.198	2060.3	0.723	617.9	0.455	204.1	0.278	63.3	0.183	23.3				
0.16	0.576	1.369	2610.9	0.826	783.1	0.520	258.7	0.318	80.2	0.209	29.6				
0.18	0.648	1.540	3217.7	0.930	965.2	0.585	318.9	0.358	98.9	0.235	36.3				
0.20	0.720	1.711	3879.1	1.033	1163.6	0.650	384.4	0.398	119.3	0.262	43.9				
0.25	0.900	2.139	5762.9	1.291	1728.6	0.812	571.0	0.497	177.2	0.327	65.1				
0.30	1.080	2.566	7963.6	1.550	2388.7	0.974	789.0	0.597	244.8	0.392	90.0				
0.35	1.260	2.994	10468.2	1.808	3139.9	1.137	1037.3	0.696	321.8	0.458	118.4				
0.40	1.440			2.066	3979.3	1.299	1314.4	0.796	407.9	0.523	150.0	0.317	45.3	0.204	15.7
0.45	1.620			2.324	4904.0	1.461	1619.9	0.895	502.6	0.589	184.8	0.356	55.8	0.229	19.5
0.50	1.800			2.583	5911.9	1.624	1952.8	0.995	606.0	0.654	222.8	0.396	67.2	0.255	23.4
0.55	1.980			2.841	7001.0	1.786	2312.5	1.094	717.6	0.719	263.9	0.435	79.6	0.280	27.8
0.60	2.160			3.100	8169.4	1.949	2698.6	1.193	837.4	0.785	307.9	0.475	92.9	0.306	32.4
0.65	2.340					2.111	3110.3	1.293	965.1	0.850	354.8	0.515	107.1	0.331	37.4
0.70	2.520					2.273	3547.4	1.392	1100.7	0.916	404.6	0.554	122.1	0.357	42.6
0.75	2.700					2.436	4009.2	1.492	1244.1	0.981	457.3	0.594	138.1	0.382	48.1
0.80	2.880					2.598	4623.4	1.591	1394.9	1.046	512.9	0.633	154.7	0.407	54.0
0.85	3.060					2.761	5005.9	1.691	1553.3	1.112	571.1	0.673	172.4	0.433	60.1
0.90	3.240					2.923	5540.1	1.790	1719.2	1.177	632.0	0.713	190.7	0.458	66.5
0.95	3.420					3.085	6097.9	1.890	1892.2	1.243	695.6	0.752	209.9	0.484	73.2
1.00	3.600							1.989	2072.5	1.309	761.9	0.792	229.9	0.509	80.2
1.10	3.960							2.188	2454.2	1.439	902.3	0.871	272.3	0.560	94.9
1.20	4.320							2.387	2863.8	1.570	1052.7	0.950	317.7	0.611	110.8

INSTANTOR® – TECHNICAL GUIDE

Flow rate		Pipe specification - Pressure loss at 10°C								Pipe specification - Pressure loss at 10°C					
		16mm		20mm		26mm		32mm		40mm		50mm		63mm	
L/s	[m^3/h]	Velocity [m/s]	P.loss [Pa/m]	Velocity [m/s]	P.loss [Pa/m]	Velocity [m/s]	P.loss [Pa/m]	Velocity [m/s]	P.loss [Pa/m]	Velocity [m/s]	P.loss [Pa/m]	Velocity [m/s]	P.loss [Pa/m]	Velocity [m/s]	P.loss [Pa/m]
1.30	4.680							2.586	3300.8	1.700	1213.5	1.029	366.2	0.662	127.7
1.40	5.040							2.785	3764.5	1.831	1383.9	1.109	417.7	0.713	145.6
1.50	5.400							2.984	4254.6	1.962	1564.1	1.188	472.1	0.764	164.6
1.60	5.760							3.183	4770.7	2.093	1753.9	1.267	529.3	0.815	184.7
1.70	6.120									2.224	1953.0	1.346	589.4	0.866	205.5
1.80	6.480									2.354	2161.4	1.425	652.2	0.917	227.5
1.90	6.840									2.485	2379.0	1.504	717.9	0.968	250.4
2.00	7.200									2.616	2605.6	1.584	796.3	1.019	274.2
2.10	7.560									2.747	2841.2	1.663	857.3	1.070	299.0
2.20	7.920									2.878	3085.6	1.742	931.2	1.120	324.8
2.30	8.280									3.008	3338.8	1.821	1007.6	1.171	351.4
2.40	8.640											1.900	1086.5	1.222	378.9
2.50	9.000											1.980	1168.2	1.273	407.4
2.60	9.360											2.059	1252.4	1.324	436.7
2.70	9.720											2.138	1339.1	1.375	467.1
2.80	10.080											2.217	1428.3	1.426	498.2
2.90	10.440											2.296	1520.1	1.477	530.1
3.00	10.800											2.375	1614.2	1.528	563.0
3.20	11.520											2.534	1810.0	1.630	631.2
3.40	12.240											2.692	2015.7	1.732	703.0
3.60	12.960											2.851	2230.8	1.833	778.0
3.80	13.680											3.009	2455.2	1.935	856.3
4.00	14.400													2.037	937.8
4.20	15.120													2.139	1022.7
4.40	15.940													2.241	1110.7
4.60	16.560													2.343	1201.8
4.80	17.280													2.445	1296.0
5.00	18.000													2.546	1393.4
5.20	18.720													2.648	1493.7
5.40	19.440													2.750	1597.2
5.60	20.160													2.852	1703.7
5.80	20.880													2.954	1813.1
6.00	21.600													3.056	1925.5

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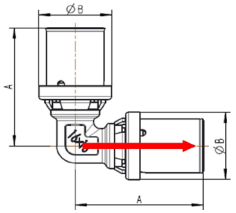
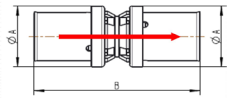
Flow rate		Pipe specification - Pressure loss at 65°C													
		16mm		20mm		26mm		32mm		40mm		50mm		63mm	
L/s	[m^3/h]	Velocity [m/s]	P.loss [Pa/m]	Velocity [m/s]	P.loss [Pa/m]	Velocity [m/s]	P.loss [Pa/m]	Velocity [m/s]	P.loss [Pa/m]	Velocity [m/s]	P.loss [Pa/m]	Velocity [m/s]	P.loss [Pa/m]	Velocity [m/s]	P.loss [Pa/m]
0.02	0.072	0.171	51.0												
0.03	0.108	0.257	104.7	0.155	31.4										
0.04	0.144	0.342	174.4	0.207	52.3	0.130	17.3								
0.05	0.180	0.428	259.2	0.258	77.7	0.162	25.7								
0.06	0.216	0.513	358.1	0.310	107.4	0.195	35.5								
0.07	0.252	0.599	470.8	0.362	141.2	0.227	46.6	0.139	14.5						
0.08	0.288	0.684	596.6	0.413	179.0	0.260	59.1	0.159	18.3						
0.09	0.324	0.770	735.3	0.465	220.5	0.292	72.9	0.179	22.6						
0.10	0.360	0.855	886.4	0.517	265.9	0.325	87.8	0.199	27.3	0.131	10.0				
0.12	0.432	1.027	1224.8	0.620	367.4	0.390	121.4	0.239	37.7	0.157	13.8				
0.14	0.504	1.198	1610.1	0.723	482.9	0.455	159.5	0.278	49.5	0.183	18.2				
0.16	0.576	1.369	2040.4	0.826	612.0	0.520	202.2	0.318	62.7	0.209	23.1				
0.18	0.648	1.540	2514.6	0.930	754.3	0.585	249.2	0.358	77.3	0.235	28.4				
0.20	0.720	1.711	3031.4	1.033	909.3	0.650	300.4	0.398	93.2	0.262	34.3				
0.25	0.900	2.139	4503.6	1.291	1350.9	0.812	446.2	0.497	138.4	0.327	50.9				
0.30	1.080	2.566	6223.4	1.550	1866.7	0.974	616.6	0.597	191.3	0.392	70.3				
0.35	1.260	2.994	8180.7	1.808	2453.8	1.137	810.6	0.696	251.5	0.458	92.5				
0.40	1.440			2.066	3109.7	1.299	1027.2	0.796	318.8	0.523	117.2	0.317	35.4	0.204	12.3
0.45	1.620			2.324	3832.4	1.461	1265.9	0.895	392.8	0.589	144.4	0.356	43.6	0.229	15.2
0.50	1.800			2.583	4620.0	1.624	1526.1	0.995	473.6	0.654	174.1	0.396	52.5	0.255	18.3
0.55	1.980			2.841	5471.1	1.786	1807.2	1.094	560.8	0.719	206.2	0.435	62.2	0.280	21.7
0.60	2.160			3.100	6384.2	1.949	2108.9	1.193	654.4	0.785	240.6	0.475	72.6	0.306	25.3
0.65	2.340					2.111	2430.6	1.293	754.2	0.850	277.3	0.515	83.7	0.331	29.2
0.70	2.520					2.273	2772.2	1.392	860.2	0.916	316.2	0.554	95.4	0.357	33.3
0.75	2.700					2.436	3133.1	1.492	972.2	0.981	357.4	0.594	107.9	0.382	37.6
0.80	2.880					2.598	3613.1	1.591	1090.1	1.046	400.8	0.633	120.9	0.407	42.2
0.85	3.060					2.761	3912.0	1.691	1213.9	1.112	446.3	0.673	134.7	0.433	47.0
0.90	3.240					2.923	4329.5	1.790	1343.5	1.177	493.9	0.713	149.0	0.458	52.0
0.95	3.420					3.085	4765.4	1.890	1478.7	1.243	543.6	0.752	164.0	0.484	57.2
1.00	3.600							1.989	1619.6	1.309	595.4	0.792	179.7	0.509	62.7
1.10	3.960							2.188	1917.9	1.439	705.1	0.871	212.8	0.560	74.2
1.20	4.320							2.387	2238.0	1.570	822.7	0.950	248.3	0.611	86.6

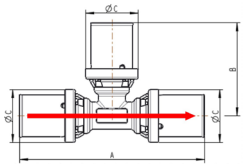
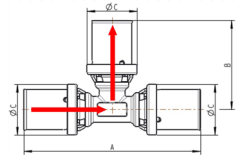
Flow rate		Pipe specification - Pressure loss at 65°C								Pipe specification - Pressure loss at 65°C					
		16mm		20mm		26mm		32mm		40mm		50mm		63mm	
L/s	[m^3/h]	Velocity [m/s]	P.loss [Pa/m]	Velocity [m/s]	P.loss [Pa/m]	Velocity [m/s]	P.loss [Pa/m]	Velocity [m/s]	P.loss [Pa/m]	Velocity [m/s]	P.loss [Pa/m]	Velocity [m/s]	P.loss [Pa/m]	Velocity [m/s]	P.loss [Pa/m]
1.30	4.680							2.586	2579.5	1.700	948.3	1.029	286.2	0.662	99.8
1.40	5.040							2.785	2941.9	1.831	1081.5	1.109	326.4	0.713	113.8
1.50	5.400							2.984	3324.9	1.962	1222.3	1.188	368.9	0.764	128.6
1.60	5.760							3.183	3728.2	2.093	1370.6	1.267	413.6	0.815	144.3
1.70	6.120									2.224	1526.2	1.346	460.8	0.866	160.8
1.80	6.480									2.354	1689.1	1.425	509.7	0.917	177.8
1.90	6.840									2.485	1859.1	1.504	561.0	0.968	195.7
2.00	7.200									2.616	2036.2	1.584	614.5	1.019	214.3
2.10	7.560									2.747	2220.3	1.663	670.0	1.070	233.7
2.20	7.920									2.878	2411.3	1.742	727.7	1.120	253.8
2.30	8.280									3.008	2609.2	1.821	787.4	1.171	274.6
2.40	8.640											1.900	849.1	1.222	296.1
2.50	9.000											1.980	912.9	1.273	318.4
2.60	9.360											2.059	978.7	1.324	341.3
2.70	9.720											2.138	1046.5	1.375	365.0
2.80	10.080											2.217	1116.2	1.426	389.3
2.90	10.440											2.296	1187.9	1.477	414.3
3.00	10.800											2.375	1261.5	1.528	440.0
3.20	11.520											2.534	1414.5	1.630	493.3
3.40	12.240											2.692	1575.2	1.732	549.4
3.60	12.960											2.851	1743.3	1.833	608.0
3.80	13.680											3.009	1918.7	1.935	669.2
4.00	14.400													2.037	732.9
4.20	15.120													2.139	799.2
4.40	15.840													2.241	868.0
4.60	16.560													2.343	939.2
4.80	17.280													2.445	1012.8
5.00	18.000													2.546	1088.9
5.20	18.720													2.648	1167.3
5.40	19.440													2.750	1248.2
5.60	20.160													2.852	1331.4
5.80	20.880													2.954	1416.9
6.00	21.600													3.056	1504.7

INSTANTOR® – TECHNICAL GUIDE

Fitting Coefficients

When water moves through a fitting, energy is lost due to wall friction and flow restriction(s). Energy is also lost when the direction of the flow is changed. Below are the flow loss coefficients

Values with Water at 15˚C and the Flow Rate at 2 m/s								
Pipe Diameter		Ø16mm	Ø20mm	Ø26mm	Ø32mm	Ø40mm	Ø50mm	Ø63mm
	Zeta	1.18	1.04	1.05	0.97	1.03	0.94	0.91
	M	0.71	0.83	1.05	1.26	1.65	1.93	2.32
	Zeta	0.74	0.60	0.60	0.52	0.54	0.49	0.46
	M	0.45	0.48	0.60	0.67	0.84	1.00	1.17

Values with Water at 15˚C and the Flow Rate at 2 m/s								
Pipe Diameter		Ø16mm	Ø20mm	Ø26mm	Ø32mm	Ø40mm	Ø50mm	Ø63mm
	Zeta	0.79	0.64	0.65	0.56	0.63	0.54	0.50
	M	0.47	0.51	0.65	0.73	1.01	1.10	1.29
	Zeta	1.70	1.55	1.56	1.47	1.54	1.45	1.41
	M	1.02	1.24	1.56	1.92	2.47	2.96	3.61

12. System Testing

Testing for Leaktightness

Testing the Instantor Press System: It is recommended to follow the procedure outlined in the European Standard and the NSAI's Standard recommendation Series S.R.50: Part 1 & Part 3: 2021.

REFERENCES:

EN806-4 2010: Specifications for installations inside buildings conveying water for human consumption

- **Part 4: Installation**
  - Section 6 Commissioning - See Table 6 EN806-4.
  - Test procedure A in accordance with 6.1.3.2.
  - Or Test Procedure B in accordance with 6.1.3.3.
  - Or Test Procedure C in accordance with 6.1.3.4.

S.R. 50-1:2021 Building Services –Code of Practice-Part 1: Water Based Heating Systems in dwellings;
- Section 17 Pre - Commissioning.

S.R. 50-3:2021 Building Services –Code of Practice-Part 3: Hot and Cold-water supply for dwellings:
- Section 19 Pre – Commissioning.

APPLICATIONS:

- Water Based Heating Systems:
  Test Pressure (TP) = 1.3x up to 1.5x MDP & using Procedure C.
- Hot & Cold Distribution Systems:
  Test Pressure (TP) = 1.1x up to 1.5x MDP & using Procedure A or B or C.

CONSIDERATIONS:

- For Hydrostatic pressure testing, the pressure gauges and recording apparatus shall have an accuracy of 0.02 MPa (0.2Bar) and shall be fitted at the lowest point in the system.
- The Systems test equilibrium temperature to be kept ≤25°C.
- A complete record of the test details shall be made and preserved.
- Where there is a temperature difference of greater than 10°C between the ambient air temperature and the water temperature, a stabilisation period of 30 mins shall be applied.

DUE CARE:

To prevent possible damage caused by water leakage during hydraulic pressure testing, an introductory pneumatic leak test shall be carried out before any hydraulic testing. The test pressure shall be a minimum of 100mBar and a maximum of 750mBar (0.75Bar) with a minimum hold period of 10 minutes. If a pressure drop is observed, the pipework shall be inspected for leaks using leak detection fluid. If the test is completed satisfactory then the installer may proceed with the Main Hydraulic Pressure test (Strength Test).

The installation must remain fully watertight.

- Further Guidance can be found within the S.R.50 Series and EN 806-4 respectively.

PROCEDURE:

- **6.1.3.2 Procedure A:**
  I. Arrange for the system to be vented.
  II. Fill the system with water, ensuring that all air is removed and seal all air vents and outlet valves.
  III. Apply the selected test pressure (TP) equal to 1.1 times the maximum design pressure (MDP) by pumping for a period of 10 min.
  IV. The test pressure must stay constant during these 10min (ΔP=o). If there is a pressure loss, the system shall be maintained at the test pressure until the obvious leaks within the system are identified.

- **6.1.3.3 Procedure B:**
  I. Arrange for the system to be vented.
  II. Fill the system with water, ensuring that all air is removed and seal all air vents and outlet valves.
  III. Apply the selected hydrostatic test pressure (TP) equal to 1.1 times the maximum design pressure (MDP) by pumping, for a period of 30mins. An inspection should be carried out to identify any obvious leaks within the system under test.
  IV. Reduce the pressure by bleeding water from the system to 0.5 times test pressure (TP).
  V. Close the bleed valve. The system will be regarded as leak-tight if the pressure maintains a value equal to or greater than 0.5 times the operating pressure for a period of 30 min after the pressure reduction. Check visually for leaks. If during that period there is a pressure drop, there will be a leak within the system. Maintain the pressure and identify the leak.

– **6.1.3.4 Procedure C:**

I. Arrange for the system to be vented.
II. Fill the system with water, ensuring that all air is removed and seal all air vents and outlet valves.
III. Apply the selected hydrostatic test pressure (TP) equal to 1.1 (or 1.3 up to 1.5x) times the maximum design pressure (MDP) by pumping, for a period of 30mins.
IV. Note the pressure after 30 min. if the pressure drop is less than 0.06 MPa (0.6 Bar), the system can be considered to have no obvious leakage. Continue the test without further pumping.
V. Check visually for leaks during the next 2 hours. If the pressure drops by more than 0.02 MPa (0.2Bar) over that period, this will indicate a leak within the system. Maintain the pressure and identify the leak, repair, and restart the testing procedure.

Leak-Tightness Test Form Form T.1

Client Name			
Job Reference / Project			
Address			
System Tested		**Section of System**	
Plant Tested			
Type of Test Required	☐ Hydraulic ☐ Pneumatic		
Test Pressure (TP)	bar/mbar	**Test Time Period**	mins
Maximum Design Pressure (mdp/mop)	bar		
Temperature During Test	˚C	**Test Environment**	
˚C Test Procedure Used	☐ A ☐ B ☐ C		
Test Start Time	˚C	**Completion Time**	

RESULTS

Any Drops in Pressure?	☐ Yes ☐ No	**Pressure After**	☐ 10 mins ☐ 30 mins
Gauge Reading	bar		
Any Visible Leaks	☐ Yes ☐ No	**Pressure After 2 Hours**	bar
		Pressure Loss Exceeded During Test Procedure C IV. 30 mins (>0.6bar)	☐ Yes ☐ No
		Pressure Loss Exceeded During Test Procedure C IV. 2 Hours (>0.2bar)	☐ Yes ☐ No
		I confirm that the System / Plant is Tight and Without Deforation	☐ Yes ☐ No
Remarks			
Report Carried Out By		**Position**	
Signed		**Date**	
Witnessed By		**Position**	
Signed		**Date**	

13. Warranty

The Instantor Press System carries a 50-year warranty. The warranty covers defects in manufacture which are attributable to our areas of responsibility.

The guarantee is only valid when the joint has been press fitted under pressure of not less than 19kN for pipe diameters of 16-40mm and 32kN for pipe diameters of 50-63mm using an Instantor Press TH-profile jaw.

This warranty is not valid if the installation was carried out by non-professionals or if the assembly instructions in our manual were not followed.

In the event of damage, this must be communicated to Sanbra Fyffe Ltd. in writing within a period of five days from the accident. Defective Instantor Press System Fittings and Pipes must be kept and made available to our technicians for the checks required in each case.

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