

Ø 12-32 mm



SYSTEM **KAN-therm**

# Catalogue

## Push Platinum Push

Reliability and Prestige

EN 02/2019



TECHNOLOGY OF SUCCESS



ISO 9001

# Contents

1	System <b>KAN-therm</b> Push / <b>KAN-therm</b> Push Platinum	
	General information.....	5
	KAN-therm Push Platinum System.....	6
	Multilayer PE-Xc/Al/PE-HD Platinum pipes .....	7
	Parameters of multilayer PE-Xc/Al/PE-HD Platinum pipes .....	7
	Multilayer PE-Xc/Al/PE-HD Platinum pipes – Physical properties .....	8
	Transport and storage.....	8
	Contact with substances containing solvents, sealing the threads.....	8
	Push Platinum connections .....	9
	Fittings for the KAN-therm Push Platinum System connections .....	9
	Plastic PVDF sliding sleeves for KAN-therm Push Platinum System joints .....	10
	Assembling Push Platinum joints .....	10
	Tools for Push Platinum joints.....	14
	Tools - Safety .....	14
	Screwed connections for PE-Xc/Al/PE-HD Platinum pipes .....	15
	Compression fittings for PE-Xc/Al/PE-HD Platinum pipes 14–18 mm .....	15
	Union connection for PE-Xc/Al/PE-HD Platinum pipes 14 – 18 mm .....	16
	Joining fittings with nickel-plated pipes with radiator fixtures .....	17
	KAN-therm Push system.....	19
	PE-RT pipes.....	21
	PE-Xc pipes .....	21
	PE-RT and PE-Xc pipes operating parameters.....	22
	PE-RT and PE-Xc pipes: Physical properties.....	23
	Transport and storage.....	23
	Contact with substances containing solvents, sealing the threads.....	23
	Push connections.....	24
	Assembly of Push connections .....	25
	Tools for Push connections.....	29
	Tools - Safety .....	29
	Screwed joints for PE-RT and PE-Xc – Ø12-32 mm .....	29
	Joining fittings with nickel-plated pipes with radiator fixtures .....	32
	Compensation of thermal elongations .....	32
	<b>System KAN-therm Push/Push Platinum - assortment .....</b>	<b>35</b>
	<b>System KAN-therm Push - diameter 18×2,0 .....</b>	<b>43</b>
	<b>KAN-therm Push/Push Platinum System - screw connections .....</b>	<b>49</b>
	<b>Tools for Push connections Push/Push Platinum .....</b>	<b>52</b>

# 1 System **KAN-therm** Push / **KAN-therm** Push Platinum

## General information

This catalogue of the KAN-therm Push System includes a new KAN-therm Push Platinum System and the standard KAN-therm Push System.

The catalogue is divided into a Technical Part and an Assortment Part:

- KAN-therm Push Platinum System Technical Part,
- KAN-therm Push System Technical Part,
- KAN-therm Push Platinum System and KAN-therm Push System common part.

The technical part includes all information required to order products and for its assembly on a construction site etc. For more details please see „KAN-therm System Designers and Contractors Guide“.

The common assortment part of the catalogue comprises:

- 1 **The KAN-therm Push Platinum System used for water supply systems and heating systems and comprising:**
  - PE-Xc/Al/PE-HD Platinum multilayer pipes within the range of 14-32 mm diameters,
  - PPSU plastic fittings and brass fittings for PE-Xc, PE-RT and PE-Xc/Al/PE-HD Platinum pipes.
- 2 **The KAN-therm Push System used for water supply systems and heating systems and comprising two material configurations of pipes and fittings:**
  - PE-Xc pipes with an anti-diffusion barrier within a range of diameters 12–32 mm,
  - PE-RT pipes with an anti-diffusion barrier within a range of diameters 12–32 mm,
  - PPSU plastic fittings and brass fittings for PE-Xc, PE-RT and PE-Xc/Al/PE-HD Platinum pipes.
- 3 **Push System fittings – diameter 18×2**
- 4 **Screwed joints for 12–32 mm diameters PE-Xc and PE-RT pipes.**
- 5 **Tools for assembling KAN-therm Push System pipes and fittings.**
- ! **CAUTION!!!**

PE-Xc and PE-RT pipes with the anti-diffusion barrier in diameters 16×2 and 20×2 designed mainly for underfloor heating and manifold-based heating systems are available in the catalogue KAN-therm System: Screwed joints and KAN-therm System – Surface heating.

## KAN-therm Push Platinum System

The KAN-therm Push Platinum System is a modern and complete system consisting of multilayer PE-Xc/Al/PE-HD Platinum pipes and standard KAN-therm Push fittings made of PPSU or brass, within a diameter range of 14-32 mm.



Push Platinum System leak-tight joints without O-Rings are made by pushing a plastic sleeve onto a fitting and a pipe. These connections do not require additional sealing like a PTFE tape or tow. The system is complemented by manifolds and installation cabinets available in section Manifolds, cabinets and accessories.

The latest plastic material invention PPSU – phenylene polysulfone – used for fittings production ensures:

- full resistance against corrosion,
- full neutrality against potable water,
- durability of fittings higher than that of pipes,
- high mechanical strength.

**The technology of making PPSU fittings practically excludes possible occurrence of hidden defects.**

Due to a perfect design of parts of the KAN-therm Push Platinum System and their mutual matching, provides:

- over a 50-years operation lifetime,
- high temperature operation –  $T_{op} = 80^{\circ}\text{C}$  (operating temperature),  $T_{max} = 90^{\circ}\text{C}$  (max. temperature the heat source must be protected against a temperature rise above that level),
- extremely durable PPSU joints with the max. operating temperatures limited by the pipe life,
- absolutely no corrosion irrespective of the water quality.

The KAN-therm Push Platinum System allows for a selection of best solutions both in technical and cost terms as:

- joints can be hidden in screed and under plaster,
- possibility of connecting with systems made of other materials,
- possible cost-saving distribution systems.

The KAN-therm Push Platinum System guarantees full safety of assembly and operation:

- PPSU fittings are made according to PN-EN ISO 15875-3:2005 and PN-EN ISO 22391-3:2010, and obtains hygiene certificates by PZH,
- brass „Push“ type fittings conform to PN-EN 1254-3:2004, and obtains hygiene certificates by PZH,
- multilayer PE-Xc/Al/PE-HD Platinum pipes conform to PN-EN ISO 21003 and obtains hygiene certificates by PZH.

## Multilayer PE-Xc/Al/PE-HD Platinum pipes

PE-Xc/Al/PE-HD Platinum pipes are manufactured as multilayer pipes, where the base-pipe is made of the PE-Xc polyethylene subjected to molecular crosslinking by an electron beam. Laser-welded aluminium layer provides a complete protection against oxygen diffusion and significantly lowers the thermal expansion of a pipe. An external coating of the high density polyethylene PE-HD protects the aluminium layer against a mechanical damage. Due to their design, pipes do not have the 'shape memory' and can be given any shape.

Assortment of PE-Xc/Al/PE-HD Platinum pipes:

- PE-Xc/Al/PE-HD Platinum multilayer pipes according to PN-EN ISO 21003-2 standard – in dia. 14, 18, 25, 32 mm.

Dimensions, application and water volumes of multilayer PE-Xc/Al/PE-HD Platinum pipes:

Rated diameter DN	OD [mm]	Wall thickness [mm]	For installation	Water volume [dm <sup>3</sup> /m]
14	14	2.25	central heating tap cold and hot water	0.071
18	18	2.5		0.133
25	25	3.7		0.243
32	32	4.7		0.401

## Parameters of multilayer PE-Xc/Al/PE-HD Platinum pipes

Operating parameters of multilayer PE-Xc/Al/PE-HD Platinum pipes acc. to PN-EN ISO 21003-2:

Installation and application class (acc. to ISO 10508)	Nominal dia. DN	External diameter [mm]	Wall thickness [mm]	Operating parameters		Type of connections	
				P <sub>op</sub> [bar]	T <sub>op</sub> / T <sub>max</sub> [°C]	Push (with sliding sleeve)	Screwed (threaded)
Tap cold water	14	14	2.25	10	20	+	+
	18	18	2.5	10	20	+	+
	25	25	3.7	10	20	+	-
	32	32	4.7	10	20	+	-
Tap hot water (class 1)	14	14	2.25	10	60/80	+	+
	18	18	2.5	10	60/80	+	+
	25	25	3.7	10	60/80	+	-
	32	32	4.7	10	60/80	+	-
Tap hot water (class 2)	14	14	2.25	10	70/80	+	+
	18	18	2.5	10	70/80	+	+
	25	25	3.7	10	70/80	+	-
	32	32	4.7	10	70/80	+	-
Underfloor heating, radiator heating – low temperature (class 4)	14	14	2.25	10	60/70	+	+
	18	18	2.5	10	60/70	+	+
	25	25	3.7	10	60/70	+	-
	32	32	4.7	10	60/70	+	-

Installation and application class (acc. to ISO 10508)	Nominal dia. DN	External diameter [mm]	Wall thickness [mm]	Operating parameters		Type of connections	
				P <sub>op</sub> [bar]	T <sub>op</sub> / T <sub>max</sub> [°C]	Push (with sliding sleeve)	Screwed (threaded)
Radiator heating (class 5)	14	14	2.25	10	80/90	+	+
	18	18	2.5	10	80/90	+	+
	25	25	3.7	10	80/90	+	-
	32	32	4.7	10	80/90	+	-

Operating temperature T<sub>op</sub> for individual classes shall be regarded as a design temperature, the maximal temp. - T<sub>max</sub> - as a temperature, which should not be exceeded – the system must be protected against it.

## Multilayer PE-Xc/Al/PE-HD Platinum pipes – Physical properties

Property	Symbol	Unit	PE-Xc/Al/PE-HD
Linear extension coefficient	$\alpha$	mm/m × K	0.025
Thermal conductivity	$\lambda$	W/m × K	0.4
Density	$\rho$	g/cm <sup>3</sup>	0.95
Module E	E	N/mm <sup>2</sup>	2950
Minimum bend radius	R <sub>min</sub>	mm	5 × D 3 × D (with a spring)
Internal wall roughness	k	mm	0.007

## Transport and storage

Multilayer PE-Xc/Al/PE-HD Platinum pipes are delivered in 25, 50, 200 m coils in carton packages. They can be stored in different temperatures, also below 0°C. Due to vulnerability to UV rays, pipes should be protected against direct, long-lasting exposure to sunlight.

## Contact with substances containing solvents, sealing the threads

- Avoid direct contact of KAN-therm elements with solvents or solvent-containing materials, such as paints, aerosols, montage foams, adhesives, etc. Under unfavorable circumstances, these substances may damage plastic parts.
- Make sure that the connection sealants, cleaners or insulation of System KAN-therm components, do not contain compounds that cause stress cracks: ammonia, ammonia retaining compounds, solvents, aromatic or chlorinated hydrocarbons (e.g., ketones and ethers). Do not use montage foams based on methacrylate and acrylate isocyanate.
- Secure the pipes and fittings from direct contact with the adhesive strips and adhesives for isolation. Apply the adhesive tapes only on external surface of the thermal insulations.
- For the threaded connections it is recommended to use hemp in an amount such that the tops of the thread are still visible. Using too much hemp may damage the thread. Winding hemp just after first turn of the thread helps to avoid diagonal screwing and thread damage.



### CAUTION!!!

Do not use chemical sealants and adhesives.

## Push Platinum connections

Performing Push Platinum connection consist in sliding plastic sleeve over the pipe and fitting with hand operated, hydraulic or electric machine.

### Fittings for the KAN-therm Push Platinum System connections

To perform connections with the KAN-therm Push Platinum pipes, standard KAN-therm Push PPSU System fittings and brass fittings are used.



- elbows and tees,
- elbows, tees and other fittings with nickel-plated Ø15 mm copper pipes,



- couplings, Platinum eurocone adapters, male and female connectors,
- wallplate elbows,
- other.

## Plastic PVDF sliding sleeves for KAN-therm Push Platinum System joints

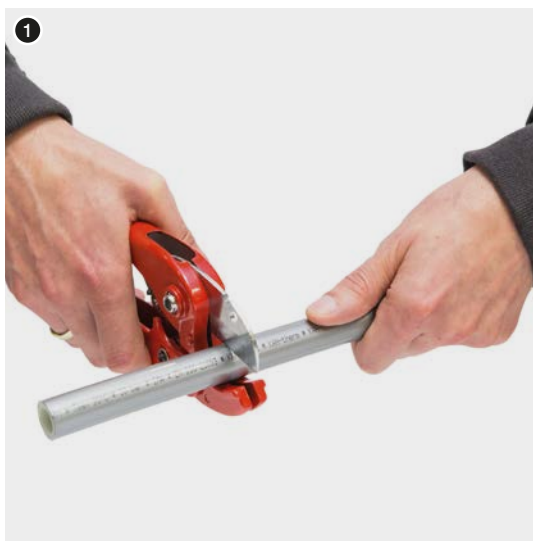
To seal KAN-therm Push Platinum System connection of a pipe and a fitting, only plastic PVDF sliding sleeves in diameters 14 - 32 mm are used. These sleeves can also be used for connection with homogeneous pipes PE-Xc and PE-RT of KAN-therm Push system. Plastic sleeves are symmetrical and do not require positioning on the pipe.



### Assembling Push Platinum joints

**1.** Cut a Multilayer PE-Xc/Al/PEHD Platinum pipe to a required length with scissors. The cut must be perpendicular to the pipe axis.

**2.** Put the sleeve onto a pipe. Plastic sleeves are symmetrical and do not require positioning on the pipe. Select the sleeve properly to the pipe diameter.



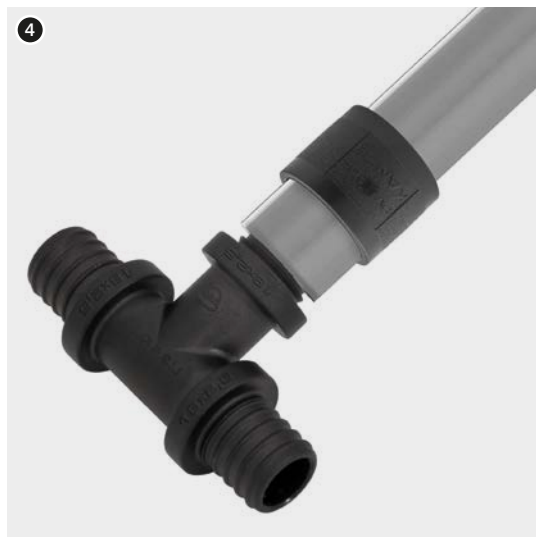
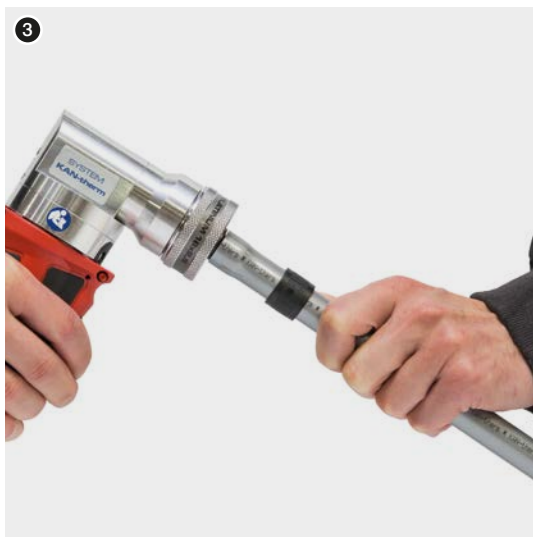
**!** **CAUTION!** For cutting use only sharp blades.

**3.** Insert the expanding head axially to the pipe axis for its full length. The pipe expansion should be done by using the manual or battery-powered expander.

In case of "ONE STEP" expanding heads, perform expansion in one step utilizing full stroke of the expander.

Note: in temperatures below 0°C expansion should always be carried out in three phases, regardless of the type of heads.

**4.** Insert the fitting into a pipe up to the last bead on the fitting.



**!** **CAUTION!** For expanding use only Push Platinum expanding heads.

If the pipe is excessively expanded, the pipe material may build up during the connection. In this case, stop sliding the plastic sleeve on the pipe in front of the retaining ring (keep a distance of approx. 2 mm from the fitting flange).



5. Slide the sleeve with a hand/hydraulic or electric machine Grip fittings only at their flange. Do not slide two sleeves at the same time.

6. Observe assembling process - after sliding the sleeve up to fittings flange, the whole process should be stopped. The connection is ready for pressure test.



#### CAUTION:

While performing connections in the Push Platinum system, attention should be paid to the correct positioning of the tool inserts. Place the forks and inserts at full depth and perpendicullary to the connected elements. Do not sway the tool from side to side while making connections.

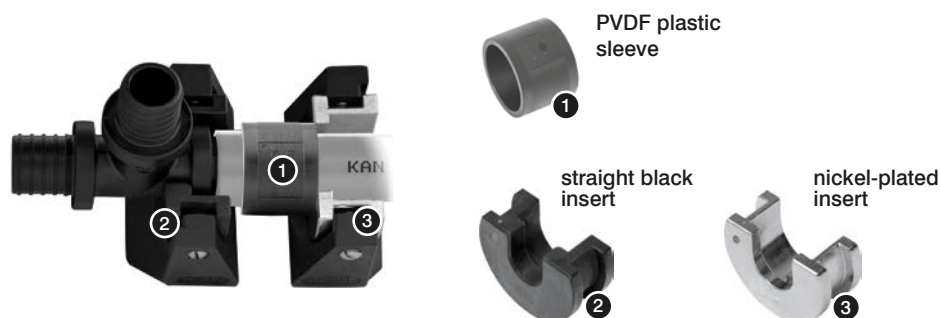


Pay attention to the correct position of the PPSU fittings in the tool forks. In the event of non-compliance with this rule, the fittings and the components of the connection may be mechanically overloaded.

There is possibility of performing Push connections at temperatures below 0° under additional conditions given in KAN-therm System Designers and Contractors guide.

**! CAUTION!**

- 1** For assembly of a PPSU fittings in diameter range 12-25 mm use only at the side of a fitting black inserts marked T (14, 18 or 25), and at the sleeve side straight nickel-plated inserts. The PPSU fitting shall be supported at its flange directly next to the stub pipe onto which the sleeve is being pushed.



- 2** In the case of 32 mm PPSU fittings, a straight nickel-plated insert Ø25 mm must be used to support the fitting and bare machine fork at the sleeve side.



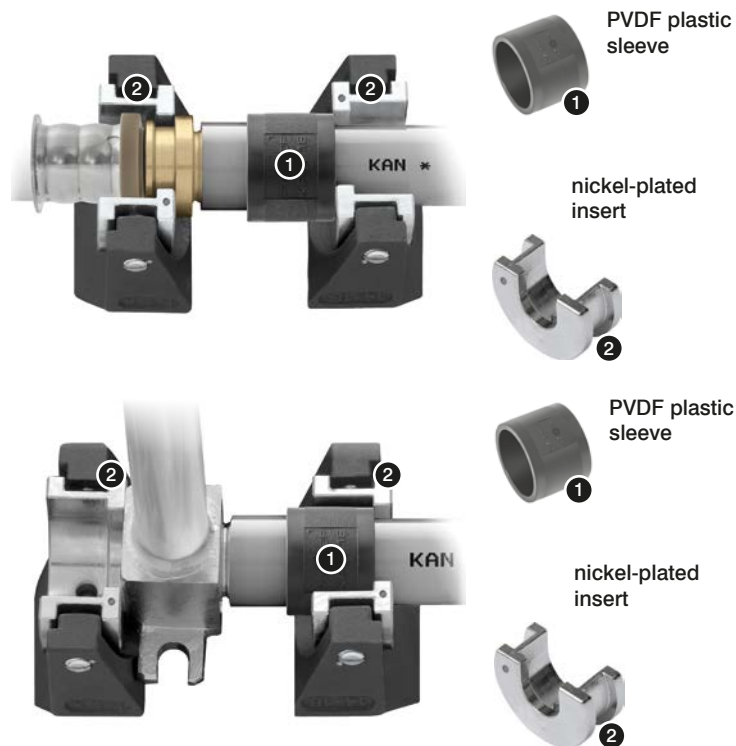
- 3** For assembly brass fittings in the diameter range Ø12 - 25 mm, use straight nickel-plated inserts at both sides (fitting and sleeve).



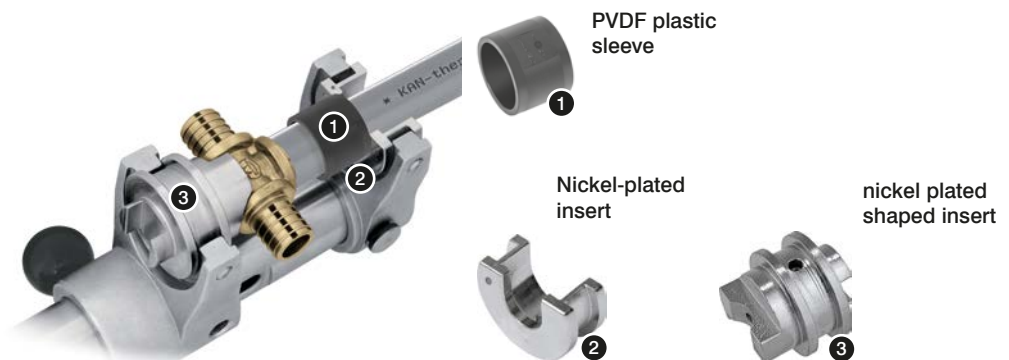
- 4** For threaded connectors Ø 32 mm use only bare jaws (without inserts).



- 5 In the case of installation of the other brass elements, e.g. fittings with threads, tap connectors (with the exception of angle tap connectors) and connection fittings to radiators you should also use straight nickel plated inserts.

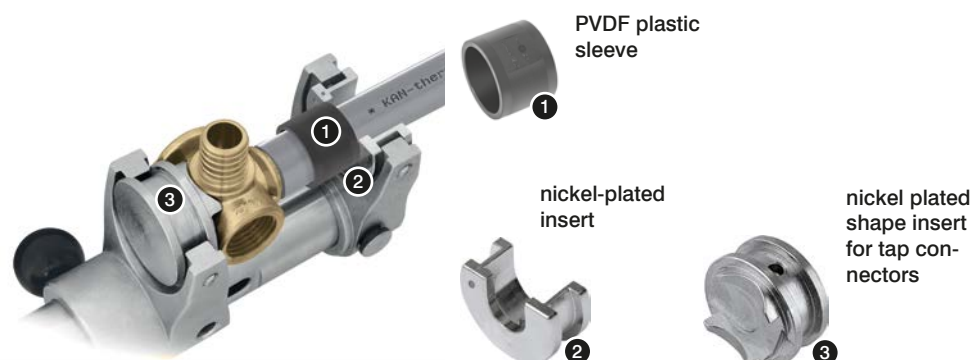


- 6 For brass tee fittings with shortened construction on branch Ø14, 18, 25 mm, use shaped nickel plated inserts at the element side. At the sleeve side use straight nickel plated inserts.



- ! **Caution: Shaped inserts are not compatible with hand chain crimping tools.**

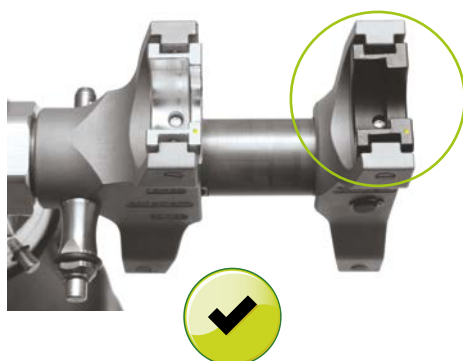
- 7 For brass angular wallplate elbows Ø18 mm, use nickel plated insert for wallplate elbows at the fitting side. At the sleeve side use straight nickel plated inserts.



## ! CAUTION!

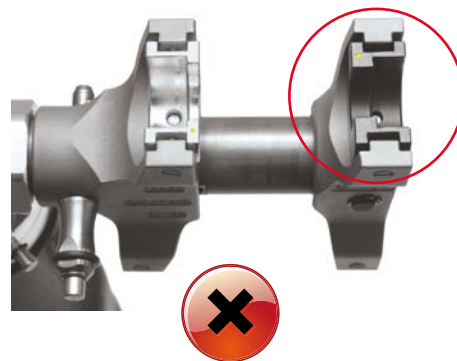
The presented above shaped inserts for brass fittings are not a standard part of tool kits, please order them separately. Shaped inserts are not compatible with hand chain crimping tools.

### Novopress tool (battery driven)



**Correct way of mounting inserts on machine forks.**

Diameter range 14 do 25 mm.



**Incorrect way of mounting inserts on machine forks.**

Diameter range 14 do 25 mm.

## Tools for Push Platinum joints

To perform a joint in the KAN-therm Push Platinum System use KAN-therm Push System tools. Tools must be provided with expanding heads for multilayer PE-Xc/Al/PE-HD Platinum pipes.

It is possible to use the complete set of hand tools for mounting of KAN-therm Push Platinum system, fitted as standard with expansion heads for Platinum pipes.

## Heads for Push Platinum joints

For connections in the KAN-therm Push Platinum system use standard tool sets the of KAN-therm Push system, supplemented by Push Platinum heads.

Push Platinum expanding heads  
„One Step“ – 14, 18, 25, 32  
(1 piece each)



## Tools - Safety

All tools must be applied and used in accordance with their purpose and the manufacturer's instructions.

Use for other purposes or in other areas are considered to be inconsistent with the intended use.

Intended use also requires compliance with the instructions, conditions of inspection and maintenance and relevant safety regulations in their current version.

All works done with tools, which do not meet the application compatible with the intended purpose may result in damage to tools, accessories and pipes. The consequence may be the leak and / or damage.

## Screwed connections for PE-Xc/Al/PE-HD Platinum pipes

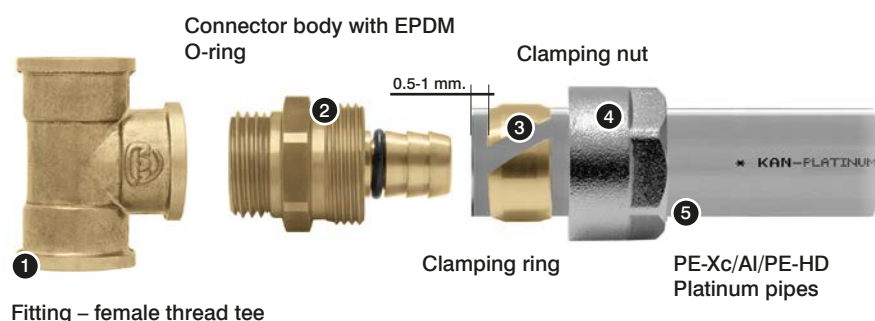
Screwed connections in System KAN-therm Push Platinum may be carried out by:

- Compression fittings for PE-Xc/Al/PE-HD Platinum pipes,
- Eurocone adapters for PE-Xc/Al/PE-HD Platinum pipes.

### Compression fittings for PE-Xc/Al/PE-HD Platinum pipes 14–18 mm

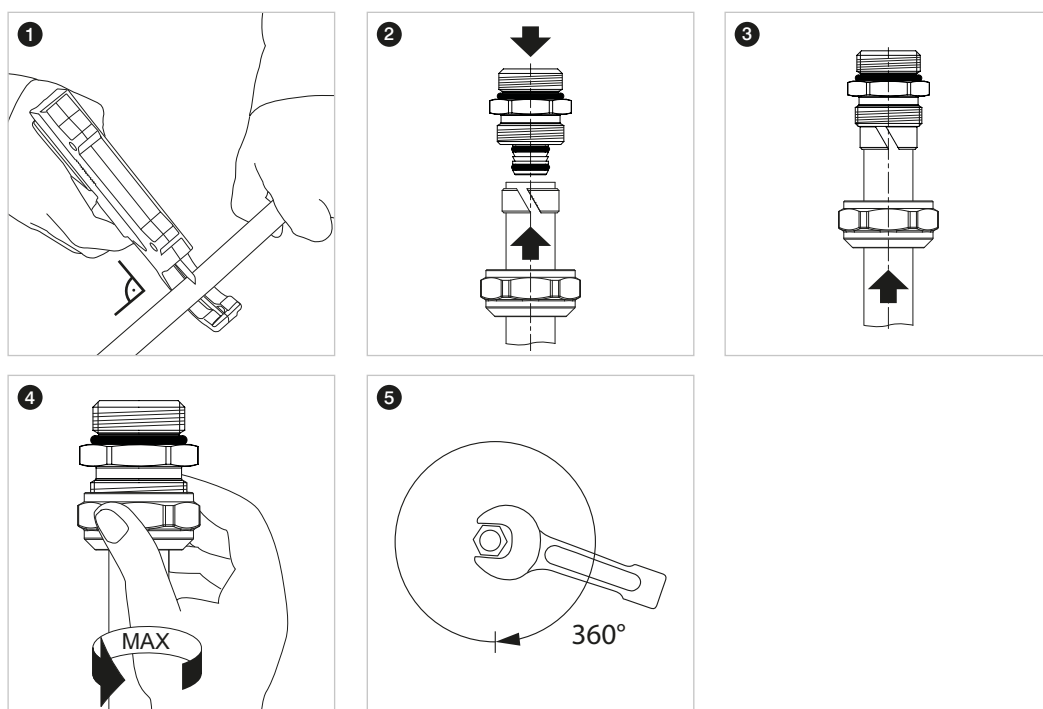
Assembling of a screwed joint:

- 1 Screw the joint body into a fitting provided with a sealed thread.
- 2 Fit the nut and the compression ring on a pipe.
- 3 Push a pipe onto the coupling body and screw on a ring-clamping nut.



Fit a compression ring onto a pipe so that the ring edge is 0,5 - 1 mm away from the pipe edge. A pipe should be pushed to the end of the pipe connectors body. This connection may be taken apart - after the connector body is pulled out of a pipe you should cut away the used pipe end and you may create a new connection.

Do not turn a fitting on a pipe during assembly and after it and do not use any lubricants to push a pipe easier onto a fitting body.



Screwed joints can be combined with:

- female threaded fittings like elbows, tees, wallplate elbows, manifolds without a nipple,
- female thread fixtures.

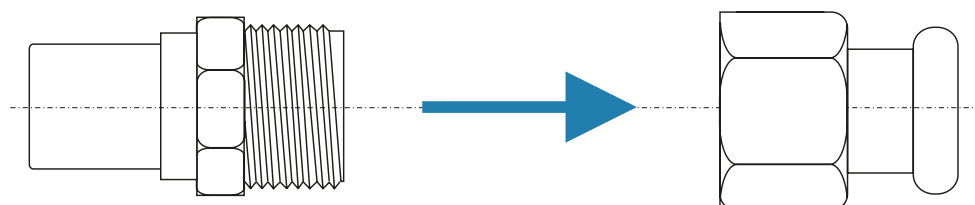


#### Seal these connections:

- Use tow and paste for sealing threads, noting that in the event of female brass threads you should not use too much tow,
- do not conceal in floors and under the plaster.

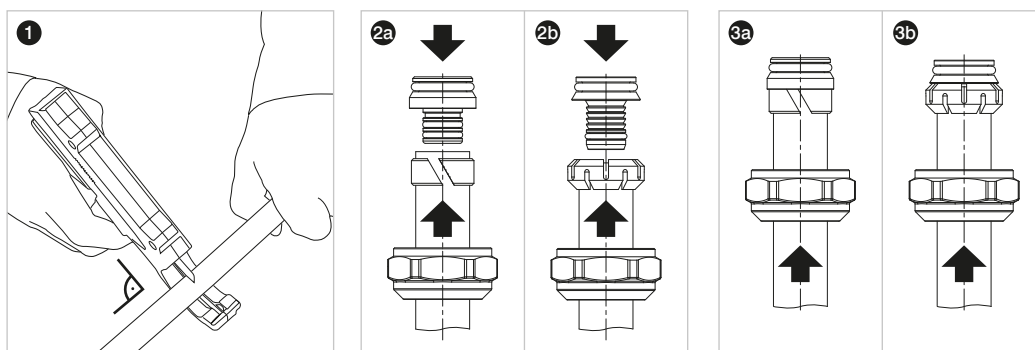
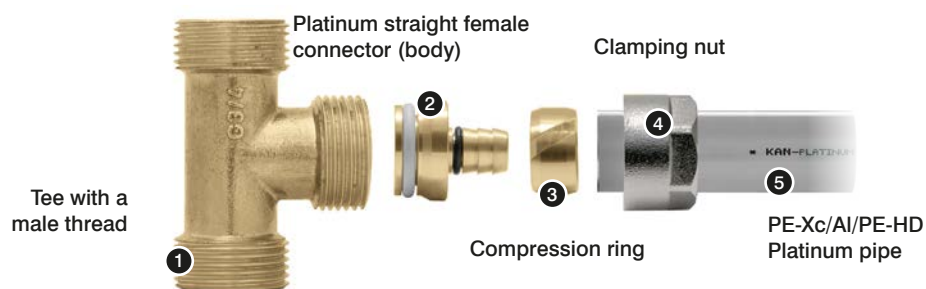
KAN-therm brass male thread connector

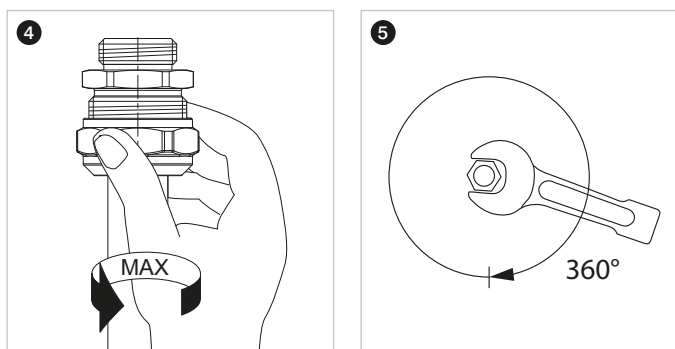
Female steel connector



### Union connection for PE-Xc/Al/PE-HD Platinum pipes 14 – 18 mm

Union connectors in the KAN-therm Push Platinum System are the only permissible form of union connections. The range of diameters for the KAN-therm Push Platinum union connectors is 14 – 18 mm.





Push Platinum screwed joints (with a white O-Ring) for Eurocone connections can be combined with:

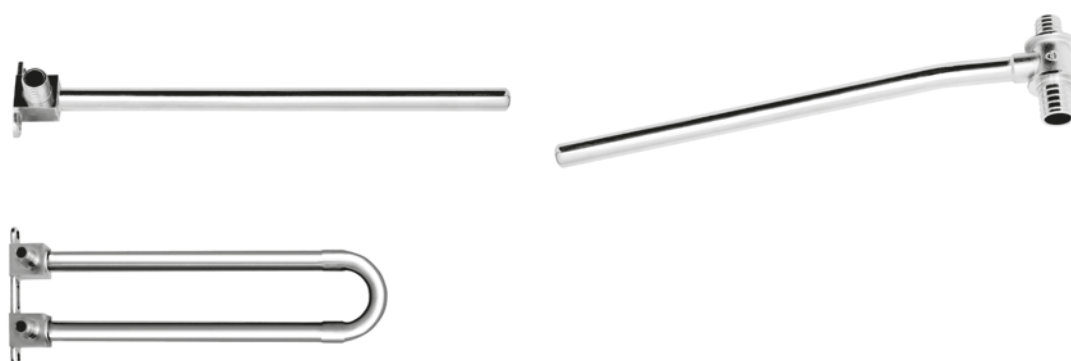
- fittings for screwed joints with a male thread (series of fittings 9012),
- manifolds equipped with special nipples,
- combined radiator valves.



This kind of joints is self-sealing and no additional sealing like PTFE tape or tow should be used. Connections must be easily accessible.

## Joining fittings with nickel-plated pipes with radiator fixtures

For good looks of a KAN-therm radiator connection both from a floor or a wall we offer special fittings with nickel-plated copper pipes.



Elbows and tees with nickel plated pipe should be connected with radiator valves and directly with VK type radiators utilizing connectors for Ø15 mm nickel plated copper pipes (please refer to chapter "manifolds, cabinets and supplementary elements").

All joints of this kind are self-sealing and no additional sealing is needed.



## Compensation of thermal elongation

The elongation ( $\Delta L$ ) due to temperature  $\Delta T$  change can be determined according to the following formula:

$$\Delta L = \alpha \times L \times \Delta T$$

where:

$\alpha$  – coefficient of linear expansion [mm/mK]

$L$  – length of pipeline section [m]

$\Delta T$  – temperature difference (assembly and operation) [K]

Required length of an flexible arm is determined from the formula:

$$L_s = K \times \sqrt{D_z \times \Delta L}$$

where::

$K$  – material constant = 36

$D_z$  – external diameter [mm]

$L_s$  – length of the elastic arm [mm]

In the case of flush-mounted installation within 14-25 mm diameters, lead the pipes with light curves (with 10% excess in relation to the straight line), which allows you to achieve self-compensation of pipeline thermal elongations.



To eliminate the phenomenon of excessive fittings mechanical load with bending force, it is forbidden to bend pipes at a distance of less than 10 external diameter from the fitting itself.





## KAN-therm Push system

The KAN-therm Push System is a complete system consisting of PE pipes PE-Xc or PE-RT and PPSU fittings or brass fittings within a diameter range Ø12-32 mm.



A KAN-therm Push System leak-tight joints without O-Rings are made by pushing a brass or plastic sleeve onto a fitting and a pipe. These joints do not require additional sealing like a PTFE tape or tow. Other complementing elements of the system are manifolds and installation cabinets.

The KAN-therm Push System was designed on a rule „fast assembly – permanent effect“ thus investment and finishing work can be substantially speed up.

## Modern technology

The latest plastic material invention PPSU – phenylene polysulfone – used for joints ensures:

- full resistance against corrosion,
- full neutrality against potable water,
- durability of fittings higher than that of pipes,
- high mechanical strength.

The technology of making PPSU fittings practically excludes possible occurrence of hidden defects.

## Technology for many years

Due to a perfect design of parts of the KAN-therm Push System and their matching merits as follows are achieved:

- over a 50-year operation life,
- possible operation at high temperatures –  $T_{op} = 80^{\circ}\text{C}$  (operating temperature),  $T_{max} = 90^{\circ}\text{C}$  (max. temperature – the heat source must be protected against a temperature rise above that level),
- extremely durable PPSU fittings the max. operating parameters are limited by the pipe life,
- absolutely no corrosion irrespective of the water quality.

## Optimum technology

The KAN-therm Push System allows for a selection of best solutions both in technical terms and cost terms as:

- Push joints can be hidden in floors,
- possible connecting with systems made of other materials,
- possible cost-saving distribution systems.

## Safe technology

The KAN-therm Push System guarantees full safety of assembly and operation:

- „Push“ type fittings made of PPSU conform to PN-EN ISO 15875-3:2005 and PN-EN ISO 22391-3:2010 and obtains hygiene certificates by PZH,
- PE-RT pipes conform to PN-EN ISO 22391-2:2010 and obtains hygiene certificates by PZH,
- PE-Xc pipes conform to PN-EN ISO 15875-2:2005 and obtains hygiene certificates by PZH,
- a 10-year guarantee for the Push system.

## PE-RT pipes

PE-RT pipes of the KAN-therm Push System are made of a high thermal resistance polyethylene.

### Assortment of PE-RT pipes:

- PE-RT pipes with an anti-diffusion barrier EVOH, series: Ø12×2; Ø14×2; Ø18×2\*; Ø18×2,5; Ø25×3,5; Ø32×4,4 for central heating systems and hot and cold tap water systems.
- PE-RT pipes with anti-diffusion barrier are also available with 6 mm insulation.



### KAN-therm Push pipes: dimensions, application and water volumes:

OD [mm]	Wall thickness [mm]	EVOH shield	For installation	Water volume [dm³/m]
12	2.0	yes	c.h. / t. c.w. & h.w.	0.050
14	2.0	yes	c.h. / t. c.w. & h.w.	0.079
18*	2.0	yes	c.h. / t. c.w. & h.w.	0.154
18	2.5	yes	c.h. / t. c.w. & h.w.	0.133
25	3.5	yes	c.h. / t. c.w. & h.w.	0.254
32	4.4	yes	c.h. / t. c.w. & h.w.	0.423

The EVOH (ethylene-vinyl alcohol) coating is applied directly on the base pipe and bound with it with a layer of glue. This coating satisfies the DIN 4726 requirements.

## PE-Xc pipes

KAN-therm Push System PE-Xc pipes are manufactured from a high-density polyethylene and are subjected to cross-linking with an electron beam („c” – a physical method, without using chemical agents).

### Assortment of PE-Xc pipes:

- PE-Xc pipes with the EVOH anti-diffusion barrier, series: Ø12×2; Ø14×2; Ø18×2\*; Ø18×2,5; Ø25×3,5; Ø32×4,4 for central heating and hot and cold tap water systems.
- PE-Xc pipes with anti-diffusion barrier are also available with 6 mm insulation.



### Dimensions of KAN-therm Push System PE-Xc pipes, their application and water volumes:

OD [mm]	Wall thickness [mm]	EVOH coating	Installation	Water volume [dm³/m]
12	2.0	yes	central heating tap cold and hot water	0.050
14	2.0	yes		0.079
18*	2.0	yes		0.154
18	2.5	yes		0.133
25	3.5	yes		0.254
32	4.4	yes		0.423

The EVOH (ethylene-vinyl alcohol) coating is applied directly on the base pipe and bound with it with a layer of glue. This coating satisfies the DIN 4726 requirements.

## PE-RT and PE-Xc pipes operating parameters

PE-RT pipes acc. to PN-EN ISO 22391-2:2010 and PE-Xc pipes acc. to PN-EN ISO 15875-2:2004: Operating parameters:

Installation and application class (acc. to ISO 10508)	Nominal diameter dn [mm]	Wall thickness [mm]	EVOH coating	Operating parameters			Connection type	
				P <sub>op</sub> [bar]		T <sub>op</sub> /T <sub>max</sub> [°C]	Push	Screwed
Cold tap water	12	2	yes	10	10	20	+	+
	14	2	yes	10	10	20	+	+
	18	2.5	yes	10	10	20	+	+
	25	3.5	yes	10	10	20	+	+
	32	4.4	yes	10	10	20	+	+
Hot tap water (class 1)	12	2	yes	10	10	60/80	+	+
	14	2	yes	10	10	60/80	+	+
	18	2.5	yes	10	10	60/80	+	+
	25	3.5	yes	10	10	60/80	+	+
	32	4.4	yes	10	10	60/80	+	+
Hot tap water (class 2)	12	2	yes	10	10	70/80	+	+
	14	2	yes	10	10	70/80	+	+
	18	2.5	yes	10	10	70/80	+	+
	25	3.5	yes	10	10	70/80	+	+
	32	4.4	yes	10	10	70/80	+	+
Underfloor heating, low temperature radiator heating (class 4)	12	2	yes	10	10	60/70	+	+
	14	2	yes	10	10	60/70	+	+
	18*	2	yes	10	8	60/70	+	+
	18	2.5	yes	10	10	60/70	+	+
	25	3.5	yes	10	10	60/70	+	+
	32	4.4	yes	10	10	60/70	+	+
Radiator heating (class 5)	12	2	yes	10	10	80/90	+	+
	14	2	yes	10	8	80/90	+	+
	18*	2	yes	8	6	80/90	+	+
	18	2.5	yes	10	8	80/90	+	+
	25	3.5	yes	10	8	80/90	+	+
	32	4.4	yes	10	8	80/90	+	+

Operational temperature, T<sub>op</sub>, in individual classes should be treated as design temperature, and the maximum temperature, T<sub>max</sub>, as the temperature against which all installations should be protected.

## PE-RT and PE-Xc pipes: Physical properties

Property	Symbol	Unit	PE-Xc	PE-RT
Linear extension coefficient	$\alpha$	mm/m $\times$ K	0,14 (20 °C) 0,20 (100 °C)	0.18
Thermal conductivity	$\lambda$	W/m $\times$ K	0.35	0.41
Density	$\rho$	g/cm <sup>3</sup>	0.94	0.933
Module E	E	N/mm <sup>2</sup>	600	580
Tensile stretch		%	400	1000
Minimum bend radius	Rmin		5 $\times$ D	5 $\times$ D
Internal wall roughness	k	mm	0.007	0.007

## Transport and storage

PE-RT and PE-Xc pipes are delivered in coils 25, 50, 200 m in cardboard packages. They can be stored at different temperatures also below 0°C. As these pipes are sensitive to UV radiation protect them against a long-term sun radiation.

## Contact with substances containing solvents, sealing the threads

- Avoid direct contact of KAN-therm elements with solvents or solvent-containing materials, such as paints, aerosols, montage foams, adhesives, etc. Under unfavorable circumstances, these substances may damage plastic parts.
- Make sure that the connection sealants, cleaners or insulation of System KAN-therm components, do not contain compounds that cause stress cracks: ammonia, ammonia retaining compounds, solvents, aromatic or chlorinated hydrocarbons (e.g., ketones and ethers). Do not use montage foams based on methacrylate and acrylate isocyanate.
- Secure the KAN-therm System elements against contact with adhesive strips and adhesives for insulation. Apply the adhesive tapes only on external surface of the thermal insulations.
- For the threaded connections it is recommended to use hemp in an amount such that the tops of the thread are still visible. Using too much hemp may damage the thread. Winding hemp just after first turn of the thread helps to avoid diagonal screwing and thread damage.



### CAUTION!

Do not use chemical sealants and adhesives.

## Push connections

A Push type connection is made by pushing a brass sleeve or a plastic onto a pipe and a fitting with the help of a hand, hydraulic or battery-driven machine.



Fittings for Push connections:



- elbows and tees,
- elbows, tees and other fittings with nickel-plated pipes Ø15mm,
- connectors, screwed couplings, male thread and female thread connectors,
- wallplate elbows,
- other fittings.

PVDF plastic sleeve for Push connections:



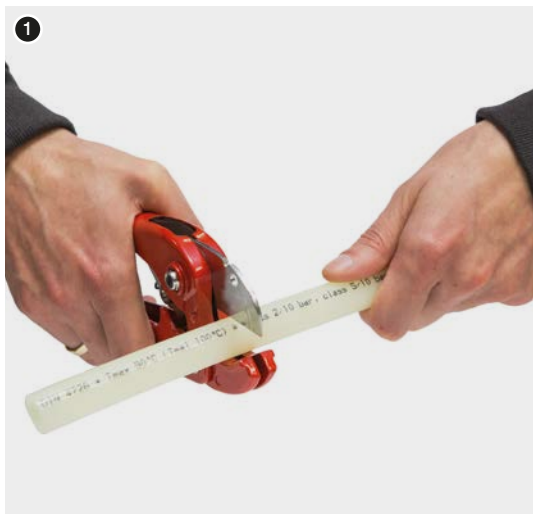
Brass sleeve for Push connections:



## Assembly of Push connections

**1.** Cut a PE-RT or PE-Xc pipe to a required length with scissors. A cut shall be perpendicular to the pipe axis. For cutting use only sharp blades.

**2.** Put the sleeve onto the pipe. In case of brass sleeve with its chamfered edge toward the fitting. Plastic sleeves are symmetrical and do not require positioning. Select the sleeve appropriately to the pipe diameter.



**3.** Insert the expanding head axially to the pipe axis for its full length. Expand the pipe with a hand or electric expanding tool. In both cases the pipe should be expanded: the pipe should be expanded in three phases. First two expansions should not be full, and the expander should be rotated in relation to the pipe by 30° and 15°. Third expansion should be full.



**4.** Insert the fitting into a pipe up to the last bead on the fitting.

If the pipe is excessively expanded, the pipe material may build up during the connection. In this case, stop sliding the sleeve on the pipe in front of the retaining ring (keep a distance of approx. 2 mm from the fitting flange).

**5.** Slide the sleeve with a hand/hydraulic or electric machine. Grip fittings only at their flange. Do not slide two sleeves at the same time.

**6.** Observe assembling process - after sliding the sleeve up to fittings flange, the whole process should be stopped. The connection is ready for pressure test.

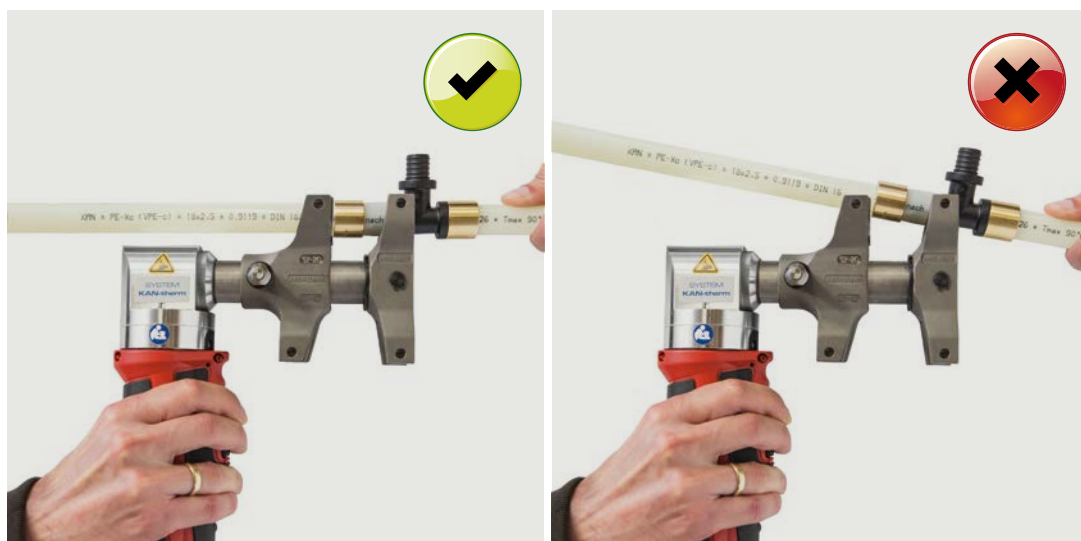






### CAUTION:

While performing connections in the Push system, attention should be paid to the correct positioning of the tool inserts. Place the forks and inserts at full depth and perpendicularly to the connected elements. Do not sway the tool from side to side while making connections.



Pay attention to the correct position of the PPSU fittings in the tool forks. In the event of non-compliance with this rule, the fittings and the components of the connection may be mechanically overloaded.

There is possibility of performing Push connections at temperatures below 0°C under additional conditions given in KAN-therm System Designers and Contractors guide.

1

For assembly of PPSU plastic fittings in diameter range 12-25 mm, at the fitting side you must use black inserts marked T (12, 14, 18 or 25), and on the sleeve side straight, nickel-plated inserts. A PPSU fitting must be supported by the collar directly next to the stub pipe you push the sleeve onto.



2

In the case of 32 mm PPSU fittings, a straight nickel-plated insert Ø25 mm must be used to support the fitting and bare machine fork at the sleeve side.

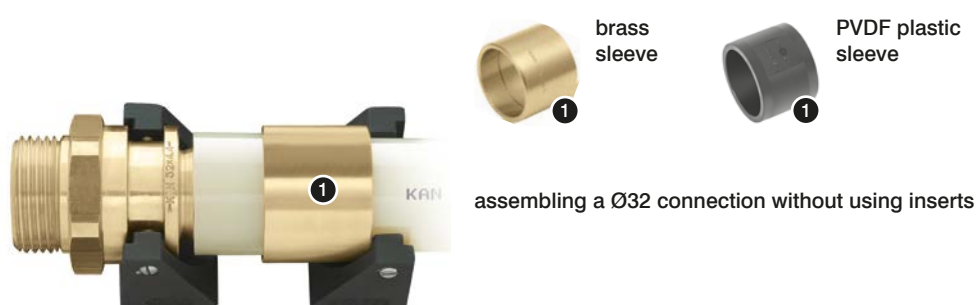




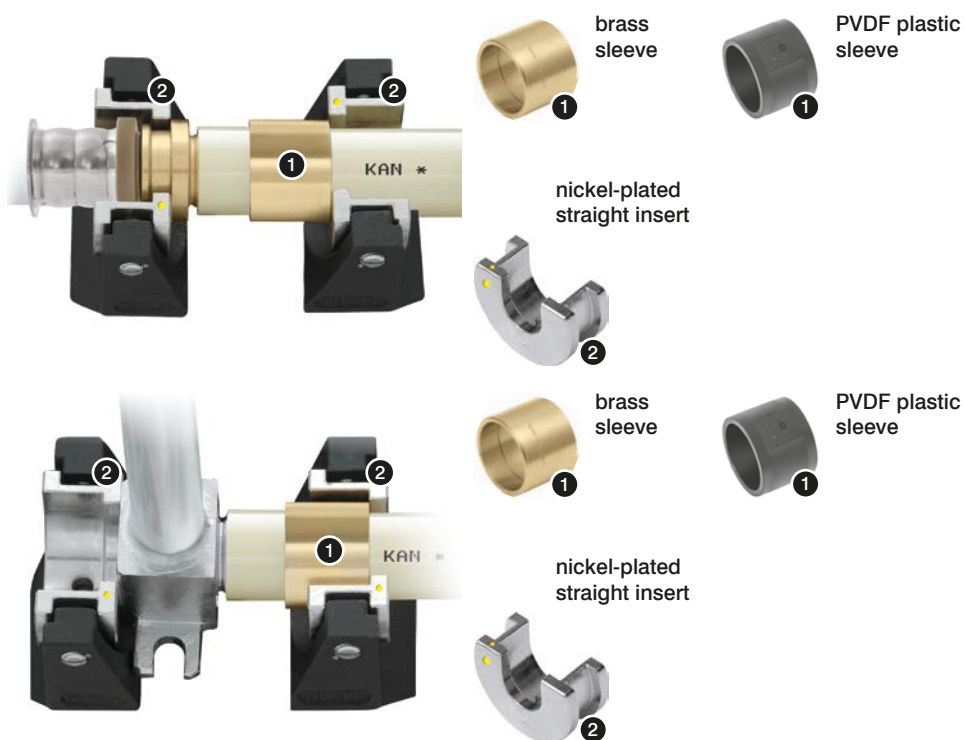
- 3 To install brass fittings with diameters of Ø12 - 25 mm, use straight nickel plated inserts at the side of fitting and sliding sleeve.



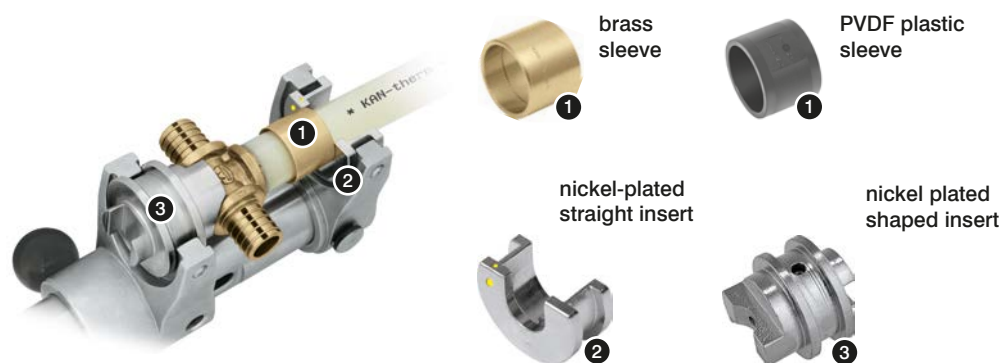
- 4 For threaded connectors Ø 32 mm apply only machine forks without inserts.



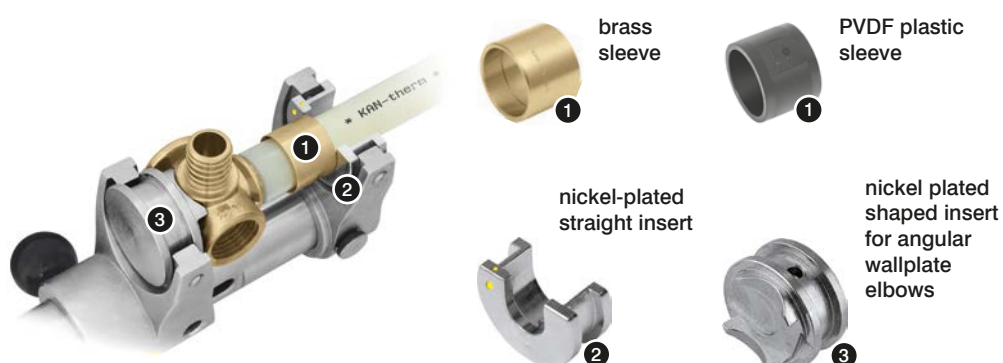
- 5 For assembly of other brass elements e.g. threaded couplings, wallplate elbows (excluding angle wallplate elbows) and radiator connectors, use nickel-plated inserts (straight).



- 6 For brass tee fittings with shortened construction branches Ø14, 18, 25 mm, use shaped nickel plated inserts at the element side. At the sleeve side use straight nickel plated inserts.



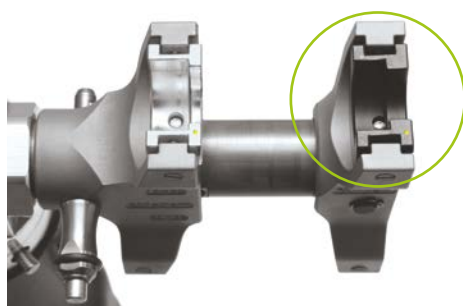
- 7 For brass angular wallplate elbows Ø18 mm, use shaped nickel plated inserts for wallplate elbows at the fitting side. At the sleeve side use a nickel-plated straight insert.



- ! **Caution: Shaped inserts are not compatible with hand chain crimping tools.**

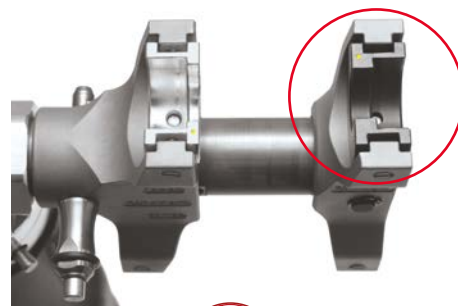
The above presented shape inserts for brass fittings are not a standard part of tool sets; they should be ordered separately.

**Novopress tool (battery driven)**



**Correct way of mounting inserts on machine forks.**

Diameter range 14 do 25 mm.



**Incorrect way of mounting inserts on machine forks.**

Diameter range 12 do 25 mm.

## Tools for Push connections

### Quick diameter recognition

All heads for expanding PE-Xc and PE-RT pipes are marked with colored strips for easy identification and provided in a practical container. Pipe press inserts are also color coded according to their diameter. This method of identification makes the work easier for people responsible for installing pipes, selling them and people working at tool rental companies.



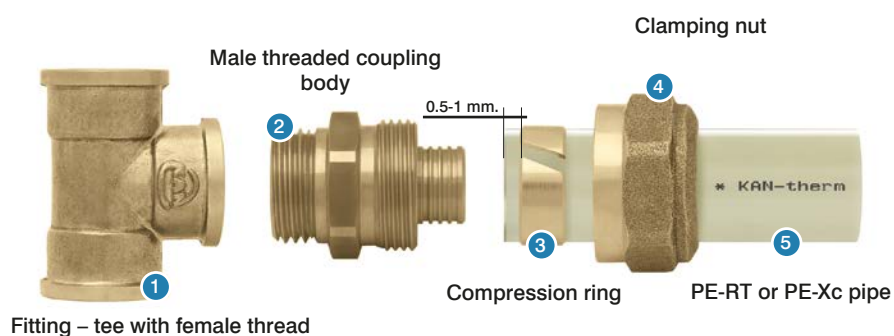
## Tools - Safety

All tools must be applied and used in accordance with their intended purpose and the user manual of the manufacturer. Use for other purposes or in another field shall be considered as contrary to the intended use. Intended use also requires compliance with the operating instructions, conditions and maintenance and appropriate safety regulations in their current version. All works done with this tool, which do not correspond with the intended purpose, may lead to damage of the tools, accessories and pipe fittings. The consequence can be leaks and/or damages to the pipe connections.

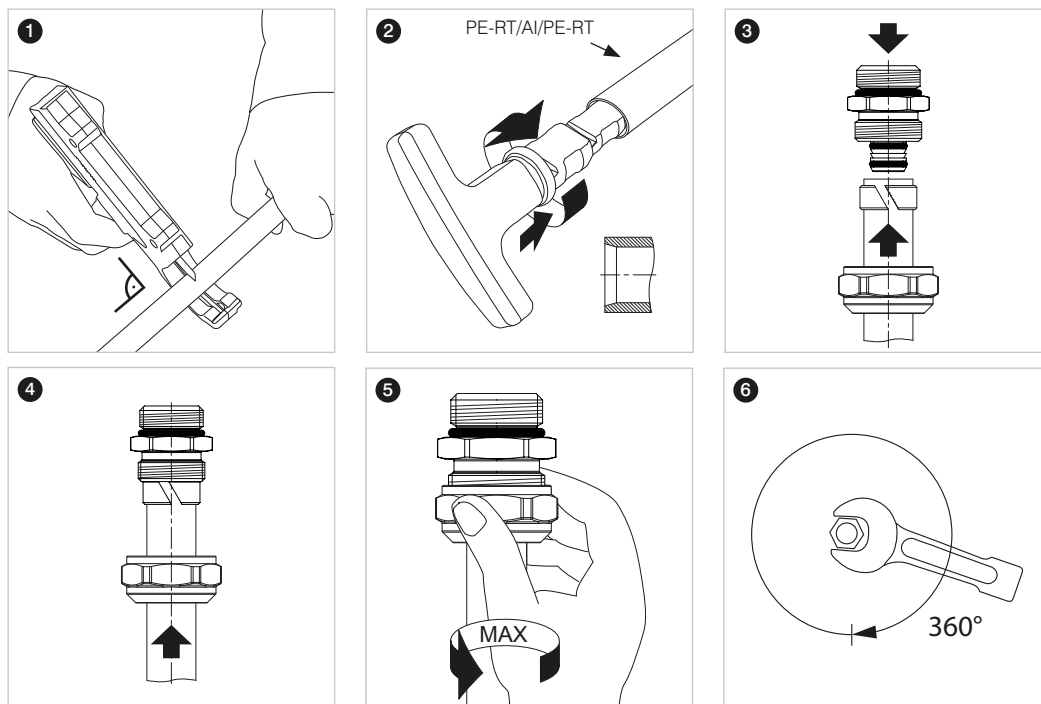
## Screwed joints for PE-RT and PE-Xc – Ø12-32 mm

Assembling of a screwed joint:

- 1 Screw the joint body into a fitting provided with a sealed thread.
- 2 Fit the nut and the compression ring on a pipe.
- 3 Push a pipe onto the coupling body and screw on a ring-clamping nut.



Fit a compression ring onto a pipe so that the ring edge is 0,5 - 1 mm away from the pipe edge. A pipe should be pushed to the end of the pipe connectors body. This connection may be taken apart - after the connector body is pulled out of a pipe you should cut away the used pipe end and you may create a new connection.



Do not turn a fitting on a pipe during assembly and after it and do not use any lubricants to push a pipe easier onto a fitting body.

#### Screwed joints can be combined with:

- Female threaded fittings like elbows, tees, wallplate elbows, manifolds without a nipple (bare),
- female thread fixtures.

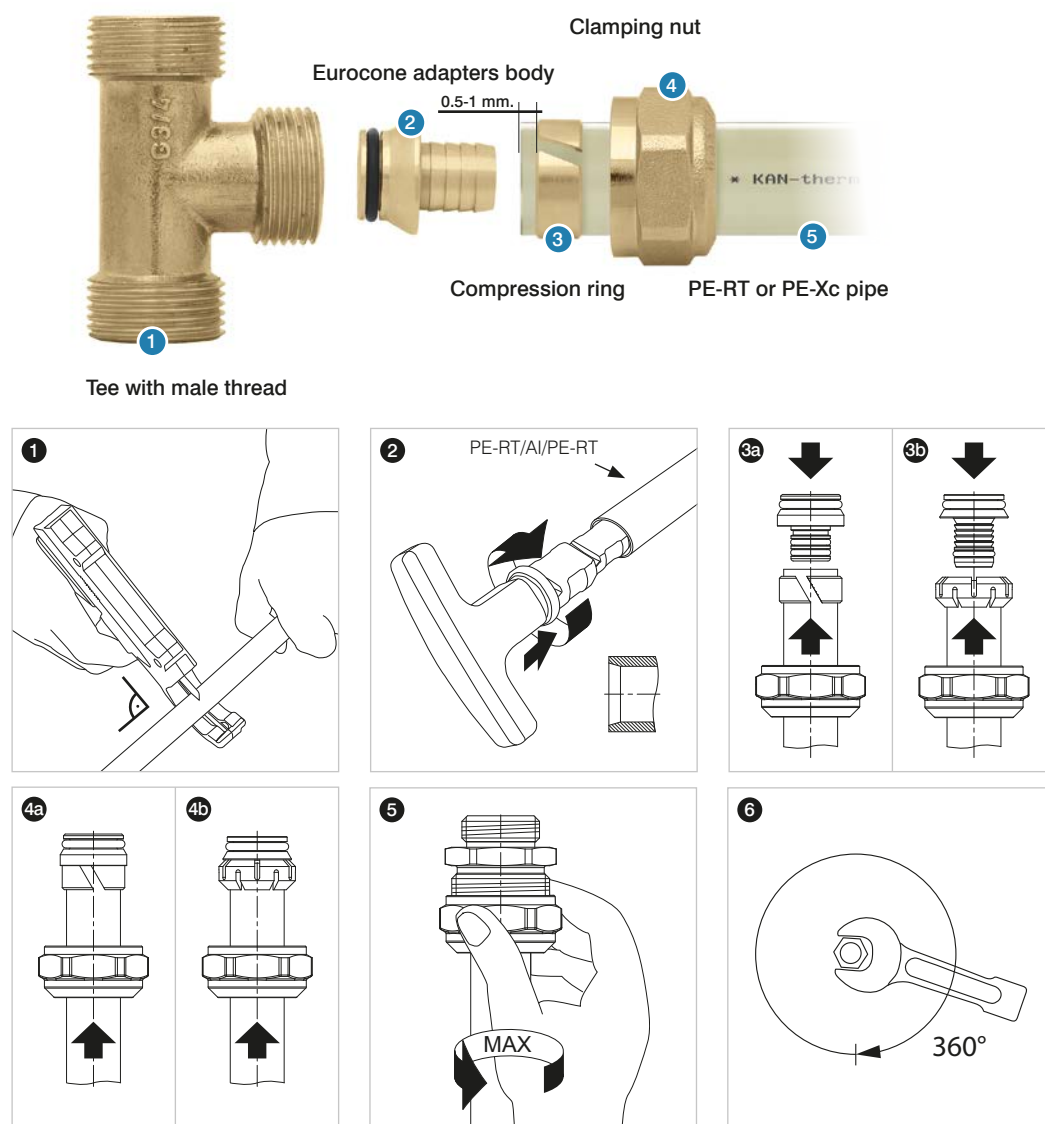


#### Connections of this type should not be laid in the flooring.

It is advised to seal threaded connections with such an amount of tow, that leaves the thread tops not covered. Using too much tow may lead to thread damage. By winding tow just after the first thread ridge you can avoid skew screwing and damaging the thread.

## Eurocone adapters for PE-RT and PE-Xc - Ø12-25 mm pipes

Eurocone adapter are a version of screwed joints.



The main element of such connections is an eurocone adapter body with a sealing O-Ring between a body and a fitting. Eurocones combine with:

- a 9012 series fittings with male threads,
- manifolds with special nipples,
- combined radiator valves.



Eurocone adapters are characteristic for a sealing on the cone and an O-Ring between body and a fitting. This kind of joints is self-sealing and no additional sealing element like a PTFE tape or tow shall be used. Locate such connections at generally accessible places.

## Joining fittings with nickel-plated pipes with radiator fixtures



For good looks of a KAN-therm radiator connection both from a floor or a wall we offer special fittings with nickel-plated copper pipes.

Elbows and tees with nickel plated copper pipe should be connected with radiator valves and directly with VK type radiators utilizing fittings for connecting Ø15 mm nickel plated copper pipes.

All joints of this kind are self-sealing and no additional sealing is needed.

## Compensation of thermal elongations

Pipeline elongation ( $\Delta L$ ) under the influence of the  $\Delta T$  difference is illustrated by the following formula:

$$\Delta L = \alpha \times L \times \Delta T$$

where:

$\alpha$  - coefficient of linear expandability [mm/mK]

$L$  - length of the pipeline section (m)

$\Delta T$  - temperature difference for installation and operation(K)

The desired length of the spring arm is calculated from the formula:

$$L_s = K \times \sqrt{D_z \times \Delta L}$$

where:

$K$  – material constant = 15

$D_z$  – external diameter [mm]

$L_s$  – length of the elastic arm [mm]

In the case of flush-mount installation with 14-25 mm diameters, lead the pipes with light curves (with 10% excess in relation to the straight line), which allows you to achieve self-compensation of pipeline thermal elongations.



To eliminate the phenomenon of excessive fitting mechanical load with bending force, it is forbidden to bend pipes at a distance of less than 10 external diameter from the fitting itself.

