∅ **14–63 mm**

SYSTEM **KAN-therm**

Press LBP

Innovativeness and uniqueness
- One system, six functions

TECHNOLOGY OF SUCCESS

ISO **9001**

Contents

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2 System **KAN-therm** Press / **KAN-therm** Press LBP

System KAN-therm Press LBP is new, complete installation system consisting of new generation LBP press fittings, multilayer PE-RT/Al/PE-RT and polyethylene PE-Xc & PE-RT pipes.

Depending on the type and configuration of the material, in Systems KAN-therm Press LBP offer occur:

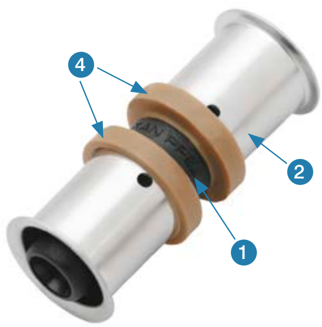
- multilayer pipes PE-RT/Al/PE-RT Multi Universal in diameter range 16–40 mm
- PE-Xc pipes with anti diffusion barrier in diameter range 16–20 mm
- PE-RT pipes with anti diffusion barrier in diameter range 16–20 mm

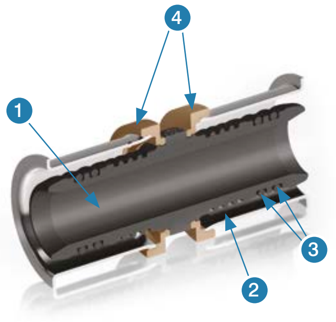
The method of connecting pipes in KAN-therm Press LBP System is "press" technique based on crimping steel sleeve. For connecting pipes to appliances there may also be used screw connection fittings present in System KAN-therm Press..

System KAN-therm Press LBP

New fittings construction

View and cross-section of KAN-therm Press LBP fitting
1. Fittings body
2. Crimping sleeve made of stainless steel
3. EPDM O-Ring seals
4. Colour plastic spacer rings





Components of KAN-therm Press LBP fittings

System KAN-therm Press LBP – features

Thanks to its special construction, KAN-therm Press LBP fittings features:

- findication of un-pressed connections (LBP – Leak Before Press) – „unpressed - leaking",
- colour plastic indentification rings,
- possibility of interchangeable use of „U" or „TH" profile jaws (in case of diameter 26 mm - „C" or „TH"),
- elimination of tube edges bevelling necessity,
- precise positioning of crimping jaws on steel sleeve,
- possibility of connecting with multilayer PE-RT/Al/PE-RT and poliethylene PE-Xc & PE-RT pipes,
- elimination of bimetallic corrosion phenomenon (in case when pipe with aluminium layer is inserted) by using plastic spacer rings,
- possibility of concealing joints in floors.

LBP function

LBP - „Leak Before Press". Mistakenly un-pressed joint is detected by the visible water leak during filling installation with water without pressure - before proper pressure test. This function is consistent with DVGW recommendations („controlled leak").

Identification

Every fitting has polymer ring, which color depends on the diameter of the connected pipe.

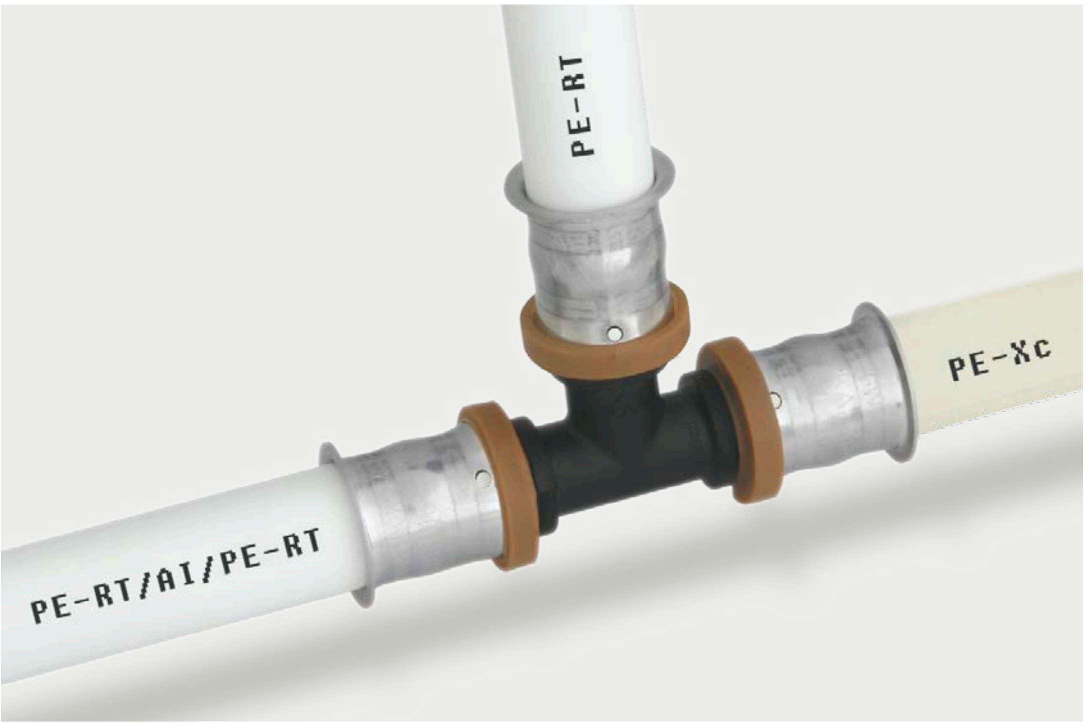
∅ 16 mm | ∅ 20 mm | ∅ 25 mm | ∅ 26 mm | ∅ 32 mm | ∅ 40 mm*

* Fittings of 40 mm diameter do not have the function of leakage control.

Such solution makes work more efficient both in the warehouse and in the construction site where it is difficult to identify fitting diameter (ex. lack of light). Regardless of the color identification, each nozzle is marked with diameter of connected pipes. Dimensions of connected pipes (outer diameter x wall thickness) are also marked on the steel sleeve.

Universality

Special construction of KAN-therm Press LBP fittings allows for connecting multilayer PE-RT/Al/PE-RT and polyethylene PE-Xc & PE-RT pipes.



Range of applications

Areas of application and operating parameters of KAN-therm Press LBP with multilayer PE-RT/Al/PE-RT pipes are shown in table:

Application (acc. to ISO 10508)	Dimension	Type of pipe
Hot and cold tap water [Class 1(2)] T_{rob}/T_{max} = 60(70)/80°C P_{rob} = 10 bar	14 × 2,0 16 × 2,0 20 × 2,0 25 × 2,5 26 × 3,0 32 × 3,0 40 × 3,5	PE-RT/Al/PE-RT
	50 4.0 63 × 4,5	PE-X/Al/PE-X
Surface heating, low parameter radiator heating [Class 4] T_{rob}/T_{max} = 60/70°C P_{rob} = 10 bar	14 × 2,0 16 × 2,0 20 × 2,0 25 × 2,5 26 × 3,0 32 × 3,0 40 × 3,5	PE-RT/Al/PE-RT
	50 × 4,0 63 × 4,5	PE-X/Al/PE-X
Radiator heating [Class 5] T_{rob}/T_{max} = 80/90°C P_{rob} = 10 bar	14 × 2,0 16 × 2,0 20 × 2,0 25 × 2,5 26 × 3,0 32 × 3,0 40 × 3,5	PE-RT/Al/PE-RT
	50 × 4,0 63 × 4,5	PE-X/Al/PE-X
For all classes T_{awarii} – 100°C	14 × 2,0 16 × 2,0 20 × 2,0 25 × 2,5 26 × 3,0 32 × 3,0 40 × 3,5	PE-RT/Al/PE-RT
	50 × 4,0 63 × 4,5	PE-X/Al/PE-X

Areas of application and operating parameters of KAN-therm Press LBP with polyethylene PE-Xc and PE-RT pipes are shown in table:

Areas of application (according to ISO 10508)	Dimension	Type of pipe
Low parameter radiator heating [Class 4] T_{rob} /T_{max} = 60/70°C P_{rob} = 6 bar	16 × 2,0 20 × 2,0	PE-RT, PE-Xc
Radiator heating [Class 5] T_{rob} /T_{max} = 80/90°C P_{rob} = 6 bar	16 2.0 20 2.0	PE-RT, PE-Xc

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.

Safety

Pipes and fittings in KAN-therm Press LBP System holds a set of necessary approvals and comply with current standards and normatives, which ensures long-lasting and trouble-free operation and full security of the installation:

- KAN-therm Press LBP PPSU fittings with steel sleeve: complies with PN-EN ISO 21003-3:2009 and positive PZH hygienic result,
- KAN-therm Press LBP brass fittings: complies with PN-EN 1254-3 and positive PZH hygienic result,
- PE-RT/Al/PE-RT pipes: complies with PN-EN ISO 21003-2:2009 and positive PZH hygienic result,
- PE-Xc pipes: complies with PN-EN ISO 15875-2:2004 and positive PZH hygienic result,
- PE-RT pipes: complies with PN-EN ISO 22391-2:2010 and positive PZH hygienic result.

Pipes and fittings of KAN-therm Press LBP System also holds positive opinion of Western certification units:

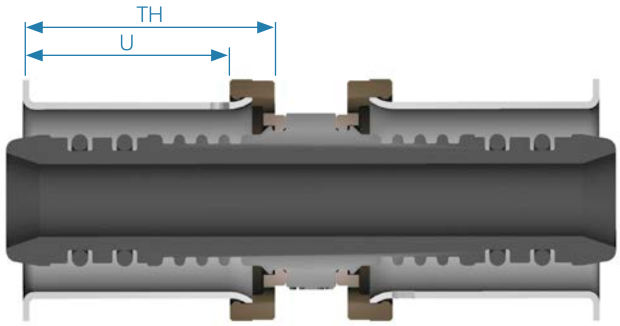
System KAN-therm Press LBP is granted with 10-year material warranty.

Connections

Press connection is based on crimping steel sleeve embedded on fittings nozzle while the tube is inserted into the coupling. Each nozzle is equipped with O-ring seals made of EPDM synthetic rubber resistant to high temperatures and pressure. Crimping the steel sleeve is made by manual or electric machine equipped with (depending on the diameter) "U","C" or "TH" profile jaw. This method allows for concealing joints in floors or plaster.

Construction KAN-therm Press LBP System fittings enables usage of different types of jaw for making joints within the same diameter – "U" and "TH" profile ("C" and "TH" for diameter 26 mm), see table below.

While making joints in KAN-therm Press System use only original tools from KAN-therm offer, or tools recommended by KAN. Tools are available as individual components or in complete sets.



Summary of KAN-therm Press LBP fittings regarding of diameter range and crimping profiles

Fitting construction KAN-therm Press LBP	Diameter range		Clamping/ pressing profile
	distance ring colours	16	U or TH
		20	
		25	
		26	C or TH
		32	U or TH
		40*	

*Fittings of 40 mm in diameter do not have the function of leakage control.

Assembly 16 - 40 mm

1. Cut a pipe at the right angle to its axis to a required length using scissors for multi-layer pipes or with a disc cutter.

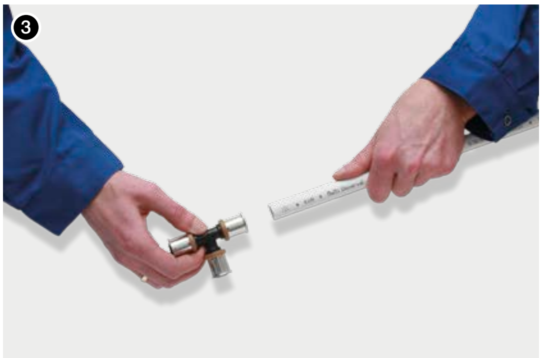
2. Shape the pipe. Bend using the external or internal spring. Observe the min. bending radius R > 5 Dz.

CAUTION

For cutting use only sharp blades.

3. Insert the pipe into a coupling - push the pipe centrally along the coupling axis. Check the insertion depth - the pipe edge must be visible in inspection holes in the steel ring.

4. Apply the press jaws exactly on the steel ring between the plastic distance ring and the steel ring collar perpendictulary to its axis. In case of the "TH" profile place the jaws on the plastic distance ring (the ring must be embraced by the jaws outern groove). In both cases due to the fitting design the clamping tool jaws will not shift during pressing.



5. Start the press drive and make the connection. The process of pressing lasts till the jaws close fully. The ring can be pressed on a pipe only once.

6. After pressing unlock the jaws and take off the tool from a clamped ring. The connection is now ready for the pressure test.

CAUTION

In case of KAN-therm Press LBP fittings there's no need for bevelling pipe edges. For bigger diameters (25 mm and above) to facilitate pipe insertion into the fitting it is recommended to use the calibration tool.

Press connections should be performed at temperatures above 0°C. Before start, check tool manuals and safety conditions.

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

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.

Compensation of thermal elongation

Guidelines for fixing pipelines, implementation of fixing points (PS), sliding supports (PP) and compensation of thermal elongation are available in technical part of KAN-therm Press directory or KAN-therm Designers and Contractors guide book.

System KAN-therm Press

KAN-therm Press System is a complete system consisting of press fittings, screwed fittings with manifolds and cabinets, and multilayer pipes in diameters range:

- PE-RT/Al/PE-RT: Ø14-40 mm,
- PE-X/Al/PE-X: Ø50-63 mm.

Modern technology

An ultra modern material - PPSU (phenylene polysulfone) - used in production of press fittings ensures:

- fully corrosion resistant,
- fully neutral towards potable water,
- fitting durability higher than pipes,
- high mechanical strength.

Production technology of PPSU fittings excludes any latent defects.

Multi Universal pipes of KAN-therm Press System consist of inner and outer layer of PE-RT polyethylene of high thermal resistance. Between polyethylene layers there is an aluminum layer that is permanently bounded with the polyethylene. Such a structure provides natural resistance to diffusion of oxygen into the system, elasticity, and the lack of "shape memory" (after bending pipes preserve shape), and also eight times smaller thermal elongation in comparison with polyethylene pipes.

Long lasting technology

KAN-therm Press System, because of the perfect design of its elements and their matching, provides:

- over 50 year of service life,
- possibility of operating in high temperatures - Twork=80°C (operating), T_{max}=90°C (maximum; the heat source should be protected against exceeding that temperature) and operating pressure of 10 bar.
- extremely durable PPSU fittings whose maximum operating parameters are limited by pipe durability,
- total lack of corrosion with all kinds of water quality.

Optimal technology

KAN-therm Press System allows to choose optimal technological and economical solutions because of:

- possibility of concealing press fittings in floor screeds an under plaster,
- possibility of using one type of pipes for water and heating systems.

Safe technology

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

- Press fittings with sleeves produced acc. to PN-EN ISO 21003-3:2009 obtains positive PZH higenical results,
- pipes PE-RT/Al/PE-RT produced acc. to PN-EN ISO 21003-2:2009 obtains and positive PZH higenical results,
- pipes PE-X/Al/PE-X produced acc. to PN-EN ISO 21003-2:2009 also obtains positive PZH higenical results,
- safe design of press fittings provides full control over O-Ring seals during assembly,
- KAN-therm Press System has a 10-year warranty.

Assembly of „pressed" connections 50 - 63 mm

1. Cut the pipe perpendicular to its axis using special cutter.

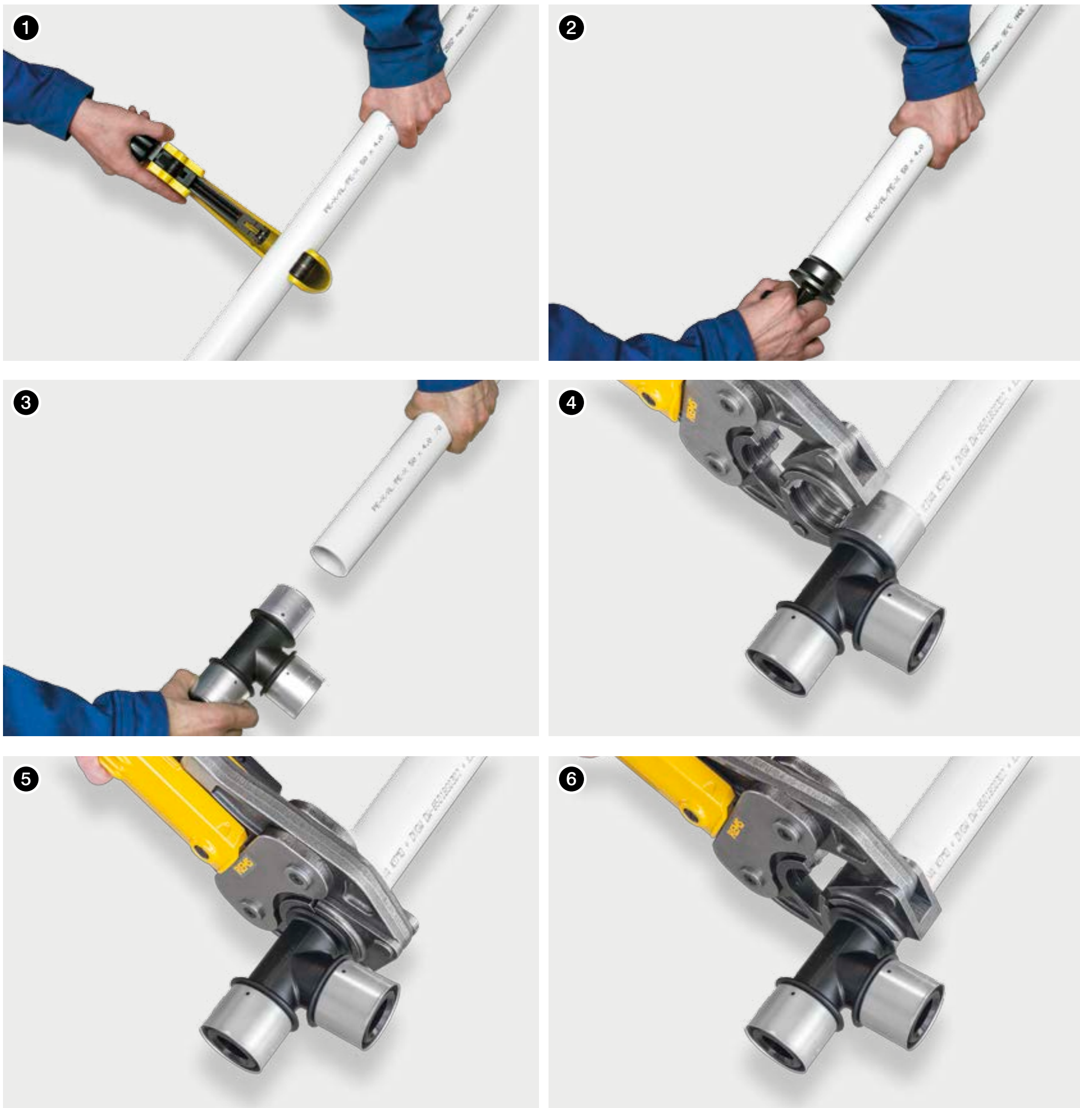
2. Calibrate the pipe and chamfer its internal edge with a calibrator but not deeper than down to the aluminium layer.

3. Thru inspection holes in the steel ring check if a pipe is inserted right – it must be visible in the holes.

4. Apply the clamping tool jaws on a ring so it contacts the tube coupling collar. The external collar of jaws shall be pushed to the tube coupling collar but not embrace it.

5. Apply the clamping tool jaws on a ring so it contacts the tube coupling collar. The external collar of jaws shall be pushed to the tube coupling collar but not embrace it. Start the clamping tool drive and make the connection.

6. Remove the clamping jaws from the connection



To eliminate the excessive overload on fittings by bending force, it is not recommended to bend pipes at a distance less than 10 external diameters from the fitting.

The system assembly should be carried out in temperatures below 0 °C.

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

Press connections with a pressed-on ring

- are self-sealing,
- can be concealed in walls and also in floors, provided O-Rings have not been damaged during the assembly,
- are made using a jaw adequate to a given pipe diameter,
- should be made using tools delivered by KAN-therm (for diameters 16, 20, 25, 32, 40 mm it is permissible to use "U" standard compatible jaws, for diameter Ø26 "C" standard compatible, and for Ø50, 63 mm "TH" standard compatible according to REMS catalog),
- have a diameter range of Ø16-63 mm.

Assembling screwed joints

1. Cut the pipe perpendicular to its axis using special cutter.

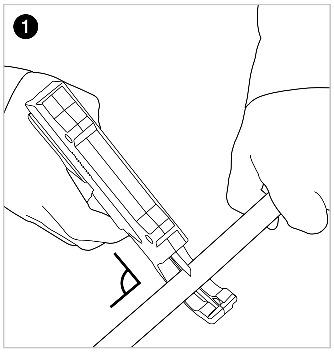
2. Shape the pipe as required. Bend using external or internal spring. Obey minimum bending radius Rg ≥ 5 Dz.

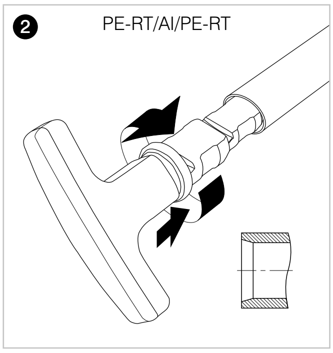
3. Calibrate the pipe and chamfer its edges with a calibrator but not deeper than to the aluminium layer. Fit onto a pipe the screwed joint nut with the cut ring (or a connection nut).

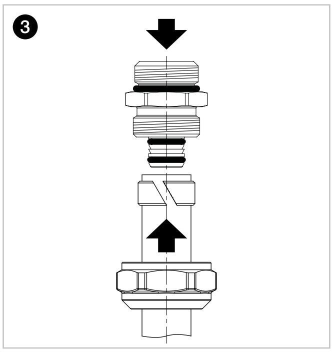
4. Insert the screwed joint body into a pipe till it definitely stops. The joint insertion depth is ca. 9 mm for pipes Ø14, 16, 20 and 12 mm for pipes Ø25, 26.

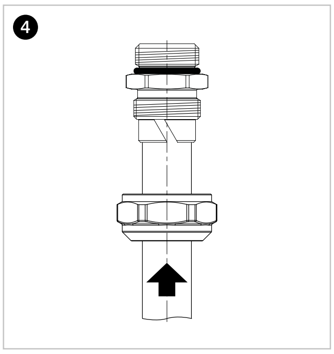
5. Slide the adapter body with the pipe into the fitting socket. Slide the compression ring to the fitting body (in case of eurocone adapter).

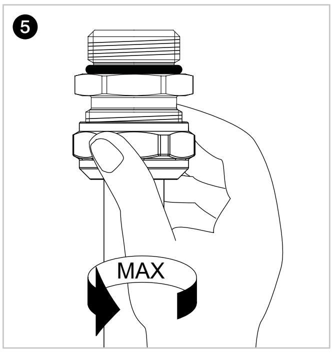
6. Screw the nut onto the fitting body using flat spanner.

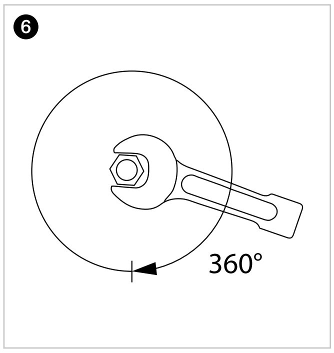












Screwed joints (pipe joints and couplings)

- are self-sealing – avaialble for diameters Ø14-26mm,
- screwed joints can not be hidden in walls,
- it is not recommended to embed this kind of connections in a floor screed,
- in case of renovating an installation they can be taken apart.

Joining fittings with nickel-plated pipes with radiator fixtures

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

Connect fixed elbows and tees with a nickel-plated pipe within radiator valves or directly with VK type radiators via elements like:

- union screw for the copper Ø15 G¾" pipe or universal union screw for Ø15 G¾" pipe,
- union screw for the copper Ø15 G½" pipe,
- clamp for the copper Ø15 G½" pipe,
- connector body G½",

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

! CAUTION

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.

Fastening pipelines

For maximum distances between pipeline supports see the Table below:

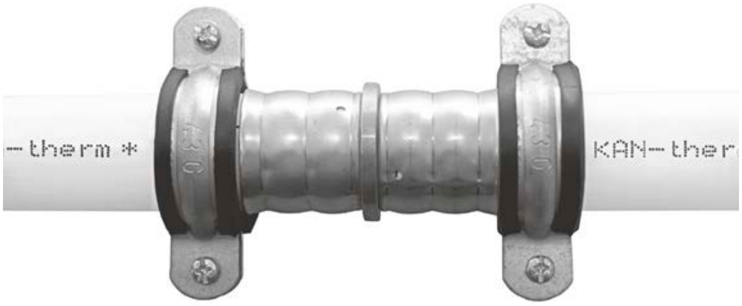
Pipe diameter	14×2	16×2	20×2	25×2,5	26×3	32×3	40×3,5	50×4	63×4,5
Max distances between pipeline fastening supports [m]	1.2	1.2	1.3	1.5	1.5	1.6	1.7	2.0	2.2

Supports can be executed as sliding supports PP. Sliding supports shall be located maintaining required distances as the pipeline weight must be supported properly. If a required location of a sliding support restricts the required length a compensating arm, instead of a sliding, support a pipeline from below.

Fixed point PS and slidable points PP

- fixed points shall prevent any movement of a pipeline therefore they shall be mounted at connections (on both sides of a connection, e.g. coupling),
- with this system pipe clamps serving as fixed points shall not be mounted directly at fittings or on pressed-on rings,
- when mounting fixed points at tees check that pipe clamps blocking a pipeline are not mounted on branches of a diameter smaller by more than one size than a pipeline from which they branch off (forces generated by large diameter pipes can damage a smaller diameter),
- sliding supports allow only axial movements of a pipeline (they act as fixed points in the perpendicular angle to the pipeline axis) and should be made using plastic, snap-on clamps supplied within the KAN-therm System,
- do not mount sliding supports at connections as this may block the pipe thermal expansion,
- don't forget that sliding supports prevent movements transverse to the pipeline axis therefore their locations can determine the length of compensation arms..

Mounting a fixed points at a joint



tight screwed clamp fastened to building element

Mounting a fixed point at a tee

CAUTION:
do not mount a clamp on a branch if this is smaller by more than one size than the tee nominal diameter

tight screwed clamp
fastened to building element

Thermal elongation

Every pipeline, when exposed to temperature difference ΔT undergoes elongation (or shortening) by the ΔL value. This amount is calculated with the below formula:

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

where:

α – thermal linear elongation coefficient 0,025 [mm/mK]

L – pipeline section length [m]

ΔT – temperature difference during installation and use [K]

Compensators

In order to eliminate linear elongation effects (uncontrolled movements of pipelines and their deformation), compensation solutions with different structures are sued (flexible arm, U- and Z-shape compensators).

$$Ls = K \times \sqrt{Dz \times \Delta L}$$

where:

Ls – flexible arm's length [mm]

K – material coefficient = 36

Dz – external diameter of the pipe [mm]

L – elongation of the pipe-line length [mm]

„L", „Z", and „U" compensator selection

Table 1. Pipe elongation for different lengths and various temperature growths

L [m]	ΔL – elongation [mm] ΔT – temperature difference [°C]							
	10	20	30	40	50	60	80	90
0.5	0.13	0.25	0.38	0.50	0.63	0.75	1.00	1.13
1	0.25	0.50	0.75	1.00	1.25	1.50	2.00	2.25
2	0.50	1.00	1.50	2.00	2.50	3.00	4.00	4.50
3	0.75	1.50	2.25	3.00	3.75	4.50	6.00	6.75
4	1.00	2.00	3.00	4.00	5.00	6.00	8.00	9.00
5	1.25	2.50	3.75	5.00	6.25	7.50	10.00	11.25
6	1.50	3.00	4.50	6.00	7.50	9.00	12.00	13.50
7	1.75	3.50	5.25	7.00	8.75	10.50	14.00	15.75
8	2.00	4.00	6.00	8.00	10.00	12.00	16.00	18.00
9	2.25	4.50	6.75	9.00	11.25	13.50	18.00	20.25
10	2.50	5.00	7.50	10.00	12.50	15.00	20.00	22.50
15	3.75	7.50	11.25	15.00	18.75	22.50	30.00	33.75
20	5.00	10.00	15.00	20.00	25.00	30.00	40.00	45.00
25	6.25	12.50	18.75	25.00	31.25	37.50	50.00	56.25
30	7.50	15.00	22.50	30.00	37.50	45.00	60.00	67.50
35	8.75	17.50	26.25	35.00	43.75	52.50	70.00	78.75
40	10.00	20.00	30.00	40.00	50.00	60.00	80.00	90.00

A ΔL elongation causes a pipeline to deform along the length of an elastic arm A.

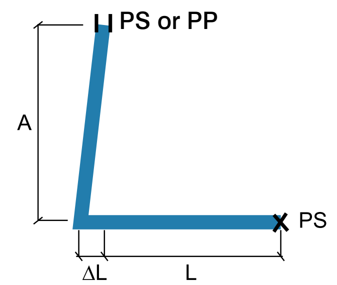
Compensation arm ***A*** length should not cause excessive stress in the pipeline (should not be smaller then value given in table 2) and depends on pipe external diameter, pipe thermal elongation, and a constant (linear expansion coefficient) for a given material.

Table 2 Minimum length A of an flexible arm depending on the pipe external diameter and its elongation

ΔL elongation [mm]	A – length of flexible arm [mm] Dz – pipe OD [mm]								
	14	16	20	25	26	32	40	50	63
5	301	322	360	402	410	455	509	569	639
10	426	455	509	569	580	644	720	805	904
15	522	558	624	697	711	789	882	986	1107
20	602	644	720	805	821	911	1018	1138	1278
30	738	789	882	986	1005	1115	1247	1394	1565
40	852	911	1018	1138	1161	1288	1440	1610	1807
50	952	1018	1138	1273	1298	1440	1610	1800	2020
60	1043	1115	1247	1394	1422	1577	1764	1972	2213
70	1127	1205	1347	1506	1536	1704	1905	2130	2391
80	1205	1288	1440	1610	1642	1821	2036	2277	2556
40	1278	1366	1527	1708	1741	1932	2160	2415	2711

Compensation of thermal expansion of pipes type L, Z, U

„L" type compensator



A – flexible arm length

PP – sliding support (allows only axial movement of a pipeline)

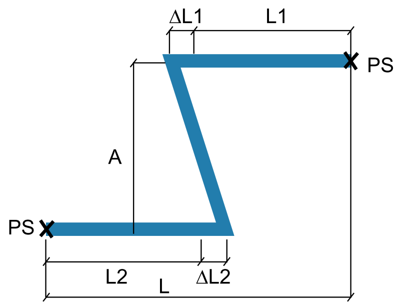
PS – fixed point (prevents any movement of a pipeline)

L – the initial length of a pipeline

ΔL – pipeline thermal elongation

For compensation arm ***A*** dimensioning, a substitute length ***Lz=L*** is taken, and for Lz length the thermal elongation value ***ΔL***, determined from formula. Next, the expansion compensation length ***A*** is determined on the basis of Tab. 2.

„Z" type compensator



A – expansion compensation length

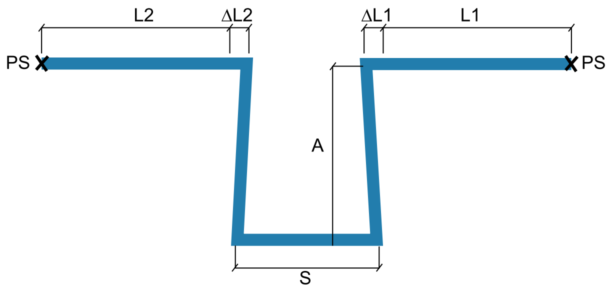
PS – fixed point (prevents the pipeline from moving)

L – pipeline initial length

ΔL – pipeline thermal elongation

For compensation arm ***A*** dimensioning, ***L1*** and ***L2*** sum is taken as a substitute length ***Lz=L1+L2***, and for ***Lz*** length a substitute ***ΔL*** is determined from formula. Next, the expansion compensation length ***A*** is determined on the basis of Tab. 2.

„U” type compensator



A – expansion compensation length

PS – fixed point (prevents the pipeline from moving)

L – pipeline initial length

ΔL – pipeline thermal elongation

S – U type compensator width

In case of placing fixed point ***PS*** in the section of compensator length **S** for compensation arm ***A*** dimensioning, the greater value from ***L1*** and ***L2***: is taken as a substitute length for ***Lz=max (L1, L2)*** and for this length the substitute elongation ***ΔL*** is determined on the basis of Tab. 1, and then the length of compensation arm ***A*** is determined on the basis of Tab. 2.

Compensator width: $S = A/2$.

The width ***S*** of a compensator shall allow a free movement of the sections ***L1*** and ***L2*** taking into account an eventual pipe insulation thickness and conditions of assembly.

$$S \geq 2\times g_{izol} + \Delta L1 + \Delta L2 + S_{min}$$

where:

g_{izol} – insulation thickness

ΔL1, ***ΔL2*** – elongation of sections L1 and L2

S_{min} – minimum length resulting from mounting of elbows or bending pipes.

Strive to minimise the width ***S***, and when the width ***S*** is above 10% of the value of ***L1*** or ***L2*** a ***U*** – compensator with its fixed point in the middle shall be determined as a ***Z*** type compensator taking into account the widthi ***S*** and the greater value from ***L1*** and ***L2***.

The minimum allowed pipe bending radius $R_{min} = 5\ Dz$ (The minimum allowed pipe bending radius 32 mm),

Dz – The minimum allowed pipe bending radius.

Assembly and rules for compensation of the thermal elongation

- 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.
- Do not install fixtures on pipelines at compensation arms and also do not block pipeline movements, e.g. against sliding supports. It is best to use mounted fixtures as fixed points thus a pipeline does not support the weight of fixtures or transfer forces occurring at opening or closing valves,
- by all means a pipeline section must be provided with the compensation of elongations,
- in case pipelines are connected at the right angle to steel tubes, the point of connection shall be regarded as a point preventing movements along the axis of a pipeline of multi-layer pipes – a fixed point for a steel pipeline by mounting pipe clamps on a pipeline made of multi-layer pipes is inadmissible. In the event a steel pipeline at a point of connection of multi-layer pipes can elongate substantially the section of connection of multi-layer pipes must be made as an elastic arm by placing a sliding support at a right place (a fixed point is inadmissible), and the length of that arm shall be determined according to the elongation ***ΔL*** of a steel pipeline using Table 2,

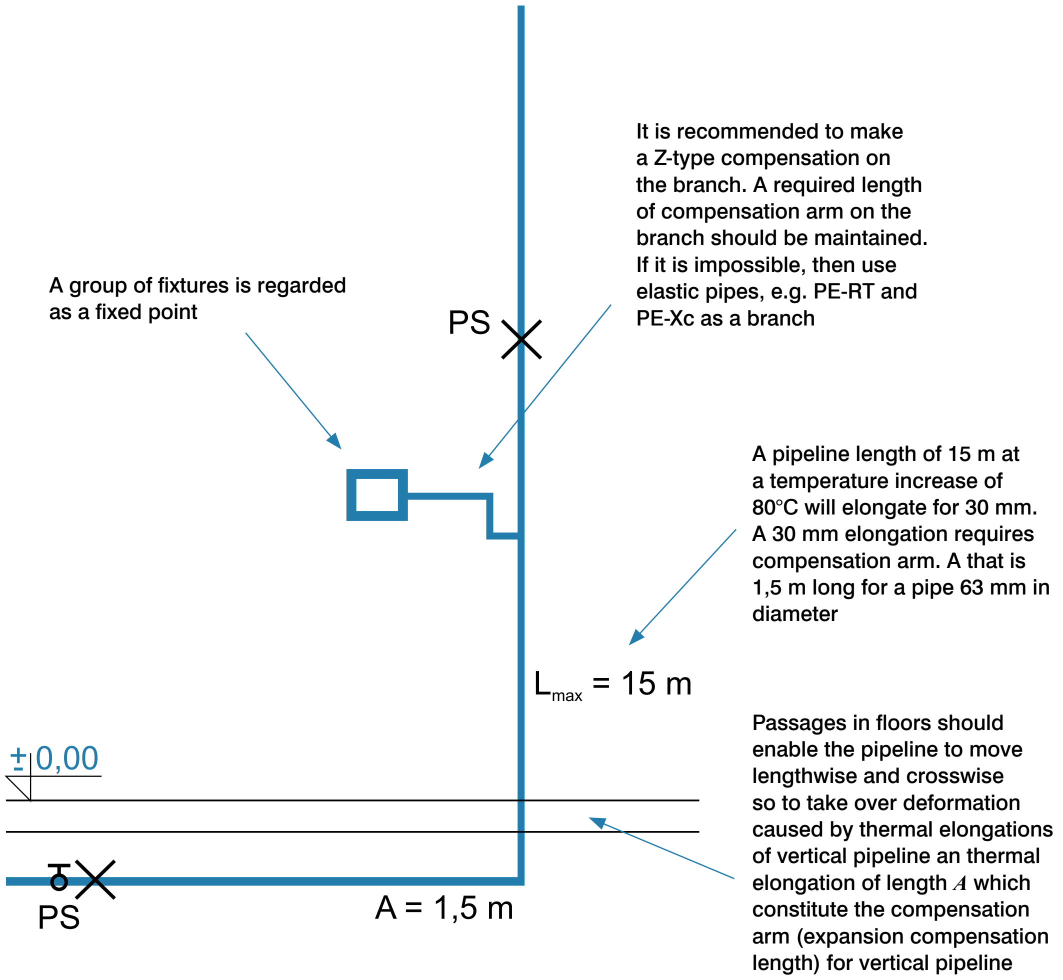
- in case a multi-layer pipeline is joined with a steel pipeline determine a compensating elastic arm taking into account the elongation of this section resulting from the sum of elongations of both pipelines,
- at a point, where a pipeline of multi-layer pipes connects with a steel pipeline, we recommend a fixed point on a steel pipeline (this should be foreseen when planning a steel pipeline compensation),
- riser sections in shafts should be free to expand thermally. In case compensation arms in riser branches are not possible, it is recommend to use for these branches elastic PE-Xc or PE-RT pipes,
- water meters and heat meters (and fixtures) mounted on pipelines must be fixed to walls (pipelines should not transfer their weight or forces generated by operating fixtures) thus being mounted as fixed points.

To eliminate the excessive load on fittings by bending force, it is not recommended to bend pipes at a distance less than 10 external diameters from the fitting.

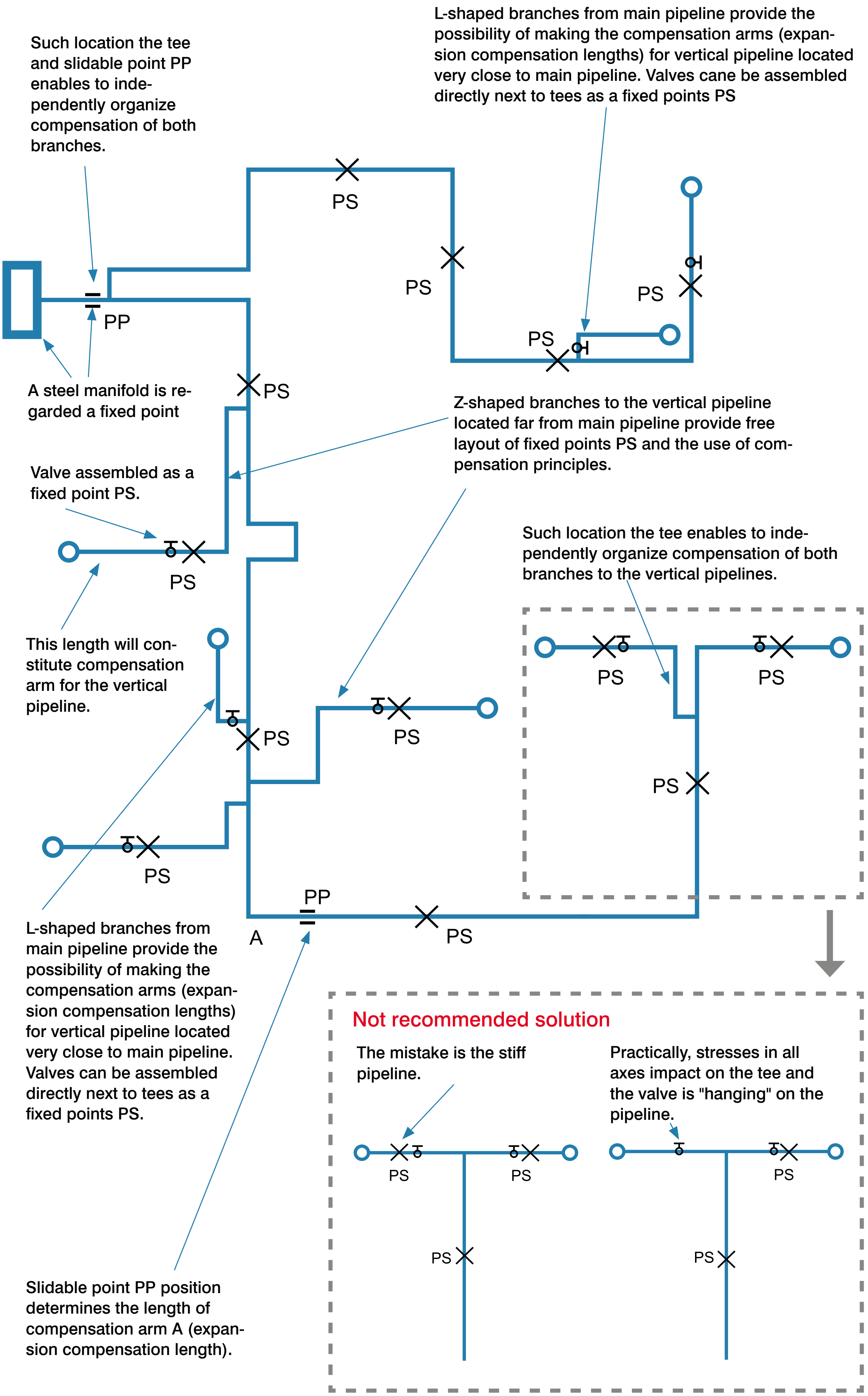
Example of compensating risers and branches

Using the compensation arm at vertical pipeline base A = 1,5 m, and placing a fixed point FP half-way the vertical pipeline height, vertical pipeline height can reach 30 m high (for pipes up to dia 63 mm.

A higher vertical pipeline can be taken if a higher thermal elongation of a segment above fixed point FP is allowed and compensation arm length A is increased.



Example of compensating elongations of main routes and it's branches



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