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System **KAN-therm**

UltraLine

System KAN-therm is the widest installation offer on the market. For your convenience, we have decided to separate the system information into 3 catalogues:

- UltraLine the most innovative installation system: New in the KAN-therm offer
- Water and heating / cooling installations
- Special installations

The following guide illustrates the possibilities of utilization of **KAN-therm** systems depending on the type of installation and suggests in which publication you will find detailed information about each of them.

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SYSTEM NAME	UltraLine	Push Platinum	Push	Press	PP	Steel
DIAMETER RANGE [mm]	14–32	14–32	12–32	16–63	16–110	12–108
INSTALLATION TYPE						
POTABLE WATER	•	٠	٠	٠	٠	
HEATING	٠	٠				
TECHNOLOGICAL HEATING	0	0	0	0	0	0
STEAM						
SOLAR SYSTEMS						0
COOLING SYSTEMS	0	0	0	0	0	0
COMPRESSED AIR	0	0	0	0	0	0
TECHNICAL GASES	0	0	0	0	0	0
NATURAL GAS AND LPG						
LUBRICATING OILS						0
TECHNOLOGICAL SYSTEMS						0
BALNEOLOGICAL SYSTEMS					0	
FIREFIGHTING SYSTEMS						

In case of non-standard application, please check the conditions of use of KAN-therm components using technical information materials or ask the KAN Technical Department for opinion. Please use the Inquiry form about the possibility of using KAN-therm elements to send basic operating parameters of the installation. Based on the achieved data, the Technical Department will assess the suitability of the given system for a particular installation. The Inquiry form is located at the end of the catalogue and on the website. To quickly fill in the form electronically, you need to scan the QR code.

CHECK WHERE YOU WILL FIND INFORMATION ABOUT THE SYSTEM!



Catalogue: Water installation for heating and cooling



www.kan-therm.com

SYSTEM **KAN-therm**

Install your future



N.C.			F					
Inox	Copper	UFH	Cabinets, manifolds	c	Groove	Coppe <mark>r</mark> Gas	Sprinkler Steel	Sprinkler Inox
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For easy identification and quick search, each System in the catalogue is marked with the unique system color, which we present in the first row of the above table.

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System **KAN-therm** UltraLine

1 The idea behind the system

System KAN-therm UltraLine is an innovative and the only technical solution on the installation market, designed to perform both standard internal heating and drinking water systems, as well as specialized piping installations such as compressed air.

Its unique design and the ability of flexible configuration of a complete end solution give great convenience to the installers and designers.

Flexibility of System KAN-therm UltraLine configuration consists of the possibility of using various types of pipes using the same design of fittings:

- **System KAN-therm UltraLine AL** uses PE-RT/AI/PE-RT multilayer pipes, brass or plastic UltraLine fittings (PPSU) and plastic sleeves (PVDF) in the entire diameter range.
- **System KAN-therm UltraLine PE** uses a combination of uniform and multilayer pipes in one solution, UltraLine fittings made of brass or plastic (PPSU) and plastic sleeves (PVDF).

The O-ringless construction of the fittings and the sliding sleeve technique guarantee high resistance of the system to assembly errors and ageing of materials during the system operation. Owing to this, the system is characterized by high safety of assembly and operation as well as high durability of the performed system.

2 Advantages of System KAN-therm UltraLine

Innovative design of System KAN-therm UltraLine fittings and the sliding sleeve technique mean:

- Possibility of any configuration of the system according to your preferences: System KAN-therm UltraLine PE pipes or System KAN-therm UltraLine AL pipes
- Universal application of the system
- ____ Quick, simple and convenient installation, even in hard to access places
- Possibility of using dedicated tools and drives widely available on the market for "Press" systems* (* when using special adapter)
- Permanent and secure connection without additional seals O-ringless construction of the fittings
- Recess mounting possible in the construction of building partitions
- Significant reduction of the diameter narrowing due to pipe expanding process
- High resistance to corrosion
- Up to 25% increased system hydraulics compared to the competitors** (**applies to diameters 25 and 32 mm assembled in the sliding sleeve technique)
- Significantly increased comfort of installation of large diameters and no need for dense fastening of the pipeline due to the multilayer structure of the pipes
- ____ The most flexible pipe on the installation market among the O-ringless systems
- Technical solution based on many years of experience in the field of systems for the construction of heating and drinking water systems

3 Pipes in the System KAN-therm UltraLine

System KAN-therm UltraLine offers the possibility of flexible configuration of the final technical solution by the system designer, contractor or investor, which is rare on the market. The selection of appropriate system may be dictated not only by the preferences of people participating in the investment process, but also by the specifics of the investment, e.g. the need for surface mounting in religious or historic buildings, where pipes with multilayer design will have much better performance properties.

3.1 Assortment of pipes in System KAN-therm UltraLine

Types and diameters of pipes

System KAN-the	System KAN-therm UltraLine AL		
PE-Xc 14×2	PE-RT 14×2	PE-RT/AI/PE-RT 14×2	
PE-Xc 16×2.2	PE-RT 16×2.2	PE-RT/AI/PE-RT 16×2.2	
PE-Xc 20×2.8	PE-RT 20×2.8	PE-RT/AI/PE-RT 20×2.8	
PE-RT/AI/PE-RT 25×2.5	PE-RT/AI/PE-RT 25×2.5	PE-RT/AI/PE-RT 25×2.5	
PE-RT/AI/PE-RT 32×3	PE-RT/AI/PE-RT 32×3	PE-RT/AI/PE-RT 32×3	

In the diameter range of 14-20 mm, both installation systems use different pipe designs, uniform and multilayer. Pipes with diameters 25-32 mm are available only as a multilayer construction and are a common part for both complete technical solutions, which means that they are included in System KAN-therm UltraLine PE and System KAN-therm UltraLine AL offer.

3.2 Configuration of the System KAN-therm UltraLine AL pipes

System KAN-therm UltraLine AL pipe types include:

- ____ multilayer pipe PE-RT/AI/PE-RT 14×2
- ____ multilayer pipe PE-RT/AI/PE-RT 16×2.2
- ____ multilayer pipe PE-RT/AI/PE-RT 20×2.8
- multilayer pipe PE-RT/AI/PE-RT 25×2.5
- ____ multilayer pipe PE-RT/AI/PE-RT 32×3

System KAN-therm UltraLine AL variant, in the entire diameter range of 14-32 mm, consists only of multilayer pipes with butt-welded aluminium insert. Pipes cooperate with the System KAN-therm UltraLine fittings made of PPSU plastic or brass and plastic sleeves. Due to the limited thermal elongation of multilayer pipes, System KAN-therm UltraLine AL version is perfect when it is necessary to perform surface montage.

3.3 Configuration of System KAN-therm UltraLine PE pipes

System KAN-therm UltraLine PE pipe types include:

- ____ uniform pipe PE-RT/AI/PE-RT 14×2
- ____ uniform pipe PE-RT/AI/PE-RT 16×2.2
- ____ uniform pipe PE-RT/AI/PE-RT 20×2.8
- ____ multilayer pipe PE-RT/AI/PE-RT 25×2.5
- ____ multilayer pipe PE-RT/AI/PE-RT 32×3

System KAN-therm UltraLine PE variant shows an innovative approach to the design and construction of internal pipe systems. The combination of two different types of pipes, i.e. uniform and multilayer, combines all the most important advantages of these different constructions in one system.

Uniform pipes available in the diameter range of 14-20 mm, used mainly for housing distribution in recess-mounted installations (distribution in floor screed or covered wall furrows) perfectly use the phenomenon of shape memory. This feature ensures a very good protection of system against accidental crushing of the pipe under the impact of high local mechanical load and thus, the creation of narrowing or its complete closing. This is a very practical feature for large investments, where many assembly brigades work simultaneously.

Multilayer pipes included in the system in the diameter range of 25-32 mm use their plastic properties exquisitely. Pipes with such diameters are mainly used for the installation of main supply pipelines and possible risers.

Lack of memory of the multilayer pipes shape and thus, no phenomenon of the so-called pipe tensioning gives great freedom and comfort in installing large diameter pipelines. The consequence of using this type of pipes may be a reduction in the number of additional profiling and anchoring elements for the pipeline.

Both PE-X or PE-RT uniform pipes and PE-RT/AI/PE-RT multilayer pipes are applicable with the System KAN-therm UltraLine fittings made of PPSU plastic or brass and plastic sleeves.

3.4 Construction and properties of System KAN-therm UltraLine pipes

3.4.1 Construction and properties of PE-X and PE-RT pipes.

All PE-X and PE-RT pipes included in System KAN-therm UltraLine PE variant (diameters 14-20 mm) are made as a five-layer structure. Both types of pipes have a barrier (EVOH layer) that prevents penetration (diffusion) of oxygen through the walls of pipes from the environment to the interior of the system. This location of the EVOH anti-diffusion layer protects it against possible damage during the assembly.



The EVOH anti-diffusion layer (ethyl vinyl alcohol) meets the requirements of DIN 4726.

PE-X pipes

System KAN-therm UltraLine PE-X pipes are produced of a high-density polyethylene and are subjected to cross-linking with an electron beam ("c" method – a physical method, without using chemical agents). Therefore, in the product range of the catalogue they will be described as PE-Xc pipes.

PE-Xc pipes are equipped with an EVOH anti-diffusion layer, therefore they can be used in both heating and drinking water systems.

Pipes in the entire diameter range, i.e. \emptyset 14×2; \emptyset 16×2,2; \emptyset 20×2,8, are available in two variants: without thermal insulation,

with 6 mm thick thermal insulation.



Pipe colour: ivory. The surface of the pipes is shiny. Depending on the diameter, the pipes are delivered in 200, 120, 50, 25-metre coils in cardboard packaging and on pallets by 500, 1000, 3000 and 4000 m.

Dimensional specification of PE-X pipes of System KAN-therm UltraLine PE type

DN [mr	Dz × t	t	Dw		Unit weight	Capacity	Packing
	$[mm \times mm]$	[mm]	[mm]	Size S Series	[kg/m]	[dm³/m]	[m]
14	14×2.0	2.0	10.0	3.0	0.085	0.079	200
16	16×2.2	2.2	11.6	3.0	0.102	0.106	200
20	20×2.8	2.8	14.4	3.0	0.157	0.163	100

PE-RT pipes

PE-RT pipes available in System KAN-therm UltraLine PE offer are made of a high thermal resistance polyethylene.

PE-RT pipes are equipped with an EVOH anti-diffusion layer, therefore they can be used in both heating and drinking water systems.

Pipes in the entire series of diameter types, i.e. \emptyset 14×2; \emptyset 16×2,2; \emptyset 20×2,8, are available in two variants:

- without thermal insulation
- with 6 mm thick thermal insulation



Pipe colour: neutral. The surface of the pipes is shiny. Depending on the diameter, the pipes are delivered in 200, 120, 50, 25-metre coils in cardboard packaging and on pallets by 500, 1000, 3000 and 4000 m.

Dimensional specification of PE-RT pipes of System KAN-therm UltraLine PE type

DN	Dz × t	t	Dw	Sizo S corios	Unit weight	Capacity	Packing
Dir	[mm × mm]	[mm]	[mm]	Size S series	[kg/m]	[dm³/m]	[m]
14	14×2.0	2.0	10.0	3.0	0.083	0.079	200
16	16×2.2	2.2	11.6	3.0	0.100	0.106	200
20	20×2.8	2.8	14.4	3.0	0.155	0.163	100

Physical properties of PE-Xc and PE-RT pipes of System KAN-therm UltraLine PE type

Property	Symbol	Unit	PE-Xc	PE-RT
Thermal expansion coefficient	α	mm/m × K	0.178	0.18
Heat conductivity	λ	W/m × K	0.35	0.41
Minimal bend radius	R_{min}	mm	5 x Dz	5 x Dz
Internal wall roughness	k	mm	0.007	0.007

Pipe marking - based on PE-RT pipes

All pipes are marked with permanent description placed continuously every 1 m i. a. the following markings:

Marking type	Example of marking
Manufacturer's name and/or trademark	System KAN-therm UltraLine PE
Nominal outer diameter x wall thickness	20×2.8
Pipe structure (material)	PE-RT
Product code	2529198002
Number of standard or Technical Certificate	DIN 16833
Application class/-es with design pressure	Class 2/10 bar, Class 5/10 bar
Anti-difussion marking	Sauerstoffdicht nach DIN 4726
Date of production	18.08.19
Other manufacturer's markings, e.g. running metre, batch number	045 m

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Note – other, additional markings, e.g. numbers of certificates (e.g. DVGW), may also be inscribed on the pipe.

3.4.2 Construction and properties of PE-RT/AI/PE-RT pipes.

System KAN-therm UltraLine AL (diameters 14-32 mm) multilayer pipes comprise of the following layers: an inner layer (core pipe) of PE-RT polyethylene with improved thermal resistance, a middle layer of an aluminium strip, ultrasonically butt-welded as well as an outer layer of PE-RT polyethylene. An adhesive binding layer is applied between the aluminium and plastic layers.



The aluminium layer serves as a anti-diffusion barrier and lowers the thermal pipe elongation index 8 times, as compared to homogenous polyethylene pipes. Owing to the butt welding of the AI strip, the thickness of individual layers of the pipe wall is constant around the entire circumference.

Pipes in the entire series of diameter types, i.e. \emptyset 14×2; \emptyset 16×2,2; \emptyset 20×2,8; 25×2,5; 32×3, are available in two variants:

- without thermal insulation,
- with 6 mm thick thermal insulation.



Pipe colour: white. The surface of the pipes is shiny.

Depending on pipe diameter, pipes are supplied in 200, 100, 50, 25 rolls (scope 14-32 mm) in cardboard boxes. Pipes are also available in 5 m straight segments.

Dimensional specification of PE-RT/AI/PE-RT pipes of System KAN-therm UltraLine AL type

DN	Dz × t	t	Dw		Unit weight	Capacity	Packing
	$[mm \times mm]$	[mm]	[mm]	Size S series	[kg/m]	[dm³/m]	[m]
14	14×2.0	2.0	10.0	3.0	0.097	0.079	200
16	16×2.2	2.2	11.6	3.0	0.114	0.106	200
20	20×2.8	2.8	14.4	3.0	0.180	0.163	100
25	25×2.5	2.5	20.0	4.5	0.239	0.314	50
32	32×3.0	3.0	26.0	4.8	0.365	0.531	50

Physical properties of PE-RT/AI/PE-RT pipes of System KAN-therm UltraLine AL type

Property	Symbol	Unit	Value
Thermal expansion coefficient	α	mm/m × K	0.025
Heat conductivity	λ	W/m \times K	0.43
Minimal bend radius	R _{min}	mm	3.5 imes Dz
Internal wall roughness	k	mm	0.007

Pipe marking - based on PE-RT/AI/PE-RT pipes

All pipes are marked with permanent descriptions placed continuously every 1 m, containing i. a. the following markings:

Marking description	Example of marking
Manufacturer's name and/or trademark	System KAN-therm UltraLine AL
Nominal outer diameter x wall thickness	16×2.2
Pipe structure (material)	PE-RT/AI/PE-RT
Product code	2529334003
Number of standard or Technical Certificate	KIWA KOMO, DVGW
Application class/-es with design pressure	Class 2/10 bar, Class 5/10 bar
Date of production	18.08.19
Other manufacturer's markings, e.g. running metre, batch number	045 m

Note – other, additional markings, e.g. numbers of certificates (e.g. DVGW), may also be inscribed on the pipe.

3.5 Operational parameters of System KAN-therm UltraLine pipes

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PE-RT pipes in accordance with PN-EN ISO 21003-2 standard, PE-X pipes in accordance with PN-EN ISO 21003-2 standard and PE-RT/AI/PE-RT pipes in accordance with PN-EN ISO 21003-2 standard can work:

Operating parameters and scope of use for PE-Xc, PE-RT and PE-RT/AI/PE-RT pipes

			Operating pressure P _{op} [bar]		Conne	ction type	
Type of installation and application class (acc. ISO 10508)	T _{op} ∕T _{max} [°C]	DN	PE-Xc	PE-RT	PE-RT/AI/ PE-RT	system	threaded
		14	10	10	10	+	+
0.111		16	10	10	10	+	+
Cold tap water	20	20	10	10	10	+	+
		25			10	+	-
		32			10	+	-
		14	10	10	10	+	+
Hot tap		16	10	10	10	+	+
water	60/80	20	10	10	10	+	+
(class 1)		25		_	10	+	-
		32			10	+	-
		14	10	10	10	+	+
Hot tap		16	10	10	10	+	+
water	70/80	20	10	10	10	+	+
(class 2)		25			10	+	-
		32			10	+	-
		14	10	10	10	+	+
l ow-temperature		16	10	10	10	+	+
and floor	60/70	20	10	10	10	+	+
heating (class 4)		25			10	+	-
		32		-	10	+	-
		14	10	10	10	+	+
		16	10	10	10	+	+
Radiator heating (class 5)	80/90	20	10	10	10	+	+
		25			10	+	-
		32		-	10	+	-

Operating temperature T_{cp} in individual classes should be treated as the design temperature, maximum temperature T_{cp} as the temperature before exceeding, in which the systems should be secured.

3.6 Transport and storage

PE-RT and PE-X pipes as well as multilayer PE-RT/Al/PE-RT pipes can be stored at temperatures below 0 °C, then they should be protected against dynamic loads. They should be protected against mechanical damage during transport. Due to the sensitivity to ultraviolet rays, the pipes should be protected against direct long-term exposure to sunlight, both during storage, transport and assembly.

During storage, transport and assembly of pipes and fittings:

- avoid surfaces with sharp edges or loose sharp elements on its surface
- _____ do not shift directly on concrete surfaces
- ____ protect against dirt, mortar, oils, greases, paints, solvents, moisture chemicals, etc.
- ____ remove components from the original packaging immediately before assembly



Detailed information on storage and transport of components can be found at www.kan-therm.com.

4 Fittings and sliding sleeves in System KAN-therm UltraLine

Apart from the offer of various types of pipes, the complete System KAN-therm UltraLine also includes fittings and sliding sleeves.

Fittings are available in plastic PPSU and brass. Sliding sleeves are produced and offered only in the plastic PVDF version.



4.1 Fittings in the System KAN-therm UltraLine

System KAN-therm UltraLine fittings, depending on the selected pipe configuration, can be used in the System KAN-therm UltraLine PE version and in the System KAN-therm UltraLine AL version.

In both cases, the fittings use a O-ringless design, thus ensuring easy and safe assembly and long-term, trouble-free operation of the installation.

 System KAN-therm UltraLine fitting
 Plastic (PVDF) sliding sleeve of the System KAN-therm UltraLine
 Pipes in System KAN-therm UltraLine PE or System KANtherm UltraLine AL variants



System KAN-therm UltraLine offer provides a whole range of fittings necessary to perform even the most complex piping installations:

- Couplings and reducers made of plastic PPSU and brass,
- ____ Steel / UltraLine transition connectors made of brass,
- ____ PPSU plastic and brass elbows,
- ____ Equal and reduction tees made of plastic PPSU and brass,
- ____ UltraLine brass plugs,
- Brass fittings with threads,
- ____ Brass elbows and tees with threads,
- ____ Tap connectors with various lengths in brass design,
- Brass elbows and tees with nickel-plated pipes.

4.2 Sliding sleeves in the System KAN-therm UltraLine

Sliding sleeves of System KAN-therm UltraLine are one of the most important elements responsible for connecting and sealing the pipe with the fitting. The sleeves are produced only of high quality PVDF.



As in the case of the fittings, depending on the selected pipe configuration, the sliding sleeves can be used in the System KAN-therm UltraLine PE version and in the System KAN-therm UltraLine AL version.

For proper tight and mechanically strong connections only System KAN-therm UltraLine sleeves must be used. It is forbidden to use sleeves other than the recommended ones or products of foreign origin.

Each original sliding sleeve of the System KAN-therm UltraLine has the KAN marking embossed and the diameter on the outer surface for which it is intended.

4.3 Advantages of fittings and sliding sleeves design

Fittings and sliding sleeves in the System KAN-therm UltraLine brings:

- wide range of fittings and threaded connections,
- _____ versatility of use, allowing the use of brass and plastic elements for virtually every type of installation,
- wide range of plastic components (PPSU), guaranteeing the possibility of price optimization of the complete investment and securing the system against negative effects of water with an unfavourable chemical composition,
- universal design of threaded couplings ensuring safe and tight connection with various types of pipes – System KAN-therm UltraLine PE and System KAN-therm UltraLine AL variants,
- design of elements in diameters 25 and 32 mm with increased internal cross-section, thanks to which the hydraulics is significantly increased and the so-called hydraulic optimization of the designed systems is enabled,
- elements of acoustic protection of the system available in the standard offer,
- aesthetic look of the fittings and bright colour of PPSU plastic design that significantly increases the visibility of the element in dark rooms,
- _____ symmetrical design of the sliding sleeves that minimizes the risk of mistakes and significantly increases convenience during assembly.

5 Connections in the System KAN-therm UltraLine

5.1 Connections with a sliding sleeve.



System KAN-therm UltraLine fittings are universal and can be used with uniform PE-X, PE-RT (System KAN-therm UltraLine PE) pipes and PE-RT/AI/PE-RT multilayer pipes (System KAN-therm UltraLine AL).

Fittings have specially shaped connector stubs (without additional seals), which are inserted into the previously expanded end of the pipe and then a plastic sleeve is slid onto the connection. The pipe is crimped circumferentially on the coupling stub in the entire contact plane. Such connection allows for conducting the installation in structural partitions (in flooring screeds coats and under layers of plaster) without any limitations.

5.1.1 Special features of the connection with a sliding sleeve in System KAN-therm UltraLine



5.2 Threaded connections in System KAN-therm UltraLine

To connect System KAN-therm UltraLine pipes, in addition to connections with a sliding sleeve, standard threaded connections with a flat wrench can be used.

Two main types of connectors are available for these couplings:

 Universal threaded couplings with internal, external threads or so-called connectors, available in diameters 14-20 mm.

Threaded fittings at the pipe connection side do not require the use of additional seals – tightness is guaranteed by the appropriate construction of the coupling stub on which the pipe is mounted. From the thread side (internal or external) an additional sealing in the form of tow should be used. Threaded connectors, due to the specificity of the fitting and its design, do not require additional sealing. These fittings should be located in easily available places.



Universal pipe unions available in the diameter range of 14-20 mm. Real advantage of those couplings is their automatic sealing after fitting. Connections of this kind are self-sealing and need no additional seal, such as Teflon tape or tow. These elements should be located in easily available spaces.



As the name suggests both universal threaded couplings and universal pipe unions have structure which allows the simultaneous installation of uniform PE-X and PE-RT (System KAN-therm UltraLine PE) pipes and multilayer PE-RT/A/PE-RT pipes (System KAN-therm UltraLine AL).

Thanks to the universal structure of couplings and pipe unions, duplicating the fitting offer is avoided, which translates into more flexible and convenient assembly, as well as saving space for storing elements.

Note! System KAN-therm UltraLine AL pipes require calibration and chamfering for threaded connectors and pipe unions!

5.3 Threaded connections using fittings with nickel-plated pipes of the System KAN-therm UltraLine

Combined fittings with nickel-plated copper pipes also provide a complete system solution. The elements are very often used for aesthetic connection of radiators or other wall mounted equipment. Depending on the needs, the system offer provides for the possibility of using fittings such as single elbows, joined elbows as well as equal and reduction tees.



The elements can also be distinguished depending on the length of the nickel-plated copper pipe. 300 mm or 750 mm lengths are available.

Elbows and tees with a nickel-plated pipe should be connected with radiator valves and directly with the VK-type radiators by means of fittings for connecting nickel-plated Ø15 mm pipes.

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

6 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 unfavourable 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 assembly foams based on methacrylate and acrylate isocyanate.
- Secure pipes and fittings against direct contact with adhesive tapes and insulation adhesives. Adhesive tapes should only be used on the outer surface of thermal insulation.
- It is advised to seal threaded connections with such an amount of hemp, that leaves the thread tops not covered. Using too much hemp may lead to thread damage. By winding hemp just after the first thread ridge you can avoid skew screwing and damaging the thread.

Do not use chemical sealants or adhesives.

Tools for installation of System KAN-therm UltraLine

All elements of System KAN-therm UltraLine must be combined using specially designated tools. These tools are included in the system offer.





Battery crimping tools set

The photo above shows an example set based on a battery crimping tool and an battery expander. These are the latest generation tools, which greatly accelerate the assembly process. These tools are dedicated to System KAN-therm UltraLine system and specially developed for the needs of optimal and safe assembly of connections. The lightweight and compact design as well as the built-in flashlight significantly increases the comfort and safety of working at the construction site. The battery indicator allows for constant monitoring and prior preparation of tools, so that users can properly organize and save their work time.

LED Identification is a function of electronic diagnostics of tools condition and the assembly process itself, through a special LED device informs the user about the possible need of tool service. Modern 10.8 V technology significantly accelerates battery charging time.

For customers basing on classic tool solutions, we have also prepared improved versions of hand operated tools that allow for the correct assembly of the system.

The hand operated crimping tool and expander are a simple and reliable constructions, made of the highest quality materials, guaranteeing their long lifespan.



Hand tools set

Very small dimensions of the hand operated crimping tool allow for performing easy connection of the UltraLine elements even in the most difficult to reach places. No need to charge the battery is a big plus in case of the absence of access to the electrical grid. Hand operated and electric tools use the same complementary accessories, i.e. crimping forks and expanding heads.

Shears

For pipes cutting, use dedicated, good-quality shears, guaranteeing correct cutting. Make sure that the cutting blade is sharp and free from damage which can deteriorate the quality of the cut and at the same time affect the quality of the connection made (especially important when assembling connections at temperatures below 0 °C).



Expanders

Expanders are used to perform the process of expanding the pipe end (flaring of the pipe end diameter). This process is possible thanks to special expanding heads working with the flaring tool.



The expanding heads have a different design, depending on the type of pipe used. Make sure that the appropriate expanding head is used in the process of flaring the pipe end.

• NOTE!

The selection of a proper expanding head for a given type of pipe is very important for the correctness of tight and durable connection of System KAN-therm UltraLine.

System KAN-therm UltraLine PE			System KAN-therm UltraLine AL				
Pipe type	Diameter	Expanding head	Pipe type	Diameter	Expanding head		
	14×2	UltraLine PE 14		14×2	UltraLine AL 14		
PE-X, PE-RT	16×2.2	UltraLine PE 16		16×2.2	UltraLine AL 16		
	20×2.8	UltraLine PE 20	PE-RT/AI/PE-RT	20×2.8	UltraLine AL 20		
	25×2.5	UltraLine AL 25		25×2.5	UltraLine AL 25		
	32×3	UltraLine AL 32		32×3	UltraLine AL 32		

Crimping tools

Crimping tools cooperate with sets of crimping forks. Two crimping forks are available for each diameter, i.e. from 14×2 to 32×3 . To make a connection on a given diameter, equip the crimping tool with a suitable set of forks.



An additional feature of System KAN-therm UltraLine is the possibility of its assembly using standard electric drives used for radial pressing (e.g. System KAN-therm Press LBP). This option is implemented by using a special System KAN-therm UltraLine adapter in combination with a "Press" tool.



Crimping forks

The design of System KAN-therm UltraLine cripming forks ensures a very wide angle of access to the fitting, which significantly increases the comfort of assembling the system in places hard to reach.



The possibility of approaching the clamp forks to the fitting at an angle from 0° to even 270° guarantees the greatest convenience and flexibility of assembly among the competitive solutions.

7.2 Completing System KAN-therm UltraLine tools

- **Set I**: tool case, expander, chain press, pipe shears and grease,
- ____ Set II: tool case, expander, adapter for "Press" type tools, pipe scissors and grease,
- ____ Set III: tool case, expander, battery crimper with spare battery, charger, shears and grease,
- **Set IV**: tool case, battery expander, battery crimp, spare battery, charger, shears and grease,
- ____ Set V: tool case, expander and grease,
- **Set VI:** tool case, battery expander, battery crimping tool, spare battery, charger, shears, expanding heads AL 16-25, crimping fork sets 16-25, pipe calibrator and grease,
- Set VII: tool case, battery expander, battery crimping tool, spare battery, charger, shears, expanding heads PE 16-20, expanding head AL 25, crimping fork sets 16-25 and grease.
- Note! Expanding heads and forks must be completed separately depending on the user preferences.

7.3 Advantages of System KAN-therm UltraLine tools

- possibility of using manual chain tools and drives for "Press" connections by the use of the System KAN-therm UltraLine adapter,
- crimping forks dedicated to specific diameters, without the need to differentiate in terms
 of material, fittings and sliding sleeves,
- mechanical stop in the construction of crimping forks protects fittings and sleeves against possible damage due to excessive force by means of electric and electro-hydraulic drives,
- wide angle of access to the fitting for crimping forks further increases the convenience of mounting, especially in places hard to reach,
- ____ quick and uncomplicated assembly simple rules,
- _____ safe and fault-free assembly process,
- new quality of tools light and handy designs due to the use of high-quality materials,
- plastic cases equipped with a special interconnecting system guarantee a convenient manner of transporting tool sets.

7.4 Safety when using tools

All tools must be used according to their dedication and the manufacturer's instruction manual. 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 its intended purpose may result in damage to tools, accessories and pipes. The consequence may be the leak and/ or damage of connections.

8 Assembly of System KAN-therm UltraLine connections

To perform connections in System KAN-therm UltraLine, use original KAN-therm tools only. Tools are available as individual components or in complete sets. Standard assembly of the System should be carried out at an ambient temperature above 0 °C.

If it is necessary to carry out assembly in subzero temperatures, please contact the KAN Technical Department for additional information.

Before starting work:

- read the instructions for use of the tools which are included in the packaging or box with a set of tools,
- ____ check technical condition of tools with which the connections are planned to be installed.

8.1 Assembly of connections with a sliding sleeve.

 The selected System KANtherm UltraLine pipe should be cut perpendicularly to the axis to the required length by means of pipe cutters. It is not allowed to use other tools or scissors which are faulty (blunt or chipped).

2. Put the sleeve onto the pipe. Symmetric structure allows for bothside installation.

 Pipe expander should be equipped with a head suitable for the type of the pipe and its diameter. Insert the expanding head fully into the pipe until it stops, axially into the pipe end. Expansion of the pipe should be carried out in two phases:

 I – initial full expansion of the pipe, in full range of the tool stroke, turn the expander by 30° after expansion,

II - final expansion of the pipe, in full range of the tool stroke.

 Directly (!) after expansion, insert the fitting into the pipe to the last protrusion on the fitting stub (do not push the pipe up to the fitting flange!). Do not use lubricants.

5. Detailed guidelines for sliding the sleeves are mentioned in point 5a \sim 8.



If cracks appear on the expanded section of pipe or the pipe has not been expanded evenly on the entire circumference, cut off the damaged piece and carry out the expansion again. If the pipe is excessively stretched, its material may build up during the connecting. In such a case, finish sliding the sleeve onto the pipe in front of fittings flange (keep a distance of max. 2 mm from the fitting flange).

Expanding of pipes in temperatures below 0 °C must be done in three stages - for more information contact KAN Technical Department.















5b. Slide the sleeve using manual chain press. The fittings may be caught only by their flanges. It is forbidden to slide on two sleeves at the same time.

5c. It is possible to slide a sleeve on with the use of electric drives, typical for "Press" connections. The condition to use this type of tools for sliding the sleeve is the use of a special adapter provided by System KAN-therm UltraLine. When sliding the sleeve onto the fitting, the assembly process should be observed - after the sleeve is pushed up to the fitting flange, the sliding process should be stopped.

6. The connection is ready for the pressure testing.

7 - 8. Pay attention to correct position of the fittings in the forks of the tools. In the event of non-compliance with this rule, the fitting and the components of the connection may be overloaded.





NOTE!

When making connections of the System KAN-therm UltraLine, special attention should be paid to the correct position of the fitting in the forks of the tool. Always insert the forks to their full depth and at right angle to the connection being made. Do not move the crimping tool sideways while making connections.

8.2 Installation of universal threaded couplings and threaded connectors

Fittings of this type are made of brass. The connections include a coupling body with a stub pipe and an O-ring seal, a cut brass ring and a threaded pressure nut are applied.



 The selected System KANtherm UltraLine pipe should be cut perpendicularly to the axis to the required length by means of pipe cutters. It is not allowed to use other tools or scissors which are faulty (blunt or chipped).

 Calibrate the pipe and chamfer (only UltraLine AL) its inner edges with a calibrator but no deeper than to the aluminium layer. Fit onto a pipe the screwed joint nut with the cut ring (or a connection nut).

3. Screw the connector body into the fitting with sealing the thread utilizing hemp or Teflon tape. Put a clamping nut on the pipe and then place a cut ring at the end of the pipe, noting that it should be located at a distance from the edge of the pipe between 0.5 to 1 mm.

4. Insert the pipe fully over the coupling stub pipe (do not use any lubricants, do not make any twisting movement of the fitting in relation to the pipe).

 As far as possible, tighten the nut over the pipe and the cut ring by hand, without using any additional tools – hand tightening only.

6. Tighten the nut over the pipe and cut ring with a spanner. When tightening, just one full 360 ° rotation is needed to obtain proper seal.

The connection can be considered as dismountable provided that after removing the coupling stub from the pipe, the worn end of the pipe will be cut off before making a new connection.

8.3 Installation of universal pipe unions

It is a variation of threaded connections, in which the basic element is a clamping cone with a conical seal with an O-Ring which does not require additional sealing methods. They can be treated as detachable, provided that the pipe is clamped.



 The selected System KANtherm UltraLine pipe should be cut perpendicularly to the axis to the required length by means of pipe cutters. It is not allowed to use other tools or scissors which are faulty (blunt or chipped).

2. Calibrate the pipe and chamfer (only UltraLine AL) its inner edges with a calibrator but no deeper than to the aluminium layer.

3. Put a clamping nut on the pipe and then place a cut ring at the end of the pipe, noting that it should be located at a distance from the edge of the pipe between 0.5 to 1 mm.

 Insert the pipe fully over the coupling stub pipe (do not use any lubricants, do not make any twisting movement of the fitting in relation to the pipe).

 As far as possible, tighten the nut over the pipe and the cut ring by hand, without using any additional tools – hand tightening only.

 Tighten the nut over the pipe and cut ring with a spanner. When tightening, just one full 360 ° rotation is needed to obtain proper seal.

8.4 Installation of pipe unions for metal pipes

System KAN-therm offer includes two types of pipe unions for connecting metal pipes.

 G_{4}^{3} "1709043005 and G_{2}^{\prime} " 1709043003 copper pipe unions can work with 15 mm nickel-plated copper pipes.

Universal pipe unions 1709043010 can work with metal pipes (copper, nickel-plated copper, System KAN-therm Steel and System KAN-therm Inox pipes with a diameter of 15 mm). The design of the universal pipe union allows its multiple use.



Cu 15 mm

1709043010





Cu 15mm Steel/Inox 15mm



NOTE

To eliminate 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.



Compensation for thermal elongations of System KAN-therm UltraLine

Under the influence of temperature resulting from medium and ambient temperature changes, installation pipelines are expanded or shortened linearly during assembly (causing an axial motion of pipelines).

In order to protect the system against situation of uncontrolled axial movement of the pipeline, it is necessary to ensure appropriate compensation of thermal elongations. Failure to do so may result in pipes and fittings and their connections failing.

In the case of flush-mounted installation in diameters of 14-25 mm, pipes should be laid with light curves (with 10% excess of length in relation to a straight line), which allows self-compensation of thermal elongation of pipelines.

In the case of 32 mm diameter, the elongation of the pipeline should be individually checked and the appropriate size of compensation arms, type of compensator and arrangement of fixed and sliding points ensuring correct thermal operation of the installation should be selected.

9.1 Linear thermal elongation

Vulnerability of pipes to linear elongation is defined by the thermal elongation coefficient α . Elongation (or shrinkage) of a pipeline section ΔL is calculated according to the following formula:

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

where:

- α coefficient of linear expansion [mm/mK]
- L length of pipeline section [m]

 ΔT – temperature difference (assembly and operation) [K]

Value of coefficient α for System KAN-therm UltraLine pipes

- PE-X, PE-RT pipes: $\alpha = 0.18$ [mm/m x K]
- PE-RT/AI/PE-RT pipes: $\alpha = 0.025$ [mm/m x K]

Changes in pipelines length may be calculated on the basis of data included in one of the following tables:

			Lir	lear elongat] PE-RT/Al/	PE-RT pipe					
L [m]		Δt [K]										
	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		

			Lir	iear elonga	tion ∆L [mm	1] PE-X and	PE-RT pipe	s				
L [m]		Δt [K]										
	10	20	30	40	50	60	70	80	90	100		
1	1.8	3.6	5.4	7.2	9.0	10.8	12.6	14.4	16.2	18.0		
2	3.6	7.2	10.8	14.4	18.0	21.6	25.2	28.8	32.4	36.0		
3	5.4	10.8	16.2	21.6	27.0	32.4	37.8	43.2	48.6	54.0		
4	7.2	14.4	21.6	28.8	36.0	43.2	50.4	57.6	64.8	72.0		
5	9.0	18.0	27.0	36.0	45.0	54.0	63.0	72.0	81.0	90.0		
6	10.8	21.6	32.4	43.2	54.0	64.8	75.6	86.4	97.2	108.0		
7	12.6	25.2	37.8	50.4	63.0	75.6	88.2	100.8	113.4	126.0		
8	14.4	28.2	43.2	57.6	72.0	88.2	100.8	115.2	129.6	144.0		
9	16.2	32.4	48.6	64.8	81.0	97.2	113.4	129.6	145.8	162.0		
10	18.0	36.0	54.0	72.0	90.0	100.8	126.0	144.0	162.0	180.0		

9.2 Compensation of elongations

Flexible arm

Thermal elongation of pipelines in installations is an undesirable phenomenon which has negative impact on the operation and durability, as well as the outer appearance of the installation. Therefore, as early as in the stage of designing an installation, specific compensation solutions, consisting of various compensators and properly arranged fixed (PS) and shifting points (PP) should be assumed.

In surface mounted installations, redirecting the installation with the use of flexible (elastic) arms is used to compensate for the loads of thermal elongation. Tensions resulting from thermal elongation are transferred onto the arm, causing it to bend slightly.



The required length of the flexible arm **Ls** is calculated as follows:

$Ls = k \times \sqrt{D \times \Delta L}$

where:

Ls - flexible arm's length [mm],

- k pipe material constant,
- D external diameter of the pipe [mm],
- ΔL change in pipe length [mm].

Length of arm Ls can be also determined on the basis of the tables below:

Length of the Ls flexible arm for PE-RT/AI/PE-RT pipes

Elongation	External pipe diameter D [mm]							
L [mm]	14	16	20	25	32			
5	301	322	360	402	455			
10	426	455	509	569	644			
15	522	558	624	697	789			
20	602	644	720	805	911			
30	738	789	882	986	1115			
40	852	911	1018	1138	1288			
50	952	1018	1138	1273	1440			
60	1043	1115	1247	1394	1577			
70	1127	1205	1347	1506	1704			
80	1205	1288	1440	1610	1821			
90	1278	1366	1527	1708	1932			
100	1347	1440	1610	1800	2036			

Length of the Ls flexible arm for PE-X and PE-RT pipes

Elongation		External pipe diameter D [mm]	
L [mm]	14	16	20
5	125	134	150
10	177	190	212
15	217	232	260
20	251	268	300
30	307	329	367
40	355	379	424
50	397	424	474
60	435	465	520
70	470	502	561
80	502	537	600
90	532	569	636
100	561	600	671

Knowledge of the length of *Ls* flexible arm is vital when assembling secure branch-offs on a pipeline subject to elongation (and when there is no fixed point on the branch-off). Applying a too short *Ls* section will cause excessive tensions in the vicinity of the tee and, in extreme case, may damage the joint.

When planning a flexible arm *Ls*, remember that its length should be lower to the maximum distance between the clamps for a given pipeline diameter.



Determination of the spring arm on the branch

Z-shaped compensator

Various types of compensators are used to eliminate the effects of thermal elongations of pipelines. Compensators presented here use the action of the flexible arm. If there is a possibility of shifting the axis of the pipeline, you may use a Z-shaped compensator.



To calculate the length of the flexible arm Ls of the compensator, assume Lz = L1 + L2 as the replacement length. For this length, calculate the elongation ratio ΔL (from the template in the table) and then the value of Ls (from the template in the table). The length of arm Ls must not exceed the maximum span of mounts for a given pipeline diameter. Do no mount any clamps on it.

U-shaped compensator

If compensating for pipeline elongation through a change in pipeline direction is impossible (the axis of the pipeline runs along one line), use a U-shaped compensator. Calculate the length of the compensator arm *Ls* according to formula or data in the tables for determining the length of flexible arm. If the distances from the middle of the compensator to the nearest PS fixed points are not the same, assume the elongation ratio *Ls* of the longer pipeline section *AL*, on which the compensator is mounted, to determine the length of the arm (in the figure, elongation ratio *AL*2 corresponds to section *L2*). The most optimal solution is to place the compensator in the middle of the pipeline section (*L*1 = *L*2).



When dimensioning the compensator, follow these principles:

- You can build a U-shaped compensator using four 90-degree system elbows and pipe sections.
- In the case of multilayer PE-RT/AI/PE-RT pipes, the U-shape compensator can be made by bending the pipe suitably, maintaining the minimum radius $R = 3.5 \times Dz$ (bending pipes with diameters exceeding 32 mm is not recommended).
- The minimal width of a compensator S must ensure unobstructed operation of the arms of compensated sections L1 and L2 and take into account possible thickness of thermal coating for the pipeline.

The following may be assumed:

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

 $S_{min} = 150 - 200 \text{ mm}$

g_{izol} – insulation thickness

The length of the compensator should not exceed the maximum span of mounts for a given pipeline diameter. Do not mount any clamps on the arms.

9.3 Principles of risers elongation – installation horizontals

When mounting installation risers/horizontals atop walls and inside installation shafts, you must consider their axis motion caused by temperature changes by carefully arranging fixed points (PS) and compensators and compensation for all tensions on branch-offs. This is why every installation subjected to elongations should be treated individually.

The assumed solution depends on the material of risers and branch-offs, the working parameters of the installation, the number of branch-offs on the riser, and the amount of space available (e.g. in the installation shaft). Figures A,B,C present examples of compensation solutions applied in installation risers.



B. Example of the construction of a riser using a fixed point in the middle of the riser (applies to PE-RT/AI/PE-RT multilayer pipes).

C. Example of vertical construction using selfcompensation ("rigid" assembly - applies to PE-X, PE-RT, PE-RT/AI/PE-RT pipes).



In the case of vertical plumbing compensation using "rigid assembly", only brass fittings may be used.

In each case, use a compensation arm of sufficient length in the riser connection. At the end of the riser, on the connection to the last container/valve, add a flexible arm of sufficient length.

Each branch-off (e.g. radiator joint, water meter connection) should allow for bending (under the influence of vertical motion of the riser) so that tension around the tee is not critical. This may be executed by ensuring correct length of flexible arm (fig. 1, 2, 3). It is particularly essential during the assembly of installations in shafts. In the case of a correctly mounted fixed point near a branch-off tee, the requirement of ensuring a flexible arm on this branch-off is not essential.

Ensuring a flexible arm on riser branch-offs in installation shafts (examples)



In the case of System KAN-therm UltraLine pipes, no application of any compensation for changes in pipe length by placing fixed point clamps directly above each tee providing branch-off to the pipe is required. This is so called rigid mounting (fig. C, page 33).

By dividing the riser (with fixed points) into considerably small sections (usually the length of the storey, but not longer than 4 m), the length of elongations is restrained and the remaining tensions are transferred onto the clamps of fixed points. Slight sideways deviations of the pipelines may be limited by dense arrangement of shifting point clamps (denser, if the riser is assembled on plaster in visible places).

9.4 Compensation of sub-plaster/sub-flooring installation elongations

In the case of conducting System KAN-therm UltraLine pipelines in layers of concrete (screed) or plaster, the thermal elongation of pipes phenomenon also applies. However, due to the fact that pipes are conducted in casing pipes or in insulation, the tensions caused by pipe elongation are not high, since the pipes have the space to bend in the casing which surrounds them (self-compensation phenomenon). Conducting pipes on small curves also has beneficial impact on thermal elongation.





This principle should be particularly significant when there is a possibility of pipelines shrinking (e.g. cold water installation laid during hot summer) – when arranging a long, straight pipeline without bends or arches. In such a case, there is a possibility of the pipe sliding out of the joint, e.g. a tee.

10 Pipeline fixing

KAN-therm offers various types of clamps for mounting System KAN-therm pipes to structural partitions. Their structure depends on the diameter of the pipe and its construction material, the working parameters of the installation and its layout.

Clamps are made of plastic or metal. Plastic clamps must be used only as shifting points for System KAN-therm UltraLine pipelines. For pipelines laid in floor slabs or wall furrows, use plastic hooks and clamps with wall plugs.



Metal clamps (zinc plated steel) are equipped with elastic pads levelling out vibrations and noises. Such clamps may serve as shifting points (PP) and fixed points (PS) in all KAN-therm installations with on-plaster mount. Metal clamps without elastic pads might damage the surface of plastic KAN-therm pipes, this is why they cannot be used.

Shifting and fixed point clamps are not to be mounted on couplings.

10.1 PP shifting points

Shifting (sliding) points should allow for unobstructed axial motion of pipelines (caused by the thermal elongation factor), which is why they should not be mounted next to the couplings (the minimal distance from the edge of a coupling must be higher than the maximum elongation of the pipe section Δ L).

When changing the direction of the pipeline, a shifting point may be mounted at distance to the elbow, exceeding the length of the flexible arm **Ls**.





 ΔL – max elongation of the pipe section)

10.2 PS fixed points

Fixed points allow for pointing thermal elongations of a pipeline in a specific direction and for dividing it into smaller sections. To form fixed points (PS) use zinc-plated steel clamps with elastic pads, ensuring precise and reliable stabilization of the pipe on its entire circumference.

The clamp should fully and tightly clamp the pipe (the spacer should be removed). The structure of clamps should allow for the transfer of forces incurred by the pipe expanding and loads caused by the weight of the pipe and its content onto the clamp.

The structures mounting the clamps on structural partitions must also be strong enough to bear the above mentioned loads.

To form a fixed point on the pipeline, use two clamps adjoining the edges of the joint (tee, connector, coupling). Fixed points are usually mounted next to pipeline of fixture branch-offs. The assembly of a fixed point (PS) at a branch-off of a reducer is possible if the diameter of the branchoff is not smaller than one-dimension of the diameter of the main pipe.

Another solution for fixed points is also allowed, provided that the circumferential clamping force of the clamp ensures no axial movement of the pipelines while protecting the installation pipes against mechanical damage.

The arrangement of fixed points results from the adopted solution of compensation of thermal elongation of the installation and should be included in the technical design.





 $\text{D2} \geq \text{D1}$





Example of execution of a fixed point next to a branch-off of System KAN-therm UltraLine pipeline



10.3 Pipeline support distances

Minimal distances between the supports for System KAN-therm UltraLine pipelines conducted at the surface of structural partitions and structures are provided in the tables.

Fixed points, shifting points and passages through structural partitions in protective sleeves are considered supports.

Maximum support spacing [m] – PE-RT/AI/PE-RT multilayer pipes:

Pipeline layout	External pipe diameter [mm]							
	14	16	20	25	32			
vertically	1.5	1.5	1.7	1.9	2.1			
horizontally	1.2	1.2	1.3	1.5	1.6			

Maximum support spacing [m] – PE-X, PE-RT multilayer pipes:

Pipe layout		External pipe diameter [mm]	
	14	16	20
vertically	0.5	0.6	0.7
horizontally	0.4	0.5	0.6

11 Installation rules

Thanks to a great diversity of solutions and a comprehensive offer of products, System KAN-therm UltraLine allows for designing and executing nearly each and every type of internal pressurized installations consisting of horizontals, risers and branch-offs. These elements may be conducted on the surface of plaster or floor slab surfaces (on-plaster mount) or placed in structural partitions (sub-plaster mount – in wall furrows and floor mortars). An indirect method of laying separating pipelines is conducting pipes in special baseboards.

11.1 On-plaster installations - risers and horizontals

On-plaster mounts on structural partitions are used when conducting installation horizontals in non-inhabited rooms (such as ceiling, garage) and when mounting installations risers e.g. in industrial and non-inhabited facilities or in installation shafts.

When designing such installations, bear in mind that, apart from technical requirements, also the visual aspect is important. Therefore:

- _____ select the proper type of pipes and joint system
- ____ carefully develop the system of compensating for thermal elongations
- _____ adopt a correct method of mounting pipelines, complying with the guidelines
- _____ select the most suitable (depending on the destination of the installation and its environment) type of thermal insulation.

For surface installation (verticals and horizontals) it is recommended to use multilayer pipes, e.g. System KAN-therm UltraLine AL or System KAN-therm Press.

11.2 Conducting installations in structural partitions

According to the requirements of modern construction practices, System KAN-therm pipelines may be conducted in wall furrows filled with mortar and plaster, as well as various types of floor mortars. This applies to pipelines made of PE-RT, PE-X and multilayer PE-RT/AI/PE-RT pipes of the System KAN-therm in manifold systems, as well as in tee systems with connections using System KAN-therm UltraLine, Press and welded sliding sleeve technique System KAN-therm PP.





- 1. floor cover
- 2. concrete mortar
- 3. foil
- 4. thermal insulation of pipe5. System KAN-therm pipe
- 6. thermal insulation
- **7.** filling, e.g. sand, pellets
- 8. insulation
- 9. floor slab



Note

Bolted clamp connections must not be covered with concrete or plaster. Pipelines in wall furrows should be protected against contact with sharp edges of the furrow, preferably by guiding in casing pipes (PEL) or thermal insulation (if required).

Pipes conducted in floor mortar must be laid in pipe casings or, if thermal protection requirements requires, in thermal insulation (see chapter Thermal insulation of System KAN-therm pipes).

Insulation may be used to reduce heat loss, to prevent the floor layer to collect heat from the pipe (max. 29°C) and it may partially serve as noise insulation to the pipeline.

Minimum thickness of the concrete layer over the top of the pipe or insulation is 4.5 cm. In the case of smaller thickness, it is recommended to make additional reinforcement of the grinding over the pipes. Laying pipes in floor screeds must not cause a violation of the uniformity of sound insulation. If the pipeline is run in a casing pipe (pipe in a pipe) or thermal insulation, its route should run so as to prevent the effects of thermal contractions of the pipelines.

Pipes should be attached to the ground with single or double plastic hooks. With sub-plaster installations, we recommend performing an inventory of the installation (e.g. using photographs) before executing any construction works. As a result, accidentally damaging the pipes hidden in plaster or screed will be avoided.

For concealed installations, it is recommended to make an inventory of the installation (e.g. photographic) before finishing construction works to avoid accidental damage to pipes hidden in plasters and screeds in the future.

12 Thermal insulation of the system

Depending on the type of the pipeline, thermal insulation aims at reducing the value of heat loss (in heating and hot tap water systems) or reducing the cold loss in cooling systems. In the case of cold water systems, thermal insulation prevents water inside the installation from heating and therefore blocks condensation on the pipeline. Thermal insulation of manifold pipes in central heating, hot tap water (including circulation pipes) and cold medium systems should observe the minimal requirements specified in the table.

Minimum thickness of thermal insulation in heating, cooling and hot tap water systems

		External diameter of System KAN-therm pipes	Minimum thickness
LP	Pipe type	UltraLine	of thermal insulation (λ = 0.035 W/(m × K) ¹⁾
1	External diameter up to 22 mm	14, 16, 20, 25	20 mm
2	Internal diameter from 22 to 35 mm	32	30 mm
3	Pipes and fixtures acc. to points 1-2 passing through walls or floor slabs, pipe crossings		1/2 of the requirements of points 1-2
4	Central heating pipes acc. to points 1-2, laid in structural components between heated rooms with various users		1/2 of the requirements of points 1-2
5	Pipes acc. to point 4 laid in floor		6 mm
6	Ice-cold water systems inside buildings ²⁾		50% of the requirements of points 1-2
7	Ice-cold water systems outside buildings ²⁾		100% of the requirements of points 1-2

¹⁾ when applying insulation material with a different heat transfer coefficient than specified in the table, correct the thickness of insulation suitably,

²⁾ thermal insulation executed as air-proof.

Note

For System KAN-therm cold water pipelines, the recommended thickness of insulation preventing water from heating and steam from condensing is provided in the table. Values provided below for other values of thermal transfer coefficients of the insulation material should be corrected.

Minimum thickness of thermal insulation in cold water systems

Pipeline location	Insulation thickness (λ = 0.04 W/(m × K)
Pipeline in non-heated room	4 mm
Pipeline in heated room	9 mm
Pipeline in channel without pipelines with hot or cold medium	4 mm
Pipeline in channel with pipelines with hot or cold medium	13 mm
Pipeline in wall furrow, vertical	4 mm
Pipeline in wall furrow, recess with pipelines with hot or cold medium	13 mm
Pipeline in floor layer (concrete screed)	4 mm

The thermal insulation material cannot have any negative impact on the pipes and couplings. It should be chemically neutral in relation to the materials of these elements.

13 Rinsing and leak tests

After completing the assembly, the system made of System KAN-therm UltraLine pipes should be rinsed and subjected to pressure test. It should be carried out before flooding the pipes with screed, covering furrows and channels. Carry out a leak test with water. If there are no favourable conditions for a water test (e.g. low temperatures), the test can be carried out with compressed air.

Before starting the water pressure test:

- disconnect fixtures and devices which could distort the results of the test (e.g. retention reservoirs, safety valves) or which could get damaged during the test,
- flush the system thoroughly; flushing the system should be done with treated water or with the use of the medium to be transported ultimately with the system. During the flushing process, it is necessary to ensure at least one replacement of volume of water in the system,
- _____ fill with the test medium (e.g. with clean water) and vent it thoroughly,
- ______ stabilize water temperature in comparison to air temperature.

Use a shield manometer with a scope exceeding the working pressure by 50% and minimum graduation of 0.1 bar. The manometer should be mounted on the lowest point of the installation. Ambient temperature of the installation should not change. Test pressure values (depending on the type of installation) and test conditions are presented in the table.

Test pressure value P _{op} [bar]						
heating systems	P_{op} +2 but not less than 4 bar (not more than 6 bar in radiant heating)					
water supply systems	${\sf P}_{\sf op}$ $ imes$ 1.5					
	Pre-test					
test time [min]	60 (including 3 times every 10 minutes in the first half, raise the test pressure to the primary value)					
permissible pressure drop [bar]	0.6					
test acceptance conditions	no drizzle or leaks					
	Main test					
test time [min]	120					
permissible pressure drop [bar]	0.2					
test acceptance conditions	no drizzle or leaks					

After finishing the pressure test, a report specifying the test pressure, the course of the test according to the procedure, pressure drop values must be drawn up and a statement whether the test ended with a positive (or negative result). The report can be written as a form.

After arriving at a positive result of the pressure test, heating systems and hot tap water systems must be tested with the use of hot water (hot pressure test).

Compressed air pressure test

It is allowed (in cases justified e.g. by the possibility of the system to freeze or cause excessive corrosion) to perform leakage tests using compressed air.

Air used for the test must not contain oils. The maximal pressure value for the pre-test is 3 bar (0.3 MPa). Ambient temperature of the system should not change (max. +/- 3 K). Leaks found may be located acoustically or, only after consulting with KAN, with a foaming liquid. Test results are considered positive when no installation leaks are detected and no pressure drops occur on the manometer.

NOTE:

Some foaming agents used to locate leaks when testing for tightness using compressed air can negatively affect the material of pipes and fittings. Consult KAN before using them.

14 System disinfection

System KAN-therm UltraLine is suitable for constructing drinking water systems and has the necessary hygiene approvals. The selection of construction materials does not affect the multiplication of pathogenic organisms or deterioration of the properties of water intended for consumption.

However, due to errors in the construction process or when using the system as well as periods of downtime or contamination of tap water, it may be necessary to disinfect the system. It should be remembered that disinfection removes the effects of contamination only – before carrying out it, causes of the contamination cause should be removed.

Thermal disinfection

Thermal disinfection is carried out with clean treated water at a higher temperature. In order to successfully carry out thermal disinfection, it should be ensured that water at 70 °C flows out in all drinking water collection points within not less than 3 minutes. Care should be taken that the permissible operating parameters (maximum permissible temperature as a function of operating pressure) of the installation system are not exceeded at any point. At the same time, safety of all users of the system (minimize the risk of burns) should be ensured.

We draw your attention to the fact that the operation of the system at higher temperatures shortens the service life of the construction materials used, hence it should be carried out only periodically.

Chemical disinfection

Chemical disinfection can be carried out in drinking water systems made of all KAN-therm systems. Chemical disinfection is carried out at ambient temperature (not higher than 25 °C) using doses of reagents and exposure time specified by the chemical preparation manufacturer. Before using the chemical agent, a written confirmation that it does not adversely affect the components of the system must be obtained. When carrying out chemical disinfection, drawing water from the system for food purposes should be prevented from.

Substance name	Max. permissible concentration	Working time in the system	
Hydrogen peroxide H ₂ O ₂	150 mg/l of active substance		
Sodium hypochloride NaOCI	50 mg/l of active substance	may 10 h	
Calcium hypochloride Ca(OCl) ₂	50 mg/l of active substance		
Chlorine dioxide CIO ₂	6 mg/l of active substance		

Concentrations and times given above for the substances must not be exceeded at any point of the system. Use personal protection when dispensing chemicals. Combining thermal disinfection and chemical disinfection is not allowed.

15 Linear resistances for the System KAN-therm UltraLine pipes – tables

	14×	<2.0	16×2.2		20×	<2.8	25>	<2.5	32×3.0	
	v [m/s]	R [Pa/m]	v [m/s]		v [m/s]	R [Pa/m]	v [m/s]	R [Pa/m]		R [Pa/m]
0.01	0.13	53	0.09	29	0.06	12	0.03	3	0.02	1
0.02	0.25	107	0.19	59	0.12	25	0.06	7	0.04	2
0.03	0.38	326	0.28	162	0.18	37	0.10	10	0.06	3
0.04	0.51	529	0.38	263	0.25	95	0.13	13	0.08	5
0.05	0.64	774	0.47	384	0.31	139	0.16	30	0.09	6
0.06	0.76	1059	0.57	524	0.37	189	0.19	40	0.11	7
0.07	0.89	1381	0.66	682	0.43	245	0.22	52	0.13	15
0.10	1.27	2570	0.95	1264	0.61	452	0.32	96	0.19	28
0.13	1.66	4077	1.23	1999	0.80	712	0.41	150	0.24	43
0.14	1.78	4648	1.32	2277	0.86	810	0.45	170	0.26	49
0.15	1.91	5252	1.42	2571	0.92	913	0.48	192	0.28	55
0.20	2.55	8774	1.89	4279	1.23	1513	0.64	315	0.38	91
0.21			1.99	4667	1.29	1648	0.67	343	0.40	99
0.22			2.08	5071	1.35	1789	0.70	372	0.41	107
0.25					1.54	2243	0.80	465	0.47	133
0.27					1.66	2572	0.86	532	0.51	152
0.30					1.84	3102	0.95	640	0.57	183
0.35					2.15	4086	1.11	840	0.66	240
0.40							1.27	1064	0.75	303
0.45							1.43	1311	0.85	372
0.50							1.59	1581	0.94	448
0.55							1.75	1875	1.04	531
0.60							1.91	2191	1.13	619
0.65							2.07	2529	1.22	713
0.70									1.32	814
0.75									1.41	921
0.80									1.51	1033
0.85									1.60	1151
0.90									1.70	1275
0.95									1.79	1405
1.00									1.88	1541

Tab. 1 Linear pressure drops in System KAN-therm UltraLine pipes for water at 10°C

	14×2.0		16×	2.2	20×	2.8	25×	2.5	32×	3.0
	v [m/s]	R [Pa/m]	v [m/s]		v [m/s]	R [Pa/m]	v [m/s]		v [m/s]	
0.01	0.13	38	0.10	19	0.06	5	0.03	1	0.02	0
0.02	0.26	122	0.19	60	0.12	22	0.06	5	0.04	1
0.03	0.39	246	0.29	121	0.19	43	0.10	9	0.06	3
0.04	0.52	407	0.38	200	0.25	71	0.13	15	0.08	4
0.05	0.65	603	0.48	295	0.31	105	0.16	22	0.10	6
0.06	0.78	834	0.58	407	0.37	144	0.19	30	0.11	9
0.07	0.91	1098	0.67	536	0.44	189	0.23	39	0.13	11
0.10	1.30	2088	0.96	1013	0.62	356	0.32	74	0.19	21
0.13	1.68	3366	1.25	1627	0.81	569	0.42	117	0.25	33
0.14	1.81	3856	1.35	1862	0.87	650	0.45	133	0.27	38
0.15	1.94	4376	1.44	2111	0.94	735	0.49	150	0.29	43
0.20	2.59	7446	1.92	3575	1.25	1238	0.65	251	0.38	71
0.21			2.02	3911	1.31	1353	0.68	274	0.40	77
0.22					1.37	1472	0.71	298	0.42	84
0.25					1.56	1860	0.81	375	0.48	106
0.27					1.69	2141	0.87	431	0.52	121
0.30					1.87	2599	0.97	521	0.57	146
0.35					2.19	3455	1.13	689	0.67	193
0.40							1.30	879	0.77	245
0.45							1.46	1090	0.86	303
0.50							1.62	1323	0.96	367
0.55							1.78	1576	1.05	436
0.60							1.94	1851	1.15	511
0.65							2.10	2147	1.25	592
0.70									1.34	678
0.75									1.44	769
0.80									1.53	866
0.85									1.63	968
0.90									1.72	1076
0.95									1.82	1189
1.00									1.92	1307

Tab 3 Linear pressure drops in	System KAN-therm Ultral ine n	ines for average temperature of	of chilled water 9.5°C (7/12°C)
abi o Emoai procoaro aropo m	oyotonn ru ar anonni ona aemo p	ipoo ioi avoiago tomporataro t	

	14×	2.0	16×	16×2.2		20×2.8		25×2.5		32×3.0	
	v [m/s]		v [m/s]	R [Pa/m]	v [m/s]	R [Pa/m]			v [m/s]		
100	0.06	26	0.05	14	0.03	6	0.02	2	0.01	1	
200	0.12	52	0.09	29	0.06	12	0.03	3	0.02	1	
400	0.24	105	0.18	58	0.12	24	0.06	7	0.04	2	
600	0.36	299	0.27	150	0.18	36	0.09	10	0.05	3	
800			0.36	242	0.23	88	0.12	13	0.07	5	
1000					0.29	128	0.15	16	0.09	6	
1200					0.35	173	0.18	37	0.11	7	
1400					0.41	225	0.21	48	0.13	14	
1600							0.24	60	0.14	18	
1800							0.27	74	0.16	22	
2000							0.30	88	0.18	26	
2200							0.33	103	0.20	30	
2400							0.36	120	0.22	35	
2600							0.39	137	0.23	40	
2800							0.43	156	0.25	45	
3000							0.46	175	0.27	51	
3200							0.49	196	0.29	57	
3400							0.52	217	0.31	63	
3600									0.32	70	
3800									0.34	76	
4000									0.36	83	
4200									0.38	91	
4400									0.40	98	
4600									0.41	106	
4800									0.43	114	
5000									0.45	122	
5200									0.47	131	
5400									0.49	139	
5600									0.50	148	
5800									0.52	158	
6000									0.54	167	
6200									0.56	177	
6400									0.57	187	
6600									0.59	197	
6800									0.61	207	
7000									0.63	218	

Tab // Linear pressure drops in S	wetom KAN_thorm I litral ino ninos for he	pating water with an average temperature 10° C (/	15/35°C)
ab. 4 Linear pressure drops in 5	ystem to a lenn ou acine pipes for ne	aling water with an average temperature 40 C (-	+3/33 0)

	14	22.0	16			20×2.8		25×2.5		(2.0
	147	∧2.0 I	107	\z.z I	207	\2.0 I	237		327	1
		R [Pa/m]	v [m/s]	R [Pa/m]		R [Pa/m]		R [Pa/m]		R [Pa/m]
100	0.00	[, 4, 11]	0.00	[]	0.01		[,0]	[1 00/111]	[,0]	[1 0411]
100	0.03	10	0.02	4	0.01	1	0.02	1		
200	0.00	26	0.05	1/	0.03	6	0.02	2	0.02	1
400 600	0.12	75	0.03	38	0.00	9	0.05	2	0.02	1
800	0.10	121	0.14	61	0.00	22	0.06	3	0.04	1
1000	0.31	177	0.23	88	0.15	32	0.08	7	0.05	1
1200	0.37	241	0.27	120	0.18	44	0.09	9	0.05	2
1400			0.32	156	0.21	56	0.11	12	0.06	4
1600			0.37	196	0.24	71	0.12	15	0.07	4
1800			0.41	239	0.27	86	0.14	18	0.08	5
2000					0.30	103	0.15	22	0.09	6
2200					0.33	122	0.17	26	0.10	8
2400					0.36	141	0.18	30	0.11	9
2600					0.39	162	0.20	34	0.12	10
2800					0.41	184	0.21	39	0.13	11
3000					0.44	207	0.23	44	0.14	13
3200							0.25	49	0.15	14
3400							0.26	55	0.15	10
3000							0.20	66	0.10	10
4000							0.29	72	0.17	21
4200							0.32	78	0.10	23
4400							0.34	85	0.20	25
4600							0.35	92	0.21	27
4800							0.37	99	0.22	29
5000							0.38	106	0.23	31
5200							0.40	113	0.24	33
5400							0.41	121	0.25	35
5600							0.43	129	0.25	37
5800							0.45	137	0.26	40
6000							0.46	145	0.27	42
6200							0.48	154	0.28	44
6400							0.49	163	0.29	47
6600							0.51	172	0.30	50
6800							0.52	181	0.31	52
7000							0.54	190	0.32	55
7200							0.55	200	0.33	58
7400							0.57	209	0.34	63
7800									0.35	66
8000									0.36	69
8200									0.37	72
8400									0.38	75
8600									0.39	78
8800									0.40	82
9000									0.41	85
9200									0.42	88
9400									0.43	92
9600									0.44	95
9800									0.45	98
10000									0.45	102
11000									0.50	120
12000									0.55	140
13000									0.59	161
14000									0.69	184
15000									0.00	207

Tab 5 Linear pressure drops in	System KAN-therm Hitral ine nines for heating	a water with an average temperature 52 5°C ($60/45^\circ$	3
iab. 5 Linear pressure urops in	System to neuron officialitie pipes for neuron	g water with an average temperature 52.5 C (00/45	\mathbf{U}_{j}

p	14×2.0 16×2.2			<2.2	20>	<2.8	25×2.5		32×3.0	
	v [m/s]	R [Pa/m]	v [m/s]	R [Pa/m]		R [Pa/m]		R [Pa/m]		
100	0.02	3	0.02	2	0.01	1				
200	0.02	7	0.02	4	0.02	2				
400	0.08	14	0.06	8	0.04	3	0.02	1		
600	0.12	21	0.09	12	0.06	5	0.02	1		
800	0.16	58	0.12	29	0.08	6	0.04	2	0.02	1
1000	0.21	84	0.15	42	0.10	15	0.05	2	0.03	1
1200	0.25	114	0.18	57	0.12	21	0.06	3	0.04	1
1400	0.29	148	0.21	74	0.14	27	0.07	6	0.04	1
1600	0.33	186	0.24	93	0.16	34	0.08	7	0.05	2
1800	0.37	227	0.28	113	0.18	41	0.09	9	0.05	3
2000			0.31	135	0.20	49	0.10	10	0.06	3
2200			0.34	159	0.22	58	0.11	12	0.07	4
2400			0.37	185	0.24	67	0.12	14	0.07	4
2600			0.40	212	0.26	76	0.13	16	0.08	5
2800					0.28	87	0.14	19	0.09	5
3000					0.30	98	0.15	21	0.09	6
3200					0.32	109	0.16	23	0.10	7
3400					0.34	121	0.17	26	0.10	8
3600					0.36	134	0.19	28	0.11	8
3800					0.38	14/	0.20	31	0.12	9
4000					0.40	174	0.21	34	0.12	10
4200					0.42	189	0.22	40	0.13	12
4600					0.46	204	0.24	43	0.14	13
4800					0.10	201	0.25	47	0.15	13
5000							0.26	50	0.15	14
5200							0.27	53	0.16	15
5400							0.28	57	0.16	17
5600							0.29	61	0.17	18
5800							0.30	64	0.18	19
6000							0.31	68	0.18	20
6200							0.32	72	0.19	21
6400							0.33	76	0.19	22
6600							0.34	81	0.20	23
6800							0.35	85	0.21	25
7000							0.36	89	0.21	26
7200							0.37	94	0.22	27
7400							0.30	102	0.23	20
7800							0.39	103	0.23	31
8000							0.41	113	0.24	32
8200							0.42	117	0.25	34
8400							0.43	123	0.26	35
8600							0.44	128	0.26	37
8800							0.45	133	0.27	38
9000							0.46	138	0.27	40
9200							0.47	144	0.28	41
9400							0.48	149	0.29	43
9600							0.49	155	0.29	45
9800							0.50	160	0.30	46
10000							0.51	166	0.30	48
11000							0.57	196	0.33	56
12000							0.62	228	0.37	55
1/000									0.40	20
15000									0.43	97
16000									0.40	109
17000									0.52	121
18000									0.55	134
19000									0.58	147
20000									0.61	161
22000									0.67	190
24000									0.73	222

Tab. 6 Linear i	pressure drops	s in System K	AN-therm Ult	raLine pipes f	or heating wate	r with an avera	age temperature 6	0°C (70/50°C)

	14×2.0		16×2.2		20×2.8		25×2.5		32×3.0	
	v [m/s]	R [Pa/m]	v [m/s]	R [Pa/m]	v [m/s]	R [Pa/m]	v [m/s]		v [m/s]	
100	0.02	2	0.01	1	0.01	1				
200	0.03	5	0.02	3	0.01	1				
400	0.06	9	0.05	5	0.03	2	0.02	1		
600	0.09	14	0.07	8	0.04	3	0.02	1		
800	0.12	34	0.09	10	0.06	4	0.03	1		
1000	0.15	50	0.11	25	0.07	5	0.04	1	0.02	1
1200	0.19	68	0.14	34	0.09	12	0.05	2	0.03	1
1400	0.22	88	0.16	44	0.10	16	0.05	2	0.03	1
1600	0.25	110	0.18	55	0.12	20	0.06	4	0.04	1
1800	0.28	134	0.21	67	0.13	24	0.07	5	0.04	1
2000	0.31	161	0.23	80	0.15	29	0.08	6	0.05	2
2200	0.34	189	0.25	94	0.16	34	0.09	7	0.05	2
2400	0.37	220	0.28	109	0.18	40	0.09	8	0.05	2
2600			0.30	120	0.19	45	0.10	10	0.06	3
2000			0.32	142	0.21	51	0.11	10	0.00	3
3200			0.37	179	0.22	65	0.12	14	0.07	4
3400			0.39	198	0.25	72	0.12	15	0.07	4
3600			0.41	219	0.27	79	0.14	17	0.08	5
3800					0.28	87	0.15	18	0.09	5
4000					0.30	95	0.15	20	0.09	6
4200					0.31	103	0.16	22	0.10	6
4400					0.33	111	0.17	24	0.10	7
4600					0.34	120	0.18	26	0.11	7
4800					0.36	130	0.19	27	0.11	8
5000					0.37	139	0.19	29	0.11	9
5200					0.39	149	0.20	32	0.12	9
5400					0.40	159	0.21	34	0.12	10
5600					0.42	169	0.22	36	0.13	10
5800					0.43	180	0.22	38	0.13	11
6000					0.45	191	0.23	40	0.14	12
6400					0.40	202	0.24	45	0.14	12
6600							0.25	40	0.15	13
6800							0.26	50	0.16	14
7000							0.27	53	0.16	15
7200							0.28	55	0.16	16
7400							0.29	58	0.17	17
7600							0.29	61	0.17	18
7800							0.30	63	0.18	18
8000							0.31	66	0.18	19
8200							0.32	69	0.19	20
8400							0.32	72	0.19	21
8600							0.33	75	0.20	22
8800							0.34	78	0.20	23
9000							0.35	81	0.21	23
9200							0.30	04 99	0.21	24
9600							0.30	Q1	0.22	20
9800							0.38	94	0.22	27
10000							0.39	98	0.23	28
11000							0.43	115	0.25	33
12000							0.46	134	0.27	39
13000							0.50	154	0.30	44
14000							0.54	176	0.32	51
15000							0.58	198	0.34	57
16000							0.62	222	0.37	64
17000									0.39	71
18000									0.41	78
19000									0.43	86
20000									0.46	94
22000									0.50	112
24000									0.55	130
26000									0.60	150
20000									0.04	102
32000									0.09	216
52000									0.70	210

Tab. 7 Linear pressure drops in System KAN-therm Ultral ine pipes for heating water with an average	temperature 70°C (80/60°C)
abi i sinoa processo arepo in ejetenno ar arena sino pipeo ren nealing hater mar arenag	

	14>	<2.0	16>	2.2	20>	<2.8	25×	2.5	32>	(3.0
		R [Pa/m]	V [m/s]		V [m/s]	R [Pa/m]	۷ [m/s]			
400	[11//0]		[11/0]	[1 4/11]	[11/3]	[r a/m]	[11/9]	[i d/iii]	[11/3]	[r ayni]
200	0.02	2	0.01	2	0.01	1				
400	0.06	8	0.05	4	0.03	2	0.02	1		
600	0.09	12	0.07	7	0.04	3	0.02	1		
800	0.12	33	0.09	16	0.06	4	0.03	1		
1000	0.16	48	0.12	24	0.07	9	0.04	1		
1200	0.19	65	0.14	32	0.09	12	0.05	2	0.03	1
1400	0.22	84	0.16	42	0.10	15	0.05	3	0.03	1
1600	0.25	106	0.18	53	0.12	19	0.06	4	0.04	1
2000	0.20	129	0.21	77	0.15	28	0.07	6	0.04	2
2200	0.34	182	0.25	91	0.16	33	0.09	7	0.05	2
2400	0.37	212	0.28	105	0.18	38	0.09	8	0.06	2
2600			0.30	121	0.19	44	0.10	9	0.06	3
2800			0.32	137	0.21	49	0.11	11	0.06	3
3000			0.35	154	0.22	56	0.12	12	0.07	3
3200			0.37	101	0.24	62	0.12	13	0.07	4
3600			0.33	211	0.23	76	0.13	16	0.08	5
3800			01.12		0.28	83	0.15	18	0.09	5
4000					0.30	91	0.16	19	0.09	6
4200					0.31	99	0.16	21	0.10	6
4400					0.33	108	0.17	23	0.10	7
4600					0.34	116	0.18	25	0.11	7
4800					0.36	125	0.19	26	0.11	8
5200					0.39	144	0.20	30	0.12	9
5400					0.40	153	0.21	32	0.12	9
5600					0.42	163	0.22	35	0.13	10
5800					0.43	174	0.23	37	0.13	11
6000					0.45	184	0.23	39	0.14	11
6200					0.46	195	0.24	41	0.14	12
6400					0.48	206	0.25	43	0.15	13
6800							0.26	48	0.16	14
7000							0.27	51	0.16	15
7200							0.28	53	0.17	15
7400							0.29	56	0.17	16
7600							0.30	59	0.17	17
7800							0.30	61	0.18	18
8200							0.31	67	0.18	19
8400							0.33	70	0.19	20
8600							0.33	73	0.20	21
8800							0.34	76	0.20	22
9000							0.35	79	0.21	23
9200							0.36	82	0.21	24
9400							0.37	85 88	0.22	24
9800							0.38	91	0.23	26
10000							0.39	94	0.23	27
11000							0.43	112	0.25	32
12000							0.47	130	0.28	37
13000							0.51	149	0.30	43
14000							0.54	170	0.32	49
16000							0.00	215	0.34	62
17000							0.02	210	0.39	69
18000									0.41	76
19000									0.44	84
20000									0.46	91
22000									0.51	108
24000									0.55	126
28000									0.00	140
30000									0.69	187
32000									0.74	210

System **KAN-therm** UltraLine - assortment



Delining

PE-RT/AI/PE-RT multilayer pipe in coil

PE-RT/AI/PE-RT multilayer pipe in o	coil					GROUP: U
Size	*	Code			UM	Price EUR/UM
14×2		2529334001	200	3000	m	
16×2,2		2529334003	200	3000	m	
20×2,8		2529334005	100	1500	m	
25×2,5		2529334007	50	750	m	
32×3		2529334009	50	600	m	

PE-RT/AI/PE-RT multilayer pipe in 6 mm insulation in coil

GROUP: U

GROUP: U

GROUP: U



PE-RT/AI/PE-RT multilayer p	oipe in bar				GROUP: U
Size	* Code	6⁄	6666	UM	Price EUR/UM
14×2	2529334000	5	160	m	
16×2,2	2529334002	5	120	m	
20×2,8	2529334004	5	70	m	
25×2,5	2529334006	5	40	m	
32×3	2529334008	5	50	m	



Delinin

PE-Xc pipe with EVOH layer in coil

Size	* Code			UM	Price EUR/UM
14×2	2529200000	200	3000	m	
16×2,2	2529200001	200	3000	m	
20×2,8	2529200002	100	1500	m	

PE-Xc pipe with EVOH layer in 6 mm insulation in coil					GROUP: U	
Size	*	Code			UM	Price EUR/UM
14×2		2529195006	50	900	m	
16×2,2		2529195007	50	900	m	
20×2,8		2529195008	50	700	m	

PE-RT pipe with EVOH layer in coil

Size	* Code			UM	Price EUR/UM
14×2	2529198000	200	3000	m	
16×2,2	2529198001	200	3000	m	
20×2,8	2529198002	100	1500	m	





PE-RT pipe with EVOH coating in 6 mm insulation in coil Sizo

Size	Code			UM	Price EUR/UN
14×2	2529195000	50	900	m	
16×2,2	2529195001	50	900	m	
20×2,8	2529195002	50	700	m	

brass female connector					GROUP: U
Size	* Code		(UM	Price EUR/UM
14 Rp½"	2509044000	10	150	рс	
16 Rp½"	2509044001	10	150	рс	
20 Rp½"	2509044002	10	150	рс	
20 Rp¾"	2509044003	10	120	рс	
25 Rp¾"	2509044004	5	70	рс	
32 Rp1"	2509044005	5	50	рс	

bra	ass male connector						GROUP: U
Siz		*	Code		(UM	Price EUR/UM
14	R½"		2509045000	10	150	рс	
16	R½"		2509045001	10	150	рс	
20	R½"		2509045002	10	150	рс	
20	R¾"		2509045003	10	150	рс	
25	R¾"		2509045005	5	80	рс	
25	R1"		2509045004	5	70	рс	
32	R1"		2509045006	5	50	рс	

brass coupling

PPSU coupling

coil 6/ bar 6000 pipes in tube

brass coupling						GROUP: U
Size	*	Code			UM	Price EUR/UM
14		2509042000	10	160	рс	
16		2509042001	5	80	рс	
20		2509042002	5	80	рс	
25		2509042003	5	80	рс	
32		2509042004	5	60	рс	

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рс

рс

рс

рс

рс

GROUP:	U	
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R/UM	
	July 1















brass reducing coupling

brass reducing coupling					GROUP: U
Size	* Code			UM	Price EUR/UM
16 / 14	2509046006	10	160	рс	
20 / 14	2509 046007	10	160	рс	
20 / 16	2509046008	10	160	рс	
25 / 16	2509046005	5	80	рс	
25 / 20	2509 046009	5	80	рс	
32 / 25	2509 046010	5	70	рс	



PPSU reducing coupling					GROUP: U
Size	* Code			UM	Price EUR/UM
16 / 14	2566046002	10	160	рс	
20 / 14	2566046003	10	160	рс	
20 / 16	2566046004	20	400	рс	
25 / 16	2566046005	5	80	рс	
25 / 20	2566046000	5	80	рс	
32 / 25	2566046001	5	70	рс	



	brass tee						GROUP: U
		*	Code			UM	Price EUR/UM
D	14		2509257000	10	100	рс	
	16		2509257001	10	80	рс	
	20		2509257002	10	80	рс	
D	25		2509257003	5	40	рс	
D	32		2509257004	2	20	рс	



PPSU tee						GROUP: U
Size	*	Code			UM	Price EUR/UM
14		2566257000	10	100	рс	
16		2566257001	10	80	рс	
20		2566257002	10	80	рс	
25		2566257003	5	40	рс	
32		2566257004	2	20	рс	



	brass reducing tee					GROUP: U
	Size *	Code		(\mathcal{D})	UM	Price EUR/UM
	14 / 16 / 14	2509260000	10	80	рс	
	16 / 14 / 14	2509260001	10	80	рс	
	16 / 14 / 16	2509260002	10	80	рс	
0	16 / 16 / 14	2509260003	10	80	рс	
	16 / 20 / 16	2509260004	10	80	рс	
	20 / 14 / 14	2509260005	10	80	рс	
	20 / 14 / 16	2509260006	10	80	рс	
	20 / 14 / 20	2509260007	10	80	рс	
	20 / 16 / 16	2509260008	10	80	рс	
	20 / 16 / 20	2509260009	10	80	рс	
0	20 / 20 / 16	2509260010	10	80	рс	
0	20 / 25 / 20	2509260011	5	40	рс	
0	25 / 14 / 20	2509260012	5	40	рс	
0	25 / 14 / 25	2509260013	5	40	рс	
0	25 / 16 / 16	2509260014	5	40	рс	
	25 / 16 / 20	2509260015	5	40	рс	
	25 / 16 / 25	2509260016	5	40	рс	
	25 / 20 / 16	2509260026	5	40	рс	
	25 / 20 / 20	2509260017	5	40	рс	
	25 / 20 / 25	2509260018	5	40	рс	
	25 / 32 / 25	2509260019	2	20	рс	
	32 / 16 / 25	2509260020	2	20	рс	
	32 / 16 / 32	2509260021	2	20	рс	
	32 / 20 / 25	2509260022	2	20	рс	
	32 / 20 / 32	2509260023	2	20	рс	
	32 / 25 / 20	2509260027	2	20	рс	
	32 / 25 / 25	2509260024	2	20	рс	
	32 / 25 / 32	2509260025	2	20	рс	



coil 6⁄ bar 666 pipes in tube bag 667 box 🕮 pallet 🚺 dostępne od końca I kw. 2020



PPSU reducing tee

PPSU reducing tee					GROUP: U
Size	* Code			UM	Price EUR/UM
14 / 16 / 14	2566260000	10	120	рс	
16 / 14 / 14	2566260001	10	80	рс	
16 / 14 / 16	2566260002	10	80	рс	
16 / 16 / 14	2566260003	10	80	рс	
16 / 20 / 16	2566260004	5	40	рс	
20 / 14 / 14	2566260005	10	80	рс	
20 / 14 / 16	2566260006	5	40	рс	
20 / 14 / 20	2566260007	5	40	рс	
20 / 16 / 16	2566260008	5	40	рс	
20 / 16 / 20	2566260009	5	40	рс	
20 / 20 / 16	2566260010	10	80	рс	
20 / 25 / 20	2566260011	5	40	рс	
25 / 14 / 20	2566260012	5	40	рс	
25 / 14 / 25	2566260013	5	40	рс	
25 / 16 / 16	2566260014	5	40	рс	
25 / 16 / 20	2566260015	5	40	рс	
25 / 16 / 25	2566260016	5	40	рс	
25 / 20 / 16	2566260026	5	40	рс	
25 / 20 / 20	2566260017	5	40	рс	
25 / 20 / 25	2566260018	5	40	рс	
25 / 32 / 25	2566260019	2	20	рс	
32 / 16 / 25	2566260020	2	20	рс	
32 / 16 / 32	2566260021	2	20	рс	
32 / 20 / 25	2566260022	2	20	рс	
32 / 20 / 32	2566260023	2	20	рс	
32 / 25 / 20	2566260027	2	20	рс	
32 / 25 / 25	2566260024	2	20	рс	
32 / 25 / 32	2566260025	2	20	рс	





brass elbow 90°

	Size	*	Code		(\mathcal{D})	UM	Price EUR/UM
D	14		2509302000	10	180	рс	
	16		2509302001	10	180	рс	
	20		2509302002	10	120	рс	
D	25		2509302003	5	60	рс	
D	32		2509302004	5	30	рс	

GROUP: U

GROUP: U

PPSU elbow 90°

Size	*	Code		\mathfrak{B}	UM	Price EUR/UM
14		2566302000	10	180	рс	
16		2566302001	10	120	рс	
20		2566302002	10	120	рс	
25		2566302003	5	60	рс	
32		2566302004	5	30	рс	



brass nipple coupling									
Size	*	Code							
14 / 15		2509046000	20						
16 / 15		2509046001	20						
20 / 18		2509046002	10						

32/28 Note:

25 / 22

It enables connection with KAN-therm systems: Steel, Inox, Copper.

	bra	ass female tee						GROUP: U
	Siz		*	Code		\bigotimes	UM	Price EUR/UM
0	14	Rp½"		2509258000	5	60	рс	
	16	Rp½"		2509258001	5	60	рс	
	20	Rp½"		2509258002	5	50	рс	
	20	Rp¾"		2509258003	5	50	рс	
	25	Rp½"		2509258004	2	30	рс	
	25	Rp¾"		2509258005	2	30	рс	
	32	Rp½"		2509258007	2	20	рс	
	32	Rp¾"		2509258008	2	20	рс	
	32	Rp1"		2509258006	2	20	pc	

2509046003

2509046004

h	famala	ماله مربر	000
prass	temale	elbow	90°

coil 6/ bar 666 pipes in tube

	br	ass female elbow 90 $^\circ$						GROUP: U
	Siz		*	Code			UM	Price EUR/UM
0	14	Rp½"		2509069000	10	120	рс	
Ð	14	Rp¾"		2509069001	10	100	рс	
	16	Rp½"		2509069002	10	120	рс	
	16	Rp¾"		2509069003	5	60	рс	
	25	Rp¾"		2509069004	5	30	рс	
	32	Rp1"		2509069005	2	30	рс	



	brass wallplate elbow						GROUP: U
		*	Code		(UM	Price EUR/UM
0	14 Rp½" $L = 41 \text{ mm}$		2509286004	5	50	рс	
	16 Rp½" L = 41 mm		2509286007	5	50	рс	
	20 Rp½" L = 41 mm		2509286010	5	50	рс	
	Note: L - dimension without plastic plug.						

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GROUP: U

160

160

120

60

60

5

5

рс

рс

рс

рс

рс



brass wallplate elbow

brass wallplate elbow					GROUP: U
Size	* Code		\mathfrak{B}	UM	Price EUR/UM
14 Rp½" L = 52,5 mm	2509286003	5	40	рс	
16 Rp½" L = 52,5 mm	2509286006	5	40	рс	
20 Rp½" $L = 52,5 \text{ mm}$	2509286009	5	40	рс	
25 Rp¾" $L = 54 \text{ mm}$	2509286012	2	30	рс	
Note: L - dimension without plastic plug. Dimension 25 has no	o plug.				

br	ass dry screed wallplate elbow					GROUP: U
Siz		* Code		\mathfrak{B}	UM	Price EUR/UM
14	Rp½" L = 78 mm	2509286005	2	20	рс	
16	Rp½" L = 78 mm	2509286008	2	20	рс	
! 20	Rp½" L = 78 mm	2509286011	2	20	рс	



	brass type U wallplate elbow						GROUP: U
		*	Code			UM	Price EUR/UM
0	14 Rp½" $L = 41 \text{ mm}$		2509286000	5	45	рс	
0	16 Rp½" L = 41 mm		2509286001	5	45	рс	
0	20 Rp½" L = 41 mm		2509286002	5	45	рс	
	Note: L - dimension without plastic plug.						



mounting plate for directly fixed wallplate elbows for dry plaster application

application					GROUP: A
Size	* Code			UM	Price EUR/UM
83, 103, 153 mm	1700210025	1	30	рс	
Noto					

Note

It allows the installation of approaches under the tap with ears on the wall, in wall furrows and in dry buildings. The plate is sold with a set of screws (6 pieces) for fixing the approaches under the tap. The plate bend depth is 39 mm.

			/	\mathbf{i}
	/	/	1	À
/	~	1	/	L
	1			

metal mounting plate

GROUP: A 83, 153 mm 1700210014 42 рс 1

Note:

It allows the installation of approaches under the tap and approaches to the tap with a mounting nut or screw, on the wall, in wall furrows and in dry buildings. Screws for mounting approaches under the tap included (6 pieces)

	1
at an	

brass elbow with Cu Ø15 pipe

brass elbow with Cu \emptyset 15 pipe						GROUP: U
Size	*	Code		(\mathcal{D})	UM	Price EUR/UM
14 L = 300 mm		2509071000	-	50	рс	
16 L = 300 mm		2509071002	-	50	рс	
20 L = 300 mm		2509071004	-	50	рс	

Note:

Variants of connecting fittings with nickel-plated pipes with all kinds of fittings are described in the technical part of the catalogue -"Assembling screwed joints".



brass elbow with Cu $arnothing$ 15 pipe					GROUP: U
	* Code			UM	Price EUR/UM
14 L = 750 mm	2509071001	-	25	рс	
16 L = 750 mm	2509071003	-	25	рс	
20 L = 750 mm	2509071005	-	25	рс	
Noto:					

Note: Variants of connecting fittings with nickel-plated pipes with all kinds of fittings are described in the technical part of the catalogue -"Assembling screwed joints".

Brass double elbow with Cu \varnothing 15 p	ipe					GROUP: U
Size	*	Code		(UM	Price EUR/UM
14 L = 300 mm		2509071006	-	10	рс	
16 L = 300 mm		2509071007	-	10	рс	
Note:						

Variants of connecting fittings with nickel-plated pipes with all kinds of fittings are described in the technical part of the catalogue -"Assembling screwed joints"

brass tee with Cu \varnothing 15 pipe					GROUP: U
	* Code		(UM	Price EUR/UM
14 L = 300 mm	2509261000	-	50	рс	
16 L = 300 mm	2509261002	-	50	рс	
20 L = 300 mm	2509261008	-	50	pc	

Note: Variants of connecting fittings with nickel-plated pipes with all kinds of fittings are described in the technical part of the catalogue -"Assembling screwed joints"

brass tee with Cu \varnothing 15 pipe						GROUP: U
Size	*	Code			UM	Price EUR/UM
14 L = 750 mm		2509261001	-	25	рс	
16 L = 750 mm		2509261003	-	25	рс	
20 L = 750 mm		2509261009	-	25	рс	

Note:

Variants of connecting fittings with nickel-plated pipes with all kinds of fittings are described in the technical part of the catalogue -"Assembling screwed joints".

brass reducing tee with Cu \varnothing 15 pipe						GROUP: U
Wymiar	*	Code		(UM	Price EUR/UM
16 / 14 L = 300 mm left		2509261004	-	50	рс	
16 / 14 L = 300 mm right		2509261005	-	50	рс	
20 / 16 L = 300 mm left		2509261010	-	40	рс	
20 / 16 L = 300 mm right		2509261011	-	40	рс	
Note:						

coil **6/** bar

When connecting radiators with reducing tees, use the set consisting of the left and right tees. Identification a reducing tee, for example the

right one, means that when viewed from the larger diameter, the bend of the copper pipe is directed to the right. Note:

in tube

Variants of connecting fittings with nickel-plated pipes with all kinds of fittings are described in the technical part of the catalogue -"Assembling screwed joints'

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L



ISO **9001**



brass reducing tee with Cu Ø15 pipe

16 / 14 L = 750 mm left 25 2509261006 pc 2509261007 16 / 14 L = 750 mm right 25 pc 20 / 16 L = 750 mm left 2509261012 25 pc 20 / 16 L = 750 mm right 2509261013 25 pc -

GROUP: U

GROUP: A

GROUP: A

When connecting radiators with reducing tees, use the set consisting of the left and right tees. Identification a reducing tee, for example the right one, means that when viewed from the larger diameter, the bend of the copper pipe is directed to the right.

Note:

Variants of connecting fittings with nickel-plated pipes with all kinds of fittings are described in the technical part of the catalogue -"Assembling screwed joints"

eurocone adapter for Cu Ø15 pipe						GROUP: A
Size	*	Code			UM	Price EUR/UM
15 G¾"		1709043005	15	150	рс	
Note:		and an alternation of a second for a	l			

Works with fittings for screw pipe unions with external threads and radiator combined valves

eurocone adapter for Cu Ø15 pipe

Size	*	Code		\bigotimes	UM	Price EUR/UM
15 G½"		1709043003	20	300	рс	
Note: Nuts and sleeves work with nipples and fittings for screw pi	ipe u	nions.				

universal eurocone adapter for Ø15 pipes

Size	*	Code		\mathfrak{B}	UM	Price EUR/UM
15 G¾"		1709043010	15	150	рс	
Noto:						

Universal joint union, enabling connection of metal pipes (e.g. copper, nickel-plated copper, KAN-therm Steel and Inox System pipes) with a diameter of 15 mm. The new joint union design allows its multiple use.

compression set	for Cu Ø15 pipes					GROUP: A
Size	*	Code			UM	Price EUR/UM
G½"		1709043011	20	300	рс	
Note:						

The clamp works with the body of the KAN connector, thermostatic valve seats of various types and some fittings for screw connections with inner thread G½"



straight female nipple body, nickel plated GROUP: A G½/G½" 1709040000 20 200 рс

Note: Connector body (nickel-plated) with the pipe Cu Ø15 clamp is used for connecting the VK radiator (bottom approach) with the Ø15 copper pipe.

📋 bag 😥 box 🕮 pallet ! available from July 1, 2020





SYSTEM **KAN-therm** UltraLine - assortment

6/ bar

pipes in tube

brass stop end						GROUP:
Size	*	Code			UM	Price EUR/U
14		2509250000	10	350	рс	
16		2509250001	10	200	рс	
20		2509250002	10	150	рс	
25		2509250003	5	150	рс	
32		2509250004	5	60	рс	

PVDF sliding sleeve

	* Code			UM	Price EUR/UM
14	2509335000	50	700	рс	
16	2509335001	50	500	рс	
20	2509335002	30	300	рс	
25	2509335003	20	200	рс	
32	2509335004	10	100	рс	

brass threaded connector

Size	*	Code			UM	Price EUR/UM	
14		2510042000	10	120	рс		
16		2510042001	10	120	рс		
20		2510042002	10	120	рс		
Note: System KAN-therm UltraLine AL pipes require calibration and chamfering before fitting the connector.							

brass female threaded connector

	* Code		(UM	Price EUR/UI
14 Rp½"	2510044000	10	150	рс	
16 Rp½"	2510044001	10	150	рс	
20 Rp½"	2510044002	10	150	рс	

Note: System KAN-therm UltraLine AL pipes require calibration and chamfering before fitting the connector.

brass male threaded connector

*	Code			UM	Price EUR/UM
	2510045000	10	150	рс	
	2510045001	10	150	рс	
	2510045002	10	150	рс	
	*	* Code 2510045000 2510045001 2510045002	* Code 2510045000 10 2510045001 10 2510045002 10	Code Image: Code 2510045000 10 150 2510045001 10 150 2510045002 10 150	* Code Image: Code UM 2510045000 10 150 pc 2510045001 10 150 pc 2510045002 10 150 pc

Note:

System KAN-therm UltraLine AL pipes require calibration and chamfering before fitting the coupling. This coupling is adapted for direct screwing into the manifold beam - sealing of the connection in the manifold is done by means of an O-ring seal.

brass eurocone type connector

coil 6/ bar 6000 pipes in tube

14 G¾" 2510271000 10 120 pc	Size	*	Code			UM	Price EUR/UM
	14 G¾"		2510271000	10	120	рс	
16 G¾" 2510271001 10 120 pc	16 G¾"		2510271001	10	120	рс	

bag 🚱 box 🕮 pallet 🚺 dostępne od końca I kw. 2020

	A.	
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	L	-















GROUP: U

GROUP: U



GROUP: U

GROUP: U



brass female half union with flat gasket

GROUP: U

GROUP: K

Size	*	Code		\mathfrak{B}	UM	Price EUR/UM
14 G½"		2510105000	10	120	рс	
14 G¾"		2510105001	10	120	рс	
16 G½"		2510105002	10	120	рс	
16 G¾"		2510105003	10	120	рс	
20 G½"		2510105004	10	80	рс	
20 G¾"		2510105005	10	80	рс	
25 G1"		2510105006	5	60	рс	
25 G¾"		2510105007	5	60	рс	
32 G1"		2510105009	5	50	рс	
32 G1 ¼"		2510105008	5	40	рс	



Tools

Eurocone adapter						GROUP: U
Size	*	Code			UM	Price EUR/UM
14 G¾"		2510271002	10	150	рс	
16 G¾"		2510271003	10	150	рс	
20 G¾"		2510271004	10	150	рс	
Note:						

UltraLine AL pipes require calibration and chamfering before fitting the pipe union.

akku tool set - expander and crimping tool + expanding heads AL 16-25

akku tool set - expander and crimping tool

	* Code			UM	Price EUR/UM
	1967267031	-	1	рс	
The set contains:					
1967267022 - battery crimping tool					
1967267023 - battery - 2 pc					
1967267024 - battery charger					
1967267025 - battery expander tool					
1941267096 - expander grease					
1967113004 - expanding head AL - 16×2,2					
1967113005 - expanding head AL - 20×2,8					
1967113006 - expanding head AL - 25×2,5					
1967267004 - forks set - 16					
1967267005 - forks set - 20					
1967267006 - forks set - 25					
1967267000 - cutter for pipes 14-25					
1967267021 - calibrator - 14-16-20					
case					



+ expanding heads PE 16-20 and AL 25 G								
	* Code	📋 🚱 UM	Price EUR/UM					
	1967267032	- 1 pc						
The set contains: 1967267022 - battery crimping tool 1967267023 - battery - 2 pc 1967267025 - battery charger 1967267025 - battery expander tool 1941267096 - expander grease 1967113001 - expanding head PE - 16×2,2 1967113006 - expanding head PE - 20×2,8 1967113006 - expanding head AL- 25×2,5 1967267004 - forks set - 16 1967267005 - forks set - 25 1967267000 - cutter for pipes 14-25 case								
coil 6/ bar 6000 pipes in tube bag	box 📇 pa	allet 🏾 ! available from July 1	, 2020					

akku tool set - expander and crimping tool						GROUP: K
	*	Code		(UM	Price EUR/UM
		1967267026	-	1	рс	
The set contains: 1967267022 - battery crimping tool 1967267023 - battery - 2 pc 1967267024 - battery charger 1967267025 - battery expander tool 1941267096 - expander grease 1967267000 - cutter for pipes 14-25 1933267029 - cutter for pipes 14-32 case Tool set must be equipped individually with expanding hea	ds ar	ld crimping forks.				

tool set - expanding and battery crim	ping tools				GROUP: K
	Code		(UM	Price EUR/UM
	1967267012	-	1	рс	
The set contains: 1967267022 - battery crimping tool 1967267023 - battery - 2 pc 1967267024 - battery charger 1967267002 - expander 1941267096 - expander grease 1967267000 - cutter for pipes 14-25					

1933267029 - cutter for pipes 14-23 case

Case Tool set must be equipped individually with expanding heads and crimping forks.

battery charger						GROUP: K
	*	Code			UM	Price EUR/UM
		1967267024	-	1	рс	



battery						GROUP: K
	*	Code			UM	Price EUR/UM
		1967267023	-	1	рс	

tool set - expanding and crimping to	ools				GROUP: K
	* Code			UM	Price EUR/UM
	1967267016	-	1	рс	
The set contains: 1938267085 - manual chain press 1967267002 - expander 1941267096 - expander grease 1967267000 - cutter for pipes 14-25 1933267029 - cutter for pipes 14-32 case Tool set must be equipped individually with expanding hear	ds and crimping forks.				

tool set - expanding and adapter for press tools GROUP: K ★ Code Image: Code UM Price EUR/UM 1967267017 1 pc The set contains: 1967267002 expander 1967267002 expander grease 1967267002 expander grease 1967267002 cutter for pipes 14-32 193267029 cutter for pipes 14-32 103326 Tool set must be equipped individually with expanding heads and crimping forks.







expanding tool in case

YYYII

forks set					group: K
Size	* Code		\bigotimes	UM	Price EUR/UM
14×2	1967267003	-	1	рс	
16×2,2	1967267004	-	1	рс	
20×2,8	1967267005	-	1	рс	
25×2,5	1967267006	-	1	рс	
32×3	1967267007	-	1	рс	

1967267001

GROUP: K

1

-

рс



	double forks set for hydraulic tool						GROUP: K
	Size	*	Code			UM	Price EUR/UM
O	14-16		1967267008	-	1	рс	
0	16-20		1967267009	-	1	рс	
0	25-32		1967267010	-	1	рс	
	Note: Heads enable conversion of hydraulic foot presses for wor	rking	with System KAN-ther	m UltraLi	ne elemer	nts.	

cutter for pipes				GROUP: K
Size	* Code		UM	Price EUR/UM
14-32	1933267029	- 1	рс	

cutter for pipes						GROUP: K
	*	Code			UM	Price EUR/UM
14-25		1967267000	-	1	рс	



cutter blade			GROUP: K
	* Code	📋 🏵 U	M Price EUR/UM
	1967267019	- 1	oc
Note:			





expanding head PE						GROUP: K
Size	*	Code			UM	Price EUR/UM
14×2		1967113000	-	1	рс	
16×2,2		1967113001	-	1	рс	
20×2,8		1967113002	-	1	рс	





GROUP: K

GROUP: K

Size	* Code		B	UM	Price EUR/UI
14×2	1967113003	-	1	рс	
16×2,2	1967113004	-	1	рс	
20×2,8	1967113005	-	1	рс	
25×2,5	1967113006	-	1	рс	
32×3	1967113007	-	1	рс	

1967267021

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рс



adapter for UltraLine tools						GROUP: K
	*	Code			UM	Price EUR/UM
		1967267015	-	1	рс	
Neter						

Note: Works with REMS, ROTHENBERGER crimpers.

expanding head AL

calibration tool

14-16-20

external bending spring for multila	ayer	pipes				GROUP: K
Size	*	Code			UM	Price EUR/UM
14	*	1936267079	-	60	рс	
16		1936267081	1	60	рс	
20		1936267086	1	40	рс	
25-26		1936267088	1	25	рс	





coil 6/ bar 666 pipes in tube

bag 😚 box 🕮 pallet 🚺 dostępne od końca I kw. 2020

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SYSTEM KAN-therm

Optimal, complete multipurpose installation system consisting of state of the art, mutually complementary technical solutions for pipe water distribution installations, heating installations, as well as technological and fire extinguishing installations.

UltraLine Push/Push Platinum Press LBP	
Push/Push Platinum Press LBP	
Press LBP	
	3
PP	
Steel)
Groove	7.
Copper	
Sprinkler)
Surface heating and automation	
Football Stadium installations)
Cabinets and manifolds	

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