

smart pipes, clever solutions



District Heating Pipes

DHP product catalog



District Heating Pipes

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Overview

COMMON INFORMATION

- About DHP
- Pipe system / Production
- Casing pipes
- Heat Insulation (PUR)
- Carrier pipes

PRODUCTS

DHP - SINGLE PIPE

- Application / Carrier pipe / Connection
- u-value / Heat loss
- Diameter / Output / Pressure loss
- Dimensions
- Curved pipe
- 90° Elbow
- Parallel branch
- 45°-T-branch
- 90°-vertical branch
- Drain / Vent
- Reduction / Reducer
- Ball valve single pipe

DHP - DOUBLE PIPE

- Added value / Application / Carrier pipe / Connection
- u-value / Heat loss
- Diameter / Output / Pressure loss
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- Curved pipe
- 90° Elbow
- Branch 90°
- 90° Twin branch
- Drain / Vent
- Reduction / Reducer
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PRODUCTS

CASING PIPES - SLEEVES

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- Non-crosslinked shrink sleeve as reducer sleeve
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About DHP

DHP District Heating Pipes specializes in the manufacturing and sales of pre-insulated piping systems. In addition, the company offers engineering-services in the field of planning and design of supply networks.

Our manufacturing facility is equipped with the latest state-of-the-art technologies and production systems to provide the district heating market with reliable, innovative and sustainable solutions.

Our pragmatic experts have more than 30 years of experience in the manufacturing and sale of district heating products and pre-insulated piping systems, ensuring that DHP stands for quality, precision and energy efficiency.

Our production site in Budapest guarantees fast, personalized service and flexible cooperation with our partners.

Our mission is to contribute to the development of energy-efficient cities of the future through intelligent systems and solutions. Our goal is to be a reliable, long-term partner in the planning, development and modernization of supply networks for district heating and cooling, local heating and cooling, as well as industrial applications.

We are fully committed to ESG principles (Environmental, Social and Governance) and deliver energy-efficient, environmentally friendly and cost-effective systems. Through our work, we aim to help create a sustainable future in Hungary and across Europe.



Pipe system / Production

In the discontinuous manufacturing of factory-preinsulated plastic-coated pipes, the service pipe is first equipped with spacers. Leak detection wires for network monitoring are attached to these spacers. Depending on the pipe size or the configuration of the monitoring system, multiple wires or different wire systems may also be embedded in the foam.

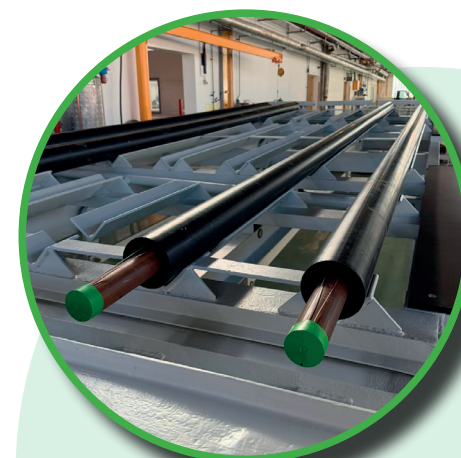
The prepared service pipe is then axially inserted into the outer casing pipe, leaving an uninsulated pipe end of approximately 220 mm at each side.

To seal the annular gap at the casing ends, special foam caps are used. These provide a positive-form limitation of the foam area and prevent the escape of the reactive mixture.

The foaming table is then tilted to a defined angle and positioned accordingly. The polyurethane reactive mixture is injected at the lower end via an electronically controlled mixing head. The inclination of the table ensures uniform distribution of the foam within the annular gap of the pipe bar.

The discontinuous manufacturing process represents the established standard in practice and is recognized as state-of-the-art in all relevant standards and guidelines (e.g., EN 253, AGFW FW 401). Particularly for the production of fittings such as bends, tees, reducers, and special components, this method is exclusively applied, as alternative continuous manufacturing processes are not suitable.

Characteristic	Value / Range	Standard / Note
Carrier pipe (material)	Steel (e.g. P235GH)	EN 10217 / EN 10216
Outer casing (Casing pipes)	PE-HD, black, UV-stabilized	EN 253
Insulation material	PUR-rigid foam (CFC-free, cyclopentane-blown)	EN 253
Thermal conductivity PUR	$\leq 0,027 \text{ W/(m}\cdot\text{K)}$ at +50 °C	EN 253, Appendix B
Max. operating temperature	120 °C (constantly), shortly up to 140 °C	EN 253
Max. operating pressure	Up to 25 bar (depends on carrier pipe)	according to design EN 13941
Linear expansion	Bend-leg compensation / thermal pre-stressing	according to the static system
Service life	≥ 30 years under standard operating conditions	EN 253
Leak detection	Monitoring systems integrable at the factory	EN 14419
Pipe length	6 m / 12 m / 16 m	Factory standard, others on request





District Heating Pipes

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Common

Casing pipes

PEHD

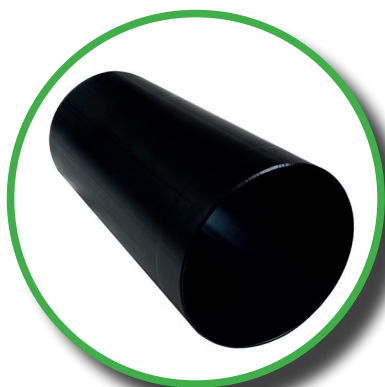
Polyethylene High Density (PEHD) is a seamless extruded, impact- and break-resistant, tough-elastic high-density polyethylene, suitable for temperatures down to -50 °C. General quality requirements are according to DIN 8075. For optimal adhesion to rigid polyurethane (PUR) foam, PEHD is corona-treated in accordance with EN 253. Corona treatment is an industrial process used to activate the HDPE surface by means of electrical discharge, thereby increasing surface energy and improving adhesion properties.

Dimensions and wall thickness comply at minimum with EN 253. The melt flow index (MFI group) is tested according to DIN 53735 / ISO 1133. PEHD is a proven plastic that has been successfully used for many years in the plastic casing pipe system (KMR).

Due to its resistance to virtually all chemicals found in soil, PEHD is ideal as a casing pipe for direct burial. In all national and international standards and guidelines, PEHD is specified as the sole material for casing pipes in the KMR composite system. PEHD is highly resistant to weathering and UV radiation. DHP exclusively uses PE materials equipped with light stabilizers. As required by EN 253, the PE pipes are effectively protected against ultraviolet radiation by the addition of specially selected, very fine carbon black at 2.5 ± 0.5 wt %.

Due to the excellent welding characteristics of PEHD, the welds of the fittings achieve a very high level of safety and quality.

PEHD bend segments are joined using a butt fusion welding machine and welded end-to-end. The socket welds on branch outlets are carried out using an extruder welding machine.



Technical characteristics PE at 20° C		Standard	Unit	Value
Specific	Density ρ	DIN 8074 / DIN EN ISO 1183	kg/dm ³	0,95
	Wall roughness k	Colebrook & White	mm	0,007
	Melt flow index, MFR-Code T	DIN EN ISO 1133	g/10 min	ca. 0,45
	Melt flow index, MFR-Code V	DIN EN ISO 1133	g/10 min	ca. 10
	MFI-group	DIN EN ISO 1133	---	T 005
Mechanical	Building material class / Fire behavior, normally flammable	DIN 4102	---	B 2
	Tensile strenght R_m	DIN EN ISO 527	N/mm ²	23
	Elongation at brake	EN 253 / DIN EN ISO 527	%	10
	Tensile strain	DIN EN ISO 527	%	> 600
	Modulus of elasticity E (Tensile test)	DIN EN ISO 527 / 178	N/mm ²	1000
	Shear modulus	DIN EN ISO 6721 / ISO R 537	N/mm ²	500 - 600
Thermal	Ball indentation hardness	DIN EN ISO 2039	N/mm ²	42
	Crystalline melting temperature	DIN EN ISO 3146	°C	ca. 130
	Vicat-softening temperature, VST-B/50	DIN EN ISO 306	°C	ca. 72
	Stability at 200° C	EN 253	min	> 20
	Thermal conductivity λ	DIN EN 12667	W/(m·K)	0,40
	Specific heat capacity c	DIN 4108 / IEC 1006	KJ/(kg·K)	1,9
Electrical	Linear thermal expansion coefficient α	DIN 53752	K ⁻¹	$1,8 \cdot 10^{-4}$
	Volume resistivity	DIN IEC 60093	W · cm	> 10 ¹⁶
	Dielectric strength	DIN IEC 60243	kV/mm	75
	Surface resistivity	DIN IEC 60093	W	> 10 ¹⁴



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Common

Casing pipes

SPIROFALZ

This casing pipe consists of a galvanized steel spiral seam duct in accordance with DIN EN 12237, with an external seam, and is therefore only suitable for above-ground pipelines inside or outside buildings. Compared to conventional insulation for above-ground pipelines, the discontinuously manufactured SPIROFALZ casing pipe offers significant advantages.

Due to the favorable thermal conductivity of the PUR rigid foam used by DHP ($\lambda_{50} = 0.027 \text{ W/(m}\cdot\text{K)}$), the insulation series can be designed considerably smaller. This results in notable savings in support structures, as both the outer diameter of the pipe and its weight are reduced.

According to DIN 4102, the metal casing itself is classified as A1 (non-combustible), while the insulated SPIROFALZ casing pipe is classified as building material class B2 (normally flammable). Compared to standard insulation series, differences arise when pipes must be insulated in accordance with the German Energy Saving Ordinance (EnEV). However, pursuant to §1, the EnEV applies only to service lines within buildings and not to underground installations.





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Common

Heat Insulation (PUR)

The optimal quality of the PUR foam used provides the best possible thermal insulation in unaged pipes. The proportion of cell gases in the overall thermal conductivity (λ) value is approximately 60 %, making it the determining factor. In conventionally manufactured pipes, during service life, partial replacement of the cell gases by air occurs, especially at continuous operating temperatures ≥ 130 °C. Due to its molecular size, the cyclopentane content largely remains within the foam cells.

However, the replacement of the CO₂ fraction leads to a deterioration of the λ value, a process referred to as aging. To prevent this, the inner surface of the casing pipe is pretreated, creating a barrier foil between the PUR foam and the PE casing. This ensures that the excellent insulation characteristics of the pipes are maintained over a long period. This is particularly important for small to medium pipe dimensions, in order to maintain the energy efficiency of a piping network at the highest level.

Thanks to the excellent adhesion of the PUR foam, very high shear strength is achieved between the casing pipe and the foam, as well as between the foam and the carrier pipe. This creates a composite structure capable of safely absorbing the frictional forces between the sand bedding and the casing pipe, as well as the shear and compressive stresses generated by thermal loading.

Insulation material

DHP composite pipe systems are insulated with rigid polyurethane foam (PUR), tested according to EN 253, consisting of Component A = light polyol and Component B = dark isocyanate. The foam is conventionally applied around the carrier pipe in the production line. Through an exothermic chemical reaction, a high-quality insulation material is formed with excellent thermal conductivity at low specific weight.

DHP exclusively uses 100 % CFC-free, environmentally friendly cyclopentane-blown PUR foam. This ensures extremely high thermal insulation performance while maintaining minimal OExpansion pad (Ozone Depletion Potential = 0) and GWP (Global Warming Potential < 0.001).

Rigid polyurethane foam is composed of polyol (Component A, light) and isocyanate (Component B, dark). The environmentally friendly blowing agent cyclopentane does not harm the ozone layer and does not contribute to the greenhouse effect. At the factory, PUR is processed on modern high-pressure machines according to proprietary formulations.

The exothermic reaction produces a high-quality insulation material with excellent thermal properties and low specific weight. PUR foam demonstrates high compressive strength under thermal load and a long service life. The temperature-dependent application range of the current development stage exceeds the minimum values required by EN 253.

Tests conducted by officially recognized material testing institutes (AMPA) confirm a service life of at least 30 years under sustained high-temperature exposure and a thermal conductivity [λ_{50}] of maximum 0.027 W/(m·K) for discontinuously produced pipes.

On-site, installers use hand-mixed cup foam blended with turbo stirrers for additional insulation and sealing work, or machine foam proportioned from preheated containers of mobile foaming units as required.

Site foam must be stored according to EN 489 at +15 °C to +25 °C and can be applied at surface temperatures between 15 °C and 45 °C. Maximum storage time is 3 months. Depending on the quantity, delivery is in 1 l, 5 l, or 10 l containers, including the required reusable mixing cups.



Heat Insulation (PUR)

Lambda-Value PUR-foam

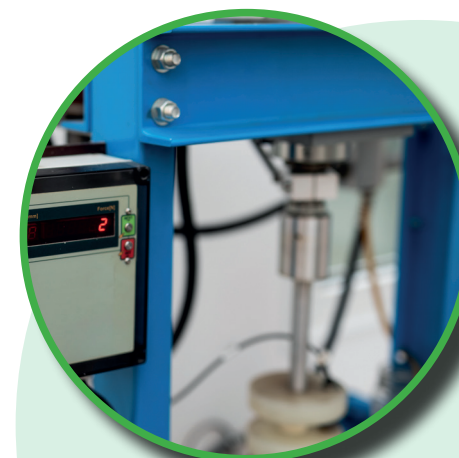
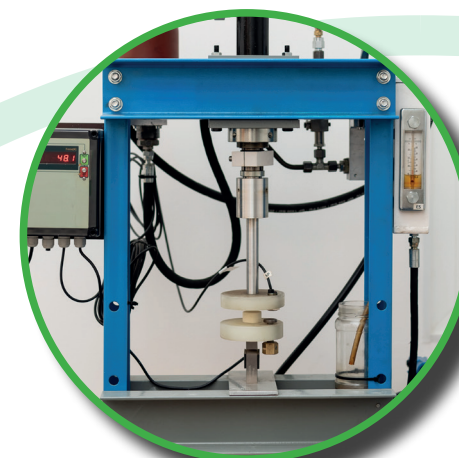
The thermal conductivity (λ) of the PUR foam is generally determined at an average temperature of 50 °C (λ_{50}) according to DIN EN ISO 8497. By commissioning independent external laboratories (e.g., FFI, AMPA, etc.), compliance with all test parameters is ensured.

In addition to external testing, our in-house laboratories continuously conduct new tests on the specified properties of the PUR foam. The significance of these internal ongoing tests increases with the repetition rate at which identical test scopes for the same product group and parameter are presented during QM audits.

Through the continuous expansion of our laboratory capabilities, DHP is able to significantly increase the frequency of testing. This helps to monitor the production processes more consistently and to further improve them.

Consequently, the specified λ -values are based on a large number of test results, which are averaged using a statistical evaluation method.

The external tests are still carried out and serve to verify the results determined internally. This methodology ensures that DHP can guarantee to its customers that the products achieve the specified thermal conductivity (λ_{50}).



Technical Characteristics PUR-foam	Unit	Actual value DHP
Density of freely foamed material ρ	kg/m ³	50
Radial compressive strength σ_{Druck} at 10% relative deformation	N/mm ²	0,40
Closed cells	%	90
Cell size in radial direction	mm	< 0,5
Water absorption after 90 Minuten boil test	vol. %	5
Maximum temperature T_{max}	°C	140
Service life L	a	≥ 30
Thermal conductivity λ at 50° C mean temperature	W/(m·K)	≤ 0,027
Specific heat capacity c_m	kJ/(kg·K)	1,4
Building material class (normally flammable)	DIN 4102	B 3
Fire resistant class (flame-retardant)	DIN 4102	< F 30
Ozon Depletion Potential OExpansion pad	---	0
Global Warming Potential GWP	---	< 0,001



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Common

Carrier pipes

As standard, DHP processes welded or seamless steel pipes P235GH in accordance with DIN 10216 / DIN 10217. These are primarily used for district heating and district cooling applications.

Welded and seamless steel pipe P235GH according to DIN 10216-1 / 10217-1

Technical Characteristics P235GH at 20°C	Value / Unit
Density ρ	7,85 kg/dm ³
Tensile strength R_m	360-500 N/mm ²
Yield strength R_e	235 N/mm ²
Wall roughness k	0,02 k
Modulus of elasticity E	211.800 N/mm ²
Thermal conductivity λ	55,2 W/(m*K)
Specific heat capacity c_m	0,46 kJ/kg°C
Coefficient of thermal expansion α	11,3*10 ⁻⁶

Furthermore, carrier pipes can also be used for other applications, for example in the food industry or for chemical media. These may include various steel or plastic pipes, such as cast iron, stainless steel, PVC, PP, PE, or similar materials.

In general, we offer solutions for the transport of flowing media across various temperature ranges. Our rigid polyurethane (PUR) foam insulation allows continuous operating temperatures of at least 120 °C.

DHP-Single pipe

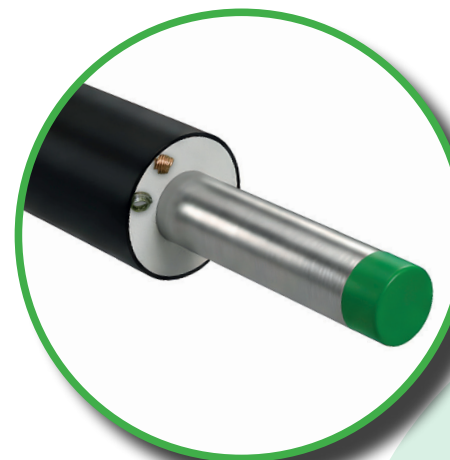
Single pipe

The DHP single pipe is a versatile energy pipe primarily used for the sustainable transport of heat and cooling in district heating and district cooling networks. It also proves effective in modern industrial production, for example in the food and oil industries.

Manufacturing is carried out using the conventional discontinuous production process, with either a PEHD outer casing for direct burial or a spiral-seam steel casing for above-ground installations. The carrier pipe, PUR foam, and casing pipe form a bonded composite system.

High-quality rigid polyurethane (PUR) foam insulation (CFC-free, cyclopentane-blown) ensures long-lasting thermal insulation properties. The PEHD casing is internally coated with EVOH, impact-resistant, and waterproof. All DHP components are perfectly compatible and easy to install on site.

- Available dimensions from DN 20 (¾") to DN 1000 (40") in conventional production
- Three insulation Series
- Various carrier pipe grades, e.g. P235GH according to EN 253, DIN EN 10216 / DIN EN 10217
- Thermal conductivity $\lambda_{50} = 0.027 \text{ W/(m}\cdot\text{K)}$
- Operating temperatures according to EN 253 and higher, design pressure up to 25 bar
- No limitation of installation length up to a static design temperature of 85 °C
- Available in 6 m, 12 m, and 16 m pipe lengths, other lengths upon request
- System Nordic (EMS) and/or other leak detection monitoring systems available





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Products - Single

Application / Carrier pipe / Connection

Application

Maximum operating temperature $T_{\max}$:	at the minimum according to EN 253
Maximum operating pressure p_B :	25 bar
Maximum axial stress $\sigma_{\max}$:	190 N/mm ²
Leak detection:	Nordic single/multiple or/and other systems
Possible media:	all heating water and other liquid substances compatible with the material

Welded carrier pipe

Welded, circular, non-alloy and fully killed steel, designation and technical delivery conditions in accordance with EN 253 and DIN EN 10217-1 and -2.

Material grade P235GH (1.0345), with inspection certificate (MTC) according to DIN EN 10204 – 3.1. For wall thicknesses > 3.0 mm, with weld seam preparation by 30° beveled pipe ends in accordance with DIN EN ISO 9692-1.

Seamless carrier pipe

Seamless, circular, non-alloy and fully killed steel, designation and technical delivery conditions in accordance with EN 253 and DIN EN 10216-2.

Material grade P235GH (1.0345), with inspection certificate (MTC) according to DIN EN 10204 – 3.1. For wall thicknesses > 3.0 mm, with weld seam preparation by 30° beveled pipe ends in accordance with DIN EN ISO 9692-1.

Connection

The joints of the steel pipes may be executed in accordance with DIN ISO 857-1 using the following welding processes: manual arc welding, oxy-acetylene gas welding, tungsten inert gas welding (TIG), or combined processes.

The quality, testing, and evaluation of the weld seams shall comply with AGFW Worksheet FW 446



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Products - Single

u-value / Heat loss

Thermal conductivity u-value [W/m²K]

The specified values are based on a mean specific heat capacity of water $c_m = 4,187 \text{ J/(kg} \cdot \text{K)}$, a soil cover $H = 0.80 \text{ m}$ (top of the casing pipe to ground level), a thermal conductivity of the soil $\lambda_E = 1.0 \text{ W/(m} \cdot \text{K)}$, a mean soil temperature $T_E = 10^\circ \text{C}$, an average clear pipe spacing $A [\text{mm}]$ according to the table, and welded steel pipe wall thicknesses.

Calculation mean temperature:

$$T_M = (T_{FL} + T_{RL}) : 2 \text{ [}^\circ \text{C]}$$

$$\text{Example: } T_M = (90^\circ \text{C} + 70^\circ \text{C}) : 2 = 80^\circ \text{C}$$

u-value in [W/(m²K)] at axis distance pipe A [mm]

Pipe	PEHD Casing pipe diameter D_A Axis distance pipe A [mm]			u-value [W/(m ² K)]		
	Series 1	Series 2	Series 3	Series 1	Series 2	Series 3
DN 20	90 / 150	110 / 150	125 / 150	0,1295	0,1114	0,1028
DN 25	90 / 150	110 / 150	125 / 150	0,1564	0,1308	0,1191
DN 32	110 / 150	125 / 150	140 / 150	0,1589	0,1420	0,1290
DN 40	110 / 150	125 / 150	140 / 150	0,1810	0,1593	0,1432
DN 50	125 / 150	140 / 150	160 / 200	0,2013	0,1763	0,1557
DN 65	140 / 150	160 / 200	180 / 200	0,2325	0,1980	0,1744
DN 80	160 / 200	180 / 200	200 / 200	0,2418	0,2076	0,1847
DN 100	200 / 200	225 / 200	250 / 200	0,2543	0,2148	0,1905
DN 125	225 / 200	250 / 200	280 / 300	0,2880	0,2459	0,2138
DN 150	250 / 200	280 / 300	315 / 300	0,3369	0,2794	0,2343
DN 200	315 / 300	355 / 300	400 / 400	0,3686	0,2953	0,2472
DN 250	400 / 400	450 / 400	500 / 400	0,3637	0,2914	0,2468
DN 300	450 / 400	500 / 400	560 / 500	0,4126	0,3284	0,2698
DN 350	500 / 400	560 / 500	630 / 500	0,4009	0,3169	0,2605
DN 400	560 / 500	630 / 500	710 / 600	0,4222	0,3277	0,2684
DN 450	630 / 500	710 / 600	800 / 700	0,4242	0,3299	0,2703
DN 500	710 / 600	800 / 700	900 / 700	0,4149	0,3249	0,2669
DN 600	800 / 700	900 / 700	1000 / 800	0,5002	0,3748	0,3065
DN 700	900 / 700	1000 / 800	n.u.	0,5665	0,4238	n.u.
DN 800	1000 / 800	1100 / 800	n.u.	0,6372	0,4732	n.u.
DN 900	1100 / 800	1200 / 900	n.u.	0,7027	0,5221	n.u.
DN 1000	1200 / 900	1300 / 900	n.u.	0,7742	0,5733	n.u.

Heat loss q at mean temperature [W/m]

Pipe	q at $T_M = 100^\circ \text{C}$ [W/m]			q at $T_M = 80^\circ \text{C}$ [W/m]			q at $T_M = 60^\circ \text{C}$ [W/m]		
	Series 1	Series 2	Series 3	Series 1	Series 2	Series 3	Series 1	Series 2	Series 3
DN 20	11,656	10,028	9,253	9,066	7,799	7,197	6,476	5,571	5,141
DN 25	14,078	11,770	10,717	10,950	9,154	8,335	7,821	6,539	5,954
DN 32	14,302	12,777	11,614	11,124	9,937	9,033	7,946	7,098	6,452
DN 40	16,290	14,340	12,892	12,670	11,153	10,027	9,050	7,967	7,162
DN 50	18,116	15,865	14,011	14,090	12,339	10,898	10,064	8,814	7,784
DN 65	20,925	17,816	15,698	16,275	13,857	12,209	11,625	9,898	8,721
DN 80	21,765	18,684	16,623	16,928	14,532	12,929	12,092	10,380	9,235
DN 100	22,884	19,335	17,145	17,799	15,039	13,335	12,713	10,742	9,525
DN 125	25,923	22,132	19,246	20,163	17,214	14,969	14,402	12,296	10,692
DN 150	30,318	25,150	21,089	23,580	19,561	16,402	16,843	13,972	11,716
DN 200	33,176	26,575	22,245	25,804	20,670	17,302	18,431	14,764	12,358
DN 250	32,736	26,228	22,208	25,461	20,399	17,273	18,186	14,571	12,338
DN 300	37,133	29,558	24,285	28,881	22,989	18,889	20,630	16,421	13,492
DN 350	36,080	28,521	23,446	28,062	22,183	18,236	20,044	15,845	13,025
DN 400	38,000	29,493	24,157	29,556	22,939	18,789	21,111	16,385	13,421
DN 450	38,180	29,690	24,331	29,696	23,093	18,924	21,211	16,495	13,517
DN 500	37,341	29,241	24,020	29,043	22,743	18,682	20,745	16,245	13,344
DN 600	45,016	33,729	27,584	35,012	26,234	21,454	25,009	18,738	15,324
DN 700	50,986	38,141	n.u.	39,656	29,665	n.u.	28,326	21,189	n.u.
DN 800	57,345	42,586	n.u.	44,602	33,123	n.u.	31,858	23,659	n.u.
DN 900	63,242	46,990	n.u.	49,189	36,548	n.u.	35,135	26,106	n.u.
DN 1000	69,679	51,601	n.u.	54,195	40,134	n.u.	38,710	28,667	n.u.

All values are based on a thermal conductivity of the PUR foam $\lambda_{50} = 0.027 \text{ W/(m} \cdot \text{K)}$.



District Heating Pipes

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Products - Single

Diameter / Output / Pressure loss

Carrier pipe					Volume pipe v [l/m]	Flow speed		Volumetric flow		Output P from / to [kw] at Delta T [K]													
DN	Zoll	d _A [mm]	EN 253 s [mm]	FW 401 s [mm]		w von / bis [m/s]		from / to [m³/h]		from / to at 20K		from / to at 25K		from / to at 30K		from / to at 35K		from / to at 40K		from / to at 45K		from / to at 50K	
20	¾"	26,9	2,0	3,2	0,41	0,3	0,6	0,44	0,89	10	21	13	26	15	31	18	36	21	41	23	46	26	51
25	1"	33,7	2,3	3,2	0,67	0,4	0,7	0,96	1,69	22	39	28	49	34	59	39	69	45	78	50	88	56	98
32	1¼"	42,4	2,6	3,2	1,09	0,5	0,9	1,96	3,53	46	82	57	102	68	123	80	143	91	164	102	184	114	205
40	1½"	48,3	2,6	3,2	1,46	0,6	1,0	3,15	5,26	73	122	91	152	110	183	128	213	146	244	165	274	183	305
50	2"	60,3	2,9	3,2	2,33	0,7	1,2	5,87	10,07	136	234	170	292	204	350	238	409	272	467	306	525	341	584
65	2½"	76,1	2,9	3,2	3,88	0,8	1,3	11,17	18,16	259	421	324	527	389	632	454	737	518	843	583	948	648	1 053
80	3"	88,9	3,2	3,2	5,34	0,9	1,4	17,30	26,91	401	624	502	780	602	937	702	1 093	803	1 249	903	1 405	1 003	1 561
100	4"	114,3	3,6	3,6	9,01	1,0	1,6	32,44	51,90	753	1 204	941	1 505	1 129	1 806	1 317	2 107	1 505	2 408	1 693	2 709	1 881	3 010
125	5"	139,7	3,6	3,6	13,80	1,1	1,7	54,65	84,46	1 268	1 959	1 585	2 449	1 902	2 939	2 219	3 429	2 536	3 919	2 853	4 409	3 170	4 898
150	6"	168,3	4,0	4,0	20,20	1,2	1,8	87,26	130,90	2 025	3 037	2 531	3 796	3 037	4 555	3 543	5 314	4 049	6 074	4 555	6 833	5 061	7 592
200	8"	219,1	4,5	4,5	34,70	1,3	2,0	162,40	249,84	3 768	5 796	4 709	7 245	5 651	8 694	6 593	10 144	7 535	11 593	8 477	13 042	9 419	14 491
250	10"	273,0	5,0	5,0	54,30	1,4	2,2	273,67	430,06	6 349	9 977	7 936	12 472	9 524	14 966	11 111	17 460	12 698	19 955	14 286	22 449	15 873	24 943
300	12"	323,9	5,6	5,6	76,80	1,5	2,3	414,72	635,90	9 622	14 753	12 027	18 441	14 432	22 129	16 838	25 818	19 243	29 506	21 648	33 194	24 054	36 882
350	14"	355,6	5,6	5,6	93,20	1,5	2,4	503,28	805,25	11 676	18 682	14 595	23 352	17 514	28 023	20 433	32 693	23 352	37 364	26 271	42 034	29 190	46 704
400	16"	406,4	6,3	6,3	121,90	1,6	2,5	702,14	1 097,10	16 290	25 453	20 362	31 816	24 435	38 179	28 507	44 542	32 579	50 905	36 652	57 269	40 724	63 632
450	18"	457,0	6,3	6,3	155,10	1,6	2,5	893,38	1 395,90	20 726	32 385	25 908	40 481	31 089	48 577	36 271	56 674	41 453	64 770	46 634	72 866	51 816	80 962
500	20"	508,0	6,3	6,3	192,70	1,7	2,5	1 179,32	1 734,30	27 360	40 236	34 200	50 295	41 040	60 354	47 881	70 413	54 721	80 472	61 561	90 530	68 401	100 589
600	24"	610,0	7,1	7,1	278,70	1,7	2,8*	1 705,64	2 809,30	39 571	65 176	49 464	81 470	59 356	97 764	69 249	114 057	79 142	130 351	89 035	146 645	98 927	162 939
700	28"	711,0	8,0	8,0	379,00	1,8	3,0*	2 455,92	4 093,20	56 977	94 962	71 222	118 703	85 466	142 443	99 710	166 184	113 955	189 924	128 199	213 665	142 443	237 406
800	32"	813,0	8,8	8,8	497,00	1,8	3,0*	3 220,56	5 367,60	74 717	124 528	93 396	155 660	112 075	186 792	130 755	217 925	149 434	249 057	168 113	280 189	186 792	311 321
900	36"	914,0	10,0	10,0	627,00	1,8	3,0*	4 062,96	6 771,60	94 261	157 101	117 826	196 376	141 391	235 652	164 956	274 927	188 521	314 202	212 087	353 478	235 652	392 753
1000	40"	1016,0	11,0	11,0	776,00	1,8	3,0*	5 028,48	8 380,80	116 661	194 435	145 826	243 043	174 991	291 652	204 156	340 260	233 321	388 869	262 487	437 478	291 652	486 086

The values are based on a mean specific heat capacity of water of 4,187 J/(kg·K).

*High flow speed only in main transport pipelines

If medium pipe wall thicknesses in accordance with AGFW FW 401 are used, the transferable capacity for DN 20 to DN 65 is slightly reduced due to the smaller internal diameter.

Excessively high flow speed can cause problems such as significant pressure losses, flow noise, erosion at bends or weld seams, and increased pump power requirements.

Conversely, a too low velocity results in poor heat distribution, larger pipe dimensions (higher investment costs), and the risk of deposits forming.

General design targets for district heating are a temperature difference (ΔT) in the network of 30–50 K and a pressure loss of 100–300 Pa/m.

The flow speed (w) should be designed for economic efficiency rather than maximum values.



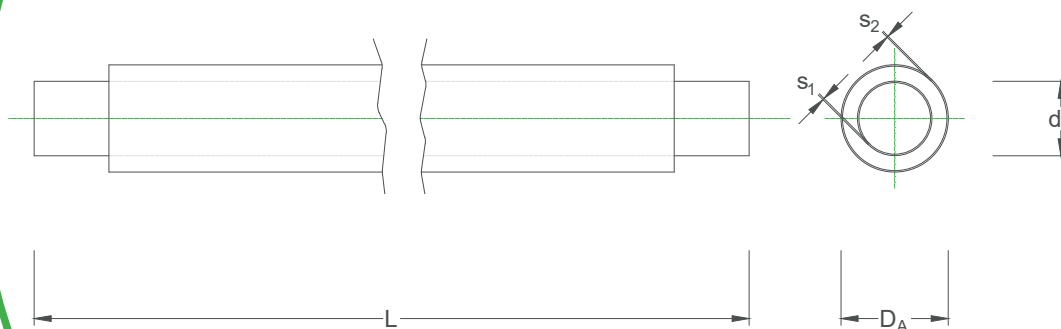
District Heating Pipes

smart pipes, clever solutions

Products - Single

Dimensions

L	Pipe length
d_A	Outer diameter Carrier pipe
D_A	Outer diameter Casing pipe
s_1	Wall thickness Carrier pipe
s_2	Wall thickness Casing pipe

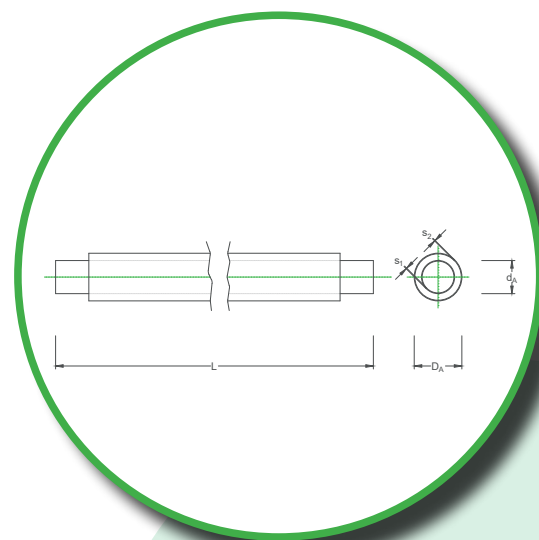


Products - Single

Dimensions

Discontinuous production - welded carrier pipe

Carrier pipe					PEHD Casing pipe diameter $D_A \times s_2$ [mm] / Weight G / Pipe length L [m]														
DN	Zoll	d_A [mm]	EN 253 s_1 [mm]	FW 401 s_1 [mm]	Series 1	G [kg/m]	6	12	16	Series 2	G [kg/m]	6	12	16	Series 3	G [kg/m]	6	12	16
20	¾"	26,9	2,0	2,6	90 x 3,0	2,68	+	-	-	110 x 3,0	3,08	+	-	-	125 x 3,0	3,41	+	-	-
25	1"	33,7	2,3	2,6	90 x 3,0	3,54	+	-	-	110 x 3,0	3,96	+	+	-	125 x 3,0	4,30	+	+	-
32	1¼"	42,4	2,6	3,2	110 x 3,0	4,60	+	+	-	125 x 3,0	4,95	+	+	-	140 x 3,0	5,32	+	+	-
40	1½"	48,3	2,6	3,2	110 x 3,0	5,04	+	+	-	125 x 3,0	5,38	+	+	-	140 x 3,0	5,76	+	+	-
50	2"	60,3	2,9	3,2	125 x 3,0	6,25	+	+	-	140 x 3,0	6,62	+	+	-	160 x 3,0	7,16	+	+	-
65	2½"	76,1	2,9	3,2	140 x 3,0	7,73	+	+	-	160 x 3,0	8,28	+	+	-	180 x 3,0	8,87	+	+	-
80	3"	88,9	3,2	3,2	160 x 3,0	9,15	+	+	-	180 x 3,0	9,75	+	+	-	200 x 3,2	10,49	+	+	-
100	4"	114,3	3,6	3,6	200 x 3,2	13,23	+	+	+	225 x 3,4	14,24	+	+	+	250 x 3,6	15,35	+	+	+
125	5"	139,7	3,6	3,6	225 x 3,4	16,09	+	+	+	250 x 3,6	17,20	+	+	+	280 x 3,9	18,72	+	+	+
150	6"	168,3	4,0	4,0	250 x 3,6	20,77	+	+	+	280 x 3,9	22,29	+	+	+	315 x 4,1	24,15	+	+	+
200	8"	219,1	4,5	4,5	315 x 4,1	30,51	+	+	+	355 x 4,5	33,02	+	+	+	400 x 4,8	36,05	+	+	+
250	10"	273,0	5,0	5,0	400 x 4,8	43,59	+	+	+	450 x 5,2	47,42	+	+	+	500 x 5,6	51,66	+	+	+
300	12"	323,9	5,6	5,6	450 x 5,2	56,40	+	+	+	500 x 5,6	60,65	+	+	+	560 x 6,0	66,19	+	+	+
350	14"	355,6	5,6	5,6	500 x 5,6	63,65	+	+	+	560 x 6,0	69,20	+	+	+	630 x 6,6	76,62	+	+	+
400	16"	406,4	6,3	6,3	560 x 6,0	80,57	+	+	+	630 x 6,6	88,00	+	+	+	710 x 6,9	92,55	+	+	+
450	18"	457,0	6,3	6,3	630 x 6,6	93,07	+	+	+	710 x 6,9	97,62	+	+	+	800 x 7,2	102,44	+	+	+
500	20"	508,0	6,3	6,3	710 x 6,9	102,40	+	+	+	800 x 7,2	107,22	+	+	+	900 x 7,9	119,09	+	+	+
600	24"	610,0	7,1	7,1	800 x 7,9	139,45	+	+	+	900 x 8,7	154,30	+	+	+	1000 x 9,4	170,59	+	+	+
700	28"	711,0	8,0	8,0	900 x 8,7	178,93	+	+	+	1000 x 9,4	195,23	+	+	+	n.u.	n.u.	n.u.	n.u.	n.u.
800	32"	813,0	8,8	8,8	1000 x 9,4	221,15	+	+	+	1100 x 10,2	239,38	+	+	+	n.u.	n.u.	n.u.	n.u.	n.u.
900	36"	914,0	10,0	10,0	1100 x 10,2	276,70	+	+	+	1200 x 11,0	296,63	+	+	+	n.u.	n.u.	n.u.	n.u.	n.u.
1000	40"	1016,0	11,0	11,0	1200 x 11,0	333,79	+	+	+	1300 x 12,5	357,76	+	+	+	n.u.	n.u.	n.u.	n.u.	n.u.



The pipe is manufactured using conventional discontinuous production. The casing pipe wall thickness is in accordance with EN 253, and the specified carrier pipe wall thicknesses correspond to DHP standards or the requirements of EN 253 / AGFW FW 401. These must be calculated for internal pressure according to DIN EN 13480.

The pipe ends are beveled at a 30° angle in preparation for welding (DIN EN ISO 9692-1). Uninsulated steel pipe ends are approximately 220 mm.



District Heating Pipes

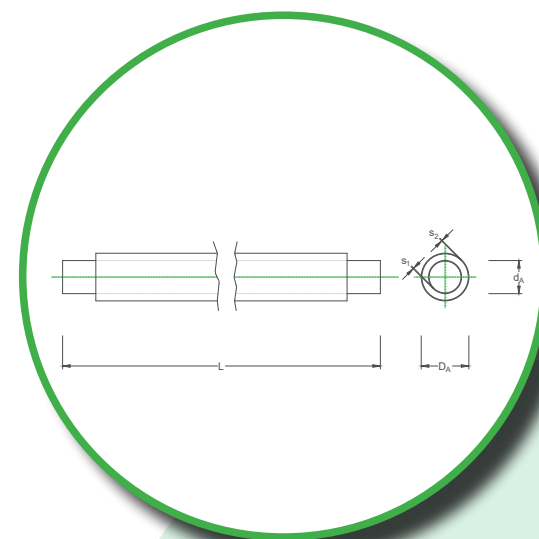
smart pipes, clever solutions

Products - Single

Dimensions

Discontinuous production - seamless carrier pipe

Carrier pipe				PEHD Casing pipe diameter D _A x s ₂ [mm] / Weight G / Pipe length L [m]															
DN	Zoll	d _A [mm]	s ₁ [mm]	Series 1	G [kg/m]	6	12	16	Series 2	G [kg/m]	6	12	16	Series 3	G [kg/m]	6	12	16	
20	¾"	26,9	2,3	90 x 3,0	2,68	+	-	-	110 x 3,0	3,08	+	-	-	125 x 3,0	3,41	+	-	-	
25	1"	33,7	2,6	90 x 3,0	3,54	+	-	-	110 x 3,0	3,96	+	+	-	125 x 3,0	4,30	+	+	-	
32	1¼"	42,4	2,6	110 x 3,0	4,60	+	+	-	125 x 3,0	4,95	+	+	-	140 x 3,0	5,32	+	+	-	
40	1½"	48,3	2,6	110 x 3,0	5,04	+	+	-	125 x 3,0	5,38	+	+	-	140 x 3,0	5,76	+	+	-	
50	2"	60,3	2,9	125 x 3,0	6,25	+	+	-	140 x 3,0	6,62	+	+	-	160 x 3,0	7,16	+	+	-	
65	2½"	76,1	2,9	140 x 3,0	7,73	+	+	-	160 x 3,0	8,28	+	+	-	180 x 3,0	8,87	+	+	-	
80	3"	88,9	3,2	160 x 3,0	9,15	+	+	-	180 x 3,0	9,75	+	+	-	200 x 3,2	10,49	+	+	-	
100	4"	114,3	3,6	200 x 3,2	13,23	+	+	+	225 x 3,4	14,24	+	+	+	250 x 3,6	15,35	+	+	+	
125	5"	139,7	4,0	225 x 3,4	17,39	+	+	+	250 x 3,6	18,51	+	+	+	280 x 3,9	20,03	+	+	+	
150	6"	168,3	4,5	250 x 3,6	22,74	+	+	+	280 x 3,9	24,26	+	+	+	315 x 4,1	26,12	+	+	+	
200	8"	219,1	6,3	315 x 4,1	39,78	+	+	+	355 x 4,5	42,29	+	+	+	400 x 4,8	45,32	+	+	+	
250	10"	273,0	6,3	400 x 4,8	52,01	+	+	+	450 x 5,2	55,83	+	+	+	500 x 5,6	60,08	+	+	+	
300	12"	323,9	7,1	450 x 5,2	67,94	+	+	+	500 x 5,6	72,19	+	+	+	560 x 6,0	77,74	+	+	+	
350	14"	355,6	8,0	500 x 5,6	83,95	+	+	+	560 x 6,0	89,49	+	+	+	630 x 6,6	96,92	+	+	+	
400	16"	406,4	8,8	560 x 6,0	104,76	+	+	+	630 x 6,6	112,18	+	+	+	710 x 6,9	116,73	+	+	+	
450	18"	457,0	10,0	630 x 6,6	133,38	+	+	+	710 x 6,9	137,93	+	+	+	800 x 7,2	142,75	+	+	+	
500	20"	508,0	11,0	710 x 6,9	159,42	+	+	+	800 x 7,2	164,24	+	+	+	900 x 7,9	176,11	+	+	+	
600	24"	610,0	12,5	800 x 7,9	218,27	+	+	+	900 x 8,7	233,12	+	+	+	1000 x 9,4	249,42	+	+	+	
700	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	
800	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	
900	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	
1000	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	



The pipe is manufactured using conventional discontinuous production. The casing pipe wall thickness is in accordance with EN 253, and the specified carrier pipe wall thicknesses correspond to DHP standards or the requirements of EN 253 / AGFW FW 401. These must be calculated for internal pressure according to DIN EN 13480.

The pipe ends are beveled at a 30° angle in preparation for welding (DIN EN ISO 9692-1). Uninsulated steel pipe ends are approximately 220 mm.



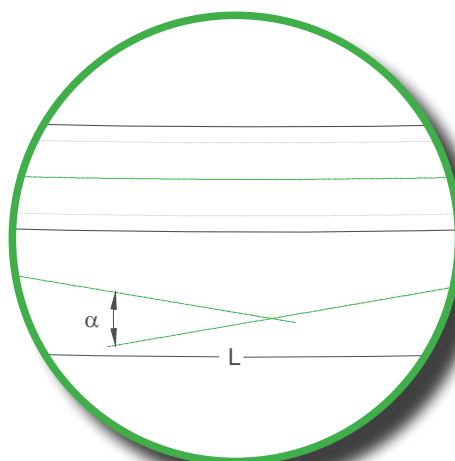
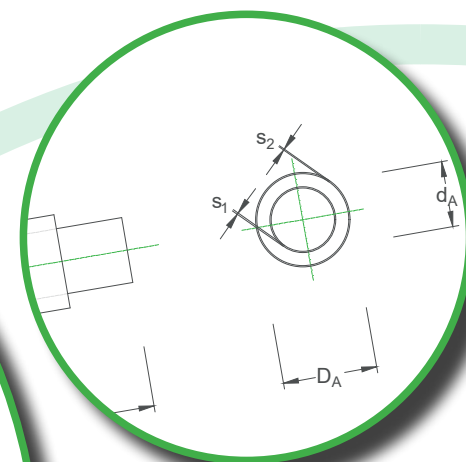
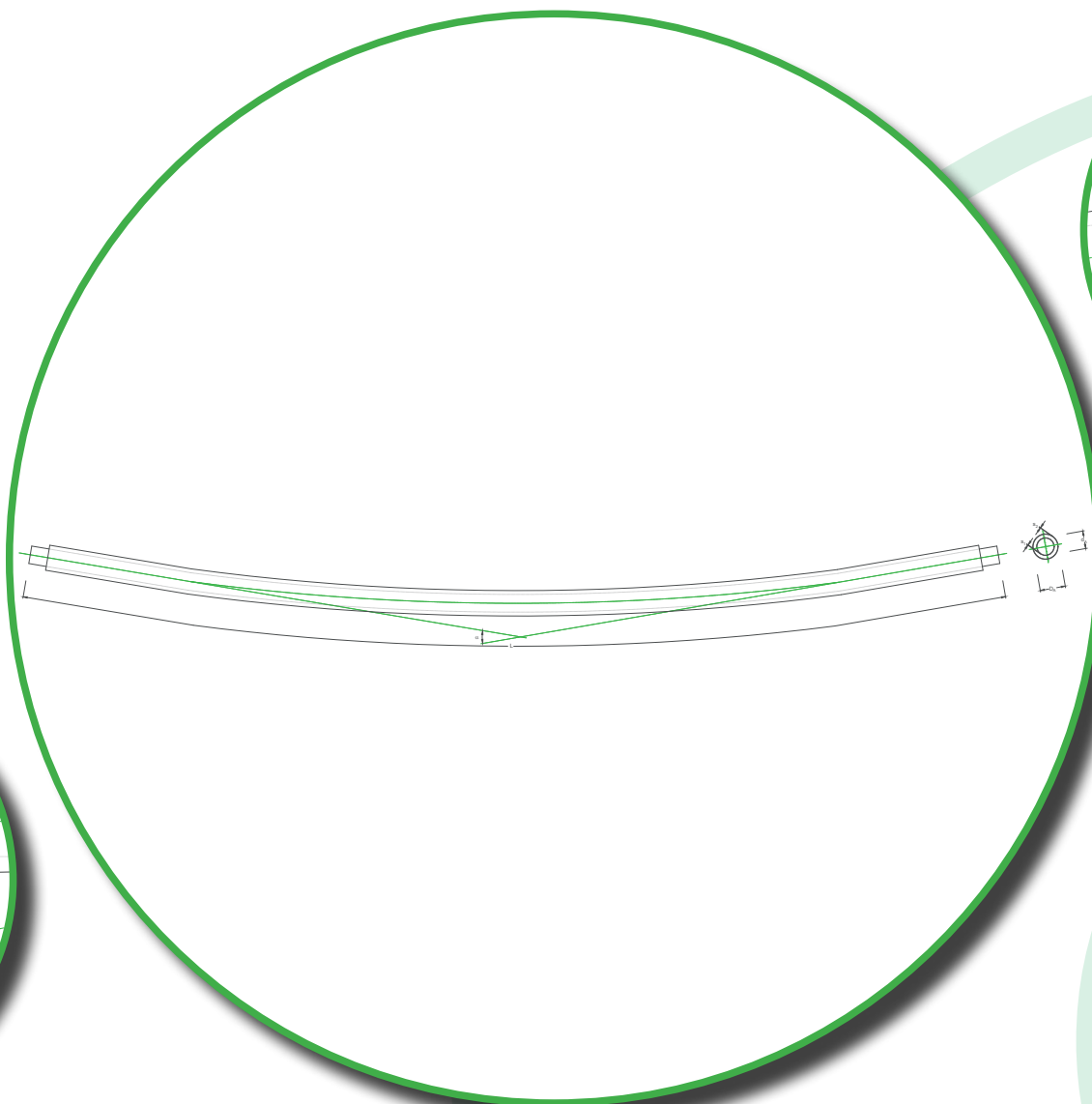
District Heating Pipes

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Products - Single

Curved pipe

L	Pipe length
d_A	Outer diameter Carrier pipe
D_A	Outer diameter Casing pipe
s_1	Wall thickness Carrier pipe
s_2	Wall thickness Casing pipe

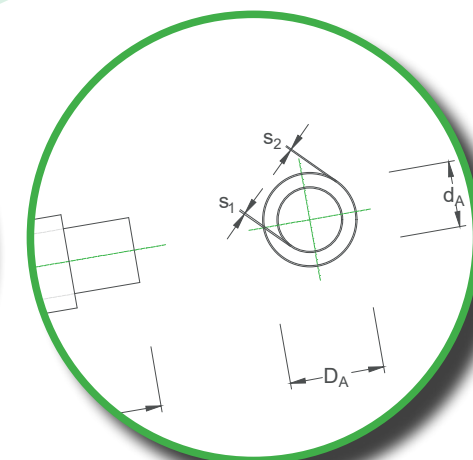
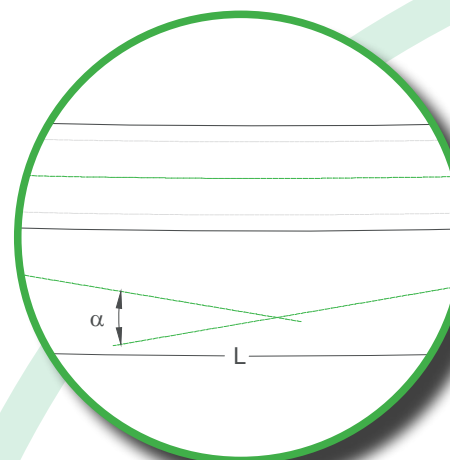


Products - Single

Curved pipe

Discontinuous production - welded carrier pipe according to EN 253 / FW 401 or seamless

DN	Zoll	d _A [mm]	Carrier pipe			PEHD Casing pipe diameter D _A x s ₂ [mm]			Maximum bending angle α [°]
			EN 253 s ₁ [mm]	FW 401 s ₁ [mm]	seamless s ₁ [mm]	Series 1	Series 2	Series 3	
100	4"	114,3	3,6	3,6	3,6	200 x 3,2	225 x 3,4	250 x 3,6	28,0
125	5"	139,7	3,6	3,6	4,0	225 x 3,4	250 x 3,6	280 x 3,9	28,0
150	6"	168,3	4,0	4,0	4,5	250 x 3,6	280 x 3,9	315 x 4,1	25,0
200	8"	219,1	4,5	4,5	6,3	315 x 4,1	355 x 4,5	400 x 4,8	22,5
250	10"	273,0	5,0	5,0	6,3	400 x 4,8	450 x 5,2	500 x 5,6	20,0
300	12"	323,9	5,6	5,6	7,1	450 x 5,2	500 x 5,6	560 x 6,0	18,0
350	14"	355,6	5,6	5,6	8,0	500 x 5,6	560 x 6,0	630 x 6,6	12,0
400	16"	406,4	6,3	6,3	8,8	560 x 6,0	630 x 6,6	710 x 6,9	6,5
450	18"	457,0	6,3	6,3	10,0	630 x 6,6	710 x 6,9	800 x 7,2	5,0
500	20"	508,0	6,3	6,3	11,0	710 x 6,9	800 x 7,2	900 x 8,7	4,0



Factory production of DHP single pipe – curved pipes is only possible with a PEHD casing in 12 m pipe lengths and starting from nominal size DN 100. The values given in the table apply regardless of the PEHD casing pipe diameter (Insulation Series 1 to 3).

Curved pipes are machine-bent according to the route alignment and allowable bending angle, based on the instructions of the local site management. Returns of bent pipes are not accepted.

When ordering, the bending angle and bending direction (left/right, depending on the route of the network monitoring) must be specified. If required, DHP determines these parameters.

For smaller dimensions, the natural deflection of the pipe lengths—caused by pipe length and weight—can be used to achieve directional changes. Additionally, it is possible to use 3°-mitred bends when welding pipe lengths together.

For nominal sizes DN 20 to DN 80, it is therefore sufficient to compensate route curves using site-formed curved pipes (elastic bending of a pipe length on site).



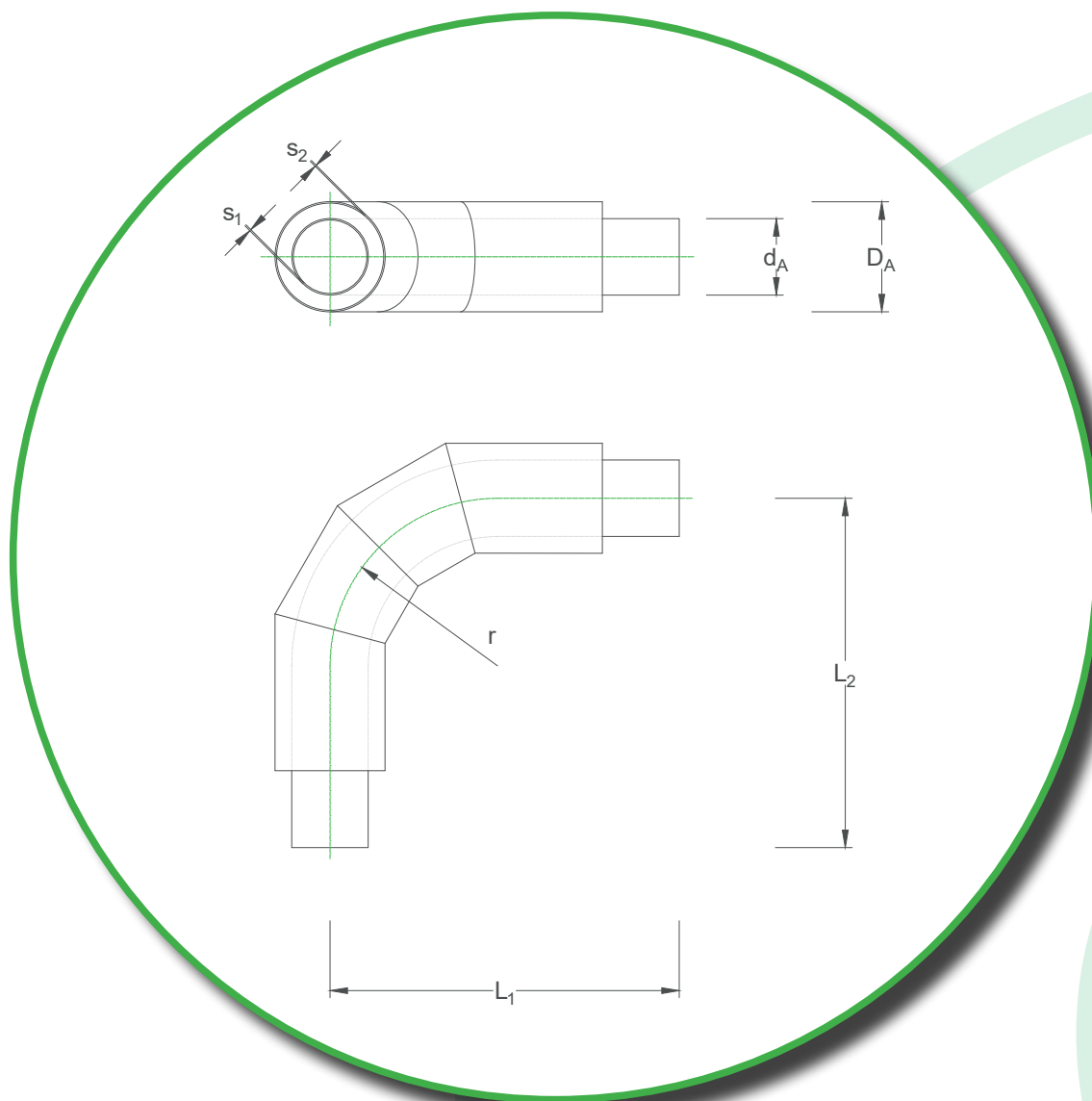
District Heating Pipes

smart pipes, clever solutions

Products - Single

90° Elbow

L_1	Leg length 1
L_2	Leg length 2
d_A	Outer diameter Carrier pipe
D_A	Outer diameter Casing pipe
s_1	Wall thickness Carrier pipe
s_2	Wall thickness Casing pipe
r	Radius carrier pipe elbow



Products - Single

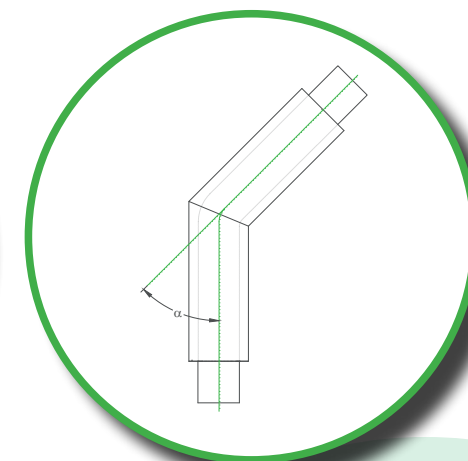
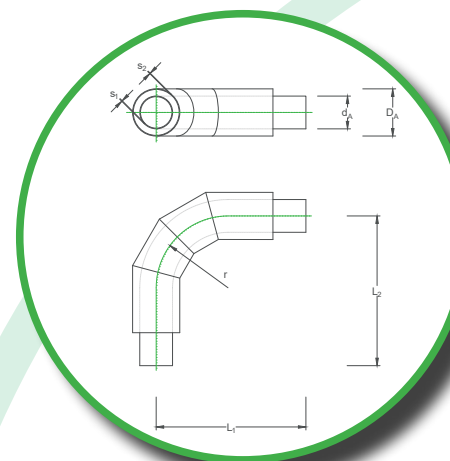
90° Elbow

Bends are produced in two ways:

-With a carrier pipe bend according to DIN EN 10253-2 plus a weld-on cylinder, depending on the dimension in welded or seamless execution. Available in all dimensions and insulation series. The welds for the weld-on cylinder can be inspected using radiographic testing.

-Depending on the dimension, one-piece bends are manufactured according to DIN EN 10220.

Carrier pipe			Carrier pipe elbow			Casing pipe diameter $D_A \times s_2$ [mm]			Leg length 1	Leg length 2
DN	Zoll	d_A [mm]	s_1 [mm]	r [mm]	Series 1	Series 2	Series 3		$L_1 \times L_2$ [mm]	$L_1 \times L_2$ [mm]
20	3/4"	26,9	2,0 / 2,6	110,0	90 x 3,0	110 x 3,0	125 x 3,0	1000 x 1000	-	-
25	1"	33,7	2,3 / 2,6	110,0	90 x 3,0	110 x 3,0	125 x 3,0	1000 x 1000	-	-
32	1 1/4"	42,4	2,6 / 3,2	110,0	110 x 3,0	125 x 3,0	140 x 3,0	1000 x 1000	-	-
40	1 1/2"	48,3	2,6 / 3,2	110,0	110 x 3,0	125 x 3,0	140 x 3,0	1000 x 1000	-	-
50	2"	60,3	2,9 / 3,2	135,0	125 x 3,0	140 x 3,0	160 x 3,0	1000 x 1000	-	-
65	2 1/2"	76,1	2,9 / 3,2	175,0	140 x 3,0	160 x 3,0	180 x 3,0	1000 x 1000	-	-
80	3"	88,9	3,2	205,0	160 x 3,0	180 x 3,0	200 x 3,2	1000 x 1000	-	-
100	4"	114,3	3,6	270,0	200 x 3,2	225 x 3,4	250 x 3,6	1000 x 1000	-	-
125	5"	139,7	3,6	330,0	225 x 3,4	250 x 3,6	280 x 3,9	1000 x 1000	1000 x 1500	-
150	6"	168,3	4,0	390,0	250 x 3,6	280 x 3,9	315 x 4,1	1000 x 1000	1000 x 1500	-
200	8"	219,1	4,5	510,0	315 x 4,1	355 x 4,5	400 x 4,8	1200 x 1200	1200 x 1500	-
250	10"	273,0	5,0	381,0	400 x 4,8	450 x 5,2	500 x 5,6	1000 x 1000	1000 x 1500	-
300	12"	323,9	5,6	457,0	450 x 5,2	500 x 5,6	560 x 6,0	1000 x 1000	1000 x 1500	-
350	14"	355,6	5,6	533,0	500 x 5,6	560 x 6,0	630 x 6,6	1000 x 1000	1000 x 1500	-
400	16"	406,4	6,3	610,0	560 x 6,0	630 x 6,6	710 x 6,9	1000 x 1000	1000 x 1500	-
450	18"	457,0	6,3	686,0	630 x 6,6	710 x 6,9	800 x 7,2	1100 x 1100	1100 x 1500	-
500	20"	508,0	6,3	762,0	710 x 6,9	800 x 7,2	900 x 7,9	1200 x 1200	1200 x 1500	-
600	24"	610,0	7,1	914,0	800 x 7,9	900 x 8,7	1000 x 9,4	1250 x 1250	-	-
700	28"	711,0	8,0	1067,0	900 x 8,7	1000 x 9,4	-	1400 x 1400	-	-
800	32"	813,0	8,8	1219,0	1000 x 9,4	1100 x 10,2	-	1600 x 1600	-	-
900	36"	914,0	10,0	1372,0	1100 x 10,2	1200 x 11,0	-	1900 x 1900	-	-
1000	40"	1016,0	11,0	1524,0	1200 x 11,0	1300 x 12,5	-	2000 x 2000	-	-



The pipe ends are beveled at a 30° angle in preparation for welding (DIN EN ISO 9692-1).

If special leg lengths or bend angles different from 90° (custom-degree bends) are required, the delivery possibility must be clarified in advance. For custom-degree bends, the additional angle $[\alpha]$ must be specified.

The specified steel wall thicknesses correspond to DHP wall thicknesses or the requirements of the standard. These must be calculated for internal pressure (DIN EN 13480).

Uninsulated steel pipe ends are approximately 220 mm.

Single pipe bends can be installed horizontally or as upward/downward bends. Bends with a long leg are used where it is practical to weld bend to bend, thereby reducing the number of connection sleeves required, for example at a thermal expansion compensation (U-bend or Z-offset).

Products - Single

Parallel branch / 45°-T-branch / 90°-vertical branch

Common

The nominal diameter and wall thickness of the run and branch are consistent with the dimensions of the respective pipe lengths. Branches with a branch size equal to the run, or one dimension smaller than the run, are manufactured with a tee according to DIN 10253-2. For other dimensions, the base pipe is saddled. The welds can be inspected using radiographic testing.

Bends in the branch are produced in two ways:

- With a carrier pipe bend according to DIN EN 10253-2 plus a weld-on cylinder. Available in all dimensions and insulation series.
The welds for the weld-on cylinder can be inspected using radiographic testing.

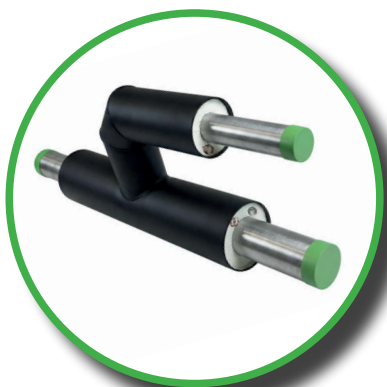
- Depending on the dimension, one-piece bends are manufactured according to DIN EN 10220.

The pipe ends are beveled at a 30° angle in preparation for welding (DIN EN ISO 9692-1).

The specified steel wall thicknesses correspond to DHP wall thicknesses or the requirements of the standard. These must be calculated for internal pressure (DIN EN 13480).

Uninsulated steel pipe ends are approximately 220 mm.

Parallel branch



45°-T-branch



T-Piece acc. to DIN EN 10253-2





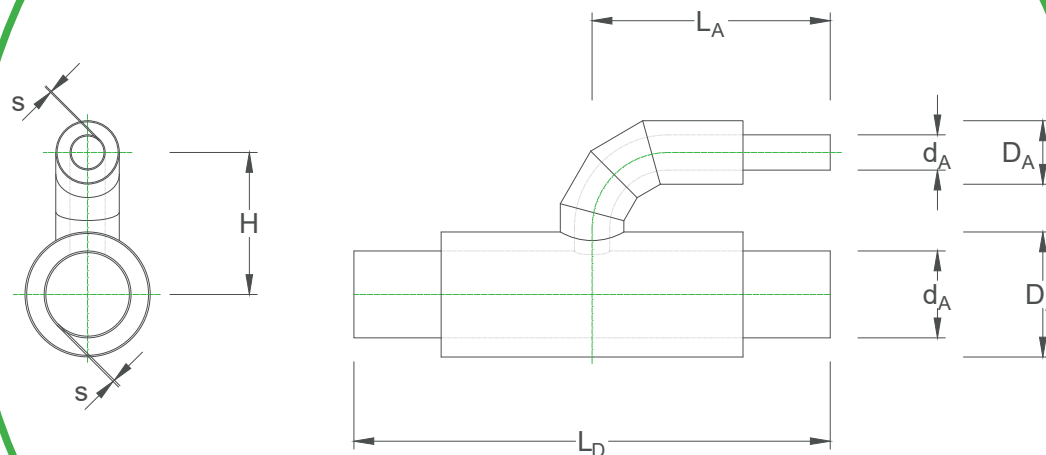
District Heating Pipes

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Products - Single

Parallel branch

L_D	Length Base pipe
L_A	Length Outlet pipe
d_A	Outer diameter Medium pipe
D_A	Outer diameter Casing pipe
s	Wall thickness Medium pipe
H	Length Outlet pipe (Height)





District Heating Pipes

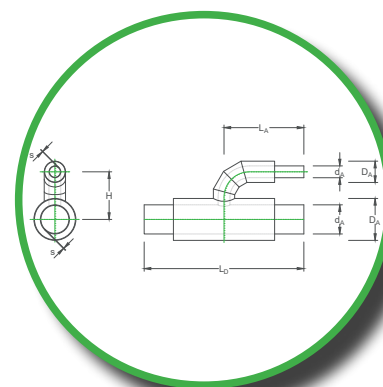
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Products - Single

Parallel branch

Insulation Series 1

Base pipe					Branch outlet DN (d _A , s, D _A as Dimension Base pipe) / Component measurement																						
					20	25	32	40	50	65	80	100	125	150	200	250	300	350	400	450	500	600	700	800	900	1000	
					L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D
					L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A
DN	Zoll	d _A	s	D _A	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H		
20	¾	26,9	2,0 2,6	90	1100																						
					600																						
					210																						
25	1	33,7	2,3 2,6	90	1100	1100																					
					600	600																					
					210	210																					
32	1 1/4	42,4	2,6 3,2	110	1100	1100	1100																				
					600	600	600																				
					220	220	230																				
40	1 1/2	48,3	2,6 3,2	110	1100	1100	1100	1100																			
					600	600	600	600																			
					220	220	230	230																			
50	2	60,3	2,9 3,2	125	1100	1100	1100	1100	1100																		
					600	600	600	600	600																		
					230	230	240	240	245																		
65	2 1/2	76,1	2,9 3,2	140	1100	1100	1100	1100	1100	1100																	
					600	600	600	600	600	600																	
					235	235	245	245	255	260																	



d_A = Steel pipe outer diameter [mm]

s = Steel pipe wall thickness according to DHP [mm]

D_A = Casing pipe outer diameter [mm]

Base pipe bzw. Outlet

Base pipe bzw. Outlet

Base pipe bzw. Outlet

L_D = Length Base pipe [mm]

L_A = Length Outlet [mm]

H = Axis distance [mm]

The specified steel wall thicknesses correspond to the minimum requirements according to the standard or the standard DHP wall thicknesses. Uninsulated steel pipe ends are approximately 220 mm.

For optimization and alignment with the state of the art, we reserve the right to make dimensional and technical modifications. Regarding possible dimensional deviations, no binding commitment can be derived in individual cases.



District Heating Pipes

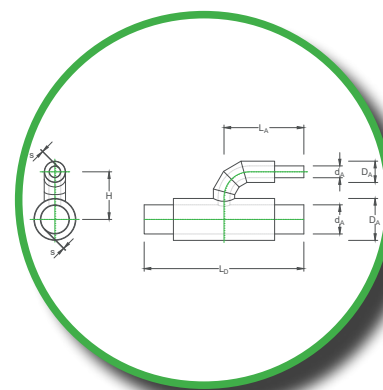
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Products - Single

Parallel branch

Insulation Series 1

Base pipe					Branch outlet DN (d _A , s, D _A as Dimension Base pipe) / Component measurement																					
					20	25	32	40	50	65	80	100	125	150	200	250	300	350	400	450	500	600	700	800	900	1000
					L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D
					L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A
DN	Zoll	d _A	s	D _A	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	
80	3	88,9	3,2	160	1100	1100	1100	1100	1100	1100	1200															
					600	600	600	600	600	600	600															
					245	245	255	255	265	270	290															
100	4	114,3	3,6	200	1100	1100	1100	1100	1100	1100	1200	1200														
					600	600	600	600	600	600	600	550														
					265	265	275	275	285	290	300	320														
125	5	139,7	3,6	225	1100	1100	1100	1100	1100	1100	1200	1200	1300													
					600	600	600	600	600	600	600	550	600													
					280	280	290	290	295	305	315	335	365													
150	6	168,3	4,0	250	1100	1100	1100	1100	1100	1100	1200	1200	1300	1300												
					600	600	600	600	600	600	600	550	600	650												
					290	290	300	300	310	315	325	345	380	375												
200	8	219,1	4,5	315	1100	1100	1100	1100	1100	1100	1200	1200	1300	1300	1400											
					600	600	600	600	600	600	600	550	600	650	700											
					325	325	335	335	340	350	360	380	390	390	485											
250	10	273	5,0	400	1100	1100	1100	1100	1100	1100	1200	1200	1300	1300	1400	1500										
					600	600	600	600	600	600	600	550	600	650	700	800										
					365	365	375	375	385	390	400	420	433	465	510	600										
300	12	323,9	5,6	450	1100	1100	1100	1100	1100	1100	1200	1200	1300	1300	1400	1500	1600									
					600	600	600	600	600	600	600	550	600	650	700	800	850									
					390	390	400	400	410	415	425	445	458	490	535	625	715									
350	14	355,6	5,6	500	1100	1100	1100	1100	1100	1100	1200	1200	1300	1300	1400	1500	1600	1700								
					600	600	600	600	600	600	600	550	600	650	700	800	850	900								
					415	415	425	425	435	440	450	470	483	515	600	640	730	815								





District Heating Pipes

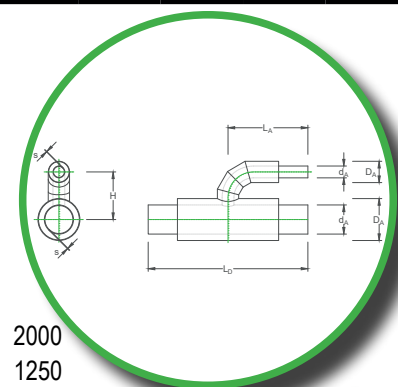
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Products - Single

Parallel branch

Insulation Series 1

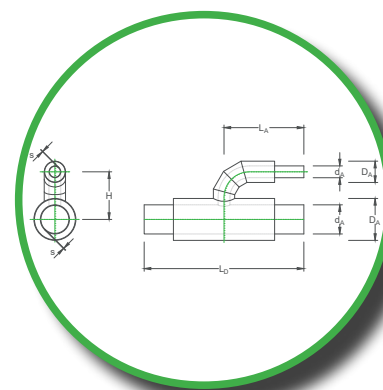
Base pipe					Branch outlet DN (d _A , s, D _A as Dimension Base pipe) / Component measurement																						
					20	25	32	40	50	65	80	100	125	150	200	250	300	350	400	450	500	600	700	800	900	1000	
					L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D
					L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A
DN	Zoll	d _A	s	D _A	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H		
400	16	406,4	6,3	560	1100	1100	1100	1100	1100	1100	1200	1200	1300	1300	1400	1500	1600	1700									
					600	600	600	600	600	600	600	550	600	650	700	800	850	900	1000								
					445	445	455	455	465	470	480	500	515	545	630	665	755	840	915								
450	18	457,0	6,3	630	1100	1100	1100	1100	1100	1100	1200	1200	1300	1300	1400	1500	1600	1700	1700	1800							
					600	600	600	600	600	600	600	550	600	650	700	800	850	900	1000	1100							
					480	480	490	490	500	505	515	535	548	580	655	690	780	865	940	1030							
500	20	508,0	6,3	710	1100	1100	1100	1100	1100	1100	1200	1200	1300	1300	1400	1500	1600	1700	1700	1800	1800						
					600	600	600	600	600	600	600	550	600	650	700	800	850	900	1000	1100	1200						
					500	500	510	510	520	525	535	555	568	600	680	765	805	890	970	1055	1145						
600	24	610,0	7,1	800	1100	1100	1100	1100	1100	1100	1200	1200	1300	1300	1400	1500	1600	1700	1700	1800	1800	2000					
					600	600	600	600	600	600	600	550	600	650	700	800	850	900	1000	1100	1200	1250					
					565	565	575	575	585	590	600	620	635	665	720	820	855	940	1020	1105	1195	1350					
700	28	711,0	8,0	900	1100	1100	1100	1100	1100	1100	1200	1200	1300	1300	1400	1500	1600	1700	1700	1800	1800	2000	2100				
					600	600	600	600	600	600	600	550	600	650	700	800	850	900	1000	1100	1200	1250	1400				
					615	615	625	625	635	640	650	670	685	715	770	830	905	990	1070	1160	1245	1425	1590				
800	32	813,0	8,8	1000	1100	1100	1100	1100	1100	1100	1200	1200	1300	1300	1400	1500	1600	1700	1700	1800	1800	2000	2100	2200			
					600	600	600	600	600	600	600	550	600	650	750	800	850	900	1000	1100	1200	1250	1400	1600			
					665	665	675	675	685	690	700	720	735	765	820	880	945	1045	1120	1210	1295	1475	1640	1820			
900	36	914,0	10,0	1100	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.			
					n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	
					n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	
1000	40	1016	11,0	1200	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.			
					n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	
					n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	



Parallel branch

Insulation Series 2

Base pipe					Branch outlet DN (d _A , s, D _A as Dimension Base pipe) / Component measurement																						
					20	25	32	40	50	65	80	100	125	150	200	250	300	350	400	450	500	600	700	800	900	1000	
					L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D
					L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A
DN	Zoll	d _A	s	D _A	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H			
20	¾	26,9	2,0 2,6	110	1100																						
					600																						
					230																						
25	1	33,7	2,3 2,6	110	1100	1100																					
					600	600																					
					230	230																					
32	1 1/4	42,4	2,6 3,2	125	1100	1100	1100																				
					600	600	600																				
					240	240	245																				
40	1 1/2	48,3	2,6 3,2	125	1100	1100	1100	1100																			
					600	600	600	600																			
					240	240	245	245																			
50	2	60,3	2,9 3,2	140	1100	1100	1100	1100	1100																		
					600	600	600	600	600																		
					245	245	255	255	260																		
65	2 1/2	76,1	2,9 3,2	160	1100	1100	1100	1100	1100	1100																	
					600	600	600	600	600	600																	
					255	255	265	265	270	280																	



d_A = Steel pipe outer diameter [mm]

s = Steel pipe wall thickness according to DHP [mm]

D_A = Casing pipe outer diameter [mm]

Base pipe bzw. Outlet

Base pipe bzw. Outlet

Base pipe bzw. Outlet

L_D = Length Base pipe [mm]

L_A = Length Outlet [mm]

H = Axis distance [mm]

The specified steel wall thicknesses correspond to the minimum requirements according to the standard or the standard DHP wall thicknesses. Uninsulated steel pipe ends are approximately 220 mm.

For optimization and alignment with the state of the art, we reserve the right to make dimensional and technical modifications. Regarding possible dimensional deviations, no binding commitment can be derived in individual cases.



District Heating Pipes

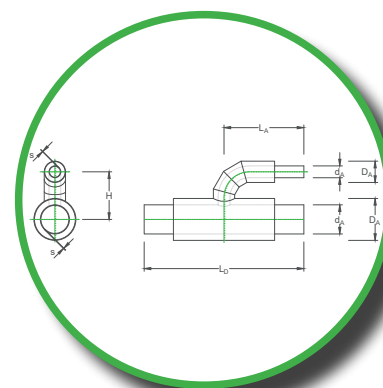
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Products - Single

Parallel branch

Insulation Series 2

Base pipe					Branch outlet DN (d _A , s, D _A as Dimension Base pipe) / Component measurement																						
					20	25	32	40	50	65	80	100	125	150	200	250	300	350	400	450	500	600	700	800	900	1000	
					L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D
					L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A
DN	Zoll	d _A	s	D _A	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H		
80	3	88,9	3,2	180	1100	1100	1100	1100	1100	1100	1200																
					600	600	600	600	600	600	600																
					265	265	275	275	280	290	300																
100	4	114,3	3,6	225	1100	1100	1100	1100	1100	1100	1200	1200															
					600	600	600	600	600	600	600	600															
					290	290	295	295	305	315	325	345															
125	5	139,7	3,6	250	1100	1100	1100	1100	1100	1100	1200	1200	1300														
					600	600	600	600	600	600	600	600	600														
					300	300	310	310	315	325	335	360	370														
150	6	168,3	4,0	280	1100	1100	1100	1100	1100	1100	1200	1200	1300	1300													
					600	600	600	600	600	600	600	600	600	650													
					315	315	325	325	330	340	350	375	405	420													
200	8	219,1	4,5	355	1100	1100	1100	1100	1100	1100	1200	1200	1300	1300	1400												
					600	600	600	600	600	600	600	600	600	650	750												
					355	355	360	360	370	380	410	410	425	460	485												
250	10	273	5,0	450	1100	1100	1100	1100	1100	1100	1200	1200	1300	1300	1400	1500											
					600	600	600	600	600	600	600	600	600	650	750	800											
					400	400	410	410	415	425	435	460	470	505	565	600											
300	12	323,9	5,6	500	1100	1100	1100	1100	1100	1100	1200	1200	1300	1300	1400	1500	1600										
					600	600	600	600	600	600	600	600	600	650	750	800	850										
					425	425	435	435	440	450	460	485	495	530	590	625	711										
350	14	355,6	5,6	560	1100	1100	1100	1100	1100	1100	1200	1200	1300	1300	1400	1500	1600	1700									
					600	600	600	600	600	600	600	600	600	650	750	800	850	900									
					455	455	465	465	470	480	490	515	525	560	620	685	730	815									





District Heating Pipes

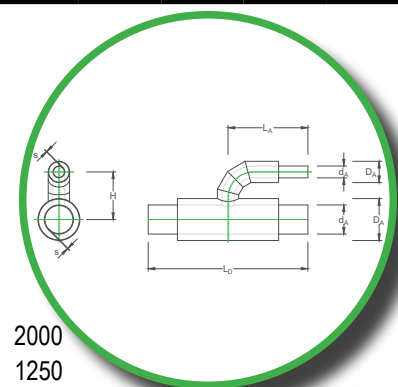
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Products - Single

Parallel branch

Insulation Series 2

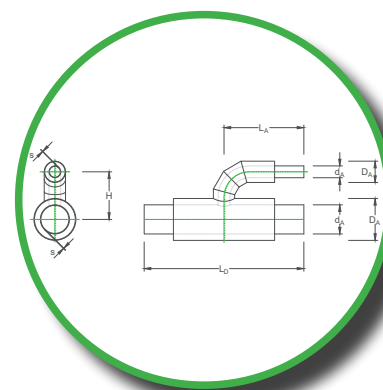
Base pipe					Branch outlet DN (d _A , s, D _A as Dimension Base pipe) / Component measurement																						
					20	25	32	40	50	65	80	100	125	150	200	250	300	350	400	450	500	600	700	800	900	1000	
					L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D
					L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A
DN	Zoll	d _A	s	D _A	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H		
400	16	406,4	6,3	630	1100	1100	1100	1100	1100	1100	1200	1200	1300	1300	1400	1500	1600	1700	1700								
					600	600	600	600	600	600	600	550	600	650	700	800	850	900	1000								
					445	445	455	455	465	470	480	500	515	545	630	665	755	840	915								
450	18	457,0	6,3	710	1100	1100	1100	1100	1100	1100	1200	1200	1300	1300	1400	1500	1600	1700	1700	1800							
					600	600	600	600	600	600	600	550	600	650	700	800	850	900	1000	1100							
					480	480	490	490	500	505	515	535	548	580	655	690	780	865	940	1030							
500	20	508,0	6,3	710	1100	1100	1100	1100	1100	1100	1200	1200	1300	1300	1400	1500	1600	1700	1700	1800	1800						
					600	600	600	600	600	600	600	550	600	650	700	800	850	900	1000	1100	1200						
					500	500	510	510	520	525	535	555	568	600	680	765	805	890	970	1055	1145						
600	24	610,0	7,1	900	1100	1100	1100	1100	1100	1100	1200	1200	1300	1300	1400	1500	1600	1700	1700	1800	1800	2000					
					600	600	600	600	600	600	600	550	600	650	700	800	850	900	1000	1100	1200	1250					
					565	565	575	575	585	590	600	620	635	665	720	820	855	940	1020	1105	1195	1350					
700	28	711,0	8,0	1000	1100	1100	1100	1100	1100	1100	1200	1200	1300	1300	1400	1500	1600	1700	1700	1800	1800	2000	2100				
					600	600	600	600	600	600	600	550	600	650	700	800	850	900	1000	1100	1200	1250	1400				
					615	615	625	625	635	640	650	670	685	715	770	830	905	990	1070	1160	1245	1425	1590				
800	32	813,0	8,8	1100	1100	1100	1100	1100	1100	1100	1200	1200	1300	1300	1400	1500	1600	1700	1700	1800	1800	2000	2100	2200			
					600	600	600	600	600	600	600	550	600	650	750	800	850	900	1000	1100	1200	1250	1400	1600			
					665	665	675	675	685	690	700	720	735	765	820	880	945	1045	1120	1210	1295	1475	1640	1820			
900	36	914,0	10,0	1200	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.			
					n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.		
					n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.		
1000	40	1016	11,0	1300	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.			
					n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.		
					n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.		



Parallel branch

Insulation Series 3

Base pipe					Branch outlet DN (d _A , s, D _A as Dimension Base pipe) / Component measurement																						
					20	25	32	40	50	65	80	100	125	150	200	250	300	350	400	450	500	600	700	800	900	1000	
					L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D
					L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A
DN	Zoll	d _A	s	D _A	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H		
20	¾	26,9	2,0 2,6	125	1100																						
					600																						
					245																						
25	1	33,7	2,3 2,6	125	1100	1100																					
					600	600																					
					245	245																					
32	1 1/4	42,4	2,6 3,2	140	1100	1100	1100																				
					600	600	600																				
					255	255	260																				
40	1 1/2	48,3	2,6 3,2	140	1100	1100	1100	1100																			
					600	600	600	600																			
					255	255	260	260																			
50	2	60,3	2,9 3,2	160	1100	1100	1100	1100	1100																		
					600	600	600	600	600																		
					265	265	270	270	280																		
65	2 1/2	76,1	2,9 3,2	180	1100	1100	1100	1100	1100	1100																	
					600	600	600	600	600	600																	
					275	275	280	280	290	300																	



d_A = Steel pipe outer diameter [mm]

s = Steel pipe wall thickness according to DHP [mm]

D_A = Casing pipe outer diameter [mm]

Base pipe bzw. Outlet

Base pipe bzw. Outlet

Base pipe bzw. Outlet

L_D = Length Base pipe [mm]

L_A = Length Outlet [mm]

H = Axis distance [mm]

The specified steel wall thicknesses correspond to the minimum requirements according to the standard or the standard DHP wall thicknesses. Uninsulated steel pipe ends are approximately 220 mm.

For optimization and alignment with the state of the art, we reserve the right to make dimensional and technical modifications. Regarding possible dimensional deviations, no binding commitment can be derived in individual cases.



District Heating Pipes

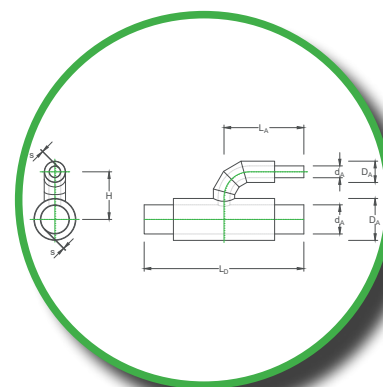
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Products - Single

Parallel branch

Insulation Series 3

Base pipe					Branch outlet DN (d _A , s, D _A as Dimension Base pipe) / Component measurement																					
					20	25	32	40	50	65	80	100	125	150	200	250	300	350	400	450	500	600	700	800	900	1000
					L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D
					L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A
DN	Zoll	d _A	s	D _A	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	
80	3	88,9	3,2	200	1100	1100	1100	1100	1100	1100	1200															
					600	600	600	600	600	600	600															
					285	285	290	290	300	310	320															
100	4	114,3	3,6	250	1100	1100	1100	1100	1100	1100	1200	1200														
					600	600	600	600	600	600	600	600														
					310	310	315	315	325	335	345	370														
125	5	139,7	3,6	280	1100	1100	1100	1100	1100	1100	1200	1200	1300													
					600	600	600	600	600	600	600	600	600													
					325	325	330	330	340	350	360	385	400													
150	6	168,3	4,0	315	1100	1100	1100	1100	1100	1100	1200	1200	1300	1300												
					600	600	600	600	600	600	600	600	600	650												
					340	340	350	350	360	370	380	405	420	435												
200	8	219,1	4,5	400	1100	1100	1100	1100	1100	1100	1200	1200	1300	1300	1400											
					600	600	600	600	600	600	600	600	600	650	750											
					385	385	390	390	400	410	420	445	460	480	540											
250	10	273	5,0	500	1100	1100	1100	1100	1100	1100	1200	1200	1300	1300	1400	1500										
					600	600	600	600	600	600	600	600	600	650	750	800										
					435	435	440	440	450	460	470	495	510	530	570	650										
300	12	323,9	5,6	560	1100	1100	1100	1100	1100	1100	1200	1200	1300	1300	1400	1500	1600									
					600	600	600	600	600	600	600	600	600	650	750	800	850									
					465	465	570	470	480	490	500	525	540	560	600	675	715									
350	14	355,6	5,6	630	1100	1100	1100	1100	1100	1100	1200	1200	1300	1300	1400	1500	1600	1700								
					600	600	600	600	600	600	600	600	600	650	750	800	850	900								
					500	500	505	505	515	525	535	560	575	600	635	695	780	815								





District Heating Pipes

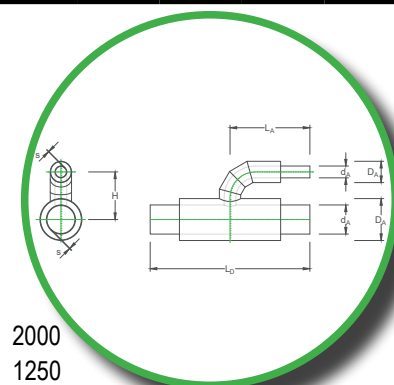
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Products - Single

Parallel branch

Insulation Series 3

Base pipe					Branch outlet DN (d _A , s, D _A as Dimension Base pipe) / Component measurement																						
					20	25	32	40	50	65	80	100	125	150	200	250	300	350	400	450	500	600	700	800	900	1000	
					L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D
					L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A
DN	Zoll	d _A	s	D _A	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H			
400	16	406,4	6,3	710	1100	1100	1100	1100	1100	1100	1200	1200	1300	1300	1400	1500	1600	1700	1700								
					600	600	600	600	600	600	600	600	600	650	750	800	850	900	1000								
					520	520	525	525	535	545	555	580	595	615	655	715	805	840	915								
450	18	457,0	6,3	710	1100	1100	1100	1100	1100	1100	1200	1200	1300	1300	1400	1500	1600	1700	1700	1800							
					600	600	600	600	600	600	600	600	600	650	750	800	850	900	1000	1100							
					540	540	545	545	555	565	575	600	615	635	675	740	830	915	940	1030							
500	20	508,0	6,3	800	1100	1100	1100	1100	1100	1100	1200	1200	1300	1300	1400	1500	1600	1700	1700	1800	1800						
					600	600	600	600	600	600	600	600	600	650	750	800	850	900	1000	1100	1200						
					585	585	590	590	600	610	620	645	660	680	720	770	855	940	970	1055	1145						
600	24	610,0	7,1	1000	1100	1100	1100	1100	1100	1100	1200	1200	1300	1300	1400	1500	1600	1700	1700	1800	1800	2000					
					600	600	600	600	600	600	600	600	600	650	750	800	850	900	1000	1100	1200	1250					
					685	685	690	690	700	710	720	745	760	780	820	880	930	995	1065	1105	1195	1350					
700	28	711,0	8,0	1100	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.				
					n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.		
					n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.		
800	32	813,0	8,8	1200	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.				
					n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.		
					n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.		
900	36	914,0	10,0	1300	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.				
					n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.		
					n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.		
1000	40	1016	11,0	1400	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.				
					n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.		
					n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.		





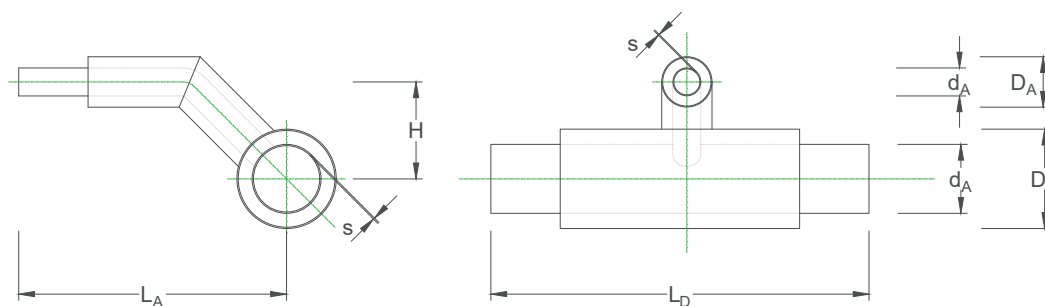
District Heating Pipes

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Products - Single

45°-T-branch

L_D	Length Base pipe
L_A	Length Outlet pipe
d_A	Outer diameter Medium pipe
D_A	Outer diameter Casing pipe
s	Wall thickness Medium pipe
H	Axis distance (Height)





District Heating Pipes

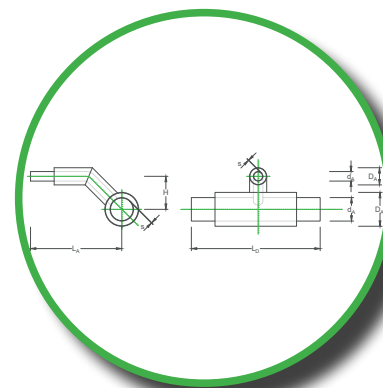
smart pipes, clever solutions

Products - Single

45°-T-branch

Insulation Series 1

Base pipe					Branch outlet DN (d _A , s, D _A as Dimension Base pipe) / Component measurement																						
					20	25	32	40	50	65	80	100	125	150	200	250	300	350	400	450	500	600	700	800	900	1000	
					L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D
					L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A
DN	Zoll	d _A	s	D _A	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H		
20	¾	26,9	2,0	90	1100																						
			2,6		695																						
					160																						
25	1	33,7	2,3	90	1100	1100																					
			2,6		695	695																					
					160	160																					
32	1 1/4	42,4	2,6	110	1100	1100	1100																				
			3,2		705	705	715																				
					170	170	180																				
40	1 1/2	48,3	2,6	110	1100	1100	1100	1100																			
			3,2		705	705	715	715																			
					170	170	180	180																			
50	2	60,3	2,9	125	1100	1100	1100	1100	1100																		
			3,2		710	710	720	720	730																		
					180	180	190	190	195																		
65	2 1/2	76,1	2,9	140	1100	1100	1100	1100	1100	1100																	
			3,2		720	720	730	730	735	745																	
					185	185	195	195	205	210																	



d_A = Steel pipe outer diameter [mm]

s = Steel pipe wall thickness according to DHP [mm]

D_A = Casing pipe outer diameter [mm]

Base pipe bzw. Outlet

Base pipe bzw. Outlet

Base pipe bzw. Outlet

L_D = Length Base pipe [mm]

L_A = Length Outlet [mm]

H = Axis distance [mm]

The specified steel wall thicknesses correspond to the minimum requirements according to the standard or the standard DHP wall thicknesses. Uninsulated steel pipe ends are approximately 220 mm.

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District Heating Pipes

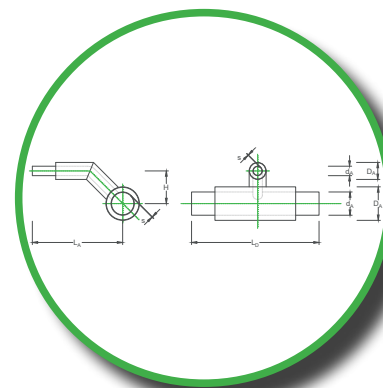
smart pipes, clever solutions

Products - Single

45°-T-branch

Insulation Series 1

Base pipe					Branch outlet DN (d _A , s, D _A as Dimension Base pipe) / Component measurement																					
					20	25	32	40	50	65	80	100	125	150	200	250	300	350	400	450	500	600	700	800	900	1000
					L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D
					L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A
DN	Zoll	d _A	s	D _A	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	
80	3	88,9	3,2	160	1100	1100	1100	1100	1100	1100	1200															
					730	730	740	740	745	745	800															
					195	195	205	205	215	220	230															
100	4	114,3	3,6	200	1100	1100	1100	1100	1100	1100	1200	1200														
					750	750	760	760	765	775	800	800														
					215	215	225	225	235	240	250	270														
125	5	139,7	3,6	225	1100	1100	1100	1100	1100	1100	1200	1200	1300													
					760	760	770	770	780	785	800	800	850													
					230	230	240	240	245	255	265	285	295													
150	6	168,3	4,0	250	1100	1100	1100	1100	1100	1100	1200	1200	1300	1300												
					775	775	785	785	790	800	800	800	850	850												
					240	240	250	250	260	265	275	295	320	320												
200	8	219,1	4,5	315	1100	1100	1100	1100	1100	1100	1200	1200	1300	1300	1400											
					805	805	815	815	825	830	850	850	850	850	950											
					275	275	285	285	290	300	310	330	340	355	385											
250	10	273	5,0	400	1100	1100	1100	1100	1100	1100	1200	1200	1300	1300	1400	1500										
					850	850	860	860	865	875	900	900	900	950	1000	1050										
					315	315	325	325	335	340	350	370	385	395	430	470										
300	12	323,9	5,6	450	1100	1100	1100	1100	1100	1100	1200	1200	1300	1300	1400	1500	1600									
					875	875	885	885	890	900	900	950	950	950	1000	1050	1100									
					340	340	350	350	360	365	375	495	410	420	455	495	520									
350	14	355,6	5,6	500	1100	1100	1100	1100	1100	1100	1200	1200	1300	1300	1400	1500	1600	1700								
					900	900	910	910	915	925	950	950	950	1000	1050	1100	1150	1200								
					365	365	375	375	385	390	400	420	435	445	480	520	545	570								





District Heating Pipes

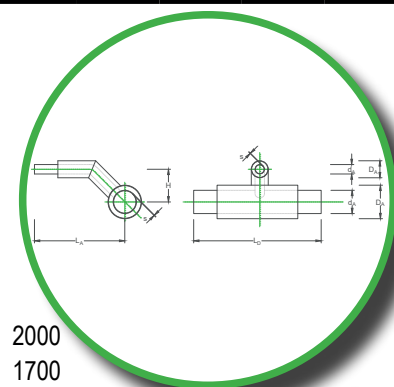
smart pipes, clever solutions

Products - Single

45°-T-branch

Insulation Series 1

Base pipe					Branch outlet DN (d _A , s, D _A as Dimension Base pipe) / Component measurement																						
					20	25	32	40	50	65	80	100	125	150	200	250	300	350	400	450	500	600	700	800	900	1000	
					L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D
					L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A
DN	Zoll	d _A	s	D _A	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H		
400	16	406,4	6,3	560	1100	1100	1100	1100	1100	1100	1200	1200	1300	1300	1400	1500	1600	1700	1700								
					930	930	940	940	945	955	950	1000	1000	1000	1050	1100	1150	1200	1250								
					395	395	405	405	415	420	430	450	465	475	510	550	575	600	630								
450	18	457,0	6,3	630	1100	1100	1100	1100	1100	1100	1200	1200	1300	1300	1400	1500	1600	1700	1700	1800							
					965	965	975	975	980	990	1000	1000	1050	1050	1100	1150	1200	1250	1300	1350							
					430	430	440	440	450	455	465	485	500	510	545	585	510	635	665	700							
500	20	508,0	6,3	710	1100	1100	1100	1100	1100	1100	1200	1200	1300	1300	1400	1500	1600	1700	1700	1800	1800						
					985	985	995	995	1000	1000	1000	1050	1050	1100	1150	1200	1250	1250	1300	1350	1500						
					450	450	460	460	470	455	485	505	520	530	565	605	630	655	685	720	740						
600	24	610,0	7,1	800	1100	1100	1100	1100	1100	1100	1200	1200	1300	1300	1400	1500	1600	1700	1700	1800	1800	2000					
					985	1050	1060	1060	1065	1075	1050	1100	1100	1150	1200	1250	1300	1300	1350	1400	1600	1700					
					450	515	525	525	535	540	550	570	585	595	630	670	695	720	750	785	805	870					
700	28	711,0	8,0	900	1100	1100	1100	1100	1100	1100	1200	1200	1300	1300	1400	1500	1600	1700	1700	1800	1800	2000	2100				
					1100	1100	1110	1110	1115	1125	1150	1150	1150	1200	1250	1300	1350	1350	1400	1450	1700	1800	1900				
					565	565	575	575	585	590	600	620	635	645	680	720	745	770	800	835	875	920	970				
800	32	813,0	8,8	1000	1100	1100	1100	1100	1100	1100	1200	1200	1300	1300	1400	1500	1600	1700	1700	1800	1800	2000	2100	2200			
					1150	1150	1160	1160	1165	1175	1150	1200	1200	1200	1250	1300	1340	1400	1450	1500	1700	1800	1900	2000			
					615	615	625	625	635	640	650	670	685	695	730	770	795	820	850	885	905	970	1020	1070			
900	36	914,0	10,0	1100	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.			
					n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.		
					n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.		
1000	40	1016	11,0	1200	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.			
					n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.		
					n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.		





District Heating Pipes

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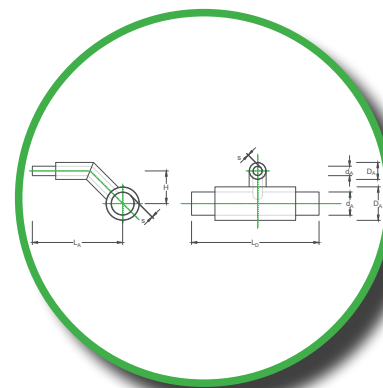
Products - Single

45°-T-branch

Insulation Series 2

Base pipe					Branch outlet DN (d _A , s, D _A as Dimension Base pipe) / Component measurement																						
					20	25	32	40	50	65	80	100	125	150	200	250	300	350	400	450	500	600	700	800	900	1000	
					L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D
					L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A
DN	Zoll	d _A	s	D _A	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H		
20	¾	26,9	2,0	90	1100																						
			2,6		715																						
					180																						
25	1	33,7	2,3	90	1100	1100																					
			2,6		715	715																					
					180	180																					
32	1 1/4	42,4	2,6	110	1100	1100	1100																				
			3,2		720	720	730																				
					190	190	195																				
40	1 1/2	48,3	2,6	110	1100	1100	1100	1100																			
			3,2		720	720	730	730																			
					190	190	195	195																			
50	2	60,3	2,9	125	1100	1100	1100	1100	1100																		
			3,2		730	730	735	735	745																		
					195	195	205	205	210																		
65	2 1/2	76,1	2,9	140	1100	1100	1100	1100	1100	1100																	
			3,2		740	740	745	745	755	765																	
					205	205	215	215	220	230																	

Technical drawing of a branch outlet connection. The drawing shows two views: a side view (left) and an end view (right). The side view shows a pipe with a branch outlet at a 45-degree angle. The end view shows the pipe with a branch outlet at a 90-degree angle. The drawing includes dimensions for the branch outlet DN (d_A, s, D_A) and the base pipe (L_A, L_D).



d_A = Steel pipe outer diameter [mm]

s = Steel pipe wall thickness according to DHP [mm]

D_A = Casing pipe outer diameter [mm]

Base pipe bzw. Outlet

Base pipe bzw. Outlet

Base pipe bzw. Outlet

L_D = Length Base pipe [mm]

L_A = Length Outlet [mm]

H = Axis distance [mm]

The specified steel wall thicknesses correspond to the minimum requirements according to the standard or the standard DHP wall thicknesses. Uninsulated steel pipe ends are approximately 220 mm.

For optimization and alignment with the state of the art, we reserve the right to make dimensional and technical modifications. Regarding possible dimensional deviations, no binding commitment can be derived in individual cases.



District Heating Pipes

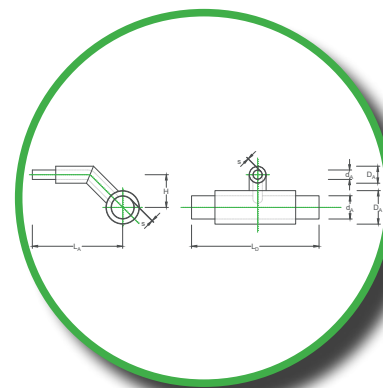
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Products - Single

45°-T-branch

Insulation Series 2

Base pipe					Branch outlet DN (d _A , s, D _A as Dimension Base pipe) / Component measurement																					
					20	25	32	40	50	65	80	100	125	150	200	250	300	350	400	450	500	600	700	800	900	1000
					L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D
					L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A
DN	Zoll	d _A	s	D _A	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	
80	3	88,9	3,2	160	1100	1100	1100	1100	1100	1100	1200															
					750	750	755	755	765	775	800															
					215	215	225	225	230	240	250															
100	4	114,3	3,6	200	1100	1100	1100	1100	1100	1100	1200	1200														
					770	770	780	780	785	795	800	850														
					240	240	245	245	255	265	275	295														
125	5	139,7	3,6	225	1100	1100	1100	1100	1100	1100	1200	1200	1300													
					785	785	790	790	800	810	800	850	850													
					250	250	260	260	265	275	285	310	320													
150	6	168,3	4,0	250	1100	1100	1100	1100	1100	1100	1200	1200	1300	1300												
					800	800	805	805	815	825	850	850	850	900												
					265	265	275	275	280	290	300	325	335	350												
200	8	219,1	4,5	315	1100	1100	1100	1100	1100	1100	1200	1200	1300	1300	1400											
					835	835	845	845	850	860	850	900	900	950	1000											
					305	305	310	310	320	330	340	360	375	390	425											
250	10	273	5,0	400	1100	1100	1100	1100	1100	1100	1200	1200	1300	1300	1400	1500										
					885	885	890	890	900	910	900	950	950	1000	1050	1100										
					350	350	360	360	365	375	385	410	420	435	475	520										
300	12	323,9	5,6	450	1100	1100	1100	1100	1100	1100	1200	1200	1300	1300	1400	1500	1600									
					910	910	915	915	925	935	950	950	1000	1000	1050	1100	1150									
					375	375	385	385	390	400	410	435	445	460	500	545	575									
350	14	355,6	5,6	500	1100	1100	1100	1100	1100	1100	1200	1200	1300	1300	1400	1500	1600	1700								
					940	940	945	945	955	965	950	1000	1000	1050	1100	1150	1200	1250								
					405	405	415	415	420	430	440	465	475	490	530	575	600	630								





District Heating Pipes

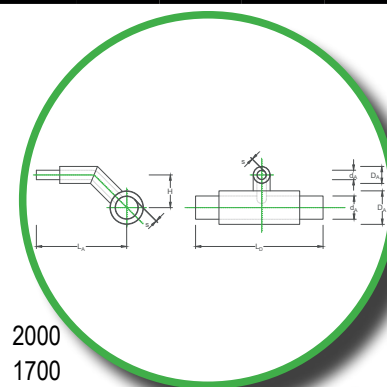
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Products - Single

45°-T-branch

Insulation Series 2

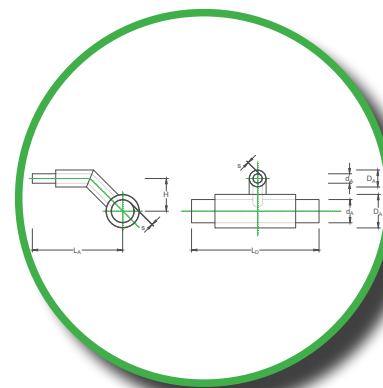
Base pipe					Branch outlet DN (d _A , s, D _A as Dimension Base pipe) / Component measurement																						
					20	25	32	40	50	65	80	100	125	150	200	250	300	350	400	450	500	600	700	800	900	1000	
					L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D
					L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A
DN	Zoll	d _A	s	D _A	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H		
400	16	406,4	6,3	560	1100	1100	1100	1100	1100	1100	1200	1200	1300	1300	1400	1500	1600	1700	1700								
					975	975	980	980	990	1000	1000	1050	1050	1100	1150	1200	1250	1300	1350								
					440	440	450	450	455	465	475	500	510	525	565	610	635	665	700								
450	18	457,0	6,3	630	1100	1100	1100	1100	1100	1100	1200	1200	1300	1300	1400	1500	1600	1700	1700	1800							
					995	995	1000	1000	1010	1020	1050	1050	1050	1100	1150	1200	1250	1300	1350	1400							
					460	460	470	470	475	485	495	520	530	545	585	630	655	685	720	740							
500	20	508,0	6,3	710	1100	1100	1100	1100	1100	1100	1200	1200	1300	1300	1400	1500	1600	1700	1700	1800	1800						
					1015	1015	1020	1020	1030	1040	1100	1100	1100	1100	1150	1250	1250	1350	1350	1400	1500						
					480	480	490	490	495	505	515	540	550	565	605	650	675	705	740	760	780						
600	24	610,0	7,1	800	1100	1100	1100	1100	1100	1100	1200	1200	1300	1300	1400	1500	1600	1700	1700	1800	1800	2000					
					1110	1110	1115	1115	1125	1135	1150	1200	1200	1250	1300	1350	1400	1450	1500	1500	1600	1700					
					575	575	585	585	590	600	610	635	645	660	700	745	770	800	835	855	875	970					
700	28	711,0	8,0	900	1100	1100	1100	1100	1100	1100	1200	1200	1300	1300	1400	1500	1600	1700	1700	1800	1800	2000	2100				
					1160	1160	1165	1165	1175	1185	1200	1250	1250	1300	1350	1400	1450	1500	1550	1550	1700	1800	1900				
					625	625	635	635	640	650	660	685	695	710	750	795	820	850	885	905	925	1020	1070				
800	32	813,0	8,8	1000	1100	1100	1100	1100	1100	1100	1200	1200	1300	1300	1400	1500	1600	1700	1700	1800	1800	2000	2100	2200			
					1210	1210	1215	1215	1225	1235	1200	1250	1250	1300	1350	1400	1450	1500	1550	1550	1700	1800	1900	2100			
					675	675	685	685	690	700	710	735	745	760	800	845	870	900	935	955	975	1070	1120	1170			
900	36	914,0	10,0	1100	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.			
					n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	
					n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	
1000	40	1016	11,0	1200	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.			
					n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	
					n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	



45°-T-branch

Insulation Series 3

Base pipe					Branch outlet DN (d _A , s, D _A as Dimension Base pipe) / Component measurement																						
					20	25	32	40	50	65	80	100	125	150	200	250	300	350	400	450	500	600	700	800	900	1000	
					L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D
					L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A
DN	Zoll	d _A	s	D _A	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H		
20	¾	26,9	2,0	90	1100																						
			2,6		730																						
					195																						
25	1	33,7	2,3	90	1100	1100																					
			2,6		730	730																					
					195	195																					
32	1 1/4	42,4	2,6	110	1100	1100	1100																				
			3,2		735	735	745																				
					205	205	210																				
40	1 1/2	48,3	2,6	110	1100	1100	1100	1100																			
			3,2		735	735	745	745																			
					205	205	210	210																			
50	2	60,3	2,9	125	1100	1100	1100	1100	1100																		
			3,2		745	745	755	755	765																		
					215	215	220	220	230																		
65	2 1/2	76,1	2,9	140	1100	1100	1100	1100	1100	1100																	
			3,2		755	755	765	765	775	785																	
					225	225	230	230	240	250																	



d_A = Steel pipe outer diameter [mm]

s = Steel pipe wall thickness according to DHP [mm]

D_A = Casing pipe outer diameter [mm]

Base pipe bzw. Outlet

Base pipe bzw. Outlet

Base pipe bzw. Outlet

L_D = Length Base pipe [mm]

L_A = Length Outlet [mm]

H = Axis distance [mm]

The specified steel wall thicknesses correspond to the minimum requirements according to the standard or the standard DHP wall thicknesses. Uninsulated steel pipe ends are approximately 220 mm.

For optimization and alignment with the state of the art, we reserve the right to make dimensional and technical modifications. Regarding possible dimensional deviations, no binding commitment can be derived in individual cases.



District Heating Pipes

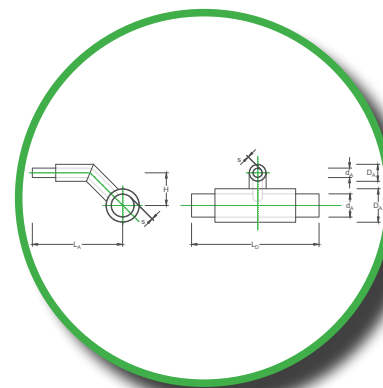
smart pipes, clever solutions

Products - Single

45°-T-branch

Insulation Series 3

Base pipe					Branch outlet DN (d _A , s, D _A as Dimension Base pipe) / Component measurement																					
					20	25	32	40	50	65	80	100	125	150	200	250	300	350	400	450	500	600	700	800	900	1000
					L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D
					L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A
DN	Zoll	d _A	s	D _A	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H
80	3	88,9	3,2	160	1100	1100	1100	1100	1100	1100	1200															
					765	765	775	775	785	795	800															
					235	235	240	240	250	260	270															
100	4	114,3	3,6	200	1100	1100	1100	1100	1100	1100	1200	1200														
					790	790	800	800	810	820	850	850														
					260	260	265	265	275	285	295	320														
125	5	139,7	3,6	225	1100	1100	1100	1100	1100	1100	1200	1200	1300													
					805	805	815	815	825	835	850	900	900													
					275	275	280	280	290	300	310	335	350													
150	6	168,3	4,0	250	1100	1100	1100	1100	1100	1100	1200	1200	1300	1300												
					825	825	830	830	840	850	850	900	950	950												
					290	290	300	300	310	320	330	355	370	385												
200	8	219,1	4,5	315	1100	1100	1100	1100	1100	1100	1200	1200	1300	1300	1400											
					865	865	875	875	885	895	950	950	1000	1000	1050											
					335	335	340	340	350	360	370	395	410	430	470											
250	10	273	5,0	400	1100	1100	1100	1100	1100	1100	1200	1200	1300	1300	1400	1500										
					915	915	925	925	935	945	1000	1000	1050	1050	1100	1200										
					385	385	390	390	400	410	420	445	460	480	520	570										
300	12	323,9	5,6	450	1100	1100	1100	1100	1100	1100	1200	1200	1300	1300	1400	1500	1600									
					945	945	955	955	965	965	1000	1000	1050	1050	1150	1200	1250									
					415	415	420	420	430	440	450	475	490	510	550	600	630									
350	14	355,6	5,6	500	1100	1100	1100	1100	1100	1100	1200	1200	1300	1300	1400	1500	1600	1700								
					980	980	990	990	1000	1010	1050	1050	1100	1100	1150	1250	1300	1350								
					450	450	455	455	465	475	485	510	525	545	585	635	665	700								



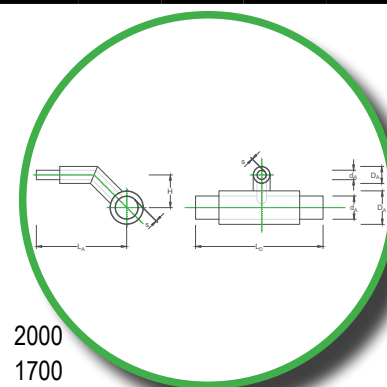
Products - Single

45°-T-branch

Insulation Series 3

Base pipe					Branch outlet DN (d _A , s, D _A as Dimension Base pipe) / Component measurement																						
					20	25	32	40	50	65	80	100	125	150	200	250	300	350	400	450	500	600	700	800	900	1000	
					L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D
					L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A
DN	Zoll	d _A	s	D _A	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H		
400	16	406,4	6,3	560	1100	1100	1100	1100	1100	1100	1200	1200	1300	1300	1400	1500	1600	1700	1700								
					1000	1000	1010	1010	1020	1030	1050	1100	1100	1150	1200	1250	1300	1350	1400								
					470	470	475	475	485	495	505	530	545	565	605	655	685	720	740								
450	18	457,0	6,3	630	1100	1100	1100	1100	1100	1100	1200	1200	1300	1300	1400	1500	1600	1700	1700	1800							
					1020	1020	1030	1030	1040	1050	1100	1100	1150	1200	1250	1300	1350	1400	1450	1450							
					490	490	495	495	505	515	525	550	565	585	625	675	705	740	760	780							
500	20	508,0	6,3	710	1100	1100	1100	1100	1100	1100	1200	1200	1300	1300	1400	1500	1600	1700	1700	1800	1800						
					1067	1067	1075	1075	1085	1085	1150	1150	1200	1200	1300	1350	1400	1450	1500	1500	1600						
					535	535	540	540	550	560	570	595	610	630	670	720	750	785	805	825	870						
600	24	610,0	7,1	800	1100	1100	1100	1100	1100	1100	1200	1200	1300	1300	1400	1500	1600	1700	1700	1800	1800	2000					
					1118	1118	1125	1125	1135	1145	1140	1175	1178	1203	1263	1330	1395	1415	1455	1490	1545	1700					
					635	635	640	640	650	660	670	695	710	730	770	820	850	885	905	925	970	1070					
700	28	711,0	8,0	900	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.				
					n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.		
					n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.		
800	32	813,0	8,8	1000	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.				
					n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.		
					n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.		
900	36	914,0	10,0	1100	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.				
					n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.		
					n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.		
1000	40	1016	11,0	1200	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.				
					n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.		
					n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.		

Technical drawing of a branch outlet connection. The drawing shows a side view and a top view of the connection. Key dimensions are labeled: L_A (length of the branch outlet), L_D (length of the base pipe), d_A (nominal diameter of the branch outlet), s (thickness of the branch outlet), and D_A (nominal diameter of the base pipe).





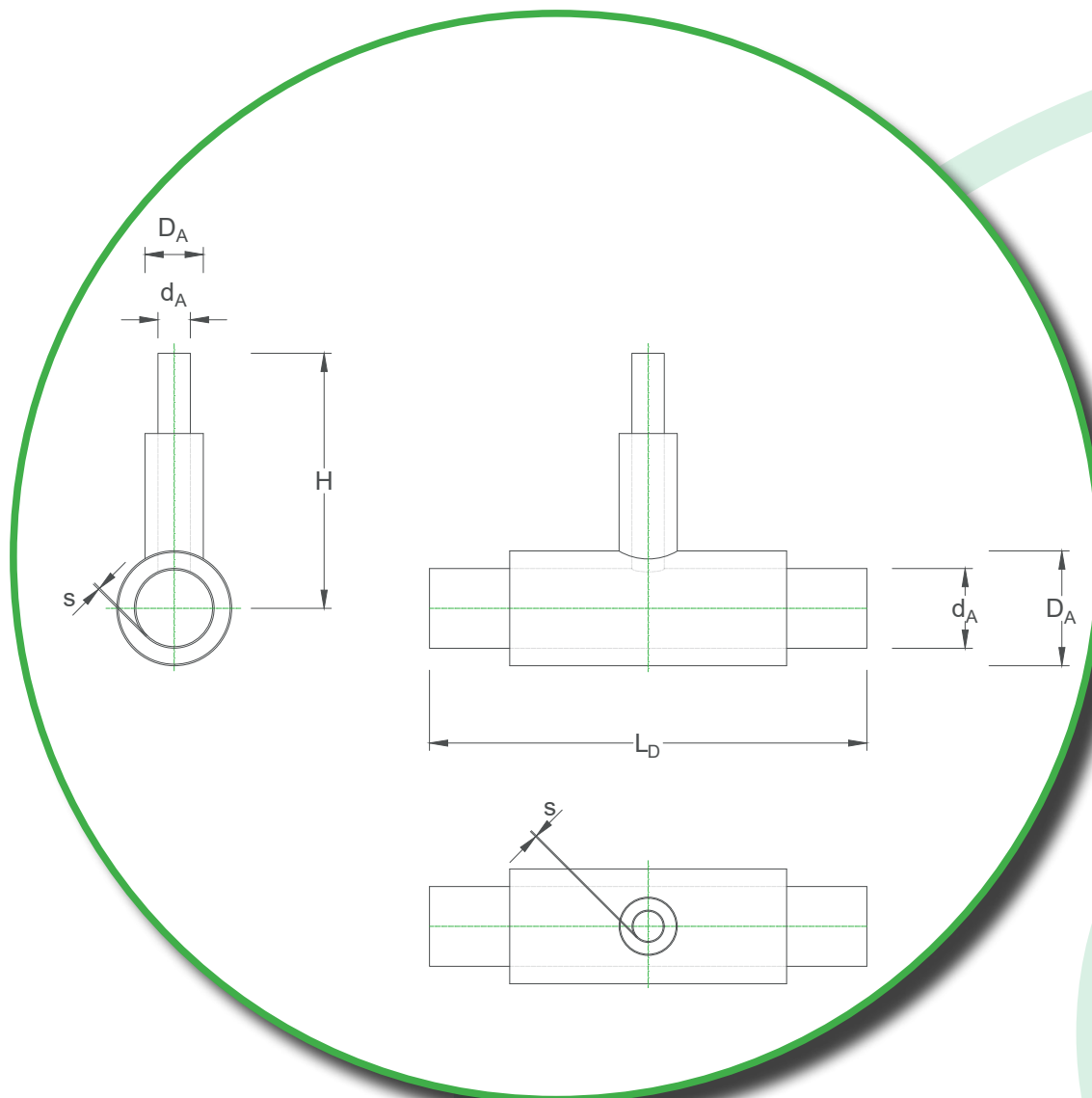
District Heating Pipes

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Products - Single

Branch 90°-vertical

L_D	Length Base pipe
d_A	Outer diameter Medium pipe
D_A	Outer diameter Casing pipe
s	Wall thickness Medium pipe
H	Length Outlet pipe (Height)



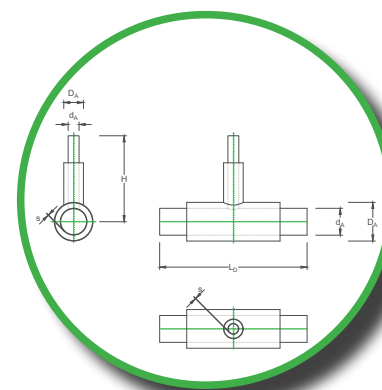
smart pipes, clever solutions

Products - Single

Branch 90°-vertical

Insulation Series 1

Base pipe					Branch outlet DN (d _A , s, D _A as Dimension Base pipe) / Component measurement																						
					20	25	32	40	50	65	80	100	125	150	200	250	300	350	400	450	500	600	700	800	900	1000	
					L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D
					H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H
DN	Zoll	d _A	s	D _A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
20	¾	26,9	2,0 2,6	90	1100																						
					600																						
					-																						
25	1	33,7	2,3 2,6	90	1100	1100																					
					600	600																					
					-	-																					
32	1 1/4	42,4	2,6 3,2	110	1100	1100	1100																				
					600	600	600																				
					-	-	-																				
40	1 1/2	48,3	2,6 3,2	110	1100	1100	1100	1100																			
					600	600	600	600																			
					-	-	-	-																			
50	2	60,3	2,9 3,2	125	1100	1100	1100	1100	1100																		
					600	600	600	600	600																		
					-	-	-	-	-																		
65	2 1/2	76,1	2,9 3,2	140	1100	1100	1100	1100	1100	1100																	
					650	650	650	650	650	650																	
					-	-	-	-	-	-																	



d_A = Steel pipe outer diameter [mm]
s = Steel pipe wall thickness according to DHP [mm]
D_A = Casing pipe outer diameter [mm]

Base pipe bzw. Outlet
Base pipe bzw. Outlet
Base pipe bzw. Outlet

L_D = Length Base pipe [mm]
H = Length Outlet [mm]

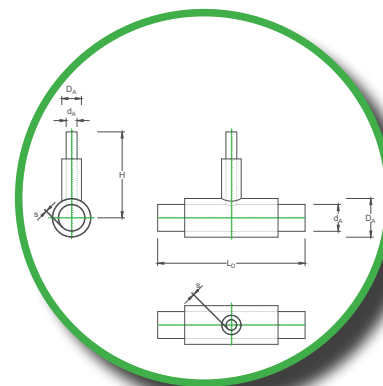
The specified steel wall thicknesses correspond to the minimum requirements according to the standard or the standard DHP wall thicknesses. Uninsulated steel pipe ends are approximately 220 mm. For optimization and alignment with the state of the art, we reserve the right to make dimensional and technical modifications. Regarding possible dimensional deviations, no binding commitment can be derived in individual cases.

Products - Single

Branch 90°-vertical

Insulation Series 1

Base pipe					Branch outlet DN (d _A , s, D _A as Dimension Base pipe) / Component measurement																						
					20	25	32	40	50	65	80	100	125	150	200	250	300	350	400	450	500	600	700	800	900	1000	
					L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D
					H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H
DN	Zoll	d _A	s	D _A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
80	3	88,9	3,2	160	1100	1100	1100	1100	1100	1100	1200																
					650	650	650	650	650	650	650																
					-	-	-	-	-	-	-																
100	4	114,3	3,6	200	1100	1100	1100	1100	1100	1100	1200	1200															
					650	650	650	650	650	650	650	650															
					-	-	-	-	-	-	-	-															
125	5	139,7	3,6	225	1100	1100	1100	1100	1100	1100	1200	1200	1300														
					700	700	700	700	700	700	700	700	700														
					-	-	-	-	-	-	-	-	-														
150	6	168,3	4,0	250	1100	1100	1100	1100	1100	1100	1200	1200	1300	1300													
					700	700	700	700	700	700	700	700	700	700													
					-	-	-	-	-	-	-	-	-	-													
200	8	219,1	4,5	315	1100	1100	1100	1100	1100	1100	1200	1200	1300	1300	1400												
					700	700	700	700	700	700	700	700	700	700	700												
					-	-	-	-	-	-	-	-	-	-	-												
250	10	273	5,0	400	1100	1100	1100	1100	1100	1100	1200	1200	1300	1300	1400	1500											
					800	800	800	800	800	800	800	800	800	800	800	800											
					-	-	-	-	-	-	-	-	-	-	-	-											
300	12	323,9	5,6	450	1100	1100	1100	1100	1100	1100	1200	1200	1300	1300	1400	1500	1600										
					800	800	800	800	800	800	800	800	800	800	800	800	800										
					-	-	-	-	-	-	-	-	-	-	-	-	-										
350	14	355,6	5,6	500	1100	1100	1100	1100	1100	1100	1200	1200	1300	1300	1400	1500	1600	1700									
					800	800	800	800	800	800	800	800	800	800	800	800	800	800									
					-	-	-	-	-	-	-	-	-	-	-	-	-	-									



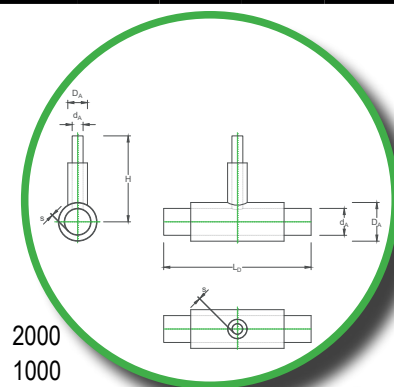
Products - Single

Branch 90°-vertical

Insulation Series 1

Base pipe					Branch outlet DN (d _A , s, D _A as Dimension Base pipe) / Component measurement																						
					20	25	32	40	50	65	80	100	125	150	200	250	300	350	400	450	500	600	700	800	900	1000	
					L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D
					H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H
DN	Zoll	d _A	s	D _A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
400	16	406,4	6,3	560	1100	1100	1100	1100	1100	1100	1200	1200	1300	1300	1400	1500	1600	1700	1700								
					800	800	800	800	800	800	800	800	800	800	800	800	800	800	800	800							
					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-							
450	18	457,0	6,3	630	1100	1100	1100	1100	1100	1100	1200	1200	1300	1300	1400	1500	1600	1700	1700	1800							
					900	900	900	900	900	900	900	900	900	900	900	900	900	900	900	900							
					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-						
500	20	508,0	6,3	710	1100	1100	1100	1100	1100	1100	1200	1200	1300	1300	1400	1500	1600	1700	1700	1800	1800						
					900	900	900	900	900	900	900	900	900	900	900	900	900	900	900	900	900						
					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-					
600	24	610,0	7,1	800	1100	1100	1100	1100	1100	1100	1200	1200	1300	1300	1400	1500	1600	1700	1700	1800	1800	2000					
					1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000					
					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
700	28	711,0	8,0	900	1100	1100	1100	1100	1100	1100	1200	1200	1300	1300	1400	1500	1600	1700	1700	1800	1800	2000	2100				
					1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000					
					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
800	32	813,0	8,8	1000	1100	1100	1100	1100	1100	1100	1200	1200	1300	1300	1400	1500	1600	1700	1700	1800	1800	2000	2100	2200			
					1100	1100	1100	1100	1100	1100	1100	1100	1100	1100	1100	1100	1100	1100	1100	1100	1100	1100	1100	1100			
					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
900	36	914,0	10,0	1100	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.			
					n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	
					n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	
1000	40	1016	11,0	1200	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.			
					n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	
					n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	

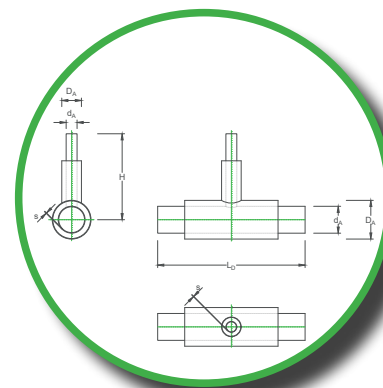
Technical drawing of a branch outlet connection. The drawing shows a side view and a top view. The side view shows a vertical pipe with a horizontal branch. The dimensions are labeled: d_A (branch outlet diameter), s (branch outlet thickness), D_A (base pipe outer diameter), L_D (base pipe length), and H (base pipe height). The top view shows the branch outlet in plan view, with dimensions d_A and D_A indicated.



Branch 90°-vertical

Insulation Series 2

Base pipe					Branch outlet DN (d _A , s, D _A as Dimension Base pipe) / Component measurement																						
					20	25	32	40	50	65	80	100	125	150	200	250	300	350	400	450	500	600	700	800	900	1000	
					L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D
					H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H
DN	Zoll	d _A	s	D _A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
20	¾	26,9	2,0 2,6	110	1100																						
					600																						
					-																						
25	1	33,7	2,3 2,6	110	1100	1100																					
					600	600																					
					-	-																					
32	1 1/4	42,4	2,6 3,2	125	1100	1100	1100																				
					600	600	600																				
					-	-	-																				
40	1 1/2	48,3	2,6 3,2	125	1100	1100	1100	1100																			
					600	600	600	600																			
					-	-	-	-																			
50	2	60,3	2,9 3,2	140	1100	1100	1100	1100	1100																		
					600	600	600	600	600																		
					-	-	-	-	-																		
65	2 1/2	76,1	2,9 3,2	160	1100	1100	1100	1100	1100	1100																	
					650	650	650	650	650	650																	
					-	-	-	-	-	-																	



d_A = Steel pipe outer diameter [mm]

s = Steel pipe wall thickness according to DHP [mm]

D_A = Casing pipe outer diameter [mm]

Base pipe bzw. Outlet

Base pipe bzw. Outlet

Base pipe bzw. Outlet

L_D = Length Base pipe [mm]

H = Length Outlet [mm]

The specified steel wall thicknesses correspond to the minimum requirements according to the standard or the standard DHP wall thicknesses. Uninsulated steel pipe ends are approximately 220 mm.

For optimization and alignment with the state of the art, we reserve the right to make dimensional and technical modifications. Regarding possible dimensional deviations, no binding commitment can be derived in individual cases.

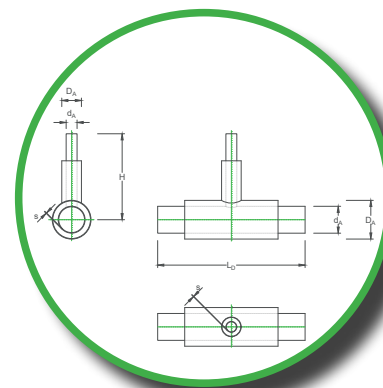
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Products - Single

Branch 90°-vertical

Insulation Series 2

Base pipe					Branch outlet DN (d _A , s, D _A as Dimension Base pipe) / Component measurement																					
					20	25	32	40	50	65	80	100	125	150	200	250	300	350	400	450	500	600	700	800	900	1000
					L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D
					H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H
DN	Zoll	d _A	s	D _A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
80	3	88,9	3,2	180	1100	1100	1100	1100	1100	1100	1200															
					650	650	650	650	650	650	650															
					-	-	-	-	-	-	-															
100	4	114,3	3,6	225	1100	1100	1100	1100	1100	1100	1200	1200														
					650	650	650	650	650	650	650	650														
					-	-	-	-	-	-	-	-														
125	5	139,7	3,6	250	1100	1100	1100	1100	1100	1100	1200	1200	1300													
					700	700	700	700	700	700	700	700	700													
					-	-	-	-	-	-	-	-	-													
150	6	168,3	4,0	280	1100	1100	1100	1100	1100	1100	1200	1200	1300	1300												
					700	700	700	700	700	700	700	700	700	700												
					-	-	-	-	-	-	-	-	-	-												
200	8	219,1	4,5	355	1100	1100	1100	1100	1100	1100	1200	1200	1300	1300	1400											
					700	700	700	700	700	700	700	700	700	700	700											
					-	-	-	-	-	-	-	-	-	-	-											
250	10	273	5,0	450	1100	1100	1100	1100	1100	1100	1200	1200	1300	1300	1400	1500										
					800	800	800	800	800	800	800	800	800	800	800	800										
					-	-	-	-	-	-	-	-	-	-	-	-										
300	12	323,9	5,6	500	1100	1100	1100	1100	1100	1100	1200	1200	1300	1300	1400	1500	1600									
					800	800	800	800	800	800	800	800	800	800	800	800	800									
					-	-	-	-	-	-	-	-	-	-	-	-	-									
350	14	355,6	5,6	560	1100	1100	1100	1100	1100	1100	1200	1200	1300	1300	1400	1500	1600	1700								
					800	800	800	800	800	800	800	800	800	800	800	800	800	800								
					-	-	-	-	-	-	-	-	-	-	-	-	-	-								





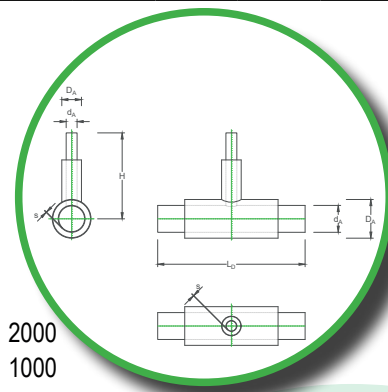
District Heating Pipes

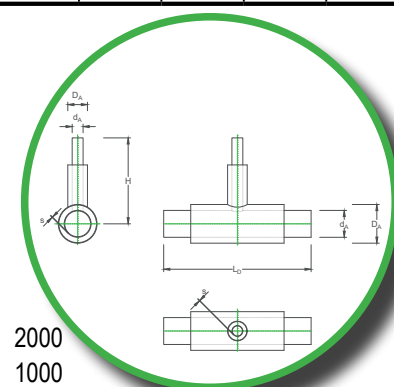
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Products - Single

Branch 90°-vertical

Insulation Series 2

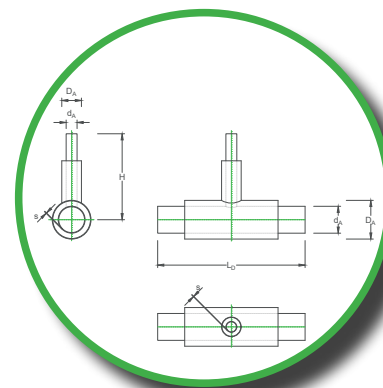
Base pipe					Branch outlet DN (d _A s, D _A as Dimension Base pipe) / Component measurement																							
					20	25	32	40	50	65	80	100	125	150	200	250	300	350	400	450	500	600	700	800	900	1000		
					L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D		
					H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	
DN	Zoll	d _A	s	D _A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
400	16	406,4	6,3	630	1100	1100	1100	1100	1100	1100	1200	1200	1300	1300	1400	1500	1600	1700	1700									
					800	800	800	800	800	800	800	800	800	800	800	800	800	800	800						800			
					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-						-	-		
450	18	457,0	6,3	710	1100	1100	1100	1100	1100	1100	1200	1200	1300	1300	1400	1500	1600	1700	1700	1800								
					900	900	900	900	900	900	900	900	900	900	900	900	900	900	900	900					900			
					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-					-	-		
500	20	508,0	6,3	710	1100	1100	1100	1100	1100	1100	1200	1200	1300	1300	1400	1500	1600	1700	1700	1800	1800							
					900	900	900	900	900	900	900	900	900	900	900	900	900	900	900	900	900			900				
					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			-	-			
600	24	610,0	7,1	900	1100	1100	1100	1100	1100	1100	1200	1200	1300	1300	1400	1500	1600	1700	1700	1800	1800	2000						
					1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000		1000				
					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-			
700	28	711,0	8,0	1000	1100	1100	1100	1100	1100	1100	1200	1200	1300	1300	1400	1500	1600	1700	1700	1800	1800	2000	2100					
					1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000		1000			
					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-		
800	32	813,0	8,8	1100	1100	1100	1100	1100	1100	1100	1200	1200	1300	1300	1400	1500	1600	1700	1700	1800	1800	2000	2100	2200				
					1100	1100	1100	1100	1100	1100	1100	1100	1100	1100	1100	1100	1100	1100	1100	1100	1100	1100	1100	1100		1100		
					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	
900	36	914,0	10,0	1200	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.				
					n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.		n.u.	n.u.	
					n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.		n.u.	n.u.	n.u.
1000	40	1016	11,0	1300	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.			
					n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.		n.u.	n.u.
					n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.		n.u.	n.u.



Branch 90°-vertical

Insulation Series 3

Base pipe					Branch outlet DN (d _A , s, D _A as Dimension Base pipe) / Component measurement																						
					20	25	32	40	50	65	80	100	125	150	200	250	300	350	400	450	500	600	700	800	900	1000	
					L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D
DN	Zoll	d _A	s	D _A	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H		
20	¾	26,9	2,0 2,6	125	1100																						
					600																						
					-																						
25	1	33,7	2,3 2,6	125	1100	1100																					
					600	600																					
					-	-																					
32	1 1/4	42,4	2,6 3,2	140	1100	1100	1100																				
					600	600	600																				
					-	-	-																				
40	1 1/2	48,3	2,6 3,2	140	1100	1100	1100	1100																			
					600	600	600	600																			
					-	-	-	-																			
50	2	60,3	2,9 3,2	160	1100	1100	1100	1100	1100																		
					600	600	600	600	600																		
					-	-	-	-	-																		
65	2 1/2	76,1	2,9 3,2	180	1100	1100	1100	1100	1100	1100																	
					650	650	650	650	650	650																	
					-	-	-	-	-	-																	



d_A = Steel pipe outer diameter [mm]

s = Steel pipe wall thickness according to DHP [mm]

D_A = Casing pipe outer diameter [mm]

Base pipe bzw. Outlet

Base pipe bzw. Outlet

Base pipe bzw. Outlet

L_D = Length Base pipe [mm]

H = Length Outlet [mm]

The specified steel wall thicknesses correspond to the minimum requirements according to the standard or the standard DHP wall thicknesses. Uninsulated steel pipe ends are approximately 220 mm.

For optimization and alignment with the state of the art, we reserve the right to make dimensional and technical modifications. Regarding possible dimensional deviations, no binding commitment can be derived in individual cases.

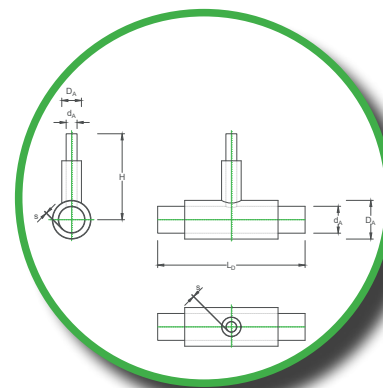
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Products - Single

Branch 90°-vertical

Insulation Series 3

Base pipe					Branch outlet DN (d _A , s, D _A as Dimension Base pipe) / Component measurement																						
					20	25	32	40	50	65	80	100	125	150	200	250	300	350	400	450	500	600	700	800	900	1000	
					L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D
					H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H
DN	Zoll	d _A	s	D _A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
80	3	88,9	3,2	200	1100	1100	1100	1100	1100	1100	1200																
					650	650	650	650	650	650	650																
					-	-	-	-	-	-	-																
100	4	114,3	3,6	250	1100	1100	1100	1100	1100	1100	1200	1200															
					650	650	650	650	650	650	650	650															
					-	-	-	-	-	-	-	-															
125	5	139,7	3,6	280	1100	1100	1100	1100	1100	1100	1200	1200	1300														
					700	700	700	700	700	700	700	700	700														
					-	-	-	-	-	-	-	-	-														
150	6	168,3	4,0	315	1100	1100	1100	1100	1100	1100	1200	1200	1300	1300													
					700	700	700	700	700	700	700	700	700	700													
					-	-	-	-	-	-	-	-	-	-													
200	8	219,1	4,5	400	1100	1100	1100	1100	1100	1100	1200	1200	1300	1300	1400												
					700	700	700	700	700	700	700	700	700	700	700												
					-	-	-	-	-	-	-	-	-	-	-												
250	10	273	5,0	500	1100	1100	1100	1100	1100	1100	1200	1200	1300	1300	1400	1500											
					800	800	800	800	800	800	800	800	800	800	800	800											
					-	-	-	-	-	-	-	-	-	-	-	-											
300	12	323,9	5,6	560	1100	1100	1100	1100	1100	1100	1200	1200	1300	1300	1400	1500	1600										
					800	800	800	800	800	800	800	800	800	800	800	800	800										
					-	-	-	-	-	-	-	-	-	-	-	-	-										
350	14	355,6	5,6	630	1100	1100	1100	1100	1100	1100	1200	1200	1300	1300	1400	1500	1600	1700									
					800	800	800	800	800	800	800	800	800	800	800	800	800	800									
					-	-	-	-	-	-	-	-	-	-	-	-	-	-									





District Heating Pipes

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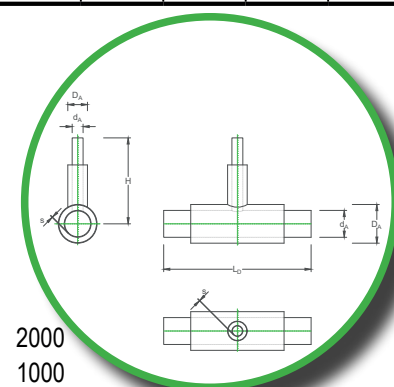
Products - Single

Branch 90°-vertical

Insulation Series 3

Base pipe					Branch outlet DN (d _A , s, D _A as Dimension Base pipe) / Component measurement																						
					20	25	32	40	50	65	80	100	125	150	200	250	300	350	400	450	500	600	700	800	900	1000	
					L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D
					H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H
DN	Zoll	d _A	s	D _A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
400	16	406,4	6,3	710	1100	1100	1100	1100	1100	1100	1200	1200	1300	1300	1400	1500	1600	1700	1700								
					800	800	800	800	800	800	800	800	800	800	800	800	800	800	800	800							
					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-							
450	18	457,0	6,3	710	1100	1100	1100	1100	1100	1100	1200	1200	1300	1300	1400	1500	1600	1700	1700	1800							
					900	900	900	900	900	900	900	900	900	900	900	900	900	900	900	900	900						
					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-						
500	20	508,0	6,3	800	1100	1100	1100	1100	1100	1100	1200	1200	1300	1300	1400	1500	1600	1700	1700	1800	1800						
					900	900	900	900	900	900	900	900	900	900	900	900	900	900	900	900	900	900					
					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-					
600	24	610,0	7,1	1000	1100	1100	1100	1100	1100	1100	1200	1200	1300	1300	1400	1500	1600	1700	1700	1800	1800	2000					
					1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000			
					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
700	28	711,0	8,0	1100	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.			
					n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	
					n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	
800	32	813,0	8,8	1200	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.			
					n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	
					n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	
900	36	914,0	10,0	1300	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.			
					n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	
					n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	
1000	40	1016	11,0	1400	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.			
					n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	
					n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	n.u.	

Technical drawing of a branch outlet connection. The drawing shows a side view and a top view. The side view shows a vertical pipe with a horizontal branch. The dimensions are labeled: d_A (branch outlet diameter), s (branch outlet thickness), D_A (base pipe outer diameter), L_D (base pipe length), and H (base pipe height).





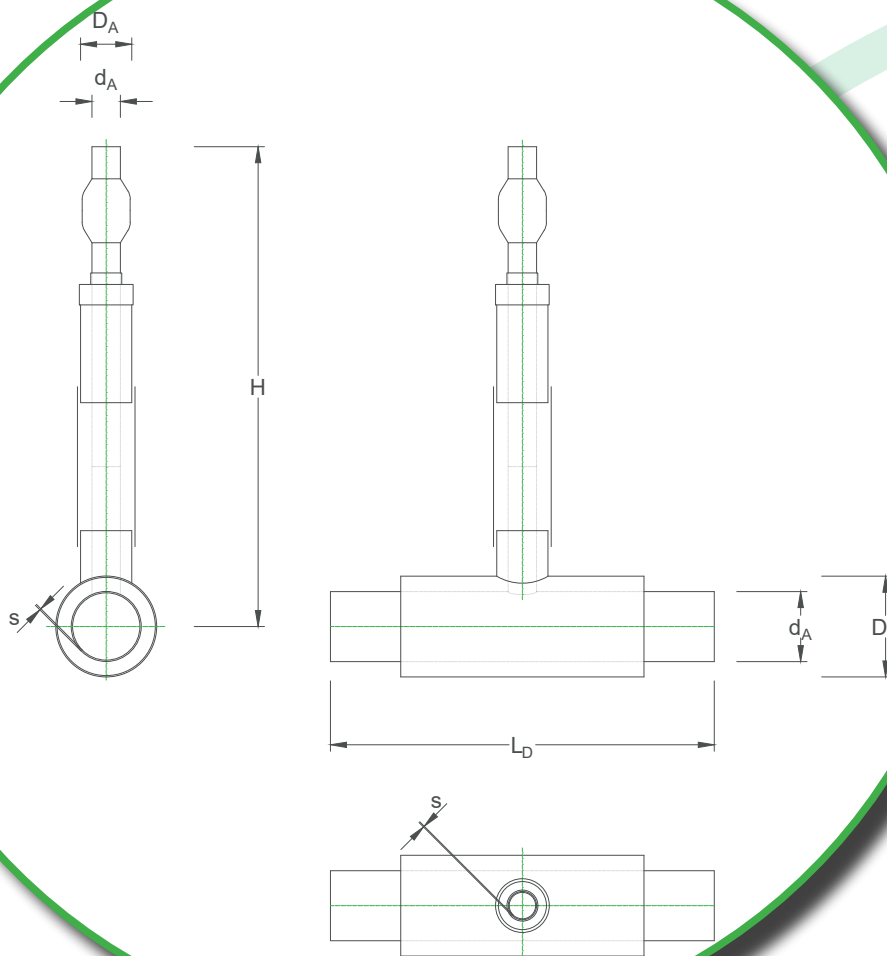
District Heating Pipes

smart pipes, clever solutions

Products - Single

Drain / Vent

- L_D Length Base pipe
- d_A Outer diameter Medium pipe
- D_A Outer diameter Casing pipe
- s Wall thickness Medium pipe
- H Length Outlet pipe (Height, variable)



smart pipes, clever solutions

Products - Single

Drain / Vent

Drain and vent assemblies are configured on site using a modular system. For this purpose, a drain/vent pipe (Standard length 1m, shortable) is welded to a 90° vertical branch. The drain connection is typically designed in DN 50, while the vent connection is usually DN 25, insulation series 1.

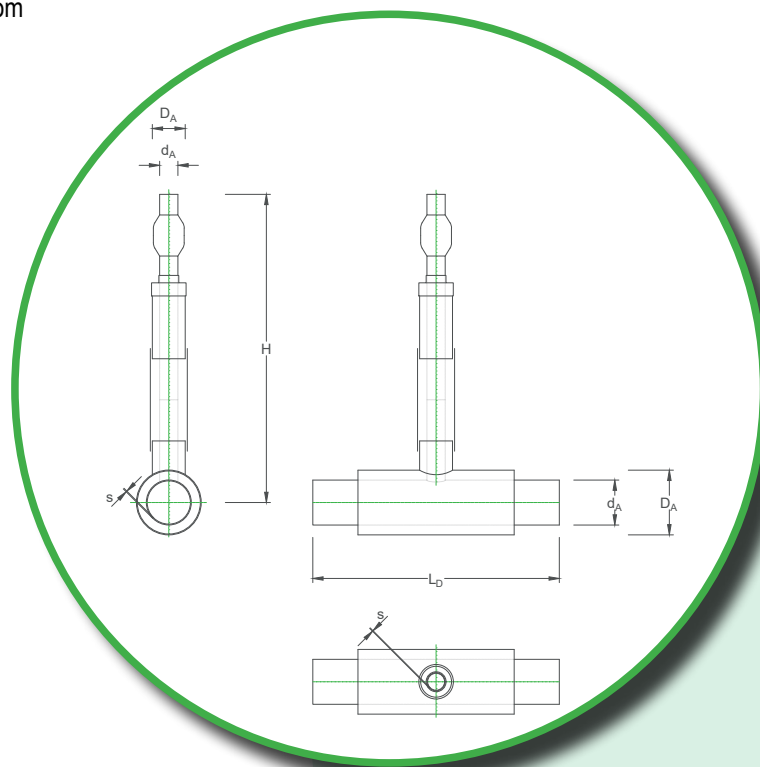
This approach offers the advantage that the installation height of the Drain / Vent ball valve can be precisely adapted to local conditions.

At the pipe end, a Drain / Vent ball valve (reduced bore, by others) with a stainless steel body and female threaded connection, including the corresponding sealing plug, can be installed. An end cap is located between the HDPE casing pipe end and the ball valve.

If the ball valve remains permanently in the closed position after installation, it should be operated once a year to prevent the seal from sticking to the ball.

Alternatively, the ball valve can be closed with a plug and left in the open position. This ensures that the seat rings and the ball are completely surrounded by water, providing lubrication of the seat rings and protecting the ball surface from deposits.

Manufacturer's recommendations must be observed.





District Heating Pipes

smart pipes, clever solutions

Products - Single

Reduction / Reducer

Reducers are installed to reduce the pipe diameter. Reduction is allowed over a maximum of two nominal sizes, as high earth pressure loads may occur at the reduction due to thermal expansion movements.

The reducer must be padded at the casing pipe reduction to avoid such excessive earth pressure loads. The expansion pad is not included with the delivery of the reducer.

Pipe cylinders matching the pipe lengths, made of seamless or welded steel.

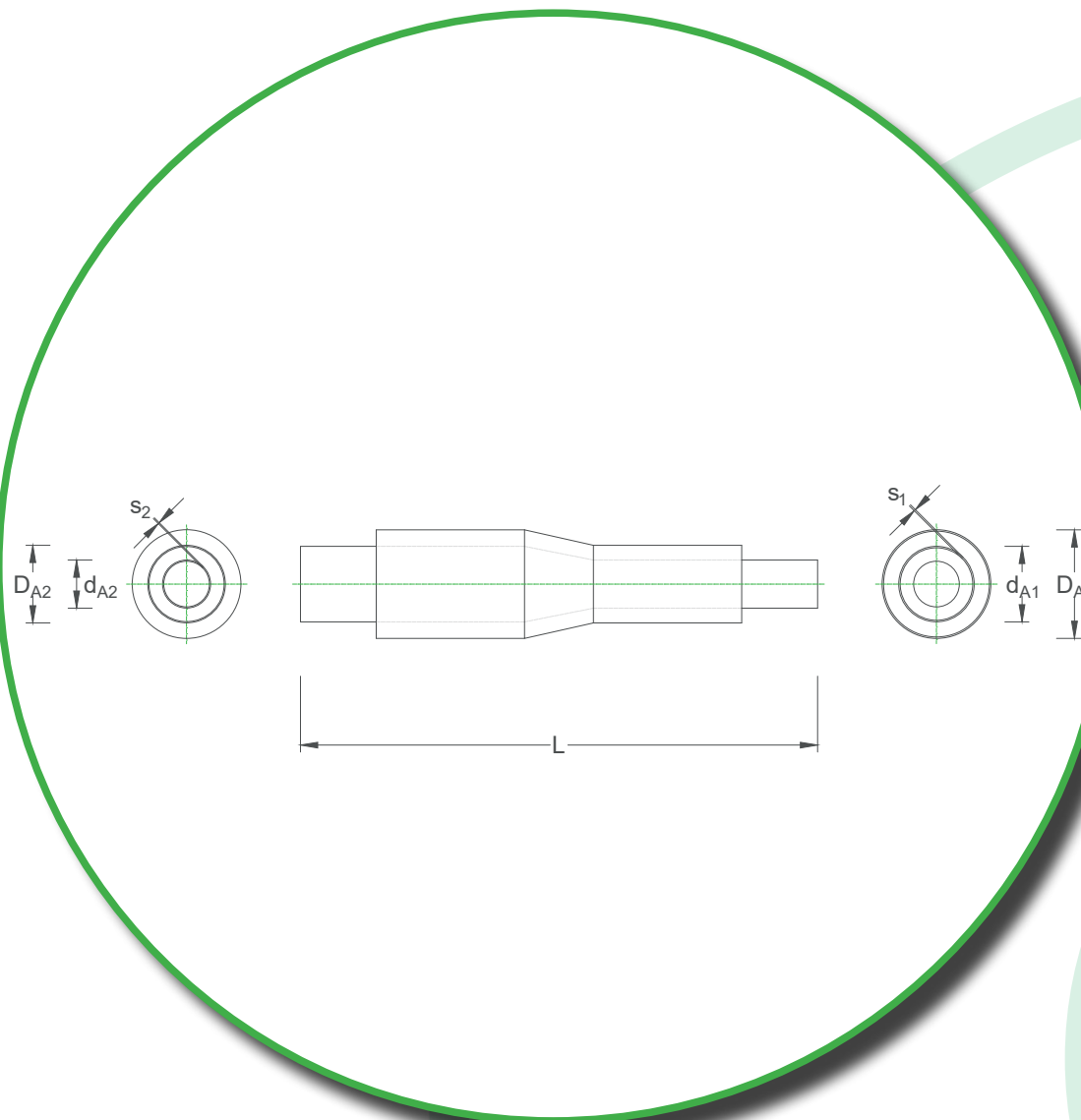
A carrier pipe reduction is provided by a concentric steel fitting according to DIN EN 10253-2 with welded pipe outlets.

The pipe ends are beveled at a 30° angle in preparation for welding (DIN EN ISO 9692-1). Uninsulated steel pipe ends are approximately 220 mm.

Products - Single

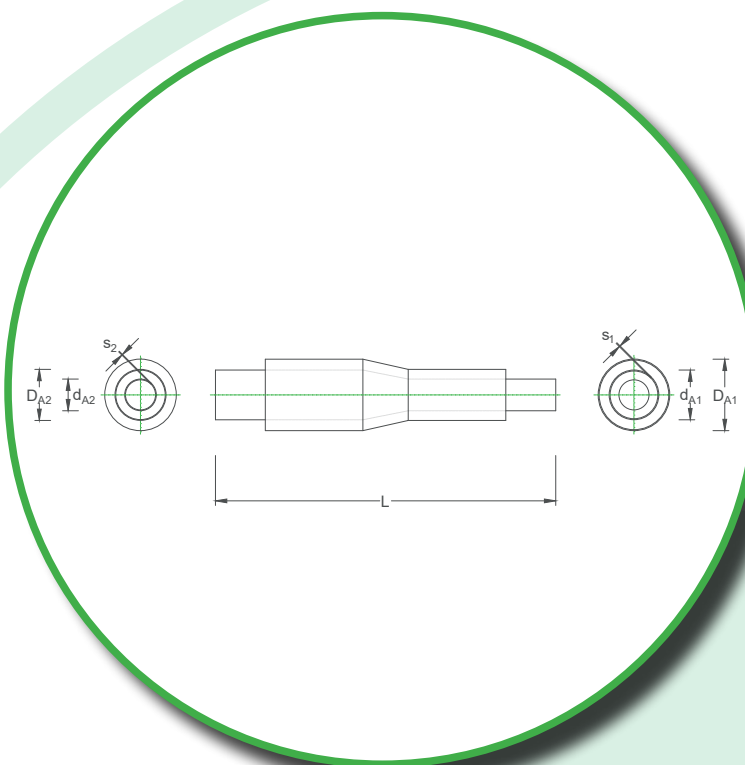
Reduction / Reducer

L	Length Reduction
d_{A1}	Outer diameter Medium pipe
D_{A1}	Outer diameter Casing pipe
d_{A2}	Outer diameter Medium pipe
D_{A2}	Outer diameter Casing pipe
s_1	Wall thickness Medium pipe
s_2	Wall thickness Casing pipe



Reduction / Reducer

Component dimensions 1					Lenght L [mm]	Component dimensions 2				
Carrier pipe		D _{A1} [mm]				Carrier pipe		D _{A2} [mm]		
DN	d _{A1} [mm]	Insulation Series				DN	d _{A2} [mm]	Insulation Series		
		Series 1	Series 2	Series 3*				Series 1	Series 2	Series 3*
25	33,7	90	110	125	1500	20	26,9	90	110	125
32	42,4	110	125	140	1500	25	33,7	90	110	125
						20	26,9	90	110	125
40	48,3	110	125	140	1500	32	42,4	110	125	140
						25	33,7	90	110	125
50	60,3	125	140	160	1500	40	48,3	110	125	140
						32	42,4	110	125	140
65	76,1	140	160	180	1500	50	60,3	125	140	160
						40	48,3	110	125	140
80	88,9	160	180	200	1500	65	76,1	140	160	180
						50	60,3	125	140	160
100	114,3	200	225	250	1500	80	88,9	160	180	200
						65	76,1	140	160	180
125	139,7	225	250	280	1500	100	114,3	200	225	250
						80	88,9	160	180	200
150	168,3	250	280	315	1500	125	139,7	225	250	280
						100	114,3	200	225	250
200	219,1	315	355	400	1500	150	168,3	250	280	315
						125	139,7	225	250	280
250	273,0	400	450	500	1500	200	219,1	315	355	400
						150	168,3	250	280	315
300	323,9	450	500	560	1500	250	273,0	400	450	500
						200	219,1	315	355	400
350	355,6	500	560	630	1500	300	323,9	450	500	560
						250	273,0	400	450	500
400	406,4	560	630	710	1500	350	355,6	500	560	630
						300	323,9	450	500	560
450	457,0	630	710	800	1500	400	406,4	560	630	710
						350	355,6	500	560	630
500	508,0	710	800	900	1500	450	457,0	630	710	800
						400	406,4	560	630	710



WARNING: Larger dimensions available upon request. Reducers in insulation Series 3 are only available as custom-made items. Please clarify delivery options in advance if required.

Ball valve single pipe

System

DHP shut-off valves must be welded into the pipeline in the fully open position, like a straight pipe section. Installation within the legs of L-, Z-, or U-bends is not permitted due to the bending stresses that occur. The first closing operation may only be performed after the pipeline has been completely flushed. Intermediate positions should generally be avoided. Operation must be slow and controlled; the end stops must not be forcibly over-turned. Improper extensions or similar aids are not permitted.

Insulation

The insulation of the shut-off valves is carried out with rigid polyurethane (PUR) foam in accordance with EN 253. The PUR system consists of Component A (polyol, light) and Component B (isocyanate, dark).

DHP uses exclusively 100% CFC-free, cyclopentane-blown PUR foam. In addition to excellent thermal insulation properties, this ensures minimal environmental impact:

OExpansion pad (Ozone Depletion Potential) = 0, GWP (Global Warming Potential) < 0.001.

Casing pipe

PEHD (High-Density Polyethylene) is a seamless extruded, impact- and fracture-resistant, tough-elastic polyethylene suitable for use down to -50 °C, and it meets the general quality requirements of DIN 8075. For optimal adhesion to the rigid PUR foam, the material is corona-treated in accordance with EN 253.

Dimensions and wall thicknesses comply at least with EN 253. The melt flow index (MFI group) is tested according to DIN 53735 or ISO 1133. PEHD is a proven material that has been successfully used for many years in plastic casing pipe systems (KMR).

Due to its high chemical resistance to almost all substances found in soil, PEHD is particularly suitable as a casing pipe for direct burial. National and international standards and guidelines list PEHD as the only material for casing pipes in the KMR composite system.

PEHD is also highly weather- and UV-resistant. DHP uses exclusively PE materials with integrated light stabilizers. As required by EN 253, UV protection is provided by the addition of special, very fine carbon black types (2.5 ± 0.5 wt %).

The excellent welding characteristics of PEHD ensure maximum safety and quality at the welds of molded parts. PEHD bend segments are butt-welded using mirror welding devices, while fillet welds at branch outlets are executed using extruder welding equipment.



District Heating Pipes

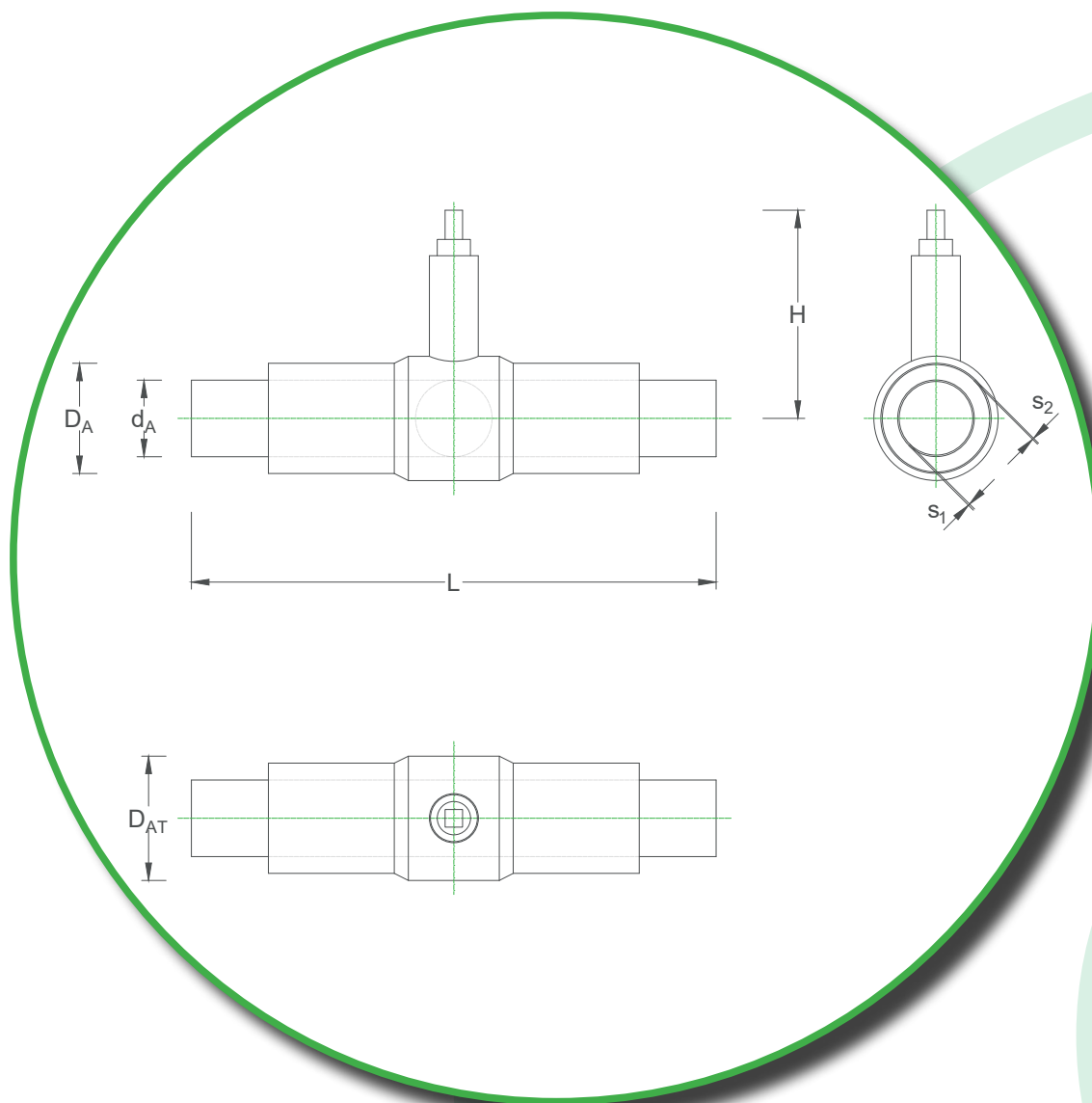
smart pipes, clever solutions

Products - Single

Ball valve single pipe

Valve Standard

L	Length Base pipe
d_A	Outer diameter Medium pipe
D_A	Outer diameter Casing pipe
D_{AT}	Outer diameter Casing pipe (Pot)
s_1	Wall thickness Medium pipe
s_2	Wall thickness Casing pipe
H	Length service chamber (Height)



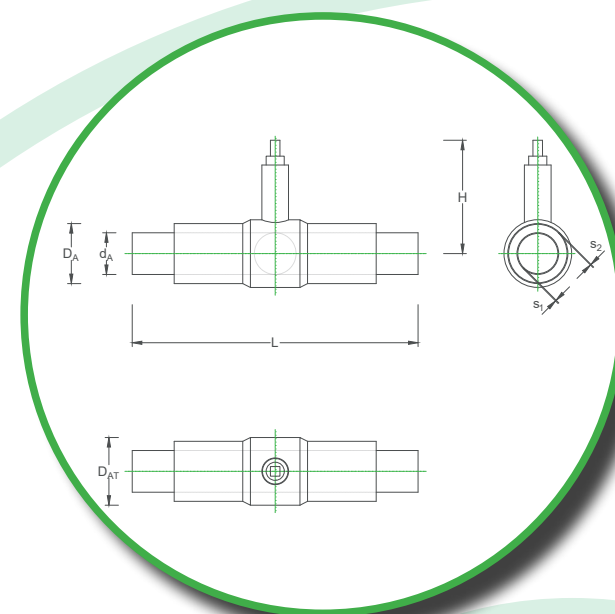
smart pipes, clever solutions

Products - Single

Ball valve single pipe

Ball valve Standard

Carrier pipe				Casing pipe $D_A \times s_2 / D_{AT}$ [mm]			H [mm]	L [mm]
DN	Zoll	d_A [mm]	s_1 [mm]					
				Insulation				
				Series 1	Series 2	Series 3		
25	1"	33,7	2,3 / 2,6	90 x 3,0 / 110	110 x 3,0 / 110	125 x 3,0 / 125	480	1500
32	1¼"	42,4	2,6 / 3,2	110 x 3,0 / 125	125 x 3,0 / 125	140 x 3,0 / 140	485	1500
40	1½"	48,3	2,6 / 3,2	110 x 3,0 / 125	125 x 3,0 / 125	140 x 3,0 / 140	495	1500
50	2"	60,3	2,9 / 3,2	125 x 3,0 / 140	140 x 3,0 / 140	160 x 3,0 / 160	500	1500
65	2½"	76,1	2,9 / 3,2	140 x 3,0 / 160	160 x 3,0 / 160	180 x 3,0 / 180	505	1500
80	3"	88,9	3,2	160 x 3,0 / 180	180 x 3,0 / 180	200 x 3,2 / 200	515	1500
100	4"	114,3	3,6	200 x 3,2 / 225	225 x 3,4 / 225	250 x 3,6 / 250	525	1500
125	5"	139,7	3,6	225 x 3,4 / 250	250 x 3,6 / 250	280 x 3,9 / 280	545	1500
150	6"	168,3	4,0	250 x 3,6 / 280	280 x 3,9 / 280	315 x 4,1 / 315	565	1500
200	8"	219,1	4,5	315 x 4,1 / 355	355 x 4,5 / 355	400 x 4,8 / 400	585	1500
250	10"	273,0	5,0	400 x 4,8 / 450	450 x 5,2 / 450	500 x 5,6 / 500	625	1500
300	12"	323,9	5,6	450 x 5,2 / 500	500 x 5,6 / 500	560 x 6,0 / 560	665	1800



Carrier pipe according to EN 488, the pipe ends are beveled at a 30° angle in preparation for welding (DIN EN ISO 9692-1). Uninsulated steel pipe ends are approximately 220 mm.

The specified component dimensions refer to the standard product used by DHP. Other available types and alternative dimensions are available upon request.

For some ball valve models, a factory-installed square protector is included. For these versions, a suitable stem extension can be used, which is operable with standard T-wrenches.

In general, the operation of the shut-off valves must be carried out using the gear mechanism, stem extension, or manufacturer-specific accessories of the respective ball valve model.

Therefore, when ordering, the exact type designation and the intended mode of operation must be specified as binding.

Standard version: reduced base pipe. Valves with a full base pipe are available as custom components.

Due to the manufacturer, the dimensions H and L may vary slightly. Protective cover pipes are available in various versions but are not included with the delivery of shut-off valves and must be ordered separately.



District Heating Pipes

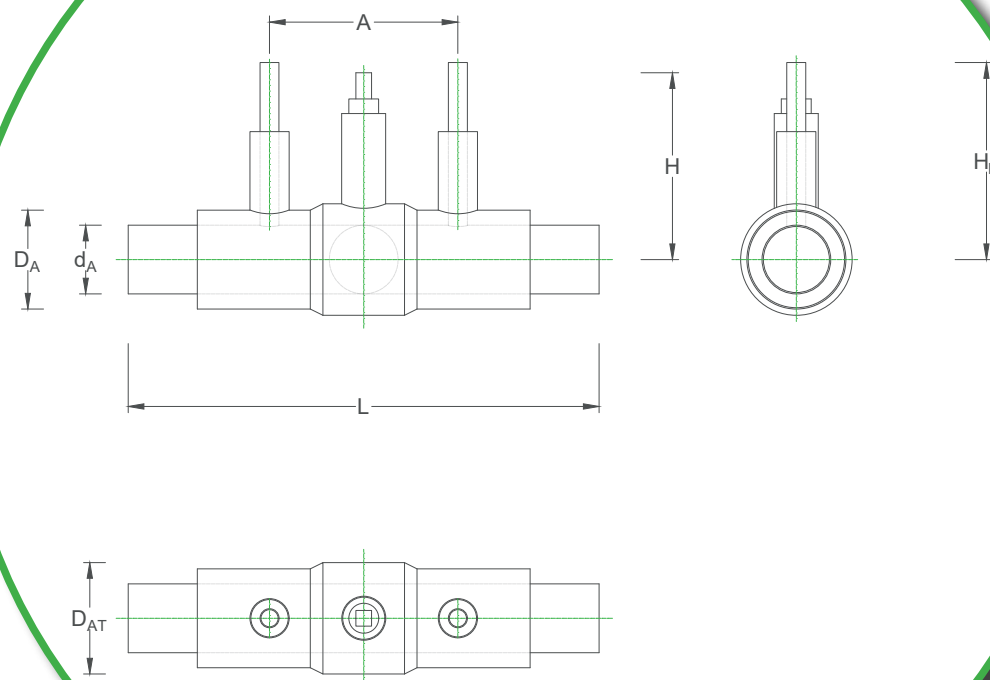
smart pipes, clever solutions

Products - Single

Ball valve single pipe

Ball valve with Drain / Vent (Combination valve)

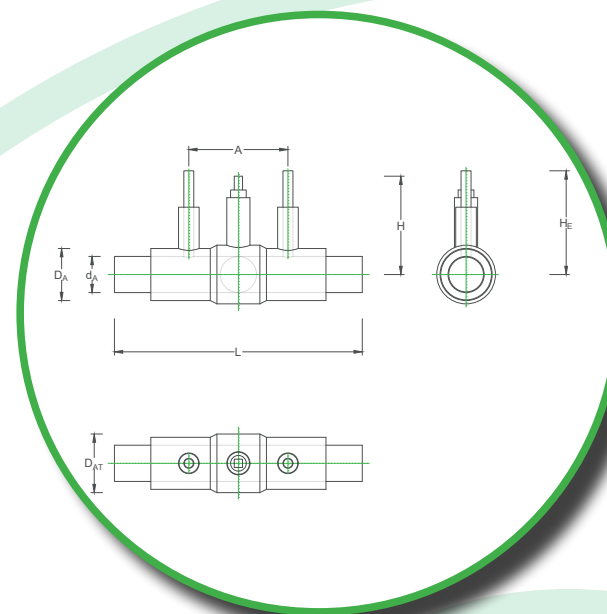
L	Length Base pipe
d_A	Outer diameter Medium pipe
D_A	Outer diameter Casing pipe
D_{AT}	Outer diameter Casing pipe (Pot)
s_1	Wall thickness Medium pipe
s_2	Wall thickness Casing pipe
H	Length service chamber (Height)
H_E	Length Drain / Vent nozzle (Height)
A	Axis distance Drain / Vent nozzle



Ball valve single pipe

Ball valve with Drain / Vent (Combination valve)

Measurements base pipe						Drain / Vent Outlet-nozzle			H _E [mm]	L [mm]
Carrier pipe			D _A x s ₂ / D _{AT} [mm]			DN	H [mm]	A [mm]		
DN	d _A [mm]	s ₁ [mm]								
			Dämmserie							
Series 1	Series 2	Series 3								
25	33,7	2,3 / 2,6	90 x 3,0 / 110	110 x 3,0 / 110	125 x 3,0 / 125	25	480	520	480	1500 - 2000
32	42,4	2,6 / 3,2	110 x 3,0 / 125	125 x 3,0 / 125	140 x 3,0 / 140	25	485	520	485	1500 - 2000
40	48,3	2,6 / 3,2	110 x 3,0 / 125	125 x 3,0 / 125	140 x 3,0 / 140	25	495	520	495	1500 - 2000
50	60,3	2,9 / 3,2	125 x 3,0 / 140	140 x 3,0 / 140	160 x 3,0 / 160	25	500	520	500	1500 - 2000
65	76,1	2,9 / 3,2	140 x 3,0 / 160	160 x 3,0 / 160	180 x 3,0 / 180	25	505	520	505	1500 - 2000
80	88,9	3,2	160 x 3,0 / 180	180 x 3,0 / 180	200 x 3,2 / 200	50	515	520	515	1500 - 2000
100	114,3	3,6	200 x 3,2 / 225	225 x 3,4 / 225	250 x 3,6 / 250	50	525	520	525	1500 - 2000
125	139,7	3,6	225 x 3,4 / 250	250 x 3,6 / 250	280 x 3,9 / 280	50	545	520	545	1500 - 2000
150	168,3	3,6	250 x 3,6 / 280	280 x 3,9 / 280	315 x 4,1 / 315	50	565	520	565	1500 - 2000
200	219,1	4,0	315 x 4,1 / 355	355 x 4,5 / 355	400 x 4,8 / 400	50	585	520	585	1500 - 2000
250	273,0	4,5	400 x 4,8 / 450	450 x 5,2 / 450	500 x 5,6 / 500	50	625	520	625	1500 - 2000
300	323,9	5,0	450 x 5,2 / 500	500 x 5,6 / 500	560 x 6,0 / 560	50	665	520	665	1800 - 2200



Carrier pipe, design, and service chamber analogous to shut-off valves, but executed as a factory-prefabricated drain and/or vent unit, preferably for installation in a manhole ring.

In the basic body of the combined valve, the vertical branches for Drain / Vent are supplied without ball valves and without end caps. The insulated nozzles can be extended, upon request, with drain or vent pipes, optionally with or without ball valves. If the drain/vent pipes are supplied loose and welded on site, the corresponding joint sleeves must be ordered separately.

Factory pre-assembly of the drain/vent pipes is possible; in this case, insulation of the connection is also carried out at the factory. For this purpose, binding dimensional specifications are required.

Various versions of protective casing pipes (slip-on protection pipes) are available. These are not included in the scope of supply of the combined valves and must be ordered separately. Valves with full bore, as well as Drain and/or Vent in reinforced insulation series, are available as special components or custom-made solutions upon request; availability must be clarified in advance.

When placing an order, the design, valve type, actuation method (T-key or plug-in gearbox), and the configuration with ELE and/or ELÜ must be specified.

Due to manufacturing constraints, dimensional deviations in H, H_E, and L may occur.

Ball valve single pipe

PEHD Protective Cover Pipe (Slip-On Type)

Protective pipes are preferably integrated into DIN road caps or manhole rings. The design depends on the nominal diameter and project-specific requirements. Dimensions and special versions (e.g. with screw cap closure) are available upon request.

The protective pipe, including protective cap and internal PE laminate (centering aid), is not included in the scope of delivery of shut-off or combination valves and must be ordered separately.

Delivery length: 1.50 m (standard). Adjustment to the required cover height is carried out on site.

Stem Extension

When installing shut-off valves at greater burial depths, stem extensions must be provided.

The scope of delivery of a stem extension includes a conical square socket for accommodating the standard dome or square protector of the valve. The upper end of the extension is likewise designed with a square protector.

The design and type of stem extension depend on the dimension and manufacturer of the shut-off valve.

Standard lengths: 0.50 m, 1.00 m, and 1.50 m. Special versions are available upon request.

T-Wrench / Gear Operator

Depending on the nominal diameter, shut-off valves are operated using a T-wrench. From DN 150 upwards, the use of a gear operator is recommended or permitted.

The T-wrench is supplied in the standard length of 1.00 m with a conical square socket. Unauthorized extensions of the lever arm to increase torque are not permitted.

Gear operators must be mounted vertically on the valve. Depending on the valve type, different gear versions are available, possibly using additional accessories (e.g. slip-on flange).

Non-type-approved torque multipliers are not permitted. Plug-in and planetary gearboxes, electric actuators, and further accessories are available upon request.

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Products Double

DHP-Double pipe

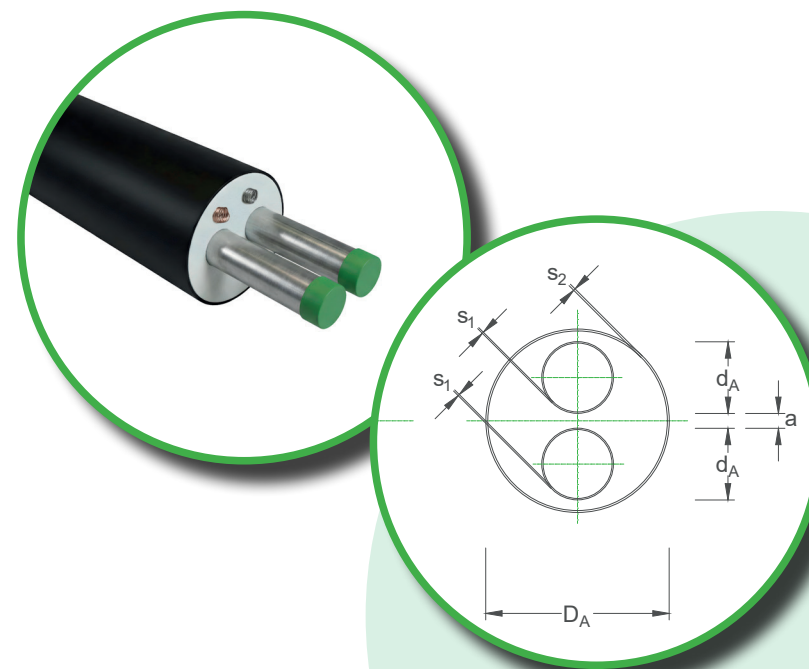
Double pipe

As an effective complement to single pipe systems, the DHP double pipe offers an additional solution for transporting district heating and district cooling to consumers with maximum ecological and economic efficiency. Production is also carried out using the proven discontinuous manufacturing process.

The DHP double pipe: optimum thermal insulation performance within a compact thermal unit (equivalent to single pipe Series 2). Reduced trench widths save space and can significantly lower installation costs.

The state of the art is to install the twin pipe in a vertical orientation (see sectional drawing). In the 12 o'clock position is the return line, and in the 6 o'clock position the supply line (thermal blocking effect). All available prefabricated fittings are designed based on this geometry and installation arrangement. Any deviation from this configuration may lead to complications and is the responsibility of the pipeline installer.

- Available dimensions from DN 20 (3/4") to DN 200 (8") in conventional production
- Three insulation Series
- Various carrier pipe grades, e.g. P235GH according to EN 253, DIN EN 10216 / DIN EN 10217
- Thermal conductivity $\lambda_{50} = 0.027 \text{ W/(m}\cdot\text{K)}$
- Operating temperatures according to EN 253 and higher, design pressure up to 25 bar
- Spread between flow pipe and return pipe up to 90 K [Δ_T]
- No limitation of installation length up to a static design temperature of 85 °C
- Available in 6 m, 12 m, and 16 m pipe lengths, other lengths upon request
- System Nordic (EMS) and/or other leak detection monitoring systems available





District Heating Pipes

smart pipes, clever solutions

Products Double

Added value / Application / Carrier pipe / Connection

Added value

- Minimal heat and energy losses, reduced excavation volume
- No trench offsets at branches (main line and branch at the same elevation)
- 50% fewer joint sleeves required, shorter sleeve installation time
- No additional fittings required for expansion compensation

- Faster overall construction time, shorter traffic disruption, easier route planning, etc.
- Significant reduction of expansion pads at bends and T-joints
- Pipe stress design based on the mean temperature of supply and return lines
- Doubled range of the network monitoring system

Application

Maximum operating temperature $T_{\max}$:	at the minimum according to EN 253
Maximum operating spread FL / RL (Δ_T) :	90 K
Maximum operating pressure p_B :	25 bar
Maximum axial stress $\sigma_{\max}$:	190 N/mm ²
Leak detection:	Nordic single/multiple or/and other systems
Possible media:	all heating water and other liquid substances compatible with the material

Welded carrier pipe

Welded, circular, non-alloy and fully killed steel, designation and technical delivery conditions in accordance with EN 253 and DIN EN 10217-1 and -2.

Material grade P235GH (1.0345), with inspection certificate (MTC) according to DIN EN 10204 – 3.1. For wall thicknesses > 3.0 mm, with weld seam preparation by 30° beveled pipe ends in accordance with DIN EN ISO 9692-1.

Seamless carrier pipe

Seamless, circular, non-alloy and fully killed steel, designation and technical delivery conditions in accordance with EN 253 and DIN EN 10216-2.

Material grade P235GH (1.0345), with inspection certificate (MTC) according to DIN EN 10204 – 3.1. For wall thicknesses > 3.0 mm, with weld seam preparation by 30° beveled pipe ends in accordance with DIN EN ISO 9692-1.

Connection

The joints of the steel pipes may be executed in accordance with DIN ISO 857-1 using the following welding processes: manual arc welding, oxy-acetylene gas welding, tungsten inert gas welding (TIG), or combined processes. The quality, testing, and evaluation of the weld seams shall comply with AGFW Worksheet FW 446.



District Heating Pipes

smart pipes, clever solutions

Products Double

u-value / Heat loss

Thermal conductivity u-value [W/m²K]

The specified values are based on a mean specific heat capacity of water $c_m = 4,187 \text{ J/(kg} \cdot \text{K)}$, a soil cover $H = 0.80 \text{ m}$ (top of the casing pipe to ground level), a thermal conductivity of the soil $\lambda_E = 1.0 \text{ W/(m} \cdot \text{K)}$, a mean soil temperature $T_E = 10^\circ \text{C}$, an average clear pipe spacing $A [\text{mm}]$ according to the table, and welded steel pipe wall thicknesses.

Calculation mean temperature:

$$T_M = (T_{FL} + T_{RL}) : 2 [^\circ \text{C}]$$

Example: $T_M = (90^\circ \text{C} + 70^\circ \text{C}) : 2 = 80^\circ \text{C}$

u-value in [W/(m²K)] at pipe distance A in [mm]

Pipe	PEHD Casing pipe diameter D_A Axis distance pipe A [mm]			u-value [W/(m ² K)]		
	Series 1	Series 2	Series 3	Series 1	Series 2	Series 3
DN 20	125 / 19	140 / 19	160 / 19	0,1830	0,1608	0,1423
DN 25	140 / 19	160 / 19	180 / 19	0,1981	0,1700	0,1516
DN 32	160 / 19	180 / 19	200 / 19	0,2154	0,1856	0,1661
DN 40	160 / 19	180 / 19	200 / 19	0,2573	0,2144	0,1882
DN 50	200 / 20	225 / 20	250 / 20	0,2495	0,2076	0,1833
DN 65	225 / 20	250 / 20	280 / 20	0,2923	0,2430	0,2074
DN 80	250 / 25	280 / 25	315 / 25	0,3343	0,2653	0,2199
DN 100	315 / 25	355 / 25	400 / 25	0,3348	0,2635	0,2197
DN 125	400 / 30	450 / 30	500 / 30	0,3100	0,2488	0,2126
DN 150	450 / 40	500 / 40	560 / 40	0,3763	0,2914	0,2379
DN 200	560 / 45	630 / 45	n.u.	0,4115	0,3037	n.u.

Heat loss q at mean temperature in [W/m]

Pipe	q at $T_M = 100^\circ \text{C}$ [W/m]			q at $T_M = 80^\circ \text{C}$ [W/m]			q at $T_M = 60^\circ \text{C}$ [W/m]		
	Series 1	Series 2	Series 3	Series 1	Series 2	Series 3	Series 1	Series 2	Series 3
DN 20	16,472	14,474	12,808	12,812	11,257	9,961	9,151	8,041	7,115
DN 25	17,828	15,299	13,641	13,866	11,899	10,610	9,905	8,500	7,578
DN 32	19,387	16,708	14,949	15,079	12,995	11,627	10,771	9,282	8,305
DN 40	23,154	19,296	16,935	18,009	15,008	13,171	12,863	10,720	9,408
DN 50	22,454	18,686	16,494	17,464	14,534	12,829	12,475	10,381	9,163
DN 65	26,311	21,868	18,665	20,464	17,008	14,517	14,617	12,149	10,370
DN 80	30,087	23,874	19,792	23,401	18,569	15,394	16,715	13,264	10,995
DN 100	30,130	23,716	19,769	23,435	18,446	15,376	16,739	13,176	10,983
DN 125	27,899	22,388	19,135	21,699	17,413	14,883	15,499	12,438	10,631
DN 150	33,866	26,228	21,413	26,340	20,399	16,654	18,815	14,571	11,896
DN 200	37,033	27,330	n.u.	28,803	21,256	n.u.	20,574	15,183	n.u.

All values are based on a thermal conductivity of the PUR foam $\lambda_{50} = 0.027 \text{ W/(m} \cdot \text{K)}$.



District Heating Pipes

smart pipes, clever solutions

Products Double

Diameter / Output / Pressure loss

Carrier pipe					Volume pipe v [l/m]	Flow speed		Volumetric flow		Output P from / to [kw] at Delta T [K]													
DN	Zoll	d _A [mm]	EN 253 s [mm]	FW 401 s [mm]		w from / to [m/s]		from / to [m³/h]		from / to at 20K		from / to at 25K		from / to at 30K		from / to at 35K		from / to at 40K		from / to at 45K		from / to at 50K	
20	¾"	26,9	2,0	3,2	0,41	0,3	0,6	0,44	0,89	10	21	13	26	15	31	18	36	21	41	23	46	26	51
25	1"	33,7	2,3	3,2	0,67	0,4	0,7	0,96	1,69	22	39	28	49	34	59	39	69	45	78	50	88	56	98
32	1¼"	42,4	2,6	3,2	1,09	0,5	0,9	1,96	3,53	46	82	57	102	68	123	80	143	91	164	102	184	114	205
40	1½"	48,3	2,6	3,2	1,46	0,6	1,0	3,15	5,26	73	122	91	152	110	183	128	213	146	244	165	274	183	305
50	2"	60,3	2,9	3,2	2,33	0,7	1,2	5,87	10,07	136	234	170	292	204	350	238	409	272	467	306	525	341	584
65	2½"	76,1	2,9	3,2	3,88	0,8	1,3	11,17	18,16	259	421	324	527	389	632	454	737	518	843	583	948	648	1 053
80	3"	88,9	3,2	3,2	5,34	0,9	1,4	17,30	26,91	401	624	502	780	602	937	702	1 093	803	1 249	903	1 405	1 003	1 561
100	4"	114,3	3,6	3,6	9,01	1,0	1,6	32,44	51,90	753	1 204	941	1 505	1 129	1 806	1 317	2 107	1 505	2 408	1 693	2 709	1 881	3 010
125	5"	139,7	3,6	3,6	13,80	1,1	1,7	54,65	84,46	1 268	1 959	1 585	2 449	1 902	2 939	2 219	3 429	2 536	3 919	2 853	4 409	3 170	4 898
150	6"	168,3	4,0	4,0	20,20	1,2	1,8	87,26	130,90	2 025	3 037	2 531	3 796	3 037	4 555	3 543	5 314	4 049	6 074	4 555	6 833	5 061	7 592
200	8"	219,1	4,5	4,5	34,70	1,3	2,0	162,40	249,84	3 768	5 796	4 709	7 245	5 651	8 694	6 593	10 144	7 535	11 593	8 477	13 042	9 419	14 491

The values are based on a mean specific heat capacity of water of 4,187 J/(kg·K).

*High flow speed only in main transport pipelines

If medium pipe wall thicknesses in accordance with AGFW FW 401 are used, the transferable capacity for DN 20 to DN 65 is slightly reduced due to the smaller internal diameter.

Excessively high flow speed can cause problems such as significant pressure losses, flow noise, erosion at bends or weld seams, and increased pump power requirements. Conversely, a too low velocity results in poor heat distribution, larger pipe dimensions (higher investment costs), and the risk of deposits forming.

General design targets for district heating are a temperature difference (ΔT) in the network of 30–50 K and a pressure loss of 100–300 Pa/m. The flow speed (w) should be designed for economic efficiency rather than maximum values.



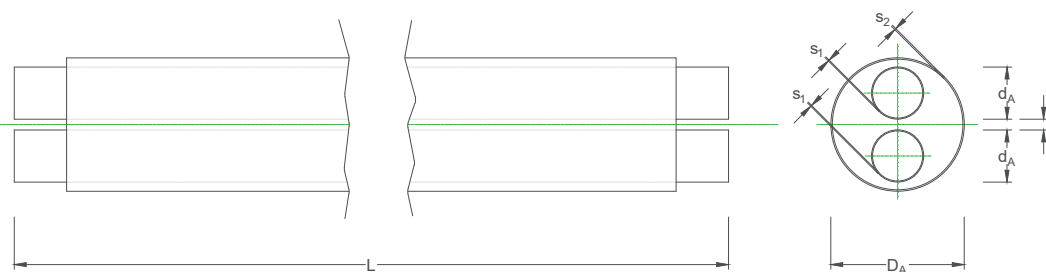
District Heating Pipes

smart pipes, clever solutions

Products Double

Dimensions

L	Pipe length
d_A	Outer diameter Carrier pipe
D_A	Outer diameter Casing pipe
s_1	Wall thickness Carrier pipe
s_2	Wall thickness Casing pipe
a	Pipe distance



Products Double

Dimensions

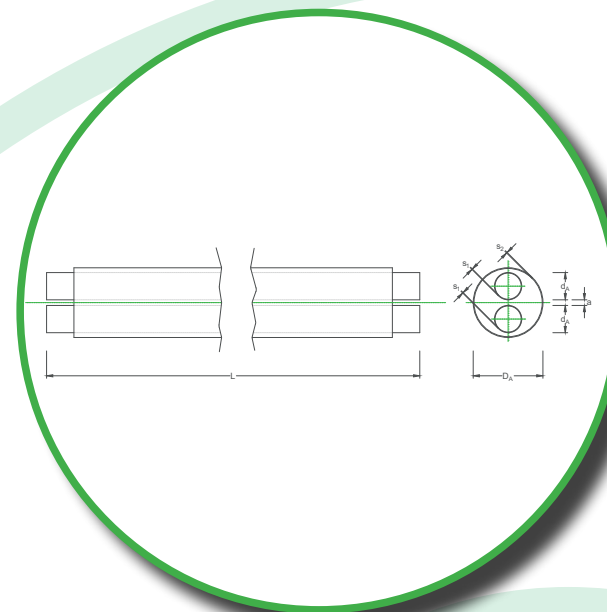
Discontinuous production - welded carrier pipe

Carrier pipe						PEHD Casing pipe diameter D _A x s ₂ [mm] / Weight G / Pipe length L [m]															
DN	Zoll	d _A [mm]	EN 253	FW 401	a [mm]	Series 1	G [kg/m]	6	12	16	Series 2	G [kg/m]	6	12	16	Series 3	G [kg/m]	6	12	16	
			s ₁ [mm]	s ₁ [mm]																	
20	¾"	2 x 26,9	2 x 2,0	2 x 2,6	19	125 x 3,0	2,68	+	-	-	140 x 3,0	3,08	+	-	-	160 x 3,0	3,41	+	-	-	
25	1"	2 x 33,7	2 x 2,3	2 x 2,6	19	140 x 3,0	3,54	+	-	-	160 x 3,0	3,96	+	+	-	180 x 3,0	4,30	+	+	-	
32	1¼"	2 x 42,4	2 x 2,6	2 x 3,2	19	160 x 3,0	4,60	+	+	-	180 x 3,0	4,95	+	+	-	200 x 3,2	5,32	+	+	-	
40	1½"	2 x 48,3	2 x 2,6	2 x 3,2	19	160 x 3,0	5,04	+	+	-	180 x 3,0	5,38	+	+	-	200 x 3,2	5,76	+	+	-	
50	2"	2 x 60,3	2 x 2,9	2 x 3,2	20	200 x 3,2	6,25	+	+	-	225 x 3,4	6,62	+	+	-	250 x 3,6	7,16	+	+	-	
65	2½"	2 x 76,1	2 x 2,9	2 x 3,2	20	225 x 3,4	7,73	+	+	-	250 x 3,6	8,28	+	+	-	280 x 3,9	8,87	+	+	-	
80	3"	2 x 88,9	2 x 3,2	2 x 3,2	25	250 x 3,6	9,15	+	+	-	280 x 3,9	9,75	+	+	-	315 x 4,1	10,49	+	+	-	
100	4"	2 x 114,3	2 x 3,6	2 x 3,6	25	315 x 4,1	13,23	+	+	+	355 x 4,5	14,24	+	+	+	400 x 4,8	15,35	+	+	+	
125	5"	2 x 139,7	2 x 3,6	2 x 3,6	30	400 x 4,8	16,09	+	+	+	450 x 5,2	17,20	+	+	+	500 x 5,6	18,72	+	+	+	
150	6"	2 x 168,3	2 x 4,0	2 x 4,0	40	450 x 5,2	20,77	+	+	+	500 x 5,6	22,29	+	+	+	560 x 6,0	24,15	+	+	+	
200	8"	2 x 219,1	2 x 4,5	2 x 4,5	45	560 x 6,0	30,51	+	+	+	630 x 6,6	33,02	+	+	+	710 x 6,9	36,05	+	+	+	

The pipe is manufactured using conventional discontinuous production.

The casing pipe wall thickness is in accordance with EN 253, and the specified carrier pipe wall thicknesses correspond to DHP standards or the requirements of EN 253 / AGFW FW 401. These must be calculated for internal pressure according to DIN EN 13480.

The pipe ends are beveled at a 30° angle in preparation for welding (DIN EN ISO 9692-1). Uninsulated steel pipe ends are approximately 220 mm.

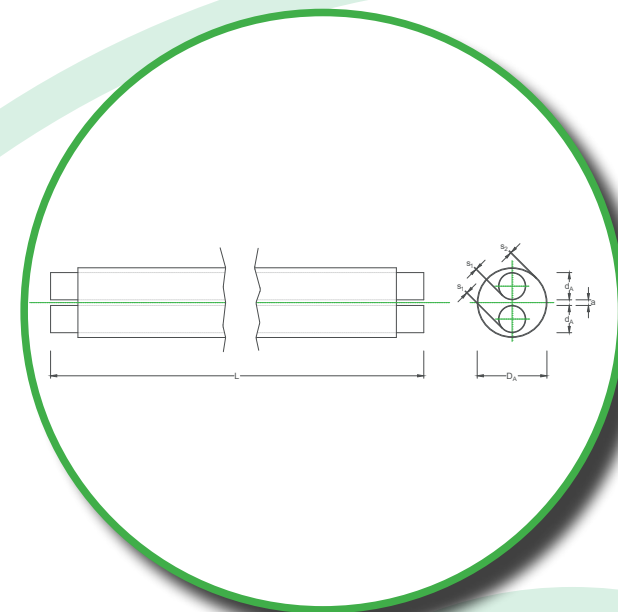


Products Double

Dimensions

Discontinuous production - seamless carrier pipe

Carrier pipe					PEHD Casing pipe diameter $D_A \times s_2$ [mm] / Weight G / Pipe length L [m]														
DN	Zoll	d_A [mm]	s_1 [mm]	a [mm]	Series 1	G [kg/m]	6	12	16	Series 2	G [kg/m]	6	12	16	Series 3	G [kg/m]	6	12	16
20	¾"	2 x 26,9	2 x 2,3	19	125 x 3,0	2,68	+	-	-	140 x 3,0	3,08	+	-	-	160 x 3,0	3,41	+	-	-
25	1"	2 x 33,7	2 x 2,6	19	140 x 3,0	3,54	+	-	-	160 x 3,0	3,96	+	+	-	180 x 3,0	4,30	+	+	-
32	1¼"	2 x 42,4	2 x 2,6	19	160 x 3,0	4,60	+	+	-	180 x 3,0	4,95	+	+	-	200 x 3,2	5,32	+	+	-
40	1½"	2 x 48,3	2 x 2,6	19	160 x 3,0	5,04	+	+	-	180 x 3,0	5,38	+	+	-	200 x 3,2	5,76	+	+	-
50	2"	2 x 60,3	2 x 2,9	20	200 x 3,2	6,25	+	+	-	225 x 3,4	6,62	+	+	-	250 x 3,6	7,16	+	+	-
65	2½"	2 x 76,1	2 x 2,9	20	225 x 3,4	7,73	+	+	-	250 x 3,6	8,28	+	+	-	280 x 3,9	8,87	+	+	-
80	3"	2 x 88,9	2 x 3,2	25	250 x 3,6	9,15	+	+	-	280 x 3,9	9,75	+	+	-	315 x 4,1	10,49	+	+	-
100	4"	2 x 114,3	2 x 3,6	25	315 x 4,1	13,23	+	+	+	355 x 4,5	14,24	+	+	+	400 x 4,8	15,35	+	+	+
125	5"	2 x 139,7	2 x 4,0	30	400 x 4,8	16,09	+	+	+	450 x 5,2	17,20	+	+	+	500 x 5,6	18,72	+	+	+
150	6"	2 x 168,3	2 x 4,5	40	450 x 5,2	20,77	+	+	+	500 x 5,6	22,29	+	+	+	560 x 6,0	24,15	+	+	+
200	8"	2 x 219,1	2 x 6,3	45	560 x 6,0	30,51	+	+	+	630 x 6,6	33,02	+	+	+	710 x 6,9	36,05	+	+	+



The pipe is manufactured using conventional discontinuous production.

The casing pipe wall thickness is in accordance with EN 253, and the specified carrier pipe wall thicknesses correspond to DHP standards or the requirements of EN 253 / AGFW FW 401. These must be calculated for internal pressure according to DIN EN 13480.

The pipe ends are beveled at a 30° angle in preparation for welding (DIN EN ISO 9692-1). Uninsulated steel pipe ends are approximately 220 mm.



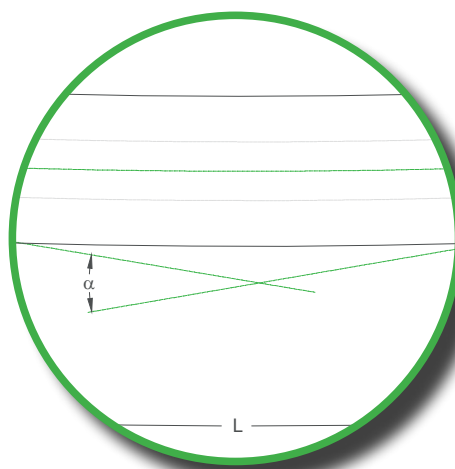
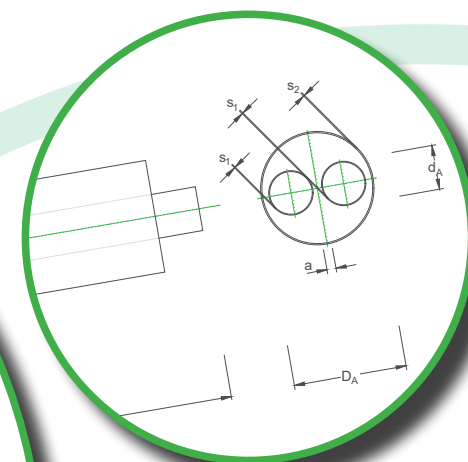
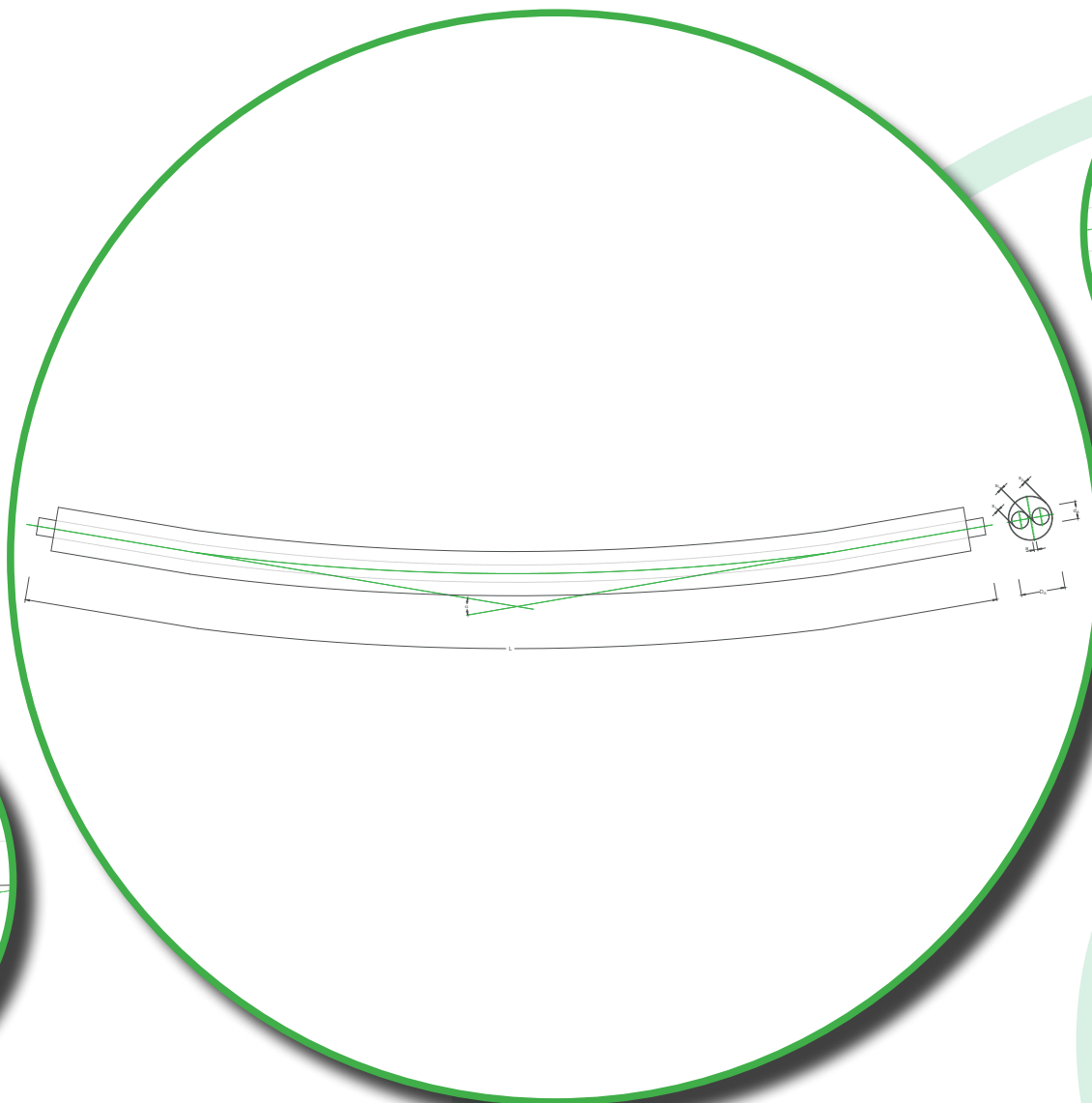
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Products Double

Curved pipe

L	Pipe length
d_A	Outer diameter Carrier pipe
D_A	Outer diameter Casing pipe
s_1	Wall thickness Carrier pipe
s_2	Wall thickness Casing pipe
a	Pipe distance

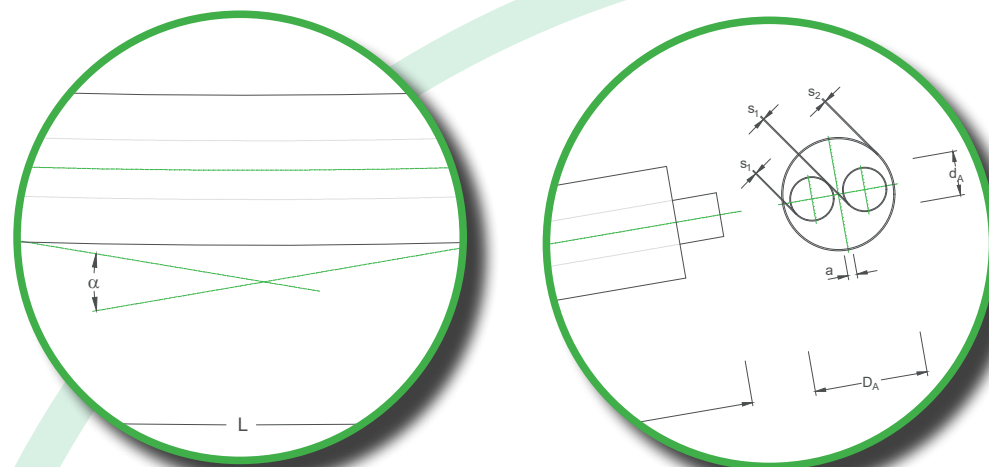


Products Double

Curved pipe

Discontinuous production - welded carrier pipe EN 253 / FW 401 or seamless

DN	Zoll	Carrier pipe d_A [mm]	EN 253			PEHD Casing pipe diameter $D_A \times s_2$ [mm]				Maximum bending angle α [°]
			FW 401 s_1 [mm]	EN 253 s_1 [mm]	seamless s_1 [mm]		Series 1	Series 2	Series 3	
50	2"	2 x 60,3	2,9	3,2	2,9	200 x 3,2	225 x 3,4	250 x 3,6		40,0
65	2 1/2"	2 x 76,1	2,9	3,2	2,9	225 x 3,4	250 x 3,6	280 x 3,9		36,0
80	3"	2 x 88,9	3,2	3,2	3,2	250 x 3,6	280 x 3,9	315 x 4,1		34,0
100	4"	2 x 114,3	3,6	3,6	3,6	200 x 3,2	225 x 3,4	250 x 3,6		28,0
125	5"	2 x 139,7	3,6	3,6	4,0	225 x 3,4	250 x 3,6	280 x 3,9		28,0
150	6"	2 x 168,3	4,0	4,0	4,5	250 x 3,6	280 x 3,9	315 x 4,1		25,0
200	8"	2 x 219,1	4,5	4,5	6,3	315 x 4,1	355 x 4,5	400 x 4,8		22,5



Factory production of DHP single pipe – curved pipes is only possible with a PEHD casing in 12 m pipe lengths and starting from nominal size DN 50. The values given in the table apply regardless of the PEHD casing pipe diameter (Insulation Series 1 to 3).

Curved pipes are machine-bent according to the route alignment and allowable bending angle, based on the instructions of the local site management. Returns of bent pipes are not accepted. When ordering, the bending angle and bending direction (left/right, depending on the route of the network monitoring) must be specified. If required, DHP determines these parameters.

For smaller dimensions, the natural deflection of the pipe lengths—caused by pipe length and weight—can be used to achieve directional changes. Additionally, it is possible to use 3°-mitred bends when welding pipe lengths together.

For nominal sizes DN 20 to DN 40, it is therefore sufficient to compensate route curves using site-formed curved pipes (elastic bending of a pipe length on site).



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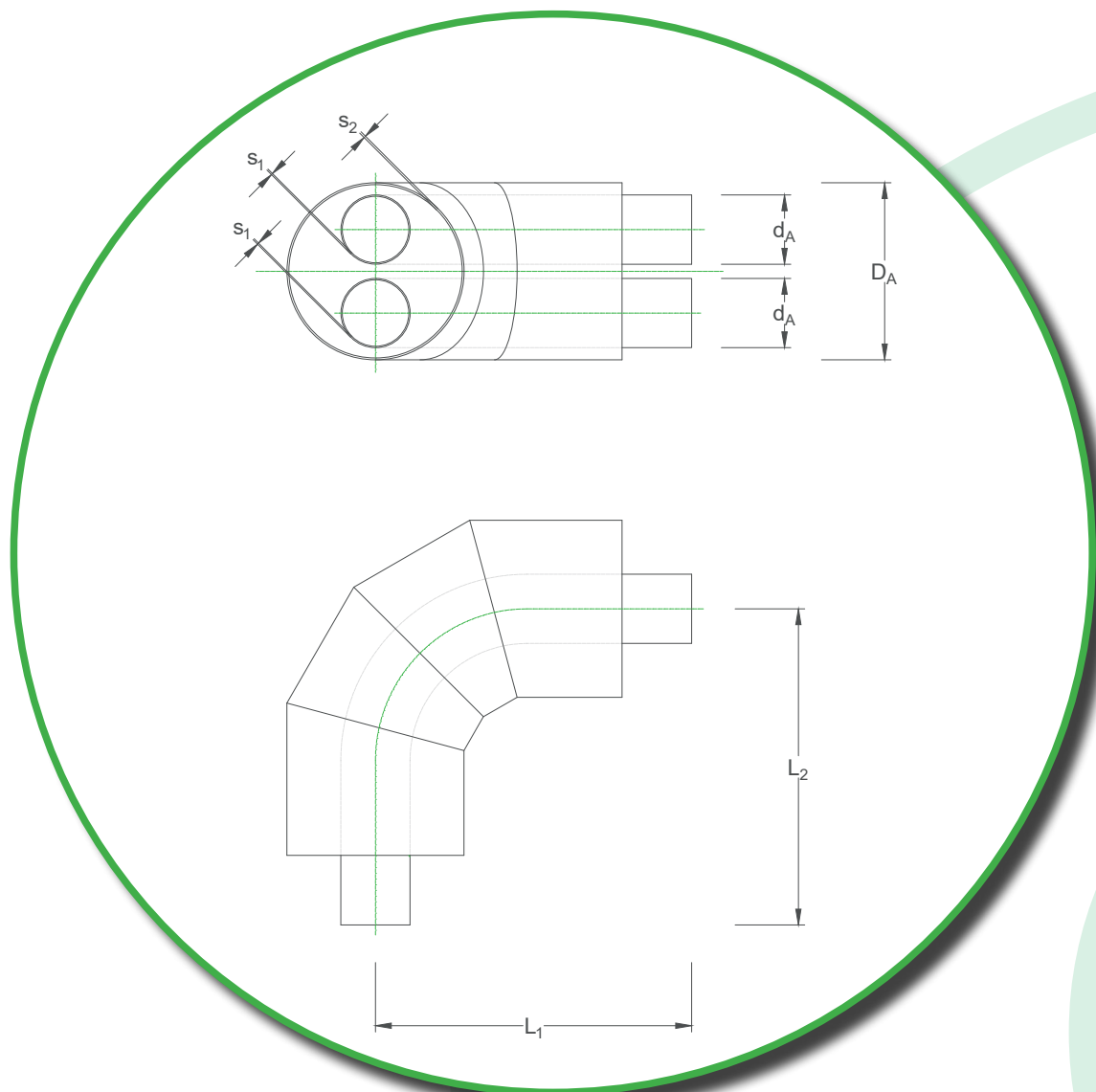
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Products Double

90° Elbow

Elbow, horizontal

L_1	Leg length 1
L_2	Leg length 2
d_A	Outer diameter Carrier pipe
D_A	Outer diameter Casing pipe
s_1	Wall thickness Carrier pipe
s_2	Wall thickness Casing pipe





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Products Double

90° Elbow

Elbow, horizontal

Bends are produced in two ways:

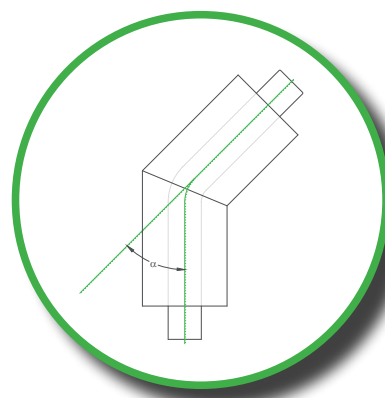
- With a carrier pipe bend according to DIN EN 10253-2 plus a weld-on cylinder. Available in all dimensions within the respective insulation Series.
The welds for the weld-on cylinder can be inspected using radiographic testing.

The pipe ends are beveled at a 30° angle in preparation for welding (DIN EN ISO 9692-1).

If special leg lengths or bend angles different from 90° (custom-degree bends) are required, the delivery possibility must be clarified in advance. For custom-degree bends, the additional angle $[\alpha]$ must be specified.

The specified steel wall thicknesses correspond to DHP wall thicknesses or the requirements of the standard. These must be calculated for internal pressure (DIN EN 13480).

Uninsulated steel pipe ends are approximately 220 mm, axis distance as carrier pipe bars.



- Depending on the dimension, one-piece bends are manufactured according to DIN EN 10220. Available in all dimensions in the respective insulation Series.

Carrier pipe			Carrier pipe elbow		Casing pipe diameter $D_A \times s_2$ [mm]			Leg length 1	Leg length 2
DN	Zoll	d_A [mm]	s_1 [mm]	r [mm]	Series 1	Series 2	Series 3	$L_1 \times L_2$ [mm]	$L_1 \times L_2$ [mm]
20	3/4"	26,9	2,0	110,0	125 x 3,0	140 x 3,0	160 x 3,0	1000 x 1000	on request
25	1"	33,7	2,3	110,0	140 x 3,0	160 x 3,0	180 x 3,0	1000 x 1000	on request
32	1 1/4"	42,4	2,6	110,0	160 x 3,0	180 x 3,0	200 x 3,2	1000 x 1000	on request
40	1 1/2"	48,3	2,6	110,0	160 x 3,0	180 x 3,0	200 x 3,2	1000 x 1000	on request
50	2"	60,3	2,9	135,0	200 x 3,2	225 x 3,4	250 x 3,6	1000 x 1000	on request
65	2 1/2"	76,1	2,9	175,0	225 x 3,4	250 x 3,6	280 x 3,9	1000 x 1000	on request
80	3"	88,9	3,2	205,0	250 x 3,6	280 x 3,9	315 x 4,1	1000 x 1000	on request
100	4"	114,3	3,6	270,0	315 x 4,1	355 x 4,5	400 x 4,8	1000 x 1000	on request
125	5"	139,7	3,6	330,0	400 x 4,8	450 x 5,2	500 x 5,6	1000 x 1000	on request
150	6"	168,3	4,0	390,0	450 x 5,2	500 x 5,6	560 x 6,0	1000 x 1000	on request
200	8"	219,1	4,5	510,0	560 x 6,0	630 x 6,6	710 x 6,9	1200 x 1200	on request

Horizontal double pipe elbows cannot be used as upward bends, as the carrier pipes in this system are arranged vertically (one above the other). Rotating a horizontal double pipe elbow upwards would result in the carrier pipes being positioned side by side.

Bends with a long leg are used where it is practical to weld bend to bend, thereby reducing the number of connection sleeves required, for example at a thermal expansion compensation (U-bend or Z-offset).



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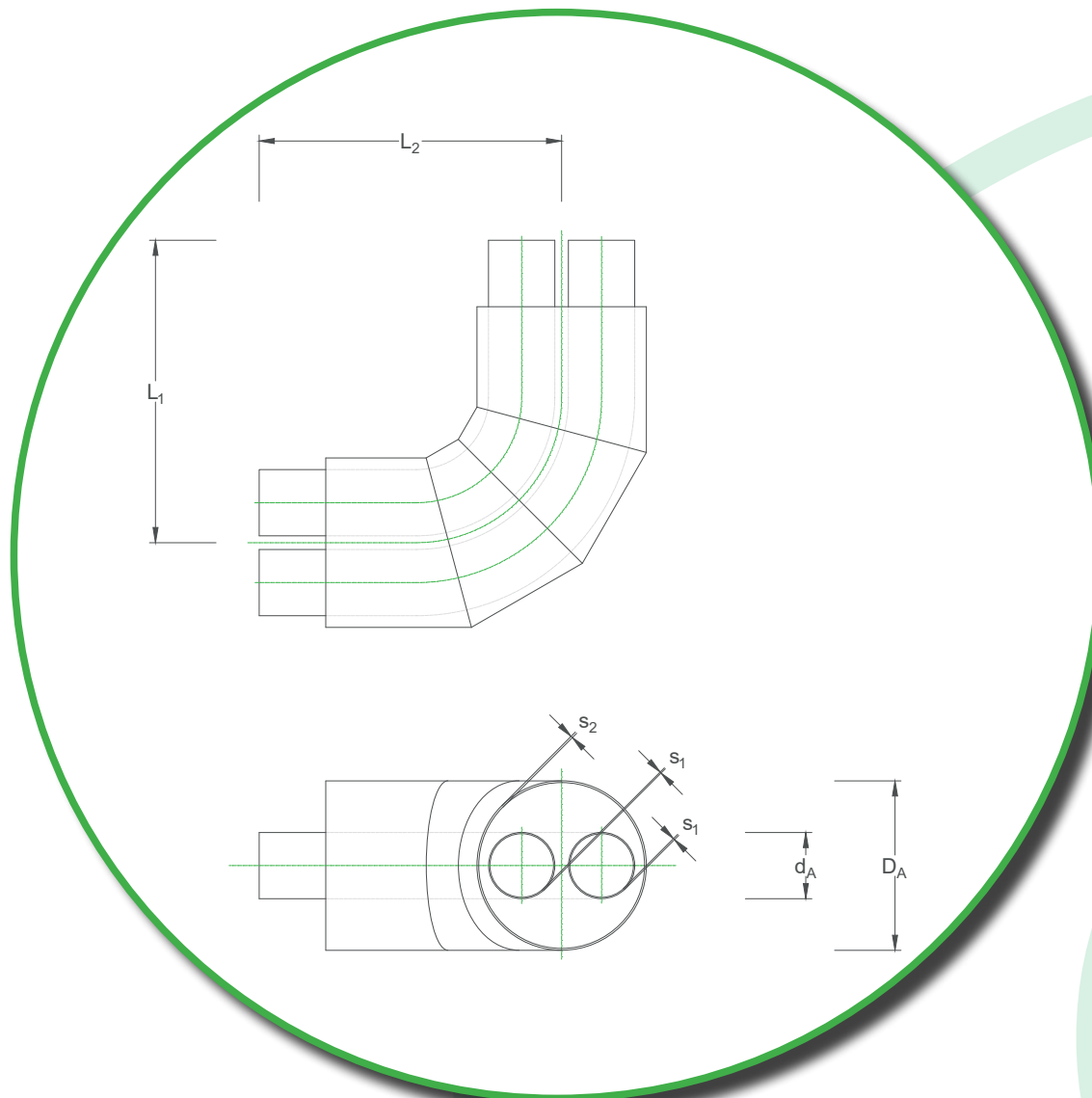
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Products Double

90° Elbow

Elbow, vertical

L_1	Leg length 1
L_2	Leg length 2
d_A	Outer diameter Carrier pipe
D_A	Outer diameter Casing pipe
s_1	Wall thickness Carrier pipe
s_2	Wall thickness Casing pipe





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Products Double

90° Elbow

Elbow, vertical

Bends are produced in two ways:

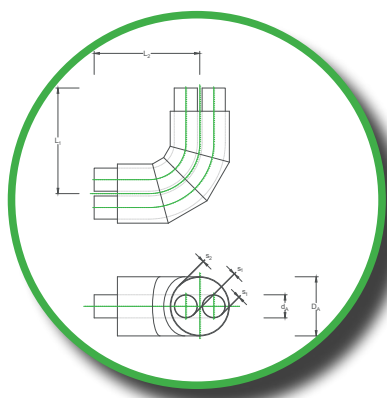
- With a carrier pipe bend according to DIN EN 10253-2 plus a weld-on cylinder. Available in all dimensions within the respective insulation Series.
- The welds for the weld-on cylinder can be inspected using radiographic testing.

The pipe ends are beveled at a 30° angle in preparation for welding (DIN EN ISO 9692-1).

If special leg lengths or bend angles different from 90° (custom-degree bends) are required, the delivery possibility must be clarified in advance. For custom-degree bends, the additional angle [α] must be specified.

The specified steel wall thicknesses correspond to DHP wall thicknesses or the requirements of the standard. These must be calculated for internal pressure (DIN EN 13480).

Uninsulated steel pipe ends are approximately 220 mm, axis distance as carrier pipe bars.



- Depending on the dimension, one-piece bends are manufactured according to DIN EN 10220.
- Available in all dimensions in the respective insulation Series.

Carrier pipe			Carrier pipe elbow		Casing pipe diameter D _A x s ₂ [mm]			Leg length 1	Leg length 2
DN	Zoll	d _A [mm]	s ₁ [mm]	r [mm]	Series 1	Series 2	Series 3	L ₁ x L ₂ [mm]	L ₁ x L ₂ [mm]
20	¾"	26,9	2,0	110,0	n.v.	140 x 3,0	160 x 3,0	1000 x 1000	on request
25	1"	33,7	2,3	110,0	n.v.	160 x 3,0	180 x 3,0	1000 x 1000	on request
32	1¼"	42,4	2,6	110,0	n.v.	180 x 3,0	200 x 3,2	1000 x 1000	on request
40	1½"	48,3	2,6	110,0	n.v.	180 x 3,0	200 x 3,2	1000 x 1000	on request
50	2"	60,3	2,9	135,0	n.v.	225 x 3,4	250 x 3,6	1000 x 1000	on request
65	2½"	76,1	2,9	175,0	n.v.	250 x 3,6	280 x 3,9	1000 x 1000	on request
80	3"	88,9	3,2	205,0	n.v.	280 x 3,9	315 x 4,1	1000 x 1000	on request
100	4"	114,3	3,6	270,0	n.v.	355 x 4,5	400 x 4,8	1000 x 1000	on request
125	5"	139,7	3,6	330,0	n.v.	450 x 5,2	500 x 5,6	1000 x 1000	on request
150	6"	168,3	4,0	390,0	n.v.	500 x 5,6	560 x 6,0	1000 x 1000	on request
200	8"	219,1	4,5	510,0	n.v.	630 x 6,6	710 x 6,9	1200 x 1200	on request

Vertical double pipe elbows are preferably used as components for upward offsets, for example in elevation changes or building entry bends (typically upwards).

For production-related reasons, vertical double pipe elbows cannot be insulated in Series 1.

Branch 90° / 90° Twin branch

Common

The nominal diameter and wall thickness of the base pipe (run) and the outlet pipe (branch) are consistent with the dimensions of the respective pipe lengths. Branches with a branch size equal to the run, or one dimension smaller than the run, are manufactured with a tee according to DIN 10253-2. For other dimensions, the base pipe is saddled. The welds can be inspected using radiographic testing.

Bends in the branch are produced in two ways:

- With a carrier pipe bend according to DIN EN 10253-2 plus a weld-on cylinder. Available in all dimensions within the respective insulation Series.

The welds for the weld-on cylinder can be inspected using radiographic testing.

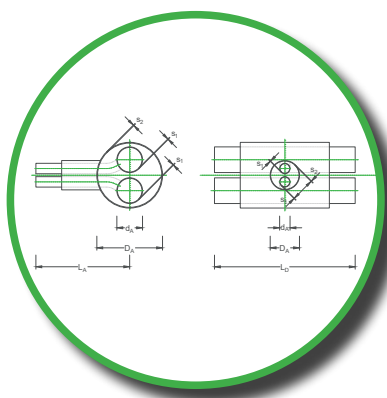
- Depending on the dimension, one-piece bends are manufactured according to DIN EN 10220.

The pipe ends are beveled at a 30° angle in preparation for welding (DIN EN ISO 9692-1).

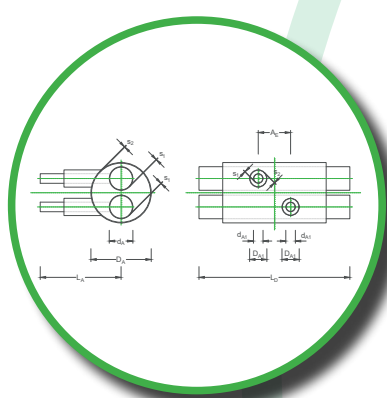
The specified steel wall thicknesses correspond to DHP wall thicknesses or the requirements of the standard. These must be calculated for internal pressure (DIN EN 13480).

Uninsulated steel pipe ends are approximately 220 mm.

Branch 90°



90° Twin branch



Application: 90° Twin branches are used when, in a double pipe system, single pipe service connections are required in the branch line.



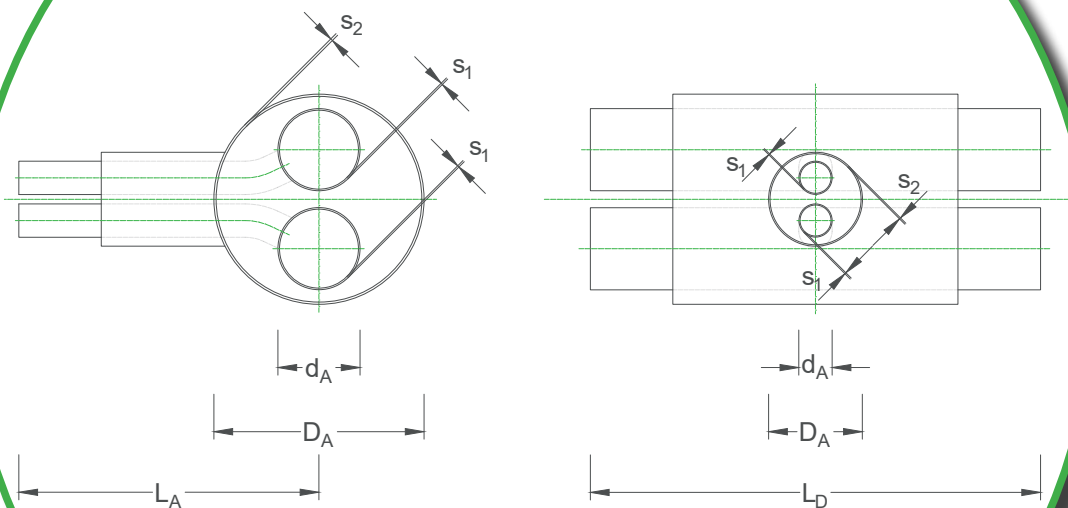
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Products Double

Branch 90°

L_D	Length Base pipe (Run)
L_A	Length Outlet pipe (Branch)
d_A	Outer diameter Medium pipe
D_A	Outer diameter Casing pipe
s_1	Wall thickness Medium pipe
s_2	Wall thickness Casing pipe
H	Axis distance (Height)

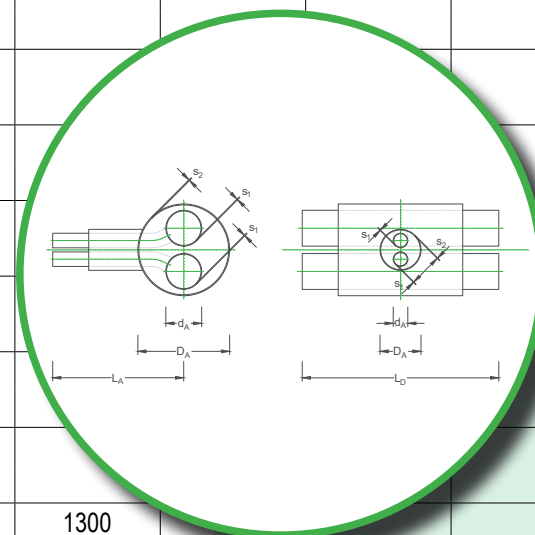


Products Double

Branch 90°

Insulation Series1

Base pipe					Branch outlet DN (d _A , s ₁ , s ₂ , D _A as dimension base pipe) / Component measurement											
					20	25	32	40	50	65	80	100	125	150	200	
					L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D
DN	Zoll	d _A	s ₁	D _A x s ₂	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	
20	¾	26,9	2,0	125 x 3,0	1200 550											
25	1	33,7	2,3	140 x 3,0	1200 600	1200 600										
32	1 1/4	42,4	2,6	160 x 3,0	1200 600	1200 600	1200 600									
40	1 1/2	48,3	2,6	160 x 3,0	1200 600	1200 600	1200 600	1200 600								
50	2	60,3	2,9	200 x 3,2	1200 600	1200 600	1200 600	1200 600	1200 600							
65	2 1/2	76,1	2,9	225 x 3,4	1200 650	1200 650	1200 650	1200 650	1200 650	1200 650						
80	3	88,9	3,2	250 x 3,6	1200 650	1200 650	1200 650	1200 650	1200 650	1200 650	1200 650					
100	4	114,3	3,6	315 x 4,1	1200 650	1200 650	1200 650	1200 650	1200 650	1200 650	1200 650	1300 650				
125	5	139,7	3,6	400 x 4,8	1200 700	1200 700	1200 700	1200 700	1200 700	1200 700	1200 700	1300 700	1300 700			
150	6	168,3	4,0	450 x 5,2	1200 700	1200 700	1200 700	1200 700	1200 700	1200 700	1200 700	1300 700	1300 700	1400 700		
200	8	219,1	4,5	560 x 6,0	1200 800	1200 800	1200 800	1200 800	1200 800	1200 800	1200 800	1300 800	1300 800	1400 800	1600 800	

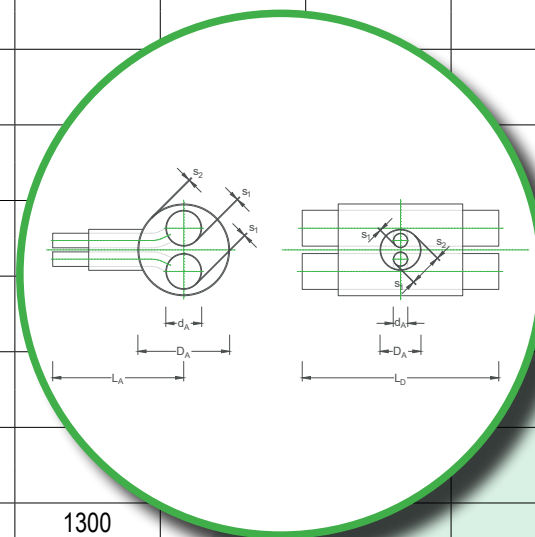


Products Double

Branch 90°

Insulation Series2

Base pipe					Branch outlet DN (d _A , s ₁ , s ₂ , D _A as dimension base pipe) / Component measurement											
					20	25	32	40	50	65	80	100	125	150	200	
					L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	
DN	Zoll	d _A	s ₁	D _A x s ₂	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	
20	¾	26,9	2,0	140 x 3,0	1200 550											
25	1	33,7	2,3	160 x 3,0	1200 600	1200 600										
32	1 1/4	42,4	2,6	180 x 3,0	1200 600	1200 600	1200 600									
40	1 1/2	48,3	2,6	180 x 3,0	1200 600	1200 600	1200 600	1200 600								
50	2	60,3	2,9	225 x 3,4	1200 600	1200 600	1200 600	1200 600	1200 600							
65	2 1/2	76,1	2,9	250 x 3,6	1200 650	1200 650	1200 650	1200 650	1200 650	1200 650						
80	3	88,9	3,2	280 x 3,9	1200 650	1200 650	1200 650	1200 650	1200 650	1200 650	1200 650					
100	4	114,3	3,6	355 x 4,5	1200 650	1200 650	1200 650	1200 650	1200 650	1200 650	1200 650	1300 650				
125	5	139,7	3,6	450 x 5,2	1200 700	1200 700	1200 700	1200 700	1200 700	1200 700	1200 700	1300 700	1300 700			
150	6	168,3	4,0	500 x 5,6	1200 700	1200 700	1200 700	1200 700	1200 700	1200 700	1200 700	1300 700	1300 700	1400 700		
200	8	219,1	4,5	630 x 6,6	1200 800	1200 800	1200 800	1200 800	1200 800	1200 800	1200 800	1300 800	1300 800	1400 800	1600 800	

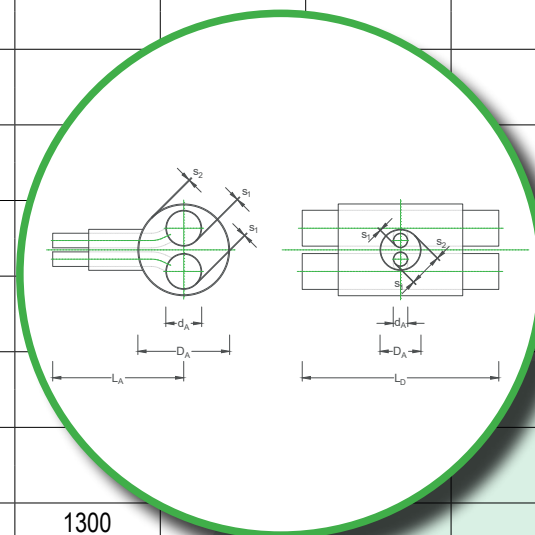


Products Double

Branch 90°

Insulation Series3

Base pipe					Branch outlet DN (d _A , s ₁ , s ₂ , D _A as dimension base pipe) / Component measurement											
					20	25	32	40	50	65	80	100	125	150	200	
					L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D	L _D
DN	Zoll	d _A	s ₁	D _A x s ₂	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	L _A	
20	¾	26,9	2,0	160 x 3,0	1200 550											
25	1	33,7	2,3	180 x 3,0	1200 600	1200 600										
32	1 1/4	42,4	2,6	200 x 3,2	1200 600	1200 600	1200 600									
40	1 1/2	48,3	2,6	200 x 3,2	1200 600	1200 600	1200 600	1200 600								
50	2	60,3	2,9	250 x 3,6	1200 600	1200 600	1200 600	1200 600	1200 600							
65	2 1/2	76,1	2,9	280 x 3,9	1200 650	1200 650	1200 650	1200 650	1200 650	1200 650						
80	3	88,9	3,2	315 x 4,1	1200 650	1200 650	1200 650	1200 650	1200 650	1200 650	1200 650					
100	4	114,3	3,6	400 x 4,8	1200 650	1200 650	1200 650	1200 650	1200 650	1200 650	1200 650	1300 650				
125	5	139,7	3,6	500 x 5,6	1200 700	1200 700	1200 700	1200 700	1200 700	1200 700	1200 700	1300 700	1300 700			
150	6	168,3	4,0	560 x 6,0	1200 700	1200 700	1200 700	1200 700	1200 700	1200 700	1200 700	1300 700	1300 700	1400 700		
200	8	219,1	4,5	710 x 6,9	1200 800	1200 800	1200 800	1200 800	1200 800	1200 800	1200 800	1300 800	1300 800	1400 800	1600 800	





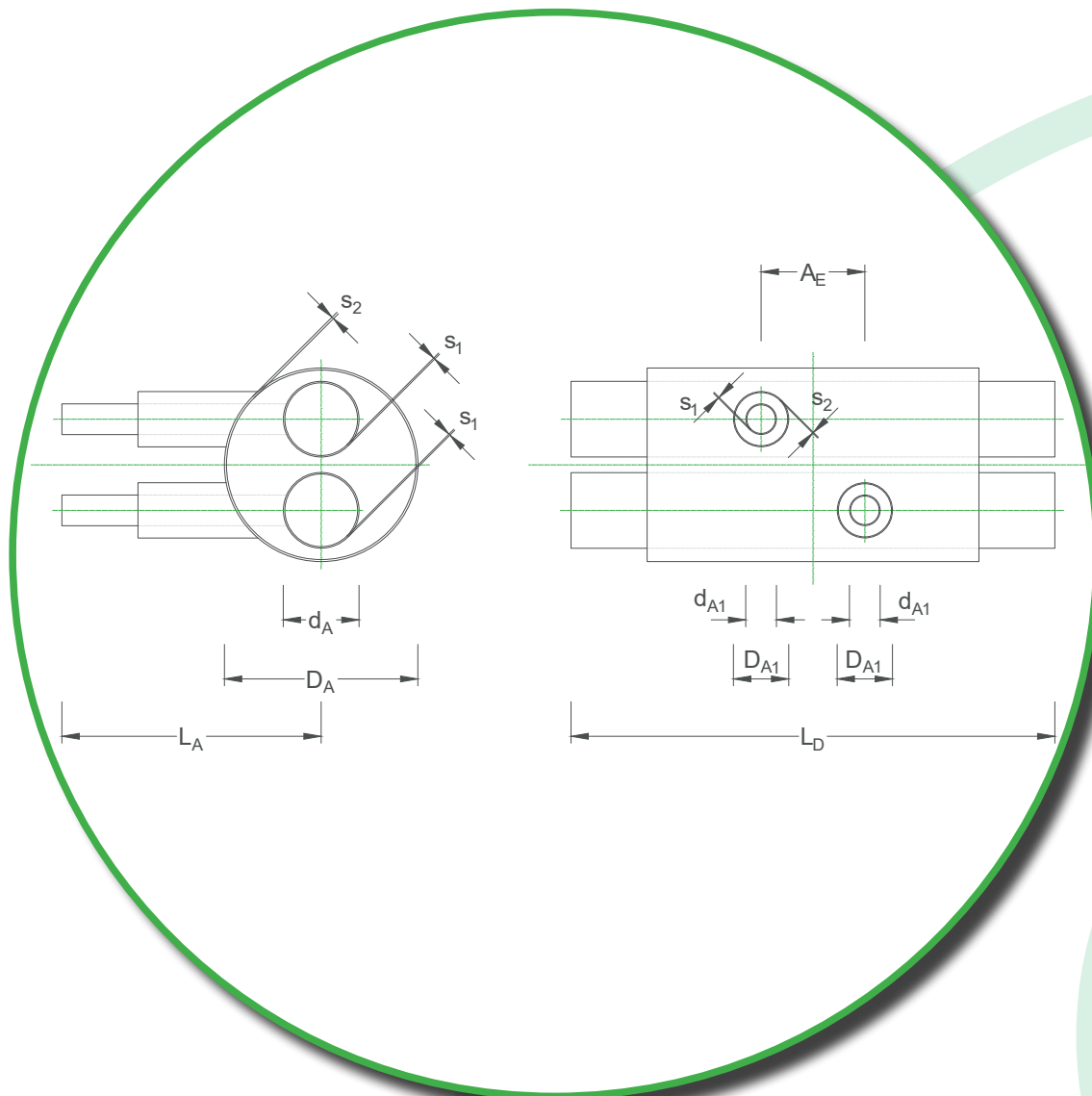
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Products Double

90° Twin branch

L_D	Length Base pipe (Run)
L_A	Length Outlet pipe (Branch)
d_A	Outer diameter Medium pipe
D_A	Outer diameter Casing pipe
d_{A1}	Outer diameter Medium pipe
d_{A2}	Outer diameter Casing pipe
s_1	Wall thickness Medium pipe
s_2	Wall thickness Casing pipe
A_E	Axis distance single pipe

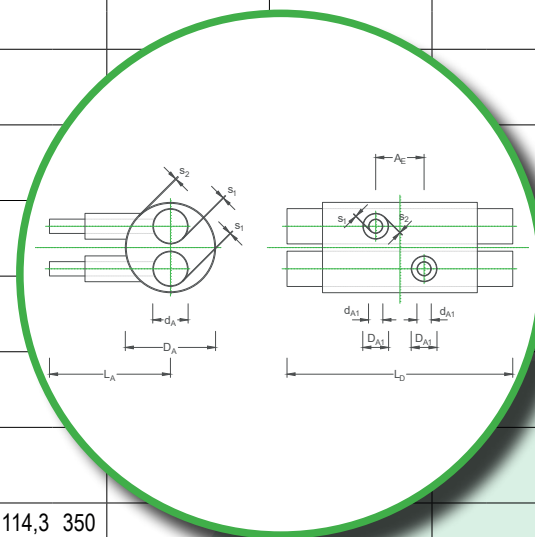


Products Double

90° Twin branch

Insulation Series1

Base pipe					Branch Outlet DN (s ₁ , s ₂ as Dimension Base pipe) / Component measurement																																		
					20			25			32			40			50			65			80			100			125			150			200				
					L _D	d _{A1}	A _E	L _D	d _{A1}	A _E	L _D	d _{A1}	A _E	L _D	d _{A1}	A _E	L _D	d _{A1}	A _E	L _D	d _{A1}	A _E	L _D	d _{A1}	A _E	L _D	d _{A1}	A _E	L _D	d _{A1}	A _E	L _D	d _{A1}	A _E	L _D	d _{A1}	A _E		
DN	Zoll	d _A	s ₁	D _A x s ₂	L _A	D _{A1}		L _A	D _{A1}		L _A	D _{A1}		L _A	D _{A1}		L _A	D _{A1}		L _A	D _{A1}		L _A	D _{A1}		L _A	D _{A1}		L _A	D _{A1}		L _A	D _{A1}		L _A	D _{A1}			
20	¾	26,9	2,0	125 x 3,0	1300 500	26,9 90	240																																
25	1	33,7	2,3	140 x 3,0	1300 500	26,9 90	240	1300 500	33,7 90	240																													
32	1¼	42,4	2,6	160 x 3,0	1300 500	26,9 90	240	1300 500	33,7 90	240	1300 500	42,4 110	240																										
40	1½	48,3	2,6	160 x 3,0	1300 550	26,9 90	240	1300 550	33,7 90	240	1300 550	42,4 110	240	1300 550	48,3 110	240																							
50	2	60,3	2,9	200 x 3,2	1300 550	26,9 90	240	1300 550	33,7 90	240	1300 550	42,4 110	240	1300 550	48,3 110	240	1300 550	60,3 125	240																				
65	2½	76,1	2,9	225 x 3,4	1300 550	26,9 90	240	1300 550	33,7 90	240	1300 550	42,4 110	240	1300 550	48,3 110	240	1300 550	60,3 125	240	1300 600	76,1 140	240																	
80	3	88,9	3,2	250 x 3,6	1300 550	26,9 90	240	1300 550	33,7 90	240	1300 550	42,4 110	240	1300 550	48,3 110	240	1300 600	60,3 125	240	1400 600	76,1 140	300	1400 600	88,9 160	300														
100	4	114,3	3,6	315 x 4,1	1300 600	26,9 90	240	1300 600	33,7 90	240	1300 600	42,4 110	240	1300 600	48,3 110	240	1300 600	60,3 125	240	1400 600	76,1 140	300	1400 600	88,9 160	300	1500 650	114,3 200	350											
125	5	139,7	3,6	400 x 4,8	1300 650	26,9 90	240	1300 650	33,7 90	240	1300 650	42,4 110	240	1300 650	48,3 110	240	1300 650	60,3 125	240	1400 650	76,1 140	300	1400 650	88,9 160	300	1500 650	114,3 200	350	1500 650	139,7 225	350								
150	6	168,3	4,0	450 x 5,2	1300 700	26,9 90	240	1300 700	33,7 90	240	1300 700	42,4 110	240	1300 700	48,3 110	240	1300 700	60,3 125	240	1400 700	76,1 140	300	1400 700	88,9 160	300	1500 700	114,3 200	350	1500 700	139,7 225	350	1600 700	168,3 250	350					
200	8	219,1	4,5	560 x 6,0	1300 750	26,9 90	240	1300 750	33,7 90	240	1300 750	42,4 110	240	1300 750	48,3 110	240	1300 750	60,3 125	240	1400 750	76,1 140	300	1400 750	88,9 160	300	1500 750	114,3 200	350	1500 750	139,7 225	350	1600 750	168,3 250	450	1700 750	219,1 315	450		





District Heating Pipes

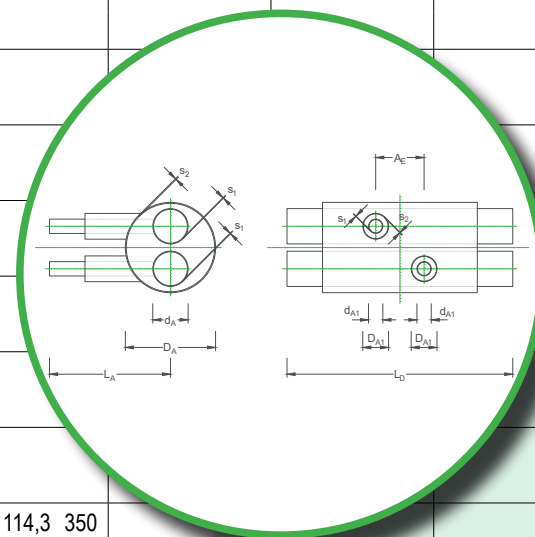
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Products Double

90° Twin branch

Insulation Series2

Base pipe					Branch Outlet DN (s ₁ , s ₂ as Dimension Base pipe) / Component measurement																																		
					20			25			32			40			50			65			80			100			125			150			200				
DN	Zoll	d _A	s ₁	D _A x s ₂	L _D	d _{A1}	A _E	L _D	d _{A1}	A _E	L _D	d _{A1}	A _E	L _D	d _{A1}	A _E	L _D	d _{A1}	A _E	L _D	d _{A1}	A _E	L _D	d _{A1}	A _E	L _D	d _{A1}	A _E	L _D	d _{A1}	A _E	L _D	d _{A1}	A _E	L _D	d _{A1}	A _E		
20	¾	26,9	2,0	140 x 3,0	1300	26,9	240																																
25	1	33,7	2,3	160 x 3,0	1300	26,9	240	1300	33,7	240																													
32	1¼	42,4	2,6	180 x 3,0	1300	26,9	240	1300	33,7	240	1300	42,4	240																										
40	1½	48,3	2,6	180 x 3,0	1300	26,9	240	1300	33,7	240	1300	42,4	240	1300	48,3	240																							
50	2	60,3	2,9	225 x 3,4	1300	26,9	240	1300	33,7	240	1300	42,4	240	1300	48,3	240	1300	60,3	240																				
65	2½	76,1	2,9	250 x 3,6	1300	26,9	240	1300	33,7	240	1300	42,4	240	1300	48,3	240	1300	60,3	240	1300	76,1	240																	
80	3	88,9	3,2	280 x 3,9	1300	26,9	240	1300	33,7	240	1300	42,4	240	1300	48,3	240	1300	60,3	240	1400	76,1	300	1400	88,9	300														
100	4	114,3	3,6	355 x 4,5	1300	26,9	240	1300	33,7	240	1300	42,4	240	1300	48,3	240	1300	60,3	240	1400	76,1	300	1400	88,9	300	1500	114,3	350											
125	5	139,7	3,6	450 x 5,2	1300	26,9	240	1300	33,7	240	1300	42,4	240	1300	48,3	240	1300	60,3	240	1400	76,1	300	1400	88,9	300	1500	114,3	350	1500	139,7	350								
150	6	168,3	4,0	500 x 5,6	1300	26,9	240	1300	33,7	240	1300	42,4	240	1300	48,3	240	1300	60,3	240	1400	76,1	300	1400	88,9	300	1500	114,3	350	1500	139,7	350	1600	168,3	350					
200	8	219,1	4,5	630 x 6,6	1300	26,9	240	1300	33,7	240	1300	42,4	240	1300	48,3	240	1300	60,3	240	1400	76,1	300	1400	88,9	300	1500	114,3	350	1500	139,7	350	1600	168,3	450	1700	219,1	450		

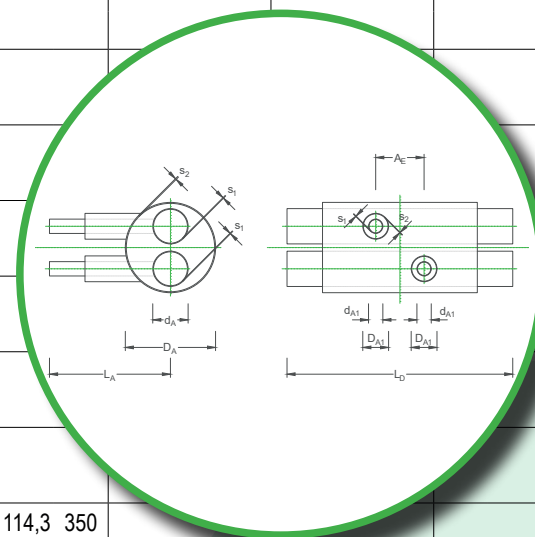


Products Double

90° Twin branch

Insulation Series3

Base pipe					Branch Outlet DN (s ₁ , s ₂ as Dimension Base pipe) / Component measurement																																						
					20			25			32			40			50			65			80			100			125			150			200								
					L _D	d _{A1}	A _E	L _D	d _{A1}	A _E	L _D	d _{A1}	A _E	L _D	d _{A1}	A _E	L _D	d _{A1}	A _E	L _D	d _{A1}	A _E	L _D	d _{A1}	A _E	L _D	d _{A1}	A _E	L _D	d _{A1}	A _E	L _D	d _{A1}	A _E	L _D	d _{A1}	A _E						
DN	Zoll	d _A	s ₁	D _A x s ₂	L _A	D _{A1}		L _A	D _{A1}		L _A	D _{A1}		L _A	D _{A1}		L _A	D _{A1}		L _A	D _{A1}		L _A	D _{A1}		L _A	D _{A1}		L _A	D _{A1}		L _A	D _{A1}		L _A	D _{A1}							
20	¾	26,9	2,0	160 x 3,0	1300 500	26,9 125	240																																				
25	1	33,7	2,3	180 x 3,0	1300 500	26,9 125	240	1300 500	33,7 125	240																																	
32	1¼	42,4	2,6	200 x 3,2	1300 500	26,9 125	240	1300 500	33,7 125	240	1300 500	42,4 140	240																														
40	1½	48,3	2,6	200 x 3,2	1300 550	26,9 125	240	1300 550	33,7 125	240	1300 550	42,4 140	240	1300 550	48,3 140	240																											
50	2	60,3	2,9	250 x 3,6	1300 550	26,9 125	240	1300 550	33,7 125	240	1300 550	42,4 140	240	1300 550	48,3 140	240	1300 550	60,3 160	240																								
65	2½	76,1	2,9	280 x 3,9	1300 550	26,9 125	240	1300 550	33,7 125	240	1300 550	42,4 140	240	1300 550	48,3 140	240	1300 550	60,3 160	240	1300 600	76,1 180	240																					
80	3	88,9	3,2	315 x 4,1	1300 550	26,9 125	240	1300 550	33,7 125	240	1300 550	42,4 140	240	1300 550	48,3 140	240	1300 600	60,3 160	240	1400 600	76,1 180	300	1400 600	88,9 200	300																		
100	4	114,3	3,6	400 x 4,8	1300 600	26,9 125	240	1300 600	33,7 125	240	1300 600	42,4 140	240	1300 600	48,3 140	240	1300 600	60,3 160	240	1400 600	76,1 180	300	1400 600	88,9 200	300	1500 650	114,3 250	350															
125	5	139,7	3,6	500 x 5,6	1300 650	26,9 125	240	1300 650	33,7 125	240	1300 650	42,4 140	240	1300 650	48,3 140	240	1300 650	60,3 160	240	1400 650	76,1 180	300	1400 650	88,9 200	300	1500 650	114,3 250	350	1500 650	139,7 280	350												
150	6	168,3	4,0	560 x 6,0	1300 700	26,9 125	240	1300 700	33,7 125	240	1300 700	42,4 140	240	1300 700	48,3 140	240	1300 700	60,3 160	240	1400 700	76,1 180	300	1400 700	88,9 200	300	1500 700	114,3 250	350	1500 700	139,7 280	350	1600 700	168,3 315	350									
200	8	219,1	4,5	710 x 6,9	1300 750	26,9 125	240	1300 750	33,7 125	240	1300 750	42,4 140	240	1300 750	48,3 140	240	1300 750	60,3 160	240	1400 750	76,1 180	300	1400 750	88,9 200	300	1500 750	114,3 250	350	1500 750	139,7 280	350	1600 750	168,3 315	450	1700 750	219,1 450	450						





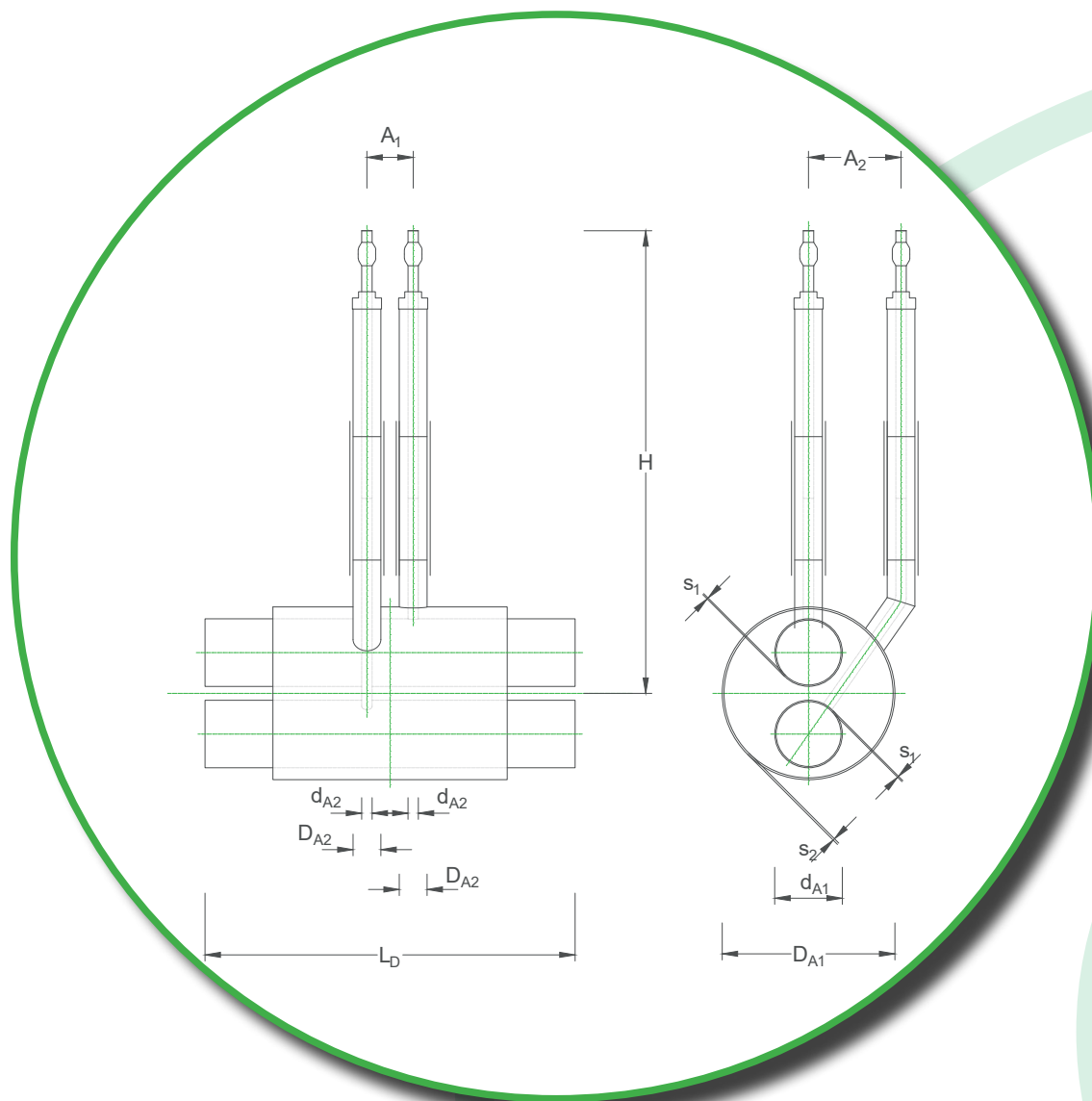
District Heating Pipes

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Products Double

Drain / Vent

L_D	Length Base pipe
d_A	Outer diameter Medium pipe
D_A	Outer diameter Casing pipe
s_1	Wall thickness Medium pipe
s_2	Wall thickness Casing pipe
H	Length Outlet pipe (Height, variable)
A_1	Axis distance (Longitudinal)
A_2	Axis distance (Lateral)



smart pipes, clever solutions

Products Double

Drain / Vent

Drain and vent assemblies are configured on site using a modular system. A drain/vent branch is a dedicated component in a double pipe system; a standard 90° branch cannot be used. For this purpose, a drain/vent pipe (Standard length 1m, shortable) is welded to a Drain / Vent branch. The drain connection is typically designed in DN 50, while the vent connection is usually DN 25, insulation series 1.

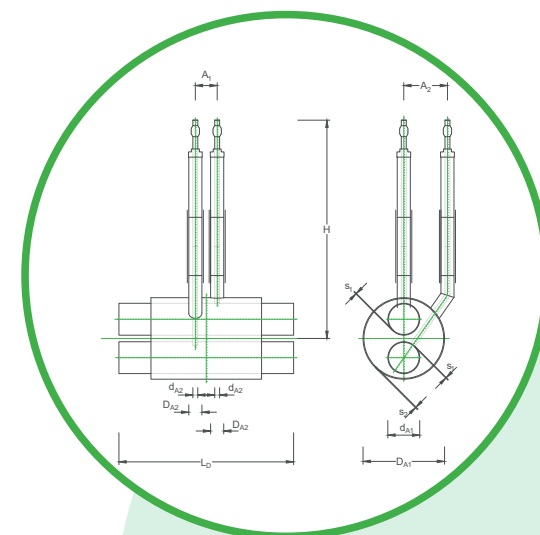
This approach offers the advantage that the installation height of the Drain / Vent ball valve can be precisely adapted to local conditions.

At the pipe end, a Drain / Vent ball valve (reduced bore, by others) with a stainless steel body and female threaded connection, including the corresponding sealing plug, can be installed. An end cap is located between the HDPE casing pipe end and the ball valve.

If the ball valve remains permanently in the closed position after installation, it should be operated once a year to prevent the seal from sticking to the ball.

Alternatively, the ball valve can be closed with a plug and left in the open position. This ensures that the seat rings and the ball are completely surrounded by water, providing lubrication of the seat rings and protecting the ball surface from deposits.

Manufacturer's recommendations must be observed!





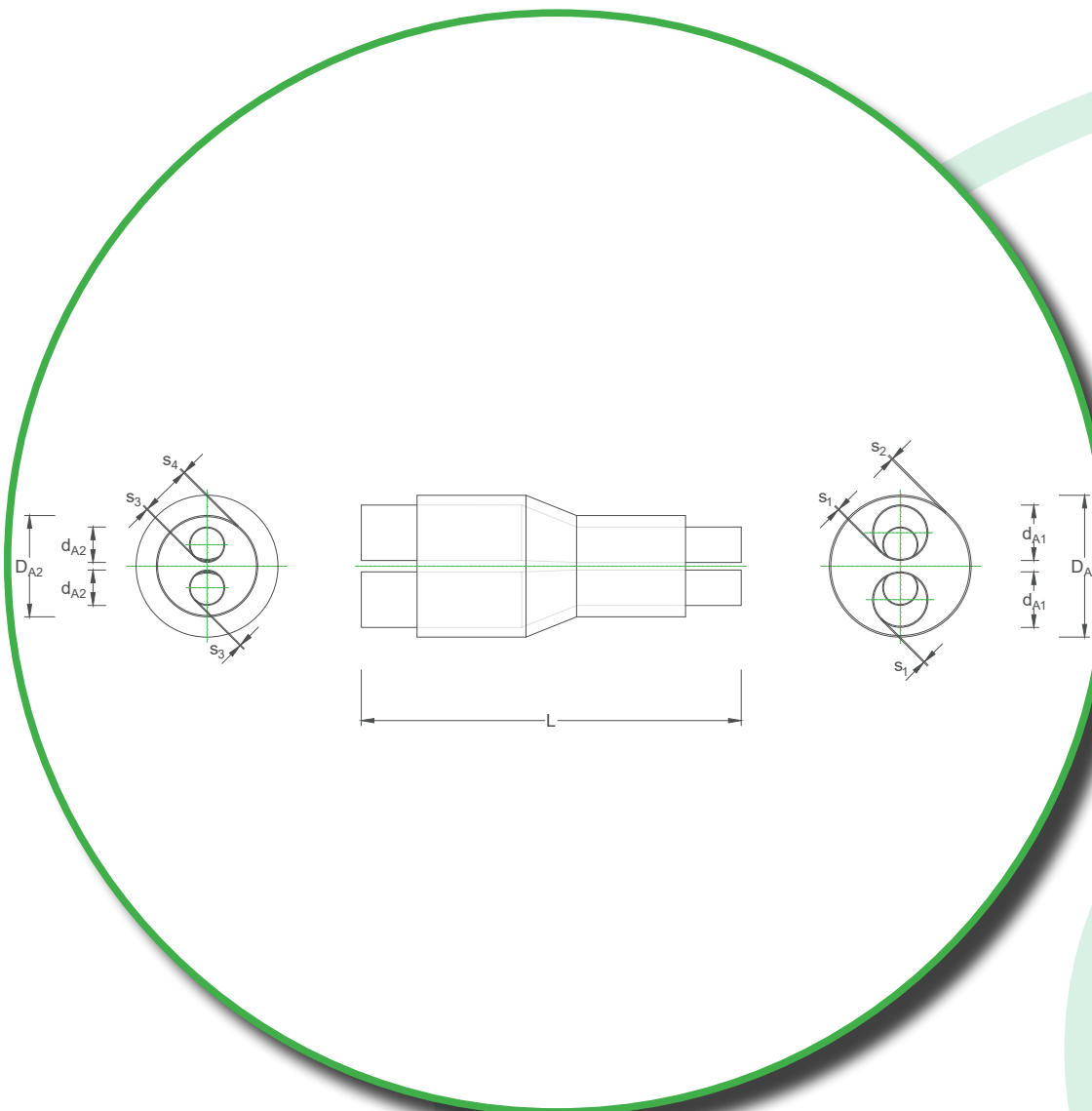
District Heating Pipes

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Products Double

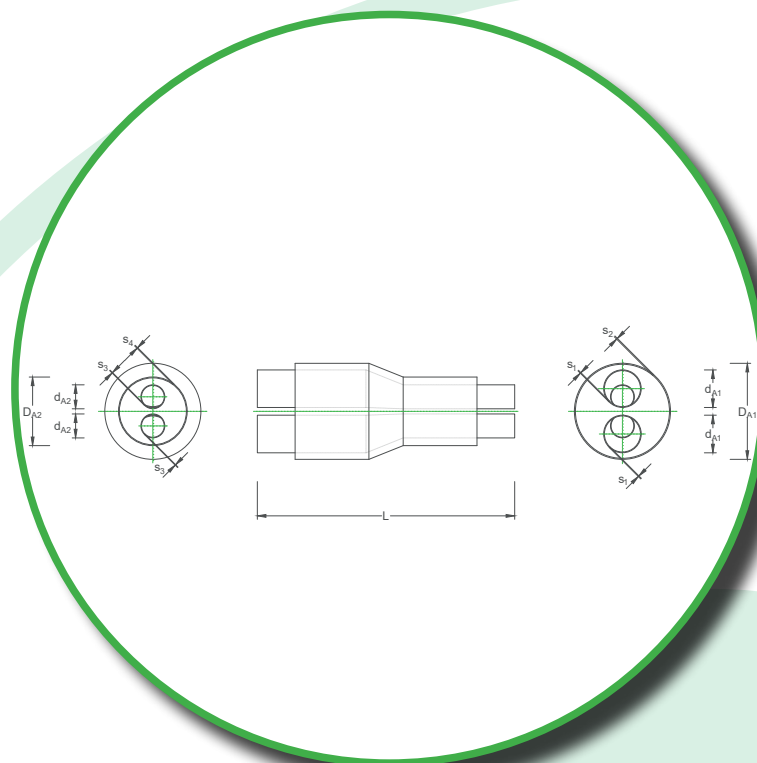
Reduction / Reducer

L	Length Base pipe
d_{A1}	Outer diameter Medium pipe
D_{A1}	Outer diameter Casing pipe
d_{A2}	Outer diameter Medium pipe
D_{A2}	Outer diameter Casing pipe
s_1	Wall thickness Medium pipe
s_2	Wall thickness Casing pipe
s_3	Wall thickness Medium pipe
s_4	Wall thickness Casing pipe



Reduction / Reducer

Component dimensions 1						Length L [mm]	Component dimensions 2					
Carrier pipe			Casing pipe / Insulation Series				Carrier pipe			Casing pipe / Insulation Series		
DN	d _{A1} [mm]	s ₁ [mm]	D _{A1} x s ₂ [mm]				DN	d _{A2} [mm]	s ₃ [mm]	D _{A2} x s ₄ [mm]		
			Series 1	Series 2	Series 3*					Serie 1	Series 2	Series 3*
25	2 x 33,7	2,3 / 2,6	140 x 3,0	160 x 3,0	180 x 3,0	1500	20	2 x 26,9	2,0 / 2,6	125 x 3,0	140 x 3,0	160 x 3,0
32	2 x 42,4	2,6 / 3,2	160 x 3,0	180 x 3,0	200 x 3,2	1500	25	2 x 33,7	2,3 / 2,6	140 x 3,0	160 x 3,0	180 x 3,0
							20	2 x 26,9	2,0 / 2,6	125 x 3,0	140 x 3,0	160 x 3,0
40	2 x 48,3	2,6 / 3,2	160 x 3,0	180 x 3,0	200 x 3,2	1500	32	2 x 42,4	2,6 / 3,2	160 x 3,0	180 x 3,0	200 x 3,2
							25	2 x 33,7	2,3 / 2,6	140 x 3,0	160 x 3,0	180 x 3,0
50	2 x 60,3	2,9 / 3,2	200 x 3,2	225 x 3,4	250 x 3,6	1500	40	2 x 48,3	2,6 / 3,2	160 x 3,0	180 x 3,0	200 x 3,2
							32	2 x 42,4	2,6 / 3,2	160 x 3,0	180 x 3,0	200 x 3,2
65	2 x 76,1	2,9 / 3,2	225 x 3,4	250 x 3,6	280 x 3,9	1500	50	2 x 60,3	2,9 / 3,2	200 x 3,2	225 x 3,4	250 x 3,6
							40	2 x 48,3	2,6 / 3,2	160 x 3,0	180 x 3,0	200 x 3,2
80	2 x 88,9	3,2	250 x 3,6	280 x 3,9	315 x 4,1	1500	65	2 x 76,1	2,9 / 3,2	225 x 3,4	250 x 3,6	280 x 3,9
							50	2 x 60,3	2,9 / 3,2	200 x 3,2	225 x 3,4	250 x 3,6
100	2 x 114,3	3,6	315 x 4,1	355 x 4,5	400 x 4,8	1500	80	2 x 88,9	3,2	250 x 3,6	280 x 3,9	315 x 4,1
							65	2 x 76,1	2,9 / 3,2	225 x 3,4	250 x 3,6	280 x 3,9
125	2 x 139,7	3,6	400 x 4,8	450 x 5,2	500 x 5,6	1500	100	2 x 114,3	3,6	315 x 4,1	355 x 4,5	400 x 4,8
							80	2 x 88,9	3,2	250 x 3,6	280 x 3,9	315 x 4,1
150	2 x 168,3	4,0	450 x 5,2	500 x 5,6	560 x 6,0	1500	125	2 x 139,7	3,6	400 x 4,8	450 x 5,2	500 x 5,6
							100	2 x 114,3	3,6	315 x 4,1	355 x 4,5	400 x 4,8
200	2 x 219,1	4,5	560 x 6,0	630 x 6,6	710 x 6,9	1500	150	2 x 168,3	4,0	450 x 5,2	500 x 5,6	560 x 6,0
							125	2 x 139,7	3,6	400 x 4,8	450 x 5,2	500 x 5,6



Reducers are installed to reduce the pipe diameter. Reduction is allowed over a maximum of two nominal sizes, as high earth pressure loads may occur at the reduction due to thermal expansion movements. The reducer must be padded at the casing pipe reduction to avoid such excessive earth pressure loads. The expansion pad is not included with the delivery of the reducer.

Pipe cylinders matching the pipe lengths. A carrier pipe reduction is provided by a concentric steel fitting according to DIN EN 10253-2 with welded pipe outlets. The pipe ends are beveled at a 30° angle in preparation for welding (DIN EN ISO 9692-1). Uninsulated steel pipe ends are approximately 220 mm.

ATTENTION: Reducers in insulation Series 3 are only available as custom-made items. Please clarify availability in advance if required.



District Heating Pipes

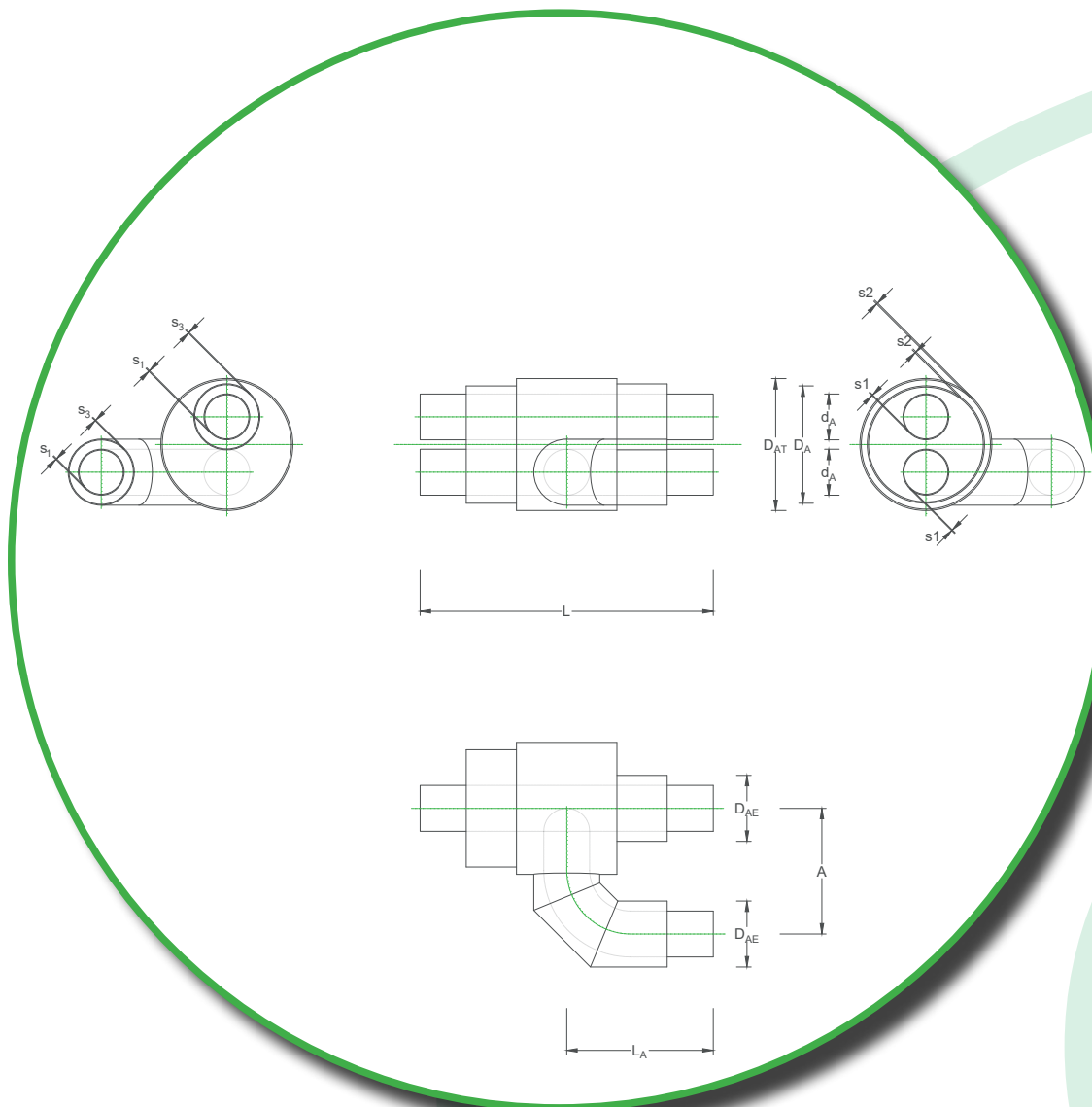
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Products Double

Breeches pipe

Variant 1

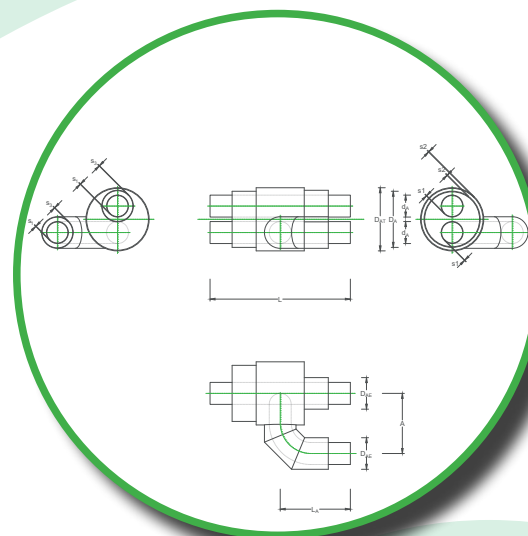
L	Length Base pipe
L_A	Length single pipe
d_A	Outer diameter Medium pipe
D_A	Outer diameter Casing pipe
D_{AT}	Outer diameter Casing pipe (Pot)
D_{AE}	Outer diameter Casing pipe (single pipe)
s_1	Wall thickness Medium pipe
s_2	Wall thickness Casing pipe
s_3	Wall thickness Casing pipe
A	Axis distance



Breeches pipe

Variant 1

Carrier pipe (Double/Single)			Double pipe						Single pipe					
DN	d _{A1} [mm]	s ₁ [mm]	Casing pipe D _A / D _{AT} x s ₂ [mm]						Casing pipe D _{AE} x s ₃ [mm]	A [mm]	L [mm]	L _A [mm]		
			D _A		D _{AT}		D _A						D _{AT}	
			Series 1		Series 2		Series 3							
20	2 x 26,9	2,0 / 2,6	125 x 3,0	140 x 3,0	140 x 3,0	140 x 3,0	160 x 3,0	160 x 3,0	90 x 3,0	240	1200	600		
25	2 x 33,7	2,3 / 2,6	140 x 3,0	160 x 3,0	160 x 3,0	160 x 3,0	180 x 3,0	180 x 3,0	90 x 3,0	240	1200	600		
32	2 x 42,4	2,6 / 3,2	160 x 3,0	180 x 3,0	180 x 3,0	180 x 3,0	200 x 3,2	200 x 3,2	110 x 3,0	260	1200	600		
40	2 x 48,3	2,6 / 3,2	160 x 3,0	180 x 3,0	180 x 3,0	180 x 3,0	200 x 3,2	200 x 3,2	110 x 3,0	260	1200	600		
50	2 x 60,3	2,9 / 3,2	200 x 3,2	225 x 3,4	225 x 3,4	225 x 3,4	250 x 3,6	250 x 3,6	125 x 3,0	275	1200	600		
65	2 x 76,1	2,9 / 3,2	225 x 3,4	250 x 3,6	250 x 3,6	250 x 3,6	280 x 3,9	280 x 3,9	140 x 3,0	290	1200	600		
80	2 x 88,9	3,2	250 x 3,6	280 x 3,9	280 x 3,9	280 x 3,9	315 x 4,1	315 x 4,1	160 x 3,0	360	1200	600		
100	2 x 114,3	3,6	315 x 4,1	355 x 4,5	355 x 4,5	355 x 4,5	400 x 4,8	400 x 4,8	200 x 3,2	400	1300	600		
125	2 x 139,7	3,6	400 x 4,8	400 x 4,8	450 x 5,2	450 x 5,2	500 x 5,6	500 x 5,6	225 x 3,4	425	1300	600		
150	2 x 168,3	4,0	450 x 5,2	500 x 5,6	500 x 5,6	500 x 5,6	560 x 6,0	560 x 6,0	250 x 3,6	450	1400	650		
200	2 x 219,1	4,5	560 x 6,0	630 x 6,6	630 x 6,6	630 x 6,6	710 x 6,9	710 x 6,9	315 x 4,1	615	1600	700		



Breeches pipes are used as transition pieces from the DHP double pipe system to a single pipe system. Pipe cylinders matching the pipe lengths.

The pipe ends are beveled at a 30° angle in preparation for welding (DIN EN ISO 9692-1). Uninsulated steel pipe ends are approximately 220 mm, axis distance as carrier pipe bars.

When placing an order, all medium pipe and casing pipe diameters must be specified. The installation orientation of the double pipe transition piece must also be observed. The installation conditions and pipe stress design must be taken into account.



District Heating Pipes

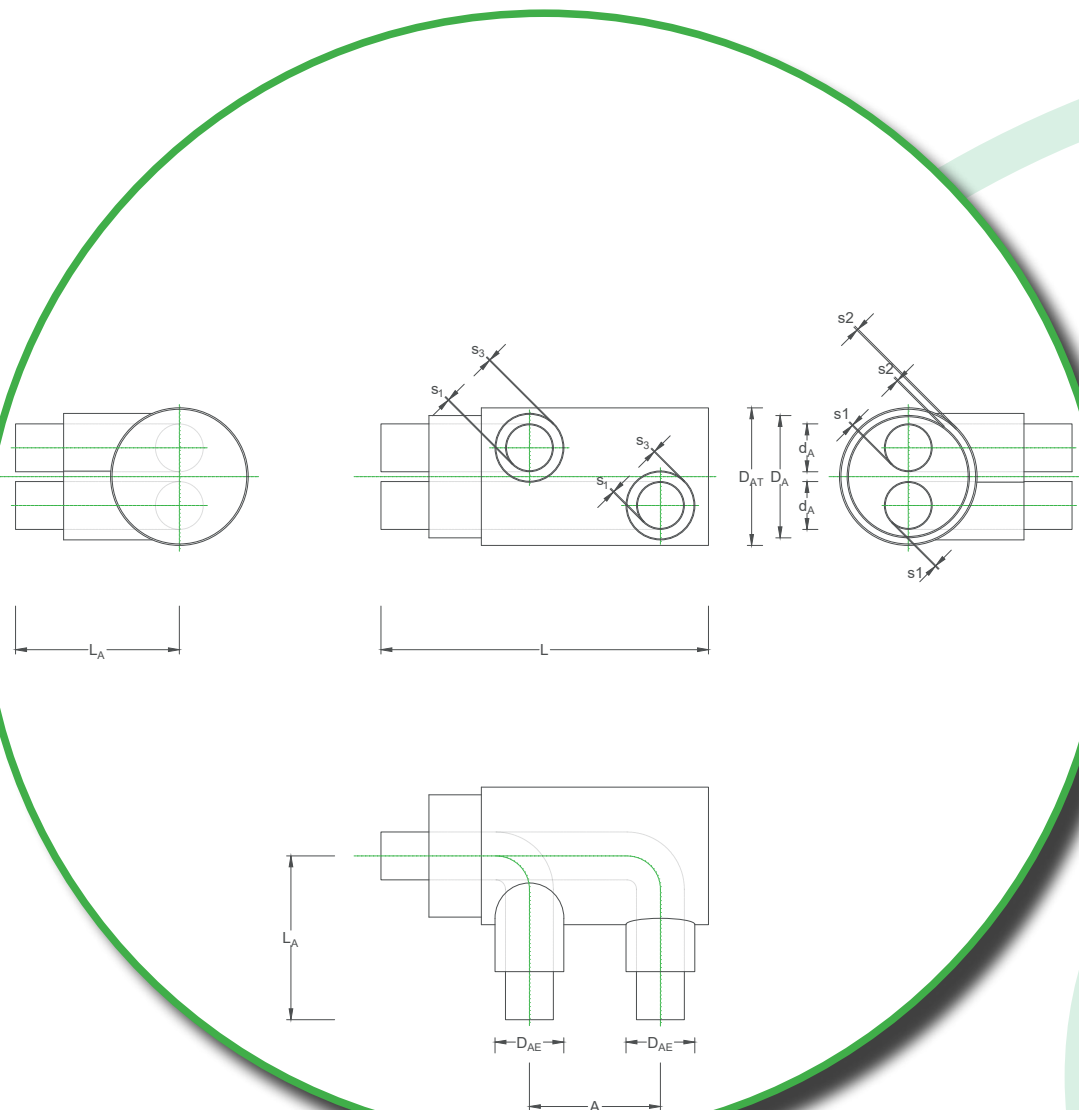
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Products Double

Breeches pipe

Variant 2

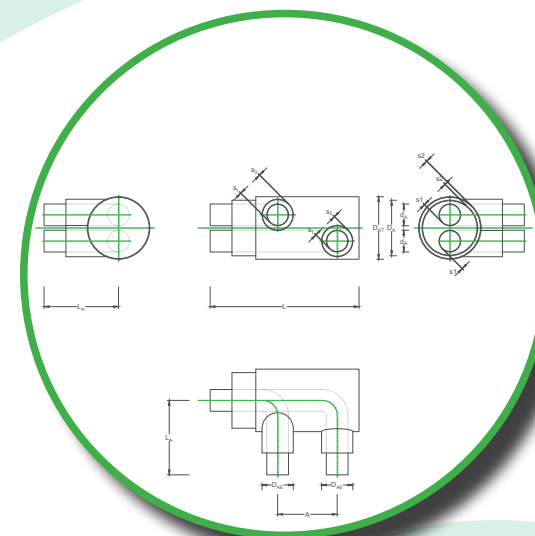
L	Length Base pipe
L_A	Length single pipe
d_A	Outer diameter Medium pipe
D_A	Outer diameter Casing pipe
D_{AT}	Outer diameter Casing pipe (Pot)
D_{AE}	Outer diameter Casing pipe (single pipe)
s_1	Wall thickness Medium pipe
s_2	Wall thickness Casing pipe
s_3	Wall thickness Casing pipe
A	Axis distance



Breeches pipe

Variant 2

Carrier pipe (Double/Single)			Double pipe						Single pipe					
DN	d _{A1} [mm]	s ₁ [mm]	Casing pipe D _A / D _{AT} x s ₂ [mm]						Casing pipe D _{AE} x s ₃ [mm]	A [mm]	L [mm]	L _A [mm]		
			D _A		D _{AT}		D _A						D _{AT}	
			Series 1		Series 2		Series 3							
20	2 x 26,9	2,0 / 2,6	125 x 3,0	140 x 3,0	140 x 3,0	140 x 3,0	160 x 3,0	160 x 3,0	90 x 3,0	240	1100	600		
25	2 x 33,7	2,3 / 2,6	140 x 3,0	160 x 3,0	160 x 3,0	160 x 3,0	180 x 3,0	180 x 3,0	90 x 3,0	240	1100	600		
32	2 x 42,4	2,6 / 3,2	160 x 3,0	180 x 3,0	180 x 3,0	180 x 3,0	200 x 3,2	200 x 3,2	110 x 3,0	260	1100	600		
40	2 x 48,3	2,6 / 3,2	160 x 3,0	180 x 3,0	180 x 3,0	180 x 3,0	200 x 3,2	200 x 3,2	110 x 3,0	260	1100	600		
50	2 x 60,3	2,9 / 3,2	200 x 3,2	225 x 3,4	225 x 3,4	225 x 3,4	250 x 3,6	250 x 3,6	125 x 3,0	275	1100	600		
65	2 x 76,1	2,9 / 3,2	225 x 3,4	250 x 3,6	250 x 3,6	250 x 3,6	280 x 3,9	280 x 3,9	140 x 3,0	290	1100	600		
80	2 x 88,9	3,2	250 x 3,6	280 x 3,9	280 x 3,9	280 x 3,9	315 x 4,1	315 x 4,1	160 x 3,0	360	1200	600		
100	2 x 114,3	3,6	315 x 4,1	355 x 4,5	355 x 4,5	355 x 4,5	400 x 4,8	400 x 4,8	200 x 3,2	400	1300	650		
125	2 x 139,7	3,6	400 x 4,8	400 x 4,8	450 x 5,2	450 x 5,2	500 x 5,6	500 x 5,6	225 x 3,4	425	1300	700		
150	2 x 168,3	4,0	450 x 5,2	500 x 5,6	500 x 5,6	500 x 5,6	560 x 6,0	560 x 6,0	250 x 3,6	450	1400	700		
200	2 x 219,1	4,5	560 x 6,0	630 x 6,6	630 x 6,6	630 x 6,6	710 x 6,9	710 x 6,9	315 x 4,1	615	1700	750		



Breeches pipes are used as transition pieces from the DHP double pipe system to a single pipe system. Pipe cylinders matching the pipe lengths.

The pipe ends are beveled at a 30° angle in preparation for welding (DIN EN ISO 9692-1). Uninsulated steel pipe ends are approximately 220 mm, axis distance as carrier pipe bars.

When placing an order, all medium pipe and casing pipe diameters must be specified. The installation orientation of the double pipe transition piece must also be observed. The installation conditions and pipe stress design must be taken into account.

Ball valve double pipe

System

DHP shut-off valves must be welded into the pipeline in the fully open position, like a straight pipe section. Installation within the legs of L-, Z-, or U-bends is not permitted due to the bending stresses that occur. The first closing operation may only be performed after the pipeline has been completely flushed. Intermediate positions should generally be avoided. Operation must be slow and controlled; the end stops must not be forcibly over-turned. Improper extensions or similar aids are not permitted.

Insulation

The insulation of the shut-off valves is carried out with rigid polyurethane (PUR) foam in accordance with EN 253. The PUR system consists of Component A (polyol, light) and Component B (isocyanate, dark).

DHP uses exclusively 100% CFC-free, cyclopentane-blown PUR foam. In addition to excellent thermal insulation properties, this ensures minimal environmental impact:

OExpansion pad (Ozone Depletion Potential) = 0, GWP (Global Warming Potential) < 0.001.

Casing pipe

PEHD (High-Density Polyethylene) is a seamless extruded, impact- and fracture-resistant, tough-elastic polyethylene suitable for use down to -50 °C, and it meets the general quality requirements of DIN 8075. For optimal adhesion to the rigid PUR foam, the material is corona-treated in accordance with EN 253.

Dimensions and wall thicknesses comply at least with EN 253. The melt flow index (MFI group) is tested according to DIN 53735 or ISO 1133. PEHD is a proven material that has been successfully used for many years in plastic casing pipe systems (KMR).

Due to its high chemical resistance to almost all substances found in soil, PEHD is particularly suitable as a casing pipe for direct burial. National and international standards and guidelines list PEHD as the only material for casing pipes in the KMR composite system.

PEHD is also highly weather- and UV-resistant. DHP uses exclusively PE materials with integrated light stabilizers. As required by EN 253, UV protection is provided by the addition of special, very fine carbon black types (2.5 ± 0.5 wt %).

The excellent welding characteristics of PEHD ensure maximum safety and quality at the welds of molded parts. PEHD bend segments are butt-welded using mirror welding devices, while fillet welds at branch outlets are executed using extruder welding equipment.



District Heating Pipes

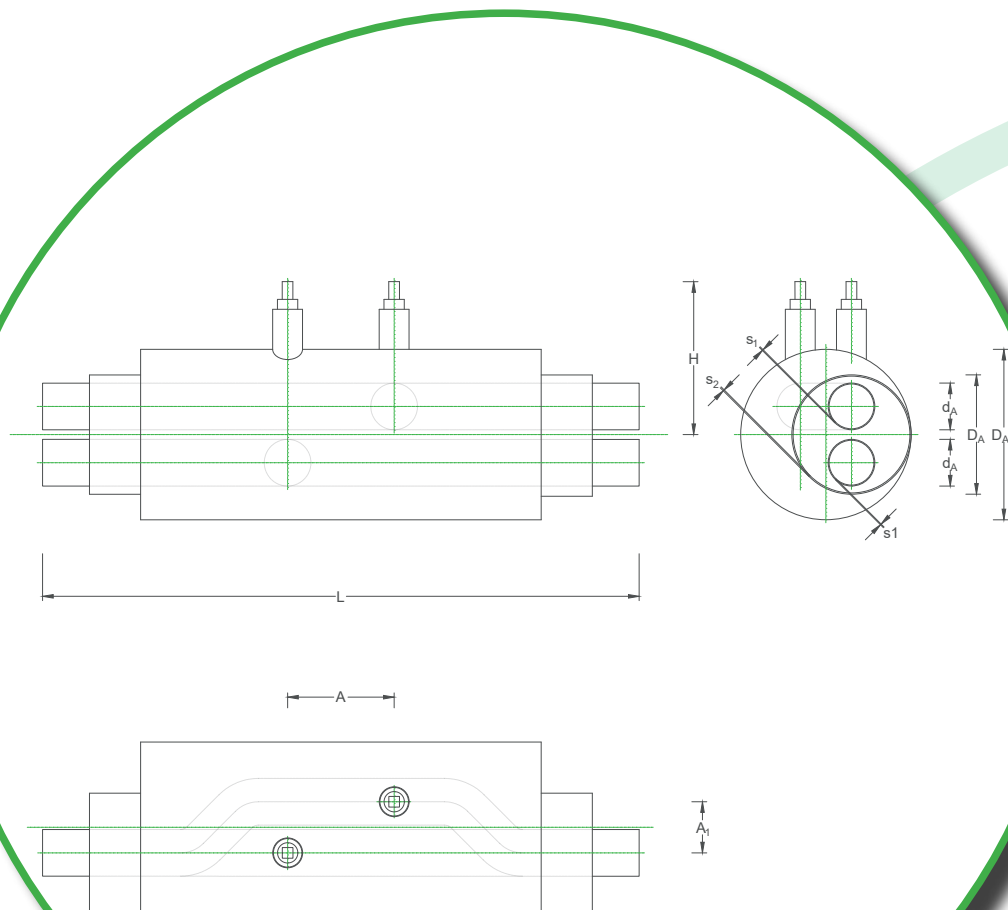
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Products Double

Ball valve double pipe

Valve Standard

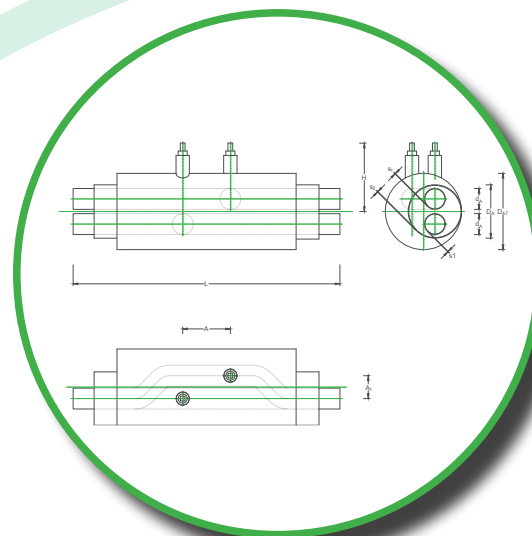
L	Length Base pipe
d_A	Outer diameter Medium pipe
D_A	Outer diameter Casing pipe
D_{AT}	Outer diameter Casing pipe (Pot)
s_1	Wall thickness Medium pipe
s_2	Wall thickness Casing pipe
A	Axis distance
A_1	Axis distance
H	Length service chamber (Height)



Ball valve double pipe

Valve Standard

Carrier pipe				Casing pipe $D_A / D_{AT} \times s_2$ [mm] / Insulation Series						A [mm]	A_1 [mm]	H [mm]	L [mm]
DN	Zoll	d_A [mm]	s_1 [mm]										
				D_A	D_{AT}	D_A	D_{AT}	D_A	D_{AT}				
				Series 1		Series 2		Series 3					
25	1"	2 x 33,7	2,3 / 2,6	140 x 3,0	200 x 3,2	160 x 3,0	225 x 3,4	180 x 3,0	250 x 3,6	250	125	480	2500
32	1¼"	2 x 42,4	2,6 / 3,2	160 x 3,0	225 x 3,4	180 x 3,0	250 x 3,6	200 x 3,2	280 x 3,9	250	125	485	2500
40	1½"	2 x 48,3	2,6 / 3,2	160 x 3,0	225 x 3,4	180 x 3,0	250 x 3,6	200 x 3,2	280 x 3,9	250	125	495	2500
50	2"	2 x 60,3	2,9 / 3,2	200 x 3,2	280 x 3,9	225 x 3,4	315 x 4,1	250 x 3,6	355 x 4,5	250	125	500	2500
65	2½"	2 x 76,1	2,9 / 3,2	225 x 3,4	315 x 4,1	250 x 3,6	355 x 4,5	280 x 3,9	400 x 4,8	250	125	505	2500
80	3"	2 x 88,9	3,2	250 x 3,6	355 x 4,5	280 x 3,9	400 x 4,8	315 x 4,1	450 x 5,2	250	125	515	2500
100	4"	2 x 114,3	3,6	315 x 4,1	450 x 5,2	355 x 4,5	500 x 5,6	400 x 4,8	560 x 6,0	250	125	525	2500
125	5"	2 x 139,7	3,6	400 x 4,8	560 x 6,0	450 x 5,2	560 x 6,0	500 x 5,6	630 x 6,6	300	150	545	2500
150	6"	2 x 168,3	4,0	450 x 5,2	630 x 6,6	500 x 5,6	630 x 6,6	560 x 6,0	800 x 7,2	300	150	565	2800
200	8"	2 x 219,1	4,5	560 x 6,0	800 x 7,2	630 x 6,6	800 x 7,2	710 x 6,9	900 x 8,7	500	250	585	3000



Carrier pipe according to EN 488, the pipe ends are beveled at a 30° angle in preparation for welding (DIN EN ISO 9692-1). Uninsulated steel pipe ends are approximately 220 mm.

The specified component dimensions refer to the standard product used by DHP. Other available types and alternative dimensions are available upon request.

In general, the operation of the shut-off valves must be carried out using the gear mechanism, stem extension, or manufacturer-specific accessories of the respective ball valve model.

Therefore, when ordering, the exact type designation and the intended mode of operation must be specified as binding.

Standard version: reduced base pipe. Valves with a full base pipe are available as custom components.

Due to the manufacturer, the dimensions H and L may vary slightly. Protective cover pipes are available in various versions but are not included with the delivery of shut-off valves and must be ordered separately.



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Products Double

Ball valve double pipe

PEHD Protective Cover Pipe (Slip-On Type)

Protective pipes are preferably integrated into DIN road caps or manhole rings. The design depends on the nominal diameter and project-specific requirements. Dimensions and special versions (e.g. with screw cap closure) are available upon request.

The protective pipe, including protective cap and internal PE laminate (centering aid), is not included in the scope of delivery of shut-off or combination valves and must be ordered separately.

Delivery length: 1.50 m (standard). Adjustment to the required cover height is carried out on site.

Stem Extension

When installing shut-off valves at greater burial depths, stem extensions must be provided.

The scope of delivery of a stem extension includes a conical square socket for accommodating the standard dome or square protector of the valve. The upper end of the extension is likewise designed with a square protector.

The design and type of stem extension depend on the dimension and manufacturer of the shut-off valve.

Standard lengths: 0.50 m, 1.00 m, and 1.50 m. Special versions are available upon request.

T-Wrench / Gear Operator

Depending on the nominal diameter, shut-off valves are operated using a T-wrench. From DN 150 upwards, the use of a gear operator is recommended or permitted.

The T-wrench is supplied in the standard length of 1.00 m with a conical square socket. Unauthorized extensions of the lever arm to increase torque are not permitted.

Gear operators must be mounted vertically on the valve. Depending on the valve type, different gear versions are available, possibly using additional accessories (e.g. slip-on flange).

Non-type-approved torque multipliers are not permitted. Plug-in and planetary gearboxes, electric actuators, and further accessories are available upon request.

Casing pipe - Sleeves

Common

Various sleeve designs are available to meet different technical requirements. All PEHD joint sleeves ensure a mechanically secure, gas- and watertight casing pipe connection. Sliding the sleeves into position prior to welding is the responsibility of the pipe installer.

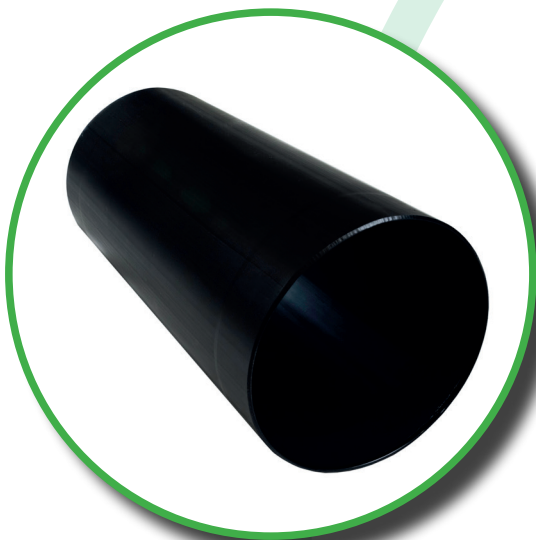
All sleeves are made of PEHD pipes. Special lengths are available upon request, for example for the subsequent insulation of weld joints on uninsulated spool pieces.

The insulation and sealing of all sleeve types may only be carried out by certified and trained specialist personnel.

Shrink Sleeves

The manually activated shrink sleeves used with the various sleeve types are made of heat-shrinkable, molecularly cross-linked and modified polyolefin with a sealing adhesive system in the form of a visco-elastic sealing zone.

This type of sleeve is resistant to thermal aging, weathering, chemical exposure, UV radiation, and soil alkalis.





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Products - Sleeves

Casing pipe - Sleeves

Non-crosslinked shrink sleeve

The non-crosslinked, PE-weldable shrink sleeve joint is a double-sealing system consisting of a one-piece, heat-shrinkable PEHD pipe, two shrink sleeves for sealing at the transitions to the casing pipe and two PE welding plugs.

During production, the sleeve is thermally expanded and, during installation, shrunk back to its original diameter using a soft gas flame (memory effect). Before the first shrinking process, a butyl rubber sealing tape is inserted between the sleeve and the casing pipe; during shrinking, this provides the primary seal.

Before foaming, the sleeve is subjected to an air pressure test of 0.2 bar and checked with a suitable indicator fluid; the results must be documented. After foaming, the second seal is achieved via the shrink sleeves. The foam filling and vent holes are closed with PE plugs.

Application range: suitable for pipeline networks with increased operating conditions and demanding soil conditions (groundwater, pressurized water).

Approved according to EN 489 in the sandbox sliding test with 100 cycles.

Available as: Joint sleeve, long sleeve, reducer sleeve, double reducer sleeve, end sleeve

Diameter: from outer diameter $D_a \geq 90$ mm up to a maximum of $D_a = 800$ mm

Delivery length: Standard = 700 mm



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Products - Sleeves

Casing pipe - Sleeves

Non-crosslinked shrink sleeve as reducer sleeve

Reducer shrink sleeves are used as transitions at carrier pipe reductions between different casing pipe diameters. A corresponding reducer ring is located in the center of the sleeve. The carrier pipe reduction itself is part of the pipeline contractor's scope of work.

In order to avoid impermissibly high frontal earth pressure loads caused by axial thermal expansion in preheated and directly buried PE casing pipes, the reduction should be limited to a maximum of two nominal sizes. Within the anchor section of a thermally pre-stressed pipeline, only one size step is generally permitted.

The sleeve must be padded circumferentially at the reducer ring using expansion pads; these are not included in the scope of delivery of the reducer shrink sleeve.

Application range: as non-crosslinked shrink sleeve

Available as: non-crosslinked shrink sleeve

Diameter: from outer diameter $D_a \geq 90$ mm up to a maximum of $D_a = 800$ mm

Delivery length: Standard = 1000 mm, other length on request



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Products - Sleeves

Casing pipe - Sleeves

Non-crosslinked shrink sleeve as double reducer sleeve

Double reducer shrink sleeves are used for the subsequent insulation of uninsulated components whose outer diameter is larger than that of the carrier pipe. By means of two reducer rings, the sleeve is expanded in the center so that the required insulation Series can be maintained for special components.

To prevent impermissibly high frontal earth pressure loads caused by axial thermal expansion in preheated and directly buried PE casing pipes, the reduction should be limited to a maximum of two nominal sizes. Within the anchor section of a thermally pre-stressed pipeline, only one size step is generally permitted.

The sleeve must be circumferentially padded at the reducer rings using expansion pads; these are not included in the scope of delivery of the double reducer shrink sleeve.

Application range: as non-crosslinked shrink sleeve

Available as: non-crosslinked shrink sleeve

Diameter: from outer diameter $D_a \geq 90$ mm up to a maximum of $D_a = 800$ mm

Delivery length: Standard = 1000 mm, other length on request



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Products - Sleeves

Casing pipe - Sleeves

Non-crosslinked shrink sleeve als end sleeve

Shrink end sleeves are used as a temporary termination for blind-ending pipes. For this purpose, the sleeve end is closed with a blind cover. Before foaming, the carrier pipe end must be tightly sealed with a dished end, pipe cap, or similar component. Pipe caps or dished ends are part of the pipeline contractor's scope of work.

To prevent impermissibly high frontal earth pressure loads caused by axial expansion in preheated and directly buried PE casing pipes, the blind cover must always be padded with an expansion pad. The expansion pad is not included in the scope of delivery of the end sleeve.

The scope of delivery includes only one shrink sleeve as a non-crosslinked shrink sleeve.

Application range: as non-crosslinked shrink sleeve

Available as: non-crosslinked shrink sleeve

Diameter: outer diameter from $D_a \geq 90$ mm up to a maximum of $D_a = 800$ mm

Delivery length: Standard = 700 mm, other length on request



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Products - Sleeves

Casing pipe - Sleeves

Crosslinked shrink sleeve

The crosslinked, self-sealing shrink sleeve joint consists of a one-piece, heat-shrinkable PEHD pipe and two PE welding plugs each. After extrusion, the sleeve body is radiation crosslinked, giving the material high-performance characteristics in terms of mechanical strength, thermal stability, and chemical resistance.

During production, the sleeve is thermally expanded. During installation, it is shrunk back to its original diameter using a soft gas flame – a phenomenon known as the memory effect. Before shrinking, a butyl rubber sealing tape is inserted between the sleeve and the casing pipe, creating a very high circumferential bonding strength. Additional shrink sleeves are therefore not required.

Before foaming, the crosslinked shrink sleeve is subjected to an air pressure test of 0.2 bar and checked with indicator fluid. After foaming, the foam filling and vent holes are sealed with PE plugs. The area of the welding plugs is not crosslinked to allow welding-in of the PE plugs.

Application range: suitable for pipeline networks with increased operating conditions and demanding soil conditions (groundwater, pressurized water).

Approved according to EN 489:2009 (D)

Diameter: from outer diameter $D_a \geq 90$ mm up to a maximum of D_a 560 mm

Delivery length: Standard = 700 mm



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Products - Sleeves

Casing pipe - Sleeves

Electric welding sleeve

The electric welding sleeve (with or without axial weld seam) consists of a closed, non-crosslinked, PE-weldable shrink sleeve, two loose copper heating conductors inserted immediately prior to installation, as well as two PE welding plugs.

The separate delivery of the sleeve and heating conductors ensures maximum cleanliness and compensates for dimensional tolerances and ovality of the casing pipe ends. The welding process is carried out fully automatically using a microprocessor-controlled welding transformer (400 V / 15 A three-phase power), with automatic monitoring of all relevant parameters, beginning with the heating phase.

Before foaming, the sleeve is subjected to an air pressure test of 0.2 bar and checked using a suitable indicator fluid. The results and welding data must be documented. After foaming, the foam filling and vent openings are sealed with PE plugs.

Application range: suitable for pipeline networks with increased operating conditions and demanding soil conditions (groundwater, pressurized water, large diameters).
Approved according to EN 489 in the sandbox sliding test with 100 cycles.
PE weld seam approved according to DVS Guideline 2207 – Part 5 by means of a long-term tensile creep test.

Available as: joint sleeve

Diameter: from outer diameter $D_a \geq 90$ mm up to a maximum of $D_a = 800$ mm

Delivery length: Standard = 700 mm



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Products - Sleeves

Casing pipe - Sleeves

Sheet metal sleeve

Sheet metal sleeves (Spiral seam sleeves) are used to create casing pipe connections on above-ground or building-installed pipelines. They are suitable for spiral seam casing pipes with internal or external seams.

The scope of delivery includes a longitudinally split pipe sleeve and a sealing plate for closing the foam filling opening. Depending on the casing pipe diameter, the required number of blind rivets for fastening the longitudinal seam and the sealing plate, as well as a butyl rubber sealing tape for the radial overlaps, are included.

Upon request, all material edges can additionally be covered with a silicone layer after foaming.

Application range: Suitable for all above-ground pipeline networks, outdoors or inside buildings, under normal operating conditions.

Available as: joint sleeve, long joint sleeve

Diameter: from outer diameter $D_a \geq 90$ mm up to a maximum of $D_a = 1200$ mm

Delivery length: Standard = 700 mm

Other Products

One-time valve

One-time ball valves are used to terminate a construction section that is intended to be extended at a later stage. As a welded end piece, the ball valve enables the continuation of the existing DHP route at any time without the need to drain or shut down the pipeline.

To protect against contamination and to prevent PUR foam from entering the open end of the ball valve, one side must be sealed using a dished end or a pipe cap in accordance with DIN EN 10253-2. The one-time ball valve must be left in the open position. This ensures that the seat rings, ball, and pipe cap are completely surrounded by water, thereby protecting the ball surface from deposits and the pipe stub and cap from corrosion.

Subsequent insulation is carried out using an end sleeve. To ensure the required insulation series, an increased minimum casing pipe diameter (DAE) must be maintained for the one-time ball valve.

Housing and welding ends made of P235, seat rings and seals made of PTFE, ball and stem made of stainless steel.

Einmalkugelhähne - Abmessungen der lieferbaren Typen

DN	d _a [mm]	h [mm]	L [mm]	D _{AE}
				Einzelrohr [mm]
20	26,9	36,0	230	110
25	33,7	45,0	235	125
32	42,4	56,5	260	140
40	48,3	62,0	260	160
50	60,3	76,5	300	180
65	76,1	87,5	360	200
80	88,9	101,5	370	225
100	114,3	122,0	390	280
125	139,7	154,0	350	355
150	168,3	193,0	400	400
200	219,1	193,0	400	500

After installation, assembly, and connection of the continuation pipeline section to the one-time connection ball valve, commissioning is carried out. For this purpose, the sealing screw of the ball valve is operated using a screwdriver or an Allen key and is subsequently welded.

Subsequent insulation is carried out using a double reducing sleeve.



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Other Products

End cap

End caps provide frontal splash water protection to prevent moisture ingress into the PUR foam at pipe ends in structures and buildings. When installed in manholes, they must be secured against flooding with warming water.

In addition, end caps prevent the diffusion of PUR foam cell gases at open pipe ends. Long-term studies show that unprotected pipe ends negatively affect the service life of plastic casing pipes. Therefore, embedding pipe ends without end caps is not permitted.

Sliding the end caps onto the pipe before connecting to conventional building pipelines is the responsibility of the pipeline installer. End caps must not be cut and must be protected from heat exposure during welding. For proper shrink fitting, a sufficient overhang of the PEHD casing pipe on the building side must be ensured.

For medium temperatures above 120 °C, end caps must additionally be secured with stainless steel tension bands on both the medium pipe and the casing pipe.

End caps are available for all common medium/casing pipe combinations. For retrofitting on already welded pipes, zipper end caps can be used.

The end caps are made of heat-shrinkable, radiation-crosslinked, modified, and thus non-meltable polyolefin. The end areas are coated with a temperature-resistant, specially formulated sealing adhesive. They are resistant to weathering, chemical influences, UV radiation, and soil alkalinity.





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Other Products

Sealing ring

Sealing rings and gasket inserts are used to prevent water ingress at wall penetrations in buildings or shafts. Sliding the sealing rings onto the pipe and centering them in the wall opening before connection to the building pipe is the responsibility of the pipeline installer.

Wall penetrations must be installed perpendicular to the wall. Radial stresses due to soil settlement at the building or shaft entry, as well as lateral shifts, can cause leaks. This must be avoided through proper compaction of the soil in the entry area.

Embedding DHP pipes without sealing rings is not permitted. A minimum overlap of the PE casing pipe on the building side must be ensured.

Sealing Ring – Standard

The standard sealing ring consists of specially profiled, age-resistant neoprene rubber and is suitable, according to DIN 18195-4, for sealing against both non-pressing and pressing water.

Ring width: 50 mm (independent of nominal diameter)

Tapered ring thickness: 12–22 mm

Installation is centered in the wall opening and subsequently cast in place. Axial movements up to 10 mm are permissible.

Gasket Insert

For pressing and backwater conditions according to DIN 18195-6, an internally adjustable, gas- and water-tight gasket insert must be used. The insert consists of a double-sealing system with two steel pressure plates and two 40 mm thick EPDM full-rubber seals (ethylene-propylene rubber), Shore hardness 35 ShA. All metal parts are electro-galvanized, yellow-chromated, and sealed. The sealing surfaces, specifically designed for KMR systems, ensure even pressure distribution on the PEHD casing pipe and prevent deformation or constriction.

Installation is carried out in a core-drilled hole or in a liner pipe. The creation of the bore or embedding of the liner pipe is performed on-site; the liner length is determined by the wall thickness.

During installation, the specified screw torque must be strictly observed to avoid damage to the casing pipe. Axial movements up to 20 mm are permissible without separate testing, provided these are creeping movements and no temperature shocks occur (e.g., in steam operation).



Expansion pad

Expansion pads are used to accommodate longitudinal and lateral movements of DHP pipelines at L-, Z-, and U-bends, branches, reducer and end couplings, shut-off valves, as well as at high and low points. In the area of the expansion pad, the increased minimum distances between casing pipes and to the trench walls must be maintained according to pipe statics requirements. Only in this way is proper installation and function of the expansion pad ensured.

Standard dimensions: 40 mm thickness, 1,000 mm length. For required thicknesses greater than 40 mm, multiple pads must be joined layer by layer using heat lamination.

Installation may only be carried out by certified and trained specialist installers.

Types

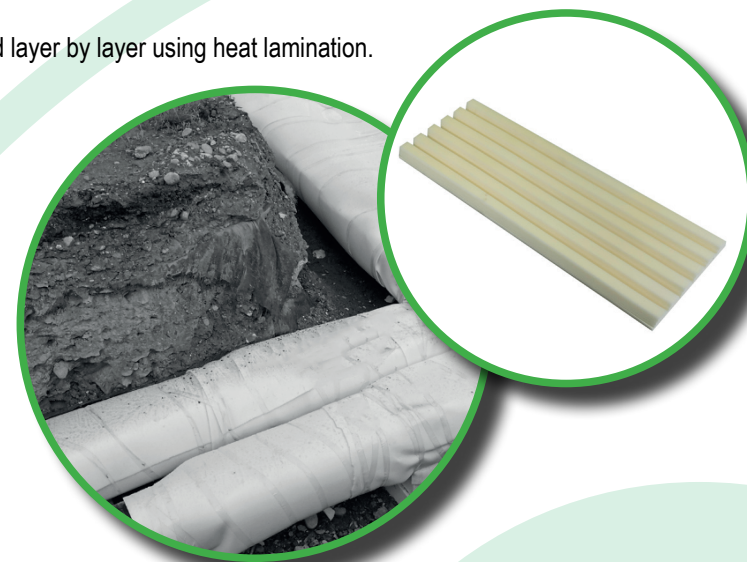
Expansion pad – Type T

Designed with an laminated outer, rigid edge zone to fully enclose the PEHD casing pipe. This prevents heat buildup and stops sand from entering between the casing pipe and the pad.

Expansion pad – Type V

Similar in design to Expansion Pad Type T, but as an Expansion pad mat for complete (100 %) circumferential coverage of the PEHD casing pipe instead of a strip design. Longitudinal and transverse joints are fused using heat lamination of the laminate.

One meter of Expansion Pad Type V consists of a 1000 mm long mat with width dependent on the pipe dimensions. Due to increased heat accumulation, especially at the pipe crown, this version has limited applicability; the pad thickness must be limited to a maximum of 80 mm.





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Other Products

Pipe supports

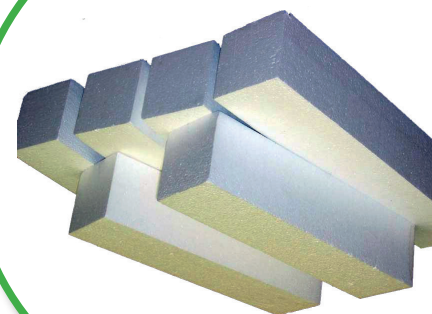
Pipe supports serve as auxiliary supports for DHP pipelines. Unlike timber blocks, they remain in the trench when backfilled and are therefore preferred.

The pipe supports are made of extruded, CFC-free rigid foam.
For every 6.00 m of pipeline, three support points or three pipe supports should be provided.

Depending on the pipe weight, two types are existing:

RG80 up to $D_A=315$ mm

RG100 from $D_A=355$ up to $D_A=1200$ mm





District Heating Pipes

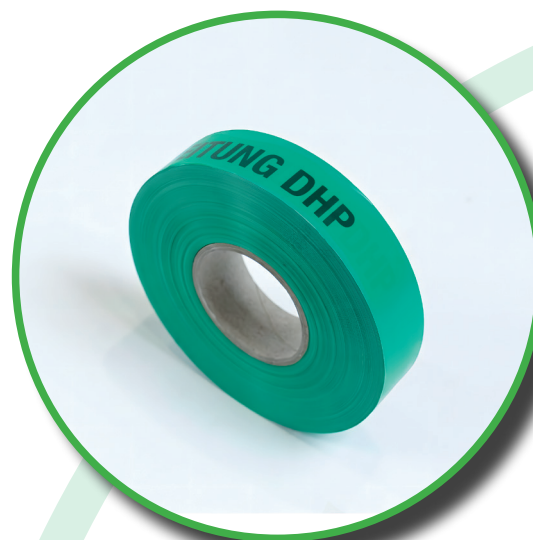
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Other Products

Tracer tape

The tracer tape is used for marking DHP pipelines and is installed above the completed sand bedding and the first fill layer (200 mm) at the 12:00 position over both the supply and return lines.

Delivery specification: 40 mm width, 250 m roll length, with black neutral inscription "Caution: District Heating Pipeline".





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Other Products

PUR-Foam

PUR foam used for insulation and sealing of joint sleeves on site is applied either as hand-mixed foam (cup foam) or machine-applied foam.

For hand-mixed foam, the components polyol (light) and isocyanate (dark) are supplied in 1 L, 5 L, or 10 L containers. They are mixed by the installer using a mechanical stirrer in accordance with the specified mixing ratio and then applied.

Machine-applied foam is dispensed as required from preheated containers of mobile foaming units.

Post-insulation has to be carried out by qualified, certified and trained personal.



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Leak Detection

Information

Small leaks or construction moisture can cause significant damage. The consequences would include heat losses, corrosion of the pipelines, and operational interruptions. For this reason, DHP offers leak warning and detection systems which, by means of embedded wires and the use of various application-specific monitoring devices, enable continuous monitoring of the entire pipeline route for moisture ingress and pipe damage.

Monitoring is not limited to the joint areas but covers every metre of the pipeline route. Even minor moisture ingress into the PUR rigid foam—caused by leaking welds or construction moisture, including in high-resistance areas—is detected. Damage to the PEHD casing pipe, for example due to excavation or planting work, as well as wire breakage, also triggers a fault signal.

Within joint connections and T-branches, no sensitive fully or semi-active electronic components are used that could lead to premature wear of the alarm system. The measuring equipment containing the electronic components is installed exclusively in buildings, shafts, or suitable distribution cabinets.

In the pipe lengths as well as in all fittings, monitoring wires are continuously embedded in the foam insulation as factory-installed surveillance conductors. These wires are wear-free and resistant to corrosion and temperature.

For visual identification, the monitoring conductors are colour-coded, for example in the Nordic system using one bare and one tinned copper wire.

The wires are connected prior to foaming of the casing pipe joints using a robust crimp connection, which is additionally soldered.

All branch lines as well as subsequent route extensions can be easily integrated into the network monitoring system at any time.

The installation of the monitoring equipment is carried out in parallel with the insulation and sealing works by qualified and trained specialist personnel. The wires of each joint connection are properly joined and, after the foaming process, rechecked for continuity.

After completion of the installation of all end components and required devices, a final documented acceptance test is carried out.



District Heating Pipes

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Leak Detection

System Nordic

The Nordic system is particularly well suited for the monitoring of pipeline networks. Its simple design and continuous development ensure a high level of operational reliability. Decades of experience have resulted in a manufacturer-independent, fully compatible wire-based monitoring system.

Standardisation, together with the widespread use of copper wires, enables cost-efficient production and installation. Uniform installation procedures in both pipes and joint connections support optimised product and functional inspection and ensure the required quality standards. The resulting reduction in installation errors significantly contributes to extending the service life of the entire pipeline network.

Due to its system architecture, the Nordic system already provides a high level of inherent fault tolerance. For example, an interrupted wire loop does not immediately lead to system failure, as simple switching within the wire system allows the fault to be localised without the need for immediate excavation. This ensures particularly economical operation over the entire service life of the installation.

A key feature is the use of two uninsulated copper wires, which contribute to fault detection across the entire pipeline network with their full surface area. This provides a significant advantage, particularly for the early detection of changes. In combination with continuously evolving monitoring technology that enables early, reliable, and precise localisation, the Nordic system offers an optimal solution for efficient pipeline network monitoring.

In the pre-insulated casing pipe system, two bare copper wires with a standardised cross-section of 1.5 mm² are factory-embedded in the insulation foam. For visual identification, one of the two wires is galvanically tinned.

The required wire connections within the casing pipe joints are made using crimp sleeves and additionally soldered with soft solder. Wire spacers ensure secure positioning of the conductors within the joint area.

At the end points of the pipeline, both wires are short-circuited to form a continuous measurement loop. Branch lines are integrated directly into this system in accordance with the wiring guidelines. The monitoring device is installed at the starting point of the measurement loop, for example in a heating plant.

By integrating the required hardware components and the standardised routing of the monitoring wires into the DHP route plans, a separate wiring diagram is no longer required. This provides a clear overall documentation at a glance and eliminates the need for time-consuming cross-checking between pipeline layout and wiring as well as duplicate archiving.



District Heating Pipes

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Leak Detection

Function

The actual monitoring in the Nordic system is carried out by measuring the ohmic resistance between the wire pair and the electrically conductive medium pipe. Since the PUR rigid foam acts as an electrical insulator, a very high insulation resistance exists between the wire and the medium pipe in an intact pre-insulated casing pipe system.

In addition, a wire loop measurement is performed for self-monitoring purposes. However, fault localisation is carried out using time-domain reflectometry (TDR), meaning that a closed wire loop is not required for this function.

Time-domain reflectometry utilises the high-frequency electrical properties of transmission lines. Due to the geometric arrangement of the embedded bare copper wires in combination with the medium pipe, as well as the dielectric properties of the PUR rigid foam, a characteristic impedance is established that remains largely constant along the entire length of the system.

Low-energy electrical pulses propagate through the system at nearly the speed of light. If moisture enters the insulation—even if it is not electrically conductive—the local characteristic impedance of the PUR foam changes. This disturbs the pulse propagation and causes a reflection of the signal at the affected location. The position of the fault is determined from the time difference between the transmitted pulse and the reflected signal.

For this purpose, DHP provides digital monitoring hardware. A key advantage lies in pulse injection using the sample-and-hold method. The wire system is sampled at regular intervals (sample), and the acquired signals are temporarily stored (hold).

At defined points in time, returning reflections are recorded. By selectively varying the acquisition timing, individual pipeline sections can be analysed in detail for reflections (echoes). With a total pulse count of 6,000, the Nordic monitoring system achieves a resolution of at least 0.5 m, with a locating accuracy of 0.2%.

In cases of high-frequency interference, the pulse count is increased accordingly. Through the use of downstream filters and mathematical evaluation algorithms, reliable measurements remain ensured even under these conditions. In addition, this technology enables the clear detection and localisation of multiple faults within a single measurement section.



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Leak Detection

System Brandes / Nickel-Chrom (NiCr)

The Brandes or NiCr system, like the Nordic system, is particularly well suited for monitoring pipeline networks of all sizes. NiCr technology can also be used to extend existing monitoring systems. Long-standing experience and continuous development in resistance reference technology enable a manufacturer-independent and fully compatible monitoring system.

The simple system design, the absence of active components within the pipeline, and the standardised installation in both pipes and joint connections ensure a high level of installation reliability. A key characteristic of this system is the continuous monitoring of both pipe and joint areas combined with high sensitivity.

A central feature of the network monitoring system is the perforated NiCr wire, which serves as the sensing element. Due to its perforation, it is available for fault detection along the entire pipeline length, enabling precise localisation of moisture-related damage. In combination with continuously evolving monitoring technology, a very high level of safety in detection and localisation is achieved.

During factory production of pre-insulated casing pipes, both monitoring wires are embedded in the insulation foam. Moisture detection is carried out via the perforated NiCr wire. It is covered with a PTFE insulation (polytetrafluoroethylene, Teflon®) that is resistant up to 260 °C. The NiCr wire (NiCr 8020) with a cross-section of 0.5 mm² is perforated at regular intervals using laser processing.

Due to its special alloy composition, the wire has a constant longitudinal resistance of 5.7 Ω/m.

The black copper wire with a cross-section of 0.8 mm² is used exclusively for loop formation and does not serve any detection function. Its temperature-resistant insulation, rated up to 205 °C, is made of FEP (fluorinated ethylene propylene).

The required connections between NiCr and copper wires within the casing pipe joints are made using crimp sleeves. To protect against direct moisture ingress, these connections are additionally covered with waterproof heat-shrink tubing made of radiation-crosslinked polyolefin (PO-Xc), temperature-resistant up to 150 °C.

To ensure a defined wire position within the joint area, wire spacers are used. The measurement loop formed by the NiCr and Cu conductors is brought together at the pipeline end points and closed at the designated starting point, for example in a monitoring device.

By integrating the required hardware components and the standardised routing of the monitoring wires into the DHP route plans, a separate wiring diagram is no longer required. This enables clear overall documentation and eliminates the need for time-consuming cross-checking between pipeline layout and wiring as well as duplicate archiving.



District Heating Pipes

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Leak Detection

Function

The actual monitoring is carried out – analogous to the Nordic Cu system – by measuring the ohmic resistance between the wire pair and the electrically conductive medium pipe. Since the PUR rigid foam acts as an electrical insulator, a very high insulation resistance exists between the wire and the medium pipe in an intact pre-insulated casing pipe system. In addition, a wire loop measurement is performed for self-monitoring purposes.

The geometric arrangement of the medium pipe together with the measuring and loop conductors forms a system with four unknown parameters. These include the two partial resistances $RX1$ and $RX2$, the pipe resistance ($R_{\text{pipe}} = RX1 + RX2$), the insulation resistance of the PUR foam ($RISO$), and the voltage source UX . The total resistance $R\Sigma$ is determined by the NiCr resistance wire. The partial resistances $RX1$ and $RX2$ depend on the location of any moisture ingress.

In the event of a fault, conductive moisture transfers a voltage divider value to the medium pipe, depending on the location of the moisture ingress. Electrically, the medium pipe thereby assumes the function of a third measuring conductor. Conceptually, the “pipe” connection can be compared to the wiper of a potentiometer, where its position represents the location of the defect.

As shown in the equivalent circuit diagram, the voltage divider formed by $RX1$ and $RX2$ at terminal 3 is not directly measurable in practice, as several interfering factors are present. In addition, the insulation resistance $RISO$ and a chemical voltage source UX must be taken into account, which arises due to the different materials of the resistance wire and the medium pipe.

In particular, the chemical voltage source distorts the actual wiper position at terminal 3. In practice, this effect is evident in the fact that measurements of the insulation resistance $RISO$ using conventional instruments yield different results depending on the polarity and magnitude of the test voltage. In some cases, even negative resistance values may be calculated, although these are physically not meaningful.

The internal resistance of the voltage source UX , and thus also the insulation resistance between the wire and the medium pipe, depend on the degree of moisture ingress as well as the chemical composition of the infiltrated medium, such as water. Both parameters significantly influence the evaluation used to determine the leak location (wiper position) and the insulation resistance $RISO$.



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Leak Detection

Function

The insulation resistance RISO therefore represents a key parameter for assessing the current condition of the pipeline. In conventional systems, the voltage source UX is neglected when determining the leak location, which can lead to significant measurement deviations.

The NiCr system determines all electrical parameters of the wire/pipe configuration with high accuracy using a novel digital method. For this purpose, different switching states are applied to terminals 1 to 3 (see previous page), and the resulting voltage and current values are recorded. After digitisation, the measurement data are transmitted to a central processing unit.

A mathematical algorithm then calculates both the location of moisture ingress and the unknown parameters of the partial resistances RX1 and RX2, the line resistance Rpipe, the insulation resistance of the PUR foam RISO, and the voltage source UX. However, due to the physical principle of the “unloaded voltage divider,” only individual moisture faults can be precisely localised in NiCr systems.

Multiple moisture faults within a single measurement section cannot be clearly distinguished from one another, in contrast to the Nordic system. It should also be noted that within the resistance reference measurement method, only a single moisture fault or a wire-to-pipe short circuit can be precisely located. Other fault types, such as a wire break, must be determined using alternative measurement methods. For this purpose, DHP – similar to the Nordic system – uses time-domain reflectometry.

With appropriate monitoring hardware, the NiCr system detects insulation resistance values RISO in the range of 10 kΩ to 20 MΩ. Below 10 MΩ, an initial localisation is performed for user information, while the alarm threshold is set at < 5 MΩ. This allows the operator to independently define the timing and scope of corrective measures.

With a recommended maximum NiCr wire length of 1,300 m, the system achieves a locating accuracy of 0.2%. The fault location can be anywhere along the entire route, including the boundary areas.

The fault position is displayed both in metres and in percent.

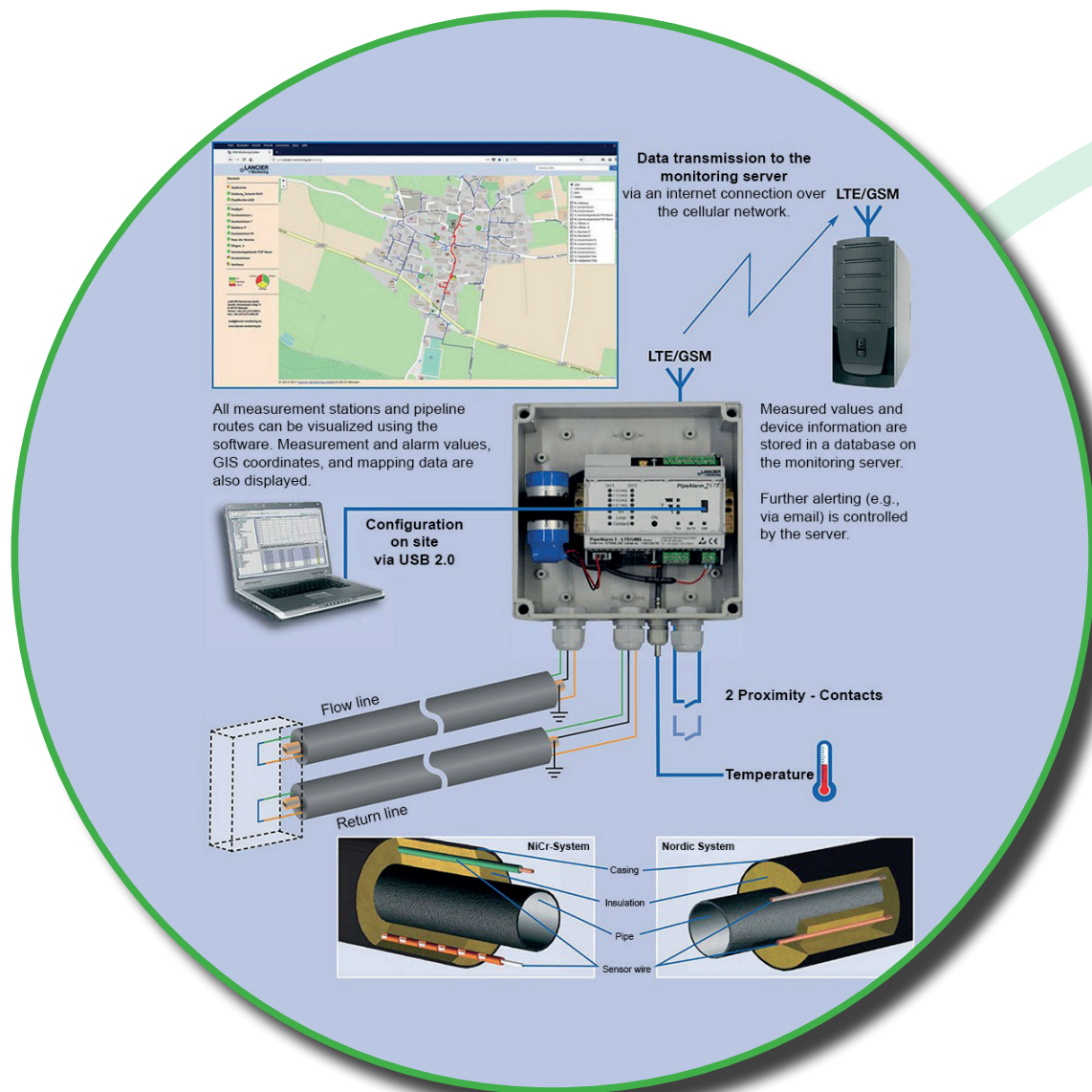


District Heating Pipes

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Leak Detection

Schematic



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Leak Detection

Monitoring device

PipeAlarm2

The PipeAlarm2 or short series is a compact and cost-effective monitoring solution for district heating and cooling pipes equipped with sensor wire pairs embedded in the insulation layer.

The devices are easy to install and simple to operate. Integrated output contacts allow alarm signals (e.g., lamps, sirens) to be triggered.

PipeAlarm2 devices monitor the supply and return lines of a district heating pipeline in parallel via two channels. They continuously measure the insulation resistance and loop resistance of a wire pair within the pipe's insulation layer for copper systems (Nordic), hierarchical systems (HDW, JR Isotronic), and NiCr systems (Brandes) in accordance with EN 14419. In the event of pipe leakage, interruption of the measurement loop, or disconnection of pipe joints, an alarm is triggered immediately, helping to prevent major damage and losses. Insulation and loop resistance alarms can be acknowledged via device buttons.

Each PipeAlarm2 unit securely stores one measured value (insulation resistance and loop resistance) per day for the last 30 days in its internal EEPROM memory.

Configuration, input of threshold values for loop and insulation resistance, as well as reading of measured data, can be carried out locally using a laptop via a web browser through the Ethernet interface. No additional operating software is required.



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Leak Detection

Monitoring device

PipeAlarm LX

The PipeAlarm LX is a compact, battery-powered, and fully independent monitoring solution for district heating pipeline networks with sensor wire pairs embedded in the thermal insulation, as well as additional digital input contacts.

It stands out for its easy installation, intuitive operation, and maximum reliability—independent of local power supply or network connections. In the event of a fault, alarms are reliably transmitted via all common wireless standards, such as LTE, LoRaWAN, 450 MHz, or NB-IoT. This ensures you remain fully informed even at remote measurement points—without the need for complex infrastructure.

The system features a modular design and can monitor up to four channels (= 8 measured values) in parallel for the supply and return lines of a pipeline. It continuously measures the insulation resistance and loop resistance of the sensor wires within the pipe insulation in accordance with EN 14419—suitable for Nordic and hierarchical systems as well as NiCr systems. Two additional potential-free digital inputs allow integration of external signals, for example from float switches or door contacts. An integrated temperature sensor also monitors ambient conditions.

In the event of pipe leaks, interruptions in the measurement loop, faulty connections, or status changes at the digital inputs, the PipeAlarm LX triggers an alarm. This enables early detection of costly damage and helps prevent system failures. Communication with the UMS2 platform is reliably ensured via all common wireless standards, such as LTE, LoRaWAN, 450 MHz, or NB-IoT. Reading measured values, setting threshold limits, or adjusting configurations can be conveniently carried out via wireless connection using a browser-based UMS2 platform or locally via the USB-C interface.

The UMS2 platform also provides reliable, flexible, and user-friendly monitoring with precise alarm handling, ensuring maximum operational safety with minimal effort.





District Heating Pipes

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Leak Detection

SystemComponents

Wiring End

Loop or building termination point for establishing a continuous sensor loop at calibration points, building connections, or within structures, as well as for connecting the alarm wires to all other system components. Installation on the PEHD casing pipe, one unit per pipe end.

Potential Connection Plate

For creating a permanent grounding connection to the service pipe, one unit per pipe end at the device location.

Cable Assembly

For separation of sensor loops. Strain-relieved and/or pressure-water-tight design, suitable for welding into weldable sleeve systems, consisting of a PEHD pipe. The scope of supply also includes an annular seal, a heat-shrink end cap, and an expansion cushioning plate to protect against axial movements.

Measurement Post

For creating a measurement and connection point above ground, outside of buildings. Includes end cap and expansion anchors for on-site installation in soil or foundations.



District Heating Pipes

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Leak Detection

SystemComponents

Wiring junction box

For routing and distribution of measuring and sensor cables in the Nordic system or technically comparable systems. Housing made of polycarbonate for humid environments, equipped with a 5-pole terminal block, one unit per pipe pair.

Protection rating: IP65

NiCr wiring junction box

For routing and distribution of measuring and sensor cables in the Brandes/NiCr system or technically comparable systems. Housing made of polycarbonate for humid environments, equipped with a numbered 8-pole terminal block, one unit per pipe pair.

Protection rating: IP65