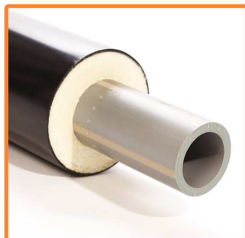


Hiline Steel Metric Catalogue



 **CPV-HILINE**

Pre-insulated Pipe Systems

For further information please visit www.cpv.co.uk

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1. Specification

MANUFACTURE & STANDARDS

HILINE METRIC STEEL RIGID pre-insulated pipes and fittings for thermal utilities are manufactured within an ISO 9001 accredited environment in accordance with EN 253, EN 448, EN 488, EN 489, EN 13941

HILINE METRIC STEEL FLEXIBLE pre-insulated pipes and accessories for thermal utilities are manufactured within an ISO 9001 accredited environment in accordance with EN 15632-4

SERVICE PIPE

Rigid Pipes

Seamless Pipe

Certified seamless steel pipe manufactured in accordance with EN 10216-2 Grade P235 GH, EN 10216-1/A1 Grade P235 TR1 & P235 TR2, DIN 1629 Grade St 37.0

Seamed Pipe (Welded)

Certified seamed (welded) steel pipe manufactured in accordance with EN 10217-2/A1 Grade P235 GH, EN 10217-5/A2 Grade P235 GH, EN 10217-1 Grade P235 TR1 or P235 TR2, DIN 1626 Grade St 37.0

Galvanised Pipe

Galvanised seamless pipe manufactured in accordance with EN 10216-1 steel grade P235 TR1 & P235 TR2, EN 10216-2 Grade P235 GH, DIN 1629 Grade St 37.0 and galvanised in accordance with EN 10240, EN 1461, EN 1179

General Properties

- Upper yield stress 235 MPa
- Tensile strength 360 - 500 MPa
- Density 7850 kg/m³
- Operating pressure 5 MPa

The external surface of the steel pipe is shot blasted to increase the adhesion of the rigid polyurethane foam (PUR)

The pipe ends are bevelled ready for welding

Inspection Certificate EN 10204 – 3.1b available on prior request

Flexible Pipes

Dar-Flex

Flexible seamless steel pipe is manufactured in accordance with EN 10305-1

Flexible welded steel pipe is manufactured in accordance with EN-10305-2 & EN 10305-3

General Properties & Applications

- Ideal for building entries
- Minimum bending radius 0.8m (Standard Insulation)
- Minimum bending radius 0.9m (Insulation Plus)
- Fewer number of elbows required
- Fewer number of welded joints
- Reduced installation cost
- Changes of direction easily diverted to suit site conditions
- Fully compatible for welding to rigid steel pipes

2. Specification

THERMAL INSULATION

Rigid Pipes

The insulation material is CFC free rigid polyurethane foam (PUR) homogenously filling the space between the service pipe and casing over the total length and in compliance with standard EN 253

Properties

- | | |
|--------------------------------------|-----------------------|
| • Thermal conductivity coefficient | 0.024 to 0.029 w/mK |
| • Radial compression strength | 0.30 MPa |
| • Minimum core mass density | 60 kg/ m ³ |
| • Continuous operating temperature | 130°C |
| • Maximum peak operating temperature | 152°C |
| • Minimum operating temperature | 4°C |

Higher performing insulation is available upon request

Flexible Pipes - Dar-Flex

Dar-Flex pipes are insulated using CFC free semi-rigid polyurethane foam (PUR) homogenously filling the space between the service pipe and casing to form a fully bonded system

Properties

- | | |
|--|-----------------------|
| • Thermal conductivity coefficient (max) | 0.023 w/mK |
| • Radial compression strength (min) | 0.12 MPa |
| • Minimum core mass density | 50 kg/ m ³ |
| • Continuous operating temperature | 120°C |
| • Maximum peak operating temperature | 140°C |
| • Minimum operating temperature | 4°C |

CASING PIPE

Rigid Pipes - HDPE

Casing pipe is manufactured in accordance with standard EN 253 from high density polyethylene (HDPE)

Properties

- Density 950 kg/m³
- Upper yield stress 19 MPa
- Elongation at break at least 350%
- Expected life at least 50 years

HDPE casing is also available with additional UV stabiliser offering greater protection against direct sunlight for above ground installations

The casing pipe inner surfaces are corona treated to ensure optimum adhesion of the insulation material (PUR) to form a fully bonded system

Spiral Wound Pipes – Spiro

Casing pipe is made of zinc coated mild steel sheet in accordance with EN 10327 or aluminium sheet in accordance with EN 485: PN-87/H-92833

Flexible Pipes – PE

Dar-Flex casing pipes are made from flexible polyethylene (PE) and meets the requirements of EN 15632-4

Properties

- Density ≥ 915 kg/m³
- MFI (190°C/5 ≤ 2.0 g/min

The casing pipe can be lined with an anti-diffusion barrier if required (optional)

SITE JOINTING TECHNIQUES

Steel Service Pipes

The welding of pre-insulated steel pipes to be installed in buried and above ground thermal utilities can be carried out using the following techniques:

- Manual arc welding with shielded electrodes 111 as per EN ISO 4063
- Inert gas arc welding with a non-consumable electrode (TIG welding) 141 as per EN ISO 4063
- Gas welding 311 as per EN ISO 4063

Rigid Casing Pipes

Rigid HDPE casing pipes in the field can be sealed using the following techniques:

- Heat shrinkable HDPE oversleeve sealed with hot melt adhesive and heat shrinkable bands (Type NT)
- Heat shrinkable crosslinked HDPE oversleeve sealed with hot melt adhesive (Type TS)
- Wrap around HDPE electrofusion coupling forming a fully fused casing joint (Type DX)
- Slide over HDPE heat shrinkable oversleeve sealed by the electrofusion technique (Type DT)

Spiral wound casing pipes field joints can be sealed with:

- Zinc coated mild steel or aluminium sheet oversleeve sealed with heat shrinkable bands (Type NS)

Flexible Casing Pipes

Dar-Flex casing pipe field joints can be sealed using the following techniques:

- Heat shrinkable HDPE oversleeve sealed with hot melt adhesive and heat shrinkable bands (Type NT)
- Heat shrinkable crosslinked HDPE oversleeve sealed with hot melt adhesive (Type TS)

Insulation

Field joints can be insulated using the following methods:

- Moulded PUR ½ shells installed before the oversleeve is fitted
- PUR liquid 2-part resin and activator either hand mixed or machine mixed and poured into casing oversleeve after it has been sealed to the casing pipe

SUPPLY PROGRAMME

Hiline Metric Steel pipes and fittings are available in the following size ranges:

- Rigid pre-insulated steel pipes can be supplied in 6m or 12m lengths in the following ranges:
Seamless steel pipes are available in size DN20 to DN500
Welded steel pipes are available in sizes DN20 to DN1200
- Rigid pre-insulated steel pipes are available as twin pipes (F&R) inside a single casing for sizes DN20+DN20 to DN200+DN200
- Dar-Flex flexible steel pipes are available in sizes DN16, DN20 & DN25 and coils up to 400m
- All pre-insulated steel pipes can be supplied with Series 1 (Standard) or Series 2 (Insulation Plus) PUR thicknesses
- Rigid pre-insulated steel pipes can also be supplied with insulation to Series 3 and above
- Special insulation for use with steel pipes for steam is also available for rigid pipes

3. Surveillance System

CPV Hiline ZPUM can be equipped with any system for detecting moisture ingress, such as Nordic pulse system 2 copper detection wires 1.5mm² (One tinned for identification) 16SWG BS4109, **or** resistance system (BRANDES), **or** HDW system **or** client specified system. Such a system comprises wires embedded in the insulation layer. The system signals moisture spots in any place of the pipeline.

4. General Principles of Laying Preinsulated Pipe in Soil

Preinsulated pipes and fittings are laid directly in ground in narrow trenches on a sand subgrade at least 10 cm thick. Prior to welding steel carrier pipes, in each common joint or a heat shrinkable one, a sleeve has to be pushed on, which will protect the joint heat insulation.

Once the pipes have been welded and leak tests are over, a heat insulation layer has to be laid down and the joint tightness tested.

A completed preinsulated pipeline is then subject to a technical acceptance, and then is backfilled with sand up to 10 cm above the upper pipe surface. Both the subgrade and backfilling layers have to be compacted, so that the line is placed in homogenous conditions. Once the backfilling layer has been stabilised, the remaining part is replenished with virgin soil. A minimal thickness of the covering layer is 40 cm. See CPV Hiline ZPUM installation guides for further details.

5. Cross-sections of Jacket and Carrier Pipes

CPV Hiline ZPUM pipes and fittings are manufactured from jacket and carrier pipes of the following diameters:

Steel Carrier Pipe				PEHD Jacket Pipe		PEHD Jacket Pipe	
DN	D _{ext}	welded	seamless	Standard insulation		Insulation Plus	
		g	g	D _{ext}	gp	D _{ext}	gp
mm	mm	mm	mm	mm	mm	mm	mm
20	26,9	2,6	2,9	75	3,0	90	3,0
25	33,7	2,6	2,9	90	3,0	110	3,0
32	42,4	2,6	2,9	110	3,0	125	3,0
40	48,3	2,6	2,9	110	3,0	125	3,0
50	60,3	2,9	3,2	125	3,0	140	3,0
65	76,1	2,9	3,2	140	3,0	160	3,0
80	88,9	3,2	3,6	160	3,0	200	3,2
100	114,3	3,6	4,0	200	3,2	225	3,4
125	139,7	3,6	4,0	225	3,4	250	3,6
150	168,3	4,0	4,5	250	3,6	315	4,1
200	219,1	4,5	6,3	315	4,1	355	4,5
250	273,0	5,0	7,1	400	4,8	450	5,2
300	323,9	5,6	7,1	450	5,2	500	5,6
350	355,6	5,6	8,0	500	5,6	560	6,0
400	406,4	6,3	8,8	560	6,0	630	6,6
450	457,0	6,3	10,0	560	6,0	630	6,6
500	508,0	6,3	11,0	630	6,6	710	7,2
600	610,0	7,1	-	800	7,9	900	8,7
700	711,0	8,0	-	900	8,7	1000	9,4
800	813,0	8,8	-	1000	9,4	1100	10,2
900	914,0	10,0	-	1100	10,2	1200	11,00
1000	1016,0	11,0	-	1200	11,00	—	—

DN - steel pipe nominal diameter; D_{ext} - external diameter g, gp - wall thickness

Recommended diameters of preinsulated jacket pipes and fittings are given on further pages of the catalogue.

Tables show pipe and fitting geometric dimensions up to a diameter of DN 600.

Geometric dimensions of products exceeding nominal diameters of DN 600 are ordered individually.

Specifications of preinsulated products should state carrier pipe steel grade (R-35 or St 37.0, and P 235GH seamless or seamed), type of thermal insulation, type of moisture detection embedded system or its lack, and for pipes their length and quote symbols used throughout the catalogue.

Other carrier pipe materials are available upon request.

6. Quality Assurance System

CPV Hiline ZPUM pre-insulated materials and products manufactured presently are based on the Integrated Quality Management System *Environment, compliant with **ISO 9001:2008** and **EN ISO 14001:2005 - Certificate No JSA-124/3/2008**.

The quality management and environment management system covers: design, development, manufacturing, supplies, service and installation of CPV Hiline ZPUM preinsulated pipes and fittings with due attention paid to environmental regulations.

7. Information on Other Products

CPV also supplies:

- Above ground chemical drainage systems : CPV-Zurn
- Below ground chemical drainage systems : CPV-Floway
- Dual contained pipe systems : CPV-Safeflo
- Pressure pipes : CPV-Chemflo
- Fabricated tanks & vessels : CPV-Bulk
- Specialist extrusions, mouldings & fabrications : CPV-Custom
- polyethylene pipes grade **PE 100** - navy blue, to be used in water mains, in diameters between Ø 25 and 1200 mm, in the following diameter ranges: SDR 9; SDR 11, SDR 13,6; SDR 17; SDR 21; SDR 26; SDR 27,6; SDR 33; SDR 41; supplied as straight units 12 m long (standard) and on customer's request -15 m (for diameters between 75 and 1200 mm), and coiled in lengths up to 200 m (for diameters between 25 and 110 mm), or in any other length as agreed with the customer;
- polyethylene pipes grade **PE 100** - black, to be used in gravity sewer systems, in diameters between Ø 32 and 1200 mm, in the following diameter ranges: SDR 9; SDR 11, SDR 13,6; SDR 17; SDR 21; SDR 26; SDR 27,6; SDR 33; SDR 41; supplied as straight units 12 m long (standard) and on customer's request -15 m (for diameters between 75 and 1000 mm), and coiled in lengths up to 200 m (for diameters between 32 and 110 mm), or in any other length as agreed with the customer;
- polyethylene culvert pipes in diameters between 50 and 1200 mm, supplied in straight units 12 m long or any other lengths as agreed with the customer;
- preinsulated flex units to be used in hot water buried utilities in PEX carrier pipes;
- PE jacket pipes in diameters between 75 and 1200 mm;
- sleeves in diameters between 83 and 472 mm;
- heat shrinkable sleeves and DX welding couplings (to set up a coupling unit thermal insulation);
- preinsulated pipes featuring polyethylene carrier pipe (diameters agreed with the customer);
- preinsulated corrugated pipes (as per **SPIRO** catalogue);
- preinsulated pipes to be used in water steam pipelines;
- **SPIRO** pipes and fittings for mining working;
- Preinsulated elbows bent by the machine with diameter from Ø 20 mm up to Ø 300 mm

8 Preinsulated Pipes

8.1.1 Straight Preinsulated Pipes

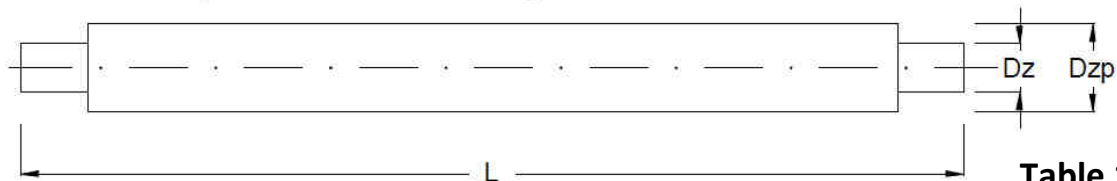


Table 1.1

Series 1 – Standard Insulation

Steel Carrier Pipe (mm)		Jacket Pipe (mm)	Length (m)	Weight (kg)		Catalogue Ref Number
Nominal Diameter DN	External Diameter Dz	External Diameter Dzp		Seamless 1m	Welded 1m	
20	26.9	75	6	2.7	2.5	R-20/75
25	33.7	90	6	3.2	3.0	R-25/90
32	42.4	110	6, 12	4.2	3.9	R-32/110
40	48.3	110	6, 12	4.6	4.3	R-40/110
50	60.3	125	6, 12	6.7	5.7	R-50/125
65	76.1	140	6, 12	7.7	7.2	R-65/140
80	88.9	160	6, 12	10.0	9.8	R-80/160
100	114.3	200	6, 12	14.3	13.2	R-100/200
125	139.7	225	6, 12	17.5	16.2	R-125/225
150	168.3	250	6, 12	22.9	21.0	R-150/250
200	219.1	315	6, 12, 16*	40.4	31.2	R-200/315
250	273.0	400	6, 12, 16*	58.7	45.2	R-250/400
300	323.9	450	6, 12, 16*	70.1	58.6	R-300/450
350	355.6	500	6, 12, 16*	86.8	66.6	R-350/500
400	406.4	560	6, 12, 16*	108.0	83.9	R-400/560
450	457.0	560	6, 12, 16*	130.6	90.6	R-450/560
500	508.0	630	6, 12, 16*	161.3	104.2	R-500/630
600	610.0	800	6, 12, 16*	-	149.3	R-600/800
700	711.0	900	6, 12, 16*	-	180.4	R-700/900
800	813.0	1000	6, 12, 16*	-	222.9	R-800/1000
900	914.0	1100	6, 12, 16*	-	278.2	R-900/1100
1000	1016.0	1200	6, 12, 16*	-	335.8	R-1000/1200

8.1.2 Straight Preinsulated Pipes

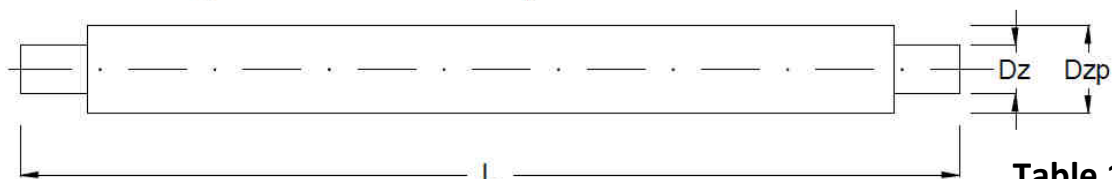


Table 1.2

Series 2 - Insulation Plus

Steel Carrier Pipe (mm)		Jacket Pipe (mm)	Length (m)	Weight (kg)		Catalogue Ref Number
Nominal Diameter DN	External Diameter Dz	External Diameter Dzp		Seamless 1m	Welded 1m	
20	26.9	90	6	3.0	3.0	R-20/75
25	33.7	110	6	3.8	3.6	R-25/90
32	42.4	125	6, 12	4.8	4.5	R-32/110
40	48.3	125	6, 12	5.2	4.9	R-40/110
50	60.3	140	6, 12	6.8	6.4	R-50/125
65	76.1	160	6, 12	8.5	7.9	R-65/140
80	88.9	200	6, 12	11.5	10.7	R-80/160
100	114.3	225	6, 12	15.7	14.6	R-100/200
125	139.7	250	6, 12	19.2	17.9	R-125/225
150	168.3	315	6, 12	26.8	24.9	R-150/250
200	219.1	355	6, 12, 16*	43.4	34.1	R-200/315
250	273.0	450	6, 12, 16*	63.0	49.5	R-250/400
300	323.9	500	6, 12, 16*	74.5	63.0	R-300/450
350	355.6	560	6, 12, 16*	92.2	72.0	R-350/500
400	406.4	630	6, 12, 16*	114.7	90.6	R-400/560

Note: When ordering specify steel grade (reference number R-35, St 37.0, or P 235H or EN 10255, BS 1387 medium or heavy gauge). Pre-insulated pipes of diameters exceeding DN 600 - DN 1200 are manufactured if their length and filling diameter (insulation thickness) have been agreed with the customer.

* Pipes with length L=16m are manufactured on individual customer's request.

8.2 Preinsulated Bend Pipes

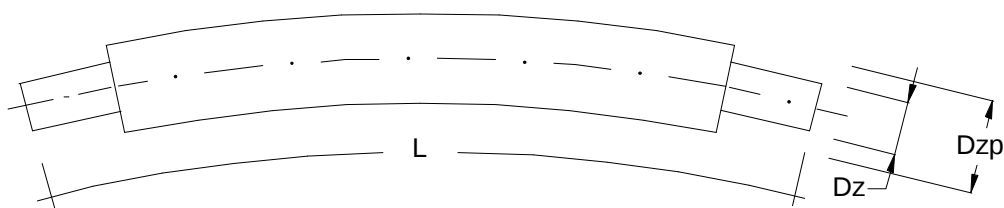


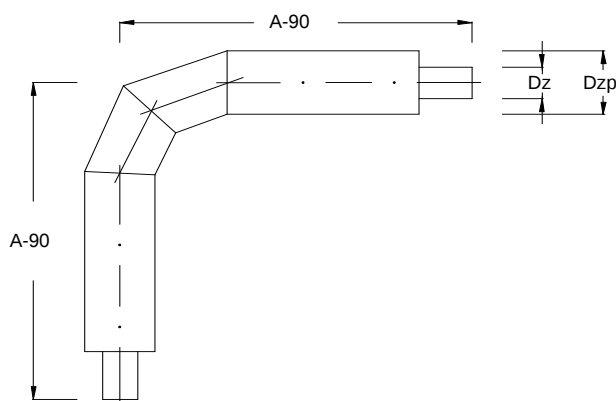
Table 2

Steel Carrier Pipe		Jacket Pipe	Length	Weight		Catalogue Reference Number
Nominal Diameter	External Diameter	External Diameter		seamless (P 235GH)	welded (P 235GH)	
DN	Dz	Dzp	L	1m	1m	
mm	mm	mm	m	kg	kg	
20	26,9	75	6	2,7	2,5	RG-20/75
25	33,7	90	6	3,2	3,0	RG-25/90
32	42,4	110	12	4,2	3,9	RG-32/110
40	48,3	110	12	4,6	4,3	RG-40/110
50	60,3	125	12	6,7	5,7	RG-50/125
65	76,1	140	12	7,7	7,2	RG-65/140
80	88,9	160	12	10,0	9,8	RG-80/160
100	114,3	200	12	14,3	13,2	RG-100/200
125	139,7	225	12	17,5	16,2	RG-125/225
150	168,3	250	12	22,9	21,0	RG-150/250
200	219,1	315	12	40,4	31,2	RG-200/315
250	273,0	400	12	58,7	45,2	RG-250/400
300	323,9	450	12	70,1	58,6	RG-300/450
350	355,6	500	12	86,8	66,6	RG-350/500
400	406,4	560	12	108,0	83,9	RG-400/560
450	457,0	560	12	130,6	90,6	RG-450/560
500	508,0	630	12	161,3	104,2	RG-500/630

Note: When ordering specify steel grade (reference number R-35, St 37.0, or P 235GH or EN10255) BS130787 medium or heavy gauge) and angle and bend direction. Preinsulated pipes of diameters exceeding DN 600 are manufactured if their length and filling diameter (insulation thickness) have been agreed with the customer.

9 Preinsulated Fittings

9.1 90° Elbow



Bend radius:
 Mechanical bending for:
 DN_s 20÷80 $3 \times Dz$
 DN_s 100÷300 $2,5 \times Dz$

With “Weld Bend” elbows for:
 DN_s 350÷1000 $1,5 \times DN$

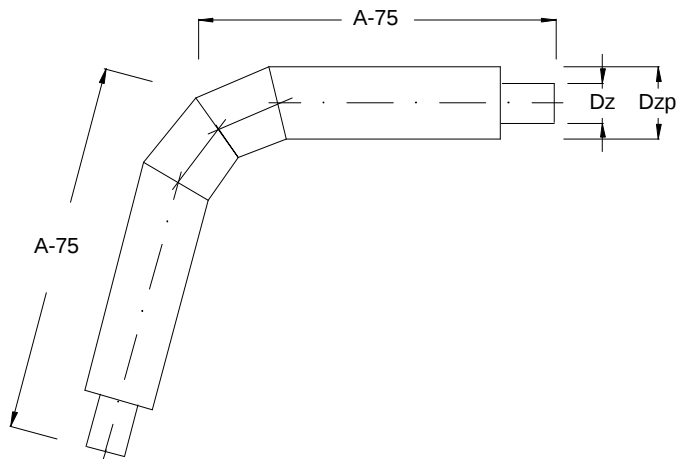
Table 3

Steel Carrier Pipe		Jacket Pipe	Dimension	Weight of Preinsulated Elbow	Catalogue Reference Number
Nominal Diameter	External Diameter	External Diameter			
DN	Dz	Dzp	A 90	1 unit	
mm	mm	mm	mm		
20	26,9	75	1000	5,0	K-20/90
25	33,7	90	1000	6,4	K-25/90
32	42,4	110	1000	8,0	K-32/90
40	48,3	110	1000	10,6	K-40/90
50	60,3	125	1000	13,0	K-50/90
65	76,1	140	1000	14,5	K-65/90
80	88,9	160	1000	17,5	K-80/90
100	114,3	200	1000	27,5	K-100/90
125	139,7	225	1000	33,0	K-125/90
150	168,3	250	1000	39,0	K-150/90
200	219,1	315	1000	50,0	K-200/90
250	273,0	400	1000	69,0	K-250/90
300	323,9	450	1500	151,0	K-300/90
350	355,6	500	1500	172,0	K-350/90
400	406,4	560	1500	218,0	K-400/90
450	457,0	560	1500	263,0	K-450/90
500	508,0	630	1500	307,0	K-500/90
600	610,0	800	1500	376,0	K-600/90

Note: *Preinsulated units of diameters exceeding DN 600 are tailor-made.

*On customer request bends for diameters DN 100-300 can be made with the 1,5xDN “Weld Bend” elbows.

9.2 75° Elbow



Bend radius:
Mechanical bending for:
DNs 20÷80 $3 \times Dz$
DNs 100÷300 $2,5 \times Dz$

With “Weld Bend” elbows for:
DNs 350÷1000 $1,5 \times DN$

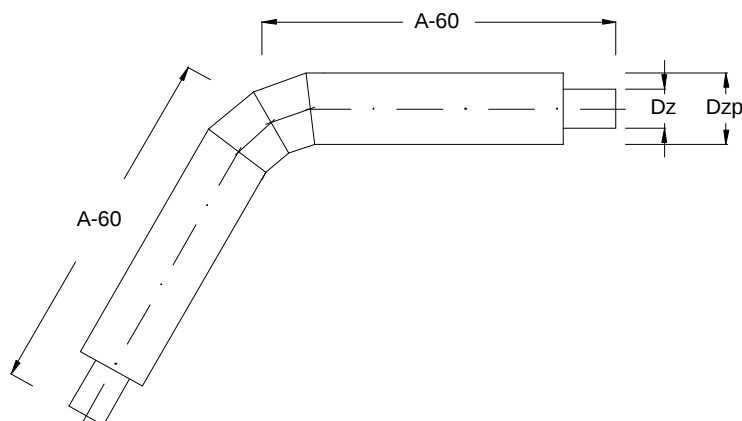
Table 4

Steel Carrier Pipe		Jacket Pipe	Dimension	Weight of Preinsulated Elbow	Catalogue Reference Number
Nominal Diameter	External Diameter	External Diameter			
DN	Dz	Dzp	A 75	1 unit	
mm	mm	mm	mm		
20	26,9	75	1000	5,0	K-20/75
25	33,7	90	1000	6,4	K-25/75
32	42,4	110	1000	8,0	K-32/75
40	48,3	110	1000	10,6	K-40/75
50	60,3	125	1000	12,0	K-50/75
65	76,1	140	1000	14,5	K-65/75
80	88,9	160	1000	18,5	K-80/75
100	114,3	200	1000	27,5	K-100/75
125	139,7	225	1000	35,5	K-125/75
150	168,3	250	1000	41,5	K-150/75
200	219,1	315	1000	56,0	K-200/75
250	273,0	400	1000	79,0	K-250/75
300	323,9	450	1500	163,0	K-300/75
350	355,6	500	1500	186,0	K-350/75
400	406,4	560	1500	237,0	K-400/75
450	457,0	560	1500	279,0	K-450/75
500	508,0	630	1500	325,0	K-500/75
600	610,0	800	1500	404,0	K-600/75

Note: *Preinsulated units of diameters exceeding DN 600 are tailor-made.

*On customer request bends for diameters DN 100-300 can be made with the 1,5xDN “Weld Bend” elbows.

9.3 60° Elbow



Bend radius:

Mechanical bending for:

DNs 20÷80 $3 \times Dz$

DNs 100÷300 $2,5 \times Dz$

With “Weld Bend” elbows

for:

DNs 350÷1000 $1,5 \times DN$

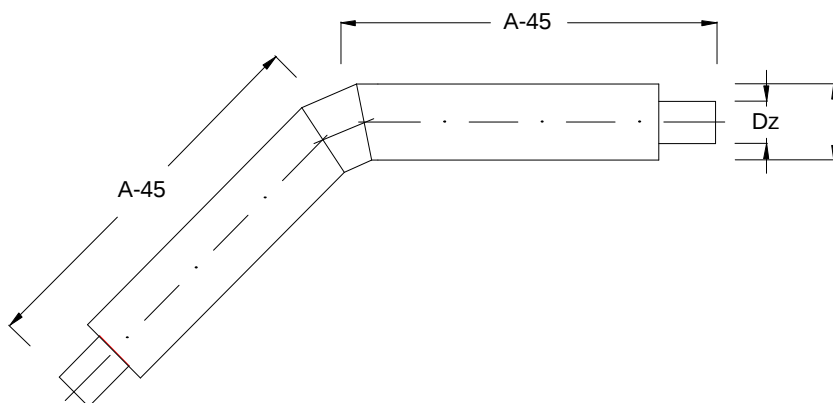
Table 5

Steel Carrier Pipe		Jacket Pipe	Dimension	Weight of Preinsulated Elbow	Catalogue Reference Number
Nominal Diameter	External Diameter	External Diameter			
DN	Dz	Dzp	A 60		
mm	mm	mm	mm	1 unit	
20	26,9	75	1000	5,0	K-20/60
25	33,7	90	1000	6,4	K-25/60
32	42,4	110	1000	8,0	K-32/60
40	48,3	110	1000	8,5	K-40/60
50	60,3	125	1000	12,0	K-50/60
65	76,1	140	1000	14,5	K-65/60
80	88,9	160	1000	19,5	K-80/60
100	114,3	200	1000	27,5	K-100/60
125	139,7	225	1000	35,5	K-125/60
150	168,3	250	1000	41,5	K-150/60
200	219,1	315	1000	69,5	K-200/60
250	273,0	400	1000	85,0	K-250/60
300	323,9	450	1500	174,0	K-300/60
350	355,6	500	1500	194,0	K-350/60
400	406,4	560	1500	247,0	K-400/60
450	457,0	560	1500	289,0	K-450/60
500	508,0	630	1500	337,0	K-500/60
600	610,0	800	1500	420,0	K-600/60

Note: *Preinsulated units of diameters exceeding DN 600 are tailor-made.

*On customer request bends for diameters DN 100-300 can be made with the 1,5xDN “Weld Bend” elbows.

9.4 45° Elbow



Bend radius:
Mechanical bending for:
DNs 20÷80 3×Dz
DNs 100÷300 2,5×Dz

With “Weld Bend” elbows
for:
DNs 350÷1000 1,5×DN

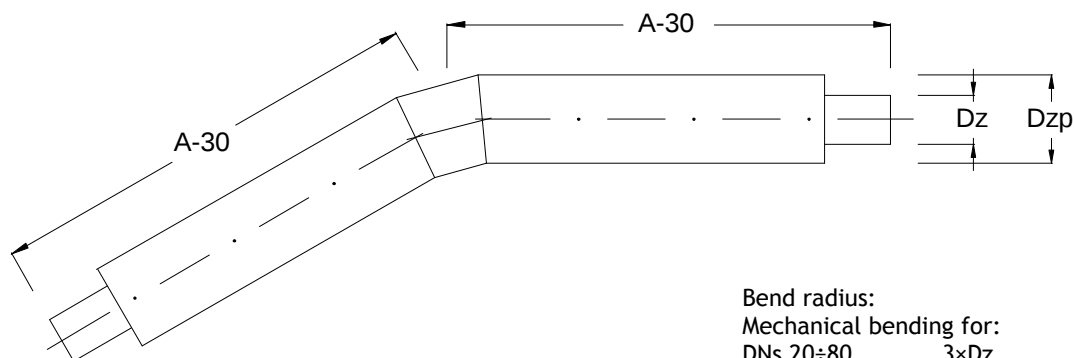
Table 6

Steel Carrier Pipe		Jacket Pipe	Dimension	Weight of Preinsulated Elbow	Catalogue Reference Number
Nominal Diameter	External Diameter	External Diameter			
DN	Dz	Dzp	A 45		
mm	mm	mm	mm	1 unit	
20	26,9	75	1000	5,0	K-20/45
25	33,7	90	1000	6,4	K-25/45
32	42,4	110	1000	8,0	K-32/45
40	48,3	110	1000	8,5	K-40/45
50	60,3	125	1000	12,0	K-50/45
65	76,1	140	1000	14,5	K-65/45
80	88,9	160	1000	19,5	K-80/45
100	114,3	200	1000	28,5	K-100/45
125	139,7	225	1000	36,5	K-125/45
150	168,3	250	1000	43,5	K-150/45
200	219,1	315	1000	70,5	K-200/45
250	273,0	400	1000	87,0	K-250/45
300	323,9	450	1500	177,0	K-300/45
350	355,6	500	1500	199,0	K-350/45
400	406,4	560	1500	253,0	K-400/45
450	457,0	560	1500	294,0	K-450/45
500	508,0	630	1500	343,0	K-500/45
600	610,0	800	1500	429,0	K-600/45

Note: *Preinsulated units of diameters exceeding DN 600 are tailor-made.

*On customer request bends for diameters DN 100-300 can be made with the 1,5xDN “Weld Bend” elbows.

9.5 30° Elbow



Bend radius:
Mechanical bending for:
DNs 20÷80 3×Dz
DNs 100÷300 2,5×Dz

With “Weld Bend” elbows for:
DNs 350÷1000 1,5×DN

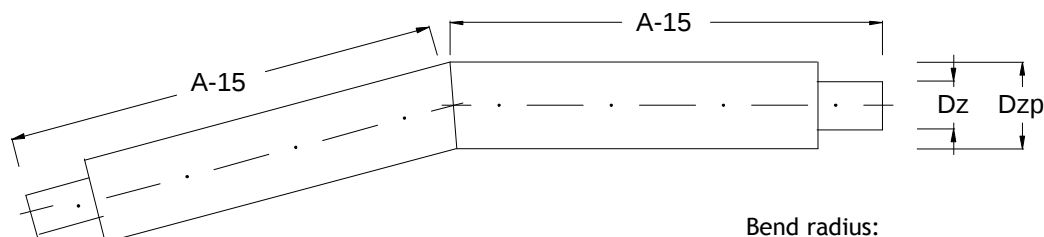
Table 7

Steel Carrier Pipe		Jacket Pipe	Dimension	Weight of Preinsulated Elbow	Catalogue Reference Number
Nominal Diameter	External Diameter	External Diameter			
DN	Dz	Dzp	A 30	1 unit	
mm	mm	mm	mm		
20	26,9	75	1000	5,0	K-20/30
25	33,7	90	1000	6,4	K-25/30
32	42,4	110	1000	8,5	K-32/30
40	48,3	110	1000	9,5	K-40/30
50	60,3	125	1000	12,0	K-50/30
65	76,1	140	1000	14,5	K-65/30
80	88,9	160	1000	19,5	K-80/30
100	114,3	200	1000	28,5	K-100/30
125	139,7	225	1000	35,5	K-125/30
150	168,3	250	1000	43,5	K-150/30
200	219,1	315	1000	70,5	K-200/30
250	273,0	400	1000	89,0	K-250/30
300	323,9	450	1500	179,0	K-300/30
350	355,6	500	1500	201,0	K-350/30
400	406,4	560	1500	256,0	K-400/30
450	457,0	560	1500	297,0	K-450/30
500	508,0	630	1500	346,0	K-500/30
600	610,0	800	1500	433,0	K-600/30

Note: *Preinsulated units of diameters exceeding DN 600 are tailor-made.

*On customer request bends for diameters DN 100-300 can be made with the 1,5xDN “Weld Bend” elbows.

9.6 15° Elbow



Bend radius:
Mechanical bending for:
DNs 20÷80 $3 \times Dz$
DNs 100÷300 $2,5 \times Dz$

With “Weld Bend” elbows for:
DNs 350÷1000 $1,5 \times DN$

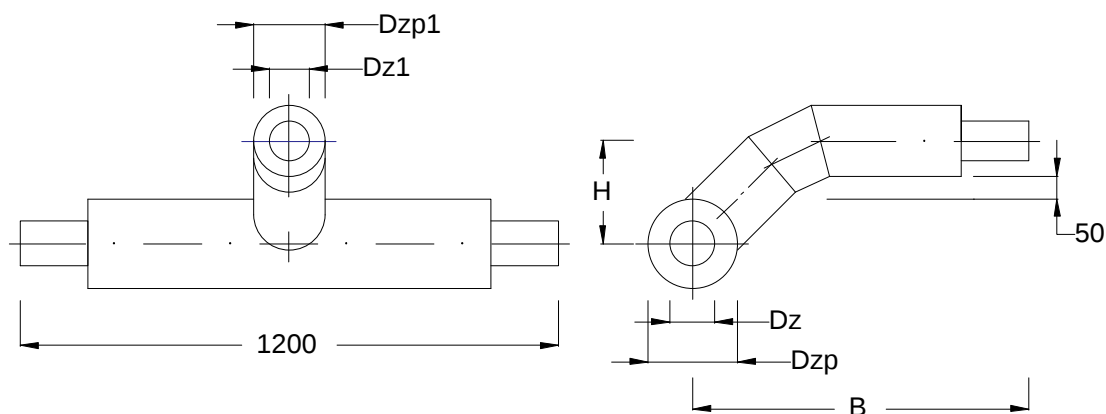
Table 8

Steel Carrier Pipe		Jacket Pipe	Dimension	Weight of Preinsulated Elbow	Catalogue Reference Number
Nominal Diameter	External Diameter	External Diameter			
DN	Dz	Dzp	A 15	1 unit	
mm	mm	mm	mm		
20	26,9	75	1000	5,0	K-20/15
25	33,7	90	1000	6,4	K-25/15
32	42,4	110	1000	8,0	K-32/15
40	48,3	110	1000	9,5	K-40/15
50	60,3	125	1000	12,0	K-50/15
65	76,1	140	1000	14,5	K-65/15
80	88,9	160	1000	19,5	K-80/15
100	114,3	200	1000	29,5	K-100/15
125	139,7	225	1000	37,5	K-125/15
150	168,3	250	1000	44,5	K-150/15
200	219,1	315	1000	61,5	K-200/15
250	273,0	400	1000	89,0	K-250/15
300	323,9	450	1500	181,0	K-300/15
350	355,6	500	1500	202,0	K-350/15
400	406,4	560	1500	257,0	K-400/15
450	457,0	560	1500	298,0	K-450/15
500	508,0	630	1500	347,0	K-500/15
600	610,0	800	1500	434,0	K-600/15

Note: *Preinsulated units of diameters exceeding DN 600 are tailor-made.

*On customer request bends for diameters DN 100-300 can be made with the $1,5 \times DN$ “Weld Bend” elbows.

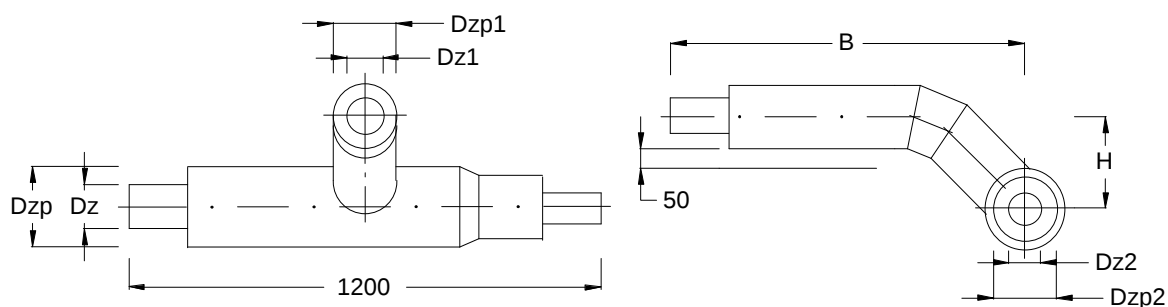
9.7 Cranked Tee


Table 9

Straight Section			Vertical Section		H	B	Catalogue Reference Number
Nominal Diameter	Carrier Pipe External Diameter	Jacket Pipe External Diameter	Carrier Pipe External Diameter	Jacket Pipe External Diameter			
DN	Dz	Dzp	Dz1	Dzp1			
mm	mm	mm	mm		mm	mm	
20	26,9	75	26,9	75	140	700	TW-20/20
25	33,7	90	26,9	75	140	700	TW-25/20
32	42,4	110	33,7	90	150	700	TW-32/25
40	48,3	110	42,4	110	160	700	TW-40/32
50	60,3	125	48,3	110	170	700	TW-50/40
65	76,1	140	60,3	125	185	900	TW-65/50
80	88,9	160	76,1	140	200	900	TW-80/65
100	114,3	200	88,9	160	230	900	TW-100/80
125	139,7	225	114,3	200	265	900	TW-125/100
150	168,3	250	139,7	225	285	900	TW-150/125
200	219,1	315	168,3	250	335	900	TW-200/150
250	273,0	400	219,1	315	410	1100	TW-250/200
300	323,9	450	273,0	400	475	1100	TW-300/250

- Note:**
1. Tees are fabricated in a free selection of diameters
 2. The H dimension changes along with branching off pipe diameter
 3. Preinsulated units of diameters exceeding DN 300 are tailor-made.

9.7.1 Reducing Cranked Tee


Table 10

Straight Section			Branching Off Section		Reduced Pipe		H	B	Catalogue Reference Number
Nominal Diameter	Carrier Pipe External Diameter	Jacket Pipe External Diameter	Carrier Pipe External Diameter	Jacket Pipe External Diameter	Carrier Pipe External Diameter	Jacket Pipe External Diameter			
DN	Dz	Dzp	Dz1	Dzp1	Dz2	Dzp2			
mm	mm	mm	mm	mm	mm	mm	mm	mm	
20	33,7	90	26,9	75	26,9	75	140	700	TWR-25/20/20
32	42,4	110	26,9	75	26,9	75	140	700	TWR-32/20/20
32	42,4	110	33,7	90	33,7	90	150	700	TWR-32/25/25
40	48,3	110	33,7	90	33,7	90	150	700	TWR-40/25/25
40	48,3	110	42,4	110	42,4	110	160	700	TWR-40/32/32
50	60,3	125	42,4	110	42,4	110	160	700	TWR-50/32/32
50	60,3	125	48,3	110	48,3	110	170	700	TWR-50/40/40
65	76,1	140	48,3	110	48,3	110	170	700	TWR-65/40/40
65	76,1	140	60,3	125	60,3	125	185	900	TWR-65/50/50
80	88,9	160	60,3	125	60,3	125	185	900	TWR-80/50/50
80	88,9	160	76,1	140	76,1	140	200	900	TWR-80/65/65
100	114,3	200	76,1	140	76,1	140	200	900	TWR-100/65/65
100	114,3	200	88,9	160	88,9	160	230	900	TWR-100/80/80
125	139,7	225	88,9	160	88,9	160	230	900	TWR-125/80/80
125	139,7	225	114,3	200	114,3	200	265	900	TWR-125/100/100
150	168,3	250	114,3	200	114,3	200	265	900	TWR-150/100/100
150	168,3	250	139,7	225	139,7	225	285	900	TWR-150/125/125
200	219,1	315	139,7	225	139,7	225	285	900	TWR-200/125/125
200	219,1	315	168,3	250	168,3	250	335	900	TWR-200/150/150
250	273,0	400	168,3	250	168,3	250	335	900	TWR-250/150/150
250	273,0	400	219,1	315	219,1	315	410	1100	TWR-250/200/200
300	323,9	450	219,1	315	219,1	315	475	1100	TWR-300/200/200
300	323,9	450	273,0	400	273,0	400	475	1100	TWR-300/250/250

Note: 1. Reducing wyes are fabricated in a free selection of diameters
2. The H dimension changes along with branching off pipe diameter

9.7.2 Elongated Cranked Tee - Mk. 2

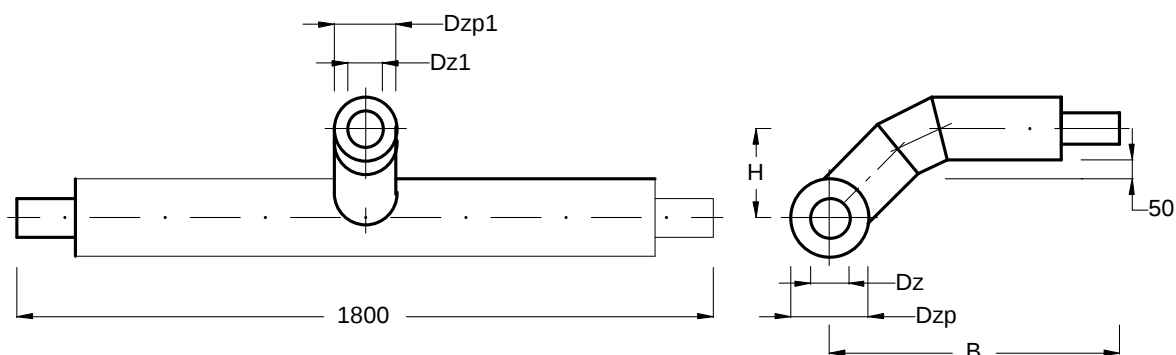
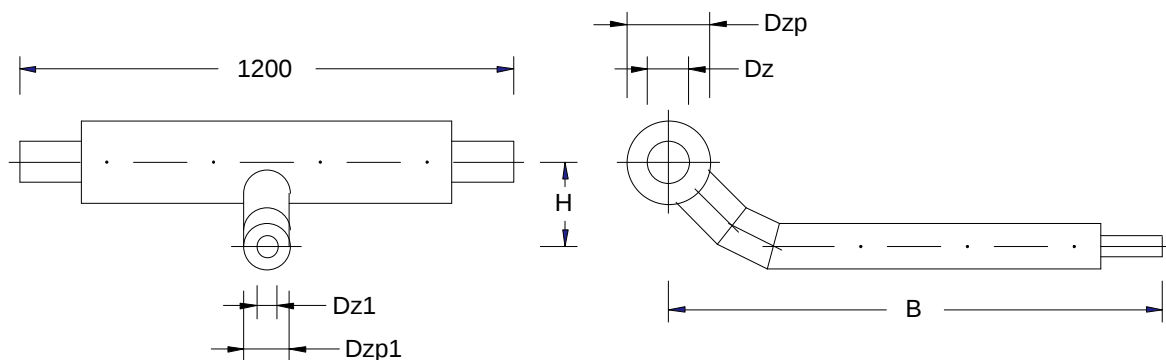


Table 11

Straight Section			Branching Off Section		H	B	Catalogue Reference Number
Nominal Diameter	Carrier Pipe External Diameter	Jacket Pipe External Diameter	Carrier Pipe External Diameter	Jacket Pipe External Diameter			
DN	Dz	Dzp	Dz1	Dzp1			
mm	mm	mm	mm	mm	mm	mm	
20	26,9	75	26,9	75	140	700	TW2-20/20
25	33,7	90	26,9	75	140	700	TW2-25/20
32	42,4	110	33,7	90	150	700	TW2-32/25
40	48,3	110	42,4	110	160	700	TW2-40/32
50	60,3	125	48,3	110	170	700	TW2-50/40
65	76,1	140	60,3	125	185	900	TW2-65/50
80	88,9	160	76,1	140	200	900	TW2-80/65
100	114,3	200	88,9	160	230	900	TW2-100/80
125	139,7	225	114,3	200	265	900	TW2-125/100
150	168,3	250	139,7	225	285	900	TW2-150/125
200	219,1	315	168,3	250	335	900	TW2-200/150
250	273,0	400	219,1	315	410	1100	TW2-250/200
300	323,9	450	273,0	400	475	1100	TW2-300/250
350	355,6	500	323,9	450	525	1300	TW2-350/300
400	406,4	560	355,6	500	580	1300	TW2-400/350
450	457,0	560	406,4	560	645	1500	TW2-450/400
500	508,0	630	457,0	630	720	1500	TW2-500/450
600	610,0	800	508,0	710	805	1700	TW2-600/500

- Note:**
1. Wyes are fabricated in a free selection of diameters
 2. They can also be fabricated as reducing wyes in any diameters
 3. The H dimension changes along with branching off pipe diameter
 4. Preinsulated units of diameters exceeding DN 600 are tailor-made.

9.8 Under Cranked Tee

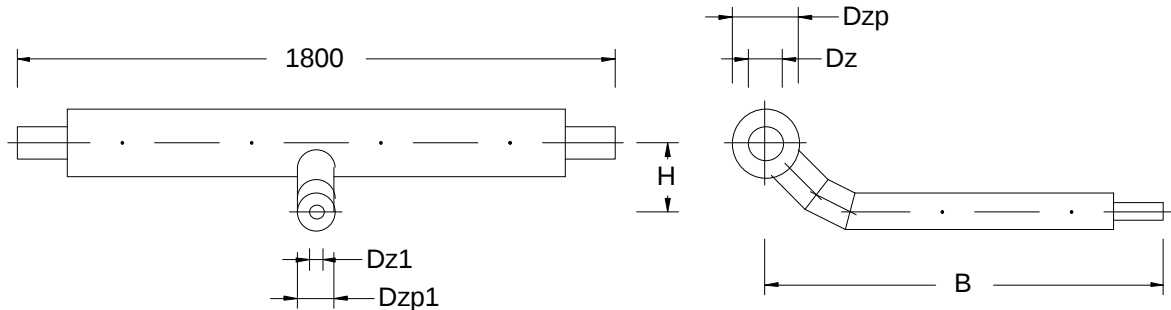

Table 12

Straight Section			Branching Off Section		H	B	Catalogue Reference Number
Nominal Diameter	Carrier Pipe External Diameter	Jacket Pipe External Diameter	Carrier Pipe External Diameter	Jacket Pipe External Diameter			
DN	Dz	Dzp	Dz1	Dzp1			
mm	mm	mm	mm	mm	mm	mm	
25	33,7	90	33,7	90	160	900	TO-25/25
32	42,4	110	33,7	90	160	900	TO-32/25
40	48,3	110	33,7	90	160	900	TO-40/25
50	60,3	125	33,7	90	167	900	TO-50/25
65	76,1	140	48,3	110	175	900	TO-65/40
80	88,9	160	48,3	110	185	1200	TO-80/40
100	114,3	200	48,3	110	205	1200	TO-100/40
125	139,7	225	48,3	110	218	1200	TO-125/40
150	168,3	250	48,3	110	230	1200	TO-150/40
200	219,1	315	60,3	125	270	1200	TO-200/50
250	273,0	400	60,3	125	313	1200	TO-250/50
300	323,9	450	60,3	125	340	1200	TO-300/50

Note:

1. Wyes are fabricated in a free selection of diameters
2. They can also be fabricated as reducing wyes in any diameters
3. The H dimension changes along with branching off pipe diameter
4. Preinsulated units of diameters exceeding DN 300 are tailor-made.

9.8.1 Under Cranked Tee - Mk. 2

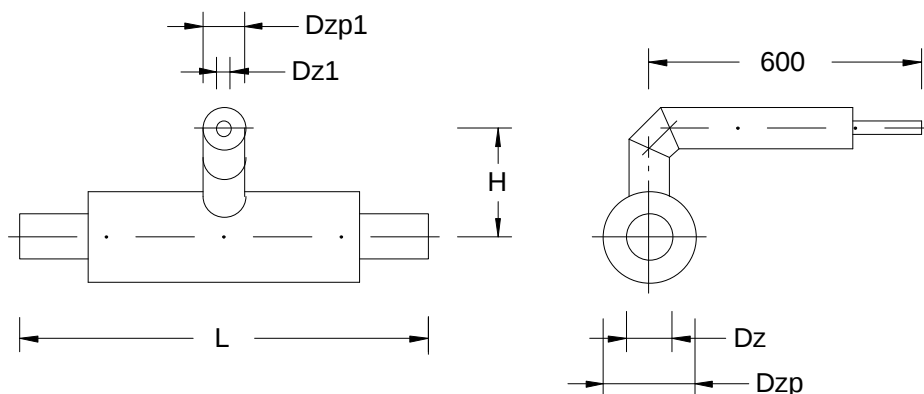

Table 13

Straight Section			Branching Off Section		H	B	Catalogue Reference Number
Nominal Diameter	Carrier Pipe External Diameter	Jacket Pipe External Diameter	Carrier Pipe External Diameter	Jacket Pipe External Diameter			
DN	Dz	Dzp	Dz1	Dzp1			
mm	mm	mm	mm	mm	mm	mm	
25	33,7	90	33,7	90	160	900	TO2-25/25
32	42,4	110	33,7	90	160	900	TO2-32/25
40	48,3	110	33,7	90	160	900	TO2-40/25
50	60,3	125	33,7	90	167	900	TO2-50/25
65	76,1	140	48,3	110	175	900	TO2-65/40
80	88,9	160	48,3	110	185	1200	TO2-80/40
100	114,3	200	48,3	110	205	1200	TO2-100/40
125	139,7	225	48,3	110	218	1200	TO2-125/40
150	168,3	250	48,3	110	230	1200	TO2-150/40
200	219,1	315	60,3	125	270	1200	TO2-200/50
250	273,0	400	60,3	125	313	1200	TO2-250/50
300	323,9	450	60,3	125	340	1200	TO2-300/50
350	355,6	500	88,9	160	380	1200	TO2-350/80
400	406,4	560	88,9	160	410	1200	TO2-400/80
450	457,0	560	114,3	200	465	1200	TO2-450/100
500	508,0	630	114,3	200	505	1200	TO2-500/100
600	610,0	800	114,3	200	550	1200	TO2-600/100

Note:

1. Wyes are fabricated in a free selection of diameters
2. They can also be fabricated as reducing wyes in any diameters
3. The H dimension changes along with branching off pipe diameter
4. Preinsulated units of diameters exceeding DN 600 are tailor-made.

9.9 Vent Tee


Table 14

Straight Section			Branching Off Section		L	H	Catalogue Reference Number
Nominal Diameter	Carrier Pipe External Diameter	Jacket Pipe External Diameter	Carrier Pipe External Diameter	Jacket Pipe External Diameter			
DN	Dz	Dzp	Dz1	Dzp1			
mm	mm	mm	mm	mm	mm	mm	
65	76,1	140	33,7	90	900	210	TD-65
80	88,9	160	33,7	90	900	220	TD-80
100	114,3	200	33,7	90	900	240	TD-100
125	139,7	225	33,7	90	900	250	TD-125
150	168,3	250	33,7	90	900	260	TD-150
200	219,1	315	33,7	90	1200	300	TD-200
250	273,0	400	33,7	90	1200	340	TD-250
300	323,9	450	33,7	90	1500	360	TD-300

Note:

1. Wyes are fabricated in a free selection of diameters
2. They can also be fabricated as reducing wyes in any diameters
3. The H dimension changes along with branching off pipe diameter
4. Preinsulated units of diameters exceeding DN 300 are tailor-made.

9.9.1 Vent Tee - Mk. 2

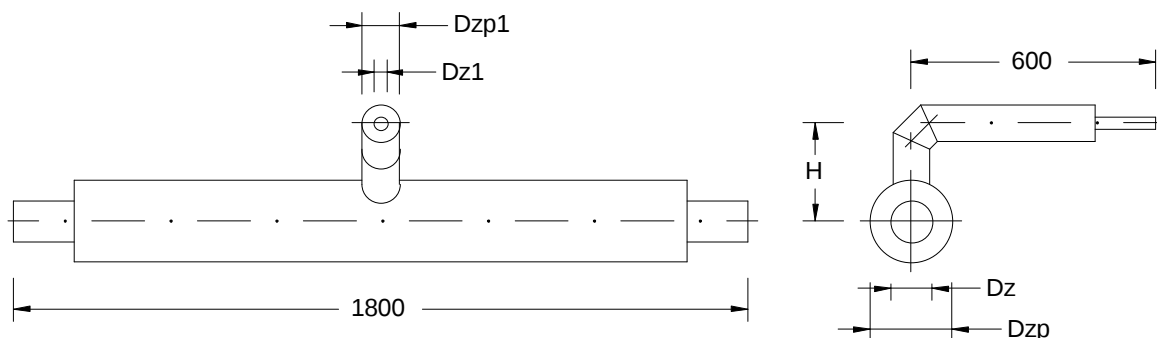


Table 15

Straight Section			Branching Off Section		H	Catalogue Reference Number
Nominal Diameter	Carrier Pipe External Diameter	Jacket Pipe External Diameter	Carrier Pipe External Diameter	Jacket Pipe External Diameter		
DN	Dz	Dzp	Dz1	Dzp1		
mm	mm	mm	mm	mm	mm	
65	76,1	140	33,7	90	210	TD2-65
80	88,9	160	33,7	90	220	TD2-80
100	114,3	200	33,7	90	240	TD2-100
125	139,7	225	33,7	90	250	TD2-125
150	168,3	250	33,7	90	260	TD2-150
200	219,1	315	33,7	90	300	TD2-200
250	273,0	400	33,7	90	340	TD2-250
300	323,9	450	33,7	90	360	TD2-300
350	355,6	500	48,3	110	400	TD2-350
400	406,4	560	48,3	110	430	TD2-400
450	457,0	560	48,3	110	460	TD2-450
500	508,0	630	48,3	110	500	TD2-500
600	610,0	800	48,3	110	550	TD2-600

Note:

1. Wyes are fabricated in a free selection of diameters
2. They can also be fabricated as reducing wyes in any diameters
3. The H dimension changes along with branching off pipe diameter
4. Preinsulated units of diameters exceeding DN 600 are tailor-made.

9.10 Parallel Tee

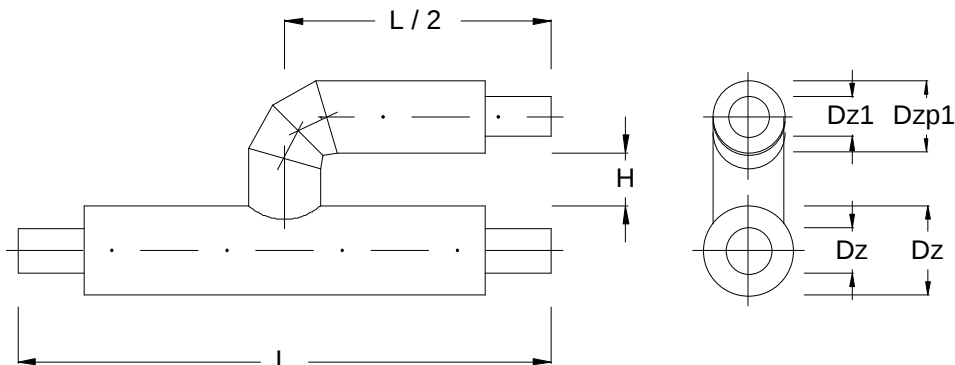


Table 16

Straight Section			Branching Off Section		H	L	Catalogue Reference Number
Nominal Diameter	Carrier Pipe External Diameter	Jacket Pipe External Diameter	Carrier Pipe External Diameter	Jacket Pipe External Diameter			
DN	Dz	Dzp	Dz1	Dzp1			
mm	mm	mm	mm	mm	mm	mm	
20	26,9	75	26,9	75	100	900	TR-20/20
25	33,7	90	26,9	75	100	900	TR-25/20
32	42,4	110	33,7	90	100	900	TR-32/25
40	48,3	110	42,4	110	100	900	TR-40/32
50	60,3	125	48,3	110	100	900	TR-50/40
65	76,1	140	60,3	125	120	1200	TR-65/50
80	88,9	160	76,1	140	120	1200	TR-80/65
100	114,3	200	88,9	160	120	1200	TR-100/80
125	139,7	225	114,3	200	150	1200	TR-125/100
150	168,3	250	139,7	225	150	1200	TR-150/125
200	219,1	315	168,3	250	200	1500	TR-200/150
250	273,0	400	219,1	315	200	1500	TR-250/200
300	323,9	450	273,0	400	250	1800	TR-300/250

Note:

1. Wyes are fabricated in a free selection of diameters
2. They can also be fabricated as reducing wyes in any diameters
3. The H dimension changes along with branching off pipe diameter
4. Preinsulated units of diameters exceeding DN 300 are tailor-made.

9.11 Flat Tee

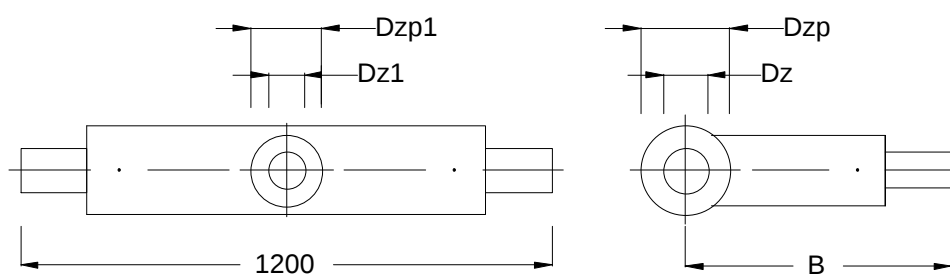


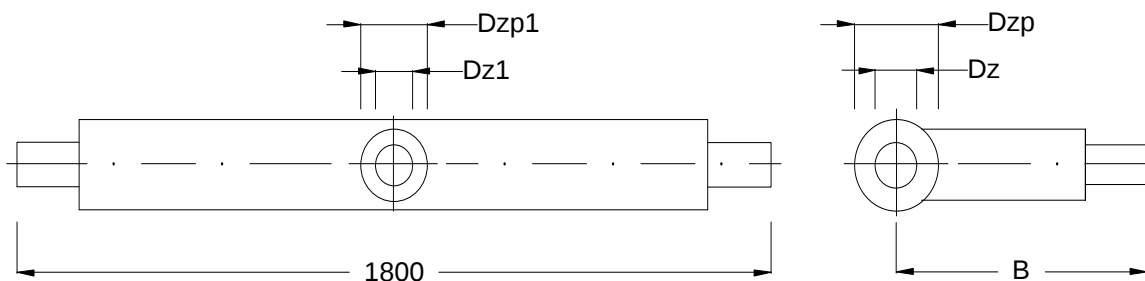
Table 17

Straight Section			Branching Off Section		B	Catalogue Reference Number
Nominal Diameter	Carrier Pipe External Diameter	Jacket Pipe External Diameter	Carrier Pipe External Diameter	Jacket Pipe External Diameter		
DN	Dz	Dzp	Dz1	Dzp1		
mm	mm	mm	mm	mm	mm	
20	26,9	75	26,9	75	600	TP-20/20
25	33,7	90	26,9	75	600	TP-25/20
32	42,4	110	33,7	90	600	TP-32/25
40	48,3	110	42,4	110	600	TP-40/32
50	60,3	125	48,3	110	600	TP-50/40
65	76,1	140	60,3	125	600	TP-65/50
80	88,9	160	76,1	140	600	TP-80/65
100	114,3	200	88,9	160	600	TP-100/80
125	139,7	225	114,3	200	700	TP-125/100
150	168,3	250	139,7	225	700	TP-150/125
200	219,1	315	168,3	250	700	TP-200/150
250	273,0	400	219,1	315	900	TP-250/200
300	323,9	450	273,0	400	900	TP-300/250

Note:

1. Tees are fabricated in a free selection of diameters
2. They can also be fabricated as reducing tees in any diameters
3. Preinsulated units of diameters exceeding DN 600 are tailor-made.

9.11.1 Flat Tee Mk. 2


Table 18

Straight Section			Branching Off Section		B	Catalogue Reference Number
Nominal Diameter	Carrier Pipe External Diameter	Jacket Pipe External Diameter	Carrier Pipe External Diameter	Jacket Pipe External Diameter		
DN	Dz	Dzp	Dz1	Dzp1		
mm	mm	mm	mm	mm	mm	
20	26,9	75	26,9	75	600	TP2-20/20
25	33,7	90	26,9	90	600	TP2-25/20
32	42,4	110	33,7	90	600	TP2-32/25
40	48,3	110	42,4	110	600	TP2-40/32
50	60,3	125	48,3	110	600	TP2-50/40
65	76,1	140	60,3	125	600	TP2-65/50
80	88,9	160	76,1	140	600	TP2-80/65
100	114,3	200	88,9	160	600	TP2-100/80
125	139,7	225	114,3	200	700	TP2-125/100
150	168,3	250	139,7	225	700	TP2-150/125
200	219,1	315	168,3	250	700	TP2-200/150
250	273,0	400	219,1	315	900	TP2-250/200
300	323,9	450	273,0	400	900	TP2-300/250
350	355,6	500	323,9	450	900	TP2-350/300
400	406,4	560	355,6	500	900	TP2-400/350
450	457,0	560	406,4	560	1100	TP2-450/400
500	508,0	630	457,0	630	1100	TP2-500/450
600	610,0	800	508,0	710	1100	TP2-600/500

Note:

1. Tees are fabricated in a free selection of diameters
2. They can also be fabricated as reducing tees in any diameters
3. Preinsulated units of diameters exceeding DN 600 are tailor-made.

9.12 Reducing Pipe

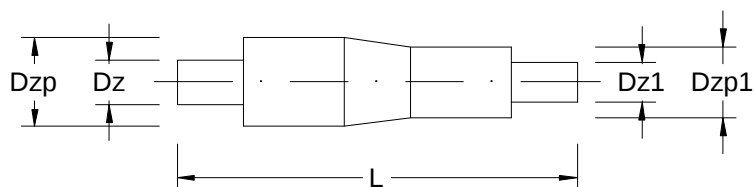
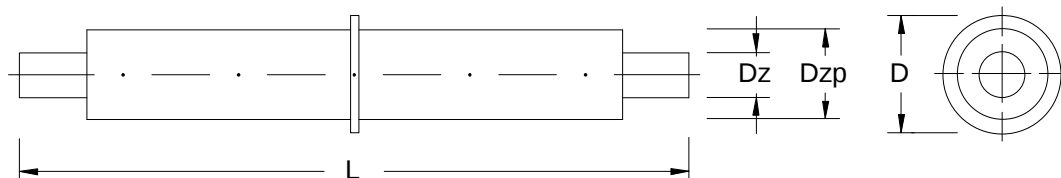


Table 19

Nominal Diameter	Straight Segment		Reduced Segment		Length	Catalogue Reference Number
DN/DN1	Dz	Dzp	Dzl	Dzpl	L	
mm	mm	mm	mm	mm	mm	
25/20	33,7	90	26,9	75	1000	Z-25/20
32/20	42,4	110	26,9	75	1000	Z-32/20
32/25	42,4	110	33,7	90	1000	Z-32/25
40/25	48,3	110	33,7	90	1000	Z-40/25
40/32	48,3	110	42,4	110	1000	Z-40/32
50/32	60,3	125	42,4	110	1000	Z-50/32
50/40	60,3	125	48,3	110	1000	Z-50/40
65/40	76,1	140	48,3	110	1000	Z-65/40
65/50	76,1	140	60,3	125	1000	Z-65/50
80/50	88,9	160	60,3	125	1000	Z-80/50
80/65	88,9	160	76,1	140	1000	Z-80/65
100/65	114,3	200	76,1	140	1000	Z- 100/65
100/80	114,3	200	88,9	160	1000	Z- 100/80
125/80	139,7	225	88,9	160	1000	Z- 125/80
125/100	139,7	225	114,3	200	1000	Z -125/100
150/100	168,3	250	114,3	200	1000	Z -150/100
150/125	168,3	250	139,7	225	1000	Z -150/125
200/125	219,1	315	139,7	225	1200	Z -200/125
200/150	219,1	315	168,3	250	1200	Z -200/150
250/150	273,0	400	168,3	250	1200	Z -250/150
250/200	273,0	400	219,1	315	1200	Z -250/200
300/200	323,9	450	219,1	315	1200	Z- 300/200
300/250	323,9	450	273,0	400	1200	Z-300/250
350/250	356,6	500	273,0	400	1200	Z-350/250
350/300	356,6	500	323,9	450	1200	Z -350/300
400/300	406,4	560	323,9	450	1200	Z-400/300
400/350	406,4	560	355,6	500	1200	Z-400/350
450/350	457,0	560	355,6	500	1200	Z-450/350
450/400	457,0	560	406,4	560	1200	Z-450/400
500/400	508,0	630	406,4	560	1200	Z -500/400
500/450	508,0	630	457,0	560	1200	Z -500/450
600/450	610,0	800	457,0	560	1200	Z-600/450
600/500	610,0	800	508,0	630	1200	Z-600/500

Note: 1. Reducing pipes are fabricated in a free selection of diameters
 2. Units of diameters exceeding DN 600 are tailor-made.

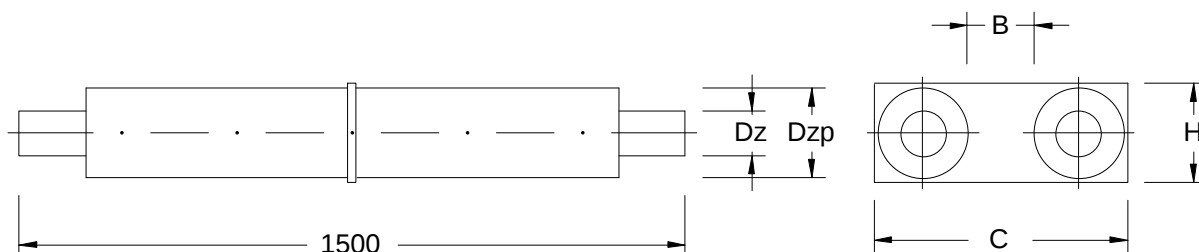
9.13 Anchor Fittings


Table 20

Nominal Diameter	Carrier Pipe External Diameter	Jacket Pipe External Diameter	Length	External Flange Diameter	Catalogue Reference Number
DN	Dz	Dzp	L	D	
mm	mm	mm	mm	mm	
20	26,9	75	2000	125	PS-20
25	33,7	90	2000	140	PS-25
32	42,4	110	2000	140	PS-32
40	48,3	110	2000	140	PS-40
50	60,3	125	2000	170	PS-50
65	76,1	140	2000	200	PS-65
80	88,9	160	2000	220	PS-80
100	114,3	200	2500	260	PS-100
125	139,7	225	2500	300	PS-125
150	168,3	250	2500	320	PS-150
200	219,1	315	2500	400	PS-200
250	273,0	400	2500	500	PS-250
300	323,9	450	2500	560	PS-300

Note: 1. Units of diameters exceeding DN 300 are tailor-made and can be included on bends and tees
 2. Fixed point concrete block diameters are specified in the Manual "Static and Designed Calculations"

9.14 Wall Mounted Anchor Point

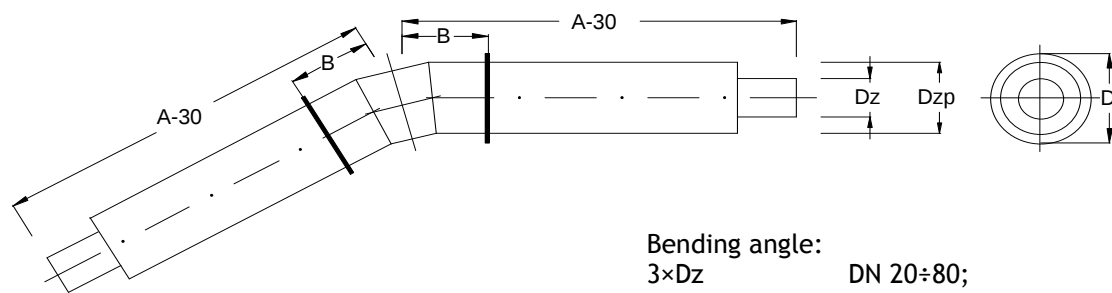

Table 21

Nominal Diameter	Steel Pipe External Diameter	Jacket Pipe External Diameter	H	B	C	Catalogue Reference Number
DN	Dz	Dzp				
mm	mm	mm				
20	26,9	75	110	150	350	PSS-20
25	33,7	90	110	150	350	PSS-25
32	42,4	110	130	150	390	PSS-32
40	48,3	110	130	150	390	PSS-40
50	60,3	125	145	150	420	PSS-50
65	76,1	140	160	150	450	PSS-65
80	88,9	160	180	150	490	PSS-80
100	114,3	200	220	150	570	PSS-100
125	139,7	225	245	150	620	PSS-125
150	168,3	250	270	150	670	PSS-150
200	219,1	315	335	150	800	PSS-200
250	273,0	400	440	200	1010	PSS-250
300	323,9	450	490	200	1140	PSS-300

Note: Units of diameters exceeding DN 300 are tailor-made to geometric configurations agreed with the customer.

9.15 Angle Anchor Point

9.15.1 30° Fixed Point



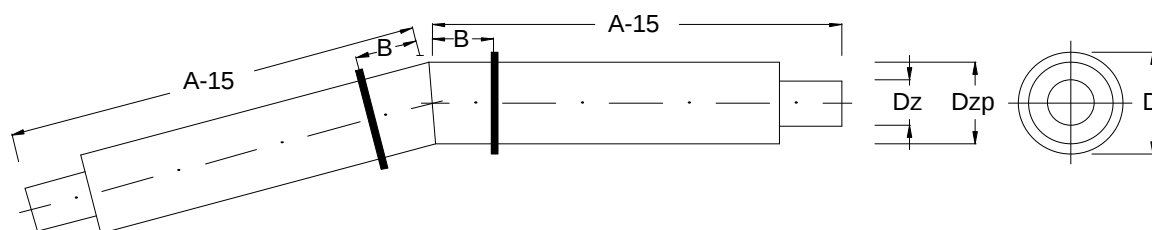
Bending angle:
 $3 \times Dz$ DN 20÷80;
 $1,5 \times DN$ DN 100÷600

Table 22

Nominal Diameter	Steel Pipe External Diameter	Jacket Pipe External Diameter	Length	Diameter	Distance	Catalogue Reference Number
DN	Dz	Dzp	A-30	D	B	
mm	mm	mm	mm	mm	mm	
20	26,9	75	1000	125	220	PSK-20/30
25	33,7	90	1000	140	230	PSK-25/30
32	42,4	110	1000	140	230	PSK-32/30
40	48,3	110	1000	140	240	PSK-40/30
50	60,3	125	1000	170	250	PSK-50/30
65	76,1	140	1000	200	260	PSK-65/30
80	88,9	160	1500	220	270	PSK-80/30
100	114,3	200	1500	260	270	PSK-100/30
125	139,7	225	1500	300	270	PSK-125/30
150	168,3	250	1500	320	270	PSK-150/30
200	219,1	315	1500	400	380	PSK-200/30
250	273,0	400	1500	500	400	PSK-250/30
300	323,9	450	2000	560	420	PSK-300/30

Note: Units of diameters exceeding DN 300 are tailor-made to geometric configurations agreed with the customer.

9.15.2 15° Anchor Point



Bending angle:

$3 \times Dz$

$1,5 \times DN$

DN 20÷80;

DN 100÷600

Table 23

Nominal Diameter	Steel Pipe External Diameter	Jacket Pipe External Diameter	Length	Diameter	Distance	Catalogue Reference Number
DN	Dz	Dzp	A-15	D	B	
mm	mm	mm	mm	mm	mm	
20	26,9	75	1000	125	210	PSK-20/15
25	33,7	90	1000	140	210	PSK-25/15
32	42,4	110	1000	140	220	PSK-32/15
40	48,3	110	1000	140	220	PSK-40/15
50	60,3	125	1000	170	220	PSK-50/15
65	76,1	140	1000	200	230	PSK-65/15
80	88,9	160	1500	220	240	PSK-80/15
100	114,3	200	1500	260	240	PSK-100/15
125	139,7	225	1500	300	240	PSK-125/15
150	168,3	250	1500	320	240	PSK-150/15
200	219,1	315	1500	400	340	PSK-200/15
250	273,0	400	1500	500	350	PSK-250/15
300	323,9	450	2000	560	360	PSK-300/15

Note: Units of diameters exceeding DN 300 are tailor-made to geometric configurations agreed with the customer.

9.16 Longitudinal Compensator

9.16.1 Single bellow longitudinal compensator operating under a nominal pressure of 1.6 MPa

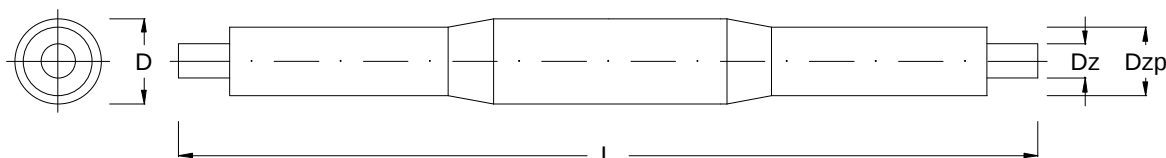


Table 24

Nominal Diameter	Carrier Pipe External Diameter	Jacket Pipe External Diameter	Diameter	Length	Compensation Increment	Catalogue Reference Number
DN	Dz	Dzp	Dzp1	Dz2	ΔL_k	
mm	mm	mm	mm	mm	mm	
40	48,3	110	160	2000	100	KP-40-100
50	60,3	125	200	2000	100	KP-50-100
65	76,1	140	200	2000	100	KP-65-100
80	88,9	160	225	2000	100	KP-80-100
80	88,9	160	225	2000	150	KP-80-150
100	114,3	200	250	2500	125	KP-100-125
100	114,3	200	250	2500	150	KP-100-155
125	139,7	225	315	2500	125	KP-125-125
125	139,7	225	315	2500	160	KP-125-160
150	168,3	250	400	2500	125	KP-150-125
150	168,3	250	400	2500	165	KP-150-165
200	219,1	315	450	2500	125	KP-200-125
200	219,1	315	450	2500	170	KP-200-170
250	273,0	400	500	2500	125	KP-250-125
250	273,0	400	500	2500	170	KP-250-170
300	323,9	450	560	2500	125	KP-300-125
300	323,9	450	560	2500	190	KP-300-190
350	355,6	500	630	3000	125	KP-350-125
350	355,6	500	630	3000	190	KP-350-190
400	406,4	560	710	3000	125	KP-400-125
400	406,4	560	710	3000	200	KP-400-200
450	457,0	560	710	3000	125	KP-450-125
450	457,0	560	710	3000	200	KP-450-200
500	508,0	630	800	3000	125	KP-500-125
500	508,0	630	800	3000	200	KP-500-200
600	610,0	800	900	3000	125	KP-600-125
600	610,0	800	900	3000	200	KP-600-200

Note: Units of diameters exceeding DN 600 are tailor-made to geometric configurations agreed with the customer.

9.16.2 Single bellow longitudinal compensator operating under a nominal pressure of 2.5 MPa

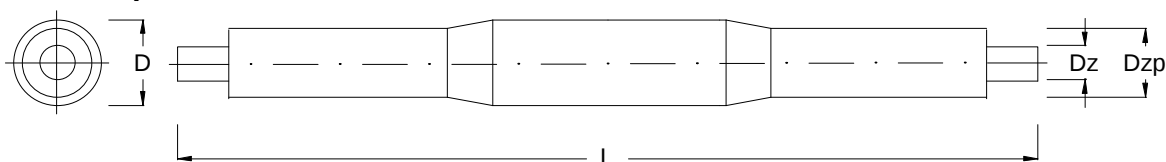


Table 25

Nominal Diameter	Carrier Pipe External Diameter	Jacket Pipe External Diameter	Diameter	Length	Compensation Increment	Catalogue Reference Number
DN	Dz	Dzp	D	L	ΔL_k	
mm	mm	mm	mm	mm	mm	
80	88,9	160	225	2000	90	KP-80-90
100	114,3	200	250	2500	90	KP-100-90
125	139,7	225	315	2500	90	KP-125-90
150	168,3	250	315	2500	90	KP-150-90
200	219,1	315	450	2500	90	KP-200-90
250	273,0	400	500	2500	90	KP-250-90
300	323,9	450	560	2500	90	KP-300-90
350	355,6	500	630	3000	90	KP-350-90
400	406,4	560	710	3000	90	KP-400-90
450	457,0	560	710	3000	90	KP-450-90
500	508,0	630	800	3000	90	KP-500-90
600	610,0	800	900	3000	90	KP-600-90

Note: Units of diameters exceeding DN 600 are tailor-made to geometric configurations agreed with the customer.

10 Preinsulated Steel Valve Fittings and Fixtures

10.1 Shutoff Ball Valve

A preinsulated shutoff ball valve is supplied together with its fittings, which comprise: a wrench to open and shutoff the valve, a street box and a jacket pipe connecting the spindle and street box.

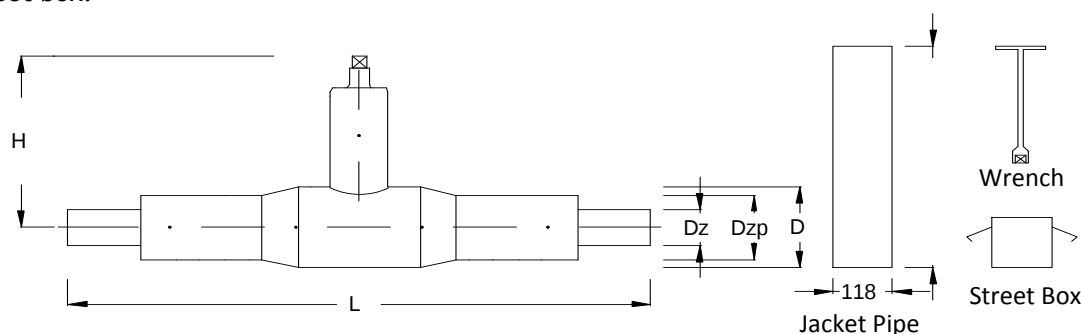


Table 26

Straight Pipe			D	H	L	Catalogue Reference Number
Nominal Diameter	Carrier Pipe External Diameter	Jacket Pipe External Diameter				
DN	Dz	Dzp				
mm	mm	mm				
20	26,9	75	90	380	1200	ZK-20
25	33,7	90	110	384	1200	ZK-25
32	42,4	110	110	388	1200	ZK-32
40	48,3	110	125	403	1200	ZK-40
50	60,3	125	140	410	1200	ZK-50
65	76,1	140	160	414	1200	ZK-65
80	88,9	160	200	427	1200	ZK-80
100	114,3	200	225	450	1500	ZK-100
125	139,7	225	315	455	1500	ZK-125
150	168,3	250	400	457	1500	ZK-150
200	219,1	315	450	515	1800	ZK-200
250	273,0	400	450	560	1800	ZK-250
300	323,9	450	560	756	1800	ZK-300
Jacket Pipe Dzn			118 mm			ZKN-100
Wrench			36 mm			ZKK-36
			50 mm			ZKK-50
Street Box			CPV Hiline ZPU type			ZKS-100

Note: Units of diameters exceeding DN 300 are tailor-made to geometric configurations agreed with the customer.

10.2 Vent Ball Valve

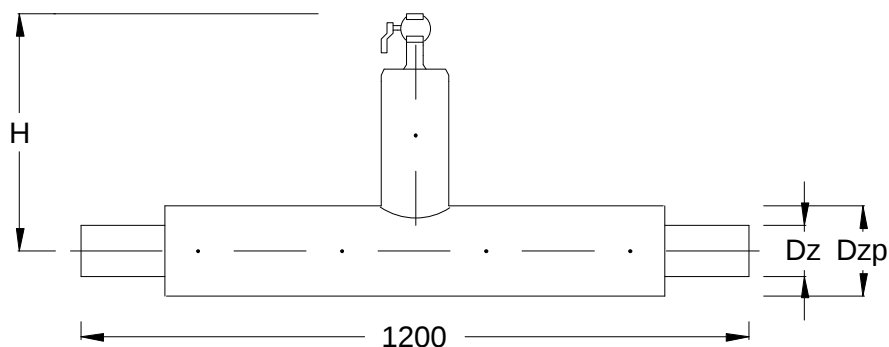


Table 27

Straight Pipe			Diameter of Vent Valve	H	Catalogue Reference Number
Nominal Diameter	Carrier Pipe External Diameter	Jacket Pipe External Diameter			
DN	Dz	Dzp			
mm	mm	mm	mm	mm	
25	33,7	90	33,7	384	ZD-25
32	42,4	110	33,7	388	ZD-32
40	48,3	110	33,7	403	ZD-40
50	60,3	125	33,7	410	ZD-50
65	76,1	140	33,7	414	ZD-65
80	88,9	160	33,7	427	ZD-80
100	114,3	200	33,7	450	ZD-100
125	139,7	225	33,7	455	ZD-125
150	168,3	250	33,7	457	ZD-150
200	219,1	315	33,7	515	ZD-200
250	273,0	400	33,7	560	ZD-250
300	323,9	450	33,7	756	ZD-300

Option: Threaded end vent valves

Note: Units of diameters exceeding DN 300 are tailor-made to geometric configurations agreed with the customer.

10.3 Strain Ball Valve

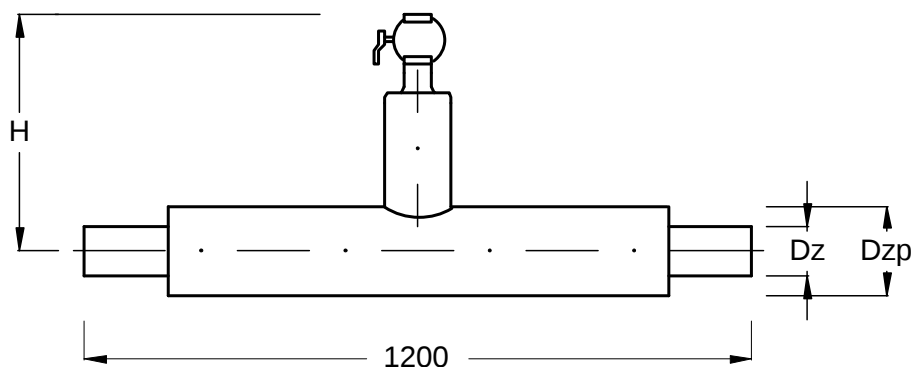


Table 28

Straight Pipe			Diameter of Strain Valve	H	Catalogue Reference Number
Nominal Diameter	Carrier Pipe External Diameter	Jacket Pipe External Diameter			
DN	Dz	Dzp			
mm	mm	mm	mm	mm	
40	48,3	110	48,3	403	ZO-40
50	60,3	125	48,3	410	ZO-50
65	76,1	140	48,3	414	ZO-65
80	88,9	160	48,3	427	ZO-80
100	114,3	200	48,3	450	ZO-100
125	139,7	225	48,3	455	ZO-125
150	168,3	250	48,3	457	ZO-150
200	219,1	315	60,3	515	ZO-200
250	273,0	400	60,3	560	ZO-250
300	323,9	450	60,3	756	ZO-300

Option: Threaded end strain valves

Note: Units of diameters exceeding DN 300 are tailor-made to geometric configurations agreed with the customer.

10.4 Shutoff Ball Valve and Vent Valve Assembly

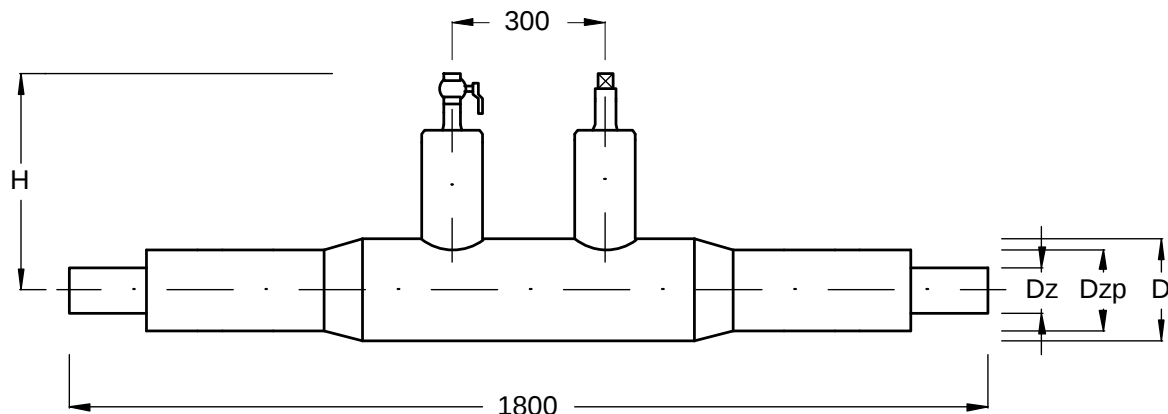


Table 29

Straight Pipe			D	H	Catalogue Reference Number
Nominal Diameter	Carrier Pipe External Diameter	Jacket Pipe External Diameter			
DN	Dz	Dzp			
mm	mm	mm	mm	mm	
32	42,4	110	110	388	ZKD-32
40	48,3	110	125	403	ZKD-40
50	60,3	125	140	410	ZKD-50
65	76,1	140	160	414	ZKD-65
80	88,9	160	200	427	ZKD-80
100	114,3	200	225	450	ZKD-100
125	139,7	225	250	455	ZKD-125
150	168,3	250	315	457	ZKD-150
200	219,1	315	400	515	ZKD-200
250	273,0	400	450	560	ZKD-250
300	323,9	450	560	756	ZKD-300

Vent valve diameter:

for pipe of nominal diameters up to **300 mm** **33,7 mm**
 nominal diameters up to **600 mm** **48,3 mm**

Option: Threaded end vent valves

Note: Units of diameters exceeding DN 300 are tailor-made to geometric configurations agreed with the customer.

10.5 Single Strain Valve Shutoff Ball Valve

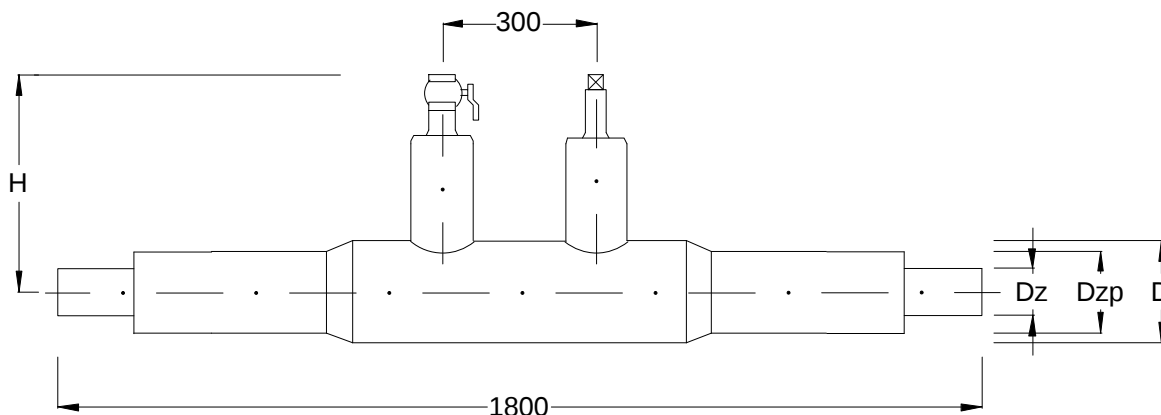


Table 30

Straight Pipe			D	H	Catalogue Reference Number
Nominal Diameter	Carrier Pipe External Diameter	Jacket Pipe External Diameter			
DN	Dz	Dzp			
mm	mm	mm	mm	mm	
40	48,3	110	125	403	ZKO-40
50	60,3	125	140	410	ZKO-50
65	76,1	140	160	414	ZKO-65
80	88,9	160	200	427	ZKO-80
100	114,3	200	225	450	ZKO-100
125	139,7	225	250	455	ZKO-125
150	168,3	250	315	457	ZKO-150
200	219,1	315	400	515	ZKO-200
250	273,0	400	450	560	ZKO-250
300	323,9	450	560	756	ZKO-300

Strain valve diameter:

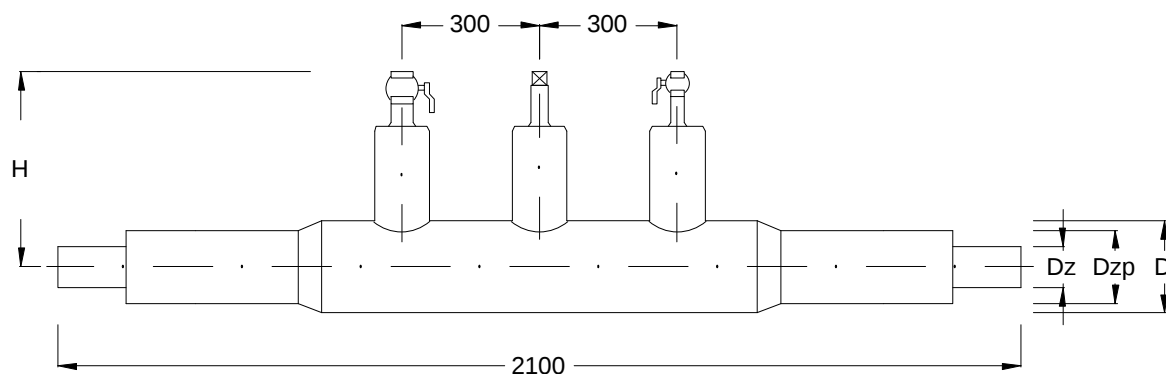
for pipe of	nominal diameters up to 150 mm	48,3 mm
	nominal diameters up to 300 mm	60,3 mm
	nominal diameters up to 400 mm	88,9 mm
	nominal diameters up to 600 mm	114,3 mm

Option:

Threaded end strain valves

Note: Units of diameters exceeding DN 300 are tailor-made to geometric configurations agreed with the customer.

10.6 Strain and Vent Shutoff Ball Valve


Table 31

Straight Pipe			D	H	Catalogue Reference Number
Nominal Diameter	Carrier Pipe External Diameter	Jacket Pipe External Diameter			
DN	Dz	Dzp			
mm	mm	mm			
40	48,3	110	125	403	ZKOD-40
50	60,3	125	140	410	ZKOD-50
65	76,1	140	160	414	ZKOD-65
80	88,9	160	200	427	ZKOD-80
100	114,3	200	225	450	ZKOD-100
125	139,7	225	250	455	ZKOD-125
150	168,3	250	315	457	ZKOD-150
200	219,1	315	400	515	ZKOD-200
250	273,0	400	450	560	ZKOD-250
300	323,9	450	560	756	ZKOD-300

Strain/vent valve diameter:

for pipe of	nominal diameters up to 150 mm	48,3 mm
	nominal diameters up to 300 mm	60,3 mm
	nominal diameters up to 400 mm	88,9 mm
	nominal diameters up to 600 mm	114,3 mm

Option:

Threaded end strain valves

Note: Units of diameters exceeding DN 300 are tailor-made to geometric configurations agreed with the customer.

11 Coupling Unit

11.1 Common Coupling N

(HPDE sleeve sealed with heat shrinkable tape)

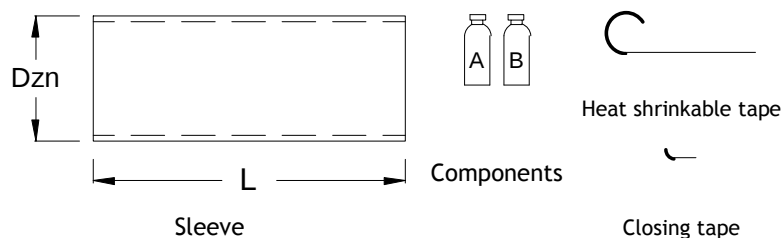


Table 32

Nominal Diameter	Carrier Pipe External Diameter	Sleeve External Diameter	Length	Components		Heat Shrinkable Tape	Closing tape	Catalogue Reference Number
DN	Dzp	Dzn	L	A	B			
mm	mm	mm	mm	g	g	cm	cm	
20	75	83	600	60	101	72	30	N-20/83
25	90	100	600	85	143	83	30	N-25/100
32	110	121	600	126	212	95	30	N-32/120
40	110	121	600	120	201	95	30	N-40/120
50	125	136	600	147	247	105	30	N-50/135
65	140	153	600	170	285	114	30	N-65/150
80	160	174	600	218	366	129	30	N-80/173
100	200	216	600	331	557	155	30	N-100/214
125	225	243	600	384	645	171	30	N-125/240
150	250	269	600	423	711	187	30	N-150/265
200	315	338	600	636	1068	233	45	N-200/333
250	400	428	700	1402	2357	288	45	N-250/420
300	450	472	700	1607	2701	320	45	N-300/472

PLUS Insulation

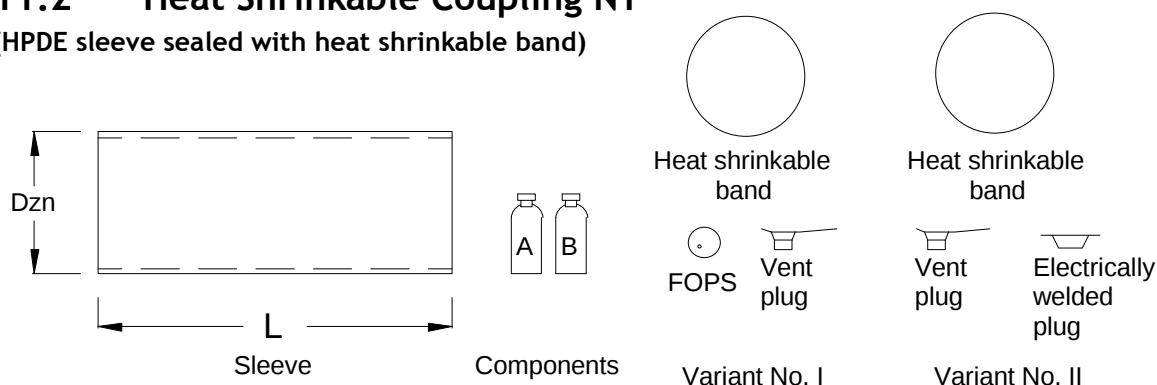
Table 32a

DN	Dzp	Dzn	L	A	B	Heat Shrinkable Tape	Closing tape	Catalogue Reference Number
mm	mm	mm	mm	g	g	cm	cm	
20	90	100	600	90	151	83	30	N-20/100
25	110	121	600	134	225	95	30	N-25/120
32	125	136	600	169	284	105	30	N-32/135
40	125	136	600	163	273	105	30	N-40/135
50	140	153	600	195	328	114	30	N-50/150
65	160	174	600	243	408	129	30	N-65/173
80	200	216	600	393	661	155	30	N-80/214
100	225	243	600	461	775	171	30	N-100/240
125	250	269	600	528	888	187	30	N-125/265
150	315	338	600	871	2313	233	45	N-150/333
200	355	380	600	1376	1346	288	45	N-200/380
250	450	472	700	2087	3509	320	45	N-250/472

Note: CPV can deliver N joints with shrinkable band on special customer's request acc. to catalogue card no.: 11.2

11.2 Heat Shrinkable Coupling NT

(HPDE sleeve sealed with heat shrinkable band)


Table 33

Nominal Diameter	Carrier Pipe External Diameter	Sleeve External Diameter	Length	Components		Heat Shrinkable Band	Plugs	Catalogue Reference Number
DN	Dzp	Dzn	L	A	B			
mm	mm	mm	mm	g	g	pieces	set	
20	75	83	600	60	101	2	2	NT-20/83
25	90	107	600	85	143	2	2	NT-25/107
32	110	129	600	126	212	2	2	NT-32/129
40	110	129	600	120	201	2	2	NT-40/129
50	125	143	600	147	247	2	2	NT-50/143
65	140	156	600	170	285	2	2	NT-65/156
80	160	178	600	218	366	2	2	NT-80/178
100	200	224	600	331	557	2	2	NT-100/224
125	225	255	600	384	645	2	2	NT-125/255
150	250	278	600	423	711	2	2	NT-150/278
200	315	341	600	636	1068	2	2	NT-200/341
250	400	430	700	1402	2357	2	2	NT-250/430
300	450	480	700	1607	2701	2	2	NT-300/480

PLUS Insulation

Table 33a

DN	Dzp	Dzn	L	A	B	Heat Shrinkable Band	Plugs	Catalogue Reference Number
mm	mm	mm	mm	g	g	pieces	set	
20	90	107	600	90	151	2	2	NT-20/107
25	110	129	600	134	225	2	2	NT-25/129
32	125	143	600	169	284	2	2	NT-32/143
40	125	143	600	163	273	2	2	NT-40/143
50	140	156	600	195	328	2	2	NT-50/156
65	160	178	600	243	408	2	2	NT-65/178
80	200	224	600	393	661	2	2	NT-80/224
100	225	255	600	461	775	2	2	NT-100/255
125	250	278	600	528	888	2	2	NT-125/278
150	315	341	600	871	1464	2	2	NT-150/341
200	355	383	600	962	1617	2	2	NT-200/383
250	450	480	700	2087	3509	2	2	NT-250/480

Note: CPV can deliver NT joints with shrinkable tape on special customer's request acc. to catalogue card no.: 11.2

11.3 Electrically Welded Heat Shrinkable Coupling DT

(HPDE sleeve sealed with heat shrinkable band)

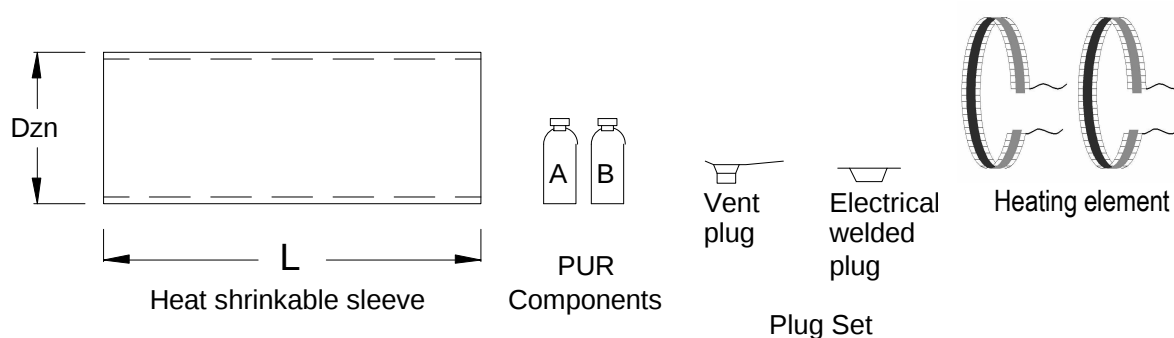
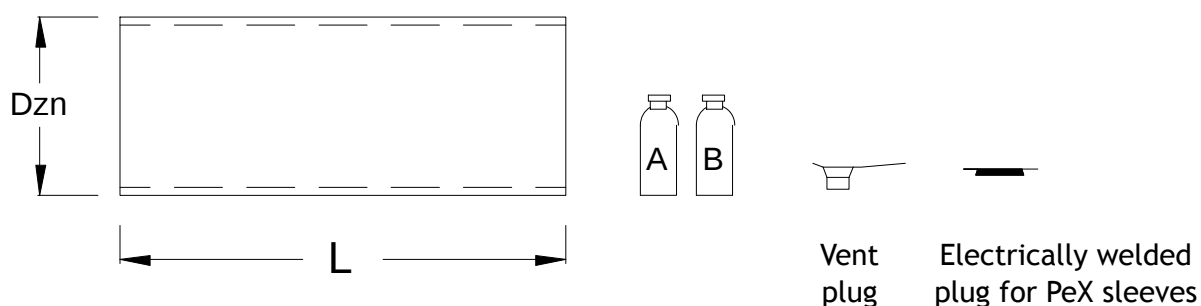


Table 33b

Nominal Diameter	Carrier Pipe External Diameter	Sleeve External Diameter	Length	PUR Components		Heating element	Plug Set	Catalogue Reference Number
DN	Dzp	Dzn	L	A	B			
mm	mm	mm	mm	g	g	pcs	set	
20	75	83	600	60	101	2	2	DT-20/83
25	90	107	600	85	143	2	2	DT-25/107
32	110	129	600	126	212	2	2	DT-32/129
40	110	129	600	120	201	2	2	DT-40/129
50	125	143	600	147	247	2	2	DT-50/143
65	140	156	600	170	285	2	2	DT-65/156
80	160	178	600	218	366	2	2	DT-80/178
100	200	224	600	331	557	2	2	DT-100/224
125	225	255	600	384	645	2	2	DT-125/255
150	250	278	600	423	711	2	2	DT-150/278
200	315	341	600	636	1068	2	2	DT-200/341
250	400	430	700	1402	2357	2	2	DT-250/430
300	450	480	700	1607	2701	2	2	DT-300/480
350	500	530	700	2033	3417	2	2	DT-350/530
400	560	590	700	1816	2960	2	2	DT-400/590
450	560	590	700	1755	2951	2	2	DT-450/590
500	630	660	700	2321	3901	2	2	DT-500/660
600	800	838	700	4438	7461	2	2	DT-600/838
700	900	949	700	5070	8523	2	2	DT-700/949
800	1000	1060	700	5677	9543	2	2	DT-800/1060

11.4 Crosslinked Heat Shrinkable Coupling - TS

(Crosslinked HPDE sleeve)



Tabel 33c

Insulation **“STANDARD”**

Nominal Diameter	Carrier Pipe External Diameter	Sleeve External Diameter	Length	PUR Components		Vent plug + electrically welded plug	Catalogue Reference Number
				A	B		
DN	Dzp	Dzn	L	g	g	set	
mm	mm	mm	mm	g	g	set	
20	75	83	600	60	101	1	TS-20/83
25	90	107	600	85	143	1	TS-25/107
32	110	129	600	126	212	1	TS-32/129
40	110	129	600	120	201	1	TS-40/129
50	125	143	600	147	247	1	TS-50/143
65	140	156	600	170	285	1	TS-65/156
80	160	178	600	218	366	1	TS-80/178
100	200	224	600	331	557	1	TS-100/224
125	225	255	600	384	645	2	TS-125/255
150	250	278	600	423	711	2	TS-150/278
200	315	341	600	636	1068	2	TS-200/341
250	400	430	700	1402	2357	2	TS-250/430
300	450	480	700	1607	2701	2	TS-300/480

11.5 Dry Heat Shrinkable Coupling NTS

(HDPE Heat Shrinkable Sleeve, PUR Lag, Heat Shrinkable Band)

Variant No. 2

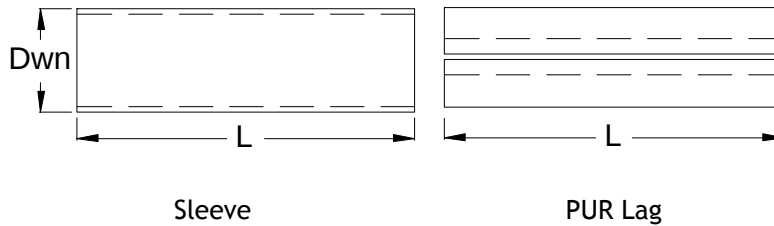
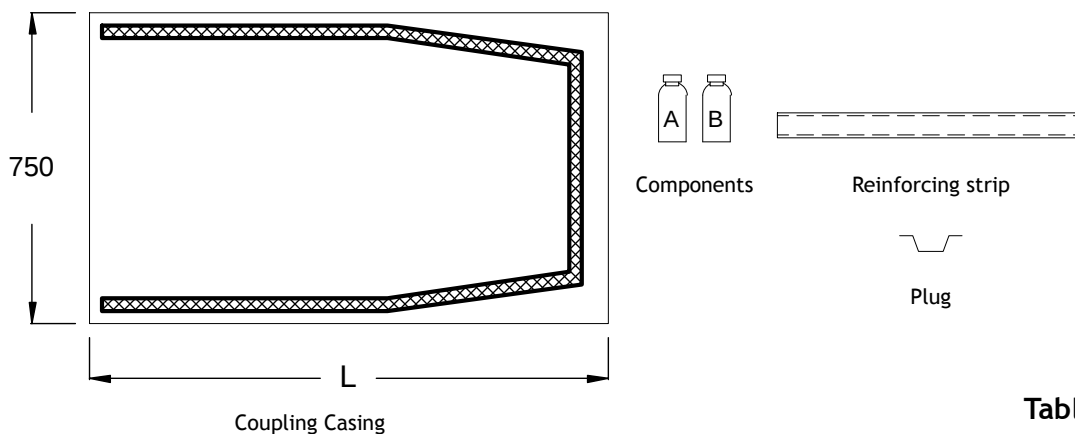

Heat
Shrinkable
Band

Table 34

Pipe Unit		Sleeve		Coupling Assembly Parts		
Nominal Diameter	Jacket Pipe External Diameter	Internal Diameter	Length	PUR Lags	Variant No. 2	Catalogue Reference Number
DN	Dzp	Dzn	L	L	Band	
mm	mm	mm	mm	mm		
20	75	83	600	350	2	NTS-20/83
25	90	107	600	350	2	NTS-25/107
32	110	129	600	350	2	NTS-32/129
40	110	129	600	350	2	NTS-40/129
50	125	143	600	350	2	NTS-50/143
65	140	156	600	350	2	NTS-65/156
80	160	178	600	350	2	NTS-80/178
100	200	224	600	350	2	NTS-100/224
125	225	255	600	350	2	NTS-125/255
150	250	278	600	350	2	NTS-150/278
200	315	341	600	450	2	NTS-200/341
250	400	430	700	450	2	NTS-250/430
300	450	480	700	450	2	NTS-300/480

11.6 DX Butt Welded Coupling (Standard Insulation)


Table 35

Nominal Diameter	Jacket Pipe External Diameter	Plate Length	Components		Plug	Catalogue Reference Number
DN	Dzp	Dzn	A	B		
mm	mm	mm	g	g	pieces	
32	110	535	126	212	2	DX-110/750
40	110	535	120	201	2	DX-110/750
50	125	583	147	247	2	DX-125/750
65	140	630	170	285	2	DX-140/750
80	160	690	218	366	2	DX-160/750
100	200	820	331	557	2	DX-200/750
125	225	900	384	645	2	DX-225/750
150	250	990	423	711	2	DX-250/750
200	315	1230	636	1068	2	DX-315/750
250	400	1500	1402	2357	2	DX-400/750
300	450	1660	1607	2701	2	DX-450/750
350	500	1820	2033	3417	2	DX-500/750
400	560	2000	1816	2960	2	DX-560/750
450	560	2000	1755	2951	2	DX-560/750
500	630	2250	2321	3901	2	DX-630/750
600	800	2870	4438	7461	2	DX-800/750
700	900	3180	5070	8523	2	DX-900/750
800	1000	3500	5677	9543	2	DX-1000/750
1000	1200	4128	6902	11603	2	DX-1200/750

Note: Option available only if a coupling unit is made by CPV Hiline ZPU trained installers.

11.6.1 DX+ Butt Welded Coupling (Plus Insulation)

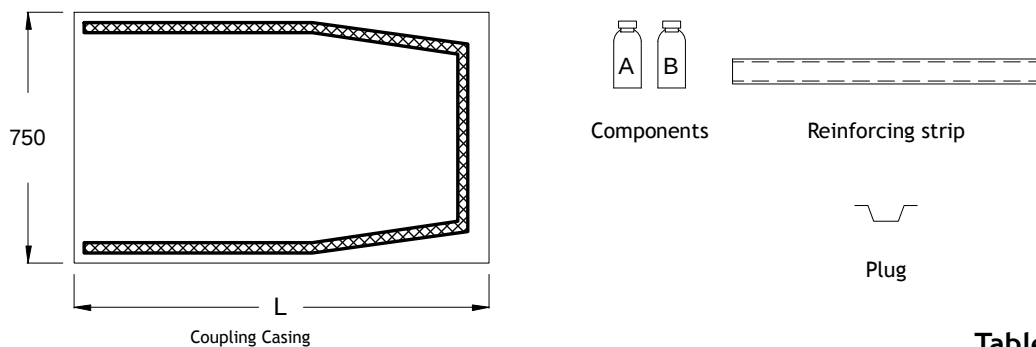


Table 35a

Nominal Diameter	Jacket Pipe External Diameter	Plate Length	Components		Plug	Catalogue Reference Number
DN	Dzp	Dzn	A	B		
mm	mm	mm	g	g	pieces	
25	110	535	134	225	2	DX+110/750
32	125	583	169	284	2	DX+125/750
40	125	583	163	273	2	DX+125/750
50	140	630	195	328	2	DX+140/750
65	160	693	243	408	2	DX+160/750
80	200	820	393	661	2	DX+200/750
100	225	900	461	775	2	DX+225/750
125	250	990	528	888	2	DX+250/750
150	315	1230	871	1464	2	DX+315/750
200	400	1500	1376	2313	2	DX+400/750
250	450	1660	2087	3509	2	DX+450/750
300	500	1820	2373	3989	2	DX+500/750
350	560	2000	2362	3970	2	DX+560/750
400	630	2000	2893	4716	2	DX+630/750
450	630	2250	3099	5209	2	DX+630/750
500	710	2530	4050	6807	2	DX+710/750
600	900	3180	7180	12069	2	DX+900/750
700	1000	3500	8135	13674	2	DX+1000/750
800	1100	3814	9064	15236	2	DX+1100/750
900	1200	4128	10015	16835	2	DX+1200/750

Note: Option available only if a coupling unit is made by CPV Hiline ZPU.

12 Insulation and Pipeline Closing

12.1 Pipeline Closing - End Sleeve

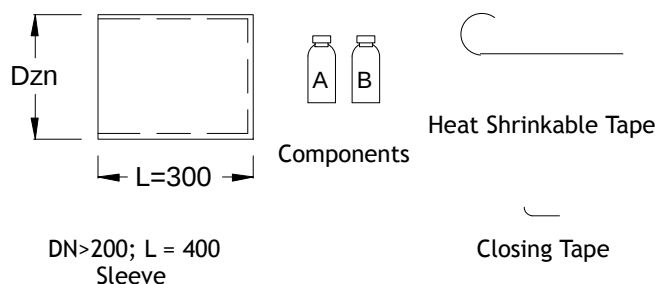


Table 36

Nominal Diameter	Jacket Pipe External Diameter	Sleeve External Diameter	Components		Heat Shrinkable Tape	Closing Tape	Catalogue Reference Number
DN	Dzp	Dzn	A	B			
mm	mm	mm	g	g	cm	cm	
20	75	83	40	66	40	15	NK-20/83
25	90	100	56	94	40	15	NK-25/100
32	110	121	83	140	47	15	NK-32/120
40	110	121	79	133	47	15	NK-40/120
50	125	136	97	163	52	15	NK-50/135
65	140	153	112	188	56	15	NK-65/150
80	160	174	144	241	64	15	NK-80/173
100	200	216	219	368	76	15	NK-100/214
125	225	243	253	426	86	15	NK-125/240
150	250	269	279	470	94	15	NK-150/265
200	315	338	420	705	115	22	NK-200/333
250	400	429	1234	2074	145	22	NK-250/420
300	450	472	1414	2377	161	22	NK-300/472

PLUS Insulation

Table 36a

Nominal Diameter	Jacket Pipe External Diameter	Sleeve External Diameter	Components		Heat Shrinkable Tape	Closing Tape	Catalogue Reference Number
DN	Dzp	Dzn	A	B			
mm	mm	mm	g	g	cm	cm	
20	90	100	59	100	47	15	NK-20/100
25	110	121	88	149	47	15	NK-25/120
32	125	136	111	187	52	15	NK-32/135
40	125	136	107	180	52	15	NK-40/135
50	140	153	129	217	56	15	NK-50/150
65	160	174	160	269	64	15	NK-65/173
80	200	216	259	436	76	15	NK-80/214
100	225	243	304	511	86	15	NK-100/240
125	250	269	349	586	94	15	NK-125/265
150	315	338	575	966	115	22	NK-150/333
200	355	380	908	1527	145	22	NK-200/380
250	450	472	1837	3088	161	22	NK-250/472

12.2 Shrink End Cap - Heat Shrinkable Sleeve

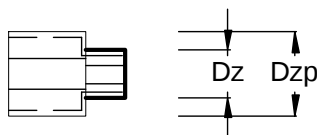


Table 37

Jacket Pipe Nominal Diameter	Catalogue Reference Number
75	E-75
90	E-90
110	E-110
125	E-125
140	E-140
160	E-160
200	E-200
225	E-225
250	E-250
315	E-315
400	E-400
450	E-450
500	E-500
520	E-520
560	E-560
630	E-630
710	E-710
800	E-800

13 Warning Tape

To be placed above a pipeline. Supplied in coils in 350 m multiple lengths. Carries a wording "CAUTION! HEATING MAINS BELOW".



Table 38

	Colour	Width [mm]	Catalogue Reference Number
Warning Tape	yellow	155	T-150

14 Wall Transition

14.1 Rubber Ring

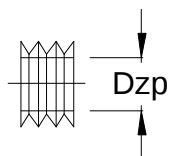


Table 39

Jacket Pipe Nominal Diameter	Catalogue Reference Number
75	P-75
90	P-90
110	P-110
125	P-125
140	P-140
160	P-160
200	P-200
225	P-225
250	P-250
315	P-315
400	P-400
450	P-450
500	P-500
520	P-520
560	P-560
630	P-630
710	P-710
800	P-800

14.2 Branch-Off Protective Tube - Joint Adapter

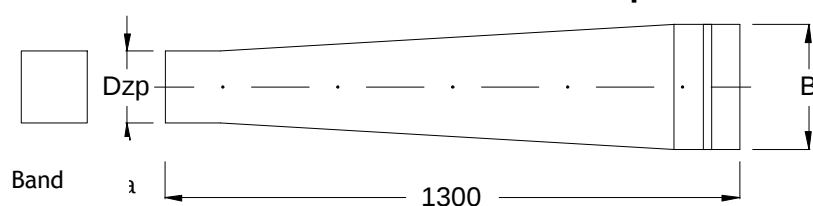
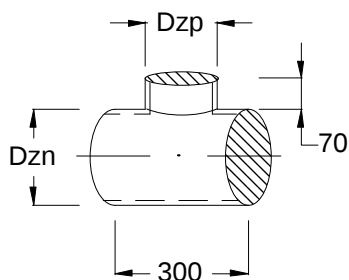


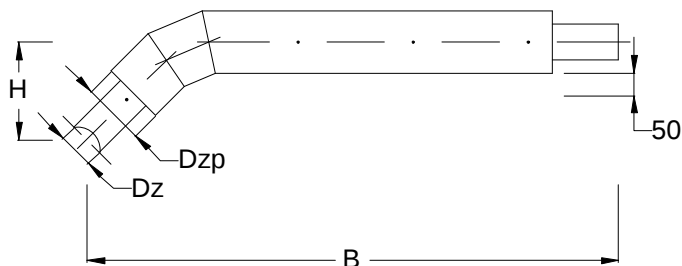
Table 40

External Pipe Nominal Diameter	Dimension B	Catalogue Reference Number
mm	mm	
75	175	A-75
90	185	A-90
110	195	A-110
125	220	A-125
140	250	A-140
160	280	A-160

15 Mains Branching Off 45° Elbow Cold Inset



TPE Tee



Branching Off Elbow



Components

Heat Shrinkable Tape 150
mm Wide

Closing Tape



Heat Shrinkable Tape 450 mm Wide



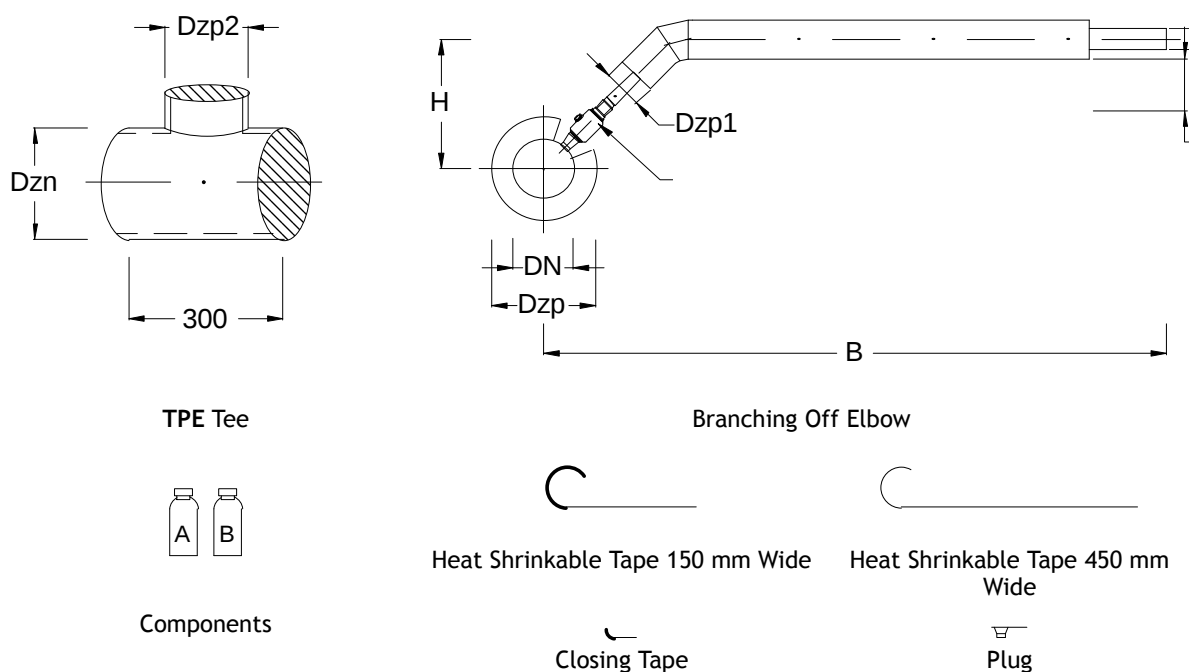
Plug

Table 41

Mains		Branching Off		Branching Off Pipe		TPE Tee		Catalogue Reference Number
Nominal Diameter	Jacket Pipe External Diameter	Nominal Diameter	Jacket Pipe External Diameter	H	B	Mains External Diameter	Branching Off External Diameter	
DN	Dzp	DN	Dzp			Dzn	Dzp	
mm	mm	mm	mm	mm	mm	mm	mm	
25	90	20	75	140	900	110	90	TPE-25/20
32	110	25	90	150	900	125	110	TPE-32/25
40	110	32	110	160	900	125	125	TPE-40/32
50	125	40	110	168	900	140	125	TPE-50/40
65	140	50	125	183	1200	160	140	TPE-65/50
80	160	65	140	200	1200	200	160	TPE-80/65
100	200	65	140	220	1200	225	160	TPE-100/65

Note: TPE tees are fabricated to accommodate any mains diameter and branching off pipe diameter up to DN 200.

16 Mains Branching Off 45° Elbow Hot Inset

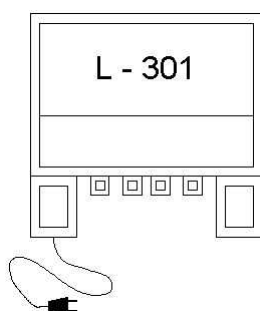

Table 42

Mains		Branching Off		Branching Off Pipe		TPE Tee		Catalogue Reference Number
Nominal Diameter	Jacket Pipe External Diameter	Nominal Diameter	Jacket Pipe External Diameter	H	B	Mains External Diameter	Branching Off External Diameter	
DN	Dzp	DN	Dzp			Dzn	Dzp	
mm	mm	mm	mm	mm	mm	mm	mm	
25	90	20	75	191	900	110	110	TPG-25/20
32	110	25	90	205	900	125	125	TPG-32/25
40	110	32	110	220	900	125	125	TPG-40/32
50	125	40	110	250	900	140	140	TPG-50/40
65	140	50	125	278	1200	160	160	TPG-65/50
80	160	65	140	305	1200	200	200	TPG-80/65
100	200	65	140	310	1200	225	200	TPG-100/65
125	225	80	160	330	1200	250	225	TPG-125/80
150	250	100	200	335	1200	315	250	TPG-150/100

Note: TPE tees are fabricated to accommodate any mains diameter and branching off pipe diameter up to DN 100.

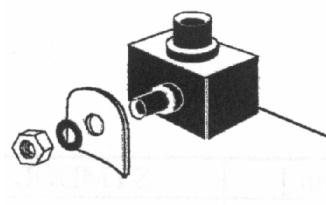
17 Pulse System

17.1 Measuring Device



Dimensions [mm]			Catalogue Reference Number
Width	Thickness	Height	
215	80	180	LA301

2a. Leak Detection System Components



Universal Connection Box

Dimensions [mm]			Catalogue Reference Number
Width	Thickness	Height	
35	35	50	UPP-1

Locating Device Resetting Terminal



Dimensions [mm]		Catalogue Reference Number
Diameter	Length	
18	40	KZL

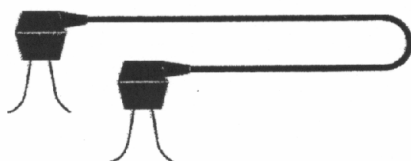
18 Pulse System

Locating Device Connecting Coaxial Cable



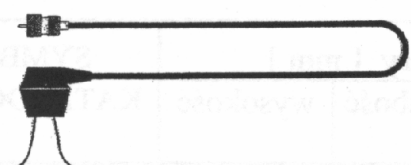
Dimensions [mm]		Catalogue Reference Number
Diameter	Length	
7	1000	K-1
7	2000	K-2
7	3000	K-3
7	4000	K-4
7	5000	K-5

Pulse Device Jumper Cable



Dimensions [mm]		Catalogue Reference Number
Diameter	Length	
7	5000	KPS-5

Pulse Device Connecting Cable



Dimensions [mm]		Catalogue Reference Number
Diameter	Length	
7	5000	KP-5

Crimp - to connect coupling assembly



Dimensions [mm]		Catalogue Reference Number
Diameter	Length	
4	15	S-4



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