Frese SPERAMAX

Underground-series

Application

Underground Ball Valves are designed for district heating systems and other closed loop water systems where the water is treated to avoid internal corrosion.

Having a fully welded body, the valves meet the requirements for valves used in district heating and district cooling systems and offer the highest degree of security.

Benefits

- Ideal for underground installation
- Floating ball suspended at the top and at gaskets that moves when pressure is applied and is not affected by axial force
- Low "break-loose" force due to stem and body design
- The valve design ensures lower turbulence, which requires lower pump power, thus reducing CO2 emissions
- The pressure drop is low, which results in big savings in operating costs
- Flexible design allows for individual customer requirements
- The stuffing box gasket can be tightened under pressure,
- Lowest required torque on the market for free floating ball valve
- Maintenance free

Features

The valve design makes them ideal for underground installation due to:

- Dimensions DN20 - DN600
- Single pipe valves high pressure-tested
- 3.1 certificate – and welding certification
- All welds are completed before high pressure testing
- Reduced material consumption
- Valves can be adjusted in height according to customer requirements

Approvals

- 100% final inspection. Leak and shell test as well as dimension and functionally test is performed on each valve according to applicable standard (EN12266 part 1 P10-P11-P12 & part 2 F20)
- Designed, produced and tested according to EUROHEAT & POWER and EN488:2015
- Production quality according to ISO 9001

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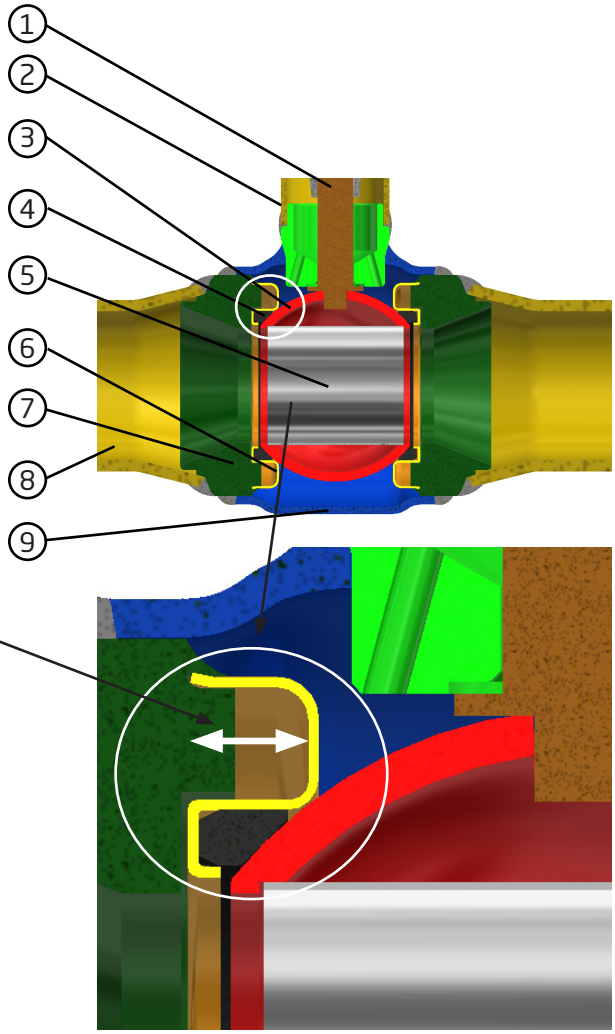
Underground-series

Ball Valve design

1. Stem
2. Extended stem
3. Ball
4. Gasket, carbon reinforced PTFE
5. Ball inner lining
6. Stainless steel spring
7. Inlet and outlet cone
8. Connection pipes
9. Valve housing

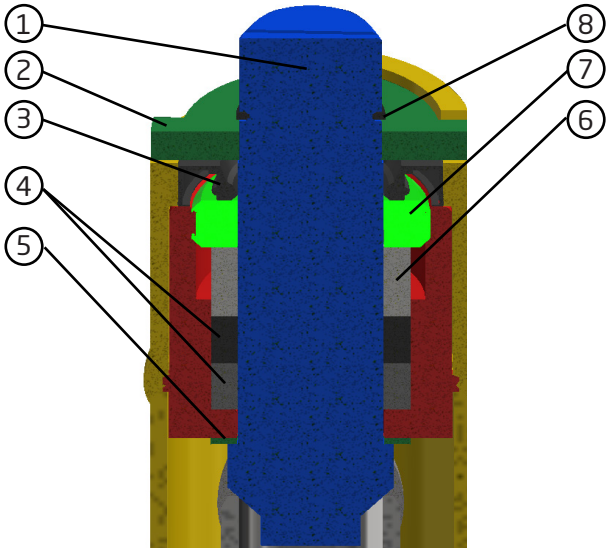


Gasket sealing design

- The gasket is mounted in a flexible spring suspension without movable sealing surfaces
- The seat gaskets are protected against dirt and deposits - even when the valve is open
- At low differential pressure (<approx. 4 bar) the valve is double sealing
- At high differential pressure, the valve, by virtue of the floating ball and water pressure, closes to the rear seat gasket
- Low break loose forces

Stuffing box design

1. Hexagon
2. Stop sector
3. Shaft seal
4. Gasket carbon reinforced PTFE
5. Washer
6. PTFE washer
7. Compression nut
8. Lock ring



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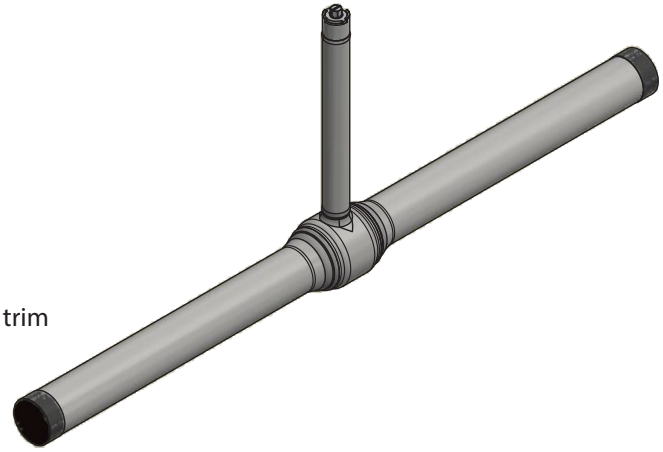
Underground-series

Technical data

Shell (Valve body):	Carbon steel P235GH
Welding ends:	Carbon steel P235GH
Valve Stem:	Stainless steel AISI 316L
Stem extension pipe:	Stainless steel AISI 316L
Ball:	Stainless steel AISI 304
Seat gasket rings:	Carbon reinforced PTFE
Stem gasket:	Carbon reinforced PTFE
Gear Box:	Cast iron with stainless steel trim
Pressure class:	PN25
Min. storage/transport temp.:	-40°C

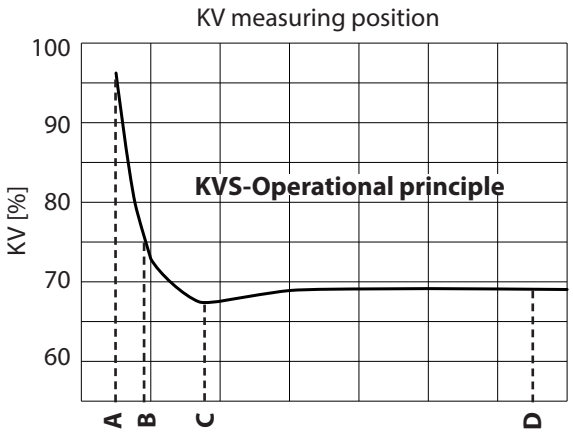


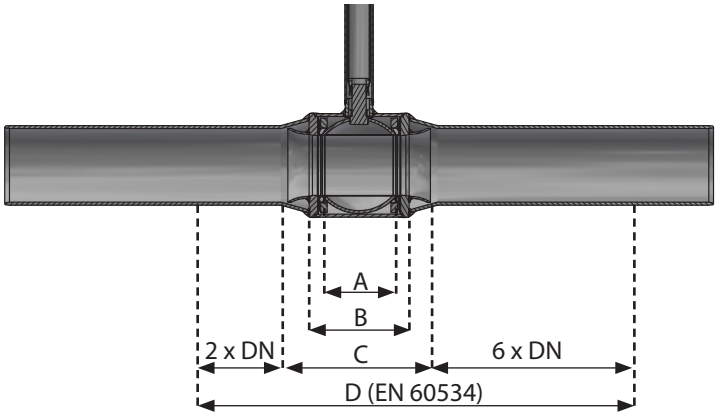
KVs and Axial Load Reduced Bore

Dimension [DN]	20	25	32	40	50	65	80	100	125	150	200	250	300	350**	400	450	500	600**
KVs Value [m³/h] **Ball Valve (B)**	15	34	52	96	184	200	470	640	1080	1900	2300	5100	9100	7000	10400	26300	23700	14300
KVs Value [m³/h] * **(EN60534) (D)**	14	31	48	79	120	190	350	530	870	1400	2160	3590	5390	5450	7640	13500	14700	13700
Max. allowed torque [Nm]	50	50	50	50	60	100	140	250	400	540	800	2000	4000	4000	8000	16000	16000	16000
Pressure class [Bar]	PN25																	
Temp. Range [°C]	0°C - 180°C																	
Medium	Circulation water / Glycolic water up to 50%																	

* KVs-values are based on EN60534 test methodology using CFD
** Double reduced valves

Valve Measuring Position and KV-dependency Reduced Bore



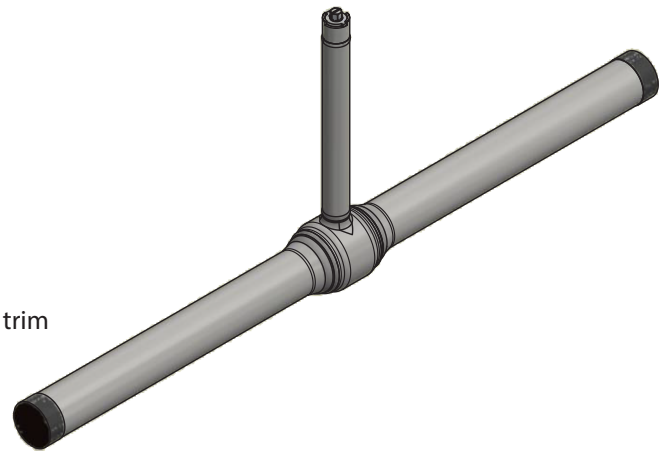


Frese SPERAMAX

Underground-series

Technical data

Shell (Valve body):	Carbon steel P235GH
Welding ends:	Carbon steel P235GH
Valve Stem:	Stainless steel AISI 316L
Stem extension pipe:	Stainless steel AISI 316L
Ball:	Stainless steel AISI 304
Seat gasket rings:	Carbon reinforced PTFE
Stem gasket:	Carbon reinforced PTFE
Gear Box:	Cast iron with stainless steel trim
Pressure class:	PN25
Min. storage/transport temp.:	-40°C

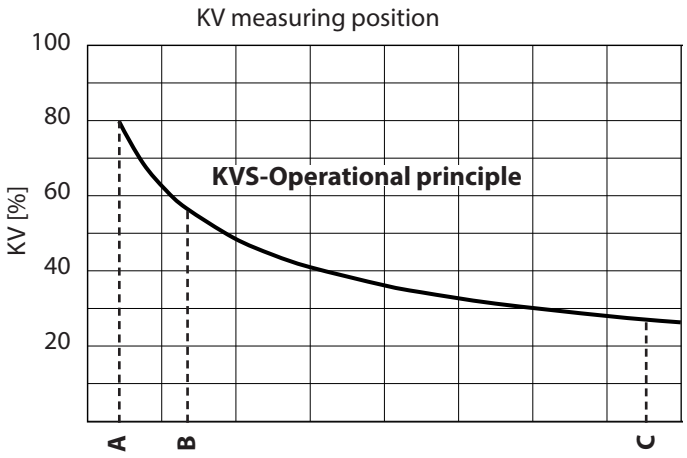


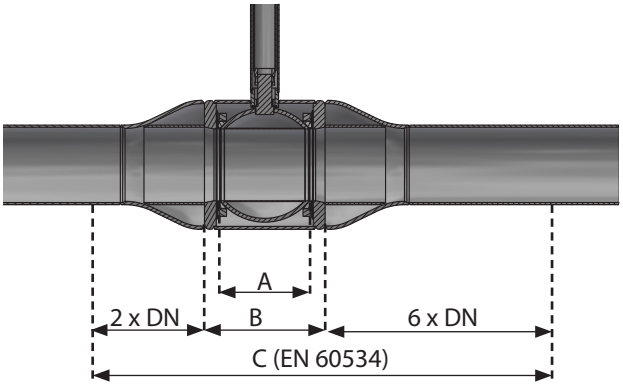
KVs and Axial Load Full Bore

Dimension [DN]	25	32	40	50	65	80	100	125	150	200	250	300	400
KVs Value [m³/h] **Ball Valve (B)**	90	160	235	395	820	1100	2300	3700	6100	11000	17500	24000	37500
KVs Value [m³/h] * **(EN60534) (C)**	44	78	100	190	360	490	870	1160	1750	3600	5010	7290	13400
Max. allowed torque [Nm]	50	50	60	100	140	250	400	540	800	2000	4000	8000	16000
Pressure class [Bar]	PN25												
Temp. Range [°C]	0°C - 180°C												
Medium	Circulation water / Glycolic water up to 50%												

* KVs-values are based on EN60534 test methodology using CFD

Valve Measuring Position and KV-dependency Full Bore

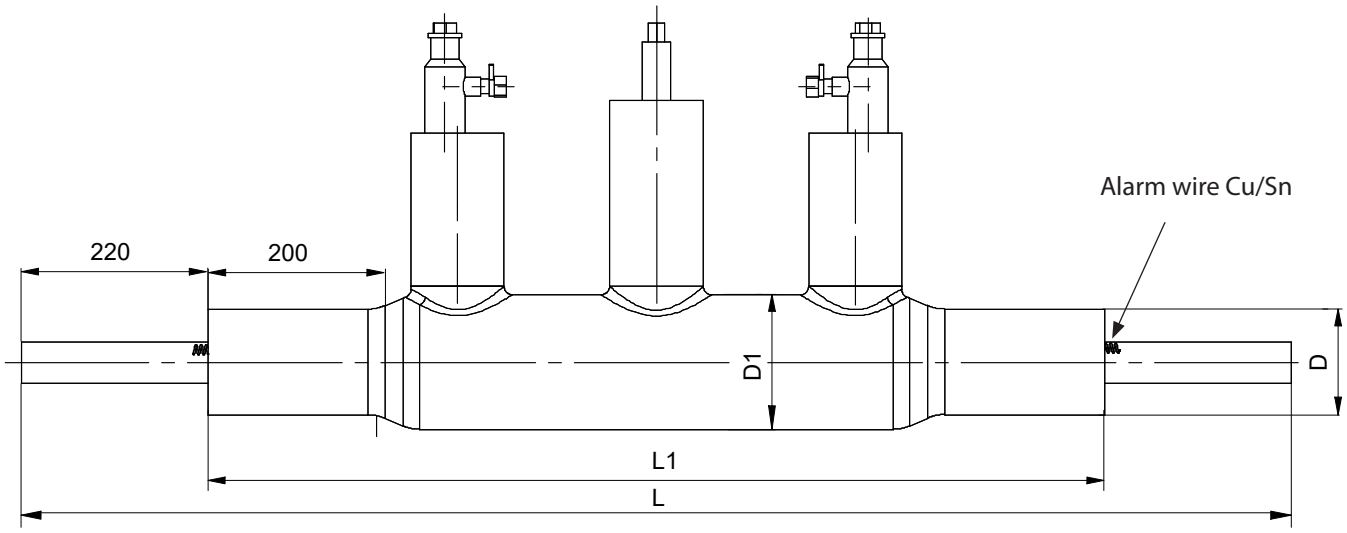




Frese SPERAMAX

Underground-series

Insulated single pipe reduced bore valve solution



Technical data insulation

Insulation:

Material	PUR (Polyurethan)
Density	65 kg/m³
Lambda-value [W/m · K]:	0,027

Outer cover:

Shrink plastic:	PE-HD PE100 (Polyethylene)
Thickness:	3.6 - 4.3 mm

Dimensions single pipe reduced bore valve solution with 2 service valves

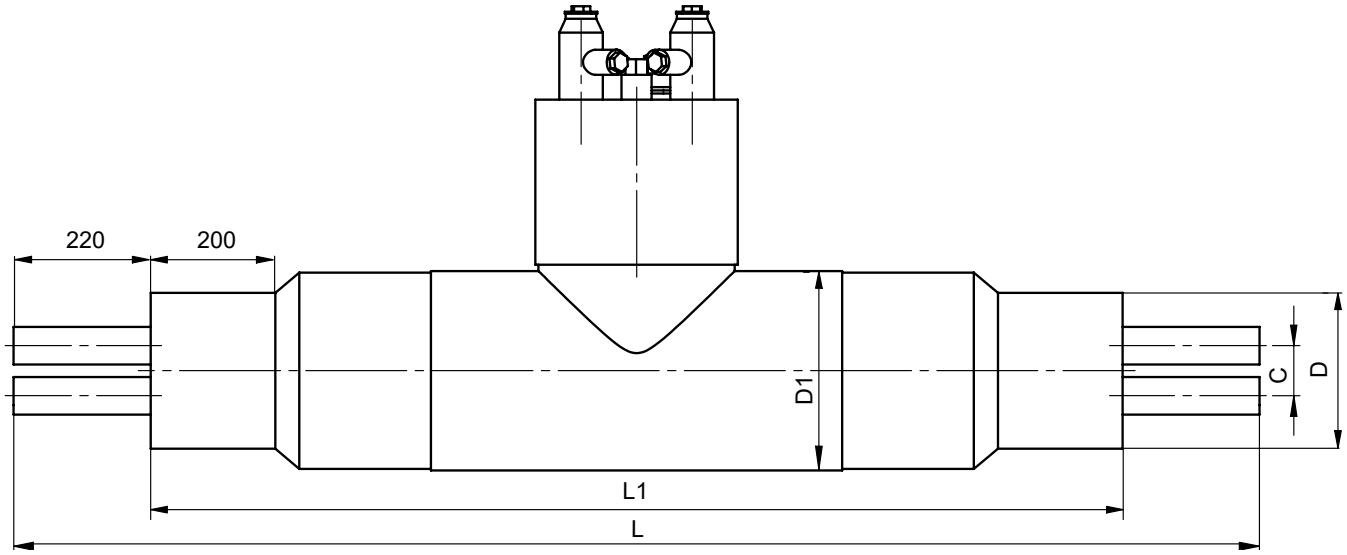
	Dimensions [mm]			
DN	L	L1	øD	øD1
32	1500	1060	110	140
40	1500	1060	110	140
50	1500	1060	125	160
65	1500	1060	140	180
80	1500	1060	160	200
100	1500	1060	200	250
125	1500	1060	225	280
150	1500	1060	250	315
200	1500	1060	315	400
250	1500	1060	400	500
300	1800	1360	450	560

For further details please see the induvidual valve specifications

Frese SPERAMAX

Underground-series

Insulated twin pipe reduced bore valve solution



Technical data insulation

Insulation:

Material	PUR (Polyurethan)
Density	65 kg/m³
Lambda-value [W/m · K]:	0,027

Outer cover:

Shrink plastic:	PE-HD PE100 (Polyethylene)
Thickness:	3.6 - 4.3 mm

Dimensions twin pipe reduced bore valve solution with 2 service valves

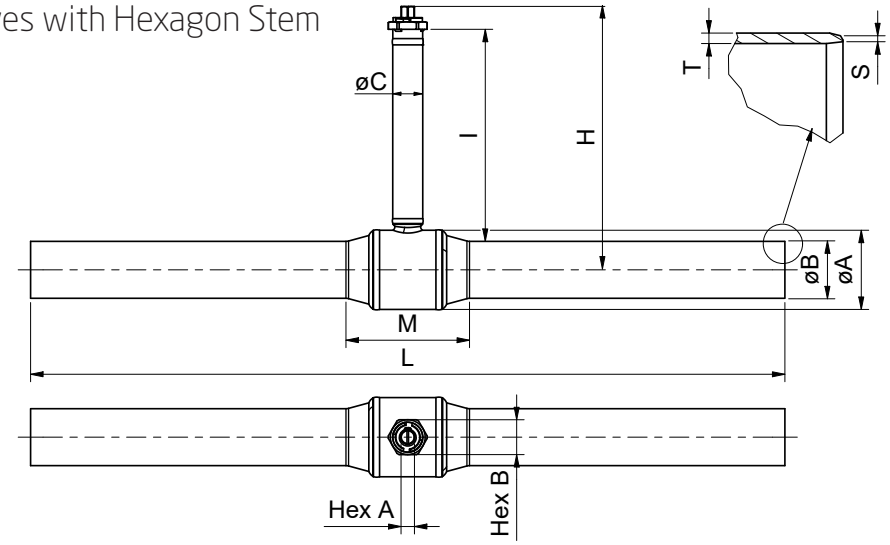
	Dimensions [mm]				
DN	L	L1	C	øD	øD1
32	2000	1560	61	160	315
40	2000	1560	67	160	315
50	2000	1560	80	200	315
65	2000	1560	96	225	355
80	2000	1560	114	250	400
100	2400	1960	139	315	450
125	2600	2160	170	400	500
150	3000	2560	208	450	630

For further details please see the induvidual valve specifications

Frese SPERAMAX

Underground-series

Reduced bore valves with Hexagon Stem



Dimensions reduced bore - Hexagon Stem

	Dimensions [mm]									
DN	M	øA	øB	T	S	H	I	øC	Hex A	Hex B
25	90	48.3	33.7	4	3.2	480	435	48.3	19	-
32	100	60.3	42.4	4.5	3.2	485	430	48.3	19	-
40	110	76.1	48.3	5	3.2	495	435	48.3	19	-
50	120	88.9	60.3	5	3.2	500	435	48.3	19	-
65	150	114.3	76.1	5	3.2	505	430	48.3	19	-
80	180	133	88.9	5.6	3.2	515	430	48.3	19	-
100	250	159	114.3	6.3	3.6	525	400	60.3	27	70
125	270	193.7	139.7	6.3	4	545	395	60.3	27	70
150	290	219.1	168.3	7.1	4.5	565	410	60.3	27	70
200	340	273	219.1	8	4.5	585	395	60.3	50	90
250	480	355.6	273	8	5	625	375	88.9	50	90
300	610	457	323.9	8	5.6	665	350	101.6	50	90

Product programme reduced bore - Hexagon Stem

DN	**Short**			**Long**		
	Item number	Length L [mm]	Weight [kg]	Item number	Length L [mm]	Weight [kg]
25	90025534	230	3.4	90025584	1500	7.5
32	90032534	260	4.5	90032584	1500	9.5
40	90040534	260	5.4	90040584	1500	11.4
50	90050534	300	6.3	90050584	1500	16
65	90065534	300	8.1	90065584	1500	19.6
80	90080534	300	9.8	90080584	1500	23.6
100	90100534	290	15.6	90100584	1500	36.1
125	90125534	315	22.7	90125584	1500	46.2
150	90150534	340	34	90150584	1500	63.9
200	90200534	390	49	90200584	1500	70.5
250	90250534	530	110	90250584	1500	165
300	90300534	660	198	90300584	1800	269

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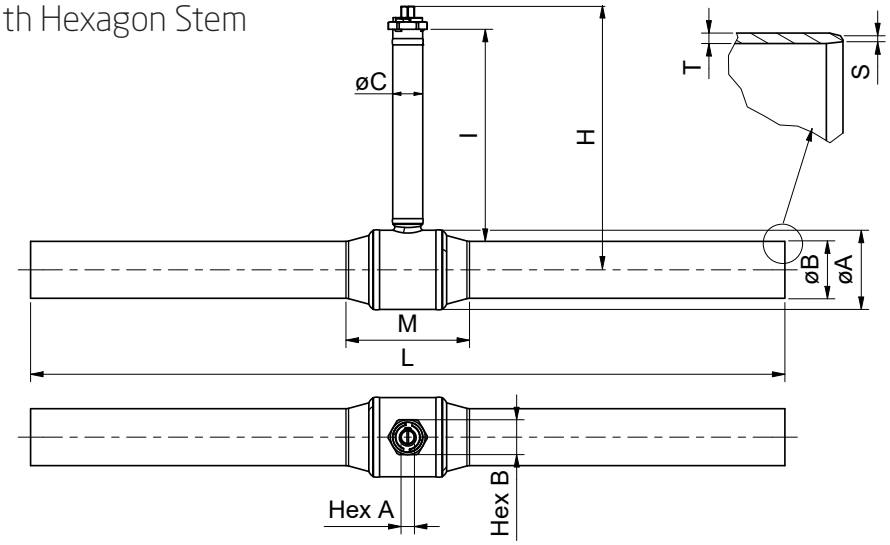
Underground-series

Full bore valves with Hexagon Stem



Dimensions full bore - Hexagon Stem

DN	Dimensions [mm]									
	M	øA	øB	T	S	H	I	øC	Hex A	Hex B
20	90	48.3	26.9	4	2.6	480	435	48.3	19	-
25	125	60.3	33.7	4	2.6	485	430	48.3	19	-
32	135	76.1	42.4	4.5	2.6	495	430	48.3	19	-
40	140	88.9	48.3	5	2.6	500	430	48.3	19	-
50	150	114.3	60.3	5	2.9	505	430	48.3	19	-
65	180	133	76.1	5	2.9	515	425	48.3	19	-
80	200	159	88.9	5.6	3.2	525	400	60.3	27	70
100	455	193.7	114.3	-	3.6	545	395	60.3	27	70
125	515	219.1	139.7	-	4	565	405	60.3	27	70
150	610	273	168.3	-	4.5	585	400	60.3	27	70
200	745	355.6	219.1	-	4.5	625	375	88.9	50	90
250	1100	457	273	-	5	665	345	101.6	50	90

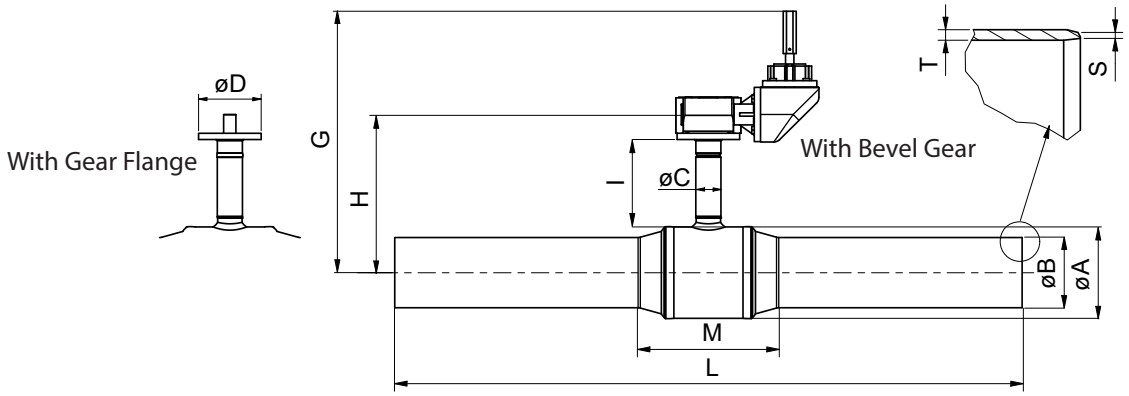
Product programme full bore - Hexagon Stem

DN	Long		
	Item number	Length L [mm]	Weight [kg]
20	70020584	1500	6.5
25	70025584	1500	8
32	70032584	1500	9
40	70040584	1500	11
50	70050584	1520	16
65	70065584	1525	20
80	70080584	1560	32
100	70100515	1500	36
125	70125515	1500	52
150	70150515	1500	75
200	70200515	1500	151
250	70250518	1800	260

Frese SPERAMAX

Underground-series

Reduced bore valves with Gear flange & Bevel gear



Dimensions reduced bore - Gear flange & Bevel gear

	Dimensions [mm]									
DN	M	øA	øB	T	S	H	G	I	øC	øD
125	270	193.7	139.7	6.3	3.6	375	545	220	60.3	150
150	290	219.1	168.3	7.1	4	395	565	225	60.3	150
200	340	273	219.1	8	4.5	455	625	260	60.3	150
250	480	355.6	273	8	5	525	690	275	88.9	200
300	610	457	323.9	8	5.6	600	765	295	101.6	200
350	525	457	355.6	8	5.6	600	765	295	101.6	200
400	715	521	406.4	8.8	6.3	645	800	300	139.7	300
450	1130	711	457	10	6.3	780	905	305	168.3	300
500	1130	711	508	11	6.3	780	905	305	168.3	300
600	1130	711	610	12.5	7.1	780	905	305	168.3	300

Product programme reduced bore - Gear flange & Bevel gear

DN	**Short**				**Long**			
	Item number		Length L [mm]	Weight [kg]	Item number		Length L [mm]	Weight [kg]
	Bevel gear	Gear flange			Bevel gear	Gear flange		
125	-	-	-	-	90125884	90125084	1500	72
150	-	-	-	-	90150884	90150084	1500	90
200	-	-	-	-	90200884	90200084	1500	97
250	-	-	-	-	90250884	90250084	1500	191
300	-	-	-	-	90300884	90300084	1800	315
350	90350834	90350034	760	245	90350884	90350084	2200	300
400	90400834	90400034	820	355	90400884	90400084	2200	420
450	90450834	90450034	1225	800	90450884	90450084	2200	900
500	90500834	90500034	1220	815	90500884	90500084	2200	895
600	90600834	90600034	1500	910	90600884	90600084	2200	985

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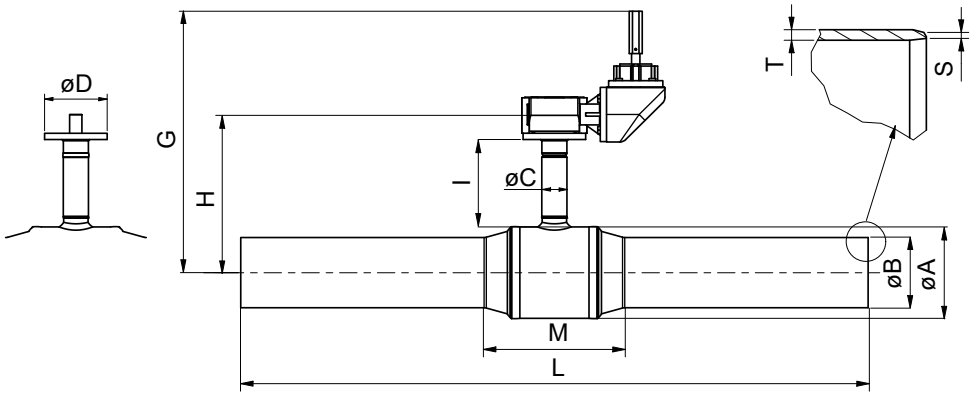
Underground-series

Full bore valves with Bevel gear



Dimensions full bore - Bevel gear

DN	Dimensions [mm]									
	M	øA	øB	T	S	H	I	øC	G	øD
125	515	219.1	139.7	-	4	400	230	60.3	565	150
150	610	273	168.3	-	4.5	460	265	60.3	625	150
200	745	355.6	219.1	-	4.5	525	285	88.9	690	150
250	1110	457	273	-	5	600	295	101.6	765	200
300	1235	521	323.9	-	5.6	645	295	139.7	800	200
400	695	711	406.4	8.8	6.3	780	305	168.3	905	300

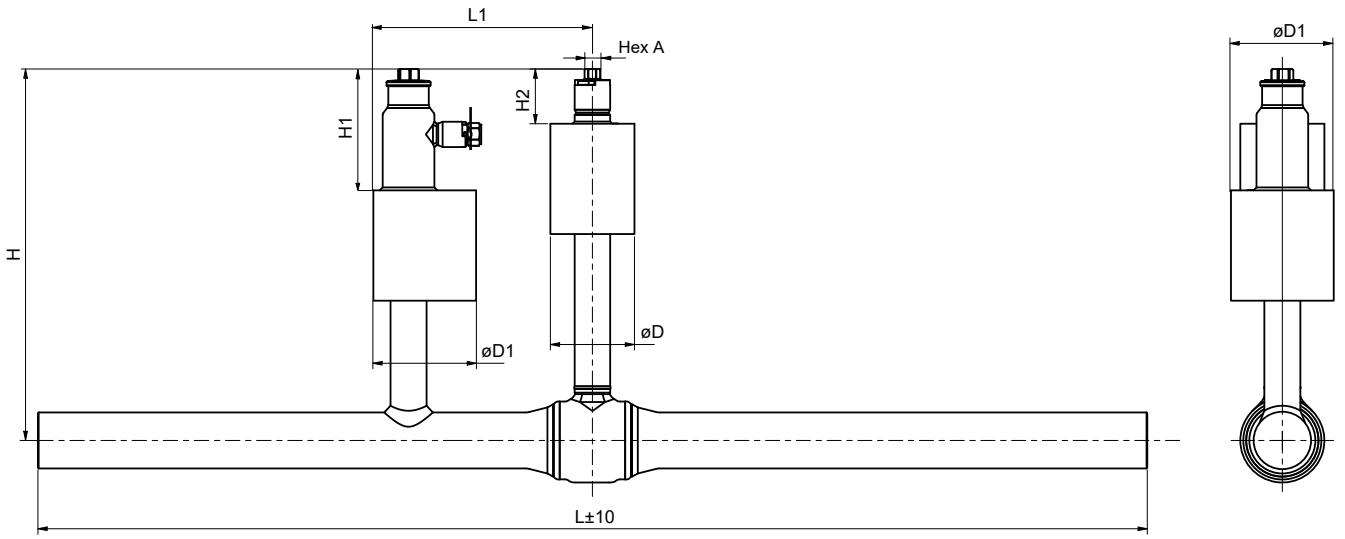
Product programme full bore - Bevel gear

DN	Long		
	Item number	Length L [mm]	Weight [kg]
125	70125815	1500	81
150	70150815	1500	105
200	70200815	1500	177
250	70250818	1800	304
300	70300818	1800	426
400	70400817	1705	895

Frese SPERAMAX

Underground-series

Single pipe reduced bore valve solution with 1 service valve



Dimensions single pipe reduced bore valve solution with 1 service valve

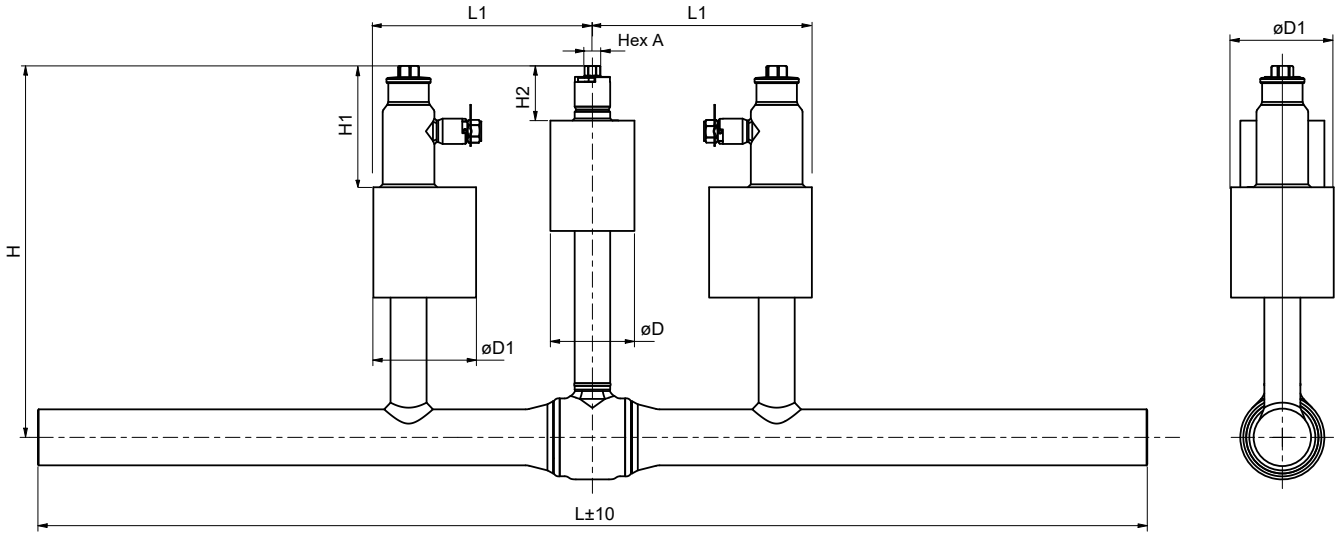
DN	Item number	Service valve dim. DN	Dimensions [mm]								Weight [kg]
			L	H	H1	H2	L1	øD	øD1	Hex A	
32	96032415	25	1500	485	130	85	293	114.3	114.3	19	14
40	96040415	25	1500	495	165	85	293	114.3	114.3	19	16
50	96050415	40	1500	500	165	85	298	114.3	139.7	19	21
65	96065415	40	1500	505	165	85	298	114.3	139.7	19	25
80	96080415	40	1500	515	165	85	298	114.3	139.7	27	30
100	96100415	40	1500	525	165	100	298	139.7	139.7	27	42
125	96125415	40	1500	545	165	100	298	139.7	139.7	27	55
150	96150415	40	1500	567	165	100	298	139.7	139.7	27	67
200	96200415	40	1500	585	165	100	298	139.7	139.7	50	104
250	96250415	50	1500	625	165	120	359	154	154	50	172
300	96300418	50	1800	665	165	120	399	204	154	50	270

For further details please see the induvidual valve specifications

Frese SPERAMAX

Underground-series

Single pipe reduced bore valve solution with 2 service valves



Dimensions single pipe reduced bore valve solution with 2 service valves

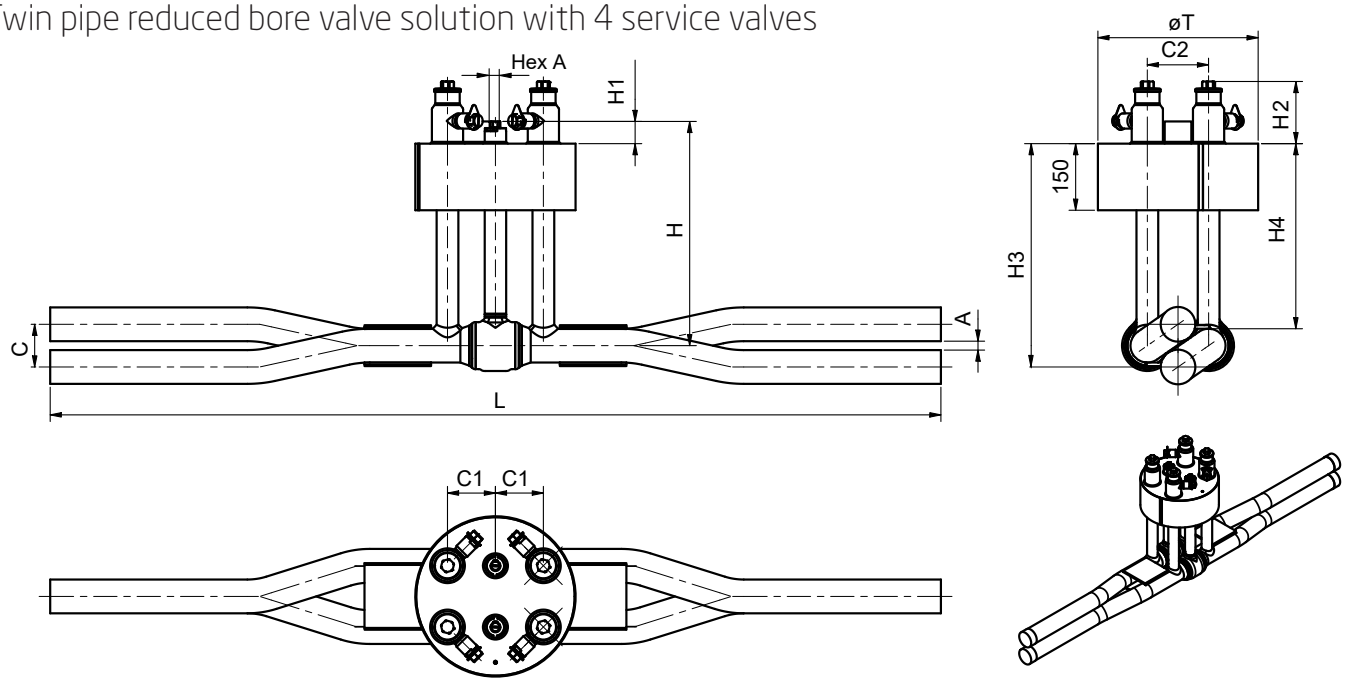
DN	Item number	Service valve dim. DN	Dimensions [mm]								Weight [kg]
			L	H	H1	H2	L1	øD	øD1	Hex A	
32	96032515	25	1500	485	130	85	293	114.3	114.3	19	17
40	96040515	25	1500	495	165	85	293	114.3	114.3	19	19
50	96050515	40	1500	500	165	85	298	114.3	139.7	19	25
65	96065515	40	1500	505	165	85	298	114.3	139.7	19	29
80	96080515	40	1500	515	165	85	298	114.3	139.7	27	35
100	96100515	40	1500	525	165	100	298	139.7	139.7	27	47
125	96125515	40	1500	545	165	100	298	139.7	139.7	27	60
150	96150515	40	1500	567	165	100	298	139.7	139.7	27	75
200	96200515	40	1500	585	165	100	298	139.7	139.7	50	109
250	96250515	50	1500	625	165	120	359	154	154	50	179
300	96300518	50	1800	665	165	120	399	204	154	50	296

For further details please see the induvidual valve specifications

Frese SPERAMAX

Underground-series

Twin pipe reduced bore valve solution with 4 service valves



Dimensions twin pipe reduced bore valve solution with 4 service valves

	Dimensions [mm]										
DN	L	H	H1	H2	øT	C	A	C1	C2	H3	H4
32	2000	485	50	140	319	61	19	89	138	465	404
40	2000	495	50	140	319	67	19	89	138	478	411
50	2000	500	50	140	319	80	20	89	138	490	410
65	2000	505	50	140	361	96	20	108	138	505	409
80	2000	515	50	140	361	114	25	108	164	522	408
100	2400	525	65	150	457	139	25	150	208	533	395
125	2600	545	65	150	509	170	30	165	258	572	403
150	3000	565	65	150	576	208	40	180	318	609	401

Product programme twin pipe reduced bore valve solution with 4 service valves

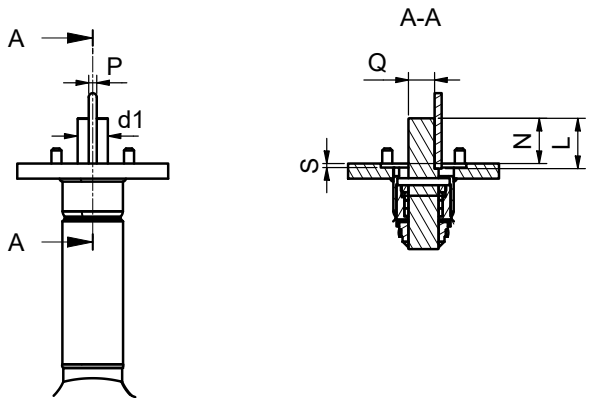
DN	Item number	Service valve dim. DN	Hex A [mm]	Weight [kg]
32	98032221	25	19	38
40	98040221	25	19	42
50	98050221	40	19	52
65	98065221	40	19	62
80	98080221	40	19	67
100	98100221	40	27	105
125	98125221	40	27	138
150	98150221	40	27	196

For further details please see the induvidual valve specifications

Frese SPERAMAX

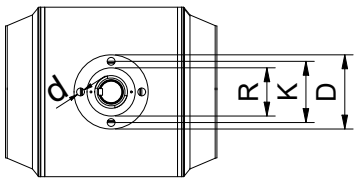
Underground-series

Gear flanges



Dimensions gear flange

DN	Dimensions [mm]													
	Reduced bore							Full bore						
	Gear flange	L	d1	N	P	Q	S	Gear flange	L	d1	N	P	Q	S
125	F10/ F12	50	30	46	8	26	4	F10/ F12	50	30	46	8	26	4
150		50	30	46	8	26	4		50	30	46	8	26	4
200		50	30	46	8	26	4	F16	60	50	48	14	44.5	5
250	F16	60	50	48	14	44.5	5		65	60	51	18	53.2	5
300		65	60	51	18	53.2	6	F25	75	75	60	20	60	6
350		65	60	51	18	53.2	6		-	-	-	-	-	-
400	F25	75	75	60	20	60	6		115	100	91	28	80	6
450		115	100	91	28	80	6	-	-	-	-	-	-	-
500		115	100	91	28	80	6	-	-	-	-	-	-	-
600		115	100	91	28	80	6	-	-	-	-	-	-	-



Gear flange connection acc. to ISO 5211

Gear flange	d [mm] x (number)	Dimensions [mm]		
		D	K	R
F10	11 x (4)	125	102	70
F12	13 x (4)	150	125	85
F16	21 x (4)	210	165	130
F25	17 x (8)	300	254	200

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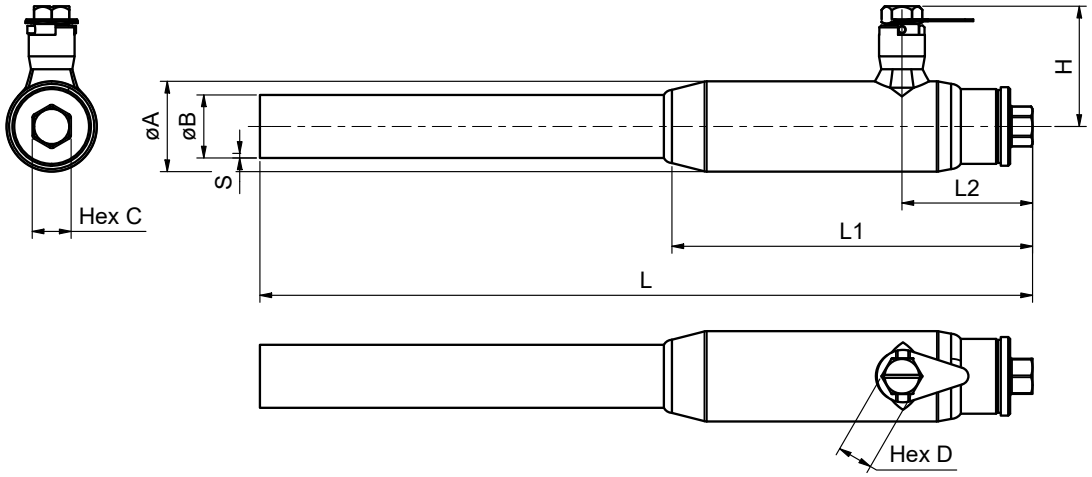
Underground-series

Service & Air vent valves



Dimensions Service valves

	Dimensions [mm]								
DN	**L**	**L1**	**L2**	**øA**	**øB**	**S**	**H**	**Hex C**	**Hex D**
20	500	195	65	42.4	26.9	2.6	55	19	19
25	500	190	70	48.3	33.7	2.6	60	19	19
32	500	195	70	51	42.4	2.6	65	19	19
40	500	225	90	70	48.3	2.6	100	27	27
50	500	230	100	76.1	60.3	2.9	105	27	27
65	500	280	105	114.3	76.1	2.9	115	19	19
80	500	310	130	133	88.9	3.2	125	19	19
100	500	330	140	168.3	114.3	3.6	140	19	19

Product programme Service valves

DN	**Item number**	**Weight [kg]**
20	97020079	2.1
25	97025079	1.9
32	97032079	2.3
40	97040079	3.4
50	97050079	4.1
65	97065079	6.5
80	97080079	8.6
100	97100079	14.5

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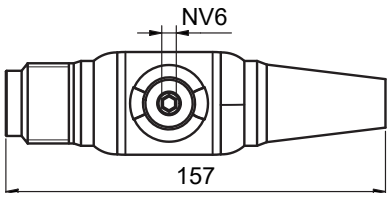
Accessories

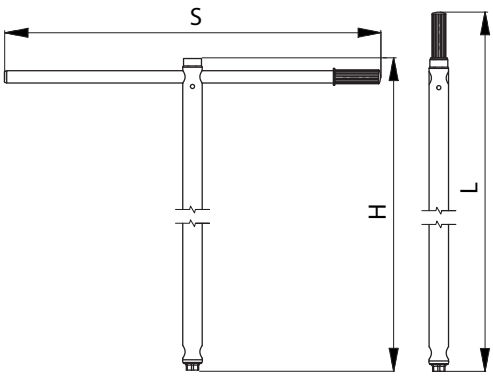


Product programme repair connection pipe

DN	Item number	Pipe
15	90015438	14
20/25	90025438	20

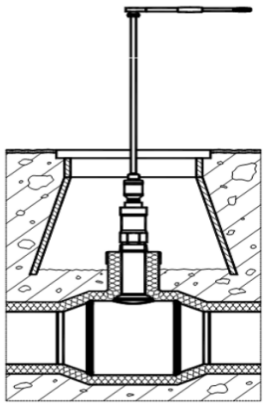
Product programme repair connection pipe toolbox

DN	Item number
-	80025096



Product programme T-key

Desciption			
For operation of DE Valves ball valves for underground installation with hexagon stem. The T-key has a 19mm hexagon connection on one side and 27mm hexagon connection on the other side. It is used for operation of underground ball valves with hexagon stem up to DN200 reduced bore or DN150 full bore. It is also used to operate worm bevel gears.			
Item number	L [mm]	H [mm]	S [mm]
80200143	1140	1040	820
80200543	1640	1540	



Product programme Mobile gear

Item number	Desciption
80300096	Mobile gear (torque reduction) for operation of DN 100 - DN300 RB (DN80 - DN 250 FB) valves with hexagon stem. Delivered in steel case with all accessories included. Weight approx. 16 kg
80300043	Extension for mobile gear making it more comfortable to operate valves installed deep in the ground.

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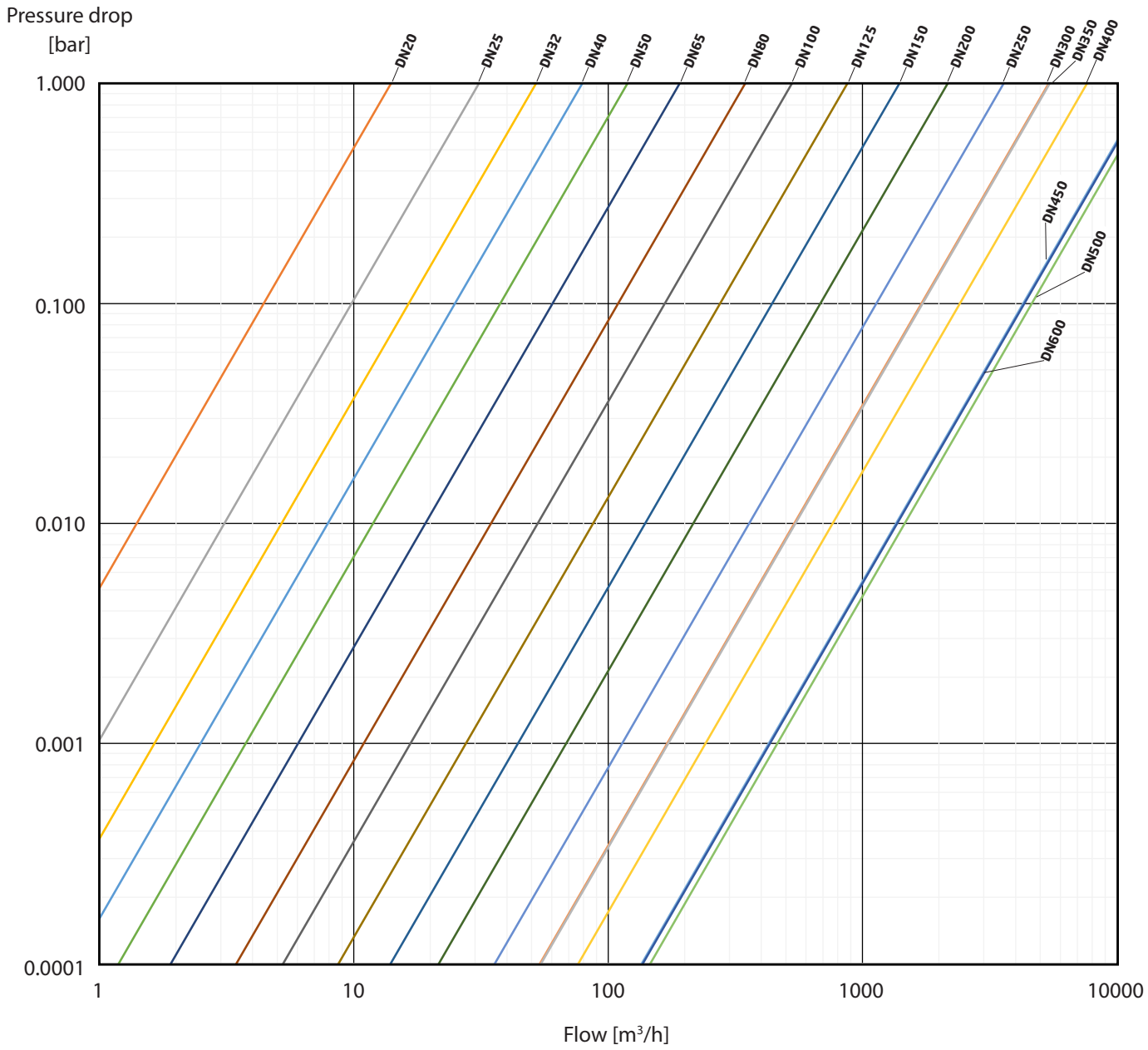
Underground-series

Flow/Pressure drop Diagramme reduced bore (Measured at position D acc. to EN60534)



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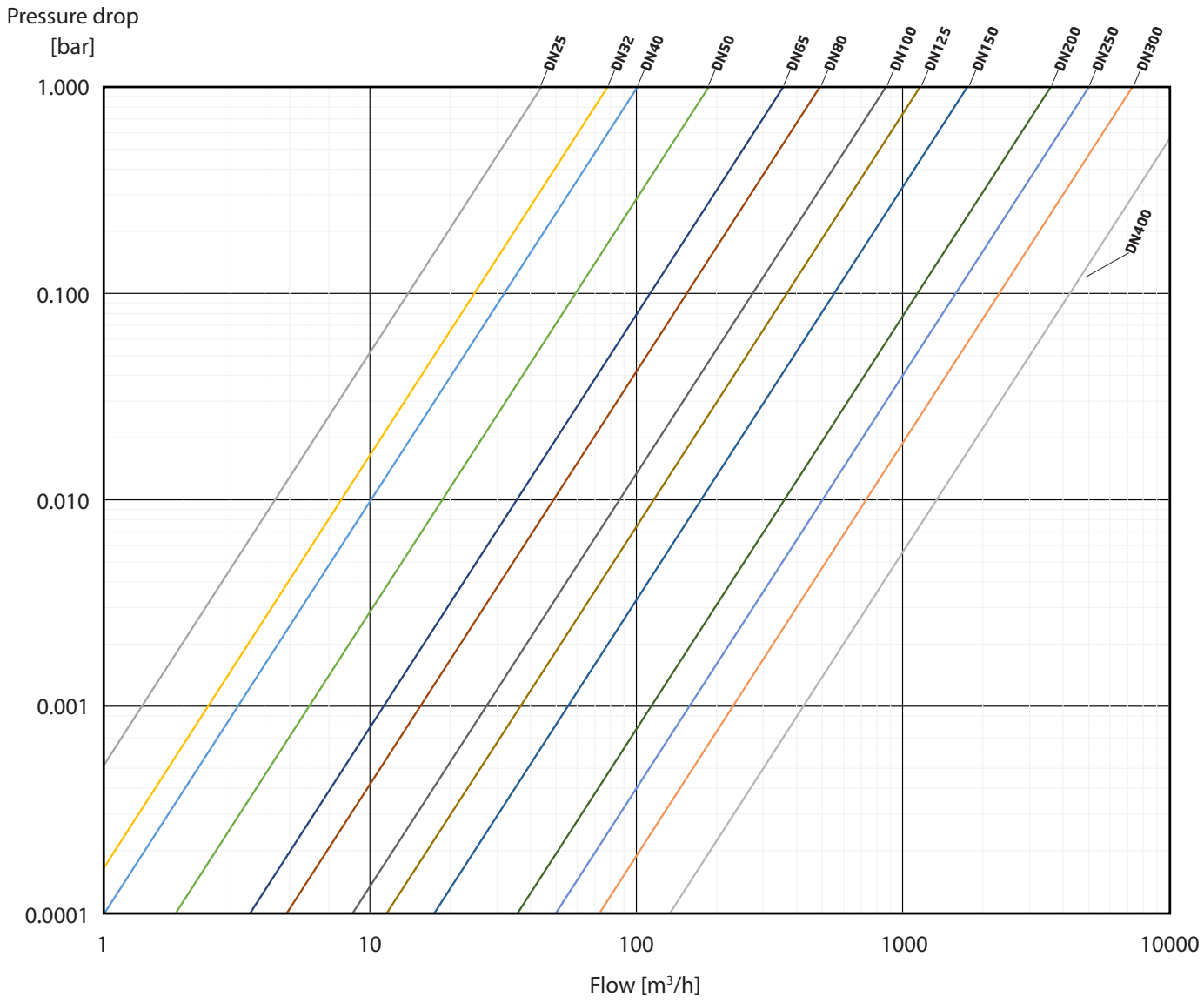
Flow/Pressure drop Diagramme full bore (Measured at position C acc. to EN60534)



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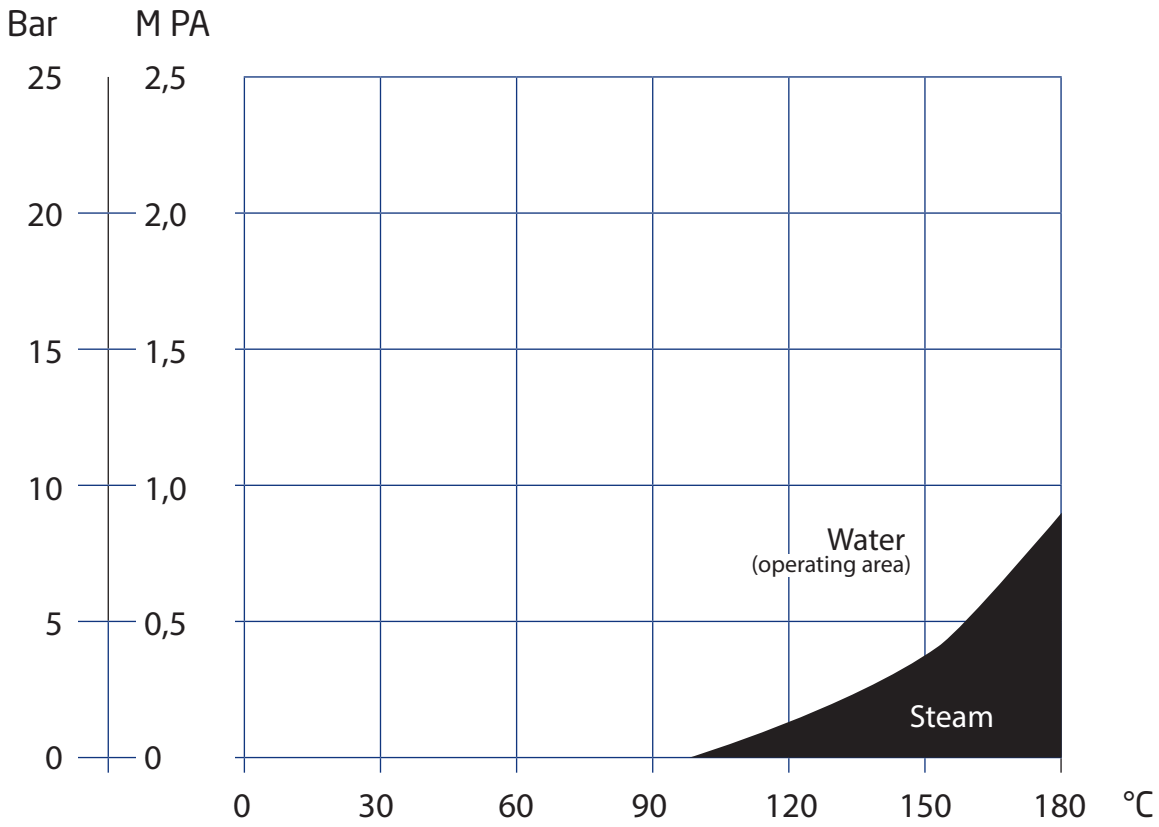
Pressure/Temperature Diagramme



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Specification Texts

Materials

- The valve housing shall be made from Carbon steel P235GH
- The valve stem and the extended stuffing box shall be made of stainless steel AISI 316L
- The ball shall be made of stainless steel AISI 304

Gaskets

- The seat rings and the stem sealings shall be made of graphite reinforced PTFE
- The seat rings shall be static and be fully protected from dirt and debris circulating in the fluid when in the open position
- The valve stem seal must be fully accessible from the outside and consist of lifetime-resistant graphite-reinforced PTFE O-rings or similar with reduced lifetime, replaceable or not may, not be used

Pressure and temperature

- The valve shall be PN25 rated
- The valve shall be able to operate up to a temperature of 180°C

Test and Design

- The valve must be subjected to a 100% final inspection with tests of internal and external leaks and inspection of dimensions and features. Leak test must be performed according to the applicable standard (EN12266 Part 1 P10-P11-P12 and Part 2 F20)
- The valve must be designed, manufactured and tested in accordance with EUROHEAT & POWER and EN488: 2015
- The valve must be provided with a position indicator that identifies the position of the ball in the housing
- The valve seats must be spring-loaded to allow a tight, double seal at low pressures. The valve body must be self-relieving
- The valve must be designed for as high KV value as possible to achieve as low a pressure drop as possible. Hereby the pump energy and CO^2 footprint can be lowered.
- The drive mechanism of the valve must have an asymmetrical design to minimize the break loose forces
- The valve must be fitted with a ball inner lining to ensure an optimal KV value (not hollow ball)
- If the valve has a reduced bore, it must have a conical inlet and outlet to minimize turbulence and achieve optimal KV value (low pressure drop)

Frese A/S
Tel: +45 58 56 00 00
info@frese.dk