

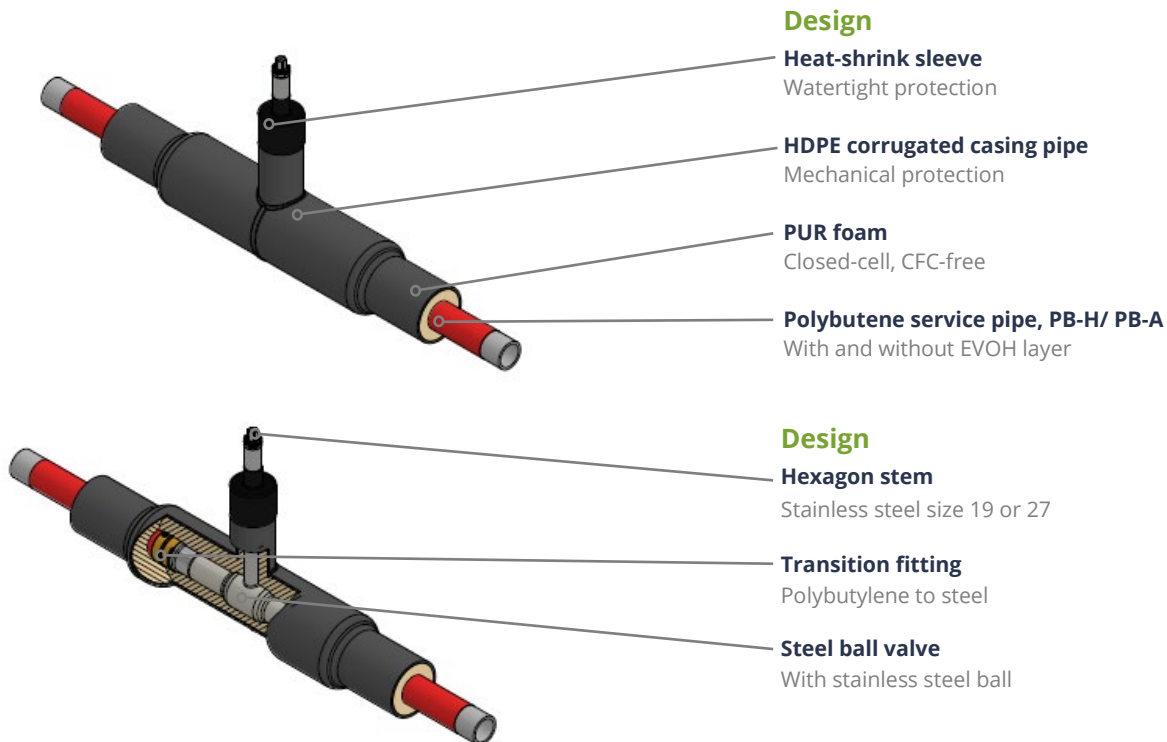
Flexalen® pre-insulated ball valves

Pre-insulated piping system by Thermaflex

High performance, pre-insulated ball valve for underground application for district energy networks.

Benefits

- Fully pre-insulated ball valves, designed for underground use.
- Ball valve designed and certified in accordance with EN488:2015.
- HDPE casing and PUR foam fulfilling functional requirement EN253/ EN488 for district heating.
- High Kv value (minimum pressure loss, minimised pumping costs).
- The ball valve has a fully welded construction and is maintenance-free throughout its service life.
- Blow-out safe stem construction ensures safe valve operation.
- The upper stem seal can be replaced even when the valve is pressurised.



Disclaimer

All recommendations and information provided on this data sheet are based on our knowledge and experience. Product specifications are intended as guidelines. Since conditions of service are beyond our control, users must satisfy themselves that products are suitable for the intended use. No guarantee or warranty is given or implied or that any use of the products will not infringe rights belonging to other parties. We reserve the right to change product design and properties without notification.



Material information

Underground ball valves, reduced/ full bore.

Ball Valve.

High-quality Vexve ball valves for district energy networks with a fully welded construction for opening and closing for district heating and cooling lines (shut-off). Available in the range DN25 up to DN150 in various service pipe casing combinations.

Part	Material
Body	Steel, P235HG (1.0345)
Ball	Stainless steel, X5CrNi18-10 (1.4301)
Ball seal	PTFE+C
Stem	Stainless steel, X8CrNi18-9 (1.4305) DN25-100 Stainless steel, X17CrNi16-2 (1.4057) DN125-150
Stem seal	FPM
Operation	With a T-key
Top of stem	Stainless steel, X5CrNi18-10 9 (1.4301)

Operation conditions: Valve temperature range (manufacturer specification): -20°C - +200°C.

Note: The shut-off valves (ball valves) are designed to be fully open or closed, check this before pressure testing or filling the system.

HDPE Casing pipe

Casing pipe
HDPE PE 100 accordance EN448 and EN 253
Colour Black
Carbon black content 2÷3%
Min. wall thickness according EN 253
Elongation break (at 23°C) ≥ 500%
Weight 944 kg/m ³

PUR foam

Thermal Insulation
PUR foam, CFC-free, Closed-cell structure
Min. wall thickness according EN 448
Thermal Conductivity $\lambda \leq 0.021$ W/m·K @ 50°C
Weight 60 kg/m ³

Heat-shrink endcap

The heat-shrink end cap is a cross-linked polyethylene backing that conforms perfectly to the casing pipe, foam and service pipe.

This ensures full contact of the adhesive layer with the underlying casing and service pipe, creating a barrier that is impermeable to the ingress of moisture. The heat-shrink end caps comply with the pressure test requirements of EN 489.



Adhesive Properties	Standard	Typical Values
Water absorption	ASTM D570	< 0.1%
Lap Shear @ 23°C	EN 12068	17 N/cm ²
Backing Properties		
Tensile Strength	ASTM D638	22MPa
Elongation	ASTM D638	450%
Sleeve Properties		
Adhesion Strength @ 23°C	ISO 21809-3	14 N/cm



Parts list underground ball valves DN 25 - 150

Part number	Description	Qty
1	Valve body	1
2	Ball	2
3	Stem	1
4	Sliding plate	1
5	O-ring	2
6	Bush	1
7	Retaining ring	1
8	Extension of stem	1
9	Sliding plate	1
10	O-ring	1
11	Bush	1
12	Block stop	2
13	Retaining ring	1
14	Spring plate	2
15	Support plate	2
16	Ball seal	2

See figure 1.

Kv value chart underground ball valves.

Service pipe		Kv - values	
DN - size	OD [mm]	Reduced bore	Full bore
25	32	25	-
32	40	41	-
40	50	67	-
50	63	105	-
65	75	182	-
80	90	315	-
100	110	470	-
100	125	-	1474*
125	140	830	-
150	160	1150	-

- *Only the PB125 is based on a full bore ball valve.
- Kv values indicate flow capacity in m³/h for water with 1 bar pressure difference.

Maximum allowed operation torques

DN - size ^A		Torque [Nm] ^B		
Reduced bore	Full bore			
DN25		15	17	19
DN32		21	23	25
DN40		34	36	39
DN50		42	45	50
DN65		60	63	68
DN80		80	58	98
DN100		110	125	150
DN125	DN100	150	200	270
DN150		280	350	520
		0	10	16
		Pressure difference [bar] ^C		

^A DN-size of the valve.

^B Max. torque needed to open/ close the valve.

^C Pressure difference across the valve ΔP .

Where $\Delta p: p = p_1 - p_2$

P1= pressure for the valve.

P2= pressure after the valve.

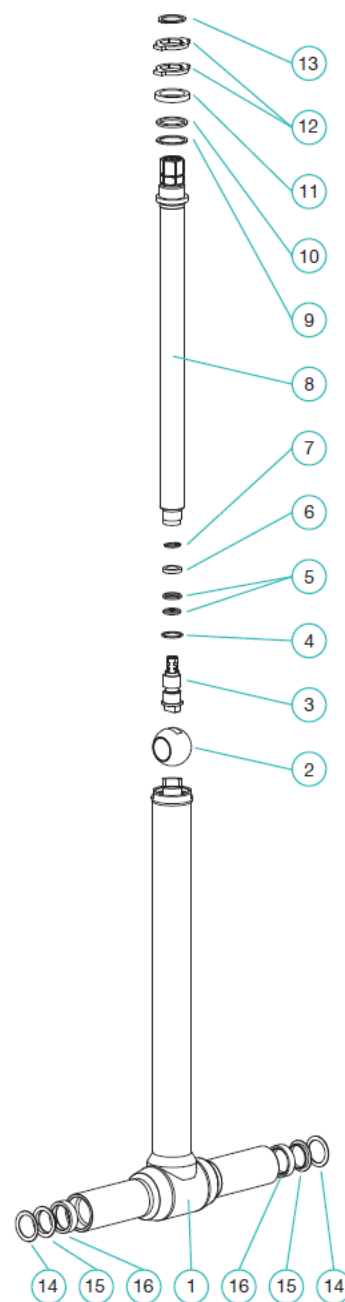
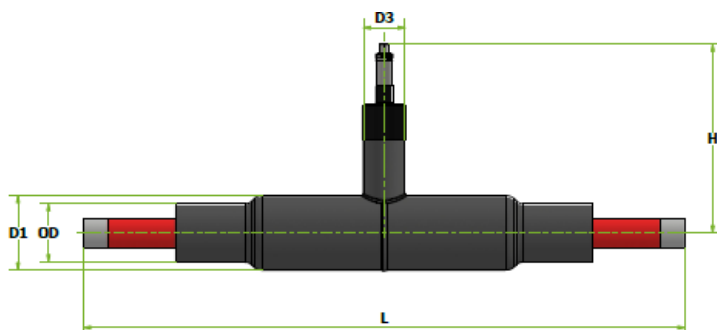


Figure 1.



Availability Flexalen® pre-insulated ball valve

Product code	Casing pipe OD [mm]	Service pipe OD [mm]	Service pipe s [mm]	Casing pipe D1 OD [mm]	Casing pipe D3 OD [mm]	L [mm]	H [mm]	Weight [kg]	Valve head hexagon [mm]	Reduced/full bore
1431-032090-000	90	32	2.9	125	90	1200	382	5.53	19	Reduced
1431-040090-000	90	40	3.7	125	90	1500	386	6.78	19	Reduced
1431-040110-000	110	40	3.7	125	90	1200	386	7.10	19	Reduced
1431-040125-000	125	40	3.7	140	90	1200	386	7.60	19	Reduced
1431-050125-000	125	50	4.6	140	90	1200	400	8.68	19	Reduced
1431-050160-000	160	50	4.6	160	90	1200	400	10.11	19	Reduced
1431-063125-000	125	63	5.8	160	90	1500	406	11.81	19	Reduced
1431-063140-000	140	63	5.8	160	90	1200	406	11.32	19	Reduced
1431-063160-000	160	63	5.8	180	90	1200	406	11.82	19	Reduced
1431-075160-000	160	75	6.8	200	90	1200	415	14.07	19	Reduced
1431-075180-000	180	75	6.8	200	90	1200	415	14.15	19	Reduced
1431-090160-000	160	90	8.2	200	90	1500	425	19.36	19	Reduced
1431-090180-000	180	90	8.2	200	90	1200	425	18.87	19	Reduced
1431-090200-000	200	90	8.2	225	90	1200	425	19.29	19	Reduced
1430-110200-000	200	110	10.0	250	110	1200	449	27.33	27	Reduced
1430-110250-000	250	110	10.0	280	110	1200	449	28.55	27	Reduced
1430-125200-000	200	125	11.4	250	110	1600	454	43.35	27	Full
1430-125225-000	225	125	11.4	250	110	1300	454	41.64	27	Full
1430-125250-000	250	125	11.4	280	110	1300	454	42.36	27	Full
1430-140225-000	225	140	12.7	280	110	1600	454	40.70	27	Reduced
1430-140280-000	280	140	12.7	280	110	1300	454	43.81	27	Reduced
1430-160250-000	250	160	14.6	315	110	1700	476	35.33	27	Reduced
1430-160315-000	315	160	14.6	315	110	1300	476	37.24	27	Reduced



Accessories for pre-insulated Ball valves

T-key

T-key for easily operating ball valve from street level. The set includes a T-key set, three replaceable impact sockets in sizes 19, 17, and 32 mm, and a split pin. The T-key is suitable for ball valves with a diameter of DN25 to DN150 (both reduced and full bore).



Product code	Description	Weight [kg]
1432-019027-032	T-key set 19-27-32 L=840	4.15

Item	Height [mm]	Handle Width [mm]
T-key	840	600



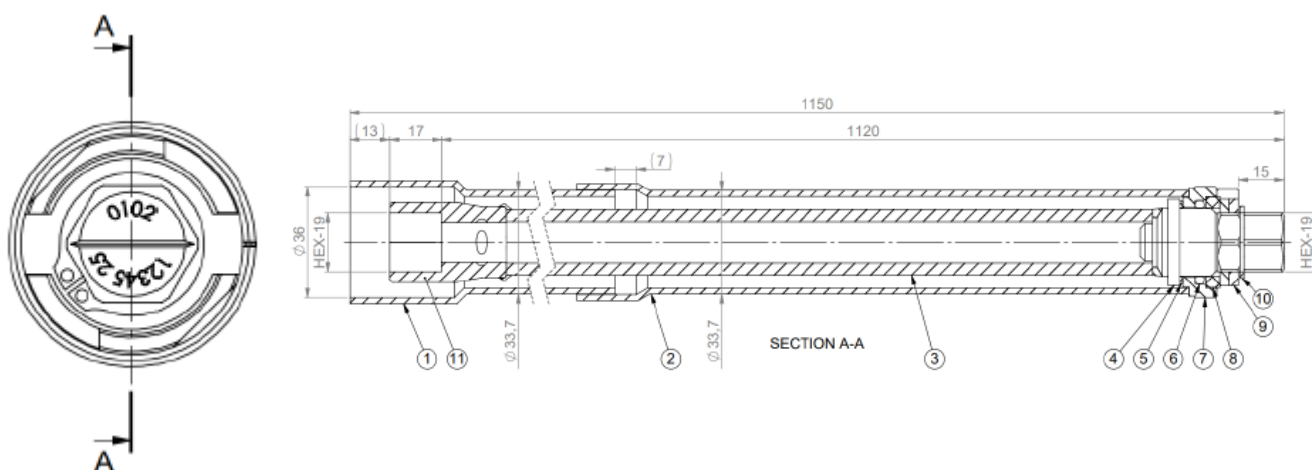
Stem extensions

With our stem extension you can easily bring the operation of the pre-insulated valve to ground level. We offer two fixed-length stem extensions and one adjustable stem extension for our entire pre-insulated valve range.

Product code	Description	Hexagon size [mm]	Weight [kg]
Stem extension for DN25-DN80 service pipes			
1432-032090-050	Stem extension DN25-80 for long stem bal H=500 / 19	19	1.80
1432-032090-100	Stem extension DN25-80 for long stem bal H=1000 / 19	19	3.40
1432-032090-115	Adjustable stem extension DN25-80 L=1150	19	4.80
Stem extension for DN100-DN150 service pipes			
1432-110160-050	Stem extension DN100-150 for long stem bal H=500 / 27	27	6.60
1432-110160-100	Stem extension DN100-150 for long stem bal H=1000 / 27	27	6.60
1432-110160-115	Adjustable stem extension DN100-150 L=1150	27	7.20

Stem extensions adjustable

Details of adjustable stem extension DN25 – DN80 Reduced bore.

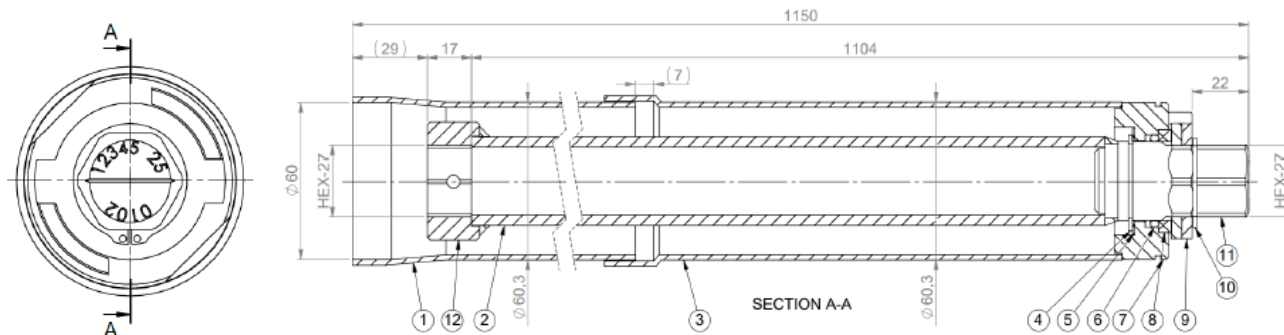


Item	Description	Material	Qty
1	Lower extension of stem bush DN25-80	EN 1.4404 (EN 10217-7)	1
2	Upper extension pipe stem of stem bush DN25-80	EN 1.4404 (EN 10217-7)	1
3	Upper extension pipe of stem DN25-80	EN 1.0345 (EN 10217-2)	1
4	Top stem DN25-80	EN 1.4301	1
5	Sliding plate DN25-80 $\varnothing 26.8/22 \times 1$	PTFE +25%C	1
6	O-ring $\varnothing 21.2 \times 3.0$ FPM	VITON/FPM	1
7	Stem bush DN25-80	EN 1.4301 (EN 10088-3)	1
8	Stem sealing bush DN25-80	PTFE +25%C	1
9	Block stop DN25-80	EN 1.4057 (EN 10088-3)	2
10	Retaining ring $\varnothing 20 \times 1.2$ DIN471	EN 1.4310 (EN 10270-3)	1
11	Socket 6k-19	CrV steel	1
12	Block stop DN25-80	EN 1.4057 (EN 10088-3)	2



Stem extensions adjustable

Details of adjustable stem extension DN100 – DN150 Reduced bore and DN80 – DN125 Full bore.

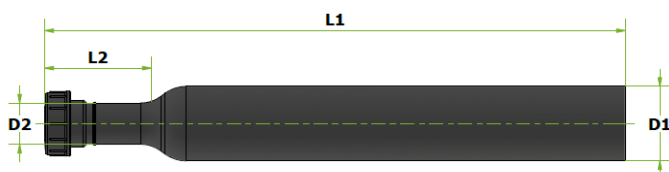


Item	Description	Material	Qty
1	Extension of stem bush DN100-150	EN 1.4404 (EN 10217-7)	1
2	Upper extension pipe stem of stem DN100-150	EN 1.0345 (EN 10217-2)	1
3	Upper extension pipe of stem bush DN100-150	EN 1.4404 (EN 10217-7)	1
4	Retaining ring $\varnothing 30 \times 1.5$ DIN471	EN 1.14122 (X39CrMo17-1)	1
5	Sliding plate $\varnothing 40/30 \times 1$ DN100-150	PTFE +25%C	1
6	O-ring $\varnothing 29.2 \times 3.0$ FPM	VITON/FPM	1
7	Stem bush DN100-150	EN 1.4301 (EN10088-3)	1
8	Stem sealing bush DN100-150	PTFE +25%C	1
9	Block stop DN100-150	EN 1.4057 (EN 10088-3)	2
10	Retaining ring $\varnothing 28 \times 1.5$ DIN471	EN 1.14122 (X39CrMo17-1)	1
11	Top stem DN100-150	EN 1.4301	1
12	Handle head HEX-27	EN 1.0569 (EN 10277-2)	1
13	Stem distance bush DN100-150	PTFE +25%C	1

Spindle extension casing pipe

Shrinkable HDPE extension pipe with screwcap with EPDM pressure ring seal. Wall thickness.

Product code	Description	Weight [kg]
1432-090000-100	Spindle extension casing pipe w/ screw cap L=1000 OD90	1.09
1432-110000-100	Spindle extension casing pipe w/ screw cap L=1000 OD110	1.61



Product code	L1 [mm]	L2 [mm]	D1 [mm]	D2 [mm]
1432-090000-100	1000	180	90	75
1432-110000-100	1000	180	110	75

Note: please select the correct heat shrink sleeve for watertight sealing between outer casing pre-insulated ball valve and spindle extension pipe.



Heat shrink-sleeve

Heat-shrink sleeve: TPSPM-PE heat-shrink, tubular sleeve for joint sealing. Adhesive is a high strength, visco-elastic sealant with low preheat for easy application.

Backing is a radiation cross-linked, high density polyethylene with PCI (Permanent Change Indicator).

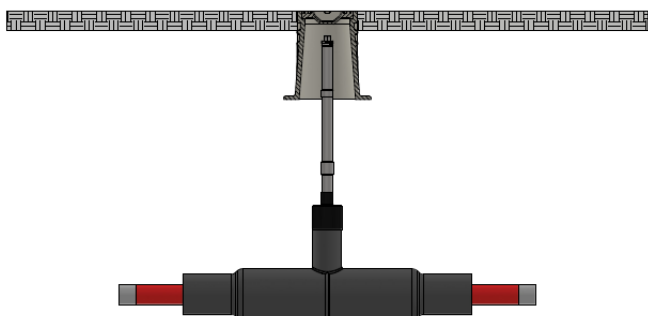
Product code	Description	For extension casing pipe	Weight [kg]
1743-090090-000	Shrink sleeve OD90	OD90	0.08
1743-110110-000	Shrink sleeve OD110	OD110	0.12

Installation examples with pre-insulated ball valves from Thermaflex.

There are multiple ways to bring the ball valve (shut-off) stem extension to street level; this depends on ground structure and local requirements.

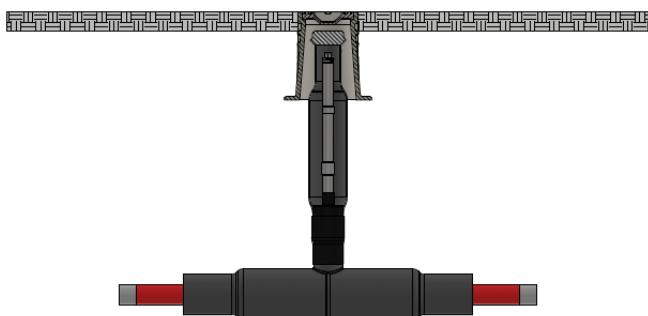
- Minimum covering 0.5 m in areas without live load.
- Minimum covering 0.8 m in areas with live load (SLW60 = 600 kN total load as per DIN 1072).
- Max. laying depth: 2.6 m, a greater depth requires the approval of Thermaflex.

Option 1:



From the valve stem, you can go to street level using the fixed stem or adjustable stem extension, ending in a valve box or surface box. From here, you can operate the shut-off valve with the T-key. This can be applied in sandy soil and free of debris.

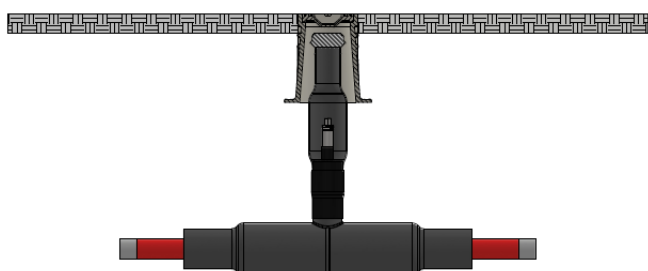
Option 2:



From the valve stem, you can go to street level using the fixed stem or adjustable stem extension. In this application, the stem is protected by an HDPE spindle extension casing pipe with a screw cap, ending in a valve box or surface box. From here, you can operate the shut-off valve with the T-key.

This is recommended in soil that is not free of debris and/or may contain stone.

Option 3:



In this application, the distance between the valve stem and street level is minimal, and the valve can be operated directly with the T-key without a stem extension (max 300mm between top valve stem and street level).

In this case, only the HDPE spindle extension casing pipe with screw cap is installed.

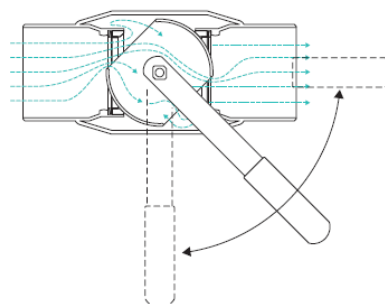
Pressure testing

Note:

- When pressure testing the pipeline the valve must be open, max allowed testing pressure is 1,5 x PN.
- The largest allowable testing pressure is 1,1 x PN (PN25 for ball valve) when the valve is closed.

Flushing

The pipeline needs to be flushed carefully after the valve installation. During flushing, carefully operate the valve a few times open and fully closed, in order to flush out any impurities from the inside of the valve and sealing surface.



Maintenance of ball valve

Approximately six months after commissioning, and from then every year you check the following periodically:

- To ensure long-term operational reliability, even when seldom used (around 2-3 times a year or less) we recommend to inspect the valve top stem sealing once a year for any leakage.

Please note: when the district heating system is in operation, the top stem of the valve may be very hot, be aware of this and take safety precautions if necessary.

Storage pre-insulated ball valves

- Store preferably in a well-ventilated, dry place on a pallet.
- Make sure the valve is in open position.
- Maximum recommended storage time is two years. If the valve is stored for more than two years, it should be operated and cleaned yearly.
- Keep Ball Valves Packed unit installation (keep PB service pipe in UV-foil until use).

Lifting the pre-insulated valve on-site

