

# Ball valve HKSF-W100

### Design Features:

RMA-ball valves type „HKSF-W“ are fully welded and completely maintenance-free designed.

The primary metal and secondary soft sealing method with the proven RMA-sealing system offers the following advantages:

Each of the seating rings on both the inlet as well as the outlet side are composed of two sealing planes. With this primary metal, sealing is ensured on both sides. The conception of the primary metal and secondary soft sealing system is based on the precision machining of metal sealing ball valves (e.g. common lapping of ball and seating rings).

The flexible soft sealing in the seating rings is first effective at low pressure ranges. The seating rings are pressed onto the ball by means of pressure springs. Additionally, the seating rings are designed in such a way that a piston effect increases the contact force proportionally to the pressure. In this way, a pure metal sealing is formed. Even at high operating pressures, the flexible soft sealing ring suffers no damage. Guard rings are used to prevent ejection or forcing out of the soft sealing ring at all pressure stages and in all switch positions.

On request, a third emergency sealing system (sealing compound system) can be added to both seating rings as well as to the spindle sleeve. For this reason a special chambering groove is incorporated in the seating rings to enable a pre-defined emergency sealing.

### Double Block and Bleed:

Proof of sealing is provided in both end positions, even under maximum operating pressure of the ball valve, using a special, self-protected bleed nipple or, if required, using drain and vent pipes with an additional ball valve.

### Sealing Types „Single Piston“ and „Double Piston“:

RMA-ball valves are available in two sealing types: „single piston“ and „double piston“ seating ring systems.

In the „single piston“-system the sealing ring on the outlet side raises when a pre-defined overpressure is present inside the valve body thus allowing this excess pressure to escape to the outlet side. The lack of pressure within the body provides proof of sealing.

We recommend the „single piston“-system for all liquid media. This system prevents damage to the body caused by excessive overpressure through thermal expansion. In this way, additional external pressure-relieve is not necessary.

In the „double piston“-system the seals and seating rings on the inlet and outlet side provide total sealing of the body inner chamber in both end positions of the ball valve. The ball valve provides sealing on the inlet and outlet sides. In this way, it is also possible to provide proof of sealing by pressurisation from outside the body.

We recommend the „double piston“-system for all gaseous media. This system offers protection in two respects to the user.

### Ball Bearing:

RMA-ball valves are trunnion mounted with maintenance-free bearings in all sizes (DN 50 and greater) and all pressure ratings. The precision machining and special low friction bearings ensure minimum wear. This is particularly advantageous for the resistance and smooth operating of ball valves. These low torque levels are also an advantage when dimensioning gears, electrical, pneumatic or hydraulic actuators.

### Electrostatic Charge:

An electric conductive connection between ball and body provides reliable prevention of electrostatic build-up.

### Spindle/Sealing:

The „anti-blow-out“-design prevents the spindle from being blown out by the medium transported or pulled out by the user himself.

The special double-screw design enables, on the one hand, correct squeezing or adjustment of the steel, PTFE and graphite sealing system manufactured by RMA and, on the other hand, rapid replacement of sealing rings under full operating pressure.

### Connection:

Inline connection on site can be ensured either with flange ends, in accordance with standard requirements, or with welding ends gauged to suit the pipes to be connected. Specific customer requirements may be taken into consideration.

### Fire Protection:

RMA-ball valves offer the high fire protection level required in oil, gas and supply pipelines (e.g. ISO 10497, API 6FA, BS 6755 Part 2).

### Materials:

For the standard model of the type „HKSF-W“, materials in accordance with DIN, ASME and NACE MR 01 75 are used.

### Vent and Drain:

In accordance with the known relevant group standards, RMA-ball valves are equipped with vent and drain pipes with additional RMA-ball valves with pressure resistant cap and/or with RMA-rotary gate valves on request or due to technical necessity.

### Scope of Application:

Surface or underground mounted, for use in transport lines, compressor stations, measuring and regulating stations, emergency shut-down units (ESD), drain or vent pipes on pig traps or other installations. RMA-ball valves are suitable for use within a wide range of media e.g. gas, oil, etc.

Technically adapted versions for other purposes, e.g. for use in district heating transmission lines, are also possible.

### Design:

The body is extremely rigid thanks to its fully-welded ball design form.

The largely dimensioned ball diameter ensures a high level of overlapping of the sealing surface in the fully-closed position with a consequently high level of sealing security.

In addition, the design form prevents turbulence in the medium transported which also helps limit premature wear.

The low weight and minimum number of weld seams required are further advantages of this design.

### Operation:

RMA-ball valves are available with hand, geared, electrical, electro-hydraulic, hydro-pneumatic or any other operating mechanism.

Diverse accessories such as position indicators, remote control options, etc. can be added.

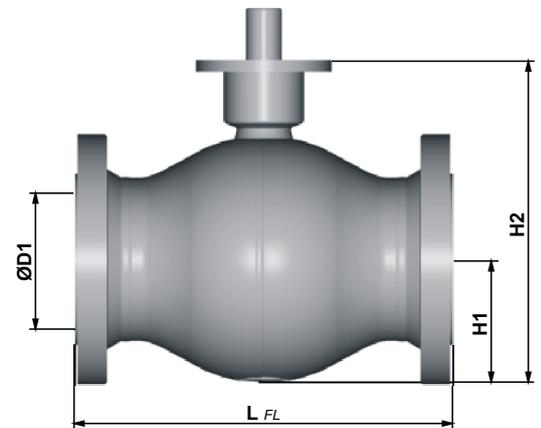
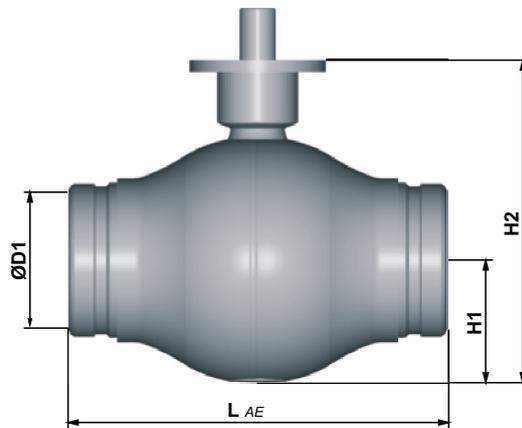
### Temperature Range:

The temperature range for RMA-ball valves type „HKSF-W“ extends as standard from -29° C to +80° C. Designs for higher or lower temperatures for corresponding operating conditions are in our programme as well.

## Ball valve HKSF-W100

### Dimensions & Weights

Size		Diameter		Height		Length	Weights	
DN		D1	H1	H2	L <sub>AE</sub> = L <sub>FL</sub>	G <sub>AE</sub>	G <sub>ANSI FL</sub>	
[mm]	[inch]	mm	mm	mm		mm	kg	kg
25	1"	25	70	155	216	9	13	
50	2"	51	95	185	292	14	19	
80	3"	76	110	240	356	27	37	
100	4"	102	130	290	432	35	69	
150	6"	152	150	395	559	115	175	
200	8"	203	190	525	660	240	323	
250	10"	254	235	630	787	351	539	
300	12"	305	270	720	838	513	705	
350	14"	337	300	770	889	752	995	
400	16"	387	335	880	991	920	1.190	
450	18"	438	372	950	1.092	1.362	1.675	
500	20"	489	410	1.060	1.194	1.675	2.000	
550	22"	540	450	1.110	1.295	2.244	2.809	
600	24"	591	505	1.200	1.397	2.600	3.350	
700	28"	686	580	1.280	1.549	3.770	5.000	
800	32"	781	655	1.440	1.778	5.500	7.200	
900	36"	876	730	1.590	2.083	7.800	9.500	
1000	40"	978	790	1.765	2.159	10.500	12.500	
1100	44"	1.067	870	1.925	2.311	12.200	14.800	
1200	48"	1.168	950	2.105	2.489	19.900	22.500	
1400	56"	1.384	1.135	2.455	2.921	31.000	36.000	



### Remarks:

- Lengths according to API 6D; as far as defined.
- Ball valves with other lengths on request
- Lengths of flange design with ANSI-flanges with flat sealing plane type "RF".
- When ordering flange ball valves, please specify whether ANSI-flanges type "RF", type "RTJ" or DIN-flanges are required.
- Ball valves with reduced bore on request.
- WE = with welding ends
- FL = with flange ends

## Ball valve HKSF-W100

### “Ball”-sealing system

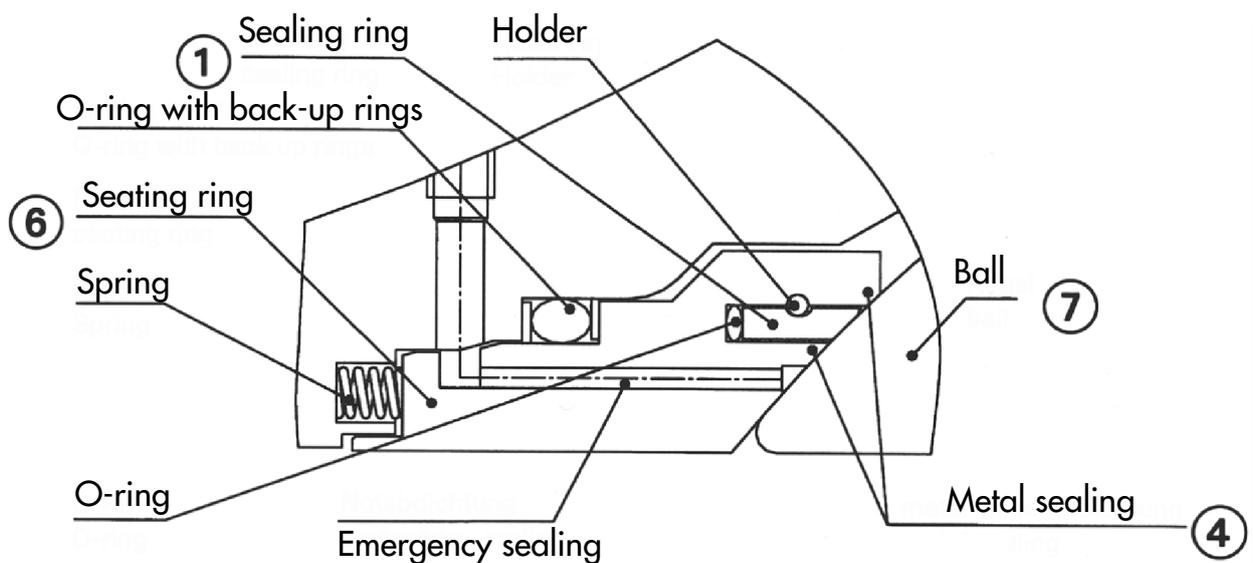
#### The primary metal and secondary soft sealing system comprises:

- 2 metal sealing planes (chrome steel) (4) and
- 1 flexible soft sealing ring (PTFE/carbon) (1)

The **soft sealing (1)** is positioned in such a way that it is first effective at low operating pressures. As the operating pressure increases, the application force of the **seating ring (6)** on the **ball (7)** increases accordingly (piston effect). The permanent spring force therefore receives additional support. In this case, the **soft sealing ring (1)** is pushed back so far that sealing is achieved entirely with the **metal sealing planes (4)**.

In case of damage to the **metal sealing planes (4)**, the **soft sealing ring (1)** enters into effect. This is achieved by increasing the pressure on the reverse side of the **soft sealing ring (1)**. The later is pressed onto the **ball (7)**. For this activation it is irrelevant whether the leakage is due to the **metal sealing plane (4)** on the body side or on the medium side.

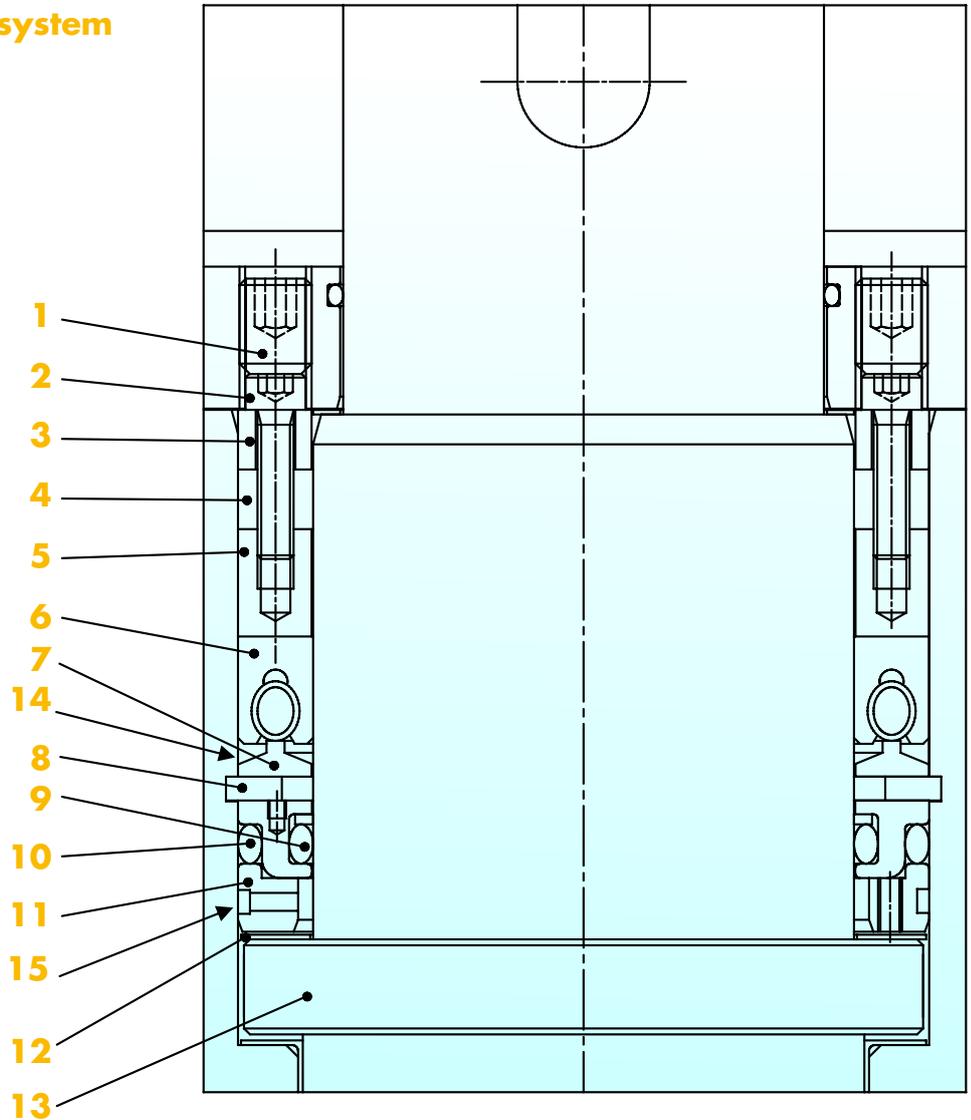
Slipping, extraction, breaking off or other damage to the **soft sealing ring (1)** is virtually not possible.



## Ball valve HKSF-W100

### “Operating spindle”-sealing system

1. Threaded pin
  2. Cylinder screw
  3. Spacer ring (13% chrome steel)
  4. Graphite ring
  5. Tension ring (13% chrome steel)
  6. Lip sealing ring (PTFE)
  7. Groove tension ring (13% chrome steel)
  8. Fastening ring
  9. O-ring (NBR or Viton)
  10. O-ring (NBR or Viton)
  11. Clamping ring (13% chrome steel)
  12. Stopping disk
  13. Operating spindle  
up to DN 400 (13% chrome steel)  
over DN 400 (chrome steel or  
nickel-plated steel)
  14. Emergency sealing
  15. Second possibility to re-tight
- Other materials due to technical



### The sealing system is composed of three seals:

- graphite ring (4)
- lip sealing ring (6)
- O-ring (9 + 10)

Radial re-tensioning of the lip sealing ring (6) is easily achieved by tightening the threaded pins (1). The graphite ring (4) can also be re-tensioned by tightening the cylinder screw (2) (remove the threaded pins).  
The O-ring (10) and the lip sealing ring (6) can be recharged by injecting a sealing compound (14).

Should it still prove necessary to replace the set of sealing rings, then this task can be carried out with the valve under pressure.

- unscrew the gear plate
- replace the set of sealing rings (4/5/6)

Under no circumstances may the fastening ring (8) be removed as this is used to ensure axial clamping of the operating spindle (13).

It is recommended that the O-rings (9 + 10) be refilled with a sealing compound before replacing the sealing rings (15).

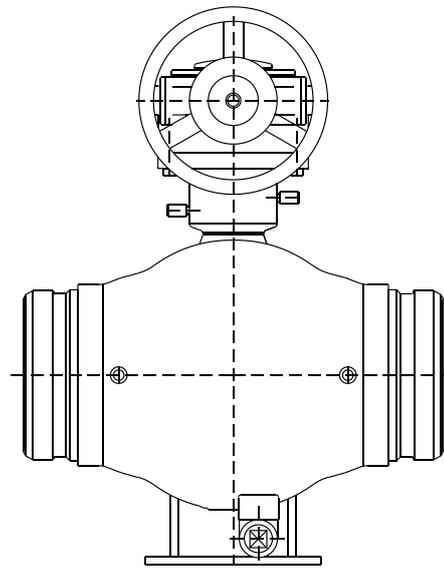
## Ball valve HKSF-W100

Some examples for variations in equipment, manufactured according to customers needs.

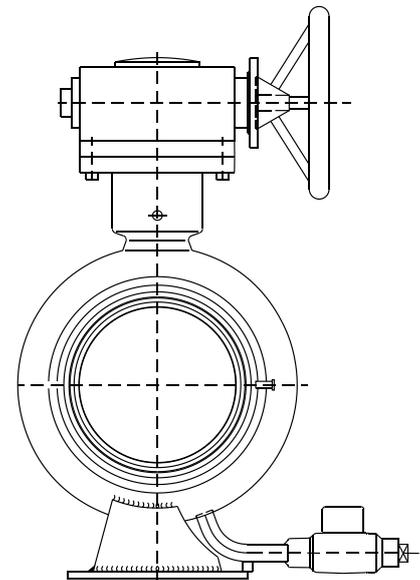
### for above ground installation

see picture 1.1 and 1.2

- with welding ends
- incl. gearbox and hand wheel
- incl. emergency sealing at
  - a) ball / seating ring
  - b) operating spindle
- with ball valve for drain and vent
- with support



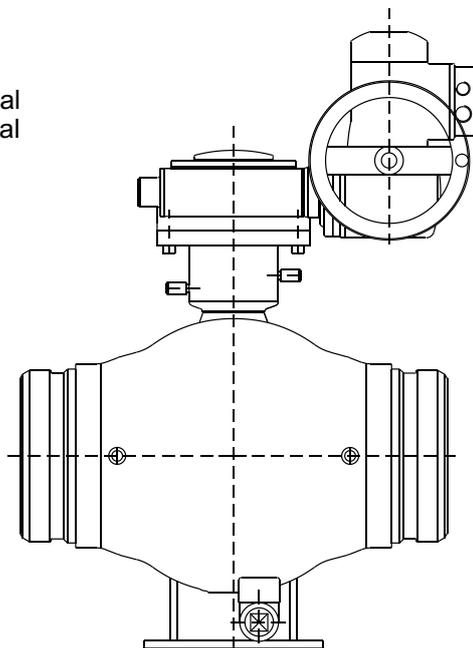
picture 1.1



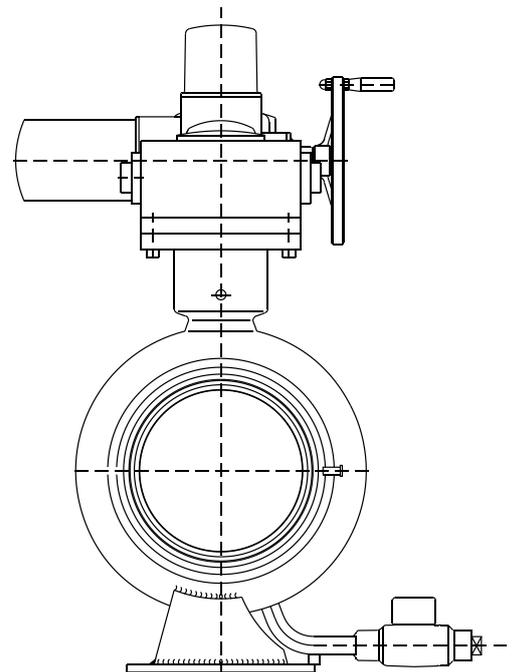
picture 1.2

see picture 2.1 and 2.2

- with welding ends
- incl. gearbox, motor and additional emergency hand wheel for manual operation on site
- incl. emergency sealing at
  - a) ball / seating ring
  - b) operation spindle
- with ball valve for drain and vent
- with support



picture 2.1



picture 2.2

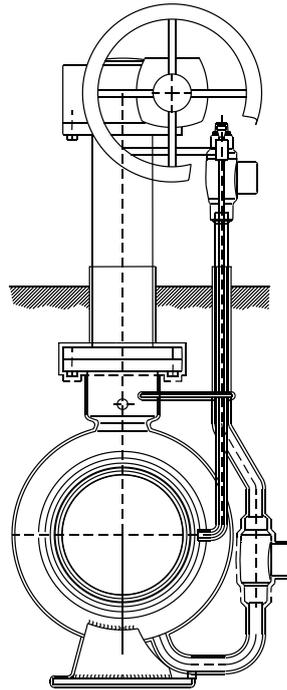
## Ball valve HKSF-W100

Some examples for variations in equipment, manufactured according to customers needs.

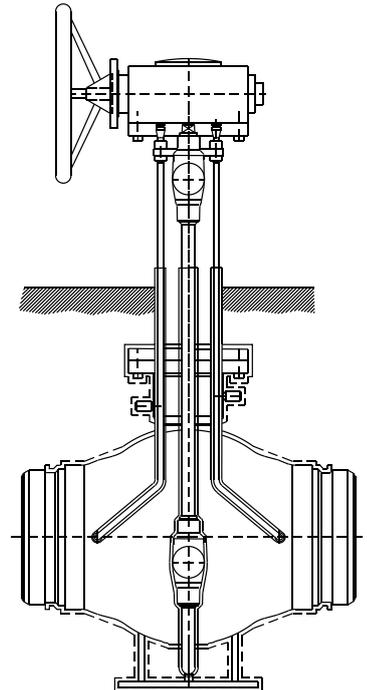
### for underground installation

see picture 3.1 and 3.2

- with welding ends
- with stem extension up to operating height
- incl. gearbox above ground and hand wheel
- incl. emergency sealing at
  - a) ball / seating ring (accessible above ground)
  - b) operating spindle
- with possibility of drain and vent above ground through vertically guided pipes with one ball valve above ground and one ball valve underground
- with support
- buried parts are coated with PUR
- parts above ground are coated with primer and painted on request



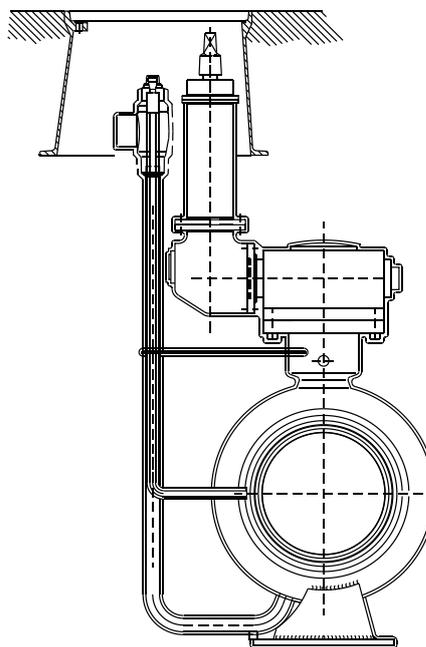
picture 3.1



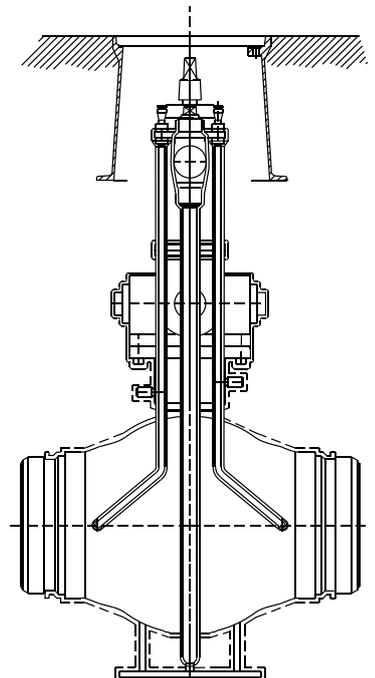
picture 3.2

see picture 4.1 and 4.2

- with welding ends
- incl. gearbox below ground
- with stem extension and actuating square shaft in road cap (a position indicator is recommended)
- incl. emergency sealing at
  - a) ball / seating ring
  - b) operating spindle
- with possibility of drain and vent through vertically guided pipes and one ball valve in road cap
- with support
- buried parts are coated with PUR



picture 4.1



picture 4.2