

Operation
& Maintenance Manual

UNDERGROUND FIRE HYDRANT

P/N
TYPE 8851
TYPE 8852

Approved for use by

President of Factory, JAFAR S.A.

Failure to comply with the guidelines and instructions in this Operation and Maintenance Manual releases the manufacturer from all obligations, liability and guarantee.

Due to continuous business development, we reserve the right to introduce modifications and structural changes to the presented product.

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1 TECHNICAL DESCRIPTION

1.1 PRODUCT NAME AND FEATURES

The subject of this O&MM is:

Underground full flow hydrant with single closure TYPE 8851

- With additional protection against flow in the form of ball valve;
located below poppet TYPE 8852
- With automatic water drainage activated by medium flow stoppage;
- With poppet (closure) embedded in 100% pure elastomer;
- Internal parts may be replaced without cutting off flow (TYPE 8852).

1.2 PURPOSE

Underground fire hydrants with single closure and additional flow protection are intended for fire protection systems, for chemically neutral pure water, free of solid impurities and for industrial systems. For use on underground installations on pipelines laid horizontally below the freezing zone.

1.3 TECHNICAL SPECIFICATION

Underground fire hydrants with single closure and additional flow protection are intended for transport of potable water and industrial water at temperatures from +1°C to +50°C.

- Available diameters (dimensions) DN80 -DN 100[mm]

- Maximum medium flow rate: - liquid up to 4 [m/s]

- driving torque at opening start and closing end are listed below:

DN [mm]	80	100
Mmax [Nm]	80	80

- equipment control: closing direction in the standard version of hydrant:
clockwise closing sense of rotation.

The closing sense of rotation can be opposite on special order.

- connection flanges are manufactured in accordance with PN-EN 1092-2:1999
with the dimensions adequate to the relevant nominal pressure of 1.6 MPa.
- Hydrant's efficiency with nominal pressure 0.2 MPa is:
10 dm³/s – above ground DN80
15 dm³/s – above ground DN100

In accordance with PN-B-02863: 1997 "Fire water supply"

- Key for controlling valves and taps PN-63/M-74085
- Manufactured in accordance with PN-EN 14339:2009

2 STRUCTURE

2.1 HYDRANT DESIGN DESCRIPTION

The underground hydrant is a column with internal structure to enable drawing water from main pipeline. In the lower part of the hydrant there is a cast-iron valve chamber with a poppet acting as closing element and a drainage device. The chamber housing is connected to the ball's (ball return valve) valve chamber finished with a connection flange for installing the hydrant on the pipeline. The top body also has a driving element on the end of bolt used for transferring rotational movement to the hydrant's poppet via distance pipe. The hydrant's main body has a toothed socket for connecting a hydrant stand which is used for attaching fire hoses.

The rotating stem is seated in a stopper with rubber sealing rings. Rotate the hydrant clockwise to close the flow. Poppet moves during rotation of the stem and flow opens. The poppet's movement closes the water draining

device's outlet opening. When closing a hydrant, the poppet lands in the seat and the water remaining in the hydrant's column is drained using the draining hole.

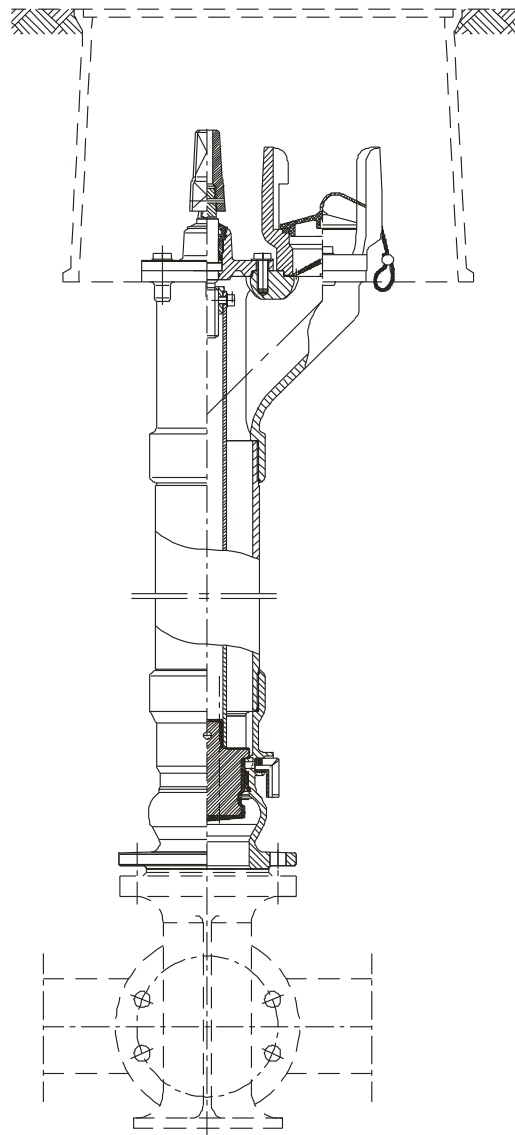
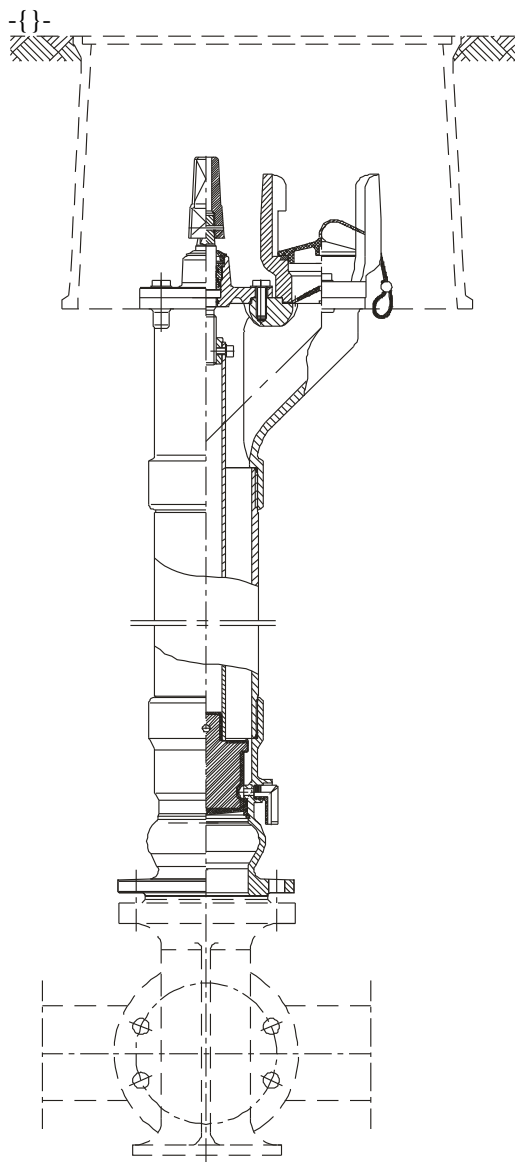
With hydrant TYPE 8852, it is possible to replace the complete internal equipment of a hydrant without cutting off the supply thanks to a ball valve.

Operation diagram for hydrant TYPE 8851 DN80

8851.1

CLOSE

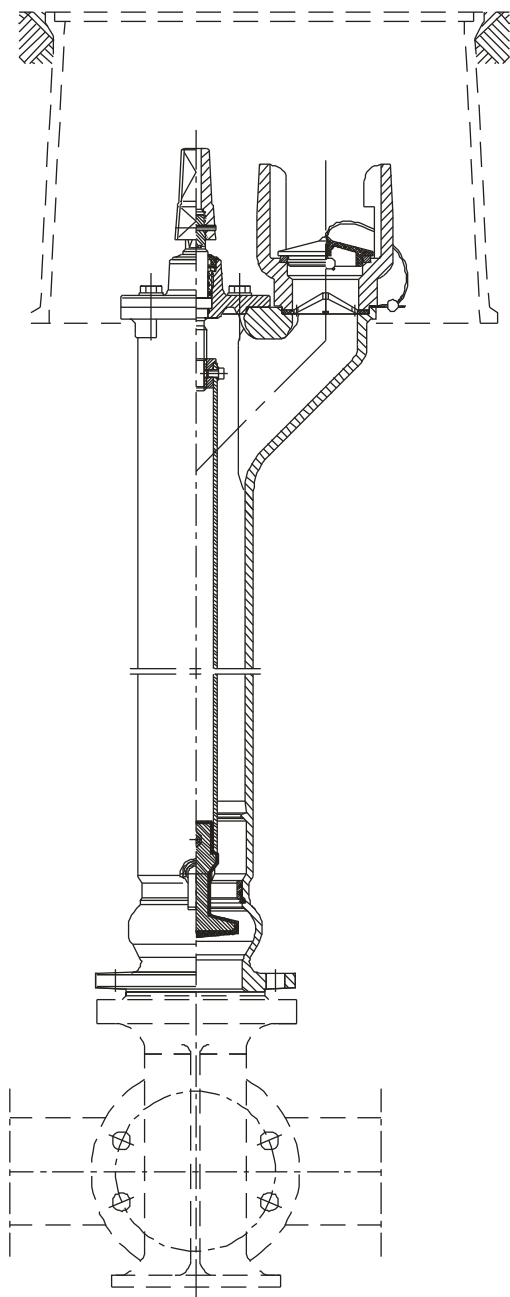
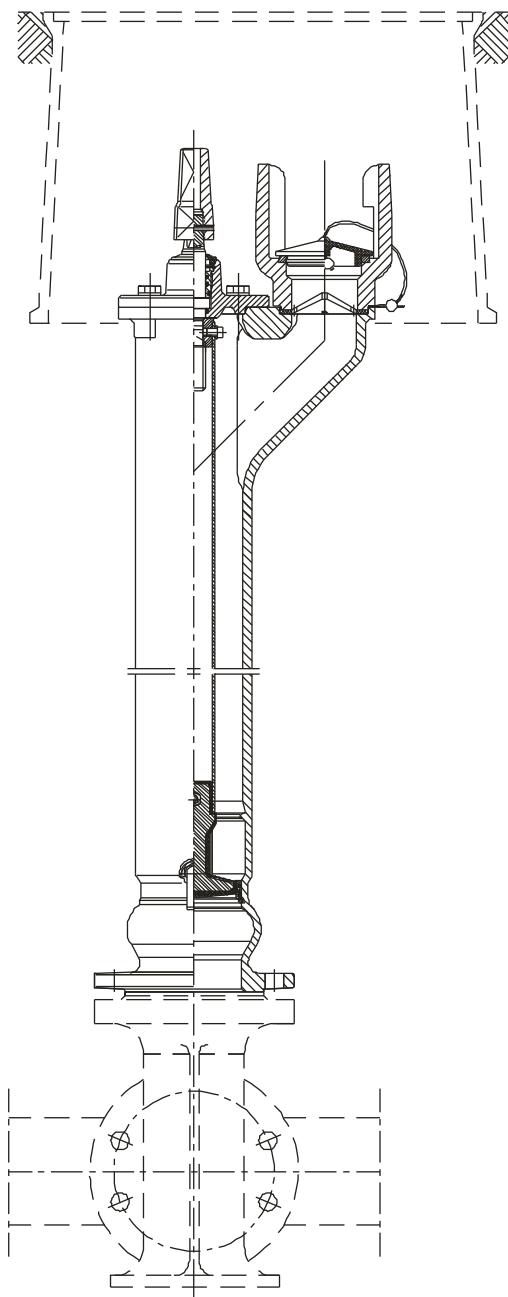
OPEN



8851.2

CLOSE

OPEN

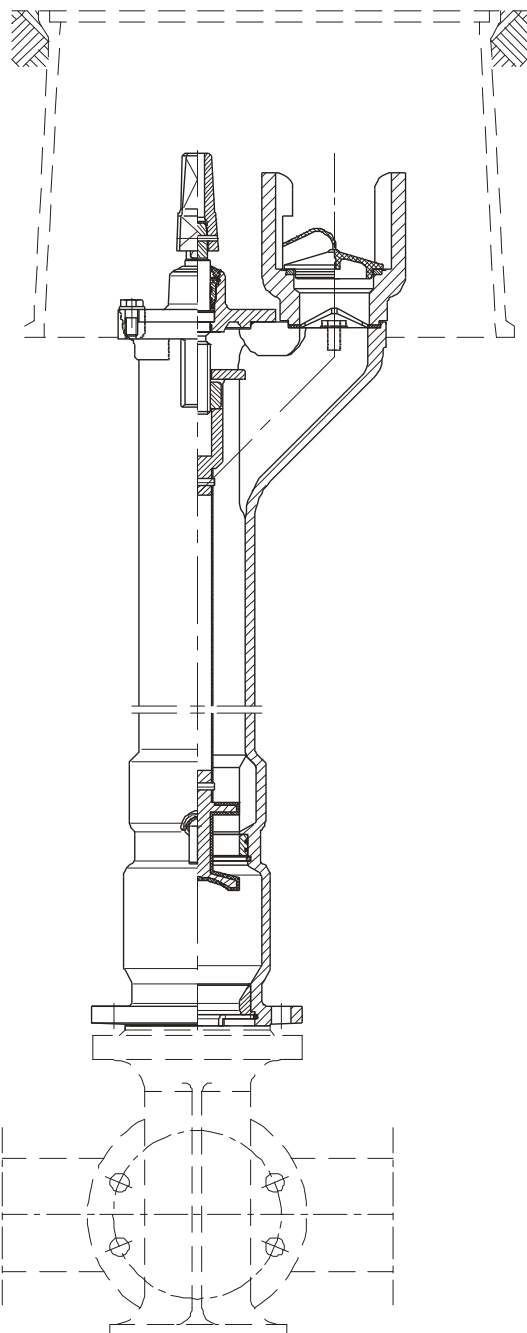
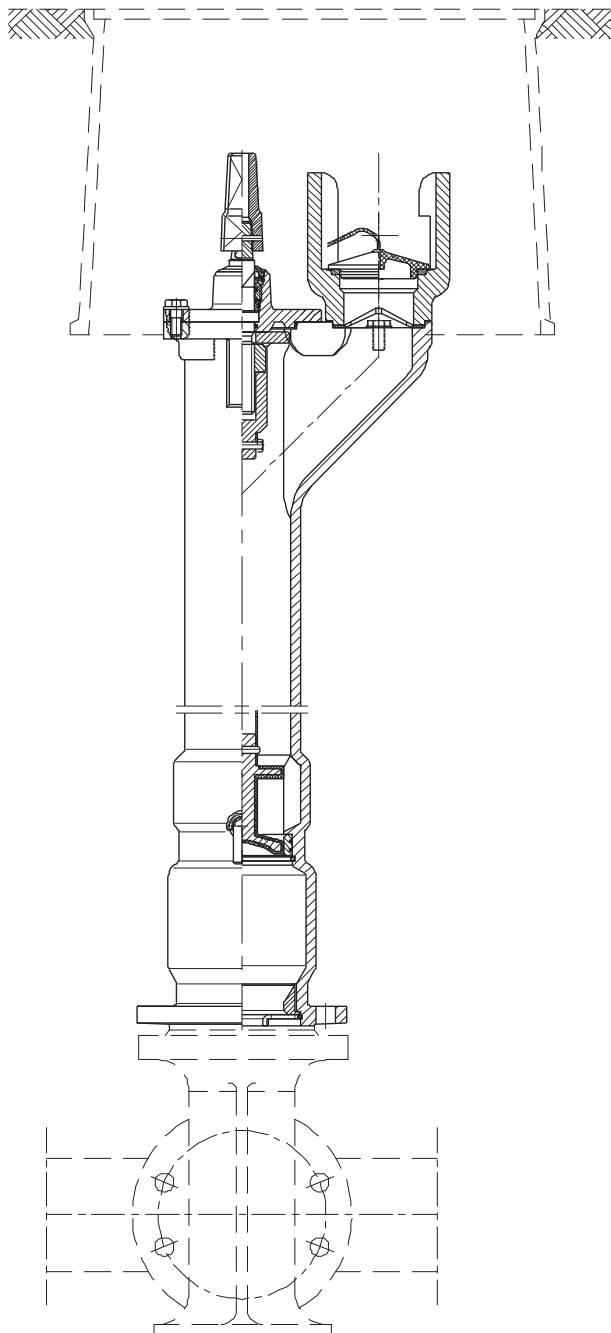


Operation diagram for hydrant TYPE 8851 DN80

8851.3

CLOSE

OPEN

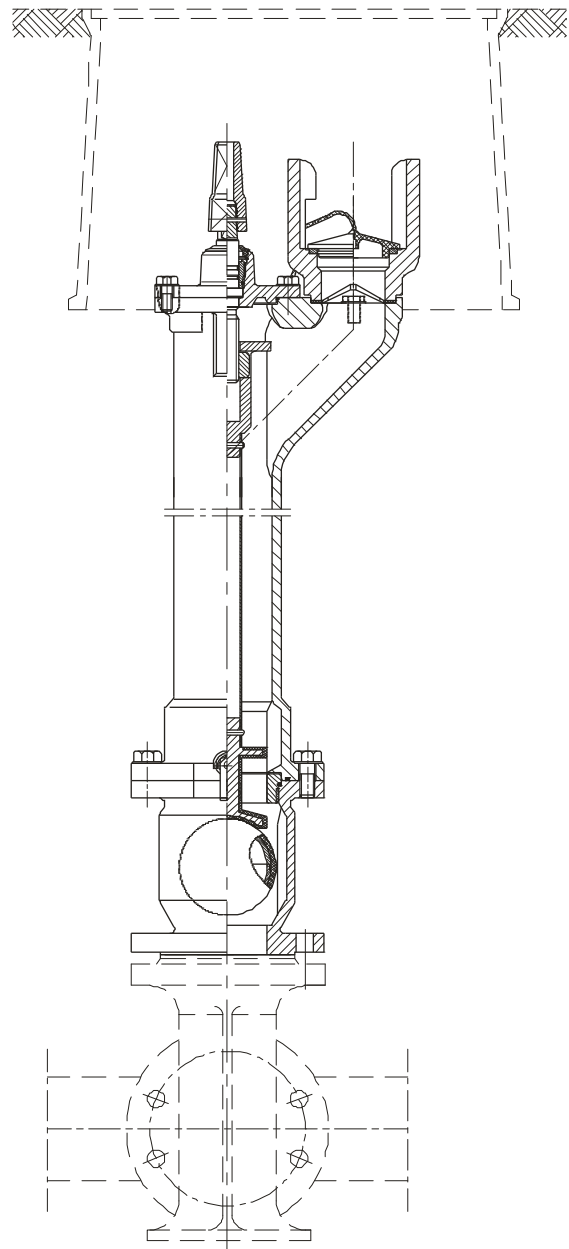
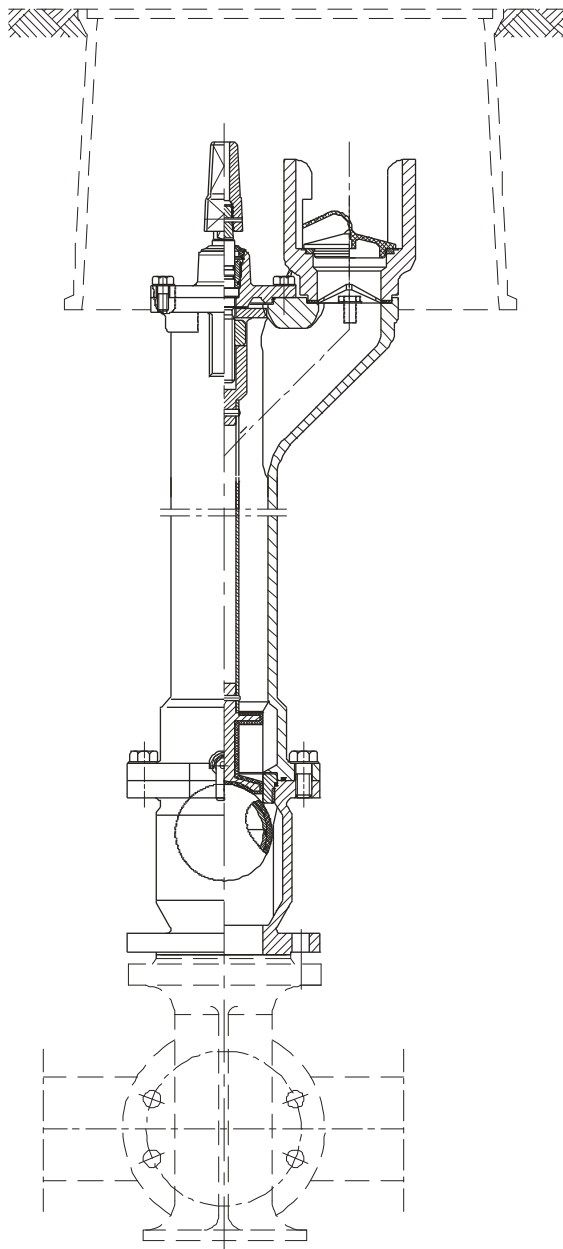


Operation diagram for hydrant TYPE 8852 DN80

8852.1

CLOSE

OPEN

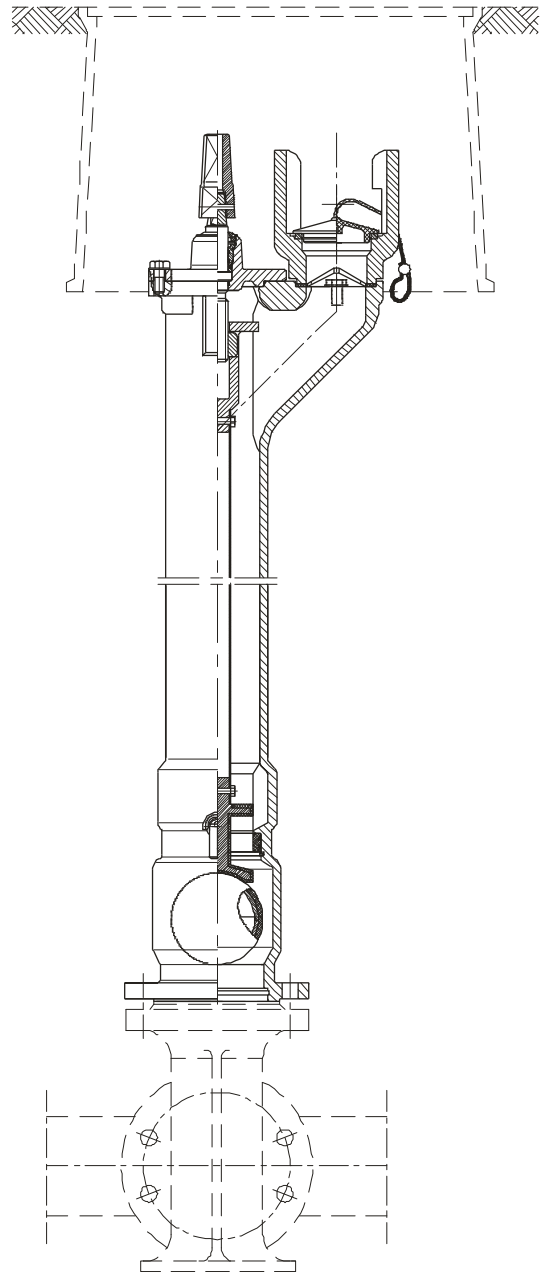
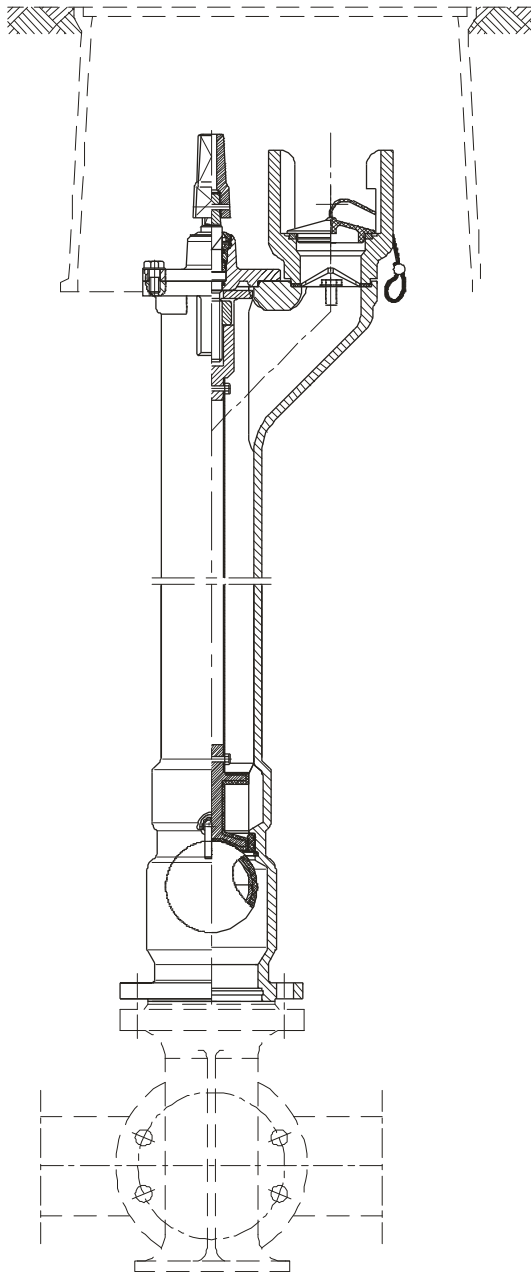


Operation diagram for hydrant TYPE 8852 DN80

8852.2

CLOSE

OPEN



The order of operations during opening and closing of a hydrant type 8852 configured with a shutoff gate valve.

- Starting:
 1. Open the shutoff gate valve.
 2. Open the hydrant.
- Stopping:
 3. Close the hydrant.

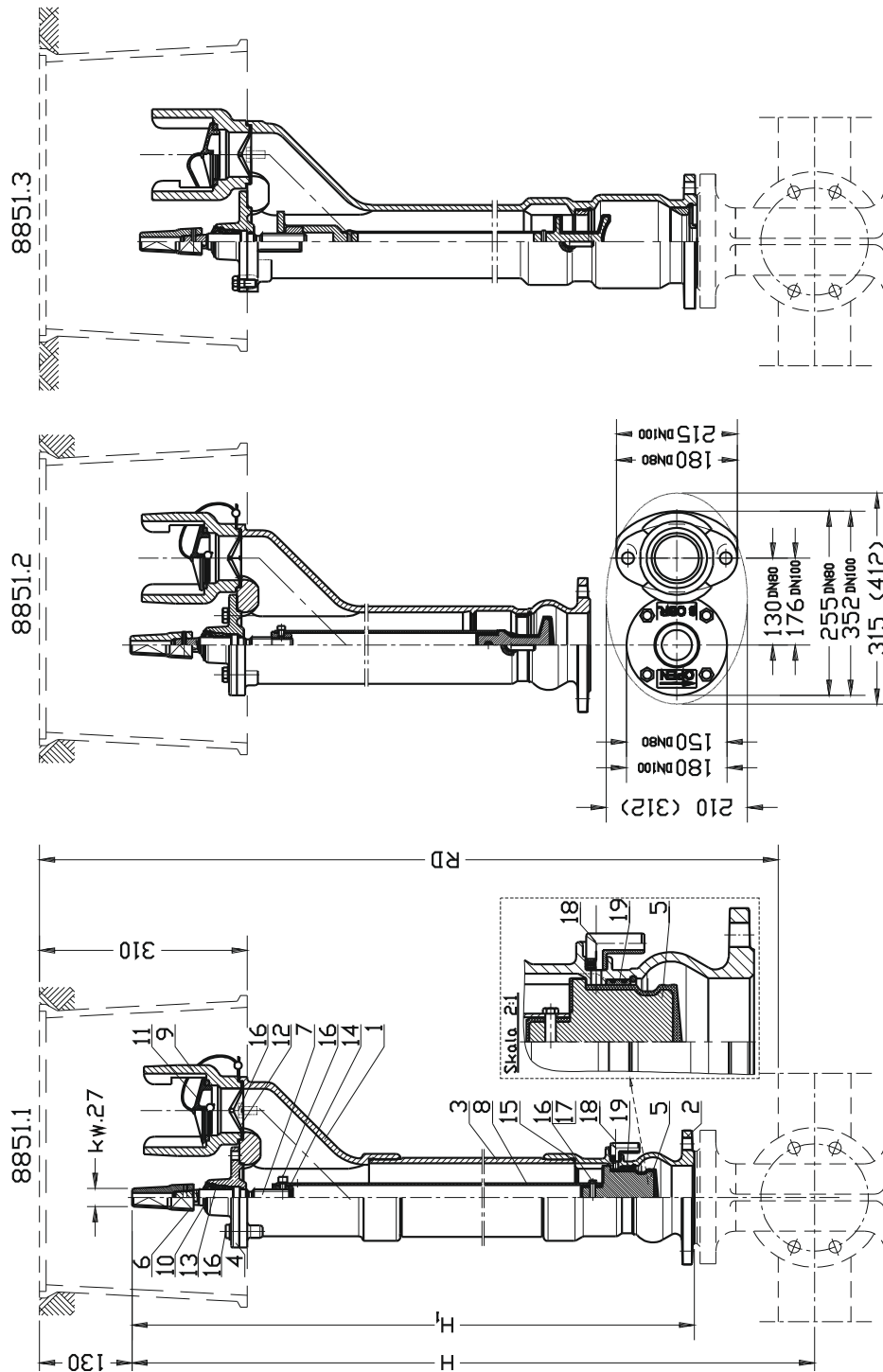
Caution! It is prohibited to open this type of hydrant with a closed shutoff gate valve because the poppet sliding down must be able to push a water column in the direction opposite to the flow direction during the first phase of its movement.

2.2 MATERIALS TYPE 8851

List of basic materials used for the construction of an underground hydrant TYPE 8851
see table

Item	Part name	Material	Reference standard
1	Main body	Cast-iron, EN-GJS 400-15 EN-GJS500-7	PN-EN1563: 2012
2	Ball chamber	Cast-iron, EN-GJS 400-15 EN-GJS500-7	PN-EN1563: 2012
3	Column	Cast-iron, EN-GJS 400-15 EN-GJS500-7 Steel 1.0254 Stainless steel 1.4301	PN-EN1563: 2012 PN-EN 1,503-3:2003 PN-EN 10088-1:2014
4	Cover	Cast-iron, EN-GJS 400-15 EN-GJS500-7	PN-EN1563: 2012
5	Poppet	Cast-iron, EN-GJS 400-15 EN-GJS500-7 EPDM	PN-EN1563:2012 PN-ISO1629:2005
6	Cap	Cast-iron, EN-GJS 400-15 EN-GJS500-7	PN-EN1563: 2012
7	Stem	Stainless steel 1.4021	PN-EN 10088-1: 2014
8	Spindle	Stainless steel 1.4301	PN-EN 10088-1:2014
9	Tooth socket	Cast-iron, EN-GJS 400-15 EN-GJS500-7	PN-EN1563: 2012
10	Gasket	EPDM	PN-ISO 1629:2005
11	Outlet seal	EPDM	PN-ISO 1629:2005
12	Deflector	EPDM	PN-ISO 1629:2005
13	Stopper	Brass	PN-EN 1982:2010
14	Stem nut	Brass	PN-EN 1982:2010
15	O-ring	EPDM	PN-ISO 1629:2005
16	Bolt	Steel St3S/Zn5 Stainless steel, A2	PN-EN ISO 4017: 2011 PN-EN ISO 4762: 2006
17	Nut	Steel St3S/Zn5 Stainless steel, A4	PN-EN ISO 4032: 2013
18	Drainage	Polypropylene PP	PN-EN ISO 1873-1:2000
19	Seat	Brass	PN-EN 1982:2010

2.3 DIMENSIONS TYPE 8851



DN	RD	H	H ₁	Weight [kg]		
[mm]				8851.1	8851.2	8851.3
80	750	665	500	-	30	-
	1000	915	750	-	34	-
	1250	1165	1000	-	39	44
	1500	1415	1250	-	45	52
	1800	1715	1500	-	-	-
100	1000	935	750	50	-	-
	1250	1185	1000	56	-	-
	1500	1435	1250	62	-	-
	1800	1735	1500	70	-	-

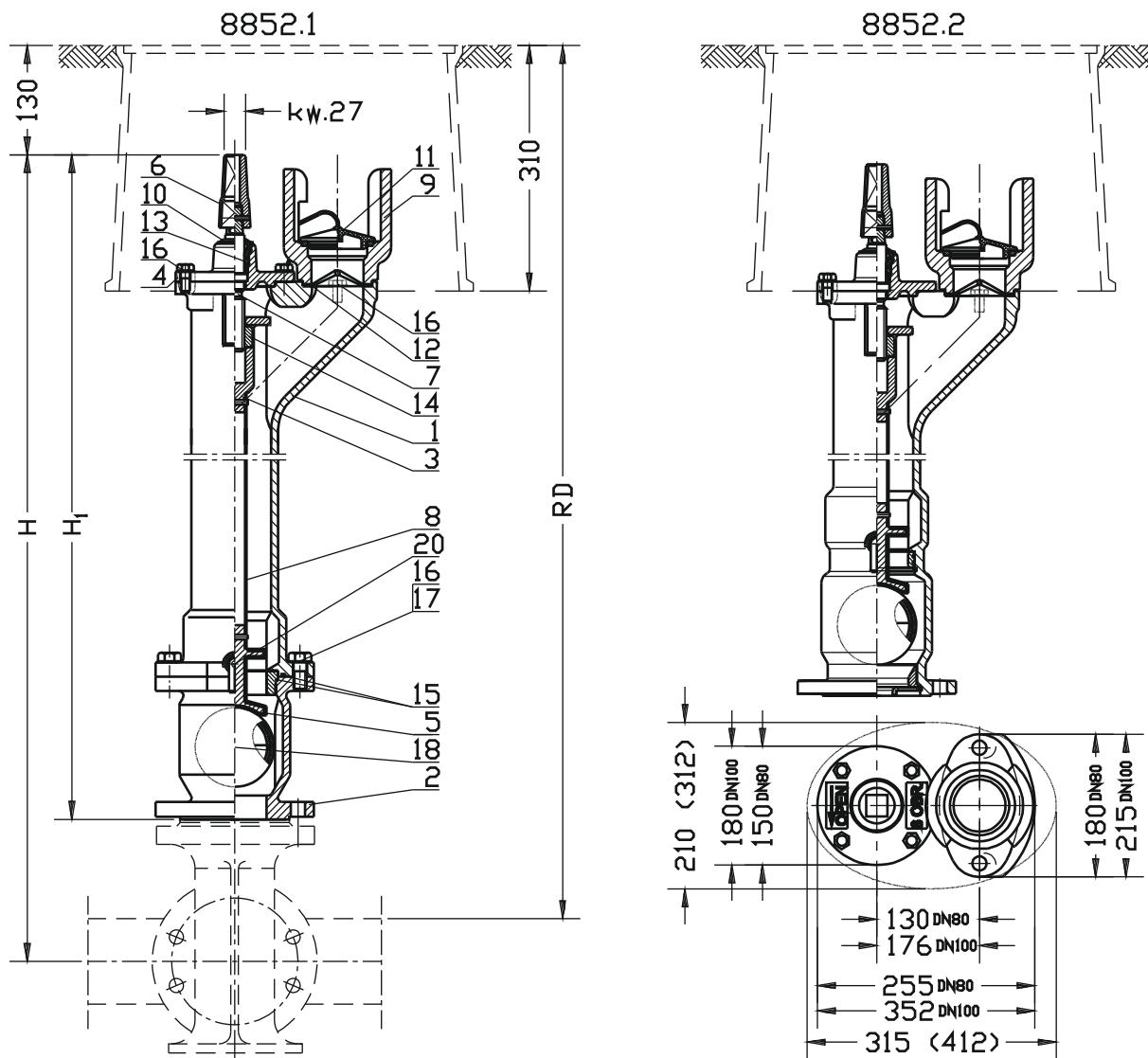
2.4 MATERIALS TYPE 8852

List of basic materials used for the construction of an underground hydrant TYPE 8852
see table

Item	Part name	Material	Reference standard
1	Main body	Cast-iron, EN-GJS 400-15 EN-GJS500-7	PN-EN1563: 2012
2	Lower body	Cast-iron, EN-GJS 400-15 EN-GJS500-7	PN-EN1563: 2012
3	Nut holder	Cast-iron, EN-GJS 400-15 EN-GJS500-7	PN-EN1563: 2012
4	Cover	Cast-iron, EN-GJS 400-15 EN-GJS500-7	PN-EN1563: 2012
5	Poppet	Cast-iron, EN-GJS 400-15 EN-GJS500-7 EPDM	PN-EN1563:2012 PN-ISO1629:2005
6	Cap	Cast-iron, EN-GJS 400-15 EN-GJS500-7	PN-EN1563: 2012
7	Stem	Stainless steel 1.4021	PN-EN 10088-1: 2014
8	Spindle	Stainless steel 1.4301	PN-EN 10088-1:2014
9	Tooth socket	Cast-iron, EN-GJS 400-15 EN-GJS500-7	PN-EN1563: 2012
10	Gasket	EPDM	PN-ISO 1629:2005
11	Outlet seal	EPDM	PN-ISO 1629:2005
12	Deflector	EPDM	PN-ISO 1629:2005
13	Stopper	Brass	PN-EN 1982:2010
14	Stem nut	Brass	PN-EN 1982:2010
15	O-ring	EPDM	PN-ISO 1629:2005
16	Bolt	Steel St3S/Zn5 Stainless steel, A2	PN-EN ISO 4017: 2011 PN-EN ISO 4762: 2006
17	Nut	Steel St3S/Zn5 Stainless steel, A4	PN-EN ISO 4032: 2013
18	Ball	Cellular polypropylene or aluminium alloy AlSi/EPDM	PN-EN 1706:2011 PN-ISO 1629:2005

19	Seat	Brass	PN-EN 1982:2010
20	Drainage	Polypropylene PP	PN-EN ISO 1873-1:2000

2.5 DIMENSIONS TYPE 8852



DN	RD	H	H ₁	Weight	
[mm]				8852.1	8852.2
80	1000	915	750	36	-
	1250	1165	1000	46	45
	1500	1415	1250	54	53
	1800	1715	1500	64	-
100	1000	935	750	55	-
	1250	1185	1000	59	-
	1500	1435	1250	63	-
	1800	1735	1500	68	-

2.6 STANDARDS

PN-EN 1074-1: 2002	Valves for water supply. Fitness for purpose requirements and appropriate verification tests. General requirements
PN-EN 1074-6: 2009	Valves for water supply. Fitness for purpose requirements and appropriate verification tests. Hydrants.
PN-89/H-02650	Fittings and pipelines. Pressures and temperatures.
PN-EN 19:2005	Industrial valves. Marking of metallic valves.
PN-EN 1092-2: 1999	Flanges and their connections. Circular flanges for pipes, valves, fittings and accessories, PN designated. Cast iron flanges.
PN-EN ISO 6708: 1998	Pipework components. Definition and selection of DN (nominal size).
PN-EN 1559-1: 2011	Founding. Technical conditions of delivery. General.
PN-EN1563: 2012	Founding. Spheroidal graphite cast irons.
PN-EN1370: 2012	Founding. Examination of surface condition by visual-tactile comparators.
PN-EN14339: 2009	Underground hydrants.
PN-EN 10088-1: 2014	Stainless steels. List of stainless steels.
PN-89/H-84023/07	Specific application steel. Pipe steel. Grades.
PN-EN 1706 2011	Aluminium and aluminium alloys. Foundings. Chemical composition and mechanical properties.
PN-EN1982: 2010	Copper and copper alloys. Ingots and castings.
PN-EN12420: 2002	Copper and copper alloys. Forgings.
PN-ISO 965-1: 2001	ISO general purpose metric screw threads. Tolerances. Principles and basic data.
PN-ISO 2903: 1996	Trapezoid ISO metric threads. Tolerances.
PN-EN ISO 4762:2006	Hexagon socket headcap screws.
PN-EN ISO 4017:2011	Hexagon head screws.
PN-EN ISO 4014:2011	Product grades A and B.
PN-EN ISO 4032:2013	Hex head bolt. Product grades A and B.
PN-EN ISO 7091:2003	Hexagon regular nuts (style 1). Product grades A and B.
PN-77/M-82008	Plain washers. Normal series. Product grade C
PN-EN ISO 8752:2009	Spring washers.
PN-69/M-80202	Spring-type straight pins. Slotted, heavy duty.
BN-89/8511-15	Steel wires 1x7.
PN-ISO 1629: 2005	Metallic seals.
PN-EN ISO 1873-1: 2000	Rubbers and lattices. Nomenclature.
PN-EN ISO 1872-1:2000	Plastic materials. Polypropylene (PP) moulding and extrusion materials. Designation system and basis for specifications.
	Plastic materials. Polyethylene (PE) moulding and extrusion materials. Designation system and basis for specifications.

2.7 ORDERING REGULATIONS

Underground fire hydrants are specific purpose industrial valves, therefore orders must include:

- product's catalogue number,
- intended use, e.g. for fire water supply systems;
- furthermore:
 - nominal diameter — acc. to PN-EN ISO 6708: 1998
 - nominal pressure, acc. to PN-89/H-02650;
 - type of body material — acc. to PN-EN 1563: 2012
 - max. operating temperature — acc. to PN-89/H — 02650.

2.8 MANUFACTURE AND ACCEPTANCE

The underground hydrants are accepted and produced in accordance with: PN-EN 1074-6:2005 (Valves for water supply. Fitness for purpose requirements and appropriate verification tests. Hydrants.) and PN-EN 14339:2005

(Underground hydrants). All hydrants (100%) are subject to tightness testing. The tests include external body tightness and closing tightness.

2.9 MARKINGS

The underground hydrants are marked in accordance with: PN-EN-19: 2005, PN-EN-1074-6: 2009 markings on the front and back walls of the body chamber. The marking contains the following data:

- nominal diameter
- nominal pressure
- type of body material
- manufacturer trade mark
- direction of medium flow.

The location on the valve specified in the documentation features the nameplate which contains the following data:

- manufacturer's company name and logo
 - product serial number
 - sealing temperature grade
 - the Polish Building Mark "B" and/or the CE mark (as applicable)
 - product type

3 PROTECTION, STORAGE & TRANSPORT

3.1 PROTECTIVE COATINGS

All inner and outer cast-iron surfaces and column pipes are protected with electro-deposited epoxy coat. The coat has been approved for contact with foodstuffs.

The anti-corrosion coating layer minimum thickness is 250µm.

The casting surface is pre-treated for epoxy coating in accordance with the relevant technical documentation and standard PN-EN ISO 12944-5: 2009.

The fastening bolts for external hydrant's part, if other than stainless steel grade 1.4301, should have corrosion protection in the form of coat, e.g. Fe/Zn5.

3.2 PACKAGING

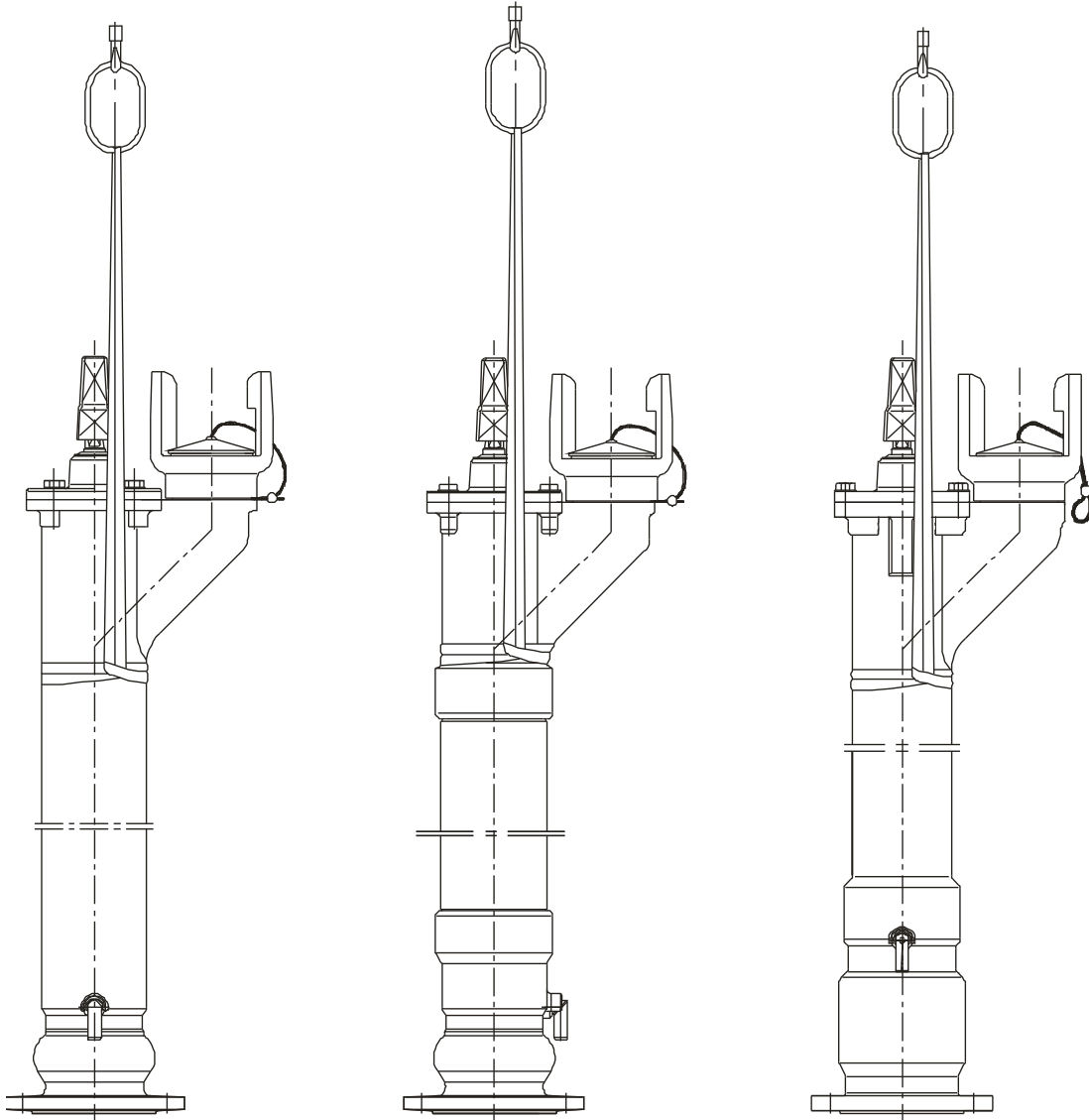
The hydrants are placed in plastic film sleeves and additionally wrapped with stretch wrap when placed on pallets.

3.3 STORAGE

Store the hydrants in sheltered rooms.

3.4 TRANSPORT

Transport the hydrants on sheltered vehicles.



4 ASSEMBLY AND INSTALLATION

4.1 INSTALLATION GUIDELINES

Underground hydrants may be installed on underground pipelines on horizontal systems. The products described herein are designed for installation using flange on the pipeline acting as medium (water) supply. Note that the system must not expose the hydrant to bending or tensile stress from loading with the unsupported pipeline sections. A hydrant assembled and adjusted by the manufacturer is ready for installation in the system. Any dismantling of the hydrant components may result in loss of tightness.

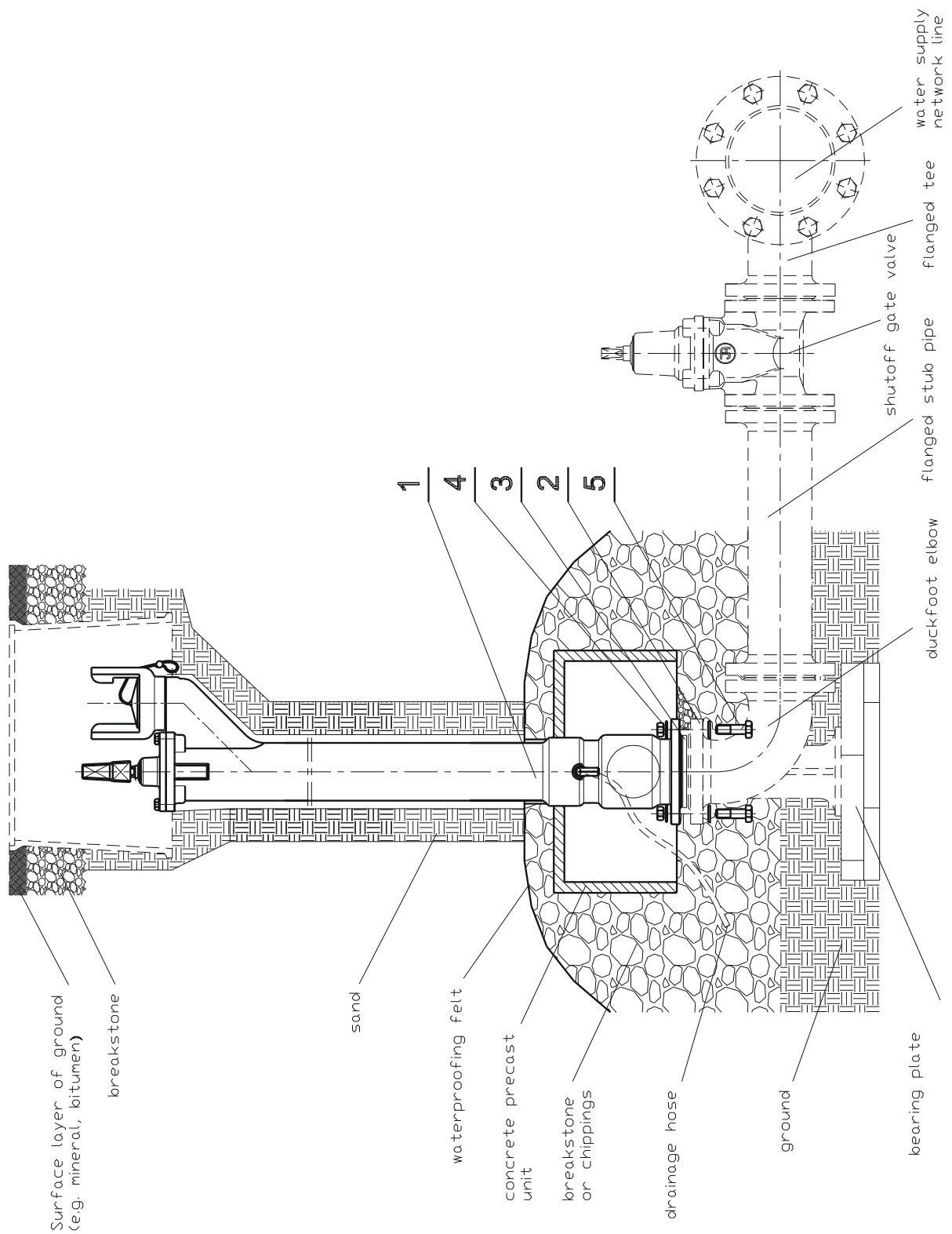
4.2 INSTALLATION INSTRUCTIONS

Before installing the hydrants, check the technical and commercial documentation, i.e. application for media and operation parameters of the pipeline, in which they are to be installed.

Note! If the product is damaged mechanically, do not install it in the pipeline.

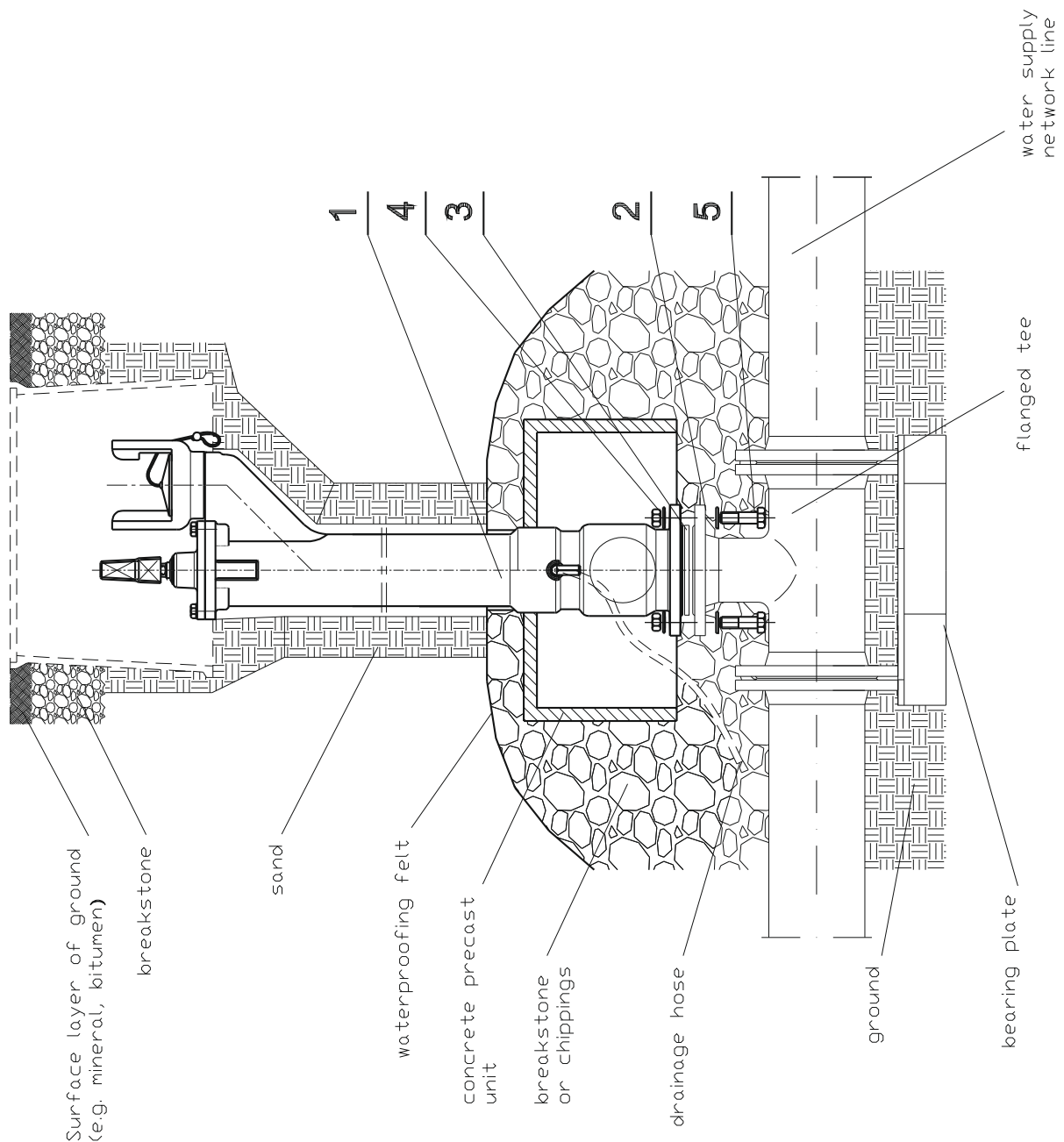
Any change in the operating conditions must be consulted with the hydrant's manufacturer beforehand.

Connection diagram for duckfoot elbow



1. Hydrant; 2. Pipeline connection flange; 3. Gasket; 4. Nut; 5. Fastening bolt

Connection diagram for a tee



1. Hydrant; 2. Pipeline connection flange; 3. Gasket; 4. Nut; 5. Fastening bolt

4.3 OPERATION

The outdoor hydrants are designed for drawing fire fighting water. Detailed requirements are given in applicable regulations defining the need for fire fighting water. The diagram above shows an example installation method for an underground hydrant, the installation method largely depends on the applied rules based on the local climate and geologic conditions.

Exceeding the operating limits of the fitting may result in damage that will not be covered by the suretyship granted by the manufacturer.

It is recommended to change the hydrant's settings once a year.

4.4 OH&S REGULATIONS

In case of hydrants, guidelines and recommendations for installation of water systems and devices installed in water supply stations and other facilities apply.

Misuse of this product is prohibited.

5 GUARANTEE CONDITIONS

The manufacturer grants guarantee for the product being installed and operated according to this O&MM. The conditions and period of the guarantee is specified in the guarantee sheet.