



VALVES and TECHNOLOGIES for WATER WORLD  
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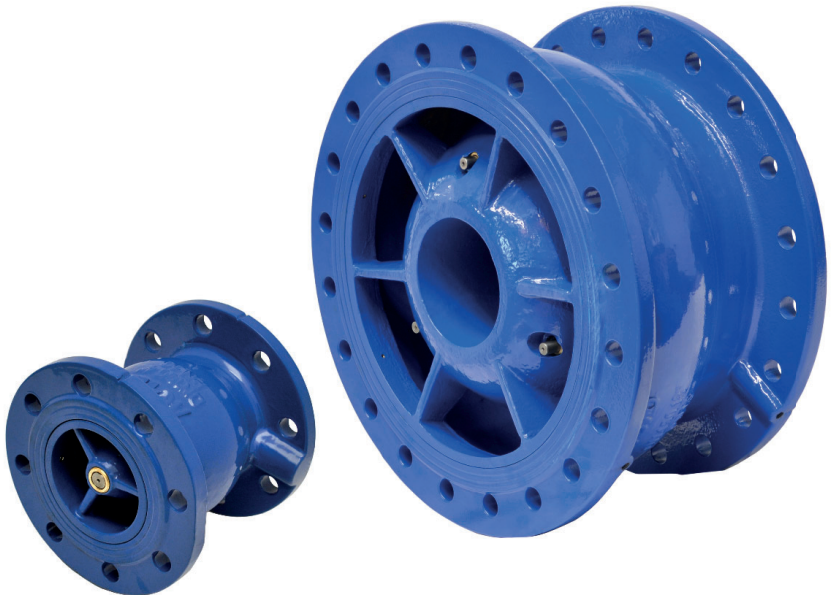
INSTALLATION, OPERATION & MAINTENANCE MANUAL

EN

# NOZZLE CHECK VALVE WITH RUBBER DISC PROFILE 'VENTURI'

FIG. 525SCV - 525ASCV - 526SCV

FIG. 525SCVV - 525ASCVV - 526SCVV





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## MANUFACTURER IDENTIFICATION

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## PRODUCT IDENTIFICATION

Thank you for purchasing our product. We kindly invite you to read carefully the operating instructions and safety rules of this manual, which is part of the product.

The valve is labeled with ACMO logo and model identification number (see the adhesive/metal label).

## GENERAL SAFETY MEASURES

- Read the IOM manual before using the valve. Comply with the manual at all times.
- The IOM manual must be available in the workplace.
- Non-compliance with the general safety measures can seriously damage human health and valve functioning. AC.MO S.r.l. will not assume any responsibility or liability for consequential damage due to the non-compliance with these instructions.
- The valve can be used for drinking water and clean service water. Other uses are prohibited because they can alter the valve safety. Never use the valve in plants where the pressure is higher than the one indicated.
- Only qualified staff can install the valve. Unqualified or underage staff cannot perform the installation. Always use protective equipment such as safety boots, safety helmets, goggles, protective gloves, etc... Personnel involved in the installation or maintenance of valves should be constantly alert to possible damages caused by an improper handling of the valve.
- Never use the valve in plants where the pressure is higher than the one indicated.
- Before performing any work on the valve, depressurize the pipeline section and ensure it is free of hazards.
- Unauthorized, unintentional and unexpected actuation, as well as any hazardous movement caused by stored energy (pressurized air, water under pressure) must be prevented.
- When a valve needs to be dismantled from a pipeline, fluid may emerge from the pipeline or the valve. The pipeline must be emptied completely before the valve is dismantled. It is strictly prohibited to disinstall any component when the system is under pressure (working) or when there is any fluid inside.
- Statutory and local provisions as well as the safety and accident prevention regulations must be observed and complied with at all times.
- For equipment that must be monitored, the relevant laws and regulations such as the Industrial Code, Accident Prevention Regulations, etc. must be complied with. In addition to this, local accident prevention regulations apply.



***Please note that if the valve closes too rapidly it can generate a water hammer in the pipes.***

## PACKING

The valves are generally delivered in europallets, alternatively, in dedicated high thickness paper boxes. In both cases, they are fastened to the pallet using bolts and covered with a polyethylene heat-shrinking film. The package depends on the valve dimensions.

## TRANSPORT AND STORING



***Please carefully inspect the unit for damages or discrepancies with the order upon arrival and report a claim immediately before unloading the goods.***



***BE CAREFUL! During the unpacking, removal and installation of the valve, use the lifting eyebolts on the valves (compliant with UNI ISO 3266 if the valve is provided with holes). Don't lift up the valves using the accessories installed on the valve.***



***BE CAREFUL! Flat washers has to be installed under the nuts when installing the valve to the pipeline flanges, to prevent the paint from cracking or chipping.***

Lifting the valve improperly may damage it. Lift the valves using slings (ISO 4878), otherwise, if present on one valve, using the specific eyebolts.

Please make sure the lifting tools (lift truck, slings, cranes, hooks, etc.) are adequate for the weight. Make sure their coefficient of safety is equal or higher than the coefficient allowed by law.



***BE CAREFUL!***  
***Before you move the valve it is necessary to consult the weight table.***

If the valve is stored for a middle or long term, it is necessary to:

- Lay the valve in a horizontal and firm position, in order to avoid capsizings which could damage things or people.
- Store the valves in an area protected from weather conditions especially from sunlight, which could damage the coats and the gaskets.

## TESTING VALVES

All valves AC.MO S.r.l. designs are tested and controlled before leaving our premises. The test (inspection certificate) is available on request.

## WARRANTY

AC.MO S.r.l. guarantees its products for the supplier or the client for a 12 month consecutive period since the delivery date to the final client. The warranty coverage period will correspond to the date on the final client's delivery note. Product faults and damages must be pointed out within 8 days since their identification.

The warranty covers all the parts manufactured/provided by AC.MO S.r.l..

Warranty does not cover normal wear damages.

The warranty does not apply to:

- Valves equipped with tools and accessories, unauthorized by AC.MO S.r.l..
- Valves damaged by misuse, accidents or other chances, negligence, excess load etc..
- Valves damaged by lack of maintenance.
- Valves equipped with non-original spare parts.
- Valves modified without authorisation.

## DISPOSAL AND RECYCLING

Even though AC.MO S.r.l. valves are designed and built to be extremely long lasting, at the end of their life cycle they must be removed and replaced.

Dismantle the valve, separate its components to dispose them of and recycle them (e.g., metal parts must be separated from plastic parts etc.).



***Please, always respect the directives on waste collection, disposal and recycling.***

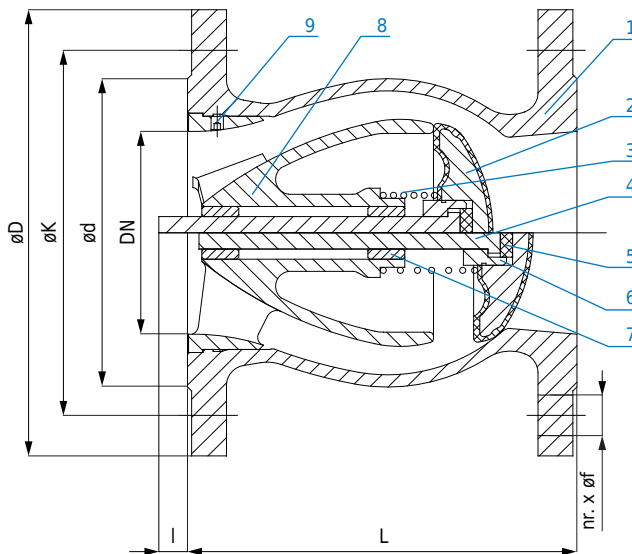
Carefully observe all steps listed in National Laws on waste disposal and recycling.

## ADDITIONAL NOTES

For product improvement purposes, AC.MO S.r.l. reserves the right to change the data in this manual at any time and without notice. Unauthorized use of data is forbidden. Please contact us for up-to-date information.

All measures are in mm.

## VALVE AND COMPONENTS DESCRIPTION DN50÷350



ITEM	DESCRIPTION	MATERIALS		STANDARDS
1	BODY	DUCTILE IRON	EN GJS-500-7	EN 1563
2	DISC	DUCTILE IRON+RUBBER	EN GJS-500-7 + EPDM	EN 1563EN 681-1
3	SPRING	STAINLESS STEEL	AISI304/AISI316	EN 10088-3
4	GUIDING STEM	STAINLESS STEEL	AISI420/AISI304/AISI316	EN 10088-3
5	WASHER	PLASTIC	EPDM	EN 681-1
6	NUT	STAINLESS STEEL	AISI420/AISI304	EN 10088-3
7	BUSHING	BRONZO	C61900	-
8	INTERNAL BODY	DUCTILE IRON	EN GJS-500-7	EN 1563
9	SET SCREW	STAINLESS STEEL	AISI304	EN 10088-3



## VALVE DIMENSIONS DN50÷350

DN	L	EN1092-2 PN10							EN1092-2 PN16						WEIGHT Kg		I*
		øD	øK	øf	nr	M	ød	øD	øK	øf	nr	M	ød	PN10	PN16		
50	150	165	125	19	4	M16	99	165	125	19	4	M16	99	6	6	8	
65	170	185	145	19	4	M16	118	185	145	19	4	M16	118	9	9	15	
80	180	200	160	19	8	M16	132	200	160	19	8	M16	132	11	11	18	
100	190	220	180	19	8	M16	156	220	180	19	8	M16	156	14,5	14,5	20	
125	200	250	210	19	8	M16	184	250	210	19	8	M16	184	18,5	18,5	21	
150	210	285	240	23	8	M20	211	285	240	23	8	M20	211	25,5	25,5	25	
200	230	340	295	23	8	M20	266	340	295	23	12	M20	266	38,5	38,5	30	
250	250	395	350	23	12	M20	319	405	355	28	12	M24	319	57	57	40	
300	270	445	400	23	12	M20	370	460	410	28	12	M24	370	73	73	45	
350	290	505	460	23	16	M20	429	520	470	28	16	M24	429	109	109	50	

\* WARNING! The guiding stem protrusion when the valve disc is open.

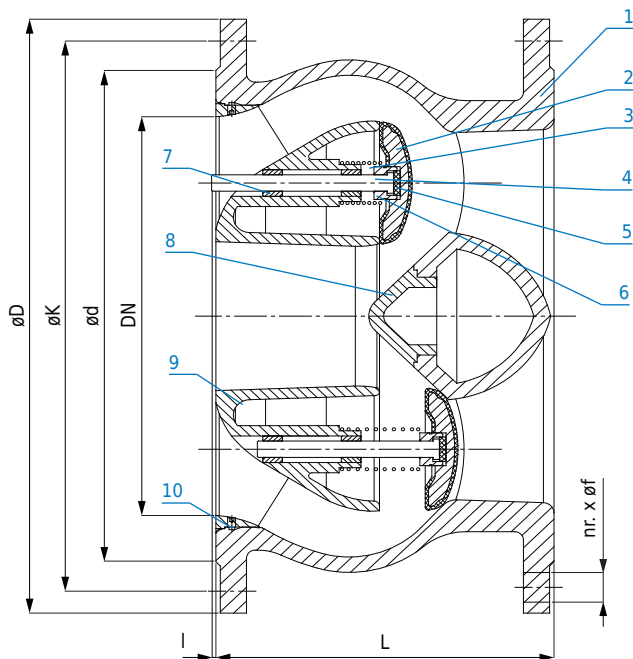
UNIT: mm

DN	L	EN1092-2 PN25							WEIGHT Kg	I*
		øD	øK	øf	nr	M	ød			
50	150	165	125	19	4	M16	99	6	8	
65	170	185	145	19	8	M16	118	9	15	
80	180	200	160	19	8	M16	132	11	18	
100	190	235	190	23	8	M20	156	15	20	
125	200	270	220	28	8	M24	184	19	21	
150	210	300	250	28	8	M24	211	27	25	
200	230	360	310	31	12	M24	274	40,5	30	
250	250	425	370	34	12	M27	330	60	40	
300	270	485	430	34	16	M27	389	76,5	45	
350	290	555	490	37	16	M30	448	128	50	

\* WARNING! The guiding stem protrusion when the valve disc is open.

UNIT: mm

## VALVE AND COMPONENTS DESCRIPTION DN400÷1200



ITEM	DESCRIPTION	MATERIALS		STANDARDS
1	BODY	DUCTILE IRON	EN GJS-500-7	EN 1563
2	DISC	DUCTILE IRON+RUBBER	EN GJS-500-7 + EPDM	EN 1563 + EN 681-1
3	SPRING	STAINLESS STEEL	AISI304/AISI316	EN 10088-1
4	STEM	STAINLESS STEEL	AISI420/AISI304	EN 10088-1
5	WASHER	PLASTIC	NYLON	-
6	NUT	STAINLESS STEEL	AISI304	EN 10088-1
7	BUSHING	BRONZE	C61900	-
8	PLUG	DUCTILE IRON	EN GJS-500-7	EN 1563
9	INTERNAL BODY	DUCTILE IRON	EN GJS-500-7	EN 1563
10	SET SCREW	STAINLESS STEEL	AISI304	EN 10088-1

## VALVE DIMENSIONS DN400÷1200

DN	L	EN1092-2 PN10							EN1092-2 PN16						WEIGHT Kg		I*
		øD	øK	øf	nr	M	ød	øD	øK	øf	nr	M	ød	PN10	PN16		
<b>400</b>	310	565	515	28	16	M24	480	580	525	31	16	M27	480	145	145	0	
<b>450</b>	330	615	565	28	20	M24	530	640	585	31	20	M27	548	168	168	7	
<b>500</b>	350	670	620	28	20	M24	582	715	650	34	20	M30	609	235	235	-5	
<b>600</b>	390	780	725	31	20	M27	682	840	770	37	20	M33	720	346	346	20	
<b>700</b>	430	895	840	31	24	M27	794	910	840	37	24	M33	795	480	480	3	
<b>800</b>	470	1015	950	34	24	M30	904	1025	950	41	24	M36	901	604	604	12	
<b>900</b>	510	1115	1050	34	28	M30	1001	1125	1050	41	28	M36	1001	850	850	19	
<b>1000</b>	550	1230	1160	37	28	M33	1112	1255	1170	44	28	M39	1112	1270	1270	28	
<b>1200</b>	630	1455	1380	41	32	M36	1328	1485	1390	50	32	M45	1328	1905	1905	-	

\* **WARNING!** The guiding stem protrusion when the valve disc is open.

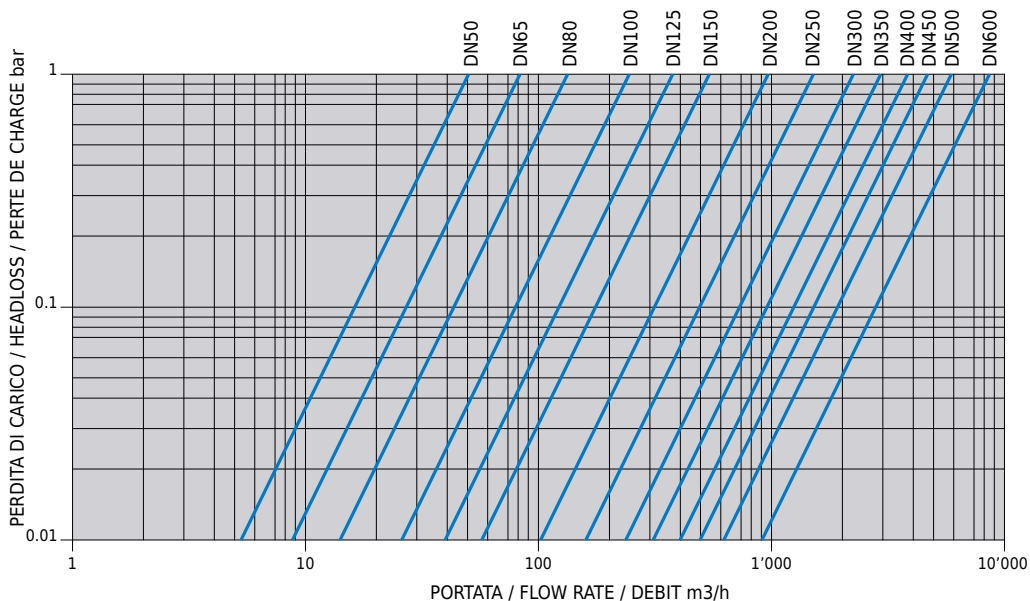
UNIT: mm

DN	L	EN1092-2 PN25							WEIGHT Kg	I*
		øD	øK	øf	nr	M	ød			
<b>400</b>	310	620	550	37	16	M33	503	154	0	
<b>450</b>	330	670	600	37	20	M33	548	192	7	
<b>500</b>	350	730	660	37	20	M33	609	255	-5	
<b>600</b>	390	845	770	41	20	M36	720	367	20	
<b>700</b>	430	960	875	44	24	M39	820	544	3	
<b>800</b>	470	1085	990	50	24	M45	928	723	12	
<b>900</b>	510	1185	1090	50	28	M45	1028	947	19	
<b>1000</b>	550	1320	1210	57	28	M52	-	1414	28	
<b>1200</b>	630	1530	1420	57	32	M52	1350	2121	-	

\* **WARNING!** Guiding stem protrusion when the valve disc is open.

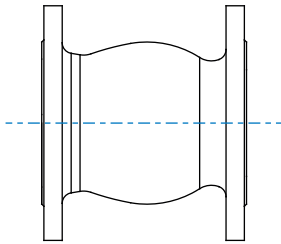
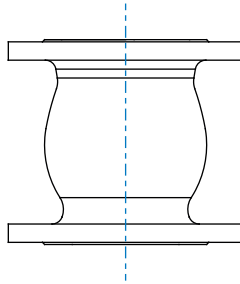
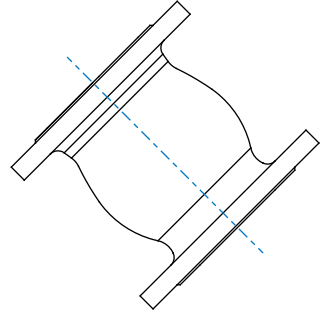
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## HEADLOSS DIAGRAM

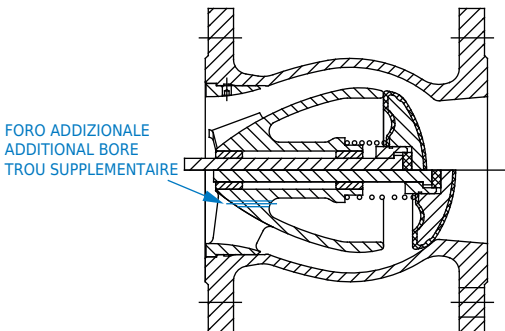
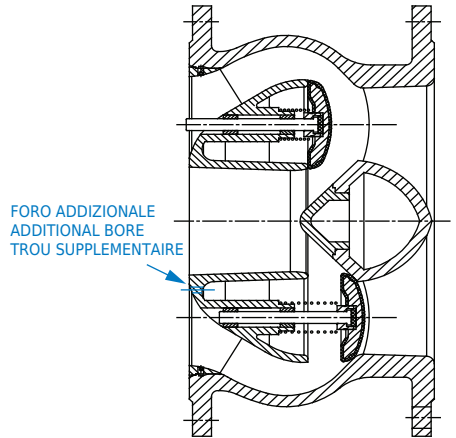


## MODE OF OPERATION

- The Nozzle Check Valve with rubber disc profile 'Venturi' is a flow-controlled non-return valve with centrally and axially moved shutter. This shutter is guided by guiding stem in an internal body. The closing movement of the valve is spring-assisted.
- The valve starts opening at incipient velocity and is fully open at a velocity approx. 2 m/s.
- The standard design is suitable for installation in horizontal pipeline and for vertical pipeline and for vertical upward flow.


**HORIZONTAL**

**VERTICAL**

**OBLIQUE**

- The internal body is designed with additional holes for drainage of the internal body (see the figure below).


**DN 50+350**

**DN 400+1200**

## INSTALLATION

- Remove all packing material from the valve.
- Prior to installation, check the pipeline for impurities and foreign and clean it if necessary.



**WARNING! Follow direction of installation according to the cast-on arrow.**

- There must be free access all around the valve for operation and maintenance.
- During installation of the valve, the distance between the pipe flanges should exceed the valve face-to-face dimension by at least 20 mm. Thus, the raised faces will not be damaged and the gaskets can be inserted.
- The matching pipe flanges must be plain-parallel and concentric.
- Tighten the connecting bolts evenly without distortion and crosswise. The pipeline mustn't by any means be pulled up to the valve.
- Prior to putting into operation and after carrying out maintenance work, check tightness of the flange connections and screwed connections if any or replace the seals.



**WARNING! During transport or installation there may be the risk of bruising the fingers by uncontrolled movement of the shutter.**



**WARNING! For DN 50-600, the guiding stems exceed the face-to-face dimension of the valve in fully open position.**

## MAINTENANCE

- Control of the performance and tightness of the Nozzle Check Valve is to be done at regular intervals. Inspection or repair of the valve must not be carried out before the pipe section in which the valve is installed has been isolated and made pressure-less.
- Recommended intervals for inspection and maintenance:

	Continuous	2 times a year	Yearly
<b>PERFORMANCE TEST (OPEN-CLOSED)</b>		x	
<b>TIGHTNESS TEST</b>		x	
<b>HEAD LOSS MEASUREMENT</b>			x
<b>EXTERNAL LEAKAGE</b>	x		
<b>DAMAGES</b>	x		
<b>CONTAMINATION / EASE OF OPERATION</b>		x	
<b>NOISE</b>	x		



**WARNING! Before carrying out maintenance work on the valve, any pressurised pipeline has to be made pressure-less and to be secured against re-starting! After finishing the maintenance work, any connection has to be checked for tightness and close fit.**

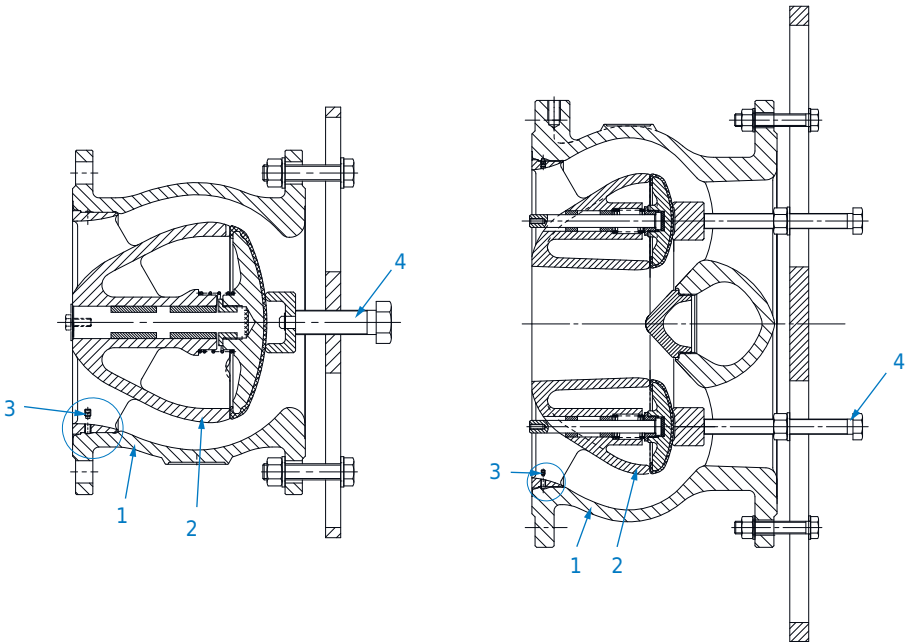
## VALVE DISASSEMBLY



**WARNING!** For replacing wearing parts the valve has to be removed from the pipeline after having depressurized the pipeline

For removing the internal body **2** from the body **1**, unscrew the threaded pins **3**. Then a force of approx. 20 kN for DN50-350 and approx. 40 kN for DN400-1200 is required. This force can be applied by means of a press, an auxiliary mounting tool or similar device. The tool is centrally placed on the pushed back valve disc, both bolts are tightened in two opposite flange holes with washers and nuts, parallel to the raised face. The internal body is pressed out of the main body by means of the central bolt **4**.

When screwing-in, the corresponding nuts have to be secured against following the bolts. When pressing the internal body out of its position, it should be held in order to avoid damage to the coating.



## VALVE ASSEMBLY

During assembly, internal body, valve disc, springs, and guiding stem are pushed into internal body. The valve disc can be fixed in its rear limit position by means of bolts including washers, screwed into guiding stem. The fitting surface of the internal body, has to be cleaned. The body's fitting surface which must also be cleaned has to be covered with sealing agent on the two transitions to vitreous enamel as well as in the groove in which the threaded pins are engaged. After having pushed the internal body into the main body, the threaded pins have to be secured with sealing agent, too, and screwed into the groove. The internal hexagon of the threaded pins is filled with sealing agent in order to ensure further screwing off. Excessive sealing agent must be removed from both transitions and be smoothed.

## TROUBLESHOOTING

<i>PROBLEM</i>	<i>CAUSE</i>	<i>SOLUTIONS</i>
<b>LEAKAGE IN THE SEAT</b>	Deposits of dirt in the seating zone	In case of firm incrustations, clean seating zone and valve disc
	Damage to the coating of the valve disc	Replace valve disc
<b>HIGH HEAD LOSS</b>	Clogging and seizing of the spring	Clean spring, in case of very dirty medium: provide spring protecting device
	Deposits on stem	Open valve manually several times until valve can be operated easily again or dismantle and clean stem and bore
	Foreign bodies between valve disc and internal body	Manually remove foreign bodies
<b>VALVE BLOCKED</b>	Foreign bodies jammed in the seating zone at $v$ (referred to DN) $< 2\text{m/s}$	Increase flow velocity and flush out foreign bodies
	Foreign bodies jammed in the seating zone at $v$ (referred to DN) $> 2\text{m/s}$	Manually remove foreign bodies
<b>INCREASED NOISE (CLOSING SHOCKS)</b>	Return spring broken	Replacement of spring
	Deposits in the guiding device due to low flow velocity	Cleaning of the bore
<b>VALVES INSTALLED IN A WRONG WAY, CONTRARY TO THE SPECIFIED DIRECTION OF INSTALLATION</b>	Pump discharges againsts closed valve. The direction arrow has not been followed during installation.	Remove the valve from the pipeline. Install the valve in right direction.









**HEADQUARTERS**

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