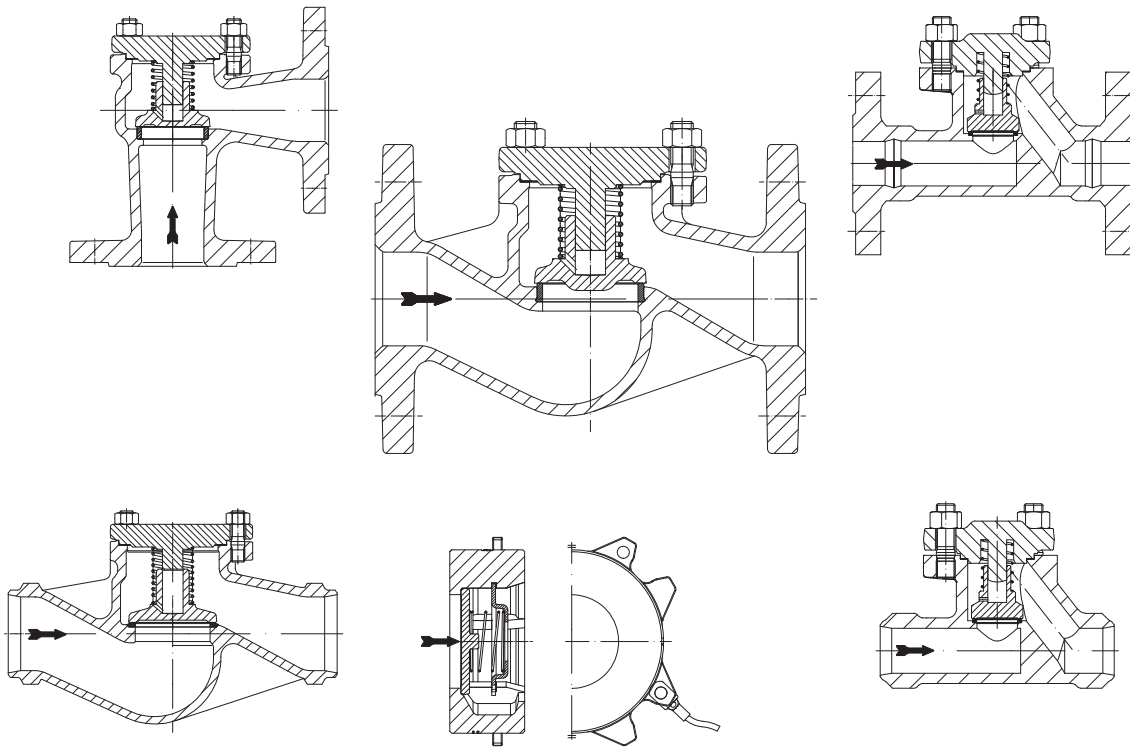


# Operating and installation instructions

## Check valves

### CHECKO<sup>®</sup>-V PN6-160 / CHECKO<sup>®</sup>-D PN40



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## 1.0 General information on operating instructions

These operating instructions provide information on mounting and maintaining the fittings. Please contact the supplier or the manufacturer in case of problems which cannot be solved by reference to the operating instructions.

They are binding on the transport, storage, installation, start-up, operation, maintenance and repair.

The notes and warnings must be observed and adhered to.

- Handling and all work must be carried out by expert personnel or all activities must be supervised and checked.

It is the owner's responsibility to define areas of responsibility and competence and to monitor the personnel.

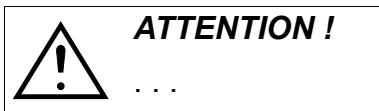
- In addition, current regional safety requirements must be applied and observed when taking the fittings out of service as well as when maintaining and repairing them.

The manufacturer reserves the right to introduce technical modifications at any time.

These operating instructions comply with the requirements of EU Directives.

## 2.0 Notes on possible dangers

### 2.1 Significance of symbols



Warning of general danger.


### 2.2 Explanatory notes on safety information

In these operating and installation instructions dangers, risks and items of safety information are highlighted to attract special attention.

Information marked with the above symbol and "**ATTENTION!**" describe practices, a failure to comply with which can result in serious injury or danger of death for users or third parties or in material damage to the system or the environment. It is vital to comply with these practices and to monitor compliance.

All other information not specifically emphasised such as transport, installation, operating and maintenance instructions as well as technical data (in the operating instructions, product documentation and on the device itself) must also be complied with to the fullest extent in order to avoid faults which in turn can cause serious injury to persons or damage to property.

## 3.0 Storage and transport

	<p><b>ATTENTION!</b></p> <ul style="list-style-type: none"><li>- Protect against external force (like impact, vibration, etc.).</li><li>- Valve mountings such as actuators, handwheels, hoods must not be used to take external forces, e.g. they are not designed for use as climbing aids, or as connecting points for lifting gear.</li><li>- Suitable materials handling and lifting equipment should be used.</li></ul> <p>See catalog sheet for weights.</p>
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- At -20 °C to +65 °C.

- The paint is a base coat to protect against corrosion during transportation and storage. Do not damage paint protection.

## 4.0 Description

### 4.1 Scope of applications

Valves are used for „preventing mediums from flowing back along pipe lines“.



#### **ATTENTION !**

- Refer to the data sheet for applications, limits on use and possibilities.
- Certain media require or preclude the use of special materials.
- The valves are designed for standard operating conditions. If conditions exceed these requirements, e.g. aggressive or abrasive media, the operator should state the higher requirements when ordering.
- Valves made from grey cast iron are not authorised for use in systems subject to TRD 110.

The information complies to the Pressure Equipment Directive 2014/68/EU.

It is the responsibility of the machine planner to ensure compliance.

The special markings on the valve must be taken into account.

Refer to the catalogue sheet to see which materials are used in standard versions.

Please contact the supplier or the manufacturer if you have any questions.

### 4.2 Operating principles

The flowing medium presses against the bottom of the plug, thereby lifting it.

The valve closes when the pressure drops below the set pressure.

<b>Set pressure:</b>	CHECKO <sup>®</sup> -V PN6-40	= 0,1 bar
	CHECKO <sup>®</sup> -V PN63-160	= 0,15 bar
	CHECKO <sup>®</sup> -D	= 0,02 bar

This prevents the medium above the plug resp. behind the valve plate from flowing back.



#### **ATTENTION !**

*When sizing the check valves please note, that a particular volume flow is necessary to bring the valve into a stable full-opened position (refer to data sheet).*

*If this full-opened position is not achieved, the valve is oversized and will result chattering noises. This means a higher abrasion and causes a valve malfunction.*

### 4.3 Diagram

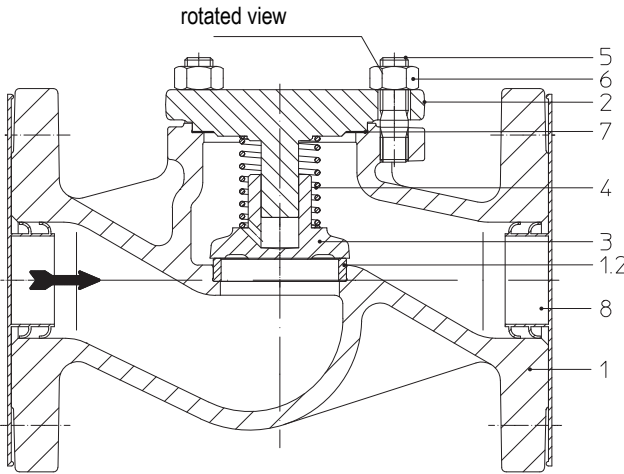


Fig. 1: CHECKO<sup>®</sup>-V PN16-40  
 - straight through (EN-JS1049/1.0619+N)

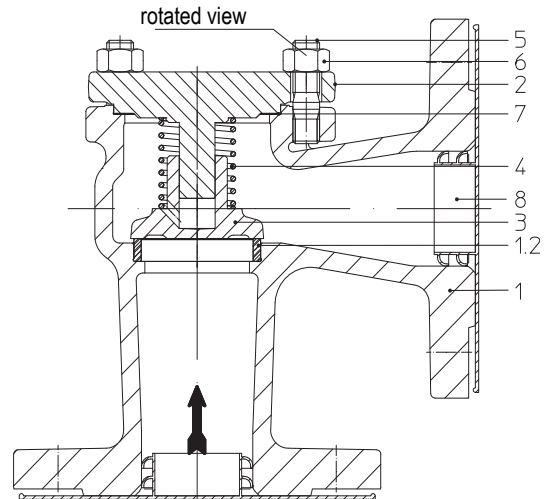


Fig. 2: CHECKO<sup>®</sup>-V PN16-40  
 - angle pattern (EN-JS1049/1.0619+N)

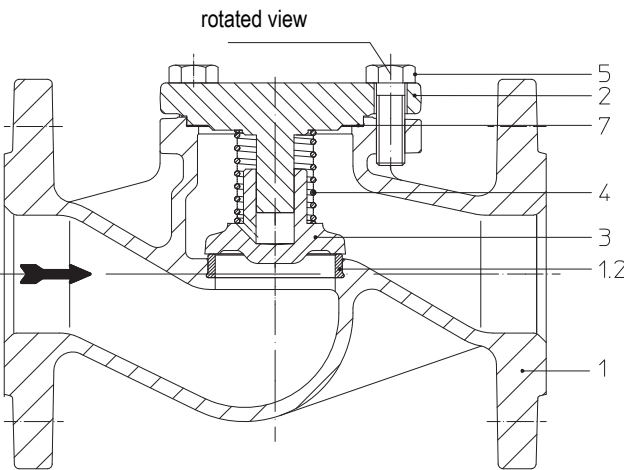


Fig. 3: CHECKO<sup>®</sup>-V PN6-16  
 - straight through (EN-JL1040)

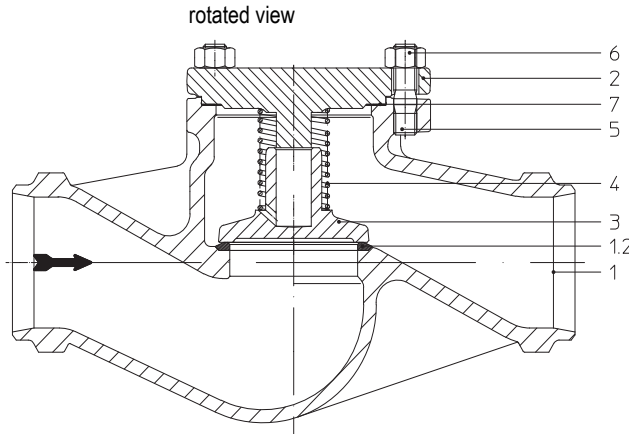


Fig. 4: CHECKO<sup>®</sup>-V PN40 - straight through  
 with butt weld ends (1.0619+N)

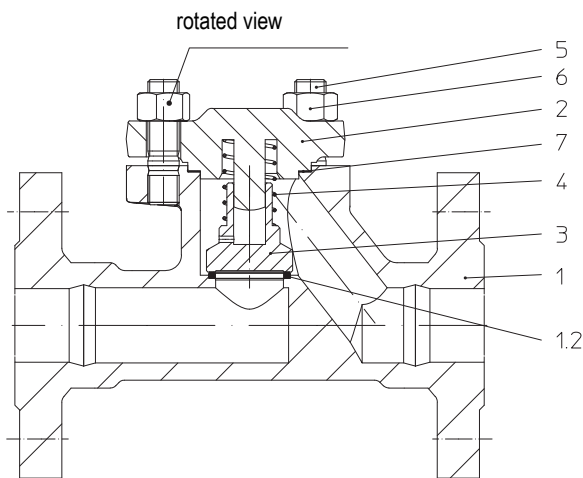


Fig. 5: CHECKO<sup>®</sup>-V - PN63-160  
 - straight through 1.0460 / 1.7335

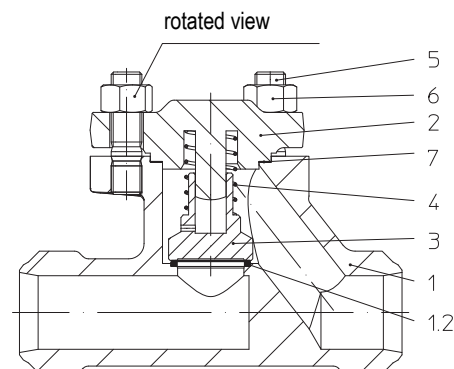


Fig. 6: CHECKO<sup>®</sup>-V - PN63-160 - straight  
 through with butt weld ends  
 1.0460 / 1.5415 / 1.7335

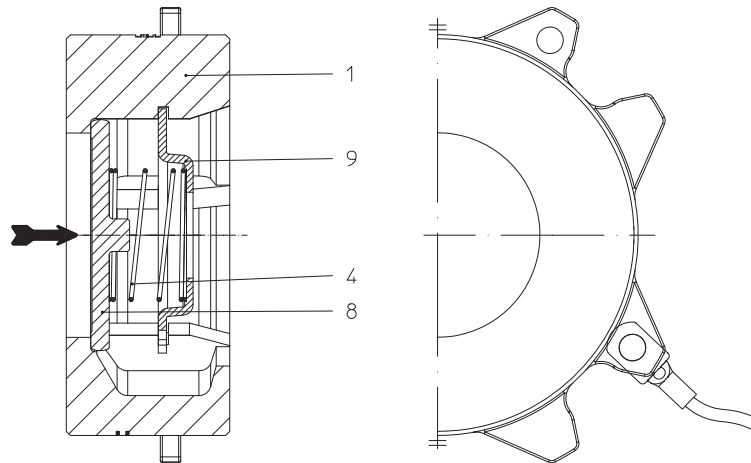


Fig. 7: CHECKO<sup>®</sup>-D PN40 - Disc check valve  
(1.4408)

Refer to the data sheet for information about materials with designations and figure numbers.

#### 4.4 Technical data - remarks

for

- Principal dimensions
- Pressure-temperature-ratings

Valves with butt weld ends, etc. refer to datasheet.

### 4.5 Marking

#### 4.5.1 PN6-40

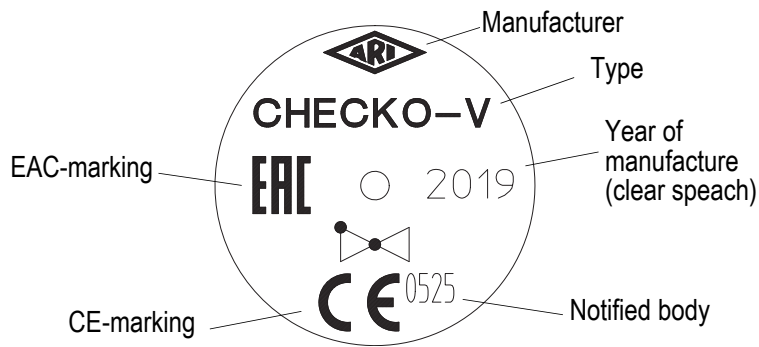


Fig. 8: CHECKO<sup>®</sup>-V

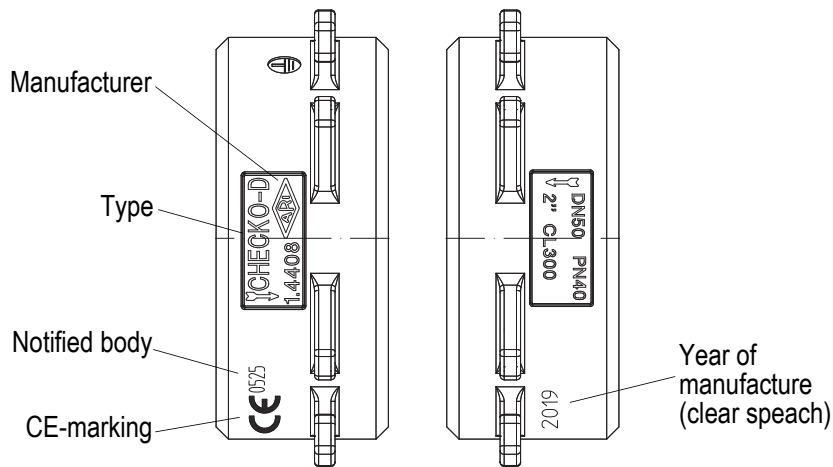


Fig. 9: CHECKO<sup>®</sup>-D

According to the Pressure Equipment Directive table 6, annex II, valves without safety function are only allowed to bear the CE-marking DN32 onwards.

#### 4.5.2 PN63-160

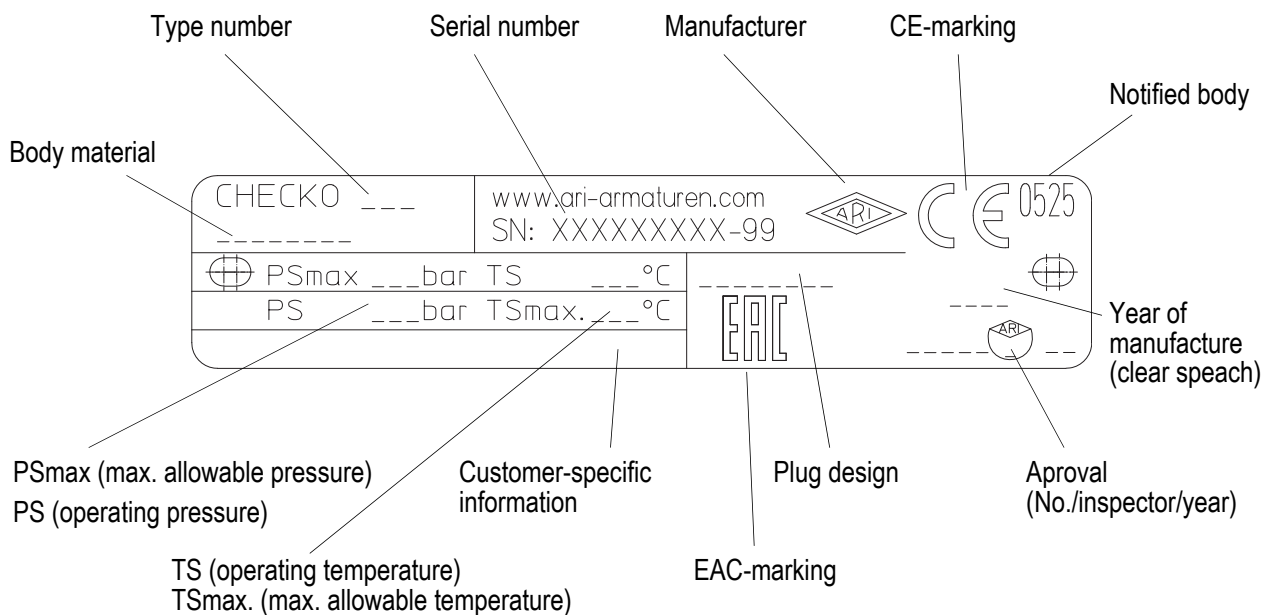


Fig. 10: Name plate

Address of manufacturer: refer to item 11.0 Warranty / Guarantee

According to the Pressure Equipment Directive table 6, annex II, valves without safety function are only allowed to bear the CE-marking DN32 onwards.

## 5.0 Installation

### 5.1 General notes on installation

The following points should be taken into account besides the general principles governing installation work:



#### **ATTENTION !**

- Remove flange covers if present.
- The interior of valve and pipeline must be free from foreign particles.
- Note installation position with reference to flow, see mark on valve. The pressure of the medium must press against the bottom of the plug.
- Steam line systems should be designed to prevent water accumulation.
- Lay pipelines so that damaging transverse, bending and torsional forces are avoided.
- Protect valves from dirt during construction work.
- Connection flanges must mate exactly.
- Connecting bolts for pipe flanges should be mounted preferably from the counter flange side (hexagon nuts from the valve side).  
At DN15-32: If valves should be mounted directly to valves, the upper flange connecting bolts should be preferably executed with studs and hexagon nuts on both sides.
- Valve mountings such as actuators, handwheels, hoods must not be used to take external forces, e.g. they are not designed for use as climbing aids, or as connecting points for lifting gear.
- Suitable materials handling and lifting equipment should be used.  
See data sheet for weights.
- Install the valve in horizontal pipe runs with the spindle vertical.  
In vertical pipe runs the check valve must be equipped with a closing spring.  
It is forbidden to install the valve upside down.
- Centre gaskets between the flanges.
- Install compensators to compensate for thermal expansion of the piping.
- Valves should be installed upside down only, if the medium being handled is clean.
- Keep the thread and shaft of the spindle free from paint.
- A plug damper should be used in critical applications, immediately downstream of pumps, compressors, etc., where severe turbulence and pulsating pressure surges may occur.  
Through the damper function of the plug, the negative influence of pressure shocks and high turbulences, are not transferred onto the valve.

- Planners / construction companies or operators are responsible for positioning and installing products.
- To ensure that the valves function correctly, the pipe run should be straight for at least 2 x DN upstream and 6 x DN downstream of each valve.
- We recommend fitting a flow stabilizing pipe at least 2 m in length or between 10 x DN and DN200 in diameter between the pump and the first stop valve in the pump discharge.
- The valves are designed for application, not influenced from weather.
- For application outside or in adverse environments like corrosion-promoting conditions (sea water, chemical vapours, etc.), special constructions or protective measures are recommended.

## 5.2 Installing valves with butt weld ends

Please note that only qualified persons using appropriate equipment and working in accordance with technical rules are allowed to install fittings by welding.

The responsibility for this lies with the system owner.

Refer to the data sheet for information about the shape of the butt weld ends.

The valves must be welded in closed position.

## 6.0 Putting the valve into operation



### **ATTENTION !**

- *Before putting the valve into operation, check material, pressure, temperature and direction of flow.*
- *Regional safety instructions must be adhered to.*
- *Residues in piping and valves (dirt, weld beads, etc.) inevitably lead to leakage.*
- *Touching the valve when it is operating at high (> 50 °C) or low (< 0 °C) media temperatures can cause injury.*  
*Affix warning notice or protective insulation as appropriate.*

*Before putting a new plant into operation or restarting a plant after repairs or modification, always make sure that:*

- *All works has been completed.*
- *The valve is in the correct position for its function.*
- *Safety devices have been attached.*



## 7.0 Care and maintenance

Maintenance and maintenance-intervals have to be defined by the operator according to the requirements.



**ATTENTION !**

- See point 10.0 and 11.0 before dismantling the valve.

### CHECKO<sup>®</sup>-V:

- Before reassembling the unit, remember that the bearing surface must be cleaned and a new gasket (pos. 7) must be inserted.
- Set the cover in place.
- Tighten the hexagon nuts (hexagon screws for valves of cast iron) evenly crosswise.
- Tightening torque's for hexagon nuts / screws:

PN	DN	hexagon nuts / hexagon screws	Torque (Nm)
6 - 40	15- 32	M 10	15-30
	40- 65	M 12	35-50
	80-100	M 16	75-100
	125-150	M 16	80-120
	200	M 20	150-200
	250-400	M 24	340-410
	500	M 27	340-410
63 - 160	10 - 25	M 16	50 <sup>±2</sup>
	32 - 50	M 20	150 <sup>±3</sup>
	65	M 24	200 <sup>+20</sup>
	80	M 20	140 <sup>+20</sup>
	100	M 24	200 <sup>+20</sup>

## 8.0 Troubleshooting

In the event of malfunction or faulty operating performance check that the installation and adjustment work has been carried out and completed in accordance with these Operating Instructions.




**ATTENTION !**

It is essential that the safety regulations are observed when identifying faults.

If malfunctions cannot be eliminated with the help of the following table "9.0 Troubleshooting table", the supplier or manufacturer should be consulted.

## 9.0 Troubleshooting table



**ATTENTION !**  
 - read point 10.0 and 11.0 prior to dismantling and repair work!  
 - read point 6.0 before restarting the plant !

Fault	Possible cause	Corrective measures
No flow	Flange covers not removed. (pos. 8; Fig. 1-2)	Remove flange covers. (pos. 8; Fig. 1-2)
Little flow	Dirt sieve clogged.	Clean / replace sieve.
	Piping system clogged.	Check piping system.
Leakage across valve seat.	Wrong Installation	Correct the Installation (see point 5.1).
	CHECKO <sup>®</sup> -V: Seat (pos. 1.2) / plug (pos. 3) damaged by foreign particles. (Fig. 1-6).  CHECKO <sup>®</sup> -D: Body (pos.1) / valve plate (pos. 8) damaged by foreign particles (Fig. 7)	Replaced valve, consult supplier/manufacturer.
	Medium contaminated (suspended solids).	Clean valve. Install dirt screen upstream of valve.
Rattling / banging of the plug resp. of the valve plate	Nominal diameter of the valve in compliance to the flow rate is <u>to big</u>	Choose smaller nominal diameter
	<ul style="list-style-type: none"> <li>- high flow turbulences;</li> <li>- the check valve is mounted directly by a centrifuged pump;</li> <li>- behind pressure reduction stations;</li> <li>- behind pipe elbows;</li> <li>- in compact plants;</li> <li>- expansion joints are missing;</li> <li>- the pump is not mounted on a damper;</li> <li>- there is no flow stabilizing pipe length;</li> <li>- there is no start-up bypass line</li> </ul>	Alter the system
		CHECKO <sup>®</sup> -V: Use a plug damper execution: see medium
Flange broken between valve and piping.	Bolts tightened unevenly. Mating flanges not properly aligned.	Re-align piping and fit new valve!

## 10.0 Dismantling the valve or the top part



### **ATTENTION !**

*The following points must be observed:*

- *Pressureless pipe system.*
- *Medium must be cool.*
- *Plant must be drained.*
- *Purge piping systems in case of caustic, inflammable, aggressive or toxic media.*

## 11.0 Warranty / Guarantee

The extent and period of warranty cover are specified in the "Standard Terms and Conditions of Albert Richter GmbH & Co. KG" valid at the time of delivery or, by way of departure, in the contract of sale itself.

We guarantee freedom of faults in compliance with state-of-the-art technology and the confirmed application.

No warranty claims can be made for any damage caused as the result of incorrect handling or disregard of operating and installation instructions, datasheets and relevant regulations.

This warranty also does not cover any damage which occurs during operation under conditions deviating from those laid down by specifications or other agreements.

Justified complaints will be eliminated by repair carried out by us or by a specialist appointed by us.

No claims will be accepted beyond the scope of this warranty. The right to replacement delivery is excluded.

The warranty shall not cover maintenance work, installation of external parts, design modifications or natural wear.

Any damage incurred during transport should not be reported to us but *rather* to the competent cargo-handling depot, the railway company or carrier company immediately or else claims for replacements from these companies will be invalidated.

