# PRODUCT OVERVIEW

## INNOVATIVE VALVE TECHNOLOGY

**Engineering . Valves . Solutions .**

GSR®

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Errors and changes, version 02/2022


# INNOVATIVE VALVE TECHNOLOGY
# —MADE IN GERMANY



With a product range of several thousand valve types, we offer you valve solutions for virtually any application.

Our range of standard valves includes over 1,000 valve combinations with four different types of control. In addition, we have a wide range of customised valves that have been developed in close coordination with the user for specific purposes. We have comprehensive engineering expertise and a proven modular system of components and options at our disposal. We supply customers in mechanical and plant engineering, washing technology, shipbuilding and many other areas where reliable components are needed. Especially for use in high-pressure applications with pressure ranges up to 17,405 psi and high-temperature applications up to 752 °F, we can draw on state-of-the-art valve technology. As innovative valve manufacturers, we have developed a 15,229 psi valve for hydrogen infrastructure, for example, and a completely new valve concept with switching times in the ms range. Through these and many other activities, we have already made adapted to areas that will become increasingly important in future, such as CNG and hydrogen, making us a professional partner on whom you can continue to rely.

Our core competence lies in rapid development of customised solutions in all areas of valve technology. We cover a very broad spectrum. This includes valve size (from DN1 to DN300), pressure range (from the vacuum range to 17,405 psi) and temperature range (from -321 °F to +752 °F).

We have 50 years of experience, work with very high vertical integration and use state-of-the-art production and testing technology. Since all the essential components are produced on state-of-the-art machines in-house, both customised products and larger series can be delivered at short notice with the highest quality.

All business processes are compliant with DIN EN ISO 9001 and are continuously monitored and improved by our quality management and technical development systems.

**A company of INDUS HOLDING AG**

# CONTENTS

# END POSITION DETECTION SENSOR


| | |
|---|---|
| End position detection sensor | suitable for solenoid system .032 and .012 |
| Housing material | Stainless steel 1.4301 / 1.4105 |
| Supply voltage | 12-24V DC |
| Ambient temperature | -40 °F to +176 °F |
| Electrical connection | M12x1 5-pin |
| Thread / connection | G1/8 (others on request) |
| Protection class | IP65 according to DIN EN 60529 |
| Option | LED connector incl. 3m cable |

## OPERATING PRINCIPLE

The sensor is mounted on the tube where the fixing nut is positioned. No fixing nut is required for the electro-solenoid. The coil is fixed in position by the sensor. The sensor is connected by means of an M12x1 5-pin connector with integrated LED display. The sensor is then ready for operation.

When the electro-solenoid is switched on, this is indicated by the LED integrated into the connector. At the same time, an analogue 24V DC signal is generated via pin 5.

## CHARACTERISTICS

## NOTE

The limit switch signals as soon as the magnetic armature is in contact with the opposite pole. In order to ensure switching accuracy and switching reliability, the rated current of the solenoid must be constant!

PATENT PENDING

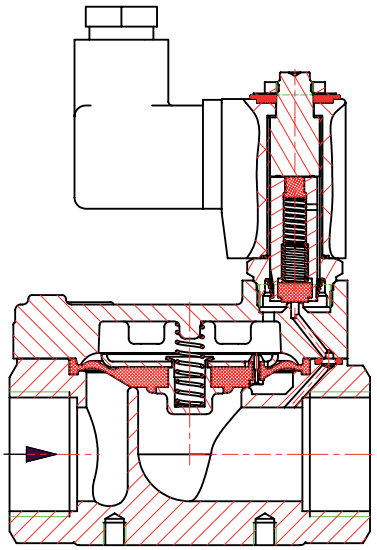
# CONTROL TYPES

## PILOT OPERATED SOLENOID VALVES

Valves of this type require a pressure differential in the operating pressure for opening and closing. The min. pressure required for this is specified as the minimum pressure on the technical data sheet. The actuator only fulfils a pilot control function here, by means of which pressure on the main sealing element (diaphragm or piston) is relieved.

The medium pressure or the existing pressure difference raises the main seal. With this type of control, high pressures with large nominal widths can be controlled by small solenoids.

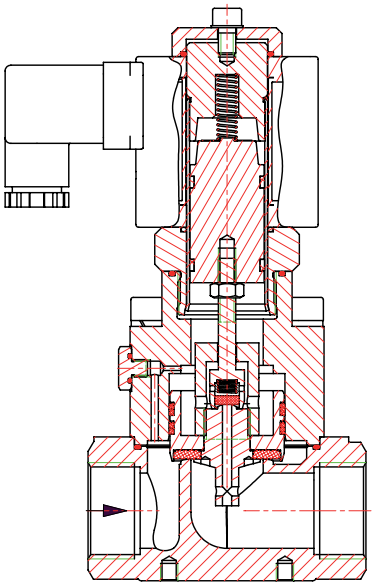
If the effective cross-section of the line on the media supply side is restricted, the switching behaviour may possibly become unstable, since the differential pressure fluctuates when the valve is closed.



## FORCE PILOT OPERATED SOLENOID VALVES

Valves of this type operate from 0 bar and can also be used wherever directly controlled valves are used.
However, they are supplied with smaller solenoids for higher pressures and larger nominal widths beyond the range of application of the latter. The actuator opens a pilot bore and then lifts the sealing element from the main seat directly or supported by the Δp of the operating pressure.
The special feature of this control is that the actuator can open and close the valve without assistance from the operating pressure. If there is a pressure differential – usually when the valve is being opened – the available energy is also used.

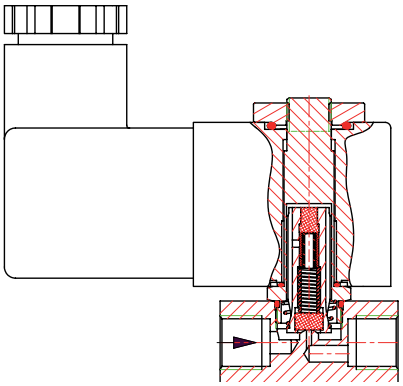
If the effective cross-section of the line on the media supply side is restricted, the switching behaviour may possibly become unstable, since the differential pressure fluctuates when the valve is closed.



## DIRECT ACTING SOLENOID VALVES

Valves of this design operate the sealing element directly via the solenoid system. As a rule, the seal must lift off from the seat against the effective operating pressure solely by means of the actuator. Supported by the medium pressure, a closing spring keeps the valve closed.

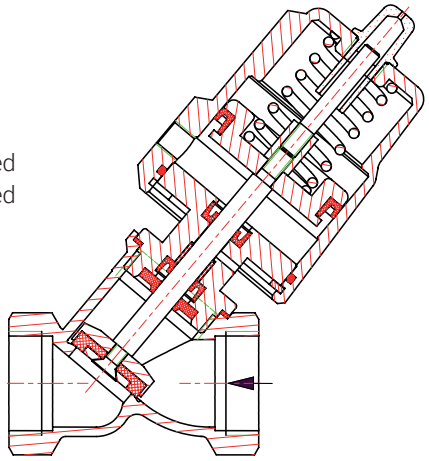
The function depends on the seat size, the effective operating pressure and the magnetic force.



PRESSURE CONTROLLED VALVES

Valves of this design are controlled by an externally operated pilot valve.

As a result, high temperatures, high pressures, contaminated media and aggressive operating media, etc. can be controlled with a clean control medium.



# CERTIFICATES

- DIN EN ISO 9001
- Type examination certificates in accordance with Gas Appliance Regulation EU2016/426 (DVGW)
- DNV-GL
- EAC
- UL approval (for NAFTA)
- and other certificates on request


# TEST CERTIFICATES

- Strength and tightness testing
- Factory certificate 2.2
- Acceptance test certificate 3.1 according to DIN EN 10204
- Acceptance test certificate 3.2 according to DIN EN 10204
- Certificate for material testing - Material batch certificates
- Certificate of origin

# SOLENOID VALVES
PILOT OPERATED

## AREAS OF APPLICATION:

- Bottling plants
- Irrigation systems
- Well technology
- Plumbing equipment
- Water treatment
- Pneumatics
- Mixing plants
- Pipe construction
- Drinking water supply
- and many applications in general mechanical and apparatus engineering

| | Series | Design | Connection | |
|---|---|---|---|---|
| | | | Inner thread *Seat diameter* | Flange |
|  | 40 | 2/2-way valve with diaphragm seal | G¼-G3 *13.5-80 mm* | - |
| | 28 | 2/2-way valve with diaphragm seal | - | DN15-DN50 |
|  | 51 | 2/2-way valve with piston seal | G¼-G2 *13.5-50 mm* | - |
| | 54 | 2/2-way valve with piston seal | - | DN15-DN50 |
| | 25 | 2/2-way valve with piston seal | - | DN65-DN250 |



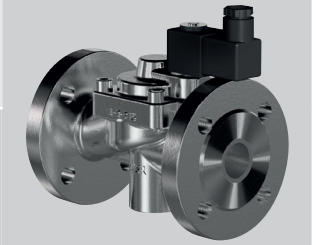
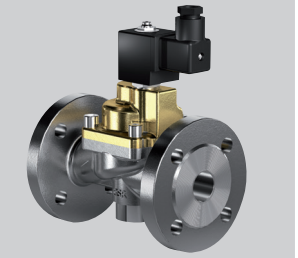
Pilot operated valves are characterized by a simple, solid design. Either a diaphragm for application pressures up to 290 psi or a piston for application pressures up to 580 psi are used as sealing elements.
Valves of this type require a pressure differential in the operating pressure for opening and closing. The minimum pressure required for this is specified as the minimum pressure on the technical data sheet.

## HOUSING AND SEAL MATERIALS:

- Housing with threaded sleeves: brass, stainless steel
- Housing with flange connection: Cast iron EN-GJL-250, cast steel GP240 GH, stainless steel, spheroidal cast iron EN-GJS-400-18-LT
- Seals made of NBR, EPDM, FKM, PTFE

## MEDIUM TEMPERATURE

- -22 °F to + 176 °F

| Pressure range | Housing material | Link to data sheet | Medium temperature | |
|---|---|---|---|---|
| 4.4-290 psi | Brass 2.0402<br>Stainless steel 1.4581 | | +14 °F/+176 °F |  |
| 4.4-290 psi | Cast iron EN-GJL-250<br>Cast steel GP240 GH<br>Stainless steel 1.4581 | | +14 °F/+176 °F | |
| 7.3-580 psi | Brass 2.0402<br>Stainless steel 1.4581 | | +14 °F/+176 °F |  |
| 7.3-580 psi | Cast iron EN-GJL-250<br>Cast steel GP240 GH<br>Stainless steel 1.4581 | | -4 °F/+176 °F | |
| 14.5-580 psi | Cast steel GP240 GH | | -22 °F/+176°F |  |

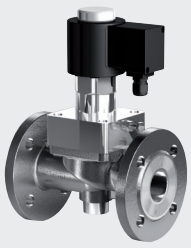


The solenoid system merely fulfils a pilot control function here, by means of which pressure on the main sealing element, the diaphragm or the piston, is relieved. The medium pressure or the existing pressure difference raises the main seal.

# SOLENOID VALVES
## FORCE PILOT OPERATED

### AREAS OF APPLICATION:

- Bottling plants
- Boiler construction
- Liquefied gas plants
- Hot water applications
- Heating circuits
- Power plant technology
- Petrochemical industry
- Pump technology
- Tank systems
- Water treatment
- Pipe construction
- Drinking water supply
- and many applications in general mechanical and apparatus engineering

| | Series | Design | Connection | |
|---|---|---|---|---|
| | | | Inner thread *Seat diameter* | Flange |
|  | 43 | 2/2-way valve with diaphragm seal | G¼-G2 *13.5-50 mm* | - |
| | 27 | 2/2-way valve with diaphragm seal | - | DN15-DN150 |
|  | 35 | 2/2-way valve with piston seal | G¼-G3 *13.5-80 mm* | - |
| | 37 | 2/2-way valve with piston seal | - | DN15-DN50 |
|  | 24 | 2/2-way valve with piston seal | - | DN65-DN300 |
| | 39 | 2/2-way valve with diaphragm seal | G½-G¾ *15-20 mm* | - |



Force pilot operated valves operate from 0 bar and can also be used wherever direct acting valves are used. However, they are supplied with smaller solenoids for higher pressures and larger nominal widths beyond the range of application of the latter. In the case of positively controlled valves, the actuator opens a pilot bore and then lifts the sealing element from the main seat

## HOUSING AND SEAL MATERIALS:

- Housing with threaded sleeves: Brass, stainless steel, PA66
- Housing with flange connection: Cast iron EN-GJL-250,
  cast steel GP240 GH, stainless steel, spheroidal cast iron EN-GJS-400-18-LT
- Seals made of NBR, EPDM, FKM, PTFE

## MEDIUM TEMPERATURE

- -40 °F to +176 °F

| Pressure range | Housing material | Link to data sheet | Medium temperature | |
|---|---|---|---|---|
| 0-232 psi | Brass 2.0402<br>Stainless steel 1.4581 | | +14 °F/+176 °F |  |
| 0-232 psi | Spheroidal cast iron EN-GJS-400-18-LT (DN150)<br>Cast iron EN-GJL-250 (DN20-150)<br>Stainless steel 1.4581 (DN15-50)<br>Cast steel GP240 GH (DN15-100) | | +14 °F/+176 °F | |
| 0-580 psi | Brass 2.0402<br>Stainless steel 1.4581 | | -40 °F/+176 °F |  |
| 0-580 psi | Cast iron EN-GJL-250<br>Cast steel GP240 GH<br>Stainless steel 1.4581 | | -40 °F/+176 °F | |
| 0-580 psi | Spheroidal cast iron EN-GJS-400-19-LT<br>Cast iron EN-GJL-250<br>Cast steel GP240 GH<br>Stainless steel 1.4581 | | -22 °F/+176 °F |  |
| 0-87 psi | PA66 | | 32 °F/+104 °F | |



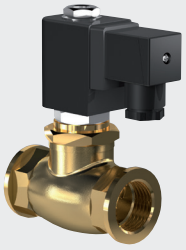
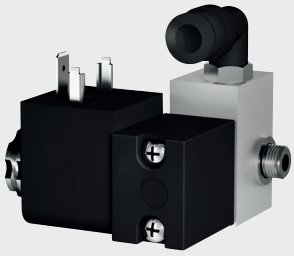
directly or supported by a difference in the operating pressure.

The special feature of this type of control is that the actuator can open and close the valve in the pressure range without assistance from the operating pressure. In the event of a pressure difference, usually when the valve is being opened, the available energy is also used.

# SOLENOID VALVES
DIRECT ACTING

## AREAS OF APPLICATION:

- Industrial and domestic gas supply
- Venting of gas and tank systems
- Safety valves for burner controls
- Pneumatics, series 52 and 72
- Vacuum technology

| | Series | Design | Connection | |
|---|---|---|---|---|
| | | | Inner thread<br>*Seat diameter* | Flange |
|  | 52 | 2/2-way valve with nipple seal | G1/8-G1/2<br>*1-6 mm* | - |
| | 72* | 3/2-way valve with nipple seal | G1/8-G1/2<br>*1-3 mm* | - |
|  | 75 | 3/2-way valve with nipple seal | G1/4<br>*1-5 mm* | - |
| | 73 | 3/2-way valve with plate seal | G1/4-G2<br>*6-40 mm* | - |
|  | 48 | 2/2-way valve with plate seal | Rp3/8-Rp3<br>*8-75 mm* | - |
| | 48FL | 2/2-way valve with plate seal | *12.5-75 mm* | DN15-DN80 |
|  | 2/131* | 3/2-way directly controlled<br>Cnomo actuator<br>integrated screw connection | G1/8<br>*1.5 mm* | - |
| | 23 | 2/2-way valve with plate seal | - | DN15-DN100 |

* can also be used as a pilot valve for pressure-controlled valves

Direct acting valves operate the sealing element directly via the solenoid system. As a rule, the seal must lift off from the seat against the effective operating pressure solely by means of the actuator. Supported by the medium pressure, a closing spring keeps the valve closed. The function depends on the seat size, the effective operating pressure and the magnetic force.

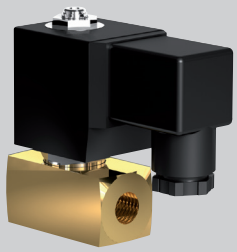
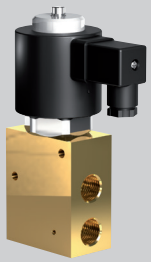
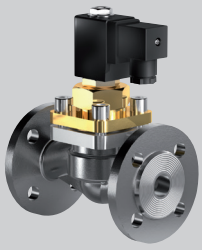
Note on PTFE seat sealing for direct acting solenoid valves:
PTFE is a hard plastic and can cause slight leaks at low pressures.

## HOUSING AND SEAL MATERIALS:

- Housing with threaded sleeves: brass, stainless steel
- Housing with flange connection: Cast iron EN-GJL-250, Cast steel GP240 GH, stainless steel
- Seals made of NBR, EPDM, FKM, PTFE

## MEDIUM TEMPERATURE

- -40 °F to +176 °F

| Pressure range | Housing material | Link to data sheet | Medium temperature | |
|---|---|---|---|---|
| 0-1,305.3 psi | Brass 2.0401 / 2.0402<br>Stainless steel 1.4305 / 1.4571 | | +14 °F/+176 °F |  |
| 0-1,305.3 psi | Brass 2.0401 / 2.0402<br>Stainless steel 1.4305 / 1.4571 | | +14 °F/+176 °F | |
| 0-580 psi | Brass 2.0402<br>Stainless steel 1.4408 | | +14 °F/+176 °F |  |
| 0-290 psi | Brass 2.0401 / 2.0402<br>Stainless steel 1.4571 | | -22 °F/+176 °F | |
| 0-72.5 psi | Brass 2.0402<br>Stainless steel 1.4581 | | -40 °F/+176 °F |  |
| 0-4.4 psi | Stainless steel 1.4408 | | +14 °F/+176 °F | |
| 0-145 psi | Aluminium 3.2315 / Stainless steel | | |  |
| 0-20.3 psi | Cast iron EN-GJL-250<br>Cast steel GP240GH | | +14 °F/+176 °F | |

We therefore only certify the leakage rate to DIN 3230 T3 in this case.

# VALVES
## PRESSURE CONTROLLED

### AREAS OF APPLICATION:

- Bottling plants
- Brewing technology
- Chemical plants
- Mixing plants
- Concrete and cement industry
- Vacuum technology
- Water treatment
- Pneumatics

### PLEASE NOTE:

For liquids, "closing against the media flow" is recommended as the direction of flow. Basic version: "with the media flow"

| | Series | Design | Connection | |
|---|---|---|---|---|
| | | | Inner thread *Seat diameter* | Flange |
|  | 63 Straight seat | 2/2-way valve with plate seal | G¼-G½ *6-13.5 mm* | - |
| | 63FL* | 2/2-way valve with plate seal | - | DN15-DN80 |
|  | 63* | 2/2-way valve with plate seal | G½-G3 *12.5-76 mm* | - |
| | 22* | 2/2-way valve with plate seal | - | DN15-DN200 |
|  | 78 | 3/2-way valve with plate seal | G½-G2 *18-50 mm* | - |
| | 79 | 3/2-way valve with plate seal | - | DN15-DN150 |

* also with 4R electro-pneumatic positioner - pages 32/33

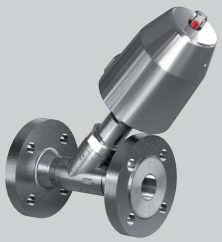
Pressure controlled valves are suitable for the control of gaseous, highly viscous, somewhat soiled and aggressive media. The drive space is separated from the operating medium. A neutral or liquid medium (58-145 psi) is required for activation. Pilot valves are available in the usual standard voltages and can be supplied on request.

## HOUSING AND SEAL MATERIALS:

- Housing with threaded sleeves: brass, stainless steel
- Housing with flange connection: Cast iron EN-GJL-250, cast steel GP240 GH, stainless steel, spheroidal cast iron EN-GJS-400-18-LT
- Seals made of NBR, EPDM, FKM, PTFE

## MEDIUM TEMPERATURE

- -40 °F to +392 °F

| Pressure range | Housing material | Link to data sheet | Medium temperature | |
|---|---|---|---|---|
| 0-232 psi | Brass 2.0402<br>Stainless steel 1.4571 / 1.4581 | | +14 °F/+176 °F |  |
| 0-580 psi | Stainless steel 1.4408 / 1.4571 | | -40 °F/+392 °F | |
| 0-580 psi | Brass 2.0402<br>Gunmetal RG5<br>Stainless steel 1.4408 | | -40 °F/+392 °F |  |
| 0-580 psi | Spheroidal cast iron EN-JS 1049<br>Cast iron EN-GJL-250<br>Cast steel GP240 GH<br>Stainless steel 1.4408 | | -40 °F/+392 °F | |
| 0-580 psi | Gunmetal RG5<br>Stainless steel 1.4571 / 1.4581 | | -40 °F/+392 °F |  |
| 0-232 psi | Spheroidal cast iron EN-JS 1049<br>Cast iron EN-GJL-250<br>Cast steel GP240 GH | | -40 °F/+392 °F | |



Since compressed air is present and available almost everywhere, this type of control is preferable for problematic media. On average, only 0.4 ltr. of air is used per switching process. A return line for the air as the control medium is not necessary, since it is released into the atmosphere during the switching process.

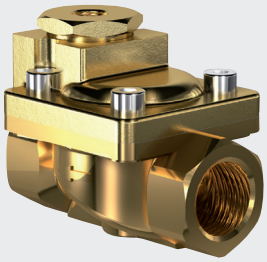
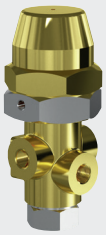
# VALVES
## PRESSURE CONTROLLED

### AREAS OF APPLICATION:

- Bottling plants
- Brewing technology
- Chemical plants
- Mixing plants
- Concrete and cement industry
- Vacuum technology
- Water treatment
- Pneumatics

### PLEASE NOTE:

We recommend "closing against the media stream" as the flow direction for liquids.

| | Series | Design | Connection | |
|---|---|---|---|---|
| | | | Inner thread *Seat diameter* | Flange |
|  | 60 | 2/2-way servo pressure controlled valve with diaphragm seal | G¼-G2 *13.5-50 mm* | - |
| | 26 | 2/2-way pressure controlled valve with piston seal | - | DN15-DN300 |
|  | 2/668 | 2/3-way pressure controlled valve with plate seal | G½-G2 *12-43 mm* | - |
| | 3/151 | 2/2-way pressure controlled valve with diaphragm seal | - | DN15-DN50 |
|  | 2/292 | 3/2-way pressure controlled valve with plate seal | G¼ *3-5 mm* | - |



OPTION G7

## ELECTRIC POSITION INDICATOR G7

For pressure controlled valves

For monitoring, querying and visual display of valve positions or for activating other system components

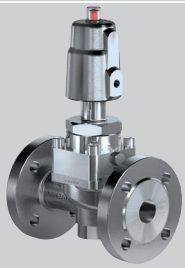
Pressure controlled valves are suitable for the control of gaseous, highly viscous, somewhat soiled and aggressive media. The drive space is separated from the operating medium. A neutral or liquid medium (58-145 psi) is required for activation. Pilot valves are available in the usual standard voltages and can be supplied on request.

## HOUSING AND SEAL MATERIALS:

- Housing with threaded sleeves: brass, stainless steel
- Housing with flange connection: Cast iron EN-GJL-250, cast steel GP240 GH, stainless steel, spheroidal cast iron EN-GJS-400-18-LT
- Seals made of NBR, EPDM, FKM, PTFE

## MEDIUM TEMPERATURE

- -40 °F to +392 °F

| Pressure range | Housing material | Link to data sheet | Medium temperature | |
|---|---|---|---|---|
| 4.4-290 psi | Brass 2.0402<br>Stainless steel 1.4581 | | +14 °F/+176 °F |  |
| 0-580 psi | Spheroidal cast iron EN-GJS-400-18-LT<br>Cast iron EN-GJL-250<br>Cast steel GP240 GH<br>Stainless steel 1.4581 / 1.4408 | | -40 °F/+392 °F | |
| 0-101.5 psi | Gunmetal RG5<br>Stainless steel 1.4408 | | +14 °F/+176 °F |  |
| 0-145 psi | Spheroidal cast iron EN-GJS-400-18-LT | | +14 °F/+176 °F | |
| 0-580 psi | Brass 2.0402<br>Stainless steel 1.4571 | | +14 °F/+176 °F | |



Since compressed air is present and available almost everywhere, this type of control is preferable for problematic media. On average, only 0.4 ltr. of air is used per switching process. A return line for the air as the control medium is not necessary, since it is released into the atmosphere during the switching process.

# HIGH-PRESSURE
VALVES

## AREAS OF APPLICATION:

- High-pressure pumps
- Paper processing industry for press beams
- Nitrogen applications
- Press and lock control
- Water and oil hydraulics
- Natural gas fuelling plants
- Hydrogen tanks
- Sheet greasing
- Metal forming
- Automotive industry
- Vehicle tank systems
- Fire extinguishing systems

| | Series | Design | Connection | Seat diameter |
|---|---|---|---|---|
|  | 55 | 2/2-way solenoid valve with nipple seal direct acting | G 1/4 | 0.5 - 6.0mm |
| | 75HD | 3/2-way solenoid valve with nipple seal direct acting | G 1/4 | 1.0 - 5.0mm |
|  | 8/000 | 2/2-way solenoid valve with piston seal pilot operated | G 1/4 & G 1/2 | 8 / 15 mm |
| | 2/529 | 2/2-way solenoid valve with piston seal pilot operated | G 1/4-G2 | 12 -50 mm |
|  | 3/071 | 2/2-way solenoid valve with piston seal pilot operated | G 1/4-G 1/2 | 8 mm |
| | 2/529pn | 2/2-way valve with piston seal servo pressure controlled | G 1/2-G2 | 13 -50 mm |
|  | 3/045 | 3/2-way solenoid valve with plate seal direct acting | G 1/8-G 1/2 | 10 mm |
| | 8/100 | 2/2-way valve with plate seal directly pressure controlled | G 1/8-G 1/4<br>7/16 UNF - 9/16 UNF | 0.5 - 8.0mm |

## HOUSING AND SEAL MATERIALS:

- Housing made of brass, stainless steel
- Seals made of NBR, EPDM, FKM, PTFE

## MEDIUM TEMPERATURE

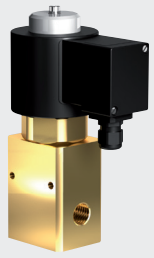
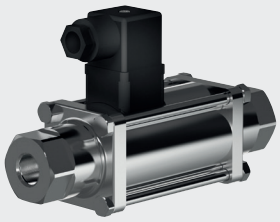
- -40 °F to +176 °F

| Pressure range | Housing material | Link to data sheet | Medium temperature | |
|---|---|---|---|---|
| 0-13,053 psi | Brass 2.0401<br>Stainless steel 1.4301 / 1.4462 / 1.4571 | | -40 °F/+176 °F |  |
| 0-4,351 psi | Brass 2.0401<br>Stainless steel 1.4301 (AISI 304) | | -22 °F/+176 °F | |
| 72.5-5,076 psi | Stainless steel 1.4301 (AISI 304) | | -40 °F/+176 °F |  |
| 14.5-6,527 psi | Stainless steel 1.4571 | | -40 °F/+176 °F | |
| 72.5-13,053 psi | Stainless steel 1.4462 | | -4 °F/+140 °F |  |
| 14.5-8,702 psi | Stainless steel 1.4571 | | -40 °F/+176 °F | |
| 0-3,626 psi | Stainless steel 1.4571 | | +14 °F/+176 °F |  |
| 0-1,7405 psi | Stainless steel 1.4301 / 1.4501 | | -40 °F/+176 °F | |

# HIGH-PRESSURE
VALVES

## AREAS OF APPLICATION:

- High-pressure pumps
- Paper processing industry for press beams
- Nitrogen applications
- Press and lock control
- Water and oil hydraulics
- Natural gas fuelling plants
- Hydrogen tanks
- Sheet greasing
- Metal forming
- Automotive industry
- Vehicle tank systems
- Fire extinguishing systems

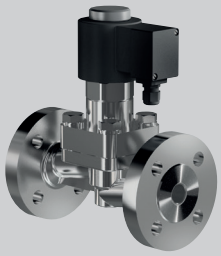
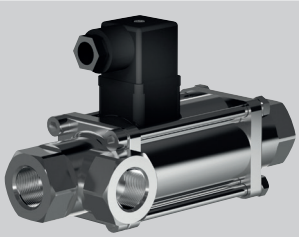
| | Series | Design | Connection | Seat diameter |
|---|---|---|---|---|
|  | 46 | 2/2-way solenoid valve with piston seal pilot operated | G1/4-G1/2 | 8 mm |
| | 1/921 | 3/2-way valve with piston seal directly pressure controlled | G1/4-G1 | 10-22 mm |
|  | 52-S | 2/2-way solenoid valve with nipple seal direct acting | G1/4 | 1-1.5 mm |
| | 1/041 FL | 2/2-way solenoid valve with piston seal force pilot operated | Flange DN15 - DN100 | |
|  | 1/041 | 2/2-way solenoid valve with piston seal force pilot operated | G1/4-G2 | 13-50 mm |
|  | 2/918 | 2/2-way coaxial solenoid valve | G3/8-G2 | 10-50 mm |
| | 3/918 | 3/2-way coaxial solenoid valve | G3/8-G1 1/4 | 10-50 mm |

## HOUSING AND SEAL MATERIALS:

- Housing made of brass, stainless steel
- Seals made of NBR, EPDM, FKM, PTFE

## MEDIUM TEMPERATURE

- -40 °F to +176 °F

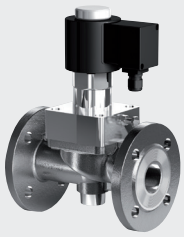
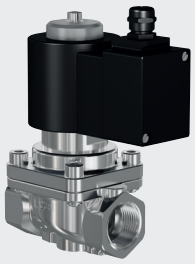
| Pressure range | Housing material | Link to data sheet | Medium temperature | |
|---|---|---|---|---|
| 14.5-1,450 psi | Stainless steel 1.4581 | | -40 °F/+176 °F |  |
| 0-7,252 psi | Stainless steel 1.4571 | | +14 °F/+176 °F | |
| 0-2,176 psi | Brass 2.0401<br>Stainless steel 1.4305<br>Stainless steel 1.4571 | | -4 °F/+176 °F |  |
| 0-1,885 psi | Steel C22.8<br>Stainless steel 1.4408 | | -40 °F/+176 °F | |
| 0-1,885 psi | Brass 2.0401<br>Stainless steel 1.4408 | | -40 °F/+176 °F | |
| 0-1,450 psi | Brass 2.0401<br>Stainless steel 1.4305 | | +14 °F/+212 °F |  |
| 0-928 psi | Brass 2.0401<br>Stainless steel 1.4305 | | +14 °F/+212 °F | |

# REFRIGERATION AND CRYOGENIC VALVES

DOWN TO -321 °F

## AREAS OF APPLICATION:

- LNG handling
- Shock freezing in the food industry

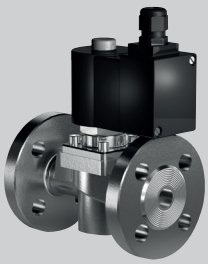
| | Series | Design | Connection | |
|---|---|---|---|---|
| | | | Inner thread *Seat diameter* | Flange |
|  | K35 | 2/2-way solenoid valve with piston seal force pilot operated | G¼-G2 *13.5-50 mm* | - |
| | K37 | 2/2-way solenoid valve with piston seal force pilot operated | *15-50 mm* | DN15-DN50 |
|  | K24 | 2/2-way solenoid valve with piston seal force pilot operated | - | DN65-DN100 |
| | 46TK | 2/2-way solenoid valve with piston seal pilot operated | G¼-G½ *8 mm* | - |
|  | K91 | 2/2-way solenoid valve with piston seal force pilot operated | G¼-G2 *13.5-50 mm* | - |
| | A91 | 2/2-way solenoid valve with piston seal force pilot operated | G¼-G2 *13.5-50 mm* | - |
|  | B91 | 2/2-way solenoid valve with piston seal force pilot operated | G¼-G2 *13.5-50 mm* | - |
| | A90 | 2/2-way valve with plate seal directly pressure controlled | G¼-G2 *13.5-50 mm* | - |
|  | B90 | 2/2-way valve with plate seal directly pressure controlled | G¼-G2 *13.5-50 mm* | - |

## HOUSING AND SEAL MATERIALS:

- Housing with threaded sleeves: brass, stainless steel
- Housing with flange connection: Stainless steel
- Seals made of PTFE, PCTFE

## MEDIUM TEMPERATURE

- -321 °F to +194 °F

| Pressure range | Housing material | Link to data sheet | Medium temperature | |
|---|---|---|---|---|
| 0-580 psi | Brass 2.0402<br>Stainless steel 1.4581 | | -76 °F/+176 °F |  |
| 0-580 psi | Cast iron EN-GJL-250<br>Cast steel GP240 GH<br>Stainless steel 1.4581 | | -76 °F/+176 °F | |
| 0-580 psi | Stainless steel 1.4581 | | -76 °F/+176 °F |  |
| 14.5-232 psi<br>14.5-435 psi | Stainless steel 1.4581<br>Stainless steel 1.4404 | | -321 °F/+176 °F | |
| 0-232 psi | Brass 2.0402<br>Stainless steel 1.4581 | | -321 °F/+176 °F |  |
| 0-232 psi | Brass 2.0402<br>Stainless steel 1.4581 | | -321 °F/+140 °F | |
| 0-580 psi | Stainless steel 1.4404 | | -321 °F/+140 °F |  |
| 0-232 psi | Stainless steel 1.4581 | | -321 °F/+140 °F | |
| 0-580 psi | Stainless steel 1.4404 | | -321 °F/+140 °F | |

# HIGH TEMPERATURE VALVES

UP TO +392 °F

## AREAS OF APPLICATION:

- Curing plants
- Blast furnace construction
- Coking plants
- Steam plants
- Steam turbines

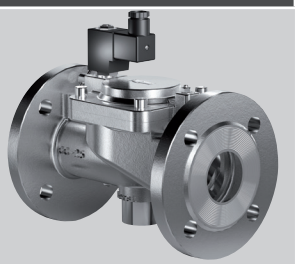
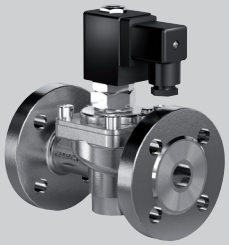
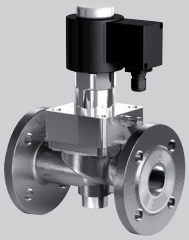
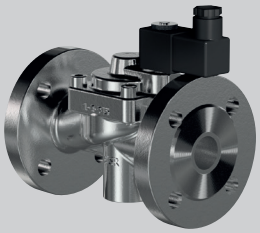
| | Series | Design | Connection | |
|---|---|---|---|---|
| | | | Inner thread *Seat diameter* | Flange |
|  | 40TM | 2/2-way solenoid valve with diaphragm seal, pilot operated | G¼-G2 *13-50 mm* | - |
| | 28TM | 2/2-way solenoid valve with diaphragm seal, pilot operated | - | DN15-DN50 |
|  | 43TM | 2/2-way solenoid valve with diaphragm seal, force pilot operated | G¼-G2 *13.5-50 mm* | - |
| | 27TM | 2/2-way solenoid valve with diaphragm seal, force pilot operated | - | DN15-DN50 |
|  | 35TH | 2/2-way solenoid valve with piston seal force pilot operated | G¼-G2 *13-50 mm* | - |
| | 24TH | 2/2-way solenoid valve with piston seal force pilot operated | - | DN65- DN200 |
|  | 37TH | 2/2-way solenoid valve with piston seal force pilot operated | - | DN15-DN50 |
| | 25TH | 2/2-way solenoid valve with piston seal pilot operated | - | DN65-DN150 |
|  | 51TH | 2/2-way solenoid valve with piston seal pilot operated | G¼-G2 *13.5-50 mm* | - |
| | 54TH | 2/2-way solenoid valve with piston seal pilot operated | | DN15-DN50 |

## HOUSING AND SEAL MATERIALS:

- Housing with threaded sleeves: brass, stainless steel
- Housing with flange connection: Cast iron EN-GJL-250, Cast steel GP240 GH, stainless steel
- Seals made of FKM, EPDM, PTFE, PEEK, metallic

## MEDIUM TEMPERATURE

- -40 °F to +752 °F

| Pressure range | Housing material | Link to data sheet | Medium temperature | |
|---|---|---|---|---|
| 4.4-290 psi | Brass 2.0402<br>Stainless steel 1.4581 | | up to +284 °F |  |
| 4.4-290 psi | Cast iron EN-GJL-250<br>Cast steel GP240 GH<br>Stainless steel 1.4581 | | up to +284 °F | |
| 0-232 psi | Brass 2.0402<br>Stainless steel 1.4581 | | up to +284 °F |  |
| 0-232 psi | Cast iron EN-GJL-250 (DN20-50)<br>Cast steel GP240 GH (DN15-50)<br>Stainless steel 1.4581 (DN15-50) | | up to +284 °F | |
| 0-580 psi | Brass 2.0402<br>Stainless steel 1.4581 | | up to +356 °F<br>up to +392 °F* |  |
| 0-580 psi | Spheroidal cast iron EN-GJS-400-19-LT<br>Cast iron EN-GJL-250<br>Cast steel GP240 GH<br>Stainless steel 1.4581 | | up to +356 °F<br>up to +392 °F* | |
| 0-580 psi | Cast iron EN-GJL-250<br>Cast steel GP240 GH<br>Stainless steel 1.4581 | | up to +356 °F<br>up to +392 °F* |  |
| 14.5-189 psi | Cast iron EN-GJL-250<br>Cast steel GP240 GH | | up to +392 °F | |
| 7.3-580 psi | Brass 2.0402<br>Stainless steel 1.4581 | | up to +356 °F |  |
| 7.3-580 psi | Cast iron EN-GJL-250<br>Cast steel GP240 GH<br>Stainless steel 1.4581 | | up to +356 °F | |

# HIGH TEMPERATURE VALVES

UP TO +752 °F

## AREAS OF APPLICATION:

- Curing plants
- Blast furnace construction
- Coking plants
- Steam plants
- Steam turbines

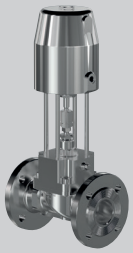
| | Series | Design | Connection | |
|---|---|---|---|---|
| | | | Inner thread *Seat diameter* | Flange |
|  | 63DT | 2/2-way valve with plate seal directly pressure controlled | G1/2-G3 *13-76 mm* | - |
| | 24DT | 2/2-way solenoid valve with piston seal force pilot operated | - | DN65-DN100 |
|  | 35DT | 2/2-way solenoid valve with piston seal force pilot operated | G1/4-G2 *13.5-50 mm* | - |
| | 37DT | 2/2-way solenoid valve with piston seal force pilot operated | - | DN15-DN100 |
|  | 63 DTE | 2/2-way valve with plate seal directly force pilot operated | G1/2-G2 *13-45 mm* | - |
| | 2/164FL | 2/2-way solenoid valve with piston seal force pilot operated | - | DN15-DN100 |
|  | 2/164 | 2/2-way solenoid valve with piston seal force pilot operated | G1/4-G2 *13-50 mm* | - |
| | 2/640FL | 2/2-way valve with plate seal directly pressure controlled | - | DN65-DN100 |
|  | 2/640 | 2/2-way valve with plate seal directly pressure controlled | G1/4-G2 *15-50 mm* | - |

## HOUSING AND SEAL MATERIALS:

- Housing with threaded sleeves: brass, stainless steel
- Housing with flange connection: Cast iron EN-GJL-250, Cast steel GP240 GH, stainless steel
- Seals made of FKM, EPDM, PTFE, PEEK, metallic

## MEDIUM TEMPERATURE

- -40 °F to +752 °F

| Pressure range | Housing material | Link to data sheet | Medium temperature | |
|---|---|---|---|---|
| 0-580 psi | Gunmetal RG5<br>Brass 2.0402<br>Stainless steel 1.4408 | | up to +482 °F |  |
| 0-580 psi | Cast steel GP240 GH<br>Stainless steel 1.4581 | | up to +482 °F | |
| 0-580 psi | Brass 2.0402<br>Stainless steel 1.4581 | | up to +482 °F |  |
| 0-580 psi | Cast steel GP240 GH<br>Stainless steel 1.4581 | | up to +482 °F | |
| 0-580 psi | Stainless steel 1.4408 / 1.4571 | | up to +572 °F |  |
| 0-580 psi | Cast steel GP240 GH<br>Stainless steel 1.4581 | | up to +572 °F | |
| 0-580 psi | Brass 2.0402<br>Stainless steel 1.4581 / 1.4571 | | up to +572 °F |  |
| 0-580 psi | Cast steel GP240 GH | | up to +752 °F | |
| 0-580 psi | Cast steel GP240 GH<br>Stainless steel 1.4571 | | up to +752 °F | |

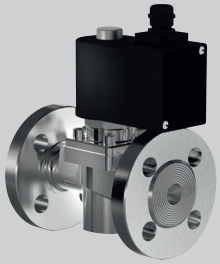
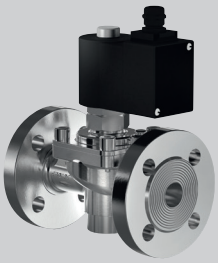
# SOLENOID VALVES
## FOR GAS APPLICATIONS

With approval under the Gas Appliance Regulation 2016/426/EU on the basis of DIN EN 161

| | |
|---|---|
| Type of control | Direct acting, force pilot operated<br>For a description of the operational principle, see p. 6 |
| Design | Seat valve with diaphragm seal<br>Seat valve with plate seal |
| Valve housing | Cast iron EN-GJL-250 and brass 2.0401 |
| Pressure range | Positively controlled 0 - 87 psi<br>Directly controlled 0 - 10 psi |
| Flow medium | Gaseous fuels acc. to 2009/142/EC |
| Seal | NBR and FKM |
| Connection voltage | AC~24V, 110V, 230V<br>DC=12V, 24V, 110V<br>Other connection voltages on request |
| Voltage tolerance | -10% / +10% |
| Degree of protection | IP65 according to DIN EN 60529 |
| Duty cycle | 100% ED-VDE 0580 |
| Type of connection | Terminal box |
| Explosion protection | acc. to 2014/34/EU (ATEX) |

- For gaseous fuels acc. to Gas Appliance Regulation
- Certified according to 2016/426/EU (test basis DIN EN 161)
- Requires no pressure difference
- Long service life
- High-quality materials
- Reliable, resilient sealing elements
- Optionally with 1 limit switch
  (-DW or -DW-D) for position indication “OPEN”


CE 0085 DVGW CERT
EU-Baumusterprüfbescheinigung
EU type examination certificate

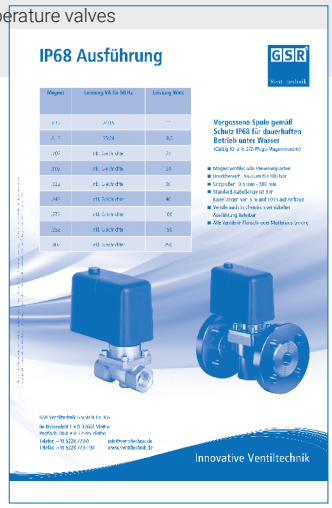
| | Series | Design | Connection | |
|---|---|---|---|---|
|  | G27DV | 2/2-way solenoid valve with diaphragm seal force pilot operated | G1-G2 |  |
| | G27DV | 2/2-way solenoid valve with diaphragm seal force pilot operated | DN25-DN300 PN16 | |
|  | G27DV-D | 2/2-way solenoid valve with plate seal direct acting | G1-G2 |  |
| | G27DV-D | 2/2-way solenoid valve with plate seal direct acting | DN25-DN300 PN16 | |

# SOLENOID VALVES
## FOR UNDERWATER APPLICATIONS

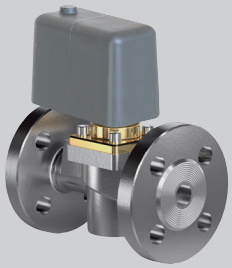
With encapsulated coil in accordance with IP68 protection for permanent operation under water up to 10 m water column

| Solenoid | power VA for 50 Hz | Wattage |
|---|---|---|
| .032 | 24/15 | 11 |
| .012 | 35/24 | 18.5 |
| .702 | incl. rectifier | 25 |
| .802 | incl. rectifier | 24 |
| .322 | incl. rectifier | 30 |
| .242 | incl. rectifier | 46 |
| .272 | incl. rectifier | 100 |
| .352 | incl. rectifier | 150 |
| .402 | incl. rectifier | 250 |

- Solenoid valves: all control types
- Pressure range: vacuum up to 13,053 psi
- Seat sizes: 0.5mm - 300mm
- Standard cable length is 3 m
  Cable lengths of 5 m and 10 m on request
- Valves also available in a chemically nickel-plated version
- All valves in flange or socket design
- Not for explosion-proof or high temperature valves






| | Series (example) | Design | |
|---|---|---|---|
|  | 43 | 2/2-way solenoid valve |  |
| | 27<br>35<br>... | 2/2-way solenoid valve<br>force pilot operated | |

# 4R PROPORTIONAL VALVES

## PRESSURE CONTROLLED CONTROL VALVES WITH ELECTRO-PNEUMATIC POSITIONER:

- For gaseous and liquid media
- Ideal for continuous media control - even in higher temperature ranges
- High dosing accuracy
- Precise control behaviour
- Three safety position options: (Open/Closed/Unchanged)
- No additional electronics for programming CE acc. to EMC DIN EN 61000
- ROHS
- Polarity reversal protection

| | Series | Design | Connection | |
|---|---|---|---|---|
| | | | Inner thread | Flange |
|  | 63-4R | Seat valve with control cone<br>Slanted seat | G¼ | - |
| | 22-4R | Seat valve with control cone<br>Straight seat, flange design | - | DN20-DN100 |



# 4R ELECTRO-PNEUMATIC POSITIONER

| | |
|---|---|
| Auxiliary power | 24 VDC max. 2.4W |
| Input signal | 4-20 mA, 0-10 V (output signal may differ from input signal) |
| Adjustment | mechanical |
| For actuator size | 50, 80, 125 mm |
| Ambient temperature | +5 °F / +140 °F |
| Hysteresis | < 1% |
| Control pressure | 58-145 psi |

## HOUSING AND SEAL MATERIALS:

- Gunmetal RG5, Stainless steel 1.4408, Stainless steel 1.4408
- Seals made of PTFE, FKM, EPDM

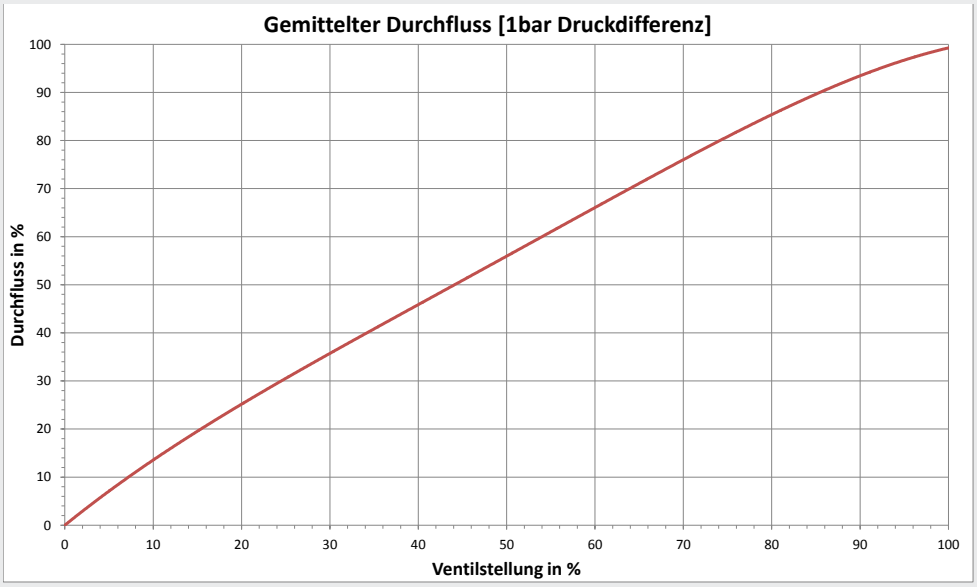
## MEDIUM TEMPERATURE

- -40 °F to +302 °F

| Pressure range | Housing material | Link to data sheet | Seal material | |
|---|---|---|---|---|
| 0-580 psi | Gunmetal RG5<br>Stainless steel 1.4408 | | PTFE |  |
| 0-189 psi | Cast iron DN-GJL-250<br>Cast steel GP240 GH<br>Stainless steel 1.4408 | | FKM, seat seal PTFE<br>PTFE<br>EPDM, seat seal PTFE | |



## CHARACTERISTIC CURVE 63-4R / 22-4R




The characteristic curve shown is valid for all series.

The corresponding Kv values are shown in the table for the specific valve.

The characteristic curve is determined in accordance with VDI-EN 2173

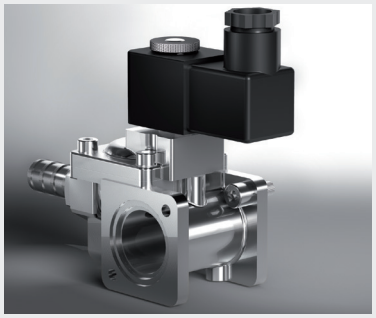
## CONTROL BEHAVIOUR

| | | | |
|---|---|---|---|
| Detection range | 0-23 mm | Hysteresis | 1% |
| Resolution | 0.5% of max. stroke | Accuracy of response | 1% |
| Repeat accuracy | 99% | Setting range | 1:200 |

# BLOCK SOLUTIONS

In addition to various valves with housings for connection in series, we also manufacture completely individual block valves and integrate all the other necessary components, such as check valves and sensors, in addition to our valves with solenoid or pneumatic actuators.

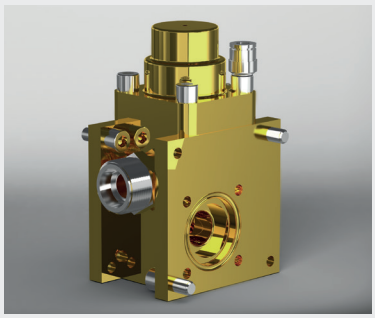
## PILOT OPERATED DIAPHRAGM VALVE WITH SERIES HOUSING



Series 44, can be used for a pressure range of 7.25-232 psi, brass housing, various options for seals. A variety of solutions can be supplied with appropriate end and connection pieces. The example shows five individual components arranged in a block for fresh water distribution in various applications. Additional, individual connections according to customer requirements. Additional attachments, connection fittings and check valves were integrated individually according to customer specifications.

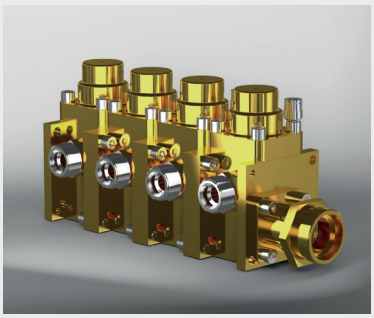


## PRESSURE CONTROLLED HIGH-PRESSURE VALVE WITH SERIES HOUSING

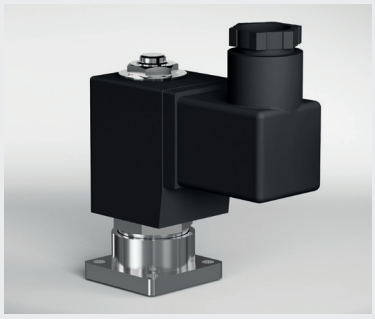


Series 2/327, can be used for a pressure range of 0 -1,450 psi, brass housing, durable seal made of PTFE. A variety of solutions can be supplied with appropriate end and connection pieces.

The example shows four individual valves arranged in a compact block for water distribution in various high-pressure applications. Additional attachments, connection fittings and check valves can be integrated individually according to customer specifications.



## DIRECT ACTING SOLENOID VALVE WITH FLANGE PLATE



Valves with flange plate made of brass or stainless steel in nominal widths from 0.5 mm to 10.0 mm. Pressure ranges up to 7,252 psi can be covered.

On request, we can manufacture block valves with a wide variety of attachments such as sensors, etc. according to customer specifications.

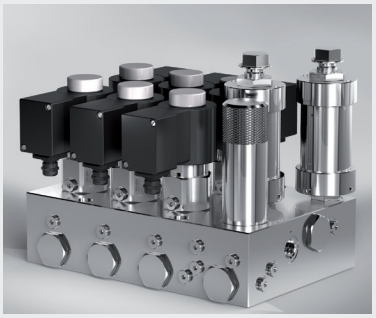
## OUR SERVICES INCLUDE:

- Design and construction of individual block solutions
- Manufacturing and testing
- Extensive technical documentation and consulting

## HIGH-PRESSURE SOLENOID VALVE IN CARTRIDGE DESIGN

The pilot operated high-pressure solenoid valve made of stainless steel for screw fitting can safely control pressures up to 4,351 psi. Special versions are designed for pressures up to 13,053 psi.

The example shows a compact block for gaseous media. Six cartridge valves, a filter, two overflow valves and various check valves were integrated. Cartridge valves make maintenance extremely easy.



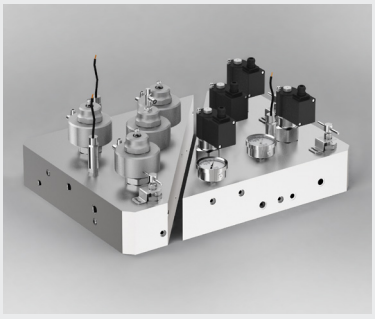


## VALVE BLOCK WITH DIRECT ACTING SOLENOID VALVES

The example shows a combination of six solenoid valves in the pressure range up to 116 psi.

The inputs and outputs can be positioned according to customer specifications. Various connection sizes and thread types can be supplied.

## VALVE BLOCK FOR HYDROGEN APPLICATIONS



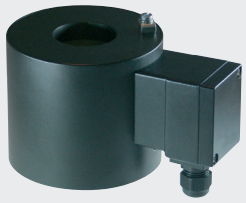
The example shows two options: a combination of 4 solenoid or pressure-controlled valves for the high-pressure range up to 15229 psi.

In addition, sensors, filters, manual and check valves and pressure gauges can be integrated.

# SOLENOIDS

## COIL VARIANTS:

- Standard coils for general applications
- Coils for higher temperature ranges
- Explosion-proof coils according to Directive 2014/34/EU (ATEX)
- Coils with UL approval

| | Article number | Design | Power | |
|---|---|---|---|---|
| | | | AC | DC |
|  | K051.... | Standard | 10.5 VA - 24 VA | 6.8 W - 250 W |
| | KD51....<br>KR51...<br>KT51... | Temperature | 24 VA | 18.5 W - 180 W |
|  | K059.... | Explosion protection (ATEX) | 3.1 VA - 10 VA | 5.2 W - 75 W |
| | K05927...KL | Explosion protection (ATEX) | - | 47 W |
|  | K051....UL | UL approval | 5.7 VA - 24 VA | 5.7 W - 150 W |



## HEATING AND POWER OF SOLENOIDS

GSR standard solenoid valves are designed for continuous operation (100% = duty cycle) under normal operating conditions.

The traction force of a solenoid coil is essentially influenced by three factors:

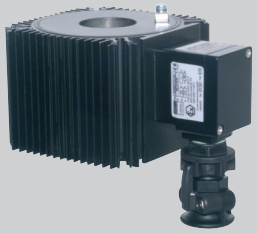
- self-heating
- medium temperature
- ambient temperature

## STANDARD CONNECTION VOLTAGES:

- AC~/Explosion protection: 24V, 110V, 230V
- DC=/Explosion protection: 12V, 24V

## PROTECTION CLASS:

- IP65

| Connection | Medium temperature | |
|---|---|---|
| Plug, terminal box | -40 °F to +176 °F |  |
| Plug, terminal box | -40 °F to +572°F | |
| Cable end, terminal box | -67 °F to +176 °F |  |
| Terminal box, heat sink | -40 °F to +158 °F | |
| Plug, terminal box | -4 °F to +176 °F | |



GSR solenoids are designed as standard for a maximum ambient temperature of +95 °F. This specification applies to the maximum permissible operating pressure indicated on the respective valve data sheet and a medium temperature of +176 °F.

A higher ambient temperature is possible if lower values apply to the other influencing parameters. In addition, deviations from the default temperature range are possible if temperature coils are used, for example, or other design measures are taken. Please consult GSR headquarters in advance on a case-by-case basis.

For detailed information about the operating conditions, please refer to the data sheets for the corresponding solenoid and solenoid valve.

Please note that the surface temperature of a coil under continuous load can heat up to +248 °F solely as a result of self-heating. The power consumption of our standard solenoids was determined according to DIN VDE 0580 at a coil temperature of +68 °F.

# ACCESSORIES

## CLOCK GENERATOR


| Digital clock generator for mounting on solenoids (according to DIN43 650-M2) | |
|---|---|
| ON/OFF function | |
| Breaks and working hours | 0.1 sec to 99 hours – adjustable on the device |
| Ambient temperature | -14 °F to +122 °F |
| Protection class | IP65 |
| max. permissible switching current | 1 A |

## SWITCHING ELECTRONICS 240 / 320

- Energy-saving – up to 75% lower energy consumption
- Reduction of heating
- Extension of the solenoid coil life
- Use of smaller solenoid coils due to overexcitation and power reduction
- Mounting on EN mounting rail
- Supply voltage 230V; 40-60 Hz
- Tightening voltage 205 VDC; holding voltage 102 VDC



## SEPARATE RECTIFIER


For installation in control cabinets

## LIMIT SWITCH

As a changeover in EEx version

## HOOD

For solenoids for outside mounting, **Solenoid types:**
802, NC
322, NC
242, NC
272, NC
352, NC
also for NO and limit switch design

## ELECTRIC POSITION INDICATOR G7

for pressure-controlled valves for monitoring, querying and visual representation of valve positions or for activation of other system components
see also page 16/17

# VALVE OPTIONS

| Option | Description | Comment |
|---|---|---|
| **For solenoid valves and pressure controlled valves** | | |
| NG | Internal NPT connection thread | |
| TT | UNF connection thread (Autoclave) | |
| AS | Welding ends | |
| FL | Flange according to DIN EN 1092-1 Form B1/B2 | |
| F1 | Flange according to DIN EN 1092-1 Form D (groove) | |
| AF | ANSI flange according to Class 150 ASME B 16.5 | |
| AX | ANSI flange according to Class 300 ASME B 16.5 | |
| NO | Normally open valve | |
| HA | Manual operation | max. 2,900 psi |
| OA | Complete valve but without fitting/housing | |
| VW | Free of substances that interfere with paint wetting | |
| GD | Back pressure-resistant design | |
| CN | Chemically nickel-plated valve | |
| UN | Universal function (each connection can be pressurized) | for 3/2-way valves |
| **for solenoid valves** | | |
| AA | Armature housing seal | for aggressive media |
| BF | Version free of non-ferrous metal | |
| SR | Adjustable closing damping | |
| MF | Suitable for installation with horizontal solenoid | |
| EA | 1 electrical limit switch (reed contact, normally open contact) | DN15 / G$^{1}/_{2}$" |
| EH | 1 electrical limit switch (reed contact, changeover contact) | from DN20 / G$^{3}/_{4}$" |
| EJ | 2 electrical limit switches (reed contact, changeover contact) | from DN20 / G$^{3}/_{4}$" |
| EX | 1 limit switch (reed contact), ATEX version | from DN20 / G$^{3}/_{4}$" |
| EZ | 2 limit switches (reed contact), ATEX version | from DN20 / G$^{3}/_{4}$" |
| EL | Electrical reversing (for high tightening and low holding power) | only 230V AC |
| 1W | Special design for hydrogen applications | recommended from 2,176 psi |
| **for pressure controlled valves** | | |
| VU | Vacuum design | |
| VD | Vacuum and pressure design | |
| AHEM | Stroke volume control | |
| EP | 1-way mechanical limit switch | |
| G7 | Inductive position sensor with LED display | |
| DW | Double-action actuator | |
| IV | Inner parts stainless steel 1.4571 / AISI 316 Ti | |
| KJ | Tri-clamp connectors | |

Note: The options listed here are just a selection.

# ORDER NUMBER SYSTEMS

## SOLENOID VALVES

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| . | 37 | 01 | / | 08 | 04 | / | . | 32 | 2 | – | E | H |
| | | | | | | | | Solenoid system | | | Valve options | |

### Series

| | |
|---|---|
| 23 | 2/2-way solenoid valve |
| 24 | 2/2-way solenoid valve |
| 25 | 2/2-way solenoid valve |
| 27 | 2/2-way solenoid valve |
| 37 | 2/2-way solenoid valve |
| 40 | 2/2-way solenoid valve |
| 43 | 2/2-way solenoid valve |
| 44 | 2/2-way solenoid valve |
| 46 | 2/2-way solenoid valve |
| 48 | 2/2-way solenoid valve |
| 49 | 2/2-way solenoid valve |
| 50 | 2/2-way solenoid valve |
| 51 | 2/2-way solenoid valve |
| 53 | 2/2-way solenoid valve |
| ... | ... |

### Connection

| | |
|---|---|
| 01 | DN15 |
| 02 | DN20 |
| 03 | DN25 |
| 04 | DN32 |
| 05 | DN40 |
| 06 | DN50 |
| 07 | DN65 |
| ... | ... |
| 21 | G 1/4 |
| 22 | G 3/8 |
| 23 | G 1/2 |
| ... | ... |
| 28 | G 2 |
| 29 | G 2 1/2 |
| 30 | G 3 |

### Seal material

| | |
|---|---|
| 00 | Metal |
| 01 | NBR |
| 02 | FKM |
| 04 | PTFE |
| 06 | EPDM |
| ... | ... |

### Housing material

| | |
|---|---|
| ... | ... |
| 06 | Stainless steel 1.4305 |
| 08 | Stainless steel 1.4581 / Stainless steel 1.4571 |
| 09 | Stainless steel 1.4104 |
| 10 | Brass |
| 11 | Gunmetal |



## PRESSURE CONTROLLED VALVES

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| . | 63 | 25 | / | 08 | 04 | / | 8 | 1 | 05 | – | X | X |
| | | | | | | | | Actuator options | Actuator size | | Valve options | |

### Series

| | |
|---|---|
| 22 | 2/2-way pressure controlled |
| 26 | 2/2-way pressure controlled |
| 60 | 2/2-way pressure controlled |
| 63 | 2/2-way pressure controlled |
| ... | ... |

### Connection

### Seal material

### Housing material

### Actuator options

| | |
|---|---|
| 7 | closed in rest position - NC |
| 8 | open in rest position - NO |
| 9 | Double-action actuator |

### Actuator size

| | |
|---|---|
| 0 | Straight seat |
| 1 | Slanted seat |
| 3 | Control cylinder stainless steel 1.4581 |
| 5 | Control cylinder pressed brass-nickel-plated |

### Valve options

**with the medium flow**

| | |
|---|---|
| 03 | Ø = 30 |
| 05 | Ø = 50 |
| 08 | Ø = 80 |
| 13 | Ø = 125 |
| 16 | Ø = 160 |
| 20 | Ø = 200 |

**against the medium flow**

| | |
|---|---|
| 53 | Ø = 30 |
| 55 | Ø = 50 |
| 58 | Ø = 80 |
| 63 | Ø = 125 |
| 66 | Ø = 160 |
| 70 | Ø = 200 |

Information on the type code is explained on the corresponding data sheets for each valve.

# MATERIAL SPECIFICATIONS

The specific application is fundamental to the valve design, with the resistance of the materials to the operating medium as the crucial factor here. Knowledge of the concentration, temperature and degree of contamination of the medium is crucial for the correct choice of material. Other criteria include the operating pressure and max. volume flow, as not only high temperatures, but also high pressures and flow velocities must be taken into account when selecting materials. All materials for our valves, whether for housings, seals or solenoids, are carefully selected according to the specific areas of application. All information is non-binding and serves as a guide only. It is not a basis for any warranty claims.

## Metallic materials

| Material | Material no. | DIN | Properties |
|---|---|---|---|
| Brass | 2.0401<br>2.0402 | CuZn39Pb3<br>CUZn39Pb2 | Versatile use. Not suitable for aggressive media or media that contain ammonia. |
| Cast iron | EN-JL 1040 | GG-25 | Mainly for flange valve housings up to PN 16.<br>The temperature range is limited. Suitable for neutral media. |
| Spheroidal cast iron | EN-JS 1025 | GGG-40.3 | Mainly for flange valve housings up to PN 25. Used<br>where GG-25 is too brittle. Suitable for neutral media. |
| Cast steel | GP 240 GH | GS-C25 | Mainly for flange valve housings up to PN 40 and higher temperature ranges.<br>Suitable for neutral media. |
| Gunmetal | CC491K | CuSn5Zn5Pb5-C<br>DINEN1982 | Can be used where brass is unsuitable, e.g. for seawater, slightly aggressive water<br>or steam. |
| Cast stainless steel | 1.4581 | G-X5CrNiMoNb19-11-2 | Austenitic high-alloy steel for aggressive media. |
| Stainless steel | 1.4571 | X6CrNiMoTi17-12-2 | Austenitic high-alloy steel for solenoid armature tubes and aggressive media. |
| Stainless steel | 1.4301 | X5CrNi18-10 | High-alloy austenitic stainless steel for internal valve parts and mildly aggressive media. |
| Stainless steel | 1.4104 | X14CrMoS17 | Corrosion-resistant ferritic (magnetisable) stainless steel for e.g. solenoid armature and pole shoe. Suitable in some cases for aggressive media. |
| Aluminium | 3.2162.05 | AlSi8Cu3 | Aluminium die casting. For neutral media. |



## Plastics

| | |
|---|---|
| PVC, polyvinyl chloride | Resistant to most acids, alkalis, salt solutions and water-miscible organic<br>solutions. Not resistant to aromatic and chlorinated hydrocarbons. |
| PVDF, polyvinylidene fluoride | Suitable for almost all aggressive media in the temperature range from -4 °F to +212 °F. |
| PFA, fluoroplastic | As resistant as PVDF, but for an extended temperature range from -4 °F to +302 °F. |
| PP, polypropylene | Resistant to aqueous solutions of acids, alkalis and salts, depending on concentration and temperature. |
| POM, polyoxymethylene | Material with high hardness and low water absorption. Not for bases, acids or oxidising agents. |

## Sealing materials

| Material | Temperature range °F | Properties |
|---|---|---|
| NBR-acrylonitrile-butadiene rubber | +14 °F to +176 °F | Elastic standard material for neutral media such as air, water. Good resistance to mechanical stresses. |
| EPDM ethylene-propylene rubber | +14 °F to +266 °F | Resistant to alkalis and acids, rubber of medium concentration, water, hot water and steam. Not resistant to oils and greases. |
| FKM-fluorine rubber | +14 °F to +176 °F | Elastomer with high temperature and weather resistance. Suitable for many acids, bases, fuels and oils (including synthetic). Unstable in hot water and steam. |
| H-NBR | -31 °F to +302 °F | Elastomer with high ozone, aging and weather resistance. Suitable for dilute acids, oils (animal and vegetable) and salt solutions. |
| PTFE polytetrafluoroethylene | -292 °F to +392 °F | A thermoplastic, i.e. not an elastic material and therefore unsuitable for "classic" membranes (separating films are possible). Valve housings and internal valve parts are also manufactured from this material. |
| Peek | -328 °F to +572 °F | A thermoplastic, i.e. not an elastic material and therefore unsuitable for "classic" membranes (separating films are possible). Suitable for extremely high temperatures and high pressures. |

# FLANGE DIMENSIONS AND OPERATING PRESSURES

## ACCORDING TO EN 1092-1 FORM B1

| Nominal width | | PN 16 | | | | PN 25 | | | | PN 40 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **DN** | | **D** | **K** | **n** | **d** | **D** | **K** | **n** | **d** | **D** | **K** | **n** | **d** |
| 10 | 3/8 | 90 | 60 | 4 | 14 | 90 | 60 | 4 | 14 | 90 | 60 | 4 | 14 |
| 15 | 1/2 | 95 | 65 | 4 | 14 | 95 | 65 | 4 | 14 | 95 | 65 | 4 | 14 |
| 20 | 3/4 | 105 | 75 | 4 | 14 | 105 | 75 | 4 | 14 | 105 | 75 | 4 | 14 |
| 25 | 1 | 115 | 85 | 4 | 14 | 115 | 85 | 4 | 14 | 115 | 85 | 4 | 14 |
| 32 | 1 1/4 | 140 | 100 | 4 | 19 | 140 | 100 | 4 | 19 | 140 | 100 | 4 | 19 |
| 40 | 1 1/2 | 150 | 110 | 4 | 19 | 150 | 110 | 4 | 19 | 150 | 110 | 4 | 19 |
| 50 | 2 | 165 | 125 | 4 | 19 | 165 | 125 | 4 | 19 | 165 | 125 | 4 | 19 |
| 65 | 2 1/2 | 185 | 145 | 4 | 19 | 185 | 145 | 8 | 19 | 185 | 145 | 8 | 19 |
| 80 | 3 | 200 | 160 | 8 | 19 | 200 | 160 | 8 | 19 | 200 | 160 | 8 | 19 |
| 100 | 4 | 220 | 180 | 8 | 19 | 235 | 190 | 8 | 23 | 235 | 190 | 8 | 23 |
| 125 | 5 | 250 | 210 | 8 | 19 | 270 | 220 | 8 | 28 | 270 | 220 | 8 | 28 |
| 150 | 6 | 285 | 240 | 8 | 23 | 300 | 250 | 8 | 28 | 300 | 250 | 8 | 28 |
| 200 | 8 | 340 | 295 | 8 | 22 | 360 | 310 | 12 | 28 | 375 | 320 | 12 | 31 |
| 250 | 10 | 405 | 355 | 12 | 26 | 425 | 370 | 12 | 31 | 450 | 385 | 12 | 34 |
| 300 | 12 | 460 | 410 | 12 | 26 | 485 | 430 | 16 | 31 | 515 | 450 | 16 | 34 |

Note: Flange connections according to EN 1092-1 Form B2 for operating pressures from PN63 to PN100 optional

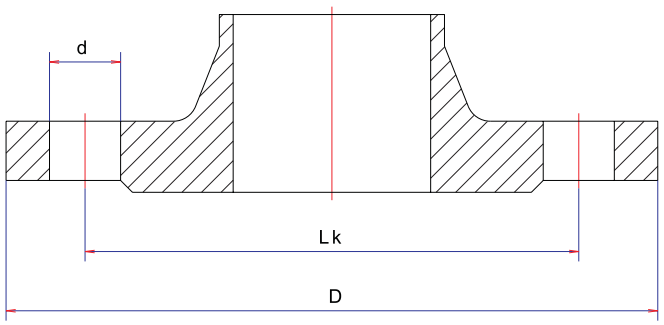


| ANSI B 16.5 Class 150 | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| DN | 15 | 20 | 25 | 32 | 40 | 50 | 65 | 80 | 100 |
| D | 90 | 100 | 110 | 115 | 125 | 150 | 180 | 190 | 230 |
| Lk | 60.3 | 69.9 | 79.4 | 88.9 | 98.4 | 120.7 | 139.7 | 152.4 | 190.5 |
| d | 15.7 | 15.7 | 15.7 | 15.7 | 15.7 | 19.1 | 19.1 | 19.1 | 19.1 |
| n | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 8 |

| ANSI B 16.5 Class 300 | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| DN | 15 | 20 | 25 | 32 | 40 | 50 | 65 | 80 | 100 |
| D | 95 | 115 | 125 | 135 | 155 | 165 | 190 | 210 | 255 |
| Lk | 66.7 | 82.6 | 88.9 | 98.4 | 114.3 | 127.0 | 149.2 | 168.3 | 200.0 |
| d | 15.7 | 19 | 19 | 19 | 22.3 | 19 | 22.3 | 22.3 | 22.3 |
| n | 4 | 4 | 4 | 4 | 4 | 8 | 8 | 8 | 8 |

| Valve lengths for flange fittings | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Flange DN | 15 | 20 | 25 | 32 | 40 | 50 | 65 | 80 | 100 | 125 | 150 | 200 | 250 | 300 |
| Overall length EN 558-1, Series1 (mm) | 130 | 150 | 160 | 180 | 200 | 230 | 290 | 310 | 350 | 400 | 480 | 600 | 730 | 850 |

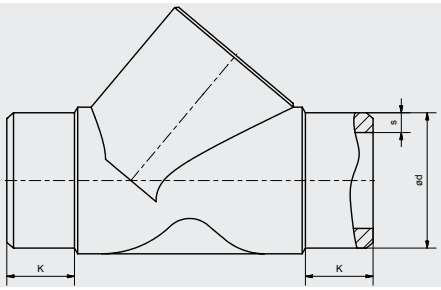
DN = Nominal width
D = Outside diameter
K = Pitch circle diameter
n = Number of flange holes
d = Hole diameter



**Option A5:**
Valve body material 1.4408 DIN11850-2

**Option A9:**
Valve body material 1.4408 EN ISO1127/ ISO4200

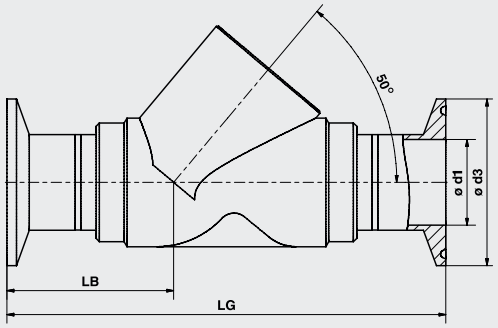
**Option A:**
Valve body material 1.4408 DIN3239




| Welding ends (mm) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| DN | Option A5 | | | Option A9 | | | Option AS | | |
| | Ø d | s | k | Ø d | s | k | Ø d | s | k |
| **15** | 19 | 1.5 | 4.5 | 21.3 | 1.6 | 5 | 24 | 3.5 | 12 |
| **20** | 23 | 1.5 | 5.5 | 26.9 | 1.6 | 5 | 30 | 4 | 12 |
| **25** | 29 | 1.5 | 5.5 | 33.7 | 2 | 10 | 36 | 4 | 14 |
| **32** | 35 | 1.5 | 6 | 42.4 | 2 | 5 | 45 | 5 | 17 |
| **40** | 41 | 1.5 | 6 | 48.3 | 2 | 6 | 52 | 5.5 | 18 |
| **50** | 53 | 1.5 | 6.5 | 60.3 | 2.6 | 7 | 65 | 5.5 | 22 |

Clamp connection, valve body material 1.4408
DIN 32676 = Option KJ

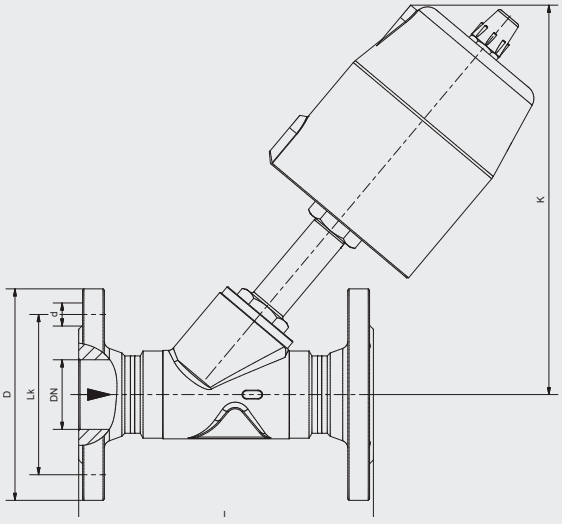
| DN | LG | LB | Ø d1 | Ø d3 |
|---|---|---|---|---|
| **15** | 130 | 48 | 16 | 34 |
| **20** | 145 | 54 | 20 | 34 |
| **25** | 160 | 56 | 26 | 50.5 |
| **32** | 180 | 60.5 | 32 | 50.5 |
| **40** | 200 | 67 | 38 | 50.5 |
| **50** | 230 | 73 | 50 | 64 |




Flange connection acc. to EN 1092-1 Form B1 and
EN 558-1 Series 1

| DN | L | K | | | Lk | D | d |
|---|---|---|---|---|---|---|---|
| | | 7105 | 7108 | 7113 | | | |
| **15** | 130 | 157 | - | - | 65 | 95 | 14 |
| **20** | 150 | 156 | - | - | 75 | 105 | 14 |
| **25** | 160 | 166 | 202 | - | 85 | 115 | 14 |
| **32** | 180 | 181 | 213 | - | 100 | 140 | 18 |
| **40** | 200 | 186 | 220 | 293 | 110 | 150 | 18 |
| **50** | 230 | 197 | 231 | 304 | 125 | 165 | 18 |

Also available as ANSI flange connection acc. to Class 150 / 300 ASME B 16.5 available



# ENQUIRY FORM

**Sender**

Company _____ Name _____

Telephone _____ Fax _____

E-mail _____

**Valve type**

☐ Solenoid valve ☐ Externally controlled valve ☐ Other _____

☐ 2/2-way ☐ 3/2-way ☐ Other _____

☐ NC ☐ NO ☐ UN (universal function) ☐ Other _____

**Material**

Housing _____ Seal _____

**Pressure range**

bar _____ psi _____ delta p _____

**Number of items**

_____

**Connection**

Socket valve G _____ Flange valve DN _____ Other _____

**Medium**

_____

**Viscosity**

$mm^2/s$ _____ Other _____

**Flow rate**

$m^3/h$ _____ l/min _____ Other _____

**Connection voltage**

AC _____ DC _____

**Temperature**

Medium _____ Environment _____

**Explosion protection**

☐ Yes, protection class _____ ☐ No

**Preferred delivery time**

_____

**Options/Extras**

_____

**Comments**

_____

_____

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**GmbH & Co. KG**

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Subject to errors and changes.
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