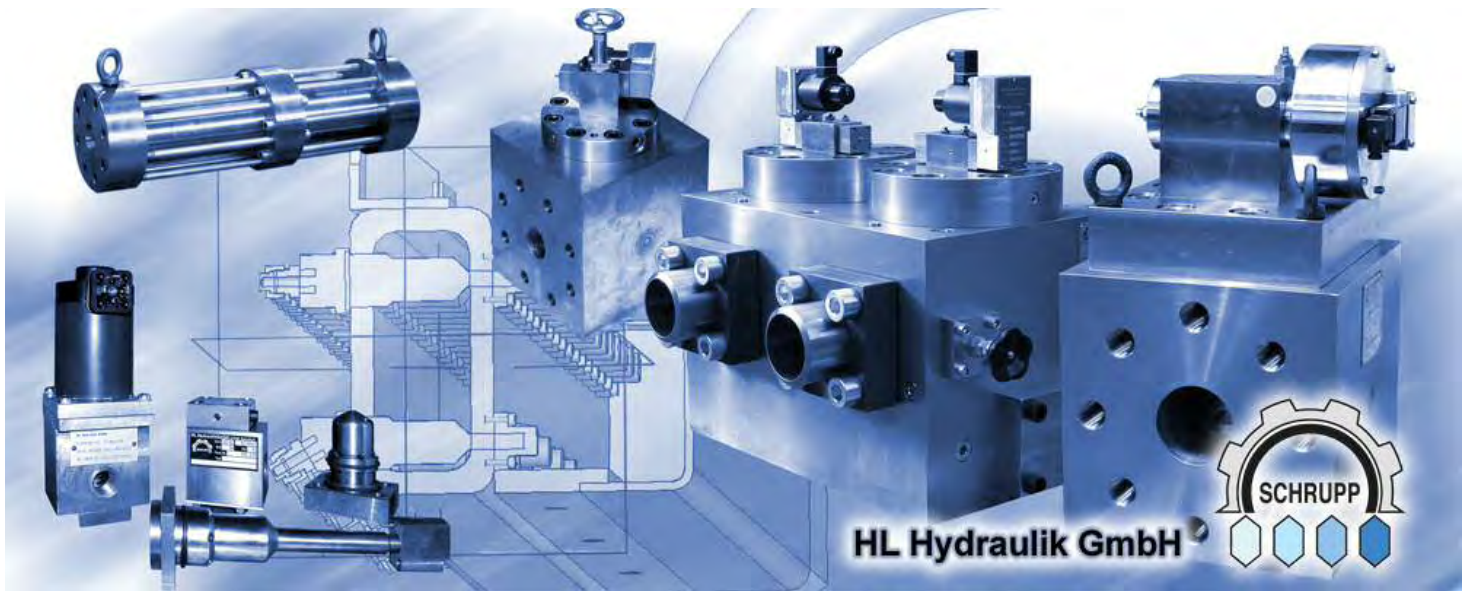




# **WATER- AND SPECIAL FLUID HYDRAULICS**

**System solutions for industry**

**HP Pneumatics**

**Water- and Special- Fluid Hydraulics**

**Equipment for Road Safety Training Centres**

**Fire Fighting Systems for Transformers**

**Live Line Washing Systems for Insulators**

**HL-Hydraulik GmbH**

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Tel: **+49 (0)2744-9324-0**

web: **[www.hl-hydraulik.de](http://www.hl-hydraulik.de)**

e-mail: **[schrupp@hl-hydraulik.de](mailto:schrupp@hl-hydraulik.de)**

E2 FEB22



## HL Hydraulik GmbH

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E-Mail: [info@hl-hydraulik.de](mailto:info@hl-hydraulik.de)

[www.hl-hydraulik.de](http://www.hl-hydraulik.de)

### *HP Pneumatic (Drucklufttechnik)*

VDEW empfohlene Druckluftsysteme und Komponenten bis 350 bar

### *HP Pneumatic*

Electrical Industry (VDEW) recommended systems and components up to 350 bar



### *Wasser- und Sonderhydraulik*

Edelstahl-Cartridgeventile und Vorsteuerungen bis 350 bar (800 bar), Nennweiten 2 bis 250 mm Entzunderungsventile, Druck- und Wegeventile, Sprühventile zur partiellen Walzenkühlung.



### *Water- and Special-Fluid Hydraulics*

Stainless steel cartridges and pilot valves up to 350 bar (optional 800 bar), size 2 to 250 mm (08-10 inch).

Descaling valves, directional, check, flow and pressure control functions, spray valves for roll coolant systems.



## *Technik für Fahrsicherheitszentren*

Innovative Technik zur Simulation kritischer Situationen im Straßenverkehr: Schleuderplatten, Fahrbahnbewässerungen, Wasserhindernissysteme

## *Equipment for Road Safety Training Centers*

To simulate critical traffic situations.  
Vehicle skidding devices, water film systems, water obstacles

## *Feuerlöschsysteme für Transformatoren*

Fremdenergie-unabhängige Wassersprühsysteme

## *Fire Fighting Systems for Transformers*

Water spraying systems for operation independent from an external power supply

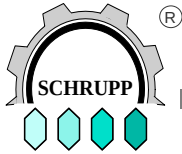


## *Isolatorenreinigungssysteme*

Stationäre Wassersprühsysteme zur Reinigung unter Spannung

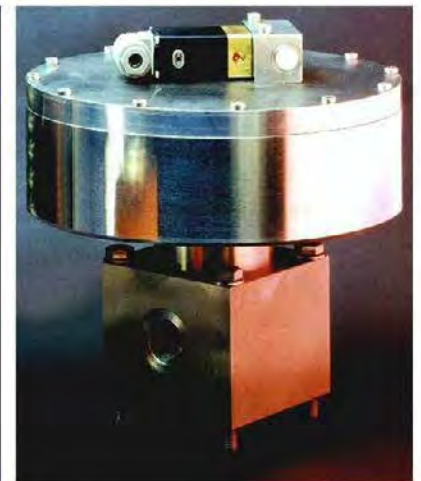
## *Insulator Cleaning Systems*

Water spraying systems for stationary live electrical line cleaning



# WATER AND SPECIAL HYDRAULICS

System Solutions for Industry



**HP Pneumatic**

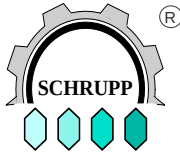
**Water- and Special- fluid Hydraulics**

**Equipment for Road Safety Training Centres**

**Fire Fighting Systems for Transformers**

**Insulator Cleaning Systems**

0



## WATER – AND SPECIAL- FLUID HYDRAULICS

System Solutions for Industry

### CARTRIDGE PROGRAM

Hard seat cartridges DN16 to 32, 350bar, pressure and throttle functions for clean water applications

Soft seat cartridges DN10 to 250, 350bar, directional and shut-off functions for clean and descaling water applications

Soft seat cartridges DN10 to 40, 800bar, directional functions for clean water applications

Individual designs for special fluids and gases possible

Dimensions acc. to ISO/DIN

Material stainless steel

Cartridge covers



### PILOTVALVES

2 and 3 directional pilot valves solenoid, pneumatically or manually operated, pressure pilot valves. DN4 to DN25, up to PN350, special designs up to 800bar.



### SPECIAL VALVES

Individual designed valves

Sea water resistant for Off Shore and Sub Sea applications

Pulsation Technology

Special cartridge valves with additional functions

Leak free valves for oil hydraulic applications



### COMPLETE VALVES

Directional, pressure and throttling functions for water, emulsions, oil and special fluids.

### DESCALING TECHNOLOGY

Complete Valves for descaling applications up to 350bar and DN250mm, including 2 and 3 directional pilot valves, solenoid, pneumatically oilhydraulically or manually operated.

Multistage breakdown orifices and accessories.

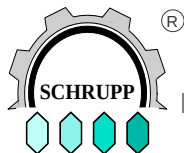
### SPRAY VALVES

For roller cooling systems at steel or aluminium rolling mills

Size 6 to 25mm.

Valves, pilots, complete spray barns and accessoires





## TABLE OF CONTENTS

Since 1934 valves and components for fluids and gases have been manufactured under the trade name SCHRUPP for the international market.

HL Hydraulik GmbH now owns all rights to the Schrupp<sup>®</sup> program. Continuous development allows improvements to this program to follow the requirements of the market.

The valves are designed for use with water, water and oil emulsions, oil and gases. Their robust construction and compact design provide long life, ease of maintenance, and high performance. The sealed poppet design provides drop tight, leak free shut off.

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Cartridge Valves according to DIN 24342, Stainless Steel

##### **E2.1.2** General Information

##### **E2.1.6** Dimensions

#### **E2.2 Cartridge -Valve Covers (Selection)**

#### **E2.3 PILOT VALVES**

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##### **E2.3.3** 3/2 Directional Valve ND10 to 25mm

##### **E2.3.7** 2/2 Way Directional Valve ND10 to 25mm

##### **E2.3.9** Pressure Valve ND2mm NP350bar

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##### **E2.4.2** Directional Valves

##### **E2.4.9** Pressure Valves

##### **E2.4.12** Non- Return Valves, Flow Control Valves, High Pressure Valves

#### **E2.5 DESCALING TECHNOLOGY**

#### **E2.6 SPECIAL VALVES**

#### **E2.7 2 WAY DIRECTIONAL VALVES**

2/2, 3/2 Directional Valves ND65, 80, 100mm NP40

#### **E2.8 SPRAY VALVES**

We reserve the right to make technical modifications without prior notification

## CARTRIDGE PROGRAM



### **Stainless Steel Cartridge valves according to DIN24342**

The valves are designed for use with water, water and oil emulsions, oil and gases. Their robust construction and compact design provide long life, ease of maintenance, and high performance.

These slip in cartridge type valves can be combined in many different ways to satisfy the requirements of a wide variety of applications. The sealed poppet design provides drop tight, leak free shut off.

### **Product range:**

#### **Cartridges for directional functions**

Soft seated ND10 to 100 for water, oil and pneumatic applications up to 350bar

Soft seated ND10 to 250 for water, descaling water and oil up to 350bar

Soft seated ND10 to 40 for water, oil and pneumatic applications up to 800bar

Hard seated ND 16 to 32 water and oil up to 350bar

#### **Cartridges for pressure relief functions**

Hard seated ND 16 to 32 for water and oil up to 350bar

#### **Cartridges for pressure reducing functions**

Hard seated ND 16 to 32 for water and oil up to 350bar

## CARTRIDGE PROGRAM

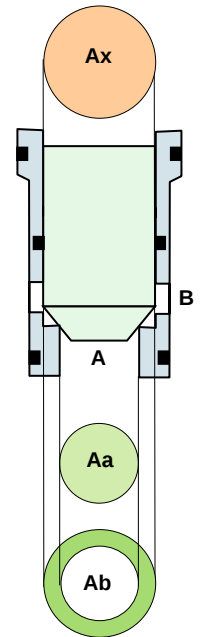
### Functional description

These valves are designed for use with special fluids:

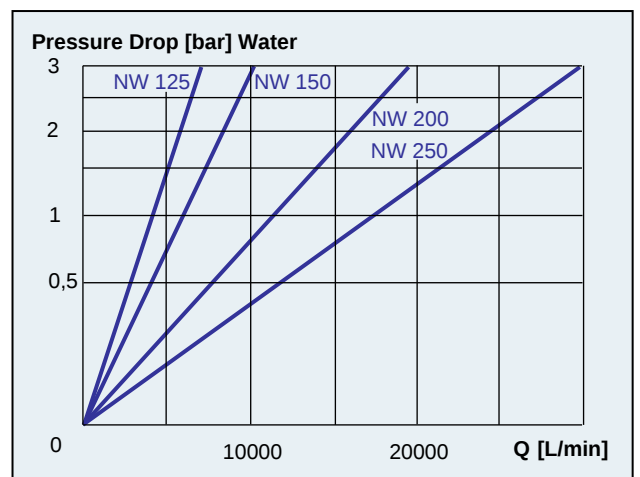
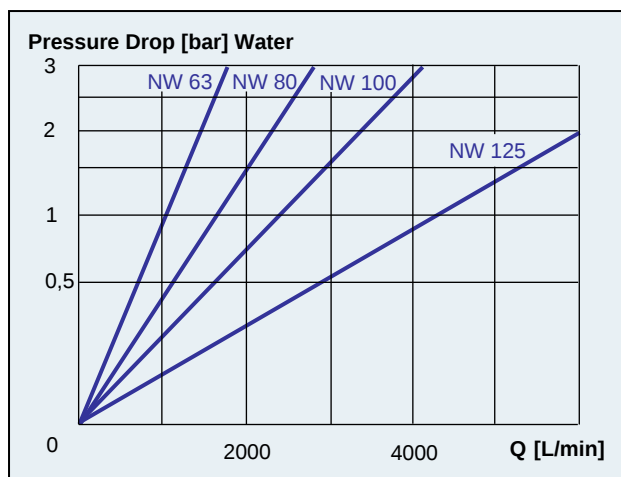
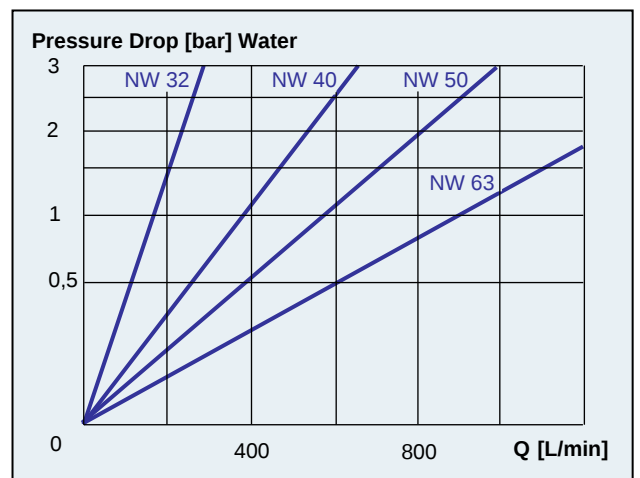
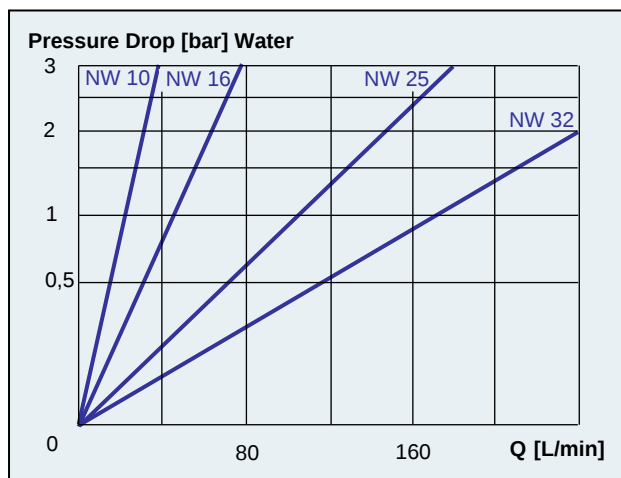
- No metal to metal contact at the sliding surfaces.
  - the use of non-lubricating mediums is possible.
- All pressurized areas are separated by soft seals
  - for thin fluids and gases under high pressure.
- Special geometry and non-corroding material
  - for water and descaling applications.

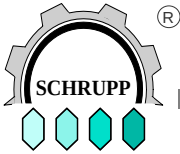
An important dimension for the function of cartridge valves is the surface ratio of the seat area  $A_a$  and the annulus area  $A_b$  to the pilot area  $P_x$ . By using a surface ratio of 1:1 the valve can be operated only in one direction. By using a surface ratio of 1:1.6 or 1:2 the valve can be operated in both directions, but cannot be used for pressure functions because of the pressure ratio which creates pre-opening of the pilot valve.

Soft-seated valves are suitable for use in shut-off and directional functions. These valves are absolutely leak-free even for long-term operation in gas or high-pressure circuits. Hard seated valves are suitable for use in pressure control functions. Because of their robust seats they can be used also in high pressure water hydraulic circuits.



### Diagrams





## CARTRIDGE PROGRAM

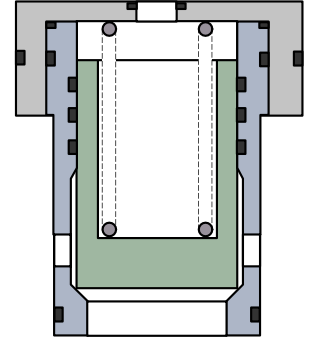
### Cartridge Valve Type 1

For directional, pressure and flow-control applications  
Dimensions according to DIN 24342  
Material: stainless steel  
Hard seated  
Area ratio 1:1 / 45°

Example / Order code

**EO - 025 - 00 - 0.0 - 1D / 0**

└─ Nominal size 016, 025, 032



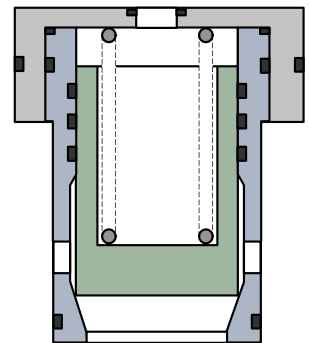
### Cartridge Valve Type 2

For pressure-control applications  
Dimensions according to DIN 24342  
Material: stainless steel  
Hard seated  
Area ratio 1:1 / 15°

Example / Order code

**EO - 025 - 00 - 0.0 - 2D / 0**

└─ Nominal. size 016, 025, 032



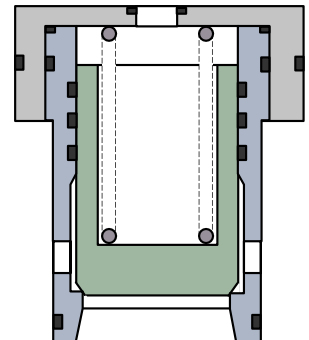
### Cartridge Valve Type 3

For directional and shut off applications  
Dimensions according to DIN 24342  
Material: stainless steel  
Hard seated  
Area ratio 1:1.6 / 45°

Example / Order code

**EO - 025 - 00 - 0.0 - 3D / 0**

└─ Nominal. size 016, 025, 032



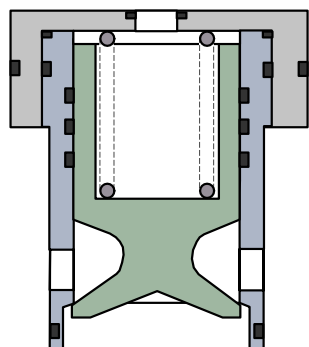
### Cartridge Valve Type 4

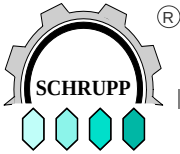
For pressure reducing, check and flow control functions  
Dimensions according to DIN 24342  
Material: stainless steel  
Hard seated  
Area ratio 1:1

Example / Order code

**EO - 025 - 00 - 0.0 - 4D / 0**

└─ Nominal. size 016, 025, 032





## CARTRIDGE PROGRAM

### Cartridge Valve Type 6

For directional and shut off applications

Dimensions according to DIN 24342

Material: stainless steel, soft seated, metal support  
area ratio 1:2, Type /Z 1:1.6

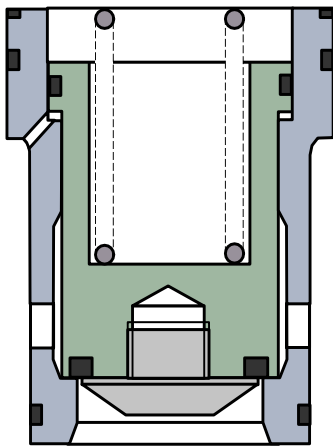
Example / Order code

**EO - 125 - 00 - 5.5 - 6D / Z**

/ S =Standard design  
/ R =Non return valve  
/ A =Active valve  
/ Z =Descaling valve  
/ H1 =High pressure valve

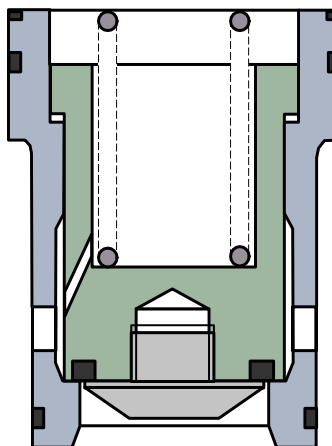
Nozzle dimension in mm  
only type /Z

Size 010, 016, 025, 032, 040, 050, 063,  
080,100, 125, 150, 200, 250mm



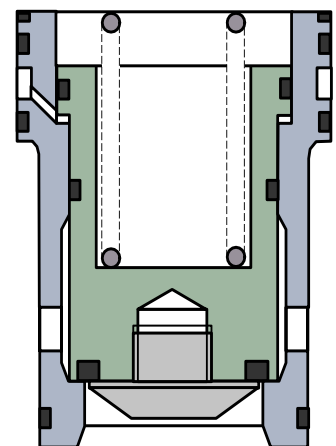
**Standard design  
Type 6D / S**

350bar - ND 010 to 100  
for water, oil and gas.  
For descaling applications up  
to size ND 250



**Non return valve  
Type 6D / R**

Up to 350bar - ND 010, 016,  
025 for water, descaling water,  
oil and gas.



**Active valve  
Type 6D / A**

Up to 350 bar - ND 16 to 100  
for water, oil and gas

#### OPTIONS:

Seawater resistant versions, expanded temperature range (200°C),  
expanded pressure range to 420bar (10% reduced flow rate)

## CARTRIDGE PROGRAM

### High pressure valve Type 6D / H1

These valves are designed for static pressures up to 1000bar.  
Pressurized opening and closing is possible with the following pressure differences:

Continuous operation water 600bar, frequently operation water 800bar.  
Continuous operation oil, compressed air 800bar

Media: water, emulsions, oil and compressed air.

Because of the stronger wall thickness the flow rate is reduced.  
For calculation please use the following flow curves:

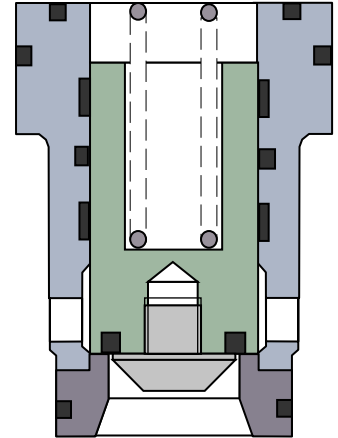
ND 16 = flow curve ND 10

ND 25 = flow curve ND 16

ND 32 = flow curve ND 25

ND 40 = flow curve ND 32

Options on request: larger sizes, sea water resistant versions, extended temperature versions (200°C)



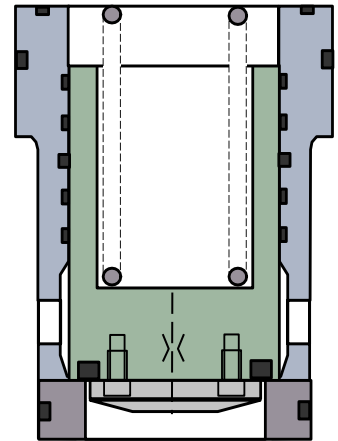
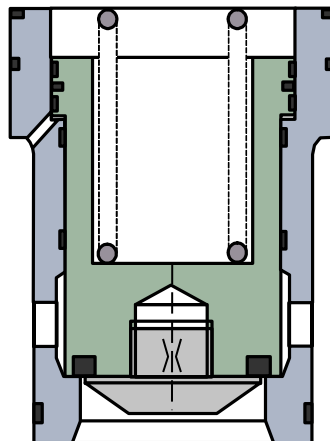
### Descaling valve Type 6D / Z

Up to 350bar - ND 063 to 250

ND 63 – 100mm area ratio 1:2

ND125 – 250mm area ratio 1:1.6

for water, descaling water and oil



### Manual operated Valve Type 7D

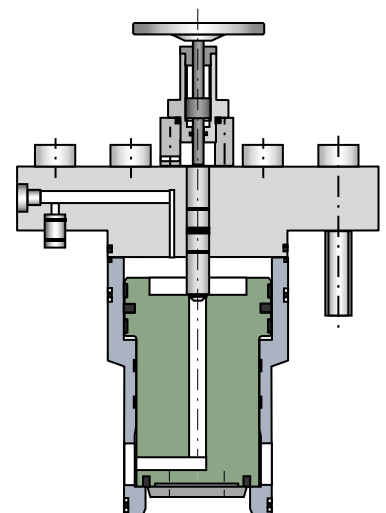
Up to 350bar - ND 063 to 150

for Water and Oil

These valves are designed for shut off functions. The servo system reduces the necessary manual power so that the valve can be operated under high pressure.

The manual spindle locks the piston in closed position even under pressure.

For more information please see catalogue DE2.4.13







## CARTRIDGE COVERS

These stainless steel cartridge covers are used for complete valve assemblies with Schrupp cartridge valves according to DIN 24342 and Schrupp pilot valves.

In addition to the standard types shown it is possible to produce special versions for individual applications:

Special covers for descaling valves

Cover with integrated functions such as position indicators, pilot combinations, special dimensions.

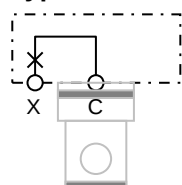
Covers for compressed air pilot valve ND6

Covers for filter

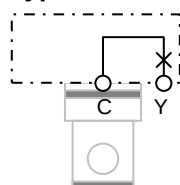
Covers with stroke limiter

### Hydraulic piloting and non-return function

**Type HX**



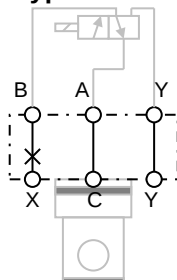
**Type HY**



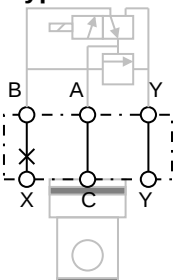
|           |           |            |            |            |            |            |                  |
|-----------|-----------|------------|------------|------------|------------|------------|------------------|
| 10        | 16        | 25         | 32         | 40         | 50         | 63         | Size             |
| 25        | 35        | 35         | 35         | 40         | 45         | 50         | Height           |
| M5<br>x30 | M8<br>x40 | M12<br>x40 | M16<br>x45 | M20<br>x55 | M20<br>x60 | M30<br>x70 | Fixing<br>screws |

### Pressure and directional functions

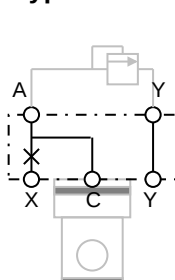
**Type WX**



**Type WX**



**Type DX**



|           |            |            |                  |
|-----------|------------|------------|------------------|
| 16        | 25         | 32         | Size             |
| 35        | 35         | 35         | Height           |
| M8<br>x40 | M12<br>x40 | M16<br>x45 | Fixing<br>screws |

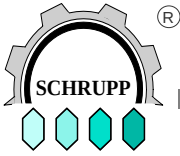
### Example / Ordering Code

WX – 025 – 0.5

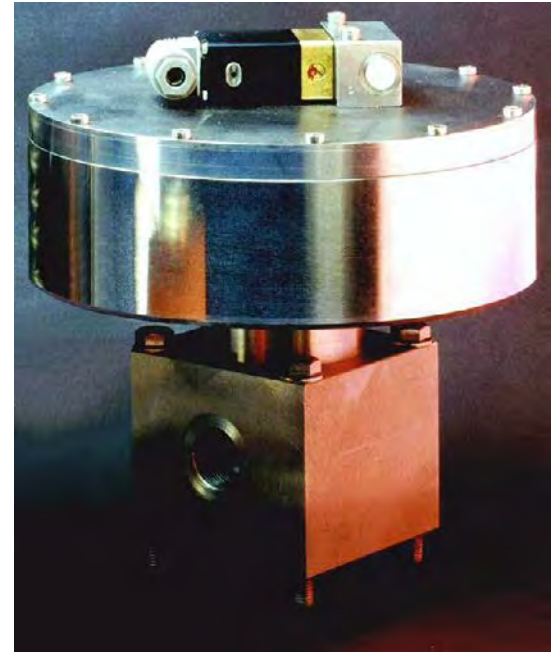
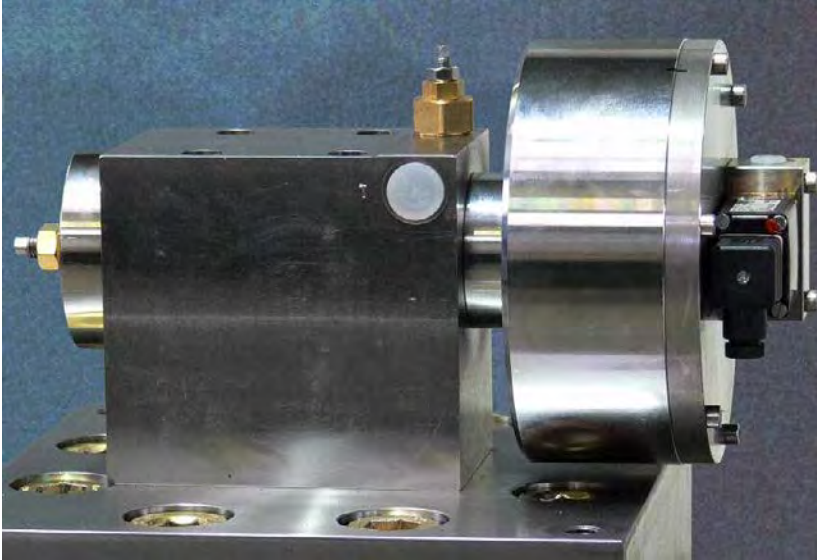
Orifice 0.5, 0.6, 0.7, 0.8, 0.9, 1.0, 1.1, 1.2

Sizes 010, 025, 032, 040, 050, 063 for HX and HY  
016, 025, 032 for WX and DX

Cover type WX, DX, HX, HY



## PILOT VALVES



### Valves for water hydraulic and descaling applications

These pilot valves can be used to operate cartridge valves from size 10 to 250mm.

The robust construction and compact design provide direct operation in circuits.  
Available as pressure and directional control valves up to 350bar.

**2/2 and 3/2 way directional control valves ND 2 to 32mm**

**Pressure relief and reducing valves ND 2mm**

Please also see our catalogues:

Cartridge program up to 350bar/pressure valves ND16 to 3/2 directional valves ND10 to 250

Complete Valves

Descaling Valves

High Pressure Valves up to 800bar

## PILOT VALVES

### 2/2, 3/2 Directional Valves

#### Type WEV 06

These robust and smooth operating valves can be used with compressed air, oil, water and emulsions. All ports can be pressurised. The valves type 500100, 500106 and 500008 are equipped with soft seats for a leak-free function. The piston is spring biased in the closed position and allows a fail safe operation so that the valve can be used for accumulator safety valves also.

Variations:

- solenoid operated
- manually operated
- hydraulically operated
- Limit switches

#### Type WEV 06 - 500100

NP 250bar ND6mm

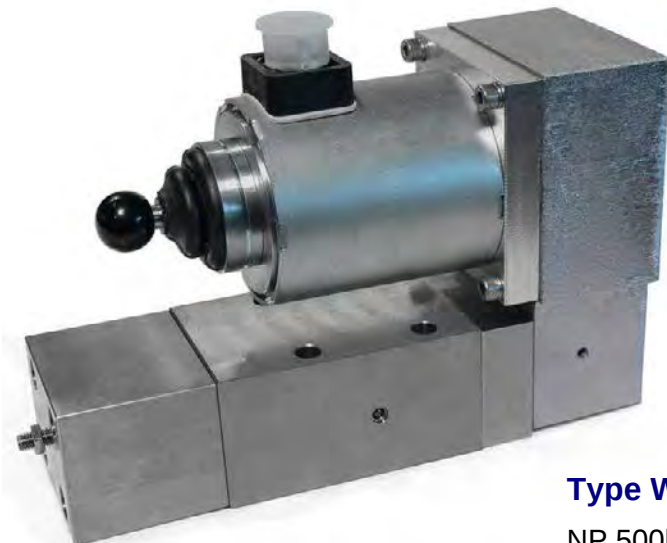
compressed air,  
gases Group 2 on request



#### Type WEV 06 - 500138

NP 250bar ND6mm

Water, oil and emulsions



#### Type WEV 06 - 500106

NP 350bar ND6mm

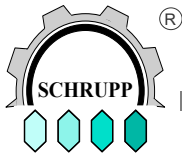
compressed air,  
gases Group 2 on request

#### Type WEV 06 - 500008

NP 500bar ND6mm

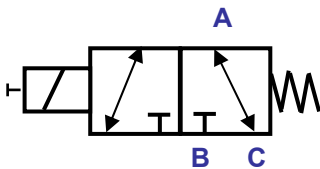
Water, oil and emulsions



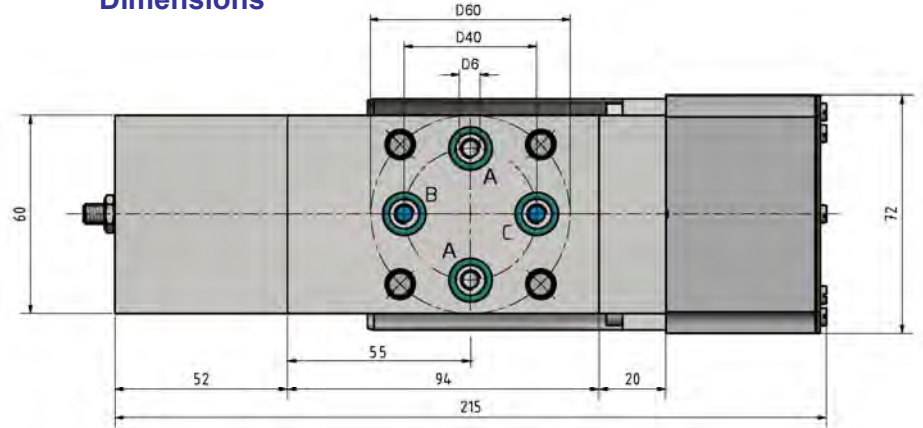


## PILOT VALVES

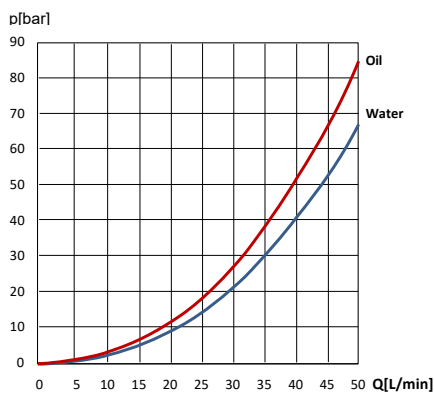
### Symbol



### Dimensions

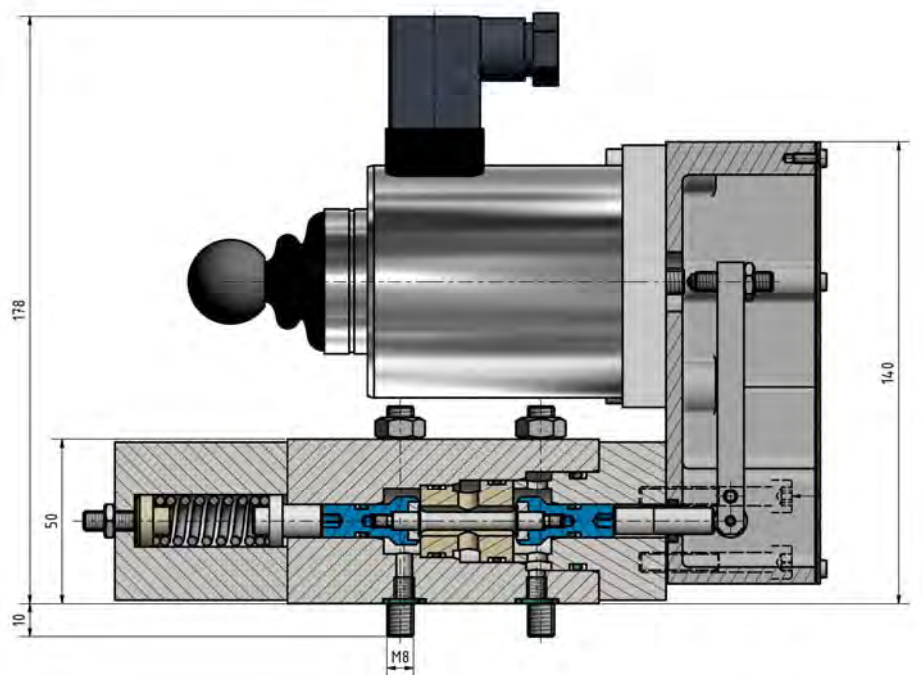


### Flow Characteristics



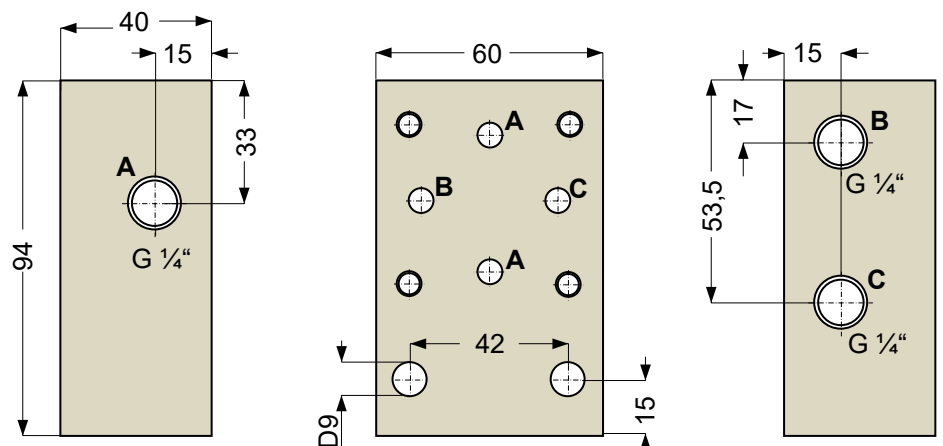
Higher operating pressures will require an orifice nozzle.

Ports A,B and C are equipped with M6 threads deep 8mm.



### Subplate for WEV06P

#### Dimensions



#### Ordering Code

Subplate: 850252

## PILOT VALVES

## 2/2, 3/2 Directional Valve Type 500138

can be used with oil, water and emulsions up to pressures of 250bar. This robust and smooth operating valve can be used also in descaling or dirty water applications. It can be used for flow in any direction.

All ports can be pressurised with 250bar. The valve is equipped with hardened seats. The piston is spring biased in the closed position and allows a fail safe operation so that the valve can be used for accumulator safety valves.

### Variations:

- solenoid operated
- gas or fluid operated
- manual operated



## Technical Data

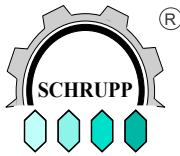
|                                                        |                                       |
|--------------------------------------------------------|---------------------------------------|
| Operating Pressure                                     | 0-250 bar                             |
| Size                                                   | DN6                                   |
| Operating Temperature                                  | -20 bis+80 °C                         |
| Ambient Temperature                                    | max 70°C                              |
| Medium                                                 | Wasser, Öl, Emulsion                  |
| Recommended Filtration                                 |                                       |
| 0-65bar                                                | 25 micron                             |
| 65-250bar                                              | 10 micron                             |
| 150-250bar water service only<br>occasionally operated |                                       |
| Max. Power consumption                                 | 42 W                                  |
| ED                                                     | 100%                                  |
| Protection Class                                       | IP 65                                 |
| Voltage Tolerance                                      | +5bis -10% VDE580                     |
| Opening and closing time                               | 100 - 200 ms                          |
| Material                                               | Stainless Steel, Brass, Delrin, Viton |

### Ordering Code

**Valve:** WEV06P-250-500138-01-024G 24V DC  
 120W 110V/50Hz (60Hz)  
 240W 220V/50Hz (60Hz)  
 max. operating pressure in bar

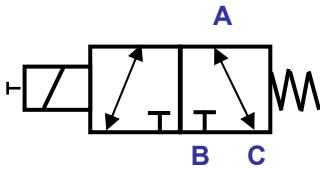
\*other voltages on request

Seal Kit: WEV06VTS-500038-01-92

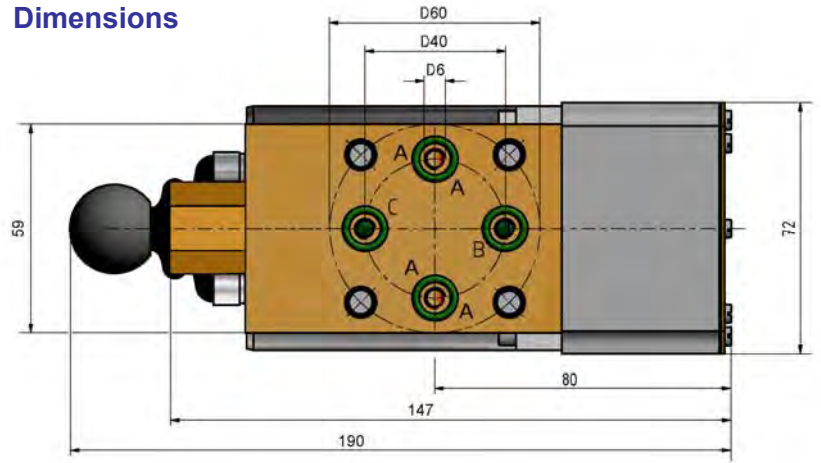


## PILOT VALVES

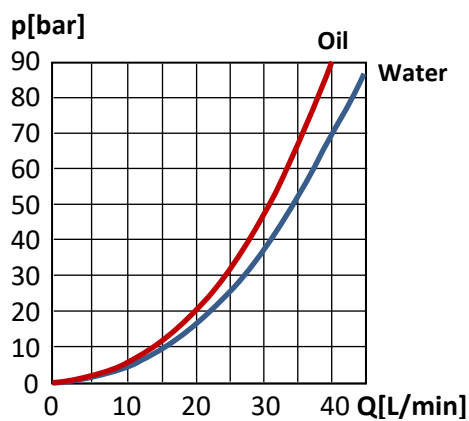
### Symbol



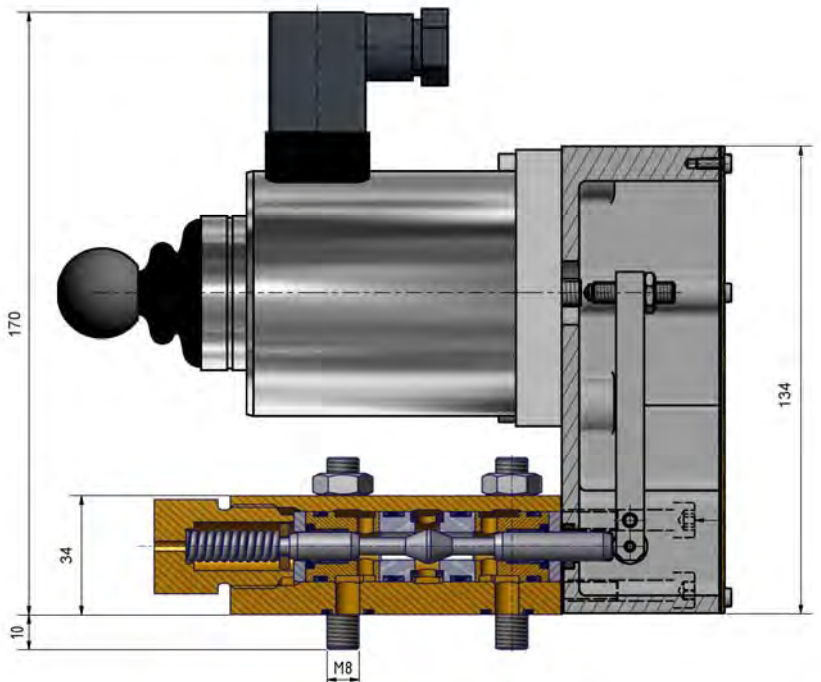
### Dimensions



### Flow Characteristics

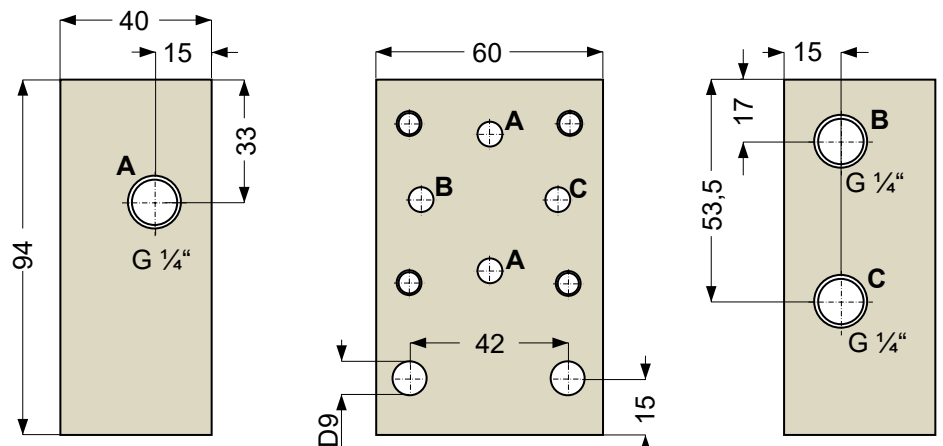


Higher operating pressures  
will require an orifice nozzle.



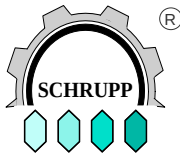
### Subplate for WEV06P

### Dimensions



### Ordering Code

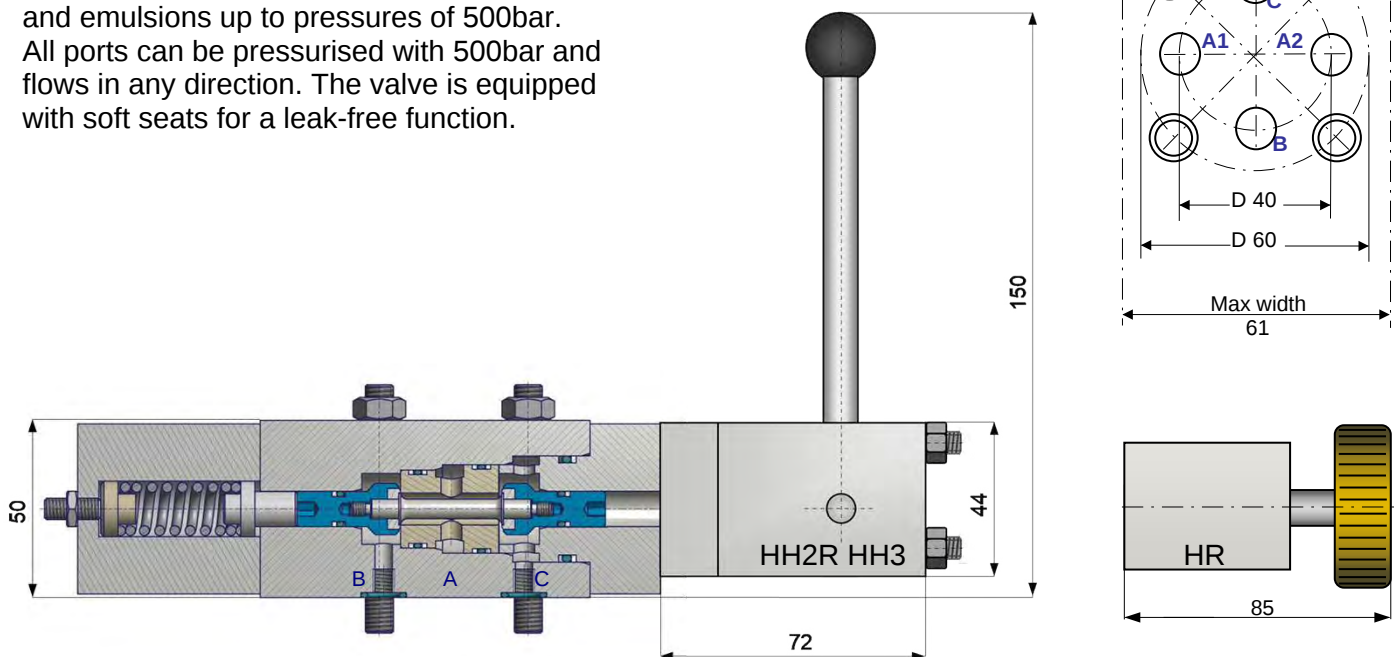
Subplate: 850252



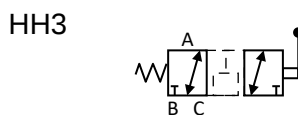
## PILOT VALVES

### Manual Operated Valves Type 500008 / 500106

can be used with compressed air, oil, water and emulsions up to pressures of 500bar.  
All ports can be pressurised with 500bar and flows in any direction. The valve is equipped with soft seats for a leak-free function.



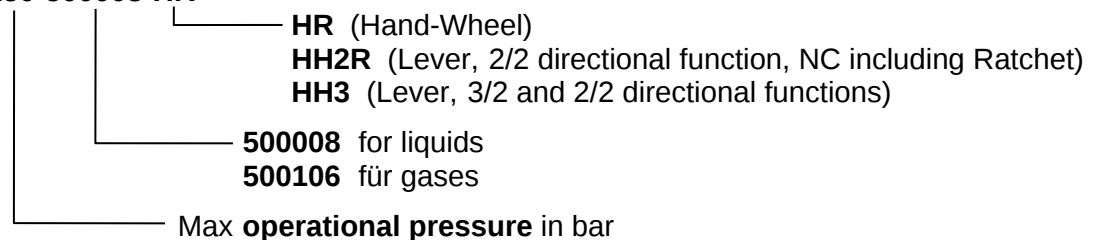
### Technical Data



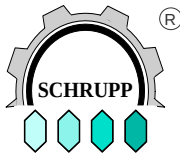
|                        |                                       |
|------------------------|---------------------------------------|
| Operating Pressure     | 0-500 bar                             |
| Nominal Size           | DN6                                   |
| Operating Temperature  | -20 bis +80 °C                        |
| Ambient Temperature    | max 70 °C                             |
| Medium                 | Gases, Water, Oil                     |
| Recommended Filtration | 25 my                                 |
| 0 to 350bar            | 10 my                                 |
| 350bar to 500bar       | Stainless Steel, Brass, Delrin, Viton |
| Material               |                                       |

### Ordering Code

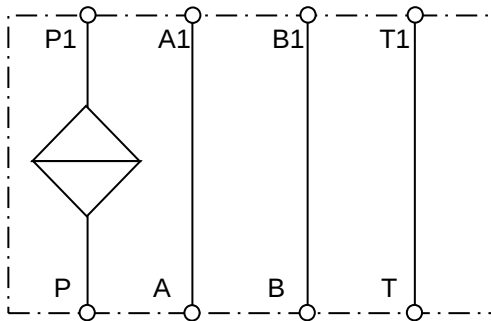
Valve: WEV06P-250-500008-HR



Others on request



## PILOT VALVES



### Filter Sandwich Plates Type 851014

Are used to protect type 500000 and 500002 pilot valves against contamination of dirt particles in compressed air, water or oil medium up to an operating pressure of 350bar. The spiral wound metal filter elements can be cleaned easily and have a filtration rate of 80 micr. These sandwich filters are used in systems with long distances between the central filter system and the pilot valves so that corrosion and dirt particles from the piping cannot penetrate into the pilot systems. The central filter system should have a filtration rate of 80micr or better.

#### Material

Stainless Steel, PTFE, PEEK, Viton

#### Technical Data

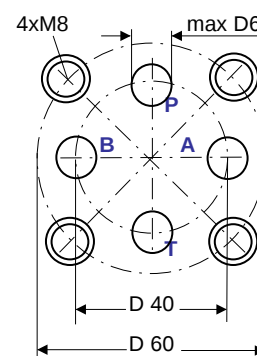
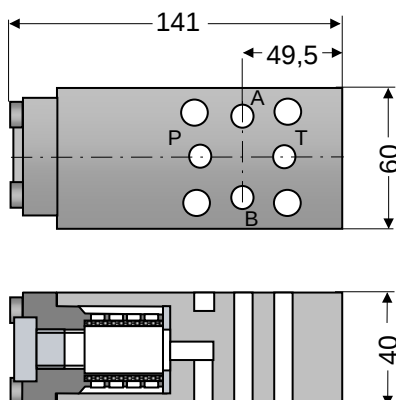
|                                              |                 |
|----------------------------------------------|-----------------|
| Operating pressure                           | 0-350 bar       |
| Nominal size                                 | DN4             |
| Operating temperature                        | -20 to +80 °C   |
| Ambient temperature                          | max 45 °C       |
| Medium                                       | Air, Water, Oil |
| Filtration                                   | 80 micr         |
| Spiral wound metal filter-element, cleanable |                 |

#### Order No.

Sandwichfilter complete  
Spare filter-element

**851014**

**157346**



## PILOT VALVES

### 3/2 Directional Pilot Valves

Schrupp pilot valves are soft seated with metal support especially designed to withstand the high pressures and levels of contamination found in typical steel mill descaling systems. The integrated throttle valves allow an adjustment of the opening and closing speed of the main valve. The valves are designed for fail safe operation, which means that the main valve will close automatically even if the electric or pneumatic power is off

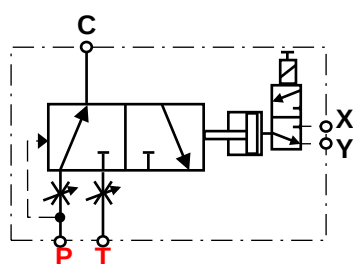
(i.e accumulator shut off valves).

#### Technical Data:

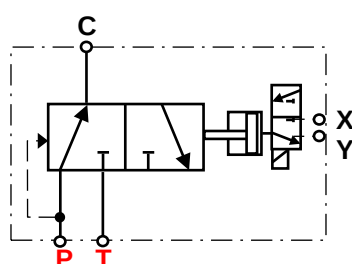
|                              |            |
|------------------------------|------------|
| ND                           | 10 mm      |
| Hydraulically oper, pressure | 15-350bar  |
| Pneumatic Pressure           | 2-10bar    |
| Filtration                   | 50-100 mic |
| Power Consumption            | 8W         |
| Tolerance Voltage            | 10%        |
| Protection Class             | IP65       |

#### Diagram

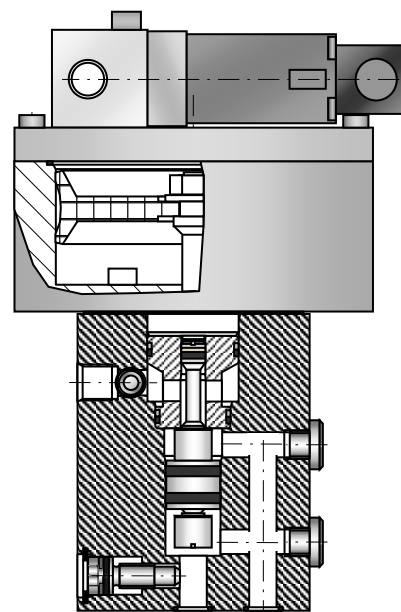
Version with integrated opening and closing speed adjustment



Version without speed adjustment



### Type 851037



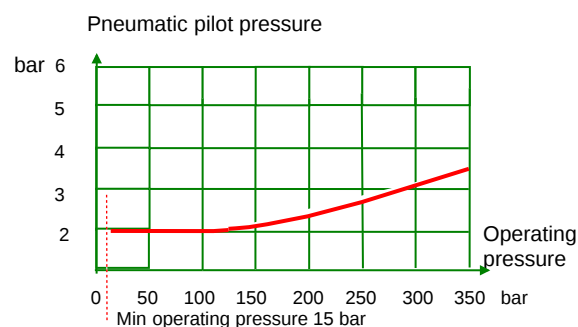
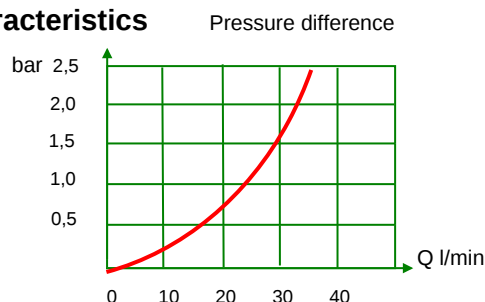
#### Ordering Code

Version with speed adjustment

|                  |             |
|------------------|-------------|
| 24V GL           | 851037 24V  |
| 110-120V 50/60Hz | 851037 120V |
| 220-240V 50/60Hz | 851037 240V |

Special designs:  
F.e. manual override, position indicator,  
different pilot pressure range,  
special materials

#### Characteristics



## PILOT VALVES

### Dimensions

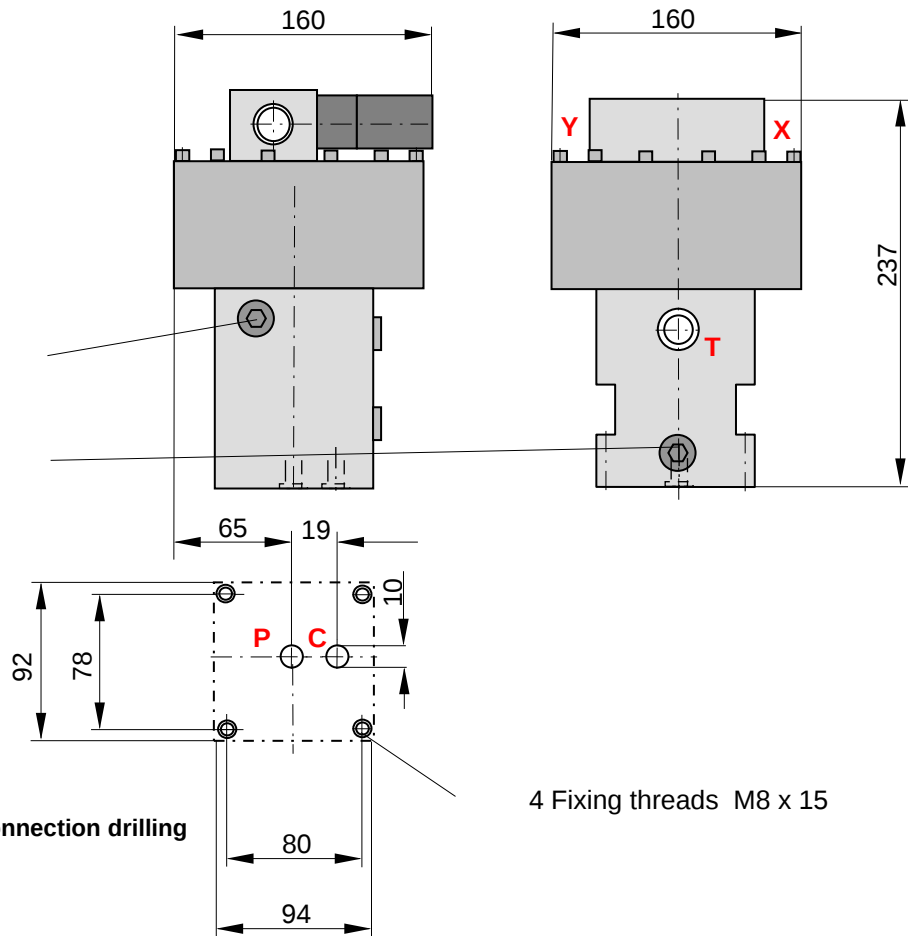
#### Connections:

X, Y = G1/4"

T = G3/8"

Opening speed  
adjustment

Closing speed  
adjustment



Max dimension of the connection drilling  
10mm.

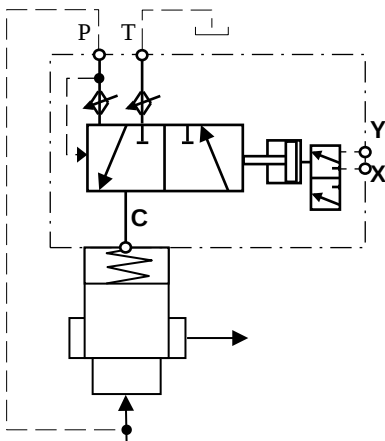
Surface  $\sqrt{R_{max4}}$

Fixing screws 4x M8x30mm.

The fixing threads have to have a depth of  
15mm min.

Altern. thread and screws 5/16" – 18 UNC

4 Fixing threads M8 x 15

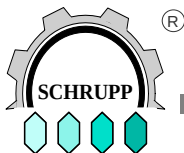


### Example

Typical application for an ND10 pilot valve in  
combination with a large cartridge valve.

The valve is spring loaded and closed without  
electrical or pneumatic power.

The pilot valve can be used for cartridges ND50 to  
ND100mm



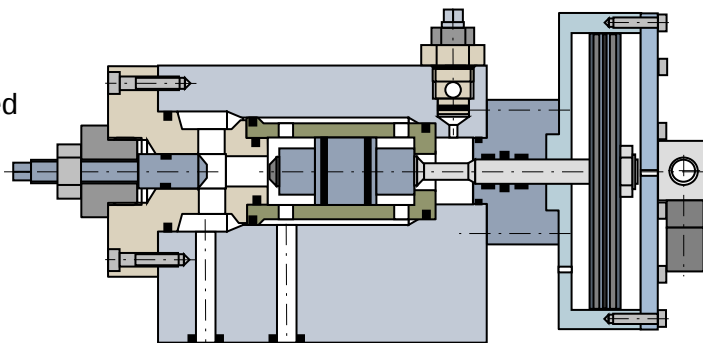
## PILOT VALVES

### 3/2 Way Pilot Valve

Schrupp pilot valves are soft seated with metal support especially designed to withstand the high pressures and levels of contamination found in typical steel mill descaling systems. The integrated throttle valves allow an adjustment of the opening and closing speed of the main valve. The valves are designed for fail safe operation, which means that the main valve will close automatically even if the electric or pneumatic power is off

(i.e accumulator shut off valves).

### Series 850885



#### Technical Data

|                              |            |
|------------------------------|------------|
| ND                           | 16 mm      |
| Hydraulically oper, pressure | 7-350bar   |
| Pneumatic Pressure           | 3-10bar    |
| Filtration                   | 50-100 mic |
| Power Consumption            | 8W         |
| Tolerance Voltage            | 10%        |
| Protection Class             | IP65       |

#### Ordering Code

Version with speed adjustment

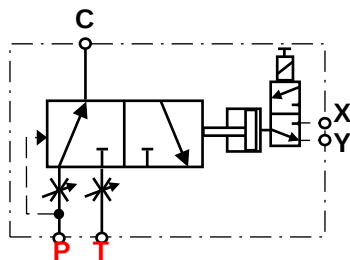
|                  |             |
|------------------|-------------|
| 24V GL           | 850885 24V  |
| 110-120V 50/60Hz | 850885 120V |
| 220-240V 50/60Hz | 850885 240V |

Version without speed adjustment

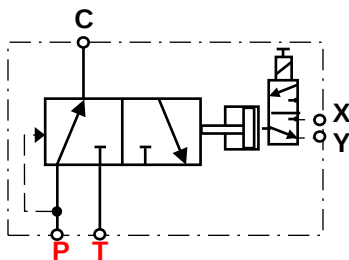
|                  |                |
|------------------|----------------|
| 24V GL           | 850885-01 24V  |
| 110-120V 50/60Hz | 850885-01 120V |
| 220-240V 50/60Hz | 850885-01 240V |

#### Diagram

Version with integrated opening and closing speed adjustment

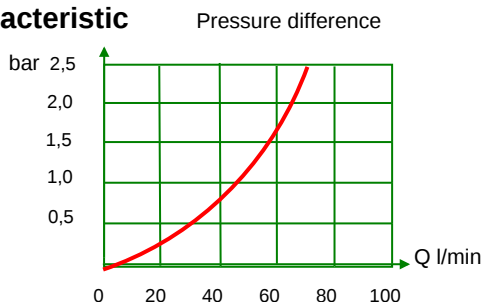


Version without speed adjustment

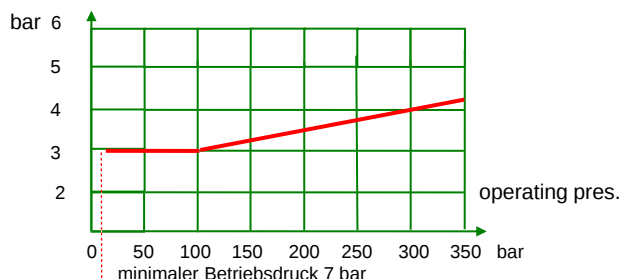


Special designs:  
F.e. manual override, position indicator,  
different pilot pressure range, special materials

#### Characteristic



#### Pneumatic pilot pressure



## PILOT VALVES

### Dimensions

#### Connections:

X, Y = G1/4"

T = G1/2"

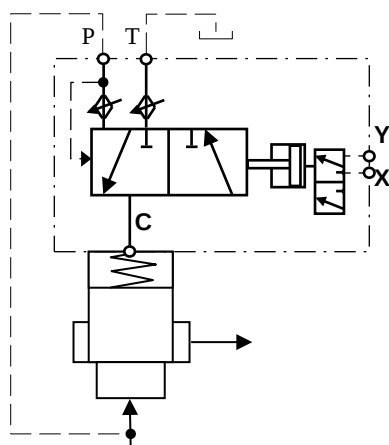
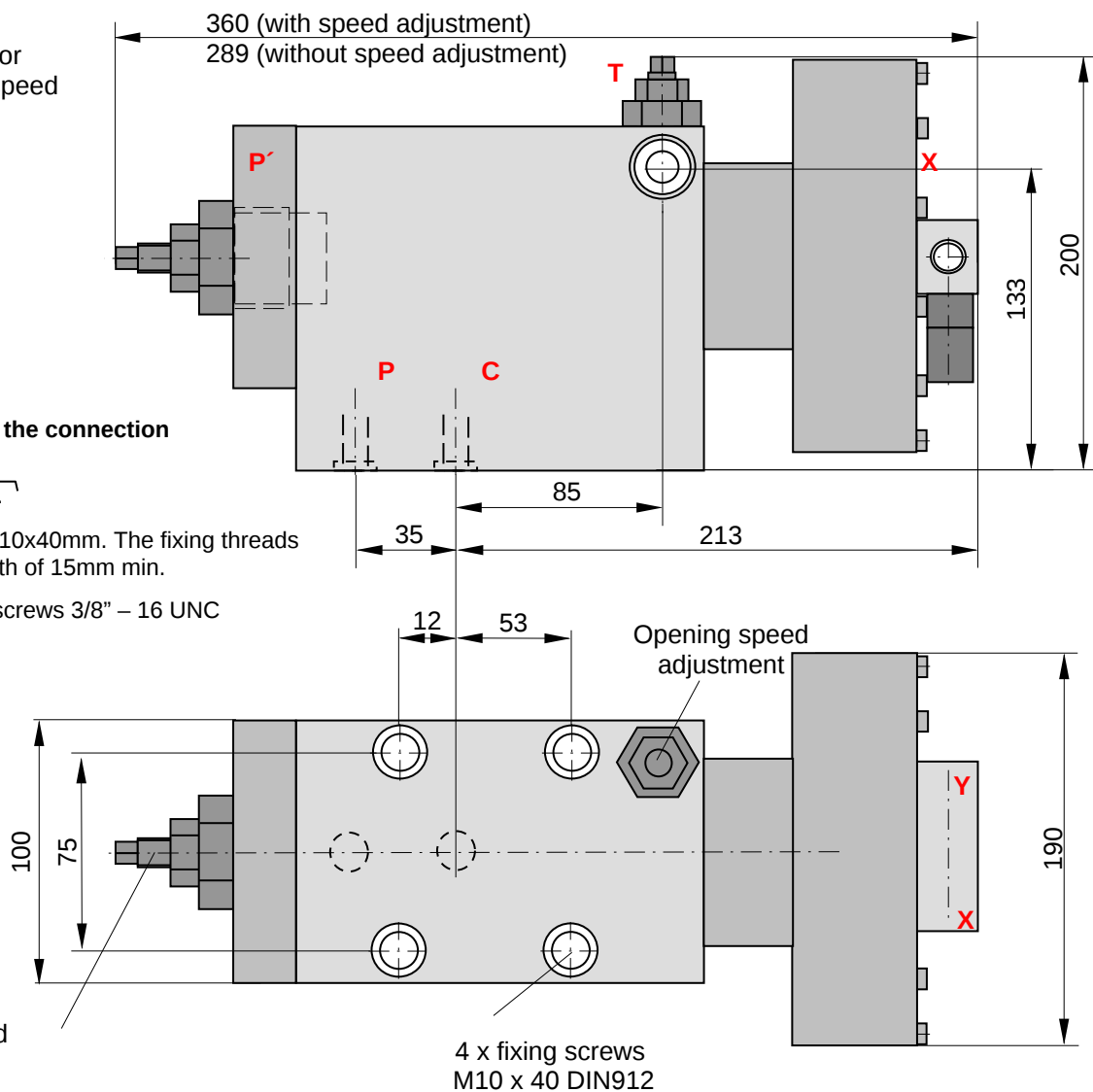
P' = G1" (only for version without speed adjustment)

Max dimension of the connection drilling 25mm.

Surface  $\sqrt{R_{max}4}$

Fixing screws 4x M10x40mm. The fixing threads have to have a depth of 15mm min.

Altern. thread and screws 3/8" – 16 UNC

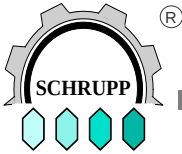


### Example

Typical application for a P6P valve in combination with a large cartridge valve.

The valve is spring loaded and closed without electrical or pneumatic power.

The pilot valve can be used for cartridges ND65 to ND250mm



## PILOT VALVES

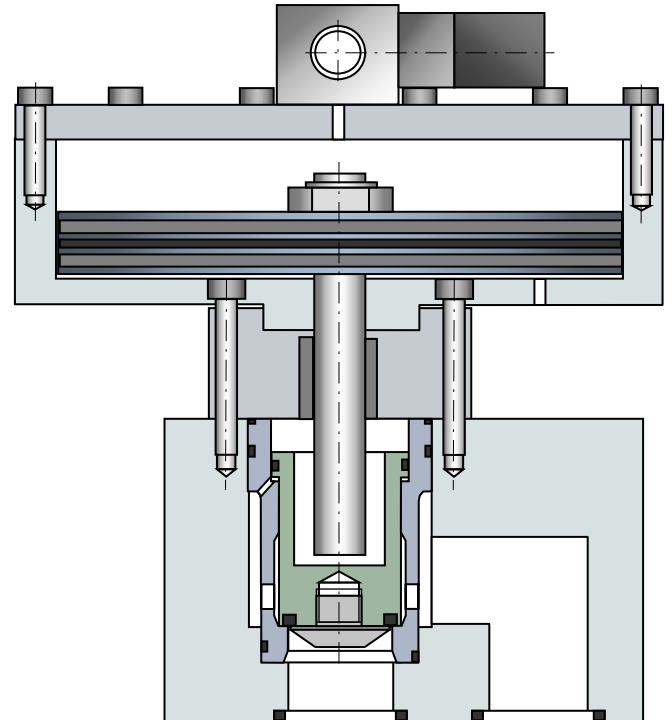
### 2/2 Directional Pilot Valve

### Type P2P

Pilot valves Type 2 are used for control of Schrupp water hydraulic valves, especially in those systems with contaminated media such as descaling systems. These robustly designed valves are frequently used without pilot filtration and can also be used as 2/2 way directional control valves.

#### Technical Data

|                              |              |
|------------------------------|--------------|
| Size                         | 10,16, 25 mm |
| Hydraulic pressure           | 350bar       |
| Pneumatic pressure           | 2-10bar      |
| Recommended filtration       | 50 mic       |
| Electrical power consumption | 8W           |
| Voltage tolerance            | 10%          |
| Electrical protection        | IP65         |



#### Ordering Code

**P2P 16 - 6 - 1 - F - 024G**

- S V Ratio if special

**024 G** = 24v DC

**220 W** = 220v/50Hz

**F** = Fluid  
**G** = Gas

**0** = without Pilot  
**1** = normal open  
**2** = normal close

**3** = Hard Seat  
**6** = Soft Seat (Standard)

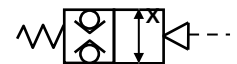
**16** = Size 10,16, 25 (mm)

**P2P** = for subplate mounting

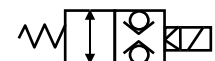
**P2R** = with threaded connections (on request)

#### Diagrams

Without pilot valve



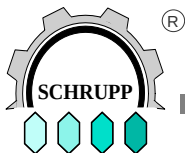
Normally open



Normally closed

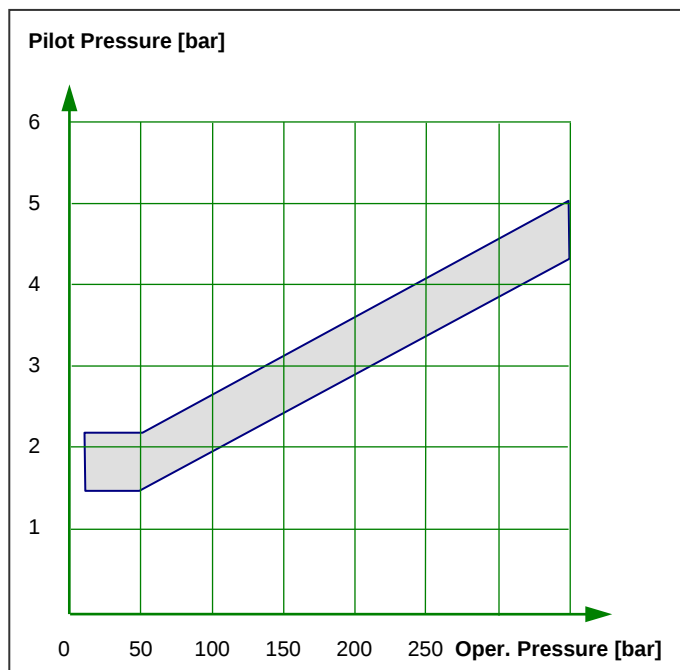
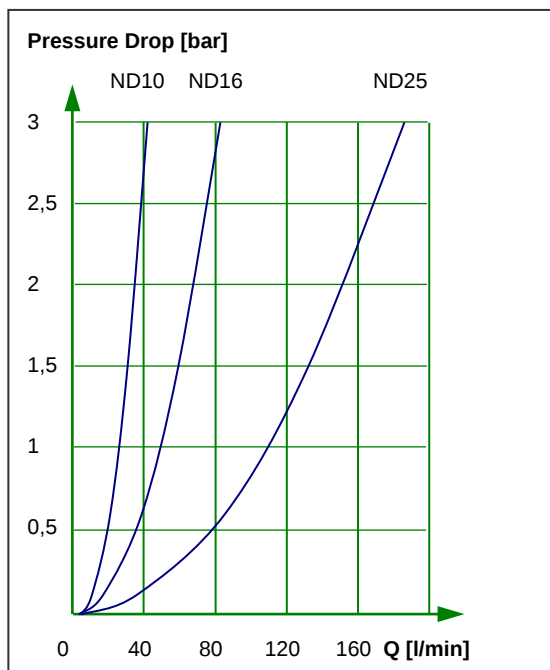


Others on request

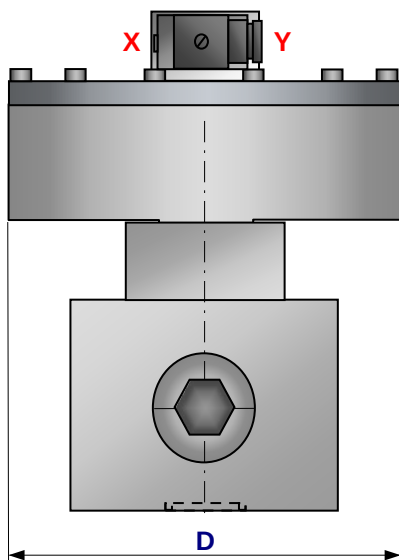


## PILOT VALVES

### Characteristics



### Dimensions



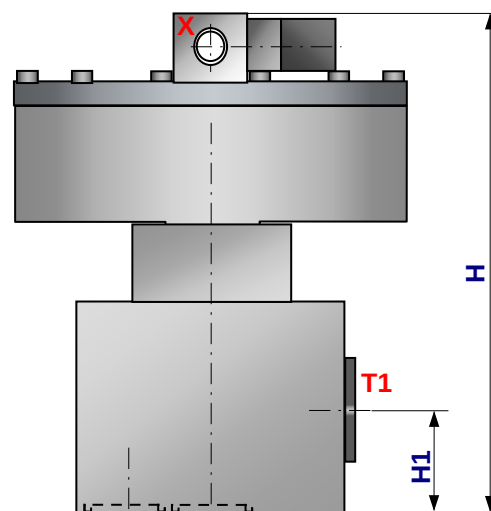
Connections:

X Pilot Pressure = G1/4"

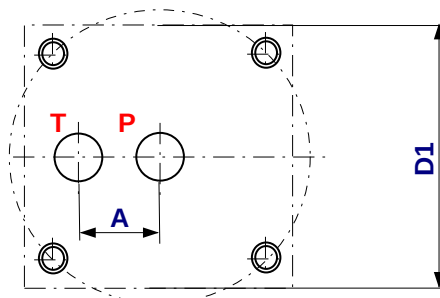
Y Vent = G1/4"

T,P main connections

T1 Alternative connection



| NW | D   | D1  | H   | H1   | A    | T, P | T1      | Fixing Bolts |              |
|----|-----|-----|-----|------|------|------|---------|--------------|--------------|
|    |     |     |     |      |      |      |         | thread       | Thread depth |
| 25 | 275 | 140 | 268 | (51) | 38,5 | D25  | (G3/4") | M12          | 20           |
| 16 | 211 | 112 | 176 | 29   | 28   | D16  | G3/8"   | M10          | 20           |
| 10 | 130 | 74  | 139 | 22,5 | 22   | D10  | G1/8    | M8           | 12           |

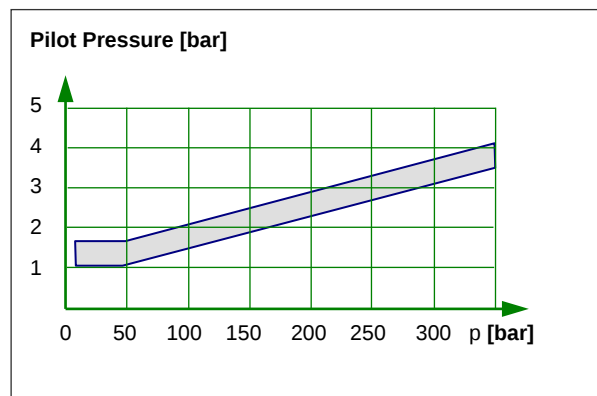
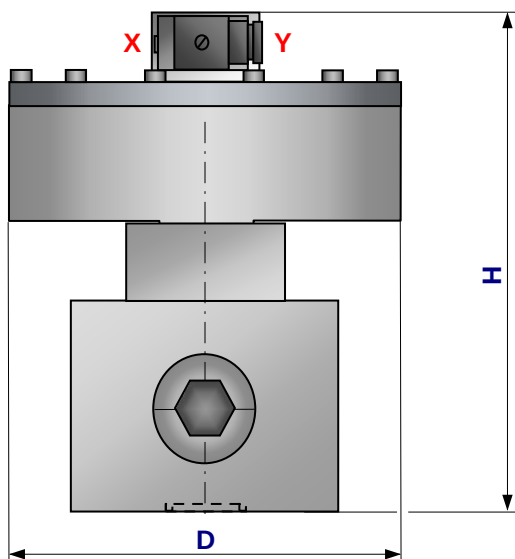


## PILOT VALVES

### 2/2 Directional Pilot Valve

### Type P2P

Special application with larger pilot cylinder



| NW | D   | H   | Other dimensions and characteristics<br>identical to standard version<br><b>Ordering Code</b><br>..... - SV |
|----|-----|-----|-------------------------------------------------------------------------------------------------------------|
| 16 | 235 | 216 |                                                                                                             |
| 10 | 160 | 156 |                                                                                                             |

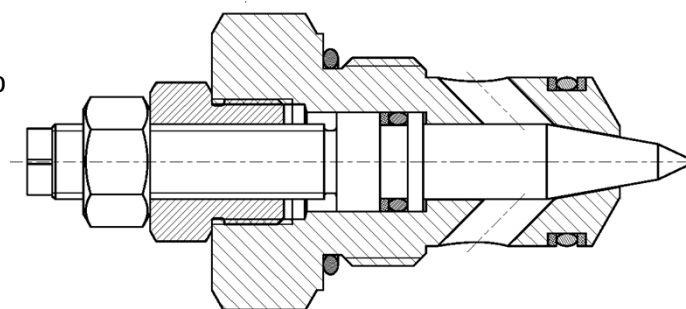
## Throttle Valves

are used in combination with pilot valves type P2P for the adjustment of the opening and closing speed and can be integrated into the cartridge cover or into an separate sandwich plate.

### Ordering Code:

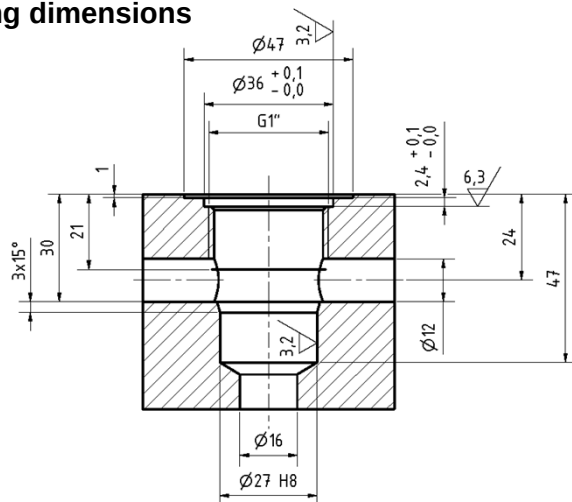
DN 10 PN350 **654261**

DN 16 PN350 **654192**

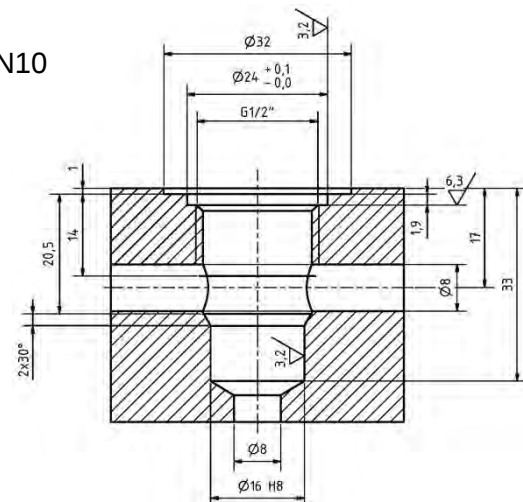


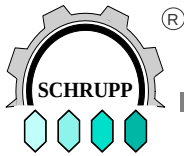
### Drilling dimensions

DN16



DN10





## PILOT VALVES

### Pressure Valves

Valves DBP, DBZ are used to pilot cartridge valves in pressure control functions. Because of their robust design they are also used for direct operations.

#### Technical Data:

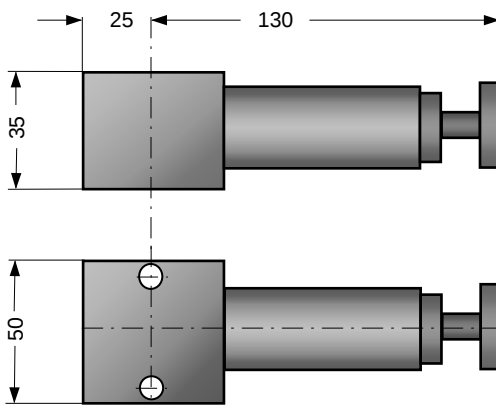
|                        |      |                  |
|------------------------|------|------------------|
| Size                   | .... | 2 mm             |
| Pressure max           |      | 350bar / 400 bar |
| Filtration min         |      | 10 mic           |
| Installation possible) |      | vertical (others |

#### Example / ordering code

**DBP2 - S**

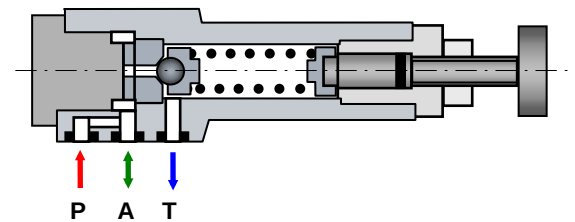
**PDBP2**= Relief valve sub plate for mounting NW 2  
**PDBZ2** = Sandwich type relief vale

#### Dimensions

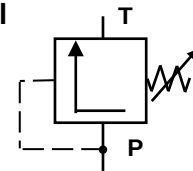


### Type PDBP/PDBZ

#### Type

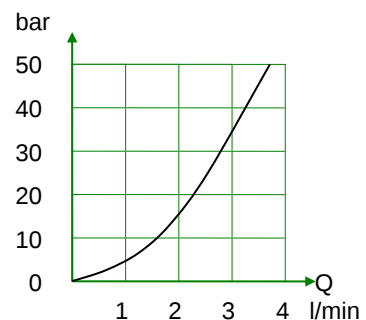


#### Symbol

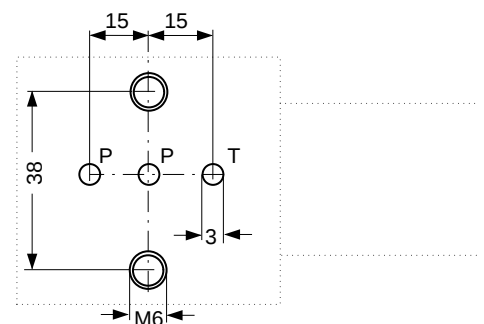


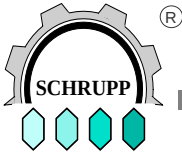
#### Diagram

Pressure difference, medium water



#### Connections





## PILOT VALVES

### Position indicator optical

to indicate the position of the piston of a cartridge type valve. The robust design is based on permanent magnets and does not need any dynamic seals, so that a safe operation even with contaminated water is possible.

#### Technical data:

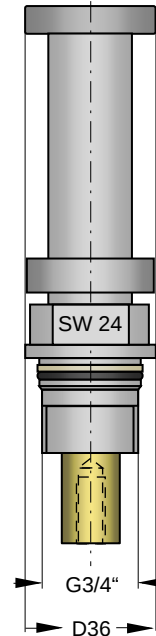
Operating pressure: 350 bar / 400 bar

Rec.filtration 300 micron or better

Media: Water, oil, gases

Installation: vertical (others possible)

Length: varies with cartridge valve dimension



### Position indicator with adjustable switches

up to 4 individual adjustable switches indicates the actual position of the piston of a cartridge type valve. The robust design is based on permanent magnets and does not need any dynamic seals, so that a safe operation even with contaminated water is possible.

#### Technical data:

Operating pressure: 350 bar / 400 bar

Rec.filtration 300micron or better

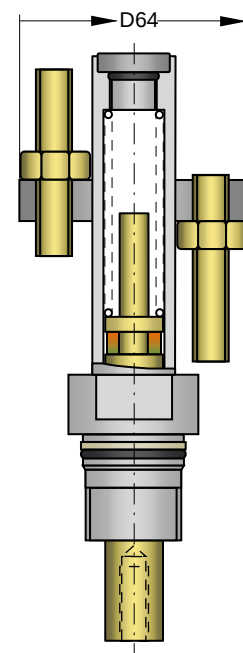
Media: Water, oil, gases

Installation: vertical (others possible)

Length: varies with cartidge valve

Electrical switches 24v, 10W NO.

Others on request



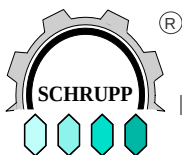


## COMPLETE VALVES

Cartridge type valves can be combined in many different ways. This selection gives an overview of the most popular valves. Special designs on request.

| Pos   | Type                                                       | Medium             | Pilot                                                              | Press. max | Size              | Symbol | Page     |
|-------|------------------------------------------------------------|--------------------|--------------------------------------------------------------------|------------|-------------------|--------|----------|
| KV 12 | Directional valve                                          | Water, Air, Oil    | Electro-hydraulic operated x,y internal or external ND6 Type WEV06 | 350bar     | 25 mm<br>40,50 mm |        | 2<br>3,4 |
| KV 2  | Directional valve                                          | Water, Air, Oil    | Electro-hydraulic ND6 Type WEV06                                   | 350bar     | 10-40mm           |        | 5        |
| KV 3  | Directional Valve                                          | Water, Air, Oil    | Electro-hydraulic ND6 Type WEV06                                   | 350bar     | 16-32mm           |        | 6        |
| KV 4  | Directional Valve with mainstream filter                   | Water, Air, Oil    | Electro-hydraulic ND6 Type WEV06                                   | 350bar     | 16mm              |        | 7        |
| KV 7  | Pressure relief valve                                      | Water              | Pressure relief NDG2 Type DBP2                                     | 350bar     | 16-32mm           |        | 10       |
| KV 8  | Pressure reducing valve                                    | Water              | Pressure relief NDG2 Type DBP2                                     | 350bar     | 16-32mm           |        | 11       |
| KV 9  | Medium operated valves, non-return valves, stroke limiter, | Water, Air, Oil    | Medium operated                                                    | 350bar     | 10-40mm           |        | 12       |
| KV 13 | Throttle Valves                                            | Water Emulsion Oil | Manual operated with servo-hydraulic assistance                    | 350bar     | 25-200mm          |        | 13       |
| KV 10 | Directional valve                                          | Water, Air, Oil    | Electro-pneumatic-hydraulic                                        | 800bar     | 10-25mm           |        | 14       |
| KV 11 | Directional valve                                          | Water, Air, Oil    | Electro-hydraulic                                                  | 800bar     | 10-40mm           |        | 15       |

Valve Type KV6 and KV7 according to produkt data sheet E2.4.8 and D2.4.9 are not available anymore



## COMPLETE VALVES

### Type 2/2 Directional Valve 850233

This robust soft seated valves can be used for the directional control of gases and fluids.

Replacement for V2003

#### Technical Data:

Nominal Pressure: 3 - 350bar

Nominal Size: 25mm

Media: Water Emulsion, Oil, compressed Air, others on request

Pilot pressure has to be equal or higher than the operating pressure. Pilot pressure max 400bar

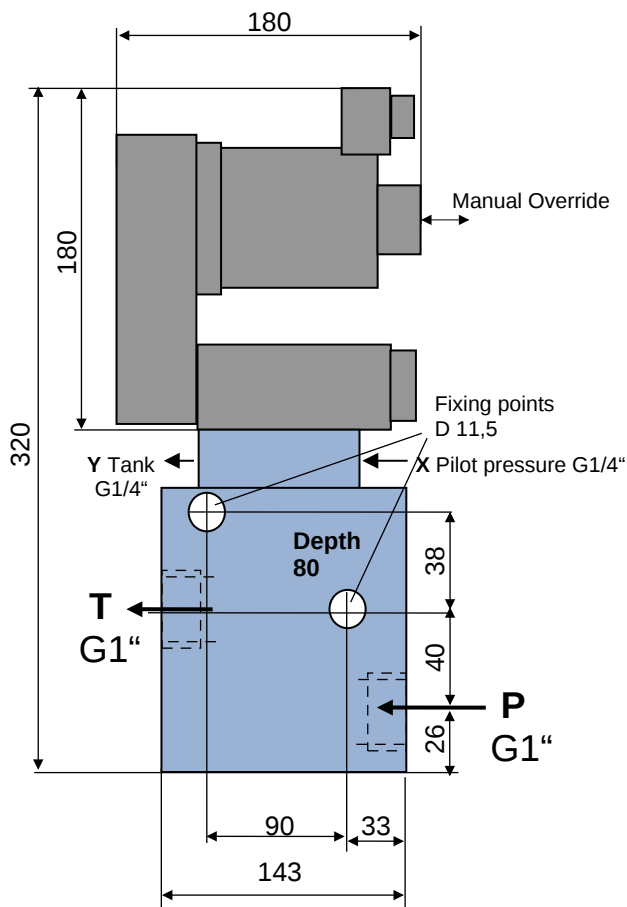
Pressure at port y-for internal operation at port T, has to be min 5bar below the operating pressure at P.

Material: Stainless Steel, Viton, Teflon

Soft seated with metal support

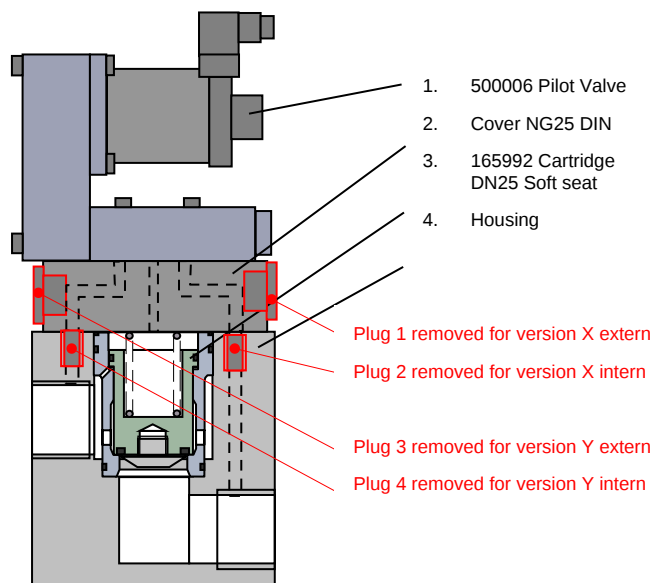
Ambient temperature: 0-50°C

Protection Class: IP65



#### Ordering Code

| 850233 | x-internal / y-internal | 024GL  | KV12 |
|--------|-------------------------|--------|------|
|        | x-extern / y-internal   | 220 WS |      |
|        | x-internal / y-extern   | 110 WS |      |
|        | x-extern / y-extern     | 048 GL |      |





## COMPLETE VALVES

### Type 2/2 Directional Valve 850269

This robust soft seated valve can be used for the directional control of gases and fluids.

Replacement for V2006

#### Technical Data:

Nominal Pressure: 3 - 350bar

Nominal Size: 50mm

Media: Water Emulsion, Oil, compressed Air, others on request

Pilot pressure has to be equal or higher than the operating pressure. Pilot pressure max 400bar

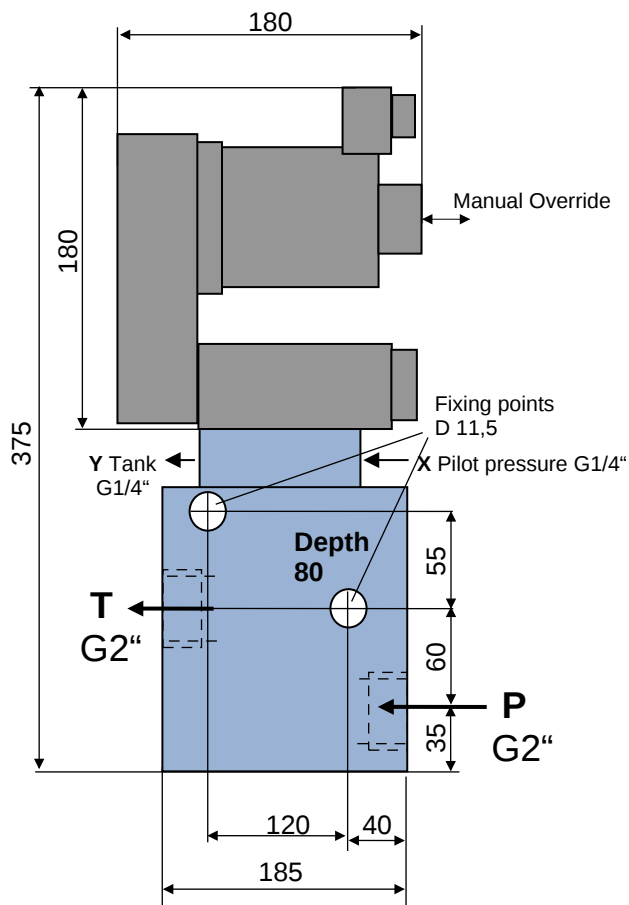
Pressure at port y-for internal operation at port T, has to be min 5bar below the operating pressure at P.

Material: Stainless Steel, Viton, Teflon

Soft seated with metal support

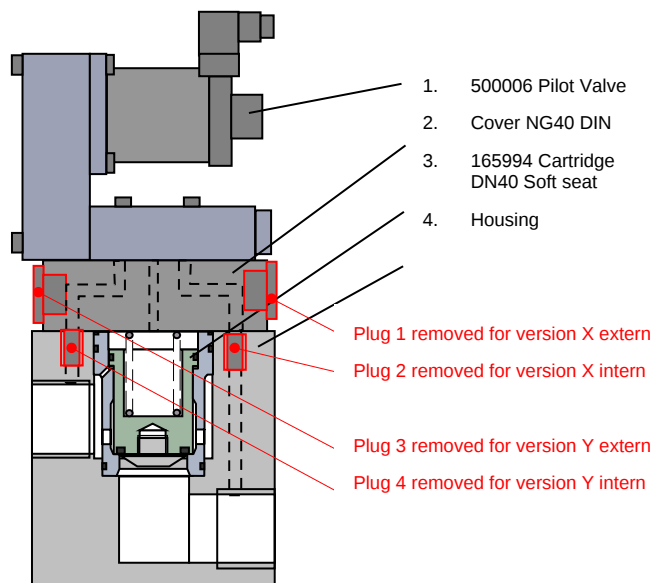
Ambient temperature: 0-50°C

Protection Class: IP65



#### Ordering Code

| 850269 | x-internal / y-internal | 024GL  | KV12 |
|--------|-------------------------|--------|------|
|        | x-external / y-internal | 220 WS |      |
|        | x-internal / y-external | 110 WS |      |
|        | x-external / y-external | 048 GL |      |





## COMPLETE VALVES

### Type 2/2 Directional Valve 850312

This robust soft seated valve can be used for the directional control of gases and fluids.

Replacement for V2005

#### Technical Data:

Nominal Pressure: 3 - 350bar

Nominal Size: 40mm

Media: Water Emulsion, Oil, compressed Air, others on request

Pilot pressure has to be equal or higher than the operating pressure. Pilot pressure max 400bar

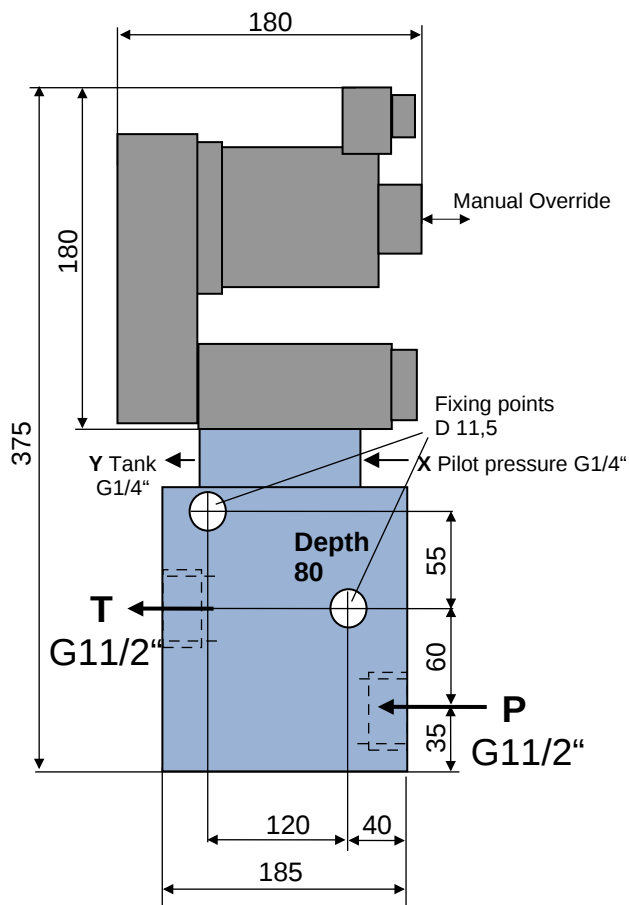
Pressure at port y-for internal operation at port T, has to be min 5bar below the operating pressure at P.

Material: Stainless Steel, Viton, Teflon

Soft seated with metal support

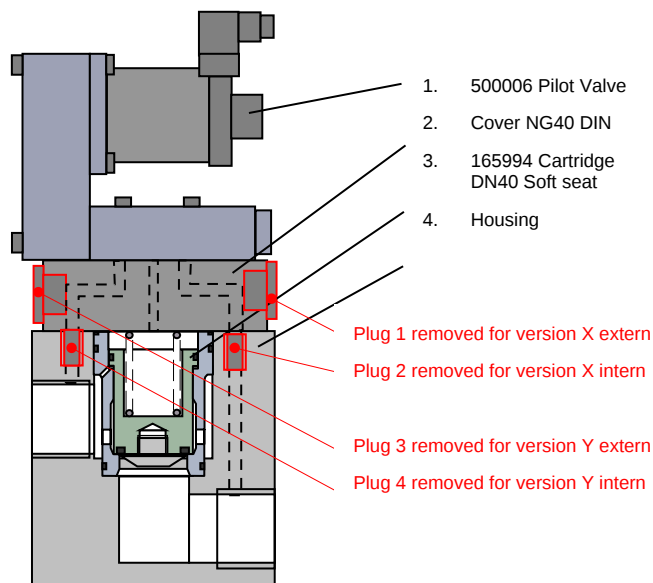
Ambient temperature: 0-50°C

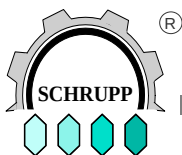
Protection Class: IP65



#### Ordering Code

| 850312 | x-internal / y-internal | 024GL  | KV12 |
|--------|-------------------------|--------|------|
|        | x-external / y-internal | 220 WS |      |
|        | x-internal / y-external | 110 WS |      |
|        | x-external / y-external | 048 GL |      |





## COMPLETE VALVES

### Type 2/2 Way Directional Valve

Medium Water, Air, Oil  
Oper. Press. 350bar  
Filtration 25mic  
Sealing Soft seat, metal supported

Material SS, brass  
Sizes\* 10, 16, 25, 32, 40 mm  
Voltage\* 24V, 48V, 98V, 196V dc  
Additional rectifier 110V/50Hz, 220V/50Hz ac

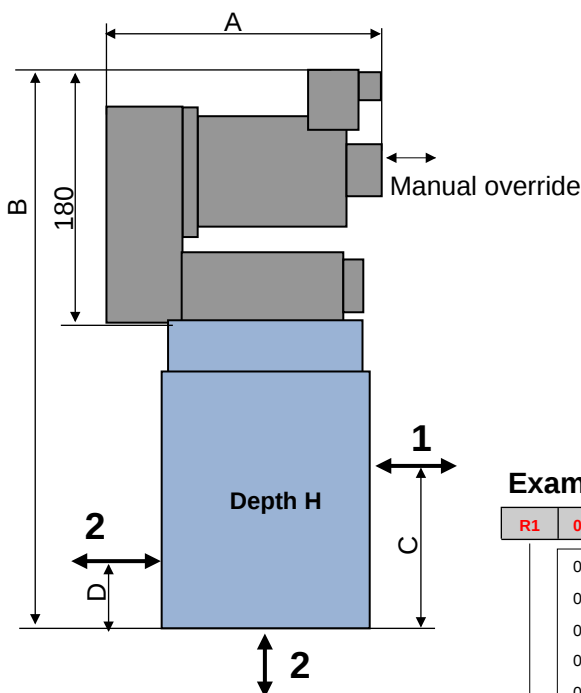
Not applicable for descaling water (please see our catalogue Descaling Valves, Pilot Valves)

\*Other voltages on request.

### Symbol



### Dimensions



| ND | Connections |         |                     | A   | B   | C   | D  | H   |
|----|-------------|---------|---------------------|-----|-----|-----|----|-----|
| 10 |             | G1/2"   |                     | 180 | 280 | 55  | 26 | 60  |
| 16 | G1/2"       | G3/4"   | SAE 3/4" Standard   | 180 | 320 | 71  | 32 | 65  |
| 25 | G3/4"       | G1"     | SAE 1" Standard     | 180 | 345 | 86  | 36 | 85  |
| 32 | G1"         | G1 1/4" | SAE 1 1/4" Standard | 180 | 370 | 103 | 39 | 102 |
| 40 |             | G1 1/2" | SAE 1 1/2" Standard | 180 | 400 | 116 | 47 | 125 |

### Example / Ordering Code

|    |     |  |    |  |      |   |     |
|----|-----|--|----|--|------|---|-----|
| R1 | 016 |  | 17 |  | 024G | B | KV2 |
|----|-----|--|----|--|------|---|-----|

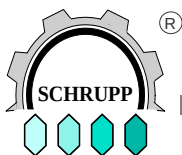
010 = Size 10  
016 = Size 16  
025 = Size 25  
032 = Size 32  
040 = Size 40

R10 = ND10 thread-connections G1/2"  
R12 = ND10 flanges SAE 1/2"  
R1 = ND16 thread-connections G1/2"  
R2 = ND16 thread-connections G3/4"  
R3 = ND16 flanges SAE 3/4"  
R4 = ND25 thread-connections G3/4"  
R5 = ND25 thread-connections G1"  
R6 = ND25 flanges SAE 1"  
R7 = ND32 thread-connections G1"  
R8 = ND32 thread-connections G1 1/4"  
R9 = ND32 flanges SAE 1 1/4"  
R13 = ND32 thread-connect. G1 1/2"  
R14 = ND32 flanges SAE 1 1/2"

B = Square ac connector small  
D = Square dc connector large  
F = Square conn. for ac and dc with ign.light

024G = 24V dc  
098G = 98V dc  
196G = 196V dc  
110W = 110V ac  
220W = 220V ac

17 = Normally closed (NC)  
18 = Normally open (NO)



## COMPLETE VALVES

### Type 2/2 Way Directional Valve

Medium Water, Air, Oil  
Oper. Press. 350bar  
Filtration 80mic  
Sealing Soft seat, metal supported

Material SS, brass  
Sizes\* 16, 25, 32mm  
Voltage\* 24V, 48V, 98V, 196V dc  
Additional rectifier 110V/50Hz, 220V/50Hz ac

\* Other voltages and sizes on request.

### Symbol

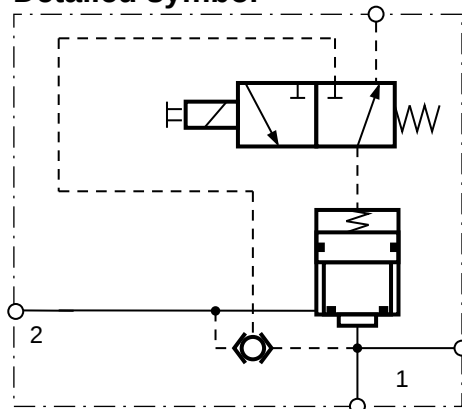


### Description

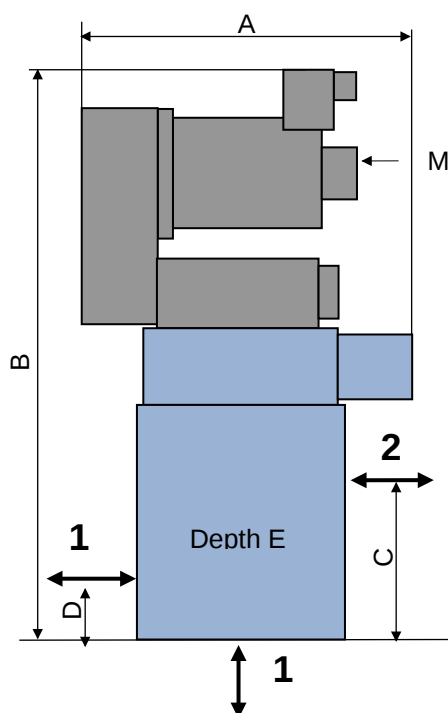
This valve can be used where air has to be sluiced from a high into a low-pressure reservoir. A pilot pressure input from the inlet and outlet side makes sure that the valve stays closed in case of failure even when the pressure in high-pressure port 1 is lower than in port 2.

The robust and compact design allows use of the valve in various fields of applications.

### Detailed symbol



### Dimensions



Manual override

| ND | Connections |         |                     | A   | B   | C   | D  | E   |
|----|-------------|---------|---------------------|-----|-----|-----|----|-----|
| 16 | G1/2"       | G3/4"   | SAE 3/4" Standard   | 180 | 325 | 71  | 32 | 68  |
| 25 | G3/4"       | G1"     | SAE 1" Standard     | 180 | 350 | 86  | 36 | 85  |
| 32 | G1"         | G1 1/4" | SAE 1 1/4" Standard | 180 | 375 | 103 | 43 | 102 |

### Example / Ordering Code

|    |     |  |    |  |      |   |     |
|----|-----|--|----|--|------|---|-----|
| R2 | 016 |  | 17 |  | 024G | B | KV3 |
|----|-----|--|----|--|------|---|-----|

016 = Size 16  
025 = Size 25  
032 = Size 32

R1 = ND16 thread-connections G1/2"  
R2 = ND16 thread-connections G3/4"  
R3 = ND16 flanges SAE 3/4"  
R4 = ND25 thread-connections G3/4"  
R5 = ND25 thread-connections G1"  
R6 = ND25 flanges SAE 1  
R7 = ND32 thread-connections G1"  
R8 = ND32 thread-connections G1 1/4"  
R9 = ND32 flanges SAE 1 1/4"

B = Square ac connector small  
D = Square dc connector large  
F = Square conn. for ac and dc with ign.light

024G = 24V dc  
098G = 98V dc  
196G = 196V dc  
110W = 110V ac  
220W = 220V ac

17 = normally closed (NC)  
18 = normally open (NO)



## COMPLETE VALVES

### Type 2/2 Way Directional Valve

Medium Water, Air, Oil  
Oper. Press. 350bar  
Filtration 80mic integrated  
Sealing Soft seat, metal supported

Material SS, brass  
Sizes 16, 25, 32mm  
Voltage\* 24V, 48V, 98V, 196V dc  
Additional rectifier 110V/50Hz, 220V/50Hz ac

\* Other voltages on request.

### Symbol

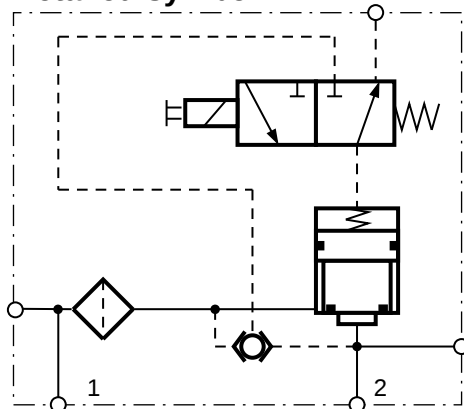


### Description

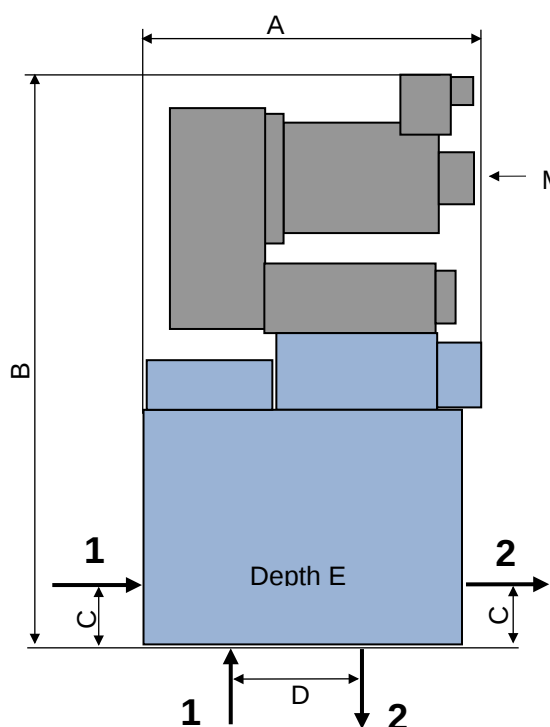
This valve can be used where air has to be sluiced from a high into a low-pressure reservoir. A pilot pressure input from the inlet and outlet side makes sure that the valve stays closed in case of failure even when the pressure in high-pressure port 1 is lower than in port 2. An 80micron filter is integrated to protect main and pilot valve.

The robust and compact design allows use of the valve in various fields of applications.

### Detailed symbol



### Dimensions



| ND | Connections |       |                   | A   | B   | C  | D  | E  |
|----|-------------|-------|-------------------|-----|-----|----|----|----|
| 16 | G1/2"       | G3/4" | SAE 3/4" Standard | 200 | 325 | 32 | 70 | 70 |

Manual override

### Example / Ordering Code

|     |     |    |      |   |     |
|-----|-----|----|------|---|-----|
| R11 | 016 | 17 | 024G | B | KV4 |
|-----|-----|----|------|---|-----|

B = Square ac connector small  
D = Square dc connector large  
F = Square conn. for ac and dc with ign.light

024G = 24V DC  
098G = 98V DC  
196G = 196V DC  
110W = 110V AC  
220W = 220V AC

17 = Normally Closed (NC)  
18 = Normally open (NO)



## COMPLETE VALVES

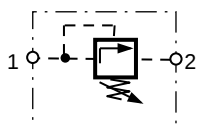
### Type Pressure Relief Valve

Medium Water  
Oper. Press. 350bar  
Filtration 25mic  
Sealing Hard seated

Material SS, brass  
Sizes\* 16, 25, 32mm

\*Other sizes on request.

### Symbol

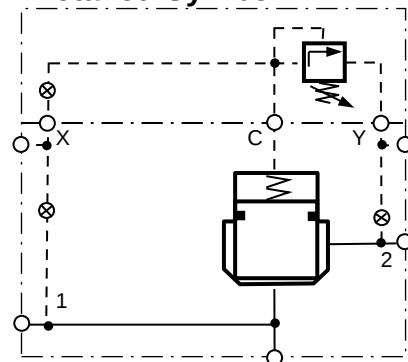


### Description

This valve can be used to protect a system against overpressure. Also it is possible to remotely operate the valve by an external pressure.

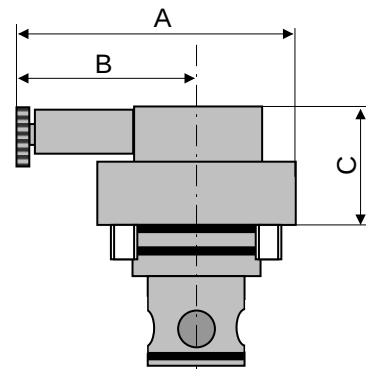
The robust and compact design allows use of the valve in various fields of applications.

### Detailed Symbol



### Dimensions

| ND | Connections 1,2 |         |                     | A   | B   | C  | D  | E   | F   | G   | H   |
|----|-----------------|---------|---------------------|-----|-----|----|----|-----|-----|-----|-----|
| 16 | G1/2"           | G3/4"   | SAE 3/4" Standard   | 160 | 128 | 70 | 32 | 71  | 175 | 170 | 65  |
| 25 | G3/4"           | G1"     | SAE 1" Standard     | 170 | 128 | 70 | 36 | 86  | 200 | 180 | 85  |
| 32 | G1"             | G1 1/4" | SAE 1 1/4" Standard | 180 | 128 | 70 | 43 | 103 | 225 | 187 | 102 |

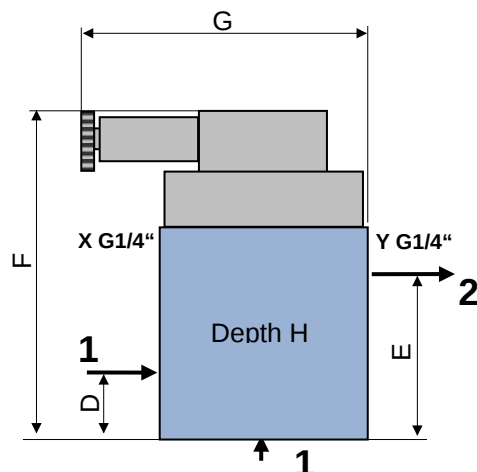


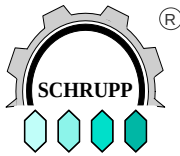
### Example / Ordering Code

|    |     |    |    |   |   |    |    |      |   |       |
|----|-----|----|----|---|---|----|----|------|---|-------|
| EO | 016 | DX | 05 | 2 | D | 23 | FS | 0000 | 0 | H KV7 |
|----|-----|----|----|---|---|----|----|------|---|-------|

016 = Size 16  
025 = Size 25  
032 = Size 32

EO = for manifold mounting  
R1 = ND16 thread-connections G1/2"  
R2 = ND16 thread-connections G3/4"  
R3 = ND16 flanges SAE 3/4"  
R4 = ND25 thread-connections G3/4"  
R5 = ND25 thread-connections G1"  
R6 = ND25 flanges SAE 1  
R7 = ND32 thread-connections G1"  
R8 = ND32 thread-connections G1 1/4"  
R9 = ND32 flanges SAE 1 1/4"





## COMPLETE VALVES

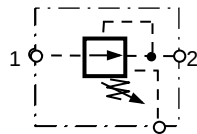
### Type Pressure Reducing Valve

Medium Water  
Oper. Press. 350bar  
Filtration 25mic  
Sealing Hard seated

Material SS, brass  
Sizes\* 16, 25, 32mm

\*Other sizes on request.

### Symbol

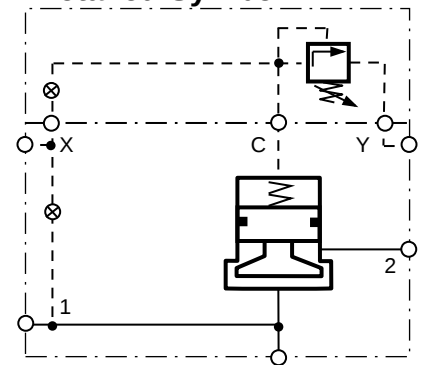


### Description

This valve can be used to reduce a pressure from a high-pressure circuit to a constant lower pressure, without any pressure influence from the feeding pressure system. Also it is possible to remotely operate the valve by an external pressure.

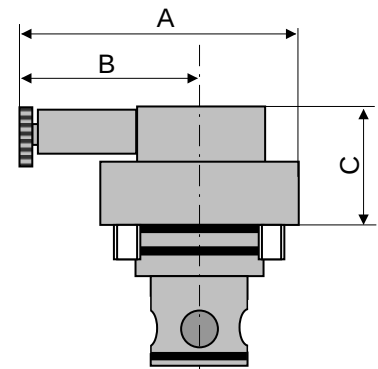
The robust and compact design allows use of the valve in various fields of applications.

### Detailed Symbol



### Dimensions

| ND | Connections 1,2 |         |                     | A   | B   | C  | D  | E   | F   | G   | H   |
|----|-----------------|---------|---------------------|-----|-----|----|----|-----|-----|-----|-----|
| 16 | G1/2"           | G3/4"   | SAE 3/4" Standard   | 160 | 128 | 70 | 32 | 71  | 175 | 170 | 65  |
| 25 | G3/4"           | G1"     | SAE 1" Standard     | 170 | 128 | 70 | 36 | 86  | 200 | 180 | 85  |
| 32 | G1"             | G1 1/4" | SAE 1 1/4" Standard | 180 | 128 | 70 | 43 | 103 | 225 | 187 | 102 |

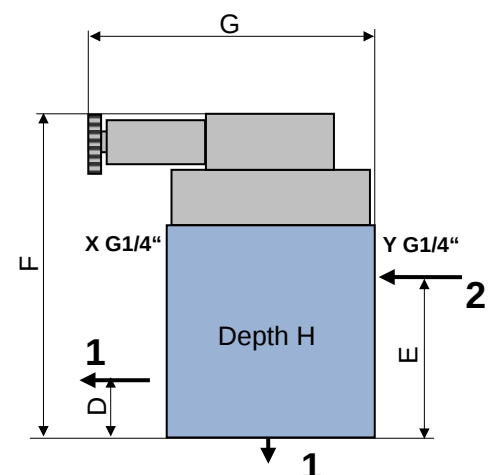


### Example / Ordering Code

|    |     |    |    |   |   |    |    |      |   |       |
|----|-----|----|----|---|---|----|----|------|---|-------|
| EO | 016 | DX | 05 | 2 | D | 24 | FS | 0000 | 0 | H KV8 |
|----|-----|----|----|---|---|----|----|------|---|-------|

016 = Size 16  
025 = Size 25  
032 = Size 32

EO = for manifold mounting  
R1 = ND16 thread-connections G1/2"  
R2 = ND16 thread-connections G3/4"  
R3 = ND16 flanges SAE 3/4"  
R4 = ND25 thread-connections G3/4"  
R5 = ND25 thread-connections G1"  
R6 = ND25 flanges SAE 1  
R7 = ND32 thread-connections G1"  
R8 = ND32 thread-connections G1 1/4"  
R9 = ND32 flanges SAE 1 1/4"





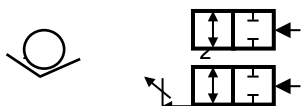
## COMPLETE VALVES

### Typ Non Return and hydraulically operated Valves, Stroke Limiters

|               |                            |          |                       |
|---------------|----------------------------|----------|-----------------------|
| Medium        | Water, Airl, Oil           | Material | SS, brass             |
| Ope. pressure | 350bar                     | Sizes*   | 10, 16, 25, 32, 40 mm |
| Filtration    | 25mic                      |          |                       |
| Sealing       | Soft seat, metal supported |          |                       |

\*Other sizes on request.

### Symbol

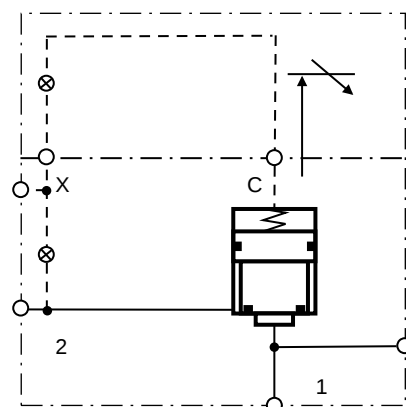


### Description

These valves are used for directional control and shut off functions. Additional stroke limiters allow also a throttling of the flow.

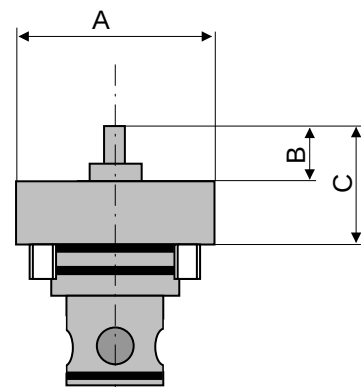
The robust and compact design allows use of the valve in various fields of applications.

### Detailed Symbol



### Dimensions

| ND | Connections |         |                     | A   | C   | B  | D  | E   | F   | G   | H   |
|----|-------------|---------|---------------------|-----|-----|----|----|-----|-----|-----|-----|
| 10 |             | G1/2"   |                     | 52  | 50  | 25 | 26 | 55  | 125 | 70  | 52  |
| 16 | G1/2"       | G3/4"   | SAE 3/4" Standard   | 65  | 75  | 40 | 32 | 71  | 180 | 85  | 65  |
| 25 | G3/4"       | G1"     | SAE 1" Standard     | 85  | 92  | 57 | 36 | 86  | 222 | 105 | 85  |
| 32 | G1"         | G1 1/4" | SAE 1 1/4" Standard | 102 | 114 | 79 | 39 | 103 | 269 | 120 | 102 |
| 40 |             | G1 1/2" | SAE 1 1/2" Standard | 125 | 120 | 80 | 47 | 116 | 300 | 145 | 125 |



### Example / Ordering Code

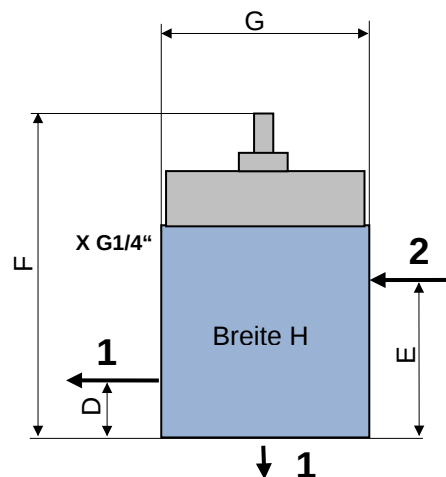
|    |     |    |    |   |   |    |    |      |   |       |
|----|-----|----|----|---|---|----|----|------|---|-------|
| EO | 016 | SX | 08 | 6 | D | 11 | F0 | 0000 | 0 | 0 KV9 |
|----|-----|----|----|---|---|----|----|------|---|-------|

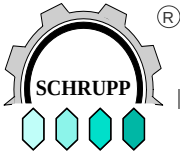
010 = Size 10  
to  
040 = Size 40

02 = Cover without limiter  
11 = Cover with stroke limiter

EO = Manifold mounting  
R1 = ND16 thread-connections G1/2"  
R2 = ND16 thread-connections G3/4"  
R3 = ND16 flanges SAE 3/4"  
R4 = ND25 thread-connections G3/4"  
R5 = ND25 thread-connections G1"  
R6 = ND25 flanges SAE 1  
R7 = ND32 thread-connections G1"  
R8 = ND32 thread-connections G1 1/4"  
R9 = ND32 flanges SAE 1 1/4"

HX = no stroke limiter  
SX = stroke limiter



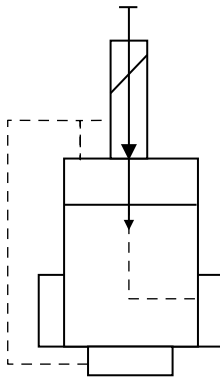


## COMPLETE VALVES

# Servo Cartridges

## Servo assisted throttle and shut off Valves

This robust and leak-free closing valve with patented servo assistance allows an easy operation with very low manual force even after a long period of non-use. For accumulator shut off functions the valve can be operated in combination together with an electrically operated pilot valve. Without electrical power the valve will close automatically (fail safe). It is always possible to close it manually or in case of maintaining the system to secure it in closed position even if the pilot valve will be energized.



### Technical Data:

|                     |                                         |
|---------------------|-----------------------------------------|
| Operating Pressure: | up to 350bar                            |
| Sizes:              | 25 – 200mm                              |
| Media:              | Water, Oil                              |
| Material:           | Stainless Steel, Buna,<br>Viton, Teflon |
| Temperature:        | 0-50°C                                  |

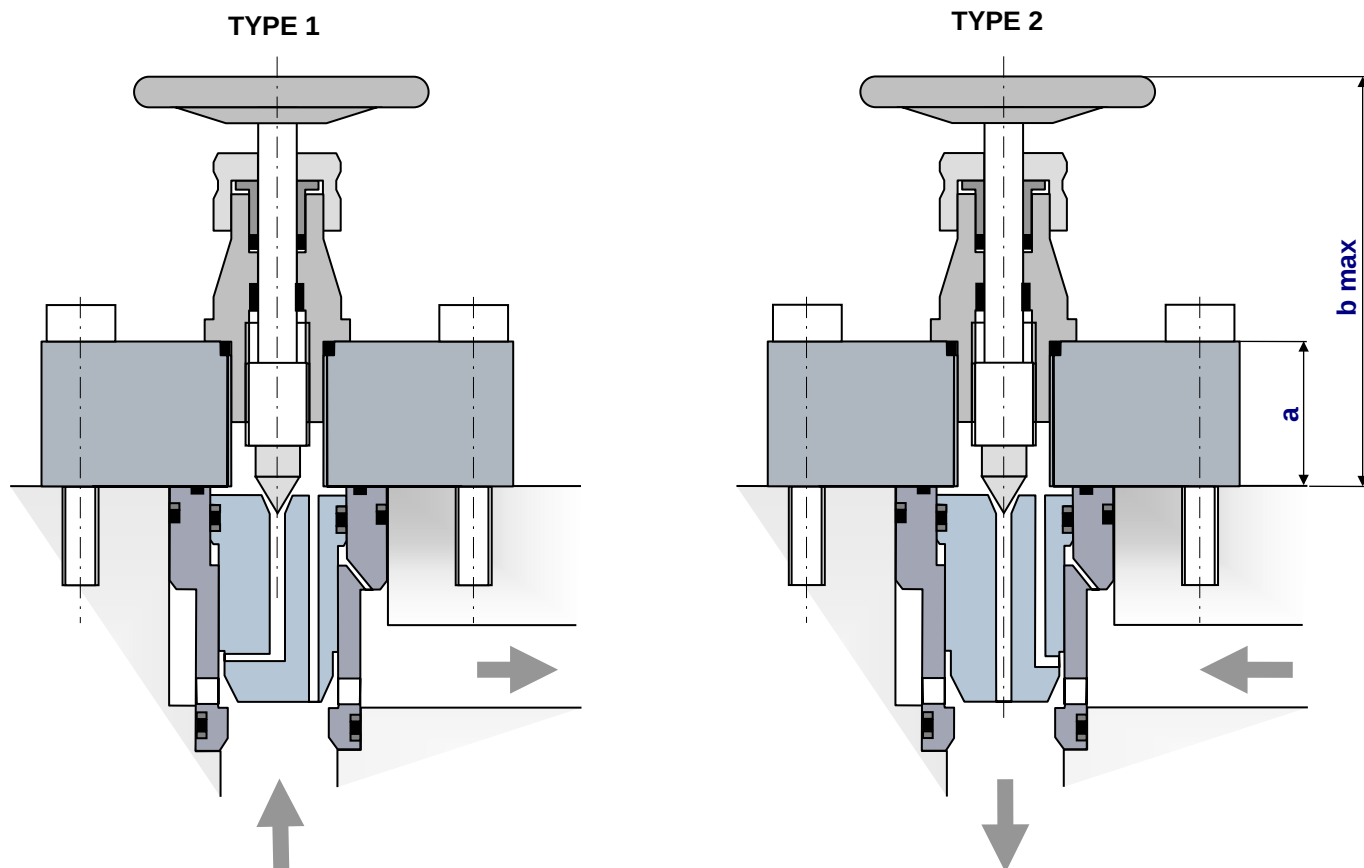




## COMPLETE VALVES

### Servo Cartridges

Servo assisted throttle and shut off Valves



| DN        | a  | b max | PART NO.  |
|-----------|----|-------|-----------|
| 25 TYPE 1 | 27 | 114   | 850193    |
| 25 TYPE 2 | 27 | 114   | 850193-01 |
| 32 TYPE 1 | 40 | 126   | 851281    |
| 32 TYPE 2 | 40 | 126   | 851281-01 |
| 40 TYPE 1 | 40 | 126   | 851276    |
| 40 TYPE 2 | 40 | 126   | 851276-01 |

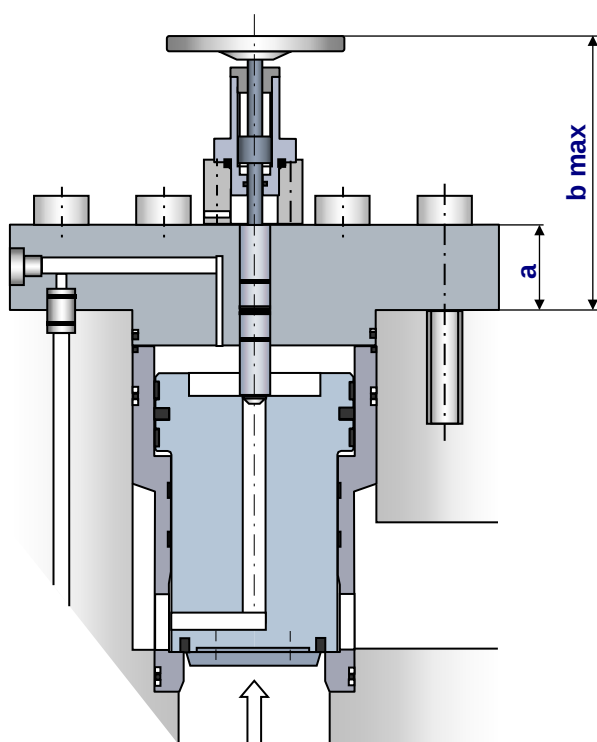


## COMPLETE VALVES

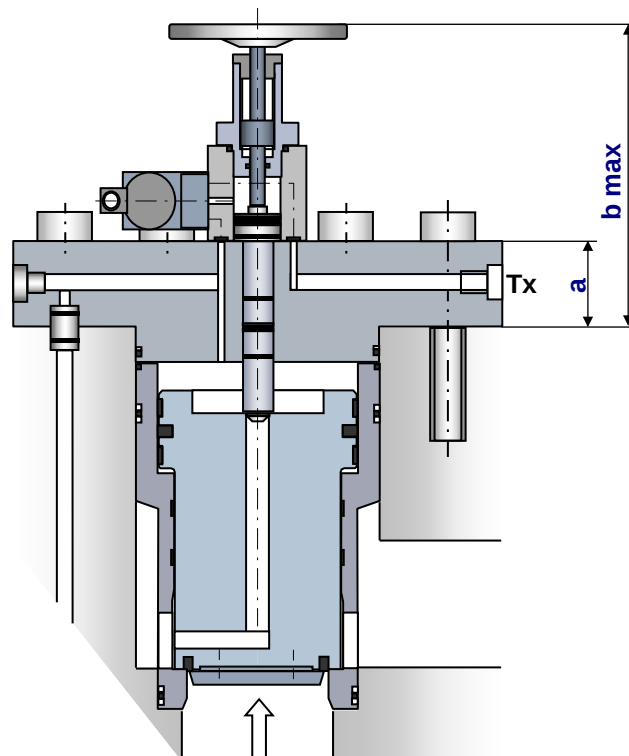
### Servo Cartridges

Servo assisted throttle and shut off Valves

**TYPE 1**  
manually operated



**TYPE 2:**  
solenoid and electrically operated



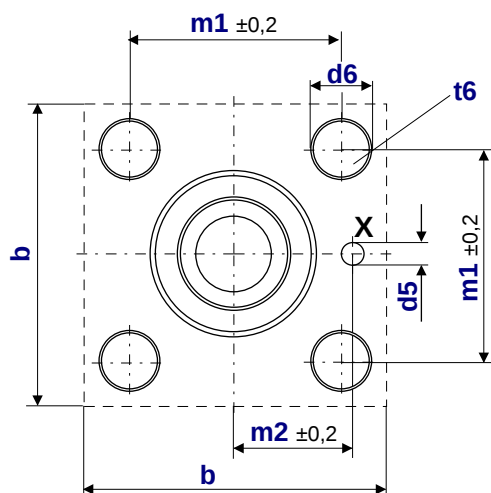
| DN         | a   | b max | Tx     | PART NO.  |
|------------|-----|-------|--------|-----------|
| 50 TYPE 1  | 45  | 249   | -      | 851270    |
| 50 TYPE 2  | 45  | 288   | G 1/2" | 851270-01 |
| 63 TYPE 1  | 50  | 254   | -      | 851223    |
| 63 TYPE 2  | 50  | 293   | G 1/2" | 851223-01 |
| 80 TYPE 1  | 80  | 284   | -      | 851216    |
| 80 TYPE 2  | 80  | 323   | G 1/2" | 851216-01 |
| 100 TYPE 1 | 80  | 284   | -      | 851233    |
| 100 TYPE 2 | 80  | 323   | G 1/2" | 851233-01 |
| 125 TYPE 1 | 100 | 388   | -      | 851243    |
| 125 TYPE 2 | 100 | 427   | G 1/2" | 851243-01 |
| 150 TYPE 1 | 120 | 408   | -      | 851247    |
| 150 TYPE 2 | 120 | 447   | G 1/2" | 851247-01 |
| 200 TYPE 1 | 150 | 512   | -      | 851261    |
| 200 TYPE 2 | 150 | 551   | G 1/2" | 851261-01 |

## COMPLETE VALVES

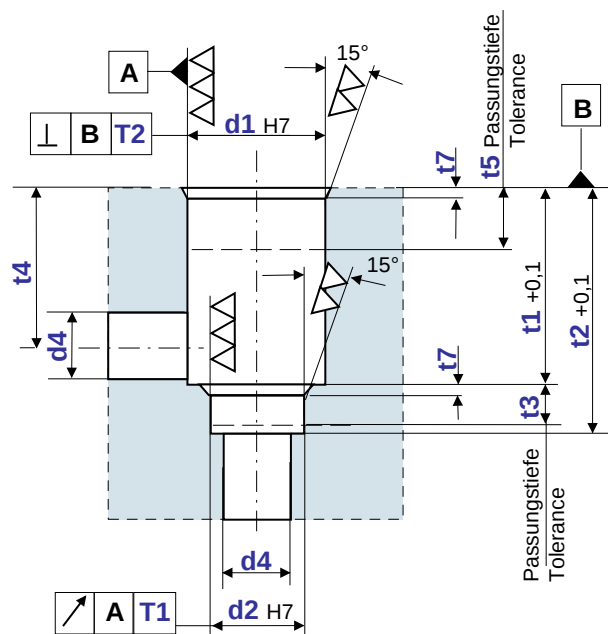
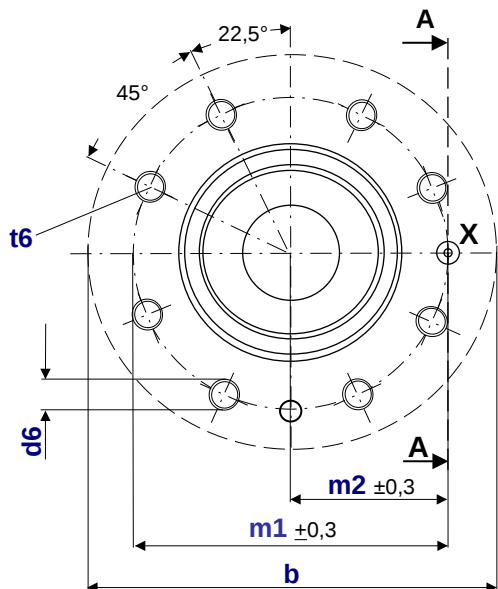
## Servo Cartridges

### Servo assisted throttle and shut off Valves

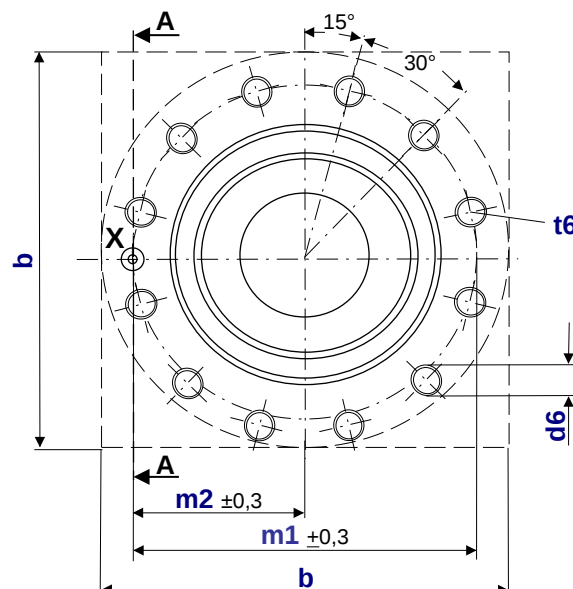
### Abmessungen / Dimensions DIN 24342, DN25-50



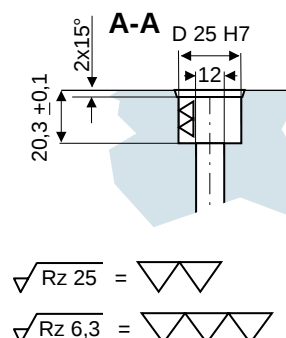
### Abmessungen /Dimensions DIN 24342, DN63-100

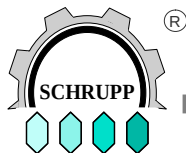


### Abmessungen / Dimensions DIN 24342, DN125-200



| DN  | b   | d1  | d2  | d4  | d5 | d6  | m1  | m2    | t1  | t2  | t3 | t4  | t5  | t6 | t7  | T1   | T2   |
|-----|-----|-----|-----|-----|----|-----|-----|-------|-----|-----|----|-----|-----|----|-----|------|------|
| 25  | 85  | 45  | 34  | 25  | -  | M12 | 58  | -     | 58  | 72  | 12 | 44  | 30  | 13 | 2,5 | 0,03 | 0,05 |
| 32  | 102 | 60  | 45  | 32  | -  | M16 | 70  | -     | 70  | 85  | 13 | 52  | 34  | 25 | 2,5 | 0,03 | 0,1  |
| 40  | 125 | 75  | 55  | 40  | -  | M20 | 85  | -     | 87  | 105 | 15 | 64  | 42  | 30 | 3   | 0,05 | 0,1  |
| 50  | 140 | 90  | 68  | 50  | 8  | M20 | 100 | 58    | 115 | 137 | 17 | 87  | 61  | 30 | 4   | 0,05 | 0,1  |
| 63  | 225 | 120 | 90  | 63  | -  | M24 | 175 | 87,5  | 150 | 175 | 20 | 115 | 82  | 35 | 4   | 0,05 | 0,2  |
| 80  | 250 | 145 | 110 | 80  | -  | M24 | 200 | 100   | 195 | 225 | 25 | 150 | 108 | 35 | 5   | 0,05 | 0,2  |
| 100 | 300 | 180 | 135 | 100 | -  | M30 | 245 | 125   | 230 | 265 | 29 | 175 | 130 | 40 | 5   | 0,05 | 0,2  |
| 125 | 360 | 220 | 180 | 125 | -  | M36 | 290 | 145   | 284 | 325 | 41 | 208 | 70  | 50 | 5   | 0,05 | 0,2  |
| 150 | 400 | 255 | 210 | 150 | -  | M36 | 330 | 165   | 330 | 375 | 41 | 245 | 75  | 50 | 5   | 0,05 | 0,2  |
| 200 | 530 | 355 | 275 | 200 | -  | M48 | 435 | 217.5 | 430 | 475 | 41 | 320 | 75  | 70 | 5   | 0,05 | 0,2  |





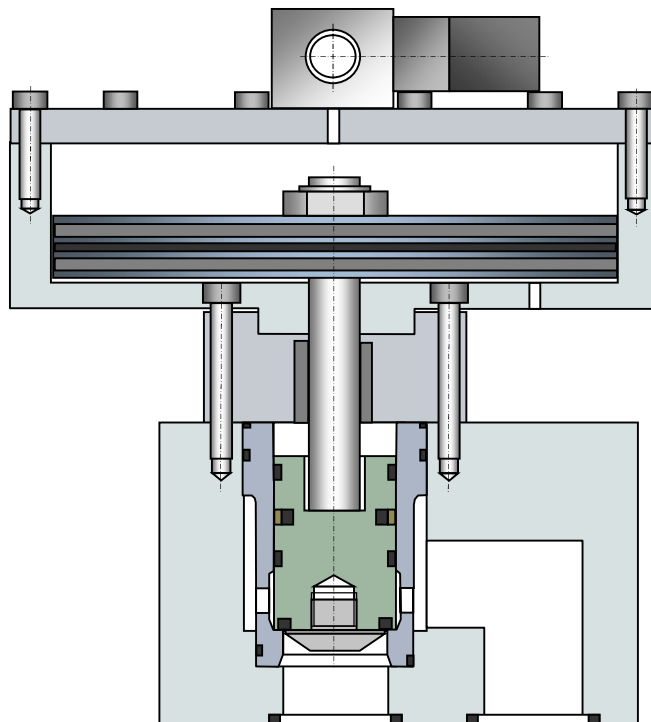
## COMPLETE VALVES

### 2/2 Way Directional Valve 800bar with electro-pneumatic Pilot valve

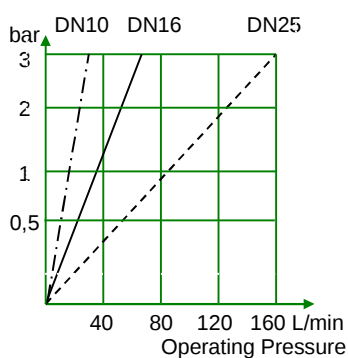
These electro-pneumatically piloted valves are designed for use in the harsh environments found in the steel and aluminum industries. Housing and the leak free soft seat cartridge are manufactured from stainless steel. Housings are also available with flange connections or for manifold mounting.

#### Technical Data:

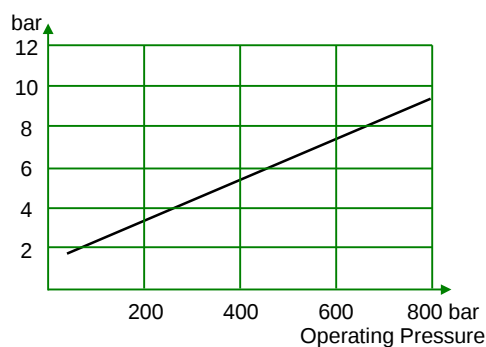
|                              |            |
|------------------------------|------------|
| Nominal Dimensions           | 10,16,25mm |
| Operating Pressure           | 800bar     |
| Pneumatic Pilot Pressure     | 2-10bar    |
| Filtration Rate min          | 50micron   |
| Electrical Power Consumption | 8W         |
| Voltage Tolerance            | 10%        |
| Electrical Protection        | IP65       |



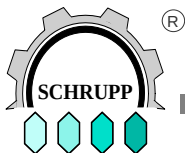
Pressure Drop Water



Pilot Pressure Air



Design details on request



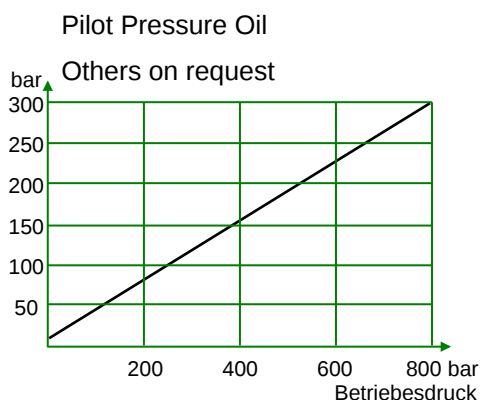
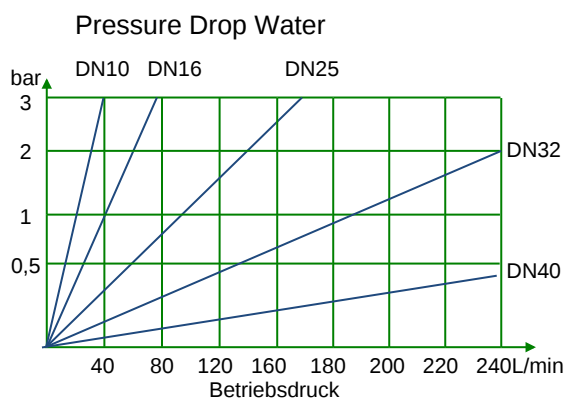
## COMPLETE VALVES

### 2/2 Way Valve 800bar with solenoid operated pilot

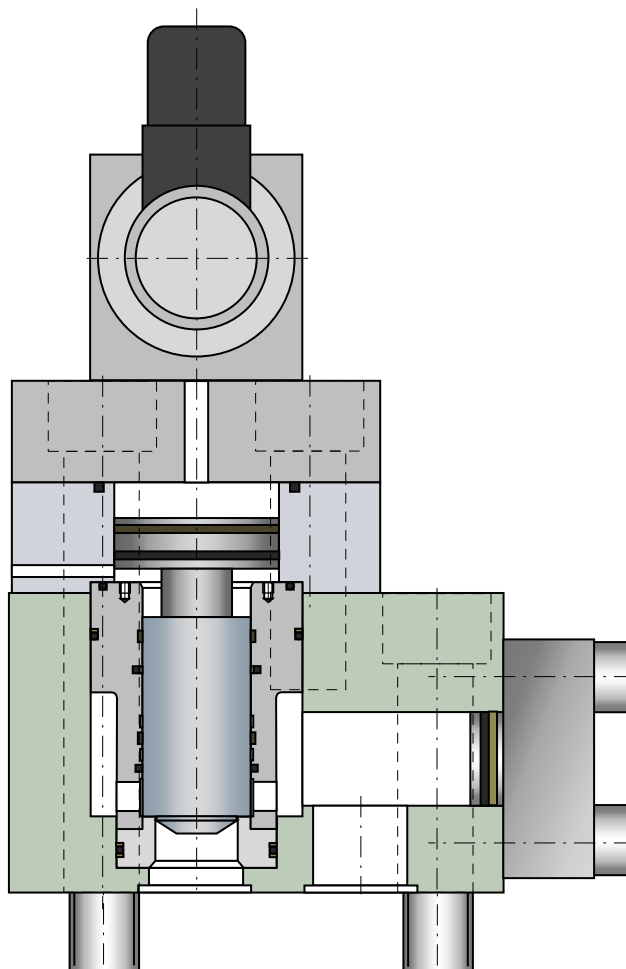
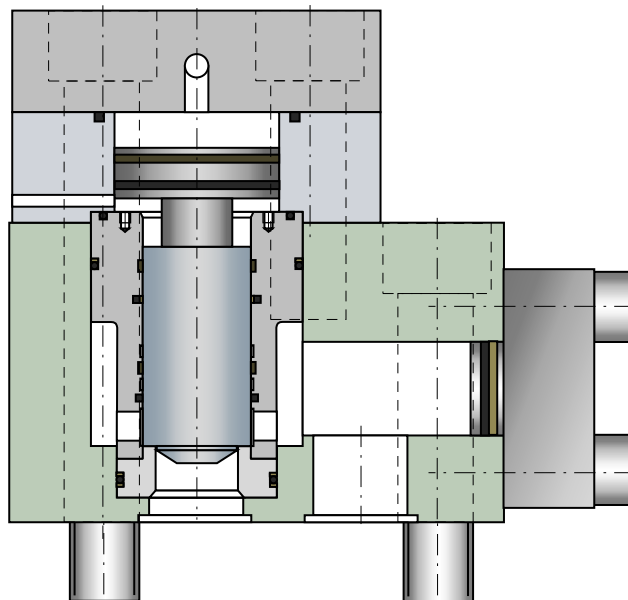
These electro-hydraulically piloted valves are designed for use in the harsh environments found in the steel and aluminum industries or at offshore applications. Housing and the leak free soft seat cartridge are manufactured from stainless steel. Housings are also available with flange connections or for manifold mounting.

#### Technical Data:

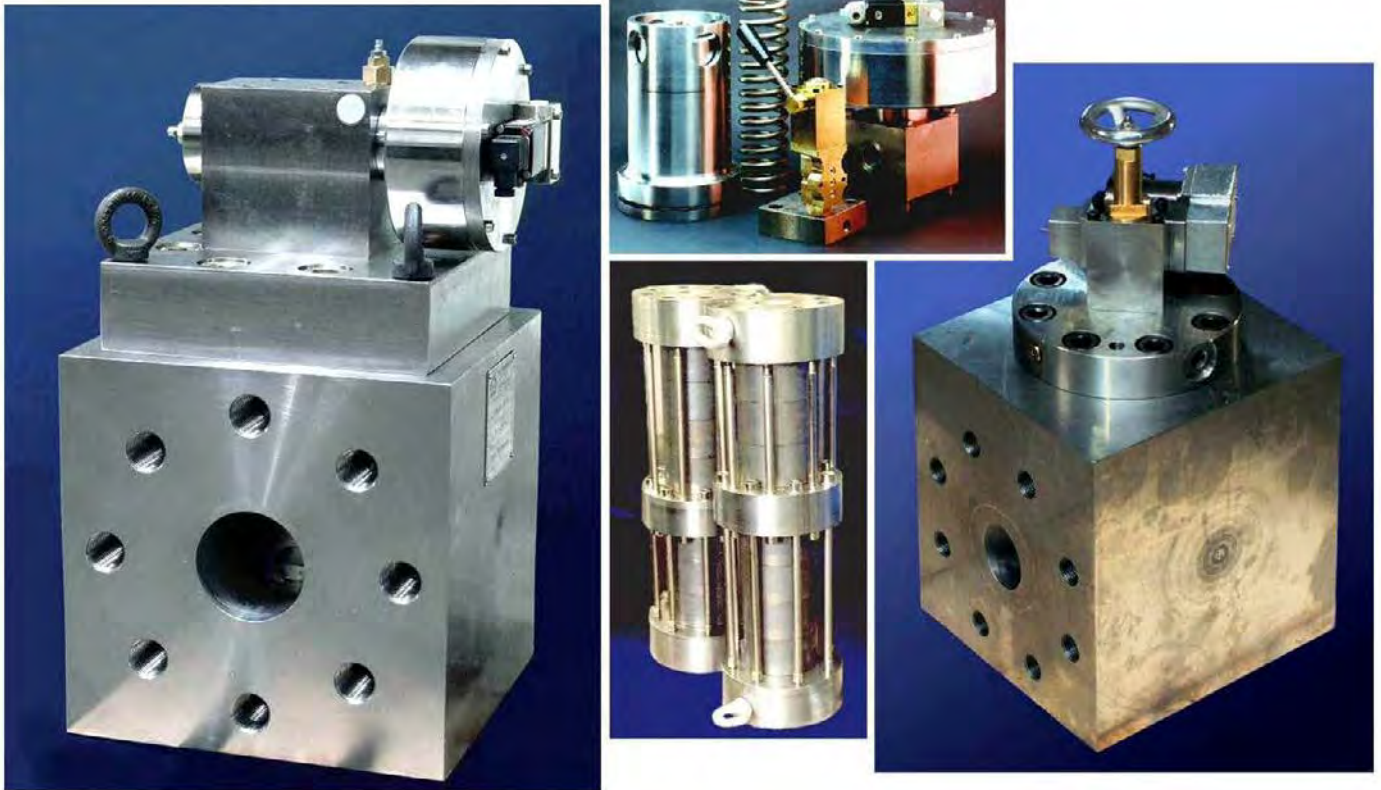
|                          |            |
|--------------------------|------------|
| Nominal Dimensions       | 10,16,25mm |
| Operating Pressure       | 800bar     |
| Pneumatic Pilot Pressure | 2-10bar    |
| Filtration Rate min      | 50micron   |



Design details on request



## ENTZUNDERUNGSTECHNIK DESCALING TECHNOLOGY



Entzunderungssysteme werden in Stahlwerken benötigt, um nach jedem Walzvorgang die Zunderschicht von der Materialoberfläche zu entfernen. Ohne ein effektives Entzunderungssystem können die heutigen Qualitätsanforderungen an Stahlprodukte nicht mehr erfüllt werden. HL Hydraulik GmbH fertigt und vertreibt unter dem Handelsnamen Schrupp die hierzu erforderlichen Ventile sowie mehrstufige Bypass Düsen.

Das Produktprogramm umfasst

- Absperrventile
- Rückschlagventile
- Magnetbetätigte Ventile
- Ventilkombinationen
- Düsenpakete
- 2- und 3- Wege Vorsteuerungen

Die Ventile sind einsetzbar bis zu Drücken von 350bar (Sonderanwendungen bis 800bar) und Volumenströmen bis 30.000 l/min

Descaling systems are used in steel rolling mills to remove the scale after each rolling procedure. Without a modern descaling system it is not possible to produce a high quality steel product. HL Hydraulik GmbH manufactures all kinds of valves and multistage break down orifices under the trade name Schrupp for this application.

The product range includes:

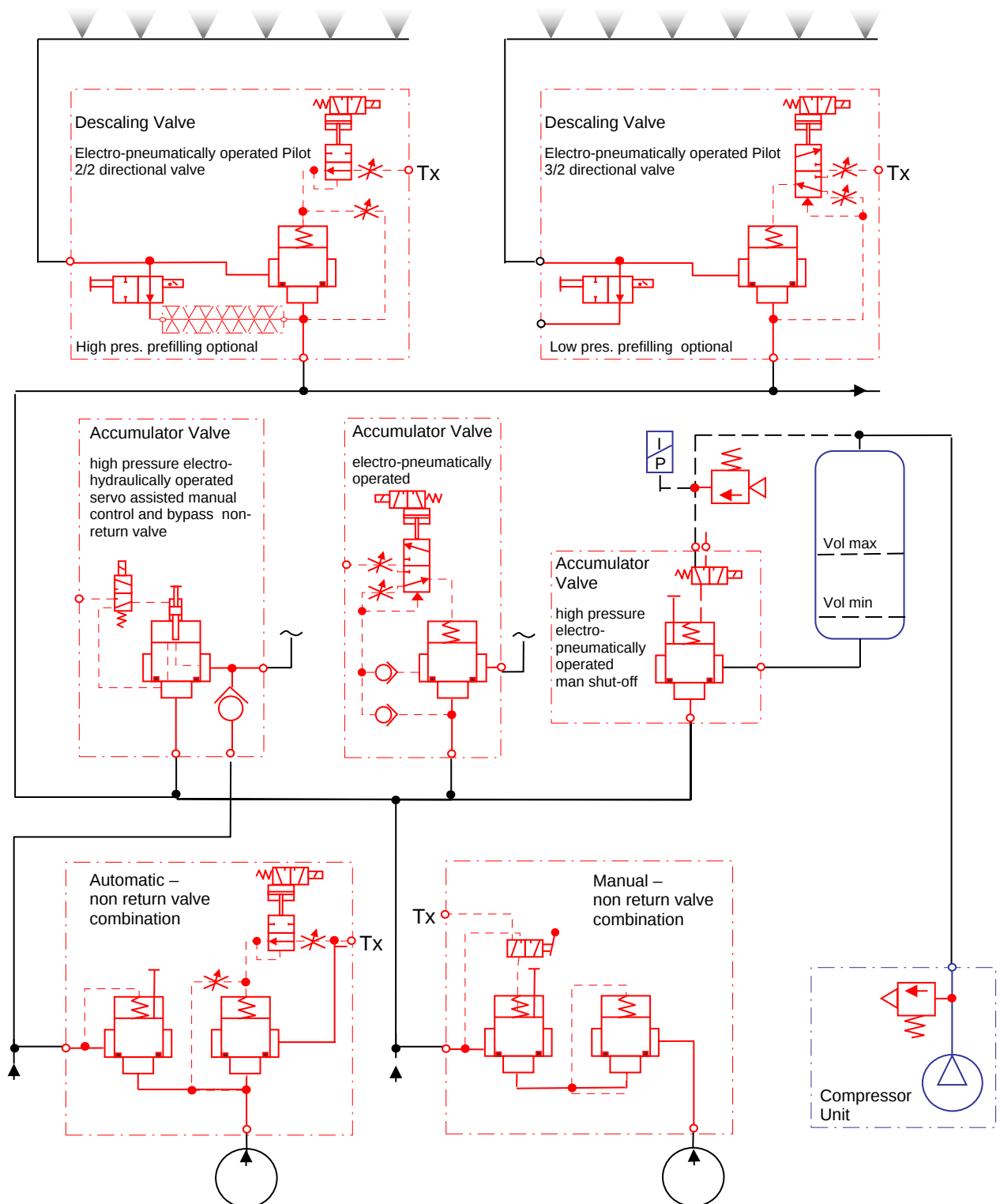
- On Off valves (Descaling Valves)
- Non Return Valves (Check Valves)
- Automatic Valves (Accumulator Safety Shut Off Valves)
- Valve Combinations
- Multistage Break Down Orifices
- 2 and 3 Way Pilot Valves

The valves are suitable for pressures up to 350bar (special applications up to 800bar) and flow rates up to 30.000 l/min

## ENTZUNDERUNGSTECHNIK DESCALING TECHNOLOGY

### Systeme mit Konstantpumpen (Kolben Pumpen)

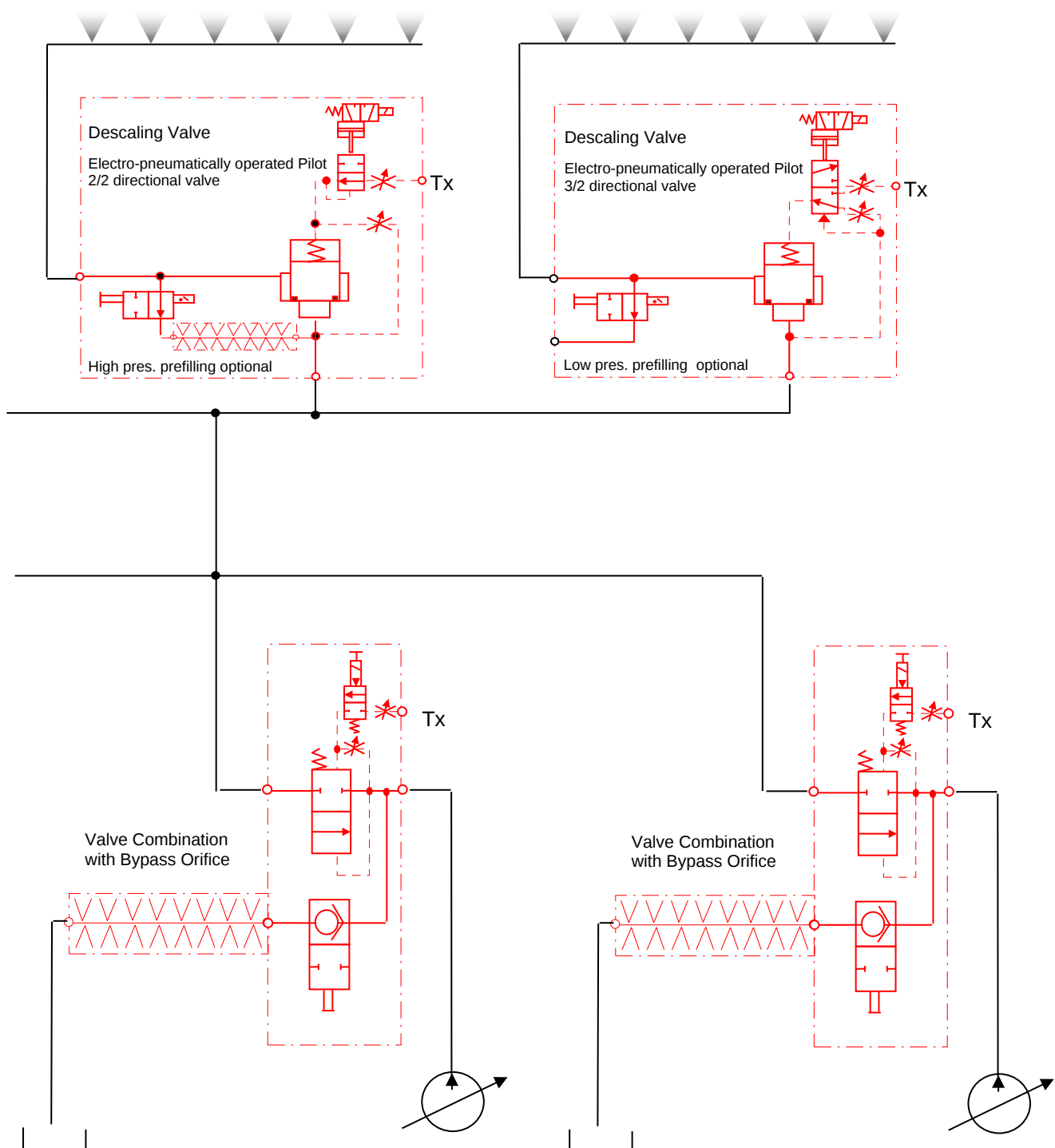
### Systems for pumps with continuous flow rates (plunger pumps)



Beispiele für eine typische Anwendungen. Rot dargestellte Komponenten stellen HL Hydraulik GmbH Produkte dar, blau dargestellte Komponenten können ebenso angeboten werden.  
Examples of typical applications. Red items are products of HL-Hydraulik GmbH blue Items can also be quoted.

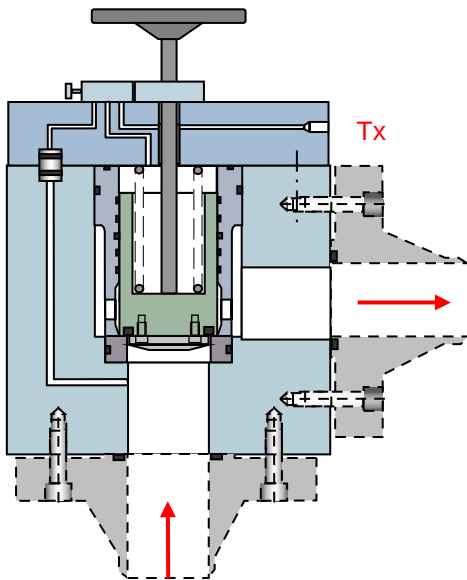
## ENTZUNDERUNGSTECHNIK DESCALING TECHNOLOGY

### Systeme mit Pumpen mit veränderlichen Volumenströmen (Zentrifugal Pumpen) Systems for pumps with variable flow rates (centrifugal pumps)



Beispiel für eine typische Anwendung. Rot dargestellte Komponenten stellen HL Hydraulik GmbH Produkte dar.  
Example of a typical application. Red items are products of HL Hydraulik GmbH.

## ENTZUNDERUNGSTECHNIK DESCALING TECHNOLOGY



### Handabsperrrventil

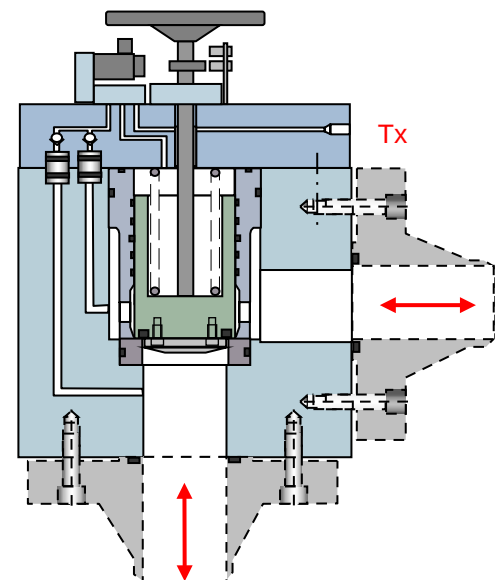
Einfach aufgebautes Ventil zur Absperrung von Rohrleitungen für eine Strömungsrichtung. Betätigung erfolgt durch 3/2 Wege hand- oder elektrisch betätigtes Ventil. Verriegelung erfolgt durch mechanische Spindel. Anders als bei handelsüblichen Spindelventilen sind die Bedienkräfte gering.

- Optionen:
- Rückschlagventile für Ventile mit beidseitiger Durchströmung
  - elektrisch betätigtes Ventil
  - Endschalter

### Manual Shut Off Valve

robust design for flows in one (both) direction. The valve will be operated hydraulically by a manually or electrically operated 3/2 directional valve and can be locked by a spindle. The operating force is much lower than for a standard spindle operated valve.

- Options:
- Check valves for flows in both directions
  - electrically operated pilot valve
  - limit switches



### Rückschlagventil

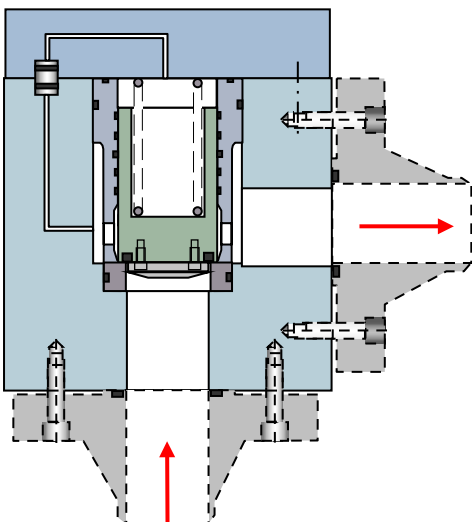
Einfach aufgebautes Ventil zur einseitigen Absperrung von Rohrleitungen.

- Option: - Spindel zur Verriegelung in geschlossener Position.

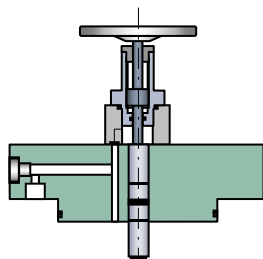
### Non Return Valve

Robust design to allow flows only in one direction

- Option: - locking spindle for closed position.



## ENTZUNDERUNGSTECHNIK DESCALING TECHNOLOGY

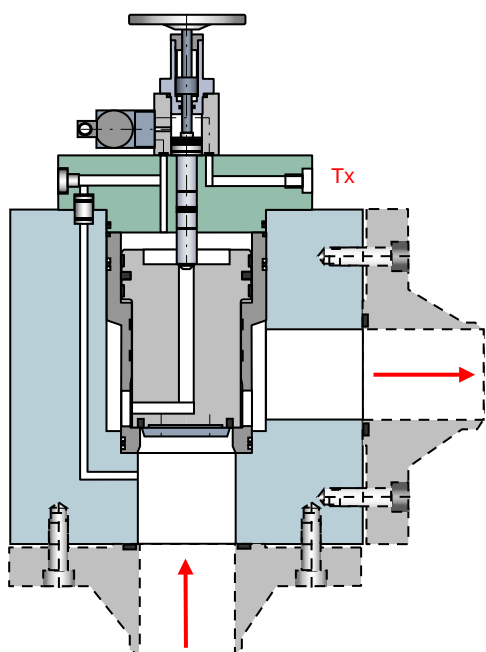


### Absperrventil mit Servounterstützung

Diese robusten dichtschießenden Ventile mit patentierter servo-hydraulischer Verstellung ermöglichen eine zuverlässige Betätigung selbst nach langen Stillstandszeiten mit geringstem Kraftaufwand. In Kombination mit einem elektrischen Vorsteuerventil ist es für den Einsatz als Speicherschnellschlussventil bestens geeignet. Das Ventil schließt bei Stromausfall automatisch (fail safe) und kann jederzeit ebenso manuell geschlossen werden. Bei Wartungsarbeiten am System kann die manuelle Betätigung als Sicherheitsverriegelung genutzt werden, so dass das Ventil selbst bei Betätigung der elektrischen Vorsteuerung nicht geöffnet werden kann.

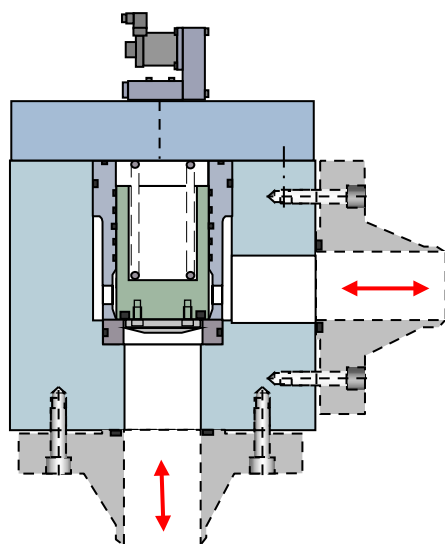
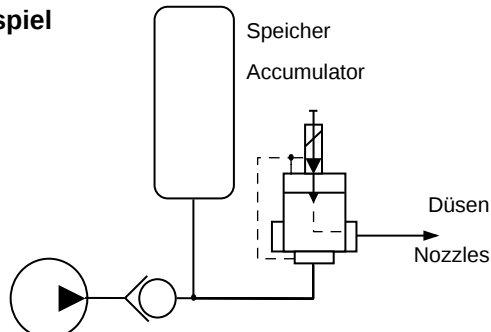
### Shut- Off Valve with Servo Assistance

This robust and leak-free shut off valve with patented servo assistance allows an easy operation with very low manual force even after long periods of non-use. For accumulator shut off functions the valve can be operated in combination with an electrically operated pilot valve. Without electrical power the valve will close automatically (fail safe). It is always possible to close it manually or in case of maintaining the system to secure it in the closed position even if the pilot valve will be energized.



### Anwendungsbeispiel

#### Example



### Absperrventil mit elektro- hochdruckpneumatischer Vorsteuerung - fail safe

Dieses preiswerte, robuste und dichtschießende Ventil wird für Anwendungen mit hoher Schalthäufigkeit wie zum Beispiel als Speicherabsperr- und Automatikventil eingesetzt. Da der pneumatische Vorsteuerdruck mindestens so hoch sein muss wie der Betriebsdruck wird das Vorsteuerventil in vielen Fällen direkt mit dem Windkessel der Entzunderungsanlage verbunden.

### Shut - Off Valve with Electro- High Pressure Pneumatic Pilot - fail safe

This robust and leak-free closing, low cost valve, is designed for the continuous use as an accumulator or automatic valve. The pneumatic pilot pressure has to be min the same as the hydraulic pressure, so that oftentimes the pilot valve is connected to the pressure vessel of the descaling system.

## ENTZUNDERUNGSTECHNIK DESCALING TECHNOLOGY

### Absperrventil mit elektro-pneumatischem 2/2 Wege Vorsteuerventil

Diese robusten dicht schließenden Ventile werden für den Einsatz in verschmutzten Wässern und mit hoher Schalthäufigkeit, zum Beispiel als Entzunderungs- oder Automatikventil eingesetzt. Durch die im Hauptkolben eingesetzte Düse wird eine Selbstreinigung erzielt.

Der pneumatische Versorgungsdruck beträgt 4-10bar, andere Ausführungen möglich.

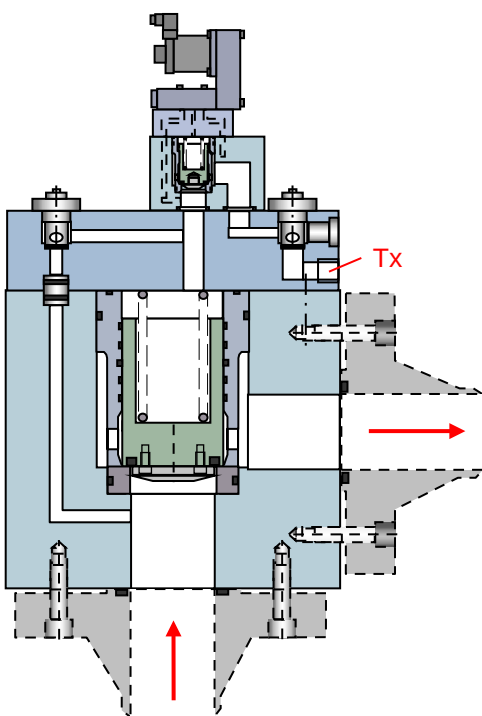
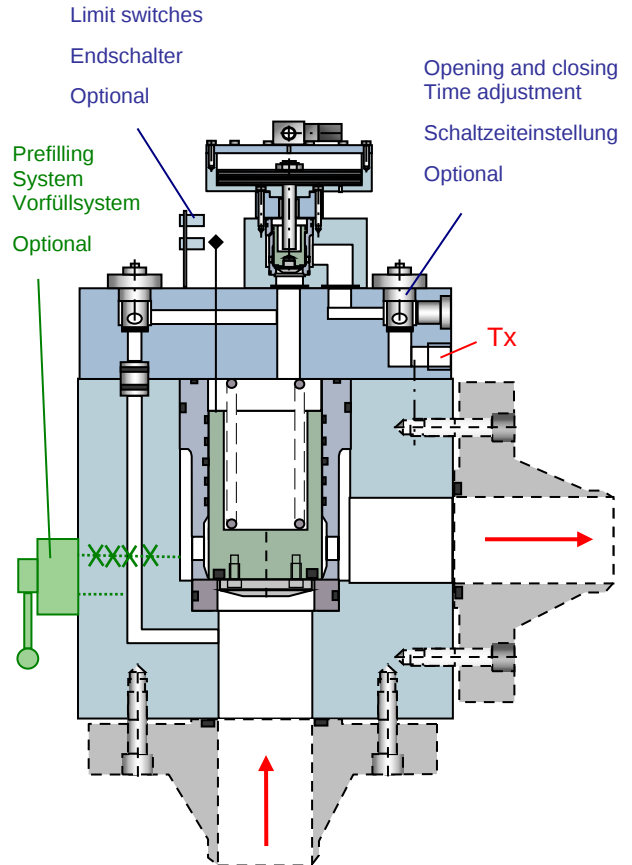
Option: -Endschalter  
-Schaltzeiteinstellung  
-Vorfüllsystem manuell oder elektrisch betätigt.

### Shut - Off Valve with Electro- Pneumatic 2/2 Directional Pilot Valve

This robust and leak-free closing valve is designed for use in systems with low water quality and continuous service i.e as descaling-, automatic valve. A nozzle at the main piston effects a continuous cleaning.

The pneumatically operated pilot power is 4-10 bar, other pressures on request.

Option: - Limit switches  
- opening and closing speed control  
- manual or electrically operated prefilling system



### Absperrventil mit elektro-hydr. Vorsteuerung

Dieses robuste dichtschießende Ventil wird für Anwendungen mit hoher Schalthäufigkeit wie zum Beispiel als Entzunderungs- oder Automatikventil eingesetzt. Statt des wasserhydraulischen Vorsteuerventils kann auch ein ölhydraulisches Vorsteuerventil eingesetzt werden und dieses mit einer externen Druckversorgung betrieben werden. Der Vorsteuerdruck hierbei muß mindestens dem Betriebsdruck entsprechen.

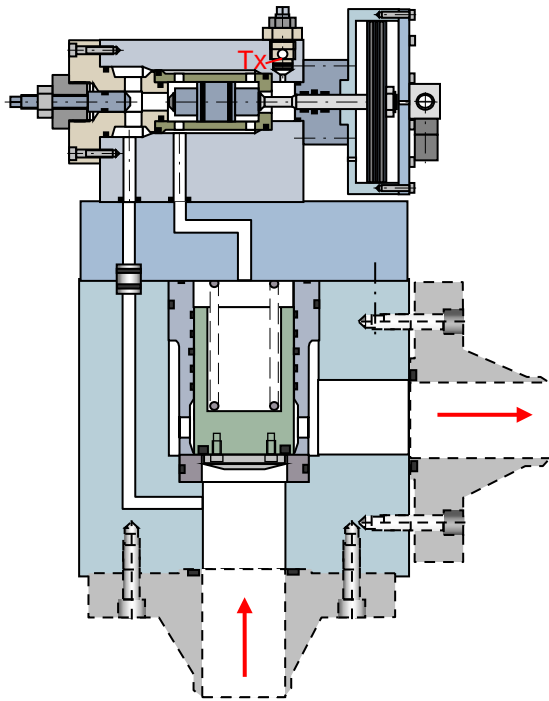
Option: -Endschalter  
-Schaltzeiteinstellung  
-Vorfüllsystem manuell oder elektrisch betätigt.

### Shut - Off Valve with electro-hydraulically Pilot

This robust and leak-free closing valve is designed for continuous use as descaling- and automatic valve. Instead of a water hydraulic pilot an oil hydraulic pilot can be used which will be serviced by an external hydraulic pumping unit. The pilot pressure has to be equal or higher than the operating pressure.

Option: - Limit switches  
- opening and closing speed control  
- manual or electrically operated prefilling system

## ENTZUNDERUNGSTECHNIK DESCALING TECHNOLOGY



### Absperrventil mit elektro- pneumatischer 3/2 Wege Vorsteuerung – fail safe

Dieses robuste dichtschießende Ventil wird für Anwendungen mit hoher Schalthäufigkeit wie zum Beispiel als Speicherabsperr- oder Automatikventil eingesetzt. Die Vorsteuerung ermöglicht eine deutliche Reduzierung der Leckagemenge am Ausgang Tx und eine komfortablere Einstellung der Schaltzeiten. Der pneumatische Versorgungsdruck beträgt 4-10bar, andere Ausführungen möglich.

- Option: -Endschalter  
-Schaltzeiteinstellung  
-Vorfüllsystem manuell oder elektrisch betätigt.

### Shut - Off Valve with 3/2 directional Electro-Pneumatic Pilot – fail safe

This robust and leak-free closing valve is designed for continuous use as an accumulator shut-off or automatic valve. The design allows for the reduction of leakage flow at port Tx to a minimum and a more comfortable adjustment of the opening and closing times.

- Option: - Limit switches  
- opening and closing speed control  
- manual or electrically operated prefilling system

### Absperrventil mit elektro- hydraulischer 3/2 Wege Vorsteuerung – fail safe

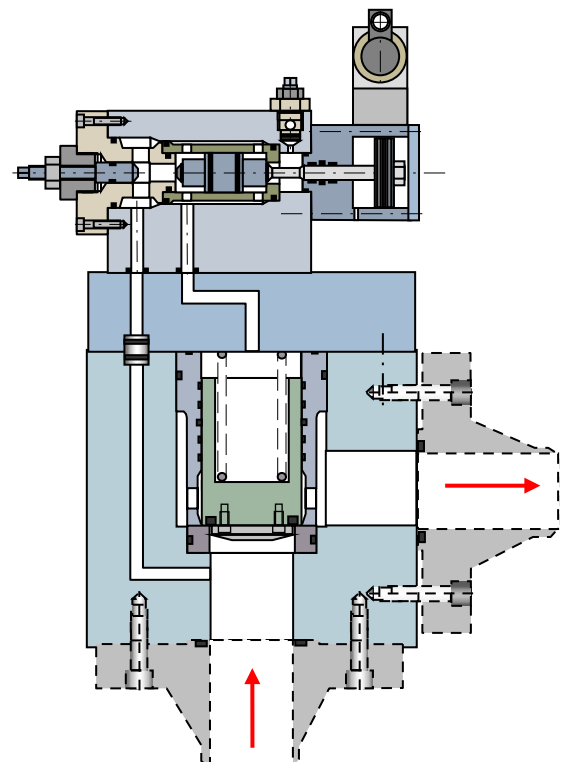
Dieses robuste dichtschießende Ventil wird für Anwendungen mit hoher Schalthäufigkeit wie zum Beispiel als Speicherabsperr- oder Automatikventil eingesetzt. Die Vorsteuerung ermöglicht eine deutliche Reduzierung der Leckagemenge am Ausgang Tx und eine komfortablere Einstellung der Schaltzeiten. Die Ansteuerung erfolgt mit gefiltertem Eigenmedium.

- Option: -Endschalter  
-Schaltzeiteinstellung  
-Vorfüllsystem manuell oder elektrisch betätigt.  
- Separater Filter für Vorsteuerung

### Shut - Off Valve with 3/2 directional Electro-hydraulic Pilot – fail safe

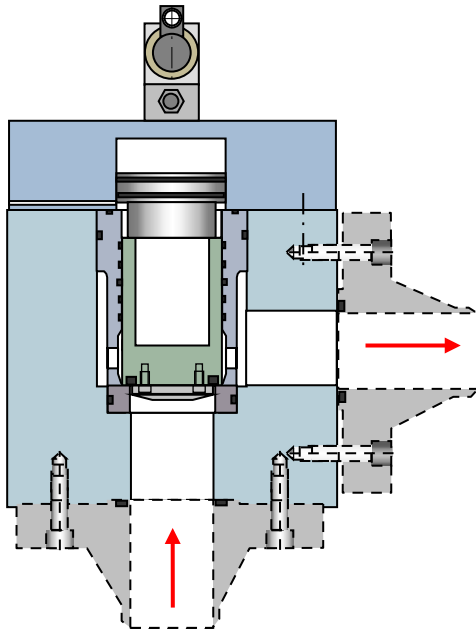
This robust and leak-free closing valve is designed for continuous use as an accumulator shut-off or automatic valve. The design allows for the reduction of leakage flow at port Tx to a minimum and a more comfortable adjustment of the opening and closing times.

- Option: - Limit switches  
- opening and closing speed control  
- manual or electrically operated prefilling system  
- separate pilot filter



## ENTZUNDERUNGSTECHNIK DESCALING TECHNOLOGY

### Absperrventil mit ölhydraulischer 3/2 Wege Vorsteuerung



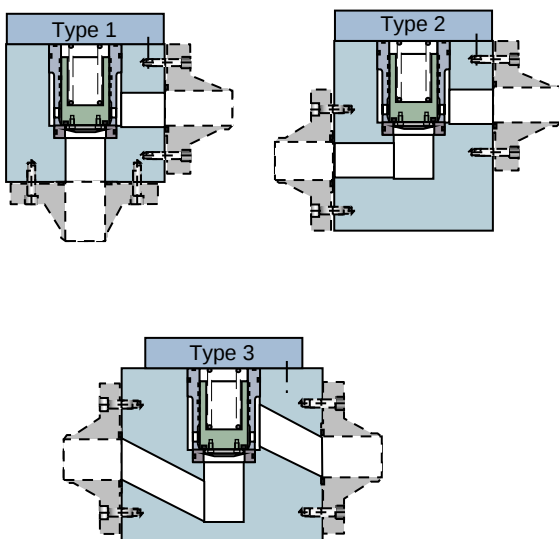
Dieses robuste dichtschießende Ventil wird für Anwendungen mit hoher Schalthäufigkeit wie zum Beispiel als Automatikventil eingesetzt. Das ölhydraulische Vorsteuersystem ermöglicht sehr kurze Schaltzeiten und einen Entfall von Vorsteuerfiltern. Die Einstellung der Schaltzeiten erfolgt auf der ölhydraulischen Seite. Zwei separate Dichtungssysteme und eine Entlüftungsbohrung verhindert die Vermischung von Steuer und Betriebsmedium und lässt Undichtigkeiten sofort erkennen.

- Option:
- Endschalter
  - Schaltzeiteinstellung
  - Vorfüllsystem manuell oder elektrisch betätigt.

### Shut - Off Valve with 3/2 directional oil-hydraulic Pilot

This robust and leak-free closing valve is designed for continuous use as an automatic valve. The oil-hydraulic pilot system allows very short opening and closing times and does not need additional pilot filters. Opening and closing times can be adjusted at the oil hydraulic side. To eliminate the risk of a penetration of oil into the water media, the system is equipped with two separate seals and a vent. A leakage at the oil or water side can be indicated immediately.

- Option:
- Limit switches
  - opening and closing speed control
  - manual or electrically operated prefilling system



### Ventilgehäuse

Unabhängig von der Funktion können die standardisierten Einbaukomponenten in verschiedenen individuell hergestellten Gehäusen untergebracht werden. Abmessungen, Material sowie Flanschgeometrie können auf den jeweiligen Bedarfsfall abgestimmt werden.

Gehäuse Typ 1 stellt die preisgünstigste und kompakteste Bauform dar. Typ 2 und 3 bieten gegenüberliegende Abgänge.

### Valve Housings

The standardised components can be integrated into individual housings. Housing dimensions, material and flange type are according to customer's specification.

Housing Type 1 is the most compact and economical, versions Type 2 and 3 are inline versions.

## ENTZUNDERUNGSTECHNIK DESCALING TECHNOLOGY

### Ventilkombinationen

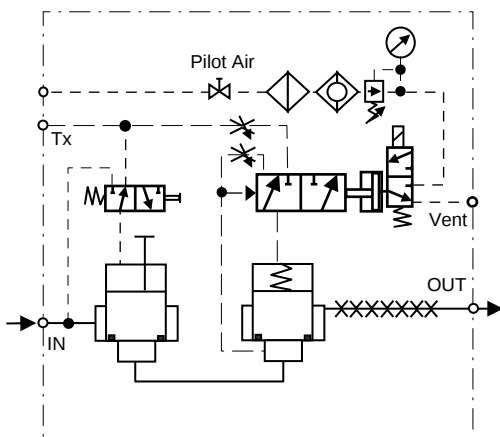
Unabhängig von der Funktion und Nennweite können die standardisierten Einbaukomponenten in Kombinationsblöcken untergebracht werden.

- Vorteile:
- Kompakte Bauweise
- Geringere Kosten bei der Montage und Wartung vor Ort
- Entfall zusätzlicher Verrohrungen und Montagerahmen

### Valve Combinations

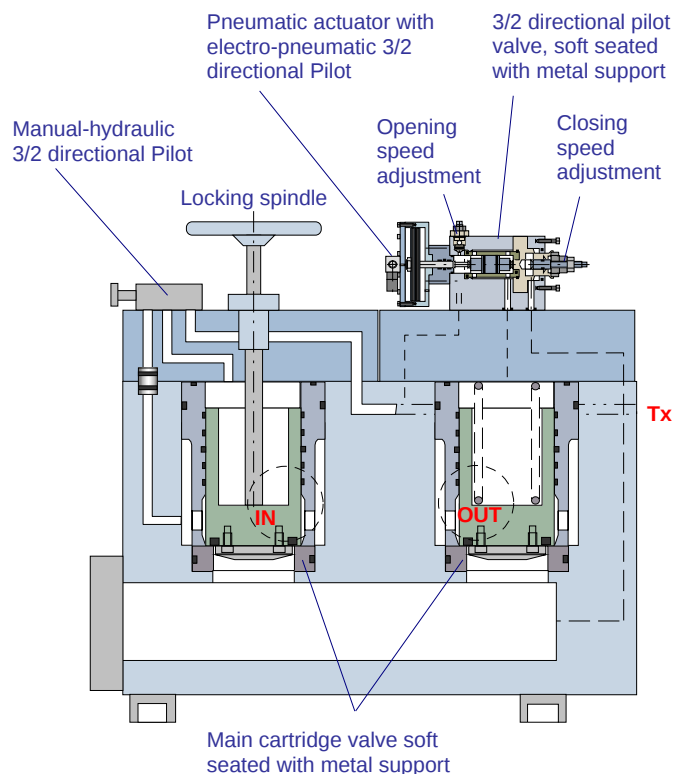
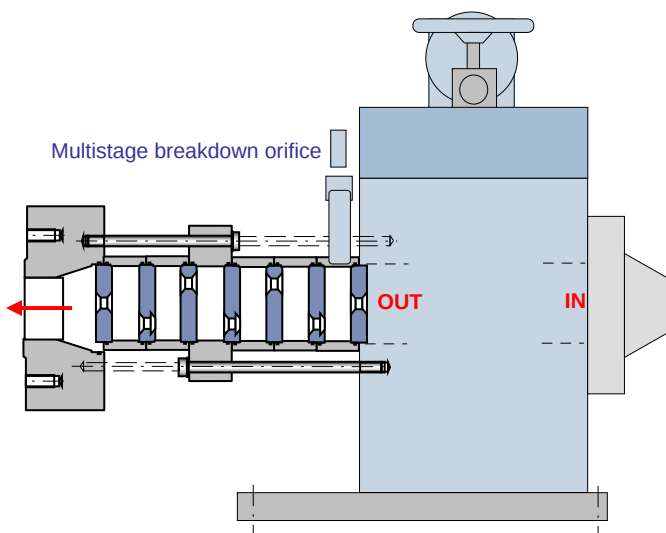
The standardized components can be integrated into combination manifolds. It is possible to combine different valve sizes and functions.

- Benefits:
- Compact design.
- Less installation and maintenance costs.
- Reduction of intermediate piping



Beispiel eines elektrisch betätigten Pumpen Bypassventils mit mehrstufiger Entlastungsdüse und Handabsperrenteil mit Verriegelungsspindel.

Example of an electrically controlled pump-bypass-valve with multistage breakdown orifice and manual shut-off valve with locking spindle.



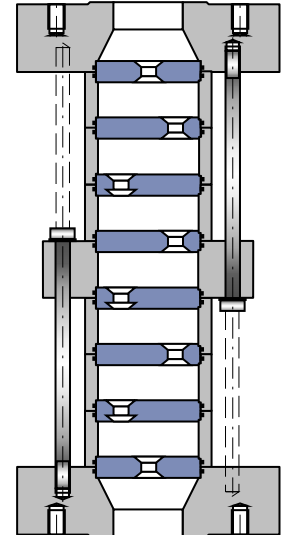
## ENTZUNDERUNGSTECHNIK DESCALING TECHNOLOGY

### Mehrstufige Düsen / Multistage Breakdown Orifice

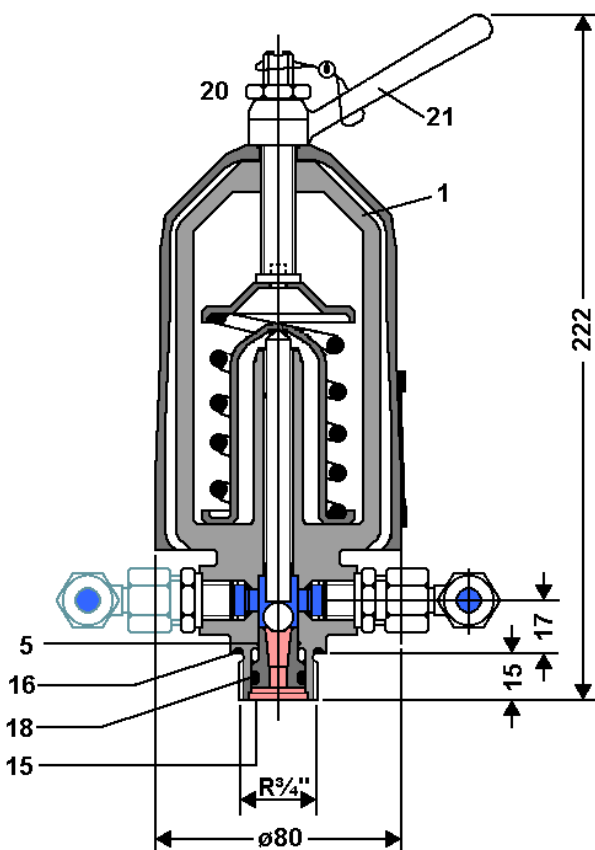
Betriebsdruck / Operating pressure up to 360/720bar  
Druckdifferenz / Pressure difference max 360bar  
Durchflußmenge / Flow rate up to 5000l/min  
Druckdifferenz pro Stufe 4 bis 12 stufig max 30bar  
Pressure difference for each stage max 30 bar 4 to 12 stages  
Flansche / Flanges DIN or ANSI

#### Material

Gehäuse, Flansche: 1.4104  
Drosselplatte: Messing (2.0405/Ms58),  
Alt. Edelstahl gehärtet, auf Wunsch TIC beschichtet  
Housing, Flanges: Stainless Steel (1.4104)  
Orifice plates: Brass (2.0405/Ms58)  
Alt. Stainless Steel, hardened, TIC coating possible



■ = Primary Pressure  
■ = Relieved Pressure



### Speichersicherheitsventil

Federbelastetes Druckluftsicherheitsventil zur Absicherung von Behältern.  
Konformität gemäß Druckgeräterichtlinie 97/23/EC  
Gase Gruppe 2, Kategorie IV. Baumusterprüfung nach Modul B (TÜV).

Gutes Ansprechverhalten und Reproduzierbarkeit auch unter extremen Bedingungen  
Kleine Bauweise  
Nennweite 6mm  
Betriebsdruck 55 - 350bar  
Durchsatz[l/min] =  $32,2 \times p[\text{bar}]$   
Betriebstemperatur 0-70°C  
Masse 1,3kg

### Accumulator Safety Valve

Spring loaded pneumatic safety relief valve for pressure vessels according to 97/23/EC for gases group 2, Category IV, with TÜV cert module B.

Low hysteresis and good operational control even under adverse conditions.  
Compact design  
Size 6mm  
Operating pressure 55-350bar  
Flow rate compressed air [l/min] =  $32,2 \times p(\text{bar})$   
Ambient Temperature 0-70 °C  
Weight 1.3KG



## ENTZUNDERUNGSTECHNIK DESCALING TECHNOLOGY

This catalogue gives only an overview of the various possibilities for our cartridge type valve technology. With this modular program an individual solution can be designed for each different application. The standard elements like Cartridge Valves and Pilots are already used worldwide in many systems. Valve housings and covers are custom made according to the individual standards and customers requests.

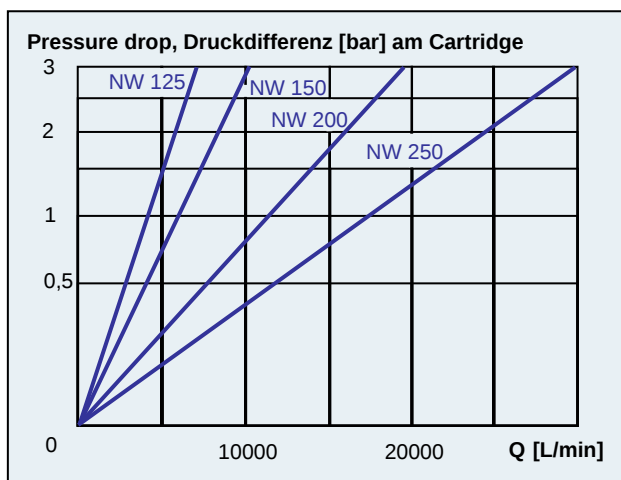
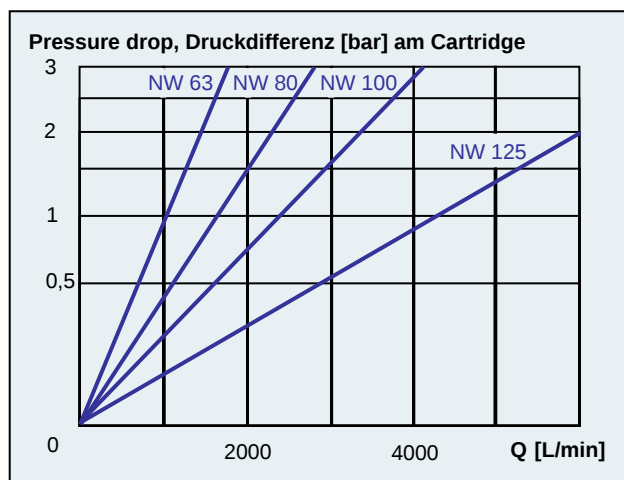
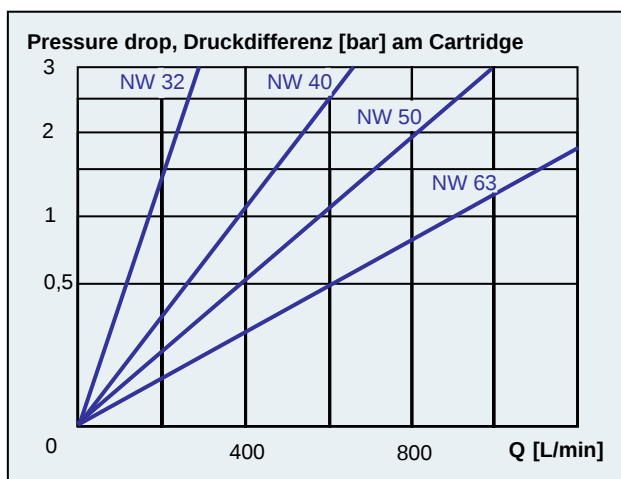
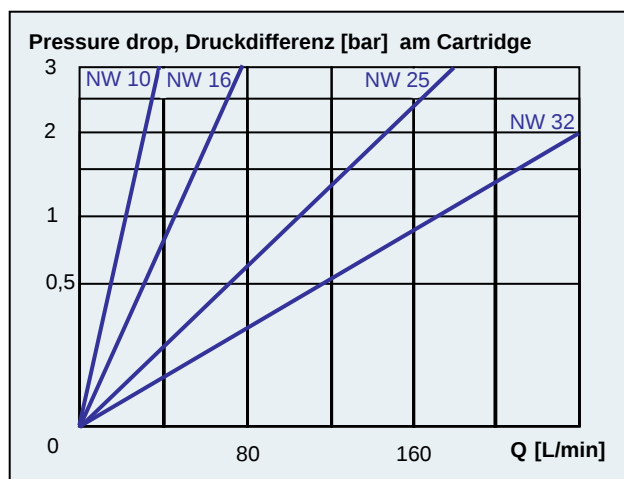
Dieser Katalog kann lediglich einen Überblick über die zahlreichen Kombinationsmöglichkeiten unserer Cartridgeventil geben. Das modular aufgebaute Programm ist bereits in vielen Systemen weltweit im Einsatz. Standardisierte Cartridges und Vorsteuerungen zusammen mit individuell nach Erfordernissen gefertigten Ventilgehäusen erlauben maß- geschneiderte Lösungen für Ihre Anwendungen.

### Technical Information, technische Informationen:

Cartridge Valves DIN Type, Stainless Steel, soft seated with metal support.

Cartridge Ventile mit Einbaumaßen nach DIN, Edelstahl, weichdichtend mit metallischer Abstützung.

### Flow characteristics, Kennlinien



### Benefits, Vorteile

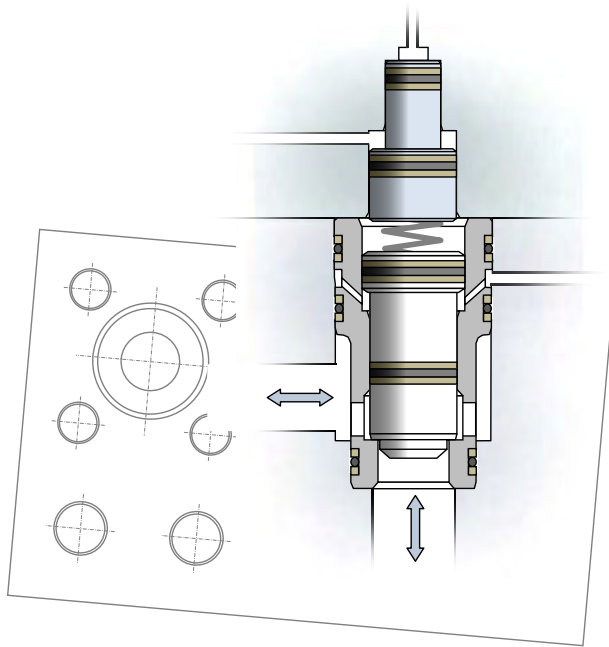
Low maintenance costs because valves and seals can be changed individually without machining. Valve housings can stay in the system during maintenance or repair. Minimal requirement of stock material because of the modular program.

Geringe Wartungskosten, da Ventile und Dichtungen ohne zusätzliche mechanische Bearbeitung separat austauschbar sind. Die Ventilgehäuse können während der Wartung eingebaut bleiben. Durch den baukastenartigen Aufbau sind nur eine geringe Anzahl an verschiedenen Ersatzteilen erforderlich.

Please find more technical details in our catalogue WATER- and SPECIAL HYDRAULICS

Weitere technische Einzelheiten finden Sie in unserem Katalog WASSER- und SONDERHYDRAULIK

## SPECIAL VALVES



### Customised Design

Individual development or design for single or serial applications.

Our main focus is on cartridges and pilot valves from 40 to 800bar with sizes of 2 to 250mm.

Depending on the design the valves can be used with water, seawater, oil media, special fluids and gases.

### Off Shore and Sub Sea Valves

Valves are coated or can be produced from seawater resistant stainless steel material.

### Pulsation Valves

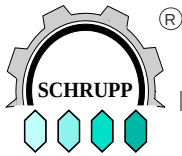
Fast responding valves with separate pilot fluid supply and materials conforming to the application.

### Replacement Valves for existing Systems

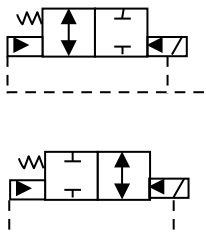
Valves to optimise the function of an existing system or to replace original valves which cannot be produced anymore.

### New Application

New valve development in close cooperation with the customer, optimised to the project.

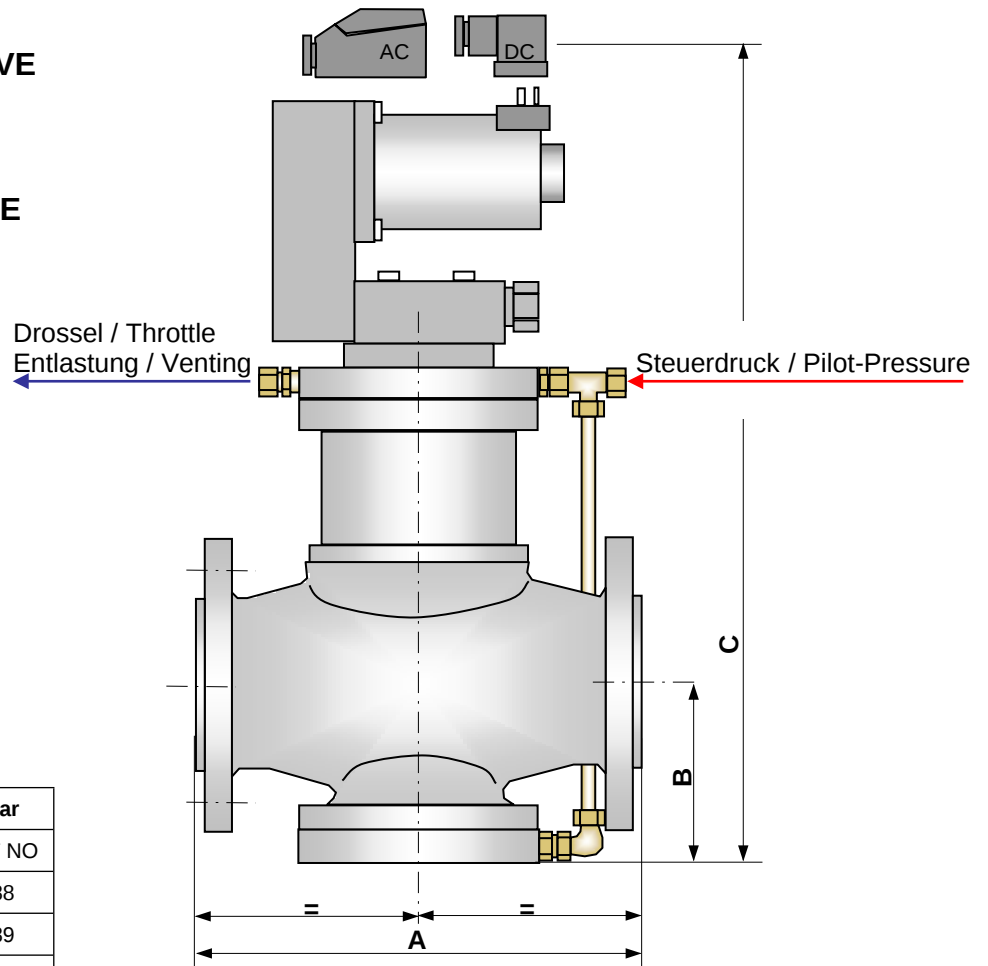


## 2/2 WAY – DIRECTIONAL 2/2 WEGE - VENTILE



**NEGATIVE**

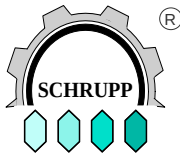
**POSITIVE**



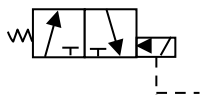
| 2/2 Directional valve DIN2635 PN40bar |     |     |     |       |         |
|---------------------------------------|-----|-----|-----|-------|---------|
| DN                                    | A   | B   | C   | MASS  | PART NO |
| 65                                    | 290 | 116 | 460 | 350 N | 168488  |
| 80                                    | 310 | 128 | 490 | 400 N | 168489  |
| 100                                   | 350 | 148 | 540 | 650 N | 168490  |

### Technische Daten / Technical Data

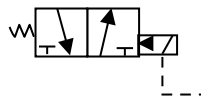
|                                               |                                                          |                                          |                                              |
|-----------------------------------------------|----------------------------------------------------------|------------------------------------------|----------------------------------------------|
| Medium                                        | Öl, Wasser, Luft                                         | Medium                                   | Oil, water, compressed air                   |
| Betriebsdruck                                 | 2 – 40 bar                                               | Operating pressure                       | 2 – 40 bar                                   |
| Nennweite                                     | 65 – 100 mm                                              | Nominal size                             | 65 – 100 mm                                  |
| Betriebstemperatur                            | 0 – 80°C                                                 | Operating temperature                    | 32 – 176°F                                   |
| Umgebungstemperatur                           | 40°C max                                                 | Ambient temperature                      | 104°F                                        |
| Vorsteuerdruck                                | max 40bar / min. Betriebsdruck                           | Pilot pressure                           | Max 40bar / min operating pressure           |
| Vorsteueranschlüsse                           | Rohr AD 8mm                                              | Pilot connections                        | Pipe AD 8mm                                  |
| Spannung                                      | 12 – 260V DC oder AC 100%ED                              | Voltage                                  | 12 – 260V DC or AC 100%ED                    |
| Schutzart                                     | IP65                                                     | Protection class                         | IP 65                                        |
| Stromaufnahme                                 | 46W max                                                  | Power consumption                        | 46W max                                      |
| Werkstoff Gehäuse<br>Innenteile<br>Dichtungen | GGG 40<br>Edelstahl, Messing, Rotguß<br>Perbunan, Delrin | Material housing<br>other parts<br>seals | GGG 40<br>Stainless, Brass<br>Buna N, Delrin |



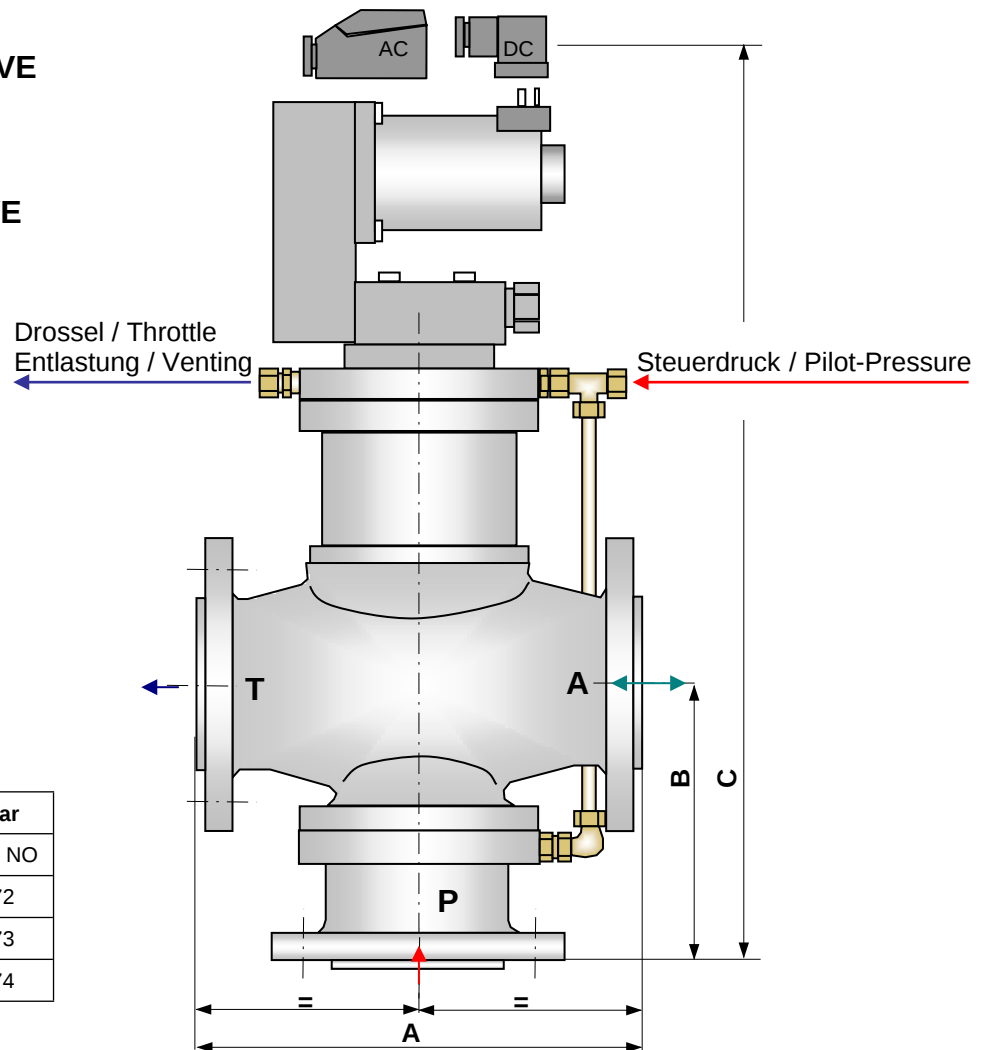
## 2/2 WAY – DIRECTIONAL 2/2 WEGE - VENTILE



**NEGATIVE**



**POSITIVE**



| 3/2 Directional valve DIN2635 PN40bar |     |     |     |       |         |
|---------------------------------------|-----|-----|-----|-------|---------|
| DN                                    | A   | B   | C   | MASS  | PART NO |
| 65                                    | 290 | 175 | 610 | 400 N | 168472  |
| 80                                    | 310 | 202 | 640 | 500 N | 168473  |
| 100                                   | 350 | 230 | 700 | 750 N | 168474  |

### Technische Daten / Technical Data

|                                               |                                                          |                                          |                                              |
|-----------------------------------------------|----------------------------------------------------------|------------------------------------------|----------------------------------------------|
| Medium                                        | Öl, Wasser, Luft                                         | Medium                                   | Oil, water, compressed air                   |
| Betriebsdruck                                 | 2 – 40 bar                                               | Operating pressure                       | 2 – 40 bar                                   |
| Nennweite                                     | 65 – 100 mm                                              | Nominal size                             | 65 – 100 mm                                  |
| Betriebstemperatur                            | 0 – 80°C                                                 | Operating temperature                    | 32 – 176°F                                   |
| Umgebungstemperatur                           | 40°C max                                                 | Ambient temperature                      | 104°F                                        |
| Vorsteuerdruck                                | max 40bar / min. Betriebsdruck                           | Pilot pressure                           | Max 40bar / min operating pressure           |
| Vorsteueranschlüsse                           | Rohr AD 8mm                                              | Pilot connections                        | Pipe AD 8mm                                  |
| Spannung                                      | 12 – 260V DC oder AC 100%ED                              | Voltage                                  | 12 – 260V DC or AC 100%ED                    |
| Schutzart                                     | IP65                                                     | Protection class                         | IP 65                                        |
| Stromaufnahme                                 | 46W max                                                  | Power consumption                        | 46W max                                      |
| Werkstoff Gehäuse<br>Innenteile<br>Dichtungen | GGG 40<br>Edelstahl, Messing, Rotguß<br>Perbunan, Delrin | Material housing<br>other parts<br>seals | GGG 40<br>Stainless, Brass<br>Buna N, Delrin |

## SPRÜHVENTILE SPRAY VALVES



### Leckagefreies Sitzventil

Beständig gegen übliche Medien zur  
Walzenkühlung

Sprühdüse kann integriert werden

Zum direkten An- oder Einbau in Sprühbalken

Geringe Abmessungen

Kurze Schaltzeiten

Lange Lebensdauer

### Non-leak valve with soft seat

Resistant to cooling media

Spray nozzle can be integrated

Assembly in or onto spray  
beams

Small size

Short actuating time

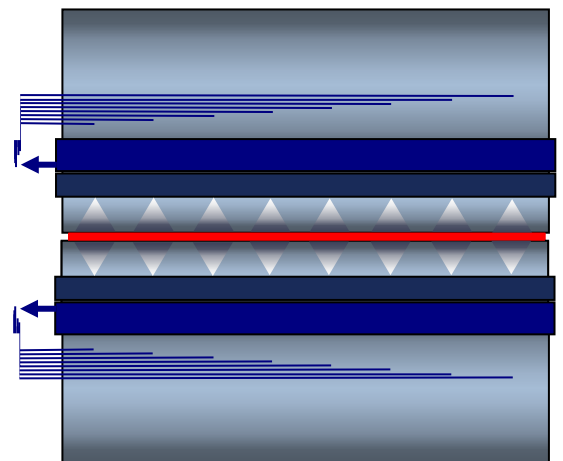
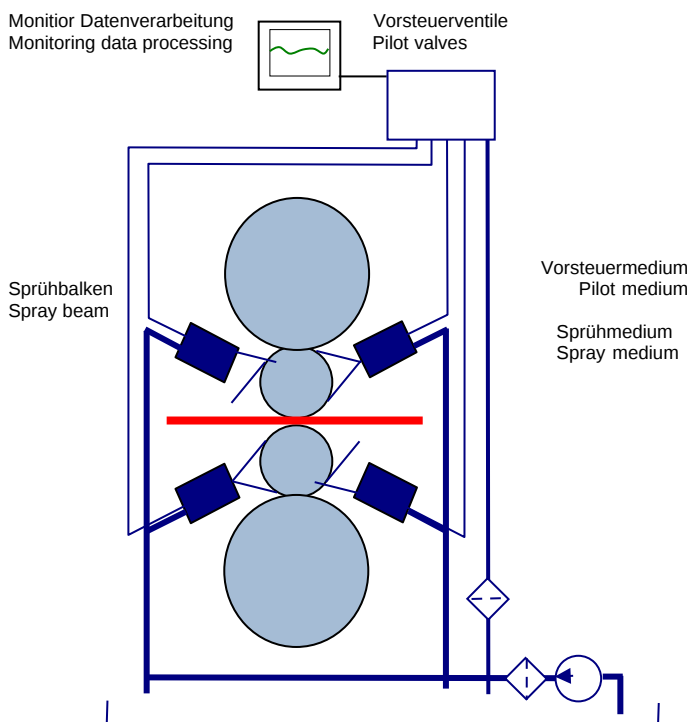
Long expected lifetime

## SPRÜHVENTILE SPRAY VALVES

### ANWENDUNG / APPLICATION

Moderne Walzverfahren zur Herstellung von Feinblech aus Aluminium oder Stahl erfordern eine schnell ansprechende partielle Walzenkühlung eng aneinander liegender Walzzonen. Schrupp Sprühventile lassen sich direkt in oder auf den Sprühbalken montieren. Die Sprühdüse kann in das Ventil integriert werden. Eine einfacher und robuster Konstruktion ermöglicht den Aufbau einer kompakten und schnell reagierenden Walzenkühlung.

Modern rolling processes for the production of aluminium or steel sheets require a quick acting valve to provide partial cooling of roller areas situated close to each other. Schrupp spray valves can be assembled in or onto the spray beam. The spray nozzle can be integrated into the valve. With their ease of maintenance and robust design the valves can be used in rapidly responding compact roller cooling systems.

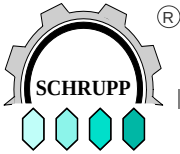


### Zu unserem Lieferprogramm gehören:

Sprühventile  
Sprühbalken  
Vorsteuer- und Ventilstände  
Verbindungstechnik

### Our manufacturing program includes:

Spray Valves  
Spray Beams (Headers)  
Pilot Valves and Valve Stands  
Piping and connections



## SPRÜHVENTILE SPRAY VALVES

### EINBAUVENTILE / CARTRIDGE TYPE

#### FUNKTION / FUNCTION

Die Funktionsweise entspricht der eines normalen 2/2 Wegeventils. Wird der Kolben über die Steuerbohrung (Anschluss Px) entlastet, öffnet der an der Differenzfläche anstehende Betriebsdruck P den Kolben entgegen der Federkraft.

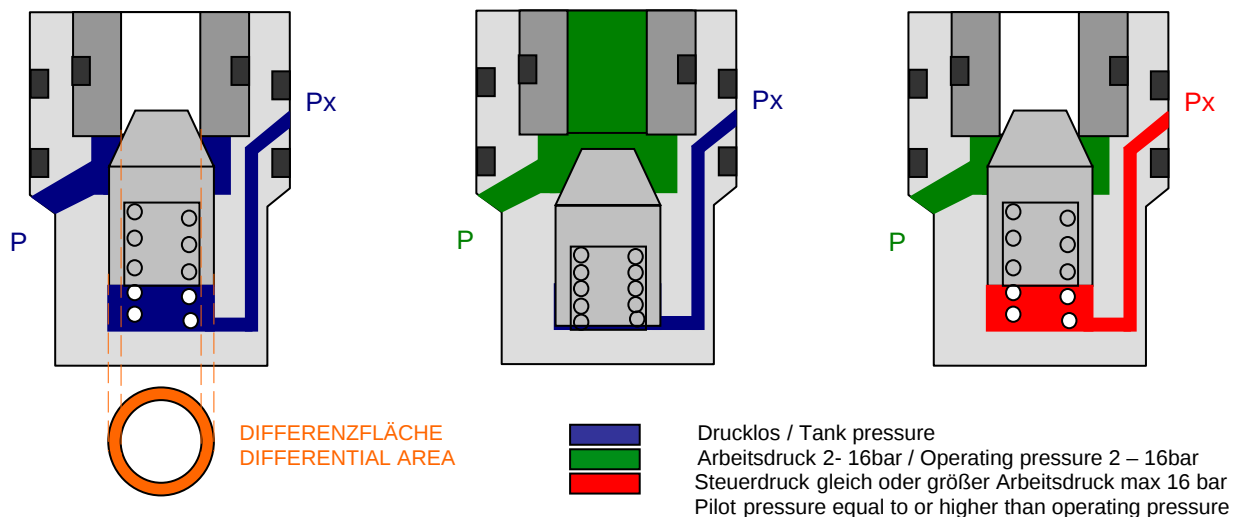
Steht an der Steuerbohrung ein Druck gleich oder größer dem Betriebsdruckes an, schließt das Ventil.

Die erforderlichen Pilotventile können außerhalb des Walzgerüsts installiert und mittels Rohren oder Schläuchen mit den Sprühventilen verbunden werden. Grundsätzlich können die Ventile mit Eigen- oder Fremdmedium vorgesteuert werden. Voraussetzung ist jedoch immer, dass der Vorsteuerdruck am Ventil gleich oder größer dem momentan anstehenden Betriebsdruck ist.

The function of the valve is identical to the function of a 2/2 way directional control valve. If the piston is unloaded via the control bore (port Px), the operating pressure P at the differential area opens the valve against the spring force.

A pressure at Px equal or higher than the operating pressure will close the valve.

The pilot valves can be located separately and outside of the roller stand and can be connected with pipes or hoses to the spray valves. The valves can be piloted by using the spraying media or compressed air or fluids. It is important, that the pilot pressure is always equal to or higher than the operating pressure.





## SPRÜHVENTILE SPRAY VALVES

### TECHNISCHE DATEN / TECHNICAL DATA

|                    |                          |                              |
|--------------------|--------------------------|------------------------------|
| Nennndruck         | Nominal pressure         | 16 bar                       |
| Betriebsdruck      | Operating pressure       | 2-16 bar                     |
| Öffnungsdruck      | Opening pressure         | 2 bar                        |
| Betriebstemperatur | Operating temperature    | 80°C max                     |
| Medium             | Wasser, Emulsion, Walzöl | Water, emulsion, rolling oil |
| Nennweiten         | Sizes                    | 6, 8, 12, 16 mm              |

#### Werkstoffe

Gehäuse, Kolben, Deckel: Edelstahl

Sitz: Peek

Dichtungen: Viton oder Perbunan

Sonderausführungen mit anderen Nennweiten oder Abmessungen auf Anfrage  
Please ask for other valves with different sizes and dimensions

#### Material

Housing , piston, covers: stainless steel

Seat: peek

Seals: viton or buna-N

#### Lebensdauer / Life expectancy

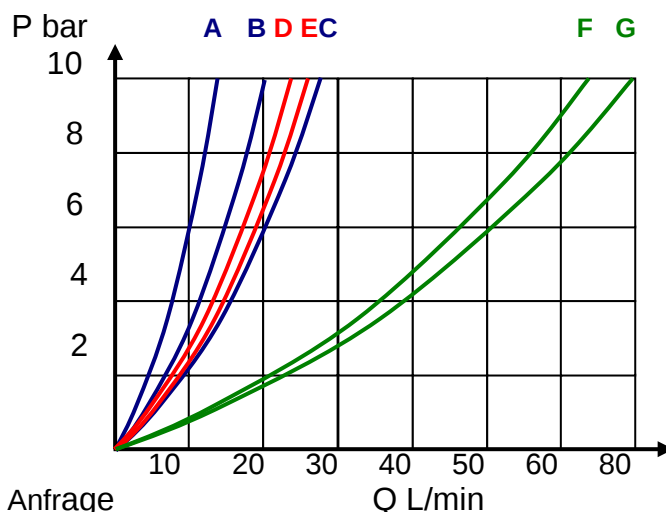
Die Lebenserwartung der Ventile ist stark abhängig von den verwendeten Betriebsmedien und deren Zustand. In Prüfstandsversuchen und in der Praxis konnten Lebenserwartungen mit gut gepflegten Medien von über 6Mio Schaltspielen erreicht werden. Der wartungsfreundliche Aufbau der Ventile ermöglicht es Verschleißteile wie Dichtungen und Sitze auszutauschen und damit die Lebenserwartung der Ventile zu verlängern.

The kind and condition of the operating media has strong influence on the expected lifetime of the valves. From test runs and also from customer`s experience we know that the lifespan of the valves can be more than 6 million cycles by using a high quality medium with good maintenance. The design allows an easy replacement of all critical parts like seats and seals, which helps to increase the life span of the valve.

#### Kennlinien für Ventile mit Düsen / Diagram for valve including nozzle

|                 |             |   |
|-----------------|-------------|---|
| FU1-652.721     | Valve ND 6  | A |
| FU1-652.761     | Valve ND 6  | B |
| FU1-562.842     | Valve ND 6  | C |
| FU1-652.801     | Valve ND 8  | D |
| FU1-652.843     | Valve ND 8  | E |
| FU3- 656.962.30 | Valve ND 16 | F |
| FU3-656.964     | Valve ND 16 | G |

Test Medium Wasser, water



Other flow curves on request / weitere Kennlinien auf Anfrage



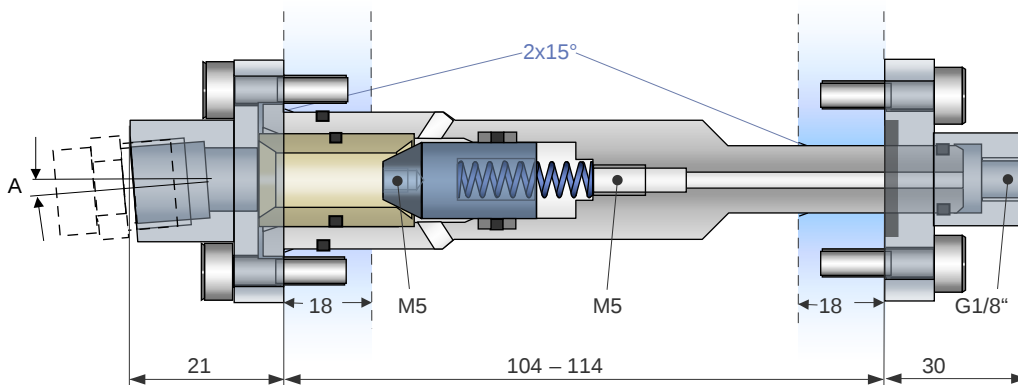
## SPRÜHVENTILE SPRAY VALVES

### SPRÜHVENTIL / SPRAY VALVE DN8 PN16

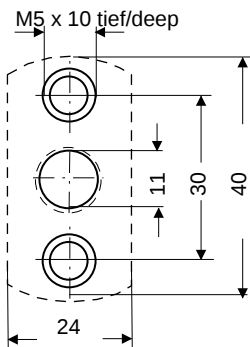
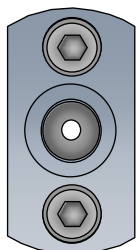
3 Deckel / Cover

1 Grundventil / Valve DN8 PN16

2 Adapter / Adaptor



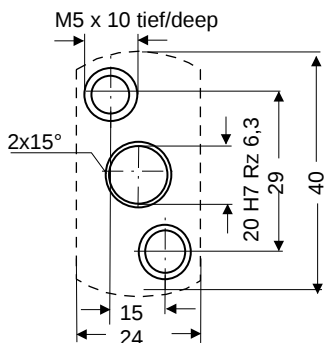
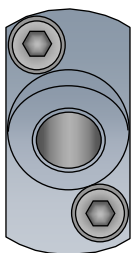
#### Adapter / Adaptor



#### Bestellbezeichnung / Ordering code

| Pos                                    | Bezeichnung<br>Part name         | Anschluß-<br>gewinde<br>Connection | Winkel<br>Spray Angle<br>A | Teilenr.<br>Part no. |
|----------------------------------------|----------------------------------|------------------------------------|----------------------------|----------------------|
| 1                                      | Grundventil / Valve<br>DN8, PN16 |                                    |                            | <b>850202</b>        |
| 2                                      | Adapter / Adaptor                | G 1/8"                             | 0                          | <b>654630</b>        |
| 3                                      | Deckel / Cover                   | RP 1/4                             | 0                          | <b>654631</b>        |
| 3.1                                    | Deckel / Cover                   | RP 1/4                             | 5°                         | <b>654632</b>        |
| 3.2                                    | Deckel / Cover                   | RP 1/4                             | 10°                        | <b>850201</b>        |
| 3.3                                    | Deckel / Cover                   | RP 1/4                             | 15°                        | <b>645633</b>        |
| Demontagewerkzeug / Disassembling tool |                                  |                                    |                            | <b>654039</b>        |

#### Deckel / Cover



Ein komplettes Sprühventil besteht jeweils aus: 1 Stk Grundventil, 1 Stk Deckel, 1 Stk Adapter. Schrauben und Dichtungen sind enthalten. Die Düse gehört nicht zum Lieferumfang. Vernickelte Deckel, Adapter sowie abweichende Ausführungen auf Anfrage.

A complete Spray Valve consists of: 1pce valve, 1pce cover, 1pce adaptor. Bolts and seals are included. Spray nozzles are not included. Please ask for special designs; for example nickel plated covers and adaptors.

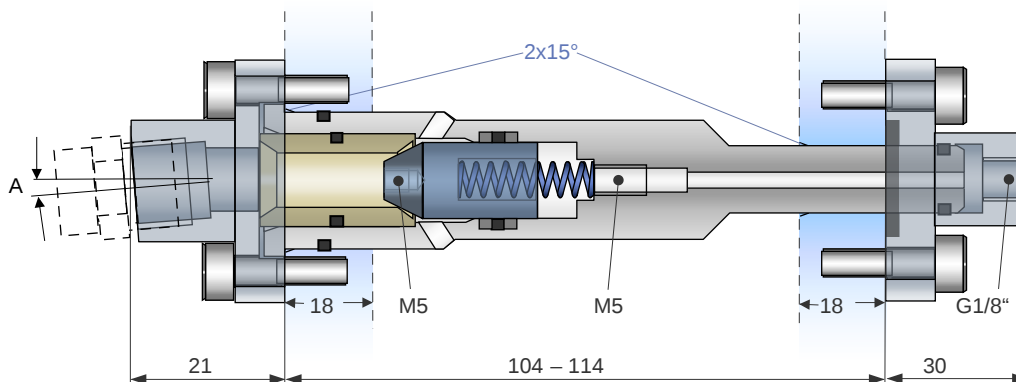
## SPRÜHVENTILE SPRAY VALVES

### SPRÜHVENTIL / SPRAY VALVE DN12 PN16

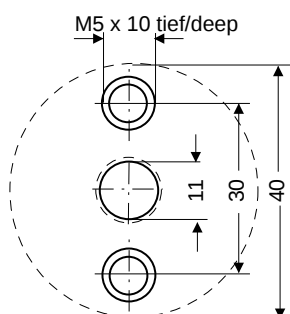
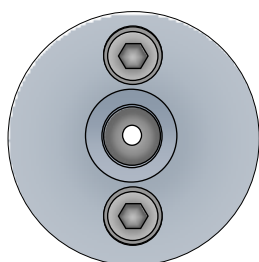
3 Deckel / Cover

1 Grundventil / Valve DN12 PN16

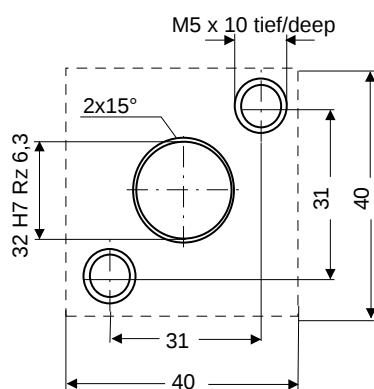
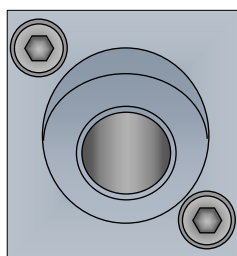
2 Adapter / Adaptor



Adapter / Adaptor



Deckel / Cover



Bestellbezeichnung / Ordering code

| Pos                                    | Bezeichnung<br>Part name          | Anschluß-<br>gewinde<br>Connection | Winkel<br>A | Teilenr.<br>Part no. |
|----------------------------------------|-----------------------------------|------------------------------------|-------------|----------------------|
| 1                                      | Grundventil / Valve<br>DN12, PN16 |                                    |             | <b>655043</b>        |
| 2                                      | Adapter / Adaptor                 | G 1/8"                             | 0           | <b>655047</b>        |
| 3                                      | Deckel / Cover                    | RP 1/4                             | 0           | <b>654653</b>        |
| 3.1                                    | Deckel / Cover                    | RP 1/4                             | 5°          | <b>655046</b>        |
| 3.2                                    | Deckel / Cover                    | RP 1/4                             | 10°         | <b>655045</b>        |
| 3.3                                    | Deckel / Cover                    | RP 1/4                             | 15°         | <b>655044</b>        |
| 3.4                                    | Deckel / Cover                    | G 3/4"                             | 0           | <b>850198</b>        |
| Demontagewerkzeug / Disassembling tool |                                   |                                    |             | <b>654039</b>        |

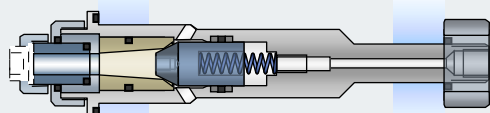
Ein komplettes Sprühventil besteht jeweils aus:

1 Stk Grundventil, 1 Stk Deckel, 1 Stk Adapter. Schrauben und Dichtungen sind enthalten. Die Düse gehört nicht zum Lieferumfang. Vernickelte Deckel, Adapter sowie abweichende Ausführungen auf Anfrage.

A complete Spray Valve consists of:

1pce valve, 1pce cover, 1pce adaptor. Bolts and seals are included. Spray nozzles are not included. Please ask for special designs; for example nickel plated covers and adaptors.

Weitere Typen auf Anfrage  
Other valve types on request



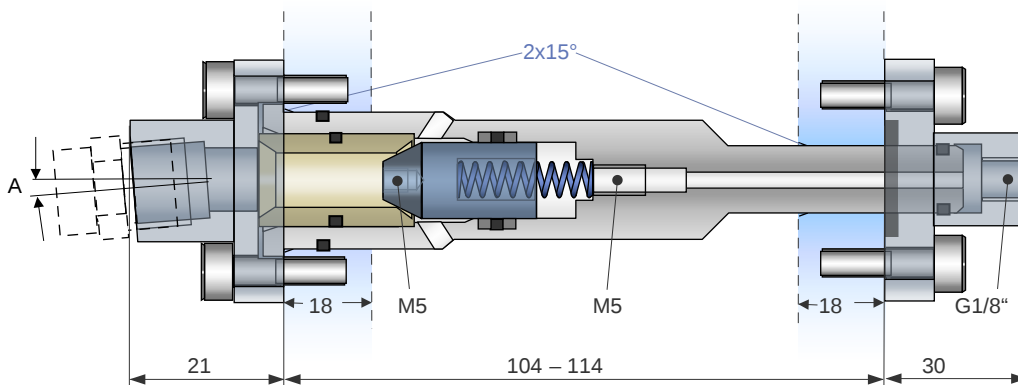
## SPRÜHVENTILE SPRAY VALVES

### SPRÜHVENTIL / SPRAY VALVE DN16 PN16

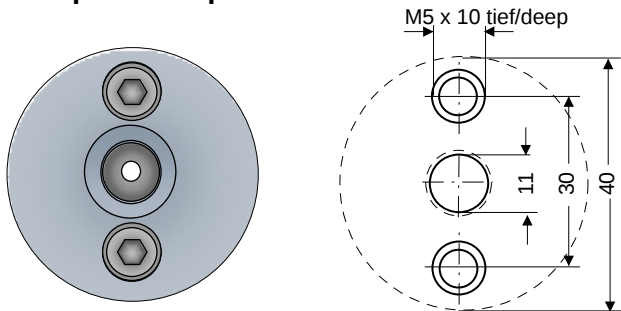
3 Deckel / Cover

1 Grundventil / Valve DN16 PN16

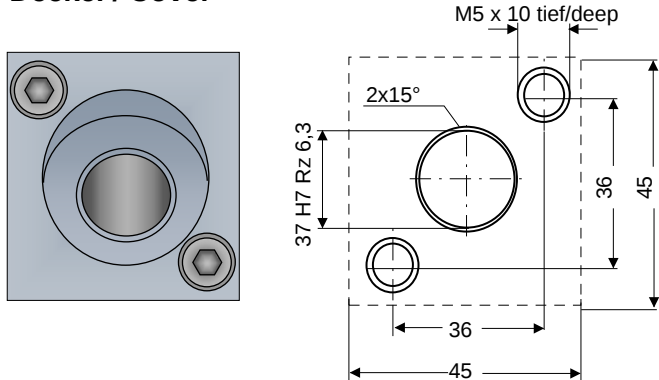
2 Adapter / Adaptor



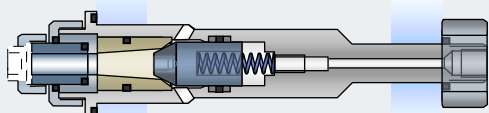
Adapter / Adaptor



Deckel / Cover



Weitere Typen auf Anfrage  
Other valve types on request



Bestellbezeichnung / Ordering code

| Pos                                    | Bezeichnung<br>Part name          | Anschluß-<br>gewinde | WinkelA | Teilenr.<br>Part<br>no. |
|----------------------------------------|-----------------------------------|----------------------|---------|-------------------------|
| 1                                      | Grundventil / Valve<br>DN16, PN16 |                      |         | <b>850339</b>           |
| 2                                      | Adapter / Adaptor                 | G 1/8"               | 0       | <b>850350</b>           |
| 3                                      | Deckel / Cover                    | RP 1/4               | 0       |                         |
| 3.1                                    | Deckel / Cover                    | RP 1/4               | 5°      |                         |
| 3.2                                    | Deckel / Cover                    | RP 1/4               | 10°     |                         |
| 3.3                                    | Deckel / Cover                    | RP 1/4               | 15°     |                         |
| 3.4                                    | Deckel / Cover                    | RP 1/2               | 10°     | <b>850850</b>           |
| 3.5                                    | Deckel / Cover                    | G 3/4"               | 0       | <b>850340</b>           |
| Demontagewerkzeug / Disassembling tool |                                   |                      |         | <b>654039</b>           |

Ein komplettes Sprühventil besteht jeweils aus:

1 Stk Grundventil, 1 Stk Deckel, 1 Stk Adapter. Schrauben und Dichtungen sind enthalten. Die Düse gehört nicht zum Lieferumfang. Vernickelte Deckel, Adapter sowie abweichende Ausführungen auf Anfrage.

A complete Spray Valve consists of:

1pce valve, 1pce cover, 1pce adaptor. Bolts and seals are included. Spray nozzles are not included. Please ask for special designs; for example nickel plated covers and adaptors.



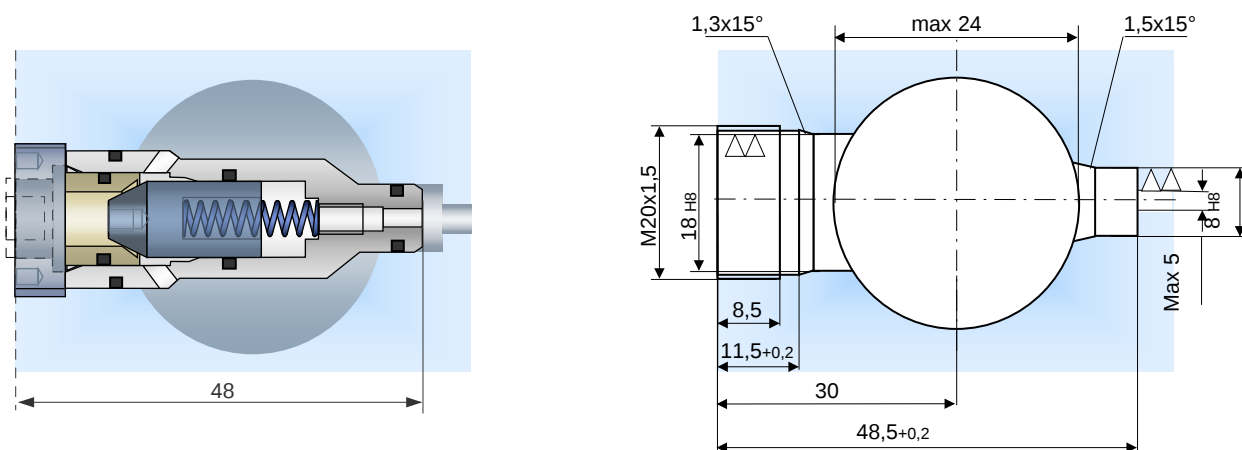
## SPRÜHVENTILE SPRAY VALVES

### SPRÜHVENTIL / SPRAY VALVE DN6 PN16

Ein komplettes Sprühventil besteht jeweils aus: 1 Stk Grundventil, 1 Stk Deckel. Schrauben und Dichtungen sind enthalten. Die Düse Typ FU1 gehört nicht zum Lieferumfang. Vernickelte Deckel sowie abweichende Ausführungen auf Anfrage.

A complete Spray Valve consists of: 1pce valve, 1pce cover. Bolts and seals are included. Spray nozzle type FU1 are not included. Please ask for special designs; for example nickel plated covers.

Bestellnr. für Ventil mit Deckel / Order no. for valve and cover: **501225**



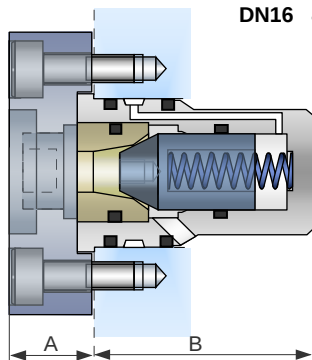
### SPRÜHVENTIL / SPRAY VALVE DN8,12,16 PN16

Ein komplettes Sprühventil besteht jeweils aus: 1 Stk Grundventil, 1 Stk Deckel. Schrauben und Dichtungen sind enthalten. Die Düse Typ FU1 gehört nicht zum Lieferumfang. Vernickelte Deckel sowie abweichende Ausführungen auf Anfrage.

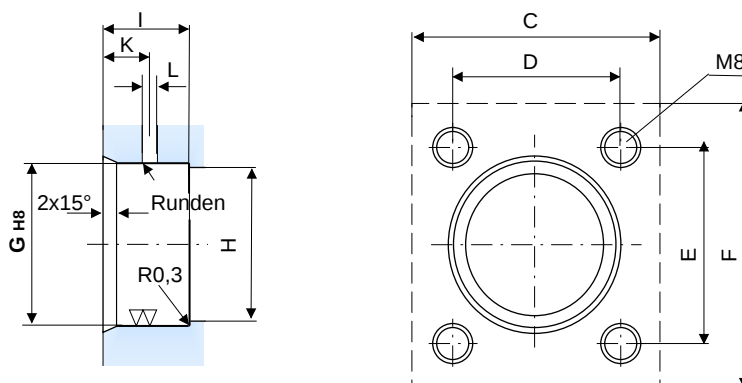
A complete Spray Valve consists of: 1pce valve, 1pce cover. Bolts and seals are included. Spray nozzles type FU1 are not included. Please ask for special designs for example nickel plated covers.

Bestellnr. für Ventil mit Deckel / Order no. for valve and cover:

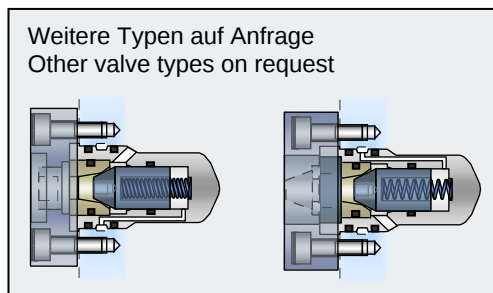
**DN8 501400**  
**DN12 501555**  
**DN16 459761**



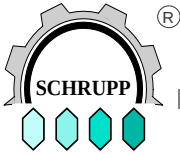
Einbaumaße / Dimensions



Weitere Typen auf Anfrage  
Other valve types on request



| Partno.<br>Teilenr. | Type      | A  | B  | C  | D  | E  | F  | G  | H    | I    | K  | L |
|---------------------|-----------|----|----|----|----|----|----|----|------|------|----|---|
| 501400              | DN8 PN16  | 20 | 47 | 49 | 36 | 36 | 49 | 37 | 32,5 | 18   | 11 | 6 |
| 501555              | DN12 PN16 | 18 | 46 | 49 | 32 | 46 | 65 | 40 | 35,5 | 17,5 | 11 | 6 |
| 459761              | DN16 PN16 | 18 | 60 | 49 | 34 | 50 | 65 | 45 | 42,5 | 19   | 11 | 6 |



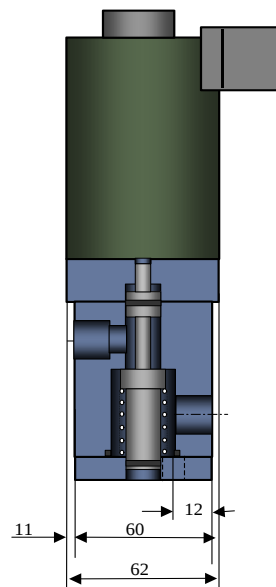
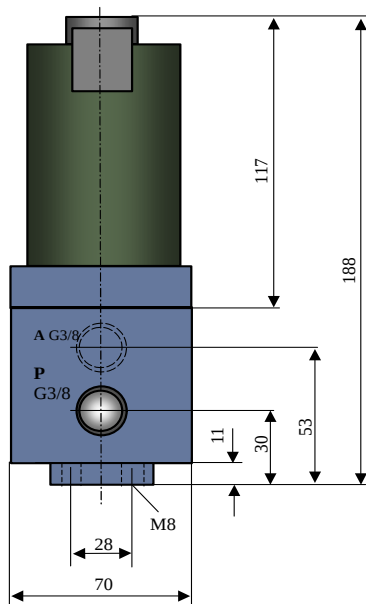
## SPRÜHVENTILE SPRAY VALVES

### SONDERVENTILE / VALVES FOR SPECIAL APPLICATIONS

#### Sprühventil für Plattenaufbau / Spray valve for inline mounting

Diese Ventile werden in Bereichen eingesetzt, wo hohe Anforderung bezüglich Dichtigkeit und Druckfestigkeit bestehen. Die schmutzunempfindliche Weichdichtung mit metallischer Abstützung ist besonders geeignet für dünnflüssige Medien und Wasser. Lieferbar ist das Ventil in den Nennweiten 10, 16, 25, 32, 40 für Druckbereiche von 5-25bar Sonderausführungen bis 350bar möglich.

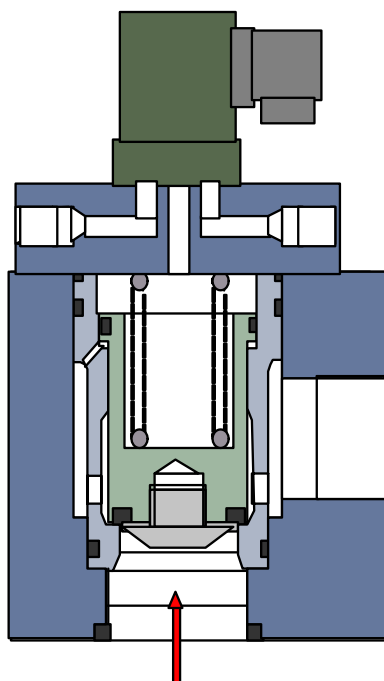
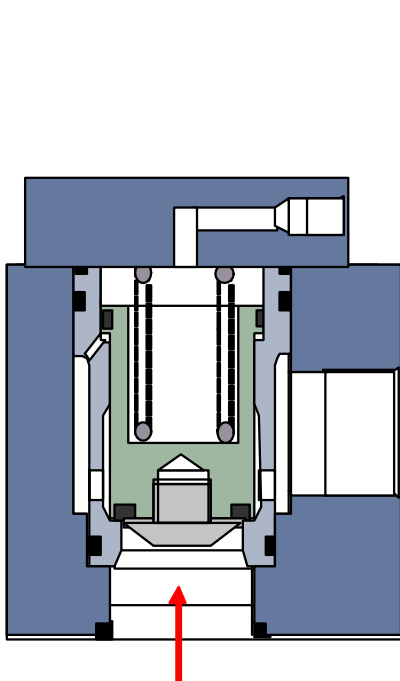
The standard valve are available in nominal sizes 10, 16, 25, 32 and 40 for pressures from 5 – 25bar. Special implementations are available with pressures to 350bar. These valves are installed into areas which require high pressure and limited space. The contamination tolerant soft-seat with metallic piston and housing is suitable for use with thin-fluid media and especially water.



#### Technische Daten

|                   |         |
|-------------------|---------|
| Spannung          | 48V DC  |
| Nennndruck        | 16bar   |
| Nennweite         | 12mm    |
| Leistungsaufnahme | 43W     |
| Durchflußmenge    | 50L/min |

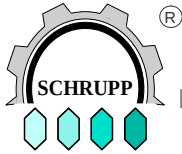
Ausführung  
stromlos geschlossen



#### Technische Daten:

|    |            |
|----|------------|
| PN | 5 - 25 bar |
| DN | 10 - 40mm  |

Weiter Informationen auf Anfrage  
Additional information on request



**HL Hydraulik GmbH**



**[www.hl-hydraulik.de](http://www.hl-hydraulik.de)**

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