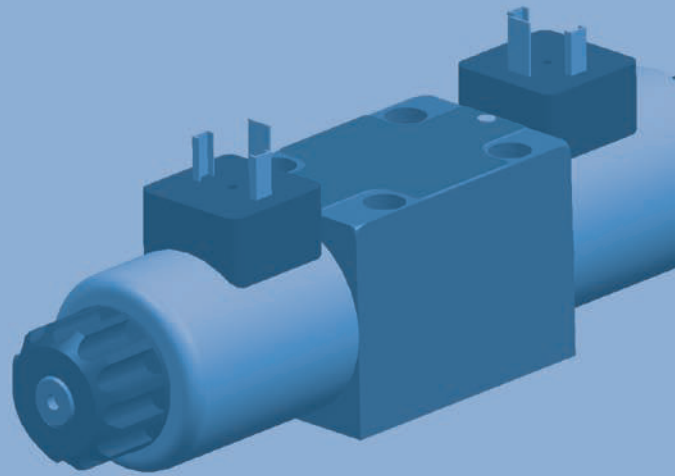
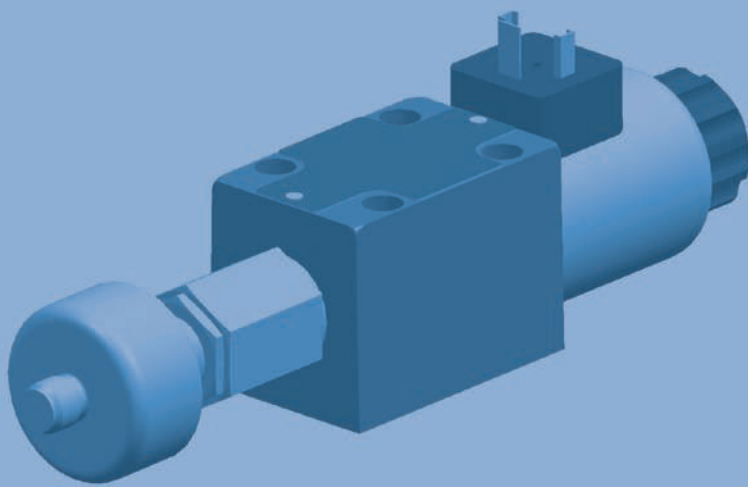
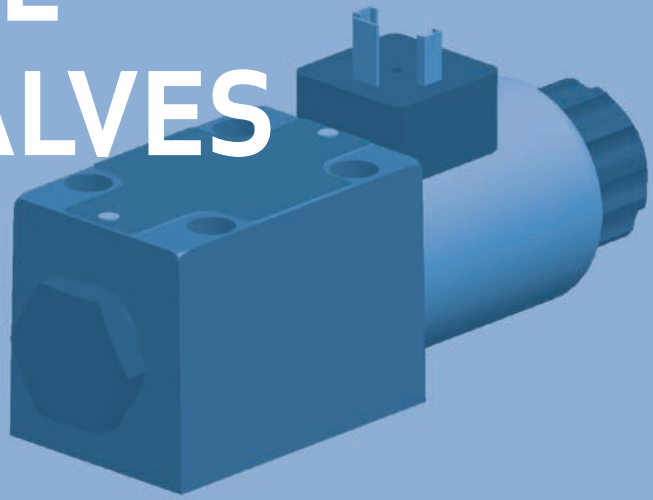


DIRECTIONAL CONTROL VALVES

SERIES X820



Rev. 02-2022

ISO 4401 SIZE 03 (NG06)

Whenever the highest levels of motion control performance and design flexibility are required, you'll find Moog expertise at work. Through collaboration, creativity and world-class technological solutions, we help you overcome your toughest engineering obstacles. Enhance your machine performance. And help take your thinking further than you ever thought possible.

Moog directional control valves series X820

Features and description	2
Directional control valve	
Symbols	3
Rating limits	4
Curves	5
Technical data	6
Dimensions	8
1 Solenoid version with position indication	
Technical data	10
Dimensions	12
Ordering Instructions	13
Seal kits	15
World-wide support	16



Our Quality Standard conforms to DIN EN ISO 9001.

This catalog is for users with technical knowledge. To ensure that all necessary characteristics for function and safety of the system are given, the user has to check the suitability of the products described herein. The products described herein are subject to change without notice. In case of doubt, please contact Moog.

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Dimensions in mm

Features

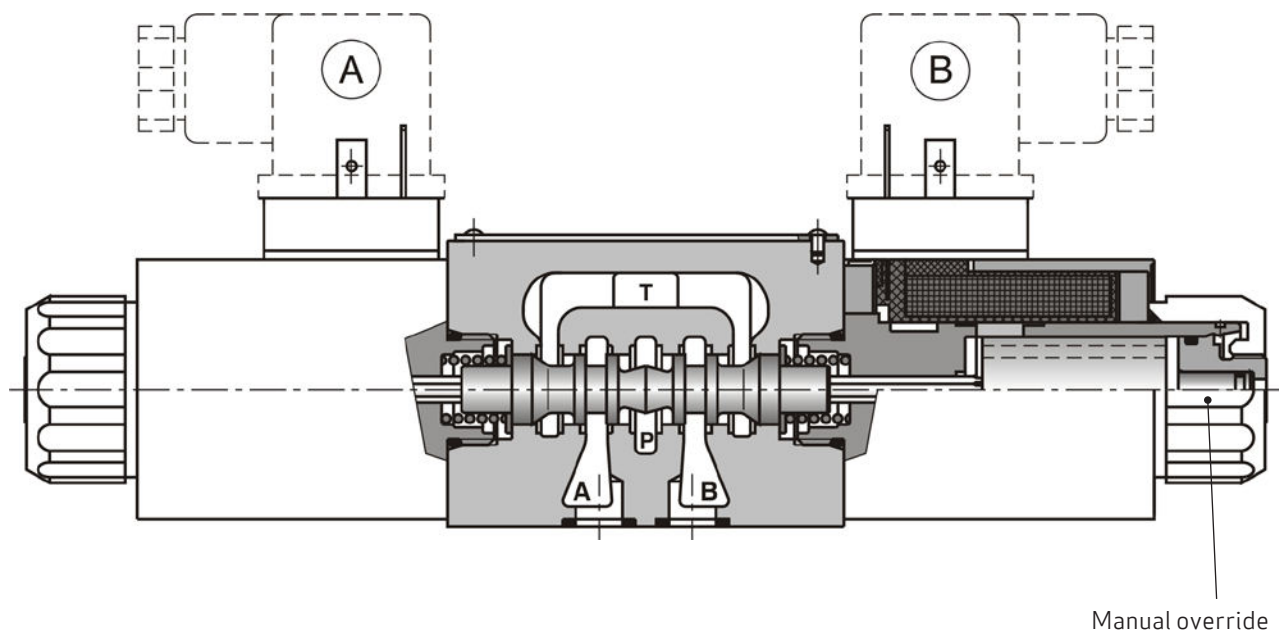
- Low pressure drop at high flow rates due to optimized flow paths in body and spool design.
- Mounting configuration according to ISO 4401-03.
- Initial position indication by inductive position switch (see page 10-12).
- Change of solenoid coil is fast and simple without risk of leakage.
- Electrical single connection of solenoids according to ISO 4400 / DIN 43650.
- The surface of the valve housing is phosphatized and the actuating solenoids are galvanized.
- Every valve is tested prior to delivery.

Description

Moog’s direct operated X820 Series Directional Control Valve conforms to CETOP 03 standard interface. It is designed to be manifold mounted, or used in conjunction with the stack valve system.

The X820 directional control valve consists basically of the longitudinal slide spool, the housing and the corresponding actuating element. The spool is shifted by use of solenoids allowing oil under pressure to flow from port P to either port A or B and subsequently connecting the alternate port to the tank (T). Deenergizing the operator allows the spring to return the spool to the center.

The manual override option allows manual operation of the spool.



Symbols

	Spool position A Spring centered	Spool position C Spring centered	Spool position B Spring centered
01N	01N	01N	01N
03P	03P	03P	03P
06P	06P	06P	06P
07N	07N	07N	07N
08P	08P	08P	08P
13P	13P	--	--
14P	--	--	14P
21P	21P	--	--
22P	--	--	22P
23N	23N	--	--
24N	--	--	24N
MC1P	MC1P	--	MC1P
Directional valve with flow control functionality (see catalogue WE42P06HMC1P)			

◆ Transfer configuration only (not switched position)

* Only these spools are available with position indication!

Other spools on request!

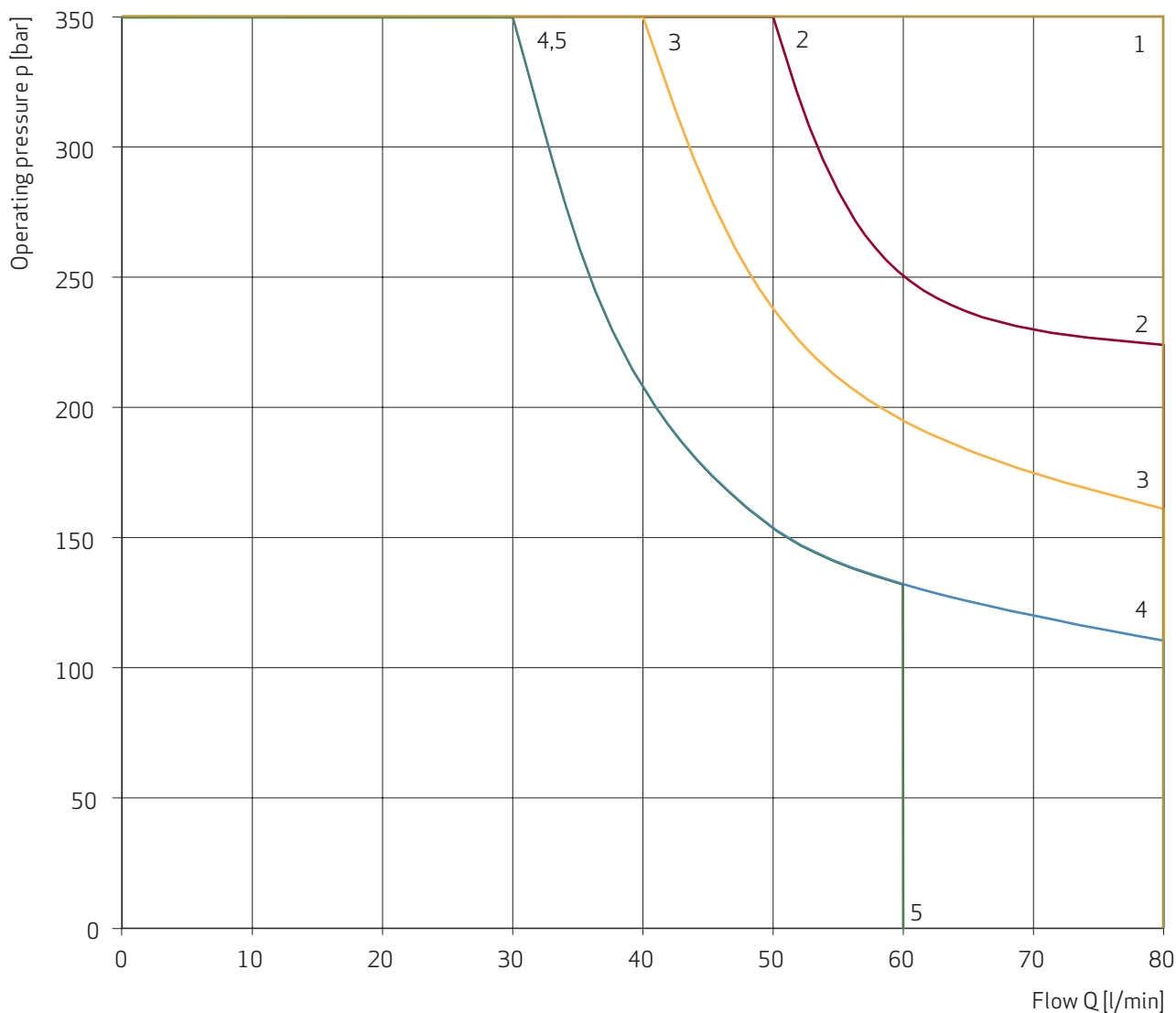
Rating limits

(measured at $v = 32 \text{ mm}^2/\text{s}$ and $t = 40^\circ\text{C}$)

The rating of the valve is limited by the flow forces acting on the spool. These depend on the system pressure and the max. flow. The specified values refer to the use as a 4-way valve in which the load ports A and B are connected. For all spools with P-T circulation in center position the data refer to the worst case that A and B are blocked.

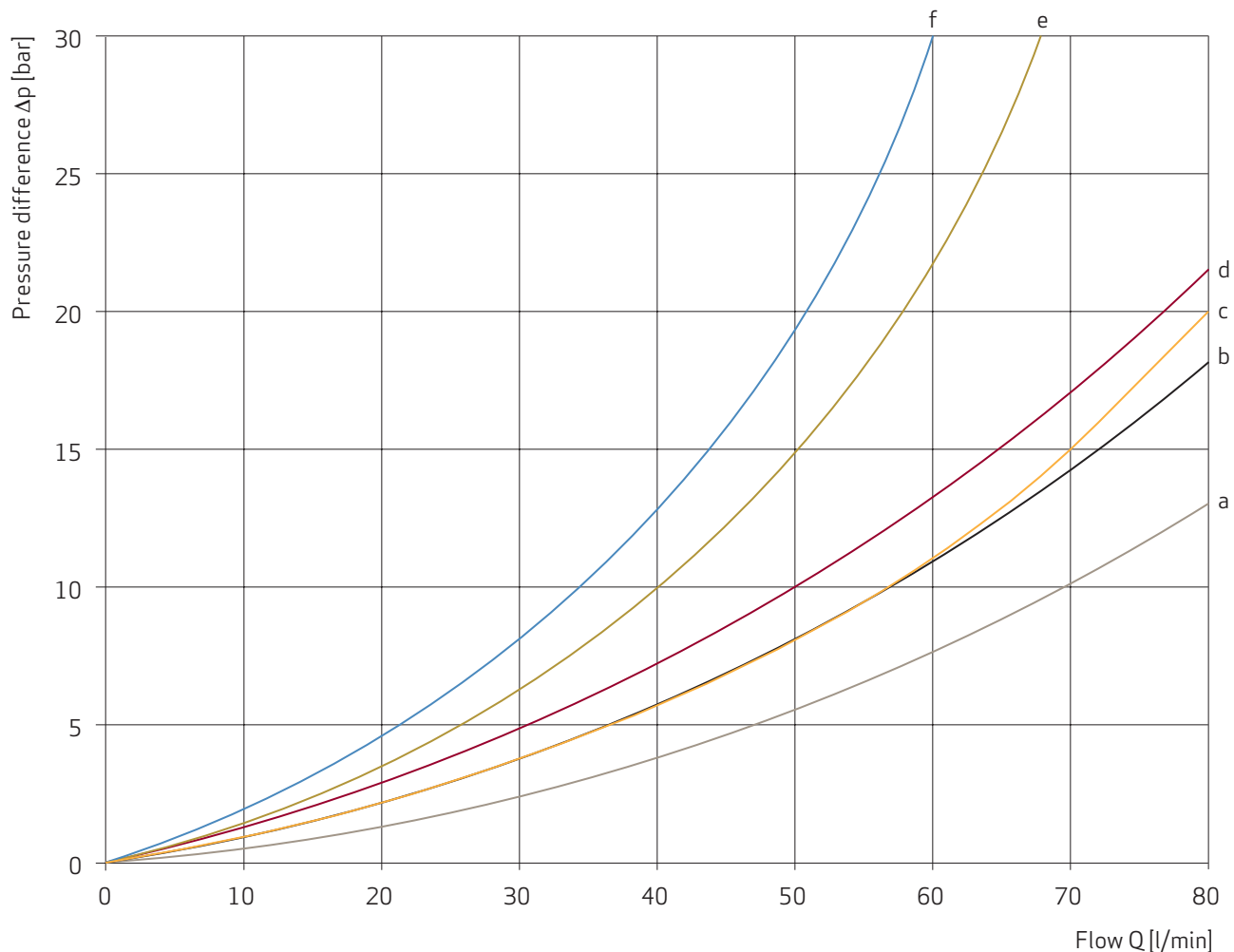
In different applications, e.g. use of only one working port A or B, flow volume transmissions in differential cylinders etc. the conditions for the flow forces are different and therefore the switching limits may be lower in some cases.

Spool type	Curve no.
01N	3
03P	1
06P	1
07N	5
08P	2
13P/14P	1
21P/22P	1
23N/24N	4



Δp -Q curves

(measured at $v = 32 \text{ mm}^2/\text{s}$ and $t = 40^\circ\text{C}$)



Spool type

Spool position	01N	03P	06P	07N	08P	13P/14P	21P/22P	23N/24N
P > A	b	b	a	e	b	c	d	b
P > B	b	b	a	e	b	b	d	b
A > T	d	d	d	e	b	--	d	--
B > T	d	d	d	f	b	--	d	--
P > T	d	--	--	d	--	--	--	--

General parameters

Technical data	Description
Design	Direct operated directional control valve
Type of mounting	Subplate
Mounting position	Any
Mounting surface	ISO 4401-03-02-0-94
Ambient temperature range	-20 °C to +60 °C
Weight	1 solenoid 1.6 kg / 2 solenoids 2.2 kg
MTTFd value according to EN ISO 13849-1	150 years

Hydraulic parameters

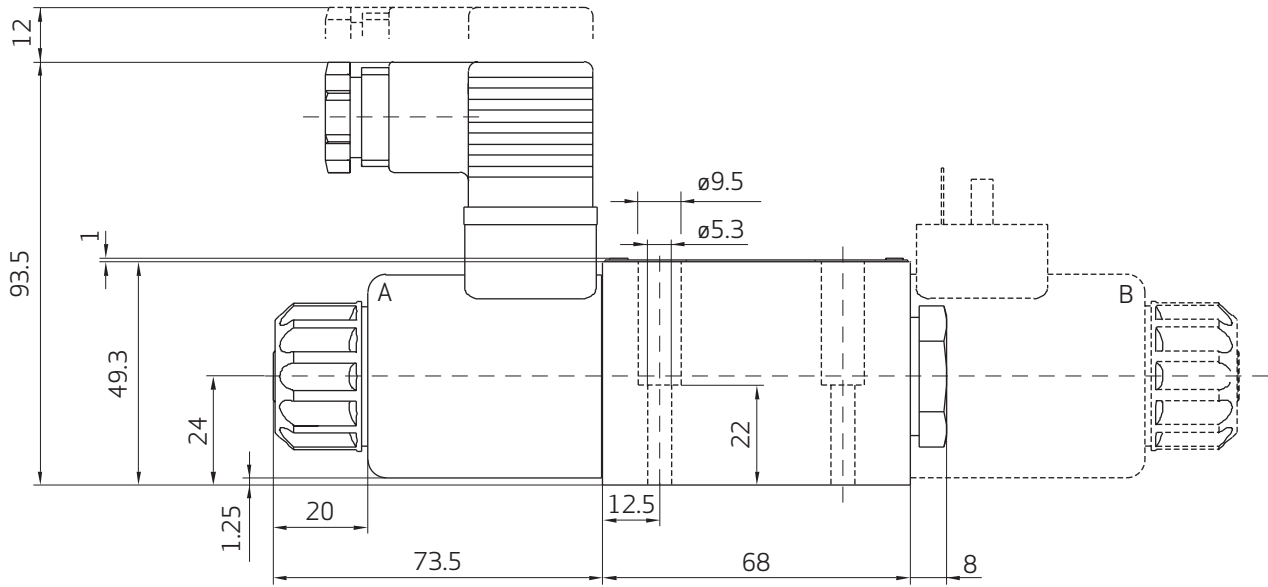
Technical data	Description
Max. operating pressure	P, A, B = 35 MPa / T = 21 MPa
Max. flow ($Q_{max.}$)	80 l/min (depending on spool type)
Pressure fluids (Seal material) (NBR standard)	NBR: mineral oil-based pressure fluids, HFA-, HFB, HFC pressure fluids FKM: mineral oil-based pressure fluids, HFD pressure fluids Gaskets for other pressure fluids on request
Pressure medium temperature range NBR	-30 °C to +80 °C
Pressure medium temperature range FKM	-10 °C to +80 °C
Viscosity range	2.8 mm ² /s to 380 mm ² /s
Contamination level	Max. permissible contamination level of the fluid according to ISO 4406 (C), Class 20/18/15

Electrical parameters

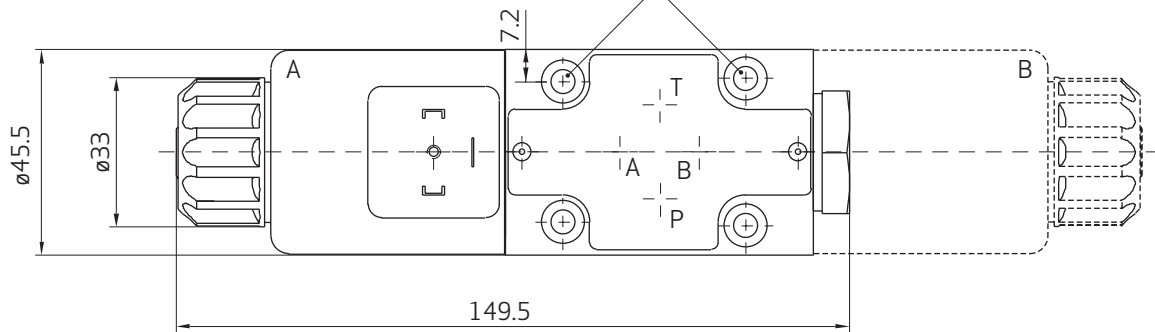
Technical data	Description
Nominal voltage	24 V DC
Permissible tolerance of nominal voltage	±10 %
Max. cycles	15.000 cycles/h
Relative operating period (OP)	100 %
Type of protection EN 60529	IP 65
Solenoid port	Plug-in connector according to DIN 43650
Solenoid type	Wet solenoid switching in oil
Power input	Max. 30 W
Max. coil temperature	155 °C
Response time *	30 ms to 50 ms (On) / 10 ms to 50 ms (Off)

* measured at a viscosity of $\nu = 32 \text{ mm}^2/\text{s}$

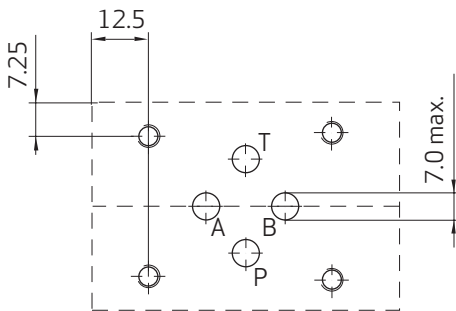
VERSION WITH 1 SOLENOID (A OR B SIDE)



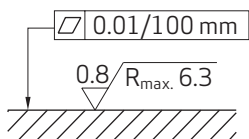
Valve Mounting Screws
ISO 4762 - M5 x 30 - 12.9
Not included in delivery!



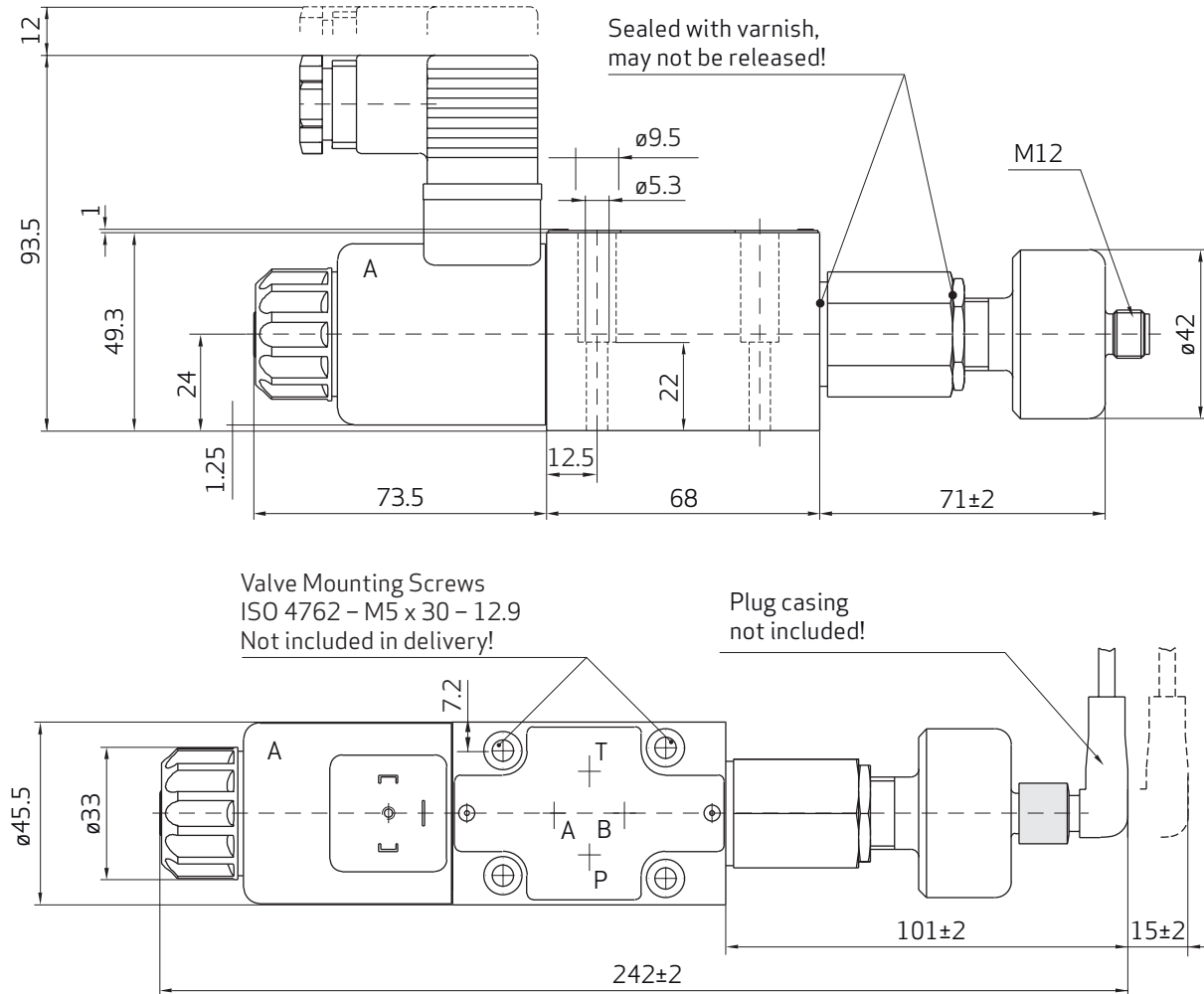
MOUNTING SURFACE ACCORDING TO ISO 4401-03-02-0-94



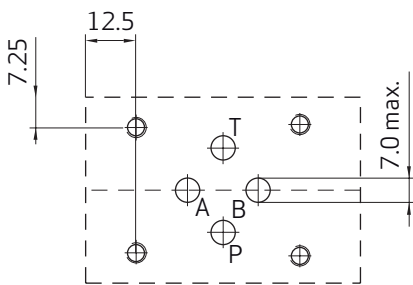
NECESSARY SURFACE QUALITY OF THE MATING PART



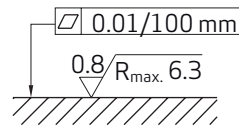
DIMENSIONS



MOUNTING SURFACE ACCORDING TO ISO 4401-03-02-0-94



NECESSARY SURFACE QUALITY OF THE MATING PART



Attention:

The safety requirements, German version EN 201 and EN 698 for injection molding machines and presses require solenoids without manual override.

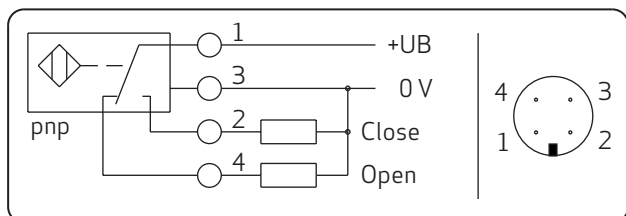
Further information about ordering instructions on page 14.

Technical data of the inductive position switch

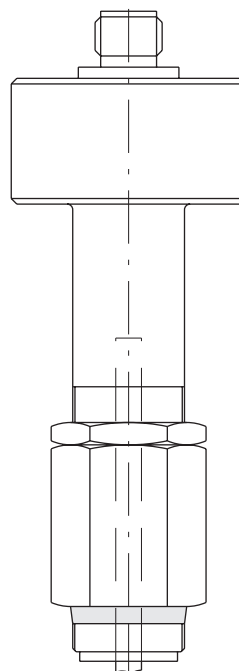
Operating voltage U_b	24 V DC \pm 20% (19.2 V DC ... 28.8 V DC)
Residual ripple U_{bss}	Max. 10 %
Max. output voltage	Min. U_b - 2.5 V
Reverse polarity protection	Max. 300 V
Current consumption (without load current)	Max. 20 mA
Switching point hysteresis	Max. 0.06 mm
Repetitive accuracy at 25°C	\pm 0.02 mm
Temperature drift	Typ. 0.002 mm / °C
Max. output current	Max. 250 mA
Leak current at blocked output	Max. 0.01 mA
Outputs	Positive switching, overload proof
Operating temperature	-20°C to +85°C
Storage temperature	-25°C to +85°C
Shake resistance 20g	40 Hz to 250 Hz
Type of protection according to DIN 40050	IP65 with mounted plug
Pressure resistance of the pressurized pipe	Max. 315 bar dynamic
Weight	Approx. 250 g
Housing	Galvanized and chromated
CE 89/336/EEC Declaration of Conformity	00 02 009 9 93

Attention:

EMC only ensured when using screened cables and plug casing.

**Contact assignment of
connector on limit switch**

- 1: + 24 V DC
- 2: Normally closed contact – high signal when the spool is in the initial position.
- 3: 0 V
- 4: Normally open contact – low signal when the spool is in the initial position.



- The limit switch has no PE connection.
- The connector is not included in delivery but can be ordered separately. (see page 14)

Type code

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
 [] - [W] [E] [4] [] [P] [06] [H] [] [] [] [O] [B] [] [O] / [...]

1 Sealing material
N NBR (standard)
V FKM

2 Valve type
W Directional control valve

3 Actuation type
E Electrical

4 Number of ports
4 4 ports

5 Number of switched positions
2 2 switched positions
3 3 switched positions

6 Port type
P Plate valve ISO 4401

7 Nominal size
06 Nominal size according to ISO 4401-03-02-0-94

8 Series
H Version H

15 Initial position indication
CI With position indication A-side inductive
DI With position indication B-side inductive

14 Electrical connection
0 Connection according to DIN 43650 without plug

13 Solenoid type
N Wet solenoid switching in oil with manual override
O Wet solenoid switching in oil without manual override

12 Solenoid voltage
B 24 V DC

11 Control oil supply
O Directly operated

10 Switched positions
C Spring centered, 2-solenoid
A Spring centered, solenoid-A
B Spring centered, solenoid-B

9 Spool symbol and covering
See page 5
P Positive covering
N Negative covering

Order numbers X820 valves* (see spool symbols on page 3)

Solenoids	Article	Order number
2 solenoids	N-WE43P06H01NCOBNO	X820-01NC-001N01
	N-WE43P06H03PCOBNO	X820-03PC-001N01
	N-WE43P06H06PCOBNO	X820-06PC-001N01
	N-WE43P06H07NCOBNO	X820-07NC-001N01
	N-WE43P06H08PCOBNO	X820-08PC-001N01
Solenoid A-side	N-WE42P06H01NAOBNO	X820-01NA-002N01
	N-WE42P06H03PAOBNO	X820-03PA-002N01
	N-WE42P06H06PAOBNO	X820-06PA-002N01
	N-WE42P06H07NAOBNO	X820-07NA-003N01
	N-WE42P06H08PAOBNO	X820-08PA-002N01
Solenoid B-side	N-WE42P06H01NBOBNO	X820-01NB-003N01
	N-WE42P06H03PBOBNO	X820-03PB-006N01
	N-WE42P06H06PBOBNO	X820-06PB-003N01
	N-WE42P06H07NBOBNO	X820-07NB-002N01
	N-WE42P06H08PBOBNO	X820-08PB-004N01
Solenoid A-side	N-WE42P06H13PAOBNO	X820-13PA-001N01
Solenoid B-side	N-WE42P06H14PBOBNO	X820-14PB-001N01
Solenoid A-side	N-WE42P06H21PAOBNO	X820-21PA-001N01
Solenoid B-side	N-WE42P06H22PBOBNO	X820-22PB-001N01
Solenoid A-side	N-WE42P06H23NAOBNO	X820-23NA-001N01
Solenoid B-side	N-WE42P06H24NBOBNO	X820-24NB-001N01

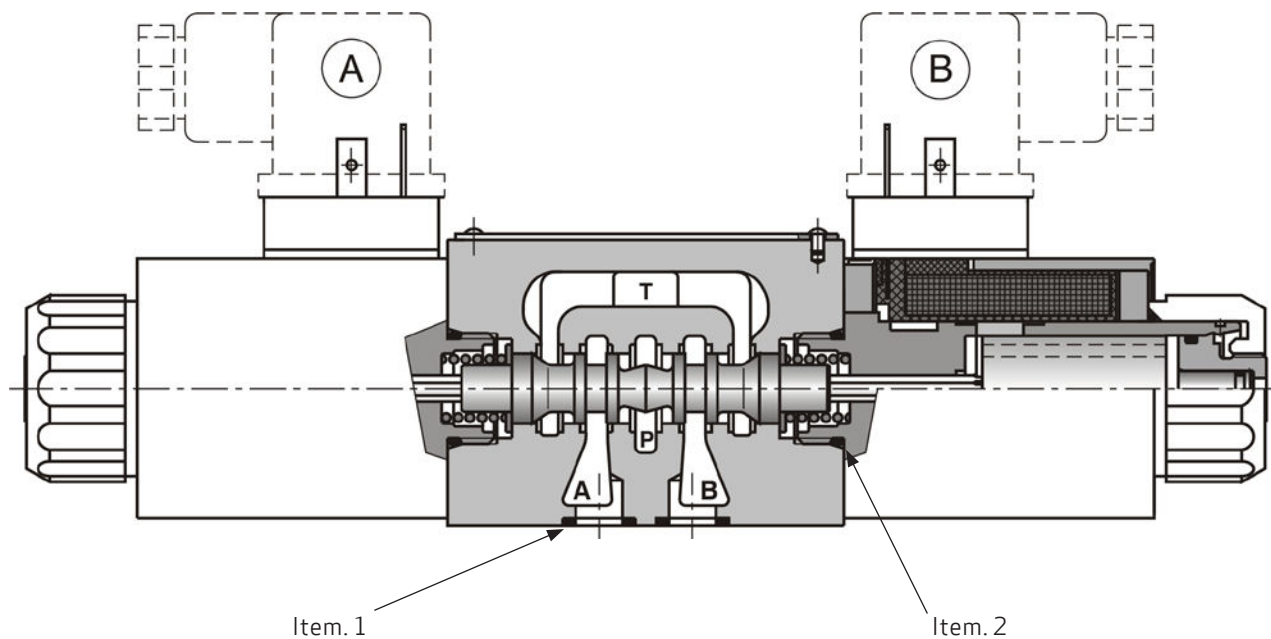
Parts not included in delivery !

4 pieces	Screws ISO 4762-M5x30-12.9 (tightening torque 8 Nm ± 0.4 Nm)	X784-10514
1 piece	Connector DIN 43650 A-side (gray)	X798-00005
1 piece	Connector DIN 43650 B-side (black)	X798-00004
1 piece	Connector of inductive limit switch with 10m cable (4-wire) and LEDs for operating voltage indication and signal output 4. The connector and cable are not shielded. (see page 11)	X798-00127

* For valves with different gaskets only the N of the gasket identification is switched with the code letter for the appropriate gasket V (FKM), the order number remains the same, e.g.: X820-03PC-001N01 becomes X820-03PC-001V01.

Seal kits *

Name		Order number
Gasket set complete NBR (Item 1+2)		X820D000N00
Item 1	Square seal NBR 9.25 x 1.68 x 1.68	X783-00403
Item 2	2 x O-Ring NBR 17.17 x 1.78	X783-00290
Gasket set complete FKM (Item 1+2)		X820D000V00
Item 1	4 x O-Ring FKM 9.25 x 1.78	X980-02012
Item 2	2 x O-Ring FKM 17.17 x 1.78	X980-02017



* Gaskets for other pressure fluids on request



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