DIRECTIONAL CONTROL VALVES

SERIES X820

ISO 4401 SIZE 03 (NG06)

WHAT MOVES YOUR WORLD

MOOG

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.

Our Quality Standard conforms to DIN EN ISO 9001.

Dimensions in mm

Features

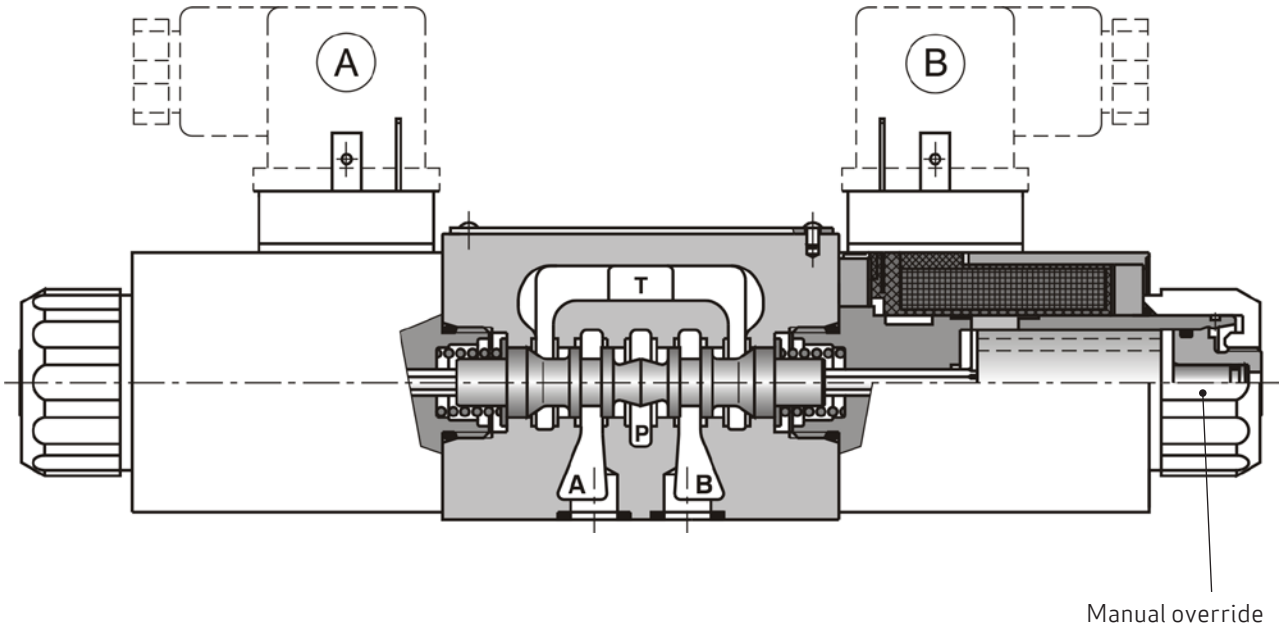
- Low pressure drop at high flow rates due to optimized flow paths in body and spool design.
- Mounting configuration according to ISO 4401-03.
- Initial position indication by inductive position switch (see page 10-12).
- Change of solenoid coil is fast and simple without risk of leakage.
- Electrical 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

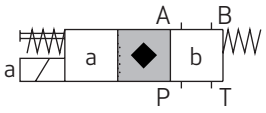
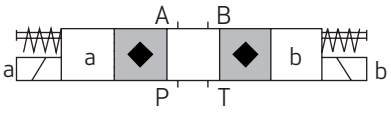
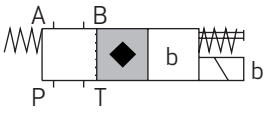
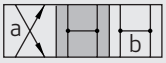
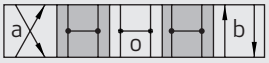
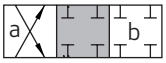
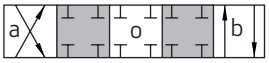
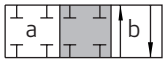
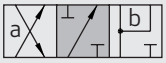
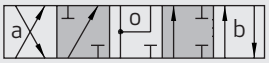
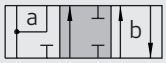
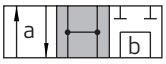
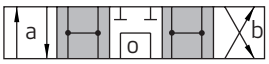
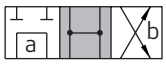
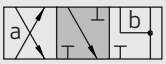
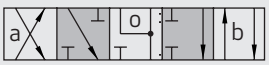
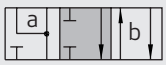
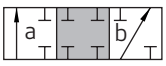
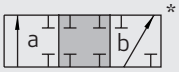
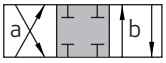
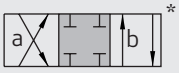
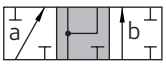
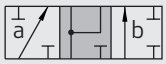
Moog's direct operated X820 Series Directional Control Valve conforms to CETOP 03 standard interface. It is designed to be manifold mounted, or used in conjunction with the stack valve system.

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 

◆ Transfer configuration only (not switched position)

* Only these spools are available with position indication!

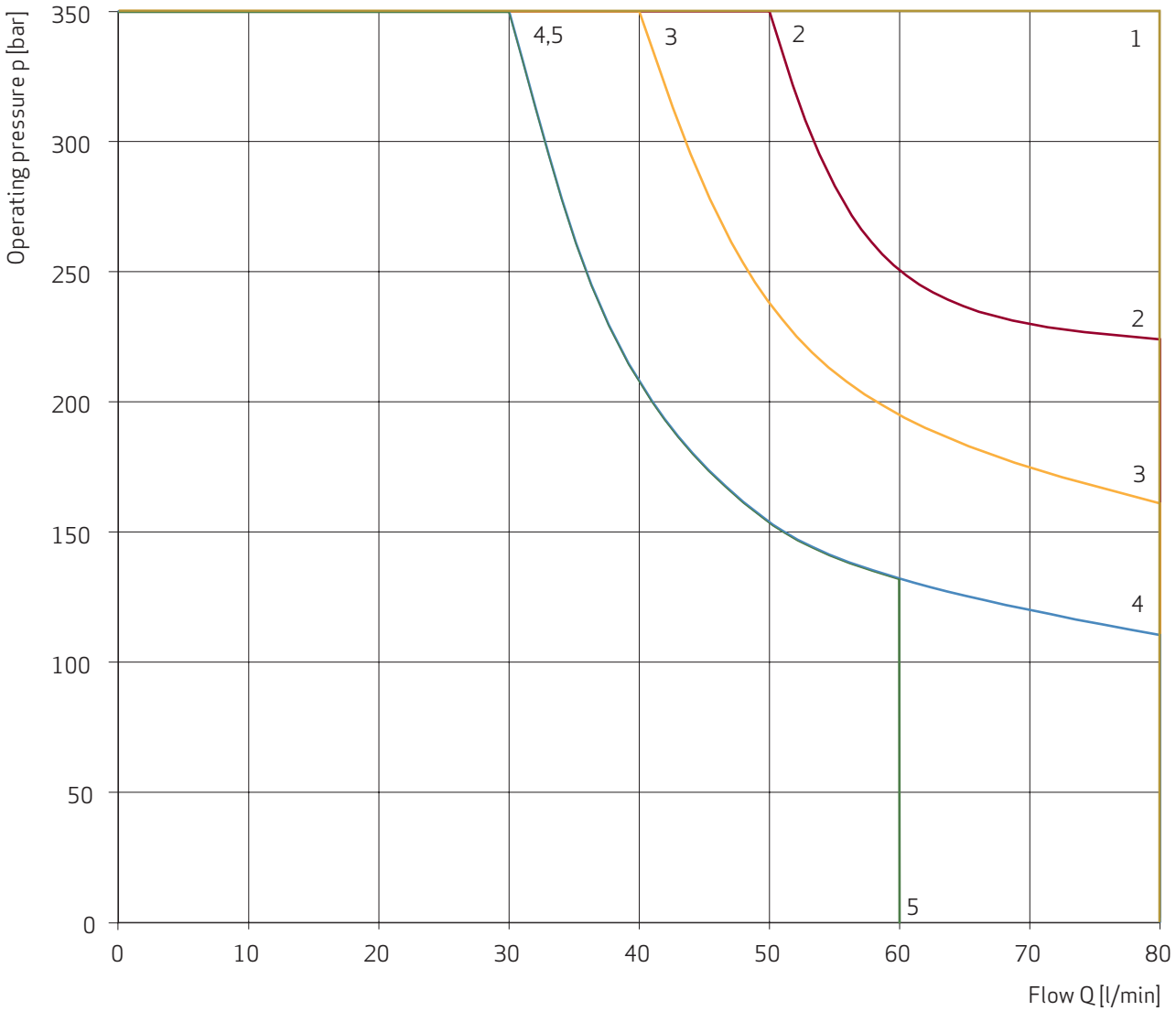
Other spools on request!

Rating limits
(measured at ν = 32 mm²/s and t = 40°C)

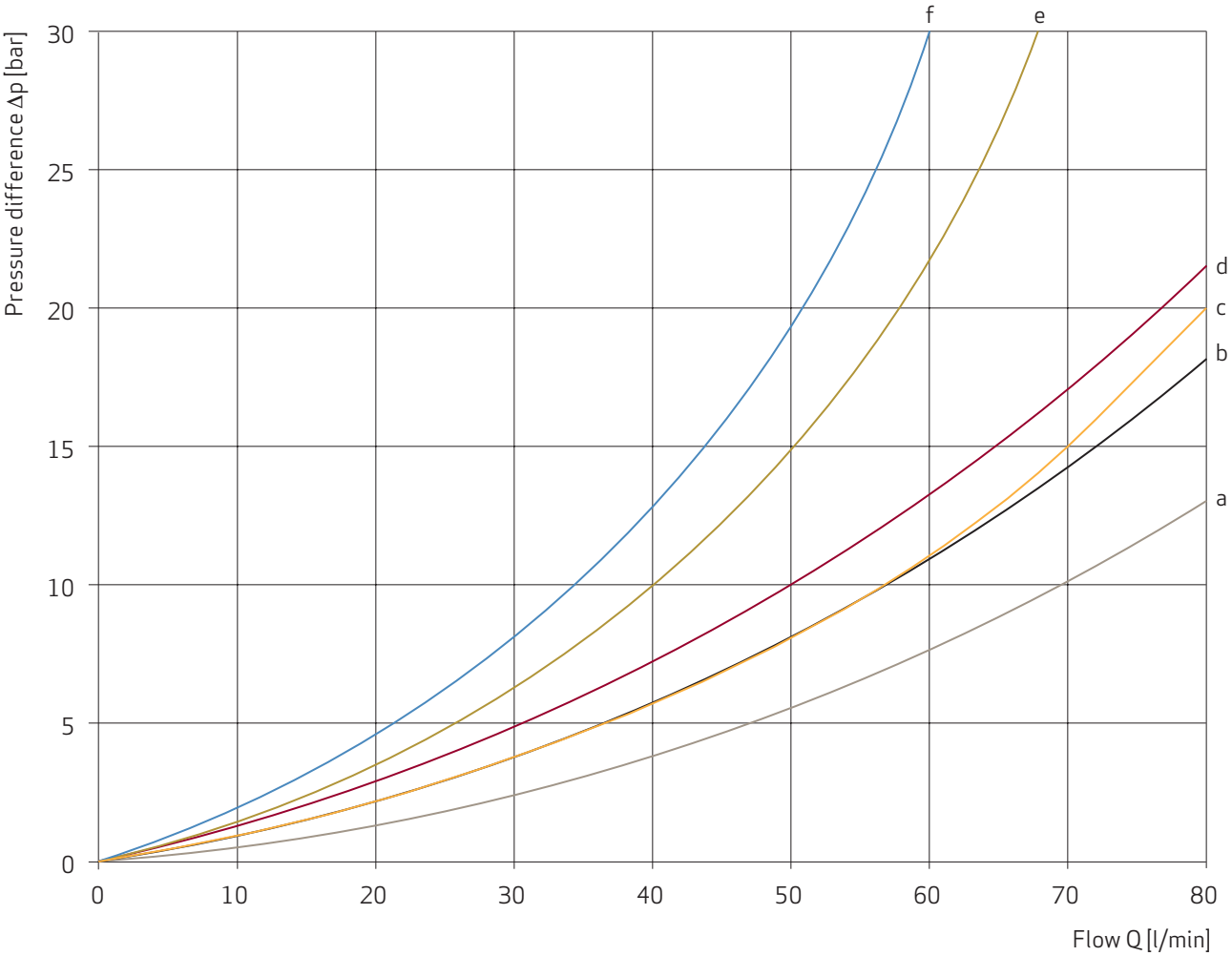
The rating of the valve is limited by the flow forces acting on the spool. These depend on the system pressure and the max. flow. The specified values refer to the use as a 4-way valve in which the load ports A and B are connected. For all spools with P-T circulation in center position the data refer 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 ν = 32 mm²/s and t = 40°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

Hydraulic parameters

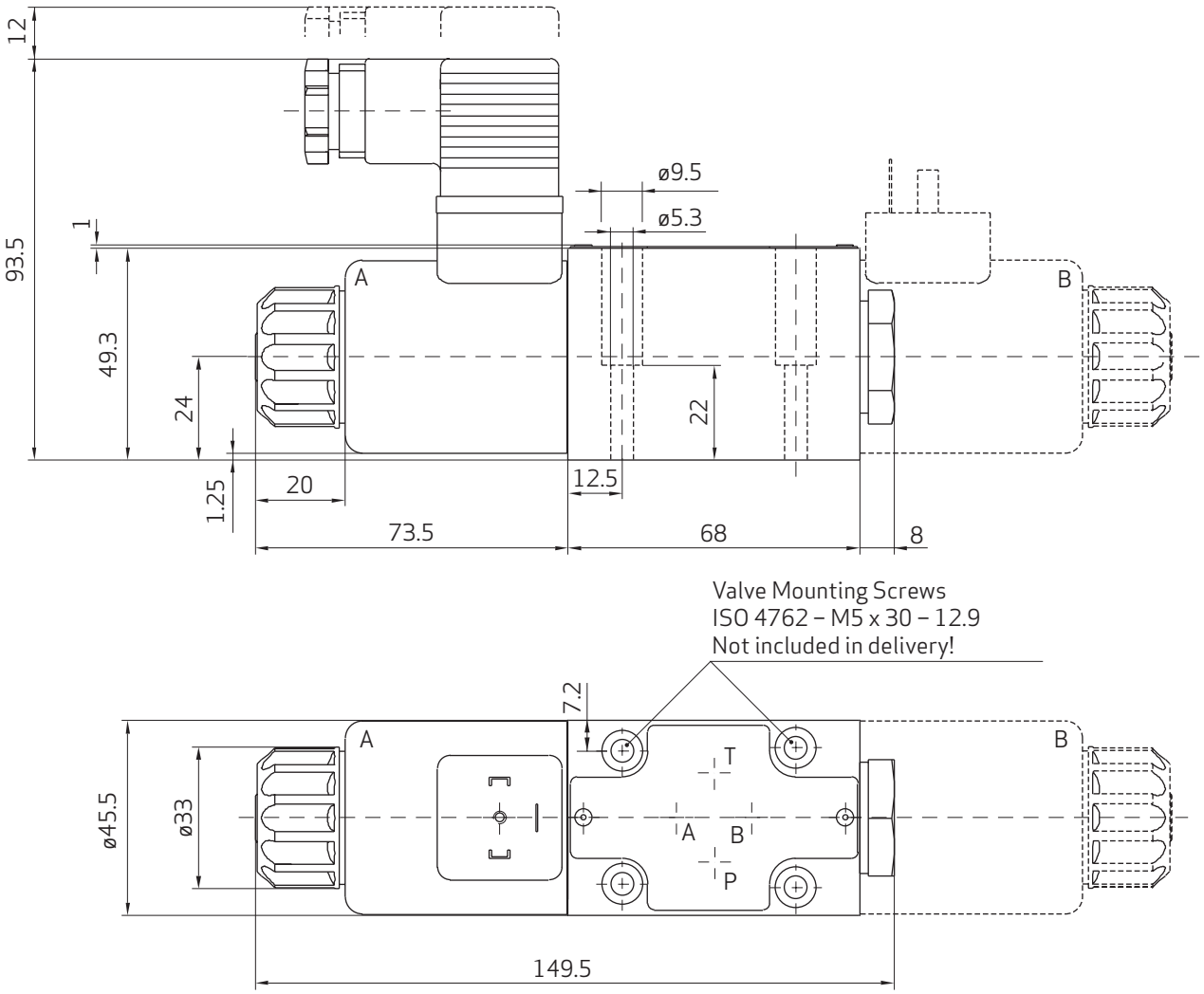
Technical data	Description
Max. operating pressure	P, A, B = 35 MPa / T = 21 MPa
Max. flow ($Q_{max.}$)	80 l/min (depending on spool type)
Pressure fluids (Seal material) (NBR standard)	NBR: mineral oil-based pressure fluids, HFA-, HFB, HFC pressure fluids FKM: mineral oil-based pressure fluids, HFD 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

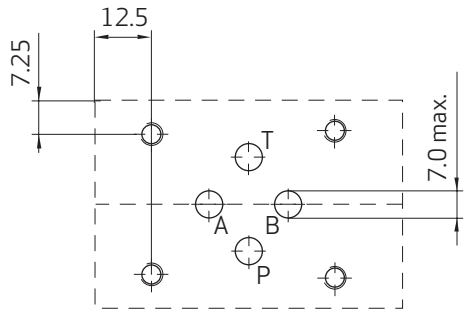
Technical data	Description
Nominal voltage	24 V DC
Permissible tolerance of nominal voltage	±10 %
Max. cycles	15.000 cycles/h
Relative operating period (OP)	100 %
Type of protection EN 60529	IP 65
Solenoid port	Plug-in connector according to DIN 43650
Solenoid type	Wet solenoid switching in oil
Power 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 v = 32 mm^2/s

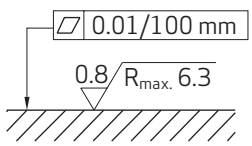
VERSION WITH 1 SOLENOID (A OR B SIDE)



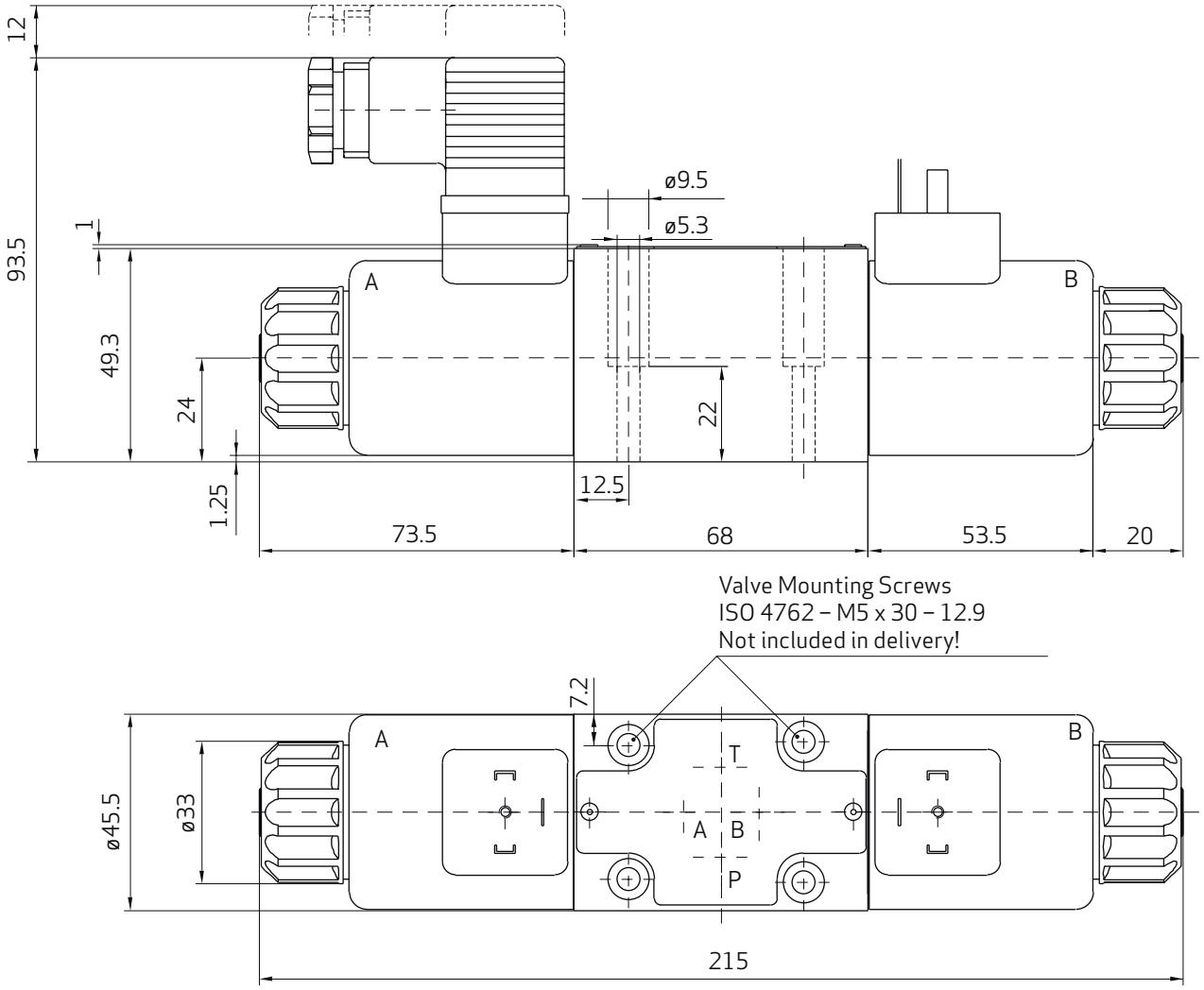
MOUNTING SURFACE ACCORDING TO ISO 4401-03-02-0-94



NECESSARY SURFACE QUALITY OF THE MATING PART



VERSION WITH 2 SOLENOIDS



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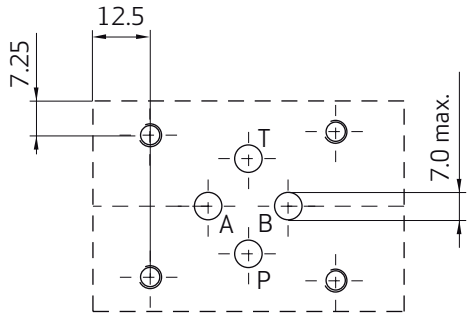
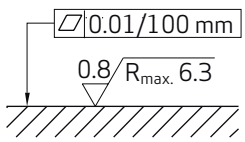
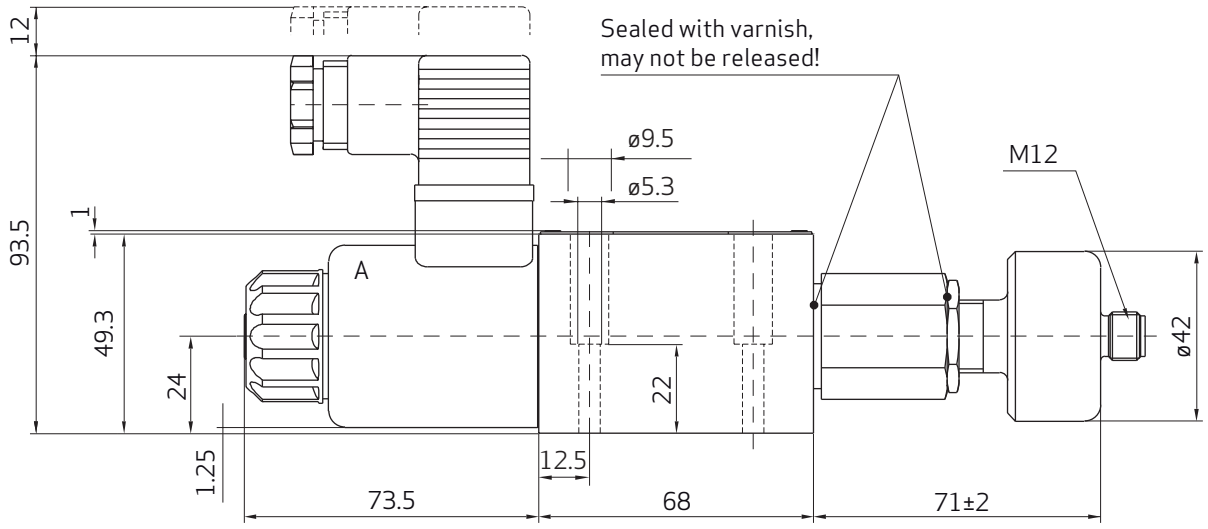
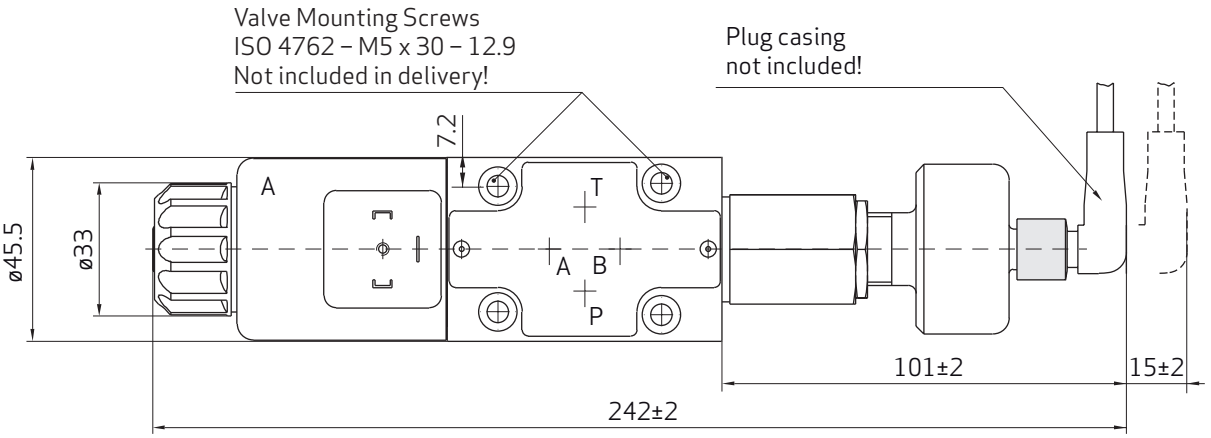


NECESSARY SURFACE QUALITY OF THE MATING PART

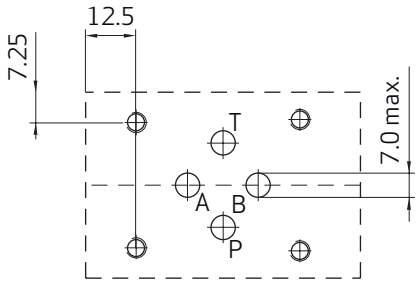


DIMENSIONS

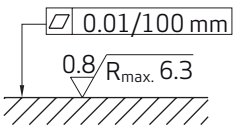




MOUNTING SURFACE ACCORDING TO ISO 4401-03-02-0-94



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.

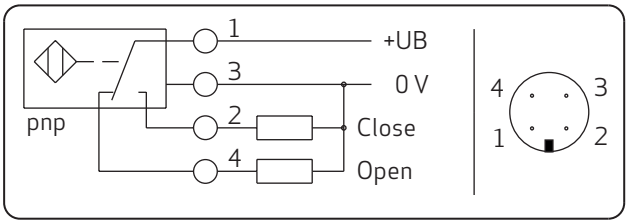
Technical data of the inductive position switch

Operating voltage U_b	24 V DC ± 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	± 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

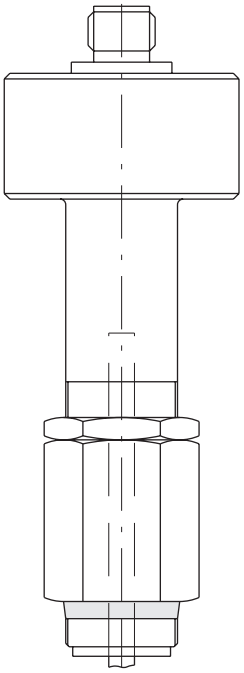
Attention:

EMC only ensured when using screened cables and plug casing.

Contact assignment of connector on limit switch

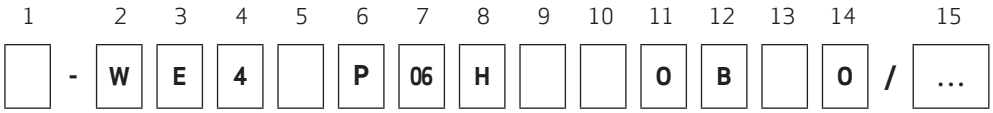


1: + 24 V DC
2: Normally closed contact – high signal when the spool is in the initial position.
3: 0 V
4: Normally open contact – low signal when the spool is in the initial position.



- 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	**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

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

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

11	**Control oil supply**
O	Directly operated

12	**Solenoid voltage**
B	24 V DC

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

14	**Electrical connection**
O	Connection according to DIN 43650 without plug

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

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

Solenoids	Article	Order number
2 solenoids	N-WE43P06H01NCOBN0	X820-01NC-001N01
	N-WE43P06H03PCOBN0	X820-03PC-001N01
	N-WE43P06H06PCOBN0	X820-06PC-001N01
	N-WE43P06H07NCOBN0	X820-07NC-001N01
	N-WE43P06H08PCOBN0	X820-08PC-001N01
Solenoid A-side	N-WE42P06H01NAOBN0	X820-01NA-002N01
	N-WE42P06H03PAOBN0	X820-03PA-002N01
	N-WE42P06H06PAOBN0	X820-06PA-002N01
	N-WE42P06H07NAOBN0	X820-07NA-003N01
	N-WE42P06H08PAOBN0	X820-08PA-002N01
Solenoid B-side	N-WE42P06H01NBOBN0	X820-01NB-003N01
	N-WE42P06H03PBOBN0	X820-03PB-006N01
	N-WE42P06H06PBOBN0	X820-06PB-003N01
	N-WE42P06H07NBOBN0	X820-07NB-002N01
	N-WE42P06H08PBOBN0	X820-08PB-004N01
Solenoid A-side	N-WE42P06H13PAOBN0	X820-13PA-001N01
Solenoid B-side	N-WE42P06H14PBOBN0	X820-14PB-001N01
Solenoid A-side	N-WE42P06H21PAOBN0	X820-21PA-001N01
Solenoid B-side	N-WE42P06H22PBOBN0	X820-22PB-001N01
Solenoid A-side	N-WE42P06H23NAOBN0	X820-23NA-001N01
Solenoid B-side	N-WE42P06H24NBOBN0	X820-24NB-001N01

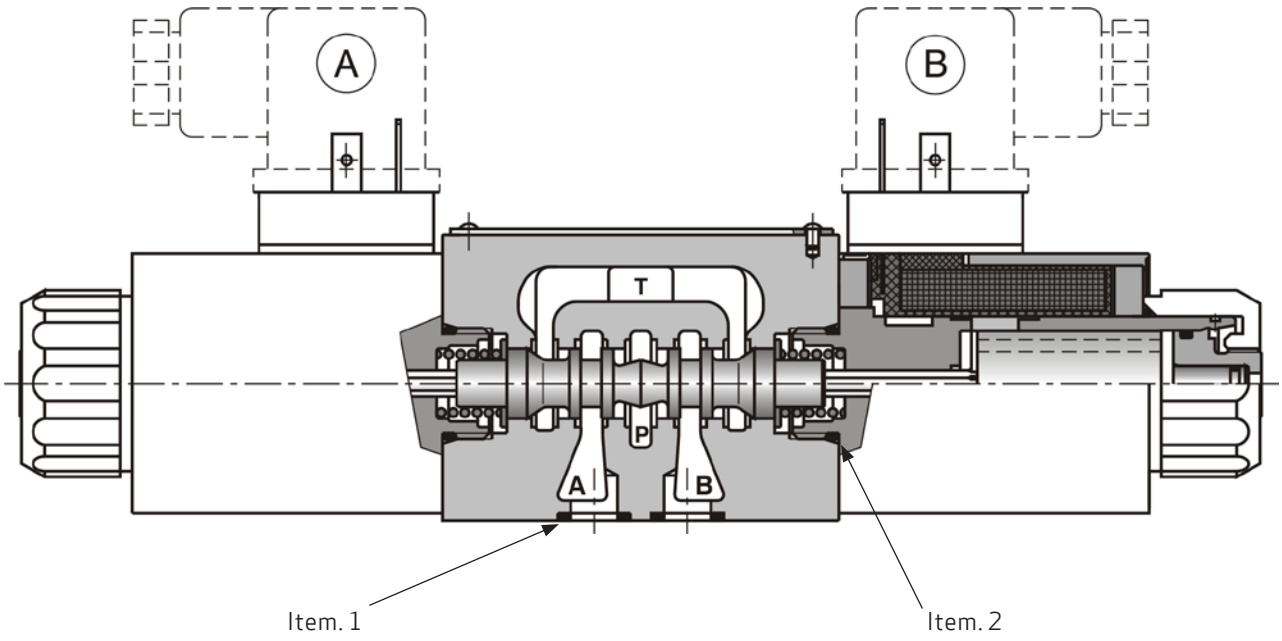
Parts not included in delivery !

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

As a recognized leader in motion drive technology, Moog offers a full range of services to support our products and ensure that they meet the expectations of customers. Moog experts are the best at helping customers select the right products and ensuring that they run reliably for a long time.

When it is time for new machine commissioning, refurbishment or routine maintenance, our engineers can help to optimize machine performance, minimize downtime and ensure the smooth application of our products.

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With facilities in over 25 countries, Moog is committed to offering convenient local service to our customers.

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