

Directional spool valves, direct operated,  
with solenoid actuation

Type WE

**RE 23340**

Edition: 2013-06

Replaces: 2012-06



- ▶ Size 10
- ▶ Component series 5X
- ▶ Maximum operating pressure 350 bar [5076 psi]
- ▶ Maximum flow 160 l/min [42.3 US gpm]

**Features**

- ▶ 4/3, 4/2 or 3/2 directional design
- ▶ High-power solenoid
- ▶ Porting pattern according to ISO 4401-05-04-0-05 and NFPA T3.5.1 R2-2002 D05
- ▶ Wet-pin DC solenoids with detachable coil
- ▶ Solenoid coil can be rotated by 90°
- ▶ The coil can be changed without having to open the pressure-tight chamber
- ▶ Electrical connection as individual or central connection
- ▶ Central connection possible via double mating connector
- ▶ Manual override, optional

**Contents**

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## Ordering code

01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17
	<b>WE</b>	<b>10</b>		<b>5X</b>	/		<b>E</b>					/				*

01	3 main ports	<b>3</b>
	4 main ports	<b>4</b>
02	Directional valve	<b>WE</b>
03	Size 10	<b>10</b>
04	Symbols e.g. C, E, EA, EB, etc; possible version see page 4 and 5	e.g. <b>C</b>
05	Component series 50 to 59 (50 to 59: Unchanged installation and connection dimensions)	<b>5X</b>
06	<b>With</b> spring return	<b>no code</b>
	<b>With</b> reinforced compression spring	<b>D</b>
	<b>Without</b> spring return	<b>O</b>
	<b>Without</b> spring return with detent	<b>OF</b>
07	High-power wet-pin solenoid with detachable coil	<b>E</b>
08	Direct voltage 12 V	<b>G12</b>
	Direct voltage 24 V	<b>G24</b>
	Direct voltage 26 V	<b>G26</b>
	Direct voltage 96 V	<b>G96</b>
	Direct voltage 110 V	<b>G110</b> <sup>1)</sup>
	Direct voltage 180 V	<b>G180</b>
	Direct voltage 205 V	<b>G205</b>
	Direct voltage 220 V	<b>G220</b>
	Alternating voltage 100 V	<b>W100R</b> <sup>1)</sup>
	Alternating voltage 110 V	<b>W110R</b> <sup>1)</sup>
	Alternating voltage 120 V	<b>W120R</b> <sup>1)</sup>
	Alternating voltage 200 V	<b>W200R</b> <sup>1)</sup>
	Alternating voltage 230 V	<b>W230R</b> <sup>1)</sup>
	Connection to AC voltage mains via control with rectifier (see table below and page 18) <sup>2)</sup>	
Electrical connections and available voltages see page 10		
09	<b>Without</b> manual override	<b>no code</b>
	<b>With</b> concealed manual override (standard)	<b>N9</b> <sup>3)</sup>
	<b>With</b> concealed manual override and protective cap <sup>5)</sup>	<b>N8</b> <sup>3)</sup>
	<b>With</b> lockable manual override "mushroom button" (large)	<b>N5</b> <sup>3); 4)</sup>
	<b>With</b> manual override "mushroom button" (large), not lockable	<b>N6</b> <sup>3)</sup>

## Corrosion resistance (outside)

10	None (valve housing primed)	<b>no code</b>
	Improved corrosion protection (240 h salt spray test according to EN ISO 9227) (see also page 10)	<b>J2</b>

1) Only for version "central connection"

2) Only for version "individual connection"

3) The manual override cannot be allocated a safety function. The manual override units may only be used up to a tank pressure of 50 bar.

4) With tank pressures above 50 bar, it cannot be guaranteed that the valve remains in the position switched by the manual override "N5".

5) Protective cap must be removed prior to actuation.

AC voltage mains (admissible voltage tolerance $\pm 10\%$ )	Nominal voltage of the DC solenoid in case of operation with alternating voltage	Ordering code
100 V - 50/60 Hz	96 V	<b>G96</b>
110 V - 50/60 Hz	96 V	<b>G96</b>
200 V - 50/60 Hz	180 V	<b>G180</b>
230 V - 50/60 Hz	205 V	<b>G205</b>

## Ordering code

01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17
	<b>WE</b>	<b>10</b>		<b>5X</b>	/		<b>E</b>				/					*

### Electrical connection

11	<b>Individual connection</b>	
	<b>Without</b> mating connector; connector according to DIN EN 175301-803	<b>K4</b> <sup>6)</sup>
	<b>Without</b> mating connector; connector according to DIN EN 175301-803	<b>K4K</b> <sup>6)</sup>
	<b>Without</b> mating connector, 4-pole with connector M12x1 according to IEC 60947-5-2, integrated interference protection circuit and status LED	<b>K72L</b> <sup>6)</sup>
	<b>Without</b> mating connector; connector AMP Junior-Timer	<b>C4Z</b> <sup>6)</sup>
	<b>Central connection</b>	
	Cable entry at the cover, with indicator light	<b>DL</b>
	Central plug-in connection at the cover, with indicator light (without mating connector); connector according to DIN EN 175201-804	<b>DK6L</b>
Additional electrical connections and available voltages see page 10		

### Switching time increase

12	<b>Without</b> switching time increase	<b>no code</b>
	<b>With</b> switching time increase (only with symbol ".73"; not for version "D" with reinforced compression spring; more information upon request)	<b>A12</b>

13	<b>Without</b> throttle insert		<b>no code</b>	
	<b>With</b> throttle insert <sup>7; 8)</sup>			
	Port	Throttle Ø in mm [inch]		
		0.8 [0.031]	1.0 [0.039]	1.2 [0.047]
	P	= <b>B08</b>	= <b>B10</b>	= <b>B12</b>
	A	= <b>H08</b>	= <b>H10</b>	= <b>H12</b>
	B	= <b>R08</b>	= <b>R10</b>	= <b>R12</b>
	A and B	= <b>N08</b>	= <b>N10</b>	= <b>N12</b>
T <sup>9)</sup>	= <b>X08</b>	= <b>X10</b>	= <b>X12</b>	
Further throttle insert diameters upon request.				

### Seal material

14	NBR seals	<b>M</b>
	FKM seals	<b>V</b>
	Seals for HFC hydraulic fluids	<b>MH</b>
	Low-temperature version	<b>MT</b>
	Attention: Observe compatibility of seals with hydraulic fluid used!	

### Control spool play

15	Standard	<b>no code</b>
	Limited (for little leakage)	<b>T06</b>
	Increased (for extended temperature range, higher leakage)	<b>T12</b>
16	Approval according to CSA C22.2 No. 139-10	<b>CSA</b>
	Porting pattern according to ANSI B93.9 (if solenoid "a" is energized, channel P is connected to A)	<b>AN</b>
17	Further details in the plain text	

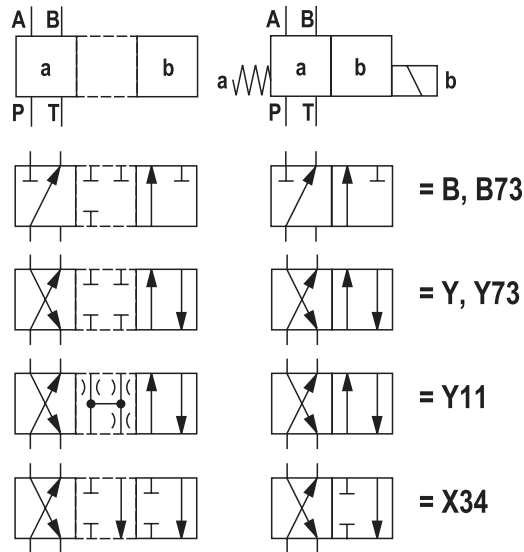
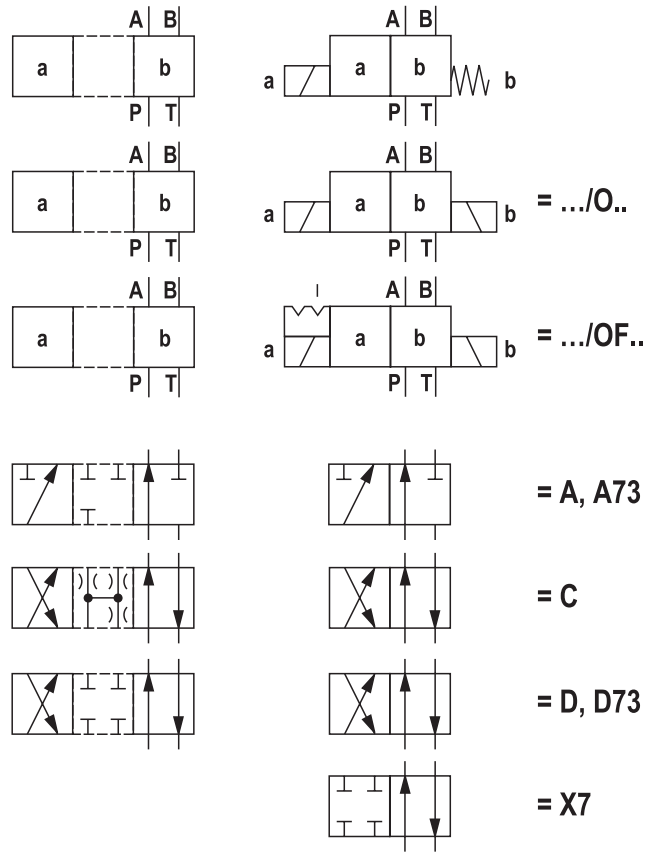
<sup>6)</sup> Mating connector, separate order, see page 18 and data sheet 08006.

<sup>7)</sup> When the admissible valve performance limits are exceeded, installation of throttle inserts is to be intended (performance limits see page 12 and 13).

<sup>8)</sup> Not with low-temperature version "MT".

<sup>9)</sup> If throttle inserts are used in channel T, the pressure in the working ports and for connection to the tank chambers must not exceed 210 bar.

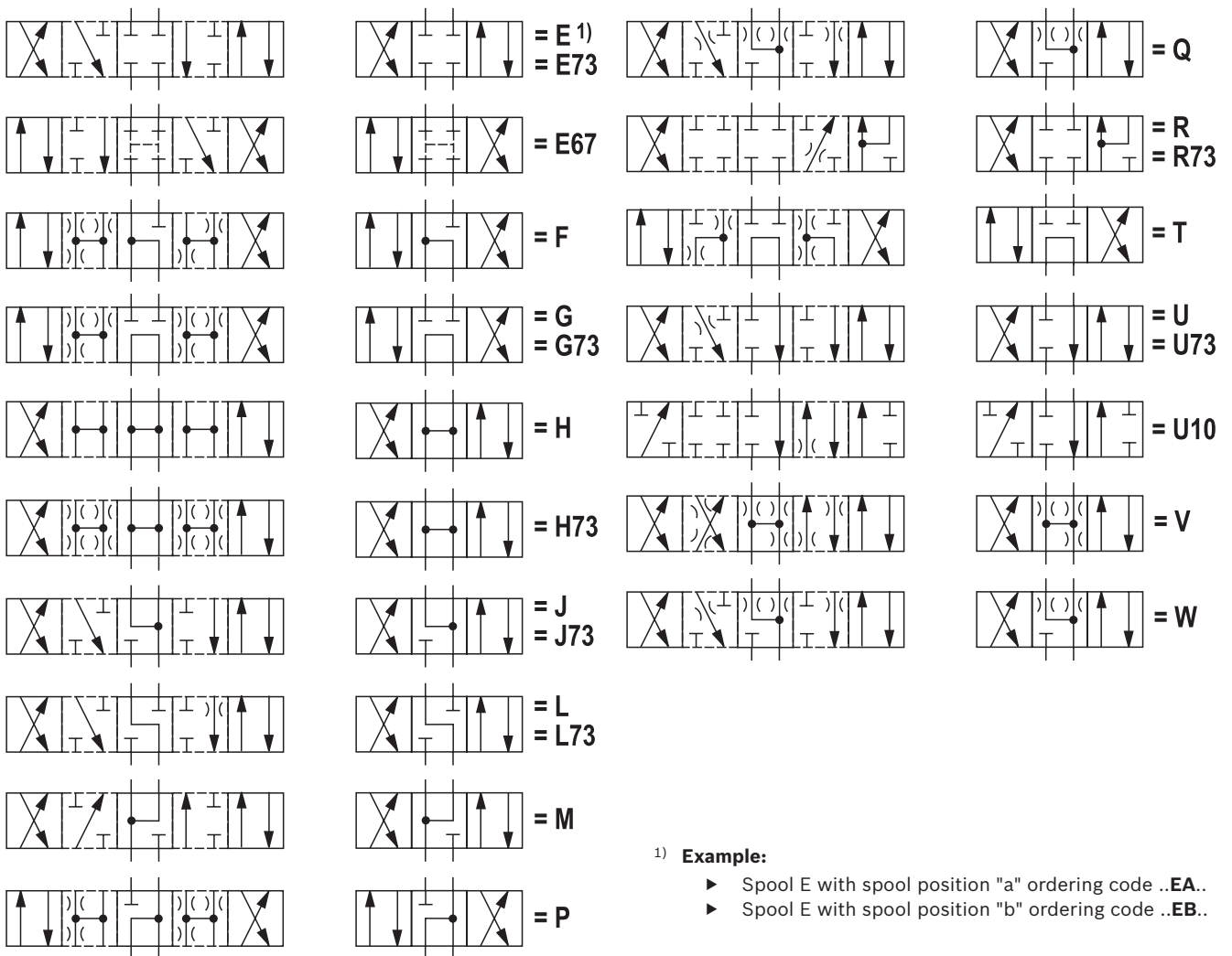
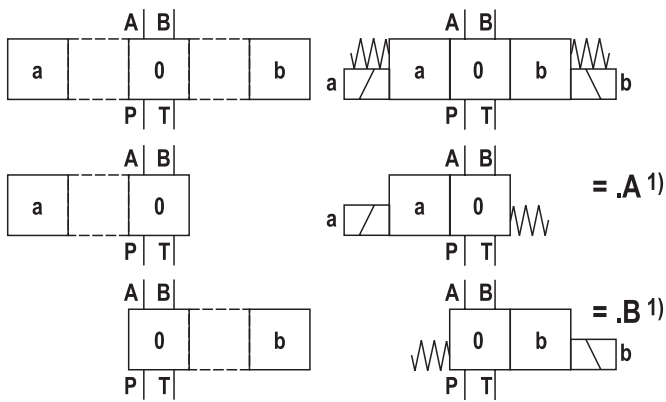
## Symbols



**Notice!**

Representation according to DIN ISO 1219-1.  
Hydraulic interim positions are shown by dashes.

**Symbols**



**1) Example:**

- ▶ Spool E with spool position "a" ordering code **..EA..**
- ▶ Spool E with spool position "b" ordering code **..EB..**

**Notice!**

- ▶ Representation according to DIN ISO 1219-1. Hydraulic interim positions are shown by dashes.
- ▶ Other symbols upon request.

## Function, section

The directional valve type WE is a solenoid-actuated directional spool valve that can be used as electro-magnetic component. It controls the start, stop and direction of a flow.

The directional valve basically consists of housing (1), one or two electronic solenoids (2), the control spool (3), and the return springs (4).

In the de-energized condition, the control spool (3) is held in the central position or in the initial position by the return springs (4) (except for version "O").

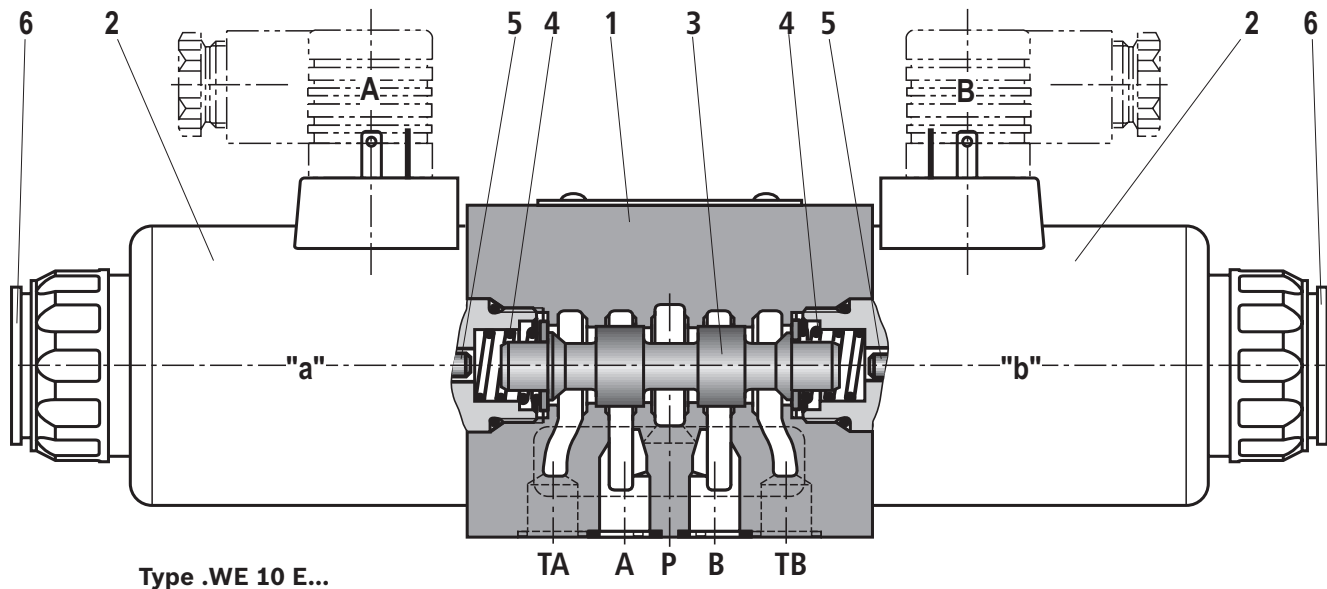
In case of energization of the wet-pin electronic solenoid (2), the control spool (3) moves out of its rest position into the required end position. In this way, the required direction of flow according to the selected symbol is released.

After the electronic solenoid (2) has been switched off, the control spool (3) is pushed back into the central position or in the initial position (except for valve with "OF" detent and valve without spring type "O").

A manual override (6) allows the valve to be switched manually without solenoid energization.

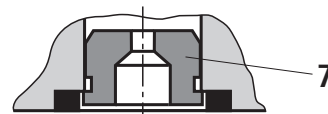
**To ensure proper functioning, care must be taken that the pressure chamber of the solenoid is filled with oil.**

More functions see page 7.



### Throttle insert "B.."

Using a throttle insert (7) in channels P, A, B or T, the flow resistance at the valve can be increased. Its use is required when, due to prevailing operating conditions, flows occur during the switching processes which exceed the performance limit of the valve.



## Function, section

**Without spring return "O"** (only possible with symbols A, C and D)

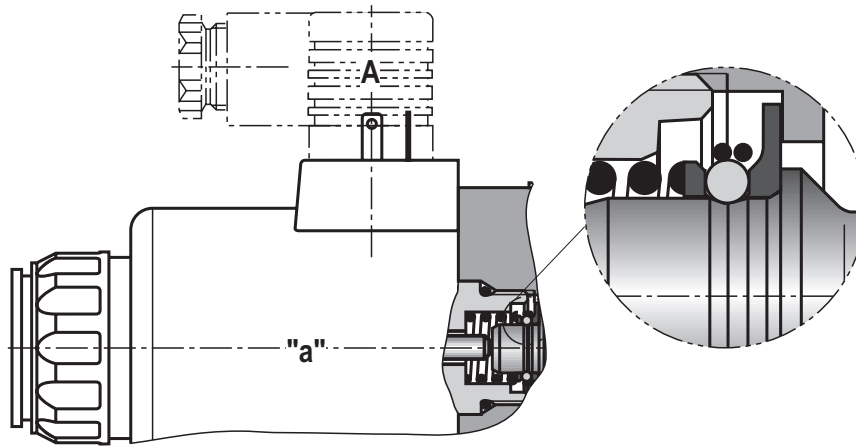
This version is a directional valve with 2 spool positions and 2 electronic solenoids **without** detent. The valve without spring return at the control spool (3) has no defined basic position in the de-energized state.

**Without spring return with "OF" detent** (only possible with symbols A, C and D)

This version is a directional valve with 2 spool positions and 2 electronic solenoids **with** detent. The detents are used to fix the control spool (3) in the relevant spool position. During operation, continuous application of current to the electronic solenoid can therefore be omitted, which contributes to energy-efficient operation.

### Notice!

Pressure peaks in the tank line to two or several valves can result in unintended control spool movements for valves with detent! We therefore recommend that separate return lines be provided or a check valve installed in the tank line.



Type .WE 10 ../OF...

**Technical data**

(for applications outside these parameters, please consult us!)

<b>general</b>				
Weight			Individual connection	Central connection
	- Valve with one solenoid	kg [lbs]	3.9 [8.6]	4.0 [8.8]
	- Valve with two solenoids	kg [lbs]	5.5 [12.1]	5.6 [12.3]
Installation position			Any <sup>1)</sup>	
Ambient temperature range	- Standard version	°C [°F]	-20 ... +70 [-4 ... +158] (NBR seals) -15 ... +70 [+5 ... +158] (FKM seals)	
	- Version for HFC hydraulic fluid	°C [°F]	-20 ... +50 [-4 ... +122]	
	- Low-temperature version <sup>2)</sup>	°C [°F]	-40 ... +50 [-40 ... +122]	
Storage temperature range		°C [°F]	-20 ... +50 [-4 ... +122]	
MTTF <sub>d</sub> values according to EN ISO 13849		Years	300 (for further details see data sheet 08012)	

<b>hydraulic</b>				
Maximum operating pressure <sup>2)</sup>	- Port A, B, P	bar [psi]	350 [5076]	
	- Port T	bar [psi]	210 [3050] Tank pressure (standard) With symbols A and B, port T must be used as leakage oil connection if the operating pressure exceeds the maximum admissible tank pressure.	
Maximum flow		l/min [US gpm]	160 [42.3]	
Hydraulic fluid			See table below	
Hydraulic fluid temperature range (at the valve working ports)		°C [°F]	-20 ... +80 [-4 ... +176] (NBR seals)	
			-15 ... +80 [+5 ... +176] (FKM seals)	
			-20 ... +50 [-4 ... +122] (HFC hydraulic fluid)	
			-40 ... +50 [-40 ... +122] (low-temperature version)	
Viscosity range		mm <sup>2</sup> /s [SUS]	2.8 ... 500 [35 ... 2320]	
Maximum admissible degree of contamination of the hydraulic fluid - cleanliness class according to ISO 4406 (c)			Class 20/18/15 <sup>3)</sup>	

Hydraulic fluid	Classification	Suitable sealing materials	Standards
Mineral oils	HL, HLP, HLPD, HVLP, HVLDP	NBR, FKM	DIN 51524
Bio-degradable	- insoluble in water	HETG	VDMA 24568
		HEES	
	- soluble in water	HEPG	VDMA 24568
Flame-resistant	- water-free	HFDU, HFDR	ISO 12922
	- containing water	HFC (Fuchs Hydrotherm 46M, Petrofer Ultra Safe 620)	NBR, HNBR ISO 12922

**Important information on hydraulic fluids!**

- ▶ For more information and data on the use of other hydraulic fluids, refer to data sheet 90220 or contact us!
- ▶ There may be limitations regarding the technical valve data (temperature, pressure range, life cycle, maintenance intervals, etc.)!
- ▶ The flash point of the hydraulic fluid used must be 40 K higher than the maximum solenoid surface temperature.

**▶ Flame-resistant – containing water:**

- Maximum pressure difference per control edge 50 bar
- Pressure pre-loading at the tank port >20% of the pressure differential, otherwise increased cavitation
- Life cycle as compared to operation with mineral oil HL, HLP 50 to 100%

- ▶ **Bio-degradable:** When using bio-degradable hydraulic fluids that are also zinc-soluble, zinc may accumulate in the fluid (per pole tube 700 mg zinc).

<sup>1)</sup> With suspended installation, higher sensitivity to contamination. Horizontal installation is recommended.

<sup>2)</sup> For use at low temperatures, see project planning information page 19.

<sup>3)</sup> The cleanliness classes specified for the components must be adhered to in hydraulic systems. Effective filtration prevents faults and at the same time increases the service life of the components. For the selection of the filters, see [www.boschrexroth.com/filter](http://www.boschrexroth.com/filter).



## Technical data

(for applications outside these parameters, please consult us!)

electric					
Voltage type		Direct voltage	Alternating voltage		
Nominal voltage according to VDE 0580 (ordering code see page 2 and 10)	V	12, 24, 26, 96, 110, 180, 205, 220	With central connection or possible via rectifier <sup>4)</sup>		
Voltage tolerance (nominal voltage)	%	±10			
Nominal power according to VDE 0580	W	40			
Duty cycle	%	100 (S1 according to VDE 0580)			
Switching time <sup>5)</sup>	– ON	Pressure change 5%	ms	60 ... 104 <sup>6)</sup>	
		Pressure change 95%	ms	90 ... 165 <sup>6)</sup>	
	– OFF	Pressure change 5%	ms	12 ... 50	230 ... 330
		Pressure change 95%	ms	48 ... 104	250 ... 360
Switching time according to ISO 6403 <sup>7)</sup>	– ON			45 ... 60	
	– OFF			20 ... 30	250 ... 360
Maximum switching frequency	1/h	15000	7200		
Protection class according to DIN EN 60529	See page 10				
Protection class according to VDE 0580	See page 10				
Maximum surface temperature of the coil <sup>8)</sup>	°C [°F]	140 [284]			
Insulation class VDE 0580	F				
Electrical protection	Every solenoid must be protected individually, using a suitable fuse with tripping characteristic K (inductive loads). The valve must be installed on a surface that is included in the equipotential bonding.				

- 4) ▶ Mating connectors with rectifier see page 18  
▶ Possible voltages see page 2  
▶ Rectifiers must comply with the relevant standards as well as the coil performance data!  
▶ With a central connection, the rectifier is on the board
- 5) Measured with flow, 80% performance limit and horizontal installation position.
- 6) Not with symbols A, B and .73.
- 7) Measured without flow
- 8) Possible surface temperature >50 °C, provide contact protection!

### Notice!

- ▶ The solenoid coils must not be painted.
- ▶ Actuation of the manual override is only possible up to a tank pressure of approx. 50 bar [725 psi]. Avoid damage to the bore of the manual override! (Special tool for the operation, separate order, material no. **R900024943**). When the manual override is blocked, actuation of the opposite solenoid must be ruled out!
- ▶ The simultaneous actuation of 2 solenoids of one valve must be ruled out!
- ▶ Use cables that are approved for a working temperature above 105 °C [221 °F].
- ▶ Valves with individual connection and supply voltage 12 V or 24 V can be operated with twice the voltage for reducing the switching time. For this purpose, the voltage has to be reduced to the nominal valve voltage after 100 ms by means of pulse width modulation. The maximum admissible switching frequency is 3 1/s.
- ▶ Due to possible overload of the board, valves with central connection must not be operated with twice the voltage.
- ▶ If the standard environmental conditions according to VDE 0580 cannot be provided, the valve must be especially protected!

 **Electrical connections** see page 10.

**Technical data**

(for applications outside these parameters, please consult us!)

**Electrical connections and available voltages**

Ordering code connector		Ordering code (voltage)								Protection class according to DIN EN 60529 <sup>8)</sup>	Protection class according to VDE 0580
		G12	G24	G26	G96	G110	G180	G205	G220		
Without mating connector, individual connection; connector according to DIN EN 175301-803	<b>K4</b>	✓ <sub>9)</sub>	✓ <sub>9)</sub>	<sup>10)</sup>	✓ <sub>9)</sub>	-	✓	✓ <sub>9)</sub>	✓	IP65	I
	<b>K4K</b>	✓	✓	✓	<sup>10)</sup>	-	-	<sup>10)</sup>	<sup>10)</sup>	IP65, IP67	I
Without mating connector, 4-pole with connector M12x1 according to IEC 60947-5-2, integrated interference protection circuit and status LED	<b>K72L</b>	-	✓	-	-	-	-	-	-	IP65	III <sup>12)</sup>
Without mating connector; connector AMP Junior-Timer	<b>C4Z</b>	-	-	✓	-	-	✓	-	-	IP66	III <sup>12)</sup>
Without mating connector; threaded connection 1/2"-14 NPT	<b>DAL</b>	✓ <sub>9)</sub>	✓ <sub>9)</sub>	-	✓ <sub>9)</sub>	-	-	✓ <sub>9)</sub>	✓ <sub>9)</sub>	IP65 <sub>13)</sub>	I
Central plug-in connection at the cover, with indicator light (without mating connector) with connector according to DIN EN 175201-804	<b>DK6L</b>	✓ <sub>9)</sub>	✓ <sub>9)</sub>	-	✓ <sub>9)</sub>	✓	-	✓ <sub>9)</sub>	✓ <sub>9)</sub>	IP65	I
Cable gland at the cover, with indicator light (terminal area 6 ... 12 mm [0.23 ... 0.47 inch])	<b>DL<sup>11)</sup></b>	✓ <sub>9)</sub>	✓ <sub>9)</sub>	-	✓ <sub>9)</sub>	✓	-	✓ <sub>9)</sub>	✓ <sub>9)</sub>	IP65	I
Cable gland at the cover, with indicator light and cable bridge at the ground connection	<b>DJL<sup>11)</sup></b>	-	✓ <sub>9)</sub>	-	-	✓ <sub>9)</sub>	-	-	-	IP65	I
Mini-change connector, 5-pin	<b>DK25L</b>	-	✓ <sub>9)</sub>	-	✓ <sub>9)</sub>	-	-	-	-	IP65	I

<sup>8)</sup> Only with correctly mounted valve with a mating connector suitable for the protection class.

<sup>9)</sup> "Recognized component" according to UL 429.


<sup>10)</sup> Upon request.

<sup>11)</sup> Possible with version "J2".

<sup>12)</sup> With protection class II, a protective extra-low voltage with isolation transformer (PELV, SELV) is to be provided.

<sup>13)</sup> Only with professionally designed connection with appropriate sealing to the central connection.

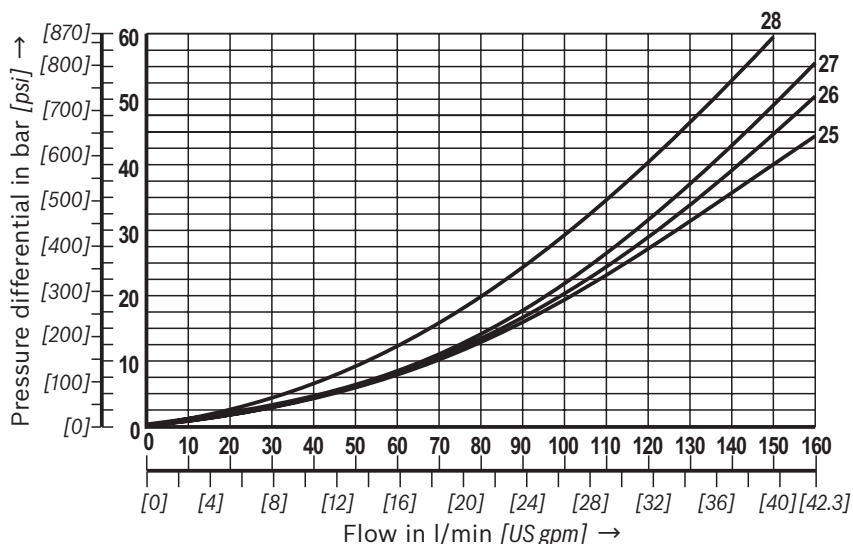
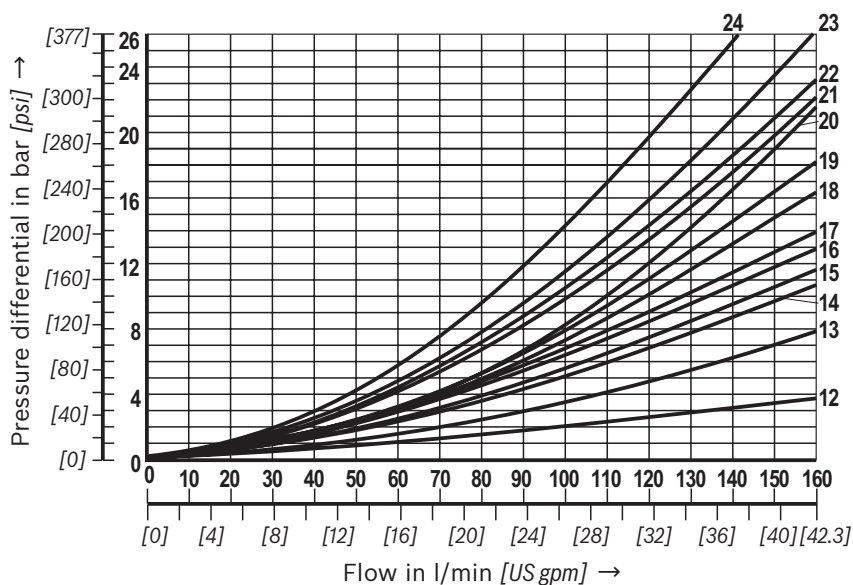
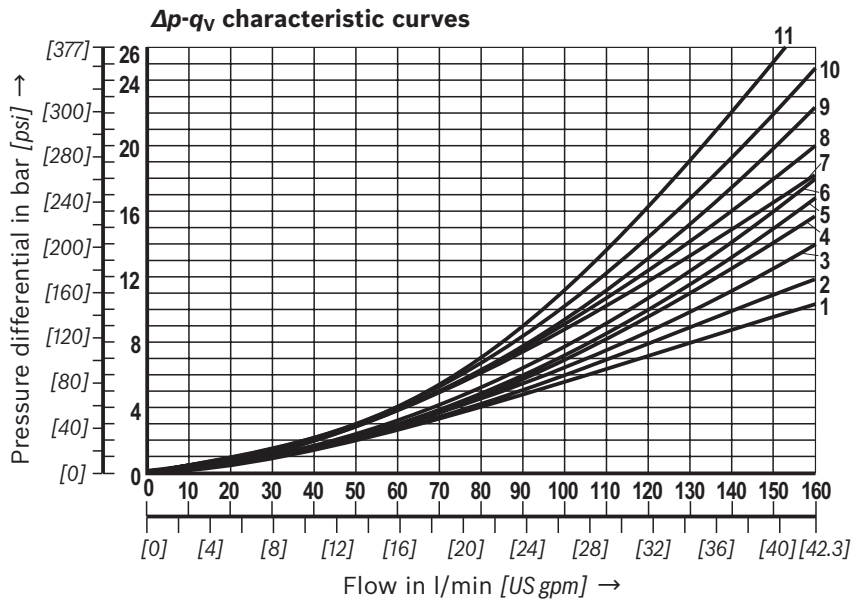
**When establishing the electrical connection, the protective earthing conductor (PE  $\perp$ ) has to be connected correctly.**

 **Notice!**

- ▶ The plug-in connectors used are not intended to be plugged in or disconnected during normal operation under load.
- ▶ Operation of the valves only admissible with appropriate and locked mating connector.

## Characteristic curves

(measured with HLP46,  $\vartheta_{oil} = 40 \pm 5 \text{ }^\circ\text{C}$  [104 ± 9 °F])



Symbol	Direction of flow			
	P - A	P - B	A - T	B - T
A; B	6	6	-	-
A73, B73	23	23	-	-
C	1	2	5	7
D	2	2	5	7
D73	25	26	26	27
E	17	16	19	21
E67	4	4	11	24
E73	17	18	21	21
F	2	3	22	23
G	4	4	24	24
G73	18	18	24	24
H	14	14	20	21
H73	14	14	6	9
J	3	3	9	11
J73	22	21	23	24
L	3	3	9	9
L73	22	10	11	24
M	14	14	6	8
P	17	14	20	23
Q	16	17	4	8
R	18	21	18	24
R73	24	24	23	24
T	18	4	10	24
U	3	3	6	11
U10	Upon request			
U73	22	22	23	24
V	17	17	18	20
W	Upon request			
X7	Upon request			
X34	Upon request			
Y	17	16	18	21
Y11	3	2	4	9
Y73	26	26	26	28

### Central position:

Symbol	Direction of flow				
	P - A	P - B	B - T	A - T	P - T
H	12	12	13	13	15

### Performance limits

(measured with HLP46,  $\vartheta_{oil} = 40 \pm 5 \text{ }^\circ\text{C}$  [ $104 \pm 9 \text{ }^\circ\text{F}$ ])

**Notice!**

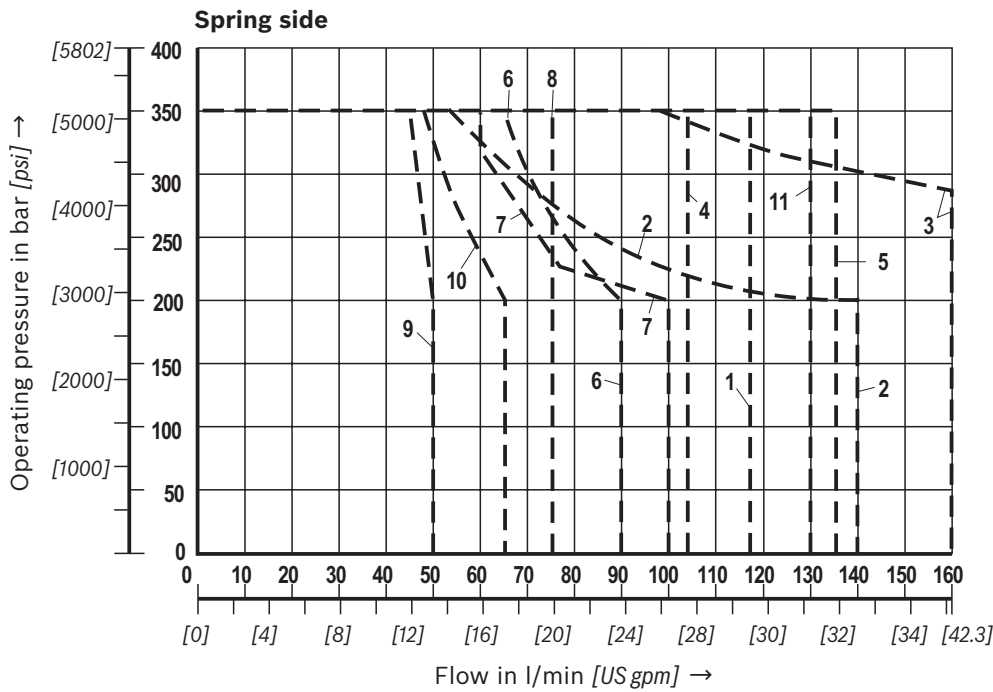
The specified performance limits are valid for use with two directions of flow (e.g. from P to A and simultaneous return flow from B to T).

Due to the flow forces acting within the valves, the admissible performance limit may be considerably lower

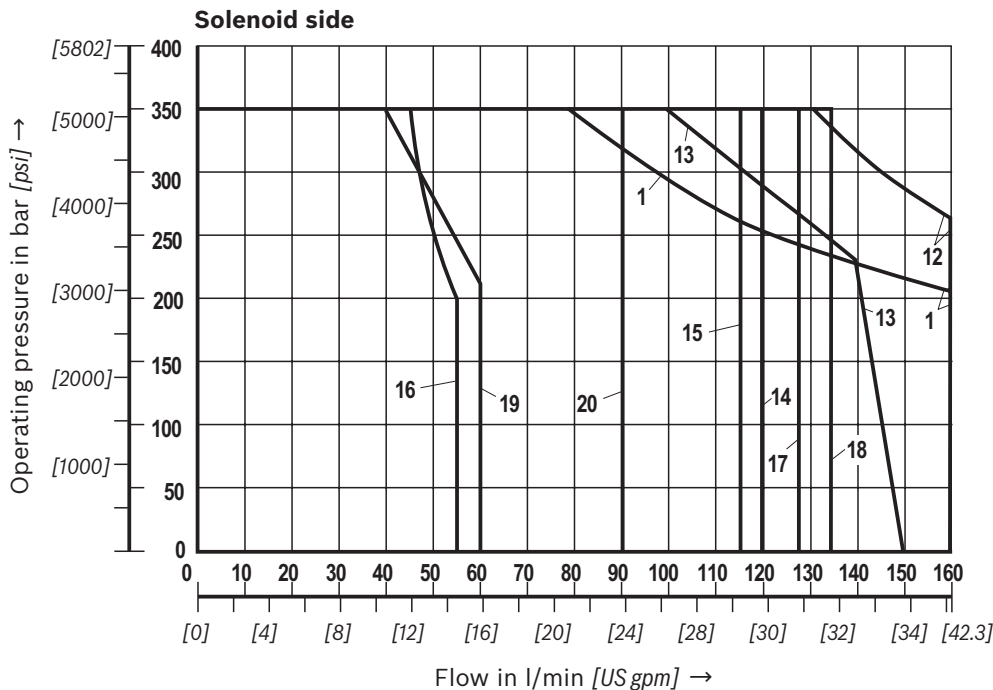
with only one direction of flow (e.g. from P to A while port B is blocked).

In such cases, please consult us!

**The performance limits were determined when the solenoids were at operating temperature, at 10% undervoltage and without tank preloading.**



Characteristic curve	Symbol
1	L
2	A
3	B
4	Y
5	E73, Q
6	F
7	G73
8	M; V
9	P
10	A73
11	H73



Characteristic curve	Symbol
1	L
12	A/O
13	J
14	H
15	D73
16	B73
17	Y11
18	C; D; E73
19	E67
20	G

### Performance limits

(measured with HLP46,  $\vartheta_{oil} = 40 \pm 5 \text{ }^\circ\text{C}$  [ $104 \pm 9 \text{ }^\circ\text{F}$ ])

**Notice!**

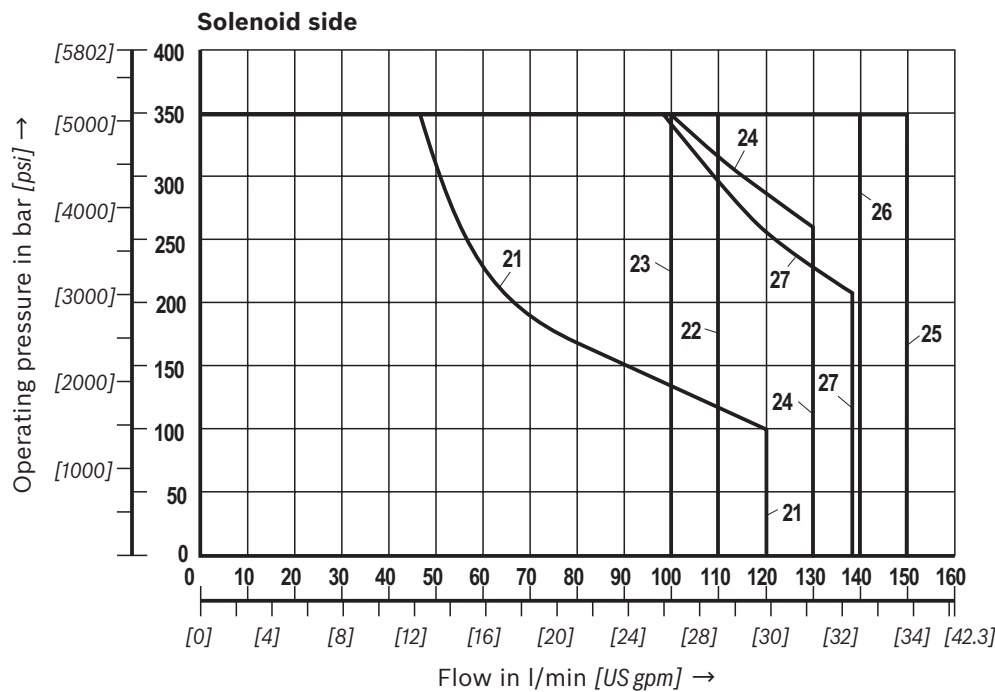
The specified performance limits are valid for use with two directions of flow (e.g. from P to A and simultaneous return flow from B to T).

Due to the flow forces acting within the valves, the admissible performance limit may be considerably lower

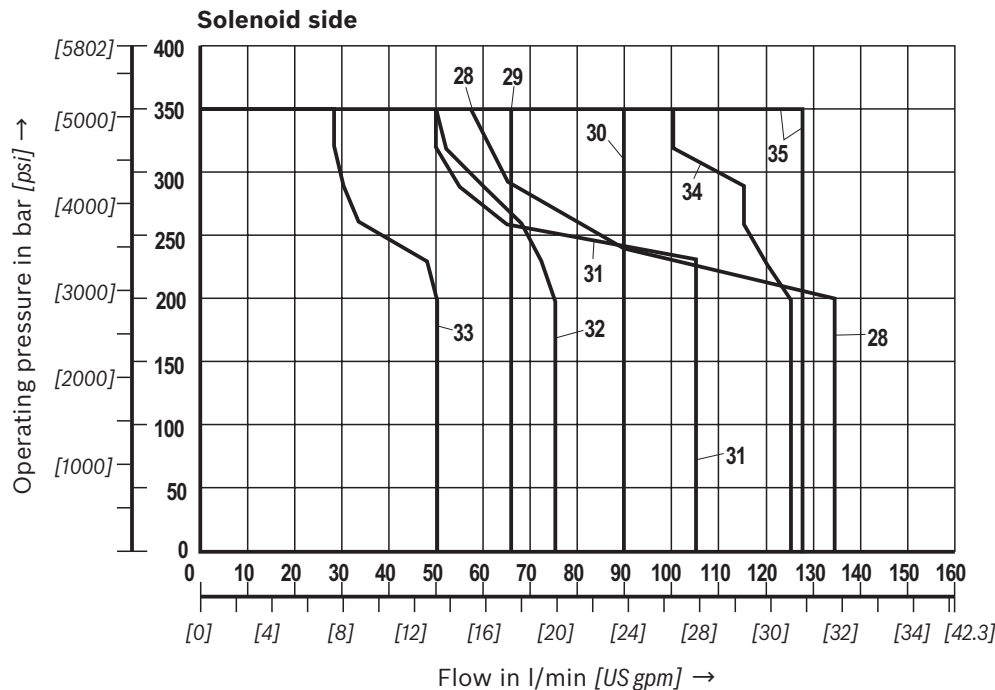
with only one direction of flow (e.g. from P to A while port B is blocked).

In such cases, please consult us!

**The performance limits were determined when the solenoids were at operating temperature, at 10% undervoltage and without tank preloading.**



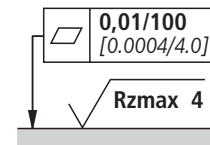
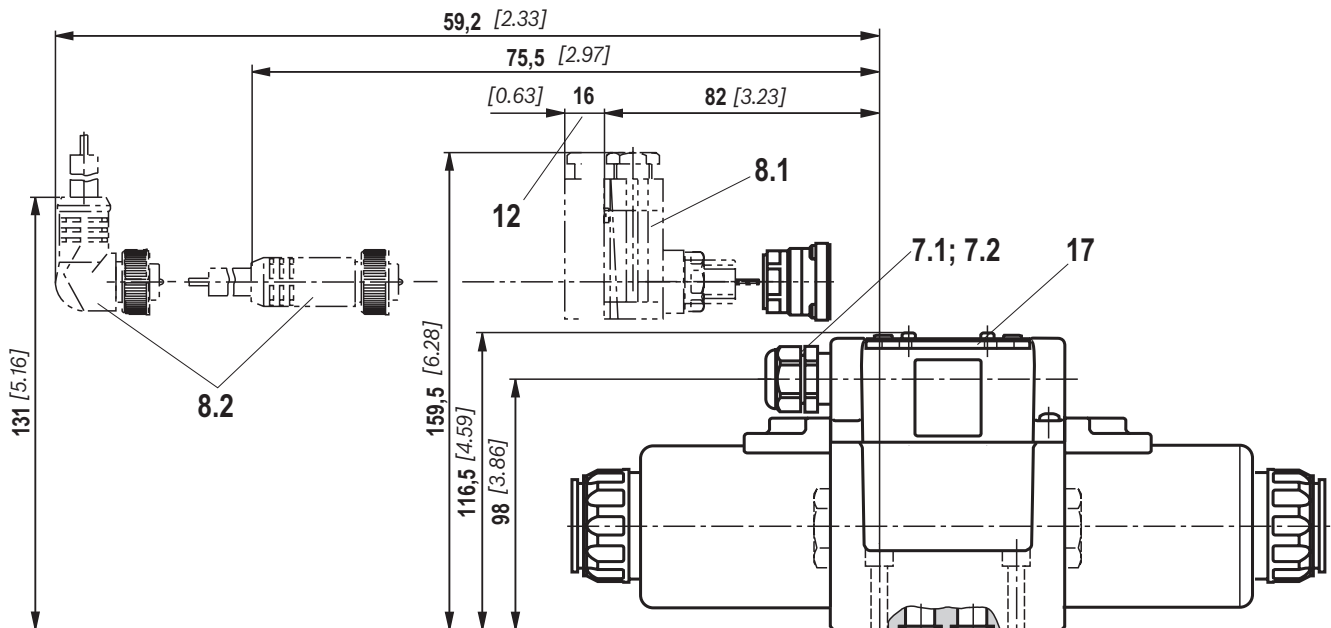
Characteristic curve	Symbol
21	A; B
22	G73
23	F; L73
24	E
25	C/O; D/O
26	J73
27	U



Characteristic curve	Symbol
28	Q
29	V
30	P
31	R
32	R73
33	T
34	U73
35	Y73



## Dimensions: Central connection (dimensions in mm [inch])



Required surface quality of the  
valve contact surface

### 👉 Special points with version "DAL" and "DL"

- ▶ Version "DL" is only suitable for permanently installed cables. Lines must be routed in a pull-relieved manner!
- ▶ Minimum line cross-section 0.75 mm<sup>2</sup>
- ▶ With a maximum line cross-section of 1.5 mm<sup>2</sup> the wire end ferrules must be crimped to a maximum cross-section of 1.5 x 2 using appropriate tools to ensure they fit into the printed circuit board terminals.
- ▶ Before crimping, at least 11 mm [0.43 inch] of the cables have to be stripped.
- ▶ For the line cross-section, wire end ferrules according to DIN 46228-1 with a minimum length of 10 mm [0.39 inch] are to be used.
- ▶ For the earthing connection, ring cable lugs according to DIN 46234-4-1 are to be used, tightening torque  $M_A = 1.75 \text{ Nm [1.29 ft-lbs]} \pm 10\%$

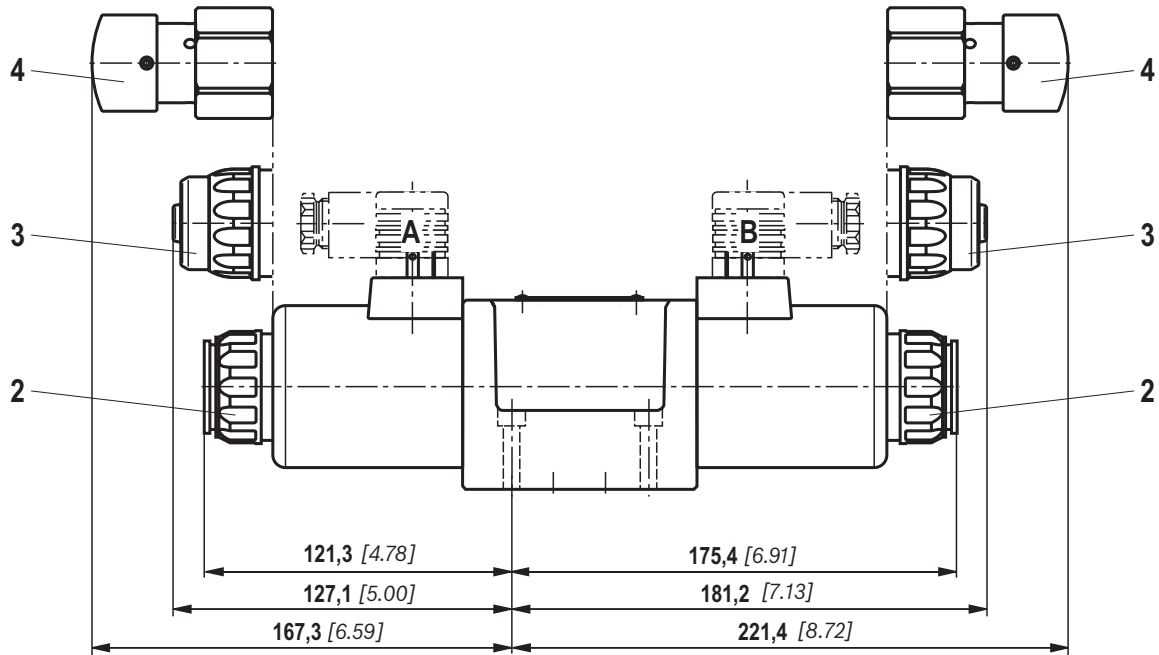
### 👉 Notice!

The dimensions are nominal dimensions which are subject to tolerances.

**Dimensions for manual overrides** see page 16.

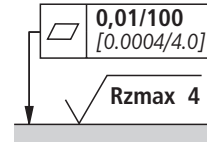
**Item explanations, valve mounting screws and subplates** see page 17.

**Dimensions:** Manual overrides  
(dimensions in mm [inch])



**Notice!**

The dimensions are nominal dimensions which are subject to tolerances.



Required surface quality of the valve contact surface

**Item explanations, valve mounting screws and subplates** see page 17.



## Dimensions

- 1.1 Solenoid "a"
- 1.2 Solenoid "b"
  - 2 Version **without** and **with concealed** manual override "N9" (standard)
  - 3 Version **with** concealed manual override and protective cap "N8". (The protective cap must be removed prior to actuation.)
  - 4 Version **with** manual override "N5" and "N6"
- 5.1 Mating connector **without** circuitry for connector "K4" (separate order, see page 18 and data sheet 08006)
- 5.2 Mating connector **without** circuitry for connector "K4K" (separate order, see data sheet 08006)
- 5.3 Mating connector angled with M12x1 plug-in connection and status LED for connector "K72L" (separate order, see data sheet 08006)
- 5.4 Double mating connector **without/with** circuitry for connector "K4" (separate order, see data sheet 08006)
- 5.5 Mating connector (AMP Junior Timer) for connector "C4Z" (separate order, see data sheet 08006)
  - 6 Mating connector **with** circuitry for connector "K4" (separate order, see page 18 and data sheet 08006)
- 7.1 Cable gland Pg 16 "DL" (terminal area 6 ... 12 mm [0.24 ... 0.47 inch]); lock nut, tightening torque  $M_A = 3.3 \text{ Nm}$  [2.43 ft-lbs]  $\pm 10\%$
- 7.2 Central connection box "DAL" 1/2" NPT, tightening torque  $M_A = 5 \text{ Nm}$  [3.69 ft-lbs]  $\pm 10\%$ ; sealing by sealant
- 8.1 Mating connector for connector "DK6L" (separate order, see data sheet 08006)
- 8.2 Mini-change connector, 5-pin for connector "DK25L" (separate order, material no. **R900057631**)
  - 9 Name plate
  - 10 Identical seal rings for ports A, B, P, TA, TB
  - 11 Plug screw for valves with one solenoid
  - 12 Space required to remove the mating connector/angled socket
  - 13 Space required to remove the coil
  - 14 Mounting nut, tightening torque  $M_A = 14.5 \pm 1.5 \text{ Nm}$  [10.69  $\pm$  1.1 ft-lbs]
  - 15 Porting pattern according to ISO 4401-05-04-0-05 and NFPA T3.5.1 R2-2002 D05
  - 16 Connection TB can only be used in connection with separately produced bore.
  - 17 Cover
 

**Attention!** The valve may only be operated with properly mounted cover! Tightening torque of the cover screws  $M_A = 1.0 \text{ Nm}$  [0.74 ft-lbs]  $\pm 10\%$ .  
Prior to opening the frame, it must be ensured that the valve has no voltage!

**Subplates** according to data sheet 45054 (separate order)

G 66/01 (G3/8)  
 G 67/01 (G1/2)  
 G 534/01 (G3/4)  
 G 66/12 (SAE-6; 9/16-18) <sup>1)</sup>  
 G 67/12 (SAE-8; 3/4-16) <sup>1)</sup>  
 G 534/12 (SAE-12; 1-1/16-12) <sup>1)</sup>

<sup>1)</sup> Upon request

**Valve mounting screws** (separate order)

**4 metric hexagon socket head cap screws**

**ISO 4762 - M6 x 40 - 10.9-f1Zn-240h-L**

(friction coefficient  $\mu_{\text{total}} = 0.09$  to 0.14);  
 tightening torque  $M_A = 12.5 \text{ Nm}$  [9.2 ft-lbs]  $\pm 10\%$ ,  
 material no. **R913000058**

or

**4 hexagon socket head cap screws**

**ISO 4762 - M6 x 40 - 10.9** (self procurement)

(friction coefficient  $\mu_{\text{total}} = 0.12$  to 0.17);  
 tightening torque  $M_A = 15.5 \text{ Nm}$  [11.4 ft-lbs]  $\pm 10\%$

**4 UNC hexagon socket head cap screws**

**1/4-20 UNC x 1-1/2" ASTM-A574**

(friction coefficient)  $\mu_{\text{total}} = 0.19$  to 0.24);  
 tightening torque  $M_A = 25 \text{ Nm}$  [18.4 ft-lbs]  $\pm 15\%$ ,  
 (friction coefficient  $\mu_{\text{total}} = 0.12$  to 0.17);  
 tightening torque  $M_A = 19 \text{ Nm}$  [14.0 ft-lbs]  $\pm 10\%$ ,  
 material no. **R978800710**

With different friction coefficients, the tightening torques are to be adjusted accordingly!

## Over-current fuse and switch-off voltage peaks


### Maximum admissible overvoltages according to DIN EN 60664-1:2008-01 (VDE 0110-1) (overvoltage category II):

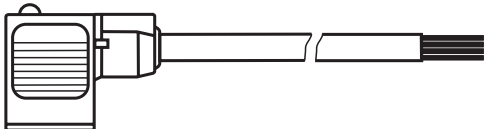
Electrical connection	Nominal voltage in V	Rated current in A	Maximum switch-off overvoltage to be energized in V
K4, K4K, DAL, D6KL, DL	12	3.72	500
K4, K4K, K72L, DAL, D6KL, DL, DJL, DK25L	24	1.74	500
K4, C4Z	26	1.70	500
K4, DAL, D6KL, DL, DK25L	96	0.47	776
D6KL, DL, DJL	110	0.41	940
K4, C4Z	180	0.28	1700
K4, DAL, D6KL, DL	205	0.22	1867
K4, DAL, D6KL, DL	220	0.21	1967

#### Notice!

When solenoid coils are switched off, voltage peaks result which may cause faults or damage in the connected control electronics. We therefore recommend limiting them to 2 x nominal voltage by means of a interference protection circuit. It must be noted that a diode switched in an antiparallel form extends the switching off time.

## Mating connectors according to DIN EN 175301-803


For details and more mating connectors see data sheet 08006						
Port	Valve side	Color	Material no.			
			Without circuitry	With indicator light 12 ... 240 V	With rectifier 12 ... 240 V	With indicator light and Zener diode suppression circuit 24 V
M16 x 1.5	a	Gray	<b>R901017010</b>	-	-	-
	a/b	Black	<b>R901017011</b>	<b>R901017022</b>	<b>R901017025</b>	<b>R901017026</b>
1/2" NPT (Pg16)	a	Red/brown	<b>R900004823</b>	-	-	-
	a/b	Black	<b>R900011039</b>	<b>R900057453</b>	<b>R900842566</b>	-

Details see data sheet 30362						
			Material number			
			Type VT-SSBA1-PWM-1X/V001/5,00 as fast switching amplifier	Type VT-SSBA1-PWM-1X/V002/5,00 for energy reduction		
M16 x 1.5	a/b	Black	<b>R901265633</b>	<b>R901290194</b>		

**Project planning information:**

Temperature range and maximum operating pressure in case of use at low temperatures

Port	Pressure	Temperature range in °C [°F]
-P, A, B, T	Static 100 bar [1450 psi]	-40 ... -35 [-40 ... -31]
-P, A, B	Dynamic from 100 bar [1450 psi] to 350 bar [5076 psi] in linear form as function of the temperature	-35 ... -30 [-31 ... -22]
-T	Dynamic from 100 bar [1450 psi] to 210 bar [3050 psi] in linear form as function of the temperature	-35 ... -30 [-31 ... -22]
-P, A, B, T	Maximum operating pressure	-30 ... +50 [-22 ... 122]

 **Notice!**

With valves for low temperatures, the "T12" control spool play is to be preferably selected.

**More information**

- ▶ Subplates
- ▶ Mineral oil-based hydraulic fluids
- ▶ Reliability characteristics according to EN ISO 13849
- ▶ General product information on hydraulic products
- ▶ Installation, commissioning and maintenance of industrial valves
- ▶ Hydraulic valves for industrial applications
- ▶ Selection of the filters

Data sheet 45054

Data sheet 90220

Data sheet 08012

Data sheet 07008

Data sheet 07300

Data sheet 07600-B

[www.boschrexroth.com/filter](http://www.boschrexroth.com/filter)

## Notes

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