

Directional spool valves, direct operated,  
with solenoid actuation

Type WE



- ▶ 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-way version
- ▶ Porting pattern according to ISO 4401-05-04-0-05 and NFPA T3.5.1 R2-2002 D05
- ▶ High-power solenoid, optionally rotatable by 90°
- ▶ Electrical connection as individual or central connection
- ▶ Cartridge optionally equipped with PWM connector (fast switching amplifier, energy reduction)
- ▶ Manual override, optional
- ▶ CE conformity according to the Low Voltage Directive 2006/95/EC for electrical voltages >50 VAC or > 75 VDC
- ▶ Solenoid coil with UR approval UL 429
- ▶ Approval according to CSA C22.2 No. 139-10, optional

## Contents

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## Ordering codes

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 (for quick switching off)	<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 48 V	<b>G48</b>
	Direct voltage 96 V	<b>G96</b>
	Direct voltage 110 V	<b>G110</b> <sup>1)</sup>
	Direct voltage 125 V	<b>G125</b>
	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 20). <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>
<b>Corrosion resistance</b> (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>J3</b>

## Electrical connection

AC voltage mains (admissible voltage tolerance ±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 codes

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>			/						*

11	<b>Individual connection</b>	
	Without mating connector; connector according to DIN EN 175301-803	<b>K4</b> <sup>6)</sup>
	Without mating connector; connector according to DIN EN 175301-803 (coil with potted-in connector base and sealing element to valve housing (IP67))	<b>K4K</b> <sup>6; 7)</sup>
	Without 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>
	Without 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>
	Without mating connector; threaded connection 1/2"-14 NPT	<b>DAL</b>
	Cable gland at the cover, with indicator light and cable bridge at the ground connection	<b>DJL</b>
	Mini-change connector, 5-pole	<b>DK25L</b>
Additional electrical connections and available voltages see page 10		

### Switching time increase

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

13	Without throttle insert		<b>no code</b>	
	With throttle insert <sup>8; 9)</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>10)</sup>	= <b>X08</b>	= <b>X10</b>	= <b>X12</b>	
Further throttle insert diameters upon request.				

### Control spool play

14	Standard	<b>no code</b>
	Minimum (to be selected in case of reduced leakage → higher level of oil cleanliness recommended)	<b>T06</b>
	Increased (to be selected in case of a hydraulic fluid/environment temperature difference >25 K → increased internal leakage)	<b>T12</b>

### Seal material

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

Explanation of the footnotes see page 4.



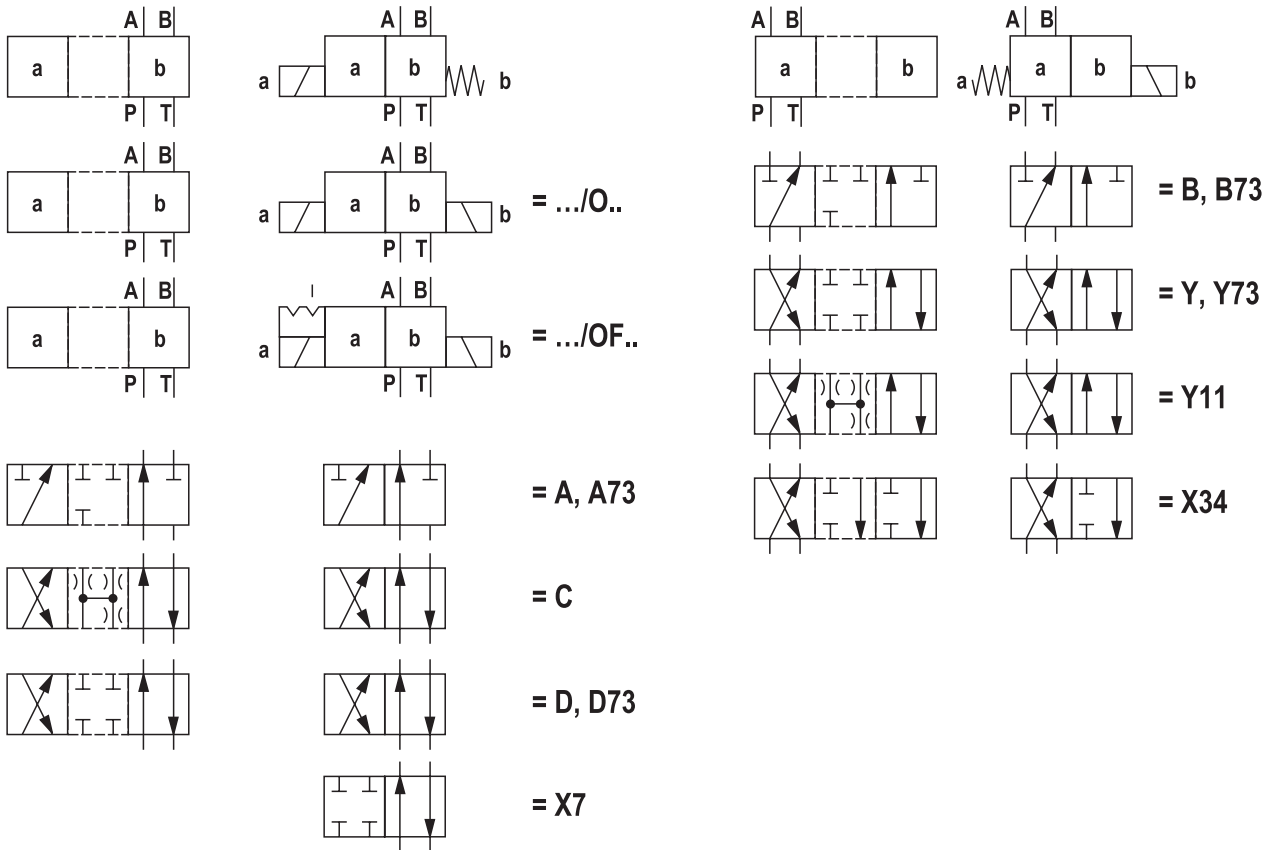
#### Notice:

For directional spool valves size 10 with spool position monitoring, see data sheet 23352.

### Ordering codes

- 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 "N5" manual override.
- 5) Protective cap must be removed prior to actuation.
- 6) Mating connectors, separate order, see page 20 and data sheet 08006.
- 7) Recommended for mobile applications; with additional sealing between solenoid coil and pole tube.
- 8) When the admissible valve performance limits are exceeded, throttle inserts are to be installed (for performance limits, see page 12 and 13).
- 9) Not with low-temperature version "MT".
- 10) 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.

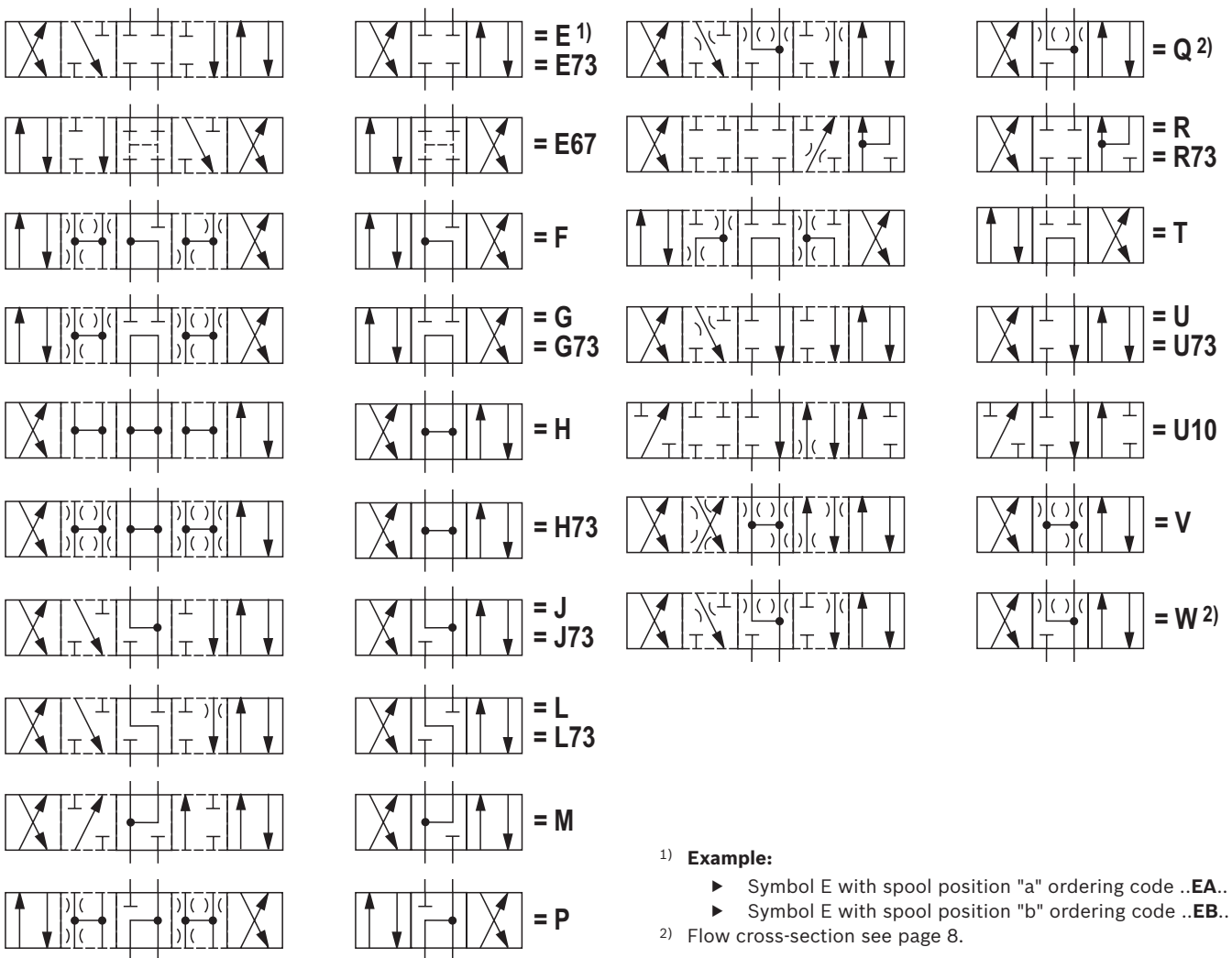
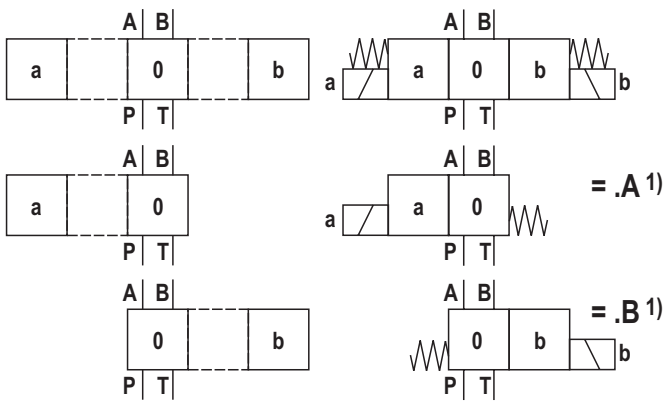
### Symbols



**Notice:**

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

**Symbols**

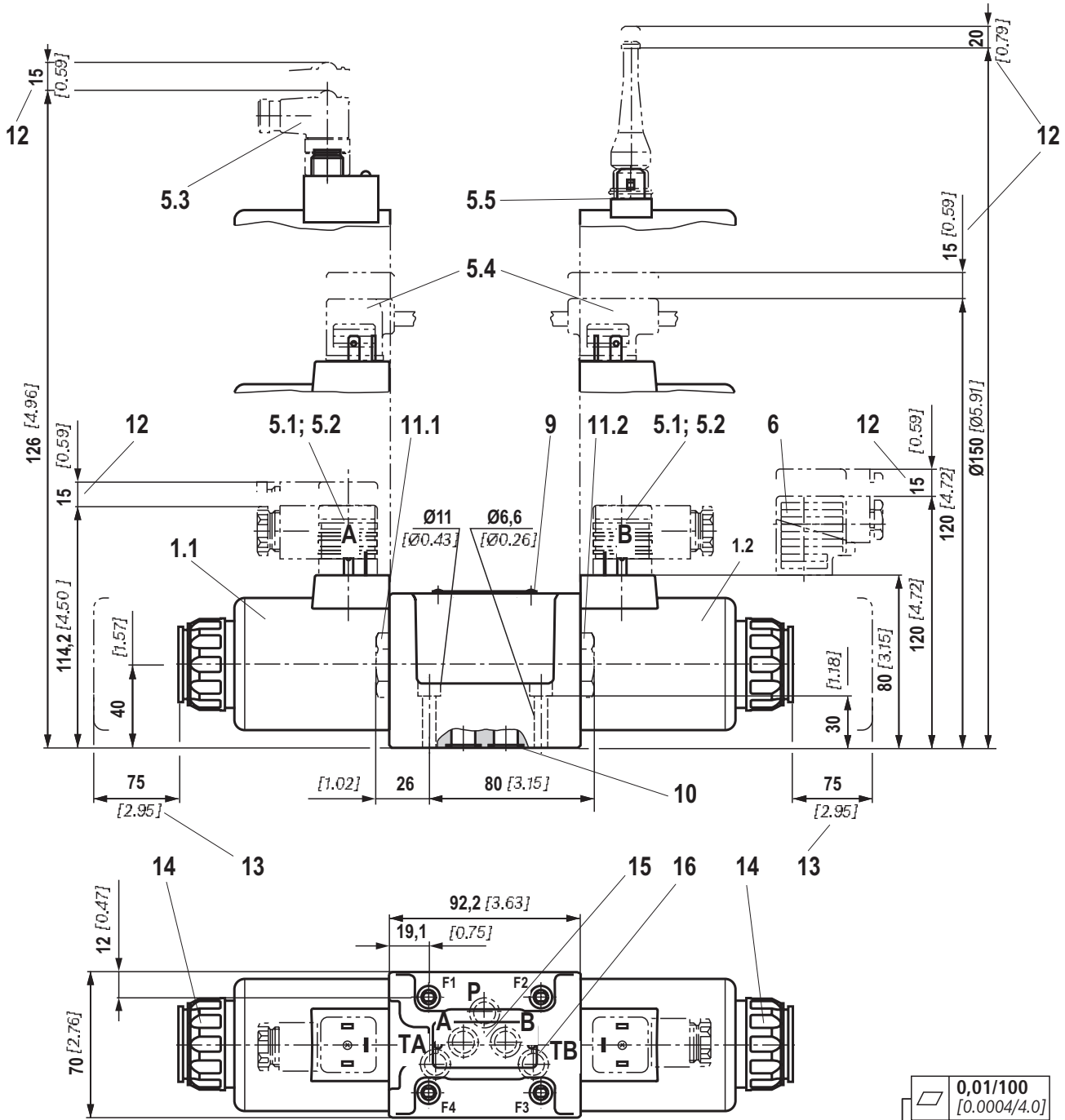


- 1) **Example:**
- ▶ Symbol E with spool position "a" ordering code **..EA..**
  - ▶ Symbol E with spool position "b" ordering code **..EB..**
- 2) Flow cross-section see page 8.

**Notices!**

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

**Dimensions:** Individual connection  
(dimensions in mm [inch])

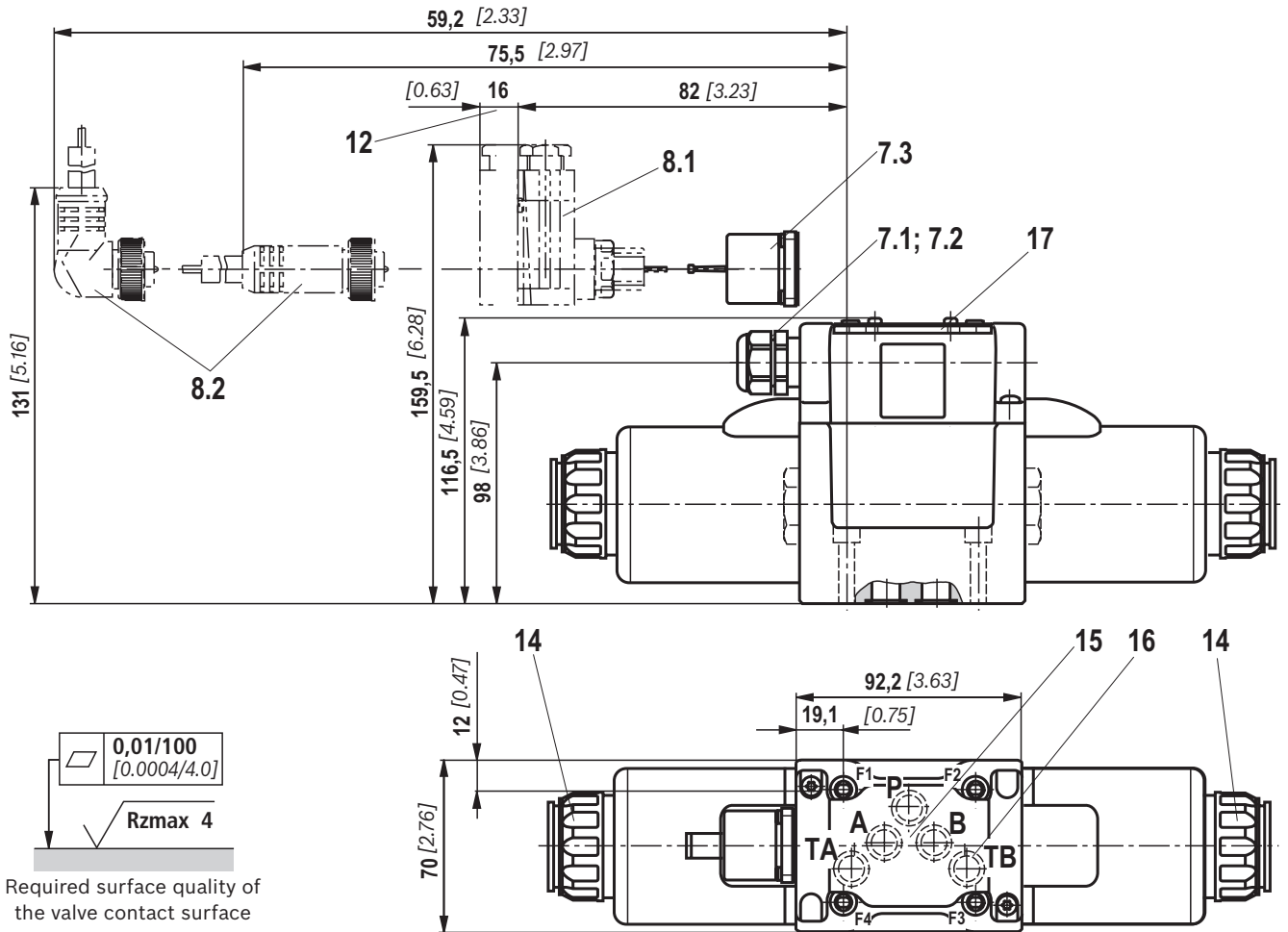


Required surface quality of the valve contact surface

**Notices:**

- ▶ Deviating from ISO 4401, port T is called TA and port T1 is called TB in this data sheet.
- ▶ The dimensions are nominal dimensions which are subject to tolerances.

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



#### 👉 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> (AWG 18)
- ▶ With a maximum line cross-section of 1.50 mm<sup>2</sup> (AWG 16) and if wire end ferrules are used, wire end ferrules without flange must be crimped to a maximum cross-section of 1.5 mm x 2 mm (trapezoidal crimp) using an appropriate tool (e. g. "PZ 6/5", co. Weidmüller) to ensure that they fit into the printed circuit board terminals.
- ▶ Before crimping, the wires have to be stripped to 9-1 mm [0.35-0.039 inch].
- ▶ For the corresponding line cross-section <sup>1)</sup>, wire end ferrules without flange (according to DIN 46228-1) with a length of 8 mm [0.31 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] ±10 %

#### 👉 Notice:

The dimensions are nominal dimensions which are subject to tolerances.

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

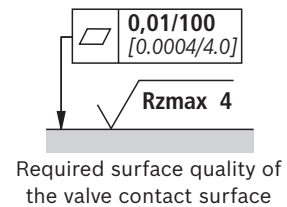
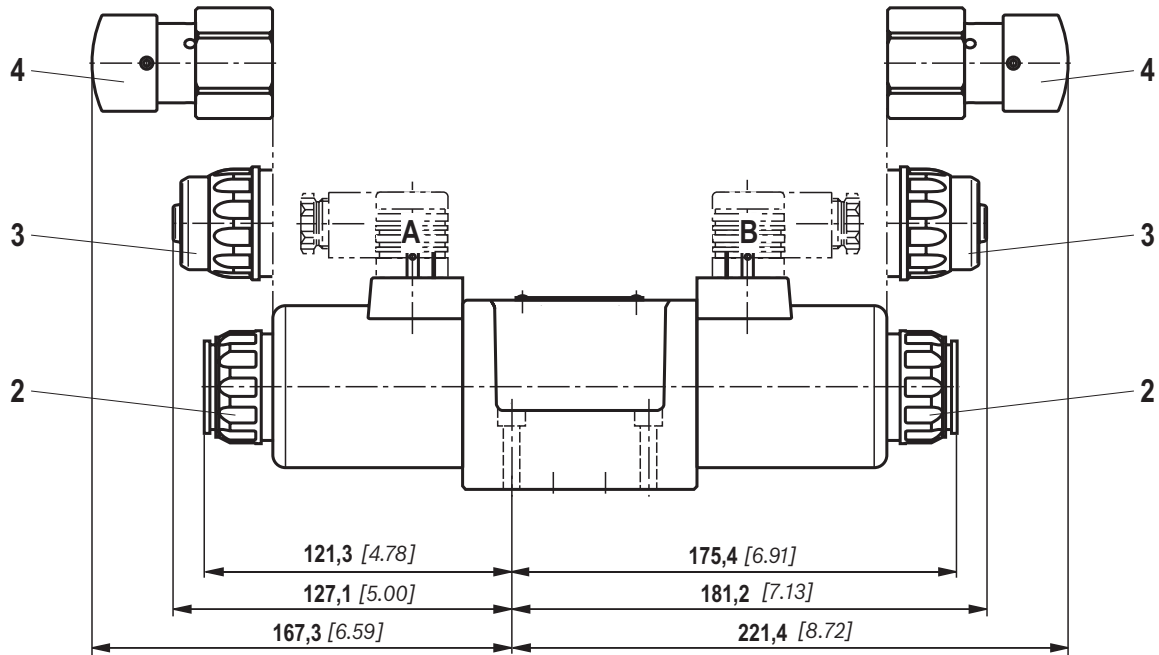
**Item explanations, valve mounting screws and subplates** see page 17.

- <sup>1)</sup> 0.75 mm<sup>2</sup> (AWG 20)  
1.00 mm<sup>2</sup> (AWG 18)  
1.50 mm<sup>2</sup> (AWG 16)

#### 👉 Notice:

The lines must be finely stranded.

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



- 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**"

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

**Notice:**

The dimensions are nominal dimensions which are subject to tolerances.



## 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 20 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 20 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
- 7.3 Connector "DK6L" and "DK25L"
- 8.1 Mating connector for connector "DK6L" (separate order, material no. **R900002803**, see data sheet 08006)
- 8.2 Mini-change connector, 5-pole for connector "DK25L" (separate order, material no. **R900057631**)
- 9 Name plate
- 10 Identical seal rings for ports A, B, P, TA, TB
- 11.1 Plug screw for valves with one solenoid on B side
- 11.2 Plug screw for valves with one solenoid on A side
- 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
 

**Notice:** 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-fIZn-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!