Directional spool valves, direct operated, with solenoid actuation

Type WE.../H

RE 23343
Edition: 2016-03
Replaces: 2014-10

H8053

- Size 10
- Component series 5X
- Maximum operating pressure 315 bar *[4568 psi]*
- Maximum flow 135 l/min *[35.7 US gpm]*

Features

- 4/3 or 4/2 directional design
- Standard 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 connection
- Manual override
- Spool position monitoring, optional

Contents

Ordering code

01	02	03	04	05		06	07	08	09	10		11	12
4	**WE**	**10**		**5X**	**/**	**H**	**G24**	**N9**	**K4**		**/**	**M**	*****

01	4 main ports	**4**
02	Directional valve	**WE**
03	Size 10	**10**
04	Symbols e.g. C, E, EA, EB, etc; possible version see page 3	e.g. **C**
05	Component series 50 to 59 (50 to 59: Unchanged installation and connection dimensions)	**5X**
06	Wet-pin solenoid with detachable coil	**H**
07	Direct voltage 24 V	**G24**
	Connection to AC voltage mains via control with rectifier (see page 11)	
08	**With** concealed manual override (standard)	**N9** [1]

Electrical connection

09	**Individual connection**	
	Without mating connector; connector according to DIN EN 175301-803	**K4** [2]

Spool position monitoring

10	**Without** position switch	**no code**
	– Inductive position switch type QY	
	Monitored spool position "b"	**QYBG24**
	For more information, see data sheet 24836	

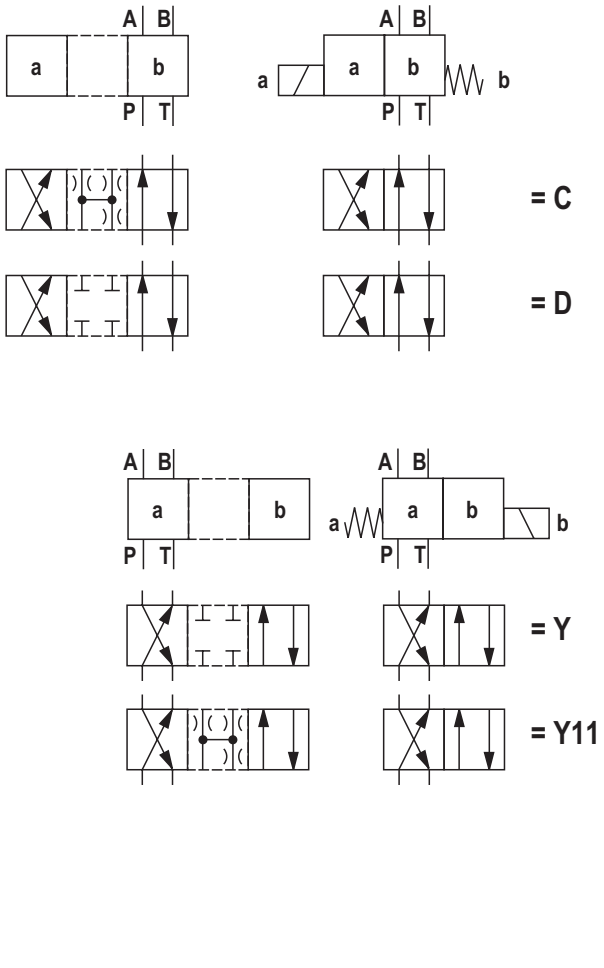
Seal material

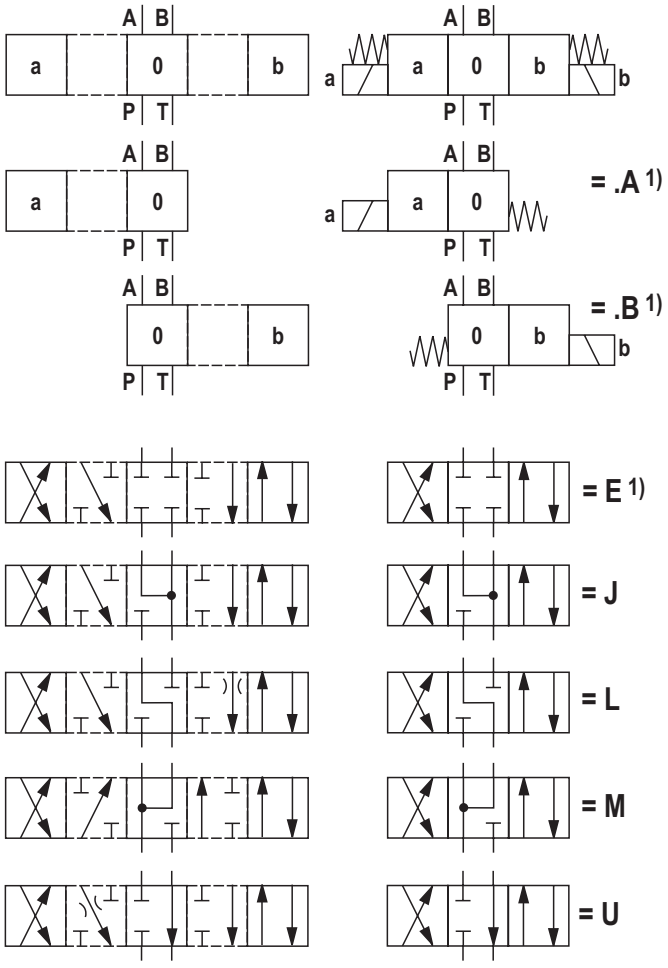
11	NBR seals	**M**
12	Further details in the plain text	*

1) 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.

2) Mating connector, separate order, see page 11 and data sheet 08006.

Symbols





1) **Example:**

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

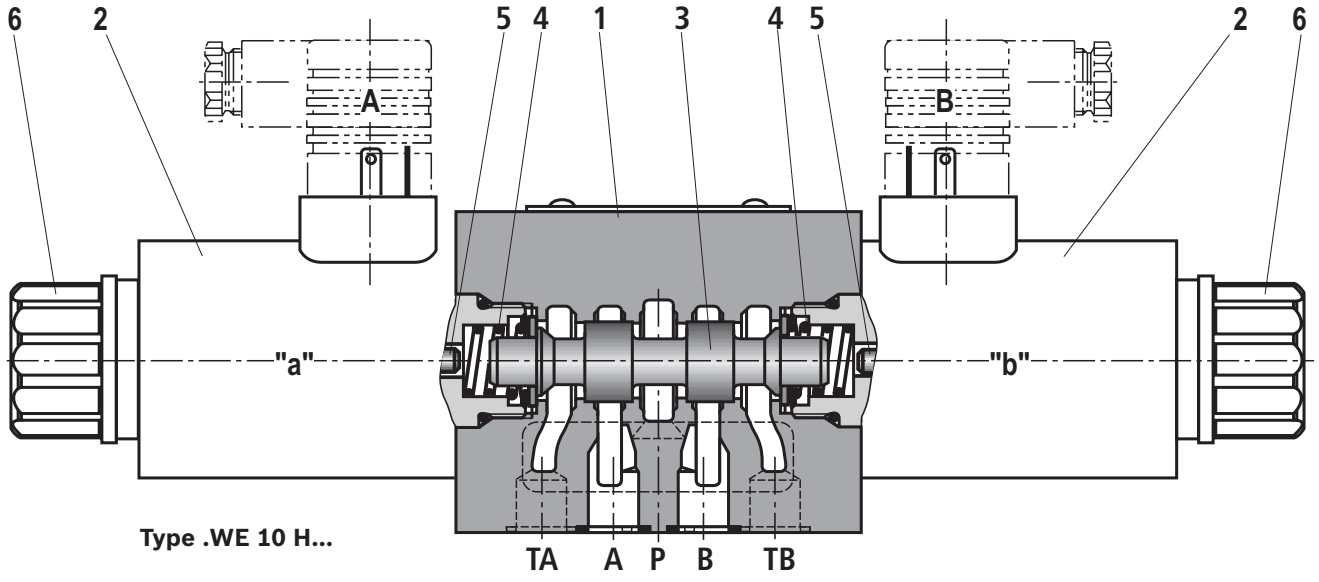
Notice:

- 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).
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.
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.



Type .WE 10 H...

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

general			
Weight	– Valve with one solenoid	kg *[lbs]*	3,6 *[7.9]*
	– Valve with two solenoids	kg *[lbs]*	4,7 *[10.4]*
Installation position			Any [1]
Ambient temperature range		°C *[°F]*	–20 ... +50 *[–4 ... +122]*
Storage temperature range		°C *[°F]*	–20 ... +50 *[–4 ... +122]*

hydraulic			
Maximum operating pressure	– Port A, B, P	bar *[psi]*	315 *[4568]*
	– Port T	bar *[psi]*	210 *[3050]* Tank pressure (standard)
Maximum flow		l/min *[US gpm]*	135 *[35.7]*
Hydraulic fluid			See table below
Hydraulic fluid temperature range (at the valve working ports)		°C *[°F]*	–20 ... +80 *[–4 ... +176]*
Viscosity range		mm^2/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 [2]

Hydraulic fluid	Classification	Suitable sealing materials	Standards
Mineral oils	HL, HLP, HLPD, HVLP, HVLPD	NBR	DIN 51524

☞ **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.

1) With suspended installation, higher sensitivity to contamination. Horizontal installation is recommended.

2) 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.

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

electric				
Voltage type				Direct voltage
Nominal voltage according to VDE 0580			V	24
Voltage tolerance (nominal voltage)			%	±10
Nominal power according to VDE 0580			W	38
Duty cycle			%	100 (S1 according to VDE 0580)
Switching time [3]	– ON	Pressure change 5%	ms	65 ... 150
		Pressure change 95%	ms	100 ... 220
	– OFF	Pressure change 5%	ms	12 ... 50
		Pressure change 95%	ms	48 ... 104
Switching time according to ISO 6403 [4]	– ON		ms	45 ... 60
	– OFF		ms	20 ... 30
Maximum switching frequency			1/h	15000
Protection class according to DIN EN 60529				IP65
Maximum surface temperature of the coil [5]			°C *[°F]*	120 *[248]*
Insulation class VDE 0580				F
Protection class according to VDE 0580				I
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.

3) Measured with flow, 80% performance limit and horizontal installation position.

4) Measured without flow

5) Possible surface temperature >50 °C, provide contact protection!

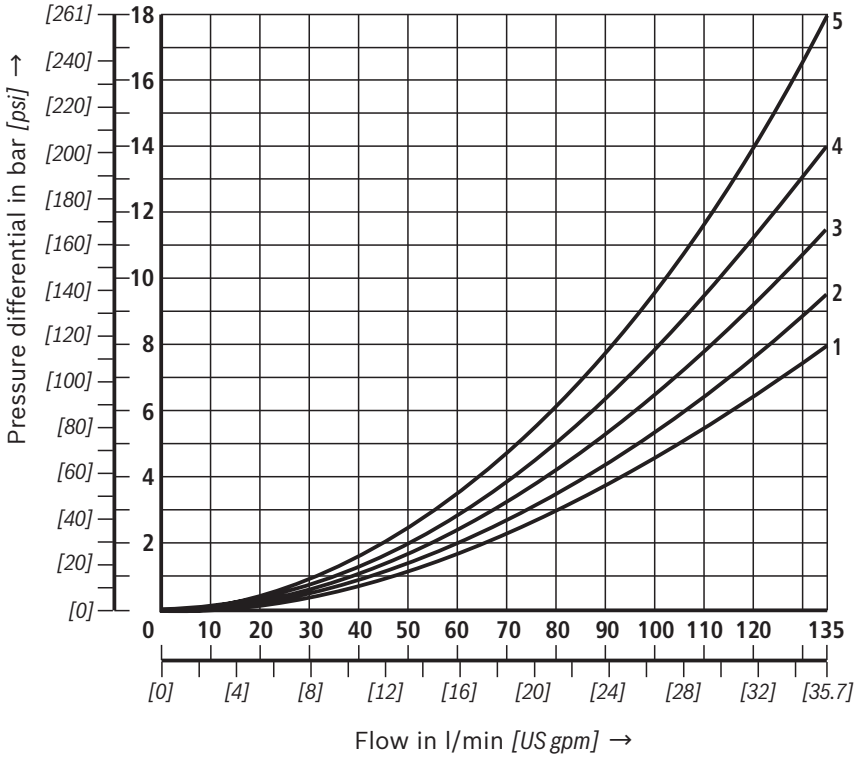
☞ **Notice:**

- 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]*.
- If the standard environmental conditions according to VDE 0580 cannot be provided, the valve must be especially protected!

Characteristic curves

(measured with HLP46, ϑ_{oil} = 40 ± 5 °C *[104 ± 9 °F]*)

***Δp-q*$_V$ characteristic curves**

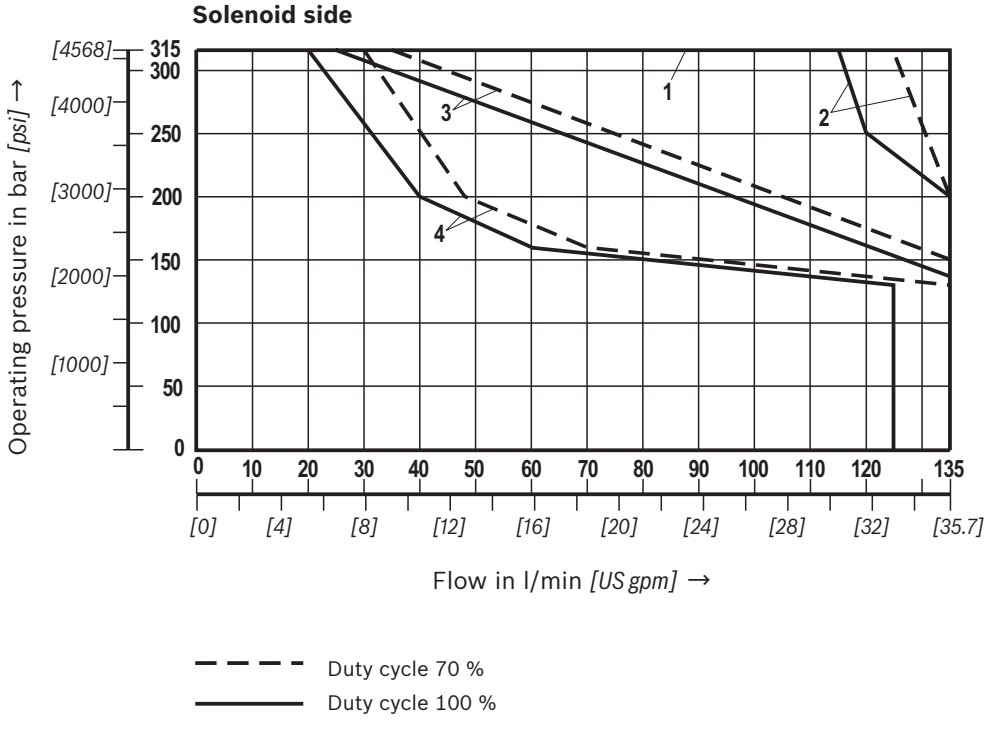


Symbol	Direction of flow			
	P – A	P – B	A – T	B – T
C	1	2	3	3
D	1	3	3	3
E	2	2	4	5
J	2	2	4	5
L	2	2	4	5
M	1	1	3	5
U	2	2	4	5
Y	2	1	1	4
Y11	2	1	1	4

Performance limits

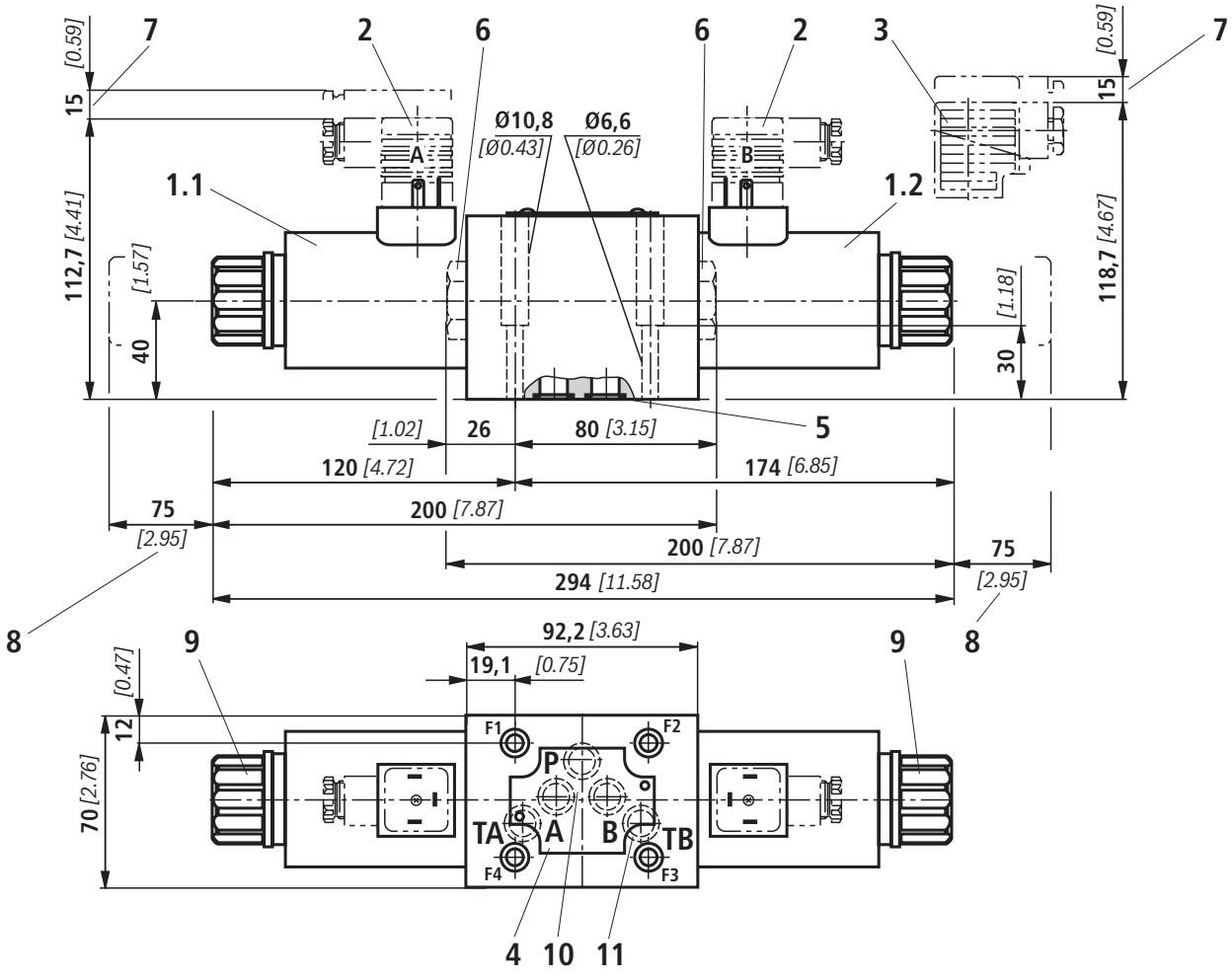
(measured with HLP46, ϑ_{oil} = 40 ± 5 °C *[104 ± 9 °F]*)

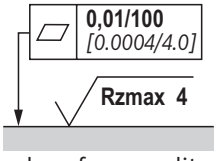
☞ **Notice:**
The specified performance limits are valid for use with two directions of flow (e.g. from P to A and simultaneous return flow from B to T).
Due to the flow forces acting within the valves, the admissible performance limit may be considerably lower with only one direction of flow (e.g. from 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.



Symbol	Characteristic curve
C, D, Y, Y11	1
M	2
E	3
J, L, U	4

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





Required surface quality of the valve contact surface

☞ **Notice:**

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

Item explanations, valve mounting screws and **subplates** see page 10.

Dimensions

1.1 Solenoid "a"
1.2 Solenoid "b"
2 Mating connector **without** circuitry (separate order, see page 11 and data sheet 08006)
3 Mating connector **with** circuitry (separate order, see page 11 and data sheet 08006)
4 Name plate
5 Identical seal rings for ports A, B, P, TA, TB
6 Plug screw for valves with one solenoid
7 Space required to remove mating connector/angled mating connector
8 Space required to remove coil
9 Mounting nut, tightening torque $\boldsymbol{M}_A$ = 9$^{\pm 1}$ Nm *[6.64*$^{\pm 0,74}$ *ft-lbs]*
10 Porting pattern according to ISO 4401-05-04-0-05 and NFPA T3.5.1 R2-2002 D05
11 Connection TB can only be used in connection with separately produced bore.

Valve mounting screws (separate order)

4 metric hexagon socket head cap screws
ISO 4762 - M6 x 40 - 10.9-flZn-240h-L
(friction coefficient $\boldsymbol{\mu}_{total}$ = 0.09 to 0.14);
tightening torque $\boldsymbol{M}_A$ = 12.5 Nm *[9.2 ft-lbs]* ± 10%,
material no. **R913000058**
or
4 hexagon socket head cap screws
ISO 4762 - M6 x 40 - 10.9 (self procurement)
(friction coefficient $\boldsymbol{\mu}_{total}$ = 0.12 to 0.17);
tightening torque $\boldsymbol{M}_A$ = 15.5 Nm *[11.4 ft-lbs]* ± 10%

4 UNC hexagon socket head cap screws
1/4-20 UNC x 1-1/2" ASTM-A574
(friction coefficient) $\boldsymbol{\mu}_{total}$ = 0.19 to 0.24);
tightening torque $\boldsymbol{M}_A$ = 25 Nm *[18.4 ft-lbs]* ± 15%,
(friction coefficient $\boldsymbol{\mu}_{total}$ = 0.12 to 0.17);
tightening torque $\boldsymbol{M}_A$ = 19 Nm *[14.0 ft-lbs]* ± 10%,
material no. **R978800710**

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

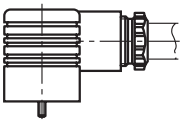
Over-current fuse and switch-off voltage peaks

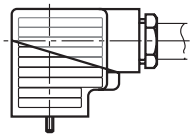
Electrical connection	**Voltage data in the valve type code**	**Nominal voltage valve solenoid** in V DC	**Rated current valve solenoid** in A	**Rated current external miniature fuse: Medium time-lag (M) according to DIN 41571 and EN/IEC 60127** in mA	**Rated voltage of external miniature fuse: Medium time-lag (M) according to DIN 41571 and EN/IEC 60127** in V
K4	G24	24	0.708	800	250

☞ **Notice:**
Corresponding to the rated current, a fuse according to DIN 41571 and EN / IEC 60127 has to be connected ahead of every valve solenoid (max. 3 x I_{rated}).
The shut-off threshold of the fuse has to match the prospective short-circuit current of the supply source.
The prospective short-circuit current of the supply source may amount to a maximum of 1500 A.

Mating connectors according to DIN EN 175301-803

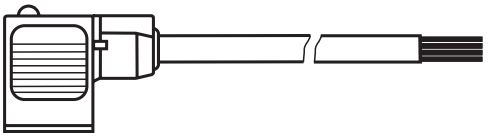
For details and more mating connectors see data sheet 08006





Port	**Valve side**	**Color**	**Material no.** Without circuitry	With indicator light 24 V	With indicator light and Zener diode suppression circuit 24 V
M16 x 1.5	a	Gray	**R901017010**	**–**	**–**
	a/b	Black	**R901017011**	**R901017022**	**R901017026**
1/2" NPT (Pg16)	a	Red/brown	**R900004823**	**–**	**–**
	a/b	Black	**R900011039**	**R900057453**	**–**

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	**R901265633**	**R901290194**

More information

▶ Subplates	Data sheet 45100
▶ Inductive position switch and proximity sensors (contactless)	Data sheet 24836
▶ Mineral oil-based hydraulic fluids	Data sheet 90220
▶ Reliability characteristics according to EN ISO 13849	Data sheet 08012
▶ Hex socket head cap screws metric/UNC	Data sheet 08936
▶ Hydraulic valves for industrial applications	Data sheet 07600-B
▶ Selection of the filters	www.boschrexroth.com/filter

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