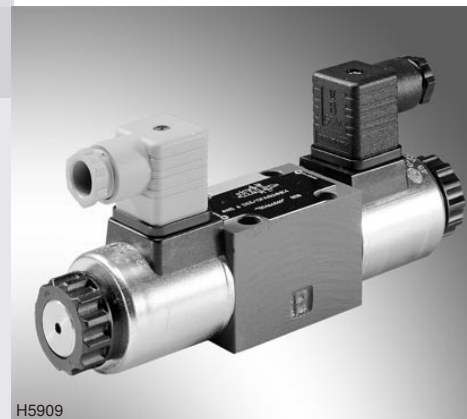


4/3, 4/2 and 3/2 directional valve with wet-pin DC solenoids

RE 23178-00/06.09 1/12
Replaces: 02.03

Type WE ...SO407

Size 6
Component series 6X
Maximum operating pressure 315 bar [4569 psi]
Maximum flow 60 l/min [15.8 US gpm]



H5909

Table of contents

Features	1
Ordering code	2
Spool symbols	3
Function, section	4
Technical data	5, 6
Characteristic curves	7
Performance limits	7
Unit dimensions	8 to 10
Mating connectors	10

Features

- Direct operated directional spool valve with solenoid actuation and **reduced electrical power consumption**
- Porting pattern according to DIN 24340 form A (**without** locating hole)
- Porting pattern according to ISO 4401-03-02-0-05 and NFPA T3.5.1 R2-2002 D03 (**with** locating hole)
- Subplates according to data sheet RE 45052 (separate order)
- 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 (for more electrical connections see RE 08010)
- with concealed manual override
- Amending documentation:
 - “General product information on hydraulic products” RE 07008
 - “Installation, commissioning and maintenance of industrial valves” RE 07300

Information on available spare parts:
www.boschrexroth.com/spc

Ordering code

	WE	6		6X/	E	G24	N9		/			SO407
--	-----------	----------	--	------------	----------	------------	-----------	--	----------	--	--	--------------

3 main ports = 3

4 main ports = 4

Size 6 = 6

Spool symbols e.g. C, E, EA, EB, etc; possible design, see page 3

Component series 60 to 69 = 6X
(60 to 69: unchanged installation and connection dimensions)

Spring return = no code

without spring return = O

without spring return with detent = OF

High-power solenoid, wet-pin with detachable coil = E

DC voltage 24 V = G24

with concealed manual override = N9

Electrical connection ¹⁾**Individual connection**without mating connector with connector DIN EN 175301-803 = K4 ²⁾**Central connection**

Cable entry at the cover, with indicator light = DL

Central plug-in connection at the cover, with indicator light = DKL ³⁾

(without mating connector)

For further electrical connections see RE 08010

Spool position monitoring

without position switch = no code

Monitored spool position "a" = QMAG24

Monitored spool position "b" = QMBG24

For further details see RE 24830

Reduced electrical power consumption

no code = without locating hole
/60 ⁴⁾ = with locating hole
/62 = with locating hole and locating pin ISO 8752-3x8-St**Seal material**

no code = NBR seals

V = FKM seals

(other seals upon request)

Attention!

Observe compatibility of seals with the hydraulic fluids used!

no code = without throttle insert
with throttle insert see table:

Connection	Throttle Ø in mm [inch]		
	0.8 [0.031]	1.0 [0.039]	1.2 [0.047]
P	= B08	= B10	= B12
A	= H08	= H10	= H12
B	= R08	= R10	= R12
A and B	= N08	= N10	= N12
T	= X08	= X10	= X12

Operations at flows which exceed the performance limit of the valve (see page 6).

¹⁾ Also available with M12x1 plug-in connection, see RE 08010

²⁾ Mating connectors, separate order, see page 8.

³⁾ Mating connectors, separate order, material no. **R900005538**

⁴⁾ Locating pin ISO 8752-3x8-St, material no. **R900005694**
(separate order)

Function, section

Directional valves of type WE are solenoid operated directional spool valves. They control the start, stop and direction of a flow. The directional valves basically consist of housing (1), one or two solenoids (2), control spool (3), and one or two return springs (4).

In the de-energized condition, control spool (3) is held in the central position or in the initial position by the return springs (4) (except for impulse spool). Control spool (3) is actuated by wet-pin solenoids (2).

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

The force of solenoid (2) acts via plunger (5) on control spool (3) and pushes the latter from its rest position to the required end position. This enables the necessary direction of flow from P to A and B to T or P to B and A to T.

After solenoid (2) was de-energized, return spring (4) pushes control spool (3) again back to its rest position.

An optional manual override (6) allows control spool (3) to be moved without energization of the solenoid.

Type .WE 6.. 6X/O... (only possible with symbols A, C and D)

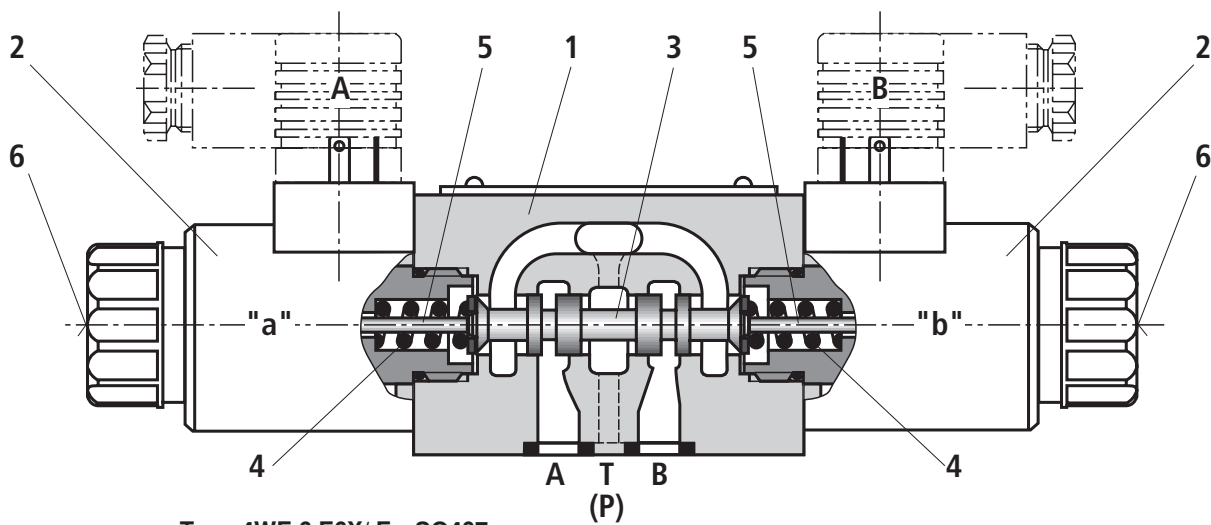
This variant is a directional valve with two spool positions and two solenoids without detent. In the de-energized condition, there is no defined spool position.

Type .WE 6.. 6X/OF... (impulse spool, only possible with symbols C46 and D46)

This variant is a directional valve with two spool positions, two solenoids and one detent. It alternately locks the two spools in position and the solenoid therefore needs not to be permanently energized.

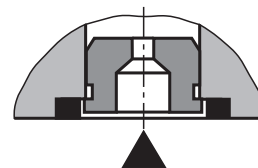
Note!

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



Throttle insert

The use of a throttle insert is required when due to prevailing operating conditions, flows can occur during the switching processes, which exceed the performance limit of the valve.



Technical data (For applications outside these parameters, please consult us!)**general**

Weight	- Valve with one solenoid	kg [lbs]	1.45 [3.2]
	- Valve with one solenoid	kg [lbs]	1.95 [4.3]
Installation position			Any
Ambient temperature range		°C [°F]	-30 to +50 [-22 to +122] (NBR seals) -20 to +50 [-4 to +122] (FKM seals)

hydraulic

Maximum operating pressure	- Port A, B, P	bar [psi]	315 [4569]
	- Port T	bar [psi]	210 [3050] With symbols A and B, port T must be used as leakage port if the operating pressure exceeds the tank pressure.
Maximum flow		l/min [US gpm]	60 [15.8]
Flow cross-section (Spool position 0)	- Spool symbol Q	mm ²	ca. 6 % of nominal cross-section
	- Spool symbol W	mm ²	ca. 3 % of nominal cross-section
Hydraulic fluid ¹⁾			Mineral oil (HL, HLP) according to DIN 51524 ²⁾ ; fast biodegradable hydraulic fluids according to VDMA 24568 (see also RE 90221); HETG (rape seed oil) ²⁾ ; HEPG (polyglycols) ³⁾ ; HEES (synthetic esters) ³⁾ ; other hydraulic fluids upon request
Hydraulic fluid temperature range		°C [°F]	-30 to +80 [-22 to +176] (NBR seals) -15 to +80 [-4 to +176] (FKM seals)
Viscosity range		mm ² /s [SUS]	2.8 to 500 [35 to 2320]
Maximum permitted degree of contamination of the hydraulic fluid – cleanliness class according to ISO 4406 (c)			Class 20/18/15 ⁴⁾

¹⁾ The flash point of the process and operating medium used must be 15 K higher than the maximum solenoid surface temperature.

²⁾ Suitable for NBR and FKM seals

³⁾ Only suitable for FKM seals

⁴⁾ The cleanliness classes specified for the components must be adhered to in hydraulic systems. Effective filtration prevents malfunction and at the same time increases the service life of the components.

For maintenance requirements of the hydraulic fluid and contamination limit values, see data sheet RE 07300.

For selecting the filters, see data sheets RE 50070, RE 50076, RE 50081, RE 50086, RE 50087 and RE 50088.

Technical data (For applications outside these parameters, please consult us!)**electrical**

Type of voltage		Direct voltage
Available voltages	V	24
Voltage tolerance (nominal voltage)	%	±10
Power consumption	W	8
Duty cycle (ED)	%	100
Switching time according to ISO 6403 ⁵⁾	– ON	ms 25 to 45
	– OFF	ms 10 to 25
Maximum switching frequency	1/h	7200
Maximum coil temperature ⁶⁾	°C [°F]	110 [383]
Protection class according to DIN EN 60529		IP 65 with mating connector mounted and locked

⁵⁾ The switching times (switching time up to 5 % pressure change) were established at a hydraulic fluid temperature of 40 °C [104 °F] and a viscosity of 46 cSt. Deviating hydraulic fluid temperatures can result in different switching times! Switching times change in dependence on the operating time and operating conditions.

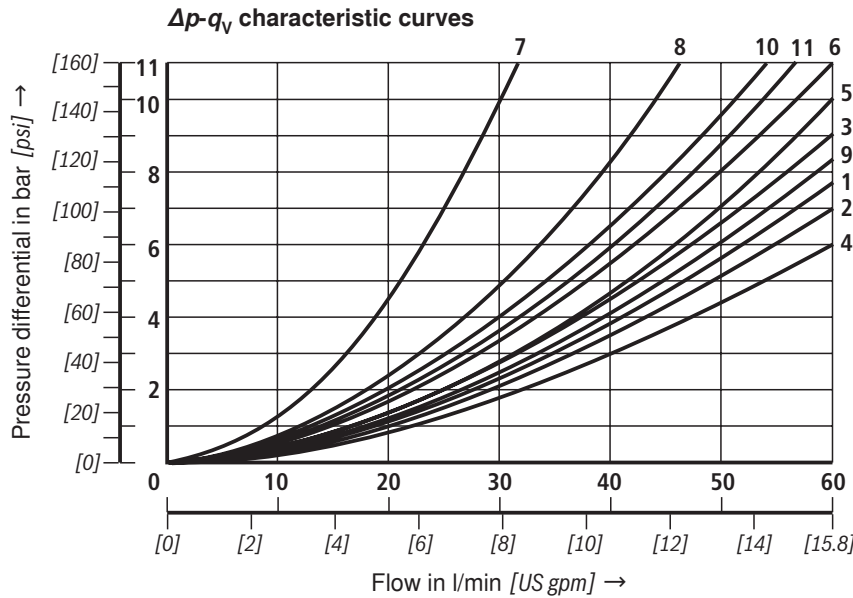
⁶⁾ Due to the temperatures occurring at the surfaces of the solenoid coils, the standards ISO 13732-1 and EN 982 need to be adhered to!

 **Notes!**

- Operation of the manual override is only possible up to a tank pressure of ca. 50 bar [725 psi]. Avoid damage to the bore for the manual override! (Special tool for actuation, separate order, material no. **R900024943**). When the manual override is blocked, the operation of the solenoid must be ruled out!
- The simultaneous operation of the solenoids must be ruled out!

When establishing the electrical connection, the protective earthing conductor (PE $\frac{1}{2}$) has to be connected properly.

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



- 7 Spool symbol "R" in spool position B – A
- 8 Spool symbol "G" and "T" in central position P – T
- 9 Spool symbol "H" in central position P – T

Spool symbol	Flow direction			
	P – A	P – B	A – T	B – T
A; B	3	3	–	–
C	1	1	3	1
D; Y	5	5	3	3
E	3	3	1	1
F	1	3	1	1
T	10	10	9	9
H	2	4	2	2
J; Q	1	1	2	1
L	3	3	4	9
M	2	4	3	3
P	3	1	1	1
R	5	5	4	–
V	1	2	1	1
W	1	1	2	2
U	3	3	9	4
G	6	6	9	9
C46/OF	11	11	6	6
D46/OF	11	11	6	6

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

Attention!

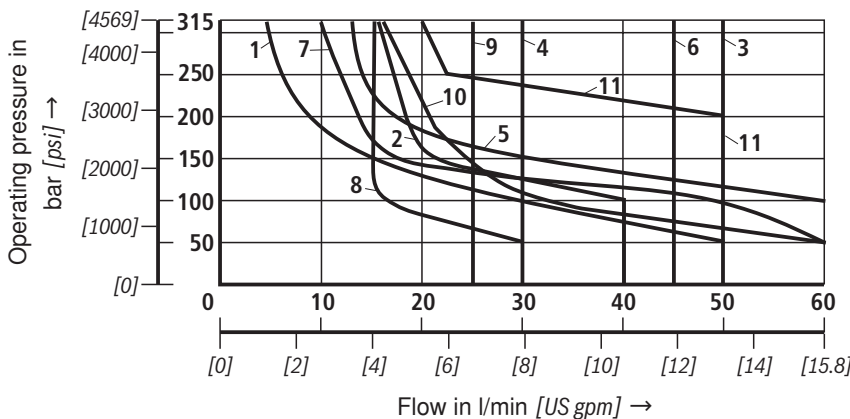
The specified switching power limits are valid for operation with two directions of flow (e.g. from P to A and simultaneous return flow from B to T).

Due to the flow forces acting within the valves, the permissible switching power limits 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!

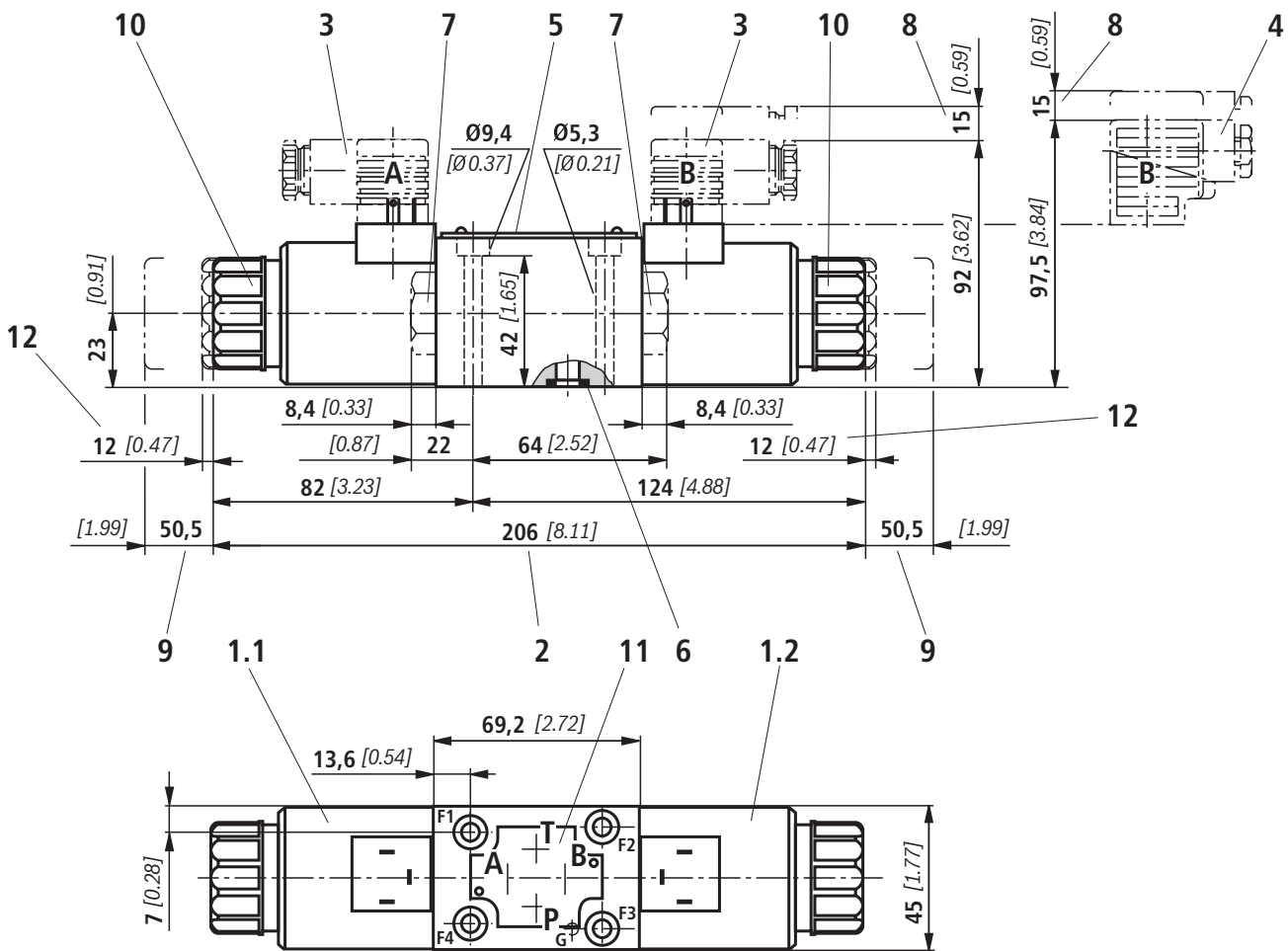
The switching power limit was established while the solenoids were at operating temperature, at 10 % undervoltage and without tank pre-loading.



DC solenoid	
Characteristic curve	Spool symbol
1	A
2	C, D, Y
3	M
4	G
5	E
6	H
7	J
8	V
9	T
10	R ¹⁾
11	C46/OF; D46/OF

¹⁾ Return flow from actuator to tank

Unit dimensions: Individual connection (dimensions in mm [inch])



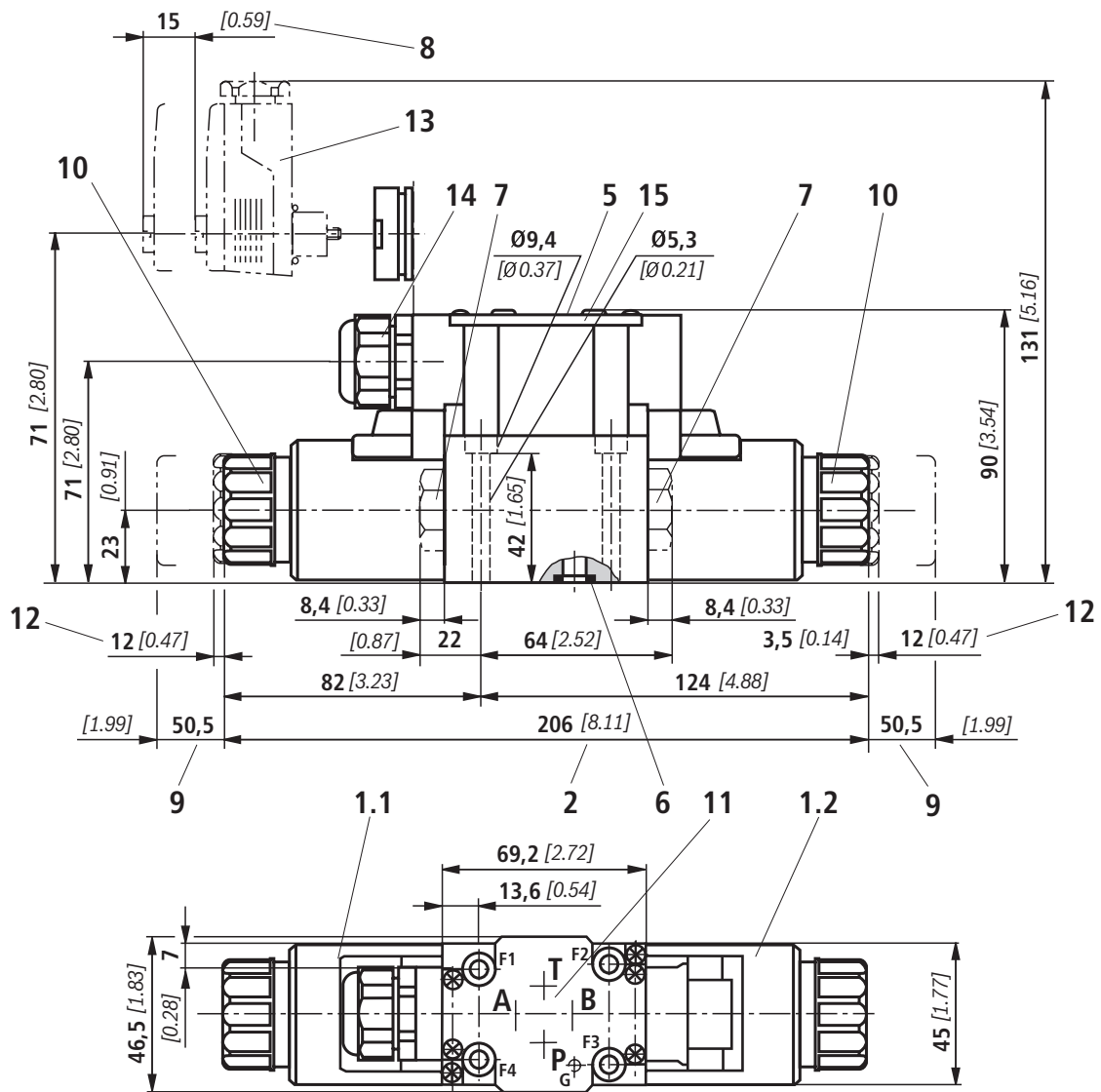
Position explanations, valve mounting screws and subplates see page 10.

0,01/100
[0.0004/4.0]

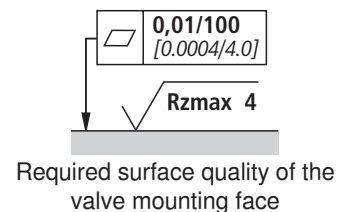
Rzmax 4

Required surface quality of the valve mounting face

Unit dimensions: Central connection (dimensions in mm [inch])



Position explanations, valve mounting screws and subplates see page 10.



Terminal assignment with central connection:

- **1 solenoid:**
Solenoid always to terminals 1 and 2,
Protective earthing conductor to terminal ⊕ PE
- **2 solenoids:**
Solenoid "a" to terminals 1 and 2,
Solenoid "b" to terminals 3 and 4,
Protective earthing conductor to terminal ⊕ PE

Unit dimensions

- 1.1 Solenoid "a"
 - 1.2 Solenoid "b"
 - 2 Dimension for solenoid with concealed manual override "N9"
 - 3 Mating connector **without** circuitry (separate order, see below and RE 08006)
 - 4 Mating connector **with** circuitry (separate order, see below and RE 08006)
 - 5 Nameplate
 - 6 Identical seal rings for ports A, B, P, T
 - 7 Plug screw for valves with one solenoid
 - 8 Space required for removing the mating connector
 - 9 Space required for removing the coil
 - 10 Lock nut, tightening torque $M_A = 4 \text{ Nm}$ [2.95 ft-lbs]
 - 11 Porting pattern according to DIN 24340 form A (**without** locating hole), or ISO 4401-03-02-0-05 and NFPA T3.5.1 R2-2002 D03 (**with** locating hole for locating pin ISO 8752-3x8-St, material no. **R900005694**, separate order)
 - 12 Dimension for solenoid with concealed manual override "N9" and detent "OF"
 - 13 Angled socket (color red, separate order) material no. **R900005538**)
 - 14 Cable gland Pg 16 [1/2" NPT] "DL"
 - 15 Cover
- Attention!
The valve may only be operated with properly mounted cover!

Subplates according to data sheet RE 45052 (separate order)

(without locating hole)	G 341/01 (G1/4)
	G 342/01 (G3/8)
	G 502/01 (G1/2)
(with locating hole)	G 341/60 (G1/4)
	G 342/60 (G3/8)
	G 502/60 (G1/2)
	G 341/12 (SAE-6) ¹⁾
	G 342/12 (SAE-8) ¹⁾
	G 502/12 (SAE-10) ¹⁾

¹⁾ On request

Valve mounting screws (separate order)

4 hexagon socket head cap screw, metric

ISO 4762 - M5 x 50 - 10.9-f1Zn-240h-L

(friction coefficient $\mu_{\text{total}} = 0.09$ to 0.14);
Tightening torque $M_A = 7 \text{ Nm}$ [5.2 ft-lbs] $\pm 10\%$,
material no. **R913000064**

or

4 hexagon socket head cap screw

ISO 4762 - M5 x 50 - 10.9 (own procurement)

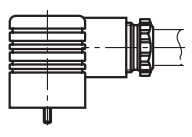
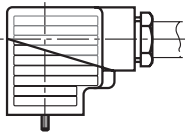
(friction coefficient $\mu_{\text{total}} = 0.12$ to 0.17);
Tightening torque $M_A = 8.1 \text{ Nm}$ [6 ft-lbs] $\pm 10\%$

4 hexagon socket head cap screw UNC

10-24 UNC x 2" ASTM-A574

(friction coefficient $\mu_{\text{total}} = 0.19$ to 0.24);
Tightening torque $M_A = 11 \text{ Nm}$ [8.2 ft-lbs] $\pm 15\%$,
(friction coefficient $\mu_{\text{total}} = 0.12$ to 0.17);
Tightening torque $M_A = 8 \text{ Nm}$ [5.9 ft-lbs] $\pm 10\%$,
material no. **R978800693**

Mating connectors according to DIN EN 175301-803

Details and more mating connectors see RE 08006			 				
Connection	Valve side	Color	Material number				
			without circuitry	with indicator light 12 ... 240 V	with indicator light and rectifier 12 ... 240 V	with rectifier 12 ... 240 V	with indicator light and Zener diode suppression circuit 24 V
M16 x 1.5	a	Gray	R901017010	-	-	-	-
	b	Black	R901017011	-	-	-	-
	a/b	Black	-	R901017022	R901017029	R901017025	R901017026
1/2" NPT (Pg 16)	a	Red/brown	R900004823	-	-	-	-
	b	Black	R900011039	-	-	-	-
	a/b	Black	-	R900057453	R900057455	R900842566	-

Notes

Notes

Bosch Rexroth AG
Hydraulics
Zum Eisengießer 1
97816 Lohr am Main, Germany
Phone +49 (0) 93 52 / 18-0
Fax +49 (0) 93 52 / 18-23 58
documentation@boschrexroth.de
www.boschrexroth.de

© This document, as well as the data, specifications and other information set forth in it, are the exclusive property of Bosch Rexroth AG. It may not be reproduced or given to third parties without its consent. The data specified above only serve to describe the product. No statements concerning a certain condition or suitability for a certain application can be derived from our information. The information given does not release the user from the obligation of own judgment and verification. It must be remembered that our products are subject to a natural process of wear and aging.