

Bosch Rexroth M-3SEW10C1X/420MG24N9K4 3/2 directional seat valve

Manufacturer: Bosch Rexroth
Manufacturer part number / published order designation: R900075565
Published model: M-3SEW10C1X/420MG24N9K4

About this compilation

Prepared by Hydmaster from selected manufacturer documentation. Original technical pages follow without cropped drawings, rewritten data or altered units. This cover and index are Hydmaster editorial material, not a manufacturer-issued exact-execution datasheet.

Coverage: selected pages relevant to the identified size and configuration. Other options or neighbouring models retained on an original page apply only where explicitly identified.

Execution notes and conditions

For the three-way circuit, pressure must satisfy $p_P \geq p_A \geq p_T$. Port T must remain connected and is limited to 100 bar.

Pressure and flow limits require the original circuit conditions: HLP46 at $40 \pm 5 \text{ }^\circ\text{C}$, solenoid at operating temperature, 10% undervoltage and no tank preloading.

Source-page index

Source page numbers below are physical pages of each complete original PDF. The original printed page labels and technical content remain unchanged. Compiled page numbers count this cover/index.

Source A: Bosch Rexroth Sew10 Re22075 2009 Original

Original pages	Compiled pages	Relevant content
1-3	2-4	Original manufacturer series overview and technical edition; Exact existing model symbol, pressure class and voltage/option key; Three-way valve function and actual U/C spring-return symbols
5-8	5-8	Hydraulic, electrical, fluid and continuous-duty technical limits; Pressure-drop curves at the stated HLP46 oil test conditions; Circuit-specific P/A/B/T pressure and flow limits with required inequalities; Three-way valve geometry, pressure-class-specific dimensions and port pattern
11-12	9-10	Mounting screw choices, pressure-class-specific interface notes and supplied-scope distinctions; Electrical connector, throttle/check insert installation and required circuit operating notes

3/2 and 4/2 directional seat valve with solenoid actuation

RE 22075/07.09
Replaces: 04.07

1/12

Type M-.SEW

Size 10
Component series 1X
Maximum operating pressure 420/630 bar [6100/9150 psi]
Maximum flow 40 l/min [10.6 US gpm]



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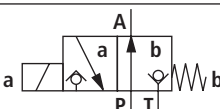
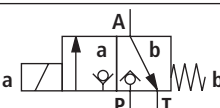
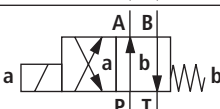
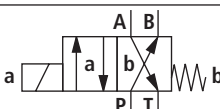
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Features

- Direct operated directional seat valve with solenoid actuation
- Porting pattern according to ISO 4401-05-04-0-05 and NFPA T3.5.1 R2-2002 D05
- Blocked connection tight
- Safe switching also with longer standstill periods under pressure
- Air-gap DC voltage solenoids with detachable coil (AC voltage possible by means of a rectifier)
- Solenoid coil can be rotated by 90°
- Electrical connection as individual connection (for more electrical connections see RE 08010)
- with concealed manual override, optional
- Inductive position switch (contactless), optional, see RE 24830.

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

3 main ports = 3
4 main ports = 4

Seat valve			
Size 10		= 10	
Main ports		3	4
Symbols		●	– = U
		●	– = C
		–	● = D
		–	● = Y
		● = Available	
Component series 10 to 19		= 1X	
(10 to 19: unchanged installation and connection dimensions)			
Operating pressure 420 bar [6100 psi]		= 420	
(Mounting screws M6)			
Operating pressure 630 bar [9150 psi]		= 630	
(Mounting screws M8)			
Solenoid (air-gap) with detachable coil		= M	
DC voltage 24 V		= G24	
DC voltage 205 V		= G205²⁾	

AC voltage mains (permissible voltage tolerance $\pm 10\%$)	Nominal voltage of the DC voltage solenoid in case of operation with AC voltage)	Ordering code
110 V - 50/60 Hz	96 V	G96
120 V - 60 Hz	110 V	G110
230 V - 50/60 Hz	205 V	G205

Further details in the
plain text

Seal material

No code = NBR seals

V = FKM seals

(other seals upon request)

Attention!

Observe compatibility of seals with hydraulic fluid used!

No code = without check valve
insert, without throttle insert

P = with check valve insert

B12 = Throttle Ø 1.2 mm
[0.047 inch]

B15 = Throttle Ø 1.5 mm
[0.059 inch]

B18 = Throttle Ø 1.8 mm
[0.071 inch]

B20 = Throttle Ø 2.0 mm
[0.079 inch]

B22 = Throttle Ø 2.2 mm
[0.087 inch]

Spool position monitoring

No code = without position switch

QMAG24 =	Monitored spool position "a"
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QMBG24 =	Monitored spool position "b"
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For further details see RE 24830

Electrical connection

K4 ^{1;2)} = without mating connector, individual connection with connector
DIN EN 175301-803

N9 = with concealed manual override

No code = **without** manual override

1) Mating connectors, separate order, see page 12.

2) For connection to the AC voltage mains, a DC voltage solenoid **must** be used, which is controlled via a rectifier (see table above).

In case of individual connections, a mating connector with integrated rectifier can be used (separate order, see page 12).

Standard types and units are contained in the
EPS (standard price list).

Function, section, symbols: 3/2-directional seat valve

General

The directional valve type M-SEW is a directional seat valve with solenoid actuation. It controls start, stop and direction of the flow.

It basically comprises a housing (1), the solenoid (2), the hardened valve system (3) and the spool (8) as closing element.

Basic principle

In the initial position, the spool (8) is pressed onto the seat by the spring (9), in spool position by the solenoid (2). The force of the solenoid (2) acts via the angled lever (6) and the ball (7) on the spool (8) which is sealed on two sides. The space between the two sealing elements is connected to port P. Thus, the valve system (3) is pressure-compensated in relation to the actuating forces (solenoid or return spring). The valves can therefore be used up to 630 bar [9150 psi].

Note!

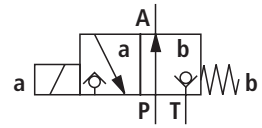
- 3/2-directional seat valves feature a “negative spool underlap”. For this reason, port T must always be connected. This means that during the switching process - when one valve seat starts to open until the other valve seat is closed - ports P-A-T are connected to each other. This process takes, however, place within such a short time that it is irrelevant in nearly all applications.
- The manual override (10) allows for the switching of the valve without solenoid energization.

Attention!

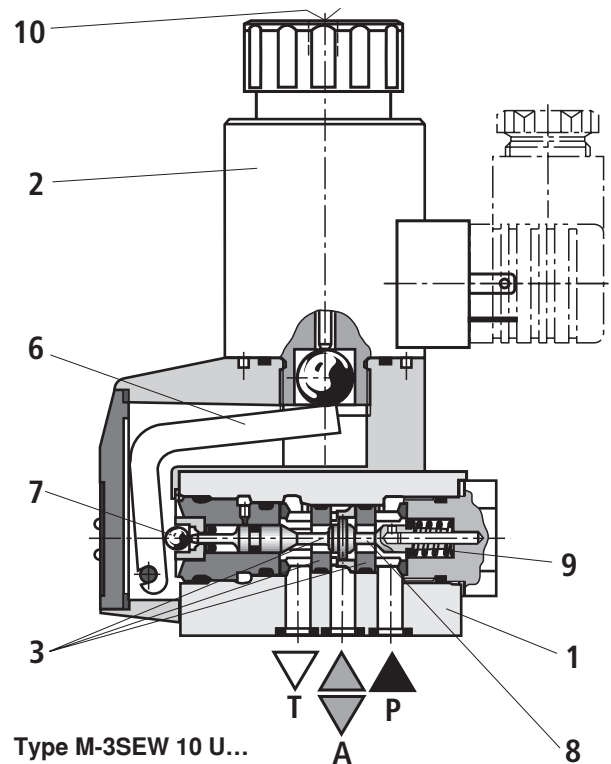
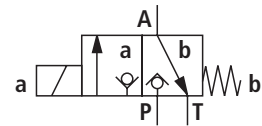
Care must moreover be taken that the specified maximum flow is not exceeded! If required, a throttle insert must be used to limit the flow (see page 12).

The seat arrangement offers the following options:

Symbol “U”:



Symbol “C”:



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

Weight	– 3/2-directional seat valve	kg [lbs]	2.0 [4.41]
	– 4/2 directional seat valve	kg [lbs]	3.5 [7.72]
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	bar [psi]	See performance limit page 7
Maximum flow	l/min [US gpm]	40 [10.6]
Hydraulic fluid	Mineral oil (HL, HLP) according to DIN 51524 ¹⁾ ; Fast biodegradable hydraulic fluids according to VDMA 24568 (see also RE 90221); HETG (rape seed oil) ¹⁾ ; HEPG (polyglycols) ²⁾ ; HEES (synthetic esters) ²⁾ ; other hydraulic fluids upon request	
Hydraulic fluid temperature range	°C [°F]	–30 to +80 [–22 to +176] (NBR seals) –20 to +80 [–4 to +176] (FKM seals)
Viscosity range	mm ² /s [SUS]	2.8 to 500 [15 to 2300]
Maximum permitted degree of contamination of the hydraulic fluid - cleanliness class according to ISO 4406 (c)		Class 20/18/15 ³⁾

electrical

Type of voltage		Direct voltage	Alternate voltage
Available voltages ⁴⁾	V	12, 24, 42, 96, 110, 205, 220	Only possible via rectifier (see page 12)
Voltage tolerance (nominal voltage)	%	±10	
Power consumption	W	30	
Duty cycle	%	100	
Switching time according to ISO 6403	– ON	ms	25 to 60 (without rectifier) 30 to 70 (with rectifier)
	– OFF		10 to 20 (without rectifier) 30 to 70 (with rectifier)
Maximum switching frequency	– Operating pressure ≤ 350 bar	1/h	15000
	– Operating pressure > 350 bar	1/h	3600
Protection class according to DIN EN 60529		IP 65 (with mating connector mounted and locked)	
Maximum surface temperature of the spool ⁵⁾		°C [°F]	120 [248]

¹⁾ Suitable for NBR and FKM seals

²⁾ Only suitable for FKM seals

³⁾ 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 selecting the filters, see datasheets RE 50070, RE 50076, RE 50081, RE 50086, RE 50087 and RE 50088.

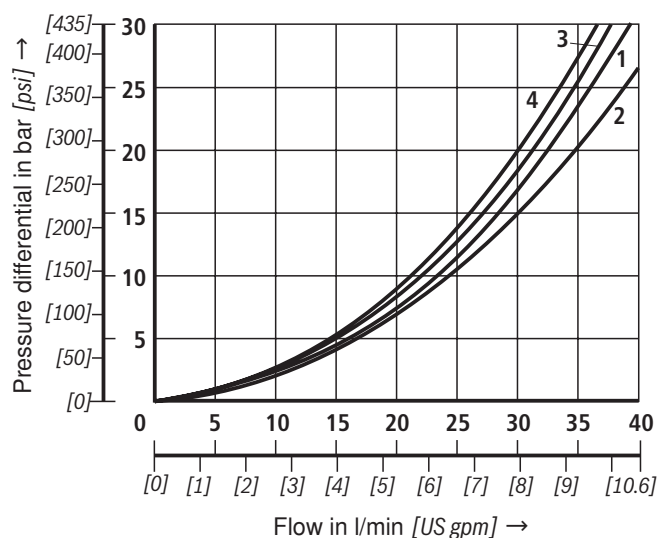
⁴⁾ Special voltages upon request

⁵⁾ 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!

When establishing the electrical connection, the protective earthing conductor (PE ≡) must be properly connected.

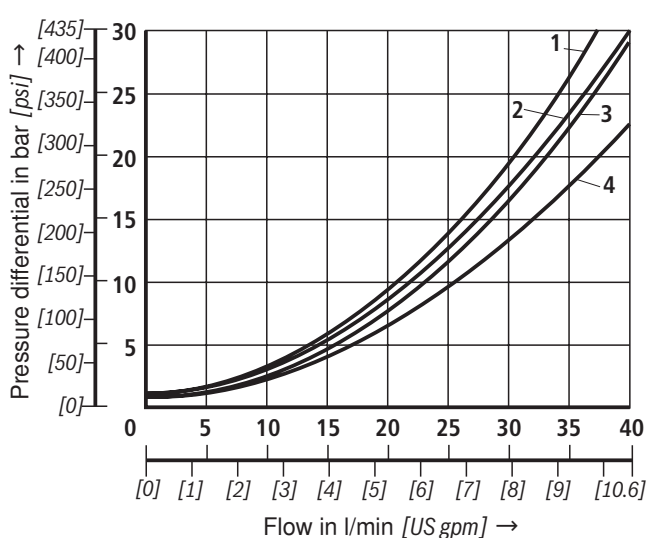
Characteristic curves (measured with HLP46, $\vartheta_{oil} = 40 \pm 5 \text{ }^{\circ}\text{C}$ [$104 \pm 9 \text{ }^{\circ}\text{F}$])

Δp - q_v characteristic curves
3/2-directional seat valve



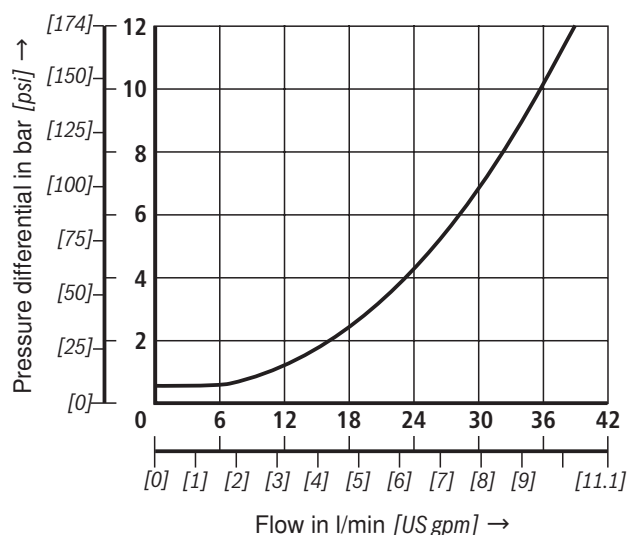
- 1 M-3SEW 10 C ..., P to A
- 2 M-3SEW 10 C ..., A to T
- 3 M-3SEW 10 U ..., P to A
- 4 M-3SEW 10 U ..., A to T

Δp - q_v characteristic curves
4/2-directional seat valve

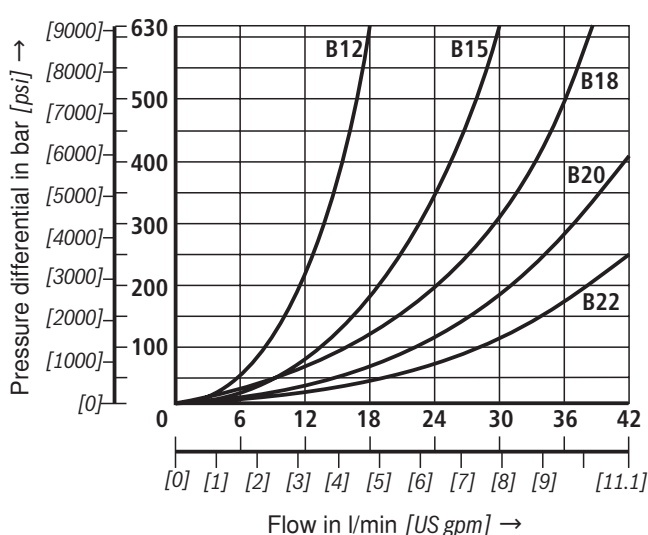


- 1 M-4SEW 10 D Y ..., A to T
- 2 M-4SEW 10 D Y ..., P to A
- 3 M-4SEW 10 D Y ..., P to B
- 4 M-4SEW 10 D Y ..., B to T

Δp - q_v characteristic curves
Check valve insert



Δp - q_v characteristic curves
Throttle insert



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

		Symbol	Comment	Maximum operating pressure in bar [psi]				Flow in l/min [US gpm]
				P	A	B	T	
2-way circuit (3/2-directional seat valve) Only as unloading function	U		Before switching from the initial position to the spool position, pressure must be applied in port A. $p_A \geq p_T$		420/630 [6100/ 9150]		100 [1450]	40 [10.6]
	C		$p_A \geq p_T$		420/630 [6100/ 9150]		100 [1450]	40 [10.6]
3-way circuit	U		$p_P \geq p_A \geq p_T$	420/630 [6100/ 9150]	420/630 [6100/ 9150]		100 [1450]	40 [10.6]
	C			420/630 [6100/ 9150]	420/630 [6100/ 9150]		100 [1450]	40 [10.6]
4-way circuit (flow only possible in the direction of arrow!)	D		3/2-directional valve (symbol "U") in connection with Plus-1 plate: $p_P > p_A \geq p_B > p_T$	420/630 [6100/ 9150]	420/630 [6100/ 9150]	420/630 [6100/ 9150]	100 [1450]	40 [10.6]
	Y		3/2-directional valve (symbol "C") in connection with Plus-1 plate: $p_P > p_A \geq p_B > p_T$	420/630 [6100/ 9150]	420/630 [6100/ 9150]	420/630 [6100/ 9150]	100 [1450]	40 [10.6]

Attention!

Please observe the general notes on page 12!

The performance limits were determined when the solenoids were at operating temperature, at 10% undervoltage and without tank pre-loading.

Technical drawing of the 3000 series ball valve, showing front, side, and top views with dimensions in mm and inches.

Front View Dimensions:

- Overall height: 149 [5.87]
- Top flange thickness: 5 [2.01]
- Distance from top flange to center of ball: 51
- Distance from top flange to center of handle: 149 [5.87]
- Distance from top flange to center of ball (alternative): 30 (47,5)
- Distance from top flange to center of ball (alternative): 32,5 [1.28]
- Distance from top flange to center of ball (alternative): 28 [1.10]
- Distance from top flange to center of ball (alternative): 68 [2.68]
- Distance from top flange to center of ball (alternative): 89 [3.50]
- Distance from top flange to center of ball (alternative): 95 [3.74]

Side View Dimensions:

- Distance from top flange to center of ball: 15 [0.59]
- Distance from top flange to center of ball: 15 [0.59]

Top View Dimensions:

- Distance from top flange to center of ball: 69⁺¹ [2.72^{+0.04}]
- Distance from top flange to center of ball: 7,5 [0.295]
- Distance from top flange to center of ball: 8,5 [0.335]
- Distance from top flange to center of ball: 63⁺¹ [2.48^{+0.04}]

Surface Quality:

Required surface quality of the valve mounting face: Rzmax 4

Position explanations and valve mounting screws
see page 11.

Unit dimensions

- 1 Solenoid "a"
- 2 Concealed manual override "N9"
- 3 Mating connector **without** circuitry (separate order, see page 12)
- 4 Mating connector **with** circuitry (separate order, see page 12)
- 5 Space required for removing the coil
- 6 Space required for removing the mating connector
- 7 Plus-1 plate
- 8 Nameplate
- 9 Lock nut, tightening torque $M_A = 4^{+1} \text{ Nm}$ [$2.95^{+0.74} \text{ ft-lbs}$]
- 10 **Attention!**
 - Ports B and TB are provided on 3/2-directional seat valves in version "420" as blind counterbore, and not provided for version "630".
 - Port TB is provided as blind counterbore on 4/2 directional seat valves in version "420".
 - Ports B and TB are not provided on 4/2 directional seat valves in version "630".
- 11 Identical seal rings for ports A, B, TA, and TB; seal ring for port P
- 12 Valve mounting screws see below
- 13 Porting pattern according to ISO 4401-05-04-0-05 and NFPA T3.5.1 R2-2002 D05
- 14 30 (420 bar); 47.5 (630 bar)

Valve mounting screws

3/2-directional seat valve (separate order)

- 420 bar [6100 psi] version:

4 hexagon socket head cap screws metric ISO 4762 - M6 x 40 - 10.9-fZn-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. **R9130001058**

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 hexagon socket head cap screws UNC 1/4-20 UNC x 1 1/2" (self procurement)

(friction coefficient $\mu_{\text{total}} = 0.19$ to 0.24 according to ASTM-574);
Tightening torque $M_A = 20 \text{ Nm}$ [14.8 ft-lbs] $\pm 15 \%$,
(friction coefficient $\mu_{\text{total}} = 0.12$ to 0.17 according to ISO 4762);
Tightening torque $M_A = 14 \text{ Nm}$ [10.3 ft-lbs] $\pm 15 \%$,
Material no. **R978800710**

- 630 bar [9150 psi] version:

4 hexagon socket head cap screws metric ISO 4762 - M8 x 60 - 10.9-fZn-240h-L

(friction coefficient $\mu_{\text{total}} = 0.09$ to 0.14);
Tightening torque $M_A = 30 \text{ Nm}$ [22.1 ft-lbs] $\pm 10 \%$,
Material no. metric **R913000217**

or

4 hexagon socket head cap screws
ISO 4762 - M8 x 60 - 10.9 (self procurement)
(friction coefficient $\mu_{\text{total}} = 0.12$ to 0.17);
Tightening torque $M_A = 37 \text{ Nm}$ [27.3 ft-lbs] $\pm 10 \%$

4 hexagon socket head cap screws UNC 5/16-18 UNC x 2" (self procurement)

(friction coefficient $\mu_{\text{total}} = 0.19$ to 0.24 according to ASTM-574);
Tightening torque $M_A = 40 \text{ Nm}$ [29.5 ft-lbs] $\pm 15 \%$,
(friction coefficient $\mu_{\text{total}} = 0.12$ to 0.17 according to ISO 4762);
Tightening torque $M_A = 28 \text{ Nm}$ [20.7 ft-lbs] $\pm 15 \%$,
Material no. **R978800730**

4/2 directional seat valve (included in scope of delivery)

- 420 bar [6100 psi] version:

4 hexagon socket head cap screws metric ISO 4762 - M6 x 90 - 10.9-fZn-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. **R913000259**

or

4 hexagon socket head cap screws
ISO 4762 - M6 x 90 - 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 hexagon socket head cap screws UNC 1/4-20 UNC x 3 1/2" (self procurement)

(friction coefficient $\mu_{\text{total}} = 0.19$ to 0.24 according to ASTM-574);
Tightening torque $M_A = 20 \text{ Nm}$ [14.8 ft-lbs] $\pm 15 \%$,
(friction coefficient $\mu_{\text{total}} = 0.12$ to 0.17 according to ISO 4762);
Tightening torque $M_A = 14 \text{ Nm}$ [10.3 ft-lbs] $\pm 15 \%$,
Material no. **R978800717**

- 630 bar [9150 psi] version:

4 hexagon socket head cap screws metric ISO 4762 - M8 x 110 - 10.9-fZn-240h-L

(friction coefficient $\mu_{\text{total}} = 0.09$ to 0.14);
Tightening torque $M_A = 30 \text{ Nm}$ [22.1 ft-lbs] $\pm 10 \%$,
Material no. **R913000260**

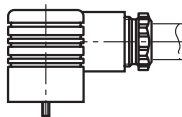
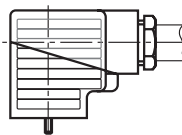
or

4 hexagon socket head cap screws
ISO 4762 - M8 x 110 - 10.9 (self procurement)
(friction coefficient $\mu_{\text{total}} = 0.12$ to 0.17);
Tightening torque $M_A = 37 \text{ Nm}$ [27.3 ft-lbs] $\pm 10 \%$

4 hexagon socket head cap screws UNC 5/16-18 UNC x 4 1/4" (self procurement)

(friction coefficient $\mu_{\text{total}} = 0.19$ to 0.24);
Tightening torque $M_A = 40 \text{ Nm}$ [29.5 ft-lbs] $\pm 15 \%$,
(friction coefficient $\mu_{\text{total}} = 0.12$ to 0.17);
Tightening torque $M_A = 28 \text{ Nm}$ [20.7 ft-lbs] $\pm 15 \%$

Mating connectors according to DIN EN 175301-803

Details and more mating connectors see RE 08006						
Connection	Valve side	Color	Material no.			
			without circuitry	with indicator light 12 ... 240 V	with rectifier 12 ... 240 V	with indicator light and Zener diode sup- pression circuit 24 V
M16 x 1.5	a	Gray	R901017010	–	–	–
	a/b	Black	R901017011	R901017022	R901017025	R901017026
1/2" NPT (Pg16)	a	Red/brown	R900004823	–	–	–
	a/b	Black	R900011039	R900057453	R900842566	–

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.

Examples:

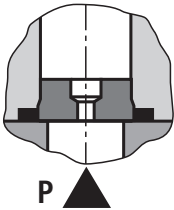
- Accumulator operation,
- Use as pilot control valve with internal pilot fluid tapping.

3/2-directional seat valve (see page 3)

The throttle insert is inserted in port P of the seat valve.

4/2 directional seat valve (see page 4)

The throttle insert is inserted in port P of the Plus-1 plate.



Check valve insert

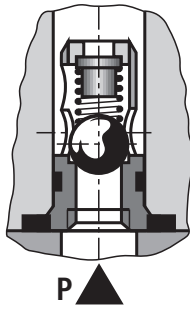
The check valve insert allows a free flow from P to A and closes A to P in a leak-free form.

3/2-directional seat valve (see page 3)

The check valve insert is inserted in port P of the seat valve.

4/2 directional seat valve (see page 4)

The check valve insert is inserted in port P of the Plus-1 plate.



General Notes

- In order to switch the valve safely or maintain it in its spool position, the pressure situation must be as follows: $P \geq A \geq T$ (for design reasons).
- Ports P, A and TA (3/2 directional seat valve) as well as P, A, B and TA (4/2 directional seat valve) are clearly assigned according to their function. They must not be exchanged or closed. The flow is only permitted in the direction of arrow.
- When the Plus-1 plate (4/2-directional function) is used, the following lower operating values must be taken into account:
 $p_{min} = 8 \text{ bar}$; $q_v > 3 \text{ l/min}$.
- The total flow of the valve must not be exceeded.

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