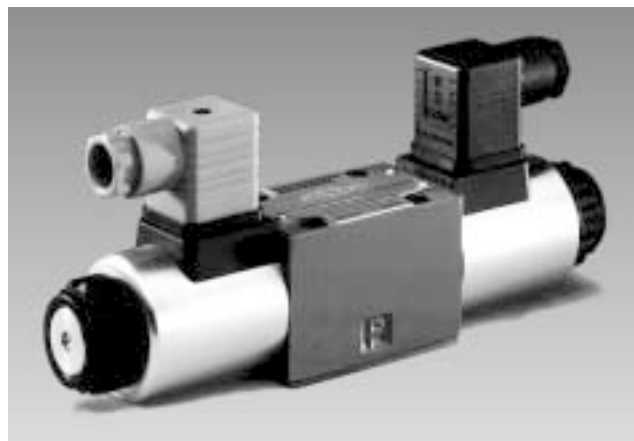


MANNESMANN REXROTH	4/3-, 4/2- and 3/2 Directional Control Valves Model WE 6.. /E, Series 6X with wet pin AC or DC solenoids		RA 23 178/08.99
	Size 6 (D 03)	up to 5100 PSI (350 bar)	up to 21 GPM (80 L/min)

Replaces: 06.98

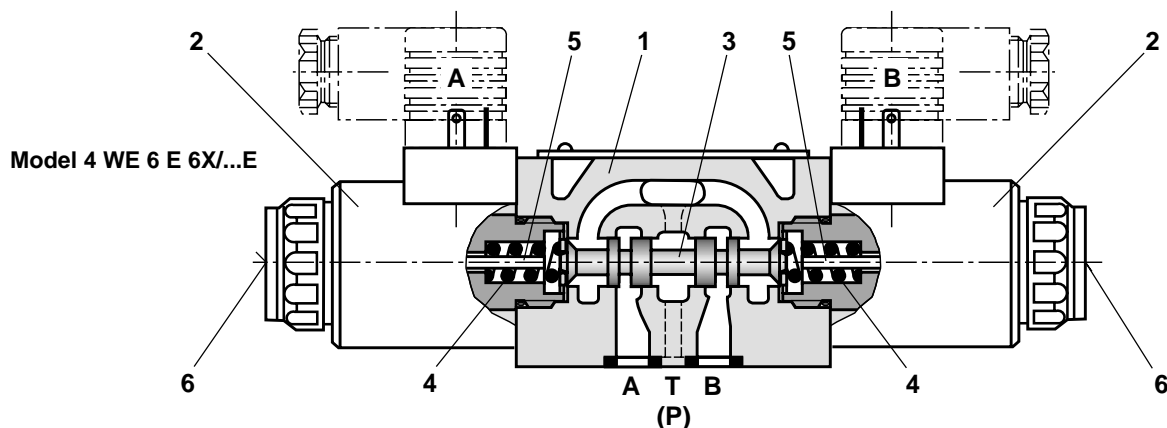
Features:

- Direct operated, solenoid controlled directional spool valve, heavy duty construction
- Mounting pattern to ISO/DIS 4401-3 NFPA T3.5. MR1 and ANSI B 93.7 **D03**
Subplates see data sheet RA 45 052
- Removable coils for quick replacement, or conversion, in AC or DC voltages
- Dual frequency solenoids AC voltage with 50 or 60 Hz operation
- Individual electrical connectors
- Wet pin core tubes, with high pressure tank capacity, standard.



H/A 3972/93
Model 4 WE 6...6X/EG 24 N9Z45

Functional description



Directional control valves Model WE 6 are solenoid operated directional spool valves. They control the start, stop and direction of flow.

They consist of housing (1), one or two solenoids (2), control spool (3) return spring(s) (4).

Unengaged, control spool (3) is held centered, by means of return spring(s) (4) (except for detented spool). Control spool (3) is shifted by wet pin solenoids (2). **To guarantee satisfactory operation, ensure that the solenoid core tube is filled with oil. Cycling the valve will typically ensure core tubes have filled with oil.**

The force of solenoid (2) extends push-pin (5) against control spool (3), moving it left or right from a neutral position. This provides flow from P to A and B to T or P to B and A to T.

When solenoid (2) is de-energized, control spool (3) returns to center by return springs (4).

Manual override (6) allows activating the control spool (3) without electrical power.

Model 4 WE 6 .. 6X/ O E... (only for spools A, C and D)

This design permits 2 switching positions with 2 solenoids and no detent. When the solenoids are de-energized there is **no defined neutral position**.

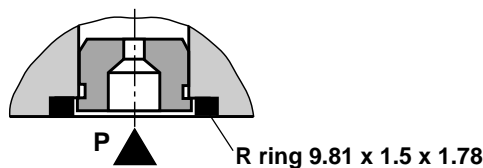
Model 4 WE 6 ..6X/ OF E... (only for spools A, C and D)

This design permits 2 switching positions with 2 solenoids and detent. Energizing either solenoid, however, only one at a time, for approx. 100 ms is sufficient to shift spool (3) and maintain a position on the detent.

Orifice Insert (Model 4 WE 6..6X/E.../B..)

To limit maximum flows, orifice inserts are optionally available. Primarily, the orifice insert is intended to prevent flow rates in excess of the maximum performance data of the valve (see page 4). The insert is installed in port "P", however, will fit any of the valve ports.

Example: 4 WE 6E 6X/EG24NDA/B12 = 1.2 mm orifice in port "P".



Ordering codes

	2	3	4	6	7	9	10	11	12	15	19	22	23
		WE	6		6X/		E			/			*
3 service ports = 3													
4 service ports = 4													
Size 6 = 6													
Spool e.g. C, E, EA, EB etc. ¹⁾ For possibilities, see below													
Series 60 to 69 (60 to 69: externally interchangeable)													
Spring return = No code													
Without spring return = O													
Without spring return but with detent = OF													
High performance solenoid wet pin (oil-immersed) with removable coil = E													
24 V DC = G24													
110 V AC 50/60 Hz or 120 V 60 Hz = W110													
96/196 V DC solenoid with built-in rectifier, angled plug, for connection to 110 V/220 V AC, frequency-independent (possible with Z55 or conduit box) = W110R = W220R													
For other ordering codes for different voltages and frequencies see page 3													
With protected manual override (Standard) = N9													
Covered manual override, with rubber boot = N													
Without manual override = No code													

Further details in clear text

No code = NBR seals
V = FPM seals

Attention!
The compatibility of the seals and pressure fluid must be taken into account!

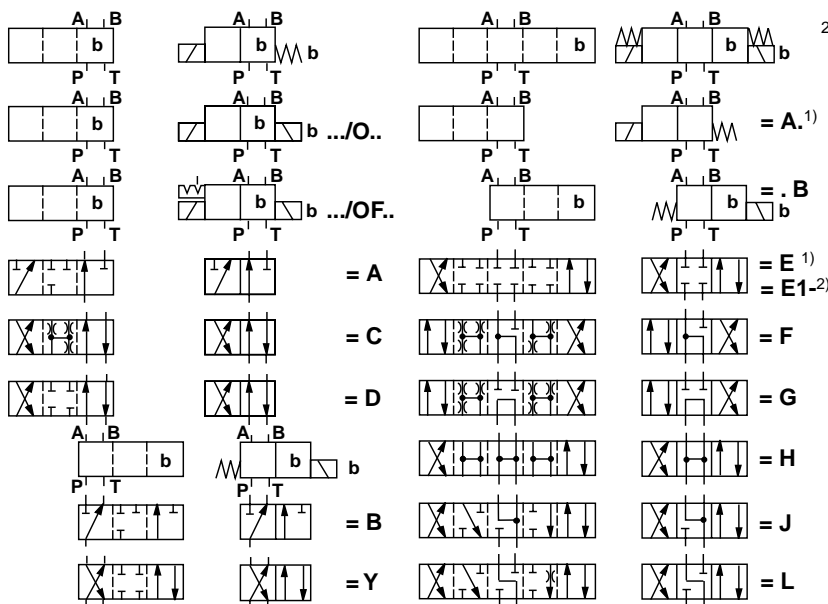
No code = Without cartridge throttle
B 08 = Throttle Ø 0.031 (0.8 mm)
B 10 = Throttle Ø 0.039 (1.0 mm)
B 12 = Throttle Ø 0.047 (1.2 mm)
Applicable if flow exceeds performance limit of valve, installed in P port

Type of electrical connection to data sheet RA 08 006

- Direct solenoid connections**
- K4 ³⁾ = Without angled plug connector(s)
- Central solenoid connections**
- DA = Terminal box with 2 1/2" NPT conduit conn.
- DAL = Terminal box with two 1/2" NPT conduit connections and light(s)
- ANSI B 93.55 M plug-pin type connectors (without female end)**
- DK23 = Terminal box with 3-pin conn. (single solenoid)
- DK25 = Terminal box with 5-pin conn. (dbl. solenoid)
- DK23L = Terminal w/ 3-pin conn. & light(s) (sgl. sol.)
- DK25L = Terminal w/ 5-pin conn. & light(s) (dbl. sol.)
- DK24L2 = Terminal box w/surge suppression⁴⁾

³⁾ For additional connectors, see page 9
⁴⁾ Surge suppression, 24VDC only, with 4 pin micro connector
Example: 4WE6E6X/E924N9DK24L2

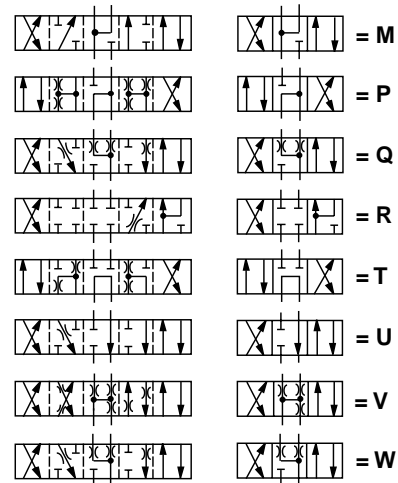
Symbols



1) Example: Spool E with switching position "a"
Order code 4 WE6 EA•6X/EW 110 NK4

2) Symbol E1-: P – A/B pre-opening

Caution: Be aware of pressure intensification in differential cylinders



Technical data (For applications outside these parameters please consult us)

General															
Installation position		Optional													
Ambient temperature, max.		t	°F (°C)	122 (50)											
Weight	Single solenoid valve	m	lbs (kg)	3.2 (1.45)											
	Valve with 2 solenoids	m	lbs (kg)	4.3 (1.95)											
Hydraulic															
Operating pressure	Port A, B, P	p	PSI (bar)	5100 (350)											
	Port T	p	PSI (bar)	up to 3050 (210) DC; up to 2320 (160) AC Where symbols A and B occur, port T must be employed as a drain port if the operating pressure is above the permitted tank pressure .											
Flow, max.		q_v	GPM (L/min)	up to 21 (80) DC; up to 15.8 (60) AC											
Cross section of flow (switching position 0):															
for symbol Q		A	in ² (mm ²)	approx. 6 % of nominal cross section											
for symbol W		A	in ² (mm ²)	approx. 3 % of nominal cross section											
Hydraulic fluid		Mineral oil (HL, HLP) to DIN 51 524 1); Fast bio-degradable pressure fluids to VDMA 24 568 (also see RA 90 221); HETG (rape seed oil) 1); HEPG (Polyglycol) 2); HEES (synthetic ester) 2); other fluids on request													
1) Suitable for NBR and FPM seals 2) Only suitable for FPM seals															
Hydraulic fluid		t	°F (°C)	– 22 to 176 (– 30 to 80) (NBR seals)											
Temperature range		– 4 to 176 (– 20 to 80) (FPM seals)													
Viscosity range		ν	SUS (mm ² /s)	35 to 2320 (2.8 to 500)											
Fluid cleanliness		Maximum permissible degree of contamination of fluid to ISO 4406 Class 18/15. We therefore recommend a filter with a minimum retention rate of $\beta_{10} \geq 75$.													
Electrical															
Type of voltage		DC voltage		AC voltage											
Available voltages ¹⁾ (for ordering codes for AC voltages see below)		U	V	12, 24, 42, 60, 96, 110, 180, 196, 220 42, 110, 120, 127, 220, 240 50/60 Hz											
Power consumption		P	W	30 –											
Holding current		P	VA	– 50											
In-rush current		P	VA	– 220											
Duty cycle		continuous		continuous											
Shifting time to	ON	T	ms	25 to 45 10 to 20											
	OFF	T	ms	10 to 25 15 to 40											
Shifting frequency		Sw/h		up to 15000 up to 7200											
Insulation		Exceeds NEMA class B		Exceeds NEMA class B											
Coil temperature		t	°F (°C)	up to 302 (150) up to 356 (180)											
¹⁾ Special voltages on request		<div style="border: 1px solid black; padding: 5px; display: inline-block;"> When making the electrical connection, the ground screw (\perp PE) must be connected to earth ground </div>													
Note on AC solenoids These solenoids may be used with 2 or 3 voltage/frequency relationships: e.g. solenoid type W110 for 110 V, 50 Hz 110 V, 60 Hz 120 V, 60 Hz		<table border="1"> <tr> <td rowspan="4" style="writing-mode: vertical-rl; transform: rotate(180deg);">Order codes</td> <td>W42</td> <td>42 V, 50 Hz 42 V, 60 Hz</td> </tr> <tr> <td rowspan="3">W110</td> <td>110 V, 50 Hz 110 V, 60 Hz 120 V, 60 Hz</td> </tr> </table>		Order codes	W42	42 V, 50 Hz 42 V, 60 Hz	W110	110 V, 50 Hz 110 V, 60 Hz 120 V, 60 Hz	<table border="1"> <tr> <td rowspan="4" style="writing-mode: vertical-rl; transform: rotate(180deg);">Order codes</td> <td>W127</td> <td>127 V, 50 Hz 127 V, 60 Hz</td> </tr> <tr> <td rowspan="3">W220</td> <td>220 V, 50 Hz 220 V, 60 Hz 240 V, 60 Hz</td> </tr> </table>		Order codes	W127	127 V, 50 Hz 127 V, 60 Hz	W220	220 V, 50 Hz 220 V, 60 Hz 240 V, 60 Hz
Order codes	W42	42 V, 50 Hz 42 V, 60 Hz													
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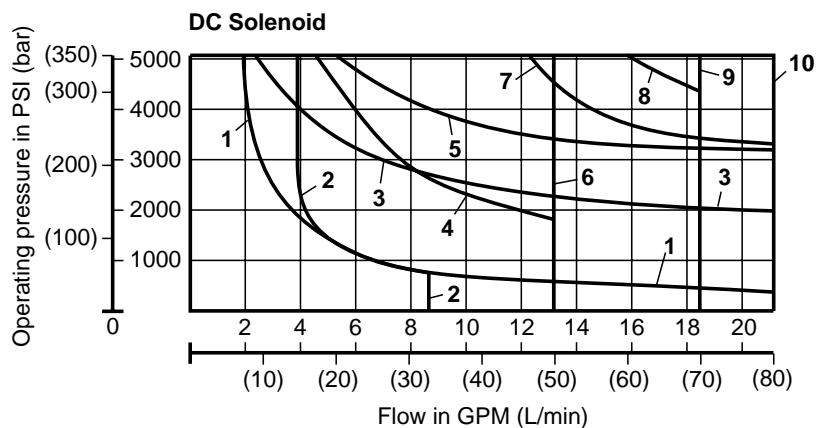
Directional valve solenoid power limits, measured at $v = 190 \text{ SUS}$ ($41 \text{ mm}^2/\text{s}$) and $t = 122 \text{ }^\circ\text{F}$ (50°C)

Because of silting, the shifting function of the valves is dependent upon filtration. To obtain the maximum flow values shown, full filtration of $25 \mu\text{m}$ is recommended. The flow forces acting within the valve also influence performance. In 4-way valves, the data provided is for applications with 2 directions of flow (flow from P to A and an equal, simultaneous return from B to T, see table).

If only one direction of flow is required, for example, when a 4-way valve has one port plugged, or unbalanced flows from large rod cylinders, the permissible flow in critical cases can be considerably lower. The A or B spool (3-way) can be used as an approximation of the limited flow performance.

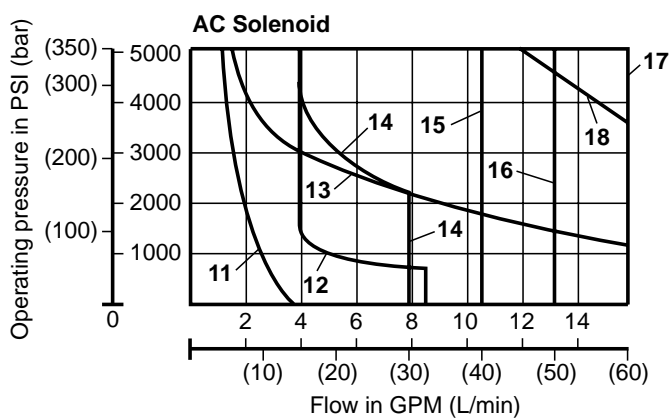
Performance limits measured with solenoids at operating temperature, 10% undervoltage and without tank port pressure.

DC solenoid e.g. G 24: 24 V		AC solenoid e.g. W110: 110 V, 50 Hz (see below)		AC solenoid e.g. W110: 110 V, 60 Hz (see below)	
Curve	Symbol	Curve	Symbol	Curve	Symbol
1	A, B ¹⁾	11	A, B ¹⁾	19	A, B ¹⁾
2	V	12	V	20	V
3	A, B	13	A, B	21	A, B
4	F, P	14	F, P	22	F, P
5	J	15	G, T	23	G, T
6	G, H, T	16	H	24	J, L, U
7	A/O, A/OF, L, U	17	A/O, A/OF, C/O, C/OF	25	A/O, A/OF, Q, W
8	C, D, Y		D/O, D/OF, E, E1 ⁻²⁾ , J, L	26	C, D, Y
9	M		M, Q, R ³⁾ , U, W	27	H
10	E, E1 ⁻²⁾ , R ³⁾ , C/O, C/OF D/O, D/OF, Q, W	18	C, D, Y	28	C/O, C/OF, D/O, D/OF, E, E1 ⁻²⁾ , M, R ³⁾

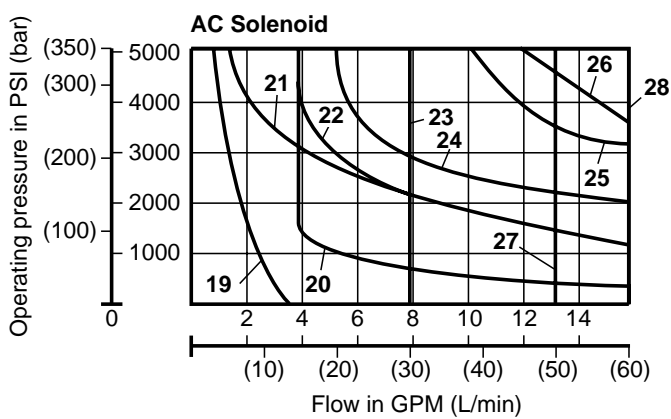


- 1) With mal override
 - 2) P – A/B pre-opening
 - 3) Return flow from actuator to tank
- DC solenoid
Curves 1 to 10
12, 24, and 96 Volt typical stock

Directional valve solenoid power limits, measured at $\nu = 190$ SUS ($41 \text{ mm}^2/\text{s}$) and $t = 122$ °F (50 °C)

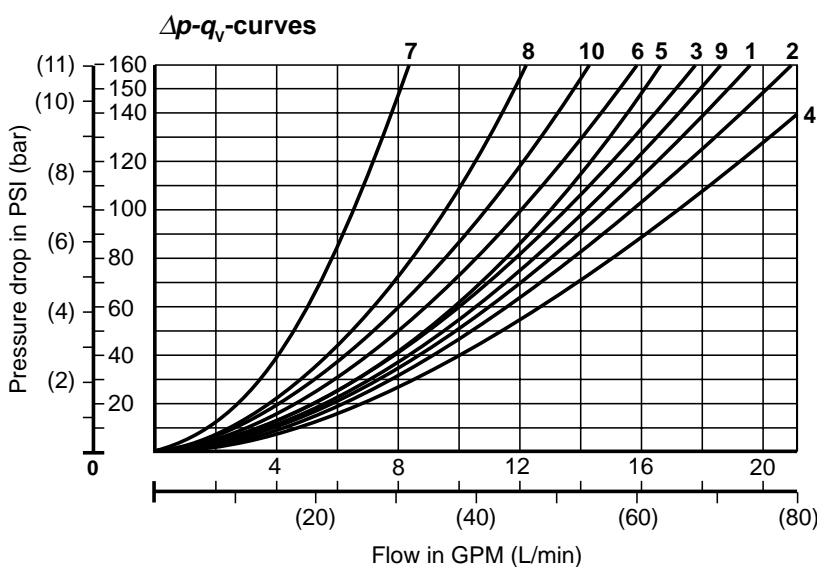


AC solenoid		
Curves	Solenoid possibilities	
11 to 18	W42	42 V, 50 Hz
	W110	110 V, 50 Hz
		120 V, 60 Hz
	W127	127 V, 50 Hz
	W220	220 V, 50 Hz
		240 V, 60 Hz



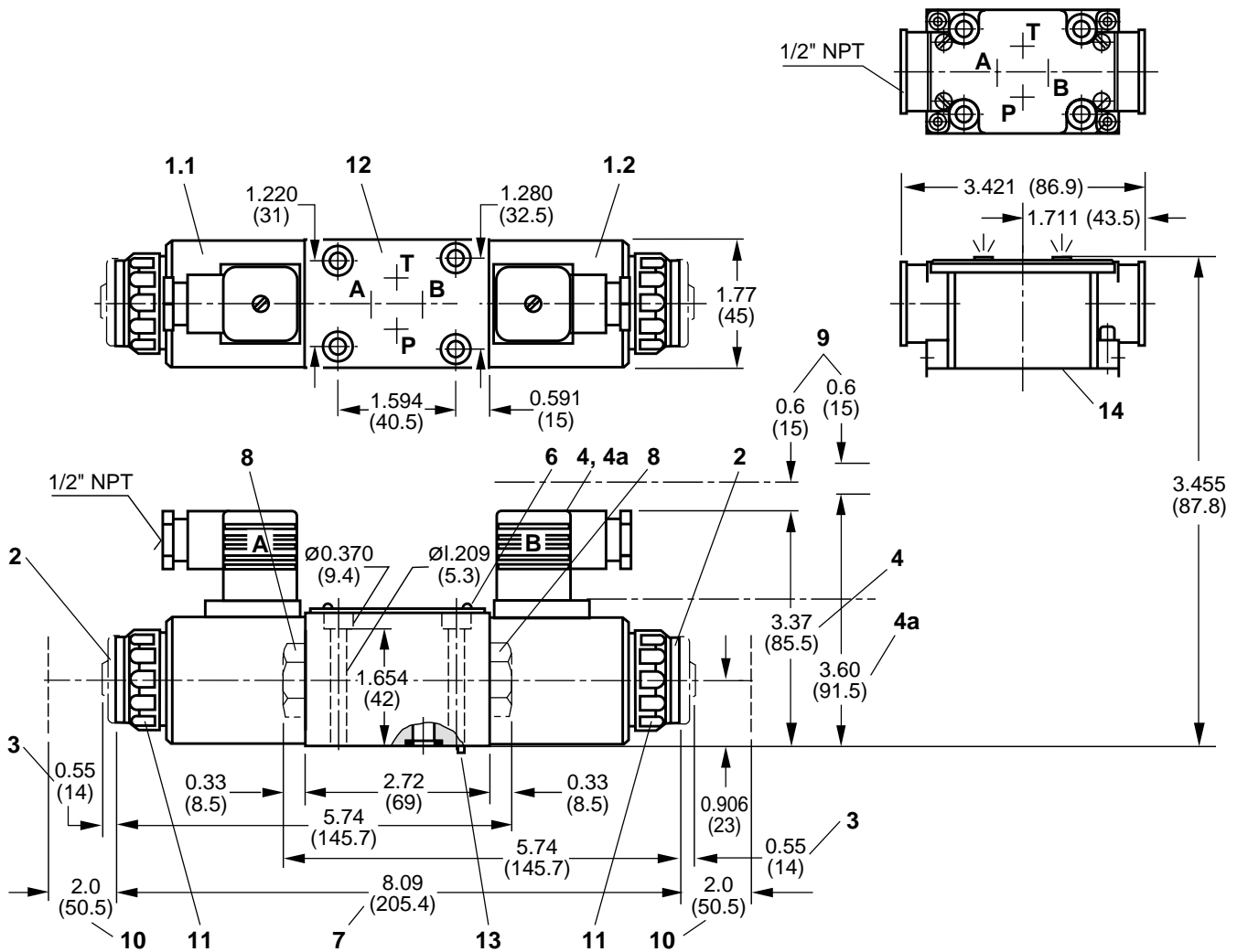
AC solenoid		
Curves	Solenoid possibilities	
19 to 28	W42	42 V, 60 Hz
	W110	110 V, 60 Hz
	W127	127 V, 60 Hz
	W220	220 V, 60 Hz

Performance curves, measured at $\nu = 190$ SUS ($41 \text{ mm}^2/\text{s}$) and $t = 122$ °F (50 °C)



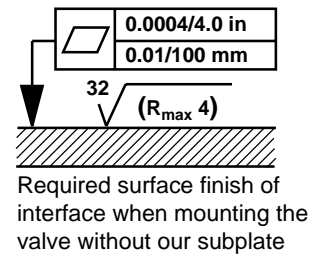
Symbol	Through flow direction			
	P-A	P-B	A-T	B-T
A, B	3	3	-	-
C	1	1	3	1
D, Y	5	5	3	3
E	3	3	1	1
F	1	3	1	1
T	10	10	9	9
H	2	4	2	2
J, Q	1	1	2	1
L	3	3	4	9
M	2	4	3	3
P	3	1	1	1
R	5	5	4	-
V	1	2	1	1
W	1	1	2	2
U	3	3	9	4
G	6	6	9	9

Unit dimensions, valve with DC solenoid: dimensions in inches (millimeters)

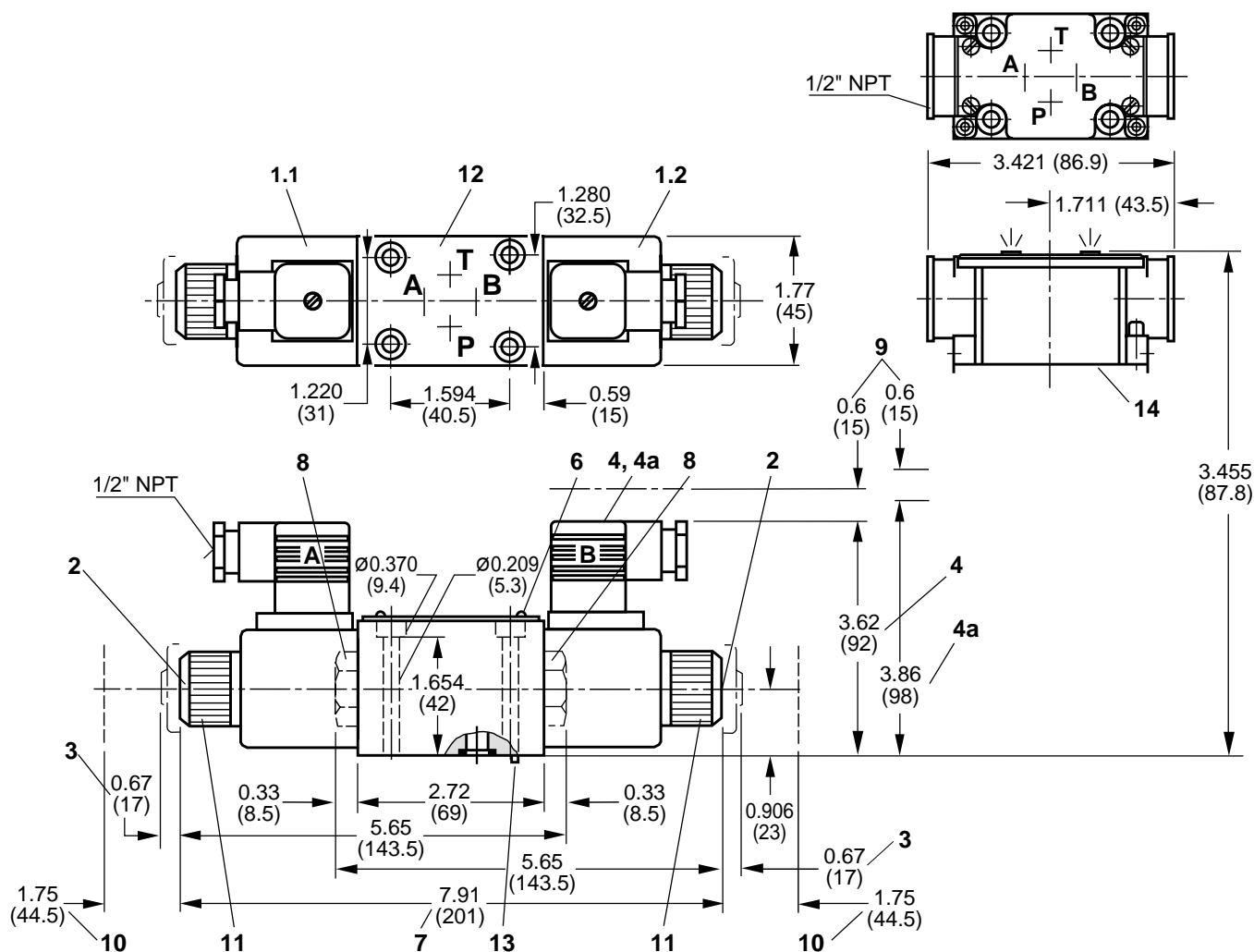


- 1.1 Solenoid a
- 1.2 Solenoid b
- 2 Manual override "N9" (standard) only possible manual operation to 725 PSI (50 bar). Do not damage the manual override bore. Handknob part # RR00 024943 may be used.
- 3 Dimension for solenoid with manual override "N", (rubber boot covered)
- 4 Angled plug Z45
- 4a Angled plugs type Z55 and Z55L
- 6 Nameplate
- 7 R-ring 9.81 mm x 1.5 mm x 1.78 mm
- 8 Screw cap for single solenoid valve
- 9 Space required to remove plug

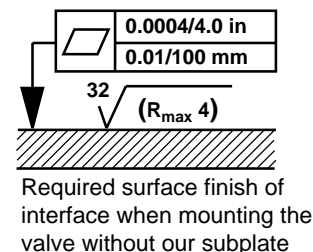
- 10 Space required to remove coil
- 11 Locknut
Tightening torque = 35 in-lbs (4 Nm)
- 12 Mounting pattern to ISO/DIS 4401-3 NFPA T3.5.1 MR1 and ANSI B93.7 D 03
Subplates: G341/12 (SAE-6), G342/12 (SAE-8), G502/12 (SAE-10)
to data sheet RA 45 052 and **valve mounting bolts** 10-24 UNC x 2" (M5 x 50mm), Tightening torque = 6.5 ft-lbs (8.9 Nm), must be ordered separately.
- 13 Hole for locating pin, Δ 0.23 in (3 mm)
- 14 Conduit box variation, model "DA" or "DAL"



Unit dimensions, valve with AC solenoid: dimensions in inches (millimeters)

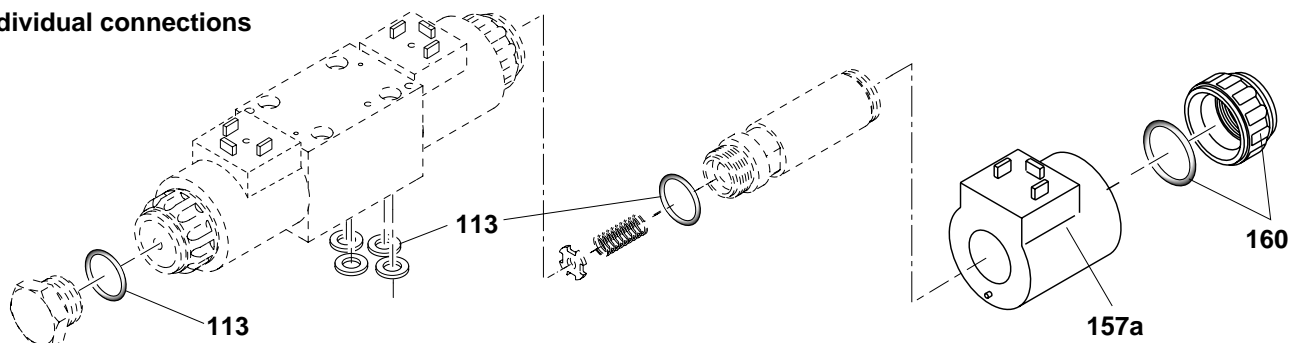


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Subplates: G 341/12 (SAE-8), G 342/12 (SAE-8), G 502/12 (SAE-10)
to data sheet RA 45 052
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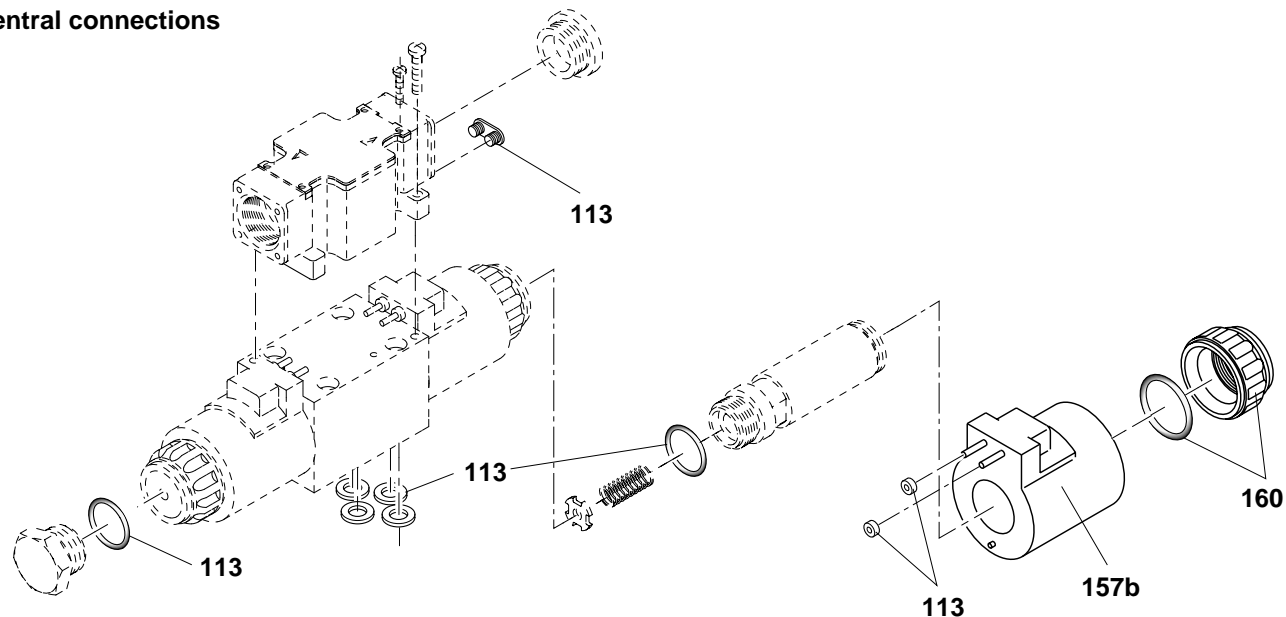


Ordering code, available spare parts and seals

Individual connections



Central connections



Spare parts – Solenoid

Item	Description	DC Voltage		AC Voltage	
		Voltage	Order No.	Voltage	Order No.
157a	Coil for individual connection	12 V	RR00 021388	110 V, 50/60 Hz	RR00 020175
		24V	RR00 021389	230 V, 50/60 Hz	RR00 020176
157b	Coil for central connection	12 V	RR00 021462	110 V, 50/60 Hz	RR00 021464
		24V	RR00 021463	230 V, 50/60 Hz	RR00 021465
160	Seal kit – Hand nut for pole tube w/o manual override and pole tube with protected manual override		RR00 068604		RR00 833831
	Seal kit – Hand nut for pole tube with manual override		RR00 068605		RR00 833808

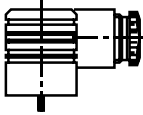
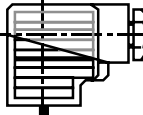
Seal kit – Valve: Plug connector “Z”

Item	Seal Material	Order number
113	NBR seals	RR00 313162
	FPM seals	RR00 313163

Seal kit – Valve: Conduit box “D”

Item	Seal Material	Order number
113	NBR seals	RR00 833687
	FPM seals	RR00 833689

Ordering code, plug-in connectors to DIN 43 650 A and ISO 4400 for component plug "K4"

For further plug-in connectors see RA 08 006							
		Material no.					
Valve side	Color	Without circuitry	With indicator light 12 ... 240 V	With LED & rectifier 24 ... 240 V	With rectifier 12 ... 240 V	With indicator light and Z diode protective circuit 24 V	Thread
a	grey	RR00 074683	-	-	-	-	Pg 11
b	black	RR00 074684	-	-	-	-	Pg 11
a/b	black	-	RR00 057292	RR00 057423	RR00 313933	RR00 310995	Pg 11
a	red/brown	RR00 004823	-	-	-	-	1/2" NPT
b	black	RR00 011039	-	-	-	-	1/2" NPT
a/b	black	-	RR00 057453	RR00 057455	RR00 842566	-	1/2" NPT

Notes:

Notes:

Empty rectangular area for notes.



Manneshmann Rexroth Corporation
Rexroth Hydraulics Div., Industrial, 2315 City Line Road, Bethlehem, PA 18017-2131 Tel. (610) 694-8300 Fax: (610) 694-8467
Rexroth Hydraulics Div., Mobile, 1700 Old Mansfield Road, Wooster, OH 44691-0394 Tel. (330) 263-3400 Fax: (330) 263-3333

Notes:

Empty rectangular area for notes.



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