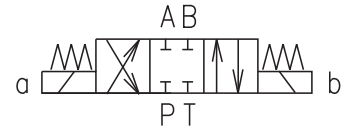


- 4/3-, 4/2- way directional control valves
- Cylindrical DC solenoids with removable coils. Electrical connectors can be rotated in three positions 90° apart
- Four-land spool - reduced functional dependence on fluid viscosity
- Push button manual override
- Installation dimensions to DIN 24 340 / ISO 4401 / CETOP RP121-H
- Subplates see data sheet HA 0002
- CSA Upon request



Functional Description

The RPE4-10 directional control valves consist of housing (1), control spool (5), centering springs (4) and operating solenoids (2, 3).

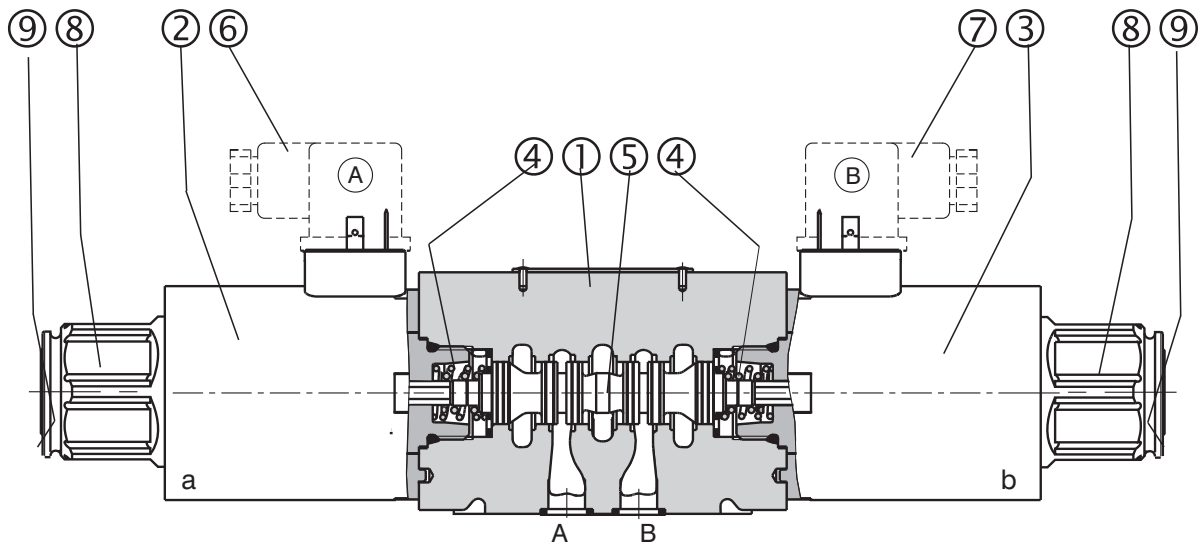
The three-position directional control valves are fitted with two solenoids and two springs. The two position directional control valves have one solenoid and one return spring.

The operating solenoids are DC solenoids and are supplied through connectors (6, 7) without rectifiers. For

AC supply the solenoids are provided with a rectifiers which are integrated directly into the coil.

By loosening the nut (8), the solenoids can be turned or replaced without interfering with any seals of the valve. Provided that the pressure in T-port does not exceed 363 PSI (25 bar), the spool of the valve can be shifted by manual override (9).

The valve housing (1) is phosphate coated, the operating solenoids (2, 3) are zinc coated.



Ordering Code

RPE4-10 /

Solenoid operated directional control valves

Nominal size

Number of operating positions

two positions
three positions

2
3

Functional symbols

see the table functional symbols

Rated supply voltage of solenoids

(at the coil terminals)

12 V DC / 3.17 A
24 V DC / 1.73 A
106V DC / 0.35 A
120 V AC / 0.35 A / 60 Hz

01200
02400
10600
 **12060**

The AC coils correspond with E5 type

CSA Upon request 

Type of the solenoid coil

with for the electrical connector, EN 175301-803
with integrated rectifier and for the electrical connector
EN 175301-803

E1
E5

Überwachung der Schaltstellung

ohne Bez. ohne Überwachung
S1 EIN-Sensor bis 50bar
S2 EIN-Sensor bis 210bar
S4 AUS-Sensor bis 50bar

Seals

no designation standard (NBR)
V Viton (FPM)

Damping

no designation without damping
T2 nozzle
T3 throttle screw

Manual override

no designation standard
N2 covered with rubber boot

Note: Connector of the position sensor **is not supplied**
(see ordering number on page 9)

Technical Data

Valve size	US (mm)	D 05 (10)	
Maximum flow	GPM (L/min)	see p-Q characteristics	
Maximum operating pressure at ports P, A, B	PSI (bar)	5076 (350)	
Maximum operating pressure at port T	PSI (bar)	3000 (210), 725(50) for version S1, S2 and 3000(210) for version S4	
Pressure drop	PSI (bar)	see Δp-Q characteristics	
Hydraulic fluid		Hydraulic oils of power classes (HL, HLP) to DIN 51524	
Fluid temperature range (NBR / Viton)	°F (°C)	-22 ... +176 (-30 ... +80) / -4 ... +176 (-20 ... +80)	
Ambient temperature max.	°F (°C)	+122 (+50)	
Viscosity range	SUS (mm ² /s)	98 ... 1840 (20 ... 400)	
Maximum degree of fluid contamination		Class 21/18/15 to ISO 4406 (1999)	
Maximum allowable voltage variation	%	AC: ±10	DC: ±10
Maximum switching frequency	1/h	15 000	
Switching time, ON; at v = 156 SUS (32 mm ² /s)	ms	AC: 50 ... 330	DC: 50 ... 120
Switching time, OFF; at v = 156 SUS (32 mm ² /s)	ms	AC: 100 ... 300	DC: 30 ... 90
Duty cycle	%	100	
Service life	cycles	10 ⁷	
Enclosure type to EN 60529		IP 65	
Weight - valve with 1 solenoid	lbs (kg)	8.60 (3.9)	
- valve with 2 solenoids		11.90 (5.4)	
Weight - valve with 1 solenoid wth sensor	lbs (kg)	10.69 (4.85)	
- valve with 2 solenoids with sensor		16.20 (7.35)	
Mounting position		any	

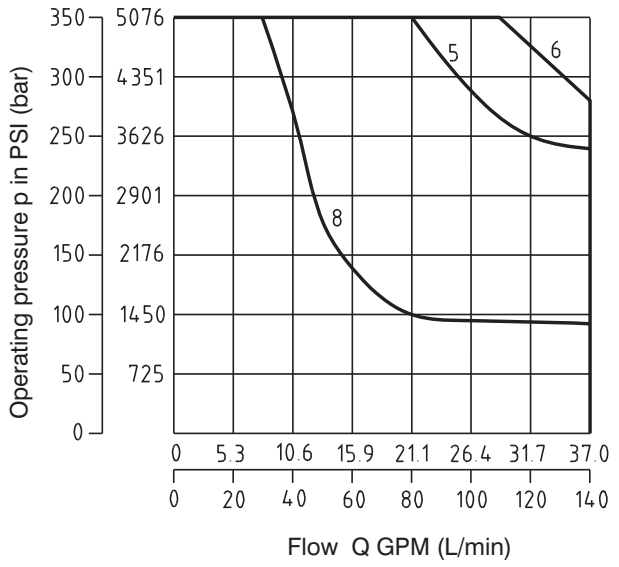
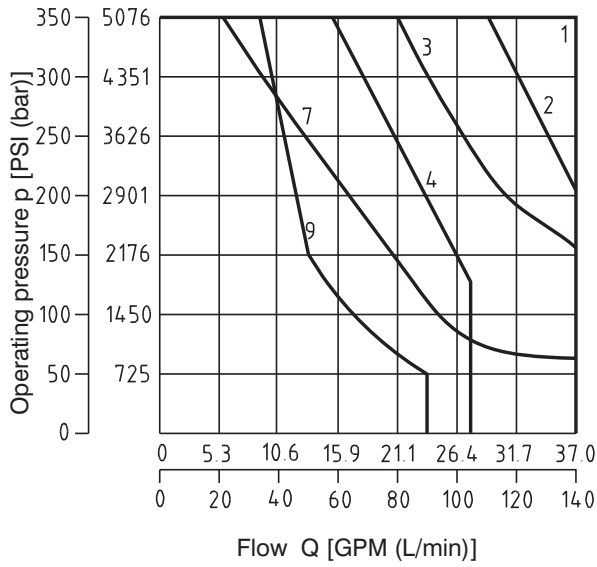
Spool Symbols

Designation	Symbol	Interposition	Designation	Symbol	Interposition
Z11			P51		
C11			Y51		
H11			C51		
P11			B51		
Y11			Z51		
L21			H51		
B11			X11		
C21			C11		
R11			H11		
R21			J15		
A51			J75		

p-Q Characteristic

Measured at $\nu = 156 \text{ SUS (32 mm}^2/\text{s)}$

Operating limits for maximum hydraulic power transferred by the directional valve. For respective spool type - see spool symbols. The power curves hold true for symmetrical valve flows (e.g. flows in directions P-A and B-T are identical). In case of an asymmetric flow, the power curves can lie substantially lower. In such cases we highly recommend to consult the

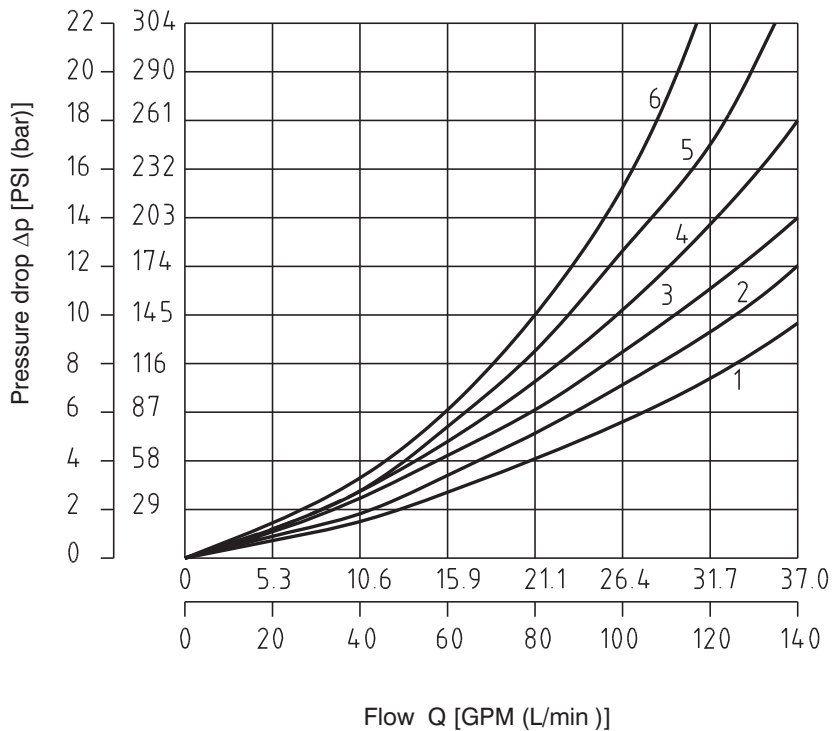


Z11	Z51	H11	H51	P11	P51	Y11	Y51	C11	C51	R11	X11	B11	B51	L21	R21	J15	J75	A51	C21
1	1	1	1	1	1	5	5	3	3	2	2	4	4	7	2	6	6	8	9

Δp -Q Characteristic

Measured at $\nu = 156 \text{ SUS (32 mm}^2/\text{s)}$

Pressure drop Δp related to flow rate.

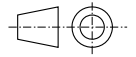


	P-A	P-B	A-T	B-T	P-T
Z11	1	1	2	2	
Z51		1	2		
H11	1	1	2	2	1
H51		1	2		1
P11	1	1	2	2	
P51		1	2		
Y11	1	1	2	2	
Y51		1	2		
C11	4	3	4	5	1
C51	4			5	1
R11	1	1	2	2	
X11	1	1	2	2	
B11	1	1	2	2	
B51		1	2		
L21	1	1	1	2	2
R21	1	1	1	3	
J15	1	2	2	3	
J75	1	1			
A51	1	1			
C21	6	6	6	6	4

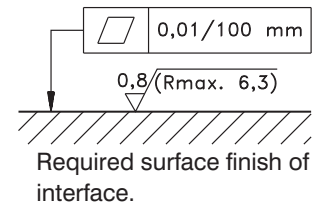
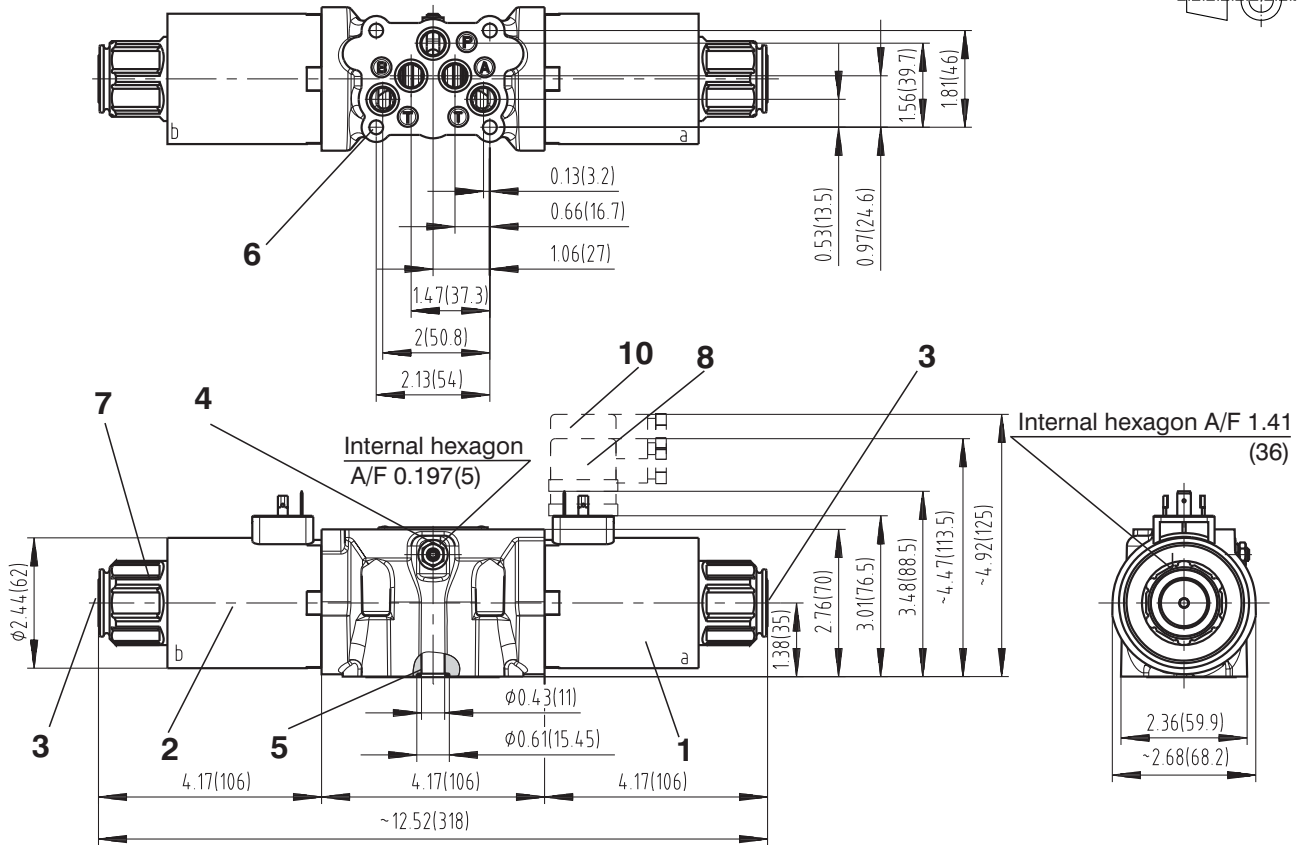
Valve Dimensions

Dimensions in inches and millimeters

ISO E

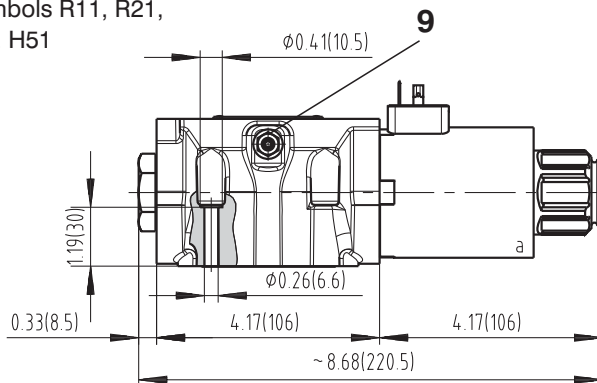


Valve with two solenoids

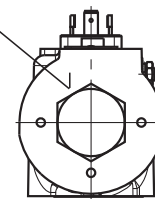


Valve with one solenoid "a"

Functional symbols R11, R21, Y51, C51, Z51, H51

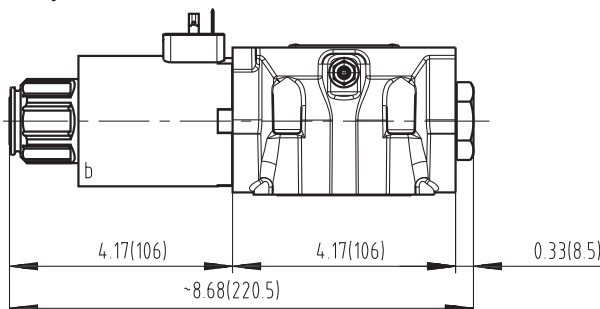


Internal hexagon A/F 1.26 (32)



Valve with one solenoid "b"

Functional symbols C11, H11

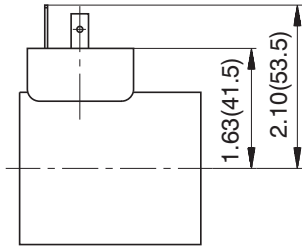


- 1 Solenoid a (Nut torque 6 Nm)
- 2 Solenoid b (Nut torque 6 Nm)
- 3 Manual override
- 4 Name plate
- 5 Square ring 12.42 x 1.68 (5 pcs.) supplied with valve
- 6 4 mounting holes
- 7 Retaining nut of the solenoid
- 8 Electrical connector, EN 175301-803
- 9 Throttle screw
- 10 Space required to remove connector

Type of the Solenoid Coil

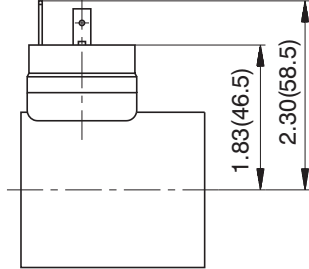
Dimensions in inches and millimeters)

E1



Solenoid coil with terminal for the electrical connector, EN 17 5301-803.

E5



Solenoid coil with integrated rectifier and terminal for electrical connector, EN 17 5301-803.

Manual Override

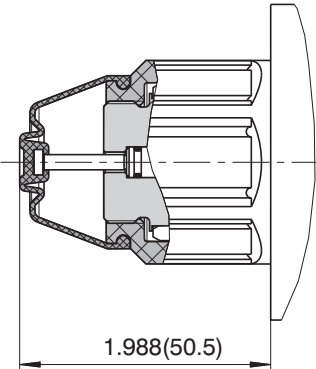
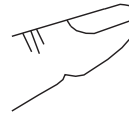
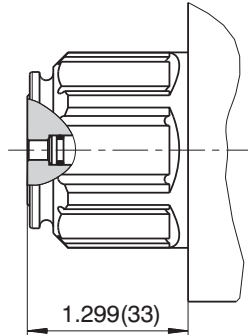
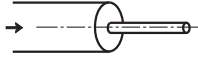
Dimensions in inches and millimeters)

Standard

Rubber boot

Without designation
Dimensions

Type **N2**
Dimensions

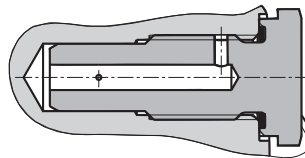
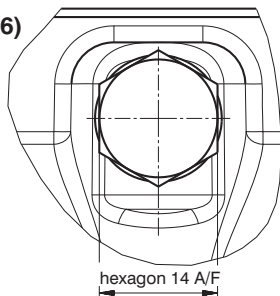


Standard model of the manual override.
Standard retaining nut of the solenoid.

Manual override protected by the rubber boot.

Soft Shifting Spool Options Delay Time

T2 - Nozzle $\varnothing 0.157 (0.6)$

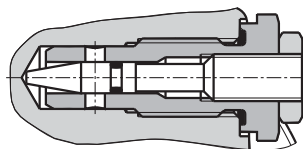
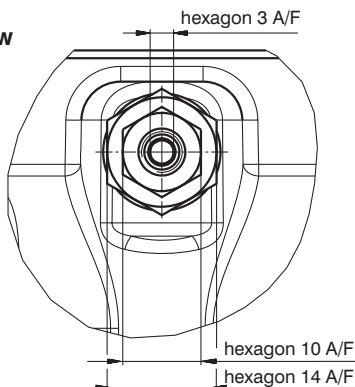


The orifice extends the valve shifting time.

Switching times

Switching time, on and off	ms	120 ... 350
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T3 - Throttle Screw



The control orifice allows for stepless adjustment of the valve shifting time.

Switching times

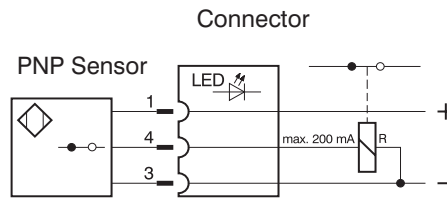
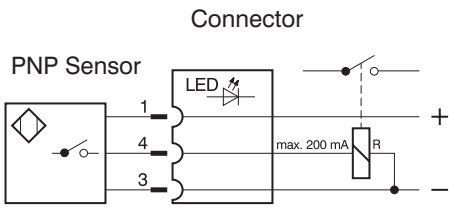
Switching time, on and off	ms	30 ... 2000
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Spool Ship Position Sensor

S1, S2 - Circuit diagram of the normally-open sensor

S4 - Circuit diagram of the normally-closed sensor

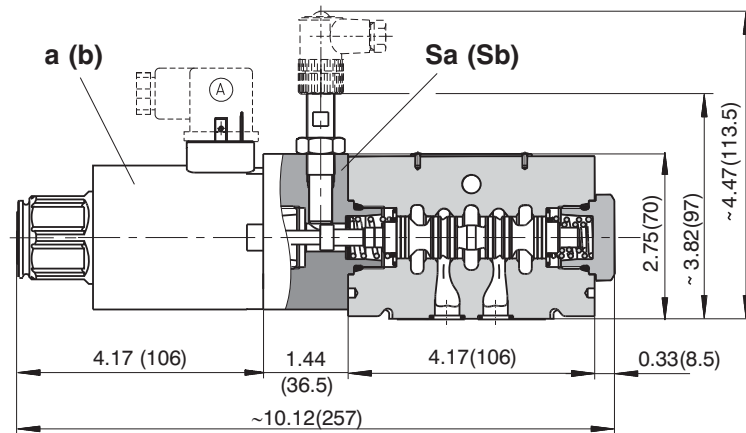
The proximity sensor transforms the spool position into an electrical step signal. It can be used with directional control valves with one or two solenoids.



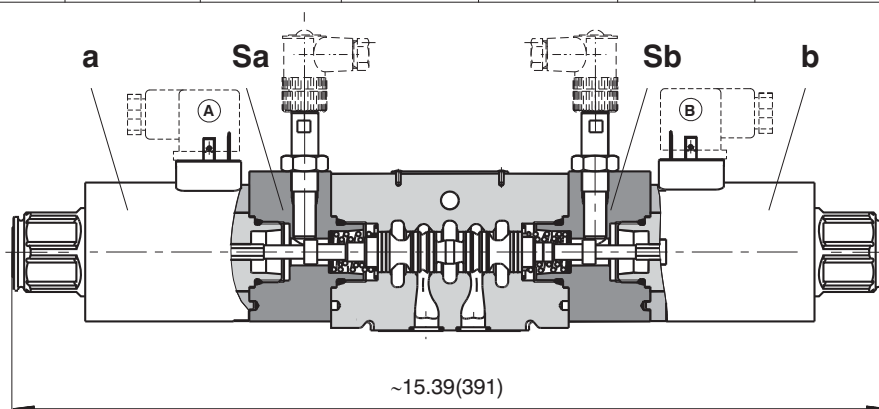
Technical Data of the Sensor		S1, S4	S2
Rated power supply voltage	V		24 DC
Power supply voltage range	V		10 ... 30 DC
Rated current	mA		200
Enclosure type of sensor to EN 60529			IP 67
Max. operating pressure	bar	725 (50)	3046 (210)
Switching frequency	Hz		1000
Ambient temperature range	°C	-13 ... +176 (-25 ... +80)	

Technical Data of the Connector		yellow LED	
Power supply voltage range	V	10 ... 30 DC	
Ambient temperature range	°F (°C)	-13 ... +176 (-25 ... +80)	
Indication			

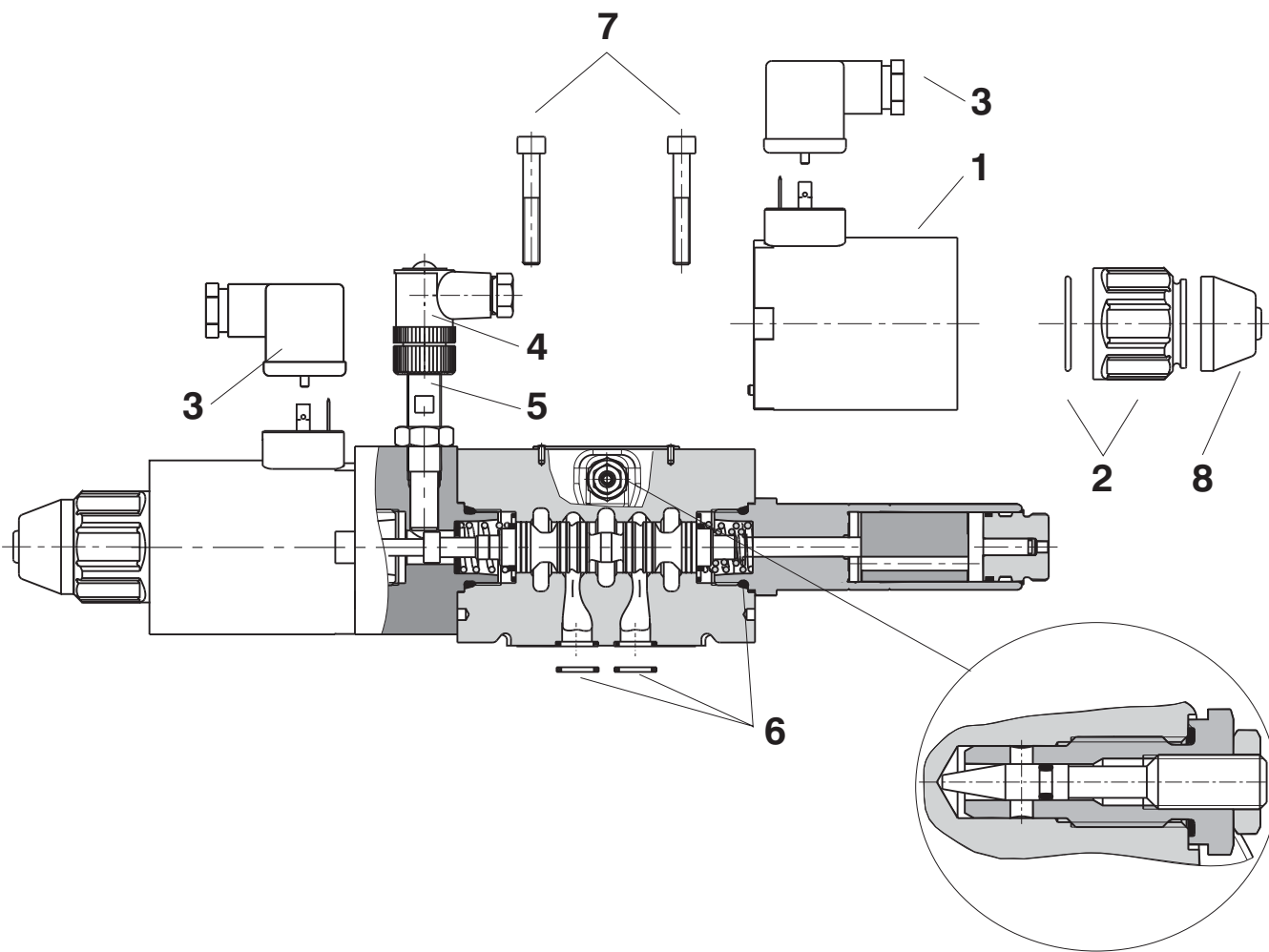
Two-Position Directional Control Valve	Signal of sensor Sa (Sb)		LED	
	S1, S2 - normally-open	S4 - normally-closed	S1, S2	S4
Signal of solenoid a (b)				
0	1	0	ON	OFF
1	0	1	OFF	ON



Three-Position Directional Control Valve		Dimensions in millimeters							
Signal of solenoid		Signal of sensor Sa (Sb)				LED			
a	b	S1, S2 - normally-open		S4 - normally-closed r		S1, S2		S4	
		Sa	Sb	Sa	Sb	Sa - LED	Sb - LED	Sa - LED	Sb - LED
0	0	1	1	0	0	ON	ON	OFF	OFF
1	0	0	1	1	0	OFF	ON	ON	OFF




Spare Parts



- 1 Solenoid coil
- 2 Nut with seal
- 3 Electrical connector
- 4 Connector of position sensor with LED
- 5 Sensor
- 6 Seal kit
- 7 Mounting bolts
- 8 Rubber cap with manual override

Solenoid coil			
Solenoid type	Coil type		
	E1	E5	
	Order number		
01200	936-4610	936-3480	
02400	936-4627		
10600	936-4679		
12060			
Solenoid retaining nut with seal			
Type of nut	Seal ring	Order number	
Standard nut	30 x 2	489-9900	
Nut with rubber boot		489-9901	
Connector of position sensor			
Type designation	Model	Max. input voltage	Ordering number
K02	connector of position sensor with LED	10...30 V DC	936-9940
S1	normally-open sensor	10...30 V DC	405111129213
S2	normally-open sensor	10...30 V DC	18838900
S4	normally-closed sensor	10...30 V DC	20725300
Seal kit			
Type	Dimensions, quantity		Order number
	Square ring	O-ring	
Standard NBR70	12.42 x 1.68 (5 pcs.)	23.81 x 2.62 (2 pcs.)	485-9960
Viton	12.42 x 1.68 (5 pcs.)	23.47 x 2.62 (2 pcs.)	485-9965
Bolt kit (for studs see HU 0040)			
Dimensions, quantity		Bolt torque	Order number
M6 x 40 DIN 912-10.9 (4 pcs.)		10.33+1.48 lbf.ft- (14+2 Nm)	485-9964
1/4-20 UNC x 1.625 (4 pcs.)			2 000 108
Soft Shifting Spool Options			
T2		7.376 lbf.ft (10 Nm)	489-9905
T3		7.376 lbf.ft (10 Nm)	489-9906

Electrical connector, EN 17 5301-803			
Type	Max. input voltage	Connector A gray	Connector B black
		Order number	
K1	230 V AC/DC	936-9902	936-9901
K5	230 V AC/DC	936-9906	936-9905
K11	230 V AC/DC	936-9916	936-9917
K2	12V DC/24V DC	936-9908	936-9907
K2	120 V AC	936-9916	936-9917
K2	230 V AC	936-9918	936-9919
K12	12 ... 24 V DC	936-9918	936-9919

Electrical Connector, EN 17 5301-803				
K1	Connector - B (black)	230 V AC/DC	M16x1.5 bushing bore \varnothing 0.24-0.31 in (\varnothing 6-8 mm)	
	Connector - A (gray)			
K5	Connector - B (black)	230 V AC/DC	M16x1.5 bushing bore \varnothing 0.16-0.24 in (\varnothing 4-6 mm)	
	Connector - A (gray)			
K11	Connector - B (black)	230 V AC/DC	1/2 NPTF bushing bore \varnothing 0.24-0.31 in (\varnothing 6-8 mm)	
	Connector - A (gray)			
K2	Connector with LED and guenching diode - B (black)	230 V AC/DC	M16x1.5 bushing bore \varnothing 0.24-0.31 in (\varnothing 6-8 mm)	
	Connector with LED and guenching diode - A (gray)			
K12	Connector with LED and guenching diode - B (black)	12 ... 24 V DC	1/2 NPTF bushing bore \varnothing 0.24-0.31 in (\varnothing 6-8 mm)	

Caution!

- In the case of directional control valves with two solenoids, any of the solenoids may be energized, but only after powering off the other.
- For directional control valves with other spool symbols as those shown in the table, please consult with manufacturer.
- Other spool symbols on request.
- The plastic packaging is recyclable.
- Mounting bolts, studs and DIN-connectors must be ordered separately. Certified documentation is available per request.
- for RPEW4-10 with CSA only:
Use supply wires suitable for at least 75°C. Employer des fils d'alimentation qui conviennent pour au moins de 75°C.

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