

- Compact modular valve system assembly
- Easy to build complex circuits
- The possibility of subsequent rebuilding or extending the valve assembly
- High variability of functional options

Functional Description

Modular assembly blocks are designed for the control of one or more hydraulic circuits, used in open hydraulic circuits. The high variability of the modular set design allows its wide use in the construction of lifting and handling equipment, machine tools and also in the field of mobile technique.

The base of the modular set is the body of the section distributor RPEK1-03. The bodies are manufactured in more several variants, which enable horizontal and vertical assembly (see RPEK1-03 directional valve data sheet HA 4027).

Channels P, T run through all horizontal sections. Inlet flow is 60 L/min nominal, sectional flow is limited with performance of RPEK directional valve 20 L/min (5.28 GPM) nominal.

Channel A, B, which run through the upper surface of the distributor body are provided with threads G1/4, or SAE6 - 9/16-18 UNF, all measuring ports are G1/4 or SAE4 - 7/16-20 UNF Unthreaded outlets on the upper or side ground surface of the body are prepared for assembly. Pressure and flow supply can be provided on the face side by a inlet P, T plate / block or in the centre of the assembled block using a central plate with radial ports of channels P, T. Furthermore, the block can be provided with a built-in pressure relief valve, which protects channel P against overloading, and the solenoid controlled valve that allows channels P-T connection thus relieving the source of the pressure fluid to tank. The supply block with the proportional distributor is used for the flow regulation in the "P" channel. Combination of 3 way pressure compensator and proportional valve allows to cave constant regulated flow independent of load.

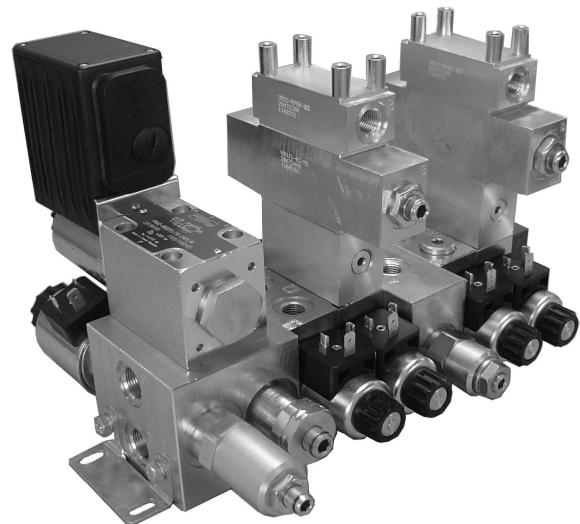
Vertical assembly allows installation of valves into channels A, B. In vertical stacking assembly is possible to mount throttle valves, or Pilot operated check valves, and secundar pressure relief valves,

Horizontal direction blocks, plates and bodies of distributors are connected into one unit using 3 screws /

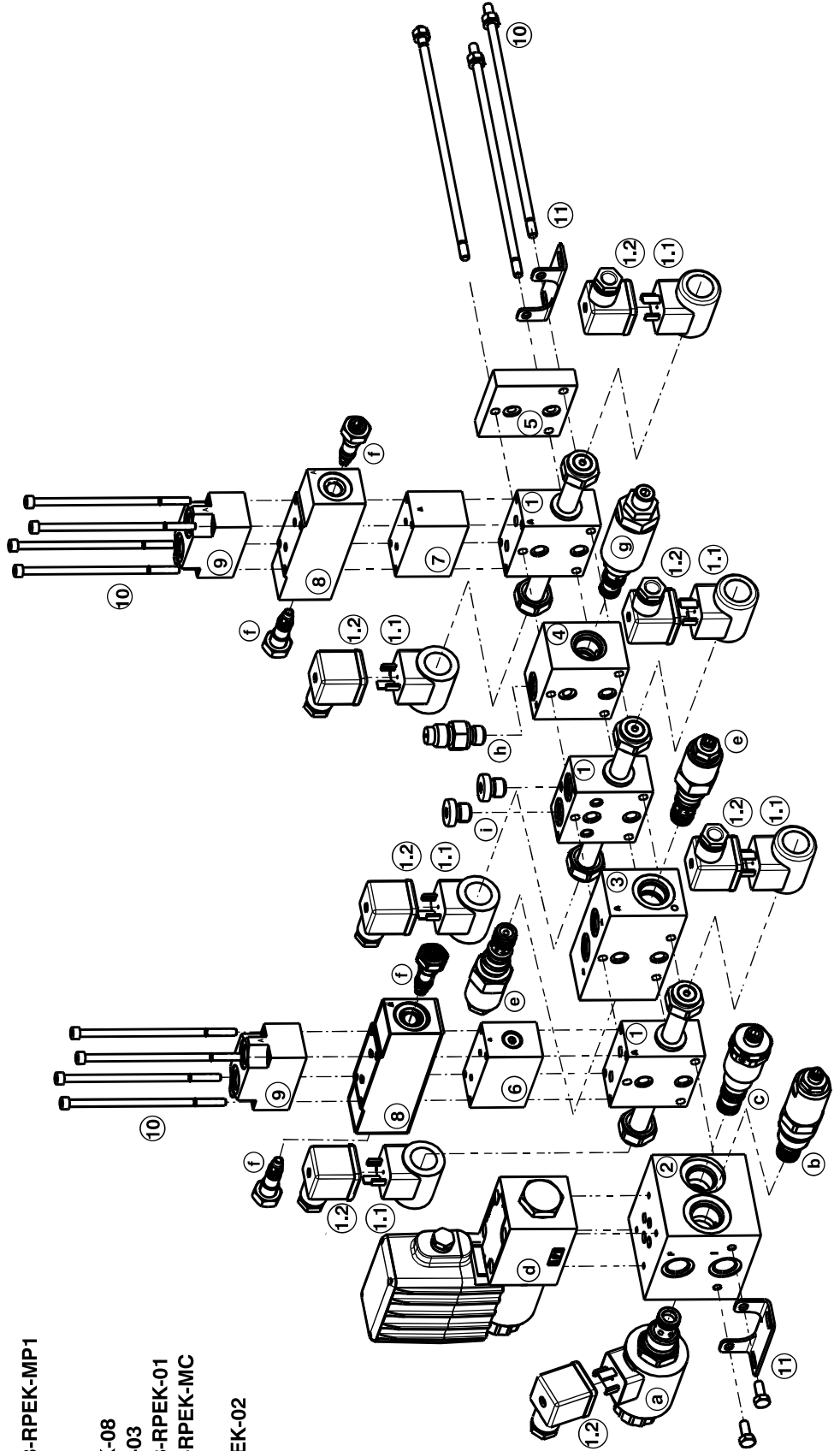
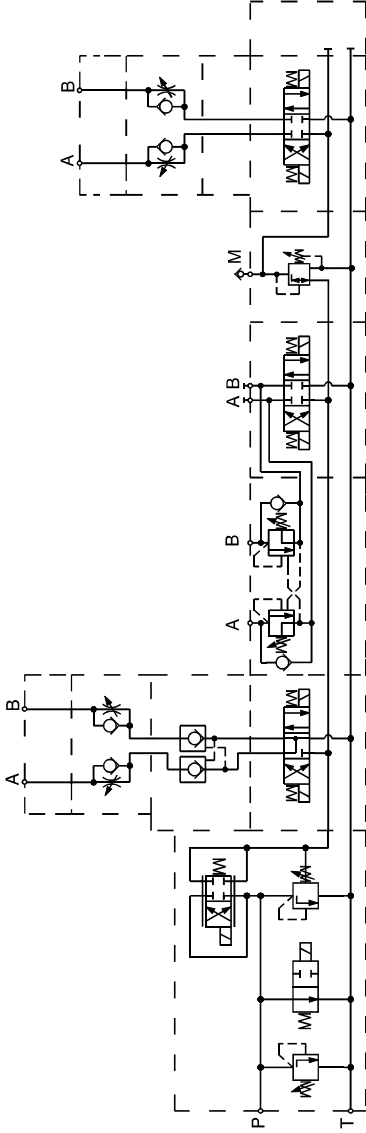
bolts and 4 bolts in the vertical direction. All connected plates are sealed.

Two fastening angles serve to mount the complete block to the base by screwing them to the face surfaces, or by using threads M6 at the bottom side of the plates and blocks.

A modular set allows horizontal assembly up to eight sections or up to sixteen sections when the centre plate is used for feeding and the blocks are grouped from both sides. It is possible to group up to four blocks vertically. In cases of more complicated block assemblies we recommend to first create a hydraulic circuit diagram.



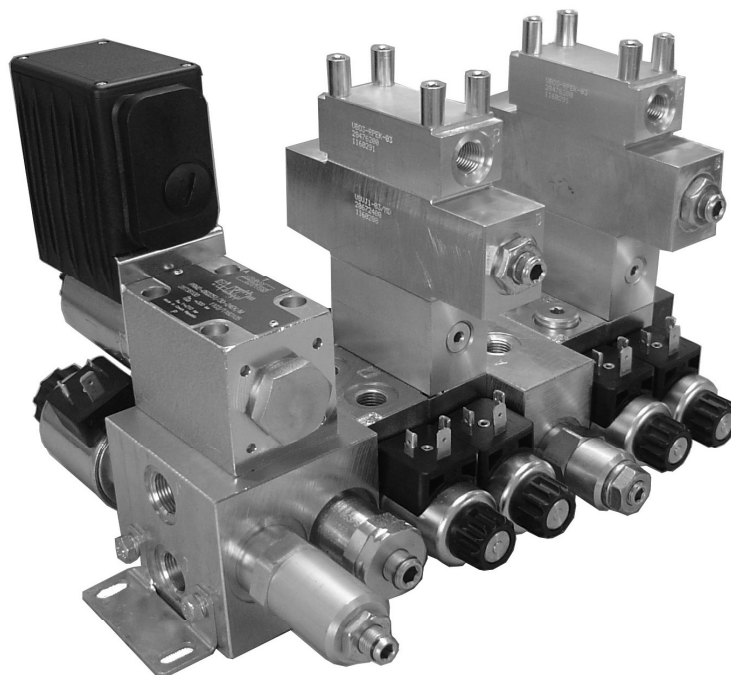
Horizontal and Vertical Assembly Illustrative Figure



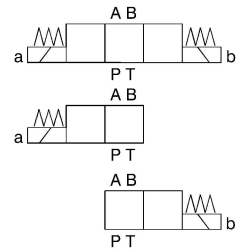
- 1. RPEK**
 - 1.1. Coils
 - 1.2. Electrical connector
 - i) Pressure plug G1/4 (SAE 6)
- 2. Inlet P, T plates HB03-RPEK-MZ**
 - a) SD2E-B2
 - b) SR1A-B2
 - c) TV2-063
 - d) PRM2-06
- 3. Sandwich plate HB03-RPEK-MAB1**
 - e) SOPA-Q3
- 4. Sandwich plate HB03-RPEK-MP1**
 - g) SP2A-A3
 - h) Minimes
- 5. End plate HB03-RPEK-08**
- 6. PO check valve VJR5-03**
- 7. Extension plate VB-03-RPEK-01**
- 8. Sandwich plate VB03-RPEK-MC**
 - f) VSV2
- 9. Cover plate VB03-RPEK-02**
- 10. Kit studs**
- 11. Kit**

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- 4/3-, 4/2 way directional control valves with solenoid control
- Solenoids can be turned around their axis to any position
- Push button manual override
- Possibility of vertical and horizontal assembly, see data sheet HA 4057



Functional Description

Distributors of the RPEK1-03 type are the basic elements for building blocks through horizontal and vertical assembly. This catalogue describes the preparation of the main unit, made up of two to eight distributors, by horizontal assembly. The distributors controlling the direction of the working fluid's flow to the individual appliances share common channels P and T. During the circuit design it is always necessary to check if the flow through the common channels covers the consumption of all appliances in all phases of the hydraulic equipment working cycle. Channels A, B outputs at the upper surface of the body are provided with threads G1/4 (type G), or SAE 9/16-18 (type S), or are prepared for vertical assembly (type O) – i.e. brought out onto a ground surface. Channels P, T, A, B outlets on the side surfaces of the body are prepared for horizontal assembly – i.e. brought out onto a ground surface or provided with the standard design of the emergency control may be additionally fitted with a pushbutton with a rubber cover, a sealing ring recess.

The individual distributor bodies are connected into a compact block using three bolts. Fastening angles serve to mount the block to the base with four screws.

An assembled block feed is provided by a plate with connecting threads G3/8 in channels P, T. It is also possible to use plate with a built-in pressure relief valve to regulate the maximum pressure in the circuit.

Use data sheet No. HA 5027 to create more complex assemblies with the use of the horizontal and vertical assembly, while also using additional building elements.

The RPEK1-03 directional control valves consist of cast iron housing (1), control spool (5) with two centering springs (4) and operating solenoids (2, 3).

The three-position directional valves are fitted with two solenoids, two-position directional valves have either one solenoid.

*The operating solenoids are DC solenoids supplied through connectors A, B (6, 7). For AC supply the solenoids are provided with rectifiers, which are integrated directly into the connectors A, B (6, 7). The connectors can be turned by 90° around . By loosening the nut (8), the solenoid can be turned around its axis up to 360°.

In the case of solenoid malfunction or power failure, the spool of the valve can be repositioned by manual override (9), provided the pressure in the T-port does not exceed 25 bar. The standard design of the emergency control may be additionally fitted with a pushbutton with a rubber cover.

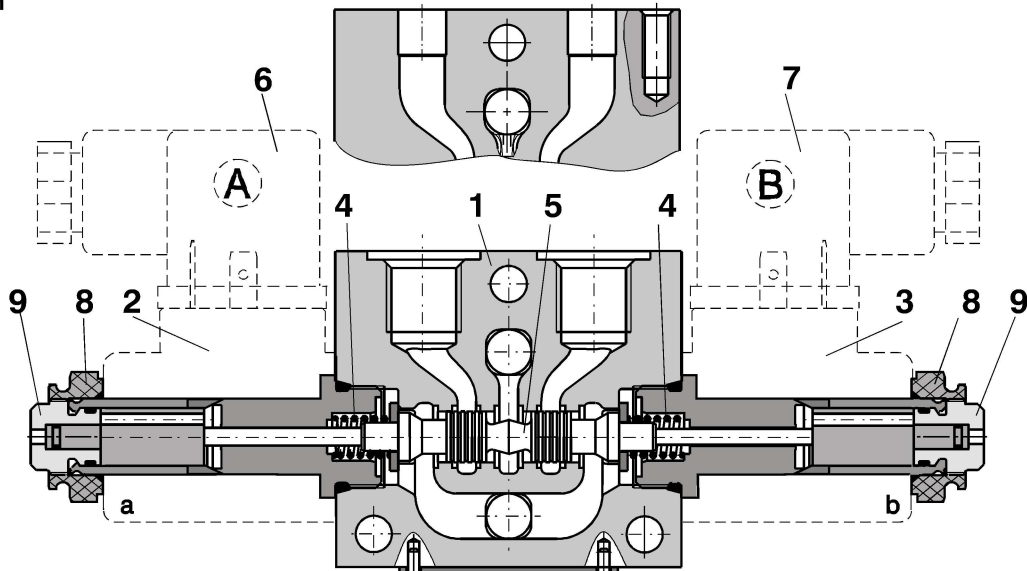
The basic surface treatment of the valve housing (1) is phosphate coated and the solenoids (2, 3) are zinc coated.

*Magnet coils are not included in the valve supply. The coil types selected by the customer must be ordered separately.

Type of connection

"O"

Type of connection
"G", "S"



Ordering Code

RPEK1-03 /

**Solenoid Operated
Directional Control Valve**

no designation

V

Seals
NBR
FPM (Viton)

Nominal size

Type of connection

G1/4

SAE 9/16-18

without thread

G
S
O

no designation

P1

Z1

Z3

through channels P, T; inlets A, B with sealing rings

one side inlets of channels P, T with sealing rings

one side inlets of channels P, T, A, B with sealing rings

Design form

standard

Number of valve positions

two positions

three positions

2
3

Manual override *

standard

no designation

Functional symbols

see the table functional symbols

*The standard design of the manual override may be additionally fitted with a pushbutton with a rubber cover (N2).

Note: solenoid coil, electrical connector and manual override (N2) **is not supplied as mounted on**, must be ordered separately (see ordering number on page 10, 11)

Technical Data

Nominal size		03
Maximum flow	l/min (GPM)	see p-Q characteristics
Maximum operating pressure at ports P, A, B	bar (PSI)	250 (3625)
Maximum operating pressure at port T	bar (PSI)	210 (3045)
Pressure drop	bar (PSI)	see Δp -Q characteristics
Hydraulic fluid		Hydraulic oils of power classes (HL, HLP) to DIN 51 524
Fluid temperature range NBR	°C (°F)	-30 ... +80 (-22 ... +176)
Fluid temperature range FPM (Viton)	°C (°F)	-20 ... +80 (-4 ... +176)
Ambient temperature, max.	°C (°F)	up to +50 (+122)
Viscosity range	mm ² /s (SUS)	20 ... 400 (98 ... 1840)
Maximum degree of fluid contamination		Class 21/18/15 to ISO 4406 (2006)
Maximum allowable voltage variation	%	AC: ± 10 DC: ± 10
Maximum switching frequency	1/h	15 000
Switching time, ON; at $v = 32 \text{ mm}^2/\text{s}$	ms	30 ... 50
Switching time, OFF; at $v = 32 \text{ mm}^2/\text{s}$	ms	AC: 70 ... 100 DC: 30 ... 50
Duty cycle	%	100
Service life	cycles	10^7
Enclosure type to EN 60 529		see page 10
Weight - valve with 1 solenoid	kg (lb)	0.90 (1.98)
- valve with 2 solenoid		1,05 (2.32)
Mounting position		optional

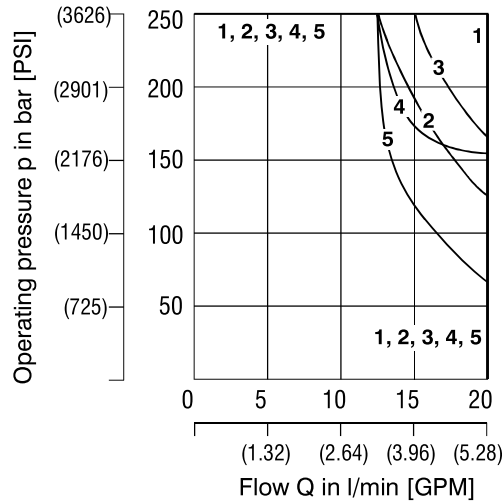
Functional Symbols

Designation	Symbol	Interposition	Designation	Symbol	Interposition
Z11			R21		
C11			Y51		
H11			C51		
Y11			Z51		
R11			H11		

p-Q Characteristic

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

Operating limits for maximum hydraulic power transferred by the directional valve.

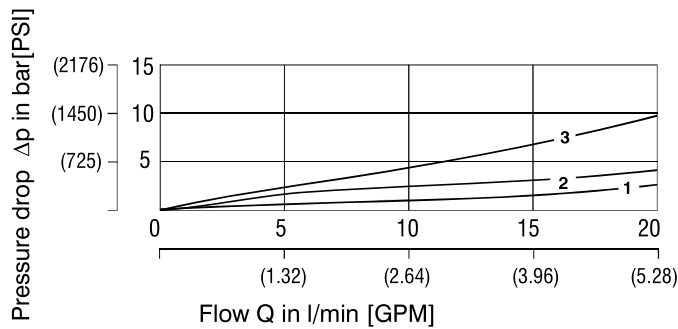


Z11	Z51	R11	R21	C11	C51	H11	Y11	Y51
1	1	1	5	2	2	3	4	4

Δp -Q Characteristic

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

Pressure drop Δp related to flow rate.



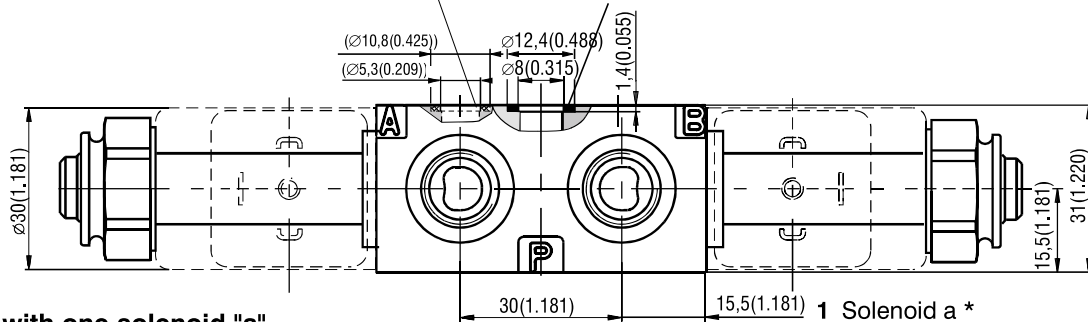
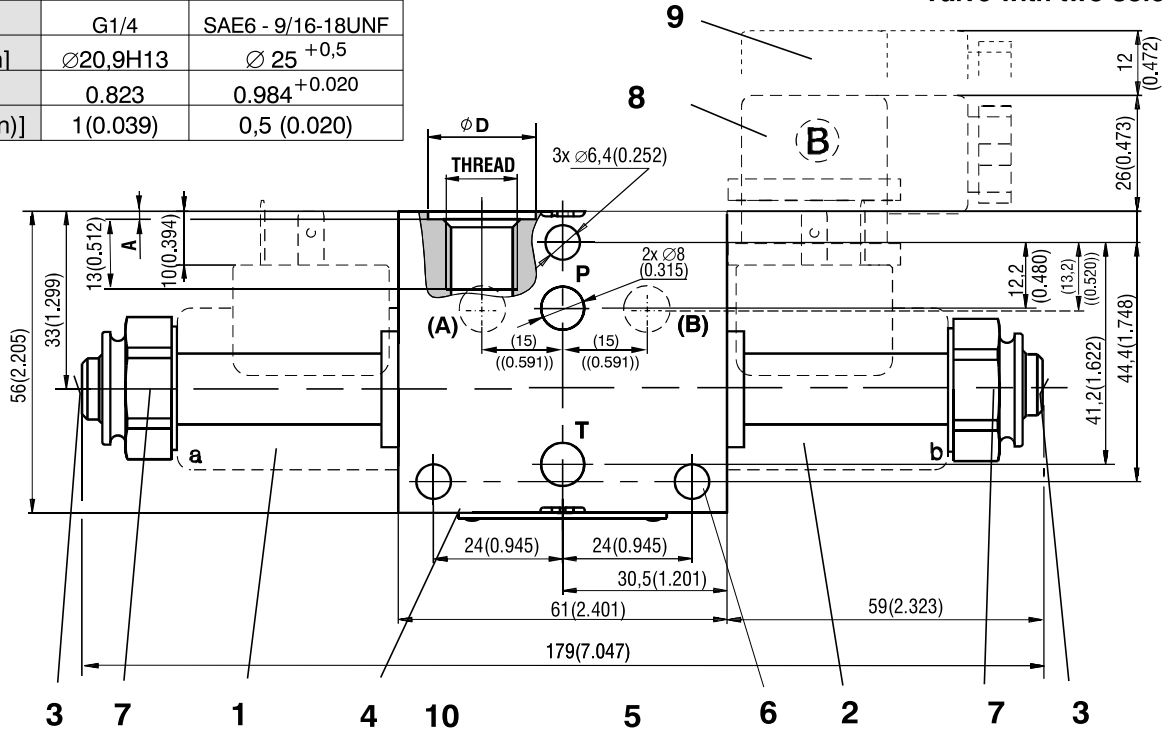
	Z11	C11	H11	Y11	R11	R21	Y51	C51	Z51
P-A	1	3	1	1	2	2		3	
P-B	1	3	1	1	2	2	1		1
A-T	1	3	1	1	2	2	1		1
B-T	1	3	1	1	2	2		3	
P-T		2	2					2	

Valve Dimensions Standard body version "G" , "S"

Dimensions in millimeters (inches)

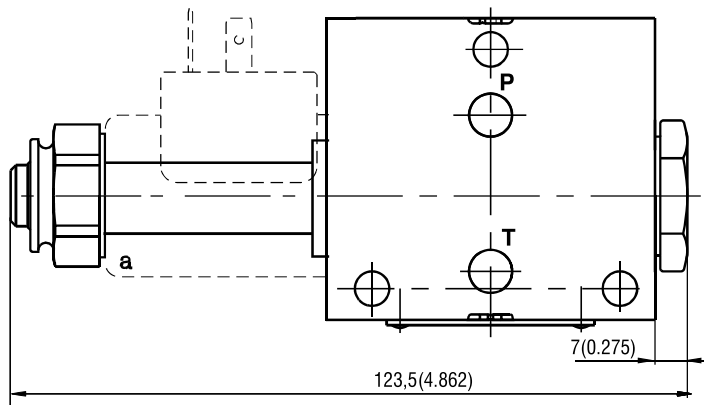
	G	S
THREAD	G1/4	SAE6 - 9/16-18UNF
ØD [mm]	Ø20,9H13	Ø 25 ^{+0,5}
ØD [in]	0.823	0.984 ^{+0.020}
A [mm (in)]	1 (0.039)	0,5 (0.020)

Valve with two solenoids



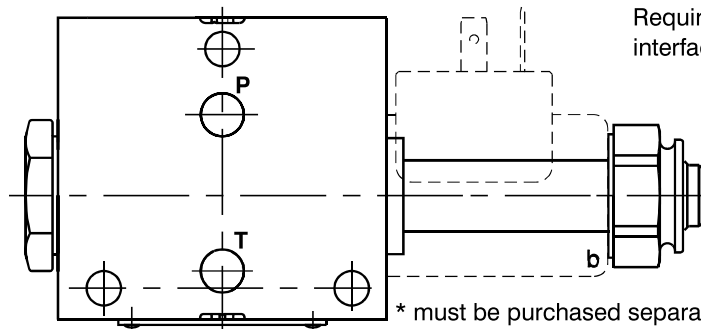
Valve with one solenoid "a"

Functional symbols R11, R21, Y51, C51, Z51



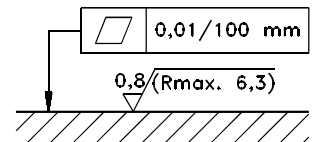
Valve with one solenoid "b"

Functional symbols H11



- 1 Solenoid a *
- 2 Solenoid b *
- 3 Manual override
- 4 Name plate
- 5 Square ring 9,25 x 1,68 (2 ks.) supplied with valve
- 6 3 mounting holes
- 7 Retaining nut of the solenoid
- 8 Electrical connector, EN 1745301-803
- 9 Space required to remove connector
- 10 Outlets A/B are only at the versions P1, Z1; Z3, Seal 7,65x1,68

* must be purchased separately (see page 7)



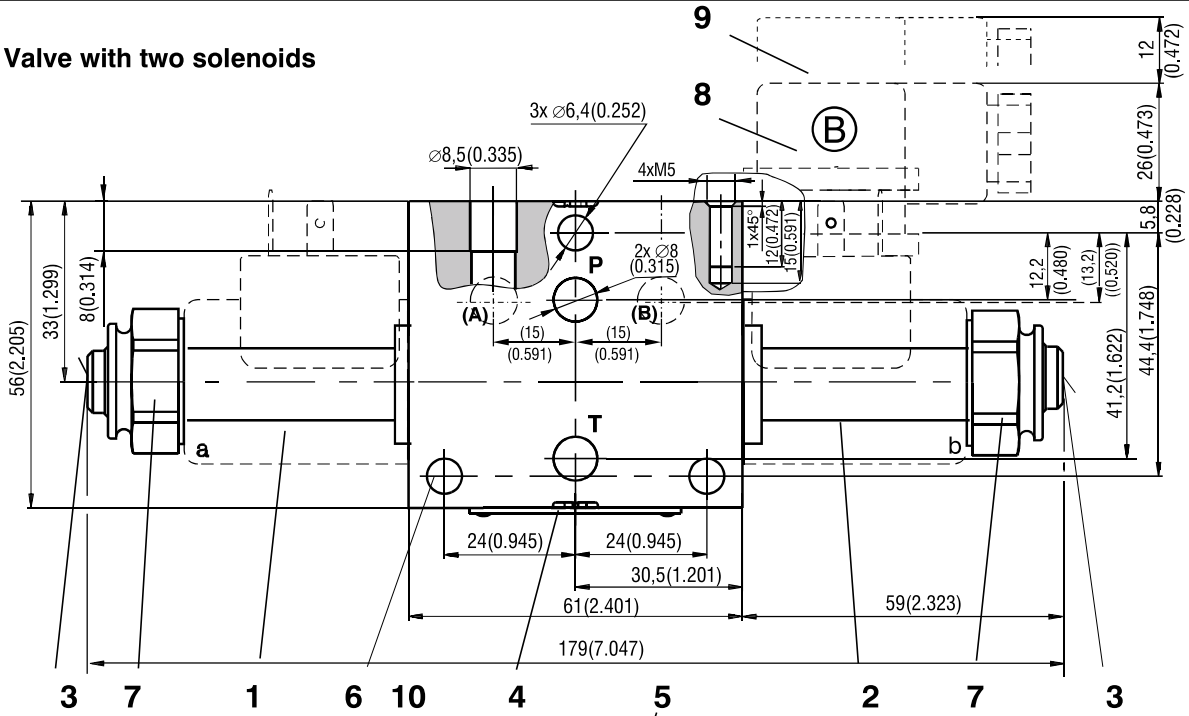
Required surface finish of interface

* must be purchased separately (see page 7)

Valve Dimensions Standard body version "O"

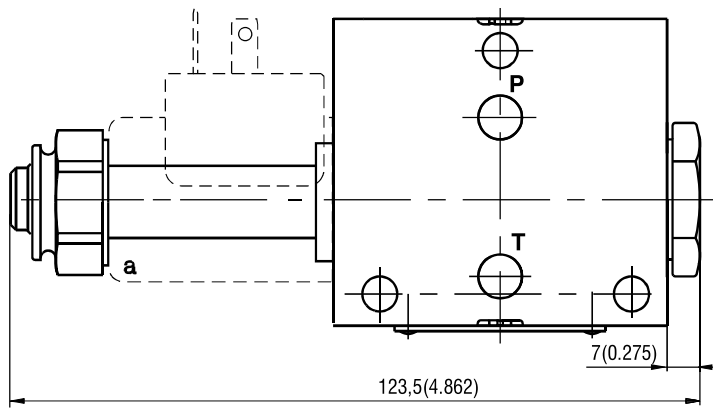
Dimensions in millimeters (inches)

Valve with two solenoids



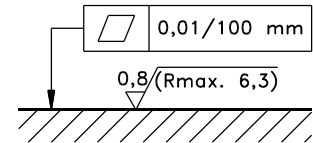
Valve with one solenoid "a"

Functional symbols R11, R21, Y51, C51, Z51



- 1 Solenoid a *
- 2 Solenoid b *
- 3 Manual override
- 4 Name plate
- 5 Square ring 9,25 x 1,68 (2 ks.) supplied with valve
- 6 3 mounting holes
- 7 Retaining nut of the solenoid
- 8 Electrical connector, EN 1745301-803
- 9 Space required to remove connector
- 10 Outlets A/B are only at the versions P1, Z3, Seal 7,65x1,68

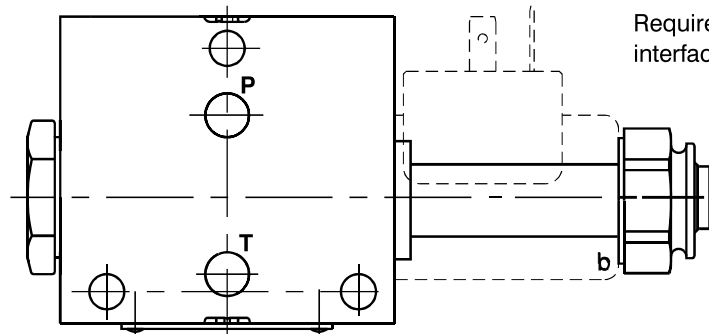
* must be purchased separately (see page 7)



Required surface finish of interface

Valve with one solenoid "b"

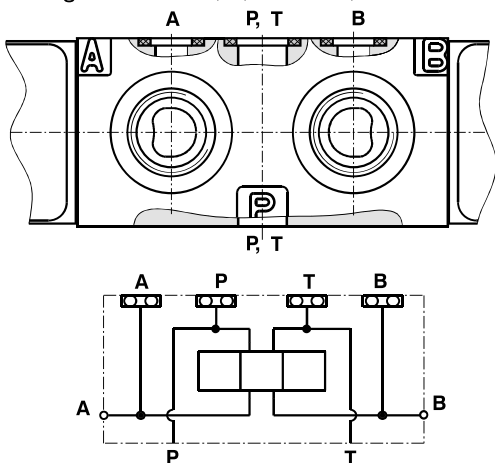
Functional symbols H11



Design form "G" ("S"), "O"

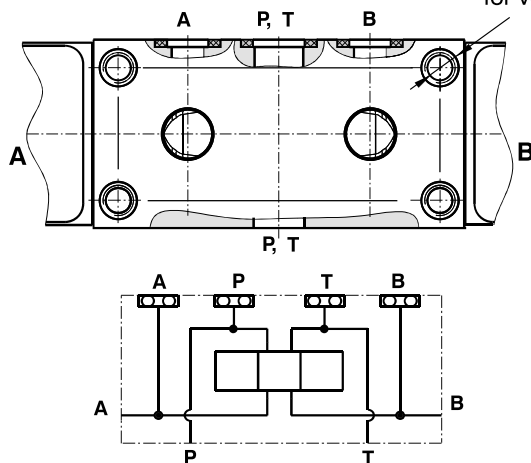
P1 - "G" ("S")

through channels P, T; outlets A, B with sealing rings



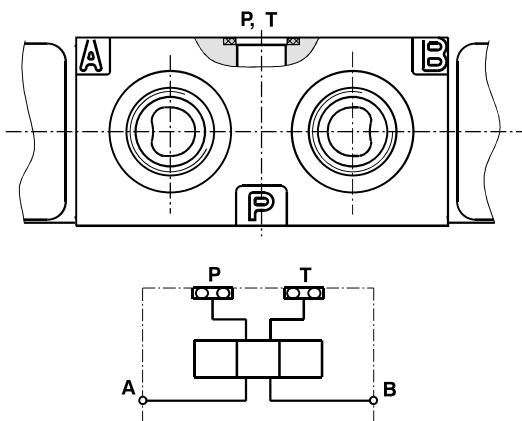
P1 - "O"

4xM5
for vertical assembly

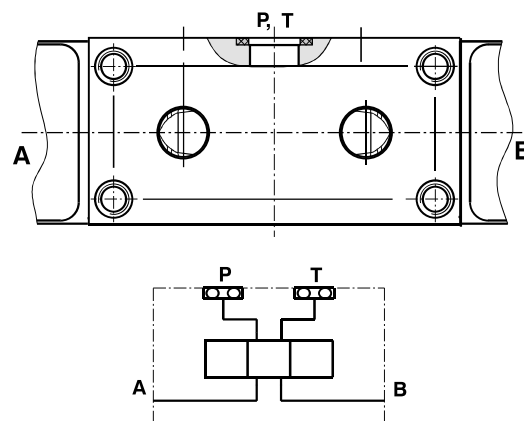


Z1 - "G" ("S")

one side inlets of channels P, T with sealing rings (outlets A, B only on the upper surface)

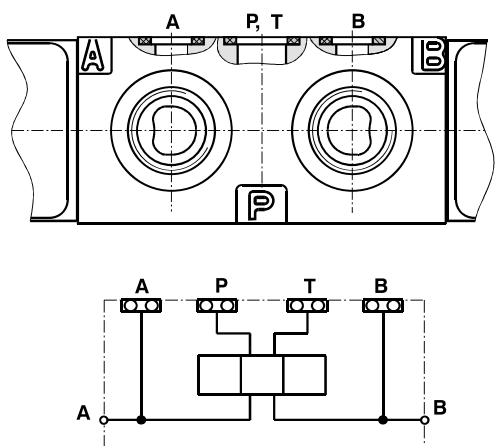


Z1 - "O"

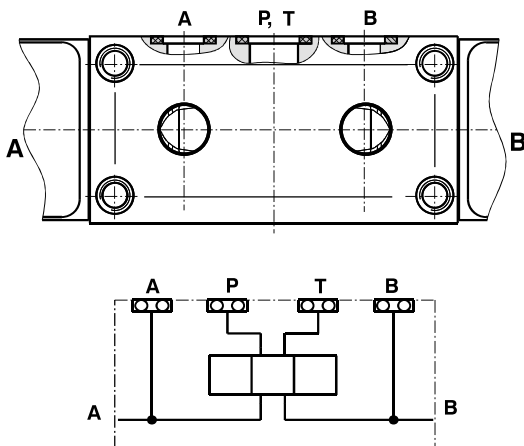


Z3 - "G" ("S")

combination of options Z1 a P1
one side inlets of channels P, T, A, B with sealing rings



Z3 - "O"

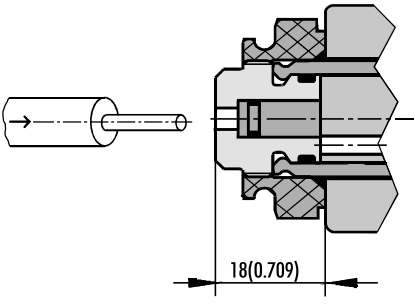
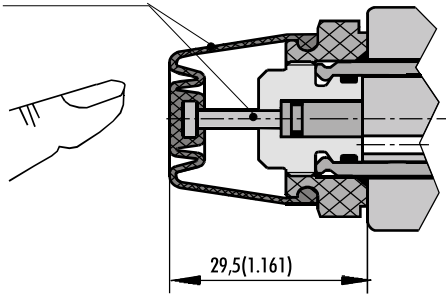


Spare Seal kit

Type	Dimensions, number			Ordering nr. Z1
	Sealing - ring	O-ring		
Standard	9,25 x 1,68 NBR 70 (2 ks.)	16 x 2 NBR 90 (2ks.)		15691300
Type	Dimensions, number			Ordering nr. P1, Z3
	Sealing - ring	O-ring	Sealing - ring	
Standard	9,25 x 1,68 NBR 70 (2 ks.)	16 x 2 NBR 90 (2 ks.)	7,65 x 1,68 (2 pcs.)	28839800
Viton	9,25 x 1,78 (2 pcs.)	16 x 2 (2 pcs.)	7,65 x 1,78 (2 pcs.)	28840100

Manual Override

Dimensions in millimeters (inches)

STANDARD		RUBBER BOOT	
NO DESIGNATION	N2	Ordering number / Kit	29269100
 <p>Standard model of the manual override. Standard retaining nut of the solenoid.</p>		 <p>Manual override protected by rubber boot. Kit must be purchased separately.</p>	

Dimensions of Coils C14

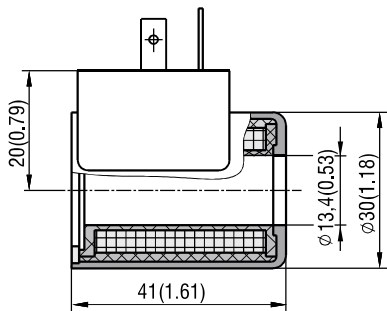
Dimensions in millimeters (inches)

Connector design

E1, E2

EN 175301-803-A

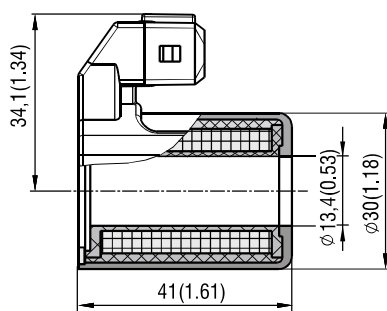
Protection degree IP65



E3A, E4A

AMP Junior Timer

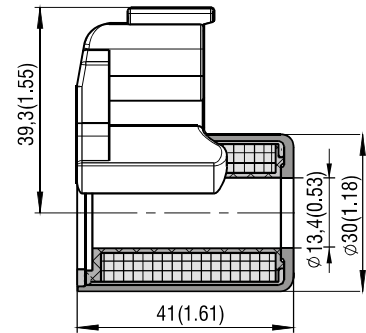
Protection degree IP65



E12, E13

Deutsch DT04-2P

Protection degree IP67, IP69



Coils C14B

Nominal voltage	Nominal current	Connector	Type code	Ordering number
12 VDC	1,83 A	E1 - EN 175301-803-A	C14B-01200E1-6,55NA	16210300
24 VDC	0,92 A	E1 - EN 175301-803-A	C14B-02400E1-26,2NA	16210400
205 V DC*	0,08 A	E1 - EN 175301-803-A	C14B-20500E1-2476NA	16210500
12 VDC	1,83 A	E2 - E1 with quenching diode	C14B-01200E2-6,55NA	24101600
24 VDC	0,92 A	E2 - E1 with quenching diode	C14B-02400E2-26,2NA	24101800
12 VDC	1,83 A	E3A - AMP Junior Timer (2 pins; male)	C14B-01200E3A-6,55NA	28822500
24 VDC	0,92 A	E3A - AMP Junior Timer (2 pins; male)	C14B-02400E3A-26,2NA	28686400
12 VDC	1,83 A	E4A - E3A se zhašecí diodou	C14B-01200E4A-6,55NA	28822600
24 VDC	0,92 A	E4A - E3A se zhašecí diodou	C14B-02400E4A-26,2NA	28822400
12 VDC	1,83 A	E12 - Deutsch DT04-2P	C14B-01200E12-6,55NA	29268200
24 VDC	0,92 A	E12 - Deutsch DT04-2P	C14B-02400E12-26,2NA	29268900
12 VDC	1,83 A	E13 - E12 se zhašecí diodou	C14B-01200E13-6,55NA	29268800
24 VDC	0,92 A	E13 - E12 se zhašecí diodou	C14B-02400E13-26,2NA	29269000

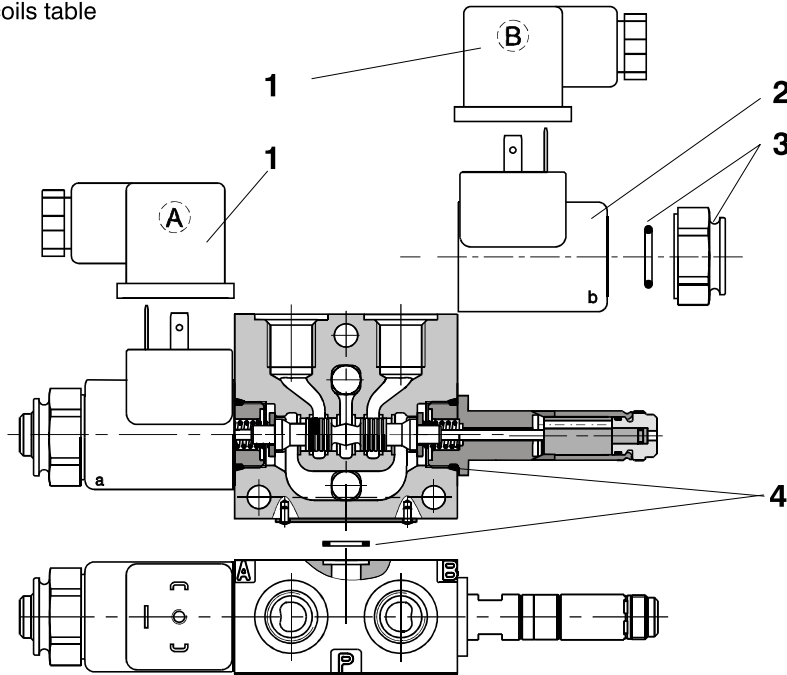
Note:

* Coil version 205 are suitable for the rectified voltage of 230V /50Hz, Rectifier in coil included

Other designs available at request.

Spare Parts

- 1 Electrical connector
- 2 Solenoid coil - see coils table
- 3 Nut with seal
- 4 Seal kit



Solenoid retaining nut with seal

Type of the nut - Mu 3 Nm(2.21lbs-ft)	Seal ring	Ordering number
Standard nut	13 x 2	15691500
Manual Override N2		29269100

Electrical connector, EN 1745301-803

Type designation	Model	Max. input voltage	Connector A grey	Connector B black
			Ordering number	
K1	without rectifier - M16x1,5 bushing bore \varnothing 6-8 mm (0.236 - 0.315 in)	230 V AC/DC	16202200	16202100
K2	without rectifier with LED and quenching diode M16x1,5 bushing bore \varnothing 6-8 mm (0.236 - 0.315 in)	12...24 V DC	16202800	16202700
K3	with rectifier - M16x1,5 bushing bore \varnothing 6-8 mm (0.236 - 0.315 in)	230 V AC	16202400	16202300
K4	with rectifier with LED and quenching diode - M16x1,5 bushing bore \varnothing 6-8 mm (0.236 - 0.315 in)	230 V AC	16203000	16202900
K5	without rectifier - M16x1,5 bushing bore \varnothing 4-6 mm (0.158 - 0.236 in)	230 V AC/DC	16202600	16202500

Caution

- When the distributor contains two electromagnets any of the two electromagnets can be switched on only after the other one switches off.
- Distributors with other interconnections than those shown in the catalogue can be supplied on request.
- The packaging foil can be recycled
- The transport base plate can be returned to the manufacturer.
- The mentioned data only serve to describe the product and in no case are to be understood in terms of law as guaranteed characteristics.