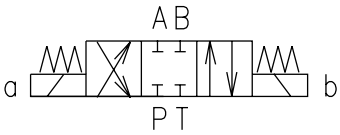
Directional control valves solenoid operated

RPEK1-03

Size 03 • p_{max} up to 250 bar • Q_{max} up to 20 L/min

HA 4027
2/2003

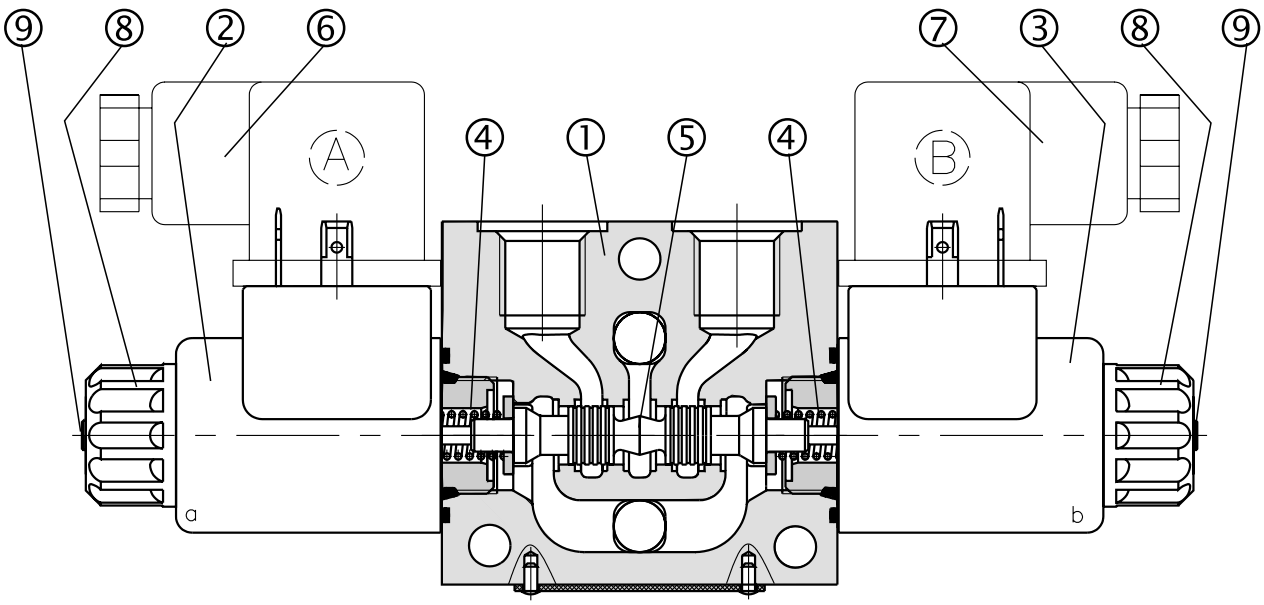
Replaces
HA 4027 10/2002



- **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**

Functional Description

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 and two springs. Two-position directional valves have either one solenoid and one return spring or two solenoids and a detent assembly.
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) or inside the coil. 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 363 PSI (25 bar).
The basic surface treatment of the valve housing (1) is phosphate coated and the solenoids (2, 3) are zinc coated.



Ordering Code

RPEK1-03 □□□/□□□□

Solenoid operated directional control valve

Nominal size

Type of connection
G1/4 **G**

Number of valve positions
two positions **2**
three positions **3**

Functional symbols
see the table functional symbols

Rated supply voltage of solenoids
(at the coil terminals)

12 V DC / 1,83 A	**01200**
24 V DC / 0,92 A	**02400**
*205 V DC / 0,08 A	**20500**

Other voltages per request

Seals
no designation NBR
V FPM (Viton)

Manual override
no designation standard

Type of solenoid coil
E1 with DIN connector

Note: Electrical connectors in DIN 43 650 have to be ordered separately. See page 10.

FOR PREFERRED TYPES SEE BOLD TYPING IN ORDERING CODE, FUNCTIONAL SYMBOLS AND TABLE OF PREFERRED TYPES ON PAGE 10

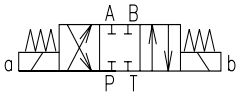
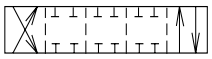
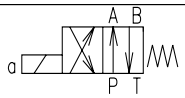
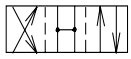
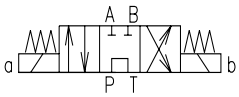
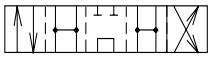
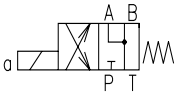
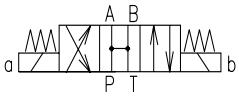
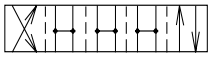
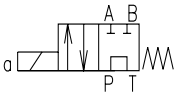
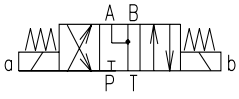
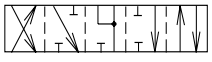
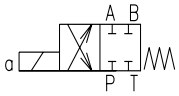
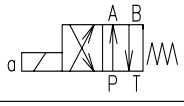
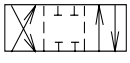
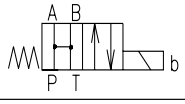
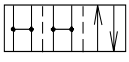
*Recommended solenoid coils used with elektrical connector with rectifiers - type designation K3, K4, see page 6.

Rated supply source voltage (permissible rated voltage variation ± 10 %)	Type designation of the solenoid voltage
230 V AC / 0,08 A / 50 (60) Hz	20500

Technical Data

Nominal size	mm	03
Maximum flow	L/min	see p-Q characteristics
Maximum operating pressure at ports P, A, B	bar	250
Maximum operating pressure at port T	bar	210
Pressure drop	bar	see Δp-Q characteristics
Hydraulic fluid		Hydraulic oils of power classes HM, HV to CETOP - RP 91H in viscosity classes ISO VG 32, 46 and 68.
Fluid temperature range (NBR / FMP (Viton)	°C	-30 ... +80 / -20 ... +80
Ambient temperature, max.	°C	up to +50
Viscosity range	mm^2/s	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 $\nu = 32\ mm^2/s$	ms	30 ... 50
Switching time, OFF; at $\nu = 32\ mm^2/s$	ms	AC: 70 ... 100 DC: 30 ... 50
Duty cycle	%	100
Service life	cycles	10^7
Enclosure type to DIN 40 050		IP 65
Weight - valve with 1 solenoid - valve with 2 solenoid	kg	0.90 1,05
Mounting position		optional

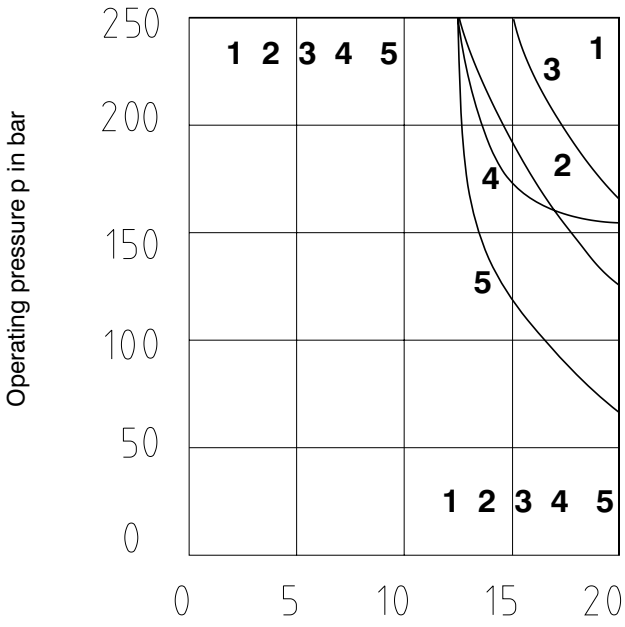
Functional Symbols

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

p-Q Characteristic

Measured at $\nu = 32\ mm^2/s$ and $t = 40\ °C$

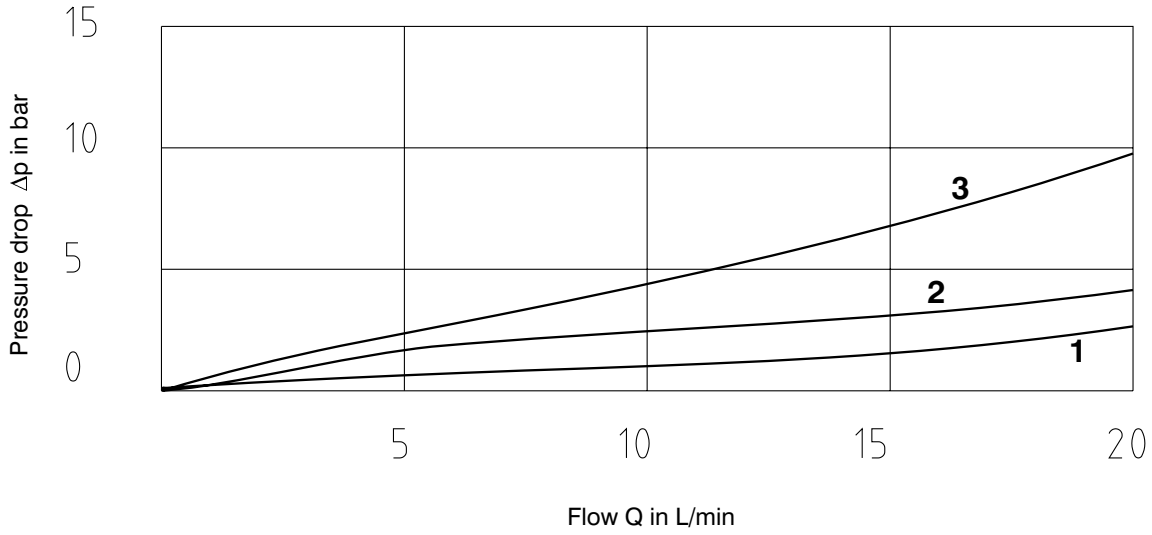
Operating limits for maximum hydraulic power transferred by the directional valve.



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

Δp-Q Characteristic

Measured at $\nu = 32\ mm^2/s$ and $t = 40\ °C$

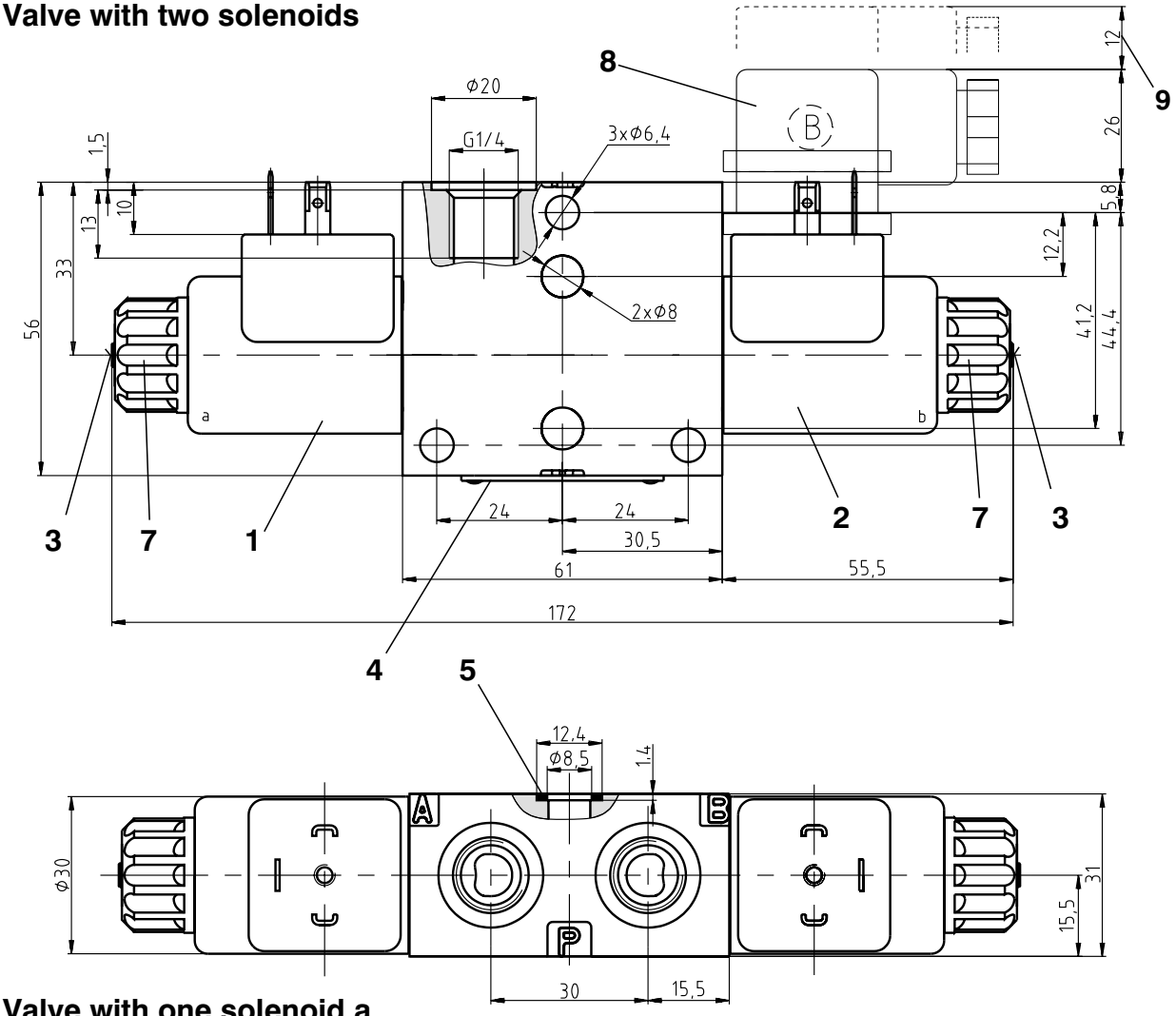


	Z11	C11	H11	Y11	R11	R21	Y51	C51	Z51
P-A	1	3	1	1	2	2		3	
P-B	1	3	1	1	2	2	1		1
A-T	1	3	1	1	2	2	1		1
B-T	1	3	1	1	2	2		3	
P-T		2	2					2	

Valve Dimensions

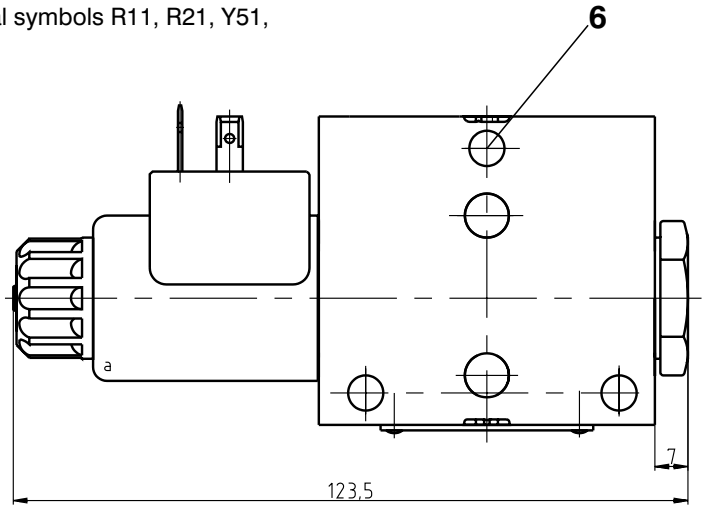
Dimensions in millimeters

Valve with two solenoids

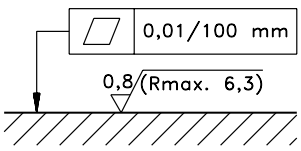


Valve with one solenoid a

Functional symbols R11, R21, Y51, C51, Z51



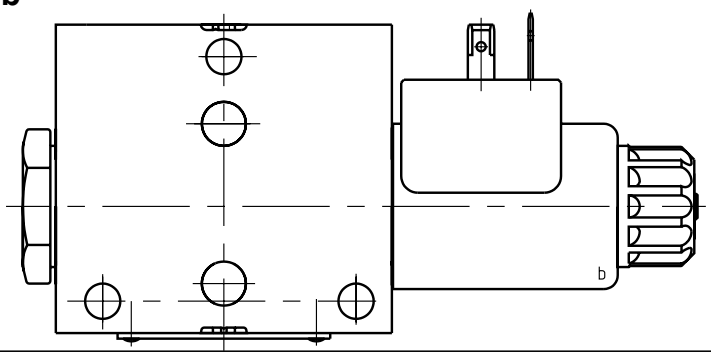
1 Solenoid a
2 Solenoid b
3 Manual override
4 Name plate
5 Square ring 9,25 x 1,68 (2 pcs.) supplied with valve
6 3 mounting holes
7 Retaining nut of the solenoid
8 Electrical connector, DIN 43 650
9 Space required to remove connector



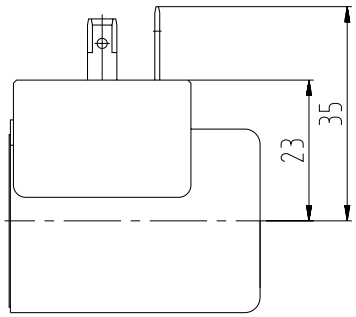
Required surface finish of interface

Valve with one solenoid b

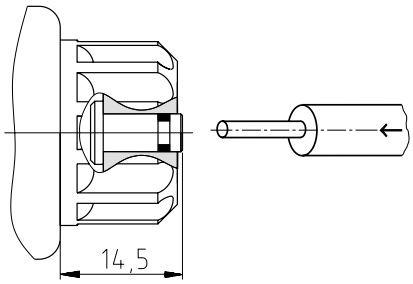
Functional symbols H11



Type of the Solenoid Coil

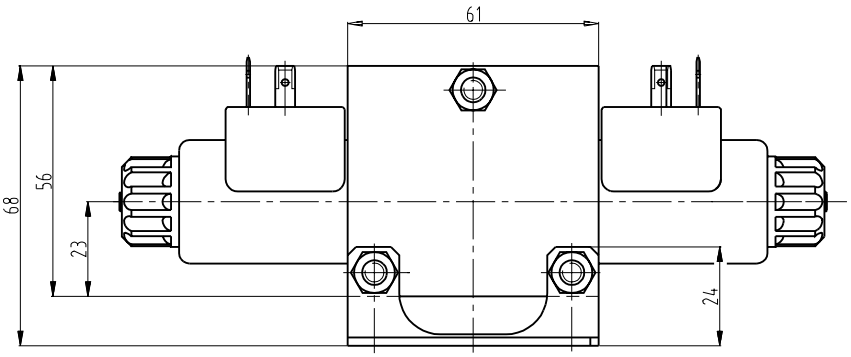
Designation	Dimensional sketch	Description
E1		Solenoid coil with terminal for the electrical connector, DIN 43 650.

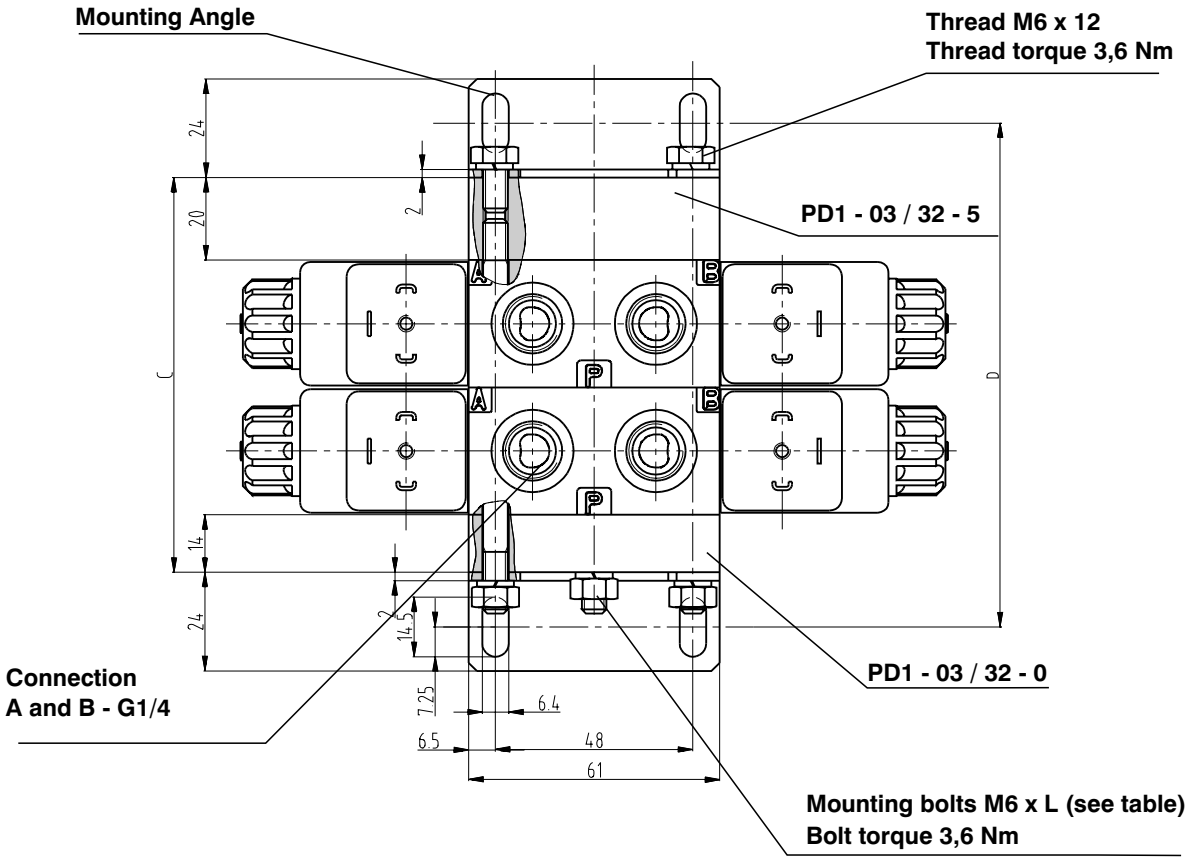
Manual Override

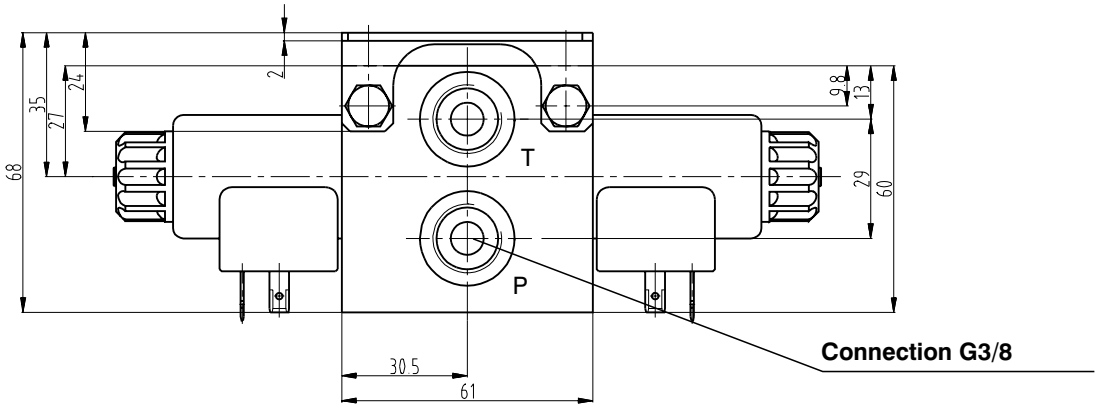
STANDARD	
Without designation Dimensional sketch  Description Standard model of the manual override. Standard retaining nut of the solenoid.	

Block Assembly

Dimensions in millimeters





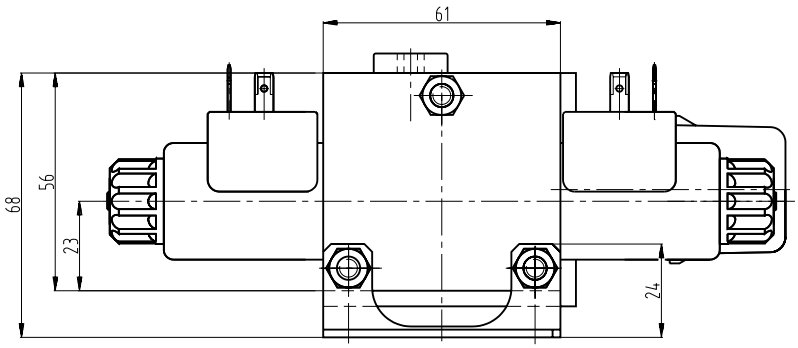


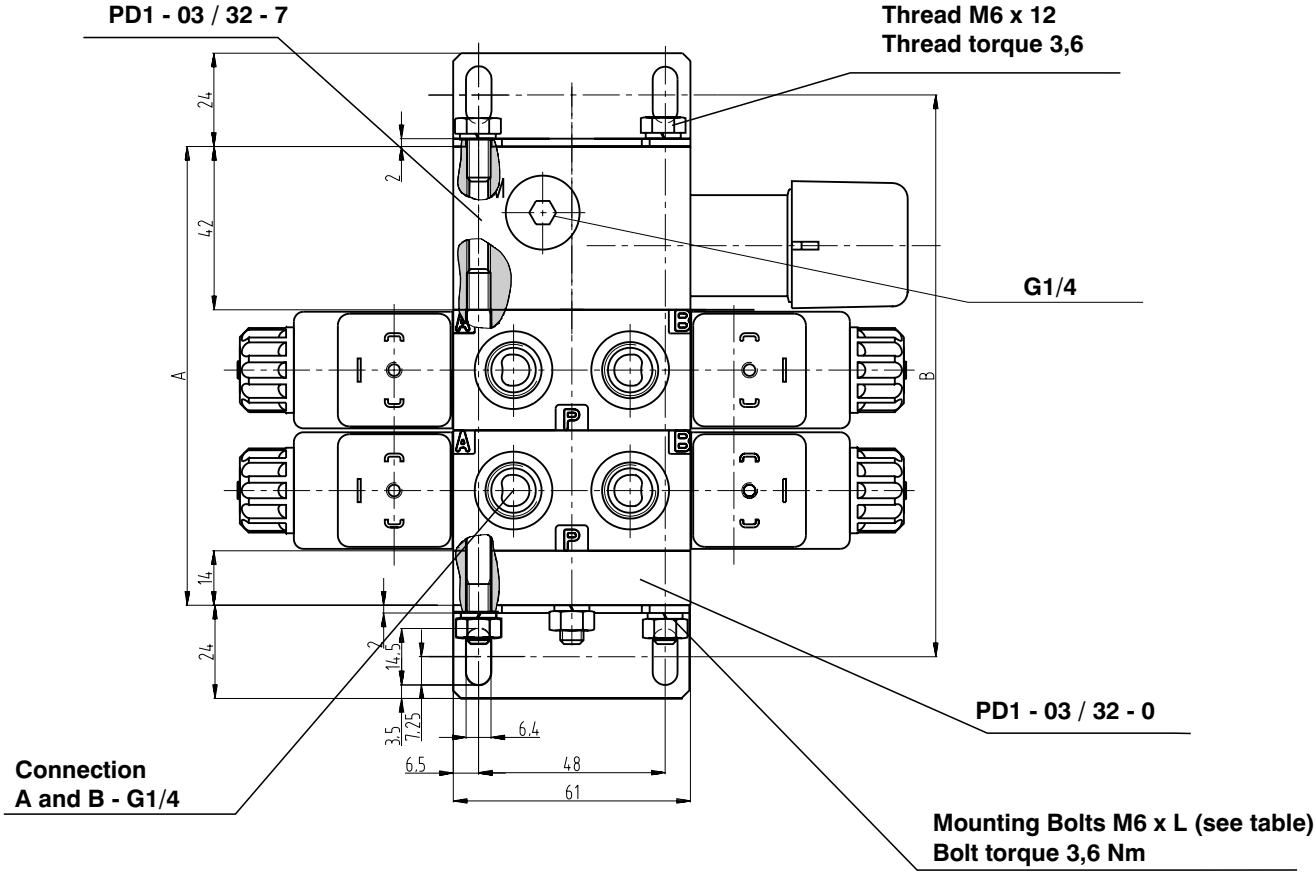
Dimensions

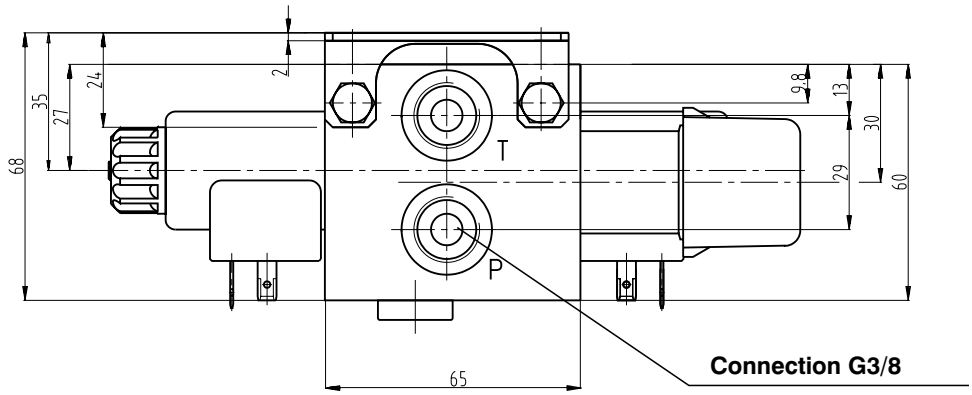
Number of section	1	2	3	4	5	6	7	8
Dimension C [mm]	65	96	127	158	189	220	251	282
Dimension D [mm]	91,5	122,5	153,5	184,5	215,5	264,5	277,5	308,5
Dimension L [mm]	55	100	133	163	194	224	256	287

Block Assembly

Dimensions in millimeters





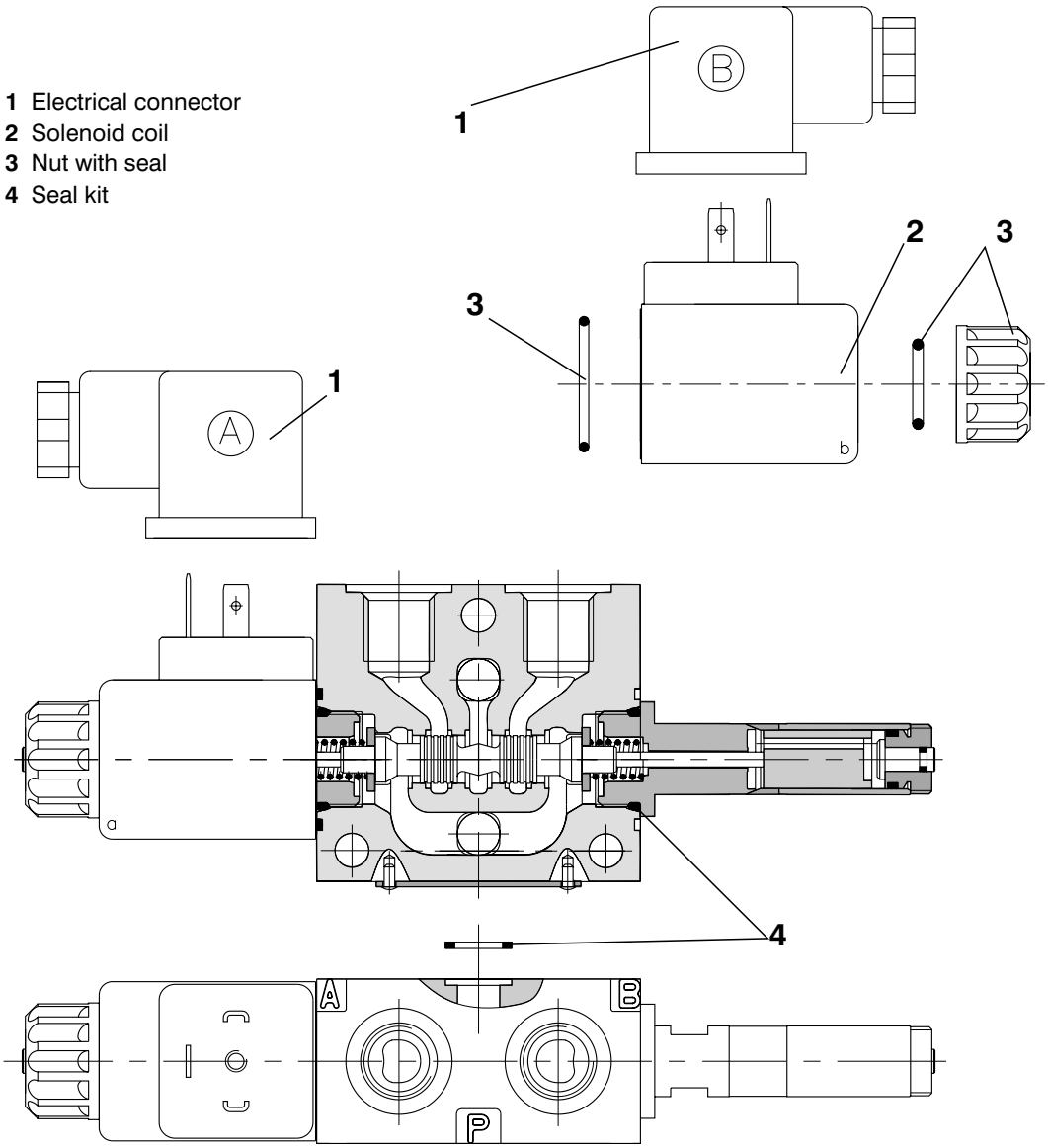


Dimensions

Number of section	1	2	3	4	5	6	7	8
Dimension A [mm]	87	118	149	180	211	242	273	304
Dimension B [mm]	113,5	144,5	175,5	206,5	237,5	268,5	299,5	330,5
Dimension L [mm]	55	100	133	163	194	224	256	287

Spare Parts

1 Electrical connector
2 Solenoid coil
3 Nut with seal
4 Seal kit



Subplates and connecting material

Subplates

Number	Type	Ordering number
Subplate No 5	PD1- 03 / 32 - 5 (G3/8)	479-9105
Subplate No 7	PD1 - 03 / 32 - 7 (G3/8 VPP2-04/S-32S)*	479-9107
Endplate No 0	PD1 - 03 / 32 - 0	479-9102

Connecting material + Mounting Angle

Number of section	3 pcs. Bolt + 3 pcs. Nut + 3 pcs. Washer (thread torque 3,6 Nm)	Ordering number
1	M6 x 55	479-9001
2	M6 x 100	479-9002
3	M6 x 133	479-9003
4	M6 x 163	479-9004
5	M6 x 194	479-9005
6	M6 x 224	479-9006
7	M6 x 256	479-9007
8	M6 x 287	479-9008
	2 pcs. Mounting angle + 2 pcs. Thread (M6 x 12) + 2 pcs. Washer (thread torque 3,6 Nm)	479-9900

Spare parts

Solenoid retaining nut with seal

Type of the nut	Seal ring		Ordering number
Standard nut	13 x 2	21,95 x 1,78	479-9502

Electrical connector, DIN 43 650

Type designation	Model	Max. input voltage	Connector A grey	Connector B black
			Ordering number	
K1	without rectifier - M16x1,5 (bushing bore ∅ 6-8 mm)	230 V AC/DC	936-9902	936-9901
K2	without rectifier with LED and quenching diode -M16x1,5 (bushing bore ∅ 6-8 mm)	12...24 V DC	936-9908	936-9907
K3	with rectifier-M16x1,5 (bushing bore ∅ 6-8 mm)	230 V AC	936-9904	936-9903
K4	with rectifier with LED and quenching diode -M16x1,5 (bushing bore ∅ 6-8 mm)	230 V AC	936-9910	936-9909
K5	without rectifier - M16x1,5 (bushing bore ∅ 4-6 mm)	230 V AC/DC	936-9906	936-9905

Seal kit

Type	Dimensions, number		Ordering number
	Square ring	O-ring	
Standard NBR70	9,25 x 1,68 (2 pcs.)	16 x 1,8 (2 pcs.)	479-9500
Viton	9,25 x 1,78 (2 pcs.)	16 x 2 (2 pcs.)	479-9501

Solenoids

Type	E1	E1	E1
Voltage	01200	02400	20500
Ordering number	941-1005	941-1007	941-1009

* For other pressure steps see ARGO-HYTOS data sheet HA 5093.

Preferred Types of Valves

Type	Ordering number	Type	Ordering number
RPEK1-03G2Z11/01200E1	479-0007	RPEK1-03G3Y11/02400E1	479-0016
RPEK1-03G2R11/01200E1	479-0005	PD1-03/32-5(G3/8)	479-9105
RPEK1-03G3Y11/01200E1	479-0048	PD1-03/32-7(G3/8VPP2-04/S-32S)	479-9107
RPEK1-03G2Z11/20500E1	479-0080	PD1-03/32-0	479-9102
RPEK1-03G2R11/20500E1	479-0081	M6 x 133	479-9003
RPEK1-03G3Y11/20500E1	479-0082	M6 x 194	479-9005
RPEK1-03G2Z11/02400E1	479-0052	M6 x 256	479-9007
RPEK1-03G2R11/02400E1	479-0045	2 pcs. Mounting angle + 2 pcs. Thread (M6 x 12) + 2 pcs. Washer (thread torque 3,6 Nm)	479-9900

Caution!

- For directional valves with two solenoids, one solenoid must be without power before the other solenoid can be powered.
- Other functional symbols on request.
- The packing foil is recyclable.
- The protecting plate can be returned to the manufacturer.
- The technical information regarding the product presented in this catalogue is for descriptive purposes only. It should not be construed in any case as a guaranteed representation of the product properties in the sense of the law.

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