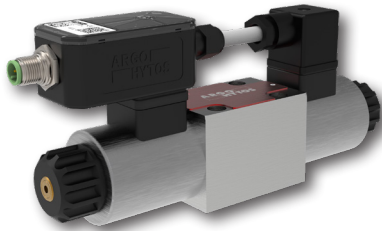


Proportional Directional Control Valve, Pilot Operated

PRM8-06

Size 06 (D03) • Q_{max} 140 l/min (37 GPM) • p_{max} 350 bar (5100 PSI)



Technical Features

- › Pilot operated proportional directional control spool valve with high hydraulic power
- › Subplate mounting surface acc. to standard ISO 4401 (size 06), DIN 24340 (CETOP 03)
- › The valve is designed for control of movement direction of actuator and continuous speed regulation proportionally to the input command signal
- › Valve control with the help of external or integrated electronic control unit in the form of connector plug
- › Manual override of valve spool
- › Optional type of electric connector for the valve without integrated ECU
- › Adjustable position of coil connector suitable for mounting, achievable by turning the coil after loosening the fastening nut
- › In the standard version, the valve housing is phosphated for basic surface corrosion protection and as preparation for painting. Steel parts are zinc-coated for 240 h salt spray protection acc. to ISO 9227
- › Enhanced surface protection for mobile sector available for the valve housing and steel parts (ISO 9227, 520 h salt spray)

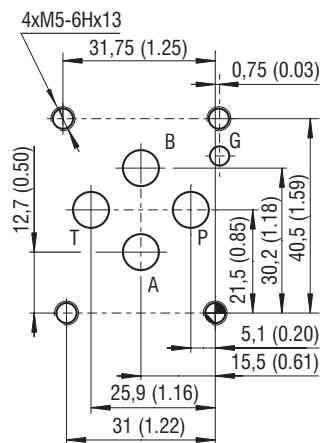
Functional Description

The proportional directional control spool valve is designed to control the movement direction (double solenoid valve), stop, control the speed and position of the piston rod of hydraulic cylinder or shaft of hydraulic motor. The speed of movement is proportional to the volumetric flow through the valve, which is continuously regulated by throttling at the control edges of spool, proportionally to the input command signal. The pilot operated directional control valve has a hydraulically operated main spool, which follows the position of control spool, operated by solenoids. The hydraulic operation of main spool allows to control high hydraulic power because the power characteristic of the valve is unlimited by acting hydrodynamic forces.

The valve can be controlled by electronic control unit EL-7, which converts an input command signal into output PWM current signal for solenoid coils. The electronic control unit EL7 is available as external for connection to a DIN rail (EL7-E, see datasheet HA 9152) or integrated on the valve in a form of connector plug (EL7-I, see datasheet HA 9151).

Technical Data

ISO 4401-03-02-0-05



Ports P, A, B, T - max. Ø7.5 mm (0.29 in)

Valve size		06 (D03)	
Max. operating pressure at ports P, A, B	bar (PSI)	350 (5100)	
Maximal flow at pressure 320 bar (4640 PSI)	l/min (GPM)	140 (37)	
Max. operating pressure at port T	bar (PSI)	210 (3050)	
Fluid temperature range (NBR)	°C (°F)	-30 ... +80 (-22 ... +176)	
Fluid temperature range (FPM)	°C (°F)	-20 ... +80 (-4 ... +176)	
Ambient temperature range	°C (°F)	-30 ... +50 (-22 ... +122)	
Nominal flow rate Q _n at Δp=10 bar (145 PSI)	l/min (GPM)	25 (6.6)	
Hysteresis	%	< 6	
Weight	kg (lbs)	2,4 (5.3)	
For protection degree of coil connector acc. to EN 60529 see page 3 - coil types			
Technical data of proportional solenoid			
Nominal supply voltage	V	12 DC	24 DC
Limit current	A	2,5	1,0
Mean resistance value at 20 °C (68 °F)	Ω	2,3	13,4
Technical data of electronic control unit EL-7			
Operating supply voltage U _{cc}	V DC	9 ... 32	
Reference voltage U _{ref}	V DC	5	
Max. current at U _{ref}	mA	20	
Types of input command signal, when EL7 is used		see datasheet EL7*	
Max. output current / 1 coil	A	3	
PWM frequency	Hz	80 ... 1 000	
Resolution of A/D converters	bit	12	
Ramp function	s	0 ... 45	
Dither – amplitude*	% from I _{max}	0 ... 30 % from I _{max}	
Dither – frequency*	Hz	60 ... 300	
* When the dither is activated, the PWM frequency is automatically set to 15 kHz			
	Datasheet	Type	
General information	HA 0060	products and operating conditions	
Coil types / Connectors	HA 8007 / HA 8008	C22B* / K*	
Mounting interface	HA 0019	Size 06	
Spare parts	HA 8010		

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Proportional Directional Control Valve, Pilot Operated									Surface treatment standard A zinc-coated (ZnCr-3), ISO 9227 (240 h) B zinc-coated (ZnNi), ISO 9227 (520 h)
Valve size									Clamping lenght for mounting screw 22mm (0.86 in)
Spool symbols see table „Spool Symbols“									Seals NBR FPM (Viton)
Nominal flow rate at Δp=10 bar (145 PSI) 25 l/min (6.6 GPM) 25									No designation V
Rated supply voltage of solenoid (at the coil terminal) Without solenoid coil (type without integrated ECU only) 00 12 V DC 12 24 V DC 24									Manual override standard (operated by pin) cap nut covered rubber boot protected
Integrated electronic control unit (standardly on the solenoid „a“)									Connector plug acc. to EN 175301-803-A valve with integrated electronic control unit K1 connector plug EN 175301-803-A without rectifier for the valve without integrated ECU and with coils E1 or E2
Electronic control unit EL7-IA with an analogue input command signal EL7-A Electronic control unit EL7-IC for connection to the CAN bus EL7-C									Connector (only for valves without EL7-I) EN 175301-803-A E1 with quenching diode E2 AMP Junior Timer - axial direction (2 pins; male) E3A E3A with quenching diode E4A loose conductors (two insulated wires) E8 E8 with quenching diode E9 Deutsch DT04-2P - axial direction (2 pins; male) E12A E12A with quenching diode E13A

- For proportional valves with two solenoids, single solenoid must be de-energized before the other solenoid can be charged.
- The solenoid operated valves are delivered without connectors. For available connectors see datasheet HA 8008.
- Mounting bolts M5x30 DIN 912-10.9 or studs must be ordered separately. Tightening torque is 8.9+1 Nm (6.56+0.7 lbf.ft).
- Besides the shown, commonly used valve versions other special models are available.
- Contact our technical support for their identification, feasibility and operating limits.

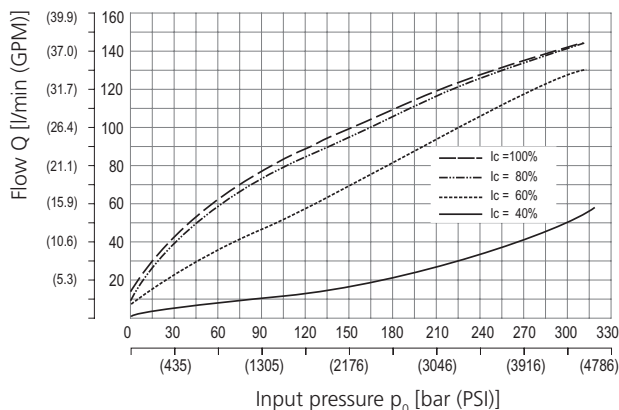
Spool Symbols

Type	Symbol	Type	Symbol
2Z11		3Y11	
3Z11		3Y21	

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

Operating limits:

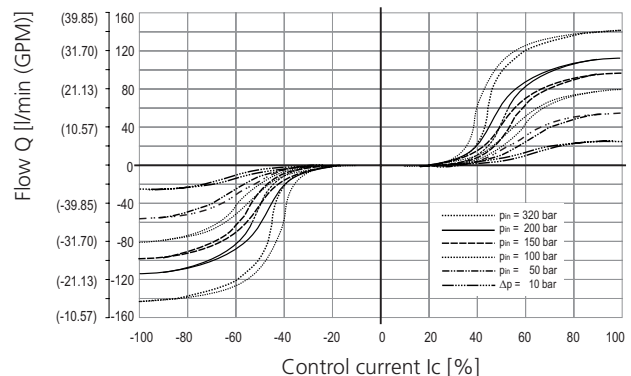
Flow direction $P \rightarrow A / B \rightarrow T$ or $P \rightarrow B / A \rightarrow T$



The coil current which initializes the flow through the proportional directional valve can differ due to the production tolerances about in a range of $\pm 6\%$ of the limit current.

Regulated flow related to control signal

$\Delta p=10$ bar (145 PSI)



Electronic control unit EL7

The ECU EL7 allows direct independent control of the valve with an analogue input command signal or connection of the valve to the CANBus control system of machine.

Proportional valve with external electronic control unit EL7-E

The valve can be controlled by external ECU EL7-E designed for connection to a DIN rail. The user electrically connects the ECU to the valve with a cable. The ECU EL7-E can be used for control of one solenoid or two solenoid valves.



Selection and setting of ECU parameters is described in datasheet HA 9152

Valve with one solenoid and integrated ECU EL7-I*-1

The ECU in the form of connector plug is simply mounted on the socket of connector EN 175301-803-A of solenoid coil and fastened with a fixing screw.

Valve with two solenoids and integrated ECU EL7-I*-2-105

The ECU in the form of connector plug is simply mounted on the socket of connector EN 175301-803-A of solenoid coil and fastened with a fixing screw. The second solenoid is connected to the ECU with a cable. If the integrated ECU EL7-I is ordered separately, the length of cable must be specified. The length of cable is defined as a distance between fastening screws of ECU and connector plug.



Selection and setting of ECU parameters is described in datasheet HA 9151

Solenoid Coil in millimeters (in)

E1, E2 Protection Degree IP65	E3A, E4A Protection Degree IP65 / IP67	E8, E9	E12A, E13A Protection Degree IP67 / 69K
		 Note: A = Standard 300 mm (11.8 in), other lengths on demand	

The specified IP rating applies only in the case of correctly connected connectors (male + female) with the corresponding IP rating.

Manual Override in millimeters (in)

No Designation - Standard (operated by pin)	Designation N1 - Cap Nut Covered	Designation N2 - Rubber Boot Protected

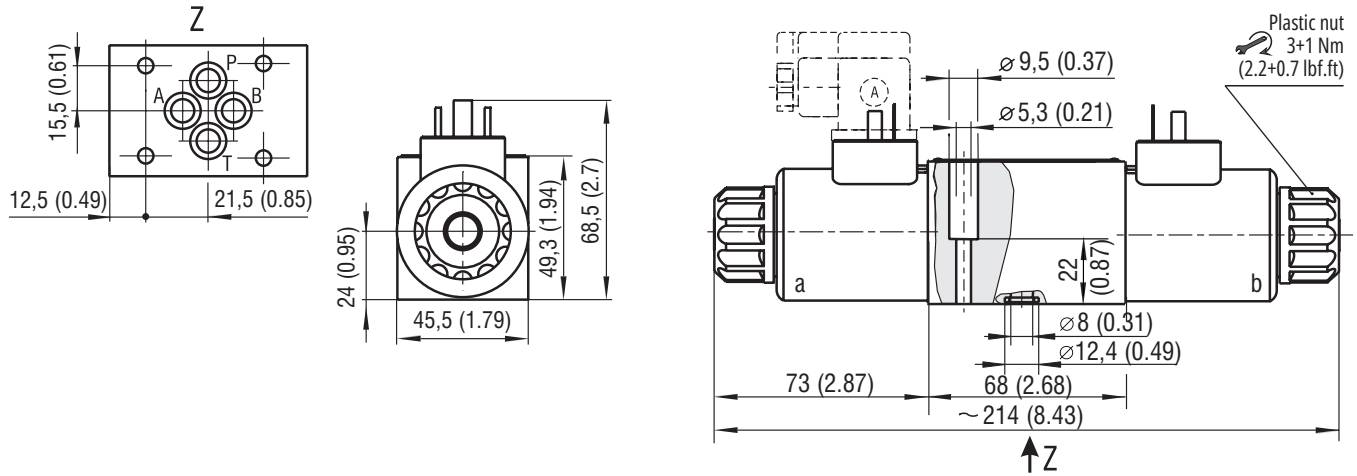
In case of solenoid malfunction or power failure, the spool of valve can be shifted with a manual override under condition that the P channel is pressurized. The main spool is operated hydraulically after shifting the control spool with the manual override. The pressure in T port does not exceed 25 bar (363 PSI). For alternative manual overrides contact our technical support.

Dimensions in millimeters (in)

PRM8-063.../-...E1

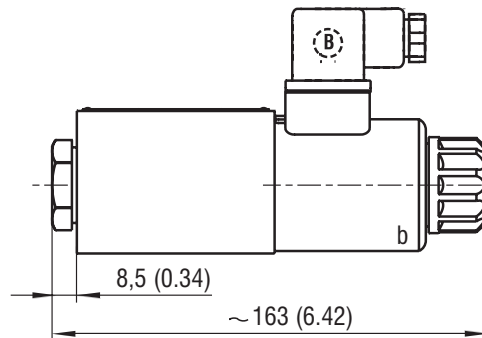
Valve with two solenoids
Example with electrical terminal
EN 175301-803-A (E1, E2)

Spool type
3Z11, 3Y11, 3Y21



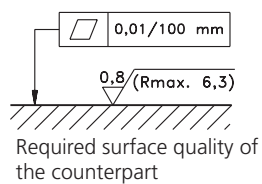
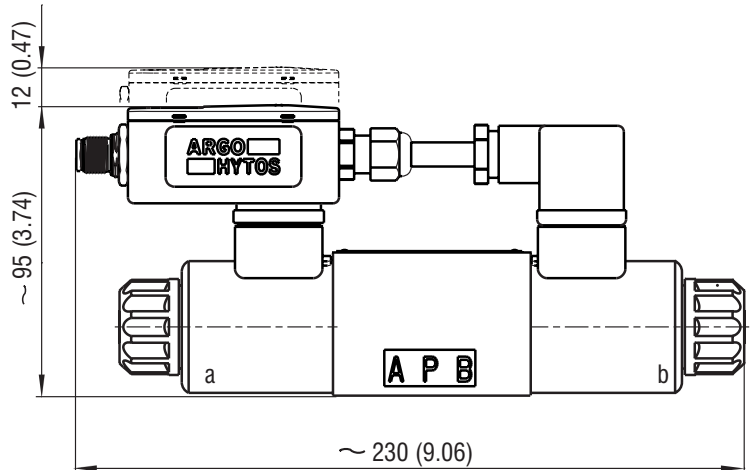
PRM8-062.../-...E1

Valve with one solenoid "b"
Spool type 2Z11



PRM8-063*/*-*EL7*...

Valve with two solenoids and integrated electronic control unit EL-I*-2-105



Required surface quality of the counterpart



Proper function of the valve is guaranteed only if the supply pressure in the "P" channel is present and exceeds always the pressure in the "T" channel.