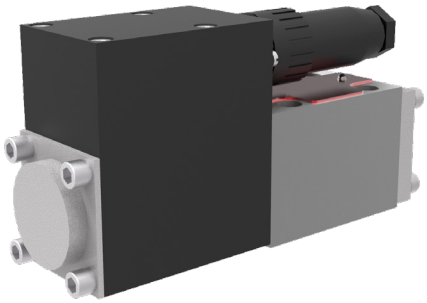
Proportional directional valve with linear motor and displacement transducer

PRL2

Size 06 (D03) • Q_{max} 32 l/min (9 GPM) • p_{max} 250 bar (3600 PSI)



Technical Features

- Proportional valve for control of hydraulic motors and actuators
- High reliability
- Single-stage control of the spool by a linear motor
- Electronic spool-position feedback
- Less stringent oil filtration requirements
- Control valve with subplate mounting surface acc. to ISO 4401, DIN 24340 (CETOP 03) standards
- In the standard version, the valve housing is phosphated and steel parts zinc-coated for 240 h salt spray protection acc. to ISO 9227

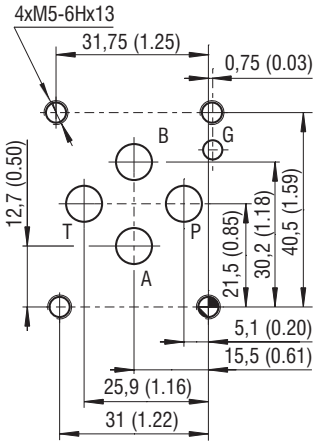
Technical Data

Valve size		06 (D03)		
Max. operating pressure	bar (PSI)	250 (3630)		
Rated flow at Δp = 70 bar	l/min (GPM)	3.2 (0.85)	16 (4.23)	32 (8.45)
Rated flow at Δp = 10 bar	l/min (GPM)	1.1(0.29)	6.3 (1.66)	12.5 (3.30)
Hysteresis	%	< 1		
Threshold	%	< 0,5		
Fluid temperature range	°C (°F)	-30 .... +80 (-22 ... +176)		
Ambient temperature, max	°C (°F)	+50 (+122)		
Weight	kg (lbs)	2.3 (5.07)		

Flow losses in l/min		Spool lap			
at input pressure 100 bar, viscosity 35 mm²/s and middle position of spool					
		0	1	2	3
PRL2-06-03-.-24	l/min	< 0.8	< 0.2	< 0.2	< 0.2
PRL2-06-16-.-24		< 1.5	< 0.2	< 0.2	-
PRL2-06-32-.-24		< 1.5	< 0.2	< 0.2	-

	Data Sheet	Type
General information	GI_0060	Products and operating conditions
Mounting interface	SMT_0019	Size 06
Spare parts	SP_8010	

ISO 4401-03-02-0-05

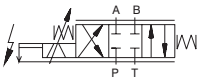
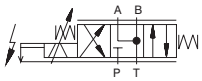
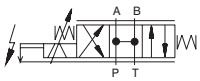


Ports P, A, B, T - max ∅7.5 mm (0.29 in)

Functional Description

Proportional directional valves PRL2 are designed for continuous remote control of hydraulic motors and actuators. The single-stage robust design and the internal electronic feedback ensure reliability, reduce the oil filtration requirements and provide the valve with very good static and dynamic properties. The valve comprises basically three sections. The hydraulic section consists of a casting valve body with the control spool with its meetering edges engineered to ensure the required function. The actuating section is a linear motor. The core of the linear motor is centered by means of springs and the working gaps are premagnetized in the opposite direction by permanent magnets (5) made from rare earth. With the control coil (energized, the core and the control spool connected with it are shifted from the middle position, the displacement being directly proportional to the control current and the displacement direction to the direction of the current. On failure of the cable or disconnection of the supply voltage, the springs return the core and spool in the middle position. The third main section of the valve PRL2 is the inductive displacement transducer. Information about the spool position is processed in the integrated electronic circuit, which also enables the null and gain adjustment. Then the information is transmitted to the controller in the electronic control unit EL2. The valve uses anAMPHENOLconnector of the enclosure type IP 65. The connection of the valve with the electronic control card EL2-24BA is made by a six-core cable. This cabel is to be ordered according to the length required. With the basic surface treatment, all the manufactured components are phosphate coated. Whereas all the connecting components are zinc coated.

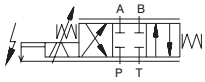
Spool Symbols

Symbols	Z11	Y11	H11
			

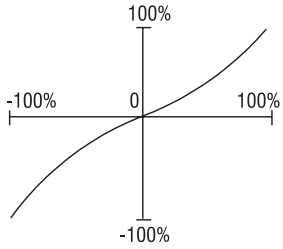
Performance Curves measured at ν = 35 mm²/s (166 SUS) and t = 40 °C (104 °F)

Spool lap 0

Flow characteristic

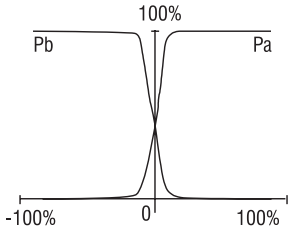


Q [l/min] / Command signal [%]



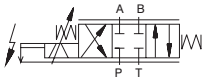
Pressure characteristic

P_A, P_B [bar] / Command signal [%]

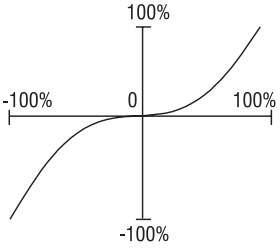


Spool lap 1

Flow characteristic

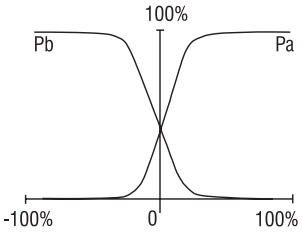


Q [l/min] / Command signal [%]

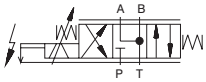


Pressure characteristic

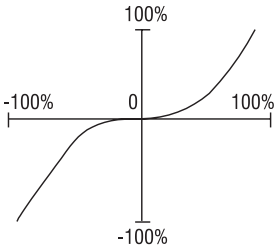
P_A, P_B [bar] / Command signal [%]



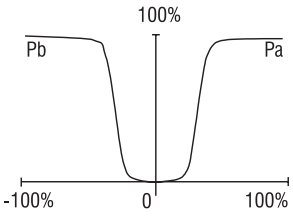
Spool lap 2



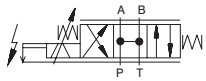
Q [l/min] / Command signal [%]



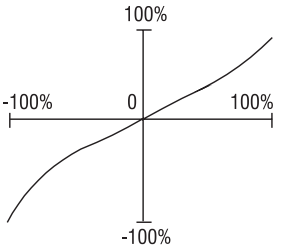
P_A, P_B [bar] / Command signal [%]



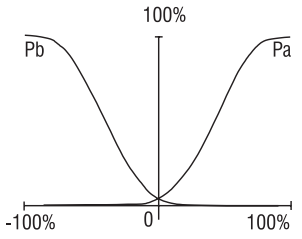
Spool lap 3



Q [l/min] / Command signal [%]



P_A, P_B [bar] / Command signal [%]



Ordering Code

PRL2-06- □ - □ - □

Proportional directional valve with linear motor and displacement transducer

Nominal size
ISO 4401-03-02-0-05,
DIN 24340 (CETOP 03), size 06

Nominal flow in l/min at the pressure difference at the valve

Δp 70	(1015)	Δp 10	(145)	[bar (PSI)]	
3,2	(0.8)	1,1	(0.29)	[l/min (GPM)]	**03**
16	(4.2)	6,3	(1.7)	[l/min (GPM)]	**16**
32	(8.5)	12,5	(3.3)	[l/min (GPM)]	**32**

Spool lap

„Z" zero	**0**
„Z" 25% overlap	**1**
„Y" 25% overlap	**2**
„Y" pressure valve (only Q_n 03)	**3**

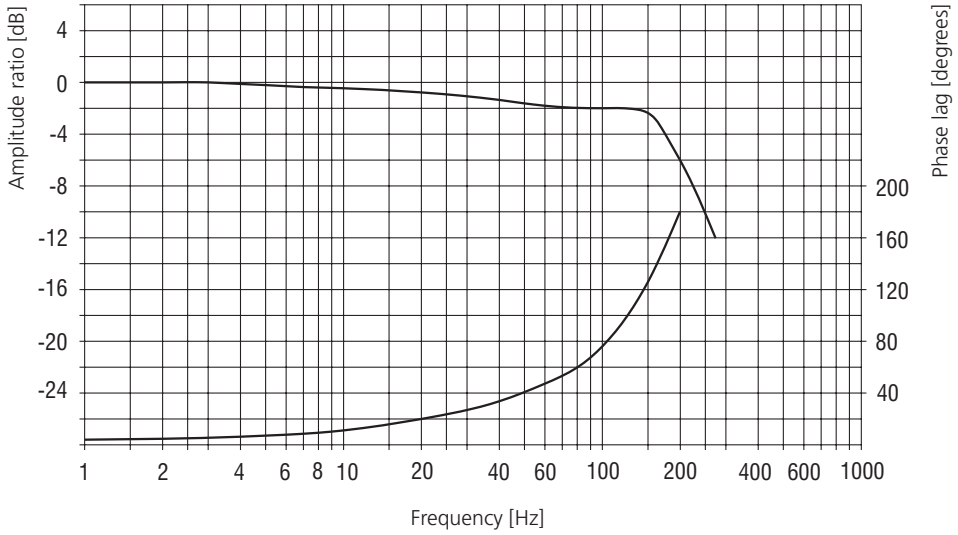
Nominal supply voltage
24 24V DC (22.4 - 27.5)

	Spool lap			
	0	1	2	3
PRL2-06-03-.-24	●	●	●	●
PRL2-06-16-.-24	●	●	●	
PRL2-06-32-.-24	❍	❍	❍	

● common types
❍ restricted max. parameters, consultation with the manufacturer necessary. Additional flow rates delivered by request.

Frequency Response

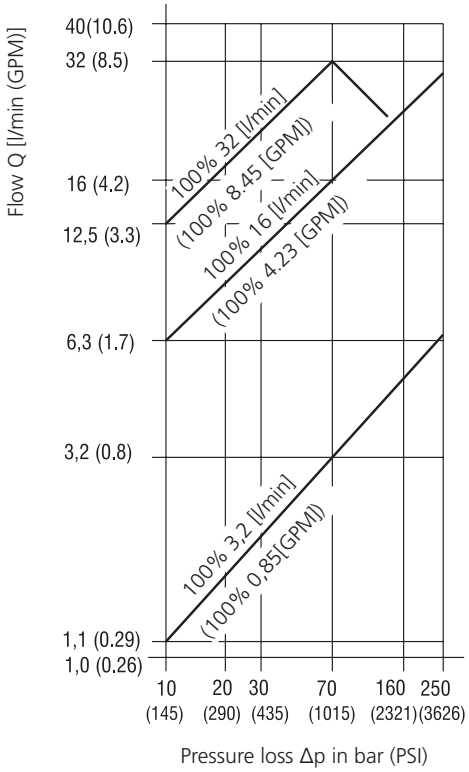
PRL2-06-16-0-24
p_o = 100 bar (1450PSI)
x = 25%



Power characteristics

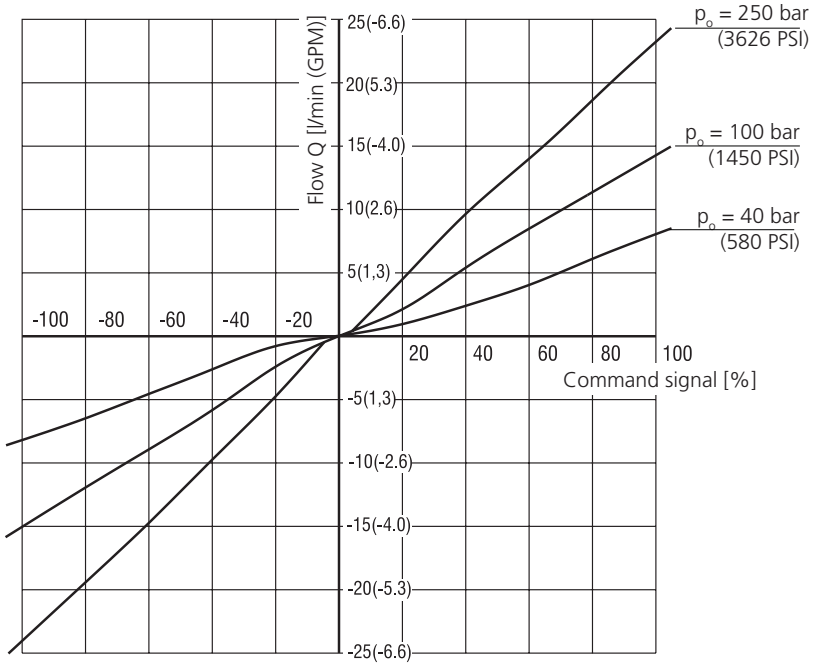
Measured at ν = 35 mm²/s (166 SUS) and t = 40 °C (104 °F)

For nominal flow rates:
3,2 and 16 and 32



Flow characteristics

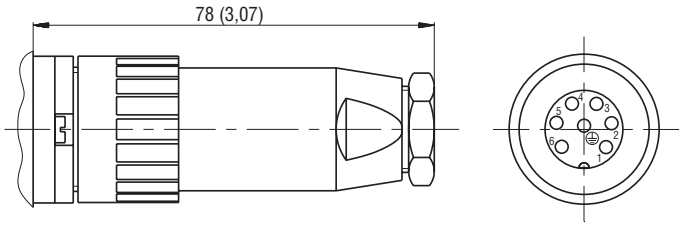
PRL2-06-16-0-24
Input Pressure Differential



Electric Connection in millimeters (inches)

Connector plug AMPHENOL T 3105 101 DIN 43 563-BF6-3/Pg11
6-core cable 2 x 1 + 4 x 0.15

Connector plug is to be ordered either separately or as part of the connecting cable - ordering number see the table bellow.



Model	Ordering number
Connector plug AMPHENOL T3105 101	16031300
Connector plug/connecting cable PRL2 - 2 m	16031400
Connector plug/connecting cable PRL2 - 3 m	16031500
Connector plug/connecting cable PRL2 - 5 m	23143300
Connector plug/connecting cable PRL2 - 10 m	23143400
Connector plug/connecting cable PRL2 - 15 m	23143600
Connector Connection	
Signal	Contact - wire colour
Inverted transducer output	1 - black
Noninverted transducer output	2 - green
Transducer supply 24V	3 - red
Transducer supply 0V	4 - white + screening
Input 1 of the linear motor PRL2	5 - white strong
Input 2 of the linear motor PRL2	6 - red strong

Dimensions in millimeters (inches)

Mounting screws 8.9 Nm (7 lbf.ft)
M5 x 45 DIN 912-10.9