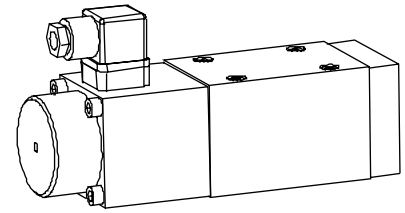


Proportional directional valve

- not pressure compensated
- $Q_{max} = 60 \text{ l/min}$
- $p_{max} = 315 \text{ bar}$

**NG10
ISO 4401-05**

DISCRIPTION

Directly controlled spool valve, actuated by a proportional solenoid, in five chamber design. Wet solenoid in oil. Spool with precisely machined notches on control edges produce a progressive volume flow characteristic similar to proportional flow valves. Reduced pressure drop achieved by optimised flow channels. Precise spool fit, long life. Spool made of hardened steel, valve body made of high quality cast iron suitable for hydraulic valves. Flange type, threaded connection by means of a connecting plate.

FUNCTION

Spool stroke, aperture and volume flow increase proportionally to the increase in the electric current at the proportional solenoid. Proportional directional valves NG10 are not load-compensated. Meter-in, meter-out and symmetrical flow control options available. The optimum spool shape and progressive characteristics curve allow fine motion control. Wandfluh power amplifiers are needed to activate the proportional directional valves (register 1.13).

APPLICATION

Because of the high resolution, high volume flow and low hysteresis, these valves are particularly suitable for demanding tasks. Applications: handling operations, robots, actuators, radar controlled vehicles, tool making and paper production machines, in other words anywhere where precise control systems are needed.

CONTENT

GENERAL SPECIFICATIONS	1.10-90/1
HYDRAULIC SPECIFICATIONS	1.10-90/1
ELECTRICAL SPECIFICATIONS	1.10-90/1
TYPE CHARTS/ DESIGNATIONS OF SYMBOLS	1.10-90/2
CONTROL MODE	1.10-90/2
CHARACTERISTICS	1.10-90/2
DIMENSIONS	1.10-90/2
PARTS LIST	1.10-90/2
ACCESSORIES	1.10-90/2

TYPE CODE

International mounting interface ISO	A	P	W	<input type="checkbox"/>	4	<input type="checkbox"/>	-	50	-	<input type="checkbox"/>	#	<input type="checkbox"/>
Proportional-control valve												
Control mode:												
Symmetrical												<input type="checkbox"/>
Meter-in												<input type="checkbox"/>
Meter-out												<input type="checkbox"/>
(see control mode on page 2.)												
Number of control ports												
Description of symbols acc. to table 1.10-90/2												
Nominal flow at 10 bar pressure drop over 2 metering edges												
$Q_N = 50 \text{ l/min}$												
Supply voltage	12 VDC		<input type="checkbox"/>		24 VDC		<input type="checkbox"/>					
			<input type="checkbox"/>				<input type="checkbox"/>					
Design-Index (Subject to change)												

GENERAL SPECIFICATIONS

Nominal size	NG10 to ISO 4401-05
Designation	4/2-, 4/3-way proportional-control valve
Construction	Direct operated spool valve
Mounting	Flange, 4 fixing holes for socket head cap screws M6x65
Fastening torque	$M_s = 9,5 \text{ Nm}$ (screw quality 8.8)
Pipe connection	Connection plates, Multi-station flange subplate, Longitudinal stacking system
Mounting position	any, preferably horizontal
Ambient temperature	-20...+50°C
Weight: 4/2-way	$m = 4,3 \text{ kg}$
4/3-way	$m = 5,7 \text{ kg}$

HYDRAULIC SPECIFICATIONS

Fluid	Mineral oil, other fluid on request
Contamination efficiency	ISO 4406, class 16/13 (Required filtration grade $\beta_{6...10} \geq 75$) refer to data sheet 1.0-50/2
Viscosity range	12 mm ² /s...320 mm ² /s
Fluid temperature	-20...+70°C
Working pressure	$p_{max} = 315 \text{ bar}$ (connection P, A, B)
Tank pressure	Max tank pressure in T $p_{max} = 160 \text{ bar}$
Nominal volume flow	$Q_N = 50 \text{ l/min}$ ($Q_{max} = 60 \text{ l/min}$) At 10 bar pressure drop over 2 metering edges. For values which deviate from the nominal flow Q_N the valve pressure drop Δp can be calculated by following formula:

$$\Delta p = \Delta p_N \cdot \left(\frac{Q}{Q_N}\right)^2$$

Q_N = Nominal volume flow
 Q = Effective volume flow
 Δp_N = Nominal pressure drop 10 bar

Min. volume flow	$Q_{min} = 0,05 \text{ l/min}$ on request
Leakage volume flow	
Resolution	1 mA *
Repeatability	≤ 1 % *
Hysteresis	≤ 2 % *
	* by optimal dithersignal

ELECTRICAL SPECIFICATIONS

Construction	Proportional solenoid, wet pin push type, pressure tight.	
Standard-Nominal voltage	U = 12 VDC	U = 24 VDC
Limiting current	$I_G = 2400 \text{ mA}$	$I_G = 1110 \text{ mA}$
Relative duty factor	100% DF (see data sheet 1.1-430)	
Protection class	IP 54 to DIN 40050	
Connection / Power supply	Over device plug connection to ISO 4400 / DIN 43650 (2P+E)	

