2-WAY FLOW CONTROL VALVE

Valve actuation with proportional solenoid
Modular stack valve NG 10 - 210 bar - to 63 L/min
special model with mounting surface to schiedrum-standart

Baureihe
280BP- M240/241

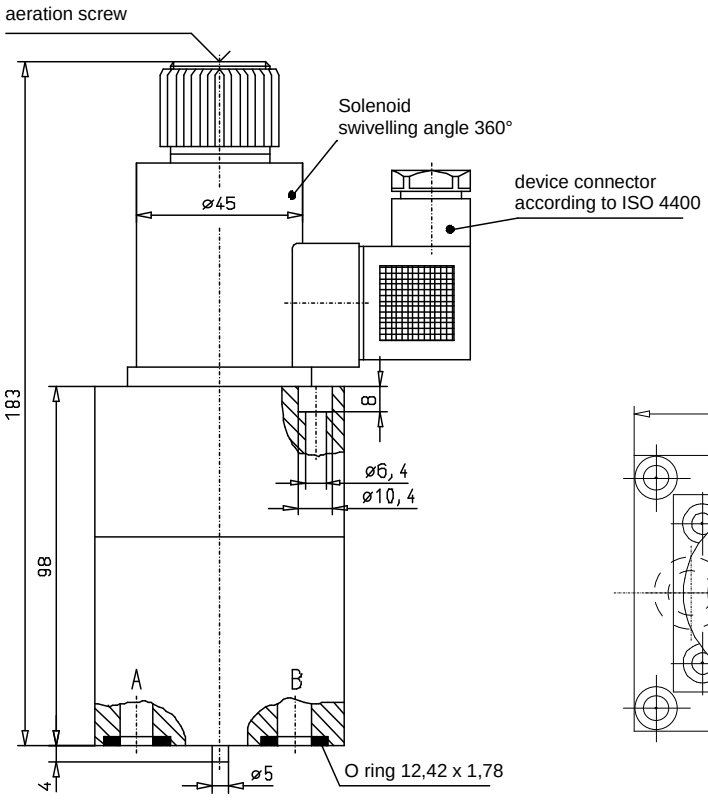
2-way flow control valves are flow valves (throttle valves) with integrated pressure regulator. The valves automatically control an adjustable volume flow independently of pressure variations in the supply or discharge line to make it constant.

FEATURES

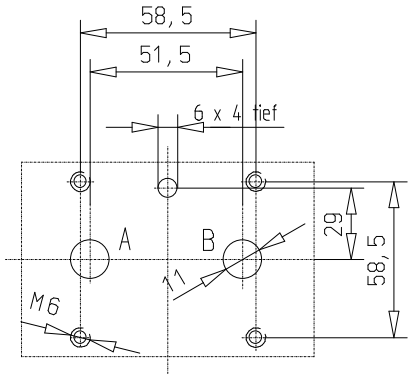
- Solenoid systems: power-controlled; pressure resistant. Coil can be replaced without opening the hydraulic system
- Remote-controllable, programmable
- Valve neutral position: closed
- Floating time 70 msec.
- Volume flow signal function: linear
- Assembly on sub plates with pipe connections or control block
- With by-pass check valve
- Standard sealing material Buna N/NBR

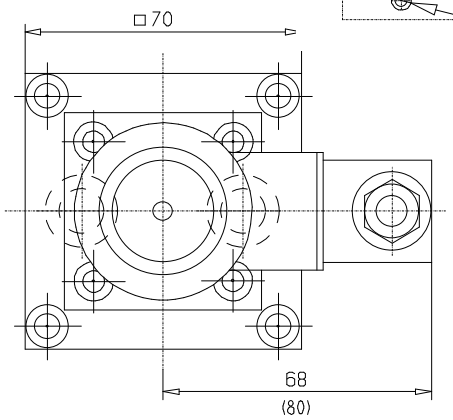
FEATURERS special model M 240 / M 241

- The valves have a company internal valve hole pattern. This makes a very compact valve building method possible.
- Valves with the modification no. M 240 have an evasion check valve. valves no. M 241 are equipped without check valve.



mounting surface





ORDER INFORMATION

The scope of the flow control valves includes the O rings for sealing the port holes and the connecting plug.
Four attachment screw
M 6 x 100 DIN 912 - 10.9
M_A= 14Nm and the Magnet device connector.

Name	2- way flow control valve	280	B	P	63	L	M 240

Type series
Series code letter
Valve operating mode P = proportional solenoid
Rated adjustment volume flow: 25; 40; 63 l/min
volume flow signal function: L = linear
modification no.: M 240 = with evasion check valve
modification no.: M 241 = without evasion check valve

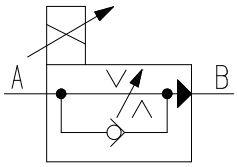
ACCESSORIES

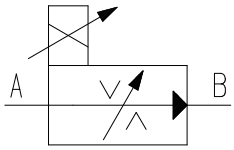
Control amplifier type StA 03 - ES	see dimension drawing 9-74-003-2014
connecting plate	see dimension drawing 9-74-200-0015

CHARATERISTICS

1. General

Symbol





Typen	280 BP-. L M 240	280 BP-. L M 241
Design	Adjustment throttle:	trunk piston with rectangular opening
	Differential pressure valve:	switched in series with the adjustment throttle
	Return valve:	spring-loaded ball valve
Weight	4 kg	
Mounting position	any	
Direction of volume flow	A to B controlled B to A unrestricted return flow	
Ambient temperature	-10℃ to +50℃	

2. Hydraulic characteristics

Rated pressure / max. pressure	210 bar for all connections
Hydraulic fluid	Hydraulic oil according to DIN 51 524 (1,2)
Hydraulic fluid temperature range	-20℃ to +70℃
Viscosity range	5 - 350 mm^2/sec
Rated variable volume flow	25; 40; 63 l/min
Min. adjustable and controllable volume flow	approx. 10 - 20 cm^3/min, recommended control range 1 : 25 referred to the rated variable volume flow
Max. permissible volume flow via the check valve	65 l/min
Contamination level / filtering	General permissible class 16/13 according to ISO 4406 or 7 according to NAS 1638 (recommended filter: minimum retaining rate $\beta_{5\text{-}10} \geq 75$)

3. Type of actuation

electrical - proportional solenoid

3.1 Solenoid

Type	Single solenoid - pressurized, pressure proof
Voltage	DC
Rated voltage	12 V
Rated current	1,6 A
Max. current	1,9 A
Min. current (basic current)	approx. 400 mA
Nominal resistance	R_{20} = 5,7 Ohm
Coil inductively	
Nominal output	14,6 W
Duty cycle	100%
Connection type	Plug connection according to DIN 43 650-AF2-PG9 (ISO 4400)
Protective system	IP 54 according to DIN 40 050 and ICE

4.Response characteristic

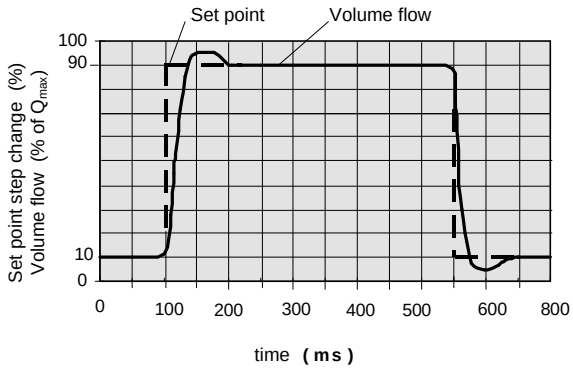
Sensitivity	< 1 %	of the rated variable volume flow at Δ p 50 bar
Repeatability	< 1 %	
Range of inversion	< 1 %	
Hysteresis	< 4 %	
Volume flow signal function	see fig. 2	
Time response	see fig. 1	

CHARATERISTICS

Time response

Fig. 1 shows the frequency response or step response in case of a set point step change from 10% to 90% and inversely.

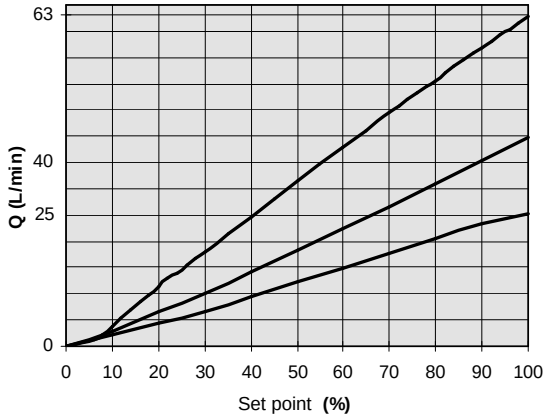
Fig. 1



Volume flow signal function characteristics Q = f (U)

Fig.2 shows the volume flow dependence on the set point voltage.

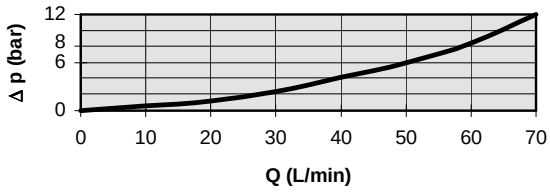
Fig. 2



Δp-Q-characteristic line; Δp=f (Q)

Fig. 3 shows the pressure loss of the valve fort he Volume flow direction B to A through the by-pass Return with the setting screen closed.

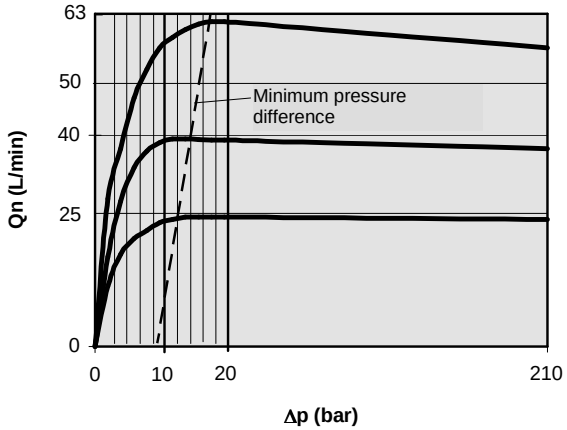
Fig. 3



Q-Δp- characteristic line; Q=f (Δp)

Fig. 4 shows the control behaviour of the valve for the volume flow direction A to B for the various rated flow volume ranges as well as the minimum pressure difference required for the function.

Fig. 4



Description of the valve

1. Valve

The valves automatically control an adjustable discharging flow constant within the function limits independently of pressure variations in the entrance or drain line. They may be integrated at the supply or discharge side of the consumer. The volume flow adjustment is infinitely variable through the proportional solenoid which is controlled by an electronic control amplifier. The proportional solenoid is an electric-mechanical transducer. Its output quantity force is proportional to the flow. The magnetic force acts against a counter check pressure spring with the orifice opening. As the orifice section increases linearly over the solenoid stroke there is also a linear relation between nominal value and volume flow.
The pressure independence of the volume flow is obtained by means of the differential pressure valve (pressure regulator). It guarantees a constant pressure difference at the setting orifice and is switched in series with the latter (secondary controller). Due to the extremely compact design, extremely short control times of few millisecond are obtained in case of pressure variations.

The pressure regulator is open in its neutral position. This may lead to a starting jump when switching on the valve. The valves can be delivered optionally with a modified control port via which the pressure regulator can be closed in its neutral position (see additional information 9-74-020-0026).The volume flow is controlled in one flow direction only. The M 240 has a evasion check valve that permitted an unrestricted return flow at low pressure loss in the opposite direction. It is designed as spring-tensioned ball bearing seat valve. In the modification M 241 current reversal is throttled.

Attention!
The valve must not be driven by the electronic, when the hydraulic is shut down. Internal valve damages cannot be excluded. For this case the proportional amplifier StA03-ES enable signal (connector Pin Z6) or the supply voltage should be disabled.

2. Material

The valve parts are made of engineering steel. All wear parts are surface-hardened. The external valve parts are burnished, the solenoid and sensor coil is galvanized and chromized.

For applications in excess of the given specifications, please contact Schiedrum.

All specified parameters are partially based on long years of experience. The data are typical and may slightly deviate depending on the valve series. All measurements were carried out on a test stand with an oil viscosity of 36 mm^2/s, a filter mesh of < 10 µm and an optimally adjusted electronic control system. All data given here should be used as description for the product only and they are not to understand as warranty (guaranteed quality) in the sense of law.

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