THROTTLE VALVE

Valve regulation with proportional control magnet
subplate mounting NG 6 -210 bar to 30 l/min
with integrated digital controller

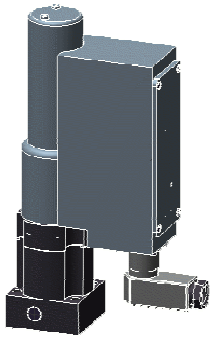
Type

108BD

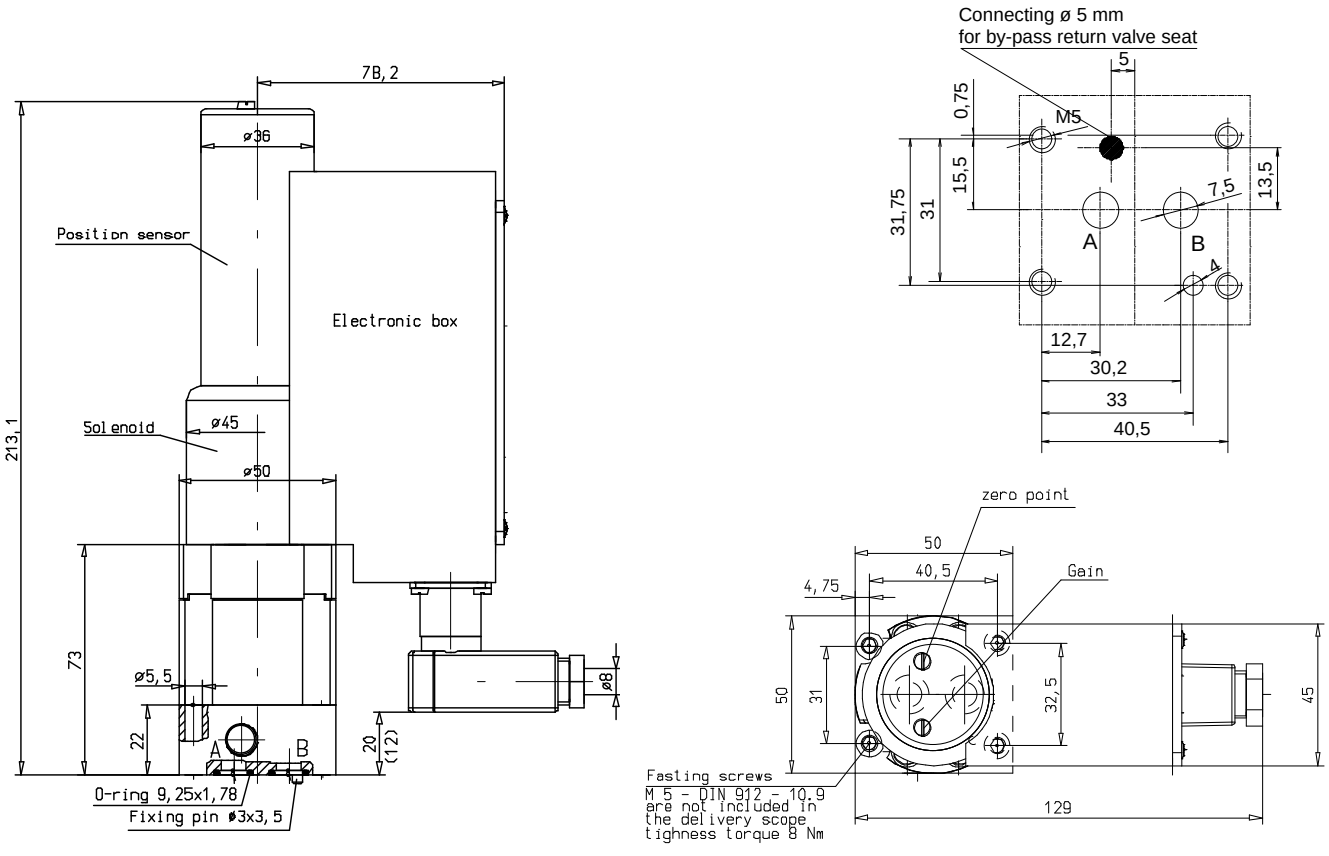
Throttle valves are hydraulic valves in which the volume flow depends on the throttle valve cross section and differential pressure. The control valve can be adjusted by means of orifice to ensure that, as far as possible, the equipment's efficiency by viscosity.

FEATURES

- Solenoid system with path sensor, pressure resistant
- Integrated digital control amplifier – ready to use
- valve neutral position: closed
- setting time: 50 - 100 ms
- flow signal function: linear
- choice (optional) of six orifice sizes
- mounting surface: DIN 24 340 - G6
- assembly to connection plates with pipe connections or control panel
- with or without by pass check valve
- standard sealing material: Buna N (NBR) other materials possible



Mounting surface DIN 24 340-G6 (ISO 5781)



ORDER INFORMATION

The scope of the flow control valve includes the O-rings for sealing the connecting holes and connecting plugs.

Description

Throttle Valve	108	B	D	2	R	B	M15

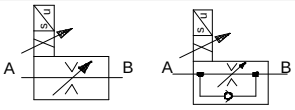
Type series
Series code letter
Valve operation: digital controlled = **D**
Flow rate: 2; 3; 4; 5; 6; 7
Return valve fitted: with = **R**; no coding = **without**
Signalrange: 0…10 V = **A**; 0…20 mA = **B**; 4…20 mA = **C**
Supplementary data for special models
e.g. special Viton sealings (FKM) = **M15**

ACCESSORY

set of valve fastenings	order no.: **44-108-00078** 4 pces socket head cap screws: M 5x30 DIN 912 -10.9
connection plates	see dimension sheet 9-74-030-2002

SPECIFICATION

1.General

Symbols	
Design	hole spool in bushing with rectangular window check valve: spring-loaded ball valve
Weight	2,1 kg
Mounting position	radon, preferably vertical
Direction of volume flow	A to B throttled, B to A unthrottled back flow with check valve
Abiment temperature range	- 25 ℃ to + 50 ℃

2.Hydraulic characteristics

Nominal pressure / max. pressure	210 bar for all connections
Max. permitted pressure difference	100 bar
Volume flow signal function	see Fig. 3-8
Leckage flow	Approx. 200 cm³/min (Δp 100 bar, set point 0, oilviskosity 36 mm²/s)
Hydraulic fluid	Hydraulic oil according to DIN 51 524 (1,2)
Hydraulic fluid temperature range	- 20 ℃ to + 70 ° C
Viscosity range	5 to 350 mm²/s
Contamination level / filtering	General permit table class 16/13 according to ISO 4406 or 7 according NAS 1638 (recommended filter: min. retaining rate $\beta_{5\text{-}10} \geq 75$)
Flow rate	2; 3; 4; 5; 6; 7 see Fig. 3-8
Max. permitted volume flow via check valve	40 L/min

3.Type of actuation

Electrically – proportional magnet position sensor

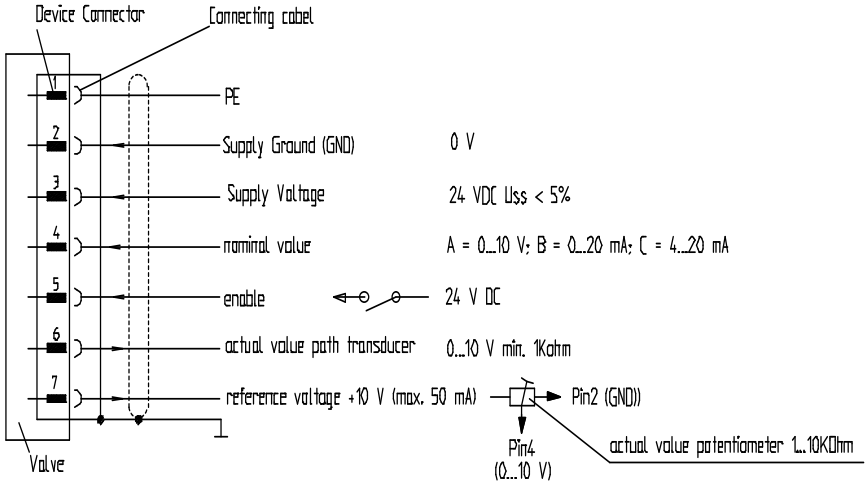
3.1 Magnet

Type	Single magnet – pressing, pressure sealed
Type of voltage	D.C. voltage
Rated voltage	12 V
Rated current	1,6 A
Limit current	1,9 A
Rated resistance	R_{20} = 5,7 ohm
Rated power	14,6 W
ON period	100 %
Type of connection	7- PIN connector, IP 65 according to DIN EN 60529

3.2 Position sensor

Type	Pressure sealed
Measuring system	Inductive; principle – differential transformer
Sensitivity, adjustable	1,5 V/mm +/- 15%
Zero shift, electrically	+/- 1 mm

Circuit diagram



Pin 5: Enable Signal:
The valve works only if the enable-pin is connected to +24V DC.
This pin can be used for emergency stop or if the hydraulic is shut down.

Pin 6: Actual value path transducer:
This Signal is proportional to the actual position of the path transducer.

3.3 Protective system (according to DIN 40050)	IP 65
3.4 Connection type	identical to C091 31F007 101 2 by Amphenol Tuchel
Cable diameter	max. 8 mm
Wire gauge	0,5 mm² (AWG 20)

4. Response characteristics

(Definition according to DIN 24 340)

Sensitivity	< 1 %	from nominal signal Δp 10 bar
Repeatability	< 1 %	
Hysterese	< 1 %	
Temperature drift (position sensor;		
Without viscosity influence)	< 0.1 % ΔQ/℃	
Time response	see Fig. 1	
Volume flow signal function	see Fig. 3-8	

CHARCTERRISTICS

Time response
The transient function or the step response for a signal input from 10 to 90% and vice versa.

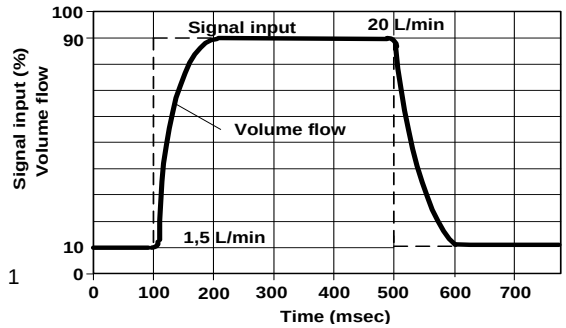


Fig. 1

Δp-Q-characteristic; Δp = f (Q)
The pressure drop in relation to the flow from connection B to A via return check valve with the orifice restrictor closed.

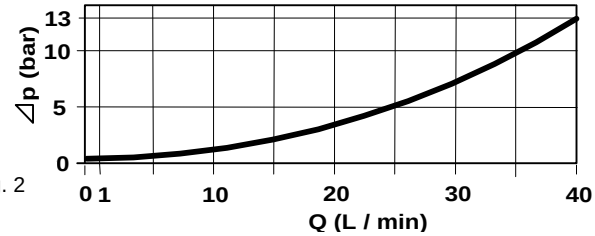
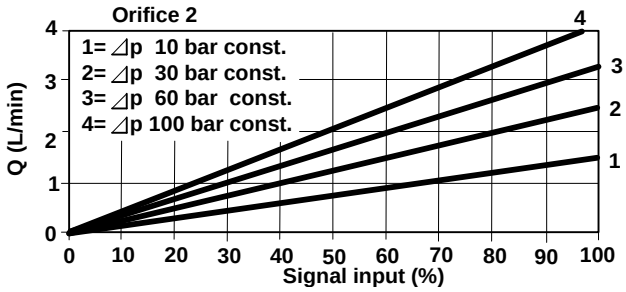
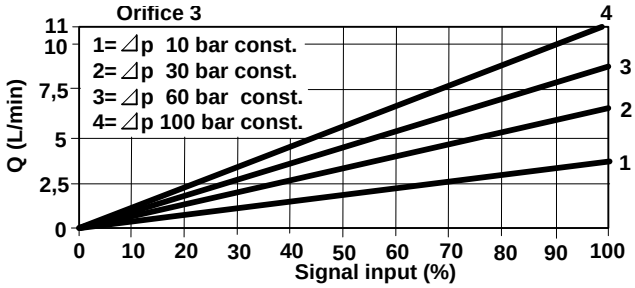
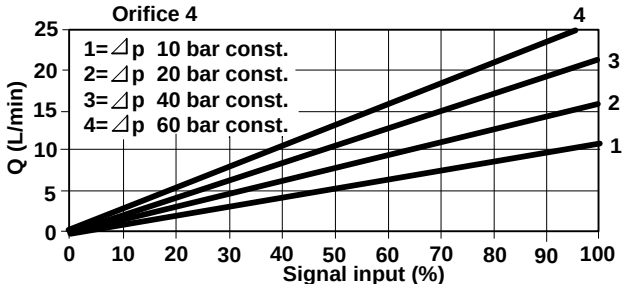


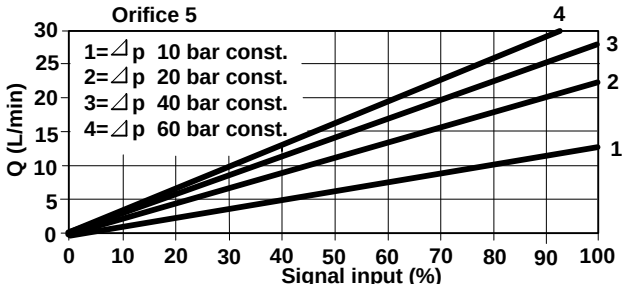
Fig. 2

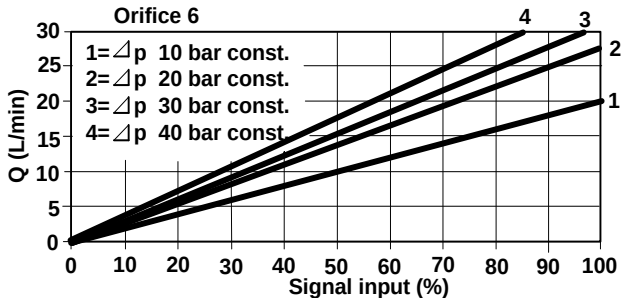
Volume flow signal function characteristic, Q = f (U; Δp = const.)
Flow characteristics of different orifices different pressure drops.
Fig. 3 - 8

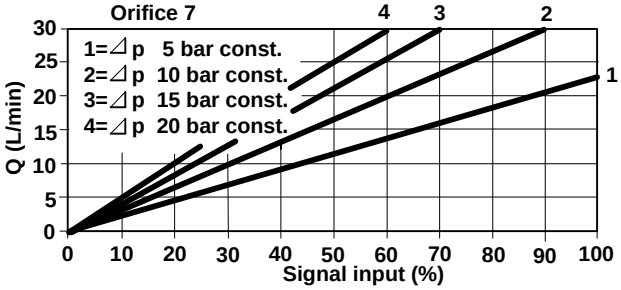












Valve Description

1. Valve

The flow control valve can be used to adjust the throttle section progressively.
It can be installed either at the input or exit of the system. The flow adjustment is by means of a proportional solenoid that is powered by the integrated digital control amplifier proportional to a specified electrical nominal value signal.

The proportional solenoid is an electric-mechanical transducer. Its output quantity force is proportional to the current. The magnetic force acts against a counter check pressure spring with the orifice opening. The solenoid is linked to the valve via a central thread. To increase the setting accuracy and to reduce the influence of disturbances, the proportional solenoid is coupled to a path measuring system. In this way, the solenoid of the piston can be switched with the orifice opening in accordance with the given nominal value via the electronic control system in the position circuit and therefore be positioned precisely. This measure for instance eliminates large hysteresis errors among others. As the orifice section increases linearly of the solenoid stroke and as the path sensor supplies a linear output signal there is also a linear relation between nominal value and volume flow. Path sensor and solenoid together form an inseparable and rigid unit. Solenoid and sensor coil can be replaced without opening the hydraulic system. The coils can be rotated by 360° so that the plug connection can be brought into virtually any position. The path sensor converts the solenoid stroke in a proportional electrical output voltage. The operating principle is based on the principle of a differential transformer consisting of a primary and two secondary coils.
The digital control amplifier is mounted in the electronic box at the path sensor. The amplifier controls the solenoid proportional to the nominal value in accordance with the path sensor. The system is calibrated by Schiedrum and must not be opened.
Zero point and amplification can be adjusted via the potentiometer on the sensor.
The flow will depend on the size of the throttle section and the pressure difference at this point. If the pressure difference remains constant, the flow will be constant.
The throttling is by means of an orifice and is thus not affected, in general, by the viscosity of the pressure medium. The connection of the flow for the throttle is from connection **A to B**.
In reverse flow direction, a by-passed check valve is integrated which allows for an unrestricted return flow at low pressure loss. It is designed as spring-loaded ball seat valve.
The valve must not be driven by the electronic, when the hydraulic is shut down. For this case the *enalble* signal (connector Pin 5) or the supply voltage shoud be disabled.

2. Materials

The housing is made from cast iron, the other valve parts are made from steel. All wear parts are hardened. The external valve parts are black-finished, the solenoid and sensor coils are galvanized and chromized. The electronic box is made from aluminium.

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 in the sense of law.