2-WAY FLOW CONTROL VALVE

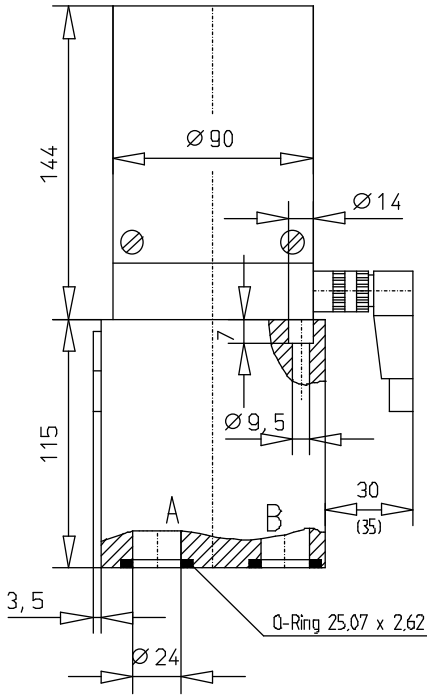
Stepping motor actuation – Analogue control
Sub-plate mounting NG 24 - 210 bar up to 160 dm^3/min

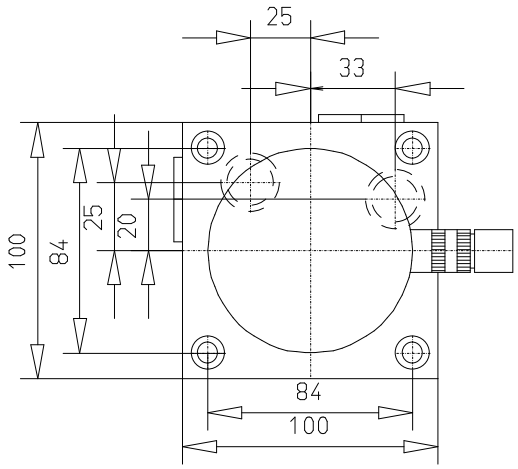
Type
261 FA

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. They may be mounted on the supply or discharge side of the consumer.

FEATURES

- remote-control, programmable
- analogue control means: the stepping motor control is realised by our control unit via an analogue input signal (0 - 10 V; 0 - 20 mA)
- stepping motor position is monitored via a feedback potentiometer
- the actuating drive is equipped with mechanical limit stops
- fail - safe characteristic: the valve keeps its last position in case of a power failure
- minimum actuating time 0,8 sec (in combination with standard control unit)
- resolution approx. 0,3 %
- adjustment: free from play, without gear
- volume flow signal function: linear, recommended control range 1 : 100
- no electrical temperature drift
- hole pattern according to internal Schiedrum standard
- assembly on connection plates with pipe joints or control block
- with by-pass check valve
- standard sealing material Buna N / NBR, other materials possible





ORDER INFORMATION

The scope of delivery of the flow control valves includes the O-rings for sealing the connecting holes, 4 mounting screws M8 x 120 DIN 912 - 10.9 (Tightening torque 30 Nm) and approx 2m cable with connecting plug.

Name	2-Wege-Stromregelventil	261	F	A	160	M 15

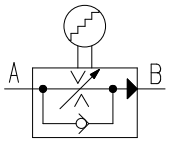
Type
Series (ID)
Ansteuerart: A = analog
Rated adjustment volume flow: 25; 40; 63; 100 or **160** l/min
Modifications-No. for special models / options
e. g. special sealings from Viton (FKM) = **M 15**

ACCESSORY

Connecting plate	see dimension sheet 9-74-201-0003
Stepping motor control unit StA 01 - DAS	see dimension sheet 9-74-001-5001

CHARACTERISTICS

1. General

Symbol	
Type designation	setting throttle: hollow piston with rectangular opening check valve: spring-loaded ball seated valve
Weight	9,6 kg
Mounting position	any, preferably in vertical position
Direction of volume flow	A to B B to A unthrottled return flow
Ambient temperature	-25℃ to +50℃

2. Hydraulic characteristics

Nominal pressure / max. pressure	210 bar for all ports
Pressure medium	Hydraulic oil according to DIN 51 524 (1,2)
Pressure fluid temperature range	-20℃ to +60℃
Viscosity range	5 - 350 mm^2/s
Rated variable volume flow	25; 40; 63; 100; 160 l/min
Min. variable and controllable volume flow	approx. 200 cm^3/min
Max. permissible volume flow via the check valve	300 l/min
Contamination degree / filtering	Class 18/15 according to ISO 4406 or 9 according to NAS 1638 (recommended filter: minimum retention rate $\beta_{10-15} \geq 75$)

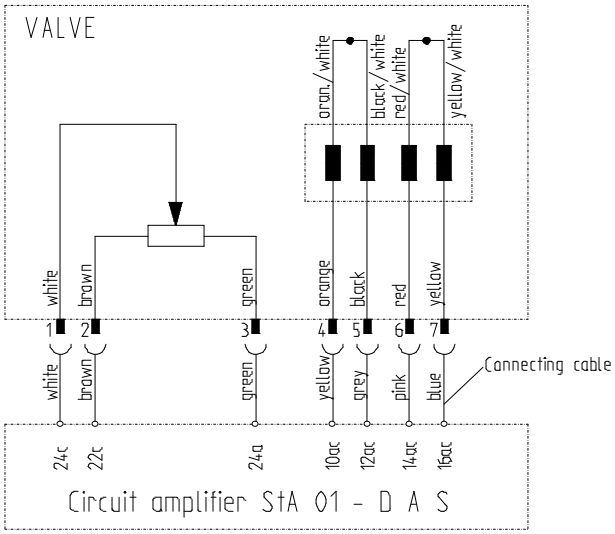
3. Type of actuation

electrically - Stepping motor

3.1 Pulse motor

Type designation	hybrid motor
Operating mode	bipolar
Number of connecting wires	4
Current per stand	max. 0,7 A
Pulse frequency per rotation	200
Max operating frequency	1000 Hz
Resistance per winding	5 Ohm
Inductance per winding	9,5 mH

CIRCUIT DIAGRAM



3.2 Potentiometer

Type designation	rotary potentiometer with wire-wrapped resistance element
Permissible load	1 W to 70℃
Resistance value	+/- 1%
Independent linearity	5 k Ohm +/- 20%
Max. loop current	1 mA
Voltage fluctuation	≤ 0,01%

3.3 Protective system

according to DIN 40 050	IP 40

3.4 Connecting type

plug connection identical to 3477 000 by Amphenol Tuchel.
Cable box with 2m connecting cable included in the scope of delivery

4. Response characteristics

Sensitivity	< 1%	from Rated volume flow
Repeatability	< 1%	from Rated volume flow
Range of inversion	< 1%	rate at Δp 50 bar
Hysteresis	< 3%	rate at Δp 50 bar

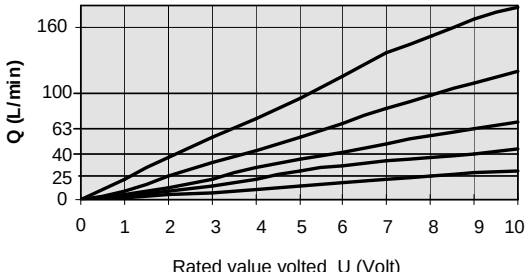
Volume flow signal function — see Fig. 1

Actuating time — the stepping motor executes approx. 175 full steps over the entire rated setting range. In combination with our standard control unit, a pulse frequency between approx. 30 to 200 Hz can be set. This results in actuating times of between 0,8 and 6 sec at 100% set point - change.

CHARACTERISTICS

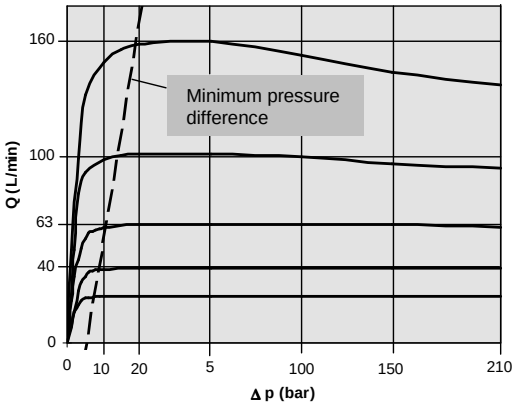
Volume flow signal function characteristic Q = f (U; Volt)
Fig. 1 shows the volume flow dependent on the set voltage.

Fig. 1



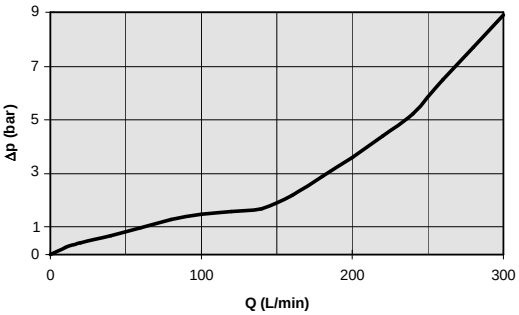
Q-Δp-characteristic; Q = f (Δp)
Fig. 2 shows the control response of the valve for the different rated flow ranges dependent on pressure difference as well as the minimum pressure difference required for operation.

Fig. 2



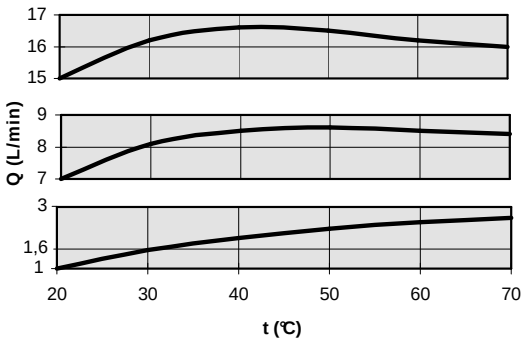
Δp-Q-characteristic; Δp = f (Q)
Fig. 3 shows the pressure loss the valve for the volume flow direction B to A through the by-pass check valve with the orifice closed.

Fig. 3



Q-t- characteristic line; Q = f (t; p = konstant)
Fig. 4 shows the volume flow change depending on the oil temperature at a constant pressure difference of 100 bar for 3 different setting values. Measured using hydraulic oil HLP 46 (ISO-VG 46)=46mm²/sec. at 40℃. For longer volume flows, the temperature influence becomes smaller. For smaller flow, low viscosity oils result in smaller volume flow deviations.

Fig. 4



Description of the valve

1. Ventil

The valves automatically control an adjustable recharging flow constant within the function limits independently of pressure variations in this supply or discharge line. They may be integrated at the supply or discharge side of the consumer (a minimum pressure difference between supplying discharged side of the valve must be present see fig.1). The volume flow adjustment is realised using a motor drive unit coupled to an actual value potentiometer feeding back the position of the setting throttle to the motor control unit. Mechanical limits stops are integrated into the potentiometer which must not be contacted during the normal operation. The motor revolution is converted into a linear movement via threaded spindle drive unit thus adjusting the setting throttle. No motor switch-off device is integrated into the valves, i.e. this must be realized via the motor control unit. We deliver a control amplifier using motor is operated as stepping motor (see catalogue seat StA 01). The advantage of the pulse motor control lies in the high precision and repeatability of the set values.

Furthermore, the valve position is kept even in case of a power failure. The volume flow is made independent of the pressure by means of the differential pressure valve (pressure balance). It provides a constant pressure difference at the setting orifice and is arranged downstream of the orifice (secondary control). The pressure balance is open in its normal position. Thus, there may be a flow change if the valve with a jump begins. The volume flow is controlled in one direction of flow only. The direction of the control is indicated by the symbol on the name plate. In the opposite direction of flow, there will be a bypass check valve for an un-throttled return flow at a very low loss of pressure. It is designed as a spring-loaded ball seated valve.

2. Materials

The valve parts are made from engineering steel, the external parts are black-finished, wear parts are surface-hardened. The housing of the actuating drive is made from aluminium, black anodized. The other parts of actuator drive are made from various materials and they are corrosion protected.

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

All other parameters specified are based on long years of experience and laboratory-type measurements. 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 and with a filter mesh of < 25 µm. All data given should be used as description for the product only and they are not to understand as warranty (zugesicherte Eigenschaften) in the sense of law.