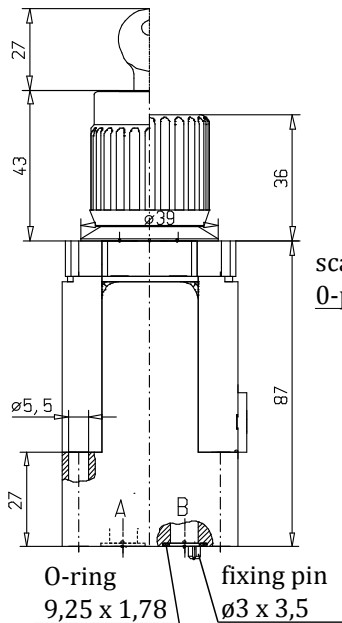


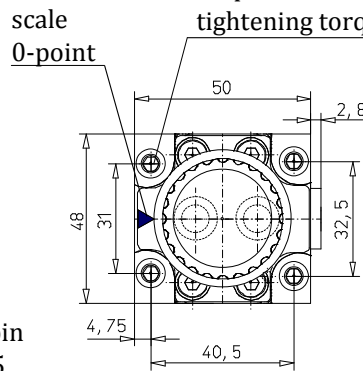
2-way flow control valves are flow valves (throttle valves) with integrated pressure compensation. These valves control an adjustable volume flow independently of pressure changes in the inlet or outlet line. They can be mounted in the inlet or outlet side of the consumer. Due to the design of the orifice, the valve 20 D works almost independent of fluid viscosity.

FEATURES

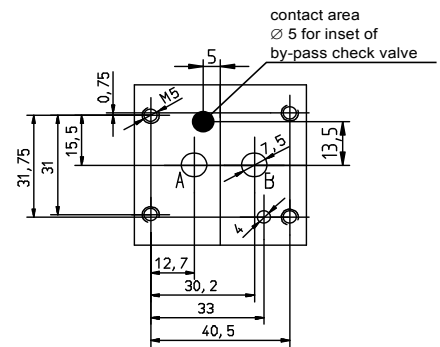
- hole pattern according to DIN 24 340 – G 6
- 7 nominal volume flow ranges up to 25 l/min
- scaled rotary knob control, setting angle 300°
- with by-pass check valve
- control knob can be locked optionally – VW locking E 10
- standard sealing material Buna N/NBR, other materials possible
- mounting possible on connection plates with pipe connection, intermediate plate elements for vertical stacking or control block
- for volume flow control in both flow directions, volume flow rectifier plate type 71 can be delivered



fixing screws
 M5 - DIN 912 - 10.9
 are not included in the
 scope of delivery
 tightening torque 8 Nm



hole pattern



ORDER INFORMATION

The scope of delivery includes the O-rings as sealings of the connection holes and a safety key if order is with safety lock "S".

NAME — **2-way flow control valve** **20** **K** **S** **25** **M..**

type series

series code letter

actuation

knob without lock = no code

knob with lock = with S

nom. volume flow in l/min: 0,4; 1; 2,5; 6,3; 10; 16; 25

supplementary details for special modification

e.g. - special sealings Viton (FKM) = M15

ACCESSORY

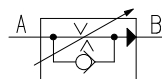
can be ordered seperately

valve fixing screw set:	order code	44-020-00928
4 cylinder head screws M5 x 35 DIN 912 – 10.9		
connection plates:	see datasheet	9-74-030-2002
flow rectifier plate type 71 CZ:	see datasheet	9-74-071-0016
valve fixing screw set:	order code	44-020-00921
4 cyl.h. screws M5 x 35 DIN 912 – 10.9 f. combination w. flow rectifier plates		

CHARACTERISTICS

1. GENERAL

Symbol



Design

adjusting orifice: flat slider with triangular notch
pressure compensator: in downstream of the orifice

Weight

approx. 1,2 kg

Mounting position

any

Direction of volume flow

A to B controlled, B to A unthrottled return flow

Ambient temperature

-25 °C to +80 °C

2. HYDRAULIC CHARACTERISTICS

Nominal/max. pressure

315 bar for all connections

Hydraulic fluid

hydraulic oil according to DIN 51 524 (1,2)

Hydraulic fluid temperature range

-20 °C to +70 °C

Range of viscosity

5 – 350 mm²/s

Nominal volume flow

0,4 - 1,0 – 2,5 – 6,3 – 10 – 16 – 25 l/min

Min. controllable volume flow

approx. 15 cm³/min

Max. return flow via check valve

40 l/min

Contamination level/filtering

class 18/15 according to ISO 4406 or 9 according to NAS 1638
(recommended filter: minimum retaining rate $\beta_{10-15} \geq 75$)

3. TYPE OF ACTUATION

manual: control knob

Adjustment angle

300°

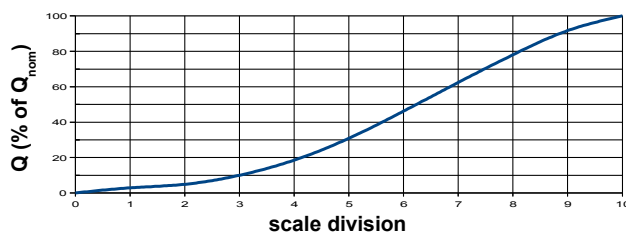
Controlling torque

approx. 60 Ncm

CHARACTERISTIC CURVES

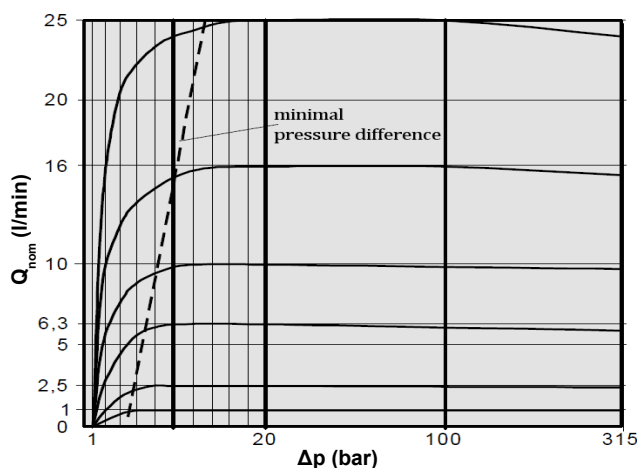
Q-S characteristic; $Q = f(\text{scale})$

Typical dependency of the volume flow as a function of the adjustment angle or scale division of the rotary knob (scaling is linear).



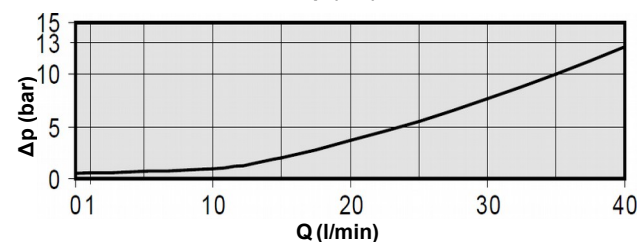
Q- Δp characteristic; $Q = f(\Delta p)$

Control behaviour of the valve for the volume flow direction A to B for several nominal volume flows as well as the minimal pressure difference required for the valves functionality.



Δp -Q characteristic; $\Delta p = f(Q)$

Pressure loss of the valve for the volume flow direction B to A via by-pass check valve at closed adjustment orifice.



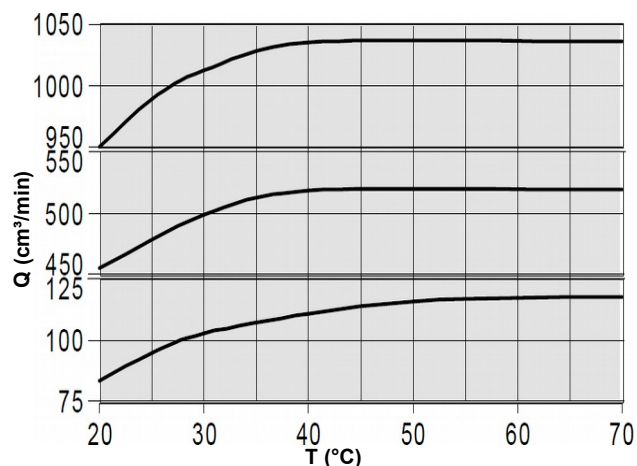
Q-T characteristic; $Q = f(T)$, $P = 100 \text{ bar}$

Volume flow change for 3 different set values in dependence of the oil temperature at a constant pressure difference of 100 bar.

Measured with hydraulic oil HLP 46 (ISO-VG 46) $\nu_{\text{oil}} = 46 \text{ mm}^2/\text{s}$ at $40 \text{ }^\circ\text{C}$.

For larger volume flows the temperature influence becomes smaller.

For smaller volume flows low viscosity oils result in smaller volume flow deviations.



DESCRIPTION

1. VALVE

The valves automatically control an adjustable volume flow at constant level independent of pressure oscillations in the feed and outlet line. For proper functionality a minimal pressure difference for the orifice is needed.

Depending on the design, control can be on the forward or return side of the consumer. The volume flow is setted continuously via a control knob with a scale graduation of 0 to 10.

The adjustable orifice for the volume flow is insensitive to viscosity and dirt cover a large area of application, due to the design of the throttle to be like an aperture. Because of the scissor-cut principle, the setting orifice adjusts a defined volume flow without leakage oil, which allows setting up very small volume flows.

The pressure independency of the volume flow is reached by the pressure compensator. The pressure compensator provides a constant pressure difference at the orifice and is setted up downstream as a secondary regulator.

Due to the very compact design, the valve reacts to pressure oscillations within few milliseconds.

The pressure compensator is opened in rest position, which may lead to a starting jump, if it is switched on. The valves for feed regulation can be delivered with a modified control connection, which allows to close the pressure compensator, to prevent starting jumps (see additional information 9-74-020-0026).

The volume flow will be regulated in one flow direction. The type plate shows which direction is regulated. A bypass check valve is installed for the opposite direction, to allow an unthrottled return flow with low pressure loss. It is designed as a spring-loaded ball seat valve.

2. MATERIAL

The valve parts are basically made of engineering steel. The external parts are burnished or galvanized. All wear parts are hardened. The control knob is made of different materials (Al, St, plastic material).