2-WAY PRESSURE CONTROL VALVE

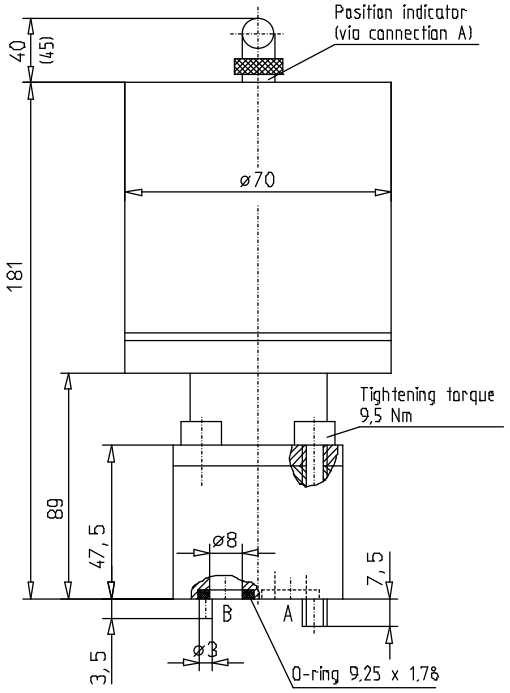
Stepping motor actuation – Analogue control
Plate configuration NG6-mounting surface according to ISO 5781
Pilot operated - 315 bar - up to 40 l/min

Type
663 CA

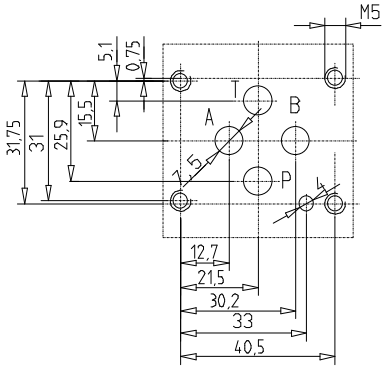
Pressure control valves control an infinitely adjustable pressure in the outlet flow to a system switched in series largely independently of primary pressure and volume flow. 2-way pressure control valves do not dispose of a secondary pressure balance, i.e. a pressure increase on the consumer side is not compensated for.

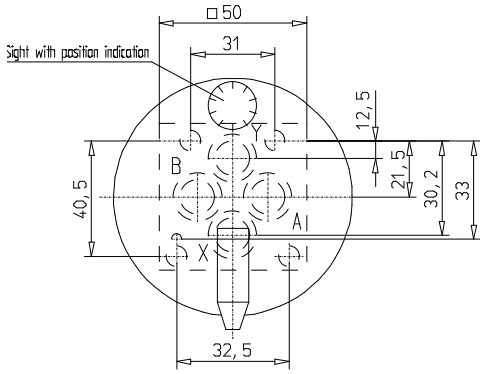
FEATURES

- 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 1,5 sec (in combination with standard control unit)
- resolution approx. 0,25 %
- 5 set volume flow ranges
- Minimum pressure set to 7 bar for all set volume flow ranges
- With control port for remote control or pressure relief port A (must be closed if the function is not required)
- Valve normal position: Open A to B
- Standard sealing material Viton (FKM)
- assembly on connection plates with pipe joints or control block



Mounting surface ISO 5781





ATTENTION!
The port assignment and identification does not correspond to the recommended standards.
Standard connection codes:
P = B; T = A; A = Y; B = X

ORDER INFORMATION

The scope of delivery of the 2-way pressure control valves includes the O-rings for sealing the connecting holes, 2 mounting screws M6 x 55 DIN 912 - 10.9 (Tightening torque 9,5 Nm) and approx 2m cable with connecting plug.

Name	2- way pressure control valve	663	C	A	315	M ...

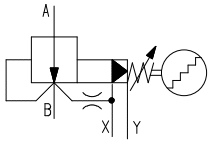
Type
Series (ID)
For input signals analog = A
Rated setting pressure in bar: **35; 70; 140; 210; 315**
Modifications-No. for special models / options
Supplementary data for special models = **M...**

ACCESSORY

Connecting plate	see dimension sheet 9-74-603-1004
Stepping motor control unit StA 01 - DAS	see dimension sheet 9-74-001-1012

CHARACTERISTICS

1. General

Symbol	
Design	Pilot-operated: pilot control = seat valve main control = piston-type valve
Weight	2,1 kg
Mounting position	any, preferably in vertical position
Direction of volume flow	A to B
Ambient temperature	-25℃ to +50℃

2. Hydraulic characteristics

Rated pressure / max. pressure	Ports A, B and X = 315 bar Port Y = 70 bar,
pressure setting range	7-35 bar; 7-70 bar; 7-140 bar; 7-210 bar; 7-315 bar
Rate volume flow	30 l/min
Hydraulic fluid	hydraulic oil according to DIN 51 524 (1,2)
Hydraulic fluid temperature range	-20℃ to +60℃
Viscosity range	5 - 350 $mm^2/sec.$
Control oil share	approx. 350 cm^3/min
Contamination level / filtering	Class 18/15 according to ISO 4406 or 9 according to NAS 1638 (recommended filter: min. retaining rate $\beta_{10\text{-}15} \geq 75$)

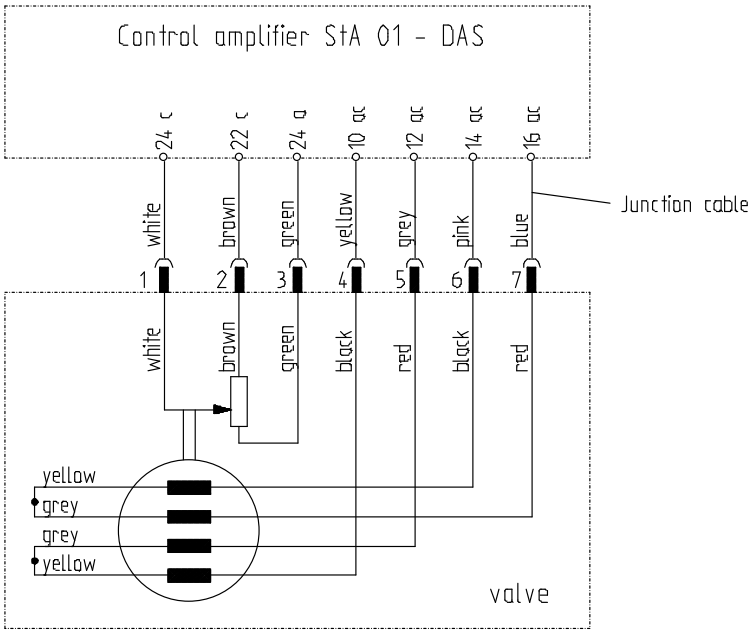
3. Type of actuation

electrically - Stepping motor

3.1 Pulse motor

Design	Permanent magnet stepping motor
Operating mode	Bipolar
Coil number of the stator	2
Pole number of the motor	24
Step number per rotation	48
Max. operating frequency	200 Hz / recommended operating frequency 160 Hz
Resistance per coil	34 ohm
Inductivity per coil	180 mH
Rated current per coil	325 mA

CIRCUIT DIAGRAM

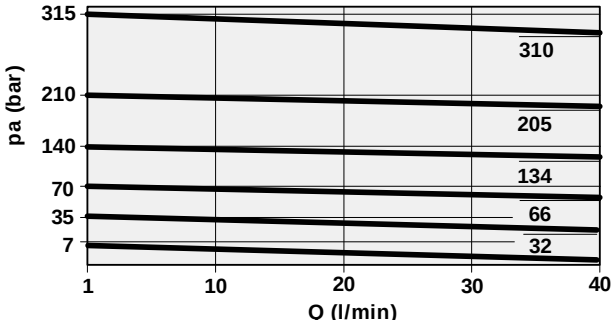


3.2 Potentiometer	
Load capacity	1,5 W to 40℃
Independent linearity	≤ 1%
Resistance	1 k Ohm +/- 20%
Max. wiper current	1 mA
Voltage smoothness	< 0,5%
3.3 Protective system	
according to DIN 40 050	IP 40
3.4 Electrical connection	Device plug and socket connection identical 3477 000 Fa. Amphenol Tuchel, the cable box is part of the scope of supply.
3.5 RELATED CONTROL UNIT	StA 01 - DAS
4. RESPONSE CHARACTERISTICS	
Response sensitivity	< 1% }
Repetitive accuracy	< 1% }
Hysteresis	< 1% } of setting pressure rang
Range of reversal	< 1% }
Actuating time	p min to p max approx. 1.5 sec. In combination with our standard control unit StA 01 - DAS, the actuating time can be increased to approx. 6 sec. by reducing the step frequency.

CHARACTERISTICS

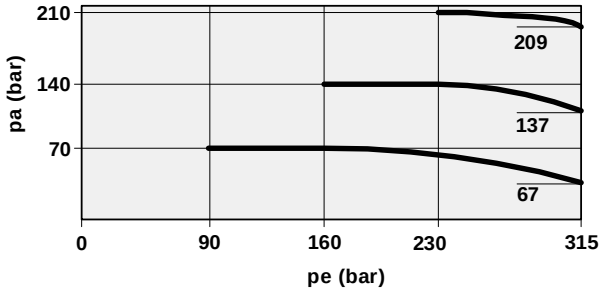
pa-Q-characteristic; pa=f (Q, pe=const.)
Fig. 1 shows the dependency of the volume flow for the outlet flow as well as the lowest set flow. Measured at an inlet flow of 20 bar above the outlet flow, control oil return to the tank in depressurized state.

Fig. 1



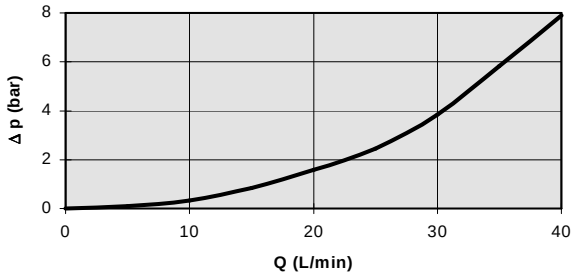
pa-pe-characteristic; pa=f (pe, Q=const.)
Fig. 2 shows the control characteristic for the outlet flow depending on the inlet flow given a volume flow of 30 l/min, control oil returns to the tank in depressurized state.

Fig. 3



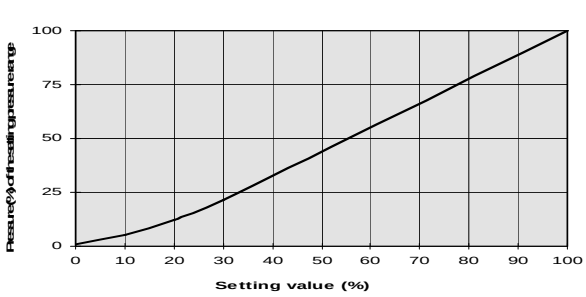
Δp-Q-Kennlinie; Δp=f (Q)
Fig. 3 shows the pressure loss in relationship to the flow rate for reverse flow direction from connection B to A or A to B with no load on connection X. Measured at an oil viscosity of 16 mm² / s.

Fig. 3



Pressure signal function characteristic
Fig. 4 shows the valve-specific characteristic for the volume flow signal function. It delivers information on linearity and hysteresis.

Fig. 4



Description of the valve

1. Ventil

The valve consists of two stages. It mainly consists of the main control part, which is controlled by an anticipatory control part. The pressure adjustment is done by means of a motor actuating drive which is coupled with an actual value potentiometer which returns the position of the adjustment to the motor control. Mechanical limit stops are integrated into the potentiometer; they should not be approached during regular operation. The valve does not contain a motor cut-off device; thus the motor must be switched off by means of the motor control. No motor switch-off device is integrated into the valves, i.e. this must be realized via the motor control unit. 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. Upon special request, the valve can also be delivered with an emergency manual actuation.

The actuator acts via a screw drive, via a pressure spring and a valve cone upon the anticipatory control valve seat, against the hydraulic force of the hydraulic liquid in the control circuit. The resulting pressure is stamped onto the control piston in the main valve as reference pressure. The control piston has the function of a pressure maintaining valve, which controls the pressure in the operating circuit according to the anticipatory control pressure. The valve is equipped with four ports, the main ports A and B for inlet and outlet plus the control ports X and Y. Via port Y, the pilot oil is drained. In order to avoid valve vibrations we recommend to make the control oil return to the tank separately in a depressurized state and without interference. Port X allows for the external valve relief on the one hand and for remote control on the other hand: The port must be closed if these function are not required. However, we recommend to provide this port in control blocks or connection plates at any rate to be able to modify the dampening characteristic of the valve via this port should any system vibrations occur.

2. Material

The valve parts are made from engineering steel, the external parts are burnished, where parts surface-are harded. 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.