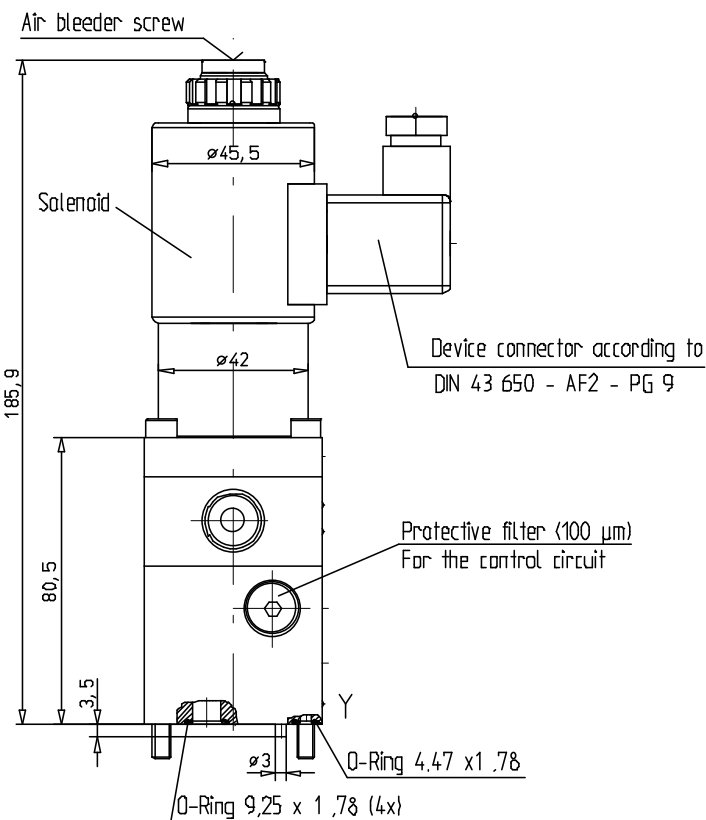
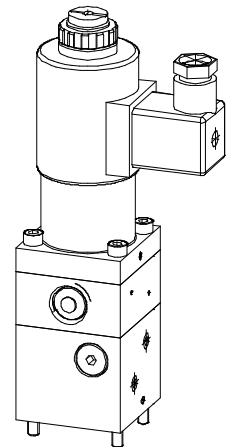


3-way pressure control valves control and limit an infinitely adjustable pressure in the outlet flow. These valves are equipped with a secondary pressure protection, i.e. a pressure increase on the consumer side is compensated.

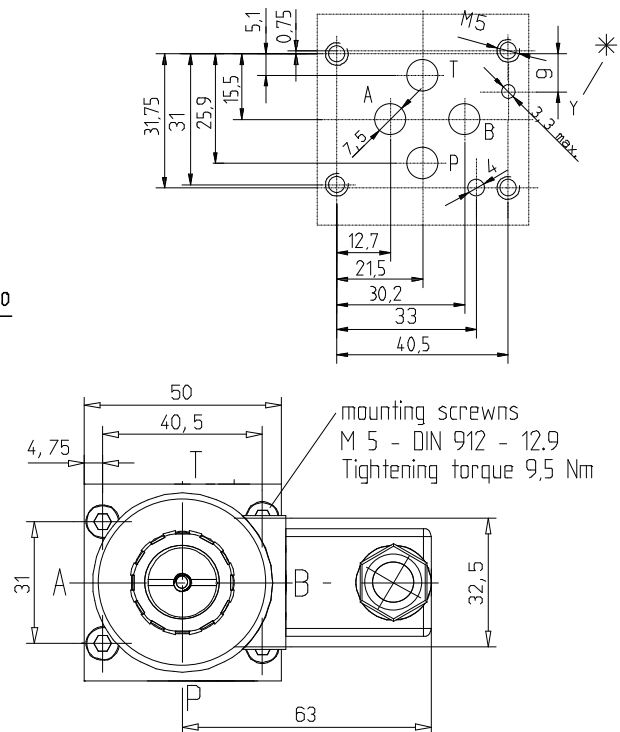
FEATURES

- Magnet system: power-controlled, pressure-sealed, coil exchangeable without opening the hydraulic system
- Operable by remote control, programmable
- Pressure setting from < 1bar
- With secondary pressure protection
- With control port for remote control or pressure unloading of port A (must be locked, if the function is not required)
- If desired, with external control oil drain (mounting surface to ISO 4401-03-03-0-94)
- Standard sealing material Viton (FKM)
- Assembly on sub plates with pipe connections or control block
- Neutral position of the valve: connection A to T; P locked
- Floating time approx. 70 ms



Mounting surface ISO 5781

*According to ISO 4401-03-0-94 for valve type "Y"



ORDER DATA

The O rings for sealing the connection holes, four fastening bolts M 5 x 90 DIN 912 - 12.9, tightening torque 9,5 Nm and the device plug and socket connection are part of the scope of supply.

Name **3-way pressure control valve 686 E P 300 Y M...**

Type

Series (letter)

Control method: P = proportional solenoid

Rated setting pressure in bar: 70; 140; 210; 300

Valve variant control oil drain (see symbol)

Control oil drain, internal = without code

*Control oil drain, external = Y

Supplementing data for special models

ACCESSORIES

Must be ordered separately.

Sub plates

* in case of valve type Y

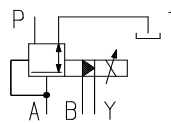
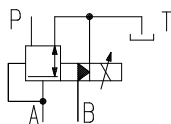
Control amplifier type StA 03-ES

see dimension drawing 9-74-030-2002
see dimension drawing 9-74-686-0007
see dimension drawing 9-74-003-0025

CHARACTERISTICS

1. General

Symbol



Type designation
Construction

686 EP ...
Pilot-operated

686 EP ... Y
pilot control = seat valve
main control = piston-type valve

Weight
Mounting position
Direction of volume flow
Ambient temperature range

2,4 kg
Any, if possible, vertical
P to A or A to T
-10°C to +50°C

2. Hydraulic characteristics

Rated pressure / max. pressure

Port P; A and B = 315 bar
Port T = 70 bar in case of external control oil drain
Port T = In case of internal control oil drain, depressurized and separately to the tank
Port Y = Depressurized and separately to the tank

Min. pressure difference P to A

15 bar

Setting pressure range

70 bar; 140 bar; 210 bar; 300 bar

Min. setting pressure

< 1 bar

Rated volume flow

30 l/min

Hydraulic fluid

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

Temperature range of hydraulic fluid

-20°C to +70 °C

Viscosity range

15 - 350 mm²/s

Control volume flow Approx.

400 cm³/min

Contamination level / filtering

Class 16/13 according to ISO 4406 or 7 according to NAS 1638
(recommended filter: min. retaining rate $\beta_{5-10} \geq 75$)

3. Operation

Electric - proportional solenoid

3.1 Solenoid

Design

Simple solenoid - pushing, pressure-sealed

Voltage

DC

Rated voltage

12 V

Rated current

1,6 A

Limiting current

1,9 A

Rated resistance

R₂₀ = 4,8 ohm

Rated capacity

12,3 W

Connection type

Device plug and socket connection according to ISO 4400

Protective system

IP 65 according to DIN 40 050 (with installed mating connector)

4. Transmission

(Definition according to DIN 24 311)

Response sensitivity

approx. 1%

Receptivity accuracy

approx. 1%

Range of reversal

approx. 1%

Hysteresis

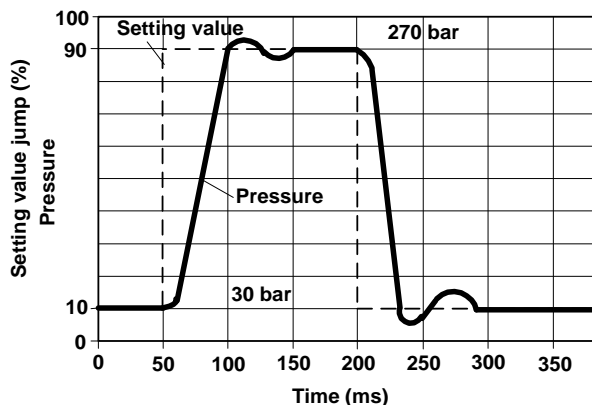
approx. 4%

of the setting pressure range

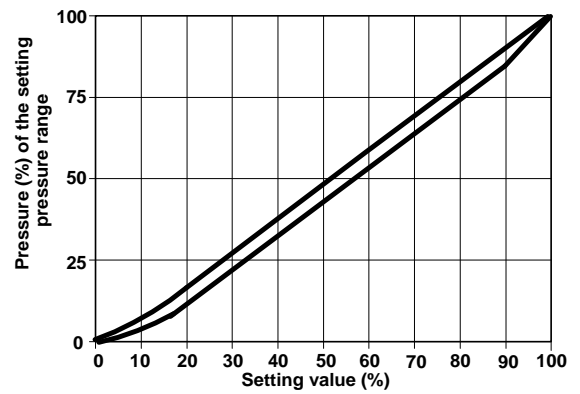
CHARACTERISTICS

Time Response

shows the step-function response of the pressure signal to a setting value jump of 10% to 90% and vice versa. Measured at a volume flow of 20 l/min. The values are extremely system-dependent.

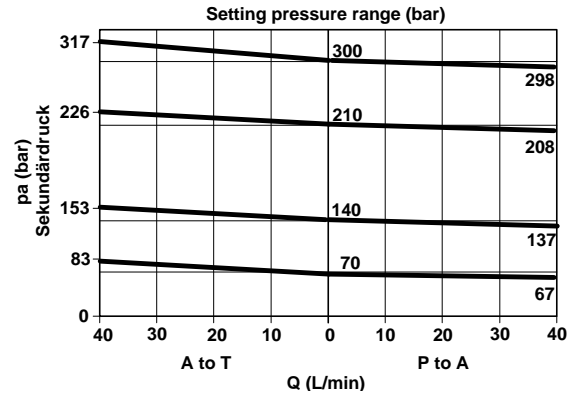


Characteristic of the pressure signal function
 the characteristic typical of the valve for the function pressure setting value. It given information on the linearity and the hysteresis.



pa-Q-characteristic

the control response of the valve for the secondary pressure at the different setting pressure ranges, dependent on the variable volume flow, at a primary pressure of 20 bar each above the setting pressure.



DESCRIPTION OF THE VALVE

1. Valve

These valves are double-stage valves, consisting mainly of the main control part which is controlled by a pilot valve with the proportional actuating solenoid. Due to the pilot control, the pressure is controlled or limited almost independent of the volume flow. The control oil for the pilot control is taken from the inlet side and kept as concept by a flow controller. The control circuit is protected against large contamination's by a filter (100 µm). In case of perturbations, the filter can easily be dismantled and cleaned. The pressure setting is done infinitely by the proportional solenoid which is actuated by an electronic control amplifier. The proportional solenoid is an electro-mechanic converter. Its output variable force is proportional to the input signal current. The result is an approximately linear relation between solenoid current and pressure. The magnetic force acts via a pressure spring 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 on the control piston in the main valve as reference pressure. The control piston is used as a pressure maintaining valve which controls the pressure in the control circuit to the pilot pressure.

The valve is equipped with four or five ports, the main ports **P** and **A** for in- and outlet, port **T** for the protection of the secondary circuit, port **B** and if desired **Y** for the separate control oil drain. For the valve type **internal control oil drain**, the control oil is let via **T**. In order to prevent valve oscillations, we recommend - according to the chosen control oil outlet - to conduct the corresponding line depressurized and trouble free, separately to the tank. We recommend the valve type with external control oil drain since it is the best guarantee for a trouble free function. Via port **B**, the valve can be unloaded and operated by external remote control; it must locked if the function is not required. Yet, we recommend to provide this port in control blocks or sub plates, because the dampening characteristics of the valve can be changed via this port in case of system vibrations. The valve should be bled via the provided bleeding screw during commissioning (see dimensions drawing).

2. Material

The valve parts are made from steel. All wear parts are hardened. The outer pieces of the valve are burnished, the solenoid coil is covered in plastic housing.

For applications not covered by the specified characteristics, please contact us.

All specified characteristics are based partly on long years of experience and on measurements made in laboratories. The data are typical of the valves and can differ in series. All measurements were carried out on a test stand with an oil viscosity of 36 mm²/s, a filter mesh of < 10 mm and optimum control electronics. All data given here should be used as description for the product only and they are not to understand as warranty (zugesicherte Eigenschaft) in the sense of law.