

IPA9 Electro-pneumatic transducer

Application

The IPA9 electro-pneumatic transducer is used where pneumatically controlled devices are to be connected to an electronic controller. It may, for example, be used in control installations in which the controlled device is situated in a hazardous area.



IPA9

Technical data

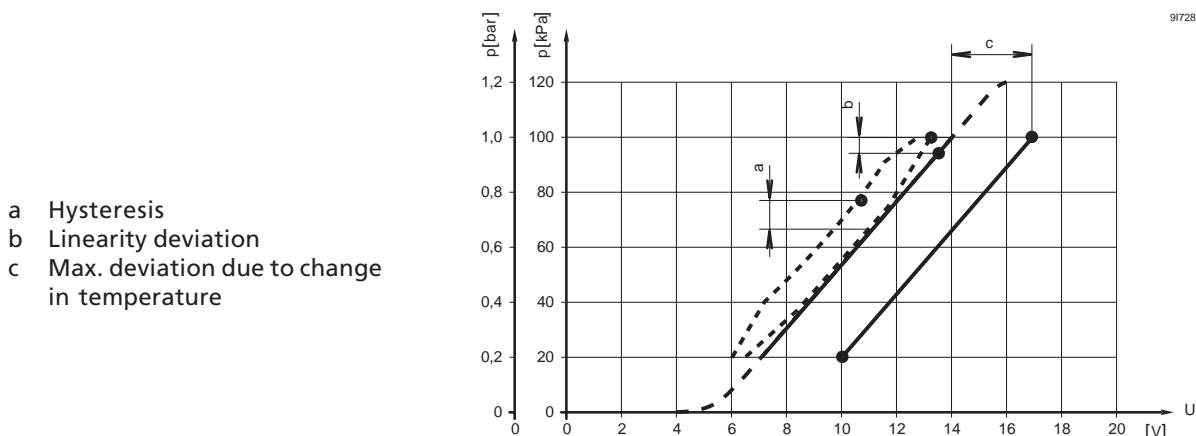
Supply voltage	DC 0 ... 20 V phase-cut
Power consumption	max. 8.5 W
Input pressure	140 kPa (1.4 bar)
Output connection p _{out}	20 ... 100 kPa (0.2 ... 1.0 bar)
Linearity deviation	2 kPa (0.02 bar)
Hysteresis	8 kPa (0.08 bar)
Direction of operation	see Pressure/voltage chart
Air flow rate	max 2 m ³ /h
Mounting orientation	upright to horizontal
Connection:	Input p _{in} screwed R 1/8
	Output p _{out} screwed R 1/8
Electrical connection	1 cable 1 m
Protection standard	IP31 to IEC529
Ambient temperature	10 ... 60 °C
Weight (incl. packaging)	1.05 kg

Principle of operation

The electrical signal from the controller is converted into a corresponding pneumatic pressure (see pressure / voltage chart). The core of the magnetic drive is connected to a diaphragm, which acts on the intake/discharge air valves.

As the voltage rises, the magnetic force increases. This overrides the counter-pressure acting on the diaphragm caused by the pressure in the system (output pressure), and opens the intake valve. Air then flows into the system until the diaphragm force and the magnetic force reach a state of equilibrium, causing the intake valve to close. A fall in voltage is accompanied by a decrease in magnetic force, so that the pressure on the diaphragm opens the discharge valve. Air then flows out of the system into the atmosphere until the diaphragm force is equivalent to the magnetic force, so that the discharge valve closed again.

Pressure / voltage chart



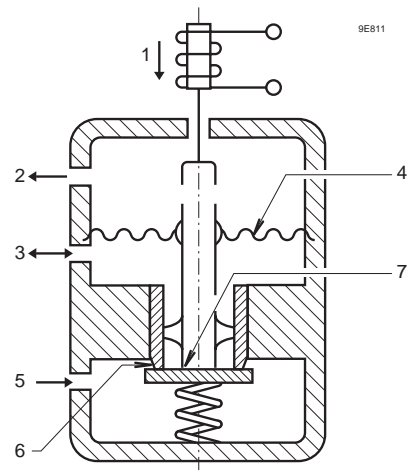
- a Hysteresis
- b Linearity deviation
- c Max. deviation due to change in temperature

Transducer in equilibrium

Diaphragm force = magnetic force

Key

- 1 P-magnet
- 2 Discharge into open air
- 3 Output pressure (system pressure)
- 4 Diaphragm
- 5 Input pressure
- 6 Intake valve
- 7 Discharge valve

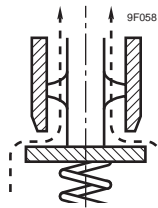


Intake valve in operation

High magnetic force

→ System pressure increases

--- Air flow



Discharge valve in operation

Low magnetic force

→ System pressure decreases

--- Air flow

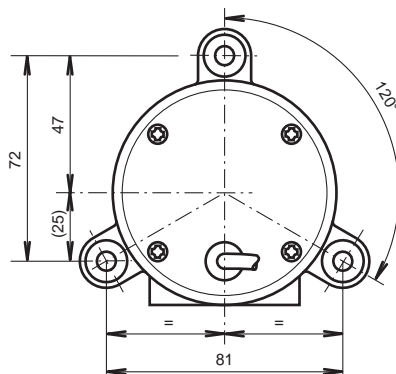
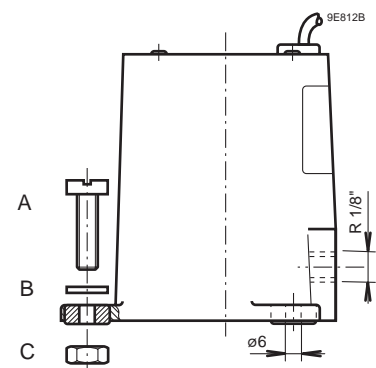
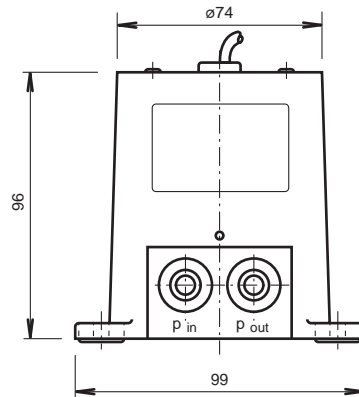


Construction

The IPA9 transducer consists basically of :

magnetic drive, diaphragm, intake valve and discharge valve.

Dimensions [mm]



- A M6 x 20 bolt
- B Washer
- C M6 nut

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