Electropneumatic Positioner
Type 3730-0

Application
Single-acting or double-acting positioner for attachment to linear pneumatic control valves
Reference variable: 4 to 20 mA
Rated travels: 5.3 to 200 mm

The positioner ensures a predetermined assignment of the valve stem position (controlled variable x) to the input signal (reference variable w). It compares the input signal received from a control system to the travel of the control valve and generates a signal pressure (output variable y).

Features
- Easy attachment to common linear actuators over SAMSON direct attachment interface (Fig. 1), over NAMUR rib (Fig. 3) or to control valves with rod-type yokes according to IEC 60534-6
- Any desired mounting position
- Calibrated travel sensor system without gear wheels that are susceptible to damage
- Analog pneumatic output prevents pulsing in case of leaking actuator
- Fast analog control loop
- High control accuracy (fine tuning) without dead band and continuous pneumatic output
- Two-wire system with small electric load below 300 Ω for explosion-protected version and version without explosion protection
- Output pressure limitation over DIP switch
- Selectable tight-closing function with fixed switching point
- Low air consumption of approx. 110 l/h independent of supply and output pressure
- Aluminum housing in degree of protection IP 65
- Check valve in the exhaust
- Resistant to shock
- Broad temperature range from –30 to 80 °C (extended temperature range on request) also in intrinsically safe version
- Travel range selectable over DIP switch within the rated travel range
- Zero and span adjustable over potentiometers
- Reference variable range and direction of action adjustable over DIP switches, e.g. for split-range operation
Principle of operation

The electropneumatic positioner is attached to pneumatic control valves. It is used to assign the valve stem position (reference variable \( x \)) to the input signal (reference variable \( w \)). The input signal received from a control system is compared to the travel of the control valve, and a signal pressure (output variable \( y \)) is produced.

The positioner consists of a travel sensor system proportional to resistance, an analog i/p converter with a downstream booster and analog controller electronics.

The position of the valve stem is transmitted as a linear travel motion over the pick-up lever to the travel sensor (2) and supplied to an analog PD controller (3). The PD controller compares this actual value to the DC control signal coming from the control system, e.g. of 4 to 20 mA. In case of a system deviation, the operation of the i/p converter (6) is changed so that the actuator of the control valve (1) is pressurized or vented accordingly over the downstream booster (7).

This causes the valve plug to move to the position determined by the reference variable.

The supply air provides the booster and the pressure regulator (8). An intermediate flow regulator (9) with fixed settings is used to purge the positioner and, at the same time, guarantees trouble-free operation of the booster.

The output signal pressure of the booster can be limited by activating DIP switch S5 (4).

The volume restriction (10) and DIP switch S6 are used to optimize the positioner by adapting it to the actuator size and changing the gain factor.

Operation

The positioner is operated and adjusted over potentiometers and DIP switches. The configuration of the positioner is facilitated by instructions included on the inside of the cover which are intended to ensure a quick and trouble-free adaptation of the positioner to the control valve.

Legend

1. Actuator
2. Travel sensor
3. Analog PD controller
4. DIP switches S1 to S10
5. i/p converter
6. Booster
7. Pressure regulator
8. Flow regulator
9. Volume restriction

Fig. 4 - Functional diagram of the Type 3730-0 Positioner
Attachment of the positioner

The Type 3730-0 i/p Positioner can be mounted directly on a Type 3277 Actuator. When attached to Type 3277-S (120 cm²) and to actuators with fail-safe action “Actuator stem extends”, the signal pressure is routed to the actuator through an internal bore in the actuator yoke.

For all actuators with fail-safe action “Actuator stem retracts” and effective areas of 240 cm² and larger, the signal pressure is transmitted to the actuator over a ready-made external pipe connection.

Using the appropriate bracket, the positioner can also be attached according to IEC 60534-6 (NAMUR recommendation). The positioner can be mounted on any side of the control valve.
Model and order numbers

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Ordering text

Positioner Type 3730- 0 x
- Without pneumatic connection (only for direct attachment to Type 3277 Actuator)
- With pneumatic connection ISO 228/1 - G¼
- With pneumatic connection ¼-18 NPT
- Without/with pressure gauge for signal pressure indication
- Attachment to Type 3277 Actuator (120/240/350/700 cm²)
- Attachment according to IEC 60534-6 (NAMUR)
- Travel: ... mm
  - If applicable, stem diameter: ... mm
- Adapter M 20x1.5 to ½ NPT
- Metal cable gland

Specifications subject to change without notice