Easy to handle

Maintenance-free

Robust

High air capacity

Pneumatic or electrical positioning signal
  – 0.2 ... 1 bar / 0 ... 20 mA / 4 ... 20 mA
  or split ranges

Reversible action
  – Direct or reverse

Explosion protection certificate, intrinsically safe

IP 65 housing, for field/outdoor mounting

Stable control loop
  – Permanent control of the output pressure

Attachment to pneumatic linear actuators
  – In accordance with DIN/IEC 534 (lateral attachment to Namur)
  integral mounting to control valves 23/24 + 23/25 + 23/26

Option modules
  – Alarm reporting for min. and max. end position
  – Analog position feedback
Construction and mode of operation

The concept

The positioner 23/57 is a mechano-pneumatic device for exact control of pneumatic actuators. It has a convenient design and is easy to handle. Due to its vibration immunity its position control functions are not affected by vibration. Through its robust IP 65 metal housing it is best suited for use on site, i.e. on control valves.

The basic version can handle pneumatic positioning signals (e.g. 0.2...1 bar or 3...15 psi). An optional I/P module for electrical positioning signals (e.g. 0 ... 20 or 4 ... 20 mA) can be added on the input side. Optional modules for reporting minimum and maximum end position alarms and for analog position feedback are available as well.

The positioner can be attached to actuators complying with DIN/IEC 534 (lateral attachment in accordance with Namur). Special integral mounting to our control valves is also possible. The respective mounting kits include the entire attachment material, except for the air pipes and pipe fittings.

This positioner can control single-acting actuators, only.

The function

The positioner 23/57 uses the force balancing principle. The force resulting from the pneumatic positioning signal (E) and the active diaphragm surface (5) is applied to the lever arm (4) and balanced with the force from the pre-tensioned spring (10), generated via the stroke pick-up unit, the cam disk (8) and the lever (9). If an imbalance occurs, the piston slide valve is actuated. The actuator is then filled with compressed air or emptied until the force balance is established via the stroke pick-up unit (2) and the change of the spring pretension (10).

The positioner can be adjusted as described below:
- Zero (start of stroke) adjustment is done with the adjustment screw (20)
- The stroke is adjusted by changing the lever length, either on the pickup lever (2) (rough adjustment) or on the lever (9).

The cam disk (8) defines the direction of action and the position control function. The action (direct/reverse) is selected by turning the cam disk (front and back of disk, together with an air plate not seen in the schematic diagram). The function is defined using the 3 segments on the cam disk (1 = linear, 2 = equal percentage, 3 = square).

![Schematic diagram](NG0044EN.EPS)

**Fig. 1:** Schematic diagram

![Option modules](NG0045EN.EPS)

**Fig. 2:** Option modules
**Technical Data**

**Input**

**Signal range (pneumatic basic version)**
0.2 ... 1 bar or 3 ... 15 psi or split ranges

**Overload capacity**
1.4 bar

**Positioning range (with add-on I/P module)**
0 ... 20 mA or 4 ... 20 mA or split ranges

**Input resistance**
\[ R_i = 170 \, \text{ohms at } 20 \, ^\circ\text{C}, \, T_k = 0.4 \, \%/\text{K} \]

**Overload capacity**
30 mA
(see certificate of explosion-proof devices for specifications)

**Capacitance / inductance**
Negligible

**Output**

**Pressure range**
0 ... supply pressure

**Air capacity**
7 kg/h = 5.5 Nm³/h = 3.2 scfm
(at supply pressure of 1.4 bar)

**Function**
For single-acting actuators

**Travel**

**Stroke**
10 ... 100 mm

**Air supply**

**Instrument air**
Free of oil, water and dust to DIN/ISO 8573-1
pollution and oil contents according to Class 3
dew point 10K below operating temperature

**Supply pressure**
1.4 ... 6 bar (20 ... 90 psi)

**Caution:** Do not exceed the maximum operating pressure of the actuator!

**Air consumption**
0.6 kg/h (+ 0.13 kg/h for I/P module)

**Transmission data and influences**

**Direction of action (control of actuator)**
Direct: = position feedback when turning clockwise
Reverse: = position feedback when turning counter-clockwise.
(with increasing pressure in the actuator)

**Characteristic (action)**
Direct: Signal 0...100 % = position 0...100 %
Reverse: Signal 100 %...0 = position 0...100 %

**Characteristic curve (travel = f signal)**
Linear or equal percentage or square
(selectable using the 3 segments on the cam disk)

**Characteristic deviation**
Typically 1.5 %

**Hysteresis**
\[ \leq 0.7 \, \% \ (1 \, \% \text{ with I/P module}) \]

**Threshold**
\[ \leq 0.5 \, \% \ (0.6 \, \% \text{ with I/P module}) \]

**Air supply**

\[ \leq 0.1 \, \% / \text{0.1 bar supply pressure} \]
\[ (0.3 \, \% \text{ with I/P module}) \]

**Influence of mechanical vibration**
\[ \leq 1 \, \% \text{ up to } 5 \, \text{g and } 10 ... 200 \, \text{Hz} \]

**Environmental capabilities**

**Climate class**
ZQF to DIN 40040

**Ambient temperature**
-20 to + 80 °C for operation, storage, transport

**Relative humidity**
\[ \leq 75 \, \% \text{ (up to } 95 \, \% \text{ for a short time), non-condensing} \]

**Explosion protection**

CENELEC intrinsically safe
EEx ia IIC T4/T5/T6, PTB No. Ex-93.C.2104X
(for the I/P module)

**Housing**

**Material**
Aluminium base plate, plastic cover, IP 65

**Connections**

Electrical: Screw terminal for 2.5 mm²
Pg 13.5 cable gland

Pneumatic: Thread G 1/4"
Tube joint for 6Ø x 1 mm tubes

**Weight**
1.8 kg (+ 0.2 kg for I/P module)

**Dimensions**
See dimensional drawings

**Option modules**

**Limit switch, dual**
Inductive limit switches,
Proximity switches SJ 3.5 SN, CENELEC intrinsically safe,
EEx ia IIC T6, PTB No. Ex-83/2022X,
Limits freely adjustable between 0 and 100 % of stroke,
Current circuit to DIN 19234 with 8 V DC control voltage
Control current \( < 1 \, \text{mA} = \text{logical } \text{"0"} \)
Control current \( > 3 \, \text{mA} = \text{logical } \text{"1"} \)

**Analog position feedback**
Current signal 4 ... 20 mA, 2-wire
Power supply 10 ... 30 V DC

**Attachment material**

**Attachment material**
For integral mounting
(to our control valves 23/24 + 23/25 + 23/26)
For lateral attachment according to DIN/IEC 534 (Namur)
## Positioner 23/57

For Pneumatic and Electropneumatic Positioning Signals

### Ordering information

<table>
<thead>
<tr>
<th>Positioner 23/57</th>
<th>Catalog No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basic version</td>
<td>V18332-</td>
</tr>
</tbody>
</table>

#### Pneumatic positioning signal

Positioning signal

<table>
<thead>
<tr>
<th>Positioning range</th>
<th>0.2 ... 1 bar</th>
<th>0.2 ... 0.6 bar</th>
<th>0.6 ... 1 bar</th>
</tr>
</thead>
<tbody>
<tr>
<td>Catalog No.</td>
<td>1</td>
<td>A</td>
<td>B</td>
</tr>
</tbody>
</table>

#### Electrical positioning signal

Positioning range

| 0 ... 20 mA  | 3 | 2 |
| 4 ... 20 mA  | 3 | 3 |
| 0 ... 10 mA  | 3 | G |
| 10 ... 20 mA | 3 | H |
| 4 ... 12 mA  | 3 | I |
| 12 ... 20 mA | 3 | J |

#### Electrical positioning signal, intrinsically safe EEx ia IIC

Positioning range

| 0 ... 20 mA  | 5 | 2 |
| 4 ... 20 mA  | 5 | 3 |
| 0 ... 10 mA  | 5 | G |
| 10 ... 20 mA | 5 | H |
| 4 ... 12 mA  | 5 | I |
| 12 ... 20 mA | 5 | J |

#### Other positioning ranges (pneumatic or electrical) on request

- Pneumatic: 0.1 ... 1 bar
- Electrical: 0 ... 10 mA, 0 ... 20 mA

#### Valve action

- Direct: (with rising positioning signal rising output pressure)
- Reverse: (with rising positioning signal falling output pressure)

#### Stroke pick-up

- Standard: 0

#### Attachment kit

- Without (when ordering a single device): 0
- Integral mounting to valves 23/24 + 23/25: 1
- Integral mounting to valves 23/26: 4
- Lateral attachment acc. to DIN/IEC 534: 6

#### Add-on equipment: End position switches

- Without: 0
- End position switches, as double proximity switch
  - SJ 3,5 SN: 1
  - SJ 3,5 SN, intrinsically safe: 5

#### Add-on equipment: Analog position feedback

- Without: 0
- Position feedback with current signal
  - 4 ... 20 mA, 2-wire: 3
  - 4 ... 20 mA, 2-wire, intrinsically safe: 4

#### Attachment cost including attachment material and adjustment

- Without (when ordering a single device): 0
- Integral mounting to valve with internal pipework (for valves 23/24 + 23/25 + 23/26): 1
- Integral mounting or lateral attachment acc. to DIN/IEC 534
  - External pipework, plastic *: 2
  - External pipework, copper: 3
  - External pipework, stainless steel: 4

* Plastic only for valve 23/06
Dimensional drawings

Integral mounting to control valves 23/24 and 23/25

Integral mounting to control valves 23/26

Mounting to rotary actuators to VDI/VDE 3845
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