

Positioner 23/57 for pneumatic and electro-pneumatic positioning signals



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 acutators, 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 pickup unit (2) and the change of the spring pretension (10).

The postioner 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).

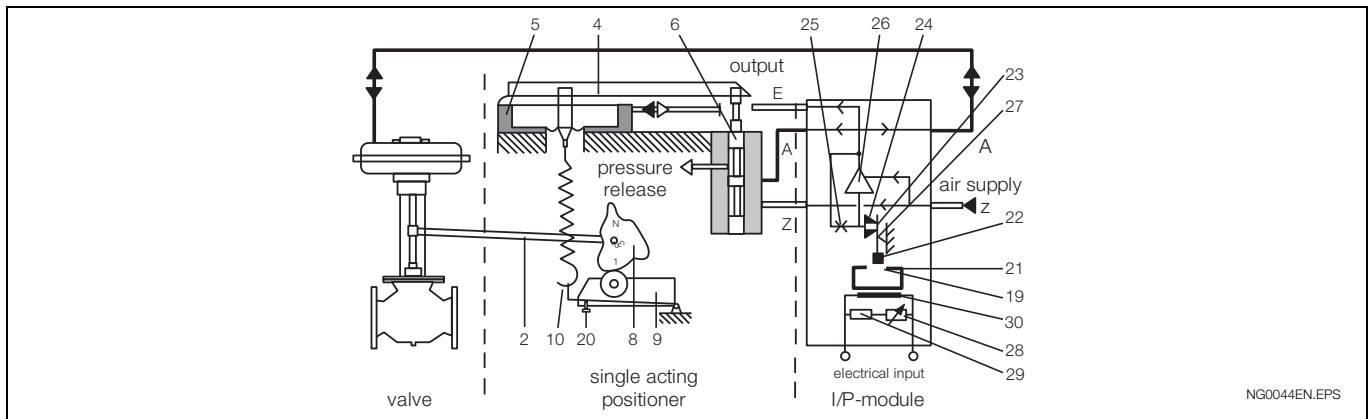


Fig. 1: Schematic diagram

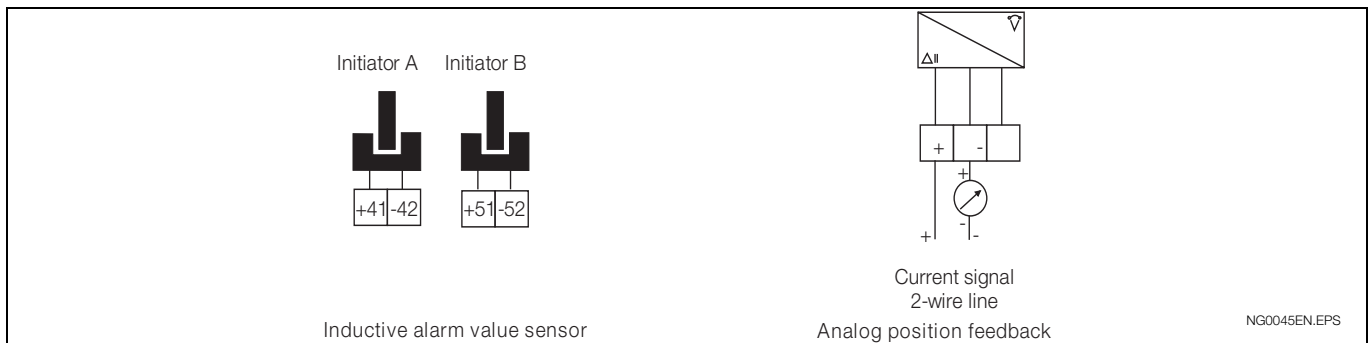


Fig. 2: Option modules

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

$R_i = 170 \text{ ohms at } 20 \text{ }^\circ\text{C, } T_k = 0.4 \text{ \%}/\text{K}$

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-clockw.
(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

≤ 0.7 % (1 % with I/P module)

Threshold

≤ 0.5 % (0.6 % with I/P module)

Air supply

≤ 0.1 % / 0.1 bar supply pressure
(0.3 % with I/P module)

Influence of mechanical vibration

≤ 1 % up to 5 g and 10 ... 200 Hz

Environmental capabilities

Climate class

ZQF to DIN 40040

Ambient temperature

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

Relative humidity

≤ 75 % (up to 95 % 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 mA = logical "0"
Control current > 3 mA = logical "1"

Analog position feedback

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

Attachment material

Attachment material

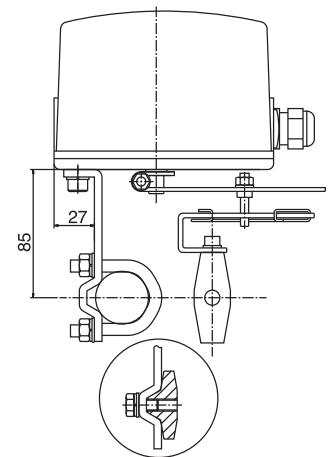
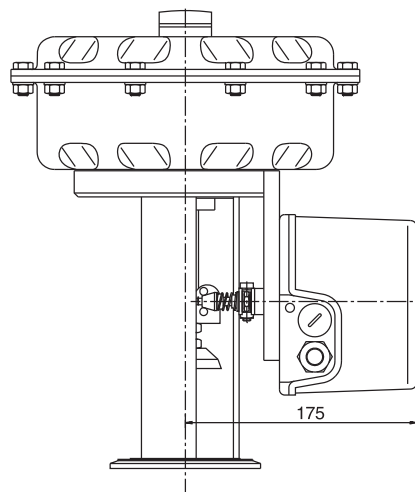
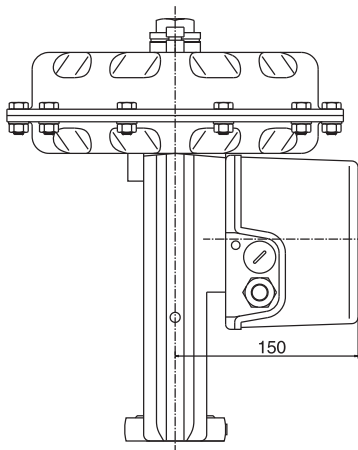
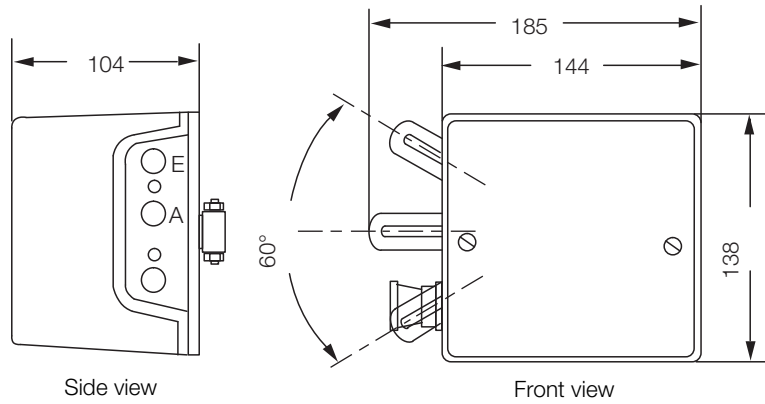
For integral mounting
(to our control valves 23/24 + 23/25 + 23/26)
For lateral attachment according to DIN/IEC 534 (Namur)

Ordering information

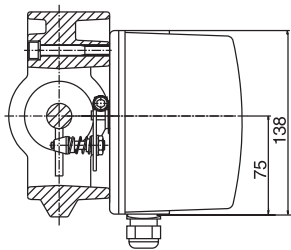
		Catalog No.									
Positioner 23/57		V18332-									
Basic version											
Pneumatic positioning signal											
Positioning range	0.2 ... 1 bar	1	1								
	0.2 ... 0.6 bar	1	A								
	0.6 ... 1 bar	1	B								
Electrical positioning signal											
Positioning range	0 ... 20 mA	3	2								
	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											
Valve action											
direct	(with rising positioning signal rising output pressure)		1								
reverse	(with rising positioning signal falling output pressure)		2								
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			1								
	SJ 3,5 SN										
	SJ 3,5 SN, intrinsically safe		5								
Add-on equipment: Analog position feedback											
Without			0								
Position feedback with current signal			3								
	4 ... 20 mA, 2-wire										
	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			2								
	External pipework, plastic *		3								
	External pipework, copper		3								
	External pipework, stainless steel		4								

* Plastic only for valve 23/06

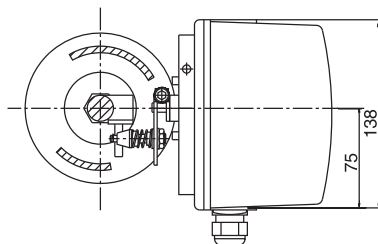
Dimensional drawings



Mounting to
 rotary actuators to
 VDI/DE 3845



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



Integral mounting to
 control valves 23/26

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