

10/18-0.25 EN



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- Convenient, simple design
- Easy to handle
- User-friendly operation, easy to understand
- Reliable concept, I/P conversion through the 500,000 times field-proven module known from TEIP 11 signal converters
- Influence of shock and vibration <1% with a load of up to 10 g and frequencies between 20 and 80 HZ
- Mechanical position indicator,
- Wide operating temperature range, - 40 to + 85 °C
- Output range 0 ... 20 or 4 ... 20 mA or split ranges
- Explosion protection certificate, CENELEC - FM - CSA, intrinsically safe
- Robust case suitable for field/outdoor mounting, IP 65
- Stable control loop through continuous modulation of the output and through adjustable control parameters
- Attachment to linear or rotary actuators in accordance with the standard
- Complies with the directives for EMC and CE conformity
- Optional pressure gage block and filter regulator

Construction and mode of operation

The concept

The design goal was to develop an especially economic device with high operational reliability and robustness for use with pneumatic actuators.

This goal could be achieved in an optimal way by using the I/P module of the TEIP 11 signal converter. This module enabled the development of a simple, easy to understand and easy to handle device. The high operational reliability and the immunity to shock and vibration already known from the 500,000 times field-proven TEIP 11 module could be passed on to the TZIM positioner.

The function

The TZIM positioner uses the force balancing principle. Force balancing takes place at the I/P module balance arm. The forces applied to the balance arm result from both the 0/4...20 mA input signal and from mechanical position feedback.

The input signal generates a magnetic field through the coil and yoke. The magnetic force is applied to the magnet at the end of the balance arm. The counter-force is applied through a rotating movement at the tension band bearing of the balance arm. This is done through mechanical pick-up of the actuator position. If an imbalance occurs, air is either filled in or vented from the actuator through a nozzle control and a pneumatic amplifier. The only external energy required is compressed air. Electric power is derived from the input signal.

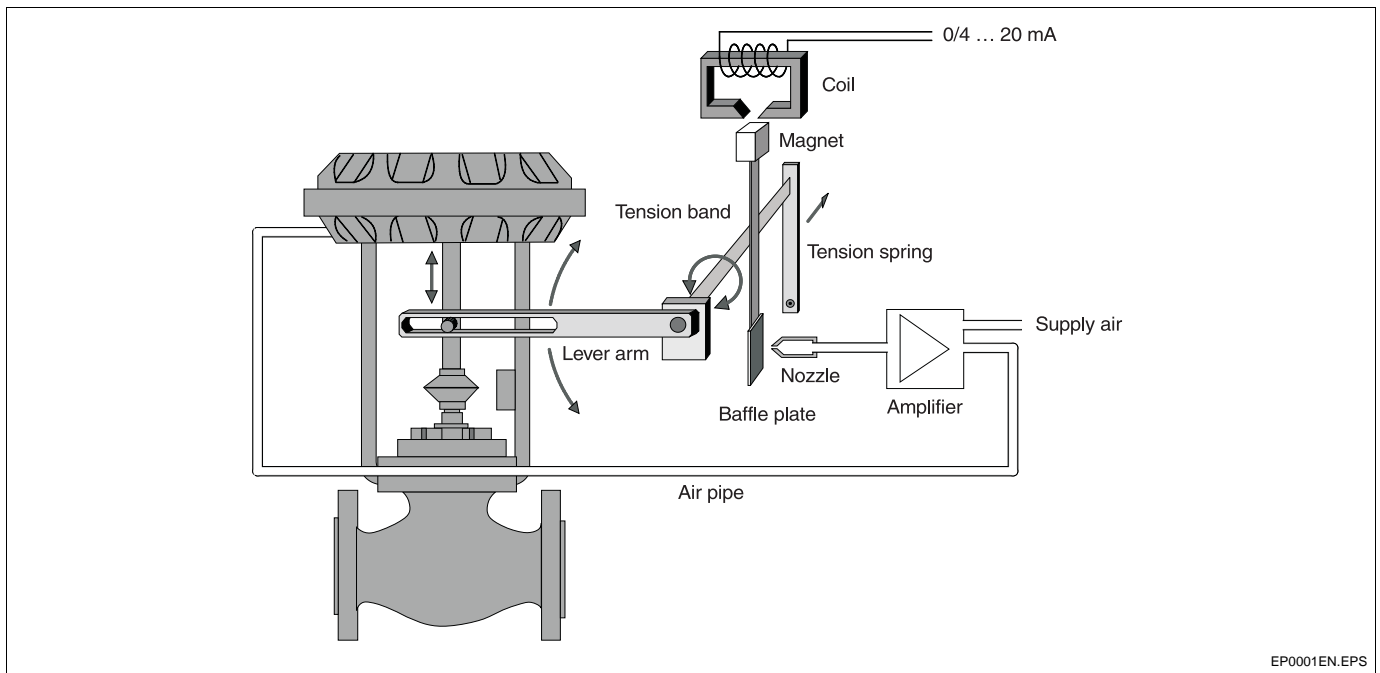


Fig. 1 TZIM schematic diagram

Matching to operating conditions

Adaptation of the positioner to the operating conditions is achieved in parts through the factory setting and in parts through adjustment while the positioner is being mounted to the actuator.

Adaptation through factory setting

- Signal range: 0 ... 20 or 4 ... 20 mA
- Valve action: Direct (input 0/4 ... 20 mA)
Reverse (input 20 ... 4/0 mA)
(with increasing pressure in actuator)
- Output: Single or double acting

Adaptation while mounting to actuator

- Signal range: Split range 4 ... 12 or 12 ... 20 mA
or 0 ... 10 or 10 ... 20 mA
- Stroke movement: Adjustment screws for zero and span
- Effective direction: Direct = feedback turning clockwise
Reverse = feedback turning counterclockwise.
(with increasing pressure in the actuator)
- Control parameters: Adjustment screws for gain (Kp) and air capacity

Construction and mode of operation

Mounting

To linear actuators in accordance with the standard

Lateral attachment is in accordance with DIN/IEC 534 (lateral attachment to Namur). The attachment kit is a complete set of required attachment material, except for pipe connections and air pipes.

To rotary actuators in accordance with the standard

Attachment to rotary actuators is in accordance with VDI/VDE 3845. The desired angle of rotation of either 60 ° or 90 ° can be selected by using the appropriate cam. The attachment kit contains the adapter for coupling the positioner feedback shaft to the actuator shaft, and a mounting bracket for mounting the positioner to the actuator. Pipe connections and air pipes are not included in the kit and have to be provided by the customer.

Integral mounting to 23/24, 23/25 + 23 /26 control valves

The actuators of 23/24, 23/25 + 23/26 control valves have been prepared for special attachment of the positioner. The benefits of this design are that, on one hand, the point for mechanical stroke measurement is inside the yoke and, thus, protected by it, and, on the other hand, no external tubing is required, since the air flow from the positioner to the actuator is guided through an internal channel bore.

Special actuator-specific mounting

In addition to the mounting methods described above, there are special actuator-specific attachments.

Please contact us for details.

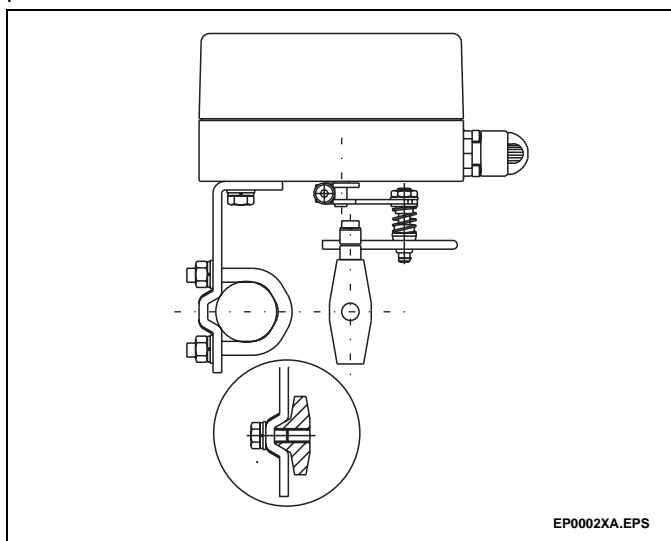


Fig. 2 Mounting to linear actuators to DIN/IEC 534

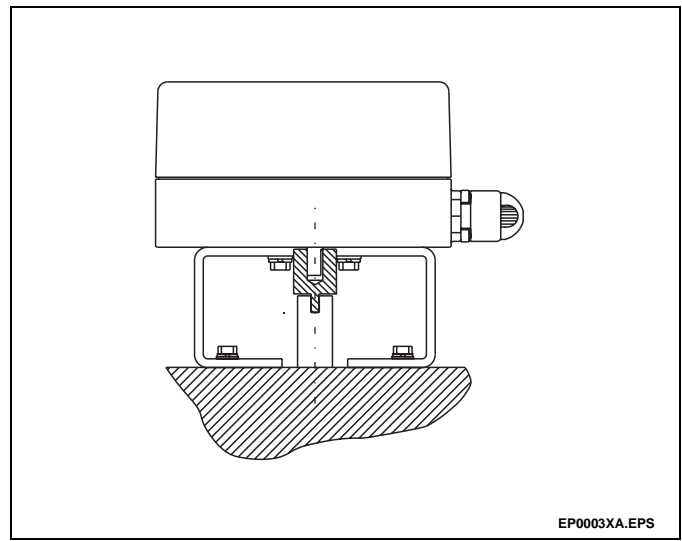


Fig. 4 Mounting to rotary actuators to VDI/VDE 3845

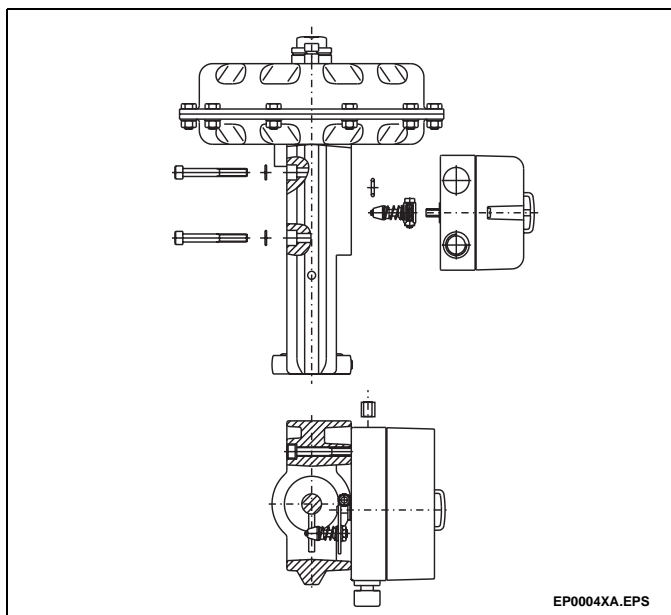


Fig. 3 Integral mounting to 23/24 + 23/25 control valves

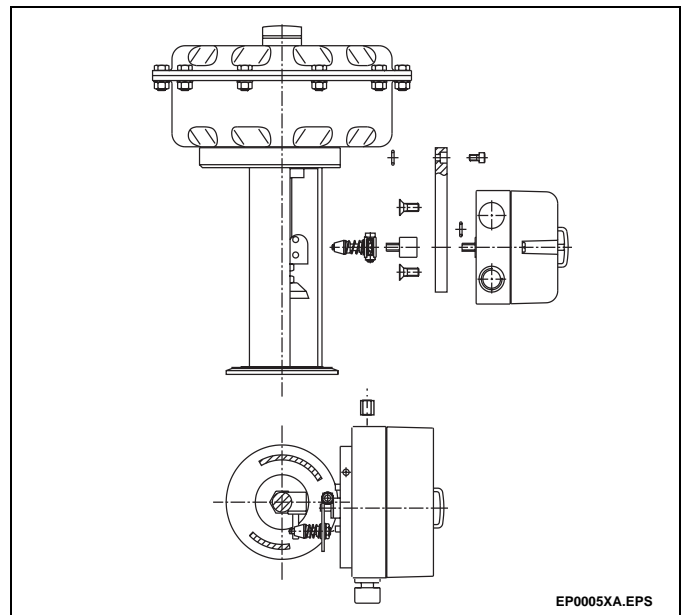


Fig. 5 Integral mounting to 23/26 control valves

Technical data

Input

Signal range
0 ... 20 mA, 4 ... 20 mA or split ranges

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

Input resistance
< 260 ohms at 20 °C ($T_k = +0.4 \% / K$)

Output

Control pressure range
0 ... supply pressure (1.4 ... 6 bar / 20 ... 90 psi)

Air capacity
At supply pressure of 1.4 bar (20 psi)
3.5 kg/h = 2.8 Nm³/h = 1.8 scfm
At supply pressure of 6 bar (90 psi)
14 kg/h = 11 Nm³/h = 7 scfm
(Booster, increases air capacity, available on request)

Function

For single-acting actuators or
for double-acting actuators

Effective direction

Direct: Position feedback turning clockwise
Reverse: Position feedback turning counterclockwise
(with increasing pressure in the actuators)

Travel

Stroke of linear actuator
10 ... 100 mm

Angle of rotation of rotary actuator
60 ° or 90 °

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 10 K below operating temperature

Supply pressure
1.4 ... 6 bar (20 ... 90 psi)
Caution: Do not exceed the max. operating pressure of the actuator!

Air consumption
< 0.4 Nm³/h
(at 1.4 bar air supply and gain Kp 100)

Transmission data and influences

Valve action
Direct: Signal range 0/4 ... 20 mA
Reverse: Signal range 20 ... 4/0 mA
(with increasing pressure in the actuator)

Characteristic curve (travel = f {positioning signal})
Linear

Characteristic deviation
Typically 1.5 %

Hysteresis

≤ 0.5 %

Threshold

≤ 0.1 %

Gain

Kp 25 ... 200, adjustable

Influence of ambient temperature

≤ 1 % for every 10 K change in temperature

Air supply

≤ 0.3 % / 0.1 bar supply pressure

Influence of vibration

≤ 1 % up to 10 g and 20 ... 80 Hz

Seismic requirements

Meets requirements to DIN/IEC 68-3-3 class III for strong and strongest earthquakes

Influence of mounting orientation

≤ 0.5 %

EMC

Complies with EMC directive 89/336/EEC as of May 1989

CE conformity

Complies with the EC directive for the CE conformity certificate

Environmental capabilities

Climate class

GPF to DIN 40040

Ambient temperature

-40 to +85 °C (-40 to +185 °F)
for operation, storage and transport

Relative humidity

<75% (for a short time 95%), non-condensing

Explosion protection

CENELEC "intrinsically safe"
EEx ia IIC T4/T5/T6, PTB No. Ex-93.C.2104X
Other approvals on request
e.g. FM and CSA approval for "intrinsically safe"

Case

Material

Aluminum base plate with plastic cap, IP 65
Case varnished black, RAL 9005
Cap varnished light gray, RAL 9002

Connections

Electrical: Screw terminal for 2.5 mm²
and Pg 13.5 cable gland
or 1/2 NPT thread
Pneumatic: G 1/4 or 1/4 NPT threads

Weight

Approx. 1.5 kg

Dimensions

See dimensional drawings

Accessories

Attachment material

For linear actuators to DIN/IEC 534,
(lateral attachment to Namur)

For rotary actuators to VDI/VDE 3845,
angle of rotation 60 ° or 90 °

For integral mounting to 23,24, 23/25 + 23/26 control valves

For special actuator-specific mounting, upon request

Pressure gages for supply pressure and output pressure

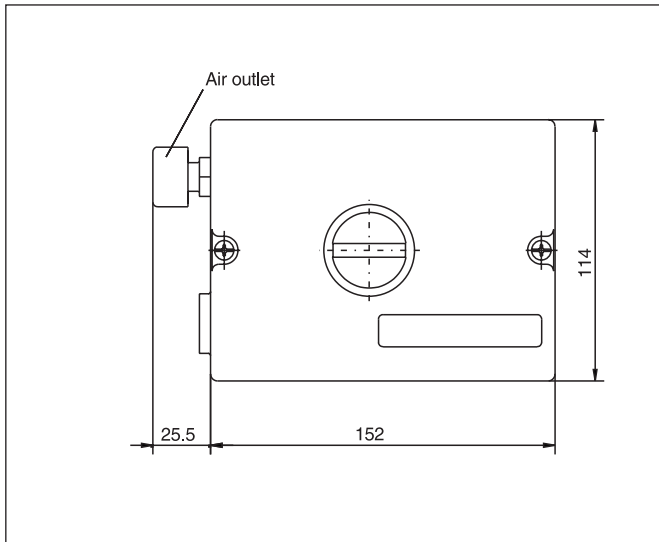
Pressure gage block with pressure gages, consisting of:
Aluminum connection block, varnished black,
Pressure gage with black plastic case Ø 28 mm
and attachment material for mounting to the positioner

Filter regulator

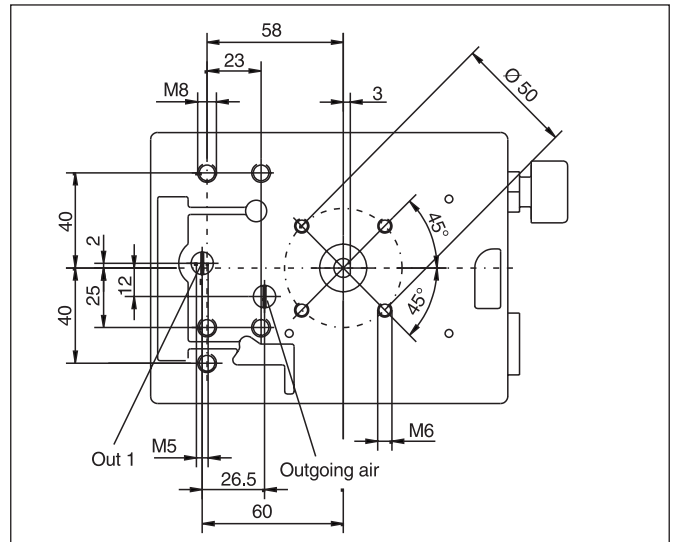
All-metal (brass), varnished
Bronze filter element, 40 µm, with condensate drain,
Max. pre-pressure 16 bar, output adjustable to 1.4 ... 6 bar

Accessories				
		Catalog No		
Mounting material and cost				
Mounting kit for linear actuators (lateral mounting to DIN/IEC 534 or Namur)				
Stroke 10... 35 mm		18391-7959125		
Stroke 20 ... 100 mm		18391-7959126		
Mouning kit for integral mounting to				
23/24 and 23/25 valve	DN 15 up to DN 100, stroke 10...35 mm	18391-7959106		
	DN 125 up to DN 150, stroke 25...65 mm	18391-7959107		
23/26 valve	DN 25 up to DN 100, stroke 10...35 mm	18391-7959108		
	DN 125 up to DN 150, stroke 25...65 mm	18391-7959109		
Mounting kit for rotary actuators (mounting to VDI/VDE 3845), consisting of				
a) Adapter (shaft coupler)		18391-7859110		
b) Mounting bracket, dimensions	A/B = 80/20 mm	18391-0319603		
	A/B = 80/30 mm	18391-0319604		
	A/B = 130/30 mm	18391-0319605		
	A/B = 130/50 mm	18391-0319606		
Mounting cost, incl. material and adjustment				
for mounting to linear actuators to DIN/IEC 534				
or to rotary actuators to VDI/VDE 3845				
External tubing with	Plastic tube	18391-0319628		
	Copper pipe	18391-0319629		
	Stainless steel pipe	18391-0319630		
for integral mounting to 23/24, 23/25 or 23/26 control valves				
Internal tubing		18391-0319627		
External tubing *) with	Copper pipe	18391-7959015		
	Stainless steel pipe	18391-7959016		
*) External tubing only for 23/24 and 23/25 control valves with "air to close/spring to open" action, otherwise "Internal tubing" only.				
Pressure gage block				
Pressure gage block including mounting material				
for single acting TZIM, with 3 pressure gages Ø 28 mm				
(1 x for air supply and 1 x for output pressure)				
G 1/4 connections	Supply pressure range 0...10 bar/ 0...140 psi			
	Output pressure range 0...4 bar/ 0...60 psi	18381-7959111		
	Output pressure range 0...10 bar/ 0...140 psi	18381-7959112		
1/4-18 NPT connect.	Supply pressure range 0...10 bar/ 0...140 psi			
	Output pressure range 0...4 bar/ 0...60 psi	18381-7959113		
	Output pressure range 0...10 bar/ 0...140 psi	18381-7959114		
for double acting TZIM, with 3 pressure gauges Ø 28 mm				
(1 x for air supply and 2 x for output pressure)				
G 1/4 connections	Supply pressure range 0...10 bar/ 0...140 psi			
	Output pressure range 0...4 bar/ 0...60 psi	18381-7959115		
	Output pressure range 0...10 bar/ 0...140 psi	18381-7959116		
1/4-18 NPT connect.	Supply pressure range 0...10 bar/ 0...140 psi			
	Output pressure range 0...4 bar/ 0...60 psi	18381-7959117		
	Output pressure range 0...10 bar/ 0...140 psi	18381-7959118		
(Pressure gage blocks are delivered as separate units for mounting by the customer)				
Filter regulator		Catalog No		
Brass filter regulator, incl. material for mounting to pressure gage block				
Connections	Thread G 1/4	18381-7959119		
	Thread 1/4-18 NPT	18381-7959120		
(Filter regulators are delivered as separate units for mounting by the customer)				

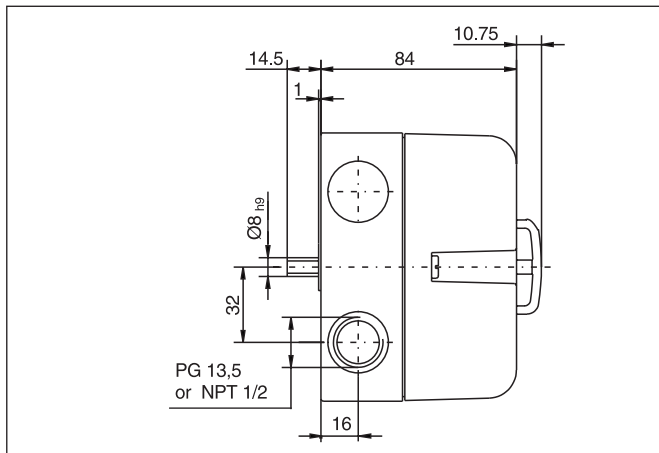
Dimensional drawings



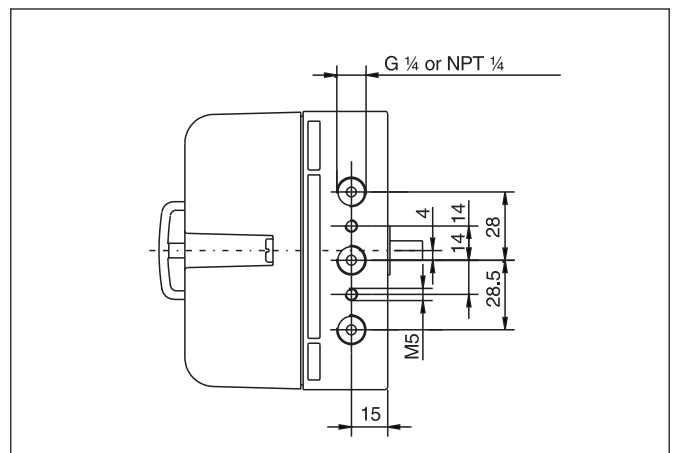
Front view



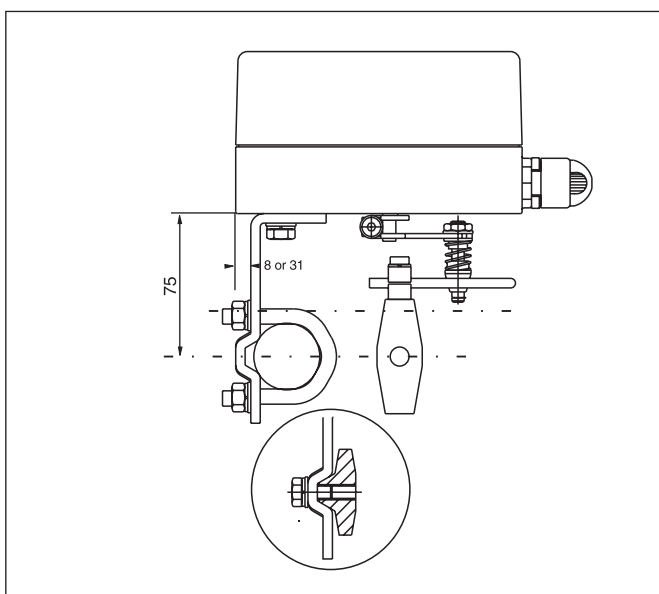
Rear view



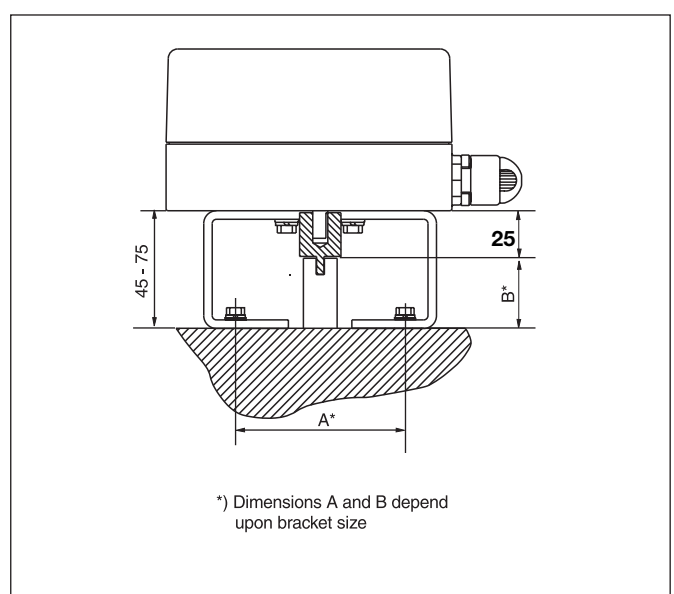
Side view (left)



Side view (right)



Mounting to linear actuators to DIN/IEC 534

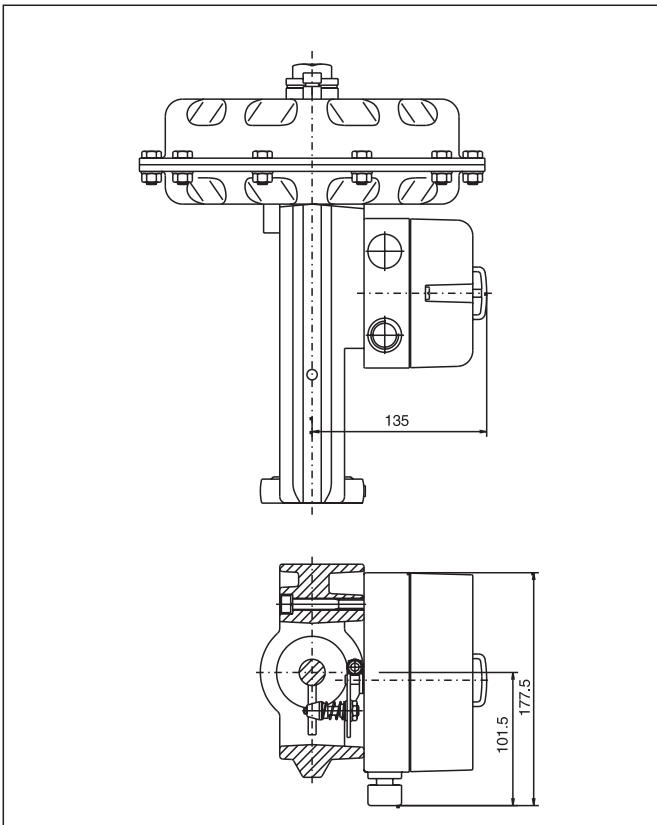


*) Dimensions A and B depend upon bracket size

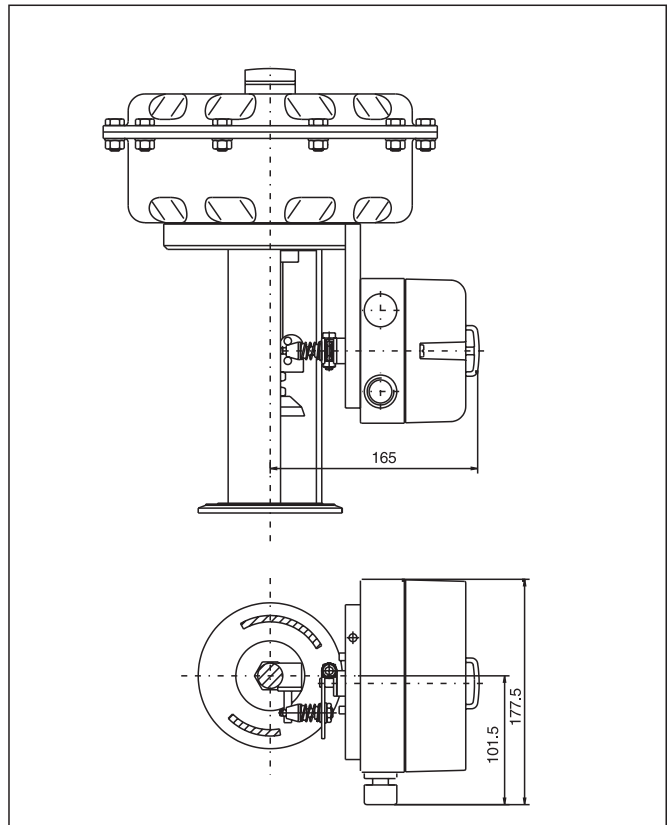
Mounting to rotary actuators to VDI/VE 3345

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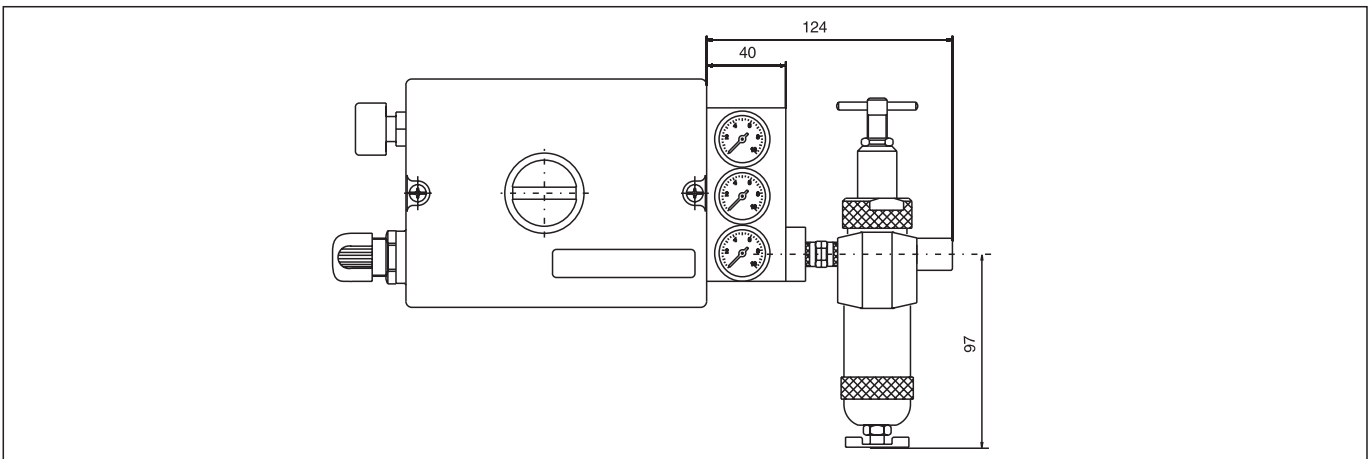
Dimensional drawings



Mounting to 23/24 and 23/25 control valves



Mounting to 23/26 control valves



TZIM with mounted pressure gage block and filter regulator

EP0007XA.EPS



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