

GEMÜ 1436 cPos

Intelligent positioner and integrated process controller



Features

- Digital inputs (option) for variable function control for automation
- Fieldbus interfaces e.g. Profibus DP, Profinet and DeviceNet (option)
- No air consumption when idle
- Simple mounting to various valve actuators
- Access rights via different user levels

Description

The GEMÜ 1436 cPos digital electro-pneumatic positioner is used with an optional integrated process controller to control pneumatically operated process valves with single-acting or double-acting linear or quarter turn actuators. When using the optional process controller, the signals from the process sensor (e.g. flow, level, pressure, temperature) are detected and the media adjusted according to the specified set value. The positioner has a robust housing with protected operating buttons and an easy-to-read, backlit LCD display.

Technical specifications

- Supply voltage: 24 V DC
 - Flow rate*: 150 l/min | 200 l/min | 300 l/min
 - Ambient temperature*: 0 to 60 °C
 - Conformities: EAC | EMC Directive
- * depending on version and/or operating parameters



Product line



	GEMÜ 1434 µPos	GEMÜ 1436 eco cPos	GEMÜ 1435 ePos	GEMÜ 1436 cPos
Controller type				
Positioner	●	●	●	●
Positioner and process controller	-	-	-	●
Flow rate	15 NI/min	150 l/min 200 l/min	50 NI/min 90 NI/min	150 l/min 200 l/min 300 l/min
Ambient temperature	0 to 60 °C	0 to 60 °C	-20 to 60 °C	0 to 60 °C
Housing material				
Aluminium	-	-	●	-
Housing cover: PP / housing base: Aluminium or stainless steel	●	-	-	-
Housing cover: PSU / housing base PP30	-	●	-	●
Control function of valve actuator				
Double acting	-	-	●	●
Single acting	●	●	●	●
Detection range				
Max. 30 mm, linear	●	●	●	●
Max. 50 mm, linear	-	●	●	●
Max. 75 mm, linear	-	●	●	●
Max. 90°, radial	-	●	●	●
Display				
No	●	●	-	-
Yes	-	-	●	●
Input option				
No	●	●	-	-
Yes	-	-	●	●

Product description



Item	Name	Materials
1	Operating and display elements, membrane keypad	Polyester film with acrylic glass
2	Housing cover	PSU
3	Housing base	PP 30
4	Mounting kit, valve specific	Materials, parts valve specific

Functions

- Positioner and process controller combined and synchronized with each other
- Automatic or manual optimizing initialisation
- Multiple point calibration for optimized valve control
- Diagnostics, alarm messages
- Operation possible when controller is active
- 4 parameter sets can be saved and reloaded
- 3 user levels (access authorization)
- Operating hours counter, event list (for details see operating instructions)
- Digital inputs (option) for variable function control for automation
- Alphanumeric display, 2 lines with 16 digits each, with background light

GEMÜ CONEXO

The interaction of valve components that are equipped with RFID chips and an associated IT infrastructure actively increase process reliability.



Thanks to serialization, every valve and every relevant valve component such as the body, actuator or diaphragm, and even automation components, can be clearly traced and read using the CONEXO pen RFID reader. The CONEXO app, which can be installed on mobile devices, not only facilitates and improves the "installation qualification" process, but also makes the maintenance process much more transparent and easier to document. The app actively guides the maintenance technician through the maintenance schedule and directly provides him with all the information assigned to the valve, such as test reports, testing documentation and maintenance histories. The CONEXO portal acts as a central element, helping to collect, manage and process all data.

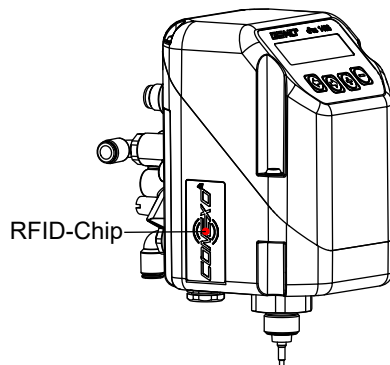
For further information on GEMÜ CONEXO please visit:

www.gemu-group.com/conexo

Ordering

GEMÜ Conexo must be ordered separately with the ordering option "CONEXO" (see order data).

Anbringung des RFID-Chips



Availability

Action	Flow rate		
	150 l/min	200 l/min	300 l/min (Booster)
Single acting	X	X	X
Double acting	X	X	-

Option code ¹⁾	Fieldbus			
	Without	DeviceNet	Profibus DP	Profinet
00	X	X	X	X
01	X	-	-	-

1) Option

Code 00: Without

Code 01: 2 additional digital inputs 24 V DC

Order data

The order data provide an overview of standard configurations.

Please check the availability before ordering. Other configurations available on request.

Note: Pneumatic connecting components (union and compressed air tube) for the connection between the process valve and positioner are included with each positioner.

Note: A valve specific mounting kit is required for assembly. For designing the mounting kit, the valve type, nominal size, control function and actuator size must be stated.

Order codes

1 Type	Code
Positioner, electro-pneumatic cPos	1436

2 Fieldbus	Code
Without	000
DeviceNet	DN
Profibus DP	DP
Profinet	PN

3 Accessory	Code
Accessory	Z

4 Action	Code
Single acting	1
Double acting	3

5 Device version	Code
Positioner	SA01
Positioner and process controller	PA01

6 Option	Code
Without	00
2 additional digital inputs 24 V DC	01

7 Flow rate	Code
150 l/min	01
200 l/min	02
300 l/min (Booster)	03

8 Travel length	Code
Potentiometer, 30 mm length	030
Potentiometer, 50 mm length	050
Potentiometer, 75 mm length	075
Potentiometer, 90° travel	090
Remote potentiometer, M12 connector	S01

9 Type of design	Code
Standard	
Dead zone presetting 2%	2442
Dead zone presetting 5%	2443
Inversed direction, for quarter turn valves control function NO (2)	6960

10 CONEXO	Code
Without	
Integrated RFID chip for electronic identification and traceability	C

Order example

Order option	Code	Description
1 Type	1436	Positioner, electro-pneumatic cPos
2 Fieldbus	000	Without
3 Accessory	Z	Accessory
4 Action	1	Single acting
5 Device version	SA01	Positioner
6 Option	00	Without
7 Flow rate	01	150 l/min
8 Travel length	030	Potentiometer, 30 mm length
9 Type of design		Standard
10 CONEXO		Without

Technical data

Medium

Working medium:	Compressed air and inert gases
Dust content:	≤ 10 mg/m ³ /particle size ≤ 40 µm (class 7)
Pressure dew point:	Class 4, max. pressure dew point +3 °C
Oil content:	Class 4, max. oil concentration 5 mg/m ³ Quality classes to DIN ISO 8573-1

Temperature

Storage temperature:	0 to 60 °C
Ambient temperature:	0 to 60 °C

Product compliance

EMC Directive:	2014/30/EU
Technical standards used:	
Interference emission:	DIN EN 61000-6-4 (09/2011) DIN EN 61326-1(industry) (10/2006)
Interference resistance:	DIN EN 61000-6-2 (03/2006) DIN EN 61326-1(industry) (10/2006)

Pressure

Operating pressure:	1.5 to 7 bar The applied pressure must not exceed the maximum control pressure of the process valve.
Flow rate:	150 l/min (flow rate code 01) 200 l/min (flow rate code 02) 300 l/min (Booster) (flow rate code 03)
Air consumption:	0 l/min (when idle)

Mechanical data

Installation position:	Optional
Protection class:	IP 65 acc. to EN 60529
Weight:	600 g
Travel sensor:	Integrated for direct mounting

	Linear design			Quarter turn design
Detection range:	0–30 mm	0 - 50 mm	0 - 75 mm	Angle of rotation 0 - 93°
Operating range:	0–30 mm	0 - 50 mm	0 - 75 mm	Angle of rotation 0 - 93°
Minimum travel sensor change:	≥ 3 % (only relevant for initialisation)			
Resistance R:	3 kΩ	5 kΩ	5 kΩ	3 kΩ
Correlation - Travel sensor¹⁾ spindle/valve position	Retracted (top) ± 100 % (valve open)			90° ± 100 % (valve open)

Technical data

Travel sensor:

	Linear design	Quarter turn design
	Extended (bottom) $\pm 0\%$ (valve closed)	$0^\circ \pm 0\%$ (valve closed)

1) Design code 6960: Inversed mode of action compared with description (Travel sensor signal inversed). For valves with inverted correlation.

Acoustic data

Noise emission:

> 80 dB (A)

Electrical data

Power supply

Supply voltage: 24 V DC (-5/+10%)

Power consumption:		Order variant fieldbus Profinet
Single acting:	$\leq 5.2 \text{ W}$	$\leq 8.6 \text{ W}$
Double acting / Booster:	$\leq 7.1 \text{ W}$	$\leq 10.7 \text{ W}$
plus in each case:	max. 36 W for active digital outputs with max. on-load current	

Reverse battery protection: Yes

Duty cycle: Continuous duty

Electrical protection class: III

Analogue inputs

Set value / actual value:

- Set value and actual value input are galvanically isolated from the supply voltage
- Set value and actual value input are **not** galvanically isolated from the actual value output
- Set value and actual value input are **not** galvanically isolated from each other

Set value input: 0/4 - 20 mA (adjustable)

Process actual value input: 0/4 - 20 mA (adjustable)
Only for device version code PA01

Input type: passive

Input resistance: 120 Ω (+ approx. 0.7 V voltage drop due to reverse battery protection)

Accuracy/linearity: $\leq \pm 0.3\%$ of full flow

Temperature drift: $\leq \pm 0.3\%$ of full flow

Resolution: 12 bit

Reverse battery protection: Yes

Overload proof: Yes (up to $\pm 24 \text{ V DC}$)

Analogue output

Actual value output: 4 - 20 mA

Output type: active

Load resistor: Max. 600 Ω

Accuracy: $\leq \pm 1\%$ of full flow

Temperature drift: $\leq \pm 0.5\%$ of full flow

Resolution: 12 bit

Short-circuit proof: Yes

Overload proof: Yes (up to $\pm 24 \text{ V DC}$)

Digital input

Note: The additional digital inputs 1 / 2 must be ordered via the ordering option "Option". In the fieldbus versions, the function of the digital inputs can be used as standard via the bus communication.

Inputs:	1 / 2
Function:	selectable via software (DigIn 1; DigIn2; DigInW; DigInX) (reference: GND X1:3)
Input voltage:	24 V DC
Input current:	2,5 mA DC at 24 V DC
High level:	>14 V DC
Low level:	< 8 V DC

Digital output

Switching outputs:	K1 / K2
Function:	selectable using software
Switching voltage:	Supply voltage
On-load current:	max. 0.5 A
Drop voltage:	Max. 2.5 V DC at 0.5 A
Type of contact:	PNP
Pull-Down resistance:	120 kΩ
Short-circuit proof:	Yes
Overload proof:	Yes (up to ± 24 V DC)

Travel sensor input (for travel length code S01 – remote potentiometer)

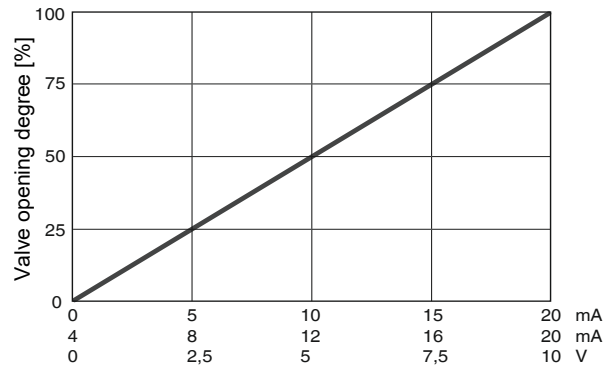
Note: Travel sensor input galvanically isolated from supply voltage, not galvanically isolated from the set value/actual value inputs and actual value output.

Input voltage range:	0 to UP+
Supply voltage U_{ps}:	Typically 10 V DC
Resistance range of remote potentiometers:	1 to 10 kΩ
Input resistance:	620 kΩ
Accuracy/linearity:	≤ ±0.3% of full flow
Temperature drift:	≤ ±0.3% of full flow
Resolution:	12 bit
Short-circuit proof:	Yes
Overload proof:	Yes (up to ± 24 V DC)

Positioner data

Note: Following diagram valid for valves with standard correlation between spindle position and valve position.
(See section "Mechanical data, correlation between travel sensor spindle/valve position")

Control diagram: Default setting / The control characteristic is adjustable.



During initialisation, the 1436 cPos positioner automatically detects the control function of the valve and adjusts itself by default so that the valve is closed when the signal is 0/4 mA.*

The assignment can be changed subsequently by means of parameters.

* with double acting actuators dependent on pneumatic actuator

Positioner

Control error: 1 % default setting
 ≥ 0.1 % (adjustable)
 ≤ 2.0 % (preset, K-no. 2442)
 ≤ 5.0 % (preset, K-no. 2443)

Parameterisation: adjustable

Initialisation: automatic or manual

Close tight function: option

Process controller

Option only for device version code PA01

Controller type: Continuous controllers

PID parameters: adjustable

Process actual value input: 0/4 - 20 mA (adjustable)

Interfaces

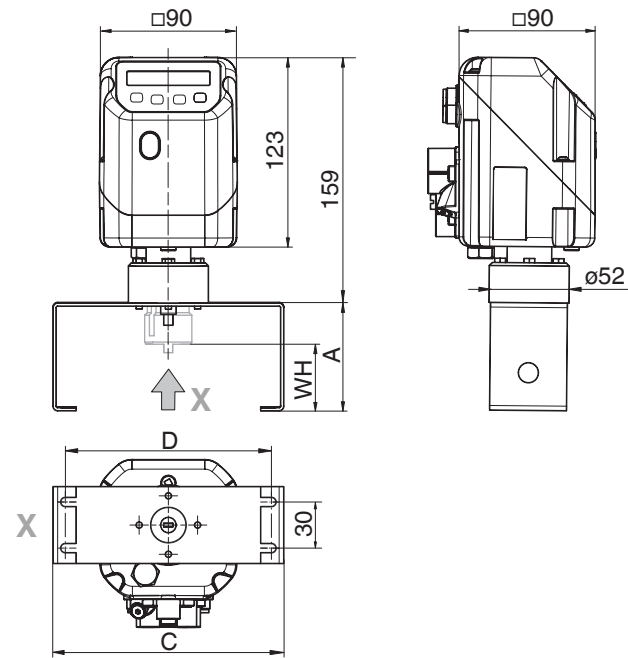
	RS232	Profibus DP	DeviceNet	Profinet
Function*	Parameterisation* via web browser	Parameterisation*/process data		
Transmission rates	-	9.6k / 19.2k / 45.45k / 93.75k / 500k baud	125k / 250k / 500k baud	100M baud**

* At the device: Menu selection - context sensitive or help texts

At the PC: Internet MS® Internet Explorer

** Two switches are connected in series internally between connection X1 and X3. Communication lead time during operation in line structure (connection X1 and X3) therefore double that of a "standard two-port device".

Direct mounting to quarter turn actuators



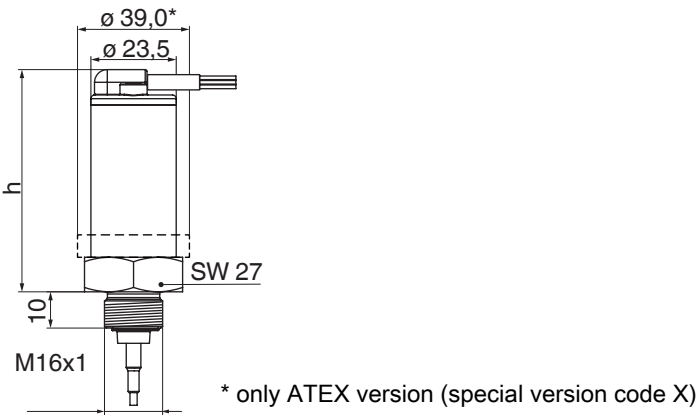
Shaft height WH	Hole spacing D	A	C
20	80	40	100
30	80	50	100
50	130	70	150

Dimensions in mm

Accessory dimensions

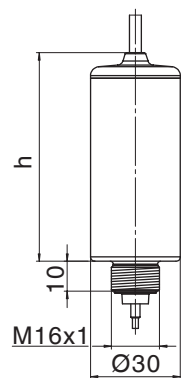
GEMÜ 4232 travel sensor

Housing material aluminium



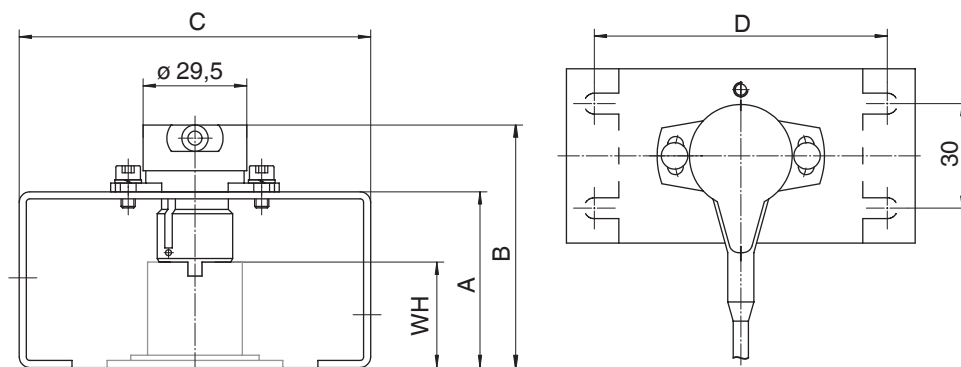
Travel length Code	h
030	62.2
050	84.2
075	109.2

Dimensions in mm

Housing material PVDF or PP

Travel length Code	h
030	69.6
050	91.6
075	116.6

Dimensions in mm

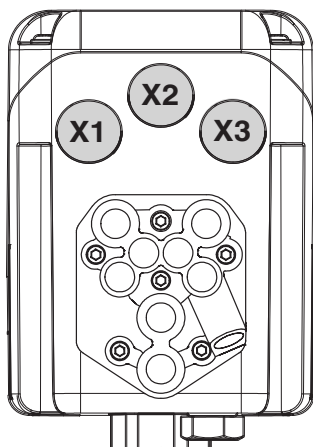
GEMÜ 4231 travel sensor with mounting bracket

WH Shaft height	D Hole spacing	A	B	C
20	80	40	59	100
30	80	50	69	100
50	130	70	89	150

Dimensions in mm

Electrical connection

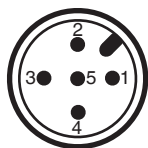
Position of the connectors



24 V

Note: Ordering option without fieldbus code 000

Connection X1



5-pin M12 plug, A-coded

Pin	Signal name
1	U _v , 24 V DC supply voltage
2	Switching output K1, 24 V DC
3	GND, (supply voltage, DigIn1+2+W +X; K1+2)
4	Switching output K2, 24 V DC
5	Digital input 1 (only for Option code 01)

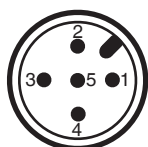
Connection X2



5-pin M12 plug, B-coded

Pin	Signal name
1	I+, actual value output
2	I-, actual value output
3	RxD, Receive Data, TxD-P
4	TxD, Transmit Data, RS 232
5	GND, RS 232

Connection X3



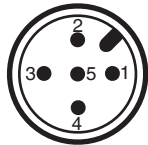
5-pin M12 plug, A-coded

Pin	Signal name
1	W+, set value input
2	W-, set value input / Digital In W
3	X+, process actual value input
4	X -, process actual value input
5	Digital input 2 (only for Option code 01)

DeviceNet

Note: Ordering option Fieldbus code DN

Connection X1



5-pin M12 plug, A-coded

Pin	Signal name
1	U _v , 24 V DC supply voltage
2	n. c.
3	GND, (supply voltage)
4	n. c.
5	n. c.

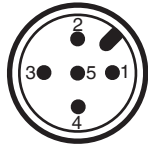
Connection X2



5-pin M12 plug, B-coded

Pin	Signal name
1	n. c.
2	n. c.
3	n. c.
4	n. c.
5	n. c.

Connection X3



5-pin M12 plug, A-coded

Pin	Signal name
1	Shield
2	V+
3	V-
4	Can H
5	Can L

Profibus

Note: Ordering option Fieldbus code DP

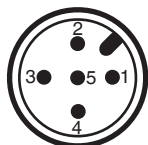
Connection X1



5-pin M12 plug, B-coded

Pin	Signal name
1	n. c.
2	RxD / TxD-N (PB-)
3	n. c.
4	RxD / TxD-P (PB+)
5	n. c.

Connection X2



5-pin M12 plug, A-coded

Pin	Signal name
1	U _v , 24 V DC supply voltage
2	n. c.
3	GND, (supply voltage)
4	n. c.
5	n. c.

Connection X3



5-pin M12 built-in socket, B-coded

Pin	Signal name
1	BUS-V DC + 5 V DC (PB_5V)
2	RxD / TxD-N (PB-)
3	D GND (PB_GND)
4	RxD / TxD-P (PB+)
5	n. c.

Profinet

Note: Ordering option Fieldbus code PN

Connector housings, connection X1 and X3, are used for shielding and are electrically connected to each other inside the device

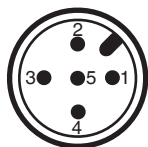
Connection X1 and X3



4-pin M12 built-in socket, D-coded

Pin	Signal name
1	TD+
2	RD+
3	TD-
4	RD-

Connection X2



5-pin M12 plug, A-coded

Pin	Signal name
1	Uv, 24 V DC supply voltage
2	n. c.
3	Uv, GND supply voltage
4	n. c.
5	n. c.

Connection X1 and X3



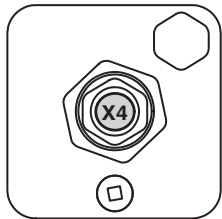
4-pin M12 built-in socket, D-coded

Pin	Signal name
1	TD+
2	RD+
3	TD-
4	RD-

Version with external actual value potentiometer

Note: Ordering option Travel sensor version code S01

Position of the connectors



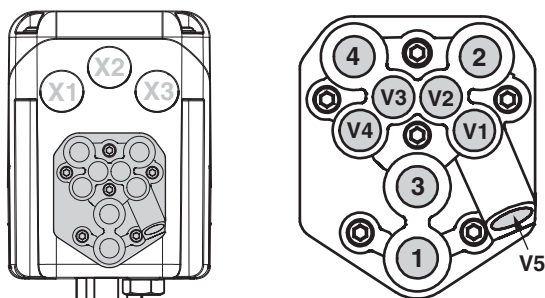
Connection X4



5-pin M12 built-in socket. A-coded

Pin	Signal name
1	UP+, output potentiometer supply voltage (+)
2	UP, input potentiometer wiper voltage
3	UP-, output potentiometer supply voltage (-)
4	n. c.
5	n. c.

Pneumatic connection



DIN ISO 1219-1	Designation	Size
1	Air supply connection P	G1/8
3	Venting connection R with silencer	G1/8
V1	Supply air throttle for A1 (connector 2)	-
V2	Exhaust air throttle for A1 (connector 2)	-
V3	Exhaust air throttle for A2* (connector 4)	-
V4	Supply air throttle for A2* (connector 4)	-
V5	Check valve	-
2	Working connection A1 for process valve (control function 1 and 2)	G1/8
4	Working connection A2 for process valve (control function 3)*	G1/8

* only double acting type (code 3)

Fail safe function		
Error	Working connection A1 (2)	Working connection A2 (4)
Power supply failure	Single acting: vented Double acting: vented	Single acting: - Double acting: pressurized
Compressed air supply failure	Single acting: vented Double acting: vented	Single acting: - Double acting: undefined
This fail safe function is not a substitute for specific plant safety requirements.		

Adjustable safety reactions		
Error	Working connection A1 (2)	Working connection A2 (4)
Set value < 4,0 mA (range adjustable from 0...22 mA under I Min W)	Single acting: Function adjustable (Open, Close**, Hold, Safe) Double acting: Function adjustable (Open, Close**, Hold, Safe)	Single acting: -
Set value > 20 mA (range adjustable from 0...22 mA under I Min W)		Double acting: Function adjustable (Open, Close**, Hold, Safe)
Actual value < 4.0 mA (range adjustable from 0...22 mA under I Min X)*		
Actual value > 20.0 mA (range adjustable from 0...22 mA under I Max X)*		
* only available for Device version code PA01 ** Close = default setting		

Mounting options

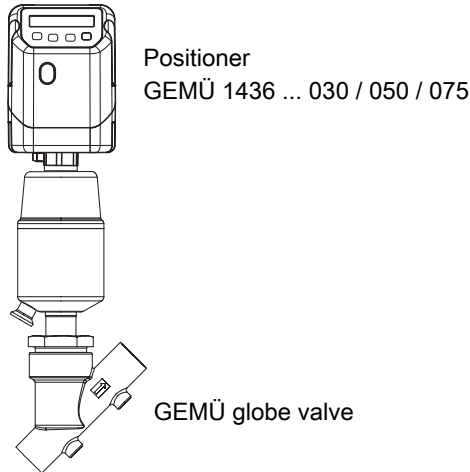
Mounting the positioner to linear actuators

Direct mounting

For direct mounting of the positioner on a valve with linear actuator, you need the following components

- GEMÜ 1436 positioner in travel sensor version code 030, 050 or 075 (dependent on the stroke of the valve used)
- GEMÜ 1436 S01 Z... valve specific mounting kit for mounting the positioner

(At the time of ordering, specify the valve type with nominal size and control function)



Remote mounting

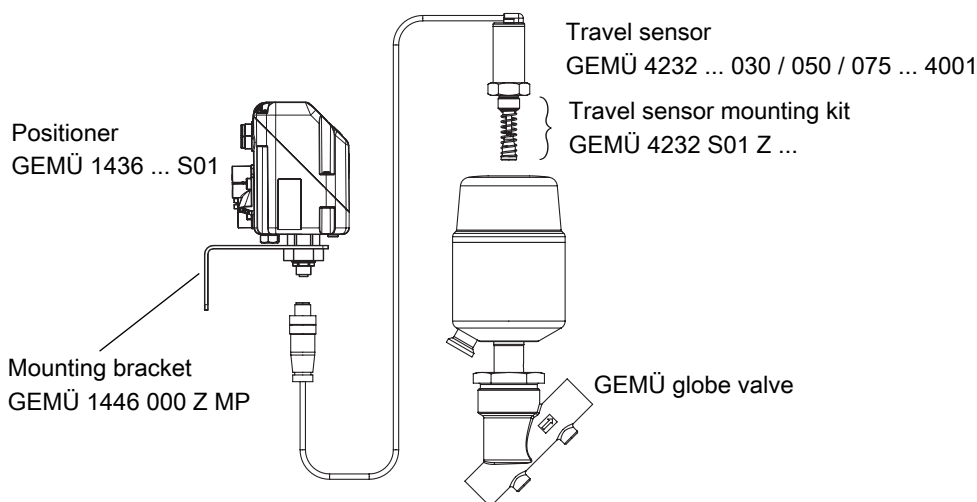
For remote mounting of the positioner on a valve with linear actuator, you need the following components

- GEMÜ 1436 positioner in travel sensor version code S01 (remote potentiometer)
- Travel sensor GEMÜ 4232 ... 030, 050 or 075... 4001

(Travel sensor version dependent on the valve used, cable length dependent on the required distance between the valve and positioner)

- GEMÜ 4232 S01 Z... valve specific mounting kit for mounting the travel sensor
- GEMÜ 1446 000 Z MP mounting bracket (optional) for fixing the positioner

(At the time of ordering, specify the valve type with nominal size and control function and the required distance to the mounting location of the positioner)



By using remote mounting and additional, deviating components, the valve can also be used in potentially explosive areas (provided that this is approved). In this case, the positioner must be installed outside the potentially explosive area and the connection with the travel sensor established via safety barriers.

The electrical connection and the installation must be carried out in accordance with the specifications in the operating instructions.

Applicable area (zone) dependent on the type of ignition protection of the valve or travel sensor.

The following deviating, supplementary components are to be used for this type of operation:

- Travel sensor in explosion-proof design GEMÜ 4232 ... 030/050/075 ... 0000 ... X
Travel sensor version dependent on the valve used, cable length dependent on the distance between the critical (potentially explosive) and safe zone
- Connector between travel sensor and positioner, GEMÜ 1219000Z0300SG00M0M125A, order number: 88208779
- Safety barrier A two-channel, safety barrier P626, order number: 99014203*
- Safety barrier B one-channel, safety barrier P630, order number: 99014207*

* Alternative safety barriers with similar characteristics can be used on-site – technical properties available on request

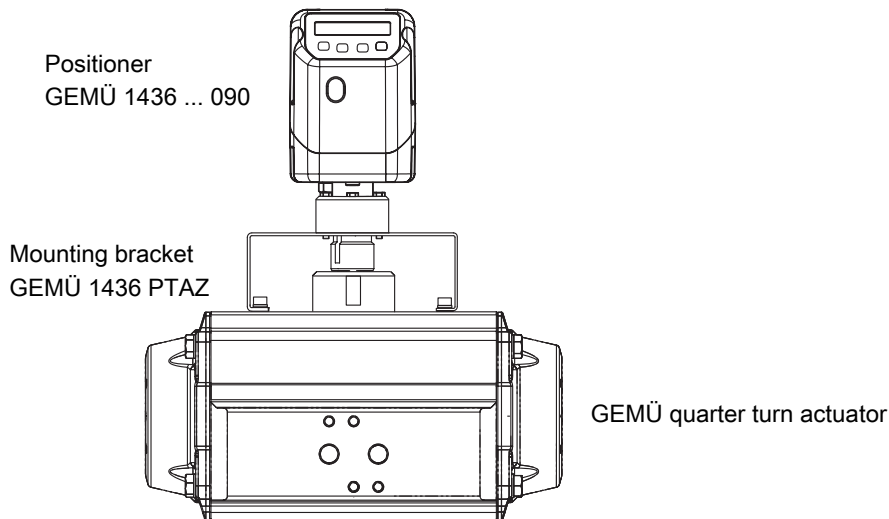
Mounting the positioner to quarter turn actuators

Direct mounting

For direct mounting of the positioner on a valve with quarter turn actuator, you need the following components

- Positioner GEMÜ 1436 ... 090
- GEMÜ 1436 PTAZ ... 090 000 valve specific mounting kit for mounting the positioner

(When ordering, specify valve type with actuator flange size)

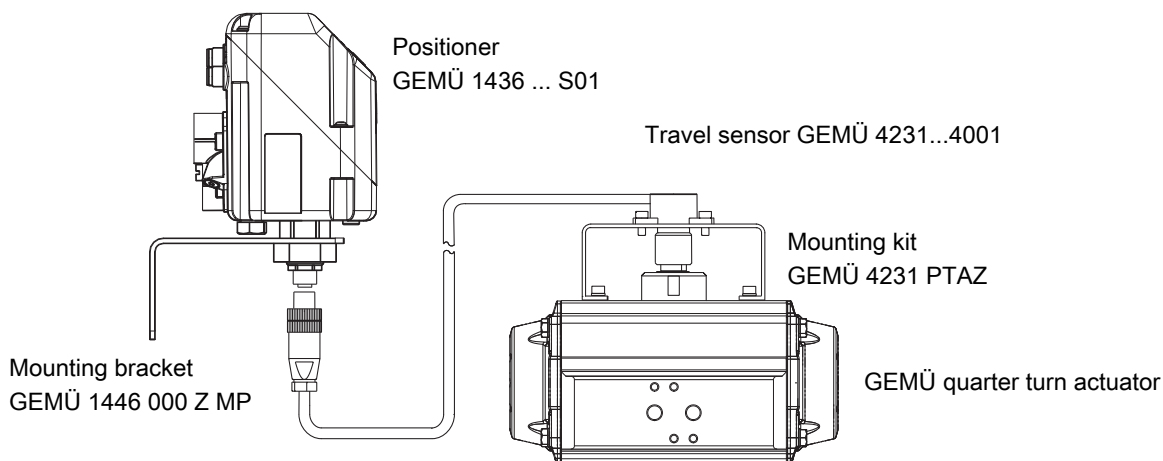


Remote mounting

For remote mounting of the positioner on a valve with quarter turn actuator, you need the following components

- GEMÜ 1436 positioner in travel sensor version code S01 (remote potentiometer)
- GEMÜ 4231...4001 travel sensor (cable length dependent on the required distance between the valve and positioner)
- 4231PTAZ... ..090 000 valve specific mounting kit for mounting the travel sensor
- GEMÜ 1446 000 Z MP mounting bracket (optional) for fixing the positioner

(At the time of ordering, specify the actuator flange size and the required distance to the mounting location of the positioner)



By using remote mounting and additional, deviating components, the valve can also be used in potentially explosive areas (provided that this is approved). In this case, the positioner must be installed outside the potentially explosive area and the connection with the travel sensor established via safety barriers.

The electrical connection and the installation must be carried out in accordance with the specifications in the operating instructions.

Applicable area (zone) dependent on the type of ignition protection of the valve or travel sensor.

The following deviating, supplementary components are to be used for this type of operation:

- GEMÜ 4231 ... 0000 travel sensor
cable length dependent on the required distance between critical (potentially explosive) and safe zone
- Connector between travel sensor and positioner, GEMÜ 1219000Z0300SG00M0M125A, order number: 88208779
- Safety barrier A two-channel, safety barrier P626, order number: 99014203 *
- Safety barrier B one-channel, safety barrier P630, order number: 99014207 *

* Alternative safety barriers with similar characteristics can be used on-site – technical properties available on request

Accessories



GEMÜ 1436 S02 Z

Connection kit

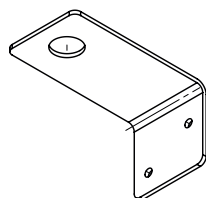
The 1436 S02 Z ... connection kit is used to electrically connect the GEMÜ 1436 cPos positioner to a control unit. The kit comprises pre-assembled cable connections with various connector plugs/sockets and suitable cables with selectable lengths or, alternatively, without a cable but with a threaded connection.

Ordering information

Designation	Connection type X1/X3, A-coded	Connection type X2, B-coded	Order number
1436S02Z00M000M0	X1/X3 angle, without cable	X2 angle, without cable	88249257
1436S02Z00M000Y0	X1/X3 angle, without cable	X2 Y cable and M12 socket without cable	88254410
1436S02ZDPM0DP M0 ²⁾	X1/X3 Profibus, angle, without cable	X2 Profibus, angle, without cable	88255343
1436S02Z05M00000	X1/X3 Profibus, angle, without cable	X2 Profibus, angle, without cable	88261515
1436S02Z10M00000	X1/X3 angle, 10 m cable	X2 protective cap	88271125
1436S02Z05M005M0	X1/X3 angle, 5 m cable	X2 angle, 5 m cable	88286587
1436S02Z00M00000	X1/X3 angle, without cable	X2 protective cap	88293897
1436S02Z15M00000	X1/X3 angle, 15 m cable	X2 protective cap	88382742
1436S02Z10M000M0	X1/X3 angle, 10 m cable	X2 angle, without cable	88418550

¹⁾ For simultaneous use - actual value output and RS232 interface (eSy.com)

²⁾ For fieldbus version Profibus DP (code DP)



GEMÜ 1446 000 ZMP

Mounting bracket for external wall mounting

Mounting bracket for wall mounting



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