

Electronic position transmitter ESM21ex (ESM21EXEBA0234)

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Note:



Notes contain important information.

Warning:



Warnings indicate special methods or handling procedures which, if not followed properly, may result in serious injury.

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Documentation number: ESM21EXEBA0234

1 General

The ESM21ex electronic position transmitter is an angle transmitter with an optical based principle. It is used for conversion of the position of an actuator to standard output signal 4...20 mA. This signal is used, e.g., for indicating the position of the actuator in the control room or is processed further by the positioner (SRG) or a superordinate process controller.

The ESM21ex is developed in protection concept "intrinsically safe" for operation in hazardous areas.

2 Dimensions, symbol, fastening

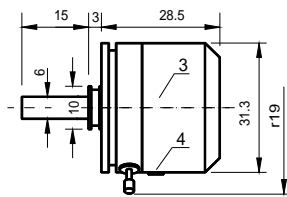


Fig.1: Dimensions

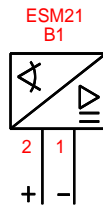


Fig.2: Symbol

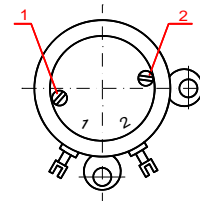


Fig.3: Fastening

The ESM21ex is fastened with two synchronous clamps, as shown in figure 3.

3 Connections

The ESM21ex is operated in a two-wire circuit (fig. 4).

The maximum load resistance is calculated as follows:

$$R_{Lmax} = \frac{(V_{cc} - 14V)}{20mA} \quad \text{e.g.: } V_{cc}=24V \Rightarrow R_{Lmax} = 500\Omega$$

ATTENTION ! All connection wires have to be taken into account when calculating the external load resistance.

ATTENTION ! Voltage against ground (housing of ESM21ex) must not exceed 30V!!

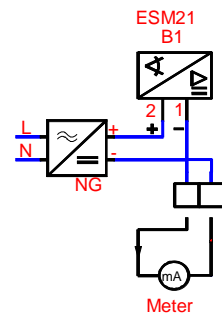


Fig.4

4 Adjustment

4.1 Adjustment potentiometer and jumper

There are two adjustment potentiometers on the ESM21ex. One for the 0-point (ZERO, fig. 3 part 2) and the other for the range (SPAN, fig. 3 part 1). Two jumpers are situated below the cover (fig. 1 part 3) which can be removed by releasing the screw (fig. 1 part 4). The jumpers are used to select the sense of rotation and the measuring range.

4.2 Selecting sense of rotation

- Jumper placed "vertically" for clockwise direction. (fig. 5)
- Jumper placed "horizontally" for counter-clockwise direction. (fig. 6)

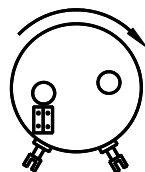


Fig.5

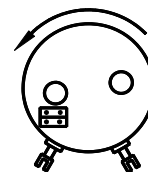


Fig.6

4.3 Selecting range

The range of the ESM21ex is preset to the range (fig. 7). The range can be reduced, if you can not reach the end value (20mA) at full travel of valve.

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The following adjustments are possible:

- Jumper at bottom for measuring range between 130° and 290° (fig. 7)
- Jumper on top for measuring range between 80° and 170° (fig. 8)
- Jumper left for measuring range between 220° and 290° (fig. 9)

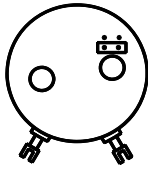


Fig.7: "130°-290° "

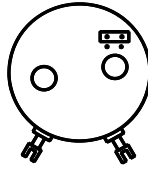


Fig.8: "80°-170° "

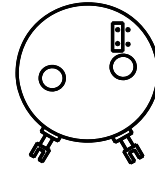


Fig.9: "220°-290° "

4.4 Mechanical preadjustment

Connect ESM21ex according to section 3. After setup of final position switches (according to operating instructions for the actuator) move the actuator from "OPEN position" to "CLOSE position". Check the course of the output current of the ESM21ex. It has to be in the working range (fig. 10) and has to fall continuously in closing direction.

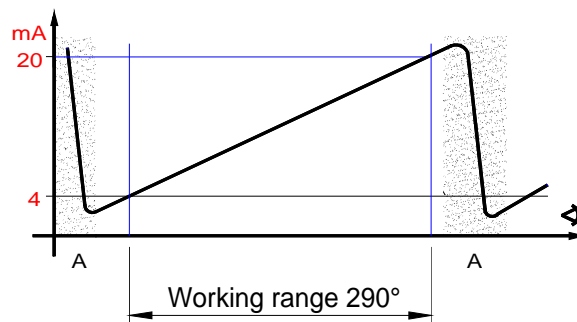


Fig.10

If the output current of the ESM21ex changes too fast (area A in fig. 10), the operating range has to be adjusted until this area lies outside of the working range. In the model with teletransmission gear (fig. 11) the working range is set by turning shaft 4 and in the model with indicator gear (fig. 12) by turning the positioning wheel. Adjust in "CLOSE position" an output current of the ESM21ex of approx. 4mA.

Due to a sliding clutch, changes of settings of the travel switches which have already been setup cannot occur.

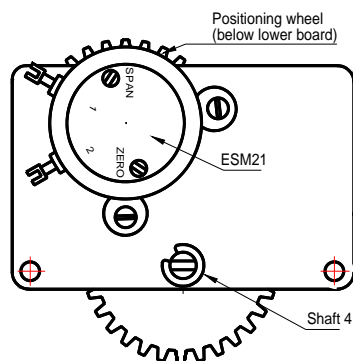


Fig.11: Teletransmission gear

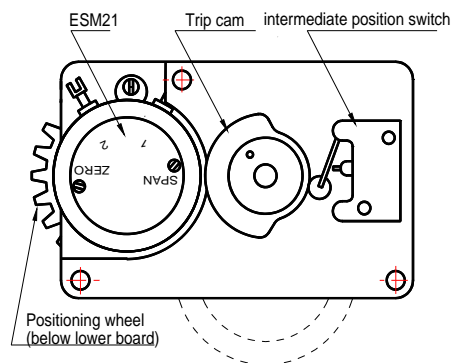


Fig.12: Indicator gear

4.5 Elektronic setting

For setup of 0-point (Zero) use the potentiometer "ZERO" (fig. 3, part 2), for the measuring range (Span) use the potentiometer "SPAN" (fig. 3, part 1).

In the following, this would be assumed:

4mA	"CLOSE" position
20mA	"OPEN" position

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Initial value: Move to "CLOSE" position. Set an output current of 4mA using the potentiometer "ZERO".

Final value: Move to "OPEN" position. Set the output signal to 20mA using the potentiometer "SPAN".

Control: After setting, check both final positions and, if necessary, readjust according to the initial value and final value points.

5 Malfunction

If there is a malfunction of the ESM21ex please check the following:

No output signal

Is the power supply connected correctly?

(pin 1 on ESM21ex...-, pin 2 on ESM21ex...+)

Is the external measuring circuit connected?

The output signal does not reach 20mA
at full travel.

Is the ESM21ex set correctly?

Is the power supply correct?

Is the resistance of the external load in the allowed range (see chapter 3 Connections)? (Does the current increase if reducing ext. load?)

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6 Technical data

Product number	OPFEX4-2R/LAP (OPFEX4-2-P)
Case and cover	Aluminium, black anodized
Shaft	Stainless steel
Weight.....	approx. 40 g
Operating voltage.....	14...30V DC
Voltage against ground	max. 30VDC
Output signal.....	4...20 mA
Residual voltage at output signal	<10 mVs
Effective rotary angle	max. 290°
Angle ranges (to be set.....	0...50/100°
by jumper)	0...100/200°
.....	0...145/290°
Deviation of linearity.....	<1%
Reproducibility	<0.1%
Temperature coefficient	<+/-200 ppm/°C
Temperature range	-20°C to +40°C
Zero setting.....	+/- 10°
Sense of rotation.....	selectable by jumper
Vibration resistance	10G, 100 - 2000 Hz, 3 axes
Shock resistance.....	100G, 6 axes
Explosion protection class.....	EEx ib IICT6
Certification nr.....	DEMKO, 90C.98014X
U_{max}	30V
I_{max}	30mA
Internal capacity, C_i	<30nF
Internal inductivity, L_i	<250μH