

Hazard Warnings

Hazard warnings in this manual indicate potential harm to the user or the product. For the person interacting with the product, the level of risk includes consequences ranging from slight, up to lethal injuries. As for the product, disobeying the warnings may cause damage to the equipment and/or void the warranty. Therefore, said warnings are made apparent to instruct and warn the user, which precautions have to be made prior to performing any actions described in this manual. The user must read and be familiar with the manual, before performing any tasks as described in this manual.

Hazard warnings in this manual are presented in these three forms:

WARNING: These warning notices refer to personal safety. Failure to obey these notices could result in personal injury or death.



WARNING

CAUTION: General precautions must be made. Failure to obey these notices could result in personal injury and/or equipment damage.



CAUTION

NOTE: Directs the user's attention to essential information.

Data sheet for the electronic position transmitter ESM21ex

SFC-DS-ENGLISH-ESM21EX-V2.10-2015.10.01

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

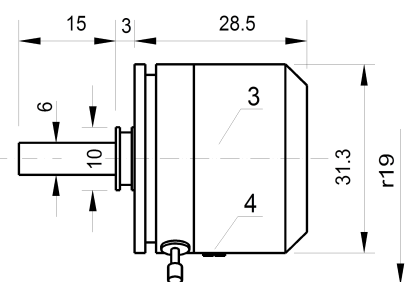


Figure 1: Dimensions

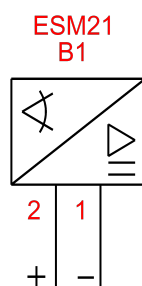


Figure 2: Symbol

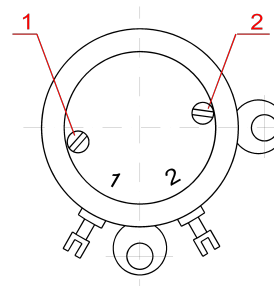


Figure 3: Fastening

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

3 Connections

The ESM21ex is operated in a two-wire circuit (see Figure 4)
The maximum load resistance is calculated as follows:

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

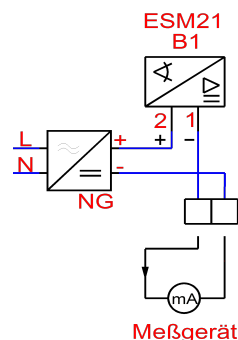


Figure 4

WARNING: All connection wires have to be taken into account when calculating the external load resistance.
Voltage against ground (housing of ESM21ex) must not exceed 28V!!!



WARNING

4 Adjustment

4.1 Einstellpotentiometer und Jumper

There are two adjustment potentiometers on the ESM21ex. One for the 0-point (ZERO, Figure 3 part 2) and the other for the range (SPAN, Figure 3 part 1). Two jumpers are situated below the cover (Figure 1 part 3) which can be removed by releasing the screw (Figure 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. (see Figure 5)
- Jumper placed "horizontally" for counter-clockwise direction (see Figure 6)

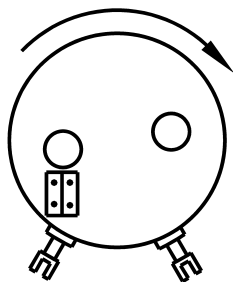


Figure 5

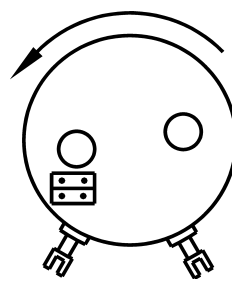


Figure 6

4.3 Selecting range

The range of the ESM21ex is preset to the range (siehe Figure 9) The range can be reduced, if you can not reach the end value (20mA) at full travel of valve.

The following adjustments are possible:

- Jumper at bottom for measuring range between 100° and 200° (see Figure 7)
- Jumper on top for measuring range between 50° and 100° (see Figure 8)
- Jumper left for measuring range between 145° and 290° (see Figure 9)

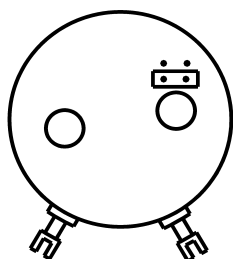


Figure 7: 100°-200°

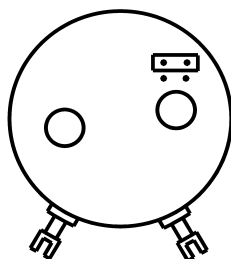


Figure 8: 50°-100°

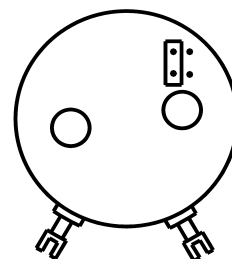


Figure 9: 145°-290°

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 (see Figure 10: „Arbeitsbereich") and has to fall continuously in closing direction.

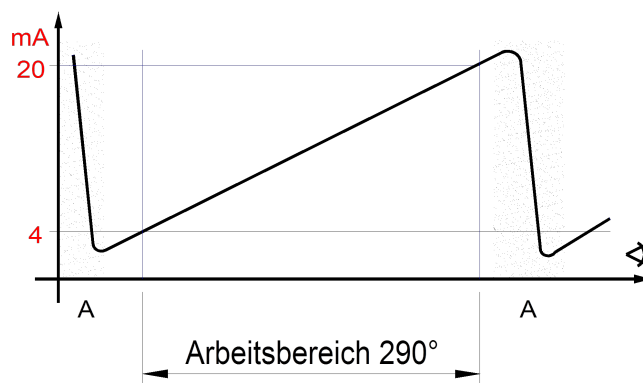


Figure 10

5 Malfunction

If the output current of the ESM21ex abruptly changes (area A in Figure 10), the operating range has to be adjusted until this area lies outside of the working range. In the model with teletransmission gear (see Figure 11) the working range is set by turning shaft 4 and in the model with indicator gear (see Figure 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.

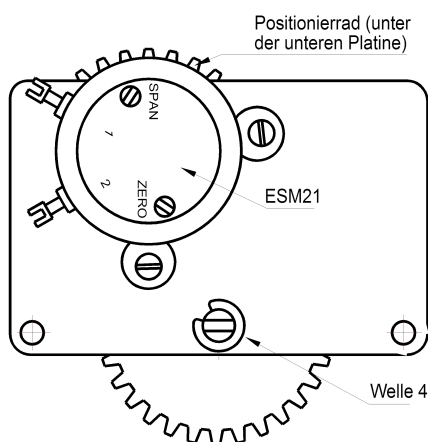


Figure 11: Teletransmission gear

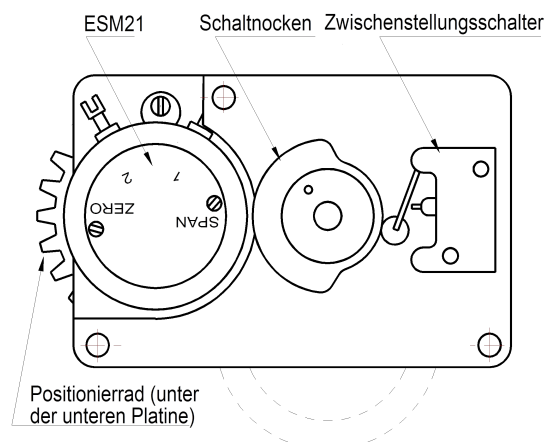


Figure 12: Indicator gear

4.5 Electronic setting

For setup of 0-point (Zero) use the potentiometer „ZERO" (see Figure 3), for the measuring range (Span) use the potentiometer „SPAN" (see Figure 3, Teil 1).

In the following, this would be assumed:

- 4mA „CLOSE" position
- 20mA „OPEN" position

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)? (Does the current increase if reducing ext. load?)

6 Technical data

Product number	OPFEX4-2R/LAP(OPFEX4-2-P)
Case	metallized plastic
Cover	stainless steel
Shaft	stainless steel
Weight	approx. 40g
Operating voltage	16...28V DC
Voltage against ground	max. 28VDC
Output signal	4...20 mA
Residual voltage at output signal	<10 mVs
Measurement range	max. 290°
Angle ranges (to be set by jumper)	0...50/100° 0...100/200° 0...145/290°
Deviation of linearity	<1%
Reproducibility	<0,1%
Temperature coefficient	<+/-200 ppm/°C
Temperature range	-20°C bis +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	Ex II 1G Ex ia IIC T6 Ga
Certification nr	Intertek, ITS11ATEX27383X /2
Ui	28V
Ii	100mA
Pi	660mW
Internal capacity, Ci	<38nF
Internal inductivity, Li	<840μH

CAUTION: The ESM21ex does not meet the 500V insulation requirement of IEC 60079-11 and shall therefore be powered by an interface providing galvanic isolation, or, when Zener Barrier is used, appropriate precautions shall be taken (earthing, etc ...).



CAUTION

7 Power supplies

The following equipment can be used for power of the ESM21ex, in that respect other makings may be approved for the purpose which is beyond our responsibility what so ever:

Stahl: Ispac 9160/12-11-11s
Pepperl+Fuchs: KFDO-CS-Ex1.50P
Phoenix: 2924029 MACX MCR-EX-SLRPSSI-UP-SP