

Electronic position transmitter ESM31 (ESM31EBA9750)

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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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1 General

The ESM31 is an angular transmitter structured on an optical basis. It serves to transform the position of the actuator into the standard power signal 0...20mA (or 4...20 mA upon request). This signal serves to signal the position of the actuator in the control room, or is further processed by a position controller (SRG) or any overriding process controller.

2 Dimensions, Symbol

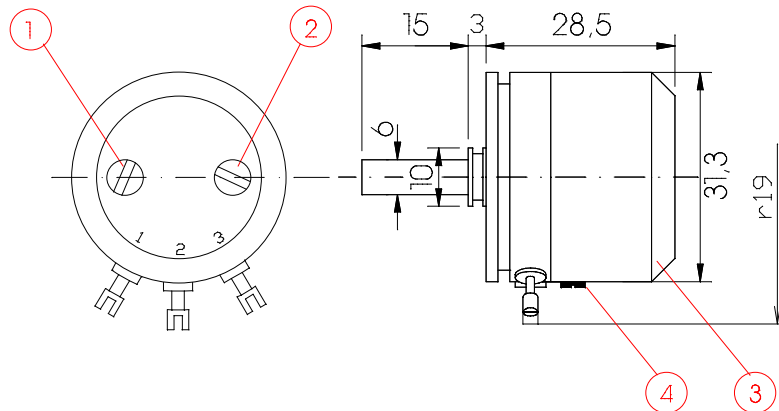


Illustration 1: Dimensions

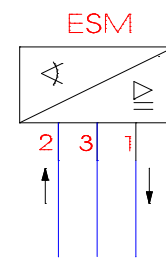


Illustration 2: Symbol

3 Connection

The ESM31 is operated in a three-wire circuit (illustration 3 and 4).

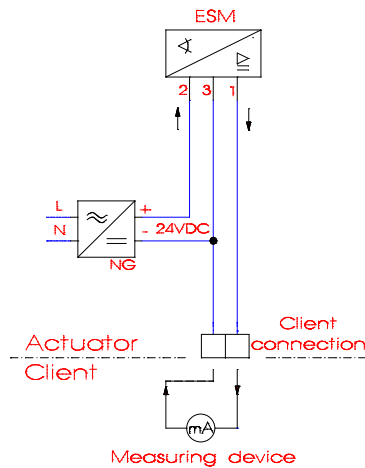


Illustration 3: ESM, supplied internally

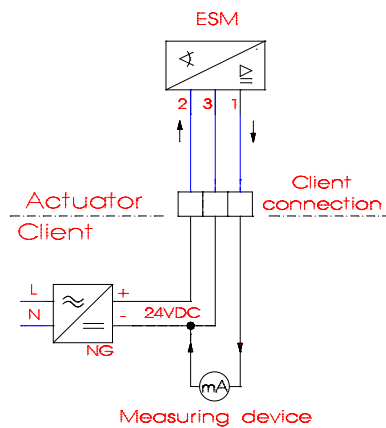


Illustration 4: ESM, supplied externally

The ESM 31 is supplied via pins 3(-) and 2(+). Pin 1 delivers the power signal against ground (pin 3) which can be measured with a measuring device. If the ESM 31 is supplied internally (illustration 3), only the measuring device for determining the output current will be required on the side of the client. In case of external supply (Illustration 4), the supply (NG) must additionally be provided on the side of the client. The client pin assignment and the circuitry (Illustration 3 or 4) can be seen in the circuit diagram delivered along with the actuator.

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4 Adjustment

4.1 Trimming Potentiometer and Jumper

The trimming potentiometer for the 0-point (ZERO, Illustration 1, Part 2), and for the measuring range (SPAN, Illustration 1, Part 1), can be accessed directly through the lid of the angular teletransmitter. One jumper is placed underneath the lid (Illustration 1, Part 3), which can be removed after loosening the screw (Illustration 1, Part 4). This serves to select the rotating direction (See Illustrations 5 and 6).

4.2 Selection of Rotating Direction, see Illustrations 5 and 6

Place the blue jumper "horizontally" for clockwise rotation. (Illustration 5).

Place the blue jumper "vertically" for counter-clockwise rotation. (Illustration 6).

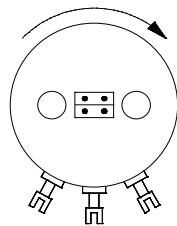


Illustration 5

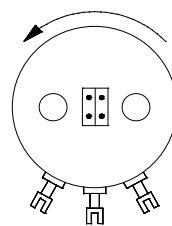


Illustration 6

The rotating direction of the ESM31 electrical position transmitter (rotating direction of the ESM31 shaft) has already been preset ex works.

(If one position transmitter is delivered as a replacement part for several actuators, the rotating direction must be checked and possibly reset.)

4.3 Measuring Range

The ESM31 is exclusively delivered with a preselected main measuring range that cannot be altered. The ESM31 standardly supplies 0...20 mA, but can be retrofitted with another gear to 4...20mA by special order.

4.4 Mechanical Presetting

Connect the ESM31 properly according to Section 3. After setting the final position switches (according to the operational instructions of the actuator), move the fittings from the "OPEN" to the "CLOSE" position. Simultaneously observe the flow of the ESM31's output current. The output current of the ESM31 must lie within the operational range (Illustrations 7 and 8) over the entire travel of the fittings, this means it must continuously decrease in the closing direction.

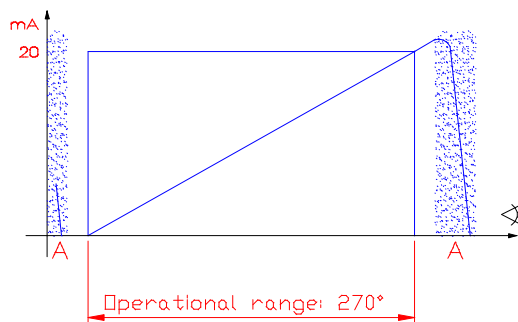


Illustration 7: Characteristic line ESM31, 0...20mA

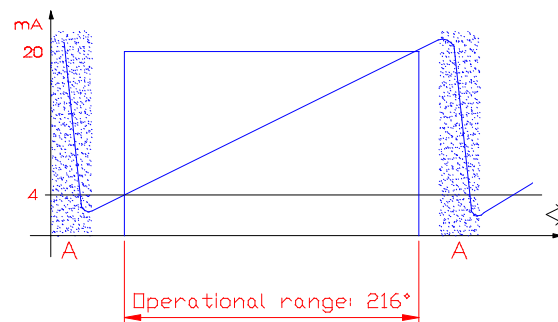


Illustration 8: Characteristic line ESM31, 4...20mA

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If the output current of the ESM31 surges during the closing process (field A in Illustrations 7 and 8), the operational range must be adjusted until field A lies outside the operational range. The operational range for models with teletransmission drives (Illustration 9), is set by turning Shaft 4; or for models with indicator gears (Illustration 10), by turning the position wheel. Then set the output current of the ESM31 to just over 0 mA in the "CLOSE" position. The positions already set for the travel switches cannot be altered through a sliding coupling.

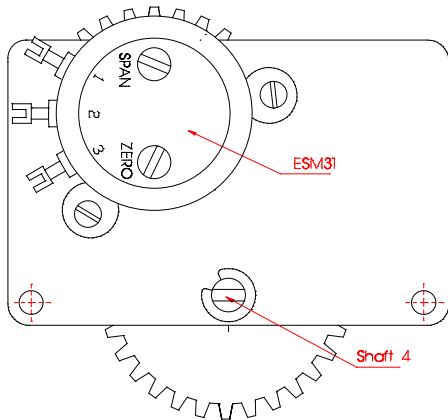


Illustration 9: Teletransmission gear

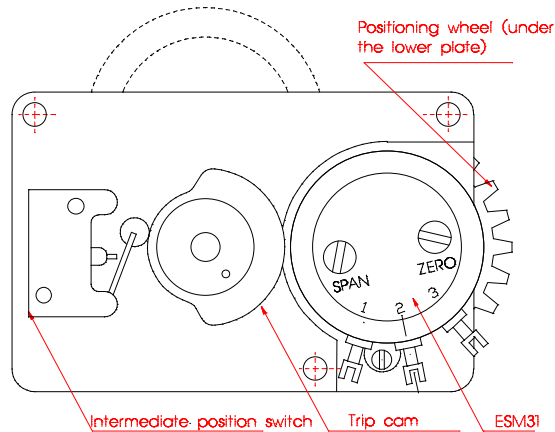


Illustration 10: Indicator gear

4.5 Electronic Setting

The 0-point (Zero) is adjusted with the potentiometer "ZERO" (see Illustration 1, Part 2), and the measuring range (Span) with the potentiometer "SPAN" (see Illustration 1, Part 1). The following settings shall apply: .. 0 and 4mA..... "CLOSE" position.
20 mA..... "OPEN" position

Output signal 0...20mA:

Starting value: Drive into the "CLOSE" position. First turn the "ZERO" potentiometer clockwise until the measuring device indicates a current of a few mA, then slowly turn counter-clockwise again, until the output signal just reaches the value of 0mA.

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

Verification: Following adjustment, check both final positions and, if necessary, readjust the starting and final values according to the points.

Output signal 4...20mA:

Starting value: Drive into the "CLOSE" position. First turn the "ZERO" potentiometer clockwise until the measuring device indicates a current of a few mA, then slowly turn counter-clockwise again, until the output signal just reaches the value of 0mA.

Presetting final value: Drive into the "OPEN" position. Set the output signal to 16mA using the "SPAN" potentiometer. Then, as defined under the Mechanical Presetting section, set the output signal to approx. 20mA using the positioning wheel or Shaft 4.

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

Starting value: Drive into the "CLOSE" position. Set the output signal to 4 mA using the "ZERO" potentiometer.

Verification: Following adjustment, check both final positions and, if necessary, readjust the starting and final values according to the points.

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5 Malfunctions

If the ESM31 does not function, please check the following:

If there is no output signal, check if

- ? the power supply is connected and correct (measure directly on the ESM31 between pins 2(+) and 3(-).
- ? the external measuring circuit is connected.

If the output value does not reach 20 mA with full travel, check if

- ? the ESM31 is correctly set.
- ? the power supply correct.
- ? the resistance of the measuring circuit less than the maximum permissible value.

6 Technical Data

Casing and lid	Aluminium, black anodized
Shaft	High-quality steel
Weight	Approx. 40g
Power supply	24V DC +/-10%
Power consumption	<33 mA
Output signal:	
Standard	0...20 mA
Upon request (specified along with your order) ..	4...20 mA
Load resistance (apparent ohmic resistance), R_L ...	0...500 Ohm
Residual voltage at the output signal	<4 mVs
Usable rotating angle	0...270°
Angular ranges	0...60/270°
Linear deviation	<1%
Reproducibility	<0,1%
Temperature coefficient	<+/-200 ppm/°C
Temperature range	-20°C up to +60°C
Zero setting	+/-10°
Rotating direction	optional
Vibration endurance limit	10G, 100...2000 Hz, 3 axes
Shock endurance limit	100G, 6 axes