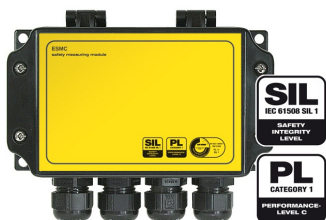
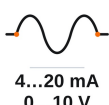


STRAIN GAUGE BRIDGE AMPLIFIER SIL1 / PL c · IP65



- ONE 350 Ω FULL BRIDGE · UP TO 4 mV/V · 1,25 ... 3 VDC SUPPLY
- 4 ... 20 mA OR 0 ... 10 V · SWITCHING OUTPUT · 0,1 % OF RANGE
- SAFETY CIRCUIT BUILT IN — NO SAFETY PLC REQUIRED · SIL1 / PL c



KEY DATA

Property	Value	Property	Value
Sensor input	1 × full bridge 350 Ω	Bridge sensitivity	up to 4 mV/V
Bridge supply	1,25 ... 3 VDC	Analog output	4 ... 20 mA or 0 ... 10 V
Accuracy	0,1 % of range + sensor	Resolution	24 bit
Switching output	30 VAC/VDC, 500 mA max.	Response time	50 ms (1)
Supply voltage	18 ... 35 VDC, 50 mA max.	Housing · protection	U-CASE 2 field · IP65
Safety rating	SIL1 · PL c — built in	Order key	Q X X X X - X X

The safety function is inside the device: a second amplifier, two comparators and a semiconductor relay watch the bridge independently of the measuring channel. A safety controller is therefore not required for SIL1 / PL c operation — the difference to the SIL3 range.



INPUT AND OUTPUT

Sensor input	1 × strain gauge full bridge 350 Ω · max. 3 VDC excitation
Bridge sensitivity	up to 4 mV/V
Bridge supply	1,25 ... 3 VDC
Analog output	Current 4 ... 20 mA
	Voltage 0 ... 10 V · 0,5 ... 10,5 V · 2 ... 10 V — one range, chosen when ordering
Load	Current output $R = (U_B - 9 \text{ V}) / 22 \text{ mA}$ · voltage output 560 kΩ minimum
Switching output	1 × limit contact · 30 VAC/VDC at 500 mA maximum
	Limit value 0,5 ... 8,2 ±0,05 mV · accuracy ±50 μV
	Response time 50 ms · 25 ms on loss of the supply voltage
Tare input	Terminals COM and IO 1 (16/17) bridged briefly

AMPLIFIER PERFORMANCE

Accuracy	max. 0,1 % of the measuring range plus the sensor error
Resolution	24 bit
Switch-on delay	<1 s

POWER SUPPLY

Supply voltage	18 ... 35 VDC
Current consumption	50 mA maximum
Reverse voltage	Protected — no function, no damage
Short circuit	Withstands short circuit
Electrical connection	Plug-in terminal strips 1 × 5-pole and 1 × 10-pole · 18 terminals in total

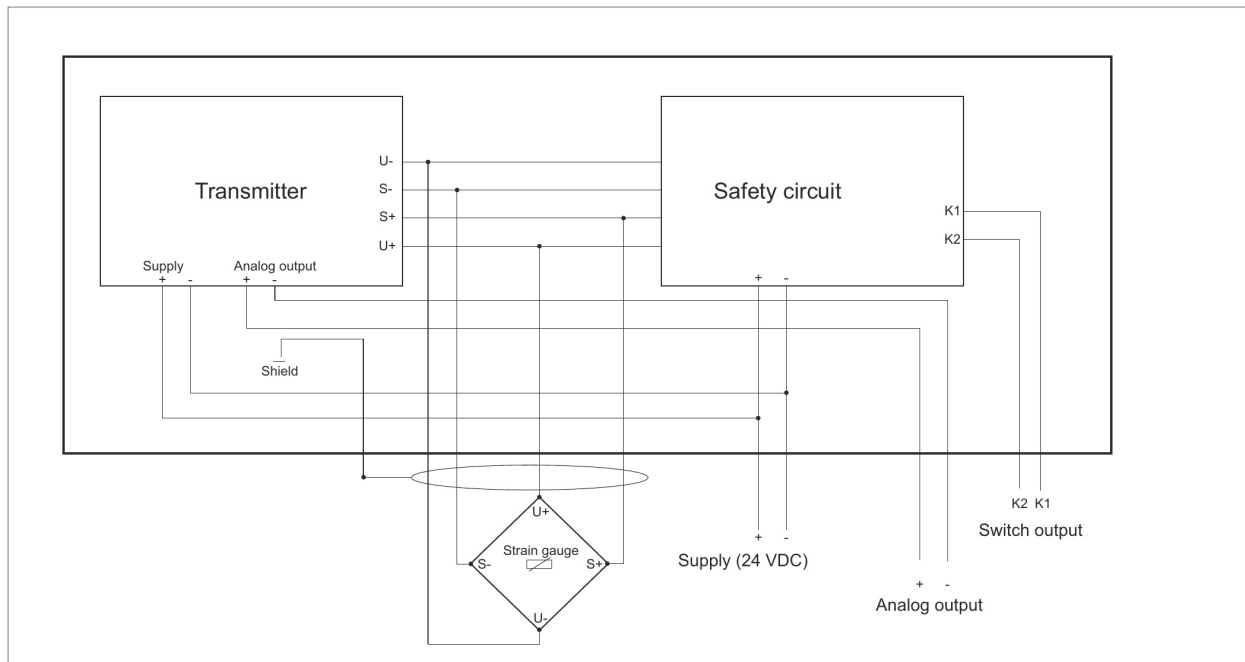
MECHANICS AND ENVIRONMENT

Housing	U-CASE 2 · 162,2 × 92,2 (101,1) × 60,2 mm
Material · colour	ASA 757G Luran S · black · flammability UL94 HB
Fixing	4 fixing holes
Cable entry	4 plastic glands M16×1,5
Protection	IP65 · no vibration protection
Weight	approx. 368 g without potting
Temperature, operating	-40 ... +85 °C
Temperature, storage	-40 ... +85 °C
Humidity	30 ... 90 % rH at 40 °C, no condensation

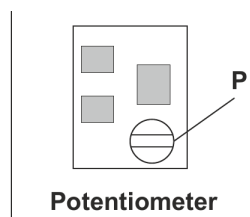
(1) The response times — 50 ms in normal operation, 25 ms on loss of the supply voltage — are those of the switching output, not of the analog output.



FUNCTION AND SETTING



The safety circuit sits parallel to the measuring amplifier and to the bridge, with its own signal amplifier whose input is biased to a high impedance so that a broken sensor cable produces the largest possible input difference. A comparator with a fixed threshold and a second comparator on the bridge supply are ANDed and drive a semiconductor relay; both of its contacts (K1, K2) are available to the user. When the relay opens, the safety circuit is in the safe state. It opens when the measured signal exceeds the switching point, when the bridge supply is too low or absent, when one or both signal lines are broken, or when the supply of the safety circuit itself is too low or absent.

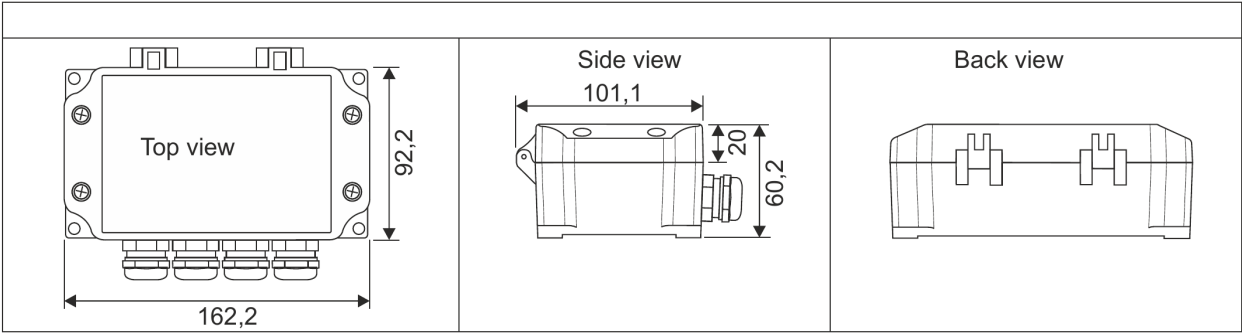


The potentiometer P of the safety circuit sets the switch-off point. Factory setting: limit value 2 mV, potentiometer secured. To set it by hand: check the state of the semiconductor relay by a continuity measurement on terminals 12 and 11 (K1 and K2); if it is closed, bridge COM and IO 1 (terminals 16 and 17) briefly to tare, then release; a second continuity measurement should now show the relay open. Apply the desired switch-off voltage as the input signal, open the front plate and move P until the relay switches. The potentiometer must not be accessible in normal operation and has to be secured against readjustment, and the housing has to be closed. Check the switch-off point and the relay state before commissioning.

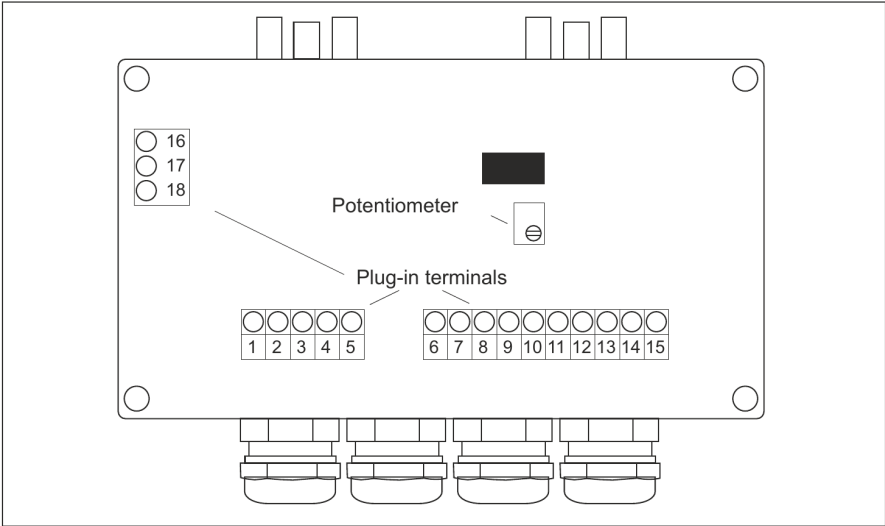


DIMENSIONS AND TERMINALS

Dimensions in mm.



Top view, side view and rear view of the U-CASE 2 field housing.



The board with the two plug-in terminal strips, the three-pole IO strip 16 ... 18 and the potentiometer. Terminal assignment in the table below.

Terminals 10, 13, 14 and 15 carry no function (NC = not used).



TERMINAL ASSIGNMENT

Terminal	Function	Terminal	Function
1	Shield	10	NC — not used
2	Strain gauge U–	11	Semiconductor relay K2
3	Strain gauge S–	12	Semiconductor relay K1
4	Strain gauge S+	13	NC — not used
5	Strain gauge U+	14	NC — not used
6	U+ supply	15	NC — not used
7	U– supply	16	COM of the IO terminals
8	Out +	17	IO 1 — tare
9	Out –	18	IO 2



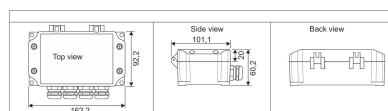
CONFORMITY AND SAFETY

Safety Integrity Level	SIL 1 — EN 61508:2010 (safety circuit)
Performance Level	PL c — EN ISO 13849-1:2015
EMC, safety circuit	EN 61000-6-2:2005, EN 61000-6-4:2007
EMC, transmitter	EN 61000-6-2:2019-11, EN 61000-6-4:2020-09
Protection	IP65
Evaluation	A safety controller is not required: the protective function is built into the device. If a controller is used, it need not itself be SIL1-rated
Functional check	Recommended every 2 years for the safety circuit
Maintenance	Maintenance-free apart from the recurring functional check
Vibration protection	None

ORDER INFORMATION

Accessories

- The plug-in terminal strips and the four plastic glands M16x1,5 are part of the device. A safety controller is not needed; if one is used, ESMD is the matching unit.



Housing
U-CASE 2 · IP65

Matching controller
ESMD

The manufacturer's key reads Q X X X X - X X; the leading Q is the manufacturer's own series letter. The factory setting is: switch-off point set to 2 mV, potentiometer secured.

ORDER KEY

Field	Code	Meaning
Product	ESMC	octogon product code — strain gauge bridge amplifier SIL1 / PL c, IP65 field housing
1 Input	0	Strain gauge, max. ± 3 VDC excitation — the only option
2 Output	0 · 1	4 ... 20 mA · 0 ... 10 V
	2 · 3	0,5 ... 10,5 V · 2 ... 10 V
3 Switching output	0	1 x limit contact, 30 VAC/VDC at 500 mA maximum
4 Configuration	0 · 1	Factory setting · customer specific, please state
5 Special model	0 · 1	No · yes, please state

