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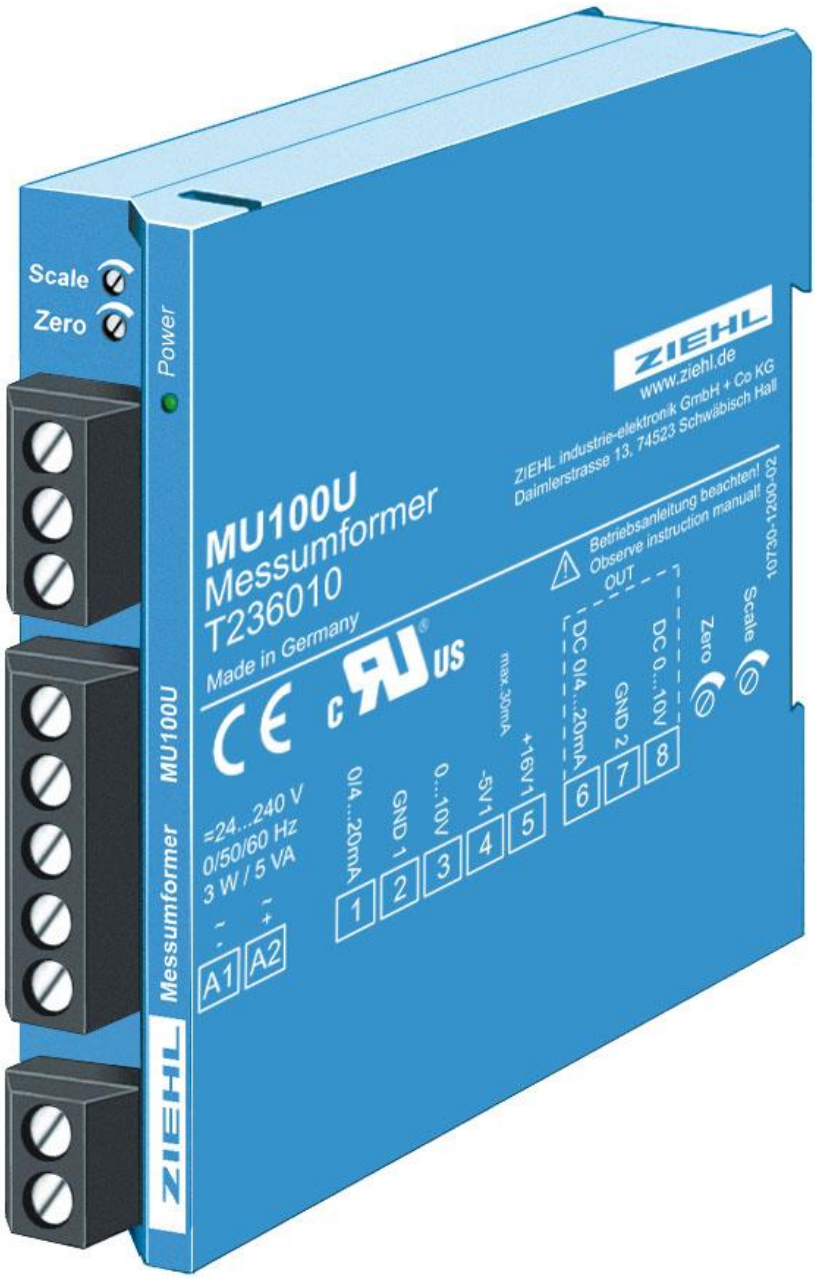
Operating Manual MU100U

updated: 2018-11-09 / sm

- Universal Transmitter / Isolation Amplifier



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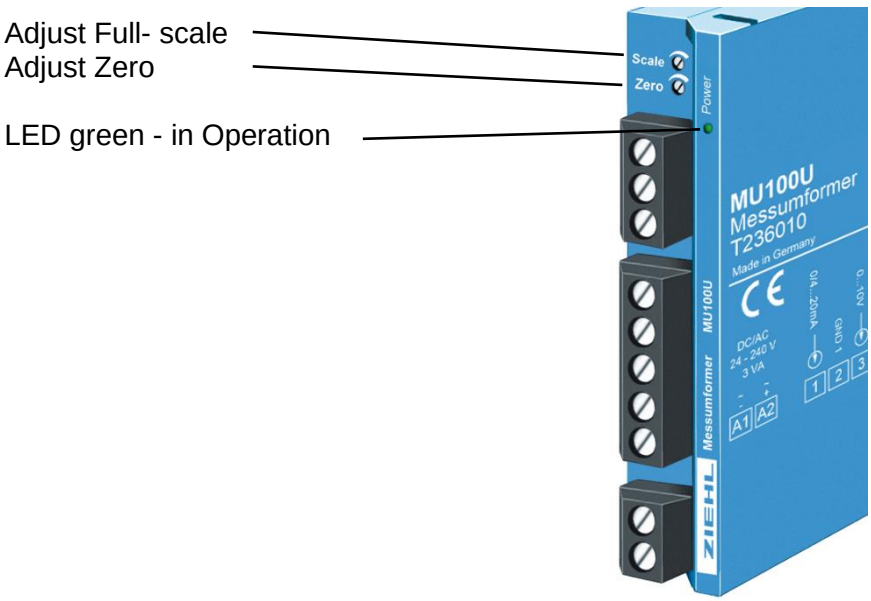


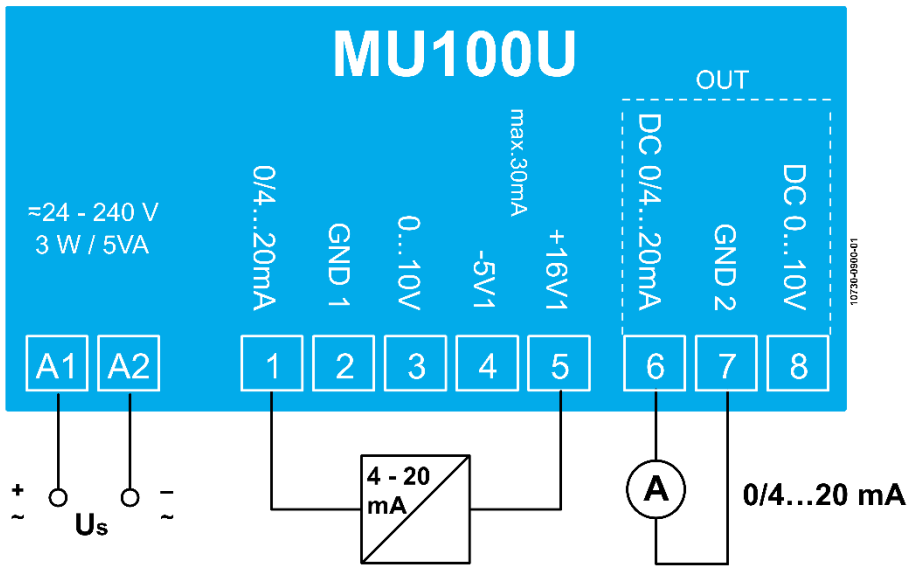
2 Application and short description

In measurement and control technology, it is often necessary to decouple the potentials of different measuring points by isolating amplifiers, as otherwise distortions of measured values by compensating currents may occur, e.g. to scribes. In addition, the low-voltage side is effectively protected against damage n case of faults on primary side.
Due to the variety of common standard signals (0-20 mA, 4-20 mA, 0-10 V), it often happens that the output of the transmitter does not match the input of the evaluation unit. MU100U eliminates these problems. The universal supply voltage and various input and output signals in one device drastically simplify warehousing. The universal transmitter MU100U can be connected to any supply voltage between 24 V and 240 V, DC or AC voltage can be connected. Input and output signals are galvanically isolated. Signals DC 0/4-20 mA or 0-0 V can be connected to the inputs. Current and voltage signals are available again at the outputs.

3 Overview of functions

- Input signals DC 0-20 mA, 0-10V
- Output signals DC 0-20 mA, 0-10 V
- Offset for signals 4-20 mA can be adjustable by customer
- Universal power supply voltage AC/DC 24-240 V
- Galvanic isolation between inputs and outputs
- Supply voltage for external transmitter DC -5 V / GND1 / +16-20 V / max. 30 mA
- Isolation voltage 2.5 kV

4 Connecting diagram



5 Important Information

DANGER!
Hazardous voltage!
Will cause death or serious injury. Turn off and lock out all power supplying this device before working on this device.

Attention! Universal power supply
The device have a universal power supply, that is suitable for DC- and AC-voltages. Before connecting the device to supply-voltage make sure that the connected voltage corresponds with the voltage on the lateral type on the device

To use the equipment flawless and safe, transport and store properly, install and start professionally and operate as directed.
Only let persons work with the equipment who are familiar with installation, start and use and who have appropriate qualification corresponding to their function. They must observe the contents of the instructions manual, the information which are written on the equipment and the relevant security instructions for the setting up and the use of electrical units.
The equipment is built according to DIN / EN and checked and leave the plant according to security in perfect condition. If, in any case the information in the instructions manual is not sufficient, please contact our company or the responsible representative.
To maintain this condition, you must observe the safety instructions in this instruction manual titled “Important Information”. Failure to follow the safety instructions may result in death, personal injury, or property damage to the equipment itself and other equipment and facilities.
Instead of the industrial norms and regulations written in this instruction manual valid for Europe, you must observe out of their geographical scope the valid and relevant regulations of the corresponding country.

6 Installation

The unit can be installed as follows:

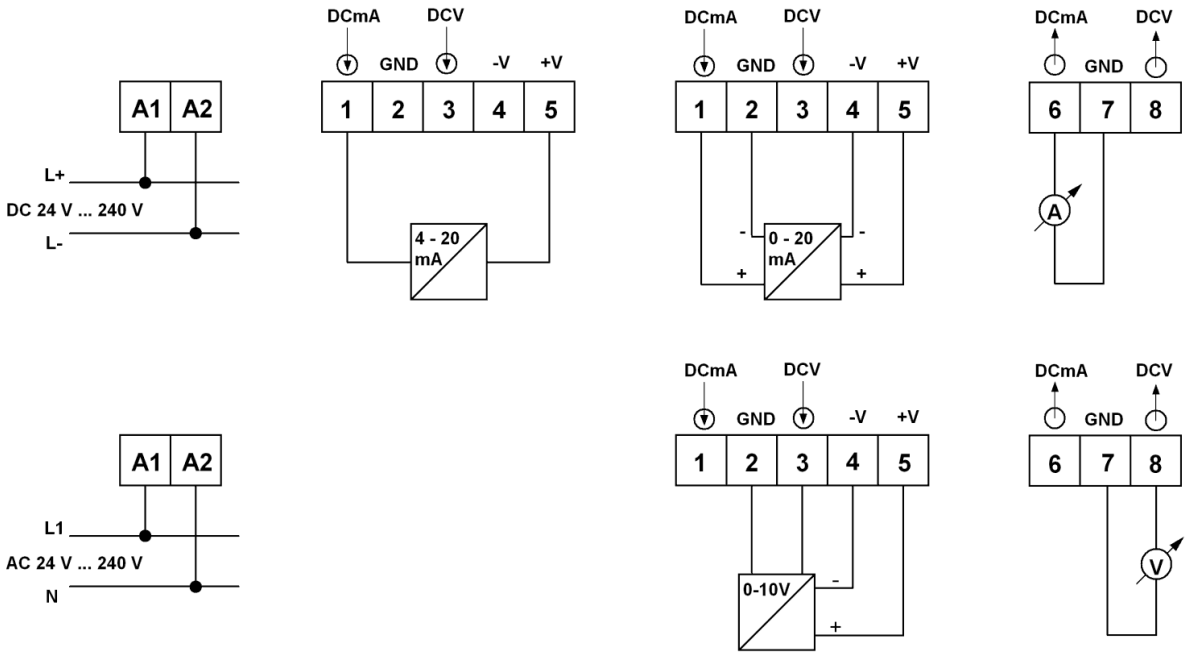
- Installation in switchgear cabinet on 35 mm mounting rail according to EN 60715 for protection against fire, external environmental conditions and mechanical effects.
- With screws M4 for installation on walls or panel. (additional latch is not included in delivery)
- Connection according to connection plan or type plate.

Failure to comply with the information in this instruction manual will not guarantee the function of the device.

Observe the maximum temperature permissible when installing in switching cabinet. Make sure sufficient space to other equipment or heat sources. If the cooling becomes more difficult e.g. through close proximity of apparatus with elevated surface temperature or hindrance of the cooling air, the tolerable environmental temperature is diminishing.

A circuit-breaker or switch must be situated within easy reach of the unit and fused. Installation excess current protection should be ≤ 10 A.

7 Connection examples



8 Commissioning

The following in-/ output ranges can be set with the two trimming potentiometers “Zero” and “Scale”.

Input	Output	
0…20 mA	0…20 mA 0...10 V	Factory Setting
0…10 V 2...10 V 4…20 mA	0…20 mA 0...10 V 2...10 V 4...20 mA	Can be adjusted by the customer

To ensure that the accuracy class 0.5 is maintained even after the customer has been readjusted, the measuring instrument used should be at least class 0.1.

9 Adjustment examples

1) Input 0…20 mA or 0…10 V
   Output 4…20 mA or 2…10 V

Zero point: with zero signal at the input (set 0 mA or 0 V or bridge input), adjust the current or voltage output with the potentiometer “Zero”.

- For current output 4…20 mA (terminals 6 and 7) adjust to 4.00 mA,
- For voltage output 2…10 V (terminals 8 and 7) adjust to 2.00 V.

Full- scale: set the input to max. signal (20 mA or 10 V), adjust the current or voltage output with the potentiometer “Scale”.

- For current output 4…20 mA (terminals 6 and 7) adjust to 20.00 mA,
- For voltage output 2…10 V (terminals 8 and 7) adjust to 10.00 V.

Check zero and Full- scale and repeat if necessary.

2) Input 4…20 mA or 2…10 V
   Output 0…20 mA or 0…10 V

Zero point: at the input (terminals 1 and 2) set current constant to 4.800 mA. Adjust the current or voltage output with the potentiometer “Zero”.

- For current output 0…20 mA (terminals 6 and 7) adjust to 1.000 mA,
- For voltage output 0…10 V (terminals 8 and 7) adjust to 0.500 V.

Full- scale: set the input to max. signal (20 mA or 10 V), adjust the current or voltage output with the potentiometer “Scale”.

- For current output 0…20 mA (terminals 6 and 7) adjust to 20.00 mA,
- For voltage output 0…10 V (terminals 8 and 7) adjust to 10.00 V.

Check zero and Full- scale and repeat if necessary.

10 Error search

The device has 2 inputs for DC voltage and current with common ground. If the connections are exchanged, no damage is possible, as a rule the transmitter will not deliver a signal at the output.
At the same time a current and voltage signal can be applied. The output then has a summed signal, limited by the maximum output value. The signals at the output are at the same time and can be loaded with their rated load. The offset adjustment has an effect on both outputs but can optionally be optimized for one output only.

11 Technical data

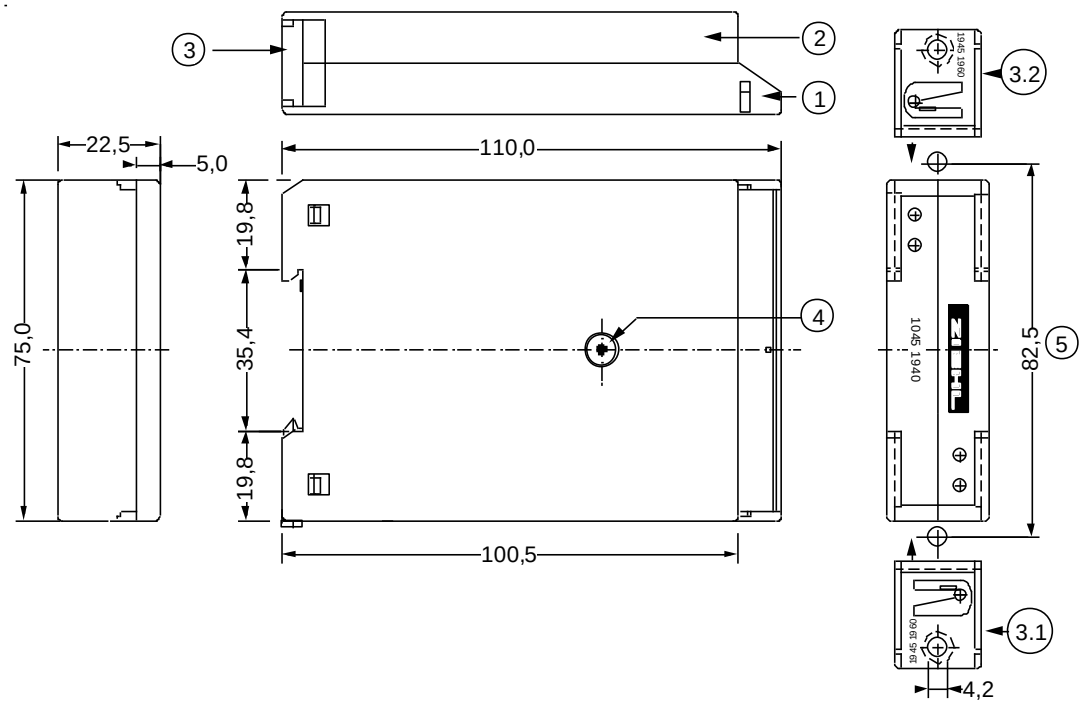
Rated supply voltage Us	DC/AC 24 – 240 V	0/50…120Hz
Tolerance	DC 20.4 - 297 V	AC 20 - 264 V
Power consumption	< 3 W	< 5 VA
Inputs	Voltage or current with GND1	
Voltage input	DC 0…10 V	
Max. permissible voltage	DC 200 V	
Nominal input resistance	>500 kΩ	
Current input	DC 0…20 mA or 4… 20 mA	
Max. permissible current	DC 50 mA	
Nominal input resistance	50 Ω	
Connection or external transmitter current	DC -5V1 / GND1 / DC +16V1 Max. 30 mA	
Outputs	Voltage or current with GND2	
Voltage output	DC 0…10 V	
Max. open circuit voltage	DC 12 V	
Load	>1 kΩ	
Current output	DC 0…20 mA or 4… 20 mA	
Max. short circuit current	DC 50 mA (short circuit protection)	
Load	<500 Ω	
Accuracy at Tu = 23 °C	Class 0.5	
Temperature coefficient	0,025% $*K^{-1}$	
Nominal rise time t= 0,9	50 ms	
Test conditions	EN 61010-1 / EN 50178	
Rated impulse voltage	4000 V	
Overvoltage category	III	
Pollution degree	2	
Rated insulation voltage Ui	300 V	
On-period	100 %	

Test voltage	Input / output / power supply 2500 VAC
EMC-tests	
Emission	EN 61000-6-2
Immunity	EN 61000-6-3
Installation conditions	
Permissible ambient temperature	0 °C ... +50 °C
Permissible storage temperature	-20 °C …+70 °C
Permissible wiring temperature	-5 °C …+70 °C
Climatic conditions	5 … 85% rel. humidity, no condition
Installation height	< 2000 m over N.N.
Housing	Type K
Dimension (H x W x D)	75 x 22,5 x 110 mm
Width	1 TE
Line connection solid wire	1 x 0,5 mm^2 – 2,5 mm^2 / AWG 22 - 14
Standard wire with insulated ferrules	1 x 0,14 mm^2 – 1,5 mm^2 / AWG 28 - 16
Torque	0,5 Nm
Protection class housing / terminals	IP40 / IP 20
Mounting	Snap mounting on 35 mm standard rail EN60715 or M4 screws (additional bar not included)
Mounting position	Various
Weight	app. 200 g

Subject to technical changes

12 Housing Type K

Dimension in mm



1 lower part
2 upper part
3 bar
4 screw
5 holes for screw mount