

# Temperature Measuring Transducer MU125



- Universal input for Pt100, Pt1000, thermocouple, NTC and resistance measurement value
- Configuration via front DIP switches
- Analog actual value output 4 .. 20mA
- Zero point and limit value can be adjusted via trim potentiometers on the front
- With Pt100 and Pt1000 sensors, monitoring of sensor break and short-circuit
- Wide-range mains adapter or 24 V DC
- Optional supply via carrier rail bus
- Removable coded screw terminals or optional push-in terminals
- Housing width 12.5 mm
- Carrier rail mounting TS35 EN60715

## Characteristics

Devices of the MU125 series convert a temperature measurement value or resistance measurement value from various sensors to a current signal of 4..20mA. The universal configurability of the measuring inputs reduces the stock requirement for various applications. The housing width of only 12.5 mm enables space-saving installation in the switch cabinet.

## Measurement inputs

Switchable via DIP switch:

	Measuring range	Basic precision	Temperature deviation *)
<b>Pt100</b>	-50.. 50°C	0.4%	0.01%/K
	0.. 50°C	0.6%	0.02%/K
	0..100°C	0.4%	0.02%/K
	0..150°C	0.4%	0.01%/K
	0..200°C	0.3%	0.01%/K
	0..250°C	0.3%	0.01%/K
	0..300°C	0.2%	0.005%/K
	0..500°C	0.2%	0.005%/K
<b>Pt1000</b>	-50.. 50°C	0.4%	0.01%/K
	-30.. 70°C	0.4%	0.01%/K
	-20.. 40°C	0.4%	0.01%/K
	0.. 50°C	0.6%	0.02%/K
	0..100°C	0.4%	0.02%/K
	0..150°C	0.4%	0.01%/K
	0..200°C	0.3%	0.01%/K
	0..250°C	0.3%	0.005%/K
<b>FeCuNi</b>	0..250°C	1.0%	0.04%/K
	0..500°C	0.5%	0.03%/K
<b>NiCrNi</b>	-50..250°C	0.7%	0.05%/K
	0..500°C	0.5%	0.04%/K
	0..750°C	0.4%	0.03%/K
	0..1000°C	0.3%	0.02%/K
	0..1250°C	0.3%	0.02%/K
<b>PtRhPt</b>	0..1500°C	1.0%	0.04%/K
<b>NTC</b> R <sub>25</sub> =10kΩ B <sub>25/85</sub> =3977K	0..100°C	1.0%	0.01%/K
	-20.. 50°C	1.5%	0.01%/K
<b>NTC</b> R <sub>25</sub> =10kΩ B <sub>25/85</sub> =3977K	0.. 100°C	1.0%	0.01%/K
<b>Resistance</b> linear**)	0.. 2kΩ	0.3%	0.005%/K
	0.. 5kΩ	0.5%	0.01%/K
	0..10kΩ	0.3%	0.005%/K

\*) Measurement deviation depending on the environmental temperature in the switch cabinet (-10..+60°C)

\*\*) Adjusting zero point and limit value via the integrated trim potentiometers makes it possible to also connect KTY sensors for these measuring ranges. The linearisation must then be accomplished with the help of a parallel resistor.

(Special measurement ranges available on request)

## Technical data

### Wide-range power supply

Supply voltage : 20..125VDC and  
20..250VAC (47..63Hz), max.1.5W

### 24V power supply

Supply voltage : 24V DC +/-15%, max. 1.5W

### Combined data

Rated voltage : 253V AC  
Test voltage : 3kV AC between  
supply // input = output

Working temperature : -10..60°C  
Storage temperature : -20..80°C  
Humidity : 10..90% (no condensation)

### Measurement inputs

Pt100 : linearised,  
measuring current approx. 1.6mA

Pt1000 : linearised,  
measuring current approx. 130µA  
In the event of a sensor break or short  
circuit, the analog output drops to 0mA.  
The operation LED blinks red

Thermocouple : linearised with comparison position  
compensation  
(optionally without internal  
compensation)

NTC : linearised for  $B_{25/85}=3977K$  or  $3528K$   
Max. load  $200\mu W$  (averaged)

Linear resistance : Mb.  $0..2k\Omega$ : approx. 1.4mA  
Mbs.  $0..5k\Omega$ ,  $0..10k\Omega$ : approx.  $300\mu A$

Zero point setting : +/-40% of the factory measuring range  
(= end value – start value)  
via 12-turn trim potentiometer

End value  
reduction : -50% based on the factory end value  
via 12-turn trim potentiometer  
Note: The measuring accuracy drops  
proportionally with the narrowing of the  
measuring range

Potentiometer setting  
limits : Limitation of the aforementioned  
adjustment ranges

Pt100	-50..500°C	(..600°C)
Pt1000	-50..250°C	(..300°C)
FeCuNi	-100..500°C	(..800°C)
NiCrNi	-150..1250°C	
PtRhPt	0..1500°C	(..1600°C)
NTC (10kΩ)	-20..100°C	(..150°C)
NTC ( 2kΩ)	-40..100°C	(-50°C..150°C)
R linear	0..10kΩ	

(values in parentheses apply for optional,  
customer-specific special measuring  
ranges that are configured at the factory)

Analog output : 4..20mA, max. burden  $400\Omega$ ,  
no galvanic isolation  
from the input signal  
(max. burden error of 0.2% at  $400\Omega$ )

Dimensions (WxDxH): 12.5 x 114 x 108mm

Material : PA6.6, light grey,  
Flammability class V0 (UL94)

Weight : 120g

Protection rating : IP20

Screw terminals : 0.2..2.5 mm<sup>2</sup>, AWG 24..14,  
removable, coded

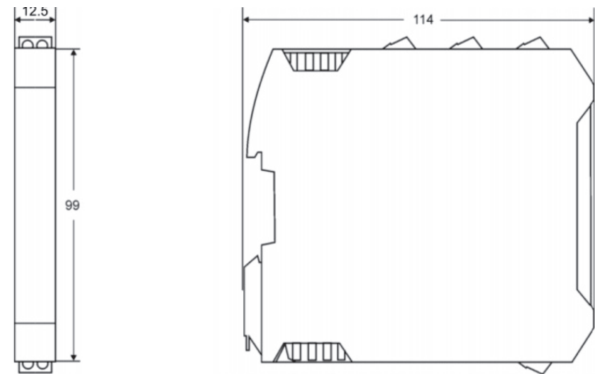
Push-in terminals : 0.5..1.5 mm<sup>2</sup>, AWG 25..16,  
Double connection (12A between  
the connections), removable, coded

Power Rail : 8A over the entire bus system  
(power supply via removable terminals  
 $0.2..2.5$  mm<sup>2</sup>, AWG 24..14)

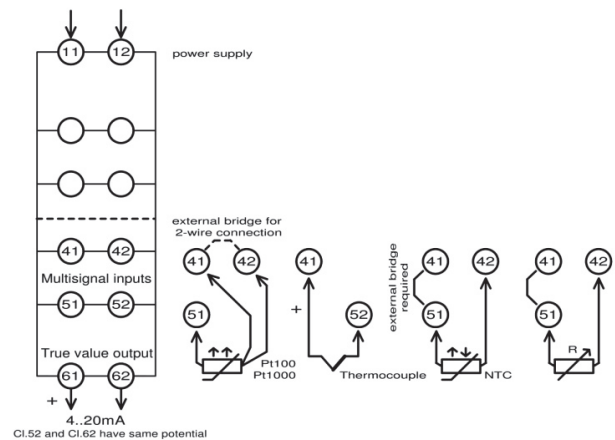
A service mode for the trim potentiometers on the front offers the following possibilities:

- 1) A check of whether potentiometers are positioned at the calibrated factory settings
- 2) The pre-adjustment of a new output characteristic curve only with connection of a current measuring device.  
(a temperature calibrator is not necessary)
- 3) Specification of a constant value at the current output, e.g. in order to test the reaction of connected devices.  
(Limited range from 5.6..20mA)

## Dimensions



## Connection diagram



## Ordering code

1.  2.   
MU  -

1.	Device version	
125L	Supply voltage 24V DC +/- 15%	
125LP	Supply voltage: 24V DC +/-15% with carrier rail bus connection *)	
125M	Wide-range mains adapter 20..125VDC / 20..253V AC	
4.	Options	
00	No options	
01	Push-in terminals (plug-in)	

\*) see separate Power-Rail information sheet