UM-01

Universal Transmitter for RTD, TC, Ohm, Potentiometer, mA and V

Features

/ Ideal for evaluation of resistance thermometers or levelmeters
/ Galv. separation of analogue signals
/ Models with relay and analogue output
/ Optionally with DNV approval
/ Universal power supply through 21.6 - 253 V AC or 19.2 - 300 V DC
/ Including sensor power supply
/ Attachable display
/ SIL 2

Description:

The UM-01 universal transmitter is a module for assembling into a switchgear cabinet that can receive at the input measured values from resistance thermometers, thermo-elements, ohmic resistors, potentiometers or devices with analogue signals and translates them into a galvanically separated analogue signal. Optionally, the UM-01 can also be equipped with two additional programmable relay outputs; alternatively it can be supplied only as a cost-effective switching unit with relay outputs. The UM-01 is programmed through a separately available mountable display PE451 which is fixed on the front side of the measurement converter to display continuously the input signal, the units, the device TAG-No. and the relay or the output status, as required. The special feature of PE451 is, however, that the UM-01 operates even without it and that the program parameters in the PE451 remain saved. Programming more than one UM-01 is, therefore, a child's play. Once the configuration is done, the settings are easily read into any new measurement converter on mounting and pressing the button; cumbersome resetting of parameters is, therefore, unnecessary. The UM-01 measurement converter is powered universally by DC or AC voltages and is compatible with most common transmitter devices like thermo-elements of type B to type LR, resistance thermometers NI100 and PT100 as 2, 3 or 4-wire and transmitters with analogue output range of 0-20 mA or 0-10 V DC.
The UM-01 has been developed in accordance with the most stringent safety measures and hence can be used in installations with SIL 2.

Application:

Wherever temperatures are measured using thermo-elements or resistance thermometers or levels are output by levelmeters as a potentiometer signal, the UM-01 is the ideal supplement in the line of measuring devices. It converts the linear input signal into an analogue output signal and offers, additionally, the facility of tapping two setpoints as a potential-free relay NO contact. Since the transmitter connected at the input of UM-01 is powered directly by the UM-01, the measurement converter is perfectly suited as a signal separator that establishes a galvanic

separation between the measuring and analyzing circuits. The UM-01 has been conceived for universal application so as to enable the user to save costs on inventory, since he would only need a single device as against two to three variants earlier. Optionally, the UM-01 can be supplied with UL approval for markets in USA or with DNV approval for shipping applications.

Electrical Specifications:

Ambient temperature /	-20°C. . .+60°C
General specifications /	
Universal power supply:	21,6. . .253 VAC, 50. . .60 Hz or 19,2. . .300 VDC
Power consumption:	≤ 2,0 W (≤ 2,5 W, UM-01.3)
Fuse:	400 mA T / 250 VAC
Insulation voltage, Test/Operation:	2,3 kVAC / 250 VAC
Communication interface:	Programming front PE451
Signal/Noise ratio:	min. 60 dB (0. . .100 kHz)
Response time (0. . .90%, 100. . .10%):	
· Temperature input:	≤ 1 s
· mA-/V input:	≤ 400ms
Calibration temp.:	20. . .28°C
Compliance with directives /	
EMV:	2014/30/E4
LVD:	2014/35/E4
FM:	3025 177
UL, Standard f. Safety	UL 508
2-wire power supply (terminals 44, 43) /	25. . .16 VDC / 0. . .20 mA
Cable diameter /	1 x 2.5 mm² max. flex
Terminal joint torque /	0.5 Nm
Rel. humidity /	<95% RF (non-condensing)
Dimensions with PE451 /	109 x 23.5 x 116 mm (H x W x D)
Dimensions without PE451 /	109 x 23.5 x 104 mm (H x W x D)
Protection class Housing/Terminal /	IP50 / IP20
Weight /	Basic weight 145 g plus 25 g in relay outputs plus 15 g with PE451

Accuracy Basic Values:

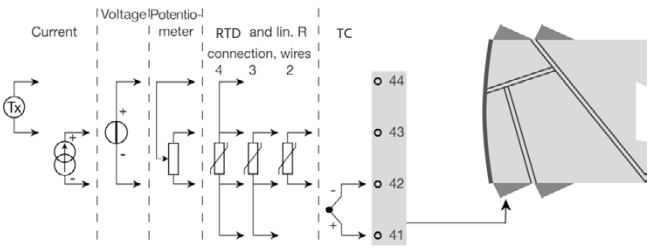
Input type	Basic accuracy	Temp. coefficient
mA	≤ ± 4 µA	≤ ± 4 µA / °C
Volt	≤ ± 20 µV	≤ ± 2 µV / °C
RTH	≤ ± 0.2°C	≤ ± 0.01°C / °C
Lin. R	≤ ± 0.1 Ω	≤ ± 0.01 Ω / °C
Potentiometer	≤ ± 0.1 Ω	≤ ± 0.01 Ω / °C
TE-Types E, J, K, L, N, T, U	≤ ± 1°C	≤ ± 0.05°C / °C
TE-Types R, S, W3, W5, LR	≤ ± 2°C	≤ ± 0.2°C / °C
TE-Type: B 85°C. . .200°C	≤ ± 4°C	≤ ± 0.4°C / °C
TE-Type: B 200°C. . .1820°C	≤ ± 2°C	≤ ± 0.2°C / °C

Accuracy in general /

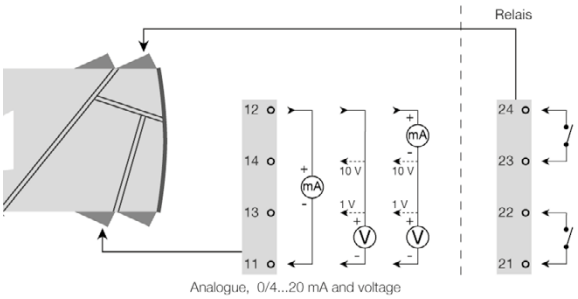
Absolute accuracy:	≤ ± 0.1% of operating range
Temperature coefficient:	≤ ± 0.01% of operating range per °C
EMV error voltage factor:	≤ ± 0.5% of measuring range
Extended EMV error stability:	NAMUR NE21, criterion A
Burst:	≤ ± 1% of measuring range

Applications

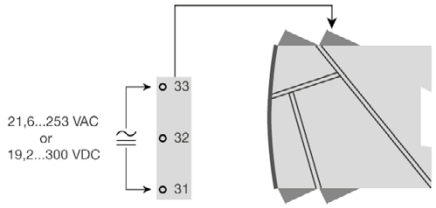
Input signals:



Output signals:



Power supply:



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Inputs:

RTD-, linear resistance and potentiometer /

Eingangsart	MIN-Wert	MAX-Wert	Norm
Pt100	-200°C	+850°C	IEC60751
Ni100	-60°C	+250°C	DIN 43760
Lin. R	0 Ω	10000 Ω	-
Potentiometer	10 Ω	100 kΩ	-

Cable resistance per wire for RTD:	50 Ω max.
Sensor current for RTD:	nom. 0.2 mA
Effect of wire resistance (3- or 4-wire RTD):	< 0.002 Ohm / Ohm
Sensor recognition RTD:	yes
Short-circuit detection RTD:	< 15 Ω

Thermo-element input /

Type	MIN-Value	MAX-Value	Standard
B	0°C	+1820°C	IEC 60584-1
E	-100°C	+1000°C	IEC 60584-1
J	-100°C	+1200°C	IEC 60584-1
K	-180°C	+1372°C	IEC 60584-1
L	-200°C	+900°C	DIN 43710
N	-180°C	+1300°C	IEC 60584-1
R	-50°C	+1760°C	IEC 60584-1
S	-50°C	+1760°C	IEC 60584-1
T	-200°C	+400°C	IEC 60584-1
U	-200°C	+600°C	DIN 43710
W3	0°C	+2300°C	ASTM E988-90
W5	0°C	+2300°C	ASTM E988-90
LR	-200°C	+800°C	GOST 3044-84

Compensations accuracy (CJC) through internal sensors:	± (2,0°C + 0,4°C * Δt)
Sensor detection all TC types:	yes
Sensor error current on detection:	nom. 2 µA, otherwise 0 µA

Power input /

Operating range:	0. . .20 mA
Programmable op. ranges:	0. . .20 and 4. . .20 mA
Input resistance:	nom. 20 Ω + PTC 50 Ω

Voltage input /

Operating range:	0 V. . .12 VDC
Programmable op. ranges:	0/0,2. . .1; 0/1. . .5; 0/2. . .10 VDC
Input resistance:	nom. 10 MΩ

Outputs:

Current output (UM-01.2 and UM-01.3 only) /

Signal range:	0. . .20 mA
Programmable operating ranges:	0/4. . .20 or 20. . .4/0 mA
Load:	800 Ω
Load stability:	≤ 0.01% of measuring range / 100 Ω
Sensor error detection:	0 / 3.5 / 23 mA / keine
NAMUR NE43 Up-/ Downscale:	23 mA / 3.5 mA
Power limiting:	≤ 28 mA

Voltage output (UM-01.2 and UM-01.3 only) /

Signal range:	0. . .10 VDC
Programmable operating ranges:	0/0,2. . .1; 0/1. . .5; 0/2. . .10; 1. . .0,2/0; 5. . .1/0; 10. . .2/0 VDC
Load:	≥ 500 kΩ

Relay outputs (UM-01.1 and UM-01.3 only) /

Relay function:	Setpoint value, Window, Sensor error, Power and Off
Hysteresis:	0. . .100%
On-/Off delay:	0. . .3600 s
Maximum voltage:	250 VRMS
Maximum current:	2 A / AC or 1 A / DC
Maximum AC power:	500 VA
Sensor error confirmation:	Close / Open / Hold

Ordering Codes:

Order number	**UM-01.**	**2.**	**1**

UM-01 Universal Transmitter

Output variants /

1 = Limit switch with two potential-free relays
2 = Transmitter with 4-20 mA- or 0-10 V DC output
3 = Transmitter with 4-20 mA- or 0-10 V DC output and two potential-free relays

Programming unit PE451 /

0 = none
1 = with programming unit PE451 for front-side mounting on the UM-01

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