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2-wire field indicator 311 for temperature sensors and process inputs

- **RTD sensors Pt100, Pt1000**
- **Thermocouples B, C, D, E, G, J, K, L, N, R, S or T**
- **Process inputs 0/4..20 mA tai 0..10 V**
- **2-wire output 4..20 mA**
- **Freely scaleable 4-digit bright LED display**
- **Configuration via front panel**
- **2 alarm relays**
- **6 points xy linearisation for process inputs**
- **Password for configuration**
- **Enclosure protection IP65**

The wide variety of sensor types makes the field indicator 311 ideal for all kind of temperature applications. Further, the 311 also accepts thermopile infrared sensors and process inputs 4-20 mA and 0-10 V. Sensor selections, display and output scalings are easy to do with front keys. You can also prevent accessing to the menu by setting a password.

The two-wire indicator 311 saves installation and cable costs especially where the distances are long, as no separate power supply is needed . Though the output 4-20 mA is available as standard you can connect power supply 12-28 V directly to output terminals, if you do not need output. The 311 takes only 8 mA from 24 VDC power supply, when output is not used. The bright red LED display shows measuring values in all conditions replacing badly readable LCD displays.

The 311 is a very accurate and stable indicator and transmitter. Therefore it can be used in all kind of applications demanding high accuracy. Input signal is measured with a 16-bit AD-converter giving resolution of 1/64000. Scaleable output uses a 12-bit converter giving resolution of 1/4000.

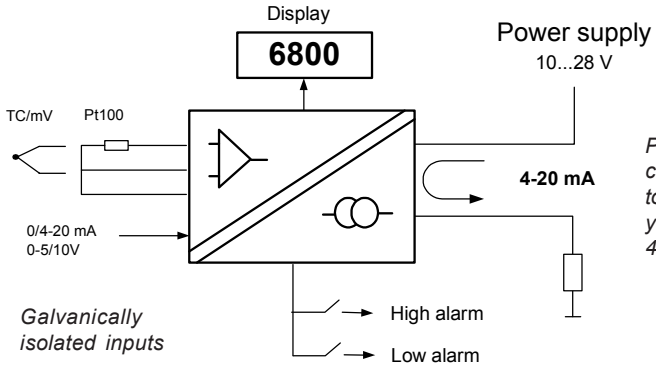
If you need one or two alarms, **model 312** is available. Only one alarm relay can be energized at a time. Alarms are indicated by red LEDs in the front panel.

Input is galvanically isolated from output giving good rejection on interference. Input and output scaling can be set separately e.g. display range is 0..5000 and ouput 0..1000 for 4-20 mA. Case protection rating is IP65.

2-wire indicator with 4-20 mA output

Inputs:

RTD-sensors
Thermocouples
mA- and V-inputs
Potentiometers
IR-sensors



Galvanically isolated inputs

Power supply 10-28V can be connected directly to output terminals when you do not need output 4-20 mA.

Specifications

Thermocouple inputs:

	Range and linearity		Linearity for limited range	
E	-100.....900°C	±0.3°C		
J	-150.....900°C	±1°C	-50.....900°C	±0.3°C
K	-150....1300°C	±0.5°C		
L	-100.....900°C	±0.5°C		
T	-150.....400°C	±0.2°C		
N	0.....1300°C	±0.2°C		
R	0.....1700°C	±1°C	400....1700°C	±0.4°C
S	0.....1700°C	±1°C	300....1700°C	±0.3°C
C (W5)	0.....2200°C	±0.4°C	400....2200°C	±0.2°C
D (W3)	0.....2200°C	±1°C	500....2200°C	±0.3°C
B	400....1700°C	±0.3°C		
G (W)	1000....2200°C	±3°C	1000...1700°C	±0.5°C

Calibration accuracy	<0.1 % of span or <1°C
Cold junction effect	<0.05 °C /°C
Wire resistance effect	<1kohm, no effects

Pt100-sensors

Sensors	Pt100, Pt500, Pt1000, Ni100
Ranges	-200....+700 °C (Pt100, Pt500) -200....+300 °C (Pt1000) -60.... +175 °C (Ni100)
Connection	3 or 4 wires
Sensor current	0.3 mA
Calibration accuracy	0.15 °C (at 0°C)
Temperature effect	<0.005°C/°C
Linearity	0.1 °C (-100..200 °C) 0.5 °C (300-700°C)
Max. wire resistance	30 ohm/wire
RTD/potentiometer	0-1000 ohm, potentiom. 50-500 ohm 3-connection

mV-input

mV-range	-100...+100 mV
Accuracy	0.05% of span
Linearity	0.03% of span
Input resistance	10 Mohm

Process input

Current	0..20 mA, 4..20 mA, -20..+20 mA
Voltage	0..5 V, 0..10 V, -10..+10V
Display scaling	freely scaleable by front keys
Input resistance	5 ohm (current), 1 Mohm (voltage)
Accuracy	0.03% of span
Linearity	0.01% of span

Infrared-sensors:

IR-sensor Exergen 140F-K and 440F-K

Range 140F-K (60°C)	-40..+350°C (linearized range)
Range 440F-K (220°C)	-30..+600°C (llinearized range)

Emissivity settings by front panel

Output

2-wire output	4-20 mA
Straight and reversed	4-20 mA or 20-4 mA
Accuracy	0.1 % of span
Output-DAC	12 bit
Output limiter	21 mA (typical)
Sensor break indication	3.5 or 21 mA

Alarms (model 312)

Alarm relays	2 solid state relays (SSR), max. 250 VAC, 150 mA
Alarm reset	Automatic or manual (hold)
Hysteresis	Selectable 0..100 %
Alarm types	Low or high alarm (NO or NC) Only one relay can be energized at a time

General

Display	4 digits red LED
Power supply range	10-28 VDC and 12,5-28VDC for 312
Maximum load	See table below
Galvanic isolation	2000 VDC/ 1 min.
Measuring rate	3…4 samples/s.
AD-converter	16 bit
Operating temperature	0..60 °C
Storage temperature	-20....+70 °C
Humidity (non condensing)	0..95 %RH
Weight	250 g
Terminals	Max. 2.5 mm^2

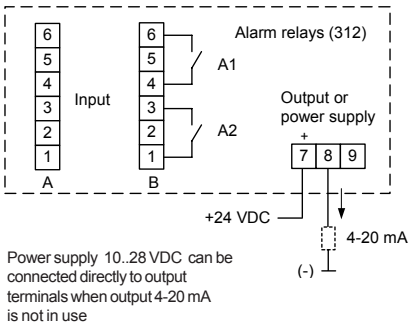
How to order

Models — 311-Pt100/3-0/100

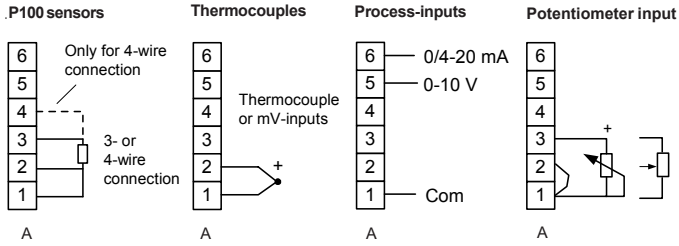
Type 311
or 312 with 2 alarms
Sensor type/connection
Output range

Standard delivery without settings of sensor type and output range.

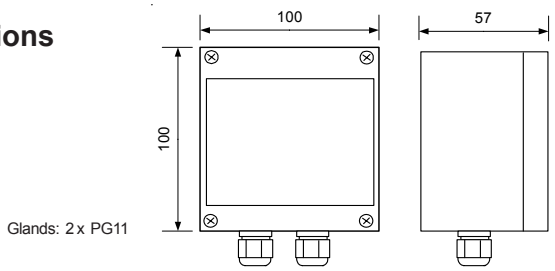
Connections



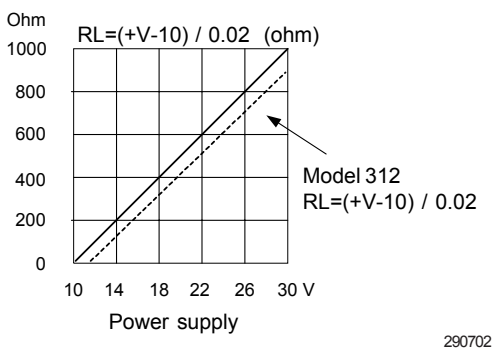
Power supply 10..28 VDC can be connected directly to output terminals when output 4-20 mA is not in use



Dimensions



Maximum output load



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