

## Universal trip amplifier

### 4131



- Input for RTD, TC, Ohm, potentiometer, mA and V
- 2 adjustable alarm limits
- FM-approved for installation in Div. 2
- 2 relay outputs
- Universal AC or DC supply



#### Advanced features

- Programmable via detachable display front (PR 4500 series), process calibration, relay simulation, password protection, error diagnostics and selection of help text in several languages.

#### Application

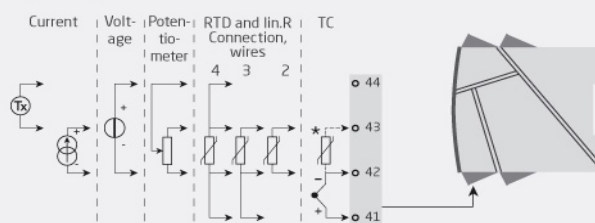
- Process control with 2 pairs of potential-free relay contacts which can be configured to suit any application.
- Trip amplifier with window function defined by a high and a low setpoint. The relay changes state outside the window.
- Relay latch function, where the relay is activated and can only be reset manually.
- Sophisticated sensor error surveillance, where one relay holds the state immediately prior to the sensor error, while allowing the process to continue. The other relay can be set for sensor error alarm so that the defect sensor can be replaced immediately.

#### Technical characteristics

- When 4131 is used with the PR 4500 display series, all operational parameters can be modified to suit any application. As the 4131 is designed with electronic hardware switches, it is not necessary to open the device for setting of DIP-switches.
- A green front LED indicates normal operation and malfunction. A yellow LED is ON for each active output relay.
- Continuous check of vital stored data for safety reasons.
- 3-port 2.3 kVAC galvanic isolation.

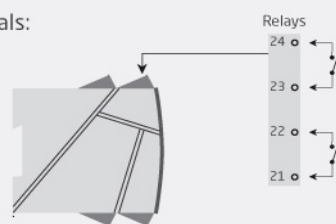
#### Applications

##### Input signals:

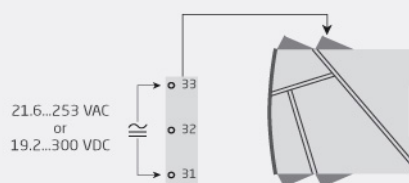


\*Order separately: CJC connector 5910.

##### Output signals:



##### Supply:



Order:

| Type |
|------|
| 4131 |

## Environmental Conditions

|                              |                      |
|------------------------------|----------------------|
| Operating temperature.....   | -20°C to +60°C       |
| Calibration temperature..... | 20...28°C            |
| Relative humidity.....       | < 95% RH (non-cond.) |
| Protection degree.....       | IP20                 |

## Mechanical specifications

|                                         |                                                       |
|-----------------------------------------|-------------------------------------------------------|
| Dimensions (HxWxD).....                 | 109 x 23.5 x 104 mm                                   |
| Dimensions (HxWxD) w/ PR 4500.....      | 109 x 23.5 x 131 mm                                   |
| Weight approx.....                      | 170 g                                                 |
| Weight incl. 4501 / 451x (approx.)..... | 185 g / 200 g                                         |
| Wire size.....                          | 0.13...2.08 mm <sup>2</sup> AWG 26...14 stranded wire |
| Screw terminal torque.....              | 0.5 Nm                                                |
| Vibration.....                          | IEC 60068-2-6                                         |
| 2...13.2 Hz.....                        | ±1 mm                                                 |
| 13.2...100 Hz.....                      | ±0.7 g                                                |

## Common specifications

### Supply

|                                |                                              |
|--------------------------------|----------------------------------------------|
| Supply voltage, universal..... | 21.6...253 VAC, 50...60 Hz or 19.2...300 VDC |
| Fuse.....                      | 400 mA SB / 250 VAC                          |
| Max. required power.....       | ≤ 2.0 W                                      |
| Max. power dissipation.....    | ≤ 2.0 W                                      |

### Isolation voltage

|                                        |                    |
|----------------------------------------|--------------------|
| Isolation voltage, test / working..... | 2.3 kVAC / 250 VAC |
|----------------------------------------|--------------------|

### Response time

|                                             |          |
|---------------------------------------------|----------|
| Temperature input (0...90%, 100...10%)..... | ≤ 1 s    |
| mA / V input (0...90%, 100...10%).....      | ≤ 400 ms |

### Auxiliary supplies

|                                                            |                                  |
|------------------------------------------------------------|----------------------------------|
| 2-w. supply (term. 44...43).....                           | 25...16 VDC / 0...20 mA          |
| Programming.....                                           | PR 4500 communication interfaces |
| Signal / noise ratio.....                                  | Min. 60 dB (0...100 kHz)         |
| Accuracy.....                                              | Better than 0.1% of sel. range   |
| EMC immunity influence.....                                | < ±0.5% of span                  |
| Extended EMC immunity: NAMUR NE21, A criterion, burst..... | < ±1% of span                    |

## Input specifications

### RTD input

|               |                                                                               |
|---------------|-------------------------------------------------------------------------------|
| RTD type..... | Pt10/20/50/100/200/250; Pt300/400/500/1000; Ni50/100/120/1000; Cu10/20/50/100 |
|---------------|-------------------------------------------------------------------------------|

|                                                    |               |
|----------------------------------------------------|---------------|
| Cable resistance per wire.....                     | 50 Ω (max.)   |
| Sensor current.....                                | Nom. 0.2 mA   |
| Effect of sensor cable resistance (3-/4-wire)..... | < 0.002 Ω / Ω |
| Sensor error detection.....                        | Yes           |
| Short circuit detection.....                       | < 15 Ω        |

### Linear resistance input

|                                   |               |
|-----------------------------------|---------------|
| Linear resistance min....max..... | 0 Ω...10000 Ω |
|-----------------------------------|---------------|

### Potentiometer input

|                               |               |
|-------------------------------|---------------|
| Potentiometer min....max..... | 10 Ω...100 kΩ |
|-------------------------------|---------------|

### TC input

|                        |                                          |
|------------------------|------------------------------------------|
| Thermocouple type..... | B, E, J, K, L, N, R, S, T, U, W3, W5, LR |
|------------------------|------------------------------------------|

### Cold junction compensation (CJC) via ext. sensor in 5910.....

|       |                                                |
|-------|------------------------------------------------|
| ..... | 20...28°C ≤ ±1°C, -20...20°C / 28...70°C ≤ 2°C |
|-------|------------------------------------------------|

|                                  |                       |
|----------------------------------|-----------------------|
| CJC via int. mounted sensor..... | ±(2.0°C + 0.4°C * Δt) |
|----------------------------------|-----------------------|

|                             |     |
|-----------------------------|-----|
| Sensor error detection..... | Yes |
|-----------------------------|-----|

### Sensor error current: When detecting / else.....

|       |                  |
|-------|------------------|
| ..... | Nom. 2 μA / 0 μA |
|-------|------------------|

### Current input

|                                      |                      |
|--------------------------------------|----------------------|
| Measurement range.....               | 0...23 mA            |
| Programmable measurement ranges..... | 0...20 and 4...20 mA |
| Input resistance.....                | Nom. 20 Ω + PTC 50 Ω |

### Voltage input

|                                      |                                  |
|--------------------------------------|----------------------------------|
| Measurement range.....               | 0...12 VDC                       |
| Programmable measurement ranges..... | 0/0.2...1, 0/1...5, 0/2...10 VDC |
| Input resistance.....                | Nom. 10 MΩ                       |

## Output specifications

### Relay output

|                            |                                                      |
|----------------------------|------------------------------------------------------|
| Relay functions.....       | Setpoint, Window, Sensor error, Latch, Power and Off |
| Hysteresis.....            | 0...100%                                             |
| ON and OFF delay.....      | 0...3600 s                                           |
| Max. voltage.....          | 250 VRMS                                             |
| Max. current.....          | 2 AAC or 1 ADC                                       |
| Max. AC power.....         | 500 VA                                               |
| Sensor error reaction..... | Break / Make / Hold                                  |
| of span.....               | = of the presently selected range                    |

## Observed authority requirements

|              |                              |
|--------------|------------------------------|
| EMC.....     | 2014/30/EU & UK SI 2016/1091 |
| LVD.....     | 2014/35/EU & UK SI 2016/1101 |
| RoHS.....    | 2011/65/EU & UK SI 2012/3032 |
| EAC.....     | TR-CU 020/2011               |
| EAC LVD..... | TR-CU 004/2011               |

**Approvals**

|                             |            |
|-----------------------------|------------|
| c UL us, UL 508.....        | E231911    |
| FM.....                     | 3025177    |
| DNV Marine.....             | TAA0000101 |
| EU RO MR Type Approval..... | MRA000000Z |