

Ex SIGNAL CALCULATOR



- Redundancy measurement with 2 input signals
- Signal calculator with the four arithmetical operations
- Duplication of the input signal
- Input for RTD, Ohm, TC, mV, mA, and V
- Universal AC or DC supply



Application:

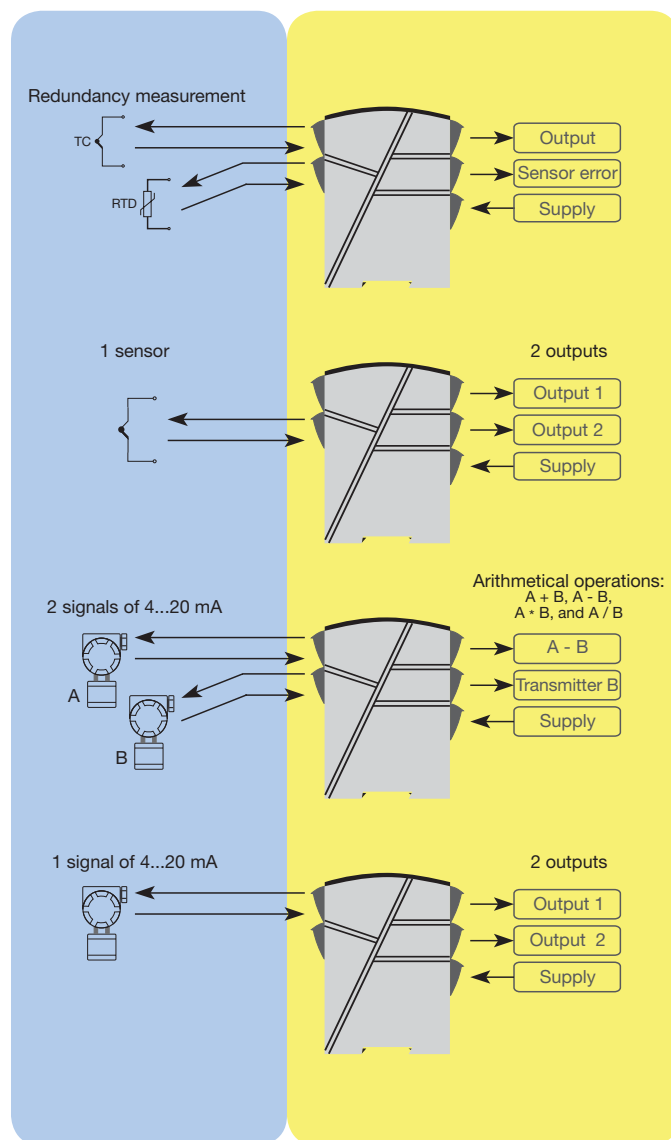
- Redundancy measurement of temperature by means of two sensors, where the secondary sensor takes over the measurement when a sensor error occurs on the primary sensor.
- Duplication of the input signal, e.g. from a temperature sensor or an analogue process signal to two separate analogue outputs.
- Signal calculator with four arithmetical operations: Addition, subtraction, multiplication and division.
- Example: Differential measurement: $(\text{Input 1} * K1) - (\text{Input 2} * K2) + K4$
- Example: Average measurement: $(\text{Input 1} * 0.5) + (\text{Input 2} * 0.5) + K4$
- Example: Different functions on the outputs: Output 1 = input 1 - input 2, and Output 2 = input 1 + input 2
- Ex safety barrier and power supply for 2-wire transmitters.

Technical characteristics:

- Within a few seconds the user can program PR5115B to a selected application using the configuration program PReset.
- A green front LED that indicates normal operation, sensor error on each sensor, and functional error.
- 5-port 3.75 kVAC galvanic isolation.

Mounting / installation:

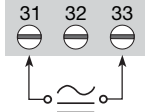
- Mounted vertically or horizontally on a DIN rail. As the modules can be mounted without any distance between neighbouring units, up to 42 modules can be mounted per metre.



Connections:

All connection options are shown in the user manual.

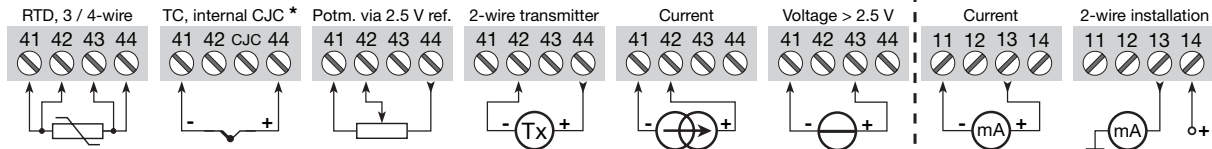
Supply:



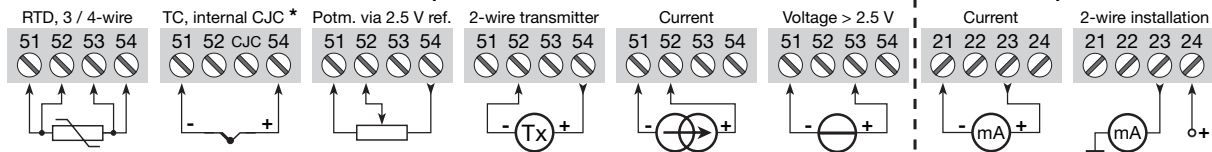
| Type | Input |
|-------|--------------------------------|
| 5115B | RTD / TC / mV / R : 1 |
| | mA / V / mV : 2 |
| | Input 1, RTD / TC / mV / R : 3 |
| | Input 2, mA / V / mV |

*NB! Please remember to order CJC connectors type 5910EEEx (input 1) and 5913EEEx (input 2) for TC inputs with an internal CJC.

Input 1:



Input 2:



Electrical specifications:

Specifications range:

-20 to +60°C

Common specifications:

Supply voltage, universal 21.6...253 VAC or 19.2...300 VDC
 Max. consumption..... ≤ 3 W
 Fuse..... 400 mA SB / 250 VAC
 Isolation voltage, test / operation..... 3.75 kVAC / 250 VAC
 Communications interface Loop Link
 Signal / noise ratio..... Min. 60 dB (0...100 kHz)
 Redundancy switch-over time ≤ 400 ms
 Signal dynamics, input 22 bit
 Calibration temperature..... 20...28°C
 Accuracy, the greater of general and basic values:

| General values | | |
|----------------|-------------------|-------------------------|
| Input type | Absolute accuracy | Temperature coefficient |
| All | ≤ ±0.05% of span | ≤ ±0.01% of span / °C |

| Basic values | | |
|---------------------------------|----------------|-------------------------|
| Input type | Basic accuracy | Temperature coefficient |
| mA | ≤ ±4 µA | ≤ ±0.4 µA/°C |
| Volt | ≤ ±10 µV | ≤ ±1 µV/°C |
| RTD | ≤ ±0.2°C | ≤ ±0.01°C/°C |
| Lin.R | ≤ ±0.1 Ω | ≤ ±10 mΩ/°C |
| TC type: E, J, K, L, N, T, U | ≤ ±1°C | ≤ ±0.05°C/°C |
| TC type: B, R, S, W3, W5, LR | ≤ ±2°C | ≤ ±0.2°C/°C |

| | |
|--|-----------------|
| EMC immunity influence | < ±0.5% of span |
| Extended EMC immunity: NAMUR NE 21, A criterion, burst..... | < ±1% of span |

Auxiliary supplies:
 Reference voltage 2.5 VDC ±0.5% / 15 mA
 2-wire supply (pin 44...42 and 54...52)..... 28...17.1 VDC/0...20 mA
 Dimensions (HxWxD)..... 109 x 23.5 x 130 mm

Electrical specifications - INPUT:

Max. offset..... 50% of selec. max. value

TC input:

Sensor error current Nom. 30 µA
 Cold junction compensation < ±1°C

mV input:

Measure. range/min. measure. range. -150...+150 mV / 5 mV
 Input resistance..... Nom. 10 MΩ

RTD and linear resistance input:

Max. cable resistance per wire..... 10 Ω
 Sensor current..... Nom. 0.2 mA

Current input:

Measure. range/min. measure. range. 0...100 mA / 4 mA
 Input resistance..... Nom. 10 Ω + PTC 10 Ω

Voltage input:

Measure. range/min. measure. range. 0...250 VDC / 5 mVDC
 Input resistance ≤ 2.5 VDC..... Nom. 10 MΩ

Electrical specifications - OUTPUT:

Max. offset..... 50% of selec. max. value

Current output:

Signal range / min. signal range..... 0...20 mA / 10 mA
 Max. load..... 20 mA / 600 Ω / 12 VDC

Voltage output:

Signal range / min. signal range..... 0...10 VDC / 500 mVDC

2-wire 4...20 mA output:

Signal range 4...20 mA
 Max. external 2-wire supply 29 VDC

Sensor error detection:

Programmable..... 0...23 mA

EEx / I.S. approval:

DEMKO 00ATEX128567 [Ex] II (1) GD
 [EEx ia] IIC
 Applicable for zone..... 0, 1, 2, 20, 21 or 22

Ex / I.S. data for 5115B, all types :

U_m..... : 250 V
Ex / I.S. data for 5115B,1 (input 1 for 5115B3) :
 Terminal 41, 42, 44 to 43 (51, 52, 54 to 53)
 U_o..... : 7.5 VDC
 I_o..... : 6.0 mADC
 P_o..... : 11.25 mW
 L_o..... : 200 mH
 C_o..... : 6.0 µF

Ex / I.S. data for 5115B2 (input 2 for 5115B3) :

Terminal 44 to 41 (54 to 51)
 U_o..... : 28 VDC
 I_o..... : 87 mADC
 P_o..... : 0.62 W
 L_o..... : 4.2 mH
 C_o..... : 0.08 µF
 Terminal 42, 43 to 41 (52, 53 to 51)
 U_o..... : 7.5 VDC
 I_o..... : 6.0 mADC
 P_o..... : 11.25 mW
 L_o..... : 200 mH
 C_o..... : 6.0 µF

Marine approval:

Det Norske Veritas, Ships & Offshore.. Stand. f. Certific. No. 2.4

GOST R approval:

VNIIFTRI, Cert. No. See homepage

Observed authority requirements: Standard:

EMC 2004/108/EC EN 61326-1
 LVD 2006/95/EC EN 61010-1
 PELV/SELV..... IEC 364-4-41 and EN 60742
 ATEX 94/9/EC..... EN 50014, EN 50020 and EN 50281-1-1

Of span = Of the presently selected range