

Ex signal calculator

5115B

- 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 supply by AC or DC



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 analog process signal to two separate analog 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
- I.S. safety barrier and power supply for 2-wire transmitters.

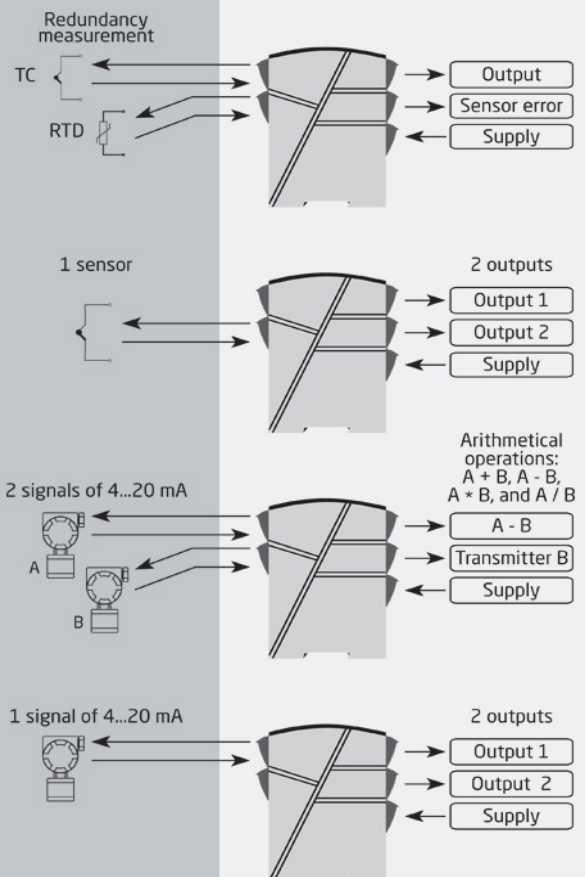
Technical characteristics

- Within a few seconds the user can program PR5115B to a selected application using the configuration program PRreset.
- A green front LED 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 devices can be mounted without any distance between neighboring units, up to 42 devices can be mounted per meter.

Applications



Order:

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.

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 130 mm
Weight approx.....	225 g
Wire size.....	1 x 2.5 mm ² 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.....	≤ 3 W
Internal power dissipation.....	≤ 2.0 W

Isolation voltage

Isolation voltage, test / working.....	3.75 kVAC / 250 VAC
PELV/SELV.....	IEC 61140

Response time

Temperature input, programmable (0...90%, 100...10%).....	400 ms...60 s
mA / V input (programmable).....	250 ms...60 s
Programming.....	Loop Link
Signal / noise ratio.....	Min. 60 dB (0...100 kHz)
Accuracy.....	Better than 0.05% of selected range
Updating time.....	115 ms (temperature input)
Updating time.....	75 ms (mA / V / mV input)
Redundancy switch-over time.....	≤ 400 ms
Signal dynamics, input.....	22 bit
Signal dynamics, output.....	16 bit
Auxiliary voltages: Reference voltage.....	2.5 VDC ±0.5% / 15 mA
EMC immunity influence.....	< ±0.5% of span
Extended EMC immunity: NAMUR NE 21, A criterion, burst.....	< ±1% of span

Input specifications**Common input specifications**

Max. offset.....	50% of selected max. value
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RTD input

RTD type.....	Pt100, Ni100, lin. R
Cable resistance per wire (max.).....	10 Ω
Sensor current.....	Nom. 0.2 mA
Effect of sensor cable resistance (3-/4-wire).....	< 0.002 Ω / Ω
Sensor error detection.....	Yes

TC input

Thermocouple type.....	B, E, J, K, L, N, R, S, T, U, W3, W5, LR
Cold junction compensation (CJC).....	< ±1.0°C

Sensor error current.....	Nom. 30 µA
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Current input

Measurement range.....	0...100 mA
Min. measurement range (span).....	4 mA
Input resistance: Supplied unit.....	Nom. 10 Ω + PTC 10 Ω
Input resistance: Non-supplied unit.....	RSHUNT = ∞, VDROPP < 6 V

Voltage input

Measurement range.....	0...250 VDC
Min. measurement range (span).....	5 mV
Input resistance.....	Nom. 10 MΩ (≤ 2.5 VDC)
Input resistance.....	Nom. 5 MΩ (> 2.5 VDC)
Input resistance.....	Nom. 10 MΩ (mV input)

mV input

Measurement range.....	-150...+150 mV
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Output specifications**Current output**

Signal range.....	0...20 mA
Min. signal range.....	10 mA
Load (@ current output).....	≤ 600 Ω
Load stability.....	≤ 0.01% of span / 100 Ω
Current limit.....	≤ 28 mA
Sensor error indication.....	Programmable 0...23 mA
NAMUR NE 43 Upscale/Downscale.....	23 mA / 3.5 mA

Voltage output

Signal range.....	0...10 VDC
Min. signal range.....	500 mV
Load (@ voltage output).....	≥ 500 kΩ

Passive 2-wire mA output

Effect of external 2-wire supply voltage variation.....	< 0.005% of span / V
Max. external 2-wire supply.....	29 VDC

2-wire 4...20 mA output: Signal

range.....	4...20 mA
Load stability, 4...20 mA output.....	≤ 0.01% of span / 100 Ω
*of span.....	= of the presently selected range

Observed authority requirements

EMC.....	2014/30/EU
LVD.....	2014/35/EU

Approvals

ATEX 2014/34/EU.....	DEMKO 00ATEX128567, II (1) GD [Ex ia] IIC
EAC.....	TR-CU 020/2011
EAC Ex TR-CU 012/2011.....	RU C-DK.GB08.V.00410
DNV-GL Marine.....	Stand. f. Certific. No. 2.4