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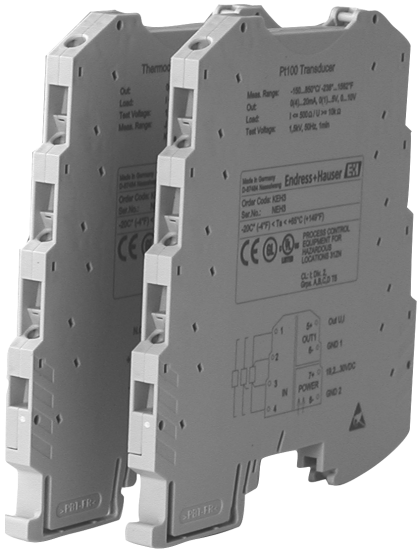
Technical Information

Easy Analog
RNB127-A1/A2 and RNB128

Configurable temperature transmitter for Pt100 temperature sensors and thermocouples



Your benefits
- Complete family in one housing
- Power supply via
  - DIN rail bus connector: less wiring, easy module change (even during operation)
  - Terminals
- Power supply 19.2 to 30 V possible
- 6.2 mm (0.244") device width
  ➔ Cost saving through reduction in space
- Installation in 120 mm (4.72") small field housings
- Easy configuration via DIP switches, most common configurations printed on device
  ➔ Configuration possible in the field
- High flexibility concerning in-/output signals
  ➔ Wide-range usage
- Low power consumption
  ➔ Small heat loss

Application
- Connection of Pt100 resistance thermometers (2-, 3- or 4-wire connection) or thermocouples
- Configurable temperature range and failure behaviour
- Wide-range usage through DIN rail mounting as per IEC 60715

CE

TI117R/06/en
51010012

Endress+Hauser
People for Process Automation

Function and system design

Measuring principle

RNB127-A1	Configurable temperature transmitter for Pt100 temperature sensors, with screw connection, pre-configured. The voltage supply (19.2...30 V DC) can either be provided via connecting terminal blocks of the module, or via the DIN rail bus connector.
RNB127-A2	Configurable temperature transmitter for Pt100 temperature sensors, with screw connection, pre-configured. With restricted temperature range. The voltage supply (19.2...30 V DC) can either be provided via connecting terminal blocks of the module, or via the DIN rail bus connector.
RNB128	Configurable temperature transmitter for thermocouples Type J and K as per IEC 60584-1, with screw connection, pre-configured. The voltage supply (19.2...30 V DC) can either be provided via connecting terminal blocks of the module, or via the DIN rail bus connector.

Input

Measured variable

Temperature

Measuring range

	RNB127-A1	RNB127-A2	RNB128
Measuring range	-150 to 850 °C (-238 to 1562 °F)	-50 to 200 °C (-58 to 392 °F)	Typ J: -150 to +1200 °C (-238 to 2192 °F) Typ K: -150 to +1350 °C (-238 to 2462 °F)
Measuring range span	min. 50 K (90 °F)	min. 50 K (90 °F)	min. 50 K (90 °F)

Input

	RNB127-A1	RNB127-A2	RNB128
Configurable	yes, pre-configured	yes, pre-configured	yes, pre-configured
Suitable sensor types	RTD Pt100 (IEC 60751)	RTD Pt100 (IEC 60751)	Thermocouples Type J, K (IEC 60584-1)
Sensor supply current	1 mA	1 mA	-
Connection type	2-, 3-, 4-wire	2-, 3-, 4-wire	-
Max. permissible conductor resistance per conductor	10 Ω	10 Ω	-

Output

Output signal

		RNB127-A1	RNB127-A2	RNB128
Configurable		yes, pre-configured	yes, pre-configured	yes, pre-configured
Output signal		0...10 V 10...0 V 0...5 V 1...5 V **0...20 mA**[1)] 4...20 mA 20...0 mA 20...4 mA	0...10 V 10...0 V 0...5 V 1...5 V **0...20 mA**[1)] 4...20 mA 20...0 mA 20...4 mA	0...10 V 10...0 V 0...5 V 1...5 V **0...20 mA**[1)] 4...20 mA 20...0 mA 20...4 mA
Max. output signal	I_{OUT}	23 mA / 12.5 V	23 mA / 12.5 V	23 mA / 12.5 V
	U_{OUT}	12.5 V / 10 mA	12.5 V / 10 mA	12.5 V / 10 mA
Load	I_{OUT}	≤ 500 Ω	≤ 500 Ω	≤ 500 Ω (20 mA)
	U_{OUT}	≥ 10 kΩ	≥ 10 kΩ	≥ 10 kΩ
Ripple	I_{OUT}	< 20 mV_{SS} (500 Ω)	< 20 mV_{SS} (500 Ω)	< 20 mV_{SS} (500 Ω)
	U_{OUT}	< 20 mV_{SS}	< 20 mV_{SS}	< 20 mV_{SS}

1) Presetting, please specify different settings in your order

Failure signal

Behaviour in the case of sensor fault (configurable: -25 to 105% of configured measuring range. The LED lights red in the case of under-/overrange.

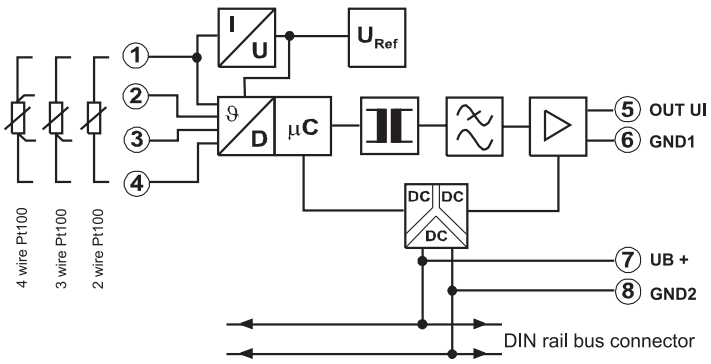
Galvanic isolation

Galvanic 3-way isolation
Test voltage: 1.5 kV, 50 Hz, 1 min

Power supply

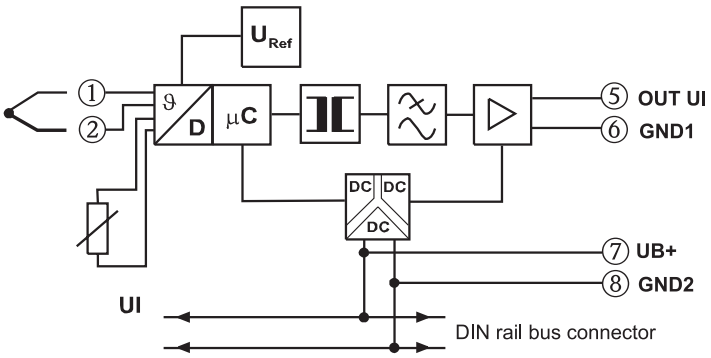
Electrical connection

RNB127-A1/A2



Terminal assignment

RNB128



Terminal assignment

Supply voltage

19.2 to 30 V

Note!
The voltage supply (19.2...30 V DC) can either be provided via connecting terminal blocks of the module, or via the DIN rail bus connector.

Current consumption

max. 25 mA (at 24 V)

Power consumption

< 500 mW

Performance characteristics

Reference operating conditions

+23 °C ± 5 °C (73.4 °F ± 9 °F)

Maximum measured error

	RNB127-A1	RNB127-A2	RNB128
at max. measuring span	max. 0.2% (of full measuring span)	max. 0.3% (of full measuring span)	max. 0.2% (of full measuring span)
with configured measuring span Δ_{TEMP}	((100 K/Δ_{TEMP}) + 0.1) % ((180 °F/Δ_{TEMP}[°F]) + 0.1) %	((50 K/Δ_{TEMP}) + 0.1) % ((90 °F/Δ_{TEMP}[°F]) + 0.1) %	((150 K/Δ_{TEMP}) + 0.1) % ((270 °F/Δ_{TEMP}[°F]) + 0.1) %

Temperature coefficient

RNB127-A1	RNB127-A2	RNB128
max. 0.02%/K (0.011%/°F)	max. 0.02%/K (0.011%/°F)	max. 0.02%/K (0.011%/°F)

Step response

RNB127-A1	RNB127-A2	RNB128
< 30 ms	< 30 ms	< 30 ms

Installation

Installation notes

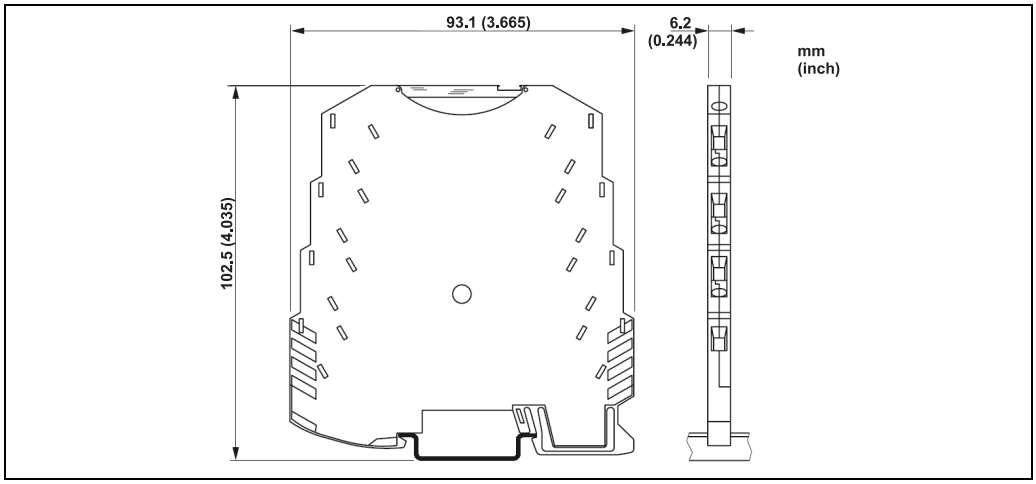
Installation on DIN rail according to IEC 60715.
The DIN rail bus connector can be used to provide the supply voltage (see "Accessories").

Environment

	RNB127-A1	RNB127-A2	RNB128
Ambient temperature limits	-20 °C to +65 °C (-4 °F to +149 °F)	-20 °C to +65 °C (-4 °F to +149 °F)	-20 °C to +65 °C (-4 °F to +149 °F)
Storage temperature	-40 °C to +85 °C (-40 °F to +185 °F)	-40 °C to +85 °C (-40 °F to +185 °F)	-40 °C to +85 °C (-40 °F to +185 °F)
Climate class	IEC 60654-1, B2	IEC 60654-1, B2	IEC 60654-1, B2
Degree of protection	IP20	IP20	IP20
Vibration resistance	4G	4G	4G
Electromagnetic compatibility	CE compliant	CE compliant	CE compliant

Mechanical construction

Design, dimensions



Dimensions of the Easy Analog devices

Weight

approx. 55 g

Material

Housing: PBT

Connection data

Conductor cross section solid min.	0.14 mm²
Conductor cross section solid max.	2.5 mm²
Conductor cross section stranded min.	0.2 mm²
Conductor cross section stranded max.	2.5 mm²
Conductor cross section AWG/kcmil min.	26
Conductor cross section AWG/kcmil max.	12
Stripping length	12 mm (0.47")
Screw thread	M3
Connection type	Screw connection

Human interface

The RNB127-A1/A2 and RNB128 temperature transmitters can be configured via DIP switches on the side of the housing.

Certificates and approvals

CE mark

The device complies with the legal requirements of the EC directives. Endress+Hauser confirms that the device has been successfully tested by affixing to it the CE mark.

Other standards and guidelines

IEC 60529: Degrees of protection through housing (IP code)

IEC 61010: Protection measures for electrical equipment for measurement, control, regulation and laboratory procedures

EN 61326/A1 (IEC 1326): Electromagnetic compatibility (EMC requirements)

Ordering information

Product structure RNB127

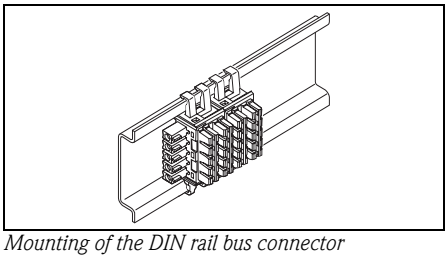
Temperature transmitter RNB127								
3-way, configurable.								
DIP switch: in-/output signal configuration.								
Power supply (19.2...30 V DC) via connecting terminal blocks or DIN rail bus connector.								
- Input: 2-/3-/4-conductor connection, PT 100 according to IEC 60751.								
- Output: 0...20 mA, 4...20 mA, 0...10 V, 0...5 V, 1...5 V, 10...0 V, 20...0 mA, 20...4 mA galvanically isolated								
	Approvals:							
	A	Non-hazardous area						
		Sensor type:						
		1	Pt100; -150-850 °C					
		2	Pt100; -50-200 °C					
			Input; Output:					
			A	3-conductor connection; 0-20mA				
			X	Special version, to be specified				
				Range:				
				A	0-100 °C			
				B	0-150 °C			
				X	Special version, to be specified			
					Connection:			
					1	Screw strip		
					3	Screw connection, power terminal block		
					4	Screw connection, DIN rail bus connector		
					5	Screw connection, power terminal block, DIN rail bus connector		
						Version:		
						A	Standard	
RNB127-	A						A	⇐ Order code complete

Product structure RNB128

Temperature transducer RNB128							
3-way separated temperature transducer, configurable.							
DIP switch:configuration in-/output, sensor type, cold junction compensation							
Output signal and type of error evaluation.							
Power supply (19.2...30 V DC) via connecting terminal blocks or DIN rail bus connector.							
- Input: connection of Thermocouples Type J, K according IEC 50584-1.							
- Output: 0...20 mA, 4...20 mA, 0...10 V, 0...5 V, 1...5 V, 10...0 V, 20...0 mA, 20...4 mA galvanically isolated.							
	Approvals:						
	A	Non-hazardous area					
		Output:					
		1	0-20 mA				
			Sensor type:				
			B	Type J (-150-1200 °C)			
			C	Type K (-150-1350 °C)			
				Connection:			
				1	Screw strip		
				3	Screw connection, power terminal block		
				4	Screw connection, DIN rail bus connector		
				5	Screw connection, power terminal block, DIN rail bus connector		
					Version:		
					A	Standard	
RNB128-	A	1			A	⇐ Order code complete	

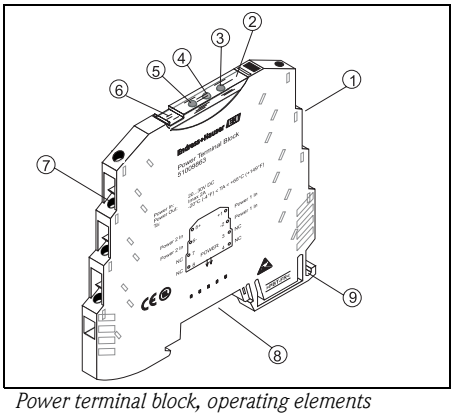
Accessories

DIN rail bus connector (order no. 51009864)



Mounting of the DIN rail bus connector

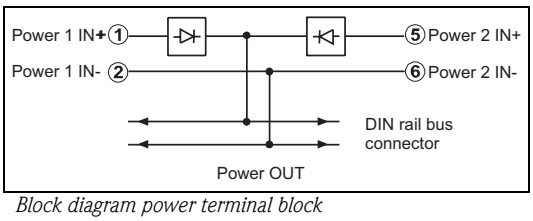
Power terminal block (order no. 51009863)



Power terminal block, operating elements

1 Input: Supply voltage 1
2 Transparent cover
3 LED: Reverse polarity indicator Power IN1
4 LED: Bus voltage state indicator
5 LED: Reverse polarity indicator Power IN2
6 Groove for Tag
7 Input: Supply voltage 2
8 Connection for DIN rail bus connector
9 Universal snap on foot for mounting rails

The power terminal block is used to feed the supply voltage to the DIN rail bus connector (order no. 51009864, see above).
Design and dimensions are the same as for all other Easy Analog devices except RNB130.
Two separate voltage inputs allow a redundant voltage supply of 24 V DC and a maximum current of 2 A.
A green LED on the front panel (fig. on the left, pos. 4) lights up when there is supply voltage on the DIN rail bus connector.
Red LEDs (fig. on the left, pos. 3 and 5) light up when supply voltages are connected to the wrong poles. When the supply voltage has been connected correctly, the respective red LED extinguishes.



Block diagram power terminal block

The power terminal block can be snapped onto all 35 mm DIN rails following IEC 60715.

System power supply RNB130

Further information can be found in the respective Technical Information (see "Documentation").

Documentation

- Technical Information RNB110, RNB111 and RNB112 (TI116R/09/en)
- Technical Information RNB150 (TI118R/09/en)
- Technical Information RNB140 (TI119R/09/en)
- Technical Information RNB130 (TI120R/09/en)
- Operating Instructions RNB127-A1 (BA208R/09/b4)
- Operating Instructions RNB127-A2 (BA207R/09/b4)
- Operating Instructions RNB128 (BA209R/09/b4)
- Brochure "System Components" (FA016K/09/en)

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