



71782830

Brief Operating Instructions RNO22

Output isolating amplifier, 1-/ 2-channel for 4 to 20 mA, HART®-transparent with 24 V_{DC} and line fault detection, optionally with SIL and Ex

These Brief Operating Instructions are not a substitute for the Operating Instructions. For further information on the product, see:

- www.endress.com/deviceviewer
- Smartphone/tablet: Endress+Hauser Operations app



Manufacturer: Endress+Hauser Wetzer GmbH + Co. KG, Obere Wank 1, D-87484 Nesselwang or www.endress.com

Basic safety instructions

Requirements for the personnel

The operating personnel must fulfill the following requirements:

- ▶ They must be trained, qualified specialists
- ▶ Before starting work, they must have read and understood the information in the Operating Instructions and certificates.

Intended use

The output isolating amplifier is used to control I/P transducers, control valves and display units. The device separates and transmits 0/4 to 20 mA signals. Digital communication signals (HART) can be superimposed on the analog measured value for operating SMART actuators and transmitted bidirectionally with galvanic isolation. The device enables open-circuit and short-circuit monitoring. An intrinsically safe version is optionally available for operation in Zone 2. The device is designed for installation on DIN rails in accordance with IEC 60715.

Product liability

The manufacturer does not accept any responsibility for damage that results from non-designated use and from failure to comply with the instructions in this manual.

Operational safety

NOTICE

Damage to the device!

- ▶ Operate the device only if it is in proper technical condition, free from errors and faults.
- ▶ The operator is responsible for interference-free operation of the device.

Product safety

This state-of-the-art device is designed and tested in accordance with good engineering practice to meet operational safety standards. It left the factory in a condition in which it is safe to operate.

It meets general safety standards and legal requirements. It also complies with the EU directives listed in the device-specific EU declaration of conformity. The manufacturer confirms this by affixing the CE mark.

Installation

Installation requirements

Dimensions

Width (B) x length (L) x height (H) (with terminals): 12.5 mm (0.49 in) x 116 mm (4.57 in) x 107.5 mm (4.23 in)

Installation instructions

- The device's IP20 degree of protection is intended for a clean and dry environment.
- Do not expose the device to mechanical and/or thermal stress that exceeds the specified limits.
- The device is intended for installation in a cabinet or similar housing. The device may only be operated as an installed device. The cabinet must meet the fire protection housing requirements according to safety standard UL/IEC 61010-1 and provide adequate protection against electric shock or burns.
- To protect against mechanical or electrical damage, the device must be installed in an appropriate housing with a suitable protection rating in accordance with IEC 60529.
- During installation, repair and maintenance work, the device must be disconnected from all effective power sources if the power sources are not SELV or PELV circuits.
- Only use copper cables as the connection cable.
- A SELV/PELV power unit with a nominal voltage of 24 V_{DC} (max. 30 V_{DC}) is required for the external device power supply.

Functional safety

A SIL version of the device is optionally available. It can be used in safety equipment in accordance with IEC 61508 up to SIL 2 (SC 3).



Please refer to Safety Manual FY01037K for the use of the device in safety instrumented systems according to IEC 61508.



Protection against modifications:

As it is not possible to disengage the operating elements (DIP switches), a lockable control cabinet is required for use in SIL applications. The cabinet must be locked by key. A normal electrical cabinet key does not suffice for this purpose.

Mounting location

The device is designed for installation on 35 mm (1.38 in) DIN rails in accordance with IEC 60715 (TH35).

The device's housing provides basic insulation from neighboring devices for 300 Veff. If several devices are installed side by side, this must be taken into consideration and additional insulation must be provided if necessary. If the adjacent device also offers basic insulation, no additional insulation is required.

NOTICE

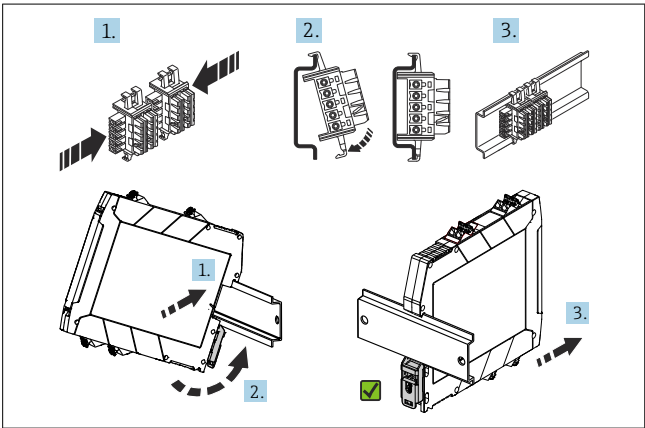
- ▶ When using in hazardous areas, the limit values of the certificates and approvals must be observed.

Important ambient conditions

Ambient temperature range	-40 to 70 °C (-40 to 158 °F)	Storage temperature	-40 to 85 °C (-40 to 185 °F)
Degree of protection	IP 20	Overvoltage category	II
Pollution degree	2	Humidity	10 to 95 % No condensation
Altitude	≤ 2 000 m (6 562 ft)		

Installing the DIN rail bus connector

i If using the DIN rail bus connector to the power supply, clip it onto the DIN rail BEFORE mounting the device. It is essential that you pay attention to the orientation of the module and the DIN rail bus connector: the snap-on clip should be at the bottom and the connector piece on the left.



1 Mounting the DIN rail bus connector 12,5 mm (0,5 in) (top) and mounting on DIN rail (bottom)

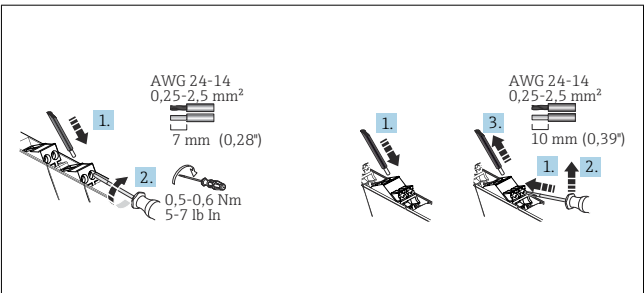
Installing a DIN rail device

The device can be installed in any position (horizontal or vertical) on the DIN rail without lateral clearance from neighboring devices. No tools are required for installation. The use of end brackets (type WEW "35/1" or similar) on the DIN rail is recommended as an end support for the device.

Electrical connection

Connecting requirements

A flat-blade screw driver is required to establish an electrical connection to screw or push-in terminals.



2 Electrical connection using screw terminals (left) and push-in terminals (right)

CAUTION

Destruction of parts of the electronics

- ▶ Switch off power supply before installing or connecting the device.

NOTICE

Destruction or malfunction of parts of the electronics

- ▶ **ESD** - Electrostatic discharge. Protect the terminals from electrostatic discharge.

Special connection instructions

- Disconnecting units and auxiliary circuit protective systems with suitable AC or DC values must be provided in the building installation.
- A switch/power circuit breaker must be provided close to the device and clearly marked as a disconnecting unit for this device.
- An overcurrent protection unit ($I \leq 6 \text{ A}$) must be provided in the installation.
- The voltages applied at the input, output and power supply are all extra-low voltages (ELV). Depending on the application, an exposed dangerous voltage ($> 30 \text{ V}_{AC} / > 60 \text{ V}_{DC}$) to ground can be present at the device. Safe galvanic isolation between the input and output side is provided for this scenario.

Important connection data

Performance characteristics

Supply voltage	24 V _{DC} (-20% / +25%)	Maximum current consumption at 24 V _{DC} / 20 mA	1-channel: < 45 mA 2-channel: < 85 mA
Power loss at 24 V _{DC} / 20 mA	1-channel: < 0.8 W 2-channel: < 1.4 W	Maximum power consumption at 24 V _{DC} / 20 mA	1-channel: ≤ 1.1 W 2-channel: < 2 W

Input data

Current input signal: Function (short-circuit detection off; 1-channel only) Function (short-circuit detection on; 1-channel only) Safety Underload/overload range	0 to 20 mA 0.2 to 20 mA 4 to 20 mA 0 to 24 mA
Line fault detection: input current response threshold	> 0.2 mA

Output data

Current output signal: Function (short-circuit detection off; 1-channel only) Function (short-circuit detection on; 1-channel only) Safety Underload/overload range	0 to 20 mA 0.2 to 20 mA 4 to 20 mA 0 to 24 mA
Open-circuit voltage	≤ 27 V
Transmission behavior	1:1 to input signal
Load: Short-circuit detection on (20 / 24 mA) Short-circuit detection off (20 / 24 mA)	100 to 700 Ω / 500 Ω 0 to 700 Ω / 500 Ω
Transmissible communication protocols	HART

Accuracies

Transmission error (typical / maximum)	0.05 % / 0.1 % of full scale value
Temperature coefficient (typical / maximum)	≤ 0.005 % / 0.01 %/K

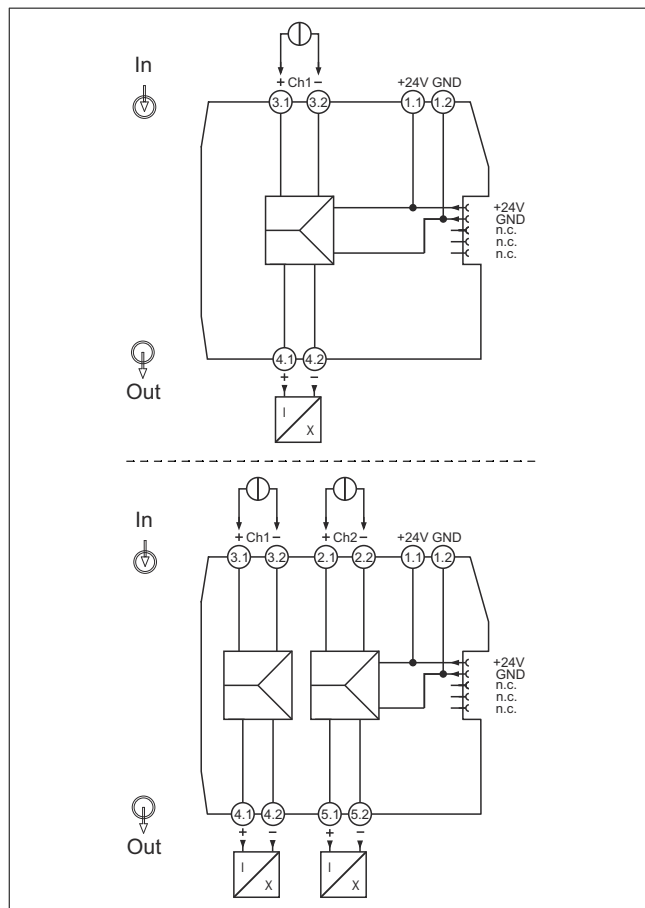
Galvanic isolation

Output / input; output / power supply (peak value according to IEC 60079-11)	375 V
Output 1 / output 2 (2-channel devices)	60 V



For detailed technical data, see the Operating Instructions

Quick wiring guide



3 Terminal assignment of RNO22: 1-channel version (top), 2-channel version (bottom)



Sockets for the connection of HART communicators are integrated in the plug-in connectors (screw connection). Ensure an adequate external resistance ($\geq 230 \Omega$) in the output circuit.

Connecting the supply voltage

Power can be supplied via terminals 1.1 and 1.2 or via the DIN rail bus connector.

Using the power and error message module to supply power

It is recommended to use the RNF22 power and error message module to provide the supply voltage to the DIN rail bus connector. An overall current of 3.75 A is possible with this option.

Supply to the DIN rail bus connector via terminals

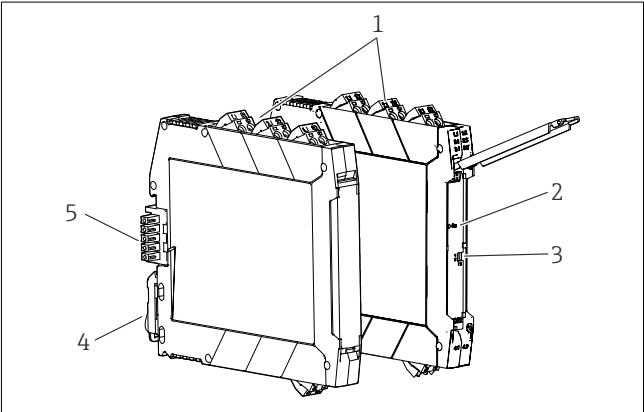
Devices installed side by side can be powered via the terminals of the device up to a total current consumption of 400 mA. The connection is via the DIN rail bus connector. The installation of a 630 mA fuse (semi-delay or slow-blow) upstream is recommended.

NOTICE

The simultaneous use of terminals and DIN rail bus connectors to supply power is not permitted! The tapping of energy from the DIN rail bus connector for further distribution is not permitted.

- The supply voltage must never be connected directly to the DIN rail bus connector!

Display and operating elements



4 Display and operating elements

1 Plug-in screw or push-in terminal with integrated test socket
2 Green LED "PWR" power supply
3 DIP switches (only on 1-channel version)
4 DIN rail clip for DIN rail mounting
5 DIN rail bus connector (optional)

Local operation

Maintenance

Maintenance work

The device does not require specific maintenance work.

Cleaning of surfaces not in contact with the medium

- Recommendation: Use a lint-free cloth that is either dry or slightly dampened using water.

Hardware settings / configuration

- Any device settings using the DIP switch must be made when the device is de-energized.
- For details refer to the Operating Instructions

Short-circuit detection

In the 1-channel version, short-circuit monitoring can be switched off or on using the DIP switches.

DIP switch	Short-circuit detection Off	Short-circuit detection On
1	I	II
2	(no function)	(no function)

- Short-circuit detection must be disabled for 0 to 20 mA signal transmission.

Otherwise, the signal range can only be used as of the line fault detection response threshold of >0.2 mA.

- Do not use any sharp objects or aggressive cleaning agents that corrode the surfaces (e.g. displays, housing) and seals.
- Do not use high-pressure steam.
- Observe the degree of protection of the device.
- The cleaning agent used must be compatible with the materials of the device configuration. Do not use cleaning agents with concentrated mineral acids, bases or organic solvents.