

# RN22 Intrinsically Safe Analog Input Isolators



Part No. [RN22-CB1A-LT](#)

The Endress+Hauser RN22 intrinsically safe isolation barriers provide galvanic isolation and intrinsically safe transmission of 0/4 to 20 mA analog signals from process instruments located in hazardous locations to the control system located in a non-hazardous location. The RN22 can accept current input from 2-wire or 4-wire process instruments or transmitters and includes an internal power supply output for loop-powered transmitters. The output signal is 0/4-20mA and equal to the input signal. Models are available in 1-channel, 2-channel, or signal doubler configurations with either screw terminals or push-in terminals. Bidirectional transmission of digital HART communication signals is possible and includes connection lugs on the front for HART communicator devices. The RN22 is powered from a nominal 24VDC power supply.

## Applications

- 1- or 2-channel or signal doubler analog input isolation barrier
- Transmission and galvanic isolation of analog 0/4 to 20 mA signals, intrinsically safe from the hazardous area
- HART transparent: allows bidirectional transmission of digital HART communication signals
- For ambient temperatures -40 to +60°C (-40 to 140°F)

## Features

- Input 0/4 to 20 mA with internal power supply for loop-powered transmitters
- Output 0/4 to 20 mA
- Connection lugs integrated on front for HART communicators
- Simple and quick wiring with either screw or push-in terminals
- Compact housing width: 12.5 mm (0.49 in)



RN22 Intrinsically Safe Analog Input Isolators										
Part Number	Input	Output	Operating Voltage	Connection	Pcs/Pkg	Wt(lb)	Price	Vendor QSG	Vendor Manual	Drawing Link
<u><a href="#">RN22-CB1A-LT</a></u>	0-20 mA or 4-20 mA	0-20 mA or 4-20 mA	19.2 to 30 VDC	Screw terminals	1	0.45	\$231.00	PDF	PDF	<u><a href="#">PDF</a></u>
<u><a href="#">RN22-CB1B-LT</a></u>				Push-in terminals	1	0.45	\$231.00			<u><a href="#">PDF</a></u>
<u><a href="#">RN22-CB2A-LT</a></u>	(2) 0-20 mA or (2) 4-20 mA	(2) 0-20 mA or (2) 4-20 mA		Screw terminals	1	0.45	\$310.00			<u><a href="#">PDF</a></u>
<u><a href="#">RN22-CB2B-LT</a></u>				Push-in terminals	1	0.45	\$310.00			<u><a href="#">PDF</a></u>
<u><a href="#">RN22-CB3A-LT</a></u>	0-20 mA or 4-20 mA	(2) 0-20 mA or (2) 4-20 mA		Screw terminals	1	0.45	\$302.00			<u><a href="#">PDF</a></u>
<u><a href="#">RN22-CB3B-LT</a></u>				Push-in terminals	1	0.45	\$302.00			<u><a href="#">PDF</a></u>

For additional details and information, refer to the vendor Quick Start Guide and Manual.

RN22 Intrinsically Safe Analog Input Isolator Specifications		
Input		
<b>Input Data, Measuring Range</b>	Input signal range (underrange / overrange)	0 to 22 mA
	Function range, input signal	0/4 to 20 mA
	Input voltage drop signal for 4-wire connection	< 7V at 20 mA
	Transmitter supply voltage	17.5 V ± 1V at 20 mA Open-circuit voltage: 24.5 V ± 5%
Output		
<b>Output Data</b>	Output signal range (underrange / overrange)	0 to 22 mA
	Function range, output signal	0/4 to 20 mA
	Transmission behavior	1:1 to input signal
	NAMUR NE 43	A current at the input that is valid according to NAMUR NE 43 is transmitted to the output (within the specified measuring uncertainty range)
	Maximum load, active mode	≤ 500Ω
	Open-circuit voltage, active mode	17.5 V (± 5%)
	Maximum load, passive mode	Rmax = (Uext - 2 V) / 0.022 A
	External voltage, passive mode	Uext = 12 to 30 V
Transmissible communication protocols	HART	

# RN22 Intrinsically Safe Analog Input Isolators

## RN22 Intrinsically Safe Analog Input Isolator Specifications Continued

<i>Output Continued</i>		
<b>Signal On Alarm</b>	Line break in input	Input 0mA / output 0mA
	Line short circuit in input	Input > 22mA / output > 22mA
<b>Galvanic Isolation</b>	Power supply / input; power supply / output Input / output; output / output	Testing voltage: 3,000 VAC 50Hz, 1 min
	Input / input	Testing voltage: 500VAC 50Hz, 1 min
<i>Power Supply*</i>		
<b>Performance Characteristics</b>	Supply voltage	24VDC (-20% / +25%)
	Supply current to the DIN rail bus connector	max. 400mA
	Power consumption at 24 VDC	1-channel: ≤ 1.5 W (20 mA) / ≤ 1.6 W (22mA) 2-channel: ≤ 3 W (20 mA) / ≤ 3.2 W (22mA) Signal doubler: ≤ 2.4 W (20 mA) / ≤ 2.5 W (22mA)
	Current consumption at 24 VDC	1-channel: ≤ 0.07 A (20 mA) / ≤ 0.07 A (22mA) 2-channel: ≤ 0.13 A (20 mA) / ≤ 0.14 A (22mA) Signal doubler: ≤ 0.1 A (20 mA) / ≤ 0.11 A (22mA)
	Power loss at 24 VDC	1-channel: ≤ 1.2 W (20 mA) / ≤ 1.3 W (22mA) 2-channel: ≤ 2.4 W (20 mA) / ≤ 2.5 W (22mA) Signal doubler: ≤ 2.1 W (20 mA) / ≤ 2.2 W (22mA)
<b>Terminals</b>	Screw terminals Tightening torque: minimum 0.5 Nm/maximum 0.6 Nm	Rigid or flexible (Stripping length = 7 mm (0.28 in); cable cross-section 0.2 to 2.5 mm <sup>2</sup> (24 to 14 AWG)
		Flexible with wire end ferrules (with or without plastic ferrule); cable cross-section 0.25 to 2.5 mm <sup>2</sup> (24 to 14 AWG)
	Push-in spring terminals	Rigid or flexible (Stripping length = 10 mm (0.39 in); cable cross-section 0.2 to 2.5 mm <sup>2</sup> (24 to 14 AWG)
		Flexible with wire end ferrules (with or without plastic ferrule); cable cross-section 0.25 to 2.5 mm <sup>2</sup> (24 to 14 AWG)
<i>Performance Characteristics</i>		
<b>Response Time</b>	Step response (10 to 90 %)	≤ 1ms
	Step response (10 to 90 %) signal doubler output 2 HART filter	≤ 50ms
<b>Reference Operating Conditions</b>	<ul style="list-style-type: none"> <li>• Calibration temperature: +25°C ±3 K (77°F ± 5.4°F)</li> <li>• Supply voltage: 24VDC</li> <li>• Output load: 225Ω</li> <li>• External output voltage (passive output): 20VDC</li> <li>• Warm-up: &gt; 1 hour</li> </ul>	
<b>Maximum Measured Error (Accuracies)</b>	Transmission error	< 0.1 % / of full scale value (< 20μA)
	Temperature coefficient	< 0.01 % /K
<b>Long-Term Drift</b>	Max. ±0.1 %/year (of full scale value)	
<i>Installation</i>		
<b>Mounting Location</b>	The device is designed for installation on 35 mm (1.38 in) DIN rails in accordance with IEC 60715 (TH35).	
<b>DIN rail Installation</b>	The device can be installed in any position (horizontal or vertical) on the DIN rail without lateral clearance from neighboring devices.	
<i>Environment</i>		
<b>Ambient Conditions</b>	Ambient temperature range	-40 to 60°C (-40 to 140°F)
	Storage temperature	-40 to 80°C (-40 to 176°F)
	Degree of protection	IP 20
	Overvoltage category	II
	Pollution degree	2
	Humidity	5 to 95%
	Altitude	≤ 2,000 m (6,562 ft)
	Insulation class	Class III

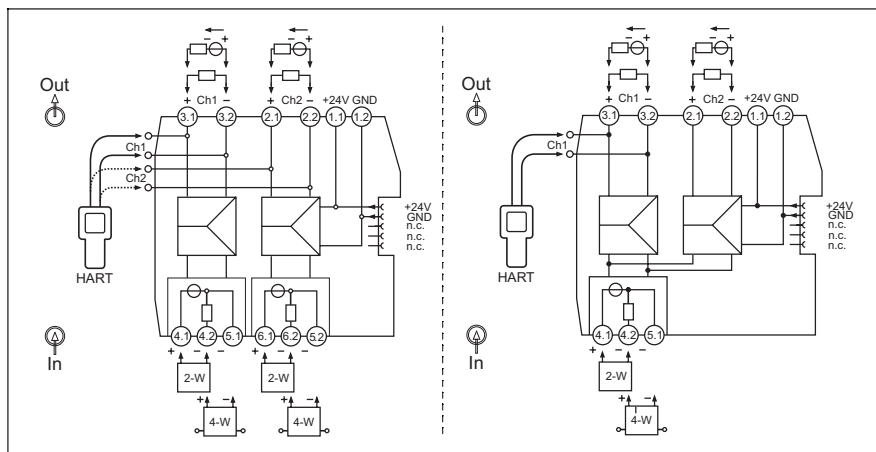
\* The data apply for the following operating scenario: input active / output active / output load 0 Ω. When external voltages are connected to the output, the power loss in the device may increase. The power loss in the device can be reduced by connecting an external output load.

# RN22 Intrinsically Safe Analog Input Isolators

RN22 Intrinsically Safe Analog Input Isolator Specifications Continued	
Environment Continued	
Maximum Temperature Change Rate	0.5 °C/min, no condensation permitted
Shock and Vibration Resistance	Sinusoidal vibrations, in accordance with IEC 60068-2-6 <ul style="list-style-type: none"> <li>• 5 to 13.2 Hz: 1 mm peak</li> <li>• 13.2 to 100 Hz: 0.7g peak</li> </ul>
Electromagnetic Compatibility (EMC)	CE compliance* <ul style="list-style-type: none"> <li>• Electromagnetic compatibility in accordance with all the relevant requirements of the IEC/EN 61326 series and NAMUR Recommendation EMC (NE21). For details, refer to the Declaration of Conformity.                             <ul style="list-style-type: none"> <li>• Maximum measured error &lt; 1% of measuring range</li> </ul> </li> <li>• Strong, pulse-like EMC interference can result in transient (&lt; 1) deviations in the output signal (<math>\geq \pm 1\%</math>).                             <ul style="list-style-type: none"> <li>• Interference immunity as per IEC/EN 61326 series, industrial requirements</li> <li>• Interference emission as per IEC/EN 61326 series (CISPR 11) Group 1 Class A</li> </ul> </li> </ul>
Mechanical Construction	
Materials	Housing: polycarbonate (PC); flammability rating according to UL94: V-0
Certificates and approvals	
Agency Approvals	cULus (E225237), cCSAus (200600), CE

\* This unit is not intended for use in residential environments and cannot guarantee adequate protection of the radio reception in such environments.

## Wiring Diagrams



1- and 2-channel version (left), signal doubler (right)



**Note:** HART communicators can be connected to the HART connecting points. Ensure an adequate external resistance ( $\geq 230\Omega$ ) in the output circuit. With the signal doubler model, the active barrier is used for the galvanic isolation of a 0/4 to 20 mA signal, which is transmitted to two galvanically isolated outputs.

- Output 1 is HART-transparent. HART communication signals are transmitted bidirectionally between the input and output 1.
- As output 2 contains a HART filter, only the galvanically isolated analog 4 to 20 mA signal is transmitted.



**Warning:** Safety products sold by AutomationDirect are Safety components only.

The purchaser/installer is solely responsible for the application of these components and ensuring all necessary steps have been taken to assure each application and use meets all performance and applicable safety requirements and/or local, national and/or international safety codes as required by the application. AutomationDirect cannot certify that our products used solely or in conjunction with other AutomationDirect or other vendors' products will assure safety for any application.

Any person using or applying any products sold by AutomationDirect is responsible for learning the safety requirements for their individual application and applying them, and therefore assumes all risks, and accepts full and complete responsibility for the selection and suitability of the product for their respective application. AutomationDirect does not provide design or consulting services, and cannot advise whether any specific application or use of our products would ensure compliance with the safety requirements for any application.