

OPERATING MANUAL

**ExTVA-600-U0 | Active
Power Isolator
1-channel for 4 ... 20 mA,
HART® transparent, 24 ...
230 V AC/DC power
supply,
Active/passive input and
output,
Ex certification**



umn_prd_extva_600_u0_vs1.0
1_en 07/2026



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1 Notes on the Document

1.1 Document Purpose

This manual describes the product's design, functions, and use, and helps ensure that the product is operated as intended.

Read the manual carefully before using the product. This will help you avoid potential injury, property damage, and damage to the device.

The operating manual is an integral part of the device and must be kept accessible at all times in the immediate vicinity of the operating site.

The information in this document is based on the knowledge available at the time of printing. Subject to change without notice.

1.2 Terminology

NOTE

Information on how to prevent malfunctions, operational errors, and damage to the device or system.



WARNING

Failure to follow these instructions may result in serious or fatal injury.

1.3 Additional Documentation

In addition to this document, you can find additional documentation online.

1.4 Registered trademarks

HART®

Registered trademark of the FieldComm Group, Austin, Texas, USA

2 Safety Instructions

2.1 Authorized Personnel

Personnel responsible for installation, commissioning, diagnostics, and maintenance must meet the following requirements:

- Trained technical personnel: Possess qualifications appropriate for this role and activity.
- Authorized by the plant operator.
- Familiar with national regulations.
- Before starting work: Read and understand the instructions in the manual and supplementary documentation, as well as any certificates (depending on the application).
- Follow instructions and guidelines.
- Operating personnel must meet the following requirements:
 - Trained and authorized by the plant operator in accordance with the task requirements.
 - Follow the instructions in this manual.

2.2 Intended Use

The signal isolator is designed for the safe isolation of 0/4 ... 20 mA standard signal circuits. The device is designed for mounting on top-hat rails in accordance with IEC 60715.

The manufacturer assumes no liability for damage resulting from failure to follow the instructions or from improper use.

We provide a warranty only if the device is installed and used in accordance with the operating instructions.

2.3 Workplace Safety

When working on or with the device:

- Wear the required personal protective equipment in accordance with national regulations.

2.4 Operational Safety



Risk of injury!

- Operate the device only when it is in technically sound and safe operating condition.
- The operator is responsible for ensuring the device operates without malfunction.
-

Modifications to the device

Unauthorized modifications to the device are not permitted and may lead to unforeseeable hazards:

- If modifications are nevertheless necessary: Consult the manufacturer.

Repair

To ensure continued operational safety:

- Perform repairs on the device only if they are expressly permitted.
- Follow national regulations regarding the repair of electrical equipment.
- Use only original replacement parts and accessories from the manufacturer.

Area Subject to Approval

To prevent any risk to persons or the system when using the device in an area subject to approval (e.g., explosion protection):

- Check the nameplate to verify that the ordered device is suitable for the intended use in the area subject to approval.
- Follow the instructions in the separate supplementary documentation, which is an integral part of this manual.

2.5 Product Safety

This device has been designed and tested in accordance with the state of the art and good engineering practice to ensure operational safety and left the factory in a condition that is technically sound in terms of safety.

2.6 Installation Instructions

- The device's IP20 protection rating is intended for a clean and dry environment.
- Do not subject the device to mechanical and/or thermal stress that exceeds the specified limits.

- The device is intended for installation in a control cabinet or a comparable enclosure. The device must only be operated when installed.
- To protect the device from mechanical or electrical damage, it must be installed in an appropriate enclosure with a suitable protection rating in accordance with IEC/EN 60529.
- The device complies with electromagnetic compatibility (EMC) regulations for industrial applications.

3 Product Description

3.1 Product Design

- The power isolator is used for the transmission and galvanic isolation of 0/4 ... 20 mA/HART signals. The device features an active/passive current input to which a 2- or 4-wire transmitter can be directly connected. The device's output can be operated in active or passive mode. The current signal is then available to the PLC or control system, or for further instrumentation, via pluggable terminal blocks.
- HART communication signals are transmitted bidirectionally by the device. Connection jacks for HART communicators are integrated into the front panel.
- The device is an "associated piece of equipment" that allows for the connection of devices in Ex Zone 0/20 [ia] and for the device to be operated in Ex Zone 2 [ec]. 2-wire transmitters are powered, and analog 0/4 ... 20 mA/HART measured values are transmitted from the Ex area to the non-Ex area. The devices come with separate Ex documentation, which is an integral part of this manual. The installation instructions and connection specifications listed therein must be observed!

3.2 Applications

This chapter describes the typical applications of the devices.

These devices perform various functions in signal conditioning:

- Amplification
- Normalization
- Filtering
- Galvanic isolation
- Power supply to the connected sensors
- Line monitoring

The devices used for these tasks are collectively referred to as isolation amplifiers or signal isolators and are available with a variety of functional capabilities. They process different types of signals.

3.2.1 Types of Signals

Signals are called analog if they can assume any value between a minimum and a maximum value in a continuous, "smooth" manner (e.g., 0/4–20 mA) and are therefore also referred to as "continuous-value" signals. The range of values within this interval is very large and, within the limits of measurement accuracy, virtually infinite.

Electrical analog signals are generated, for example, by a sensor that detects states or changes in the states of physical quantities and converts them into an electrical signal.

In plant and process engineering, the following quantities are typically measured:

- Temperature
- Pressure
- Level
- Flow rate
- Analytical values (e.g., turbidity, conductivity, pH ...)

These analog signals are evaluated in the control system (PLC/SPS), and the signals can be used in a "target device," e.g., for

- display devices, such as level indicators
- control/regulation, e.g., level control
- Actuators, e.g., for filling a tank

A transmitter can also be connected downstream of the sensor; this converts the analog measurement signal into a so-called standard signal, thereby enabling further processing of the signal using other standardized electrical components. The transmitter may already be integrated into the sensor's housing.

Binary signals take on only two values, thereby indicating the states "on" or "off" or "1" or "0." Binary signals are often equated with "digital" signals because digital signals are generally encoded in binary.

HART (Highway Addressable Remote Transducer) signals are characterized primarily by the fact that, unlike other digital fieldbus systems, they are operated and used as a supplement to classic analog standard signals. Thus, they do not replace point-to-point wiring but rather enable the integration of intelligent field devices. In this process, the digital signals are superimposed onto an analog

4 ... 20 mA standard current signal to transmit digital information in addition to the analog information representing the process value.

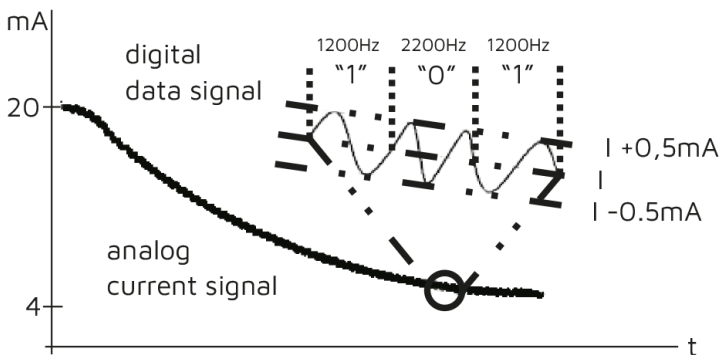


Image 3.1: grf00340_fun_extva600_1.jpg

Modulated HART signal

A Analog signal

B Digital signal

NAMUR sensors are operated with a bias current and have four states, allowing even sensor faults to be detected by an analog evaluation unit. This is also referred to as the quiescent current principle.

NAMUR sensors can assume four states at the output:

- Current 0 mA: Wire break; open circuit
- Current <1.2 mA: Sensor ready, unattenuated
- Current >2.1 mA: Sensor ready, damped
- Maximum current >6 mA: Short circuit, maximum current

3.2.2 Power Isolators

The power isolators perform several functions. In addition to galvanic signal isolation and proportional transmission of the analog 0/4–20 mA signals, they supply power to connected sensors. The device is HART-transparent, meaning it also transmits, for example, the HART information sent by sensors. The HART signals can be tapped via the front-panel HART connections, or connected “SMART” sensors can be conveniently configured.

The following examples illustrate typical applications of the power isolators. Each application is briefly explained and described using a diagram.

Note: The devices have an active and a passive current input to which a 2- or 4-wire transmitter can be connected directly. The device's output can be operated in active or passive mode. The current signal is then available to the PLC/control system or for further instrumentation.

Pressure Measurement in an Explosion-Proof Area

- The passive 2-wire sensor supplies a current signal proportional to the pressure to the active input of the isolation transformer
- The power isolator supplies an active current output signal proportional to the input signal to a passive input of the evaluation unit

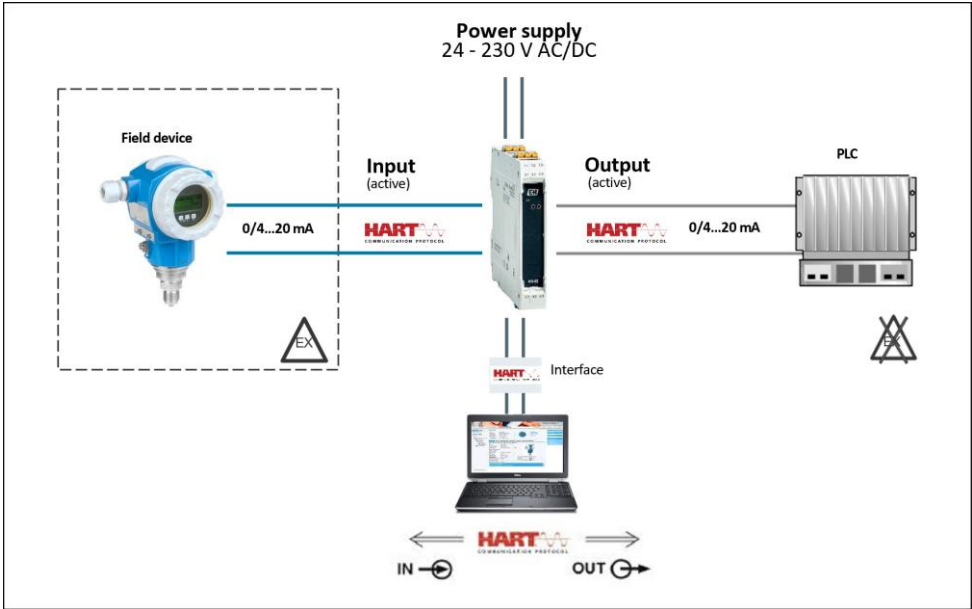


Image 3.2: grf00341_fun_extva600_2.jpg

Flow measurement in an explosion-protected area

- The active 4-wire sensor supplies a current signal proportional to the flow rate to the passive input of the power isolator
- The power isolator supplies a passive current output signal proportional to the input signal to an active input of the evaluation unit

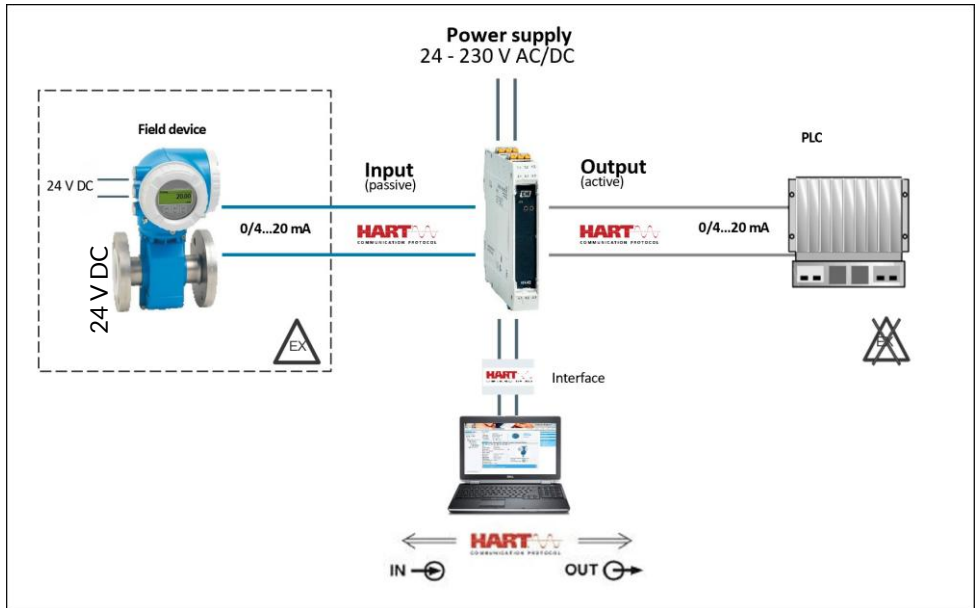


Image 3.3: grf00342_fun_extva600_3.jpg

3.3 Nameplate

Is this the right device?

- The following information about the device can be found on the nameplate:
- Manufacturer identification, device designation
- Order code
- Extended order code
- Serial number
- Measurement point designation (TAG) (optional)
- Technical Specifications, e.g., supply voltage, current consumption, ambient temperature, communication-specific data (optional)
- Protection class
- Approvals with symbols
- Reference to safety instructions (XA)

Compare the information on the nameplate with the order.

3.4 Dimensions

Dimensions in mm (in)

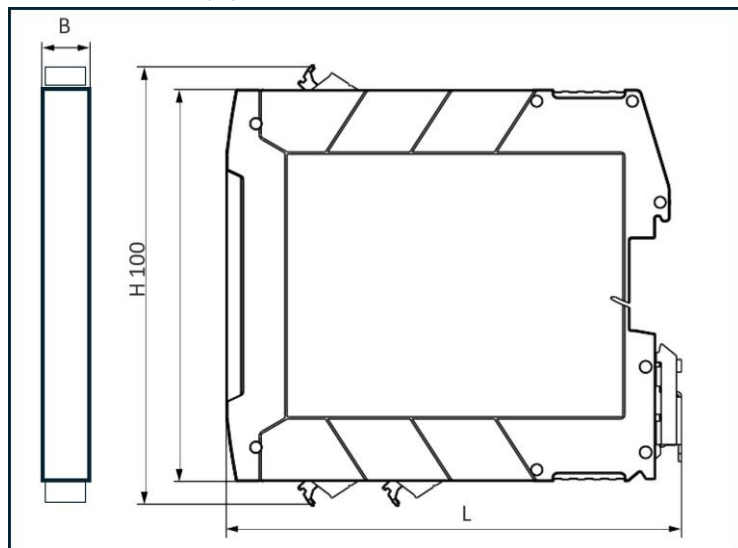


Image 3.4: grf00338_ins_extva600_4.jpg

Width (W) x Length (L) x Height (H) (with terminal blocks):

17.5 mm (0.69 in) x 116 mm (4.57 in) x 107.5 mm (4.23 in)

3.5 Packaging, Shipping, and Storage

Upon receipt of the shipment:

- 1 Check the packaging for damage.
- 2 Report any damage to the manufacturer immediately.
- 3 Do not install damaged components.
- 4 Check the contents of the shipment against the packing slip.
- 5 Compare the information on the nameplate with the order details on the packing slip.
- 6 Check that the technical documentation and all other required documents, such as certificates, are complete.

If any of the above conditions are not met: Contact the manufacturer.

Storage temperature: $-40 \dots +80 \text{ }^{\circ}\text{C}$ ($-40 \dots +176 \text{ }^{\circ}\text{F}$)

Maximum relative humidity: $< 95\%$

When storing and transporting the device, pack it so that it is reliably protected from impacts and external influences. The original packaging provides optimal protection.

When storing the device, be sure to avoid the following environmental factors:

- Direct sunlight
- Proximity to hot objects
- Mechanical vibration
- Corrosive substances

4 Installation

4.1 Installation conditions

4.1.1 Dimensions

For information on the device's dimensions, see the "Technical Data" chapter.

4.1.2 Installation Location

The device is designed for mounting on 35 mm (1.38 in) top-hat rails in accordance with IEC 60715 (TH35).

NOTE

For use in potentially explosive atmospheres, the limit values specified in the certificates and approvals must be observed.

For information on environmental conditions, see the "Technical Data" chapter.

4.2 Installation

The device can be mounted on a top-hat rail in any orientation (horizontal or vertical) without requiring any lateral spacing from adjacent devices. No tools are required for this. End supports (Type "WEW 35/1" or equivalent) on the top-hat rail are recommended to provide end support for the device.

When installing multiple devices side by side, ensure that the maximum side-wall temperature of each individual device does not exceed 80 °C (176 °F). If this cannot be guaranteed, mount the devices at a distance from one another or ensure adequate cooling.

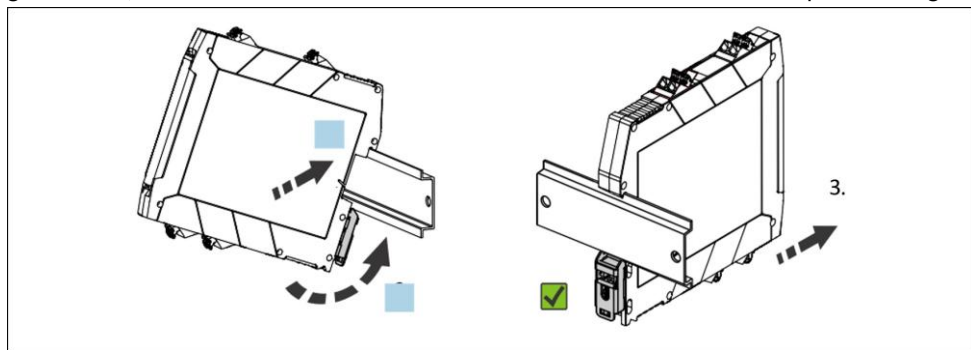


Image 4.1: grf00330_ins_extva600_1.jpg

- Align the upper DIN rail slot with the top end of the DIN rail.

- Lower the front of the device horizontally until the device's locking clip audibly clicks into place on the DIN rail.
- Gently pull on the device to check whether it is correctly mounted on the DIN rail.

4.3 Removal

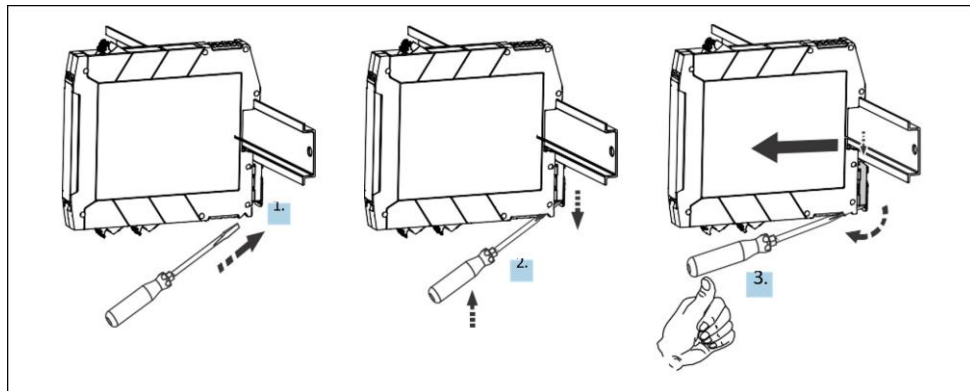


Image 4.2: grf00331_ins_extva600_2.jpg

- Insert a screwdriver into the tab of the DIN rail clip.
- Use the screwdriver to pull the DIN rail clip downward as shown in the illustration.
- Keep the screwdriver pressed down while removing the device from the DIN rail.

5 Electrical Connection

5.1 Connection Requirements

A flat-blade screwdriver is required for the electrical connection to screw-type or push-in terminal blocks.

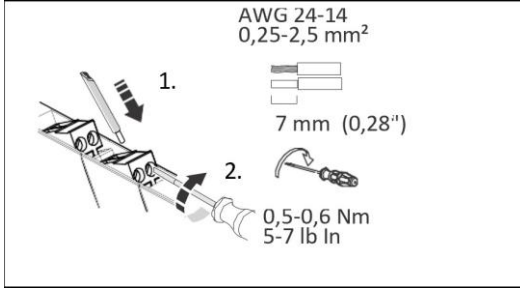


Image 5.1: grf00332_eac_extva600_1.jpg

WARNING

Install the device only when it is de-energized.

WARNING

Switch off all connected control devices before commissioning.

NOTE

Damage or malfunction of electronic components

- ESD—Electrostatic Discharge. Protect the terminals and HART jacks on the front panel from electrostatic discharge.
- A shielded cable is recommended for HART communication. Observe the system's grounding scheme.

For information on connection specifications, see the "Technical Data" chapter.

Use only copper cables with a temperature rating of at least 75 °C (167 °F) as connection cables.

5.2 Special Connection Instructions

- In the building installation, isolating devices and branch circuit protection devices with suitable AC or DC ratings must be provided within reach.
- A switch or circuit breaker must be provided near the device and clearly marked as the disconnecting device for this device.
- A circuit breaker (rated current ≤ 10 A; breaking capacity 6 kA; e.g., Type B) must be installed within reach for the supply line.

For information on connection data, see the "Technical Data" chapter.

5.3 Wiring at a Glance

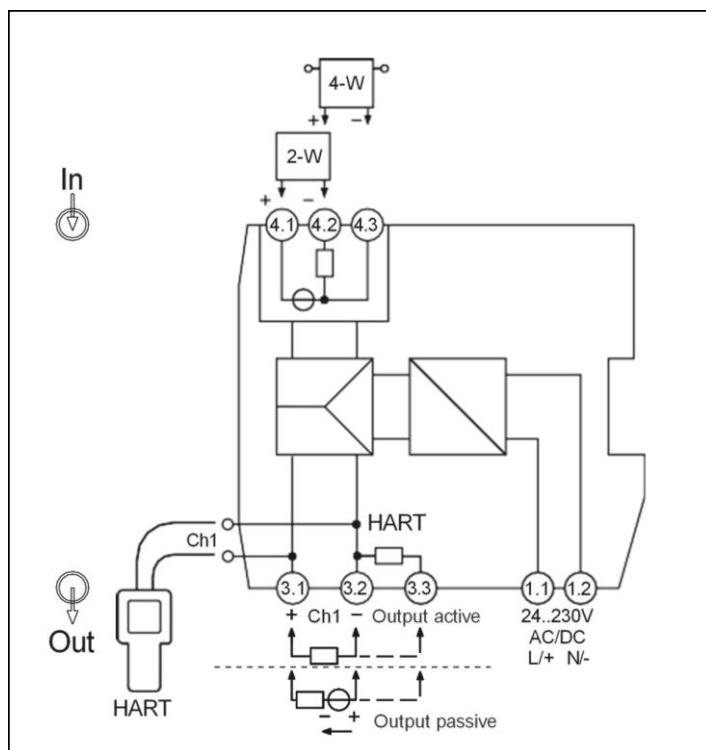


Image 5.2: grf00333_eac_extva600_2.jpg

Connection for operation with active output:

- Connect to 3.1.
- - Connect to 3.2

The operating mode switches automatically.

Connection for operation with a passive output:

- Connect + to 3.2.
- - Connect to 3.1

The operating mode switches automatically.

HART communicators can be connected to the HART connection jacks. Ensure that there is a sufficient external load ($\geq 230 \Omega$) in the output circuit. If the external load is insufficient, an internal 250Ω communication resistor can be added to the measurement loop via the alternative terminal configuration (terminal 3.3) to use the HART connection jacks.

5.4 Power Supply Connection

The power supply is connected via terminals 1.1 and 1.2.

5.5 Connection Check

- Are the device and cables undamaged (visual inspection)?
- Do the environmental conditions comply with the device specifications (e.g., ambient temperature, measurement range, etc.)?
- >> See 'Technical Data'
- Does the supply voltage match the specifications on the nameplate?
- >> Power isolator: $U = 24...230 \text{ V}$
- Are the auxiliary power and signal cables connected correctly?
- Are all screw terminals securely tightened, and have the connections of the push-in terminals been checked?

6 Operation

6.1 Display and Control Elements

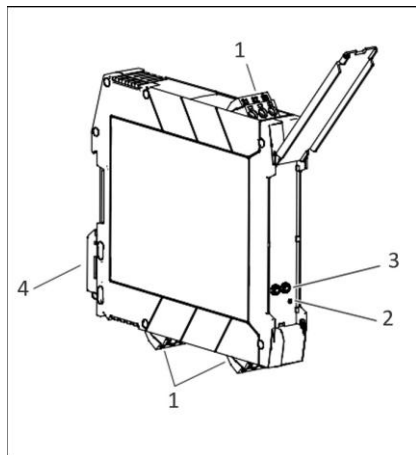


Image 6.1: grf00334_ope_extva600_1.jpg

- 1 Plug-in screw terminal
- 2 Green "On" LED (power supply)
- 3 Connection sockets for HART communication (Channel 1)
- 4 Top-hat rail clip for mounting on mounting rails

6.1.1 On-site operation

Hardware settings / configuration

No manual hardware settings need to be made on the device for commissioning.

When connecting 2-wire or 4-wire transmitters, note the different terminal assignments. On the output side, the connected system is detected, and the device automatically switches between active and passive modes.

7 Commissioning

7.1 Installation Check

Ensure that all installation and connection checks have been performed before putting the device into operation.

NOTE

Before commissioning, verify that the supply voltage matches the specifications on the nameplate. Failure to do so may result in damage to the device due to an incorrect supply voltage.

7.2 Turning on the Device

Turn on the power supply. The green LED on the front of the device indicates that the device is ready for operation.

To rule out wiring errors, verify the output current by simulating a high alarm at the input.

8 Troubleshooting and Fault Resolution

8.1 General Troubleshooting

Always begin troubleshooting with the following checklists if malfunctions occur after commissioning or during measurement operation. The various checks will guide you directly to the cause of the error and the corresponding corrective actions.

Due to its design, the device cannot be repaired. However, it is possible to send the device in for inspection. Refer to the "Returns" section.

Error	Possible Cause	Solution
The device does not respond.	The supply voltage does not match the value specified on the nameplate.	Check the voltage directly with a voltmeter and correct it.
	The connection cables are not making contact with the terminals.	Check the cable connections and correct them if necessary.
	The electronics are defective.	Replace the unit.
HART communication is not working.	Communication resistor is missing or installed incorrectly.	Install the communication resistor ($\geq 230 \Omega$) correctly.
	The HART modem is connected incorrectly.	Connect the HART modem correctly.
	The HART modem is not set to "HART."	Set the HART modem's selector switch to "HART".
The power LED (green) on the DIN rail device is not lit.	Power failure or insufficient supply voltage.	Check the supply voltage and ensure correct wiring.
A high alarm at the input cannot be output at the output.	The output load is too high (max. active/passive output load: see Technical Data)	Reduce the output load.
	Passive mode: External voltage at the output is connected incorrectly	Connect the external voltage to the output correctly.

If the malfunction cannot be resolved, please contact the manufacturer.

9 Maintenance and Cleaning

The device generally requires no special maintenance.

9.1 Cleaning surfaces not in contact with the medium

- Recommendation: Use a dry or slightly damp, lint-free cloth.
- Do not use sharp objects or harsh cleaning agents that could damage the surfaces (e.g., displays, housing) or seals.
- Do not use high-pressure steam.
- Observe the device's protection class.

The cleaning agent used must be compatible with the materials of the device configuration. Do not use cleaning agents containing concentrated mineral acids, alkalis, or organic solvents.

10 Repair

The device is not intended for repair by the user. Repairs may only be performed by the manufacturer.

10.1 Disassembly

Wear appropriate protective clothing, e.g., safety goggles and gloves.



WARNING

Disassemble the device only when it is de-energized.



WARNING

Turn off all connected control units before disassembly.

10.2 Returns

Returns can only be accepted if a decontamination declaration is included with the device. The form is available for download on the website and must be fully completed and affixed to the outside of the packaging in a manner that protects it from the elements and ensures safe transport.

10.3 Disposal

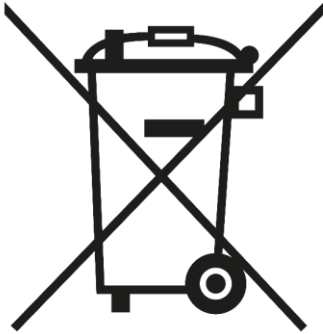


Image10.10.1:sym00001_weee_can.ai

In accordance with EU Directive 2012/19/EU on Waste Electrical and Electronic Equipment (WEEE), the product is marked with the symbol shown to minimize the disposal of WEEE as unsorted household waste. These products must not be disposed of as unsorted household waste and can be returned to the manufacturer for disposal. Returns are subject to the manufacturer's general terms and conditions or individually agreed terms.

11 Technical Specifications

11.1 Input

11.1.1 Input Data, Measurement Range

Input signal range (lower/upper limit)	0 ... 22 mA
Operating range of input signal	0/4 ... 20 mA
Input voltage drop for 4-wire connection	< 7 V at 20 mA
Transmitter supply voltage	17.5 V ±1 V at 20 mA Open-circuit voltage: 24.5 V ±5%

11.2 Output

11.2.1 Output data

Output signal range (lower/upper limit)	0 ... 22 mA
Operating range of output signal	0/4 ... 20 mA
Transfer characteristic	1:1 relative to the input signal
NAMUR NE 43	A current at the input that complies with NAMUR NE 43 is transmitted to the output (within the specified measurement uncertainty range)
Maximum load in active mode	≤ 500 Ω
Open-circuit voltage in active mode	17.5 V (± 5%)
Maximum load in passive mode	$R_{max} = (U_{ext} - 4 \text{ V}) / 0.022 \text{ A}$
External voltage in passive mode	$U_{ext} = 12 \dots 30 \text{ V}$
Supported communication protocols	HART

11.2.2Fault signal

Input wire break	Input 0 mA / Output 0 mA
Input short circuit	Input > 22 mA / Output > 22 mA

11.2.3Ex connection ratings

See the accompanying XA safety instructions

11.2.4Galvanic isolation

Power supply to input/output	Test voltage: 3,000 V _{AC} 50 Hz, 1 min
Input to output	Test voltage: 1,500 V _{AC} 50 Hz, 1 min

11.3 Power supply

11.3.1Performance Data Power supply

Supply voltage	24 ... 230 V _{AC/DC} (-20% / +10%, 0/50/60 Hz)
Power Consumption	≤ 4.9 VA / 2.4 W (20 mA); ≤ 5 VA / 2.5 W (22 mA)
Power Dissipation	≤ 2 W (20 mA); ≤ 2.1 W (22 mA)
Current consumption at 24 V _{DC}	≤ 0.1 A (20 mA); ≤ 0.1 A (22 mA)
Current consumption at 230 V _{AC}	≤ 0.02 A (20 mA); ≤ 0.02 A (22 mA)

These specifications apply to the following operating conditions: Input active / Output active / Output load 0 Ω. Connecting external voltages to the output may increase power dissipation in the device. Power dissipation in the device can be reduced by connecting an external output load.

11.3.2Terminals

A flat-blade screwdriver is required for electrical connection to the screw terminals.

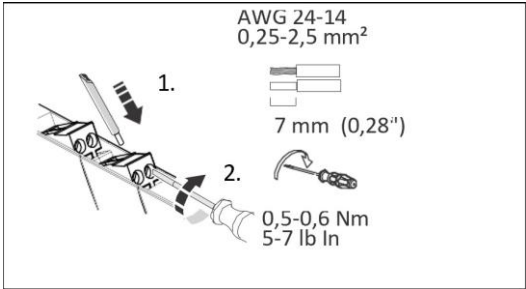


Image 11.1: grf00336_eac_extva600_4.jpg

Terminal Configuration	Cable design	Conductor cross-section
Screw terminals Tightening torque: minimum 0.5 Nm/maximum 0.6 Nm	Rigid or flexible (strip length = 7 mm (0.28 in))	0.2 ... 2.5 mm ² (24 ... 14 AWG)
	Flexible with wire end ferrules (with or without plastic sleeve)	0.25 ... 2.5 mm ² (24 ... 14 AWG)

11.3.3Cable Specifications

A shielded cable is recommended for HART communication. Observe the system’s grounding concept.

11.4 Performance Characteristics

11.4.1Response time

Step response (10 ... 90 %)	≤ 1 ms
-----------------------------	--------

11.4.2Reference Conditions

- Calibration temperature: +25 °C ±3 K (77 °F ±5.4 °F)
- Supply voltage: 230 VAC
- Output load: 225 Ω
- External output voltage (passive output): 20 VDC
- Warm-up time: > 1 h

11.4.3 Maximum Measurement Error - Accuracies

Transmission error	< 0.1% / of the full-scale value of the measurement range (< 20 µA)
Temperature coefficient	< 0.01 %/K

11.4.4 Long-term drift

max. ±0.1%/year (from the full-scale value of the measurement range)

11.5 Environment

11.5.1 Important environmental conditions

Ambient temperature range	–40 ... 60 °C (–40 ... 140 °F)	Storage temperature	–40 ... 80 °C (–40 ... 176 °F)
Protection class	IP 20	Overvoltage category	II
Degree of contamination	2	Relative humidity	5 ... 95%
Operating altitude	≤ 2,000 m (6,562 ft)	Insulation class	Class II

11.5.2 Maximum temperature change rate

0.5 °C/min, no condensation allowed

11.5.3 Shock and vibration resistance

Sinusoidal vibrations in accordance with IEC 60068-2-6

- 5 ... 13.2 Hz: 1 mm peak
- 13.2 ... 100 Hz: 0.7 g peak

11.5.4 Electromagnetic Compatibility (EMC)

Electromagnetic compatibility in accordance with all relevant requirements of the IEC/EN 61326 series and the NAMUR EMC recommendation (NE21). Details can be found in the Declaration of Conformity.

- Maximum measurement deviation < 1% of the full-scale value

- Severe, pulsed EMC interference can cause brief (< 1 s) deviations in the output signal ($\geq \pm 1\%$)
- Immunity according to the IEC/EN 61326 series, industrial environment requirements
- Emission in accordance with the IEC/EN 61326 series (CISPR 11), Group 1, Class A

This device is not intended for use in residential areas and cannot guarantee adequate protection of radio reception in such environments.

11.6 Physical Design

11.6.1 Weight

Unit with terminal blocks (figures rounded up): approx. 135 g (4.76 oz)

11.6.2 Color

Light gray

11.6.3 Materials

All materials used are RoHS-compliant.

Housing: Polycarbonate (PC); Flammability rating per UL94: V-0

11.7 Certificates and Approvals

Certificates and approvals valid for the device: see information on the nameplate

12 Safety Instructions XA

ATEX, IECEx: II(1)G [Ex ia Ga] IIC

ATEX, IECEx: II(1)D [Ex ia Da] IIIC

Intrinsic Safety

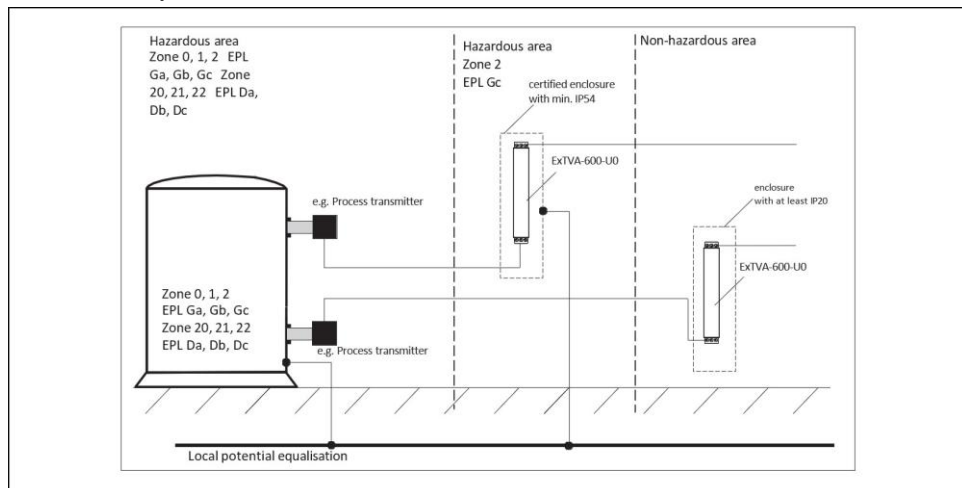


Image 12.1: grf00343_ins_extva600_6.jpg

- Follow the installation and safety instructions in the operating manual.
- Install in accordance with the manufacturer's instructions and applicable standards and regulations (e.g., EN/IEC 60079-14).
- The device is an associated piece of electrical equipment and must only be installed outside of potentially explosive atmospheres.
- The device must be installed in such a way that at least protection class IP 20 is achieved.
- When installing the device, ensure that a distance of at least 50 mm (zone radius) is maintained from the intrinsically safe connections.
- Tighten unused terminal blocks securely to maintain the required clearances between the intrinsically safe circuits/terminals.

Specific Operating Conditions

- When installing multiple devices side by side, ensure that the maximum side-wall temperature of each individual device does not exceed 80 °C (176 °F). If this cannot be guaranteed, mount the devices at a distance from one another or ensure adequate cooling.

- If the device is installed in Zone EPL Gc, a certified enclosure must be used that meets a protection rating of at least IP54 and complies with the requirements for enclosures specified in IEC/EN 60079-0.
- Do not open the certified enclosure while it is energized in a potentially explosive atmosphere (ensure that a protection rating of at least IP54 is maintained during operation).
- To obtain certification as electrical equipment for use in EPL Gc, the relevant tests must be performed in accordance with
- IEC 60079-0:2017, Sections 5.2 and 5.3, must be performed. A temperature class must be assigned based on the test results.

Category	Type of Protection (ATEX)
II(1)G	[Ex ia Ga] IIC
II(1)D	[Ex ia Da] IIIC

Type of protection (IECEx)
[Ex ia Ga] IIC
[Ex ia Da] IIIC

Ambient temperature: -40 ... +60 °C

Electrical Specifications			
Terminals 1.1 (L/+), 1.2 (N/-)		U = 24 to 230 V AC/DC (-20%/+10%) 50/60 Hz Um = 250 V	
Output circuit: Terminals 3.1 (+), 3.2 (-)		U = 30 V DC I = 0/4-20 mA, Um = 30 V	
Input circuit: 2-wire connection (active) Terminals 4.1 (+), 4.2 (-)		Uo ≤ 27.3 V DC Io ≤ 87.6 mA Po = 597 mW Ci = negligibly small Li = negligibly small	
Maximum connection values Individual values:	Ex ia IIC Ex ia IIB Ex ia IIA	Lo = 5.2 mH Lo = 20.8 mH Lo = 44.8 mH	Co = 88 nF Co = 683 nF Co = 2280 nF

Combined Lo/Co values:	Ex ia IIC	1.3 mH/0.05 μ F 1 mH/0.052 μ F 0.5 mH/0.065 μ F
	Ex ia IIB	26 mH/0.39 μ F 2 mH/0.44 μ F 1 mH/0.53 μ F 0.5 mH/0.64 μ F 0.2 mH/0.683 μ F
	Ex ia IIA	49 mH/1.3 μ F 20 mH/1.6 μ F 1 mH/1.8 μ F; 0.5 mH/2.2 μ F 0.2 mH/2.28 μ F
4-wire connection (passive) Pins 4.2 (+), 4.3 (-)		$U_o \leq 27.3$ V DC $I_o \leq 10$ mA $P_o = 68$ mW $C_i =$ negligibly small $L_i =$ negligibly small
Maximum connection values	Ex ia IIC	100 mH/0.065 μ F; 2 mH/0.072 μ F; 1 mH/0.081 μ F; 0.5 mH/0.088 μ F
Combined values Lo/Co:	Ex ia IIB	100 mH/0.48 μ F; 2 mH/0.52 μ F; 1 mH/0.59 μ F; 0.5 mH/0.683 μ F
	Ex ia IIA	100 mH/1.7 μ F; 1 mH/1.9 μ F; 0.5 mH/2.28 μ F
4-wire connection (passive) Terminals 4.2 (+), 4.3 (-)		$U_i \leq 30$ V DC $I_i =$ not applicable if U_i is maintained $P_i =$ not applicable if U_i is maintained $C_i =$ negligibly small $L_i =$ negligibly small

13 Revision

Version	Changes
UMN07.26	Initial release

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