



WG 21

For powering intrinsically safe 2-wire transmitters and SMART transmitters.



The Advantages

The WG 21 provides protective separation and high isolation between the input, output, and power supply.

The Technology

The high supply voltage, the good hazardous-area ratings, and the broad-range power supply allow for universal use. Cables up to 1400 m in length can be used without any problems.

Thanks to a new transformer-based transmission technique, the WG 21 achieves an extraordinarily high transmission accuracy for hazardous-area applications.

The encapsulation provides maximum operating safety, long-term stability and disruptive strength even under extreme ambient conditions.

The Task

The WG 21 repeater power supply is used to supply power to intrinsically safe 2-wire transmitters. It supplies the transmitter with power and transmits the measurement signal to the output with galvanic isolation and high accuracy.

In addition to the analog signal, the WG 21 also optionally transmits data protocols for SMART transmitters (HART). It allows for bidirectional communication between the field device from every point of the wiring.

WG 21

Facts and Features

- **SMART transmission**
(Optional) Bidirectional point-to-point transmission of digital data according to the HART specification
- **High supply voltage and good hazardous area ratings**
Universal use
- **Broad-range power supply**
Just 2 versions for all mains voltages

- **Protective separation according to EN 61140**
Protection of maintenance staff and subsequent devices against excessively high voltages
- **3-port isolation**
Protection against incorrect measurements or damage to the equipment due to parasitic voltages
- **High transmission accuracy**
Exact transmission of measured values

- **Explosion protection according to ATEX**
Easy use in hazardous areas
- **22.5 mm modular housing**
Straightforward installation due to compact design
- **5-year warranty**





Product Line

Devices

WG 21

Order no.

WG 21 A7

Power supply

90 ... 253 V AC

24 V AC/DC

Order no.

336

Options (for WG 21 A7 only)

Transmission of data protocols for SMART transmitters (HART)

Order no.

470

Specifications

Input data

Current loop

Intrinsically safe supply voltage ≥ 18 V, constant for 0 ... 22 mA, floating, current limited to approx. 30 mA; residual ripple 10 mV

Output data

Output

4 ... 20 mA¹⁾

Load

≤ 13 V

Offset

< 20 μ A

Residual ripple at output

< 10 mV

Transmission behavior

Transmission error

0.2 % meas. val.

Response time T_{90}

< 10 ms

Temperature coefficient

< 0.5 μ A/K +0.005 %/K meas. val. (average TC), (reference temperature 23 °C)

Communication
(Option 470)

Bidirectional transmission of FSK signals between output and current loop according to HART specification

Power supply

Power supply

90 ... 253 V AC, 48 ... 62 Hz, approx. 3 VA

Opt. 336:

24 V AC/DC AC: -15 % $+10$ %, 48 ... 500 Hz, approx. 3 VA
DC: -15 % $+20$ %, approx. 2 W

WG 21

Specifications (continued)

Isolation

Galvanic isolation	3-port isolation between input, output, and power supply
Test voltage	4 kV AC (current loop against output and power supply) 3 kV AC (power supply against output)
Working voltages (basic insulation)	1000 V AC/DC across current loop and output / power supply, 600 V AC/DC across output and power supply with overvoltage category II and pollution degree 2 according to EN 61010-1 For applications with high working voltages, take measures to prevent accidental contact and make sure that there is sufficient distance or insulation between adjacent devices. Allowable working voltage for other overvoltage categories and pollution degrees on request. The maximum working voltage for use in hazardous areas is 250 V.
Protection against electric shock	Protective separation to EN 61140 by reinforced insulation according to EN 61010-1. 600 V AC/DC working voltage with overvoltage category II and pollution degree 2, 300 V AC/DC across current loop and output / power supply, across output and power supply For applications with high working voltages, take measures to prevent accidental contact and make sure that there is sufficient distance or insulation between adjacent devices.

Standards and approvals

Explosion protection	II (1) G [EEx ia] IIC PTB 01 ATEX 2059, intrinsically safe current loop See certificates of conformity for further specifications
EMC ²⁾	EN 61326-1, NAMUR NE 21
RoHS conformity	According to directive 2011/65/EU

Further data

Ambient temperature	Operation: -10 ... +60 °C Transport and storage: -30 ... +80 °C
Ambient conditions	Indoor use ³⁾ Relative humidity 5 ... 95 %, no condensation; max. altitude 2000 m (air pressure: 790 ... 1060 hPa) ⁴⁾
Design	Modular housing, 22.5 mm wide, screw terminals; see dimension drawings for further measurements
Tightening torque	0.6 Nm
Ingress protection	Housing: IP 40, terminals: IP 20
Mounting	With snap-on mounting for 35 mm DIN rail according to EN 60715
Connection	Captive terminal screws M 3 x 8 ; box-type terminals with self-raising wire protection, max. conductor cross section: 1 x 4 mm ² solid 1 x 2.5 mm ² stranded with ferrule 2 x 1.5 mm ² stranded with ferrule Only trained and qualified personnel may perform installation, commissioning, and maintenance!
Weight	Approx. 250 g

¹⁾ Linear transmission from 3.6 ... 22 mA

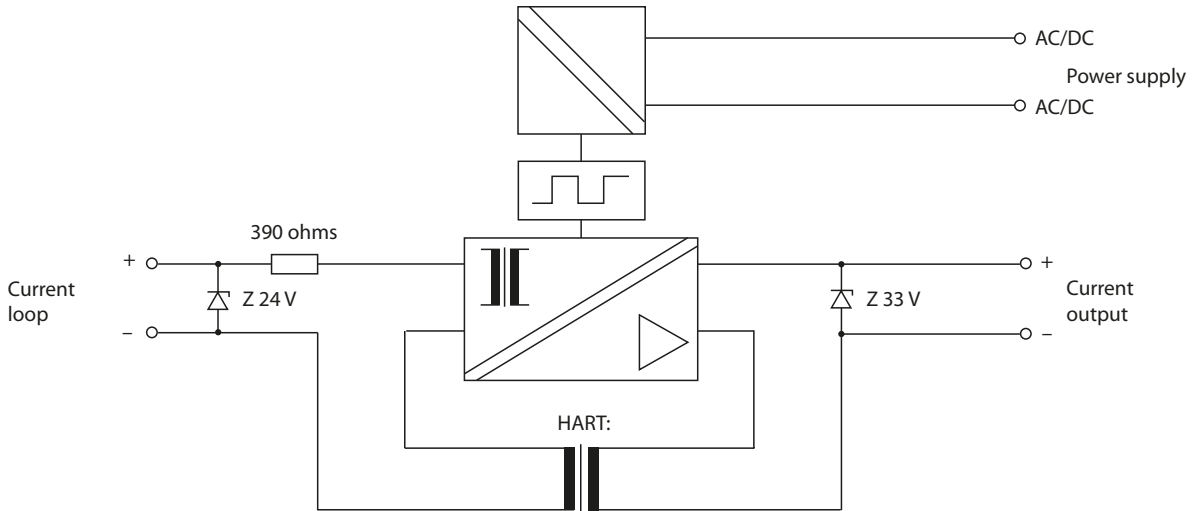
²⁾ Low transmission errors possible while there is interference

³⁾ Closed, weather protected operating areas (stationary operation), water and wind-driven precipitation (rain, snow, hail, etc.) excluded

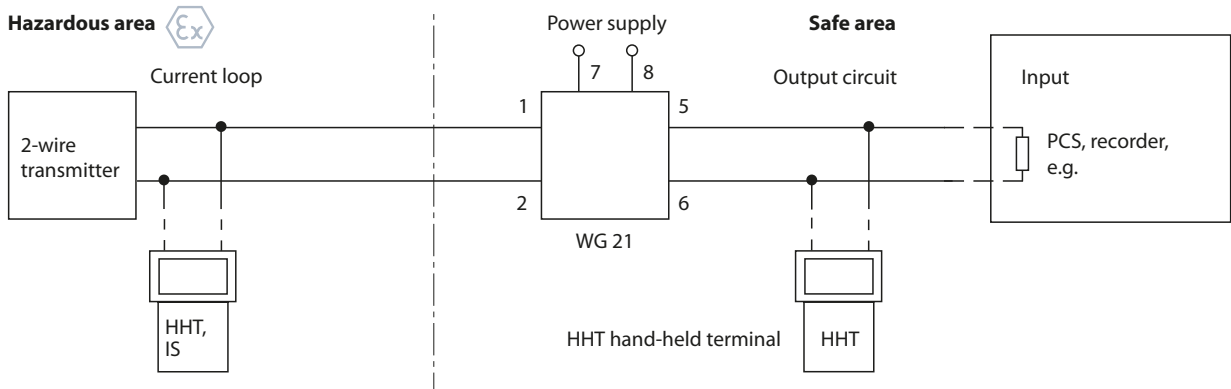
⁴⁾ Lower air pressure reduces the allowable working voltages.



Block Diagram



Typical Application



HART communication between transmitter and HHT on the intrinsically safe current loop.

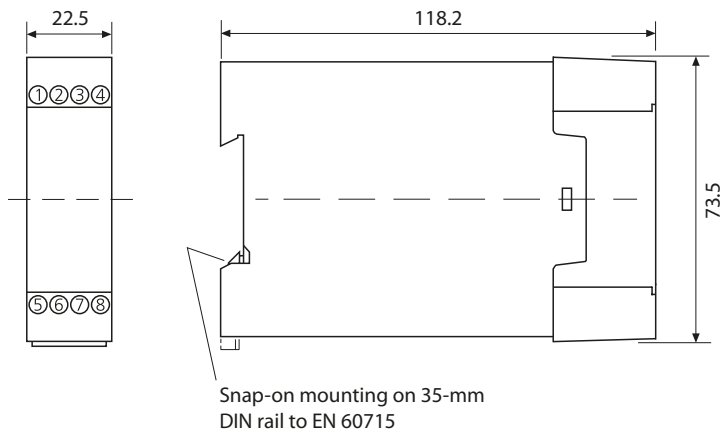
The communication signals are also transmitted to the non-intrinsically safe output circuit. A HART resistor of 390 ohms is integrated in the WG 21.

HART communication between the transmitter and PCS, HHT on the non-intrinsically safe output circuit.

The communication signals are transmitted bidirectionally through the WG 21. A minimum load resistor of 230 ohms is required and must be installed if necessary.

WG 21

Dimension Drawing and Terminal Assignments



Terminal assignments

- 1 Current loop +
- 2 Current loop –
- 5 Output +
- 6 Output –
- 7 Power supply AC/DC
- 8 Power supply AC/DC

Captive terminal screws M 3 x 8
Box-type terminals with
self-raising wire protection,
max. conductor cross section:
1 x 4 mm² solid
1 x 2.5 mm² stranded with ferrule
2 x 1.5 mm² stranded with ferrule

Only trained and qualified personnel may
perform installation, commissioning, and
maintenance!