

Repeater power supply Type series WG21



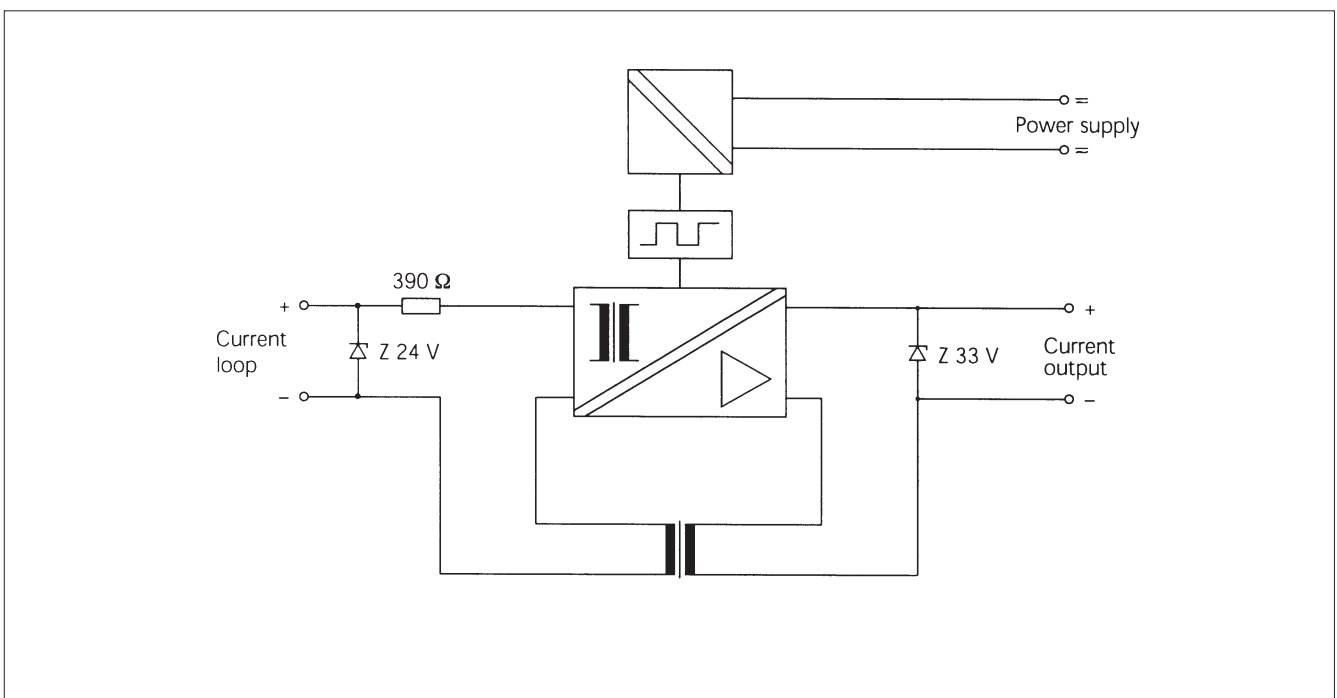
Features

- Compact housing for snap-on rail mounting (22.5 mm wide)
- 3-port isolation
- High transmission accuracy
- Protective separation to VDE 0100 Part 410
- Extended-range supply
- Ex-protection: II(1)G [Ex ia] IIC
- High supply voltage and favorable hazardous-area specifications
- SMART-transmission (HART, optional)

Application

The WG 21 Repeater Power Supply feeds intrinsically safe 2-wire transmitters. It powers the transmitter and delivers the measured signal galvanically isolated and at high accuracy to the output. Optionally the WG 21 also transmits data protocols for SMART transmitters (HART®) besides the analog signal. It allows bidirectional communication with a field unit from each point of the cabling. The WG 21 provides protective separation and high insulation between input, output and power supply. High supply voltage, favorable hazardous-area specifications and the new broad range mains adapter allow for universal applications. Long leads of 1400 m are no problem. Innovative transformer transmission technique provides transmission accuracy which is extraordinary high for hazardous area applications. New vacuum encapsulation technology offers optimum reliability, long-term stability and disruptive strength even under extreme ambient conditions.

Circuit diagram



Techn. Data

Construction

Compact housing A7, polycarbonate, with snap-on mounting for 35 mm top-hat rail to EN 50022,
 protection: IP 40,
 terminals: IP 20
 width: 22.5 mm

Current loop

Intrinsically safe power supply ≥ 18 V, constant for 0...22 mA, floating, current limited to 30 mA; ripple < 10 mV_{pp}

Output

4 ... 20 mA
 linear transmission from 3.6 to 22 mA

Load

≤ 13 V

Output ripple

< 10 mV_{pp}

Transmission error (at output)

$< 20 \mu\text{A} + 2 \cdot 10^{-3}$ of meas. value

Temperature coefficient (at output)

$< 0.5 \mu\text{A/K} + 50 \text{ ppm/K}$ of meas. value (average TC)

Response time

< 10 ms


Communication (Option 470)

bidirectional transmission of FSK signals between output and current loop according to HART® specifications

Chopper frequency

approx. 100 kHz

Explosion protection

 II(1)G [EEx ia] IIC
 Certificate of Conformity
 PTB 01 ATEX 2059
 current loop intrinsically safe

Test voltage

4 kV AC (current loop against output and power supply)
 3 kV AC (power supply against output)

Protection against electrical shock

reinforced insulation to EN 61010-1 and protective separation to VDE 0100 Part 410 as defined in VDE 0106 Part 101

EMC

to EN 50081-1 and EN 50082-2

Ambient temperature

Operation $-10 \dots +60$ °C
 transport and storage $-30 \dots +80$ °C

Power Supply

90 ... 253 V AC, 48 ... 62 Hz, approx. 3 VA
 Opt. 336: 24 V AC /DC
 AC: -15% $+10 \%$, 48 to 500 Hz, approx. 3 VA
 DC: -15% $+20 \%$, approx. 2 W

Weight

approx. 250 g

Permissible working voltages

	Overvoltage category / pollution degree	Current loop against output and power supply	Output against power supply
for basis insulation to EN 61010-1 or DIN VDE 0110 Part 1	II / degree 2	1 kV \cong ; 2,2 kV ⁻¹ ; 3,1 kV ⁻¹	600 V \cong
	II / degree 3	630 V \cong	300 V \cong
	III / degree 3	600 V \cong	300 V \cong
reinforced insulation to EN 61 010-1 and protective separation to VDE 0100 Part 410 as defined in VDE 0106 Part 101	II / degree 2	600 V \cong	300 V \cong
	III / degree 2	300 V \cong	150 V \cong

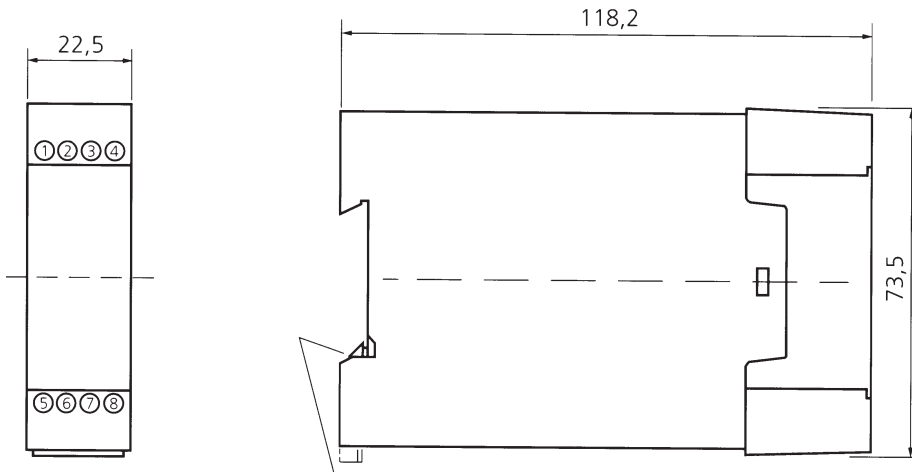
¹⁾ for circuits type 1 to EN 61 010-1, Table D.13

For applications with high working voltages take measures to prevent accidental contact and make sure that there is sufficient distance to adjacent instruments or sufficient insulation between them.

Permissible working voltages for other overvoltage categories and pollution degrees on request.

Max. permissible working voltage for application in hazardous area: 250 V

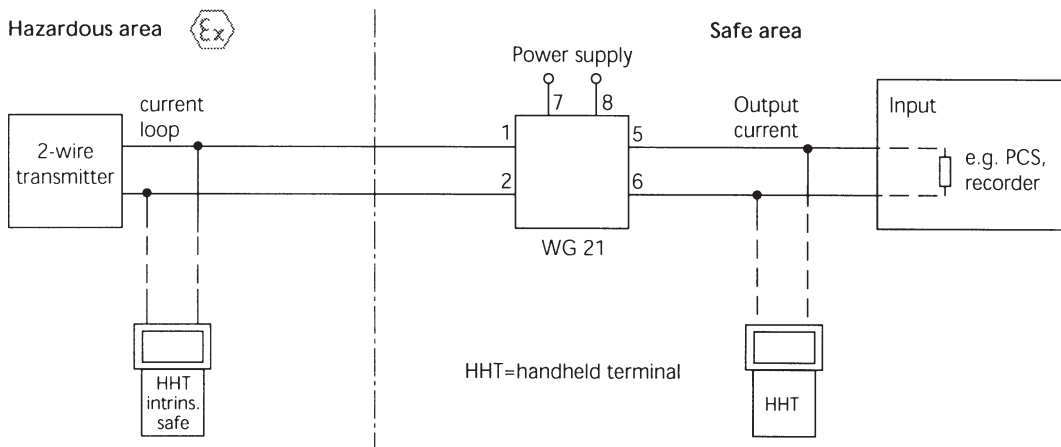
Dimension drawings and terminal assignment



- | | |
|------------------|---|
| 1 current loop + | snap-on mounting on 35 mm top-hat rail to EN 50022 |
| 2 current loop - | |
| 5 output + | Captive terminal screws M3x8 |
| 6 input - | |
| 7 power supply - | Box terminals with self-releasing wire protection, max. conductor size each |
| 8 power supply - | |
| | |

Installation, commissioning and maintenance may only be performed by electricians!

Typical applications



HART communication between transmitter and HHT on the intrinsically safe input.

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


The signals are also transmitted to the not-intrinsically safe output. A HART resistor of 390 Ω is integrated.

The WG 21 transmits the communication signals in both directions. A minimum load resistance of 230 W is required. (If not provided, a corresponding resistor must be inserted.)

Order Details - please give additional specifications for models not listed-

Repeater power supply WG 21		WG21A7
options		
power supply	· 24 V AC/DC	336
transmission of data protocols for SMART transmitters (HART)		470
order code (example):	WG21A7	

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Braunschweig und Berlin

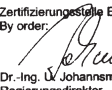
(1) **EC-TYPE-EXAMINATION CERTIFICATE**
(Translation)


(2) Equipment and Protective Systems Intended for Use in Potentially Explosive Atmospheres - **Directive 94/9/EC**

(3) EC-type-examination Certificate Number:
PTB 01 ATEX 2059



(4) Equipment: Repeater power supply, type WG 21 A7 Opt. ...
(5) Manufacturer: Knick Elektronische Meßgeräte GmbH & Co.
(6) Address: Beuckestraße 22, 14163 Berlin, Deutschland
(7) This equipment and any acceptable variation thereto are specified in the schedule to this certificate and the documents therein referred to.
(8) The Physikalisch-Technische Bundesanstalt, notified body No. 0102 in accordance with Article 9 of the Council Directive 94/9/EC of 23 March 1994, certifies that this equipment has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of equipment and protective systems intended for use in potentially explosive atmospheres, given in Annex II to the Directive.
The examination and test results are recorded in the confidential report PTB Ex 01-21018.
(9) Compliance with the Essential Health and Safety Requirements has been assured by compliance with:
EN 50014:1997 + A1 + A2 **EN 50020:1994**
(10) If the sign "X" is placed after the certificate number, it indicates that the equipment is subject to special conditions for safe use specified in the schedule to this certificate.
(11) This EC-type-examination Certificate relates only to the design and construction of the specified equipment in accordance with Directive 94/9/EC. Further requirements of this Directive apply to the manufacture and supply of this equipment.
(12) The marking of the equipment shall include the following:
Ex II (1) G [EEEx ia] IIC


Zertifizierungsgesellschaft Explosionsschutz Braunschweig, July 19, 2001
By order: 
Dr.-Ing. U. Johannsmeyer
Regierungsdirektor



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EC-type-examination Certificates without signature and official stamp shall not be valid. The certificates may be circulated only without alteration. Extracts or alterations are subject to approval by the Physikalisch-Technische Bundesanstalt. In case of dispute, the German text shall prevail.
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(13) **SCHEDULE**

(14) **EC-TYPE-EXAMINATION CERTIFICATE PTB 01 ATEX 2059**

(15) Description of equipment

The repeater power supply, type WG 21 A7 Opt. ... is mainly used for the supply of intrinsically safe 2-wire measuring transducers and for the transmission of a measuring current into the electrically isolated output circuit. Optionally data protocols for SMART-transmitters are transmitted bi-directionally between the supply measuring circuit and the output circuit.

The apparatus will be installed outside the hazardous area.
The maximum permissible ambient temperature is 60 °C.

Electrical data

Auxiliary power circuit 90 ... 253 V AC, approx. 5 VA
(terminals 7, 8)
24 V AC -15 % +10 %, approx. 3.5 VA
24 V DC -15 % +20 %, approx. 2.5 W
U_n = 253 V

Supply measuring circuit type of protection Intrinsic Safety EEx ia IIC
(terminals 1, 2) resp. EEx ib IIC

Maximum values:
U₀ = 23.1 V
I₀ = 82 mA
P₀ = 643 mW
R_i = 386 Ω

trapezoidal characteristic
C_i negligibly low
L negligibly low


The correlation between type of protection and maximum permissible values for the external capacitances and inductances is shown in the following table:

	EEx ia IIC	EEx ia IIB	EEx ia IIB
C ₀	87 nF	300 nF	200 nF
L ₀	0.5 mH	1 mH	5 mH

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SCHEDULE TO EC-TYPE-EXAMINATION CERTIFICATE PTB 01 ATEX 2059

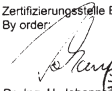
Output circuit (terminals 5,6) I = 0 - 20 mA
U = 13 V
U_n = 250 V AC


The intrinsically safe supply measuring circuit is safely electrically isolated from the other non-intrinsically safe circuits up to a peak value of the nominal voltage of 375 V.

(16) Test report PTB Ex 01-21018

(17) Special conditions for safe use
none

(18) Essential health and safety requirements
will be met by cited standards

Zertifizierungsgesellschaft Explosionsschutz Braunschweig, July 19, 2001
By order: 
Dr.-Ing. U. Johannsmeyer
Regierungsdirektor



sheet 3/3

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Safety and installation information

Be sure to read and observe the following instructions!

Safety information
Whenever it is likely that the protection has been impaired, the device shall be made inoperative and secured against unintended operation.
The protection is likely to be impaired if, for example:

- the device shows visible damage
- the device fails to perform the intended measurements
- after prolonged storage at temperatures above 80 °C
- after severe transport stresses

Before recommissioning the device, a professional routine test in accordance with EN 61010-1 must be performed. This test should be carried out at our factory.

Installation and commissioning
The Model WG 21 A7 is an associated equipment for operation outside hazardous locations. The intrinsically safe current loop may be led into hazardous locations. Only certified intrinsically safe circuits may be connected to the current loop. Before commissioning it must be established that the intrinsic safety is maintained when connecting the current loop to other equipment, including lines.

Be sure to observe the EC-Type-Examination Certificate and the regulations of EN 60079-14: 1996 and the following.

Assembly / dismantling, installation, operation and maintenance may only be carried out by qualified personnel as defined by the automation industry in compliance with the applicable regulations and the operating instructions. Be sure to observe the technical specifications and input ratings.

Proper use
The Model WG 21 A7 is used for the supply of intrinsically safe 2-wire transmitters.