



IECEx Certificate of Conformity

INTERNATIONAL ELECTROTECHNICAL COMMISSION IEC Certification Scheme for Explosive Atmospheres

for rules and details of the IECEx Scheme visit www.iecex.com

Certificate No.: IECEx BVS 09.0056X issue No.:1
Status: Current
Certificate history:
Issue No. 1 (2012-7-24)
Issue No. 0 (2009-11-12)

Date of Issue: 2012-07-24 Page 1 of 4

Applicant: **Grünwald GmbH**
Oberallener Weg 7
59069 Hamm
Germany

Electrical Apparatus: **Measuring Gauge type SMALL * / ** / ** / *** ** / ** / *** / *** / ** / *** / ** / ***
Optional accessory:

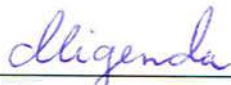
Type of Protection: **Equipment protection by intrinsic safety "i", Equipment with equipment protection level (EPL) Ga**

Marking: Ex ia IIC T4 / T6 Ga/Gb or
Ex ia IIC T4 / T6 Gb or
Ex ia / ib I Ma / Mb or
Ex ia I Ma

Approved for issue on behalf of the IECEx Certification Body: P. Migenda

Position: Deputy Head of Certification Body

Signature:
(for printed version)



2012-07-24

Date:

1. This certificate and schedule may only be reproduced in full.
2. This certificate is not transferable and remains the property of the issuing body.
3. The Status and authenticity of this certificate may be verified by visiting the [Official IECEx Website](http://www.iecex.com).

Certificate issued by:

DEKRA EXAM GmbH
Dinnendahlstrasse 9
44809 Bochum
Germany

 **DEKRA**
DEKRA EXAM GmbH



IECEX Certificate of Conformity

Certificate No.: IECEx BVS 09.0056X

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Manufacturer: **Grünewald GmbH**
Oberallener Weg 7
59069 Hamm
Germany

Manufacturing location(s):

This certificate is issued as verification that a sample(s), representative of production, was assessed and tested and found to comply with the IEC Standard list below and that the manufacturer's quality system, relating to the Ex products covered by this certificate, was assessed and found to comply with the IECEx Quality system requirements. This certificate is granted subject to the conditions as set out in IECEx Scheme Rules, IECEx 02 and Operational Documents as amended.

STANDARDS:

The electrical apparatus and any acceptable variations to it specified in the schedule of this certificate and the identified documents, was found to comply with the following standards:

IEC 60079-0 : 2011 Edition: 6.0	Explosive atmospheres - Part 0: General requirements
IEC 60079-11 : 2011-06 Edition: 6.0	Explosive atmospheres - Part 11: Equipment protection by intrinsic safety "i"
IEC 60079-26 : 2006 Edition: 2	Explosive atmospheres - Part 26: Equipment with equipment protection level (EPL) Ga

*This Certificate **does not** indicate compliance with electrical safety and performance requirements other than those expressly included in the Standards listed above.*

TEST & ASSESSMENT REPORTS:

A sample(s) of the equipment listed has successfully met the examination and test requirements as recorded in

Test Report:
[DE/BVS/ExTR09.0055/01](#)

Quality Assessment Report:

[DE/BVS/QAR08.0004/02](#)



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Schedule

EQUIPMENT:

Equipment and systems covered by this certificate are as follows:

General product information:

See Annex

Subject and type:

See Annex

Description:

See Annex

Ratings:

See Annex

CONDITIONS OF CERTIFICATION: YES as shown below:

Special conditions for safe use:

1. The installation of the sensor / the process connection of the Measuring Gauge in the wall to areas requiring EPL Ga equipment shall provide a degree of protection IP67 according to IEC 60529.
2. The installation of the sensor of the Measuring Gauge in the wall to areas requiring EPL Ga equipment shall be carried out in such a way, that the metallic sensor enclosure / the process connection is included in the local equipotential bonding / grounding.
3. Manufacturer's technical information related to use of the Measuring Gauge in contact with aggressive / corrosive media and to avoid any risk of mechanical impact shall be observed.



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DETAILS OF CERTIFICATE CHANGES (for issues 1 and above):

The Measuring Gauge type SMALL */**/**/*****/**/**/**/**/**/**/* is an intrinsically safe supplied apparatus providing different electronic designs for Group I and Group II application with regard to signal output interface. Some versions of the Measuring Gauge have been subjected to revision with regard to internal constructive details.



IECEX Ex TEST REPORT COVER

ExTR Reference Number..... :	DE/BVS/ExTR09.0055/01	
ExTR Free Reference Number :	DE/BVS/09/2181/N1	A 20120573
Compiled by + signature (ExTL).... :	Dipl.-Ing. Wilfried Schäfer	<i>W. Schäfer</i>
Reviewed by + signature (ExTL)... :	Dipl.-Ing. Günther Schumann	<i>G. Schumann</i>
Approved by + signature (ExCB)... :	Dr.-Ing. Franz Eickhoff	<i>F. Eickhoff</i>
Date of issue	2012-07-13	
Ex Certification Body (ExCB)	DEKRA EXAM GmbH	
Address	Dinnendahlstr. 9 44809 Bochum, Germany	
Ex Testing Laboratory (ExTL)	DEKRA EXAM GmbH	
Address	Dinnendahlstr. 9 44809 Bochum, Germany	
Applicant's name	Grünewald GmbH	
Address	Oberallener Weg 7, 59069 Hamm, Germany	
Standards..... :	IEC 60079-0:2011, Ed.6 IEC 60079-11:2011, Ed.6 IEC 60079-26:2006 Ed.2	
Test procedure	IECEX Scheme	
Test Report Form No. :	ExTR Cover_BVS	
TRF Originator..... :	DEKRA EXAM GmbH	
IECEX Test Report National Differences attached	:	(Yes / No)
<p>Instructions for Intended Use of Cover Sheet: This document is to be compiled and reviewed by the ExTL, with the ExCB giving the final approval, or compiled by the ExCB without the involvement of the ExTL. It is to serve as the sole cover for an ExTR package, which may be comprised of a single ExTR document or multiple ExTR documents. This ExTR Cover is to be completed and attached to the completed ExTR package.</p>		
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Test item description.....	: Measuring Gauge
Trademark.....	: 
Model/type reference.....	: SMALL * / ** / ** / *** ** / ** / *** / *** / ** / *** / ** / * / *
Manufacturer	: Grünewald GmbH
Address.....	: Oberallener Weg 7, 59069 Hamm, Germany
Code (e.g. Ex _ II_ T_).....	: Group I and II (details: see general description)
Rating.....	: See ratings below
<p>Copy of Marking Plate</p> <p>The measuring devices are marked with a printed sticker. The label is as follows:</p> <p>Company name: Grünewald GmbH</p> <p>Type designation: SMALL * / ** / ** / *** ** / ** / *** / *** / ** / *** / ** / * / * (Main Unit) SMALL P / N / T / TS / V (removable external sensor)</p> <p>Certificate no.: IECEx BVS xx.xxxx X</p> <p>Type of protection: see 'Ratings' for detailed allocation</p> <p>Ambient temperature: $-20\text{ °C} \leq T_a \leq 60\text{ °C} / 80\text{ °C} / 100\text{ °C}$</p> <p>Serial number: is coded and can be shown e.g. in a bar code</p> <p>Parameters (optional) $U_i = xx\text{ V} \quad I_i = yy\text{ mA} \quad P_i = zz\text{ mW})^2$</p> <p>The marking which is normally specified in the design standards for the electrical apparatus concerned.</p> <p>)² parameters according to the individual device</p>	
<p>Particulars: test item vs. test requirements</p> <p>Classification of installation and use..... : stationary</p> <p>Ingress protection</p> <p>Rated ambient temperature range (°C)</p>	
<p>General remarks:</p> <p>The Measuring Gauge type SMALL * / ** / ** / *** ** / ** / *** / *** / ** / *** / ** / * / * is an intrinsically safe supplied apparatus providing different electronic designs for Group I and Group II application with regard to signal output interface. Some versions of the Measuring Gauge have been subjected to revision with regard to internal constructive details. The revisions have been assessed in Annexes IEC 60079-0 and IEC 60079-11, issue 01 of this test report. Annex IEC 60079-26 of issue 00 remains valid without change.</p> <p>Special conditions for safe use:</p> <ol style="list-style-type: none"> 1. The installation of the sensor / the process connection of the Measuring Gauge in the wall to areas requiring EPL Ga equipment shall provide a degree of protection IP67 according to IEC 60529. 2. The installation of the sensor of the Measuring Gauge in the wall to areas requiring EPL Ga equipment shall be carried out in such a way, that the metallic sensor enclosure / the process connection is included in the local equipotential bonding / grounding. 3. Manufacturer's technical information related to use of the Measuring Gauge in contact with aggressive / corrosive media and to avoid any risk of mechanical impact shall be observed. 	

General product information:

Allocation of Ex marking to model		
Main Unit:	External sensor:	
	permanently connected	Removable
Ex ia IIC T4 / T6 Ga/Gb or	none	N / A
Ex ia IIC T4 / T6 Gb or	N / A	Ex ia IIC T4 / T6 Ga/Gb
Ex [ia Ma] ib I Mb or	none	Ex ia I Ma
Ex ia I Ma	none	Ex ia I Ma

Subject and type

in the subsequent extended type code tables, the Asterisk are replaced as follows

SMALL * / ** / ** / *** *** / ** / *** / *** / ** / *** / ** / * / *

a b c d e f g h i j k l m

a	b	c	d	e	f	g	h to m
Physical unit	Size	Rated voltage	Measuring range	Unit	Mechanical connection	Feature	
P Pressure	RG [enclosure round size]	12 [12V DC] E12 [12V DC External]	*** [*-***]	mb [mbar] b [bar] * [***]	G1 [R¼" AG] G2 [R½" AG] G3 [R¾" AG] ** [special] O [plug- O DN20] F [flange]	-- [none]	see subsequent table
	IL [enclosure size 'in-line']	16 [12V DC] E16 [12V DC External] 24 [24V DC] 2-wire version only	*** [*-***]	mb [mbar] b [bar] * [***]		-- [none]	

a	b	c to g	h	i	j	k	l	m
Physical unit) ¹	Size		Electrical connection	Display	Sensor arrangement	Interface		
						1	2	3
P Pressure	RG [enclosure round size]	see table above	B [PROMOS BN 41...AT] H [HARTING] J [JOWO] S [SOURIAU] K [KROTT] ** [special **] L...m [cable with length in m]	A [display provided] KA [no display]	KG [compact-device] AS...m [external sensor; cable length in m]	S10 [0 - 20 mA] S14 [4 - 20 mA] SI... [*... mA] S0 [0 - 20 mA] S4 [4 - 20 mA] S... [*... mA] U... [*... V]	F*) ² [5 - 15 Hz]	C [CAN] H [HART] 2-wire version only P [PROFIBUS]
	IL [enclosure size 'in-line']			-- [no display with 'in-line' size]	-- [no external sensor with 'in-line' size]			

SMALL * / ** / ** / *** *** / ** / *** / *** / ** / *** / ** / * / *

a b c d e f g h i j k l m

a	b	c	d	e	f	g	h to m
Physical unit	Size	Rated voltage	Measuring range	Unit	Mechanical connection	Feature	
N Level	RG [enclosure round size]	12 [12V DC] E12 [12V DC Extern]	*** [*..***]	mm [mmWs] * [***]	G1 [R¼" AG] G2 [R½" AG] G3 [R¾" AG] ** [special] O [plug- O DN20] F [flange]	-- [none]	see subsequent table
	IL [enclosure size 'in-line']	16 [12V DC] E16 [12V DC External] 24 [24V DC] 2-wire version only					

a	b	c to g	h	i	j	k	l	m
Physical unit) ¹	Size		Electrical connection	Display	Sensor arrangement	Interface		
						1	2	3
N Level	RG [enclosure round size]	see table above	B [PROMOS BN 41...AT] H [HARTING] J [JOWO] S [SOURIAU] K [KROTT] ** [special **] L...m [cable with length in m]	A [display provided] KA [no display]	KG [compact-device] AS...m [external sensor; cable length in m]	S10 [0 - 20 mA] S14 [4 - 20 mA] S1... [*..** mA] S0 [0 - 20mA] S4 [4 - 20mA] S... [*..** mA] U... [*..**V]	F*) ² [5 - 15 Hz]	C [CAN] H [HART] 2-wire version only P [PROFIBUS]
	IL [enclosure size 'in-line']		-- [no display with 'in-line' size]	-- [no external sensor with 'in-line' size]				

SMALL * / ** / ** / *** ** / ** / *** / *** / ** / *** / ** / * / *

a b c d e f g h i j k l m

a	b	c	d	e	f	g	h to m
Physical unit	Size	Rated voltage	Measuring range	Unit	Mechanical connection	Feature	see subsequent table
T Temperature	RG [enclosure round size]	12 [12V DC] E12 [12V DC Extern]	*** [*..***]	C [°C] * [***]	G1 [R¼" AG] G2 [R½" AG] G3 [R¾" AG] ** [special] O [plug- O DN20] F [flange]	probe length *** [*** mm] Max. 1000 mm	
TS Temperature (special mechanical design)	IL [enclosure size 'in-line']	16 [12V DC] E16 [12V DC External] 24 [24V DC] 2-wire version only					

a	b	c to g	h	i	j	k	l	m
Physical unit ¹	Size	see table above	Electrical connection	Display	Sensor arrangement	Interface		
T Temperature	RG [enclosure round size]		B [PROMOS BN 41...AT] H [HARTING] J [JOWO] S [SOURIAU] K [KROTT] ** [special **] L...m [cable with length in m]	A [display provided] KA [no display]	KG [compact-device] AS...m [external sensor; cable length in m]	1	2	3
TS Temperature (special mechanical design)	IL [enclosure size 'in-line']		-- [no display with 'in-line' size]	-- [no external sensor with 'in-line' size]	SI0 [0 - 20 mA] SI4 [4 - 20 mA] SI...- [*..** mA] S0 [0 - 20 mA] S4 [4 - 20 mA] S...- [*..** mA] U...- [*..**V]	F*)² [5 - 15 Hz]	C [CAN] H [HART] 2-wire version only P [PROFIBUS]	

SMALL * / ** / ** / *** ** / ** / *** / *** / ** / *** / ** / * / *

a b c d e f g h i j k l m

a	b	c	d	e	f	g	h to m
Physical unit	Size	Rated voltage	Measuring range	Unit	Mechanical connection	Feature	
V Volume	RG [enclosure round size]	12 [12V DC] E12 [12V DC Extern]	*** [*-***]	L [l/min] cbm [m ³ /h] rpm [l/min] * [***]	G1 [R¼" AG] G2 [R½" AG] G3 [R¾" AG] ** [special] O [plug- O DN20] F [flange]	-- [none]	see subsequent table
	IL [enclosure size 'in-line']	16 [12V DC] E16 [12V DC External] 24 [24V DC] 2-wire version only					

a	b	c to g	h	i	j	k	l	m
Physical unit) ¹	Size		Electrical connection	Display	Sensor arrangement	Interface		
						1	2	3
V Volume	RG [enclosure round size]	see table above	B [PROMOS BN 41...AT] H [HARTING] J [JOWO] S [SOURIAU] K [KROTT] ** [special **] L...m [cable with length in m]	A [display provided] KA [no display] -- [no display with 'in-line' size]	KG [compact-device] AS...m [external sensor; cable length in m] -- [no external sensor with 'in-line' size]	SI0 [0 - 20 mA] SI4 [4 - 20 mA] SI...- [*-** mA] S0 [0 - 20 mA] S4 [4 - 20 mA] S...- [*-** mA] U...- [*-** V]	F*)² [5 - 15 Hz]	C [CAN] H [HART] 2-wire version only P [PROFIBUS]
	IL [enclosure size 'in-line']							

Remarks:

)¹ in case of Measuring Gauge type SMALL * / RG / ** / providing electronic assembly for more than one measured physical unit, the physical unit code letters are listed subsequently.

Empty sections of the above type code are closed up by moving the other elements to the left.

)² optional variations of interface 2 (frequency signal output):

- F, F1, F2 specify different resistor / diode shunt circuitry of the opto-isolator output
- F* (other than F1, F2) specify different frequency range
- FA, F1A, F2A, F*A: same as F, F1, F2, F*, but active output, Collector of opto-isolator transistor connected to supply voltage U_i

Description

General:

Measuring Gauge of type series SMALL * / ** / ** / *** ** / ** / *** / *** / ** / *** / ** / * / * provide measuring of pressure, temperature and level of liquid- or gaseous media in areas requiring EPL Ga/Gb, Gb, Ma and/or Mb equipment.

With reference to the mechanical model of the measuring gauge, PCB fitted with electronic components are located in a metal or plastics enclosure (surface resistance $\leq 10^9 \Omega$) of round size or 'in-line' size.

Type SMALL * / RG / ** / *** ** / ** / *** / *** / ** / *** / ** / * / *

Optional features of the models providing round size enclosure:

- cover fitted with inspection glass above the display
- integrated or external pressure- level- , temperature- or pulse sensor
- cable glands and/or connectors for the IS circuits (power supply, voltage- / current outputs, opto-isolator outputs, and/or external sensors.
- permanently connected cable (length up to 200 m) between main electronics and external sensor
- removable cable (length up to 200 m) between main electronics and external sensor
- electronic assembly for more than one measured physical unit.

The round size enclosure is designated for installation in areas requiring EPL Gb or EPL Ma, EPL Mb.

The sensor compartment of the models providing round size enclosure or the external sensors respectively are designated for mounting in the boundary wall, separating areas requiring EPL Ga or EPL Gb equipment.

The round size enclosure may be supported with one or more of the following PCB and associated assemblies:

1.) for Group I and Group II application:

- type GWR_101-1; 2-wire 4 - 20 mA current loop; rated supply voltage DC 24 V; with or without display-pcb type Display GWR_101/1, optionally extended with:
- type GWR_101-1-HART; (HART assembly for PCB type GWR_101-1)

2.) for Group I application:

- type GWR_100-1; 3-wire supply- and (5-15 Hz, current or voltage) signal circuit; rated supply voltage DC 12 V or DC 16 V with or without display-pcb type Display GWR_100/1, optionally extended with
- type GWR_IMP*; (pulse counter pickup assembly for PCB type GWR_100-1) and/or
- type GWR_100-1-CAN; (CAN-bus assembly for PCB type GWR_100-1) exclusive-or
- type GWR_100-1-RS485; (RS485 assembly for PCB type GWR_100-1).

Type SMALL * / IL / ** / *** ** / ** / *** / *** / ** / *** / ** / * / *

The tubular enclosure of 'in-line' size may be supported with one of the following PCB and associated assemblies:

1.) for Group I and Group II application:

- type GWR_121-1; 2-wire 4 - 20 mA current loop; rated supply voltage DC 24 V, optionally extended with:
- type GWR_121-1-HART; (HART assembly for PCB type GWR_121-1)

2.) for Group I application:

- type GWR_120-1; 3-wire supply- and (5-15 Hz, current or voltage) signal circuit; rated supply voltage DC 12 V or DC 16 V optionally extended with
- type GWR_IMP*; (pulse counter pickup assembly for PCB type GWR_120-1) and / or
- type GWR_120-1-CAN; (CAN-bus assembly for PCB type GWR_120-1) exclusive-or
- type GWR_120-1-RS485; (RS485 assembly for PCB type GWR_120-1)

Front end and rear end are fitted with process connection of the integrated sensor or respectively with a connector / cable gland for the permanently connected cable.

The process connection of the 'in-line' enclosure is designated for mounting in the boundary wall, separating areas requiring EPL Ga or EPL Gb equipment.

Type SMALL * / RG / E12 / * ** / ** / *** / *** / F*)¹ / ***, **Type SMALL * / RG / E16 / *** ** / ** / *** / *** / F*)¹ / ***
Type SMALL * / IL / E12 / * ** / ** / *** / *** / F*)¹ / ***, **Type SMALL * / IL / E16 / *** ** / ** / *** / *** / F*)¹ / ***

Refers to all versions of round size / 'in line' size enclosures type SMALL * / ** / E1* / *** ** / ** / *** / *** F*)¹ / *: intrinsically safe Opto-isolator outputs providing safe galvanic separation from IS power supply and other circuits are allocated to:

- connectors, suitable to carry two different IS circuits, or
- special interconnection cable, suitable to carry two different IS circuits.

)¹ type FA, F*A excluded

Ratings:

1 Models designed to be connected to a Group I or Group II IS 2-wire 4 - 20 mA current loop

- Device marking: Ex ia I Ma, Ex ia IIC T4 Ga/Gb or Ex ia IIC T4 Gb
- Circuit Marking: Ex ia I and/or Ex ia IIC

Measuring Gauge		
type SMALL * / RG / 24 / *** ** / ** / *** / *** / ** / ***		
type SMALL * / RG / 24 / *** ** / ** / *** / *** / ** / *** / H		
type SMALL * / IL / 24 / *** ** / ** / *** / ***		
type SMALL * / IL / 24 / *** ** / ** / *** / *** / H		
	a b c d e f g h i j m	
Parameter	Supply- and signal circuit	
	h = B, H, J, S, K, **) ¹	h = L***m
Voltage U _i	DC 26.6 V	
Current I _i	100 mA	
Power P _i	750 mW	
effective internal capacitance C _i	negligible	N / A
effective internal inductance L _i	negligible	N / A
effective internal capacitance C _i (permanently connected cable)	N / A	185 pF/m
effective internal inductance L _i (permanently connected cable)	N / A	0.8 μH/m
Ambient temperature range	-50 °C ≤ T _a ≤ +80 °C (T4) -50 °C ≤ T _a ≤ +60 °C (T6)	
Remarks:		
- interfaces 1 and 2 ('k', 'l') not provided		
- integrated interface 3: 'm' = H for HART (optional)		
-) ¹ optional other suitable connectors as specified in manufacturer's documents		
- N / A = not applicable		

2 Models designed to be connected to a Group I 3-wire supply- and signal circuit providing (exclusive-or) current-, voltage- or frequency-signal output. The models may be extended optionally with CAN bus- or RS485- interface providing galvanic separating from all other circuits (see 'Ratings 4' for details)

2.1 Current signal

2.1.1 Output, marked with S0, S4, S...-

- Device marking: Ex ia I Ma
- Circuit Marking: Ex ia I

Measuring Gauge				
	a	b	c	d
type SMALL	*	/	RG / 1x /	*** ** / ** / *** / *** / ** / *** / S0 / *
type SMALL	*	/	IL / 1x /	*** ** / ** / *** / *** / S0 / *
type SMALL	*	/	RG / 1x /	*** ** / ** / *** / *** / ** / *** / S4 / *
type SMALL	*	/	IL / 1x /	*** ** / ** / *** / *** / S4 / *
type SMALL	*	/	RG / 1x /	*** ** / ** / *** / *** / ** / *** / S... / *
type SMALL	*	/	IL / 1x /	*** ** / ** / *** / *** / S... / *
	e	f	g	h
	i	j	k	m
Parameter	Supply circuit		Signal circuit	
	h = B, H, J, S, K, **) ¹	h = L***m	h = B, H, J, S, K, **) ¹	h = L***m
Voltage U _i	DC 14 V / DC 16.1 V		DC 14 V / DC 16.1 V	
Current I _i	3 A		10 mA	
Power P _i	--) ²		100 mW	
Voltage U _o	N / A		DC 14 V	
Current I _o	N / A		≤110 mA	
Power P _o	N / A		400 mW	
effective internal capacitance C _i	negligible		negligible	
effective internal inductance L _i	negligible		negligible	
effective internal capacitance C _i (permanently connected cable)	N / A	185 pF/m	N / A	185 pF/m
effective internal inductance L _i (permanently connected cable)	N / A	0.8 μH/m	N / A	0.8 μH/m
Ambient temperature range	-50 °C ≤ T _a ≤ +100 °C			
Remarks:				
<ul style="list-style-type: none"> - x = 2: 12 V version; - x = 6: 16 V version; - interface 2 ('I') not provided - interface 3 ('m'): optional extension - interface 'm' = C for CAN bus, exclusive or - interface 'm' = P for RS485 (Profibus) -)¹ optional other suitable connectors as specified in manufacturer's documents -)² any value or equal to the applied IS power supply - N / A = not applicable 				

2.1.2 Output, marked with SI0, SI4, SI...-

- Device marking: Ex ia I Ma
- Circuit Marking: Ex ia I

Measuring Gauge				
	type SMALL * / RG / 1x / *** ***/ **/ *** / ** / *** / SI0 / *			
	type SMALL * / IL / 1x / *** ***/ **/ *** / *** / SI0 / *			
	type SMALL * / RG / 1x / *** ***/ **/ *** / ** / *** / SI4 / *			
	type SMALL * / IL / 1x / *** ***/ **/ *** / *** / SI4 / *			
	type SMALL * / RG / 1x / *** ***/ **/ *** / ** / *** / SI...- / *			
	type SMALL * / IL / 1x / *** ***/ **/ *** / *** / SI...- / *			
	a	b	c	d
	e	f	g	h
	i	j	k	m
Parameter	Supply circuit		Signal circuit	
	h = B, H, J, S, K, **) ¹	h = L***m	h = B, H, J, S, K, **) ¹	h = L***m
Voltage U _i	DC 14 V / DC 16.1 V		DC 14 V / DC 16.1 V	
Current I _i	3 A		N / A	
Power P _i	--) ²		N / A	
Voltage U _o	N / A		DC 14 V	
Current I _o	N / A		110 mA	
Power P _o	N / A		400 mW	
effective internal capacitance C _i	negligible		negligible	
effective internal inductance L _i	negligible		negligible	
effective internal capacitance C _i (permanently connected cable)	N / A	185 pF/m	N / A	185 pF/m
effective internal inductance L _i (permanently connected cable)	N / A	0.8 μH/m	N / A	0.8 μH/m
Ambient temperature range	-50 °C ≤ T _a ≤ +100 °C			
Remarks:	<ul style="list-style-type: none"> - x = 2: 12 V version; - x = 6: 16 V version; - interface 2 ('I') not provided - interface 3 ('m'): optional extension - interface 'm' = C for CAN bus, exclusive or - interface 'm' = P for RS485 (Profibus) -)¹ optional other suitable connectors as specified in manufacturer's documents -)² any value or equal to the applied IS power supply - N / A = not applicable 			

2.2 Voltage signal

- Device marking: Ex ia I Ma
- Circuit Marking: Ex ia I

Measuring Gauge				
type SMALL * / RG / 1x / *** ** / ** / ** / ** / ** / ** / U... / *				
type SMALL * / IL / 1x / *** ** / ** / ** / ** / ** / U... / *				
a b c d e f g h i j k m				
Parameter	Supply circuit		Signal circuit	
	h = B, H, J, S, K, **)¹	h = L***m	h = B, H, J, S, K, **)¹	h = L***m
Voltage U _i	DC 14 V / DC 16.1 V		DC 14 V / DC 16.1 V	
Current I _i	3 A		10 mA	
Power P _i	--)²		100 mW	
Voltage U _o	N / A		DC -5 V ≤ U ≤ +12.7 V	
Current I _o	N / A		-5 mA ≤ I ≤ +12.7 mA	
Power P _o	N / A		60 mW	
effective internal capacitance C _i	negligible	N / A	negligible	negligible
effective internal inductance L _i	negligible	N / A	negligible	negligible
effective internal capacitance C _i (permanently connected cable)	N / A	185 pF/m	N / A	0.6 μF + 185 pF/m
effective internal inductance L _i (permanently connected cable)	N / A	0.8 μH/m	N / A	0.8 μH/m
Ambient temperature range	-50 °C ≤ T _a ≤ +100 °C			
Remarks: - x = 2: 12 V version; - x = 6: 16 V version; - interface 2 ('I') not provided - interface 3 ('m'): optional extension - interface 'm' = C for CAN bus, exclusive or - interface 'm' = P for RS485 (Profibus) -)¹ optional other suitable connectors as specified in manufacturer's documents -)² any value or equal to the applied IS power supply - N / A = not applicable				

2.3 5 - 15 Hz frequency signal

- Device marking: Ex ia I Ma
- Circuit Marking: Ex ia I

Measuring Gauge				
type SMALL * / RG / 1x / *** ** / ** / *** / *** / ** / *** / F* / *				
type SMALL * / IL / 1x / *** ** / ** / *** / *** / F* / *				
type SMALL * / RG / 1x / *** ** / ** / *** / *** / ** / *** / F*A / *				
type SMALL * / IL / 1x / *** ** / ** / *** / *** / F*A / *				
a b c d e f g h i j l m				
Parameter	Supply circuit		Signal circuit	
	h = B, H, J, S, K, **) ¹	h = L***m	h = B, H, J, S, K, **) ¹	h = L***m
Voltage U _i	DC 14 V / DC 16.1 V		DC 14 V / DC 16.1 V	
Current I _i	3 A		--) ²	
Power P _i	--) ²		--) ²	
Voltage U _o	N / A		N / A	
Current I _o	N / A		N / A	
Power P _o	N / A		N / A	
effective internal capacitance C _i	negligible		negligible	
effective internal inductance L _i	negligible		negligible	
effective internal capacitance C _i (permanently connected cable)	N / A	185 pF/m	N / A	185 pF/m
effective internal inductance L _i (permanently connected cable)	N / A	0.8 μH/m	N / A	0.8 μH/m
Ambient temperature range	-50 °C ≤ T _a ≤ +100 °C			
Remarks: - x = 2: 12 V version; - x = 6: 16 V version; - interface 1 ('k') not provided - interface 3 ('m'): optional extension - interface 'm' = C for CAN bus, exclusive or - interface 'm' = P for RS485 (Profibus) -) ¹ optional other suitable connectors as specified in manufacturer's documents -) ² any value or equal to the applied IS power supply - N / A = not applicable				

**3. Models designed to be connected to two independent IS circuits
(2-wire supply circuit, 2-wire 5 - 15 Hz frequency signal circuit)**

- Device marking: Ex ia I Ma
- Circuit Marking: Ex ia I

Measuring Gauge				
type SMALL * / RG / E1x / *** ** / ** / *** / ** / *** / F*) ³ / *				
type SMALL * / IL / E1x / *** ** / ** / *** / ** / *** / F*) ³ / *				
a b c d e f g h i j l m				
Parameter	Supply circuit		Signal circuit	
	h = J, H, S, K, **) ⁴	h = L***m	h = J, H, S, K, **) ⁴	h = L***m
Voltage U _i	DC 14 V / DC 16.1 V		DC 14 V	
Current I _i	3 A		--) ²	
Power P _i	--) ¹		--) ²	
Voltage U _o	N / A		N / A	
Current I _o	N / A		N / A	
Power P _o	N / A		N / A	
effective internal capacitance C _i	negligible		negligible	
effective internal inductance L _i	negligible		negligible	
effective internal capacitance C _i (permanently connected cable)	N / A	185 pF/m	N / A	185 pF/m
effective internal inductance L _i (permanently connected cable)	N / A	0.8 μH/m	N / A	0.8 μH/m
Ambient temperature range	-50 °C ≤ T _a ≤ +100 °C			
Remarks: - x = 2: 12 V version; - x = 6: 16 V version; - interface 1 ('k') not provided - interface 3 ('m'): optional extension - interface 'm' = C for CAN bus, exclusive or - interface 'm' = P for RS485 (Profibus) -) ¹ any value or equal to the applied IS power supply -) ² opto-isolator protected by series resistor; I _i , P _i any value or equal to the applied IS circuit not exceeding U _o = DC 14 V -) ³ opto-isolator configuration FA, F1A, F2A, F*A excluded -) ⁴ optional other suitable connectors as specified in manufacturer's documents - N / A = not applicable				

4. Optional extension: interface 3 ('m')

- Device marking: Ex [ia Ma] ib I Mb
- Circuit Marking: Ex ib I

Measuring Gauge				
type SMALL * / RG / 1x / *** ** / ** / *** / *** / ** / *** / ** / * / *				
type SMALL * / IL / 1x / *** ** / ** / *** / *** / ** / *** / ** / * / *				
a b c d e f g h i j k l m				
Parameter	Interface 3			
	m = C CAN bus		m = P RS485 (Profibus)	
	h = J, H, S, K, **)¹	h = L***m	h = J, H, S, K, **)¹	h = L***m
Voltage U_i	equal to U_o		equal to U_o	
Current I_i	equal to I_o		equal to I_o	
Power P_i	equal to P_o		equal to P_o	
Voltage U_o	6 V		6 V	
Current I_o	100 mA		100 mA	
Power P_o	600 mW		600 mW	
effective internal capacitance C_i	3 μ F		3 μ F	
effective internal inductance L_i	negligible		negligible	
effective internal capacitance C_i (permanently connected cable)	N / A	185 pF/m	N / A	185 pF/m
effective internal inductance L_i (permanently connected cable)	N / A	0.8 μ H/m	N / A	0.8 μ H/m
Characteristic	rectangular		rectangular	
Remarks:				
- x = 2: 12 V version;				
- x = 6: 16 V version;				
- **)¹ optional other suitable connectors as specified in manufacturer's documents				
- N / A = not applicable				

Manufacturer's Documents			
Title:	Drawing No.:	Rev. Level:	Date: (yyyy.mm.dd)
Power supply, I/O-converter; Amplifier			
Schematic measuring amplifier	GWR100-1 (page 2/4)	V1.30	2012/05/09
Schematic IO and power supply	GWR100-1 (page 3/4)	V1.30	2012/05/09
Schematic voltage output	GWR100-1 (page 4/4)	V1.30	2012/05/09
Layout- / component allocation	GWR100-1 (5 pages)	V1.30	2012/05/09
Parts list	GWR100 / GWR100-1 (5 pages)	V1.30	2012/04/23
Processor and AD-DA converter board (in-line size)			
Schematic processor and AD-DA converter	GWR120-1 (page1/4)	V1.30	2012/05/09
Schematic measurement amplifier	GWR120-1 (page 2/4)	V1.30	2012/05/09
Schematic IO and power supply	GWR120-1 (page 3/4)	V1.30	2012/05/09
Schematic voltage output	GWR120-1 (page 4/4)	V1.30	2012/05/09
Layout /component allocation	GWR120-1 (5 pages)	V1.30	2012/05/09
Parts list	GWR120 / GWR120-1 (6 pages)	V1-30	2012/04/23