EG Prototype technical release certificate

-Guidelines 94/9/EG-

Equipment and protection systems in accordance with regulations for use in explosion endangered areas

BVS 06 ATEX E 005 X

Device:	Measuring instrument Type Small *
Manufacturer:	Grünewald GmbH
Address:	D – 59069 Hamm

The construction of this device as well as the different designs are defined in the annex of this technical release certificate.

The certification centre of the EXAM BBG testing and certification GmbH, notified body Nr. 0158 according to article 9 of the guideline 94/9/EG of the European parliaments and its council, from the 23 of March 1994, certifies that this device fulfils the basic health and safety
Regulations for the concept and manufacturing of equipment for the use in explosion endangered areas according to Annex II.
The results of the testing are contained in the test records BVS PP 06.2007 EG .

The basic health and safety regulations are fulfilled according to:

EN 50014:1997	+ A1 – A2	General regulations
EN 50020:2002		Intrinsically safe "i"
EN50284:1999		Equipment group II category 1G
EN50303:2000		Equipment group I category M1

If the character "X" follows the certification number, the regulations for the safe use of the equipment is pointed out and is contained in the appendix of this certificate.

This EG Prototype technical release certificate relates only to the concept and the prototype test of the described device according to guideline 94/9/EG.
For the manufacturing and distribution of the device, separate requirements of the guideline are to be fulfilled, which are not accounted for in this certificate.

For identification purposes the following details must be contained:

II 1/2G EEx ia IIC T4
I M1 EEx ia I

EXAM BBG testing and certification GmbH
Bochum, the 26th of January 2006

Certification centre Department

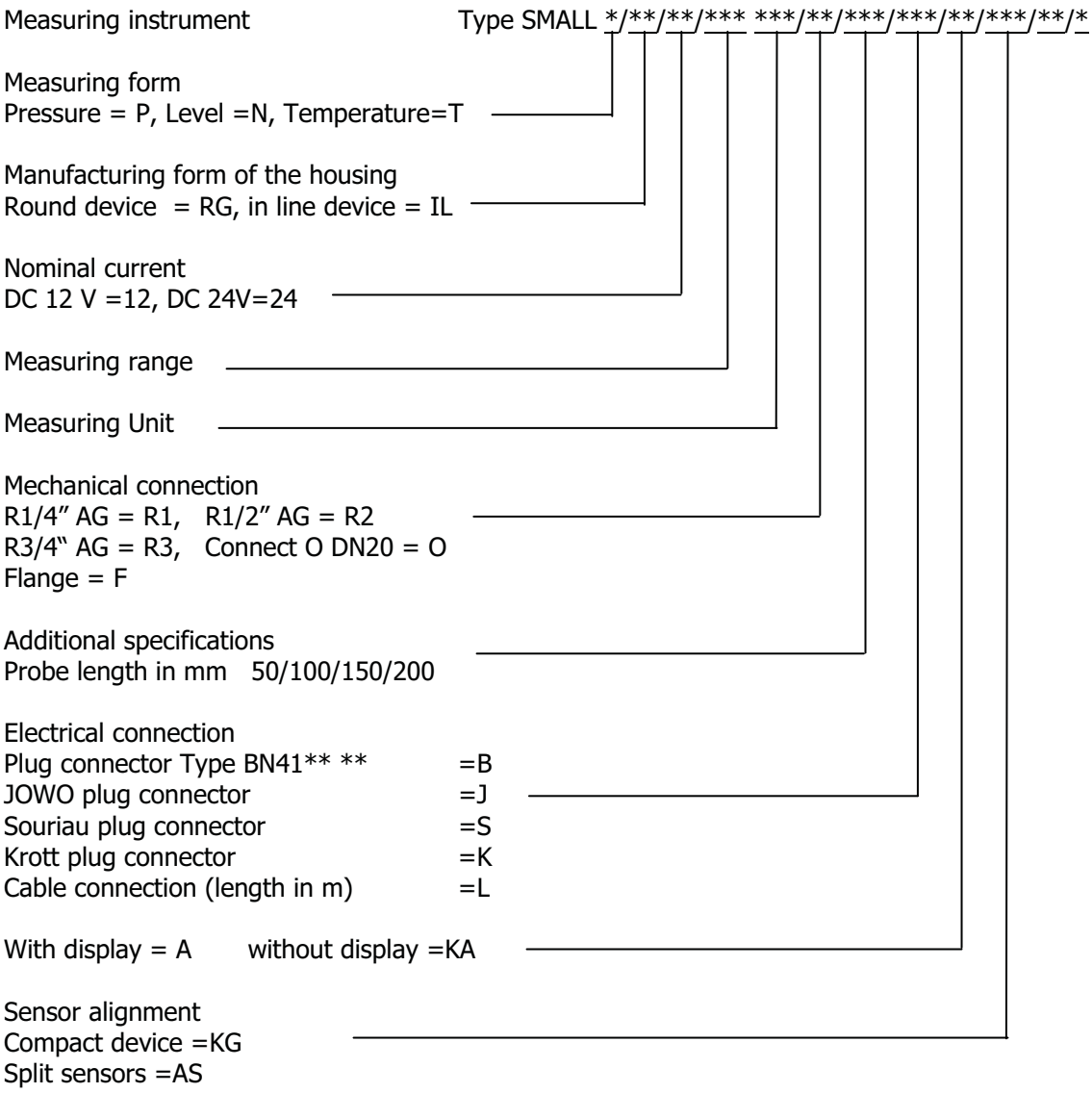
Appendix to

EG Prototype technical release certificate.

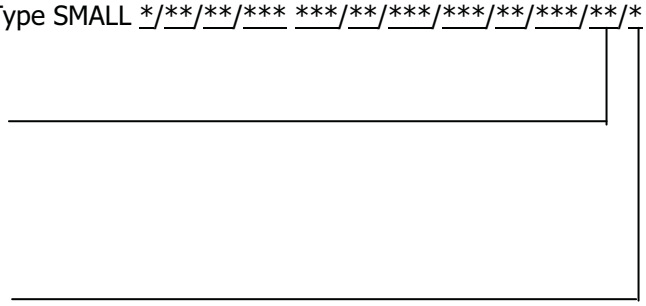
BVS 06 ATEX E 005 X

15.1 Article and type

Measuring instrument Type Small *
In the complete description the "*" is substituted according to the description key:



Measuring instrument Type SMALL */**/**/*** ***/**/***/***/**/***/**/*



(Positions that are not used are to be closed in on the left hand side)

1) Measuring instrument Type SMALL T/**/**/*** ***/**/***/***/**/***/**/*
2) Measuring instrument Type SMALL */RG/**/*** ***/**/***/***/**/***/**/*

15.2 Description

The type SMALL measuring instruments are used for measuring pressure, temperature or the level height of liquid or gaseous mediums, and meet the requirements for the areas of category 1/2G, 2G,M1 and M2

Circuit boards with electronic parts (depending on the mechanical design of the measuring instrument) are built inside a housing made of either metal or plastic (surface resistance lower than 10 Ohm)

The round housing design is optionally equipt with or without a view glass inside the cover, above the digital display as well as a directly connected or split Pressure, Temperature or level sensor.

On the side of the round housing, there are cable connections and/or plug sockets for the intrinsically safe electric circuit (Supply, current output, Optocoupler output and, if applicable, the split sensor) .

The split sensor is connected to the circuit board (type GRW_100 electronic evaluation circuit board) inside of the housing using a cable up to 200m long and plug/socket connectors.

The sensor part of the round housing or the split sensor respectively, is screwed into the partition (receptacle wall/ pipeline), that separates the areas from themselves, this requires equipment in the category 1G or 2G respectively.

The pipe form metal or plastic housing of the In Line design contains a GWR_120 electronic evaluation circuit board.

Both ends of the housing are completed with the plug/socket or fixed cable connection to the built in sensor respectively.

The In- Line instrument is mounted into the partition (receptacle wall/ pipeline), that separates the areas from themselves, this requires equipment in the category 1G or 2G respectively.

The round housing or In – Line housing made of stainless steel/ light metal or plastic are constituted in explosion endangered areas, and require equipment in the category 2G.

The round housing or In – Line housing made of stainless steel/ or plastic are constituted in explosion endangered areas, and require equipment in the category M1 or M2 respectively.

With Instruments where the frequency output is galvanically separated, the frequency output and the electrical circuit supply are in separate conductors, or in separate plug/socket connectors respectively.

15.3 Nominal sizes

15.3.1 Electrical circuit supply

Measuring instrument Type SMALL*/**/XX/*** ***/**/***/***/**/***/**/*																
Parameter	Group I								Group II							
	xx = 24				xx = 12				xx = 24				xx = 12			
Voltage U_i	DC 28 V				DC 13,5 V				DC 28 V				Dc 13,5 V			
Current I_i	--				--				100 mA				100 mA			
Power P_i	--				--				700 mW				700 mW			
Internal capacity C_i	1,8 µF				2,64 µF				12 nF				12 nF			
Internal capacity C_i (fixed cable connection)	1,8 µF + 185 pF/m				2,64 µF + 185 pF/m				12 nF + 185 pF/m				12 nF +185 pF/m			
Internal inductivity L_i	not applicable								not applicable							
Internal inductivity L_i (fixed cable connection)	0,8 µH/m								0,8 µH/m							
Allocation of the clamp connection	B	J	S	K	B	J	S	K	B	J	S	K	B	J	S	K
Ring / Pin number	5,7	1,2	1,2	5,7	5,7	1,2	1,2	5,7	5,7	1,2	1,2	5,7	5,7	1,2	1,2	5,7
Surrounding temperature area	-20 °C ≤ Ta ≤ +80 °C								-20 °C ≤ Ta ≤ +60 °C							
Temperature class	-				-				T4				T4			

15.3.2 Frequency signal output galvanically separated: (Optocoupler)

Measuring instrument Type SMALL*/**/**/*** ***/**/***/***/**/***/**/F																
Parameter	Group I								Group II							
Voltage U_i	DC 28 V				DC 13,5 V				DC 28 V				Dc 13,5 V			
Current I_i	--				--				--				--			
Power P_i	1,3 W				--				0,7 W				--			
Internal capacity C_i	not applicable								not applicable							
Internal capacity C_i (fixed cable connection)	185 pF/m								185 pF/m							
Internal inductivity L_i	not applicable								not applicable							
Internal inductivity L_i (fixed cable connection)	0,8 µH/m								0,8 µH/m							
Allocation of the clamp connection	B	J	S	K	B	J	S	K	B	J	S	K	B	J	S	K
Ring / Pin number	4,5	2,3	2,3	4,5	4,5	2,3	2,3	4,5	4,5	2,3	2,3	4,5	4,5	2,3	2,3	4,5
Surrounding temperature area	-20 °C ≤ Ta ≤ +80 °C								-20 °C ≤ Ta ≤ +60 °C							
Temperature class	-				-				T4				T4			

15.3.3 Current/Voltage output without galvanic separation

Measuring instrument Type SMALL*/**/xx/*** ***/**/***/***/**/***/S0/* Measuring instrument Type SMALL*/**/xx/*** ***/**/***/***/**/***/S4/* Measuring instrument Type SMALL*/**/xx/*** ***/**/***/***/**/***/U/*																
Parameter	Group I								Group II							
	xx = 24				xx = 12				xx = 24				xx = 12			
Voltage U_o	10,6 V				10,6 V				10,6 V				10,6 V			
Current I_o	85 mA				107 mA				46 mA				100 mA			
Power P_o	559 mW				1,135 W				302 mW				700 mW			
Characteristic	Trapeze				Rectangle				Trapeze				Trapeze			
Internal capacity C_i	1,8 µF				2,64 µF				356 nF				356 nF			
Internal capacity C_i (fixed cable connection)	1,8 µF + 185 pF/m				2,64 µF + 185 pF/m				356 nF + 185 pF/m				356 nF +185 pF/m			
Internal inductivity L_i	not applicable								not applicable							
Internal inductivity L_i (fixed cable connection)	0,8 µH/m								0,8 µH/m							
Allocation of the clamp connection	B	J	S	K	B	J	S	K	B	J	S	K	B	J	S	K
Ring / Pin number	4,5	2,3	2,3	4,5	4,5	2,3	2,3	4,5	4,5	2,3	2,3	4,5	4,5	2,3	2,3	4,5
Surrounding temperature area	-20 °C ≤ Ta ≤ +80 °C								-20 °C ≤ Ta ≤ +60 °C							
Temperature class	-				-				T4				T4			

Test certificate
BVS PP 06.2007 EG, revision 26.01.2006

Special circumstances for safe use

17.1 The mounting of the sensor or the connection of the measuring instrument on the wall of areas that require equipment of category 1G, is to be carried out so that the protection class IP67 according to EN 60529, is fulfilled and that the metallic sensor housing/ connections in the potential equalisation is included

17.3 The technical information given by the manufacturer when using the sensor in combination with aggressive or corrosive mediums and to the prevention from mechanical hazards are to be taken into consideration.

DEKRA

Translation

1st Supplement

(Supplement in accordance with Directive 94/9/EC Annex III number 6)

to the EC-Type Examination Certificate
BVS 06 ATEX E 005 X

Equipment: **Measuring Gauge type SMALL */**/**/*** ***/**/***/***/**/***/**/*/***

Manufacturer: **Grünewald GmbH**

Address: **59069 Hamm**

Description

The Measuring Gauge can be modified according to the descriptive documents as mentioned in the pertinent test and assessment report and provides a changed and extended type code

The Essential Health and Safety Requirements of the modified equipment are assured by compliance with:

EN 60079-0:2009	General requirements
EN 60079-11:2007	Intrinsic safety 'i'
EN 60079-26:2004	Equipment Group II Category 1G
EN 50303:2000	Equipment Group I Category M1

The marking of the equipment shall include the following:

II 1/2G Ex ia IIC T4 Ga/Gb or
II 2G Ex ia IIC T4 / T6 Gb or
I Ex ia I Ma or
I Ex ia / ib I Ma Mb

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Description of changes

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 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 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 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)

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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
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 with a connector / cable gland for the permanently connected cable respectively.

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 * / IL / E12 / *** *** / ** / *** / *** / F*)[1] / *
Refers to all versions of round size / 'in line' size enclosures type
SMALL * / ** / E12 / *** *** / ** / *** / *** 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

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Type code

in the subsequent 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] **24** [24V DC] 2-wire version only	*** [*-***]	**mb** [mbar] **b** [bar] * [***]	**G1** [R¼" AG] **G2** [R½"AG] **G3** [R¾"AG] ** [special] **O** [plugg- O DN20] **F** [flange]	-- [none]	see subsequent table
	IL [enclosure size 'in-line']		*** [*-***]	**mb** [mbar] **b** [bar] * [***]		-- [none]	
N Level	**RG** [enclosure round size]		*** [*-***]	**mm** [mmWs] * [***]		-- [none]	
	IL [enclosure size 'in-line']		*** [*-***]	**mm** [mmWs] * [***]		-- [none]	
T Temperature **TS** Temperature (special mechanical design)	**RG** [enclosure round size]	**12** [12V DC] **E12** [12V DC External] **24** [24V DC] 2-wire version only	*** [*-***]	**C** [°C] * [***]	**G1** [R¼" AG] **G2** [R½"AG] **G3** [R¾"AG] ** [special] **O** [plugg- O DN20] **F** [flange]	probe length *** [*** mm] Max. 1000 mm	see subsequent table
	IL [enclosure size 'in-line']			**C** [°C] * [***]			
V Volume	**RG** [enclosure round size]	**12** [12V DC] **E12** [12V DC External] **24** [24V DC] 2-wire version only		**L** [l/min] **cbm** [m^3/h] **rpm** [l/min] * [***]		-- [none]	see subsequent table

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DEKRA

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

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

a	b	c to g	h	i	j	k	l	m
Physical unit)[1]	Size		Electrical connection	Display	Sensor arrange-ment	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]	**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]			
N Level	**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	**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]			
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	**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]
TS Temperature (special mechanical design)	**IL** [enclosure size 'in-line']			-- [no display with 'in-line' size]	-- [no external sensor with 'in-line' size]			
V Volume	**RG** [enclosure round size]			**A** [display provided] **KA** [no display]	**KG** [compact-device] **AS...m** [external sensor; cable length in m	**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]			

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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.

)[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

Parameters

I Models designed to be connected to a Group II IS 2-wire 4 - 20 mA current loop
(apparatus marking: ⟨Ex⟩ II 1/2G Ex ia IIC T4 / T6 Ga/Gb)
or
(apparatus marking: ⟨Ex⟩ II 2G Ex ia IIC T4 / T6 Gb)

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	-20 °C ≤ T_a ≤ +80 °C (T4) -20 °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		

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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.
(apparatus marking: ⟨Ex⟩ I Ex ia I Ma)

The models may be extended optionally with galvanically separated CAN bus- or RS485- interface (see 'Ratings 4' for details)

2.1 Current signal

Measuring Gauge type SMALL * / RG / 12 / *** *** / ** / *** / *** / ** / *** / S0 / * type SMALL * / IL / 12 / *** *** / ** / *** / *** / S0 / * type SMALL * / RG / 12 / *** *** / ** / *** / *** / ** / *** / S4 / * type SMALL * / IL / 12 / *** *** / ** / *** / *** / S4 / * type SMALL * / RG / 12 / *** *** / ** / *** / *** / ** / *** / S..-.. / * type SMALL * / IL / 12 / *** *** / ** / *** / *** / S..-.. / * 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 14 V	
Current I_i	3 A		10 mA	
Power P_i	--)[1]		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	-20 °C ≤ T_a ≤ +100 °C			

Remarks:
- interface 2 ('l') 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
-)[1] optional other suitable connectors as specified in manufacturer's documents
- N / A = not applicable

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2.2 Voltage signal

Measuring Gauge type SMALL * / RG / 12 / *** *** / ** / *** / *** / ** / *** / U..-.. / * type SMALL * / IL / 12 / *** *** / ** / *** / *** / 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 14 V	
Current I_i	3 A		10 mA	
Power P_i	--)[1]		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	-20 °C ≤ T_a ≤ +100 °C			

Remarks:
- interface 2 ('l') 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
-)[1] optional other suitable connectors as specified in manufacturer's documents
- N / A = not applicable

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2.3 5 - 15 Hz frequency signal

Measuring Gauge type SMALL * / RG / 12 / *** *** / ** / *** / *** / ** / *** / F* / * type SMALL * / IL / 12 / *** *** / ** / *** / *** / F* / * type SMALL * / RG / 12 / *** *** / ** / *** / *** / ** / *** / F*A / * type SMALL * / IL / 12 / *** *** / ** / *** / *** / 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, **)[2]	h = L***m	h = B, H, J, S, K, **)[2]	h = L***m
Voltage U_i	DC 14 V		DC 14 V	
Current I_i	3 A		--)[1]	
Power P_i	--)[1]		--)[1]	
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	-20 °C ≤ T_a ≤ +100 °C			

Remarks:
- 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] optional other suitable connectors as specified in manufacturer's documents
- N / A = not applicable

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3. Models designed to be connected to two independent IS circuits
(2-wire supply circuit, 2-wire 5 - 15 Hz frequency signal circuit
(apparatus marking: ⟨Ex⟩ I Ex ia I Ma)

Measuring Gauge type SMALL * / RG / E12 / *** *** / ** / *** / *** / ** / *** / F*)[3] / * type SMALL * / IL / E12 / *** *** / ** / *** / *** / 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 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	-20 °C ≤ T_a ≤ +100 °C			

Remarks:
- 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

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4. Optional extension: interface 3 ('m')
(apparatus marking: ⟨Ex⟩ I Ex ia / ib I Ma Mb)

Measuring Gauge type SMALL * / RG / 12 / *** *** / ** / *** / *** / ** / *** / ** / * / * type SMALL * / IL / 12 / *** *** / ** / *** / *** / ** / * / * 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 µF		3 µF	
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
Characteristic	rectangular		rectangular	
Remarks: -)[1] optional other suitable connectors as specified in manufacturer's documents - N / A = not applicable				

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 category EPL Ga 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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Test and assessment report

BVS PP 06.2007 EG as of 16.11.2009

DEKRA EXAM GmbH
Bochum, dated 16. November 2009

Signed: Simanski
Certification body

Signed: Hauke
Special services unit

We confirm the correctness of the translation from the German original.
In the case of arbitration only the German wording shall be valid and binding.

44809 Bochum, 16. November 2009
BVS-Scha/Her A 20060192

DEKRA EXAM GmbH

Certification body

Special services unit

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(until 31.03.2007 EXAM BBG Prüf- und Zertifizier GmbH)

Translation

(1) 2. Supplement to the EC-Type Examination Certificate

(2) Equipment and protective systems intended for use in potentially explosive atmospheres - Directive 94/9/EC
Supplement accordant with Annex III number 6

(3) No. of EC-Type Examination Certificate: **BVS 06 ATEX E 005 X**

(4) Equipment: **Measuring Gauge type SMALL */**/**/*** ***/**/***/***/**/***/**/*/***

(5) Manufacturer: **Grünewald GmbH**

(6) Address: **Oberallener Weg 7, 59069 Hamm, Germany**

(7) The design and construction of this equipment and any acceptable variation thereto are specified in the appendix to this supplement.

(8) The certification body of DEKRA EXAM GmbH, notified body no. 0158 in accordance with Article 9 of the Directive 94/9/EC of the European Parliament and the Council 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 test and assessment report BVS PP 06.2007 EG.

(9) The Essential Health and Safety Requirements are assured by compliance with:

EN 60079-0:2009	**General requirements**
EN 60079-11:2012	**Intrinsic safety ´i´**
EN 60079-26:2007	**Equipment with equipment protection level (EPL) Ga**
EN 50303:2000	**Equipment Group I Category M1**

(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 appendix to this certificate.

(11) This supplement to the EC-Type Examination Certificate relates only to the design, examination and tests of the specified equipment in accordance to Directive 94/9/EC.
Further requirements of the Directive apply to the manufacturing process and supply of this equipment. These are not covered by this certificate.

(12) The marking of the equipment shall include the following:

II 1/2G Ex ia IIC T4 Ga/Gb or
II 2G Ex ia IIC T4 / T6 Gb or
I M2 Ex ia I Ma or
I M2 (M1) Ex [ia Ma] ib I Mb

DEKRA EXAM GmbH
Bochum, dated 13.07.2012

Signed: Simanski
Certification body

Signed: Dr. Eickhoff
Special services unit

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(13) Appendix to

(14) **2. Supplement to the EC-Type Examination Certificate BVS 06 ATEX E 005 X**

(15) 15.1 Subject and type

In the subsequent 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] **16** [12V DC] **E16** [12V DC External] **24** [24V DC] 2-wire version only	*** [*-***]	**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']		*** [*-***]	**mb** [mbar] **b** [bar] * [***]		-- [none]	
N Level	**RG** [enclosure round size]	**12** [12V DC] **E12** [12V DC External] **16** [12V DC] **E16** [12V DC External] **24** [24V DC] 2-wire version only	*** [*-***]	**mm** [mmWs] * [***]	**G1** [R¼" AG] **G2** [R½"AG] **G3** [R¾"AG] ** [special] **O** [plug- O DN20] **F** [flange]	-- [none]	
	IL [enclosure size 'in-line']		*** [*-***]	**mm** [mmWs] * [***]		-- [none]	
T Temperature	**RG** [enclosure round size]	**12** [12V DC] **E12** [12V DC External] **16** [12V DC] **E16** [12V DC External] **24** [24V DC] 2-wire version only	*** [*-***]	**C** [°C] * [***]	**G1** [R¼" AG] **G2** [R½"AG] **G3** [R¾"AG] ** [special] **O** [plug- O DN20] **F** [flange]	probe length *** [*** mm] Max. 1000 mm	see subsequent table
TS Temperature (special mechanical design)	**IL** [enclosure size 'in-line']			**C** [°C] * [***]			
V Volume	**RG** [enclosure round size]	**12** [12V DC] **E12** [12V DC External] **16** [12V DC] **E16** [12V DC External] **24** [24V DC] 2-wire version only		**L** [l/min] **cbm** [m^3/h] **rpm** [l/min] * [***]		-- [none]	see subsequent table

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

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

a	b	c to g	h	i	j	k	l	m
Physical unit)[1]	Size		Electrical connection	Display	Sensor arrange-ment	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]	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']			-- [no display with 'in-line' size]	-- [no external sensor with 'in-line' size]			
N Level	RG [enclosure round size]			A [display provided] KA [no display	KG [compact-device] AS...m [external sensor; cable length in m			
	IL [enclosure size 'in-line']			-- [no display with 'in-line' size]	-- [no external sensor with 'in-line' size]			
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			
TS Temperature (special mechanical design)	IL [enclosure size 'in-line']			-- [no display with 'in-line' size]	-- [no external sensor with 'in-line' size]			
V Volume	RG [enclosure round size]			A [display provided] KA [no display]	KG [compact-device] AS...m [external sensor; cable length in m			
	IL [enclosure size 'in-line']			-- [no display with 'in-line' size]	-- [no external sensor with 'in-line' size]			

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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.
)[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

15.2 Description

The Measuring Gauge can be modified according to the descriptive documents as mentioned in the pertinent test and assessment report and receives then the marking according to the above type code.

Description of changes

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

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.

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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

15.3 Parameters

15.3.1 Models designed to be connected to a Group I or Group II IS 2-wire 4 - 20 mA current loop
Apparatus marking: ⟨Ex⟩ I M1 Ex ia I Ma or ⟨Ex⟩ II 1/2G Ex ia IIC T4 / T6 Ga/Gb
or
Apparatus marking: ⟨Ex⟩ II 2G Ex ia IIC T4 / T6 Gb

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		

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15.3.2 Models designed to be connected to a Group I 3-wire supply- and signal circuit providing (exclusive-or) current- , voltage- or frequency-signal output
Apparatus marking: ⟨Ex⟩ I M1 Ex ia I Ma

The models may be extended optionally with galvanically separated CAN bus- or RS485- interface (see 'Ratings 15.3.4' for details).

15.3.2.1 Current signal
output, marked with S0, S4, S..-..

Measuring Gauge
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..-.. / *
a b c d e f g h i j k m

Parameter	Supply circuit		Signal circuit	
	h = B, H, J, S, K, **)[2]	h = L***m	h = B, H, J, S, K, **)[2]	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	--)[1]		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	$-50\ °C \le T_a \le +100\ °C$			

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] any value or equal to the applied IS power supply
-)[2] optional other suitable connectors as specified in manufacturer's documents
- N / A = not applicable

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15.3.2.2 Current signal
output, marked with SI0, SI4, SI..-..

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, **)[2]	h = L***m	h = B, H, J, S, K, **)[2]	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	--)[1]		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:
- x = 2: 12 V version;
- x = 6: 16 V version;
- interface 2 ('l') 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] optional other suitable connectors as specified in manufacturer's documents
- N / A = not applicable

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15.3.2.3 Voltage signal

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, **)[2]	h = L***m	h = B, H, J, S, K, **)[2]	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	--)[1]		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 ('l') 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] optional other suitable connectors as specified in manufacturer's documents
- N / A = not applicable

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15.3.2.4 5 - 15 Hz frequency signal

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, **)[2]	h = L***m	h = B, H, J, S, K, **)[2]	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		--)[1]	
Power P_i	--)[1]		--)[1]	
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] optional other suitable connectors as specified in manufacturer's documents
- N / A = not applicable

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15.3.3 Models designed to be connected to two independent IS circuits (2-wire supply circuit, 2-wire 5 - 15 Hz frequency signal circuit
Apparatus marking: ⟨Ex⟩ I M1 Ex ia I Ma

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 / DC 16.1 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	$-50\ °C \le T_a \le +100\ °C$			

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

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15.3.4 Optional extension: interface 3 ('m')
Interface circuit CAN bus or RS485 type of protection Ex ib I
Apparatus marking: ⟨Ex⟩ I M2 (M1) Ex [ia Ma] ib I Mb

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 µF		3 µF	
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
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

(16) Test and Assessment Report

BVS PP 06.2007 EG as of 13.07.2012

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(17) Special conditions for safe use Installation

17.1 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 EN 60529.

17.2 The installation of the sensor of the Measuring Gauge in the wall to areas requiring category EPL Ga shall be carried out in such a way, that the metallic sensor enclosure / the process connection is included in the local equipotential bonding / grounding.

17.3 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.

We confirm the correctness of the translation from the German original.
In the case of arbitration only the German wording shall be valid and binding.

DEKRA EXAM GmbH
44809 Bochum, 13.07.2012
BVS-Scha/Sch A 20120574

Certification body

Special services unit

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