

GREISINGER electronic GmbH

Digital pressure sensor for **GMH 3111 - ex,**
GMH 3151 - ex,
and **GMH 3156 - ex**

Operating Manual

MSD - exMade in
Germany

WEEE-Reg.-Nr. DE93889386

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Content

1	INTENDED USE	2
2	GENERAL	2
3	SAFETY REQUIREMENTS	2
4	OPERATING AND MAINTENANCE ADVICE	3
5	GENERAL SAFETY REQUIREMENTS	3
6	DISPOSAL	3
7	SPECIFICATION	4
7.1	SPECIFICATION (MSD ... BAE - EX):	4
7.2	SPECIFICATION (MSDRE - EX):	4
7.3	COMMON SPECIFICATIONS (MSD ... BAE - EX, MSDRE - EX):	4
7.4	ATEX:	5
8	ADDENDUM 1: EC-TYPE-EXAMINATION CERTIFICATE	5
9	ADDENDUM 1: CE – DECLARATION OF CONFORMITY.....	6

1 Intended use

The pressure sensors are designed for the connection to an hand-held instrument of the following types:

GMH 3111 - ex, GMH 3151 - ex, GMH 3156 - ex

The sensors have following application areas:

- air, aggressive gases
- aggressive media, water, etc.

2 General

Read through this document attentively and make yourself familiar to the of the device before you use it. Keep this document in a ready-to-hand way in order to be able to look up in the case of doubt.

3 Safety requirements

- Please note the safety requirements of the handheld device !!
- Sensor can only be used with a GMH 3111 - ex, GMH 3151 - ex or GMH 3156 - ex!
Usage of other devices may result in destruction of sensor and device
- Only use approved connection cable with max. 1 approved extension cable for the connection of sensor to the handheld device.
- When using a GMH 3156-ex with 2 stainless steel sensors, take care that the sensors are not screwed in or have contact to surfaces with different electrical potentials.
- **Potential equalisation:**



All components (pressure sensor, power supply unit, interface, etc.) connected to the device must be on the same potentials! If this is not guaranteed, you have to connect them for a potential equalisation.

4 Operating and Maintenance Advice

- a.) You must only use the sensor with GMH 3111 - ex, GMH 3151 - ex or GMH 3156 - ex devices!
Usage of other devices may result in destruction of sensor and device.
- b) Treat sensor and device carefully. Use only in accordance with above specification. (do not throw, hit against etc.).
Protect plug from soiling.
- c) To disconnect pressure sensor adapter cable from the device do not pull at the cable but at the plug (to open lock).
When connecting the sensor make sure that arrows are pointing upwards and that plug is entered into device socket centrally. Do not twist plug when entering socket.
If plug is entered correctly, it will slide in smoothly
If plug is twisted or entered incorrectly the connecting pins of the plug can be spoilt by bending or broken
=> Plug can no longer be used and connecting cable needs to be replaced.
- d) **MSDRE - ex** (= relative pressure sensor):
Caution: The pressure compensation hole has to be kept clean! It is placed at the back part of the housing.
Do not cover with stickers or similar things!

5 General Safety requirements

This device has been designed and tested in accordance with the safety regulations for electronic devices. However, its trouble-free operation and reliability cannot be guaranteed unless the standard safety measures and special safety advises given in this manual will be adhered to when using the device.

1. Trouble-free operation and reliability of the device can only be guaranteed if the device is not subjected to any other climatic conditions than those stated under "Specification".
2. If the device is transported from a cold to a warm environment condensation may result in a failure of the device. In such a case make sure the device temperature has adjusted to the ambient temperature before trying a new start-up.
3. If there is a risk whatsoever involved in running it, the device has to be switched off immediately and to be marked accordingly to avoid re-starting.
Operator safety may be at risk if:
 - there is visible damage to the device.
 - the device is not working as specified.
 - the device has been stored under unsuitable conditions for a longer time.In case of doubt, please return device to manufacturer for repair or maintenance.
4. **Warning:** Do not use this product as safety or emergency stop device or in any other application where failure of the product could result in personal injury or material damage.
Failure to comply with these instructions could result in death or serious injury and material damage.
5. **Any changes or repair of the device is not allowed.**
Please return device to manufacturer for repair or maintenance.

6 Disposal



This device must not be disposed as "residual waste".
To dispose this device, please send it directly to us (adequately stamped).
We will dispose it appropriately and environmentally friendly

7 Specification

7.1 Specification (MSD ... BAE - ex):

	MSD 1 BAE - ex	MSD 2,5 BAE - ex	MSD 4 BAE - ex	MSD 6 BAE - ex	MSD ... BAE - ex (special range)
Measuring range:	0 ... 1000 mbar abs.	0 ... 2500 mbar abs.	0 ... 4000 mbar abs.	0 ... 6000 mbar abs.	refer to type plate
Overload: (max.)	5 bar abs.	10 bar abs.	17 bar abs.	35 bar abs.	refer to type plate
Resolution:	1 mbar	1 mbar	1 mbar	1 mbar	refer to type plate

Sensortype: stainless steel absolute pressure sensor.
Suitable for aggressive media, water, etc.

7.2 Specification (MSDRE - ex):

	MSD 400 MRE - ex	MSD 1 BRE - ex	MSD 2,5 BRE - ex	MSD 4 BRE - ex	MSD 6 BRE - ex	MSD 10 BRE - ex	MSD 25 BRE - ex	MSD 40 BRE - ex
Measuring range:	0,0 ... 400,0 mbar rel.	0 ... 1000 mbar rel.	0 ... 2500 mbar rel.	0 ... 4000 mbar rel.	0 ... 6000 mbar rel.	0,00 ... 10,00 bar rel.	0,00 ... 25,00 bar rel.	0,00 ... 40,00 bar rel.
Overload: (max.)	2 bar	5 bar	10 bar	17 bar	35 bar	35 bar	50 bar	80 bar
Resolution:	0,1 mbar	1 mbar	1 mbar	1 mbar	1 mbar	0,01 bar	0,01 bar	0,01 bar

	MSD 60 MRE - ex	MSD 100 BRE - ex	MSD 160 BRE - ex	MSD 250 BRE - ex	MSD 400 BRE - ex	MSD 600 BRE - ex	MSD 1000 BRE - ex	MSDRE - ex (special range)
Measuring range:	0,00 ... 60,00 bar rel.	0,0 ... 100,0 bar rel.	0,0 ... 160,0 bar rel.	0,0 ... 250,0 bar rel.	0,0 ... 400,0 bar rel.	0,0 ... 600,0 bar rel.	0 ... 1000 bar rel.	refer to type plate
Overload: (max.)	120 bar	200 bar	320 bar	500 bar	800 bar	1200 bar	1500 bar	refer to type plate
Resolution:	0,01 bar	0,1 bar	0,1 bar	0,1 bar	0,1 bar	0,1 bar	1 bar	refer to type plate

Sensortype: stainless steel relative pressure sensor for overpressure measuring.
Suitable for aggressive media, water, etc.

Caution: The pressure compensation hole at the back part of the housing has to be kept clean!

7.3 Common specifications (MSD ... BAE - ex, MSDRE - ex):

Accuracy: (typ. values) $\pm 0,2\%$ FS (hysteresis and linearity)
 $\pm 0,4\%$ FS (temperature influence from 0-50°C)

Pressure connection: connections thread G1/4. Key width: 27 mm

Device Connection: M12-plug, for connection cable MSD-K31-ex

Electronics: PC-board with amplifier and data memory for sensor data (measuring data, calibration etc.) integrated in sensor housing.

Nominal temperature: 25 °C

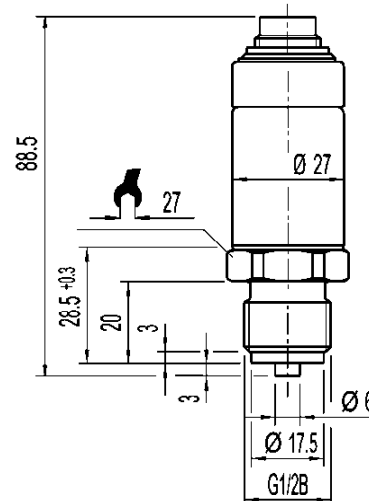
Operating conditions: -20 to +50 °C (compensated range: 0 to 50 °C)

Storage temperature: -40 to +80 °C

Housing: made of stainless steel (CrNi steel or Elgiloy®)

Weight: 220 g

IP rating: IP 67 (sensor), IP 54 (plug)



EMC:

The MSD ... corresponds to the essential protection ratings established in the Regulations of the Council for the Approximation of Legislation for the member countries regarding electromagnetic compatibility (2004/108/EG). Additional fault: <1%

7.4 ATEX:**Ex- certification:**

BVS 11 ATEX E 078 X,  II 2G Ex ib IIC T4

Connection data:

Ui_max = 10,4 V, li_max = 100 mA, Pi_max = 500 mW
Co ≤ 600 nF, Li = ~0

8 Addendum 1: EC-type-examination certificate

(13) Appendix to
(14) **EC-Type Examination Certificate**
BVS 11 ATEX E 078 X

(15) 15.1 Subject and type
Digital pressure sensor type MSD ***-E-ex
Typ MSD ***-E-ex
Measuring method
R = Relative pressure
A = Absolute pressure
Unit of the measuring range
B = bar
M = mbar
Measuring range

15.2 Description
The Digital pressure sensor type MSD ***-E-ex transforms measured pressure into an intrinsically safe signal and consists of a tubular enclosure made of stainless steel. Its electronic is fully potted with casting compound within the enclosure. The external electrical connection of the digital pressure sensor is provided by the prefabricated cable with a length of max. 5 m.

15.3 Parameters

Power supply	UI	DC	V
Maximum input voltage	li	100	mA
Maximum input power	Pi	500	mW
Maximum internal capacitance	Co	600	nF
Maximum internal inductance	Li	negligible	

15.4 Ambient temperature range
Ta
-20 °C up to +50 °C

(16) Test and assessment report
BVS PP 11 2128 EG as of 17.05.2011

(17) Special conditions for safe use
The Digital pressure sensor type MSD ***-E-ex can be used in an ambient temperature range of -20 °C to +50 °C.

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, 17.05.2011
BVS-SieSch A 20110165

Certification body

Special services unit

Page 2 of 2: BVS 11 ATEX E 078 X
This certificate may only be reproduced in its entirety and without change.
DEKRA EXAM GmbH Dirmendahlstrasse 9 44809 Bochum Phone +49 234 3696-105 Fax +49 234 3696-110 z-exam@dekra.com

Translation
EC-Type Examination Certificate

(1) Equipment and protective systems intended for use in potentially explosive atmospheres - Directive 94/9/EC

(2) No. of EC-Type Examination Certificate: BVS 11 ATEX E 078 X

(3) Equipment: Digital pressure sensor type MSD ***-E-ex

(4) Manufacturer: GREISINGER electronic GmbH

(5) Address: 93128 Regenstauf, Germany

(6) The design and construction of this equipment and any acceptable variation thereto are specified in the appendix to this type examination certificate.

(7) 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 11 2128 EG.

(8) The Essential Health and Safety Requirements are assured by compliance with:
EN 60079-0:2009 General requirements
EN 60079-11:2007 Intrinsic Safety "i"

(9) 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.

(10) This 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.

(11) The marking of the equipment shall include the following:
 II 2G Ex ib IIC T4 or
 II 2G Ex ib IIC T4 Gb

DEKRA EXAM GmbH
Bochum, dated 17.05.2011

Signed: Simanski
Certification body

Signed: Dr. Eickhoff
Special services unit

Page 2 of 2: BVS 11 ATEX E 078 X
This certificate may only be reproduced in its entirety and without change.
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9 Addendum 1: CE – Declaration of Conformity



EC – Declaration of Conformity

For the following identified products

MSD - ex

will certified herewith, that the device corresponds to the essential protection ratings established in the Regulations of the Council for the Approximation of Legislation for the member countries regarding electromagnetic compatibility (2004/108/EG), the low voltage directives (2006/95/EG), the pressure equipment directive (97/23/EG) and the Ex directive (RL 94/9/EG).

The conformity to EMC and Ex are verified under observance of following standards:

EMC: **EN 61326-1 : 2006**

Ex: **EN 60079-0 : 2009**
EN 60079-11 : 2007

*EC-Type Examination Certificate BVS 11 ATEX E 078 X from
DEKRA EXAM GmbH, 44809 Bochum, Germany*

This declaration is responsible for the reseller

GREISINGER electronic GmbH

Hans-Sachs-Straße 26

D - 93128 Regenstauf

released by

Oehler, Günther
Managing Director

Regenstauf
place

26.05.2011
date


signature