

GOVERNMENT APPROVED TEST LABORATORY
IN TERMS OF ARP 0108: "REGULATORY REQUIREMENTS FOR EXPLOSION PROTECTED APPARATUS"

IA CERTIFICATE

Date Issued: **12 Dec 2017**
*Expiry date: **12 Dec 2020**
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Ex – Type Examination Certificate

Certificate Number: **S-XPL/08253 X**
Equipment: **Flowmeter**
Model / Type: **PROMAG 50/51/53 H/P/W**_*******
Applicant: **Endress+Hauser**
PO Box 783996
Sandton
2146

Manufacturer: **Endress+Hauser Flowtec AG**
Serial No: All serial numbers imported between issued- and expire date and all serial numbers covered by a valid report or acceptable product certification mark.

Supplied by
Endress+Hauser
Identified by Inspection Authority number
S-XPL/08253 X

And as described in the Explolabs file number **XPL/9525/08253** is hereby certified "Explosion Protected (Refer to General, clause 1, for Ex Rating)", having been examined and inspected in accordance with the relevant requirements of South African Standards.

- SANS 60079-0: 2012 Ed 5** Explosive atmospheres Part 0: Equipment — General requirements
- IEC 60079-0: 2011 Ed 6**
- SANS 60079-1: 2009 Ed 4** Explosive atmospheres Part 1: Equipment protection by flameproof enclosures "d"
- IEC 60079-1: 2007 Ed 6**
- SANS 60079-7: 2007 Ed 3** Explosive atmospheres Part 7: Equipment protection by increased safety "e"
- IEC 60079-7: 2006 Ed 4**
- SANS 60079-11: 2012 Ed 4** Explosive atmospheres Part 11: Equipment protection by intrinsic safety "i"
- IEC 60079-11: 2011 Ed 6**
- SANS 60079-31: 2014 Ed 2** Explosive atmospheres Part 31: Equipment dust ignition protection by enclosure "t"
- IEC 60079-31: 2013 Ed 2**

Risk of ignition provided:

Protection afforded	Equipment Protection Level (EPL)	Performance of protection	Conditions of operation	T class or Max Surface Temp (°C)
	Group			
Very high	[Ga] Group II	Two independent means of protection or safe even when two faults occur independently of each other	Equipment remains functioning in zones 0, 1 and 2	T6 (85 °C) T1 (450 °C)
High	Gb Group II	Suitable for normal operation and frequently occurring disturbances or equipment where faults are normally taken into account	Equipment remains functioning in zones 1 and 2	T6 (85 °C) T1 (450 °C)
High	Db Group III		Equipment remains functioning in zones 21 and 22	Txx °C

Type	Terminal No.	Safety parameters	
		Ex ia IIC	Ex ia IIB
PROMAG 5****_*****T	24 and 25	Ui = 30 V li = 500 mA Pi = 600 mW Ci ≤ 6 nF Li = negligible	
	26 and 27	Ui = 30 V li = 100 mA Pi = 1.25 W Ci ≤ 6 nF Li = negligible	
PROMAG 5****_*****U	24 and 25 26 and 27	Ui = 30 V li = 100 mA Pi = 1.25 W Ci ≤ 6 nF Li = negligible	

Sensor circuits

Transmitter

Exciter coil circuit (non-intrinsically safe)

Terminals no. 41 and 42

Voltage	DC	60 V
Current		90 mA

Electrode circuit (intrinsically safe)

Terminals no. 4 (Pipe GND), 5/6 (E1/S1), 7/8 (E2/S2) and 36/37 (EPD)

Uo	37 V
Io	25 mA
Po	138 mW

		IIC	IIB
lumped values	Lo	50 mH	200 mH
	Co	39 nF	353 nF
mixed analysis	Lo	10 mH	10 mH
	Co	20 nF	100 nF

Sensor

Exciter coil circuit (non-intrinsically safe)

Terminals no. 41 and 42

Voltage	DC	60 V
Current		90 mA

Electrode circuit (intrinsically safe)

Terminals no. 4, 5, 7

Ui	60 V
li	n.a.
Pi	n.a.
Li	negligible
Ci	negligible

Interconnection between transmitter and sensor

Instead of using the above (3.1.2) listed parameters for L and C the connection of the electrode circuit of the sensor and the transmitter can alternatively be made by a cable which has the following parameters:

L _{cabel}	≤ 1 mH/km
C _{cabel}	≤ 400 nF/km
Length of the cabel	
for group IIB	≤ 800 m
for group IIC	≤ 90 m

Ambient temperature range

	Ambient temperature range
PROMAG 5****_*****A**** PROMAG 5****_*****P**** PROMAG 5****_*****U****	$T_a: -20\text{ °C} \leq T_a \leq 50\text{ °C}$
PROMAG 5****_*****G**** PROMAG 5****_*****N**** PROMAG 5****_*****T**** PROMAG 5****_*****W****	$T_a: -20\text{ °C} \leq T_a \leq 60\text{ °C}$
PROMAG 5****_*****6**** PROMAG 5****_*****V****	$T_a: -40\text{ °C} \leq T_a \leq 50\text{ °C}$
PROMAG 5****_*****7**** PROMAG 5****_*****8****	$T_a: -40\text{ °C} \leq T_a \leq 60\text{ °C}$

PROMAG 5****_*****V/6/7/8**** always with PTFE or PFA liner or as high pressure version.

Medium temperature

The medium temperature range depends on the material of the liner or the construction of the sensor.

For type PROMAG 5*H**_***** (liner material always PFA) and for type PROMAG 5*P**_***** and PROMAG 5*W**_***** (with liner material PFA):

$-20\text{ °C} \leq T_{\text{Med}} \leq 150\text{ °C}$ or $-40\text{ °C} \leq T_{\text{Med}} \leq 150\text{ °C}$ depending on the type of PFA

150 °C is the maximum for the upper limit of the medium temperature range.

Depending on the temperature class resp. the maximum surface temperature of the Flowmeter the upper limit of the medium temperature range can be lower (see Temperature classes / surface temperatures).

For type PROMAG 5*P**_***** and PROMAG 5*W**_***** (with liner material hard rubber):

$-20\text{ °C} \leq T_{\text{Med}} \leq 80\text{ °C}$

For type PROMAG 5*P**_***** and PROMAG 5*W**_***** (with liner material PTFE):

$-40\text{ °C} \leq T_{\text{Med}} \leq 130\text{ °C}$

130 °C is the maximum for the upper limit of the medium temperature range. Depending on the temperature class resp. the maximum surface temperature of the Flowmeter the upper limit of the medium temperature range can be lower (see Temperature classes / surface temperatures).

For type PROMAG 5*P**_***** and PROMAG 5*W**_***** (with liner material polyurethane):

$-20\text{ °C} \leq T_{\text{Med}} \leq 50\text{ °C}$

For type PROMAG 5*P**_***** (high pressure construction): $-40\text{ °C} \leq T_{\text{Med}} \leq 110\text{ °C}$ 110 °C is the maximum for the upper limit of the medium temperature range. Depending on the temperature class resp. the maximum surface temperature of the Flowmeter the upper limit of the medium temperature range can be lower (see Temperature classes / surface temperatures).

Temperature classes / surface temperatures

The relation between the maximum ambient temperature, the maximum medium temperature and the temperature class is the following:

For PROMAG 5*W**_***** and PROMAG 5*P**_*****

For the compact versions

PROMAG 5*W**_*****A****,
PROMAG 5*W**_*****P****,
PROMAG 5*W**_*****U****,
PROMAG 5*W**_*****V****,
PROMAG 5*W**_*****6****,

Marking

Name of the manufacturer or its trademark

Serial number

Certificate number

Ambient temperature range

Max. medium pressure

Warning: For the transmitter a delay time of 10 minutes after switching off the power before opening the enclosure has to be regarded.

Transmitter

Type/Order code	Marking Gas	Marking Dust
PROMAG 5****-*****	Ex de [ia Ga] IIC/IIB T6 ... T1 Gb	Ex tb IIIC Txx °C Db

Sensor

Type/Order code	Marking Gas	Marking Dust
PROMAG 5****-*****	Ex e [ia] IIC/IIB T6 ... T1 Gb	Ex tb IIIC Txx °C Db

For types PROMAG 5****-*****F and PROMAG 5****-*****G additional marking with: Fisco Field device

Based on the following documentation: IECEx BVS 07.0011X issue No.: 6

2. INSTALLATION INSTRUCTIONS

It is the manufacturer's responsibility to supply installation instructions with each unit offered for sale as required by IEC/SANS 60079-0 Clause 30.

3. SPECIAL CONDITIONS FOR SAFE USE *(denoted by X after certificate number)*

- i. All equipment of the measurement system shall be included in the equipotential bonding. Along the intrinsically safe sensor circuits potential equalisation must exist.
- ii. The sensors may only be used for those media, for which the wetted parts are known to be suitable.
- iii. For the application of the transmitter in an ambient temperature of less than -20 °C suitable cables and suitable certified cable or conduit entries, for this condition shall be used. Entry holes which are not needed shall be closed by stopping plugs evaluated in this certificate or separately for this purpose.
- iv. The dimensions of the flameproof joints are in parts other than the relevant minimum or maximum values of IEC 60079-1:2007. For information on the dimensions of the flameproof joints contact the manufacturer.

4. CONDITIONS OF CERTIFICATION

All production units must be covered by a QAN (Quality Assurance Notification), Product Mark Scheme or batch evaluation.

5. **MARKING**

The following (or similar) information have to be clearly and permanently marked on all units:

- Supplier : Endress+Hauser
- Manufacturer : Endress+Hauser Flowtec AG
- Equipment : Flowmeter
- Model/Type : PROMAG 50/51/53 H/P/W** - *****
- Serial No. : ---
- Ex Rating : (Refer to General, clause 1, for Ex Rating)
- IA Certificate No : S-XPL/08253 X

This certification indicates compliance with R10.1 of the Mines Health and Safety Act and/or EMR 9(2) of the Occupational Health and Safety Act, provided that the apparatus is used as relevant in accordance with:

- i) SANS 10086 and IEC/SANS 61241-14 requirements as applicable;
- ii) Any conditions mentioned in the above report;
- iii) Any relevant requirements and codes of practice enforced in terms of the Mine Health and Safety Act or Occupational Health and Safety Act; and
- iv) Any restrictions and conditions enforced by the Chief Inspector of Mines or the Principal Inspector or the Chief Inspector: Occupational Health and Safety.
- v) A revision certificate replaces all previous version of the certificate.
- vi) * - Only covers equipment Imported between the "Issued" and "Expire" dates.
- vii) If and when your QAN (Quality Assurance Notification) Certificate for your equipment manufacturer expires during the valid period of the IA Certification (issued for your equipment) and a new certificate is not submitted the existing IA Certification will then be cancelled. It is thus the client's responsibility to always submit the updated and valid QAN certificate(s) to Explolabs (Pty) Ltd

Responsible Testing Officer:

Reviewed by:




**P van Staden
Testing Officer**

**D Maree
Senior Testing Officer**

EXPLOLABS EXPLOSION PREVENTION SERVICES

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