

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

**IA CERTIFICATE**

Date Issued: **08 Mar 2018**  
 \*Expiry date: **08 Mar 2021**  
**Page 1 of 9**  
**Issue: 1**

**Ex – Type Examination Certificate**

Certificate Number: **S-XPL/15.0228 X**  
 Equipment: **Flowmeter**  
 Model / Type: **Promag 5\*\*\*\*\_\*\*\*\*\*+###**  
 Applicant: **Endress + Hauser (Pty) Ltd**  
**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 (Pty) Ltd**  
 Identified by Inspection Authority number  
**S-XPL/15.0228 X**

And as described in the Explolabs file number **XPL/9525/15.0228** 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**
- IEC/SANS 60079-7: 2015** "Explosive atmospheres, Part 7: Equipment protection by increased safety 'e'"
- SANS 60079-11: 2012 Ed 4** "Explosive atmospheres - Part 11: Equipment protection by intrinsic safety 'i'"
- IEC 60079-11: 2011 Ed 6**
- IEC 60079-31: 2013 Ed 2** Explosive atmospheres – Part 31: Equipment dust ignition protection by enclosure "t"



**Risk of ignition protection provided**

The various levels of protection of equipment must be capable of functioning in conformity with the operational parameters established by the manufacturer to that level of protection.

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	T1...T6 T1 (450°C)...T6 (85°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	T1...T6 T1 (450°C)...T6 (85°C)
High	Db Group III		Equipment remains functioning in zones 21 and 22	Txx °C

**1. GENERAL**

Marking: Transmitter  
Ex db eb [ia Ga] IIC/IIB T6...T1 Gb  
Ex tb IIIC T\*\*<sup>1)</sup>°C Db

Sensor:  
Ex eb [ia] IIC T6...T1 Gb  
Ex tb IIIC T\*\*<sup>1)</sup>°C Db

<sup>1)</sup> Temperature table:

The maximum surface temperature for EPL Db shall be defined by the temperature table under consideration of ambient temperature  $T_a$  and medium temperature  $T_{med}$ .

Description of the Flowmeter

The flow meter is designed for flow measurement of conductive fluids.

The measuring systems consist of a transmitter and a sensor which can be mounted together (compact version) or can be used separately (remote version).

The electronic parts of the transmitter (type Promag 5\*a) are certified in IECEx BVS 06.0006U and are mounted inside the enclosure Proline G02 or G12 (including terminal enclosures for remote versions) which are certified in IECEx BVS 06.0012U. For these flowmeters only the version of the enclosure with the electronics compartment and the terminal compartment separated by a bushing (marking Ex db IIC or Ex db eb IIC) is used.

The sensors are certified in IECEx BVS 12.0036U.

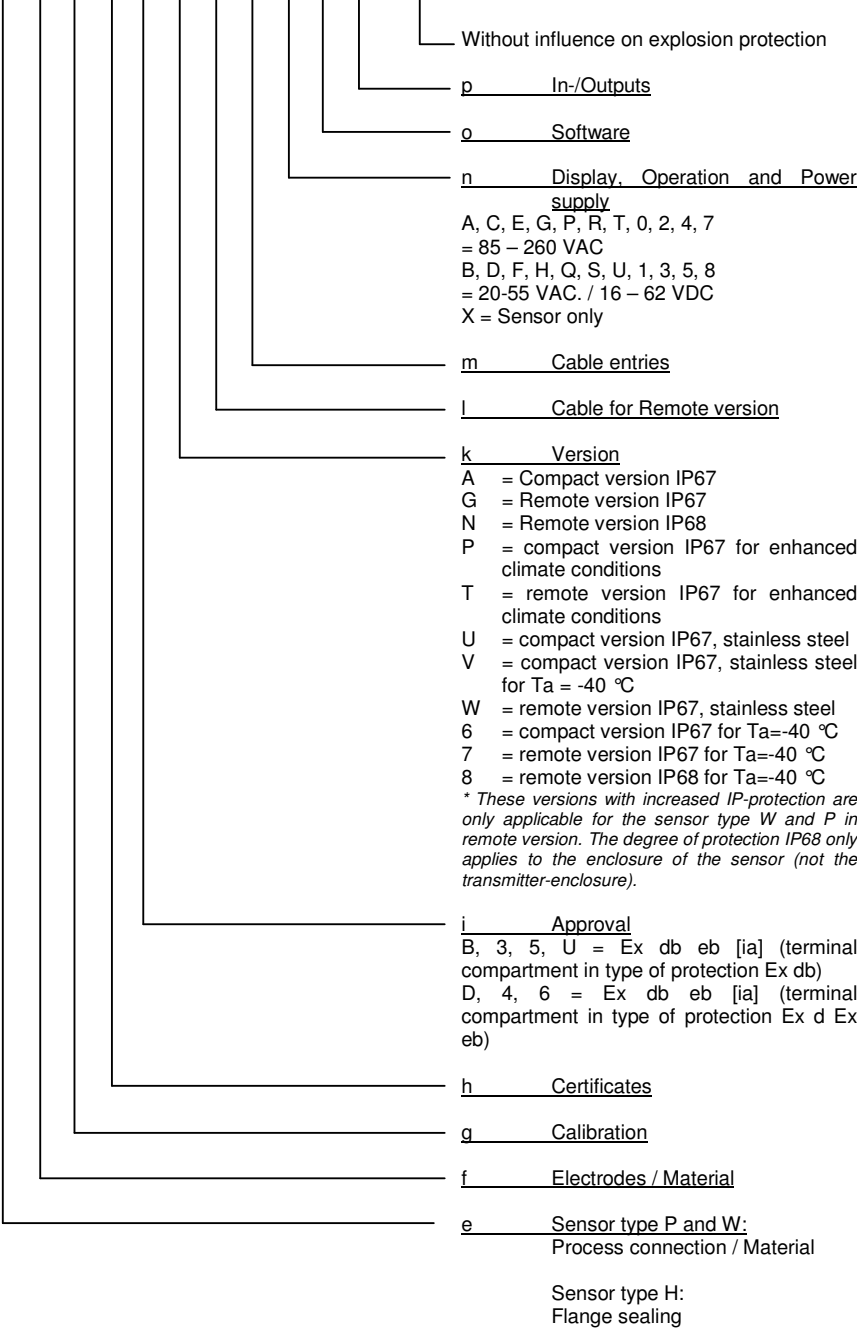
**Subject and Type**

Flowmeter type Promag 5\*\*\*\*-\*\*\*\*\*+###

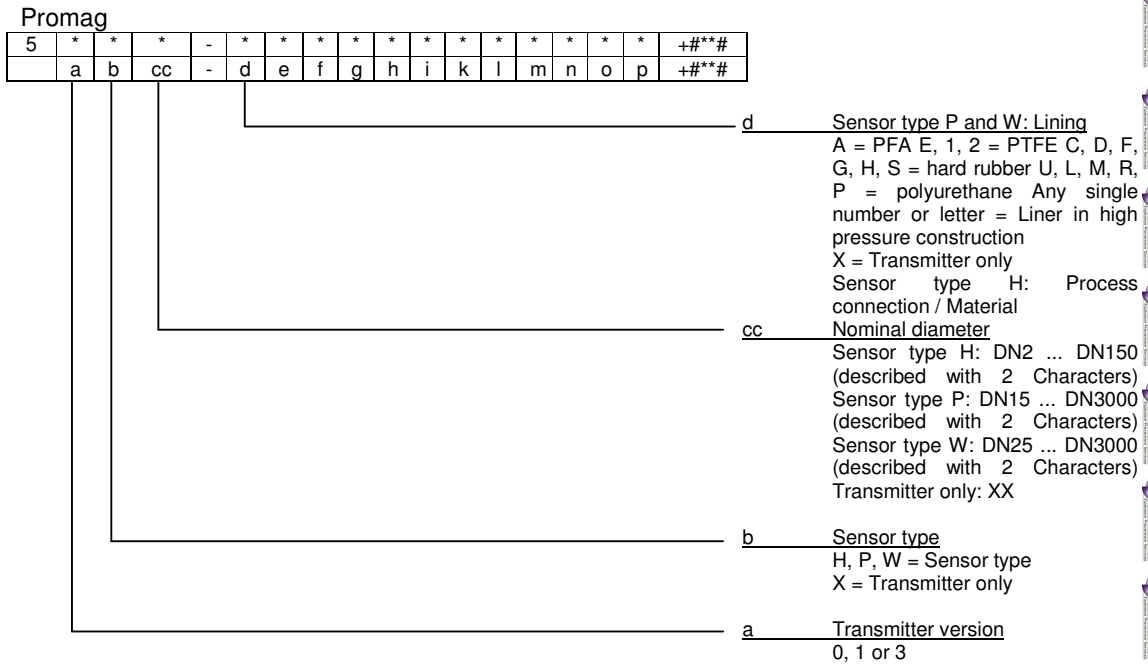
Instead of the \*\*\* in the complete denomination letters and numerals will be inserted which characterize modifications:

**Promag**

5	*	*	*	-	*	*	*	*	*	*	*	*	*	*	*	*	###
	a	b	cc	-	d	e	f	g	h	i	k	l	m	n	o	p	###



- Without influence on explosion protection
- p** In-/Outputs
- o** Software
- n** Display, Operation and Power supply  
 A, C, E, G, P, R, T, 0, 2, 4, 7 = 85 – 260 VAC  
 B, D, F, H, Q, S, U, 1, 3, 5, 8 = 20-55 VAC. / 16 – 62 VDC  
 X = Sensor only
- m** Cable entries
- l** Cable for Remote version
- k** Version  
 A = Compact version IP67  
 G = Remote version IP67  
 N = Remote version IP68  
 P = compact version IP67 for enhanced climate conditions  
 T = remote version IP67 for enhanced climate conditions  
 U = compact version IP67, stainless steel  
 V = compact version IP67, stainless steel for Ta = -40 °C  
 W = remote version IP67, stainless steel  
 6 = compact version IP67 for Ta=-40 °C  
 7 = remote version IP67 for Ta=-40 °C  
 8 = remote version IP68 for Ta=-40 °C  
*\* These versions with increased IP-protection are only applicable for the sensor type W and P in remote version. The degree of protection IP68 only applies to the enclosure of the sensor (not the transmitter-enclosure).*
- i** Approval  
 B, 3, 5, U = Ex db eb [ia] (terminal compartment in type of protection Ex db)  
 D, 4, 6 = Ex db eb [ia] (terminal compartment in type of protection Ex d Ex eb)
- h** Certificates
- g** Calibration
- f** Electrodes / Material
- e** Sensor type P and W:  
 Process connection / Material  
  
 Sensor type H:  
 Flange sealing



Listing of all used components

Subject and type	Certificate	Standards
Transmitter enclosure type Proline G02 and G12	IECEX BVS 06.0012U (DE/BVS/06/2091)	IEC/SANS 60079-0:2011 IEC/SANS 60079-1:2014 IEC/SANS 60079-7:2015 IEC/SANS 60079-31:2013
Magnetic inductive sensor type Promag *	IECEX BVS 12.0036U (DE/BVS/12/2068)	IEC/SANS 60079-0:2011 IEC/SANS 60079-7:2015 IEC/SANS 60079-11:2011 IEC/SANS 60079-15:2010 IEC/SANS 60079-31:2013
Transmitter electronics type Promag 5*a	IECEX BVS 06.0006U (DE/BVS/06/2074)	IEC/SANS 60079-0:2011 IEC/SANS 60079-11:2011

Parameters

Power supply / terminals no. 1 (L/+) and 2 (N/-)

Nominal voltage

Pure AC version

DC/AC version

or

Max. voltage

Power consumption

AC	85 up to 260 V
DC	16 up to 62 V
AC	20 up to 55 V
Um AC	260 V
	approx. 15 W / VA

I/O-Circuits

Non-intrinsically safe I/O-circuits

Type	Terminal No.	Safety parameters
PROMAG 5***_*****A	20 ... 27	U <sub>max</sub> = 260 V, I <sub>max</sub> = 0.5 A
PROMAG 5***_*****B		
PROMAG 5***_*****C		
PROMAG 5***_*****D		
PROMAG 5***_*****E		
PROMAG 5***_*****H		
PROMAG 5***_*****J		
PROMAG 5***_*****K		
PROMAG 5***_*****L		
PROMAG 5***_*****M		
PROMAG 5***_*****N		

Type	Terminal No.	Safety parameters
PROMAG 5****_*****P		
PROMAG 5****_*****Q		
PROMAG 5****_*****V		
PROMAG 5****_*****W		
PROMAG 5****_*****0		
PROMAG 5****_*****1		
PROMAG 5****_*****2		
PROMAG 5****_*****3		
PROMAG 5****_*****4		
PROMAG 5****_*****5		
PROMAG 5****_*****6		
PROMAG 5****_*****7		
PROMAG 5****_*****8		
PROMAG 5****_*****9		

Intrinsically safe I/O circuits

Type	Terminal No.	Safety parameters	
		Ex ia IIC	Ex ia IIB
PROMAG 5****_*****F and PROMAG 5****_*****G	26 and 27	Ui = 30 V li = 600 mA Pi = 8.5 W Li ≤ 10 µH Ci ≤ 5 nF	
PROMAG 5****_*****R	24 and 25 26 and 27	Uo = 21.8 V Io = 90 mA Po = 491 mW Co = 0.16 µF    Co = 1.16 µF Lo = 4.1 mH     Lo = 15 mH	
		Ui = 30 V li = 10 mA Pi = 300 mW Ci ≤ 6 nF Li = negligible	
PROMAG 5****_*****S	24 and 25	Uo = 21.8 V Io = 90 mA Po = 491 mW Co = 0.16 µF    Co = 1.16 µF Lo = 4.1 mH     Lo = 15 mH	
	26 and 27	Ui = 30 V li = 10 mA Pi = 300 mW Ci ≤ 6 nF Li = negligible	
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



PROMAG 5****_*****N****	
PROMAG 5****_*****T****	
PROMAG 5****_*****W****	
PROMAG 5****_*****7****	-40 °C ≤ Ta ≤ 60 °C
PROMAG 5****_*****8****	

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

The relationship between maximum ambient, medium temperatures, temperature class and maximum surface temperature

Compact version

For types:

- PROMAG 5\*W\*\*\_\*\*\*\*\*A\*\*\*\*,
- PROMAG 5\*W\*\*\_\*\*\*\*\*P\*\*\*\*,
- PROMAG 5\*W\*\*\_\*\*\*\*\*U\*\*\*\*,
- PROMAG 5\*W\*\*\_\*\*\*\*\*V\*\*\*\*,
- PROMAG 5\*W\*\*\_\*\*\*\*\*6\*\*\*\*,
- PROMAG 5\*P\*\*\_\*\*\*\*\*A\*\*\*\*,
- PROMAG 5\*P\*\*\_\*\*\*\*\*P\*\*\*\*,
- PROMAG 5\*P\*\*\_\*\*\*\*\*U\*\*\*\*,
- PROMAG 5\*P\*\*\_\*\*\*\*\*V\*\*\*\*, and
- PROMAG 5\*P\*\*\_\*\*\*\*\*6\*\*\*\*

Temperature table temperature class	Max. medium temperature *			
	T6	T5	T4	T1-T3
max. surface temperature, Group III	85 °C	100 °C	135 °C	200 °C
Ta up to 40 °C	80 °C	95 °C	130 °C	150 °C
Ta up to 45 °C	80 °C	95 °C	130 °C	130 °C
Ta up to 50 °C	80 °C	95 °C	95 °C	95 °C

\* the maximum medium temperature is additionally limited by the liner material or the construction of the sensor

For types

- PROMAG 5\*H\*\*\_\*\*\*\*\*A\*\*\*\*,
- PROMAG 5\*H\*\*\_\*\*\*\*\*P\*\*\*\*,
- PROMAG 5\*H\*\*\_\*\*\*\*\*U\*\*\*\*,
- PROMAG 5\*H\*\*\_\*\*\*\*\*V\*\*\*\* and
- PROMAG 5\*H\*\*\_\*\*\*\*\*6\*\*\*\*

Temperature table temperature class	Max. medium temperature *			
	T6	T5	T4	T1-T3
max. surface temperature, Group III	85 °C	100 °C	135 °C	200 °C
Ta up to 40 °C	80 °C	95 °C	130 °C	150 °C
Ta up to 45 °C	80 °C	95 °C	130 °C	150 °C
Ta up to 50 °C	80 °C	95 °C	95 °C	95 °C

\* the maximum medium temperature is additionally limited by the liner material.

Remote version

For types

- PROMAG 5\*W\*\*\_\*\*\*\*\*G\*\*\*\*,
- PROMAG 5\*W\*\*\_\*\*\*\*\*N\*\*\*\*,
- PROMAG 5\*W\*\*\_\*\*\*\*\*T\*\*\*\*,
- PROMAG 5\*W\*\*\_\*\*\*\*\*W\*\*\*\*,
- PROMAG 5\*W\*\*\_\*\*\*\*\*7\*\*\*\*,
- PROMAG 5\*W\*\*\_\*\*\*\*\*O\*\*\*\*,
- PROMAG 5\*P\*\*\_\*\*\*\*\*G\*\*\*\*,
- PROMAG 5\*P\*\*\_\*\*\*\*\*N\*\*\*\*,
- PROMAG 5\*P\*\*\_\*\*\*\*\*T\*\*\*\*,
- PROMAG 5\*P\*\*\_\*\*\*\*\*W\*\*\*\*,
- PROMAG 5\*P\*\*\_\*\*\*\*\*7\*\*\*\* and
- PROMAG 5\*P\*\*\_\*\*\*\*\*8\*\*\*\*

Transmitter At an ambient temperature of 60 °C the interior temperature and therefore the surface temperature is  $\leq 80$  °C. The transmitter of the remote version therefore has the temperature class T6 / surface temperature 80 °C.

Sensor

Temperature table	Max. medium temperature *			
	T6	T5	T4	T1-T3
temperature class				
max. surface temperature, Group III	85 °C	100 °C	135 °C	200 °C
Ta up to 50 °C	80 °C	95 °C	130 °C	150 °C
Ta up to 60 °C	80 °C	95 °C	130 °C	130 °C

\* the maximum medium temperature is additionally limited by the liner material or the construction of the sensor.

For types

PROMAG 5\*H\*\*\_\*\*\*\*\*G\*\*\*\*\*,  
 PROMAG 5\*H\*\*\_\*\*\*\*\*N\*\*\*\*\*,  
 PROMAG 5\*H\*\*\_\*\*\*\*\*T\*\*\*\*\*,  
 PROMAG 5\*H\*\*\_\*\*\*\*\*W\*\*\*\*\*,  
 PROMAG 5\*H\*\*\_\*\*\*\*\*7\*\*\*\*\*, and  
 PROMAG 5\*H\*\*\_\*\*\*\*\*8\*\*\*\*\*

Transmitter:

At an ambient temperature of 60 °C the interior temperature and therefore the surface temperature is  $\leq 80$  °C. The transmitter of the remote version has the temperature class T6 / surface temperature 80 °C.

Sensor:

Temperature table	Max. medium temperature			
	T6	T5	T4	T1-T3
temperature class				
max. surface temperature, Group III	85 °C	100 °C	135 °C	200 °C
<b>Ta up to 50 °C</b>				
DN2 up to DN25	80 °C	95 °C	130 °C	150 °C
<b>Ta up to 60 °C</b>				
DN2 up to DN25	80 °C	95 °C	130 °C	130 °C
<b>Ta up to 60 °C</b>				
DN40 up to DN150	80 °C	95 °C	130 °C	150 °C

Ingres Protection IP64, IP68 (see IEC/SANS 60079-0, clause 26.4.5)

Based on the following documentation: IECEx BVS 07.0011X Issue No 7

## 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)*

All equipment of the measurement system shall be included in the equipotential bonding. Along the intrinsically safe sensor circuits potential equalisation must exist.

The sensors may only be used for those media, for which the wetted parts are known to be suitable.

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.

The dimensions of the flameproof joints are in parts other than the relevant minimum or maximum

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values of IEC/SANS 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 (Pty) Ltd  
Manufacturer : Endress+Hauser Flowtec AG  
Equipment : Flowmeter  
Model/Type : Promag 5\*\*\*\*-\*\*\*\*\*+###  
Serial No. : ---  
Ex Rating : (Refer to General, clause 1 for Ex rating)  
IA Certificate No : S-XPL/15.0228 X  
**WARNING** : For the transmitter a delay time of 10 minutes after switching off the power before opening the enclosure has to be regarded.

*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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