

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

IA CERTIFICATE

Date Issued: **13 Mar 2017**
 *Expiry date: **13 Mar 2020**
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Issue: 0

Ex – Type Examination Certificate

Certificate Number: **S-XPL/17.0005 X**
 Equipment: **Flowmeter**
 Model / Type: **Proline Promass 300/500, Proline Cubemass 300/500**
 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/17.0005 X

And as described in the Explolabs file number **XPL/18198/17.0005** 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.

<p>SANS 60079-0: 2012 Ed 5 IEC 60079-0: 2011 Ed 6</p> <p>SANS 60079-1: 2015 Ed 5 IEC 60079-1: 2014 Ed 7</p> <p>IEC/SANS 60079-7: 2015</p> <p>SANS 60079-11: 2012 Ed 4 IEC 60079-11: 2011 Ed 6</p> <p>SANS 60079-15: 2010 Ed 4 IEC 60079-15: 2010 Ed 4</p> <p>IEC/SANS 60079-26: 2014</p> <p>SANS 60079-31: 2014 Ed 2 IEC 60079-31: 2013 Ed 2</p>	<p>Explosive atmospheres Part 0: Equipment — General requirements</p> <p>Explosive atmospheres Part 1: Equipment protection by flameproof enclosures "d"</p> <p>Explosive atmospheres Part 7: Equipment protection by increased safety "e"</p> <p>Explosive atmospheres Part 11: Equipment protection by intrinsic safety "i"</p> <p>Explosive atmospheres Part 15: Equipment protection by type of protection "n"</p> <p>Explosive atmospheres – Part 26: Equipment with equipment protection level (EPL) Ga</p> <p>Explosive atmospheres Part 31: Equipment dust ignition protection by enclosure "t"</p>
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Risk of ignition provided:

Protection afforded	Equipment Protection Level (EPL)	Performance of protection	Conditions of operation	T class or Max Surface Temp (°C)
	Group			
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) T6...T4
High	Db Group III		Equipment remains functioning in zones 21 and 22	T**
Enhanced	Gc Group II	Suitable for normal operation	Equipment remains functioning in zone 2	T6...T1

1. GENERAL Description

The Proline 300 / 500 is a platform used for flowmeters of type Proline Promass 300, Proline Promass 500, Proline Cubemass 300 and Proline Cubemass 500. All flowmeters are available in two versions, a compact version (Proline 300) and a remote version (Proline 500). The remote Proline 500 version is also available as an analog version where the sensor sends analog signals to the transmitter and a digital version where the sensor is connected by a digital circuit to the transmitter with additional electronics located at the sensor for assessment of the sensor signals.

For all versions of the Proline 300, an additional remote Display, e.g. DKX001, may be connected to the electronics. The remote display is available in two options for the user. Either it is ordered as a separate product or by the product of the flowmeter.

Different electronics are used for the flowmeters where the sensor is installed in a Zone 1 or 2 location and where the transmitter can be installed in a safe area or Zone 1 or 2 locations. All versions of electronics are designed either with intrinsically safe IO's (Ex ia for Zone 1 or Ex ic for Zone 2) or with non-intrinsically safe IO's. A mix of type of protections, Ex i in combination with non-Ex i IO's is not allowed.

Order Code

Proline Promass 300/500, Proline Cubemass 300/500

Extended order code Proline Promass 300 and Cubemass 300:

- 8a3bcc – ddefghjlpstttvww + ###**
- 08a3bcc – ddefghjlpstttvwwyy + ###** for OEM-version
- 8x3bxx – ddefghjlpssww + ###** for replacement transmitter only

Extended order code Proline Promass 500 and Cubemass 500:

- 8a5bcc – ddefghijklmnopstttvww + ###**
- 08a5bcc – ddefghijklmnopstttvwwyy + ###** for OEM-version
- 8x5bxx – ddefghijklmopqrrssww + ###** for replacement transmitter only

- a = **Type of sensor**
 A = Promass A; C = Cubemass C; E = Promass E; F = Promass F; H = Promass H;
 I = Promass I; O = Promass O; P = Promass P; Q = Promass Q; S = Promass S; X
 = Promass X
- b = **Generation**
 B = Generation of Flowmeter
- cc = **Size**
 any double digits with combination of number or letter
- dd = **Approval**
Proline Promass 300 (IECEX + ATEX):
 BA = Ex db eb [ia] IIB T6...T1 Gb
 Ex tb IIIC T** Db
 BB = Ex db eb [ia] IIC T6...T1 Gb
 Ex tb IIIC T** Db
 BC = Ex db [ia] IIB T6...T1 Gb
 Ex tb IIIC T** Db
 BD = Ex db [ia] IIC T6...T1 Gb
 Ex tb IIIC T** Db
 BS = Ex ec IIC T6...T1 Gc

Proline Promass 500 (IECEX + ATEX):
 BA = Ex db eb [ia] IIB T6...T4 Gb (transmitter)
 Ex ia IIB T6...T1 Gb (sensor)
 Ex tb IIIC T** Db (transmitter + sensor)
 BB = Ex db eb [ia] IIC T6...T4 Gb (transmitter)
 Ex ia IIC T6...T1 Gb (sensor)
 Ex tb IIIC T** Db (transmitter + sensor)
 BC = Ex db [ia] IIB T6...T4 Gb (transmitter)
 Ex ia IIB T6...T1 Gb (sensor)
 Ex tb IIIC T** Db (transmitter + sensor)
 BD = Ex db [ia] IIC T6...T4 Gb (transmitter)
 Ex ia IIC T6...T1 Gb (sensor)
 Ex tb IIIC T** Db (transmitter + sensor)
 BI = [Ex ia] IIC (transmitter)
 Ex ia IIB T6...T1 Gb (sensor)
 Ex tb IIIC T** Db (sensor)
 BJ = [Ex ia] IIC (transmitter)
 Ex ia IIC T6...T1 Gb (sensor)
 Ex tb IIIC T** Db (sensor)
 BL = non-Ex (transmitter)
 Ex ec IIC T6...T1 Gc (sensor)
 BM = Ex ec [ia Ga] IIC T6...T1 Gc (transmitter)
 Ex ia IIB T6...T1 Gb (sensor)
 Ex tb IIIC T** Db (sensor)
 BN = Ex ec [ia Ga] IIC T6...T1 Gc (transmitter)
 Ex ia IIC T6...T1 Gb (sensor)
 Ex tb IIIC T** Db (sensor)
 BS = Ex ec IIC T6...T1 Gc (transmitter + sensor)
- e = **Power Supply**
 D = 24Vdc
 E = 100-230Vac
 I = 100-230Vac / 24Vdc
 X = sensor only
- ff = **Input / Output 1**
 BA = 4-20mA HART
 BB = 4-20mA WHART
 CA = 4-20mA HART Ex i
 CB = 4-20mA WHART Ex i
 GA = Profibus PA
 HA = Profibus PA Ex i
 LA = Profibus DP
 NA = EtherNet/IP

- rr** = **Existing Product**
any double digits with combination of number or letter
- ss** = **Measuring tube material**
any double digits with combination of number or letter
- ttt** = **Process connection**
any triple digits with combination of number or letter
- v** = **Calibration**
any single number or letter
- ww** = **Device model (two digit)**
A1 = product version 1
- yy** = **Customer version (one digit)**
any double digits with combination of number or letter
- **** = **Option in two digits (none, two or multiple of two digits)**
any combination of number and/or letter
- #, +** = **Signs used as indicator for optional abbreviation of extended order code**

Sensor Groups

In the following tables, the Promass 300/500 sensors are assigned to different sensor groups from A1 to C2 depending on their sensor size and electronics version.

Assignment of Promass sensors and Cubemass sensors installed in Zone 1:

Sensor Group	Type of sensor	Size of sensor	Group	T _{Med,min}
A1	A	01, 02, 04	IIC	-50 °C
	C	01, 02, 04, 06	IIC	-50 °C
	E	25, 40, 50	IIC	-50 °C
	F	08, 15, 25, 40, 50	IIC	-50 °C
	F(HT)	25, 50	IIC	-50 °C
	H, S, P	08, 15, 25, 40	IIC	-50 °C
	I	08, 15, 16, 25, 26, 40	IIC	-50 °C
	Q	25, 50	IIC	-50 °C
B1	E	08, 15, 80	IIC	-50 °C
	F	08, 15	IIC	-50 °C
	F, O	80, 100, 150, 250	IIC	-50 °C
	I	41, 50, 51, 80	IIC	-50 °C
	H, S, P	50	IIC	-50 °C
	Q	80, 100	IIC	-50 °C
C1	F	25, 40, 50	IIC	-200 °C
	Q	25, 50	IIC	-200 °C
D1	F	08, 15, 80, 100, 150, 250	IIC	-200 °C
	Q	80, 100	IIC	-200 °C
E1	E	80	IIB	-50 °C
	F, O	80, 100, 150, 250	IIB	-50 °C
	H, S, P	50	IIB	-50 °C
	I	41, 50, 51, 80	IIB	-50 °C
	Q	80, 100	IIB	-50 °C
H1	X	350	IIB	-50 °C
	F	80, 100, 150, 250	IIB	-200 °C
	Q	80, 100	IIB	-200 °C

Note: All sensors of Promass 300 and Promass 500 versions are available for EPL Ga/Gb except the versions "A" (size DN1), "H" (all sizes) and "I" (all sizes) which are only available for EPL Gb. For sensors with EPL Ga, Zone 0, the protection is only applicable for the interior of the measuring tube.

Assignment of Promass sensors and Cubemass sensors installed in Zone 2:

Sensor Group	Type of sensor	Size of sensor	T _{Med,min}
A2	C	01, 02, 04, 06	-50°C
	E	25, 40, 50, 80	-50°C
	F	25, 40, 50, 80, 100, 150, 250	-50°C
	H, S, P	15, 25, 40, 50	-50°C
	I	08, 15, 16, 25, 26, 40, 41, 50, 51, 80	-50°C
	O	80, 100, 150, 250	-50°C
	Q	25, 40, 80, 100	-50°C
B2	X	350	-50°C
	A	01, 02, 04	-50°C
	F	08, 15	-50°C
	E	08, 15	-50°C
C2	H, S, P	08	-50°C
	F	25, 40, 50, 80, 100, 150, 250	-200°C
D2	Q	25, 40, 80, 100	-200°C
	F	08, 15	-200°C

Parameters

Electrical Parameters

Power Supply		
Order Code	terminal no.	values
e =		
D ¹⁾	No. 1(L+/L), 2(L-/N)	U _N = 19.2...28.8V _{DC} U _M = 250Vac
E ¹⁾	No. 1(L+/L), 2(L-/N)	U _N = 85...264V _{AC} U _M = 250Vac
I ²⁾	No. 1(L+/L), 2(L-/N)	U _N = 19.2...28.8V _{DC} / 85...264V _{AC} U _M = 250 V

¹⁾ applicable for products with approval code dd = BA, BB, BC, BD

²⁾ applicable for products with approval code dd = BS, BI, BJ, BL, BM, BN

Input/Output 1		
Order Code	terminal no.	values
ff =		
BA, BB, MA	No. 26, 27	U _N = 30V _{DC} U _M = 250Vac
LA, GA, SA	No. 26, 27	U _N = 32V _{DC} U _M = 250Vac
CA, CB	No. 26, 27	U _i = 30V I _i = 100mA P _i = 1.25W L _i = 0 Ci = 0
HA, TA	No. 26, 27	¹⁾ U _i = 30V I _i = 570mA P _i = 8.5W L _i = 10µH C _i = 5nF ²⁾ U _i = 32V I _i = 570mA P _i = 8.5W L _i = 10µH C _i = 5nF
NA, RA	IO1 / RJ45	U _N = 30V _{DC} U _M = 250Vac

¹⁾ applicable for products with approval code dd = BA, BB, BC, BD

²⁾ applicable for products with approval code dd = BS, BM, BN

Input/Output 2		
Order Code g =	terminal no.	values
C, G	No. 24, 25	U _i = 30V I _i = 100mA P _i = 1.25W L _i = 0 C _i = 0
B, D, E, F, I, J	No. 24, 25	U _N = 30V _{DC} U _M = 250Vac
H	No. 24, 25	U _N = 30V _{DC} I _N = 100mA _{DC} / 500mA _{AC} U _M = 250Vac

Input/Output 3		
Order Code h =	terminal no.	values
C, G	No. 22, 23	U _i = 30V I _i = 100mA P _i = 1.25W L _i = 0 C _i = 0
B, D, E, F, I, J	No. 22, 23	U _N = 30V _{DC} U _M = 250Vac
H	No. 22, 23	U _N = 30V _{DC} I _N = 100mA _{DC} / 500mA _{AC} U _M = 250Vac

Input/Output 4		
Order Code i =	terminal no.	values
C, G	No. 20, 21	U _i = 30V I _i = 100mA P _i = 1.25W L _i = 0 C _i = 0
B, D, E, F, I, J	No. 20, 21	U _N = 30V _{DC} U _M = 250Vac
H	No. 20, 21	U _N = 30V _{DC} I _N = 100mA _{DC} / 500mA _{AC} U _M = 250Vac

Service Interface		
Order Code dd =	terminal no.	values
BA, BB, BC, BD	Service Interface	Service Interface shall only be installed in areas which are known to be non hazardous
not for: BA, BB, BC, BD	Service Interface	U _N = 3.3V

Display remote		
Order Code dd =	terminal no.	values
BA, BB, BC, BD	No. 81, 82, 83, 84	U _o = 3.9V I _o = 1.5A (spark) 200mA (power) P _o = 600mW R _i = 2.6Ω C _o = 670μF L _o = 0
not for: BA, BB, BC, BD	No. 81, 82, 83, 84	U _N = 3.3V I _N = 150mA

For Transmitter with approval code dd = BA, BB, BC, BD connected to the Remote Display of Endress+Hauser, Type DKX001 or ODKX001, the cable parameter with ration L/R = ≤ 0.024 mH/ Ω applies.

Promass and Cubemass Remote Transmitter and Remote Sensor:

8****-... and O8****-... with order code dd = BA, BB, BC, BD in combination with k = B:
Transmitter:

Terminals 41, 42-> exciter coil circuit:	U _o = 15V, I _o = 129mA, P _o = 484mW (sensor group A1/C1/E1)
	U _o = 15V, I _o = 46mA, P _o = 173mW (sensor group B1/D1/H1)
Terminals 9, 10, 11, 12-> temperature circuit:	U _o = 15V, I _o = 18.2mA, P _o = 68.3mW
Terminals 4, 5, 6, 7-> sensor coil circuit:	U _o = 15V, I _o = 15.2mA, P _o = 57mW

Sensor:

Terminals 41, 42-> exciter coil circuit:	U _i = 15V, I _i = 132mA, P _i = 494mW (sensor group A1/C1/E1)
	U _i = 15V, I _i = 48mA, P _i = 180mW (sensor group B1/D1/H1)
Terminals 9, 10, 11, 12-> temperature circuit:	U _i = 15V, I _i = 18.2mA, P _i = 68.3mW
Terminals 4, 5, 6, 7-> sensor coil circuit:	U _i = 15V, I _i = 15.2mA, P _i = 57mW

For interconnection using a cable with a maximum length of 120m is allowed when using a cable which has the following parameters:

Cable inductance ≤ 0.5 mH/km
Cable capacitance ≤ 0.5 μ F/km

8****-... and O8****-... with order code dd = BS in combination with k = B:

Transmitter:

Terminals 41, 42-> exciter coil circuit:	U _N = 15 V, I _N = 100mA (sensor group A2/C2)
	U _N = 15 V, I _N = 72mA (sensor group B2/D2)
Terminals 9, 10, 11, 12-> temperature circuit:	U _N = 15 V, I _N = 18.2mA
Terminals 4, 5, 6, 7-> sensor coil circuit:	U _N = 15 V, I _N = 15.2mA

Sensor:

Terminals 41, 42-> exciter coil circuit:	U _N = 15 V
Terminals 9, 10, 11, 12-> temperature circuit:	U _N = 15 V
Terminals 4, 5, 6, 7-> sensor coil circuit:	U _N = 15 V

8****-... and O8****-... with order code dd = BI, BJ, BM, BN in combination with k = A:

Transmitter:

terminals 61, 62, 63, 64 ->	U _o = 13.8V, I _o = 1.156A, P _o = 3.3W
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Sensor:

terminals 61, 62, 63, 64 ->	U _i = 14V, I _i = 1.2A, P _i = 3.4W
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For interconnection of transmitter to sensor any cable may be used with the following requirements:

- L/R ≤ 0.0089 mH/ Ω and C_{cable} ≤ 760 nF for group IIC, L/R ≤ 0.0356 mH/ Ω and C_{cable} ≤ 4.2 μ F for group IIB

Or

- L_{cable} ≤ 26 μ H and C_{cable} ≤ 760 nF for group IIC, L_{cable} ≤ 104 μ H and C_{cable} ≤ 4.2 μ F for group IIB

8****-... and O8****-... with order code dd = BL, BS in combination with k = A:

Transmitter:

terminals 61, 62->	U _N = 32V
terminals 63, 64->	U _N = 3.3V

Sensor:
 terminals 61, 62-> $U_N = 32V$
 terminals 63, 64-> $U_N = 3.3V$

Based on the following documentation: IECEx CSA 16.0031X issue No.: 1

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 circuits potential equalization must exist.
- The sensors may only be used for those process media, for which the wetted parts are known to be suitable.
- Plastic transmitter enclosures for the order codes
 Proline Promass 8*5***-(BI/BJ)*****A....,
 Proline Promass O8*5***-(BI/BJ)*****A....,
 Proline Promass 8*5*xx-(BI/BJ)*****A....
 shall be installed in an area of at least pollution degree 2.
- Equipment with the following order codes shall be installed using a transient protection not exceeding 140% of the peak rated voltage value at the supply terminals to the equipment. For order code 'dd' = BM, BN, BS.
- If the flowmeter system is connected to remote display type DKX001, the approval codes 'dd' for the flowmeter shall be paired to the approval code "bb" of the remote display as follows:

Approval code 'dd' of Proline Promass 300	Approval code 'bb' of remote display DKX001/ODKX001 as covered by IECEx DEK 15.0024
BA, BB, BC or BD	BE, BF or BG
BS	BS

4. CONDITIONS OF CERTIFICATION

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

