



EU Type Examination Certificate CML 16ATEX2331X Issue 1

- 1 Equipment intended for use in Potentially Explosive Atmospheres Directive 2014/34/EU
- 2 Equipment **MicroFlow-i and MicroFlow-T**
- 3 Manufacturer **Pulsar Process Measurement Ltd.**
- 4 Address Cardinal Building
Enigma Commercial Centre
Sandy's Road
Malvern
WR14 1JJ
UK
- 5 The equipment is specified in the description of this certificate and the documents to which it refers.
- 6 Certification Management Limited, Unit 1 Newport Business Park, New Port Road, Ellesmere Port CH65 4LZ, UK, Notified Body Number 2503, in accordance with Article 17 of Directive 2014/34/EU of the European Parliament and of the Council, dated 26 February 2014, certifies that this equipment has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of equipment intended for use in potentially explosive atmospheres given in Annex II to the Directive.

The examination and test results are recorded in the confidential reports listed in Section 12.

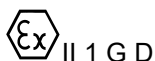
- 7 If an 'X' suffix appears after the certificate number, it indicates that the equipment is subject to conditions of safe use (affecting correct installation or safe use). These are specified in Section 14.
- 8 This EU Type Examination certificate relates only to the design and construction of the specified equipment or component. Further requirements of Directive 2014/34/EU Article 13 apply to the manufacture of the equipment or component and are separately certified.
- 9 Compliance with the Essential Health and Safety Requirements, with the exception of those listed in the confidential report, has been demonstrated through compliance with the following documents:

EN 60079-0:2012:A11:2013

EN 60079-11:2012

- 10 The equipment shall be marked with the following:

MicroFlow-i:



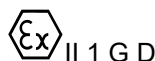
II 1 G D

Ex ia IIC T4 Ga

Ex ia IIIC T135°C Da

Ta= -20°C to +60°C

MicroFlow-T:



II 1 G D

Ex ia IIC T4 Ga

Ex ia IIIC T135°C Da

Ta= -30°C to +60°C

A Snowden



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11 Description

MicroFlow-i

The MicroFlow-i is a two wire loop powered process flow measurement sensor utilising radar technology. The sensor is housed in a non-metallic enclosure with integral cable which connects to control equipment located in the safe area. The equipment can be operated in either 4-20 mA loop powered mode or digital HART mode. The enclosure incorporates a threaded cap which allows the equipment to be mounted on a suitable bracket.

Intrinsic safety is achieved by connecting to the non-hazardous area via an intrinsically safe interface device, and by encapsulation of the electronics and sensor.

The equipment has the following safety description:

$U_i = 28 \text{ V}$
 $I_i = 162 \text{ mA}$
 $P_i = 1.03 \text{ W}$
 $C_i = 0$
 $L_i = 0$

MicroFlow-T

The MicroFlow-T is a DC powered process flow measurement sensor utilising radar technology. The sensor is housed in a non-metallic enclosure with integral five core cable which connects to control equipment located in the safe area providing power and data communication. The enclosure incorporates a threaded cap which allows the equipment to be mounted on a suitable bracket.

Intrinsic safety is achieved by connecting to the non-hazardous area via an intrinsically safe interface device, and by encapsulation of the electronics and sensor.

The equipment has the following safety description:

$U_i = 9.6 \text{ V}$
 $I_i = 350 \text{ mA}$
 $P_i = 0.65 \text{ W}$
 $C_i = 0$
 $L_i = 0$

Variation 1

This variation introduces the following modifications:

- i. Changes to the circuit and PCB layout of the power supply board.
- ii. A revised front face arrangement of the MicroFlow-i.
- iii. Addition of a new version, the MicroFlow-T, to the certificate.
- iv. The addition of a further "X" condition to consider the integral cable parameters.



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12 Certificate history and evaluation reports

| Issue | Date | Associated report | Notes |
|-------|-------------|-------------------|-----------------------------|
| 0 | 11 Nov 2016 | R950A/00 | Issue of prime certificate |
| 1 | 04 Sep 2017 | R11291A/00 | Introduction of Variation 1 |

Note: Drawings that describe the equipment or component are listed in the Annex.

13 Conditions of manufacture

None

14 Special Conditions for Safe Use (Conditions of Certification)

The following conditions relate to safe installation and/or use of the equipment.

- 14.1 Under certain extreme circumstances, the non-metallic parts incorporated in the enclosure of this equipment may generate an ignition-capable level of electrostatic charge. Therefore, the equipment shall not be installed in a location where the external conditions are conducive to the build-up of electrostatic charge on such surfaces. This is particularly important if the equipment is installed in a zone 0 location. In addition, the equipment shall only be cleaned with a damp cloth.
- 14.2 The equipment must be routinely inspected to avoid the build-up of dust layers when installed in a Zones 20, 21, or 22.
- 14.3 When installing the equipment, the installer shall consider the length of integral cable attached to the equipment, in addition to any externally installed cable. The integral cable shall be considered to have parameters of 200pF/m, and 1μH/m or 30μH/Ω.

Certificate Annex



Certificate Number CML 16ATEX2331X
Equipment MicroFlow-i and MicroFlow-T
Manufacturer Pulsar Process Measurement Ltd.

The following documents describe the equipment or component defined in this certificate:

Issue 0

| Drawing No | Sheets | Rev | Approved date | Title |
|--------------|--------|-----|---------------|---|
| D-804-1199-A | 1 of 1 | - | 10 Nov 2016 | Microflow transducer cap |
| D-804-1200-B | 1 of 1 | B | 10 Nov 2016 | Microflow-i loop powered Exia generic wraparound label |
| D-804-1201-A | 1 of 1 | - | 10 Nov 2016 | Microflow base housing |
| D-804-1202-A | 1 of 1 | - | 10 Nov 2016 | Sub shield machining for ATEX Microflow |
| D-804-1203-A | 1 of 1 | - | 10 Nov 2016 | Microflow ATEX housing face |
| D-804-1204-A | 1 of 1 | - | 10 Nov 2016 | Microflow cable for Exia |
| D-804-1189-A | 1 to 2 | A | 10 Nov 2016 | Flowradar sensor V1.2 (1) Haz area |
| D-804-1191-A | 1 to 4 | 1.2 | 10 Nov 2016 | Microflow sensor PCB |
| D-804-1190-A | 1 to 2 | A | 10 Nov 2016 | Flowradar power V1.2 (1) Haz area |
| D-804-1192-A | 1 to 4 | 1.2 | 10 Nov 2016 | Microflow power PCB |
| D-804-1188-A | 1 to 2 | A | 10 Nov 2016 | Flowradar HART V1.0 (2) Haz area |
| D-804-1193-B | 1 to 4 | B | 10 Nov 2016 | Microflow HART PCB |
| A-301-0148-A | 1 to 2 | 1.2 | 10 Nov 2016 | Microflow sensor PCB BOM |
| A-301-0149-A | 1 to 2 | 1.2 | 10 Nov 2016 | Microflow power PCB BOM |
| A-301-0155-A | 1 to 2 | 1.0 | 10 Nov 2016 | Microflow HART PCB BOM |
| D-804-1172-C | 1 of 1 | C | 10 Nov 2016 | Microflow loop powered hazardous area protection overview |
| D-804-1171-C | 1 of 1 | C | 10 Nov 2016 | Microflow loop powered Exia general layout |
| BOM-0017-A | 1 of 1 | 1.0 | 10 Nov 2016 | Microflow loop powered Ex ia O/A BOM |
| D-804-1216-A | 1 of 1 | - | 10 Nov 2016 | Microflow ATEX potting detail |

Issue 1

| Drawing No | Sheets | Rev | Approved date | Title |
|--------------|--------|-----|---------------|--|
| D-804-1190-B | 1 to 2 | B | 04 Sep 2017 | Flowradar Power V2.0 haz area sch |
| D-804-1192-B | 1 to 4 | B | 04 Sep 2017 | Microflow Power PCB |
| D-804-1171-D | 1 of 1 | D | 04 Sep 2017 | Microflow loop powered Ex ia general layout |
| D-804-1216-B | 1 of 1 | B | 04 Sep 2017 | Microflow Ex ia ATEX potting detail |
| D-804-1234-B | 1 of 1 | B | 04 Sep 2017 | Technolog MicroFlow-T Ex ia wraparound label |
| D-804-1254-A | 1 to 4 | A | 04 Sep 2017 | Cello Interface |

Certificate Annex

Certificate Number CML 16ATEX2331X
Equipment MicroFlow-i and MicroFlow-T
Manufacturer Pulsar Process Measurement Ltd.



| Drawing No | Sheets | Rev | Approved date | Title |
|----------------|--------|-----|---------------|---|
| D-804-1255-B | 1 of 1 | B | 04 Sep 2017 | Cello Interface V2.0 Haz area sch |
| D-804-1256-A** | 1 of 1 | A | 04 Sep 2017 | Microflow Ex ia Housing Face |
| D-804-1257-B | 1 of 1 | B | 04 Sep 2017 | Microflow-T Ex ia version hazardous area protection |
| D-804-1258-A | 1 of 1 | A | 04 Sep 2017 | Microflow-T Ex ia general layout |
| D-804-1259-A | 1 of 1 | A | 04 Sep 2017 | Microflow-T cable assembly |
| A-301-0149-A | 1 of 1 | 2.0 | 04 Sep 2017 | Microflow Power V2.0 hazardous area BOM |
| A-301-0161-A | 1 of 1 | 2.0 | 04 Sep 2017 | Cello Interface V2.0 Hazardous area BOM |
| BOM-0017-A | 1 of 1 | 1.1 | 04 Sep 2017 | Controlled Bill of Materials – Microflow loop powered Ex ia |
| BOM-0019-A | 1 of 1 | 1.0 | 04 Sep 2017 | Controlled Bill of Materials – Microflow-T Ex ia |

**This drawing replaces drawing D-804-1203-A