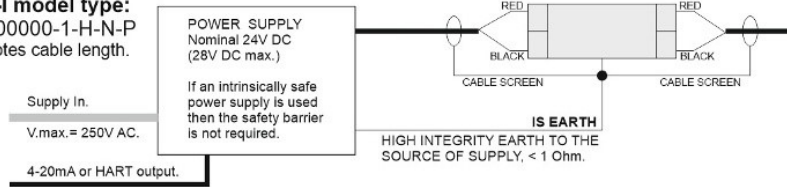


CERTIFICATION DRAWING - DO NOT MODIFY  
WITHOUT AUTHORISATION FROM FM APPROVALS.

**MicroFlow-I model type:**  
dR-F-i-xxx-00000-1-H-N-P  
where 'x' denotes cable length.

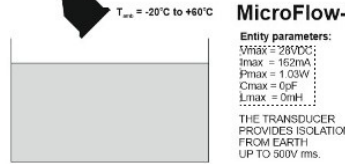


**Restriction:** If installed in zones 20, 21 or 22, routinely inspect for dust build-up.  
**ElectroStatic Hazard:** Clean only with a damp cloth.

**Restriction:** Si installé dans des zones 20, 21 or 22, inspecter régulièrement pour l'accumulation de poussière.  
**Danger ElectroStatique:** Nettoyer uniquement avec un chiffon humide.

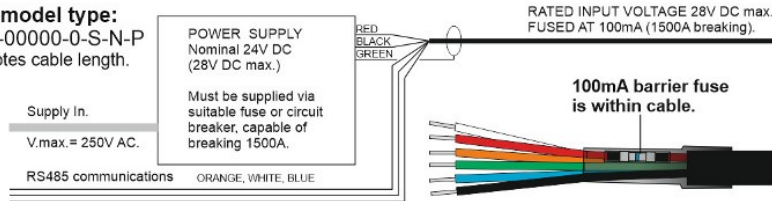
**CLASS I DIV.1 GROUP A, B, C & D, T4.**  
**CLASS II DIV.1 GROUP E, F & G, T4.**  
**CLASS III, T4.**

**Class I, Zone 0, AEx/Ex ia IIC T4 Ga**  
**Zone 20, AEx/Ex ia IIIC T135°C Da**



**MicroFlow-I**  
Entry parameters:  
S<sub>max</sub> = 28VDC  
I<sub>max</sub> = 162mA  
P<sub>max</sub> = 1.03W  
C<sub>max</sub> = 0µF  
L<sub>max</sub> = 0mH  
THE TRANSDUCER PROVIDES ISOLATION FROM EARTH UP TO 500V rms.

**MicroFlow model type:**  
dR-F-S-xxx-00000-0-S-N-P  
where 'x' denotes cable length.

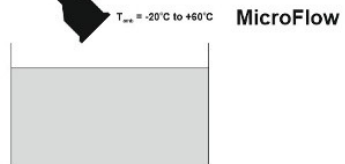


**Restrictions:** Do not use in the presence of these groups of chemicals: Aliphatic HydroCarbons, Ketones, Esters, Alcohols or Acids.  
If installed in zones 21 or 22, routinely inspect for dust build-up.  
**ElectroStatic Hazard:** Clean only with a damp cloth.

**Restrictions:** Ne pas utiliser en présence de ces groupes de produits chimiques: hydrocarbures aliphatiques, cétones, esters, alcools ou des acides.  
Si installé dans des zones 21 or 22, inspecter régulièrement pour l'accumulation de poussière.  
**Danger ElectroStatique:** Nettoyer uniquement avec un chiffon humide.

**CLASS I DIV.1 GROUP A, B, C & D, T4.**  
**CLASS II DIV.1 GROUP E, F & G, T4.**  
**CLASS III, T4.**

**Class I, Zone 1, AEx/Ex mb IIC T4 Gb**  
**Zone 21, AEx/Ex mb IIIC T135°C Db**



**MicroFlow**

**Canada:**  
Installation must be in accordance with CEC part 1.

**Le Canada:**  
L'installation doit être conforme à CEC part 1.

The system must not be supplied from, nor contain, under normal or abnormal conditions, a source of potential with respect to earth exceeding 250V rms or 250V DC.

Le système ne doit pas être alimenté par, ni contenir, dans des conditions normales ou anormales, une source de tension par rapport à la terre dépassant 250V rms ou 250V DC.

The installation, including the barrier earthing arrangements, must comply with the installation requirements in the country of use; e.g. ANSI/ISA RP12.6 (Installation of intrinsically safe systems for hazardous / classified locations) and the National Electrical Code.

INSTALLATION MUST BE IN ACCORDANCE WITH THE MANUFACTURERS GUIDELINES.

L'INSTALLATION DOIT ÊTRE CONFORME AUX DIRECTIVES DU FABRICANT.

DATE	MATERIAL	MOD.	DATE	DETAILS	INITIALS	TITLE
2/12/2019		A	2/12/2019	Original drawing.	T.B.	Pulsar MicroFlow transducers, FM hazardous area system diagrams.
DRAWN	PARTS LIST					
APPROVED	SCALE					FILE NAME: D841329A.cdr
CAD SYSTEM	DO NOT SCALE					DRAWING No.
CoralDraw 14-18	ALL DIMENSIONS IN mm UNLESS OTHERWISE STATED					A4 D-804-1329-A
						SHEET 1

Radio approval, FCC ID: UXS-IPM165F.

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**pulsar**<sup>®</sup>  
PROCESS MEASUREMENT



**FM approved**

**MicroFlow-i (I.S. / AEx/Ex ia)**

**MicroFlow (AEx/Ex mb)**

**INSTALLATION MANUAL**

Full manuals available at:

<https://www.pulsar-pm.com/support/downloads/manuals.aspx>

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M-MFI-FM-0-001-1P

# DESCRIPTION

The MicroFlow range has been specified and designed to meet the demanding requirements of today's process flow measurement applications. The unit is positioned above and at 45 degrees to the flow and measures flow velocity.

Two FM hazardous area approved versions are available:

- 2 wire loop-powered version with HART protocol and is intrinsically safe (I.S.) AEx/Ex ia.
- 5 wire RS485 version that is independently powered, encapsulated and with AEx/Ex mb certification.

The 2 wire version can either be used in digital HART mode or as 4-20mA loop powered device. The Microflow loop powered version can be set up using a HART modem with either proprietary HART software such as Pactware or Pulsar Microflow HART PC software.

The RS485 version can be used on a Pulsar FlowCert, velocity interface or Ultimate controller. The sensor can also be used on any Modbus system. Pulsar MicroFlow PC software can be used for set up and diagnostics.

Standard cable lengths 10, 20 or 30m. Process connection: 1" NPT. A range of mounting brackets are available. Operating temperature: -20 to +60°C, Ingress Protection: IP68.

# Hazardous Area Installation

MicroFlow models are FM, IECEx and ATEX certified, check label for approval details. There are two different versions:

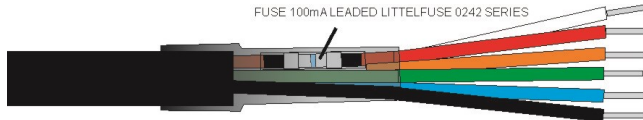
I.S. certified to II 1 G AEx/Ex ia IIC T4 Ga & II 1 D AEx/Ex ia IIC T135°C Da for use in Division 1 / Zones 0, 1, 2, 20, 21, 22 applications (Zener or Galvanic safety barrier required), and another certified to II 2 G AEx/Ex mb IIC T4 Gb & II 2 D AEx/Ex mb IIC T135°C Db suitable for use in Division 1 / Zones 1, 2, 21, 22 (no barriers required). Certain special conditions apply:

Refer to the installation drawing & labels for chemical compatibility.

AEx/Ex ia version – This model has a 2 core screened cable, Red (+) and Black (-) and is loop powered 4-20mA HART compatible.

AEx/Ex mb version – This model must be supplied from apparatus that provides protection from prospective short circuit currents up to 1500A. This fuse is fitted in the safe area end of the cable.

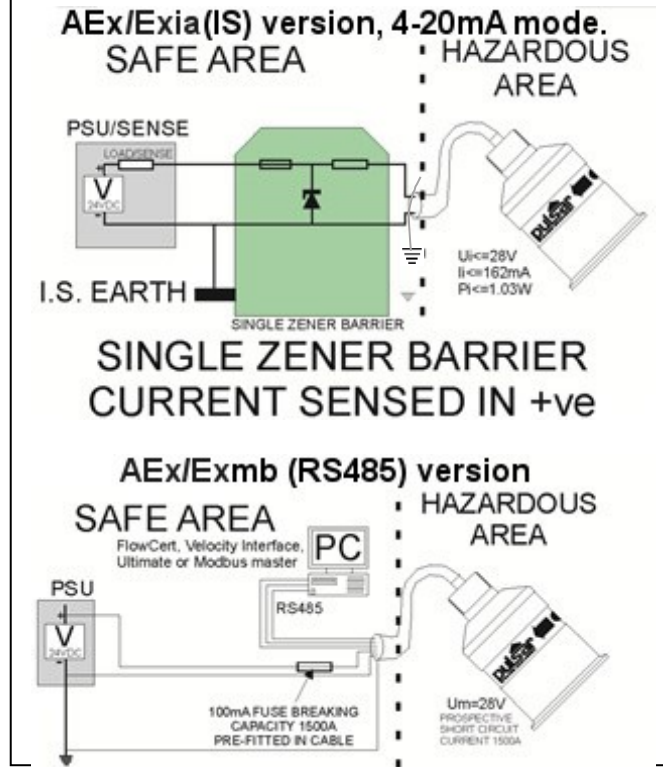
FUSE 100mA LEADED LITTELFUSE 0242 SERIES



Wiring Detail for AEx mb version

Colour	Description	Limits
RED	DC Power +ve	28V DC max.
BLACK	DC 0V	
ORANGE	RS485+	
WHITE	RS485-	
BLUE	RS485 COMMON	
GREEN	Cable Screen	

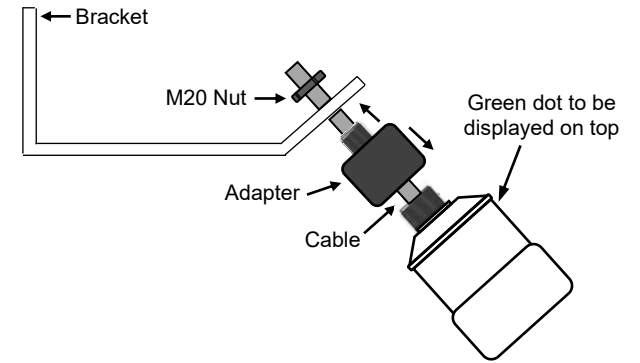
Hazardous area labelling for the two versions of protection.		
<b>Intrinsically Safe for:</b> Class I, Div.1, Group A,B,C & D, T4 Class II, Div.1, Group E,F & G, T4 Class III, T4 Drawing D-804-1329-A		Class 1, Zone 0, AEx ia IIC T4 Ga Zone 20, AEx ia IIC T135°C Da Class 1, Zone 0, Ex ia IIC T4 Ga Zone 20, Ex ia IIC T135°C Da FM19US0197X FM19CA0100X
<b>Restriction:</b> If installed in zones 20, 21 or 22, routinely inspect for dust build-up. ElectroStatic Hazard: Clean only with a damp cloth.		T <sub>amb</sub> = -20°C to +60°C IP68 Ui=28V, Ii=162mA, Pi=1.03W
<b>Suitable for:</b> Class I, Div.1, Group A,B,C & D, T4 Class II, Div.1, Group E,F & G, T4 Class III, T4		Class 1, Zone 1, AEx mb IIC T4 Gb Zone 21, AEx mb IIC T135°C Db Class 1, Zone 1, Ex mb IIC T4 Gb Zone 21, Ex mb IIC T135°C Db FM19US0197X FM19CA0100X
<b>Restrictions:</b> Do not use in the presence of these groups of chemicals: Aliphatic HydroCarbons, Ketones, Esters, Alcohols or Acids. If installed in zones 21 or 22, routinely inspect for dust build-up. ElectroStatic Hazard: Clean only with a damp cloth.		T <sub>amb</sub> = -20°C to +60°C IP68 Drawing D-804-1329-A Um=28V



# GENERAL INSTALLATION

The MicroFlow should be installed directly above the flow with the axis at 45 degrees to the flow to be measured. It should be on a clear straight section. Mount at a height of 250mm above maximum liquid level or up to two times the channel width from minimum liquid level, whichever is greater, but less than 3m. For further details on Microflow or MicroFlow-i installation and setup, please refer to the relevant sensors instruction manual.

The MicroFlow is mounted by the 1" NPT thread on the cap, using a 45° angled bracket an adapter and M20 nut as shown in the picture below:



# MicroFlow Dimensions

