FlowPod Installation and Operating Instructions

FlowPod

Version

Manual-Version

VFF_FlowPod_IOM_EN_241001_E002

SW-Version

This manual is valid for

Main SW: V3.00 and higher

Display SW: V3.00 and higher

INTRODUCTION

These instructions cover the installation and basic operation of the LM FlowPod series display instruments. All configuration and set-up methods are detailed in a separate manual.

Installation and operating instructions for the flowmeter will be separate from these instructions and should be consulted in addition to these instructions, along with relevant drawings where supplied.

Index

1. Certification standards

Litre Meter confirms that the FlowPod conforms with the latest standards.

	Certificate references	Latest standards
ATEX	EN 60079-0:2012 A11:2013 (2011 IECEx)	BS EN IEC 60079-0:2018
	EN 60079-1:2014	Still current, Under review
	EN 60079-31: 2014	Still current, Under review
IECEx	IEC 60079-0:2011 Ed6	IEC 60079-0:2018
	IEC 60079-1:2014 Ed7	Still current, Ed 8 in development
	IEC 60079-31:2013 Ed2	2022 current, 2013 harmonised
cCSAus	CAN/CSA-C22.2 No. 60079-0:11	CAN/CSA-C22.2 No. 60079-0:19
	CAN/CSA-C22.2 No. 60079-1:11	60079-1:16, re-affirmed 2021
	CAN/CSA-C22.2 No. 60079-31:12	60079-31:15, re-affirmed 2020

Tab. 1: Certification standards

1.1. Conditions of Acceptability

1) (cCSAus only) The FlowPod is Externally Powered by a Class 2, 12-30Vdc, 0.09A, 5W max. CSA or other NRTL certified main supply and must be an approved type acceptable to the authorities in the country where the equipment is sold.

2) The FlowPod shall be installed and used within the ambient temperature range that is marked on the product, however, when the products are being stored, the lower temperature remains the same, but the maximum temperature may be raised to 80°C (75°C cCSAus only).

3) Equipment has only been tested for electrical safety. No evaluation of functional safety and performance characteristics has been conducted.

4) (cCSAus only) Stand alone unit shall be used with Class I, Groups B, C, D & Class II, Groups E, F and G & Class III and Ex db and Ex tb certified cable gland with -40° C≤ Tamb≤ 85° C, suitable for this application.

1.2. Certificates

Sira 15ATEX1190X

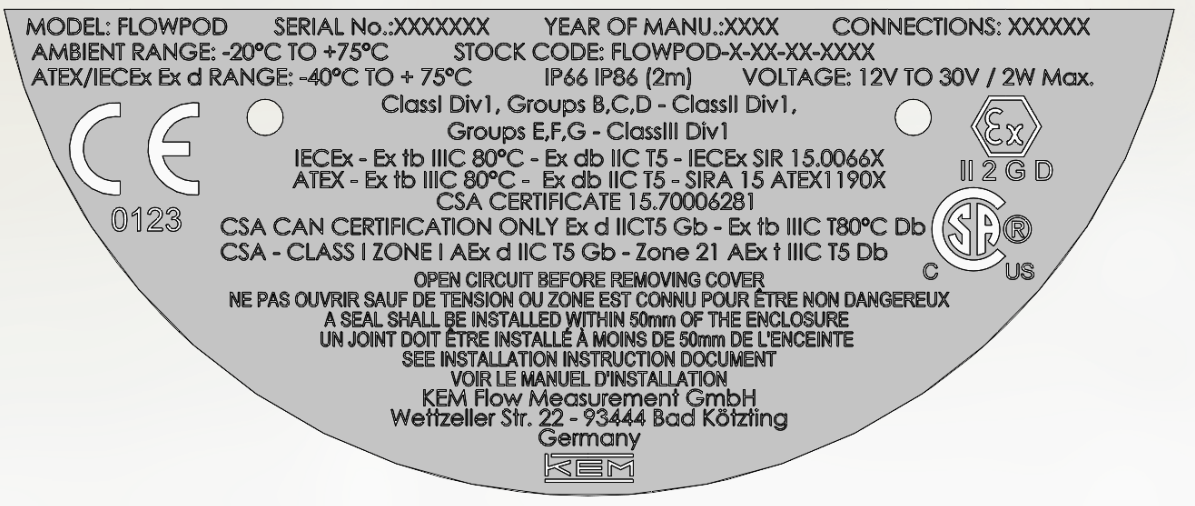
IECEx SIR 15.0066X

2. ENCLOSURE LABELS

2.1. LM CIFM-series Sensor (VFF) & Stand-alone Display

FlowPod Enclosure

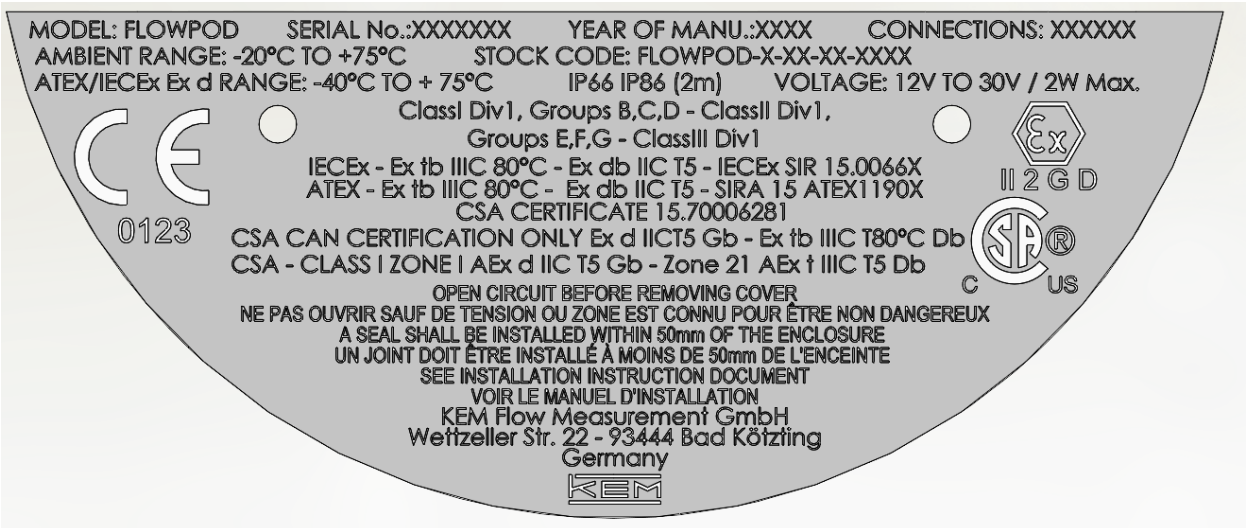
Remote Enclosure (Remote Junction Box)



3. KEM SV-series Sensor only (NB, not cCSAus)

FlowPod Enclosure

Remote Junction Box



4. General Instructions

The FlowPod display is housed in either a Stainless Steel or Epoxy-Painted Aluminium enclosure (aluminium is not available with cCSAus) that can be supplied mounted directly on to the flowmeter, with integral connections; or remotely via suitable cable and glanded cable entries; or as a separate display with empty cable entries for installation by the customer.

4.1. Cables and Glands

All cables, glands and cable in conduit should be suitable for the following conditions:

	ATEX/IEC-Ex	cCSAus
Operating Temperature Range	-40°C to +85°C	-40°C to +85°C
Ingress Protection	IP66/IP68 (2m)	NEMA 4X
Certification	Ex db / Ex tb	Ex db / Ex tb / Class 1 Div 1
Thread Size	¾"NPT or M20	¾"NPT or M20 (M20 not Canada)

Tab. 2: Cables and Glands

If the FlowPod is Stand Alone, for example without a VFF meter, then the gland must be as the (4) Condition of Acceptability (page 4).
All cable entries will be either ¾" NPT or M20 thread sizes. These can be identified by the relevant code in the instrument part code on the instrument or the remote junction box:

	Code	Field Entry	Sensor Entry
FlowPod	E*1	2x ¾" NPT	1x ¾" NPT
	E*2	2x M20	1x ¾" NPT
	E*3	2x M20	1x M20
Junction Box	J*1	1x ¾" NPT	1x ¾" NPT
	J*2	1x M20	1x ¾" NPT
Material (*)	**Blank** = 316L Stainless Steel		
	S = 316L Stainless Steel		
	A = Epoxy Painted Aluminium		

Tab. 3: Cables and Glands

A seal shall be installed within 50mm of the enclosure, if not incorporated into suitable barrier glands.

4.2. Grounding and Bonding Terminals

The Enclosure and remote Junction Box include a supplementary external grounding or bonding terminal that is identified by being either coloured green and/or by being marked "⏚".

NOTE:
Note the internal grounding terminal shall be used for the equipment grounding connection and the external terminal is for a supplementary bonding connection where local codes or authorities permit or require such connection.

The Enclosure will require external bonding to the flowmeter body. Wire used for this purpose must be a minimum of 4mm² (or equivalent).

5. Safety Parameters

5.1. Temperature

	Gas (Ex db)	Dust (Ex tb)	Comments
Ambient – Stainless Steel	-40°C to +75°C	-20°C to +75°C	cCSAus -20°C to +75°
Ambient – Aluminium	-20°C to +75°C	-20°C to +75°C	(-40° available to special order for Gas (Ex db) ATEX and IECEx only).
Storage Temperature Range	-40°C to +80°C	-40°C to +80°C	
Max. Surface Temp. (T5):	+100°C	+80°C	

Tab. 4:Temperature

5.2. Power

Power Supply (Loop & External Power)	Voltage range	12-30 Vdc	
	Current	90 mA max.	Max. Total current all in/out combined
	Power	2.0 W max.	Max. Total Power all in/out combined
Loop Current	Normal range	4.0 – 20.0 mA	
	Overrange	< 21mA (Overrange)	
	Fault	>21mA <= 24mA	
Sensor Excitation		3.3 / 5 / 8 / 12 / 15 / Ext.V	Rev.B = Factory select, Ext.V all others
Ext. Power mA (dependant on sensor / options.)		65mA max.	Total available current for all options.
OC1 & OC2 outputs		30Vdc max./ 50mA max.	Absolute max. for each output.

Tab. 5: Power

WARNING!

Total current/power of all inputs & outputs combined MUST not exceed 90mA/2.0W

5.3. Sensor

Signal Type	Frequency Input	
Frequency Range	0.001 Hz to 10.0 kHz	Low Pass filter limits at approx. 50 Hz
Sensor Types	Reed Switch / Open Transistor / NPN / PNP / Inductive Coil / Carrier Freq. Coil / Variable Resistor/ NAMUR / Sine Wave.	'Debounce' Low Pass filter on some inputs. In-built amplifier available for coil inputs.
Sensor Excitation Supply	3.3 / 5 / 8 / 12 / 15 / Ext.V	Rev.B = Factory selected, Ext.V all others
Internal Reference Voltage	3.3 Vdc	
Max. Signal Voltage	24 Vdc	Dependant on signal type.

Tab. 6: Sensor

5.4. Electrical Connections:

- Externally Powered 4-20mA loop, with HART communications
- External DC Power supply (version dependant)

- RS485 interface (version dependant)
- 2x Transistor outputs (external power required)
- Sensor signal(s) and internal DC Excitation Supply (version dependant)
- Control Signal input (version dependant)

All electrical connections will require external fuses or protection circuits, as required. No internal fuses are fitted. This equipment does not contain any batteries.

5.5. Miscellaneous

- Flamepaths shall not be repaired.

WARNING!

Warning use fasteners with yield stress ≥ 450 mPa for models with KEM SV-series FlowPod sensor adaptor.

6. Installation

6.1. Assembly & Disassembly

The unit will typically be supplied assembled onto a flowmeter, for Direct-mount versions. Remote-mount versions may be supplied with a sensor cable, or with empty entries for customer-supplied cables/glands.

For most installations, it is advised to disconnect the sensor cabling at the meter or junction box, in preference to the instrument connections. However, where conditions require it may be beneficial to disconnect the wiring at the instrument.

The M4x10 stainless steel set screw needs to be screwed in once the lid is fully screwed down/secured.

6.1.1. Direct-mount unit

CIFM Sensor Union

The direct-mount stem includes a union that can be split to separate the instrument from the flowmeter. This is achieved by loosening the union nut and carefully lifting the display a short distance.

NOTE:

Note the internal grounding terminal shall be used for the equipment grounding connection and the external terminal is for a supplementary bonding connection where local codes or authorities permit or require such connection.

Once separated slightly it will be possible to access the sensor connector inside the mounting stem. Undo the locknut of the connector and remove it from the sensor assembly. The instrument can now be removed from the flowmeter.
Assembly is the reverse of this procedure.

KEM Sensor Adaptor - SV-series

The SV adaptor must be removed from the meter body first. This may require field wiring to be removed to allow the FlowPod/Sensor assembly to be rotated.
Loosen sensor lock-nut at meter body then unscrew sensor from meter body, by rotating complete display & sensor assembly.
Assembly is the reverse of this procedure. However, do not overtighten the sensor into the meter body to position display alignment. If display alignment needs adjusting, loosen the grub screws on side of SV-sensor

adaptor to allow rotation of the display to the desired position. Do not rotate display >180°. Re-tighten grub screws.
The SV series is not available with cCSAus certification.

6.1.2. Remote-mount unit

Disconnecting the sensor wiring of the Remote-mounted unit will require access to the field connections inside the main enclosure. See below for details.

6.2. Field Connections

All sensor and Field connections are made to a terminal board mounted in the base of the enclosure. Terminals are two-part and can be removed for ease of assembly.

NOTE:
Max. wire capacity for each terminal is 1.5mm².

Where supplied as a system with a flowmeter, or where a specific sensor type has been specified, the device will be configured for the appropriate sensor. In all other cases, please consult the supplier for details and advice BEFORE connections are made.
Field connections can be accessed by removing the front cover of the enclosure and removing the LCD module. (Note the orientation of module when removing, to ensure correct re-fitting later.) The module is connected to the terminal board with a ribbon cable. If necessary, this may be disconnected from the LCD module to aid access to the terminals.

WARNING!

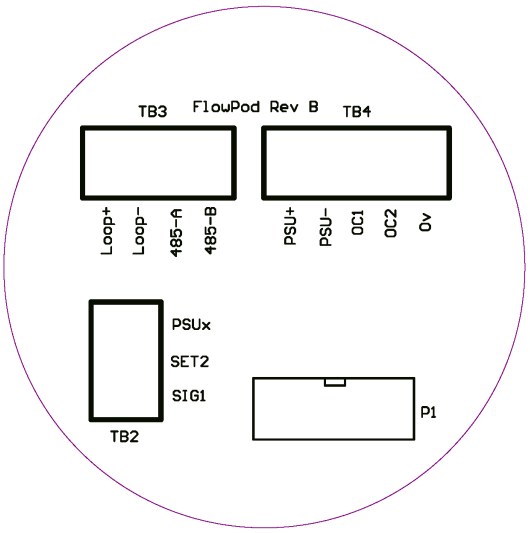
The LCD module is mounted on pillars with retaining springs. Care must be taken not to lose the springs when removing the LCD module. Ensure springs are re-fitted onto pillars prior to re-fitting the LCD module. When refitting the LCD module, ensure it is correctly orientated and that the mounting pillars locate in the moulded holes in the plastic bezel.

WARNING!

Advise Factory of any changes made to the display – including, but not limited to, display board change, sensor change, housing change.

6.3. Terminal Board Layout Diagrams & Terminal Assignment

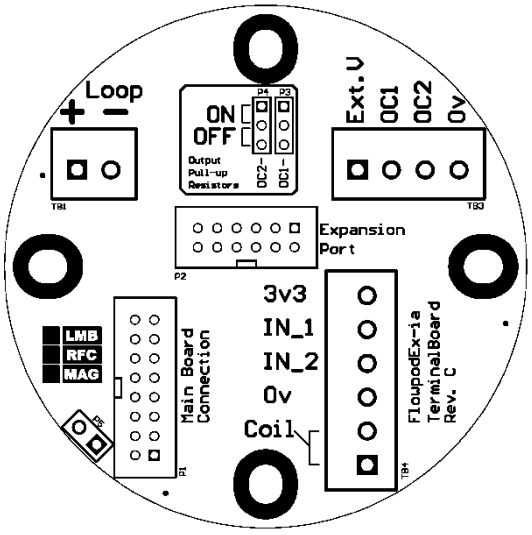
6.3.1. Terminal Board (Rev. B)



Block		Use (*) = refer to appendix for details
TB2	Sig1	Primary Sensor + (*)
	Set2	Primary Sensor - or Secondary Sensor + for Dual Reed Sensor (*)
	PSUx	Sensor Excitation + or 0V Return for Reed Sensors (*)
TB3	Loop+	4-20mA Loop Input / Supply Voltage + (loop-powered version)
	Loop-	4-20mA Loop Return / Supply Voltage - (loop-powered version)
	485-A	Optional RS485 Comms.
	485-B	Optional RS485 Comms.
TB4	PSU+	External Power + (12-24Vdc) ('4-wire' version only)
	PSU-	External Power - (0Vdc) ('4-wire' version only)
	OC1	Switch output 1
	OC2	Switch output 2
	0V	Optional 0Vdc connection for sensors

Tab. 7:

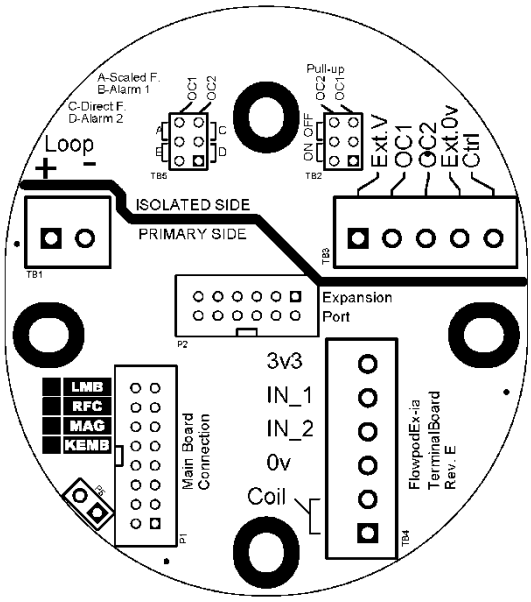
6.3.2. Terminal Board (Rev. C)



Block		Use
TB1	Loop+	4-20mA Loop Input / Supply Voltage + (loop-powered version)
	Loop-	4-20mA Loop Return / Supply Voltage - (loop-powered version)
TB3	Ext.V	External Power +V
	OC1	Switch output 1
	OC2	Switch output 2
	0V	0V common for outputs & Ext.V
TB4	3V3	3v3 Reference voltage/sensor supply
	IN_1	Pulse Input Ch.1 (NPN/PNP/Reed, etc.)
	IN_2	Pulse Input Ch.2 (NPN/PNP/Reed, etc.)
	0V	0V common for sensor inputs
	Coil	RF/Inductive (Mag) Coil sensor inputs
	Coil	RF/Inductive (Mag) Coil sensor inputs
P2		Expansion port connector
P3		OC1 pull-up selector
P4		OC2 pull-up selector

Tab. 8:

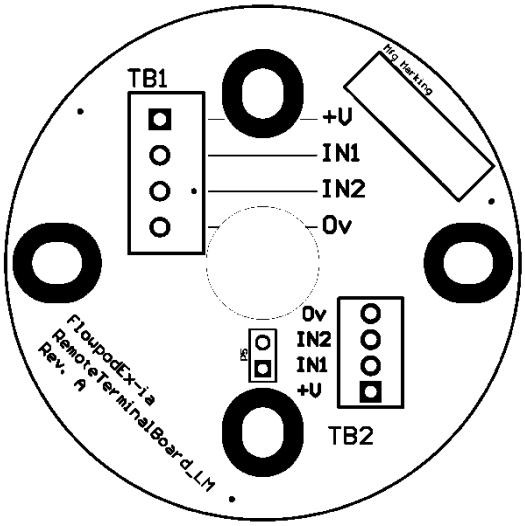
6.3.3. Terminal Board (Rev. E)



Block		Use
TB1	Loop+	4-20mA Loop Input / Supply Voltage + (loop-powered version)
	Loop-	4-20mA Loop Return / Supply Voltage - (loop-powered version)
TB3	Ext. V	External Power +V
	OC1	Switch output 1
	OC2	Switch output 2
	Ext. 0V	0V common for outputs & Ext.V
	Ctrl	Control Signal Input
TB4	3V3	3v3 Reference voltage/sensor supply
	IN_1	Pulse Input Ch.1 (NPN/PNP/Reed, etc.)
	IN_2	Pulse Input Ch.2 (NPN/PNP/Reed, etc.)
	0V	0V common for sensor inputs
	Coil	RF/Inductive (Mag) Coil sensor inputs
	Coil	RF/Inductive (Mag) Coil sensor inputs
P2		Expansion port connector
TB2		OC1/OC2 pull-up selector
TB5		OC1/OC2 function selector

Tab. 9:

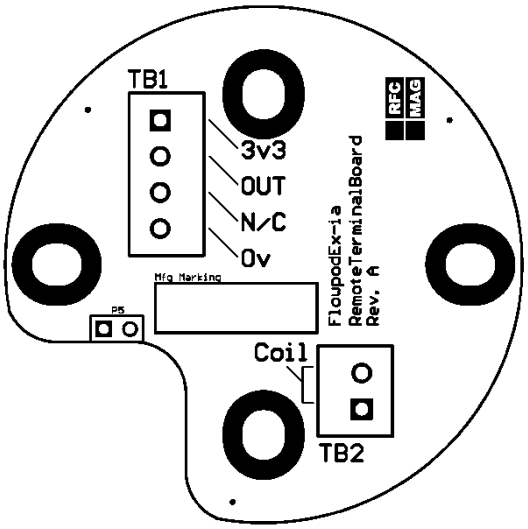
6.3.4. Junction Box / Remote Terminal Boards (Rev. A)



Remote terminals LM (Pulse signals) Rev.A

Block			Use
TB1	+V		Ref.V/sensor supply from Display
	IN_1		Ch.1 signal to Display
	IN_2		Ch.2 signal to Display
	0V		0V common to Display
TB2	+V		Ref.V/sensor supply to Sensor
	IN_1		Ch.1 signal from Sensor
	IN_2		Ch.2 signal from Sensor
	0V		0V common from Sensor

Tab. 10:



Remote terminals (RF/Mag Coils) Rev.A

Block		Use
TB1	3v3	Ref.V/sensor supply from Display
	Out	Ch.1 signal to Display
	N/C	No Connection
	0V	0V common to Display
TB2	Coil	RF/Inductive (Mag) Coil sensor inputs
	Coil	RF/Inductive (Mag) Coil sensor inputs

Tab. 11:

6.4. Sensor connections

Direct–mounted displays will include sensor wiring, which will normally be connected.

Remote-mounted display will require sensor connections via cable entry.

A terminal block is provided for sensor connections. These terminals have different functions depending on the sensor type. Details of connections will be found in the Configuration and operating instructions. Typical and project-specific wiring diagrams should also be consulted.

6.5. Display Orientation

The display can be mounted in many orientations, depending on the position of the flowmeter:

6.5.1. Direct Mount

HORIZONTAL: Assuming the meter is installed horizontally, with the display perpendicular, the horizontal orientation of the display can be changed simply by loosening the union in the mounting stem and rotating the display to the required position. Re-tighten the union nut. (NB: SV-type union is secured by 2x hex grub screws.)

WARNING!

Warning: Care must be exercised to ensure that the head is not rotated to far so as to twist the sensor wires unnecessarily.

VERTICAL: the LCD module within the enclosure may be rotated in 90° steps:

- Remove the front cover of the enclosure.
- Carefully remove LCD/display module from the enclosure.
- Rotate the display in the required direction and refit module onto mounting pillars, ensuring that the springs are fitted and that the pillars locate into the moulded holes in the plastic bezel.
- Refit enclosure cover.

WARNING!

Warning: Ensure retaining springs on mounting pillars are not lost.)

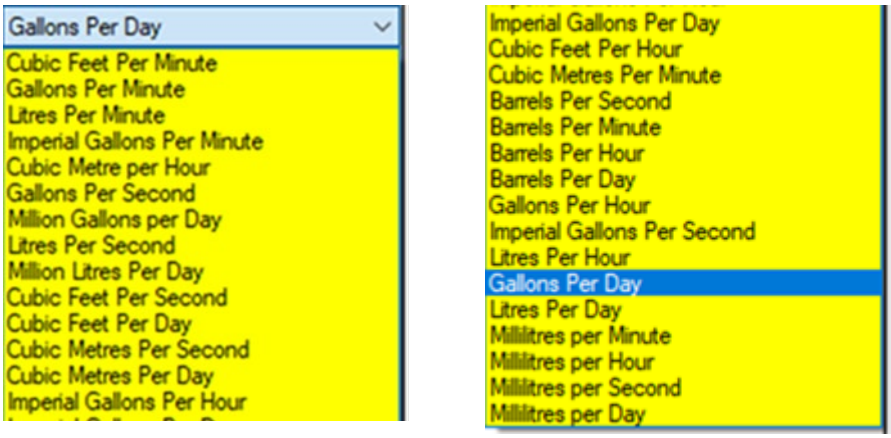
6.5.2. Remote Mount

HORIZONTAL: The horizontal orientation will be determined by the mounting bracket and location.

VERTICAL: Adjustment of the Vertical orientation will be the same as for Direct-mount.

6.6. Units of Measurement

The display is supplied pre-calibrated according to the application. These are the choice of flow rate units available:



7. Listings

7.1. List of Tables

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