

Flow Monitor / Totalizer

with linearization, pulse/alarm and analog outputs and HART communication



Advantages

- ✓ Robust IP67 (NEMA4X) field enclosure. It is so rugged, you can even stand on it!
- ✓ Intrinsically Safe available: ATEX, IECEx and CSA approval for gas and dust applications. FM is pending.
- ✓ Programming can be done by your own crew, with the sensible menu-driven structure, saving cost and irritation. Know one, know them all!
- ✓ Very diverse mounting possibilities: walls, pipes, panels or directly onto outdoor sensors!

Features

- ✓ Displays instantaneous flow rate, total and accumulated total.
- ✓ Fifteen point linearization of the flowcurve - with interpolation.
- ✓ Two alarm values can be entered: low and high flow rate alarm.
- ✓ Large 17mm (0.67") digits for flow rate or total.
- ✓ Clear flashing LED backlight in case of an alarm.
- ✓ Battery powered or 8 - 30V DC power supply or output loop powered.
- ✓ Sensor supply 3.2 / 8.2 / 12 / 24V DC.

Outputs

- ✓ HART communication.
- ✓ One digital output that can be configured as a scaleable pulse output or as a flow rate alarm output.
- ✓ Galvanically isolated, loop powered 4 - 20mA output according to the linearized flow rate.

Inputs

- ✓ Ability to process all types of volumetric or mass flow meter signals: Reed-switch, NAMUR, NPN/PNP pulse, Sine wave (coil), Active pulse signals.

Applications

- ✓ The F-Series is your first and safest choice for field mount indicators in safe and hazardous area applications. Especially in harsh weather conditions like rain, snow, salty atmospheres and temperatures between -40°C up to +80°C (-40°F up to 176°F).
- ✓ Flow rate monitoring with a precise calculation over the full measurement range, where re-transmission of the totalizer and monitoring of the flow rate function and HART communication is required. Alternative models: F016, F112, F118.

General information

Introduction

The F018 is a local indicator with linearization, that displays the actual flow rate, resettable total and non-resettable accumulated total. The F-Series is known worldwide as a range of user-friendly indicators. The F018 is even more impressive. The HART communication with specific DD allows you to communicate in an easy way with other smart field devices and control / monitoring systems.

Linearization

In addition to the average K-Factor or Span, fifteen linearization points can be entered with their frequencies or values. The unit will interpolate between these points greatly enhancing accuracy in any flow range, even for very low frequency applications. This linearization affects all displayed information as well as the signal outputs.

Display

The display has large 17mm (0.67") and 8mm (0.31") digits which can be set to show flow rate and totals. On-screen engineering units are easily configured from a comprehensive menu. The accumulated total can register up to 11 digits and is backed-up in EEPROM memory every minute, just as the running total. A smart display update function achieves a readable display even at -40°C / -40°F.

Backlight

For those applications where readability during day and night is an issue, a bi-color backlight is available. Also Intrinsically Safe available.

Configuration

All configuration settings are accessed via a simple operator menu which can be pass-code protected. Each setting is clearly indicated with an alphanumerical description, which avoids confusing abbreviations. Once familiar with one F-series product, you will be able to program all models in all series without a manual.

Analog output signal

The linearised flow rate is re-transmitted with the galvanically isolated 4 - 20mA output signal. With the output signal a filter function is available to smoothen out the signal if desired. The F018 can even be powered via the loop-current.

Flow meter input

The F018 accepts most pulse input signals for volumetric flow or mass flow measurement.

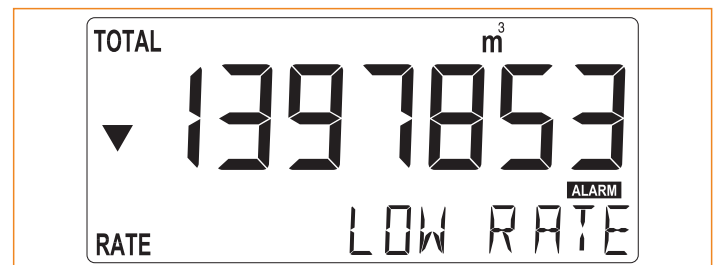
Clear alarm messages and flashing display



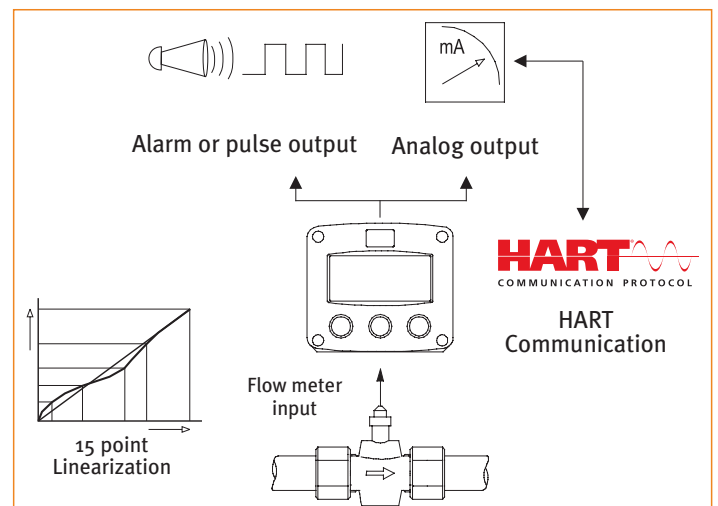
Resistant to harsh weather conditions



Display example - 90 x 40mm (3.5" x 1.6")



Overview application F018



Pulse / Alarm outputs

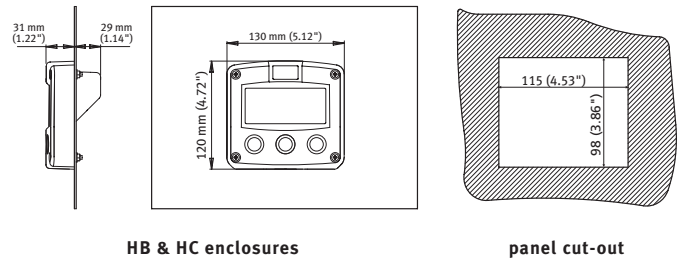
One digital output is available, that can be set as an alarm output to transmit the flow rate alarm or as a scaleable pulse output. The alarm output can be set to switch for a low, high or both alarms!

The pulse output reflects the count on the accumulated display. The pulse length is user defined from 0.001 up to 10 seconds. The maximum output frequency is 500Hz. The output is a passive NPN signal.

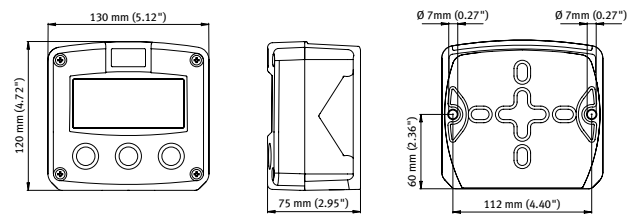
HART Communication

All process data and every single menu setting can easily be read and modified via the HART communication link with a device-specific DD. This guarantees that they will operate hassle free with other registered DD enabled host systems. Fluidwell lifts the user-friendly configuration to the next level! The HART functionality is also Intrinsically Safe available.

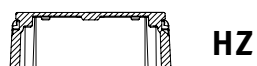
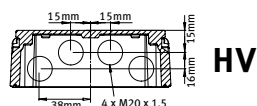
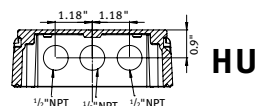
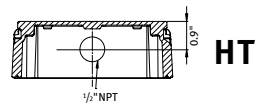
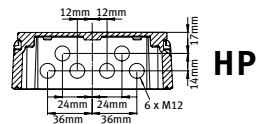
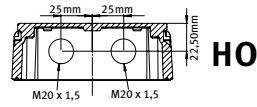
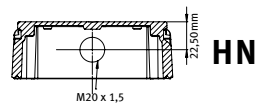
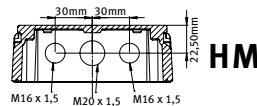
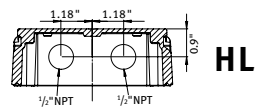
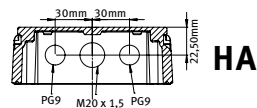
Dimensions enclosures



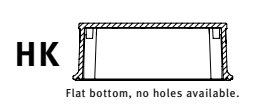
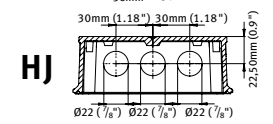
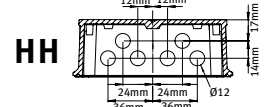
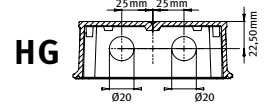
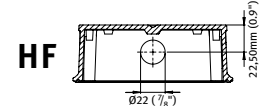
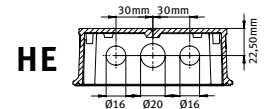
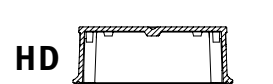
Aluminum & GRP panel mount enclosure



Aluminum



GRP



HART REGISTERED

**Certificate of Registration
HCF Verified**

Fluidwell bv Manufacturer	F018p Product Name
6039 Manufacturer ID (Hex)	E0EA Expanded Device Type (Hex)
7 HART Protocol Revision	01 Device Revision (Hex)
01 Hardware Revision (Hex)	01 Software Revision (Hex)
04/02/2014 Test Date	HCF Verification Method

The above product has successfully completed the validation process and meets the requirements to be "HART REGISTERED".

"HART REGISTERED" products conform to GB/T 29910.1-6-2013 and IEC 61158 standards.

Registration Number: L2-06-1000-326 Registration Issue Date: April 2, 2014 HCF QA Approval: *J. Mastus*

HART
COMMUNICATION FOUNDATION

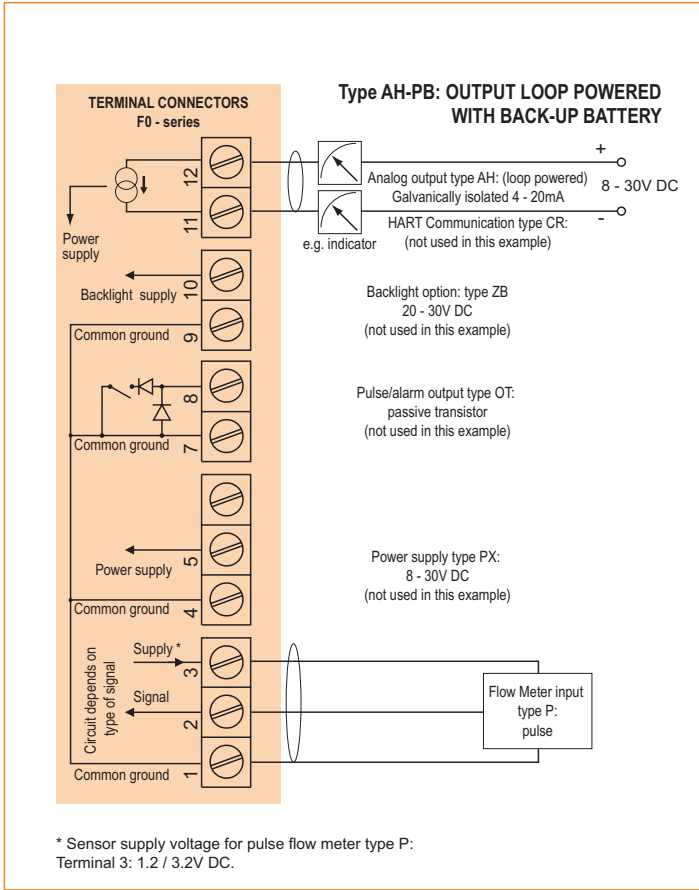
HART® is a registered trademark of the HART Communication Foundation

Enclosures

Various types of enclosures can be selected, all ATEX and IECEx approved. As standard the F018 is supplied in an GRP panel mount enclosure. Most popular is our aluminum field mount enclosure with IP67 / NEMA 4X rating. Both European or U.S. cable gland entry threads are available.

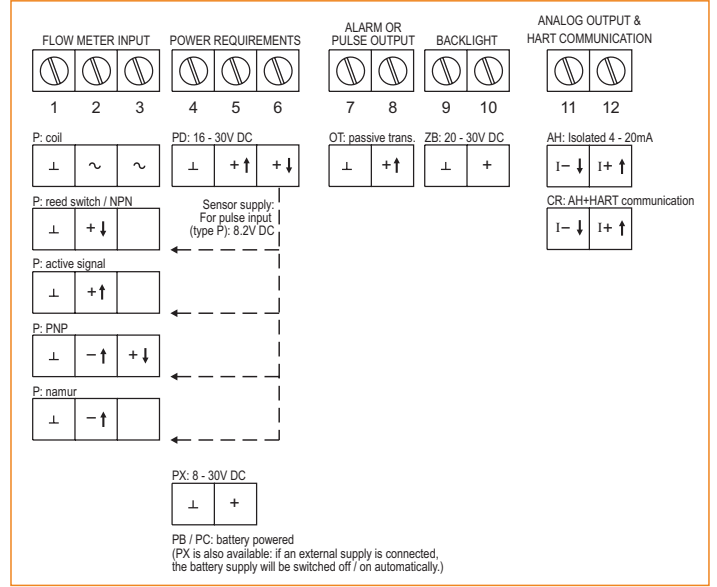
Configuration examples

Safe area - Fo18-P-AH-CX-PB



Terminal connections

Power requirement PB/PC - PD - PX



Hazardous area applications

The Fo18 has been certified according ATEX and IECEx by DEKRA and according CSA c-us with an ambient temperature of -40°C to +70°C (-40°F to +158°F). FM is pending.

- The **ATEX** markings are:
 - Gas: **Ex II 1 G Ex ia IIC T4 Ga.**
 - Dust: **Ex II 1 D Ex ia IIIC T100°C Da.**
- The **IECEx** markings are:
 - Gas: **Ex ia IIC T4 Ga.**
 - Dust: **Ex ia IIIC T100°C Da.**
- The **CSA c-us** markings are:
 - Class I/II/III, Division 1, Groups A, B, C, D, E, F, G, Temperature class T4 and Class I, Zone o, AEx ia IIC T4.

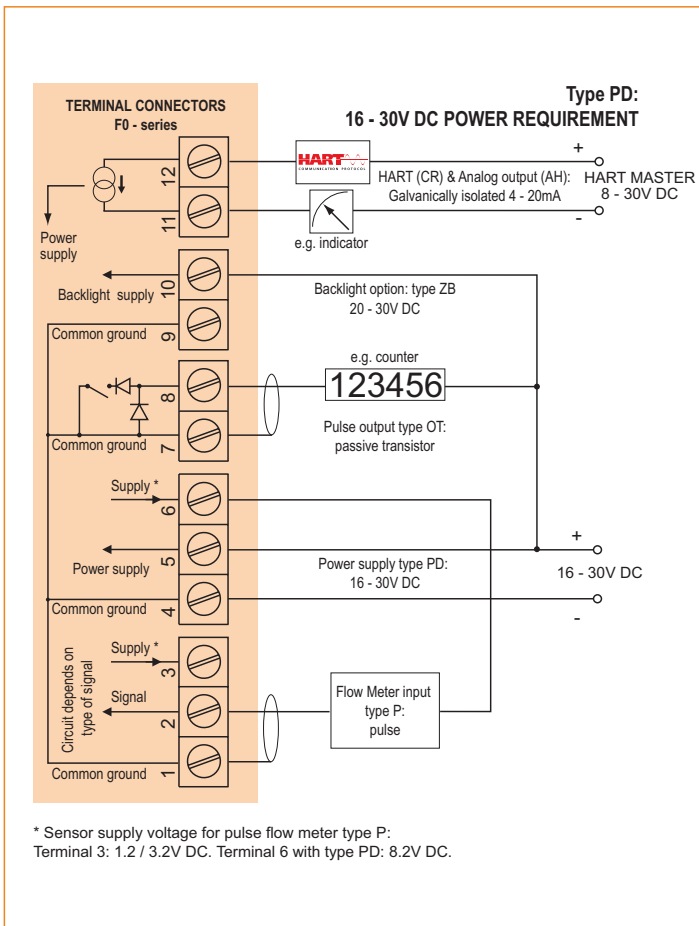
It is allowed to connect up to three I.S. power supplies to power the unit, sensor and backlight. Consult the certificate for the maximum input and output values of the circuits. The Fo18-PD-XI offers a 8.2V DC sensor supply to power e.g. a Namur sensor or the input voltage to power an analog sensor. Please contact your supplier for further details.

Certificate of conformity

KEMA 05ATEX1168 X • IECEx KEM 08.0006X • CSA.08.2059461 X

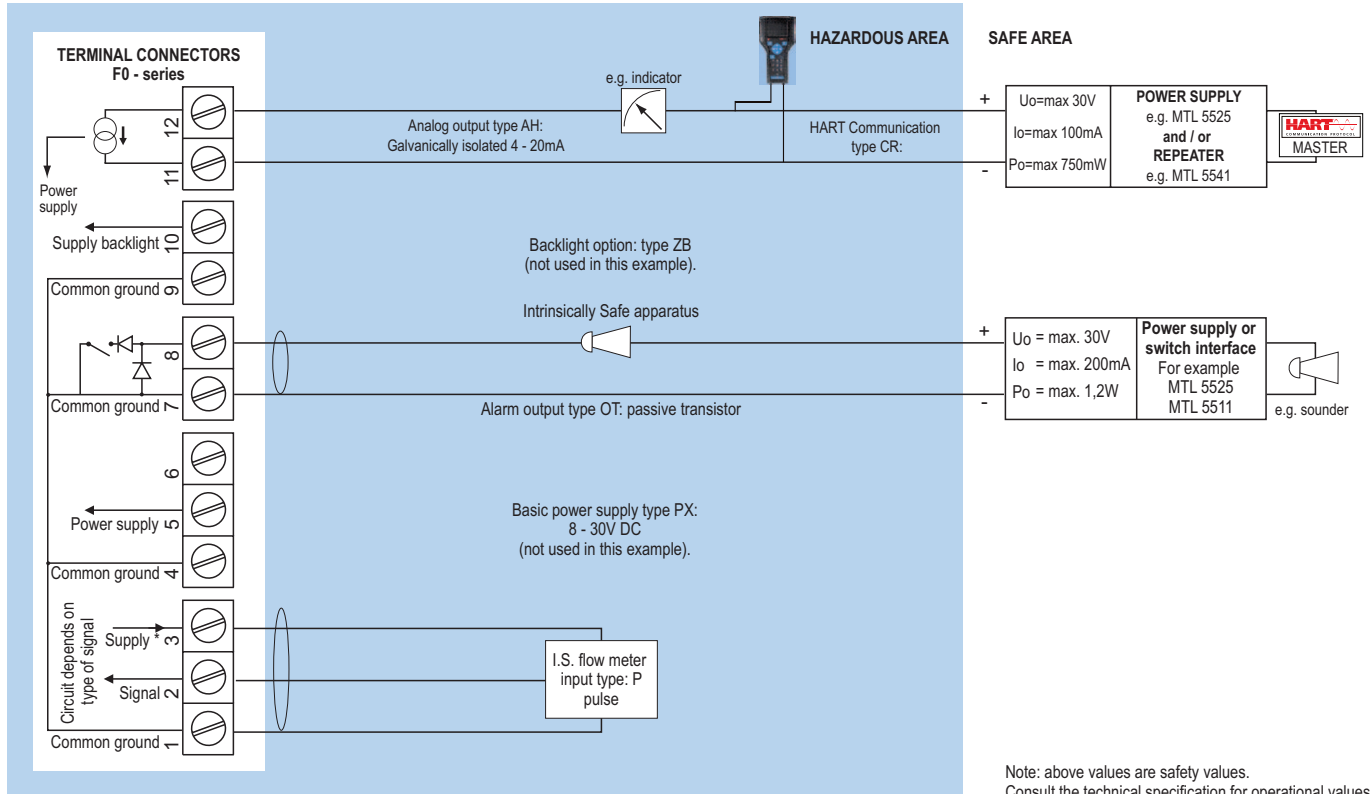


Safe area Fo18-P-AH-CR-OT-PD-ZB



Configuration examples

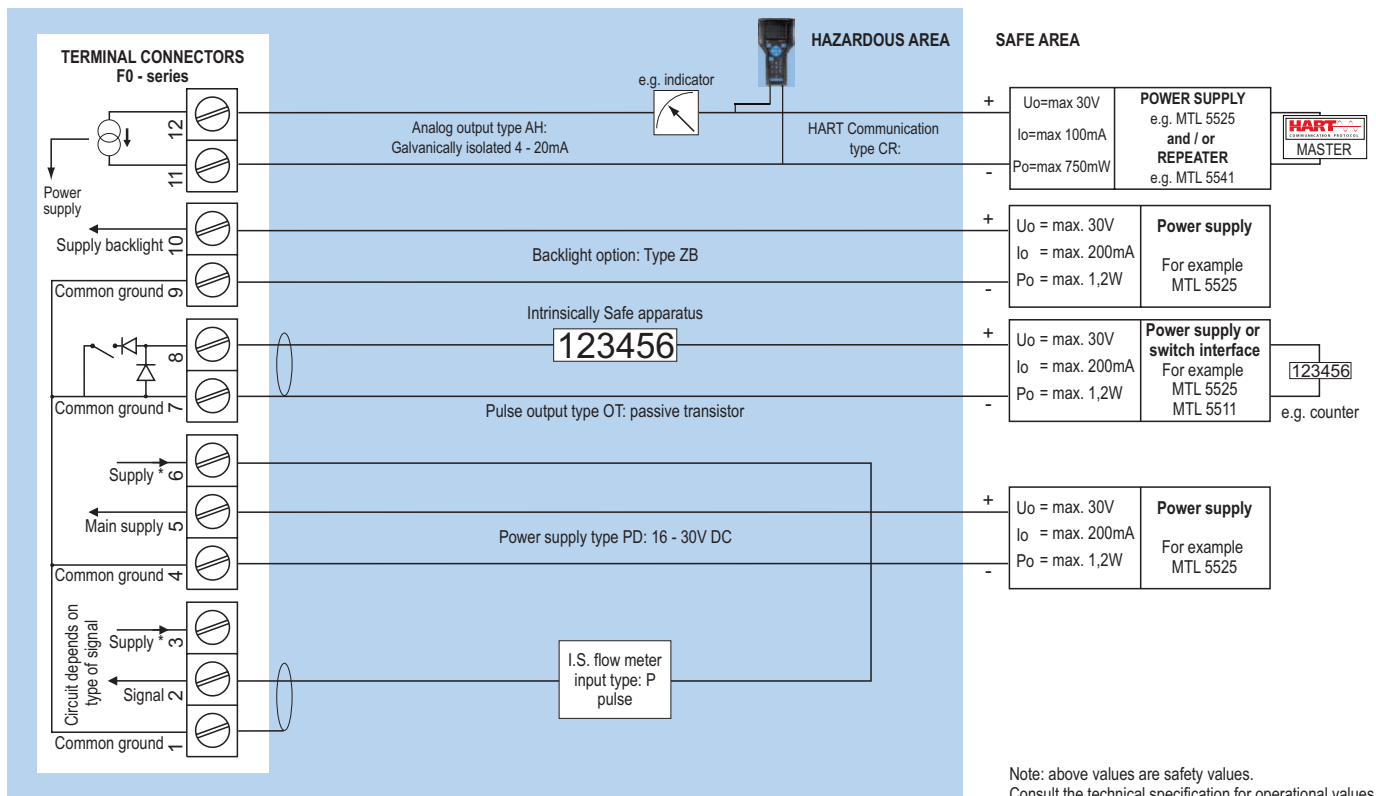
Ex ia IIC / IIIC - Fo18-P-AH-CR-OT-PX-XI - Output loop powered



* Sensor supply voltage for pulse flow meter type P : Terminal 3: 1.2 / 3.2V DC.

Please note: type PX may be used in combination with the battery (type PC). PX will power the unit; the battery will be disabled automatically till power is disconnected.

Ex ia IIC / IIIC - Fo18-P-AH-CR-OT-PD-XI-ZB - Power requirement 16 - 30V DC



* Sensor supply voltage for pulse type P: Terminal 3: 1.2V / 3.2V DC. Terminal 6: 8.2V DC.

Please note: type PD may be used in combination with the battery (type PC). PD will power the unit; the battery will be disabled automatically till power is disconnected.

Technical specification

General

Display	
Type	High intensity reflective numeric and alphanumeric LCD, UV-resistant.
Dimensions	90 x 40mm (3.5" x 1.6").
Digits	Seven 17mm (0.67") and eleven 8mm (0.31") digits. Various symbols and measuring units.
Refresh rate	User definable: fast, 1sec, 3sec, 15sec, 30sec, off.
Option ZB	Transflective LCD with bi-color LED-backlight; green / amber. Intensity and color selected through the keyboard. Good readings in full sunlight and darkness. Also available Intrinsically Safe.

Ambient temperature

Standard unit	-40°C to +80°C (-40°F to +176°F).
Intrinsically Safe	-40°C to +70°C (-40°F to +158°F).

Power requirements

Type PB	Long life Lithium battery - life-time depends upon settings and configuration - up to 5 years.
Type PC	Intrinsically Safe long life lithium battery - life-time depends upon settings and configuration - up to 5 years.
Type PD	16 - 30V DC. Power consumption max. 1 Watt.
Type PX	8 - 30V DC. Power consumption max. 0.3 Watt.
Type ZB	20 - 30V DC. Power consumption max. 1 Watt.
Type AH	10 - 30V DC. Power consumption max. 0.7 Watt.
Note PB	Not available Intrinsically Safe.
Note	For Intrinsically Safe applications, consult the safety values in the certificate.

Sensor excitation

Type PB/PC/PX	3.2V DC for pulse signals and 1.2V DC for coil
Type AH	pick-up.
Note	This is not a real sensor supply. Only suitable for sensors with a very low power consumption like coils (sine wave) and reed-switches.
Type PD	1.2 / 3.2 / 8.2V DC - Max. 5mA@8.2V DC.

Terminal connections

Type	Removable plug-in terminal strip. Wire max. 1.5mm ² and 2.5mm ² .
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Data protection

Type	EEPROM backup of all settings. Backup of running totals every minute. Data retention at least 10 years.
Pass-code	Configuration settings can be pass-code protected.

Enclosure

General	
Window	Polycarbonate window.
Sealing	Silicone.
Control keys	Three industrial micro-switch keys. UV-resistant silicone keypad.

Aluminum wall / field mount enclosures

General	Die-cast aluminum wall/field mount enclosure IP67 / NEMA 4X with 2-component UV-resistant coating.
Dimensions	130 x 120 x 75mm (5.12" x 4.72" x 2.95") - W x H x D.
Weight	1100 gr.
Type HA	Cable entry: 2 x PG9 and 1 x M20.
Type HL	Cable entry: 2 x 1/2" NPT.
Type HM	Cable entry: 2 x M16 and 1 x M20.
Type HN	Cable entry: 1 x M20.
Type HO	Cable entry: 2 x M20.
Type HP	Cable entry: 6 x M12.
Type HT	Cable entry: 1 x 1/2" NPT.
Type HU	Cable entry: 3 x 1/2" NPT.
Type HV	Cable entry: 4 x M20.
Type HZ	Cable entry: no holes.





GRP wall / field mount enclosures

General	GRP wall/field mount enclosure IP67 / NEMA 4X, UV-resistant and flame retardant.
Dimensions	130 x 120 x 75mm (5.12" x 4.72" x 2.95") - W x H x D.
Weight	600 gr.
Type HD	Cable entry: no holes.
Type HE	Cable entry: 2 x Ø 16mm and 1 x Ø 20mm.
Type HF	Cable entry: 1 x Ø 22mm (7/8").
Type HG	Cable entry: 2 x Ø 20mm.
Type HH	Cable entry: 6 x Ø 12mm.
Type HJ	Cable entry: 3 x Ø 22mm (7/8").
Type HK	Flat bottom, cable entry: no holes.

Panel mount enclosures

Dimensions	130 x 120 x 60mm (5.12" x 4.72" x 2.36") - W x H x D.
Panel cut-out	115 x 98mm (4.53" x 3.86") L x H.
Type HB	Die-cast aluminum panel mount enclosure IP65 / NEMA 4X.
Weight	600 gr.
Type HC	GRP panel mount enclosure IP65 / NEMA 4X, UV-resistant and flame retardant.
Weight	450 gr.

Hazardous area

Intrinsically Safe	
ATEX certification	 II 1 G Ex ia IIC T4 Ga.  II 1 D Ex ia IIC T100°C Da.
IECEx certification	 Ex ia IIC T4 Ga.  Ex ia IIC T100°C Da.
CSA c-us	Intrinsically Safe for Class I/II/III, Div. 1, Groups A, B, C, D, E, F, G, Temp. class T4 and Class I, Zone o, AEx ia IIC T4.
Ambient Ta	-40°C to +70°C (-40°F to +158°F).

Directives & Standards	
EMC	Directive 2004/108/EC, FCC 47 CFR part 15.
Low voltage	Directive 2006/95/EC.
ATEX/IECEx	Directive 94/9/EC, IEC 60079-0, IEC 60079-11, IEC 60079-26.
IP & NEMA	EN 60529 & NEMA 250.
HART	HCF Verified, ID6039.

Signal input

Flow meter sensor	
Linearization	Fifteen free definable linearization positions with interpolation function.
Type P	Coil / sine wave (HI: 20mVpp or LO: 80mVpp - sensitivity selectable), NPN/PNP, open collector, reed-switch, Namur, active pulse signals 8 - 12 and 24V DC.
Frequency	Minimum 0Hz - maximum 7kHz for total and flow rate. Maximum frequency depends on signal type and internal low-pass filter. E.g. reed switch with low-pass filter: max. frequency 120Hz.
K-Factor	0.000010 - 9,999,999 with variable decimal position.
Low-pass filter	Available for all pulse signals.
Option ZF	coil sensitivity 10mVpp.
Option ZG	coil sensitivity 5mVpp.

Signal output

Digital output	
Function	<ul style="list-style-type: none"> Pulse output - transmitting accumulated total. Alarm output: low, high or both alarms.
Frequency	Max. 500Hz. Pulse length user definable between 1msec up to 10 seconds.
Type OT	One passive transistor output (NPN) - not isolated. Max. 50V DC - 300mA per output.

Analog output	
Function	Transmitting linearised flow rate.
Accuracy	12 bit. maximum stepsize 0.01mA. Analog output signal can be scaled to any desired range.
Type AH	Galvanically isolated, loop powered 4 - 20mA output for Intrinsically Safe applications.
Linear overrang	-0.125% ± 0.1% ... +3.125% ± 0.1% / 3.8mA ... 20.5mA
Maximum current	106.125% / 21.0mA.
Multidrop current	Parked @ 4.0mA.

Communication option	
Function	Reading display information, reading / writing all configuration settings.
Type CR	HART Communication protocol, Revision 7.0.
Liftoff voltage	10V.
Loop resistance	Typical 250Ohm. Min. 120Ohm. Max. 666Ohm @ 24V.
Addressing	Selectable 0 ... 63.

Operational

Operator functions	
Displayed functions	<ul style="list-style-type: none"> Linearised flow rate and / or total. Linearised total and accumulated total. Total can be reset to zero by pressing the CLEAR-key twice. Alarm values low - high flowrate. Alarm values can be entered (can be disabled).

Total	
Digits	7 digits.
Units	L, m ³ , GAL, USGAL, kg, lb, bbl, no unit.
Decimals	0 - 1 - 2 or 3.
Note	Total can be reset to zero.

Accumulated total	
Digits	11 digits.
Units / decimals	According to selection for total.
Note	Can not be reset to zero.

Flow rate	
Digits	7 digits.
Units	l/sec - l/min - l/hr - nm ³ /sec - nm ³ /min - nm ³ /hr - nm ³ /day - g/sec - g/min - g/hr - kg/sec - kg/min - kg/hr - kg/day - ton/min - ton/hr - ton/day - gal/sec - gal/min - gal/hr - gal/day - bbl/sec - bbl/min - bbl/hr - bbl/day - lb/sec - lb/min - lb/hr - lb/day - cf/sec - cf/min - cf/hr - rev/sec - rev/min - none.
Decimals	0 - 1 - 2 or 3.

Alarm values	
Digits	7 digits.
Units	According to selection for flow rate.
Decimals	According to selection for flow rate.
Time units	According to selection for flow rate.
Type of alarm	Low and high flow rate alarm. Includes alarm delay time and configurable alarm output.

Datasheet F018

So robust, you can even stand on it!



Reliable

Count on us.

Ordering information

Standard configuration: F018-P-AH-CX-HC-OT-PX-XX-ZX.

Ordering information: F018	-P	-AH	-C	-H	-OT	-P	-X	-Z
Flow meter input signal								
P Pulse input: coil, npn, pnp, namur, reed-switch.								
Analog output signal								
AH Galvanically isolated, loop powered 4-20mA output.								
Communication								
CR HART Communication protocol.								
CX No communication.								
Panel mount enclosures - IP65 / NEMA4X								
HB Aluminum enclosure.								
HC GRP enclosure.								
GRP field / wall mount enclosures - IP67 / NEMA4X								
HD Cable entry: no holes.								
HE Cable entry: 2 x Ø 16mm & 1 x Ø 20mm.								
HF Cable entry: 1 x Ø 22mm (7/8").								
HG Cable entry: 2 x Ø 20mm.								
HH Cable entry: 6 x Ø 12mm.								
HJ Cable entry: 3 x Ø 22mm (7/8").								
HK Flat bottom, cable entry: no holes.								
Aluminum field / wall mount enclosures - IP67 / NEMA4X								
HA Cable entry: 2 x PG9 + 1 x M20.								
HL Cable entry: 2 x 1/2"NPT.								
HM Cable entry: 2 x M16 + 1 x M20.								
HN Cable entry: 1 x M20.								
HO Cable entry: 2 x M20.								
HP Cable entry: 6 x M12.								
HT Cable entry: 1 x 1/2"NPT.								
HU Cable entry: 3 x 1/2"NPT.								
HV Cable entry: 4 x M20.								
HZ Cable entry: no holes.								
Digital output signal								
OT One passive transistor output - standard configuration.								
Power requirements								
PB Lithium battery powered.								
PC Lithium battery powered - Intrinsically Safe.								
PD 16 - 30V DC + sensor supply.								
PX Basic power supply 8 - 30V DC (no real sensor supply).								
Hazardous area								
XI Intrinsically Safe, according ATEX, IECEx. and CSA c-us (FM is pending).								
XX Safe area only.								
Other options								
ZB Backlight.								
ZF Coil input 10mVpp.								
ZG Coil input 5mVpp.								
ZX No options.								

The bold marked text contains the standard configuration.

Available Intrinsically Safe.



Quality
ISO 9001
www.dekra-qa.com

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