FLOW RATE INDICATOR / TOTALIZER
WITH LINEARISATION AND PULSE SIGNAL OUTPUT

Features
• Displays instantaneous flow rate, total and accumulated total.
• Eight point linearisation of the flowcurve - with interpolation.
• Large 17mm (0.67”) digit selection for flow rate or total.
• Ability to process all types of flowmeter signals.
• Auto backup of settings and running totals.
• Operational temperature -40°C up to +80°C (-40°F up to 178°F).
• Very compact design for panel mount, wall mount or field mount applications.
• Rugged aluminum field mount enclosure IP67/NEMA4X.
• Intrinsically Safe - ATEX, IECEx and CSA approval for gas and dust applications.
• Explosion/flame proof II 2 GD EEx d IIB T5.
• LED backlight option.
• Loop or battery powered, 8 - 24V AC/DC or 115 - 230V AC power supply.
• Sensor supply 3.2 / 8.2 / 12 / 24V DC.

Signal output
• Scaled pulse output according to linearised accumulated total.

Signal input
Flow
• Reed-switch.
• NAMUR.
• NPN/PNP pulse.
• Sine wave (coil).
• Active pulse signals.
• (0)4 - 20mA.
• 0 - 10V DC.

Applications
• Liquid flow measurement with mechanical flowmeters where a precise calculation over the full measurement range is required. Also re-transmission of the totalizer function is desired. Alternative more advanced models: F112 - F118.
General information

Introduction
The F016 is a local indicator with linearisation to display the actual flow rate, total and non-resettable accumulated total. In addition to the average K-Factor or Span, eight linearisation points can be entered with their frequencies or values. The unit will interpolate between these points greatly enhancing accuracy in any flowrange. Even for very low frequency applications it is catered for. This linearisation affects all displayed information as well as the pulse output. A wide selection of options further enhance this model’s capabilities, including Intrinsically Safe.

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 selection. 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. The background color green or amber and the intensity can be adjusted from the keyboard. The display is a transflective type, which means that a high contrast reading is guaranteed in full sunlight as well as during the night. This backlight option is also available Intrinsically Safe.

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, therefore avoiding confusing abbreviations. Once familiar with one F-series product, you will be able to program all models in the series without a manual.

Pulse output
The scaleable pulse output reflects the count on the accumulated display. The pulse length is user defined from 0.001 second up to 10 seconds. The maximum output frequency is 500Hz. The output signal can be a passive NPN or an active PNP transistor, or an isolated electro-mechanical relay.

Signal input
The F016 will accept most pulse and analog input signals for flow or mass flow measurement. The input signal type can be selected by the user in the configuration menu without having to adjust any sensitive mechanical dip-switches, jumpers or trimmers. The analog input version is even available as 4 - 20mA input loop powered display.

Hazardous area
For hazardous area applications, this model has been ATEX, IECEx and CSA certified Intrinsically Safe for gas and dust applications, with an allowed operational temperature of -40°C to +70°C (-40°F to +158°F). FM certification is expected to be available in 2009. A flame proof enclosure with ATEX certification offers the rating II 2 GD Ex d IIB T5.

Enclosures
Various types of enclosures can be selected, all ATEX, IECEx and CSA approved. As standard the F016 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.

Overview application F016
Dimensions enclosures
Aluminum & GRP panel mount enclosure

Aluminum & GRP field / wall mount enclosures

Terminal connections power supply
PB/PC - PD - PL - PX

Terminal connections power supply PF - PM

Flat bottom, no holes available.
**Typical wiring diagram F016-P-(OT)-PB-(PX)-(ZB)**

**Typical wiring diagram F016-A-OT-PX-ZB**

**Typical wiring diagram F016-A-(OT)-PL-ZB**

**Typical wiring diagram F016-P-OT-PD-ZB**

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

*Sensor supply voltage for analog flowmeter type A / U: Terminal 3: not available.*

---

**TERMINAL CONNECTORS**

F0-series

Backlight supply

Common ground

Common ground

Main supply

Common ground

Signal

Flowmeter input type P: pulse

**Type PB: BATTERY POWERED**

Backlight option: type ZB

20 - 30V DC

(Not used in this example)

Pulse output type OT: passive transistor

(Not used in this example)

Power supply type PX:

8 - 30V DC

(Not used in this example)

**Type PL: INPUT LOOP POWERED**

Backlight option: type ZB

20 - 30V DC

Sensor supply: sensor is externally powered.

---

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

*Sensor supply voltage for analog flowmeter type A / U:
Terminal 3: not available.*

---

**Type PX:**

**Type PX: BASIC 8 - 30V DC POWER SUPPLY (STANDARD)**

**Type PD:**

**Type PD: 16 - 30V DC POWER SUPPLY**

Backlight option: type ZB

20 - 30V DC

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

*Sensor supply voltage for analog flowmeter type A / U:
Terminal 3: not available.

*Sensor supply voltage for analog flowmeter type A / U:
Terminal 3: not available.

*Sensor supply voltage for analog flowmeter type A / U:
Terminal 3: not available.

*Sensor supply voltage for analog flowmeter type A / U:
Terminal 3: not available.

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

*Sensor supply voltage for analog flowmeter type A / U:
Terminal 3: not available.

*Sensor supply voltage for analog flowmeter type A / U:
Terminal 3: not available.

*Sensor supply voltage for analog flowmeter type A / U:
Terminal 3: not available.

*Sensor supply voltage for analog flowmeter type A / U:
Terminal 3: not available.

*Sensor supply voltage for analog flowmeter type A / U:
Terminal 3: not available.

*Sensor supply voltage for analog flowmeter type A / U:
Terminal 3: not available.
**Typical wiring diagram Fo16-P-OA-PF-ZB**

**TERMINAL CONNECTORS**
- **Type PF:**
  - 24V AC / DC POWER SUPPLY

- **Backlight option:** type ZB
- Internally powered.

- **Supply**
- **Signal**

- **Circuit depends on type of signal**

- **Flowmeter input type P:** pulse

- **Main supply**

- **Power supply type PF:** 8 - 24V AC / DC

- **Common ground**

- **123456** e.g. counter

- **Pulse output type OA:** active 24V DC pulse

- **Earth**

* Sensor supply voltage for pulse flowmeter type P:
  Terminal 7: 1.2 / 3.2 / 8.2 / 12 / 24V DC.

* Sensor supply voltage for analog flowmeter type A / U:
  Terminal 7: 8.2 / 12 / 24V DC.

**Typical wiring diagram Fo16-A-OT-PF-ZB**

**TERMINAL CONNECTORS**
- **Type PF:**
  - 24V AC / DC POWER SUPPLY

- **Backlight option:** type ZB
- Internally powered.

- **Flowmeter input type A:** (0)4 - 20mA

- **E.P. counter**

- **Main supply**

- **Power supply type PF:** 8 - 24V AC / DC

- **Common ground**

- **123456** e.g. counter

- **Pulse output type OT:** passive transistor

* Sensor supply voltage for pulse flowmeter type P:
  Terminal 7: 1.2 / 3.2 / 8.2 / 12 / 24V DC.

* Sensor supply voltage for analog flowmeter type A / U:
  Terminal 7: 8.2 / 12 / 24V DC.

**Typical wiring diagram Fo16-A-OA-PM-ZB**

**TERMINAL CONNECTORS**
- **Type PM:**
  - 115 - 230V AC POWER SUPPLY

- **Backlight option:** type ZB
- Internally powered.

- **Flowmeter input type A:** (0)4 - 20mA

- **-**

- **Main supply**

- **Power supply type PM:** 115 - 230V AC

- **Common ground**

- **123456** e.g. counter

- **Pulse output type OA:** active 24V DC pulse

* Sensor supply voltage for pulse flowmeter type P:
  Terminal 7: 1.2 / 3.2 / 8.2 / 12 / 24V DC.

* Sensor supply voltage for analog flowmeter type A / U:
  Terminal 7: 8.2 / 12 / 24V DC.

**Typical wiring diagram Fo16-P-OR-PM-ZB**

**TERMINAL CONNECTORS**
- **Type PM:**
  - 115 - 230V AC POWER SUPPLY

- **Backlight option:** type ZB
- Internally powered.

- **Flowmeter input type P:** pulse

- **L1**

- **Main supply**

- **Power supply type PM:** 115 - 230V AC

- **Common ground**

- **123456** e.g. counter

- **Pulse output type OR:** mechanic relay

* Sensor supply voltage for pulse flowmeter type P:
  Terminal 7: 1.2 / 3.2 / 8.2 / 12 / 24V DC.

* Sensor supply voltage for analog flowmeter type A / U:
  Terminal 7: 8.2 / 12 / 24V DC.
Hazardous area applications
The F016-XI has been certified according ATEX and IECEx by KEMA and according CSA c-us for use in Intrinsically Safe applications with an ambient temperature of -40°C to +70°C (-40°F to +158°F).

- The ATEX markings for gas and dust applications are:
  - II 1 G Ex ia IIC T4
  - II 1 D Ex iaD 20 IP 65/67 T 100 °C.
- The IECEx markings for gas and dust applications are: Ga Ex ia IIC T4 and Ex iaD 20 IP 65/67 T100 °C.
- 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 0, AEx ia IIC T4.
- FM approval is expected to become available in 2009.

It is allowed to connect up to three I.S. power supplies to power the unit, sensor and backlight. The F016-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. An ATEX approved flame proof enclosure with rating II 2 GD EEx d IIB T5 is available as well. Please contact your supplier for further details.

Certificate of conformity KEMA 05ATEX1168 X
- IECEx KEM 08.0006X • CSA.08.2059461 X

Configuration example IIA - IIB and IIC
F016-P-(OT)-(PC)-(PX)-XI-(ZB) - Battery powered unit

<table>
<thead>
<tr>
<th>TERMINAL CONNECTORS</th>
<th>HAZARDOUS AREA</th>
<th>SAFE AREA</th>
</tr>
</thead>
<tbody>
<tr>
<td>F0 - series</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12 3</td>
<td>Common ground</td>
<td></td>
</tr>
<tr>
<td>Signal</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Supply *</td>
<td>Circuit depends on type of signal</td>
<td></td>
</tr>
<tr>
<td>7 8</td>
<td>Common ground</td>
<td></td>
</tr>
<tr>
<td>4 5</td>
<td>Common ground</td>
<td></td>
</tr>
<tr>
<td>Main supply</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9 10</td>
<td>Common ground</td>
<td></td>
</tr>
<tr>
<td>Supply backlight</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Sensor supply voltage for pulse flowmeter 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.
Configuration example IIA - IIB and IIC - F016-P-OT-PX-XI-(ZB) - Basic power supply 8 - 30V DC

TERMINAL CONNECTORS
F0 - series
- Supply backlight
- Common ground
- Main supply
- Common ground
- Circuit depends on type of signal
- Supply
- Signal

HAZARDOUS AREA
- Backlight option: type ZB (not used in this example).
- Intrinsically Safe apparatus
- Pulse output type OT: passive transistor
- Power supply type PX: 8 - 30V DC

SAFE AREA
- + U₀ = max. 30V
- I₀ = max. 200mA
- P₀ = max. 1,2W
- Power supply or switch interface
  For example MTL5025
  MTL5011B
e.g. counter
- + U₀ = max. 30V
- I₀ = max. 200mA
- P₀ = max. 1,2W
- Power supply
  For example MTL5025

Note: above values are safety values. Consult the technical specification for operational values.

* Sensor supply voltage for pulse type P: Terminal 3: 1.2V / 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.

Configuration example IIA - IIB and IIC - F016-P-OT-PX-XI-ZB - Basic power supply 8 - 30V DC

TERMINAL CONNECTORS
F0 - series
- Supply backlight
- Common ground
- Main supply
- Common ground
- Circuit depends on type of signal
- Supply
- Signal

HAZARDOUS AREA
- Backlight option: type ZB (not used in this example).
- Intrinsically Safe apparatus
- Pulse output type OT: passive transistor
- Power supply type PX: 8 - 30V DC

SAFE AREA
- + U₀ = max. 30V
- I₀ = max. 200mA
- P₀ = max. 0.75W
- Power supply or switch interface
  For example MTL5025
  MTL5011B
e.g. counter
- + U₀ = max. 30V
- I₀ = max. 200mA
- P₀ = max. 1,2W
- Power supply
  For example MTL5025
- + U₀ = max. 30V
- I₀ = max. 150mA
- P₀ = max. 0.92W
- Power supply
  For example MTL5025

Note: above values are safety values. Consult the technical specification for operational values.

* Sensor supply voltage for pulse type P: Terminal 3: 1.2V / 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.
Configuration example IIA - IIB and IIC - F016-P-OT-PD-XI-ZB - Power supply 16 - 30V DC

TERMINAL CONNECTORS
F0 - series

HAZARDOUS AREA

SAFE AREA

* 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.

Note: above values are safety values. Consult the technical specification for operational values.

Configuration example IIA - IIB and IIC - F016-A-OT-PD-XI-ZB - Power supply 16 - 30V DC

TERMINAL CONNECTORS
F0 - series

HAZARDOUS AREA

SAFE AREA

* Sensor supply voltage for analog flowmeter type A / U: Terminal 6: as input voltage terminal 5 (internally linked).
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.
Configuration example IIA - IIB and IIC - F016-A-OT-PL-XI-ZB - Input loop powered

**TERMINAL CONNECTORS**

- **F0 - series**
  - Supply backlight
  - Common ground
  - Common ground
  - Main supply
  - Signal
  - Circuit dependent on type of signal

**HAZARDOUS AREA**

- Backlight option: type ZB
- Intrinsically Safe apparatus
- Pulse output type OT: passive transistor
- I.S. flowmeter input: type A-PL: 4-20mA input loop powered.

**SAFE AREA**

- Power supply
  - $U_o = 30V$
  - $I_o = 200mA$
  - $P_o = 0.75W$
  - For example MTL5025

- Power supply or switch interface
  - For example MTL5025 MTL5011B e.g. counter

**Note:** above values are safety values. Consult the technical specification for operational values.

Sensor supply is not available: unit is input loop powered (type PL).

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

---

**Configuration example IIA - IIB and IIC - F016-A-OT-PX-XI-ZB - Basic power supply 8 - 30V DC**

**TERMINAL CONNECTORS**

- **F0 - series**
  - Supply backlight
  - Common ground
  - Common ground
  - Main supply
  - Signal
  - Circuit dependent on type of signal

**HAZARDOUS AREA**

- Backlight option: type ZB
- Intrinsically Safe apparatus
- Pulse output type OT: passive transistor
- I.S. flowmeter input: type A: (0)-4-20mA

**SAFE AREA**

- Power supply
  - $U_o = 30V$
  - $I_o = 93mA$
  - $P_o = 0.92W$
  - For example MTL5025

- Power supply or switch interface
  - For example MTL5025 MTL5011B e.g. counter

**Note:** above values are safety values. Consult the technical specification for operational values.

* Sensor supply voltage for analog flowmeter type A / U: not available in this example.

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.
Technical specification

Display

General

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: 8 times/sec. - 30 secs - off.
Option ZB Transflective LCD with bi-color LED-backlight; green / amber. Intensitiy and color selected trough the keyboard. Good readings in full sunlight and darkness. Also available Intrinsically Safe.

Operating temperature

Standard unit -40°C to +80°C (-40°F to +178°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 PF 24V AC / DC ± 10%. Power consumption max. 15 Watt.
Type PL Input loop powered from sensor signal 4 - 20mA (type A).
Type PM 115 - 230V AC ± 10%. Power consumption max. 15 Watt.
Type PX For pulse signals: 1.2 / 3.2 / 8.2 / 12 / 24V DC - max. 400mA @ 24V DC.
With analog input: 8.2 / 12 / 24V DC - max. 400mA @ 24V DC.
Type ZB 20 - 30V DC. Power consumption max. 1 Watt.

Note PB/PF/PM Not available Intrinsically Safe.
Note PF/PM The total consumption of the sensor, active output type OA and backlight type ZB may not exceed 400mA @ 24V DC.

Sensor excitation

Type PB/PC/PX 3.2V DC for pulse signals and 1.2V DC for coil pick-up.
Type PD 16 - 30V DC. Power consumption max. 1 Watt.
Type PF 24V AC / DC ± 10%. Power consumption max. 15 Watt.
Type PL Input loop powered from sensor signal 4 - 20mA (type A).
Type PM 115 - 230V AC ± 10%. Power consumption max. 15 Watt.
Type PX For pulse signals: 1.2 / 3.2 / 8.2 / 12 / 24V DC - max. 400mA @ 24V DC.
With analog input: 8.2 / 12 / 24V DC - max. 400mA @ 24V DC.

Note For Intrinsically Safe applications, consult the safety values in the certificate.

Terminal connections

Type Removable plug-in terminal strip.
Wire max. 1.5mm² and 2.5mm².

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.

Casing

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 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 (\(\frac{7}{8}\))
Type HG Cable entry: 2 x Ø 20mm.
Type HH Cable entry: 6 x Ø 12mm.
Type HJ Cable entry: 3 x Ø 22mm (\(\frac{7}{8}\)).
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 4.
Weight 600 gr.
Type HC GRP panel mount enclosure IP65 / NEMA 4, UV-resistant and flame retardant.
Weight 450 gr.

ABS wall / field mount enclosures

General Silicone free ABS wall/field mount enclosure IP65 with EPDM and PE sealings. UV-resistant polyester keypad (old HD enclosure).
Dimensions 130 x 114 x 71mm (5.1" x 4.5" x 2.8") - W x H x D.
Weight 450 gr.
Type HS Cable entry: no holes.
### Hazardous area

<table>
<thead>
<tr>
<th>Certification</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>IECEx Ex iaD 20 IP 65 / 67 T 100 °C.</td>
<td>Inherently Safe for Class I, Zone 0, AEx ia IIC T4.</td>
</tr>
<tr>
<td>CSA c-us Intrinsically Safe</td>
<td>for Class I, Zone 0, AEx ia IIC T4.</td>
</tr>
</tbody>
</table>

### Explosion proof

<table>
<thead>
<tr>
<th>Certification</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ATEX XF</td>
<td>Dimensions of enclosure: 300 x 250 x 200mm (11.8&quot; x 9.9&quot; x 7.9&quot;) L x H x D.</td>
</tr>
</tbody>
</table>

### Environment


### Signal input

<table>
<thead>
<tr>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>P</td>
<td>Coil / sine wave (minimum 20mVpp or 80mVpp - sensitivity selectable), NPN/PNP, open collector, reed-switch, Namur, active pulse signals 8 - 12 and 24V DC.</td>
</tr>
<tr>
<td>Frequency</td>
<td>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 120kHz.</td>
</tr>
<tr>
<td>K-Factor</td>
<td>0.000001 - 9,999,999 with variable decimal position.</td>
</tr>
<tr>
<td>Low-pass filter</td>
<td>Available for all pulse signals.</td>
</tr>
<tr>
<td>Option ZF</td>
<td>Coil sensitivity 10mVpp.</td>
</tr>
<tr>
<td>Option ZG</td>
<td>Coil sensitivity 5mVpp.</td>
</tr>
<tr>
<td>Type A</td>
<td>(0)4 - 20mA. Analog input signal can be scaled to any desired range within 0 - 20mA.</td>
</tr>
<tr>
<td>Type U</td>
<td>0 - 10V DC. Analog input signal can be scaled to any desired range within 0 - 10V DC.</td>
</tr>
<tr>
<td>Accuracy</td>
<td>Resolution: 16 bit. Error &lt; 0.01mA / ± 0.05% FS. Low level cut-off programmable.</td>
</tr>
<tr>
<td>Span</td>
<td>0.001 / 999,999 with variable decimal position.</td>
</tr>
<tr>
<td>Update time</td>
<td>Four times per second.</td>
</tr>
<tr>
<td>Voltage drop</td>
<td>Type A: max. 2V DC @ 20mA.</td>
</tr>
<tr>
<td>Voltage drop</td>
<td>Type A - PL (loop powered): max. 2.6V DC @ 20mA.</td>
</tr>
<tr>
<td>Load impedance</td>
<td>Type U: 3kΩ.</td>
</tr>
<tr>
<td>Relationship</td>
<td>Linear and square root calculation.</td>
</tr>
<tr>
<td>Note</td>
<td>For sensor type A and U: external power to sensor is required; e.g. type PD.</td>
</tr>
</tbody>
</table>

### Signal output

<table>
<thead>
<tr>
<th>Function</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pulse output</td>
<td>Pulse output - transmitting accumulated total.</td>
</tr>
<tr>
<td>Frequency</td>
<td>Max. 500Hz. Pulse length user definable between 1μsec up to 10 seconds.</td>
</tr>
<tr>
<td>Type OA</td>
<td>One active 24V DC transistor output (PNP); load max. 400mA (requires PF or PM).</td>
</tr>
<tr>
<td>Type OR</td>
<td>One electro-mechanical relay output - isolated; max. switch power 230V AC (N.O.) - 0.5A (requires PF or PM).</td>
</tr>
<tr>
<td>Type OT</td>
<td>One passive transistor output (NPN) - not isolated. Max. 50V DC - 300mA per output.</td>
</tr>
</tbody>
</table>

### Operational

<table>
<thead>
<tr>
<th>Operator functions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Displayed</td>
</tr>
<tr>
<td>functions</td>
</tr>
<tr>
<td>Total</td>
</tr>
</tbody>
</table>

### Total

| Digits | 7 digits. |
| Units | L, m³, GAL, USGAL, KG, lb, bbl, no unit. |
| Decimals | 0 - 1 - 2 or 3. |
| Note | Can not 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 | mL, L, m³, Gallons, KG, Ton, lb, bl, cf, RND, ft³, scf, Nm³, NI, igal - no units. |
| Decimals | 0 - 1 - 2 or 3. |
| Time units | /sec - /min - /hr - /day. |

### Accessories

<table>
<thead>
<tr>
<th>Mounting accessories</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACF02</td>
</tr>
<tr>
<td>ACF05</td>
</tr>
<tr>
<td>ACF06</td>
</tr>
<tr>
<td>ACF07</td>
</tr>
<tr>
<td>ACF08</td>
</tr>
<tr>
<td>ACF09</td>
</tr>
<tr>
<td>ACF10</td>
</tr>
</tbody>
</table>

### Display example - 90 x 40mm (3.5” x 1.6”)

![Display example](image-url)
## Ordering information

**Standard configuration:** F016-P-HC-OT-PX-XX-ZX.

### Ordering information:

<table>
<thead>
<tr>
<th>Flowmeter Sensor input signal</th>
<th>F016</th>
<th>-</th>
<th>-H</th>
<th>-O</th>
<th>-P</th>
<th>-X</th>
<th>-Z</th>
</tr>
</thead>
<tbody>
<tr>
<td>A (0)4 - 20mA input.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>P Pulse input: coil, npn, pnp, namur, reed-switch.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>U 0 - 10V DC input.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Panel mount enclosures - IP65 / NEMA4

<table>
<thead>
<tr>
<th>HB</th>
<th>Aluminum enclosure.</th>
</tr>
</thead>
<tbody>
<tr>
<td>HC</td>
<td>GRP enclosure.</td>
</tr>
</tbody>
</table>

### GRP field / wall mount enclosures - IP67 / NEMA4X

<table>
<thead>
<tr>
<th>HD</th>
<th>Cable entry: no holes.</th>
</tr>
</thead>
<tbody>
<tr>
<td>HE</td>
<td>Cable entry: 2 x Ø 16mm &amp; 1 x Ø 20mm.</td>
</tr>
<tr>
<td>HF</td>
<td>Cable entry: 1 x Ø 22mm (7/8”).</td>
</tr>
<tr>
<td>HG</td>
<td>Cable entry: 2 x Ø 20mm.</td>
</tr>
<tr>
<td>HH</td>
<td>Cable entry: 6 x Ø 12mm.</td>
</tr>
<tr>
<td>HJ</td>
<td>Cable entry: 3 x Ø 22mm (7/8”).</td>
</tr>
<tr>
<td>HK</td>
<td>Flat bottom, cable entry: no holes.</td>
</tr>
</tbody>
</table>

### Aluminum field / wall mount enclosures - IP67 / NEMA4X

| HA | Cable entry: 2 x PG9 + 1 x M20. |
| 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 ½”NPT. |
| HU | Cable entry: 3 x ½”NPT. |
| HZ | Cable entry: no holes. |

### ABS field / wall mount enclosures

| HS | Silicone free ABS field enclosure IP65 – Cable entry: no holes (old HD enclosure). |

### Output

| OA | One active transistor output - requires PF or PM. |
| OR | One mechanical relay output - requires PF or PM. |
| OT | One passive transistor output - standard configuration. |

### Power supply

| PB | Lithium battery powered. |
| PC | Lithium battery powered - Intrinsically Safe. |
| PD | 16 - 30V DC + sensor supply. |
| PF | 24V AC / DC + sensor supply. |
| PL | Input loop powered from sensor signal 4 - 20mA (type A). |
| PM | 115 - 230V AC + sensor supply. |
| PX | Basic power supply 8 - 30V DC (no real sensor supply). |

### Hazardous area

| XI | Intrinsically Safe. |
| XF | EExd enclosure - 3 keys. |
| 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.

Specifications are subject to change without notice.