Features

- Displays instantaneous flow rate, total and accumulated total.
- Large 17mm (0.67”) digit selection for flow rate or total.
- Selectable on-screen engineering units; volumetric or mass.
- Ability to process all types of flowmeter signals.
- Auto backup of settings and running totals.
- Operational temperature -30°C up to +80°C (-22°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 II 1 GD EEx ia IIB/IIC T4 T100°C.
- Explosion/flame proof II 2 GD EEx d IIB T5.
- Analog and pulse signal outputs.
- Full Modbus communication RS232/485/TTL.
- 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

- (0)4 - 20mA / 0 - 10V DC according to flow rate.
- Scaled pulse output according to 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 where re-transmission of the flow rate and/or totalizer functions or serial communication is required. Alternative basic models: F010 - F011 - F012 - F014 or more advanced F112 - F113 - F118.
**General information**

**Introduction**
The F110 is the most popular model in our range of flow rate / totalizers, complete with pulse and analog output signals. Even demanding applications are catered for with our base unit configuration. A wide selection of options further enhance this model’s capabilities, including Intrinsic Safety and full Modbus communication.

**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.

**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 and baffling codes. Once familiar with one F-series product, you will be able to program all models in the series without a manual. All settings are safely stored in EEPROM memory in the event of sudden power failure.

**Analog output signal**
The flow rate is re-transmitted with the (0)4 - 20mA or 0 - 10V DC output signal. The output signal is updated ten times per second with a filter function being available to smoothen out the signal if desired. The output value is user defined in relation to the flow rate, e.g. 4mA equals to 15L/Hr and 20mA equals to 2000L/Hr. The output signal can be passive, active or isolated where the passive output type will loop power the F110 as well.

**Pulse output**
The scaleable pulse output, reflects the count on the accumulated display. The pulse length is user defined from 0.008 second up to 2 seconds. The maximum output frequency is 64Hz. The output signal can be a passive NPN, active PNP or an isolated electro-mechanical relay.

**Signal input**
The F110 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 or jumpers. The analog input versions are even available as 4-20mA input loop powered displays.

**Communication**
All process data and settings can be read and modified manually or through the Modbus communication link (RS232 / RS485). Full Modbus functionality remains available for the Intrinsically Safe version (TTL).

**Hazardous areas**
For hazardous area applications, this model has been ATEX certified Intrinsically Safe Ex ia I GD EE Ex ia IIB / IIC T4 T100°C with an allowed operational temperature of -30°C to +70°C (-22°F to +158°F). A flame proof enclosure is also available with the rating Ex da II 2 GD EE Ex d IIB T5.

**Enclosures**
Various types of enclosures can be selected, all ATEX approved. As standard the F110 is supplied in an GRP panel mount enclosure, which can be converted to an IP67 / NEMA 4X GRP field mount enclosure by the addition of a back case. Most popular is our rugged aluminum field mount enclosure with IP67 / NEMA 4X rating. Both European or U.S. cable gland entry threads are available.

**Overview application F110**

![Overview application F110 diagram]
Dimensions enclosures

Aluminum & GRP panel mount enclosure

Dimensions enclosures
Aluminum & GRP field / wall mount enclosures

Terminal connections

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

Total

1742638

Rate

1853.9 L/Min
**Typical wiring diagram F110-P-(AP)-CH-IB-OT-PB**

- **Modbus communication type CH:** RS485 - 2 wire

**TERMINAL CONNECTORS**

- **F100-series**

**TERMINAL CONNECTORS**

- **F100-series**

**BATTERY POWERED**

- Common ground
- Signal
- Supply *
- Circuit depends on type of signal
- Flowmeter input type: P pulse
- Status input type IB: reset total
- + 3.2V low-pass filter
- Common ground
- Supply *
- Circuit depends on type of signal
- Flowmeter input type: P pulse
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**OUTPUT LOOP POWERED**

- Common ground
- Signal
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- Flowmeter input type: P pulse
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- Common ground
- Signal
- Supply *
- Circuit depends on type of signal
- Flowmeter input type: P pulse
- Status input type IB: reset total
- + 3.2V low-pass filter

Please note: AP may be used in combination with the battery! AP will power the unit (output loop powered); the battery will be disabled automatically until power is disconnected.

* Supply voltage: 1.2 / 3.2V DC to sensor

* Supply voltage: 1.2 / 3.2V DC to sensor
**Typical wiring diagram F110-A-AA-CB-IB-OA-PD**

**24V AC / DC POWER SUPPLY**

- Modbus communication type CB: RS232

**TERMINAL CONNECTORS**

- F100-series

- TXD
- RXD
- DTR
- 12V

**Common ground**

- 8 - 24V DC

**Main supply**

- 8 - 24V AC

**Power supply type PD:**

- 8 - 24V AC / DC

- Earth

**Supply:**

- 3.2 / 8.2 / 12 / 24V DC

**Signal:**

- + 3.2V

**Status input type IB:**

- reset total

**Flowmeter input type A:**

- (0)4 - 20mA

**Analog output type AA:**

- active 4 - 20mA

**Pulse output type OA:**

- active 24V DC pulse

**E.g. indicator**

- 123456

**E.g. counter**

- 123456

**Earth**

- +

**E.g. indicator**

- 123456

**E.g. counter**

- 123456

**Pulse output type OR:**

- mechanic relay

**Status input type IB:**

- reset total

**Flowmeter input type A:**

- (0)4 - 20mA

**Power supply type PM:**

- 115 - 230V AC

**Analog output type AI:**

- passive isolated 4 - 20mA

**Modbus communication type CI:**

- RS485 - 4 wire

- 8 - 30V DC

**L1**

- N

**Earth**

- +

**Supply voltage:**

- 3.2 / 8.2 / 12 / 24V DC to sensor

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* Supply voltage: 3.2 / 8.2 / 12 / 24V DC to sensor
Hazardous area applications

The F110-XI has been ATEX approved by KEMA for use in Intrinsically Safe applications. It is approved according to II 1 GD EEx ia IIB/IIC T4 T100°C for gas and dust applications with an operational temperature range of -30°C to +70°C (-22°F to +158°F). Besides the I.S. power supply for the pulse output, it is allowed to connect up to three I.S. power supplies in IIB applications or one in IIC applications.

Full functionality of the F110 remains available, including 4 - 20mA output, pulse output and Modbus communication (type CT). Power supply type PD-XI offers a 8.2V sensor supply e.g. for one Namur sensor.

A 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 03ATEX1074 X

Configuration example IIB and IIC F110-P-(AP)-(CT)-IB-(OT)-PC-XI - Battery powered unit

* Note sensor supply voltage: 1.2V DC for coil sensors or 3.2V DC for other pulse sensors.
Configuration example IIB and IIC - F110-P-AP-(CT)-IB-OT-PX-XI - Output loop powered

**Analog output type AP:** passive 4 - 20mA (output loop powered)

**Flowmeter input type:** P pulse

**ISOLATOR:** I.S. Certified Isolator
- TTL to RS232 / RS422 / TTL
  - For example: MTL5051

**Power supply:**
- e.g. MTL 5025
- and/or
- REPEATER
  - e.g. MTL 5042

**Switch interface:**
- e.g. MTL 5011B

**Modbus communication type CT:** TTL
- Please note: communication type CT is not allowed in IIC applications.
- For example: MTL 5051

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

---

*Note sensor supply voltage: 1.2V DC for coil sensors or 3.2V DC for other pulse sensors.*
**Configuration example IIB and IIC - F110-A-AF-(CT)-IB-OT-PD-XI - Power supply 16 - 30V DC**

- **Main supply Power supply type PD:** 16 - 30V DC  
  (please note: PD and battery supply (type PC) is NOT allowed in IIC applications).

- **Power supply type PD:** 16 - 30V DC
  (please note: PD and battery supply (type PC) is NOT allowed in IIC applications).

- **Common ground**

- **TOTAL Cf (of all connected analog apparatus in IIC applications may not exceed 66nF - minus 17nF (17nF is used by the analog output signal terminal 7 + 8).**

- **Ci is negligibly small**

- **Flowmeter input type A:** passive floating 4 - 20mA  
  (please note: communication type CT is not allowed in IIC applications).

- **Flowmeter input type A:** passive floating 4 - 20mA

- **Ci is negligibly small**

- **Analog output type AF:** passive floating 4 - 20mA

- **Ci is negligibly small**

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

- **Ci is negligibly small**

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

- **Modbus communication type CT:** TTL

- **Please note:** communication type CT is not allowed in IIC applications.

- **ISOLATOR:** I.S. Certified Isolator
  TTL to
  RS232 / RS422 / TTL
  For example: MTL5051

- **e.g. PC**

- **+ 3.2V**

- **DTR**

- **+12V**

- **TXD**

- **RXD**

- **DTR**

- **+12V**

- **TXD**

- **RXD**

- **COMMON GROUND**

- **Power supply type PD:** 16 - 30V DC
  (please note: PD and battery supply (type PC) is NOT allowed in IIC applications).

- **Power supply type PD:** 16 - 30V DC
  (please note: PD and battery supply (type PC) is NOT allowed in IIC applications).

- **Note:** above values are safety values. Consult the technical specification for operational values.
**Configuration example IIB - F110-A-AF-CT-IB-OT-(PC)-(PD)-(PL)-XI - Power supply 16 - 30V DC, battery or loop powered**

Configuration details:
- **Power supply** 16 - 30V DC
- **Battery type PC**
- **Loop powered type PL**
- **External power supply type PD**
- **Pulse output type OT**: passive transistor
- **Analog output type AF**: passive floating 4 - 20mA
- **Main supply Circuit** depends on type of signal
- **Signal**: pulse sensors maximum 8.7V (Uo=max 8.7V, Io=max 25mA, Po=max 150mW) and to analog sensors as connected to terminal 1 (internally linked).
- **Ci**: negligibly small
- **Note**: above values are safety values. Consult the technical specification for operational values.

**TERMINAL CONNECTORS**
- F100-series
- **RXD**: Common ground
- **TXD**: Common ground
- **DTR**: +12V
- **+3.2V**: Common ground

**HAZARDOUS AREA**
- **Modbus communication type CT**: TTL

**SAFE AREA**
- **ISOLATOR**: I.S. Certified Isolator TTL to RS232/RS422/TTL
  - For example: MTL5051
- **POWER SUPPLY**
  - For example: MTL5025
  - Uo=max 30V
  - Io=max 100mA
  - Po=max 750mW

**TERMINAL CONNECTORS**
- **RXD**: 23
- **TXD**: 24
- **DTR**: 25
- **+3.2V**: 26

**Additional Information**
- Due to analog output type AF, the unit has to be powered with battery type PC, loop loop powered type PL or with external power supply type PD.

*Note: power supply type PD: the supply voltage to pulse sensors is maximum 8.7V (Uo=8.7V, Io=25mA, Po=150mW) and to analog sensors as connected to terminal 1 (externally linked).*
## Technical specification

### 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.

**Option ZB**
- Transflective LCD with green LED backlight. Good readings in full sunlight and darkness.

**Note ZB**
- Only available for safe area applications.

### 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.

**Option ZB**
- Transflective LCD with green LED backlight. Good readings in full sunlight and darkness.

**Note ZB**
- Only available for safe area applications.

### Operating temperature

**Operational**
- -30°C to +80°C (-22°F to +178°F).

**Intrinsically Safe**
- -30°C to +70°C (-22°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**
- 8 - 24V AC / DC ± 10%. Power consumption max. 10 Watt. Intrinsically Safe: 16 - 30V DC; power consumption max. 0.75 Watt.

**Type PF**
- 24V AC / DC ± 10%. Power consumption max. 15 Watt.

**Type PL**
- Input loop powered from sensor signal 4 - 20mA (type "A") - requires types AI or AF and OT.

**Type PM**
- 115 - 230V AC ± 10%. Power consumption max. 15 Watt.

**Type PX**
- 8 - 30V DC. Power consumption max. 0.5 Watt.

**Type ZB**
- 12 - 24V DC ± 10% or type PD / PF / PM. Power consumption max. 1 Watt.

**Note PB/PC/PM**
- Not available Intrinsically Safe.

**Note PF/PM**
- The total consumption of the sensors and outputs may not exceed 400mA @ 24V.

**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 pick-up.

**Type PD**
- 1.2 / 3.2 / 8.2 / 12 / 24V DC - max. 50mA @ 24V DC.

**Type PD-XI**
- 1.2 / 3.2 / 8.2V DC - max. 7mA @ 8.2V DC and mains power supply voltage (as connected to terminal 1).

**Note**
- In case PD-XI and signal A or U: the sensor supply voltage is according to the power supply voltage connected to terminal 1. Also terminal 2 offers the same voltage.

**Type PF / PM**
- 1.2 / 3.2 / 8.2 / 12 / 24V DC - max. 400mA @ 24V DC.

### 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.

### Hazardous area

**Intrinsically Safe**
- ATEX approval ref.: II 1 GD EEx ia IIB/IIC T4 T5@100°C.

**Type X1**
- Maximum ambient +70°C (158°F).

**Explosion proof**
- ATEX approval ref.: II 2 GD EEx d IIB T5.

**Type XF**
- Dimensions of enclosure: 300 x 250 x 200mm (11.8" x 9.9" x 7.9") L x H x D.

**Weight**
- appr. 15 Kg.

### Environment

**Electromagnetic compatibility**

### 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**
- 1100 gr.

**Type HA**
- Cable entry: 2 x PG9 and 1 x M20.

**Type HM**
- Cable entry: 2 x M16 and 1 x M20.

**Type HO**
- Cable entry: 2 x M20.

**Type HP**
- Cable entry: 6 x M12.

**Type HT**
- Cable entry: 1 x ½” NPT.

**Type HU**
- Cable entry: 3 x ½” NPT.

**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 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.
**Signal inputs**

**Flowmeter**
- Type P: Coil / sine wave (minimum 20mVpp or 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.
- Type U: 0 - 10V DC. Analog input signal can be scaled to any desired range within 0 - 20mA.
- Accuracy: Resolution: 14 bit. Error <0.025mA / ± 0.125% FS. Low level cut-off programmable.
- Span: 0.000000 - 9,999,999 with variable decimal position.
- Update time: Four times per second.
- Voltage drop: Type A: 2.5V @ 20mA.
- Load impedance: Type U: 3kΩ.
- Relationship: Linear and square root calculation.
- Note: For signal type A and U: external power to sensor is required; e.g. type PD.

**Logic inputs**
- Function: Terminal input to reset total remotely.
- Type IB: Internally pulled-up switch contact - NPN.
- Duration: Minimum pulse duration 100msec.

**Signal outputs**

**Analog output**
- Function: Transmitting flow rate.
- Accuracy: 10 bit. Error <0.05%. Analog output signal can be scaled to any desired range.
- Update time: Ten times per second.
- Type AA: Active 4 - 20mA output (requires OA + PD, PF or PM).
- Type AB: Active 0 - 20mA output (requires OA + PD, PF or PM).
- Type AF: Passive floating 4 - 20mA output for Intrinsically Safe applications (requires PC, PL or PD).
- Type AI: Passive galvanically isolated 4 - 20mA output - also available for battery powered models (requires PB, PD, PF, PL or PM).
- Type AP: passive 4 - 20mA output - not isolated. Unit will be loop powered.
- Type AU: Active 0 - 10V DC output (requires OA + PD, PF or PM).

**Pulse output**
- Function: Pulse output - transmitting accumulated total.
- Frequency: Max. 64Hz. Pulse length user definable between 7.8 msec up to 2 seconds.
- Type OA: One active 24V DC transistor output (PNP); max. 50mA per output (requires AA + PD, PF or PM).
- Type OR: One electro-mechanical relay output - isolated; max. switch power 230V AC (N.O.) - 0.5A per relay (requires PF or PM).
- Type OT: One passive transistor output (NPN) - not isolated. Max. 50V DC - 300mA per output.

**Communication option**
- Function: Reading display information, reading / writing all configuration settings.
- Protocol: Modbus ASCII / RTU.
- Speed: 1200 - 2400 - 4800 - 9600 baud.
- Addressing: Maximum 255 addresses.

**Operational**

**Operator functions**
- Displayed: • Flow rate and / or total.
- Functions: • Total and accumulated total.
- • Total can be reset to zero by pressing the CLEAR-key twice.

**Total**
- Digits: 7 digits.
- Units: L, m³, 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: mL, L, m³, Gallons, KG, Ton, lb, cf, RND, ft³, scf, Nm³, NI, igal - no units.
- Decimals: 0 - 1 - 2 or 3.
- Time units: /sec - /min - /hr - /day.

**Accessories**

**Mounting accessories**
- ACF02: Stainless steel wall mounting kit.
- ACF05: Stainless steel pipe mounting kit (worm gear clamps not included).
- ACF06: Two stainless steel worm gear clamps Ø 44 - 56mm.
- ACF07: Two stainless steel worm gear clamps Ø 58 - 75mm.
- ACF08: Two stainless steel worm gear clamps Ø 77 - 95mm.
- ACF09: Two stainless steel worm gear clamps Ø 106 - 138mm.
- ACF10: Customized Grevopal tagplates for ACF02 and ACF05, including stainless steel screws. Dimension: 95mm x 12.5mm (3.75” x 0.50”).

**Cable gland accessories**
- ACF20: For HA enclosure, includes O-rings.
- ACF25: For HE enclosure, includes locknuts and O-rings.
- ACF26: For HF enclosure, includes locknuts and O-rings.
- ACF27: For HG enclosure, includes locknuts and O-rings.
- ACF28: For HH enclosure, includes locknuts and O-rings.
- ACF29: For HJ enclosure, includes locknuts and O-rings.
- ACF32: For HM enclosure, includes O-rings.
- ACF33: For HN enclosure, includes O-rings.
- ACF34: For HO enclosure, includes O-rings.
- ACF35: For HP enclosure, includes O-rings.
- ACF39: For HT enclosure, includes O-rings.
- ACF40: For HU enclosure, includes O-rings.
### Ordering information

**Standard configuration:** F110-P-AP-CX-EX-HC-IX-OT-PX-TX-XX-ZX.

<table>
<thead>
<tr>
<th>Ordering Information:</th>
<th></th>
<th>A</th>
<th>C</th>
<th>EX</th>
<th>H</th>
<th>I</th>
<th>O</th>
<th>P</th>
<th>TX</th>
<th>X</th>
<th>Z</th>
</tr>
</thead>
</table>

**Flowmeter input signal**

- **A**: 0 - 20mA input.
- **P**: Pulse input: coil, npn, pnp, namur, reed-switch.
- **U**: 0 - 10V DC input.

**Analog output signal**

- **AA**: Active 4 - 20mA output - requires OA + PD, PF or PM.
- **AB**: Active 0 - 20mA output - requires OA + PD, PF or PM.
- **AF**: I.S. floating 4 - 20mA output - requires PC, PL or PD.
- **AI**: Isolated 4 - 20mA output - requires PB, PD, PF, PL or PM.
- **AP**: Passive 4 - 20mA output, loop powered unit.
- **AU**: Active 0 - 10V DC output - requires OA + PD, PF or PM.

**Communication**

- **CB**: Communication RS232 - Modbus ASCII / RTU.
- **CH**: Communication RS485 - 2-wire - Modbus ASCII / RTU.
- **CI**: Communication RS485 - 4-wire - Modbus ASCII / RTU.
- **CT**: Intrinsically Safe TTL - Modbus ASCII / RTU.
- **CX**: No communication.

**Flow equations**

- **EX**: No flow equations.

**Panel mount enclosures - IP65 / NEMA4**

- **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 ("/").
- **HG**: Cable entry: 2 x Ø 20mm.
- **HH**: Cable entry: 6 x Ø 12mm.
- **HJ**: Cable entry: 3 x Ø 22mm ("/").
- **HK**: Flat bottom, cable entry: no holes.

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

- **HA**: Cable entry: 2 x PG9 + 1 x M20.
- **HM**: Cable entry: 2 x PG9 + 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.
- **HZ**: Cable entry: no holes.

**ABS field / wall mount enclosures**

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

**Additional inputs**

- **IB**: Terminal input to reset total.
- **IX**: No external input.

**Outputs**

- **OA**: One active transistor output - requires AA, AB or AU and PD, 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**: 8 - 24V AC/DC + sensor supply - with XI: 16 - 30V DC.
- **PF**: 24V AC/DC + sensor supply.
- **PL**: Input loop powered from sensor signal type “A” - requires AI or AF and OT.
- **PM**: 115 - 230V AC + sensor supply.
- **PX**: Basic power supply 8 - 30V DC (no real sensor supply). Unit requires external loop AP.

**Temperature input signal**

- **TX**: No temperature input signal.

**Hazardous area**

- **XI**: Intrinsically Safe.
- **XF**: EExd enclosure - 3 keys.
- **XX**: Safe area only.

**Other options**

- **ZB**: Backlight.
- **ZF**: Coil input 10mVpp.
- **ZX**: No options.

The bold marked text contains the standard configuration.

© Available Intrinsically Safe.

Specifications are subject to change without notice.