# F 113 Datasheet

Your success counts

# Flow rate Monitor / Totalizer

## with high / low alarm, analog and pulse signal outputs



Modbus IEC IECEx

***Application examples:*** *Extreme cold weather regions*

*Hot and sandy deserts*


*Red flashing LED backlight in case of a flow rate alarm.*

**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).**

## Advantages

- Robust aluminum or stainless steel 316L field enclosure (IP67 / NEMA Type4X). It is so rugged, a truck can even stand on it!
- Intrinsically Safe available - ATEX and IECEx approval for gas and dust applications.
- 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.
- Four alarm values can be entered: low-low, low, high and high-high flow rate alarm.
- Large 17mm (0.67") digit selection for flow rate or total.
- LED backlight option.
- Selectable on-screen engineering units; volumetric or mass.
- Ability to process all types of signals: Sine wave (coil), NAMUR, NPN/PNP pulse, Reed-switch, Active pulse signals, (0)4-20mA.
- Up to four free configurable alarm outputs.
- Up to four scaled pulse outputs according to accumulated total.
- Analog (loop powered) output according to flow rate.
- Full Modbus communication RS232/485/TTL.
- Power requirements: Loop or battery powered, 8 - 30V DC, 8 - 24V AC/DC or 115 - 230V AC.
- Sensor supply: 3 / 8.2 / 12 / 24V DC.

## Introduction

The F113 is a versatile flow rate indicator and totalizer with continous flow rate monitoring feature. It offers the facility to set two low flow rate and two high flow rate alarm values. If desired, a delay function can be set up to allow for an incorrect flow rate for a certain period of time. Up to four outputs are available to transmit the alarm condition and/or the accumulated total. A wide selection of options further enhance this models capabilities, including backlight, 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, totals and alarm values. The alarm values can be password protected. 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.

## Configuration

All configuration settings are accessed via a simple operator menu which can be password protected. Each setting is clearly indicated with an alphanumerical description, which avoides 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.

## Pulse output / alarm output

Up to four free configurable outputs are available to transmit the flow rate alarm condition and/or to generate a pulse in relation to the accumulated total. A maximum of two outputs are available in Intrinsically Safe applications. The pulse width is user defined from 0.001 second up to 9.999 seconds. The maximum output frequency is 500Hz. The output signals can be a passive NPN, active PNP or an isolated electro-mechanical relay.


LED backlight, red flashing in case of an alarm

Displayed function

Trend indication

Clear 17mm (0.67") numeric digits

Displayed function

3 rugged buttons and user-friendly menu-structure: "**Know one, know them all!"**

Intrinsically Safe available:**ATEX and IECEx.**

Measurement units

Status indication

Clear 8mm (0.31") alphanumeric digits

Robust IP67 (Type4X) field enclosure.
**So rugged, a truck can even stand on it!**

Resistant to harsh weather conditions like snow,rain and -40°C to +70°C (-40°F to +158°F)

## 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

his model is ATEX and IECEx certified as Intrinsically Safe for gas applications with an allowed ambient temperature of -40°C to +70°C (-40°F to +158°F) and dust applications with an allowed ambient temperature of -40°C to +50°C (-40°F to +122°F). A flame proof Ex d enclosure with ATEX/IECEx certification is also available.

## 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 eight 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 F113 as well.

All info at a glance

Easy to install

Easy to program

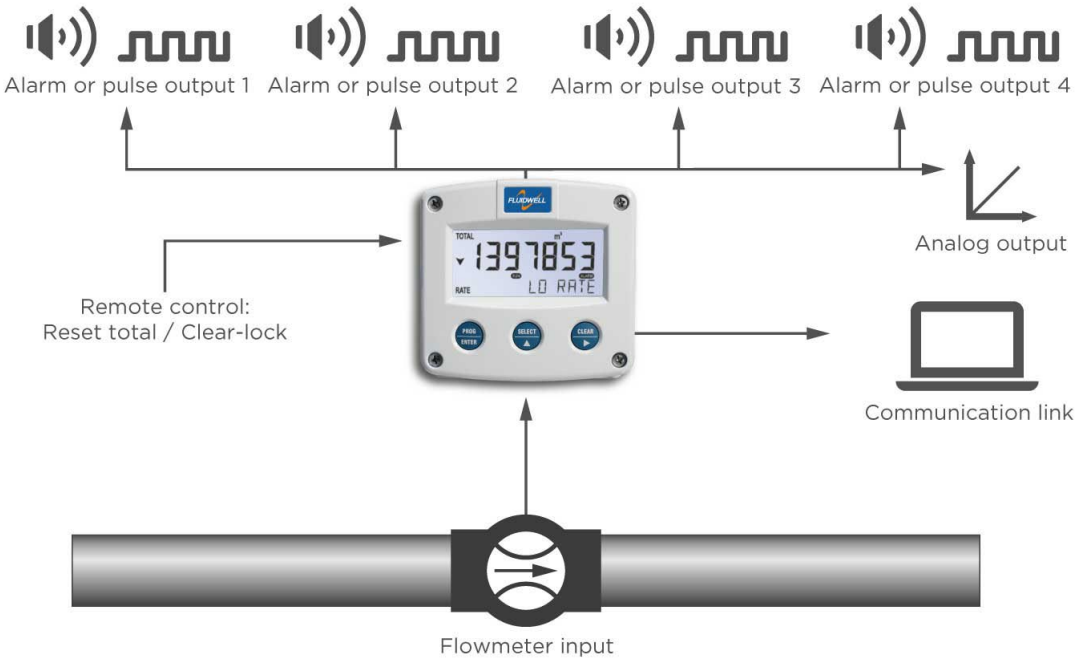
Know one know them all!

Reliable

User-friendly

## Overview application F113

The F-Series is your first and safest choice for field mount indicators. 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) for safe and hazardous area applications! Liquid flow measurement where continues flow rate monitoring is important. Also re-transmission of the flow rate and/or totalizer functions or serial communication is required. Alternative basic model: F013 or more advanced F118, F018 with HART communication or the D-Series DIN panel mount flow rate indicators.




## Signal input

The F113 accepts most pulse and analog input signals for volumetric 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 is available with linear and square root calculation and even as 4 - 20mA input loop powered.

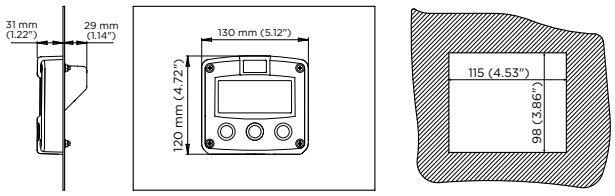
| Type of signal | Resistance | Low Pass filter (LP) | Max. frequency | Max. frequency Low Pass filter (LP) | Min. amplitude P-P | Remark |
|---|---|---|---|---|---|---|
| NPN | 100kΩ pull-up | 100kΩ pull-up | 6kHz Threshold 1.2V | 1.2kHz | | Open collector |
| REED | 1MΩ pull-up | 1MΩ pull-up | 1.2kHz Threshold 1.2V | 120Hz | | |
| PNP | 100KΩ pull-down | 100KΩ pull-down | 6kHz Threshold 1.2V | 1.2kHz | | |
| NAMUR | 820Ω pull-down | - | 4kHz | - | | External power required |
| COIL LO | - | - | | - | $80mV_{pp}$ | Default sensitivity |
| COIL-HI | - | - | - | - | $20mV_{pp}$ | Sensitive for interference! |
| COIL-HI (Type ZF) | | | | | $10mV_{pp}$ | |
| ACTIVE 8.2V DC | 3K9Ω | | 10kHz Threshold 4V | | | External power required |
| ACTIVE 12V DC | 4KΩ | | 10kHz Threshold 6V | | | External power required |
| ACTIVE 24V DC | 3KΩ | | 10kHz Threshold 12V | | | External power required |

## Enclosures

Various types of enclosures can be selected, all ATEX and IECEx approved. The F113 is supplied in an GRP panel mount enclosure as standard, which can be converted to an IP67 / NEMA Type4X GRP field mount enclosure by the addition of a back case. Most popular is our robust aluminum field mount enclosure which is also available with an extended backcover with undrilled preparation for direct meter mounting at the back side. It is so rugged, even a truck can stand on it! For the most challenging environments we have a durable high grade Stainless steel 316L enclosure. All enclosures have a IP67 / NEMA Type4X rating and EU or U.S. cable gland entry threads available.

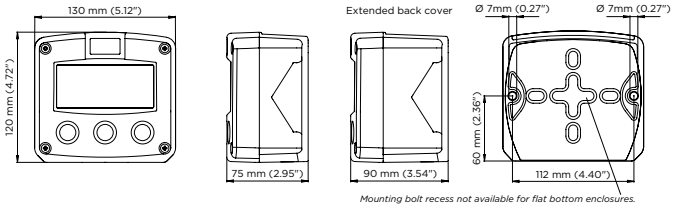
## Dimensions enclosures

*Aluminum & GRP panel mount enclosure*




**HB & HC enclosures** **panel cut-out**

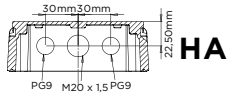
*Aluminum, GRP & Stainless steel 316L field mount enclosures*



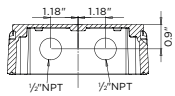

*Mounting bolt recess not available for flat bottom enclosures.*

*Cable entries*

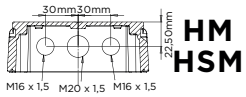
**Aluminum / Stainless Steel**



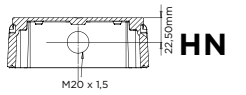

**HA**



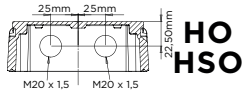

**HL**



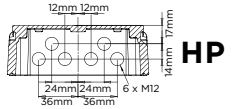

**HM HSM**



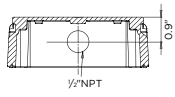

**HN**



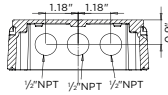

**HO HSO**



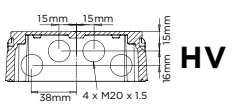

**HP**



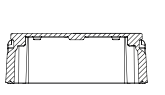

**HT**




**HU HSU**

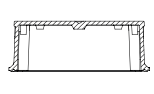



**HV**

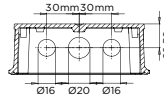


**HZ**

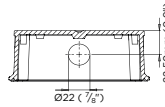
**GRP**



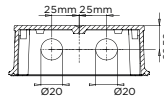
**HD**



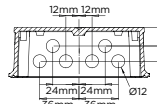

**HE**



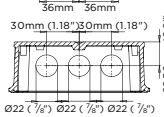

**HF**



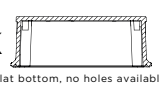

**HG**



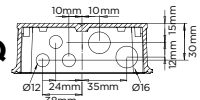

**HH**




**HJ**

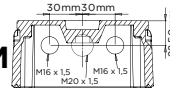



**HK**

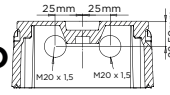



**HQ**

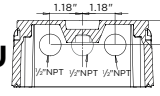
**Extended Aluminum**




**HBM**

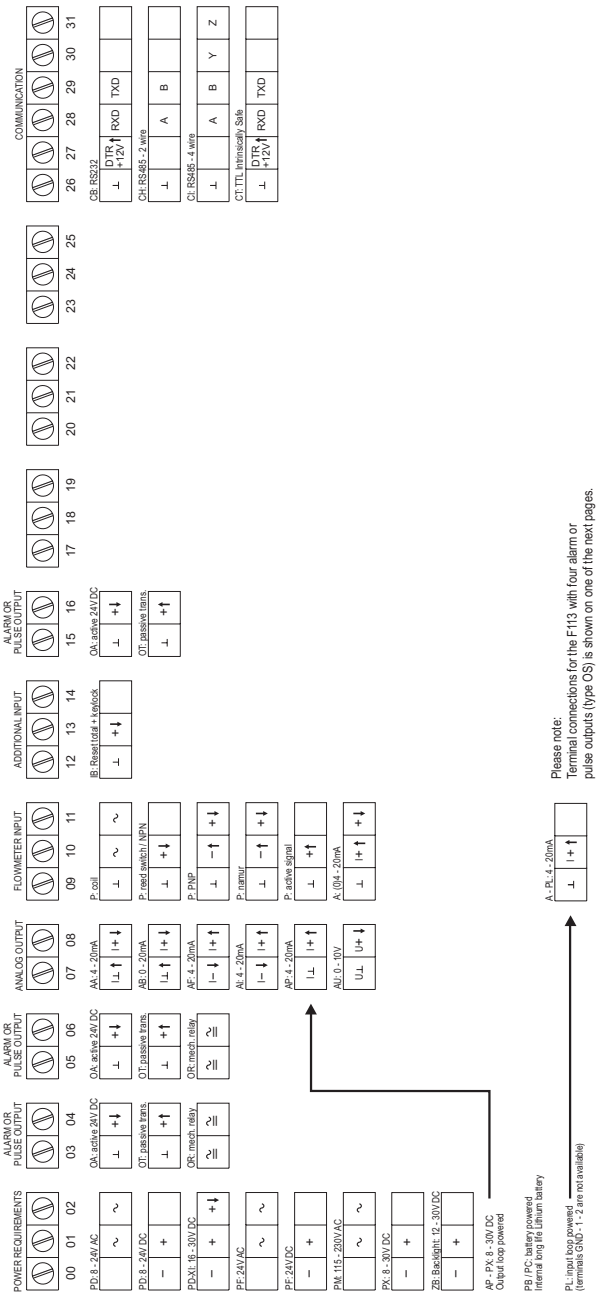



**HBO**

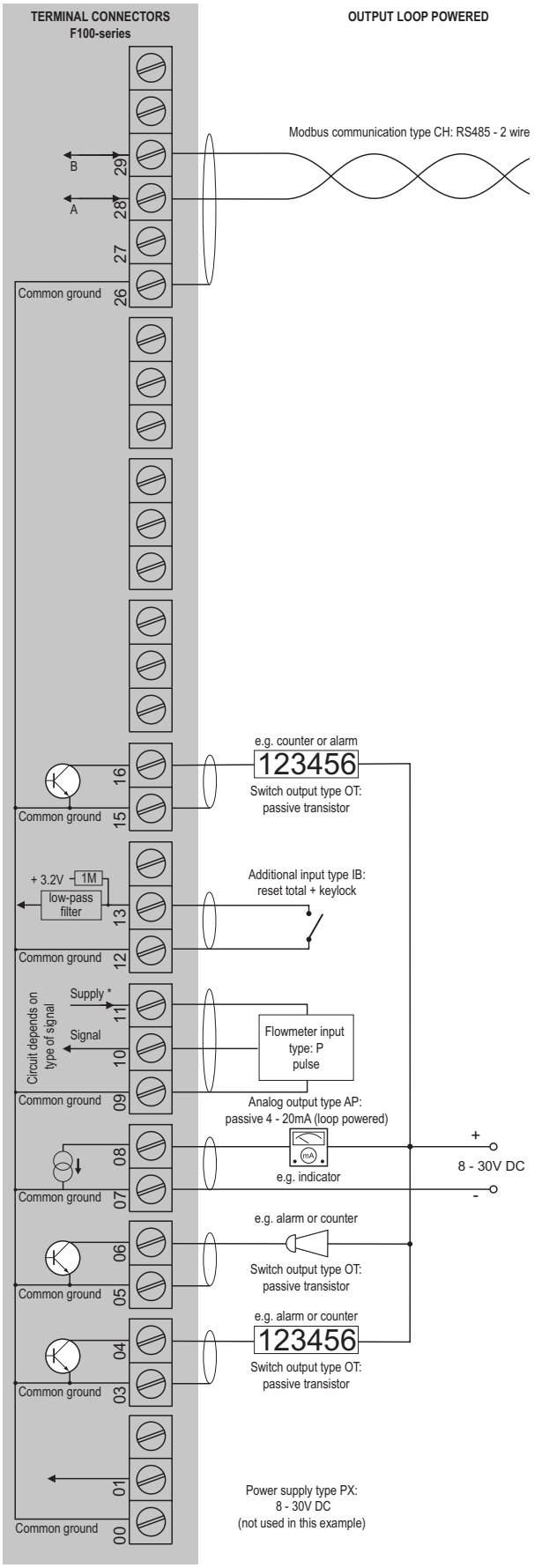



**HBU**

## Terminal connections

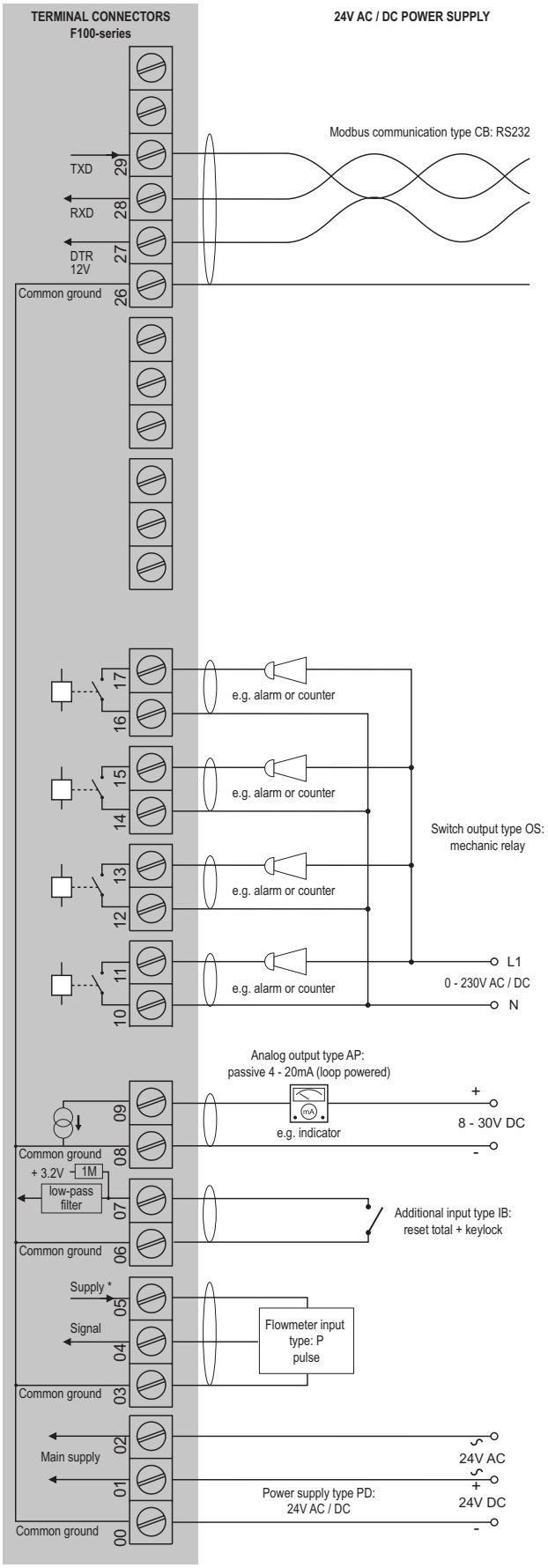


## *Configuration example F113-P-AP-CH-IB-OT-(PX)-XX-ZX*




* For pulse type inputs: $V_{ref}$: 1.2V/3.0V available.- NO power output, available $I_{supply}$: <1mA.
Note: using these ref. voltages at max. load, will reduce battery life significantly.

## *Configuration example F113-P-AP-CR-IB-OS-PD-XX-ZX*




* $U_{max}$ sensor is 2V below $U_{supply}$
$U_{max}$ sensor: 8.2V requires 10VDC(8VAC) $U_{supply}$
12V requires 14VDC(10VAC) $U_{supply}$
24V requires 26VDC(18VAC) $U_{supply}$

## Hazardous area applications

The F113-XI has been certified according to ATEX and IECEx by DEKRA for use in Intrinsically Safe applications with an ambient temperature of -40°C to +70°C (-40°F to +158°F).
For equipment category Dust, zone 20 (1 D / EPL Da), the maximum ambient temperature is limited to 50°C (+122°F) and a maximum dust layer thickness of 200mm.

- The ATEX markings for gas and dust applications are:
  - Gas: **II 1 G Ex ia IIB/IIC T4 Ga.**
  - Dust: **II 1 D Ex ia IIIC $T_{200}$ 100 °C Da.**
- The IECEx markings for gas and dust applications are:
  - Gas: **Ex ia IIC/IIB T4 Ga.**
  - Dust: **Ex ia IIIC $T_{200}$ 100 °C Da.**

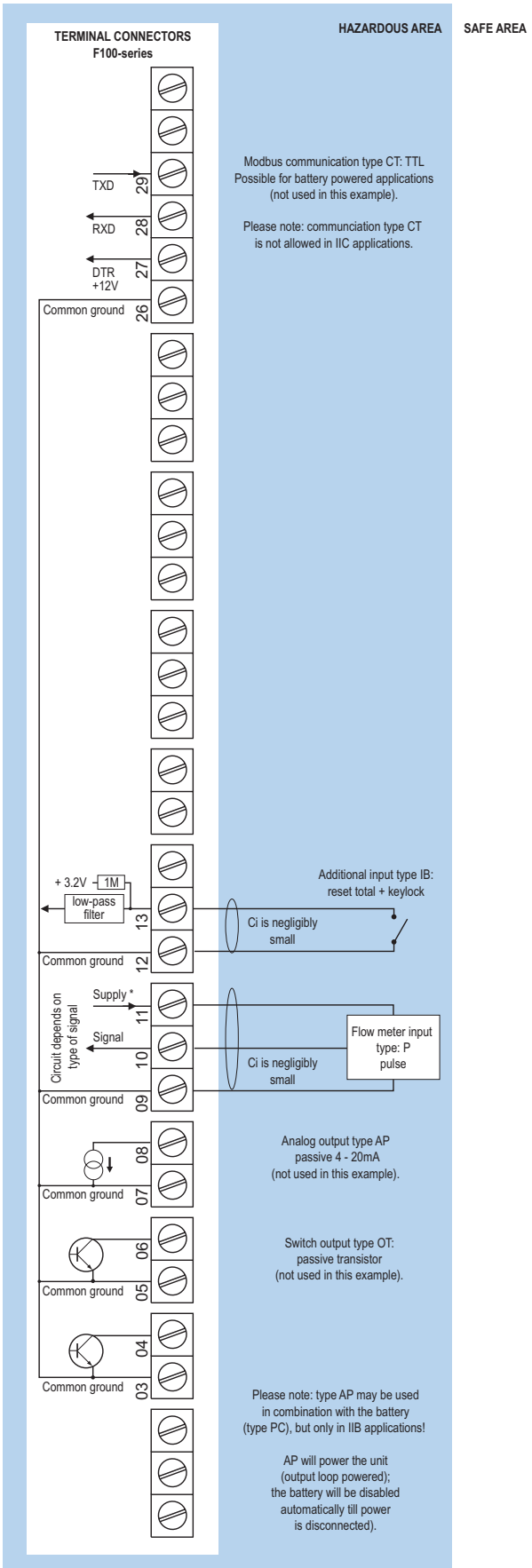
Besides the I.S. power supplies for the two alarm / pulse outputs, it is allowed to connect up to three I.S. power supplies in IIB/IIIC applications or one in IIC applications. Consult the certificate for the maximum input and output values of the circuits. Full functionality of the F113 remains available, including two alarm or pulse outputs and 4 - 20mA output and Modbus communication (type CT). Power supply type PD-XI offers a 8.2V sensor supply e.g. for one Namur sensor. An ATEX/IECEx approved flame proof Ex d enclosure is available as well. Please contact your supplier for further details.

*Certificate of conformity KEMA 03ATEX1074 X*

*• IECEx DEK 11.0042X*

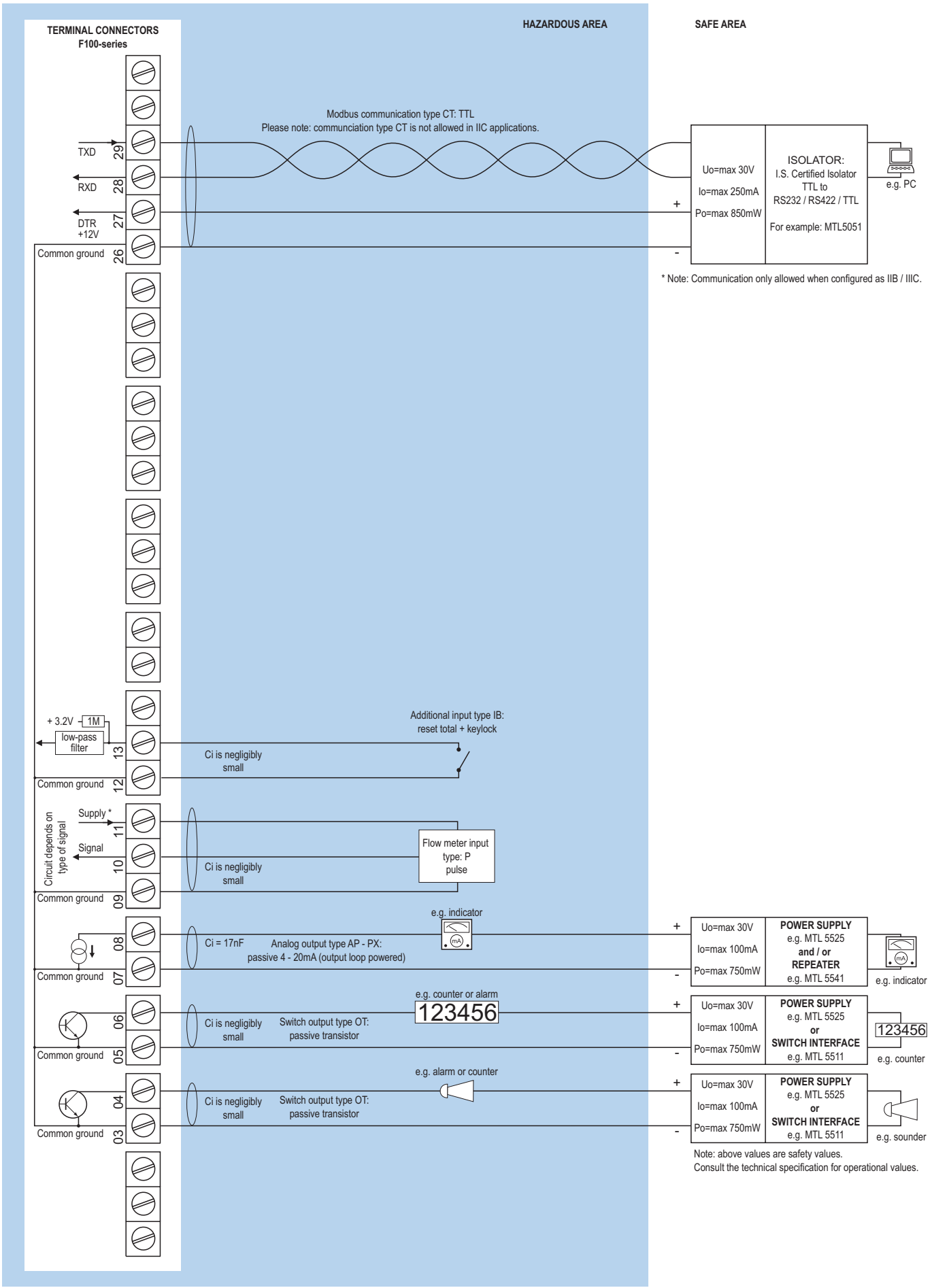

*Configuration example IIB / IIIC and IIC*

*F113-P-(AP)-(CT)-IB-(OT)-PC-XI - Battery powered unit*



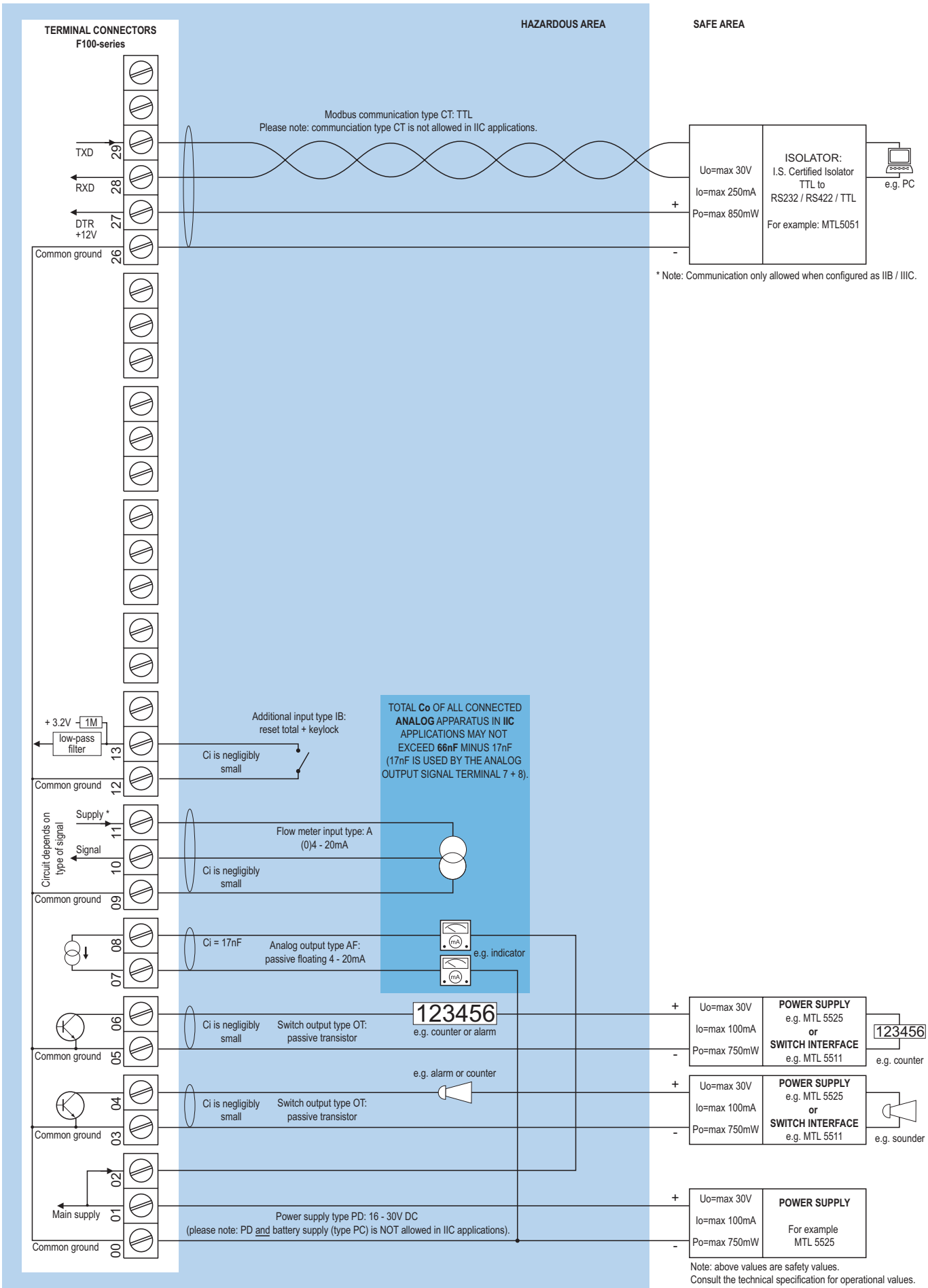

* For pulse type inputs: $V_{ref}$: 1.2V/3.0V available.- NO power output, available $I_{supply}$: <1mA.
Note: using these ref. voltages at max. load, will reduce battery life significantly.

*Configuration example IIB / IIIC and IIC - F113-P-AP-(CT)-IB-OT-(PX)-XI - Output loop powered*



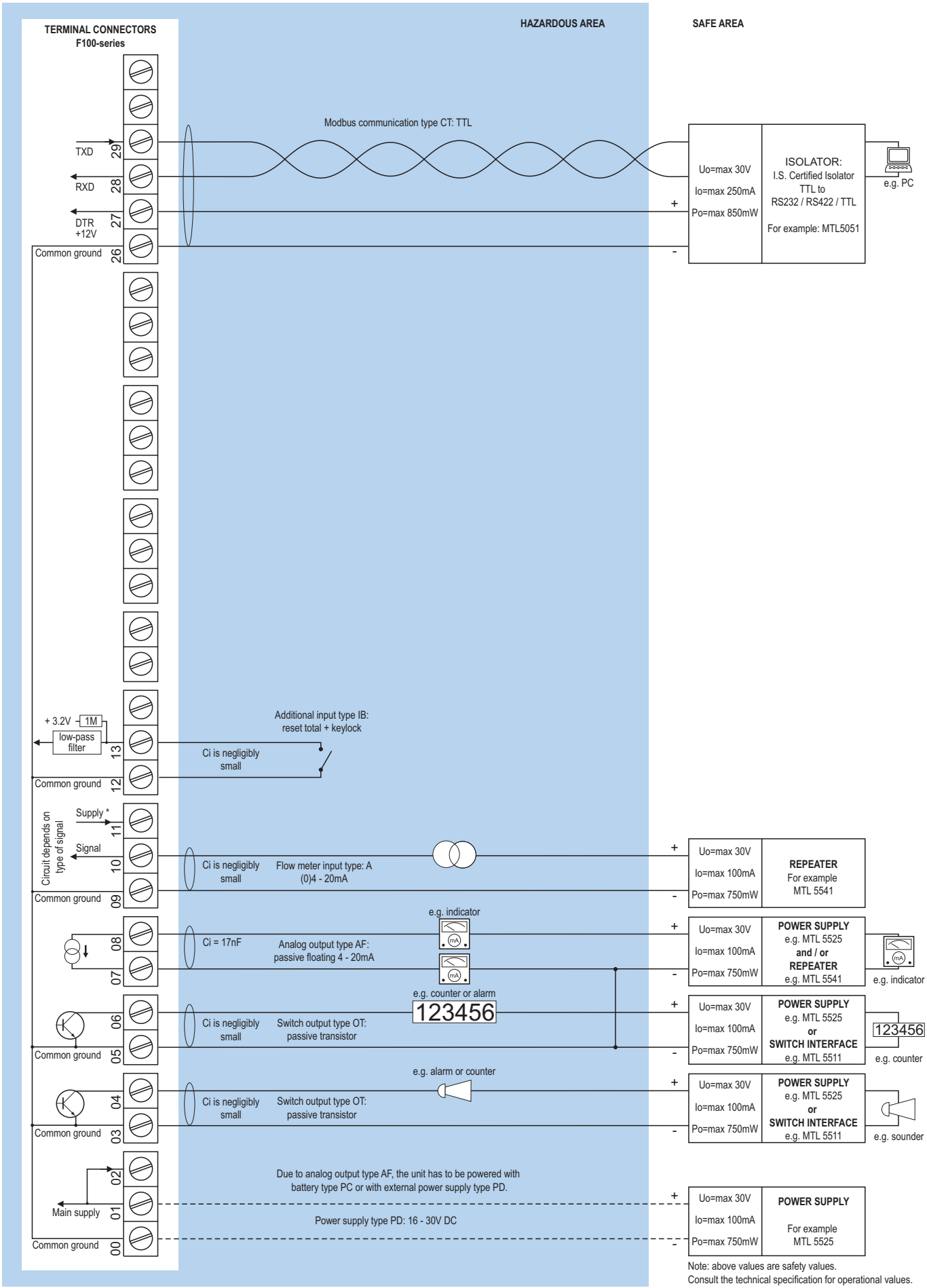

* For pulse type inputs: $V_{ref}$: 1.2V/3.0V available.- NO power output, available $I_{supply}$: <1mA.
Note: using these ref. voltages at max. load, will reduce battery life significantly.

*Configuration example IIB / IIIC and IIC - F113-A-AF-(CT)-IB-OT-PD-XI - Power requirement 16 - 30V DC*




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

*Configuration example IIB / IIIC - F113-A-AF-CT-IB-OT-(PC)-(PD)-XI - Power requirement 16 - 30V DC or battery powered*




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

## 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 white LED-backlight. Red (flashing) backlight during alarm conditions. |
| **Note ZB** | Only available for safe area applications, with option PD, PF, PM or PX. |

## Ambient temperature

| | |
|---|---|
| **Safe areas** | -40°C to +80°C (-40°F to +176°F). |
| **Intrinsically Safe** | -40°C to +70°C (-40°F to +158°F). |
| **Dust, zone 20** | -40°C to +50°C (-40°F to +122°F). |

## Terminal connections

| | |
|---|---|
| **Type** | Removable plug-in terminal strip. Wire max. 1.5mm$^2$ and 2.5mm$^2$. |

## Data protection

| | |
|---|---|
| **Type** | EEPROM backup of all settings. Backup of running totals every minute. Data retention at least 10 years. |
| **Password** | Configuration settings can be password protected. |

## Directives & Standards

| | |
|---|---|
| **EMC** | Directive 2014/30/EU, FCC 47 CFR part 15. |
| **Low voltage** | Directive 2014/35/EU |
| **RoHS** | Directive 2011/65/EU |
| **ATEX / IECEx** | Directive 2014/34/EU, IEC 600079-0, IEC 60079-11. |
| **IP & NEMA** | EN 60529 & NEMA 250 |

## Intrinsically Safe (Type XI)

| | |
|---|---|
| **ATEX** | Gas: II 1 G Ex ia IIB/IIC T4 Ga.<br>Dust: II 1 D Ex ia IIIC $T_{200}$ 100 °C Da. |
| **IECEx** | Gas: Ex ia IIC/IIB T4 Ga.<br>Dust: Ex ia IIIC $T_{200}$ 100 °C Da. |
| **Ambient Ta** | -40°C to +70°C (-40°F to +158°F). |
| **Dust, zone 20** | -40°C to +50°C (-40°F to +122°F). |

## Explosion proof (Type XF)

| | |
|---|---|
| **ATEX/IECEx** | Gas: II 2 G Ex db IIB+H2 T5 Gb.<br>Dust: II 2 D Ex tb IIIC T80°C. |
| **Protection** | IP66 |
| **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. 15kg. |

## Enclosure

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

## 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 Type4X. |
| **Weight** | 600 gr. |
| **Type HC** | GRP panel mount enclosure IP65 / NEMA Type4X, UV-resistant and flame retardant. |
| **Weight** | 450 gr. |
| **Type HSB** | Die-cast stainless steel 316L IP67 / NEMA Type4X. |
| **Weight** | 1150gr. |

## GRP wall / field mount enclosures

| | |
|---|---|
| **General** | GRP wall/field mount enclosure IP67 / NEMA Type4X, 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 (⅞"). |
| **Type HG** | Cable entry: 2 x Ø 20mm. |
| **Type HH** | Cable entry: 6 x Ø 12mm. |
| **Type HJ** | Cable entry: 3 x Ø 22mm (⅞"). |
| **Type HK** | Flat bottom, cable entry: no holes. |
| **Type HQ** | Cable entry: 2 x Ø 16mm & 3 x Ø 12mm. |

## Aluminum wall / field mount enclosures

| | |
|---|---|
| **General** | Die-cast aluminum wall/field mount enclosure IP67 / NEMA Type4X with 2-component UV-resistant coating.<br>Extended back cover available with undrilled preparation for direct meter mounting. |
| **Dimensions** | 130 x 120 x 75mm (5.12" x 4.72" x 2.95") - W x H x D.<br>130 x 120 x 90mm (5.12" x 4.72" x 3.54") - W x H x D. |
| **Weight** | 1100 gr. / extended enclosure: 1310 gr. |
| **Type HA** | Cable entry: 2 x PG9 and 1 x M20. |
| **Type HL** | Cable entry: 2 x ½" NPT. |
| **Type HM/HBM** | Cable entry: 2 x M16 and 1 x M20. |
| **Type HN** | Cable entry: 1 x M20. |
| **Type HO/HBO** | Cable entry: 2 x M20. |
| **Type HP** | Cable entry: 6 x M12. |
| **Type HT** | Cable entry: 1 x ½" NPT. |
| **Type HU/HBU** | Cable entry: 3 x ½" NPT. |
| **Type HV** | Cable entry: 4 x M20. |
| **Type HZ** | Cable entry: no holes. |

## Stainless steel 316L wall / field mount enclosures

| | |
|---|---|
| **General** | Die-cast stainless steel 316L wall / field mount enclosure with flat bottom. IP67 / NEMA Type4X. |
| **Dimensions** | 130 x 120 x 75mm (5.12" x 4.72" x 2.95") - W x H x D. |
| **Weight** | 2700 gr. |
| **Type HSM** | Cable entry: 2 x M16 + 1 x M20. |
| **Type HSO** | Cable entry: 2 x M20. |
| **Type HSU** | Cable entry: 3 x ½"NPT. |

## Signal inputs - Flowmeter

| | |
|---|---|
| **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 6kHz 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 A** | (0)4 - 20mA. Analog input signal can be scaled to any desired range within 0 - 20mA. |
| **Type U** | 0 - 10V DC. Contact factory. |
| **Accuracy** | Resolution: 14 bit. Error < 0.025mA / ± 0.125% FS. Low level cut-off programmable. |
| **Span** | 0.000010 - 9,999,999 with variable decimal position. |
| **Update time** | Four times per second. |
| **Voltage drop** | Type A: 2.5V @ 2omA. |
| **Relationship** | Linear and square root calculation. |
| **Note A** | For signal type A: external power to sensor is required; e.g. type PD. |

## Signal inputs - Additional input

| | |
|---|---|
| **Function** | • Terminal input to reset total remotely.<br>• If this terminal input is closed, the “clear total”-function is disabled. |
| **Type IB** | Internally pulled-up switch contact - NPN. |
| **Duration** | Minimum pulse duration 100msec. |

## Signal outputs - 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. |
| **Type CB** | RS232 |
| **Type CH** | RS485 2-wire |
| **Type CI** | RS485 4-wire |
| **Type CT** | TTL Intrinsically Safe. |

## Signal outputs - Digital output

| | |
|---|---|
| **Function** | All outputs are user defined: pulse output or low, low-low, high, high-high or all alarms output. |
| **Frequency** | Max. 500Hz. Pulse width user definable between 0.001 second up to 9.999 seconds. |
| **Type OA** | Three active 24V DC transistor outputs (PNP); max. 50mA per output (requires PD, PF, PM or PX). Requires min. 24V power supply. |
| **Type OR** | Two electro-mechanical relay outputs isolated max. switch power 230V AC (N.O.) - 0.5A per relay and one OT passive transistor output (requires PF or PM). |
| **Type OS** | Four electro-mechanical relay outputs - isolated N.O.); max. switch power 230V AC - 0.5A per relay (requires XX, AP and PD with 24V AC / DC). |
| **Type OT** | Three passive transistor outputs (NPN) - not isolated. Max. 50V DC - 300mA per output. |
| **Note XI** | Intrinsically Safe applications: only two transistor outputs type OT available. |

## 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** | Eight times per second. |
| **Type AA** | Active 4 - 20mA output (requires PD, PF, PM or PX). |
| **Type AB** | Active 0 - 20mA output (requires PD, PF, PM or PX). |
| **Type AF** | Passive floating 4 - 20mA output for Intrinsically Safe applications (requires XI + PD). |
| **Type AI** | Passive galvanically isolated 4 - 20mA output - also available for battery powered models. |
| **Type AP** | Passive 4 - 20mA output - not isolated. Unit will be loop powered. |
| **Type AU** | Active 0 - 10V DC output (requires PD, PF, PM or PX). Requires min. 12V power supply. |

## Power requirements

| | |
|---|---|
| **Type AP** | Analog output loop powered, 8 - 30V DC. Power consumption max 0.5 Watt. |
| **Type PB** | Long life Lithium battery - life-time depends upon settings and configuration - up to 5 years. (requires PD, PL or PX) |
| **Type PC** | Intrinsically Safe long life lithium battery life-time depends upon settings and configuration - up to 5 years. (requires XI and PD, PL or PX) |
| **Type PD** | 8 - 24V AC / DC ± 10%. Power consumption max. 5W. Intrinsically Safe: 16 - 30V DC; power consumption max. 1 W. |
| **Type PD-XI** | 16 - 30V DC power consumption max. 1W. |
| **Type PD-OS** | 20 - 30V DC / 15 - 24V AC power consumption max. 1 W. (requires XX and AP) |
| **Type PF** | 24V AC / DC ± 10%. Power consumption max. 15W. |
| **Type PL** | Input loop powered from sensor signal 4 - 20mA (type "A") - requires types AI and OT (not Xi). Not available with option ZB. |
| **Type PM** | 115 - 230V AC ± 10%. Power consumption max. 15W. |
| **Type PX** | 8 - 30V DC. Power consumption max. 0.75W. |
| **Type ZB** | 12 - 30V DC ± 10%. Power consumption max. 1.5W. |
| **Note PB/PF/PM** | Not available Intrinsically Safe. |
| **Note PF/PM** | The total consumption of the sensors and outputs may not exceed 400mA @ 24V. |
| **Note XI** | For Intrinsically Safe applications, consult the safety values in the certificate. |

## Sensor excitation

| | |
|---|---|
| **Type PB/PC/PX** | 3V DC for pulse signals and 1.2V DC for coil pick-up. |
| **Note PB/PC/PX** | 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 / 8.2 / 12 / 24V DC - max. 50mA @ 24V DC. $U_{max}$ sensor is 2V below $U_{supply}$ |
| **Type PD-XI** | 1.2 / 3 / 8.2V DC - max. 7mA @ 8.2V DC and mains power supply voltage (as connected to terminal 1). |
| **Note PD-XI** | In case PD-XI and signal A: 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 / 8.2 / 12 / 24V DC - max. 400mA @ 24V DC. |

## Operator functions

| | |
|---|---|
| **Displayed info** | • Flow rate and / or total.<br>• Total and accumulated total.<br>• Low-low alarm value.<br>• Low alarm value.<br>• High alarm value.<br>• High-high alarm value.<br>• Alarm values can be set (or only displayed).<br>• Total can be reset to zero by pressing the CLEAR-key twice. |

## 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** | mL, L, $m^3$, Gallons, kg, Ton, lb, bl, cf, RND, $ft^3$, scf, $Nm^3$, Nl, igal - no units. |
| **Decimals** | 0 - 1 - 2 or 3. |
| **Time units** | /sec - /min - /hr - /day. |

## 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, high, low-low or high-high flow rate alarm. Includes delay time alarm and configurable alarm outputs. |

## 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. |
| **ACF11** | Swivel with 25° movement from center axis for direct flowmeter mounting: 1" NPT to 1/2" NPT. |

| | | Description |
|---|---|---|
| Model | **F113** | **Flow rate monitor / totalizer with high / low alarm, analog and pulse signal outputs.** |
| Input | A | (0)4 - 20mA input. |
| | **P** | **Pulse input, e.g., coil, npn, pnp, namur, reed-switch.** |
| Analog output | AA | Active 4 - 20mA output - requires XX and PD, PF, PM or PX. |
| | AB | Active 0 - 20mA output - requires XX and PD, PF, PM or PX. |
| | AF | I.S. floating 4 - 20mA output - requires XI + PD. |
| | AI | Isolated 4 - 20 mA output - requires XX. |
| | **AP** | **Passive 4 - 20mA output, loop powered unit.** |
| | AU | Active 0 - 10V DC output - requires XX and PD, PF, PM or PX. |
| Communication | CB | Communication RS 232 - Modbus ASCII / RTU - requires XX. |
| | CH | Communication RS 485 - 2wire - Modbus ASCII / RTU - requires XX. |
| | CI | Communication RS 485 - 4wire - Modbus ASCII / RTU - requires XX. |
| | CT | Intrinsically Safe TTL - Modbus ASCII / RTU - requires XI. |
| | **CX** | **No communication.** |
| Enclosures | HB | Aluminum panel mount enclosure. |
| | **HC** | **GRP panel mount enclosure.** |
| | HSB | Stainless steel 316L panel mount enclosure. |
| | HD | GRP field mount - Cable entry: no holes. |
| | HE | GRP field mount - Cable entry: 2 x Ø 16mm & 1 x Ø 20mm. |
| | HF | GRP field mount - Cable entry: 1 x Ø 22mm (⅞"). |
| | HG | GRP field mount - Cable entry: 2 x Ø 20mm. |
| | HH | GRP field mount -Cable entry: 6 x Ø 12mm. |
| | HJ | GRP field mount - Cable entry: 3 x Ø 22mm (⅞"). |
| | HK | GRP field mount - Flat bottom, cable entry: no holes. |
| | HQ | GRP field mount - Cable entry: 2 x Ø 16mm & 3 x Ø 12mm. |
| | HA | Aluminum field mount - Cable entry: 2 x PG9 + 1 x M20. |
| | HL | Aluminum field mount - Cable entry: 2 x ½"NPT. |
| | HM | Aluminum field mount - Cable entry: 2 x M16 + 1 x M20. |
| | HN | Aluminum field mount - Cable entry: 1 x M20. |
| | HO | Aluminum field mount - Cable entry: 2 x M20. |
| | HP | Aluminum field mount - Cable entry: 6 x M12. |
| | HT | Aluminum field mount - Cable entry: 1 x ½"NPT. |
| | HU | Aluminum field mount - Cable entry: 3 x ½"NPT. |
| | HV | Aluminum field mount - Cable entry: 4 x M20. |
| | HZ | Aluminum field mount - Cable entry: no holes. |
| | HBM | Extended Alu. field/meter mount - Cable entry: 2 x M16 + 1 x M20. |
| | HBO | Extended Alu. field/meter mount - Cable entry: 2 x M20. |
| | HBU | Extended Alu. field/meter mount - Cable entry: 3 x ½"NPT. |
| | HSM | Stainless steel 316L field mount - Cable entry: 2 x M16 + 1 x M20. |
| | HSO | Stainless steel 316L field mount - Cable entry: 2 x M20. |
| | HSU | Stainless steel 316L field mount - Cable entry: 3 x ½"NPT. |
| Additional | IB | Remote control input to reset total or to lock the "clear total" button. |
| | **IX** | **No remote control input.** |
| Digital output | OA | Three active transistor outputs - requires XX and PD, PF, PM or PX. |
| | OR | Two mechnical relay outputs + one OA or OT - requires XX and PF or PM. |
| | OS | Four mechanical relay outputs - requires XX, AP and PD. |
| | **OT** | **Three passive transistor outputs.** |
| Power | PD | 8 - 24V AC/DC + sensor supply - with XI: 16 - 30V DC. |
| | PF | 24V AC/DC + sensor supply - requires XX. |
| | PL | Input loop powered from sensor signal type "A" - requires XX, AI and OT. |
| | PM | 115 - 230V AC + sensor supply - requires XX. |
| | **PX** | **Basic power supply 8 - 30V DC.** |
| Battery | PB | Additional lithium battery powered (optional) - requires XX and PD or PX. |
| | PC | Additional lithium battery powered (optional) - Intrinsically safe - requires XI, and PD or PX. |
| Hazar-dous | XI | Intrinsically safe, according ATEX and IECEx. |
| | XF | Ex d enclosure - 3 keys according ATEX and IECEx.. |
| | **XX** | **Safe area only, according CE / UKCA.** |
| Options | ZB | Backlight - requires XX and PD, PF, PM or PX. |
| | ZF | Coil input 10mVpp. |
| | **ZX** | **No options.** |

The **bold** marked text contains the standard configuration: F113-P-AP-CX-HC-IX-OT-PX-XX-ZX.

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