DATASHEET F116 – FLOWCOMPUTER

# DIFFERENTIAL / SUM FLOWCOMPUTER

## WITH ANALOG AND PULSE SIGNAL OUTPUTS


### Features

- Calculates differential flow rate (consumption) total and accumulated total of flow A and B or the sum .
- Precautions for pulsating flows and very low consumption readings.
- 7 digit resettable total.
- 11 digit accumulated total.
- Large 17mm (0.67") digit selection for flow rate or total.
- Analog and pulse signal outputs.
- Very compact design for panel mount, wall mount or field mount applications.
- Operational temperature -30°C up to +80°C (-22°F up to 178°F).
- Rugged aluminum field mount enclosure IP67/NEMA4X.
- Intrinsically Safe Ⓔx II 1 GD EEx ia IIB/IIC T4 T100°C.
- Explosion/flame proof Ⓔx II 2 GD EEx d IIB T5.
- 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 differential / sum flow rate.
- Scaled pulse output according to differential / sum accumulated total.
- Negative pulse value indication.

### Signal input

#### Flow

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

### Applications

- fuel consumption calculation for diesel engines on board of ships or locomotives. Sum function: where flows are split-up in two pipe-lines and total flow has to be calculated. More advanced model: F127.

# General information

## Introduction

The flowcomputer Model F116 has been developed to calculate differential or total volume. Typical applications are the measurement of fuel consumption or the calculation of total flow (sum) if - for costs reasons - two low cost flowmeters can be used instead of one expensive flowmeter. The usual difficulties encountered in such applications include: pulsating flows, very low consumption readings, vibration and high ambient temperatures. These are all well catered for in the design and operation of the F116.

## Display

The display has large 17mm (0.67") and 8mm (0.31") digits which can be set to show flow rate and total. 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. 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 loss.

## Analog output signal

The calculated 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 F116 as well.

## Pulse output

The scaleable pulse output, reflects the count on the accumulated display. The pulse length is user defined and the maximum output frequency is 64Hz. The second output will be switched in case the total is counting down (negative consumption). The output signal can be a passive NPN, active PNP or an isolated electro-mechanical relay.

## Signal input

The F116 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.

## 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).

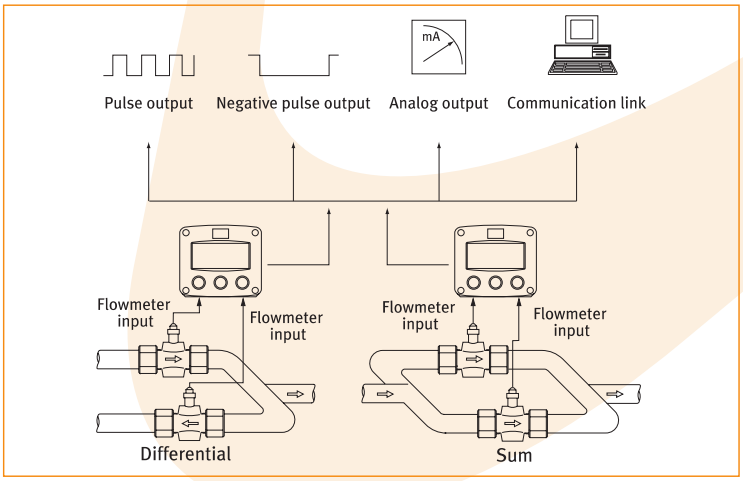
## Hazardous areas

For hazardous area applications, this model has been ATEX certified Intrinsically Safe Ⓔx II 1 GD EEx 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 Ⓔx II 2 GD EEx d IIB T5.

## Enclosures

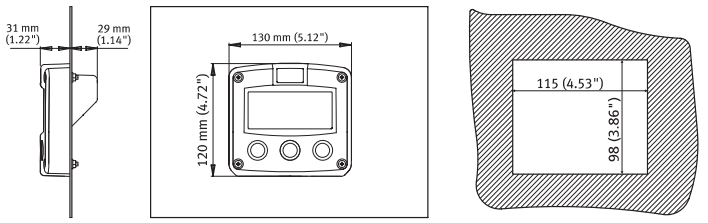
Various types of enclosures can be selected, all ATEX approved. As standard the F116 is supplied in an GRP panel mount enclosure. Most popular is our rugged aluminum field mount enclosure with IP67 / NEMA 4X rating. Both European or U.S. cable gland entry threads are available.

# Overview application F116



# Dimensions enclosures

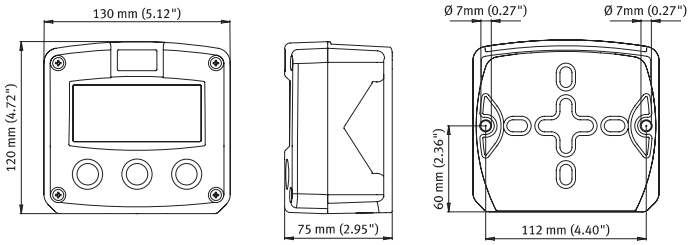
## *Aluminum & GRP panel mount enclosure*



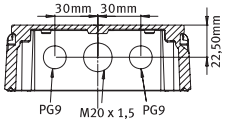

HB & HC enclosures

panel cut-out

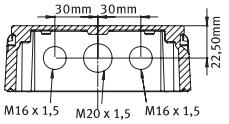
## *Aluminum & GRP field / wall mount enclosures*



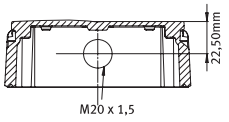

### Aluminum



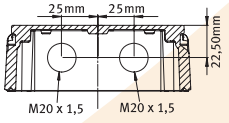

**HA**



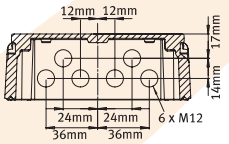

**HM**



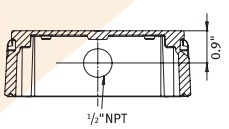

**HN**



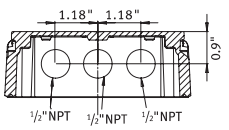

**HO**



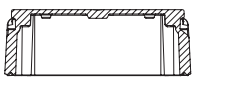

**HP**




**HT**

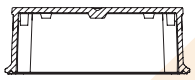



**HU**

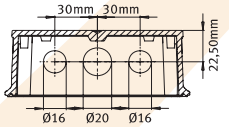


**HZ**

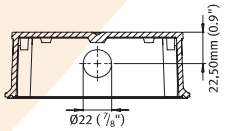
### GRP



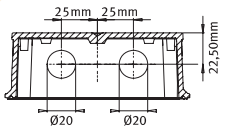
**HD**



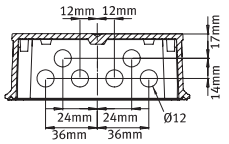

**HE**



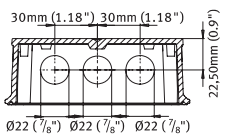

**HF**



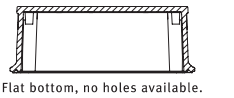

**HG**




**HH**



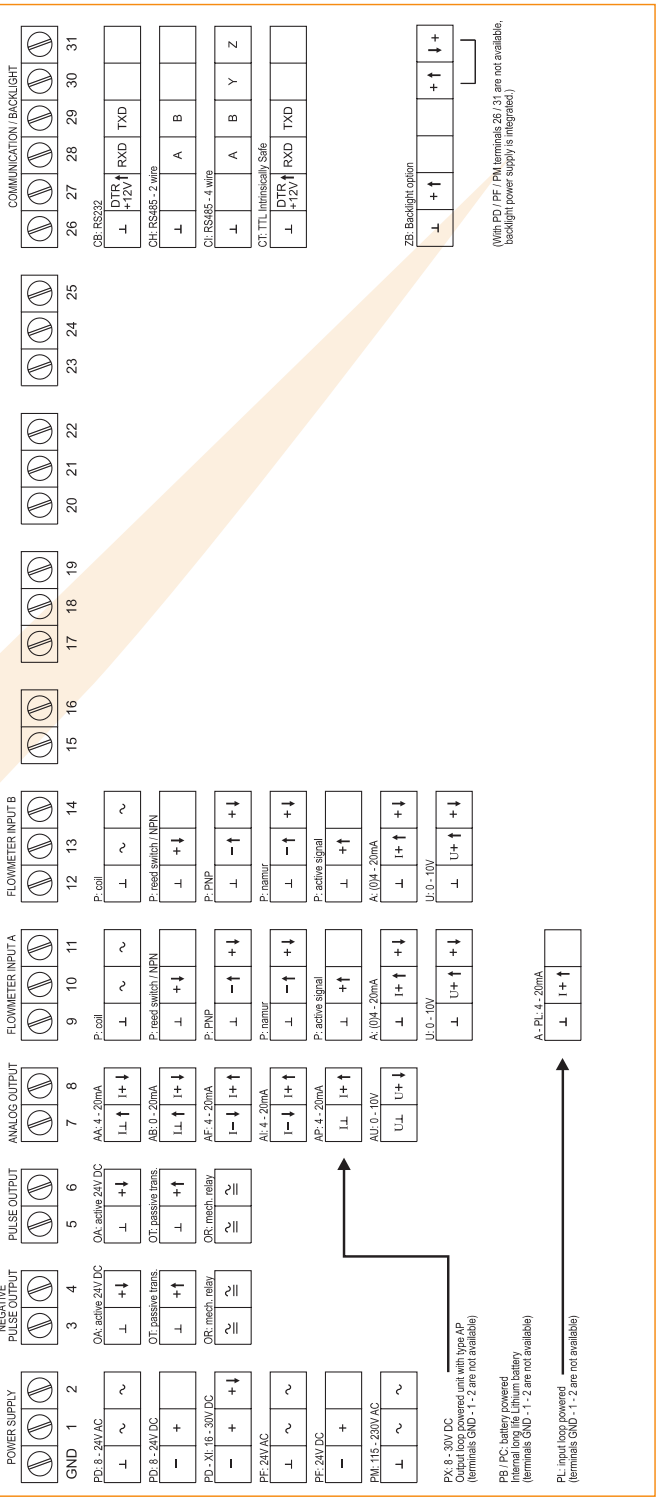

**HJ**



**HK**

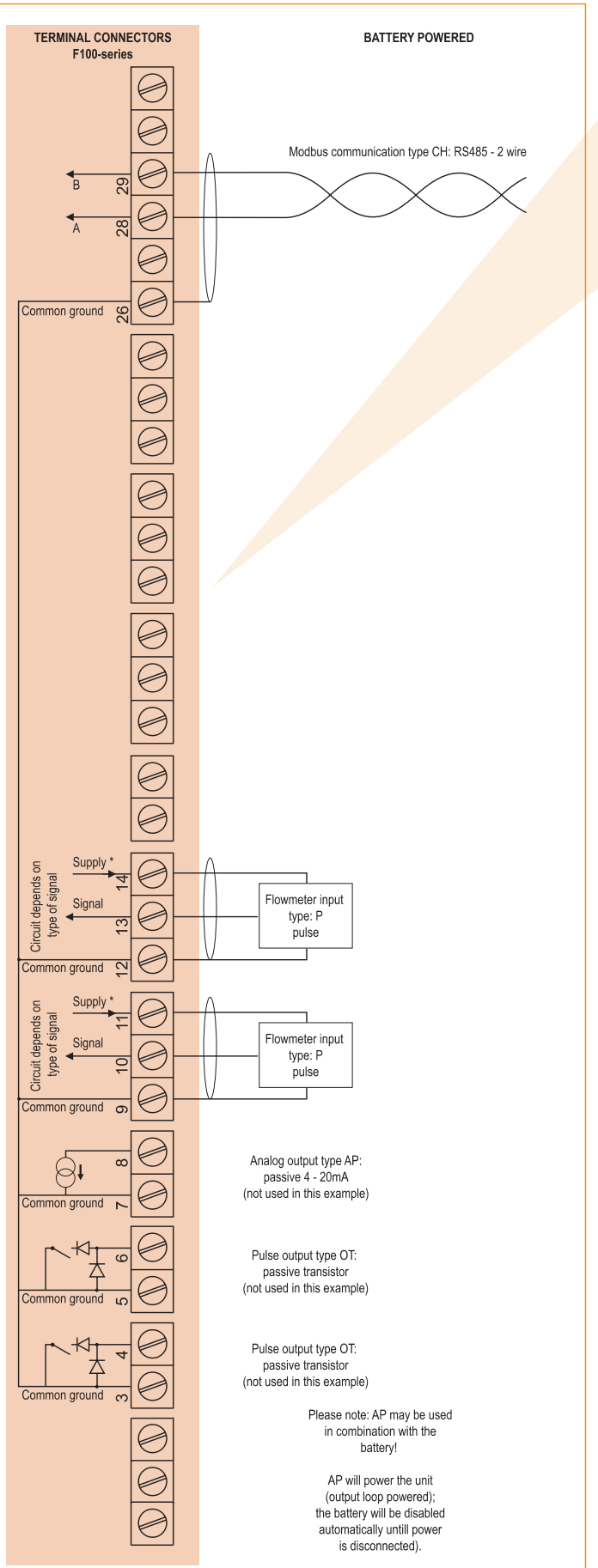
Flat bottom, no holes available.

# Terminal connections



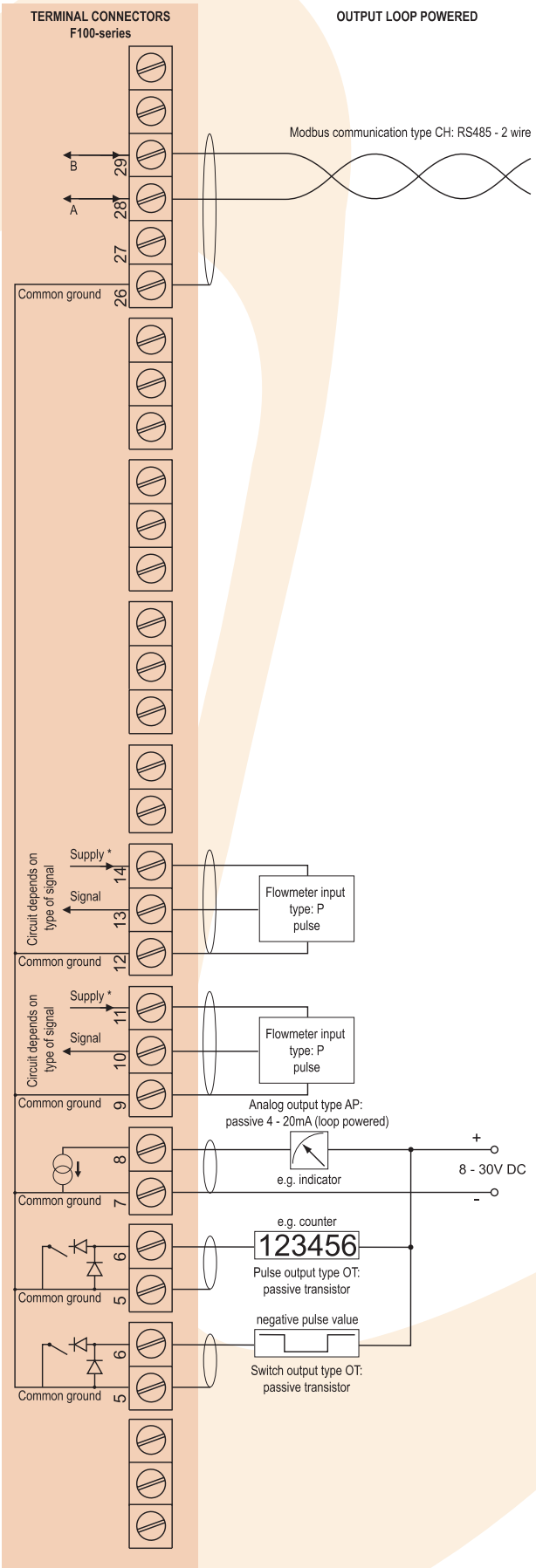

## *Display example - 90 x 40mm (3.5" x 1.6")*

## Typical wiring diagram F116-P-(AP)-CH-(OT)-PB



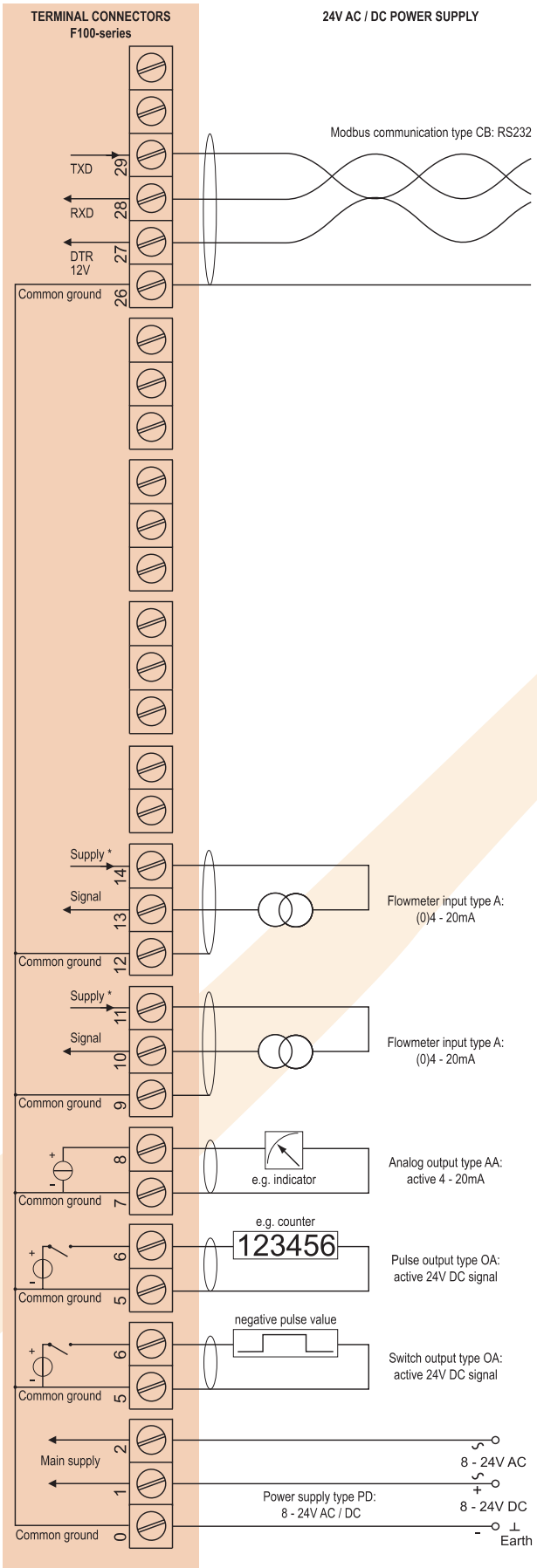

* Supply voltage: 1.2 / 3.2V DC to sensor

## Typical wiring diagram F116-P-AP-CH-OT-PX



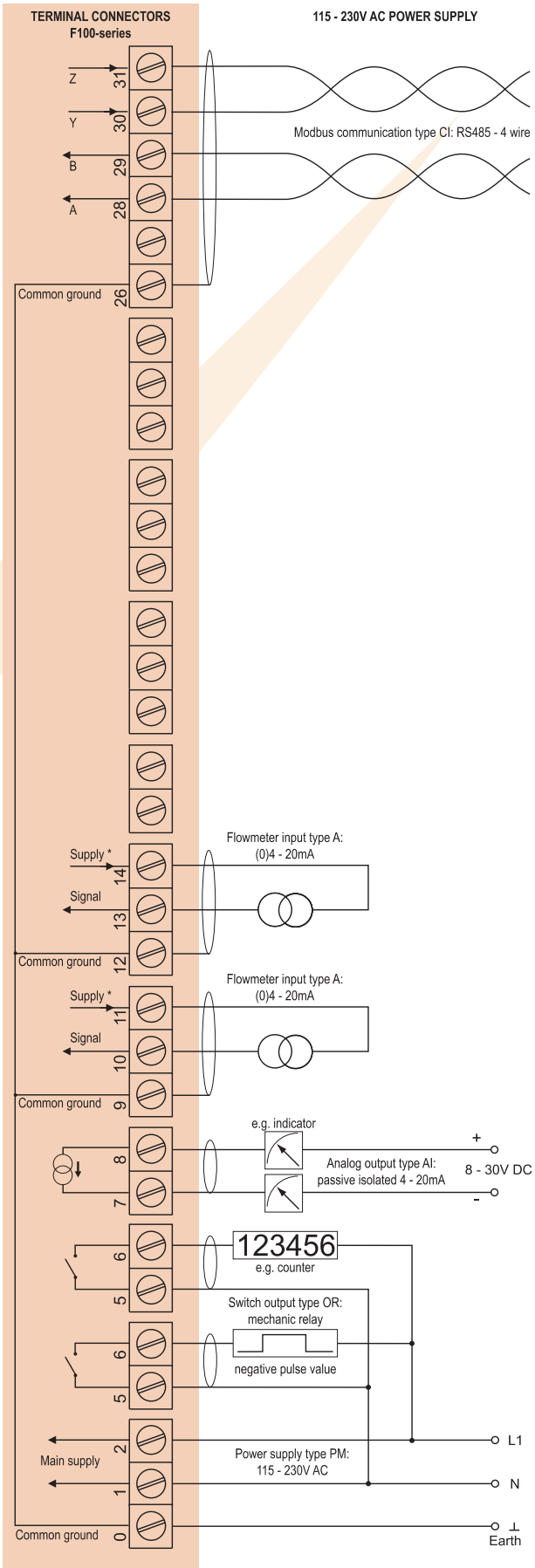

* Supply voltage: 1.2 / 3.2V DC to sensor

## Typical wiring diagram F116-A-AA-CB-OA-PD




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

## Typical wiring diagram F116-A-AI-CI-OR-PM




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

## Hazardous area applications

The F116-XI has been ATEX approved by KEMA for use in Intrinsically Safe applications. It is approved according to ⟨Ex⟩ 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 two I.S. power supplies for the pulse outputs, it is allowed to connect up to four I.S. power supplies in IIB applications or one in IIC applications.
Full functionality of the F116 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 two Namur sensors.
A flame proof enclosure with rating ⟨Ex⟩ II 2 GD EEx d IIB T5 is available as well.
Please contact your supplier for further details.

### *Certificate of conformity KEMA 03ATEX1074 X*

KEMA

(1) **EC-TYPE EXAMINATION CERTIFICATE**

(2) Equipment or protective system intended for use in potentially explosive atmospheres – Directive 94/9/EC

(3) EC-Type Examination Certificate Number: **KEMA 03ATEX1074 X**

(4) Equipment or protective system: **Indicator Model F100 Series**

(5) Manufacturer: **Fluidwell B.V.**

(6) Address: **Eisenhowerweg 1, 5466 AB Veghel, The Netherlands**

(7) This equipment or protective system and any acceptable variation thereto is specified in the schedule to this certificate and the documents therein referred to.

(8) KEMA Quality B.V., notified body number 0344 in accordance with Article 9 of the Council Directive 94/9/EC of 23 March 1994, certifies that this equipment or protective system has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of equipment and protective systems intended for use in potentially explosive atmospheres given in Annex II to the Directive.

The examination and test results are recorded in confidential report no. 2028528.

(9) Compliance with the Essential Health and Safety Requirements has been assured by compliance with:

EN 50014 : 1997 EN 50020 : 2002 EN 50281-1-1 : 1998 EN 50284 : 1999

(10) If the sign "X" is placed after the certificate number, it indicates that the equipment or protective system is subject to special conditions for safe use specified in the schedule to this certificate.

(11) This EC-Type Examination Certificate relates only to the design, examination and tests of the specified equipment or protective system according to the Directive 94/9/EC. Further requirements of the Directive apply to the manufacturing process and supply of this equipment or protective system. These are not covered by this certificate.

(12) The marking of the equipment or protective system shall include the following:

⟨Ex⟩ II 1 G D EEx ia IIB/IIC T4 T 100 °C

Arnhem, 2 July 2003
KEMA Quality B.V.

T. Pijpker
Certification Manager

* This Certificate may only be reproduced in its entirety and without any change

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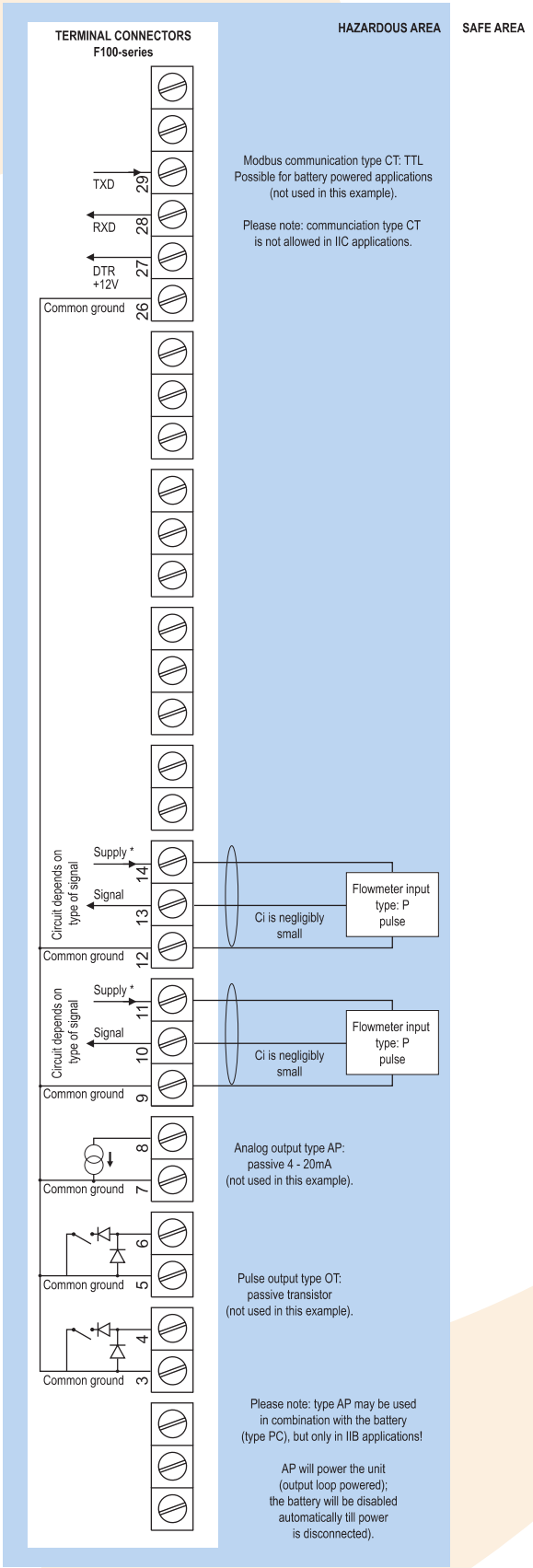
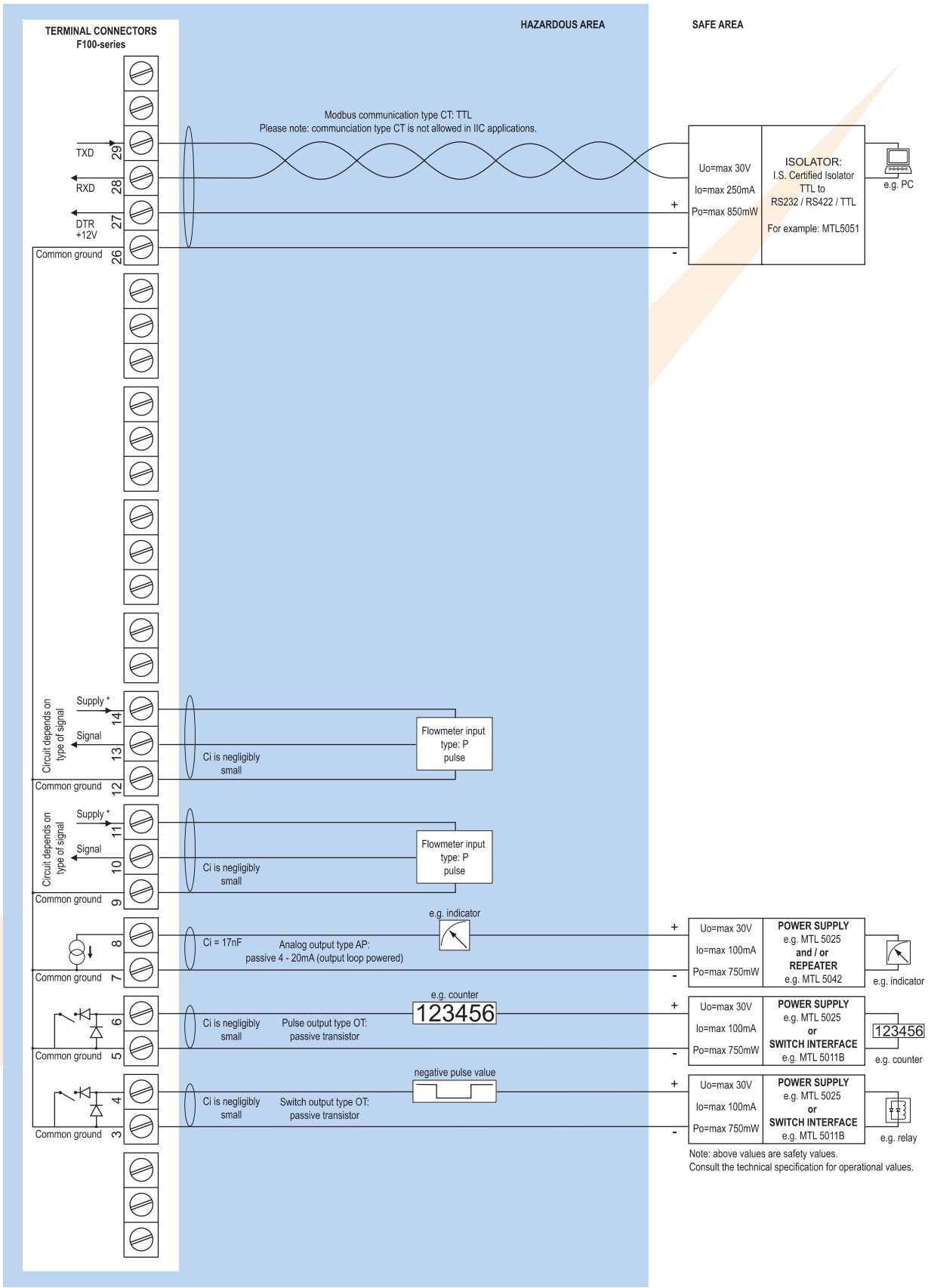
### *Configuration example IIB and IIC*
### *F116-P-(AP)-(CT)-(OT)-PC-XI - Battery powered unit*



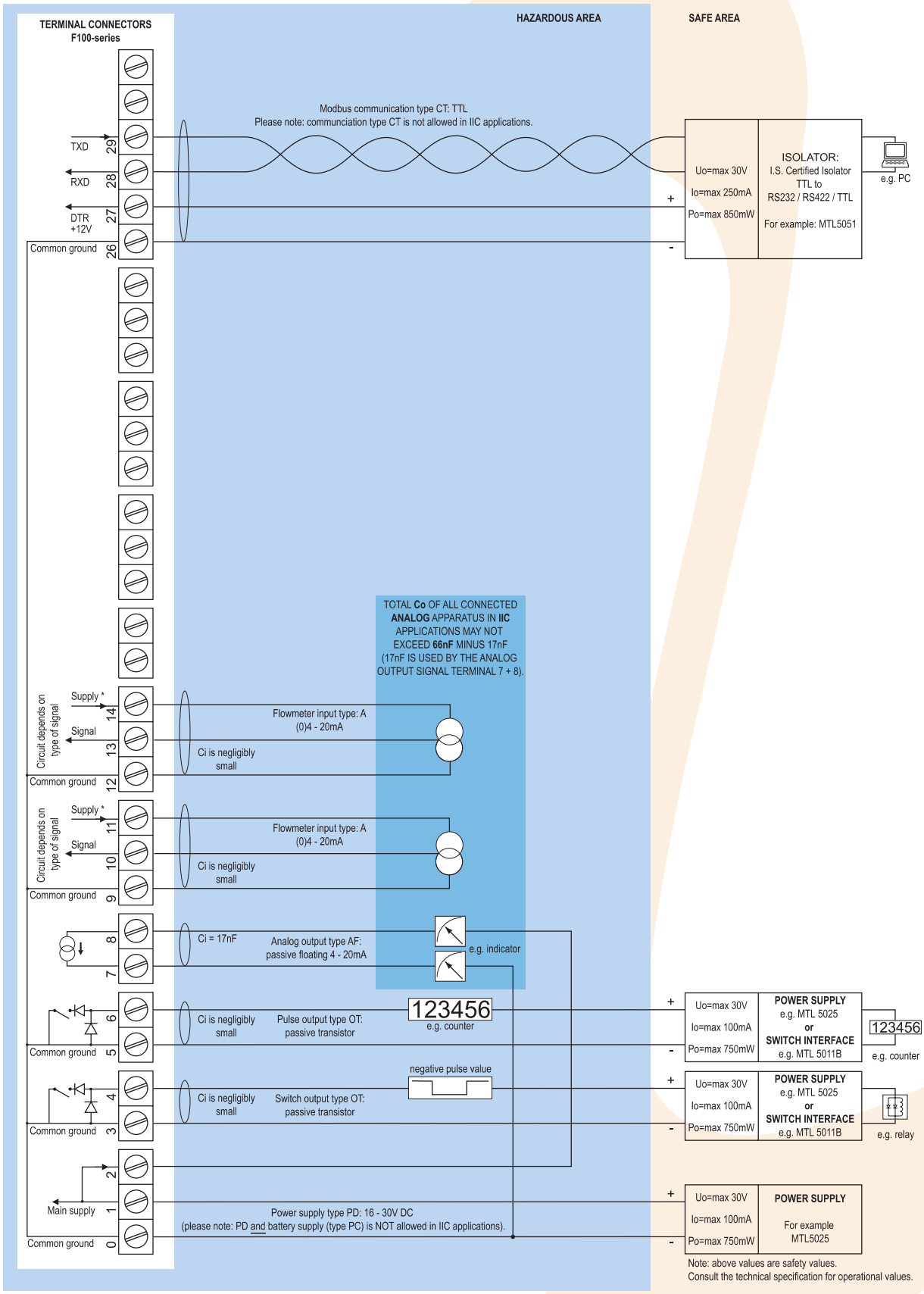

* Note sensor supply voltage: 1.2V DC for coil sensors or 3.2V DC for other pulse sensors.

## *Configuration example IIB and IIC - F116-P-AP-(CT)-OT-PX-XI - Output loop powered*



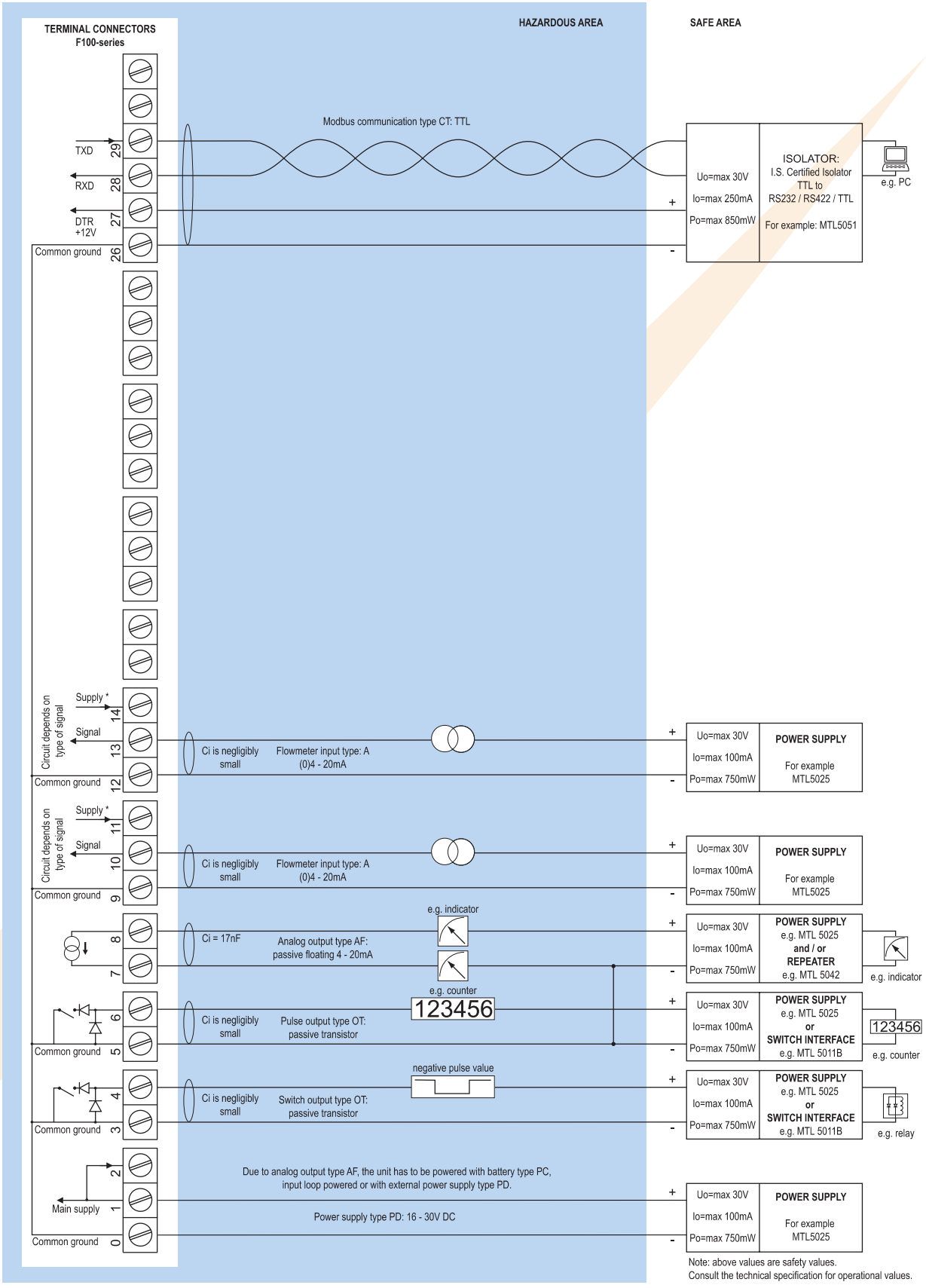

* Note sensor supply voltage: 1.2V DC for coil sensors or 3.2V DC for other pulse sensors.

## *Configuration example IIB and IIC - F116-A-AF-(CT)-OT-PD-XI - Power supply 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 - F116-A-AF-CT-OT-(PC)-(PD)-(PL)-XI - Power supply 16 - 30V DC, battery or loop powered*




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

* 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).

# 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: 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/PF/PM | Not availble 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. |
| 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 / 8.2 / 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.: Ⓔx II 1 GD EEx ia IIB/IIC T4 T100°C. |
| Type XI | Maximum ambient +70°C (158°F). |
| Explosion proof | ATEX approval ref.: Ⓔx 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 | Compliant ref: EN 61326 (1997), EN 61010-1 (1993). |

## *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 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 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-resisitant 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 A | (0)4 - 20mA. Analog input signal can be scaled to any desired range within 0 - 20mA. |
| Type U | 0 - 10V DC. Analog input signal can be scaled to any desired range within 0 - 10V DC. |
| 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 @ 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. |

## Signal outputs

| Analog output | |
|---|---|
| Function | Transmitting differential / sum 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 according to differential or sum accumulated total and indication negative pulse output. |
| Frequency | Max. 64Hz. Pulse length user definable between 7.8 msec up to 2 seconds. |
| Type OA | Two active 24V DC transistor outputs (PNP); max. 50mA per output (requires AA + PD, PF or PM). |
| Type OR | Two electro-mechanical relay outputs (N.O.) - isolated; max. switch power 230V AC - 0.5A per relay (requires PF or PM). |
| Type OT | Two passive transistor outputs (NPN) - not isolated. Max. 50V DC - 300mA per output. |

| Communication option | |
|---|---|
| Function | Reading display information, reading / writing all configuration settings. |
| Protocol | Modbus 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. |

## Operational

| Operator functions | |
|---|---|
| Displayed functions | • Differential flow rate (consumption) or the sum of both flow rates.<br>• Differential / sum total and accumulated total.<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. |

## 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: F116-P-AP-CX-EX-HC-IX-OT-PX-TX-XX-ZX.

| Ordering information: | F116 | -_ | -A _ | -C _ | -EX | -H _ | -IX | -O _ | -P _ | -TX | -X _ | -Z _ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Flowmeter input signal** | | | | | | | | | | | | |
| A | (o)4 - 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 RTU. | | | | | | | | | | | |
| CH | Communication RS485 - 2wire - Modbus RTU. | | | | | | | | | | | |
| CI | Communication RS485 - 4 wire - Modbus RTU. | | | | | | | | | | | |
| CT | Intrinsically Safe TTL - Modbus 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 (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. | | | | | | | | | | | |
| 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. | | | | | | | | | | | |
| 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** | | | | | | | | | | | | |
| **IX** | **No additional input.** | | | | | | | | | | | |
| **Outputs** | | | | | | | | | | | | |
| OA | Two active transistor outputs - requires AA, AB or AU and PD, PF or PM. | | | | | | | | | | | |
| OR | Two mechanical relay outputs - requires PF or PM. | | | | | | | | | | | |
| **OT** | **Two passive transistor outputs - 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.

KEMA DUTCH COUNCIL FOR ACCREDITATION

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