DATASHEET F132 - BATCH CONTROLLER

# BATCH CONTROLLER

## WITH TWO STAGE CONTROL AND RECEIPT PRINTER DRIVER


### Features

- Receipt printing function after each batch.
- Large display shows preset value and running batch value simultaneously.
- Easy operation to enter a batch value, print an extra receipt and to control the process.
- Count-up and count-down function available.
- Self-learning overrun correction.
- No-flow monitoring.
- Selectable on-screen engineering units; volumetric or mass.
- Operational temperature -40°C up to +80°C (-40°F up to 176°F).
- Very compact design for panel mount, wall mount or field mount applications.
- Rugged aluminum field mount enclosure IP67/NEMA4X.
- Intrinsically Safe - ATEX and IECEx approval for gas and dust applications.
- Explosion/flame proof Ⓔx II 2 GD EEx d IIB T5.
- Lithium battery powered, 8 - 24V AC/DC or 115 - 230V AC power supply.
- Sensor supply 3.2 / 8.2 / 12 / 24V DC.

### Signal output

- Two configurable control outputs: for two-stage or one-stage control.

### Signal input

#### Flow

- Reed-switch.
- NAMUR.
- NPN/PNP pulse.
- Sine wave (coil).
- Active pulse signals.

#### Status

- Remote control: start.
- Remote control: pause / stop.

### Applications

- Batching of small and /or large quantities, single or repeating batches where printed information is requested. Alternative basic model: F030 or more sophisticated models: F130, F131, F136 and 0300 series.

# General information

## Introduction

The F132 is a straight forward two stage batch controller with the unique function to send a “print receipt” command to a printer after every batch. The operator can easily enter a batch quantity, send an extra “print receipt” command or execute repeating batches. During the batch, the preset value is displayed as well as the batched (or remaining) quantity including the units of measurement. The automatic self-learning overrun correction ensures an accurate result after each batch. A wide selection of options further enhances the capabilities of this model, wich includes Intrinsic Safety.

## Display

The display has large 17mm (0.67”) and 8mm (0.31”) digits which show the batched quantity and the preset value simultaneously. On-screen engineering units are easily configured from a comprehensive menu.
A seven digit resettable "day total" is available as well as an eleven digit non-resettable accumulated total. All values are 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, 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.

## Control outputs

Two outputs are available which can be configured to operate as two stage control for large batch quantities or as one stage control for smaller batches. The output signals can be passive NPN, active PNP or isolated electro-mechanical relays.

## Signal input

The F132 accepts most pulse input signals for volumetric flow or mass flow measurement.

For remote control, two inputs are available to start, pause and stop the batch process.

## No-flow

If there is a predefined time-out in the input signal, the no-flow alarm will be triggered. The F132 goes in pause-mode and the display will show: NO FLOW.

## Printer communication

The “print receipt” command is processed through the ASCII data communication link (RS232 / RS485). Receipt printing functionality remains available for the Intrinsically Safe version (TTL).

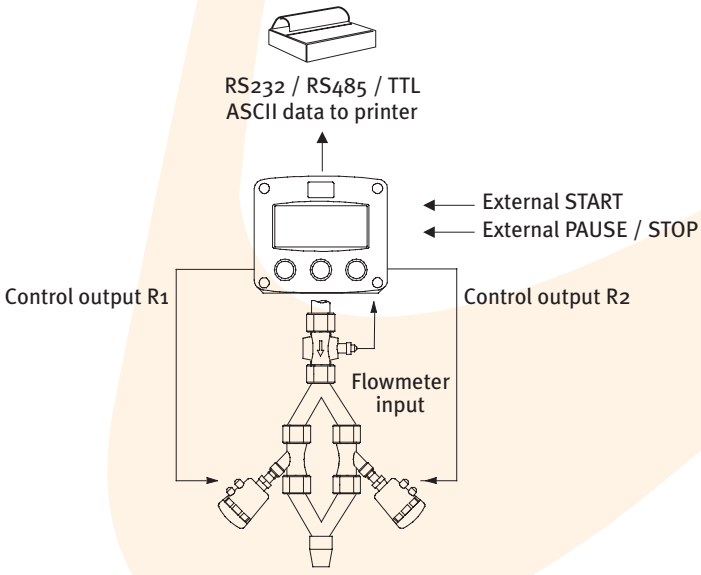
## Hazardous areas

This model has been ATEX and IECEx certified Intrinsically Safe for gas and dust applications, with an allowed operational temperature of -40°C to +70°C (-40°F to +158°F).
A flame proof enclosure with ATEX certification offers the rating Ex II 2 GD EEx d IIB T5.

## Enclosures

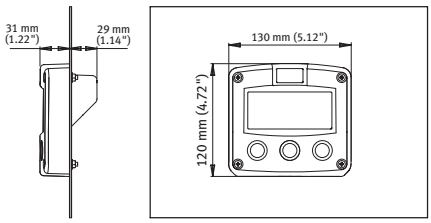
All enclosures are ATEX and IECEx approved. As standard the F132 is supplied in an GRP panel mount enclosure, which can be converted to an IP67 / NEMA 4X GRP field mount enclosure by the addition of a back case. Most popular is our rugged aluminum field mount enclosure.

# Overview application F132

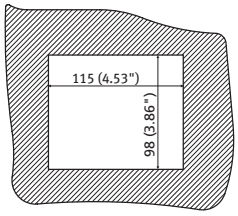


# Dimensions enclosures

## *Aluminum & GRP panel mount enclosure*

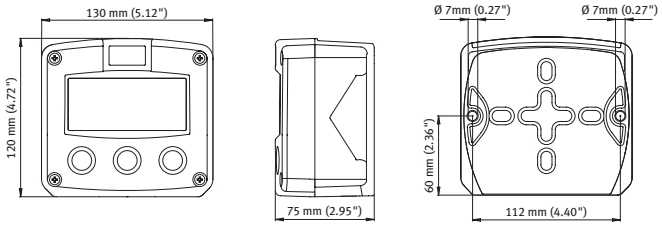



HB & HC enclosures

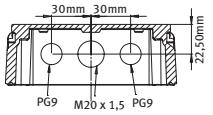



panel cut-out

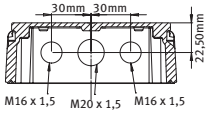
## *Aluminum & GRP field / wall mount enclosures*



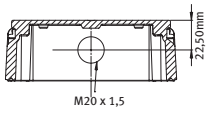

**Aluminum**



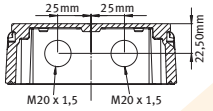

**HA**



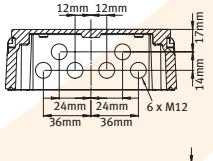

**HM**



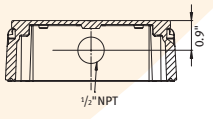

**HN**



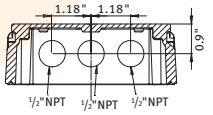

**HO**



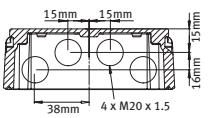

**HP**



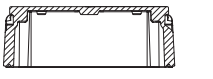

**HT**




**HU**

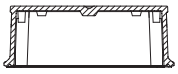



**HV**

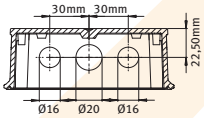


**HZ**

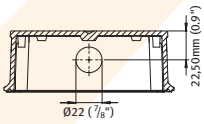
**GRP**



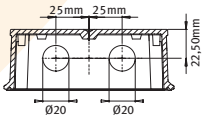
**HD**



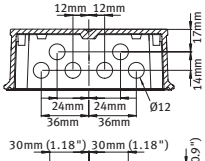

**HE**



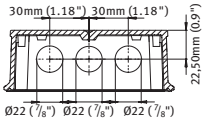

**HF**



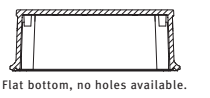

**HG**




**HH**



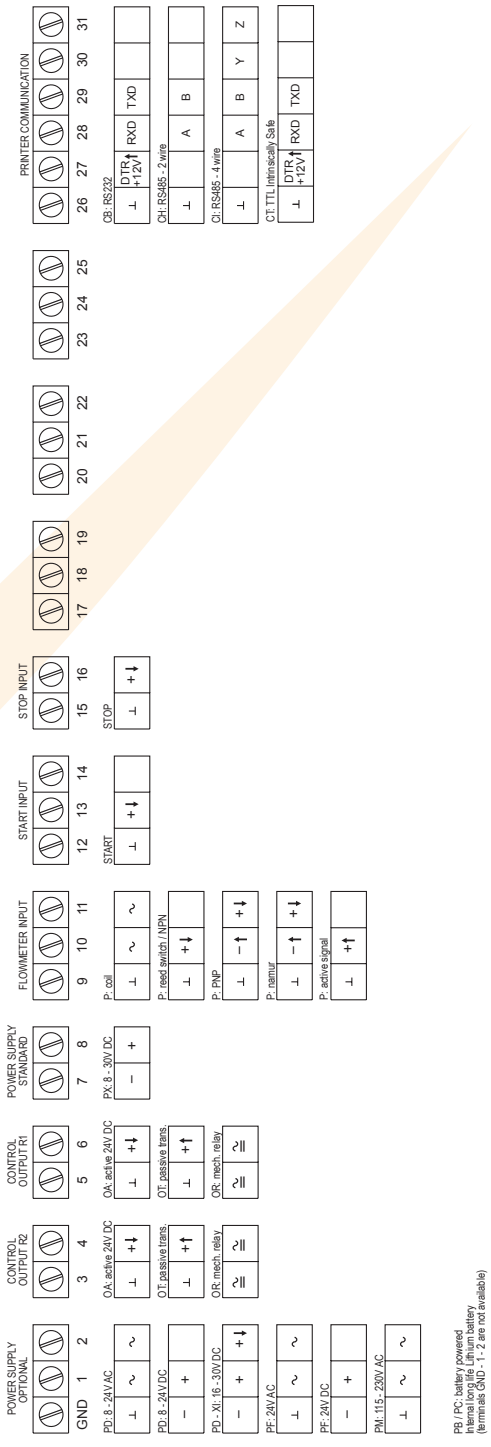

**HJ**



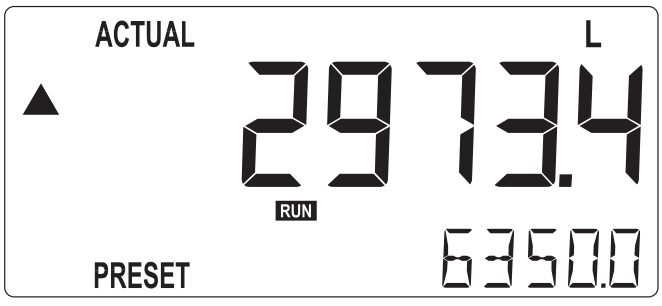
**HK**

Flat bottom, no holes available.

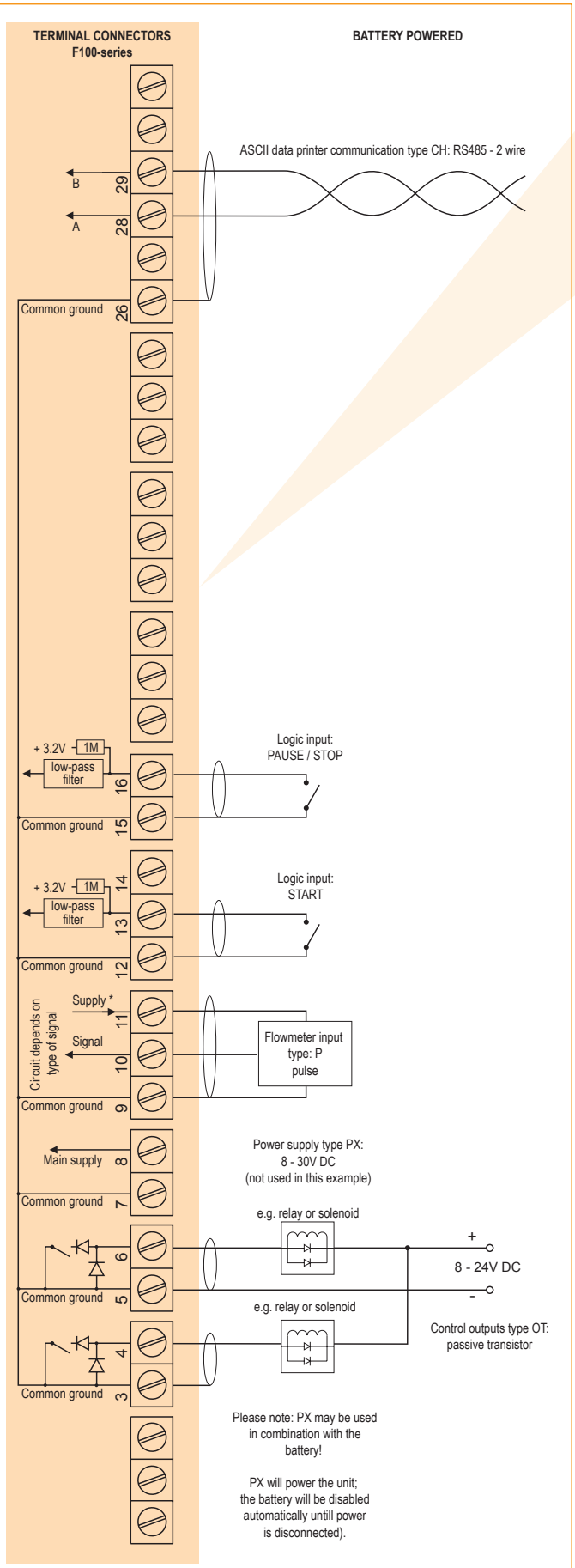
# Terminal connections




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

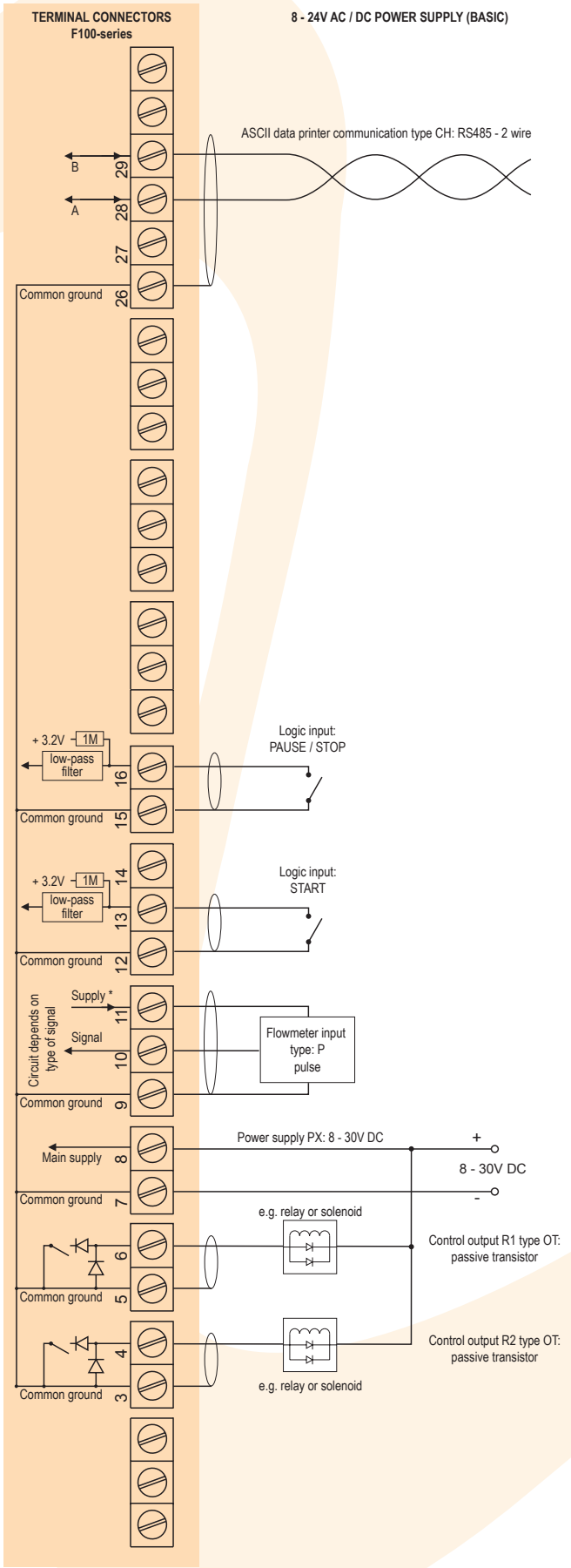


## Typical wiring diagram F132-P-CH-OT-PB-(PX)



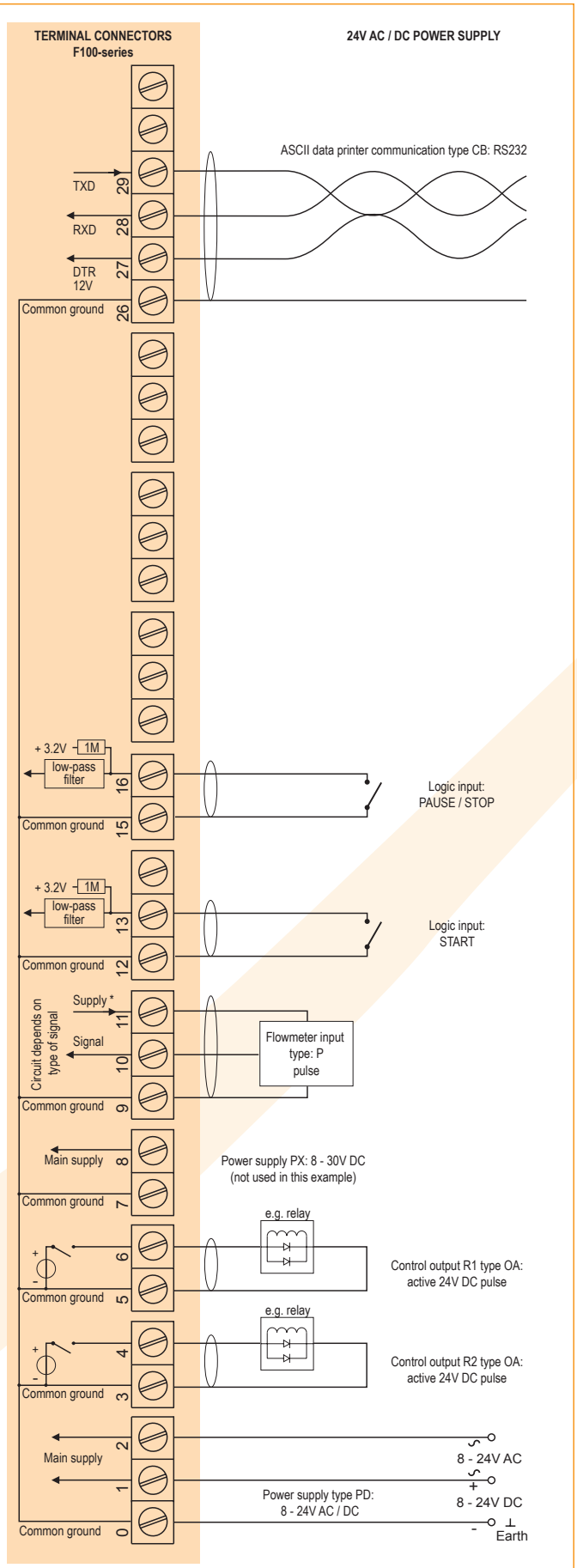

*Supply voltage: 1.2 / 3.2V DC to sensor

## Typical wiring diagram F132-P-CH-OT-PX



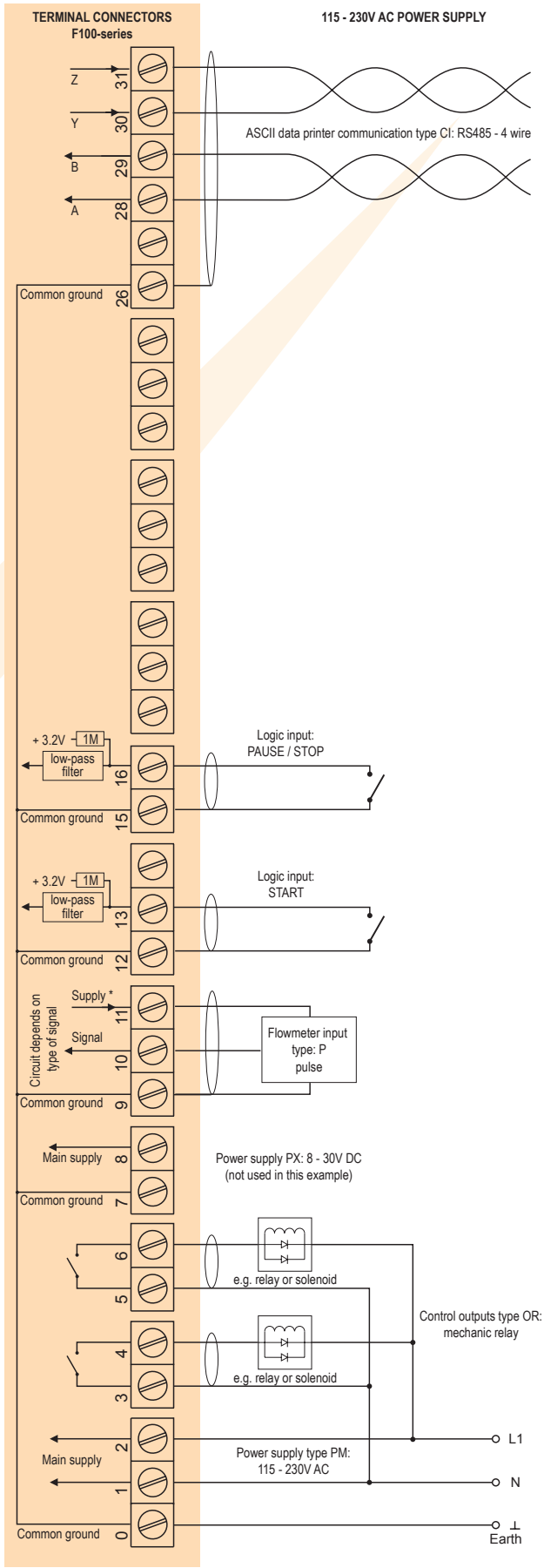

*Supply voltage: 1.2 / 3.2V DC to sensor

## Typical wiring diagram F132-P-CB-OA-PD




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

## Typical wiring diagram F132-P-CI-OR-PM




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

## Hazardous area applications

The F132-XI has been certified according 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).

- The ATEX markings for gas and dust applications are:
  **II 1 G Ex ia IIB/IIC T4 Ga**
  **II 1 D Ex ia IIIC T100 °C Da IP6X**.
- The IECEx markings for gas and dust applications are: **Ex ia IIC/IIB T4 Ga** and **Ex ia IIIC T100 °C Da IP6X**.

Besides the I.S. power supplies for the control outputs, it is allowed to connect up to two 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 F132 remains available, including two stage control 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 ATEX **II 2 GD EEx d IIB T5** is available as well.

Please contact your supplier for further details.

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

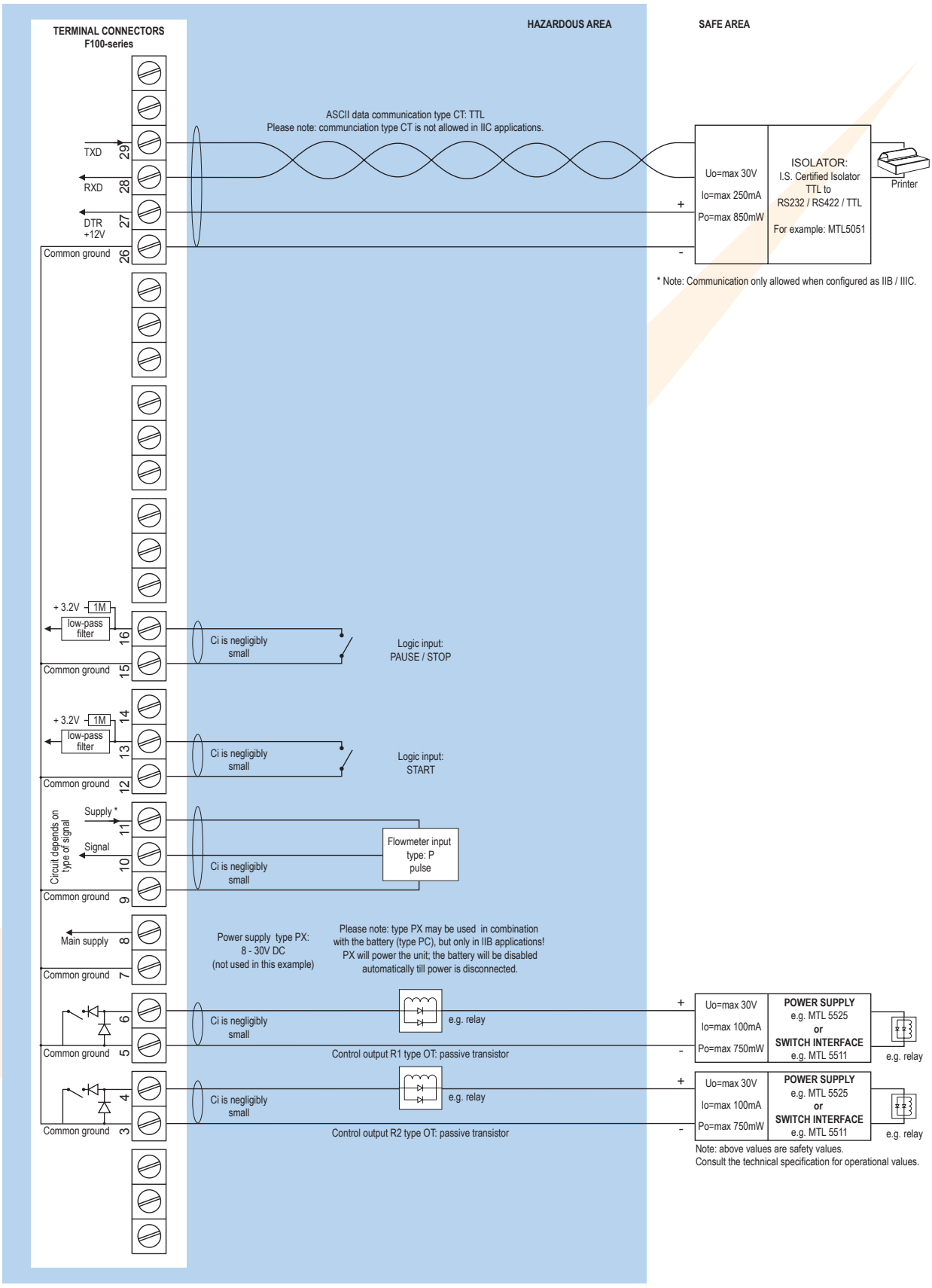
### *• IECEx DEK 11.0042X*

IECEx Certificate of Conformity

INTERNATIONAL ELECTROTECHNICAL COMMISSION
IEC Certification Scheme for Explosive Atmospheres

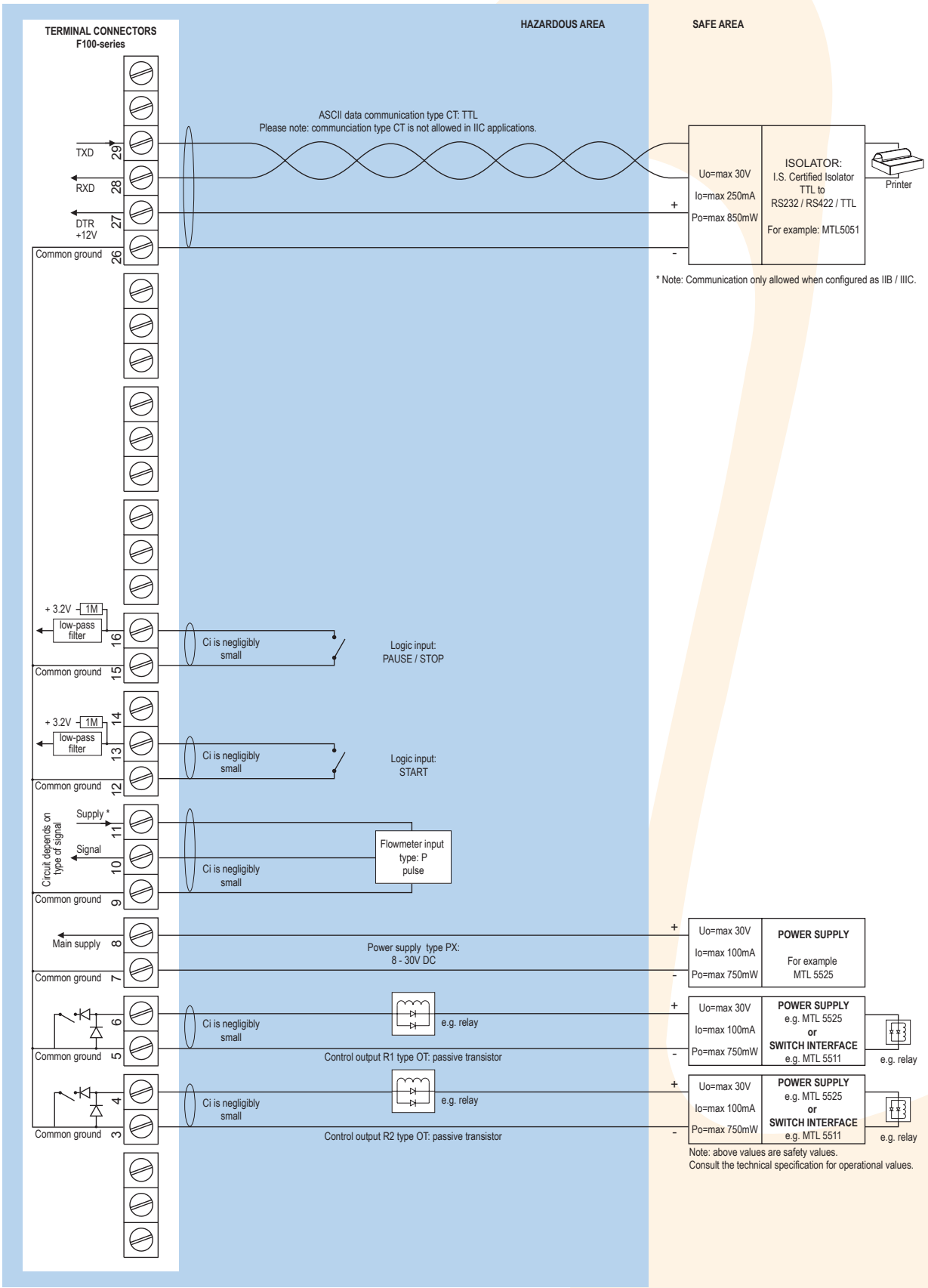
CERTIFICATE
EC-Type Examination

## *Configuration example IIB / IIIC and IIC - F132-P-(CT)-OT-PX-XI - Battery powered unit*



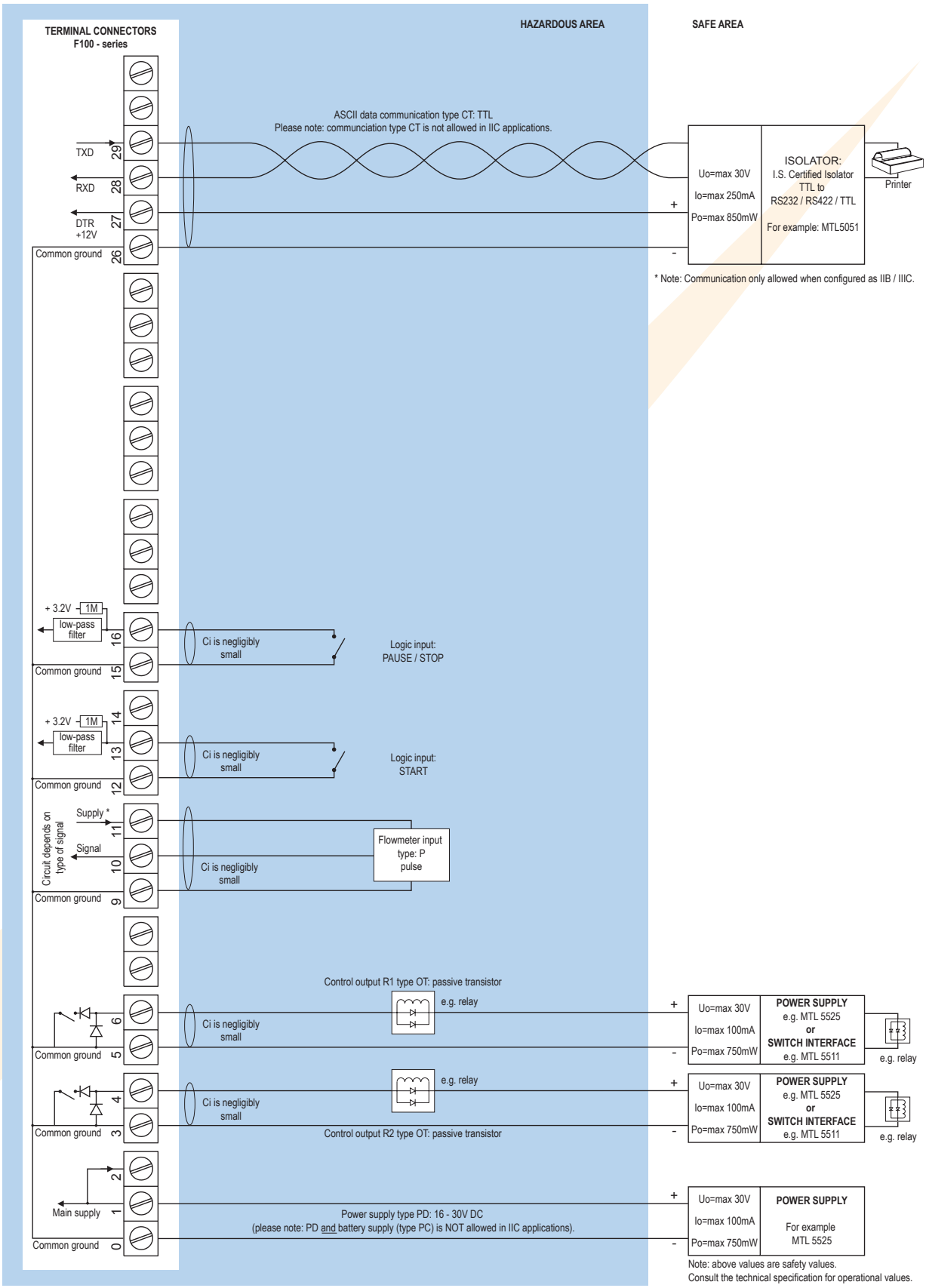

* Note sensor supply voltage: 1.2V DC for coil sensors or 3.2V DC for other pulse sensors.

## *Configuration example IIB / IIIC and IIC - F132-P-(CT)-OT-PX-XI - Basic power supply 8 - 30V DC*




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

## *Configuration example IIB / IIIC and IIC - F132-P-(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).

# 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. - 1 time/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 | |
|---|---|
| Standard unit | -40°C to +80°C (-40°F to +176°F). |
| Intrinsically Safe | -40°C to +70°C (-40°F to +158°F). |

| Power requirements | |
|---|---|
| Type PB | Long life Lithium battery - life-time depends upon settings and configuration - up to 5 years. |
| Type PC | Intrinsically Safe long life lithium battery - life-time depends upon settings and configuration - up to 5 years. |
| Type PD | 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 PM | 115 - 230V AC ± 10%. Power consumption max. 15 Watt. |
| Type PX | 8 - 30V DC. Power consumption max. 0.5 Watt. |
| Type ZB | Internally powered, only available with 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). |
| 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. |

## *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 HV | Cable entry: 4 x M20. |
| Type HZ | Cable entry: no holes. |

| GRP wall / field mount enclosures | |
|---|---|
| General | GRP wall/field mount enclosure IP67 / NEMA 4X, UV-resistant and flame retardant. |
| Dimensions | 130 x 120 x 75mm (5.12" x 4.72" x 2.95") - W x H x D. |
| Weight | 600 gr. |
| Type HD | Cable entry: no holes. |
| Type HE | Cable entry: 2 x Ø 16mm and 1 x Ø 20mm. |
| Type HF | Cable entry: 1 x Ø 22mm ($^7/_8$"). |
| Type HG | Cable entry: 2 x Ø 20mm. |
| Type HH | Cable entry: 6 x Ø 12mm. |
| Type HJ | Cable entry: 3 x Ø 22mm ($^7/_8$"). |
| Type HK | Flat bottom, cable entry: no holes. |

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

| 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. |

## Hazardous area

| Intrinsically Safe (Type XI) | |
|---|---|
| ATEX certification | II 1 G Ex ia IIB/IIC T4 Ga.<br>II 1 D Ex ia IIIC T100 °C Da IP6X. |
| IECEx certification | Ex ia IIC/IIB T4 Ga.<br>Ex ia IIIC T100 °C Da IP6X. |
| Ambient Ta | -40°C to +70°C (-40°F to +158°F). |

| Explosion proof (Type XF) | |
|---|---|
| ATEX certification | II 2 GD EEx d IIB T5. |
| Dimensions | 300 x 250 x 200mm (11.8" x 9.9" x 7.9") L x H x D. |
| Weight | Appr. 15kg. |

| Environment | |
|---|---|
| Electromagnetic compatibility | Compliant ref: EN 61326 (1997), EN 61010-1 (1993). |

## 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. |

| Logic inputs | |
|---|---|
| Function | Two terminal inputs to start, pause and stop the batch process. |
| Type | Internally pulled-up switch contact - NPN. |
| Duration | Minimum pulse duration 100msec. |

## Signal outputs

| Control / pulse output | |
|---|---|
| Function | User defined: batch process one or two stage control. |
| Type OA | Two active 24V DC transistor outputs (PNP); max. 50mA per output (requires 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. |

| Printer communication option | |
|---|---|
| Function | Send a “print receipt” command after every batch. |
| Protocol | ASCII data. |
| Speed | 1200 - 2400 - 4800 - 9600 baud. |
| Type CB | RS232 |
| Type CH | RS485 2-wire |
| Type CI | RS485 4-wire |
| Type CT | TTL Intrinsically Safe. |

## Operational

| Operator functions | |
|---|---|
| Displayed functions | • Preset value - can be entered by the operator.<br>• Batched quantity or remaining quantity.<br>• Total and accumulated total.<br>• Nr. of batches.<br>• Reprint the last receipt.<br>• No-flow alarm. |

| Preset and 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. |

## 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. |

| Blind plug accessories | |
|---|---|
| ACF50 | For HA enclosure, includes O-rings. |
| ACF55 | For HE enclosure, includes locknuts and O-rings. |
| ACF56 | For HF enclosure, includes locknuts and O-rings. |
| ACF57 | For HG enclosure, includes locknuts and O-rings. |
| ACF58 | For HH enclosure, includes locknuts and O-rings. |
| ACF59 | For HJ enclosure, includes locknuts and O-rings. |
| ACF62 | For HM enclosure, includes O-rings. |
| ACF63 | For HN enclosure, includes O-rings. |
| ACF64 | For HO enclosure, includes O-rings. |
| ACF65 | For HP enclosure, includes O-rings. |
| ACF69 | For HT enclosure, includes O-rings. |
| ACF70 | For HU enclosure, includes O-rings. |

# Ordering information

Standard configuration: F132-P-AX-CX-EX-HC-IX-OT-PX-TX-XX-ZX.

| Ordering information: | | F132 -_ | -AX | -C _ | -EX | -H _ | -IX | -O _ | -P _ | -TX | -X _ | -Z _ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Flowmeter input signal** | | | | | | | | | | | | |
| **P** | Ex | **Pulse input: coil, npn, pnp, namur, reed-switch.** | | | | | | | | | | |
| **Analog output signal** | | | | | | | | | | | | |
| **AX** | Ex | **No analog output.** | | | | | | | | | | |
| **Printer communication** | | | | | | | | | | | | |
| CB | | Communication RS232 - ASCII data. | | | | | | | | | | |
| CH | | Communication RS485 - 2-wire - ASCII data. | | | | | | | | | | |
| CI | | Communication RS485 - 4-wire - ASCII data. | | | | | | | | | | |
| CT | Ex | Intrinsically Safe TTL - ASCII data. | | | | | | | | | | |
| **CX** | Ex | **No printer communication.** | | | | | | | | | | |
| **Flow equations** | | | | | | | | | | | | |
| **EX** | Ex | **No flow equations.** | | | | | | | | | | |
| **Panel mount enclosures - IP65 / NEMA4X** | | | | | | | | | | | | |
| HB | Ex | Aluminum enclosure. | | | | | | | | | | |
| **HC** | Ex | **GRP enclosure.** | | | | | | | | | | |
| **GRP field / wall mount enclosures - IP67 / NEMA4X** | | | | | | | | | | | | |
| HD | Ex | Cable entry: no holes. | | | | | | | | | | |
| HE | Ex | Cable entry: 2 x Ø 16mm & 1 x Ø 20mm. | | | | | | | | | | |
| HF | Ex | Cable entry: 1 x Ø 22mm (7/8"). | | | | | | | | | | |
| HG | Ex | Cable entry: 2 x Ø 20mm. | | | | | | | | | | |
| HH | Ex | Cable entry: 6 x Ø 12mm. | | | | | | | | | | |
| HJ | Ex | Cable entry: 3 x Ø 22mm (7/8"). | | | | | | | | | | |
| HK | Ex | Flat bottom, cable entry: no holes. | | | | | | | | | | |
| **Aluminum field / wall mount enclosures - IP67 / NEMA4X** | | | | | | | | | | | | |
| HA | Ex | Cable entry: 2 x PG9 + 1 x M20. | | | | | | | | | | |
| HM | Ex | Cable entry: 2 x M16 + 1 x M20. | | | | | | | | | | |
| HN | Ex | Cable entry: 1 x M20. | | | | | | | | | | |
| HO | Ex | Cable entry: 2 x M20. | | | | | | | | | | |
| HP | Ex | Cable entry: 6 x M12. | | | | | | | | | | |
| HT | Ex | Cable entry: 1 x ½"NPT. | | | | | | | | | | |
| HU | Ex | Cable entry: 3 x ½"NPT. | | | | | | | | | | |
| HV | Ex | Cable entry: 4 x M20. | | | | | | | | | | |
| HZ | Ex | Cable entry: no holes. | | | | | | | | | | |
| **ABS field / wall mount enclosures - IP65** | | | | | | | | | | | | |
| HS | Ex | Silicone free ABS field enclosure – Cable entry: no holes (old HD enclosure). | | | | | | | | | | |
| **Additional inputs** | | | | | | | | | | | | |
| **IX** | Ex | **No additional input.** | | | | | | | | | | |
| **Outputs** | | | | | | | | | | | | |
| OA | | Two active transistor outputs - requires PD, PF or PM. | | | | | | | | | | |
| OR | | Two mechanical relay outputs - requires PF or PM. | | | | | | | | | | |
| **OT** | Ex | **Two passive transistor outputs - standard configuration.** | | | | | | | | | | |
| **Power supply** | | | | | | | | | | | | |
| PB | | Lithium battery powered. | | | | | | | | | | |
| PC | Ex | Lithium battery powered - Intrinsically Safe. | | | | | | | | | | |
| PD | Ex | 8 - 24V AC/DC + sensor supply - with XI: 16 - 30V DC. | | | | | | | | | | |
| PF | | 24V AC/DC + sensor supply. | | | | | | | | | | |
| PM | | 115 - 230V AC + sensor supply. | | | | | | | | | | |
| **PX** | Ex | **Basic power supply 8 - 30V DC (no real sensor supply).** | | | | | | | | | | |
| **Temperature input signal** | | | | | | | | | | | | |
| **TX** | Ex | **No temperature input signal.** | | | | | | | | | | |
| **Hazardous area** | | | | | | | | | | | | |
| XI | Ex | Intrinsically Safe, according ATEX and IECEx. | | | | | | | | | | |
| XF | | EExd enclosure - 3 keys. | | | | | | | | | | |
| **XX** | | **Safe area only.** | | | | | | | | | | |
| **Other options** | | | | | | | | | | | | |
| ZB | | Backlight - requires PD, PF or PM. | | | | | | | | | | |
| ZF | Ex | Coil input 10mVpp. | | | | | | | | | | |
| **ZX** | Ex | **No options.** | | | | | | | | | | |

The bold marked text contains the standard configuration.

Ex Available Intrinsically Safe.

Specifications are subject to change without notice.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