DATASHEET F132 - BATCH CONTROLLER

BATCH CONTROLLER

WITH TWO STAGE CONTROL AND RECEIPT PRINTER DRIVER

ACP01 - Portable printer

ACP02/03 - Panel printer

Advantages

- Robust IP67 (NEMA4X) field enclosure. It is so rugged, **you 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

- 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.
- 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

- Ability to process all types of flow meter signals: Reed-switch, NAMUR, NPN/PNP pulse, Sine wave (coil), Active pulse signals.

Remote control

- Start.
- Pause / Stop.

Applications

- The F-Series is your first and safest choice for field mount indicators. Especially in harsh weather conditions like rain, snow, salty atmosphers and temperatures between -40°C up to +80°C (-40°F up to 176°F) for safe and hazardous area 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 300-Series or the D-Series DIN panel mount indicators and controllers.

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 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.

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).
More receipt information on page 6.

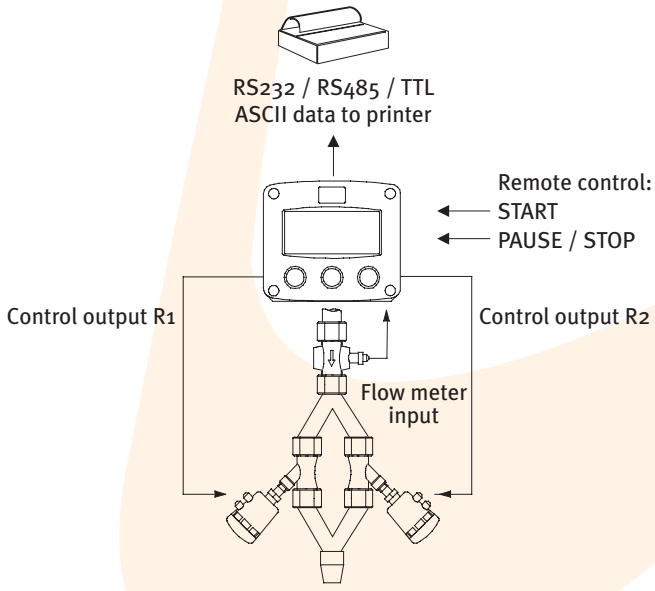
Hazardous areas

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

Enclosures

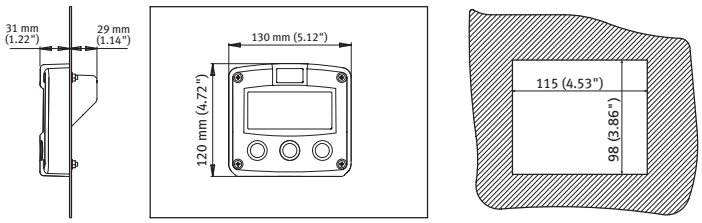
All enclosures are ATEX and IECEx approved. As standard the F132 is supplied in an GRP panel mount enclosure, which can be converted to an IP67 / NEMA 4X GRP field mount enclosure by the addition of a back case. Most popular is our rugged aluminum field mount enclosure.

Overview application F132



Dimensions enclosures

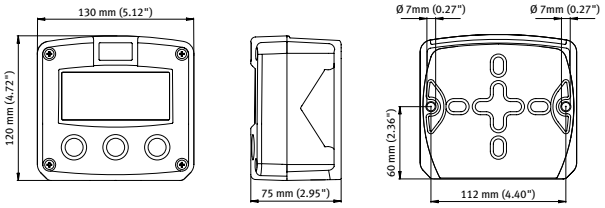
Aluminum & GRP panel mount enclosure



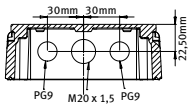
HB & HC enclosures

panel cut-out

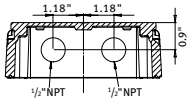
Aluminum & GRP field / wall mount enclosures



Aluminum



HA



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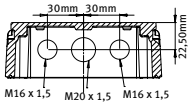

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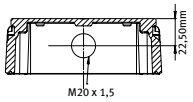

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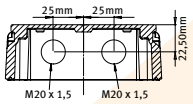

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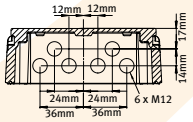

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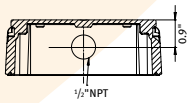

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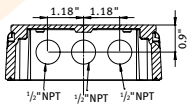

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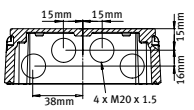
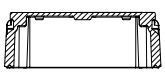
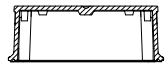


HV



HZ

GRP



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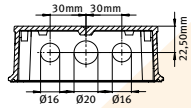

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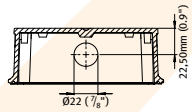

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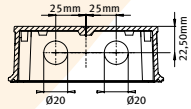

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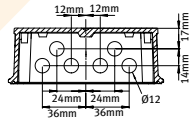

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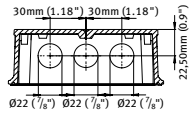

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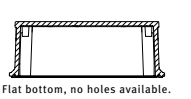
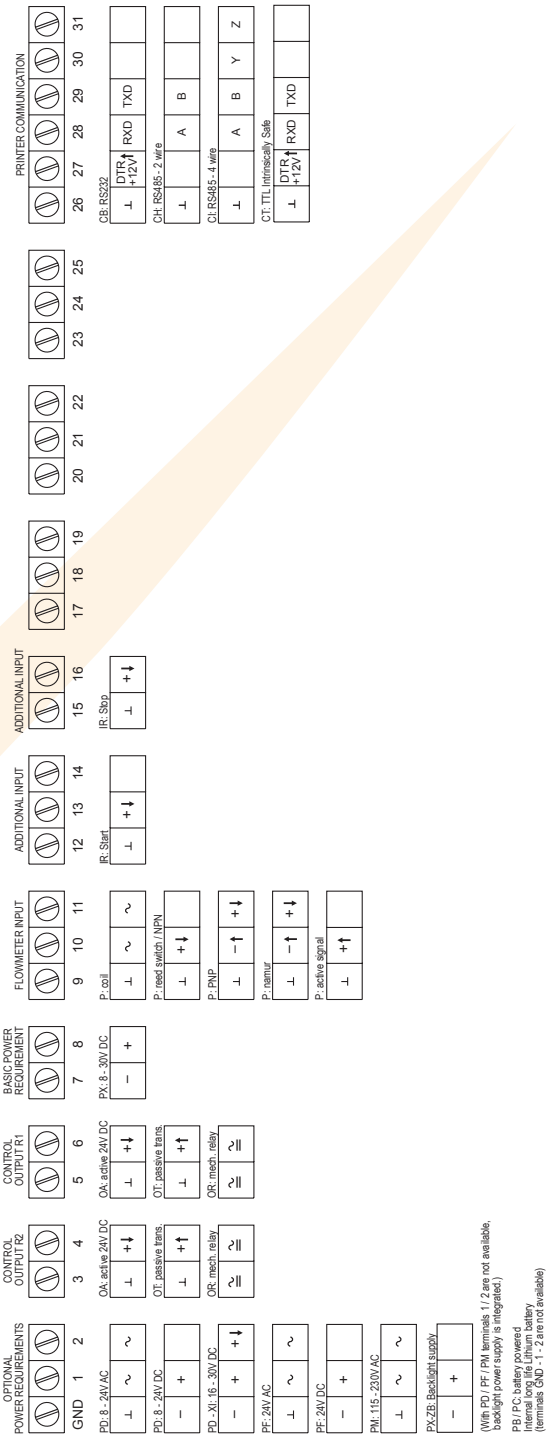


HK

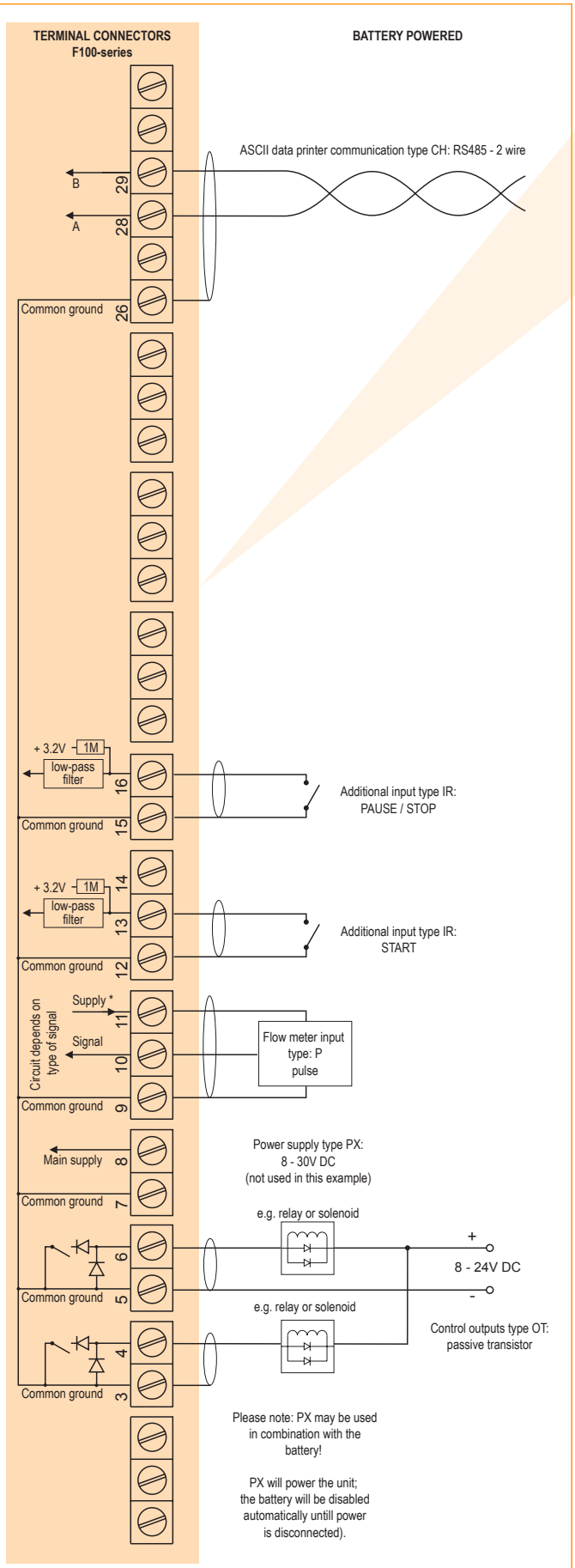
Flat bottom, no holes available.

Terminal connections



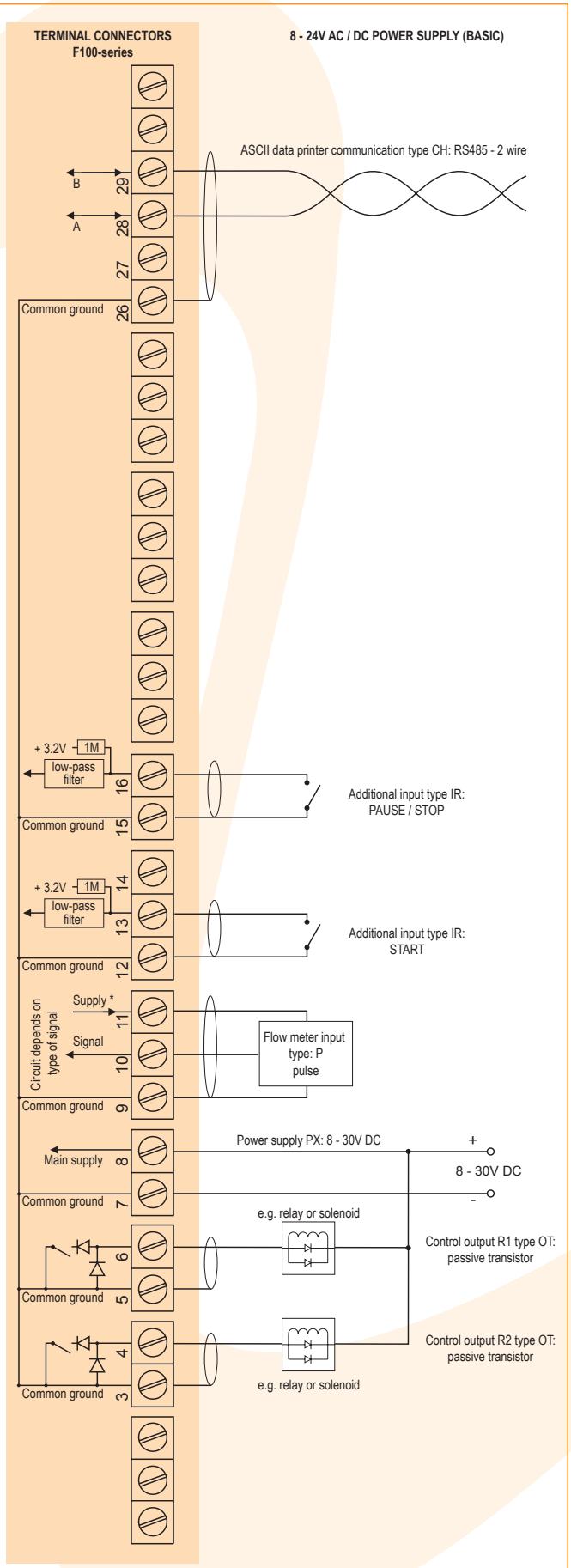
Display example - 90 x 40mm (3.5" x 1.6")

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



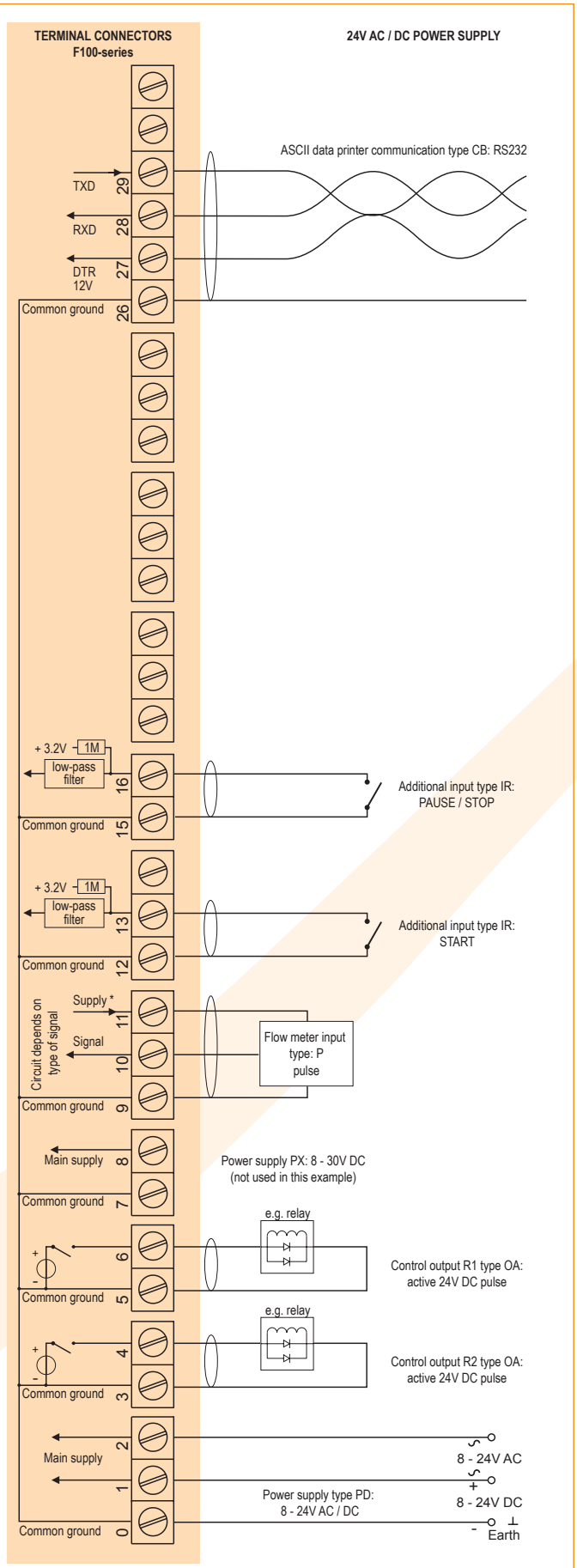
*Supply voltage: 1.2 / 3.2V DC to sensor

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



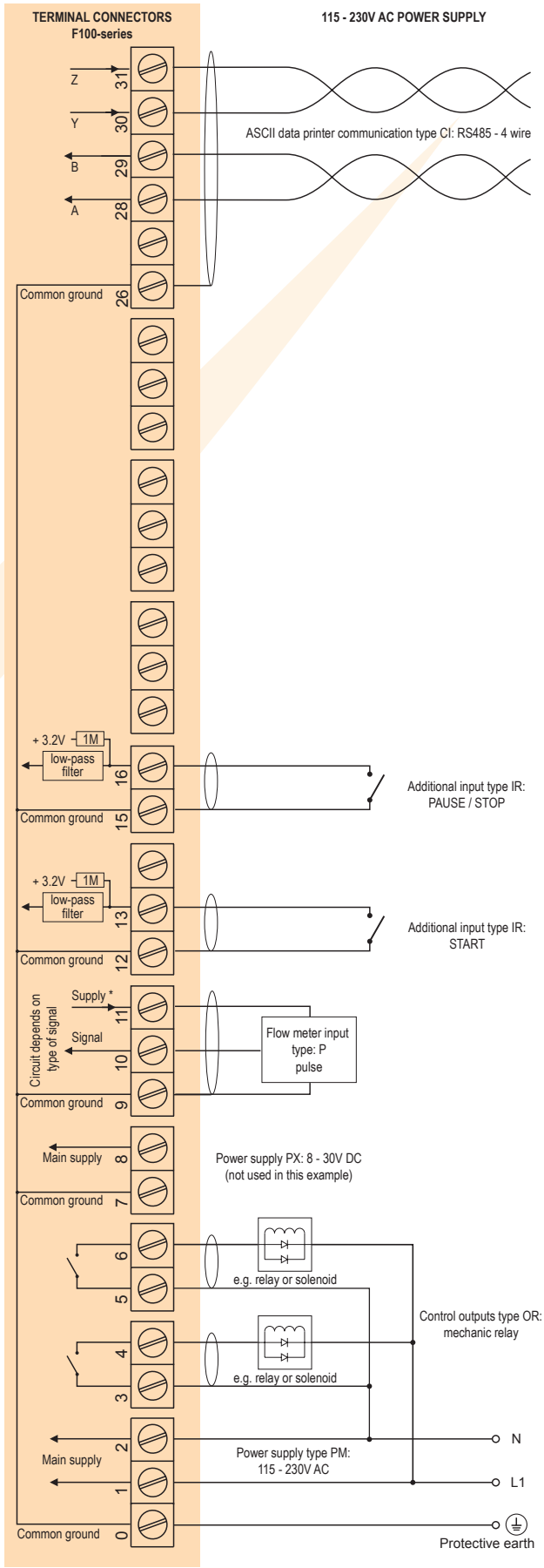
*Supply voltage: 1.2 / 3.2V DC to sensor

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

Receipt information

After each completed batch a receipt is printed on an external device. Additional receipts can be printed on demand.

Standard information printed on the receipt:

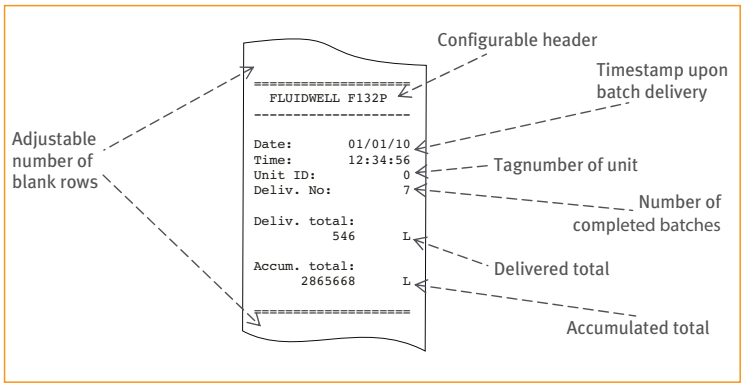
- A date- and timestamp.
- Tagnumber.
- Number of completed batches
- Delivered total.
- Accumulated total.

Configurable information printed on the receipt:

- 16 character upper case text header.
- 1 to 9 empty lines before printing the receipt.
- 1 to 9 empty lines after printing the receipt.

Below example shows a printed receipt.
The arrows indicate the items that can be configured.

receipt example



Accessories

Three printers are optional available.

Printers	
ACP01	Ap 1300 - Thermal portable printer (incl. cables and battery charger).
ACP02	Ap 1400 - Thermal panel printer with standard 3.5V DC to 8.5V DC power supply (incl. cables).
ACP03	Ap 1400 - Thermal panel printer with external 100 - 240V AC power supply (incl. cables).

Hazardous area applications

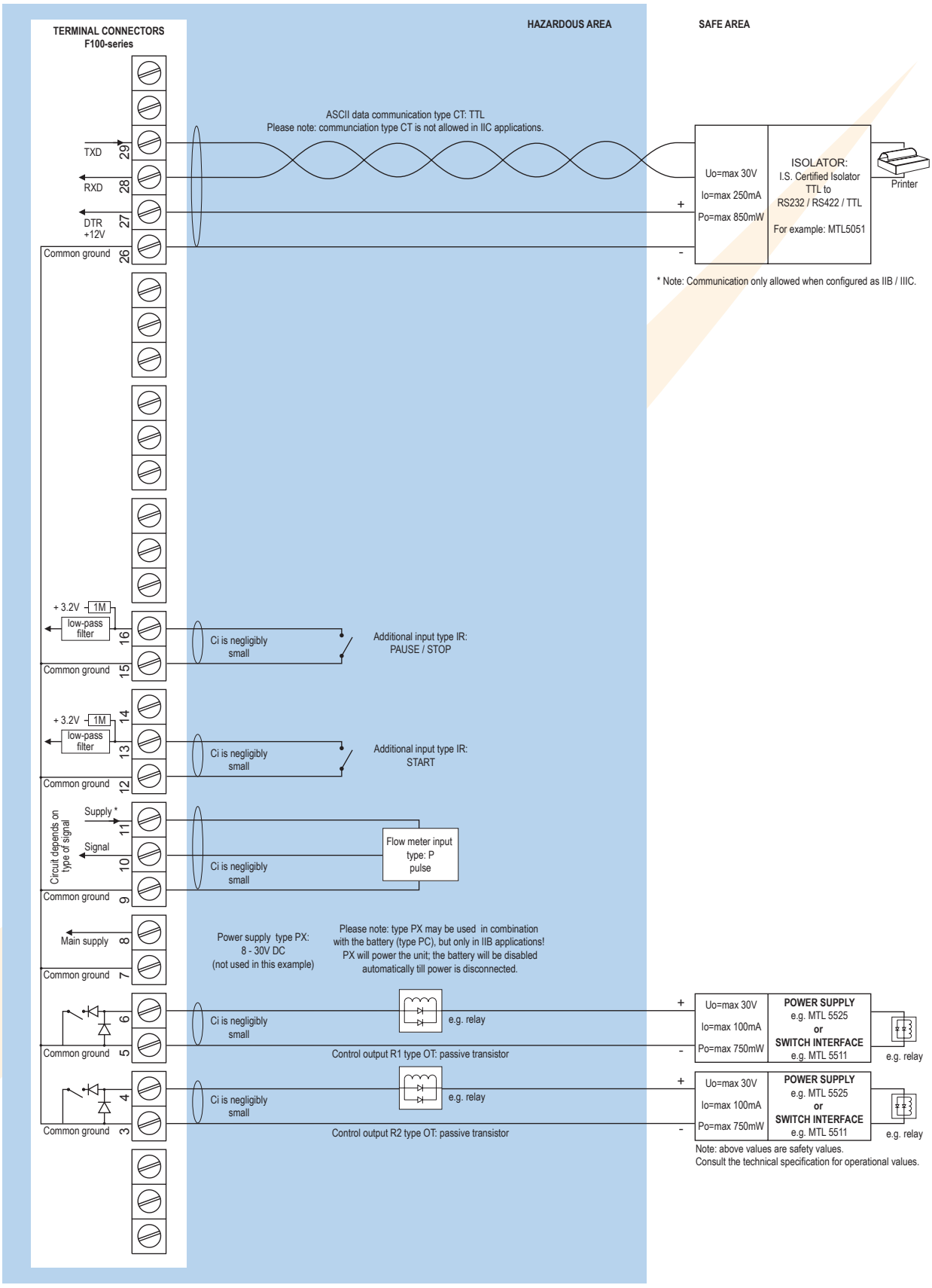
The F132-XI has been certified according ATEX and IECEx by DEKRA for use in Intrinsically Safe applications with an ambient temperature of -40°C to +70°C (-40°F to +158°F).

- 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.

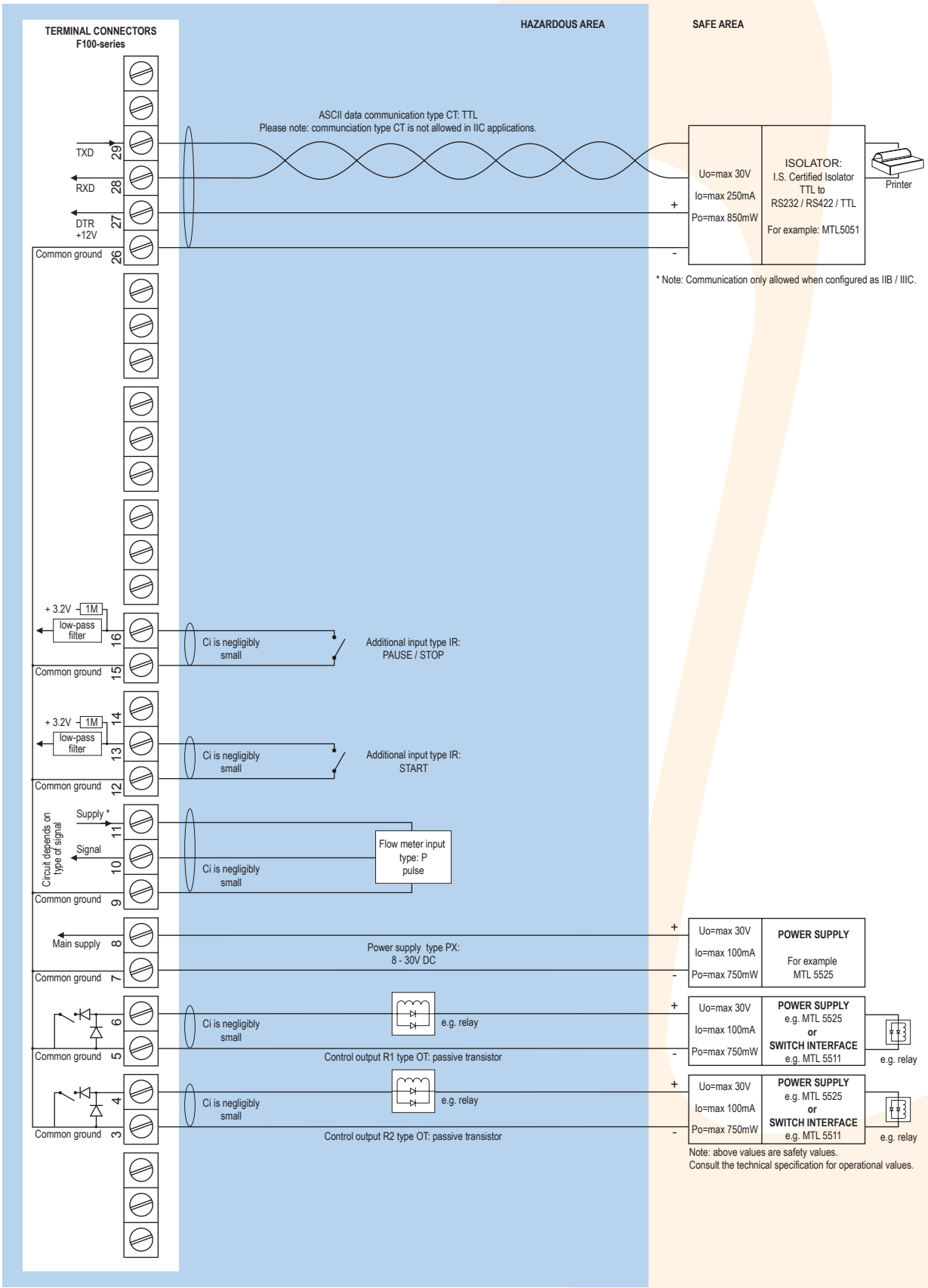
Certificate of conformity KEMA 03ATEX1074 X
• IECEx DEK 11.0042X

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



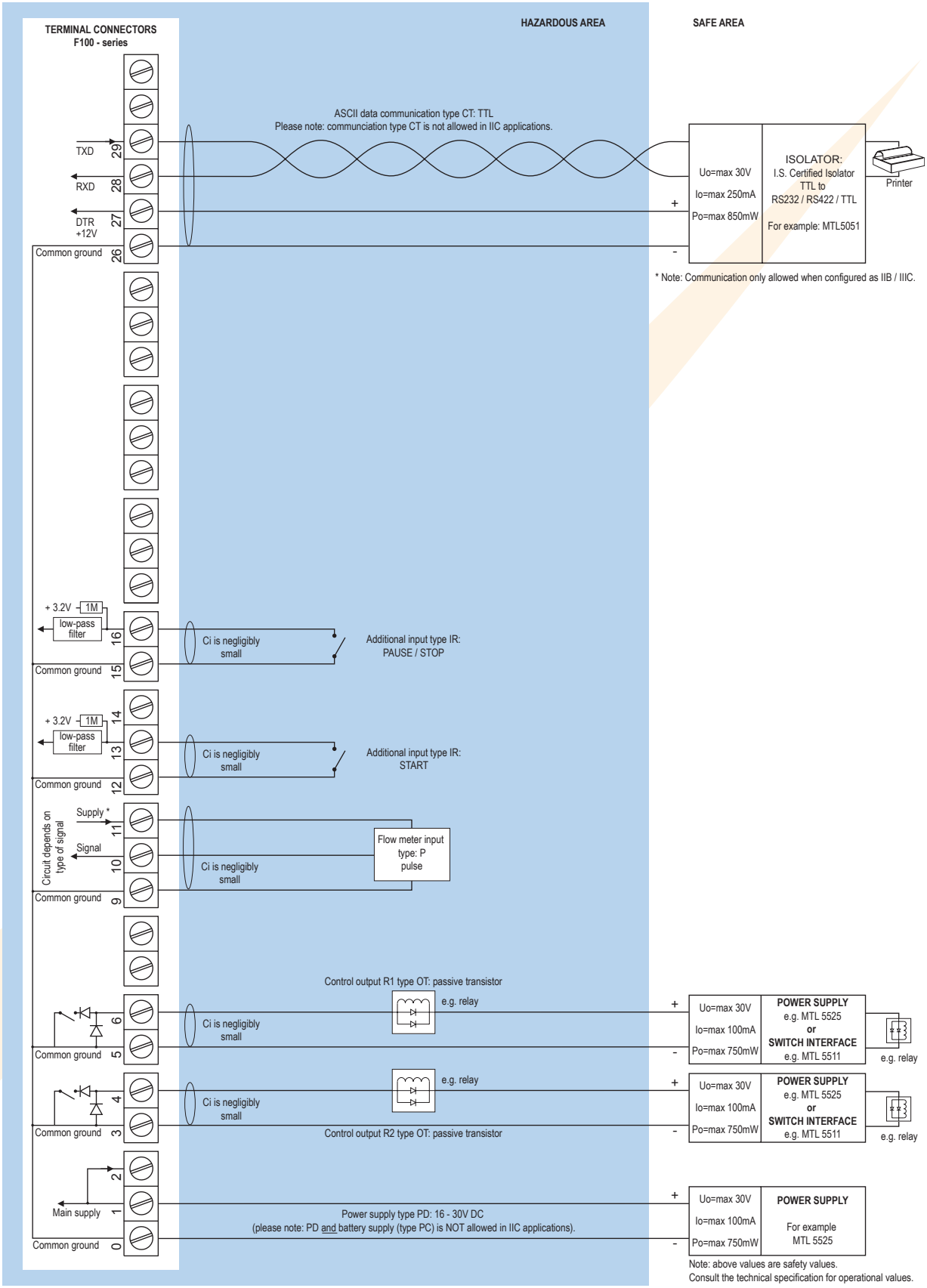
* Note sensor supply voltage: 1.2V DC for coil sensors or 3.2V DC for other pulse sensors.

Configuration example IIB / IIIC and IIC - F132-P-(CT)-OT-PX-XI - Basic power requirement 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 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).

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: fast, 1sec , 3sec, 15sec, 30sec, off.
Option ZB	Transflective LCD with green adjustable LED backlight. Good readings in full sunlight and darkness.
Note ZB	Only available for safe area applications.

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).

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	12 - 24V DC ± 10% or internally powered 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.
Password	Configuration settings can be password protected.

Directives & Standards	
EMC	Directive 2004/108/EC, FCC 47 CFR part 15.
Low voltage	Directive 2006/95/EC
ATEX / IECEx	Directive 94/9/EC, IEC 60079-0, IEC 60079-11, IEC 60079-26.
IP & NEMA	EN 60529 & NEMA 250

Enclosure

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 HL	Cable entry: 2 x $^1/_2$" NPT.
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.

Hazardous area

Intrinsically Safe (Type XI)	
ATEX certification	II 1 G Ex ia IIB/IIC T4 Ga. II 1 D Ex ia IIIC T100 °C Da IP6X.
IECEx certification	Ex ia IIC/IIB T4 Ga. 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	
Dimensions	300 x 250 x 200mm (11.8" x 9.9" x 7.9") L x H x D.
Weight	Appr. 15kg.

Signal inputs

Flow meter	
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 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.

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

Signal outputs

Digital outputs	
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. • Batched quantity or remaining quantity. • Total and accumulated total. • Nr. of batches. • Reprint the last receipt. • 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”).

Intrinsically Safe isolators	
ACG01	MTL5511 - One channel pulse or switch output transfer from hazardous area to safe area.
ACG02	MTL5525 - One channel power supply from safe area to hazardous area (e.g. to power the unit with PD or to power a switching or analog device in hazardous area).
ACG03	MTL5541 - One channel 4 - 20mA repeater from hazardous area to safe area.
ACG04	MTL 5051 - Bi-direction serial-data-isolator (for Modbus communication).
ACG05	MTL5516C - Two channel pulse or switch output transfer from hazardous area to safe area.
ACG06	MTL5513 - One channel pulse or switch output transfer from hazardous area to safe area.
ACG07	MTL5546Y - One channel isolated driver bringing 4 - 20mA from safe area to hazardous area, HART transparent, OCD.

Printers	
ACP01	Ap 1300 - Thermal portable printer (incl. cables and battery charger).
ACP02	Ap 1400 - Thermal panel printer with standard 3.5V DC to 8.5V DC power supply (incl. cables).
ACP03	Ap 1400 - Thermal panel printer with external 100 - 240V AC power supply (incl. cables).

Ordering information

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

Ordering information:		F132	-_	-AX	-C _	-EX	-H _	-IR	-O _	-P _	-TX	-X _	-Z _
Flow meter input signal													
P	⍟	**Pulse input: coil, npn, pnp, namur, reed-switch.**											
Analog output signal													
AX	⍟	**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	⍟	Intrinsically Safe TTL - ASCII data.											
CX	⍟	**No printer communication.**											
Flow equations													
EX	⍟	**No flow equations.**											
Panel mount enclosures - IP65 / NEMA4X													
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.											
HL	⍟	Cable entry: 2 x 1/2"NPT.											
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.											
HV	⍟	Cable entry: 4 x M20.											
HZ	⍟	Cable entry: no holes.											
Additional input signal													
IR	⍟	**Remote control input to start, pause or stop.**											
Digital output signals													
OA		Two active transistor outputs - requires PD, PF or PM.											
OR		Two mechanical relay outputs - requires PF or PM.											
OT	⍟	**Two passive transistor outputs - standard configuration.**											
Power requirements													
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.											
PM		115 - 230V AC + sensor supply.											
PX	⍟	**Basic power supply 8 - 30V DC (no real sensor supply).**											
Temperature input signal													
TX	⍟	**No temperature input signal.**											
Hazardous area													
XI	⍟	Intrinsically Safe, according ATEX and IECEx.											
XF		EExd enclosure - 3 keys.											
XX		**Safe area only.**											
Other options													
ZB		Adjustable backlight - requires PD, PF or PM.											
ZF	⍟	Coil input 10mVpp.											
ZX	⍟	**No options.**											

The bold marked text contains the standard configuration.

⍟ Available Intrinsically Safe.

Specifications are subject to change without notice.

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