DATASHEET F133 - DISPENSER

DISPENSER

FOR DELIVERY PURPOSES
WITH TWO CONTROL OUTPUTS.

Features

- Large display shows supplied quantity, flowrate and status.
- Suitable for filling-up multiple compartments within one delivery.
- All control functions available for pump start, valve control and flowrate monitoring including flexible response times.
- Selectable on-screen engineering units; volumetric or mass.
- Communication link for customized ticket printing.
- Operational temperature -30°C up to +80°C (-22°F up to 178°F).
- Very compact design for panel mount, wall mount or field mount applications.
- Rugged aluminum field mount enclosure IP67/NEMA4X.
- Intrinsically safe Ex II 1GD EEx ia IIB/IIC T4 T100°C.
- Explosion/flame proof Ex II 2G 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

- Two control outputs for pump-start and valve control.
- Communication option to monitor or control the process and to print the bill of lading.

Signal input

Flow

- Reed-switch.
- NAMUR.
- NPN/PNP pulse.
- Coil (sine wave).
- Active pulse signals.

Status

- Remote control: start, stop, pause or continuous signal.

Applications

- For delivery purposes, small scale gas stations or on board of ships or trucks for customer deliveries.

General information

Introduction

The F133 is a unique product as it is especially designed for a controlled delivery of undefined quantities. It offers all the functionality known from gas stations to fill-up your car. The unit incorporates special functions with delay times to start a pump first, control a valve and expect a flow within a certain period of time.
Moreover, the flowrate and the allowed total dispensed quantity is monitored as well.
If, for whatever reason, no pulses are coming in, the delivery will be terminated after a pre-defined time. Sub-deliveries is also gathered for which allows you to fill up several compartments within one and the same delivery. A wide selection of options further enhance this models capabilities, including intrinsic safety and full Modbus communication.

Display

The display has large 17mm (0.67") and 8mm (0.31") digits which will zero after a start-command and display "leading eight's". During the delivery, the actual dispensed quantity is displayed together with the actual flowrate and the status of the controller. Several resettable and non-resettable totalisers are available as well as a batch counter. All 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, therefore avoiding confusing abbreviations and baffling codes. Once familiar with one F-series product, you will be able to program all models in the series without a manual. All settings are safely stored in EEPROM memory in the event of sudden power failure.

Control outputs

One output is available to control a pump after receiving a start-signal. After the start-up-time, a second output will be switched to control the valve to allow the product to be dispensed. The output signals can be a passive NPN, active PNP or an isolated electro-mechanical relay.

Signal input

The F133 will accept most pulse 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. Further, two inputs are available to control the process remotely if desired.

Communication

All process data and settings can be read and modified manually or through the Modbus communication link (RS232 / RS485). If desired, the delivery can even be started and stopped through communication. After the delivery, the dispensed quantity and batch number is available to be used for ticket printing (B.O.L.). The F133 has the ability to be locked-out until this information has been read and initialized.

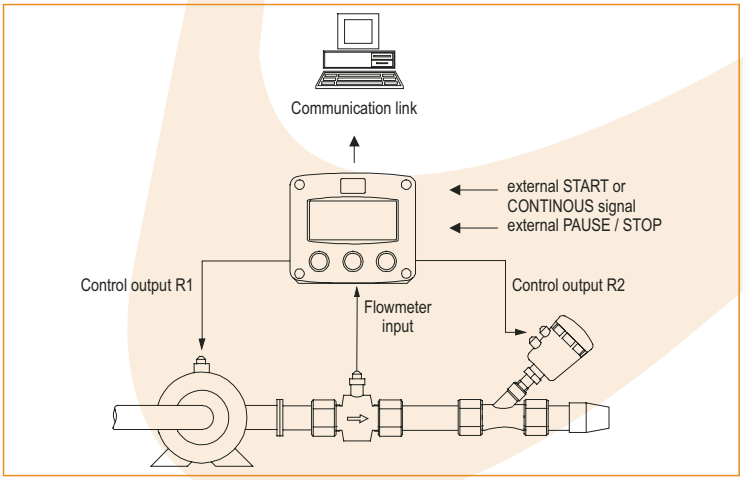
Hazardous areas

For hazardous area applications, this model has been ATEX certified intrinsically safe Ex II 1GD 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 Ex II 2G EEx d IIB T5.

Enclosures

Various types of enclosures can be selected, all ATEX approved. As standard the F133 is supplied in an ABS 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 F133

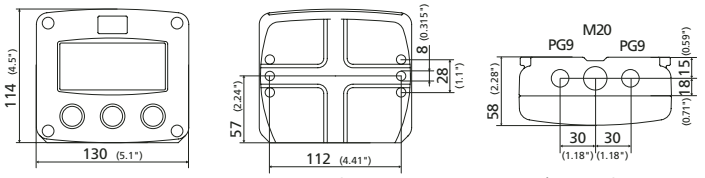


Dimensions enclosures

Enclosure HA

Aluminum field mount enclosure

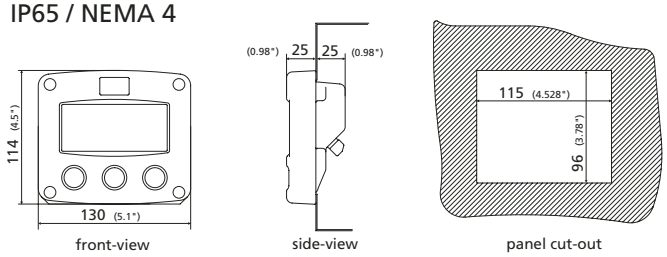
IP67 / NEMA 4X
Tapped holes: European thread



Enclosure HB

Aluminum panel mount enclosure

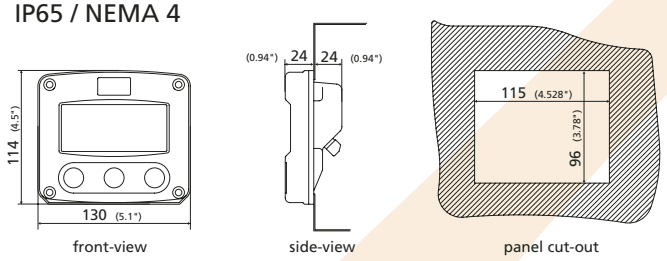
IP65 / NEMA 4



ENCLOSURE HC (STANDARD)

ABS PANEL MOUNT ENCLOSURE

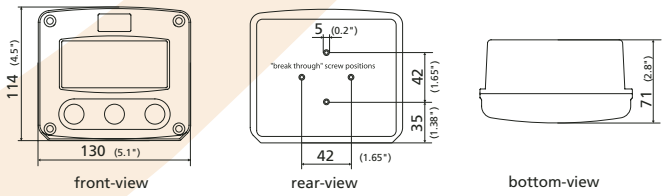
IP65 / NEMA 4



Enclosure HD

ABS wall mount enclosure

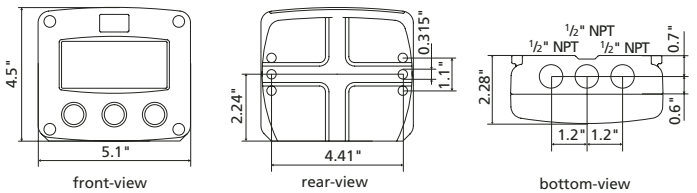
IP67 / NEMA 4X
Holes user defined



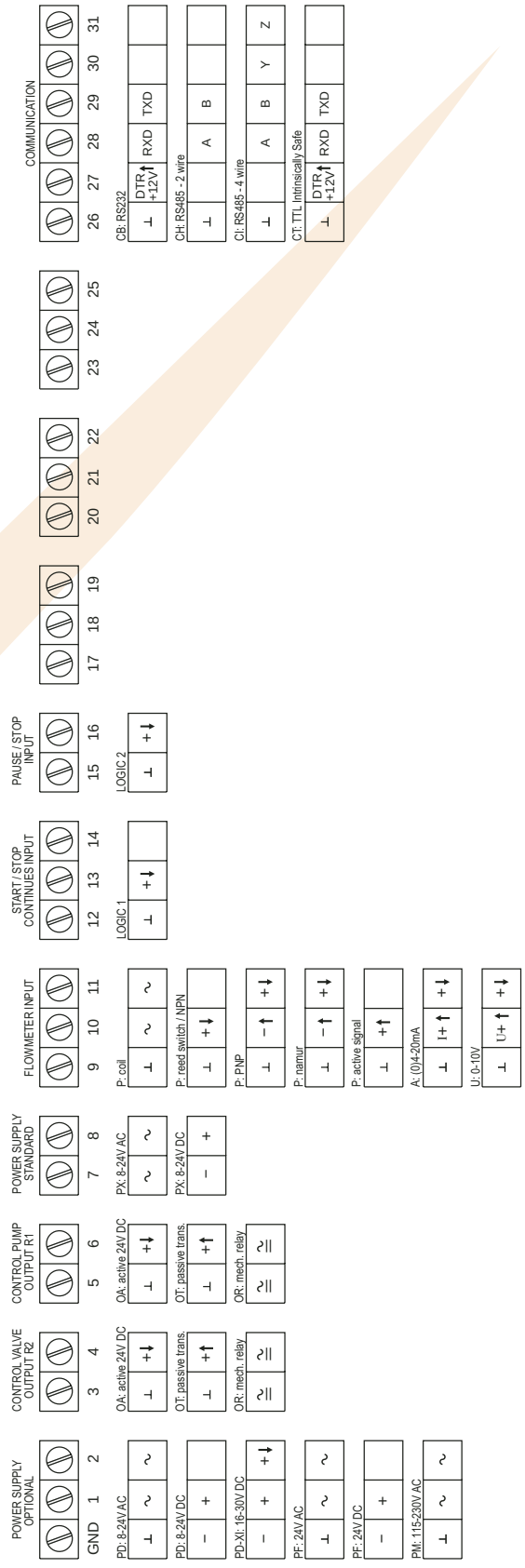
Enclosure HU

Aluminum field mount enclosure

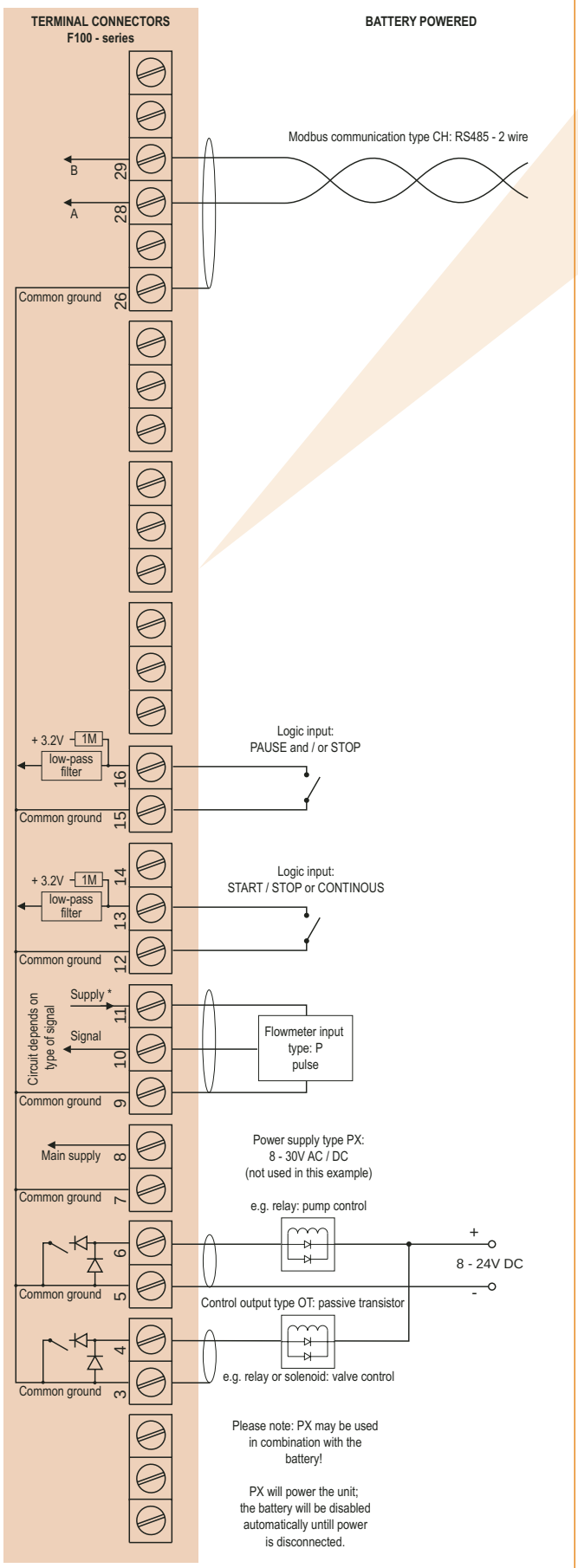
IP67 / NEMA 4X
Tapped holes: U.S. thread



Terminal connections

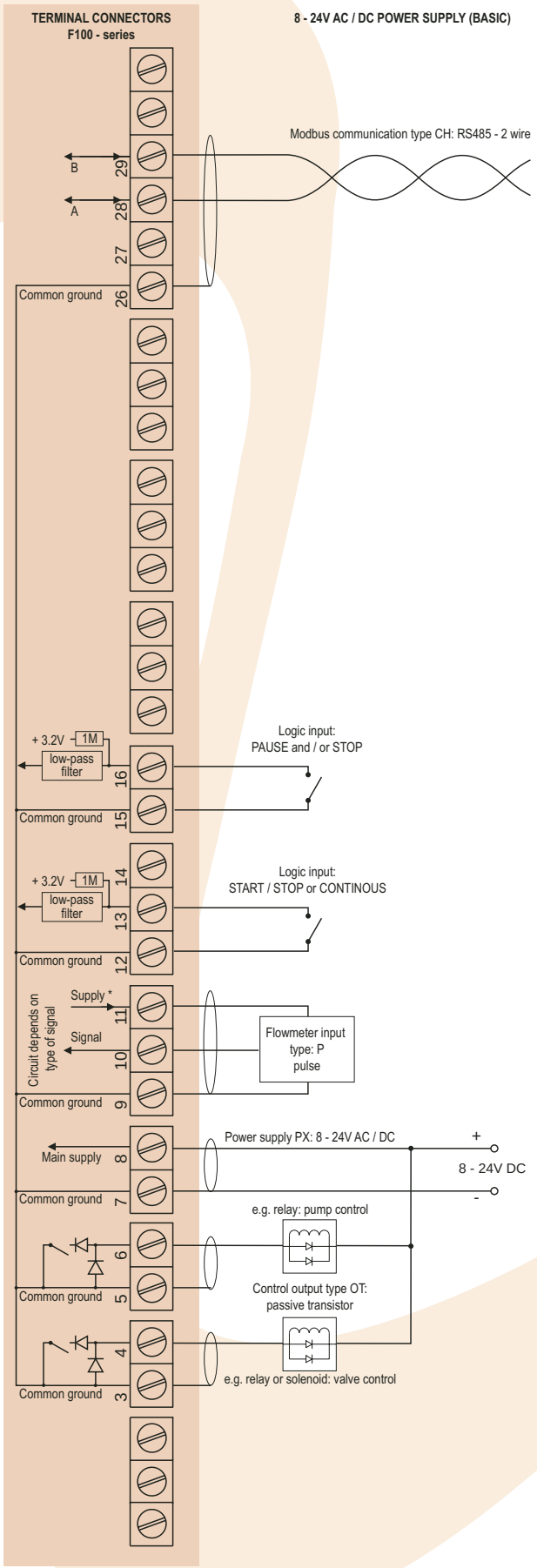


Typical wiring diagram F133-P-CH-PB-(PX)-OT



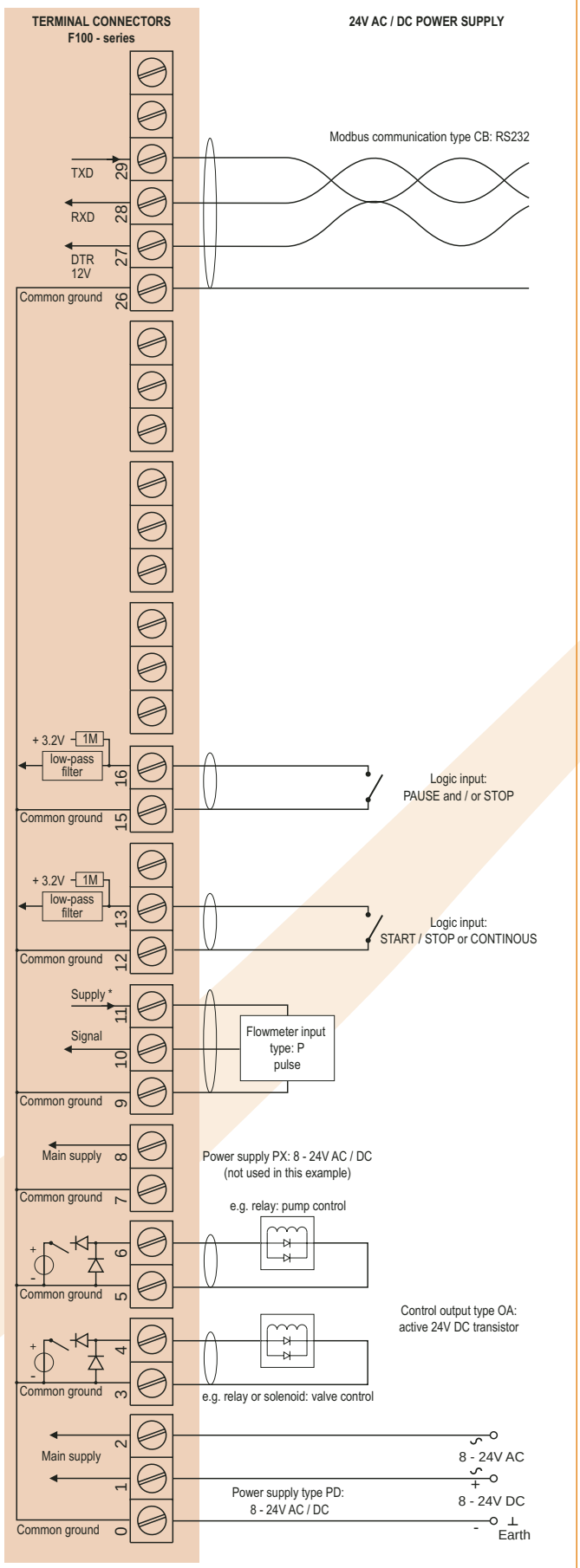
*Supply voltage: 1.2 - 3.2V DC to sensor

Typical wiring diagram F133-P-CH-PX-OT



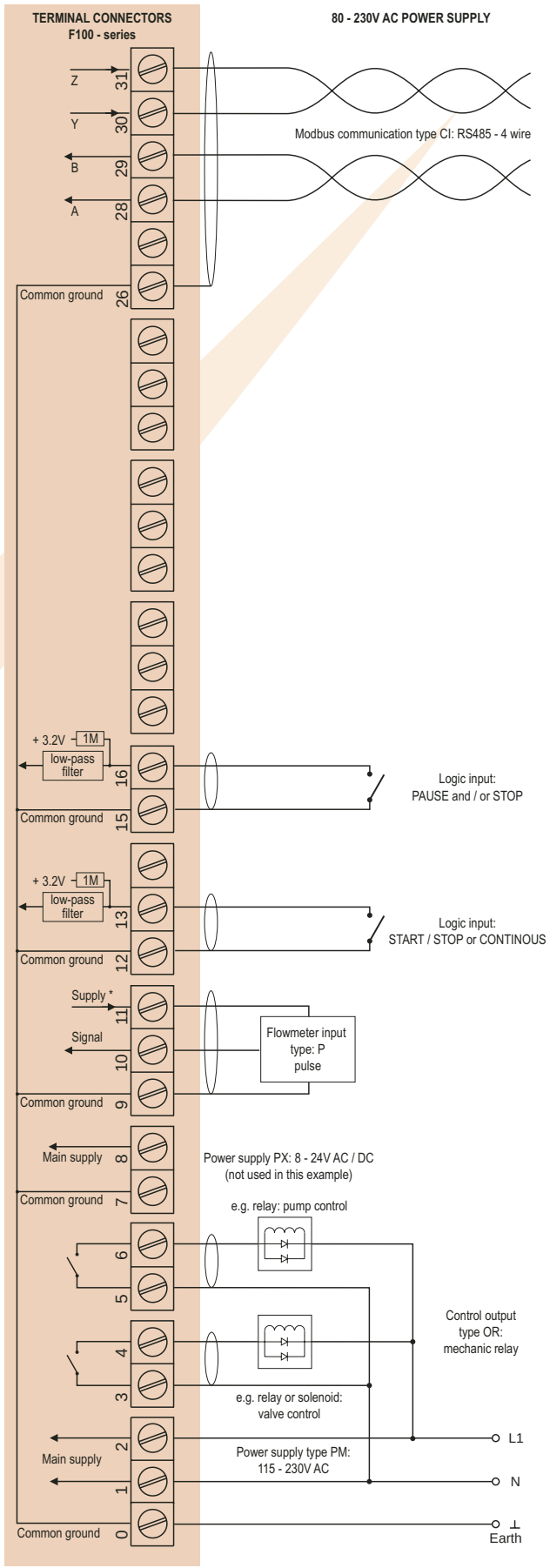
*Supply voltage: 1.2 - 3.2V DC to sensor

Typical wiring diagram F133-P-CB-OA-PD



*Supply voltage: 1.2 - 3.2 - 8.2 - 12 - 24V DC to sensor

Typical wiring diagram F133-P-CI-OR-PM



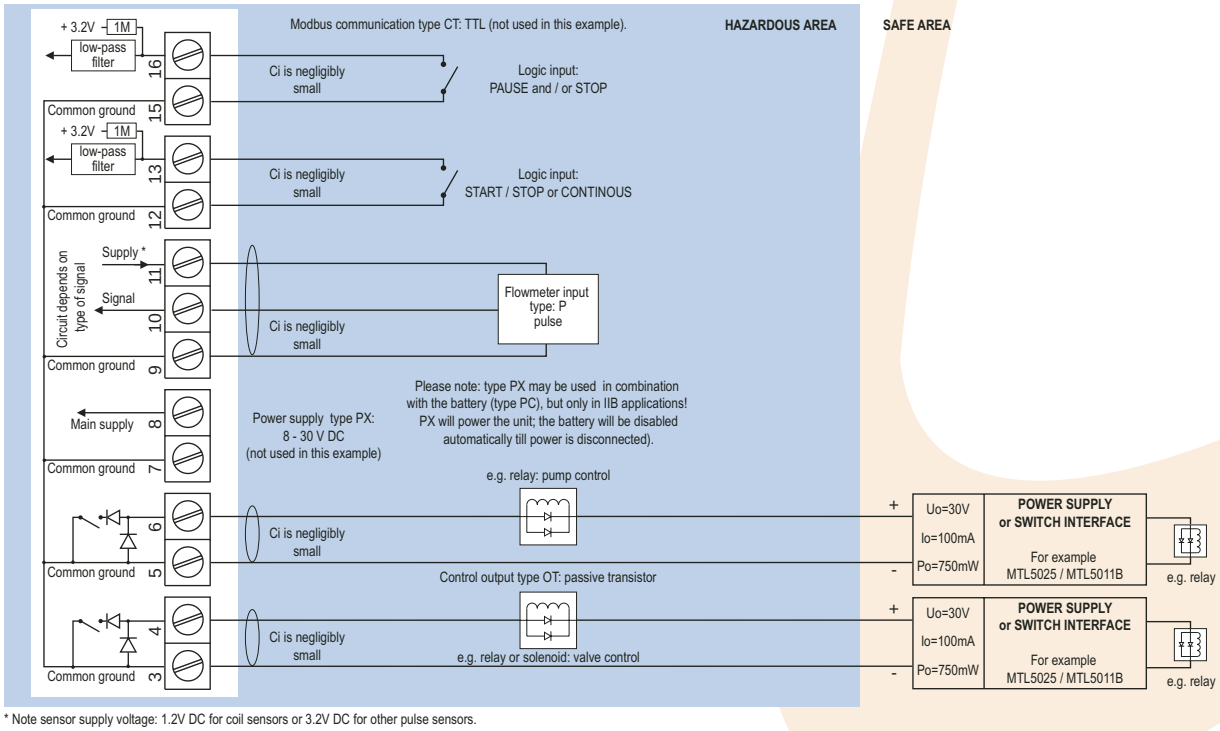
*Supply voltage: 1.2 - 3.2 - 8.2 - 12 - 24V DC to sensor

Hazardous area applications

The F133-XI has been ATEX approved by KEMA for use in intrinsically safe applications. It is approved according to Ex II 1GD EEx ia IIB/IIC T4 T100°C for gas and dust applications with an operational temperature range of -30°C to +70°C (-22°F to +158°F). Besides the I.S. power supplies for the control outputs, it is allowed to connect up to two I.S. power supplies in IIB applications or one in IIC applications. Full functionality of the F133 remains available, including pump and valve 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 Ex II 2G EEx d IIB T5 is available as well. Please contact your supplier for further details.

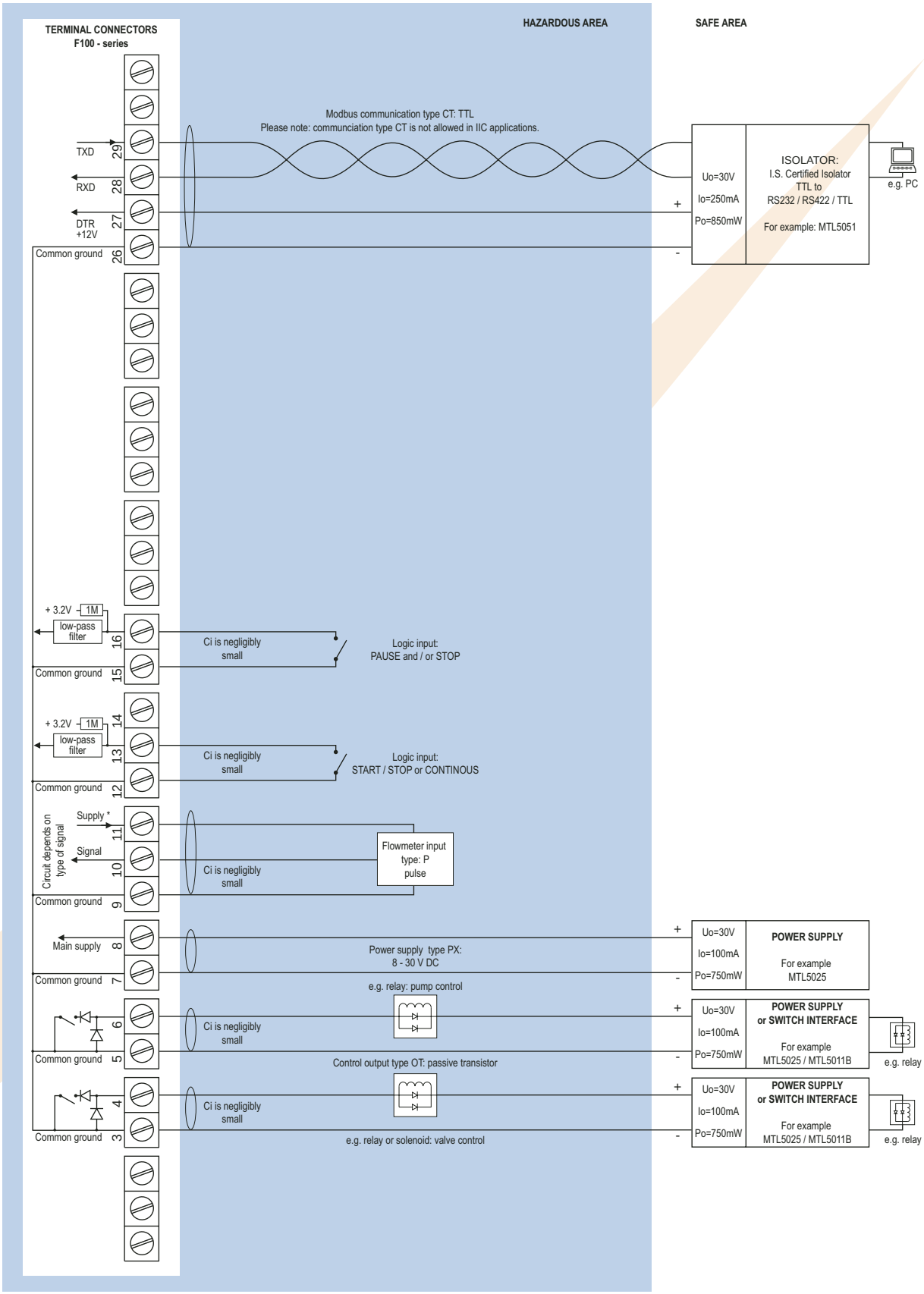
Certificate of conformity KEMA 03ATEX1074 X

Configuration example IIB and IIC
F133-P-(CT)-OT-PC-(PX)-XI - battery powered unit



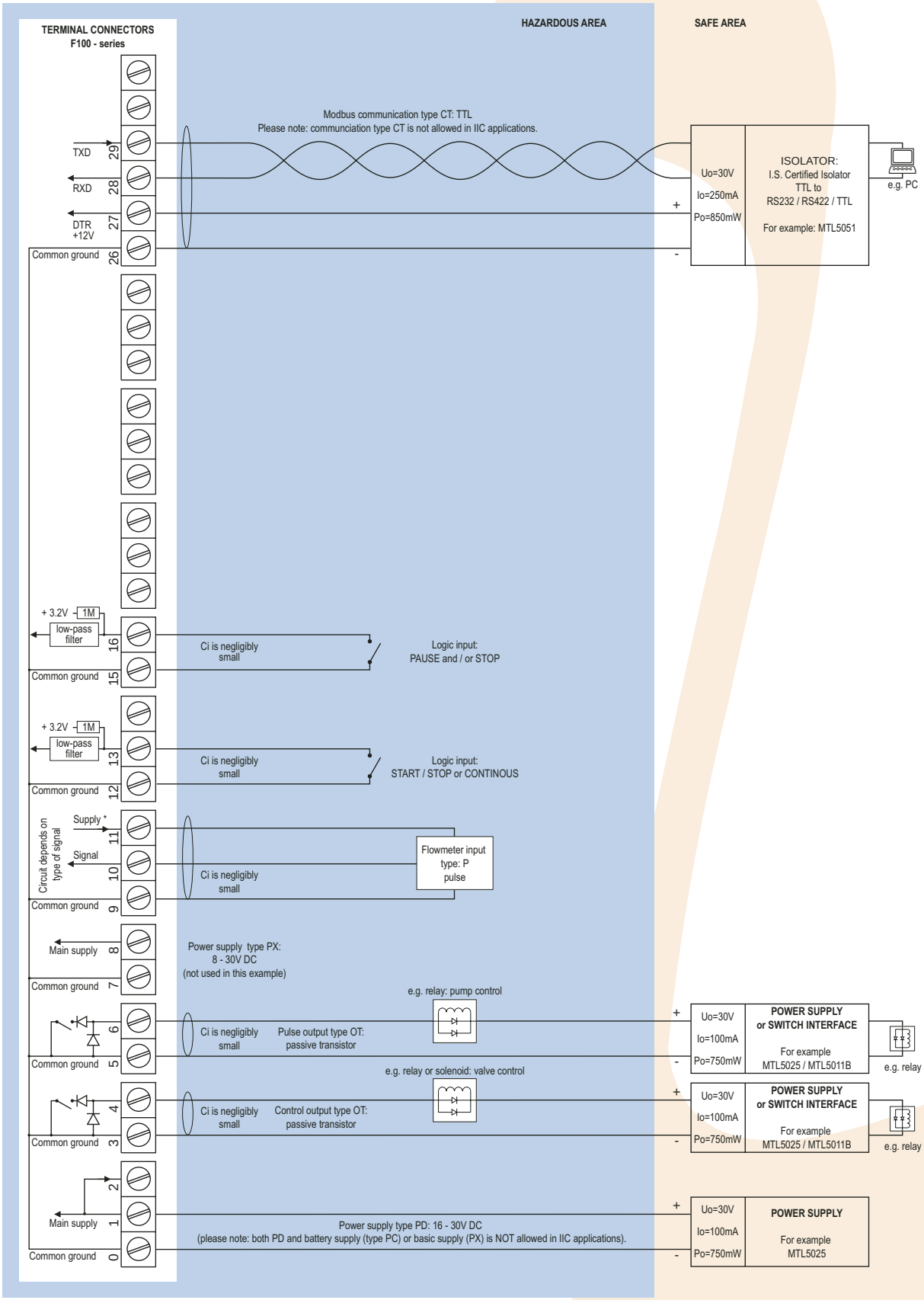
* Note sensor supply voltage: 1.2V DC for coil sensors or 3.2V DC for other pulse sensors.

Configuration example IIB and IIC - F133-P-(CT)-OT-PX-XI - basic power supply 8 - 30V DC



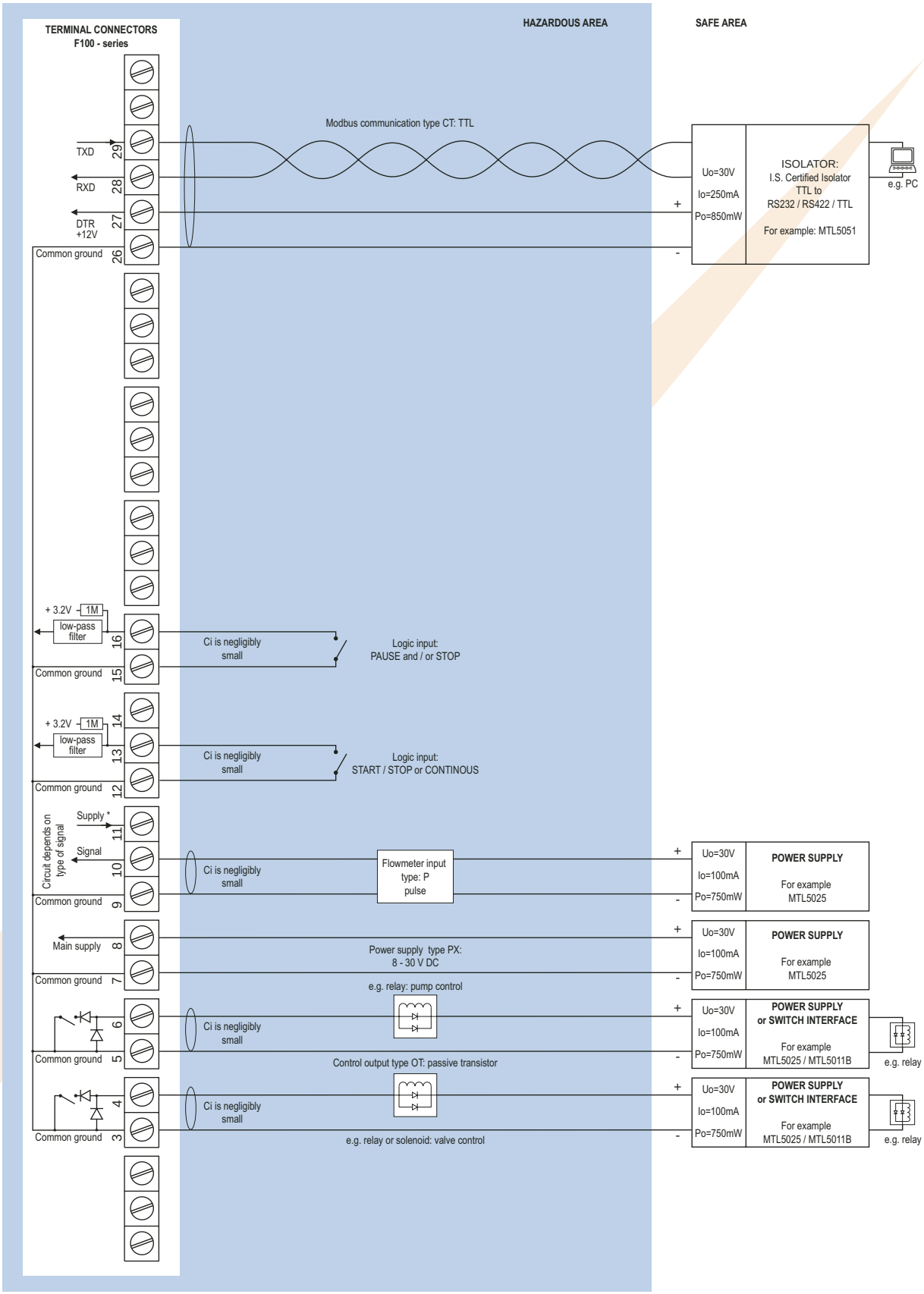
* Note sensor supply voltage: 1.2 V DC for coil sensors or 3.2V DC for other pulse sensors.

Configuration example IIB and IIC - F133-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=8.7V Io=25mA Po=150mW) and to analog sensors as connected to terminal 1 (internally linked).

Configuration example IIB - F133-P-CT-OT-PX-XI - basic power supply 8 - 30V DC



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

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	LED-backlight.

Casing	
Window	Polycarbonate window.
Sealing	EPDM and PE.
Control keys	Three industrial micro-switch keys. UV-resistant polyester keypad.
Type HA	Die-cast aluminum field mount enclosure IP67 / NEMA 4X with 2-component UV-resistant coating.
Dimensions	130 x 114 x 58mm (5.1" x 4.5" x 2.28") - W x H x D.
Cable Entry	2 x PG9 and 1 x M20 tapped hole in the centre.
Weight	950 gr.
Type HB	Die-cast aluminum panel mount enclosure IP65 / NEMA 4 with 2-component UV-resistant coating.
Dimensions	130 x 114 x 50mm (5.1" x 4.5" x 1.97") - W x H x D.
Panel cut-out	115 x 96mm (4.53" x 3.78") L x H.
Weight	525 gr.
Type HC	ABS panel mount enclosure IP65 / NEMA 4, UV-resistant and flame retardent.
Dimensions	130 x 114 x 48mm (5.1" x 4.5" x 1.89") - W x H x D.
Panel cut-out	115 x 96mm (4.53" x 3.78") L x H.
Weight	300 gr.
Type HD	ABS wall mount enclosure IP67 / NEMA 4X, UV-resistant and flame retardent.
Dimensions	130 x 114 x 71mm (5.1" x 4.5" x 2.8") - W x H x D.
Cable Entry	None, user defined.
Weight	400 gr.
Type HU	Die-cast aluminum field mount enclosure IP67 / NEMA 4X with 2-component UV-resistant coating.
Dimensions	5.1" x 4.5" x 2.28" - W x H x D.
Cable Entry	3 x $^1/_2$" NPT tapped hole.
Weight	950 gr.

Operating temperature	
Operational	-30°C to +80°C (-22°F to +178°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%.
Type PD-XI	16 - 30V DC (Intrinsically Safe).
Type PF	24V AC/DC ± 10%.
Type PM	115 - 230V AC ± 10%.
Type PX	8 - 24V AC/DC (PX-XI 8 - 30V DC).

Sensor excitation	
Type PB/PC/PX	3.2V DC for pulse signals and 1.2V DC for coil pick-up.
Type PD	1.2 - 3.2 - 8.2 - 12 and 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 and 24V DC - max. 200mA@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 Type XI	ATEX approval ref: Ⓔx II 1GD EEx ia IIB/IIC T4 T100°C. Maximum ambient +70°C (158°F).
Explosion proof Type XF	ATEX approval ref: Ⓔx II 2G EEx d IIB T5. Dimensions of enclosure: 218 x 418 x 210mm (8.58" x 16.45" x 8.38") L x H x D.
Weight	16 Kg.

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 flowrate. 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 or continous signal.
Type	Internally pulled-up switch contact - NPN.
Duration	Minimum pulse duration 300msec.

Signal outputs

Control output	
Function	To control a pump and a valve.
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.
Load	Max. 50V DC - 300mA per output.

Communication option	
Function	Reading display information, reading / writing all configuration settings + lockout function.
Type CB	RS232
Type CH	RS485 2-wire
Type CI	RS485 4-wire
Type CT	TTL Intrinsically Safe.
Protocol	Modbus RTU.
Speed	1200 - 2400 - 4800 - 9600 baud.
Addressing	Maximum 255 addresses.

Operational

Operator functions	
Displayed functions	• Leading eight's before zeroing. • Supplied quantity. • Flowrate. • Resettable supplied quantity (automatically after new start-command). • Non-resettable accumulated supplied quantity. • Resettable total measured quantity. • Non-resettable accumulated total measured quantity. • Non resettable batch counter.

Total	
Digits	7 digits.
Units	L, m3, GAL, USGAL, KG, lb, bbl, no unit.
Decimals	0 - 1 - 2 or 3.
Note	Total can be reset to zero.

Accumulated total	
Digits	11 digits.
Units / decimals	According to selection for total.
Note	Can not be reset to zero.

Flowrate	
Digits	7 digits.
Units	mL, L, m3, Gallons, KG, Ton, lb, bl, cf, RND, ft3, scf, Nm3, 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 flowrate.
Decimals	According to selection for flowrate.
Time units	According to selection for flowrate.
Type of alarm	Low, high flowrate alarm. Includes alarm delay time.

Batch counter	
Function	Value will be incremendet after every succesfull delivery.
Digits	7.
Note	Non-resettable.

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

Ordering information

Example (standard configuration)

F133-P-CX-HC-OT-PX-XX-ZX.

Explanation standard configuration:

P: flowmeter signal: pulse; **CX**: no communication; **HC**: ABS panel mount enclosure; **OT:** passive transistor output; **PX**: 8 - 24V AC / DC; **XX**: Safe area; **ZX**: no options.

Ordering information:		F133 -_	-C _	-H _	-O _	-P _	-X _	-Z _
Flowmeter input signal								
P	Ex	**Pulse input: coil, npn, pnp, namur, reed-switch.**						
Communication								
CB		Communication RS232 - Modbus RTU.						
CH		Communication RS485 - 2wire - Modbus RTU.						
CI		Communication RS485 - 4 wire - Modbus RTU.						
CT	Ex	Intrinsically Safe TTL - Modbus RTU.						
CX	Ex	**No communication.**						
Enclosure								
HA	Ex	Aluminum field mount enclosure IP67 / NEMA 4X.						
HB	Ex	Aluminum panel mount enclosure IP65 / NEMA 4.						
HC	Ex	**ABS panel mount enclosure IP65 / NEMA 4.**						
HD	Ex	ABS wall mount enclosure IP67 / NEMA 4X.						
HU	Ex	Aluminum field mount enclosure IP67 / NEMA 4X.						
Outputs								
OA		Two active transistor outputs - requires PD, PF or PM.						
OR		Two mechanic 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	**8 - 24V AC / DC (no sensor supply).**						
Hazardous area								
XI	Ex	Intrinsically safe.						
XF	Ex	EExd enclosure - 3 keys.						
XX		**Safe area only.**						
Other options								
ZB		Backlight.						
ZF	Ex	Coil input 10mVpp.						
ZX	Ex	**No options.**						

The bold marked text contains the standard configuration.

Ex Available Intrinsically Safe.

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