DATASHEET F151 - DUAL INPUT PRESSURE INDICATOR

DUAL INPUT PRESSURE INDICATOR

FLUIDWELL
Accurate Liquid Management

Features

- Displays for both inputs the actual pressure.
- Large 17mm (0.67") digits.
- Selectable on-screen engineering units for each input individually.
- Abillity to process (0)4 - 20mA or 0 - 10V signals.
- Auto backup of all settings.
- 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 input

Pressure

- (0)4 - 20mA.
- 0 - 10V DC.

Applications

- For those applications where instead of two just one indicator is desired. Alternative basic model: two F050's.

General information

Introduction

The F151 incorporates two fully separated pressure indicators in one enclosure. There is no relationship between the inputs, even different measuring units can be used. A wide selection of options is availabe to 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. For each pressure input, on-screen engineering units are easily configured from a comprehensive selection. The measuring unit is displayed together with the input channel information A or B. The F151 can be set to select the channel to display manually or with an automatic toggle function.

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.

Signal input

The F151 will accept (0)4 - 20mA or 0 - 10V input signals from a pressure transducer.
Both signal inputs require the same signal type, but different measuring ranges are allowed.
Also available is an input loop powered version where the measuring range is 4 - 20mA.

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).

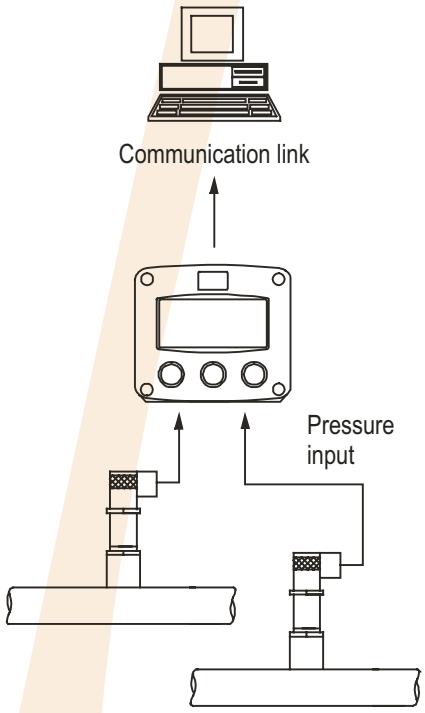
Hazardous areas

For hazardous area applications, this model has been ATEX certified intrinsically safe 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 F151 is supplied in an ABS panel mount enclosure, which can be converted to an IP67 / NEMA 4X ABS field mount enclosure by the addition of a back case. 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 F127

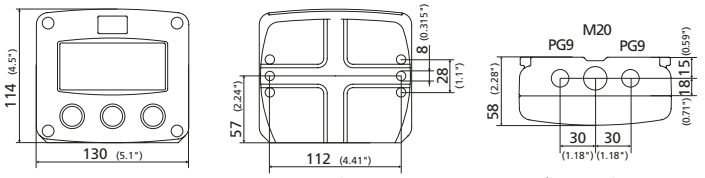


Dimensions enclosures

Enclosure HA

Aluminum field mount enclosure

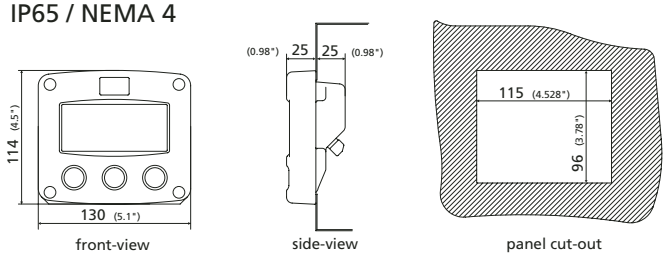
IP67 / NEMA 4X
Tapped holes: European thread



Enclosure HB

Aluminum panel mount enclosure

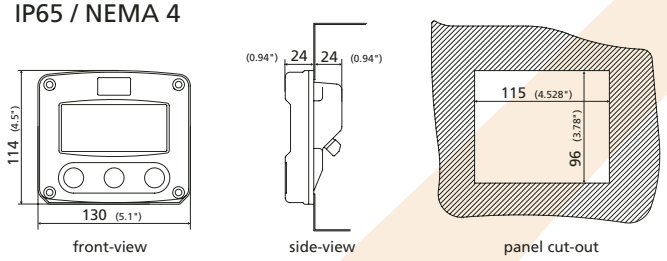
IP65 / NEMA 4



ENCLOSURE HC (STANDARD)

ABS PANEL MOUNT ENCLOSURE

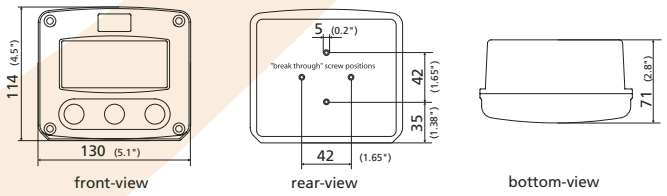
IP65 / NEMA 4



Enclosure HD

ABS wall mount enclosure

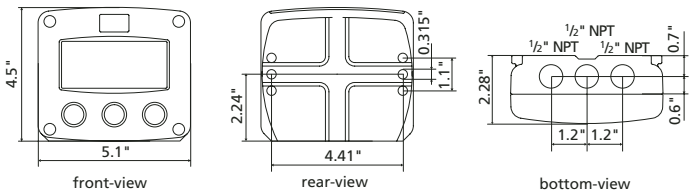
IP67 / NEMA 4X
Holes user defined



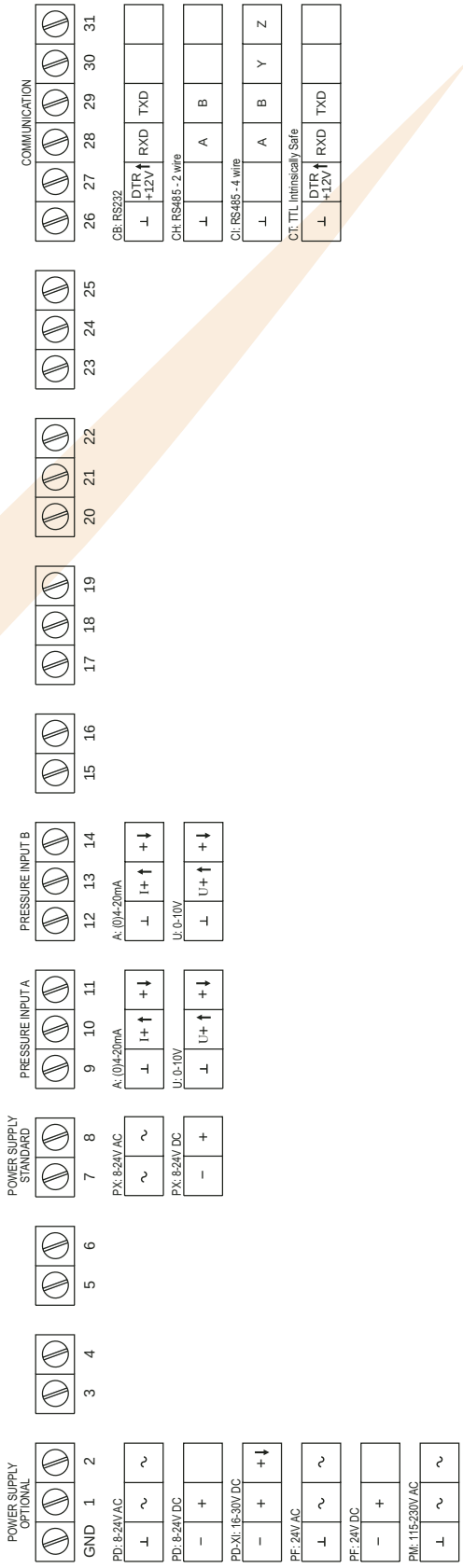
Enclosure HU

Aluminum field mount enclosure

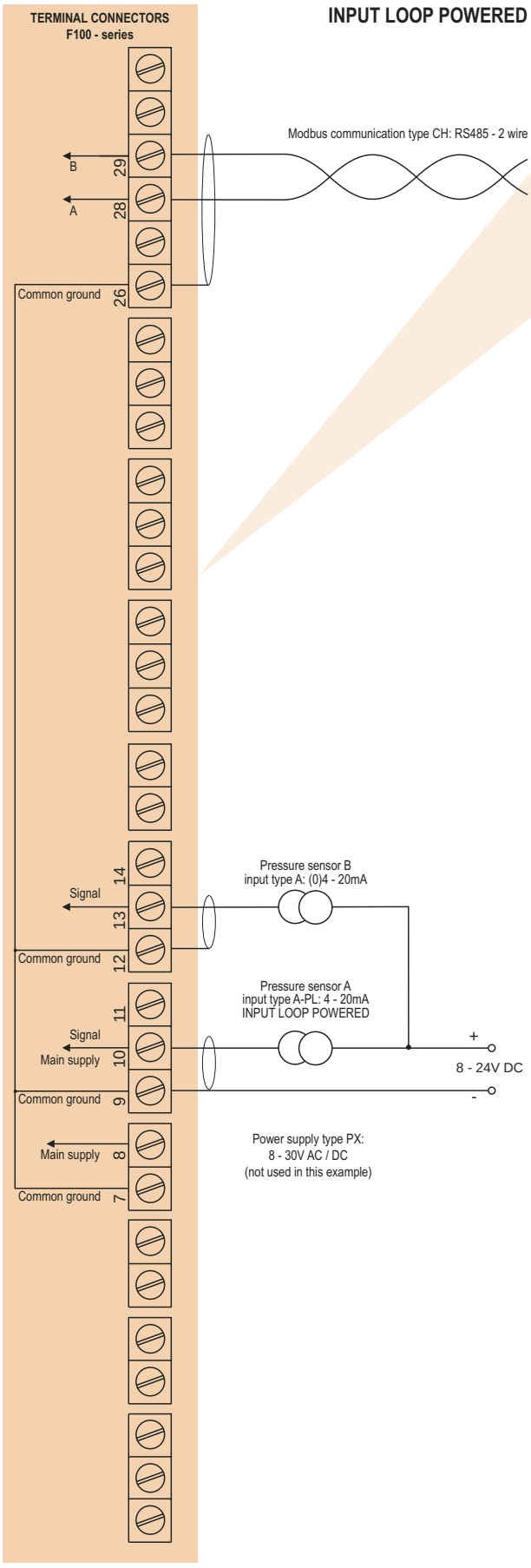
IP67 / NEMA 4X
Tapped holes: U.S. thread



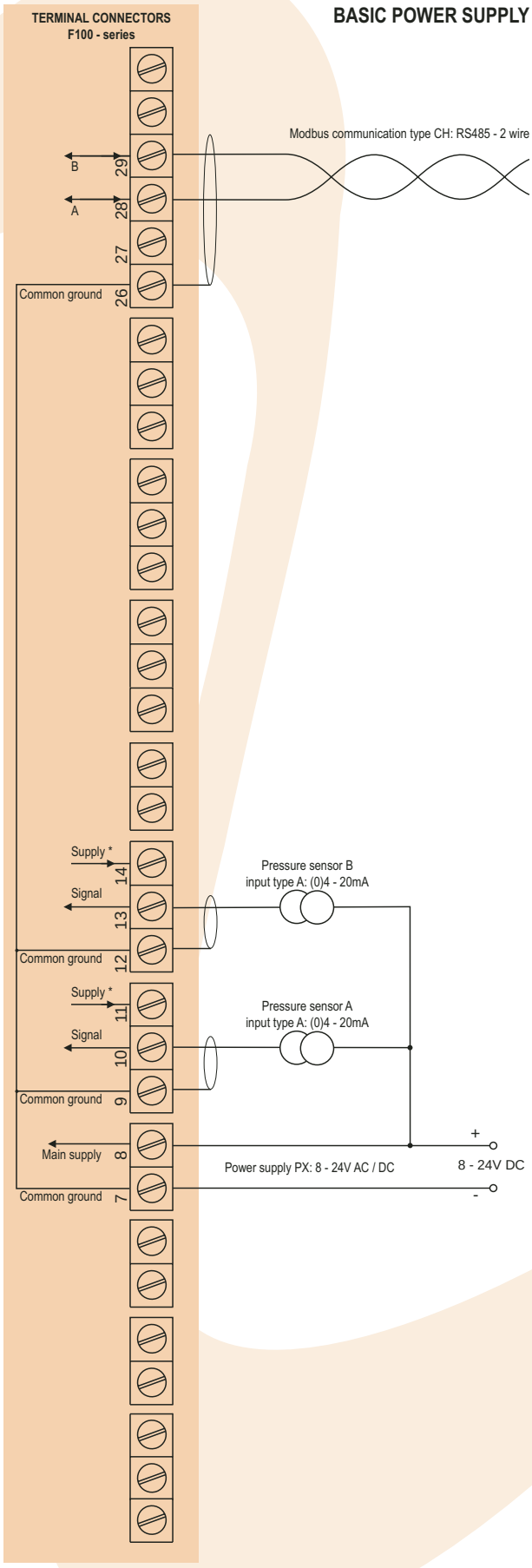
Terminal connections



Typical wiring diagram F151-A-CH-PL

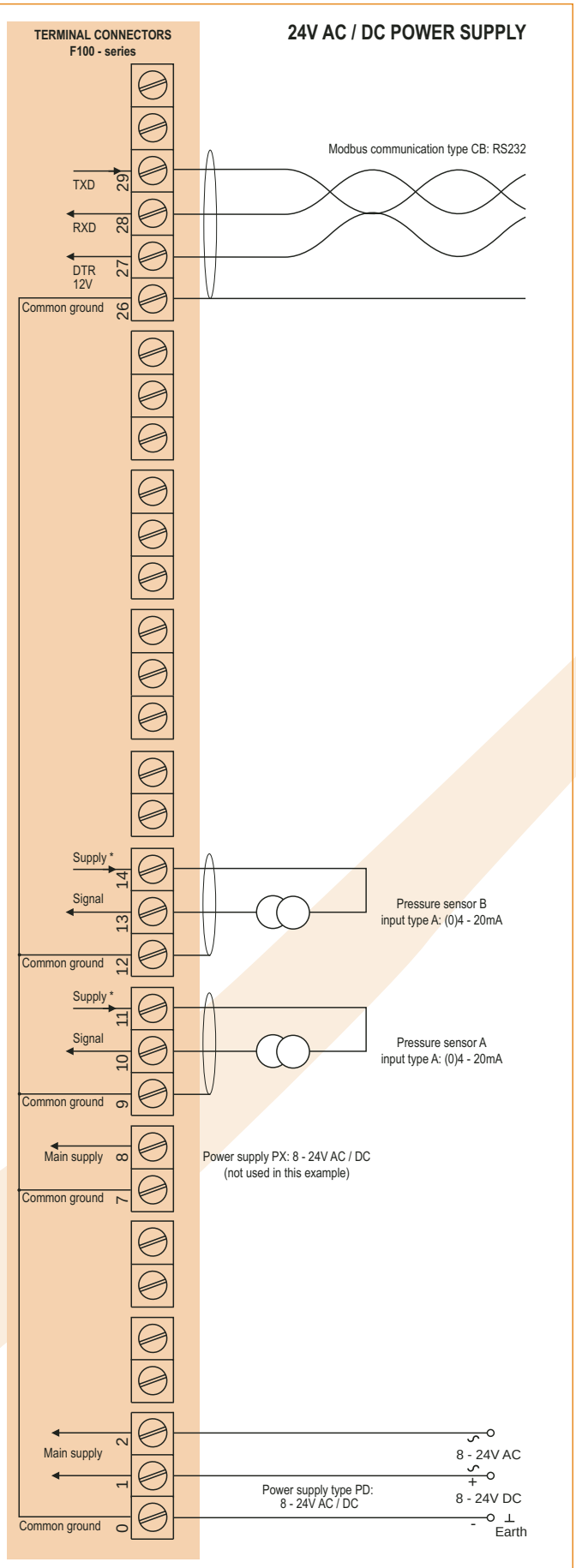


Typical wiring diagram F151-A-CH-PX



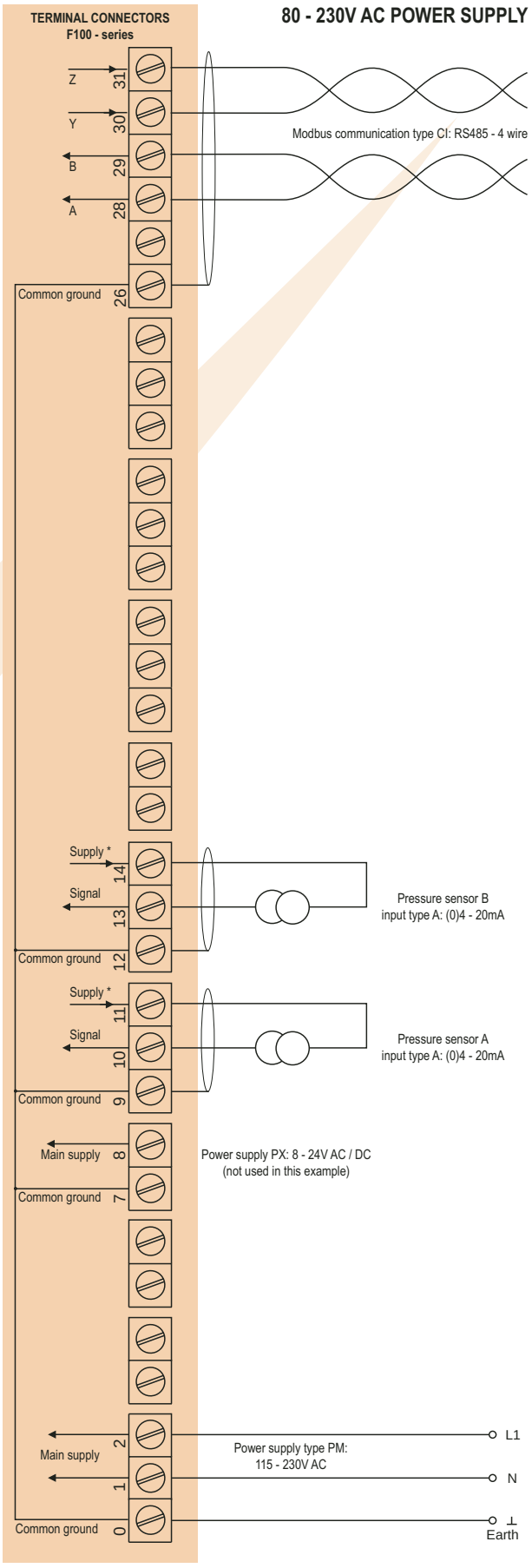
*Supply voltage: 3.2V DC to sensor

Typical wiring diagram F151-A-CB-PD



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

Typical wiring diagram F151-A-CI-PM



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

Hazardous area applications

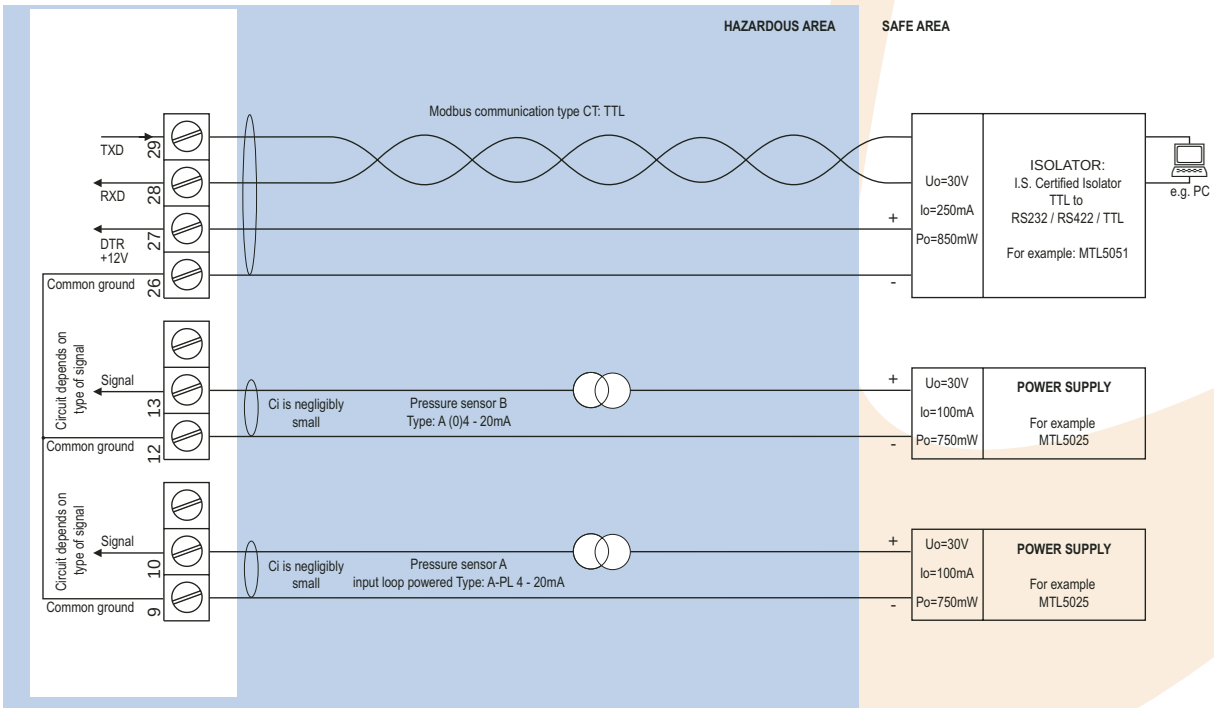
The F151-XI has been ATEX approved by KEMA for use in intrinsically safe applications. It is approved according to Ex II 1GD EEx ia IIB/IIC T4 T100°C for gas and dust applications with an operational temperature range of -30°C to +70°C (-22°F to +158°F). It is allowed to connect up to three I.S. power supplies in IIB applications or one in IIC applications.
Full functionality of the F151 remains available, including the Modbus communication (type CT). Power supply type PD-XI offers a sensor supply according to the connected power supply voltage at terminal 1. 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

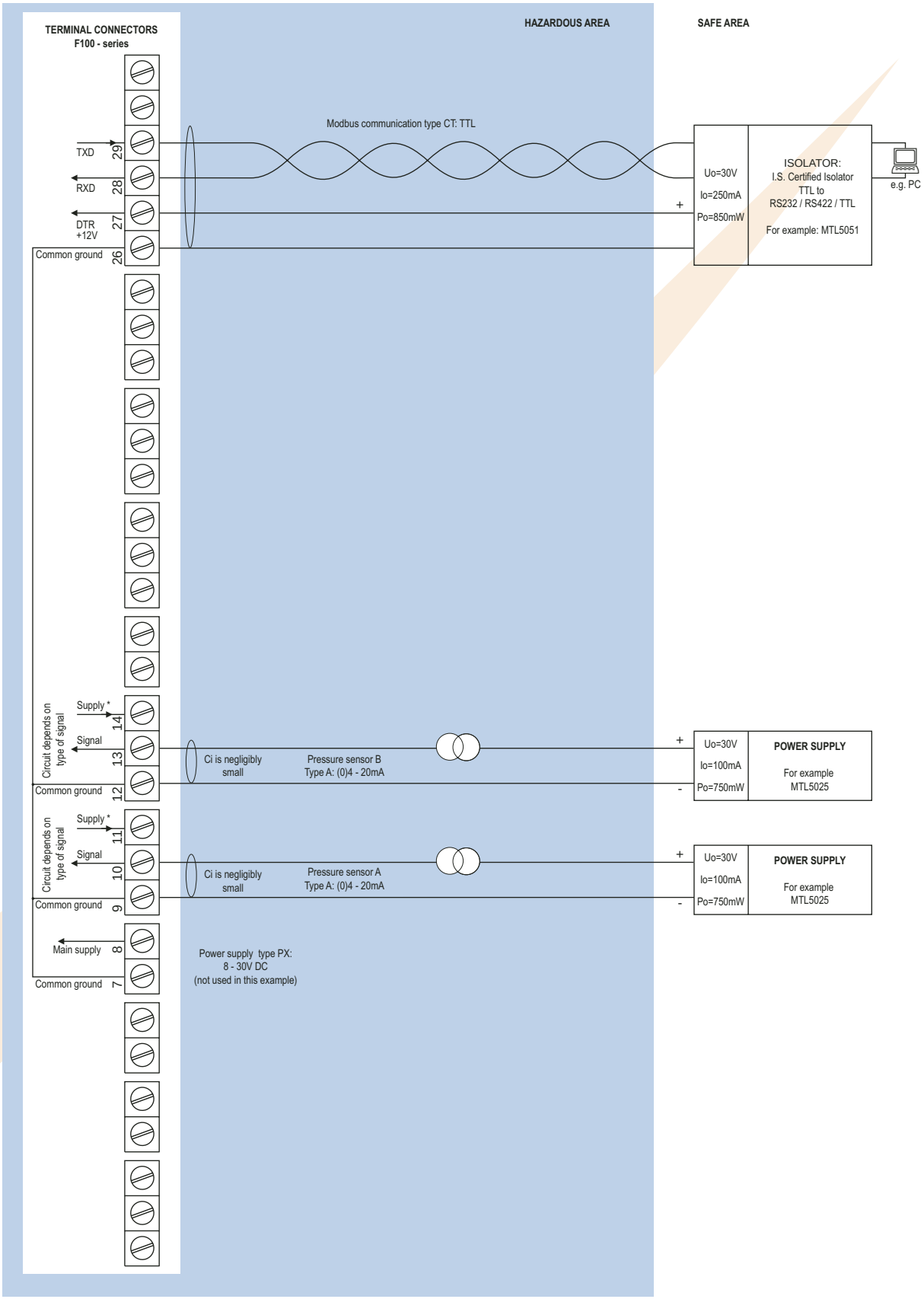

KEMA

EC-TYPE EXAMINATION CERTIFICATE

Configuration example IIB
F151-A-CT-PL-XI - input loop powered unit

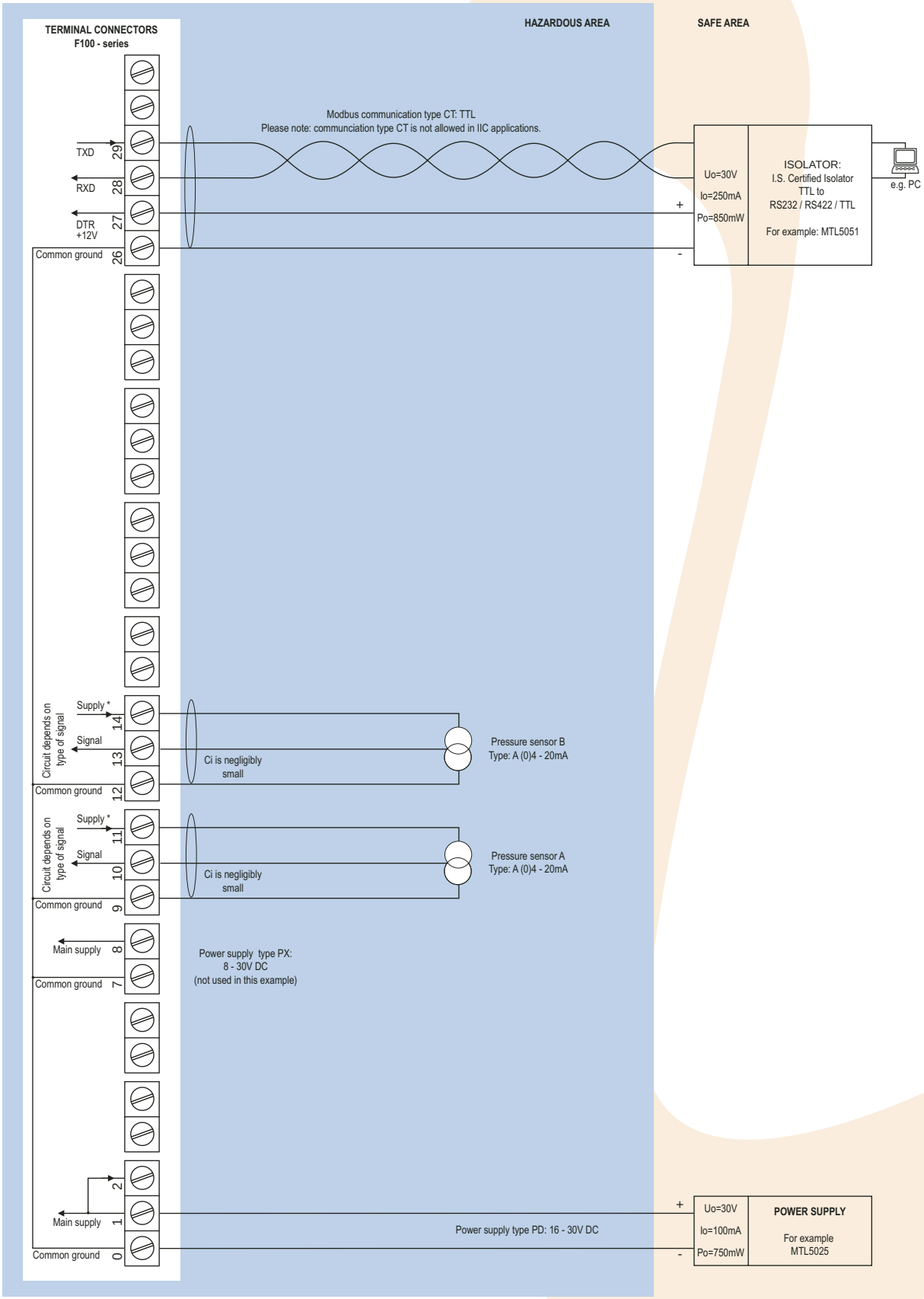


Configuration example IIB - F151-A-CT-PB-XI - battery powered



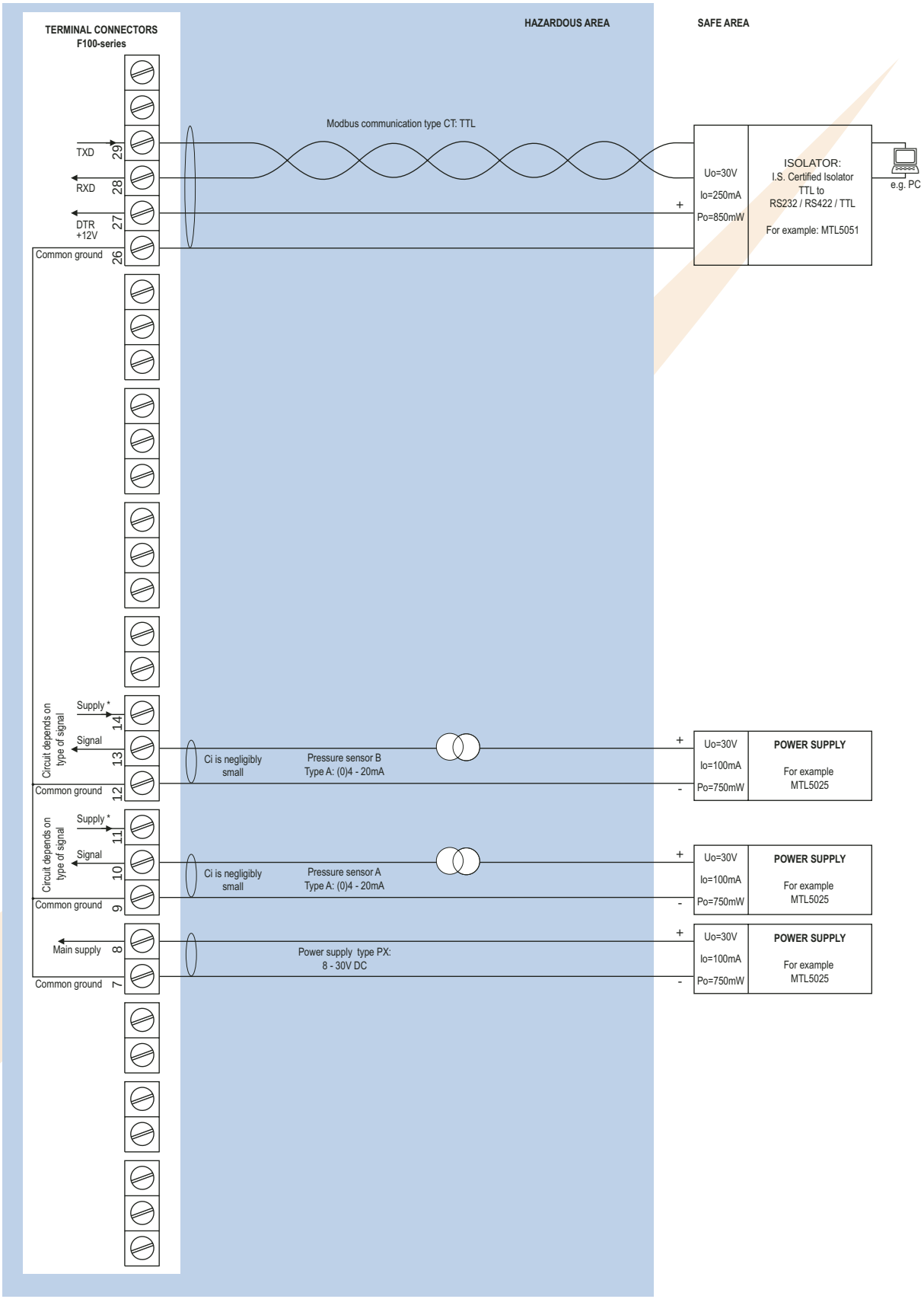
* Note sensor supply voltage: 3.2V DC - not suitable to power analog sensors.

Configuration example IIB / IIC - F151-A-(CT)-PD-XI - power supply 16 - 30V DC



* Note power supply type PD: the supply voltage to the sensor is as connected to terminal 1 (internally linked).

Configuration example IIB - F151-A-CT-PX-XI - basic power supply



* Note sensor supply voltage: 3.2V DC - not suitable to power analog 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 PL	Input loop powered from sensor signal 4 - 20mA (type “A”) - requires types AI or AF and OT.
Type PM	115 - 230V AC ± 10%.
Type PX	8 - 24V AC/DC.

Sensor excitation	
Type PB/PC/PX	3.2V DC.
Type PD	3.2 - 8.2 - 12 and 24V DC - max. 50mA@24V DC.
Type PD-XI	The sensor supply volage will be according to power supply as connected to terminal 1.
Type PF / PM	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. Data retention at least 10 years.
Pass-code	Configuration settings can be pass-code protected.

Hazardous area	
Intrinsically safe	ATEX approval ref: Ⓔx II 1GD EEx ia IIB/IIC T4 T100°C.
Type XI	Maximum ambient +70°C (158°F).
Explosion proof	ATEX approval ref: Ⓔx II 2G EEx d IIB T5.
Type XF	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

Pressure sensors	
Accuracy	14 bit. Error < 0.05%. Low level cut-off programmable.
Update time	Four times per second.
Type A	(0)4 - 20mA. Analog input signal can be scaled to any desired range within 0 - 20mA.
Span	0.000010 - 9,999,999 with variable decimal position.
Offset	0.000 - 9,999.999.
Voltage drop	2.5V@20mA.
Type U	0 - 10V DC. Analog input signal can be scaled to any desired range within 0 - 10V DC.
Span	0.000010 - 9,999,999 with variable decimal position.
Load impedance	3kΩ.
Note	For signal type A and U: external power to sensor required; e.g. PD.

Signal outputs

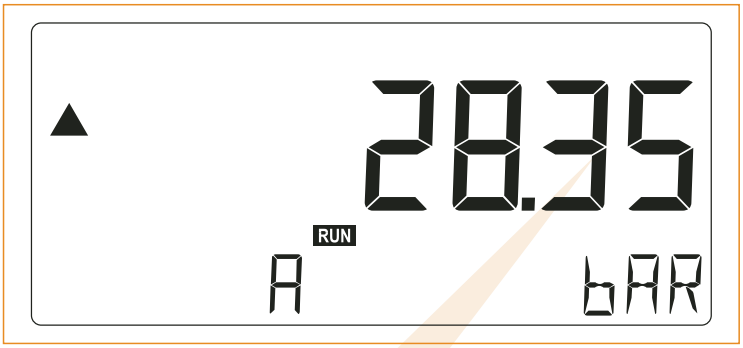
Communication option	
Function	Reading display information, reading / writing all configuration settings.
Type CB	RS232
Type CH	RS485 2-wire
Type CI	RS485 4-wire
Type CT	TTL Intrinsically Safe.
Protocol	Modbus ASCII / RTU.
Speed	1200 - 2400 - 4800 - 9600 baud.
Addressing	Maximum 255 addresses.

Operational

Operator functions	
Displayed functions	• Pressure A. • Pressure B.

Line pressure	
Digits	6 digits.
Units	mbar, bar, PSI, no-unit.
Decimals	0 - 1 - 2 - 3.

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



Ordering information

Example (standard configuration)

F151-A-CX-HC-PX-XX-ZX.

Explanation standard configuration:

A: pressure signal: (0)4 - 20mA analog input;**CX**: no communication; **HC**: ABS panel mount enclosure; **PX**: 8 - 24V AC/DC; **XX**: Safe area; **ZX**: no options.

Ordering information:		F151 -_	-C _	-H _	-P _	-X _	-Z _
Pressure input signal							
A	Ⓔx	**(0)4 - 20mA input.**					
U	Ⓔx	0 - 10V DC input.					
Communication							
CB		Communication RS232 - Modbus ASCII / RTU.					
CH		Communication RS485 - 2-wire - Modbus ASCII / RTU.					
CI		Communication RS485 - 4-wire - Modbus ASCII / RTU.					
CT	Ⓔx	Intrinsically Safe TTL - Modbus ASCII / RTU.					
CX	Ⓔx	**No communication.**					
Enclosure							
HA	Ⓔx	Aluminum field mount enclosure IP67 / NEMA 4X.					
HB	Ⓔx	Aluminum panel mount enclosure IP65 / NEMA 4.					
HC	Ⓔx	**ABS panel mount enclosure IP65 / NEMA 4.**					
HD	Ⓔx	ABS wall mount enclosure IP67 / NEMA 4X.					
HU	Ⓔx	Aluminum field mount enclosure IP67 / NEMA 4X.					
Power supply							
PB		Lithium battery powered.					
PC	Ⓔx	Lithium battery powered - Intrinsically Safe.					
PD	Ⓔx	8 - 24V AC / DC + sensor supply - with XI: 16 - 30V DC.					
PF		24V AC / DC + sensor supply.					
PL	Ⓔx	Input loop powered from sensor signal type “A”.					
PM		115 - 230V AC + sensor supply.					
PX	Ⓔx	**No power supply option. Unit requires external loop AP.**					
Hazardous area							
XI	Ⓔx	Intrinsically safe.					
XF	Ⓔx	EExd enclosure - 3 keys.					
XX		**Safe area only.**					
Other options							
ZB		Backlight.					
ZX	Ⓔx	**No options.**					

The bold marked text contains the standard configuration.

Ⓔx Available Intrinsically Safe.

FLUIDWELL bv
P.O. Box 6
5460 AA - Veghel - The Netherlands
Tel.: +31 (0)413 343786
Fax.: +31 (0)413 363443
sales@fluidwell.com
Internet: www.fluidwell.com