

DUAL INPUT PRESSURE INDICATOR



Features

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

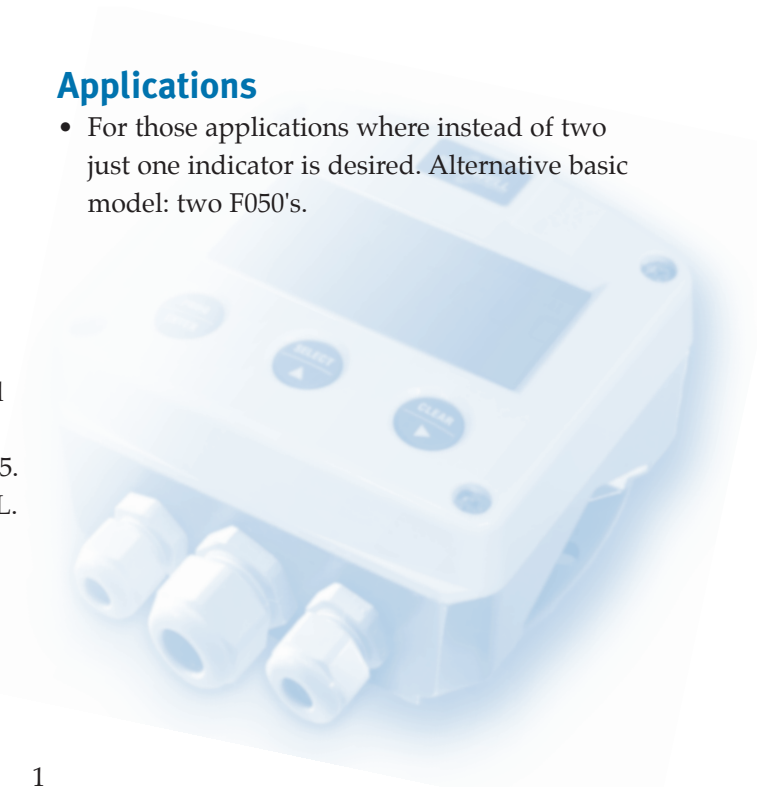
Signal input

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 further enhances the capabilities of this model, 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 menu. 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, which avoids 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

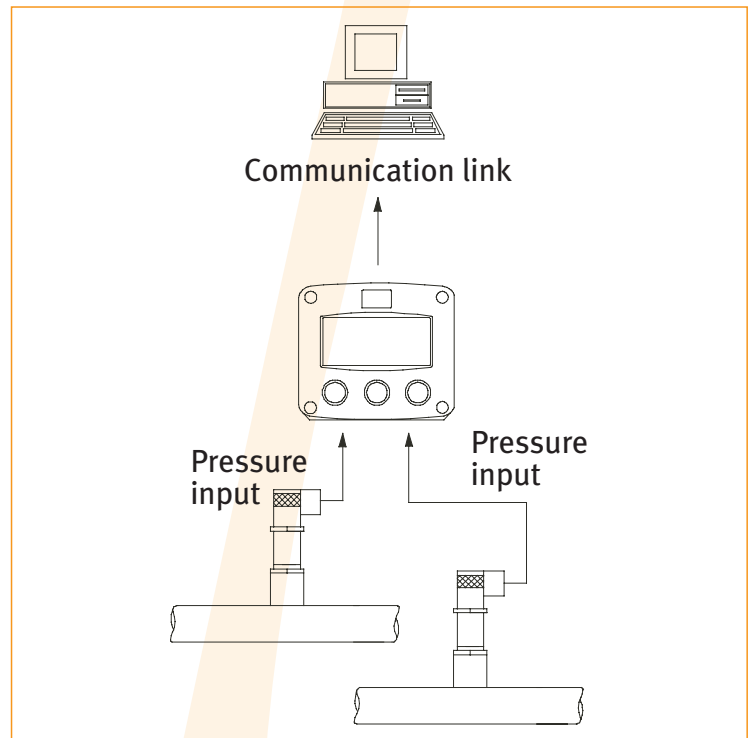
This model has been ATEX and IECEx certified Intrinsically Safe for gas and dust applications, with an allowed operational temperature of -40°C to +70°C (-40°F to +158°F).

A flame proof enclosure with ATEX certification offers the rating $\text{Ex II 2 GD EEx d IIB T5}$.

Enclosures

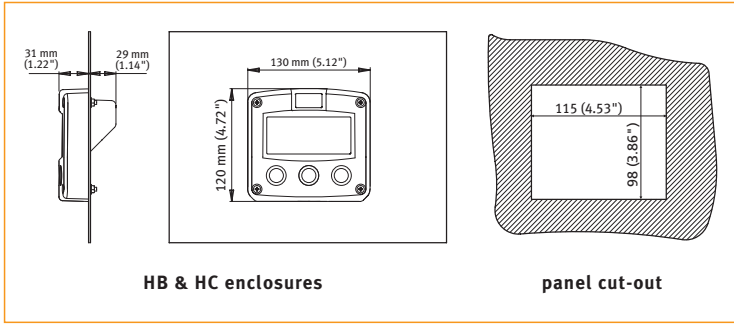
Various types of enclosures can be selected, all ATEX and IECEx approved. As standard the F151 is supplied in an GRP panel mount enclosure, which can be converted to an IP67 / NEMA 4X GRP field mount enclosure by the addition of a back case. Most popular is our rugged aluminum field mount enclosure with IP67 / NEMA 4X rating. Both European or U.S. cable gland entry threads are available.

Overview application F151

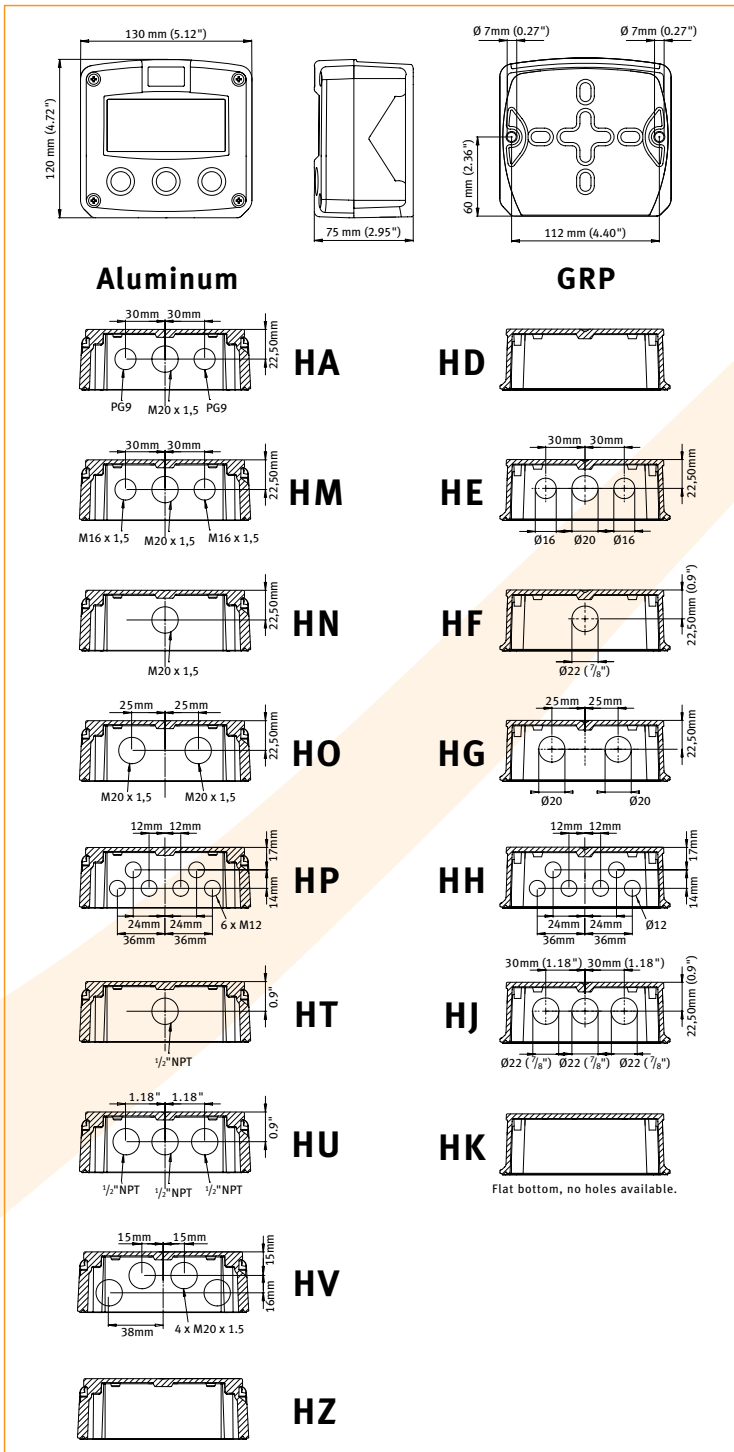


Dimensions enclosures

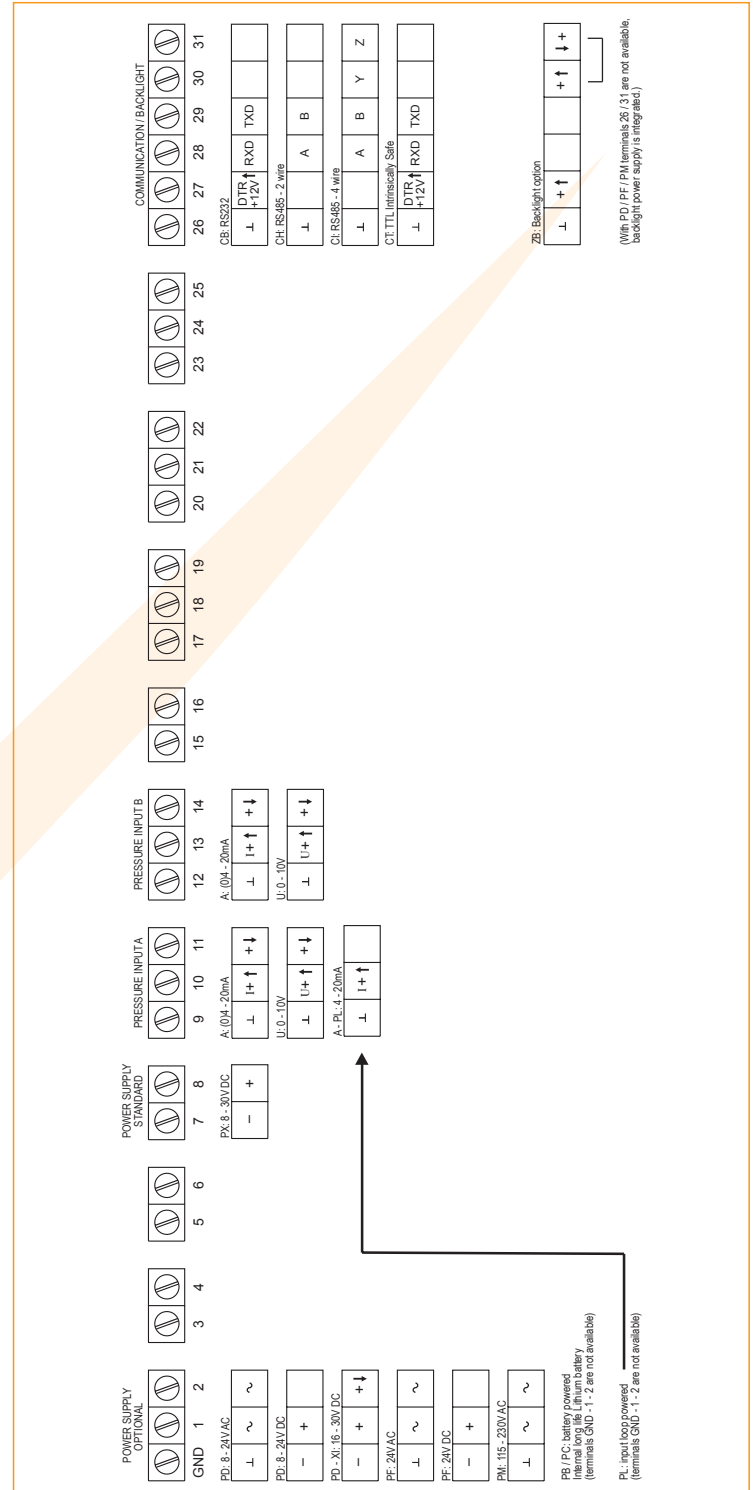
Aluminum & GRP panel mount enclosure



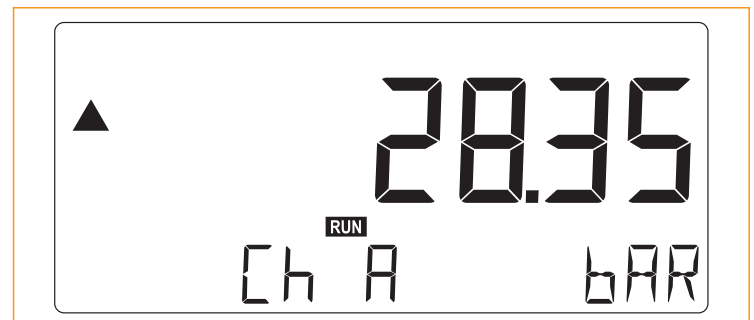
Aluminum & GRP field / wall mount enclosures



Terminal connections

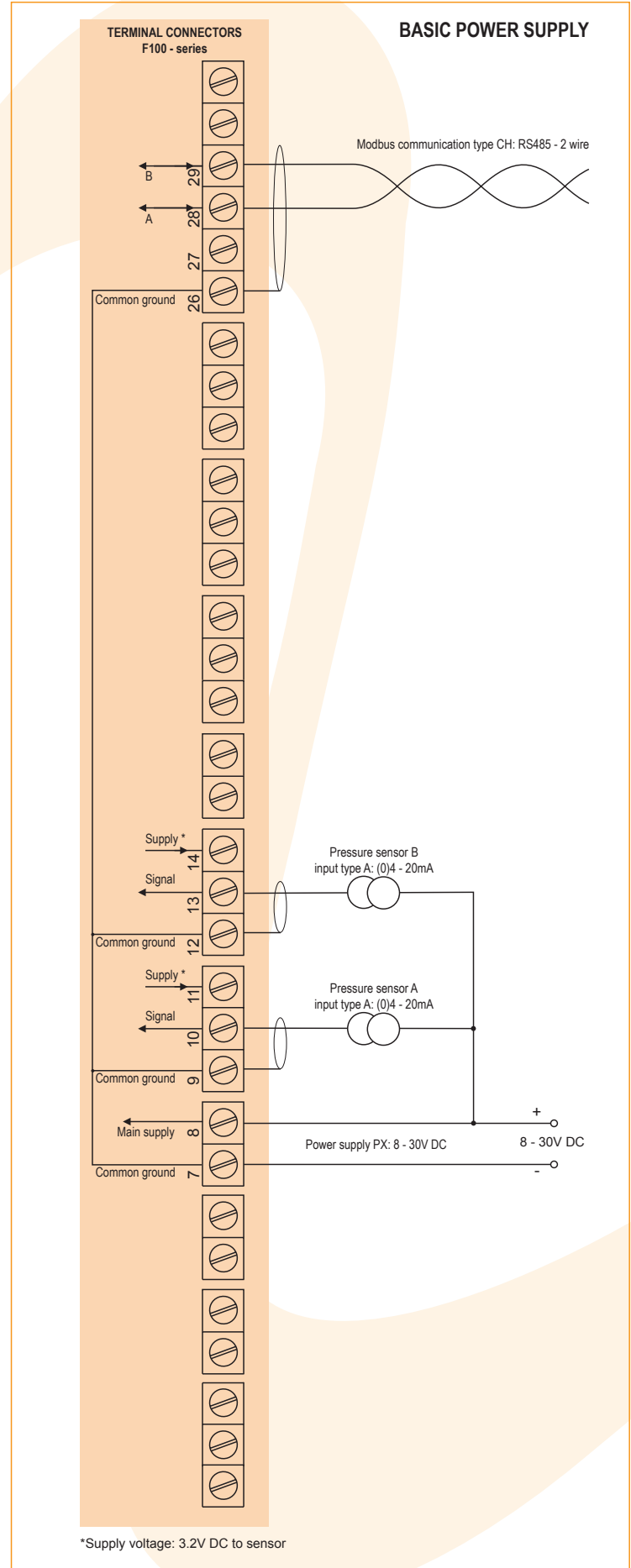
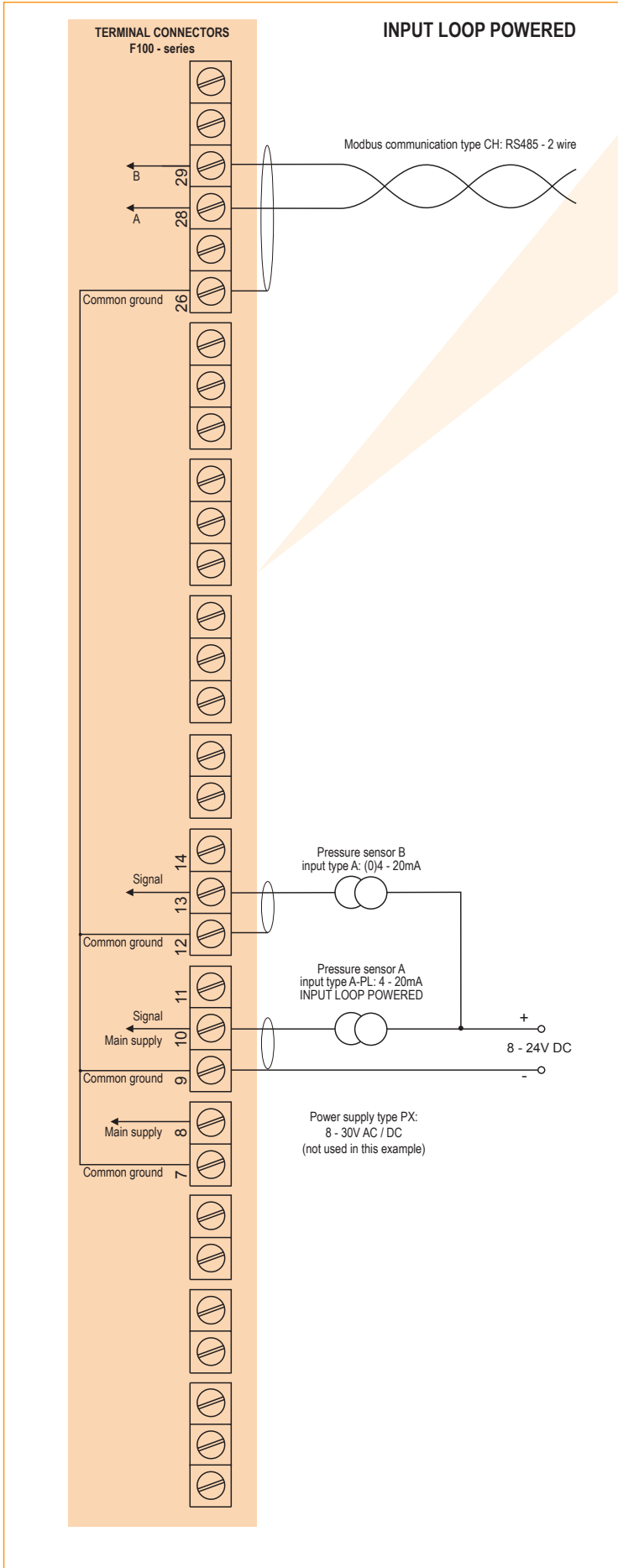


Display example - 90 x 40mm (3.5" x 1.6")



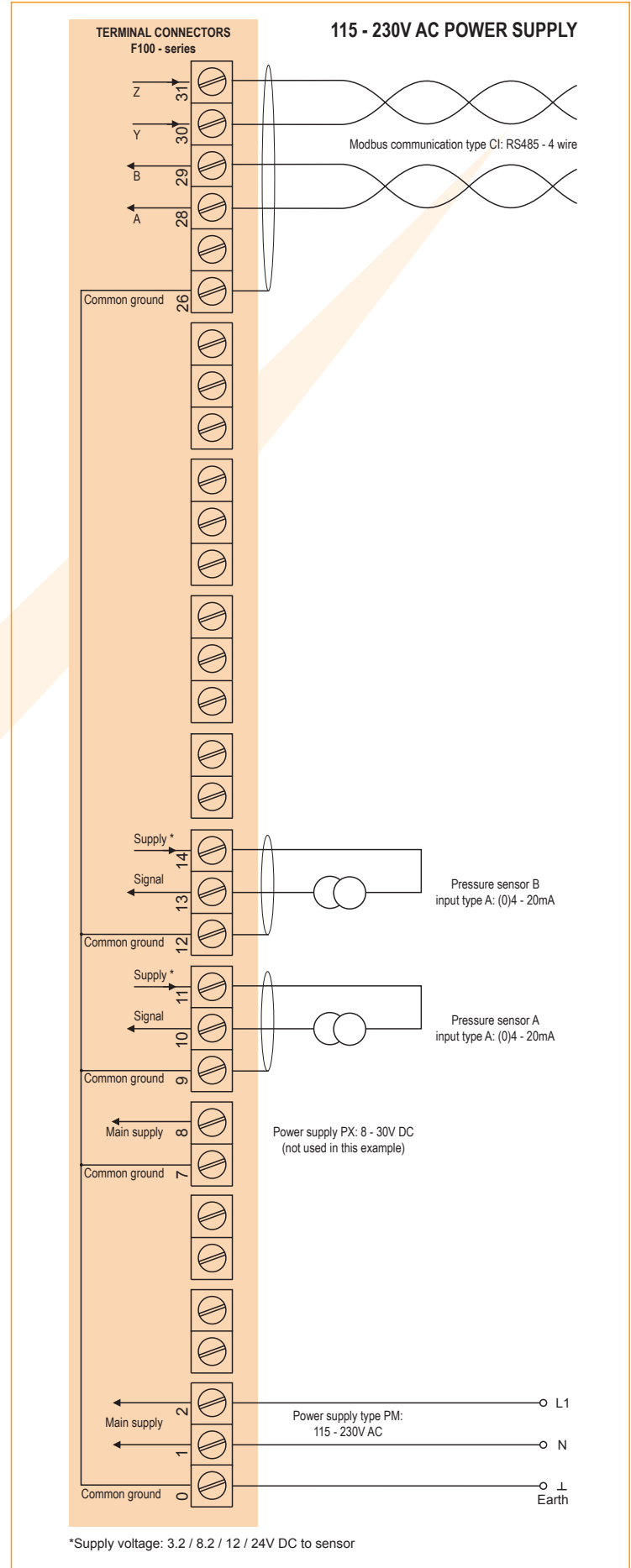
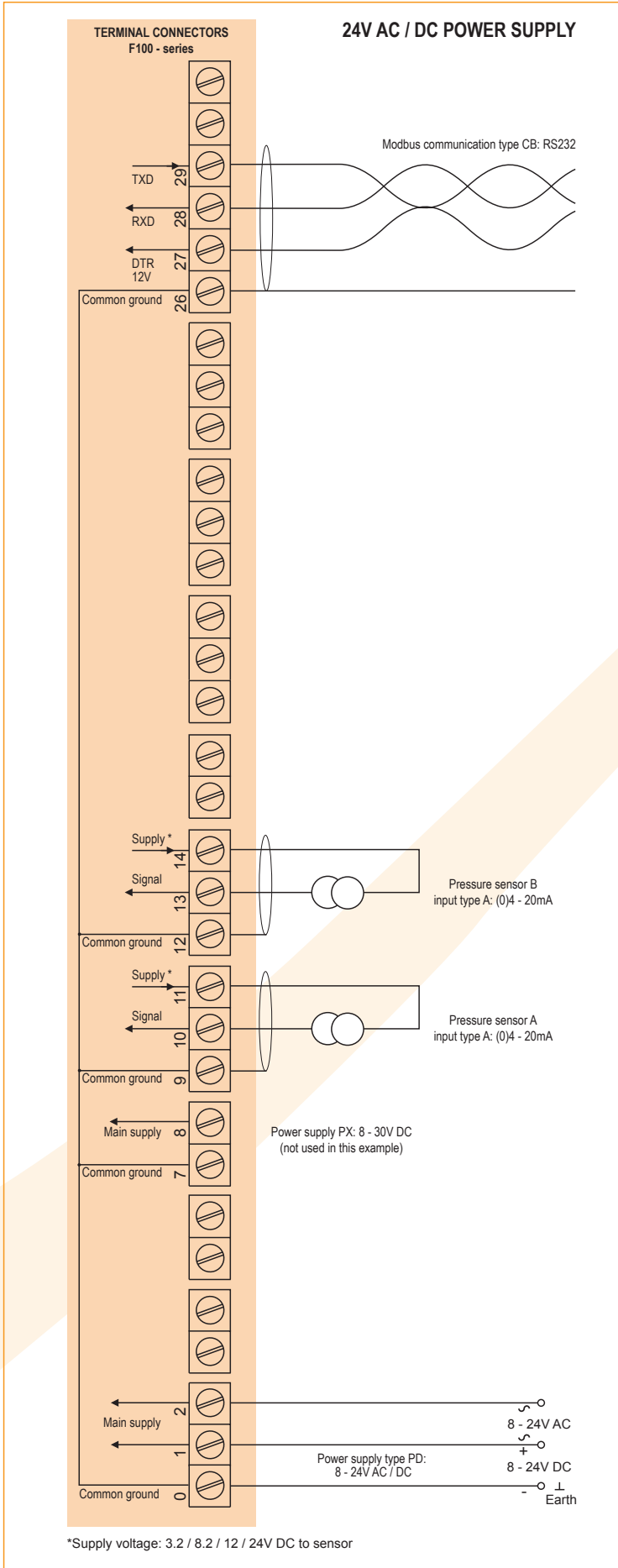
Typical wiring diagram F151-A-CH-PL

Typical wiring diagram F151-A-CH-PX



Typical wiring diagram F151-A-CB-PD

Typical wiring diagram F151-A-CI-PM



Hazardous area applications

The F151-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:

Ex 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**.

It is allowed to connect up to three 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 F151 remains available, including the Modbus communication (CT).

Power supply type PD-XI offers a sensor supply according to the connected power supply voltage at terminal 1.

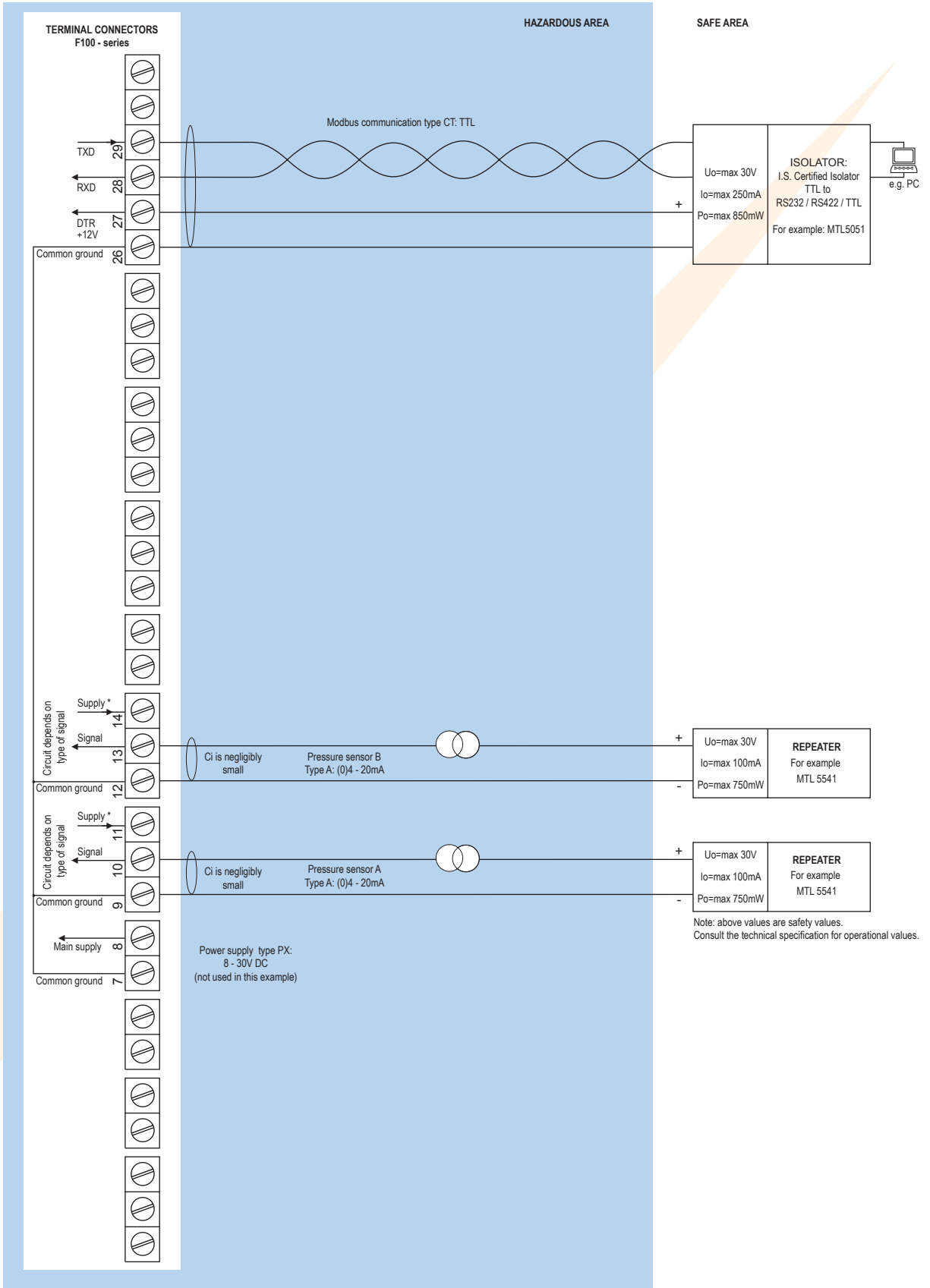
A flame proof enclosure with rating ATEX **Ex** II 2 GD EEx d IIB T5 is available as well. Please contact your supplier for further details.

Certificate of conformity KEMA 03ATEX1074 X

- IECEx DEK 11.0042X

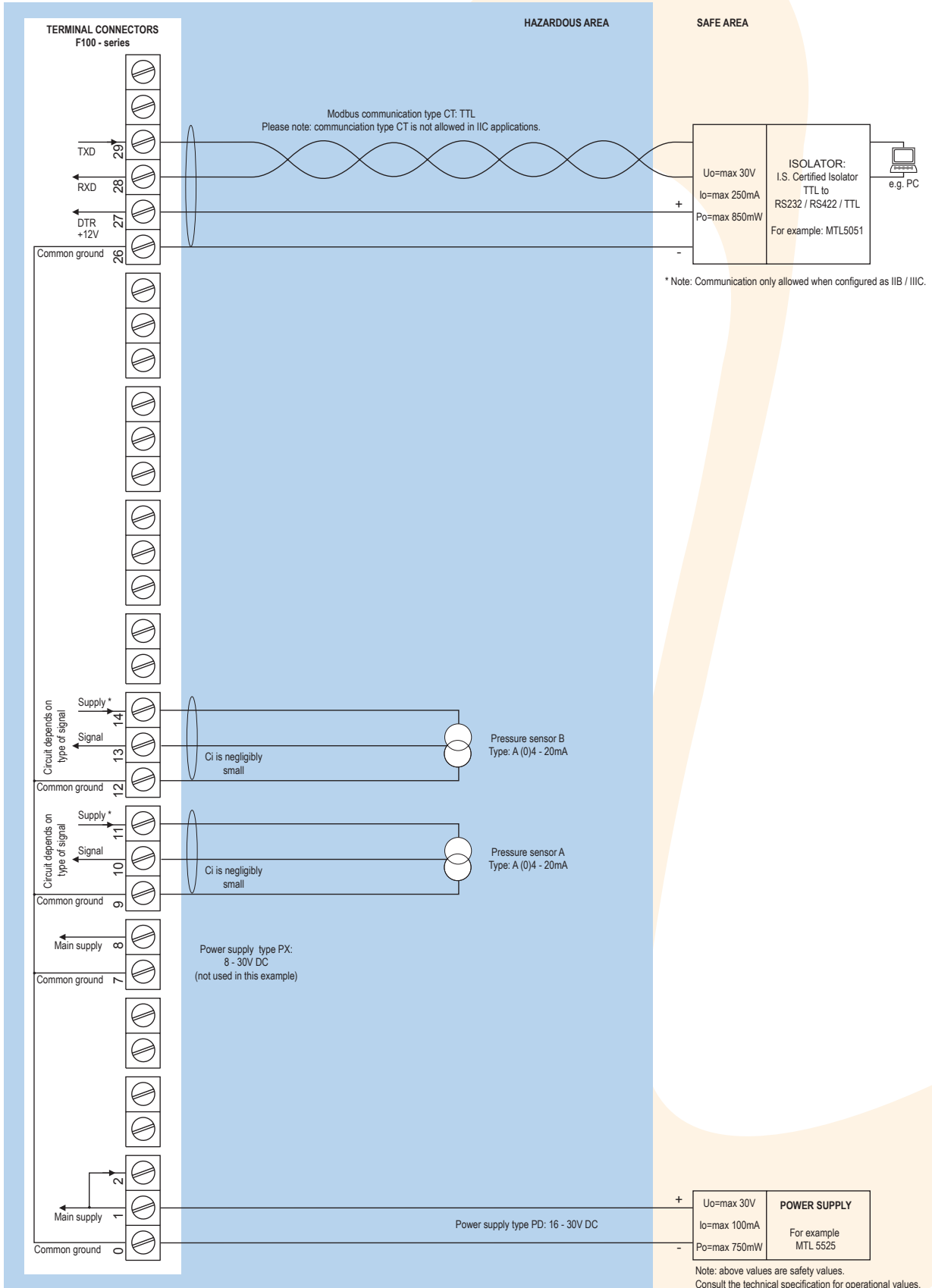


Configuration example IIB / IIIC - F151-A-CT-PC-XI - Battery powered



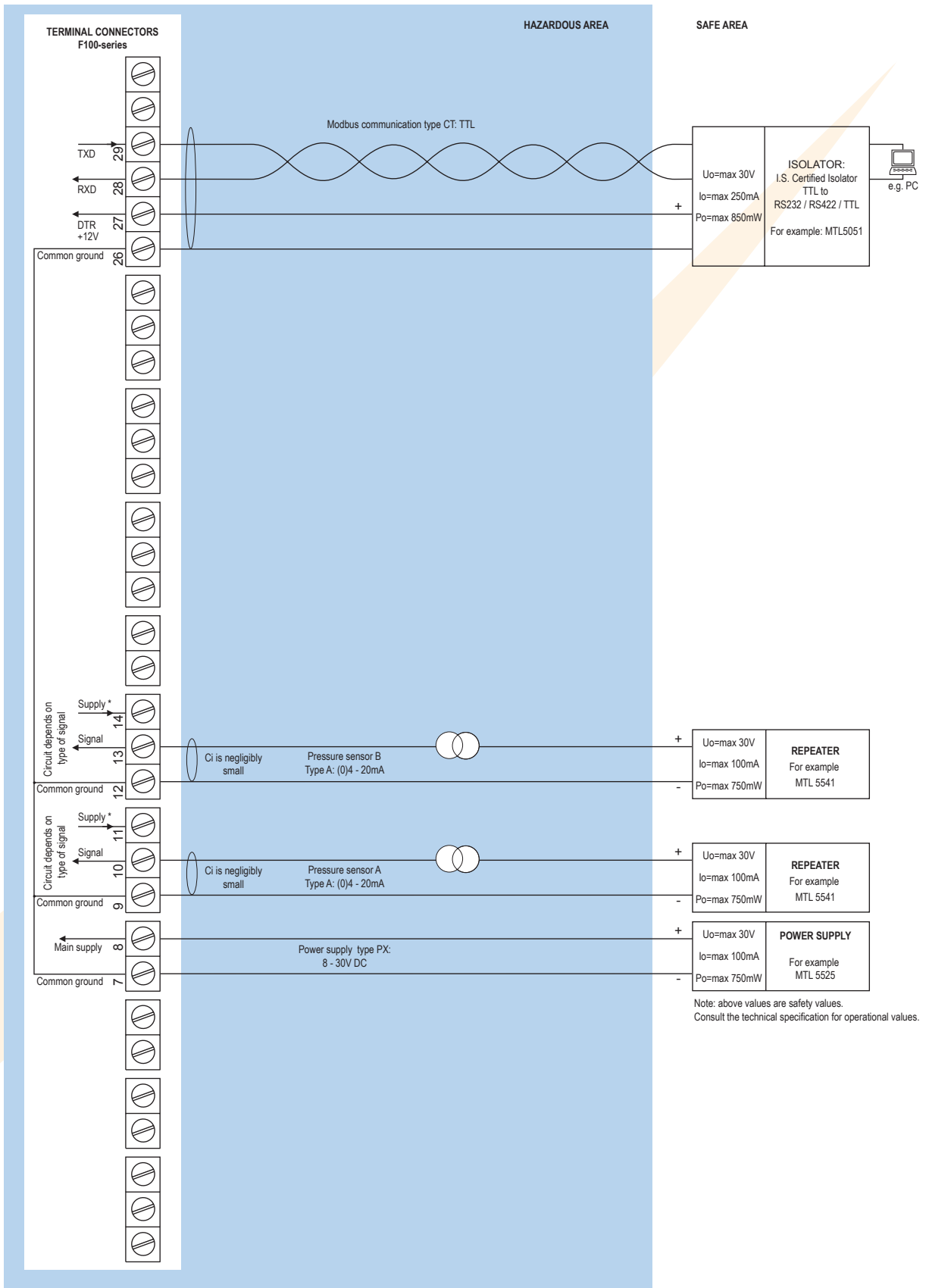
* Note sensor supply voltage: 3.2V DC - not suitable to power analog sensors.

Configuration example IIB / IIIC and 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 / IIC - F151-A-CT-PX-XI - Basic power supply 8 - 30V DC



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 \pm 10%. Power consumption max. 10 Watt. Intrinsically Safe: 16 - 30V DC; power consumption max. 0.75 Watt.
Type PF	24V AC / DC \pm 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 (not Xi).
Type PM	115 - 230V AC \pm 10%. Power consumption max. 15 Watt.
Type PX	8 - 30V DC. Power consumption max. 0.5 Watt.
Type ZB	12 - 24V DC \pm 10% or internally powered with type PD / PF / PM. Power consumption max. 1 Watt.
Note PB/PF/PM	Not available 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.
Note	This is not a real sensor supply. Only suitable for sensors with a very low power consumption.
Type PD	3.2 / 8.2 / 12 / 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 / 24V DC - max. 400mA @ 24V DC.

Terminal connections

Type	Removable plug-in terminal strip. Wire max. 1.5mm ² and 2.5mm ² .
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Data protection

Type	EEPROM backup of all settings. 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 \emptyset 16mm and 1 x \emptyset 20mm.
Type HF	Cable entry: 1 x \emptyset 22mm (7/8").
Type HG	Cable entry: 2 x \emptyset 20mm.
Type HH	Cable entry: 6 x \emptyset 12mm.
Type HJ	Cable entry: 3 x \emptyset 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. 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	 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).
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Signal inputs

Pressure sensors

Accuracy	Resolution: 14 bit. Error < 0.025mA / ± 0.125% FS. 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.
Protocol	Modbus ASCII / 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	<ul style="list-style-type: none"> • Pressure A. • Pressure B.
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Pressure

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

Accessories

Mounting accessories

ACFo2	Stainless steel wall mounting kit.
ACFo5	Stainless steel pipe mounting kit (worm gear clamps not included).
ACFo6	Two stainless steel worm gear clamps Ø 44 - 56mm.
ACFo7	Two stainless steel worm gear clamps Ø 58 - 75mm.
ACFo8	Two stainless steel worm gear clamps Ø 77 - 95mm.
ACFo9	Two stainless steel worm gear clamps Ø 106 - 138mm.
ACFo10	Customized Grevopal tagplates for ACFo2 and ACFo5, 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: F151-A-AX-CX-EX-HC-IX-OX-PX-TX-XX-ZX.

Ordering information: F151 _ -AX -C _ -EX -H _ -IX -OX -P _ -TX -X _ -Z _



Pressure input signal

- A  **(0)4 - 20mA input.**
- U  0 - 10V DC input.

Analog output signal

- AX  **No analog output.**



Communication

- CB Communication RS232 - Modbus ASCII / RTU.
- CH Communication RS485 - 2-wire - Modbus ASCII / RTU.
- CI Communication RS485 - 4-wire - Modbus ASCII / RTU.
- CT  Intrinsically Safe TTL - Modbus ASCII / RTU.
- CX  **No 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.
- 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.

ABS field / wall mount enclosures - IP65

- HS  Silicone free ABS field enclosure – Cable entry: no holes (old HD enclosure).




Additional inputs

- IX  **No additional input.**

Outputs

- OX  **No output.**


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" (not Xi).
- 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 Backlight.
- ZX  **No options.**

The bold marked text contains the standard configuration.

 Available Intrinsically Safe.

Specifications are subject to change without notice.