DATASHEET F070 - LEVEL MONITOR

LEVEL MONITOR

WITH RUGGED ALUMINUM FIELD ENCLOSURE OR PANEL MOUNT ENCLOSURE

Features

- Displays level and percentage filled.
- Large 17mm (0.67") digits.
- Selectable on-screen engineering units; volumetric or mass.
- Operational temperature -40°C up to +80°C (-22°F up to 178°F).
- Very compact design for panel mount, wall mount or field mount applications.
- Auto backup of all settings.
- 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.
- LED backlight option.
- 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

Level

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

Applications

- Applications where a basic level measurement display is required without level monitoring and linearisation. More sophisticated models: F073, F077, F170 and F173.

General information

Introduction

The F070 is a straight forward level indicator. The measuring unit to be displayed is simply selected through an alfa-numerical configuration menu. No adhesive labels have to be put on the outside of the enclosure: a weather proof and user friendly solution!
The configuration of the Span, off-set and number of decimals is done through software functions, without any sensitive dip-switches or trimmers. A wide selection of options further enhance this models capabilities, including Intrinsic Safety for hazardous area applications.

Display

The display has large 17mm (0.67") and 8mm (0.31") digits which can be set to show level and percentage. As the F070 has been designed for field mounted applications, a smart display update function has been incorporated. Related to the lower temperatures, the update frequency of the LCD is tuned automatically to achieve a readable display even at -40°C / -40°F.

Backlight

For those applications where readabillity during day is an issue, a bi-color backlight is available. The background color green or amber and the intensity can be adjusted from the keyboard. The display is a transflective type, which means that a high contrast reading is guaranteed in full sunlight as well as during the night. This back-light option is also available Intrinsically Safe.

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. All settings are safely stored in EEPROM memory in the event of sudden power failure.

Signal input

The F070 does accept (0)4 - 20mA and 0 - 10V input signals from any type of level measurement device. Also a 4 - 20mA input loop powered model is available.

Power supply

Several power supply options are available to power the F070 and sensor. A battery powered version with a long life lithium battery which will last up to five years. For analog sensors, a 4 - 20mA loop powered version is available as well. A real sensor supply is offered with the 24V AC / DC or 115 - 230V AC power supply option.

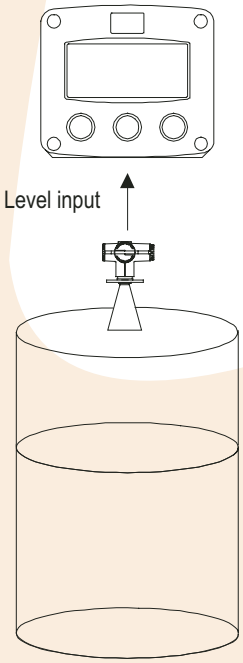
Hazardous areas

For hazardous area applications, ATEX Intrinsically Safe certification is pending according ⟨Ex⟩II 1GD EEx ia IIB / IIC T4 T100°C with an allowed operational temperature of -40°C to +70°C (-40°F to +158°F). CSA and IEC certification is expected to be available in november 2005.
A flame proof enclosure with ATEX certification offers the rating ⟨Ex⟩II 2G EEx d IIB T5.

Enclosures

Various types of enclosures can be selected. As standard the F070 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 aluminum field mount enclosure with IP67 / NEMA 4X rating. Both European or U.S. cable gland entry threads are available.

Overview application F070

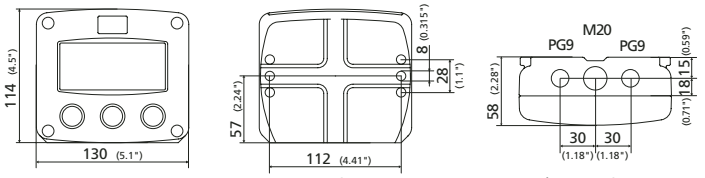


Dimensions enclosures

Enclosure HA

Aluminum field mount enclosure

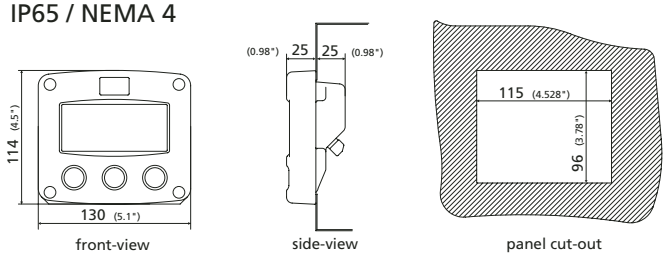
IP67 / NEMA 4X
Tapped holes: European thread



Enclosure HB

Aluminum panel mount enclosure

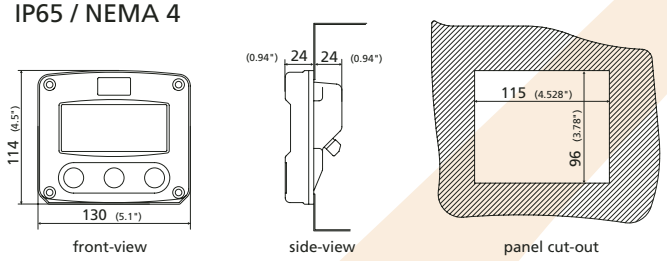
IP65 / NEMA 4



ENCLOSURE HC (STANDARD)

ABS PANEL MOUNT ENCLOSURE

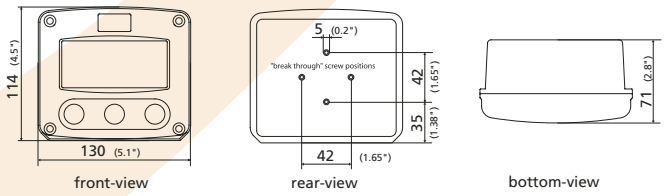
IP65 / NEMA 4



Enclosure HD

ABS wall mount enclosure

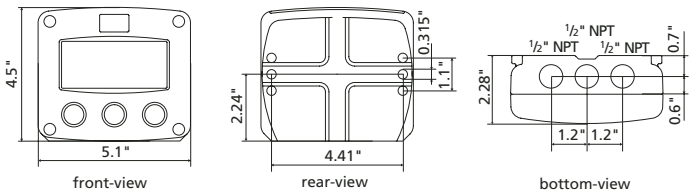
IP67 / NEMA 4X
Holes user defined



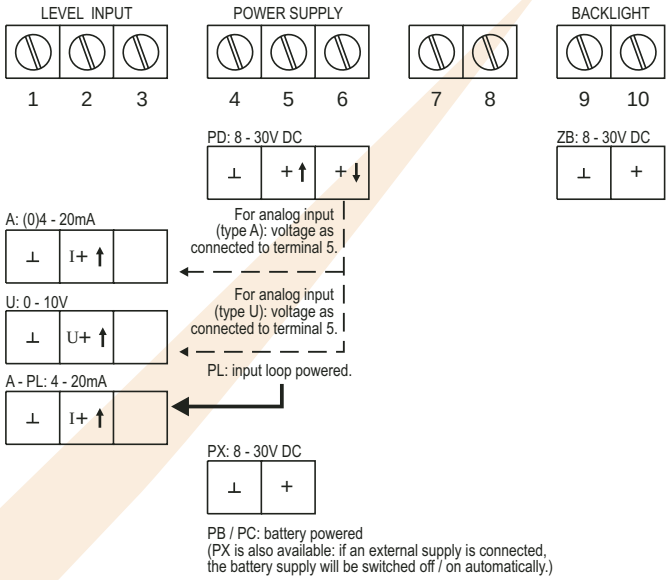
Enclosure HU

Aluminum field mount enclosure

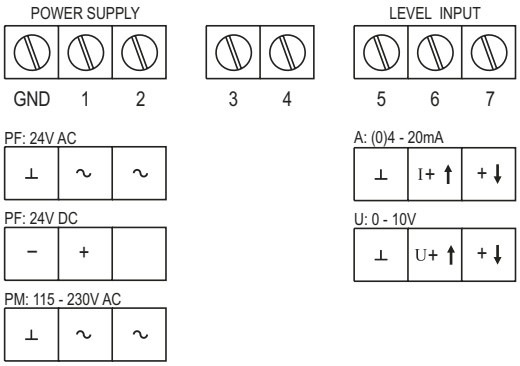
IP67 / NEMA 4X
Tapped holes: U.S. thread



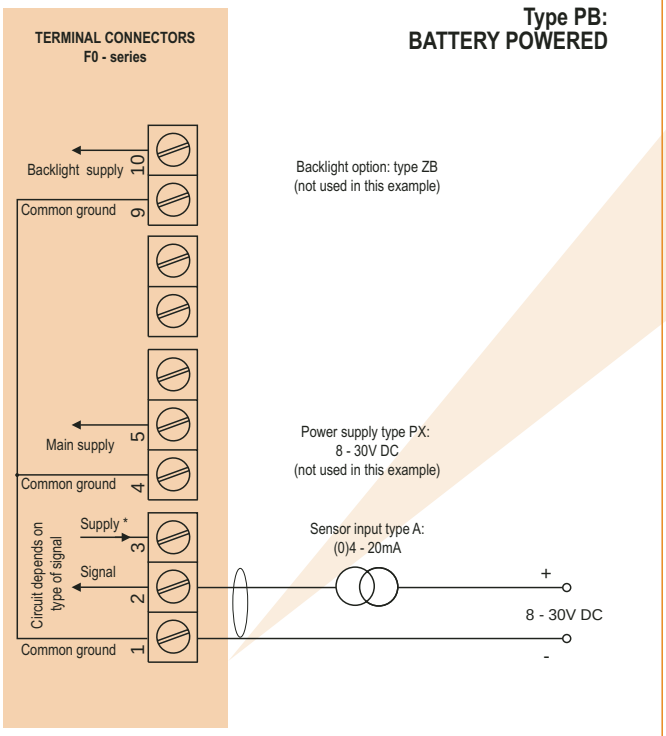
Terminal connections power supply PB/PC - PD - PL - PX



Terminal connections power supply PF - PM

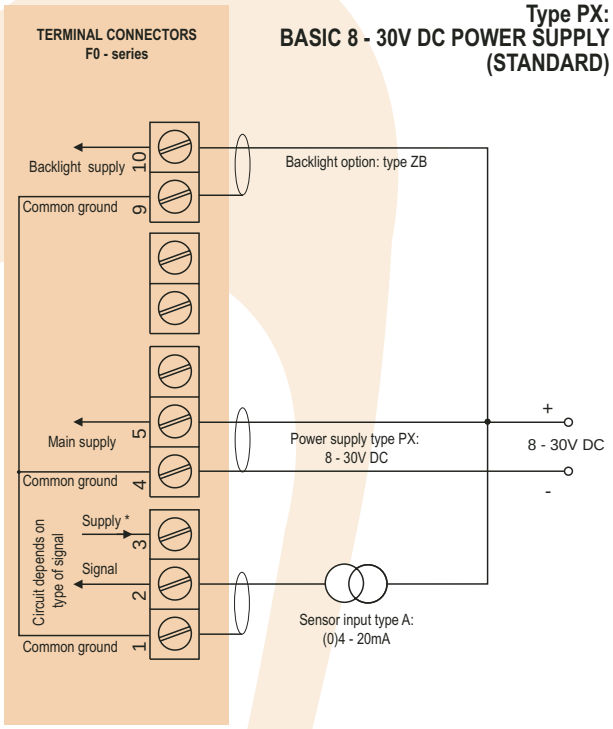


Typical wiring diagram Fo70-A-PB-(PX)-(ZB)



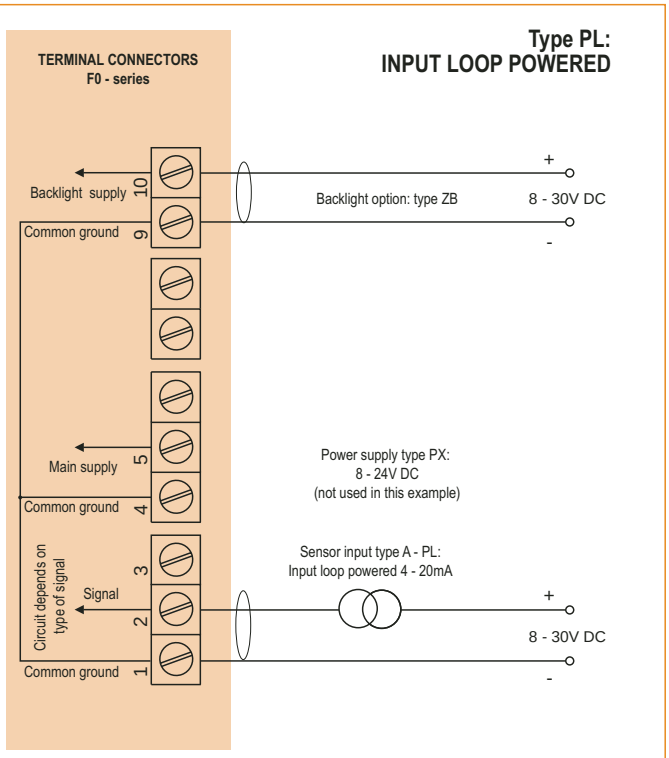
* Sensor supply voltage: Terminal 3: 3.2V DC.

Typical wiring diagram Fo70-A-PX-ZB



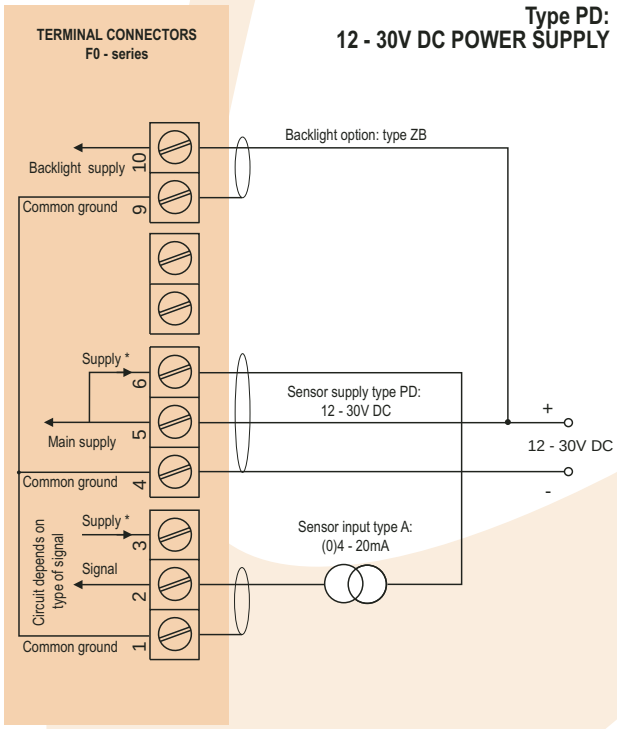
* Sensor supply voltage: Terminal 3: 3.2V DC.

Typical wiring diagram Fo70-A-PL-ZB



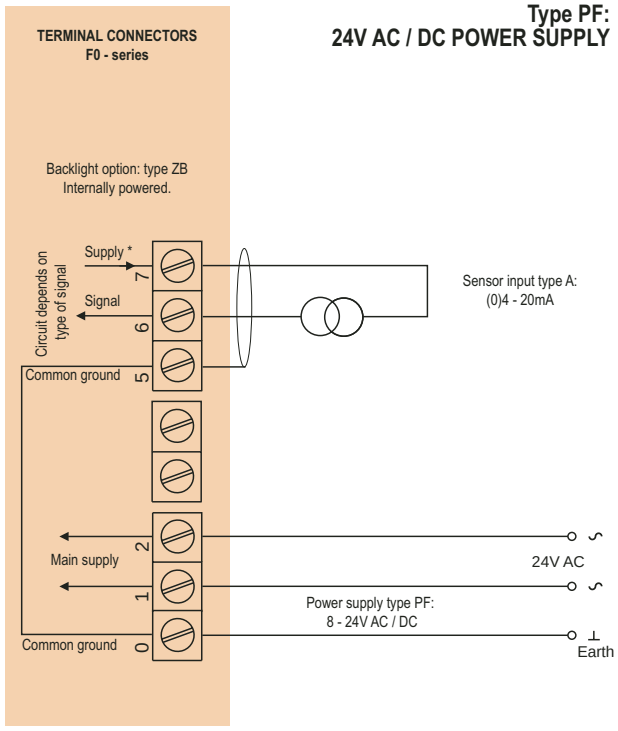
Sensor supply: sensor is externally powered.

Typical wiring diagram Fo70-A-PD-ZB



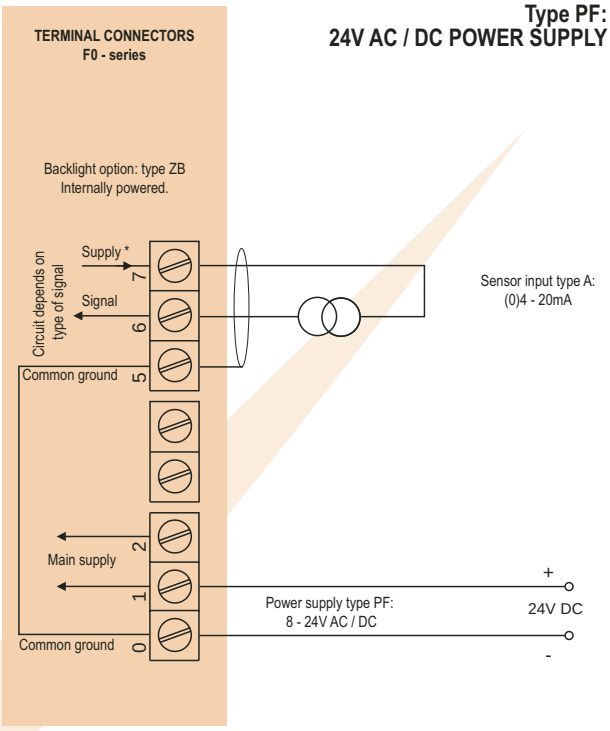
* Sensor supply voltage: Terminal 3: 3.2V DC.
Terminal 6 with type PD: voltage as connected to terminal 5 (internally linked).

Typical wiring diagram Fo70-A-PF-ZB



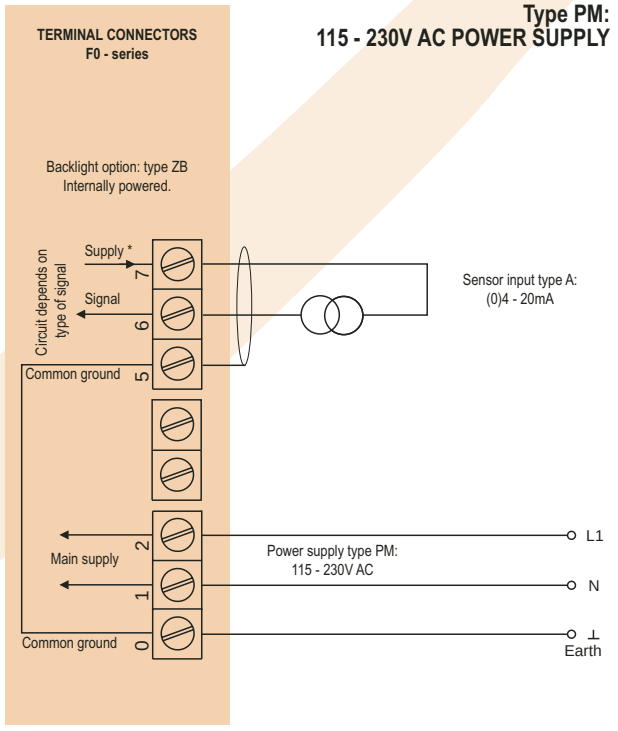
* Sensor supply voltage: Terminal 7: 3.2 - 8.2 - 12 - 24V DC.

Typical wiring diagram Fo70-A-PF-ZB



* Sensor supply voltage: Terminal 7: 3.2 - 8.2 - 12 - 24V DC.

Typical wiring diagram Fo70-A-PM-ZB



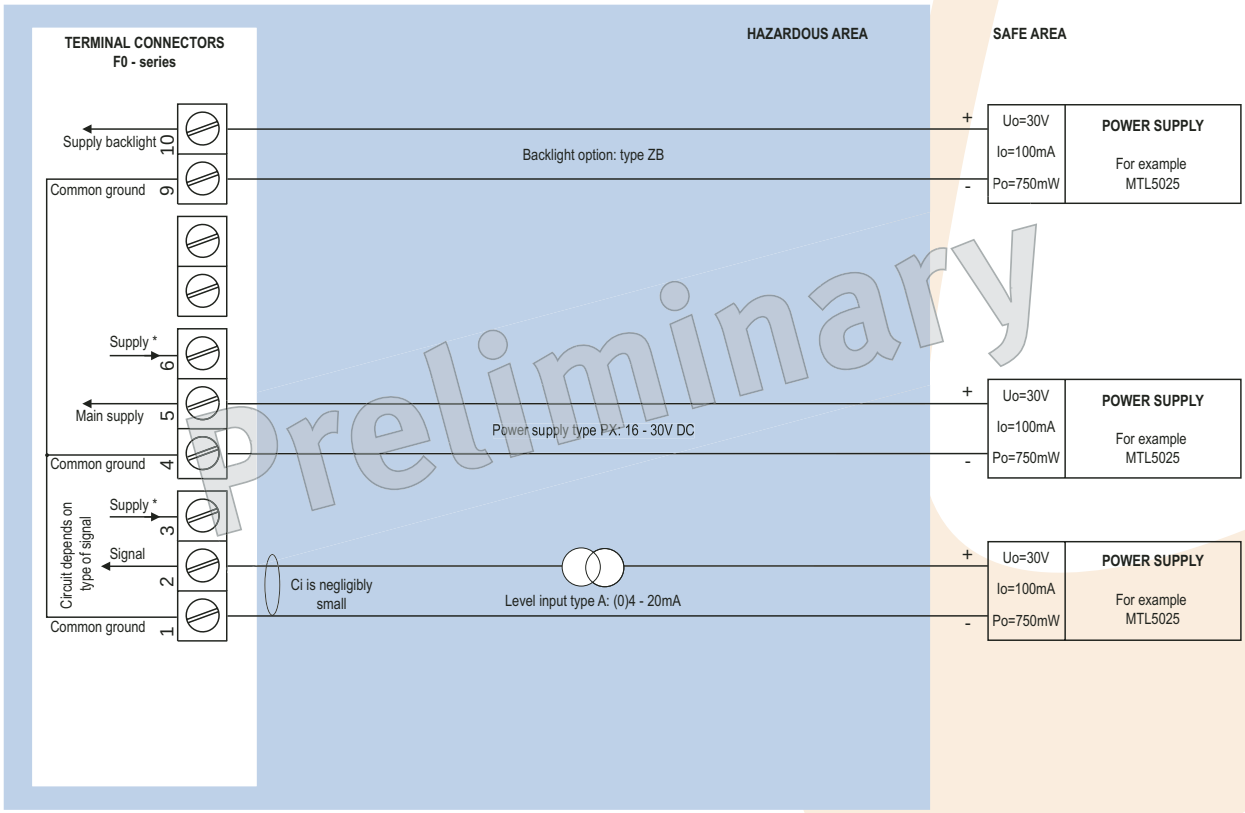
* Sensor supply voltage: Terminal 7: 3.2 - 8.2 - 12 - 24V DC.

Hazardous area applications

ATEX certification of the F070-XI for use in Intrinsically Safe applications is pending. It is going to be approved according to Ex II 1GD EEx ia IIB/IIC T4 T100°C for gas and dust applications with an operational temperature range of -40°C to +70°C (-40°F to +158°F).
IEC certification with the same ratings is expected to become available in november 2005, just as the CSA certification. The CSA (US/C) rating will be: Intrinsically Safe Class I, II, or III, Zone 0 or 1, Division 1 or 2, Group A through G (I.S.) and Non-Incendive Division 2 and Zone 2 (N.I.).
A flame proof enclosure with rating Ex II 2G EEx d IIB T5 is available as well. Please contact your supplier for further details.

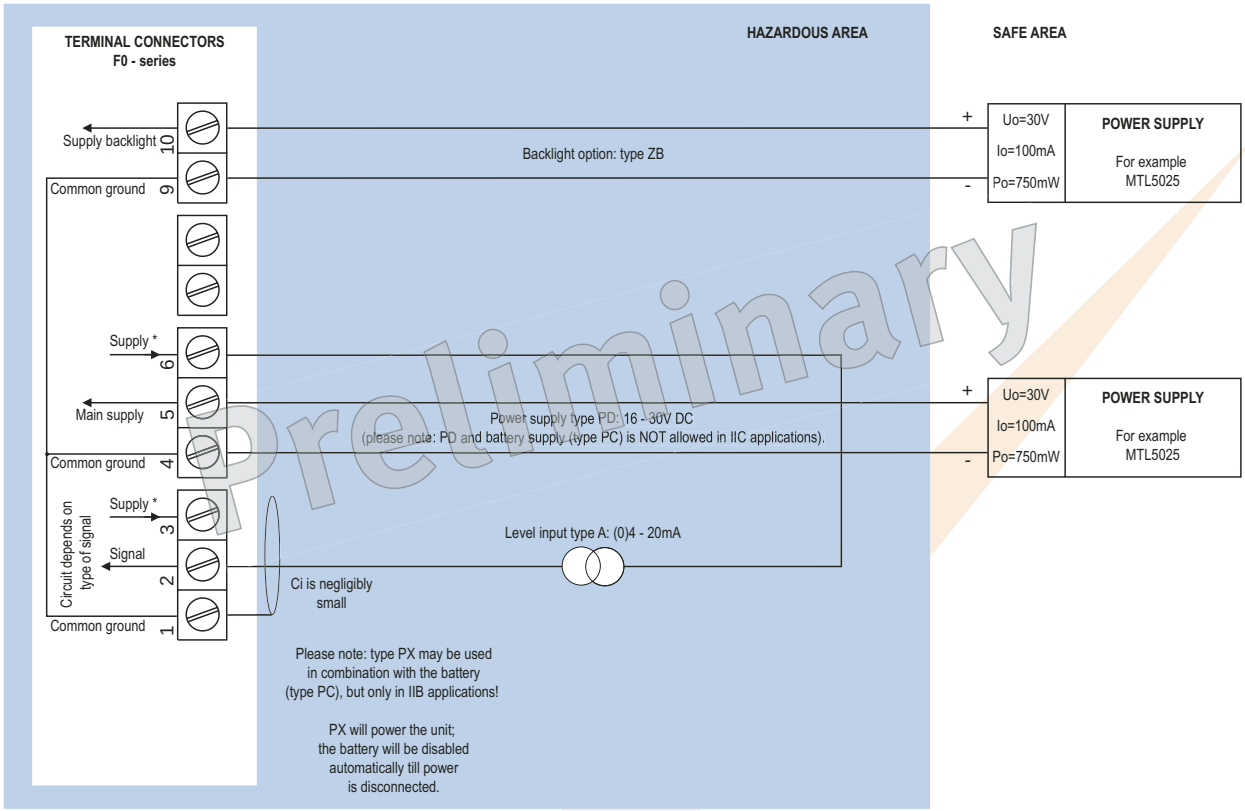
Certificate of conformity KEMA 03ATEX1074 X

Configuration example IIB and IIC
Fo70-A-PX-XI-ZB - basic power supply 8 - 30V DC



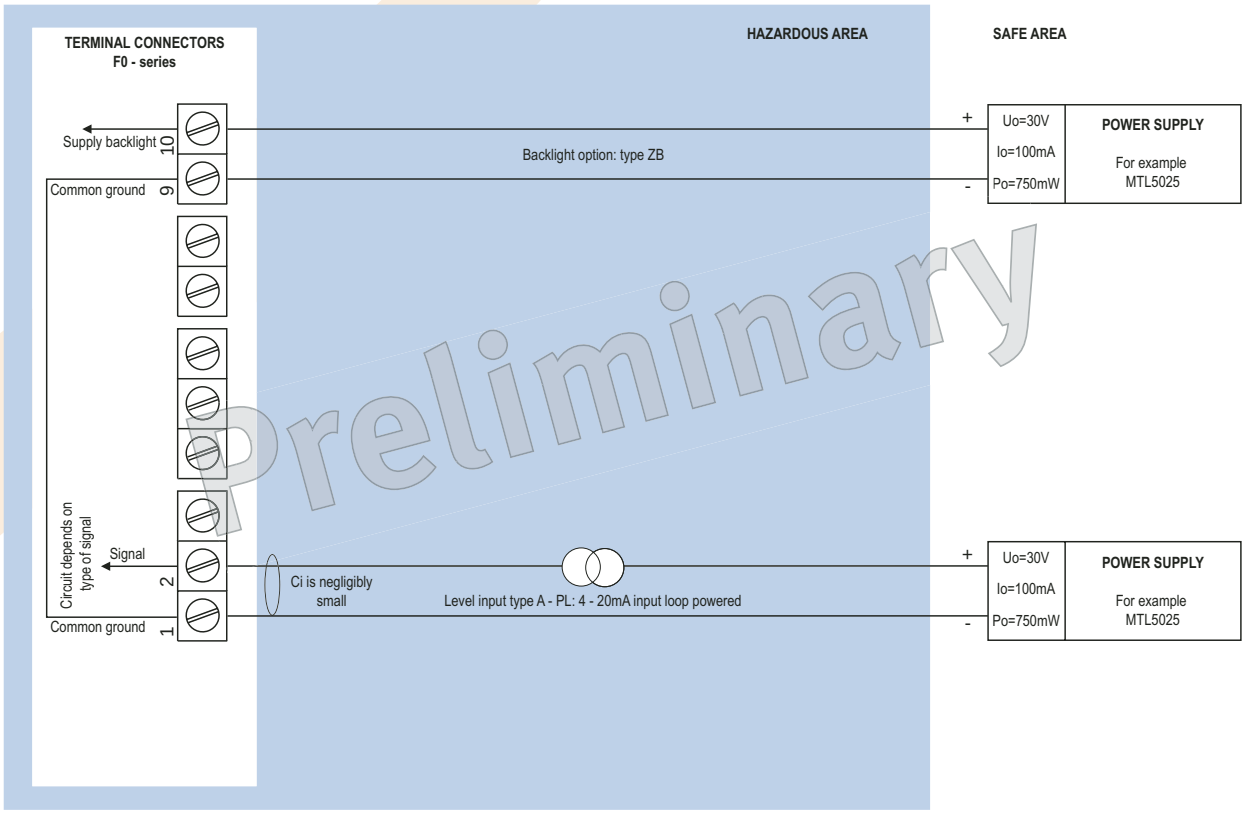
* Sensor supply voltage for analog flowmeter type A / U: Terminal 3: 3.2V DC.

Configuration example IIB and IIC - F070-A-PD-XI-ZB - power supply 16 - 30V DC



* Sensor supply voltage for analog flowmeter type A / U: Terminal 3: 3.2V DC.

Configuration example IIB and IIC - F070-A-PL-XI-ZB - input loop powered



* Sensor supply is not available: unit is input loop powered.

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 - off.
Option ZB	Transflective LCD with bi-color LED-backlight; green / amber. Intensitiy and color selected trough the keyboard. Good readings in full sunlight and darkness. Also available Intrinsically Safe.

Operating temperature	
Standard unit	-40°C to +80°C (-40°F to +178°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	12 - 28V DC ± 10%. Intrinsically Safe 16 - 30V DC.
Type PF	24V AC / DC ± 10%.
Type PL	Input loop powered from sensor signal 4 - 20mA (type "A").
Type PM	115 - 230V AC ± 10%.
Type PX	8 - 28V DC ± 10% (limited sensor supply voltage).
Note	PB, PF and PM are not available Intrinsically Safe.

Sensor excitation	
Type PB/PC/PX	3.2V DC.
Type PD	the sensor supply voltage will be according to power supply voltage (as connected to terminal 5).
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.

Casing

General	
Window	Polycarbonate window.
Sealing	EPDM and PE.
Control keys	Three industrial micro-switch keys. UV-resistant polyester keypad.

Aluminum field enclosures	
General	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.
Weight	950 gr.
Type HA	Cable entry: 2 x PG9 and 1 x M20 tapped hole in the centre.
Type HT	Cable entry: 1 x $^1/_2$" NPT tapped hole in the centre.
Type HU	Cable entry: 3 x $^1/_2$" NPT tapped hole.
Type HZ	Cable entry: none, user defined.

ABS wall mount enclosures	
General	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.
Weight	400 gr.
Type HD	Cable entry: none, user defined.
Type HF	Cable entry: 1x 22mm (0.866") hole in the centre.

Panel mount enclosures	
Type HB	Die-cast aluminum panel mount enclosure IP65 / NEMA 4.
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.

Hazardous area

Intrinsically safe	
ATEX / IECEx certification	Pending.
CSA C-US certification	Pending.
Ambient	-40°C to +70°C / -40° to +158°F.

Explosion proof	
ATEX certification	⟨Ex⟩ II 2G EEx d IIB T5.
Type XF	Dimensions of enclosure: 350 x 250 x 200mm (13.78" x 9.84" x 7.87") L x H x D.
Weight	16 Kg.

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

Signal input

Level sensor	
Type A	(o)4 - 20mA. Analog input signal can be scaled to any desired range within o - 20mA.
Type U	o - 10V DC. Analog input signal can be scaled to any desired range within o - 10V DC.
Accuracy	14 bit. Error < 0.05%. Low level cut-off programmable.
Span	0.000010 - 9,999,999 with variable decimal position.
Offset	0.000 - 9,999.999 units.
Update time	Four times per second.
Voltage drop	Type A: 2.6V@20mA.
Load impedance	Type U: 3kΩ.
Relationship	Linear and square root calculation.
Note	For signal type A and U: external power to sensor is required; e.g. type PD.

Operational

Operator functions	
Displayed functions	• Level and percentage.

Level	
Digits	7 digits.
Units	mL, L, m3, Gallons, KG, Ton, lb, bl, cf, RND, ft3, scf, Nm3, Nl, igal - no units.
Decimals	o - 1 - 2 or 3.

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

Ordering information

Example (standard configuration)

F070-A-HC-PX-XX-ZX.

Explanation standard configuration:

A: level input signal: analog; **HC:** ABS panel mount enclosure; **PX:** the unit is powered with 8 - 28V DC (basic power supply); **XX:** Safe area; **ZX:** no options.

ordering information:		F070 -_ -H _ -P _ -X _ -Z _
Level sensor input signal		
A	Ex	**(0)4 - 20mA input.**
U	Ex	0 - 10V DC input.
Enclosure		
HA	Ex	Aluminum field mount enclosure IP67 / NEMA 4X - two holes PG9 + one hole M20.
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.
HF	Ex	ABS wall mount enclosure IP67 / NEMA 4X - 1x hole 22mm.
HT	Ex	Aluminum field mount enclosure IP67 / NEMA 4X - one hole $^1/_2$"NPT.
HU	Ex	Aluminum field mount enclosure IP67 / NEMA 4X - three holes $^1/_2$"NPT.
HZ	Ex	Aluminum field mount enclosure IP67 / NEMA 4X - no holes.
Power supply		
PB		Lithium battery powered.
PC	Ex	Lithium battery powered - Intrinsically Safe.
PD	Ex	12 - 24V DC + sensor supply - with XI: 16 - 30V DC.
PF		24V AC / DC + sensor supply.
PL	Ex	Input loop powered from sensor signal type “A”.
PM		115 - 230V AC + sensor supply.
PX	Ex	**Basic power supply 8 - 28V DC (no real sensor supply).**
Hazardous area		
XI	Ex	Intrinsically safe.
XF	Ex	EExd enclosure - 3 keys.
XX		**Safe area only.**
Other options		
ZB	Ex	Backlight.
ZX	Ex	**No options.**

The bold marked text contains the standard configuration.

Ex Available Intrinsically Safe from november 2005.

Specifications are subject to change without notice.

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DUTCH COUNCIL FOR ACCREDITATION