

Multi Purpose Indicator

loop powered with very large digits



The F-Series is your first and safest choice for field mount indicators in safe and hazardous area applications. Especially in harsh weather conditions like rain, snow, salty atmospheres and temperatures between -40°C up to $+70^{\circ}\text{C}$ (-40°F up to 158°F).

Advantages

- Robust aluminum or stainless steel 316L field enclosure (IP67 / NEMA Type4X). It is so rugged, a truck can even stand on it!
- Intrinsically Safe available - ATEX, IECEx and CSA 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

- Universal loop powered indicator.
- Displays the actual value, measuring unit and loop current.
- Very large 26mm (1") digits.
- Piegraph indication: ten segments.
- Number of digits: 5 1/2.
- LED backlight option.
- Selectable on-screen engineering units: m, mL, L, nL, M3, nM3, mg, g, kg, ton, gal, sgal, igal, lb, bbl, cf, scf, p, rev, $^{\circ}\text{C}$, $^{\circ}\text{F}$, $^{\circ}\text{K}$, %, mm, cm, mtr, inch, ft, mmwk, mmwc, cmwk, cmwc, mwk, mwc, inwc, ftwc, mbar, bar, psi, pH, mV, /sec, /min, /hr, /day or no unit (others on request).
- Input signal: 4 - 20mA
- Loop powered.
- Auto backup of all settings.

Introduction

The F090 is a local indicator to display the actual process value, range and loop current. 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 Span, offset and number of decimals is done through software functions, without any sensitive dip-switches or trimmers. A wide selection of options further enhances the capabilities of this model, including Intrinsic Safety for hazardous area applications.

Hazardous areas

For hazardous area applications, this model is ATEX, IECEx and CSA certified as Intrinsically Safe for gas and dust applications, with an allowed ambient temperature of -40°C to +70°C (-40°F to +158°F).

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 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.

Backlight

For those applications where readability during day and night is an issue, a white backlight is available. The intensity can be adjusted from the keyboard. The display is a transfective type, which means that a high contrast reading is guaranteed in full sunlight as well as during the night. This backlight option is also available Intrinsically Safe.



Display

The display has 5 1/2 large 26mm (1") digits to show the main process information. At the bottom line, smaller 8mm (0.31") alfanumerical digits are available to display the measuring unit and additional messages in case of an alarm; range error e.g. With the piegraph, an actual range indication is offered in a single glance. If desired, additional information can be presented

after pressing the select key, like the actual loop current and the 0% and 100% process value. As the F090 has been designed for field mounted applications, a smart display update function has been incorporated to achieve a readable display even at -40°C (-40°F).



All info
at a glance



Easy
to install



Easy
to program



Know one
know them all!



Reliable



User-friendly

Overview application F090

The F-Series is your first and safest choice for field mount indicators in safe and hazardous area applications. Especially in harsh weather conditions like rain, snow, salty atmospheres and temperatures between -40°C up to +70°C (-40°F up to 158°F). The F090 takes operating energy from an input current (2-wire 4 - 20mA) and reduces installation cost. It accepts a wide range of process instruments, including flow (linear or square root), level, pressure and temperature transmitters. All these process parameters can be displayed in their own engineering units. The F090 is, like other F-Series, optional available with Intrinsic Safety for hazardous area applications. For DIN panel mount indicators, check our D-Series.



Signal input

The F090 accepts 4 - 20mA input signals only. The input signal type can be tuned and set by the user in the configuration menu without having to adjust any sensitive mechanical dip-switches, jumpers or trimmers.

Power requirements

The F090 is designed to be a loop powered indicator, which means it takes its operating energy from an input current (2-wire 4 - 20mA).



Robust, even a truck can stand on it!



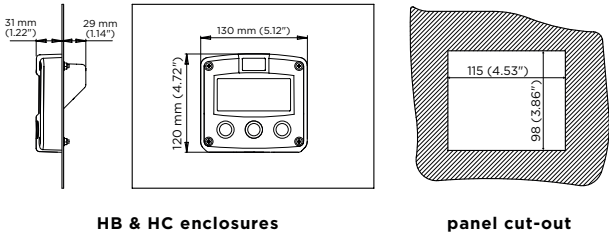
Resistant to harsh weather

Enclosures

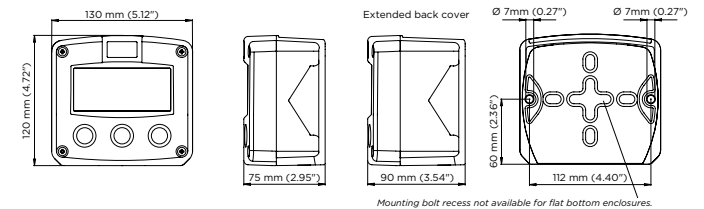
Various types of enclosures can be selected, all ATEX, IECEx and CSA approved. The F090 is supplied in an GRP panel mount enclosure as standard, which can be converted to an IP67 / NEMA Type4X GRP field mount enclosure by the addition of a back case. Most popular is our robust aluminum field mount enclosure which is also available with an extended backcover with undrilled preparation for direct meter mounting at the back side. It is so rugged, even a truck can stand on it! For the most challenging environments we have a durable high grade Stainless steel 316L enclosure. All enclosures have a IP67 / NEMA Type4X rating and EU or U.S. cable gland entry threads available.

Dimensions enclosures

Aluminum & GRP panel mount enclosure

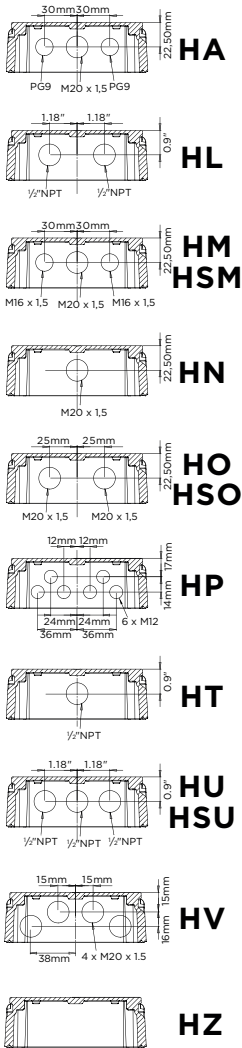


Aluminum, GRP & Stainless steel 316L field mount enclosures

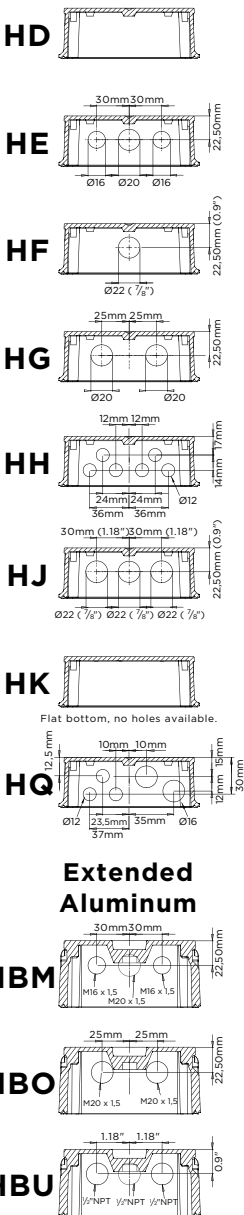


Cable entries

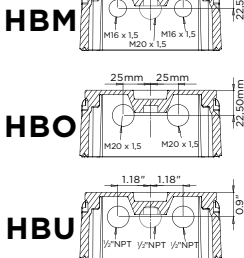
Aluminum / Stainless Steel



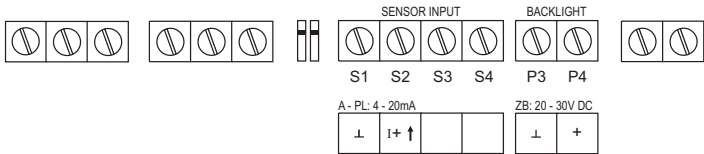
GRP



Extended Aluminum



Terminal connections
power requirement type PL



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



Display

Type	High intensity reflective numeric and alphanumeric LCD, UV-resistant.
Dimensions	90 x 40mm (3.5" x 1.6").
Digits	5 1/2 very large 26mm (1") digits. Various symbols and measuring units.
Option ZB	Transflective LCD with white LED-backlight. Intensity can be adjusted in the configuration menu. Good readings in full sunlight and darkness. Also available Intrinsically Safe.

Piegraph

Digits	10 segments.
Relation	To the min. and max. input signal (0 - 100%).

Hazardous area applications

The F090-XI has been certified according to ATEX and IECEx by DEKRA and according to CSA c-us and FM for use in Intrinsically Safe applications with an ambient temperature of -40°C to +70°C (-40°F to +158°F). For equipment category 1 D (EPL Da), -40°C to +50°C (-40°F to +122°F).

- The ATEX markings for gas and dust applications are:
 Gas: **II 1 G Ex ia IIC T4 Ga.**
 Dust: **II 1 D Ex ia IIIC T₂₀₀ 100 °C Da.**
- The IECEx markings for gas and dust applications are:
Gas: **Ex ia IIC T4 Ga**
Dust: **Ex ia IIIC T₂₀₀ 100 °C Da.**
- The CSA c-us markings are:
IS Class I/II/III, Division 1, Groups A to G T4.
Class 1 Zone 0 AEx ia IIC T4 Ga.
Ex ia IIC T4 Ga.

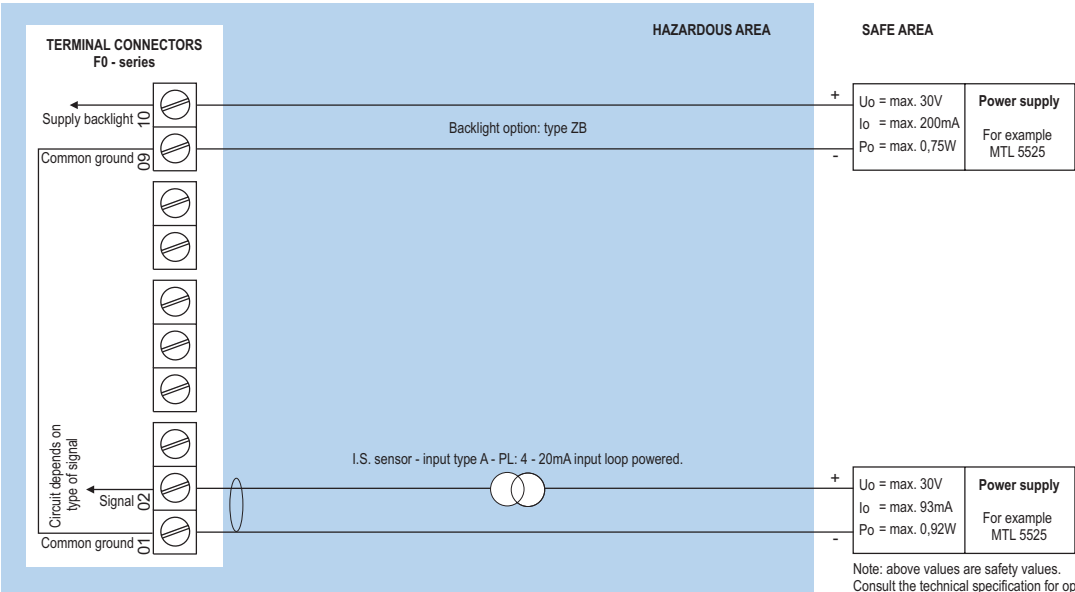
It is allowed to connect up to two I.S. power supplies to power the unit and backlight. Consult the certificate for the maximum input and output values of the circuits.

Note: Extended aluminum enclosures are not available with CSA c-us approval.

Certificate of conformity KEMA 05ATEX1168 X • IECEx KEM 08.0006X
• CSA.08.2059461



Configuration example IIA - IIB and IIC - F090-A-PL-XI-ZB - Input loop powered



Sensor supply is not available: unit is input loop powered (type PL).

Display

Type	High intensity reflective numeric and alphanumeric LCD, UV-resistant.
Dimensions	90 x 40mm (3.5" x 1.6").
Digits	5½ very large 26mm (1") digits. Various symbols and measuring units.
Piegraph	Ten segments - related to the input signal.
Refresh rate	User definable: fast, 1sec, 3sec, 15sec, 30sec, off.
Option ZB	Transflective LCD with white LED-backlight. Intensity can be adjusted in the configuration menu. Good readings in full sunlight and darkness. Also available Intrinsically Safe.

Ambient temperature

Safe areas	-40°C to +70°C (-40°F to +158°F).
EPL Ga / 1G	-40°C to +70°C (-40°F to +158°F).
EPL Da / 1D	-40°C to +50°C (-40°F to +122°F). max. dust layer thickness: 200mm.
EPL Db / 2D	-40°C to +70°C (-40°F to +158°F). max. dust layer thickness: 5mm.

Power requirements

Type PL	Input loop powered from sensor signal 4 - 20mA
Type ZB	For backlight 20 - 30V DC. Power consumption max. 1 Watt.
Note XI	For Intrinsically Safe applications, consult the safety values in the certificate.

Terminal connections

Type	Removable plug-in terminal strip. Wire max. 1.5mm²
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Data protection

Type	EEPROM backup of all settings. Data retention at least 10 years.
Password	Configuration settings can be password protected.

Directives & Standards

EMC	Directive 2014/30/EU, FCC 47 CFR part 15.
Low voltage	Directive 2014/35/EU
RoHS	Directive 2011/65/EU
ATEX / IECEx	Directive 2014/34/EU, IEC 600079-0, IEC 60079-11.
CSA	CSA 22.2 No. 157-92.

Intrinsically Safe (Type XI)

ATEX	Gas: II 1 G Ex ia IIC T4 Ga. Dust: II 1 D Ex ia IIIC T ₂₀₀ 100 °C Da.
IECEx	Gas: Ex ia IIC T4 Ga. Dust: Ex ia IIIC T ₂₀₀ 100 °C Da.
CSA c-us	IS Class I/II/III, Division 1, Groups A to G T4. Class 1 Zone 0 AEx ia IIC T4 Ga. Ex ia IIC T4 Ga
Note	Extended aluminum enclosures are not available with CSAC-us and FM approvals.
CSA c-us	

Signal inputs - Sensor

Type A	4 - 20mA. Analog input signal can be scaled to any desired range within 4 - 20mA.
Accuracy	Resolution: 16 bit. Error < 0.01mA / ± 0.05% FS. Low level cut-off programmable.
Span	0.00001 - 199,999 with variable decimal position.
Offset	-99,999 / +199,999 units.
Update time	Four times per second.
Voltage drop	Max. 2.6V DC @ 20mA.
Relationship	Linear and square root calculation.

Operator functions

Displayed info	• Top line: main display value. • Bottom line: measuring unit and messages. • Piegraph: 10 segments related to input signal. • Actual sensor input value in mA. • Displayed value at 0% of the input signal. • Displayed value at 100% of the input signal.
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Displayed information

Digits	5½ digits. (height 26mm / 1").
Units	m - mL - L - nL - M³ - nM³ - mg - g - kg - ton - gal - sgal - ical - lb - bbl - cf - scf - p - rev - °C - °F - °K - % - mm - cm - mtr - inch - ft - mmwk - mmwc - cmwk - cmwc - mwk - mwc - inwc - ftwc - mbar - bar - psi - pH - mV - no unit.
Time units	/sec - /min - /hr - /day - no unit.
Decimals	0 - 1 - 2 - 3 - 4 or 5.

Enclosure

Window	Polycarbonate window.
Sealing	Silicone.
Control keys	Three industrial micro-switch keys. UV-resistant silicone keypad.

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 Type4X.
Weight	600 gr.
Type HC	GRP panel mount enclosure IP65 / NEMA Type4X, UV-resistant and flame retardant.
Weight	450 gr.
Type HSB	Die-cast stainless steel 316L IP67/NEMA Type4X.
Weight	1150gr.

Aluminum wall / field mount enclosures

General	Die-cast aluminum wall/field mount enclosure IP67 / NEMA Type4X with 2-component UV-resistant coating. Extended back cover available with undrilled preparation for direct meter mounting.
Dimensions	130 x 120 x 75mm (5.12" x 4.72" x 2.95") - W x H x D. 130 x 120 x 90mm (5.12" x 4.72" x 3.54") - W x H x D.
Weight	1100 gr. / extended enclosure: 1310 gr.
Type HA	Cable entry: 2 x PG9 and 1 x M20.
Type HL	Cable entry: 2 x 1/2" NPT.
Type HM/HBM	Cable entry: 2 x M16 and 1 x M20.
Type HN	Cable entry: 1 x M20.
Type HO/HBO	Cable entry: 2 x M20.
Type HP	Cable entry: 6 x M12.
Type HT	Cable entry: 1 x 1/2" NPT.
Type HU/HBU	Cable entry: 3 x 1/2" NPT.
Type HV	Cable entry: 4 x M20.
Type HZ	Cable entry: no holes.
Note	Extended aluminum enclosures are not available with CSA c-us/FM approvals.

GRP wall / field mount enclosures

General	GRP wall/field mount enclosure IP67 / NEMA Type4X, 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.
Type HQ	Cable entry: 2 x Ø 16mm & 3 x Ø 12mm.

Stainless steel 316L wall / field mount enclosures

General	Die-cast stainless steel 316L wall / field mount enclosure with flat bottom. IP67 / NEMA Type4X.
Dimensions	130 x 120 x 75mm (5.12" x 4.72" x 2.95") - W x H x D.
Weight	2700 gr.
Type HSM	Cable entry: 2 x M16 + 1 x M20.
Type HSO	Cable entry: 2 x M20.
Type HSU	Cable entry: 3 x 1/2" NPT.

Description		
Model	F090	Multi Purpose Indicator loop powered with very large digits.
Input	A	4 - 20mA input.
Enclosures	HB	Aluminum panel mount enclosure.
	HC	GRP panel mount enclosure.
	HSB	Stainless steel 316L panel mount enclosure.
	HD	GRP field mount - Cable entry: no holes.
	HE	GRP field mount - Cable entry: 2 x Ø 16mm & 1 x Ø 20mm.
	HF	GRP field mount - Cable entry: 1 x Ø 22mm ($\frac{7}{8}$ ").
	HG	GRP field mount - Cable entry: 2 x Ø 20mm.
	HH	GRP field mount - Cable entry: 6 x Ø 12mm.
	HJ	GRP field mount - Cable entry: 3 x Ø 22mm ($\frac{7}{8}$ ").
	HK	GRP field mount, flat bottom - Cable entry: no holes.
	HQ	GRP field mount - Cable entry: 2 x Ø 16mm & 3 x Ø 12mm.
	HA	Aluminum field mount - Cable entry: 2 x PG9 + 1 x M20.
	HL	Aluminum field mount - Cable entry: 2 x $\frac{1}{2}$ "NPT.
	HM	Aluminum field mount - Cable entry: 2 x M16 + 1 x M20.
	HN	Aluminum field mount - Cable entry: 1 x M20.
	HO	Aluminum field mount - Cable entry: 2 x M20.
	HP	Aluminum field mount - Cable entry: 6 x M12.
	HT	Aluminum field mount - Cable entry: 1 x $\frac{1}{2}$ "NPT.
	HU	Aluminum field mount - Cable entry: 3 x $\frac{1}{2}$ "NPT.
	HV	Aluminum field mount - Cable entry: 4 x M20.
	HZ	Aluminum field mount - Cable entry: no holes
	HBM	Extended Alu. field/meter mount - Cable entry: 2 x M16 + 1 x M20 (not with CSAc-us approval).
	HBO	Extended Alu. field/meter mount - Cable entry: 2 x M20 (not with CSAc-us approval).
	HBU	Extended Alu. field/meter mount - Cable entry: 3 x $\frac{1}{2}$ "NPT (not with CSAc-us approval).
	HSM	Stainless steel 316L field mount - Cable entry: 2 x M16 + 1 x M20.
	HSO	Stainless steel 316L field mount - Cable entry: 2 x M20.
	HSU	Stainless steel 316L field mount - Cable entry: 3 x $\frac{1}{2}$ "NPT.
Power	PL	Input loop powered from sensor signal type "A".
Hazardous	XI	Intrinsically safe, according ATEX, IECEx and CSA c-us.
	XX	Safe area only, according CE / UKCA.
Options	ZB	Backlight.
	ZX	No options.

The **bold** marked text contains the standard configuration: F090-A-HC-PL-XX-ZX.