

Your success counts

## Multi Purpose Indicator

loop powered with very large digits



Application examples: Salty Off-Shore conditions



Extreme cold weather at polar regions



Hot and sandy deserts

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  $-40^{\circ}\text{C}$  up to  $+80^{\circ}\text{C}$  ( $-40^{\circ}\text{F}$  up to  $176^{\circ}\text{F}$ ).

### 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, FM 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:  $5\frac{1}{2}$ .
- LED backlight option.
- Selectable on-screen engineering units: %, PPM, meter, m, cm, mm, ft, sqft, ML, L, NL,  $\text{M}^3$ ,  $\text{nM}^3$ , GAL, USGAL, IGAL, bbl, CUFT, mg, g, kg, ton, lb, psi, psig, mbar, bar, barg,  $^{\circ}\text{C}$ ,  $^{\circ}\text{F}$ , K, P, Rev, K, KPA, 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, FM 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 alphanumeric 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") alphanumeric 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 +80°C (-40°F up to 176°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!



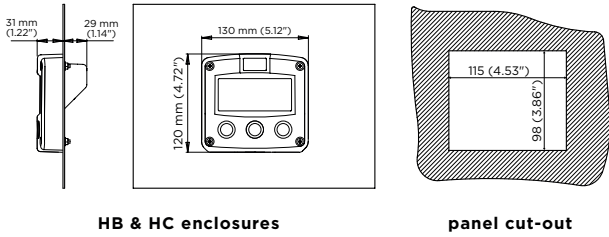
Resistant to harsh weather

## Enclosures

Various types of enclosures can be selected, all ATEX and IECEx 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

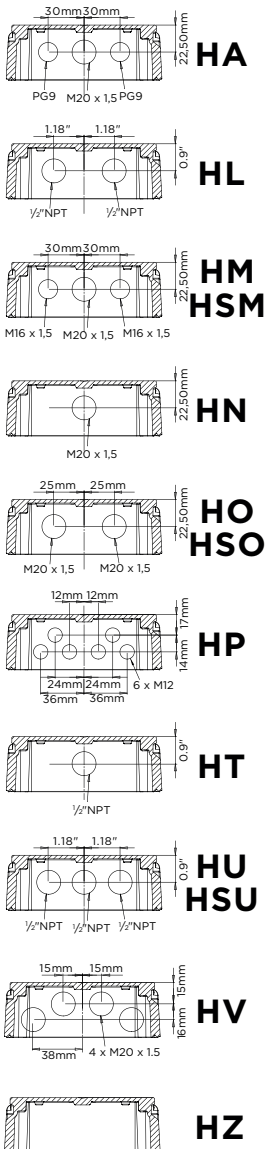


HB & HC enclosures

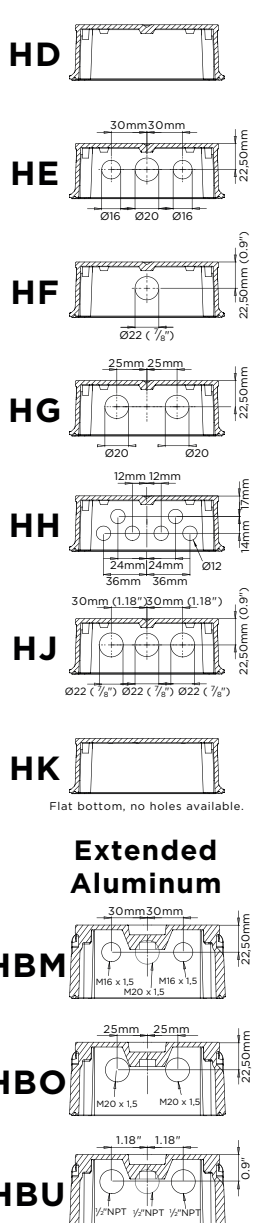
panel cut-out

Cable entries

### Aluminum / Stainless Steel

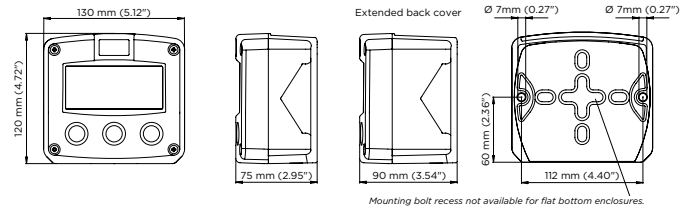


### GRP

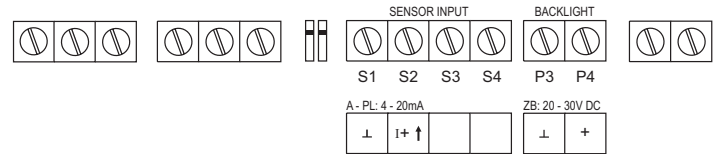


### Extended Aluminum

Aluminum, GRP & Stainless steel 316L field mount enclosures



## 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%).

### Ambient temperature

Safe areas	-40°C to +80°C (-40°F to +176°F).
Intrinsically Safe	-40°C to +70°C (-40°F to +158°F).

## 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 T<sub>200</sub> 100 °C Da.**

- The IECEx markings for gas and dust applications are:

Gas: **Ex ia IIC T4 Ga**

Dust: **Ex ia IIIC T<sub>200</sub> 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.**

- The FM markings are:

**IS, Class I, II, III, Division 1, Groups A to G T4.**

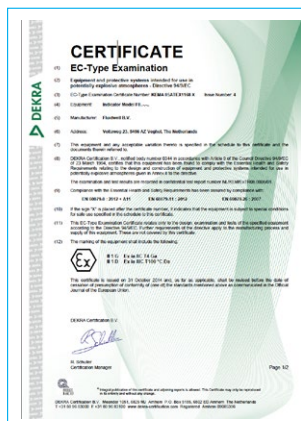
**Class I, Zone 0, AEx ia IIC T4**

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.

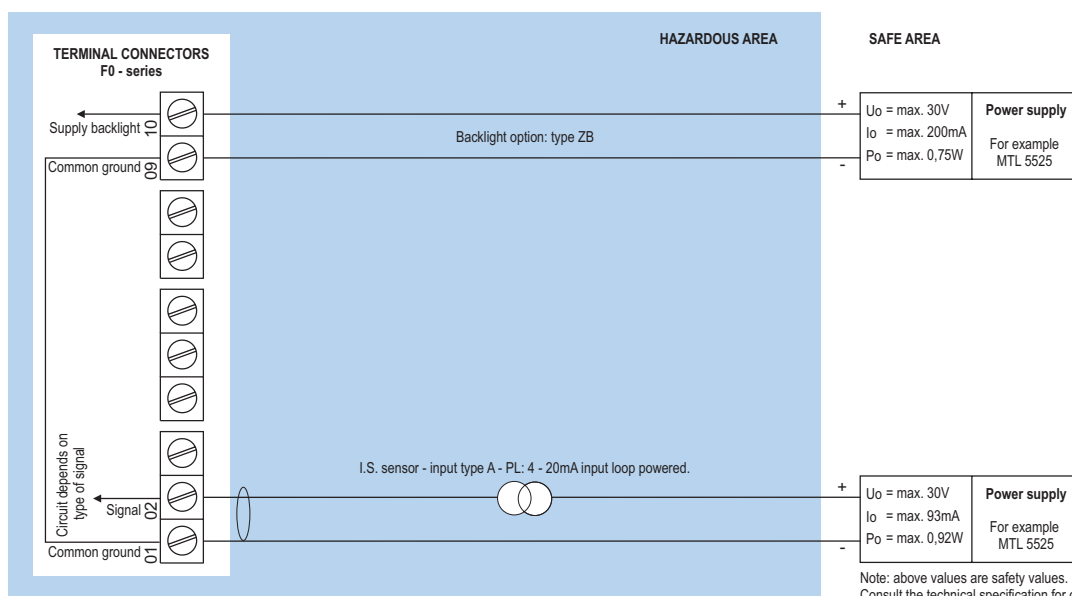
Note: Extended aluminum enclosures are not available with CSA c-us and FM approvals.

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

<b>Type</b>	High intensity reflective numeric and alphanumeric LCD, UV-resistant.
<b>Dimensions</b>	90 x 40mm (3.5" x 1.6").
<b>Digits</b>	5½ very large 26mm (1") digits. Various symbols and measuring units.
<b>Piegraph</b>	Ten segments - related to the input signal.
<b>Refresh rate</b>	User definable: fast, 1sec, 3sec, 15sec, 30sec, off.
<b>Option ZB</b>	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

<b>Safe areas</b>	-40°C to +80°C (-40°F to +176°F).
<b>EPL Ga / 1G</b>	-40°C to +70°C (-40°F to +158°F).
<b>EPL Da / 1D</b>	-40°C to +50°C (-40°F to +122°F). max. dust layer thickness: 200mm.
<b>EPL Db / 2D</b>	-40°C to +70°C (-40°F to +158°F). max. dust layer thickness: 5mm.

## Power requirements

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

## Terminal connections

<b>Type</b>	Removable plug-in terminal strip. Wire max. 1.5mm <sup>2</sup>
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## Data protection

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

## Directives & Standards

<b>EMC</b>	Directive 2014/30/EU, FCC 47 CFR part 15.
<b>Low voltage</b>	Directive 2014/35/EU
<b>RoHS</b>	Directive 2011/65/EU
<b>ATEX / IECEx</b>	Directive 2014/34/EU, IEC 600079-0, IEC 60079-11.
<b>FM</b>	FM Class No. 3600, FM Class No. 3610.
<b>CSA</b>	CSA 22.2 No. 157-92.

## Intrinsically Safe (Type XI)

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

## Signal inputs - Sensor

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

## Operator functions

<b>Displayed info</b>	<ul style="list-style-type: none"> <li>• Top line: main display value.</li> <li>• Bottom line: measuring unit and messages.</li> <li>• Piegraph: 10 segments related to input signal.</li> <li>• Actual sensor input value in mA.</li> <li>• Displayed value at 0% of the input signal.</li> <li>• Displayed value at 100% of the input signal.</li> </ul>
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## Displayed information

<b>Digits</b>	5½ digits. (height 26mm / 1").
<b>Units</b>	m - mL - L - nL - M <sup>3</sup> - nM <sup>3</sup> - mg - g - kg - ton - gal - sgal - igal - 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.
<b>Time units</b>	/sec - /min - /hr - /day - no unit.
<b>Decimals</b>	0 - 1 - 2 - 3 - 4 or 5.

## Enclosure

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

## Panel mount enclosures

<b>Dimensions</b>	130 x 120 x 60mm (5.12" x 4.72" x 2.36") - W x H x D.
<b>Panel cut-out</b>	115 x 98mm (4.53" x 3.86") L x H.
<b>Type HB</b>	Die-cast aluminum panel mount enclosure IP65 / NEMA Type4X.
<b>Weight</b>	600 gr.
<b>Type HC</b>	GRP panel mount enclosure IP65 / NEMA Type4X, UV-resistant and flame retardant.
<b>Weight</b>	450 gr.
<b>Type HSB</b>	Die-cast stainless steel 316L IP67/NEMA Type4X.
<b>Weight</b>	1150gr.

## Aluminum wall / field mount enclosures

<b>General</b>	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.
<b>Dimensions</b>	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.
<b>Weight</b>	1100 gr. / extended enclosure: 1310 gr.
<b>Type HA</b>	Cable entry: 2 x PG9 and 1 x M20.
<b>Type HL</b>	Cable entry: 2 x 1/2" NPT.
<b>Type HM/HBM</b>	Cable entry: 2 x M16 and 1 x M20.
<b>Type HN</b>	Cable entry: 1 x M20.
<b>Type HO/HBO</b>	Cable entry: 2 x M20.
<b>Type HP</b>	Cable entry: 6 x M12.
<b>Type HT</b>	Cable entry: 1 x 1/2" NPT.
<b>Type HU/HBU</b>	Cable entry: 3 x 1/2" NPT.
<b>Type HV</b>	Cable entry: 4 x M20.
<b>Type HZ</b>	Cable entry: no holes.
<b>Note</b>	Extended aluminum enclosures are not available with CSA c-us/FM approvals.

## GRP wall / field mount enclosures

<b>General</b>	GRP wall/field mount enclosure IP67 / NEMA Type4X, UV-resistant and flame retardant.
<b>Dimensions</b>	130 x 120 x 75mm (5.12" x 4.72" x 2.95") - W x H x D.
<b>Weight</b>	600 gr.
<b>Type HD</b>	Cable entry: no holes.
<b>Type HE</b>	Cable entry: 2 x Ø 16mm and 1 x Ø 20mm.
<b>Type HF</b>	Cable entry: 1 x Ø 22mm (7/8").
<b>Type HG</b>	Cable entry: 2 x Ø 20mm.
<b>Type HH</b>	Cable entry: 6 x Ø 12mm.
<b>Type HJ</b>	Cable entry: 3 x Ø 22mm (7/8").
<b>Type HK</b>	Flat bottom, cable entry: no holes.

## Stainless steel 316L wall / field mount enclosures

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

		Description
Model	<b>F090</b>	<b>Multi Purpose Indicator loop powered with very large digits.</b>
Input	<b>A</b>	<b>4 - 20mA input.</b>
Enclosures	HB	Aluminum panel mount enclosure.
	<b>HC</b>	<b>GRP panel mount enclosure.</b>
	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.
	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 / FM approvals).
	HBO	Extended Alu. field/meter mount - Cable entry: 2 x M20 (not with CSAc-us / FM approvals).
	HBU	Extended Alu. field/meter mount - Cable entry: 3 x $\frac{1}{2}$ "NPT (not with CSAc-us / FM approvals).
	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	<b>PL</b>	<b>Input loop powered from sensor signal type "A".</b>
Hazardous	XI	Intrinsically safe, according ATEX, IECEx, CSA c-us and FM.
	<b>XX</b>	<b>Safe area only, according CE / UKCA.</b>
Options	ZB	Backlight.
	<b>ZX</b>	<b>No options.</b>

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