GENERAL PURPOSE INDICATOR

LOOP POWERED WITH VERY LARGE DIGITS

FLUIDWELL
Accurate Liquid Management

Features

- Universal loop powered indicator.
- Very large 26mm (1") high digits.
- Displays the actual value, measuring unit and loop current.
- Selectable on-screen engineering units: %, PPM, meter, m, cm, mm, ft, sqft, ML, L, NL, M^3, nM^3, GAL, USGAL, IGAL, bbl, CUFT, mg, g, kg, ton, lb, psi, psig, mbar, bar, barg, °C, °F, K, P, RPM, K, KPA, pH, mV, /sec, /min, /hr, /day or no unit (others on request).
- Piegraph indication: ten segments.
- Number of digits: 5½.
- Green/amber LED backlight with adjustable intensity.
- Operational temperature -40°C to +80°C (-40°F to 178°F).
- Environmental protection to IP67 (NEMA4X).
- Intrinsically Safe - ATEX, IECEx and CSA approval for gas and dust applications.

Signal input

- 4 - 20mA.

Power supply

- Loop powered.

Applications

- 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.

General information

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 enhance this models capabilities, including Intrinsic Safety for hazardous area applications.

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).

Backlight

For those applications where readabillity during day and night might is an issue, a bi-color back-light is available. The background color can be set to 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 backlight 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 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 F090 does accept 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 supply

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).
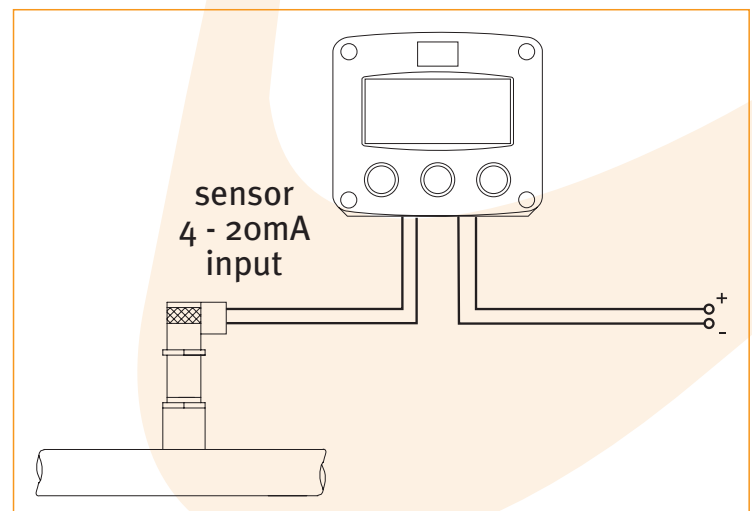
Hazardous area

For hazardous area applications, this model has been ATEX, IECEx and CSA certified Intrinsically Safe for gas and dust applications, with an allowed operational temperature of -40°C to +70°C (-40°F to +158°F). FM certification is expected to be available in 2009.
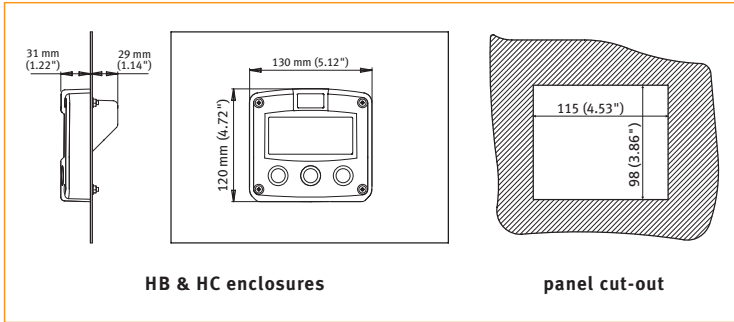
Enclosures

Various types of enclosures can be selected, all ATEX, IECEx and CSA approved. As standard the F090 is supplied in a ruggered 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 aluminum field mount enclosure with IP67 / NEMA 4X rating. Both European or U.S. cable gland entry threads are available.
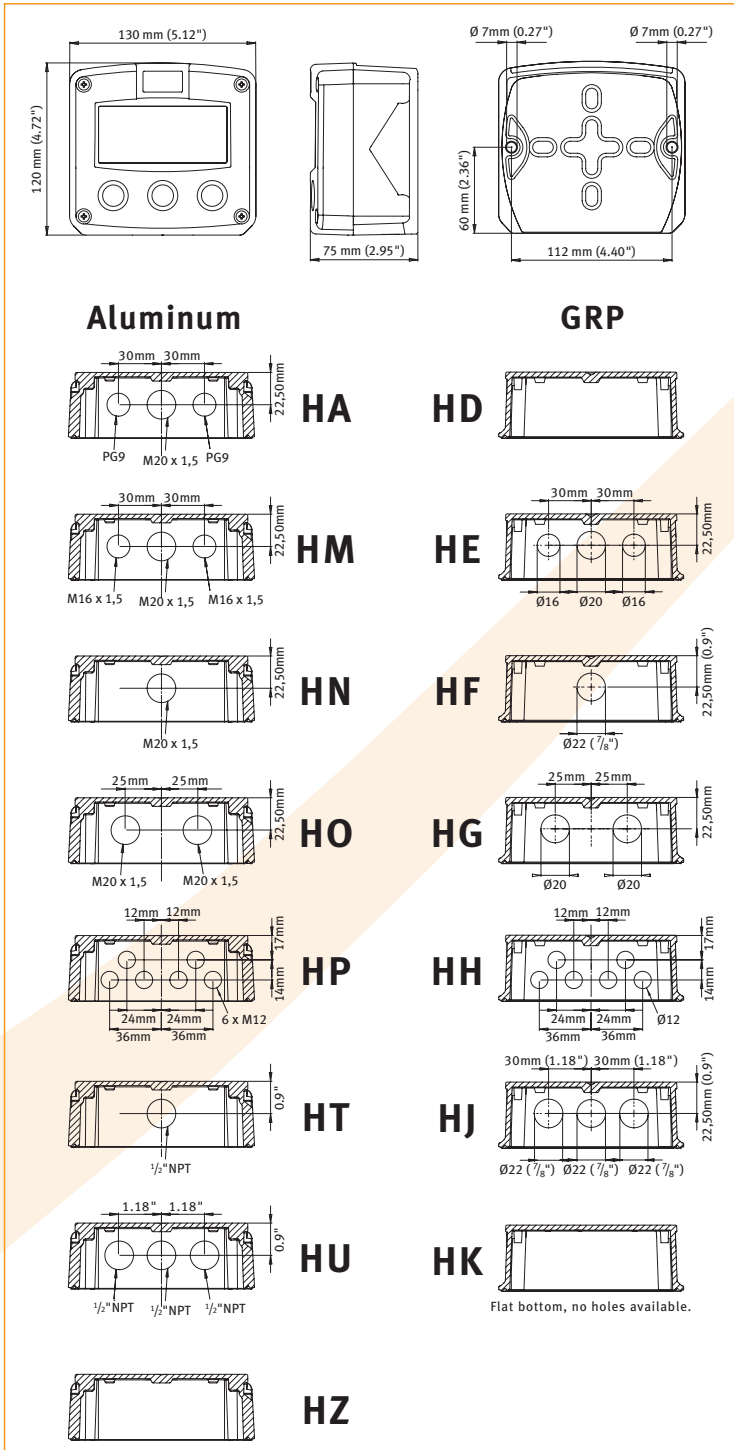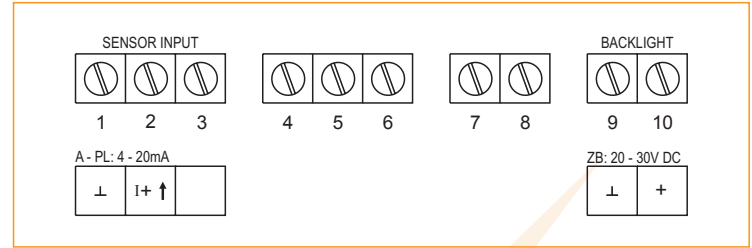
Overview application F090

sensor
4 - 20mA
input

Dimensions enclosures
Aluminum & GRP panel mount enclosure

31 mm (1.22") 29 mm (1.14") 130 mm (5.12") 120 mm (4.72") 115 (4.53") 98 (3.86")

HB & HC enclosures   **panel cut-out**

Aluminum & GRP field / wall mount enclosures

130 mm (5.12") 120 mm (4.72") 75 mm (2.95") Ø 7mm (0.27") Ø 7mm (0.27") 60 mm (2.36") 112 mm (4.40")

Aluminum   **GRP**

30mm 30mm 22,50mm **HA** PG9 M20 x 1,5 PG9   **HD**

30mm 30mm 22,50mm **HM** M16 x 1,5 M20 x 1,5 M16 x 1,5   30mm 30mm 22,50mm **HE** Ø16 Ø20 Ø16

22,50mm **HN** M20 x 1,5   22,50mm (0.9") **HF** Ø22 (⅞")

25mm 25mm 22,50mm **HO** M20 x 1,5 M20 x 1,5   25mm 25mm 22,50mm **HG** Ø20 Ø20

12mm 12mm 17mm 14mm **HP** 24mm 24mm 36mm 36mm 6 x M12   12mm 12mm 17mm 14mm **HH** 24mm 24mm 36mm 36mm Ø12

0.9" **HT** ½"NPT   30mm (1.18") 30mm (1.18") 22,50mm (0.9") **HJ** Ø22 (⅞") Ø22 (⅞") Ø22 (⅞")

1.18" 1.18" 0.9" **HU** ½"NPT ½"NPT ½"NPT   **HK** Flat bottom, no holes available.

HZ

Terminal connections
power supply type PL

SENSOR INPUT 1 2 3   4 5 6   7 8   BACKLIGHT 9 10

A - PL: 4 - 20mA   ⊥ I+ ↑   ZB: 20 - 30V DC   ⊥ +

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

1683.92
RUN
GAL/dAY

Accessories

Mounting accessories	
ACF02	Stainless steel wall mounting kit.
ACF05	Stainless steel pipe mounting kit (worm gear clamps not included).
ACF06	Two stainless steel worm gear clamps Ø 44 - 56mm.
ACF07	Two stainless steel worm gear clamps Ø 58 - 75mm.
ACF08	Two stainless steel worm gear clamps Ø 77 - 95mm.
ACF09	Two stainless steel worm gear clamps Ø 106 - 138mm.
ACF10	Customized Grevopal tagplates for ACF02 and ACF05, 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.

FLUIDWELL
Accurate Liquid Management

Hazardous area applications

The F090-XI has been certified according ATEX and IECEx by KEMA and according CSA c-us 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:

  II 1 G Ex ia IIC T4
  II 1 D Ex iaD 20 IP 65/67 T 100 °C.

- The IECEx markings for gas and dust applications are: **Ga Ex ia IIC T4** and **Ex iaD 20 IP 65/67 T100 °C**.

- The CSA c-us markings are: **Class I/II/III, Division 1, Groups A, B, C, D, E, F, G, Temperature class T4** and **Class I, Zone 0, AEx ia IIC T4**.

- FM approval is expected to become available in 2009.

It is allowed to connect up to two I.S. power supplies to power the unit and backlight. Please contact your supplier for details.

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

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

TERMINAL CONNECTORS F0 - series

HAZARDOUS AREA | **SAFE AREA**

Supply backlight 10
Common ground 9

Backlight option: type ZB

+
Uo = max. 30V
Io = max. 200mA
Po = max. 0,75W
−

Power supply
For example
MTL5025

I.S. sensor - input type A - PL: 4 - 20mA input loop powered.

Circuit depends on type of signal

Signal 2
Common ground 1

+
Uo = max. 30V
Io = max. 93mA
Po = max. 0,92W
−

Power supply
For example
MTL5025

Note: above values are safety values.
Consult the technical specification for operational values.

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

Technical specification
General

Display

Type	High intensity reflective numeric and alphanumeric LCD, UV-resistant.
Dimensions	90 x 40mm (3.5" x 1.6").
Digits	5$\frac{1}{2}$ very large 26mm (1") and eleven 8mm (0.31") digits. Various symbols and measuring units.
Piegraph	10 segment range indication in relation to its measuring range 0 - 100%
Option ZB	Transflective LCD with bi-color LED-backlight; green / amber. Intensitiy and color selected trough the keyboard.

Piegraph

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

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

Terminal connections

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

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 certification		II 1 G Ex ia IIC T4. II 1 D Ex iaD 20 IP 65 / 67 T 100 °C.
IECEx certification		Ga Ex ia IIC T4. Ex iaD 20 IP 65 / 67 T 100 °C.
CSA c-us certification		Intrinsically Safe for Class I/II/III, Div. 1, Groups A, B, C, D, E, F, G, Temp. class T4 and Class I, Zone 0, AEx ia IIC T4.
Ambient		-40°C to +70°C / -40° to +158°F.

Environment

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

Signal input

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.

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 $\frac{1}{2}$" NPT.
Type HU	Cable entry: 3 x $\frac{1}{2}$" NPT.
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 Ø 16mm and 1 x Ø 20mm.
Type HF	Cable entry: 1 x Ø 22mm ($\frac{7}{8}$").
Type HG	Cable entry: 2 x Ø 20mm.
Type HH	Cable entry: 6 x Ø 12mm.
Type HJ	Cable entry: 3 x Ø 22mm ($\frac{7}{8}$").
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 4.
Weight	600 gr.
Type HC	GRP panel mount enclosure IP65 / NEMA 4, 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.

Operational

Operator functions

Displayed functions	• 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.

Total

Digits	5$\frac{1}{2}$ digits (height 26mm / 1").
Units	m - mL - L - nL - M³ - nM³ - 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.
Time units	/sec - /min - /hr - /day - no unit.
Decimals	0 - 1 - 2 - 3 - 4 or 5.

FLUIDWELL
Accurate Liquid Management

Ordering information

Standard configuration: F090-A-HC-PL-XX-ZX.

ordering information:			F090	-A	-H _	-PL	-X _	-Z _
Sensor input signal								
A	⬡	4 - 20mA input.						
Panel mount enclosures - IP65 / NEMA4								
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.						
HZ	⬡	Cable entry: no holes.						
ABS field / wall mount enclosures								
HS	⬡	Silicone free ABS field enclosure IP65 – Cable entry: no holes (old HD enclosure).						
Power supply								
PL	⬡	**Input loop powered from sensor signal 4 - 20mA (type A).**						
Hazardous area								
XI	⬡	Intrinsically Safe.						
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.

FLUIDWELL
Accurate Liquid Management

ISO 9001:2000
KEMA
DUTCH COUNCIL
FOR ACCREDITATION