GENERAL PURPOSE INDICATOR
LOOP POWERED WITH VERY LARGE DIGITS

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, M³, nM³, 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 Intrinsically Safety for hazardous area applications.

Display
The display has 5½ 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 readabiility during day and night might is an issue, a bi-color backlight 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**

- **HB & HC Enclosures**
- **Panel Cut-Out**

## Aluminum & GRP Field / Wall Mount Enclosures

## Terminal Connections

**Power Supply Type PL**

- **Sensor Input**
  - 1: PL 4 - 20mA
  - 2: 9 - 10
  - **Output:** 20 - 30V DC

- **Backlight**
  - **Display Example:** 90 x 40mm (3.5" x 1.6")

## Display Example - 90 x 40mm (3.5" x 1.6")

### Display - 90 x 40mm

- **Example:** 1683.92

## 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 HH enclosure, includes locknuts and O-rings.
- **ACF28** For HG 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.
- **ACF36** For HH 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 HH enclosure, includes locknuts and O-rings.
- **ACF58** For HG 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.
Hazardous area applications
The F090-XI has been certified according to ATEX and IECEx by KEMA and according to 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.

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).
Technical specification

General
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”) 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 Transreflective LCD with bi-color LED-backlight; green / amber. Intensitiy and color selected through 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
ATEX certification II 1 G Ex ia IIC T4.
II 1 D Ex ia2 20 IP 65 / 67 T 100 °C.
IECEx certification Ga Ex ia IIC T4.
Ex ia2 20 IP 65 / 67 T 100 °C.
CSA c-us certification SC-IA IA T4.
Intrinsically Safe for Class I/II/III, Div. 1, Groups A, B, C, D, E, F, G, Temp. class T4 and Zone 0, AEx ia IIC T4.
Ambient -40°C to +70°C / -40°F to +158°F.

Environment

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 / +99,999 units.
Update time Four times per second.
Voltage drop Max. 2.6V DC @ 20mA.
Relationship Linear and square root calculation.

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

Aluminum / field mount enclosures
General Die-cast aluminum wall/fiel 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 PG69 and 1 x M20.
Type HM Cable entry: 2 x M16 and 1 x M20.
TypeHN 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 HZ Cable entry: no holes.

GRP wall / field mount enclosures
General GRP wall/fiel 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 (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.

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-resistant 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.

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 5½, digits (height 26mm / “) Units m - mL - L - nL - M 3 - nM3 - mg - g - kg - ton - gal - sgal - 1gal - lb - bbl - cf - scf - p - rev - °C - °F - °K - % - mm - cm - mtr - inch - ft - mmmk - mmwc - cmwc - mwc - mmwk - mwc - cmwk - cmwc - mbar - bar - psi - pH - mV - no unit.
Decimals 0 - 1 - 2 - 3 - 4 or 5.
### Ordering information

**Standard configuration:** Fogo-A-HC-PL-XX-ZX.

|-----------------------|------|----|----|-----|----|----|

**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.