

# SERIES IEF | INSERTION ELECTROMAGNETIC FLOW TRANSMITTER



## FEATURES/BENEFITS

- Field configurable, integral or remote displays allow for ultimate flexibility by accommodating a variety of applications through multiple display configurations
- High performance accuracy is maintained through changes in temperature, density, and viscosity
- Setup Wizard and installation tool are simple to use allowing for quick and precise installation
- Accessory setup kit A-IEF-KIT ensures exact installation application depth with included thickness gage and measuring tape
- Long life cycle and minimal maintenance requirements with no moving parts to wear or break and electrodes that discourage fouling
- Isolation valve accessory options allow for installation in operational systems via hot-tap kit or easy removal without system downtime
- NIST calibration certificate included standard for Carbon Steel Schedule 40 pipes sized 4" (102 mm), 6" (150 mm), 8" (200 mm), and 10" (250 mm) with high accuracy option



Shown with A-IEF-VLV-BR accessory valve

## APPLICATIONS

- |  |                            |
|--|----------------------------|
| • Boiler feed water                    | • Ground water remediation |
| • Chilled water                        | • Chemical processing      |
| • Open and closed loop condenser water | • Pump protection          |
| • Irrigation system                    | • Wastewater               |
| • Municipal water distribution         | • Mining                   |
| • Process and coolant flow             |                            |

## DESCRIPTION

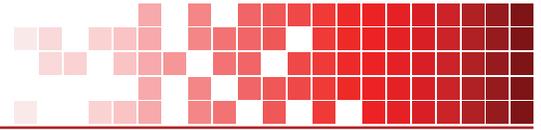
The Series IEF Insertion Electromagnetic Flow Transmitter is an adjustable insertion flowmeter featuring electromagnetic technology that accurately and reliably measures fluid velocity in addition to providing several continuous signal outputs. This series is specifically designed to offer superior performance paired with simple installation and use. One unit is adjustable to fit pipe sizes from 4 to 36" (102 to 914 mm), and offers several output options including selectable BACnet MS/TP or Modbus® RTU communications protocol over 2-wire RS-485 in addition to the standard analog, frequency and alarm outputs.



-LCD option shown

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### SPECIFICATIONS

|  |   |
|--|---|
| <b>Service</b>   | Compatible clean or dirty non coating, conductive liquids.  |
| <b>Range</b>   | 0 to 20 ft/s (0 to 6 m/s).*   |
| <b>Wetted Materials</b>                                  | Body shaft/fitting: 316 SS; Electrodes: 316 SS; Electrode cap: Polymer/Polystyrene; O-ring: Silicone.   |
| <b>Accuracy</b>  | IEF-HX-X: $\pm 0.5\%$ of reading at calibrated velocity; $\pm 1\%$ of reading from 2 to 20 ft/s (0.6 to 6 m/s); $\pm 0.02$ ft/s ( $\pm 0.006$ m/s) at $< 2$ ft/s (0.6 m/s); IEF-SX-X: $\pm 1\%$ FS.   |
| <b>Temperature Limits</b>                                | Ambient: -20 to 160°F (-29 to 71°C); Process: 15 to 250°F (121°C); Storage: -40 to 185°F (-40 to 85°C).   |
| <b>Process Connection</b>                                | 1" NPT or BSPT with accessory full port ball valve options.   |
| <b>Pressure Limits</b>                                   | 400 psi (27.6 bar) @ 100° F (37.8°C).   |
| <b>Pressure Drop</b>                                     | $< 0.1$ psi at 12 ft/s in 4" (101.6 mm) and larger pipe.  |
| <b>Outputs</b>   | (1) Analog: 4 to 20 mA, 0 to 5 V, 0 to 10 V or 2 to 10 V (display selectable);<br>(1) Pulse/Frequency: 0 to 15 V peak pulse, 0 to 500 Hz or scalable pulse output (display selectable);<br>(2) Alarm: (1) Empty pipe detection or minimum/maximum velocity, (display selectable); (1) Reverse flow output indication. |
| <b>Power Requirements</b>                                | 12 to 42.4 VDC, 0.25 A @ 24 VDC; 12 to 36 VAC.  |
| <b>Electrical Connection</b>                             | Removable terminal blocks, model selectable 1/2" female NPT conduit connection, PG 16 gland or PG 16 gland with (2) 10 ft (3 m) 9 conductor 22 AWG plenum rated cables, accessory cable lengths up to 200 ft (61 m) optional.   |
| <b>Display (-LCD option)</b>                             | 2" ( 5.08 cm) x 2" (5.08 cm) graphic LCD with backlight.  |
| <b>Conductivity</b>                                      | $> 20$ microsiemens   |
| <b>Enclosure Material</b>                                | Powder coated die cast aluminum.  |
| <b>Enclosure Ratings</b>                                 | NEMA 6P (IP68) (Non display models); NEMA 4X (IP66) (-LCD option).  |
| <b>Agency Approvals</b>                                  | BTL, CE, NSF/ANSI 61 and 372 pending.   |
| *For max flowrates $> 10$ ft/s (3 m/s) order option -CC. |   |

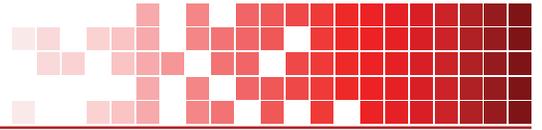
### COMMUNICATIONS SPECIFICATIONS (-COM OPTION)

|                             |  |
|-----------------------------|--|
| <b>Type</b>                 | BACnet MS/TP or Modbus® RTU communication protocol (default disabled, display selectable). |
| <b>Supported Baud Rates</b> | 9600, 19200, 38400, 57600, 76800, or 115200 bps (display selectable).                      |
| <b>Device Load</b>          | 1/8 unit load.   |

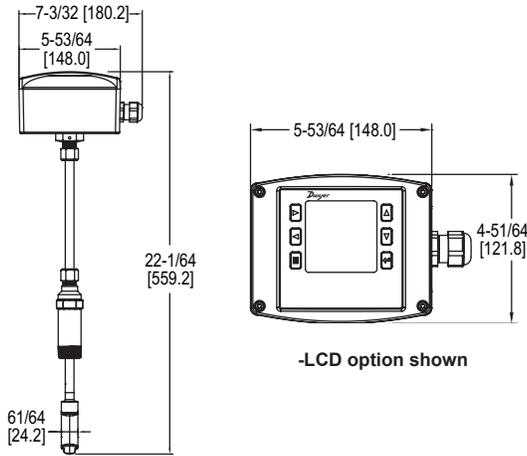
### ADDITIONAL SPECIFICATIONS

|                                     |  |
|-------------------------------------|--|
| <b>Applicable Pipe Material</b>     | BACnet MS/TP or Modbus® RTU communication protocol (default disabled, display selectable). |
| <b>Applicable Pipe Size</b>         | 9600, 19200, 38400, 57600, 76800, or 115200 bps (display selectable).                      |
| <b>Diameter Length Requirements</b> | $> 10$ upstream; $> 5$ downstream.   |
| <b>Glycol</b>                       | 0 to 100% display selectable.  |

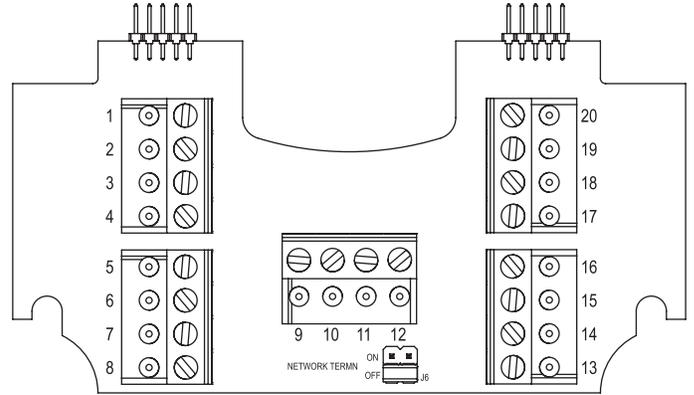




## DIMENSIONS



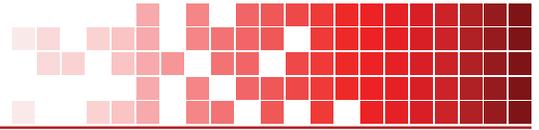
## WIRING DIAGRAM



| WIRING DIAGRAM                         |            |            |                                  |   |
|--|------------|------------|----------------------------------|---|
| Cable*                                 | Terminal # | Wire Color | Description                      | Note  |
| A                                      | 1          | Red        | Power Supply Positive            | Connect to +24VDC or VAC transformer                    |
| A                                      | 2          | Black      | Power Supply Common              | Connect to 24VDC/VAC common                             |
| A                                      | 13         | Shield     | -                                | If used - Application Dependant                         |
| B                                      | 14         | Shield     | -                                | If used - Application Dependant                         |
| External                               | -          | -          | Earth/Chassis Ground             | -   |
| <b>Analog Current Output</b>           |            |            |                                  |   |
| B                                      | 3          | Brown      | (+) Analog current output        | 4 to 20 mA process output                               |
| B                                      | 4          | Blue       | (-) Analog output common         | Current output common                                   |
| <b>Analog Voltage Output</b>           |            |            |                                  |   |
| B                                      | 5          | Green      | (+) Analog voltage output        | May be configured; 0 to 10 V, 0 to 5 V, 2 to 10 V, etc. |
| B                                      | 6          | White      | (-) Analog output common         | Voltage output common                                   |
| <b>Frequency Output</b>                |            |            |                                  |   |
| B                                      | 8          | Violet     | (+) Frequency output             | 0 to 500 Hz output (@ 0/15 VDC output level)            |
| B                                      | 7          | Grey       | (-) Analog output common         | Frequency output common                                 |
| <b>RS-485 Communication (optional)</b> |            |            |                                  |   |
| B                                      | 11,12      | Orange     | RS-485 (+)                       | On board short for daisy chain connection               |
| B                                      | 9,10       | Yellow     | RS-485 (-)                       | On board short for daisy chain connection               |
| <b>Reverse Flow</b>                    |            |            |                                  |   |
| A                                      | 15         | Brown      | Isolated solid state output N.O. | 50 V AC/VDC @ 100 mA maximum                            |
| A                                      | 16         | Blue       | Isolated solid state output N.O. | 50 V AC/VDC @ 100 mA maximum                            |
| <b>Alarm</b>                           |            |            |                                  |   |
| A                                      | 17         | Green      | Isolated solid state output N.O. | 50 V AC/VDC @ 100 mA maximum                            |
| A                                      | 18         | White      | Isolated solid state output N.O. | 50 V AC/VDC @ 100 mA maximum                            |
| <b>Pulse</b>                           |            |            |                                  |   |
| A                                      | 19         | Orange     | Isolated solid state output N.O. | 50 V AC/VDC @ 100 mA maximum                            |
| A                                      | 20         | Yellow     | Isolated solid state output N.O. | 50 V AC/VDC @ 100 mA maximum                            |
| <b>No Connection</b>                   |            |            |                                  |   |
| B                                      | -          | Red        | Do not connect                   | -   |
| B                                      | -          | Black      | Do not connect                   | -   |
| A                                      | -          | Violet     | Do not connect                   | -   |
| A                                      | -          | Grey       | Do not connect                   | -   |

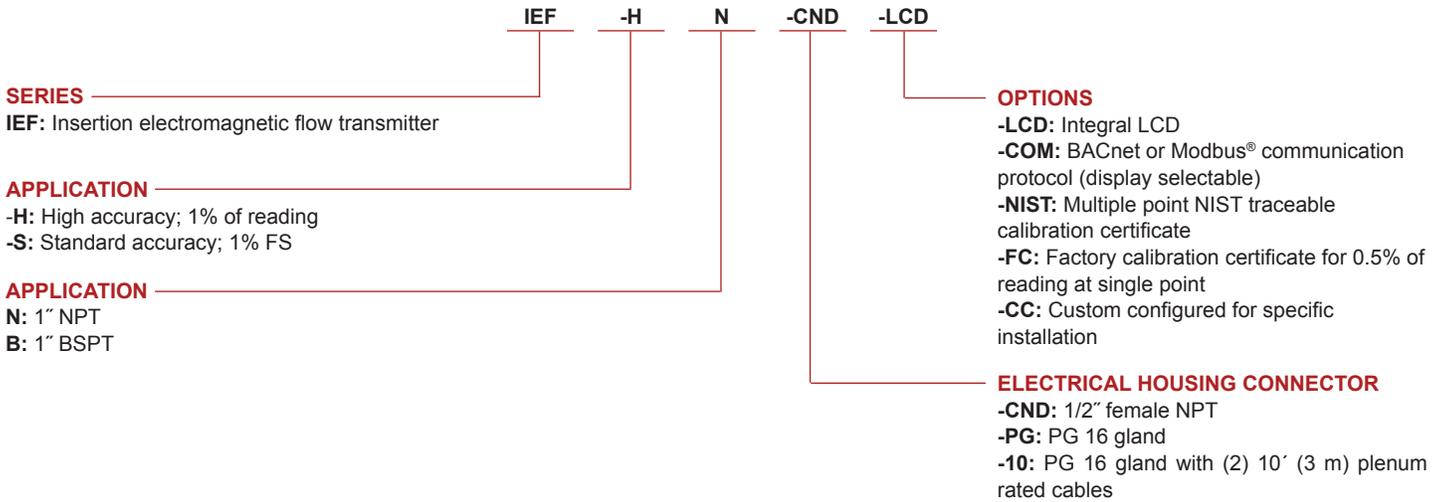
\*Supplied cables - shown





## HOW TO ORDER

Use the **bold** characters from the chart below to construct a product code.



## ACCESSORIES

| Model               | Description   |
|---------------------|---|
| <b>A-IEF-KIT</b>    | Setup kit (includes setup display, thickness gage and measuring tape) |
| <b>A-IEF-DSP</b>    | Setup display   |
| <b>A-IEF-CBL-50</b> | Plenum rated cable 50 ft (15.2 m)                                     |
| <b>A-IEF-VLV-BR</b> | 1-1/4" full port isolation valve brass                                |
| <b>A-IEF-VLV-SS</b> | 1-1/4" full port isolation valve 316 SS                               |
| <b>A-IEF-INGD</b>   | Installation alignment kit  |
| <b>A-IEF-PA</b>     | AC wall adapter   |

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