

## DESCRIPTION

The Recordall® series is a positive displacement meter. The series is best suited for metering fluids up to a viscosity of 700 mPas and at an operating temperature of 50°C up to 120°C.

## APPLICATIONS

Clean and moderately dirty liquids, hard and demineralized water, oils, fuel, solvents, etc.

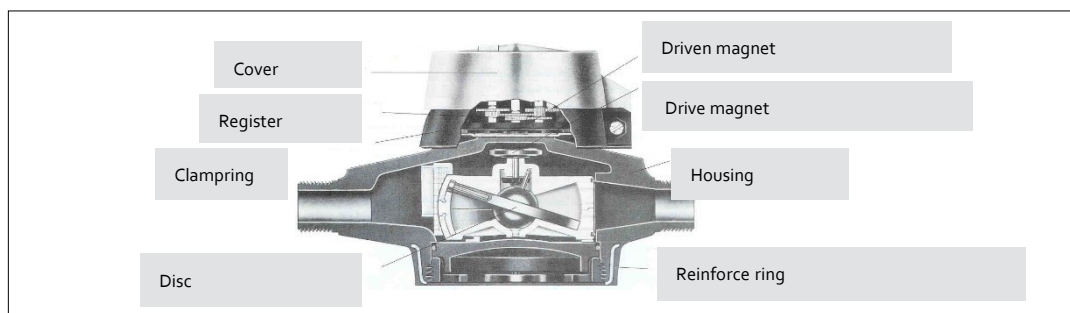
## DESIGN

The metering chamber includes disc, positioning bar and transmission magnet. The chamber is inserted into the meter body. A screen in the inlet side of the body protects the chamber against penetration of larger solid particles.



## FEATURES

- Magnetic coupling
- Compatible with many liquids
- Wide flow range
- Low pressure loss
- Low weight
- High durability, accuracy
- Low-cost
- Modular system
- Protection class IP 65

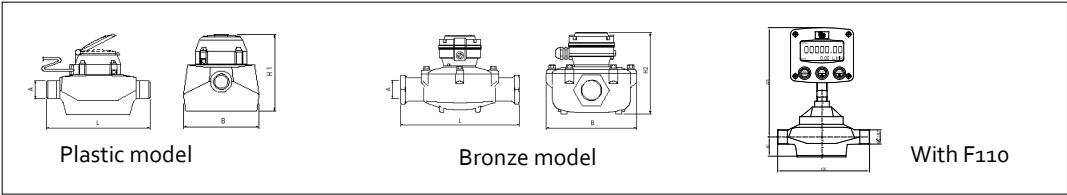


WORKING PRINCIPAL

The top and lower part of the meter chamber are spherical shaped. A ball bearing centralizes the disc between the two spherical cups. A nutating motion of the disc is generated when flow enters the meter chamber. Complete separation between inlet and outlet chamber volumes is always

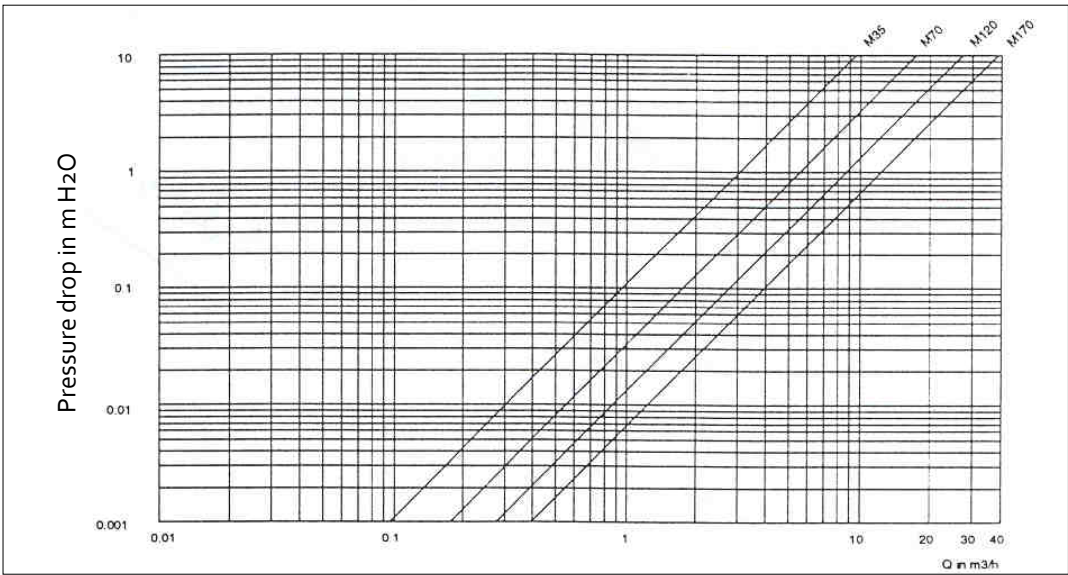
achieved by one dedicated disc diameter line. The inlet and outlet parts of the meter chamber are separated by a partition plate. The positioning bar forces the disc to nutate around the center axis of the chamber thus driving the transmission magnet.

DIMENSIONS (MM)



| Type                   | M 25        |             |                 | M 35   | M 70       | M 120        | M 170  |
|------------------------|-------------|-------------|-----------------|--------|------------|--------------|--------|
|                        | Plastic     | Bronze      | Stainless steel | Bronze | Bronze     | Bronze       | Bronze |
| Connection A           | R 3/4" / 1" | R 3/4" / 1" | 1"              | R 1"   | R 1 - 1/4" | 1 - 1/2" NPT | 2" NPT |
| Lay length L           | 190         | 190         | 190             | 230    | 270        | 321          | 387    |
| Width B                | 122         | 122         | 135             | 133    | 184        | 223          | 240    |
| Height register H 1    | 125         | 125         | 130             | 132    | 165        | 178          | 204    |
| Height transmitter H 2 | 128         | 128         | 155             | 168    | 200        | 213          | 239    |
| Height F110            | 265         | 265         | 265             | 270    | 310        | 323          | 349    |

PRESSURE DROP



## TECHNICAL DATA

| Type                      | M 25    |         |                 | M 35    | M 70     | M 120    | M 170   |
|---------------------------|---------|---------|-----------------|---------|----------|----------|---------|
|                           | Plastic | Bronze  | Stainless Steel | Bronze  | Bronze   | Bronze   | Bronze  |
| Size DN                   | 15 / 20 | 15 / 20 | 20              | 20      | 25       | 40       | 50      |
| Nominal pressure PN       | 16      | 16      | 16              | 16      | 16       | 16       | 16      |
| Max. Temperature (PPO)    | 50°C    | 50°C    | 50°C            | 50°C    | 50°C     | 50°C     | 50°C    |
| Max. temperature (Vectra) | -       | 120°C   | 120°C           | -       | 120°C    | 120°C    | -       |
| Flow range l/min (PPO)    | 1 – 100 | 1 – 100 | 1 – 100         | 2 – 132 | 4 – 265  | 8 – 454  | 8 – 643 |
| Flow range l/min (Vectra) | -       | 3 - 100 | 3 - 100         | -       | 19 – 265 | 18 – 454 | -       |
| Accuracy (1:10)           | ±0,5 %  |         |                 |         |          |          |         |
| Accuracy (flow range)     | ±1,5 %  |         |                 |         |          |          |         |
| Weight                    | 1,2 kg  | 1,8 kg  | 5,8 kg          | 2,7 kg  | 5,5 kg   | 10,5 kg  | 13,6 kg |

## MATERIALS

|                         |                               |              |                             |              |           |                             |                     |                             |              |                             |           |                             |
|-------------------------|-------------------------------|--------------|-----------------------------|--------------|-----------|-----------------------------|---------------------|-----------------------------|--------------|-----------------------------|-----------|-----------------------------|
| Type                    | M 25                          |              |                             |              | M 35      |                             | M 70                |                             | M 120        |                             | M 170     |                             |
| Housing                 | Nylon                         | Bronze       | Nickel coated<br>Bronze     | SS<br>1.4571 | Bronze    | Nickel coated               | Bronze              | Nickel coated               | Bronze       | Nickel coated               | Bronze    | Nickel coated               |
| Measuring chamber       | PPO                           | PPO / Vectra |                             |              | PPO       | PPO / Vectra                | PPO / Vectra        |                             | PPO / Vectra |                             | PPO       | PPO                         |
| O -rings                | Buna                          | Buna / Viton |                             |              | Buna      | Buna / Viton                | Buna / Viton        |                             | Buna / Viton |                             | Buna      | Buna                        |
| Retainer strap (PPO)    | Nylon                         |              |                             |              |           |                             |                     |                             |              |                             |           |                             |
| Retainer strap (Vectra) | Stainless steel 316           |              |                             |              | PPO       |                             | Stainless steel 316 |                             |              |                             |           |                             |
| Screen                  | PPO                           |              |                             |              |           |                             |                     |                             |              |                             |           |                             |
| Bottom (PPO)            | Nylon                         | Cast iron    | Cast iron/<br>Nickel coated | SS           | Cast iron | Cast iron/<br>Nickel coated | Cast iron           | Cast iron/<br>Nickel coated | Cast iron    | Cast iron/<br>Nickel coated | Cast iron | Cast iron/<br>Nickel coated |
| Bottom (Vectra)         | -                             | Bronze       | Bronze<br>Nickel coated     | SS           | -         | Bronze<br>Nickel coated     | Bronze              | Bronze<br>Nickel coated     | Bronze       | Bronze<br>Nickel coated     | -         | Bronze<br>Nickel coated     |
| Retainer ring           | Nylon                         | -            | -                           | -            | -         | -                           | -                   | -                           | -            | -                           | -         | -                           |
| Magnet                  | Bariumferrit                  |              |                             |              |           |                             |                     |                             |              |                             |           |                             |
| Crossbar                | Nylon                         |              |                             |              |           |                             |                     |                             |              |                             |           |                             |
| Thrust roller           | Nylon                         |              |                             |              |           |                             |                     |                             |              |                             |           |                             |
| Roller insert           | Stainless steel 316 / 316 S/S |              |                             |              |           |                             |                     |                             |              |                             |           |                             |

## F-SERIES (F012, F018, F110, F131)



### INPUT FEATURES

With the F-series, the following signals types can be processed:

- Flow measurement: Turbine sine wave (coil) pick-ups, reed switches, hall-effect sensors and other active or passive NPN/PNP pulse signals, NAMUR sensors and 2 or 3 wire (o)4 - 20mA or 0 - 10V DC.
- Temperature measurement: 2, 3 or 4 wire PT100 (PRTD) elements, thermocouple as well as 2 or 3 wire (o)4 - 20mA or 0 - 10V DC signals. Linearization of the input signal, data filter functions and square root calculation are all available to process the input signals.

### MODELS

F012 Display with external power supply or battery powered

F018 Alarm or pulse output, analog output with HART communication

F110 Pulse output, analog output, optional RS232/RS485

F131 Batch controller with pulse output, analog output, 2 batching outputs, optional RS232/RS485

### OPTIONS FOR HAZARDOUS AREA INSTALLATION

The F1-series can be supplied with certified intrinsically safe to ATEX and IECEx.

The basic Fo-series have got the following certifications 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.

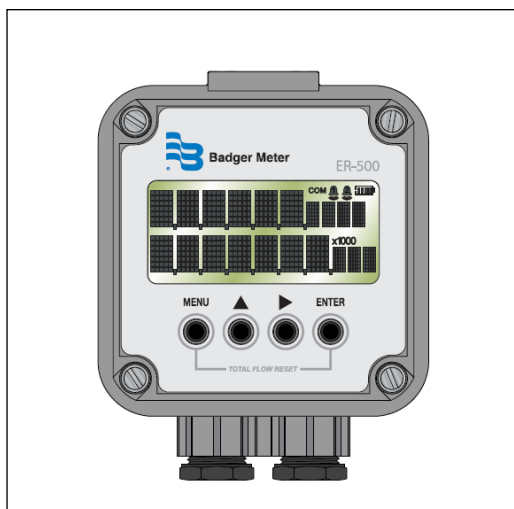
### OUTPUT FEATURES

Related to the functionality of the selected model, the following output features are available:

- Analog output proportional to the flow rate. The active, passive or isolated (o)4 - 20mA or 0 - 10V DC analog output can also be used to control actuators with the PI(D) controllers.
- Transistor or relay outputs for high and low alarms, scaled pulse output, flow-direction as well as the control of valves/relays in batch and level control applications.
- The RS232, RS485 or TTL interface makes it possible to communicate remotely, even with the battery-powered unit.

All software parameters can be monitored and modified in addition to the usual transfer of data using the Modbus protocol.

## FLOW MONITOR ER-500



### INPUT

|                         |                        |
|-------------------------|------------------------|
| Frequency range         | 1 to 3500 Hz           |
| Frequency accuracy      | $\pm 0,1 \%$           |
| Over voltage protection | 28V DC Frequency range |

### OUTPUT

Analog: 4-20mA

### TOTALIZING PULSE

Optoisolated (ISO) open collector transistor, non-isolated open drain FET.

### STATUS ALARMS

Open collector transistor, adjustable flow rate with programmable dead band and phase.

### MODBUS

Modbus RTU over RS485, 127 addressable units / 2-wire network, 9600 baud, long integer and single precision IEEE754 formats; retrieve: flow rate, job totalizer, grand totalizer, alarm status and battery level; write: reset job total-izer, reset grand totalizer

### PROTECTION CLASS

NEMA 4X/IP 66

More information you get in the data sheet "Flow monitor ER-500".

### FEATURES

- Compact size
- High accuracy and repeatability (0,05 %)
- Flexibility of installation options
- Robust alarm parameters provide faster warning when something changes in the process or pipeline.
- Advanced connectivity options allow you to connect meters to your network for remote monitoring and process automation capabilities.
- Flexible power options include battery and 4-20mA loop power, providing a number of benefits including: The ability to install in remote location and be up and running immediately.
- Maintains readings and settings in the event of a power loss, and prolong the life of the batteries for up to 6 years.
- An updated display and enhanced totalization options provide more flow information at your fingertips, including display of rate and total at the same time and standard, batch and grand totals.

REGISTER

Typ ILR 701, 750



FEATURES

- Large six-digit LCD display
- Display in liters, pints, quarts or gallons, freely programmable
- 11 digits, non-resettable lifetime totalizer and 6 digits, resettable totalizer
- ILR series: -20 °C to +80 °C (-4 °F to +140 °F)
- Replaceable long life battery
- Calibration factor saved in non-volatile memory
- 9 point linearization (ILR 750, ILR 701)
- Scalable pulse output (ILR 750)
- 4-20 mA output (ILR 750)
- Protection class IP65

DESCRIPTION

The electronic register module contains a microprocessor board powered by a lithium battery. It can be programmed to batch in liters, pints, quarts, or gallons and will totalize in liters or gallons. A calibration factor and unit of measure are programmed during factory test. Unlike mechanical registers, these units can be electronically recalibrated in the field when necessary. A 6-digit LC display, accurate to three decimal places, shows the exact amount of fluid that has passed through the meter. The entire register module is protected from normal wear and tear by a rugged, shock resistant housing.

OPERATION

The nutating disc meter has magnets on the gears that cause the reed switches to send pulses to the register as they rotate. The register is in a sleep mode until it detects these pulses caused by fluid going through the meter. The micro-processor in the register then measures the flow and will

display either the batch totalization or the flow rate of the fluid going through the meter on the 6-digit display. The registers batch totalizer is a 6-digit display with three places of resolution after the decimal point. If the total dispensed exceeds 999.999 then the display will shift and only 2 digits will be displayed after the decimal point, 9999.99 and will continue to shift to the maximum value of 999999. After reaching 999999 the batch totalizer will rollover to 0.000. The batch totalizer is reset to zero when the reset button is depressed.

The register also has a resettable totalizer that requires that the total and reset button both be depressed to reset (hold the “Total” button, then press the “Reset” button to reset this totalizer while resettable totalize is displayed). This would be used for multiple batch totalization purposes.

The register’s lifetime totalizer is 11 digits and will either be in gallons or liters based on the unit of measure selected. Pushing and holding the total button while the lifetime totalizer is displayed will display the full 11-digit lifetime totalizer value.

|                                      | Register features   |
|--------------------------------------|---|
| ILR 701                              | Flow rate or totalizer display selectable in the programming menu <ul style="list-style-type: none"><li>• Selectable unit of measure</li><li>9 point linearization</li></ul>  |
| ILR 750 pulse output + 4-20mA output | <ul style="list-style-type: none"><li>• Scalable pulse output</li><li>• Ability to set pulse output length</li><li>• Analog 4-20mA output representing the flow rate of the meter</li><li>• Minimum and maximum values can be set for analog output</li><li>• 9 point linearization</li></ul> |

## REEDSWITCH PULSE TRANSMITTER TYPE PFT-2 / OGT



### FEATURES

- Reed switch unscaled
- Cost effective

### DESCRIPTION

The pulse transmitter PFT-2 supplies pulses through a reed switch, which is free of potential.

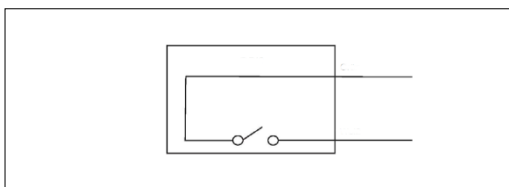
### PULSE TABELE

| Meter type | DN | Size | PPL  | PPG   |
|------------|----|------|------|-------|
| RCDL M25   | 20 | 5/8" | 52,4 | 198,3 |
| RCDL M35   | 20 | 3/4" | 33,5 | 126,7 |
| RCDL M70   | 25 | 1"   | 12,3 | 46,8  |
| RCDL M120  | 40 | 1½"  | 6,3  | 23,9  |
| RCDL M170  | 50 | 2"   | 3,8  | 14,6  |

### TECHNICAL DATA

|                                |  |
|--------------------------------|--|
| Life expectancy of reed switch | Up to 5x10 <sup>8</sup> switch closures, depending on load |
| Switch load                    | 10 W, 12 VA, 0,5 A max.                                    |
| Fluid temperature              | 220 VDC max.   |
| Protection class               | 120 °C   |
| Housing                        | IP 65 / IP42 (OGT)   |

### WIRING DIAGRAM



ELECTRONIC PULSE TRANSMITTER TYPE PFT-2E



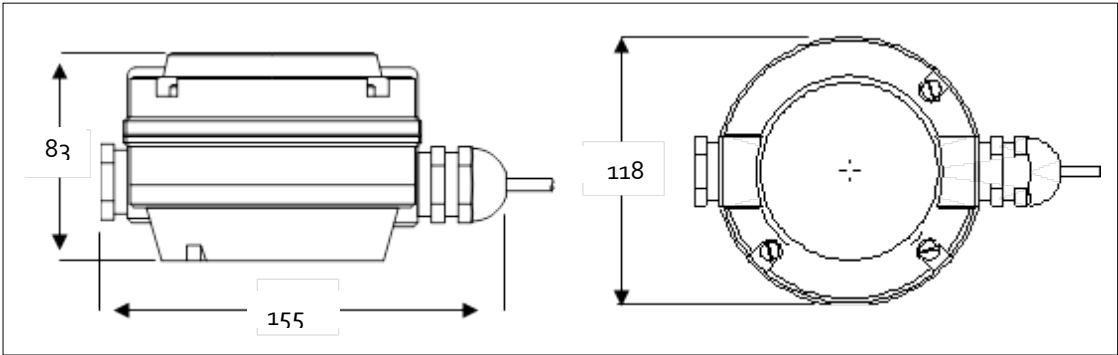
| Technical data      |                              |
|---------------------|------------------------------|
| Power supply        | 6 – 24 VDC                   |
| Current consumption | 13,5 mA max.                 |
| Output Max. current | Open collector NPN20 mA      |
| Fluid temperature   | 120 °C                       |
| Protection class    | IP 65                        |
| Housing             | High impact reinforced nylon |

| Meter type | Size | PPL  |
|------------|------|------|
| M25        | 20   | 52,4 |
| M70        | 25   | 12,3 |
| M120       | 40   | 6,3  |
| M170       | 50   | 3,8  |
|            |      |      |
| OP15       | 15   | 58,9 |
| OP25       | 25   | 20,3 |
| OP50       | 50   | 5,4  |

DESCRIPTION

A magnetoresistive sensor generates unscaled pulses, supplied by an open collector.

DIMENSIONS (MM)





PULSE TRANSMITTERS PM5-xx\*-ILR FOR RCDL METERS



DESCRIPTION

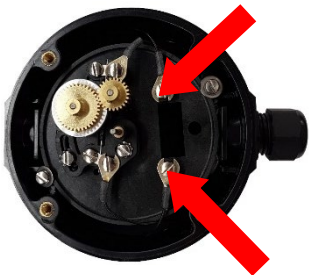
The pulse transmitter type PM5 supplies pulses through a reed switch, which is free of potential. The PM5-ILR offers the same function and has an additional display with flow rate and/or totalizer.

FEATURES

- Scalable reedswitch
- Optional display (PM5-ILR)

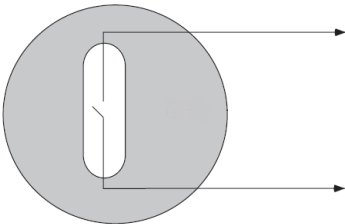
TECHNICAL DATA

|                                |  |
|--------------------------------|--|
| Life expectancy of reed switch | up to 5x10 <sup>8</sup> switch closures, depending on load |
| Switch load                    | 10 W, 12 VA, 0,5 A max.<br>220 VDC/VAC max.                |
| Fluid temperature              | 120 °C for PM 5  |
| Protection class               | 120 °C for PM 5-ILR  |
| Life expectancy of battery     | IP 65  |



MODELS


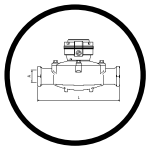

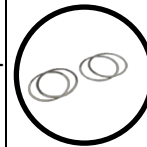


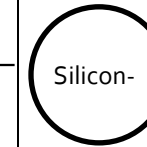
|         |   |
|---------|---|
| PM5     | Pulse output  |
| PM5-ILR | Resettable totalizer of flow rate<br>programmable, format xxxx.x L, PT, QT, GAL |



## PULSE RESOLUTION (PULSE/LITER)

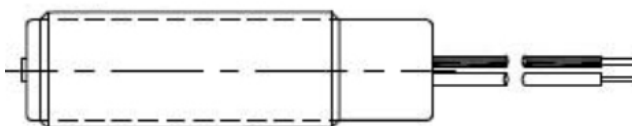
| Meter type | Pulse transmitter                                |   |    |     |
|------------|--|---|----|-----|
|            | PM5 & PM5-ILR                                    |   |    |     |
|            | 0,1  | 1 | 10 | 100 |
| RCDL M25   | ---  | x | x  | x   |
| RCDL M35   | ---  | x | x  | x   |
| RCDL M70   | x  | x | x  | --- |
| RCDL M120  | x  | x | x  | --- |
| RCDL M170  | x  | x | x  | --- |
|            | Other pulse resolutions are possible on request. |   |    |     |


## ORDER MATRIX

|        | Housing material  | Housing dimension   | Measuring chamber material  | O-rings material  | Connection (specify only for M25)  | Register  | Additional features   |
|--------|---|---|---|---|--|---|---|
| RCDL – |  |  |  |  |  |  |  |
|        | BR  | M25   | PPO   | Buna  | 3/4"   | ILR701  | SIL   |
|        | BRN   | M35   | Vec   | Vit   | 1"   | ILR740  |   |
|        | SS  | M70   |   | EPDM  |  | ILR750  |   |
|        |   | M120  |   | FEB   |  | RZW10   |   |
|        |   | M170  |   |   |  | RZW100  |   |
|        |   |   |   |   |  | F110 A*   |   |

## ATEX SENSOR

NPN / PNP



White (  )

Red (+)

Black (-)

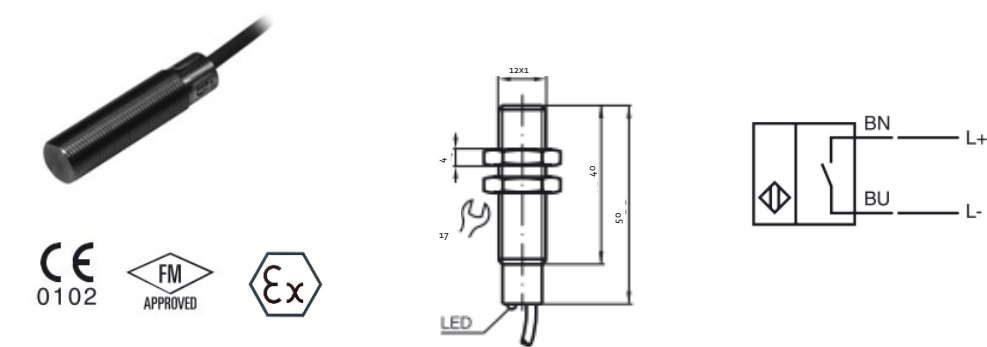
## TECHNICAL DATA

|                                |  |
|--------------------------------|--|
| Switching function             | Open collector                           |
| Output type                    | NPN or PNP 3-wire (2 versions available) |
| Supply voltage                 | 5-30 VDC (I ≤ 15 mA)                     |
| Supply current                 | 100 mA max ( Pmax = 0,66 watt)           |
| Effective internal inductivity | CI ≤ 12 nF                               |
| Effective internal inductance  | LI ≤ 0 μH                                |
| Cable length                   | 3 meters                                 |
| Material                       | Stainless steel 1.4404 (316L)            |
| Protection class               | IP66 / IP67                              |

## MARKING

|               |  |
|---------------|--|
| <b>USA</b>    | Intrinsically safe<br>Class I, II, III, Division 1<br>GROUP ABCDEFG T6 to T5<br>Class I, Zone 0, AEx ia IIC T6 to T5 |
| <b>Canada</b> | Intrinsically safe<br>Class I, Division 1<br>GROUP ABCD T6 to T5<br>Class I, Zone 0, Ex ia IIC T6 to T5              |
| <b>ATEX</b>   | Ex II 1G Ex ia IIC T6 bis T4 Ga  |
| <b>IIEx</b>   | Ex ia IIC T6 to T4 Ga  |

NAMUR SENSOR



TECHNICAL DATA

|                                |   |
|--------------------------------|---|
| Switching function             | Normally open (NO)                              |
| Output type                    | NAMUR 2-wire                                    |
| Nominal voltage                | Uo 8,2 V (Ri ca. 1 kΩ)                          |
| Effective internal inductivity | Ci ≤ 15 nF; a cable length of 10m is considered |
| Effective internal inductance  | Li ≤ 35 μH; a cable length of 10m is considered |
| Switch state indicator         | LED (yellow)                                    |
| Ambient temperature            | -25 to 70°C (-13 to 158°F)                      |
| Cable length                   | 2 meters (PVC)                                  |
| Core cross-section             | 0,34 mm²  |
| Material                       | Stainless steel 1.4404 (316L)                   |
| Protection class               | IP66 / IP67                                     |

MARKING

|       |                                   |
|-------|-----------------------------------|
| Namur | CE 0102 / Ex II2G Ex ib IIC T6 Gb |
|-------|-----------------------------------|