

# MMRT-II Rate Totalizer

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## Rate Totalizers

The MMRT-II is a dual-line, five-digit, explosionproof pulse input rate meter and totalizer. It provides a local non resettable totalizer, a resettable totalizer, and a flow-rate indicator on a meter while providing 4 to 20 milliamper (mA) scaled output or proportional pulse and alarm outputs. This totalizer can be used on Guidant meters with direct electronic outputs.

The MMRT-II has a five-digit and a seven-digit display that are user configurable by using the through-glass buttons. Its tool-free design enables programming and totalizer reset on site. The display also provides programmable k-factor and decimal point, enabling the display of totals and rate in measurement units.

## Uses

The MMRT-II accepts inputs from most Guidant meter transmitters, including:

- PRIME 4 PD Meter
- Turbine pickup
- Turbine preamplifier
- Universal pulse transmitter (UPT)
- Genesis PD Meter
- Low-resolution large numeral counter transmitter (LR-LNC)

- High-resolution large numeral counter transmitter (HR-LNC)
- Ultrasonic Meter

## Features

- Explosion-proof, IP68, NEMA 4X enclosure
- Pulse, open collector, negative-positive-negative (NPN), positive-negative-positive (PNP), transistor-transistor logic (TTL), switch contact, sine wave (coil), square wave, opto-isolated inputs
- Isolated 4 to 20 mA output for rate, total, or grand total
- Two isolated open-collector pulse outputs, up to 5 kilohertz (kHz)
- Thirteen-digit totalizer with total overflow feature
- SafeTouch through-glass button programming
- Password protection

## Specifications

### Power

- Internal battery: 3.6 volt (V) primary lithium (Li-SOCI<sub>2</sub>)
  - Life expectancy of up to seven and a half years, depending on use
- External power: 9 to 30 volts direct current (VDC), 2.2 watts (W) maximum

### Programming

- Manually programmable using through-glass buttons without opening the enclosure
- Optional programming cable

## LCD Display

- Top display: five digits, leading zero blanking, seven-segment display
- Bottom display: seven digits, leading zero blanking, 14-segment display
- Backlight: white light-emitting diode (LED), 10-second auto-off on battery power
- Display assignment options:
  - Top: Rate or total
  - Bottom: Rate, total, grand total, units, and custom tags

## Totalizers

- Calculates total and grand total based on rate and k-factor to display value in engineering units
- Zero to six decimal places
- Totalizer can display numbers up to 9,999,999,999,999

## Inputs

- Through-glass buttons: Four sensors that enable programming and operation without removing the cover in a hazardous environment
- Can be disabled for security purposes by a mechanical switch on the display module

## Pulse Input

- Field selectable: sourcing or sinking pulse or square wave 0 to 5 V, 0 to 12 V, 0 to 24 V
- Voltage threshold:
  - Normal: Low (1.2 V), high (2.0 V)
  - Low: Low (0.2 V), high (1.2 V)
- Frequency range:
  - Maximum: 64 kHz
  - Minimum pulse width: 5 microseconds ( $\mu$ S)
- Opto-isolated input:
  - Sourcing or sinking pulse or square wave
  - 0 to 5 V, 0 to 12 V, 0 to 24 V
- Voltage threshold:
  - Normal: Low (1 V), high (2 V)

- Frequency range:
  - Maximum: 20 kHz
  - Minimum pulse width: 20  $\mu$ s
- Low voltage magnetic pickup input (sinusoidal):
  - Sensitivity: 20 millivolt peak-to-peak (mVpp) to 24 volts peak-to-peak (Vpp) places
  - Frequency range: maximum: 6 kHz
  - Minimum: 0.0001 hertz (Hz)
- Input impedance:
  - Pulse input: >75 kilohm at 1 kHz
- Open collector/switch input: 100 kilohms

## Outputs

- 4-20 mA transmitter output:
  - Scaling range: 4 to 20 mA
  - Under-range: 3.8 mA
  - Over-range: 20.5 mA
  - Accuracy: +/-0.05% span +/-0.004 mA
  - External loop power supply: 30 VDC maximum
  - Loop resistance:
    - 24 VDC: 10 to 750 ohm
    - 30 VDC: 100 to 1100 ohm
- Open collector output:
  - Two isolated outputs available
  - Individually programmable for rate, alarms, and totalizer
  - Pulse output maximum frequency: 5 kHz (50% duty cycle)
  - Pulse rate retransmit output: Output generates 100 to 130  $\mu$ S pulses at the falling edge of every input pulse
  - Quadrature output: Output set to quadrature lags the other pulse by 90 electrical degrees at the given output frequency

## Environmental

- Ambient operating temperature: -40 to 167 °F (-40 to 75 °C)
- Humidity: 90% non-condensing

## Mechanical

- Explosion-proof, die-cast aluminum with glass window, corrosion-resistant epoxy coating
- Three 3/4-inch national pipe thread (NPT) threaded conduit openings
- One 3/4-inch NPT metal plug with 12 millimeter (mm) hex key fitting installed
- Weight: 5.00 pounds (lb) (80 ounces (oz)); 2.27 kilograms (kg))

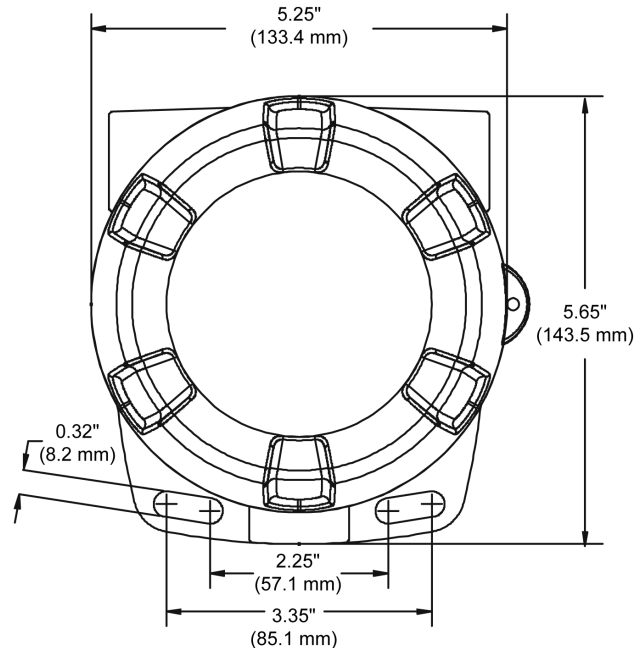
## Ratings and Approvals

- FM: Explosion-proof for use in Class I, Division 1, Groups B, C, and D; Class II, Division 1, Groups E, F, and G; Class III, Division 1; T6; Class I, Zone 1, AEx d IIC T6 Gb; Zone 21, AEx tb IIC T85 °C; Tamb = -40 to 167 °F (-40 to 75 °C)
  - Enclosure: Type 4X and IP66
  - FM 3040391
- ATEX: II 2 G D; Ex d IIC T6 Gb; Ex tb IIC T85 °C Db IP68; Tamb = -40 to 75 °C
  - SIRA 10 ATEX 1116X
- IECEx: Ex d IIC T6 Gb; Ex tb IIC T85 °C Db IP68; Tamb = -40 to 75 °C
  - IECEx SIR 10.0056X
- CSA: Class I, Division 1, Groups B, C, and D; Class II, Division 1, Groups E, F, and G; Class III, Division 1; T6; Class I, Zone 1, Ex d IIC T6; Tamb = -40 to 75 °C
  - Enclosure: Type 4X and IP66
  - CSA 11 2325749

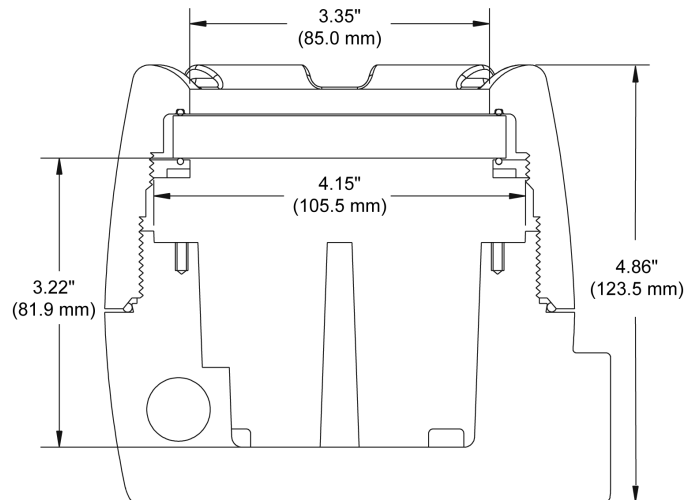
## Mounting Dimensions

The dimensions in the following drawings are shown in inches (") to the nearest hundredth (millimeters (mm) to the nearest tenth), each independently dimensioned from respective engineering drawings.

## Enclosure Front View



## Enclosure Side View



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The specifications contained herein are subject to change without notice and any user of said specifications should verify from the manufacture that the specifications are currently in effect. Otherwise, the manufacturer assumes no responsibility for the use of specifications which may have been changed and are no longer in effect.

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