

# TURBINE FLOWMETERS BY **HOFFER**

Perfecting Measurement™



# HRT1

Rate Indicator/Totalizer with  
HART® Communication Protocol

Product Bulletin HRT1-111L

## TECHNICAL DATA SHEET

### OUTSTANDING FEATURES

- ◆ **HART® Field Communication Protocol**
- ◆ **5 Digit Rate, 8 Digit Totalizer LCD display with configurable decimal point location**
- ◆ **8 Digit, Non-resettable Grand Total display**
- ◆ **Pulse Input supports turbine as well as many other pulse generating flowmeters**
- ◆ **4-20mA Analog Output**
- ◆ **Up to 20 Point Linearization**
- ◆ **Optional Scaled Pulse Output representing an increment of volume for each pulse**
- ◆ **Two Optional Alarm Outputs configurable for Rate and Total**
- ◆ **Magnetically operated switch for Total reset**
- ◆ **Internal battery backup**
- ◆ **Configuration and Grand Total stored in non-volatile memory; Grand Total saved once per minute**



### GENERAL DESCRIPTION

Featuring 5 digits of rate and 8 digits of total, the HRT1 is a loop powered indicator capable of accepting magnetic pickup, DC pulse or switch closure inputs. The HRT1 uses the 4-20mA loop to provide power when this output is used and to provide the HART® communication link.

### SPECIFICATIONS


#### GENERAL

##### TOTAL DISPLAY:

8 Digits 0.26" high. Resettable

**Total Units:** GAL, LIT, FT3, M3, BBL & "blank"

##### GRAND TOTAL:

8 Digits 0.26" high, Non-resettable. Value stored once per minute in non-volatile memory. Grand Total is displayed for 15 seconds after pressing the  button.

##### RATE DISPLAY:

5 Digits 0.5" High, Display updates once every two seconds

**Rate Units:** /SEC /MIN /HR /DAY

**K-factor:** The pulses per unit of Total (e.g. pulses/gallon) are configurable in the range 0.001 to 99,999,999

**Linearization:** Up to 20 points

**Decimal Points:** Configurable for 0, .0, .00 or .000 for rate and total

**Accuracy:** Total: ±1 count, Rate: ±0.01%

#### INPUTS

##### Magnetic Pickup:

Frequency Range: 0.2 Hz to 5000 Hz

Signal Level: 30 mV<sub>p-p</sub> to 30V<sub>p-p</sub>

##### Opto-Isolated DC Pulse:

Frequency Range: 0 Hz to 3000 Hz

Signal Type: DC Pulse

High (Logic 1): 4 to 30 VDC

Low (Logic 0): <1 VDC

Min Pulse Width: 0.1 msec

##### Contact Closure:

Frequency Range: 0 to 5000 Hz

Signal Type: Contact closure, Sig+ Terminal to DC common

Internal Pull-up: 220 KΩ to +3.3 VDC

##### Reset:

Signal Type: Contact closure, Reset Terminal to DC common

Min On: 25 msec

Internal Pull-Up: 100KΩ to +3.3 VDC

External Magnet: Activates internal magnetic switch

## HRT1 ORDERING INFORMATION

### DC POWER/LOOP POWERED

Voltage: 8 to 30 VDC

Current: <24 mA

Loop Burden: 8 VDC maximum

Supply Backup: C-size Lithium battery or battery pack for Ex d certified system

Battery Life: 8 months w/no DC power

Protection: Reverse polarity protected

### ANALOG OUTPUT

Scale: 4-20mA follows rate

Accuracy: 0.02% of Full Scale @ 20°C

Temperature drift: 40 ppm/°C

Update Time: 2.0 seconds

Connection: Two wire

### PULSE OUTPUT

Type: 0-5 TTL, 0-Supply Voltage, open collector (30 VDC, 100mA)

### ALARM 1 AND ALARM 2

Type: 0-5V TTL, 0-Supply voltage, open collector (30 VDC, 100 mA)

Function: Rate or Total

### PHYSICAL

Operating Temperature:

-40°F (-40°C) to + 158°F (70°C)

Humidity: 0 - 90% Non-condensing

Packaging: NEMA 4X, Panel mount or Aluminum casting

Dimensions for NEMA 4X enclosure:

4.33" (110 mm) wide x 4.33" (110 mm) long x 4.33" (110 mm) tall

HRT1- A - B - C - D - E - F - G

#### A. Enclosure Style

(2) NEMA 4X

(3\*) Aluminum casting powder coated enclosure (IP66)

(P) Panel mount (IP40)

(PD) Panel mount w/door and lock (IP40)

(4) NEMA 1 Enclosure for indoor/dry installation

(5) NEMA 4X Enclosure w/sunshade

(7\*) Stainless steel enclosure (IP66)

#### \*Options for 3 and 7

(\_M) M20 thread

(\_S) Sunshade

#### B. Pulse Input

(M) Magnetic Coil

(R) Isolated pulse, RP, Hall Effect coils

#### C. Analog Output

(W) Wired 4-20mA Loop Powered

#### D. Pulse Output

(5) 0-5V TTL/CMOS

(OC) Open Collector

(V) 8-30 VDC with Pullup to VDC+

#### E. Alarms

(5) 0-5V TTL/CMOS

(OC) Open Collector

(V) 8-30 VDC with Pullup to VDC+

#### G. Special Features

(CE) CE mark required for Europe

(X) None

#### F. Mounting

(F) NEMA 4X style 2 enclosure mounted on turbine

(FHT) NEMA 4X style 2 enclosure w/8" long riser mounted on turbine

(FX) Style 3 or 7 enclosure mounted on turbine

(FXHT) Style 3 or 7 enclosure w/8" long riser mounted on turbine

(NP) NEMA 4X enclosure pipe mounting kit 2" pipe or smaller

#### Certified Mounting Options for Style 3 and 7 Enclosures:

(MX\_) Meter mounted. Process temp -40°C to +70°C.

(MA\_) Meter Mounted w/ ATEX riser. Process temp -40°C to +70°C.

(RX\_) Remote mounted. Includes E2 junction box and 1"x3/4" SS adapter.

(RA\_) Remote mounted w/ ATEX riser. Includes E2 junction box.

#### Union Options:

(\_U1) 1" Ex-proof union for MX or RX

(\_U2) 3/4" Ex-proof union for MA or RA

### Ex d Ratings Certified Systems Style 3 & 7:

#### CSA/US Zones

Ex db IIB+H<sub>2</sub> T<sub>6</sub>: Gb; Ex tb IIIC T72°C Db; IP66

CLASS I, Zone 1, AEx db IIB+H<sub>2</sub> T<sub>6</sub>: Gb; Zone 21, AEx tb IIIC T72°C Db; IP66.

#### ATEX/IECEX:

II 2 G Ex db IIB+H<sub>2</sub> T<sub>6</sub> Gb

II 2 D Ex tb IIIC to T72°C Db IP66

T1-T6= -40°C to +70°C

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