

# TURBINE FLOWMETERS BY **HOFFER**

Perfecting Measurement™



# HRT1

Rate Indicator/Totalizer with  
HART® Communication Protocol

Product Bulletin HRT1-111G

## 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 reed switch for Total reset**
- ◆ **Internal battery backup**
- ◆ **Configuration and Grand Total stored in non-volatile memory; Grand Total saved once per minute**



Explosion-proof Enclosure Option

### 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 reed switch

# HRT1 ORDERING INFORMATION

## DC POWER/LOOP POWERED

Voltage: 8 to 30 VDC  
 Current: <24 mA  
 Loop Burden: 8 VDC maximum  
 Supply Backup: (1) C-size Lithium battery  
 Battery Life: 4 years typical  
 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 Explosion-proof  
 Dimensions for NEMA 4X enclosure:  
 4.33" (110 mm) wide x 4.33" (110 mm) long x 4.33" (110 mm) tall

### Enclosure Exd Ratings:

#### STYLE 3

**CSA/FM:** CLASS I, DIV.1, GR. ABCD, CLASS II, DIV.1, GR. EFG, CLASS III, TYPE 4X;  
 CLASS 1 ZONE1 AEx d IIC, IP66

#### STYLE 3A

**Same as above plus ATEX/IECEx:** II 2 G Ex d IIC Gb; IP66

#### STYLE 7

**CSA:** CLASS I, DIV.1, GR. BCD, CLASS II, DIV.1, GR. EFG, CLASS III, TYPE 4X, IP66;  
 CLASS I ZONE 1 Ex d IIB+H2, IP66

**ATEX/IECEx:** II 2 G Ex d IIC Gb; IP66

Basic Model Number	HRT1 - (A) - (B) - (C) - (D) - (E) - (F) - (G)
<b>Series:</b>	
<b>A. Enclosure Style:</b>	
2	NEMA 4X Enclosure (HRT1 mounted behind clear cover)
3*	Explosion-Proof Enclosure
3A*	ATEX Exd Enclosure
P	Panel Mount Enclosure
PD	Panel Mount Enclosure with Door and Lock
4	NEMA 1 enclosure (HRT1 mounted to the outside of clear cover for indoor/dry installation only)
5	NEMA 4X enclosure (HRT1 behind clear cover) with Sunshade
7*	ATEX Stainless Steel Explosion-Proof Enclosure
<b>*Options for Enclosure Style 3, 3A and 7</b>	
(M)	Insert "M" for M20 Thread. M20 Thread not available for use in Canada
(S)	Sunshade
<b>B. Pulse Input:</b>	
M	Magnetic coil, Pulse, Dry contact
R	Isolated Pulse, RPM, RPR, Hall Effect coils
<b>C. Analog Output:</b>	
W	Wired 4-20mA Loop Powered
T	Wireless 4-20mA Output. TBA (Coming in near future)
<b>D. Pulse Output:</b>	
5	0-5 TTL/CMOS
OC	Open Collector
V	8-30 VDC with Pullup to V+
<b>E. Alarms:</b> (Two opto-isolated alarms with user-defined levels for rate and/or total)	
5	0-5 TTL/CMOS
OC	Open Collector
V	8-30 VDC with Pullup to V+
<b>F. Mounting:</b>	
F	Nema 4X Style 2 enclosure mounted on turbine. Must be used with "X" riser turbine option.
FHT	8" long temperature riser for Nema 4X Style 2 enclosure mounted on turbine. Required when fluid temperature exceeds 140 deg. F. Must be used with "X" riser turbine option.
FX	Explosion-proof Style 3 enclosure mounted on turbine. Must be used with "X" riser option on turbine.
FXHT	8" long temperature riser for Explosion-Proof Style 3 enclosure mounted on turbine. Required when temperatures exceed 140 deg. F. Must be used with "X" riser turbine option.
NP	Nema 4X enclosure pipe mounting kit 2" pipe or smaller. Specify if pipe is vertical or horizontal.
<b>G. Special Features:</b>	
CE	CE Mark required for Europe
SP	Any special features that are not covered in the model number use a written description of the -SP