BAT RAT MILLENNIUM

Battery Powered Ratemeter & Totalizer with Alarm Output

Features

- UL/C-UL Intrinsically Safe Listed
- Magnetic Pickup Input, Contact Closure Input, DC Pulse Input (Optically Isolated)
- Displays Rate & Total Simultaneously
- 5 Digit Rate Display, 8 Digit Totalizer Display
- 4-20mA Analog Output (optional)
- Powered From Internal Battery, External DC Supply or 4-20 mA Output Loop
- 20 Point Linearization (optional); 10 Point Linearization with Data Logger option
- Isolated High/Low Flow Rate Alarm Output
- Nonvolatile Flash Memory of Setup Data

- RS485 Modbus Communications and Data Logger (optional)
- Setup Software Available for Easy Programming and Monitoring Using a PC and Special Serial Cable (optional)

Description
Featuring 5 digits of rate and 8 digits of total, the BAT RAT Millenium (BATRAT-M) is a battery powered indicator with flow rate alarm output. It is capable of accepting magnetic pickup, DC pulse and switch closure inputs from pulse producing flowmeters. The unit can be ordered with an optional 4-20mA output. The BAT RAT uses the 4-20mA loop to provide power when this output is used.

Specifications
Power:
BATTERY POWERED
Supplied with 2 C size Lithium battery pack.
EXTERNAL POWER INPUT
Voltage: 8.5 to 30 VDC
Current: Less than 5 mA
Supplied with 1 C size lithium battery for standby operation
Protection: Reverse Polarity Protection on DC Power Input
LOOP POWERED
Voltage: 8.5 to 30 VDC
Supplied with 1 C size lithium battery for standby operation
Protection: Reverse Polarity Protection on Current Loop
Loop Burden: 8.5V maximum

BATTERY LIFE EXPECTANCY:
Expected Years of Operation for BATRAsT-M of various powering options at equipment duty cycles

MODEL	RUN TIME			
	Idle	2hrs/day	8hrs/day	24hrs/day
BATRAT-M-A	10 yrs	10 yrs	10 yrs	9.1 yrs
BATRAT-M-A-4	10 yrs	10 yrs	10 yrs	8.4 yrs
BATRAT-M-B/C standby-operation	10 yrs	10 yrs	10 yrs	10 yrs
BATRAT-M -B/C Indefinite operation when externally powered External or loop power				

NOTE: Battery shelf life is rated at 10 years by manufacturer
Life expectancy based on rated battery capacity at 20°C
The above table is shown with alarm output inactive. Use of alarm output shortens battery life.

Display:
Rate Display: (selectable decimal)
5 Digits (99999), 0.35" High, Display updates once per second with battery power, 8X per second with DC or Loop power
Rate Descriptors: /SEC, /MIN, /HR
/MIN, /HR, /DAY with "D" option
Min. Input Frequency: 0.01 Hz to 10 Hz (selectable delay of 0.1 to 99.9 seconds)*
Selectable Rate Display Damping
Totalizer Display: (selectable decimal)
8 Digits (99999999), 0.2" High
Totalizer Descriptors: GAL, LIT, FT3, M3, "blank"
GAL, BBL, MCF, M3, "blank" with "D" option
Warning Displays: Low battery warning

Alarm Output:
Combination High-Low flow rate alarm output activates when flow rate is less than low set point or greater than high set point.
Type: Opto-isolated photomos relay
Max. voltage (off state): 30 VDC
Current (on state): 100 mA

Mounting Styles:
0- Circuit Board- OEM option (consult factory)
1- Panel Mount - NEMA 4X Front
2- Wall Mount - NEMA 4X Enclosure with BAT RAT mounted behind clear cover
3- Explosion Proof - Class I, Division I, Groups B, C & D
Class II, Division I, Groups E, F & G
5- Wall Mount - NEMA 4X with keypad mounted outside opaque cover

ACCURACY:
0.01% Reading, ±1 count
Temperature Drift: 50 ppm/°C Worst Case

SAFETY LISTINGS:
UL/C-UL File E225832
CLASS 1, DIV 1, GROUPS B, C, D
See Installation DWNG 17075-1

ENVIRONMENTAL:
OPERATING TEMPERATURE
-4°F (-20°C) to + 158°F (70°C)
Extended Temp: -22°F (-30°C) to + 158°F (70°C)
HUMIDITY
0 - 90% Noncondensing

MOUNTING STYLES:
0- Circuit Board- OEM option (consult factory)
1- Panel Mount - NEMA 4X Front
2- Wall Mount - NEMA 4X Enclosure (keypad mounted behind clear cover)
3- Explosion Proof - Class I, Division I, Groups B, C & D Class II, Division I, Groups E, F & G
5- Wall Mount - NEMA 4X Enclosure (keypad mounted on cover)
6- Double Ended Explosion Proof - Class I, Division I, Groups B, C & D Class II, Division I, Groups E, F & G (contact factory for details)
NOTE: Meter mounting kits available for styles 2, 3 and 5 Consult Factory

INPUTS:
MAGNETIC PICKUP INPUT
Frequency Range: 0 to 3500 Hz
Trigger Sensitivity: 10 mV p-p
Over Voltage Protected: ± 30 VDC
OPTO-ISOLATED DC PULSE INPUT
High (logic 1): 4-30 VDC
Low (logic 0): Less Than 1 VDC
Minimum Current: .5 mA
Hysteresis: 0.4 VDC
Frequency Range: 0 to 5 kHz
Min. Pulse Width: 0.1 msec
CONTACT CLOSURE INPUT (contact closure to common)
Internal Pullup Resistor: 100 KΩ to +3.6 VDC
High (logic 1): Open or 4-30 VDC
Low (logic 0): Less Than .5 VDC
Internal Switch Debounce Filter: 0 to 40 Hz
NOTE: Sustained contact closure will shorten battery life.
RESET INPUT (contact closure to common)
Internal Pullup Resistor: 100 KΩ to +3.6 VDC
High (logic 1): Open or 4-30 VDC
Low (logic 0): Less Than .5 VDC
Minimum On : 25 msec
NOTE: Sustained contact closure will shorten battery life.
K-FACTOR
Range: 0.001 to 99999999
Decimal Point Locations: XXXX.XXXX to XXXXXXXX

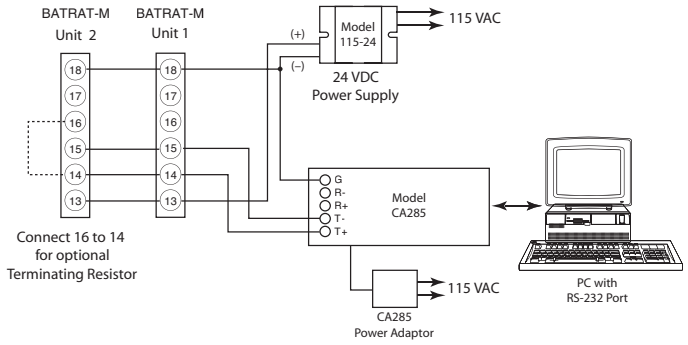
20 Point Linearization Option (10 Point with Data Logger option)
This feature allows the user to enter 20 different frequencies with 20 different corresponding K-Factors to linearize non linear signals.

ANALOG OUTPUT OPTION:
Type: 4-20 mA follows rate display, Two wire hookup
Accuracy: 0.025% Full Scale at 20° C
Temperature Drift:
50 ppm/°C Typical
Reverse Polarity Protected
Update Rate: 8 times/second
NOTE: The BATRT-M uses the 4-20 mA loop power as its primary power source when this option is used. The battery is still required for standby battery operation.

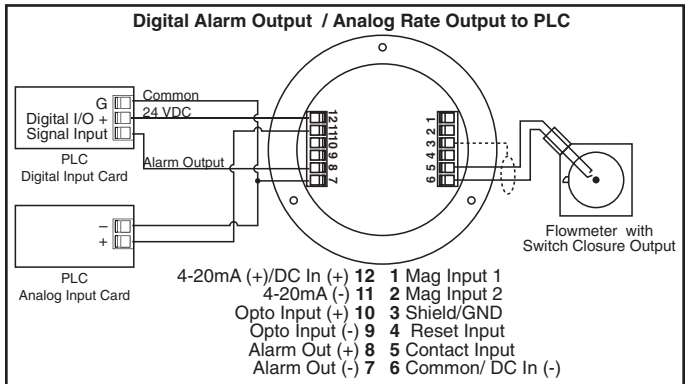
COMMUNICATIONS OPTION (S1):
RS232 SERIAL SETUP SOFTWARE OPTION:
This option enables you to access a variety of process parameters through serial communications. PC compatible communications software is included with this option. With this software and a BA-TRAT-M Serial Adapter Cable (BSAC1) you will be able to setup the BATRAT-M through your PC.

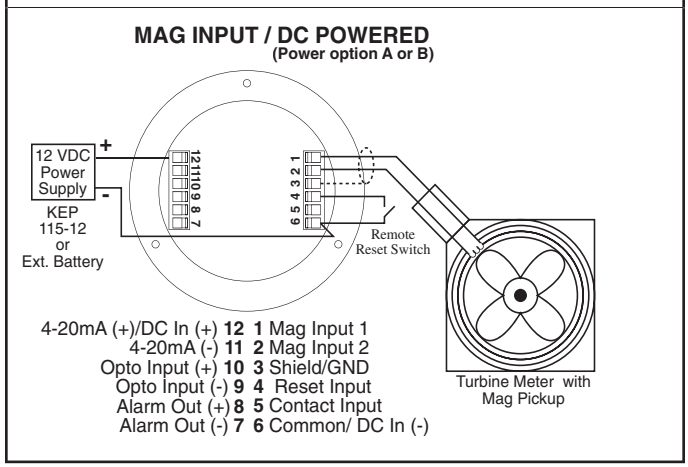
DATA STORAGE:
Setup Information: Stored in flash memory
Totalizer: Stored in battery backed RAM but can be saved to flash memory by operator for recall after battery change out.

RS-485 MODBUS and DATA LOGGER OPTION (S2):
The optional RS-485 card utilizes Modbus RTU protocol to access a variety of process parameters. The Data Logger stores the totalizer to flash memory once every 24 hours at the time you set. Requires external DC power.

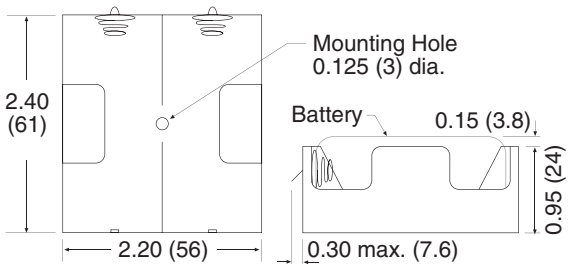


Typical Wiring:

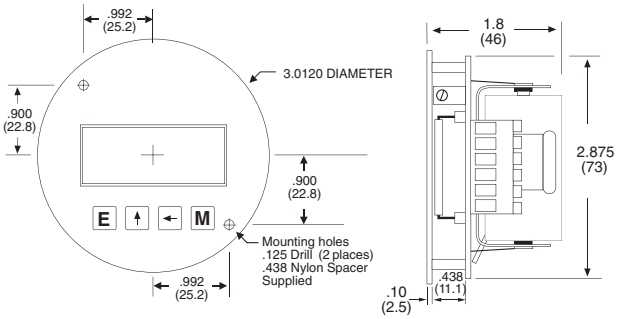




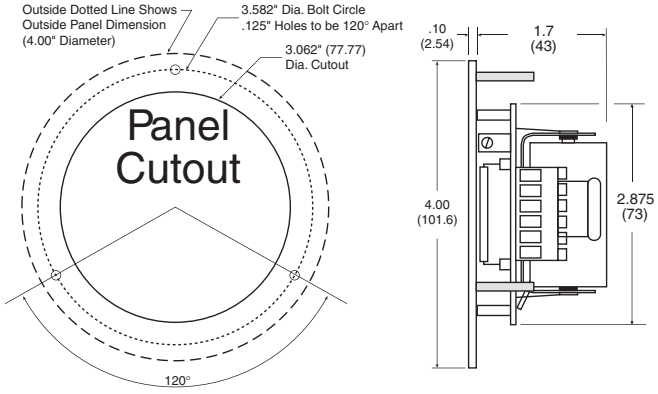
BATPACK



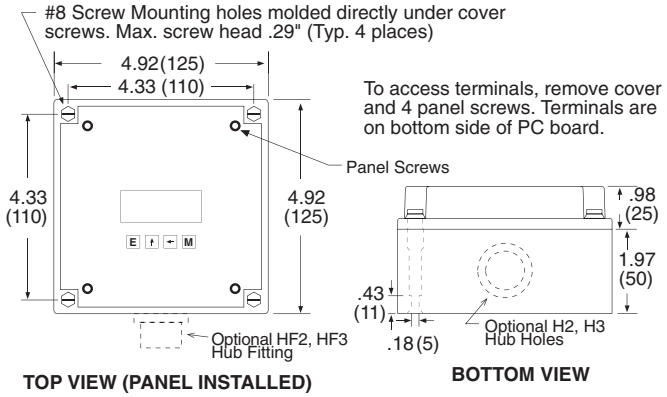
BATRAT-M-0



BATRAT-M-1



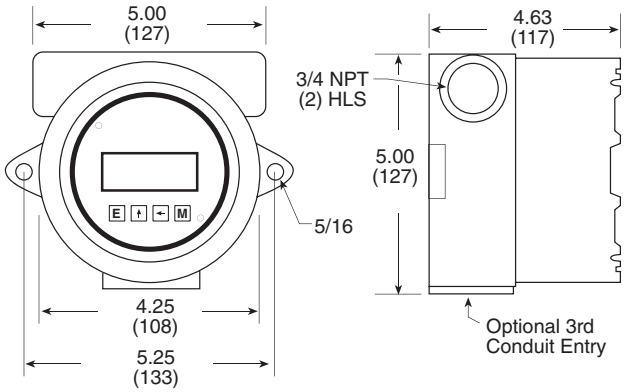
BATRAT-M-2



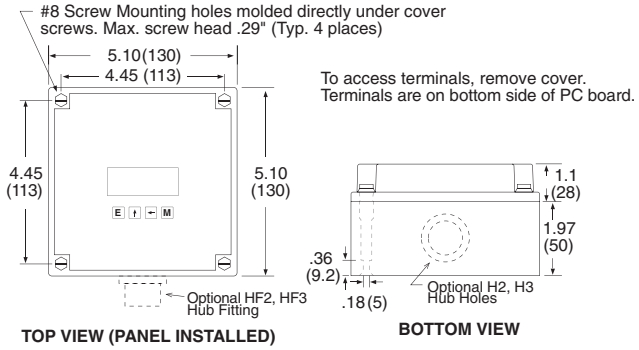
NOTE: Additional entry holes may be provided on styles 2 and 5.

BATRAT-M-3

To access terminals, unscrew cover and loosen 2 panel screws.
Terminals are on bottom side of PC board.



BATRAT-M-5



Ordering Information

EXAMPLE: BATRATM 3 A 4 ET

Series:

Mounting:

* 0 = OEM

* **1** = Panel Mount

2 = NEMA 4X Box (BATRATM behind clear cover)

3 = Explosion Proof Housing

5 = NEMA 4X Box (BATRATM outside opaque cover)

6 = Double Ended Explosion Proof Housing (consult factory)

Power Supply:

* A = Battery (2 supplied)

B = External Power Supply (8.5 to 30 VDC)

C = Loop Powered with 4-20 mA Output

AC = Loop Powered with 4-20 mA Output and 2 Batteries

Options (Multiple Options Available)

S1 = Serial Setup Software for use with BSAC1

S2 = RS485/Modbus/Data Logger - Isolated (power options B. C only)

4 = 20 Point Linearization (10 point with S2 option)

D = Rate per Day , Hour or Minute

ET = Extended Temp.: -22°F to 158°F (-30°C to 70°C)

CE** = CE Compliant

CSA** = CSA Listed Explosion Proof

IS** = UL/C-UL Listed IS

TRX = NEMA7 Explosion Proof Reset Switch (mounting style 3 only)

RN = External Magnetic Reset

T = Third Conduit Entry in Ex-Proof Housing (mounting style 3)

H2 = 0.875" Hole for mounting styles 2 and 5

HF2 = 0.5" Female NPT Hub fitting for mounting styles 2 and 5

H3 = 1.125" Hole for mounting styles 2 and 5

HF3 = 0.75" Female NPT Hub fitting for mounting styles 2 and 5

Accessories:

BATPACK= External Batt. Pack with 2 C Size Batteries & 12" leads

BATC = Single Battery: Tadiran P/N TL2200/S 3.6V 7200mAh or equal

115-24 = 115 VAC to 24 VDC power supply

BSAC1 = RS232 Serial Adapter Cable with setup software

* External battery pack supplied with models BATRATM0A & BATRATM1A

** Contact factory for latest information