

BAT RAT MILLENNIUM

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

Description

Featuring 5 digits of rate and 8 digits of total, the BAT RAT Millennium (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 BATRAT-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	10 yrs	10 yrs	10 yrs	10 yrs

standby-operation
 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.

Battery Powered Ratemeter & Totalizer with Alarm Output



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

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 XXXXXXXXX

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 BATRAT-M Serial Adapter Cable (BSAC1) you will be able to setup the BATRAT-M through your PC.

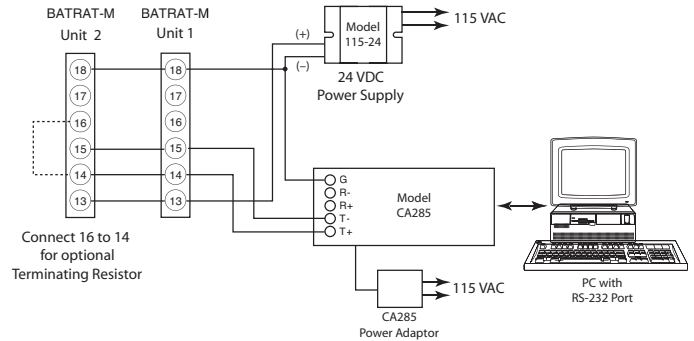
DATA STORAGE:

Setup Information: Stored in flash memory

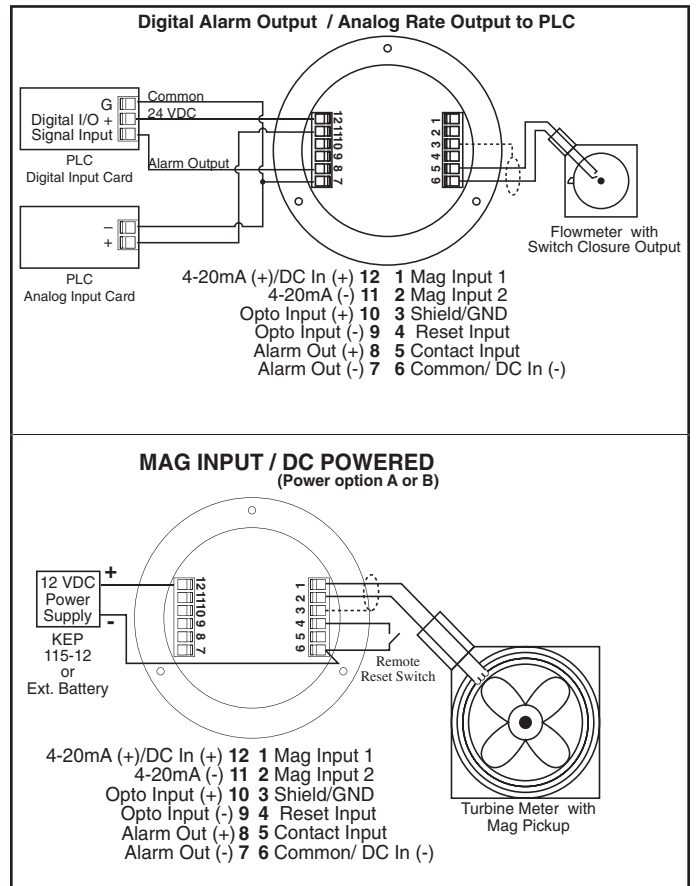
Totalizer: Stored in battery backed RAM but can be saved to flash memory by operator for recall after battery change out.

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.

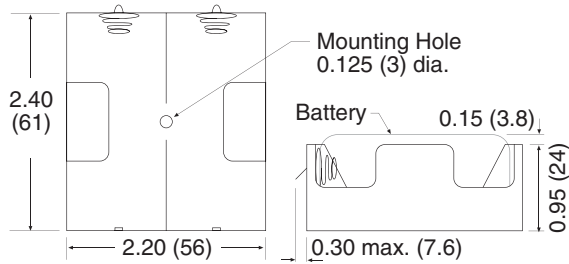


Typical Wiring:

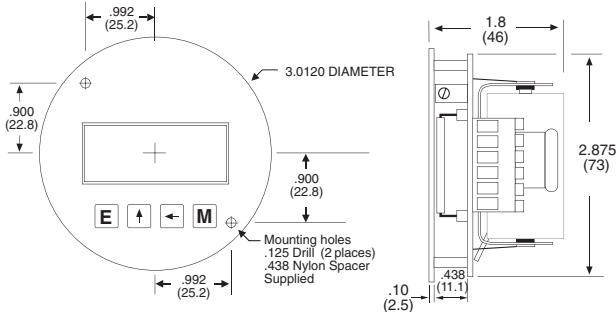


Flow Instruments
FIELD INDICATORS

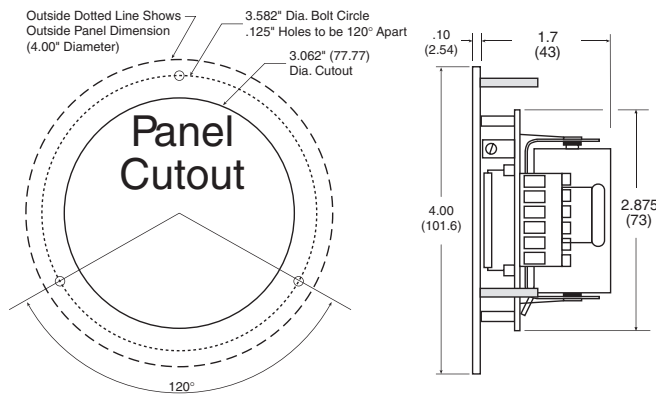
BATPACK



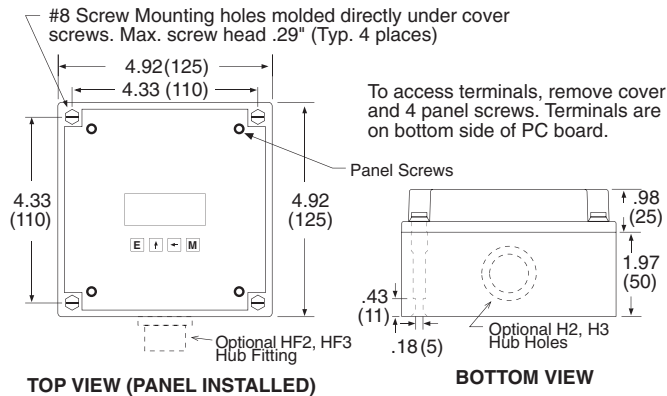
BATRAT-M-0



BATRAT-M-1

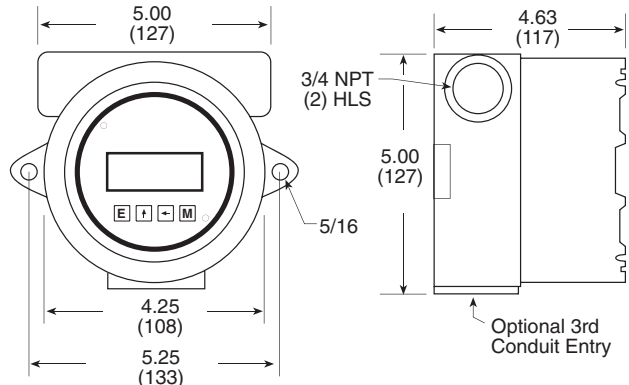


BATRAT-M-2

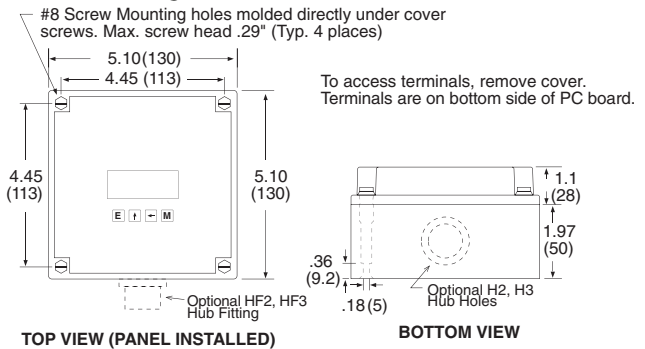


BATRAT-M-3

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

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