SQUIRT-R

LOOP POWERED INDICATOR
INSTRUCTION MANUAL

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SPECIFICATIONS

Description:
Featuring up to 4 1/2 digits of display, the Squirt-R is a loop powered indicator capable of accepting either linear or square root 4-20 mA inputs. Numeric password protection prevents unauthorized access to the menu. The easy to read menu prompts make the Squirt-R so easy to program that you will feel comfortable programming it without the use of a manual.

Specifications:

POWER:
Loop powered 4-20 mA
Internal Battery (Memory only):
3 V 250 mA-H Lithium (2 yr. Standby life)

DISPLAY:
Display: (selectable decimal)
3.5 or 4.5 Digits (selectable), 0.35" High, Display updates once every two seconds.
Rate Descriptors: /SEC, /MIN, /HR or "blank"
Units (totalizer) Descriptors: GAL, LIT, FT3, M3, "blank"
Low Battery Error Detection: "BAT" descriptor & flashing display
Under/Over range Indication: Display flashes when out of range

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

ACCURACY: (Rate @ 20°C)
0.1% Full Scale Resolution, ±1 count
Temperature Drift:
50 ppm/°C Typical 200 ppm/°C Worst Case

LOCKOUT:
Password: Unauthorized menu changes can be pre-vented by entering a user selectable password (5 digit number).
Jumper: An internal jumper shunt is provided for applica-tions requiring a "sealed" menu lockout. Install the jumper to enable the lock. (see Typical Wiring, Pg. 2)

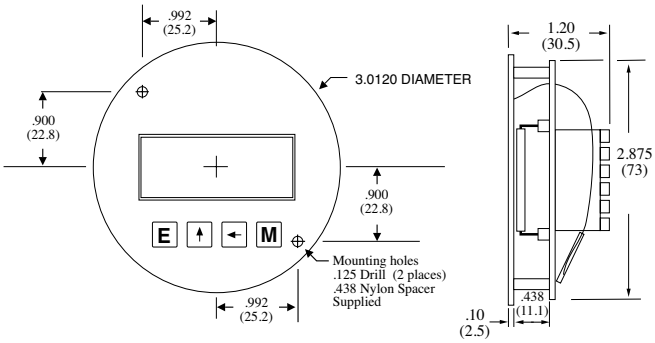
INPUTS:
Signal Input:
Full Scale Range: 4 to 20 mA DC
Loop Voltage Drop: 6 Volts Maximum
Reverse Polarity Protected
Over Current Protection to 60 mA 16 Bit resolution; 1 sample every 2 seconds Low Cutoff supplied to inhibit indications at low flow rates.

CALIBRATION & OPERATION:
Input Scaling: Via front keypad
Calibration: Via front keypad
Decimal Point: Via front keypad
Keypad: 4 tactile feedback keys

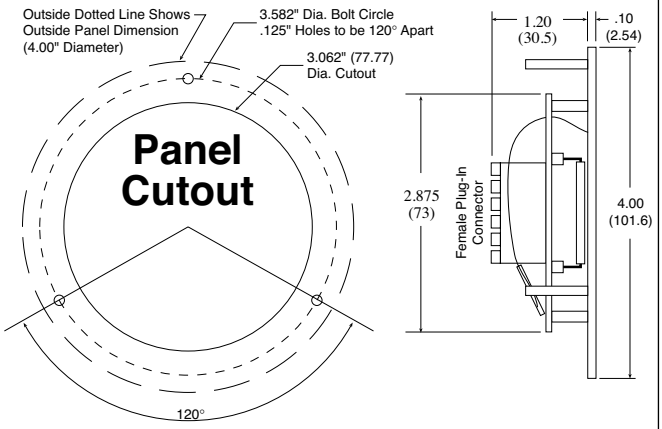
MOUNTING:

0- Circuit Board -	OEM option (consult factory)
1- Panel Mount -	NEMA 4 Front
2- Wall Mount -	NEMA 4X Box (SquirtR 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 Box (SquirtR outside opaque cover)

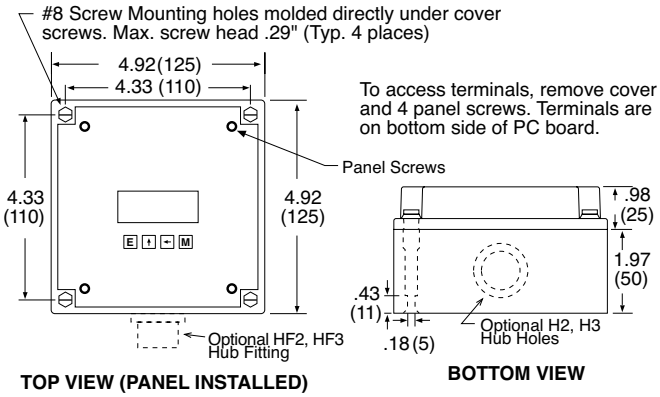
SquirtR-0



SquirtR-1

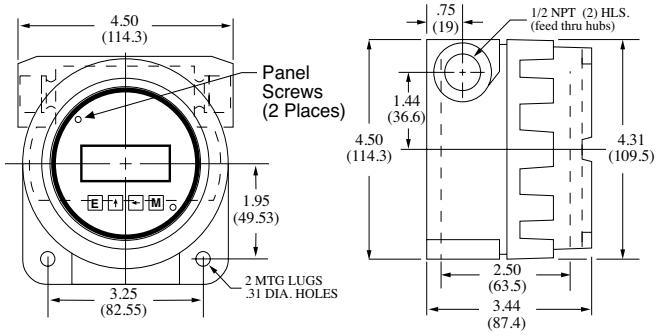


SquirtR-2

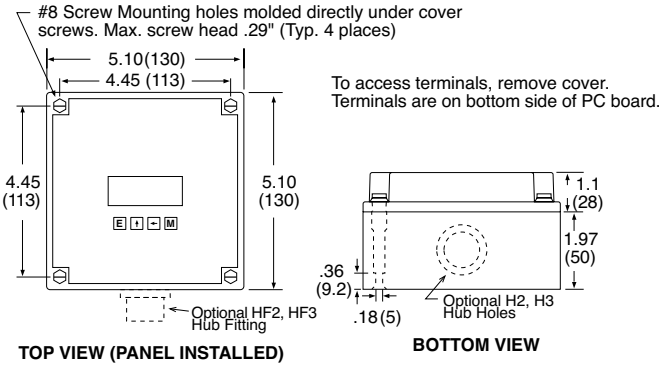


SquirtR-3

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



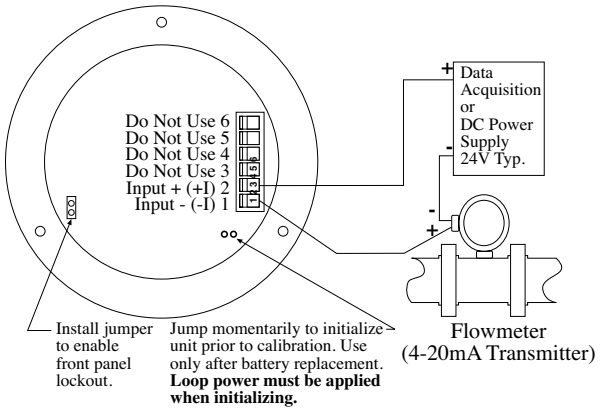
SquirtR-5



Typical Wiring

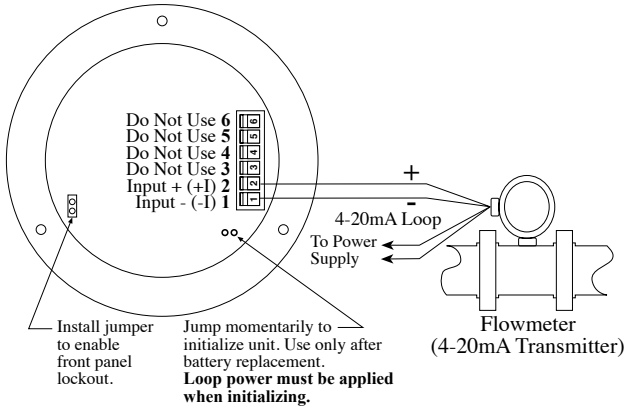
2-Wire Transmitter

Rear View



4-Wire Transmitter

Rear View



DEFINITIONS

EntCodE: (enter code) This prompt will only appear if the panel lock is ON. Enter the password code to enter the program menu. Press the ↑ key to increment each digit. Press the ← key to step to the next digit to the left. Press the **E** key to enter the 4 digit code. If the entered code is correct, the display will advance to the next menu prompt (CLr tot). If incorrect, the display will return to the run mode.

CLr tot: (clear total) Clears (resets) the totalizer. Press the **E** key to clear the total and return to the run mode. Press the **M** key to skip and advance to the next menu selection.

3 or 4: (3.5 or 4.5 digits) Choose between 3.5 or 4.5 digit rate display. Press the ↑ key to step to the desired choice. Press the **E** key to enter the displayed choice.

dEC LoC: (Decimal Location) Sets the decimal location for the display and the rAtE Lo & rAtE Hi settings. Press the ← key to move the decimal. Press the **E** key to enter the displayed decimal location.

tot dESC: (totalizer descriptor) This allows you to display one of the available descriptors on the display (GAL, LIT, FT3, M3 or "blank"). Press the ↑ key to select the descriptor. Press the **E** key to enter the selected descriptor.

rAt dESC: (ratemeter descriptor) Sets the rate descriptor. Choose rate per hour, minutes, seconds or "blank". Press the ↑ key to step to the desired choice. Press the **E** key to enter the displayed descriptor.

inPut: (input type) Choose between linear (Lin) or Square Root Extraction (Sq.u) . Press the ↑ to step to the desired input type. Press the **E** key to enter the displayed choice.

rAtE Lo: (rate low) Sets the low setting for the 4-20 mA analog input. Key in the low rate value which corresponds to the 4mA input. Press the ↑ key to increment each digit. Press the ← key to step to the next digit to the left. Press the **E** key to enter the displayed rate lo value.

rAtE Hi: (rate high) Sets the high setting for the 4-20 mA analog input. Key in the high rate value which corresponds to the 20mA input. Press the ↑ key to increment each digit. Press the ← key to step to the next digit to the left. Press the **E** key to enter the displayed rate hi value.

Lo Cut: (low cutoff) Percent of input span (0.1 to 9.9) below which all inputs will assume the rate lo value. (With LoCut set at 9.9, and rAtELo set to 0, all inputs below 5.6mA will read 0)
CALCULATION EXAMPLE: Given: Cutoff desired at 9.9% span Compute: mA corresponding to 9.9% = ((9.9%*16mA)/100%) + 4mA = 5.6mA

DEFINITIONS
(continued)

CAL: (calibrate; yes or no) Select YES to calibrate the unit, select no to skip the calibration procedure. Press the ↑ key to select YES or NO. Press the **E** key to enter the displayed selection.

CAL Lo: (calibrate low) Apply an accurate 4 mA signal to the input and press the **E** key. If the calibration is successful the unit will display "donE CAL Lo". If the calibration is not successful the display will read "donE CAL Err" see error codes page 7. Press the **M** key to continue.

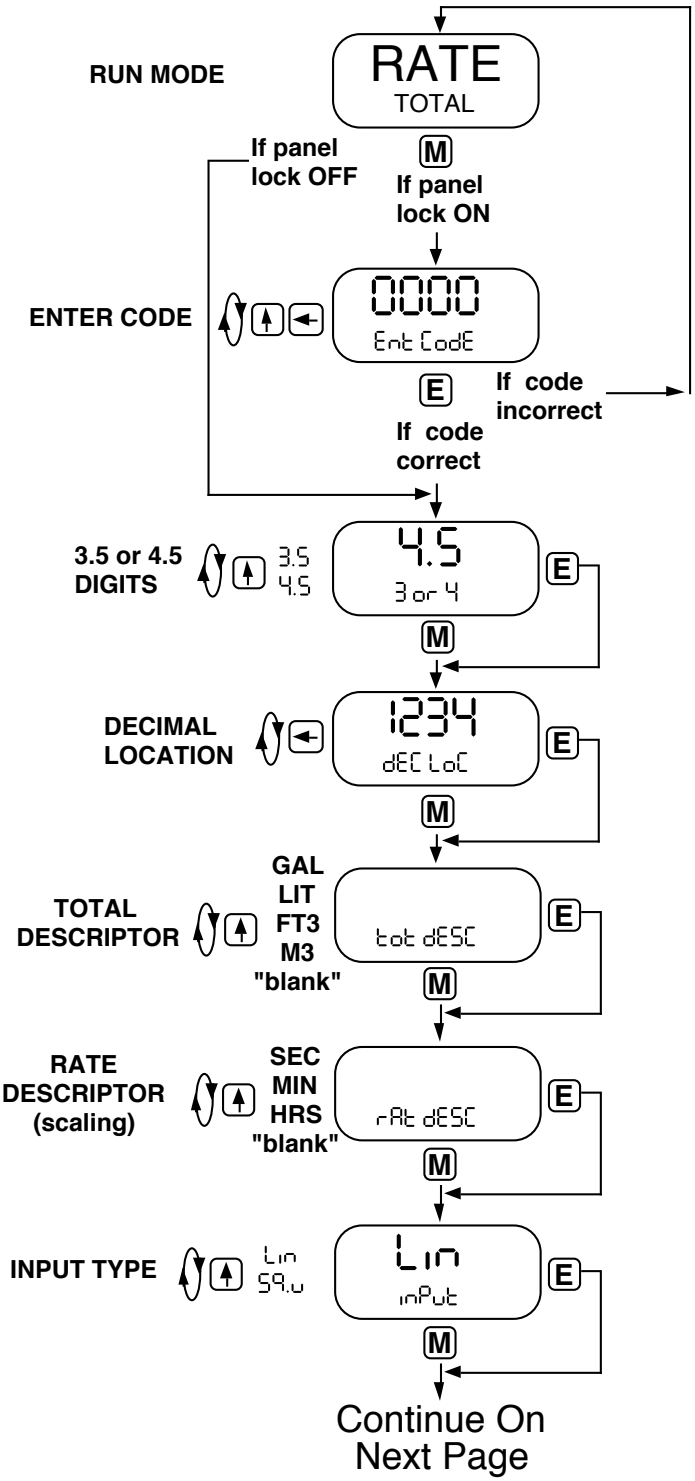
CAL Hi: (calibrate high) Apply an accurate 20 mA signal to the input and press the **E** key. If the calibration is successful the unit will display "donE CAL Hi". If the calibration is not successful the display will read "donE CAL Err" see error codes page 7. Press the **M** key to continue.

LoC CodE: (lock code) Sets the 4 digit lock code to be entered when the unit prompts Ent CodE. This allows the user to gain access to the menu when the unit is locked. Press the ↑ key to increment each digit. Press the ← key to step to the next digit to the left. Press the **E** key to enter the displayed code. (Factory Default Code = 1000)
Record this number for later use!

LoC unit: (lock unit) Sets the panel lock ON or OFF. Press the ↑ key to select YES (ON) or no (OFF). Press the **E** key to enter the displayed selection.
NOTE: A hardware jumper menu lockout is also available. (see Typical Wiring Pg. 2)

PROGRAMMING FLOWCHART

NOTE: All menu selections are saved upon exiting the program menu and returning to the run mode. When making menu changes, do not remove loop power until returning to the run mode.



Press the **M** key to enter the programming menu.

If the panel lock is on, you must enter the 4 digit lock code to gain access to the menu. (Factory Default Code = 1000)

Press the ↑ key to increment each individual digit of the code.
Press the ← key to advance to the next digit.
Press the **E** key to enter the displayed code.
If the code is correct, display advances to "CLr tot", if not, display returns to run mode

Press the ↑ key to step to the desired number of digits.
Press the **E** key to enter the displayed choice.
Press the **M key** to skip and keep the existing choice.

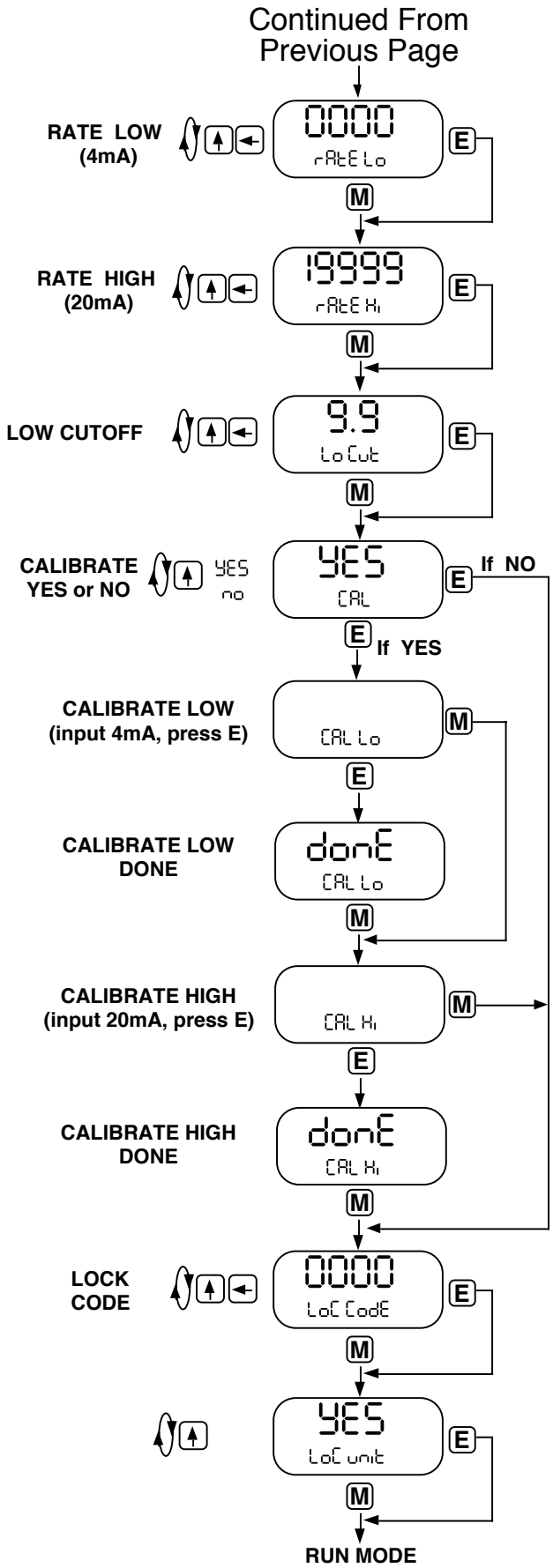
Press the ← key to step the decimal to the next digit.
Press the **E** key to enter the displayed decimal location.
Press the **M key** to skip and keep the existing decimal location.

Press the ↑ key to step to the desired totalizer descriptor.
Press the **E** key to enter the displayed descriptor.
Press the **M** key to skip and keep the existing descriptor.

Press the ↑ key to step to the desired rate descriptor.
Press the **E** key to enter the displayed descriptor.
Press the **M** key to skip and keep the existing descriptor.

Press the ↑ key to step to the desired input type.
Press the **E** key to enter the displayed choice.
Press the **M** key to skip and keep the existing input type.

PROGRAMMING FLOWCHART
(continued)



Press the ↑ key to increment each individual digit of the rate low setting.
Press the ← key to advance to the next digit.
Press the **E** key to enter the displayed value.
Press the **M** key to skip and keep the existing value.

Press the ↑ key to increment each individual digit of the rate high setting.
Press the ← key to advance to the next digit.
Press the **E** key to enter the displayed value.
Press the **M** key to skip and keep the existing value.

Press the ↑ key to increment each individual digit of the low cutoff setting.
Press the ← key to advance to the next digit.
Press the **E** key to enter the displayed value.
Press the **M** key to skip and keep the existing value.

Press the ↑ key to step to cal YES or cal NO.
Press the **E** key to enter the displayed choice.
Press the **M** key to skip and proceed to loc code.

Press the **E** key when 4mA is supplied to the input.
Press the **M** key to skip and proceed to cal hi.

Done will appear to signal that the cal lo was successful.
Press the **M** key to advance to cal hi.

Press the **E** key when 20mA is supplied to the input.
Press the **M** key to skip and proceed to loc code.

Done will appear to signal that the cal hi was successful.
Press the **M** key to advance toloc code.

Press the ↑ key to increment each individual digit of the lock code.
Press the ← key to advance to the next digit.
Press the **E** key to enter the displayed code.
Press the **M** key to skip and keep the existing code.

Press the ↑ key to step to the desired lock setting.
Press the **E** key to enter the displayed lock setting.
Press the **M** key to skip and keep the existing setting.

ERROR CODES

0000
rAtE Err

This error message is displayed when the "RATE LO" value is set equal to or higher than the "RATE HI" value. Press Ⓜ to re-enter the "RATE LO" and "RATE HI" values.

donE
CAL Err

This error message is displayed when the "CAL LO" or "CAL HI" input is set at a value which is out of range (see "CAL LO" and "CAL HI" in programming section for calibrating input ranges). Press Ⓜ to re-enter the "CAL LO" and/or "CAL HI" procedure.

E bAttry

If a low battery / invalid memory condition is detected, the display will flash and the "BAT" descriptor will come on. Press Ⓜ to acknowledge the condition, E BATTERY will be displayed. Replace the battery, reinitialize and recalibrate the unit. (see "Battery Replacement" below).

Battery Replacement

Suggested Battery:
Panasonic BR2330

The polarity of the battery must be correct. Plus (+) must be on top as signified on the conductor arm.

Note: The unit **must** be powered by the loop and reinitialized immediately after battery replacement to prevent early battery discharge.
All menu items must be re-entered and the unit must be re-calibrated.

DECODING PART NUMBER

Example: SQUIRT-R 3 *ET*

SQUIRT
Loop powered; Rate Only
Mounting:
0 = OEM
1 = Panel Mount
2 = NEMA 4X Box (Squirt behind clear cover)
3 = Explosion Proof Housing
5 = NEMA 4X Box (Squirt outside opaque cover)
Options:
ET = Extended Temp.: -22°F to 158°F (-30°C to 70°C)
ATEXCASE** = European Flame Proof ATEX Case (consult factory)
H2 = 0.875" Hole for mounting styles 2 and 5
HF2 = 0.5" Female NPT Hub fitting (mount styles 2 & 5)
H3 = 1.125" Hole for mounting styles 2 and 5
HF3 = 0.75" Female NPT Hub fitting (mount styles 2 & 5)

** Contact factory for latest information

WARRANTY

This product is warranted against defects in materials and workmanship for a period of two (2) years from the date of shipment to Buyer.

The Warranty is limited to repair or replacement of the de-fective unit at the option of the manufacturer. This war-ranty is void if the product has been altered, misused, dismantled, or otherwise abused.

ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED, ARE EXCLUDED, INCLUDING BUT NOT LIMITED TO THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.