

# **Model IN60**

## **4-20 mA Input**

### **Totalizer/Ratemeter**

Installation & Operating Instructions



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## APPLICATION

Batch control, cut to length, packaging, blending. The display may be toggled between total, rate, and grand total. Programmable K-factor makes keying - in engineering units easy. The unit accepts 4-20 mA analog input and provides two separate preset controls.

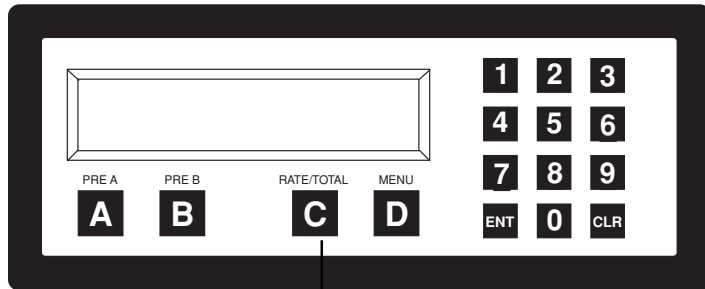
## FEATURES

- \* Analog Input (with Totalizing Integration)
- \* Display Total, Rate or Grand Total
- \* 2 Presets - User Selectable for Total, Rate or Grand Total
- \* K - Factor Programmable to 8 Places
- \* Security Lockout
- \* NEMA 4X Front Panel

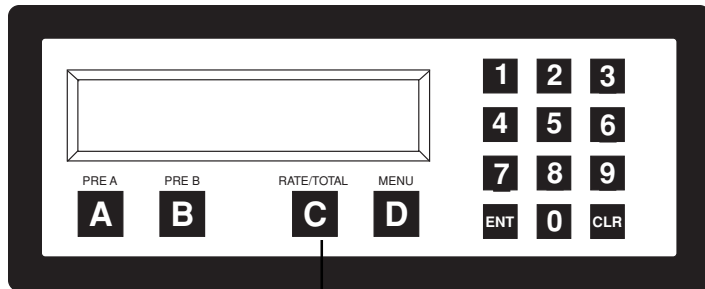
## DESCRIPTION

Featuring 8 digits of bright, .55", alphanumeric display, the analog input version accepts inputs of 4 to 20mA. It uses a highly linear integrator (V to F converter) to generate 0 to 10KHz digital pulses. The unit has two separate, 8 digit, floating decimal, "K" factors to convert the inputs to meaningful count and rate data. The user, with the push of a button, can toggle back and forth to view the total of the batch, the rate of flow and the grand total count.

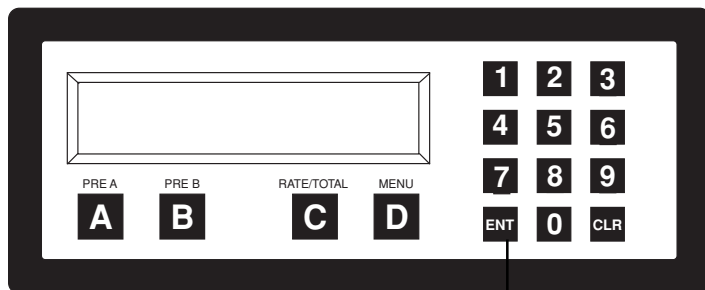
Two controls outputs can be assigned independently by the user to activate at preset batch count, rate or grand total for .1 to 9.9 seconds or until reset externally.



PRESS "C" TO SEE RATE



PRESS "C" AGAIN TO SEE BATCH TOTAL.



PRESS "ENT" TO SEE GRAND TOTAL

## Part Number Breakdown

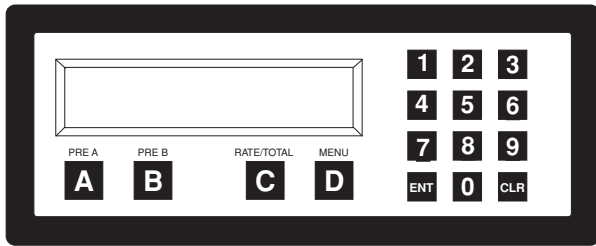
| Part# | Description  |
|-------|--|
| IN-60 | 4-20 mA Analog Input, 110 VAC or 12-27 VDC, 2 Control Relays |

# WORKSHEET

MODEL # \_\_\_\_\_

SERIAL # \_\_\_\_\_

UNIT # \_\_\_\_\_



|                                 |                                  |
|---------------------------------|----------------------------------|
| LOCKOUT CODE _____              |                                  |
| PR-LCK <input type="checkbox"/> | PR-UNLK <input type="checkbox"/> |

## COUNTER

K-FACTOR \_\_\_\_\_

Reset to 0

Set to Preset

DECimal LOCation (0-8)

8    7    6    5    4    3    2    1    0   none

## RATEMETER

K-FACTOR \_\_\_\_\_

WINDOW (02-24) \_\_\_\_

SIGNificant FIGures (1-6) \_\_\_\_

WEIGHT (00-99) \_\_\_\_

PRESET A \_\_\_\_\_

PRESET B \_\_\_\_\_

RELAY

A TOTAL

A GRand TOTal

A RATE

DURation of A (0.0-9.9) \_\_\_\_ . \_\_\_\_

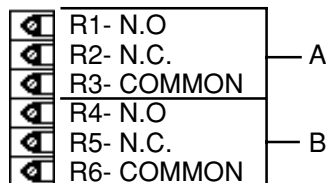
B TOTAL

B GRand TOTal

B RATE

DURation of B (0.0-9.9) \_\_\_\_ . \_\_\_\_

- 1- NOT USED
- 2- SCALED OUTPUT O.C.
- 3- ANALOG OUTPUT (SINK)
- 4- INPUT A (PULSE/ANALOG)
- 5- RESET INPUT
- 6- NOT USED
- 7- NOT USED
- 8- NOT USED
- 9- NOT USED
- 10- NOT USED
- 11- GROUND (-DC)
- 12- GROUND (-DC) INPUT COMMON
- 13- +12 VDC OUT
- 14- +DC POWER IN
- 15- ISOLATED -12VDC
- 16- ISOLATED +12VDC
- 17- AC IN
- 18- AC IN
- 19- NOT USED
- 20- NOT USED



# SETUP PROCEDURE

**NOTE:** Start here and finish to the end. If you make a mistake, press ENT until you reach the beginning.

STEP  
1  
SETTING  
PRESET A

|  |   |
|--|---|
| <u>PRESS</u>   | <u>DISPLAY</u>                            |
| <b>A</b> (FINAL PRESET)                                | <b>PRESET A</b><br>THEN FLASHING PRESET # |
| <b>CLR</b>   | 0 FLASHES                                 |
| <b>1</b> <b>2</b> <b>3</b> <b>4</b><br>(SAMPLE PRESET) | 1 2 3 4 PRESET FLASHES                    |
| <b>ENT</b>   | 1 2 3 4 IS ENTERED                        |

STEP  
2  
SETTING  
PRESET B

|   |   |
|---|---|
| <b>B</b> (PREWARN)                                      | <b>PRESET B</b><br>THEN FLASHING PRESET # |
| <b>CLR</b>  | 0 FLASHES                                 |
| <b>1</b> <b>2</b> <b>0</b> <b>0</b><br>(SAMPLE PREWARN) | 1 2 0 0 PRESET FLASHES                    |
| <b>ENT</b>  | 1 2 0 0 IS ENTERED                        |

STEP  
3  
SETTING  
THE  
COUNTER

|   |   |
|---|---|
| <b>D</b>  | <b>MENU</b> FLASHES TO <b>DEV TYP</b> ↓                                   |
| <b>ENT</b>  | <b>RT</b> ↓ <b>CNT</b> ↓ (RATE OR COUNT)                                  |
| <b>D</b> (SET UP COUNTER)   | <b>K FACTOR</b> FLASHES; THEN SHOWS<br>CURRENT K-FACTOR                   |
| <b>CLR</b>  | 0 FLASHES   |
| <b>1</b> <b>D</b> <b>2</b> <b>7</b> <b>8</b><br>(PRESS D FOR DECIMAL POINT)<br>K FACTOR IS DIVIDER. IT CONVERTS INPUT TO ENGINEERING UNITS. | 1 . 2 7 8 FLASHES   |
| <b>ENT</b> (K FACTOR ENTERED)   | <b>R0</b> ↓ <b>SP</b> ↓ (RESET TO 0 "ADD" OR SET TO<br>PRESET "SUBTRACT") |
| <b>B</b> OR <b>D</b>  | SELECTS <b>R0</b> OR <b>SP</b>  |
| <b>ENT</b> SELECTION ENTERED  | <b>DEC LOC</b> (DECIMAL LOCATION)   |
| PRESS ANY NUMBER  | DECIMAL POINT MOVES TO THAT POSITION                                      |
| <b>ENT</b>  | LAST COUNT READING  |

STEP  
4  
**SETTING  
THE  
RATEMETER**

|  |  |
|--|--|
| <u>PRESS</u>   | <u>DISPLAY</u>                                       |
| <b>D</b>   | <b>MENU FLASHES TO DEV TYP ↓</b>                     |
| <b>ENT</b>   | <b>RT ↓ CNT ↓ (RATE OR COUNT)</b>                    |
| <b>B</b> (SET UP RATEMETER)  | <b>K FACTOR FLASHES; THEN SHOWS CURRENT K-FACTOR</b> |
| <b>CLR</b>   | <b>0 FLASHES</b>                                     |
| <b>1 7 D 8</b><br>(PRESS D FOR DECIMAL POINT)<br>K FACTOR IS DIVIDER. IT CONVERTS INPUT TO ENGINEERING UNITS.  | <b>17.8 FLASHES</b>                                  |
| <b>ENT</b> (K FACTOR ENTERED)  | <b>WINDOW ##</b>                                     |
| <b>CLR</b>   | <b>WINDOW 00</b>                                     |
| <b>5</b> (AS AN EXAMPLE)<br>(EXTENDS THE SAMPLING WINDOW TO 5 SECONDS)   | <b>WINDOW 05</b>                                     |
| <b>ENT</b> (WINDOW ENTERED)  | <b>SIG FIG ##</b>                                    |
| <b>CLR</b>   | <b>SIG FIG 00</b>                                    |
| <b>6</b> (AS AN EXAMPLE)<br>(SIG FIG INDICATES HOW MANY MEANINGFUL DIGITS ARE SHOWN TRAILING ZEROS ARE INSERTED IF NECESSARY)  | <b>SIG FIG 06</b>                                    |
| <b>ENT</b> (SIG FIG ENTERED)   | <b>WEIGHT #.#</b>                                    |
| <b>CLR</b>   | <b>WEIGHT 0.0</b>                                    |
| <b>9 9</b> (AS AN EXAMPLE)<br>WEIGHT IS AN AVERAGING FACTOR. HIGHER SETTINGS PROVIDE MORE AVERAGING, FOR A MORE STABLE DISPLAY. DERIVED FROM: $\frac{(\text{OLD DATA} \times \text{"WEIGHT"} + \text{NEW DATA})}{(\text{"WEIGHT"} + 1)}$ | <b>WEIGHT 9.9</b>                                    |
| <b>ENT</b> (WEIGHT ENTERED)  | <b>LAST COUNT READING</b>                            |

STEP  
5  
**SETTING  
LOCKOUT  
CODE**

|  |  |  |
|--|--|--|
|  | <b>MENU FLASHES TO DEV TYP ↓</b>                                 |  |
| <b>D</b>                               | <b>LOCKOUT ↓</b>   |  |
| <b>ENT</b> (LOCKOUT SELECTED)          | <b>CODE FLASHES; THEN SHOWS OLD CODE #.</b>                      |  |
| <b>CLR</b>                             | <b>0 FLASHES</b>   |  |
| <b>1 1 1 1</b> (AS AN EXAMPLE)         | <b>1 1 1 1 FLASHES</b>   |  |
| <b>ENT</b> (CODE ENTERED)              | <b>PR LCK ↓</b><br>(LOCKOUT OF FRONT PANEL)                      | <b>PR UNLK ↓</b><br>(LOCKOUT OF ALL FRONT BUTTONS EXCEPT PRESETS A, B AND CLR) |
| <b>ENT</b> (LOCKOUT SELECTION ENTERED) | <b>LAST COUNT READING</b>  |  |
| <b>1 1 1 1</b>                         | <b>LOCK ON FLASHES</b><br>(APPROPRIATE PANEL CHANGES LOCKED OUT) |  |
| <b>1 1 1 1</b>                         | <b>LOCK OFF FLASHES</b><br>(PANEL CHANGES ALLOWED)               |  |

STEP  
6

**SETTING  
RATE OR  
COUNT FOR  
ANALOG  
OUTPUT**

**SKIP IF NOT  
USED**

| <u>PRESS</u>  | <u>DISPLAY</u>                                    |
|---|---|
| <b>D</b>  | <b>MENU FLASHES TO DEV TYP ↓</b>                  |
| <b>D</b>  | <b>LOCKOUT ↓</b>                                  |
| <b>D</b>  | <b>OUTCARD ↓</b>                                  |
| <b>D</b>  | <b>ALG OUT ↓</b>                                  |
| <b>ENT</b> (ANALOG SETUP SELECTED)  | <b>ANLG RT ↓</b> (4-20mA OUTPUT FOR RATE)         |
| <b>D</b> (PRESS D TO TOGGLE BETWEEN SELECTIONS)   | <b>ANLG CT ↓</b> (4-20mA OUTPUT FOR COUNT)        |
| <b>ENT</b> (ANLG RT OR ANLG CT SELECTED)  | <b>SET LOW</b> FLASHES THEN CURRENT LOW SETTING   |
| <b>CLR</b>  | <b>0</b> FLASHES                                  |
| <b>1 2 5 D 5</b><br>(PRESS D FOR DECIMAL POINT)<br>AS AN EXAMPLE (IN THIS CASE 125.5 = 4mA)   | <b>1 2 5 . 5</b> FLASHES                          |
| <b>ENT</b> (LOW SET AT 125.5)   | <b>SET HIGH</b> FLASHES THEN CURRENT HIGH SETTING |
| <b>CLR</b>  | <b>0</b> FLASHES                                  |
| <b>1 5 0 D 7</b><br>(PRESS D FOR DECIMAL POINT)<br>AS AN EXAMPLE (IN THIS CASE 150.7 = 20 mA) | <b>1 5 0 . 7</b> FLASHES                          |
| <b>ENT</b> (HIGH SET AT 150.7)  | LAST COUNT READING                                |

STEP  
7

**SETTING  
OUTPUT  
PULSE  
FREQUENCY**

**SKIP IF NOT  
USED**

|                                     |   |
|-------------------------------------|---|
| <b>D</b>                            | <b>MENU FLASHES TO DEV TYP ↓</b>        |
| <b>D</b>                            | <b>LOCKOUT ↓</b>                        |
| <b>D</b>                            | <b>OUTCARD ↓</b>                        |
| <b>D</b>                            | <b>ALG OUT ↓</b>                        |
| <b>D</b>                            | <b>OUT FREQ ↓</b>                       |
| <b>ENT</b> (OUT FREQUENCY SELECTED) | <b>2000 ↓</b> (DISPLAYS LAST SELECTION) |
| <b>D</b>                            | <b>200 ↓</b>                            |
| <b>D</b>                            | <b>10 ↓</b>                             |
| <b>D</b>                            | <b>20000 ↓</b> (PRESS D TO GO TO 2000)  |
| <b>ENT</b> (PRESS AS DESIRED)       | LAST COUNT READING                      |

**STEP  
8  
SETTING  
RELAY  
FUNCTION  
AND  
ON TIMES**

| PRESS                             | DISPLAY  |
|-----------------------------------|--|
| <b>D</b>                          | <b>MENU FLASHES TO DEV TYP ↓</b>                         |
| <b>D</b>                          | <b>LOCKOUT ↓</b>   |
| <b>D</b>                          | <b>OUTCARD ↓</b>   |
| <b>D</b>                          | <b>ALG OUT ↓</b>   |
| <b>D</b>                          | <b>OUT FREQ ↓</b>  |
| <b>D</b>                          | <b>RELAY ↓</b>   |
| <b>ENT</b> (RELAY SELECTED)       | <b>A GR TOTAL ↓</b> (RELAY A SET TO GRAND TOTAL)         |
| <b>D</b>                          | <b>A RATE ↓</b> (IF RATE SELECTED, DURATION IS DISABLED) |
| <b>D</b>                          | <b>A TOTAL ↓</b> (RELAY A SET TO TOTAL)                  |
| <b>ENT</b> (PRESS AS DESIRED)     | <b>DUR A ##</b>  |
| <b>CLR</b>                        | <b>DUR A 0.0</b>   |
| <b>1</b> <b>2</b> (AS AN EXAMPLE) | <b>DUR A 1.2</b> (RELAY ACTIVATES FOR 1.2 SEC.)          |
| <b>ENT</b> (ON TIME ENTERED)      | <b>B RATE ↓</b> (IF RATE SELECTED, DURATION IS DISABLED) |
| <b>D</b>                          | <b>B TOTAL ↓</b> (RELAY B SET TO TOTAL)                  |
| <b>D</b>                          | <b>B GR TOTAL ↓</b> (RELAY B SET TO GRAND TOTAL)         |
| <b>ENT</b> (PRESS AS DESIRED)     | <b>DUR B ##</b>  |
| <b>CLR</b>                        | <b>DUR B 0.0</b>   |
| <b>5</b> <b>5</b> (AS AN EXAMPLE) | <b>DUR B 5.5</b> (RELAY ACTIVATES FOR 5.5 SEC.)          |
| <b>ENT</b> (ON TIME ENTERED)      | LAST COUNT READING                                       |

**VIEWING  
RATE,  
BATCH  
TOTAL,  
GRAND  
TOTAL**

|            |   |
|------------|---|
| <b>C</b>   | <b>R #####</b> (RATE READING)   |
| <b>C</b>   | <b>#####</b> (BATCH TOTAL)<br>PRESS C TO GO BACK TO RATE AGAIN  |
| <b>ENT</b> | <b>GR TOTAL</b> FLASHES THEN THE GRAND TOTAL VALUE FLASHES  |
| <b>ENT</b> | <b>#####</b> (BATCH TOTAL)<br>PRESS C TO GO BACK TO RATE AGAIN<br>PRESS ENT TO GO BACK TO GRAND TOTAL |



## SPECIFICATIONS

### Display

8 Digit, .55" Segment, Red Orange, LED.

### Input Power

A: 110 VAC  $\pm 15\%$  or 12 to 27 VDC

### Current

Maximum 5.3 VA at rated AC voltage.

### Output Power

+12 VDC at 100mA. Separate isolated 12 VDC at 100mA to allow +12 VDC or +12 VDC regulated  $\pm 5\%$  worst case.

### Memory

EEPROM stores all program and count data for minimum of 10 years if power is lost.

### Analog Inputs

The current loop input is converted to a highly linear 0 to 10KHz frequency. This frequency can then be scaled by the 8 digit K - Factors to count or display rate in separate engineering units.

Accuracy over full temperature range:

Zero error:  $\pm 0.175\%$  full scale max.

Overall error:  $\pm 0.5\%$  full scale max.

### Reset

Front push button: "CLR" resets displayed number and control output.

Remote: 3 to 30 VDC positive edge resets batch counter and control output.

Impedance: 10K to ground (-DC)

Minimum pulse: 5 msec

### Temperature

Operating: +32°F (0°C) to +130°F (+54°C)





















Storage: -40°F (-40°C) to +200°F (+93°C)







### Control Outputs

SPDT Relay Version:

10A 120/240 VAC or 28 VDC (Standard)

## TERMINATIONS

|  |                               |
|--|-------------------------------|
|   | 1- NOT USED                   |
|   | 2- SCALED OUTPUT O.C.         |
|   | 3- ANALOG OUTPUT (SINK)       |
|   | 4- INPUT A (PULSE/ANALOG)     |
|   | 5- RESET INPUT                |
|   | 6- NOT USED                   |
|   | 7- NOT USED                   |
|   | 8- NOT USED                   |
|   | 9- NOT USED                   |
|   | 10- NOT USED                  |
|   | 11- GROUND (-DC)              |
|   | 12- GROUND (-DC) INPUT COMMON |
|   | 13- +12 VDC OUT               |
|   | 14- +DC POWER IN              |
|   | 15- ISOLATED -12VDC           |
|   | 16- ISOLATED +12VDC           |
|   | 17- AC IN                     |
|   | 18- AC IN                     |
|   | 19- NOT USED                  |
|  | 20- NOT USED                  |

|   |            |     |
|---|------------|-----|
|    | R1- N.O    | — A |
|    | R2- N.C.   |     |
|   | R3- COMMON |     |
|  | R4- N.O    | — B |
|  | R5- N.C.   |     |
|  | R6- COMMON |     |

## **OPERATIONS**

### **Presets**

Two control presets are provided on the unit. The preset numbers can be made to flash without interrupting the control function by pressing "A" (Preset A) or "B" (Preset B). Press "ENT" to return to rate or total display. Change the preset by clearing the flashing preset number and keying in a new number before pressing the "ENT" button. (Count pulses may be lost if the preset is changed while pulses are coming in.) In the "Relay Set-Up" the user selects either one or both preset outputs to be activated the total, grand total, or rate. If selected for total or grand total the outputs can be set to activate the preset relay for 0.1 to 9.9 seconds or latch (0.0 setting) until reset. If selected for rate control, the rate will be compared with the preset at each display update and the output activated if the rate is equal or greater than the preset. The output drops out again only if the rate drops below the preset. If the rate goes out of scale, the display will show all "F" and the output will remain in the state prior to going out of scale.

### **Lockout**

Unauthorized front panel changes can be prevented by entering a user selected 4-digit code, in the "LOCKOUT" mode. A (2) level "LOCKOUT" offers the user the option to "LOCKOUT" all front panel changes or "LOCKOUT" all but preset A, B, and CLR. The status of the unit can be observed but, "LOCK ON" appears if changes are attempted. Entering the code returns the unit to "LOCK OFF" status.

## **RATEMETER**

Accurate to 5 1/2 digits ( $\pm 1$  display digit). The rate meter can be programmed to display any unit of measurement by simply dialing in the proper "K" factor.

Press the "C" button while the units is displaying the total to display the rate; "R" is displayed on the left side of the display.

### **K-FACTOR**

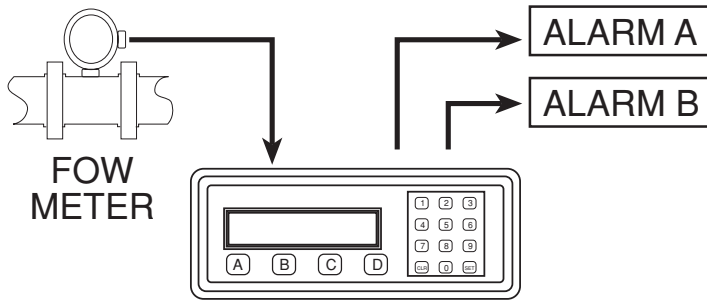
The K-Factor is used to convert the frequency generated internally by the analog input to engineering units. The 8 digit K-Factor dividers, with decimal keyed into any position, allow easy direct entry of any K-Factor greater than 0.0001 to 99999999.

Separate K-Factors may be entered for the count and rate section. Thus, you may batch and total in gallons and display rate in liters per hour. The maximum factored rate is 7 digits.

## **COUNTER**

Each of the total and grand total counters have 8 digits. In the set-up mode choose "RO" (reset to zero) for adding operation or "SP" (set to preset) for subtracting operation. While viewing the count, the display can be made to flash the grand total. While flashing the grand total, CLR resets the grand total counter.

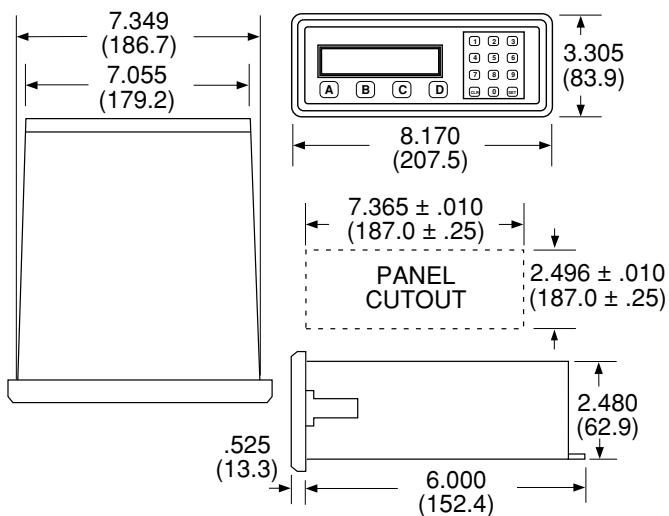
## APPLICATION



The unit monitors the Flow and displays the rate, total or grand total usage. Either control Relay A or Relay B can be activated by rate, total or grand total readings. If Relay A is set for rate, it can activate an alarm for load management if the preset usage is exceeded. Relay B can be set to activate at any rate, total or grand total alarm setting.

## MOUNTING DIMENSION

Dimensions are in inches (mm)



## ANALOG INPUTS

The analog input versions accept signals from transmitters that give linear outputs. The input signal modules are mounted just behind the display and are calibrated for the input specified. Insure that the sensor output matches the unit input.

## CALCULATING THE K- FACTORS

The analog inputs are converted to a highly linear 0 to 10000 pulse per second frequency. The high level of any analog input will generate this 10000 Hz frequency. The pulses go directly to the central processor. The K- Factors are used to convert the pulses into the correct units of measurement.

**Rate K- Factor:**  $10000/R$ , where R = high output rating (20mA or 5V) of transmitter. 10000 divided by 20mA or 5V rating of transmitter. Eg. 20mA rating of transmitter is 250 gal. per min. The rate K - Factor to key into the unit for gal. per min. is 40 (10000 divided by 250).

If a rate is desired in a different unit of measure or a different timebase, factor the transmitter rating to the unit of measure and timebase desired and use the formula above. Eg. 5V output rating of a transmitter is 300 gal. per min. and rate desired is liters per hr. The factored rate for this transmitter for liters per hr. is 68135.94 (300 x 3.78533 [gal. to liters] x 60 [min. to hr.]). The rate K - Factor for liters per hr. is 0.1467654 (10000 divided by 68135.94).

**Counter K-Factor:** =  $10,000/R/Sec$ , where R = High output rating (20mA or 5V) of transmitter factored to rate per second. Eg. 20mA rating of transmitter is 500 gal. per min. Rate per sec. is 8.3333333 (500 divided by 60). Counter K-Factor to key into unit is 1200 (10000 divided by 8.3333333).

If a different unit of measure is desired, factor the given transmitter rating to the desired unit of measure in units per second and use the formula above. Eg. 5V rating of transmitter is 250 gal. per hr. and it is desired to totalize in liters. Rate in liters per second is .2628701 (250 x 3.78533 [gal. to liters] divided by 3600 [hr. to sec]). Counter K-Factor to key into unit to totalize in liters from 250 gal. per hr. transmitter is: 38041.603 (10000 divided by .2628701).

## RESET

### REMOTE

The reset is positive edge active; once reset, the unit will accept new data even if reset is held. Applying a 3 to 30VDC pulse of minimum 5 msec resets the batch counter and control output. Impedance 10K to ground (-DC).

### FRONT PUSH BUTTON RESET

Pressing the front CLR button will reset the control output and any displayed number (load the "Preset A" number into the display if "SP", subtracting mode of operation, has been selected).

### AUTO RESET

To recycle the unit, choose the preset which is to activate the reset and set it's "Relay Duration" as short as possible. Place a 10K Ohm resistor between reset (Pin 5) and the chosen transistor output for the preset chosen (Pin 19 or Pin 20). The relay acts as a pull up resistor and the unit resets after the control output "times out". After the unit is reset it will operate even though the reset is high. The reset is edge triggered and only resets when the input goes high. Note that if Pin 5 is pulled high by a resistor, it must be pulled low a min. of 5 msec and then allowed to go high to reset the unit.

### FACTOR/"DATA LOST"/"RFFF..."

The K- Factor is used to convert the frequency generated internally by the analog input to engineering units. The 8 digit K -Factor dividers, with decimals keyed into any position by use of the "D" button, allows easy direct entry of the desired K - Factor. A separate K - Factor may be entered for the count and rate section. Thus you may batch and total in gallons and display rate in liters per hour.

NOTE: If the counter K - Factor is .0001 or less or if the factored count speed exceeds 20000 CPS, "DATA LOST" flashes. If the input divided by the rate K - Factor exceeds 7 digits "RFFF..." flashes. These alarms indicate that the factored speed has been exceeded and data is invalid. Increase the K - Factor divider.

### COUNTER

The unit accumulates up to 8 digits of batch and grand total count. In the setup mode choose "R0" (Reset to Zero ) for adding operation or "SP" (Set to Preset) for subtracting operation. While running display can be made to display an 8 digit grand total by pressing "ENT" while the unit is running. Activating "CLR" while the grand total is flashing,

resets the grand total counter.

### PRESETS

The unit has two independent presets. In the setup mode the user selects whether the Counter, Rate Meter or Grand Total counter activates either or both Preset A and Preset B outputs. The preset numbers can be displayed or updated at any time by pressing "A" (Preset A) or "B" (Preset B). Enter the flashing preset number or press "CLR" and key in a new number and "ENT" to enter it.

If the Total or Grand Total counter is set to control an output, that output will activate for the time duration selected under "RELAY" when the counter reaches the selected preset number.

If the Rate is set to control and output, that output will be activated when the rate equals or exceeds the preset rate and drop out again when the rate goes below the preset rate. Note that the preset for rate can be entered with decimal when keying in the rate preset number.

## **RELAY - OUTPUT TIMING**

Control output timing is selected by pressing D until the RELAY mode is selected and entered. Any time duration from .1 to 9.9 seconds or latch until reset (0.0 setting) may be entered for the A and B outputs. Once the output has been activated, the unit must be reset before another output will occur.

## **RATE METER**

Accurate to 5 1/2 digits (+ one display digit); the ratemeter is autoranging and can be programmed by the K - Factor to display almost any engineering unit of measurement. To display the rate press the "C" (RATE/TOTAL) button while the unit is displaying the batch. "R" is displayed on the left side of the display to indicate that rate is being displayed.

1 to 6 "SIG FIG" (significant figures) can be selected in the set up mode. The unit will normally display the number of digits selected. The unit is auto ranging and will place the decimal within these digits to display the true factored rate. If the rate, scaled by the K - Factor, has more digits to the left of the decimal point than the number of significant digits selected, additional zeros will be added to fill in digit spaces to the left of the decimal place. Eg. Factored rate is 123.456. A: "SIG FIG" set 4, display reads 123.4 B: "SIG FIG" set 2, display reads 120. This allows the user to show either the exact rate with the least significant digits changing with only a slight rate change or to create a more stable display by showing zeros in the less significant digits.

NOTE: If the rate exceeds 7 digits, the display shows "RFF..." indicating speed has been exceeded.

## **LOCKOUT**

Unauthorized front panel changes can be prevented by entering a four digit code chosen by the user in the LOCK-OUT setup mode. The unit leaves the factory with code 1,000. (If a code of less than 4 digits has been entered, the unit adds prefix "0's" to make a four digit code.) The selected code should be recorded in a safe place. A choice of two level lockout offers the user the option to lockout all front panel changes or lock out all but presets A, B and CLR. Entering the code in the set up mode does not disable the keypad, but keying in the four digit code while in the run mode will activate "LOCK ON". The status of the presets, rate and grand total can be viewed but "LOCK ON" appears if changes are attempted. Only by keying in the four digit code into the keypad while the unit is in the run mode will the unit return to the "LOCK OFF" status.

## **REMOVING THE CASE**

To install or change the input or data interface cards, the case must be removed. Before opening case, remove all power. CMOS logic is used. Use standard precautions against damage by static discharge. Remove the six (6) flat head 4-40 x 1/4" screws behind the panel and lift off the panel/lens assembly. Slide the main board display out the front of the case. Once modifications are made, reverse the procedure to re-assemble the unit, insuring that the main board is in the track. The six (6) screws that hold the panel must be tight to seal the rubber keypad panel assembly, approximately 0.6 in" lb. torque.