Model RT Rate Totalizer

Installation, Operation Manual

WARNING

This instrument contains electronic components that are susceptible to damage by static electricity. Proper handling* procedures must be observed during the removal, installation, or handling of internal circuit boards or devices.

*Handling Procedure

1. Power to unit must be removed.

2. Personnel must be grounded, via wrist strap or other safe, suitable means, before any printed circuit board or other internal device is installed, removed or adjusted.

3. Printed circuit boards must be transported in a conductive bag or other conductive container. Boards must not be removed from protective enclosure until the immediate time of installation. Removed boards must be placed immediately in protective container for transport, storage, or return to factory.

Comments

This instrument is not unique in its content of EDS (electrostatic discharge sensitive) components. Most modern electronic designs contain components that utilize metal oxide technology (NMOS, CMOS, etc.). Experience has proven that even small amounts of static electricity can damage or destroy these devices. Damaged components, even though they appear to function properly, exhibit early failure.

TABLE OF CONTENTS

DESCRIPTION & SPECIFICATIONS

Description:
Featuring 6 digits of bright, 7-segment LED displays, this unit is an integrating totalizer/ratemeter which accepts analog signal inputs. The unit can be field programmed to accept 0-20mA, 4-20mA, 0-5V, 0-10V or 1-5V signals. A 4-20mA output option is available to control strip recorders or other peripherals. Two assignable set points are standard for two stage shut off. The full scale setting is programmable from the front panel. By pressing the "view" button, the unit will display: integrated total, rate, peak or valley.

Specifications:
Display: 6 digit, .55" high, 7 segment, red orange, LED.
Input Power: 110 VAC ± 15% or 12 to 24VDC.
Current: maximum 300 mA DC or 8.0 VA at rated AC voltage.
Output Power: (AC powered units only) + 24VDC @ 100mA regulated ±5%
Temperature:
Operating: +41°F (5°C) to +130°F (+54°C).
Storage: -40°F (-40°C) to +200°F (93°C).
Memory: EEPROM stores data for ten years if power is lost.
Reset:
Front Panel: resets displayed values and control outputs.
Remote: 4-30VDC positive edge, resets totalizer and control outputs.
Output:
Type: Open collector sinks 250mA from 30VDC when active.
Usage: rate alarm, total alarm, scaled pulse output for remote totalizers.
Analog Out: The full scale setting is programmable from the front panel. A sinking driver generates a corresponding linear current through the external devices. The output updates with each update of the rate. Accuracy is ±0.25% FS worst case. Compliance voltage must be 3 to 30 VDC non inductive. (The unit can provide the DC source as long as the drop across the devices being driven does not exceed 21V).
Input:
Type: Linear 0-20mA, 4-20mA, 0-5V, 0-10V or 1-5V selectable from the front panel.

Input Impedance: Current: 100Ω; Voltage: 115KΩ
Calibration: The unit does all of the calibrations internally. There are no potentiometers to adjust and the unit never needs to be removed from the case.
Set Points: Two control set points are provided. The set point outputs can be assigned to rate or total or pulse scaling. The unit comes standard with two open collector control outputs. The outputs are programmable from 0.01 to 599.99 sec or latched until reset when assigned to the total or pulse and a hysteresis (alarm range) when assigned to the rate.
Rate Display: Updates 5 times per second, Accurate to 4.5 digits.
Totalizer: Integrates from the rate reading and accumulates up to 6 digits of total count. The time base (seconds, minutes, hours or days) and totalize conversion factor are field programmable from the front panel.
Programming: Decimal points, Scaling from 0 to 59999 units per selected time base, set points, input type, security lock code, and assigning outputs are all programmable from the front panel.
Housing: Standard 1/8 DIN, high impact ABS plastic case (NEMA 4/IP65 front panel).
Shipping Weight: 2 lbs.
Overvoltage Protection:
50 V
Overcurrent Protection:
50 mA
Resolution: 14.5 Bits
Accuracy:

RANGE	% FS ERROR (worst case)	% FS ERROR (typical)
4-20 mA	0.1%	.05%
0-10 VDC	0.2%	0.1%
0-5 VDC	.25%	.15%
1-5 VDC	.25%	.15%

Square Law: (above 5% of bottom range) 0.1% (5V inputs .4%) Worst case over complete range: 2%

Temperature Stability: Will not drift more than 20 parts per million per °C from 5°C to 54°C
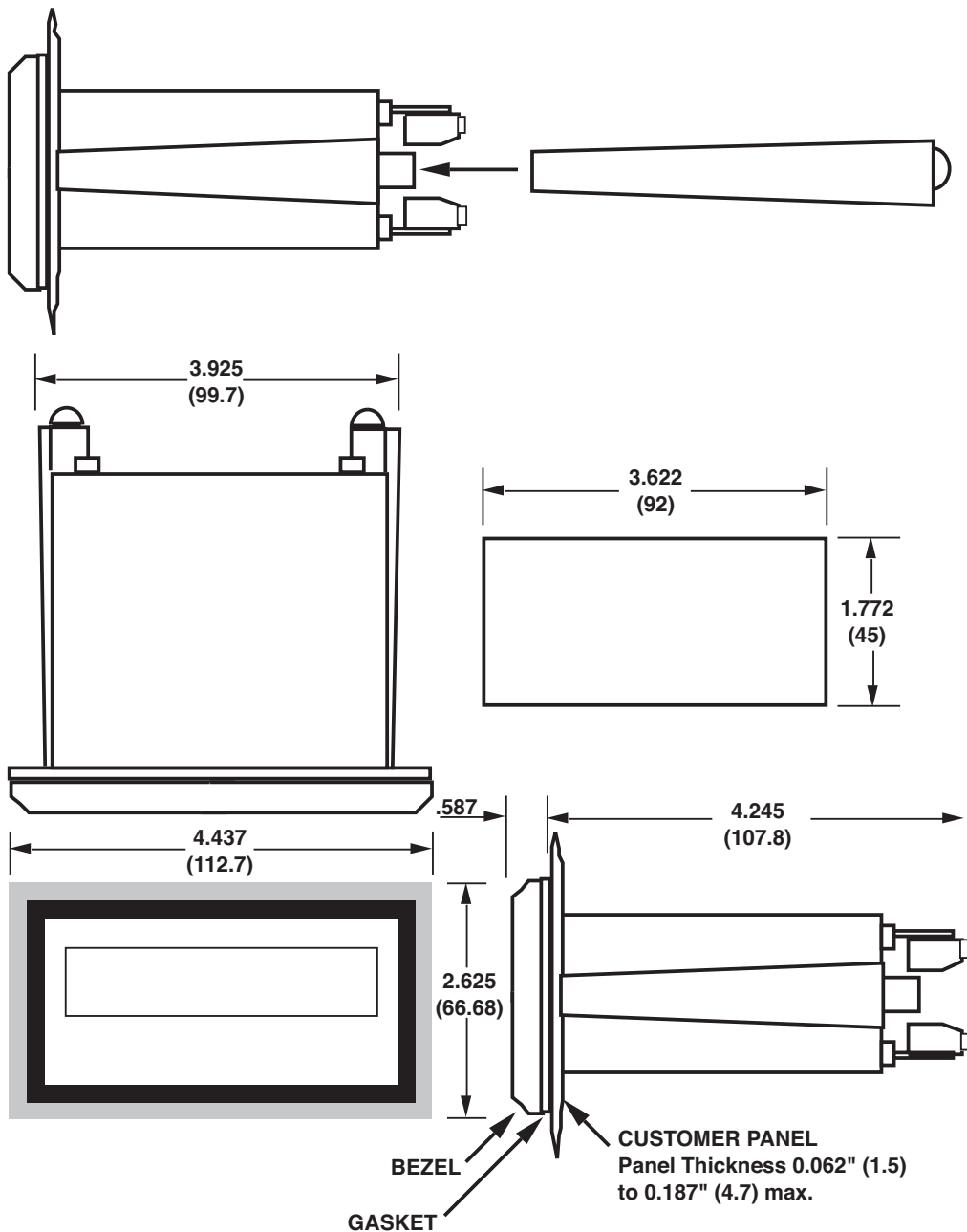
MOUNTING

HOW TO MOUNT:

Slide the body of the unit through the rubber gasket. Insert the unit into the panel. Slide the brackets up the groove to press against the back of the panel, as shown in "FIG. A". Insert the screws into the rear of the brackets.

Tighten the screws evenly and alternately. A panel less than 0.1" may distort if the clamps are screwed too tightly. Do not over tighten! A normal level of torque is required. Maximum torque should be 3" pounds.

FIG. A

3.925
(99.7)

3.622
(92)

1.772
(45)

.587

4.437
(112.7)

2.625
(66.68)

4.245
(107.8)

BEZEL

GASKET

CUSTOMER PANEL
Panel Thickness 0.062" (1.5)
to 0.187" (4.7) max.

WIRING

AC / DC CONNECTIONS:
NOTE: Connect power only after other connections are finished. Do not touch the live AC power terminals. The unit has been designed with an isolated AC input, therefore polarity is not a concern for the AC power. The chassis is plastic, therefore earth ground is not used. For DC operation, connect +DC to terminal 10 and -DC to terminal 3.

Although the unit is designed to be immune from line or RF interference, the unit is controlled by a microprocessor and an electrically "noisy" environment could cause operating problems. The input power lines should not be common to power lines for motors, pumps, contactors, etc.

Four sources of noise can occur:

1) AC power line noise- If the unit cannot be connected to an electrically clean power source, an inductive load suppressing device (MOV as GE#V130LA1 or Resistor Capacitor as Paktron# .2uf/220 ohm @ 400V) can be installed. Although locating the suppressor across the AC supply at the unit should help, best results are obtained by connecting the suppressor across the leads of the "load" at the device causing the spikes.
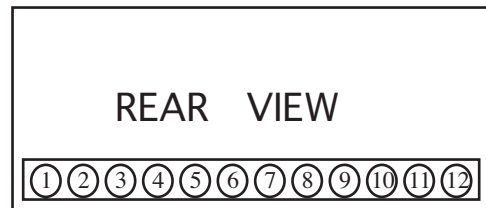
2) Input line noise- The noise is carried on the input and DC ground lines. Make sure the input wires are not run into the unit in a bundle with power input lines. We recommend using shielded cable. Connect the shield to DC signal ground of the unit and "earth" at one point in the circuit preferably at the DC ground terminal of the unit.

3) Output lines- The unit has two open collector outputs. When these outputs are used to run external relays or solenoids, spikes can be generated upon activation. This noise can spread through the instrument causing operating problems. If the source is a D.C. operated device, a general purpose diode (IN4004) placed across the solenoid prevents electrical noise spikes. Connect the cathode (banded side) to the more positive side of the coil. If the source is an A.C. operated device, use a Resistor Capacitor or MOV across the coil.

4) 24 VDC output supply- Noise can be generated on the 24 VDC output supply if it is used to drive inductive loads or if the current draw exceeds 50mA. Insure that all inductive loads have a diode (such as IN4004) across the coil and that the current does not exceed 50mA.
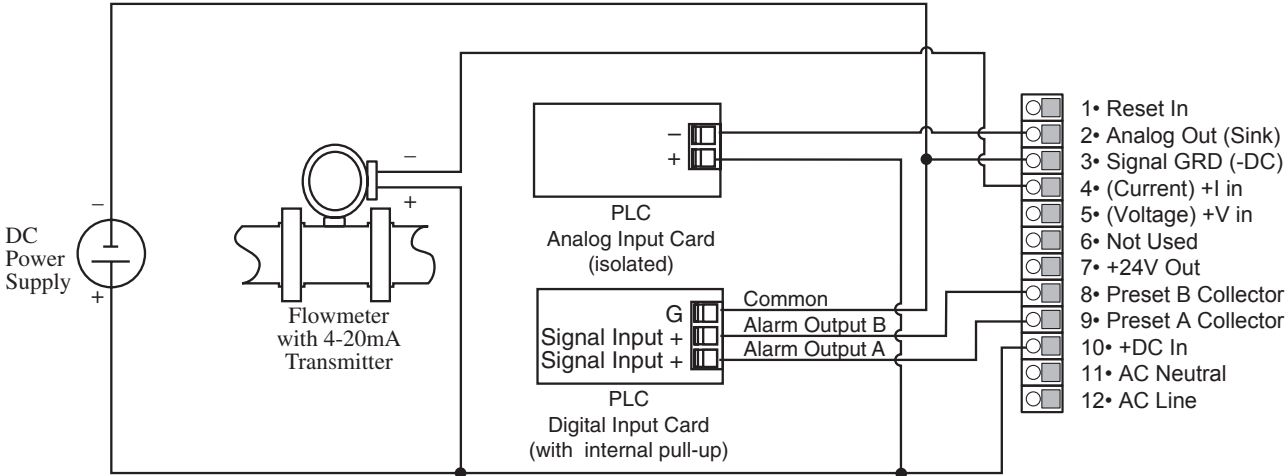
WIRING CONNECTIONS

1• Reset In
2• Analog Out (Sink)
3• Signal GRD (-DC)
4• (Current) +I in
5• (Voltage) +V in
6• Not Used
7• +24V Out
8• Preset B Collector
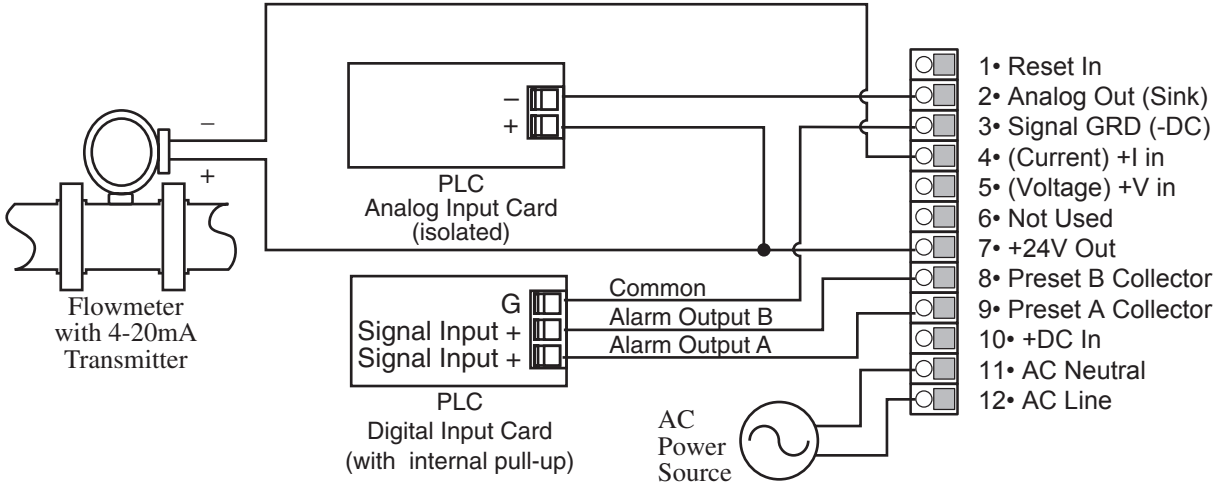9• Preset A Collector
10• +DC In
11• AC Neutral
12• AC Line

REAR   VIEW

① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩ ⑪ ⑫

TYPICAL WIRING HOOKUPS

DC Powered

Flowmeter
with 4-20mA
Transmitter

DC
Power
Supply

PLC
Analog Input Card
(isolated)

PLC
Digital Input Card
(with internal pull-up)

G
Signal Input +
Signal Input +

Common
Alarm Output B
Alarm Output A

1• Reset In
2• Analog Out (Sink)
3• Signal GRD (-DC)
4• (Current) +I in
5• (Voltage) +V in
6• Not Used
7• +24V Out
8• Preset B Collector
9• Preset A Collector
10• +DC In
11• AC Neutral
12• AC Line

AC Powered

Flowmeter
with 4-20mA
Transmitter

PLC
Analog Input Card
(isolated)

PLC
Digital Input Card
(with internal pull-up)

G
Signal Input +
Signal Input +

Common
Alarm Output B
Alarm Output A

AC
Power
Source

1• Reset In
2• Analog Out (Sink)
3• Signal GRD (-DC)
4• (Current) +I in
5• (Voltage) +V in
6• Not Used
7• +24V Out
8• Preset B Collector
9• Preset A Collector
10• +DC In
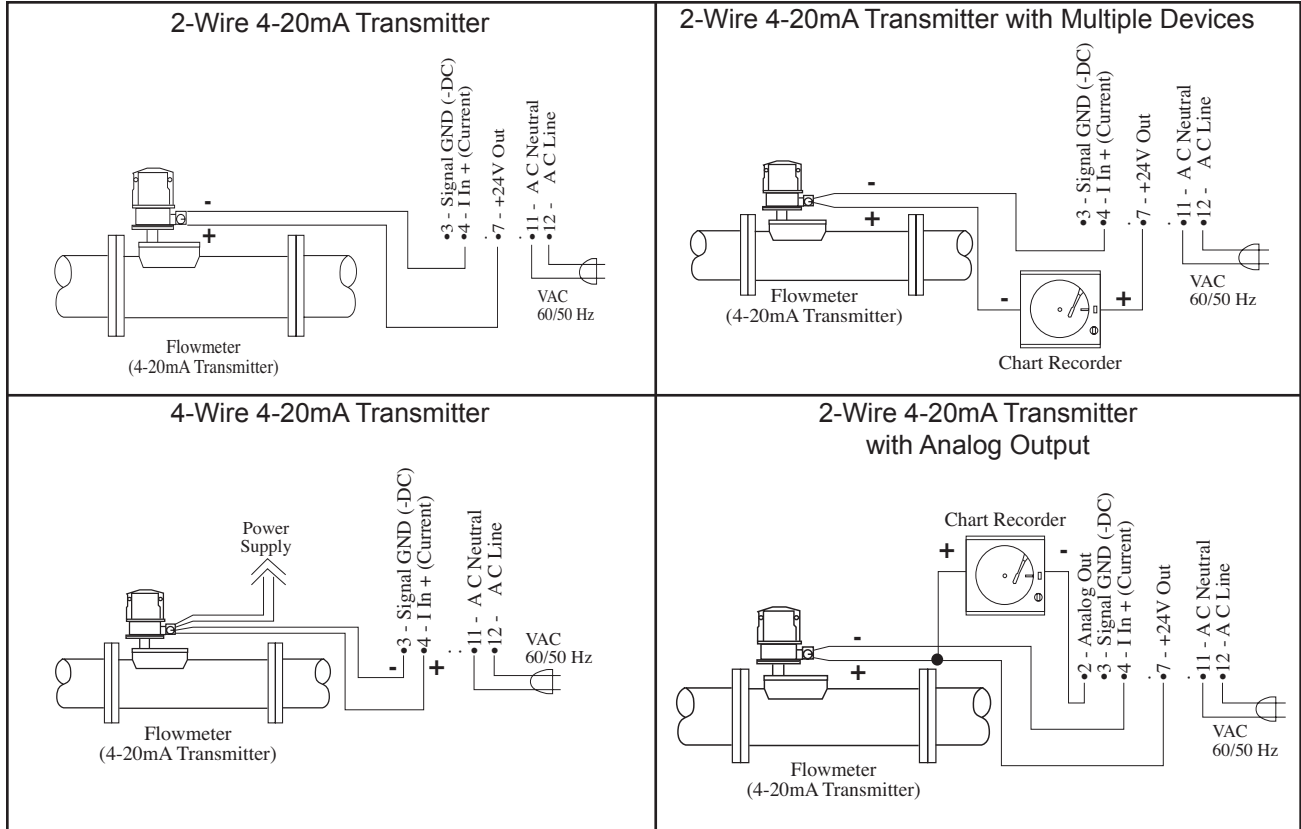11• AC Neutral
12• AC Line

4

TYPICAL WIRING HOOKUPS (continued)

2-Wire 4-20mA Transmitter

2-Wire 4-20mA Transmitter with Multiple Devices

4-Wire 4-20mA Transmitter

2-Wire 4-20mA Transmitter with Analog Output

OPEN COLLECTOR

The open collector outputs trigger when the total or rate (assignable; see programming step 2) equals the corresponding Preset (A or B). When the output is assigned to "ᑭᵤᒪ" (pulse output) the outputs trigger with each count of the total (or multiples).

When the outputs are assigned to the "total", the operator can assign a duration of time (.01 to 599.99 sec.) that the output will remain energized. If 0.00 is assigned, the output will latch until reset. If output A is set at a duration (other than 0.00), the totalizer will autorecycle when Preset A is reached. At this time, output B will de-energize (if it was energized). Preset A is the final preset and should be set higher than Preset B, when both outputs are assigned to the total. If output A is set at a duration other than 0.00 and Preset A is set less than Preset B, Preset B will be ignored (provided that they are both assigned to total). The totalizer will never autorecycle at Preset B.

When the outputs are assigned to the "rate", the outputs can be assigned a hysteresis (alarm range). The hysteresis is the number of units below the preset that the output will remain energized. EXAMPLE: Preset set @ 100; Hysteresis set @ 10. The output will energize when the rate equals 100 and de-energize when the rate falls below 90 (10 below Preset).

Select "ᑭᵤᒪ" (pulse output) to use the output for remote totalizers. When set to "ᑭᵤᒪ", a minimum duration in seconds (0.00 to 599.99) can be assigned to the time the output will remain energized and de-energized. If 0.00 is chosen the relay or open collector is disabled. The pulse output follows the total and the relay or open collector will output a "pulse" on every multiple of the Preset Setpoint. (ie. Preset is set to 10. A pulse will be generated for total values 10, 20, 30, 40, ... , etc).
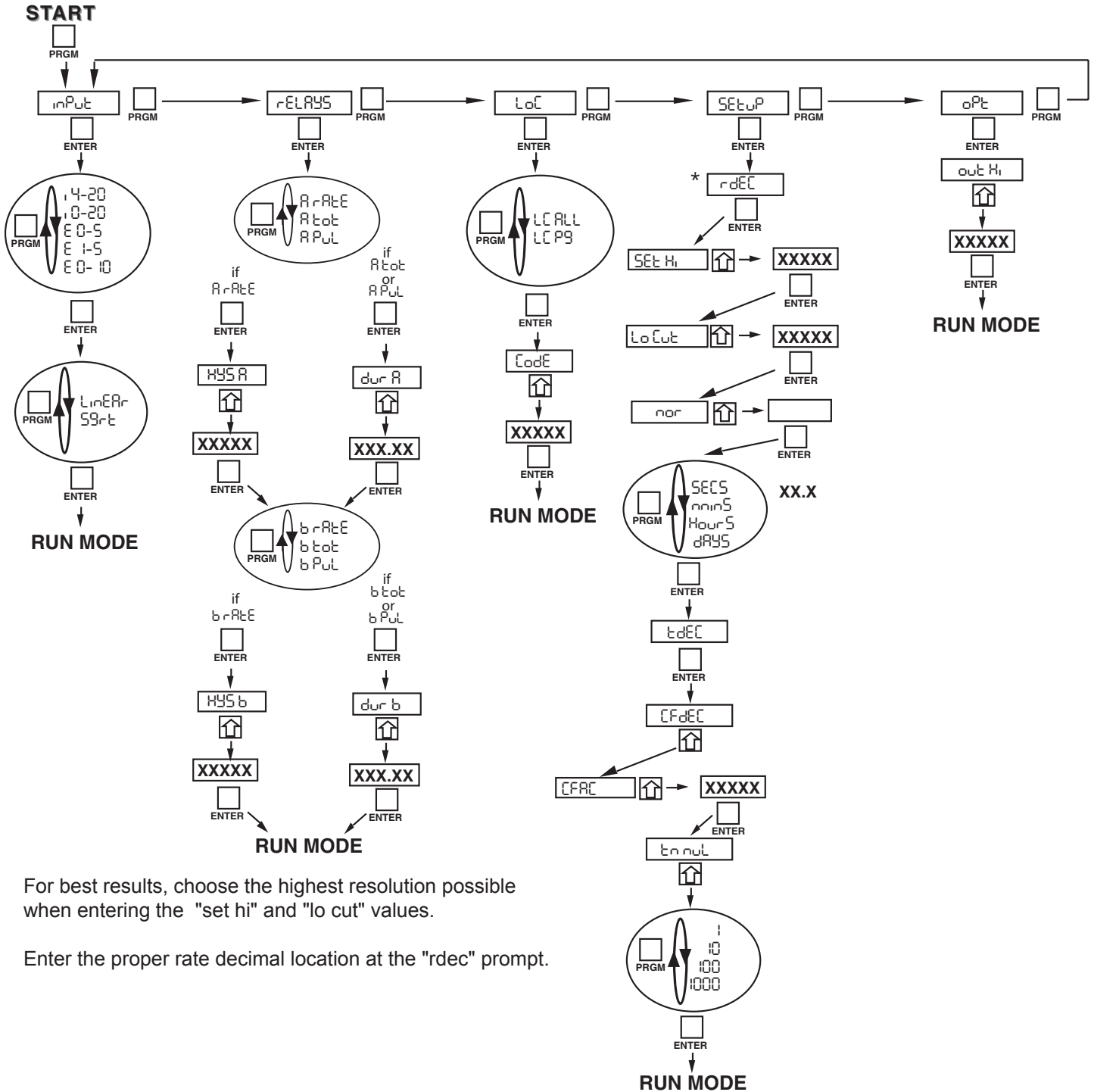
NOTE: If unit is setup to autorecycle then pulse output should not be used.

PROGRAMMING FLOWCHART

⬆ This symbol indicates any key.

☐ **PRGM** Press this key to step through Menu choices

☐ **ENTER** Press this key to enter displayed value.

START

☐ PRGM

| inPut | rELAYS | LoC | SEtuP | oPt |

inPut → ENTER

14-20
10-20
E 0-5
E 1-5
E 0-10

ENTER

LinEAr
SQrt

ENTER

RUN MODE

rELAYS → ENTER

A rAtE
A tot
A PuL

if A rAtE → ENTER
HYS A ⬆
XXXXX
ENTER

if A tot or A PuL → ENTER
dur A ⬆
XXX.XX
ENTER

b rAtE
b tot
b PuL

if b rAtE → ENTER
HYS b ⬆
XXXXX
ENTER

if b tot or b PuL → ENTER
dur b ⬆
XXX.XX
ENTER

RUN MODE

LoC → ENTER

LC ALL
LC PG

ENTER

CodE ⬆
XXXXX
ENTER

RUN MODE

SEtuP → ENTER

* rdEC

ENTER

SEt Hi ⬆ → XXXXX
ENTER

Lo Cut ⬆ → XXXXX
ENTER

nor ⬆ → ☐
ENTER

SECS
nninS
HourS
dAYS   XX.X

ENTER

tdEC

ENTER

CFdEC ⬆

CFAC ⬆ → XXXXX
ENTER

tn nuL ⬆

1
10
100
1000

ENTER

RUN MODE

oPt → ENTER

out Hi ⬆
XXXXX
ENTER

RUN MODE

For best results, choose the highest resolution possible when entering the "set hi" and "lo cut" values.

Enter the proper rate decimal location at the "rdec" prompt.

6

<u>DEFINITIONS</u>

ınPut - INPUT; This section of the program menu assigns the type of input the unit will be using (0-20 mA, 4-20 mA, 0-5 V, 0-10 V, 1-5 V, Linear or square root extraction).

ı4-20 - I 4-20; This sets the unit for a current input of 4 to 20 mA.

ı0-20 - I 0-20; This sets the unit for a current input of 0 to 20 mA.

E 1-5 - E 1-5; This sets the unit for a voltage input of 1 to 5 volts.

E 0-5 - E 0-5; This sets the unit for a voltage input of 0 to 5 volts.

E 0- 10 - E 0-10; This sets the unit for a voltage input of 0 to 10 volts.

LınEAr - LINEAR; This sets the unit for linear input.

S9rt - SQUARE ROOT; This sets the unit for square root extraction.

rELAYS - RELAYS; This section of the program menu sets the control output variables (open collector).

A rAtE- OUTPUT A FOR RATE; This assigns the A output to the rate.

HYS A- HYSTERESIS FOR OUTPUT A; This value is the number of units below Preset A that the output will remain "ON". EXAMPLE: Preset A set at 100, Hys set at 10. Output A will activate (turn on) when the rate equals 100; Output A will deactivate (turn off) when the rate falls below 90 (10 below Preset A)

A tot- OUTPUT A FOR TOTAL; This assigns the A output to the totalizer.

A PuL- Relay A assigned to pulse output.

dur A- OUTPUT A DURATION; This is the duration of time (.01 to 599.99 sec) that Output A will remain ener-gized. If 0.00 is entered the output will latch until reset. If a value other than 0.00 is entered the unit will autorecycle at Preset A.

b rAtE- OUTPUT B FOR RATE; This assigns the B output to the rate.

HYS b- HYSTERESIS FOR OUTPUT B; Same as HYS A.

b tot- OUTPUT B FOR TOTAL; This assigns the B output to the totalizer.

b PuL- Relay B assigned to pulse output.

dur b- OUTPUT B DURATION; This is the duration of time (.01 to 599.99 sec) that Output B will remain ener-gized. If 0.00 is entered the output will latch until reset.

LoC - LOCK; This section of the program menu sets up the lockout type and code.

LC ALL - LOCK ALL; When this is selected the lockout will lock the program as well as the Presets and reset button. The presets can be viewed but not changed.

LC PG - LOCK PROGRAM; When this is selected the lockout will lock only the program. The Reset can be activated and the presets can be viewed and changed.

CodE - CODE; This is a 5-digit code which will be used to lock and unlock the front panel.

SEtuP- SETUP; This section of the program menu sets up the operating variables.

rdEC - RATE DECIMAL LOCATION; This allows the user to program a decimal point for the rate display.

SEt Hi - SET HIGH; This is the rate value for the highest input (5 or 10 Volts; 20 mA). (i.e. 20 mA = 500 lbs/hr.)

Lo Cut - LOW CUT-OFF; This is the lowest rate value to be recognized. All rate readings below this value will assume the "set lo" value.

nor - NORMALIZING FACTOR; This is an averaging factor (00.0 to 99.9). Higher settings provide more normalizing (averaging) for a more stable display. Derived from the equation:

$$\frac{(\text{OLD DATA x "NOR" + NEW DATA})}{(\text{"NOR" + 1})}$$

SEC - SECONDS; This tells the unit that the High input value is entered in units per second.

ninS - MINUTES; This tells the unit that the High input value is entered in units per minute.

HourS - HOURS; This tells the unit that the High input value is entered in units per hour.

dAYS- DAYS; This tells the unit that the High input value is entered in units per day.

tdEC- TOTALIZER DECIMAL LOCATION; This allows the user to enter a decimal for the totalizer display. This decimal is not a dummy decimal and will scale the totalizer display accordingly. (i.e. if the tdec is set in the tenths position (#####.#), 100 will be displayed as 100.0)

CFdEC- CONVERSION FACTOR DECIMAL; This menu allows users to select a decimal location for the conversion factor

CFAC- CONVERSION FACTOR; This is a conversion divider factor that will be applied to convert from rate volume units to total volume units (i.e. rate is gal/(units time) to ft^3 Conversion factor = 7.4805 (gal/ft^3).

<u>tn nuL</u> - TOTALIZER FACTOR; This factor divides the totalizer display by 1, 10, 100 or 1000.

<u>oPt</u> - OPTIONS; This section of the program menu is for setting up optional features (analog out)

<u>out Hi</u> - OUT HIGH; The displayed rate value at which the unit will output 20 mA (2000 lbs./hr = 20 mA out).

<u>PXXXXX</u> - P; This will appear in the 6th (furthest to the left) digit when viewing the Peak. The peak value is the highest rate reading that the unit had displayed since the peak had been reset. The peak is not retained in memory when power is lost.

<u>uXXXXX</u> - U; This will appear in the 6th (furthest to the left) digit when viewing the Valley. The valley value is the lowest rate reading that the unit had displayed since the valley had been reset. The valley is not retained in memory when power is lost.

<u>rXXXXX</u> - R; This will appear in the 6th (furthest to the left) digit when viewing the Rate.

FRONT PANEL OPERATIONS

RST	A	B	C	D	E
ENTER	LOCK	PRE A	PRE B	VIEW	PRGM
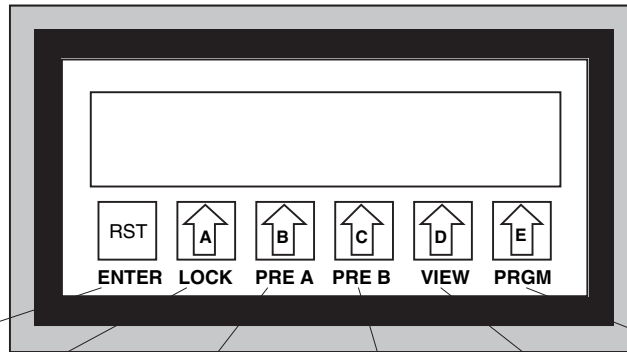
Press to RESET in operating mode; Press to "ENTER" in programming mode.

Press once to freeze display. Press any key to update display normally. Press rapidly (3 times within 5 seconds) to "enter" LOCK code for panel lock.

Press to view or change Preset A

Press to view or change Preset B

Press to alternately view Rate, Total, Peak & Valley.

Press to cycle through PROGRAM choices; Press to step through set up choices in program mode.

PROGRAMMING
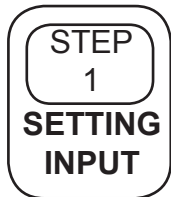
STEP 1 SETTING INPUT	PRESS	DISPLAY	REMARKS
	PRGM	ınPut	This section of the menu is used to set up the type of signal the unit will be receiving.
	PRGM **ENTER**	ı 4-20, ı 0-20 E ı-5, E 0-5 or E 0- ı0	Press the PRGM key to step through choices. Press the RST/ENTER key to enter the displayed choice.
	PRGM **ENTER**	LinEAr or S9rt	Press the PRGM key to toggle between the choices and press the RST/ENTER key to enter the desired choice. **NOTE:** Always choose LINEAR

PRESS	DISPLAY	REMARKS

⬆ PRGM ⬆ PRGM	inPut ⌐ELAYS	This section of the menu sets up the open collector outputs.
⬆ PRGM ⬆ ENTER	A ⌐AtE, A tot or A PuL	Output A assigned to the rate, total or pulse output. Press the PRGM key to toggle between choices, press the RST/ENTER key to enter the displayed choice.
⬆ ENTER	(IF TOT or PUL SELECTED) dur A (hit any key to view or change existing dur A value XX.X)	dur A = the duration of time (0.01 to 599.99 sec) that output A will remain on or energized. When dur A is displayed, hit any key to view or change dur A. Press the RST/ENTER key to enter displayed value. When dur A is set at 0.00, output A will latch until reset; when dur A is set other than 0.00 the counter will autorecycle at Preset A.
⬆ ENTER	(IF RATE SELECTED) HYS A (hit any key to view or change existing HyS A value XXXXX)	Hys (hysteresis)= The number of units below the preset that the output will remain "ON". EXAMPLE: Preset set @ 100; HyS set @ 10. Output will activate (turn on) when rate = 100 and turn off when rate falls below 90 (10 below preset).
⬆ PRGM ⬆ ENTER	b ⌐AtE, b tot or b PuL	Follow instructions for A RATE, A TOT & A PUL
⬆ ENTER	(IF TOT or PUL SELECTED) dur b	Follow instructions for dur A
⬆ ENTER	(IF RATE SELECTED) HYS b	Follow instructions for hys A

STEP 2
SETTING RELAYS

NOTE: If outputs are not used, set **dur A** & **dur B** at "0.00" to prevent the counters from resetting at the presets.

	PRESS	**DISPLAY**	**REMARKS**

STEP 3
SETTING LOCK

PRESS	DISPLAY	REMARKS
⬆ PRGM	inPut	
⬆ PRGM	rELAYS	
⬆ PRGM	LoC	This section of the menu is used to set up the lockout type and code.
⬆ PRGM ⬆ ENTER	LC PG or LC ALL	LC PG = Locks program but presets are accessible. LC ALL= Locks program & presets. Press the PRGM button to toggle between choices; Press RST/ENTER to enter displayed choice.
⬆ ENTER	CodE Press any key to view or change the lock code	When CODE is displayed, press any key to view existing lock code. To change the code press the key under each digit to be changed. Press RST/ENTER to enter displayed value.

STEP 4
SETTING SETUP

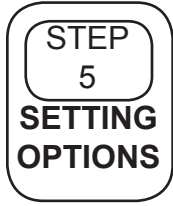| PRESS	DISPLAY	REMARKS
⬆ PRGM	inPut	
⬆ PRGM	rELAYS	
⬆ PRGM	LoC	
⬆ PRGM	SEtuP	This section of the menu is used to set up important operating variables.
⬆ ENTER	rdEC	RDEC= rate decimal location; Press the key under the digit with the desired location. Press the "E" key if a decimal is not desired. Press RST/ENTER to enter the displayed location.
⬆ ENTER	SEt HI Press any key to view or change existing value	SET HI= Rate value for the highest input (5 or 10V; 20mA).(i.e. 20mA = 500 lbs/hr.). Key in the desired high value and press RST/ENTER to enter displayed value.

CONTINUED ON NEXT PAGE

SETTING SETUP

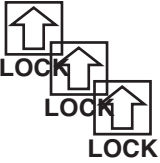| PRESS	DISPLAY	REMARKS
⬆ ENTER	Lo Cut — Press any key to view or change existing value	LO CUT= Low cut-off; Lowest rate value to be recognized. All rate readings below the "cutoff" will assume the "set lo" value. Key in the desired value and press RST/ENTER to enter displayed value.
⬆ ENTER	nor — Press any key to view or change existing value	NOR= Normalizing (averaging) factor (00.0 to 99.9); Key in the desired value and press RST/ENTER to enter displayed value. Higher settings provide more normalizing (averaging) for a more stable display.
⬆ PRGM ⬆ ENTER	SEC, minS, HourS or dAYS	This section tells the unit that the high setting is entered in units per Second, Minute, Hour or Day. Press the PRGM key to step through choices. Press RST/ENTER to enter displayed choice.
⬆ ENTER	tdEC	TDEC= Totalizer Decimal; Press the arrow keys to enter in the desired totalizer decimal. Press RST/ENTER to enter displayed choice. Entering a decimal will add resolution to the total. (i.e. tdec=#####.#; 100 will be displayed as 100.0)
⬆ ENTER	CFdEC	CFDEC= Conversion Factor Decimal; Press the arrow keys to enter in the desired conversion factor decimal. Press RST/ENTER to enter displayed choice.
⬆ ENTER	CFAC	CFAC= Conversion Factor; The conversion factor allows you to convert rate to total volume units.
⬆ ENTER	tmul — Press any key to view or change existing value	TMUL= Totalizer Multiplier; This factor allows you to divide the totalizer by 1, 10, 100, 1000
⬆ PRGM ⬆ ENTER	1, 10, 100 or 1000	Press the PRGM key to step to the desired factor. Press RST/ENTER to enter displayed choice.

NOTE:
See Appendix i (PG17) for a chart containing common conversion factors

	PRESS	DISPLAY	REMARKS
	⬆ PRGM	inPut	
STEP 5 SETTING OPTIONS	⬆ PRGM	rELAYS	
	⬆ PRGM	LoC	
	⬆ PRGM	SEtuP	This section of the menu is for setting up the variables for any options which were ordered (Analog out or Serial communications).
	⬆ PRGM	oPt	
	⬆ ENTER	out Hi Press any key to view or change existing value	OUT HI = The rate value represented by the 20 mA end of the 4-20 mA output. Key in the desired value and press RST/ENTER to enter displayed value. Press PRGM to recycle through list choices.

THE PROGRAM SETUP IS COMPLETE! YOU ARE NOW READY TO SET THE PRESETS.

SETTING THE PRESETS & PANEL LOCK

	PRESS	DISPLAY	REMARKS
SETTING THE PRESETS	⬆ **PRE A**	PrE A Press any key to view or change existing value	PRE A = Preset A (Final Preset); The set point at which output A will trigger. If the displayed value is not the desired preset, press the key(s) under the digit to be changed.
	⬆ **PRE B**	PrE b Press any key to view or change existing value	PRE B = Preset B (Prewarn); The set point at which output B will trigger. If the displayed value is not the desired preset, press the key(s) under the digit to be changed.
SETTING THE LOCK STATUS	⬆ **LOCK** ⬆ **LOCK** ⬆ **LOCK** Press LOCK 3 times within 5 seconds (If LOCK is pressed once, unit freezes display)	CodE Press any key to enter the 5-digit lock code.	Key in the lock code (see programming step 3) by pressing the keys under the digits to be changed. Each time a key is pressed the digit will increment one. Press the RST/ENTER key to enter the displayed code.
	⬆ **ENTER**	LoC or un LoC	After the code is entered the unit will display LOC (unit is locked) or UN LOC (unit is un-locked). This message will be displayed for approximately 3 seconds before the unit returns to the run mode. If an invalid code is entered, no message is displayed; try again.

TROUBLESHOOTING GUIDE

PROBLEM	POSSIBLE CAUSES	SOLUTIONS
Power is applied to unit but the display does not light.	1. AC or DC power wiring is incorrect.	1. Recheck power wiring.
Unit works but occasionally the display freezes or skips counts.	1. Line noise is effecting the processor due to a current spike or surge.	1. Use a different power supply or install a surge suppressor.
Input signal is connected but the unit does not totalize or rate.	1. Input wiring is incorrect 2. High scaling or Low cutoff settings are incorrect. 3. Transmitting device is defective. 4. Unit is defective.	1. Recheck input wiring. 2. Recheck high scaling and low cutoff settings. 3. Replace transmitting device. 4. To confirm set meter for 0-10V input, low @ 0; high @ 10. Apply a 0-10V signal to the voltage input (pin 5). When viewing the rate the meter should display the voltage value that is applied. If not call factory for an RMA#.
Display reading is inaccurate.	1. Input wiring is incorrect.	1. Be sure that voltage signals are connected to voltage input (pin 5) and current signals are connected to current input (pin 4).
Ratemeter works properly but totalizer is incorrect.	1. Time base is incorrect. 2. Conversion factor is incorrect 3. Total multiplier is incorrect	1. Recheck time base setting in setup section of the program menu. 2. Recheck conversion factor settings. 3. Recheck total multiplier factor settings.

IF YOU HAVE ANY OTHER PROBLEMS, PLEASE CALL THE FACTORY.

We hope you will be pleased with our product. If you have any questions concerning our warranty, repair, modification or returned goods process, please contact your local distributor.

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 defective unit at the option of the manufacturer.   This warranty is void if the product has been altered, misused, dismantled, or otherwise abused.

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

DECODING PART NUMBER

Model	Description
RTAL-P	Rate Totalizer Panel Mount
RTAL-W	Rate Totalizer Wall Mount

Appendix i - Units Conversion Chart

Engineering Units		Total Factor (CFAC)	Total Multiplier (tmul)	Totalizer LSD Value	
Rate Unit	Total Unit				
Gallons	Gallons	10	1 10 100 1000	10 100 1000 10,000	GAL
Gallons	Cubic Feet	7.481	1 10 100 1000	1 10 100 1000	CF
Gallons	Acre-Feet	32.59	1 10 100 1000	.0001 .001 .01 .1	AFT
Cubic Feet	Acre-Feet	.2295	1 10 100 1000	.0001 .001 .01 .1	AFT
Liters	Liters	10	10 100	100 1000	LTR
	Cubic Meters	10	1 10 100 1000	.1 1 10 100	CM
Cubic Meters	Cubic Meters	1	1 10 100 1000	1 10 100 1000	CM

Consult the factory for total factors and multipliers for engineering units not shown.