GUIDANT

Battery or Loop Powered Ratementer/Totalizer

Model 4300

Installation/Operation Manual

January 2007 Bulletin MNIT043

Description

Featuring 5 digits of rate and 8 digits of total, the 4300 is a battery or loop powered indicator capable of accepting magnetic pickup, DC pulse or switch closure inputs from pulse producing fl owmeters. The unit can be ordered with an optional 4-20mA output (Models 4300-3I and 4300-3O). The 4300 uses the 4-20mA loop to provide power when this output is used.

Specifications

POWER:

BATTERY POWERED (Model 4300-3A)

Supplied with 2 C size Lithium batteries.

LOOP POWERED (Models 4300-3I and 4300-3O)

Voltage: 8.5 to 30 VDC

Supplied with 2 C size lithium batteries

Protection: Reverse Polarity Protection on Current Loop
Loop Burden: 8.5V maximum

BATTERY LIFE EXPECTANCY:

Expected Years of Operation for 4300 of various powering options at equipment duty cycles

MODEL	RUN TIME			
	Idle	2hrs/day	8hrs/day	24hrs/day
4300-3A	10 yrs	10 yrs	10 yrs	8.4 yrs
4300-3I	Indefinite operation when loop powered			
4300-3O	Indefinite operation when loop powered			

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 pulse output inactive. Use of pulse output shortens battery life.*
Example: A pulse output of 0.06 sec. duration, once per second, would derate the battery life by 20%.

DISPLAY:

Rate Display: (selectable decimal)

5 Digits (99999), 0.35" High, Display updates once per second with model 4300-3A, 8X per second with 4300-3I or 4300-3O

Rate Descriptors: /SEC, /MIN, /HR for model 4300-3I
/MIN, /HR, /DAY for models 4300-3A and 4300-3O

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:

Model 4300-3I: GAL, LIT, FT3, M3

Model 4300-3A and 4300-3O: GAL, BBL, MCF, M3

Warning Displays: Low battery warning

PULSE OUTPUT:

The pulse output advances with the least significant digit of the totalizer or decimal multiples there of (see Pulse scale divider).

Type: Isolated photomos relay
Max. voltage (off state): 30 VDC
Current (on state): 100mA
Pulse Duration: Selectable 0.5, 0.25, 0.125, 0.0625 sec.
Pulse Scale divider (Pulscale): User selectable, ÷1, ÷10, ÷100 or OFF

NOTE: *Select OFF for max. battery life.*

ACCURACY:

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

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

ENCLOSURE STYLE:

Explosion Proof - Class I, Division I, Groups B, C & D
Class II, Division I, Groups E, F & G

APPROVALS:

CSA/NRTL Explosion Proof Listed LR91109

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 KÙ 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 KÙ 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
This feature allows the user to enter 20 different frequencies with 20 different corresponding K-Factors to linearize non-linear signals.

ANALOG OUTPUT (Models 4300-3I and 4300-3O):

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 4300 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.*

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.

* Slow input puse rates, large delay setting and internal math operations may delay the update rate of information.

Battery Installation and Replacement

Battery Installation

All 4300 models are shipped without the batteries installed. This preserves battery life when the unit is not in service.

To install the battery, begin by locating the battery holder. This requires opening the enclosure cover and removing the 4300 to expose the battery holder.

The plus terminal of the battery is marked with a (+) symbol stamped into the battery holder. Be sure to install the batteries correctly.

Install batteries to begin setup procedure. See Programming Flowchart to setup desired operating parameters.

Battery Replacement

The 4300 has a battery monitor feature which illuminates when the lithium battery voltage approaches its end of life. A descriptor, “BAT”, illuminates when the battery voltage falls below this predetermined value. The low battery detector operates correctly with all power options.

The battery, or batteries, should be replaced within several weeks of the fi rst occurrence of low battery warning, “BAT”. Left unattended, the unit may become inaccurate, cease to operate or malfunction.

Before replacing the batteries, Press the . (left arrow) key to save the totalizer. The display will show “SAVE TOTAL”. This will save the current total value and the total will resume from this value when the new batteries is(are) installed. **NOTE:** If the display starts to fl ash after the “SAvE totAL” message times out, press the “E” (enter) key. If the message “E FLASH” is displayed, then there was not enough power left to save the setup and totalizer to fl ash memory. At this point you must record the totalizer and setup information and re-enter the setup data after the new batteries are installed.

Install new batteries as described above.

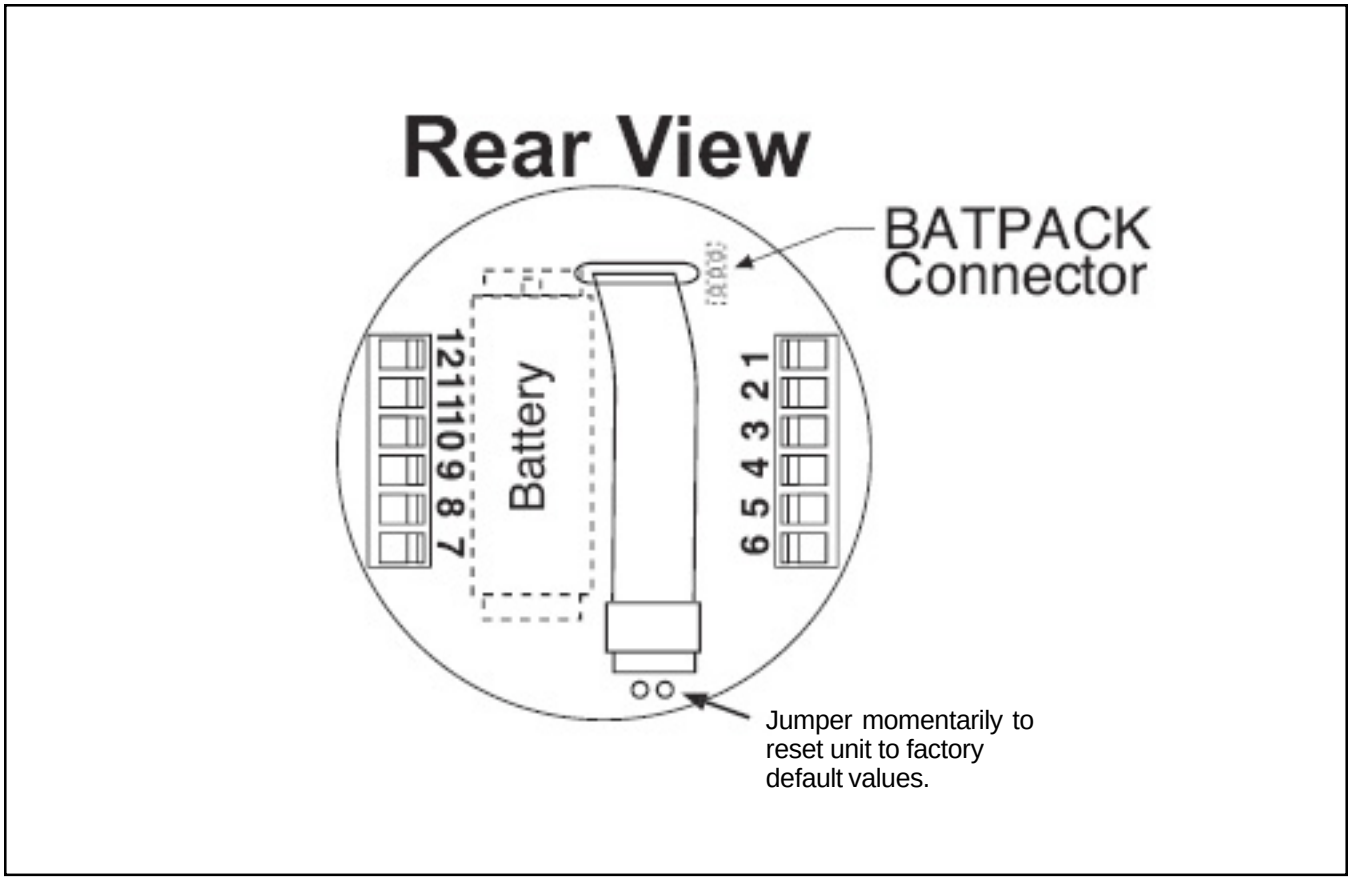


Figure 1

THEORY OF OPERATION

Flow rate equation:

$$\text{Flow Rate Indication} = \frac{\text{Input Frequency}}{\text{FAC}} \times \text{Time Scaler}$$

Flow total equation:

$$\text{Flow Total} = \frac{\text{Sum of Input Pulses}}{\text{FAC}}$$

Where Time Scaler is equal to: 1 for rate per second read out (3400-3I only)
60 for rate per minute read out
3600 for rate per hour read out
86400 for rate per day read out (4300-3A and 4300-3O only)

20 Point Linearization:

A 20 point linearization table is used to construct a curve describing the relationship of K-Factor and input frequency.

The measured input frequency is used to access the table. A linear interpolation of adjacent point pairs is used to arrive at the K-Factor at that input frequency. The fl ow rate and total are then computed based upon the K-Factorfor that measurement sample.

NOTE: For best performance and resolution choose as many decimal places as possible in the K-Factor.
Example: Enter a K-Factor of 1 as 1.000.

Wiring

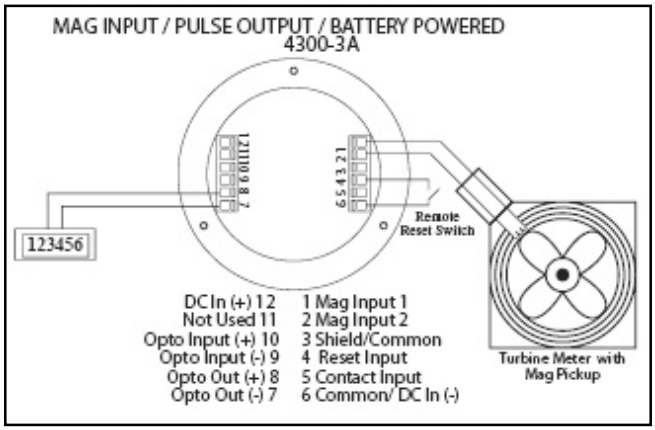
Typical applications for the 4300 are shown below. The isolated pulse output may be freely used so long as proper polarity is observed.

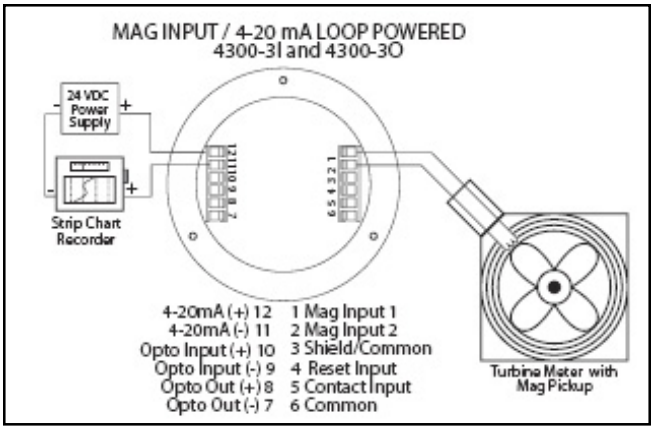
Caution: 4-20 mA loop option is provided with models 4300-3I and 4300-3O, the power wiring to the loop power option should always be to terminals (+) 12 and (-) 11. Accidental wiring to (+) 12 and (-)6 should be avoided since excessive current fl ow may result.

Caution: The magnetic pickup input requires isolated sensors for proper operation. Accidental connections to earth may result in erroneous operation of the analog output and/or excessive current fl ow may result.

Caution: Accidental connections from circuit common (3 or 6) to earth or terminal (11) may result in erroneous operation of the analog output and/or excessive current fl ow may result.

Typical Applications





Definitions

SAvE totAL: (Save Total) Press the **E** key while the unit is running to save the total value. The display will show “save total” for a few seconds. This is a very useful “scratch pad” to save and restore total when replacing the batteries

Ent CodE: (enter code) This prompt will only appear if the panel lock is ON. 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 5 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.

FdEC: (factor decimal) Sets the decimal location for the factor. This location is restricted to 3 places (99.999). The use of this decimal automatically limits the number of decimal locations allowable in the rate and total to acceptable ranges. Press the . key to move the decimal. Press the **E** key to select the displayed decimal location.

NOTE: *For best performance and resolution choose as many decimal places as possible in the K-Factor.*

Example: Enter a K-Factor of 1 as 1.000.

FAC LinEAr/20Point: (factor type) This prompt will only appear if the unit is ordered with the 20 point linearization option.

The 20 poInt linearization selection is recommended for fl ow meters whose K-factors change with different fl ow rates. This selection allows users to enter up to 20 different frequencies with 20 corresponding K-factors for different fl ow rates. The lInear setting is used for fl ow meters whose output is linear over its’ entire operating fl ow range. Press the . key to step to the desired choice. Press the **E** key to enter the displayed factor type.

no/YES SEt PntS: (set 20 point?) This prompt allows the user to skip the 20 point setup routine. Select yes for initial setup or to change the present 20 point values. Select No to skip and keep the existing values.

FAC : (factor) This prompt appears on all units with linear inputs. The Factor is the number of pulses per unit volume for the fl ow sensor. The pulses/unit volume is implied by the totalizer descriptor when a descriptor is used. The implied units for the Factor are then as follows:

4300-3A	**4300-3I and 4300-3O**
GAL pulses/gallon	GAL pulses/gallon
LIT pulses/liter	BBL pulses/BBL
FT3 pulses/ft3	MCF pulses/MCF
M3 pulses/M3	M3 pulses/M3

Factors from 0.0001 to 99999999 may be used. A “0” value for the factor is not allowed and the unit will default to “1” in LSD if a “0” entry is attempted . The factor is displayed on the subsidiary (lower) display. 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 factor.

Fr# : (frequency for point #) This prompt will only appear when 20 point selected. It sets the frequency for each of the 20 points (#). 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 desired frequency for point #.

FAC# : (factor for point #) This prompt will only appear when 20 point selected. It sets the factor for each of the 20 points (#). 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 desired factor for point #.

NOTE: *The display will advance to the next point (Fr#) after each entry of the Fr & Fac until all 20 points are complete. Entering a 0 in the Fr or fac setting will advance the display to the next menu prompt (tdec).*

tdeC: (totalizer decimal) Sets the decimal location for the totalizer. The totalizer decimal is not a dummy decimal and will scale the totalizer display accordingly. (i.e. if the tdec is set in the tenths position (1234567.8), 100 will be displayed as 100.0). The location of the decimal point allows for greater resolution of both the totalizer display and the pulse output. The pulse output advances at a rate dependent on the least signifi cant digit of the totalizer.

The totalizer decimal location is restricted to a maxmum of 4 places (1234.5678). However, the number of totalizer decimal locations allowable is reduced with each decimal place added to the factor decimal. Press the . key to move the decimal. Press the **E** key to enter the displayed decimal location.

NOTE: *The selection of the factor decimal point limits the available selections for the number of decimal points available for the totalizer. This is automatic. Enter your selection of the Factor’s decimal point before entering the totalizer decimal point to assure the proper selection of the totalizer decimal point has been made.*

Definitions

tot desC: (totalizer descriptor) This allows you to illuminate one of the available descriptors on the display

4300-3A: GAL, LIT, FT3, M3

4300-3I / 4300-3O: GAL, BBL, MCF, M3

Press the . key to select the descriptor. Press the **E** key to enter the selected descriptor.

r sCale: (ratemeter scaling) Sets the timebase for the rate readout. Choose rate per hour (Hrs), minutes mIn) or

seconds (seC) for 4300-3A. Choose rate per day (day), hour (Hrs) or minutes (nnIn) for 4300-3I and 4300-3O.

The scale setting is shown on the main (upper) display. Press the . key to step to the desired choice. Press the **E** key to enter the displayed scale setting.

Note: A rate descriptor corresponding to the above choice will be illuminated on the display.

r deCloC: (ratemeter decimal location) Sets the decimal location for the ratemeter information. The ratemeter decimal is not a dummy decimal and will scale the rate display accordingly. (i.e. if the r decloc is set in the tenths position (123.4), 100 will be displayed as 100.0). The ratemeter decimal location is restricted to a maximum of 4 places (.1234). However, the number of ratemeter decimal locations allowable is reduced with each decimal place added to the factor decimal. Press the . key to move the decimal. Press the **E** key to enter the displayed decimal location.

Note: The flow rate indicator will fl ash “99999” if the computed flow rate exceeds the 99999 display capability of the indicator. Choose a new decimal point location to avoid this.

nor# NORMALIZING FACTOR - Normalizes (averages or dampens) the fl ow rate data being received. Enter a value from 0 to 9. Higher settings provide more normalizing (averaging) for a more stable display. Derived from the equation:

(Old Data x “NOR” + New Data)

(“NOR” + 1)

delay: (delay) Sets the amount of time (0.1 to 99.9 seconds) that the unit will “look” for valid input data. If pulses are not detected within this “window”, the rate will display 0. The display will update once every second as long as the unit receives valid data within a second. Some internal mathematics may delay this update.

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 delay value.

outLo: (out low) Sets the low setting for the 4-20 mA analog output. Key in the low rate value at which the unit will output 4mA. 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 out lo value.

out Hi: (out high) Sets the high setting for the 4-20 mA analog output. Key in the high rate value at which the unit will output 20 mA. 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 out hi value.

PuLSCALE: (pulse out scaling) This allows the unit to output a pulse for each least signifi cant total count divided by the selected divider. The pulse out can be divided by 1 (d 1), 10 (d 10), 100 (d 100), or turned off (off). With the divider set at 1, the unit will give a pulse out for every increment of the LSD displayed.

Note: For maximum battery life, turn the pulse output off when pulse output is not used.

Selecting the proper pulse output divider may be needed so that the pulse output does not exceed the maximum rate of the pulse output. If the pulse output pulses too quickly a fl ashing display will result. Pressing the “M” key will result in a display of an error message “E PULSE”. Press the “E” key to return to the run mode.

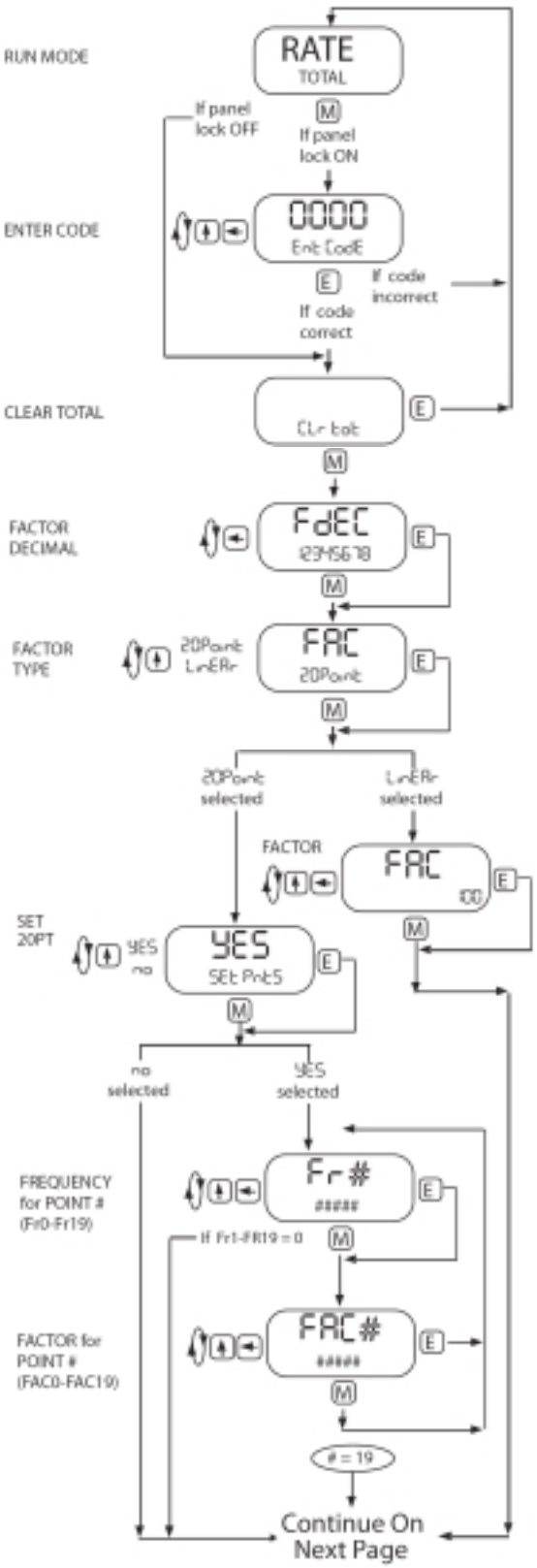
P uuidtH: (pulse width) Sets the pulse width of the pulse output. Selections are: 0.5 (1Hz), 0.25 (2Hz),0.125 (4Hz)for 0.0625 (8Hz). This menu item is skipped if pUlscale is turned off.

LoC CodE: (lock code) Sets the 5 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.

Record this number for later use! LOCK CODE: _____

LoC unit: (lock unit) Sets the panel lock ON or OFF. Press the . key to select On or OFF. Press the **E** key to enter the displayed selection.

Programming Flowchart



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.

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 **E** key to clear the totalizer and return to the programming menu.

Press the **M** key to skip and go to next menu item.

Press the ← key to step the factor decimal to the desired location.

Press the **E** key to enter the displayed decimal location.

press the **M** key to skip and keep the existing location.

NOTE: For best performance and resolution choose as many decimal places as possible in the K-Factor.

Example: Enter a K-Factor of 1 as 1.000.

Press the ↑ key to choose factor type (20Point or LinEAr).

Press the **E** key to enter the displayed factor type.

Press the **M** key to skip and keep the existing factor type.

The FAC prompt will only appear if LinEAr is selected or if the unit was ordered without the 20 point linearization option.

Press the ↑ key to increment each individual digit of the factor.

Press the← key to advance to the next digit.

Press the **E** key to enter the displayed factor

Press the **M** key to skip and keep the existing factor.

The SEt PntS prompt will only appear if 20Point is selected. This allows users to bypass the 20 point set up and keep the existing values.

Press the ↑ key to choose YES or NO.

Press the E key to enter the displayed selection.

Press the M key to skip (same as selecting NO).

Press the ↑ key to increment each individual digit of the frequency for point #.

Press the← key to advance to the next digit.

Press the **E** key to enter the displayed frequency.

Press the **M** key to skip and keep the existing frequency.

If 0 is entered, the display will advance to the next prompt (tdec).

NOTE: Frequency/factor point pairs must be entered in ascending order of frequency.

Press the ↑ key to increment each individual digit of the factor for point #.

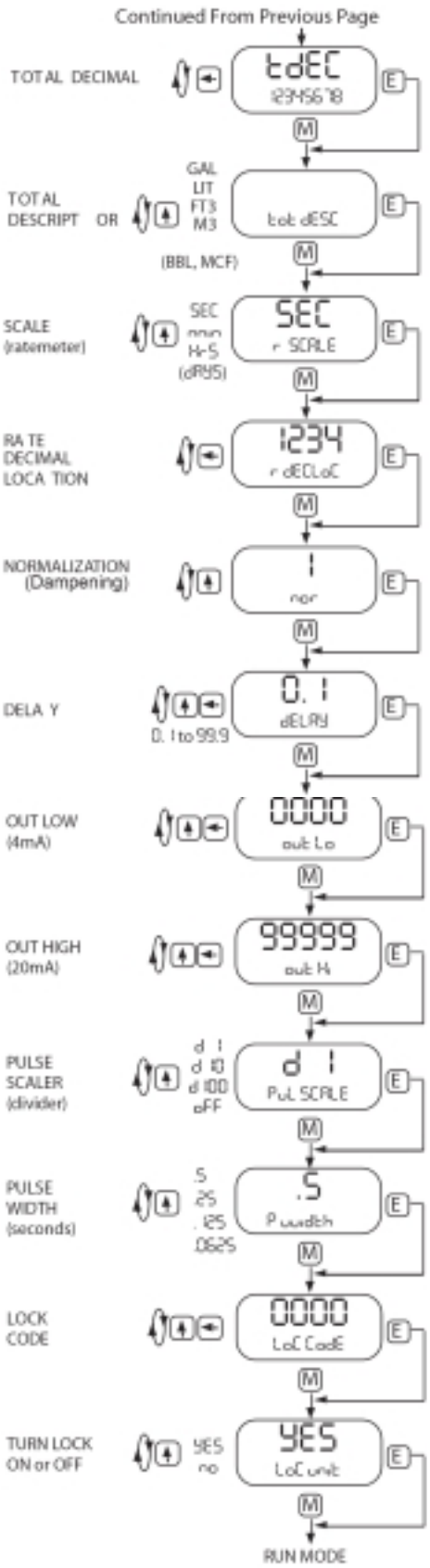
Press the ← key to advance to the next digit.

Press the **E** key to enter the displayed factor.

Press the **M** key to skip and keep the existing factor.

If 0 is entered, the display will advance to the next prompt (tdec).

Programming Flowchart



Press the ← key to step the totalizer decimal to the desired location.
Press the **E** key to enter the displayed decimal location
Press the **M** key to skip and keep the existing 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.
NOTE: Selections are GAL, LIT, FT3, M3 for 4300-3I
GAL, BBL, MCF, M3 for 4300-3A/4300-3O

Press the ↑ key to step to the desired scale setting.
Press the **E** key to enter the displayed scale setting.
Press the **M** key to skip and keep the existing setting.
NOTE: Selections are: min, SEC, HrS for 4300-3I
min, HrS, dAYS for 4300-3A/4300-3O

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

Press the ↑ key to increment each individual digit of the delay.
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 “nor” factor.
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 out low setting (4mA value). This will only display on 4300-3I and 4300-3O.
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 out low setting (4mA value). This will only display on 4300-3I and 4300-3O.
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 the desired pulse scale divider for the pulse output.
Press the **E** key to enter the displayed pulse scale divider.
Press the **M** key to skip and keep the existing pulse scale value.

Press the ↑ key to step to the desired pulse width for pulse output.
Press the **E** key to enter the displayed pulse width.
Press the **M** key to skip and keep the existing pulse width.
This will not display if Pulse Out is turned OFF.

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 value.
Press the **M** key to skip and keep the existing value.

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.

Operation

A suitable pulse producing device or fl ow meter is wired to one of the three pulse inputs provided on the 4300. Only one of these inputs is used in a given application. There are no connections to the two unused pulse inputs.

Isolated magnetic pickups may be connected to terminals 1 and 2. Isolated contact closures may be connected to terminals 5 and 6. Any high level, DC pulse type may be connected to terminals 9(-) and 10(+).

Power to the unit may be provided by internal batteries or the current loop. In all cases, the internal battery will provide for continued operation in the event primary power is lost.

Once properly wired, the operation of the 4300 is automatic.

The flow totalizer is updated once per second* with battery power, 8 times per second with DC or loop power. If no input counts are received the unit remains in a low power state to conserve power.

The fl ow total may be cleared by the front panel switch sequence or by a contact closure on the remote reset terminal to circuit common.

To reset the unit from the front panel, the following key sequence is required:

Press **M** “CLr tot” will be displayed (if the panel lock is on, the display will prompt “Ent CodE”.

Enter the proper code to advance to the CLr tot prompt)

Press **E** To clear the total. Unit will return to operation

The flow rate indicator will measure the fl ow rate once every second* with 4300-3A, 8 times per second with 4300-3I and 4300-3O and display the fl ow rate.

If the input pulses are not detected within the delay setting (0.1 to 99.9 seconds), a fl ow rate of 0 will be indicated.

The analog output will be scaled based on the user selected zero and full scale and the measured fl ow rate. The analog output is updated at the same time as the rate display.

The pulse output updates at the same rate as the total display in accordance with the instrument setup of pulse scaling.

** Slow input pulse rates, large delay setting and internal math operations may delay the update rate of information. A faster update rate occurs when the unit is loop powered or externally powered.*

Error Messages

The 4300 is provided with extensive self checking which assists the user in the location of setup entry errors and in reporting malfunctions or unusual operating conditions. When an error occurs, the display will fl ash. Press any key to see the error message corresponding to the error that has occurred. Press any key again to acknowledge the error. (If the error can be eliminated by a change of setup values, the unit will automatically advance to the MENU so that the appropriate setup changes can be made).

The table below illustrates the warning message, problem, and recommended corrective actions.

Warning Message	Cause	Corrective Action
rAtE Er	Rate Low set higher than Rate Hi	Set Rate Hi greater than Rate Lo
FAC Err	Factor = 0	Set in correct Factor
"BAT" Descriptor	Low Battery	Replace batteries
E totAL	Total rollover	None required
E rAtE	Rate exceeds 99999	Use lower rate dec point
E PuLSE	Pulse out Overflow	Use different pulse scaler or totalizer decimal point.
E FLASH	Save to flash memory failed	Write down displayed total and setup values if you are changing the battery. If total wasn't saved, it will display an arbitrary total when new battery is installed. In this case, reset the total to 0 and check the setup information.

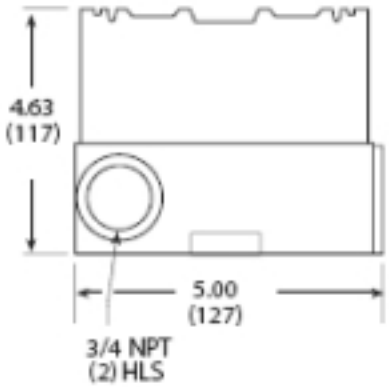
Analog Output Calibration

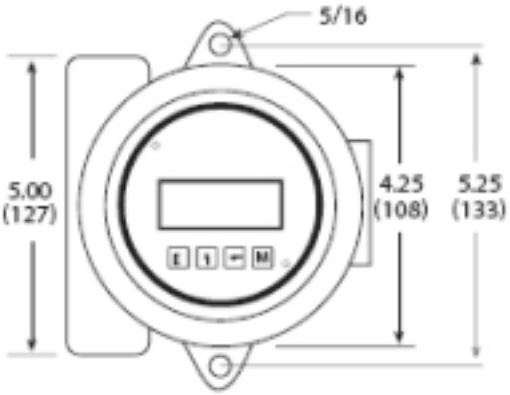
CAUTION: Performing the analog output calibration will erase all programming values. Please record all programmed values before beginning the analog output calibration On models 4300-3I and 4300-3O, the 4-20 mA has been accurately set to 4.000 and 20.000 mA by the factory. No calibrationshould be required.

The 4-20 mA output may be verified periodically by installing a digital milliamp meter(DMM) in series with the analog output and simulating a full scale or over range flow rate. If the output is out of calibration, perform the following:

Remove power and/or disconnect batteries. Hold down the scroll (.) key and replace the battery. This will initiallize the unit and advance to the analog output calibration mode. Connect a DMM set to read current in series with a power supply (8.5 to 30 volts DC) to TB12 (+) and TB11 (–). The output should read 4.000 ma (± 0.005). If it does not, Adjust the numbers on the display up or down until the output reads 4.000 ma (± 0.005). Press the "E" key. The DMM should now read 20.000 ma (± 0.005). If it does not, Adjust the numbers on the display up or down until the output reads 20.000 ma (± 0.005). Press "E" and the unit will return to the "RUN" mode.

Dimensions





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

Technical Support

Contact Information:
Field Service Response Center
24/7 Technical Support/Schedule a Technician: 1-844-203-4014
System Installation Supervision, Start-Up, Commissioning Services, and Training Available

The specifications contained herein are subject to change without notice and any user of said specifications should verify from the manufacturer that the specifications are currently in effect. Otherwise, the manufacturer assumes no responsibility for the use of specifications which may have been changed and are no longer in effect.

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