

# DFM-6300 SERIES Instruction Manual



## KEY FEATURES

- NEMA 4X, IP65 Front
- Universal 85-265 VAC Input Power Models
- Large Dual-Line 6-Digit Display, 0.60" & 0.46"
- Isolated 24 VDC Transmitter Power Supply
- Programmable Displays & Function Keys
- Sunlight Readable Display Models
- Rate Displayed as Gallons per minute, Liters per second, Liters per minute
- Total displayed as Gallons, Cubic Meters, Cubic Feet
- Total, Grand Total or Non-Resettable Grand Total
- 9-Digit Totalizer with Total Overflow Feature
- K-Factor Calibration
- Optional Outputs – Models DFM 6301: Two C Form Relays programmable for rate or total + Isolated 4-20 mA Output to transmit rate

## ORDERING INFORMATION

DFM-6300-00		Wall Mount flow monitor displays rate and total
DFM-6300-01		Panel mount flow monitor displays rate and total
DFM-6301-00		Wall mount flow monitor with Outputs 4-20mA + 2 relays
DFM-6301-01		Panel mount flow monitor with Outputs 4-20mA + 2 relays

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## COMPLIANCE INFORMATION

### Safety

<b>UL &amp; c-UL LISTED</b>	USA & Canada UL 508 Industrial Control Equipment
<b>UL FILE NUMBER</b>	E160849
<b>FRONT PANEL</b>	UL Type 4X, NEMA 4X, IP65; panel gasket provided
<b>LOW VOLTAGE DIRECTIVE</b>	EN 61010-1:2010 Safety requirements for measurement, control, and laboratory use

### Electromagnetic Compatibility

<b>EMISSIONS</b>	EN 55022:2010 Class A ITE emissions requirements
Radiated Emissions	Class A
AC Mains Conducted Emissions	Class A
<b>IMMUNITY</b>	EN 61326-1:2006 Measurement, control, and laboratory equipment EN 61000-6-2:2005 EMC heavy industrial generic immunity standard
RFI - Amplitude Modulated	80 -1000 MHz 10 V/m 80% AM (1 kHz) 1.4 - 2.0 GHz 3 V/m 80% AM (1 kHz) 2.0 - 2.7 GHz 1 V/m 80% AM (1 kHz)
Electrical Fast Transients	±2kV AC mains, ±1kV other
Electrostatic Discharge	±4kV contact, ±8kV air
RFI - Conducted	10V, 0.15-80 MHz, 1kHz 80% AM
AC Surge	±2kV Common, ±1kV Differential
Surge	1KV (CM)
Power-Frequency Magnetic Field	3 A/m 70%V for 0.5 period
Voltage Dips	40%V for 5 & 50 periods 70%V for 25 periods
Voltage Interruptions	<5%V for 250 periods

*Note:*

*Testing was conducted on DFM6300 meters installed through the covers of grounded metal enclosures with cable shields grounded at the point of entry representing installations designed to optimize EMC performance.*

*Declaration of Conformity available at [www.creativesensortechnology.com](http://www.creativesensortechnology.com)*

## SAFETY INFORMATION



**CAUTION:** *Read complete instructions prior to installation and operation of the meter.*



**WARNING:** *Risk of electric shock or personal injury.*



**Warning!**

***Hazardous voltages exist within enclosure. Installation and service should be performed only by trained service personnel.***

## INSTALLATION

There is no need to remove the meter from its case to complete the installation, wiring, and setup of the meter for most applications.

### Unpacking

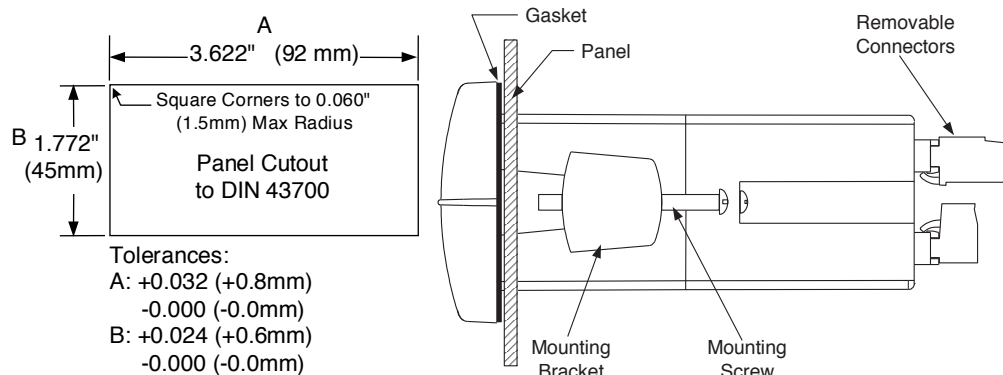
Remove the meter from box. Inspect the packaging and contents for damage. Report damages, if any, to the carrier.

If any part is missing or the meter malfunctions, please contact your supplier or the factory for assistance.

### Panel Mounting Instructions

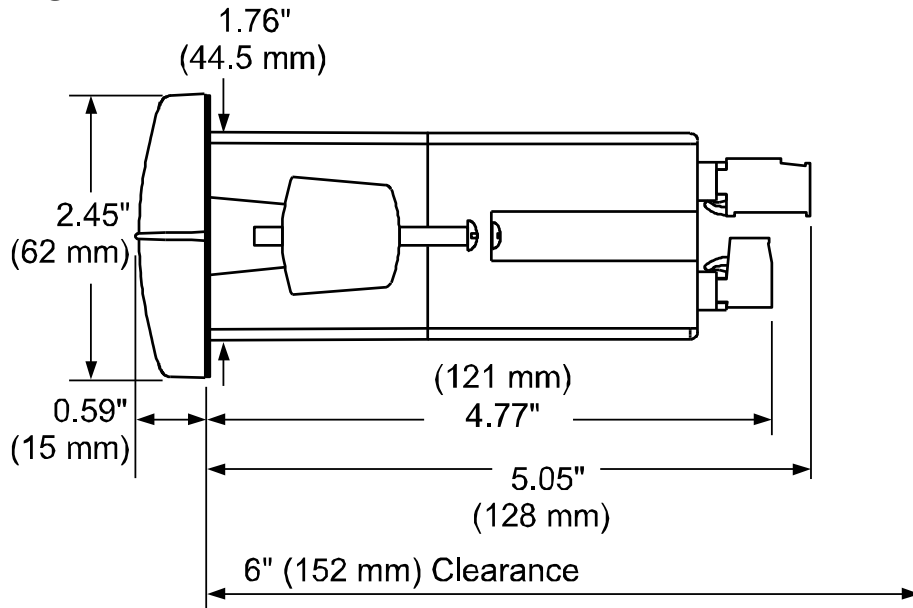
- Prepare a standard 1/8 DIN panel cutout – 3.622" x 1.772" (92 mm x 45 mm). Refer to Figure 1 for more details.
- Clearance: allow at least 6.0" (152 mm) behind the panel for wiring.
- Panel thickness: 0.04" - 0.25" (1.0 mm - 6.4 mm).  
Recommended minimum panel thickness to maintain Type 4X rating: 0.06" (1.5 mm) steel panel, 0.16" (4.1 mm) plastic panel.
- Remove the two mounting brackets provided with the meter (back-off the two screws so that there is ¼" (6.4 mm) or less through the bracket. Slide the bracket toward the front of the case and remove).
- Insert meter into the panel cutout.
- Install mounting brackets and tighten the screws against the panel. To achieve a proper seal, tighten the mounting bracket screws evenly until meter is snug to the panel along its short side. **DO NOT OVER TIGHTEN**, as the rear of the panel may be damaged.

*Note: See Figure 10 on page 30 for 1/8 DIN Panel Cutout Template*

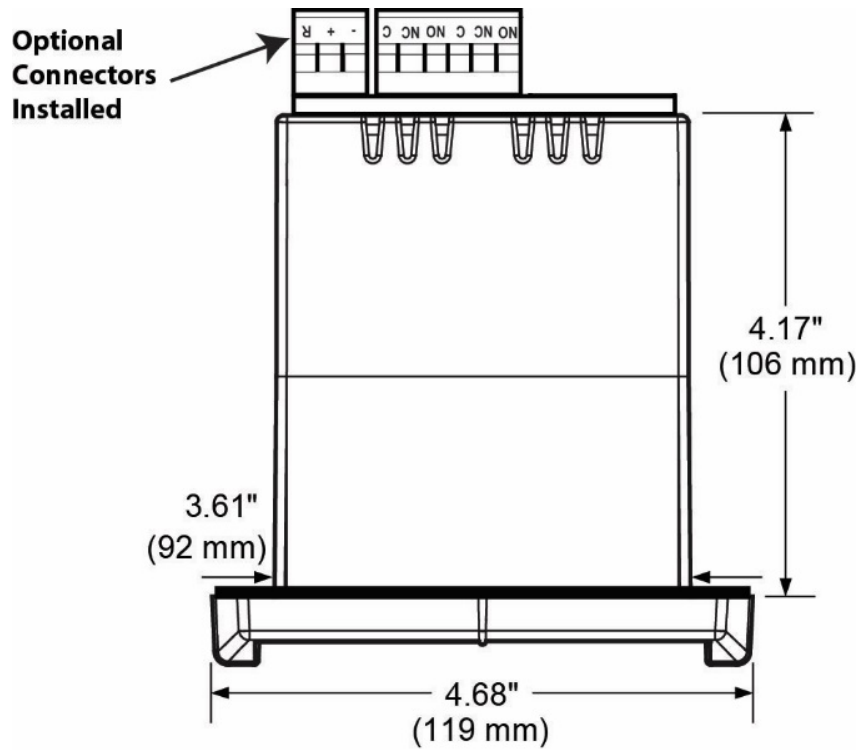


**Figure 1: 1/8 DIN Panel Cutout and Mounting**

**Mounting Dimensions**




**Figure 2: Meter Dimensions - Side View**



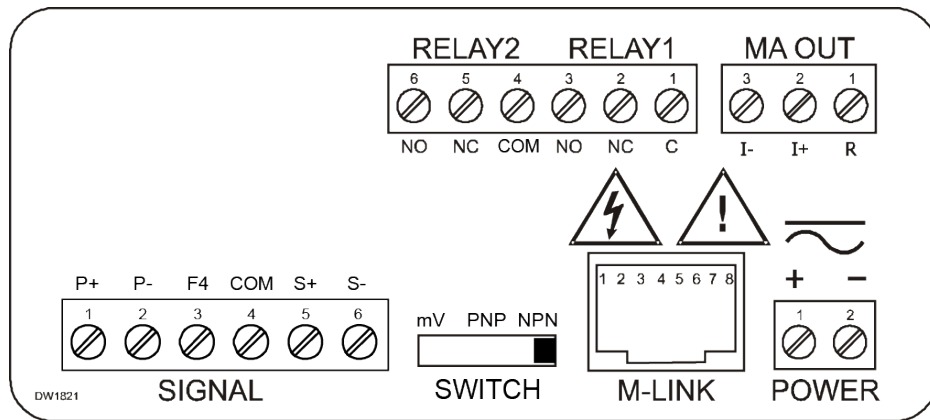
**Figure 3: Meter Dimensions - Top View**

### Connectors Labeling

The connectors' label, affixed to the meter, shows the location of all connectors available with requested configuration.



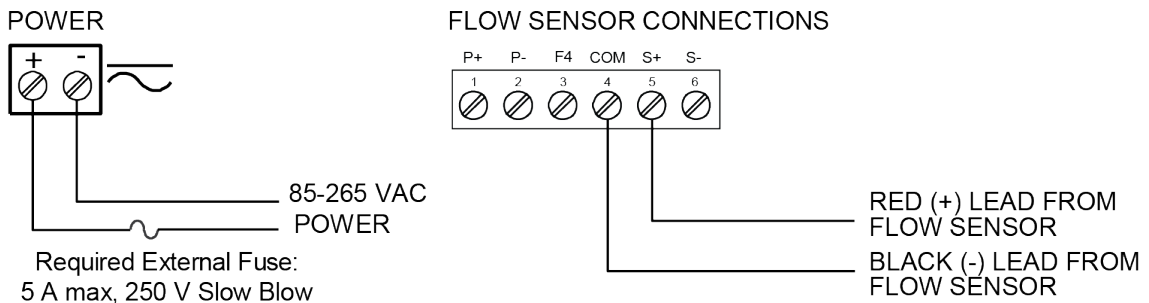
**Warning!** *Do not connect any equipment to the RJ45 M-LINK connector. This connector is intended for factory use only. If non-standard equipment is connected to the M-LINK, damage will occur to the equipment and the meter.*



**Figure 4: Connector Labeling for Fully Loaded PD6300-CS**

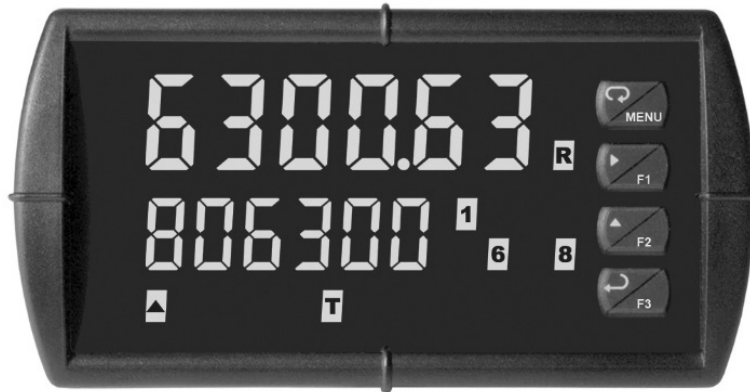
### Wiring Connections

Power connections are made to a two-terminal connector labeled POWER on Figure 4. The + and - symbols are only a suggested wiring convention.



**Figure 5: Wiring Connections**

## Front Panel Buttons and Status LED Indicators



Button Symbol	Description
	<b>Menu</b>
	<b>Right arrow/F1</b>
	<b>Up arrow/F2</b>
	<b>Enter/F3</b>

LED	Status
1-8	Alarm 1 – 8 indicator
R	Rate indicator
T	Total indicator
G T	Grand Total indicator
▲	Total overflow indicator
M	Manual control relays &/or analog output

- Press the Menu button to enter or exit the Programming Mode at any time.
- Press the Right arrow button to move to the next digit during digit or decimal point programming.
- Press or hold the Up arrow button to scroll through the menus, decimal point, or press or hold to increment the value of a digit.
- Press the Enter button to access a menu or to accept a setting.

## Display Functions and Messages

The meter displays various functions and messages during setup, programming, and operation. The following table shows the main menu functions and messages in the order they appear in the menu.

Display	Parameter	Action/Setting Description
<b>DFM-6300 SERIES</b>		
SEnSor	<i>Sensor</i>	Select the appropriate sensor
T 10	<i>T10</i>	Type T10 Sensor
T 15	<i>T15</i>	Type T15 Sensor
T20	<i>T20</i>	Type T20 Sensor
S-30	<i>S-30</i>	Type S-30 Sensor
S-40	<i>S-40</i>	Type S-40 Sensor
CUSt	<i>Custom</i>	Custom Sensor
KFactor	<i>K-Factor</i>	Custom Sensor K-Factor
OFFSEt	<i>Offset</i>	Custom Sensor Offset
rRtE Un ts	<i>Rate Units</i>	Select the display units for rate
tOtAL Un ts	<i>Total Units</i>	Select the display units for total
<b>OPTIONAL OUTPUT: DFM-6301 MODELS</b>		
rELAY	<i>Relay</i>	Enter the <i>Relay</i> menu
RSS Un	<i>Assignment</i>	Assign relays to rate, total, grand total, or Modbus
RS Un 1	<i>Assign 1</i>	Relay 1 assignment
rRtE	<i>Rate</i>	Assign relay to rate
tOtAL	<i>Total</i>	Assign relay to total
G tOtAL	<i>Grand total</i>	Assign relay to grand total
rLY 1	<i>Relay 1</i>	Relay 1 setup
Rct 1	<i>Action 1</i>	Set relay 1 action
RuTo	<i>Automatic</i>	Set relay for automatic reset
R-man Rn	<i>Auto-manual</i>	Set relay for automatic & manual reset any time
LRtCH	<i>Latching</i>	Set relay for latching operation (relays assigned to rate)

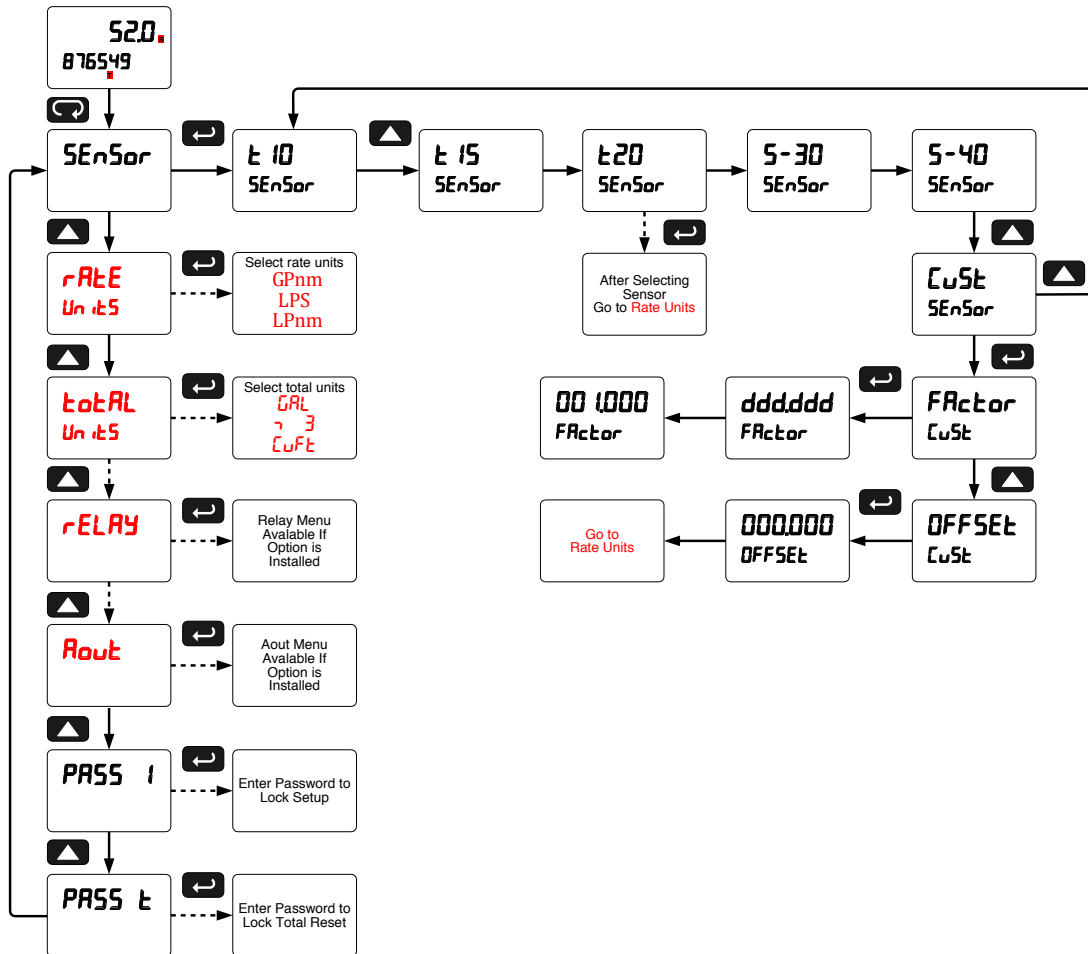


Display	Parameter	Action/Setting Description
Lt-Clr	Latching-cleared	Set relay for latching operation with manual reset only after alarm condition has cleared (relays assigned to rate)
ALtErn	Alternate	Set relay for alternation control (relays assigned to rate)
SRnnn PL	Sampling	Set relay for sampling operation
OFF	Off	Disable relay and front panel status LED (Select Off to enable Interlock feature)
SEt 1	Set 1	Program set point 1
rSEt 1	Reset 1	Program reset point 1
rLY 2	Relay 2	Relay 2 setup
FRILSF	Fail-safe	Enter Fail-safe menu
FLS 1	Fail-safe 1	Set relay 1 fail-safe operation
on	On	Enable fail-safe operation
oFF	Fail-safe off	Disable fail-safe operation
dELAY	Delay	Enter relay Time Delay menu
dLY 1	Delay 1	Enter relay 1 time delay setup
On 1	On	Set relay 1 On time delay
OFF 1	Off	Set relay 1 Off time delay
Rout	Analog output	Enter the Analog output scaling menu
d15 1	Display 1	Program display 1 value
Out 1	Output 1	Program output 1 value (e.g. 4.000 mA)
d15 2	Display 2	Program display 2 value
Out 2	Output 2	Program output 2 value (e.g. 20.000 mA)
<b>ALL DFM-6300 SERIES</b>		
PASS 1	Password	Password protect the meter
PASS t	Total Password	Password protect the resetting of the total

## Main Menu

The main menu consists of the most commonly used functions: *Sensor*, *Rate Units*, *Total Units*, *Relay*, *Analog Out*, *Password* and *Total Password*.

- Press Menu button to enter *Programming Mode* then press the *Up Arrow* button to scroll through the main menu.



- Press Menu, at any time, to exit and return to *Run Mode*. Changes made to settings prior to pressing *Enter* are not saved.
- Changes to the settings are saved to memory only after pressing *Enter*.
- The display moves to the next menu every time a setting is accepted by pressing *Enter*.

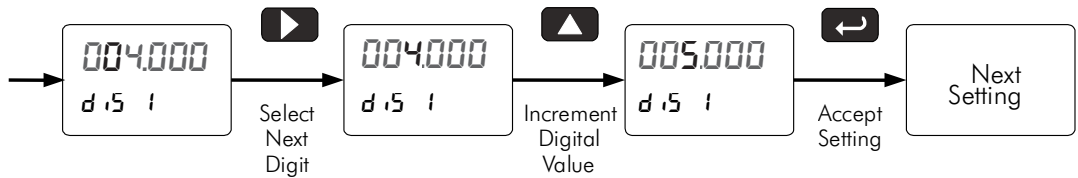
### Setting Numeric Values

The numeric values are set using the Right and Up arrow buttons. Press Right arrow to select next digit and Up arrow to increment digit value.

The digit being changed is displayed brighter than the rest.

Press and hold up arrow to auto-increment the display value.

Press the Enter button, at any time, to accept a setting or Menu button to exit without saving changes.

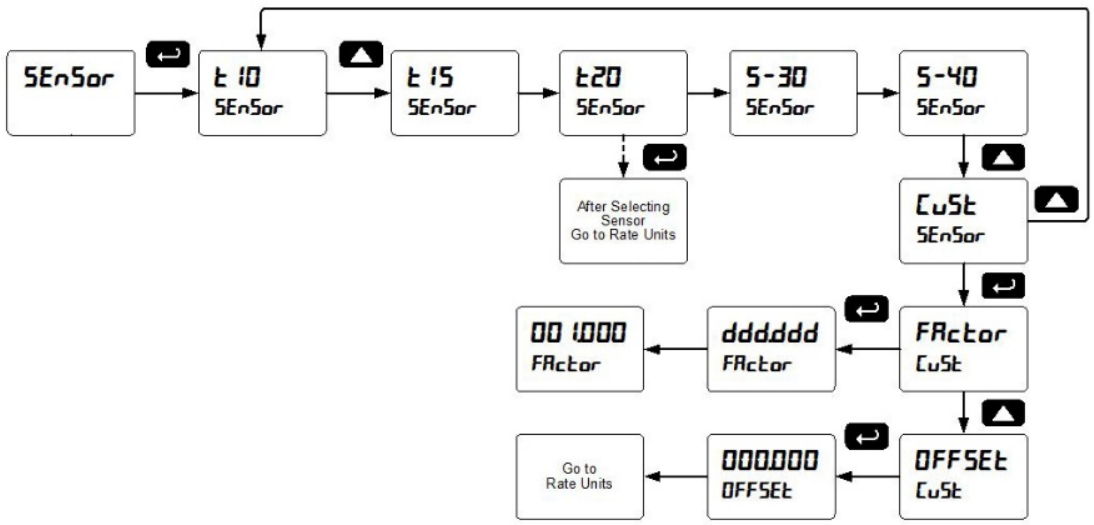


### Selecting a Sensor Type (SEnSor)

The *Sensor* menu is used to select the sensor type from the following options:

1. T10
2. T15
3. T20
4. S-30
5. S-40
6. Custom

Press the *Enter* button to access any menu or press the *Up Arrow* button to scroll through choices. Press the *Menu* button to exit at any time.



Use the Custom menu to enter the K-Factor and Offset for a custom sensor not included in this meter.

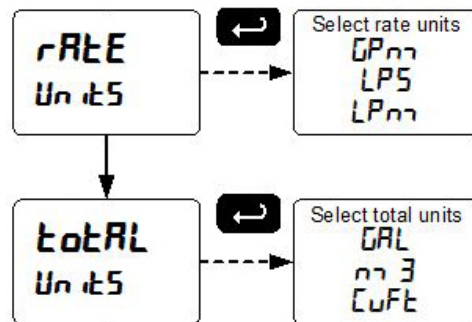
### K-Factor Calibration (FRctOr)

The meter may be calibrated using the *K-Factor* function. Most flowmeter manufacturers provide this information with the device. Enter the *K-Factor* (FRctOr) menu and select the decimal point with highest resolution possible and program the k-factor value (*from sensor manual*). The meter will automatically calculate the flow rate using the k-factor and the time base selected.



### Select Rate and Total Units (rAtE unItS/totAL unItS)

Use the rate units and total units menus to select the appropriate rate and total units for your application.



The units available for rate are:

1. Gallons per minute (GPM)
2. Liters per second (LPS)
3. Liters per minute (LPM)

The units available for total are:

1. Gallons (GAL)
2. Cubic meters (m<sup>3</sup>)
3. Cubic feet (CuFt)

## Setting up the Password (PASS)

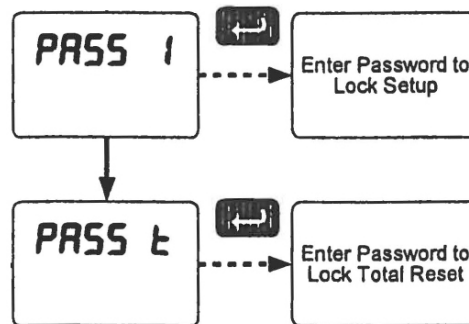
The *Password* menu is used for programming two levels of security to prevent unauthorized changes to the programmed parameter settings.

Pass 1: Restricts all programming and function keys  
 Pass T: Prevents resetting the total manually.

### Protecting or Locking the Meter

Enter the *Password* menu and program a six-digit password.

For instructions on how to program numeric values see Setting Numeric Values, page 11.



Record the password for future reference. If appropriate, it may be recorded in the space provided.

Model:	
Serial Number:	
Password 1:	__ __ __ __ __ __
Total Password	__ __ __ __ __ __

### Making Changes to a Password Protected Meter

If the meter is password protected, the meter will display the message *L o c k* (*Locked*) when the Menu button is pressed. Press the Enter button while the message is being displayed and enter the correct password to gain access the menu. After exiting the programming mode, the meter returns to its password protected condition.

## Disabling Password Protection

To disable the password protection, access the setup menu by following the instructions under **Making Changes to a Password Protected Meter** on page 13. Navigate to the applicable password menu, press *Enter* and then enter the correct password.

If the correct six-digit password is entered, the meter displays the message *unLck* (unlocked) and the protection is disabled until a new password is programmed.

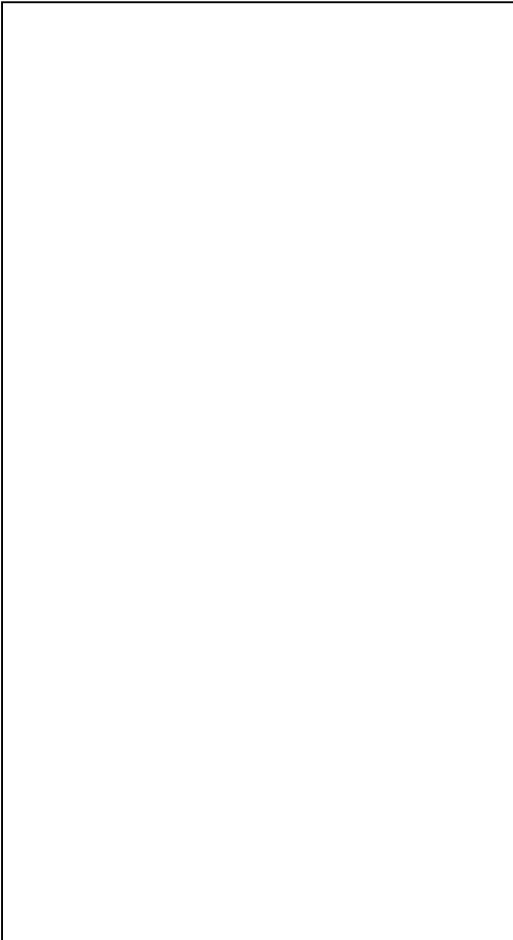
If the password entered is incorrect, the meter displays the message *Lckd* (Locked) for about two seconds, and then it returns to Run Mode. To try again, press *Enter* while the *Locked* message is displayed.

### **Did you forget the password?**

The password may be disabled by entering a master password once. If you are authorized to make changes, enter the master password 508655 to unlock the meter.

## TROUBLESHOOTING

Symptom	Check/Action
No display at all	Check power at power connector
Not able to change setup or programming, <i>LoCd</i> is displayed	Meter is password-protected, enter correct six-digit password to unlock
Meter displays error message during calibration ( <i>Error</i> )	Check: 1. Signal connections 2. Minimum input span requirements
Meter displays 999999 -999999	Check: 1. Input selected in <i>Setup</i> menu 2. Corresponding signal at Signal connector
Display is unstable	Check: 1. Input signal stability and value 2. Display scaling vs. input signal
Display reading is not accurate	Check: Scaling or calibration
Display does not respond to input changes, reading a fixed number	Check: Display assignment, it might be displaying max, min, or set point.
Display alternates between 1. <i>H</i> and a number 2. <i>Lo</i> and a number	Press Menu to exit max/min display readings.
Relay operation is reversed	Check: 1. Fail-safe in <i>Setup</i> menu 2. Wiring of relay contacts
Relay and status LED do not respond to signal	Check: 1. Relay action in Setup menu 2. Set and reset points
If the display locks up or the meter does not respond at all	Cycle the power to reboot the microprocessor.
Other symptoms not described above	Call Technical Support for assistance. Contact information is located on the last page of this manual.



**Figure 6: 1/8 DIN Panel Cutout Template**