

Safety information

Please read this entire document before unpacking, setting up or operating this equipment. Pay attention to all danger and caution statements. Failure to do so could result in serious injury to the operator or damage to the equipment.

To ensure that the protection provided by this equipment is not impaired, do not use or install this equipment in any manner other than that specified in this document.

Important Note: *The manufacturer is not responsible for any damages due to misapplication or misuse of this product including, without limitation, direct, incidental and consequential damages, and disclaims such damages to the full extent permitted under applicable law. The user is solely responsible to identify critical application risks and install appropriate mechanisms to protect processes during a possible equipment malfunction.*

Use of hazard information

- DANGER**
Indicates a potentially or imminently hazardous situation which, if not avoided, will result in death or serious injury.
- WARNING**
Indicates a potentially or imminently hazardous situation which, if not avoided, could result in death or serious injury.
- CAUTION**
Indicates a potentially hazardous situation that may result in minor or moderate injury.
- Important Note:** *Information that requires special emphasis.*
- Note:** *Information that supplements points in the main text.*

Precautionary labels
Read all labels and tags attached to the instrument. Personal injury or damage to the instrument could occur if not observed. A symbol, if noted on the instrument, will be included with a danger or caution statement in the manual.

	This symbol, if noted on the instrument, references the instruction manual for operation and/or safety information.
	Electrical equipment marked with this symbol may not be disposed of in European public disposal systems after 12 August of 2005. In conformity with European local and national regulations (EU Directive 2002/96/EC), European electrical equipment users must now return old or end-of life equipment to the Producer for disposal at no charge to the user. Note: <i>For return for recycling, please contact the equipment producer or supplier for instructions on how to return end-of-life equipment, producer-supplied electrical accessories, and all auxiliary items for proper disposal.</i>

Introduction

This quick-start booklet contains condensed instructions to assist the user in starting and operating the instrument. These condensed instructions pertain to basic flow measurement operation using a impeller flow sensor and wiring the transmitter in a two-wire hookup. Refer

to the PRO-F3 manual for information about using a non-Hach flow sensor, wire in a three or four-wire hookup, or use a specific instrument feature.

Mount the transmitter

Refer to the PRO-F3 manual for instructions on mounting the transmitter.

Connect the sensor

DANGER

Explosion Hazard. Do not connect or disconnect electrical components or circuits to the equipment unless power has been removed or the area is known to be non-hazardous.

WARNING

Multiple hazards. Only qualified personnel must conduct the tasks described in this section of the document.

Connect the impeller flow sensor, matching wire colors to terminals as indicated in [Table 1 on page 2](#).

Table 1 Sensor connections

Wire colors	TB2 Terminal connections
Black	Terminal 1
Red	Terminal 2
Cable shield	Terminal 3

Connect the DC power

In a two-wire hookup, at least 14 VDC is required for operation. A load device can be connected in the current loop as shown in [Figure 1 on page 3](#).

Depending on how the transmitter is mounted, route the DC power/analog output wiring into the transmitter as follows:

- **Wall/Pipe-mounted transmitter:** Route the cable through the right side cable entry knockout hole in the back cover.
- **Panel-mounted transmitter:** Route the cable behind the panel to the exposed TB1 terminal strip.
- **Integral sensor-mounted transmitter:** Route the cable through the right side cable entry knockout hole the back cover. (Do not open left side cable entry knockout hole in cover.)

Note: Use high quality, shielded instrumentation cable.

For more information about wiring the transmitter in a three or four-wire hookup arrangement or monitor mode hookup, refer to the PRO-F3 manual.

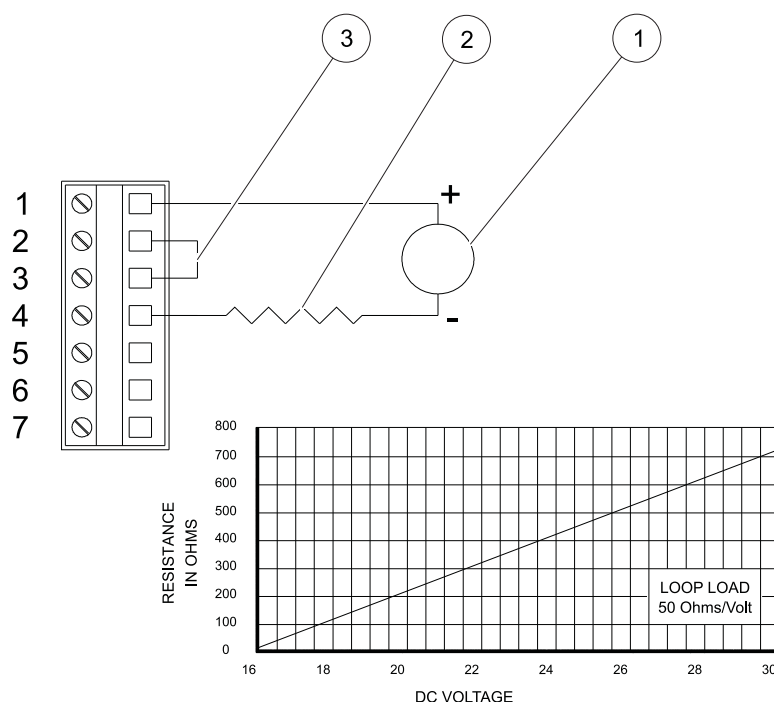


Figure 1 Load device connected in the current loop

1	Loop power 14–30 VDC class 2, 4–20 mA	3	Jumper required
2	Loop resistance (see nomograph)		

Set the flow rate readout (multiplier, decimal and measurement unit annunciator)

The displayed flow rate always includes a user-set multiplier. The measured flow rate can be shown as a whole number or decimal (XXX.X or XX.XX). The factory-set measurement unit annunciator for flow rate is US GAL/MIN, with a large selection of other choices available.

To set the flow rate readout:

1. Press **MENU** to display the Main Menu screen. If the Main Menu screen is not displayed press the **UP** or the **DOWN** arrow key to display it.
2. Press **ENTER** to display the Configure Set Output screen.
3. Press the **DOWN** arrow to display the Configure Sensor screen.
4. Press **ENTER** to display the Sensor Set Multiplier screen.
5. Press **ENTER** again to display the Set Multiplier? (x100) screen. Press the **UP** and the **DOWN** arrow keys to select x1, x10, x100, x1000 or x10000 and press **ENTER**.
6. After the Sensor Set Multiplier screen appears, press the **DOWN** arrow to display the Sensor Set Decimal screen.
7. Press **ENTER** to display the Set Decimal? (xxx.x) screen. Press the **UP** and the **DOWN** arrow keys to select XXXX, XXX.X or XX.XX and press **ENTER**.
8. After the Sensor Set Decimal screen appears, press the **DOWN** arrow to display SENSOR FLOW UNITS.
9. Press **ENTER** to display the Flow Units? (US Gal/Min) screen. Press the **UP** and **DOWN** arrow keys to select the desired flow rate measurement unit annunciator, and press **ENTER**.

Set the volume readout (volume unit annunciator and totalizer reset mode)

Unlike flow rate, volume is shown as a whole number without a multiplier. Choose from a variety of volume measurement unit annunciators. The totalizer mode is factory-set for automatic reset, which resets the displayed volume to zero after reaching its maximum limit and starts a new count. The totalizer can be set to a manual reset mode to preserve the total volume. In manual mode, the totalizer can be manually reset back to zero at any time by using the "Reset Vol" function in the Test/Maint menu.

To set the volume readout and totalizer mode:

1. From the Sensor Flow Units screen, press the **DOWN** arrow to display VOLUME UNITS.
2. Press **ENTER** to display the Volume Units? (US Gallons). Press the **UP** and **DOWN** arrow keys to select the desired volume measurement unit annunciator, and press **ENTER**.
3. After the Sensor Volume Units screen appears, press the **DOWN** arrow twice to display the Sensor Totalizer Mode screen.
4. Press **ENTER** to display the Totalizer Mode? (Auto Reset) screen. Press the **UP** and the **DOWN** arrow keys to select the Auto Reset mode or the Manual Reset mode and press **ENTER**.

Select sensor type/entering sensor data (calibration)

To configure/calibrate the transmitter so that measured values will accurately represent the actual process flow, select the sensor type and enter the specific related data. This is a normal part of the initial configuration setup.

The data entered depends on the sensor and how it is mounted:

- **Sensor mounted in tee:** Enter the Tee size and Tee material.
- **Sensor mounted in pipe (using weldolet, pipe saddle or ball valve assembly):** Enter the inside diameter of the pipe (Set Pipe Id).
- **Non-Hach sensor (any mounting):** Enter a slope value (Set Slope) and offset value (Set Offset).

Using the following procedure enter an appropriate sensor data to calibrate the transmitter. Thereafter adjust the calibration to linearly offset measured flow readings by using the Calibrate menu. Consider adjusting the calibration when transmitter readings match the user-supplied "qualified reference" flow instrument. For more information about completing the calibration adjustment, refer to the PRO-F3 manual.

Note: The following configuration/calibration procedure is only for sensors. For more information about entering specific data for non-Hach sensors, refer to the PRO-F3 manual, section "Set Sensor Data" under "Non-Hach Sensor Setup" category.

1. From the Sensor Totalizer mode screen, press the **DOWN** arrow to display the Select Sensor screen.
2. Press **ENTER** to display the Select Sensor? (Hach Polyprop/T). Press the **UP** and **DOWN** arrow keys to select the type of sensor and mounting arrangement being used and press **ENTER**.
 - Pipe Mount: For sensor mounted in a pipe using weld-olet, pipe saddle or ball valve.
 - POLYPROP/T: For poly-propylene sensor mounted in a tee.
 - PVDF/T: For PVDF sensor mounted in a tee.
 - 316SS/T: For stainless steel-sleeved sensor with 2-inch NPT hex adapter mounted in a tee.
 - Brass/T: For brass-sleeved sensor with 2-inch NPT hex adapter mounted in a tee.

3. After the Select Sensor screen appears, press the **DOWN** arrow to display SET SENSOR and press **ENTER**. Depending on the selected sensor/mounting arrangement, the screen appearing is:
 - The Set Sensor Tee Size screen when POLYPROP/T, PVDF/T, 316SS/T or Brass/T was selected.
 - The Set Sensor Set Pipe Id when "Pipe Mount" was selected.
 - The Set Sensor Set Slope when "Non-Hach Sensor" was selected.

Refer to the appropriate section corresponding to the mounting to complete sensor data entry.

Tee mount sensor setup (select tee size and tee material)

1. From the Set Sensor Tee Size screen, press **ENTER** to display the Tee Size? (2.0 inches) screen. Press the **UP** and **DOWN** arrow keys to select the tee size in which the sensor is mounted, and press **ENTER**.

0.5 in.	1.25 in.
3.0 in.	0.75 in.
1.5 in.	4.0 in.
1.0 in.	2.0 in.
1 in. Mhf15l2 ¹	2.5 in.

¹ Select only when using a PVC 1-inch MHF15L2 tee for higher flow range (up to 65 GPM).

2. After the Set Sensor Tee Size screen appears, press the **DOWN** arrow to display Set Sensor Tee Material screen.
3. Press **ENTER** to display the Tee Material? (PVC). Press the **UP** and **DOWN** arrow keys to select the material of the tee in which the sensor is mounted, and press **ENTER**. (Previously selected tee size determines available tee material choices.)

The transmitter is now ready to measure flow and volume.

Pipe mount sensor setup (set pipe id)

1. Determine the inside diameter (ID) of the pipe by either actually measuring the pipe or referring to an appropriate table.

Pipe IDs for commonly-used Schedule 40 and Schedule 80 pipes are listed in [Table 2](#).

Table 2 Pipe IDs for schedule 40 and schedule 80 pipes

Nominal pipe size (inches)	Pipe id (inches)
Schedule 40 pipe	
3	3.068
4	4.026
5	5.047
6	6.065
8	7.981
10	10.020
12	11.938
14	13.124
16	15.000
18	16.876
20	18.812

Table 2 Pipe IDs for schedule 40 and schedule 80 pipes

Nominal pipe size (inches)	Pipe id (inches)
24	22.624
Schedule 80 pipe	
3	2.900
4	3.826
5	4.813
6	5.761
8	7.625
10	9.562
12	11.374
14	12.500
16	14.312
18	16.124
20	17.938
24	21.562

- From the Set Sensor screen, press **ENTER** to display the Set Pipe Id? (3.000 inches) screen. Adjust the displayed value to exactly match the actual pipe ID (in-side diameter). Starting with the extreme right blinking digit, Press the **UP** and **DOWN** arrow keys to adjust its value. Then press the **LEFT** arrow to select the next digit, and press the **UP** and **DOWN** arrow keys to adjust its value. Repeat this procedure until the desired value is displayed, and press **ENTER**.

The transmitter is now ready to measure flow and volume.

Non-Hach sensor setup (set slope and set offset values)

For more information about entering specific data for non-Hach sensors, refer to the PRO-F3 manual.

Complete the transmitter configuration

To further configure the transmitter to the application requirements, use the appropriate Configure screens to make selections and "key in" values. For more information about completing the configuration details, refer to the PRO-F3 manual.

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