00809-0100-4015
English
Rev. B1

Model 3095FT HART® Flow Transmitter

Product Discontinued

ROSEMOUNT® MEASUREMENT

FISHER-ROSEMOUNT™ Managing The Process Better.™

Model 3095FT HART®
Flow Transmitter

Model 3095FT Software: 64
Model 3095FT User Interface Software: 2.02

NOTICE

Read this manual before working with the product. For personal and system safety, and for optimum product performance, make sure you thoroughly understand the contents before installing, using, or maintaining this product.

Within the United States, Rosemount Inc. has two toll-free assistance numbers.

Customer Central: 1-800-999-9307 (*7:00 a.m. to 7:00 p.m. CST)*
Technical support, quoting, and order-related questions.

North American Response Center: 1-800-654-7768 (*24 hours a day – Includes Canada)*
Equipment service needs.

For equipment service or support needs outside the United States, contact your local Rosemount representative.

⚠CAUTION

The products described in this document are NOT designed for nuclear-qualified applications.

Using non-nuclear qualified products in applications that require nuclear-qualified hardware or products may cause inaccurate readings.

For information on Rosemount nuclear-qualified products, contact your local Rosemount Sales Representative.

SNF-0004

Rosemount Inc.
Measurement Division
8200 Market Boulevard
Chanhassen, MN 55317 USA
Tel 1-800-999-9307
Telex 4310012
Fax (612) 949-7001

CE Fisher-Rosemount satisfies all obligations coming from legislation to harmonize product requirements in the European Union.

ROSEMOUNT® MEASUREMENT

FISHER-ROSEMOUNT™ Managing The Process Better.™

Publication Number 00809-0100-4015

Printed in the USA

Table of Contents

SECTION 4
Using the Model 3095FT User Interface Software

SECTION 5 Troubleshooting and Maintenance

SECTION 6
Theory of Operation

SECTION 7
Specifications and Reference Data

Section 1 Introduction

OVERVIEW

This manual provides installation, configuration, calibration, troubleshooting, and maintenance instructions for the Rosemount® Model 3095FT HART Flow Transmitter and for its operation with the Model 3095FT User Interface Software.

USING THIS MANUAL

Section 2 **Initial Checkout and Field Installation** explains how to install the Model 3095FT. This includes testing the transmitter, reviewing transmitter configuration data, installation considerations, and field installation.

Section 3 **Options and Accessories** presents options such as the LCD meter, mounting brackets, transient protection terminal block, custom configuration, and the remote power supply.

Section 4 **Using the Model 3095FT User Interface Software** describes how to use the configuration software. This includes installing the software onto a personal computer, establishing communications with the Model 3095FT, configuring the flow transmitter, creating a configuration file, calibrating the flow transmitter, and retrieving log data from the Model 3095FT. This section also explains each configuration software menu.

Section 5 **Troubleshooting and Maintenance** provides troubleshooting instructions for dealing with potential mechanical or electrical difficulties.

Section 6 **Theory of Operation** discusses the basic operating principles of the transmitter.

Section 7 **Specifications and Reference Data** includes specification data for the Model 3095FT, the Model 3095FT configuration data sheet (CDS 4015), and spare parts information.

Appendices A and B These appendices illustrate Factory Mutual (FM) certified drawings.

Appendices C and D These appendices illustrate Canada Standards Association (CSA) certified drawings.

Appendix E **Software Error Messages** identifies and explains error messages that might occur while using the Model 3095FT User Interface Software.

Appendix F **Flow-Cal™ Import Information** explains how to import Model 3095FT logged data into the Flow-Cal software.

Appendix G **Model 3095FT Flow Transmitter HART Commands** identifies the HART commands that a control system can use to monitor or configure the Model 3095FT Flow Transmitter.

SYSTEM DESCRIPTION

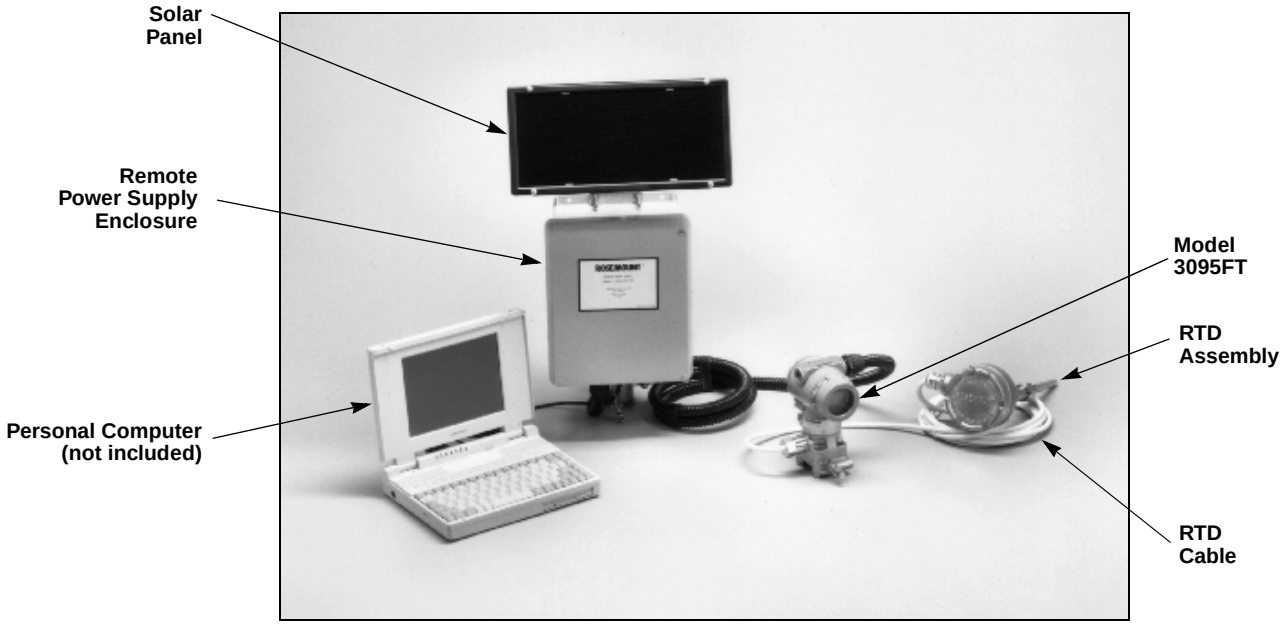
The Model 3095FT HART Flow Transmitter is an advanced compact electronic gas measurement (EGM) device. Where traditional transmitters measure just one process variable, the Model 3095FT measures three variables simultaneously: differential pressure, absolute pressure, and process temperature. The Multivariable™ module incorporates a high-accuracy capacitance sensor for measuring differential pressure, a high-accuracy piezoresistive sensor for measuring absolute pressure, and a four-wire RTD input for process temperature measurement. In addition, the sensor electronics convert the process variables directly into digital format for further correction and compensation within the sensor module.

The Model 3095FT performs American Gas Association flow calculations per A.G.A. Report No. 3 (API MPMS Chapter 14.3 — GPA 8185-92) and A.G.A. Report No. 8 (API MPMS Chapter 14.2), and stores all relevant data in nonvolatile memory in accordance with American Petroleum Institute electronic flow measurement standards (API - Manual of Petroleum Measurement Standards, Chapter 21.1, “Electronic Gas Measurement”). The three process variables and the flow rate are available at all times via the HART® protocol on a single two-wire system.

Configuring the Model 3095FT is accomplished by using the Model 3095FT User Interface Software, an easy-to-use software package which runs on a DOS-based personal computer (386 and above) running Microsoft® Windows.® This software package can include a modem to connect a computer to the Model 3095FT, and provides both configuration capabilities and retrieval capabilities for the Model 3095FT logged data.

Finally, the Model 3095FT can be installed in remote locations using a solar power and battery system. Figure 1-1 shows the components of the Model 3095FT system.

FIGURE 1-1. Model 3095FT System.

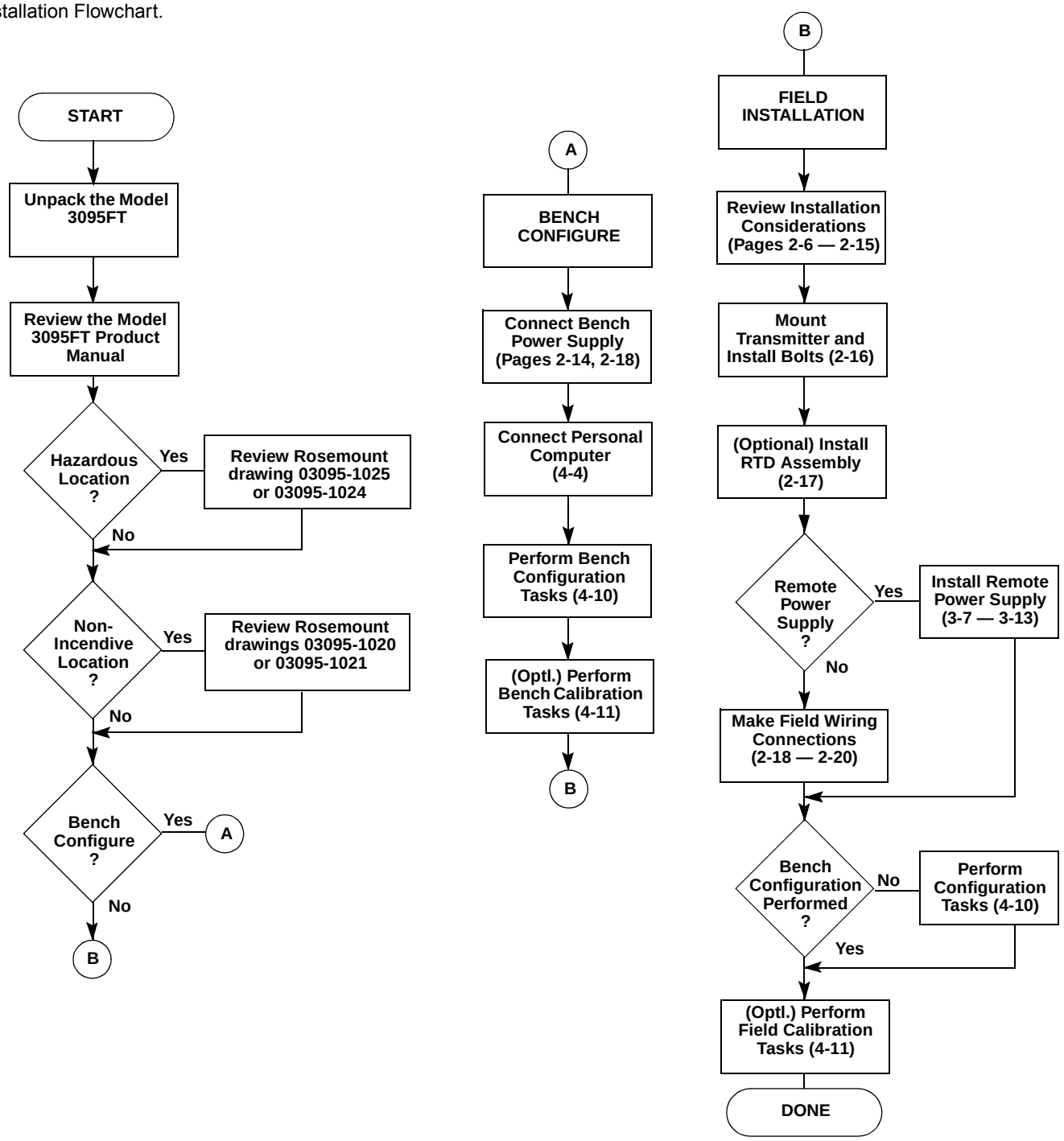


Section 2

Initial Checkout and Field Installation

This section contains an installation flowchart, information on the Model 3095FT system, installation considerations, and a field installation procedure. The suggested sequence of Model 3095FT installation and wiring is shown in Figure 2-1.

FIGURE 2-1. Model 3095FT Installation Flowchart.



UNPACKING THE MODEL 3095FT

Depending on the system ordered, the Model 3095FT may arrive in four different shipping containers:

Model 3095FT

This box contains the Model 3095FT. If ordered, this package also contains an RTD cable and optional mounting hardware. One Model 3095FT Flow Transmitter Product Manual is included with each order of transmitters.

User Interface Software Package (Accessory)

The complete user interface package includes one 3.5-in. floppy disk containing the User Interface Software, one HART modem, one set of modem cables, and the Model 3095FT Flow Transmitter Product Manual. User interface components may also be ordered separately.

RTD Assembly (Optional)

This box contains the optional Series 68 or Series 78 RTD Assembly and the Sensor Wiring Instruction Sheet.

Remote Power Supply (Optional)

If the Remote Power Supply package is ordered, this box contains a remote power supply enclosure, battery, and solar panel. If the Battery Backup package is ordered, this box contains the remote power supply enclosure and battery.

BECOMING FAMILIAR WITH THE MODEL 3095FT

Figure 2-2 illustrates a typical Model 3095FT installation site, and Figure 2-3 illustrates the exploded view of the Model 3095FT. Major components of the Model 3095FT System and the Model 3095FT Flow Transmitter are identified in these figures.

FIGURE 2-2. Typical Model 3095FT Installation Site.

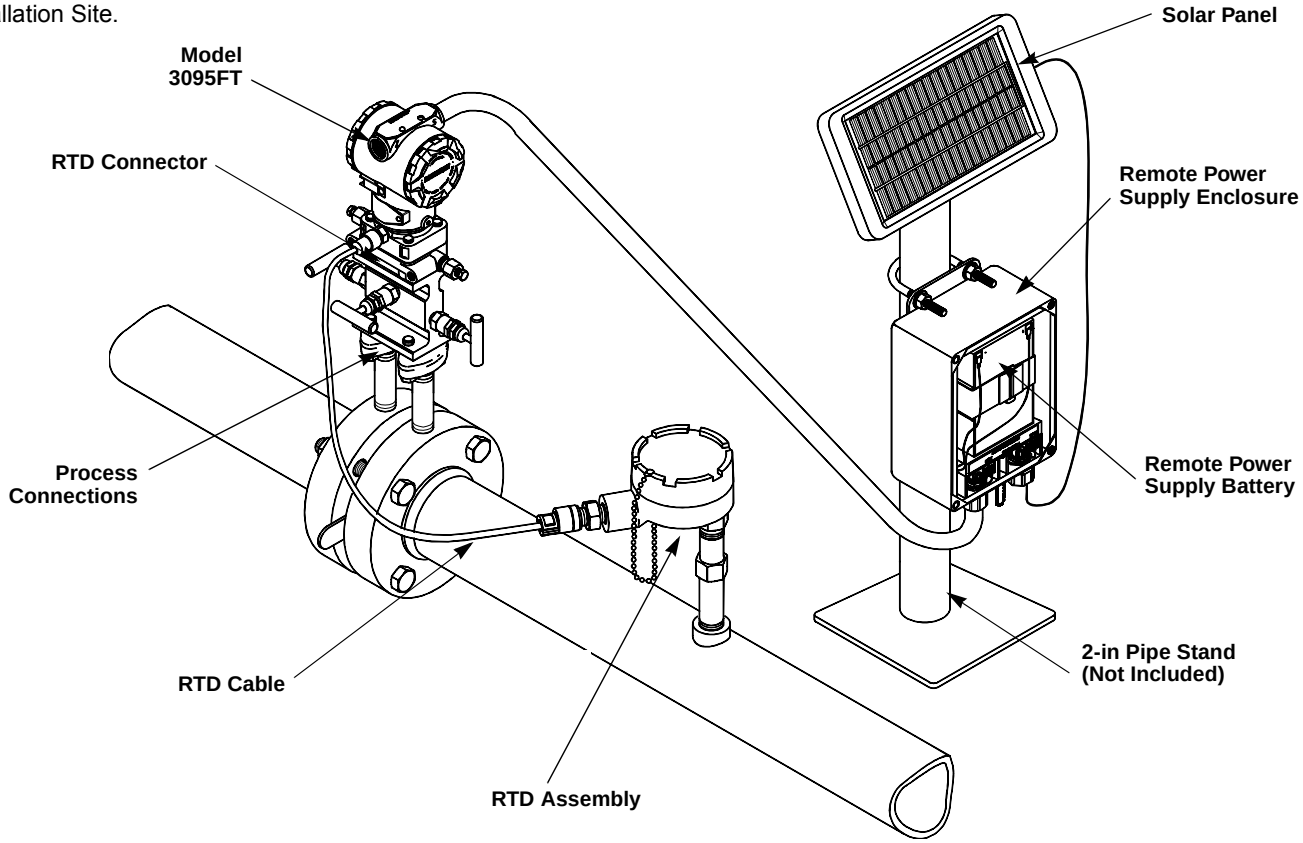
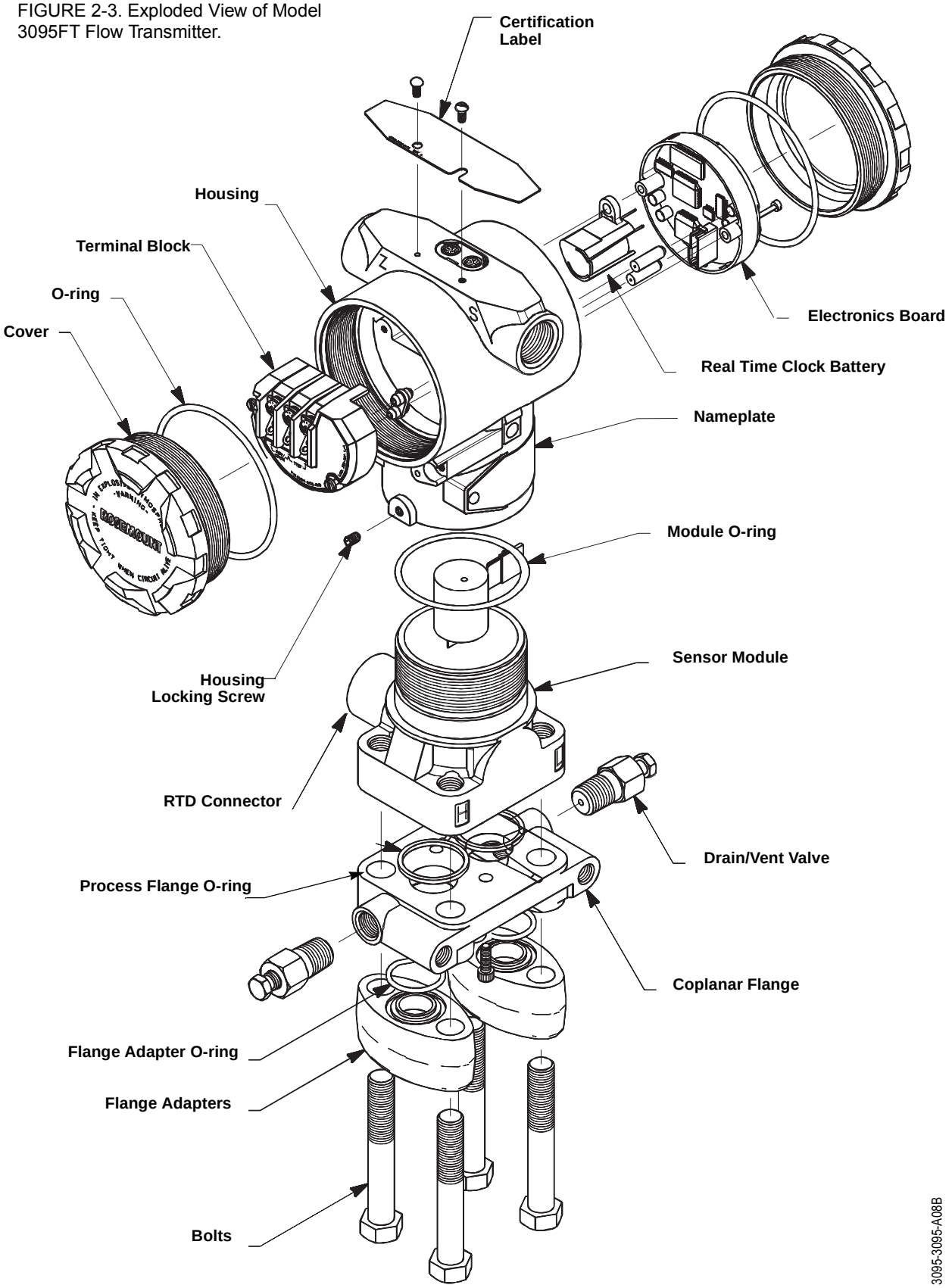


FIGURE 2-3. Exploded View of Model 3095FT Flow Transmitter.



INITIAL INSPECTION

1. Place the shipping containers on a secure bench and open them, taking care not to damage the contents.
2. Review the packing list to verify that all equipment was received.
3. Inspect the equipment and report any shipping damage to the carrier.

Bench Configuration and Calibration

Before mounting the Model 3095FT in the field, the flow transmitter should be configured on the bench using a personal computer and the Model 3095FT User Interface Software.

This software provides advanced configuration capabilities, including flow parameters (such as meter tube bore, orifice bore, orifice plate material, contract hour, DP cut-off, and static pressure type), gas properties (for example, A.G.A. 8 GrHvCO2), and audit trail configuration (such as configuration log, event log, and hourly and daily quantity transaction record).

After bench configuration, the Model 3095FT may be bench calibrated. These procedures include absolute pressure sensor offset and slope trim, and differential pressure sensor offset and slope trim.

For information concerning Model 3095FT bench configuration and Model 3095FT bench calibration, see pages 4-10 and 4-11.

Write Protect (WP) / Real-Time Clock (RTC) Switches

Once the transmitter has been configured, the configuration data can be protected by moving the write protection (WP) switch. When this switch is set to “ON,” the transmitter will not allow any changes to its configuration memory, and will not allow the transmitter to be placed into any Maintenance Mode.

The real-time clock switch (RTC) determines whether the battery powers the real-time clock during power outages. This switch should always be set to “ON” because the real-time clock battery is required for maintaining the internal Model 3095FT clock if transmitter power is interrupted.

When shipped from the factory, the write protect switch is set to “OFF,” and the real-time clock switch is set to “ON” (see Figure 2-4).

NOTE
Setting the real-time clock switch to “OFF” may result in inaccurate time-stamps if power to the Model 3095FT is interrupted. Therefore, always set the real-time clock switch to “ON.”

Use the following steps to change the switch settings:

⚠WARNING

Explosions can cause death or serious injury. Do not remove the instrument cover in explosive atmospheres when the circuit is alive.

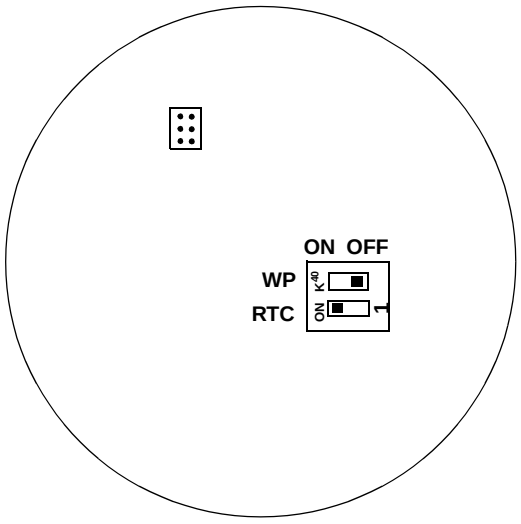
1. If the transmitter is installed, secure the loop, and remove power.
2. Remove the housing cover opposite the field terminal side.
3. Remove the LCD meter if present.
4. Locate the switches on the output electronics board (see Figure 2-4), then move the switch to the desired setting.

⚠WARNING

Explosions can cause death or serious injury. Both transmitter covers must be fully engaged to meet explosion-proof requirements.

5. Reattach the transmitter cover. Metal to metal contact is preferred.
6. If the transmitter is installed, reapply power.

FIGURE 2-4. Write Protect and Real-Time Battery Switches.



OUTPUT ELECTRONICS BOARD

NOTE
Default switch settings are shown.

GENERAL CONSIDERATIONS

The accuracy of a flow or pressure measurement depends to a great extent on proper installation of the transmitter and impulse piping. The piping between the process and transmitter must accurately transmit process pressure to the transmitter. Mount the flow transmitter close to the process and use a minimum of impulse piping to achieve best accuracy. Keep in mind, however, the need for easy access, safety of personnel, practical field calibration, and a suitable transmitter environment. In general, install the transmitter so as to minimize vibration, shock, and temperature fluctuations.

For installations using the Remote Power Supply option, be sure the mounting location is in an area that allows the Remote Power Supply to receive full sun.

MECHANICAL CONSIDERATIONS

The Rosemount Model 3095FT may be panel-mounted, wall-mounted, or attached to a two-inch pipe with an optional mounting bracket. Figure 2-5 illustrates Model 3095FT mounting configurations.Figure 2-6 shows the transmitter dimensions, and Figure 2-6 illustrates example installations.

NOTE
When the transmitter is oriented on its side, the Coplanar™ flange may be mounted to ensure proper venting or draining. Mount the flange as shown in Figure 2-6 so that the drain/vent connections are on the bottom half of the flange.

The following paragraphs discuss the factors necessary for a successful transmitter installation.

FIGURE 2-5. Mounting Configurations.

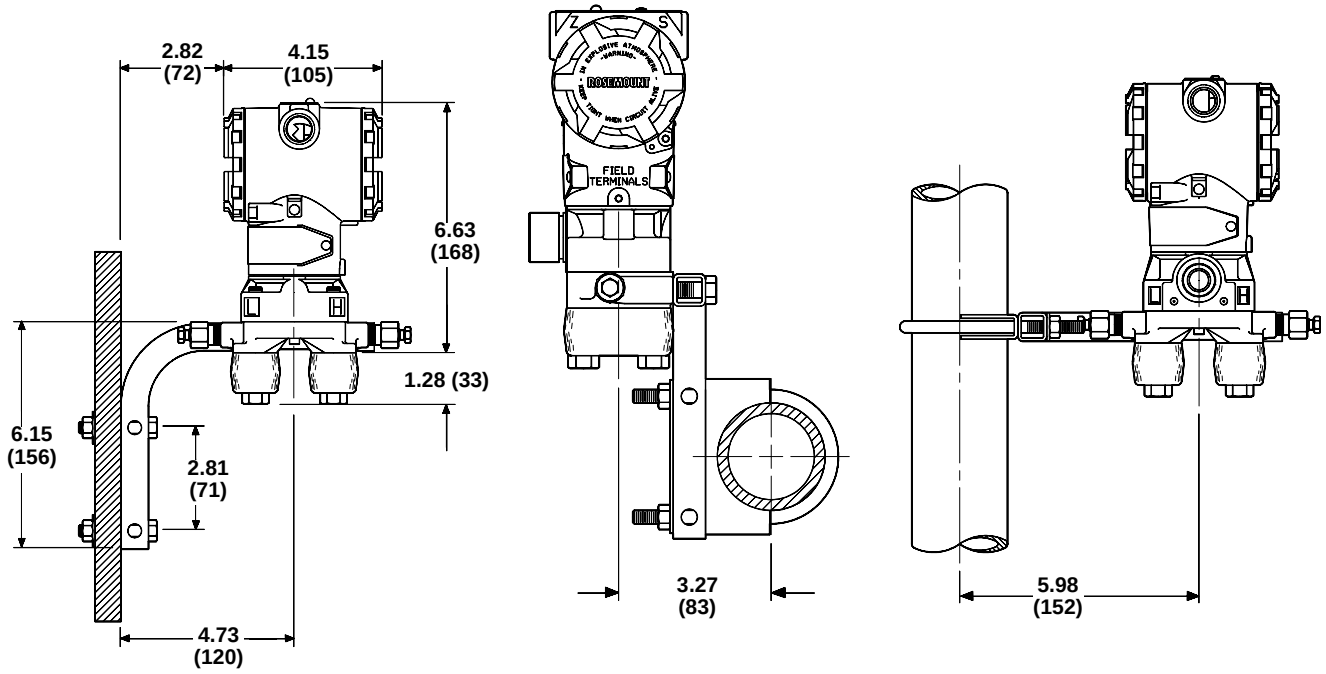


FIGURE 2-6. Dimensional Drawings of Model 3095FT.

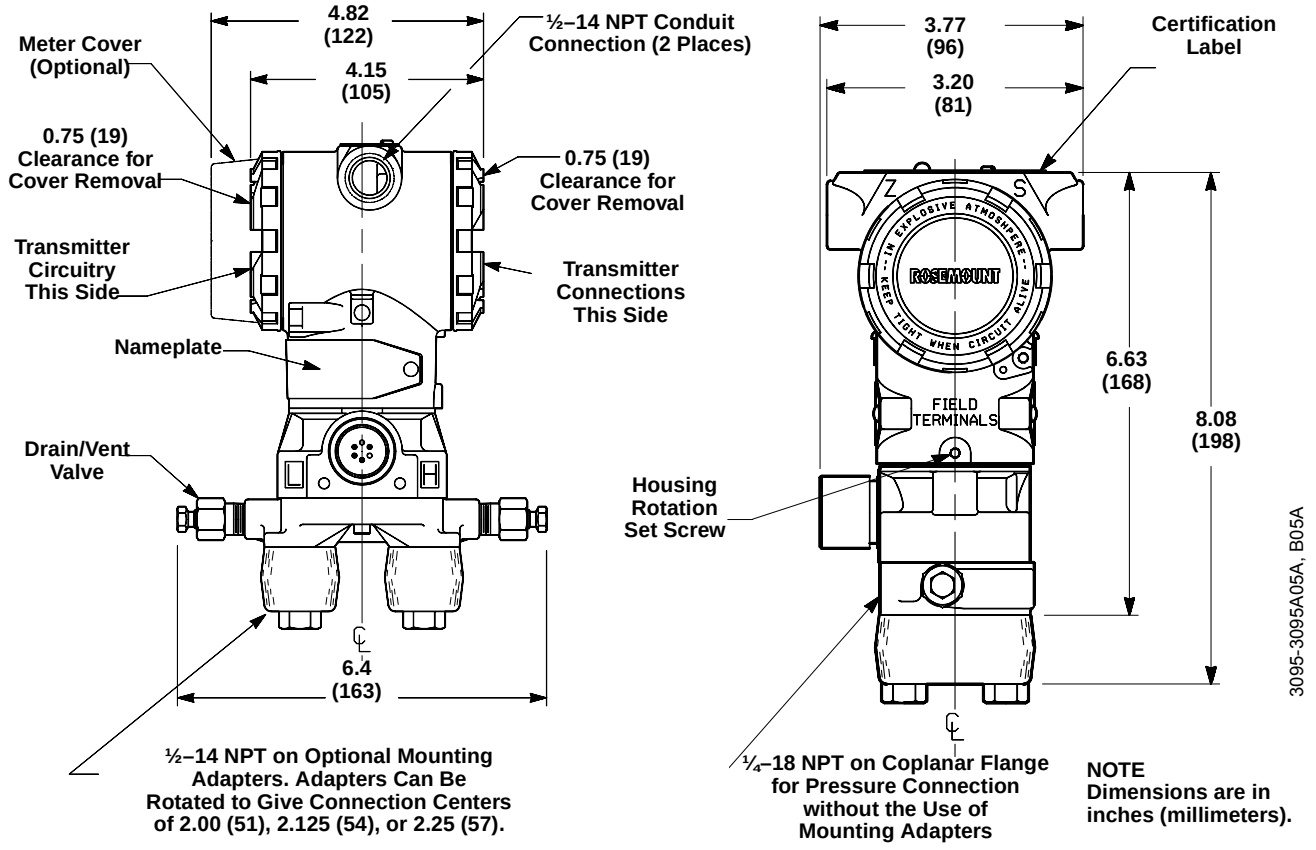
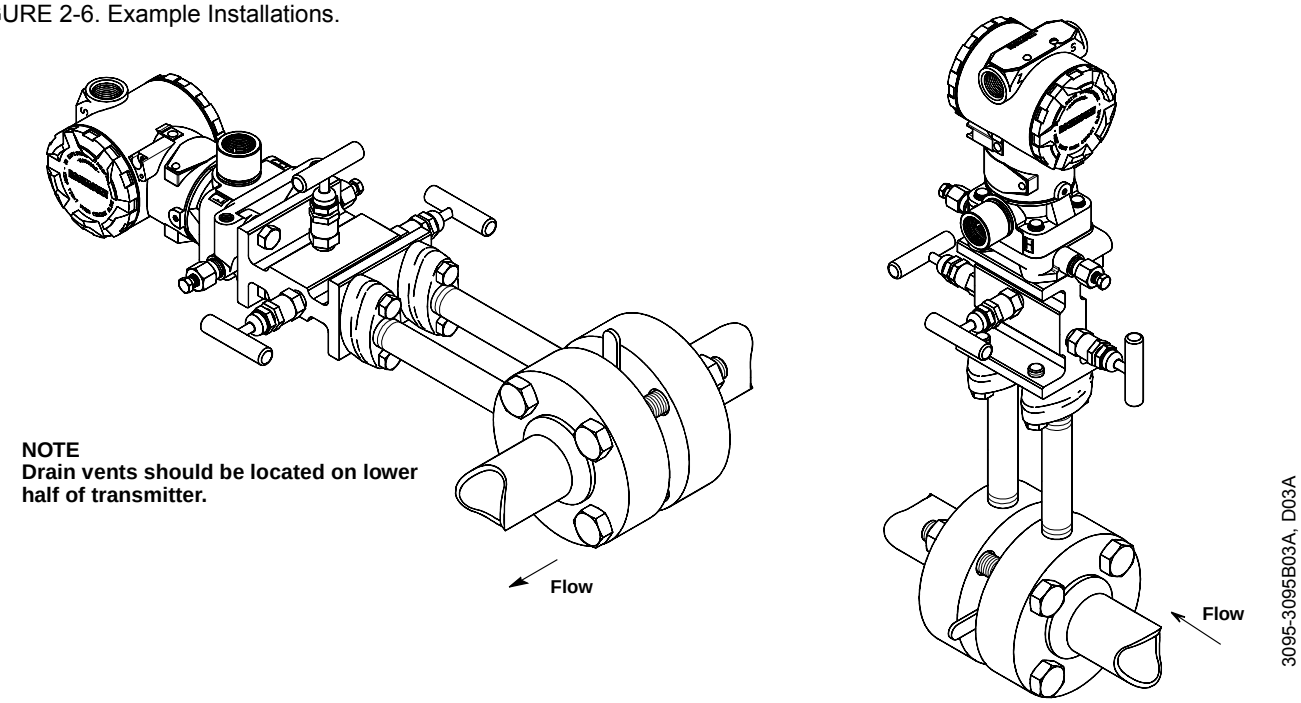


FIGURE 2-6. Example Installations.



Taps

For gas flow measurement, place taps in the top or side of the line and mount the transmitter beside or above the taps so liquid will drain into the process line.

Impulse Piping

The piping between the process and the transmitter must accurately transfer the pressure to obtain accurate measurements. In this pressure transfer, three possible sources of error can occur: leaks, friction loss, and liquid in the impulse line.

Consider the following general rules in determining flow transmitter location and placement of impulse piping:

- Keep impulse piping as short as possible.
- Slope the impulse piping at least one inch per foot (8 centimeters per meter) downward from the transmitter toward the process connection.
- Avoid low points in gas lines.
- Use impulse piping large enough to avoid friction effects and prevent blockage.
- Keep corrosive or hot (above 185 °F (85 °C)) process material out of direct contact with the sensor module and flanges.
- Prevent sediment deposits in the impulse piping.
- Avoid conditions that might allow process fluid to freeze within the process flange.

Environmental Considerations

Mount the transmitter to minimize ambient temperature changes. Section 7 - Specifications and Reference Data lists the transmitter temperature operating limits. Mount the transmitter to avoid vibration and mechanical shock, and to avoid external contact with corrosive materials.

Access Requirements

When choosing an installation location and position, take into account the need for access to the transmitter.

Process Flange Orientation

The process flanges must be oriented to enable process connections to be made. In addition, consider the possible need for a testing or calibration input.

⚠CAUTION

Drain/vent valves must be oriented so that process fluid is directed away from technicians when the valves are used.

Housing Rotation

The electronics housing may be rotated to improve field access to the two compartments. To rotate the housing less than 90 degrees, release the housing rotation set screw and turn the housing not more than 90 degrees from the orientation shown in Figure 2-6 on Page 2-7. To rotate the housing greater than 90 degrees, follow steps 1–6 of the disassembly procedure on page 5-10.

⚠CAUTION

Rotating the housing greater than 90 degrees without performing the disassembly procedure may damage the Model 3095FT sensor module.

Terminal Side of Electronics Housing

Wiring connections are made through the conduit openings on the top side of the housing. The field terminal side is marked on the electronics housing. Mount the transmitter so that the terminal side is accessible. A 0.75-inch clearance is required for cover removal. Install a conduit plug on the unused side of the conduit opening.

Circuit Side of Electronics Housing

The circuit compartment should not routinely need to be opened when the unit is in service; however, provide 0.75 inches clearance if possible to allow access. A 3-inch clearance is required for cover removal if a meter is installed. See Section 3 - Options.

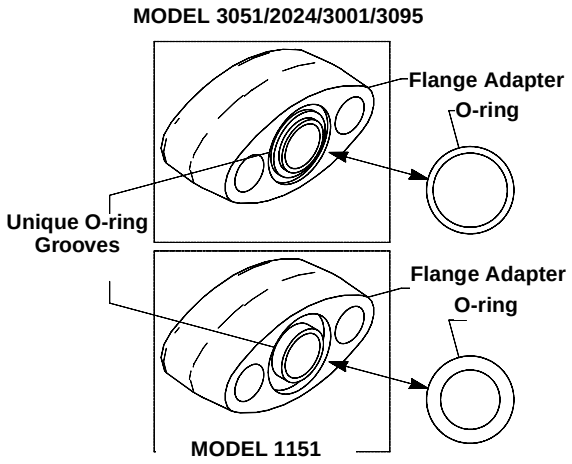
Process Considerations

Model 3095FT process connections on the transmitter flange are $^1/_4$–18 NPT. Flange adapter unions with $^1/_2$–14 NPT connections are supplied as options. These are Class 2 threads; use your plant-approved lubricant or sealant when making the process connections. The process connections on the transmitter flange are on $2^1/_8$-inch (54-mm) centers to allow direct mounting to a three- or five-valve manifold. By rotating one or both of the flange adapters, connection centers of 2, $2^1/_8$, or $2^1/_4$ inches (51, 54, or 57 mm) may be obtained.

⚠WARNING

Failure to install proper flange adapter O-rings can cause process leaks, which can result in death or serious injury.

There are two styles of Rosemount flange adapters, each requiring a unique O-ring, as shown below. Each flange adapter is distinguished by its unique groove.



Use only the O-ring designed to seal with the corresponding flange adapter. Refer to the Spare Parts List on Page 7-17 for the correct part numbers of the flange adapters and O-rings designed for the Model 3095FT Flow Transmitter.

When compressed, Teflon® O-rings tend to cold flow, which aids in their sealing capabilities. Whenever flanges or adapters are removed, visually inspect the Teflon O-rings. Replace them if there are any signs of damage, such as nicks or cuts. If they are undamaged, they may be reused. If the O-rings are replaced, the flange bolts may need to be retorqued after installation to compensate for cold flow. Refer to the process sensor body reassembly procedure on page 5-15.

Mounting Considerations

The Model 3095FT Flow Transmitter total weight varies depending on the components ordered (see Table 2-1). This weight must be securely supported.

TABLE 2-1. Transmitter Weight.

Component	Weight
Model 3095FT Without Options	6 lb (2.7 kg)
LCD Meter for Aluminum Housing	0.5 lb (0.2 kg)
SST Mounting Bracket for Coplanar Flange	1.0 lb (0.5 kg)
12 ft (3.66 m) cable	0.5 lb (0.2 kg)
24 ft (7.32 m) cable	2.2 lb (1.0 kg)
Remote Power Supply	20 lb (9 kg)

Mounting Brackets

Optional mounting brackets available with the Model 3095FT facilitate mounting to a panel, wall, or 2-inch pipe. The bracket option for use with the Coplanar flange is 316 SST with 316 SST bolts. Figure 2-7 shows bracket dimensions and mounting configurations for this option.

When installing the transmitter to one of the mounting brackets, torque the bolts to 125 in-lb.

Mounting Pressure Effect

The transmitter is calibrated in an upright position at the factory. If this orientation is changed during mounting, the resulting mounting pressure effects can be corrected by using the field calibration procedure described on page 4-29.

Bolt Installation Guidelines

The following guidelines have been established to ensure a tight flange, adapter, or manifold seal. Use only bolts supplied with the transmitter or sold by Rosemount Inc. as a spare part to the Model 3095FT transmitter.

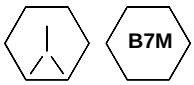
The Model 3095FT is shipped with the Coplanar flange installed with four 1.75-inch flange bolts. The following bolts also are supplied to facilitate other mounting configurations:

- Four 2.25-inch manifold/flange bolts for mounting the Coplanar flange on a three-valve manifold. In this configuration, the 1.75-inch bolts may be used to mount the flange adapters to the process connection side of the manifold.
- (Optional) If flange adapters are ordered, four 2.88-inch flange/adapter bolts for mounting the flange adapters to the Coplanar flange.

Figure 2-7 shows the optional mounting bracket and mounting configurations. Figure 2-8 shows mounting bolts and bolting configuration for the Model 3095FT with the coplanar flange.

Stainless steel bolts supplied by Rosemount Inc. are coated with a lubricant to ease installation. Carbon steel bolts do not require lubrication. No additional lubricant should be applied when installing either type of bolt. Bolts supplied by Rosemount Inc. are identified by their head markings:

Steel Head Markings (CS)



teel Head Markings (SST)

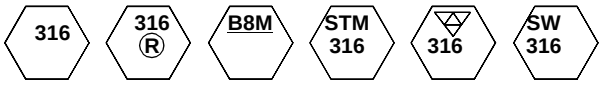
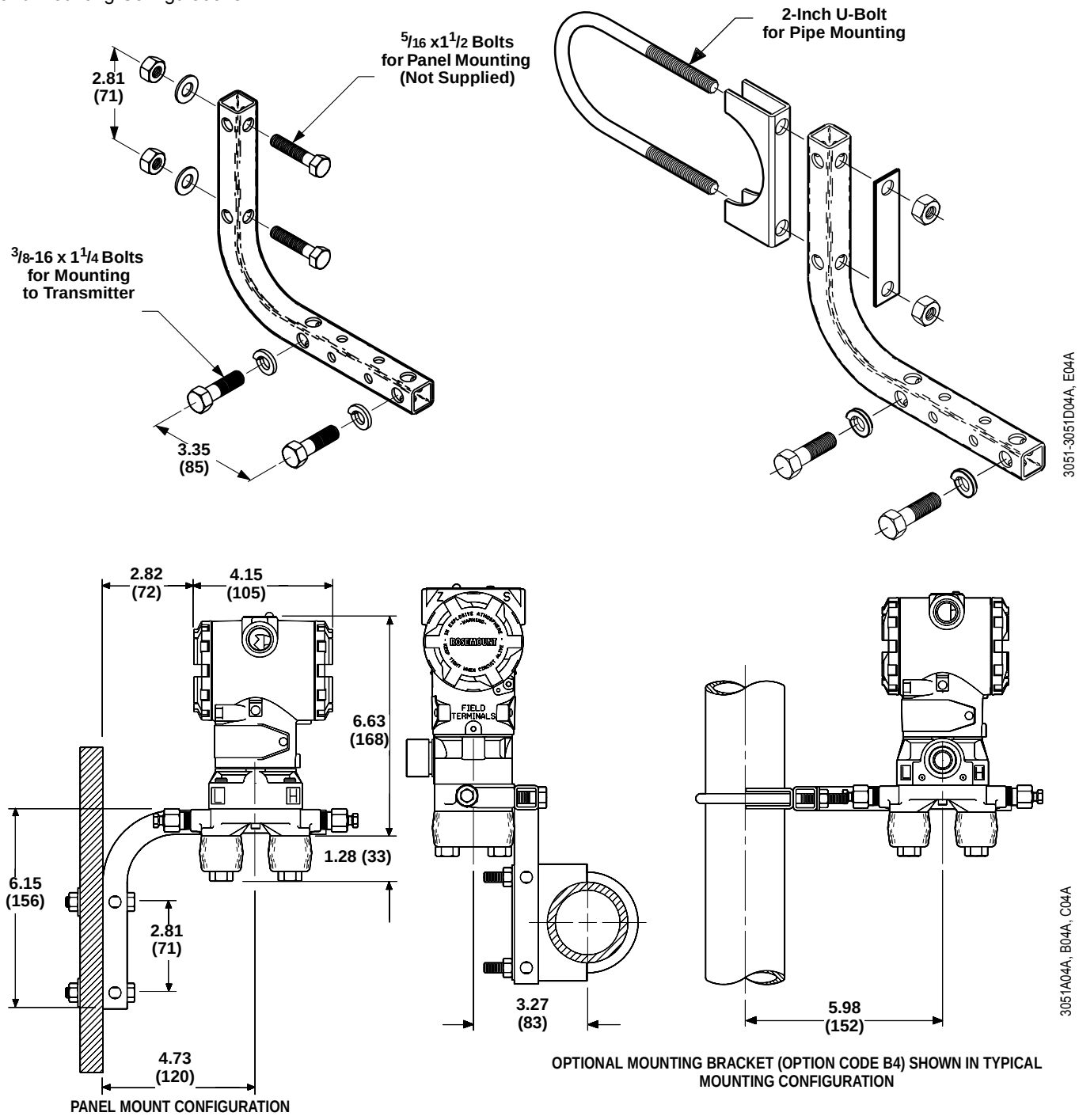


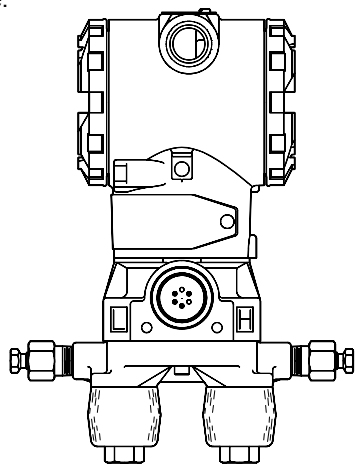
FIGURE 2-7. Optional Mounting Bracket and Mounting Configurations.



NOTE
Dimensions are in inches (millimeters).

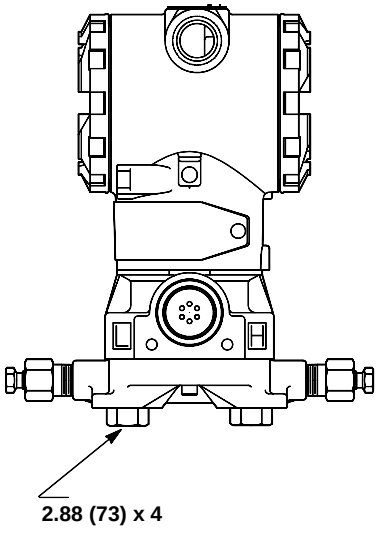
FIGURE 2-8. Coplanar Mounting Bolts and Bolting Configurations for Coplanar Flange.

Description	Qty.	Size in. (mm)
Flange bolts	4	1.75 (44)
Flange/adapter bolts	4	2.88 (73)
Manifold/flange bolts	4	2.25 (57)



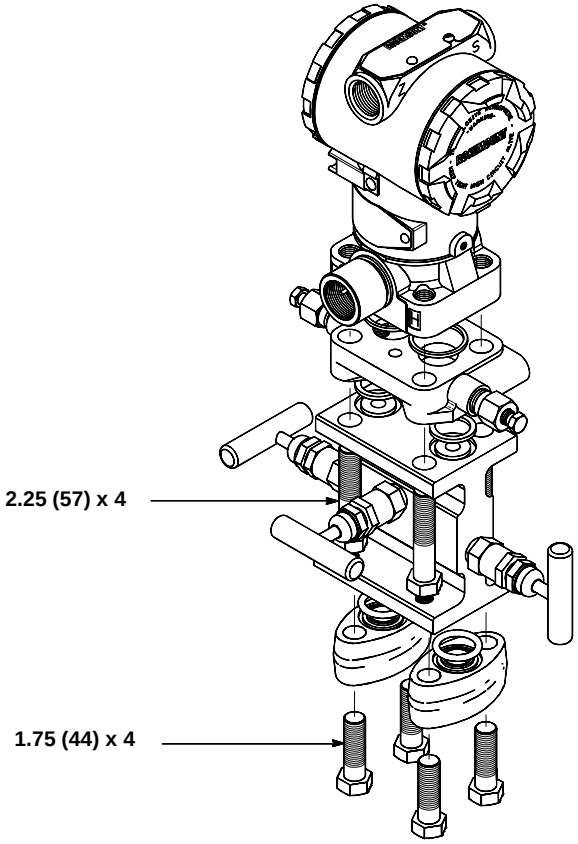
1.75 (44) x 4

TRANSMITTER WITH FLANGE BOLTS



2.88 (73) x 4

TRANSMITTER WITH OPTIONAL FLANGE ADAPTERS AND FLANGE/ADAPTER BOLTS



2.25 (57) x 4

1.75 (44) x 4

TRANSMITTER WITH 3-VALVE MANIFOLD MANIFOLD/FLANGE BOLTS FLANGE ADAPTERS AND FLANGE/ADAPTER BOLTS

NOTE
Dimensions are in inches (millimeters).

3095-3095D05A, 3095E05A, 3095B29A

ELECTRICAL CONSIDERATION

The signal terminals are located in a compartment of the electronics housing separate from the transmitter electronics. Figure 2-9 illustrates power supply load limitations for the transmitter.

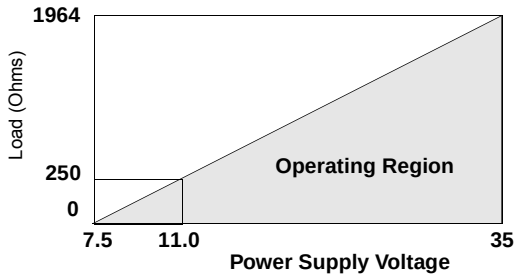
Power Supply

The dc power supply should provide power with less than 2% ripple. The total resistance load is the sum of the resistance of the signal leads and the load resistance of the controller, indicator, and related pieces. Note that the resistance of intrinsic safety barriers, if used, must be included.

NOTE
A minimum loop resistance of 250 ohms is required to communicate with a personal computer. With 250 ohms of loop resistance, the transmitter requires a minimum of 11.0 volts.

If a single power supply is used to power more than one Model 3095FT transmitter, the power supply used, and circuitry common to the transmitters, should not have more than 20 ohms of impedance at 1200 Hz.

If the Remote Power Supply enclosure is installed, a 250 ohm resistor is factory installed — do not add additional loop resistance.



Maximum loop resistance is determined by the voltage of the external power supply, as described by:

$$\text{Max. Loop Resistance} \leq \frac{\text{Power Supply Voltage} - 7.5}{0.014}$$

Communication requires a minimum loop resistance of 250 ohms.

⚠CAUTION

Inductive-based transient protectors, including the Rosemount Model 470, can adversely affect the output of the Model 3095FT. Do not use the Model 470 for transient protection with the Model 3095FT. If transient protection is desired, install the Transient Protection Terminal Block as explained on Page 3-5.

HAZARDOUS LOCATIONS

The Model 3095FT was designed with an explosion-proof housing and circuitry suitable for intrinsically safe and non-incendive operation. Individual transmitters are clearly marked with a tag indicating the certifications they carry. See Section 7 - Specifications and Reference Data for specific approval categories, and see Appendices A through D for approval drawings.

FIELD INSTALLATION EQUIPMENT

The following equipment and tools are not provided with the Model 3095FT. Be sure to review this list before field installing the transmitter.

- Installation tools
- Field wire between the power supply and the Model 3095FT
- Barriers or seals required for non-incendive or hazardous locations
- Conduit
- 2-in. mounting pipe or saddles
- Power supply (unless the Remote Power Supply was ordered)
- 3- or 5-valve manifolds
- Impulse piping
- Tie wraps
- Lock for the remote power supply enclosure.

FIELD INSTALLATION PROCEDURE

⚠WARNING

For explosion-proof installations, installation location must be made in accordance with Rosemount drawing 03095-1025 or 03095-1024.

For instrinsically safe installations, installation location must be made in accordance with Rosemount drawings 03095-1020 and 03095-1030; or 03095-1021 and 03095-1031.

1. Review Installation Considerations

1. Review the installation considerations described on pages 2-6 through 2-15 in this chapter to determine the location for the Model 3095FT. If the installation includes the Remote Power Supply, also review the sunlight considerations described on page 3-8.

2. Mount Transmitter and Install Bolts

2. Mount the Model 3095FT in the desired location, and install flange or flange/adaptor bolts.

⚠WARNING

Only use bolts supplied with the Model 3095FT or sold by Rosemount Inc. as a spare part to the Model 3095FT. Unauthorized parts can affect product performance and may render the instrument dangerous.

a. Finger-tighten the bolts.

b. Torque the bolts to the initial torque value using a cross-pattern (see Table 2-2).

c. Torque the bolts to the final torque value using the same cross-pattern.

TABLE 2-2. Bolt Installation Torque Values.

Bolt Material	Initial Torque Value	Final Torque Value
Carbon Steel (CS)	300 in-lb	650 in-lb
Stainless Steel (SST)	150 in-lb	300 in-lb

When installing the transmitter to one of the mounting brackets, torque the mounting bracket bolts to 125 in-lb.

3. Make Process Connections

3. Connect the transmitter to the process.

⚠WARNING

Process leaks can cause death or serious injury. All four flange bolts must be installed and tight before applying pressure, or process leakage will result. When properly installed, the flange bolts will protrude through the top of the module housing. Attempting to remove the flange bolts while the transmitter is in service will result in leakage of the process fluid.

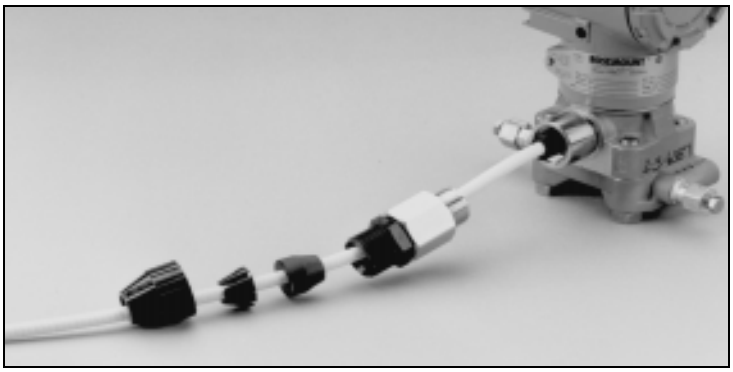
4. Install RTD Assembly

4.(Optional) Install the Series 68 or Series 78 RTD Assembly.

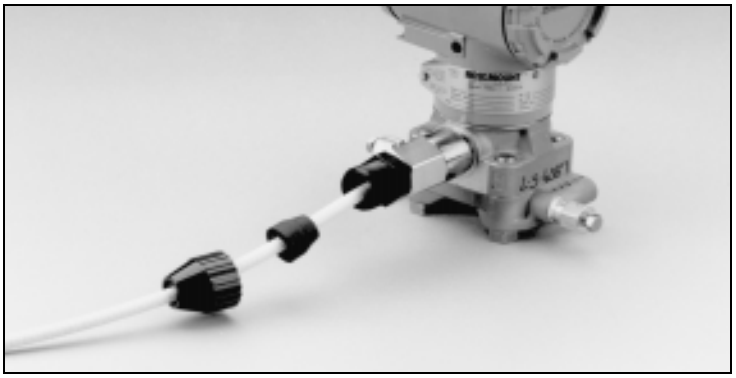
a.Mount the RTD Assembly in the desired location in accordance ith AGA Report No. 3/API MPMS Chapter 14.3, Part 2.

b.Connect the RTD cable to the Model 3095FT RTD connector as illustrated in the following photos.

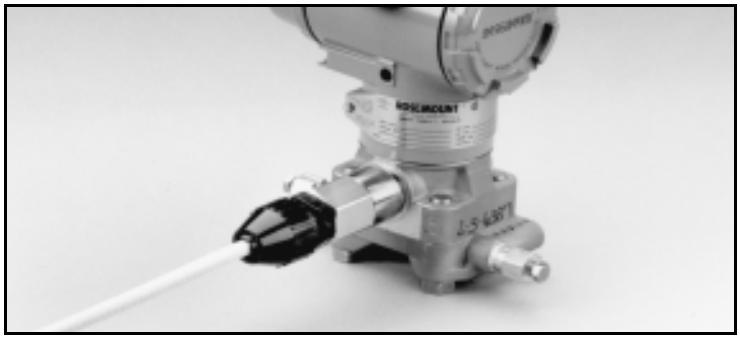
FIRST FULLY ENGAGE THE BLACK CABLE CONNECTOR



SCREW IN AND TIGHTEN THE CABLE ADAPTER UNTIL METAL TO METAL CONTACT OCCURS

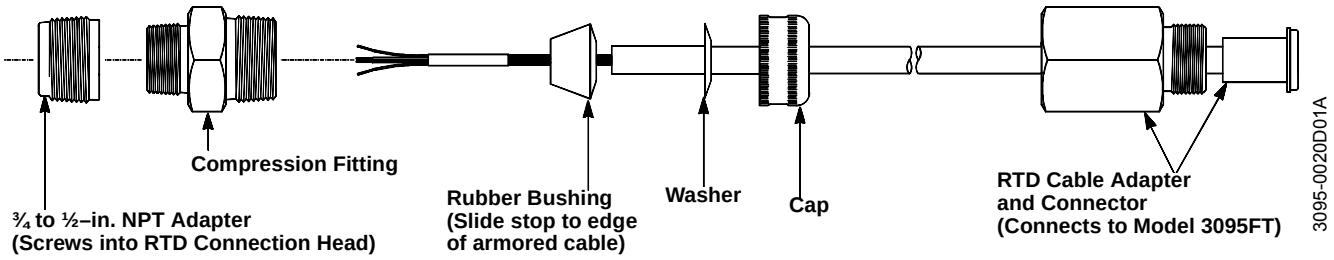


SCREW IN AND TIGHTEN THE STRAIN RELIEF CLAMP



3095-069AB, 068AB, 067AB

c. (Optional) If using an armored, shielded cable, install the armored cable compression seal as illustrated below, and use a pliers to tighten the cap onto the compression fitting.



d. Make all necessary wiring connections inside the RTD Flat Connection Head as explained in the Sensor Wiring Instructions included with the RTD.

NOTE
If you are using two- or three-wire RTD connections, jump together the extra RTD wires.

5. Check for Leaks

5. Check all process penetrations for leaks.

NOTE
If the installation includes either the Remote Power Supply (Part No. 03095-5000-101x) or the Battery Backup (Part No. 03095-5000-200x), do not perform Steps 6 through 9 that follow. Instead, complete installation as explained in Section 3 (Remote Power Supply—see pages 3-7 through 3-12; Battery Backup—see pages 3-14 through 3-16).

6. Field Wiring (Power and Signal)

6. Make field wiring connections (see Figure 2-10). These connections provide both power and signal wiring.

⚠WARNING

For explosion-proof installations, wiring connections must be made in accordance with Rosemount drawing 03095-1025 or 03095-1024.

For instrinsically safe installations, wiring connections must be made in accordance with ANSI/ISA-RP12.6, and Rosemount drawings 03095-1020 or 03095-1031.

For **ALL** installations, wiring connections must follow the National Electric Code.

NOTES
- Do not run field wiring in conduit or open trays with other power wiring, or near heavy electrical equipment.
- Field wiring need not be shielded, but twisted pairs should be used for best results.
- To ensure communication, wiring should be 24 AWG or larger and not exceed 5,000 feet (1,500 meters).
- For connections in ambient temperatures above 140 °F (60 °C), use wiring rated for at least 194 °F (90 °C).

⚠CAUTION

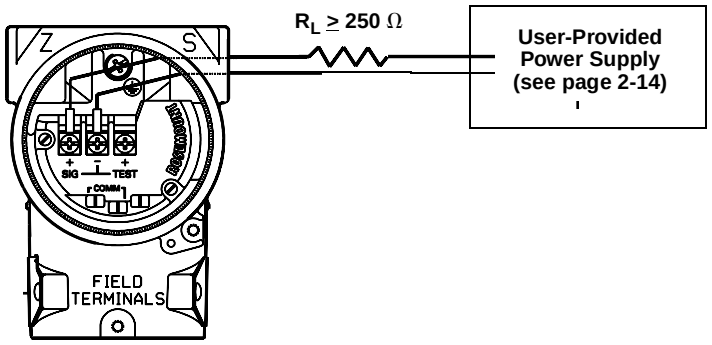
Incorrect field wiring connections may damage the Model 3095FT. Do not connect field wiring to the “TEST +” terminals.

a. Remove the cover on the side marked FIELD TERMINALS on the electronics housing.

b. Connect the lead that originates at the positive side of the power supply to the terminal marked "+ SIG." Be sure to include loop resistance.

c. Connect the lead that originates at the negative side of the power supply to the terminal marked "–."

FIGURE 2-10. Field Wiring Connections.



⚠WARNING

Explosions can cause death or serious injury. The unused conduit opening on the transmitter housing must be plugged and sealed to meet explosion-proof requirements.

d. Plug and seal unused conduit connections on the transmitter housing to avoid moisture accumulation in the terminal side of the housing.

NOTE

If the conduit connections are not sealed, the transmitter should be mounted with the electrical housing positioned downward for drainage. Conduit should be installed with a drip loop, and the bottom of the drip loop should be lower than the conduit connections or the transmitter housing.

7. Install Grounds

Field Wiring Ground

Ground the Transmitter Case

7. Install field wiring ground (optional), and ground the transmitter case (required).
   a. Field wiring may be grounded at any one point on the signal loop, or it may be left ungrounded. The negative terminal of the power supply is a recommended grounding point.
   b. The transmitter case should always be grounded in accordance with national and local electrical codes. The most effective transmitter case grounding method is direct connection to earth ground with minimal impedance. Methods for grounding the transmitter case include:

- **External Ground Assembly**: This assembly is included with the transient protection terminal block. The External Ground Assembly can also be ordered as a spare part (03031-0398-0001).
- **Internal Ground Connection**: Inside the FIELD TERMINALS side of the electronics housing is the Internal Ground Connection screw. This screw is identified by a ground symbol: ⏚.

NOTE
The transient protection terminal block does not provide transient protection unless the transmitter case is properly grounded. Use the above guidelines to ground the transmitter case.

Do not run the transient protection ground wire with field wiring as the ground wire may carry excessive current if a lighting strike occurs.

Grounding the transmitter case via threaded conduit connection may not provide sufficient ground.

8. Field Calibration

8. After completing the installation, the Model 3095FT can be field calibrated to correct for mounting position effects using the Model 3095FT User Interface Software.
   a. Establish communications (see page 4-4)
   b. Enter either the system administrator or a maintenance level password.
   c. Place the transmitter into Off-line or On-line Maintenance.
   d. Perform a Trim DP Offset (zero).
   e. (Optional) If a barometer that is four times as accurate as the Model 3095FT AP sensor is available, perform an AP Offset.

9. Replace Cover

⚠WARNING

Explosions can cause death or serious injury. Both transmitter covers must be fully engaged to meet explosion-proof requirements.

9. Replace the cover.

Section 3

Options and Accessories

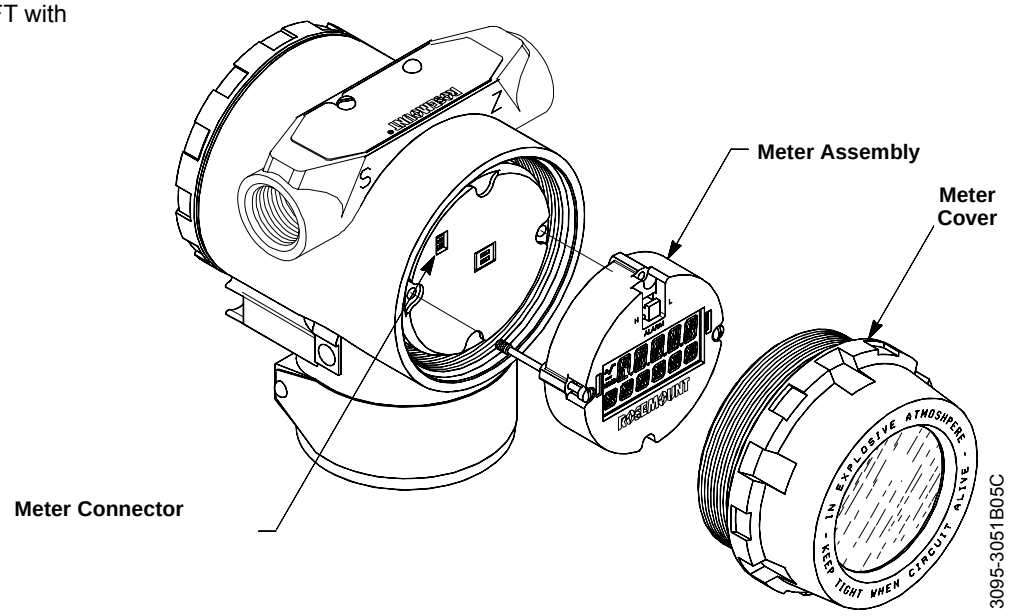
Options and accessories available with the Model 3095FT can facilitate installation and operation or enhance the security of the system. These items include the LCD meter, mounting brackets, custom configuration, optional bolt materials, the transient protection terminal block, and the remote power supply.

LCD METER (03095-0392-0001)

The LCD meter (Part No. 03095-0392-0001) provides local display of Model 3095FT process variables, calculations, and transmitter diagnostic messages. The meter is located on the circuit side of the transmitter, leaving direct access to the signal terminals. An extended cover is required to accommodate the meter. Figure 3-1 shows the transmitter fitted with the LCD meter and extended cover.

NOTE
A 3-inch (76 mm) clearance is required for cover removal if a meter is installed.

FIGURE 3-1. Model 3095FT with Optional Meter.

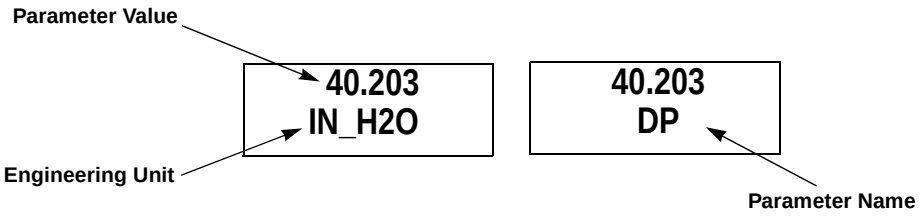


The LCD Meter can be ordered factory-installed, or meters can be ordered as spare parts to retrofit existing Model 3095FTs already in the field.

This meter features a liquid crystal display that provides readouts of Model 3095FT process variables and flow calculations. Use the Model 3095FT User Interface Software to change the parameters displayed by the LCD meter (see Page 4-24). Any number of the following engineering units and calculations are available for display:

Parameter Name	LCD Parameter Name	Engineering Unit/Example
Flow Rate	FLOW	SCFD
Differential Pressure	DP	IN_H2O
Totalized Flow Today	TFLOWT	SCF
Totalized Flow Yesterday	TFLOWY	SCF
Static Pressure	P	PSI
Temperature	T	DEG_F
Energy Flow Rate	E_FLOW	BTU
Totalized Energy Today	TENERT	BTU
Totalized Energy Yesterday	TENERY	BTU
Mole %CO2	ML_CO2	NA
Mole % N2	ML_N2	NA
Orifice Bore at 68 °F	OR_DIA	IN
Date	DATE	18OC94(1)
Time	TIME	0245PM
Heating Value	HEAT_V	BTU
Relative Density (Spec. Gravity)	RELDEN	NA

During normal operation, the display changes every three seconds to display user-selected parameters. The LCD meter uses two displays to indicate a parameter's value, engineering unit, and parameter name:



Each display lasts three seconds, with a brief blank display before the LCD meter shows the next parameter. The LCD scrolls through the entire list of selected parameters before repeating the displays.

During Fatal Alarm States only fatal alarm messages are displayed. During Critical Alarm States, the LCD messages alternate between displaying the selected parameters and the critical alarms. See Page 5-3 for information concerning Fatal Alarm Messages and Critical Alarm Messages.

(1) Valid month codes are: JA FE MR AP MY JN JL AU SE OC NO DE.

Installing the Meter

For transmitters ordered with the LCD meter, the meter is shipped installed. Installing the meter on a Model 3095FT transmitter requires a small instrument screwdriver and the meter kit (PN 3095-0392-0001).

The meter kit includes:

- one LCD meter assembly
- one extended cover with cover O-ring installed
- two captive screws
- one meter connector.

Use the following steps and Figure 3-1 as references to install the meter.

⚠WARNING

Explosions can cause death or serious injury. Do not remove the instrument cover in explosive atmospheres when the circuit is alive.

1. If the transmitter is installed in a loop, secure the loop and disconnect power.
2. Remove the transmitter cover opposite the field terminal side.

⚠CAUTION

The circuit board is electrostatically sensitive. Be sure to observe handling precautions for static-sensitive components.

3. Insert the meter connector into the six-pin socket on the electronics circuit board (see Figure 3-1).
4. Remove the two circuit board captive screws. To do this, loosen the screws to release the board, then pull out the screws until they are stopped by the captive thread inside the circuit board standoffs. Then continue unscrewing and remove.

NOTE
The meter may be installed in 90-degree increments for easy viewing. One of the four connectors on the back of the meter assembly must be positioned to accept the meter connector.

5. The electronics housing may be rotated to improve field access to the two compartments. To rotate the housing less than 90 degrees, release the housing rotation set screw and turn the housing not more than 90 degrees from the orientation shown in Figure 2-6. To rotate the housing greater than 90 degrees, follow steps 1–6 of the disassembly procedure on Page 5-10.

⚠CAUTION

Rotating the housing greater than 90 degrees without performing the disassembly procedure may damage the Model 3095FT sensor module.

6. Decide which direction the meter should be oriented. Insert the long meter screws into the two holes on the meter assembly that coincide with the holes on the circuit board.
7. Attach the meter assembly to the circuit board by threading the screws into captive threads and attaching the meter assembly to the meter connector. Tighten the meter screws in the standoffs to secure the meter assembly and electronic circuit board in place. The meter screws are designed to be captive screws, so they must first be tightened past the captive thread within the standoffs and then tightened again to hold the meter/circuit board assembly to the housing.

⚠WARNING

Explosions can cause death or serious injury. Both transmitter covers must be fully engaged to meet explosion-proof requirements.

8. Attach the extended cover

Note the following LCD temperature limits:
Operating: –13 to 185 °F (–25 to 85 °C)
Storage: –40 to 185 °F (–40 to 85 °C)

SST MOUNTING BRACKETS

Optional mounting brackets available with the Model 3095FT facilitate mounting to a panel, wall, or 2-inch pipe. The bracket option for use with the Coplanar flange is 316 SST with 316 SST bolts. Figure 2-7 shows bracket dimensions and mounting configurations for the SST mounting bracket option.

TRANSIENT PROTECTION TERMINAL BLOCK

The transient protection terminal block option increases the Model 3095FT Flow Transmitter ability to withstand electrical transients induced by lightning, welding, or heavy electrical equipment. The Model 3095FT, with integral transient protection installed, meets the standard performance specifications as outlined in this product manual. In addition, the transient protection circuitry meets IEEE Standard 587, Category B and IEEE Standard 472, Surge Withstand Capability.

Transient protection terminal blocks can be ordered factory-installed, or they can be ordered as a spare part to retrofit existing Model 3095FT transmitters already in the field. The Rosemount spare part number for the transient protection terminal block is 3095-0302-0002.

Installation Procedure

The transient protection terminal block is shipped installed when ordered at the same time as the Model 3095FT. Use the following procedure to install this terminal block when this option is ordered as a spare part or retrofit.

⚠WARNING

Explosions can cause death or serious injury. Do not remove the instrument cover in explosive atmospheres when the circuit is alive.

1. Remove the cover above the side marked FIELD TERMINALS on the Model 3095FT electronics housing.
2. Loosen the terminal block's two mounting screws and pull the standard terminal block out.
3. If present, transfer the signal wires from the old terminal block to the transient protection terminal block. Be sure that the + signal wire is reconnected to the SIG + terminal, and the - signal wire is reconnected to the SIG - terminal.
4. Install the terminal block by positioning the terminal block above the post connector pins, and press into place.
5. Use the captive mounting screws on the terminal block to secure it to the electronics housing.
6. Ground the terminal block using one of the options described on Page 2-19.

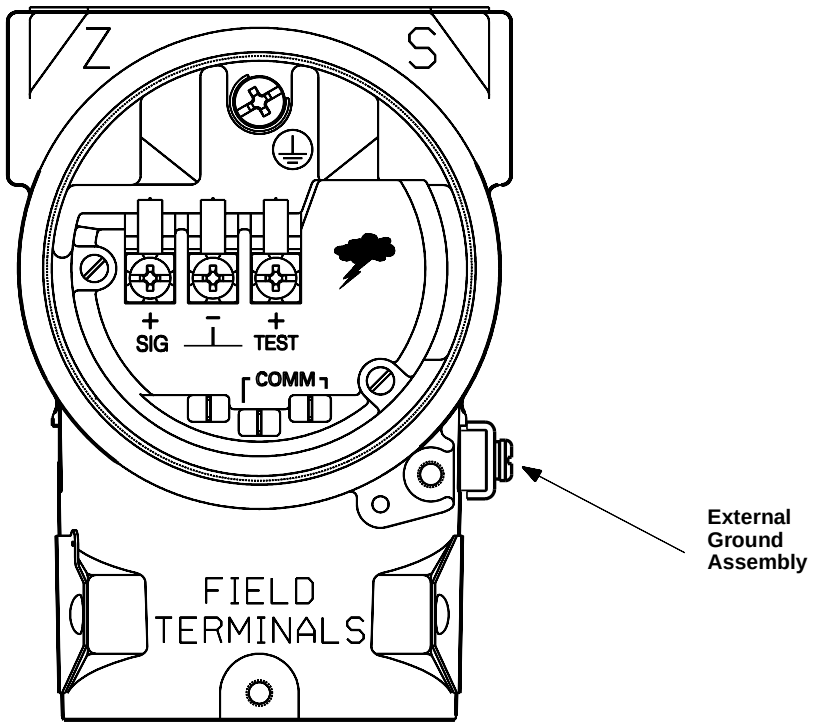
⚠WARNING

Explosions can cause death or serious injury. Both transmitter covers must be fully engaged to meet explosion-proof requirements.

7. Replace the Model 3095FT cover.
8. (Optional) If desired, re-trim the transmitter (see Page 4-29).

NOTE
Installation of the Transient Protection Terminal Block does not provide transient protection unless the Model 3095FT is properly grounded. See Page 2-19 for grounding information.

FIGURE 3-2. Transient Protection Terminal Block with External Ground Assembly.



CUSTOM CONFIGURATION (OPTION CODE C1)

Option Code C1 allows a customer to receive a Model 3095FT which is custom configured for their application. CDS 4015 on Page 7-13 explains how to define a custom configuration.

FLANGE ADAPTERS (OPTION CODE DF)

Three types of flange adapters are available for use with the Model 3095FT: Plated CS, SST, and Hastelloy C. Flange adapters are illustrated in Figure 2-3 on Page 2-3. When ordered with the transmitter, the shipped flange adapters match the ordered flange material. Option Code DF includes bolts.

MODEL 3095FT USER INTERFACE SOFTWARE

The Model 3095FT User Interface Software package is available with or without the HART modem and connecting cables (see Page 7-6 for available packages). The complete package (PN 03095-5100-0001) contains the following items:

- One 3.5-in. floppy disk containing the Model 3095FT User Interface Software
- One HART modem
- One set of modem cables

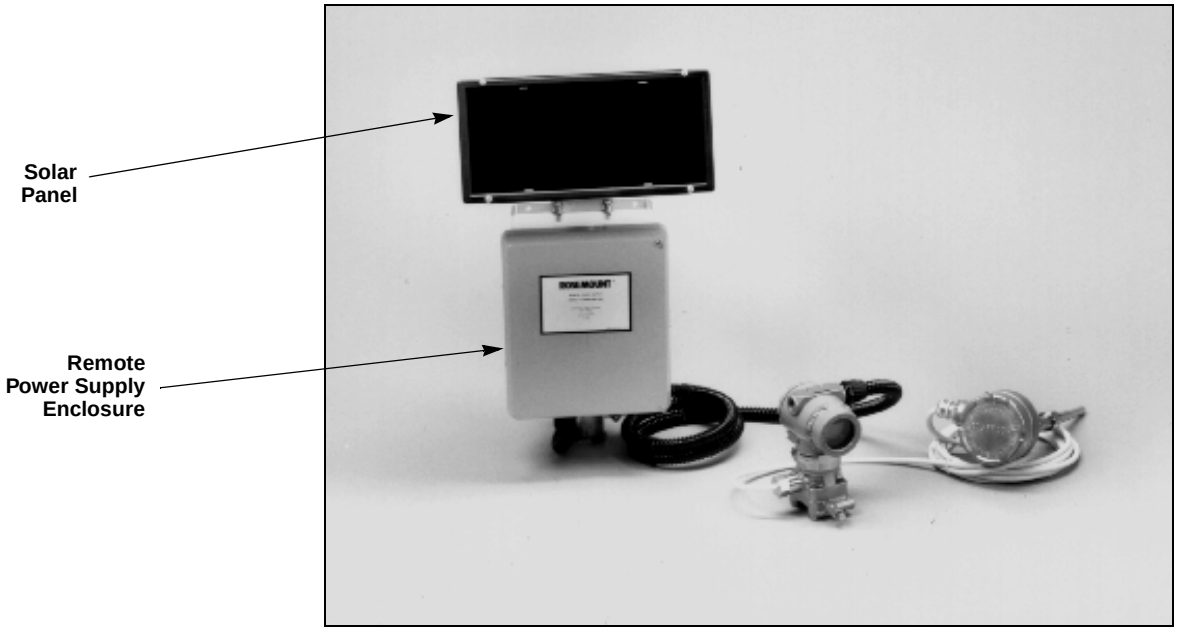
Chapter 4 in this manual provides information for using the Model 3095FT User Interface Software to configure and calibrate the Model 3095FT, and also explains how to retrieve Model 3095FT logged data. Appendix E identifies possible error messages which might occur while using the User Interface Software.

REMOTE POWER SUPPLY (03095-5000-101X)

The Remote Power Supply (Part No. 03095-5000-1010, 03095-5000-1011, or 03095-5000-1012) provides a continuous power source for the Model 3095FT in locations where power is not available. The Remote Power Supply enclosure provides a BNC computer hookup, thereby allowing remote computer connection to the attached Model 3095FT without removing the flow transmitter cover or the Remote Power Supply cover. In addition, the enclosure includes the required loop resistor for communications, which eliminates the need to install external resistance to the signal wiring.

NOTE
The Remote Power Supply battery should be changed every three years.

FIGURE 3-3. Remote Power Supply.



Installation Procedure

Use the following procedure to install the remote power supply option:

Check Battery Voltage Level

1. Check the battery's voltage level with a multimeter, and recharge the battery if the voltage is less than 12.5 volts (see Page 3-12).

Sunlight Considerations

2. Figure 3-4 illustrates a map of North America with a line marked 2.5 equivalent sun hours. Verify that the desired installation location is at or beneath this 2.5 line (that is, equal to or more than 2.5 equivalent sun hours per day). If the installation location is above the 2.5 line, contact a Rosemount Sales Engineer concerning the advisability for installing the remote power supply in that location.
3. Verify that there are no obstructions due south of the installation location which might block sunlight from reaching the solar panel. Also verify that there are no obstructions during the winter when the angle of the sun is at its lowest.

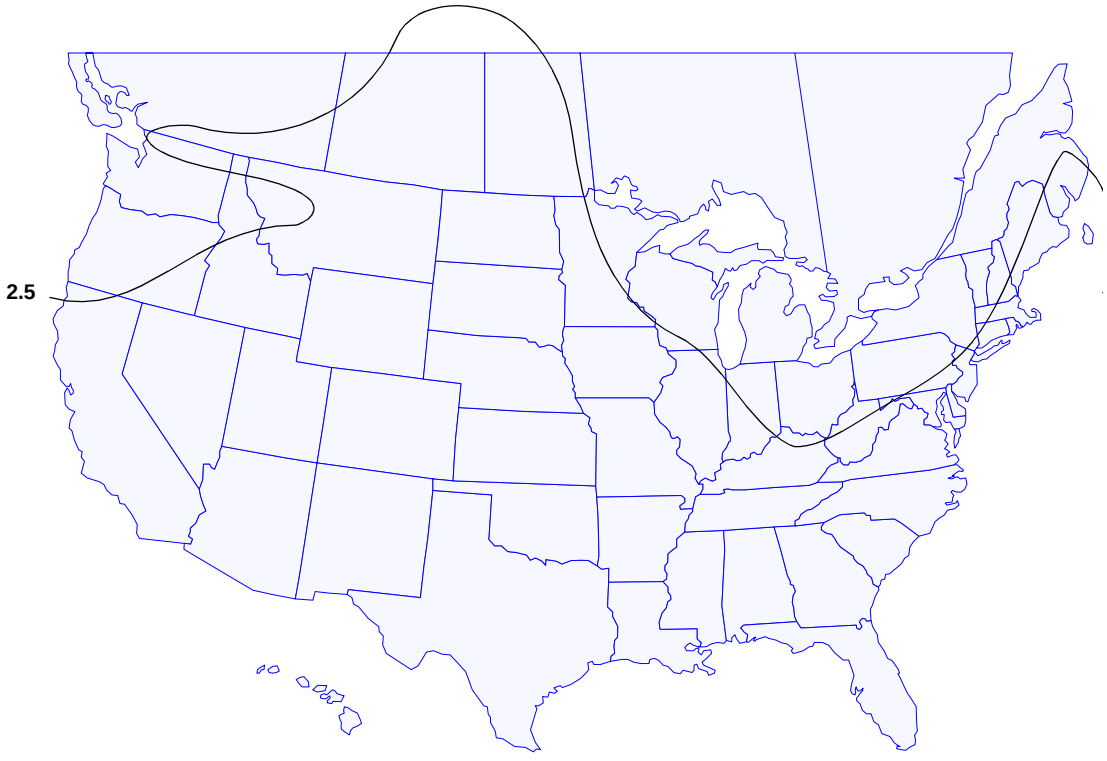
⚠WARNING

The Remote Power Supply must always be located in a non-hazardous area.

For Model 3095FT explosion-proof installations, wiring connections must be made in accordance with Rosemount drawing 03095-1025 or 03095-1024.

For Model 3095FT instrinsically safe installations, installation location must be made in accordance with Rosemount drawings 03095-1020 and 03095-1030; or 03095-1021 and 03095-1031.

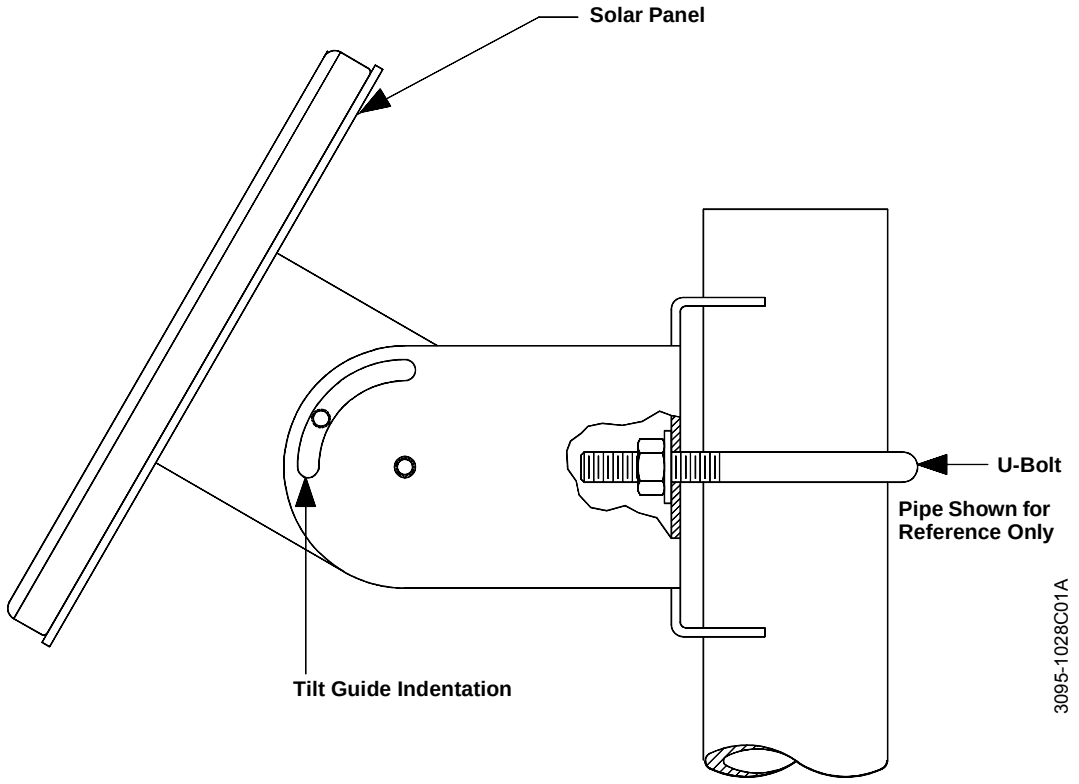
FIGURE 3-4. Lowest Winter Sunlight - 2.5 Equivalent Sun Hours.



Mount Solar Panel

4. Remove the solar panel bracket assembly package from the Remote Power Supply container.
5. Determine the top of the solar panel (see Figure 3-2) by locating the tilt guide indentation, and mount the assembled panel to a 2-inch pipe (not supplied) using one U-Bolt. When tightening the assembled panel, ensure that the solar panel faces due south. Do not torque the U-Bolt beyond 50 in-lb.
6. Move the solar panel until the tilt of the solar panel is approximately 45 degrees, then tighten both screws.

FIGURE 3-5. Solar Panel Bracket Assembly.



Mount Remote Power Supply Enclosure

7. Determine the desired location for the Remote Power Supply enclosure, and mount the enclosure to a 2-inch pipe using two U-Bolts. Do not torque the U-Bolts beyond 50 in-lb.

NOTE
15 feet of wire is provided for connecting the solar panel to the Remote Power Supply enclosure.

Remote Power Supply Wiring Connections

⚠WARNING

The Remote Power Supply must always be located in a non-hazardous area.

For Model 3095FT explosion-proof installations, wiring connections must be made in accordance with Rosemount drawing 03095-1025 or 03095-1024.

For Model 3095FT instrinsically safe installations, wiring connections must be made in accordance with ANSI/ISA-RP12.6; and Rosemount drawings 03095-1020 and 03095-1030; or 03095-1021 and 03095-1031.

For **ALL** installations, wiring connections must follow the National Electric Code.

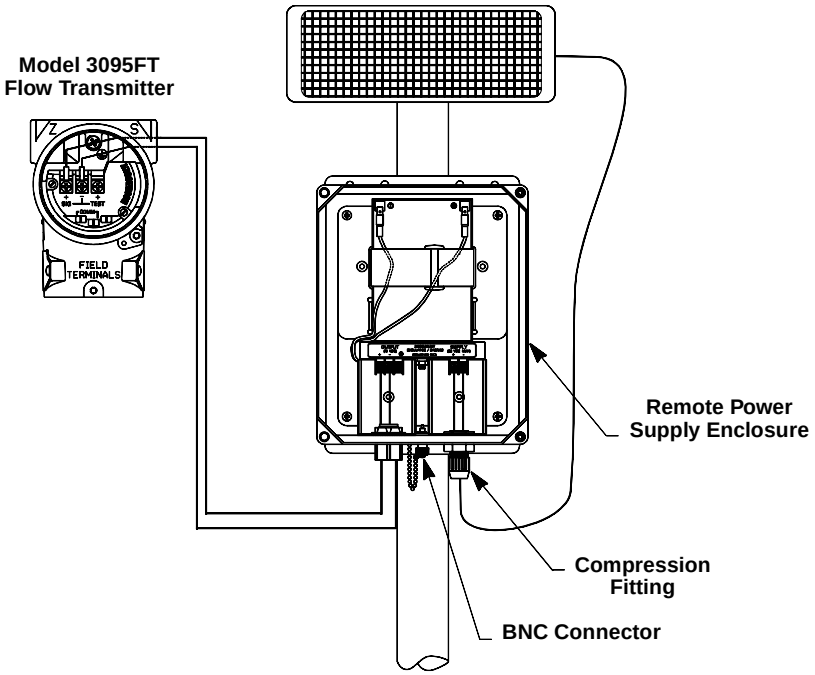
8. Open the Remote Power Supply cover and remove the wiring compartment covers. Thread the solar panel wires through the compression fitting, then connect wires from the solar panel to the remote power supply enclosure (see Figure 3-2):
   a. Connect battery wires.
   b. Connect the red wire to the “Supply +” terminal.
   c. Connect the black wire to the “Supply –” terminal.
   d. Tighten the compression fitting to secure the wires.
   e. Use tie wraps (not supplied) to secure the wire between the solar panel and the compression fitting.
9. Bring two signal wires (not supplied) from the Remote Power Supply enclosure to the transmitter.
   Maximum Distance: 100 feet.
   Recommended Wire Size: 14–22 AWG.

⚠WARNING

Explosions can cause death or serious injury. Do not remove the instrument cover in explosive atmospheres when the circuit is alive.

10. Remove the cover on the side marked FIELD TERMINALS on the Model 3095FT electronics housing.
11. Thread the wires through a Model 3095FT conduit opening, then connect wires at the terminal block:
    a. Connect the positive wire to the “SIG +” terminal.
    b. Connect the negative wire to the “SIG –” terminal.
12. Connect wires at remote power supply enclosure.
    a. Connect the positive wire to the “OUTPUT +” terminal.
    b. Connect the negative wire to the “OUTPUT –” terminal.

FIGURE 3-4. Remote Power Supply Wiring Connections.



b. Connect the negative wire to the "OUTPUT –" terminal.

⚠WARNING

Explosions can cause death or serious injury. Both transmitter covers must be fully engaged to meet explosion-proof requirements.

13. Replace the cover on the Model 3095FT.

⚠WARNING

Explosions can cause death or serious injury. The unused conduit opening on the transmitter housing must be plugged and sealed to meet explosion-proof requirements.

14. Plug and seal unused conduit connections on the transmitter housing to avoid moisture accumulation in the terminal side of the housing.

NOTE

If the conduit connections are not sealed, the transmitter should be mounted with the electrical housing positioned downward for drainage. Conduit should be installed with a drip loop, and the bottom of the drip loop should be lower than the conduit connections or the transmitter housing.

15. Replace the wiring compartment covers.
16. Close the Remote Power Supply cover, and secure the cover by tightening the two screws on the right side of the Remote Power Supply cover.
17. If desired, install a lock (not supplied) on the Remote Power Supply enclosure.

Recharging the Battery

Always measure the Remote Power Supply battery voltage with a multimeter before installing the Remote Power Supply. If the voltage is below 12.5 volts, recharge the Remote Power Supply battery:

⚠WARNING

Contact with caustic materials can cause blindness or serious burns. If the remote power supply battery is cracked or leaking, rinse any residual acid gel present, and replace damaged parts. Dispose of the battery in an environmentally responsible manner.

1. Connect battery wires.
2. Connect a power supply to the supply terminals as illustrated in Figure 3-5.

⚠WARNING

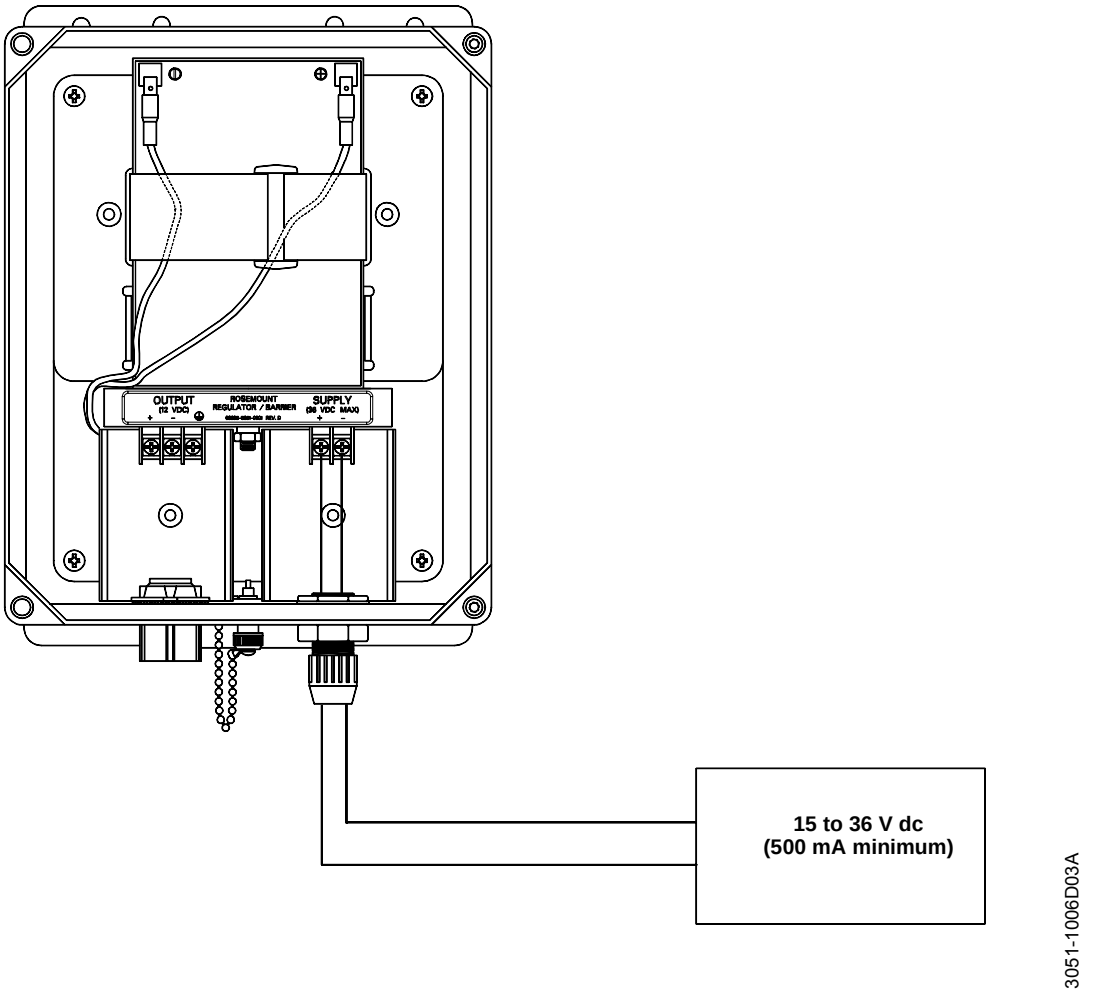
Explosions can cause death or serious injury. Do not exceed 36 V dc when recharging the battery.

3. Allow the battery to charge for the duration indicated in Table 3-1, or until the battery voltage is at or above 12.5 V at 68 °F (20 °C). Note that the battery recharges faster at lower power supply voltages than higher power supply voltages.
4. After Step 3, recheck the battery voltage to verify that the voltage is at or above 12.5 V at 68 °F (20 °C). The battery is fully charged at 13.9 V dc.

TABLE 3-1. Battery Charge Time.

Power Supply Voltage	Approximate Time to fully charge battery (to 13.9 V at 68 °F)
15 V	2.5 days
30 V	3.75 days
36 V	4.5 days

FIGURE 3-5. Recharging the Battery.



BACKUP POWER SUPPLY (03095-5000-200X)

The Battery Backup (Part No. 03095-5000-2000, 03095-5000-2001, or 03095-5000-2002) provides a continuous power source for one Model 3095FT in locations where the dc power may not be reliable due to power line outages. This option consists of the Remote Power Supply without the solar panel.

The Remote Power Supply enclosure provides a BNC computer hookup, thereby allowing remote computer connection to the attached Model 3095FT without removing the flow transmitter cover. In addition, the enclosure includes the loop resistor for Model 3095FT communications, which eliminates the need to install external resistance to the signal wiring.

⚠WARNING

Contact with caustic materials can cause blindness or serious burns. If the remote power supply battery is cracked or leaking, rinse any residual acid gel present, and replace damaged parts. Dispose of the battery in an environmentally responsible manner.

Mount Remote Power Supply Enclosure

1. Determine the desired location for the Remote Power Supply enclosure, and mount the enclosure to a 2-inch pipe using the supplied U-Bolts. Do not torque the U-Bolts beyond 50 in-lb.

⚠WARNING

The Battery Backup Supply must always be located in a non-hazardous area.

For Model 3095FT explosion-proof installations, wiring connections must be made in accordance with Rosemount drawing 03095-1025 or 03095-1024.

For Model 3095FT instrinsically safe installations, wiring connections must be made in accordance with ANSI/ISA-RP12.6; and Rosemount drawing 03095-1020 and 03095-1030; or Rosemount drawings 03095-1021 and 03095-1031.

For **ALL** installations, wiring connections must follow the National Electric Code.

Battery Backup Wiring Connections

2. Open the Remote Power Supply cover and remove the wiring compartment covers. Thread two wires through the compression fitting, and connect wires from the user-provided dc power supply to the Remote Power Supply enclosure (see Figure 3-8):
   a. Connect battery wires.
   b. Connect the positive wire to the “Supply +” terminal.
   c. Connect the negative wire to the “Supply –” terminal.
   d. Tighten the compression fitting to secure the wires.
3. Bring two wires (not supplied) from the remote power supply enclosure to the transmitter.
   Maximum Distance: 100 feet.
   Recommended Wiring Size: 14–22 AWG.

⚠WARNING

Explosions can cause death or serious injury. Do not remove the instrument cover in explosive atmospheres when the circuit is alive.

4. Remove the cover on the side marked FIELD TERMINALS on the Model 3095FT electronics housing.
5. Thread the wires through a Model 3095FT conduit opening, then connect wires at the terminal block:
   a. Connect the positive wire to the “SIG +” terminal.
   b. Connect the negative wire to the “SIG –” terminal.
6. Connect wires at remote power supply enclosure.
   a. Connect the positive wire to the “OUTPUT +” terminal.
   b. Connect the negative wire to the “OUTPUT –” terminal.

⚠WARNING

Explosions can cause death or serious injury. Both transmitter covers must be fully engaged to meet explosion-proof requirements.

7. Replace the cover on the Model 3095FT.

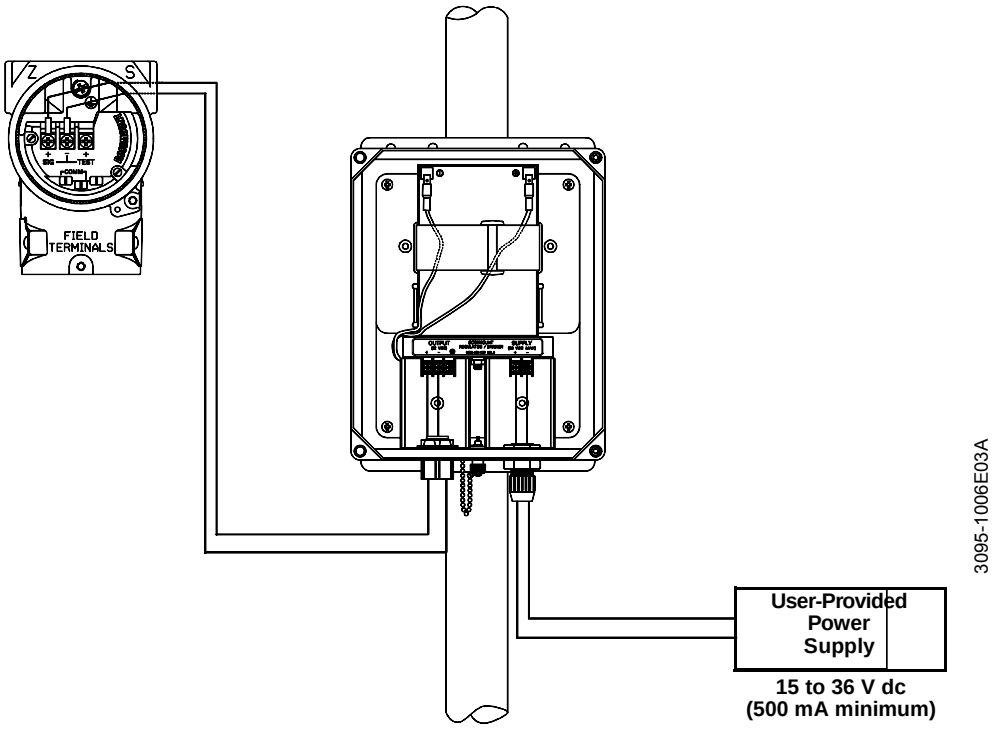


FIGURE 3-6. Battery Backup Wiring Connections.

⚠WARNING

Explosions can cause death or serious injury. The unused conduit opening on the transmitter housing must be plugged and sealed to meet explosion-proof requirements.

8. Plug and seal unused conduit connections on the transmitter housing to avoid moisture accumulation in the terminal side of the housing.

NOTE
If the conduit connections are not sealed, the transmitter should be mounted with the electrical housing positioned downward for drainage. Conduit should be installed with a drip loop, and the bottom of the drip loop should be lower than the conduit connections or the transmitter housing.

9. Replace the wiring compartment covers.
10. Close the Remote Power Supply cover, and secure the cover by tightening the two screws on the right side of the Remote Power Supply cover.
11. If desired, install a lock (not supplied) on the Remote Power Supply enclosure.

Section 4

Using the Model 3095FT User Interface Software

This section explains how to use the Model 3095FT User Interface (UI) Software with the Model 3095FT Flow Transmitter, and it is divided into four sub-sections:

- Install the Model 3095FT User Interface Software.
- Establish communications between a personal computer and a Model 3095FT (Page 4-4).
- Sample Procedures (Page 4-12).
- User Interface Software Screens (Page 4-14).

INSTALL THE MODEL 3095FT USER INTERFACE SOFTWARE

The Model 3095FT User Interface Software package is available with or without the HART modem and connecting cables. The complete User Interface package contains one 3.5-in. floppy disk, one HART modem, and a set of cables for connecting the computer to the Model 3095FT (see Figure 4-1).

System Requirements

MInimum Equipment and Software

- DOS-based 386 computer or above
- 1 MB RAM
- Hard Disk
- Model 3095FT User Interface Software, HART modem, set of modem cables
- MS DOS® 3.1 or higher
- Microsoft® Windows® 3.1, Windows for Workgroups 3.11

NOTE
The UI software does not work with Windows 95 or Windows NT.

Although not required, the User Interface Software supports a mouse or other pointing device.

Recommended Equipment and Software

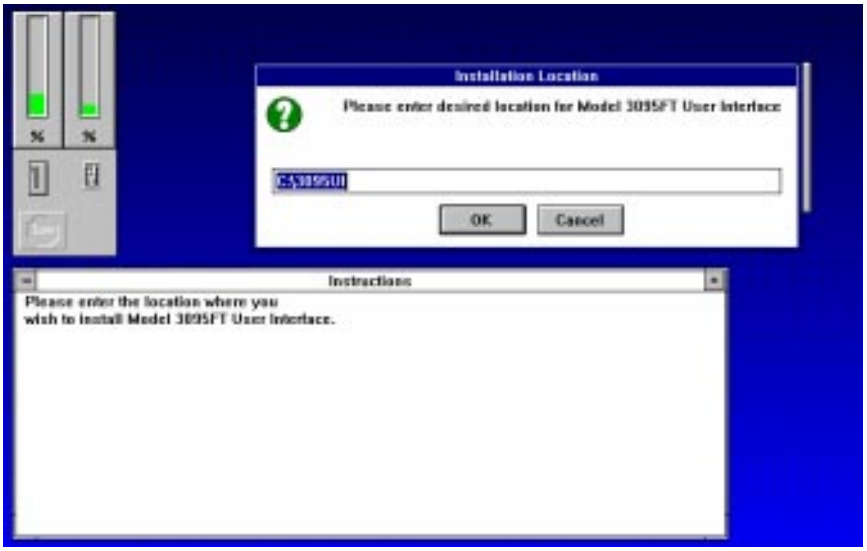
- DOS-based 386 computer or above
- 4 MB RAM minimum
- Microsoft Windows 3.1, Windows for Workgroups 3.11
- MS DOS 3.1 or higher
- Mouse or other pointing device.
- 2 MB of free hard disk space
- Model 3095FT User Interface Software, HART modem, set of modem cables

INSTALLATION PROCEDURE

This procedure assumes that both DOS and Windows are already installed.

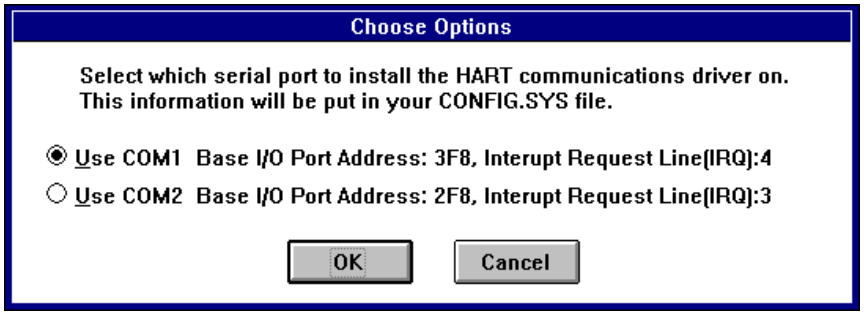
NOTE
In this manual, ***return*** indicates to press the return or enter key.

1. Power on the computer
2. After completion of boot-up procedures, verify that the computer is in Microsoft Windows. If the computer is at the DOS prompt (for example, C:\), type win ***return*** to open Windows.
3. Insert the floppy disk containing the User Interface Software into the personal computer disk drive.
4. Select File, then select Run to display the Run window. Depending on the disk drive, enter either a: setup or b: setup, then click OK to display the following screen:



3095-30950506

5. If desired, change the file location, then click the OK button,

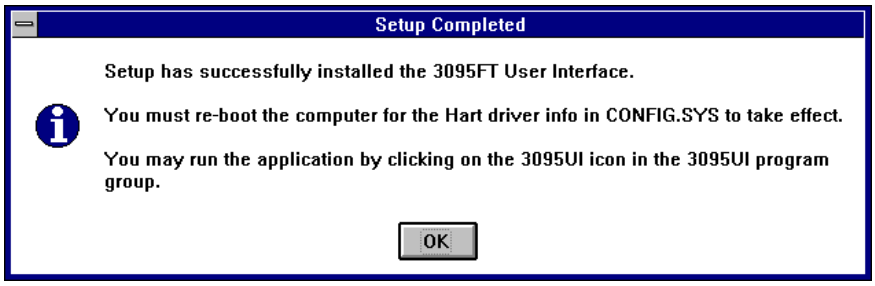


3095-30950581

6. Decide which serial port will be assigned as the HART communications port, then click continue.

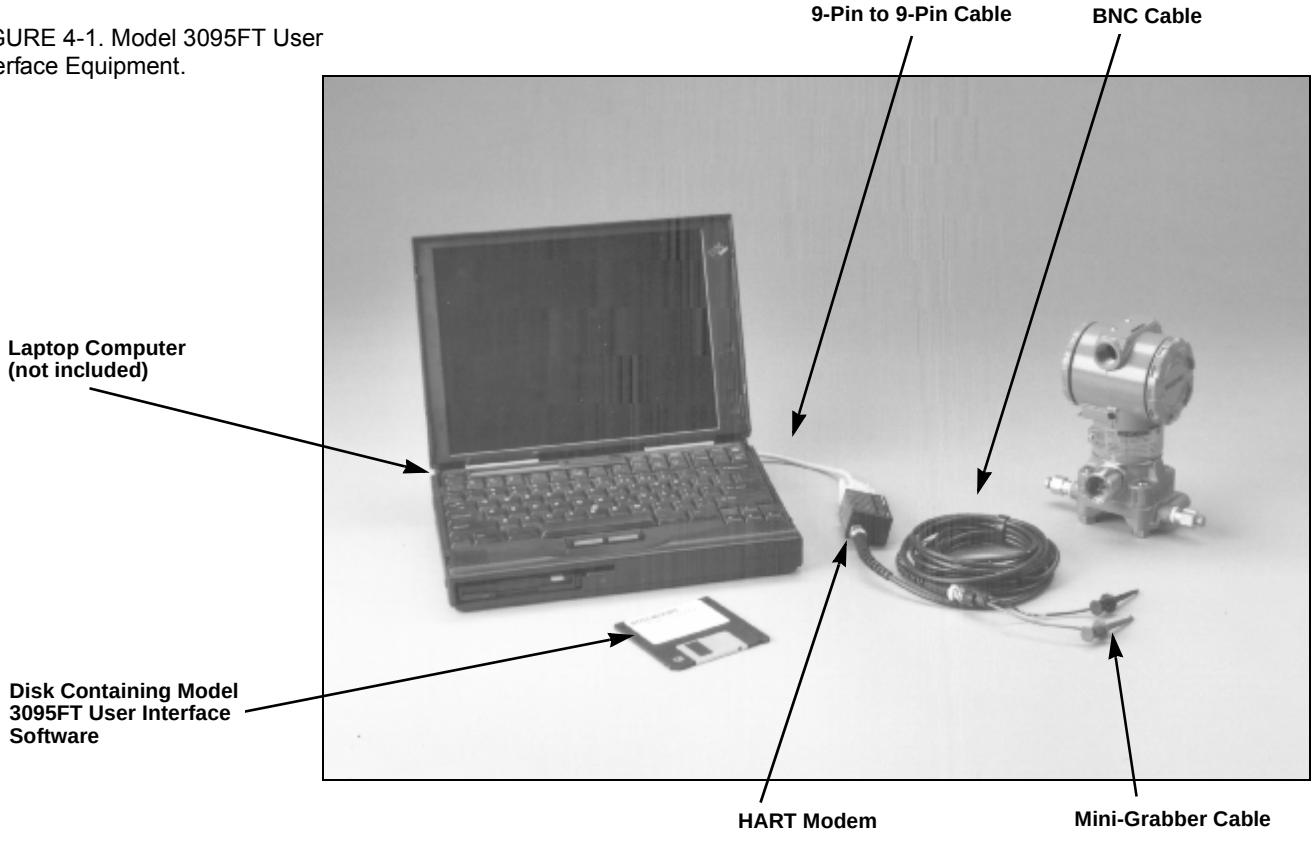
NOTE
This screen defines the HART communications port as either COM1 or COM 2. The HART communications port must be different than the mouse port.

7. After installing files, the installation program then prompts for the operator to re-boot the computer.



8. The computer must be re-booted for the User Interface Software to function. Push the computer reset button to reboot the computer, or press CTL-ALT-DEL.

FIGURE 4-1. Model 3095FT User Interface Equipment.



ESTABLISH COMMUNICATIONS

Figure 4-2 and Figure 4-3 illustrates the two methods for connecting a computer to a Model 3095FT.

Connect a Personal Computer to a Model 3095FT

⚠WARNING

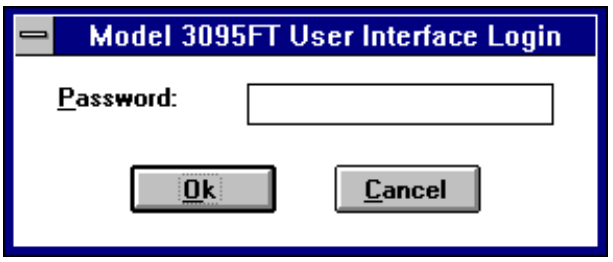
Explosions can cause death or serious injury. Before making any computer connections, ensure that the Model 3095FT area is non-hazardous.

1. Connect the computer to the Model 3095FT. See Warning above, and Figure 4-1 and Figure 4-2.
   a. Connect one end of the 9-pin to 9-pin cable to the HART communications port on the personal computer.
   b. Connect the other end of the 9-pin cable to the HART modem.
   c. Connect one end of the BNC cable to the HART modem.
   d. Connect the mini-grabber cable to the other end of the BNC cable.

⚠WARNING

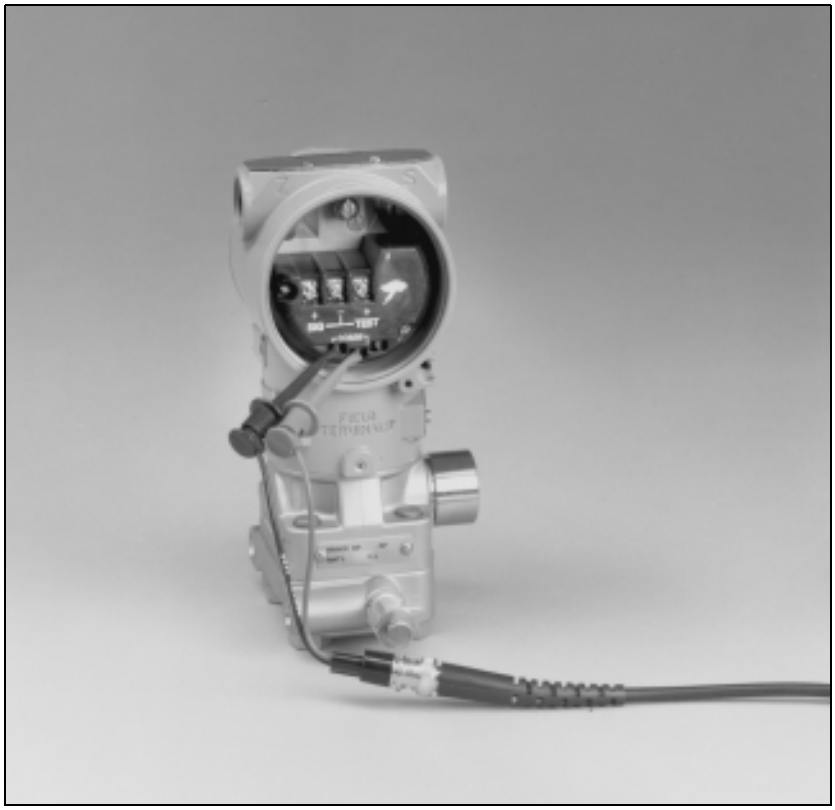
Explosions can cause death or serious injury. Do not remove the instrument cover in explosive atmospheres when the circuit is alive.

   e. Open the cover above the side marked Field Terminals, and connect the mini-grabbers to the two Model 3095FT terminals marked COMM as shown in Figure 4-2.
2. Power on the computer.
3. Type win ***return*** at the DOS prompt.
4. Double click on the Model 3095FT User Interface icon.
5. If password security is enabled, the User Interface Login menu appears:

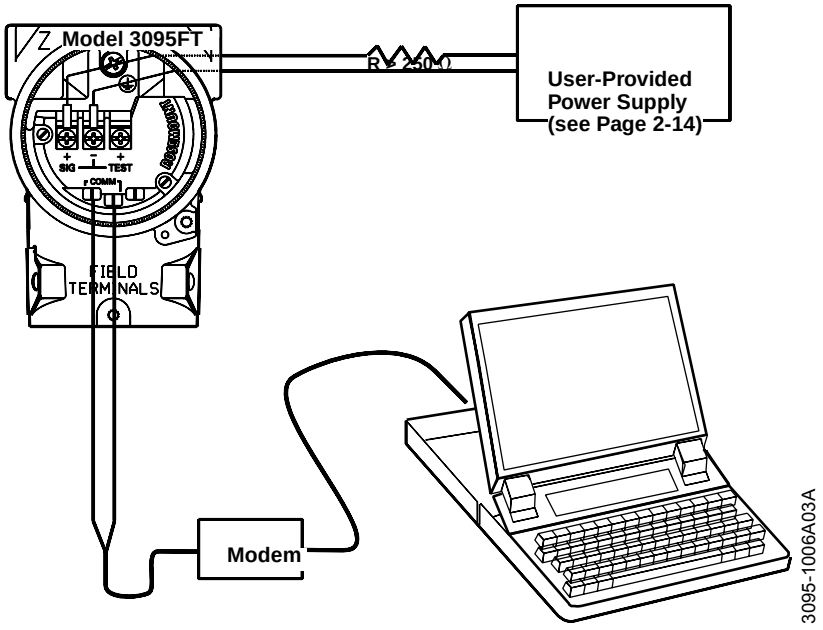


6. Enter a password and press Return. The status bar then reflects the security level as determined by the entered password:
   SL3 System Administrator SL1 Operator Access
   SL2 Maintenance Access SL0 View Process Variables
   SL(Disabled) Security Disabled

FIGURE 4-2. Connecting a Personal Computer to a Model 3095FT.



3095-018AB



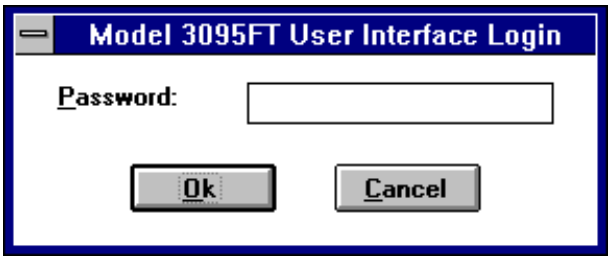
3095-1006A03A

Connect a Personal Computer to a Remote Power Supply

⚠WARNING

For instrinsically safe installations, computer connections must be made in accordance with ANSI/ISA-RP12.6; and Rosemount drawings 03095-1020 and 03095-1030, or 03095-1021 and 03095-1031.

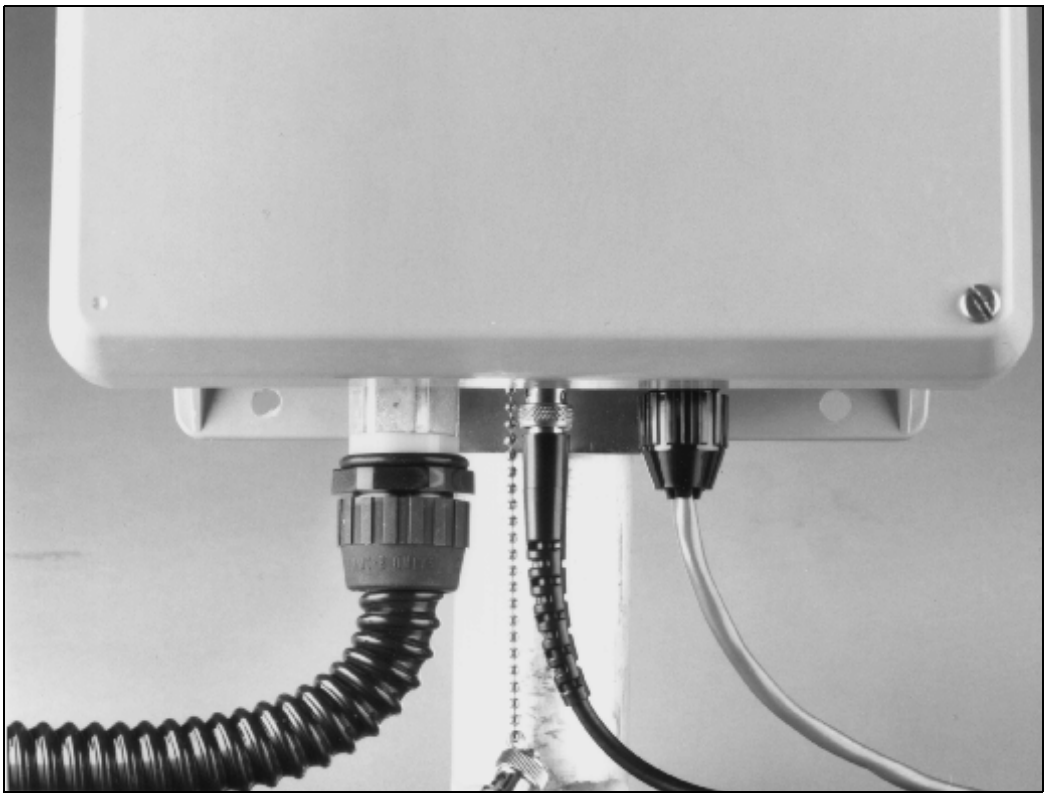
1. Connect computer to the Remote Power Supply. See Warning above, and Figure 4-3.
   a. Connect one end of the 9-pin to 9-pin cable to the HART communications port on the personal computer.
   b. Connect the other end of the 9-pin cable to the HART modem.
   c. Connect one end of the BNC cable to the HART modem.
   d. Connect the other end of the BNC cable to the BNC connector on the Remote Power Supply as shown in Figure 4-3.
2. Turn on the computer.
3. Type win ***return*** to open Windows, then click on the Model 3095FT User Interface icon.
4. If password security is enabled, the User Interface Login menu appears:



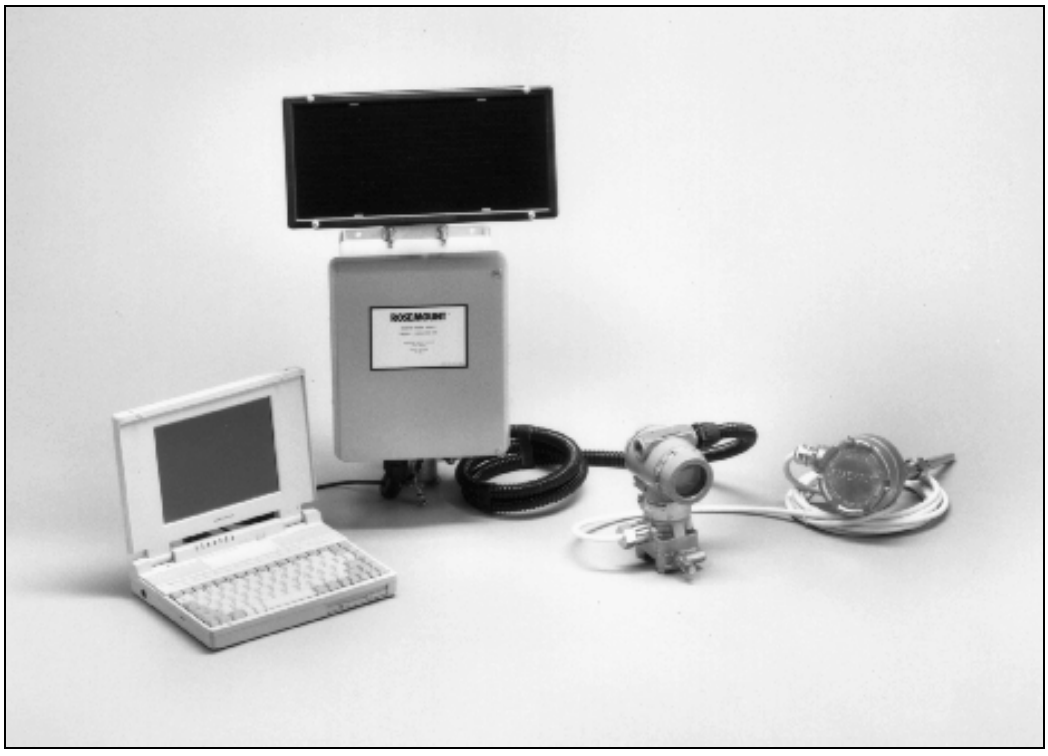
5. Enter a password, then press ***return***.

   The status bar then reflects the security level as determined by the entered password:
   SL3 System Administrator
   SL2 Maintenance Access
   SL1 Operator Access
   SL0 View Process Variables
   SL(Disabled) Security Disabled

FIGURE 4-3. Connecting a Personal Computer to the Remote Power Supply.



3095-008AB



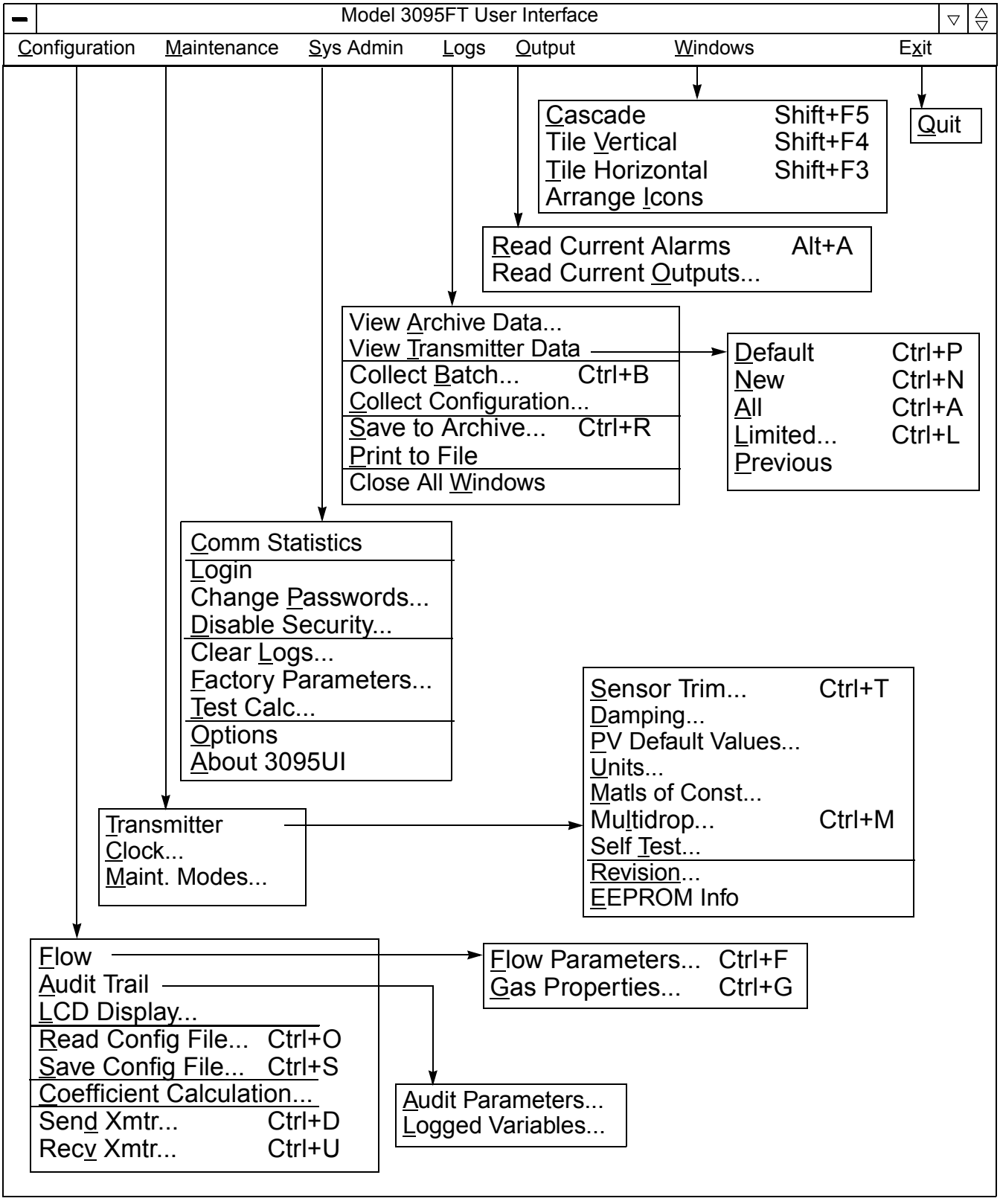
3095-020AB

SAMPLE PROCEDURES

Menu Structure

Figure 4-4 illustrates the complete menu structure for the Model 3095FT User Interface Software.

FIGURE 4-4. User Interface Menu Structure.



Menu Categories

The Model 3095FT menu bar identifies five menu categories:

Configuration This category contains screens for configuring the Model 3095FT. Changes to any field in this series of menus does not change the connected transmitter until “Send Xmtr...” is selected.

Maintenance This category contains Model 3095FT maintenance screens. With the exception of “Matls of Const” which is a read-only screen, any changes made in this series of screens occurs **immediately** to the connected transmitter.

Sys Admin The system administrator screens include communication test screens, the login screen, and other administrative screens only available for users with the System Administrator password.

Logs The log selection provides access to the Model 3095FT audit trail data.

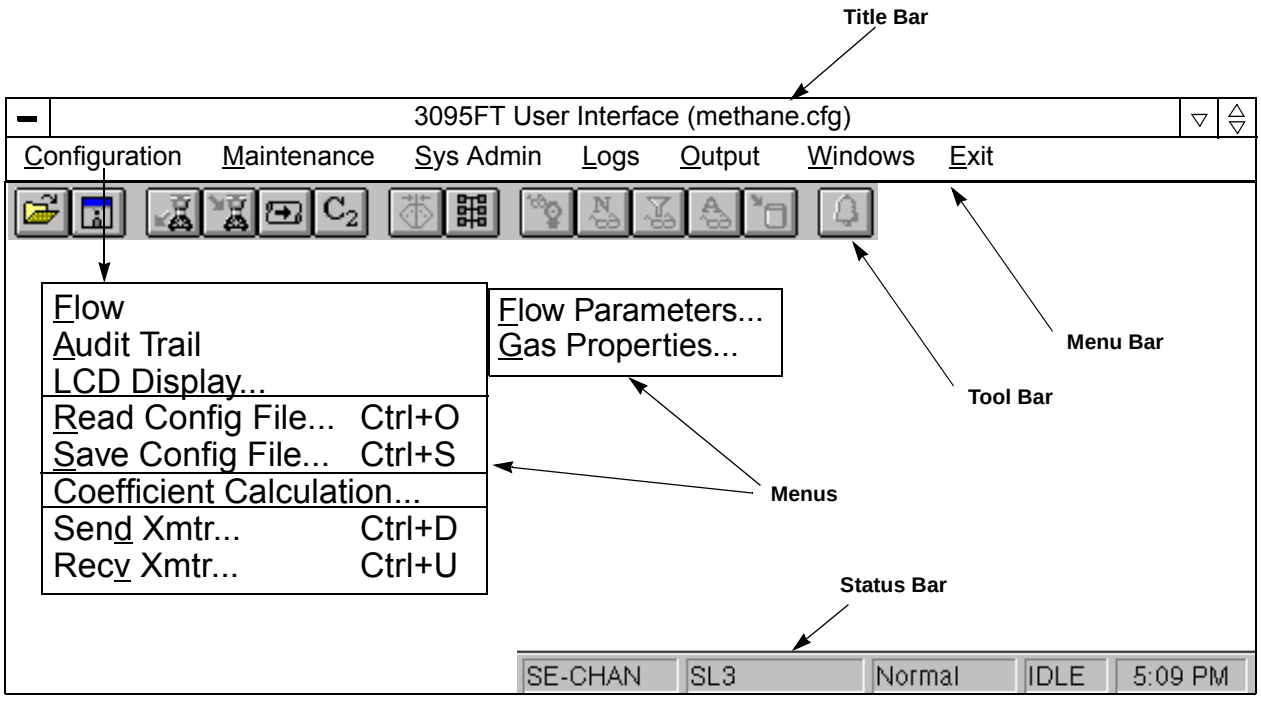
Output The output selections display the current process variable values and current alarms.

Windows The windows selection provides standard window functionality.

Exit Allows the user to quit the Model 3095FT User Interface program.

SCREEN COMPONENTS AND CONVENTIONS

Screen Components The following figure illustrates basic screen components:



The Model 3095FT User Interface uses standard Window elements and tools, including scroll bars, minimize button, maximize button, window border, mouse pointer, and buttons. It is beyond the scope of this manual to discuss basic Windows terminology and techniques. For additional information concerning Windows, see Windows Fundamentals in the Microsoft Windows User’s Guide.

Title Bar Code

The title bar identifies the configuration file status:

- (methane.cfg) indicates that the configuration file METHANE.CFG was loaded into the User Interface memory.
  Other options:
  (Uploaded Data) indicates that the current configuration information was uploaded from a transmitter.
  (Untitled) indicates configuration information has not been loaded in from a transmitter or from a configuration file.

Status Bar Codes

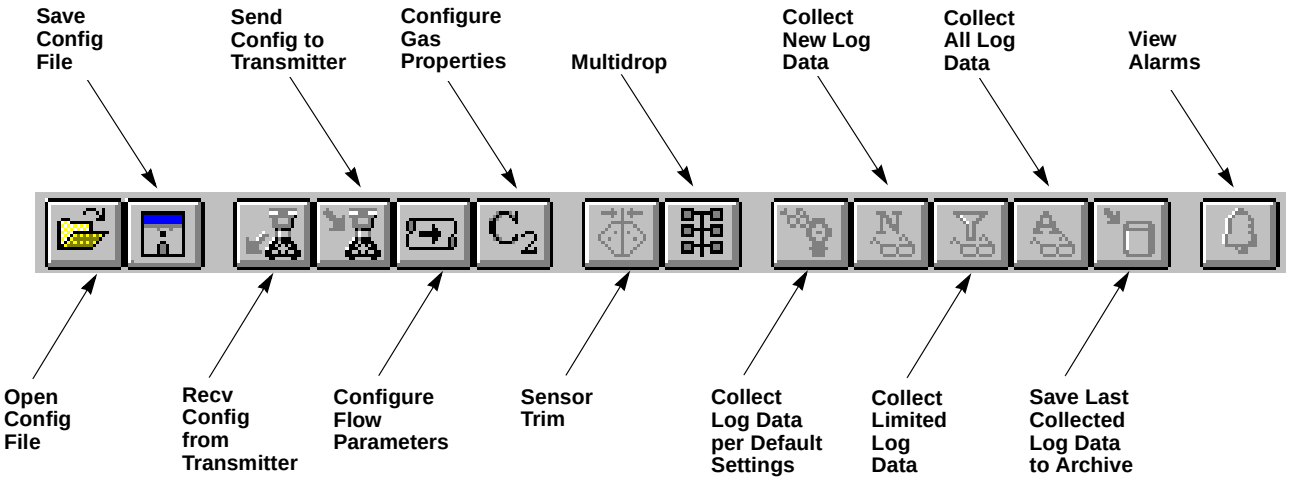
- Current Transmitter Tag, if any.
- Password status. The password options are:
  SL3 System Administrator access
  SL2 Maintenance access
  SL1 Operator access
  SL0 View process variables
  SL(Disabled) Security disabled.
- Current Maintenance Mode (see page 4-36).
- Communication Status: BUSY indicates that the User Interface is currently communicating with the transmitter.

Hot Keys

An underline character in a menu selection indicates the Hot Key for that selection. Press the character to select that menu item.

Toolbar

Another fast way to access User Interface screens is the tool bar. Simply click on the icon to access the screen.



Path Name Convention

In this section, each heading also identifies the path name. For example, consider the following heading:

Configuration
Flow
Flow Parameters

This indicates that the menu is found under the Configuration, Flow, Flow Parameters path. This menu can be accessed in multiple ways. Three examples are shown:

- Click Configuration, click Flow, click Flow Parameters
- Press Alt-C, F, F
- Press Alt-C, use the arrow keys to highlight Flow and press ***return***, use the arrow keys to highlight Flow Parameters and press ***return***.

Procedure Convention

Rather than explaining all of the possible ways to access a particular screen, procedures in this manual use the term "Select" to indicate there are multiple ways to select an option. For example, the first step in the Sensor Trim procedure is illustrated below.

1. Select Maintenance, Transmitter, Sensor Trim to display the Sensor Trim Select screen.

OK and Cancel Buttons

All User Interface screens that allow data entry or transmitter action contain both OK and Cancel buttons. Select Cancel to exit the screen without making any changes, or select OK to implement changes.

Automatic Error Messages

If the User Interface polls the Model 3095FT and discovers an unacknowledged error, the following message appears:

Selecting "OK" acknowledges the error. To view the error message, select Output, Read Current Alarms.

When the error condition is resolved, the User Interface displays the following message:

SAMPLE PROCEDURES

Bench Configuration (Standard)

This bench configuration procedure only outlines the major configuration steps. Refer to the individual screen explanations for additional information.

1. Establish communications (see Page 4-4).
2. Enter either the system administrator or a maintenance level password.
3. (Optional) If a configuration file is already created, use Read Configuration File to retrieve those configuration settings.
4. Fill out the Flow Parameters screen.
5. Fill out the Gas Properties screen.
6. Fill out the Audit Parameters screen.
7. Select logged variables using the Logged Variables screen.
8. (Optional) Select LCD variables if LCD meter ordered.
9. Save the Configuration File.
10. Place the transmitter into Off-line or On-line Maintenance.
11. Send the configuration to connected transmitter using Send Xmtr.
12. Set or verify the Real Time Clock.
13. Set the PV Default Values.
14. Set the Units.
15. (Optional) Change the multidrop address.

Bench Configuration (Option Code C1)

This bench configuration procedure only outlines the major configuration steps when option code C1 is ordered. Refer to the individual screen explanations for additional information.

1. Establish communications (see Page 4-4).
2. Enter either the system administrator or a maintenance level password.
3. Read the current transmitter settings using Recv Xmtr.
4. Verify the Flow Parameters screen.
5. Verify the Gas Properties screen.
6. Verify the Audit Parameters screen.
7. Verify the Logged Variables.
8. (Optional) Verify the LCD variables if LCD meter ordered.
9. If any changes were made in steps 4 through 8, place the transmitter into Off-line or On-line Maintenance, and send the configuration to connected transmitter using Send Xmtr.
10. Verify the Real Time Clock.
11. Verify the PV Default Values.
12. Verify the Units.
13. (Optional) Verify the multidrop address.

Bench Calibration Procedure

After a transmitter is bench configured, the transmitter can be bench calibrated.

1. Enter either the system administrator or a maintenance level password.
2. Set or verify the Damping settings.
3. Place the transmitter into Off-line or On-line Maintenance.
4. Perform sensor trim procedures:

NOTE
Although the Model 3095FT can calculate and log static pressure as absolute or gage, flow is always calculated using the absolute pressure sensor measurement.

   a. Trim SP Offset (zero).
   b. Trim SP Slope (span).
   c. Trim DP Offset (zero).
   d. Trim DP Slope (span).
   e. Trim PT Offset (zero).
   f. Trim PT Slope (span).

Field Calibration Procedure

To correct for mounting position effects, field calibrate the Model 3095FT after installation:

1. Establish communications (see Page 4-4)
2. Enter either the system administrator or a maintenance level password.
3. Place the transmitter into Off-line or On-line Maintenance.
4. Perform a Trim DP Offset (zero).
5. (Optional) If a barometer that is four times as accurate as the Model 3095FT AP sensor is available, perform an AP Offset.

Collect New Log Data

During this procedure, the Model 3095FT User Interface checks the archive, and only retrieves data that it does not yet have.

1. Establish communications (see Page 4-4)
2. Enter either the system administrator, a maintenance level password, or an operator password.
3. Click  in the tool bar.

Collect All Log Data

This procedure retrieves all data from the connected transmitter.

1. Establish communications (see Page 4-4)
2. Enter either the system administrator, a maintenance level password, or an operator password.
3. Click  in the tool bar.

Collect Log Data per System Defaults

During this procedure, the Model 3095FT User Interface collects log data according to the defaults set in the Sys Admin, Options screen.

1. Establish communications (see Page 4-4)
2. Enter either the system administrator, a maintenance level password, or an operator password.
3. Click  in the tool bar.

USER INTERFACE SOFTWARE SCREENS

This section illustrates each major Model 3095FT User Interface screen, and provides information on using the screen.

Configuration Screens

The configuration screens define a configuration that can be sent to a transmitter (Send Xmtr), and/or saved to a file (Save Config File).

NOTE
Security Level SL1 provides read-only access. Security Level SL2 and SL3 provides read/write capability to an attached transmitter.

Configuration
Flow
Flow Parameters

The flow parameters screen (Figure 4-5) should be completed first whenever preparing a Model 3095FT configuration. This screen defines:

Software Tag
The software tag uniquely identifies the transmitter. This tag is also used to identify audit trail data retrieved from the transmitter.

Meter Tube Bore @ 68F (in)
Identifies the diameter of the meter tube bore.

Meter Tube Matl
Allows selecting one of five meter tube materials: carbon steel, SST 304, SST 316, Hastelloy C, and Monel.

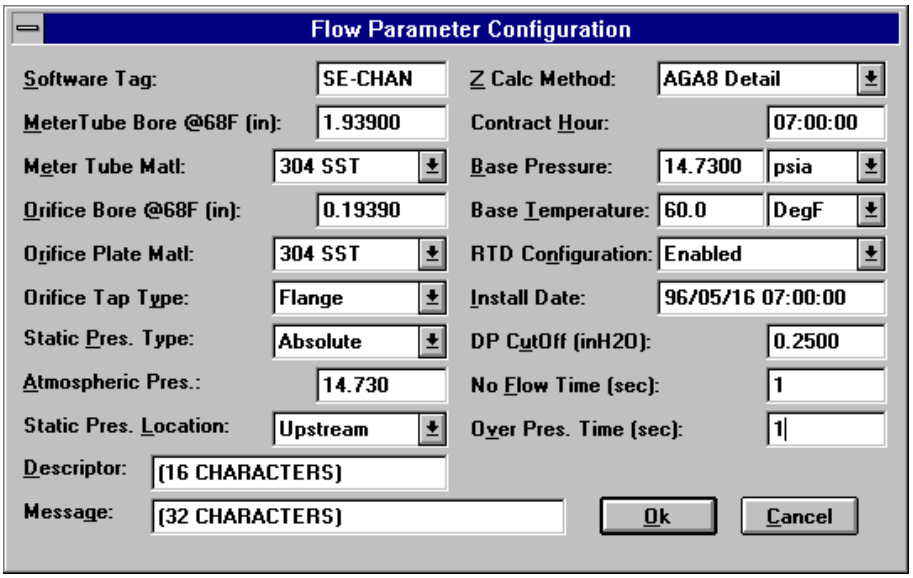
Orifice Bore @ 68F (in)
Identifies the diameter of the orifice bore.

NOTE
The Orifice Bore/Meter Tube Bore ratio (β) should be within the following range:
Flange Tap: $0.1 \leq \beta \leq 0.75$ Pipe Tap: $0.2 \leq \beta \leq 0.67$

Orifice Plate Matl
Allows selecting one of five orifice plate materials: carbon steel, SST 304, SST 316, Hastelloy C, and Monel.

Orifice Tap Type
Allows selecting either flange or pipe taps.

FIGURE 4-5. Flow Parameters Screen.



Static Pressure Type
Allows specifying the static pressure as “Gage” or “Absolute.” See note.

Atmospheric Pressure
This field is only used if “Gage” is selected for static pressure type.

SP Location
Allows selecting the static pressure tap location as upstream or downstream of the transmitter. See note.

NOTE
To meet existing billing system requirements, the Model 3095FT can calculate and log static pressure as absolute or gage, based on upstream or downstream tap location. However, flow is always calculated using the upstream absolute pressure measurement for greatest accuracy.

Descriptor
A 16-character field for describing the transmitter.

Message
A 32-character field for entering a user-determined message.

Z Calc Method
Allows selecting as the gas flow calculation method one of three Characterization Methods allowed by A.G.A. Report No. 8 (1992): AGA8 Gr-Hv-CO2, AGA8 Gr-CO2-N2, or AGA8-Detail. Select the option that best fits the gas composition (see page 4-16). This field must be selected to access the Gas Properties menu.

Contract Hour
Identifies the start of the contract period. (Range: 00:00:00 – 23:59:59.)

Base Pressure
Identifies the Base Pressure for all Model 3095FT flow calculations. Default value is 14.73 psia. (Recommended range: 13.0–16.0 psia; 0.09–0.11 MPaa).

Base Temperature
Identifies the Base Temperature for all Model 3095FT flow calculations. Default value is 60 °F. (Recommended range: 32–77 °F; 0–25 °C).

RTD Configuration
Identifies whether the RTD connector is enabled or disabled. When disabled, the Model 3095FT uses the PT default value for all calculations (see Page 4-30).

Install Date
Identifies the Model 3095FT installation date. This field defines the start date and time for Model 3095FT logging, and must be in the following format: YYMMDD HHMMSS.

DP Cutoff (inH2O)
Identifies the low flow cut-off point. Flow is considered to have stopped if the differential pressure drops below this point.

No Flow Time (sec)
Identifies the length of time the differential pressure must be above the DP cutoff before flow is considered re-established.

Over Press. Time (sec)
Identifies the length of time the differential pressure must produce a valid output before flow is considered re-established.

The Model 3095FT calculates the gas compressibility factor using either gross or detail characterization methods. Gross characterization is a simplified method that is acceptable for a narrow range of pressure, temperature, and gas composition. Detail characterization covers all pressure, temperature, and gas composition ranges for which A.G.A. computes compressibility factors.Table 4-1 identifies the acceptable ranges for both of these characterization methods.

TABLE 4-1. Acceptable Ranges:
Gross vs. Detail Characterization Methods.

User Interface Abbreviation	Variable	Gross Method	Detail Method
	Pressure	0–1200 psia (1)	0–20,000 psia (1)
	Temperature	32 to 130 °F (1)	–200 to 400 °F (1)
	Specific Gravity	0.554–0.9	0.07–1.52
	Heating Value	477–1200 BTU/SCF	0–1800 BTU/SCF
N2	Mole % Nitrogen	0–50.0	0–100
CO_2	Mole % Carbon Dioxide	0–30.0	0–100
H_2S	Mole % Hydrogen Sulfide	0–0.02	0–100
H2O	Mole % Water	0–0.05	0–Dew Point
He	Mole % Helium	0–0.2	0–3.0
C1	Mole % Methane	45.0–100	0–100
C2	Mole % Ethane	0–10.0	0–100
C3	Mole % Propane	0–4.0	0–12
iC4	Mole % i-Butane	0–1.0	0–6 (2)
nC4	Mole % n-Butane	0–1.0	0–6 (2)
iC5	Mole % i-Pentane	0–0.3	0–4 (3)
nC5	Mole % n-Pentane	0–0.3	0–4 (3)
C6	Mole % n-Hexane	0–0.2	0–Dew Point
C7	Mole % n-Heptane	0–0.2	0–Dew Point
C8	Mole % n-Octane	0–0.2	0–Dew Point
C9	Mole % n-Nonane	0–0.2	0–Dew Point
C10	Mole % n-Decane	0–0.2	0–Dew Point
O2	Mole % Oxygen	0	0–21.0
CO	Mole % Carbon Monoxide	0–3.0	0–3.0
H2	Mole % Hydrogen	0–10.0	0–100
Argon	Mole % Argon	0	0–1.0

NOTE
Reference conditions are 14.73 psia and 60 °F for Gross Method.

(1) The Model 3095FT sensor operating limits may limit the pressure and temperature range.

(2) The summation of i-Butane and n-Butane cannot exceed 6 percent.

(3) The summation of i-Pentane and n-Pentane cannot exceed 4 percent.

Configuration
Flow
Gas Properties (CO2)

The displayed gas properties screen is determined by the calculation method selected in the Flow Parameters screen. If "AGA8 Gr-Hv-CO2" is selected, then the Gross Characterization Method, Option 1, is displayed (Figure 4-6a). The Option 1 method requires the entry of real gas specific gravity, heating value, and CO2 mole percent, and also allows entry of H2 mole percent and CO mole percent. H2 and CO are typically zero for natural gas applications.

The valid ranges for the Gas Properties (CO2) screen selections are:

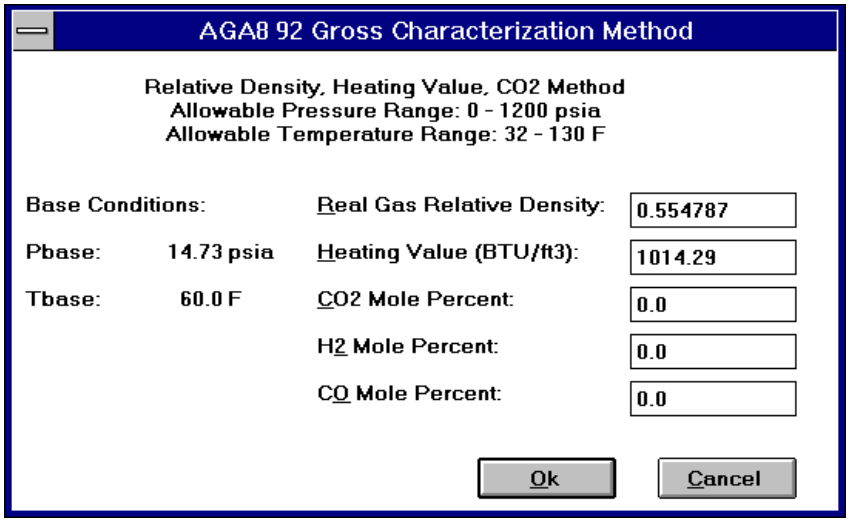
Real gas relative density (specific gravity) at base conditions
0.554000–0.900000.

Volumetric Gross Dry Heating Value at base conditions.
477–1200 BTU/SCF.

CO2 (carbon dioxide) mole percent
0–30 percent.

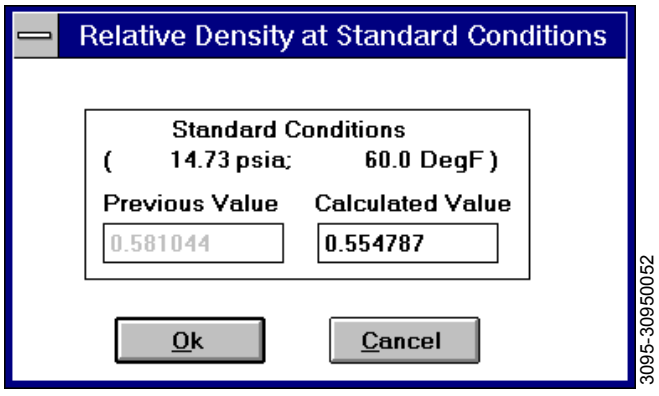
H2 (hydrogen) mole percent
0–10 percent.

CO (carbon monoxide) mole percent
0–3 percent.



If base conditions changed (Base Pressure ≠ 14.73 or Base Temperature ≠ 60 °F), then a second screen for modifying relative density at standard conditions is displayed (Figure 4-6b).

FIGURE 4-6b. Gas Properties Screen (AGA8 Gr-Hv-CO2).



Configuration
Flow
Gas Properties (N2)

The displayed gas properties screen is determined by the calculation method selected in the Flow Parameters screen. If "AGA8 Gr-CO2-N2" is selected, then the Gross Characterization Method, Option 2, is displayed (Figure 4-7a). This method requires the entry of real gas specific gravity, CO2 mole percent, and N2 mole percent, and also allows entry of H2 mole percent, CO mole percent, and heating value. H2 and CO are typically zero for natural gas applications.

NOTE
This gross characterization method does not require heating value. However, heating value is required if energy rates or totals are to be logged or displayed on the LCD meter.

The valid ranges for the Gas Properties (N2) screen selections are:

Real gas relative density (specific gravity) at base conditions
0.554000–0.900000.

CO2 (carbon dioxide) mole percent
0–30 percent.

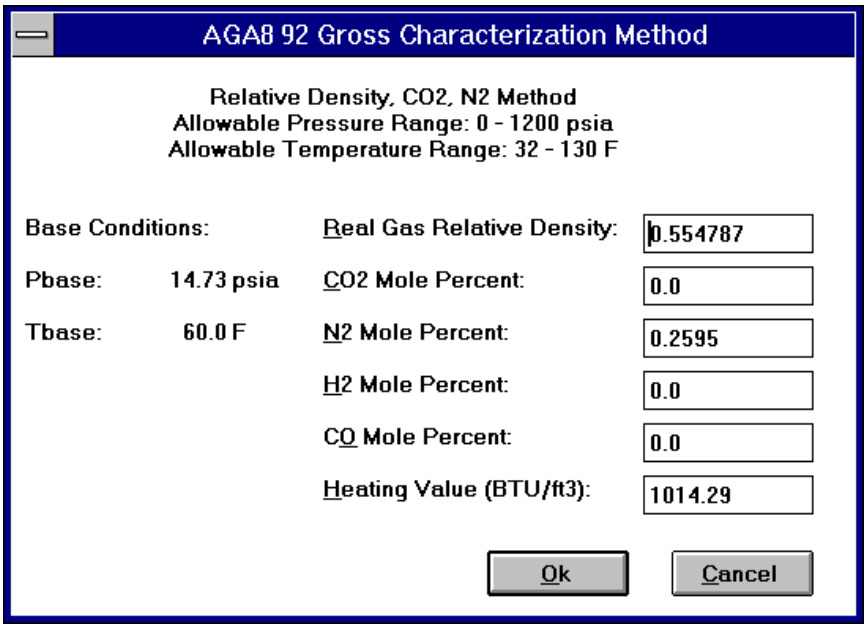
N2 (nitrogen) mole percent
0–50 percent.

H2 (hydrogen) mole percent
0–10 percent.

CO (carbon monoxide) mole percent
0–3 percent.

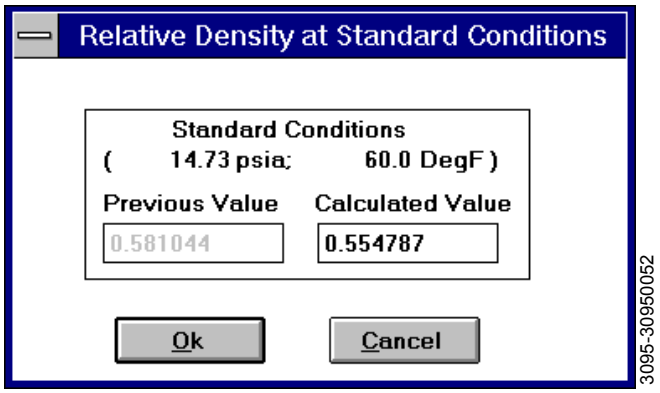
Volumetric Gross Dry Heating Value at base conditions
477–1200 BTU/SCF.

FIGURE 4-7a. Gas Properties Screen (AGA8 Gr-CO2-N2).



If base conditions changed (Base Pressure ≠ 14.73 or Base Temperature ≠ 60 °F), then a second screen for modifying relative density at standard conditions is displayed (Figure 4-7b).

FIGURE 4-7b. Gas Properties Screen (AGA8 Gr-CO2-N2).



Configuration
Flow
Gas Properties (Detail)

The displayed gas properties screen is determined by the calculation method selected in the Flow Parameters screen. If "AGA8 Detail" is selected, then the AGA 8 (1992) Full Composition Analysis screen is displayed (Figure 4-8a). This method allows entry of up to 21 different gas composition mole percentages. Listed below is the variable name for each abbreviation. Table 4-1 on Page 4-16 identifies the valid range for each variable.

N2	Nitrogen	iC5	i-Pentane
CO2	Carbon Dioxide	nC5	n-Pentane
H2s	Hydrogen Sulfide	C6	Hexane
H20	Water	C7	Heptane
He	Helium	C8	Octane
C1	Methane	C9	Nonane
C2	Ethane	C10	Decane
C3	Propane	O2	Oxygen
iC4	i-Butane	CO	Carbon Monoxide
nC4	n-Butane	H2	Hydrogen
		Argon	Argon

When entering numbers into the detail gas properties screen, the Total Mole % field indicates the sum of all percentages entered. The Total Mole % field must add up to 100.0000 percent for the User Interface to accept the new values.

To zero all 21 fields, select clear. The normalize button provides a method to automatically modify all non-zero values so that they add up to 100.0000.

After the mole percentages are entered, select Ok to display the AGA 8 Gas Properties screen (Figure 4-8).

FIGURE 4-8a. Full Composition Analysis Screen (AGA8-Detail).

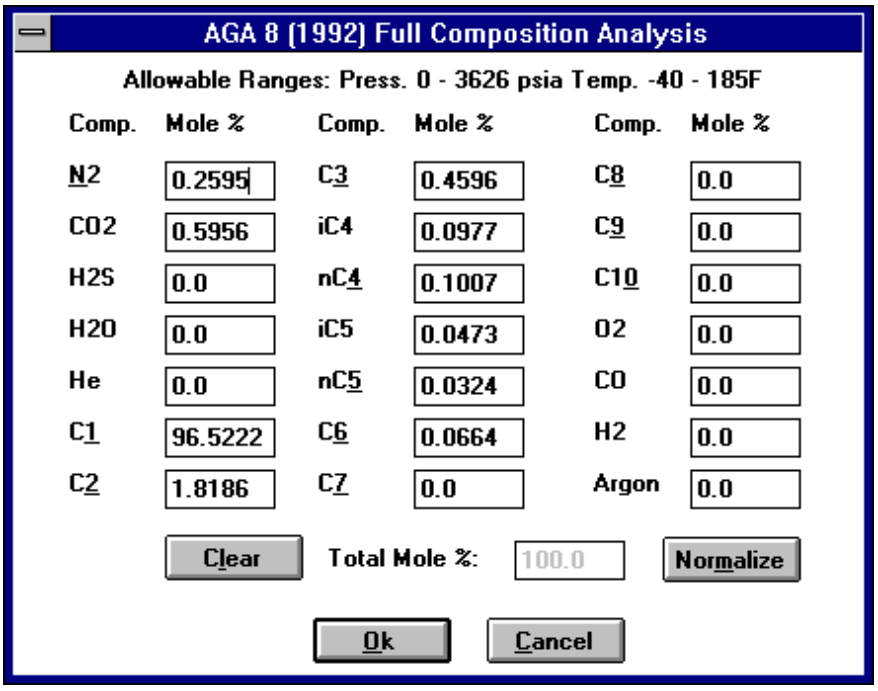
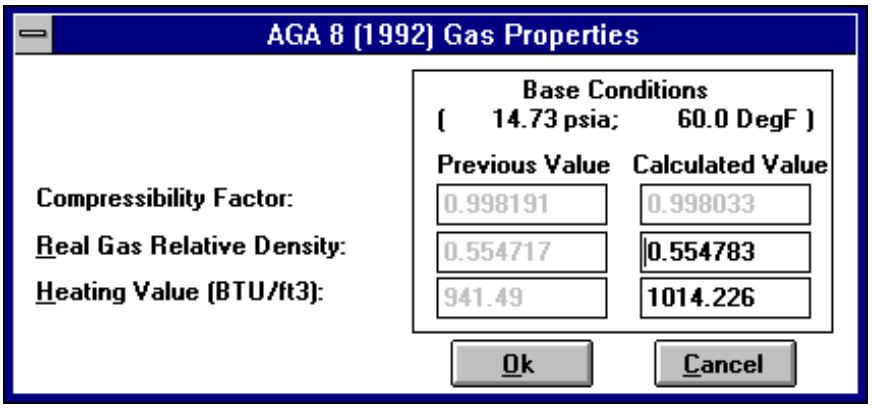


FIGURE 4-8b. Gas Properties Screen (AGA8-Detail).



The displayed values are calculated per the A.G.A. 8 Detail Characterization Method. If desired, either the Real Gas Relative Density or the Heating Value can be modified.

After reviewing the gas properties numbers, select Ok. The User Interface then prompts to “Accept all Composition Data?” Select Ok once more to confirm the composition values.

For additional information concerning the Detail Characterization Method, refer to the A.G.A. Report No.8/API MPMS Chapter 14.2, Second Edition, November 1992.

Configuration
Audit Trail
Audit Parameters

This screen sets three parameters for determining when and how Model 3095FT logging occurs.

Averaging: The averaging method for the Model 3095FT is flow-dependent time-weighted formulaic average:

$$\overline{p_f} = \overline{p_f^y}^{\frac{1}{y}} \text{ where } \overline{p_f^y} = \frac{1}{t_f} \sum_{i=1}^{k} p_i^y t_i F_i$$

where:

p_f = Average of input variable during calculation periods with flow.

p_n = Average of input variable during calculation periods without flow.

i = Index specifying the sample period.

k = Total samples in calculation period.

p_i = Input variable value at sample period i.

y = Lowest order power with which the input variable appears in the flow or volume measurement equation.

t_i = Time interval for sampling period i.

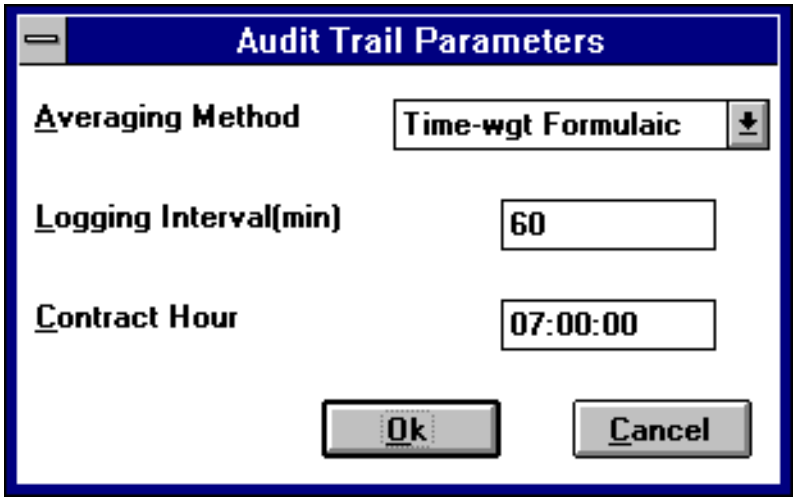
F_i = Flow dependency factor. 0 if no flow at sample period i, 1 if flow at sample period i.

For additional information, refer to API MPMS Chapter 21.1 Electronic Gas Measurement.

Logging Interval: This field defines the interval between variable logs. Enter any value between 01-99 minutes. The standard logging interval is 60 minutes. If logged data is to be integrated in the FlowCal software packing, use either 15 or 60 minutes as the logging interval.

Contract Hour: This field defines the start of the contract day. Enter any value between 00:00:00 to 23:59:59.

FIGURE 4-9. Audit Parameters Screen.



Configuration
Audit Trail
Logged Variables

The Logged Variables screen defines the variables that will be logged for variable and daily logs. Any number of the following parameters may be logged. Bold items indicate API required variables.

NOTE
If logged data is to be integrated into the Flow-Cal™ software package, select at minimum the API required variables.

Total Flow (Mass Flow)	Maximum Static Pressure
Total Flow Time	Minimum Static Pressure
Total Energy	**Average Process Temperature**
Average Flow Rate	Maximum Process Temperature
Average Energy Rate	Minimum Process Temperature
Average Differential Pressure	Heating Value
Maximum Differential Pressure	Average Compressibility Factor
Minimum Differential Pressure	Average Integral Value
Average Static Pressure	Average CPrime
Specific Gravity (Relative Density)	**Date and Time** (see note)

NOTE
Date and Time will not show up in the Logged Variables list, since they are always logged.

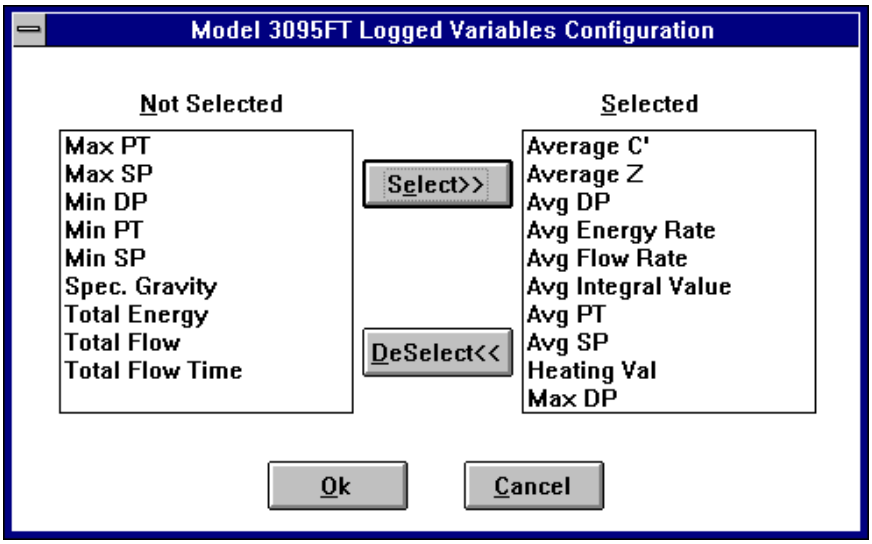
The number of variables selected significantly influences the number of logs the Model 3095FT can perform before rollover occurs. Rollover indicates that the transmitter is writing over previously logged data.

For example, assume that the variable log is set at 60 minutes:

- If the seven API required items are selected for logging, the Model 3095FT can log 55 days of hourly data and 85 days of daily data before rollover occurs.
- If all items are selected, the Model 3095FT can log 20 days of hourly data and 30 days of daily data before rollover occurs.

To choose the logged variables, simply highlight all the desired variables, and click the select button. The deselect button works identically. For selecting with a keyboard, use the hot keys, space bar, and arrow keys to select the desired variables. Once the variables in the selected column are correct, select “Ok.”

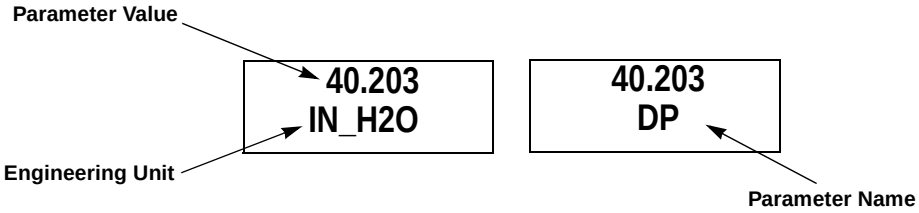
FIGURE 4-10. Logged Variables Screen.



Configuration
LCD Display

The LCD meter provides local display of Model 3095FT process variables, calculations, and transmitter diagnostic messages.

During normal operation, the display changes every three seconds to display user-selected parameters. The LCD meter uses two displays to indicate a parameter's value, engineering unit, and parameter name:



Each display lasts three seconds, with a brief blank display before the LCD meter shows the next parameter. The LCD scrolls through the entire list of selected parameters before repeating the displays.

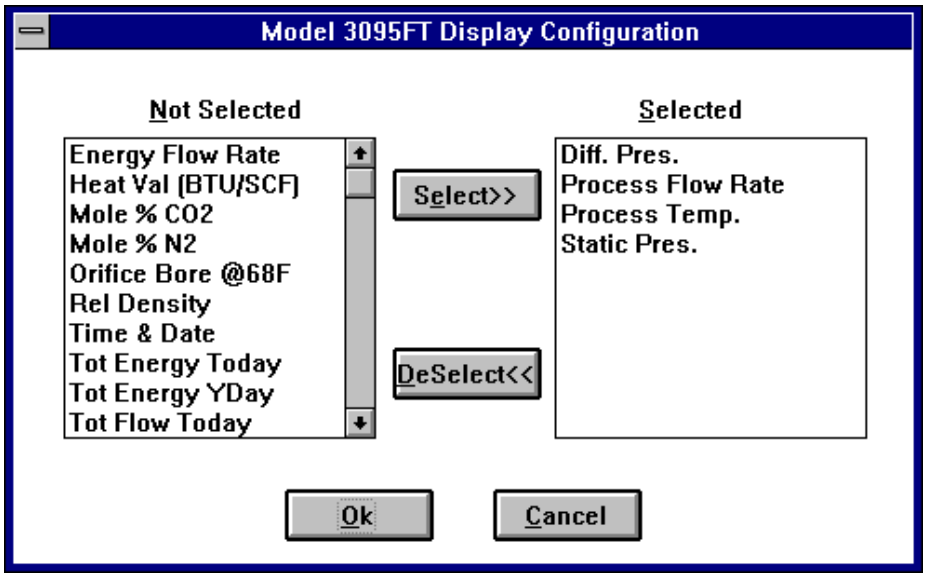
During Fatal Alarm States only fatal alarm messages are displayed. During Critical Alarm States, the LCD messages alternate between displaying the selected parameters and the critical alarms. See Section 5 Troubleshooting and Maintenance, for information concerning Fatal Alarm Messages and Critical Alarm Messages.

Any of the following variables may be selected for the LCD Display:

- Flow Rate
- Differential Pressure
- Totalized Flow Today
- Totalized Flow Yesterday
- Static Pressure
- Temperature
- Energy Flow Rate
- Totalized Energy Today
- Totalized Energy Yesterday
- Mole Percent CO_2
- Mole Percent N_2
- Orifice Bore at 68 °F
- Date and Time
- Heating Value
- Specific Gravity (Rel. Density)

To choose the LCD variables, simply highlight all the desired variables, and click the select button. The deselect button works identically. For selecting with a keyboard, use the hot keys, arrow keys, and space bar to select the desired variables. Once the variables in the selected column are correct, select "Ok."

FIGURE 4-11. LCD Display Screen.

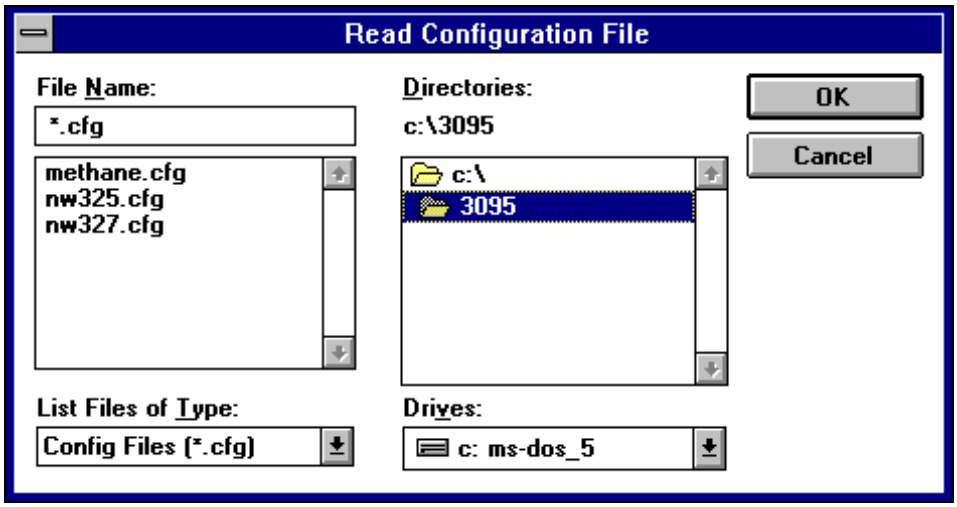


Configuration
Read Config File

The Model 3095FT User Interface Software stores configuration files with the file extension .CFG. Configuration files are read using a standard read file window as illustrated in Figure 4-12. Simply select the directory and double click on the desired file.

Once the selected file is read into the User Interface memory, the User Interface Software adds the configuration file name (for example, methane.cfg) to the title bar. This name remains in the title bar until one of the following occurs: Recv Xmtr is selected, a new configuration file is read, or the operator exits the User Interface.

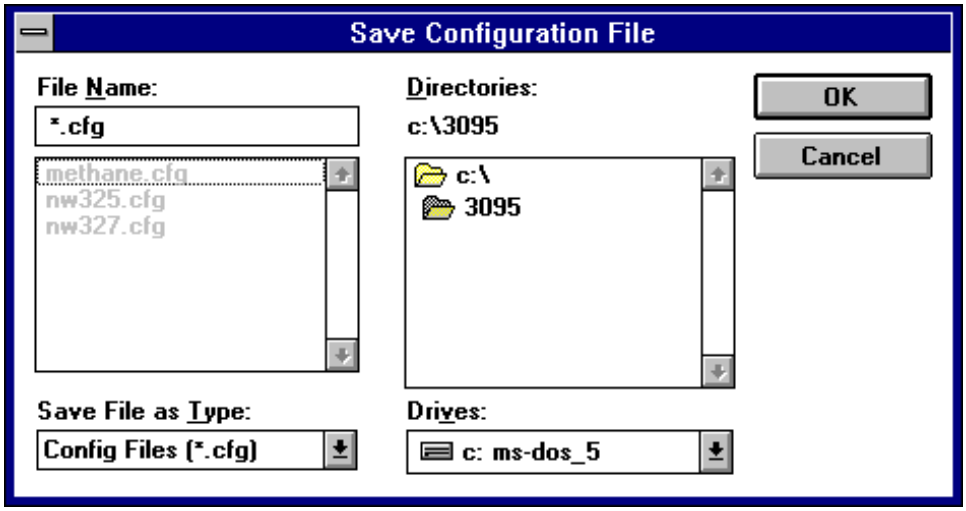
FIGURE 4-12. Read Configuration File Screen.



Configuration
Save Config File

Once a configuration is completed, it is recommended to save it for future use. The configuration file contains all the information entered on the following screens: Flow Parameters, Gas Properties, Audit Parameters, Logged Variables, and LCD Display. The Model 3095FT User Interface Software stores configuration files with the file extension .CFG. Simply select the directory and double click on the desired file name to replace a current file, or enter a new file name and click Ok.

FIGURE 4-13. Save Configuration File Screen.



Configuration Coefficient Calculation

If there are any changes to the Flow Parameters or the Gas Properties screens, the coefficient calculations are automatically recalculated before The Model 3095FT User Interface sends the configuration to a transmitter. The Coefficient Calculations selection provides a method to test for valid beta ratios prior to sending the configuration.

FIGURE 4-14. Coefficient Calculation.

Configuration Send Xmtr

This selection sends the current contents of the User Interface configuration to the transmitter. If desired, the contents of the User Interface configuration can be viewed before sending by re-viewing the Flow Parameters, Gas Properties, Audit Parameters, Logged Variables, and LCD Display screens.

It is not necessary to read a configuration file to send a configuration to the transmitter. An operator can simply read the current contents of a transmitter (Recv Xmtr), make one or two changes, then send the new configuration to the transmitter (Send Xmtr).

NOTE
At the completion of "Send Xmtr," the Model 3095FT User Interface displays a summary screen identifying any transmission errors. The number of errors should always be zero. If any number besides zero is displayed, repeat the procedure.

Configuration Recv Xmtr

Selecting Recv Xmtr uploads the configuration data from the connected transmitter to User Interface memory. The contents of this configuration can then be viewed by displaying the Flow Parameters, Gas Properties, Audit Parameters, Logged Variables, and LCD Display screens.

Once the information is read into the User Interface memory, the User Interface Software displays "Uploaded Data" in the title bar to indicate that the configuration data was uploaded from a transmitter. This term remains in the title bar until one of the following occurs: a configuration file is read (Read Config file), the configuration is saved to a file, or the operator exits the User Interface.

NOTE
At the completion of "Recv Xmtr," the Model 3095FT User Interface displays a summary screen identifying any transmission errors. The number of errors should always be zero. If any number besides zero is displayed, repeat the procedure.

Maintenance Screens

Maintenance screens perform maintenance and calibration tasks such as sensor trim, damping, and setting the units of measure. Unlike the configuration screens, any changes made using a maintenance screen occur *immediately* to the connected Model 3095FT transmitter. The only exception is the "Matls of Const" screen, which is read-only.

NOTE
Security Level SL1 provides read-only access. Security Level SL2 and SL3 provides read/write capability.

Maintenance Transmitter Sensor Trim

The sensor trim screens are used during bench and field calibration of the Model 3095FT Flow Transmitter.

In addition to the User Interface Software, the following equipment is required for a sensor trim procedure:

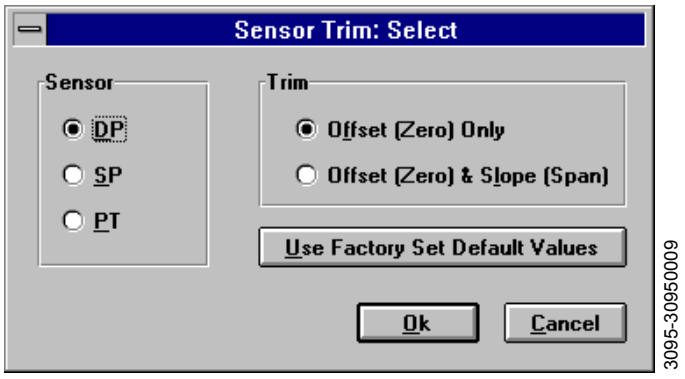
- Model 3095FT
- Dead-weight tester
- Power supply
- Vacuum pump or a barometer that is *at least* 4 times as accurate as the Model 3095FT AP sensor. A barometer is preferred.

Sensor Trim Procedure (For Bench Calibration)

NOTE
Although the Model 3095FT can calculate and log static pressure as absolute or gage, flow is always calculated using the absolute pressure sensor measurement.

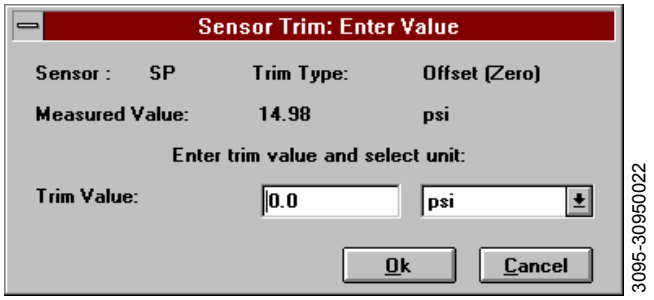
1. Trim SP Offset (Zero).
   a. Select Maintenance, Transmitter, Sensor Trim to display the Sensor Trim Select screen.

FIGURE 4-15. Sensor Trim Select Screen.



   b. Select SP and Offset & Slope, then select Ok to display the "Sensor Trim: Enter Value" screen.

FIGURE 4-16. Sensor Trim Enter Value Screen.

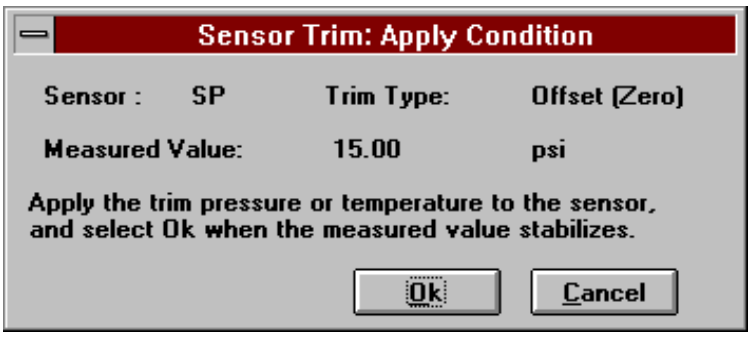


c. If using a vacuum pump, pull a vacuum to both the low and high sides of the transmitter, then enter the low value as the trim value, set the units, then select Ok.

OR

If using a barometer, enter the barometric reading as the Trim Value, select the units, then click Ok.

FIGURE 4-17. Sensor Trim Apply Condition Screen.



d. Wait for the Measured Value to stabilize, then click Ok.
The User Interface then displays the SP slope screen.

2. Trim SP Slope (Span).
   a. Using the dead-weight tester, apply the desired high pressure to both the low and high sides of the transmitter.
   b. Enter the high value as the Trim Value, select the units, then click Ok.
   c. Wait for the Measured Value to stabilize, then click Ok.

3. Trim DP Offset (Zero).
   a. Select Maintenance, Transmitter, Sensor Trim to display the Sensor Trim Select screen.
   b. Select DP and Offset & Slope, then select Ok to display the "Sensor Trim: Enter Value" screen.
   c. Using the dead-weight tester, apply the desired low pressure value to the high side of the transmitter, enter the low value as the trim value, select the units, then click Ok.

NOTE
If zero is the desired low value, do not use the dead weight tester. Instead, enter zero as the trim value, select the units, then click Ok.

d. Wait for the Measured Value to stabilize, then click Ok.
The User Interface then displays the DP slope screen.

4. Trim DP Slope (Span).
   a. Using the dead-weight tester, apply the desired high pressure to the high side of the transmitter.
   b. Enter the high value as the Trim Value, select the units, then click Ok.
   c. Wait for the Measured Value to stabilize, then click Ok.

5. Trim PT Offset (Zero).
   a. Select Maintenance, Transmitter, Sensor Trim to display the Sensor Trim Select screen.
   b. Select PT and Offset & Slope, then select Ok to display the "Sensor Trim: Enter Value" screen.
   c. Insert the RTD probe into an ice bath, enter the low value as the Trim Value (32 °F or 0 °C), select the units, then click Ok.
   d. Wait for the Measured Value to stabilize, then click Ok.
   The User Interface then displays the PT slope screen.

6. Trim PT Slope (Span).
   a. Insert the RTD probe into a hot oil bath.
   b. Enter the high value as the Trim Value, select the units, then click Ok.
   c. Wait for the Measured Value to stabilize, then click Ok.

Sensor Trim Procedure (For Field Calibration)

To correct mounting position effects, field calibrate the Model 3095FT after installation:

1. Establish communications (see Page 4-4).
2. Enter either the system administrator or a maintenance level password.
3. Perform a Trim DP Offset (Zero).
   a. Select Maintenance, Transmitter, Sensor Trim to display the Sensor Trim Select screen.
   b. Select DP and Offset Only, then select Ok to display the "Sensor Trim: Enter Value" screen.
   c. Enter the low value as the Trim Value, select the units, then click Ok.
   d. Wait for the Measured Value to stabilize, then click Ok.
4. (Optional) If a barometer that is *at least* 4 times as accurate as the Model 3095FT AP sensor is available, perform an SP Offset (Zero).
   a. Select Maintenance, Transmitter, Sensor Trim to display the Sensor Trim Select screen.
   b. Select SP and Offset Only, then select Ok to display the "Sensor Trim: Enter Value" screen.
   c. Enter the barometric reading as the Trim Value, select the units, then click Ok.
   d. Wait for the Measured Value to stabilize, then click Ok.

Maintenance
Transmitter
Damping

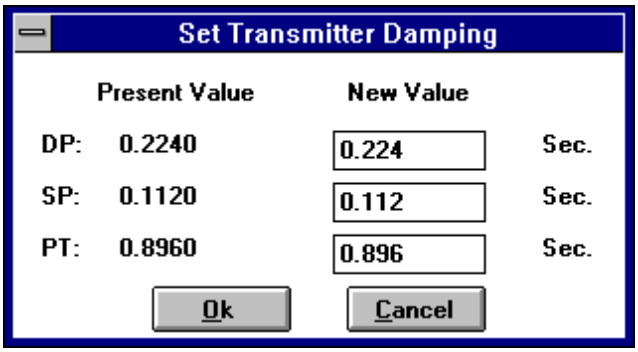
The Model 3095FT has electronic damping that can change the response time of the transmitter to smooth the process variable reading when there are rapid input variations. Different damping values can be entered for the DP, SP, and PT process variables. The following damping values are available:

0.112 0.224 0.448 0.896 1.792 3.584 7.168

High damping values filter out process noise, but response time is decreased. Low damping values increase response time, but process noise can also be detected. The factory default damping value is 0.896.

To change the damping value, simply enter new values, then select Ok. The User Interface immediately sends the new values to the transmitter, then redisplays the "Set Transmitter Damping" screen. If a new value is selected that is not available, the Model 3095FT transmitter automatically selects the closest damping value, and displays an operator message indicating the change.

FIGURE 4-18. Damping Screen.

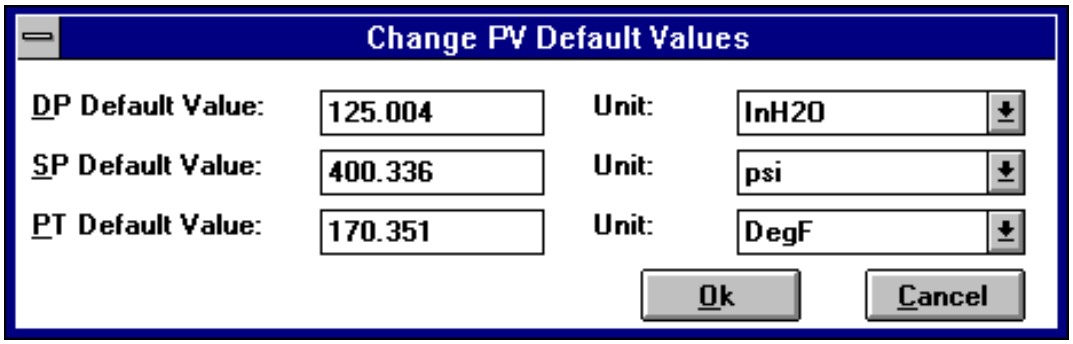


Maintenance
Transmitter
PV Default Values

The PV Default Values screen sets the default values used by the Model 3095FT Transmitter to calculate flow and logging when the transmitter is in "On-Line Maint. Use Default Values" mode. These values are also used by the Model 3095FT for flow calculations during an over-range condition. In addition, the PT Default Value is used for flow calculations if the RTD connector is disabled (see page 4-15).

To change a default value, enter a new value, select the Unit, then click Ok.

FIGURE 4-19. PV Default Values Screen.



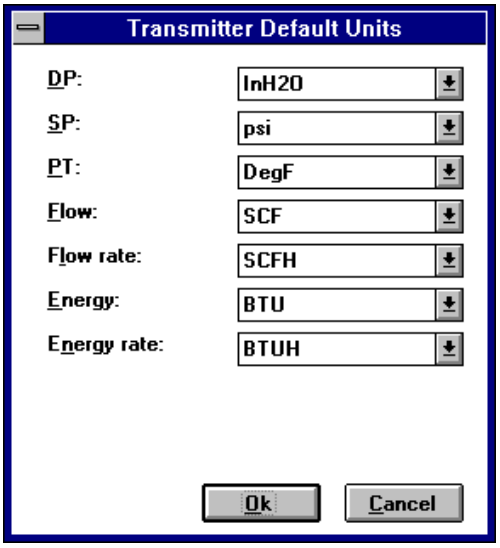
Maintenance
Transmitter
Units

The Transmitter Default Units screen sets the units of measure for the LCD Display and all logs. The following choices are available:

DP:	InH_2O (at 60 °F)	kPA (Kilo Pascals)
SP:	psi	MPA
Temperature:	DegF	DegC
Flow:	SCF (Standard Cubic Feet)	Sm3 (Standard Cubic Meters)
Flow Rate:	SCFH (/hour) SCFD (/day)	Sm3H Sm3D
Energy	BTU DTH	MJoules
Energy Rate:	BTUH BTUD	MJouleH MJouleD

FIGURE 4-20. Units Screen.

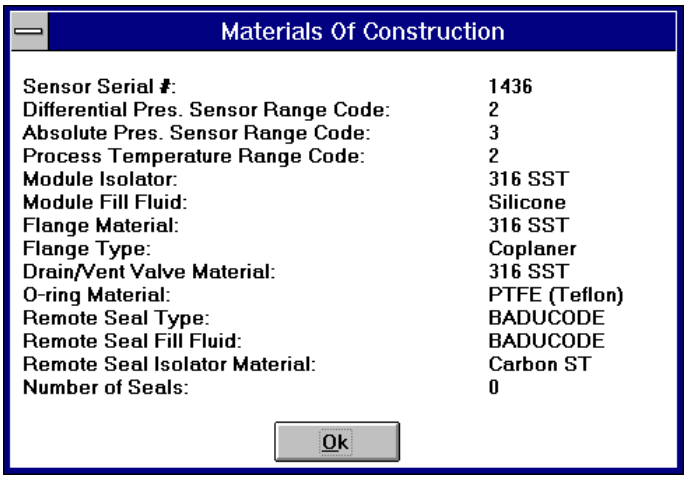
To change a unit of measure, select the new unit, then select Ok.



Maintenance
Transmitter
Matls of Const

The Matls of Const screen identifies the materials of construction for the attached Model 3095FT Flow Transmitter. This is a read-only screen.

FIGURE 4-21. Materials of Construction Screen.



Maintenance
Transmitter
Multidrop

The multidrop screen provides two functions: to change the address for the connected Model 3095FT transmitter, and to change the Model 3095FT that the User Interface is connected to during multidrop applications.

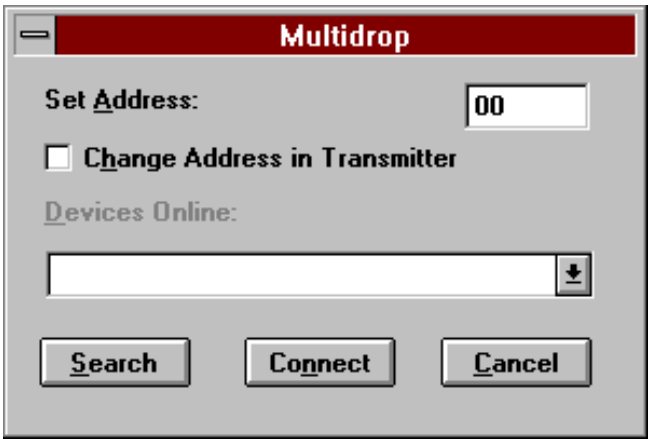
When this screen is accessed, it always appears as illustrated in Figure 4-22: the new address is 0, and there are no devices on-line.

Change Address

Use the following procedure to change the Model 3095FT address.

1. Select Maintenance, Transmitter, Multidrop to display the Multidrop screen.
2. Select Search.
   The User Interface searches for all connected Model 3095FT transmitters, then displays found transmitters in the "Devices Online" box. Devices are identified by the software tag entered in the Flow Parameters screen (see Figure 4-5 on Page 4-14).
3. Select the desired device from the Model 3095FTs identified in the "Devices Online" window.
4. Enter the desired new address for that device.
5. Select the "Change Address in Transmitter" box (an "X" appears), then select Ok.

FIGURE 4-22. Set Address Screen.



Change Connection

During multidrop applications, the Model 3095FT User Interface is connected to one device at a time. Use the following procedure to change this connection pointer.

1. Select Maintenance, Transmitter, Multidrop to display the Multidrop screen.
2. Select Search.
   The User Interface searches for all connected Model 3095FT transmitters, then displays found transmitters in the "Devices Online" box. Devices are identified by the software tag entered in the Flow Parameters screen (see Figure 4-5 on Page 4-14).
3. Verify that the "Change Address in Transmitter" box does NOT contain an "X."
4. Select the desired device from the Model 3095FTs identified in the "Devices Online" window and select Ok.
   The Model 3095FT User Interface is now connected to the device selected in Step 4. If security is enabled, the User Interface displays the Login screen.
5. Enter a password for the new device, then select OK.

NOTE
Be aware that changing the connection does not change the configuration data in the User Interface screens.

For example, assume a multidrop location has three devices online identified as FT-1, FT-2, and FT-3. An operator reads configuration data from FT-1, then uses the Change Connection procedure to switch the connection pointer to FT-3. The User Interface configuration data is still from FT-1, not FT-3. If desired, use the Recv Xmtr procedure (page 4-26) to upload data from FT-3.

⚠CAUTION

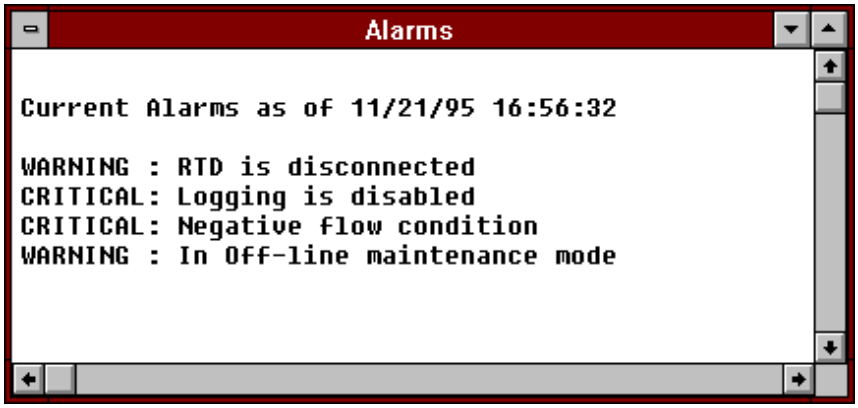
The Flow Parameters screen identifies the Software Tag for each Model 3095FT transmitter. It is important not to accidentally override this unique tag, since logged audit trail data is retrieved, stored, and identified by that Software Tag.

Maintenance
Transmitter
Self Test

The Self-Test screen performs diagnostic routines, and then displays all current Model 3095FT alarms as illustrated in Figure 4-23.

For information on interpreting these alarms, see Appendix E, Software Error Messages, and Chapter 5, Troubleshooting and Maintenance.

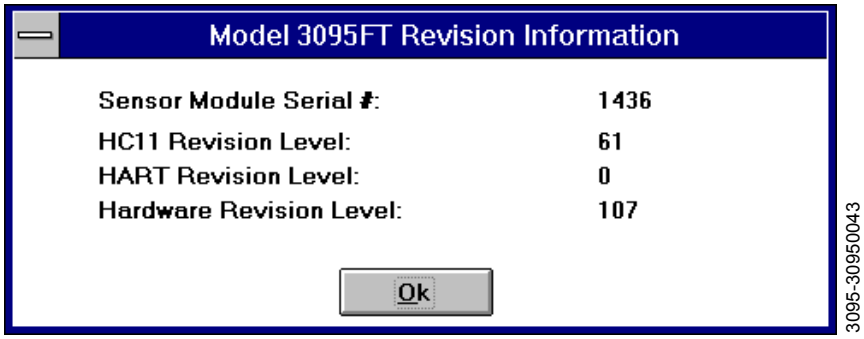
FIGURE 4-23. Self Test Screen.



Maintenance
Transmitter
Revision

The Revision screen displays the current revision information for the attached Model 3095FT.

FIGURE 4-24. Model 3095FT Revision Screen.



Maintenance
Transmitter
EEPROM Info

Selecting EEPROM Info does not display any screens, but performs advanced troubleshooting data gathering that can only be interpreted by the factory.

When directed by a Rosemount Customer Central technical representative, perform the following tasks to gather this data.

1. Select Maintenance, Transmitter, then select EEPROM Info.
2. Select Logs, then select Collect Configuration.
3. Gather your typical log information. (For example, if you typically gather 30 days of log data, then retrieve 30 days of data.)
4. Select Sys Admin, then select Comm Statistics.
5. Select Sys Admin, then select Comm Options.
6. Using File Manager (or the DOS prompt), copy the following files from the 3095FT working directory to a floppy disk:
   \comm.sts
   \3095ui.ini
   filename.log\xmitter.dmp
   filename.log\xmitter.cfg
   filename.log\xmitter.day
   filename.log\xmitter.var
   filename.log\xmitter.evt
7. Send the floppy disk containing these files to Rosemount as directed by Rosemount Customer Central.

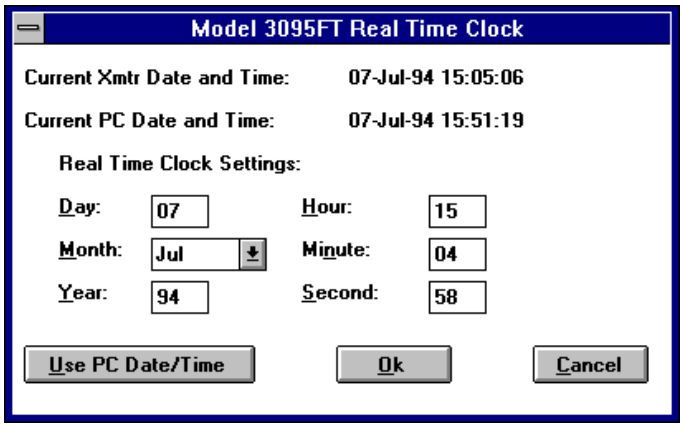
Maintenance
Clock

Since flow is a time-based measurement and gas billings are based on time, it is extremely important that the Model 3095FT transmitter contains the current time and date.

The simplest method to set the Model 3095FT time is to verify that the "Current PC Date and Time" is correct, then click "Use PC Date/Time" (see Figure 4-25).

Alternatively, type in the correct date and time in the six boxes, then click ok.

FIGURE 4-25. Clock Screen.



Maintenance
Maintenance Modes

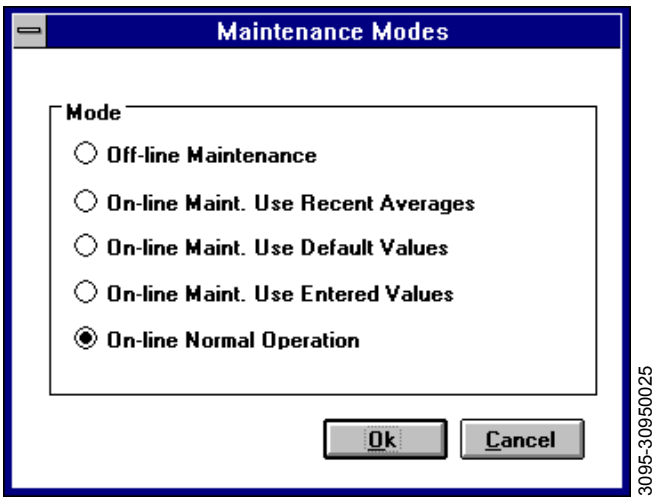
When the User Interface Maintenance Modes screen is selected, the current Model 3095FT operation mode is indicated by the filled bullet (see Figure 4-26).

To change to a different mode, select the desired mode, then select Ok. Changing between maintenance modes typically takes 20 seconds to complete.

The standard operation mode is "On-line Normal Operation." When the transmitter is in this mode, the audit trail data and the current configuration can be read from the transmitter, but sending a configuration to the transmitter and all sensor trim maintenance tasks are prevented.

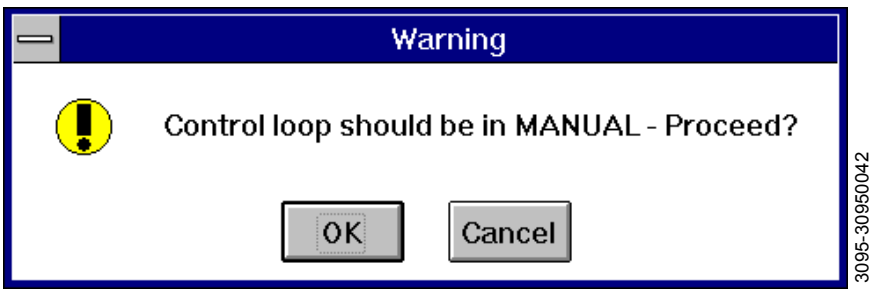
NOTE
All maintenance and configuration tasks, except On-Line Maintenance Modes, are prevented when the WP (write protect) switch is set to ON. See Page 2-4 to change this switch to OFF.

When the transmitter is in any of the four maintenance modes, sending a configuration file and performing sensor trim maintenance tasks are allowed. On-line maintenance is typically used when gas is flowing in the line, while off-line maintenance is typically used when the gas flow has stopped.



When the transmitter is placed into "Off-line Maintenance," an event log is generated, and all Model 3095FT flow calculations and logging activities stop.

In addition, before the Model 3095FT User Interface Software places the transmitter into off-line maintenance, a message is displayed.



If the transmitter is part of control loop, this message is a reminder to place the control loop into manual control before proceeding. As soon as OK is selected, the Model 3095FT is placed into off-line maintenance.

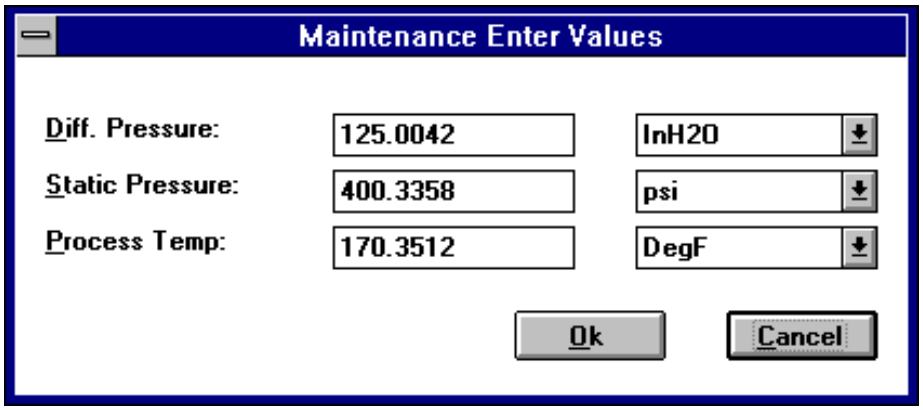
When switching from off-line maintenance to on-line normal operation, another message is displayed.

This is a reminder to return the control loop to automatic control if the transmitter is part of a control loop.

In contrast to off-line maintenance, the three On-line maintenance modes continue logging and flow calculations during the maintenance period:

- "Use Recent Averages" uses the most recent process variable readings and flow averages to calculate and log flow.
- "Use Default Values" uses the process variable values entered in the PV Default Values screen (See Figure 4-19 on Page 4-30).
- "Use Entered Values" displays a screen (see Figure 4-29) for the operator to enter process variable values and units that will be used during the maintenance period.

FIGURE 4-29. Maintenance Enter Values Screen.



NOTE
Be sure to return the Model 3095FT to "On-line Normal Operation" when finished with the maintenance tasks.

Sys Admin Screens

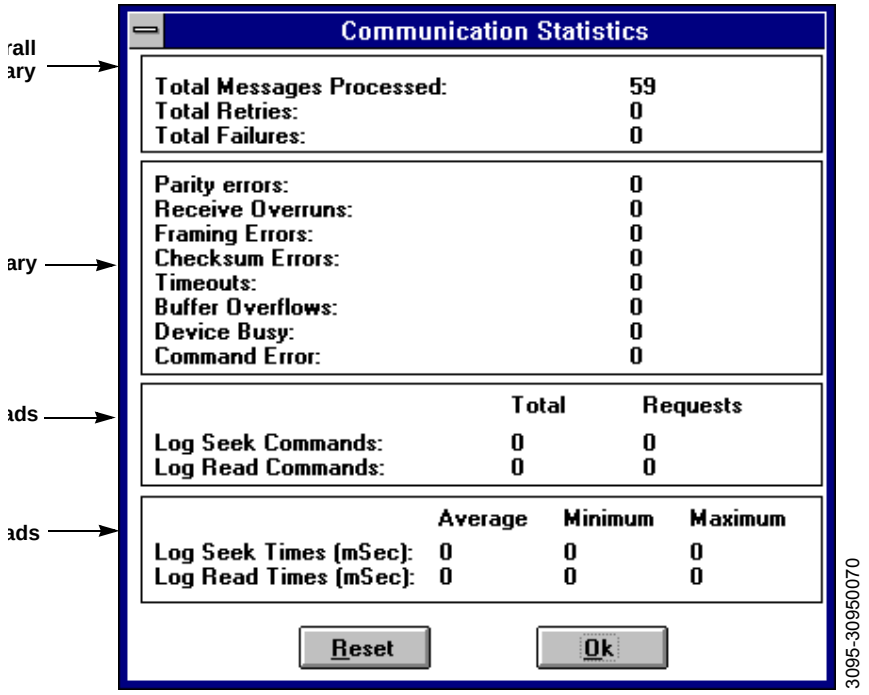
Except for Options, Comm Statistics, and Login, these screens are only available when the System Administrator password has been entered. If the User Interface title bar access does not display SL3 (indicating System Administrator Access), use the Login screen to enter the system administrator password.

NOTE
When shipped from the factory, all passwords are blank. Simply press ***return*** when the login screen appears, and SL3 access is granted.

Sys Admin Comm Statistics

Communication Statistics is a troubleshooting assistant screen that shows a snapshot of the communications activity between the User Interface Software and the attached Model 3095FT transmitter when reading or sending data. To zero all fields in this screen, select Reset.

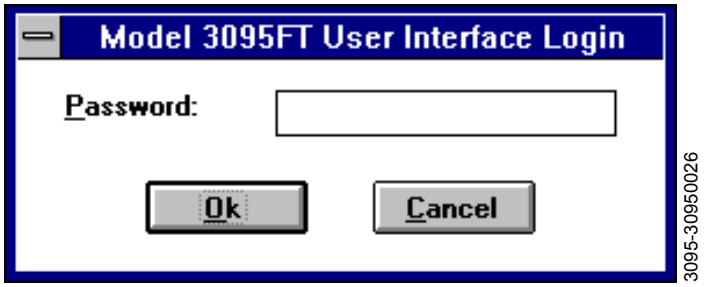
FIGURE 4-30. Communication Statistics Screen.



Sys Admin Login

This screen is identical to the login screen displayed when the Model 3095FT User Interface is started. Enter a password, then select Ok.

FIGURE 4-31. User Login Screen.



Sys Admin
Change Passwords

Figure 4-32 illustrates the Change Passwords screen as shipped from the factory. Before filling in this screen, consider the following issues concerning User Interface passwords:

- If a password is left blank, a ***return*** at the login screen accesses that password level.
- If passwords are identical, the higher level access is granted.
- Spaces and underscores are not allowed in passwords.
- Passwords are up to 8 alphanumeric characters in length.
- Passwords are not upper or lower case sensitive.

Once a password is entered, the title bar indicates current password access. Each password level allows access to specific functions.

SL0 (invalid password)

Read Only: Outputs, Archive logs, Previous logs.

SL1 (operator access)

Adds all Log functions, Recv Xmtr, Read Config File, and View Xmtr Maintenance. No transmitter write capabilities.

SL2 (maintenance access)

Adds write capabilities, Send xmtr, Save Config, and Maintenance Tasks.

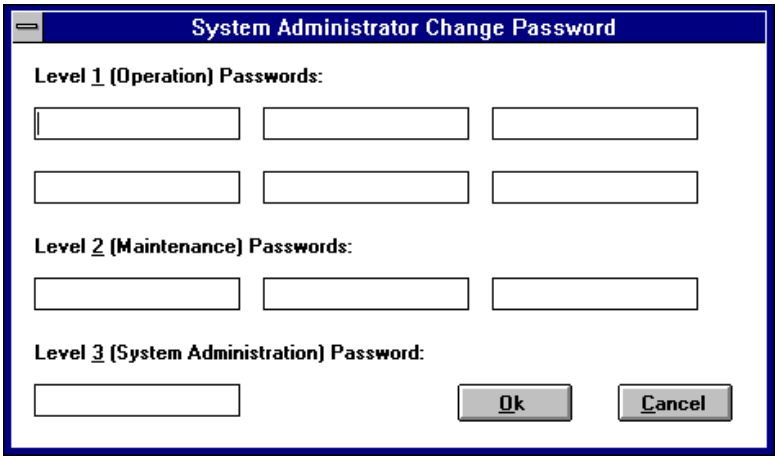
SL3 (system administrator)

Provides full access for the system administrator.

NOTE
Be sure to record passwords in a safe location.
If the Level 3 password is lost or forgotten, consult the factory.

To change the passwords, type in the desired passwords, then select Ok.

FIGURE 4-32. Change Passwords Screen.



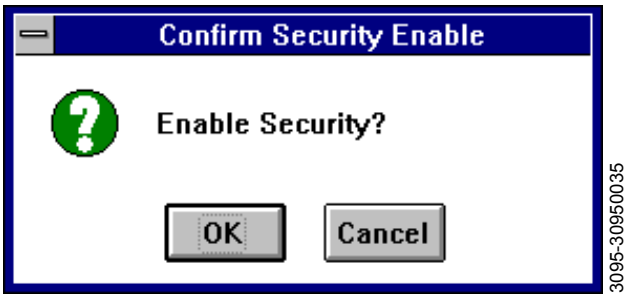
Sys Admin
Disable Security

The Disable Security screen removes password protection from the User Interface. If security is disabled and the User Interface is started, access is automatically set at SL(Disabled). SL(Disabled) access is identical to SL3 access.

FIGURE 4-33. Disable Security Screen.

Use the following procedure to re-enable security.

1. Select Sys Admin, Login, and enter in the SL3 password.
2. Select Sys Admin, Disable Security to display the "Enable Security" confirmation screen.



3. Select "OK."
   The User Interface automatically sets the security level to SL0.
4. Select Sys Admin, Login, and enter in the desired password.

Sys Admin
Clear Logs

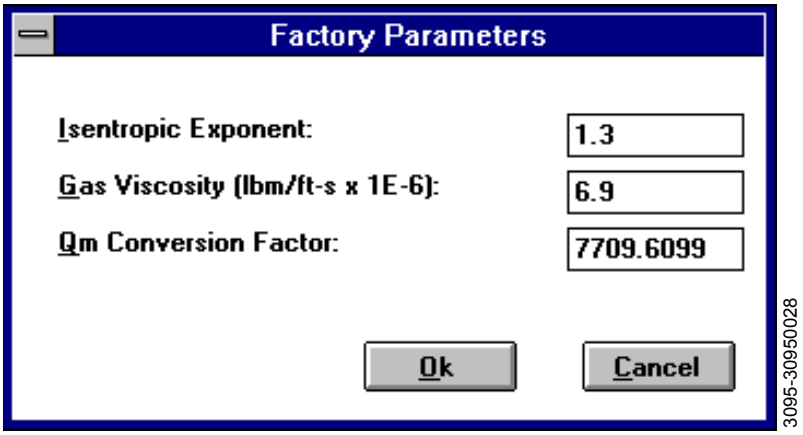
Selecting this option displays a confirmation screen. Selecting OK from this confirmation screen immediately clears all stored log data in the connected Model 3095FT Flow Transmitter.

NOTE
This command requires that the transmitter be in off-line maintenance mode.

Sys Admin
Factory Parameters

The factory parameters screen displays three settings used for Model 3095FT flow calculations. Under most circumstances, these values should be left at the factory default settings.

FIGURE 4-34. Factory Parameters Screen.



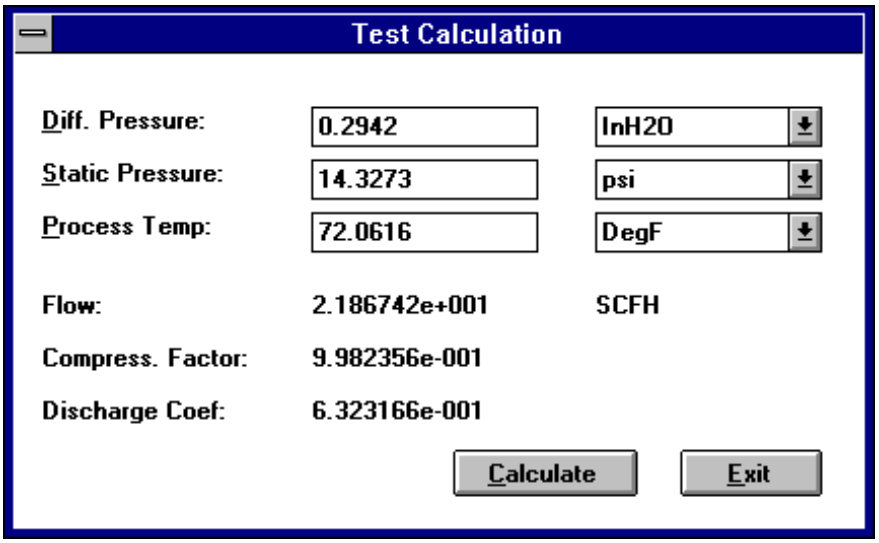
Sys Admin
Test Calc

The test calculations screen provides a method to view the Model 3095FT flow, compressibility factor, and discharge coefficient calculations for the current process variables. Optionally, the system administrator can enter process variable values, and then view the resulting calculations.

NOTE
Since Test Calc changes flow calculations and subsequent logged data, the following procedure should only be performed during bench configuration.

1. Select Sys Admin, Test Calc to display the Test Calculation screen. The initial values indicate current process variable readings.
2. (Optional) Enter values and units for DP, SP, and PT process variables.
3. Click the Calculate button.
   The test calculation screen updates continuously with flow, compressibility factor, and discharge coefficient calculations. Wait at least 30 seconds to allow for completion of the compressibility factor and discharge coefficient calculations.
4. Select Exit.
   The User Interface automatically switches the connected Model 3095FT to On-line normal operation.

FIGURE 4-35. Test Calculation Screen.



Sys Admin Options

The Options screen provides two functions. The Communication Options section displays communication options between the User Interface Software and the attached Model 3095FT transmitter when reading or sending data. The Log Options section defines which logs will be collected when “collect default logs” is selected.

Communication Options

Initial Device Address

Indicates the device address for the attached Model 3095FT transmitter.

Number of Retries

Indicates the number of times the User Interface Software attempts to complete a communication task before declaring a communications failure. Under most circumstances, this value should never be less than three. (Valid Range: 0–99. Default Value: 3.)

Log Buffer Size

This value should not be changed unless directed by Rosemount Customer Central.

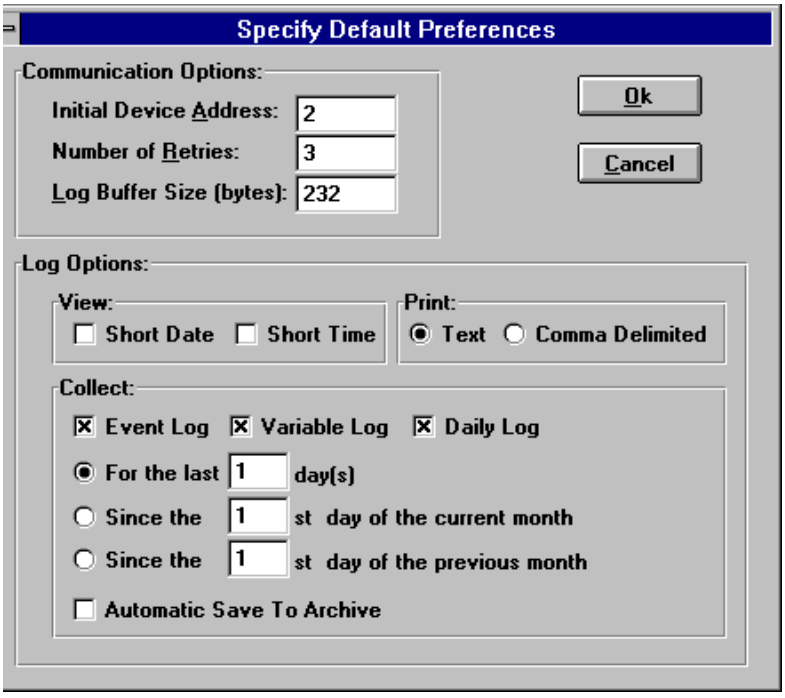
Log Options

View: View Short Date is an option that changes the collected log data between long date (95-07-28) and short date (07-28). View Short Time is an option that changes the collected log data between long time (06:43:48) and short time (06:43). An ☒ indicates that the short option is selected.

Print: Print Text indicates the log will be stored as ASCII data, while print comma delimited is used when the log will be imported into a spreadsheet. An ◉ indicates which option is selected.

Collect: The collect options define which logs will be automatically collected when “collect default logs” is selected, either via the toolbar or via the menu selection (Logs, View Transmitter Data, Default).

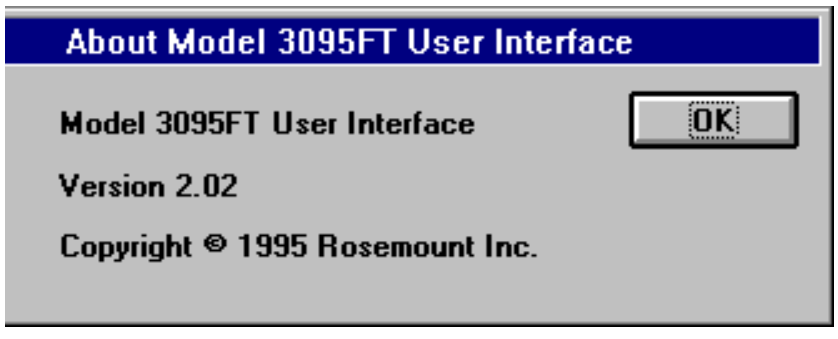
FIGURE 4-36. Options Screen.



Sys Admin
About 3095UI

This selection identifies the revision level of the User Interface Software.

FIGURE 4-37. HART Communication Options Screen.



Log Screens

The log screens provide access to retrieving, viewing, and archiving the Model 3095FT logged data.

NOTE
If the transmitter loses power, totalized values for the daily and variable log are reset to zero.

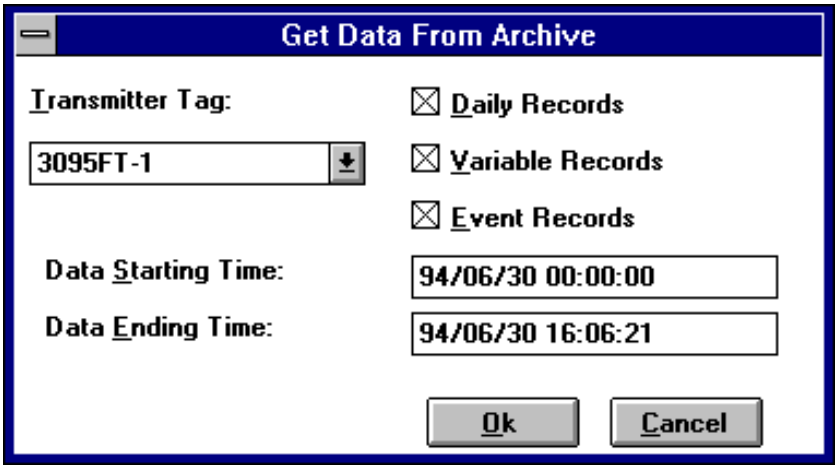
If a power loss occurs, use the values stored in the other variable logs to determine that day's total flow.

Logs
View Archive Data

The View Archive Data selection retrieves a subset of logged data from an audit trail file, then displays that data.

1. Access the Transmitter Tag pull-down menu, then select the desired audit trail file. Audit trail files are identified by the Software Tag entered in the Flow Parameters screen (see Figure 4-5 on Page 4-14).
2. Select the records to generate: Daily, Variable, or Event. ("X" indicates selected.)
3. Set the starting and ending dates and times using the YYMMDD HHMMSS format.
4. Click Ok.
   The User Interface displays the selected logged data.

FIGURE 4-38. View Archive Data Screen.



Logs
View Transmitter Data
Default

During this procedure, the Model 3095FT User Interface retrieves data from the connected Model 3095FT according to the default settings set in the Sys Admin, Options screen.

Logs
View Transmitter Data
New

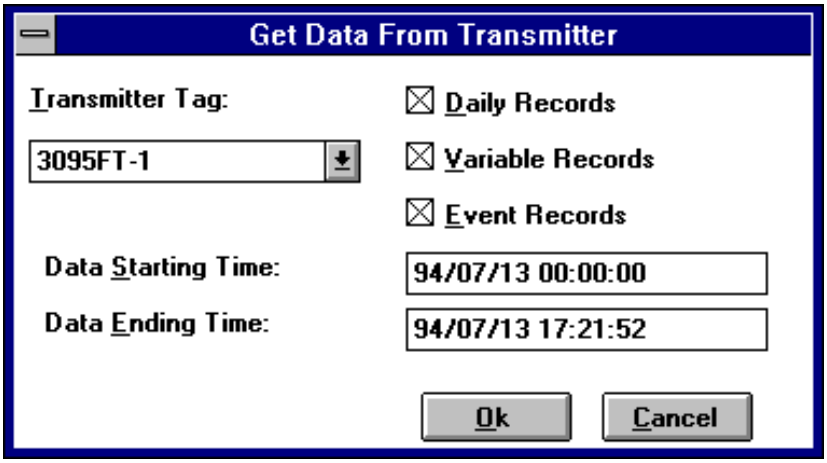
During this procedure, the Model 3095FT User Interface prompts for confirmation, checks the archive, and then retrieves data from the connected Model 3095FT that it does not yet have.

Logs
View Transmitter Data
All

During this procedure, the Model 3095FT User Interface retrieves all log data from the connected Model 3095FT.

Logs
View Transmitter Data
Limited

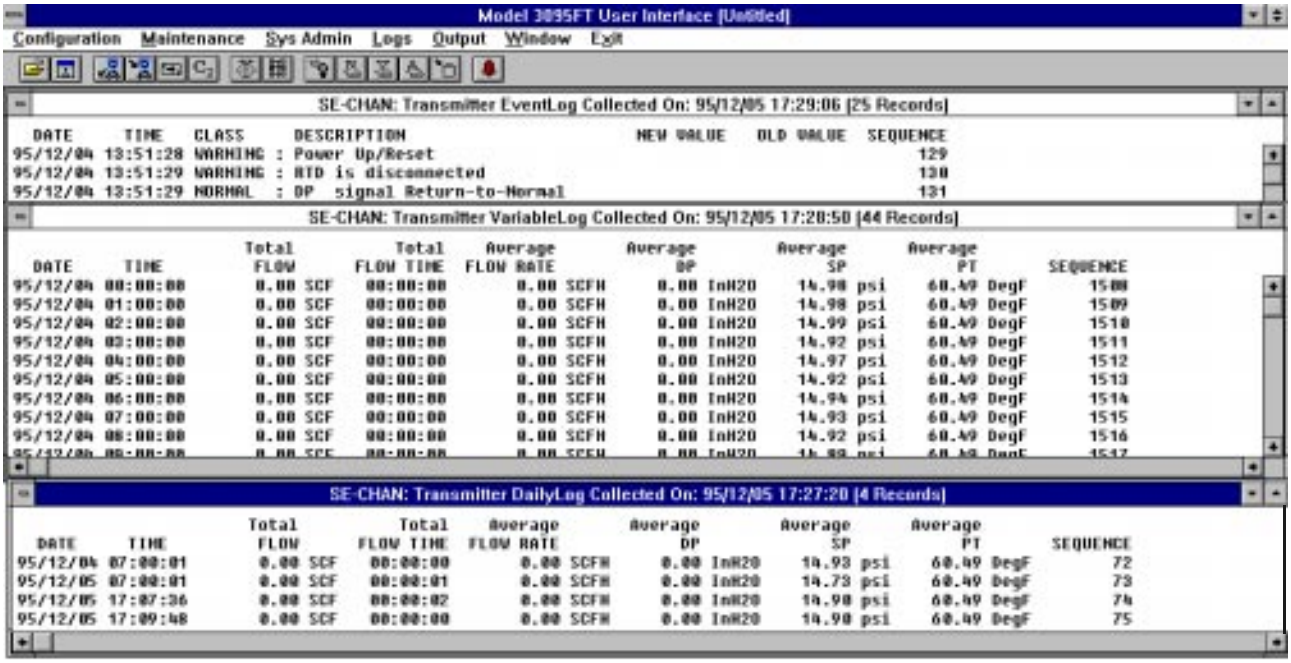
During this procedure, the Model 3095FT User Interface retrieves the log data for a specific time range from the connected Model 3095FT transmitter.



Logs
View Transmitter Data
Previous

During this procedure, the Model 3095FT User Interface retrieves the previously extracted log data.

FIGURE 4-39. Example Audit Trail Data.



NOTE
All four View Transmitter Data selections display Model 3095FT logged data as illustrated above. Be sure to save retrieved data to archive and/or print to a file before exiting this portion of the software.

To access the data using a mouse, click on a window, then use the scroll bars to view the data.

To access the data using the keyboard, press Ctl-Tab to switch between windows, then use the arrow keys, Home Key, End Key, PgUp, PgDn, Ctl ←, and Ctl→ keys to view the data within a window.

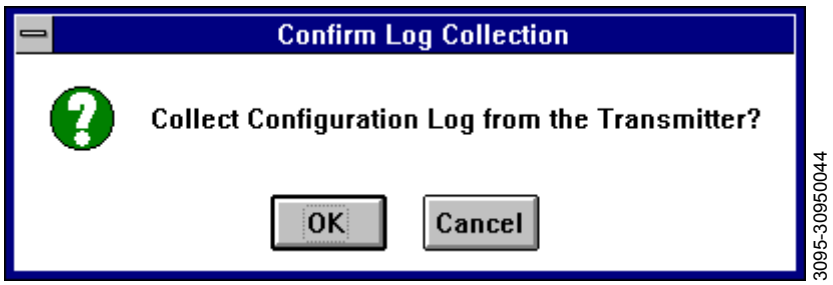
Logs
Collect Batch

During this procedure, the Model 3095FT User Interface retrieves data from all transmitters on the multidrop loop according to the default settings set in the Sys Admin, Options screen. If there is only one transmitter in the loop, this procedure is identical to selecting Logs, View Transmitter Data, Default.

Logs
Collect Configuration

A configuration is required for importing data into Flow-Cal. During this procedure, the Model 3095FT User Interface prompts for confirmation, then retrieves a configuration log from the connected Model 3095FT. This log is not available for viewing or editing.

For additional Flow-Cal information, see Appendix F.



Logs
Save to Archive

Anytime new logged data is retrieved from a transmitter, the data should be saved to archive, and/or printed to a file. This selection saves the retrieved data to the archive, saving the data to the same filename as the software tag. This procedures saves all three types of logged data. The Model 3095FT User Interface checks the file before saving, and only saves logged data that has not yet been saved.

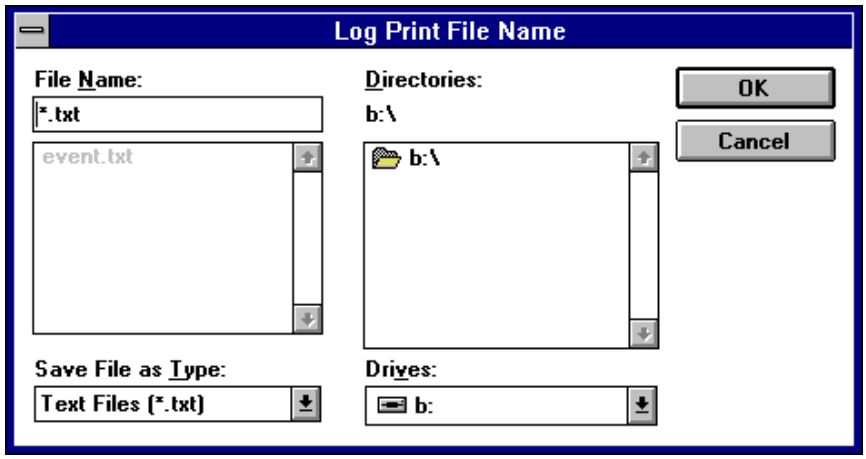
Logs
Print to File

After a new report is generated (see above), use the print to file option to save the data (see Figure 4-40). Use the "Save File as Type" window to store this data as an ASCII file (*.txt) or as a comma separated values file (*.csv). After printing this information to a file, the data can be sent to a printer or retrieved into a spreadsheet program (not provided).

Note that only the active window is printed to a file. To save all three types of files, select each window (click the window with the mouse or press Ctl-Tab to switch active windows), and save each set of data under different file names.

NOTE
If a filename is selected that already exists, the Model 3095FT User Interface appends the logs to the end of the file. The software does not check to verify whether the data has already been saved to file, or whether different types of logs are being printed to the same file.

FIGURE 4-40. Print to File Screen.



Logs
Close all Windows

This selection closes all log windows.

Interpreting Variable and Daily Logs

Table 4-2 identifies the possible components for variable and daily logs. The components for these logs are determined by the Logged Variables screen (see Page 4-23).

TABLE 4-2. Interpreting Variable and Daily Logs.

Log Heading	Explanation
Date and time	Date and time of the log.
Totalized Flow	Displays total flow (mass flow) for this log period.
Total Flow Time	Indicates the total time during this log period when there was flow.
Totalized Energy	Displays the total energy for this log period.
Average Flow Rate	Displays the average flow rate for this log period.
Average Energy Rate	Displays the average energy rate for this log period (Average Flow Rate × Heating Value).
Heating Value	Displays the gas heating value.
Average DP	Displays the average DP reading during the log period.
Maximum DP	Displays the maximum DP reading during the log period.
Minimum DP	Displays the minimum DP reading during the log period.
Average SP	Displays the average SP reading during the log period.
Maximum SP	Displays the maximum SP reading during the log period.
Minimum SP	Displays the minimum SP reading during the log period.
Average PT	Displays the average PT reading during the log period.
Maximum PT	Displays the maximum PT reading during the log period.
Minimum PT	Displays the minimum PT reading during the log period.
Specific Gravity (Relative Density)	Displays the specific gravity (relative density) for the gas.
Average Z	Displays the average compressibility factor for this log period.
Average Integral (AP × DP)	Displays the average integral value for this log period.
Average C'	Displays the average integral multiplier value for this log period.

Importing files into a spreadsheet

The basic procedure for importing a Model 3095FT log into a spreadsheet is provided below. Modify this procedure to fit a specific spreadsheet.

This procedure imports files created by the "Print to File" procedure that selected .CSV as the file type (see page 4-47).

1. Open the spreadsheet.
2. Select Open File.
3. Identify file type as ".CSV" for column separated values.
4. Identify column delimiter as "comma."
5. Select Ok.

Importing a file into *edit.com*

EDIT.COM is a utility included with DOS 5.0 or higher. This utility provides an easy method to view data retrieved from the Model 3095FT.

This procedure imports files created by the "Print to File" procedure that selected .TXT as the file type (see page 4-47).

1. Access the DOS prompt (for example, c:\).
2. Type: EDIT *filename.txt* ***return***
   where *filename.txt* is the name of the desired logged file.

Output Screens

The output selections display the current Model 3095FT alarms and process variable values

NOTE
Output selections are available for security levels SL1, SL2, and SL3.

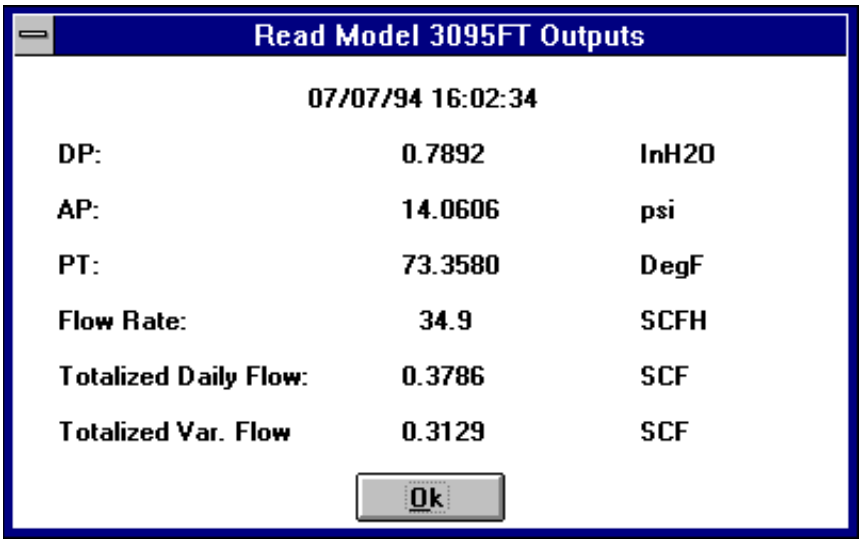
Output
Read Current Alarms

Selecting Read Current Alarms displays the current Model 3095FT alarms.

Output
Read Current Outputs

Selecting Read Current Outputs displays the current process variable values as illustrated in Figure 4-41. This screen continuously updates with current data. If the RTD Connector is disabled, this screen indicates the PT default value (see page 4-30) for the PT value. To exit this screen, select Ok.

FIGURE 4-41. Read Current Outputs.



Windows Selections

These selections are standard Microsoft Windows options that can rearrange the log windows.

Exit Selection

This selection exits the Model 3095FT User Interface Software.

Section 5

Troubleshooting and Maintenance

This section describes troubleshooting and maintenance tasks associated with the Model 3095FT. These include Model 3095FT Flow Transmitter maintenance procedures, field replaceable part procedures, and Remote Power Supply maintenance procedures.

⚠WARNING

Use only the procedures and new parts specifically referenced in this manual. Unauthorized procedures or parts can affect product performance and the output signal used to control a process, and may render the instrument dangerous. Direct any questions concerning these procedures or parts to Rosemount Inc.

MAINTENANCE MODES

As described on Page 4-35, the Model 3095FT User Interface Software allows placing the Model 3095FT into two different maintenance modes: off-line and on-line. Be sure to return the Model 3095FT to "On-line Normal Operation" when finished with the maintenance tasks.

Off-line Maintenance

Placing the Model 3095FT into off-line maintenance mode stops all flow calculations and the logging process. The Model 3095FT considers this a totalizing event, and generates variable, daily, and event logs.

When Off-line maintenance mode is exited, an event log is created, the Model 3095FT restarts logging, and all subsequent calculations are performed using the new values entered during off-line maintenance.

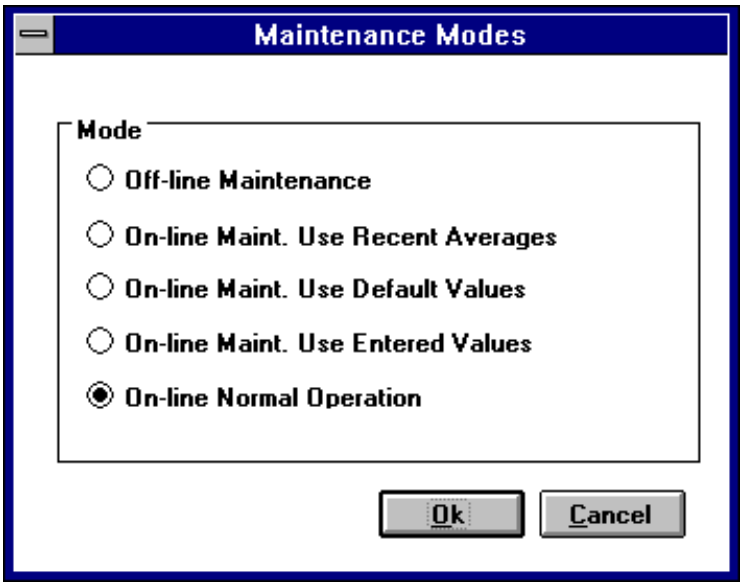
On-line Maintenance

When the Model 3095FT is placed into on-line maintenance mode, both logging and flow calculations continue. During on-line maintenance, the technician has 3 choices as illustrated in Figure 5-1:

- "Use Recent Averages" uses the most recent process variable readings and flow averages to calculate and log flow.
- "Use Default Values" uses the process variable values entered in the PV Default Values screen (See Page 4-30).
- "Use Entered Values" displays a screen for the operator to enter process variables which will be used during the maintenance period.

When on-line maintenance mode is exited, the Model 3095FT generates an event log, and all subsequent calculations are performed using the new values entered during on-line maintenance.

FIGURE 5-1. Maintenance Mode Screen.



MODEL 3095FT TROUBLESHOOTING

If a malfunction is suspected, follow the procedures described here to verify that transmitter hardware and process connections are in good working order. Under each major symptom, specific suggestions are offered for solving the problem. Always deal with the most likely and easiest-to-check conditions first.

Transmitter Does Not Communicate With the Model 3095FT User Interface Software

Potential Source and Corrective Action

Loop Wiring

- If the Remote Power Supply is not installed, check for a minimum of 250 ohms resistance between the power supply and the computer connection.
- Check for adequate voltage to the transmitter. (If the computer is connected and 250 ohms resistance is properly in the loop, then the transmitter will require a minimum of 11 volts at the terminals to operate.)
- Check for intermittent shorts, open circuits, and multiple grounds.
- Check for capacitance across the load resistor. Capacitance should be less than 0.1 microfarad.

Poor Communication Between the Model 3095FT User Interface Software and the Transmitter

Potential Source and Corrective Action

Communications

Use the communication troubleshooting screens (Comm Statistics and Comm Options) in the Model 3095FT User Interface to check the communications wiring. For difficulties with data logging, see Pages 4-48 and 4-49. For difficulties with configuration reading and sending, see Pages 4-37 and 4-38.

Interpreting Model 3095FT Alarms and Events

All Model 3095FT alarms are entered in the event log. In addition, specific alarm conditions are displayed on the optional LCD Meter, and specific alarm conditions can be viewed via the Model 3095FT User Interface software (see the Maintenance, Transmitter, Self Test selection on Page 4-34). Table 5-2 summarizes these alarm messages.

Column 2 of Table 5-2 identifies an event code for major alarms and events. Table 5-1 explains these event codes. Also note that the last column of Table 5-2 identifies corrective actions, and when necessary cross-references to sections of this manual for additional information.

TABLE 5-1. Event Code Explanation.

Event Code	Alarm/Event	Explanation
0	Fatal Alarm	Non-recoverable error causing transmitter to stop calculations
1	Critical Alarm	Error which may result in unreliable data
2	Warning	Outside normal operational conditions
3	Return to Normal	Return to normal operational conditions
4 or 5	Configuration Parameter Changed	User change to configuration parameter via HART command

TABLE 5-2. Model 3095FT Event and Alarm Summary

Alarm Description, UI Display - Self Test, and Event Log Description	Event Code (Table 5-1)	Alarm Code (Index)	LCD Display	Action
Power Up / Master Reset	2	0	F_NO_ SIGNAL	The Model 3095FT has been reset by one of the following actions: Power Up, Master Reset Command (Starting or exiting any maintenance task), or Start Data Logging
Sensor module is not updating	0	1	F_NO_ SIGNAL	The sensor module has undergone a component or software failure. Replace the sensor module as described on Page 5-10. Contact your Field Service Center.
DP signal exceeded Upper Range Limit + 10% (URL + 10%)	1	2	C_DP_ O_RANG	This display means that the transmitter differential pressure reading exceeds its sensor limits by more than 10%. There are two possible causes. Either the transmitter is overpressured, or it has a sensor malfunction. Check the pressure input to the transmitter. If an overpressure condition exists, correct it. If not, replace the sensor module as described on Page 5-10.
DP signal return-to-normal	3	3	none	No action required.
AP signal exceeded Upper Range Limit + 10% (URL + 10%)	1	4	C_AP_ O-RANG	This display means that the transmitter absolute pressure reading exceeds its sensor limits by more than 10%. There are two possible causes. Either the transmitter is overpressured, or it has a sensor malfunction. Check the pressure input to the transmitter. If an overpressure condition exists, correct it. If not, replace the sensor module as described on Page 5-10.
AP signal is unreasonable - open bridge	1	5	C_AP_ OPEN_B	This display means that the transmitter absolute pressure reading exceeds its sensor limits. There are two possible causes. Either the transmitter is overpressured, or it has a sensor malfunction. Check the pressure input to the transmitter. If an overpressure condition exists, correct it. If not, replace the sensor module as described on Page 5-10.
AP signal below 0.5 psia	1	6	C_AP_ VERY_L	This display means that the transmitter absolute pressure reading exceeds its sensor limits. There are two possible causes. Either the transmitter is underpressured, or it has a sensor malfunction. Check the pressure input to the transmitter. If an underpressure condition exists, correct it. If not, replace the sensor module as described on Page 5-10.
AP sensor shorted	0	7	F_AP_ SHORTD	The sensor module has undergone a component or software failure. Replace the sensor module as described on Page 5-10. Contact your Field Service Center.

Alarm Description, UI Display - Self Test, and Event Log Description	Event Code (Table 5-1)	Alarm Code (Index)	LCD Display	Action
AP signal return-to-normal	3	8	none	No action required.
RTD is disconnected	2	9	C_RTD DISABL	Check the transmitter RTD connector and RTD screw terminals to ensure the RTD cable is properly connected.
RTD signal is less than low limit (<-40F)	2	10	C_RTD LOWLIM	Check the transmitter RTD connector and RTD screw terminals to ensure the RTD cable is properly connected. Verify that the process temperature is between -40F and 185F.
RTD signal is greater than high limit (>185F)	2	11	C_RTD HI_LIM	Check the transmitter RTD connector and RTD screw terminals to ensure the RTD cable is properly connected. Verify that the process temperature is between -40F and 185F.
RTD signal return-to-normal	3	12	none	No action required.
PRT signal is less than low limit (<-50F)	1	13	C_PRT LOWLIM	This message indicates that the ambient temperature limit of the transmitter is being exceeded. Verify that the transmitter ambient temperature is between -40F and 185F. If transmitter temperature exceeds these limits, correct the temperature. If transmitter temperature is within these limits, replace the sensor module as described on Page 5-10.
PRT signal is greater than high limit (>195F)	1	14	C_PRT HI_LIM	This message indicates that the and RTD screw terminals temperature limit of the transmitter is being exceeded. Verify that the transmitter ambient temperature is between -40F and 185F. If transmitter temperature exceeds these limits, correct the temperature. If transmitter temperature is within these limits, replace the sensor module as described on Page 5-10.
PRT signal return-to-normal	3	15	none	No action required.
Output board eeprom burn failure	1	16	C_OUT EEPROM	The transmitter electronics has undergone a component or software failure. Replace the output electronics board as described on Page 5-10.
Sensor board eeprom burn failure	1	17	C_SEN EEPROM	The transmitter electronics has undergone a component or software failure. Replace the sensor module as described on Page 5-10. Contact your Field Service Center.
Sensor microprocessor does not respond	0	18	F_SEN M_DEAD	The transmitter electronics has undergone a component or software failure. Replace the sensor module as described on Page 5-10. Contact your Field Service Center.
Sensor hardware incompatible with software	0	19	F_SEN HW_MSM	The transmitter electronics has undergone a component or software failure. Replace the sensor module as described on Page 5-10. Contact your Field Service Center.
Output board eeprom not initialized	1	20	C_OUT EE_INI	The output electronics has not been properly initialized. Replace the output electronics board as described on Page 5-10. Contact your Field Service Center.
Sensor module CRC error - static region	1	21	C_CRC S_SEE	The sensor module has undergone a component or software failure. Replace the sensor module as described on Page 5-10. Contact your Field Service Center.
Logging is disabled	1	22	C_LOG DISABL	The transmitter is in Off-Line Maintenance Mode, which has disabled logging. Use the Model 3095FT User Interface software to change to On-Line Normal Maintenance Mode.
Negative flow condition	1	23	C_NEG FLOW	This display indicates negative differential pressure. First check the line pressure. If line pressure is correct, check the calibration of the differential pressure sensor.
Flash eeprom soft (recoverable) error	2	24	C_FLA SOFT_E	If this is a common error, replace the output electronics board as described on Page 5-10.
Flash eeprom hard (non-recoverable) error	1	25	C_FLA HARD_E	The transmitter electronics has undergone a component or software failure. Replace the output electronics board as described on Page 5-10.
Sensor module CRC error - dynamic region	1	26	C_CRC D_SEE	The sensor module has undergone a component or software failure. Replace the sensor module as described on Page 5-10. Contact your Field Service Center.
On-line maintenance mode	2	27	A_ONL MAINTN	Verify transmitter was returned to On-Line Normal Operation.

Alarm Description, UI Display - Self Test, and Event Log Description	Event Code (Table 5-1)	Alarm Code (Index)	LCD Display	Action
Exit on-line maintenance mode	2	28	none	Also performs a master reset (alarm code 0). No action required.
Sensor board eeprom not initialized, default values used	1	29	C_SEN EE_INI	The sensor electronics has not been properly initialized at the factory. Replace the sensor module as described on Page 5-10. Contact your Field Service Center.
Event log upload to host.	2	30	none	The User Interface software retrieved the event log from the Model 3095FT. No action required.
Variable log upload to host.	2	31	none	The User Interface software retrieved the variable log from the Model 3095FT. No action required.
Daily log upload to host.	2	32	none	The User Interface software retrieved the daily log from the Model 3095FT. No action required.
Off-line maintenance mode	2	33	A_OFF LINE_M	Return transmitter to On-Line Normal Operation.
Exit off-line maintenance mode	2	34	none	Also performs a master reset (alarm code 0). No action required.
C_d calc. floating point range exceeded	2	36	none	Indicates failure in the flow calculation. Contact your Field Service Center.
C_d calc. failure to converge	2	37	none	Can occur at extremely low Reynolds numbers. Contact your System Engineer. Consider raising your low flow cut-off value.
C_d calc. result late	2	38	none	Indicates failure in the flow calculation. Contact your Field Service Center.
C_d calc.return to normal	2	39	none	No action required.
Z calc. floating point range exceeded	2	40	none	Indicates failure in the flow calculation. Contact your Field Service Center.
Z calc. failure to converge	2	41	none	Indicates failure in the flow calculation. Contact your Field Service Center.
Z calc. result late	2	42	none	Indicates failure in the flow calculation. Contact your Field Service Center.
C_d calc.return to normal	2	43	none	Indicates failure in the flow calculation. Contact your Field Service Center.
On-line maintenance mode with default PVs	2	44	none	Verify transmitter was returned to On-Line Normal Operation.
On-line maintenance mode with one second average PVs	2	45	none	Verify transmitter was returned to On-Line Normal Operation.
On-line maintenance mode with user entered PVs	2	46	none	Verify transmitter was returned to On-Line Normal Operation.
Flash eeprom error	0	47	F_CRC EEPROM	Flash eeprom checksum failed indicating corrupted output board memory. Replace the output electronics board as described on Page 5-10.

Unexpected Process Variable (PV) Readings

The Model 3095FT User Interface Software provides a means to continuously display the current process variables and flow calculations (see Page 4-42.) Unexpected process variable readings may also be detected when reading the audit trail logs.

⚠WARNING

The following performance limitations may inhibit efficient or safe operation. Critical applications should have appropriate diagnostic and backup systems in place.

Pressure transmitters contain an internal fill fluid. It is used to transmit the process pressure through the isolating diaphragms to the pressure sensing element. In rare cases, oil loss paths in oil-filled pressure transmitters can be created. Possible causes include: physical damage to the isolator diaphragms, process fluid freezing, isolator corrosion due to an incompatible process fluid, etc.

A transmitter with oil fill fluid loss may continue to perform normally for a period of time. Sustained oil loss will eventually cause one or more of the operating parameters to exceed published specifications while a small drift in operating point output continues. Symptoms of advanced oil loss and other unrelated problems include:

- Sustained drift rate in true zero and span or operating point output or both
- Sluggish response to increasing or decreasing pressure or both
- Limited output rate or very nonlinear output or both
- Change in output process noise
- Noticeable drift in operating point output
- Abrupt increase in drift rate of true zero or span or both
- Unstable output
- Output saturated high or low.

Symptom High PV Reading

Potential Source and Corrective Action

Orifice Plate

- Check for restrictions at the orifice plate.
- Check the installation and condition of the orifice plate.
- Note any changes in process gas properties that may affect output.

Impulse Piping

- Check to ensure that the pressure connection is correct.
- Check for leaks or blockage.
- Check to ensure that blocking valves are fully open.
- Check for entrapped liquid in the gas lines.
- Check for sediment in the transmitter process flange.

Power Supply

- Check the output voltage of the power supply at the transmitter. It should be 11 to 35 V dc with no load at the transmitter terminals.

⚠CAUTION

Do not use over 35 volts to check the loop, or damage to the transmitter electronics may result.

Transmitter Electronics

- Connect a personal computer and use the User Interface Software to check the sensor limits to ensure calibration adjustments are within the sensor range and that calibration is correct for the pressure being applied.
- Connect a personal computer and using the User Interface Software, select Maintenance, Transmitter, Self Test (see Page 4-34) to detect any electronic failures.
- Make sure the post connectors are clean.
- Confirm that the electronics housing is properly sealed against moisture.
- If the electronics are still suspect, substitute new electronics.

Sensing Element

- The sensing element is not field repairable and must be replaced if found to be defective. Check for obvious defects, such as a punctured isolating diaphragm or fill fluid loss, and contact your nearest Rosemount Service Center.

Symptom: Erratic PV Reading

Potential Source and Corrective Action

Orifice Plate

- Check the installation and condition of the orifice plate.

Loop Wiring

- Check for adequate voltage to the transmitter. It should be 11 to 35 V dc with no load at the transmitter terminals.
- Check for intermittent shorts, open circuits, and multiple grounds.

⚠CAUTION

Do not use over 35 volts to check the loop, or damage to the transmitter electronics may result.

Process Pulsation

- Adjust the electronic damping (see Page 4-30).

Transmitter Electronics

- Connect a personal computer and use the User Interface Software to check the sensor limits to ensure calibration adjustments are within the sensor range and that calibration is correct for the pressure being applied.
- Make sure the post connectors are clean.
- Confirm that the electronics housing is properly sealed against moisture.
- If the electronics are still suspect, substitute new electronics.

Impulse Piping

- Check for entrapped liquid in the gas line.

Sensing Element

- The sensing element is not field repairable and must be replaced if found to be defective. Check for obvious defects, such as a punctured isolating diaphragm or fill fluid loss, and contact your nearest Rosemount Service Center.

Symptom: Low PV Reading or No PV Reading

Potential Source and Corrective Action

Orifice Plate

- Check the installation and condition of the orifice plate.
- Note any changes in process fluid properties that may affect output.

Loop Wiring

- Check for adequate voltage to the transmitter. It should be 11 to 35 V dc.

⚠CAUTION

Do not use over 35 volts to check the loop, or damage to the transmitter electronics may result.

- Check the milliamp rating of the power supply against the total current being drawn for all transmitters being powered. The Model 3095FT requires 8.5 mA.
- Check for shorts and multiple grounds.
- Check for proper polarity at the signal terminal.
- Check loop impedance.
- Check the wire insulation to detect possible shorts to ground.

Impulse Piping

- Check to ensure that the pressure connection is correct.
- Check for leaks or blockage.
- Check for entrapped liquid in the gas lines.
- Check for sediment in the transmitter process flange.
- Check to ensure that blocking valves are fully open and that bypass valves are tightly closed.

Transmitter Electronics

- Connect a personal computer and use the User Interface Software to check the sensor limits to ensure calibration adjustments are within the sensor range and that calibration is correct for the pressure being applied.
- Connect a personal computer and using the User Interface Software, select Maintenance, Transmitter, Self Test (see Page 4-34) to detect any electronic failures.
- Make sure the post connectors are clean.
- Confirm that the electronics housing is properly sealed against moisture.
- If the electronics are still suspect, substitute new electronics.

Sensing Element

- The sensing element is not field repairable and must be replaced if found to be defective. Check for obvious defects, such as a punctured isolating diaphragm or fill fluid loss, and contact your nearest Rosemount Service Center.

Symptom: Sluggish Output Response/Drift

Potential Source and Corrective Action

Orifice Plate

- Check for restrictions at the orifice plate.

Impulse Piping

- Check for leaks or blockage.
- Ensure that blocking valves are fully open.
- Check for sediment in the transmitter process flange.

Transmitter Electronics

- Connect a personal computer and using the User Interface Software, select Maintenance, Transmitter, Self Test (see Page 4-34) to detect any electronic failures.
- Confirm that damping is correctly set (see Page 4-30).
- Confirm that electronics housing is properly sealed against moisture.

Sensing Element

- The sensing element is not field repairable and must be replaced if found to be defective. Check for defects, such as a ruptured isolating diaphragm or fill fluid loss, and contact your nearest Rosemount Service Center.
- Confirm that the electronics housing is properly sealed against moisture.

DISASSEMBLY PROCEDURE

1. Read the following information carefully before disassembling a transmitter. General information concerning the process sensor body and electrical housing follow. Figure 2-3 on Page 2-3 shows an exploded view of the transmitter.

⚠WARNING

Explosions can result in death or serious injury.
Do not remove the instrument cover in explosive environments.

Process Sensor Body

NOTE
Transmitters should not be left in service once they have been determined to be inoperable.

Be aware of the following:

⚠CAUTION

Process should be isolated from the transmitter and vented before the transmitter is removed from service for disassembly.

- The process flange can be detached by removing the four flange bolts and the two alignment screws that secure it.

⚠CAUTION

To prevent damage which may lead to inaccurate measurements, do not scratch, puncture, or depress the isolating diaphragms.

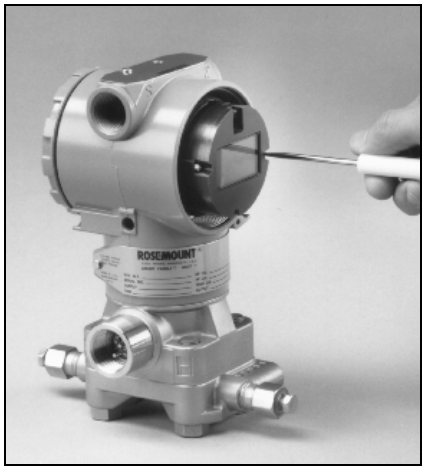
- Isolating diaphragms may be cleaned with a soft rag, mild cleaning solution, and clear water rinse.

⚠CAUTION

To prevent damage which may lead to inaccurate measurements, do not use any chlorine or acid solutions to clean the diaphragms.

- The flange adapters and process flange may be rotated or reversed for mounting convenience.
- Whenever removing the process flange or flange adapters, visually inspect the Teflon O-rings. Replace the O-rings if they show any signs of damage, such as nicks or cuts. If they are undamaged, they may be reused.
- If the teflon sensor module O-rings have been replaced, the flange bolts should be re-torqued after installation to compensate for cold flow.

Electrical Housing



Electrical connections are located in a compartment identified as FIELD TERMINALS on the electronics housing. The signal terminals are accessible by unscrewing the cover on this side.

The signal terminal block can be removed by loosening the two small screws located at the 9 o'clock and 4 o'clock positions, then pulling the terminal block straight out to disconnect the block from the post connectors.

The transmitter electronics are located behind the cover opposite the terminal side.

⚠CAUTION

To prevent damage to the circuit board, remove power from the transmitter before removing the electronics cover.

To remove the electronics board:

⚠WARNING

Explosions can result in death or serious injury.
Do not remove the instrument cover in explosive environments.

1. Remove the housing cover opposite the field terminal side.
2. Loosen the two captive screws that anchor the board.

⚠CAUTION

The circuit board is electrostatically sensitive. To prevent damage to the circuit board, be sure to observe handling precautions for static-sensitive components.

3. Slowly pull the electronics board out of the housing.

4. Disconnect the sensor module ribbon cable to release the electronics board from the transmitter.

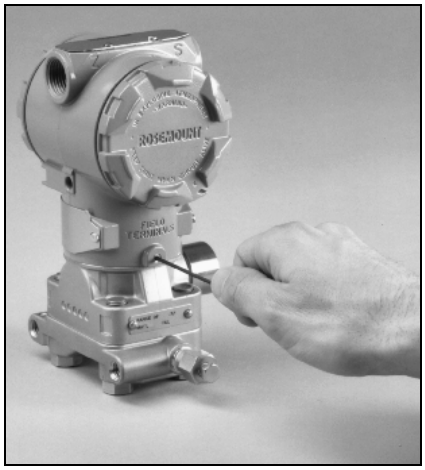
5. Carefully tuck the cable connector completely inside the internal shroud. The shroud protects the cable from damage that might occur when the housing is rotated.

⚠CAUTION

Do not remove the housing until the cable connector has been completely tucked inside the internal shroud. Damage to the sensor module ribbon cable may occur if the connector does not rotate with the sensor module.

Removing the Sensor from the Electrical Housing

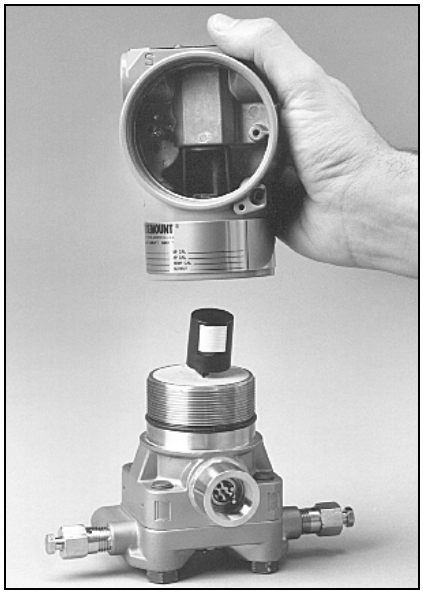
6. Loosen the housing rotation set screw with a 5/64-inch hex wrench and back off one full turn.



⚠CAUTION

Before removing the sensor module from the electrical housing, disconnect the electronics board power cable from the sensor module. This will prevent damage to the sensor module ribbon cable.

7. Unscrew the housing from the module, making sure the shroud and sensor cable do not catch on the housing. Damage can occur to the cable if the internal shroud and sensor cable rotate with the housing. Carefully pull the shroud and sensor ribbon cable assembly through the housing opening.



⚠CAUTION

If the Coplanar flange has been removed, take care not to damage the isolating diaphragm after disassembly. Damage to the isolating diaphragm may lead to inaccurate measurements.

The sensing module is a complete assembly and cannot be further disassembled.

Reassembly Procedure

Follow these procedures carefully to ensure proper reassembly:

1. Inspect all cover and housing (non-process-wetted) O-rings and replace if necessary. Lightly grease with silicone lubricant to ensure a good seal.
2. Carefully tuck the cable connector completely inside the internal shroud. To do this, turn the shroud and cable counterclockwise one rotation to tighten the cable.

3. Lower the electronics housing onto the module, and guide the internal shroud and cable through the housing and into the external shroud.
4. Fasten the housing to the module by turning clockwise.

⚠CAUTION

To prevent damage to the cable connector, watch the cable and shroud as you attach the housing to the module. Make sure the cable connector does not slip out of the internal shroud and begin to rotate with the housing. Reinsert the cable connector into the shroud if it escapes before the housing is fully fastened.

5. Inspect the threaded connections.

⚠WARNING

Explosions can result in death or serious injury.
The bottom of the electronic housing must be within $^{1}/_{16}$-in. of the sensor module to maintain explosion-proof requirements.

6. Tighten the housing rotation set screw.

Connecting the Electrical Housing to the Sensor

7. Remove the cable connector from its position inside the internal shroud, and attach the cable to the electronics board.
8. Align the post-receptacle connectors with the posts inside the electronics housing.
9. Insert the electronics board into the housing and tighten the captive mounting screws.

⚠WARNING

Explosions can cause death or serious injury. Both transmitter covers must be fully engaged to meet explosion-proof requirements.

10. Replace the electronics housing cover. Metal to metal contact is preferred.

Reassembling the Process Sensor Body

11. Visually inspect the Teflon sensor module O-rings. If the O-rings are undamaged, they may be re-used. If the O-rings show signs of damage, such as nicks or cuts, or if there is any doubt about their sealing ability, replace them with new O-rings. Use the following steps:
    a. Remove the damaged O-rings by carefully prying them from the O-ring grooves. Take care not to damage the surface of the isolating diaphragm during this process.
    b. Replace the damaged O-rings by fitting new O-rings into the O-ring grooves.
12. Install the process flange on the sensor module. To hold the process flange in place, install the two hex head alignment screws. These screws are not pressure retaining and need only be finger tight. Do not overtighten; this will affect the module/flange alignment.
13. Install the appropriate flange bolts using Figure 4-4 as a reference:
    - For installations requiring a $^1/_4$–18 NPT mounting, install the four 1.75-inch process flange bolts. First finger-tighten the bolts. Then tighten the bolts incrementally in a cross pattern until they are securely tightened to 650 in-lb (300 in-lb for stainless steel bolts). After tightening, the bolts should protrude through the top of the module housing.
    - For installations requiring a $^1/_2$–14 NPT mounting, hold the optional flange adapters and flange adapter O-rings in place while finger-tightening the four 2.88-inch process flange/adapter bolts. Tighten the bolts in a cross pattern following the procedure outlined above. (Use two 2.88- inch bolts and two 1.75-inch bolts for gage pressure configurations.) After tightening, the bolts should protrude through the top of the module housing. If the bolts do not extend all the way through the module housing, you have used a bolt of incorrect length. Replace the bolt with one of the correct length, and repeat the procedure.

- For installations with a three-valve manifold, align the process flange with the three-valve manifold. Install the four 2.25-inch manifold flange bolts following the procedure outlined above. After tightening, the bolts should protrude through the top of the module housing. If the bolts do not extend all the way through the module housing, you have used a bolt of incorrect length. Replace the bolt with one of the correct length, and repeat the procedure. Optional flange adapters can be installed on the process end of the three-valve manifold using the 1.75-inch flange bolts supplied with the transmitter.

14. If the Teflon sensor module O-rings have been replaced, the flange bolts should be re-torqued after installation to compensate for cold flow.
15. Follow these steps to install the drain/vent valve:
    - Apply sealing tape to the threads on the seat. Starting at the base of the valve with the threaded end pointing toward the installer, apply two clockwise turns of the sealing tape.
    - Take care to orient the opening on the valve so that process fluid will drain toward the ground and away from personnel when the valve is opened.
    - Tighten the drain/vent valve to 250 in-lb.

RETURN OF MATERIALS

To expedite the return process outside the United States, contact the nearest Rosemount representative.

Within the United States, call the Rosemount North America National Response Center using the 1-800-654-RSMT (7768) toll-free number. This center, available 24 hours a day, will assist you with any needed information or materials.

The center will ask for product model and serial numbers, and will provide a Return Material Authorization (RMA) number. The center will also ask for the name of the process material the product was last exposed to.

⚠CAUTION

People who handle products exposed to a hazardous substance can avoid injury if they are informed and understand the hazard. If the product being returned was exposed to a hazardous substance as defined by OSHA, a copy of the required Material Safety Data Sheet (MSDS) for each hazardous substance identified must be included with the returned goods.

The Rosemount National Response Center will detail the additional information and procedures necessary to return goods exposed to hazardous substances.

BATTERY REPLACEMENT

Replacing the Real-time Clock Battery

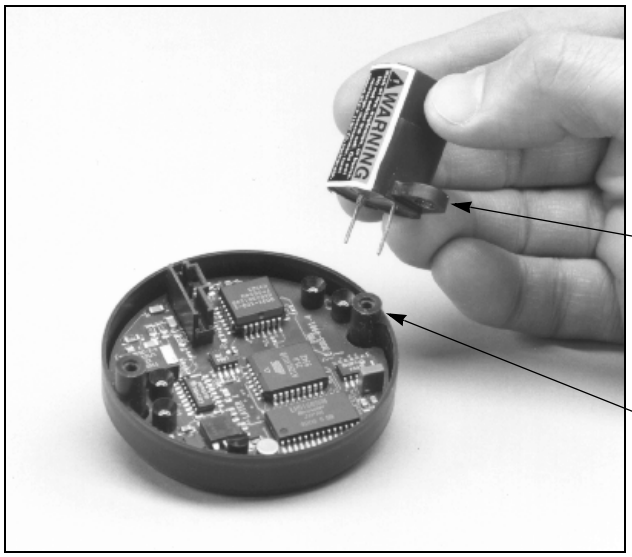
The purpose of the Model 3095FT real-time clock battery is to power the Model 3095FT real-time clock during power failures. When power is returned, the Model 3095FT real-time clock is still accurate, and there is no need to reset the clock. With normal use, the real-time clock battery should last at least seven years.

NOTE
If the real-time clock battery fails, only the logged time-stamp is affected. Flow calculations and totalizing are unaffected.

An audit trail date of 1-1-70 indicates that the real-time battery failed during the last power outage. Before replacing the battery, be sure that the real-time clock battery switch was not set to "OFF."

Use the following procedure to replace this battery.

1. Perform steps 1 through 3 of the disassembly procedure as explained on pages 5-10 and 5-11.
2. Remove the real-time clock battery.
3. Insert the new real-time clock battery into the post receptacles. Be sure to align the battery tab with the captive mounting screw location.



4. Align the post-receptacle connectors with the posts inside the electronics housing.
5. Insert the electronics board into the housing and tighten the captive mounting screws.
6. Replace the electronics housing cover. Each cover must be fully engaged to comply with explosion-proof requirements.
7. Dispose of the old lithium battery in an environmentally safe manner.
8. Reset the Model 3095FT clock as described on Page 4-35.

Replacing the Remote Power Supply Battery

The Remote Power Supply battery should be replaced every 3 years. Use the following procedure to replace this battery.

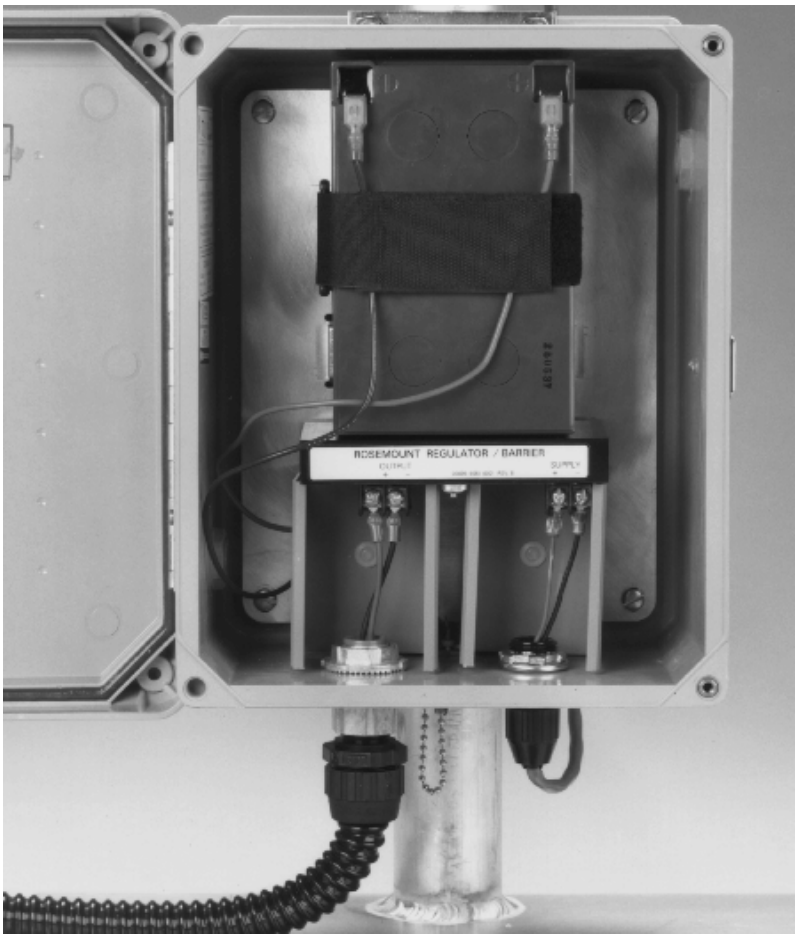
NOTE
This procedure removes power from the Model 3095FT. If desired, retrieve Model 3095FT logged data before performing this procedure.

⚠WARNING

Contact with caustic materials can cause blindness or serious burns. If the remote power supply battery is cracked or leaking, wash any residual acid gel (if present), and replace damaged parts.

1. Check the battery's voltage level with a multimeter, and recharge the battery if the voltage is less than 12.5 volts (see Page 3-12).
2. Open the Remote Power Supply cover.
3. Disconnect the battery wires from the + and - terminals.
4. Open up the hook and loop strap, then remove the battery from the Remote Power Supply.
5. Install the new battery with the terminals toward the top of the enclosure facing out (see Figure 5-2).
6. Connect the black wire to the - terminal.
7. Connect the red wire to the + terminal.
8. Use the hook and loop strap to secure the battery.
9. Record the installation date on the Remote Power Supply inside cover label.
10. Close the Remote Power Supply cover. If desired, secure the remote power supply enclosure by installing a lock (not supplied). If a lock is not used, secure the cover by tightening the two screws on the right side of the remote power supply cover.
11. Dispose of the battery in an environmentally responsible manner.

FIGURE 5-2. Replacing the Remote Power Supply Battery.



Section 6 Theory of Operation

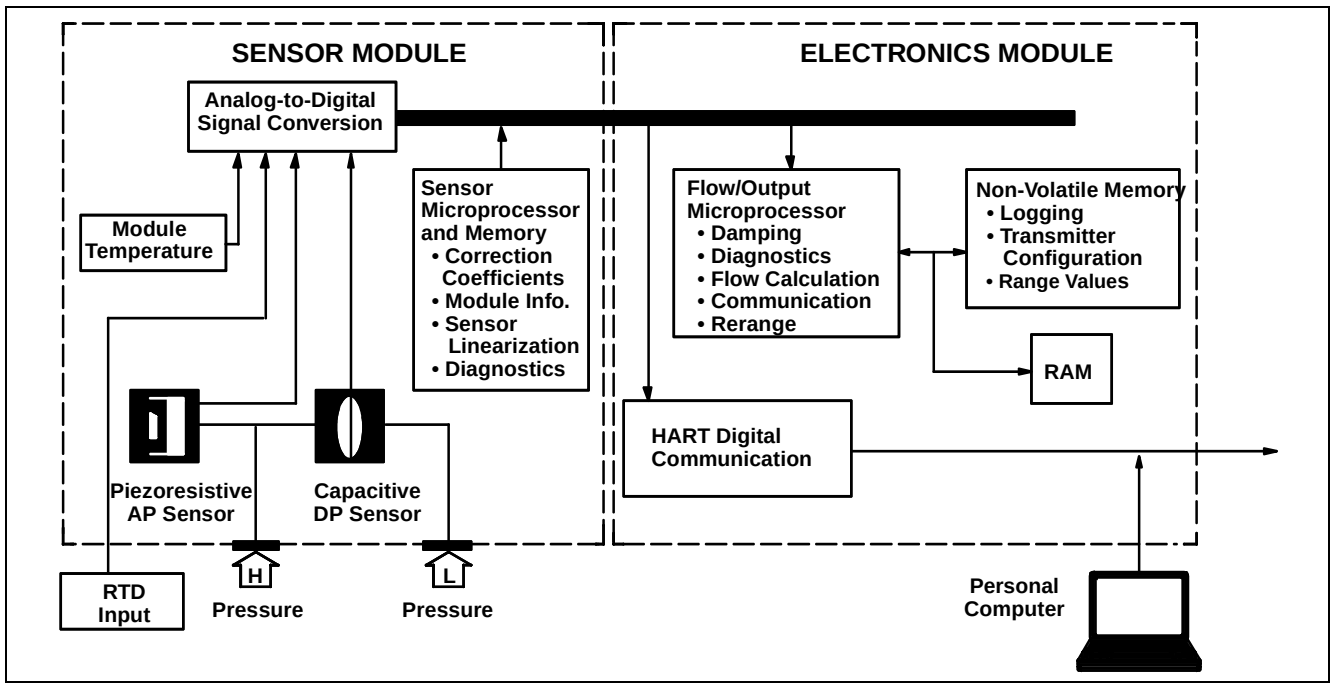
The Model 3095FT Flow Transmitter is a microprocessor-based instrument. As such, it operates differently from conventional analog transmitters. This section describes the basic theory of operation for the Model 3095FT.

The extensive use of application-specific integrated circuits (ASICs) and surface-mount electronic technology significantly reduces the size and weight of the transmitter. The Model 3095FT Flow Transmitter actually performs the same measurement and computing functions of other electronic flow measurement devices over 10 times its size and weight.

TRANSMITTER DESCRIPTION

Figure 6-1 shows a functional block diagram of the Model 3095FT Flow Transmitter. Its functionality is divided between the sensor module and the electronics module. The sensor module performs all tasks related to measuring and correcting the process variables, while the electronics module performs the flow calculation, data logging, and output functions.

FIGURE 6-1. Model 3095FT Flow Transmitter Block Diagram.



MULTIVARIABLE SENSOR MODULE

The advanced sensor module of the Model 3095FT (see Figure 6-2) measures three process variables simultaneously. The multivariable module incorporates a high-accuracy capacitance sensor for differential pressure, a high-accuracy piezoresistive silicon sensor for absolute pressure, and a four-wire RTD input for process temperature measurement. In addition, the sensor electronics convert the process variables directly into digital format for further correction and compensation within the sensor module.

Capacitive Differential Pressure Sensor

In the differential pressure sensor, process pressure is transmitted through the isolating diaphragm and fill fluid to the sensing diaphragm in the center of the capacitance cell. Capacitor plates on both sides of the sensing diaphragm detect its position. The differential capacitance between the sensing diaphragm and the capacitor plates is directly proportional to process pressure.

Piezoresistive Absolute Pressure Sensor

The absolute pressure silicon sensor is fabricated utilizing a processing method called chemical vapor deposition (CVD). This technique, which is superior to other technologies that are vulnerable to drift over time, isolates the sensing element from the silicon substrate to achieve high accuracy and repeatability.

The absolute sensor consists of a Wheatstone bridge circuit made from polysilicon resistors deposited on a silicon substrate. The absolute pressure sensor is hydraulically connected to the high pressure side of the transmitter. Process pressure is transmitted through the fill fluid to the sensing element, creating a very small deflection of the silicon substrate. The resulting strain on the substrate changes the bridge resistance in proportion to the pressure applied.

Both the absolute and differential sensors are laser welded and isolated mechanically, electrically, and thermally from the process medium and the external environment. Mechanical and thermal isolation is achieved by moving these sensors away from the process flange to a position in the neck of the electronics housing. This design relieves mechanical stress on the cell, thereby improving static pressure performance and removing the sensors from direct process heat.

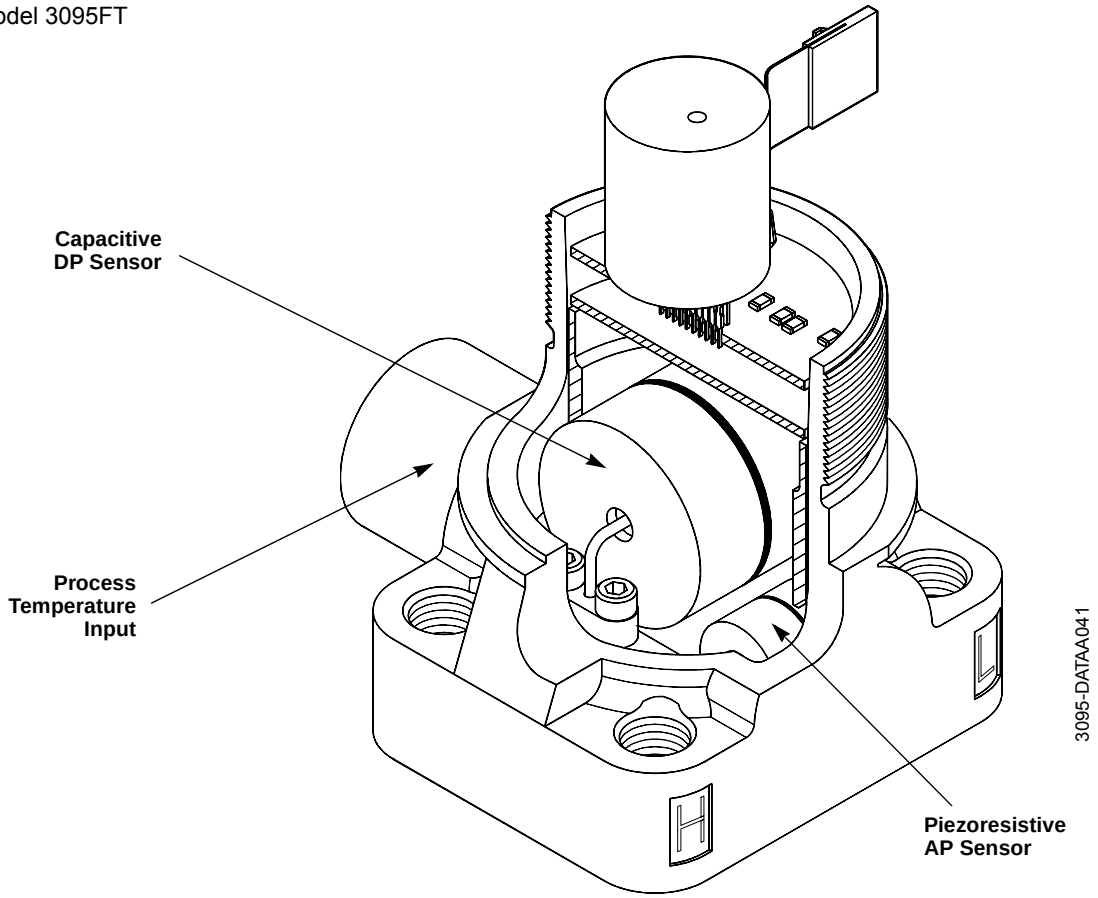
Glass-sealed pressure transport tubes and insulated cell mountings provide electrical isolation, thus improving the flexibility, performance, and transient protection of the electronic circuitry.

Process Temperature

Process temperature is measured using an input connection on the sensor module for a standard resistance temperature device (RTD). Rosemount Inc. offers a special shielded cable with connector for connecting the RTD input to the Model 3095FT (see Page 7-5).

The Model 3095FT can accept a signal from any 100-ohm platinum RTD that conforms to IEC-751 Class B. The Model 3095FT Flow Transmitter can be supplied with an optional Rosemount Series 68 or 78 RTD temperature sensor. For further information on Rosemount temperature sensors and accessory hardware, refer to Product Data Sheet PDS 2654.

FIGURE 6-2. Model 3095FT Sensor Module.



Sensor Microprocessor

The Model 3095FT uses a dedicated microprocessor, located inside the sensor module, to linearize and correct the raw sensor outputs. To ensure premium performance, this sensor microprocessor uses the absolute pressure measurement to compensate for zero line pressure effects and an internal temperature measurement to compensate for thermal effects.

During the characterization process at the factory, all modules are run through pressure and temperature cycles over the complete operating range of the transmitter. Correction coefficients generated from these cycles are stored in the sensor module memory (nonvolatile EEPROM memory). This data is retained in the transmitter when power is interrupted, so the transmitter is functional upon power-up. This compensation data is used to correct and linearize the process variables before they are sent to the electronics module.

ELECTRONICS MODULE

The major functions of the electronics module are to send process variables to the flow equation, log the appropriate audit trail data in memory, and provide a HART output for communications. These tasks are accomplished by a single electronics board incorporating ASIC and surface-mount technology. The main components of the board are the flow/output microprocessor and nonvolatile memory for logging flow, configuration, and event data.

The electronics module accepts the three corrected digital process variables from the sensor module. The output section of the electronics module converts the digital signal to HART protocol, and handles communication with the Model 3095FT User Interface Software. Also available is an LCD meter that plugs into the electronics board and displays process variables, flow calculations, and transmitter diagnostic messages

Flow/Output Microprocessor

The flow/output microprocessor controls operation of the transmitter. In addition, it performs flow calculations, sensor linearization, engineering unit conversion, transmitter self-diagnostics, reranging, damping, and digital communication.

Nonvolatile Memory

The nonvoltaile memory (EEPROM) holds all transmitter configuration data. This memory also holds range values if the Model 3095FT was reranged at the factory, and it also stores all variable, daily and event logs. The data in this memory remains intact even when no power is applied.

RAM (Random Access Memory)

The RAM is a temporary workspace used by the microprocessor for its calculations. It cannot be accessed directly by the user.

HART Digital Communication

The Model 3095FT communicates via the industry standard HART protocol, which uses the Bell 202 Frequency Shift Keying (FSK) technique. Remote communication is accomplished by superimposing a high-frequency signal on top of the fixed output signal. Since all communication is accomplished using HART, the Model 3095FT does not provide a 4–20 mA output signal.

Personal Computer

A personal computer operating the Model 3095FT User Interface Software communicates to the Model 3095FT over the HART interface. The User Interface Software is used to both configure and calibrate the Model 3095FT, and is also used to retrieve Model 3095FT logged data.

Section 7

Specifications and Reference Data

MODEL 3095FT FUNCTIONAL SPECIFICATIONS

Service

Natural gas.

Differential Sensor

Range

Code 2: 0–2.5 to 0–250 inH_2O (0–0.62 to 0–62.2 kPa).

Limit

Code 2: –250 to 250 inH_2O (–62.2 to 62.2 kPa).

Absolute Sensor

Ranges

Code 3: 0–8 to 0–800 psia (0–55.16 to 0–5515.8 kPa).
Code 4: 0–36.36 to 0–3,626 psia (0–250 to 0–25000 kPa).

Limit

Code 3: 0.5 to 800 psia (3.4 to 5515.8 kPa).
Code 4: 0.5 to 3,626 psia (3.4 to 25000 kPa).

Output

Two-wire fixed 9.5 mA with digital HART protocol superimposed on current signal.

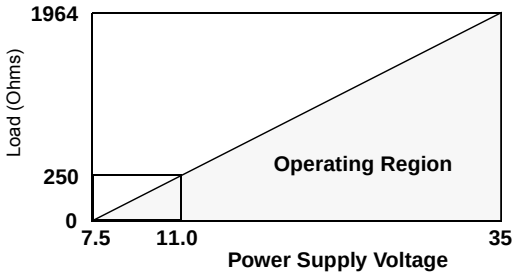
Power Supply

External power supply required. Transmitter operates on terminal voltage of 7.5–35 V dc with a constant average operating current of 9.5 mA.

Load Limitations

Maximum loop resistance is determined by the voltage level of the external power supply, as described by:

$$\text{Max. Loop Resistance} \leq \frac{\text{Power Supply Voltage} - 7.5}{0.014}$$



Communication requires a minimum loop resistance of 250 ohms.

LCD Meter

Optional dual-row, 11-digit, alphanumeric, scrolling liquid crystal display.

LCD Meter Temperature Limits

Operating: –13 to 185 °F (–25 to 85 °C)
Storage:–40 to 185 °F (–40 to 85 °C)

Hazardous Locations Certifications and Approvals

Factory Mutual (FM) Approvals

A Explosion Proof for Class I, Division 1, Groups B, C, and D. Dust-Ignition Proof for Class II, Division 1, Groups E, F, and G. Suitable for Class III, Division 1, indoor and outdoor (NEMA 4X) hazardous locations. Factory Sealed. Provides non-incendive RTD connections for Class I, Division 2, Groups A, B, C, and D. Install per Rosemount drawing 03095-1025.

B Combination of Approval Code A and the following: Intrinsically Safe for use in Class I, Division 1, Groups A, B, C and D; Class II, Division 1, Groups E, F, G; nonincendive for Class I, Division 2, Groups A, B, C, and D. Temperature Code T4. NEMA 4X. Factory Sealed. Install per Rosemount drawing 03095-1020.

Canadian Standards Association (CSA) Approvals

C Explosion Proof for Class I, Division 1, Groups B, C, and D. Dust-Ignition Proof for Class II, Division 1, Groups E, F, and G. Suitable for Class III, Division 1, indoor and outdoor hazardous locations, CSA enclosure Type 4X. Factory Sealed. Provides non-incendive RTD connection for Class I, Division 2, Groups A, B, C, and D. Approved for Class I, Division 2, Groups A, B, C, and D. Install in accordance with Rosemount Drawing 03095-1024.

D Combination of Approval Code C and the following: Intrinsically Safe for Class I, Division 1, Groups A, B, C, and D when installed in accordance with Rosemount drawing 03095-1021. Temperature Code T3C.

Zero Elevation and Suppression

Can be set anywhere within the sensor limits as long as the span is greater than or equal to the minimum span, the lower range value does not exceed the lower range limit, and the upper range value does not exceed the upper range limit.

NOTE

Flow calculations will cease with negative DP readings.

Over Pressure Limit

0 psia to two times the absolute pressure sensor range with a maximum of 3,626 psia.

Static Pressure Limit

Operates within specifications between static line pressures of 0.5 psia and the URL of the absolute pressure sensor.

Temperature Limits

Process:
–40 to 185 °F (–40 to 85 °C)

Ambient:
–40 to 185 °F (–40 to 85 °C)

Storage:
–50 to 212 °F (–46 to 100 °C)

Failure Mode Alarm

If self-diagnostics detect a gross transmitter failure, the HART output registers an alarm with each message.

Humidity limits

0–100% relative humidity.

Turn-on Time

Process variables will be within specifications less than 60 seconds after power is applied to transmitter.

Damping

Response to step input change can be user-selectable from 0 to 7 seconds for one time constant. This is in addition to sensor response time of 0.2 seconds.

Real-Time Clock Accuracy

±2 minutes per month at reference conditions.

MODEL 3095FT PERFORMANCE SPECIFICATIONS

(Zero-based spans, reference conditions, silicone oil fill, 316 SST isolating diaphragms, and digital trim values equal to the span end points.)

Differential Pressure

Range 2

0–2.5 to 0–250 inH_2O (0–0.62 to 0–62.2 kPa)
(100:1 rangeability is allowed).

Reference Accuracy

(including Linearity, Hysteresis, Repeatability)
±0.075% of span for spans from 1:1 to 10:1 of URL

For spans less than 10:1 rangedown,

$$\text{Accuracy} = \left[0.025 + 0.005\left(\frac{\text{URL}}{\text{Span}}\right)\right]\% \text{ of Span}$$

Ambient Temperature Effect per 50 °F (28 °C)

±(0.025% URL + 0.125% span) spans from 1:1 to 30:1.
±(0.035% URL – 0.175% span) spans from 30:1 to 100:1.

Static Pressure Effects

Zero error = ±0.10% of URL per 1,000 psi (6894 kPa).
Span error = ±0.20% of reading per 1,000 psi (6894 kPa).

Stability

±0.1% of URL for 12 months.

Absolute Pressure

Range 3: 0–8 to 0–800 psia (0–55.16 to 0–5515.8 kPa)
(100:1 rangeability is allowed).

Range 4: 0–36.26 to 0–3,626 psia (0–250 to 0–25000 kPa)
(100:1 rangeability is allowed).

Reference Accuracy

(including Linearity, Hysteresis, Repeatability)
±0.075% of span for spans from 1:1 to 6:1 of URL.

For spans less than 6:1 rangedown,

$$\text{Accuracy} = \left[0.03 + 0.0075\left(\frac{\text{URL}}{\text{Span}}\right)\right]\% \text{ of span}$$

Ambient Temperature Effect per 50 °F (28 °C)

±(0.05% URL + 0.125% span) spans from 1:1 to 30:1.
±(0.06% URL – 0.175% span) spans from 30:1 to 100:1.

Stability

±0.1% of URL for 12 months.

Process Temperature (RTD)

Specification for process temperature is for the transmitter portion only. Sensor errors caused by the RTD are not included. The transmitter is compatible with any PT100 RTD conforming to IEC 751 Class B, which has a nominal resistance of 100 ohms at 0 °C and $\propto$ = 0.00385. Examples of compatible RTDs include the Rosemount Series 68 and 78 RTD Temperature Sensors.

Range

–40 to 185 °F (–40 to 85 °C).

Accuracy (including Linearity, Hysteresis, Repeatability)

±1.0 °F (0.56 °C).

Ambient Temperature Effects per 50 °F (28 °C)

±0.72 °F (0.40 °C).

Stability

±1.0 °F (0.56 °C) for 12 months.

MODEL 3095FT PHYSICAL SPECIFICATIONS

Electrical Connections

½–14 NPT, CM 20, PG-13.5.

Process Connections

Transmitter: ¼–18 NPT on 2⅛-in. centers.
RTD: RTD dependent (see ordering information).

Process Wetted Parts

Isolating Diaphragms

316L SST or Hastelloy C-276.®

Drain/Vent Valves

316 SST or Hastelloy C.®

Flanges

Plated carbon steel, 316 SST, or Hastelloy C.

Wetted O-rings

Glass-Filled TFE.

Non-Wetted Parts

Electronics Housing

Low copper aluminum.

Bolts

Plated carbon steel per ASTM A449, Grade 5;
or austenitic 316 SST.

Fill Fluid

Silicone oil.

Paint

Polyurethane.

O-rings

Buna-N.

Weight

Component	Weight in lb (kg)
Model 3095FT Transmitter	6.0 (2.7)
LCD Meter	0.5 (0.2)
SST Mounting Bracket	1.0 (0.4)
12 ft (3.66 m) RTD Cable	0.5 (0.2)
24 ft (7.32 m) RTD Cable	2.2 (1.0)

TABLE 7-1. Model 3095FT Flow Transmitter Model Number.

Model	Product Description	
3095F	Flow Transmitter	
Code	**Output**	
H	Digital *HART* Protocol signal	
Code	**Differential Pressure Range**	
2	0–2.5 to 0–250 inH_2O (0–0.62 to 0–62.2 kPa)	
Code	**Absolute Pressure Ranges**	
3	0–8 to 0–800 psia (0–55.16 to 0–5515.8 kPa)	
4	0–36.26 to 0–3,626 psia (0–250 to 0–25000 kPa)	
Code	**Isolator Material**	**Fill Fluid**
A	316L SST	Silicone
B(1)	*Hastelloy C-276*	Silicone
Code	**Flange Style and Material**	
A	*Coplanar*, CS	
B	*Coplanar*, SST	
C(1)	*Coplanar*, *Hastelloy C*	
Code	**Drain/Vent Material**	
A	SST	
C	*Hastelloy C*	
Code	**O-ring**	
1	Glass-filled TFE	
Code	**Process Temperature Cable (RTD ordered separately)**	
0	Fixed Process Temperature (no cable)	
1	RTD Input with 12 ft (3.66 m) of Shielded Cable (Intended for use with conduit.)	
2	RTD Input with 24 ft (7.32 m) of Shielded Cable (Intended for use with conduit.)	
3	RTD Input with 12 ft (3.66 m) of Armored, Shielded Cable	
4	RTD Input with 24 ft (7.32 m) of Armored, Shielded Cable	
Code	**Transmitter Housing Material**	**Conduit Entry Size**
A	Polyurethane-Covered Aluminum	½–14 NPT
B	Polyurethane-Covered Aluminum	M20 × 1.5 (CM20)
C	Polyurethane-Covered Aluminum	PG 13.5
Code	**Terminal Block**	
A	Standard	
B	With Integral Transient Protection	
Code	**Meter**	
0	None	
1	LCD Meter for Flow Units, Aluminum Housing	
Code	**Bracket**	
0	None	
1	*Coplanar* SST Flange Bracket for 2-in. Pipe or Panel Mount, SST bolts	
Code	**Bolts**	
0	CS bolts	
1	Austenitic 316 SST bolts	
Code	**Approvals**	
0	None	
A	Factory Mutual (FM) Explosion-Proof Approval	
B	Factory Mutual (FM) Explosion-Proof Approval and Non-Incendive/Intrinsic Safety Approval Combination	
C	Canadian Standards Association (CSA) Explosion-Proof Approval	
D	Canadian Standards Association (CSA) Explosion-Proof Approval and Non-Incendive/Intrinsic Safety Approval Combination	
Code	**Software Functionality**	
A	{ Averaging Method: Flow Dependent Time-weighted Formulaic Averaging Compressibility Factor: A.G.A. Report No. 8 /API MPMS Chapter 14.2	

Code	Options	
C1	Custom Configuration	
DF	Flange Adapters — Adapter Type Determined by Selected Flange Material:	{ Plated CS / SST / *Hastelloy C*
Typical Model Number	**3095F H 2 3 A B A 1 1 A B 1 1 0 A A**	

(1) Meets NACE material recommendations per MR 01-75.

Accessories

User Interface Software Packages

The User Interface software package is available with or without the HART modem and connecting cables. All configurations are packaged separately.

Part No. 03095-5100-0001: Windows User Interface Software–Single Site License, HART Modem, and Cables.

Part No. 03095-5110-0001: Windows User Interface Software–Single Site License.

Part No. 03095-5110-0003: Windows User Interface Software–Site License.

Part No. 03095-5105-0001: HART Modem and Cables.

Optional Three-valve Manifolds

(Packaged Separately)

Part No. 01151-0150-0001: 3-Valve Manifold, Carbon Steel (Anderson, Greenwood & Co., M4AVIC).

Part No. 01151-0150-0002: 3-Valve Manifold, 316 SST (Anderson, Greenwood & Co., M4AVIS).

Remote Power Supply Packages

The Remote Power Supply package (Part No. 03095-5000-101x) provides a continuous power source for one Model 3095FT in locations where power is not available. All configurations are packaged separately.

Part No. 03095-5000-1010: Remote Power Supply Enclosure, Battery, and Solar Panel.

Part No. 03095-5000-1011: Remote Power Supply Enclosure, Battery, and Solar Panel. Provides Factory Mutual (FM) intrinsically safe connection to the Model 3095FT.

Part No. 03095-5000-1012: Remote Power Supply Enclosure, Battery, and Solar Panel. Provides Canadian Standards Association (CSA) intrinsically safe connection to the Model 3095FT.

Backup Power Supply Packages

The Backup Power Supply package (Part No. 03095-5000-200x) provides a continuous power source for one Model 3095FT in locations where the dc power supply may not be reliable due to power line outages. All configurations are packaged separately.

Part No. 03095-5000-2000: Remote Power Supply Enclosure and Battery.

Part No. 03095-5000-2001: Remote Power Supply Enclosure and Battery. Provides Factory Mutual (FM) intrinsically safe connection to the Model 3095FT.

Part No. 03095-5000-2002: Remote Power Supply Enclosure and Battery. Provides Canadian Standards Association (CSA) intrinsically safe connection to the Model 3095FT.

Options

Standard Configuration

Unless otherwise specified, transmitter is shipped as follows:

Engineering units:	
Differential	inH_2O (Range 2)
Absolute	psi (all ranges)
Output:	Digital HART protocol signal
Flange type:	Specified model code option
Flange material:	Specified model code option
O-ring material:	Specified model code option
Drain/vent:	Specified model code option
Flow Configuration Parameters:	Factory default
Software tag:	(Blank)

Software tag (8 characters maximum) is left blank unless specified.

Custom Configuration (Option Code C1)

If Option Code C1 is ordered, the customer may specify the following information in addition to the standard configuration parameters. Refer to Configuration Data Sheet CDS 4015 (see Page 7-13).

Gas composition parameters, contract hour, log parameters, LCD display parameters, meter run configuration parameters, low flow cut-off, passwords, static pressure tap location, static pressure measurement, damping, descriptor, and message.

Tagging

Three customer tagging options are available:

1. Standard SST tag is wired to the transmitter. Tag character height is 0.125 in. (3,18 mm), 85 characters maximum.
2. Tag may be permanently stamped on transmitter nameplate upon request. Tag character height is 0.0625 in. (1,59 mm), 65 characters maximum.
3. Tag may be stored in transmitter memory. Software tag (8 characters maximum) is left blank unless specified.

Remote Power Supply Assembly

(Included with Part No. 03095-5000-101x and 03095-5000-200x)

General Specifications

Enclosure

Fiberglass reinforced polyester, NEMA 3R rating.

Enclosure Dimensions

11.5 × 8.8 × 5.4 in. (292 × 224 × 137 mm).

Enclosure Electrical Openings

Output (to transmitter)

½–14 NPT conduit hub.

Supply (from solar panel or power source)

½-inch compression fitting.

Computer Hookup

BNC connector. Protected by waterproof BNC cap and chain.

Enclosure Security

$^3/_8$-in. inside diameter stainless steel latch suitable for padlock.

Remote Power Supply Assembly (cont.)

(Included with Part No. 03095-5000-101x and 03095-5000-200x)

Performance

Power Output
9.5 mA average.
11.35 V minimum (no load).

Intrinsically Save Output Approvals

Factory Mutual (FM)
(Part No. 03095-1011 or 03095-2001):
Device must be located in non-hazardous location. Provides intrinsically safe connections for Class I, Division 1, Groups A, B, C, and D when connected in accordance with Rosemount Drawing 03095-1030. NEMA 3R Enclosure.

Canadian Standards Assocation (CSA)
(Part No. 03095-1012 or 03095-2002):
Device must be located in non-hazardous location. Provides intrinsically safe connections for Class I, Division 1, Groups A, B, C, and D when connected in accordance with Rosemount Drawing 03095-1031. CSA Enclosure Type 3R.

Operating Temperature
–40 to 140 °F (–40 to 60 °C).

Charging Temperature
–4 to 140 °F (–20 to 60 °C).

Longest No Power Duration
Fully charged battery with no solar input will power transmitter for a minimum of:
35 days at 60 °F (15.6 °C).
24 days at –4 °F (–20 °C).

Minimum Equivalent Sun Hours/Day
2.5.

Enclosure Weight with Battery
20 lb (9.0 kg).

Solar Panel Specifications

Type
2 Watt, photovoltaic.

Dimensions
13.75 × 6.75 × 0.50 in. (35 × 17× 1 mm).

Weight
1.3 lb (0.6 kg).

Battery Specifications

Type
12 Volt, 12 amp-hour, maintenance-free sealed lead acid.

Terminals
¼-in. insulated quick disconnect tabs.

Dimensions
5.95 × 3.86 × 3.84 in. (151 × 98 × 96 mm).

Weight
8.82 lb (4.0 kg).

Expected Service Life
3 years from installation date.

Battery Backup Specifications (Applies to Part No. 03095-5000-200x)

User-Supplied Power Supply
15–40 V dc, 500 mA minimum.

TEMPERATURE SENSOR ASSEMBLIES

This section describes Series 68 and 78 RTDs available in Ⓛ lengths from 1 to 9 inches. Rosemount Inc. builds a full range of RTD sensors available for use with the Model 3095FT. This information is provided as a guideline to the sensors most likely to be used in the Model 3095FT systems. See Product Data Sheet PDS 2654 for information concerning sensors not listed in Table 7-4.

Series 68 RTD

Rosemount Series 68 RTD Temperature Sensors are used for measurements from –148 to 752 °F (–100 to 400 °C). Series 68 sensors are available in capsule, general purpose, and spring-loaded designs in ⊗ lengths from 1 to 24 inches.

Table 7-2 shows the interchangeability of the Series 68 RTD.

TABLE 7-2. Series 68 Interchangeability.

±1.44 °F	(±0.80 °C)	at	–148 °F	(–100 °C)
±0.99 °F	(±0.55 °C)	at	–58 °F	(–50 °C)
±0.54 °F	(±0.30 °C)	at	32 °F	(0 °C)
±1.44 °F	(±0.80 °C)	at	212 °F	(100 °C)
±2.34 °F	(±1.30 °C)	at	392 °F	(200 °C)
±2.88 °F	(±1.60 °C)	at	500 °F	(260 °C)
±4.14 °F	(±2.30 °C)	at	752 °F	(400 °C)

Platinum Element and Lead Wire Configurations

Single-element temperature sensors have four lead wires and may be used in 2-, 3-, and 4-wire signal conditioning systems.

Series 78 RTD

Series 78 sensors are intended for special applications that require high temperature, compensation loop, or dual element sensors.

Rosemount Series 78 RTD Temperature Sensors are used for measurements from –328 to 1220 °F (–200 to 660 °C). Series 78 sensors are available in capsule, general purpose, and spring-loaded designs in ⊗ lengths from 1 to 24 inches.

Table 7-3 shows the interchangeability of the Series 78 RTD.

TABLE 7-3. Series 78 Interchangeability.

±0.88 °F	(±0.49 °C)	at	–148 °F	(–100 °C)
±0.47 °F	(±0.26 °C)	at	32 °F	(0 °C)
±0.95 °F	(±0.53 °C)	at	212 °F	(100 °C)
±2.54 °F	(±1.41 °C)	at	572 °F	(300 °C)
±3.38 °F	(±1.88 °C)	at	752 °F	(400 °C)

Platinum Element and Lead Wire Configurations

Single-element, high temperature sensors have four lead wires and may be used in 2-, 3-, and 4-wire signal conditioning systems.

NOTE
Series 68 and 78 sensors conform to international standards: IEC-751 Class B; DIN 43760; and BS 1904 Grade II. For additional information on temperature sensor assemblies, refer to Rosemount Product Data Sheet PDS 2654.

NOTE
Table 7-4 summarizes Series 68 and 78 Sensors that are most likely to be used with the Model 3095FT. The sensor assembly code shown in Table 7-4 combines sensor type, an FM or CSA approved connection head, and no extension.

TABLE 7-4. Sensor Assembly Ordering Information.

Code	Sensor Assemblies
68F11N00	Platinum RTD, General Purpose, Single Element, Flat Connection Head, FM approved, –100 to 400 °C
68F21N00	Platinum RTD, Spring Loaded, Single Element, Flat Connection Head, FM approved, –100 to 400 °C
78F11N00	Platinum RTD, General Purpose, Single Element, Flat Connection Head, FM approved, –200 to 400 °C
78F21N00	Platinum RTD, Spring Loaded, Single Element, Flat Connection Head, FM approved, –200 to 400 °C
68H11N00	Platinum RTD, General Purpose, Single Element, Flat Connection Head, CSA approved, –100 to 400 °C
68H21N00	Platinum RTD, Spring Loaded, Single Element, Flat Connection Head, CSA approved, –100 to 400 °C
78H11N00	Platinum RTD, General Purpose, Single Element, Flat Connection Head, CSA approved, –200 to 400 °C
78H21N00	Platinum RTD, Spring Loaded, Single Element, Flat Connection Head, CSA approved, –200 to 400 °C
	Thermowell Assemblies

If Ordering WITHOUT Thermowell, Continue To Select From This Table

Code	Immersion Length (L)
N010	1.0 inch
N020	2.0 inch
N025	2.5 inch
N030	3.0 inch
N035	3.5 inch
N040	4.0 inch
N045	4.5 inch
N050	5.0 inch
N055	5.5 inch
N060	6.0 inch
Typical Model Number	**68F11N00 N040**

←**or**→

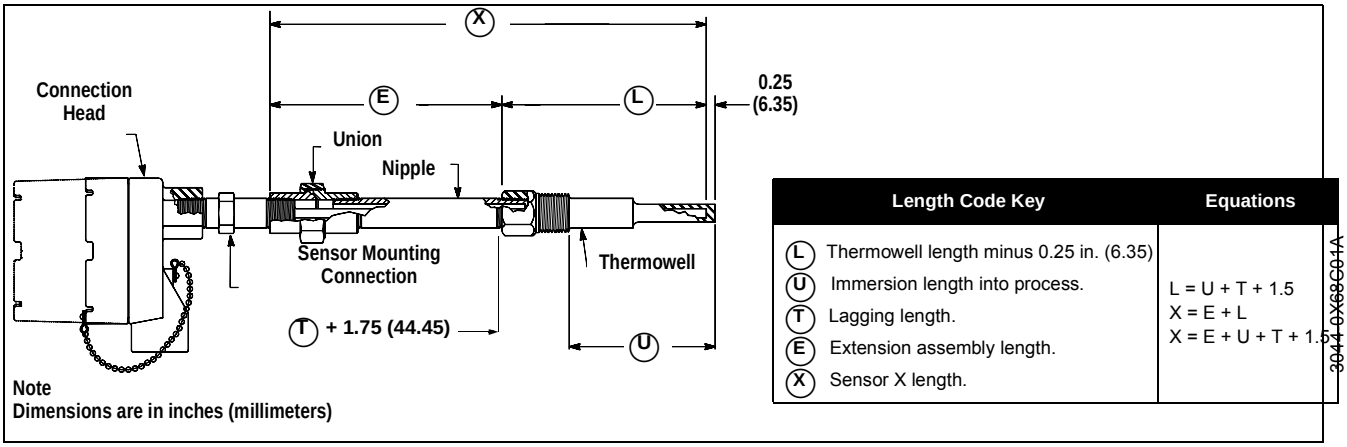
If Ordering WITH Thermowell, Continue To Select From This Table

Code	Thermowell Material
A	316 SST
B	304 SST
C	Carbon Steel
J	*Hastelloy* C
L	*Hastelloy* B

Code	With Thermowell (U) Length		(L) Length
020	2.0 inch	} Available only in straight stem	4 inch
025	2.5 inch		4 inch
030	3.0 inch		6 inch
035	3.5 inch		6 inch
040	4.0 inch		6 inch
045	4.5 inch		6 inch
050	5.0 inch		9 inch
055	5.5 inch		9 inch
060	6.0 inch		9 inch

Code	Thermowell Style
T20	Thread Mount, ½–14 NPT, Stepped
T22	Thread Mount, ¾–14 NPT, Stepped
T24	Thread Mount, 1–11.5 NPT, Stepped
T32	Thread Mount, ½–14 NPT, Straight (6 inch L lengths or less)
W38	Weld Mount, ¾-in. Pipe, Stepped
W40	Weld Mount, 1-in. Pipe, Stepped
F52	Flange Mount, 1-in. ANSI Class 150, Stepped
F54	Flange Mount, 1½-in. ANSI Class 150, Stepped
Typical Model Number	**68F11N00 A N040 T22**

TABLE 7-5. Sensor Assembly



Length Code Key	Equations
(L) Thermowell length minus 0.25 in. (6.35)	L = U + T + 1.5
(U) Immersion length into process.	X = E + L
(T) Lagging length.	X = E + U + T + 1.5
(E) Extension assembly length.	
(X) Sensor X length.	

Note
Dimensions are in inches (millimeters)

FLAT COVER CONNECTION ASSEMBLIES

The Flat Cover Connection Head (P/N 00079-0325-0002) is for general purpose and spring-loaded sensors. The terminal block has six terminals for either single- or dual-element sensors.

Sensor Connections

½–14 NPT mounting thread. Screw terminals for lead wire connections.

Electrical Connection

¾–14 NPT conduit.

Materials of Construction

Housing: Low-copper aluminum alloy.
O-ring seal: Silicone rubber.
Terminals: Nickel-plated brass.

Temperature Limits

-100 to 200 °C (-148 to 392 °F).

Hazardous Locations Certifications (Flat Connection Head Assembly)

Explosion Proof

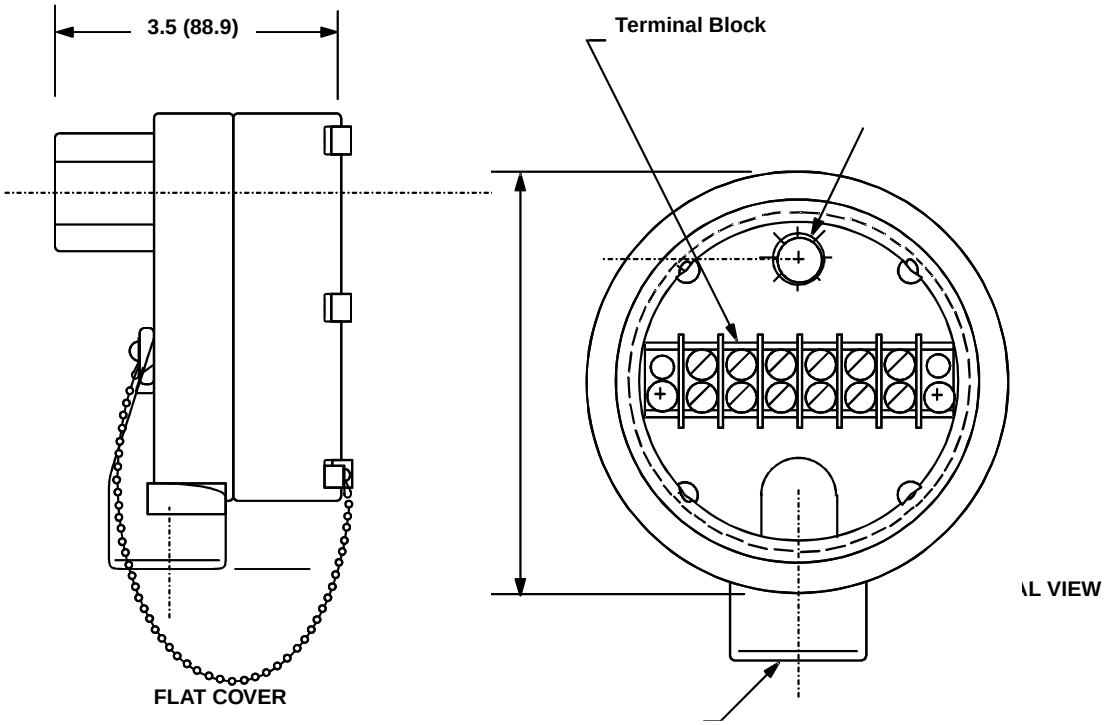
Approved by Factory Mutual (FM) for Class I, Division 1, Groups B, C, and D; Class II, Division 1, Groups E, F, and G; and Class III, Division 1, hazardous locations.

Approved by the Canadian Standards Association (CSA) for Class I, Division 2, Groups A, B, C, and D; Class 1, Division 1, Groups C and D; Class II, Division 1, Groups E, F, and G; Class III, Division 1 and enclosure 4.

Weight

Flat cover type: 1 lb 9 oz (0.71 kg).

FIGURE 7-1. Connection Head Dimensional Drawing.



NOTE
Dimensions are in inches (millimeters).

CONFIGURATION DATA
SHEET CDS 4015A00

Complete this data sheet to define a custom configuration for the Model 3095FT.
Unless specified, the Model 3095FT will ship with the default values identified by the ★ symbol.

CONFIGURATION DATA SHEET

Customer: _____ P.O. No.: _____

Model No.:(1) _____ Line Item: _____

SST Tag No.: _____

Software Tag: |__|__|__|__|__|__|__|__| (8 characters)

TRANSMITTER INFORMATION

Descriptor:|__|__|__|__|__|__|__|__|__|__|__|__|__|__|__|__|
(16 characters)

Message: |__|__|__|__|__|__|__|__|__|__|__|__|__|__|__|__|__|__|__|__|__|__|__|__|__|__|__|__|__|__|__|__|
(32 characters)

Differential Pressure Range: ☐ 0–2.5 to 0–250 inH_2O (0–0.62 to 0–62.2 kPa)

Absolute Pressure Range: ☐ 0–8 to 0–800 psia (0–55.16 to 0–5515.8 kPa)

☐ 0–36.26 to 0–3,626 psia (0–250 to 0–25000 kPa)

LCD Meter: ☐ None ☐ Installed

FLOW INFORMATION

Low Flow Cut-off Point: |__| . |__|__| inH_2O 0.25 InH_2O★

Base Conditions:

			Valid Range
Base Temperature Units =	☐ °F ★ ☐ °C		
Base Temperature =	|__|__| . |__|__|	60 °F ★	32 to 77 °F (0 to 25 °C)
Base Pressure Units =	☐ psia ★ ☐ kPa		
Base Pressure =	|__|__| . |__|__|	14.73 psia ★	13.0–16.0 psia (0.09–0.11 MPaa)

Deadbands:

Minimum time to exit no-flow condition =	|__|__| seconds	10 seconds★
Minimum time to exit over-range condition =	|__|__| seconds	10 seconds★

Damping (in seconds): Select one damping value for each process variable.

Differential Pressure =	☐ 0.112	☐ 0.224	☐ 0.448	☐ 0.896★	☐ 1.792
	☐ 3.584	☐ 7.168			
Absolute Pressure =	☐ 0.112	☐ 0.224	☐ 0.448	☐ 0.896★	☐ 1.792
	☐ 3.584	☐ 7.168			
Temperature =	☐ 0.112	☐ 0.224	☐ 0.448	☐ 0.896★	☐ 1.792
	☐ 3.584	☐ 7.168			

PV Defaults:

				Valid Range
DP Default Value =	|__|__|__| . |__|__|__| 0 ★	☐ inH_2O ★	☐ kPa	LRL–URL
SP Default Value =	|__|__|__|__|__| . |__|__|__| 0 ★	☐ psia ★	☐ kPa	LRL–URL
PT Default Value =	|__|__|__| . |__|__|__| 60 ★	☐ °F ★	☐ °C	LRL–URL

AVERAGING AND COMPRESSIBILITY FACTOR INFORMATION

☐ { Averaging Method: Flow Dependent Time-weighted Formulaic Averaging
Compressibility Factor: A.G.A. Report No. 8/API MPMS Chapter 14.2

★ ***Indicates default value.***

(1) A complete model number is required before Rosemount can implement this custom configuration.

LOGGING INFORMATION

Contract Hour: |__|__| : |__|__| : |__|__| 07:00:00★

Logging Interval: ☐ Hourly★ ☐ Set Interval |__|__| minutes (Valid intervals: 1—99 minutes)

Logged Parameters (Select any number of variables. Selected parameters apply to both daily logs and variable logs.)

- ☐ Total Flow★
- ☐ Total Flow Time★
- ☐ Total Energy
- ☐ Average Flow Rate★
- ☐ Average Energy Rate
- ☐ Average Differential Pressure★
- ☐ Maximum Differential Pressure
- ☐ Minimum Differential Pressure
- ☐ Average Static Pressure★
- ☐ Maximum Static Pressure
- ☐ Minimum Static Pressure
- ☐ Average Process Temperature★
- ☐ Maximum Process Temperature
- ☐ Minimum Process Temperature
- ☐ Average Heating Value
- ☐ Average Compressibility Factor
- ☐ Average Integral Value
- ☐ Average CPrime
- ☐ Specific Gravity

LCD DISPLAY INFORMATION (Only enter if LCD meter ordered.)

Displayed Parameters (Select any number of variables.)

- ☐ Flow Rate★
- ☐ Differential Pressure★
- ☐ Totalized Flow Today
- ☐ Totalized Flow Yesterday
- ☐ Static Pressure★
- ☐ Temperature★
- ☐ Energy Flow Rate
- ☐ Totalized Energy Toda
- ☐ Totalized Energy Yesterday
- ☐ Mole Percent CO_2
- ☐ Mole Percent N_2
- ☐ Orifice Bore at 68 °F
- ☐ Date and Time
- ☐ Specific Gravity
- ☐ Heating Value

UNITS OF MEASURE

Select one unit of measure for each category. Selected measuring units apply to LCD Displays and all Logs.

Flow Rate: ☐ SCFH (Standard Cubic Feet per Hour)★ ☐ NCMH (Normal Cubic Meters per Hour) ☐ SCFD (Standard Cubic Feet per Day) ☐ NCMD (Normal Cubic Meters per Day)

Differential Pressure: ☐ IN_H_2O (Inches of Water @ °60 F)★ ☐ PA (Pascals)

Static Pressure: ☐ PSI (Pounds per square inch)★ ☐ PA (Pascals)

Temperature: ☐ DEG_F (Degrees Fahrenheit)★ ☐ DEG_C (Degrees Celsius)

Energy: ☐ BTU (BTUs)★ ☐ JOULES (Joules)

STATIC PRESSURE INFORMATION

The Model 3095FT can calculate and log static pressure as absolute or gage, based on upstream or downstream tap locations. However, flow is always calculated using the upstream absolute pressure measurement for greatest accuracy.

Static Pressure Tap Location:
☐ Upstream★ ☐ Downstream

Static Pressure Units:
☐ Absolute★ ☐ Gage (Enter atmospheric pressure if gage selected: |__|__| . |__|__| 14.73★)

METER RUN INFORMATION

Meter Tube Bore at 68 °F (inches): |__|__| . |__|__|__| 1.939 in.★

Meter Tube Material: ☐ Carbon Steel ☐ SST 304 ☐ SST 316★ ☐ *Hastelloy C®* ☐ *Monel®*

Orifice Tap Type: ☐ Flange ★ ☐ Pipe

Orifice Bore at 68 °F (inches): |__|__| . |__|__|__|__| 0.1939 in.★

Orifice Bore Material: ☐ Carbon Steel ☐ SST 304 ☐ SST 316★ ☐ *Hastelloy C* ☐ *Monel*

★ ***Indicates default value.***

COMPRESSIBLITY FACTOR INFORMATION:

Choose desired characterization method, and only enter values for that method:

☐ Detail Characterization Method, (AGA8 1992)

			Valid Range	Default Values★
N2	Nitrogen mole percent	|__|__|__| . |__|__|__|__| %	0–100 percent	0
CO2	Carbon Dioxide mole percent	|__|__|__| . |__|__|__|__| %	0–100 percent	0
H2S	Hydrogen Sulfide mole percent	|__|__|__| . |__|__|__|__| %	0–100 percent	0
H2O	Water mole percent	|__|__| . |__|__|__|__| %	0–Dew Point	0
He	Helium mole percent	|__|__| . |__|__|__|__| %	0–3.0 percent	0
C1	Methane mole percent	|__|__|__| . |__|__|__|__| %	0–100 percent	100
C2	Ethane mole percent	|__|__|__| . |__|__|__|__| %	0–100 percent	0
C3	Propane mole percent	|__|__| . |__|__|__|__| %	0–12 percent	0
iC4	i-Butane mole percent	|__|__| . |__|__|__|__| %	0–6 percent (1)	0
nC4	n-Butane mole percent	|__|__| . |__|__|__|__| %	0–6 percent (1)	0
iC5	i-Pentane mole percent	|__|__| . |__|__|__|__| %	0–4 percent (2)	0
nC5	n-Pentane mole percent	|__|__| . |__|__|__|__| %	0–4 percent (2)	0
C6	Hexane mole percent	|__|__| . |__|__|__|__| %	0–Dew Point	0
C7	Heptane mole percent	|__|__| . |__|__|__|__| %	0–Dew Point	0
C8	Octane mole percent	|__|__| . |__|__|__|__| %	0–Dew Point	0
C9	Nonane mole percent	|__|__| . |__|__|__|__| %	0–Dew Point	0
C10	Decane mole percent	|__|__| . |__|__|__|__| %	0–Dew Point	0
O2	Oxygen mole percent	|__|__| . |__|__|__|__| %	0–21 percent	0
CO	Carbon Monoxide mole percent	|__|__| . |__|__|__|__| %	0–3.0 percent	0
H2	Hydrogen mole percent	|__|__|__| . |__|__|__|__| %	0–100 percent	0
Argon	Argon mole percent	|__|__| . |__|__|__|__| %	0–1.0 percent	0

(1) The summation of i-Butane and n-Butane cannot exceed 6 percent.

(2) The summation of i-Pentane and n-Pentane cannot exceed 4 percent.

☐ Gross Characterization Method, Option 1 (AGA8 Gr-Hv-CO2)★

		Valid Range	Default Values★
Volumetric Gross Heating Value at Base Conditions	|__|__|__|__|__| . |__|__| BTU/SCF	477–1200 BTU/SCF	1014.29
Specific gravity at 14.73 psia and 60 °F	. |__|__|__|__|__|__|__|	0.554000–0.900000	0.554787
Specific gravity at Base Conditions	. |__|__|__|__|__|__|__|	0.554000–0.900000	0.554787
Carbon dioxide mole percent	|__|__| . |__|__|__|__| %	0–30 percent	0
Hydrogen mole percent	|__|__| . |__|__|__|__| %	0–10 percent	0
Carbon monoxide mole percent	|__| . |__|__|__|__| %	0–3 percent	0

☐ Gross Characterization Method, Option 2 (AGA8 Gr-CO2-N2)

		Valid Range	Default Values★
Specific Gravity at 14.73 psia and 60 °F	. |__|__|__|__|__|__|__|	0.554000–0.900000	0.554787
Specific gravity at Base Conditions	. |__|__|__|__|__|__|__|	0.554000–0.900000	0.554787
Nitrogen mole percent	|__|__| . |__|__|__|__| %	0–50 percent	0
Carbon dioxide mole percent	|__|__| . |__|__|__|__| %	0–30 percent	0
Hydrogen mole percent	|__|__| . |__|__|__|__| %	0–10 percent	0
Carbon monoxide mole percent	|__| . |__|__|__|__| %	0–3 percent	0
Volumetric Gross Heating Value at Base Conditions	|__|__|__|__|__| . |__|__| BTU/SCF	477–1200 BTU/SCF	1014.29

NOTE

Default characterization values assume 100% methane gas.

REAL-TIME CLOCK

Select one time zone:

☐ Alaska ☐ Pacific ☐ Mountain ☐ Central★ ☐ Eastern ☐ Atlantic

WRITE PROTECT SWITCH

When ON, the write protect switch prevents any software changes to the transmitter.

☐ On ☐ Off★

★ ***Indicates default value.***

SIGNAL SELECTION

Select one output format:

☐ Digital *HART*®★

☐ Burst mode of *HART* digital process variable

Select desired burst mode output option:

☐ All dynamic variables in engineering units (DP, AP, Temperature, Flow Rate)★

☐ Differential pressure in engineering units

☐ Differential pressure in percent of range

Select one communication method:

☐ Standard★

☐ Multidrop Communications

Choose transmitter multidrop short address (1-15): |__|__| 1★

PASSWORDS (OPTIONAL)

Level 1 password allows retrieving and viewing logged data. Level 2 adds access to transmitter maintenance and configuration. Level 3 provides full access for the system administrator. (Enter up to six passwords for Level 1, and up to three passwords for level 2. Enter one password for Level 3.)

Level 1 |__|__|__|__|__|__|__|__| |__|__|__|__|__|__|__|__| |__|__|__|__|__|__|__|__| |__|__|__|__|__|__|__|__|
|__|__|__|__|__|__|__|__| |__|__|__|__|__|__|__|__|

Level 2 |__|__|__|__|__|__|__|__| |__|__|__|__|__|__|__|__| |__|__|__|__|__|__|__|__|

Level 3 |__|__|__|__|__|__|__|__|

SPECIAL CALIBRATION (OPTIONAL)

Default values indicate standard calibration. Enter lower trim and upper trim values if special calibration is desired:

	Lower Trim Value	Upper Trim Value	Default Values★
Differential Pressure:	_____		0, URL
Absolute Pressure:	_____		0, URL
Temperature:	_____		–40, 185 °F

Model 3095FT Flow Transmitter Range Units

Differential Pressure Range 2 Span			Absolute Pressure Range 3 Span		Absolute Pressure Range 4 Span	
Units	min	max	Units	min	max	min	max
inH_2O	2.5	250	psia	150	800	40	4000
kPa	0.62161	62.1606	MPa	0.05516	5.51581	0.275791	27.5790

★ ***Indicates default value.***

MODEL 3095FT SPARE PARTS

The following provides spare parts information for the Model 3095FT Flow Transmitter.

Item No.	SENSOR MODULES Part Description	Part Number	Price Each	Spares (1) Category
9	**Silicone Fill Sensor Module**			B
	Differential: 0–2.5/250 inH_2O, Range 2			
	Absolute: 0–8/800 psia, Range 3			
	316L SST	03095-0345-2312	•	
	Hastelloy C-276	03095-0345-2313	•	
	Differential: 0–2.5/250 inH_2O, Range 2			
	Absolute: 0–36.26/3,626 psia, Range 4			
	316L SST	03095-0345-2412	•	
	Hastelloy C-276	03095-0345-2413	•	
Item No.	**ELECTRONICS BOARD ASSEMBLY HARDWARE Part Description**	**Part Number**	**Price Each**	**Spares (1) Category**
5	Output Electronics Board	03095-0303-0004	•	A
6	Real-Time Clock Battery	03095-0378-0001	•	
Item No.	**HOUSING, COVERS, TERMINAL BLOCKS Part Description**	**Part Number**	**Price Each**	**Spares (1) Category**
	Standard Aluminum Housing			
4	Electronics Housing without Terminal Block (½–14 NPT conduit, includes RFI filters)	03031-0291-1201	•	
1	Electronics Cover	03031-0547-0001	•	B
3	Standard Terminal Block Assembly	03095-0302-0001	•	A
3	Transient Protection Terminal Block Assembly	03095-0302-0002	•	B
	External Ground Assembly	03031-0398-0001	•	A
Item No.	**FLANGES Part Description**	**Part Number**	**Price Each**	**Spares (1) Category**
	Process Flanges			A
11	Differential *Coplanar* Flange (Figure 7-2)			
	Nickel-plated Carbon Steel	03031-0388-0025	•	
	316L SST	03031-0388-0022	•	
	Hastelloy C	03031-0388-0023	•	
	Coplanar Flange Alignment Screw *(package of 12 screws)*	03031-0309-0001	•	
Item No.	**FLANGE ADAPTER UNION Part Description**	**Part Number**	**Price Each**	**Spares (1) Category**
13	Nickel-plated Carbon Steel	02024-0068-0005	•	B
	316L SST	02024-0069-0002	•	
	Hastelloy C	02024-0069-0003	•	

NOTE *Item numbers are references to figure callouts.*

(1) Spares Category: "A" — One spare part for every 25 transmitters recommended.
"B" — One spare part for every 50 transmitters recommended.

Item No.	DRAIN/VENT VALVE KITS Part Description	Part Number	Price Each	Spares (1) Category
10	Vent Valve Kits			A
	316L SST Valve Stem and Seat Kit	01151-0028-0022	•	
	Hastelloy C Valve Stem and Seat Kit	01151-0028-0023	•	
	(Each kit contains parts for one transmitter.)			
Item No.	**O-RING PACKAGES** **Part Description**	**Part Number**	**Price Each**	**Spares (1) Category**
2	Electronic Housing, Cover (Standard and Meter)	03031-0232-0001	•	B
8	Electronics Housing, Module	03031-0233-0001	•	B
15	Process Flange, Glass-filled *Teflon* ®	03031-0234-0001	•	B
14	Flange Adapter, Glass-filled *Teflon*	03031-0242-0001	•	B
	(Each package contains 12 O-rings.)			
Item No.	**MOUNTING BRACKETS** **Part Description**	**Part Number**	**Price Each**	**Spares (1) Category**
	Coplanar **Flange Bracket Kits (Figure 7-3)**			
	SST Bracket, 2-in. Pipe or Panel Mount, SST Bolts	03031-0189-0003	•	B
Item No.	**BOLT KITS** **Part Description**	**Part Number**	**Price Each**	**Spares (1) Category**
	***Coplanar* Flange (Figure 7-8)**			B
30	Flange Bolt Kit			
	Carbon Steel (set of 4)	03031-0312-0001	•	
	316 SST (set of 4)	03031-0312-0002	•	
31	Flange/Adapter Bolt Kit			
	Carbon Steel (set of 4)	03031-0306-0001	•	
	316 SST (set of 4)	03031-0306-0002	•	
32	Manifold/Flange Kit			
	Carbon Steel (set of 4)	03031-0311-0001	•	
	316 SST (set of 4)	03031-0311-0002	•	
	(Each kit contains bolts for 1 transmitter)			
	Manifold			
	Carbon Steel	Use Bolts Supplied with Anderson Greenwood Manifold		
	316 SST			
Item No.	**LCD METER OPTION** **Part Description**	**Part Number**	**Price Each**	**Spares (1) Category**
	Aluminum Housing (Figure 7-5)			
	Meter Kit	03095-0392-0001	•	A
17	Meter Display			
33	6-pin Interconnection Header			
18	Cover Assembly			
	Meter	03095-0392-0002	•	
17	Meter Display			
33	6-pin Interconnection Header			
	Cover Assembly Kit	03095-0392-0003	•	A

Item No.	RTD Cables, Adapters and Plugs Part Description	Part Number	Price Each	Spares (1) Category
	RTD Input with 12 ft (3.66 m) of Shielded Cable (Intended for use with conduit.)	03095-0320-0011	•	B
	RTD Input with 24 ft (7.32 m) of Shielded Cable (Intended for use with conduit.)	03095-0320-0012	•	
	RTD Input with 12 ft (3.66 m) of Armored, Shielded Cable	03095-0320-0001	•	
	RTD Input with 24 ft (7.32 m) of Armored, Shielded Cable	03095-0320-0002	•	
	¾ to ½–in. NPT Adapter (conduit adapter for Rosemount RTD Connection Head)	03095-0308-0001	•	
	Armored Cable Compression Seal	03095-0325-0001	•	
	NOTE: *The following connect to the Model 3095FT RTD Connector:*			
27	RTD Connector Plug (for transmitters without an RTD)	03095-0323-0001	•	
28	½–in. NPT RTD Cable Adapter	03095-0322-0001	•	

Item No.	Accessories Part Description	Part Number	Price Each	Spares (1) Category
	Model 3095FT User Interface Software (Figure 7-6)			
19, 20	*Windows* User Interface Software–Single PC License, HART Modem, Cables	03095-5100-0001	•	
19	*Windows* User Interface Software–Single PC License	03095-5110-0001	•	
	Windows User Interface Software–Site License	03095-5110-0003	•	
20	HART Modem and Cables	03095-5105-0001	•	
	HART Modem	03095-0309-0001	•	
	Cables	03095-0307-0001	•	
	Remote Power Supply (Figure 7-7)			
21	Battery	03095-0359-0002	•	
22	Solar Panel	03095-0340-0001	•	B
23	Solar Panel Bracket Kit	03095-0311-0001	•	B
24	Barrier/Regulator Assembly	03095-0360-0001	•	
25	½–in. NPT Conduit Hub	03095-0361-0001	•	
26	Solar Panel Compression Fitting	03095-0362-0001	•	

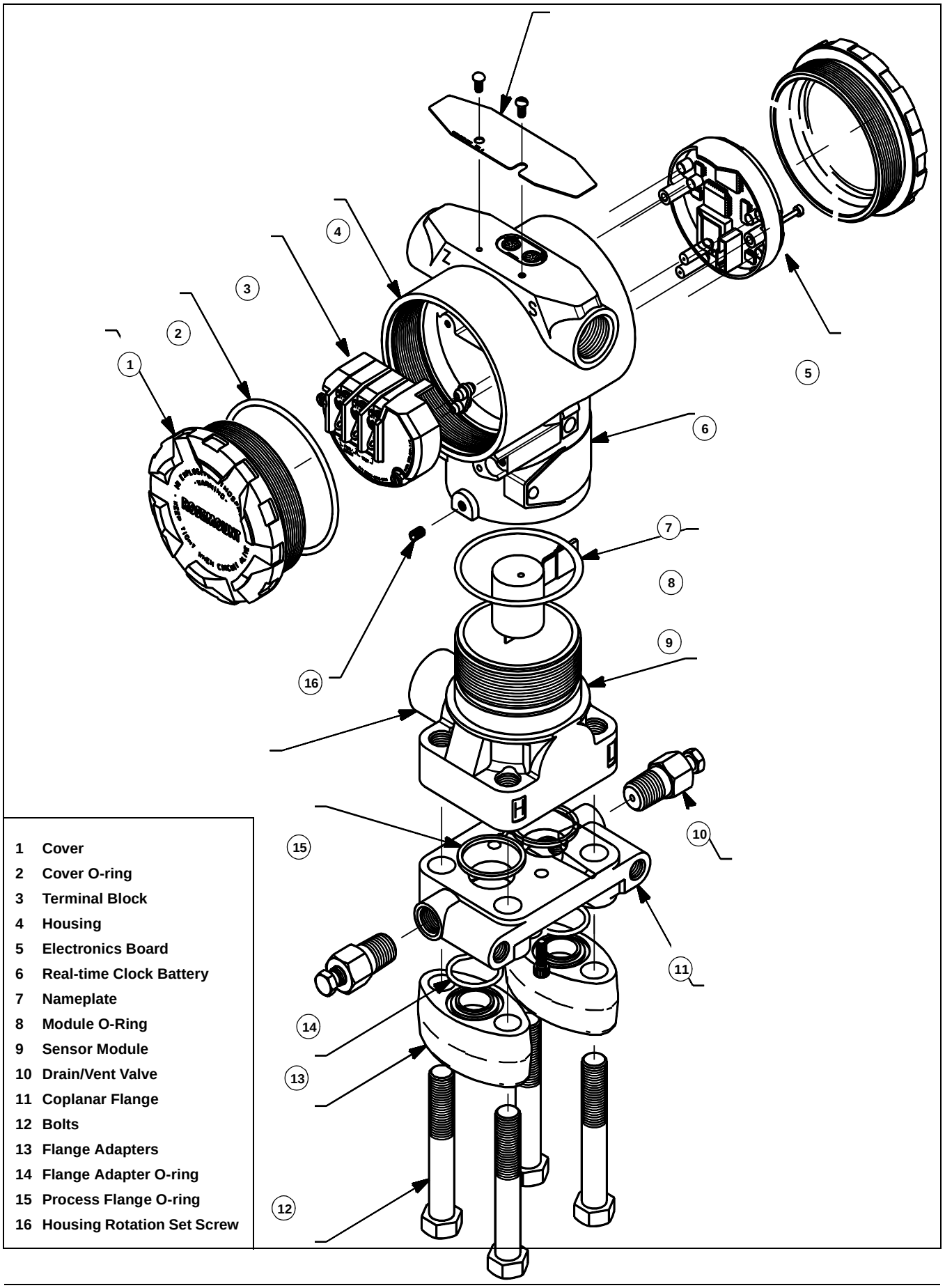


FIGURE 7-2. Model 3095FT Flow Transmitter Exploded View (with Coplanar Flange).

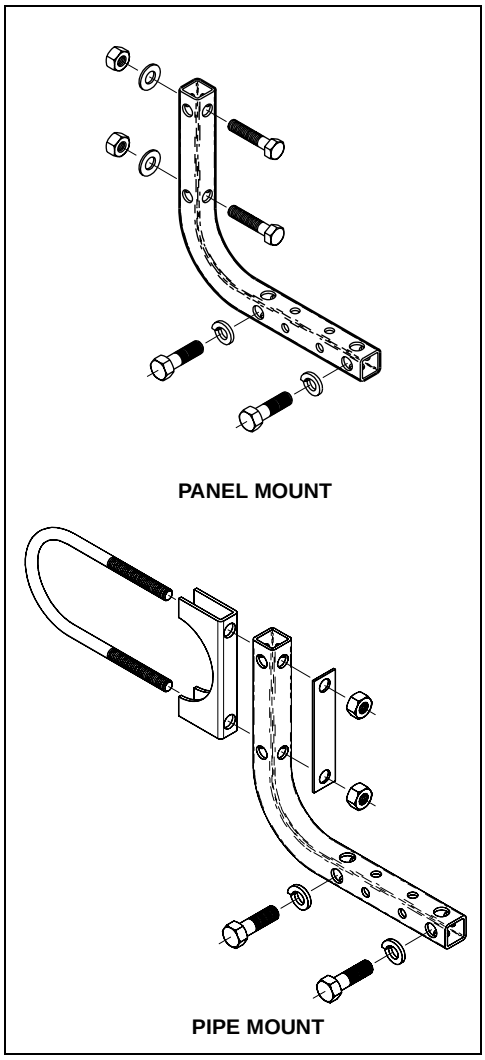


FIGURE 7-3. Mounting Bracket Kits.

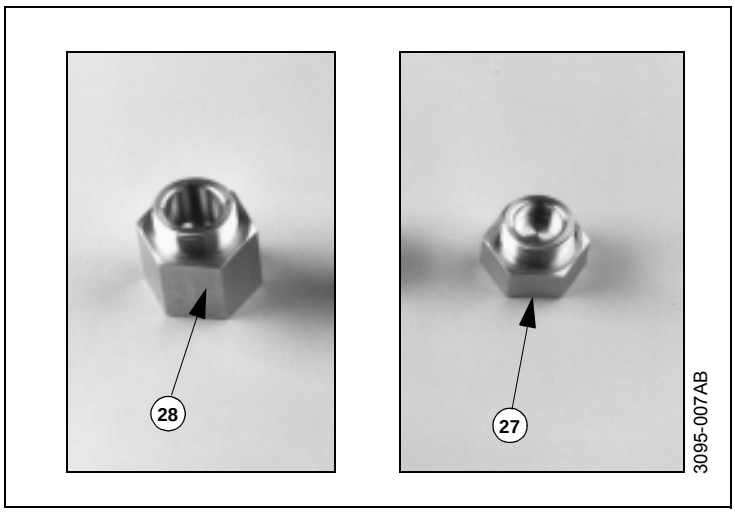


FIGURE 7-4. RTD Adapters and Plug.

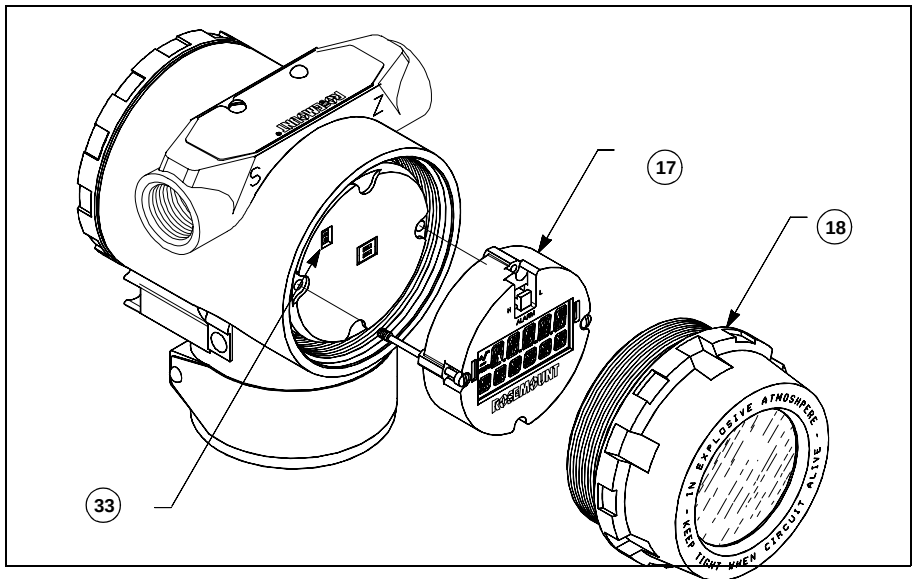


FIGURE 7-5. LCD Meter.

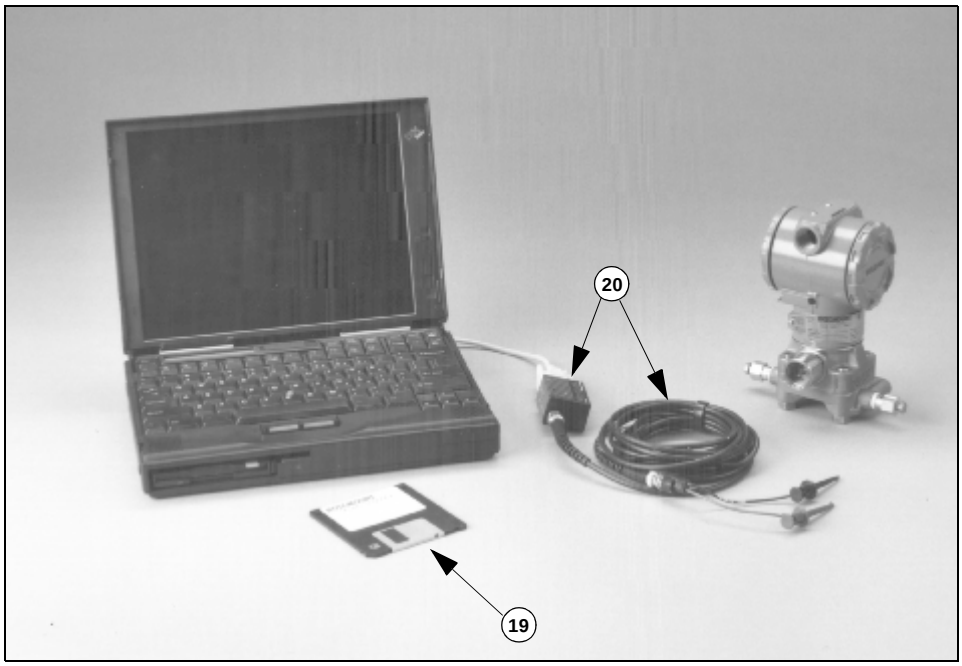


FIGURE 7-6. User Interface Software, HART Modem, Cables.

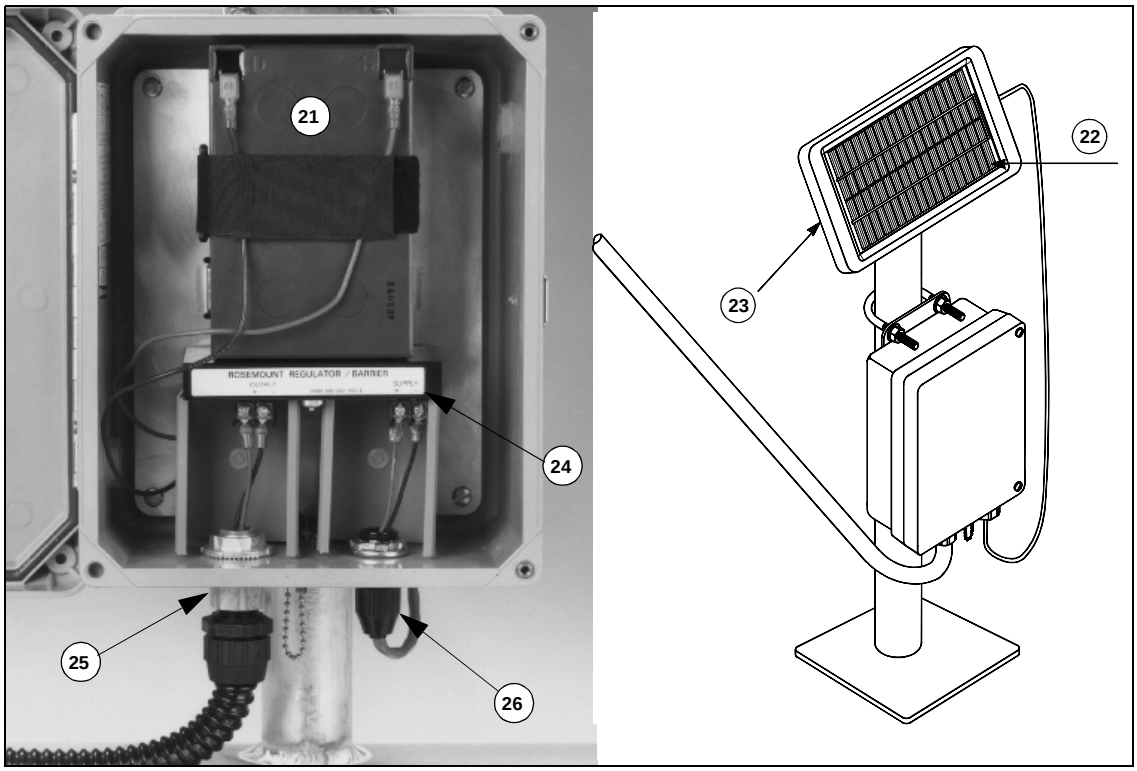
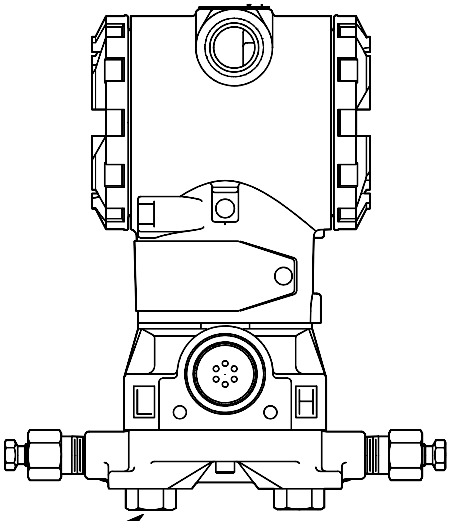
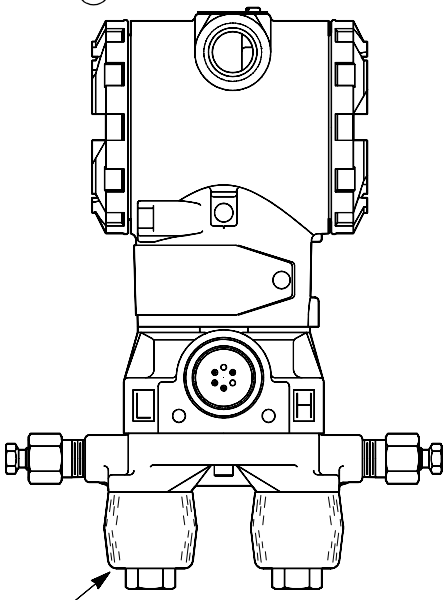


FIGURE 7-7. Remote Power Supply Spare Parts.



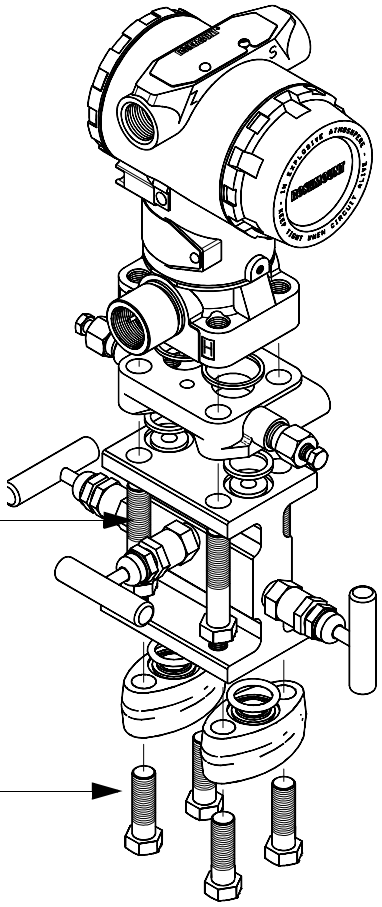
Transmitter with
Flange Bolts

30



Transmitter with
Optional Flange Adapters and
Flange/Adapter Bolts

31



32

31

Transmitter with 3-Valve Manifold, Manifold/
Flange Bolts, Optional Flange Adapters, and
Flange/Adapter Bolts

BOLTS REQUIRED FOR ASSEMBLY

Item No.	Description	Qty	Size in.(mm)
30	Flange Bolts	4	1.75 (44)
31	Flange/Adapter Bolts	4	2.88 (73)
32	Manifold/Flange Bolts	4	2.25 (57)

3095-3095D05A, E05A, A29A

FIGURE 7-8. Bolting Configurations.

Appendix A

Model 3095 Explosion-Proof Installation Drawing, Factory Mutual
(Drawing Number 03095-1025, Rev. G.)

PROPRIETARY INFORMATION IS CONTAINED HEREIN AND MUST BE HANDLED ACCORDINGLY
BY _____ DATE _____

REVISIONS

REV	DESCRIPTION	CHG. NO.	APP'D	DATE
C	ADD NOTE 10	656722	**B.L.L.**	10/12/93
D	CHG TO A SIZE, ADD NOTE 11	656967	**B.L.L.**	10/28/93
E	CHG NOTES 9,11	657643	**M.J.Z.**	1/26/94
F	DEL NOTES 7,10,11 ADD NOTE 12	661305	**K.J.A.**	8/26/94
G	ADD DIV 1,2	662265	**M.J.Z.**	9/6/94

NOTES:

12. INSTALLATION TO BE IN ACCORDANCE WITH NATIONAL ELECTRICAL CODE.

9. NON-INCENDIVE FIELD WIRING METHODS MAY BE USED FOR CONNECTING THE TEMPERATURE SENSING ASSEMBLY. WHEN USING NON-INCENDIVE FIELD WIRING, THE CONNECTION HEAD AND TEMPERATURE SENSOR ASSEMBLY NEED NOT BE EXPLOSION PROOF, BUT ALL COMPONENTS CONNECTED TO THE TEMP SENSOR CONNECTOR MUST BE CLASSIFIED "SIMPLE APPARATUS". SIMPLE APPARATUS ARE DEVICES WHICH ARE INCAPABLE OF GENERATING OR STORING MORE THAN 1.2V, 0.1A, 25mW, OR 20 μJ (RTD's QUALIFY AS SIMPLE APPARATUS).

8. DIVISION 2 WIRING METHOD.

6. CLASS II INSTALLATIONS MUST USE A CSA APPROVED DUST-IGNITIONPROOF SENSOR.

5. IN AMBIENTS GREATER THAN 40°C, SPRING LOADED TEMPERATURE SENSORS USED WITHOUT AN EXPLOSIONPROOF THERMOWELL MUST BE RATED FOR AT LEAST 85°C.

4. COMPONENTS REQUIRED TO BE APPROVED MUST BE APPROVED FOR GAS GROUP APPROPRIATE TO AREA CLASSIFICATION.

3. ALL CONDUIT THREADS TO BE ASSEMBLED WITH FIVE FULL THREADS MINIMUM.

2. TRANSMITTER MUST NOT BE CONNECTED TO EQUIPMENT GENERATING MORE THAN 250VAC.

1. WIRING METHOD SUITABLE FOR CLASS I, DIV 1, ANY LENGTH.

THIS DRAWING WAS CREATED ON CAD. DRAWING IS ARCHIVED ON MAGNETIC TAPE FOR ECO CHANGES.

UNLESS OTHERWISE SPECIFIED DIMENSIONS IN INCHES. REMOVE ALL BURRS AND SHARP EDGES. MACHINE SURFACE FINISH 125

- TOLERANCES -

DECIMALS	FRACTIONS
.X±.1	±1/32
.XX±.02	ANGLES
.XXX±.010	±2°

DO NOT SCALE PRINT

CONTRACT NO.

DR. **Myles Lee Miller** 7/21/93

CHK'D **BLL**

APP'D. **BEN LOUWAGIE** 8/17/93

APP'D. GOVT.

ROSEMOUNT® Measurement Control Analytical Valves

Rosemount Inc.
12001 Technology Drive
Eden Prairie, MN 55344 USA

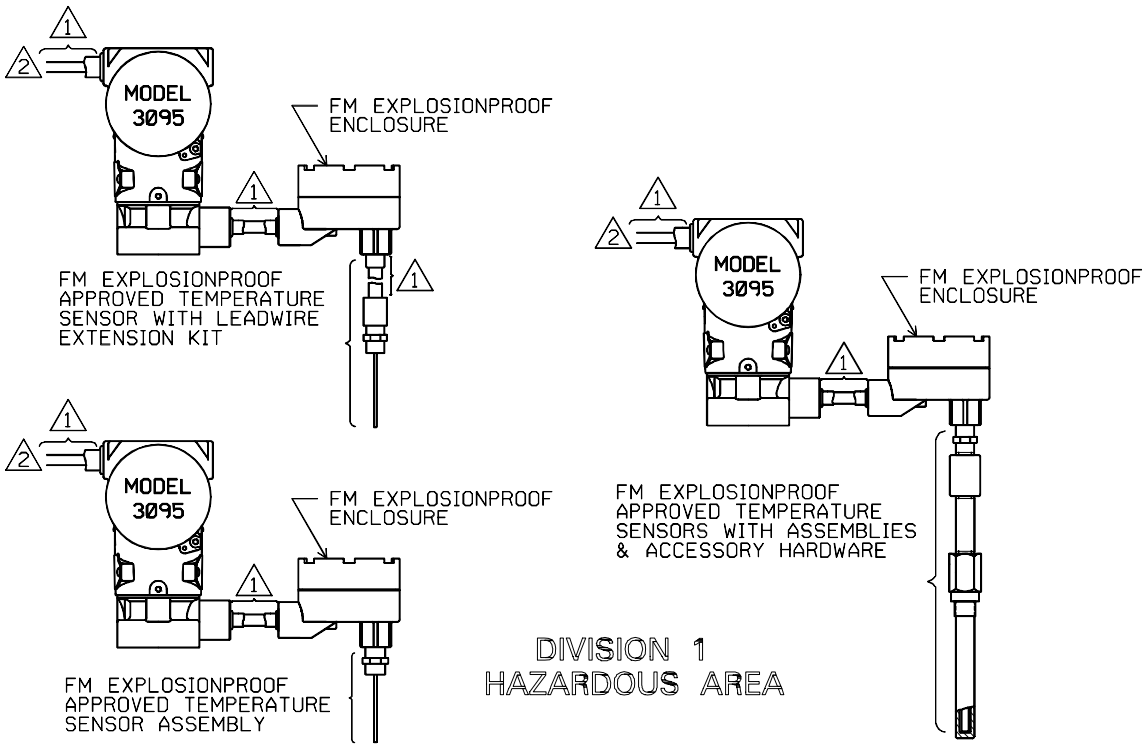
TITLE MODEL 3095 EXPLOSIONPROOF INSTALLATION DRAWING, FACTORY MUTUAL

SIZE	FSCM NO	DWG NO.
A		03095-1025

SCALE | WT. _____ | SHEET 1 OF 3

FORM NO. 60651A-1 REV. C

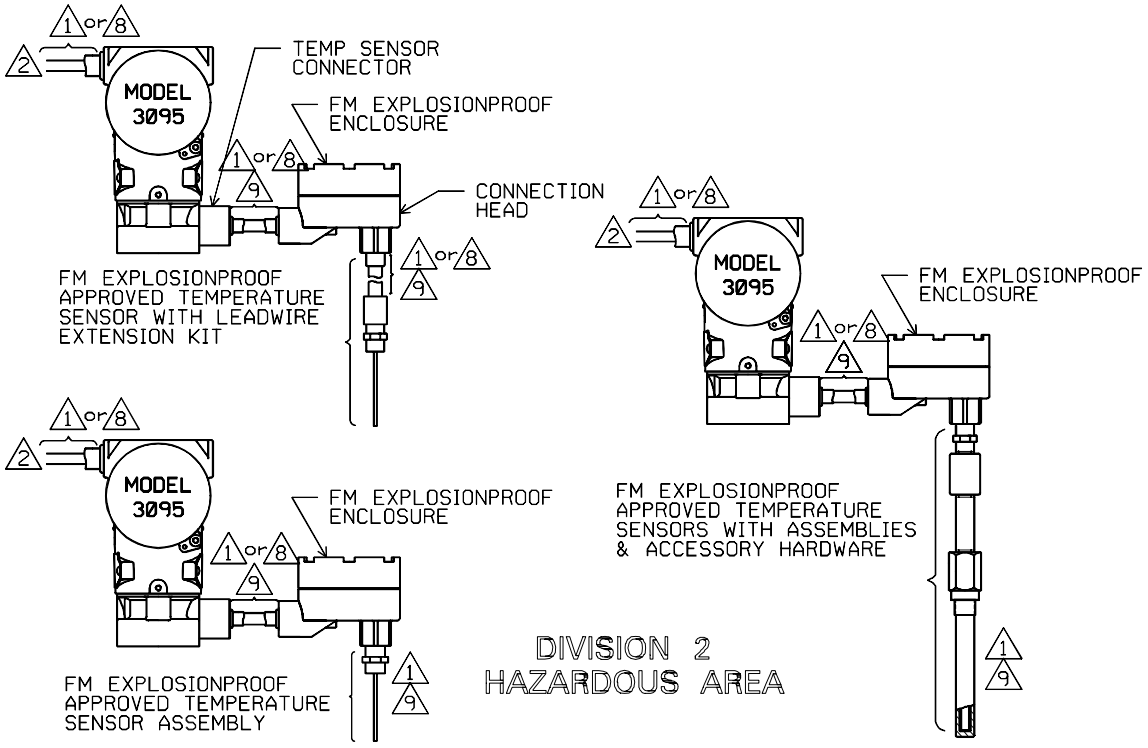
REVISIONS				
REV	DESCRIPTION	CHG. NO.	APP'D	DATE
G		662265		



Rosemount Inc. 12001 Technology Drive Eden Prairie, MN 55344 USA	THIS DRAWING WAS CREATED ON CAD. DRAWING IS ARCHIVED ON MAGNETIC TAPE FOR ECO CHANGES.			
DR. Myles Lee Miller	SIZE A	FSCM NO	DWG NO. 03095-1025	
ISSUED	SCALE N/A	WT. ———	SHEET 2 OF 3	

FORM NO. 60651A-1 REV. C

REVISIONS				
REV	DESCRIPTION	CHG. NO.	APP'D	DATE
G		662265		



Rosemount Inc. 12001 Technology Drive Eden Prairie, MN 55344 USA	THIS DRAWING WAS CREATED ON CAD. DRAWING IS ARCHIVED ON MAGNETIC TAPE FOR ECO CHANGES.		
DR. Myles Lee Miller	SIZE A	FSCM NO	DWG NO. 03095-1025
ISSUED	SCALE N/A	WT. ———	SHEET 3 OF 3

FORM NO. 60651A-1 REV. C

Appendix B

Index of I.S. F.M. for 3095
and
Index of I.S. F.M. for 03095-5000
(Drawing Numbers 03095-1020 and 03095-5000).

PROPRIETARY INFORMATION IS CONTAINED HEREIN AND MUST BE HANDLED ACCORDINGLY
BY _____ DATE _____

REVISIONS

REV	DESCRIPTION	CHG. NO.	APP'D	DATE
B	ADD OPTIONAL COMPUTER CONNECTION	655550	D.E.W.	8/17/94
C	CORRECT ENTITY PARAMETERS	660398	K.D.V.	5/16/94
D	INCREASE Vmax	660728	K.D.V.	6/1/94

ENTITY APPROVALS FOR 3095

THE ROSEMOUNT TRANSMITTERS LISTED ABOVE ARE F.M. APPROVED AS INTRINSICALLY SAFE WHEN USED IN CIRCUIT WITH F.M. APPROVED BARRIERS WHICH MEET THE ENTITY PARAMETERS LISTED IN THE CLASS I, II, AND III, DIVISION 1 GROUPS INDICATED, TEMP CODE T4. ADDITIONALLY, THE ROSEMOUNT 751 FIELD SIGNAL INDICATOR IS F.M. APPROVED AS INTRINSICALLY SAFE WHEN CONNECTED IN CIRCUIT WITH ROSEMOUNT TRANSMITTERS (FROM ABOVE) AND F.M. APPROVED BARRIERS WHICH MEET THE ENTITY PARAMETERS LISTED FOR CLASS I, II, AND III, DIVISION 1, GROUPS INDICATED, TEMP CODE T4.

TO ASSURE AN INTRINSICALLY SAFE SYSTEM, THE TRANSMITTER AND BARRIER MUST BE WIRED IN ACCORDANCE WITH THE BARRIER MANUFACTURER'S FIELD WIRING INSTRUCTIONS AND THE APPLICABLE CIRCUIT DIAGRAM INDICATED ON SHEET 3.

THIS DRAWING WAS CREATED ON CAD. DRAWING IS ARCHIVED ON MAGNETIC TAPE FOR ECO CHANGES.

UNLESS OTHERWISE SPECIFIED DIMENSIONS IN INCHES. REMOVE ALL BURRS AND SHARP EDGES. MACHINE SURFACE FINISH 125

- TOLERANCES -

DECIMALS
.X±.1
.XX±.02
.XXX±.010

FRACTIONS
±1/32

ANGLES
±2°

DO NOT SCALE PRINT

CONTRACT NO.

DR. Myles Lee Miller 3/19/93

CHK'D

APP'D. Kevin Voegele 4/8/93

APP'D. GOVT.

ROSEMOUNT® Measurement Control Analytical Valves

Rosemount Inc.
12001 Technology Drive
Eden Prairie, MN 55344 USA

TITLE INDEX OF I.S. F.M. FOR 3095

SIZE A | FSCM NO | DWG NO. 03095-1020

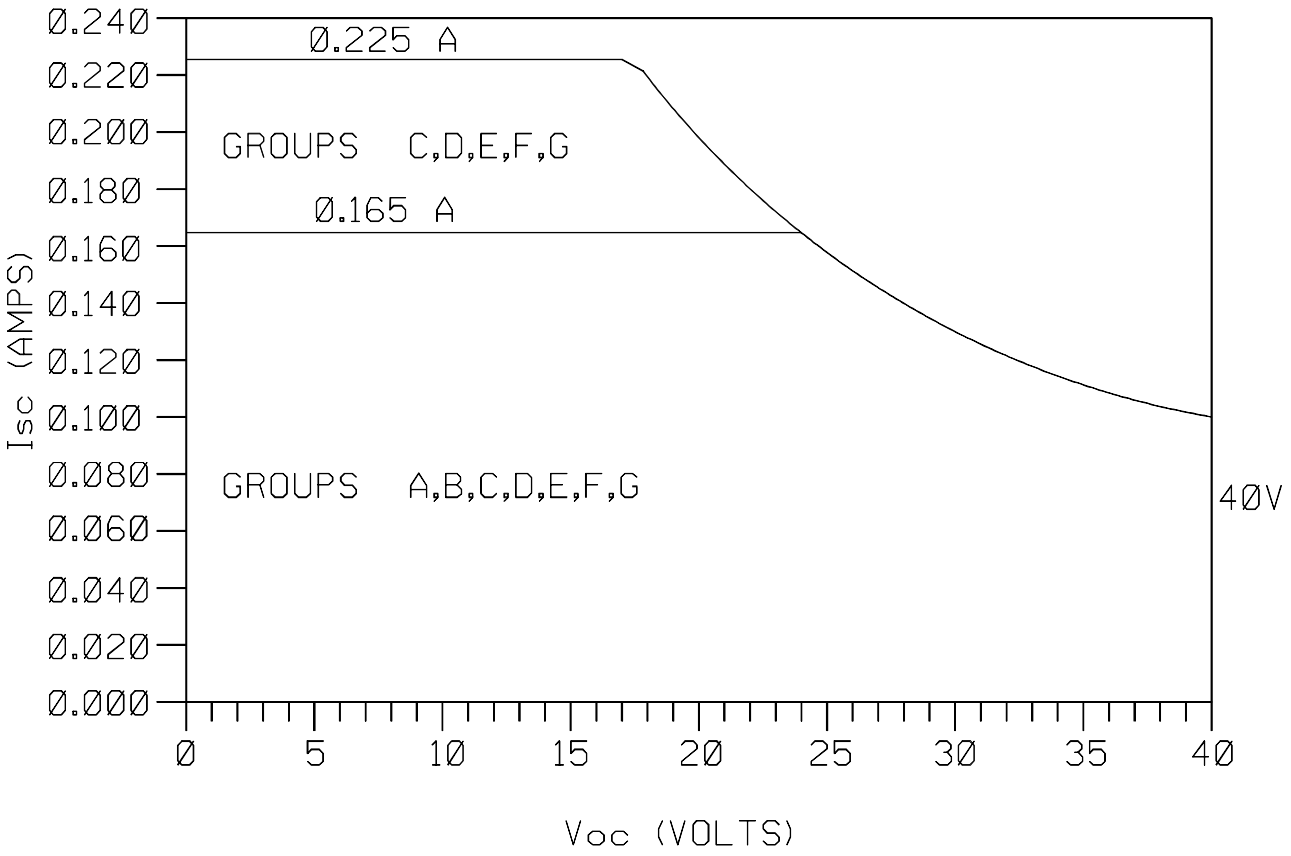
SCALE N/A | WT. _____ | SHEET 1 OF 4

FORM NO. 60651A-1 REV. C

REVISIONS				
REV	DESCRIPTION	CHG. NO.	APP'D	DATE
D		660728		

BARRIER PARAMETERS

Pmax = 1WATT

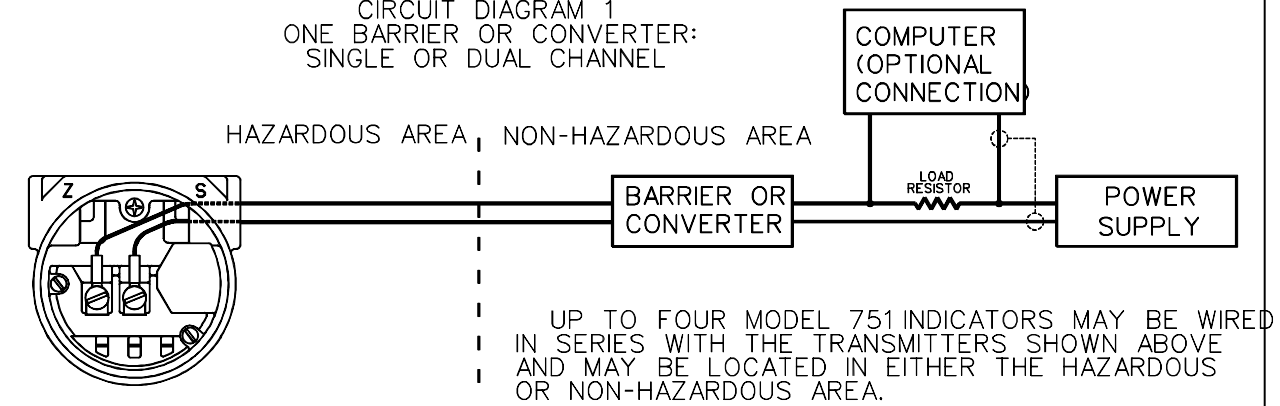


Rosemount Inc. 12001 Technology Drive Eden Prairie, MN 55344 USA	THIS DRAWING WAS CREATED ON CAD. DRAWING IS ARCHIVED ON MAGNETIC TAPE FOR ECO CHANGES.		
DR. Myles Lee Miller	SIZE A	FSCM NO	DWG NO. 03095-1020
ISSUED	SCALE N/A	WT. ———	SHEET 2 OF 4

FORM NO. 60651A-1 REV. C

REVISIONS				
REV	DESCRIPTION	CHG. NO.	APP'D	DATE
D		660728		

CIRCUIT DIAGRAM 1
ONE BARRIER OR CONVERTER:
SINGLE OR DUAL CHANNEL

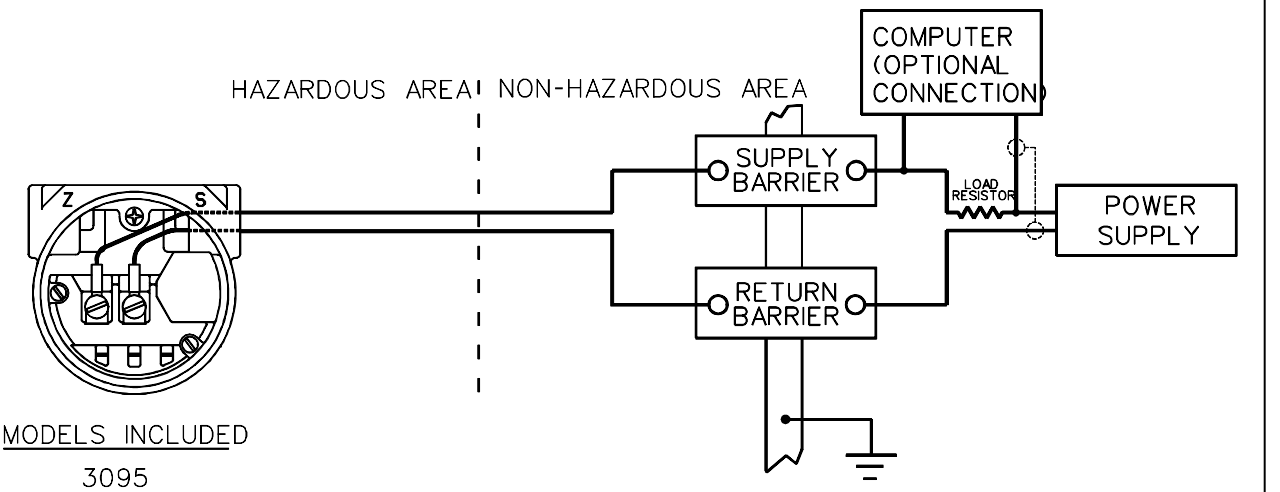


UP TO FOUR MODEL 751 INDICATORS MAY BE WIRED IN SERIES WITH THE TRANSMITTERS SHOWN ABOVE AND MAY BE LOCATED IN EITHER THE HAZARDOUS OR NON-HAZARDOUS AREA.

MODELS INCLUDED

3095

CIRCUIT DIAGRAM 2
SUPPLY AND RETURN BARRIERS
(ONLY FOR USE WITH BARRIERS APPROVED IN THIS CONFIGURATION)



MODELS INCLUDED

3095

UP TO FOUR MODEL 751 INDICATORS MAY BE WIRED IN SERIES WITH THE TRANSMITTERS SHOWN ABOVE AND MAY BE LOCATED IN EITHER THE HAZARDOUS OR NON-HAZARDOUS AREA.

Rosemount Inc. 12001 Technology Drive Eden Prairie, MN 55344 USA	THIS DRAWING WAS CREATED ON CAD. DRAWING IS ARCHIVED ON MAGNETIC TAPE FOR ECO CHANGES.		
DR. Myles Lee Miller	SIZE A	FSCM NO	DWG NO. 03095-1020
ISSUED	SCALE N/A	WT. ———	SHEET 3 OF 4

FORM NO. 60651A-1 REV. C

REVISIONS				
REV	DESCRIPTION	CHG. NO.	APP'D	DATE
D		660728		

ENTITY CONCEPT APPROVALS

THE ENTITY CONCEPT ALLOWS INTERCONNECTION OF INTRINSICALLY SAFE APPARATUS TO ASSOCIATED APPARATUS NOT SPECIFICALLY EXAMINED IN COMBINATION AS A SYSTEM. THE APPROVED VALUES OF MAX. OPEN CIRCUIT VOLTAGE (Voc OR Vt) AND MAX. SHORT CIRCUIT CURRENT (Isc OR It) AND MAX. POWER (Voc X Isc/4) OR (Vt X It/4), FOR THE ASSOCIATED APPARATUS MUST BE LESS THAN OR EQUAL TO THE MAXIMUM SAFE INPUT VOLTAGE (Vmax), MAXIMUM SAFE INPUT CURRENT (Imax), AND MAXIMUM SAFE INPUT POWER (Pmax) OF THE INTRINSICALLY SAFE APPARATUS. IN ADDITION, THE APPROVED MAX. ALLOWABLE CONNECTED CAPACITANCE (Ca) OF THE ASSOCIATED APPARATUS MUST BE GREATER THAN THE SUM OF THE INTERCONNECTING CABLE CAPACITANCE AND THE UNPROTECTED INTERNAL CAPACITANCE (C_i) OF THE INTRINSICALLY SAFE APPARATUS, AND THE APPROVED MAX. ALLOWABLE CONNECTED INDUCTANCE (La) OF THE ASSOCIATED APPARATUS MUST BE GREATER THAN THE SUM OF THE INTERCONNECTING CABLE INDUCTANCE AND THE UNPROTECTED INTERNAL INDUCTANCE (L_i) OF THE INTRINSICALLY SAFE APPARATUS.

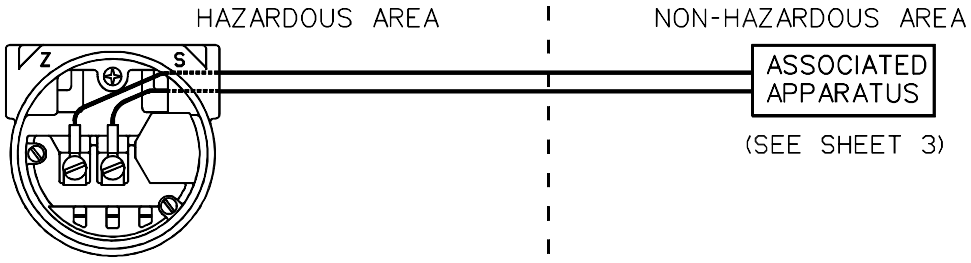
NOTE: ENTITY PARAMETERS LISTED APPLY ONLY TO ASSOCIATED APPARATUS WITH LINEAR OUTPUT.

CLASS I, DIV. 1, GROUPS A AND B

V_{MAX} = 40V	V_T OR V_{OC} IS LESS THAN OR EQUAL TO 40V
I_{MAX} = 165mA	I_T OR I_{SC} IS LESS THAN OR EQUAL TO 165mA
P_{MAX} = 1 WATT	$(\frac{V_T X I_T}{4})$ OR $(\frac{Voc \times Isc}{4})$ IS LESS THAN OR EQUAL TO 1 WATT
C_I = .012μf	C_A IS GREATER THAN .012μf
L_I =20μH	L_A IS GREATER THAN 20μH

CLASS I, DIV. 1, GROUPS C AND D

V_{MAX} = 40V	V_T OR V_{OC} IS LESS THAN OR EQUAL TO 40V
I_{MAX} = 225mA	I_T OR I_{SC} IS LESS THAN OR EQUAL TO 225mA
P_{MAX} = 1 WATT	$(\frac{V_T X I_T}{4})$ OR $(\frac{Voc \times Isc}{4})$ IS LESS THAN OR EQUAL TO 1 WATT
C_I = .012μf	C_A IS GREATER THAN .012μf
L_I =20μH	L_A IS GREATER THAN 20μH



MODELS INCLUDED

3095

Rosemount Inc.
12001 Technology Drive
Eden Prairie, MN 55344 USA

DR. Myles Lee Miller

ISSUED

THIS DRAWING WAS CREATED ON CAD. DRAWING IS ARCHIVED ON MAGNETIC TAPE FOR ECO CHANGES.

SIZE	FSCM NO	DWG NO.	
A		03095-1020	
SCALE N/A	WT. ———	SHEET 4 OF 4	

FORM NO. 60651A-1 REV. C

PROPRIETARY INFORMATION IS CONTAINED HEREIN AND MUST BE HANDLED ACCORDINGLY
BY _____ DATE _____

DASH NO.	DESCRIPTION
-1011	REMOTE POWER SUPPLY
-2001	BACKUP POWER SUPPLY

REVISIONS

REV	DESCRIPTION	CHG. NO.	APP'D	DATE
D	ADD DIV. 2 APPROVAL	666891	K.J.A.	6/7/95
E	REMOVE GRP C FROM DIV 2 ON CIRCUIT DIAGRAM 2	667373	M.J.Z.	6/15/95

ENTITY APPROVALS FOR 3095-5000

ENTITY CONCEPT APPROVALS

THE ENTITY CONCEPT ALLOWS INTERCONNECTION OF INTRINSICALLY SAFE APPARATUS TO ASSOCIATED APPARATUS NOT SPECIFICALLY EXAMINED IN COMBINATION AS A SYSTEM. THE APPROVED VALUES OF MAX. OPEN CIRCUIT VOLTAGE (Vmax) AND MAX. SHORT CIRCUIT CURRENT (Imax) AND MAX. POWER (Pmax), FOR THE INTRINSICALLY SAFE APPARATUS MUST BE LESS THAN OR EQUAL TO THE MAXIMUM SAFE OUTPUT OPEN CIRCUIT VOLTAGE (Voc) AND OUTPUT SHORT CIRCUIT CURRENT (Isc) AND OUTPUT POWER (Voc x Isc/4) OF THE ASSOCIATED APPARATUS. IN ADDITION, THE SUM OF THE INTERCONNECTING CABLE CAPACITANCE AND THE UNPROTECTED INTERNAL CAPACITANCE (C_i) OF THE INTRINSICALLY SAFE APPARATUS MUST BE LESS THAN THE ALLOWABLE CONNECTED CAPACITANCE (C_a) OF THE ASSOCIATED EQUIPMENT, AND THE SUM OF THE INTERCONNECTING CABLE INDUCTANCE AND THE UNPROTECTED INTERNAL INDUCTANCE (L_i) OF THE INTRINSICALLY SAFE APPARATUS MUST BE LESS THAN THE APPROVED MAX. ALLOWABLE CONNECTED INDUCTANCE (L_a) OF THE ASSOCIATED APPARATUS.

OUTPUT PARAMETERS CLASS I, DIV. 1, GROUPS A, B, C, AND D	
V_{OC} = 19V	V_{MAX} IS LESS THAN OR EQUAL TO 19V
I_{SC} = 165mA	I_{MAX} IS LESS THAN OR EQUAL TO 165mA
C_A = 0.30 uF	C_1 IS LESS THAN 0.3 uF
L_A = 1 mH	L_1 IS LESS THAN 1 mH
INPUT 250 VAC MAX.	

THIS DRAWING WAS CREATED ON CAD. DRAWING IS ARCHIVED ON MAGNETIC TAPE FOR ECO CHANGES.

UNLESS OTHERWISE SPECIFIED DIMENSIONS IN INCHES. REMOVE ALL BURRS AND SHARP EDGES. MACHINE SURFACE FINISH 125

- TOLERANCES -

DECIMALS .X±.1 .XX±.02 .XXX±.010
FRACTIONS ±1/32
ANGLES ±2°

DO NOT SCALE PRINT

CONTRACT NO.

DR. S. CAPAUL 11/02/93

CHK'D

APP'D. M. SCHLESINGER 11/03/93

APP'D. GOVT.

ROSEMOUNT® Measurement Control Analytical Valves

Rosemount Inc.
12001 Technology Drive
Eden Prairie, MN 55344 USA

TITLE INDEX OF I.S. F.M. FOR 03095-5000

SIZE	FSCM NO	DWG NO.	
A		03095-1030	

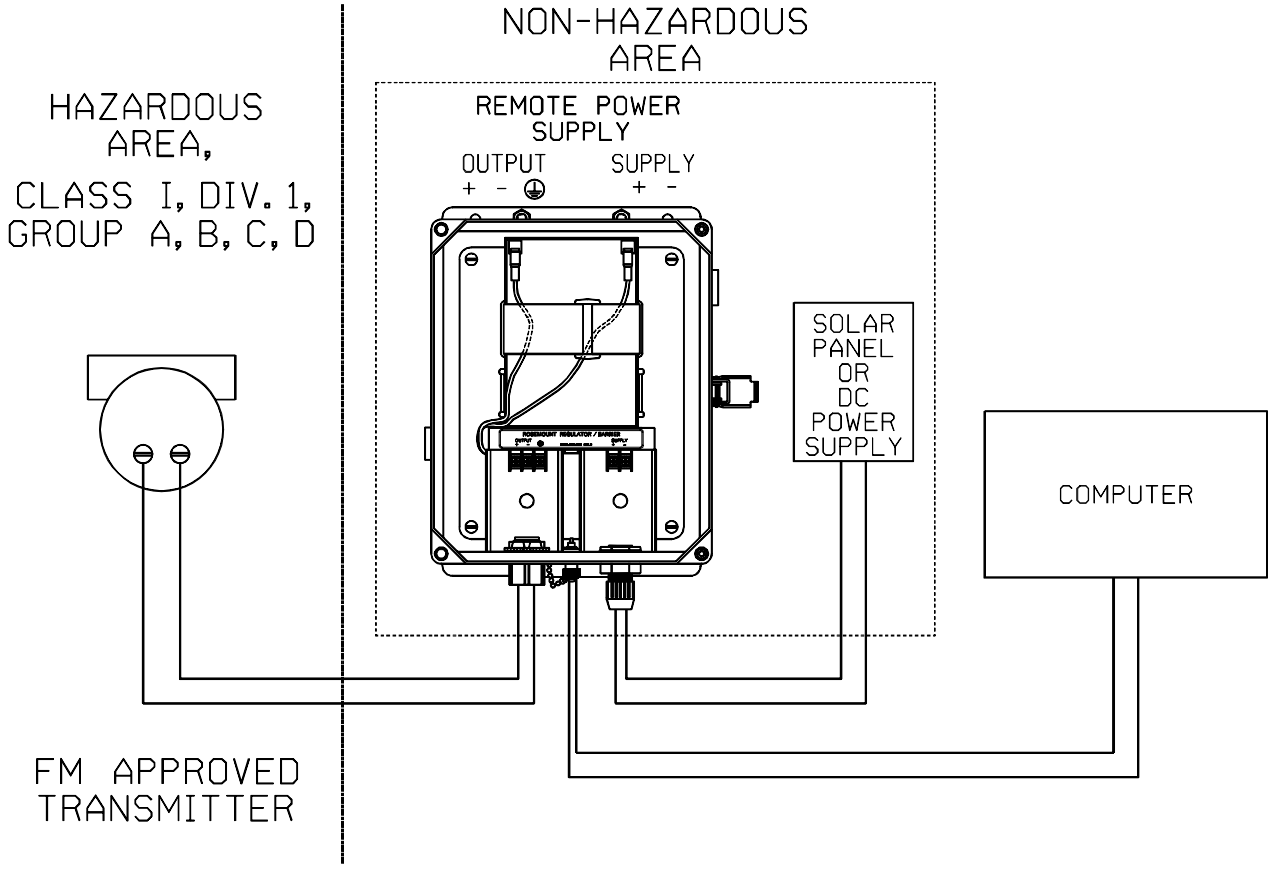
SCALE N/A WT. _____ SHEET 1 OF 3

FORM NO. 60651A-1 REV. C

REVISIONS				
REV	DESCRIPTION	CHG. NO.	APP'D	DATE
E		667373		

CIRCUIT DIAGRAM 1: POWER SUPPLY LOCATED IN NON-HAZARDOUS AREA

REMOTE POWER SUPPLY/BATTERY BACK-UP IS IN A NON-HAZARDOUS AREA AND PROVIDES INTRINSICALLY SAFE OUTPUT FOR CLASS I, DIVISION 1, GROUPS A, B, C, D. MODELS 03095-5000-1011 AND 03095-5000-2001



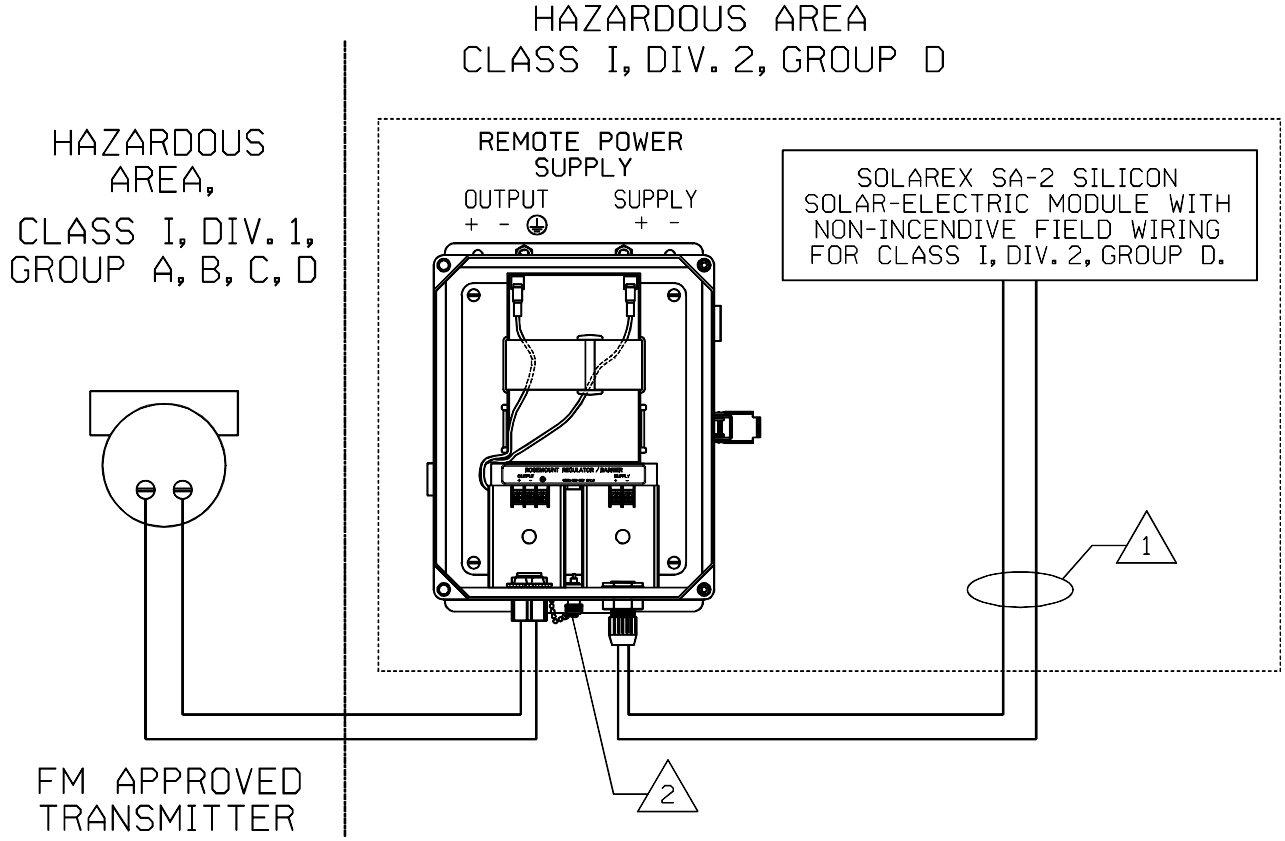
Rosemount Inc. 12001 Technology Drive Eden Prairie, MN 55344 USA	THIS DRAWING WAS CREATED ON CAD. DRAWING IS ARCHIVED ON MAGNETIC TAPE FOR ECO CHANGES.		
DR. S. CAPAUL 11/02/93	SIZE A	FSCM NO	DWG NO. 03095-1030
ISSUED	SCALE N/A	WT.	SHEET 2 OF 3

FORM NO. 60651A-1 REV. C

REVISIONS				
REV	DESCRIPTION	CHG. NO.	APP'D	DATE
E		667373		

CIRCUIT DIAGRAM 2: POWER SUPPLY LOCATED IN A CLASS I, DIV. 2, HAZARDOUS AREA

REMOTE POWER SUPPLY IS IN A CLASS I, DIV. 2, GROUP D HAZARDOUS AREA AND PROVIDES INTRINSICALLY SAFE OUTPUT FOR CLASS I, DIVISION 1, GROUPS A, B, C, D. MODEL Ø3095-5ØØØ-1Ø11



1. NON-INCENDIVE FIELD WIRING INSTALLATION PER NATIONAL ELECTRICAL CODE (NFPA 7Ø) ARTICLE 5Ø1, SECTION 5Ø1-4(b).

CABLE ALLOWANCE	
INDUCTANCE	CAPACITANCE
Ø.5 mH	Ø.19 µF

2. COMPUTER CONNECTION MAY ONLY BE USED WHEN AREA IS KNOWN TO BE NON-HAZARDOUS.

Rosemount Inc.
12001 Technology Drive
Eden Prairie, MN 55344 USA

THIS DRAWING WAS CREATED ON CAD. DRAWING IS ARCHIVED ON MAGNETIC TAPE FOR ECO CHANGES.

DR.	SIZE	FSCM NO	DWG NO.
J. LAABS 5/23/95	A		Ø3095-1Ø3Ø
ISSUED	SCALE N/A	WT.	SHEET 3 OF 3

FORM NO. 60651A-1 REV. C

Appendix C

Model 3095 Explosion-Proof Installation Drawing, CSA
(Drawing Number 03095-1024, Rev. D.)

PROPRIETARY INFORMATION IS CONTAINED HEREIN AND MUST BE HANDLED ACCORDINGLY
BY _____ DATE _____

REVISIONS

REV	DESCRIPTION	CHG. NO.	APP'D	DATE
A	INITIAL RELEASE	656967	**B.L.L.**	10/28/93
B	CHG NOTES 9,11	657643	**M.J.Z.**	1/26/94
C	DEL NOTES 7,10,11 ADD NOTE 12	661305	**K.J.A.**	8/26/94
D	ADD DIV 1,2	662265	**M.J.Z.**	9/6/94

12. INSTALLATION TO BE IN ACCORDANCE WITH CANADIAN ELECTRICAL CODE.

△9. NON-INCENDIVE FIELD WIRING METHODS MAY BE USED FOR CONNECTING THE TEMPERATURE SENSING ASSEMBLY. WHEN USING NON-INCENDIVE FIELD WIRING, THE CONNECTION HEAD AND TEMPERATURE SENSOR ASSEMBLY NEED NOT BE EXPLOSION PROOF, BUT ALL COMPONENTS CONNECTED TO THE TEMP SENSOR CONNECTOR MUST BE CLASSIFIED "SIMPLE APPARATUS". SIMPLE APPARATUS ARE DEVICES WHICH ARE INCAPABLE OF GENERATING OR STORING MORE THAN 1.2V, 0.1A, 25mW, OR 20μJ (RTD's QUALIFY AS SIMPLE APPARATUS).

△8. DIVISION 2 WIRING METHOD.

6. CLASS II INSTALLATIONS MUST USE A CSA APPROVED DUST-IGNITIONPROOF SENSOR.

5. IN AMBIENTS GREATER THAN 40°C, SPRING LOADED TEMPERATURE SENSORS USED WITHOUT AN EXPLOSIONPROOF THERMOWELL MUST BE RATED FOR AT LEAST 85°C.

4. COMPONENTS REQUIRED TO BE APPROVED MUST BE APPROVED FOR GAS GROUP APPROPRIATE TO AREA CLASSIFICATION.

3. ALL CONDUIT THREADS TO BE ASSEMBLED WITH FIVE FULL THREADS MINIMUM.

△2. TRANSMITTER MUST NOT BE CONNECTED TO EQUIPMENT GENERATING MORE THAN 250VAC.

△1. WIRING METHOD SUITABLE FOR CLASS I, DIV 1, ANY LENGTH.

NOTES:

THIS DRAWING WAS CREATED ON CAD. DRAWING IS ARCHIVED ON MAGNETIC TAPE FOR ECO CHANGES.

UNLESS OTHERWISE SPECIFIED DIMENSIONS IN INCHES. REMOVE ALL BURRS AND SHARP EDGES. MACHINE SURFACE FINISH 125

- TOLERANCES -

DECIMALS	FRACTIONS
.X±.1	±1/32
.XX±.02	ANGLES
.XXX±.010	±2°

DO NOT SCALE PRINT

CONTRACT NO.

DR. **Myles Lee Miller** 10/27/93

CHK'D

APP'D. **BEN LOUWAGIE** 10/28/93

APP'D. GOVT.

ROSEMOUNT® Measurement Control Analytical Valves

Rosemount Inc.
12001 Technology Drive
Eden Prairie, MN 55344 USA

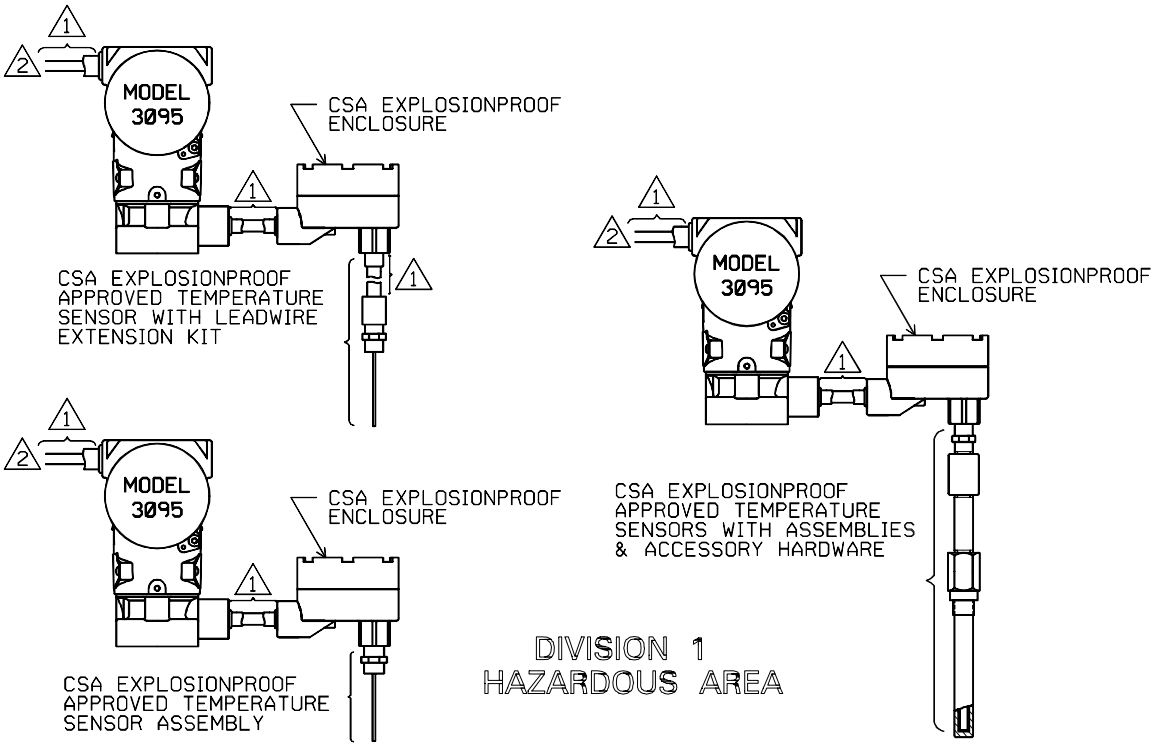
TITLE MODEL 3095
EXPLOSIONPROOF INSTALLATION
DRAWING, CSA

SIZE	FSCM NO	DWG NO.
A		03095-1024

SCALE | WT. _____ | SHEET 1 OF 3

FORM NO. 60651A-1 REV. C

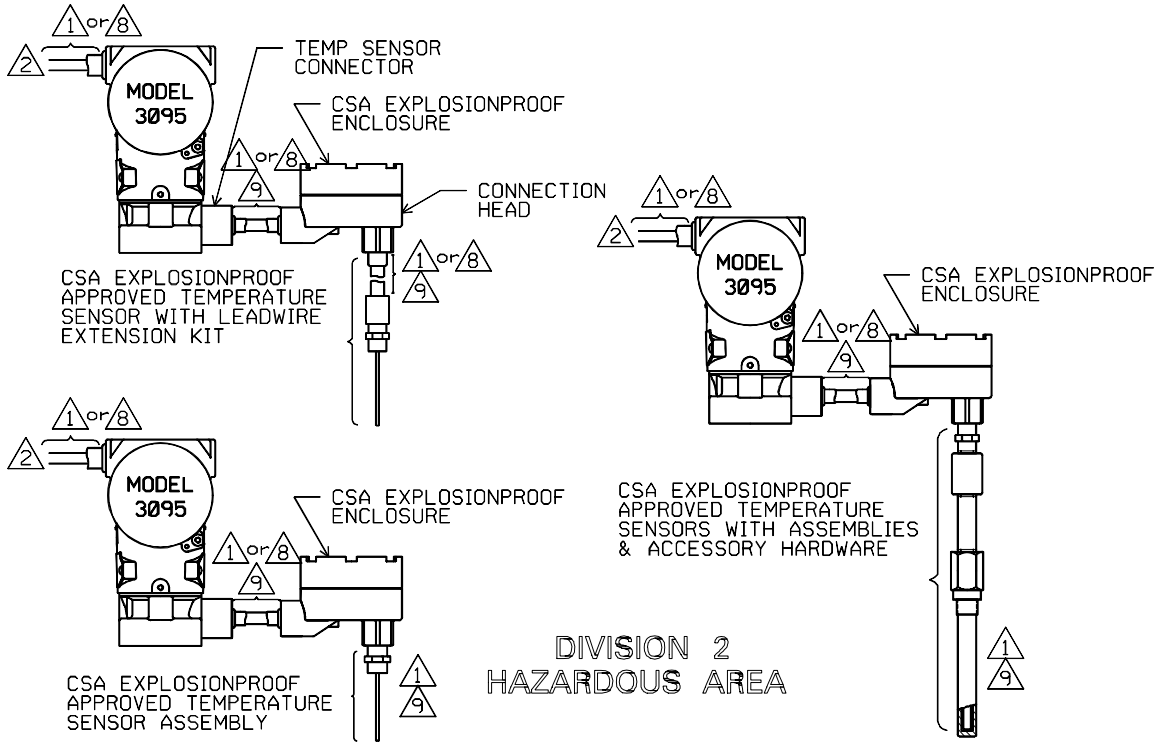
REVISIONS				
REV	DESCRIPTION	CHG. NO.	APP'D	DATE
D		662265		



Rosemount Inc. 12001 Technology Drive Eden Prairie, MN 55344 USA	THIS DRAWING WAS CREATED ON CAD. DRAWING IS ARCHIVED ON MAGNETIC TAPE FOR ECO CHANGES.			
DR. Myles Lee Miller	SIZE A	FSCM NO	DWG NO. 03095-1024	
ISSUED	SCALE N/A	WT. ———	SHEET 2 OF 3	

FORM NO. 60651A-1 REV. C

REVISIONS				
REV	DESCRIPTION	CHG. NO.	APP'D	DATE
D		662265		



Rosemount Inc. 12001 Technology Drive Eden Prairie, MN 55344 USA	THIS DRAWING WAS CREATED ON CAD. DRAWING IS ARCHIVED ON MAGNETIC TAPE FOR ECO CHANGES.		
DR. Myles Lee Miller	SIZE A	FSCM NO	DWG NO. 03095-1024
ISSUED	SCALE N/A	WT. ———	SHEET 3 OF 3

FORM NO. 60651A-1 REV. C

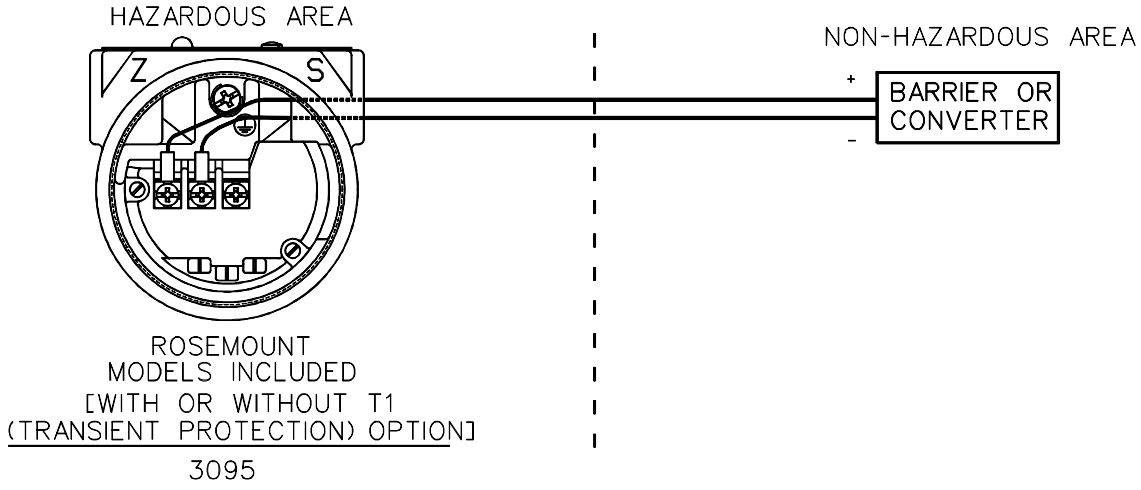
Appendix D

Index of I.S. CSA for 3095
and
Index of I.S. CDA for 03095-5000
(Drawing Numbers 03095-1021 and 03095-1031).

PROPRIETARY INFORMATION IS CONTAINED HEREIN AND MUST BE HANDLED ACCORDINGLY
BY _____ DATE _____

REVISIONS				
REV	DESCRIPTION	CHG. NO.	APP'D	DATE
B	DEL. REF. TO 268	655548	D.E.W.	08/17/93
C	ADD 3095-5000 TO DEVICES	656973	M.L.S.	11/03/93

CSA INTRINSIC SAFETY APPROVALS
CIRCUIT CONNECTION WITH BARRIER OR CONVERTER
Ex ia
INTRINSICALLY SAFE/SECURITE INTRINSEQUE



ROSEMOUNT
MODELS INCLUDED
[WITH OR WITHOUT T1
(TRANSIENT PROTECTION) OPTION]
3095

WARNING - EXPLOSION HAZARD - SUBSTITUTION OF COMPONENTS MAY IMPAIR SUITABILITY FOR CLASS I, DIVISION 2.

AVERTISSEMENT - RISQUE D'EXPLOSION - LA SUBSTITUTION DE COMPOSANTS PEUT RENDRE CE MATERIEL INACCEPTABLE POUR LES EMPLACEMENTS DE CLASSE I, DIVISION 2.

THIS DRAWING WAS CREATED ON CAD. DRAWING IS ARCHIVED ON MAGNETIC TAPE FOR ECO CHANGES.

UNLESS OTHERWISE SPECIFIED DIMENSIONS IN INCHES. REMOVE ALL BURRS AND SHARP EDGES. MACHINE SURFACE FINISH 125

- TOLERANCES -

DECIMALS .X±.1 .XX±.02 .XXX±.010
FRACTIONS ±1/32
ANGLES ±2°

DO NOT SCALE PRINT

CONTRACT NO.

DR. Myles Lee Miller 3/19/93

CHK'D

APP'D. Kevin Voegele 4/8/93

APP'D. GOVT.

ROSEMOUNT® Measurement Control Analytical Valves

Rosemount Inc.
12001 Technology Drive
Eden Prairie, MN 55344 USA

TITLE INDEX OF I.S. CSA FOR 3095

SIZE	FSCM NO	DWG NO.	
A		03095-1021	

SCALE	N/A	WT.	SHEET 1 OF 2

REVISIONS				
REV	DESCRIPTION	CHG. NO.	APP'D	DATE
C		656973		

DEVICE	PARAMETERS	APPROVED FOR CLASS I, DIV.1
CSA APPROVED SAFETY BARRIER	30 V OR LESS 330 OHMS OR MORE 28 V OR LESS 300 OHMS OR MORE 25 V OR LESS 200 OHMS OR MORE 22 V OR LESS 180 OHMS OR MORE	GROUPS A, B, C, D
FOXBORO CONVERTER 2A1-12V-CGB, 2AI-13V-CGB, 2AS-131-CGB, 3A2-12D-CGB, 3A2-13D-CGB, 3AD-131-CGB, 3A4-12D-CGB, 2AS-121-CGB, 3F4-12DA		GROUPS B, C, D
CSA APPROVED SAFETY BARRIER	30 V OR LESS 150 OHMS OR MORE	GROUPS C, D
ROSEMOUNT 03095-5000-1012 03095-5000-2002	19 V OR LESS 200 OHMS OR MORE	GROUPS A, B, C, D

Rosemount Inc. 12001 Technology Drive Eden Prairie, MN 55344 USA	THIS DRAWING WAS CREATED ON CAD. DRAWING IS ARCHIVED ON MAGNETIC TAPE FOR ECO CHANGES.		
DR. Myles Lee Miller	SIZE A	FSCM NO	DWG NO. 03095-1021
ISSUED	SCALE N/A	WT. ———	SHEET 2 OF 2

FORM NO. 60651A-1 REV. C

PROPRIETARY INFORMATION IS CONTAINED HEREIN AND MUST BE HANDLED ACCORDINGLY
BY _____ DATE _____

DASH NO.	DESCRIPTION
-1012	REMOTE POWER SUPPLY
-2002	BACKUP POWER SUPPLY

REVISIONS

REV	DESCRIPTION	CHG. NO.	APP'D	DATE
A	NEW RELEASE	656973	M.L.S.	11/03/93
B	LARGER ENCLOSURE	658396	M.L.S.	02/02/94
C	DEL SHEET 3	661305	K.J.A.	8/26/94
D	ADD ASSOC. EQUIP. VERBAGE	662814	M.J.Z.	10/21/94

03095 REMOTE POWER SUPPLY

OUTPUT PARAMETERS

19 V OR LESS
200 OHMS OR MORE

APPROVED FOR

CLASS I, DIV 1
GROUPS A, B, C, D

THIS DRAWING WAS CREATED ON CAD. DRAWING IS ARCHIVED ON MAGNETIC TAPE FOR ECO CHANGES.

UNLESS OTHERWISE SPECIFIED DIMENSIONS IN INCHES. REMOVE ALL BURRS AND SHARP EDGES. MACHINE SURFACE FINISH 125

- TOLERANCES -

DECIMALS
.X±.1
.XX±.02
.XXX±.010

FRACTIONS
±1/32

ANGLES
±2°

DO NOT SCALE PRINT

CONTRACT NO.

DR. S. CAPAUL 11/02/93

CHK'D

APP'D. M. SCHLESINGER 11/03/93

APP'D. GOVT.

ROSEMOUNT® Measurement Control Analytical Valves

Rosemount Inc.
12001 Technology Drive
Eden Prairie, MN 55344 USA

TITLE INDEX OF I.S. CSA FOR 03095-5000

SIZE A | FSCM NO | DWG NO. 03095-1031

SCALE N/A | WT. _____ | SHEET 1 OF 2

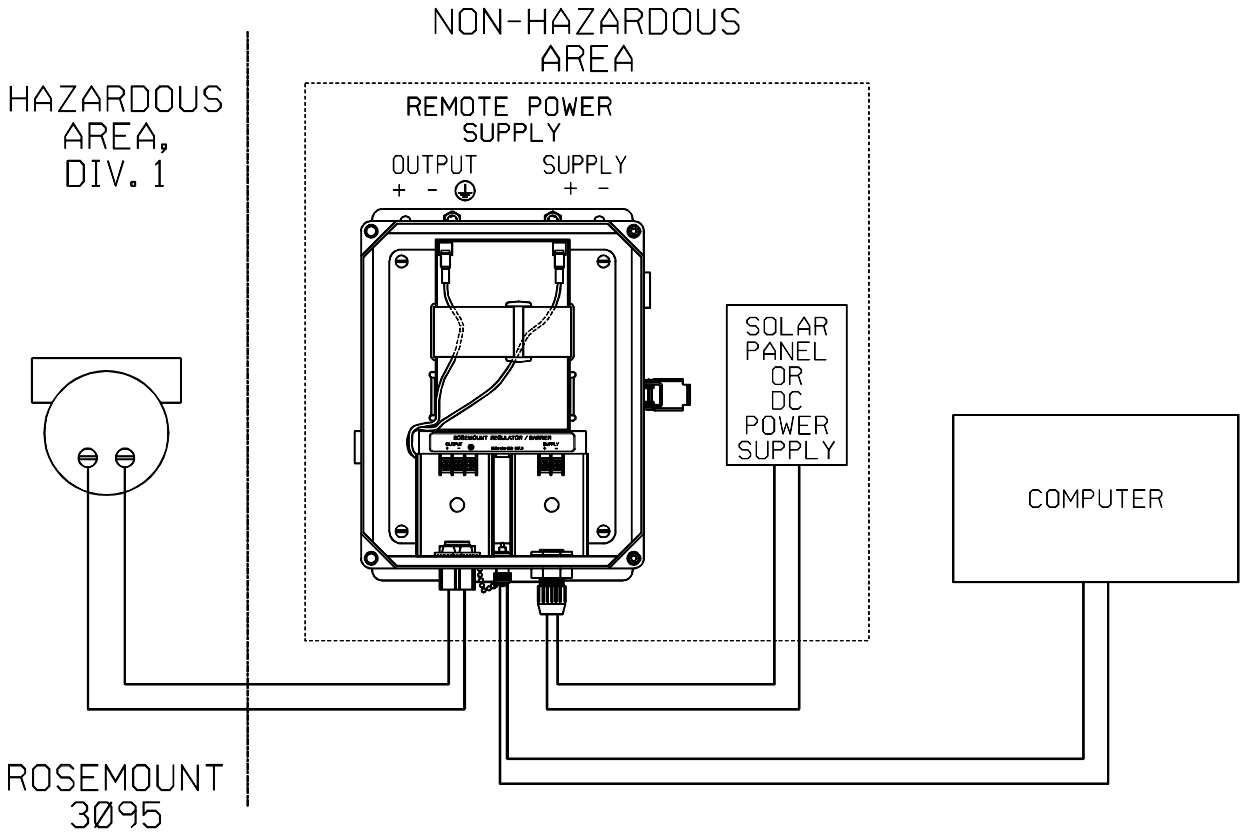
FORM NO. 60651A-1 REV. C

REVISIONS				
REV	DESCRIPTION	CHG. NO.	APP'D	DATE
D		662814		

CSA INTRINSIC SAFETY APPROVALS
[Exia]
ASSOCIATED EQUIPMENT/APPAREILLAGE CONNEXE

CIRCUIT DIAGRAM 1

REMOTE POWER SUPPLY IS IN NON-HAZARDOUS AREA
AND PROVIDES REQUIRED BARRIER
MODELS Ø3095-5000-1012 AND Ø3095-5000-2002



Rosemount Inc. 12001 Technology Drive Eden Prairie, MN 55344 USA	THIS DRAWING WAS CREATED ON CAD. DRAWING IS ARCHIVED ON MAGNETIC TAPE FOR ECO CHANGES.			
DR. S. CAPAUL 11/02/93	SIZE A	FSCM NO	DWG NO. Ø3095-1031	
ISSUED	SCALE N/A	WT. ———	SHEET 2 OF 2	

FORM NO. 60651A-1 REV. C

Appendix E Software Error Messages

This appendix identifies errors messages that might occur while using the Model 3095FT User Interface Software.

COMMON ERROR MESSAGES

ERROR: The following data has not yet been entered:_____.

The data item described by the message is missing. Enter the data using the “Configuration” menu.

ERROR: There is no transmitter configuration to send

You attempted to send a configuration to the transmitter but there was no current configuration. Receive a configuration from the transmitter or read a configuration file before attempting to send.

ERROR: The connected device is not a Model 3095FT

The manufacturer code and transmitter type codes returned by the multi-drop device do not match those of a Rosemount Model 3095FT. The User Interface Software will only connect to a Rosemount Model 3095FT.

ERROR: Address must be between 0 and 15 inclusive

You attempted to enter a transmitter address outside of this range in the Transmitter, Multidrop screen.

ERROR: A Calculation Method must be selected in Flow Parameters

You attempted to configure gas properties but the calculation method has not yet been defined in the flow parameters configuration.

ERROR: This Calculation Method is not defined yet

You attempted to configure gas properties but the calculation method has not yet been defined in the flow parameters configuration.

ERROR: Cannot download while transmitter on-line (use Maintenance/Maint. Mode to change mode)

The Model 3095FT Transmitter must be in maintenance mode before a new configuration can be downloaded.

ERROR: Password is not recognized - Security Level unchanged

SECURITY ERRORS

An invalid security level password was entered for the currently connected Model 3095FT transmitter. Try again.

If you have forgotten your security level 1 or 2 password, then go to security level 3 and modify the appropriate lower level password.

If you have forgotten your security level 3 password, then contact Rosemount.

CALCULATION ERRORS

ERROR: CD Calculation: Diameter too small

The nominal pipe diameter must be greater than or equal to 2.00 inches.

ERROR: CD Calculation: Calculation exceeds valid beta range

The beta value must be within the range 0.1000 to 0.7500 inclusive.

ERROR: CD Calculation: Not enough memory to do calculation

An attempt to allocate memory from the heap failed. Shut down some other applications.

ERROR: Bad Gross method calculation

An error occurred in one of the AGA-8 Gross Calculation functions.

ERROR: This Calculation method is not supported at this time

The calculation type has not been configured or has not been defined. Ensure that you have selected a calculation method using the Flow Parameter Configuration dialog.

Error: Coefficient Calculation divide by Zero Error

Internal programming error. Division by zero occurred while calculating a coefficient of discharge.

Error: Coefficient Calculation divide by Bad Dimension Error

Internal programming error. An incorrect dimension was passed.

DATA ENTRY RANGE CHECK ERRORS

The following error messages are issued if range checks fail during data entry or coefficient calculations.

ERROR: Meter tube bore must be between 1.75 and 99 inches inclusive

ERROR: Orifice bore must be greater than 0 and less than 99 inches

ERROR: Atmospheric pressure must be greater than zero

ERROR: Real Gas Relative Density must be between 0.554 and 0.900 inclusive

ERROR: Heating Value must be between 477 and 1200 inclusive

ERROR: CO2 mole % must be between 0 and 30 inclusive

ERROR: H2 mole % must be between 0 and 10 inclusive

ERROR: CO mole % must be between 0 and 3 inclusive

ERROR: N2 mole % must be between 0 and 50 inclusive

ERROR: Isentropic Exponent must be between 1.0 and 2.0 inclusive

ERROR: Gas Viscosity must be between 5.9 and 7.9 (x 10E-6) inclusive

ERROR: Qm must be between 7700 and 7800 inclusive

ERROR: There is no transmitter configuration to send

DATE CHECKING

Standard and complete range checks are performed on all date entry fields. The date range accepted by the User Interface Software is:

January 1, 1970 00:00:00 to December 31, 2035 23:59:59

The following error messages are possible:

ERROR: Date Format is YY/MM/DD (Too many days are entered for the given month)

ERROR: The entered hours must be between 0 and 23

ERROR: The entered minutes must be between 0 and 59

ERROR: The entered seconds must be between 0 and 59

ERROR: Date Format is YY/MM/DD (Entered month is not valid)

ERROR: The year must be between 1970 and 2035

DATA VIEW SPECIFIC MESSAGES

The following messages are only issued by the Data View logging subsystem:

ERROR: There is no more data in the log

An end of data condition occurred while reading the log.

Either the log is empty or less data was available than previously indicated by log seek operations. The latter condition may indicate that non-sequential sequence numbers exist on the log records.

ERROR: There are no log records within the specified date range

Log seeks to the specified start and end times indicate that the transmitter does not contain any log records within the requested date range.

ERROR: Start time must be less than or equal to end time

The Data View subsystem expects the start time to be less than or equal to the end time. All log data is retrieved from the transmitter and displayed in time ascending order.

FILE SYSTEM ERRORS

ERROR: This file could not be opened for reading

The specified Model 3095FT configuration file could not be opened.

Possible Causes:

- the pathname you specified does not exist
- the pathname you specified is greater than 200 characters long
- a hardware error has occurred on the target disk(ette)

ERROR: This file appears to be corrupt

An invalid record format was encountered while reading the specified Model 3095FT configuration file.

All configuration file records must contain three valid fields separated by spaces or tab characters. An example of a valid Model 3095FT configuration file record is:

```
Dp_cutoff          VALTYPE_FLOAT8          2.500000e-001
```

Possible Causes:

- you made an error while manually editing a configuration file
- the disk media is corrupt

ERROR: This file contains an unknown data type

An unknown data type was encountered while reading a Model 3095FT configuration file into the data dictionary. Possible dictionary data types are:

VALTYPE_UNDEFINED, VALTYPE_UNKNOWN, VALTYPE_BOOL,

VALTYPE_CHAR, VALTYPE_UINT1, VALTYPE_UINT2, VALTYPE_UINT4,

VALTYPE_INT2, VALTYPE_INT4, VALTYPE_FLOAT4, VALTYPE_FLOAT8,

VALTYPE_STRING

ERROR: This file contains an unsupported data type

A dictionary data type not supported by the Model 3095FT User Interface Software was encountered while reading a model 3095FT configuration file into the data dictionary. Supported dictionary data types are:

VALTYPE_CHAR, VALTYPE_UINT1, VALTYPE_UINT2, VALTYPE_UINT4,

VALTYPE_INT2, VALTYPE_INT4, VALTYPE_FLOAT4, VALTYPE_FLOAT8,

VALTYPE_STRING

ERROR: This file could not be opened for writing

The Model 3095FT configuration file could not be saved to the filename you specified.

Possible Causes:

- the diskette is write-protected
- the pathname you specified does not exist
- the pathname you specified is greater than 200 characters long
- a hardware error has occurred on the target disk(ette)

HART GENERAL COMMUNICATION ERRORS

ERROR: No response to HART Command

An attempt to communicate with the Model 3095FT transmitter using a previously opened slave address has failed after three(3) retry attempts.

Possible Causes:

- the physical connection to the device is loose or broken
- the Model 3095FT transmitter has been powered off or is no longer responding

ERROR: No response from HART device

An attempt to open a connection to a HART device at the specified short address has failed after three(3) retry attempts.

Possible Causes:

- the multi-drop address which you specified does not exist
- the physical connection to the Model 3095FT transmitter is loose or broken
- the Model 3095FT transmitter is powered off or is not responding

ERROR: HART experienced a hardware failure

The HART device driver detected a UART initialization failure.

Possible Causes:

- a hardware failure has occurred on the PC's COM port
- a device conflict exists with the PC's COM port

ERROR: HART device driver failed

The HART device driver failed. Contact Rosemount.

ERROR: HART device was not found

A session could not be established with the HART communications driver software.

Possible Causes:

- the "HARTDEV.SYS" driver has not been installed or has been installed incorrectly A valid "device = " statement for the HART driver must appear in your PC's "config.sys" file. An example of a valid configuration for most PCs using port COM1 is:

  device =c:\HARTDEV.SYS 3F8 4 A

ERROR: HART did not receive a transmit message response

An internal programming error exists in the HART driver or the Model 3095FT User Interface Software.

ERROR: HART did not receive a confirmation message response

An internal programming error exists in the HART driver or the Model 3095FT User Interface Software.

ERROR: HART Reply was not expected length

The response message length does not equal the expected message length based on the request “byte count” field and the response code is zero(0).

Possible Causes:

- the response message was corrupted and all other error checks (e.g. - LRC) failed

HART RESPONSE MESSAGES

The following messages are issued if bit 7 of the response code = 1 and all retry attempts have failed. These messages correspond to response code bits 0 through 6.

ERROR: HART Undefined Response Error

ERROR: HART Buffer Overflow

ERROR: HART Time Out

ERROR: HART Longitudinal Parity Error

ERROR: HART Framing Error

ERROR: HART Overrun Error

ERROR: HART Parity Error

The following messages are issued if the response code is non-zero and bit 7 of the response code = 0 and all retry attempts have failed. These messages correspond to response code bits 4 through 6.

ERROR: HART Transmitter Fault

ERROR: HART Transmitter Busy

ERROR: HART Command Not Supported

HART COMMAND SPECIFIC ERRORS

This section lists error responses returned by the Model 3095FT flow transmitter. These error responses are specific to the HARTcommand being executed. If the Model 3095FT Transmitter returns an unexpected error response, then the following error message is issued:

ERROR: Command Specific HART Err Response code =

General Errors

The following errors are used by various HART commands. The User Interface Software uses a generalized mapping within the common communications process to generate these messages.

ERROR: Illegal Parameter Index

The User Interface Software sent an invalid parameter index to the transmitter for the requested HART command.

ERROR: Incorrect Byte count

The User Interface Software sent an invalid request byte count to the transmitter for the requested HART command.

ERROR: Internal Software Error: call Rosemount

The Model 3095FT transmitter encountered a software error while attempting to read or write an indexed flow parameter.

ERROR: Warning: The Sensor Module appears to be disconnected

The sensor module appears to be disconnected.

ERROR: Write protect switch on - This action is not allowed

An attempt was made to write a value to the transmitter but the write protect switch was on.

Specific Errors

The following errors are very specific to individual HART commands and dependent on the function of the command being executed. The User Interface Software maps these exception responses within the individual command functions of the program.

Command 6 - Write Transmitter (short) Address

ERROR: Illegal New Address

Commands 144 & 145 - Write Sensor Trim

ERROR: Illegal Units Code
ERROR: Parameter Too High
ERROR: Parameter Too low
ERROR: Process Too High
ERROR: Process Too Low
ERROR: Excess Correction
ERROR: Span Too Small

Commands 160,161,162,163 - Data Logging Commands

ERROR: Illegal Log Code

Command 173 - Write PVs 'default' (pre-determined) Values

ERROR: Burst Mode not supported

Command 177 - Write Indexed Flow Parameter

ERROR: Flash EEPROM burn fail
ERROR: Parameter is Read Only

Command 184 - Write Damping

ERROR: Damping Value too large
ERROR: Negative Damping Value not allowed
ERROR: Damping set as near as possible to entered value

Appendix F Flow-Cal™ Import Information

This appendix explains how to import Model 3095FT logged data into Flow-Cal. Flow-Cal is a software package developed by Coastal Flow Measurement Inc., which can be purchased by contacting Coastal Flow.

Because Coastal Flow provides a Flow-Cal manual with the software and the Flow-Cal software is subject to revision, the following information is only a broad outline of the steps to import logged data into the Flow-Cal package. For more detailed information, refer to the Flow-Cal manual.

NOTE
The Model 3095FT audit trail should be configured to match Flow-Cal requirements. The logging interval should be set to either 15 or 60 minutes (see page 4-22), and the logged variables should at minimum include the API required variables (see page 4-23).

IMPORT OUTLINE

Before importing data into Flow-Cal, the following files must be in the same DOS directory entitled *filename*.log, where *filename* is the name of the software tag:

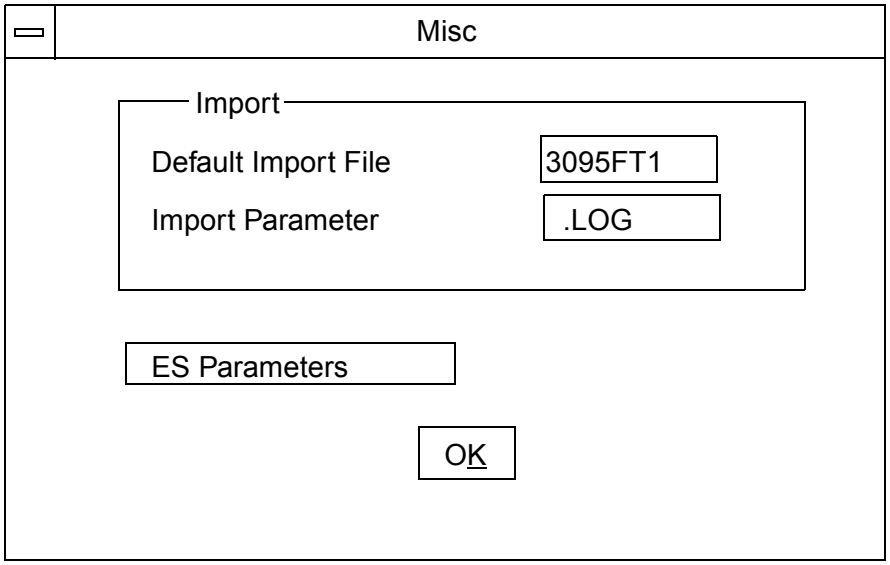
iyymmdd.var	Variable log file (See the Save to Archive procedure on page 4-47.)
iyymmdd.evt	Event log file (See the Save to Archive procedure on page 4-47.)
iyymmdd.cfg	Configuration file (See the Collect Configuration Log procedure on page 4-47.)

Where:

i = interval	D (daily), W (weekly), or M (monthly)
yy = year	(for example, 95)
mm = month	(01–12)
dd = day	(01–31)

1. Start the Flow-Cal software.
2. Login with a valid password.
3. Select Admin, System, then set up the system information. (Suggestion: click List).
4. Select Admin, Station, then set up the station information. (Suggestion: click List).

5. Click Edit, then click Misc to display the following screen:



6. Enter "*filename*" into the Default Import File, enter ".LOG" into the Import Parameter box, then click OK.
7. Select File, Import, Station, then select the station number from the pick list, then click OK.

Appendix G

Model 3095FT Flow Transmitter HART Commands

This appendix identifies the list of HART commands available for the Model 3095FT HART Flow Transmitter.

For additional information concerning these commands, refer to the Model 3095FT HART Master Document, Document Number D9400005.

TABLE G-1. Model 3095FT Flow Transmitter HART Commands.

HART Command No.	BYTCNT	RESP BYTCNT	Description	HART Master Document Location
00 ($00)	00	14 ($0E)	identify transmitter	sec. 3.0, pg. 17
01 ($01)	00	07	read primary variable	sec. 5.0, pg. 63
02 ($02)	00	10 ($0A)	read current and% of range	sec. 5.0, pg. 64
03 ($03)	00	26 ($1A)	read all dynamic variables and primary variable current	sec. 5.0, pg. 65
06 ($06)	01	03	write transmitter (short) address	sec. 3.0, pg. 18
11 ($0B)	06	14 ($0E)	tag-addressed command 0	sec. 3.1, pg. 21
12 ($0C)	00	26 ($1A)	read user-entered message	sec. 3.2, pg. 22
13 ($0D)	00	23 ($17)	read user-entered tag, descriptor, date	sec. 3.1, pg. 20
14 ($0E)	00	18 ($12)	read sensor info	sec. 5.0, pg. 67
15 ($0F)	00	19 ($13)	read output info	sec. 5.0, pg. 68
16 ($10)	00	05	read transmitter serial number	sec. 3.2, pg. 24
17 ($11)	24 ($18)	26 ($1A)	write user-entered message	sec. 3.2, pg. 22
18 ($12)	21 ($15)	23 ($17)	write user-entered tag, descriptor, date	sec. 3.1, pg. 19
19 ($13)	03	05	write transmitter serial number	sec. 3.2, pg. 24
35 ($23)	09	11 ($0B)	write primary variable range values	sec. 4.5, pg. 50
38 ($26)	00	02	reset configuration changed flag	sec. 4.0, pg. 27
41 ($29)	00	02	self test (run a Cyclic Redundancy Check and display all segments of LCD)	sec. 8.0, pg. 77
42 ($2A)	00	02	master reset (exit from on line maint. mode)	sec. 4.9.2, pg. 62 sec. 8.0, pg. 77
48 ($30)	00	08	read additional transmitter status	sec. 8.0, pg. 79
108 ($6C)	01	03	set burst mode command	sec. 5.0, pg. 71
109 ($6D)	01	03	enter/exit burst mode	sec. 5.0, pg. 72
110 ($6E)	00	22 ($16)	read all dynamic variables	sec. 5.0, pg. 73
128 ($80)	00	18 ($12)	read materials of construction	sec. 3.2, pg. 26

TABLE G-1. Model 3095FT Flow Transmitter HART Commands.

HART Command No.	BYTCNT	RESP BYTCNT	Description	HART Master Document Location
129 ($81)	08	10 ($0A)	write materials of construction	sec. 3.2, pg. 25
144 ($90)	06	08	write sensor trim slope point	sec. 4.3, pg. 44
145 ($91)	06	08	write offset trim slope point	sec. 4.3, pg. 45
152 ($98)	01	12 ($0C)	read sensor trim points	sec. 4.3, pg. 46
159 ($9F)	01	03	use ‘default’ (factory set) values	sec. 4.3, pg. 46
160 ($A0)	01	03	start or stop data logging	sec. 4.9.1, pg. 58
161 ($A1)	01	03	clear logging memory	sec. 8.0, pg. 77
162 ($A2)	05	07	set start of sequential log read	sec. 6.0, pg. 74
163 ($A3)	04	7 <= n <= 240	read sequential log data	sec. 6.0, pg. 75
164 ($A4)	00	08	read present time and date	sec. 4.8, pg. 56
165 ($A5)	06	08	write present time and date	sec. 4.8, pg. 56
167 ($A7)	01	03	write user message code to event log	sec. 3.2, pg. 23
170 ($AA)	00	02	start on line maint. mode with PVs at ‘default’ value	sec. 4.9.2, pg. 60
171 ($AB)	00	02	start on line maint. mode with 1 sec. avg. PVs	sec. 4.9.2, pg. 60
172 ($AC)	15 ($0F)	17 ($11)	start on line maint. mode with user-entered PVs	sec. 4.9.2, pg. 61
173 ($AD)	15 ($0F)	17 ($11)	write PVs ‘default’ (pre-determined) values	sec. 4.5, pg. 50
174 ($AE)	00	17 ($11)	read PVs ‘default’ (pre-determined) values	sec. 4.5, pg. 51
176 ($B0)	01	03 + n	read indexed flow parameter	sec. 2.0, pg. 13
177 ($B1)	01 + n	03 + n	write indexed flow parameter	sec. 2.0, pg. 15
178 ($B2)	00	17 ($11))	read sensor full scale values	sec. 5.0, pg. 69
179 ($B3)	00	10 ($0A)	read compressibility and discharge coeff	sec. 5.0, pg. 70
183 ($B7)	01	07	read indexed damping value	sec. 4.4, pg. 48
184 ($B8)	05	07	write damping	sec. 4.4, pg. 47
185 ($B9)	03	05	write HART® units codes for PVs	sec. 4.0, pg. 27

S

T

U

V

W

Rosemount Inc.
8200 Market Boulevard
Chanhassen, MN 55317 USA
Tel 1-800-999-9307
Fax (612) 949-7001

www.rosemount.com

00809-0100-4015, Rev. B1

ROSEMOUNT®

FISHER-ROSEMOUNT™ Managing The Process Better.™