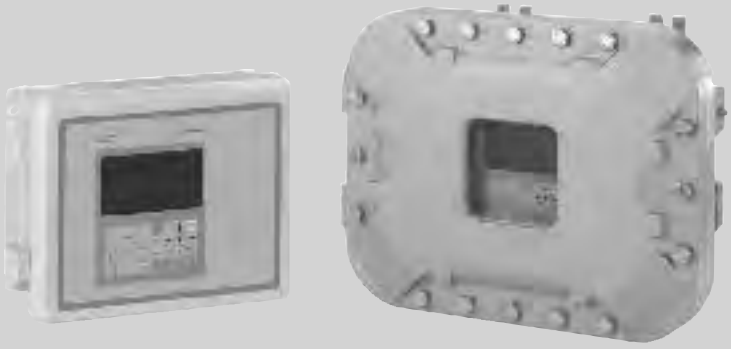
Ultrasonic flowmeters

SITRANS FUS1010 IP65 NEMA 4X & IP66 NEMA 7
Gross Volume 7ME353x-2, x=0,3

SITRANS FUH1010 IP65 NEMA 4X & IP66 NEMA 7
Standard Volume 7ME360x-4, x=0,3
Precision Volume 7ME360x-3, x=0,3
Interface Detector 7ME360x-1, x=0,3

SITRANS FUE1010 IP65 NEMA 4X
Gross Volume 7ME3500

Quick Start - January 2013



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Ultrasonic Flowmeters FUS1010 IP65 NEMA 4X & IP66 NEMA 7 Quick Start

Operating Instructions

01/2013

A5E03086486-AC

Legal information

Warning notice system

This manual contains notices you have to observe in order to ensure your personal safety, as well as to prevent damage to property. The notices referring to your personal safety are highlighted in the manual by a safety alert symbol, notices referring only to property damage have no safety alert symbol. These notices shown below are graded according to the degree of danger.

⚠ DANGER

indicates that death or severe personal injury **will** result if proper precautions are not taken.

⚠ WARNING

indicates that death or severe personal injury **may** result if proper precautions are not taken.

⚠ CAUTION

indicates that minor personal injury can result if proper precautions are not taken.

NOTICE

indicates that property damage can result if proper precautions are not taken.

If more than one degree of danger is present, the warning notice representing the highest degree of danger will be used. A notice warning of injury to persons with a safety alert symbol may also include a warning relating to property damage.

Qualified Personnel

The product/system described in this documentation may be operated only by **personnel qualified** for the specific task in accordance with the relevant documentation, in particular its warning notices and safety instructions. Qualified personnel are those who, based on their training and experience, are capable of identifying risks and avoiding potential hazards when working with these products/systems.

Proper use of Siemens products

Note the following:

⚠ WARNING

Siemens products may only be used for the applications described in the catalog and in the relevant technical documentation. If products and components from other manufacturers are used, these must be recommended or approved by Siemens. Proper transport, storage, installation, assembly, commissioning, operation and maintenance are required to ensure that the products operate safely and without any problems. The permissible ambient conditions must be complied with. The information in the relevant documentation must be observed.

Trademarks

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Disclaimer of Liability

We have reviewed the contents of this publication to ensure consistency with the hardware and software described. Since variance cannot be precluded entirely, we cannot guarantee full consistency. However, the information in this publication is reviewed regularly and any necessary corrections are included in subsequent editions.

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Order number: A5E03086486
℗ 02/2013 Technical data subject to change

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Introduction 1

1.1 Introduction

This Quick Start Guide is for the Siemens SITRANS FUS1010 IP65 (NEMA 4X), FUH1010 IP65 (NEMA 4X), FUE1010 IP65 (NEMA 4X) Dual Channel/Path flow meters and the FUH1010 IP65 (NEMA 4X) Interface Detector. It illustrates a typical setup using D-Series sensors in the Reflect Mode (for Direct Mode see Operating Instruction manual). These procedures can also be applied to other single and multi-channel models as well.

To use the Siemens Si-Ware program to assist in flow meter installation download the program at [http://s13.me/ns/cv].

Note

This Quick Start Guide applies to the following FUS1010, FUH1010 and FUE1010 IP65 (NEMA 4X) operating systems: Version 3.03.00 and later / Version 5.03.00 and later.

1.2 Items supplied

- SITRANS FUS1010 IP65 NEMA 4X & IP66 NEMA 7 Transmitter
- SITRANS F Literature CD
- Quick Start Guide

Note

For additional items refer to your packing slip.

1.3 Safety Notes

Quick Start Safety Information for Hazardous Areas

⚠ DANGER

Explosion Hazard

Death, serious injury or property damage will result if unauthorized and unqualified personnel tamper with equipment.

Restrict use and repair to qualified personnel.

⚠ DANGER

Explosion Hazard

Death or severe personal injury and/or equipment and property damage will result if proper Hazardous (Classified) Locations installation precautions are not taken.

Restrict use and repair to qualified personnel.

⚠ DANGER

Explosion Hazard

The use of unauthorized parts in the repair of the equipment, tampering by unqualified personnel, or operation with the cover open in a Hazardous (Classified) Location will result in dangerous conditions which will cause death, serious injury, and/or equipment and property damage.

Follow all safety instructions contained or referenced herein.

⚠ DANGER

Explosion Hazard

Death or severe personal injury and/or equipment and property damage will result due to improper installation or use of this equipment when located in a Hazardous (Classified) Location.

- Install as directed.
- Disconnect power source before servicing.
- Keep cover closed when equipment is operating.

⚠ WARNING

Qualified personnel

This flowmeter system may only be set up and used in conjunction with this Quick Start and the instructions on the electronic media provided. Installation, maintenance and operation of the flowmeter system may only be performed by qualified personnel. Within the context of this Quick Start, qualified persons are defined as persons who have the skills and knowledge related to the construction and operation of the electrical equipment and installations and have received safety training to recognize and avoid the potentially explosive hazards involved.

Qualified personnel possess the following qualifications

1. Is trained and authorized to energize, de-energize, clear, ground and tag circuits and equipment in accordance with established safety practices.
2. Is trained in the proper care and use of protective equipment such as rubber gloves, hard hat, safety glasses or face shields, flash clothing, etc., in accordance with established safety practices.
3. Is trained in rendering first aid

Note

This Quick Start does not purport to cover all details or variations in equipment, or to provide for every possible contingency to be met in connection with installation, operation or maintenance. Should further information be desired or should particular problems arise, which are not covered sufficiently for the purchaser's purposes, the matter should be referred to the local Siemens sales office (www.siemens.com). The contents of this Quick Start shall not become part of or modify any prior or existing agreement, commitment or relationship. The sales contract contains the entire obligation of Siemens. The warranty contained in the contact between the parties is the sole warranty of Siemens. Any statements contained herein do not create new warranties or modify the existing warranty.

Quick Start Safety Information for Hazardous Areas

Note

Ratings under this heading apply to specific model families

Check Your Model Number:
FUE1010 7ME3500, FUH1010 7ME3600 and FUS1010 7ME3530 only

FM-CSA installation

Read, understand and follow all safety instructions on the electronic media provided. This equipment is rated for use in hazardous (classified) locations as stated below and must be installed according to the 1010-304 installation drawing provided on the media. Failure to install the equipment in the prescribed manner will result in unsafe operation. Follow all local jurisdictional safety codes when operating this equipment. When properly installed the equipment meets the following FM – CSA ratings.

Transmitter

- Intrinsically safe connections Class I and II, Division 1, Groups A, B, C, D, E, F and G;
- Nonincendive for Class I, Division 2, Groups A, B, C and D;
- Suitable for Class II Division 2, Groups E, F and G outdoor (Type 4X), Class III (CSA only)
- Temperature code T5 at an ambient of 40°C

Sensors

- Intrinsically safe Class I and II, Division 1, Groups A, B, C, D, E, F and G;
- Nonincendive for Class I, Division 2, Groups A, B, C and D;
- Suitable for Class II, Division 2, Groups B, E, F and G outdoor (Type 4X), Class III (CSA only)
- Temperature code T6 at an ambient of 40°C

ATEX installation

Read, understand and follow all safety instruction on the electronic media provided. This equipment complies with Directive 94/9/EC and is rated for use in potentially explosive atmospheres. The equipment markings are shown and explained below. Equipment must be installed according to the 1010-389 installation drawing provided on the media. Failure to install the equipment in the prescribed manner will result in unsafe operation. Follow all regional safety laws when operating this equipment. When properly installed the equipment meets the following ATEX ratings as stated in EC-Type Examination Certificate KEMA03ATEX1134

Transmitter Markings and Explanations

- ⟨Ex⟩II (1) G [Ex ia] IIC – Transmitter located in the non-hazardous area with intrinsically safe circuits of category Ex ia, which can be connected to Category 1 Sensors
- ⟨Ex⟩II 3 (1) G Ex nC [ia] IIC T5 – Category 3 Transmitter located in Zone 2 explosive atmosphere with intrinsically safe circuits of category Ex ia, which can be connected to Category 1 Sensors in Zone 0
- IP65 – Ingress protection against solid bodies, rating of dust-tight and against liquid, rating of water jets

Sensors Markings and Explanations

- ⟨Ex⟩II 1 G Ex ia IIC T5 – Category 1 Sensors located in Zone 0 explosive atmosphere with intrinsically safe circuits of category Ex ia for use in potentially explosive atmosphere containing gases
- IP65 – Ingress protection against solid bodies, rating of dust-tight and against liquid, rating of water jets

Quick Start Safety Information for Hazardous Areas

Note

Ratings under this heading apply to specific model families

Check Your Model Number:
FUS1010 7ME3533, FUH1010 7ME3603 only

FM-CSA installation

Read, understand and follow all safety instruction on the electronic media provided. This equipment is rated for use in hazardous (classified) locations as stated below and must be installed according to the 1010-443 installation drawing provided on the media. Failure to install the equipment in the prescribed manner will result in unsafe operation. Follow all local jurisdictional safety codes when operating this equipment. When properly installed the equipment meets the following FM – CSA ratings:

Transmitter

- Explosionproof for Class I, Division1, Groups B, C, D;
- Dust-ignitionproof for Class II, Division 1, Groups E, F and G
- Intrinsically safe connections for Class I and II, Division 1, Groups A, B, C, D, E, F and G;
- Nonincendive for Class I, Division 2, Groups A, B, C and D;
- Suitable for Class II, Division 2, Groups B, E, F and G outdoor (Type 4X), Class III (CSA only)

Sensors

- Intrinsically safe Class I and II, Division 1, Groups A, B, C, D, E, F and G;
- Nonincendive for Class I, Division 2, Groups A, B, C and D;
- Suitable for Class II, Division 2, Groups B, E, F and G outdoor (Type 4X), Class III (CSA only)
- Temperature code T6 at an ambient of 40°C

ATEX installation

Read, understand and follow all safety instruction on the electronic media provided. This equipment is rated for use in explosive atmospheres as stated below and must be installed according to the 1010-464 installation drawing provided on the media. Failure to install the equipment in the prescribed manner will result in unsafe operation. Follow all regional safety laws when operating this equipment. When properly installed the equipment meets the following ATEX ratings as stated in EC-Type Examination Certificate KEMA03ATEX1134

Transmitter Markings and Explanations

- ⟨Ex⟩II (1) G [Ex ia] IIC– Transmitter located in the non-hazardous area with intrinsically safe circuits of category Ex ia, which can be connected to Category 1 Sensors for use in potentially explosive atmosphere containing gases
- ⟨Ex⟩II 3 (1) G Ex nC [ia] IIC T5 (Tamb = 0° To + 60°C) – Category 3 Transmitter located in Zone 2 explosive atmosphere with intrinsically safe circuits of category Ex ia, which can be connected to Category 1 Sensors in Zone 0 for use in potentially explosive atmosphere containing gases
- ⟨Ex⟩II 2 (1) G Ex d [ia IIC] IIB T5 (Tamb = 0° To + 50°C) – Category 2 Transmitter located in Zone 1 explosive atmosphere with intrinsically safe circuits of category Ex ia, which can be connected to Category 1 Sensors for use in potentially explosive atmosphere containing gases (Model families FUG1010 7ME3612 and 7ME3613 only)
- ⟨Ex⟩II 2 (1) G Ex d [ia IIC] IIB+H2 T5 (Tamb = 0° To + 50°C) – Category 2 Transmitter located in Zone 1 explosive atmosphere with intrinsically safe circuits of category Ex ia, which can be connected to Category 1 Sensors for use in potentially explosive atmosphere containing gases
- IP66 – Ingress protection against solid bodies, rating of dust-tight and against liquid, rating of heavy seas

Sensors Markings and Explanations

- ⟨Ex⟩II 1 G Ex ia IIC T5 – Category 1 Sensors located in Zone 0 explosive atmosphere with intrinsically safe circuits of category Ex ia for use in potentially explosive atmosphere containing gases
- IP65 – Ingress protection against solid bodies, rating of dust-tight and against liquid, rating of water jets

Quick Start Safety Information for Hazardous Areas

Note

Ratings under this heading apply to specific model families

Check Your Model Number:
FUS1010 7ME3531, FUH1010, 7ME3601

FM-CSA installation

Read, understand and follow all safety instruction on the electronic media provided. This equipment is rated for use in hazardous (classified) locations as stated below and must be installed according to the 1010-341 installation drawing provided on the media. Failure to install the equipment in the prescribed manner will result in unsafe operation. Follow all local jurisdictional safety codes when operating this equipment. When properly installed the equipment meets the following FM–CSA ratings:

Transmitter

- Explosionproof for Class I, Division1, Groups B, C, D;
- Dust-ignitionproof for Class II, Division 1, Groups E, F and G

- Intrinsically safe connections for Class I and II, Division 1, Groups A, B, C, D, E, F and G;
- Nonincendive for Class I, Division 2, Groups A, B, C and D;
- Suitable for Class II, Division 2, Groups B, E, F and G outdoor (Type 4X), Class III (CSA only)

Sensors

- Intrinsically safe Class I and II, Division 1, Groups A, B, C, D, E, F and G;
- Nonincendive for Class I, Division 2, Groups A, B, C and D;
- Suitable for Class II, Division 2, Groups B, E, F and G outdoor (Type 4X), Class III (CSA only)
- Temperature code T6 at an ambient of 40°C

ATEX installation

Read, understand and follow all safety instruction on the electronic media provided. This equipment is rated for use in explosive atmospheres as stated below and must be installed according to the 1010-422 installation drawing provided on the media. Failure to install the equipment in the prescribed manner will result in unsafe operation. Follow all regional safety laws when operating this equipment. When properly installed the equipment meets the following ATEX ratings as stated in EC-Type Examination Certificate KEMA03ATEX2133

Transmitter

- Ⓔx II 2 (1) G Ex d [ia] IIB+H2 – Category 2 Transmitter located in Zone 1 explosive atmosphere with intrinsically safe circuits of category Ex ia, which can be connected to Category 1 Sensors for use in potentially explosive atmosphere containing gases
- IP65 – Ingress protection against solid bodies, rating of dust-tight and against liquid, rating of water jets

Sensors

- Ⓔx II 1 G Ex ia IIC T5 – Category 1 Sensors located in Zone 0 explosive atmosphere with intrinsically safe circuits of category Ex ia for use in potentially explosive atmosphere containing gases
- IP65 – Ingress protection against solid bodies, rating of dust-tight and against liquid, rating of water jets

See also

Contacts (http://www.siemens.com/processinstrumentation/contacts)

Installing/Mounting 2

2.1 Application Guidelines

Basic Requirements

- Determine pipe material and dimensions.
- Avoid vertical pipes flowing in a downward direction.
- Avoid installation of sensors on the top and bottom of horizontal pipes, if possible.
- Select a location with the longest straight run of pipe.
- Identify upstream piping configuration (elbow, reducer, etc.).
- Pipe surface should be smooth and, if necessary, free of paint.
- Avoid pressure reduction components upstream.
- Avoid mounting on or near weld seams.
- Pipe must be full to achieve proper operation.

2.2 Mounting the Transmitter

⚠ WARNING
Hazardous Voltage
May cause death or serious personal injury.
Disconnect power before working on this product.

Wall Mounting

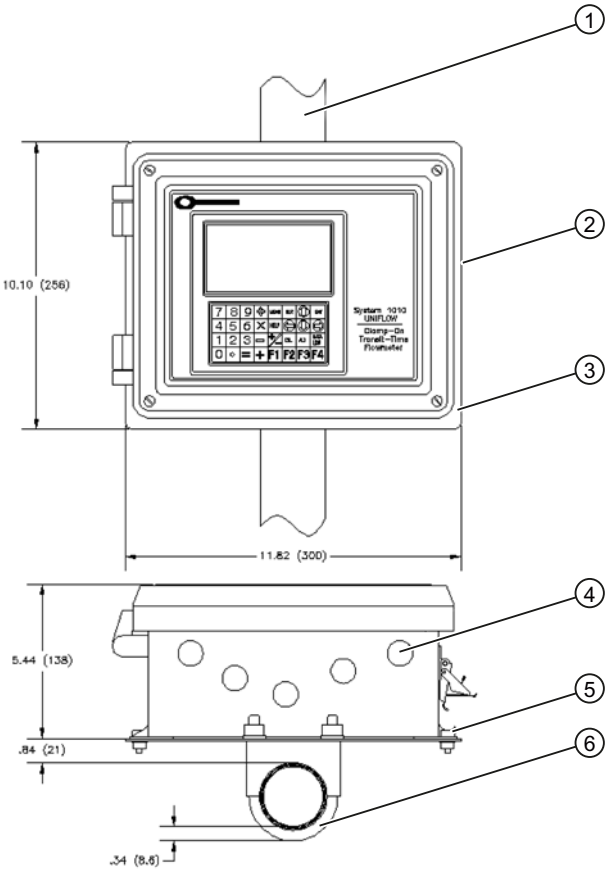
The transmitter can be mounted on any wall surface including wood, metal or concrete. Use the appropriate bolts and screws as needed for your mounting application and adhere to local codes. (See figure below for mounting bracket locations.)

Pipe Mounting

For installation on 2-inch (6 cm) mounting pipe use Pipe Mount Kit CQO:1012NMB-1 (optional - see catalog). See figure below.

Note

Pipe mounting kit CQO:1012NMB-1 is not available for IP66 NEMA 7 enclosures.



①	2-in (6cm) pipe	④	Cable Entry Ports
②	Transmitter	⑤	Mounting Flange (also use for wall mounting)
③	Mounting Plate	⑥	U-Bolt Assembly for standard 2-in (6 cm) mounting pipe

Figure 2-1 Pipe Mounting and Mounting Locations for Transmitter

Note

Use conduit fittings or cable glands on all cables.

NOTICE
Weather Seal Malfunctions Incorrect installation of weather seals may result in failure to meet to IP65 standards and damage to the equipment. Install weather tight seals at all unused holes using proper cable conduit and close additional holes to IP65 standards.

Connecting

3

3.1 Safety notes for connecting

Use in hazardous locations

⚠ DANGER

Explosion Hazard

Death or severe personal injury and/or equipment and property damage will result if proper Hazardous (Classified) Locations installation precautions are not taken.

Restrict use and repair to qualified personnel. Only qualified personnel may carry out work on the electrical connections.

Before opening the terminal box check that:

- No explosion hazard exists
- Local safety codes and policy requirements have been followed
- All connection leads are potential free

⚠ DANGER

Explosion Hazard

"Flameproof enclosure" type of protection

Only open devices with type of protection "Flameproof enclosure" (e.g. FUT1010 NEMA 7) in hazardous areas when the power to the device is turned off, otherwise there is a risk of explosion.

⚠ DANGER

Explosion Hazard

Hazardous areas

Observe the type examination certificates or the test certifications applicable in your country if you use transmitters as category 1/2 equipment, otherwise there is a risk of explosion.

⚠ DANGER

Explosion Hazard

Intrinsically safe circuits

If a non-conforming supply unit is used, the "fail-safe" type of protection will no longer be effective and the approval certification will be invalid, otherwise there is a risk of explosion.

With intrinsically safe circuits, use only certified meters appropriate for the transmitter.

⚠ DANGER

Explosion Hazard

Laying Cables

Cable for use in zone 1 and 2 must satisfy the requirements for having a proof voltage < AC 500 V applied between the conductor/ground, conductor/shield and shield/ground, otherwise there is a risk of explosion.

Connect the devices that are operated in hazardous areas as per the stipulations applicable in the country of operation, e.g. for Ex "d" and "nA", permanent cables must be laid.

⚠ DANGER

Explosion Hazard

Devices with the common approval "Intrinsically safe" and "Flameproof"

The following is applicable for devices with the common approval "Intrinsically safe" and "Flameproof" (Ex ia + Ex d): Before commissioning, make sure that the type of protection that is not suitable is permanently defaced on the nameplate to avoid improper use, otherwise there is a risk of explosion.

If a non-conforming infeed is used, the "fail-safe" type of protection will no longer be effective.

WARNING

Electrical Voltage Hazard

Incorrect device connections may result in death or severe personal injury and/or equipment and property damage.

Only commission the device after the device has been properly connected and, if required, closed.

3.2 Transmitter Wiring

Connecting Power

DANGER

Electrical Shock Hazard

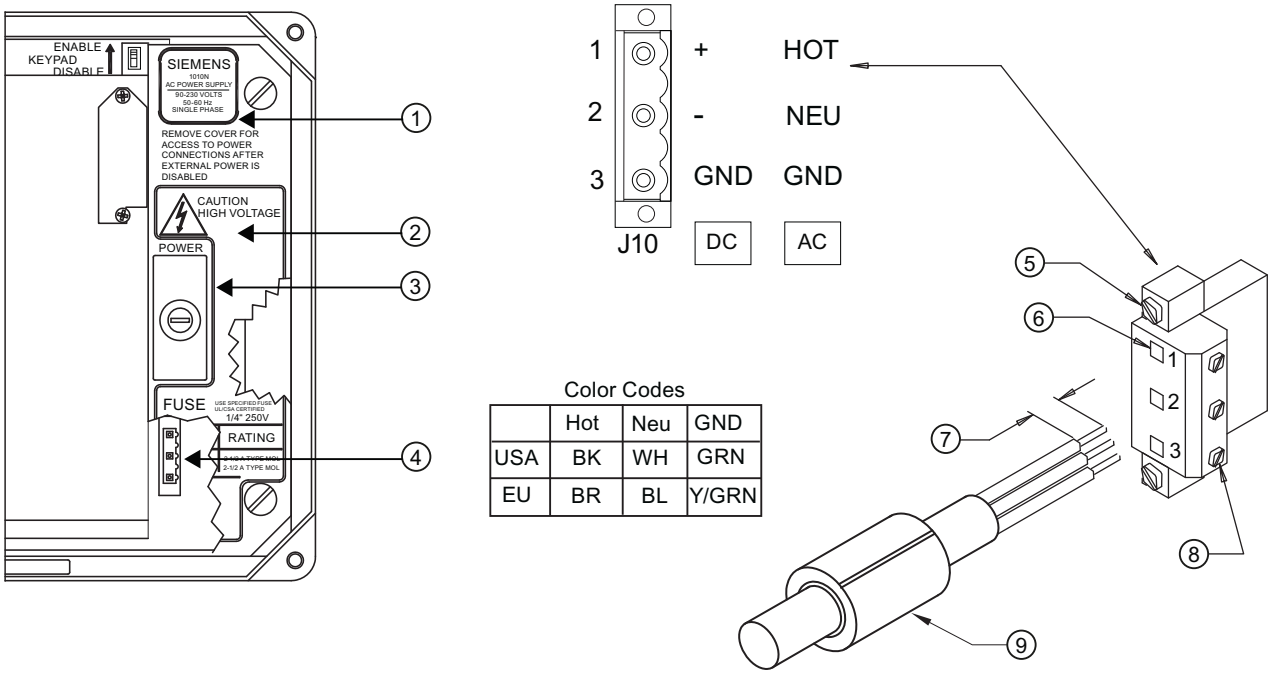
Contact with exposed wiring will lead to fire, electric shock, or serious personal injury.

Turn off main power before installing AC connections to the transmitter.

Note

If the transmitter is not already mounted and cabling has not been run, proceed to Mounting the Transmitter (Page 15) before connecting power.

1. Open the transmitter top cover by releasing the cover latch (for IP66 NEMA 7, remove bolts).
2. Unscrew the two power supply access cover fasteners and remove access cover.
3. Locate power supply connector J10. Using a flat blade screwdriver, remove plug from connector J10. Set aside.



Color Codes

	Hot	Neu	GND
USA	BK	WH	GRN
EU	BR	BL	Y/GRN

① Power Supply
② Power Supply Access Cover
③ Fuse F1
④ Input Power Conn. J10
⑤ Connector mounting screws
⑥ Wire Entry
⑦ Strip length 8mm (0.31 in)
⑧ Wire Clamp Screws
⑨ Ferrite power cord

Figure 3-1 Input Power Plug (J10) Wiring

4. Pull the desired length of input power wires through a cable gland and into transmitter case before wiring connector.
5. Wire input power connector for AC or DC power depending on power supply provided.

Note

Dress cables and make sure cable length is not excessive as to impede proper replacement of access cover.

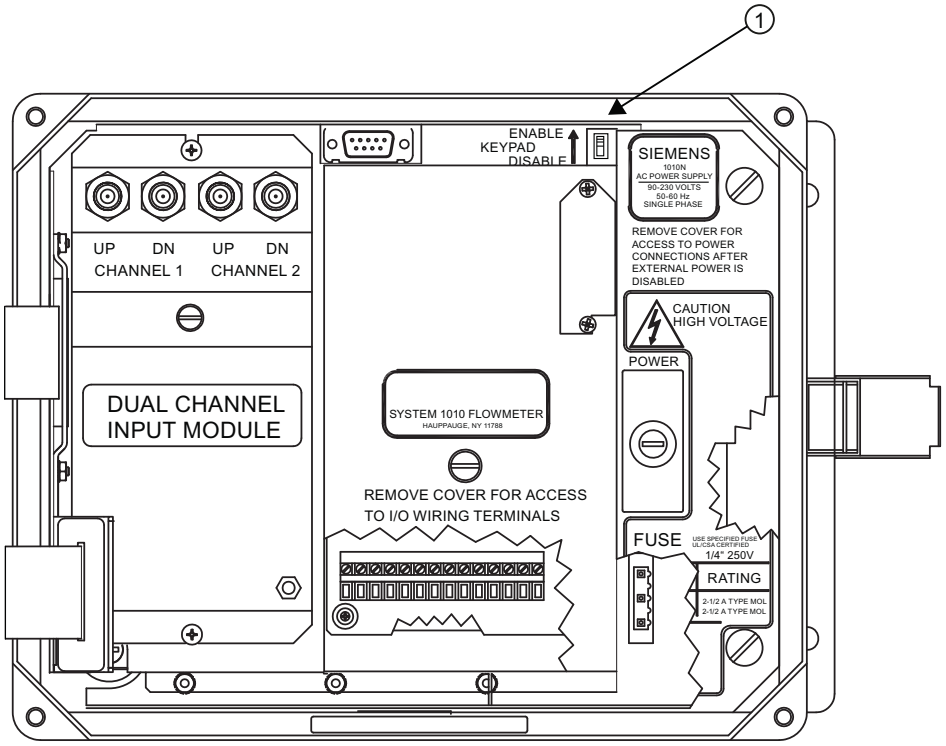
6. Insert wires into wire entry holes and secure by tightening wire clamp screws (see figure above).

Note

Power Supply connector wires should be stripped AWG 12 - 18 stranded wire or solid conductors.

7. Plug input power plug into connector J10 and secure using two captive connector mounting screws.

8. Replace access cover. Make sure Keypad Enable switch is in the "Enable" position (see below).



① Keypad Enable Switch

9. If installing a Temperature Sensor board, go to Wiring Temperature Sensor to Transmitter (Page 25). If not, go to step 10.

CAUTION

Power Supply Damage

Improper power connections will damage power supply and may result in serious injury.

Ensure that all AC or DC power supply connections are properly connected to the appropriate power source (100-250 VAC @ 50/60 Hz or 9-36 VDC).

WARNING

Electrical Shock Hazard

Certain parts inside the device carry dangerous high voltage and may result in electric shock, or serious personal injury.

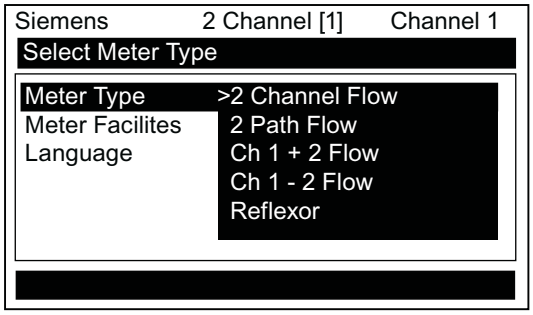
The transmitter must be grounded and the top cover closed before applying power to the device.

10. Connect the power cables to the appropriate power source (90-240 VAC @ 50/60 Hz or 9-36 VDC). Close top cover.
11. Apply power.

12. Within 10 seconds of power-up the transmitter main display will become active and a typical Siemens graphic will appear. The screen also identifies the software version of the unit as shown below.

① Software Version (xx.xx.xx)

13. Press the <MENU> key and the Main Menu will appear. (Language selection is not on Version 3 op systems.)



3.2.1 Wiring Temperature Sensor to Transmitter

Wiring Temperature Sensor to the Analog Input Module

⚠ DANGER

Hazard Voltage

Contact with exposed wiring will lead to fire, electric shock, or serious personal injury.

Set transmitter and instrumentation power to OFF when inserting or removing the Analog Input Module, or when making connections to TB1, TB2, TB3 and TB4.

1. Disconnect power from the unit to the transmitter.
2. Open the transmitter top cover by releasing the cover latch.
3. Loosen the captive thumbscrew securing the Access Cover and remove Access Cover.
4. Using a flat-blade screwdriver, remove four captive screws securing the I/O board. Remove board and set it aside.

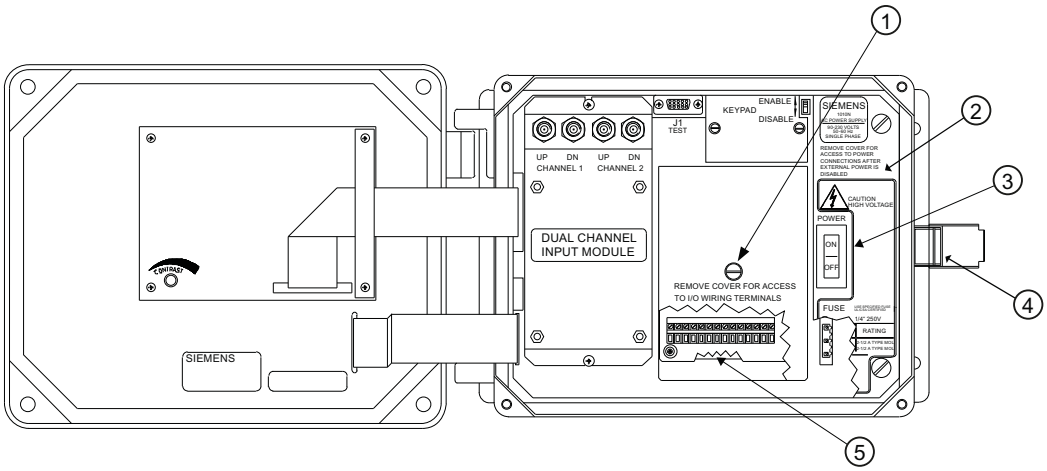


Figure 3-2 Analog Input Module Access

①	Access Cover Screw	④	Latch
②	Flow Meter	⑤	Access to Analog Input Module
③	Power Switch		

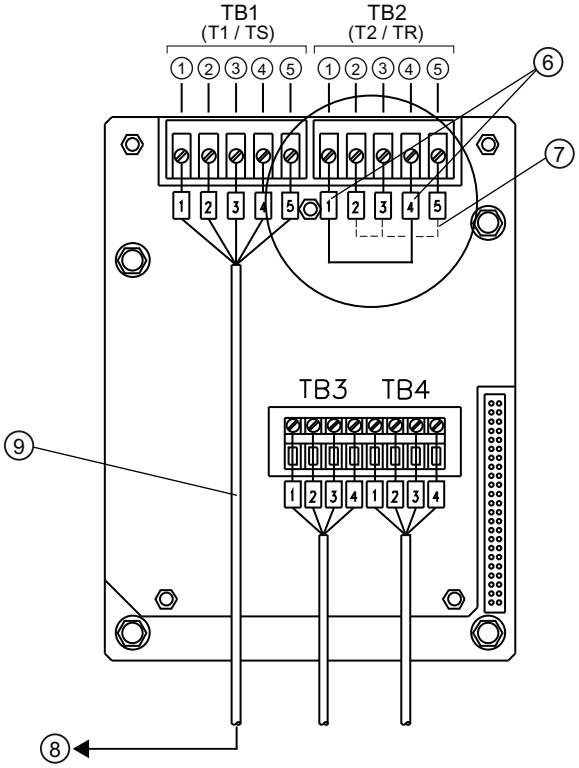


Figure 3-3 Single Channel Temperature Sensor Inputs

①	Black	⑥	Short Terminals 1 and 4 (For FUE1010 - TB2 is used for another Temperature sensor.)
②	Orange	⑦	Ground Terminals 2 and 3 to Terminal 5
③	Brown	⑧	To Sensor
④	Red	⑨	7ME39600CR (992EC) Series Cable
⑤	Blue		

Note

Alternate color codes for certain 1012EC cables:

White = Orange

Green = Brown

Wiring Temperature Sensor Board

1. Using a flat-blade screwdriver, loosen Terminal Block TB1 and TB2 screws.
2. Wire the RTD liquid 992EC temperature cable as shown in the table below:

992EC Series Cable	Terminal TB1
Wire #1 (Black)	To TB1--1
Wire #2 (Orange)	To TB1--2
Wire #3 (Brown)	To TB1--3
Wire #4 (Red)	To TB1--4
Wire #5 GND/SHLD (Blue)	*To TB1--5

Note

*For cathodically protected pipes, do not attach blue #5 wire at RTD end of cable.

3. For single channel use, wire TB2 as shown in figure above.
4. For dual channel use, connect Channel 2 temperature sensor to TB2.
5. Replace I/O Board and secure with four captive screws paying careful attention to pin alignment.
6. Replace Access Cover and finger tighten captive thumbscrew.

Note

TB3 and TB4 are also active analog inputs. See wiring table below.

Pin	TB3 Function	TB4 Function	Use	Description	Behavior	Load	Wiring
1	AUX. 1 IN	AUX. 3 IN	Iin1 Input	Analog current input referenced to meter ground.	4 to 20mA	200Ω	305 meters (1000 ft.) Max w/o factory approval
2	AUX. 1 COM	AUX. 3 COM	Iin1 Common				
3	AUX. 2 IN	AUX. 4 IN	Iin2 Input				
4	AUX. 2 COM	AUX. 4 COM	Iin2 Common				

Note

If analog input is used for temperature, this will take priority over clamp-on RTD measurement.

⚠ WARNING

Electrical Shock Hazard

Certain parts inside the device carry dangerous high voltage and may result in electric shock, or serious personal injury.

The transmitter must be grounded and the top cover closed before applying power to the device.

NOTICE

Power Supply Damage

Improper power connections will damage power supply.

Ensure that all AC or DC power supply connections are properly connected to the appropriate power source (100-250 VAC @ 50/60 Hz or 9-36 VDC).

7. Connect power cables to the appropriate power source (90-240 VAC @ 50-60 Hz or 9-36 VDC). Close transmitter top cover.

3.3 Navigating the Menu

Installation Menu Navigation

The Installation Menu Chart is a multi-level structure divided into three columns from left to right		
Level A - lists the major menu categories.		
Level B - list the menu cells associated with Level A. You can enter data into Level B menu cells that are display parameters in a column at the right of the screen.		
Level C - lists the Level B data		
Level A	**Level B**	**Level C**
	Recall Site Setup	**Pump 1** **Pump 2**
	Channel Enable	
	Create/Name Site	
	Site Security	
	Delete Site Setup	
	Save/Rename Site	

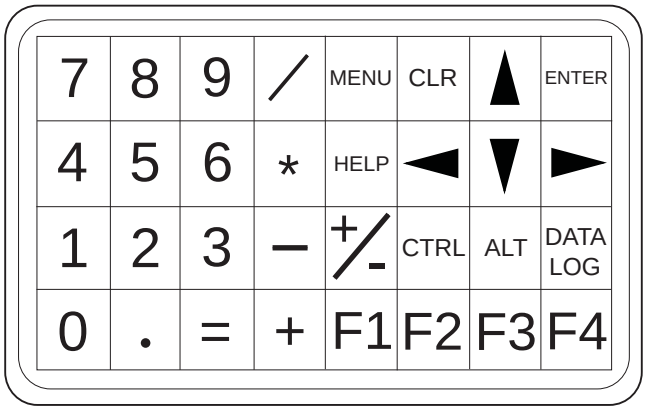


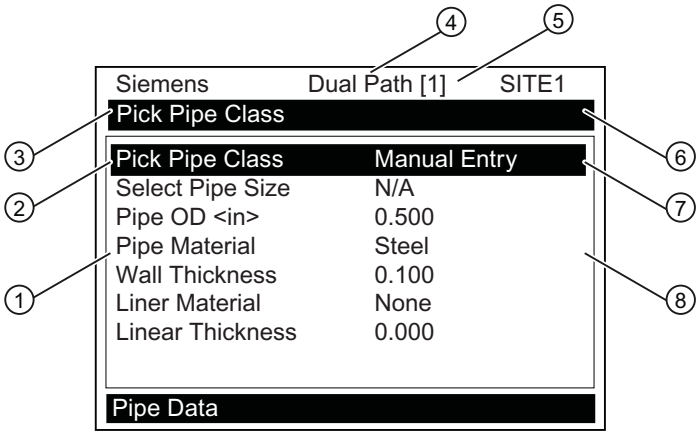
Figure 3-4 Key Pad

Note

Use <Left Arrow> key to return to previous menus.

Table 3- 1 Keypad Function Chart

Keys	Description
MENU	Press to activate the Installation Menu.
ENTER	Store numeric data, select from option lists, etc.
Left / Right Arrows	Menu navigation keys move cursor.
Up / Down Arrows	Same as <Left> and <Right> arrows. Scrolls option lists and graphic display screen.
CLR	Erases data or selects list options.
Numbers 0 - 9	Use to type numeric data.
Decimal Point	Use for decimal points in numeric data.
Math Operators	4-function math operations in numeric entry cells.
"F" Keys 1, 2, and 3	Used to start/stop/reset Totalizer.
F4	Caution: used during power up for system reset.
CTRL and ALT	Used as shift keys for alternative key functions.
DATALOG	Triggers immediate Datalogger report.
Plus and Minus [+ / -]	Changes the sign of numeric data.



① Menu Cell Data (left-hand column)
② Highlighted Menu Cell
③ Menu Prompt Line (Reverse Video)
④ Current Selected Meter Type
⑤ Current Selected Measurement Channel
⑥ Site Name Identified
⑦ Highlighted Data
⑧ Menu Cell Data (right-hand column)

Figure 3-5 Typical Installation Menu Screen

3.4 Programming the Transmitter

Select Language and Units

Note

Before creating a site select a Language and then English or Metric units from the [Meter Facilities] menu.

Note

To select English or metric units: In [Meter Type] menu, scroll to [Meter Facilities] menu. Press <Right Arrow> and select [Preferred Units]. Press <ENTER> to select. Press <Left Arrow> and <Up Arrow> to return to main menu.

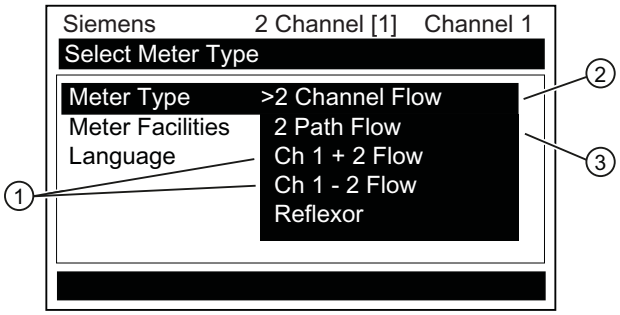
Select a Meter Type

1. Press the <MENU> key and select the Meter Type.
2. Press the <Right Arrow> and scroll to [2 Channel Flow]

   Note

   Select [2 Channel Flow] if measuring two different pipes and [Dual Path Flow] if sensors are mounted on the same pipe.

3. Press <ENTER> to select. Press <Right Arrow> to select a different meter function, if desired then press <ENTER>.



① Select for summing or subtracting flow from two different pipes.
② Select for measuring two different pipes. (Not available for all models.)
③ Select if two sensors are mounted on the same pipe.

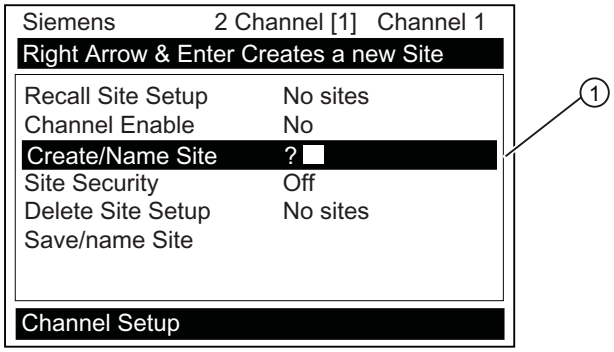
Create a Site

1. At the [Channel Setup] menu press the <Right Arrow>.

Note

Before proceeding make sure that English or Metric units have been selected.

2. Press the <Down Arrow> to select the [Create/Name Site] and enter a Site name.
3. Press <Right Arrow> to create Site name (e.g., ABC).



① Insert desired name (8 characters max.)

Note

To select letters: Press <Right Arrow> to cursor and then press <Up/Down Arrows> to select letters. Press <ENTER> when done.

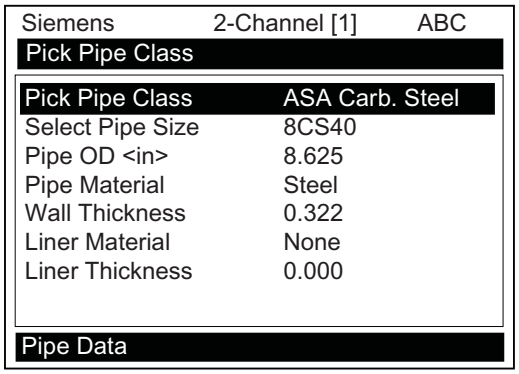
4. Press <Left Arrow> and return to the [Channel Setup] menu.

Note

After site configuration procedures that follow are complete the newly created site must be saved again to retain the new site data. Refer to the Save/Rename Site procedure below.

Select Pipe Class

1. Press the <Right Arrow> to select [Pick Pipe Class]. Press <Right Arrow> again and scroll to desired Pipe Class.
2. Press <ENTER> to select.



3. Pre-programmed Pipe Size and relevant pipe parameters will appear in menu cells. Press <Right Arrow> and scroll to desired pipe size. Press <ENTER>. Enter dimensions manually if pre-programmed dimensions do not match application.

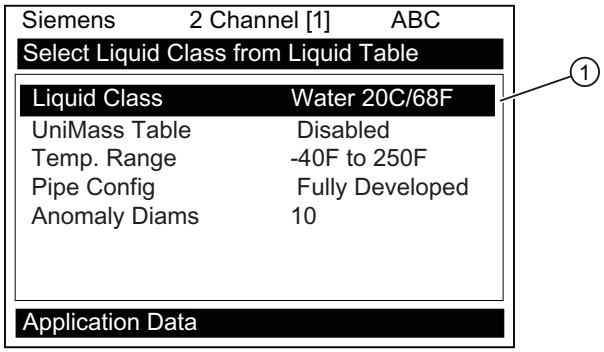
Note

The DN sizes listed in the [Select Pipe Size] menu option list are referenced to DIN Table 2448. After selecting pipe size, check pipe OD and wall thickness for correct dimensions.

4. Press the <Left Arrow> and return to the main menu.

Select Liquid Class

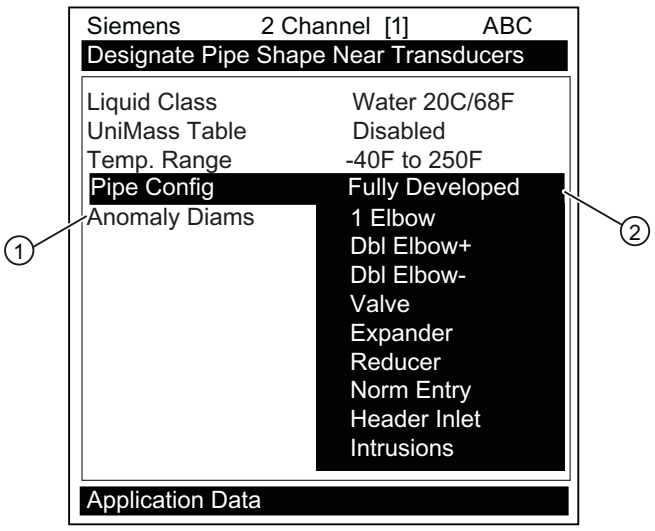
1. Press the <Down Arrow> and scroll to [Application Data].
2. Press the <Right Arrow> to select [Liquid Class].
3. Press the <Right Arrow> again and scroll to desired liquid.
4. Press <ENTER> to save selection.



① Select from list.

Select Pipe Configuration

1. Scroll down to [Pipe Config] and press the <Right Arrow>.
2. Select a configuration that approximates the conditions upstream of your sensor mounting location. (Refer to the definitions below.)
3. Press <ENTER> to save selection.



① Use this menu cell to enter the number of pipe diameters between the upstream configuration and the Sensor installation.

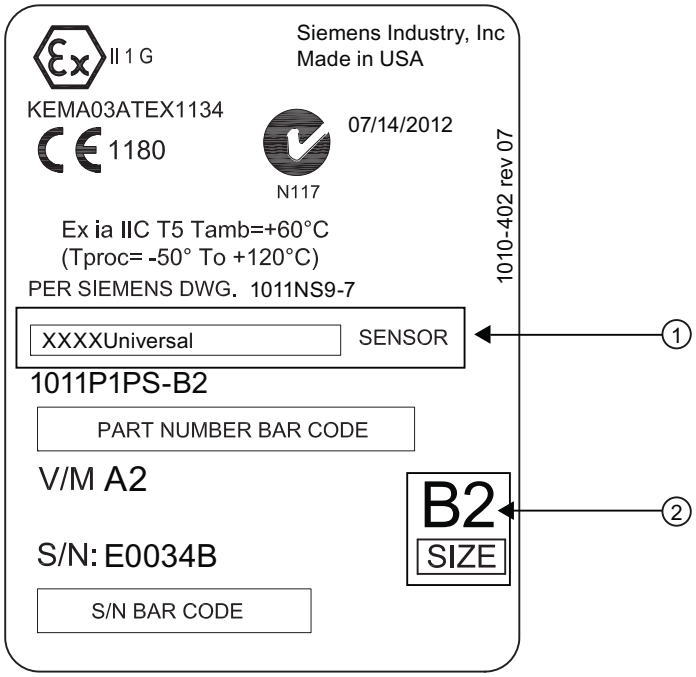
② Use this menu cell to select the pipe configuration that most accurately represents the upstream pipe condition.

4. Press the <Left Arrow> and return to the main menu.

Table 3- 2 Pipe Configuration Option List Definitions

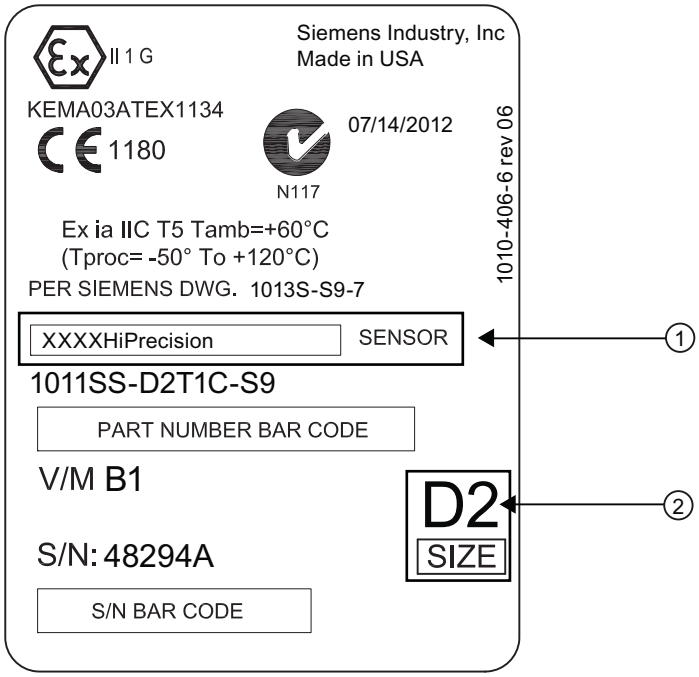
Options	Definitions
Fully Developed	Fully developed flow, as would be expected for very long straight pipe runs or installation downstream of a flow condition.
1 Elbow	Single 90 degree Elbow upstream of sensor installation.
Dble Elbow+	Double out-of-plane Elbows upstream of sensor installation.
Dble Elbow-	Double in-plane Elbows upstream of sensor installation.
Valve	Not available at this time.
Expander	Pipe expansion upstream of sensor installation.
Reducer	Pipe reduction upstream of sensor installation.
Norm Entry	Not available at this time.
Header Inlet	Header or pipe manifold upstream of sensor installation.
Intrusions	Not available at this time.

Typical Sensor Labels



① Universal sensor model number
② Sensor size

Figure 3-6 Universal Sensor Label



① Hi Precision sensor model number
② Sensor size

Figure 3-7 Hi Precision Sensor Label

Sensor Selection

The following is a typical sensor selection procedure.

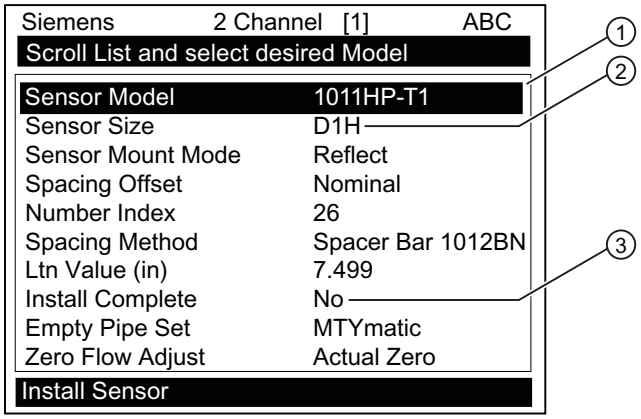
1. Press <Left Arrow> to return to Main Menu. At the [Meter Type], press the <Right Arrow> and then <ENTER>.
2. The [Channel Setup] menu will appear.
3. Press the <Down Arrow> to select [Install Sensor].
4. Press the <Right Arrow> to [Sensor Model]. Press <Right Arrow> and scroll to select the sensor model number on the sensor label.

5. The drop down menu lists the following sensor selections:
   - 1011 Universal
   - 1011HP-T1 - Usable -40 to 120°C, recommended for Ø Temperature <40°C; Standard.
   - 1011HP-T2 - Usable -40 to 120°C, recommended for Ø Temperature >40°C - <80°C; Named as high temperature.
   - 1011HP-T3 - Usable -40 to 120°C, recommended for Ø Temperature >80°C <120°C; special request.
   - 991 Universal

   Note

   The meter will automatically recommend a sensor depending on the application data that has been entered.

6. For this example, select the sensor model that appears on the sensor label then press <ENTER>.



① Select based on type.

② Select based on size

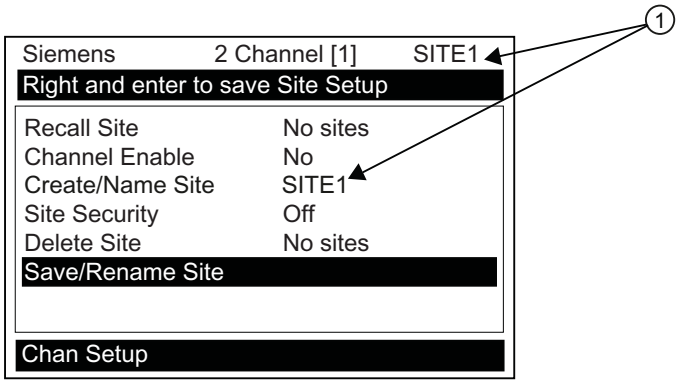
③ **After sensor is mounted select "Install.**

7. To select Sensor Size, press <Right Arrow>. Scroll to select the sensor size that matches the size indicated on the sensor label. Press <ENTER>.
8. At [Sensor Mount Mode], press the <Right Arrow>. Scroll to select [Reflect] or [Direct] mount and then press <ENTER>.
9. **IMPORTANT: Record Spacing Method and Number Index. This data will be used to mount the sensors.**
10. Sensors can now be mounted. Refer to mounting procedures and select the mounting mode desired.
11. **After sensors are mounted scroll to [Install Complete] and select [Install].**

Save/Rename Site procedure

Whenever new site configurations are added to an existing site that site must be saved again to retain the new site changes.

1. **To save all programmed data to site**, press <Left Arrow> and then scroll up to [Channel Setup].
2. Press <Right Arrow> and scroll to [Save/Rename Site].



① The saved site name now appears in the menu screen.

3. Press <Right Arrow> and then <ENTER> to save all programmed data to site.
4. To return to the top menu level, continue to press the <Left Arrow> key.

3.5 Sensor Installation

3.5.1 General information

Reflect and Direct Mounting Modes

Reflect and Direct mounting modes are supported for clamp-on sensors. The transmitter recommends a mounting mode after analyzing your pipe and liquid data entries. This Quick Start illustrates a typical sensor setup using the Reflect Mode.

Note

For Direct Mount refer to the Operating Instructions manual.

Mounting Supplies

The following items will be needed to mount the sensors (most are supplied):

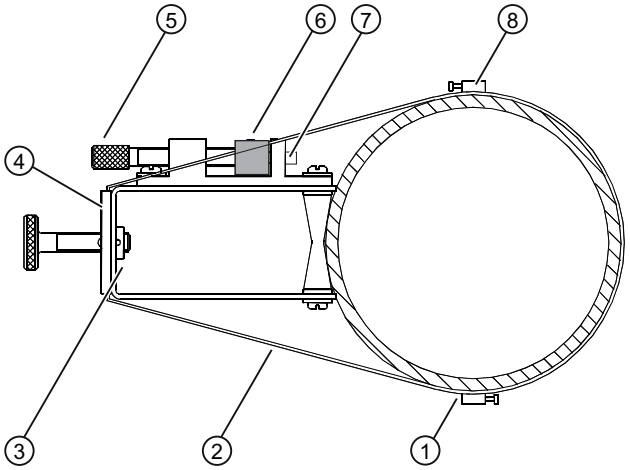
- Flat blade screwdriver
- Mounting Frames or Mounting tracks
- Tape, chalk and a ruler or measuring tape
- Mounting Straps
- Spacer Bar
- Mounting Guide (for Direct Mount)
- Ultrasonic coupling compound
- Sensors (matched set)

3.5.2 Reflect Mount

Reflect Mount - Sensor Installation using Mounting Frames and Spacer Bar

1. After receiving the spacing index from the Installation Menu, prepare the pipe surface area where the sensors will be mounted.
2. Degrease the surface and remove any grit, corrosion, rust, loose paint, etc.

Before beginning refer to the Reflect Mount Installation diagram example below.



①	Optional: On larger pipes, multiple lengths of straps can be linked together to surround pipe	⑤	Space Bar Platform & Clamping Screw
②	Mounting Strap positioned around Mounting Frame	⑥	Space Bar (Front View)
③	Sensor shown in the 9 o'clock position on pipe	⑦	Metal Post
④	Mounting Frame	⑧	Mounting Strap Adjusting Screw

Figure 3-8 Reflect Mount with Mounting Frames and Spacer Bar

Note

Minimum Ltn 18 mm (0.75 in).

Ltn Menu Cell

This view only menu cell shows the distance in inches or millimeters between the front faces of the sensors along the axis of the pipe. If you are mounting the sensors without a track or spacer bar, you have to space them according to this value. Note that Ltn may be a negative number for direct mount on very small pipes where the sensor spacing overlaps.

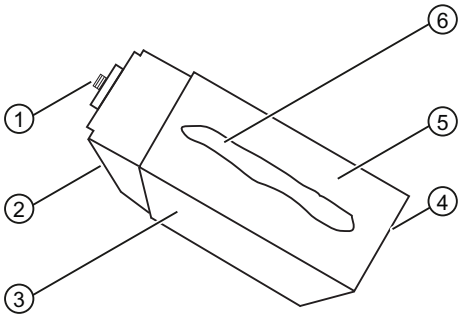
Preparing the Pipe

1. On a flat surface, attach the Spacer Bar to a Mounting Frame so that the Reference Hole on the Spacer Bar fits over the metal post on the platform of the frame. Tighten the clamping screw.
2. Slide the second Mounting Frame onto the other end of the Spacer Bar and align the Number Index Hole with the metal post on the platform. Then tighten the clamping screw. *Ensure that the angled sides of both frames face away from each other.*

3. Wrap a Mounting Strap around the pipe. Make sure to position it so there is easy access to the Mounting Strap Adjusting Screw.
4. At the mounting location, place the Mounting Frame/Spacer Bar Assembly on the pipe so that it rests on the top of the pipe.
5. Engage the end of the Mounting Strap with the Mounting Strap Adjusting Screw.
6. Slide strap under the spring clip of one of the Mounting Frames.
7. Tighten the Mounting Strap Screw enough to take up all of the slack, but not enough to prevent rotation of the assembly. *Repeat procedure for the other Mounting Frame*.
8. Rotate the assembly on the pipe to the final conditioned location, ensuring that it is straight along the pipe axis. (Refer to the sensor orientation diagram)
9. Tighten the mounting straps to seat the assembly firmly on the pipe. Do not over tighten.

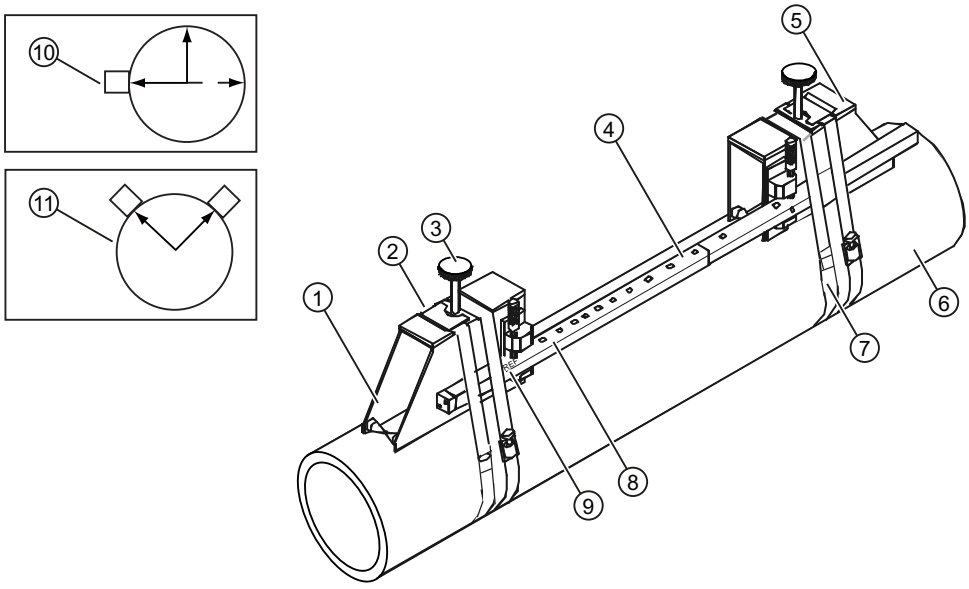
Installing the Sensor

1. Take either sensor and apply a continuous lengthwise 3mm (1/8-inch) bead of coupling compound across the center of the sensor emitting surface.



① F-Connector
② Angled Edge
③ Sensor
④ Front Face
⑤ Emitting Surface
⑥ Coupling Compound

Figure 3-9 Sensor



① Front View
② Spring Clip (Not present on some models)
③ Sensor Clamping Screw
④ Spacer Bar
⑤ 7ME39600M Mounting Frame
⑥ Pipe
⑦ Mounting Strap Note: Optional 2nd Mounting Strap shown. Larger pipes over 76cm (30 inches) may need an additional support.
⑧ Spacer Bar Platform and Clamping Screw
⑨ Spacer Bar Reference Hole
⑩ Orientation for Single Beam Sensor at 9 o'clock position
⑪ Orientation for Dual Beam Sensor at 10 & 2 o'clock positions

Figure 3-10 Sensor Installation

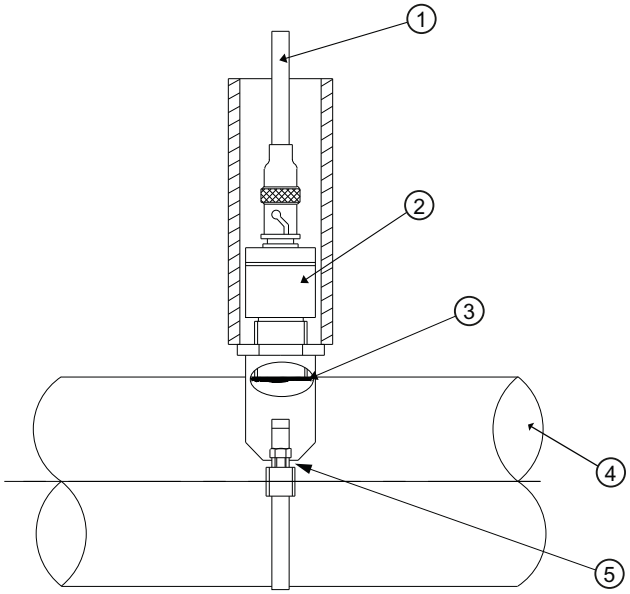
2. Slide sensor into a mounting frame back end first aligning the angled edge of the sensor with the angled edge of the mounting frame. Keep sensor from making contact with the pipe until it butts up against the mounting frame stop. Push sensor down to mate with pipe.
3. Tighten the sensor clamping screws to hold the sensor firmly in place. *Repeat procedure for the other sensor.*
4. If installing a temperature sensor proceed to Mounting Temperature Sensor (Page 43). If not, proceed to Sensor Wiring (Page 45).

3.5.3 Mounting Temperature Sensors

Temperature is used to normalize the liquids sonic velocity in order to properly determine interfaces and for density determination. Temperature sensors are available in clamp-on style or in insert (Thermowell) style. Refer to the table below. Both styles incorporate 1000 ohm platinum RTD's for high precision.

Table 3- 3 Temperature Sensors

Description	Part Number
Standard clamp-on RTD	7ME39501TA00
Submersible clamp-on RTD (not for FUP1010 or FUE1010	7ME39501TB00
Standard clamp-on RTD pair for FUE1010 energy system	7ME39501TA10
Insertion style RTD (size 1): 140mm (5.5 in)	7ME39501TJ00
Insertion style RTD (size 2): 216mm (8.5 in)	7ME39501TJ01
Insertion style RTD (size 3): 292mm (11.5 in)	7ME39501TJ02
Insertion style RTD (size 4): 368mm (14.5 in)	7ME39501TJ03
Insertion style RTD pair (size 1) for FUE1010, 140mm (5.5 in)	7ME39501TJ10
Insertion style RTD pair (size 2) for FUE1010, 216mm (8.5 in)	7ME39501TJ11
Insertion style RTD pair (size 3) for FUE1010, 292mm (11.5 in)	7ME39501TJ12
Insertion style RTD pair (size 4) for FUE1010, 368mm (14.5 in)	7ME39501TJ13

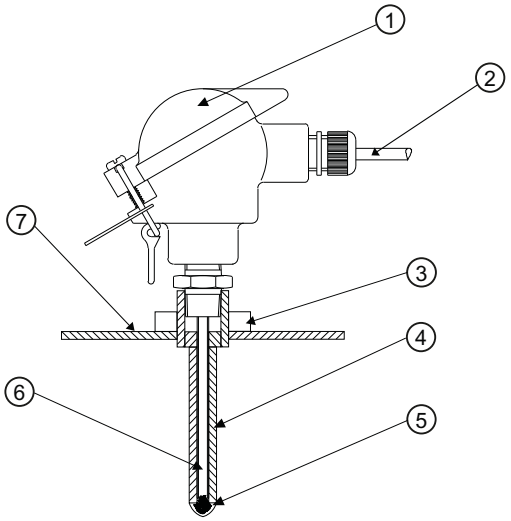


① 7ME39600CR 992EC Series Cable
② Clamp-on Temperature Sensor (Matched pair required for FUE1010)
③ Thermal Couplant
④ Pipe
⑤ Mounting Assembly

Figure 3-11 Clamp-on Temperature Sensor

Clamp-on Sensors

Clamp-on style sensors are mounted on the surface of the monitored pipe using series mounting assemblies. Apply a generous quantity of the thermal couplant provided to the tip of the sensor and attach it securely to the cleaned pipe surface with the proper mounting assembly. Temperature measurement anomalies resulting from variations in the ambient conditions can be minimized by insulating the pipe and sensor after installation.



①	Temperature Sensor Connector Head Assembly	⑤	Thermal Couplant
②	7ME39600CR 992EC Series Cable	⑥	Spring Loaded Sensing Element
③	Threaded Pipe Fitting	⑦	Pipe Wall
④	Thermowell		

Figure 3-12 Insert Temperature Sensor

Insert sensors are designed to be used in pipes equipped with Thermowells. These are spring-loaded, 1/4" diameter sensors with 1/2" NPT integral connection heads, available in several lengths to accommodate a range of pipe sizes.

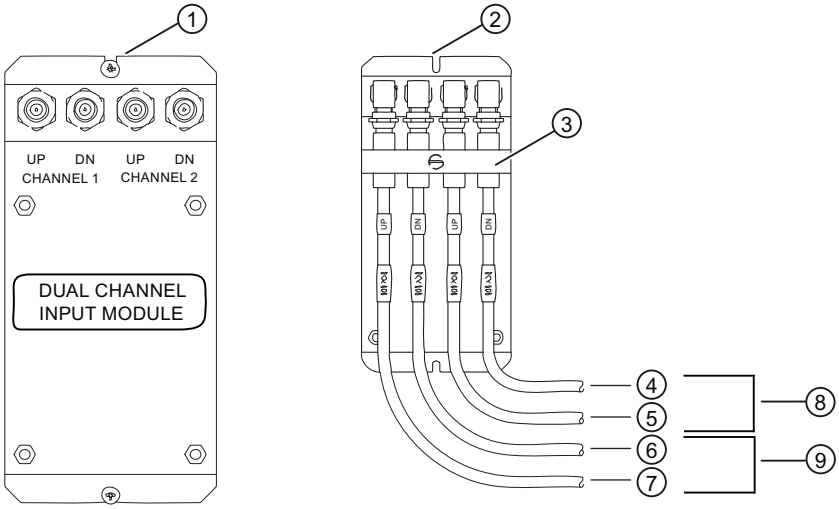
Proceed to Commissioning (Page 47).

3.6 Sensor Wiring

Connecting Sensors to the Transmitter

1. Open the transmitter top cover. Using a flat blade screwdriver, remove the Cable Strain Relief bracket (see figure below).
2. Observing the upstream and downstream orientation, attach the UP (upstream) and DN (downstream) cables to the sensors and make snug. Attach the other ends to the UP and DN terminals of the flow meter (see figure below).

3. Replace the Cable Strain Relief bracket. Close top cover.
4. Proceed to Commissioning (Page 47).



①	Transmitter Input Module	⑤	To CH-2 UP
②	Sensor Cables Connected to Transmitter	⑥	To CH-1 DN
③	Cable Strain Relief Bracket	⑦	To CH-1 UP
④	To CH-2 DN	⑧	Channel 2
		⑨	Channel 1

Figure 3-13 Sensor Cable Connections

Commissioning

4

4.1 Commissioning

Note

Refer to [Programming the Transmitter] (Page 31) if needed.

1. Scroll down to [Install Sensor] and press <Right Arrow>.
2. Scroll down to [Install Complete]. Press the <Right Arrow> and select [Install]. Press <ENTER>. The flow meter will go through its drives.

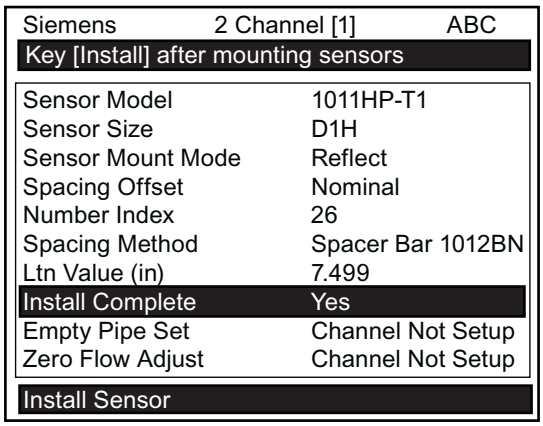


Figure 4-1 Final Setup

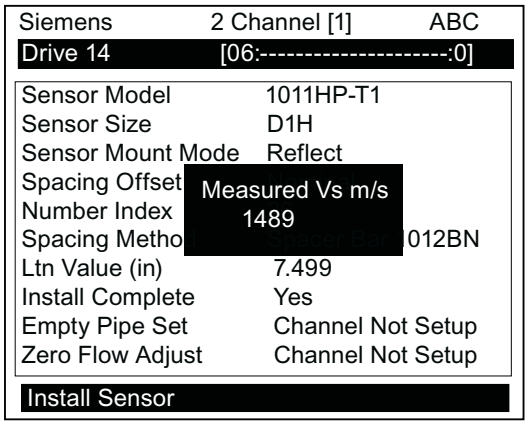
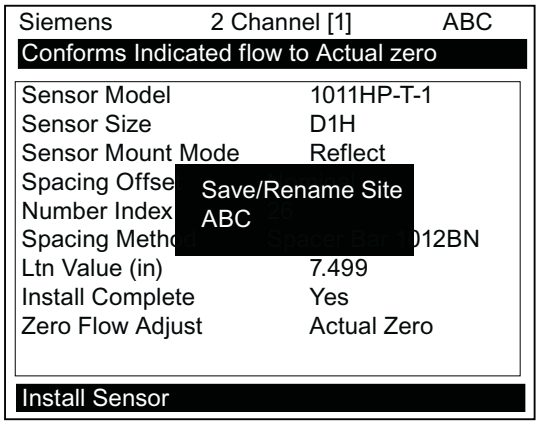


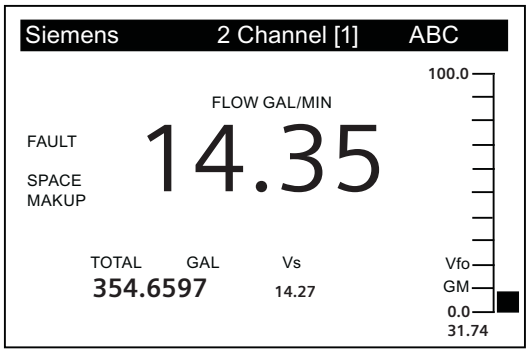
Figure 4-2 Measuring Flow

3. Observe the Measured Vs window and verify a correct sound velocity measurement (if known).
4. Press the <Down Arrow> to accept sound velocity value.

5. Press the <MENU> key.



6. Press the <Right Arrow> and then <ENTER> to save the site data.
7. **The flow meter is now ready to report flow.**



See also

Refer to I/O Connection Tables (Page 53) for input/output wiring and the Span Data manual section for data spanning procedures.

Troubleshooting

5

5.1 Troubleshooting

The following is list of troubleshooting tips and messages that you may encounter. They include explanations and, in some cases, a recommended action. If a problem seems unsolvable, contact your local Siemens office or regional Ultrasonic Flow Representative for expert help at: http://www.automation.siemens.com/partner (http://www.automation.siemens.com/partner).

Table 5- 1 Troubleshooting Tips

Error or Message	Probable Cause	Solution
Memory Full!	Response to an attempt to save site data, when data memory is full.	Delete an obsolete site or clear Datalogger memory to make room for the new data.
Memory Corrupted!	Memory read error occurred while accessing the active site data.	Refer to F4 reset procedure in the Operation Instructions manual.
Chan Not Setup	Response to an attempt to invoke an operation that requires a channel to be enabled.	Enable the channel [Channel Setup - Channel Enable - Yes]. Note that a channel cannot be enabled until an "Install" operation is completed.
Clr Active Memory?	Response to pressing and holding the F4 key during power-up.	Use the F4 key function to restore operation if a severe event (e.g., a violent power surge) disrupts system operation.
Clr Saved Data?	[Clr Saved Data?] only appears after pressing the <Down Arrow> in response to [Clr Active Memory?].	Answering Yes to [Clr Saved Data?] will erase **ALL** saved data. To invoke in RS-232 serial mode, type @@@ and then press <ENTER> key.
<EOT>	Response to a request to output Datalogger data to the printer or the Graphics screen when no Datalogger data exists or at the end of a transmitted file..	Set up the Datalogger.
No Sites - Press <ENTER>	Response while trying to recall/delete a site setup when no sites are stored.	Create a site.
Security	Response upon changing previously entered data when security switch is in [Disable] position or security code has been entered.	• Change switch position to [Enable]. • Enter previously set security code.
RTC Error	Component level problem.	• Meter requires service. Request RMA.
- - -F- - - Fault Alarm	• Loss of signal strength (ALC) • Change of Rx signal location (Beam Blowing)	• Recouple sensors with fresh couplant. • Install sensors in Direct mount mode • Note: If problem persists call Tech support.

Error or Message	Probable Cause	Solution
Re-space Index	The measured liquid sonic velocity (Vs) is more than +/- 25% of the average Vs range.	• Ensure proper pipe dimensions and/or Liquid data entries are correct. • Properly enter correct Sensor Size into the meter [Install Sensor] menu. • Confirm sensor spacing is correct by checking [Install Sensor] menu spacing parameters.
Invalid Setup (use Direct Mode)	During the Initial Makeup the system detects invalid Sensor spacing, erroneous liquid or pipe parameters, or some other factor that prevents it from completing the Initial Makeup.	This may be due to one of the following: • An out-of-range data entry. • An invalid condition (e.g., overlapping Sensors in Reflect Mode). If selecting Direct Mode does not resolve, review all site setup and Sensor installation choices; particularly data entered for pipe and liquid. • In Reflect Mode the flow meter detects that the pipe wall signal may impinge upon the liquid signal. Use Direct Mode instead. • Press <ENTER>, <Up Arrow>, <Down Arrow>, or <Left Arrow> to abort install routine. Continue programming other site data in anticipation of resolving the difficulty later. Call technical support for help if necessary.
Low Signal - Press <ENTER>	During the Initial Makeup the flow meter decides that the level of the receive signal is insufficient for proper operation.	Some reasons for low signal are: • Invoking [Install Complete?] on an empty pipe. • Coupling compound insufficient; not applied or evaporated. Reapply couplant. • A disconnected or broken Sensor cable. • The pipe needs to be conditioned at the mounting location. • Flush out large air bubbles. • The Sensor cables are defective or not connected to the correct channel. • The Set Empty routine performed when pipe was NOT actually empty. If you locate and correct the improper condition immediately, press <ENTER> to resume the installation procedure. Otherwise, press the <Left Arrow> to abort the installation and conduct a thorough investigation.
Detection Fault	If it appears that the flow meter cannot complete an Initial Makeup it means that the pipe and/or liquid conditions do not permit a receive signal that meets the flow detection standards. The system will not operate.	Attempt to improve operating conditions by reinstalling the Sensors at a different spacing offset, or even at a different location on the pipe. Switching from Reflect to Direct Mount may solve the problem. However, operation may not be possible if there is poor liquid or pipe wall sonic conductivity.

Note

If you receive a Detection Fault message, it is strongly recommended that the Technical Service Department (http://www.automation.siemens.com/partner) be contacted.

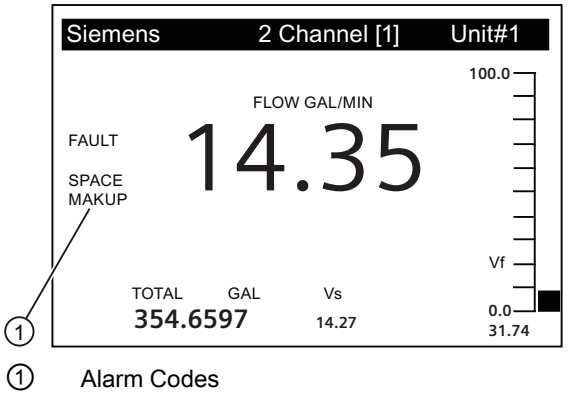
5.2 Alarm Codes

The following alarm codes appear on the main display of the flow meter.

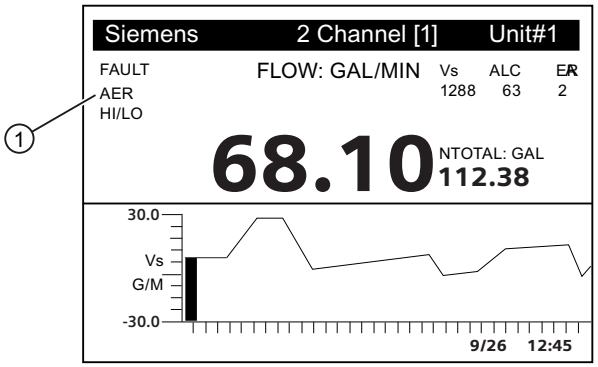
Table 5- 2 Alarm Codes and Descriptions

Letter Codes	Alarm Code	Description
SPACE	Spacing	Sensor spacing may need adjustment
EMPTY	Empty	Pipe is empty
HI / LO	Rate	Flow above High setting or below Low setting
FAULT	Fault	Three continuous seconds without new data update
AER	Aeration	Current aeration percentage exceeds the alarm set point
MEMRY	Memory	Last valid reading for a selected interval during Fault condition
MAKUP	Makeup	In-Process Makeup occurred
The following alarm codes appear in the Datalogger status messages:		
I	Interface	Liquid Vs exceeds interface alarm set point
P	Pig	Pig passage detected (optional)
Z	ZeroMatic	ZeroMatic signal occurred

The displays shown below indicate where the Alarm Codes appear on the screen. Press <UP> or <DOWN> Arrows to change screen views.



① Alarm Codes



① Alarm Codes

Appendix

A

A.1 I/O Connections and Wiring

Terminal Block Wiring - 7ME39400AL00 and 7ME39400AL01 I/O Module

(Refer to manual drawing 1010N-2-7 sheet 2 of 2)

These connection diagrams apply to the part numbers listed below.

Table A- 1 Connection Diagrams and Part Numbers

1010N-2-7 (Sheet 2 of 2) Drawing	
FUS1010	7ME3530, 7ME3533
FUE1010	7ME3500
FUH1010	7ME3600, 7ME3603

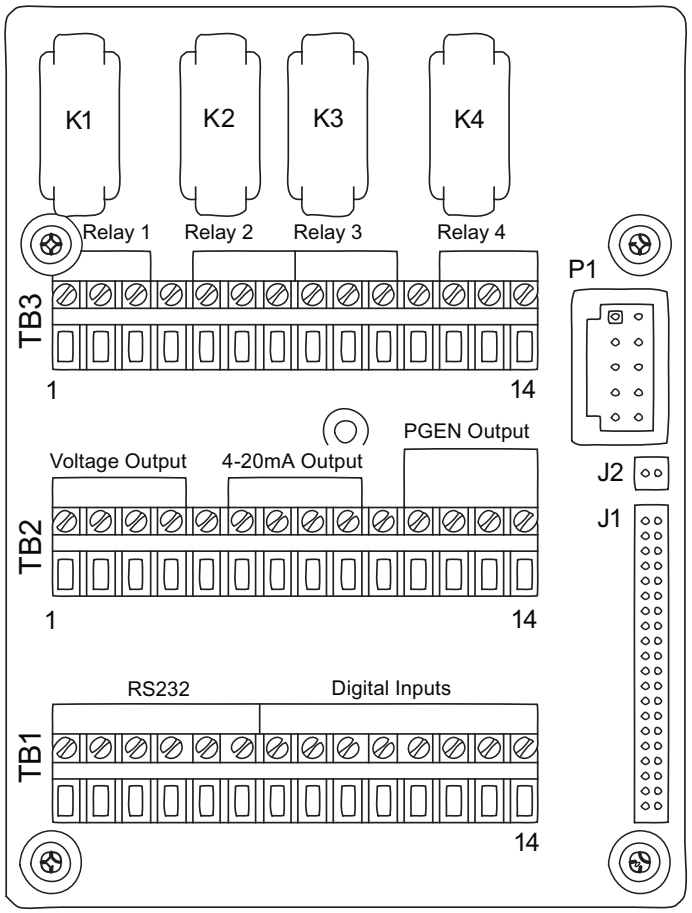
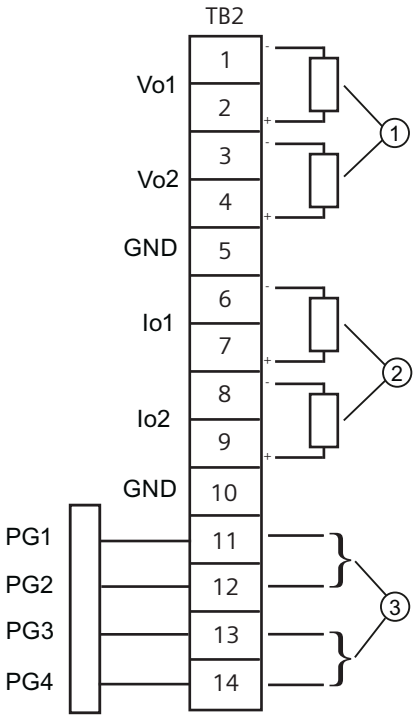


Figure A-1 7ME39400AL00 and 7ME39400AL01 I/O Module

Table A- 2 Input/Output Wiring (TB2) - 7ME39400AL00 and 7ME39400AL01 I/O Module (for 7ME3500 or 7ME3530 only)

Pin#	Signal	Description	Definition	Function
1	Vo1+	Meter process variables are assigned to individual outputs under menu control.	0-10 Volt Analog Output	System outputs assignable and scalable to flow related parameters. CGND is for cable shield terminations. 4-20mA outputs also provide a fault indication by dropping to 2mA if assigned to flow rate and under fault conditions.
2	Vo1-		Ref. Ground	
3	Vo2+		0-10 Volt Analog Output	
4	Vo2-		Ref. Ground	
5	CGND		Chassis GND	
6	Io1+		4-20mA Output 1	
7	Io1-		Isolated Return	
8	Io2+		4-20mA Output 2	
9	Io2-		Isolated Return	
10	CGND		Chassis GND	
11	PG1	0 -5000 Hz Frequency output; assignable.	Frequency Output 1	5V TTL
12	PG2		GND	GND
13	PG3		Frequency Output 2	5V TTL
14	PG4		GND	GND



① 0-10VDC, Load 10k ohm (min)

② 4-20mA Load 1k ohm (max)

③ Note: 7ME360x only, Totalizer pulses

TB2-11 - NEG [-] Total OC (GND TB2-2 or TB2-4)

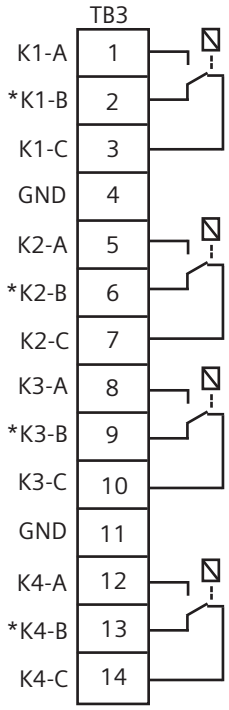
TB2-12 - NEG [-] Total TTL (GND TB2-2 or TB2-4)

TB2-13 - POS [+] Total OC (GND TB2-2 or TB2-4)

TB2-14 - POS [+] Total TTL (GND TB2-2 or TB2-4)

Table A- 3 Input/Output Wiring (TB3) - 7ME39400AL00 and 7ME39400AL01 I/O Module

Pin#	Signal	Definition	Description	Function Single Channel	Function Dual Channel	Function Dual Path	Function Dual Path Only
1	K1 A	Relay 1 Normally Open	Relay 1	Alarm or control functions set by CH 1	Alarm or control functions set by CH 1	Alarm or control functions set by CH 3	Alarm or control functions set by CH 3
2	K1 B	Relay 1 Normally Closed (7ME39400AL01 only)					
3	K1 C	Relay 1 Common					
4	GND	Digital Return [GND]	GND	GND	GND	GND	GND
5	K2 A	Relay 2 Normally Open	Relay 2	Alarm or control functions set by CH 1	Alarm or control functions set by CH 1	Alarm or control functions set by CH 3	Alarm or control functions set by CH 3
6	K2 B	Relay 2 Normally Closed (7ME39400AL01 only)					
7	K2 C	Relay 2 Common					
8	K3 A	Relay 3 Normally Open	Relay 3	Alarm or control functions set by CH 1	Alarm or control functions set by CH 2	Alarm or control functions set by CH 3	Alarm or control functions set by CH 3
9	K3 B	Relay 3 Normally Closed (7ME39400AL01 only)					
10	K3 C	Relay 3 Common					
11	GND	Digital Return [GND]	GND	GND	GND	GND	GND
12	K4 A	Relay 4 Normally Open	Relay 4	Alarm or control functions set by CH 1	Alarm or control functions set by CH 2	Alarm or control functions set by CH 3	Alarm or control functions set by CH 3.
13	K4 B	Relay 4 Normally Closed (7ME39400AL01 only)					
14	K4 C	Relay 4 Common					



Note

Relays shown in Power OFF position, which is the same as the alarm assertion position.

*7ME39400AL00 Mercury Relay only available with Normally Open.

Terminal Block Wiring - 7ME39400AL03 and 7ME39400AL04 Expanded I/O Module

(Refer to manual drawing 1010N-7-7 sheet 2 of 2)

These connection diagrams apply to the part numbers listed below.

Table A- 4 Connection Diagrams and Part Numbers

1010N-7-7 (Sheet 2 of 2) Drawing	
FUS1010	7ME3530, 7ME3533
FUE1010	7ME3500
FUH1010	Not Used

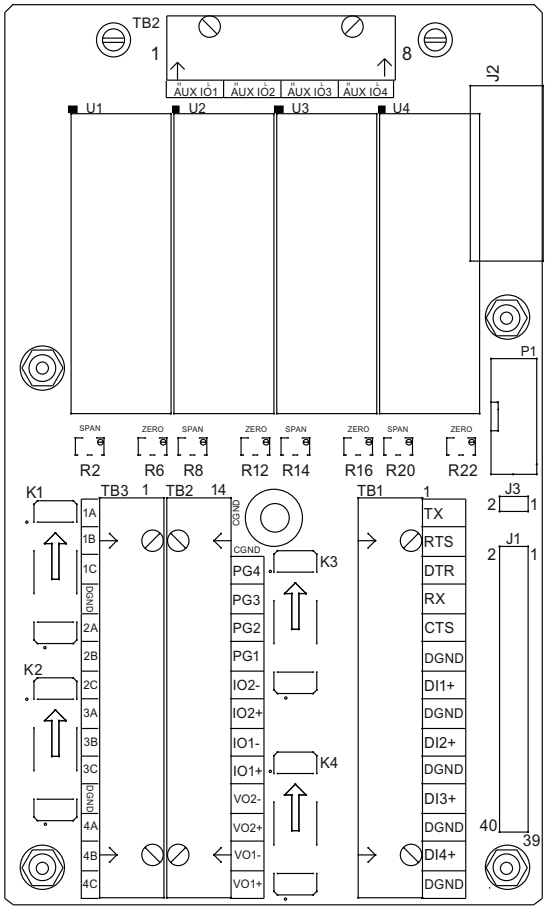
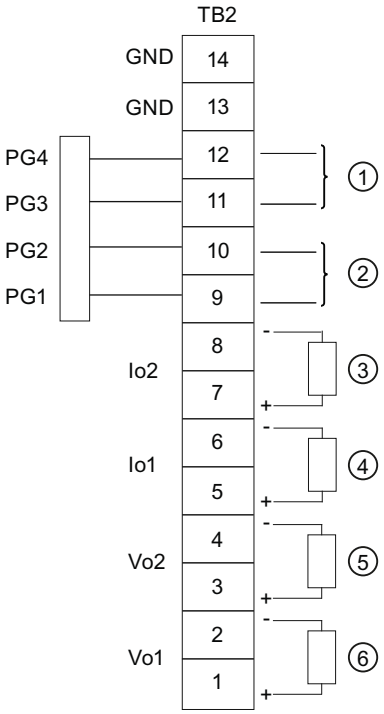


Figure A-2 7ME39400AL03 and 7ME39400AL04 Expanded I/O Module

Table A- 5 Input/Output Wiring (TB2) - 7ME39400AL03 and 7ME39400AL04 Expanded I/O Module

Pin#	Signal	Definition	Description	Function Dual/Quad Path Only
14		Chassis Ground	Chassis Ground	Cable Shield Terminations
13		Chassis Ground	Chassis Ground	Cable Shield Terminations
12	PG4	GND	0-5000 Hz frequency output , assignable	GND
11	PG3	TTL		5V TTL
10	PG2	GND		GND
9	PG1	TTL		5V TTL
8	Io2 (-)	Isolated Return	Flow meter process variables assigned to individual outputs under menu control.	System outputs assignable & scalable to flow related parameters. 4-20mA outputs also provide a fault indication by dropping to 2mA if assigned to flow rate and under fault conditions.
7	Io2 (+)	4-20mA Output 2		
6	Io1 (-)	Isolated Return		
5	Io1 (+)	4-20mA Output 1		
4	Vo2-	Ref. Ground		
3	Vo2+	0-10 Volt Output		
2	Vo1-	Ref. Ground		
1	Vo1+	0-10 Volt Output		



① TB2-11 - POS [+] Total OC
TB2-12 - POS [+] Total TTL

② TB2-9 - NEG [-] Total OC
TB2-10 - NEG [-] Total TTL

③ 4-20mA Load 1k ohm (max)

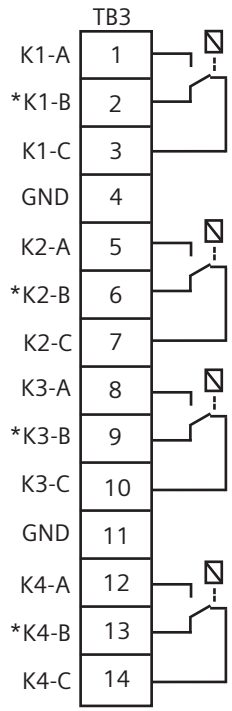
④ 4-20mA Load 1k ohm (max)

⑤ 0-10V Load 10k ohm (min)

⑥ 0-10V Load 10k ohm (min)

Table A- 6 Input/Output Wiring (TB3) - 7ME39400AL03 and 7ME39400AL04 Expanded I/O Module

Pin#	Signal	Definition	Description	Function Dual Path Only	Function Quad Path Only
1	K1 A	Relay 1 Normally Open	Relay 1	Alarm or control functions set by CH 3	Alarm or control functions set by CH5
2	K1 B	Relay 1 Normally Closed (7ME39400AL04 only)			
3	K1 C	Relay 1 Common			
4	GND	Digital Return (GND)	DGND		
5	K2 A	Relay 2 Normally Open	Relay 2	Alarm or control functions set by CH 3	Alarm or control functions set by CH5
6	K2 B	Relay 2 Normally Closed (7ME39400AL04 only)			
7	K2 C	Relay 2 Common			
8	K3 A	Relay 3 Normally Open	Relay 3	Alarm or control functions set by CH 3	Alarm or control functions set by CH5
9	K3 B	Relay 3 Normally Closed (7ME39400AL04 only)			
10	K3 C	Relay 3 Common			
11	GND	Digital Return (GND)	DGND		
12	K4 A	Relay 4 Normally Open	Relay 4	Alarm or control functions set by CH 3	Alarm or control functions set by CH5
13	K4 B	Relay 4 Normally Closed (7ME39400AL04 only)			
14	K4 C	Relay 4 Common			



Note

Relays shown in Power OFF position, which is the same as the alarm assertion position.

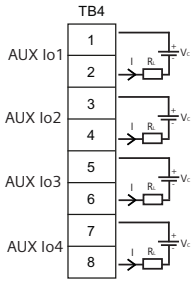
*7ME39400AL03 Mercury Relay only available with Normally Open.

Table A- 7 Input/Output Wiring (TB4) - 7ME39400AL03 and 7ME39400AL04 Expanded I/O Module

Pin#	Signal	Definition	Description	Single CH Function	Dual CH Function	Dual Path Function	Dual Path Only Function	Quad Path Only Function
1	AUX I01+	Isolated Loop Supply Io1	Io1 External Power	+30V max. supply voltage allowed			Not Used	
2	AUX I01-	Io1 4-20mA Output	Io1 Signal	Same output assignment as TB2-9				
3	AUX I02+	Isolated Loop Supply Io2	Io2 External Power	+30V max. supply voltage allowed				
4	AUX I02-	Io2 4-20mA Output	Io2 Signal	Same output assignment as TB2-11				
5	AUX I03+	Isolated Loop Supply Io3	Io3 External Power	System outputs assignable and scalable to flow related parameters. 4-20mA outputs also provide a fault indication by dropping to 2mA if assigned to flow rate and under fault conditions.			+30V max. Same as TB2-1	
6	AUX I03-	Io3 4-20mA Output	Io3 Signal					
7	AUX I04+	Isolated Loop Supply Io4	Io4 External Power				+30V max. Same as TB2-3	
8	AUX I04-	Io4 4-20mA Output	Io4 Signal					

Note

Auxiliary 4-20mA loops are assigned and spanned under menu control of Vo and PGEN outputs.



Vc: 24 VDC typical (+15VDC to 30VDC max) Loop Supply

R_L: 1000 ohms max, = Loop wire resistance plus user's input load resistance

I: 4-20mA

Terminal Block Wiring - 7ME39400AL04 Expanded I/O Module

(Refer to manual drawing 1010N-7-7 sheet 2 of 2)

These connection diagrams apply to the part numbers listed below.

Table A- 8 Connection Diagrams and Part Numbers

1010N-7-7 (Sheet 2 of 2) Drawing	
FUH1010	7ME3600, 7ME3603
FUS1010	Not Used
FUE1010	Not Used

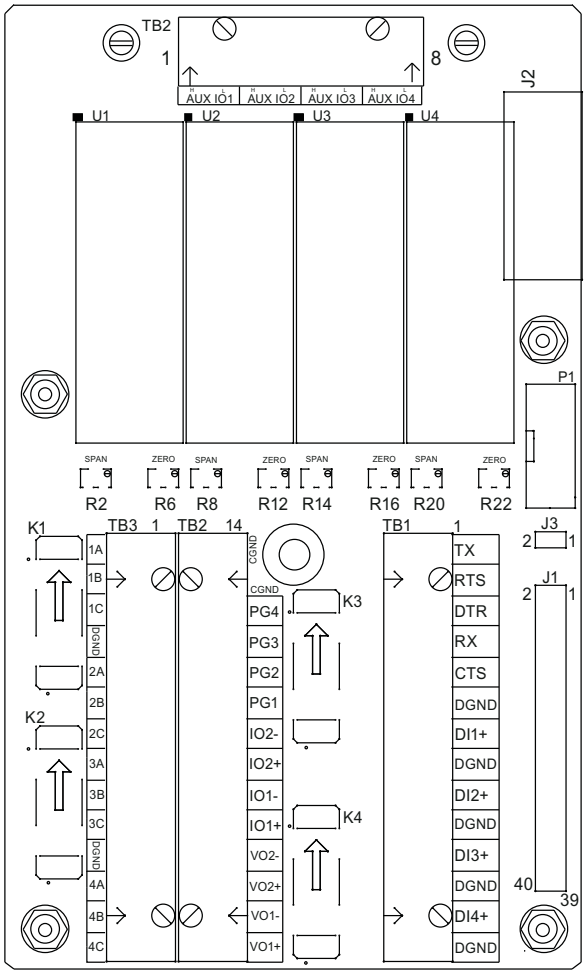


Figure A-3 7ME39400AL04 Expanded I/O Module

Table A- 9 Input/Output Wiring (TB2) - 7ME39400AL04 Expanded I/O Module

Pin#	Signal	Definition	Description	Function Dual/Quad Path Only
14		Chassis Ground	Chassis Ground	Cable Shield Terminations
13		Chassis Ground	Chassis Ground	Cable Shield Terminations
12	PG4	POS [+] Total TTL	Totalizer Pulses, scalable	POS [+] Total TTL
11	PG3	POS [+] Total OC		POS [+] Total OC
10	PG2	NEG [-] Total TTL		NEG [-] Total TTL
9	PG1	NEG [-] Total OC		NEG [-] Total OC
8	Io2 (-)	Isolated Return	Flow meter process variables assigned to individual outputs under menu control. 4-20mA outputs also provide a fault indication by dropping to 2mA if assigned to flow rate and under fault conditions.	System outputs assignable & scalable to flow related parameters. OC = Open Collector
7	Io2 (+)	4-20mA Output 2		
6	Io1 (-)	Isolated Return		
5	Io1 (+)	4-20mA Output 1		
4	Vo2-	Ref. Ground		
3	Vo2+	0-10 Volt Output		
2	Vo1-	Ref. Ground		
1	Vo1+	0-10 Volt Output		

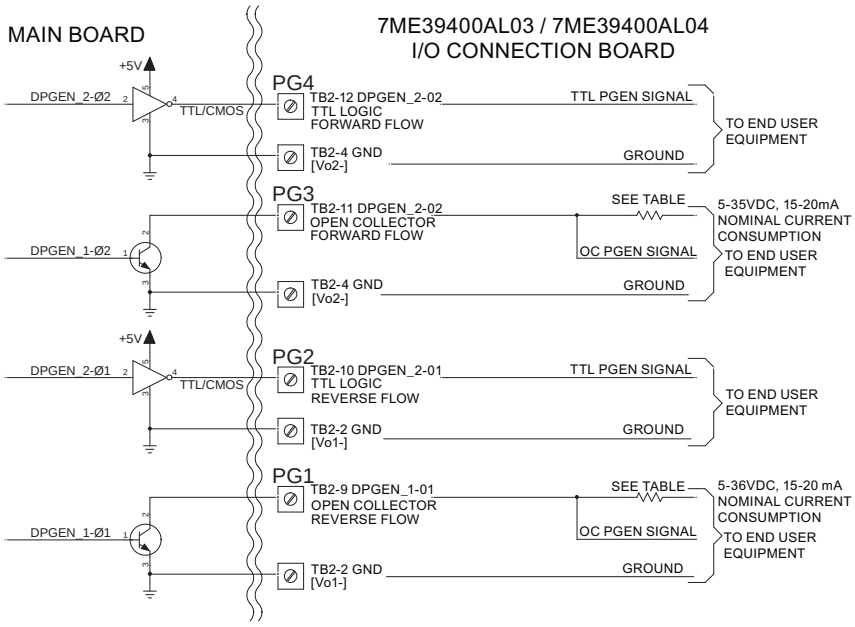


Table A- 10 Open Collector User Resistor Recommendations

User Supply Voltage (VDC)	External Resistor (Ohms)	Expected Current Draw (mA)	Recommended Resistor Wattage (Watts)
5	270	18.5	1/2
9	510	17.6	1/2
12	680	17.6	1/2
18	1000	18	3/4
24	1500	16	1
28	1800	15.5	1 1/4
36	2400	15	1 1/4

Note

TB2-9 and TB2-11 are Open Collector Outputs that require external pull-up resistors for operation. See table for External Supply Voltage and suggested resistor value and ratings. Maximum current into the transistor is 100mA. Maximum Voltage is +36 VDC.

NOTICE

Transistor Damage

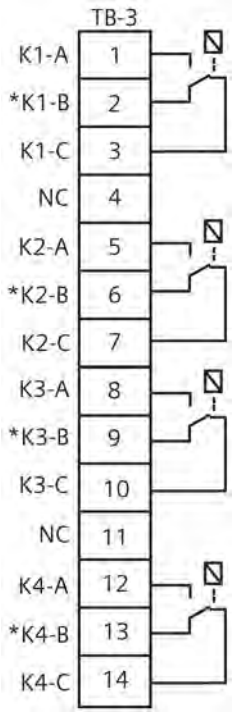
Negative voltages with respect to ground will permanently damage transistors.

Use caution when applying power to circuit boards.

Table A- 11 Input/Output Wiring (TB3) - 7ME39400AL04 Expanded I/O Module

Pin#	Signal	Definition	Description	Function Dual Path Only	Function Quad Path Only
1	K1 A	Relay 1 Normally Open	Relay 1	Alarm or control functions set by CH 3.	Alarm or control functions set by CH 5.
2	K1 B	Relay 1 Normally Closed (7ME39400AL04 only)			
3	K1 C	Relay 1 Common			
4	GND	Digital Return (GND)	DGND		
5	K2 A	Relay 2 Normally Open	Relay 2	Alarm or control functions set by CH 3.	Alarm or control functions set by CH 5.
6	K2 B	Relay 2 Normally Closed (7ME39400AL04 only)			
7	K2 C	Relay 2 Common			
8	K3 A	Relay 3 Normally Open	Relay 3	Alarm or control functions set by CH 3.	Alarm or control functions set by CH 5.
9	K3 B	Relay 3 Normally Closed (7ME39400AL04 only)			
10	K3 C	Relay 3 Common			

Pin#	Signal	Definition	Description	Function Dual Path Only	Function Quad Path Only
11	GND	Digital Return (GND)	DGND		
12	K4 A	Relay 4 Normally Open	Relay 4	Alarm or control functions set by CH 3.	Alarm or control functions set by CH 5.
13	K4 B	Relay 4 Normally Closed (7ME39400AL04 only)			
14	K4 C	Relay 4 Common			



Note

Relays shown in Power OFF position, which is the same as the alarm assertion position.

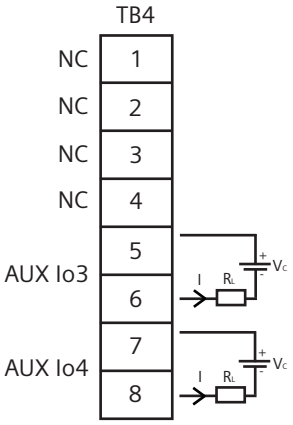
*7ME39400AL03 Mercury Relay only available with Normally Open.

Table A- 12 Input/Output Wiring (TB4) - 7ME39400AL04 Expanded I/O Module

Pin#	Signal	Function	Description
1		No Connection	
2		No Connection	
3		No Connection	
4		No Connection	
5	AUX 103+	Isolated Loop Supply	Connect +30V max. Loop Supply here
6	AUX 103-	Loop-Powered 4-20mA	PGEN 1 Data Presented as 4-20mA
7	AUX 104+	Isolated Loop Supply	Connect +30V max. Loop Supply here
8	AUX 104-	Loop-Powered 4-20mA	PGEN 2 Data Presented as 4-20mA

Note

Auxiliary 4-20mA loops are assigned and spanned under menu control of Vo and PGEN outputs.



Vc: 24 VDC typical (+15 VDC to +30 VDC max) Loop Power

R_L: 1000 ohms (max), Loop wire resistance plus user's input load resistance

I: 4-20mA

Terminal Block Wiring - 7ME39406ML00 I/O Module (4-Channel)

FUS1010, 7ME35309 only

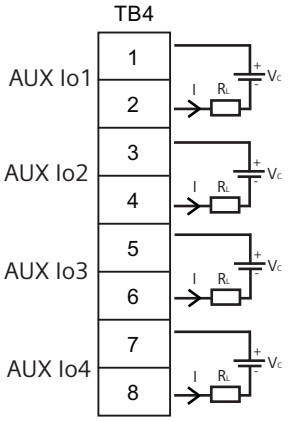
(Refer to manual drawing 1010N-8MS2-7 (sheet 2 of 2)

Table A- 13 Input/Output Wiring (TB3) - 7ME39406ML00 I/O Module (4-Channel)

Pin#	Signal	Function	Description
1	Iout 1+	Isolated Loop Supply	4-20mA proportional to spanned, selected variable (loop power). 4-20mA outputs also provide a fault indication by dropping to 2mA if assigned to flow rate and under fault conditions.
2	Iout 1-	Isolated Loop Return	
3	Iout 2+	Isolated Loop Supply	
4	Iout 2-	Isolated Loop Return	
5	Iout 3+	Isolated Loop Supply	
6	Iout 3-	Isolated Loop Return	
7	Iout 4+	Isolated Loop Supply	
8	Iout 4-	Isolated Loop Return	

Note

Flow meter requires external power supply. Shunt as shown. Current is controlled within loop. 4-20mA inputs and outputs are isolated.



Vc = +30V (max) Loop Supply 1k ohm (max)

Terminal Block Wiring - 7ME39404SB00 - Analog Input Module - 2 Channel/Dual Path

(Refer to manual drawing 1010N-5DS2-7)

These connection diagrams apply to the part numbers listed below.

Table A- 14 Connection Diagrams and Part Numbers

1010N-5DS2-7 Drawing	
FUS1010	7ME3530, 7ME3533
FUE1010	7ME3500
FUH1010	7ME3600, 7ME3603

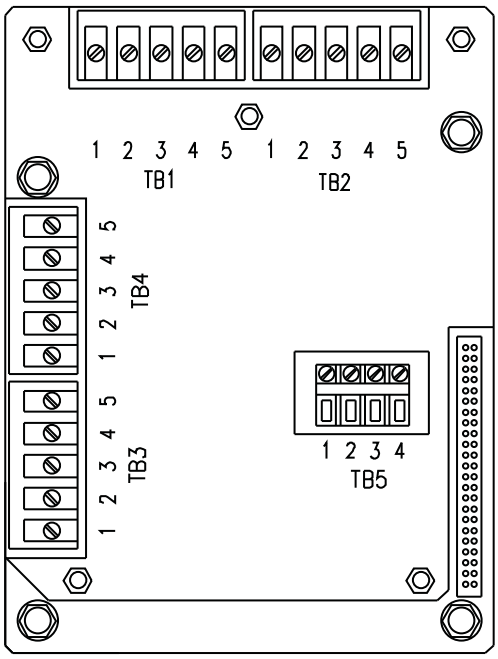


Figure A-4 7ME39404SB00 Analog Input Module

Note

Use 1012ECN series cables to connect between temperature sensor input wiring terminals TB1 through TB4 and 991T or 1011T series temperature sensors. Note Supply and Return temperature sensor designations when used with FUE1010 series energy flowmeter.

Note

Alternate color codes for certain 1012EC cables: white = orange Green = Brown

Table A- 15 Input/Output Wiring TB1 7ME39404SB00 - Analog Input Module (2 Chan/Dual Path)

Pin	Color	Function	Description	Wiring/Cable
TB1-1	Black	RTD Current High	RTD Temperature measurement T1 or Channel 1 Ts (Supply Temperature)	AWG. 14 - 24 / 1000 Ft max w/o factory approval
TB1-2	White	RTD Voltage High		
TB1-3	Green	RTD Voltage Low		
TB1-4	Red	RTD Current Low		
TB1-5	Blue	Ground		

Table A- 16 Input/Output Wiring TB2 7ME39404SB00 - Analog Input Module (2 Chan/Dual Path)

Pin	Color	Function	Description	Wiring/Cable
TB2-1	Black	RTD Current High	RTD Temperature measurement T2 or Channel 1 Tr (Return Temperature)	AWG. 14 - 24 / 1000 Ft max w/o factory approval
TB2-2	White	RTD Voltage High		
TB2-3	Green	RTD Voltage Low		
TB2-4	Red	RTD Current Low		
TB2-5	Blue	Ground		

Table A- 17 Input/Output Wiring TB3 7ME39404SB00 - Analog Input Module (2 Chan/Dual Path)

Pin	Color	Function	Description	Wiring/Cable
TB3-1	Black	RTD Current High	RTD Temperature measurement T3 or Channel 2 Ts (Supply Temperature)	AWG. 14 - 24 / 1000 Ft max w/o factory approval
TB3-2	White	RTD Voltage High		
TB3-3	Green	RTD Voltage Low		
TB3-4	Red	RTD Current Low		
TB3-5	Blue	Ground		

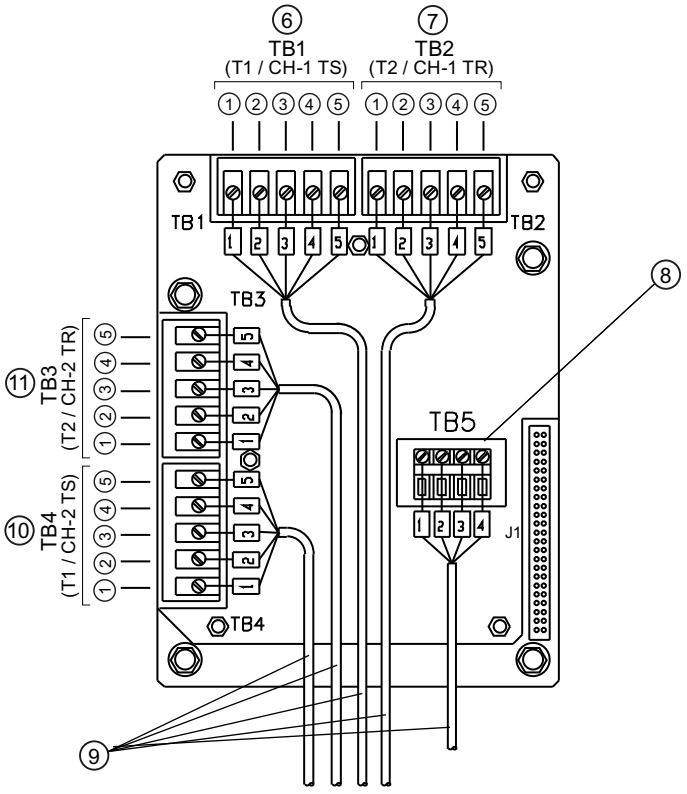
Table A- 18 Input/Output Wiring TB4 7ME39404SB00 - Analog Input Module (2 Chan/Dual Path)

Pin	Color	Function	Description	Wiring/Cable
TB4-1	Black	RTD Current High	RTD Temperature measurement T4 or Channel 2 Tr (Return Temperature)	AWG. 14 - 24 / 1000 Ft max w/o factory approval
TB4-2	White	RTD Voltage High		
TB4-3	Green	RTD Voltage Low		
TB4-4	Red	RTD Current Low		
TB4-5	Blue	Ground		

Table A- 19 Input/Output Wiring TB5 7ME39404SB00 - Analog Input Module (2 Chan/Dual Path)

Pin	Function	Use	Description	Behavior	Load	Wiring/Cable
TB5-1	AUX. 1 IN	Iin1 Input	Analog current input referenced to meter ground	4 to 20 mA	200 Ω	AWG. 14-24 / 100 ft. max. w/o factory approval
TB5-2	AUX. 1 COM	Iin1 Common				
TB5-3	AUX. 2 IN	Iin2 Input				
TB5-4	AUX. 2 COM	Iin2 Common				

Net load is 335 ohms when safety barriers are used.



① Black
② Orange
③ Brown
④ Red
⑤ Blue
⑥ Terminal Board 1
⑦ Terminal Board 2
⑧ Terminal Board 5
⑨ To Sensors
⑩ Terminal Board 4
⑪ Terminal Board 3

Figure A-5 Temperature Sensor Inputs

Terminal Block Wiring - 7ME39400SA00 - Analog Input Module - Single Channel

(Refer to manual drawing 1010N-5S2-7)

These connection diagrams apply to the part numbers listed below.

Table A- 20 Connection Diagrams and Part Numbers

1010N-5S2-7 Drawing	
FUS1010	7ME3530, 7ME3533
FUH1010	7ME3600, 7ME3603

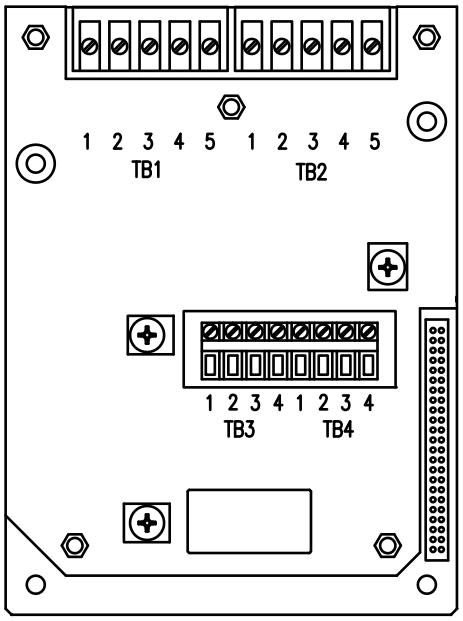


Figure A-6 7ME39400SA00 - Analog Input Module

Table A- 21 Input/Output Wiring TB1 7ME39400SA00 - Analog Input Module

Pin	Color	Function	Description	Wiring/Cable
TB1-1	Black	RTD Current High	RTD Temperature measurement T1 or Channel 1 Ts (Supply Temperature)	AWG. 14 - 24 / 1000 Ft max w/o factory approval
TB1-2	White	RTD Voltage High		
TB1-3	Green	RTD Voltage Low		
TB1-4	Red	RTD Current Low		
TB1-5	Blue	Ground		

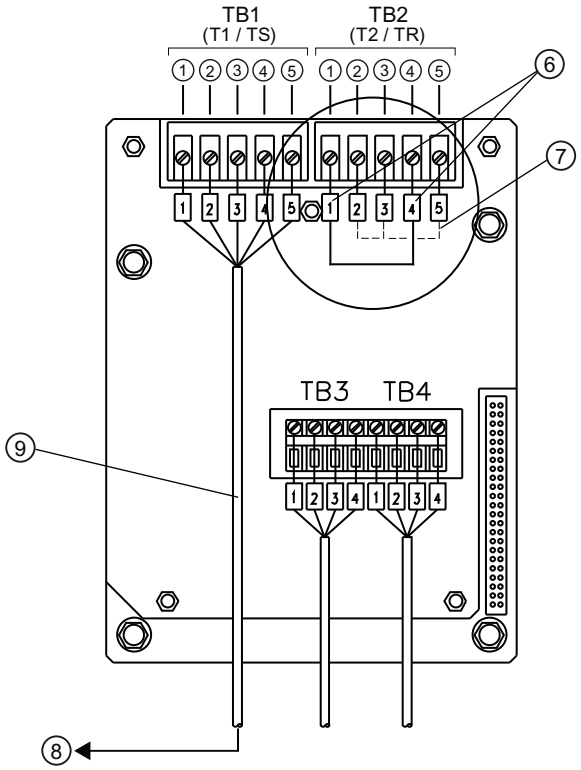
Table A- 22 Input/Output Wiring TB2 7ME39400SA00 - Analog Input Module

Pin	Color	Function	Description	Wiring/Cable
TB2-1	Black	RTD Current High	RTD Temperature measurement T2 or Channel 1 Tr (Return Temperature)	AWG. 14 - 24 / 1000 Ft max w/o factory approval
TB2-2	White	RTD Voltage High		
TB2-3	Green	RTD Voltage Low		
TB2-4	Red	RTD Current Low		
TB2-5	Blue	Ground		

Table A- 23 Input/Output Wiring TB3 and TB4 7ME39400SA00 - Analog Input Module

Pin	TB3 Function	TB4 Function	Use	Description	Behaviour	Load	Wiring
1	AUX. 1 IN	AUX. 3 IN	Iin1 Input	Analog current input referenced to meter ground.	4 to 20mA	200Ω	305 meters (1000 ft.) Max w/o factory approval
2	AUX. 1 COM	AUX. 3 COM	Iin1 Common				
3	AUX. 2 IN	AUX. 4 IN	Iin2 Input				
4	AUX. 2 COM	AUX. 4 COM	Iin2 Common				

Net load is 335 ohms when safety barriers are used.



① Black
② Orange
③
④ Red
⑤ Blue
⑥ Short Terminals 1 and 4 (For FUE1010 - TB2 is used for another Temperature sensor.)
⑦ Ground Terminals 2 and 3 to Terminal 5
⑧ To Sensor
⑨ 7ME39600CR (992EC) Series Cable

A.2 Technical Data

Transmitter

- Operating Temperature Range: -18°C to 60°C (0°F to 140°F)
- Storage Temperature Range: -20°C to 93°C (-4°F to 200°F)

Degree of Protection

- Wall mount enclosure: IP65 (NEMA 4X)
- Wall mount explosionproof: IP66 (NEMA 7)

Input

- Flow Range: ± 12 m/s (± 40 ft/s), bidirectional
- Flow sensitivity: 0.0003 m/s (0.001 ft/s), flow rate independent

Accuracy

- Calibratable accuracy: ± 0.15% to 0.3% of flow, depending on version
- Batch repeatability: ± 0.05% of flow, maximum
- Zero Drift: 0.0003 m/s (0.001 ft/s), with ZeroMatic path active
- Data refresh rate; 5 Hz (80 Hz output for flow rate available on special order)

Power Supply

- IP65 (NEMA 4X) and IP66 (NEMA 7) Wall Mount - 90 to 240 VAC @ 50 or 60 Hz 30 VA / 9 to 36 VDC, 12 Watts

Sensor

- Type: Nonintrusive, externally mounted
- Temperature Range: -40°C to +120°C (-40°F to +250°F)

Dimensions

- 23.6 cm (9.31 in) x 28.7 cm (11.31 in)
- Net weight: 4.1 kg (9.0 lbs.) max

Liquid Temperature

- Standard: -40°C to +121°C (-40°F to +250°F)
- Optional: -40°C to +232°C (-40°F to +450°F)

Liquid Type

- Water
- Multiple Crude Oils
- Light Crude only
- Heavy Crude only
- Multiple Finished Products
- Gasolines Only
- Kerosene
- Jet Fuel

- Diesel
- Multiple Fuel Oils
- Heavy Fuel Oils
- Liquefied Gases
- Other (Define Liquid name and Vs)

Unit Repair and Excluded Liability

All changes and repairs must be done by qualified personnel, applicable safety regulations must be followed. Please note the following:

- The user is responsible for all changes and repairs made to the device.
- All new components must be provided by Siemens Industry, Inc.
- Restrict repair to faulty components only.
- Do not re-use faulty components.

SIEMENS

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Industry Automation Division
CoC Ultrasonic Flow
Hauppauge, New York 11788 USA
Web: www.usa.siemens.com

DUCTILE IRON PIPE

Nominal Diameter	Actual O.D.	CLASS 50		CLASS 51		CLASS 52		CLASS 53		CLASS 54		CLASS 55		CLASS 56		Liner (Cement)	
		Wall	I.D.	Wall	I.D.	Wall	I.D.	Wall	I.D.	Wall	I.D.	Wall	I.D.	Wall	I.D.	Single	Double
3	3.96	N/A	N/A	0.25	3.46	0.28	3.40	0.31	3.34	0.34	3.28	0.37	3.22	0.40	3.16	0.125	0.250
4	4.80	N/A	N/A	0.26	4.28	0.29	4.22	0.32	4.16	0.35	4.10	0.38	4.04	0.41	3.98	0.125	0.250
6	6.90	0.25	6.40	0.28	6.34	0.31	6.28	0.34	6.22	0.37	6.16	0.40	6.10	0.43	6.04	0.125	0.250
8	9.05	0.27	8.51	0.30	8.45	0.33	8.39	0.36	8.33	0.39	8.27	0.42	8.21	0.45	8.15	0.125	0.250
10	11.10	0.29	10.52	0.32	10.46	0.35	10.40	0.38	10.34	0.41	10.28	0.44	10.22	0.47	10.16	0.125	0.250
12	13.20	0.31	12.58	0.34	12.52	0.37	12.46	0.40	12.40	0.43	12.34	0.46	12.28	0.49	12.22	0.125	0.250
14	15.30	0.33	14.64	0.36	14.58	0.39	14.52	0.42	14.46	0.45	14.40	0.48	14.34	0.51	14.28	0.1875	0.375
16	17.40	0.34	16.72	0.37	16.66	0.40	16.60	0.43	16.54	0.46	16.48	0.49	16.42	0.52	16.36	0.1875	0.375
18	19.50	0.35	18.80	0.38	18.74	0.41	18.68	0.44	18.62	0.47	18.56	0.50	18.50	0.53	18.44	0.1875	0.375
20	21.60	0.36	20.88	0.39	20.82	0.42	20.76	0.45	20.70	0.48	20.64	0.51	20.58	0.54	20.52	0.1875	0.375
24	25.80	0.38	25.04	0.41	24.98	0.44	24.92	0.47	24.86	0.50	24.80	0.53	24.74	0.56	24.68	0.1875	0.375
30	32.00	0.39	31.22	0.43	31.14	0.47	31.06	0.51	30.99	0.55	30.90	0.59	30.82	0.63	30.74	0.250	0.500
36	38.30	0.43	37.44	0.48	37.34	0.53	37.24	0.58	37.14	0.63	37.04	0.68	36.94	0.73	36.84	0.250	0.500
42	44.50	0.47	43.56	0.53	43.44	0.59	43.32	0.65	43.20	0.71	43.08	0.77	42.96	0.83	42.84	0.250	0.500
48	50.80	0.51	49.78	0.58	49.64	0.65	49.50	0.72	49.36	0.79	49.22	0.86	49.08	0.93	48.94	0.250	0.500
54	57.56	0.57	56.42	0.65	56.26	0.73	56.10	0.81	55.94	0.89	55.78	0.97	55.62	1.05	55.46	0.250	0.500

CAST IRON PIPE - AWWA STANDARD

Pipe Size	CLASS A			CLASS B			CLASS C			CLASS D			CLASS E			CLASS F			CLASS G			CLASS H		
	O.D	Wall	I.D.	O.D	Wall	I.D.	O.D	Wall	I.D.	O.D	Wall	I.D.	O.D	Wall	I.D.	O.D	Wall	I.D.	O.D	Wall	I.D.	O.D	Wall	I.D.
3	3.80	0.39	3.02	3.96	0.42	3.12	3.96	0.45	3.06	3.96	0.48	3.00												
4	4.80	0.42	3.96	5.00	0.45	4.10	5.00	0.48	4.04	5.00	0.52	3.96												
6	6.90	0.44	6.02	7.10	0.48	6.14	7.10	0.51	6.08	7.10	0.55	6.00	7.22	0.58	6.06	7.22	0.61	6.00	7.38	0.65	6.08	7.38	0.69	6.00
8	9.05	0.46	8.13	9.05	0.51	8.03	9.30	0.56	8.18	9.30	0.60	8.10	9.42	0.66	8.10	9.42	0.71	8.00	9.60	0.75	8.10	9.60	0.80	8.00
10	11.10	0.50	10.10	11.10	0.57	9.96	11.40	0.62	10.16	11.40	0.68	10.04	11.60	0.74	10.12	11.60	0.80	10.00	11.84	0.86	10.12	11.84	0.92	10.00
12	13.20	0.54	12.12	13.20	0.62	11.96	13.50	0.68	12.14	13.50	0.75	12.00	13.78	0.82	12.14	13.78	0.89	12.00	14.08	0.97	12.14	14.08	1.04	12.00
14	15.30	0.57	14.16	15.30	0.66	13.96	15.65	0.74	14.17	15.65	0.82	14.01	15.98	0.90	14.18	15.98	0.99	14.00	16.32	1.07	14.18	16.32	1.16	14.00
16	17.40	0.60	16.20	17.40	0.70	16.00	17.80	0.80	16.20	17.80	0.89	16.02	18.16	0.98	16.20	18.16	1.08	16.00	18.54	1.18	16.18	18.54	1.27	16.00
18	19.50	0.64	18.22	19.50	0.75	18.00	19.92	0.87	18.18	19.92	0.96	18.00	20.34	1.07	18.20	20.34	1.17	18.00	20.78	1.28	18.22	20.78	1.39	18.00
20	21.60	0.67	20.26	21.60	0.80	20.00	22.06	0.92	20.22	22.06	1.03	20.00	22.54	1.15	20.24	22.54	1.27	20.00	23.02	1.39	20.24	23.02	1.51	20.00
24	25.80	0.76	24.28	25.80	0.89	24.02	26.32	1.04	24.22	26.32	1.16	24.00	26.90	1.31	24.28	26.90	1.45	24.00	27.76	1.75	24.26	27.76	1.88	24.00
30	31.74	0.88	29.98	32.00	1.03	29.94	32.40	1.20	30.00	32.74	1.37	30.00	33.10	1.55	30.00	33.46	1.73	30.00						
36	37.96	0.99	35.98	38.30	1.15	36.00	38.70	1.36	39.98	39.16	1.58	36.00	39.60	1.80	36.00	40.04	2.02	36.00						
42	44.20	1.10	42.00	44.50	1.28	41.94	45.10	1.54	42.02	45.58	1.78	42.02												
48	50.50	1.26	47.98	50.80	1.42	47.96	51.40	1.71	47.98	51.98	1.96	48.06												
54	56.66	1.35	53.96	57.10	1.55	54.00	57.80	1.90	54.00	58.40	2.23	53.94												
60	62.80	1.39	60.02	64.40	1.67	60.06	64.20	2.00	60.20	64.82	2.38	60.06												
72	75.34	1.62	72.10	76.00	1.95	72.10	76.88	2.39	72.10															
84	87.54	1.72	84.10	88.54	2.22	84.10																		

STAINLESS STEEL, HASTELLOY “C” & TITANIUM△ PIPE

Sched.	Size	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	3 1/2	4	5	6	8	10	12	14	16	18	20	22	24
5S◇	O.D.	0.840	1.050	1.315	1.660	1.900	2.375	2.875	3.500	4.000	4.500	5.563	6.625	8.625	10.750	12.750	14.000	16.000	18.000	20.000	22.000	24.000
	I.D.	0.710	0.920	1.185	1.530	1.770	2.245	2.709	3.334	3.834	4.334	5.345	6.407	8.407	10.482	12.438	13.688	15.670	17.670	19.634	21.624	23.563
	Wall	0.065	0.065	0.065	0.065	0.065	0.065	0.083	0.083	0.083	0.083	0.109	0.109	0.109	0.134	0.156	0.156	0.165	0.165	0.188	0.188	0.218
10S◇	I.D.	0.674	0.884	1.097	1.442	1.682	2.157	2.635	3.260	3.760	4.260	5.295	6.357	8.329	10.420	12.390	13.624	15.624	17.624	19.564	21.564	23.500
	Wall	0.083	0.083	0.109	0.109	0.109	0.109	0.120	0.120	0.120	0.120	0.134	0.134	0.148	0.165	0.180	0.188	0.188	0.188	0.218	0.218	0.250
40S	I.D.	0.622	0.824	1.049	1.380	1.610	2.067	2.469	3.068	3.548	4.026	5.047	6.065	7.981	10.020	12.000						
	Wall	0.109⊗	0.113⊗	0.133⊗	0.140⊗	0.145⊗	0.154⊗	0.203⊗	0.216⊗	0.226⊗	0.237⊗	0.258⊗	0.280⊗	0.322⊗	0.365⊗	* .375						
80S	I.D.	0.546	0.742	0.957	1.278	1.500	1.939	2.323	2.900	3.364	3.826	4.813	5.761	7.625	9.750	11.750						
	Wall	^.147	^.154	^.179	^.191	^.200	^.218	^.276	^.300	^.318	^.337	^.375	^.432	^.500	^.500	* .500						

CARBON STEEL and PVC△ PIPE

Pipe	Size	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	3 1/2	4	5	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	42
	O.D.	0.840	1.050	1.315	1.660	1.900	2.375	2.875	3.500	4.000	4.500	5.563	6.625	8.625	10.750	12.750	14.000	16.000	18.000	20.000	22.000	24.000	26.000	28.000	30.000	32.000	34.000	36.000	42.000
Stand-ard	I.D.	0.622	0.824	1.049	1.380	1.610	2.067	2.469	3.068	3.548	4.026	5.047	6.065	7.981	10.020	12.000	13.250	15.250	17.250	19.250	21.250	23.250	25.250	27.250	29.250	31.250	33.250	35.250	41.250
	Wall	0.109	0.113	0.133	0.140	0.145	0.154	0.203	0.216	0.226	0.237	0.258	0.280	0.322	0.365	0.375	0.375	0.375	0.375	0.375	0.375	0.375	0.375	0.375	0.375	0.375	0.375	0.375	* .375
Extra Strong (XS)	I.D.	0.546	0.742	0.957	1.278	1.500	1.939	2.323	2.900	3.364	3.826	4.813	5.761	7.625	9.750	11.750	13.000	15.000	17.000	19.000	21.000	23.000	25.000	27.000	29.000	31.000	33.000	35.000	41.000
	Wall	0.147	0.154	0.179	0.191	0.200	0.218	0.276	0.300	0.318	0.337	0.375	0.432	0.500	0.500	0.500	0.500	0.500	0.500	0.500	0.500	0.500	0.500	0.500	0.500	0.500	0.500	0.500	* .500
Double Extra Strong (XXS)	I.D	0.252	0.434	0.599	0.896	1.100	1.503	1.771	2.300	2.728	3.152	4.063	4.897	6.875	8.750	10.750													
	Wall	0.294	0.308	0.358	0.382	0.400	0.436	0.552	0.600	0.636	0.674	0.750	0.864	0.875	1.000	1.000													
Sched. 10	I.D.																13.500	15.500	17.500	19.500	21.500	23.500	25.376	27.376	29.376	31.376	33.376	35.376	
	Wall																0.250	0.250	0.250	0.250	0.250	0.250	0.312	0.312	0.312	0.312	0.312	0.312	
Sched. 20	I.D.													8.125	10.250	12.250	13.376	15.376	17.376	19.250	21.250	23.250	25.000	27.000	29.000	31.000	33.000	35.000	41.000
	Wall													0.250	0.250	0.250	0.312	0.312	0.312	0.375⊗	0.375⊗	0.375⊗	^.500	^.500	^.500	^.500	^.500	^.500	^.500
Sched. 30	I.D.													8.071	10.136	12.090	13.250	15.250	17.124	19.000	21.000	22.876		26.750	28.750	30.750	32.750	34.750	40.750
	Wall													0.277	0.307	0.330	0.375⊗	0.375⊗	0.438	^.500	^.500	0.562		0.625	0.625	0.625	0.625	0.625	* .625
Sched. 40	I.D.	0.622	0.824	1.049	1.380	1.610	2.067	2.469	3.068	3.548	4.026	5.047	6.065	7.981	10.020	11.938	13.124	15.000	16.876	18.184		22.626							
	Wall	0.109⊗	0.113⊗	0.133⊗	0.140⊗	0.145⊗	0.154⊗	0.203⊗	0.216⊗	0.226⊗	0.237⊗	0.258⊗	0.280⊗	0.322⊗	0.365⊗	0.406	0.438	^.500	0.562	0.593		0.687							
Sched. 60	I.D.													7.813	9.750	11.626	12.814	14.688	16.500	18.376	20.250	22.064							
	Wall													0.406	^.500	0.562	0.593	0.656	0.750	0.812	0.875	0.968							
Sched. 80	I.D.	0.546	0.742	0.957	1.278	1.500	1.939	2.323	2.900	3.364	3.826	4.813	5.761	7.625	9.564	11.376	12.500	14.314	16.126	17.938	19.750	21.564							
	Wall	^.147	^.154	^.179	^.191	^.200	^.218	^.276	^.300	^.318	^.337	^.375	^.432	^.500	0.593	0.687	0.750	0.843	0.937	1.031	1.125	1.218							
Sched. 100	I.D.													7.439	9.314	11.064	12.126	13.938	15.688	17.438	19.250	20.938							
	Wall													0.593	0.718	0.843	0.937	1.031	1.156	1.281	1.375	1.531							
Sched. 120	I.D.										3.624	4.563	5.501	7.189	9.064	10.750	11.814	13.564	15.250	17.000	18.750	20.376							
	Wall										0.438	0.500	0.562	0.718	0.843	1.000	1.093	1.218	1.375	1.500	1.625	1.812							
Sched. 140	I.D.													7.001	8.750	10.500	11.500	13.124	14.876	16.500	18.250	19.876							
	Wall													0.812	1.000	1.125	1.250	1.438	1.562	1.750	1.875	2.062							
Sched. 160	I.D.	0.466	0.614	0.815	1.160	1.338	1.689	2.125	2.624		3.438	4.313	5.189	6.813	8.500	10.126	11.188	12.814	14.438	16.064	17.750	19.314							
	Wall	0.187	0.218	0.250	0.250	0.281	0.343	0.375	0.438		0.531	0.625	0.718	0.906	1.125	1.312	1.406	1.593	1.781	1.968	2.125	2.343							

NON-STANDARD CARBON

Size	10	20	24	24
O.D.	10.750	20.000	24.000	24.000
I.D.	10.192	19.375	23.375	22.126
Wall	0.279	0.312	0.312	0.937

The above sizes are produced by pipe mills but dimensions do not conform to any regular standard or schedule.

△ These materials are generally available in Schedules 40 and 80 only.

◇ Wall Thickness of Schedule 5S & 10S does not permit threading in accordance with the American Standard for Pipe Threads (ASA No. B2.1)

⊗ Wall thickness identical with thickness of “Standard Weight” pipe.

^ Wall Thickness identical with thickness of “Extra-Heavy” pipe.

* These do not conform to American Standard B36. 10.

PIPE WEIGHT FORMULA FOR STEEL PIPE (lbs per foot)
10.68 (D-t) t, where D=Outside Diameter and t=Wall Thickness

SIEMENS

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FUS1010 IP65 (NEMA 4X) Installation Menu Chart

LEVEL A	LEVEL B	LEVEL C/D	LEVEL E (see manual)	LEVEL F	LEVEL G
Meter Type ☞ ①	**2 Channel Flow**	**Channel 1/2 Clamp-on** ☞	Recall Site	Enter From List	
	Dual Path Flow	⇩	Channel Enable	No/Yes	
	Ch 1+2 Flow	**Channel Setup** ☞ ②	**Create/Name Site**	**Enter Site Name**	
	Ch 1-2 Flow		Site Security	On/Off	
	Reflexor		Delete Site	Enter From List	
			Save/Rename Site	Enter/Clear Site Name	
		③ ☞ **Pipe Data**	**Pick Pipe Class**	**Enter From List**	
			Select Pipe Size	**Enter From List**	
			Pipe OD (in)	**Numeric Entry**	
			Pipe Material	**Enter From List**	
			Wall Thickness	**Numeric Entry**	
			Liner Material	Enter From List	
			Liner Thickness	Numeric Entry	
		④ ☞ **Application Data**	**Liquid Class**	**Select Liquid**	**Enter from List**
				Estimated Vs M/S	Numeric Entry
				Viscosity <cS>	Numeric Entry
				Density S.G.	Numeric Entry
			UniMass Tables	Enter From List	
			Temp. Range	Enter From List	
			Pipe Config	Enter From List	
			Anomaly Diams	Numeric Entry	
		⑤ ☞ **Install Sensor**	**Sensor Model**	**Enter From List**	
			Sensor Size	**Enter From List**	
			Sensor Mount Mode	**Enter From List**	
			Spacing Offset	**Enter From List**	
			Number Index	**View Only**	
			Spacing Method	**View Only**	
			Ltn Value <in>	**View Only**	
			Install Complete	**No/Install**	**Select Install**
			Empty Pipe Set	Enter From List	
			Zero Flow Adjust	Enter From List	
		Operation Adjust	Damping Control	Time Average / SmartSlew	
			Deadband Control	Numeric Entry	
			Memory/Fault Set	Fault/Memory	
			Memory Delay (s)	N/A	
		Flow/Total Units	Flow Vol. Units	Enter From List	
			Flow Time Units	Enter From List	
			Flow Disp. Range	Autorange/High	
			Flow Disp. Scale	Enter From List	
			Total Vol. Units	Enter From List	
			Totalizer Scale	Enter From List	
			Total Resolution	Enter From List	
			Totalizer Mode	Enter From List	
			Batch/Sample Tot	Numeric Entry	
		Span/Set/Cal	Span Data	Enter From List	
			Set Alarm Levels	Enter From List	
			Calib. Flowrate	Intrinsic	
				Kc	
				MultiPoint	
		Display Setup	Select Data	Enter From List	
			Data Display	Enter From List	
			Time Base	Enter From List	
			Stripchart Clear	Yes/No	

This Menu Chart applies to:
MLFB - 7ME3530
7ME3533

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Siemens Industry, Inc.
Industry Automation Division
CoC Ultrasonic Flow
Hauppauge, New York
USA
Web: www.usa.siemens.com

FUS1010 IP65 (NEMA 4X) Installation Menu Chart

LEVEL A	LEVEL B	LEVEL C/D	LEVEL E (see manual)	LEVEL F	LEVEL G
		Logger Setup	Logger Mode	Enter From List	
			Logger Data	Enter From List	
			Logger Interval	Enter From List	
			Logger Events	Enter From List	
			Display Logger	Enter From List	
		I/O Data Control	Analog Out Setup	Enter From List	
			Relay Setup	Relay 1/2	
			Analog Inp Setup	Enter From List	
		Diagnostic Data	Flow Data	Enter From List	
			Application Info	Enter From List	
			Liquid Data	Enter From List	
			Site Setup Data	Enter From List	
			Test Facilities	Enter From List	
			Print Site Setup	No/Yes	
			Site Created:	View Only	mm.dd.yy hh.mm.ss

LEVEL A	LEVEL B	LEVEL C	LEVEL D	LEVEL E	LEVEL F
Meter Facilities	Preferred Units	English/Metric			
	Table Setups	Pipe Table	Create/Edit Pipe	Enter From List	
			Delete Pipe	Enter From List	
		Sensor Type	Enter From List		
	Logger Control	Display Logger	Off/Line Wrap / No Line Wrap		
		Output Logger	Yes/No		
		Circular Memory	Yes/No		
		Est LogTime Left	View Only		
		Clear Logger	Yes/No		
	Memory Control	Log Memory Left	View Only		
		Memory Map	Yes/No		
		Defragment	Yes/No		
	Analog Out Trim	Trim Io1	Operate / Trim @ 4mA		
		Trim Io2	Operate / Trim @ 4mA		
		Trim Vo1	Operate / Trim @ 2V		
		Trim Vo2	Operate / Trim @ 2V		
		Trim Pgen1	Operate / Trim @ 1 kHz		
		Trim Pgen2	Operate / Trim @ 1 kHz		
	RTD Calibrate	RTD 1	Factory / User Cal		
		RTD 2	Factory / User Cal		
	Clock Set	Date (MM.DD.YY)	Edit Date		
		Time ((HH.MM)	Edit Time		
	RS-232 Setup	Baud Rate	Enter From List		
		Parity	Enter From List		
		Data Bits	7/8		
		Line Feed	Yes/No		
		Network ID	Numeric Entry		
		RTS Key Time	Enter From List		
	Backlight	Enter from List			
	System Info	Version	View Only		
		Reset Data/Time	View Only	mm.dd.yy hh.mm.ss	
		Op System P/N	View Only		
		Checksum	View Only		
		Code	View Only		
		System Time	View Only	mm.dd.yy hh.mm.ss	
Language	Enter From List				

FUH1010 IP65 (NEMA 4X) Installation Menu Chart

LEVEL A	LEVEL B	LEVEL C	LEVEL D (see manual)	LEVEL E	LEVEL F
Meter Type ①	Dual Path Flow	Chan/Path Setup	Recall Site	Enter From List	
			Channel Enable	No/Yes	
		②	**Create/Name Site**	**Enter Site Name**	
			Site Security	On/Off	
			Delete Site	Enter From List	
			Save/Rename Site	Enter/Clear Site Name	
		③ **Pipe Data**	**Pick Pipe Class**	**Enter From List**	
			Select Pipe Size	**Enter From List**	
			Pipe OD (in)	**Numeric Entry**	
			Pipe Material	**Enter From List**	
			Wall Thickness	**Numeric Entry**	
			Liner Material	Enter From List	
			Liner Thickness	Numeric Entry	
			ThermExp Coef 1/F	Numeric Entry	
			Mod of Elast PSI	Numeric Entry	
		④ **Application Data**	**Liquid Class**	**Select Liquid**	**Enter from List**
				Estimated Vs M/S	Numeric Entry
				Viscosity <cS>	Numeric Entry
				Density S.G.	Numeric Entry
			Liquid Table	Enter From List	
			Temp. Range	Enter From List	
			Pipe Config	Enter From List	
			Anomaly Diams	Numeric Entry	
		⑤ **Install Xdcr**	**Install Path**	**1, 2**	
			Transducer Model	**Enter From List**	
			Transducer Size	**Enter From List**	
			Xdcr Mount Mode	**Enter From List**	
			Spacing Offset	**Enter From List**	
			Number Index	**View Only**	
			Spacing Method	**View Only**	
			Ltn Value <in>	**View Only**	
			Install Complete	**No/Install**	**Select Install**
			Empty Pipe Set	Enter From List	
			Zero Flow Adjust	Enter From List	
		Operation Adjust	Damping Control	Time Average / SmartSlew	
			Deadband Control	Numeric Entry	
			Memory/Fault Set	Fault/Memory	
			Memory Delay (s)	N/A	
			SL Rate	Enter From List	
		Flow/Total Units	Flow Vol. Units	Enter From List	
			Std Vol Corr	No/Yes	
			Flow Time Units	Enter From List	
			Flow Disp. Range	Autorange/High	
			Flow Disp. Scale	Enter From List	
			Total Vol. Units	Enter From List	
			Std Vol Corr	No/Yes	
			Totalizer Scale	Enter From List	
			Total Resolution	Enter From List	
			Totalizer Mode	Enter From List	
			Batch/Sample Tot	Numeric Entry	
		Span/Set/Cal	Span Data	Enter From List	
			Set Alarm Levels	Enter From List	
			Interface Alarms	Enter From List	
			Calib. Flowrate	Intrinsic	
				Kc	
			Calib. Table 1	Index Variable 1	Enter From List
				Calib. Table 1	New Point
				Table Active 1	No/Yes
				Clear Table 1	No/Yes
			Calib. Table 2	Same as Calib. Table 1	
			Calib. Table 3	Same as Calib. Table 1	

This Menu Chart applies to:
MLFB - 7ME3600-4
7ME3603-4

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FUH1010 IP65 (NEMA 4X) Installation Menu Chart

LEVEL A	LEVEL B	LEVEL C	LEVEL D (see manual)	LEVEL E	LEVEL F
		Display Setup	Select Data	Enter From List	
			Data Display	Enter From List	
			Time Base	Enter From List	
			Stripchart Clear	Yes/No	
		Logger Setup	Logger Mode	Enter From List	
			Logger Data	Enter From List	
			Logger Interval	Enter From List	
			Logger Events	Enter From List	
			Display Logger	Enter From List	
		I/O Data Control	Analog Out Setup	Enter From List	
			Relay Setup	Relay 1,2,3,4	
			Analog Inp Setup	Enter From List	
		Diagnostic Data	Path Select	1, 2, 1 & 2	
			Path Enable	No/Yes	
			Flow Data	Enter From List	
			Application Info	Enter From List	
			Liquid Data	Enter From List	
			Site Setup Data	Enter From List	
			Test Facilities	Enter From List	
			Print Site Setup	No/Yes	
			Site Created:	View Only	mm.dd.yy hh.mm.ss
Meter Facilities	Preferred Units	English/Metric			
	Table Setups	Pipe Table	Create/Edit Pipe	Enter From List	
			Delete Pipe	Enter From List	
		Transducer Type	Enter From List		
	Logger Control	Display Logger	Off/Line Wrap/No Line Wrap		
		Output Logger	Yes/No		
		Circular Memory	Yes/No		
		Est LogTime Left	View Only		
		Clear Logger	Yes/No		
	Memory Control	Log Memory Left	View only		
		Memory Map	Yes/No		
		Defragment	Yes/No		
	Analog Out Trim	Trim Io1	Operate		
			Trim @ 4mA		
		Trim Io2	Operate		
			Trim @ 4mA		
		Trim Vo1	Operate		
			Trim @ 2V		
		Trim Vo2	Operate		
			Trim @ 2V		
		Trim Pgen1	Operate		
			Trim @ 1 kHz		
		Trim Pgen2	Operate		
			Trim @ 1 kHz		
	RTD Calibrate	RTD 1	Factory		
			User Cal		
		RTD 2	Factory		
			User Cal		
	Clock Set	Date (MM.DD.YY)	Edit Date		
		Time ((HH.MM)	Edit Time		
	RS-232 Setup	Baud Rate	Enter From List		
		Parity	Enter From List		
		Data Bits	7/8		
		Line Feed	Yes/No		
		Network ID	Numeric Entry		
		RTS Key Time	Enter From List		
	Backlight	Enter from List			
	System Info	Version	View Only		
		Reset Data/Time	View Only	mm.dd.yy hh.mm.ss	
		Op System P/N	View Only		
		Checksum	View Only		
		Code	View Only		
		System Time	View Only	mm.dd.yy hh.mm.ss	
Language	Enter From List				

FUH1010 IP65 (NEMA 4X) Installation Menu Chart

LEVEL A	LEVEL B	LEVEL C	LEVEL D (see manual)	LEVEL E	LEVEL F
Meter Type ①	Dual Path Flow	Chan/Path Setup	Recall Site	Enter From List	
			Channel Enable	No/Yes	
			② **Create/Name Site**	**Enter Site Name**	
			Site Security	On/Off	
			Delete Site	Enter From List	
			Save/Rename Site	Enter/Clear Site Name	
		③ **Pipe Data**	**Pick Pipe Class**	**Enter From List**	
			Select Pipe Size	**Enter From List**	
			Pipe OD (in)	**Numeric Entry**	
			Pipe Material	**Enter From List**	
			Wall Thickness	**Numeric Entry**	
			Liner Material	Enter From List	
			Liner Thickness	Numeric Entry	
			ThermExp Coef 1/F	Numeric Entry	
			Mod of Elast PSI	Numeric Entry	
		④ **Application Data**	**Liquid Class**	**Select Liquid**	**Enter from List**
				Estimated Vs M/S	Numeric Entry
				Viscosity <cS>	Numeric Entry
				Density S.G.	Numeric Entry
			Liquid Table	Enter From List	
			Temp. Range	Enter From List	
			Pipe Config	Enter From List	
			Anomaly Diams	Numeric Entry	
		⑤ **Install Xdcr**	**Install Path**	**1, 2**	
			Transducer Model	**Enter From List**	
			Transducer Size	**Enter From List**	
			Xdcr Mount Mode	**Enter From List**	
			Spacing Offset	**Enter From List**	
			Number Index	**View Only**	
			Spacing Method	**View Only**	
			Ltn Value <in>	**View Only**	
			Install Complete	**No/Install**	**Select Install**
			Empty Pipe Set	Enter From List	
			Zero Flow Adjust	Enter From List	
		Operation Adjust	Damping Control	Time Average / SmartSlew	
			Deadband Control	Numeric Entry	
			Memory/Fault Set	Fault/Memory	
			Memory Delay (s)	N/A	
			SL Rate	Enter From List	
		Flow/Total Units	Flow Vol. Units	Enter From List	
			Flow Time Units	Enter From List	
			Flow Disp. Range	Autorange/High	
			Flow Disp. Scale	Enter From List	
			Total Vol. Units	Enter From List	
			Totalizer Scale	Enter From List	
			Total Resolution	Enter From List	
			Totalizer Mode	Enter From List	
			Batch/Sample Tot	Numeric Entry	
		Span/Set/Cal	Span Data	Enter From List	
			Set Alarm Levels	Enter From List	
			Calib. Flowrate	Intrinsic	
				Kc	
			Calib. Table 1	Index Variable 1	Enter From List
				Calib. Table 1	New Point
				Table Active 1	No/Yes
				Clear Table 1	No/Yes
			Calib. Table 2	Same as Calib. Table 1	
			Calib. Table 3	Same as Calib. Table 1	
		Display Setup	Select Data	Enter From List	
			Data Display	Enter From List	
			Time Base	Enter From List	
			Stripchart Clear	Yes/No	

This Menu Chart applies to:
MLFB - 7ME3600-3 or 7ME3600-0
7ME3603-3 or 7ME3603-0

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FUH1010 IP65 (NEMA 4X) Installation Menu Chart

LEVEL A	LEVEL B	LEVEL C	LEVEL D (see manual)	LEVEL E	LEVEL F
		Logger Setup	Logger Mode	Enter From List	
			Logger Data	Enter From List	
			Logger Interval	Enter From List	
			Logger Events	Enter From List	
			Display Logger	Enter From List	
		I/O Data Control	Analog Out Setup	Enter From List	
			Relay Setup	Relay 1,2,3,4	Enter From List
			Analog Inp Setup	Enter From List	
		Diagnostic Data	Path Select	1, 2, 1 & 2	Enter From List
			Path Enable	No/Yes	
			Flow Data	Enter From List	
			Application Info	Enter From List	
			Liquid Data	Enter From List	
			Site Setup Data	Enter From List	
			Test Facilities	Enter From List	
			Print Site Setup	No/Yes	
			Site Created:	View Only	mm.dd.yy hh.mm.ss
Meter Facilities	Preferred Units	English/Metric			
	Table Setups	Pipe Table	Create/Edit Pipe	Enter From List	
			Delete Pipe	Enter From List	
		Transducer Type	Enter From List		
	Logger Control	Display Logger	Off/Line Wrap/No Line Wrap		
		Output Logger	Yes/No		
		Circular Memory	Yes/No		
		Est LogTime Left	View Only		
		Clear Logger	Yes/No		
	Memory Control	Log Memory Left	View only		
		Memory Map	Yes/No		
		Defragment	Yes/No		
	Analog Out Trim	Trim Io1	Operate		
			Trim @ 4mA		
		Trim Io2	Operate		
			Trim @ 4mA		
		Trim Vo1	Operate		
			Trim @ 2V		
		Trim Vo2	Operate		
			Trim @ 2V		
		Trim Pgen1	Operate		
			Trim @ 1 kHz		
		Trim Pgen2	Operate		
			Trim @ 1 kHz		
	RTD Calibrate	RTD 1	Factory		
			User Cal		
		RTD 2	Factory		
			User Cal		
	Clock Set	Date (MM.DD.YY)	Edit Date		
		Time ((HH.MM)	Edit Time		
	RS-232 Setup	Baud Rate	Enter From List		
		Parity	Enter From List		
		Data Bits	7/8		
		Line Feed	Yes/No		
		Network ID	Numeric Entry		
		RTS Key Time	Enter From List		
	Backlight	Enter from List			
	System Info	Version	View Only		
		Reset Data/Time	View Only	mm.dd.yy hh.mm.ss	
		Op System P/N	View Only		
		Checksum	View Only		
		Code	View Only		
		System Time	View Only	mm.dd.yy hh.mm.ss	
Language	Enter From List				

FUH1010 IP65 (NEMA 4X) Installation Menu Chart

LEVEL A	LEVEL B	LEVEL C/D	LEVEL E (see manual)	LEVEL F	LEVEL G
Meter Type ①	Dual Channel	Channel 1/2 Clamp-on	Recall Site	Enter From List	
		⇩	Channel Enable	Enter From List	
		Channel Setup ②	**Create/Name Site**	**Enter Site Name**	
			Site Security	On/Off	
			Delete Site	Enter From List	
			Save/Rename Site	Enter/Clear Site Name	
		③ Pipe Data	**Pick Pipe Class**	**Enter From List**	
			Select Pipe Size	**Enter From List**	
			Pipe OD (in)	**Numeric Entry**	
			Pipe Material	**Enter From List**	
			Wall Thickness	**Numeric Entry**	
			Liner Material	Enter From List	
			Liner Thickness	Numeric Entry	
		④ **Application Data**	**Liquid Class**	**Select Liquid**	**Enter from List**
				Estimated Vs M/S	Numeric Entry
				Viscosity <cS>	Numeric Entry
				Density S.G.	Numeric Entry
			Liquid Table	Enter From List	
			Temp. Range	Enter From List	
		⑤ **Install Xdcr**	**Transducer Model**	**Enter From List**	
			Transducer Size	**Enter From List**	
			Xdcr Mount Mode	**Enter From List**	
			Spacing Offset	**Enter From List**	
			Number Index	**View Only**	
			Spacing Method	**View Only**	
			Ltn Value (in)	**View Only**	
			Install Complete	**No/Install**	**Select Install**
			Empty Pipe Set	Enter From List	
		Operation Adjust	Memory/Fault Set	Fault/Memory	
			Memory Delay (s)	N/A	
			SL Rate	Enter From List	
		Span/Set/Cal	Span Data	Enter From List	
			Set Alarm Levels	Enter From List	
			Interface Alarms	ROC Alm Set m/s	Numeric Entry
				Interval Secs	Numeric Entry
				Relay Hold Time	Numeric Entry
				High LiquIdent	Numeric Entry
				Low LiquIdent	Numeric Entry
		Display Setup	Main Data Display	Enter From List	
			StripChart Data	Enter From List	
			Chart Data	Enter From List	
			Time Base	Enter From List	
			Stripchart Clear	Yes/No	
		Logger Setup	Logger Mode	Enter From List	
			Logger Data	Enter From List	
			Logger Interval	Enter From List	
			Logger Events	Enter From List	
			Display Logger	Enter From List	
		I/O Data Control	Analog Out Setup	Enter From List	
			Relay Setup	Enter From List	
			Analog Inp Setup	Enter From List	
		Diagnostic Data	Signal Data	Enter From List	
			Application Info	Enter From List	
			Liquid Data	Enter From List	
			Site Setup Data	Enter From List	
			Test Facilities	Enter From List	
			Print Site Setup	No/Yes	
			Site Created:	View Only	mm.dd.yy hh.mm.ss

This Menu Chart applies to:
MLFB - 7ME3600-1 or -2
7ME3603-1or -2

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FUH1010 IP65 (NEMA 4X) Installation Menu Chart

LEVEL A	LEVEL B	LEVEL C/D	LEVEL E (see manual)	LEVEL F	LEVEL G
Meter Facilities	Preferred Units	English/Metric			
	Table Setups	Pipe Table	Create/Edit Pipe	Enter From List	
			Delete Pipe	Enter From List	
		Transducer Type	Enter From List		
	Logger Control	Display Logger	Enter From list		
		Output Logger	Yes/No		
		Circular Memory	Yes/No		
		Est LogTime Left	View Only		
		Clear Logger	Yes/No		
	Memory Control	Log Memory Left	View Only		
		Memory Map	Yes/No		
		Defragment	Yes/No		
	Analog Out Trim	Trim Io1	Operate		
			Trim @ 4mA		
		Trim Io2	Operate		
			Trim @ 4mA		
		Trim Vo1	Operate		
			Trim @ 2V		
		Trim Vo2	Operate		
			Trim @ 2V		
		Trim Pgen1	Operate		
			Trim @ 1 kHz		
		Trim Pgen2	Operate		
			Trim @ 1 kHz		
	RTD Calibrate	RTD 1	Factory		
			User Cal		
		RTD 2	Factory		
			User Cal		
	Clock Set	Date (MM.DD.YY)	Edit Date		
		Time ((HH.MM)	Edit Time		
	RS-232 Setup	Baud Rate	Enter From List		
		Parity	Enter From List		
		Data Bits	7/8		
		Line Feed	Yes/No		
		Network ID	Numeric Entry		
		RTS Key Time	Enter From List		
	Backlight	Enter from List			
	System Info	Version	View Only		
		Reset Data/Time	View Only	mm.dd.yy hh.mm.ss	
		Op System P/N	View Only		
		Checksum	View Only		
		Code	View Only		
		System Time	View Only	mm.dd.yy hh.mm.ss	
Language	Enter From List				

FUE1010 IP65 (NEMA 4X) Installation Menu Chart

LEVEL A	LEVEL B	LEVEL C/D	LEVEL E (see manual)	LEVEL F	LEVEL G
Meter Type ①	**2 Chan Energy**	**Channel 1/2 Clamp-on**	Recall Site	Enter From List	
	2 Path Energy	⇩	Channel Enable	No/Yes	
	Ch 1+2 Energy	**Channel Setup** ②	**Create/Name Site**	**Enter Site Name**	
	Ch 1-2 Energy		Site Security	On/Off	
			Delete Site	Enter From List	
			Save/Rename Site	Enter/Clear Site Name	
		③ **Pipe Data**	**Pick Pipe Class**	**Enter From List**	
			Select Pipe Size	**Enter From List**	
			Pipe OD (in)	**Numeric Entry**	
			Pipe Material	**Enter From List**	
			Wall Thickness	**Numeric Entry**	
			Liner Material	Enter From List	
			Liner Thickness	Numeric Entry	
		④ **Application Data**	**Liquid Class**	**Select Liquid**	**Enter from List**
				Estimated Vs M/S	Numeric Entry
				Viscosity <cS>	Numeric Entry
				Density S.G.	Numeric Entry
			Location	Supply/Return	
			Service	Heating/Cooling/Heat Pump	
			Temp. Range	Enter From List	
			Pipe Config	Enter From List	
			Anomaly Diams	Numeric Entry	
		⑤ **Install Xdcr**	**Transducer Model**	**Enter From List**	
			Transducer Size	**Enter From List**	
			Xdcr Mount Mode	**Enter From List**	
			Spacing Offset	**Enter From List**	
			Number Index	**View Only**	
			Spacing Method	**View Only**	
			Ltn Value <in>	**View Only**	
			Install Complete	**No/Install**	**Select Install**
			Empty Pipe Set	Enter From List	
			Zero Flow Adjust	Enter From List	
		Operation Adjust	Damping Control	Time Average / SmartSlew	
			Energy Deadband	Numeric Entry	
			Deadband Control	Numeric Entry	
			Memory/Fault Set	Fault/Memory	
			Memory Delay (s)	N/A	
		Flow/Total Units	Energy Units	E Rate Units	Enter From List
				E Rate Scale	Enter From List
				Energy Tot Units	Enter From List
				Energy Tot Scale	Enter From List
				Energy Tot Res	Enter From List
				Energy Tot Mode	Enter From List
			Volume Units	Flow Vol. Units	Enter From List
				Flow Time Units	Enter From List
				Flow Disp. Range	Autorange/High
				Flow Disp. Scale	Enter From List
				Total Vol. Units	Enter From List
				Totalizer Scale	Enter From List
				Total Resolution	Enter From List
				Totalizer Mode	Enter From List
				Batch/Sample Tot	Numeric Entry
		Span/Set/Cal	Span Data	Enter From List	
			Set Alarm Levels	Enter From List	
			Calib. Flowrate	Enter From List	
		Display Setup	Select Data	Enter From List	
			Data Display	Enter From List	
			Time Base	Enter From List	
			Stripchart Clear	Yes/No	

This Menu Chart applies to:
MLFB - 7ME3500

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FUE1010 IP65 (NEMA 4X) Installation Menu Chart

LEVEL A	LEVEL B	LEVEL C/D	LEVEL E (see manual)	LEVEL F	LEVEL G
		Logger Setup	Logger Mode	Enter From List	
			Logger Data	Enter From List	
			Logger Interval	Enter From List	
			Logger Events	Enter From List	
			Display Logger	Enter From List	
		I/O Data Control	Analog Out Setup	Enter From List	
			Relay Setup	Relay 1 / 2 / 3 / 4	
		Diagnostic Data	Energy Data	Enter From List	
			Flow Data	Enter From List	
			Application Info	Enter From List	
			Liquid Data	Enter From List	
			Site Setup Data	Enter From List	
			Test Facilities	Enter From List	
			Print Site Setup	No/Yes	
			Site Created:	View Only	mm.dd.yy hh.mm.ss
Meter Facilities	Preferred Units	English/Metric			
	Table Setups	Pipe Table	Create/Edit Pipe	Enter From List	
			Delete Pipe	Enter From List	
		Transducer Type	Enter From List		
	Logger Control	Display Logger	Enter From list		
		Output Logger	Yes/No		
		Circular Memory	Yes/No		
		Est LogTime Left	View Only		
		Clear Datalogger	Yes/No		
	Memory Control	Log Memory Left	View Only		
		Memory Map	Yes/No		
		Defragment	Yes/No		
	Analog Out Trim	Trim Io1	Operate / Trim @ 4mA		
		Trim Io2	Operate / Trim @ 4mA		
		Trim Vo1	Operate / Trim @ 2V		
		Trim Vo2	Operate / Trim @ 2V		
		Trim Pgen1	Operate / Trim @ 1 kHz		
		Trim Pgen2	Operate / Trim @ 1 kHz		
	RTD Calibrate	CH 1 Ts - RTD 1	Factory / User Cal		
		CH 1 Tr - RTD 2	Factory / User Cal		
		CH 2 Ts - RTD 3	Factory / User Cal		
		CH 2 Tr - RTD 4	Factory / User Cal		
	Clock Set	Date (MM.DD.YY)	Edit Date		
		Time ((HH.MM)	Edit Time		
	RS-232 Setup	Baud Rate	Enter From List		
		Parity	Enter From List		
		Data Bits	7/8		
		Line Feed	Yes/No		
		Network ID	Numeric Entry		
		RTS Key Time	Enter From List		
	Backlight	Enter from List			
	System Info	Version	View Only		
		Reset Data/Time	View Only	mm.dd.yy hh.mm.ss	
		Op System P/N	View Only		
		Checksum	View Only		
		Code	View Only		
		System Time	View Only	mm.dd.yy hh.mm.ss	
Language	Enter From List				