

# CLAMP-ON ULTRASONIC ENERGY FLOWMETER

## For Liquids



### FDT-40E Series



- ✓ Bi-Directional Flow/Energy Measurement
- ✓ Rugged, Aluminum Enclosure
- ✓ Rate and Total Backlit Display
- ✓ 4 to 20 mA and Dual Alarm Outputs
- ✓ USB Programming Port
- ✓ RS485 MODBUS® Network Connection

FDT-40E Series ultrasonic flow and energy meters clamp on to the outside of pipes and do not come in contact with the internal liquid. The technology has inherent advantages over alternate devices including: low-cost installation, no pressure head loss, no moving parts to maintain or replace, no fluid compatibility issue, and a large, bi-directional measuring range that ensures reliable readings even at very low and high flow rates. FDT-40E Series is available in a variety of configurations that permit the user to select a meter with features suitable to meet particular application requirements.

### SPECIFICATIONS

#### System

**Liquid Types:** Most clean liquids or liquids containing small amounts of suspended solids or gas bubbles

**Velocity Range:** Bi-directional to greater than 40 FPS (12 MPS)

#### Flow Accuracy:

**Larger Than 50 mm (2"):** ±1% of reading or ±0.01 FPS (0.003 MPS), whichever is greater

**25 to 50 mm (1 to 2"):** ±1% of reading or ±0.04 FPS (0.012 MPS), whichever is greater

**19 mm (¾") and Smaller:** ±1% of full scale



FDT-40E and FDT-46-ANSI both shown smaller than actual size.

#### Temperature Accuracy:

**Absolute:** 0.25°C (0.45°F)

**Difference:** 0.1°C (0.18°F)

**Energy Temperature Range:** 0 to 100°C (32 to 212°F)

**Sensitivity Flow:** 0.001 FPS (0.0003 MPS)

**Temperature:** 0.025°C (0.05°F)

**Repeatability:** 0.5% of reading

#### Transmitter

**Power Requirements (AC):** 95 to 264 Vac 47 to 63 Hz @ 17 VA maximum standard, 20 to 28 Vac 47 to 63 Hz @ 0.35 A maximum ("24VAC" models), 10 to 28 Vdc @ 5 W maximum ("VDC" models)

**Protection:** Auto resettable fuse, reverse polarity and transient suppression

**Display:** Two line LCD, LED backlit; top row 18 mm (0.7") height, 7-segment; bottom row 9 mm (0.35") height, 14-segment

**Icons:** RUN, PROGRAM, RELAY1, RELAY2

**Flow Rate Indication:** 8-digit positive, 7-digit negative maximum; auto decimal, lead zero blanking

**Flow Totalizer:** 8-digit positive, 7-digit negative maximum (re-set via keypad press, software, network command or momentary contact closure)

#### Enclosure NEMA 4 (IP65)

**Construction:** Powder-coated aluminum, polycarbonate, stainless steel, polyurethane, nickel-plated steel mounting brackets

#### Size (Electronic Enclosure Only):

152 W x 112 H x 56 mm D (6.0 x 4.4 x 2.2")

**Conduit Holes:** (2) ½ NPT female

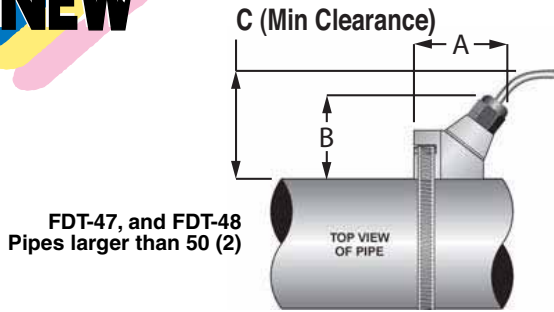
(1) ¼ NPT female

**Temperature:** -40 to 85°C

(-40 to 185°F)

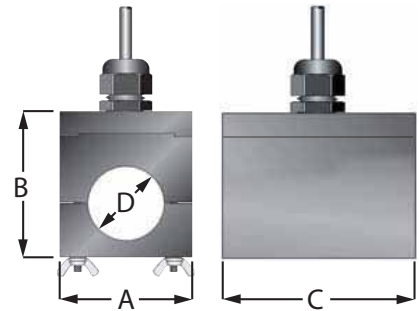
**RTD:** Platinum 385, 1000Ω, 3-wire

**Configuration:** Via optional keypad or PC running software (Note: not all configuration parameters are available from the keypad – i.e. flow and temperature calibration and advanced filter settings)



FDT-47, and FDT-48  
Pipes larger than 50 (2)

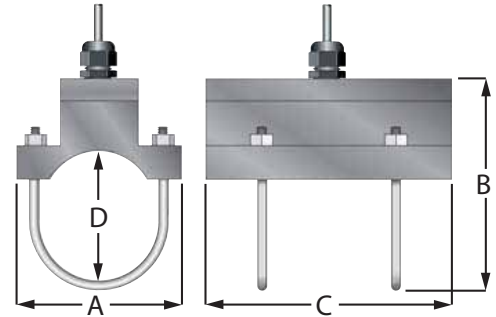
FDT-41 thru FDT-46  
(except U-bolt)  
Pipes/Tubing 12 to  
50 mm (½ to 2")



Dimensions: mm (inches)

Model No.	A	B	C
FDT-47 FDT-47-HT	74.9 (2.95)	69.8 (2.75)	76.2 (3)
FDT-48	86.4 (3.40)	74.7 (2.94)	81.3 (3.20)

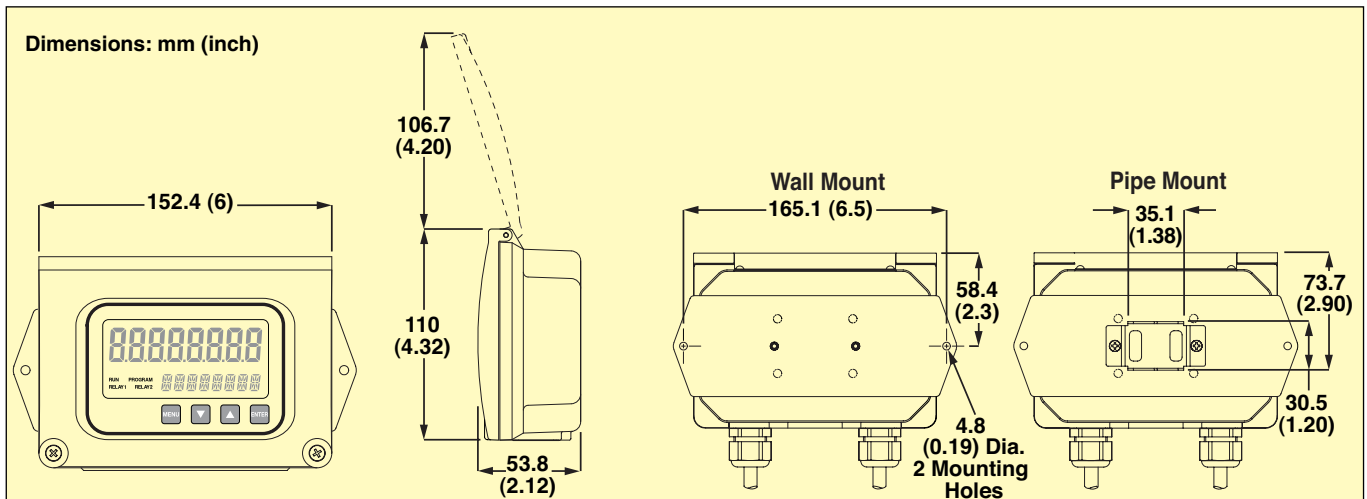
FDT-46-ANSI, -CP  
U-bolt Connections  
ANSI/DN and Copper  
50 mm (2") Models



Transducer Dimensions: mm (inch)

Pipe Size	Pipe Material	A	B	C	D	Measuring Range
½"	ANSI/DN	62.5 (2.46)	59.9 (2.36)	67.6 (2.66)	21.3 (0.84)	2 to 38 GPM/8 to 144 LPM
	Copper	62.5 (2.46)	59.9 (2.36)	84.6 (3.33)	15.9 (0.63)	1.8 to 27 GPM/7 to 102 LPM
	Tubing	62.5 (2.46)	57.9 (2.28)	94.5 (3.72)	12.7 (0.50)	1.5 to 18 GPM/6 to 68 LPM
¾"	ANSI/DN	62.5 (2.46)	65.3 (2.57)	67.6 (2.66)	26.7 (1.05)	2.75 to 66 GPM/10 to 250 LPM
	Copper	62.5 (2.46)	63.5 (2.50)	90.4 (3.56)	22.2 (0.88)	2.5 to 54 GPM/10 to 204 LPM
	Tubing	62.5 (2.46)	63.5 (2.50)	90.4 (3.56)	19 (0.75)	2.5 to 45 GPM/10 to 170 LPM
1"	ANSI/DN	62.5 (2.46)	74.2 (2.92)	72.6 (2.86)	33.4 (1.32)	3.5 to 108 GPM/13 to 409 LPM
	Copper	62.5 (2.46)	72.9 (2.87)	96.5 (3.80)	28.6 (1.13)	3.5 to 95 GPM/13 to 320 LPM
	Tubing	62.5 (2.46)	69.9 (2.75)	96.5 (3.80)	25.4 (1)	3.5 to 85 GPM/13 to 320 LPM
1¼"	ANSI/DN	71 (2.80)	80.8 (3.18)	79.8 (3.14)	42.2 (1.66)	5 to 186 GPM/19 to 704 LPM
	Copper	62.5 (2.46)	76.2 (3)	102.6 (4.04)	43.9 (1.38)	4.5 to 152 GPM/17 to 575 LPM
	Tubing	62.5 (2.46)	76.2 (3)	102.6 (4.04)	31.8 (1.25)	4 to 136 GPM/15 to 514 LPM
1½"	ANSI/DN	76.7 (3.02)	86.9 (3.42)	84.6 (3.33)	48.3 (1.90)	6 to 250 GPM/23 to 946 LPM
	Copper	68.8 (2.71)	72.6 (2.86)	108.7 (4.28)	41.3 (1.63)	5 to 215 GPM/19 to 814 LPM
	Tubing	68.8 (2.71)	84.1 (3.31)	108.7 (4.28)	38.1 (1.5)	5 to 200 GPM/19 to 757 LPM
2"	ANSI/DN	94 (3.70)	86.9 (3.42)*	139.7 (5.50)	60.3 (2.375)*	8 to 420 GPM/30 to 1590 LPM
	Copper	94 (3.70)	85.9 (3.38)*	139.7 (5.50)	54 (2.125)*	8 to 375 GPM/30 to 1419 LPM
	Tubing	81.5 (3.21)	98 (3.85)	120.7 (4.75)	50.8 (2)	8 to 365 GPM/30 to 1381 LPM

\* Varies due to u-bolt configuration.





## To Order

Model No.	Description	Energy Range
<b>FDT-40E</b>	Energy flowmeter display 95 to 264 Vac	0 to 100°C (32 to 212°F)
<b>FDT-40E-VDC</b>	Energy flowmeter display 10 to 28 Vdc	0 to 100°C (32 to 212°F)
<b>FDT-40E-24VAC</b>	Energy flowmeter display 24 Vac	0 to 100°C (32 to 212°F)
<b>FDT-40E-HT</b>	Energy flowmeter display 95 to 264 Vac	-40 to 176°C (-40 to 350°F)
<b>FDT-40E-VDC-HT</b>	Energy flowmeter display 10 to 28 Vdc	-40 to 176°C (-40 to 350°F)
<b>FDT-40E-24VAC-HT</b>	Energy flowmeter display 24 Vac	-40 to 176°C (-40 to 350°F)

Comes complete with operator's manual (**Transducers sold separately, see chart below**).

### Engineering Units Flow Meter:

Feet, gallons, cubic feet, million gallons, barrels (liquid and oil), acre-feet, lbs, meters, cubic meters, liters, million liters, kg

**Engineering Units Energy Meter:** BTU, MBTU, MMBTU, Tons

### Inputs/Outputs USB 2.0:

For connection of a PC running configuration utility

**RS485:** MODBUS RTU command set

**4 to 20 mA:** 12-bit, internal power, can span negative to positive flow/energy rates

### Transducers

#### Construction

**Standard (FDT-41 thru 46):**

NEMA 6 (IP67), PVC, PEI, Nylon cord grip, PVC cable jacket

**Temperature:** -40 to 60°C

(-40 to 140°F)

**FDT-41 thru 46 with "-HT" option,**

**FDT-47 and FDT-48:** NEMA 6 (IP67),

CPVC, PEI, Nylon cord grip, PVC cable jacket

**Temperature:** -40 to 90°C

(-40 to 194°F)

**FDT-47 "-HT":** NEMA 6 (IP67), PTFE,

polyimide, Nickel-plated

brass cord grip, PFA cable jacket

**Temperature:** -40 to 176°C

(-40 to 350°F)

#### Frequency:

**FDT-41 thru 46:** 2 MHz

**FDT-47:** 1 MHz

**FDT-48:** 500 KHz

**Cables:** RG59 coaxial, 75 Ω or twin axial, 78 Ω (optional armored conduit)

**Cable Length:** Standard 6 m (20') [300 m (990') maximum in 3 m (10') increments; submersible conduit limited to 30 m (100') for transducers]

#### Software Utilities

Utilized to configure, calibrate and troubleshoot flowmeters. Connection via USB A/B cable; software is compatible with Windows 2000, Windows XP, Windows Vista® and Windows® 7

### RS485 Network

All FDT-40 meters come equipped with RS485 drivers and utilize a MODBUS RTU command set (data can be returned in single-precision, double-precision, integer or floating point values). Up to 126 units products can be run on a single daisy-chain network and be individually queried for flow rate, positive flow accumulator, negative flow

accumulator and signal strength.

Flow accumulators can be cleared at discrete addresses or globally.

The RS485 network is also compatible with direct to Excel, application.

### Transducers/Accessories (Display Sold Separately, see chart above)

Model No.	Description
<b>FDT-41-ANSI</b>	Remote transducer for ½" ANSI pipe
<b>FDT-42-ANSI</b>	Remote transducer for ¾" ANSI pipe
<b>FDT-43-ANSI</b>	Remote transducer for 1" ANSI pipe
<b>FDT-44-ANSI</b>	Remote transducer for 1¼" ANSI pipe
<b>FDT-45-ANSI</b>	Remote transducer for 1½" ANSI pipe
<b>FDT-46-ANSI</b>	Remote transducer for 2" ANSI pipe
<b>FDT-41-CP</b>	Remote transducer for ½" copper pipe
<b>FDT-42-CP</b>	Remote transducer for ¾" copper pipe
<b>FDT-43-CP</b>	Remote transducer for 1" copper pipe
<b>FDT-44-CP</b>	Remote transducer for 1¼" copper pipe
<b>FDT-45-CP</b>	Remote transducer for 1½" copper pipe
<b>FDT-46-CP</b>	Remote transducer for 2" copper pipe
<b>FDT-41-TUBE</b>	Remote transducer for ½" tubing
<b>FDT-42-TUBE</b>	Remote transducer for ¾" tubing
<b>FDT-43-TUBE</b>	Remote transducer for 1" tubing
<b>FDT-44-TUBE</b>	Remote transducer for 1¼" tubing
<b>FDT-45-TUBE</b>	Remote transducer for 1½" tubing
<b>FDT-46-TUBE</b>	Remote transducer for 2" tubing
<b>FDT-47</b>	Remote transducer for 2 to 24" pipe
<b>FDT-48</b>	Remote transducer for pipes over 24"
<b>FDT-40E-RTD1</b>	RTD kit, clamp-on, 130C, 1000Ω, 6.1 m (20')
<b>FDT-40E-RTD2</b>	RTD kit, clamp-on, 200C, 1000Ω, 6.1 m (20')
<b>FDT-40E-RTD3</b>	RTD kit, insertion, 3 x ¼", 126C, 1000Ω, 6.1 m (20')
<b>FDT-40E-RTDCONN</b>	RTD connector kit for all other 1000Ω Platinum RTD
<b>FDT-40-PC-CABLE</b>	Optional USB PC programming cable
<b>FDT-GREASE</b>	Replacement acoustic couplant 150 g (5.3 oz)
<b>FDT-HT-GREASE</b>	High temperature acoustic couplant 56 g (2 oz)
<b>FDT-NS-GREASE</b>	Non-silicone acoustic couplant 79 g (2.8 oz)

Transducers come with mounting gel.

For high temp transducers add "**-HT**" to the transducer model number for additional cost.

For transducers with 30 m (100') cable add "**-100FT**" to the transducer model number for additional cost.

**Ordering Example:** **FDT-40E**, energy/flowmeter display/electronics 95 to 264 Vac, and **FDT-42-ANSI** remote transducer for ¾" ANSI pipe.