ULTRASONIC ENERGY METER, FLOW METER
DE/DB SERIES

Dynasonics

DESCRIPTION

The **Dynasonics DE Series ultrasonic energy meter** and **DB Series ultrasonic flow meter** attach externally to water distribution piping to measure flow rate and (the **DE Series**) supply/return temperature difference to calculate energy consumption. Since they are non-invasive, they add no pressure head loss to the system and can be installed on existing piping systems without shutdown or interruption. Installation is easy and fast, there are no moving parts, and they measure bi-directional flow. The DE energy meter measures energy usage in BTU, MBTU, MMBTU, Tons, kJ, kW, MW and is perfect for retrofit of existing hot water or chilled water hydronic systems. Network communication models include Modbus RTU over RS485, Modbus TCP/IP, and Ethernet communication includes BACNet®/IP, EtherNet/IP® protocols.

The DE and DB meters have a backlit display (available with or without a keypad interface), a USB port for programming, and integral or remote clamp-on flow transducer configurations. The **DE Series** uses strap-on RTD temperature sensors (immersion sensors are also available). The **DE and DB meters** work with pipe sizes 1/2" and up, are available in 24 VAC, 120 VAC, or 24 VDC power, and have a 4-20 mA analog output for flow rate and a pulse output for totalizing. Free ULTRALINK™ software is used to configure the meters.

FEATURES

- **Backlit display for easy reading in low light**
- **USB Port for configuration and monitoring**
- **No fluid contact means no fluid compatibility issues, no pressure drop, and no plant shutdown necessary for installation**
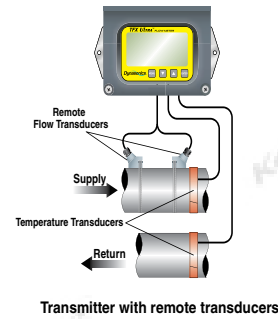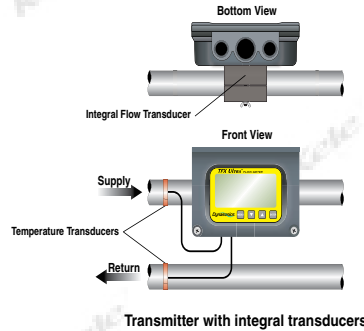- **Bi-directional flow measurement for reversing flow systems**

- **No moving parts to maintain or replace minimizes service costs**
- **models available for large projects (up to 126 meters per network)**
- **Keypad models allow access to many parameters**
- **Free Ultralink™ software for configuration**
- **5 point NIST certification included**

SPECIFICATIONS

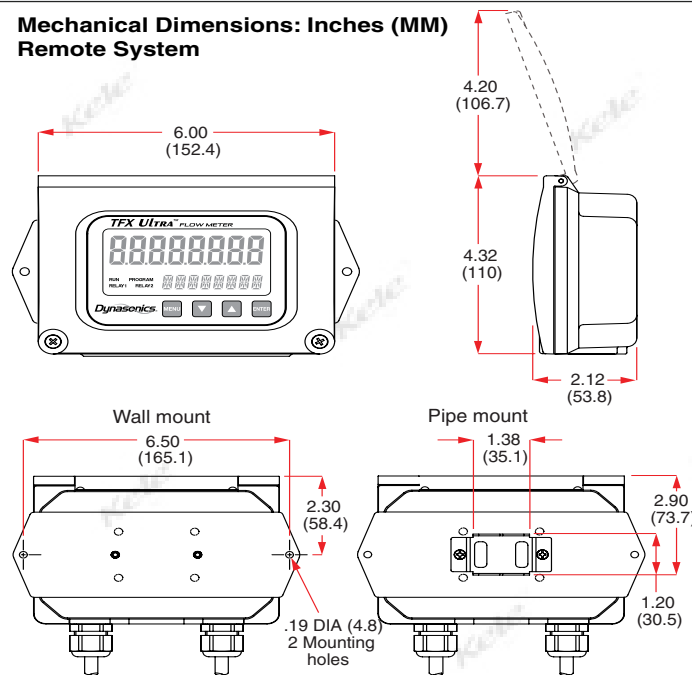|			
Supply Voltage	95-264 VAC, 47-63 Hz @ 17 VA 20-28 VAC, 47-63 Hz @ 8.4 VA 10-28 VDC @ 200 mA		ENERGYLINK network monitoring software 10/100 Base-T: RJ45 communication via Modbus TCP/IP, Ethernet/IP and BACnet®/IP
Accuracy	Flow: ± 1.0% of reading above 1 fps (0.3 mps) velocity, ± 0.01% of reading below 1 fps (0.3 mps) Temperature (DE only): 0.45°F (0.25°C), NIST certification inlcuded	**Configuration**	PC running free ULTRALINK™ software or via integral display keypad (limited access to parameters)
Signal Output	DE: 4-20 mA @ 400Ω internal power, can span negative-to-positive flow/energy rates DB: 4-20 mA @ 400Ω internal power, can span negative-to-positive flow/energy rates; two 0-1,000 Hz open collector transistors that can be configured for flow rate, alarming or totalizing	**Display**	Two-line LCD, LED backlit, top row: 0.7" (1.8 cm) height, 7-segment; bottom row: .35" (0.9 cm) height, 14-segment; flow rate and totalization indication
		Engineering Units	DB: flow rate in gallons, cubic feet, million gallons, barrels, acre-feet, lbs., meters, cubic meters, liters, million liters, kg.
Frequency	DTTS small transducers: 2 MHz DTTN remote transducers: 1 MHz DTTL large pipe transducers: 500 kHz		DE: flow rates above plus BTU, MBTU, MMBTU, Tons, kJ, kW, MW
Repeatability	0.5% of reading	**Pipe Size Range**	1/2" (1.2 cm) and larger
Sensitivity	Flow: 0.001 fps (.0003 mps) Temperature: 0.05°F (.025°C)	**Media Compatibility**	Most clean liquids or liquids with some suspended solids or aeration; get factory approval for glycol applications
Velocity Range	0.1 to 40 fps (feet/second), 0.03 to 12.4 mps (meters/second), bi-directional	**Materials Of Construction**	
Wiring	Transducer cables: RG59 coaxial 75Ω or Twinaxial 78Ω, (optional armored conduit), maximum length 990' (300 m) in 10' (3m) increments RTDs (DE meters only): Platinum 385, 1 kΩ, 3-wire PVC jacket cable		Enclosure: powder-coated aluminum, polycarbonate, stainless steel, polyurethane, nickel-plated steel mounting brackets, Transducers: NEMA 6 (IP67), PVC/CPVC, Ultem®, Nylon cord grip, PVC cable jacket
Conduit Opening	Two 1/2" FNPT and one 3/4" FNPT	**Operating Temperature**	-40° to 185°F (-40° to 85°C); remote DTTS/DTTN transducers have upper limit of 250°F (121°C) and high temperature DTTH have upper limit of 400°F (200°C)
Cable Length	Remote transducer models available with 20' (6.1m), 50' (15m), or 100' (30m) cables		
Communication	USB: 2.0 for connection to PC running ULTRALINK™ configuration utility RS485: Modbus RTU command set,	**Enclosure Rating**	NEMA 4 (IP65) as long as a liquid-tight connectors are used
		Approvals	CSA C22.2 No. 61010-1 (24 VDC, 120 VAC only); CE EN61326-1:2006
		Warranty	1 year

INSTALLATION (DE MODEL SHOWN; DB DOES NOT HAVE TEMPERATURE TRANSDUCERS)

Bottom View

Integral Flow Transducer

Front View

Supply

Temperature Transducers

Return

Transmitter with integral transducers

Remote Flow Transducers

Supply

Temperature Transducers

Return

Transmitter with remote transducers

DIMENSIONS AND FLOW RANGES

Mechanical Dimensions: Inches (MM)
Remote System

6.00 (152.4)

4.20 (106.7)

4.32 (110)

2.12 (53.8)

Wall mount

6.50 (165.1)

2.30 (58.4)

.19 DIA (4.8) 2 Mounting holes

Pipe mount

1.38 (35.1)

2.90 (73.7)

1.20 (30.5)

Integral System

2.12 (53.8)

B

C

D

A
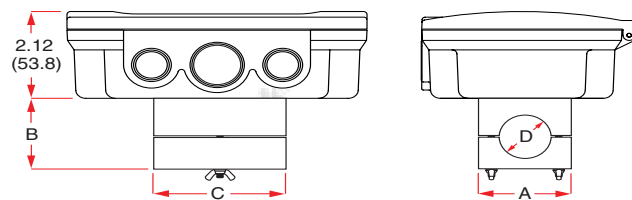
DTTS/DTTN Transducer Dimensions: Inches (MM)

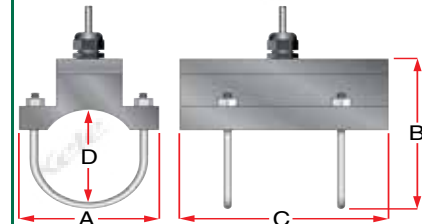| Pipe Size	Pipe Material	A	B	C	D	Measuring Range
½"	ANSI/DN	2.46 (62.5)	2.36 (59.9)	2.66 (67.6)	0.84 (21.3)	2 - 38 GPM 8 - 144 LPM
	Copper	2.46 (62.5)	2.36 (59.9)	3.33 (84.6)	0.63 (15.9)	1.8 - 27 GPM 7 - 102 LPM
	Tubing	2.46 (62.5)	2.28 (57.9)	3.72 (94.5)	0.50 (12.7)	1.5 - 18 GPM 6 - 68 LPM
¾"	ANSI/DN	2.46 (62.5)	2.57 (65.3)	2.66 (67.6)	1.05 (26.7)	2.75 - 66 GPM 10 - 250 LPM
	Copper	2.46 (62.5)	2.50 (63.5)	3.56 (90.4)	0.88 (22.2)	2.5 - 54 GPM 10 - 204 LPM
	Tubing	2.46 (62.5)	2.50 (63.5)	3.56 (90.4)	0.75 (19.0)	2.5 - 45 GPM 10 - 170 LPM
1"	ANSI/DN	2.46 (62.5)	2.92 (74.2)	2.86 (72.6)	1.32 (33.4)	3.5 - 108 GPM 13 - 409 LPM
	Copper	2.46 (62.5)	2.87 (72.9)	3.80 (96.5)	1.13 (28.6)	3.5 - 95 GPM 13 - 360 LPM
	Tubing	2.46 (62.5)	2.75 (69.9)	3.80 (96.5)	1.00 (25.4)	3.5 - 85 GPM 13 - 320 LPM
1-¼"	ANSI/DN	2.80 (71.0)	3.18 (80.8)	3.14 (79.8)	1.66 (42.2)	5 - 186 GPM 19 - 704 LPM
	Copper	2.46 (62.5)	3.00 (76.2)	4.04 (102.6)	1.38 (34.9)	4.5 - 152 GPM 17 - 575 LPM
	Tubing	2.46 (62.5)	3.00 (76.2)	4.04 (102.6)	1.25 (31.8)	4 - 136 GPM 15 - 514 LPM
1-½"	ANSI/DN	3.02 (76.7)	3.42 (86.9)	3.33 (84.6)	1.90 (48.3)	6 - 250 GPM 23 - 946 LPM
	Copper	2.71 (68.8)	2.86 (72.6)	4.28 (108.7)	1.63 (41.3)	5 - 215 GPM 19 - 814 LPM
	Tubing	2.71 (68.8)	3.31 (84.1)	4.28 (108.7)	1.50 (38.1)	5 - 200 GPM 19 - 757 LPM
2"	ANSI/DN	3.70 (94.0)	3.42 (86.9)*	5.50 (139.7)	2.375 (60.3)*	8 - 420 GPM 30 - 1590 LPM
	Copper	3.70 (94.0)	3.38 (85.9)*	5.50 (139.7)	2.125 (54.0)*	8 - 375 GPM 30 - 1419 LPM
	Tubing	3.21 (81.5)	3.85 (98.0)	4.75 (120.7)	2.00 (50.8)	8 - 365 GPM 30 - 1381 LPM

* Varies due to U-bolt configuration

DTTN/DTTH
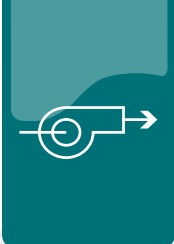Pipes larger than 2" (50 mm)

C (Min Clearance)

A

B

TOP VIEW OF PIPE

	A	B	C
DTTN	2.95 (74.9)	2.75 (69.8)	3.00 (76.2)
DTTH	2.95 (74.9)	2.75 (69.8)	3.00 (76.2)
DTTL	3.40 (86.4)	2.94 (74.7)	3.20 (81.3)
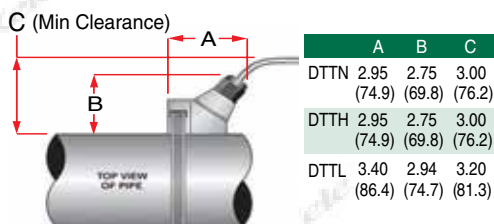
DTTS
Pipes/Tubing ½" to 2" (12 mm to 50 mm)

B

D

A

C
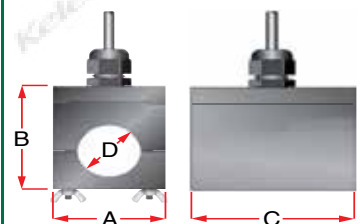
DTTS U-Bolt Connections
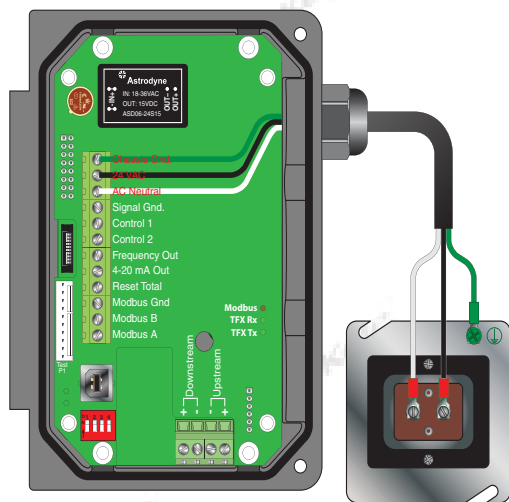ANSI/DN & Copper 2" (50 mm) Models

D

B

A

C

FLOW

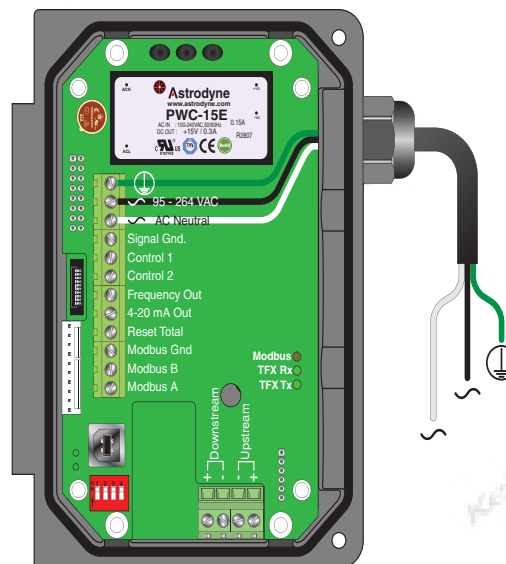## ULTRASONIC ENERGY METER, FLOW METER
DE/DB SERIES

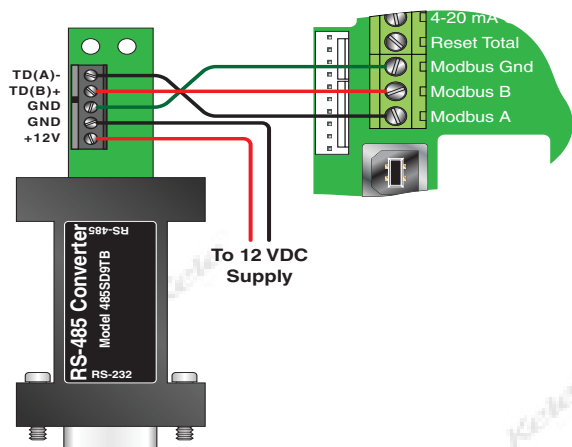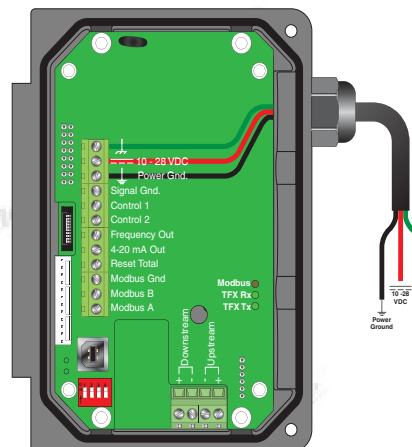### POWER WIRING FOR 24 VAC
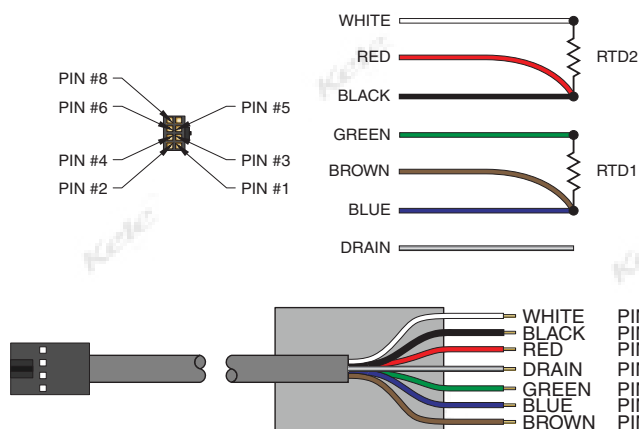

24 VAC Transformer

POWER WIRING FOR 120 VAC
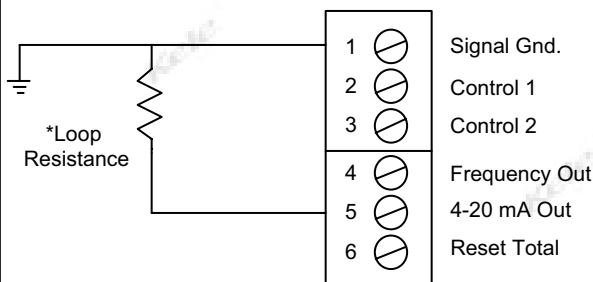

COMMUNICATIONS WIRING (MODEL SPECIFIC)

TD(A)-
TD(B)+
GND
GND
+12V

4-20 mA
Reset Total
Modbus Gnd
Modbus B
Modbus A

RS-485 Converter
Model 485SD9TB
RS-485
RS-232

To 12 VDC Supply

POWER WIRING FOR 24 VDC

TEMPERATURE SENSOR WIRING

PIN #8
PIN #6
PIN #4
PIN #2
PIN #5
PIN #3
PIN #1

WHITE
RED   RTD2
BLACK
GREEN
BROWN   RTD1
BLUE
DRAIN

WHITE   PIN#5
BLACK   PIN#3
RED   PIN#1
DRAIN   PIN#8
GREEN   PIN#6
BLUE   PIN#4
BROWN   PIN#2

4-20 mA OUTPUT WIRING

*Loop Resistance

1	Signal Gnd.
2	Control 1
3	Control 2
4	Frequency Out
5	4-20 mA Out
6	Reset Total

DE/DB Series

*Loop resistance maximum = 400 ohms for AC powered units or (supply voltage – 7 VDC/0.02 for DC powered units.

ORDERING INFORMATION

MODEL	DESCRIPTION
DE	BTU Meter
DB	Flowmeter

	PIPE SIZE	
	IA	1/2" ANSI pipe
	IB	3/4" ANSI pipe
	IC	1" ANSI pipe
	ID	1 1/4" ANSI pipe
	IE	1 1/2" ANSI pipe
	IF	2" ANSI pipe
	IG	1/2" copper
	IH	3/4" copper
	II	1" copper
	IJ	1 1/4" copper
	IK	1 1/2" copper
	IL	2" copper
	IM	1/2" OD tubing
	IN	3/4" OD tubing
	IP	1" OD tubing
	IQ	1 1/4" OD tubing
	IR	1 1/2" OD tubing
	IS	2" OD tubing
	RZ	Remote Flow Transducers (see DT, DS tables)

		TRANSDUCER MATERIAL/TEMPERATURE	
		L	PVC: -40 to +185˚F (-40 to +185˚C)
		H	CPVC: -40 to +250˚F (-40 to +121˚C)
		N	None (select for Remote Transducer Only)

			POWER	
			A	90-264 VAC
			C	20-28 VAC
			D	11-28 VDC

				KEYPAD	
				Y	Keypad
				N	No keypad

				COMMUNICATIONS	
				Y	10/100 Base-T (EtherNet/IP, BACnet/IP, Modbus TCP/IP)
				H	BACnet MSTP @ 7800 band
				B	BACnet MSTP
				N	No communications

					ENERGY TEMPERATURE RANGE (Separately ordered RTD kit required)	
					L	+32 to +122˚F (0 to +122˚C)
					M	+32 to +212˚F (0 to +100˚C)
					N	None (for DB flowmeter)
					H	-40 to +350˚F (-40 to +177˚C)
					X	-4 to +85˚F (-20 to +30˚C)

						APPROVALS	
						N	General safety (power supply C only)

							OPTIONS	
							0	None, plugged ports
							1	Cable Gland Kit

Two Remote transducers for small pipes (with "RZ" pipe size)

MODEL	DESCRIPTION
DTTS	Remote transducers for 1/2" to 2" pipes
DTTC	High Temperature transducer for 1/2" to 2" pipes

	PIPE SIZE*	
	D	1/2"
	F	3/4"
	G	1"
	H	1 1/4"
	J	1 1/2"
	L	2"

		PIPE TYPE	
		P	ANSI carbon steel
		C	Copper
		T	Tubing

			CABLE LENGTH	
			020	20 feet (6.1 m)
			050	50 feet (15 m)
			100	100 feet (30 m)

				CABLE ARMOR OPTION	
				N	No armor
				A	Flexible armor

					CABLE ARMOR LENGTH	
					000	No armor
					020	20 feet (6.1 m)
					050	50 feet (15 m)
					100	100 feet (30 m)

Two Remote transducers for large pipes (with "RZ" pipe size)

MODEL	DESCRIPTION
DTTN	Standard transducer for 2 1/2" to 20" pipes*
DTTH	High temperature transducer for 2 1/2" to 100" pipes*
DTTL	Large transducer for 22" to 100" pipes

	CABLE LENGTH	
	020	20 feet (6.1 m)
	050	50 feet (15 m)
	100	100 feet (30 m)

		CABLE ARMOR OPTION	
		N	No armor
		A	Flexible armor

			CABLE ARMOR LENGTH	
			000	No armor
			020	20 feet (6.1 m)
			050	50 feet (15 m)
			100	100 feet (30 m)

				OPTIONS	
				N	Normal area rating

Note: Shaded selections are special order.
*DT remote transducers come with 36"
straps that fit pipes up to 10".
(P/N D002-2007-001)

ACCESSORIES

D005-0803-104	UltraLink PC software for DE/DB Meters (required accessory)
D005-2117-003	USB A/B Cable, 10 ft. (3 m) for DE/DB Series Meters (required accessory
D005-2117-004	USB A/B Cable, 15 ft. (4.6 m) for DE/DB Series Meters
D002-2007-005	72" stainless steel straps, 1 pair, for DTTN/DTTH, for pipes up to 20"
D005-0350-300	RTD Connector Kit (required for non-standard sensors)
D010-2102-010	Mounting track assembly for DTTN/DTTH transducers, for <10" pipes
D010-2102-016	Mounting track assembly for DTTN/DTTH transducers, for 10" to 16" pipes
D010-3000-120	RTD kit for DE Energy Meter, strap-on, 20 ft. cables
D010-3000-121	RTD kit for DE Energy Meter, strap-on, 50 ft. cables
D010-3000-122	RTD kit for DE Energy Meter, strap-on, 100 ft. cables