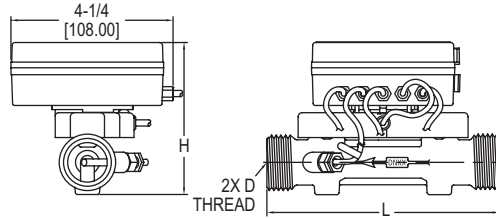


ULTRASONIC ENERGY METERS

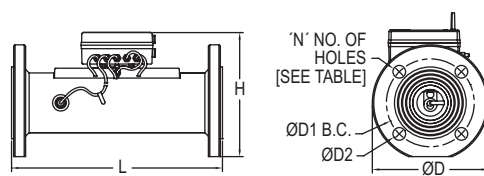
Flow & Temperature Monitoring Capability, Modbus® or BACnet Communication



TUF-150/400



TUF-500



DIMENSIONS in [mm]			
Model	L	D	H
TUF-150-XX	4-21/64 [110.00]	G3/4B	3-31/32 [101.00]
TUF-200-XX	5-1/8 [130.00]	G1B	3-31/32 [101.00]
TUF-250-XX	6-19/64 [160.00]	G11/4B	4-11/64 [106.00]
TUF-320-XX	7-3/32 [180.00]	G11/2B	4-29/64 [113.00]
TUF-400-XX	7-7/8 [200.00]	G2B	4-49/64 [121.00]

DIMENSIONS in [mm]						
Model	L	ØD	H	ØD1	ØD2	N
TUF-500-XX	7-7/8 [200]	6-1/2 [165.00]	9-27/32 [250]	4-59/64 [125.00]	45/64 [18.00]	4
TUF-650-XX	7-7/8 [200]	7-9/32 [185.00]	10-7/16 [265]	5-45/64 [145.00]	45/64 [18.00]	4
TUF-800-XX	8-55/64 [225]	7-7/8 [200.00]	11-1/32 [280]	6-19/64 [160.00]	45/64 [18.00]	8
TUF-1000-XX	9-27/32 [250]	8-21/32 [220.00]	12-13/64 [310]	7-3/32 [180.00]	45/64 [18.00]	8
TUF-1250-XX	9-27/32 [250]	9-27/32 [250.00]	12-63/64 [330]	8-17/64 [180.00]	45/64 [18.00]	8

The Series TUF Ultrasonic Energy Meters are highly accurate and stable energy meter that utilizes ultrasonic technology to measure heating and cooling energy consumption. The Series TUF is a compact meter with a flowmeter and energy calculator in one, making it great for installation on chillers and boilers.

FEATURES/BENEFITS

- Lower maintenance costs with local parameter display and no moving parts
- Serial communication output allows for easy transfer of data
- Flow and temperature monitor in one unit eliminates the need for multiple units

APPLICATIONS

- Heat metering
- Tenant billing
- Utilities billing
- Monitoring of water heating or cooling: radiators, fan coils

INSTRUCTIONS FOR ORDERING

- Choose 1 ultrasonic energy meter model (includes 2 BSPP pipe fittings, 2 tightening nuts, 2 O-rings, and 1 thermowell with welding collar)
- Choose 1 pipe fitting model given the appropriate fitting size if NPT or BSPT connections are required (for DN15 to DN40 only)*

Example: TUF-150-MD, Fitting Size: A, select pipe fitting Model WM-ACC-C01 or WM-ACC-C11.

SPECIFICATIONS

Service: Clean, compatible liquids.
Wetted Materials: Brass and 316L SS.
Range: See chart.
Display: 8-digit LED.
Accuracy: BTU: EN1434/CJ128 Class 2; Flow: $\pm(2+(0.02 Q_p / Q))\%$; Temperature: $\pm 0.1^\circ\text{C}$.
Power Requirements: 24 VDC/VAC (model dependent) or 3.6 V ER26500 lithium metal battery, user supplied and installed, battery acts as back-up if power is lost.
Power Consumption: 1 W.
Temperature Limits: Ambient: 41 to 131°F (5 to 55°C); Process: 36 to 203°F (2 to 95°C).
Humidity Limit: < 93%.

Pressure Limits: 232 psi (16 bar) for DN15 to DN40; 362 psi (25 bar) for >DN50.
Pressure Drop: < 1.5 psi (10 kPa).
Process Connection: See chart.
Serial Communications: Modbus® RTU or BACnet MSTP (selectable)**.
Enclosure Rating: IP65.
Enclosure Material: Plastic.
Repeatability: Flowmeter: 1%.
Electrical Connections: 3' (0.91 m) 4x0.2 mm2 cable with terminal block.
Flow Direction: Unidirectional.
Mounting Orientation: Horizontal or vertical.
Weight: See chart.
Agency Approvals: CE.

**M-BUS available upon request.

MODEL CHART										
Ultrasonic Energy Meter Model	Body Size†	Pipe Size		Fitting Size	Communication	Meter Connection	GPM (LPM)			Weight lb (kg)
		in	mm				Min Flow (Qi)	Nominal Flow Range (Qp)	Max Flow (Qs)	
TUF-150-MD	DN15	1/2	15	A	Modbus®	G-3/4	0.1 (0.5)	6.6 (25)	13 (50)	3.1 (1.4)
TUF-200-MD	DN20	3/4	20	B	Modbus®	G1	0.2 (0.8)	11 (42)	22 (83)	3.1 (1.4)
TUF-250-MD	DN25	1	25	C	Modbus®	G1-1/4	0.3 (1.2)	15 (58)	31 (117)	4.1 (1.8)
TUF-320-MD	DN32	1-1/4	32	D	Modbus®	G1-1/2	0.5 (2)	26 (100)	53 (200)	5.2 (2.3)
TUF-400-MD	DN40	1-1/2	40	E	Modbus®	G2	0.9 (3)	44 (167)	88 (333)	6.6 (3)
TUF-500-MD*	DN50	2	50	-	Modbus®	Flange	1.3 (5)	66 (250)	132 (500)	33 (15)
TUF-650-MD	DN65	2-1/2	65	-	Modbus®	Flange	2.2 (8.3)	110 (417)	220 (833)	10.1 (4.6)
TUF-800-MD	DN80	3	80	-	Modbus®	Flange	3.5 (13.3)	176 (667)	352 (1333)	13.5 (6.1)
TUF-1000-MD	DN100	4	100	-	Modbus®	Flange	5.3 (20)	264 (1000)	528 (2000)	16.5 (7.5)
TUF-1250-MD	DN125	5	125	-	Modbus®	Flange	8.8 (33)	440 (1667)	881 (3333)	21.1 (9.6)
TUF-150-BN	DN15	1/2	15	A	BACnet	G-3/4	0.1 (0.5)	6.6 (25)	13 (50)	3.1 (1.4)
TUF-200-BN	DN20	3/4	20	B	BACnet	G2	0.2 (0.8)	11 (42)	22 (83)	3.1 (1.4)
TUF-250-BN	DN25	1	25	C	BACnet	G1-1/4	0.3 (1.2)	15 (58)	31 (117)	4.1 (1.8)
TUF-320-BN	DN32	1-1/4	32	D	BACnet	G1-1/2	0.5 (2)	26 (100)	53 (200)	5.2 (2.3)
TUF-400-BN	DN40	1-1/2	40	E	BACnet	G2	0.9 (3)	44 (167)	88 (333)	6.6 (3)
TUF-500-BN*	DN50	2	50	-	BACnet	Flange	1.3 (5)	66 (250)	132 (500)	33 (15)
TUF-650-BN	DN65	2-1/2	65	-	BACnet	Flange	2.2 (8.3)	110 (417)	220 (833)	10.1 (4.6)
TUF-800-BN	DN80	3	80	-	BACnet	Flange	3.5 (13.3)	176 (667)	352 (1333)	13.5 (6.1)
TUF-1000-BN	DN100	4	100	-	BACnet	Flange	5.3 (20)	264 (1000)	528 (2000)	16.5 (7.5)
TUF-1250-BN	DN125	5	125	-	BACnet	Flange	8.8 (33)	440 (1667)	881 (3333)	21.1 (9.6)
Model		Power Requirements								
TUF-XXX-XX		24 VAC/VDC								
TUF-XXX-XX-DC		24 VDC								

*A pipe fitting is required to use the DN15 to DN40 energy meters. The DN50 has a flange connection and does not require a pipe fitting.
 †For additional sizes up to 8" (203.2 mm) contact factory.

MODEL CHART							
Fitting Size	Pipe Fitting Model*	Process Connection Size	Weight lb (kg)	Fitting Size	Pipe Fitting Model*	Process Connection Size	Weight lb (kg)
A	WM-ACC-C01	1/2" NPT	0.6 (0.3)	C	WM-ACC-C13	1" BSPT	1.8 (0.8)
A	WM-ACC-C11	1/2" BSPT	0.6 (0.3)	D	WM-ACC-C04	1-1/4" NPT	2.3 (1.1)
B	WM-ACC-C02	3/4" NPT	1.2 (0.5)	D	WM-ACC-C14	1-1/4" BSPT	2.3 (1.1)
B	WM-ACC-C12	3/4" BSPT	1.2 (0.5)	E	WM-ACC-C05	1-1/2" NPT	4.4 (2)
C	WM-ACC-C03	1" NPT	1.8 (0.8)	E	WM-ACC-C15	1-1/2" BSPT	4.4 (2)

*Each model includes 1 fitting.

USA: California Proposition 65
 ⚠ WARNING: Cancer and Reproductive Harm
 www.P65Warnings.ca.gov

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