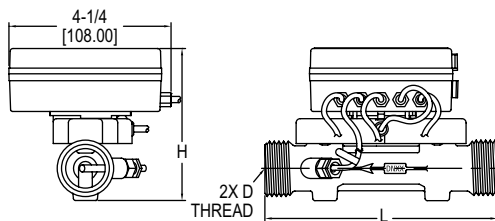


ULTRASONIC ENERGY METERS

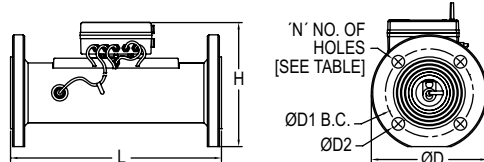
Flow and Temperature Monitoring Capability, Modbus® or BACnet Communication



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]	G1 1/4B	4-11/64 [106.00]	
TUF-320-XX	7-3/32 [180.00]	G1 1/2B	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 [210.00]	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.

BENEFITS/FEATURES

- Lower maintenance costs with local parameter display and no moving parts
- Seamless data transfer with serial communication output standard
- Eliminate the need for multiple units with a flow and temperature monitor in one

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.

Note: Series TUF units are factory set for supply line installation. (Can be modified in the field via communication protocol.)

SPECIFICATIONS

Service: Clean, compatible liquids.	Pressure Limits: 232 psi (16 bar) for DN15 to DN40; 362 psi (25 bar) for >DN50.
Wetted Materials: Brass and 316L SS.	Pressure Drop: < 1.5 psi (10 kPa).
Range: See chart.	Process Connection: See chart.
Display: 8-digit LED.	Serial Communications: Modbus® RTU or BACnet MSTP (selectable)*.
Accuracy: BTU: EN1434/CJ128 Class 2; Flow: $\pm(2+(0.02 Q_p / Q))\%$;	Enclosure Rating: IP65.
Temperature: $\pm 0.1^\circ\text{C}$.	Enclosure Material: Plastic.
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.	Repeatability: Flowmeter: 1%.
Power Consumption: 1 W.	Electrical Connections: 3' (0.91 m) 4x0.2 mm ² cable with terminal block.
Temperature Limits: Ambient: 41 to 131°F (5 to 55°C); Process: 36 to 203°F (2 to 95°C).	Flow Direction: Unidirectional.
Humidity Limit: < 93%.	Mounting Orientation: Horizontal or vertical.
	Weight: See chart.
	Compliance: CE.

*M-BUS available upon request.

**Power supply must be floating, not grounded. Model numbers ending in "-DC" are for DC only applications.

MODEL CHART									
Ultrasonic Energy Meter Model	Body Size**	Pipe Size		Fitting Size	Communication	Meter Connection	GPM (LPM)		
		In	mm				Min Flow (Qt)	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)
TUF-200-MD	DN20	3/4	20	B	Modbus®	G1	0.2 (0.8)	11 (42)	22 (83)
TUF-250-MD	DN25	1	25	C	Modbus®	G1-1/4	0.3 (1.2)	15 (58)	31 (117)
TUF-320-MD	DN32	1-1/4	32	D	Modbus®	G1-1/2	0.5 (2)	26 (100)	53 (200)
TUF-400-MD	DN40	1-1/2	40	E	Modbus®	G2	0.9 (3)	44 (167)	88 (333)
TUF-500-MD*	DN50	2	50	-	Modbus®	Flange	1.3 (5)	66 (250)	132 (500)
TUF-650-MD	DN65	2-1/2	65	-	Modbus®	Flange	2.2 (8.3)	110 (417)	220 (833)
TUF-800-MD	DN80	3	80	-	Modbus®	Flange	3.5 (13.3)	176 (667)	352 (1333)
TUF-1000-MD	DN100	4	100	-	Modbus®	Flange	5.3 (20)	264 (1000)	528 (2000)
TUF-1250-MD	DN125	5	125	-	Modbus®	Flange	8.8 (33)	440 (1667)	881 (3333)
TUF-150-BN	DN15	1/2	15	A	BACnet	G-3/4	0.1 (0.5)	6.6 (25)	13 (50)
TUF-200-BN	DN20	3/4	20	B	BACnet	G2	0.2 (0.8)	11 (42)	22 (83)
TUF-250-BN	DN25	1	25	C	BACnet	G1-1/4	0.3 (1.2)	15 (58)	31 (117)
TUF-320-BN	DN32	1-1/4	32	D	BACnet	G1-1/2	0.5 (2)	26 (100)	53 (200)
TUF-400-BN	DN40	1-1/2	40	E	BACnet	G2	0.9 (3)	44 (167)	88 (333)
TUF-500-BN*	DN50	2	50	-	BACnet	Flange	1.3 (5)	66 (250)	132 (500)
TUF-650-BN	DN65	2-1/2	65	-	BACnet	Flange	2.2 (8.3)	110 (417)	220 (833)
TUF-800-BN	DN80	3	80	-	BACnet	Flange	3.5 (13.3)	176 (667)	352 (1333)
TUF-1000-BN	DN100	4	100	-	BACnet	Flange	5.3 (20)	264 (1000)	528 (2000)
TUF-1250-BN	DN125	5	125	-	BACnet	Flange	8.8 (33)	440 (1667)	881 (3333)

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-C14	1-1/4" BSPT	2.3 (1.1)
B	WM-ACC-C02	3/4" NPT	1.2 (0.5)	E	WM-ACC-C05	1-1/2" NPT	4.4 (2)
B	WM-ACC-C12	3/4" BSPT	1.2 (0.5)	E	WM-ACC-C15	1-1/2" BSPT	4.4 (2)
C	WM-ACC-C03	1" NPT	1.8 (0.8)				

***Each model includes 1 fitting.

USA: California Proposition 65

WARNING: This product can expose you to chemicals including Lead, which is known to the State of California to cause cancer and birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov.

Modbus® is a registered trademark of Schneider Electric USA, Inc.