Dynasonics®
Ultrasonic Flow Meters

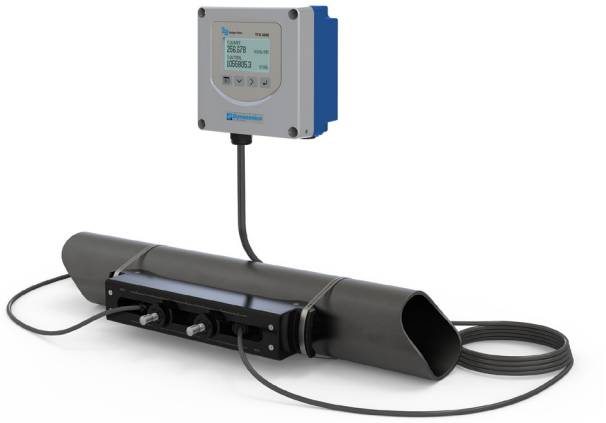
Transit Time Ultrasonic Flow Meters

TFX-5000 Meter

DESCRIPTION

The TFX-5000 transit time ultrasonic flow meter measures volumetric flow and heating/cooling energy rates in clean liquids as well as those with small amounts of suspended solids or aeration, such as surface water or raw sewage.

TFX-5000 flow and energy meters clamp onto the outside of pipes and do not contact the internal liquid.



BENEFITS

By clamping onto the outside of pipes, the meters have inherent advantages over other flow meter technologies, including:

- Reduced installation time and cost
- Non-invasive, non-contact measurement
- Continued operation during installation—no need to shut down the process
- No pressure head loss
- No moving parts to maintain or replace

FEATURES

- Large, bi-directional flow measuring range
- Data log up to 8 records
- Modbus® RTU or BACnet® MS/TP over EIA-485; Modbus TCP/IP; BACnet/IP; EtherNet/IP; AquaCUE®/BEACON® connectivity
- Configure and troubleshoot over USB with SoloCUE
- Reynolds, ultrasonic speed and temperature compensation
- Large, easy-to-read graphical display
- Rugged, aluminum enclosure for a long service life in harsh environments

APPLICATIONS

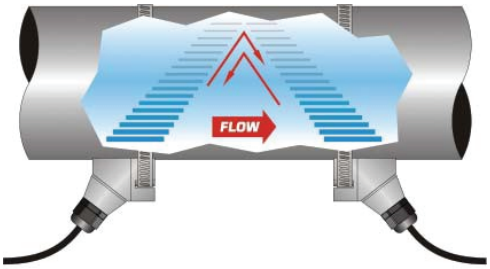
The TFX-5000 meter is available in a variety of configurations that permit the user to select a meter with features suitable to meet particular application requirements.

The TFX-5000 meter is available in two versions:

- A flow meter for water delivery, sewage, cooling water, water-glycol mixtures, alcohols and chemicals
- A heating/cooling energy flow meter used in conjunction with dual clamp-on RTDs for temperature measurement—ideal for hydronic process and HVAC applications

OPERATION

Transit time flow meters measure the time difference between the travel time of an ultrasound wave going *with* the fluid flow and *against* the fluid flow. The time difference is used to calculate the velocity of the fluid traveling in a closed-pipe system. The transducers used in transit time measurements operate alternately as transmitters and receivers. Transit time measurements are bi-directional and are most effective for fluids that have low concentrations of suspended solids and are sonically conductive.



An ultrasonic meter equipped with heat flow capabilities measures the rate and quantity of heat delivered or removed from devices such as heat exchangers. By measuring the volumetric flow rate of the heat exchanger liquid, the temperature at the inlet pipe and the temperature at the outlet pipe, the energy usage can be calculated.

Badger Meter

TTM-DS-02221-EN-08 (April 2021)

madshean

Product Data Sheet

SPECIFICATIONS

System

Liquid Types	Most clean liquids or liquids containing small amounts of suspended solids or gas bubbles	
Flow Accuracy	Medium Pipes (JZ, KZ, NZ, RZ, WZ, HZ)	± 0.5% ± 0.025 ft/s (0.008 m/s) of reading
	Large Pipes (LZ, YZ)	± 0.5% ± 0 0.049 ft/s (0.015 m/s) of reading
	Small Pipes (CA-CT, UZ)	1 in. (25 mm) and larger = ±1% ± 0.03 ft/s (0.009 m/s) of reading 3/4 in. (20 mm) and smaller = ±1% of full scale
Repeatability	0.2% above 1.5 ft/s	
Velocity	Medium and Large Pipes	Up to 40 ft/s, depending on pipe and fluid
	Small Pipes	Up to 20 ft/s, depending on pipe and fluid
Straight Run Requirements	10 diameters upstream, 5 diameters downstream from single elbow	
Certification and Compliance	**General Safety (all models):** cCSAus, CE, Pollution Degree 2, CE compliance to Low Voltage Directive, 2014/35/EU **U.S./Canada Hazardous Location transmitter and transducers:** **Transmitter and transducers (certification option B):** cCSAus Class I Division 2 Groups ABCD T4 Requires flexible conduit Not available with UZ, HZ or JZ and KZ (Easy Rail) transducers, Auxiliary Dry Contact card or units with AquaCUE/BEACON endpoints **Transmitter (certification option R):** cCSAus Ex ec ic nC IIC T4 Gc; Ex tc IIIB T100° C Dc; Class I, Zone 2, AEx ec ic nC IIC T4 Gc; Zone 22, AEx tc IIIB T100° C Dc; Class II, Division 2, Groups FG; Class III Not available with Auxiliary Dry Contact card or units with AquaCUE/BEACON endpoints **Transducers RZ LZ, NZ, RZ, WZ, YZ (certification option R):** cCSAus Ex ec IIC T6 Gc; Ex tc IIIB T60° C Dc; Class I, Zone 2, AEx ec IIC T6 Gc; Zone 22, AEx tc IIIB T60° C Dc; Class II, Division 2, Groups FG; Class III Requires flexible conduit Not available with CA-CT, UZ, HZ or JZ and KZ (Easy Rail) transducers **ATEX Hazardous Location:** Transmitter (certification option V): II 3 G D Ex ec ic nC IIC T4 Gc, Ex tc IIIB T100° C Dc; Tamb: -25…60° C JZ (DTTJ), KZ (DTTK), LZ (DTTL), NZ (DTTN) and RZ (DTTR) Transducers: II 3 G D Ex ec IIC T6 Gc; Ex tc IIIB T60°C Dc; Tamb: -25…60° C Not available with UZ, CA to CT, or HZ transducers; flexible conduit, Auxiliary Dry Contact card or AquaCUE/BEACON endpoints **IECEx Hazardous Location:** Transmitter (certification option V): Ex ec nC ic IIC T4 Gc; Ex tc IIIC T100° C Dc; Tamb: -25°C…60° C JZ, KZ, LZ, NZ and RZ Transducers: Ex ec IIC T6 Gc; Ex tc IIIB T60° C Dc; Tamb: -25…60° C Not available with UZ, CA to CT, or HZ transducers; flexible conduit, Auxiliary Dry Contact card or AquaCUE/BEACON endpoints	

Transmitter

Power Options	24V DC/AC	9…28V DC @ 8 W max. or 20…26 AC 47…63 Hz @ 0.5 A max., 2 Amp slow-blow fuse, not field replaceable
	Mains AC	85…264V AC 47…63 Hz @ 24VA max. 1 Amp slow-blow fuse, manually field replaceable
		Over-Voltage Rating Category II (CAT II)
Display	Options	Display with keypad or no display/keypad
	Keypad	4-button navigation, keypad with tactile feedback; polyester film
	Display	128 × 64 pixel LED backlit graphical display; adjustable brightness and timeout; polycarbonate window
	Flow rate/total	8-digit
Enclosure	NEMA Type 4X, IP67	
Construction	Aluminum construction; painted; wall, panel or pipe mounting; stainless steel fasteners and mounting hardware; EPDM gasket	
	Conduit Holes	(4) 1/2 in. NPT, M20 × 1.5 or 1/2 BSPP; cable glands available for NPT and M20
Environmental Ratings	Pollution Degree	2
	Altitude Restriction	Up to 2000 m (6561 ft)
	Ambient Temperature Range	–4…140° F (–20…60° C)
	Storage Temperature Range	–40…176° F (–40…80° C)
	Humidity	0…85%, non-condensing
Configuration	Via optional keypad or SoloCUE configuration software; SoloCUE available on DVD or download	
Units (Field-Selectable)	Velocity	feet/second, meters/second
	Volumetric total	US Gallons, Million Gallons, Imperial Gallons, Million Imperial Gallons, Acre-Feet, Liters, Hectoliters, Cubic Meters, Cubic Feet, Oil Barrels (42 gallons), Fluid Barrels (31.5 gallons), Imperial Fluid Barrels (36 imperial gallons), Pounds (Kilograms) and custom units
	Flow rate	Acre Feet/Day, Liters/Second, Liters/Minute, Liters/Hour, Cubic Meters/Second, Cubic Meters/Minute, Cubic Meters/Hour, Cubic Feet/Minute, Cubic Feet/Minute, Cubic Feet/Hour, Gallons/Second, Gallons/Minute, Gallons/Hour, Million Gallons/Day, Imperial Gallons/Second, Imperial Gallons/Minute, Imperial Gallons/Hour, Million Imperial Gallons/Day, Oil Barrels/Day, Fluid Barrels/Day, Imperial Fluid Barrels/Day and custom units
	Energy total (energy meters)	British Thermal Unit (Btu), Thousand Btu, Millions Btu, Kilocalories, Mega calories, Kilowatt-hour, Megawatt hour, Kilojoules, Mega joules, Ton-hour (Refrigeration)
	Heat/cooling rate (energy meters)	Btu/hour, Thousand Btu/hour, Millions Btu/hour, Ton (Refrigeration), Watts, Kilowatts, Megawatts, Kilojoules/hour, Mega joules/hour, Kilocalories/hour, Mega calories/hour
	Temperature (energy meters)	Farenheit, Celcius, Kelvin

		Flow Meter	**Energy Meter**
Inputs and Outputs	0/4…20 mA output	One 16-bit, isolated, max 800 Ohms, internal or external power	Two 16-bit, isolated, max 800 Ohms, internal or external power
	Digital input	One 5…30V DC, isolated, externally or internally sourced, reset totalizer or alarm output	
	Digital output	Two selectable pulse, alarm, flow direction, sink isolated open collector, 5…30V DC, max. 50 mA externally or internally sourced, leakage current 1uA max.	Three selectable pulse, frequency, alarm, flow direction, isolated open collector, 5…30V DC, externally or internally sourced, leakage current 1uA max.
		Frequency output: 50% duty cycle, 63…10k Hz maximum frequency	
		Pulse (totalizer) output: Open collector, pulse width 1…500 ms programmable	
		Optional: Two dry contact output for alarm or flow direction 30V DC max., 5A max. (Ethernet not available with this option)	
	RTD (energy only)	None	Two 2-wire, 3-wire or 4-wire Pt100/Pt1000 RTD 12-bit inputs; Range of –40…200° C; Clamp-on resistor kits available
Ports	Programming	USB 2.0 mini B connector for connection to a device with SoloCUE configuration software	
	EIA-485	Modbus RTU command set or BACnet MS/TP; Baud rates 9600, 14400,19200, 38400, 57600, 76800, 115k; terminating resistor selectable	
	Ethernet	Optional 10/100 Base T RJ45, communication via Modbus TCP/IP, BACnet/IP or EtherNet/IP	
	AquaCUE/BEACON	Connectivity to AquaCUE/BEACON endpoint (LTE cellular)	
Data Logging	Number of points	Up to 8 parameters per record. Selectable 1 second to 1 day Transfer logs via memory card	
	Real Time Clock	Backed up with a super capacitor, minimum of 32 days of data retention without power; Requires no servicing	
	MicroSD card slot	8 GB card, included with transmitter	
Alarms	Records 150 previous alarms, warnings or errors		
Languages	English, French, German, Italian, Spanish		
Security	Four levels: Read-only, Operator, Service and Admin; 6-digit passcode number; selectable auto logout		

Transducers

Model	Construction	Cable Length Max.	Pipe/Tubing Sizes [1]	Flow Rate Max. GPM (LPM)	Pipe/ Tubing Materials
CA-CT [5] fixed small pipe	CPVC, Ultem®, Nylon cord grip, PVC cable jacket; –40…194° F	100 ft	0.5…2 in.	190	See [2]
UZ adjustable small pipe	CPVC, Ultem, and anodized aluminum track system; Nickel-plated brass connector with Teflon insulation; PVC cable jacket, –40…194° F (–40…90° C)	100 ft (30 m)	0.5…2 in. (12…50 mm)	190 (720)	
NZ (IP67) standard pipe	CPVC, Ultem®, Nylon cord grip, PVC cable jacket; –40…194° F (–40…90° C)	300 ft (90 m)	2.5…12 in. (DN65…DN300)	4000 (15,000)	
RZ (IP54) standard pipe	PBT glass filled, Ultem®, Nylon cord grip; PVC cable jacket; , –40…250° F (–40…121° C)	300 ft (90 m)	2.5…12 in. (DN65…DN300)	4000 (15,000)	
JZ, KZ (IP54) standard pipe, integrated rail	PBT glass filled, Ultem, Nylon cord grip; PVC cable jacket; –40…250° F (–40…121° C)	300 ft (90 m)	2.5…6 in. (DN65…DN150) 2.5…12 in. (DN65…DN300)	4000 (15,000)	
WZ (IP68) [7] standard pipe, submersible	CPVC, Ultem, Nylon cord grip; Polyethylene cable jacket; –40…194° F (–40…90° C)	300 ft (90 m)	2.5…12 in. (DN65…DN300)	4000 (15,000)	
HZ high temperature	PTFE, Vespel, Nickel-plated brass cord grip; FEP cable jacket; –40…350° F (–40…176° C)	300 ft (90 m)	2.5…12 in. (DN65…DN300)	4000 (15,000)	
LZ (IP67) large pipe	CPVC, Ultem, Nylon cord grip PVC cable jacket; –40…194° F (–40…90° C)	300 ft (90 m) [6]	8…48 in. (DN200…DN1200) [3,4]	33,000 (125,000)	
YZ (IP68) [7] large pipe, submersible	CPVC, Ultem, Nylon cord grip; Polyethylene cable jacket; –40…194° F (–40…90° C)	300 ft (90 m) [6]	8…48 in. (DN200…DN1200) [3,4]	33,000 (125,000)	

[1] Recommendations based on unlined, new pipes with water. Recommended pipe or tubing sizes vary with pipe conditions and fluid.
[2] PVC, CPVC, HDPE, PTFE, PDVF, stainless steel, ductile iron, aluminum, brass naval, carbon steel copper.
[3] Large pipe transducers are recommended for 8…12 in. pipes if normal velocity is expected to be greater than 12 ft/s (3.6 m/s).
[4] Consult factory for larger pipe sizes.
[5] Not for metric pipes.
[6] Cable lengths up to 600 ft are available. Consult factory for lead times.
[7] IP68 tested at 1 meter for 24 hours.

RTD Kits

Part Number	Description	Installation	RTD Type	Construction	Temperature Range
68996-001	RTD pair; 15 ft (4.5 m) cable	Pipe clamp, surface mount, IP54	Pt 1000, Class A ± (0.15 + 0.002*| t |) with t as temperature °C	Aluminum body, silicone cable jacket	-58…356° F (-50…180° C)
68996-002	RTD pair; 50 ft (15 m) cable				
68996-003	RTD pair; 100 ft (30 m) cable				

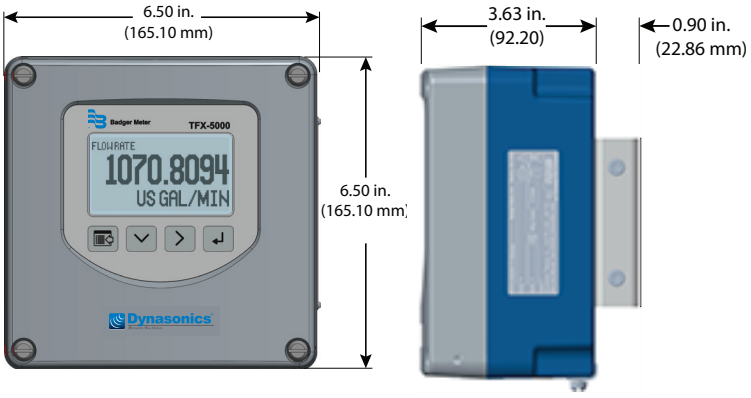
SoloCUE Flow Device Manager Software

The flow meter *may* be programmed through the keypad or with SoloCUE software. If the meter is ordered without a display/keypad, the flow meter *must* be programmed with SoloCUE software. The software is used to configure, calibrate and communicate with TFX-5000 meters with English, French, German, Italian and Spanish menus. Additionally, it has numerous troubleshooting tools to make diagnosing and correcting installation problems easier.

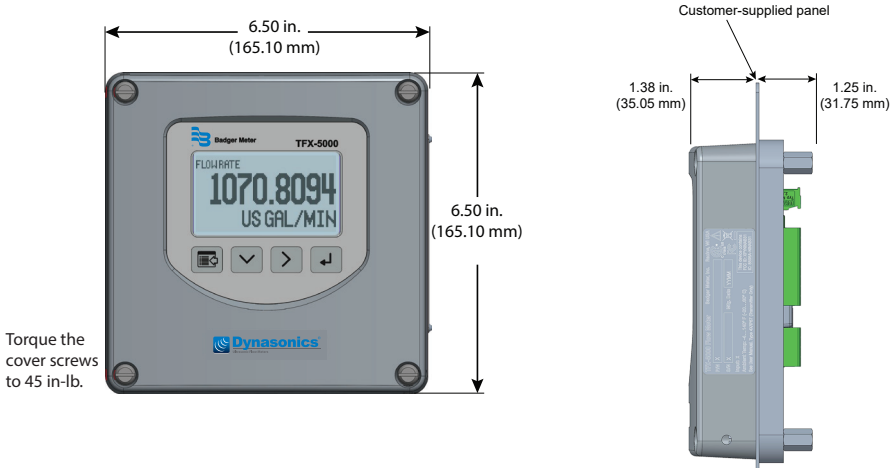
SoloCUE	Used to configure, calibrate and troubleshoot flow meters and control valves; Software is compatible with Windows 7, 8, 10	
USB Cable	RC820648	USB 2.0 mini B connector to A connector, shielded

DIMENSIONS

Remote System Enclosure



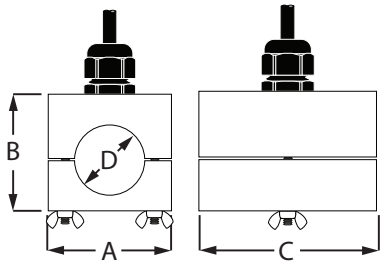
Panel Mount Enclosure



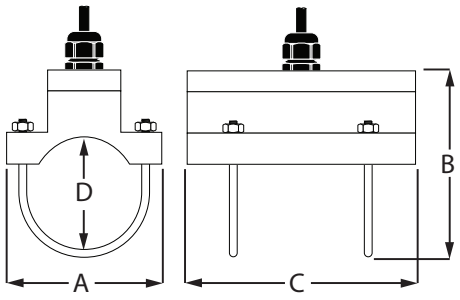
Consult factory for part number selection.

Transducers

Fixed Small Pipe
Pipes and Tubing 1/2…2 in. *(Not for metric pipes.)*



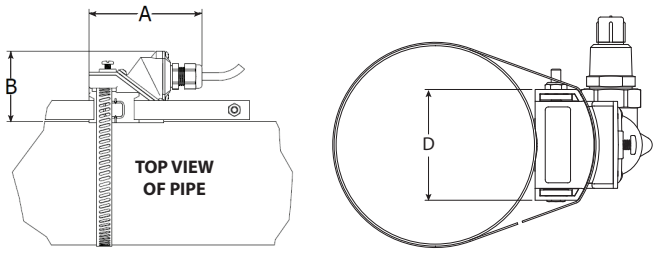
Fixed Small Pipe U-Bolt Connections CF, CL
ANSI/DN and Copper 2 in. Models *(Not for metric pipes.)*



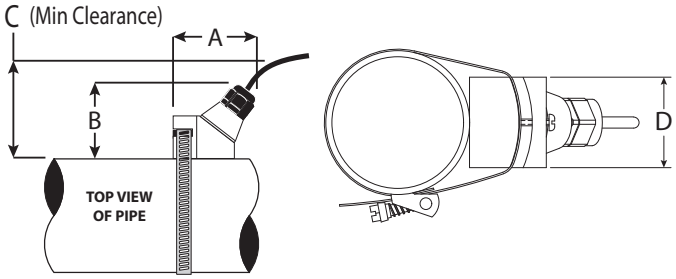
Pipe Size	Pipe Material	A	B	C	D
1/2 in.	ANSI/DN	2.46 in. (62.48 mm)	2.36 in. (59.94 mm)	2.66 in. (67.56 mm)	0.84 in. (21.34 mm)
	Copper	2.46 in. (62.48 mm)	2.36 in. (59.94 mm)	3.33 in. (84.58 mm)	0.63 in. (16.00 mm)
	Tubing	2.46 in. (62.48 mm)	2.28 in. (57.91 mm)	3.72 in. (94.49 mm)	0.50 in. (12.70 mm)
3/4 in.	ANSI/DN	2.46 in. (62.48 mm)	2.57 in. (65.28 mm)	2.66 in. (67.56 mm)	1.05 in. (26.67 mm)
	Copper	2.46 in. (62.48 mm)	2.50 in. (63.50 mm)	3.56 in. (90.42 mm)	0.88 in. (22.35 mm)
	Tubing	2.46 in. (62.48 mm)	2.50 in. (63.50 mm)	3.56 in. (90.42 mm)	0.75 in. (19.05 mm)
1 in.	ANSI/DN	2.46 in. (62.48 mm)	2.92 in. (74.17 mm)	2.86 in. (72.64 mm)	1.32 in. (33.53 mm)
	Copper	2.46 in. (62.48 mm)	2.87 in. (72.90 mm)	3.80 in. (96.52 mm)	1.13 in. (28.70 mm)
	Tubing	2.46 in. (62.48 mm)	2.75 in. (69.85 mm)	3.80 in. (96.52 mm)	1.00 in. (25.40 mm)
1-1/4 in.	ANSI/DN	2.80 in. (71.12 mm)	3.18 in. (80.77 mm)	3.14 in. (79.76 mm)	1.66 in. (42.16 mm)
	Copper	2.46 in. (62.48 mm)	3.00 in. (76.20 mm)	4.04 in. (102.62 mm)	1.38 in. (35.05 mm)
	Tubing	2.46 in. (62.48 mm)	3.00 in. (76.20 mm)	4.04 in. (102.62 mm)	1.25 in. (31.75 mm)
1-1/2 in.	ANSI/DN	3.02 in. (76.71 mm)	3.40 in. (86.36 mm)	3.33 in. (84.58 mm)	1.90 in. (48.26 mm)
	Copper	2.71 in. (68.83 mm)	2.86 in. (72.64 mm)	4.28 in. (108.71 mm)	1.63 in. (41.40 mm)
	Tubing	2.71 in. (68.83 mm)	3.31 in. (84.07 mm)	4.28 in. (108.71 mm)	1.50 in. (38.10 mm)
2 in.	ANSI/DN	3.70 in. (93.98 mm)	3.42 in. (86.87 mm)*	5.50 in. (139.70 mm)	2.38 in. (60.45 mm)*
	Copper	3.70 in. (93.98 mm)	3.38 in. (85.85 mm)*	5.50 in. (139.70 mm)	2.13 in. (54.10 mm)*
	Tubing	3.21 in. (81.53 mm)	3.85 in. (97.79 mm)	4.75 in. (120.65 mm)	2.00 in. (50.80 mm)

* Varies due to U-bolt configuration

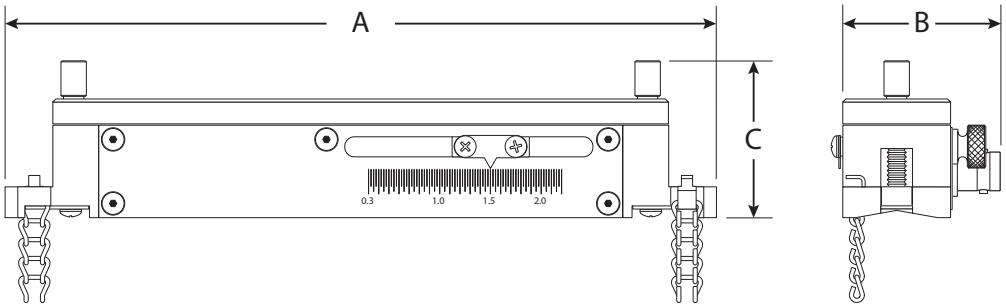
RZ
Pipes Larger than 2 in. (50 mm)



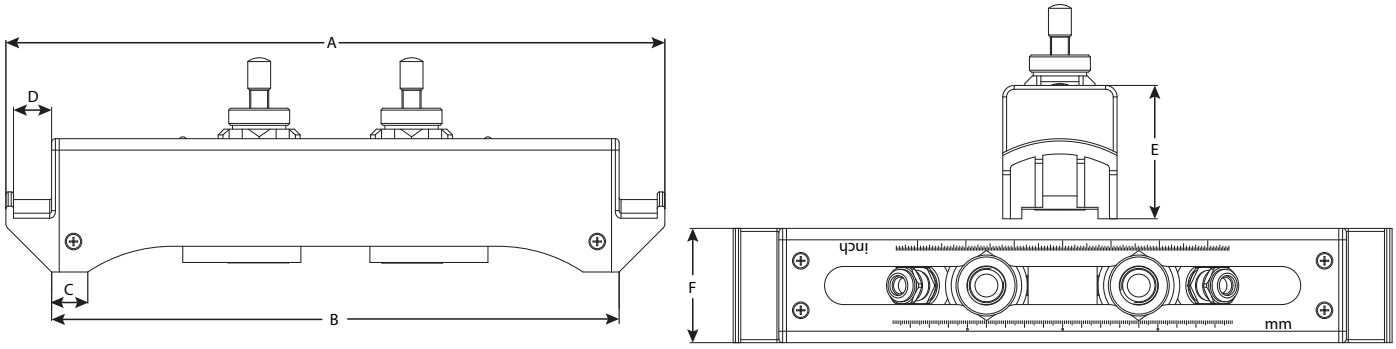
NZ, WZ, HZ, LZ, YZ
Pipes Larger than 2 in. (50 mm)



UZ
Adjustable Small Pipe



Easy Rail (JZ, KZ)



	RZ	NZ, WZ	HZ	LZ, YZ	UZ	JZ	KZ
A	3.75 in. (95 mm)	2.95 in. (74.9 mm)	2.95 in. (74.9 mm)	3.40 in. (86.4 mm)	7 in. (178 mm)	13.62 in. (345.95 mm)	19.92 in. (505.97 mm)
B	2.35 in. (60 mm)	2.75 in. (69.8 mm)	2.75 in. (69.8 mm)	2.94 in. (74.7 mm)	1.6 in. (42 mm)	11.73 in. (297.94 mm)	18.03 in. (457.96 mm)
C	—	3.00 in. (76.2 mm)	3.00 in. (76.2 mm)	3.20 in. (81.3 mm)	1.5 in. (39 mm)	0.75 in. (19.05 mm)	0.75 in. (19.05 mm)
D	2.19 in. (56 mm)	1.70 in. (43.2 mm)	1.71 in. (43.4 mm)	2.50 in. (63.5 mm)	—	0.79 in. (20.06 mm)	0.79 in. (20.06 mm)
E	—	—	—	—	—	2.76 in. (70.10 mm)	2.76 in. (70.10 mm)
F	—	—	—	—	—	2.36 in. (59.94 mm)	2.36 in. (59.94 mm)

PART NUMBER CONSTRUCTION

Part Number Construction for TFX-5000 Flow Meters for Pipes 2 in. and Smaller

DQ	-	G	-		-		-		-		-		-		-	XX	-		-		-	

Model

TFX-5000 Ultrasonic Clamp-On Meter	DQ

Certification

General Area US/Canada, CE	G

Transducer Type [1]

1/2 inch ANSI Pipe	CA
3/4 inch ANSI Pipe	CB
1 inch ANSI Pipe	CC
1-1/4 inch ANSI Pipe	CD
1-1/2 inch ANSI Pipe	CE
2 inch ANSI Pipe	CF
1/2 inch Copper Tube	CG
3/4 inch Copper Tube	CH
1 inch Copper Tube	CT
1-1/4 inch Copper Tube	CJ
1-1/2 inch Copper Tube	CK
2 inch Copper Tube	CL
Small pipe, universal, DTTSU (not available with conduit)	UZ

Transmitter Type

110/220V AC Remote Mounted	R
24V DC/AC Remote Mounted	B

Display

Display and Keypad	S
No Display/Keypad	W

Remote Cable Length

15 feet (4.5 m)	AC
30 feet (9 m)	AF
50 feet (15 m)	AK
75 feet (23 m)	AR
100 feet (30 m)	BW

Conduit Type and Length (Conduit length is less than or equal to cable length)

None	WW
5 feet (1.5 m)	AA
15 feet (4.5 m)	AC
30 feet (9 m)	AF
50 feet (15 m)	AK
75 feet (23 m)	AR
100 feet (30 m)	BW

Hardware

1/2 in. NPT Threads, Poly cable glands	S
1/2 in. NPT Threads, Nickel Plated Brass cable glands	T
1/2 in. NPT Threads, no cable glands	N
M20 Threads, Poly cable glands	C
M20 Threads, Nickel Plated Brass cable glands	D
M20 Threads, no cable glands	A

Endpoint Wiring Method

None	XX

Communication/Output

Standard Output (Modbus RTU or BACnet MS/TP field selectable)	S
Standard Output plus Modbus TCP Ethernet	T
Standard Output plus BACnet/IP Ethernet	V
Standard Output plus EtherNet/IP	U
Standard Output plus Aux Output	9

Units of Measure Totalizer/Flow Rate [2]

Gallons/gallons per minute	G
Liters/liters per minute	P

Testing & Tagging

Factory Calibrated	F
Factory Calibrated/Stainless Steel Tag	S

[1] Stainless steel tube 1/2…2 in. options are available.

[2] Field selectable, additional options available.

Part Number Construction for TFX-5000 Flow Meters for Pipes 2 in. and Smaller for Hazardous Locations

DQ - B - [ ] - [ ] - [ ] - [ ] - [ ] [ ] - XX - [ ] - [ ] - [ ]

Model	
TFX-5000 Ultrasonic Clamp-On Meter	DQ
Certification	
Hazardous Location, Class I, Division 2	B
Transducer Type [1]	
1/2 inch ANSI Pipe	CA
3/4 inch ANSI Pipe	CB
1 inch ANSI Pipe	CC
1-1/4 inch ANSI Pipe	CD
1-1/2 inch ANSI Pipe	CE
2 inch ANSI Pipe	CF
1/2 inch Copper Tube	CG
3/4 inch Copper Tube	CH
1 inch Copper Tube	CT
1-1/4 inch Copper Tube	CJ
1-1/2 inch Copper Tube	CK
2 inch Copper Tube	CL
Transmitter Type	
110/220V AC Remote Mounted	R
24V DC/AC Remote Mounted	B
Display	
Display and Keypad	S
No Display/Keypad	W
Remote Cable/Conduit Length [2]	
15 feet (4.5 m)	AC AC
30 feet (9 m)	AF AF
50 feet (15 m)	AK AK
75 feet (23 m)	AR AR
100 feet (30 m)	BW BW
Hardware	
1/2 in. NPT Threads, Poly cable glands	S
1/2 in. NPT Threads, Nickel Plated Brass cable glands	T
1/2 in. NPT Threads, no cable glands	N
M20 Threads, Poly cable glands	C
M20 Threads, Nickel Plated Brass cable glands	D
M20 Threads, no cable glands	A
Endpoint Wiring Method	
None	XX
Communication/Output	
Standard Output (Modbus RTU or BACnet MS/TP field selectable)	S
Standard Output plus Modbus TCP Ethernet	T
Standard Output plus BACnet/IP Ethernet	V
Standard Output plus EtherNet/IP	U
Units of Measure Totalizer/Flow Rate [3]	
Gallons/gallons per minute	G
Liters/liters per minute	P
Testing & Tagging	
Factory Calibrated	F
Factory Calibrated/Stainless Steel Tag	S

[1] Stainless steel tube 1/2…2 in. options are available.

[2] For hazardous location units, Remote Cable and Conduit Length codes must match.

[3] Field selectable, additional options available.

Part Number Construction for TFX-5000 Flow Meters for Pipes Larger than 2 in.

DQ - G - [ ] - [ ] - [ ] - [ ] - [ ] - [ ] - [ ] - XX - [ ] - [ ] - [ ]

Model	
TFX-5000 Ultrasonic Clamp-On Meter	DQ
Certification	
General Area US/Canada, CE	G
Transducer Type	
Medium pipe, DTTR, 2.5 in. (65 mm) or larger	RZ
Medium pipe, submersible DTTN, 2.5 in. (65 mm) or larger [1]	WZ
2.5…6 inches (65…150 mm) Easy Rail (not available with conduit	JZ
2.5…12 inches (65…300 mm) Easy Rail (not available with condu	KZ
Medium pipe, high temperature (not available with conduit)	HZ
Large pipe, DTTL, 8 in. (200 mm) or larger	LZ
Large pipe, submersible DTTL, 8 in. (200 mm) or larger [1]	YZ
Transmitter Type	
110/220V AC Remote Mounted	R
24V DC/AC Remote Mounted	B
Display	
Display and Keypad	S
No Display/Keypad	W
Remote Cable Length	
15 feet (4.5 m)	AC
30 feet (9 m)	AF
50 feet (15 m)	AK
75 feet (23 m)	AR
100 feet (30 m)	BW
150 feet (46 m)	BK
200 feet (61 m)	DW
250 feet (76 m)	DK
300 feet (90 m)	EW
350 feet (107 m) (DTTL "LZ" and "YZ" only)	EK
400 feet (122 m) (DTTL "LZ" and "YZ" only)	FW
450 feet (137) (DTTL "LZ" and "YZ" only)	FK
500 feet (152 m) (DTTL "LZ" and "YZ" only)	GW
550 feet (168) (DTTL "LZ" and "YZ" only)	GK
600 feet (183 m) (DTTL "LZ" and "YZ" only)	HW
Conduit Type and Length (Conduit length is less than or equal to cable length)	
None	WW
5 feet (1.5 m)	AA
15 feet (4.5 m)	AC
30 feet (9 m)	AF
50 feet (15 m)	AK
75 feet (23 m)	AR
100 feet (30 m)	BW
150 feet (46 m)	BK
200 feet (61 m)	DW
250 feet (76 m)	DK
300 feet (90 m)	EW
Hardware	
1/2 in. NPT Threads, Poly cable glands	S
1/2 in. NPT Threads, Nickel Plated Brass cable glands	T
1/2 in. NPT Threads, no cable glands	N
M20 Threads, Poly cable glands	C
M20 Threads, Nickel Plated Brass cable glands	D
M20 Threads, no cable glands	A
Endpoint Wiring Method	
None	XX
Communication/Output	
Standard Output (Modbus RTU or BACnet MS/TP field selectable)	S
Standard Output plus Modbus TCP Ethernet	T
Standard Output plus BACnet/IP Ethernet	V
Standard Output plus EtherNet/IP	U
Standard Output plus Aux Output	9
Units of Measure Totalizer/Flow Rate [2]	
Gallons/gallons per minute	G
Liters/liters per minute	P
Testing & Tagging	
Factory Calibrated	F
Factory Calibrated/Stainless Steel Tag	S

[1] Submersible transducer cables use two conduit openings.

[2] Field selectable, additional options available.

Part Number Construction for TFX-5000 Flow Meters for Pipes Larger than 2 in. for U.S./Canada Hazardous Locations

DQ - [ ] - [ ] - [ ] - [ ] - [ ] - [ ] - [ ] - [ ] - XX - [ ] - [ ] [ ]

Model															
TFX-5000 Ultrasonic Clamp-On Meter	DQ														
Certification															
Hazardous Location, Class I, Division 2		B													
Hazardous Location Class I, Div 2, Zone 2/22; Class		R													
Transducer Type															
Medium pipe, DTTR, 2.5 in. (65 mm) or larger			RZ												
Medium pipe, submersible DTTN, 2.5 in. (65 mm) or larger [1]			WZ												
Large pipe, DTTL, 8 in. (200 mm) or larger			LZ												
Large pipe, submersible DTTL, 8 in. (200 mm) or larger [1]			YZ												
Transmitter Type															
110/220V AC Remote Mounted				R											
24V DC/AC Remote Mounted				B											
Display															
Standard					S										
No Display/Keypad					W										
Remote Cable/Conduit Length															
15 feet (4.5 m)						AC	AC								
30 feet (9 m)						AF	AF								
50 feet (15 m)						AK	AK								
75 feet (23 m)						AR	AR								
100 feet (30 m)						BW	BW								
150 feet (46 m)						BK	BK								
200 feet (61 m)						DW	DW								
250 feet (76 m)						DK	DK								
300 feet (90 m)						EW	EW								
Hardware															
1/2 in. NPT Threads, Poly cable glands								S							
1/2 in. NPT Threads, Nickel Plated Brass cable glands								T							
1/2 in. NPT Threads, no cable glands								N							
M20 Threads, Poly cable glands								C							
M20 Threads, Nickel Plated Brass cable glands								D							
M20 Threads, no cable glands								A							
Endpoint Wiring Method															
None										XX					
Communication/Output															
Standard Output (Modbus RTU or BACnet MS/TP field selectable)											S				
Standard Output plus Modbus TCP Ethernet											T				
Standard Output plus BACnet/IP Ethernet											V				
Standard Output plus EtherNet/IP											U				
Units of Measure Totalizer/Flow Rate [2]															
Gallons/gallons per minute												G			
Liters/liters per minute												P			
Testing & Tagging															
Factory Calibrated															F
Factory Calibrated/Stainless Steel Tag															S

[1] Submersible transducer cables use two conduit openings.

[2] Field selectable, additional options available.

Part Number Construction for TFX-5000 Flow Meters for Pipes Larger than 2 in. for ATEX/IECEx Hazardous Locations

	DQ	-		-		-		-		-		-		-	XX	-		-		-	
Model																					
TFX-5000 Ultrasonic Clamp-On Meter	DQ																				
Certification																					
Hazardous Location, ATEX Zone 2/22, IECEx Zone 2		V																			
Transducer Type																					
Medium pipe, DTTR, 2.5 in. (65 mm) or larger			RZ																		
Medium pipe, submersible DTTN, 2.5 in. (65 mm) or larger [1]			WZ																		
2.5…6 inches (65…150 mm) Easy Rail (not available with conduit			JZ																		
2.5…12 inches (65…300 mm) Easy Rail (not available with condu			KZ																		
Large pipe, DTTL, 8 in. (200 mm) or larger			LZ																		
Large pipe, submersible DTTL, 8 in. (200 mm) or larger [1]			YZ																		
Transmitter Type																					
110/220V AC Remote Mounted					R																
24V DC/AC Remote Mounted					B																
Display																					
Display and Keypad							S														
No Display/Keypad							W														
Remote Cable Length																					
15 feet (4.5 m)									AC												
30 feet (9 m)									AF												
50 feet (15 m)									AK												
75 feet (23 m)									AR												
100 feet (30 m)									BW												
150 feet (46 m)									BK												
200 feet (61 m)									DW												
250 feet (76 m)									DK												
Conduit Type and Length (Conduit length is less than or equal to cable length)																					
None											WW										
Hardware																					
1/2 in. NPT Threads, Poly cable glands													S								
1/2 in. NPT Threads, Nickel Plated Brass cable glands													T								
1/2 in. NPT Threads, no cable glands													N								
M20 Threads, Poly cable glands													C								
M20 Threads, Nickel Plated Brass cable glands													D								
M20 Threads, no cable glands													A								
Endpoint Wiring Method																					
None															XX						
Communication/Output																					
Standard Output (Modbus RTU or BACnet MS/TP field selectable)																	S				
Standard Output plus Modbus TCP Ethernet																	T				
Standard Output plus BACnet/IP Ethernet																	V				
Standard Output plus EtherNet/IP																	U				
Units of Measure Totalizer/Flow Rate [2]																					
Gallons/gallons per minute																			G		
Liters/liters per minute																			P		
Testing & Tagging																					
Factory Calibrated																					F
Factory Calibrated/Stainless Steel Tag																					S

[1] Submersible transducer cables use two conduit openings.

[2] Field selectable, additional options available.

Part Number Construction for TFX-5000 Energy Meters for Pipes 2 in. and Smaller

DR - G - [ ] - [ ] - [ ] - [ ] - [ ] - [ ] - [ ] - [ ] - [ ] - [ ] - XX - [ ] - [ ] - [ ] - [ ]

Model	
TFX-5000 Ultrasonic Clamp-On Meter	DR
Certification	
General Area US/Canada, CE	G
Transducer Type [1]	
1/2 inch ANSI Pipe	CA
3/4 inch ANSI Pipe	CB
1 inch ANSI Pipe	CC
1-1/4 inch ANSI Pipe	CD
1-1/2 inch ANSI Pipe	CE
2 inch ANSI Pipe	CF
1/2 inch Copper Tube	CG
3/4 inch Copper Tube	CH
1 inch Copper Tube	CT
1-1/4 inch Copper Tube	CJ
1-1/2 inch Copper Tube	CK
2 inch Copper Tube	CL
Small pipe, universal, DTTSU (not available with conduit)	UZ
Transmitter Type	
110/220V AC Remote Mounted	R
24V DC/AC Remote Mounted	B
Display	
Display and Keybad	S
No Display/Keypad	W
Remote Cable Length	
15 feet (4.5 m)	AC
30 feet (9 m)	AF
50 feet (15 m)	AK
75 feet (23 m)	AR
100 feet (30 m)	BW
Conduit Type and Length (Conduit length is less than or equal to cable length)	
None	WW
5 feet (1.5 m)	AA
15 feet (4.5 m)	AC
30 feet (9 m)	AF
50 feet (15 m)	AK
75 feet (23 m)	AR
100 feet (30 m)	BW
RTD Type	
Surface, Commercial	C
None (user provided)	X
RTD Cable Length	
15 feet	AC
50 feet	AK
100 feet	BW
None (user provided)	WW
Hardware	
1/2 in. NPT Threads, Poly cable glands	S
1/2 in. NPT Threads, Nickel Plated Brass cable glands	T
1/2 in. NPT Threads, no cable glands	N
Endpoint Wiring Method	
None	XX
Communication/Output	
Standard Output (Modbus RTU or BACnet MS/TP field selectable)	S
Standard Output plus Modbus TCP Ethernet	T
Standard Output plus BACnet/IP Ethernet	V
Standard Output plus EtherNet/IP	U
Standard Output plus Auxiliary Dry Contact Output	9
Units of Measure Totalizer/Flow Rate [2]	
Gallons/gallons per minute	G
Liters/liters per minute	P
Units of Measure Energy Totalizer/Rate	
Kilowatt-hour/Watt (field selectable, additional options available)	R
Testing & Tagging	
Factory Calibrated	F
Factory Calibrated/Stainless Steel Tag	S

[1] Stainless steel tube 1/2…2 in. options are available.

[2] Field selectable, additional options available.

Part Number Construction for TFX-5000 Energy Meters for Pipes Larger than 2 in.

DR - G - [ ] - [ ] - [ ] - [ ] - [ ] - [ ] - [ ] - [ ] - [ ] - [ ] - XX - [ ] - [ ] - [ ] - [ ] - [ ]

Model	
TFX-5000 Ultrasonic Clamp-On Meter	DR
Certification	
General Area US/Canada, CE	G
Transducer Type	
Medium pipe, DTTR, 2.5 in. (65 mm) or larger	RZ
Medium pipe, submersible DTTN, 2.5 in. (65 mm) or larger [1]	WZ
2.5…6 inches (65…150 mm) Easy Rail (not available with conduit)	JZ
2.5…12 inches (65…300 mm) Easy Rail (not available with conduit)	KZ
Medium pipe, high temperature (not available with conduit)	HZ
Large pipe, DTTL, 8 in. (200 mm) or larger	LZ
Large pipe, submersible DTTL, 8 in. (200 mm) or larger [1]	YZ
Transmitter Type	
110/220V AC Remote Mounted	R
24V DC/AC Remote Mounted	B
Display	
Standard	S
No Display/Keypad	W
Remote Cable Length [2]	
15 feet (4.5 m)	AC
30 feet (9 m)	AF
50 feet (15 m)	AK
75 feet (23 m)	AR
100 feet (30 m)	BW
150 feet (46 m)	BK
200 feet (61 m)	DW
250 feet (76 m)	DK
300 feet (90 m)	EW
Conduit Type and Length (Conduit length is less than or equal to cable length)	
None	WW
5 feet (1.5 m)	AA
15 feet (4.5 m)	AC
30 feet (9 m)	AF
50 feet (15 m)	AK
75 feet (23 m)	AR
100 feet (30 m)	BW
150 feet (46 m)	BK
200 feet (61 m)	DW
250 feet (76 m)	DK
300 feet (90 m)	EW
RTD Type	
Surface, Commercial	C
None (user provided)	X
RTD Length	
15 feet (4.5 m)	AC
50 feet (15 m)	AK
100 feet (30 m)	BW
None (user provided)	WW
Hardware	
1/2 in. NPT Threads, Poly cable glands	S
1/2 in. NPT Threads, Nickel Plated Brass cable glands	T
1/2 in. NPT Threads, no cable glands	N
M20 Threads, Poly cable glands	C
M20 Threads, Nickel Plated Brass cable glands	D
M20 Threads, no cable glands	A
Endpoint Wiring Method	
None	XX
Communication/Output	
Standard Output (Modbus RTU or BACnet MS/TP field selectable)	S
Standard Output plus Modbus TCP Ethernet	T
Standard Output plus BACnet/IP Ethernet	V
Standard Output plus EtherNet/IP	U
Standard Output plus Aux Output	9
Units of Measure Totalizer/Flow Rate [3]	
Gallons/gallons per minute	G
Liters/liters per minute	P
Units of Measure Energy Totalizer/Rate	
Kilowatt-hour/Kilowatt (field selectable, additional options available)	R
Testing & Tagging	
Factory Calibrated	F
Factory Calibrated/Stainless Steel Tag	S

[1] Contact factory for DTTL cable lengths longer than 300 ft.

[2] Submersible transducer cables use two conduit openings.

[3] Field selectable, additional options available.

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