

ULTRASONIC CLAMP-ON FLOWMETER

Series TFXL ultrasonic flow meters clamp onto the outside of existing pipe and do not contact the internal liquid. This advanced product provides instantaneous rate and accumulated flows along with 4-20mA and pulse outputs. Inherent advantages over competitive technologies include ease of installation, fluid compatibility, immunity to suspended solids and gas pockets and a large, bi-directional measuring range. TFXL is housed in an enclosure suitable for outdoor mounting and is available with and without a local display. Integral mount transducers are available for pipes 2 inches [50 mm] and smaller. Pipe sizes from 1/2- inch [12 mm] through 100-inches [2540 mm] can be accommodated with remote mount transducers. A software utility is available for customer configuration and in-field calibration.



FEATURES

- Series TFXL provides easy and low cost installation by clamping on the outside of existing piping systems.
- Non-invasive system allows solids to pass through the pipe with no affect on meter. Y-strainers or filtering devices are not needed.
- Greater accuracy can be attained in applications consisting of entrained gases. The Series TFXL will automatically correct displayed flow rates and electronic outputs.
- Direct interface is provided to data collection systems via 4-20mA output and either TTL - pulse or simulated turbine meter outputs that are proportional to fluid flow rate.
- Series TFXL can be used on applications such as well water and other liquids with moderate amounts of suspended solids or aeration.
- UltraLink™ software utility allows configuration, calibration and troubleshooting of each meter.
- Series TFXL is a bi-directional flow measurement system. Multiple totalizers simultaneously operate to measure forward total, reverse total and net total.
- Designed to replace mechanical flowmeters in applications where liquid conditions tend to damage or impede mechanical flow meter operation. No maintenance is required.



PART NUMBER CONSTRUCTION

Series TFXL



Integral System—1/2" to 2"

D T F X L - - **N N**

Display Options

- 1) No display - ABS enclosure
- 2) Rate & Totalizer display - ABS enclosure
- 3) No display - UL approved polycarbonate enclosure
- 4) Rate & Totalizer display - UL approved polycarbonate enclosure

Pipe Size

- | | |
|---------------------------------|------------------------------|
| A) 1/2 -inch ANSI Pipe | K) 1-1/2 -inch Copper |
| B) 3/4 -inch ANSI Pipe | L) 2 -inch Copper |
| C) 1 -inch ANSI Pipe | M) 1/2 -inch Tubing |
| D) 1-1/4 -inch ANSI Pipe | N) 3/4 -inch Tubing |
| E) 1-1/2 -inch ANSI Pipe | P) 1 -inch Tubing |
| F) 2 -inch ANSI Pipe | Q) 1-1/4 -inch Tubing |
| G) 1/2 -inch Copper | R) 1-1/2 -inch Tubing |
| H) 3/4 -inch Copper | S) 2 -inch Tubing |
| I) 1 -inch Copper | X) Remote Transducer |
| J) 1-1/4 -inch Copper | (see below) |

Output Options

- 1) 4-20 mA and Pulse

Connector Options

- N)** 1/2-inch Conduit Hole
- A)** Water-tight Cable Clamp
- C)** Circular MIL-style Connector
- D)** 1/2-inch Flexible Conduit Connector

Accessories

- PC Cable w/UltraLink™ software:
- 90-240VAC Power Supply:

Part Number

- D010-0204-001
- D005-2502-005

Remote Transducer (with X-option only)

Large Pipe—2" to 100" [51mm to 2540mm]

D T T - - -

Type

- N)** Standard [CPVC, Ultem®]
- H)** High Temp [TFP, Vespel®]

Cable Length

- 020)** 20 feet [6.1 m]
- 050)** 50 feet [15 m]
- 100)** 100 feet [30 m]

Conduit Type

- N)** None—Bare RG59 Cable
- A)** Flexible armored

Conduit Length

- 000)** 0 feet [0 m]
- 020)** 20 feet [6.1 m]
- 050)** 50 feet [15 m]
- 100)** 100 feet [30 m]

Options

- N)** Ordinary Area

Small Pipe—1/2" to 2" [12mm to 50mm]

D T T S - -

Nominal Pipe Size

- D)** 1/2 -inch
- F)** 3/4 -inch
- G)** 1 -inch
- H)** 1-1/4 -inch
- J)** 1-1/2 -inch
- L)** 2 -inch

Pipe Type

- P)** ANSI Pipe
- C)** Copper Pipe
- T)** Tubing

Cable Length

- 020)** 20 feet [6.1 m]
- 050)** 50 feet [15 m]
- 100)** 100 feet [30 m]

Conduit Type

- N)** None—Bare RG59 Cable
- A)** Flexible armored

Conduit Length

- 000)** 0 feet [0 m]
- 020)** 20 feet [6.1 m]
- 050)** 50 feet [15 m]
- 100)** 100 feet [30 m]

Series TFXL

SPECIFICATION

| DESCRIPTION | SPECIFICATION |
|----------------------------|---|
| Liquid Types | Most clean liquids or liquids containing moderate amounts of suspended solids or aeration. |
| Power Requirements | 11-30 VDC @ 0.25A |
| Velocity | 0.1 to 40 FPS [0.03 to 12.4 MPS] |
| Inputs/Outputs | <p>4-20mA Output (standard output)</p> <p>Resolution of 12-bit for all outputs</p> <p>Power Source</p> <p>Insertion loss 5V max</p> <p>Loop impedance 900 ohms max.</p> <p>Isolation Can share ground common with power supply — isolated from piping system</p> <p>Turbine Frequency Output/TTL -Pulse Output</p> <p>Switch selectable</p> <p>Type Non-ground referenced AC / Ground referenced square wave</p> <p>Amplitude 100mVpp minimum/5VDC</p> <p>Frequency range 0-1,000Hz</p> <p>Duty cycle 50% ±10%</p> |
| Display | <p>Type 2 line x 8 character LCD; top row: 0.7" [18mm] tall, 7-segment;</p> <p>Bottom row: 0.35" [9mm] tall, 14-segment none</p> <p>Rate 8 maximum rate digits, lead zero blanking</p> <p>Total 8 maximum totalizer digits, exponential multipliers from -1 to +6</p> |
| Units | <p>Engineering Units: Feet, gallons, ft³, million-gal, barrels (liquor & oil), acre-feet, lbs., meters, m³, liters, million-liters, kg</p> <p>Rate Units: sec, min, hr, day</p> |
| Ambient Temperature | General Purpose: 0 to +185°F [-20 to +85°C]; Hazardous Locations: : 0 to +105°F [-20 to +40°C] |
| Liquid Temperature | 0 to +185°F [-20 to +85°C] |
| Enclosure | NEMA 3 [Type 3] ABS or polycarbonate, CPVC, Ultem, brass or SS hardware, 3W x 6L x 2.5H inches [75W x 150L x 63L mm], pipe mount |
| Transducer Type | Clamp-on, uses time of flight ultrasonic |
| Pipe Sizes | 1/2" to 100" [12mm to 2540mm] |
| Pipe Materials | Carbon steel, stainless steel, copper, and plastic |
| Accuracy | ±1% of reading at rates above 1 FPS [0.3 MPS]; ±0.01 FPS [.003 MPS] of reading at rates lower than 1 FPS [0.3 MPS] |
| Response Time | 0.3 to 30 seconds, adjustable |
| Protection | Reverse-polarity, surge suppression |
| Approvals | <p>General Requirements: ANSI/ISA 582.01;</p> <p>Hazardous Locations: ANSI/ISA 12.12.01</p> <p>Class I Div 2, Groups C & D</p> <p>CSA C22.2 No. 213, E79-15-95</p> |
| UltraLink™ Utility | Windows® based software utility, requires serial communication cable Windows® 95, 98, 2000, and XP compatible |





Series TFXL

APPLICATION DATA SHEET

Job Name/Reference #: _____ Date: _____

Name: _____ Title: _____

Company: _____ E-Mail: _____

Address: _____

City: _____ State/Province: _____

Zip/Postal: _____ Country: _____

Telephone: _____ Fax: _____

Liquid Type: Water: _____ Wastewater: _____ Oil: _____ Other: _____

Liquid Composition (% volume, solids or aeration): _____

Max. Liquid Temp: _____ °F/°C **Pressure:** _____ PSIG/kPa/Bar **Viscosity:** _____

Full Pipe during flow measurement: Yes No

Pipe O.D. : _____ inches _____ mm **Schedule/Class:** _____ **Material:** _____

Liner (if applicable): Type _____ Thickness _____

Length of straight pipe (in pipe diameters): _____ Upstream _____ Downstream

Nearest obstruction (i.e. elbow, valve): _____

Flow Range: Minimum _____ Maximum _____ Nominal _____

Flow Units: GPM _____ LPM _____ Other _____

Display: None Rate / Total **Power Requirement:** _____ AC/DC

Output Requirements: None 4-20mA Rate Pulse

Environment: Indoor Outdoor Submersible Hazardous Area

Other Requirements: _____

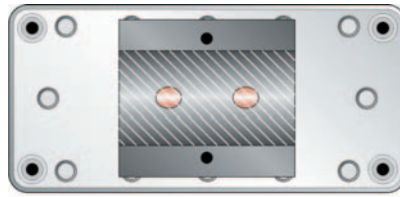
It is recommended that a Dynasonics application expert review new TFXL applications before ordering. Fill out the information noted above and fax to Dynasonics at 262-639-2267. Please enclose contact information so Dynasonics personnel may contact you regarding any additional questions.



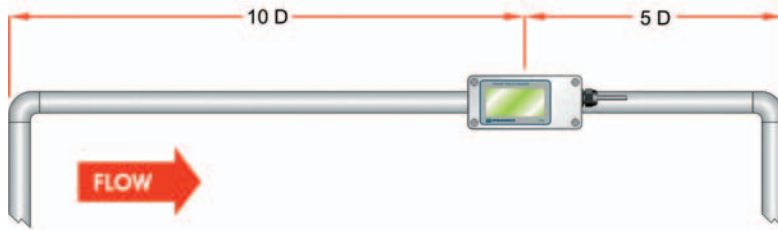
PRODUCT INSTALLATION

Installation

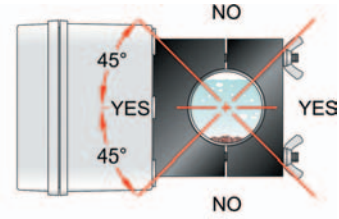
1. Apply couplant grease to the transducer surfaces that contact the pipe.
2. Mount the flowmeter onto the pipe and secure with two wing nuts or clamps.
3. Connect and apply DC power.
4. Connect the 4-20mA, frequency or both outputs to the monitoring system.



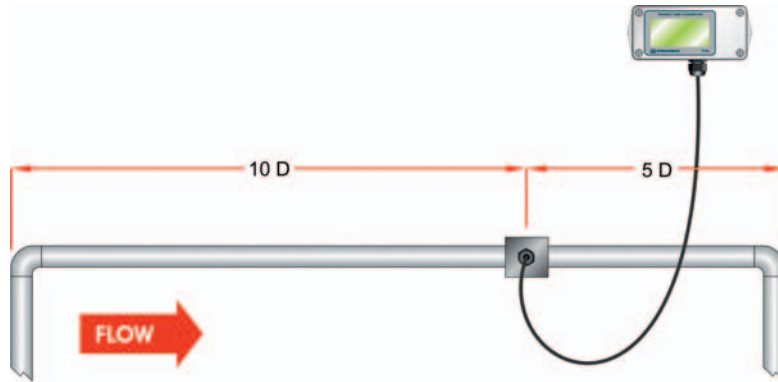
ACCOUSTIC COUPLANT APPLICATION



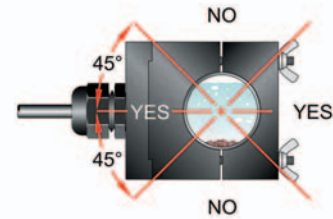
INTEGRAL MOUNTING



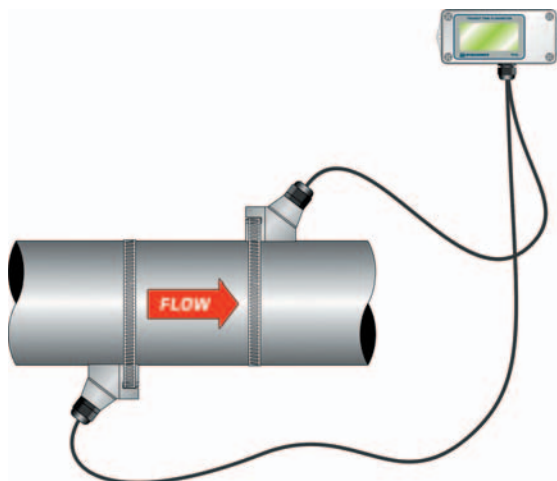
INTEGRAL MOUNTING ORIENTATION



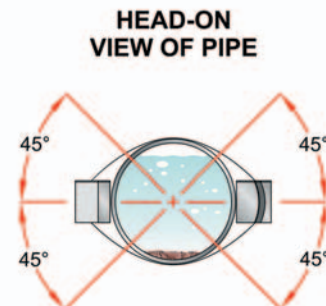
REMOTE MOUNTING- SMALL PIPE



REMOTE SMALL PIPE TRANSDUCER MOUNTING ORIENTATION



REMOTE MOUNTING- STANDARD PIPE



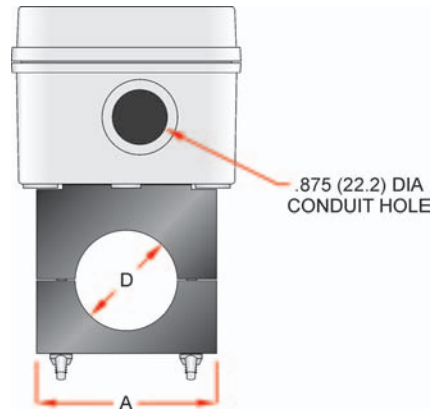
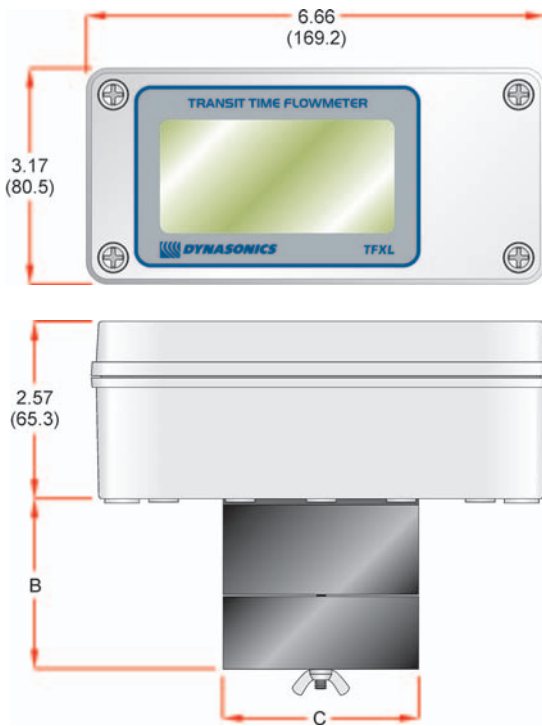
REMOTE STANDARD PIPE TRANSDUCER MOUNTING ORIENTATION

Series TFXL

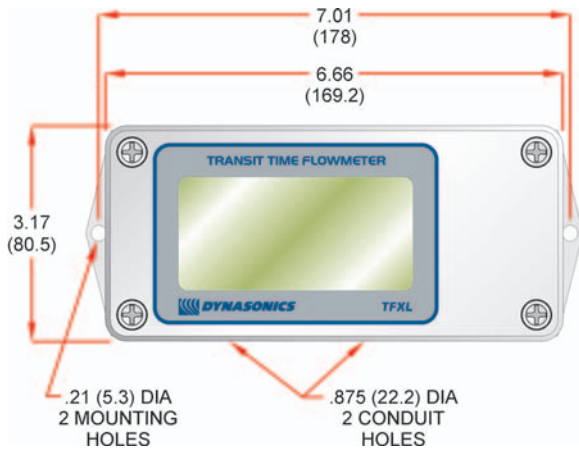
DIMENSIONAL SPECIFICATIONS

MECHANICAL DIMENSIONS: INCHES (MM)

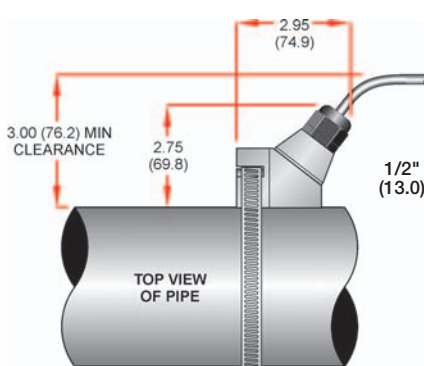
Integral



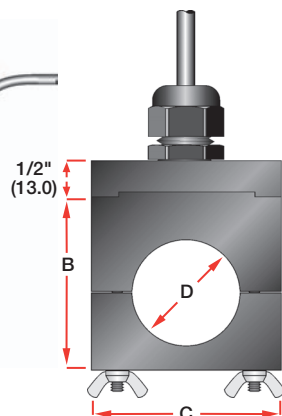
Remote



DTTN



DTTS



| Pipe Size | Pipe Material | A | B | C | D | Measuring Range |
|-----------|---------------|-------------|-------------|--------------|--------------|----------------------------|
| 1/2" | ANSI | 2.46 (62.5) | 1.86 (47.2) | 2.50 (63.5) | .840 (21.3) | .5 - 25 GPM 2-100 LPM |
| | Copper | 2.46 (62.5) | 2.13 (54.1) | 3.33 (84.6) | .625 (15.9) | .5 - 25 GPM 2-100 LPM |
| | Tubing | 2.46 (62.5) | 1.99 (50.5) | 3.33 (84.6) | .500 (12.7) | .5 - 25 GPM 2-100 LPM |
| 3/4" | ANSI | 2.46 (62.5) | 2.07 (52.6) | 2.66 (67.6) | 1.050 (26.7) | 1 - 55 GPM 4-200 LPM |
| | Copper | 2.46 (62.5) | 2.25 (57.2) | 3.56 (90.4) | .875 (22.2) | 1 - 55 GPM 4-200 LPM |
| | Tubing | 2.46 (62.5) | 2.12 (53.8) | 3.56 (90.4) | .750 (19.0) | 1 - 55 GPM 4-200 LPM |
| 1" | ANSI | 2.46 (62.5) | 2.42 (61.5) | 2.86 (72.6) | 1.315 (33.4) | 2 - 100 GPM 8 - 375 LPM |
| | Copper | 2.46 (62.5) | 2.37 (60.2) | 3.80 (96.5) | 1.125 (28.6) | 2 - 100 GPM 8 - 375 LPM |
| | Tubing | 2.46 (62.5) | 2.25 (57.2) | 3.80 (96.5) | 1.000 (25.4) | 2 - 100 GPM 8 - 375 LPM |
| 1-1/4" | ANSI | 2.79 (70.9) | 2.68 (68.0) | 3.14 (79.8) | 1.660 (42.2) | 4 - 150 GPM 15-570 LPM |
| | Copper | 2.46 (62.5) | 2.50 (63.5) | 4.04 (102.6) | 1.375 (34.9) | 4 - 150 GPM 15-570 LPM |
| | Tubing | 2.46 (62.5) | 2.37 (60.2) | 4.04 (102.6) | 1.250 (31.8) | 4 - 150 GPM 15-570 LPM |
| 1-1/2" | ANSI | 3.02 (76.7) | 2.92 (74.2) | 3.33 (84.6) | 1.900 (48.3) | 5 - 220 GPM 18-830 LPM |
| | Copper | 2.71 (68.8) | 2.63 (66.8) | 4.28 (108.7) | 1.625 (41.3) | 5 - 220 GPM 18-830 LPM |
| | Tubing | 2.71 (68.8) | 2.49 (63.2) | 4.28 (108.7) | 1.500 (38.1) | 5 - 220 GPM 18-830 LPM |
| 2" | ANSI | 3.50 (88.9) | 3.42 (86.9) | 3.69 (93.7) | 2.375 (60.3) | 8 - 400 GPM 30-1500 LPM |
| | Copper | 3.21 (81.5) | 3.38 (85.9) | 4.75 (120.7) | 2.125 (54.0) | 8 - 400 GPM 30-1500 LPM |
| | Tubing | 3.21 (81.5) | 3.24 (82.3) | 4.75 (120.7) | 2.000 (50.8) | 8 - 400 GPM 30-1500 LPM |

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