

## Ultrasonic (Transit-Time) Flow Meter TFX-5000 Flow

### DESCRIPTION

The **DQ Ultrasonic Transit-Time Flow Meter** is designed for non-intrusive pipe monitoring which means no pressure head loss and can be installed on new or existing piping systems without shutdown or interruption. They are useful in Potable, Dirty or Glycol HVAC water systems. The transducers (Xdcr) install in pipes 1/2" to 2" pipe clamp-on or 2.5" to 90" with Strap-On Xdcr's. The TFX-5000 measures both uni- & bi-directional flow and has a backlit display.

Configuration is easy with free software via a cable connection from a PC to the flow meter. All meters include outputs including one analog 0/4-20mA, Two pulse and one frequency for flow and BACnet MSTP or MODBUS RTU as standard.

Optional BACnet/IP or MODBUS TCP/IP or Ethernet comm. card or SPST relay cards are available. (One option card only)



### FEATURES

- Ultra-Sonic Time Transit Non-Invasive Transducers (Xdcr)
- No obstruction flow through design (No moving parts)
- $\pm 0.5\%$  Flow Accuracy w/pulse and 4-20mA
- 1/2" to 2" Clamp-on Installation
- 2.5" to 90" Strap-On Installation
- Data logging w/Removable SD card and Backlit Display
- BACnet MSTP or Modbus RTU w/Opt. IP Operation

### APPLICATION

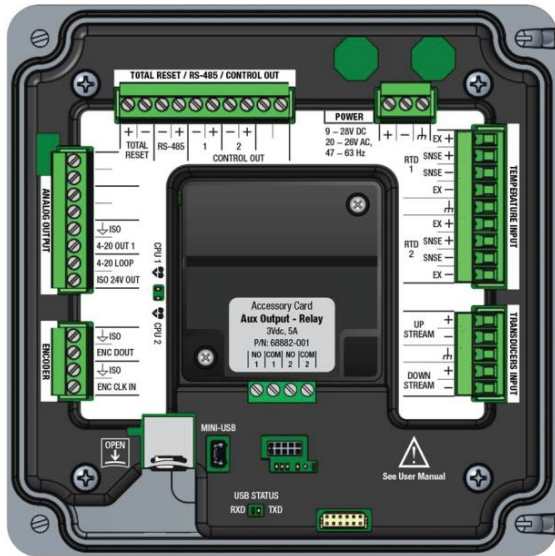
- HVAC Chilled water & Hot water flow
- Make-up water flow measurement
- Domestic potable water used
- Irrigation water used
- Process water flow measurement
- Grey water measurement (small suspended solids)
- Gasoline, Diesel fuel, Ethanol, Methanol (fluids)

### SPECIFICATIONS

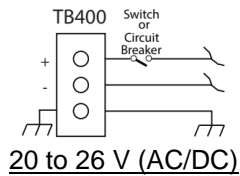
<b>Power</b>	9 to 28 VDC @286mA 20 to 26 VAC, 10VA 85 to 264 VAC, 24VA, (Available on request)
<b>Output</b>	1, 4-20 mA sourcing @800Ω
<b>Pulse</b>	2, Open collector 0-5K Hz, 5-30VDC, 50mA max
<b>Frequency</b>	TTL Square wave 63-10K Hz max
<b>Input DI</b>	Voltage 5-30VDC, (Totalizer Reset Typically)
<b>Accuracy</b>	
<b>Pipes &gt;1"</b>	$\pm 0.5\%$ , $\pm .049$ fps (0.015 mps)
<b>Pipes <math>\leq 1"</math></b>	$\pm 1.0\%$ , $\pm .03$ fps (0.009 mps)
<b>Repeatability</b>	$\pm 0.2\%$ >1.5 fps
<b>Sensitivity</b>	Large Pipe >1", Up to 40 FPS Small Pipe $\leq 1"$ , Up to 20 FPS
<b>Sensor</b>	Dual Ultrasonic Transit Time transducer
<b>Remote CBL</b>	15', 50', 100' or greater per order
<b>Adjustments</b>	Laptop via USB connector cable
<b>SoloCUE</b>	Config. Software required (Free download)
<b>USB-A-MF</b>	1.5' (0.5M), USB A to mini B cable required
<b>Display</b>	4-line, 8 digit graphical backlite display
<b>Eng Units</b>	Gallons, Liters, FPS, MPS, and many others
<b>Keypad</b>	Tactile 4-button w/polyester protective film
<b>Language's</b>	English, Spanish, French, German, Italian
<b>Data Logging</b>	MicroSD card slot for 8GB SD card included
<b>Security</b>	Four access levels w/6 digit passcode
<b>Normal Measurement Range</b>	
<b>Pipes &gt;1"</b>	0.1 to 40 fps (0.03 to 12.4 mps), bi-directional
<b>Pipes <math>\leq 1"</math></b>	0.05 to 20 fps (0.015 to 6.1 mps), bi-directional
<b>Pipe Size</b>	Transducer Specific 1/2" to 90" per order
<b>Clamp-On</b>	1/2" to 90", (13mm to 2286mm)
<b>Remote XDCCR</b>	2.5" to 90", (63mm to 2286mm)
<b>Easy Rail</b>	2.5" to 12", (63mm to 305mm)
<b>High Temp.</b>	2.5" to 90", (63mm to 2286mm)

<b>Communication</b>	BACnet, MODBUS, Ethernet (opt.)
<b>BACnet</b>	BACnet MSTP std. or Opt. BACnet IP
<b>MODBUS</b>	Modbus RTU std. or Opt. Modbus TCP/IP
<b>Ambient Temperature</b>	
<b>Meter &amp; Display</b>	-4° to 140°F (-20° to 60°C)
<b>Clamp-On</b>	-40 to 194°F (-40 to 90°C) (Meter w/ transducer)
<b>Remote</b>	-40 to 194°F (-40 to 90°C) (DTTL, DTTR, DTTS)
<b>Easy Rail</b>	-40 to 250°F (-40 to 121°C)
<b>High Temp.</b>	-40 to 350°F (-40 to 176°C) (DTTC, DTTH)
<b>Ambient RH</b>	0 to 85% RH, Non-condensing
<b>Wetted Parts</b>	None- Except Submersible transducers
<b>Construction</b>	Transmitter & Display, Aluminum/Plastic
<b>Clamp-On Mtr</b>	Alum./Plastic w/CPVC & Ultem transducer
<b>Remote Xdcr</b>	CPVC, and Ultem (DTTN, DTTS)
<b>Easy Rail Xdcr</b>	PBT glass filled, Ultem, Nylon and PVC
<b>High T. Xdcr</b>	PTFE, Vespel and Brass (DTTH, DTTC)
<b>Media Comp.</b>	Clean liquids or w/some solids or aeration
<b>Water, Sewage, Sea wtr, Brine, Glycol, Gasoline, Diesel &amp; more</b>	
<b>Xdcr MNT.</b>	Stainless Steel Straps or clamp per order Straight pipe 10 dia up & 5 dia downstream
<b>Wiring Terminations</b>	
<b>BAS</b>	Terminals with four 1/2" conduit knockouts
<b>Transducer</b>	20', 50' or 100' RG59 cable per order
<b>Enclosure</b>	Transmitter & Xdcr, NEMA-4X (IP-67)
<b>Submersible</b>	Special transducers, NEMA 6P, IP68
<b>Dimensions</b>	See Diagrams below
<b>Weight</b>	Integral transmitter/transducer, $\approx 3$ lb. (1.4kg)
<b>Remote Encl.</b>	$\approx 2$ lb. (0.9kg)
<b>Remote Xdcr</b>	$\approx 3$ lb. (1.4kg)
<b>Easy Rail</b>	$\approx 5$ lb (2.27kg)
<b>Approvals</b>	CSA, UL, CE
<b>Warranty</b>	1 Year

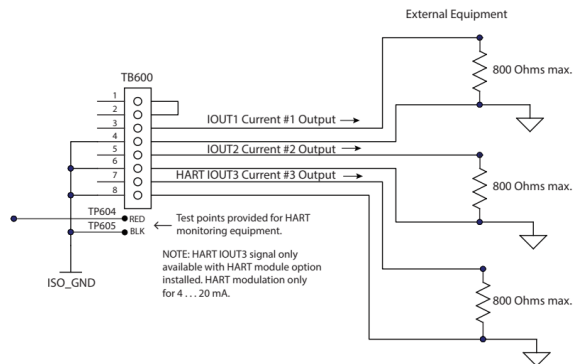
## WIRING



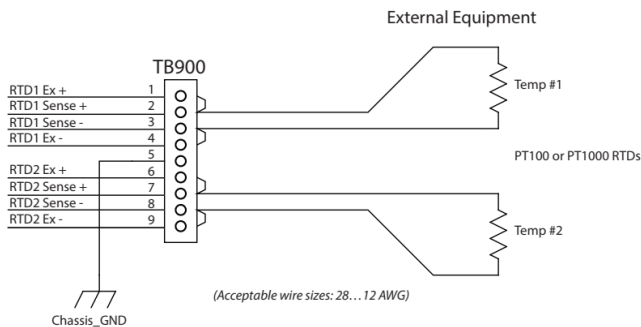
**Terminal Identification**



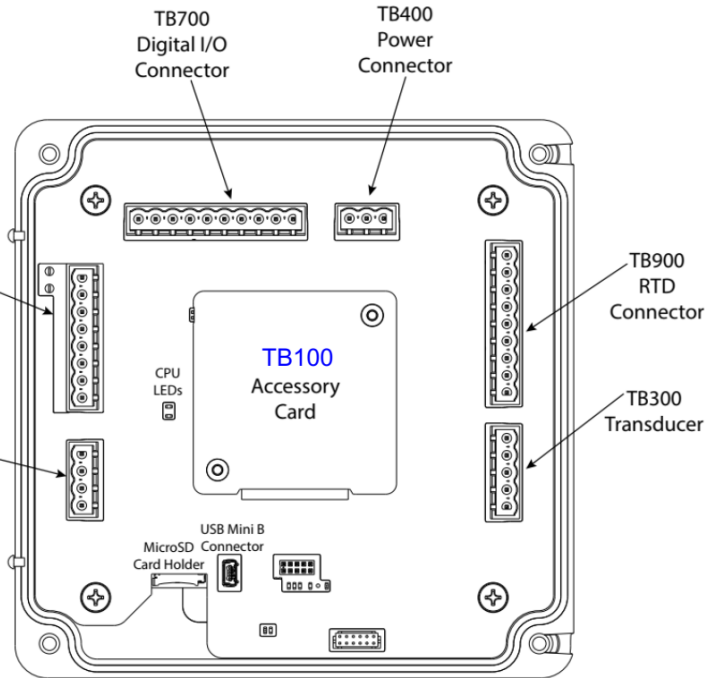
**20 to 26 V (AC/DC)**



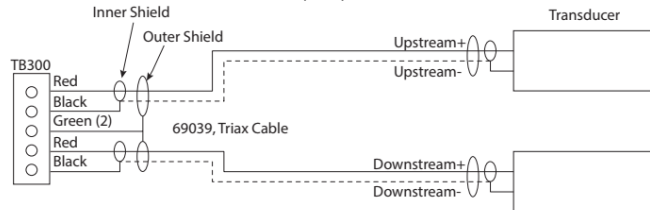
**Dual 4-20mA Sourcing Output**



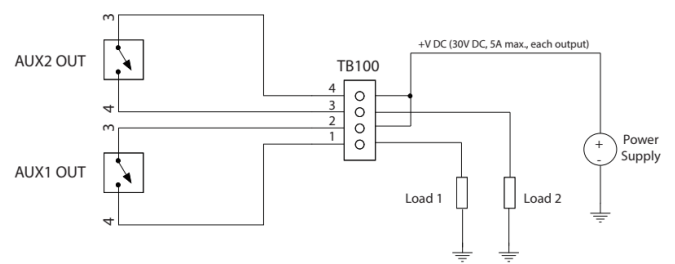
**Platinum 2w-RTD 385 Curve (3 & 4 wire RTD also)**



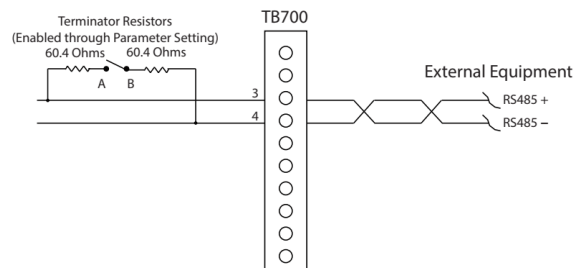
**Terminal Block (TB) Identification**



**Cables supplied per order with the Transducers (XDCRs)**

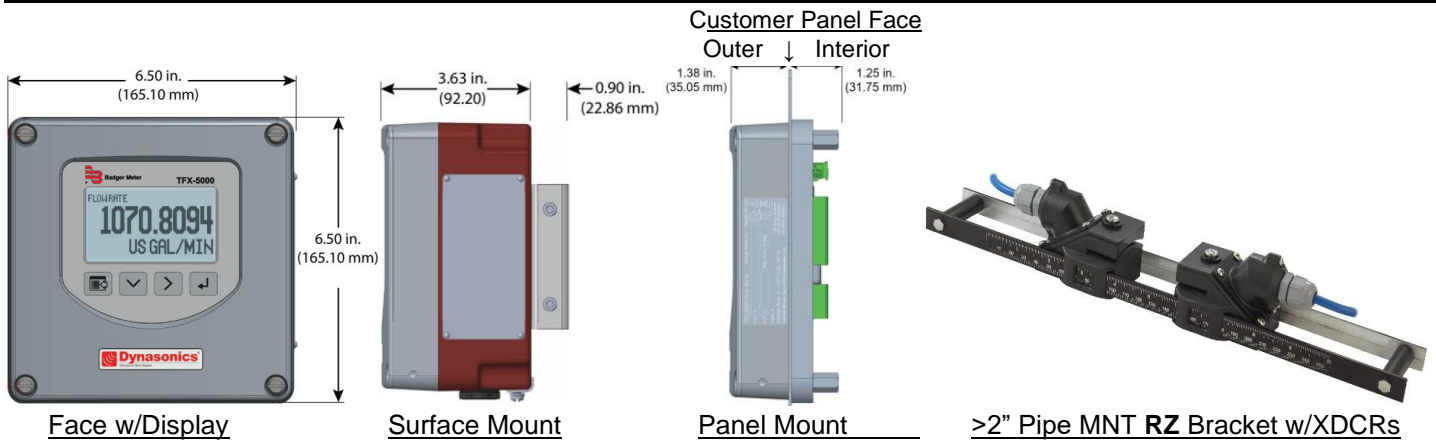


**Optional, Dual Pulse Output Contact**



**BACnet MSTP or MODBUS RTU Communication**

## DIMENSIONS



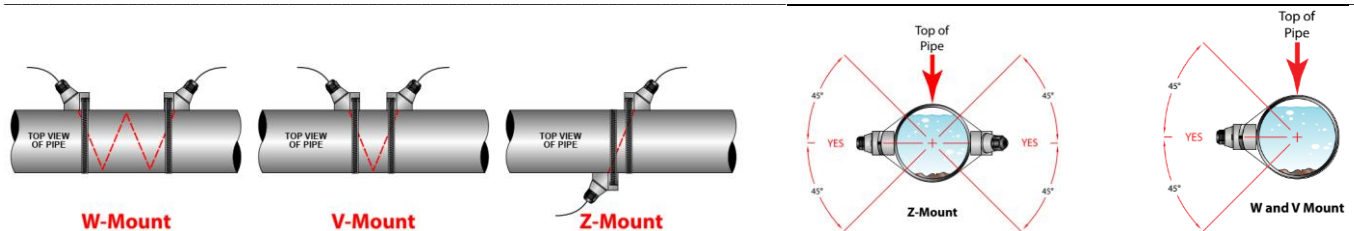
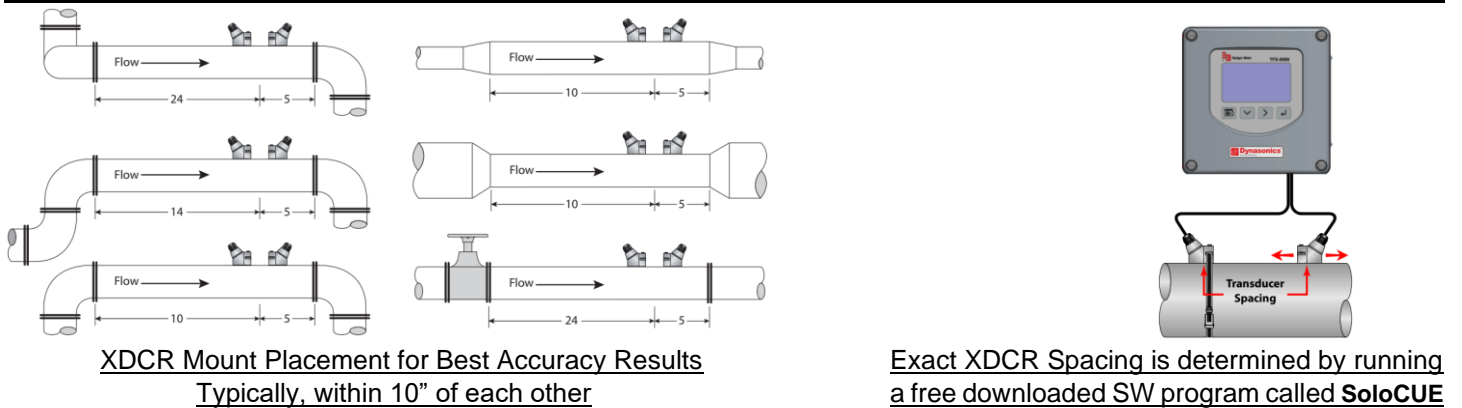
Easy Rail #	JZ	KZ	UZ
A Length	13.62" (346 mm)	19.92" (506 mm)	7.00" (178 mm)
B Width	2.36" (60 mm)	2.36" (60 mm)	1.6" (42 mm)
C Height	2.76" (70.1 mm)	2.76" (70.1 mm)	1.5" (39 mm)

Easy Rail by Part Option Number (Transducer Inside)

Dim.	RZ	HZ, NZ, WZ	LZ, YZ	Cx .5" to 1.5"	CF, CL
A	3.75" (95mm)	2.95" (74.9mm)	3.40" (86.4mm)	≈2.46"-3" (No metric)	3.7" (No metric)
B	2.35" (60mm)	2.75" (69.8mm)	2.94" (74.7mm)	≈2.36"-3" (No metric)	3.42" (No metric)
C	≈14" Length	3.00" (76.2mm)	3.20" (81.3mm)	≈2.66"-4.28" (No metric)	5.5" (No metric)

Individual Transducer Dimensions

## MOUNTING



Mounting Technique is determined by pipe size  
Most XDCRs are mounted <10" apart (Exact spacing Calc. required)

Horizontal Pipe Orientation (Side mount is best)  
Vertical Pipe is OK if the pipe is full at all times (No air)

## ORDERING

MODEL	DESCRIPTION
DQ-G-	TFX-5000 ULTRASONIC CLAMP-ON FLOW METER (1/2" THROUGH 90")
	<b>TRANSDUCER SELECTION BY PIPE SIZE, TYPE &amp; MOUNTING TECHNIQUE (XDCRs come with SS straps)</b>
CA	1/2" ANSI-Black Iron Pipe (Clamp-on)
CB	3/4" ANSI-black Iron Pipe (Clamp-on)
CC	1" ANSI-Black Iron Pipe (Clamp-on)
CD	1-1/4" ANSI-Black Iron Pipe (Clamp-on)
CE	1-1/2" ANSI-Black Iron Pipe (Clamp-on)
CF	2" ANSI-Black Iron Pipe (U-Bolt)
CG	1/2" Copper Tube (Clamp-on)
CH	3/4" Copper Tube (Clamp-on)
CT	1" Copper Tube (Clamp-on)
CJ	1-1/4" Copper Tube (Clamp-on)
CK	1-1/2" Copper Tube (Clamp-on)
CL	2" Copper Tube (U-Bolt)
CM	1/2" Stainless Steel Tube (Clamp-on)
CN	3/4" Stainless Steel Tube (Clamp-on)
CP	1" Stainless Steel Tube (Clamp-on)
CQ	1-1/4" Stainless Steel Tube (Clamp-on)
CR	1-1/2" Stainless Steel Tube (Clamp-on)
CS	2" Stainless Steel Tube (U-Bolt)
RZ	Medium pipe, 2.5" - 16" pipe (Bracket)
JZ	2.5" to 6" (Easy Rail)
KZ	2.5" to 12" (Easy Rail)
LZ	Large pipe, >18" pipe (Pipe Strap-on)
XX	Transmitter only selection
	<b>TRANSMITTER w/DISPLAY SUPPLY VOLTAGE</b>
-B-S	24VDC/AC Transmitter w/Display and Keyboard
	<b>REMOTE TRANSDUCER CABLE LENGTH to the TRANSMITTER</b>
-AC	A pair of 15 feet cable leads
-AF	A pair of 30 feet cable leads
-WW	Transmitter only selection, (Remote transducers acquired separately)
	<b>FLOW TRANSMITTER ENTRY HARDWARE</b>
-WW-S-XX	1/2" NPT, with Poly cable glands
	<b>COMMUNICATION OUTPUT</b>
-S	Standard Output includes 4-20mA and RS485 (Modbus RTU/BACnet MS/TP selectable)
-T	Standard Output plus Modbus TCP Ethernet (Includes 69313-004)
-U	Standard Output plus Ethernet/IP (Includes 69313-003)
-V	Standard Output plus BACnet/IP Ethernet (Includes 69313-002)
-9	Standard Output plus Auxilliary Output (Includes 69313-005)
	<b>UNITS OF MEASURE/FLOW RATE</b>
-G-F	Gallons per minute/factory calibrated (other units available upon request)
-Q-F	Liters per minute/factory calibrated (other units available upon request)

DTTC Transducer

DTTR Transducer w/ Bracket

DTTJ Transducer w/ Easy Rail

DTTK Transducer w/Easy Rail

DTTL Transducer (No mounting bracket available)

(Remote Transducers Acquired Separately)

## ACCESSORIES

RC820648	10' (3m), USB-A to USB-Mini-B Configuration Cable
USB-A-MF	1.5' (0.5m), USB-A to USB-Mini-B Configuration Cable
69032-001	MicroSD Card, 8 GB
68898-001*	Configuration SoloCue software (DVD version)
68898-002*	Configuration SoloCue software (USB Flash Drive version)
69313-002	BACnet IP Communication option Card (Fits into the one center card slot)
69313-003	Ethernet IP Communication option Card (Fits into the one center card slot)
69313-004	MODBUS TCP Communication option Card (Fits into the one center card slot)
69313-005	Auxiliary Relay option Card w/Two-SPST, 5A @ 30 VDC (Fits into the one center card slot)
D002-2007-005	One pair of 72" Stainless Steel Straps for pipe up to 20" (needed for most large pipe applications)

\* Note: SoloCue software is a free download from <https://www.badgermeter.com/brands/dynasonics/> Under→ "Support"