SoundWater

SoundWater Camano™

Fluid flow sensing, redefined

Transit Time Ultrasonic Flowmeter

Instruction Guide

For Camano

Contents

General Information

Page

Getting Started

Flowmeter Installation

Troubleshooting

MODEL: SWT CAMANO-01

General Information

When you want accurate, reliable and dedicated flow measurement quickly—with minimum set up time and maximum ease of use, in a wide range of applications—here's your device.

Meet SoundWater Camano.
Ultrasonic. Installs outside the pipe. And as easy to use as a typical mobile app.

What is Camano?
New from SoundWater, Camano is a powerful, dedicated ultrasonic flowmeter that's accurate, easy to use, and a snap to set up—and that's just for starters. Camano is engineered to accept ongoing enhancements as applications and capabilities evolve.

Quick to install. Flexible brackets let you quickly and easily wall-mount the Camano control unit. The Camano Sensor mounts quickly and easily—outside the pipe—using standard straps.

Connect with SCADA & PLC. Camano can deliver a range of outputs, including 4–20 mA, pulse, and MODBUS to your automated systems. You can also set digital alarms for high/low flow, open circuit, and low signal events.

Works with cellular data. Simply combine Camano with the Ayyeka Wavelet ™ to seamlessly transmits flow data from your Camano using mobile networks—and you access your data through any web browser.

Easy to use. The built-in, touchscreen is your access to the Camano app, with its familiar Android-app user experience. Swipe, tap, scroll, and (if needed) use an on-screen keyboard to specify application parameters.

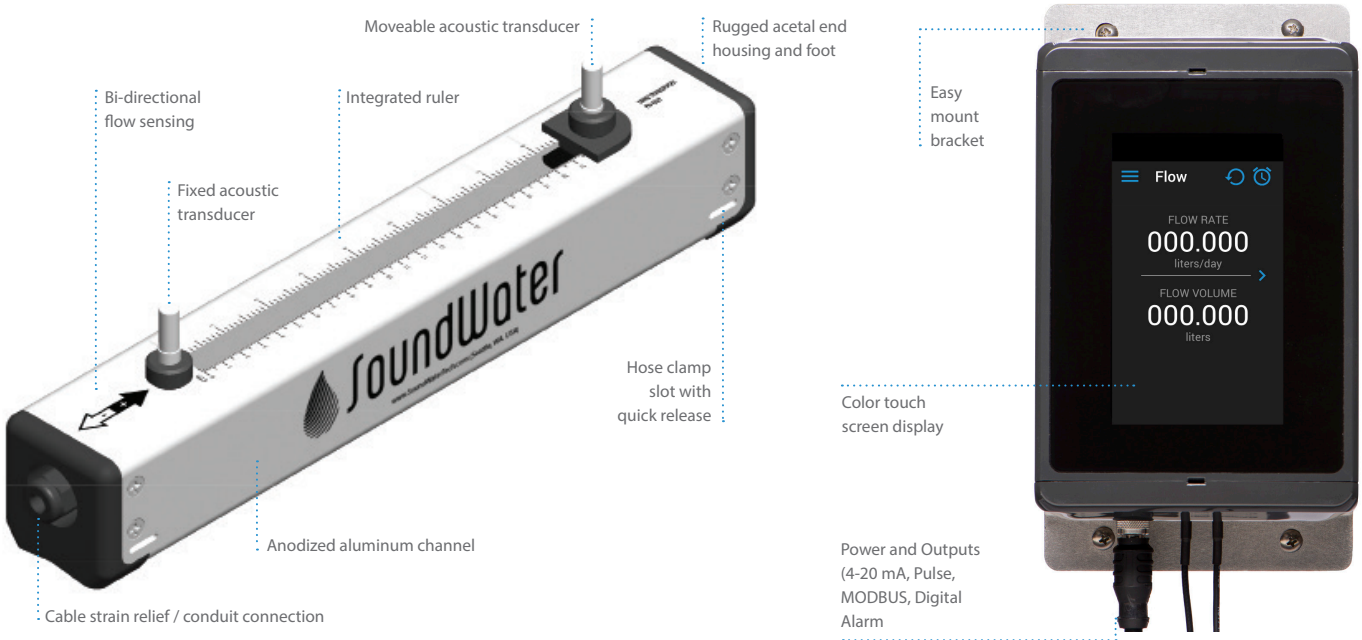
Pre-set menus, plain-language dialogs, and intuitive navigation let you easily choose from pre-loaded pipe and fluid data (or enter your own)—no more complex codes or cumbersome instructions. In seconds, Camano displays optimal transducer spacing and flow measurements.

Next, quickly install the Camano Sensor on the pipe, secure power and data output wiring, and you're ready to monitor, and output to data collection systems. Start viewing flow directly on the built-in touch screen and instantly toggle between flow volume and rate with a simple swipe.

Along with fast, easy installation and set up—and no need to break pipe—Camano works with a wide range of applications. With Camano's ultrasonic technology, you (and your automated systems) can get started tracking flow quickly and easily.

Meter Features & Control Unit

All Camano models include the features as shown below.



Camano Specifications*

* Specifications subject to change.

Installation	15 pipe diameters upstream, 5 diameters downstream for optimal performance (typical)
Flow Detection	Bi-directional; 0.1 ft/s to 20 ft/s (0.03 m/s to 6 m/s)
Pipe Size	1" to 24" (nominal)

Performance

PIPE SIZE	ACCURACY	OPERATING RANGE	REPEATABILITY
3″ to 24″	±1.0% to 2.0% typical	-20 to 20 ft/s (-6 to 6 m/s)	0.5%
1″ to 2″	±2.0% to 3.0% typical	-20 to 20 ft/s (-6 to 6 m/s)	0.5%

*Under standard conditions, assuming fully developed and symmetrical flow profile (typically taken on a straight run of 15 diameters upstream and 5 diameters downstream; flow rate above 3 ft/s or 1m/s; non-aerated liquids).
If the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

Turndown	200:1
Environmental	IP65 splash proof; weather and corrosion resistant

Materials

CONTROL BOX

Polycarbonate enclosure, glass touch screen, stainless steel circular connector, nickel plated brass USB connector, nickel plated brass transducer connector, EPDM rubber

BACKPLATE

Stainless steel

TRANSDUCER ASSEMBLY

Anodized aluminum housing, acetal footings, aluminum transducer strain relief, PVC strain relief, EPDM O-rings, EPDM strain relief gasket, stainless steel fasteners, epoxy silk screen, PVC coaxial cable, nickel plated brass coaxial cable connectors

MOUNTING STRAPS

Stainless steel

Temperature	Ambient & Fluid: -20˚ to 150˚ F (-29˚ to 65˚ C)
Display	Android-based touchscreen user interface; backlit; 20+ year lifetime with power save mode 3+ year lifetime with full-power, continuous use Metric and English units
Software	Android OS/Android-based app; easy software updates via USB thumb drive
Power	12-24 V DC or AC, external power; 400mA typical@20 V, 1 A inrush Recommended external AC-DC converter part #PLUS ML30.241
Security	6-digit passcode protects configuration/set up, and volume reset

Specifications continued on next page

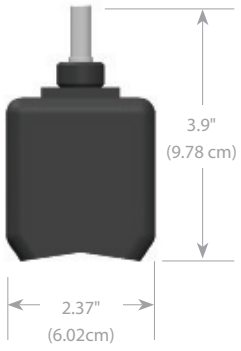
Outputs	NOTE: The isolation for all outputs is as a group; that is, all of the outputs share a common reference. CURRENT (4-20 MA) Isolated 4-20 mA, directly proportional to flow—4 mA/zero flow (fixed), 20 mA/user programmable flow. Accuracy (linearity): 16-bit (15 ppm); PULSE Isolated, NFET (NPN type) open drain output with a frequency directly proportional to flow Maximum frequency: 10 kHz; mark: space ratio = 50.0: 50.0 (accurate to < 1 ppm) DIGITAL ALARM Isolated, NFET (NPN type) open drain output, configured to change state at any user-selected combination of: (1) high flow, (2) low flow, (3) poor acoustic signal (e.g., empty pipe, disconnected transducers, etc.), (4) open 4-20 mA circuit. MODBUS RTU Isolated, RS485 full or half duplex. User configurable port settings.
Manufacture	SoundWater Technologies (Wenatchee, WA. USA)

Dimensions

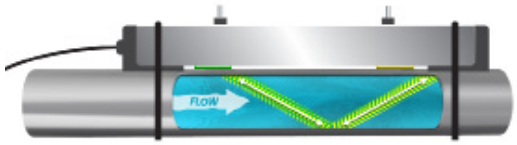
For 8" to 24" pipe (requires two)

For 1" to 4.5" pipe

For 2" to 12" pipe



Technology



The transit time flowmeter operates by alternately transmitting and receiving a burst of sound energy between the two transducers.

The burst is first transmitted in the direction of fluid flow and then against fluid flow.

Since sound energy in a moving liquid is carried faster when it travels in the direction of fluid flow (downstream) than it does when it travels against fluid flow (upstream), a difference in the travel times will occur. The sound's travel time is accurately measured in both directions and then used to compute the flow rate.

Sound waves can bounce in many directions as they travel through various materials. The more the sound waves scatter, the fewer actually reach the second transducer. The Camano uses sophisticated methods to maximize transducer efficiency, thus allowing the unit to run on very low power. Focusing of the sound wave is also important to ensure it reaches the second transducer without degrading. This is accomplished by accurately spacing the transducers to allow for optimum sound transit between transducers. The Camano app computes this spacing based on the pipe size, pipe material, and type of liquid.

Transit time technology works best in clean or mildly dirty water or fluids with minimal turbulence or flow distortion.

The Camano Control Unit and Camano App Features

App Features

Android-based, interactive touchscreen

Easy configuration for 4-20 mA, pulse, MODBUS, and digital alarms

Programmable alarms

Select from a wide range of fluids and pipe types

Flexible control unit mounting and connections

Backlit for maximum visibility in darkness or sunlight

English or metric units

Camano Features

Complete monitoring and data

Output flow data—in a range of analog or digital formats—plus alarms/alerts can be automatically transferred to your automated systems.

Cellular Data & IoT Web Interface

For remote applications (or where hard-wired communication is impractical), make Camano an IoT device by adding the Ayyeka Wavelet. Wavelet seamlessly transmits flow data from your Camano using mobile networks—and you access your data through any web browser.

Ongoing enhancement

Upgrade your Camano with ease—just download the latest software and load it to the control unit with a thumb drive. You'll always have the latest, most capable version.

Easy to Mount

Camano comes with an easy-mount wall bracket that puts your control unit right where you need it, yet out of the way—in just a few minutes.

Easy to Connect

Use the included cable to connect the control unit to the Camano Sensor (transducers). Power connections are just as easy—cable is included—and linking to your automated systems is both fast and flexible.

Easy to Set up

The full-color Camano App and extensive, built-in parameter libraries help you easily specify pipe, fluid and other values—then shows you how to space transducers.

Connecting to Power & Communications

Control Box

Control Box, bottom view

Getting Started

Mount the Control Unit

Camano comes with an easy-mount wall bracket. The flexible brackets let you quickly and easily wall-mount the Camano control unit.

Connect to a Power Source

Connect the supplied cable to your 12-24V DC or AC power, by attaching the red wire to the positive supply terminal, and the black wire to the 0V terminal.

For all wired connections, check the wire color code table, and pinout diagrams below for proper set up. Also, refer to wiring diagrams on the following pages for guidelines.

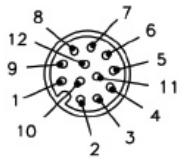
If not using the supplied cable for wiring power and communications, be sure to use a compatible part to Turk USA # RKSV 12T.

Once power and communications have been wired properly. Plug the power and communications cable into the flowmeter display at the mating circular connector.

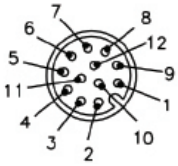
Wiring Color Definitions:

	1	Analog & digital isolated ground 0V
	2	RS485 Tx Data (A) -
	3	Pulse output, open drain
	4	4-20mA output
	5	RS485 Tx Data (B) +
	6	MODBUS, isolated ground
	7	Not connected
	8	Power 12-18V DC or AC
	9	Alarm output, open drain
	10	RS485 Rx Data (A) -
	11	Power ground 0V
	12	RS485 Rx Data (B) +

Flowmeter Display Pinout:

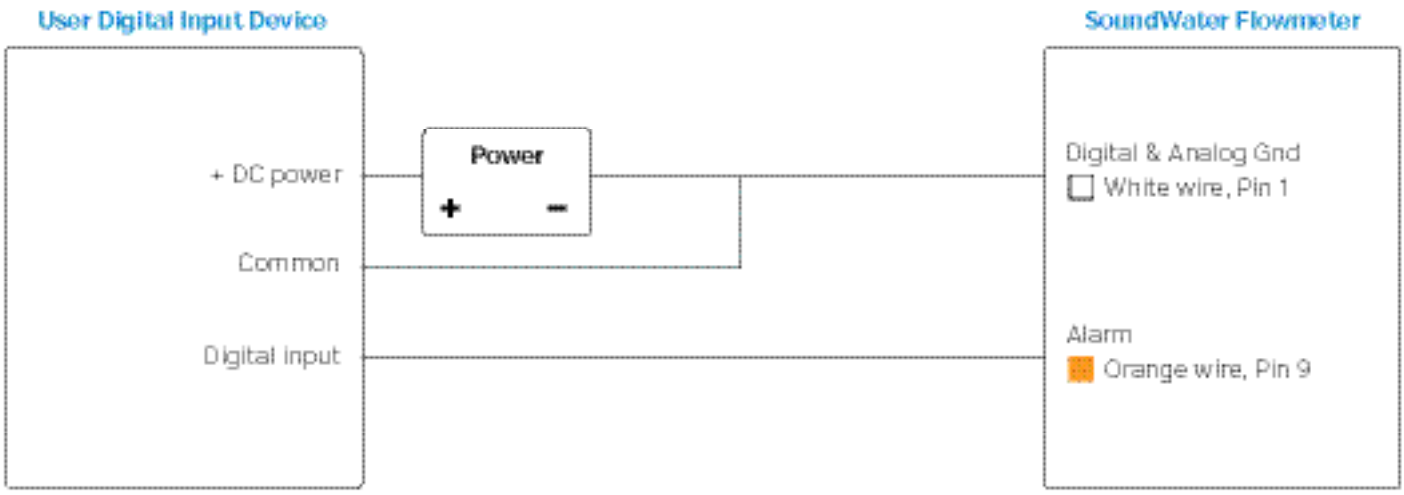


Supplied Cable Pinout:

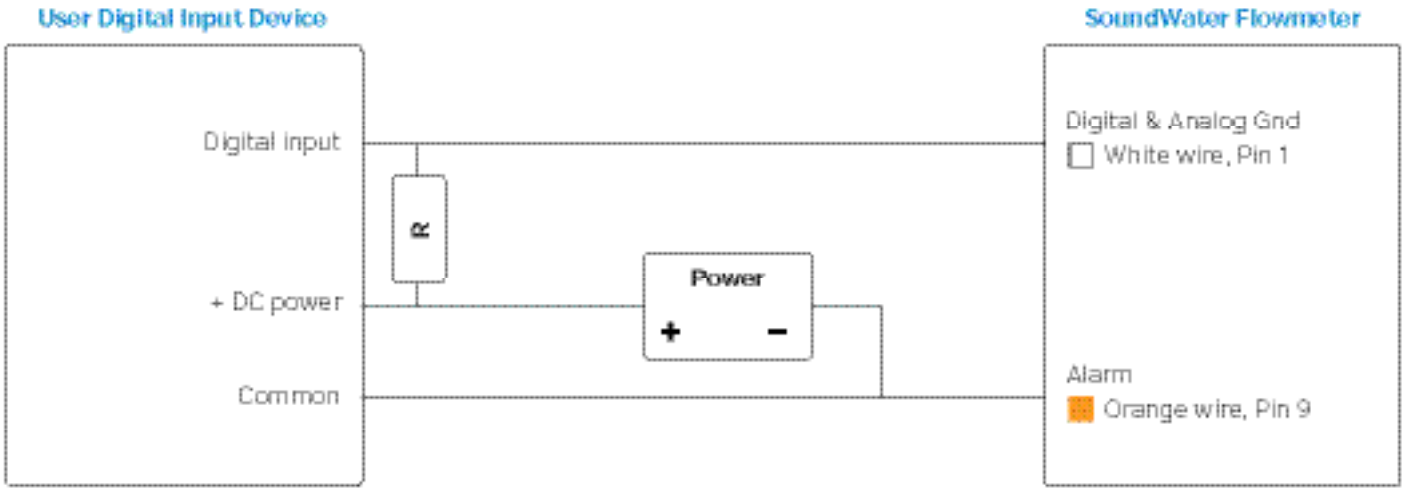


Wiring

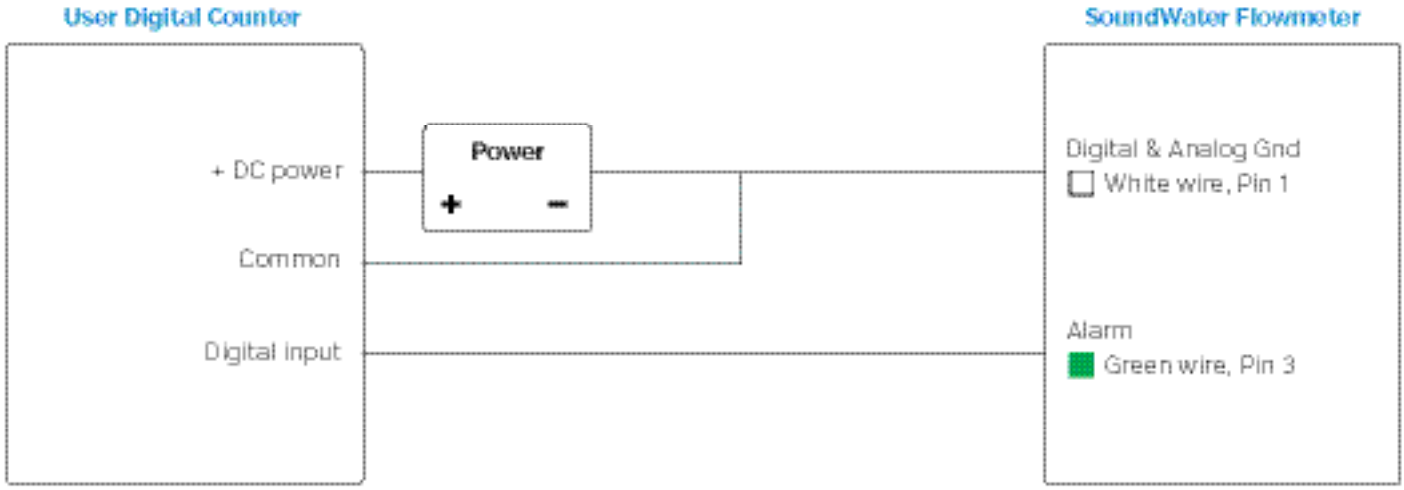
Alarm Output (sourcing input)

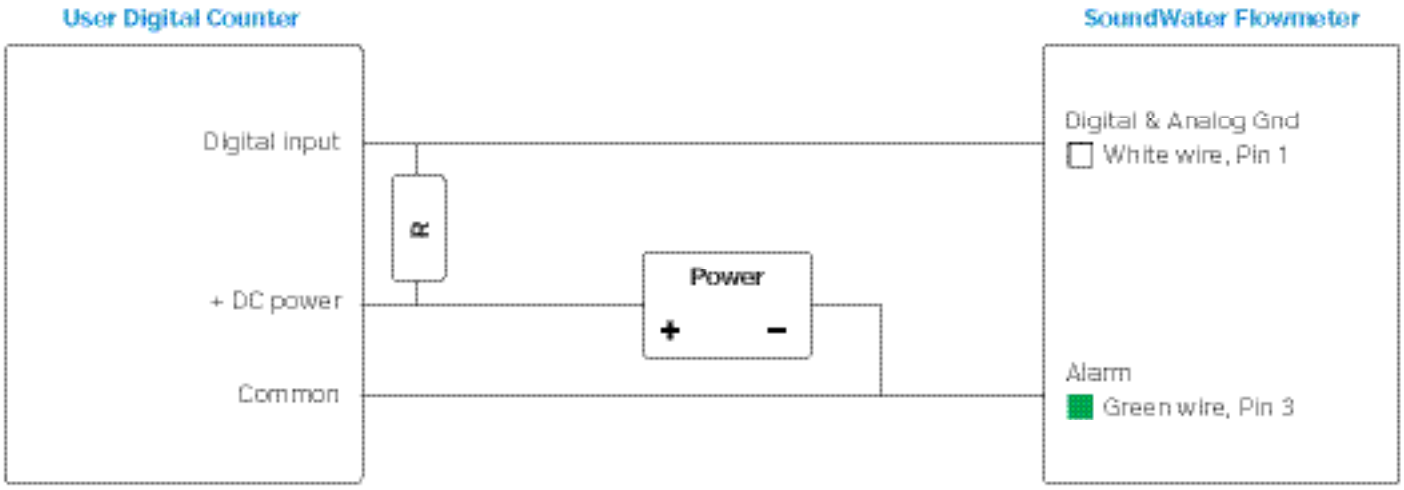


Alarm Output (sinking input)

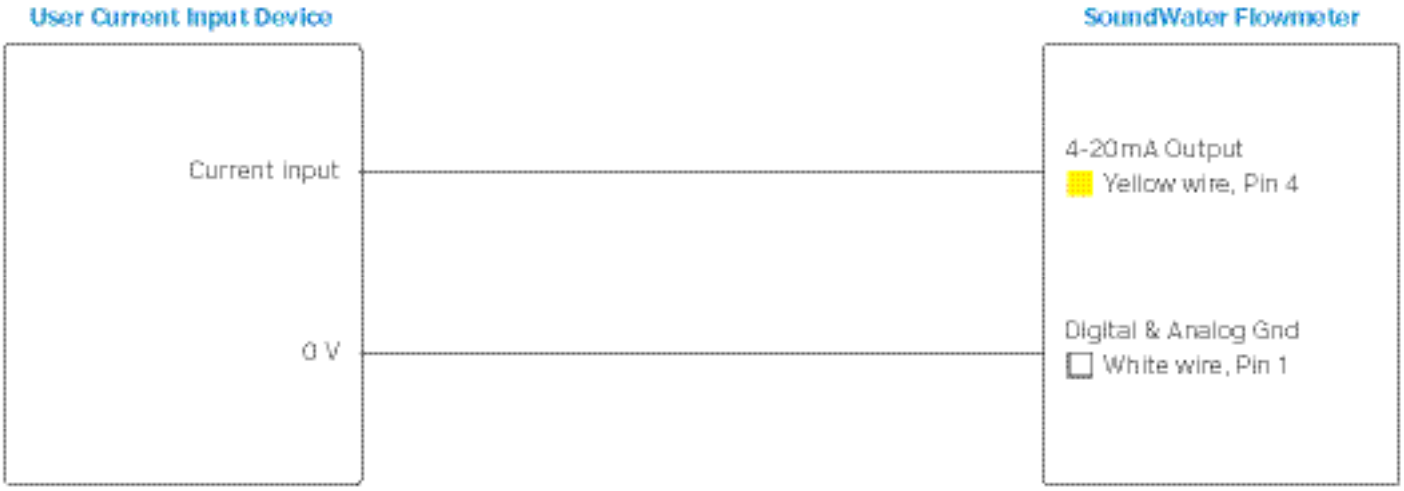


Pulse Output (sourcing input)





4-20mA Analog Output



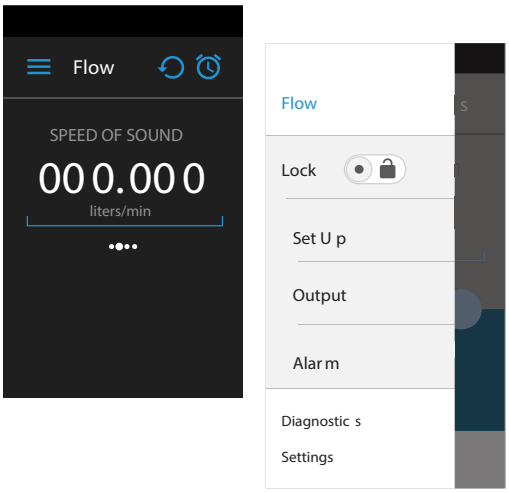
App Installation

Setting up the App

Your Camano ships complete with power cabling.

Selecting a PIN

Choose and enter your own PIN (6-digit access code)—and remember it, as you'll need it going forward to access the app.

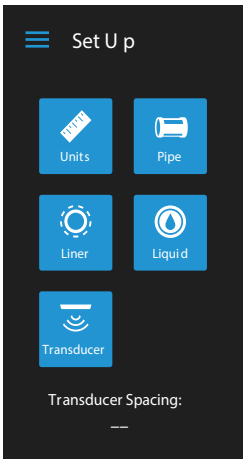


Prepare for Set up

Use the Drawer Icon ( ) to access Camano's menu—then select 'Set Up' for parameter settings.

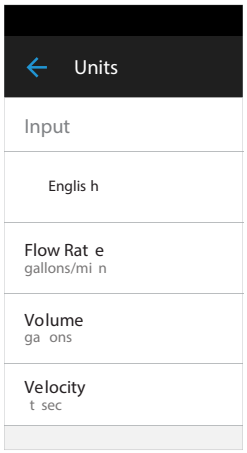
Parameter settings are protected behind a lock. To unlock, simply tap on the Lock icon ( ) and enter your PIN.

Parameter Set Up



The Set up Screen

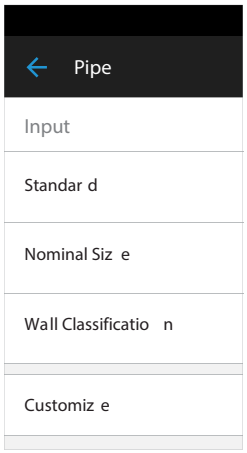
Use the handy parameter selection screens to set your units of measure and display preferences. Conveniently select pipe, liner, and liquid specifications from lists of pre-loaded values. Don't see the right option? Add your custom values.



Units

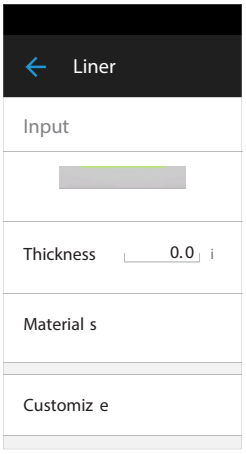
Toggle between Imperial and metric units of measure.

Select Flow Rate, Volume, and Velocity from Camano's pre-loaded values or add your own custom values.



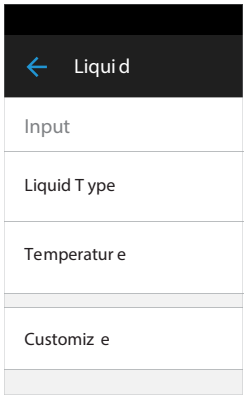
Pipe

Select Pipe Type, Size, and Wall Classifications from our pre-loaded values or add custom values by selecting Custom under Pipe Type. When entering a custom type, you must supply the outer diameter, wall thickness, speed of sound through the pipe material, and the surface roughness—enter zero if unknown roughness.



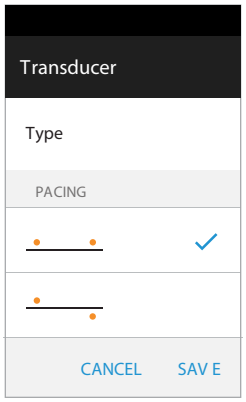
Liner

Switch between liner and no liner. When selecting Liner Enabled, enter Liner Thickness and choose Liner Material from our pre-loaded list or add custom values. When adding a custom material, you must enter the speed of sound through that material.



Liquid

Select Liquid Type and Temperature from our pre-loaded list of values or add a custom liquid type. When adding a custom liquid, you will need to enter the speed of sound through that liquid, the viscosity, and the density.



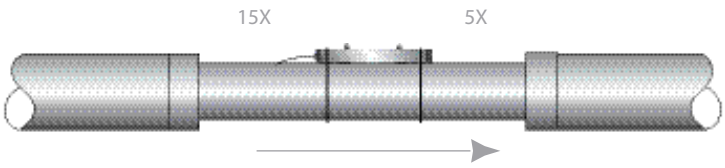
Transducer

Select the Transducer Type and Orientation.

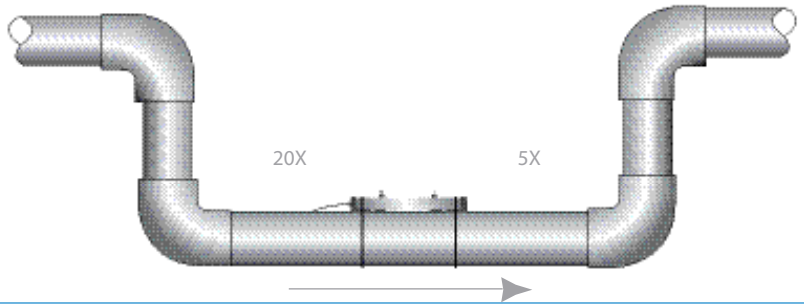
Flowmeter Installation

Straight Pipe Recommendations (X = diameter)

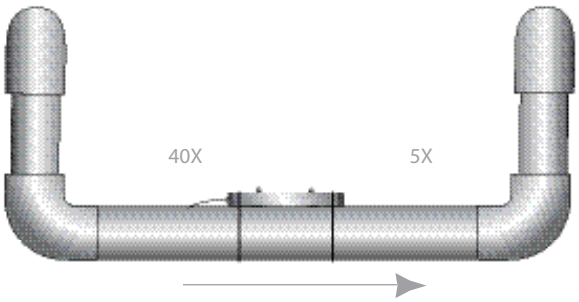
Reduced Pipe



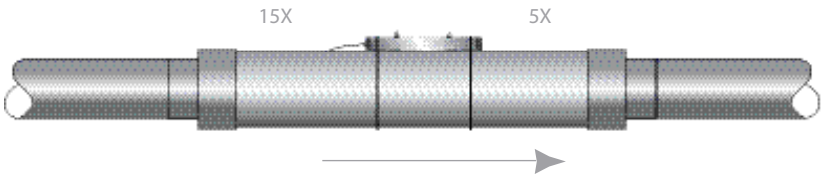
Two Elbows In Plane



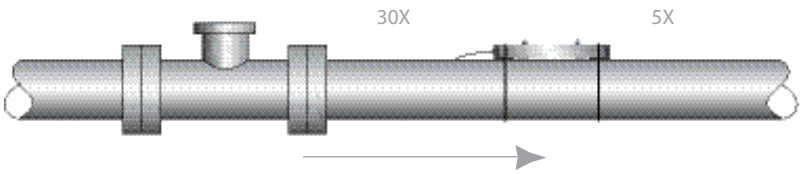
Two Elbows, Out Of Plane



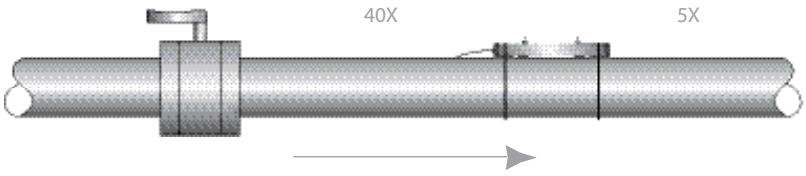
Expanded Pipe



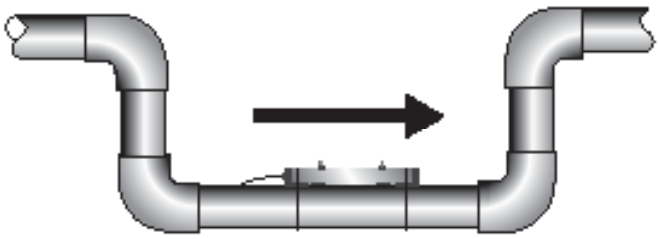
Swirling Flow:
Propeller Meter



Swirling Flow:
Partially Open
Butterfly Valve

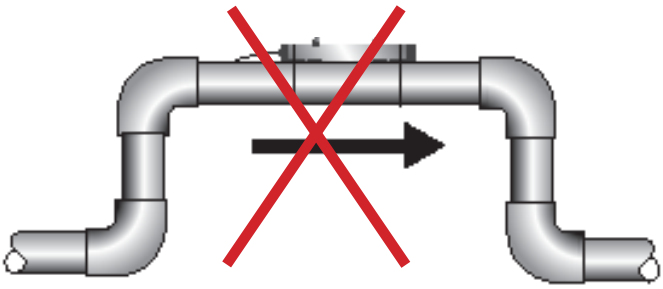


Full Pipe Recommendations



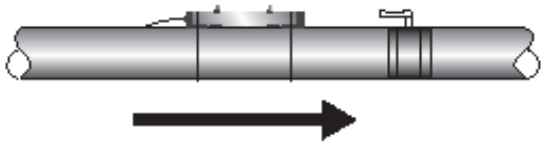
Recommended:

Keep pipe full at meter for accuracy



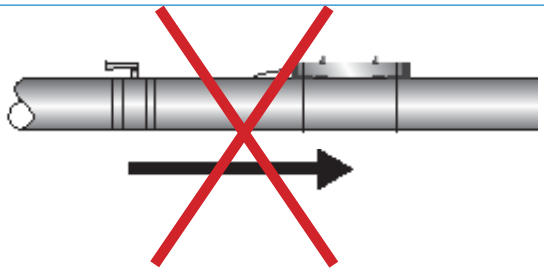
Not Ideal:

Allows air pockets to form at meter



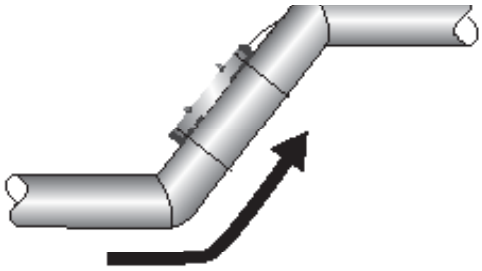
Recommended:

Keeps pipe full at meter for accuracy



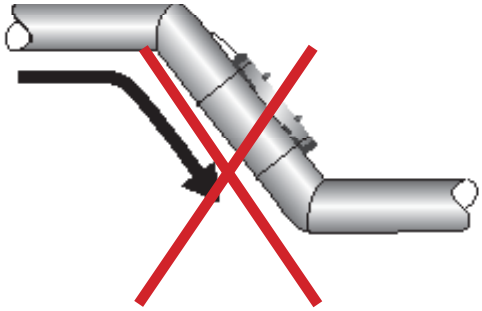
Not Ideal:

Post-valve cavitation can create air pocket



Recommended:

Allows air to bleed off

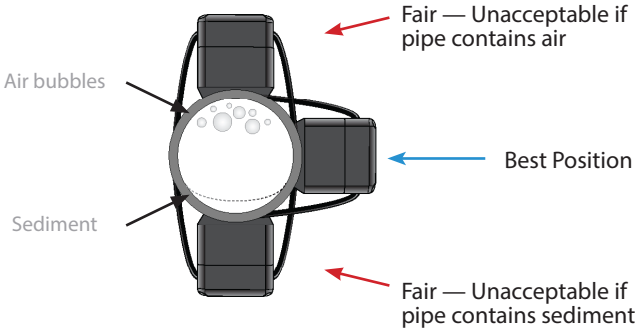


Not Ideal:

Air can be trapped

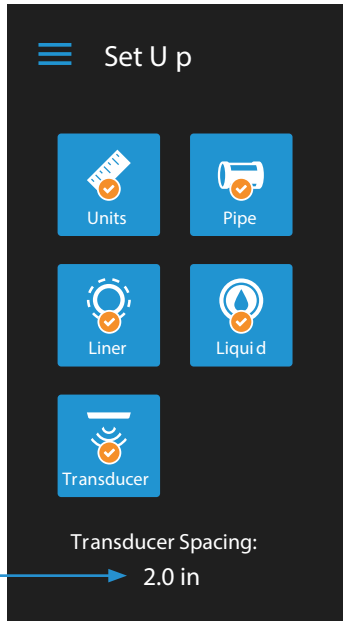
Flowmeter Orientation

This is a view looking directly into a pipe, with the meter in multiple possible positions on the side of the pipe. Horizontal (3 o'clock or 9 o'clock position) is the preferred installation orientation, since it avoids problems with trapped air and sediment.



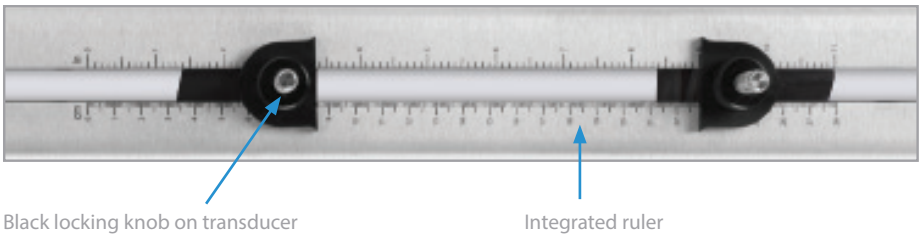
Transducer Spacing

Once you entered your parameters in the previous section, the app automatically computed the proper transducer spacing. This is shown at the bottom of the main app screen.



The next step is to adjust the transducer spacing on the flowmeter, as follows:

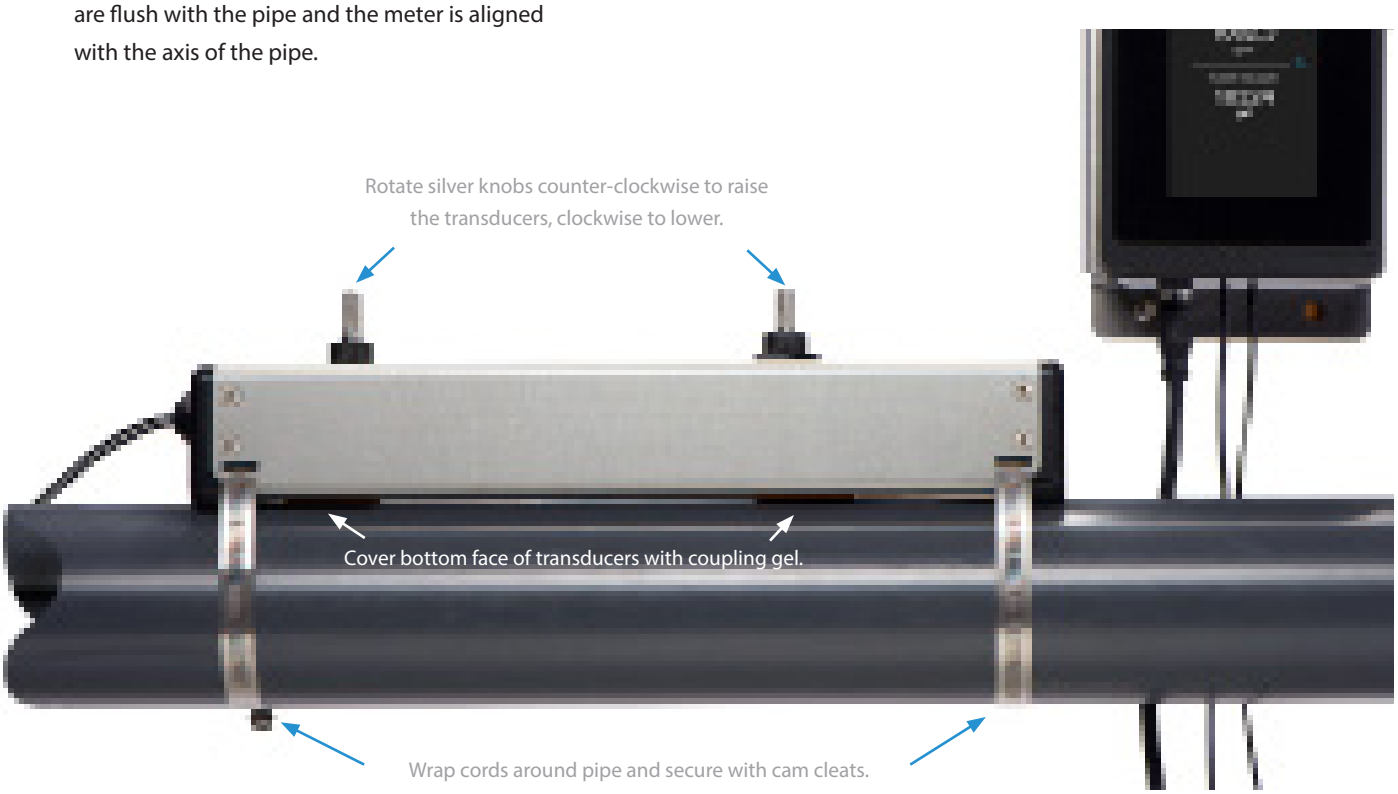
1. Rotate the black knob to unlock the horizontal motion for each transducer.
2. Move the transducers to the specified transducer spacing by sliding them along the integrated ruler. Note: It is not necessary to start at zero on the ruler, so long as the actual spacing is correct.
3. Lock into place using the black knobs. This is important to prevent the transducer spacing from moving when mounting the flowmeter!



Installing the Flowmeter

Once the transducer spacing has been set and locked in place, you are ready to install the flowmeter on your pipe.

1. Wall mount the display.
2. Rotate the silver knobs counter clockwise until they stop. This raises the transducers up above the meter footings.
3. Apply coupling gel liberally to the transducer faces, covering the entire bottom face of each transducer.
4. Place flowmeter on pipe, assuring that the footings are flush with the pipe and the meter is aligned with the axis of the pipe.
5. Strap the meter to pipe with the mounting straps.
6. Rotate silver knobs clockwise to press transducers onto the pipe. Hand tighten only until seated firmly. Warning: Tightening too much can lift the meter away from the pipe, causing incorrect readings.



Do's and Don'ts

Do store your Camano in a dry, inside area when not in use.

Do keep your Camano in its protective case when transporting to prevent damage.

Do gently clean the transducer pads regularly with isopropyl alcohol to prevent hardening and build up of used coupling gel.

Do periodically check that there is sufficeint coupling gel.

Don't store, transport, or use your Camano where the device may exceed 150˚F (65˚C).

Don't bang or drop the Camano on hard objects or surfaces.

Don't nick the transducer pads.

To prevent damage, you must use the recommended coupling gel.

Troubleshooting

Problem	Probable Causes	Things to try…
No signal	Incorrect set up	Confirm pipe settings
	Air in pipe	Rotate meter to 3 o'clock position
		Remove air
		Relocate meter to another location where there is no air
	Corroded rusty pipe	Relocate meter to clean section of pipe. If no clean section is available, move meter to other locations until a signal is found—try to find a section of pipe with less corrosion or rust.

SoundWater

1-509-899-7838

sales@soundwatertech.com

support@soundwatertech.com

soundwatertech.com

SWT 3710 Camano™
SWT 9676 R03