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EASZ-10P

Operating Instructions



Introduction	2
Sensor Mounting	2
Keypad	4
Battery	4
Menu System	5
Error/Warning Messages	6
Troubleshooting	7
Questions and Answers	8

Introduction



The EESiFlo EASZ-10P Flow Meter measures the velocity of fluids in pipes using a totally non-intrusive principle and gives flow rates and totalized flow in either METRIC or IMPERIAL units

The EASZ-10P contains a high speed, 16-bit microprocessor with 32-Kbyte FLASH memory. The user-friendly flowmeter comes with a wide range of features to ensure easy and reliable flow measurement. The flow signal from the flow transducer is continuously analyzed and should the signal quality become unacceptable an error message is displayed.

The EASZ-10P is designed for use with sewage, waste water, pulp stock, mining slurries, food products and other fluids which contain in excess of 0.1% suspended solids or bubbles. The particle size for successful operation must be greater than 100 microns

Sensor mounting

Location

- Select a location for mounting the sensor at a point where the flow profile is fully developed. Generally the principle of 10 pipe diameters of straight pipe upstream, and 5 pipe diameters downstream will suffice, but should valves or bends exist upstream of the sensor, the amount of straight pipe immediately upstream will need to be increased.
- Ensure that the sensor is mounted as far as possible from potential noise sources, such as pumps, control valves etc. and mount the sensor at approximately 3 or 9 o'clock on the pipe (if horizontal) to avoid errors due to air pockets on top, or sediment at the bottom of the pipe.

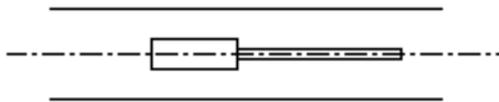
- Either vertical or horizontal pipe runs are acceptable for sensor mounting.

Surface preparation

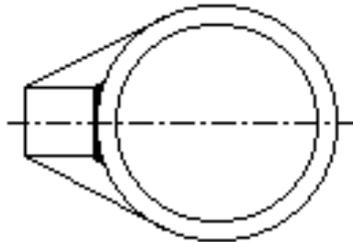
- Before attaching the transducer to the pipe, an area slightly larger than the flat surface of the transducer must be cleaned to bare metal. (A small amount of pipe pitting, even with spots of paint or rust, will not cause problems).

Orientation

- The transducer must be mounted accurately, parallel to the pipe axis, for correct performance, and transducer to pipe contact should be along the centre line of the transducer head.



SIDE VIEW - 3 O'CLOCK POSITION
ON PIPE IF HORIZONTAL



Good

Bonding

- Bonding to the pipe is achieved with silicone acoustic coupling compound. Be sure to fill in any air gaps that may remain at the pipe transducer interface with additional compound.
- Silicone Acoustic Coupling Compound is included with the flow meter.

Keypad

Pressing the **ON/OFF** button turns the flowmeter ON and OFF.

- The EASZ-10P has an easy to use 4-button programming system.
- The **MENU** button is used to scroll through the menu structure.
- The **SAVE** button is used to save entered changes to the flowmeter program.

The  and  buttons are used to change numbers and scroll through options.

Battery

Recharging and battery care

- The EASZ-10P is supplied with 4 x 1.2V 650mAh AA size Ni-Cd removable cells and a 110 VAC battery charger.
- Charge battery fully before first use and thereafter recharge only when fully discharged. The EASZ-10P will indicate an error message when battery charge is low and automatically switch off.
- The 110 VAC battery charger supplied as standard with the EASZ-10P is a 65mA constant current charger. The EASZ-10P should be switched off during charging. The charge time for the 650mAh cells supplied is 14-16 hours (maximum 20 hours). **THE CELLS MUST NOT BE OVER CHARGED.** Under charging of the cells will reduce the life and capacity of the cells.

Low power consumption

- The EASZ-10P is designed for low power consumption allowing over 10 hours operation before re-charging the battery. The EASZ-10P features a Low Battery warning with automatic power down.

Storage

If the EASZ-10P is to be stored for an extended time period the cells should be removed.

Menu System (10P Version 1.00)

The EASZ-10P menu system is easy to use and designed for programming simplicity.

With the EASZ-10P powered up the EASZ-10P will test the suitability of the flow signal. If the signal is suitable the flow total and flow rate are displayed, if not an error message is displayed.

00000000 gpm 1250.68 gal

START PROGRAMMING - Press "**MENU**"

Units

Mn_1 units? English

Metric and English units of rate and total are available.

Press  until desired value is displayed and **MENU** to continue.

Pipe ID

Mn_2 Pipe ID inch? 12.0

Enter the precise internal diameter (ID) of the pipe here.

Use the  button to position the cursor below the number to be changed and press the  button until the desired value is displayed. Press **MENU** to continue

Rate units

Mn_3 rate units?

gpm

Press ▲ until desired unit is displayed then press **MENU** to continue.

Total units

Mn_4 tot units?
gal

Press ▲ until desired unit is displayed then press **MENU** to continue

Clear total?

Mn_5 clr total?
save total

The total can either be cleared or saved.

Press ▲ to either save or clear the total then press **MENU** to continue.

Damping

Mn_6 damping?
5.0 Sec

The level of damping (averaging) can be selected.

Press ▲ until desired unit is displayed then press **MENU** to continue.

Cut-off

Mn_7 % cutoff
2%

The level of cut-off can be entered.

Press the ▲ button until the desired value is displayed then press **MENU** to continue.

Save data

Mn_8 save data?
Press SAVE

Press **SAVE** to accept all changes made.

Error/Warning Messages

Error message	Error	Possible solution
poor signal	Poor signal Flow rate less than min. flow rate of 0.25m/s	Increase flow rate
no signal	No signal	Establish flow Inject air into line
charge battery	Battery charge low	Charge battery
total error counts > 100/s	Totalizer count-rate too high	Select more suitable total units
rate overflow	Rate > 999999	Select more suitable rate units

Troubleshooting guide

PROBLEM	POSSIBLE SOLUTION
Meter reading lower than expected	
Source particles velocity not indicative of average velocity	Relocate sensor to a position where source particles are expected to be moving at the average velocity
Incorrect mounting of flow sensor	Remount sensor correctly
Programming error	Review all programmed entries
Flow rate lower than expected	Investigate possible causes and confirm flow rate independently
Insufficient particle size or concentration	Locate sensor at position where acceptable particle size or concentration is expected. Inject air into the line
Meter reading when there is no flow	
Local ultrasonic noise source	Relocate sensor or remove noise source
“Poor signal” displayed when flow exists	

Insufficient particle size or concentration	Locate sensor at position where acceptable particle size or concentration is expected. Inject air into the line
Sensor coupling to pipe poor	Remount sensor to pipe correctly
Meter reading higher than expected	
Programming error	Review all programmed entries
Flow rate higher than expected	Investigate possible causes and confirm flow rate independently
Particle velocity at sensor not indicative of average velocity	Relocate sensor to a position where source particles are expected to be moving at the average velocity
Incorrect mounting of flow sensor	Remount sensor correctly
Local electrical noise	Relocate sensor
Meter reading erratic	
Particle velocity at sensor not indicative of average velocity and erratic	Relocate sensor to a position where the velocity profile is expected to be suitable

Questions and Answers

The pipe vibrates. Will it affect the flow meter?

Common vibration frequencies are far lower than the sonic frequencies used by the flow meter, and will not normally affect accuracy or performance.

Will pipe corrosion affect accuracy of the flow meter?

Yes. Rust, loose paint etc. must be removed from the outside of the pipe to provide a clean mounting area when installing a Doppler sensor. Severe corrosion/oxidation on the inside of the pipe may prevent the Doppler signal from penetrating into the flow. If the pipe cannot be cleaned, a spool piece should be installed for sensor mounting.

What effect do pipe liners have on the flow meter?

The air gap between loose insertion liners and the pipe wall prevent the Doppler signal from entering the flow. Better results can be expected with bonded liners such as

rubber, epoxy or tar, however an on site test is recommended to determine if the application is suitable for a Doppler flow meter.

Why is Doppler only recommended for liquids containing suspended solids or gases?

The Doppler sensor transmits sound into the flow stream, which must be reflected back to the sensor to indicate flow velocity. Gas bubbles or suspended solids act as reflectors for the Doppler signal. As a guideline, EESIFLO Doppler flow meters are recommended for liquids containing solids or bubbles with a minimum size of 100 microns and a minimum concentration of 100 ppm.

Can the sensor be submerged in water?

Yes, for short periods of time or by accident, but not for continuous operation. The sensor is constructed to withstand submersion without damage, but external liquid moving in contact with the sensor can be interpreted as flow and cause false readings.

Can I change the length of the sensor cable?

No. A 6 foot cable is supplied with the 10P as standard.

Does the direction of flow matter for Sensor mounting?

The 10P Doppler flow meter will measure and totalize flow in either direction. A check valve should be used in applications where backflow may occur.