

Model 7510P Penstock Protection System



About Accusonic

Accusonic® Technologies, a division of ADS® LLC, designs and manufactures ultrasonic transit-time flow measurement systems that are renowned for their precise accuracy and reliability in difficult operating environments. Accusonic flowmeter systems can be found in hydroelectric plants, thermal power plants, water and wastewater treatment facilities, sewage collection systems, and other types of water flow conveyance pipelines and channels. With over 35 years of experience and over 3000 systems installed worldwide, Accusonic offers a full range of services including installation, system integration, turbine performance testing services, and field training.



SYSTEM DESCRIPTION

The Accusonic Model 7510P flowmeter console is designed for accurate, reliable flow measurement in pipes and penstocks. When used as a 4 parallel or 8 crossed path flowmeter on pressurized pipes, the 7510 measures flow to within $\pm 0.5\%$ of actual flowrate when installed according to Accusonic specifications.

Flow in pipes of 1 to 40 ft. (0.3 to 12m) in. diameter can be measured economically with the system. Transducers can be selected for a variety of applications, including:

- Exposed steel pipes
- Concrete pipes
- Buried or encased pipes
- Pipes with external access only
- Pipes that cannot be dewatered for installation



The Accusonic Model 7510P "Penstock Protection" System is designed for the detection of leaks in penstocks. In its standard configuration, the system consists of two multi-path ultrasonic flowmeters, one at each end of the penstock. One is designated the "Master", usually at the lower end, and the other ("Slave"), at the upper end. A serial digital communication link using modems and a two-wire cable or fiber optic link connects the two flowmeters. The communications link is used to synchronize the flow measurements at the two ends of the penstock, send data from the Slave to the Master and enable operational control of the system in the Master unit.

The system may be configured to provide independent determination of flow, analog outputs and alarm relays for two separate and dissimilar penstocks. At the Master flowmeter, the flows in the pipe sections at the two ends of the penstock are compared and alarm relays are set if either flowrate or the difference between the Master and Slave flows exceeds specified thresholds for longer than specified times.

Nine relays are provided to indicate:

- Minor Master section fault
- Master section failure
- Slave section failure
- Master flow in excess of first threshold
- Master flow in excess of second threshold
- Flow difference in excess of first threshold
- Flow difference in excess of second threshold
- A minor leak
- Command to close the butterfly valve.


At the Slave flowmeter, 5 relays are provided for each penstock to indicate:

- Minor slave section fault
- Slave section failure
- Slave flow in excess of first threshold
- Slave flow in excess of second threshold
- Command to close the butterfly valve.

DESIGN SPECIFICATIONS

Applications in water and wastewater pipelines and open channels with path lengths of up to 50 feet* (15.2 meters) in hazardous locations when connected to Accusonic Model 7500/7510 series flowmeter.

* Maximum path length depends on sediment concentration and aeration.
Contact Accusonic regarding application suitability.



Operational Frequency:	500 kHz
Maximum Operating Pressure:	30 psi (2 bar)
Temperature Range:	32 ^o to 122 ^o F (0 ^o to 50 ^o C) operation 14 ^o to 122 ^o F (-10 ^o to 50 ^o C) storage
Construction Material:	CPVC
Hazardous Location Rating:	FM and CSA Class I, Divisions 1 and 2, Groups C and D Note: Not approved for use in locations where the vapors of ketones or esters are present
Dimensions:	1.75 inches (45mm) in diameter 7.5 inches (190mm) long for Model 7656 Installed length varies with pipe wall thickness for feedthrough applications
Conduit Connection:	1 inch NPT female (Feedthrough) 1 inch NPT male (Internal Mount)
Electrical Connection:	Junction box at rear of feedthrough in nonhazardous areas Two conductor underwater-pluggable neoprene connector (Internal Mount)

Specialized Applications: High-Pressure, Internal-Mount, Hot-Tap

Contact Accusonic Technologies for information on transducers recommended for specialized applications.