



VANTAGE 4800

Single & Multipath Spool Construction

AWWA/ANSI C750-03
TRANSIT-TIME FLOWMETERS

 **EASTECH**

VANTAGE 4800



Designed to AWWA/ANSI Standards

AWWA/ANSI C750 – 03

In 2003, the American Water Works Association in conjunction with the American National Standards Institute issued an official Standard for Transit-Time Flowmeters in Full Closed Conduits. This new Standard, AWWA/ANSI C750 – 03, sets the requirements for ultrasonic transit-time flowmeters in water service applications; included are components, performance, calibration and verification. The Standard also goes on to voice its concern over improper installation, disturbed flow conditions, less than adequate calibration techniques, and the resulting effects they will have on the accuracy of the meter.

Realizing this, the engineers at Eastech decided to create a totally new series of transit-time flowmeters that specifically addressed and consequently eliminated all of the operating accuracy concerns mentioned in the AWWA/ANSI Standard.

MEETING EVERY REQUIREMENT

The Engineering Team at Eastech believed that in order to absolutely meet all of the requirements of AWWA/ANSI C750 – 03, a flowmeter had to be designed that not only adhered to every section of the Standard, but also eliminated any possibility of improper installation, inaccurate velocity measurements, and less than adequate calibration procedures. A flowmeter, in order to meet these requirements, would have to possess the following features:

- Factory aligned spoolpiece sensors for guaranteed installed accuracy
- High accuracy flow measurement under disturbed flow profiles
- Advanced electronic meters with onboard dataloggers
- NIST traceable calibration under actual operating conditions

CONCERN: C750 – 03, SEC.4.5.1.4: **IMPROPER INSTALLATION**

“Improper installation may result in errors caused by inaccurate measurement. This is especially critical for all field installed transducers.”

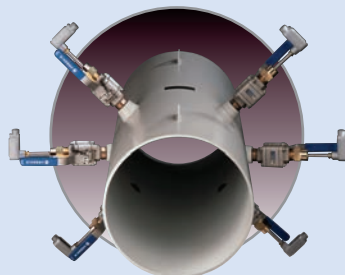
SOLUTION:
Provide every flowmeter with a factory engineered spoolpiece, thereby assuring precision placement and alignment of each acoustic transducer.



CONCERN: C750 – 03, SEC. 4.5.1.1: **NON-UNIFORM FLOW PROFILE**

“Distorted flow profiles and crossflow, as a result of insufficient or improper piping arrangements, can dramatically effect the flowmeter’s accuracy.”

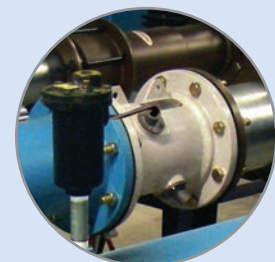
SOLUTION:
Provide multiple path transducers that concurrently measure and average the statistical relationship of two or three chordal paths in order to ascertain the true average velocity.



CONCERN: C750 – 03, SEC. 5: **VERIFICATION**

“Most water meters are calibrated by passing water through them at a known rate. Calibration yielding less accuracy may also be conducted using other techniques.”

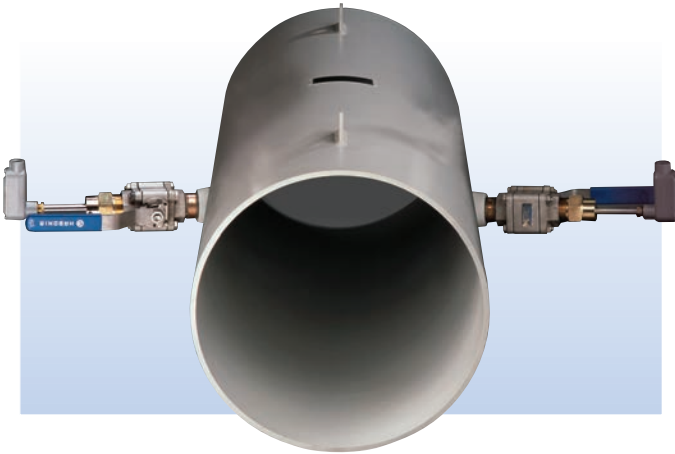
SOLUTION:
Provide NIST traceable calibration, under actual operating conditions, on all flanged spool-type meters under 14 inches, at the Eastech in-house flow laboratory at no additional charge to the end-user.



FIELD READY SPOOL & SENSOR COMBINATIONS

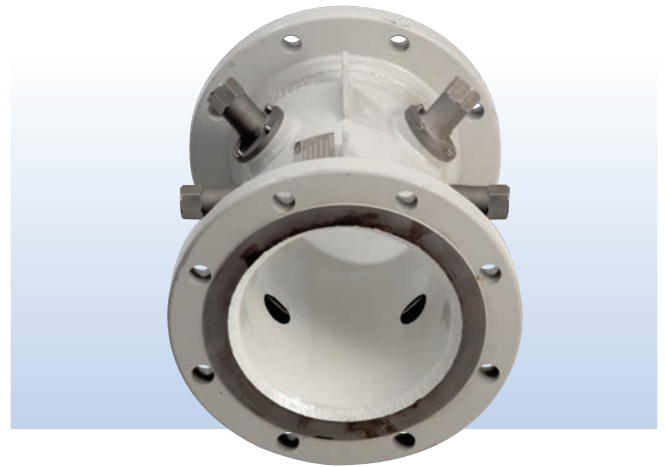
Factory manufactured spoolpieces with exact known internal diameters, are combined with either precision factory aligned Hot Shot or Embedded Window acoustic sensors for guaranteed installed accuracy.

The Hot Shot sensor is ideal for applications involving raw sewage, since the sensor can be removed in the field for cleaning due to pipe wall build-up of the media. The Embedded Window sensor transmits and receives ultrasonic pulses through an Ultem® thermoplastic corrosion resistant window that allows for easy sensor removal without de-watering of the pipeline.



MULTIPATH CONFIGURATIONS

Two and three path diametrical sensor configurations are recommended for applications that do not have normal upstream straight runs to produce well developed velocity profiles. The average axial velocity component for each acoustic path is utilized to establish the velocity profile. The velocity profile is then numerically integrated over the conduit's cross-sectional area to determine the volumetric flow rate. As a result, flowmeter accuracy is relatively independent of the velocity profile.



ADVANCED ELECTRONIC METERS

Daily Averages: Daily summary allows viewing of the previous eight days. This includes times, dates, and totals.

Logger Graph: In addition, a bar graph may be visually displayed on the Vantage 4800. The graph will display the stored logger data in pre-programmed time intervals.

Data Retrieval: Logger data can be collected by using a laptop computer or an optional modem installed within the enclosure.



NIST TRACEABILITY

Prior to shipment, every flanged flowmeter under 14" is individually tested, calibrated and certified at our in-house Flow Metrology Lab. All flowmeter calibrations are directly traceable to standards established by the National Institute of Standards and Technology (NIST).



SPECIFICATIONS / ORDERING GUIDE

AWWA/ANSI C750 – 03, SEC. 4.4: PERFORMANCE ISSUES

Table 1 Transit-time ultrasonic flowmeter performance criteria

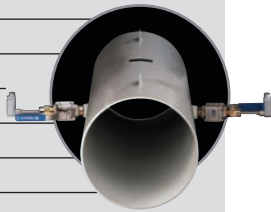
Design	System Accuracy	Rangeability	Linearity	Repeatability
Single-Path	+/- 1% over a specified flow range	Site Dependent	+/- 0.5%	+/- 0.25%
Multipath	+/- 0.5% over a specified flow range with sufficient paths to accurately determine true average velocity	Site Dependent	+/- 0.5%	+/- 0.25%

APPLICATIONS

- **WATER:** Influent/effluent, distribution flows, water wells
- **WASTEWATER:** Lift stations, WWTP influent/effluent, clarifier effluent, primary clarifier sludge flows
- **INDUSTRIAL PROCESS:** In plant monitoring, transportation lines, power plant cooling water, HVAC
- Turnouts, aqueduct flow

SENSOR SPECIFICATION (HOT SHOT)

Construction	PVC & Stainless Steel
Sensor collar	Brass
Sensor nipple	Brass, 2.0" male NPT
Ball valve	2.0" Bronze, 300PSI
Cable	Triax w/ PVC coating
Temp. Range	-30° to 150°F
Pressure rating	300 PSI Max



SENSOR SPECIFICATION (EMBEDDED WINDOW)

Construction	304 Stainless
Window	Ultem® Thermoplastic
Cable	Triax w/ PVC coating
Temp. Range	-30° to 150°F
Pressure Rating	150 PSI Max



ENCLOSURE

Standard	IP66 / Nema 4, 4X polycarbonate
Optional	Explosionproof, Aluminum Class I, Grps. C & D, Class II, Grps. E, F, G, Div. 1 & 2
Accessories	Heater and thermostat, Door Lock and Modem

TEMPERATURE

Standard	-4° to 158°F (-20 to 70°C)
With Heater	-40° to 158°F (-40 to 70°C)

OUTPUTS

4-20 mA	Analog isolated into 800 ohms max, monitored to detect open circuits. RFI and gas discharge surge protection and two fuses.
Relay Alarms	3 standard, SPDT relays (socketed) 3.0A @ 120VAC / 24VDC

SERIAL PORTS

RS-232	1200-38400 Baud, Modbus RTU protocol
RS-485	Optically isolated, Modbus RTU protocol
Network Protocols	Modbus, Profibus or DeviceNet
DC Power Out	12 VDC, 100mA maximum

DISPLAY


Backlit LCD	160 x 128 pixel graphical
-------------	---------------------------

POWER

Wattage	12 (Single Path), 12 (Multipath)
Voltage	100 to 240 VAC, 50/60 Hz / 12 to 24VDC @ 300 mA.

DATA LOGGING

Memory	Non-volatile flash memory, storage of up to 32768 records.
--------	--

METER	SENSOR PATHS	SENSOR STYLE	PIPE SIZE	SPOOL BODY	END CONNECT	SENSOR CABLE	OPTIONS
48 	One 10	Hot Shot H	Specify Size (inches)	Carbon Steel CS	Flanges Carbon CS	30 ft. W	Heater & Thermostat B
	Two 20	Window E		304S/S 4S	304S/S 4S	50ft. X	Keylock C
	Three 30			316S/S 6S	Plain End PE	100ft. Y	Splice Kit D
						200ft. Z	Modem. M
						Over 200ft (Specify)	