

## **ELECTRONIC FLOW METER (INSERTION TYPE) with INTEGRAL TOUCH SCREEN DISPLAY**

### **INTRODUCTION**

This specification covers the design, manufacture, and testing of Electronic Flow Meters (Insertion Type) with Integral Touch Screen Display for control valve sizes 2 in. (50 mm) through 36 in. (900 mm) Cla-Val Automatic Control Valves

### **PART 1 - GENERAL**

1. Standard products - use the same manufacturer for multiple units of same type.
2. "Tying" of equipment into packages for the purpose of thwarting competition shall be considered to be in non-compliance with these specifications.
3. Manufacturers shall price items under different subsections or sections separately.

### **PART 2 - PRODUCTS**

#### **2.01 ELECTRONIC FLOW METER (INSERTION TYPE) with INTEGRAL TOUCH SCREEN DISPLAY**

##### **A. FUNCTION**

1. The electronic flow meter shall be designed to be installed in the inlet tapping of either side of a Cla-Val Automatic Control Valve to provide accurate flow measurement data without the need to install a separate meter.
2. Flow shall be measured by the electronic flow meter using the vortex shedding methodology. Flow meter shall employ a bluff body within the measurement cylinder that causes vortices to be generated. The vortices shall be, in turn, counted by an internal piezoelectric sensor that communicates with the integral touch screen display circuit board located in the meter head.
3. The electronic flow meter configuration shall include a threaded swivel insert with measurement cylinder, fittings and electronics housing fabricated from stainless steel and shall have no moving parts.
4. The electronic flow meter signal interface shall be 4-20 mA loop powered and capable of communicating with SCADA, a remote mounted display or other communication devices. The flow data signal shall be converted to 4-20mA, pulse, depending on the application.
5. The electronic flow meters power requirement shall be 12-24VDC, 0.7 watts minimum. It shall be capable of connecting with most commercially available data loggers.
6. The electronic flow meter shall be CE Certified.

##### **B. MATERIALS**

1. Material Specification for the Electronic Flow Meter as follows:

<u>Component</u>	<u>Material</u>
Swivel Insert	Stainless Steel
Measurement Cylinder and Bluff Body	Teflon® Coated Stainless Steel
Housing & Cover Enclosure	Stainless Steel
Environmental	IP-68 submersible, 2 meter for 48 hours
Locking Collar	Stainless Steel
O-Ring Seals	Buna-N® Rubber

Vortex Sensor	Plastic
Insertion Tool	Stainless Steel
Circuit Board	Electrical Grade Fiberglass Laminate
Cable	30 feet (9.144m), Multi-Conductor, Braided Screen, Abrasive Resistant and Black PVC Jacketed
Pressure Rating	Same as Control Valve; Class 150 lb. (250psi Max.) Class 300 lb. (400psi Max.)
Fluid Temperature Range	Water - 15° F to 175° F (-10° C to 80° C)
Ambient Temperature	-20° F to 140° F (-29° C to 60° C)
Velocity Range	0.5ft/s to 20 ft/s

### C. ELECTRICAL:

Power Requirement:	12-24VDC - 1.0 Watts Minimum – Screen Max Brightness
Display Type:	TFT LCD - Touch Screen - 128 x 160 (Moisture Proof)
Outputs:	4-20ma / Pulse
User Interface:	ICON Graphical TFT w/Touch Screen
User Configuration:	via Display Touch Screen
Operating System:	ANSI C / RTOS - Processor ARM Cortex M3

### D. MANUFACTURE

#### 1. Factory Assembly and Testing:

- a. Each Electronic Flow Meter shall be manufactured by the control valve manufacture.
- b. The Quality Management System of the factory shall be certified in accordance with ISO 9001: 2008.
- c. Each Electronic Flow Meter shall be factory assembled and tested.
- d. The Electronic Flow Meter shall have been subjected to performance testing by at least one independent laboratory. The laboratory test results shall illustrate that flow data measured by the flow meter is accurate to within +/- 2% of full scale.

#### 2. Nameplates:

- a. Each Electronic Flow Meter shall be provided with an identifying nameplate.

#### 3. Factory Settings and Field Adjustment:

- a. Factory settings shall be adjustable in the field without removal of the electronic flow meter or the valve from the pipeline.
- b. The Electronic Flow Meter's Analog Range (4-20mA Scaling) shall be set at the factory, for the proper valve size, prior to shipping. Operational Flow Range is from 0.5ft/s to 20ft/s.
- c. The Electronic Flow Meter shall be programmable and field adjustable to change all parameter settings, by utilizing the integral touch screen display.

### E. PRODUCT DATA

#### 1. The following information shall be provided:

- a. Electronic Flow Meter manufacturer's technical product data.
- b. Electronic Flow Meter manufacturer's Installation, Operation and Maintenance manual (IOM).

## PART 3 - EXECUTION

### A. DELIVERY, STORAGE AND HANDLING

#### 1. Delivery

- a. The Manufacture shall deliver the Electronic Flow Meter to:

*Address, City, State, Zip. Attention: Phone number:  
Call 48 hours prior to delivery.*

- b. Upon delivery, Electronic Flow Meter shall be stored by the

*Owner, district or municipality.*

#### 2. Packing and Shipping

- a. Prior to shipping, the Electronic Flow Meter shall be packaged and tagged in a manner that will prevent entry of foreign material, protecting it from damage to facilitate the final assembly in the field.
- b. Care shall be taken in handling the Electronic Flow Meter to protect it from damage. Meter shall not be dropped. Electronic Flow Meter shall be examined before installation. No meter shall be installed which is found to be defective. Any damage(s) shall be repaired.
- c. All packaged Electronic Flow Meters shall be shipped, remain packaged and stored on site until they are installed and put into use.

### B. INSTALLATION

1. The Electronic Flow Meter shall be capable of being installed in either inlet tapping of a Cla-Val main valve body using an insertion tool that shall be provided with the flow meter.
2. The flow meter shall be factory configured so that it can either be field installed/retrofitted into an existing 3" thru 36" Cla-Val Automatic Control Valves or factory installed and programmed into new 2" thru 36" Cla-Val Automatic Control Valves.
3. Sufficient clearance, around the control valve, from any existing obstruction(s), is required to safely field install the Electronic Flow Meter.
4. Once installed, Electronic Flow Meter shall protrude, from the exterior valve body port, by no more than 8".
5. A thirty (30) foot cable shall be provided with the flow meter to complete field wiring.
6. Installation and field wiring shall be performed in accordance with the manufacturer's IOM Manual or the Quick Start and Wiring Instructions which shall be shipped with the meter.

### C. FIELD TESTING AND MAINTENANCE

1. A direct factory representative shall be made available by the equipment supplier for start-up service, inspection and necessary adjustments.
2. Sufficient clearance around the valve from any existing obstruction(s) is required to safely remove meter for inspection, cleaning and maintenance. The internal sensor and measurement cylinder with integral bluff body shall be replaceable using replacement parts or repair kits available through the original manufacturer.

The Electronic Flow Meter manufacturer shall warrant the flow meter to be free of defects in material and workmanship for a period of one year from date of shipment provided the flow meter is installed and used in accordance with all applicable instructions.

The Electronic Flow Meter (insertion type) with Integral Touch Screen shall be **CLA-VAL Company Model No. X144D e-Flow Meter**, as manufactured by Cla-Val Co., Costa Mesa, CA 92627-4416.

**END OF SECTION**