



## Technical Advantages

CST Flow Sensors outperform the competition

### 1. Flow Range of Sensors

**FSI Tee type Sensors measure flows from ¼ to 15 fps (feet per second) and FSI Saddle type sensors measure flow from 1/4 to 12 fps while the Data Industrial 220P sensors measure from 1 to 20 fps.\* The DI 735 Series are even worse with a minimum of 2 fps\*\***

FSI sensors can measure lower flows because the sensing device, the impeller, is smaller and lighter and the sensor insert and mounting tee have been custom designed to enhance the path of the water through the device. The difference is significant, a 1 ½" CST sensor will measure 1 ½ gpm while a 1 ½" DI 220P sensor is rated at a minimum of 7 gpm. The minimum flow in a 2" size is 3 gpm for the CST and 10 GPM for DI. In fact, a 1 1/2" CST sensor will measure lower flows than a 1/2" Data Industrial 735.\*\*

The upper end of the range for both sensors is well beyond the 5 fps maximum design flows of irrigation pipe. Flow sensors should be sized to the flow range rather than the pipe size. Often it is necessary to install a smaller flow sensor than the pipe size. As the size goes down- the velocity of flow goes up. CST's maximum flow of 15 fps is high enough to insure that the flow sensor is capable of measuring the maximum design flows of pipes larger than the sensor. Rating a flow range to 30 fps is beyond any practical application and meaningless.

### 2. 1" Sensor Construction

**CST has a 1 inch PVC Sensor in the FSI series, DI has only a threaded brass unit.**

With today's emphasis on drip irrigation, stream rotors and other lower precipitation products, smaller irrigation zones and smaller flow rates require smaller size, more sensitive flow sensors. CST FSI series includes a 1 inch PVC sensor that measures flow rates below 1 gpm. This cost effective sensor features socket connections to easily install on PVC piping without adapters.

The DI 250B sensor is expensive, requires threaded adapters and does not measure flow below ½ fps.

\* Specifications taken from "Badger IR220P -PVC Irrigation Flow Sensor - Sample Specifications" **DSS-016-01** on Badger website

\*\* Specifications taken from "Badger 735 Series -Plastic Tee Type Impeller Flow Sensor - Technical Brief" **DTB-084-01** on Badger website



### **3. Pressure Rating**

**The CST FSI Series tee type flow sensors are rated at 240 psi and saddle type sensors are rated at 150 psi working pressure, the DI sensor while fabricated out of a schedule 80 tee is only rated at 100 psi.\***

FSI sensor parts are custom designed and molded. Each sensor size has been tested to allow a working pressure of 240 psi at 60° F. The DI sensor is made from a standard schedule 80 tee and machined PVC parts. The location of the mounting pin through the PVC adapter limits its pressure rating to 100 psi at 60°F.

### **4. Sensor Assembly**

**The CST sensor insert is held into the mounting tee with a larger diameter, ACME threaded retaining nut making disassembly and assembly quick and easy, particularly in underground valve boxes.**

**The DI sensor insert is held in the mounting tee with a pin and split ring. The insert must be aligned and inserted to the correct depth in order to push the pin horizontally through the housing. This can be awkward and difficult in the small valve box.**

### **5. Electrical Protection**

**The CST sensor electronics have been designed with protection against reverse wiring, overvoltage and over current.**

Both the CST and the DI circuits are protected against reverse wiring- connecting the flow sensor leads to the wrong flow sensor terminals + and -. However, the CST electronic circuits are newly designed and incorporate the latest protection against over-voltage- connecting the flow sensor wires to another higher voltage circuit like zone valve wiring. CST circuits also feature over current protection to protect the sensor from wiring issues.

### **6. Watertight Integrity**

**The CST sensor housing and wiring has been designed to protect the electronics from moisture, improving on the design flaw of the DI sensor.**

Flow sensors are mounted below grade in moist and often flooded valve boxes. The CST sensor housing has been designed to hold the detection electronics encapsulated with a water resistant epoxy completely surrounding the circuit board. The wire leads are constructed using a water blocking design insuring that moisture cannot wick down the wires and enter the circuit. The DI design is flawed by design. The pin that holds the housing into the mounting tee pierces the potting compound fractions of an inch from the circuit board. This has been a moisture path and cause of sensor failure for the life of the sensor.

\* Specifications taken from "Badger IR220P –PVC Irrigation Flow Sensor - Sample Specifications" DSS-016-01 on Badger website