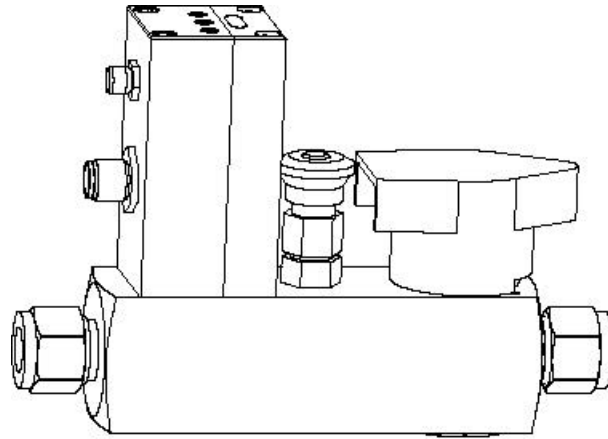


Ordering Information: CFTI Part Number 0503002

# C5V DeviceNet Flow Switch

## Low-Cost Flow and Temperature Sensor

### Microprocessor Controlled, Hardware Relay, Stainless Steel and Kynar Construction.



- **Advanced DeviceNet communications in a compact sensor**
- **Simultaneously measures both flow and temperature**
- **Low-cost, advanced design**
- **Alarm Point (low flow) triggers electromechanical safety relay**
- **Measure low viscosity fluids, compatible with most coolants – DI water, glycol mixtures**
- **Reliable design – completely solid state sensor with no moving parts**
- **CE, SEMI-S2, UL, CSA, DeviceNet approved**

The C5V Flow Switch is designed to provide accurate and repeatable measurement of liquid flow and temperature. Colorado Flow uses a microprocessor to collect and process flow and temperature data, yielding improved range and accuracy. Flow range is 3-42 liters per minute (0.8 – 11.1 Gallons per minute). Temperature is measured from – 10C to 105 C. The Kynar sensor and stainless body construction is rugged, and easy to install. Unit is pre-calibrated; calibration and serial number data are stored in non-volatile memory.

The system can be used as a safety interlock FLOW SWITCH using the built in electromechanical relay. When the measured flow is below a Low Flow trigger point, the relay contacts are opened, while when the flow is greater than the trigger point, the relay contacts are held closed. The Low Flow alarm trigger point is preset at the factory for 1.0 gal (US)/min (3.7 l/min) and can be changed in the field using DeviceNet.

Output and alarm units are selectable for English and SI units. Access to flow and temperature data, as well as Low Flow trigger point and metric units selection is provided to the user through the DeviceNet Bus. All user selectable settings (alarm trigger level, DeviceNet MacID, units selection, etc) are stored in non-volatile memory. Upon power loss and restart, previous settings are automatically restored.

The C5V, with no moving parts, provides years of uninterrupted service and reduces the need for periodic service. Vortex flowmeters, highly accurate and repeatable, are suitable for numerous process control measurements and applications. Applications include chemicals, clean liquids, deionized water, ultra-pure water (hot or cold), seawater, solvents, etc.

**DeviceNet**  
CONFORMANCE TESTED

**CE** EN55011A  
EN61326

**SEMI: S2-0200**



EN61010

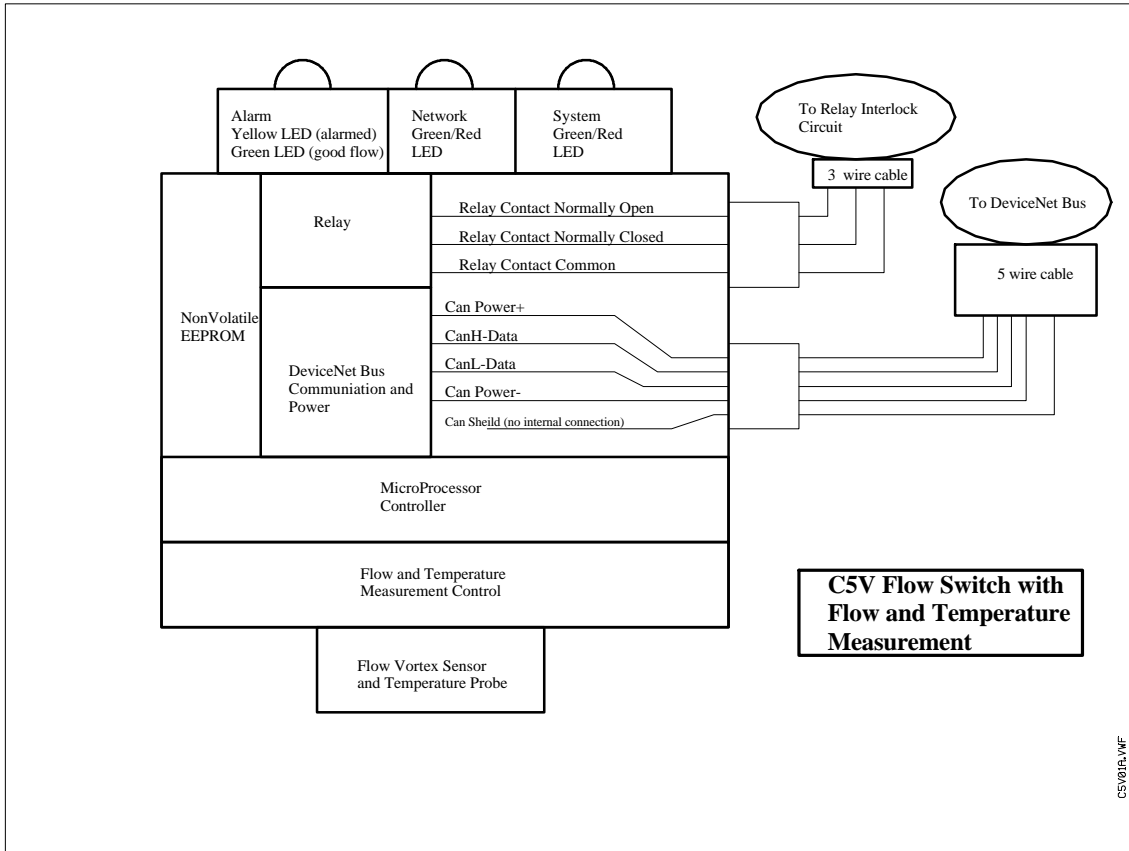


3101-1

## C5V SPECIFICATIONS

Ordering Information: CFTI Part Number 0503002

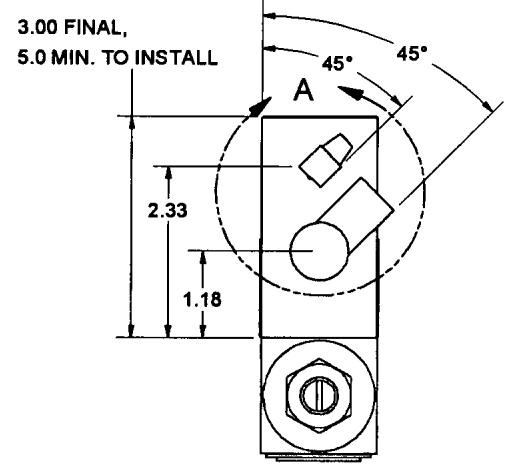
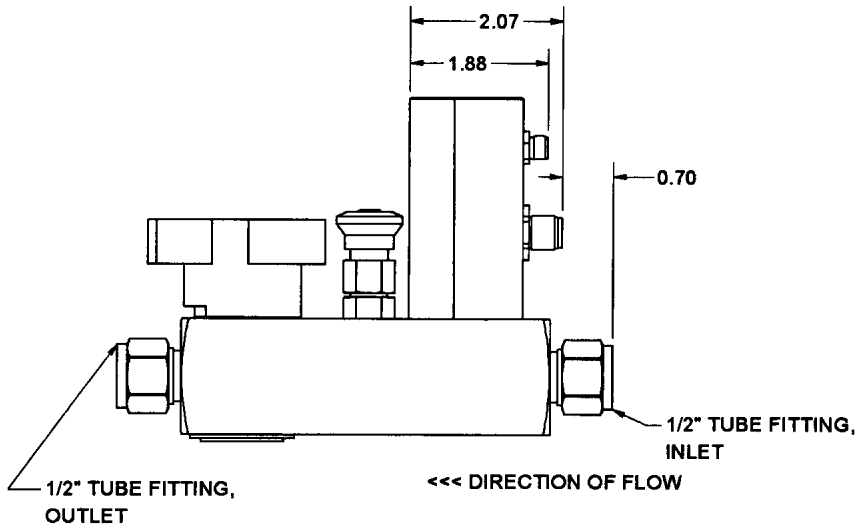
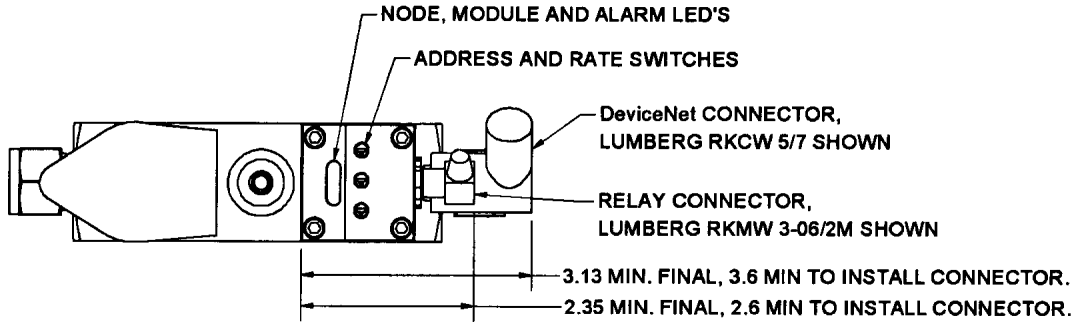
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|---|--|
| Sensor Type.                                    | Solid state Karmen Vortex shedding type with improved bluff body design. No moving parts. Microprocessor controlled for digital accuracy, control and advanced communications ability. Measures liquid (water) flow and temperature simultaneously.        |
| Configuration.                                  | Single Sensor. Receives power and communications through DeviceNet. LED's indicate Sensor status, Network status and Alarm status.   |
| Output / Alarm Units.                           | Flow: user selectable liters/min or gal/min. Temperature: user selectable degrees C or F.  |
| Material Compatibility / Wetted Materials.      | Low Viscosity liquid service, compatible with water, distilled water and water (50%)/ethylene glycol (50%). Other fluids upon request. Wetted Materials are KYNAR (Sensor), Stainless Steel (Body) and EPDM (O-Ring).                                      |
| Sensor End Fittings.                            | 1/2" Tube Fittings as inlet and outlet fittings.   |
| Flow Measurement Range and Resolution.          | Range: Standard: 2-38 liters/min (0.5 - 10 gal/min). Resolution: 0.1 liter/min (0.05 gal/min)  |
| Temperature Range and Resolution.               | Measurement Range: -10 to 105 C. Maximum Operating temperature: 80 C. Resolution: 1.0 C. FREEEZING MAY DAMAGE UNIT. (May exceed 80C for 5 min; do not exceed 105C)   |
| Alarm Setting: Minimum setting, and Resolution. | Minimum Flow: 0.0 liter/min (0.0 g/m). Max 378 liter/min (100 gal/min)<br>Alarm Flow Resolution: 0.1 liter/min (0.01 gal/min)  |
| Electromechanical Relay (Normally Open)         | 1) Electromechanical contacts, 2) Max switching current: 1A, 3) Max. Switching voltage DC 150V, AC 125V, 4) Max switching power, DC 30W, AC 60VA, 5) Approvals: UL, CSA, CECC, 6) Electrical endurance for resistive loads: ~3 e06 @ 24V, 1A contact load. |
| Alarm Mode.                                     | Low flow alarm triggers relay contacts open and Yellow Alarm LED. Set point and hysteresis can be independently adjusted using DeviceNet port. Relay contacts are held closed when flow is above trigger level. Power off results in relay open.           |
| PROCESSOR                                       | 1) Calculate Flow, 2) Calculate Temperature, 3) Nonvolatile cal factors, 4) Communications software, 5) Control three LED's, 6) Control relay, 7) Watchdog timer   |
| Operating Modes.                                | Real time flow and temperature measurement. G2 slave.  |
| Repeatability.                                  | Flow: +/- 5% of flow for flows greater than 4.0 liter/min and +/- 10% of flow for flows below 4.0 liter/min (1 gal/min), Temperature: +/- 1 C (+/- 2 F).   |
| Linearity of Display.                           | Flow: +/- 5% full scale. Temperature: +/- 1 C (+/- 2 F).   |
| Sensor Pressure.                                | Operational 1 - 145 psi @ 70 F, 150 psi Max. @ 95 C Max.   |
| Power Required                                  | 24 VDC, 200 mA through DeviceNet Connector.  |
| DeviceNet Communications Modes.                 | Group 2 slave utilizing the predefined Master/Slave connection with explicit message and poll ports.   |
| Certifications.                                 | SEMI (S2-0200), CE (EN555011A - 1998, EN612326 - 1998), CSA (EN61010), UL (3101-1) and DeviceNet Conformance Checked.  |
| DeviceNet Port.                                 | DeviceNet Connector: 1) Power (24vdc,.2A), 2) COMM +, 3) COMM -, 4) GND, 5) SHIELD   |
| Direction of Flow.                              | One direction only, as marked on Flow Sensor.  |
| Flow Sensor Mounting.                           | Any orientation; if vertical, water must flow up; to prevent cavitation at sensor, any flow control valves or restrictions should be mounted down stream from sensor.  |



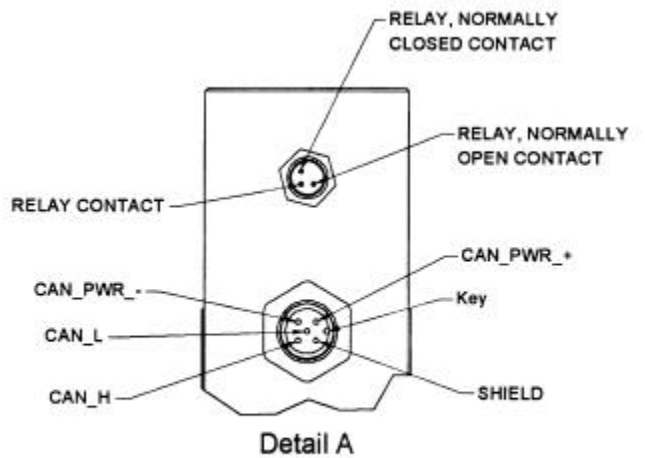
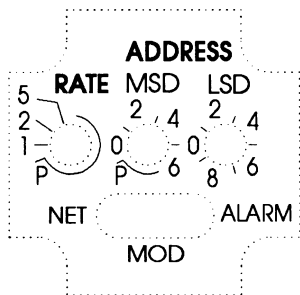
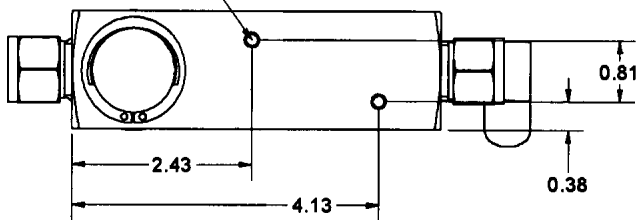
### Block Diagram of C5V Flow Switch

The Device Net capable C5V flow switch, as shown in the above block diagram, is designed to measure the flow and temperature of a liquid. In a typical installation, the electromagnetic contact relay would be wired in series with other flow switch relays forming a safety interlock loop. When flow is measured to be above the Low Flow trigger level, the flow switch will hold the relay contacts closed, completing the safety circuit. If the flow switch detects a Low Flow condition (flow measured below the trigger level), the relay will open breaking the safety interlock circuit. With electrical power removed, the relay will also be open. The Sealed 8mm three pin male connector provides the Relay contact, Relay, Normally Closed and Relay Normally Open connections.

Device Net bus connections that provide Device Net communications and bus power are through a standard sealed DeviceNet mini male connector. The flow switch is designed to act as a Group 2 slave server utilizing the DeviceNet predefined Master/Slave Group 2 connection set. Device Net communications allow communication of flow and temperature data, as well as alarm status, and sensor status. Alarm level settings can also be set over the Device Net bus.



#10-32-UNF-2B:V .38  
2 PLACES



C5V 9/19/2000 RELAY AND DeviceNet (CAN) ELECTRICAL CONTACTS

## C5V OUTLINE AND INSTALL DETAILS

### C5V RATE AND ADDRESS LABEL