



## **Raw Water Flow System Installation and Operation Instructions**

Model# WFG + color + 1", 1.25", 1.5" or 2" Tee Size

### **The Concept:**

The Raw Water Flow is a patented system, developed to indicate normal or below normal flow for a single device with plumbing hose sizes 3/4" through 3". Processing takes place on a circuit board that is attached to and mounted behind the dash panel. Flow status information and visual alarm indication is displayed on a 2-5/8" panel-mount gauge.

### **Components:**

- \*Bronze Sensor Housing, sized to match the hose ID of the system to be monitored
- \*Flow sensor (mounted inside the bronze housing) and 30-foot cable
- \*Control pcb
- \* 2 5/8" cutout Gauge (2 3/4" overall)

### **Flow Sensor Installation:**

For convenience, bronze flow sensor housings should be installed with their pull-ring facing up, but it is difficult to predict how a sensor will react to the flow in any plumbing system; the port engine sensor may react differently than the starboard engine sensor due to hydrodynamic variables within each system, particularly with propulsion engines. If you experience "nuisance" alarms during operation with the pull-rings facing up, re-orient the housing with pull-ring facing down. ALWAYS recalibrate a device (only the device that is changed) after changing any part of the plumbing system.

Each sensor is sized to fit the hose ID of the connected plumbing system. Insert the bronze barbs fully into the hose and double-clamp each side. For best results install the housing with at least 12" (more of possible) of straight plumbing before and after the sensor to assure maximum "quiet" water. Paddlewheel assemblies are interchangeable. Install the paddlewheel assembly into the bronze housing so its directional arrow (on top opposite the cable exit) points in the direction of flow.

### **PCB Installation:**

- \*The processor pcb must be located within 24" of the gauge location, but do not permanently install the pcb until Calibration is complete.
- \*The processor pcb connects to the gauge by the 24" cable with rectangular connector. Carefully align the notches of the connector halves while making this connection.
- \*After calibration is complete the processor pcb should be fastened to a flat surface through the four mount holes. If mounting in this method is not possible, the pcb may be cable-tied to adjacent cables. If this method is chosen, suspend the pcb by the connecting cables to the flow sensor and to the gauge. Leave enough cable for disconnecting either component.

### **Audible Alarm:**

You may want to hear an audible alarm in addition to the visual indication (LED on the gauge face) when reduced flow is detected. A buzzer or bell (15 mA maximum) may be connected to pcb positions 8 and 9 (Refer to the installation drawing for proper polarity). IMPORTANT – if a buzzer is installed you must also install a momentary switch to acknowledge and silence the buzzer. Acknowledging the audible alarm will change the LED from blinking to solid "ON"; the LED will stay on until the cause of the flow reduction is removed. Connect the momentary switch to pcb positions 4 and 5.

## **Tachometer Connection:**

Connection to the tachometer is required to provide engine speed information to the processor. Connect tachometer (-) to pcb position 10 and tachometer (+) to pcb position 11.

## **Gauge Installation:**

NOTE: Connections to the processor pcb will be more easily made before the gauge is permanently mounted, and with connecting cables pulled through the gauge hole. Do not permanently install the gauge until Calibration is complete.

- \*Cut a 2-5/8" hole for the gauge, connect the gauge to the pcb, but do not install the gauge into the hole.
- \*Run the 30-foot Cable from the sensor to the gauge location and connect to the mating connector on the pcb. Carefully align the notches on the connector halves while making this connection.
- \*Make connections to the control pcb in accordance with the "Installer Connections" chart.
- \*Dipswitch settings on the pcb board are set at the factory for proper performance of this product. Do Not Change.

SW-1 = OFF, SW-2 = ON, SW-3 = ON, SW-4 = ON

SW-1 is for sensitivity. You can select a less sensitive system by changing SW-1 to ON. Do not change dipswitch settings 2, 3 and 4.

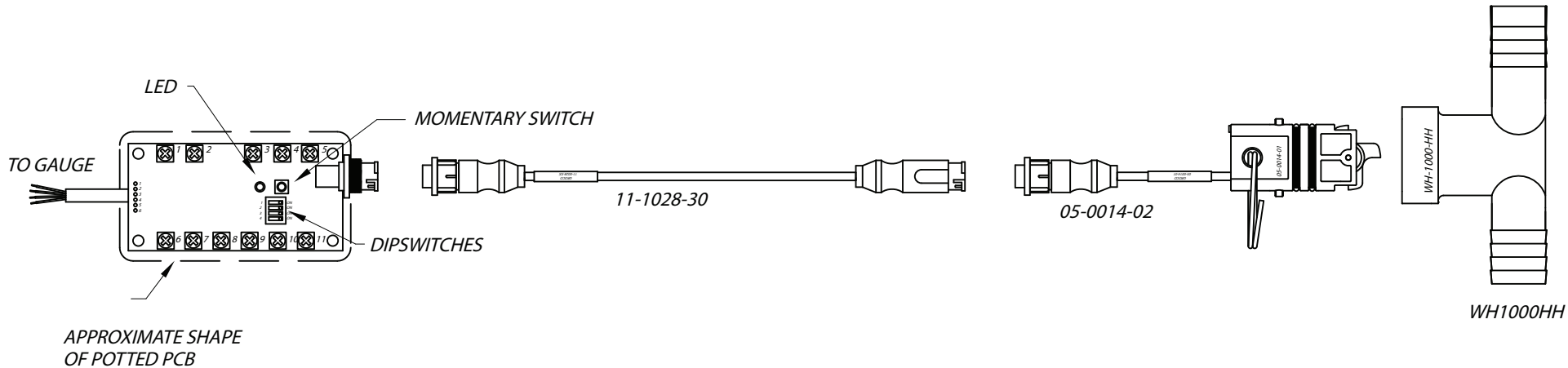
## **Calibration:**

Note: Calibration must be done away from the dock, in open water where it is safe to operate the boat at full throttle. Before calibrating, confirm that all plumbing connections are secure, valves are fully open, the raw water pump is operating properly, and the strainer basket is clean.

- \*After all pcb connections have been made, pull the gauge far enough out of the panel to allow access to the LED and Momentary Switch on the pcb.
- \*Run the engine at idle speed, in neutral, and with the boat sitting still. Allow cooling water flow to stabilize.
- \*Press and hold momentary switch for 3 seconds – LEDs on the pcb and the gauge will flash 3 times, and will then blink slowly. Press the momentary switch to accept idle speed flow data.
- \*The LEDs will change to a faster blinking rate. Increase throttle until maximum RPM and flow are achieved. Allow at least 15-seconds for flow to stabilize.
- \*Press momentary switch to accept full throttle flow data.
- \*When calibration is complete the processor will exit calibration mode and enter operation mode.

## **Alerts:**

- \*With an optional buzzer or horn connected to Terminals 8 & 9 an audible alert will sound if flow drops below 20% of "normal", regardless of engine RPM.
- \*With an optional momentary switch connected to Terminals 4 & 5 the audible alert may be acknowledged (silenced).
- \*The red LED on the gauge face will illuminate if flow drops below 20% of "normal", regardless of engine RPM. The LED will stay on as long as the reduced flow condition continues.
- \*Dip switch SW1 is for system tolerance. OFF = low tolerance; ON = high tolerance. We suggest trying the Low Tolerance setting first, and change only if it proves to be too sensitive.



**INSTALLER CONNECTIONS**

SILVER	1	INSTRUMENT PANEL LIGHT CONTROL
BLACK	2	DC GROUND
RED	3	INPUT DC POWER + 12VDC
SILVER	4	CUSTOMER SUPPLIED MOMENTARY SWITCH TO ACKNOWLEDGE ALERT
SILVER	5	CUSTOMER SUPPLIED MOMENTARY SWITCH TO ACKNOWLEDGE ALERT
BLUE	6	CUSTOMER SUPPLIED LED (+), 35 ma MAX
YELLOW	7	CUSTOMER SUPPLIED LED (-)
SILVER	8	CUSTOMER SUPPLIED HORN (+), 15 mA MAX
SILVER	9	CUSTOMER SUPPLIED HORN (-)
WHITE	10	DO NOT USE
GREEN	11	TACHOMETER (+)

**LIVORSI**

715 Center Street Grayslake IL 60030  
 P: 847.752.2700 F: 847.752.2415  
 www.livorsi.com info@livorsi.com

Raw Water Flow System