

## APPLICATION NOTE 700149E WATER FLOW SWITCH (WFS) INSTALLATION GUIDELINES

Kit Assembly 600632 consisting of 600297-004 and 700149

The ENTRON Water Flow Switch Option (WFS) includes (1) Water Flow Switch (Assembly 600297-004) equipped with 3/8" hose barb fittings. The WFS is used to monitor cooling system water flow. If the water flow is impeded (slowed), overheated system components may be damaged. A flow rate of less than .75 gallons/min. will actuate a set of Form C contacts. The Water Flow Switch Option can be added to any system requiring water flow detection (i.e., water cooled SCRs, IGBTs or welding transformers). In some cases, there may not be sufficient mounting space available within the welding control cabinet. In such cases or for transformer cooling, a suitable external mounting location must be chosen.

The Water Flow Switch Option (WFS) is a piston activated, in-line flow switch which requires filtering of the cooling system water to insure proper operation and long product life. It is recommended that a 50 micron filter be used to protect the internal actuator of the switch.

**! CAUTION !**  
**BEFORE INSTALLING THE WATER FLOW SWITCH,  
REMOVE ALL POWER TO THE CONTROL!**

### ELECTRICAL CONNECTION

The switch assembly has three wire connections:

- Red - Normally Open (No Flow)
- Orange - Normally Closed (Flow)
- Black - Common

**NOTICE**

ENTRON defines N.C. to indicate Flow. Flow Switch manufacturer defines opposite way (No Flow).

There are several connection points on ENTRON Controls where a WFS can be connected to indicate a water flow problem and effect the operation of the control. Since control features may differ slightly by model, please refer to the control's Instruction Manual for clear definition of terminal connection points.

The most typical wiring configuration, shown below, uses TLS1/AUX1 to TS1-GND (Temperature Limit Switch Operation – open to stop weld; closed to weld).

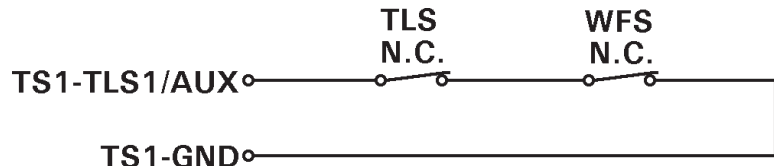


Figure 1

## ALTERNATIVE ENTRON CONTROL TERMINAL STRIP CONNECTIONS

PS1 – Pressure Switch (open to stop the weld until closed again)

NW1 – No Weld (open to stop weld)

ES1 – Emergency Stop (open to stop the control operation)

## PLUMBING / MOUNTING

Mounting location of the Water Flow Switch will differ with each application. Choose the best location for the control and machine you are fitting with Water Flow Switch. Figure 2 shows mechanical mounting information (mounting hole location, hose barb size, etc.).

The hose barbs can be rotated slightly to accommodate the various hose routing configurations necessary for most Water Flow Switch mounting locations.

Figure 3 shows the recommended routing of water through the contactor (SCR).

On connections where the hose has to stand off high voltage, it is recommended that 18" length non-conductive reinforced hose be used to avoid stagnant water becoming conductive if power to the control is left ON.

It is recommended that all water connections be located low and away from all electrical components (if possible) so if a leak were to develop, over time, the water will not collect (drip) on any high voltage connection. Once the switch is mounted and plumbing installed, with power to the welding control OFF, turn on the cooling system water and inspect for leaks.

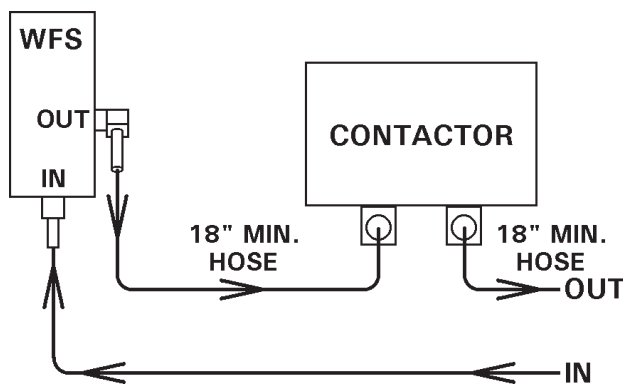


Figure 3

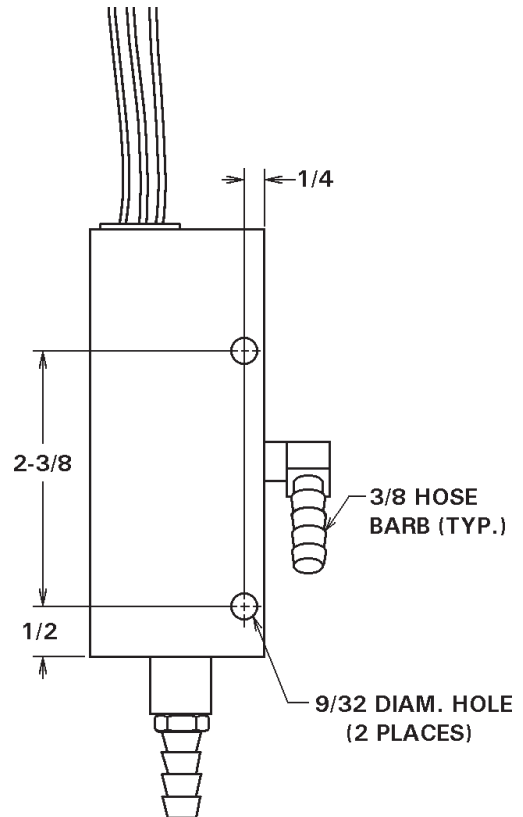


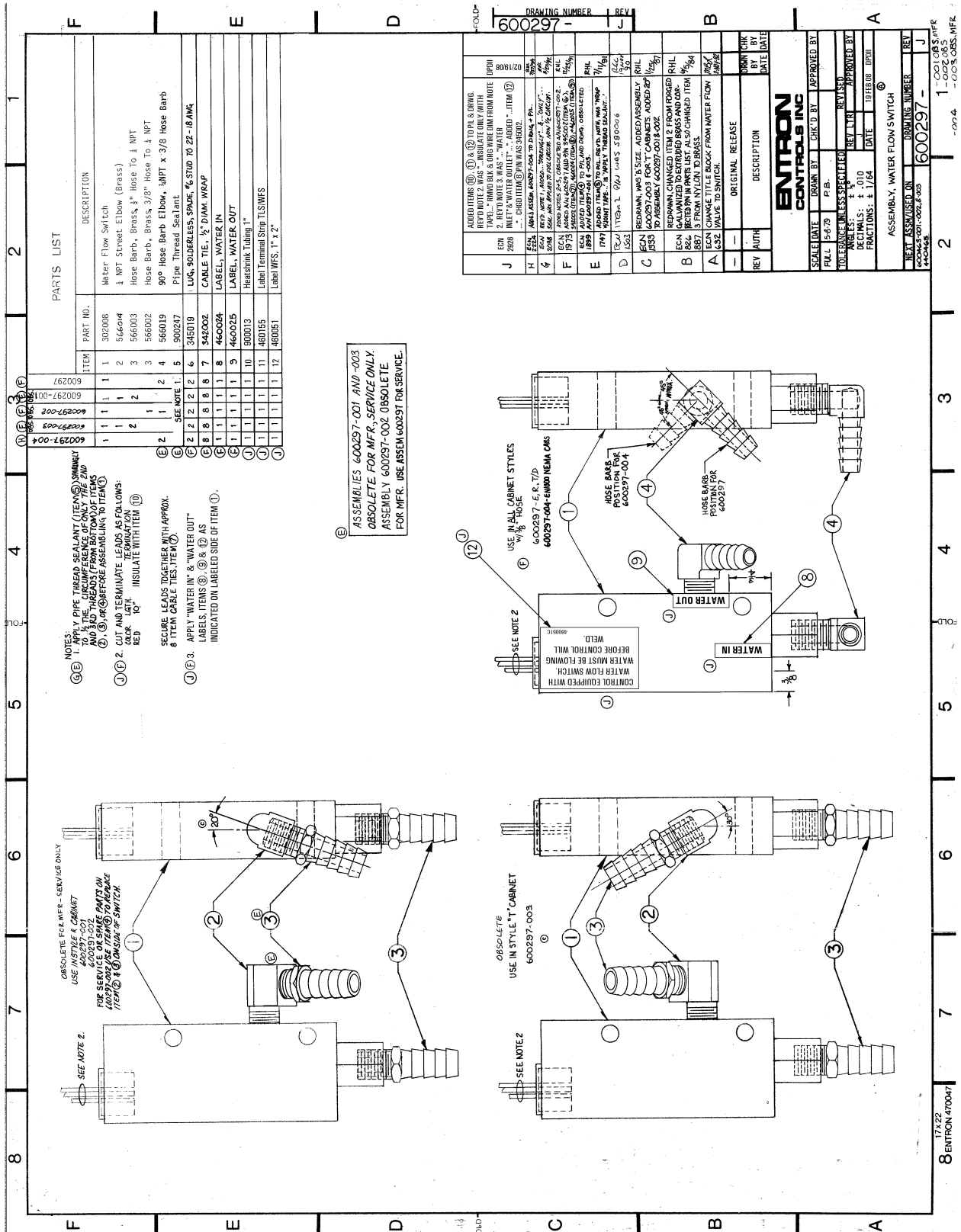
Figure 2

## OPERATIONAL CHECK

Inspect all electrical connections for proper termination. With cooling system ON (water flowing) and power to the welding control ON, place the control in NO WELD. Initiate the control. The control should sequence properly. Place the control in WELD. Initiate the control again. Turn water OFF and initiated the control again.

The control should react to the lack of flow from the cooling system. Actual control function will differ depending on the “trouble” input used to “stop” the control from firing.

# WIRING DIAGRAM



**PARTS LIST**

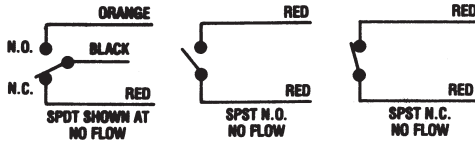
ITEM	PART NO.	DESCRIPTION
1	302008	Water Flow Switch
2	566004	1/2 NPT Street Elbow (Brass)
3	566003	Hose Barb, Brass, 1/2" Hose To 1/2 NPT
4	566002	Hose Barb, Brass, 3/8" Hose To 1/2 NPT
5	566019	90° Hose Barb Elbow, 1/2 NPT x 3/8 Hose Barb
6	900247	Pipe Thread Sealant
7	345019	LOG, SOLDERLESS, SRAE, 1/2" DIA. W/ 22-18 ANK
8	345002	CABLE TIE, 1/2" DIA. WRAP
9	460004	LABEL, WATER IN
10	460025	LABEL, WATER OUT
11	900013	Handbook Taping 1"
12	460155	Label Terminal Strip TLSWFS
13	460051	Label WFS, 1" x 2"

⑬ ASSEMBLIES 600297-001 AND -003 OBSOLETE FOR MFR. SERVICE ONLY. ASSEMBLY 600297-002 OBSOLETE FOR MFR. USE ASSEM 600297 FOR SERVICE.

REV	DESCRIPTION	DATE	BY	CHK'D BY	DATE
1	ORIGINAL RELEASE				
2	REWORKMAN, WPS'S SIZE ADDED ASSEMBLY 600297-001 & 002 TO ASSEMBLY 600297-001 & 002				
3	REWORKMAN, CHANGED ITEM 2 FROM FORGED TO BUSHED ALUMINUM HOSE BARBS, CHANGED ITEM 3 FROM NYLON TO BRASS.				
4	ECN CHANGE TITLE BLOCK FROM WATER FLOW SWITCH TO SWITCH.				
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## INSTALLATION and MAINTENANCE Models 1500, 1600, 1700, 1800, 1801, 1900, 2000, 2600, 2601

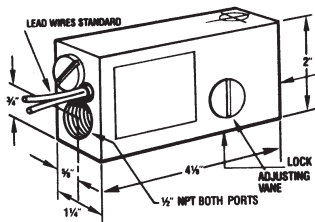
### WIRING DIAGRAMS . . .



**INSTALLATION:** Install to Proper IN-OUT directions and calibration attitude. Keep unit free of all thread sealing compounds, etc. The use of 50 micron filtration is suggested for MODELS 1500,1600,1700,1800,1801,1900,2000,2600,2601

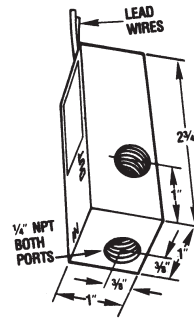
**MAINTENANCE:** Before servicing any Thomas Products Flow Switch, for safety reasons system should be shut down, pressure released and excess liquid removed.

#### MODEL 1500



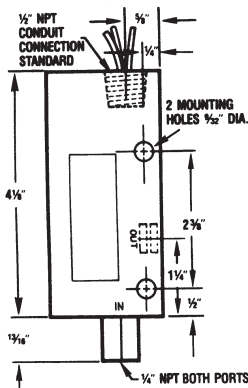
**INSTALLATION:** Unless otherwise specified Model 1500 can be installed in any attitude for which calibrated.  
**SETTING ACTUATION:** With unit connected and desired flow pumping (liquid or gas) loosen locking screw only enough for rotation of vane. Adjust vane until switch first actuates for either N.O. or N.C. condition, tighten locking screw.  
**MAINTENANCE:** To disassemble, remove piston plug, spring and piston, wipe down components as necessary.

#### MODEL 1900



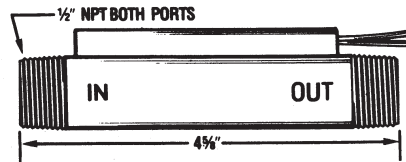
**INSTALLATION:** Unless otherwise specified Model 1900 is factory calibrated in water on increasing flow. Install vertically as shown with lead wires up. Set point accuracy will slightly change in other than vertical position.  
**MAINTENANCE:** To disassemble, remove retaining ring, piston and spring, wipe down as necessary.

#### MODEL 1600 1700



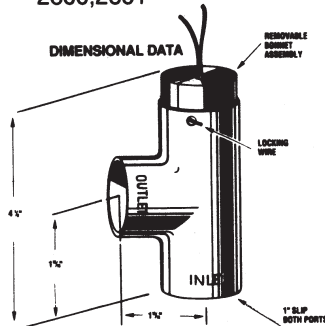
**INSTALLATION:** Unless otherwise specified Models 1600 and 1700 are factory calibrated in water on increasing flow. Install vertically as shown with lead wires up. Set point accuracy will slightly change in other than vertical position.  
**MAINTENANCE:** To disassemble, remove inlet fitting, piston and spring, wipe down as necessary.

#### MODEL 2000



**INSTALLATION:** Unless otherwise specified Model 2000 is factory calibrated in water on decreasing flow. Install horizontally as shown. Set point accuracy will slightly change in other than horizontal position.  
**MAINTENANCE:** To disassemble, remove retaining ring, orifice, piston, spring and stop washer, wipe down as necessary.

#### MODEL 1800 1800,1801 2600,2601



**INSTALLATION:** Unless otherwise specified Model 1800 is factory calibrated in water on increasing flow. Install vertically as shown with lead wires up. Set point accuracy will slightly change in other than vertical position.  
**INSTALLATION OF 1" PVC PIPE OR ADAPTERS:** Use standard medium bodied PVC solvent cement, (customer supplied). Follow assembly instructions on label. Do not use excess cement.  
**MAINTENANCE:** To disassemble push down on bonnet, pull out locking wire, slowly pull up bonnet using care not to damage "O" ring in locking wire hole. Remove retaining ring and wipe down as necessary.

### CAUTION:

Installation, operation and maintenance must be in strict accordance with Thomas Catalogue and installation/maintenance sheets.

### WARNING:

Misuse of product can cause personal injury. Do not exceed any ratings listed in Thomas Products catalogue and installation/maintenance sheets. Flow switches must not be field repaired. Consult factory for any additional assistance required.