



## FLT93 Series Flow and Level Switches

### Instructions for Conversion/Replacement of Through-Hole Electronics (P/N 5294 type) With New Surface Mount Electronics (P/N 5208 type)

This guide is provided to owners of FCI's FLT93 Series who are replacing through-hole type electronics circuit boards with FCI's newer surface mount type electronic circuit boards within FCI's standard, single and dual conduit port aluminum and single conduit port stainless steel enclosures. This procedure is intended to be performed by qualified instrument or electronics technicians with access to proper tools.

#### **Retrofit Kits P/N K5208-A1AA, K5208-A1BA, K5208-A3AA, and K5208-A3BA include the following items:**

Qty	Description
1	Washer, Internal Tooth, #10 (P/N H52-0210)
1	Screw, Pan HD Phillips, NO. 10-32 x .25 LG (P/N H10-021104)
2	Spacers, Round .312(.312 dia x .125 LG) (P/N 022141-01)
1	Tube Loctite (Blue NO .242) (P/N 010821-20)
2	Standoff, Male, 5/16 inch Hex x .125 LG, No. 8-32 UNC, SST (P/N 022143-01)
2	Washers, Split-lock, SST, NO.8 (P/N H51-0109)
1	Main Circuit Board (Assembly 5208)
1	Wiring Terminal Board, (P/N 020786-01)
1	Terminal Board Insulator (P/N 021929-01)
2	Standoff, F/F 5/16 Inch Hex x .906 LG, NO. 8-32 UNC, SST (P/N 022142-01)

#### **Kits P/N K5208-A1AB, K5208-A1BB, K5208-A3AB, K5208-A3BB (Required if FLT93 enclosure is stainless steel type) also include:**

Qty	Description
1	Stainless Steel Enclosure Lid, (P/N 000434-03)

#### **Tools and Supplies Required (Not included):**

Qty	Description
1	Wire Stripper/Crimper (preferably with 32AWG slot)@
1	Phillips Head Screw Driver
1	Multimeter (DMM) for finding the as found setpoint voltages on the old circuit board and setting new setpoint voltages in your new circuit board.

### SAFETY NOTES FOR INSTALLED UNITS

- OPERATION OF POSSIBLE FALSE ALARMS FROM FLT 93 DURING THIS RETROFIT. BEFORE DEENERGIZING UNIT, SET TO CAL AND RECORD SWITCH POINT VOLTAGES
- ⚠️ DISCONNECT POWER SUPPLY TO FLT 93 POWER INLETS AND TO RELAY CONTACTS
- ENSURE NO UNINTENDED PROCESS OPERATION CAN OCCUR
- THE RETROFIT DOES NOT EFFECT ANY AGENCY APPROVALS FOR HAZARDOUS AREAS
- FOLLOW ALL LOCK -OUT/TAG-OUT PROCEDURES

#### Before installing the new electronics obtain and record the switch point settings from the circuit board that is being replaced

Be advised this procedure will cause the relay(s) to change state and may cause an undesired or unintended trip signal. To ensure this does not happen before proceeding disconnect the relay outputs or make connections that bypass the FLT 93's switch relays in a Jbox or PLC input. Refer to your Model FLT93 Owner's Manual (IO&M) to find locations of the testpoints, potentiometers and indicator lamps.

1. Obtain a standard multimeter and place it in DC volts (<10Vdc) and attach its test leads to P1 pins 1 & 2, which is a black plastic plug on the circuit board, Pin1 is positive (+), pin2 is negative (-). These bottom two pins are the flow voltage in run mode and the "CAL" voltage in calibration mode. Those modes are selectable via S1, which is a two position slide switch just below the transformer and next to R24, the "CAL" potentiometer.
2. Record your current (old) board as found flow voltage in run mode for future reference. These same steps apply to the temperature output but those points are on P1 pins 3(+) and pin 4(-).
3. With the voltmeter test leads still on pins 1 & 2 and slide S1 to the left. Record this voltage. This voltage is generated by the circuit board and will be used to calibrate the setpoints on the new electronics and as described in the IO&M, chapter 3 "Numerical Alarm Setpoint Adjustment". You will use it to trip the alarms now and record that voltage, it is your setpoint for that alarm, either flow, level, or temperature. The voltage at which the Red and Green LED lamps turn on & off is your trip point voltage and will be used to set the same setpoints on your new circuit card. Retain the recorded voltages for use in Step 9.
4. Record the position of all configuration jumpers, temperature compensation settings, and the positioning of the current power and relay wiring in a safe and secure place before beginning this retrofit procedure. Retain these for use in Step 9.

### Installation Procedure

Step 1: Remove existing top circuit board from the mounting socket.

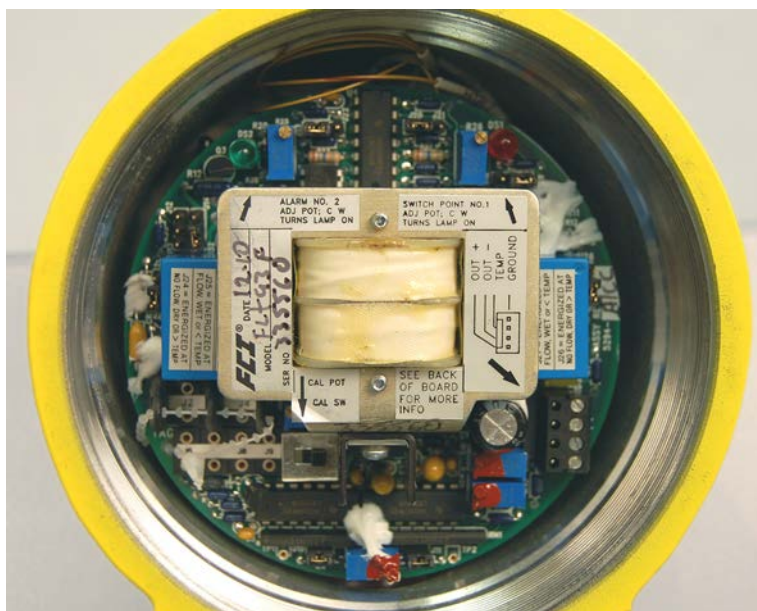


Figure 1

- Step 2A: Remove the A/C power leads from the 12 pin socket and remove Ground Terminal lead from the lug.
- Step 2B: Remove the six (6) sensor element leads from 12 pin socket terminations
- Step 2C: Remove the two socket mounting screws and LIFT the 12 pin socket from enclosure base.

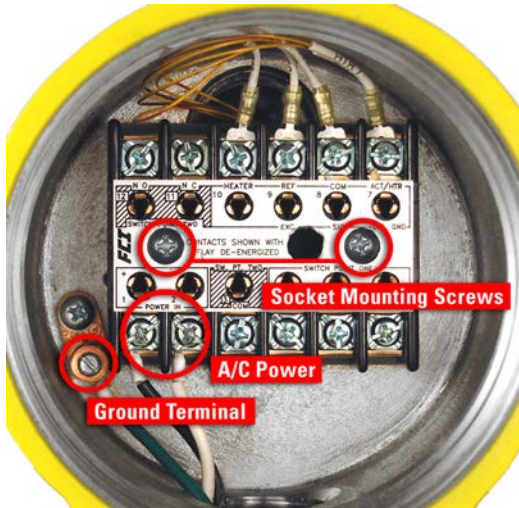
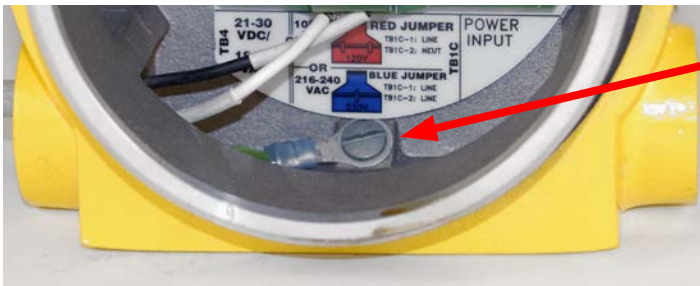


Figure 2 (Single Conduit Port Enclosure)



Figure 3 (Single Conduit Port Enclosure)



Ground terminal in dual conduit port enclosure

- Step 2D: (Using wire cutter) Cut sensor element wire leads at the end of the insulation of the termination wire lugs to ensure the proper wire length is maintained. Slide the white wire marker back or remark to ensure the word labeled is maintained.

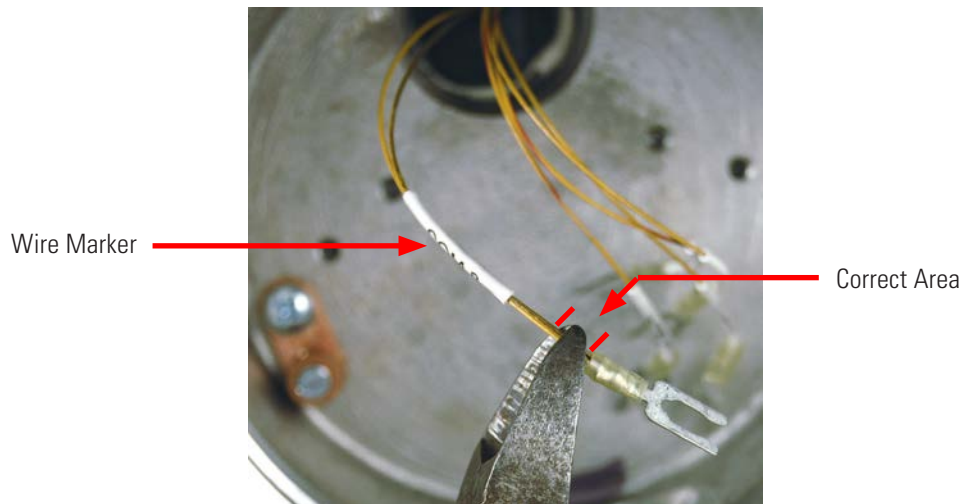


Figure 4

Step 2E: Using the wire stripping tool, preferably with a 32AWG slot\*. Strip all sensor wires approximately ¼ inch (6.35 mm).

**\*Caution:** A clean, sharp stripping tool with a 32 AWG slot is recommended. The sensor wires are special Kapton insulated steel, 32 AWG, stranded wire. Do not use a 34AWG or smaller slot which will cut the entire wire.



Figure 6

Step 2F: **If single conduit port enclosure**, remove existing ground terminal lug from enclosure; discard the screw and retain the lug.  
If dual conduit port enclosure, go to Step 3.



Figure 7



Figure 8

Step 3: Locate from the retrofit kit the following items:

Qty. 1 Washer, Internal Tooth, #10 (P/N H52-0210)

Qty. 1 Screw, Pan HD Phillips, NO. 10-32 x .25 LG (P/N H10-021104)

Step 4: Using the items retained in Step 2F and those found in step 3, re-install the ground terminal lug into the enclosure into the 10-32 threaded hole located just below where the prior ground terminal lug was removed.



Figure 9



Figure 10

- Step 5a: Locate from the retrofit kit the following items
- Qty. 2 Spacers, Round .312(.312 dia x .125 LG) (PN#022141-01)
  - Qty. 1 Tube Loctite (Blue NO .242) (PN#10821-20)
  - Qty. 2 Standoff, Male, 5/16 inch Hex x .125 LG, No. 8-32 UNC, SST (PN#022143-01)
  - Qty. 2 Washers, Split-lock, SST, NO.8 (PN# H51-0109)

Step 5b: Apply Loctite to threaded end of standoff that will be threaded into enclosure. (Fig 11)

Step 5c: Using the existing holes from which the two socket mounting screws were removed on step 2C, place a Spacer (PN#022141-01) at each of the threaded mounting screw holes first, then a Split-Lock washer (PN# H51-0109) and insert, thread and tighten the male standoff's into enclosure. (Fig 12 or Fig 13)



Figure 11



Figure 12



Figure 13  
In Dual Conduit type and Remote Enclosure

Step 6a: Locate the following items from the retrofit kit:

Qty. 1 Wiring Terminal Board (P/N 020786-01)

Qty. 1 Terminal Board Insulator (P/N 021929-01)

Qty. 2 Standoff, F/F 5/16 Inch Hex x .906 LG, NO. 8-32 UNC, SST (P/N 022142-01)

Step 6b: Place Insulator (P/N 021929-01) on the bottom of the enclosure aligning holes over the installed standoffs. (Fig 14 or Fig 15)



Figure 14  
Single Conduit Port Type Enclosure



Figure 15  
Dual Conduit Port Type Enclosure

Step 6c: Place the Wiring Terminal Board (P/N 020786-01) on top of Insulator (aligning holes) over the previously installed male standoffs. Using ( female) Standoff (P/N 022142-01) tighten (snugly) the Wiring Terminal Board into the enclosure. (Fig 16 or 17).

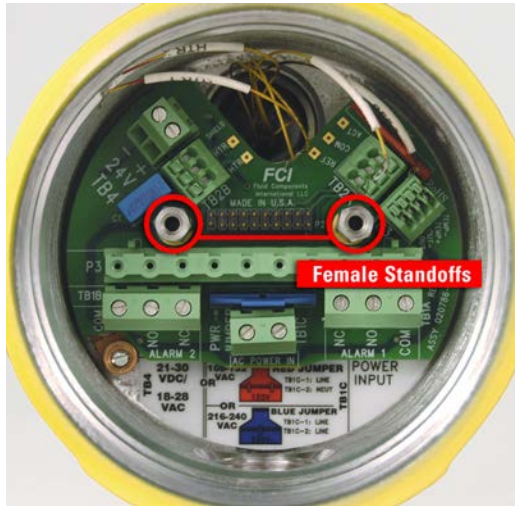


Figure 16

Single Conduit Port Type Enclosure



Figure 17

Dual Conduit Port Type & Remote Enclosure

Step 7: Reinstall trimmed sensor wires into new wiring terminal board

Tan/Red Wire	labeled (HTR10) to HTR+ termination, located on the T2B connector. (Fig 18)
Tan/Red Wire	labeled (HTR 7) to HTR- termination, located on the T2B connector
Tan Wire	labeled (SHLD) to SHIELD termination, located on the TB2B connector
Tan Wire	labeled (ACT 7) to ACT termination, located on the T2A connector.(Fig 19)
Two Tan Wires	labeled (COM8) to COM termination, located on the T2A connector
Tan Wire	labeled (REF 9) to REF termination, located on the T2A connector.

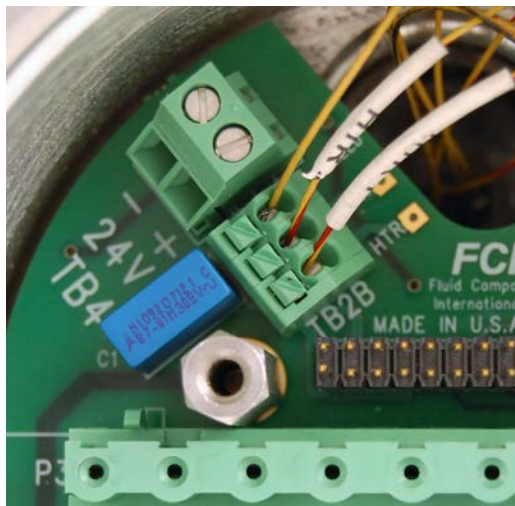


Figure 18



Figure 19

A completed sensor wire hook-up should look like Fig. 20 which follows

Step 8: Re-Installing Power Wires and Setting AC Input Power Jumpers

**AC Power:** Install the correct power jumper\* to power configuration pin located next to the TB1 terminal block. (Figure 20). Then go to Step 8A

\*Install **Red** Jumper for: 108 – 132 VAC

Install **Blue** Jumper for: 216 – 240 VAC

**DC Power:** Wire to TB4, + and – terminals. (Note: Position of AC power jumper has no effect on DC)

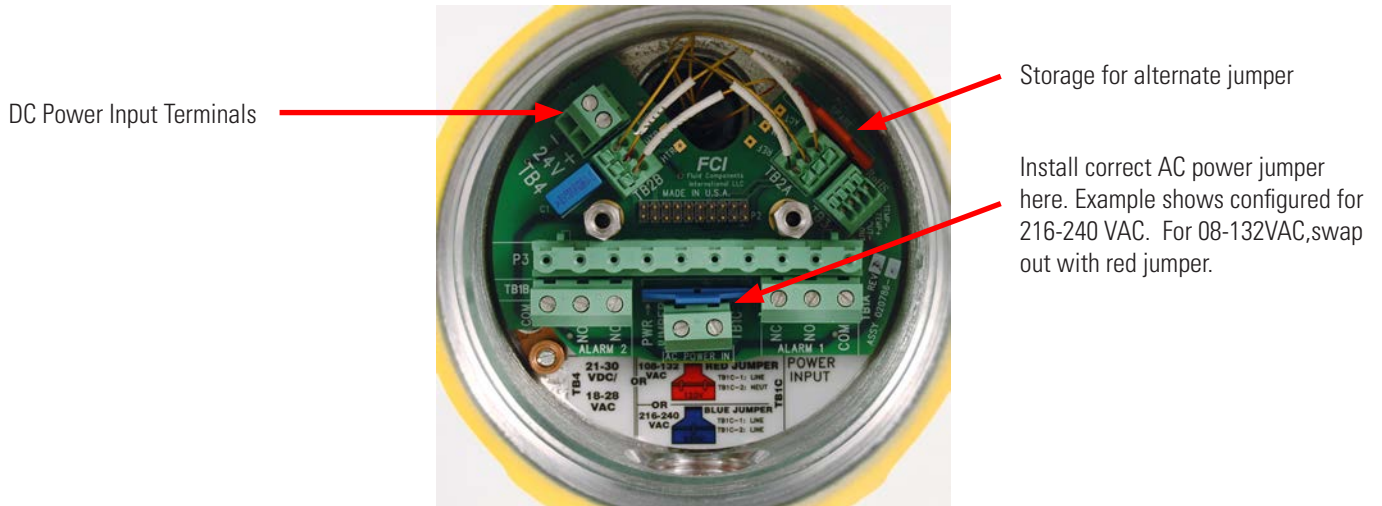


Figure 20

Step 8A: Install AC power wires to the wiring terminal board. (Fig 21 or 22)



Figure 21  
Single Port Enclosure



Figure 22  
Dual Port Enclosure



Step 9: Installing the Top/Main Board (Fig. 23)

Step 9A: Install the new main/top board- assembly 5208 into the switch housing. Align the slotted screw heads so they seat into the female standoffs on the wiring terminal board and firmly tighten.

Step 9B: Obtain the data you recorded in Step 1 and use it to re-set the switch points, configuration jumpers, and temperature compensation settings.



Figure 23



Figure 24

**Note:** If you have an existing aluminum lid with the plastic safety button inserted **you must remove it** prior to putting the lid back on the enclosure (containing the new electronics). Failure to do so will cause damage to the electronics.

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### If FLT93 enclosure is stainless steel type

Discard the existing stainless steel lid and replace it with new lid P/N 000434-03 supplied in kits P/N K5208-A1AB, K5208-A1BB, 5208-A3AB, 5208-A3BB.

**Note:** Do not attempt to re-use existing lid as it will not fully seat, and if forced, will damage the new electronics.

If you ordered the kit without the lid and need the new lid, contact FCI and order P/N 000434-03.

New FLT93 Stainless Steel Lid  
P/N 000434-03



Figure 25

Previous FLT93  
Stainless Steel Lid



Figure 26

**Customer Service / Technical Support**

FCI provides full in-house technical support. Additional technical representation is also provided by FCI field representatives. Before contacting a field or in-house representative, please perform the troubleshooting techniques outlined in this document.

***By Mail***

Fluid Components International LLC  
1755 La Costa Meadows Dr.  
San Marcos, CA 92078-5115 USA  
Attn: Customer Service Department

***By Phone***

Contact the area FCI regional representative. If a field representative is unable to be contacted or if a situation is unable to be resolved, contact the FCI Customer Service Department toll free at 1 (800) 854-1993.

***By Fax***

To describe problems in a graphical or pictorial manner, send a fax including a phone or fax number to the regional representative. Again, FCI is available by facsimile if all possibilities have been exhausted with the authorized factory representative. Our Fax number is 1 (760) 736-6250; it is available 7 days a week, 24 hours a day.

***By E-Mail***

FCI Customer Service can be contacted by e-mail at: [techsupport@fluidcomponents.com](mailto:techsupport@fluidcomponents.com).  
Describe the problem in detail making sure a telephone number and best time to be contacted is stated in the e-mail.

***International Support***

For product information or product support outside the contiguous United States, Alaska, or Hawaii, contact your country's FCI International Representative or the one nearest to you.

***After Hours Support***

For product information visit FCI's Worldwide Web at [www.fluidcomponents.com](http://www.fluidcomponents.com). For product support call 1 (800) 854-1993 and follow the prerecorded instructions.

***Point of Contact***

The point of contact for service, or return of equipment to FCI is your authorized FCI sales/service office. To locate the office nearest you, please go to [www.fluidcomponents.com](http://www.fluidcomponents.com).



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