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## 1.1 Introduction

### 1.1.1 About This Manual

This manual introduces the installation and operation procedures for the KRAUS Automatic Temperature Compensation system.

In an effort to help our customers take full advantage of our state-of-the-art products, we have provided this handbook to aid in initial set up and later to be used as a reference guide should the need arise.

The three divided sections are:

**1. INFORMATION**

Gives general information on system functions as well as cautionary advice.

**2. INSTALLATION**

Gives all information needed to successfully install and operate the system, as well as technical illustrations to aid in understanding text.

**3. TECHNICAL DATA**

Gives information on products that make up the system, in the form of drawings, manufacturer's literature, and references to related systems and products.

These three sections are set up in such a way that information is easily understood and instantly available to those who need it, whether they are an engineer, technician or supply manager.

Due to different environmental conditions this manual may be subject to, it has been designed to fit neatly in a protective three holed binder. This also serves the function of containing information from other related products in one convenient package.

### 1.1.2 Helpful Hints and Warnings

Throughout this manual, in the left hand margin, there will be indicators, with text, to give various hints and warnings. The following are examples of what you will see, and their meanings:

**SUGGESTION**

**Gives a hint on how to best use the equipment or advice on proper procedures.**

**ATTENTION**

**Gives notice to an important aspect of system operation.**

**CAUTION**

**Gives a warning to prevent damage to equipment or cause human injury.**

**Kraus Industries Ltd. assumes no responsibility for personal injury or equipment damage caused by non-observance of the safety warnings.**

### 1.1.3 Service and Product Support

Should you experience any difficulties in system operation, customer assistance is available.

The procedure to receive such assistance is as follows:

**1. Document the following information:**

- System Disfunctions
- Corrective Measures Taken
- System Model Number
- System Serial Number
- Purchase Order Information
- Date of Installation
- Equipment Location (i.e. City, Address etc...)

**2. Call or Fax our Product Service line at:**

| | |
|---|---|
| Company Service number | 1 204 988 1234 |
| Company Fax number | 1 204 654 2881 |

One of our qualified personnel will provide assistance in getting your system operational.

## 1.2 Product Information

### 1.2.1 System Components

The following is a list of operating components used in this installation, along with a brief explanation of their function:

**ATC Board**

Takes the signals from the temperature probe and flow meter, compensates for temperature deviation from 15 $^{o}$C (60 $^{o}$F), then sends the compensated signal back to the main processor board.

**Intrinsic Safety (I.S.) Barrier**

Energy limits the temperature probe signal, then sends the same signal on to the ATC board.

**Temperature Probes**

Converts temperature of the product to a corresponding voltage signal that is sent to the ATC board, via the I.S. Barrier.

**Thermal Test Well**

Provides a mechanical-thermal connection to accommodate a remote temperature probe, for calibration purposes, to give a true reading of product temperature.

**Probe Connector Assembly**

Provides secure electrical connection between the temperature probe(s) and I.S. Barrier.

## 2.1 Pre-Installation

### 2.1.1 Site Preparation

**CAUTION**

**The following is a list of precautions that should be followed before installation of this product. Failure to do so could result in serious personal injury!**

- Extreme caution should be used to ensure that no ignition sources exist.
- The dispensing area should be roped off or isolated from public use.
- Dispenser station operator should be made aware of the work that needs to be completed to prevent accidental “turn on” of the pump.
- Any main electrical disconnection should be labeled or locked to prevent accidental power up.

### 2.1.2 Installation Requirements

**ATTENTION**

**The following points should be taken into consideration before installing this product:**

- Any electrical installation should be carried out by a registered electrician.
- Any fuel dispensing connections should be made by qualified and experienced personnel.
- Installation must be performed in accordance with the relevant standards, laws and by-laws governing the type of application.

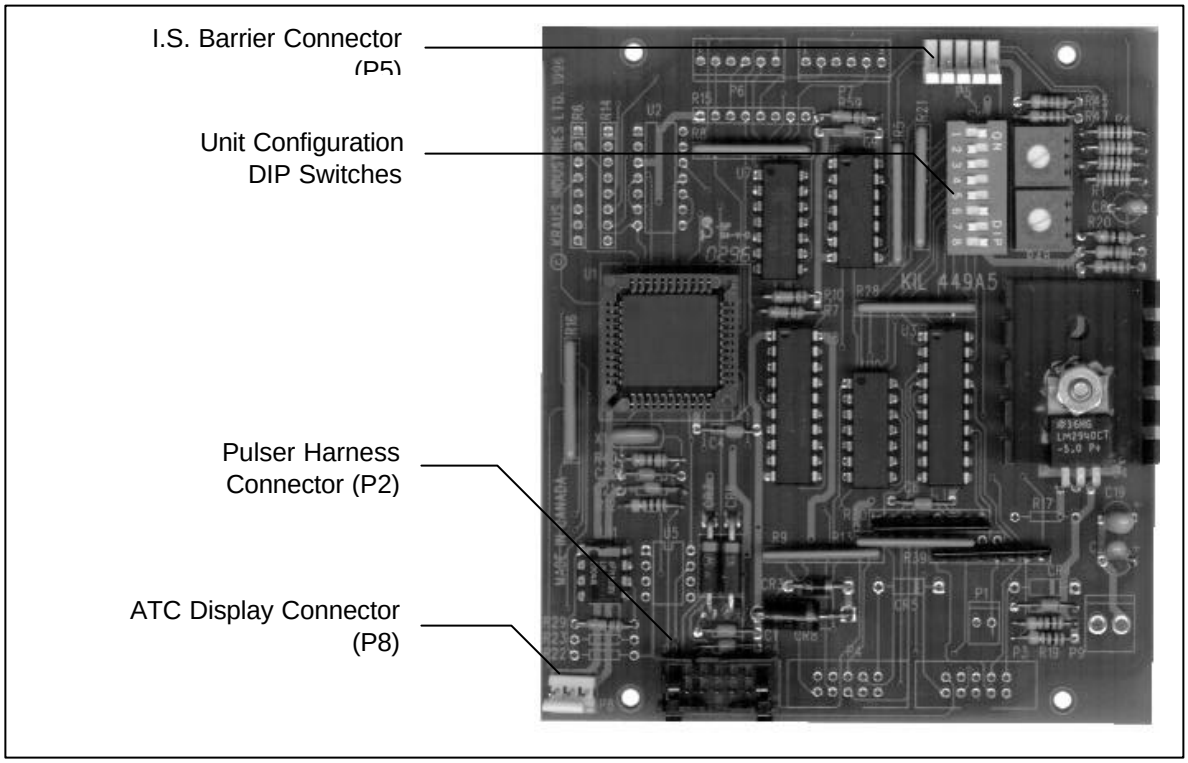
## 2.1 Pre-Installation 2.1.3 Unit Configuration

Before the ATC board can be installed, it must be configured for the particular application it is to control. This is accomplished by setting the DIP switches on the ATC circuit board.

Options for configuration can be set in accordance with the table below:

**ATC Board Jumper Settings** **Southwest TTC 200-1S & 2S**

| Switch # | OPTION | POSITION |
|---|---|---|
| 1 | Selects whether product 1 or side A is gasoline or diesel | ON = DIESEL |
| 2 | Selects whether product 2 or side B is gasoline or diesel | ON = DIESEL |
| 3 | Not Used | N/A |
| 4 | Not Used | N/A |
| 5 | Not Used | N/A |
| 6 | One or Two Probe Configuration | ON = 1 PROBE |
| 7 | Not Used | N/A |
| 8 | Selects whether ATC is enabled or disabled | ON = ENABLED |



## 2.2 Component Installation

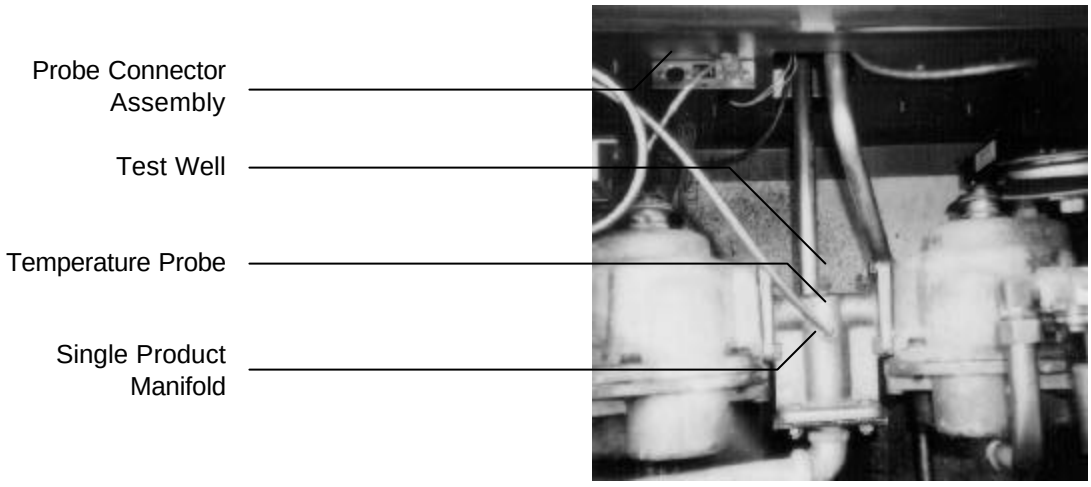
### 2.2.1 Test Well and Temperature Probes

2.2.1.1 In a Single Product Dispenser

**CAUTION**

**Before components can be installed, power MUST be shut off to the dispenser.**

1. Remove the lower panels.
2. Locate the single product supply manifold. (See Figure 2).
3. Remove manifold from pump assembly.




**CAUTION**

**Due to the presence of combustible gasses, DO NOT drill holes or solder fittings to parts directly connected to any piping.**

## 2.2 Component Installation

### 2.2.1 Test Well and Temperature Probes

2.2.1.1 In a Single Product Dispenser (Cont'd)

4. With the manifold mounted securely, drill two holes of size Q (0.332") and tap for 1/8" NPT, male thread. Holes should be located near the center of the manifold.

The following guidelines should also be followed for installing the test well:

- The hole should be drilled so that the extension will be at an angle within $45^{o}$ of vertical when the extension is installed and manifold is reconnected. This is so that it will hold thermally conductive fluid for measuring purposes.
- The fitting should provide easy access for insertion of a thermometer.
- The fitting should be placed in an appropriate position so as not to hinder reinstallation of the assembly.

**ATTENTION**

**If a probe is for two hoses, the probe and test well must be in a portion of the flow which is common to both hoses.**

5. Install temperature probe and extension fitting.

**ATTENTION**

**Any connections must be made using thread sealing compound suitable for use with gasoline. Any connections having less than five (5) threads should be soldered.**

6. Install test well into the manifold and, after tightening, cover with the thermal well plug.

7. Re-connect manifold to pump assembly.

**ATTENTION**

**Make sure manifold is cleaned thoroughly before connecting manifold to pump assembly. This is to prevent drill cuttings from entering the dispensing system.**

## 2.2 Component Installation

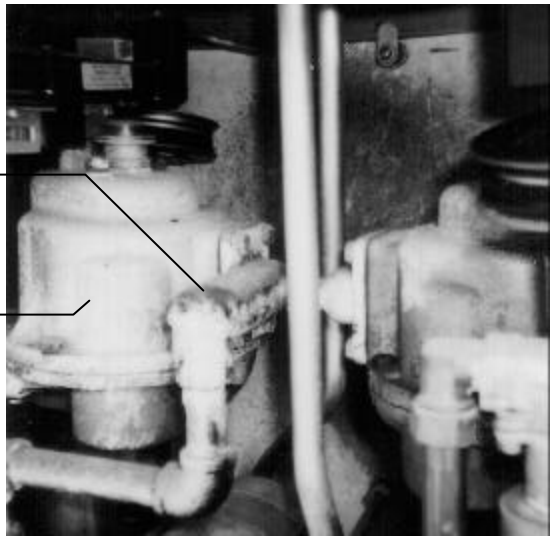
### 2.2.1 Test Well and Temperature Probes

2.2.1.2 In a Dual Product Dispenser

**CAUTION**

**Before components can be installed, power MUST be shut off to the dispenser.**

1. Remove lower panels.
2. Locate the fittings connected to the inlet of each meter. (See Figure 3)




3. Remove the fitting.

**CAUTION**

**Due to the presence of combustible gasses, DO NOT drill holes or solder fittings to parts directly connected to any piping.**

4. With the fitting mounted securely, drill two holes of size Q (0.332") and tap for 1/8" NPT. The following guidelines should also be followed for installing the test well and probe fittings:

## 2.2 Component Installation

### 2.2.1 Test Well and Temperature Probes

2.2.1.2 In a Dual Product Dispenser (Cont'd)

- The hole should be drilled so that the well will be at an angle within $45^{o}$ of vertical when installed. This is so that it will hold thermally conductive fluid for measuring purposes.
- The fittings should provide easy access for insertion of a thermometer.
- The fitting should be placed so as not to hinder reinstallation of the assembly.

**ATTENTION**

**Any connections must be made using thread sealing compound suitable for use with gasoline. Any connections having less than five (5) threads should be soldered.**

5. Install the temperature probe and extension fitting.
6. Install the test well into the pipe section and, after tightening, cover with the supplied plug.
7. Reconnect pipe section to pump assembly. (Repeat procedure for each product)

**ATTENTION**

**Before reconnecting, make sure pipe section is thoroughly cleaned to prevent drill cuttings from entering the dispensing system.**

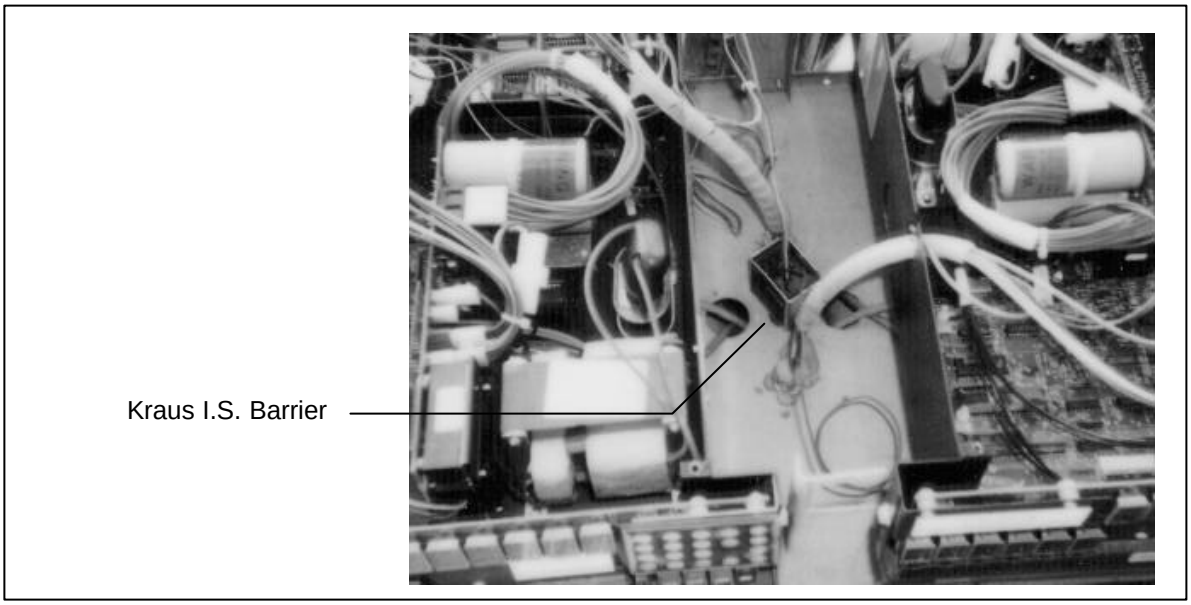
## 2.2 Component Installation

### 2.2.2 I.S. Barrier and Probe Connector Assembly

1. Place the threaded extension of the I.S. Barrier through the center hole in the mounting plate between the A and B side control registers.

   If there is no hole in the mounting plate, drill one of 5/16" near the center.

   If there is no mounting plate, attach the Kraus supplied plate to the front of the dispenser frame, then attach the I.S. Barrier.




2. Connect the intrinsic safety barrier ground (20 AWG green wire), coming out of the top of the barrier (epoxy side), to the grounding stud beside one of the electronic registers.

3. Connect the other wires to the like coloured ones on the W172 harness, **using crimp on wire nuts or butt connectors only.**

**ATTENTION**

**Connections made using crimp on wire nuts or butt connectors is a Weights and Measures requirement to make the connection tamper resistant.**

### 2.2.2 I.S. Barrier and Probe Connector Ass'y (Cont'd)

4. Remove the covers from the lower enclosure.

5. Mount the probe connector assembly bracket to the inside top of the dispenser. (See Figure 2)

6. Connect the wires from the probe connector assembly to the like coloured wires of the I.S. barrier using crimp on wire nuts or butt connectors only.

7. Plug the temperature probes into the connector assembly.

**ATTENTION**

**Connections made using crimp on wire nuts or butt connectors is a Weights and Measures requirement to make the connection tamper resistant.**

## 2.2 Component Installation

### 2.2.3 ATC Board Installation

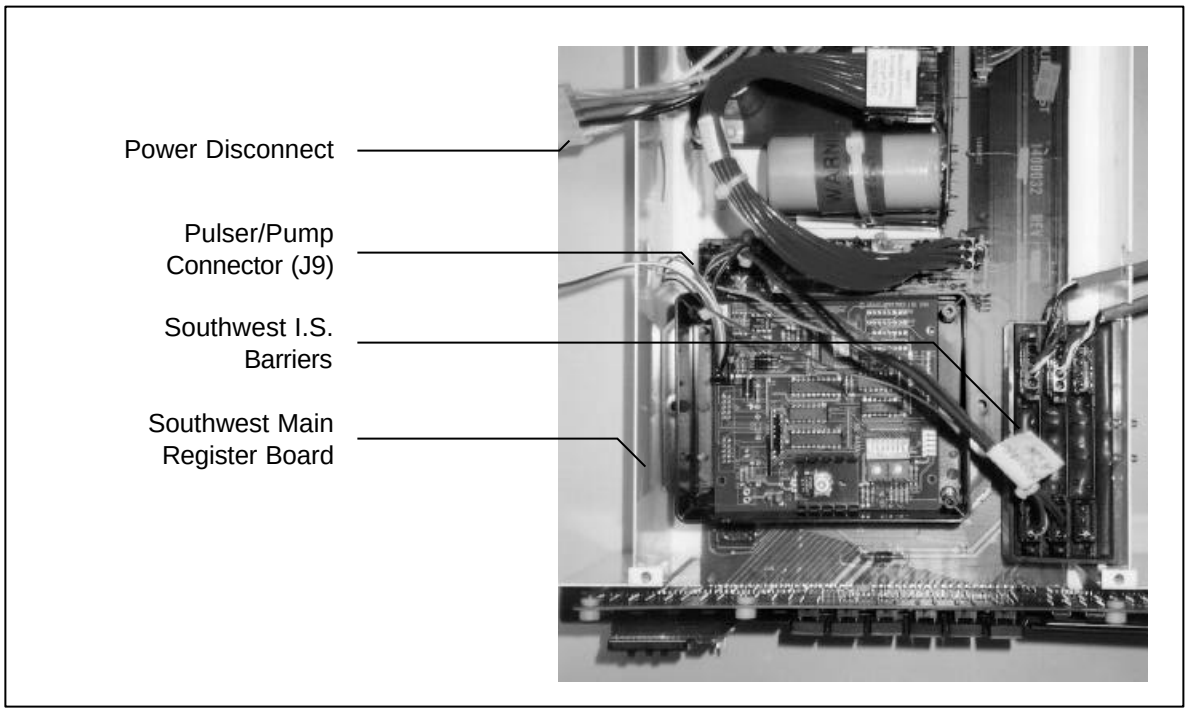
**(Refer to Figure 7 for Connection Diagram)**

1. Remove power to the A and B side registers by detaching the power line connectors. (See Figure 5)

2. Remove the 9 pin plug from J6 on the main register board (See Figure 5).

3. Remove the 3-pin pulser and pump plugs (the same harness) from the Southwest I.S. Barriers (store the un-used harness for possible use in the future).

4. Mount the ATC casing to the three (3) plastic standoffs attached to the main register board.




5. Connect the 9 pin plug ( “A” Side, 8 wire) connector on the W234 harness to J6 on the main register board.

6. Connect the 10 pin plug (on the W234 harness) to P2 on the ATC board.

7. Connect the 3 pin pulser and pump plugs (on the W234 harness) to the Southwest I.S. Barriers (plugs will be labeled).

### 2.2.3 ATC Board Installation (Cont'd)

8. Run the 4 wire extension of the W234 harness to the "B" side register (if there is no "B" side, neatly coil the un-used section of the W234 harness).

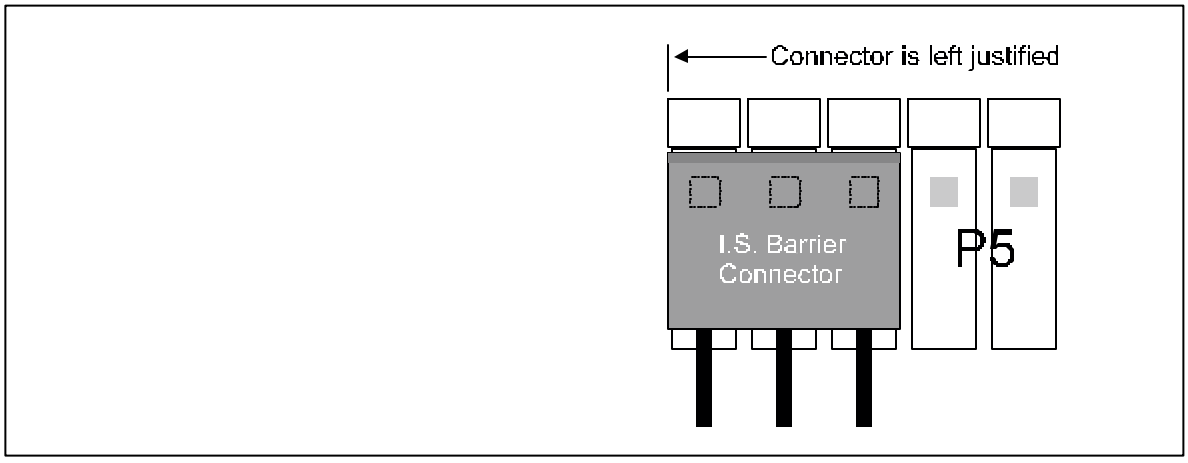
9. Disconnect the 9 pin plug from J6 on the "B" Side main register board.

10. Disconnect the two 3 pin plugs leading to the Southwest I.S. barriers ("B" Side).

11. Connect the 9 pin (6 wire) plug to J6 on the "B" Side main register board.

12. Connect the two remaining 3 pin plugs on the W234 harness to the I.S. barriers accordingly.

13. Connect the 3 pin connector from the Kraus I.S. Barrier harness (W172) to P5 on the ATC board (the plug should be connected left justified) as shown in Fig. 6. (Harness may have 5 pins for straight connection)



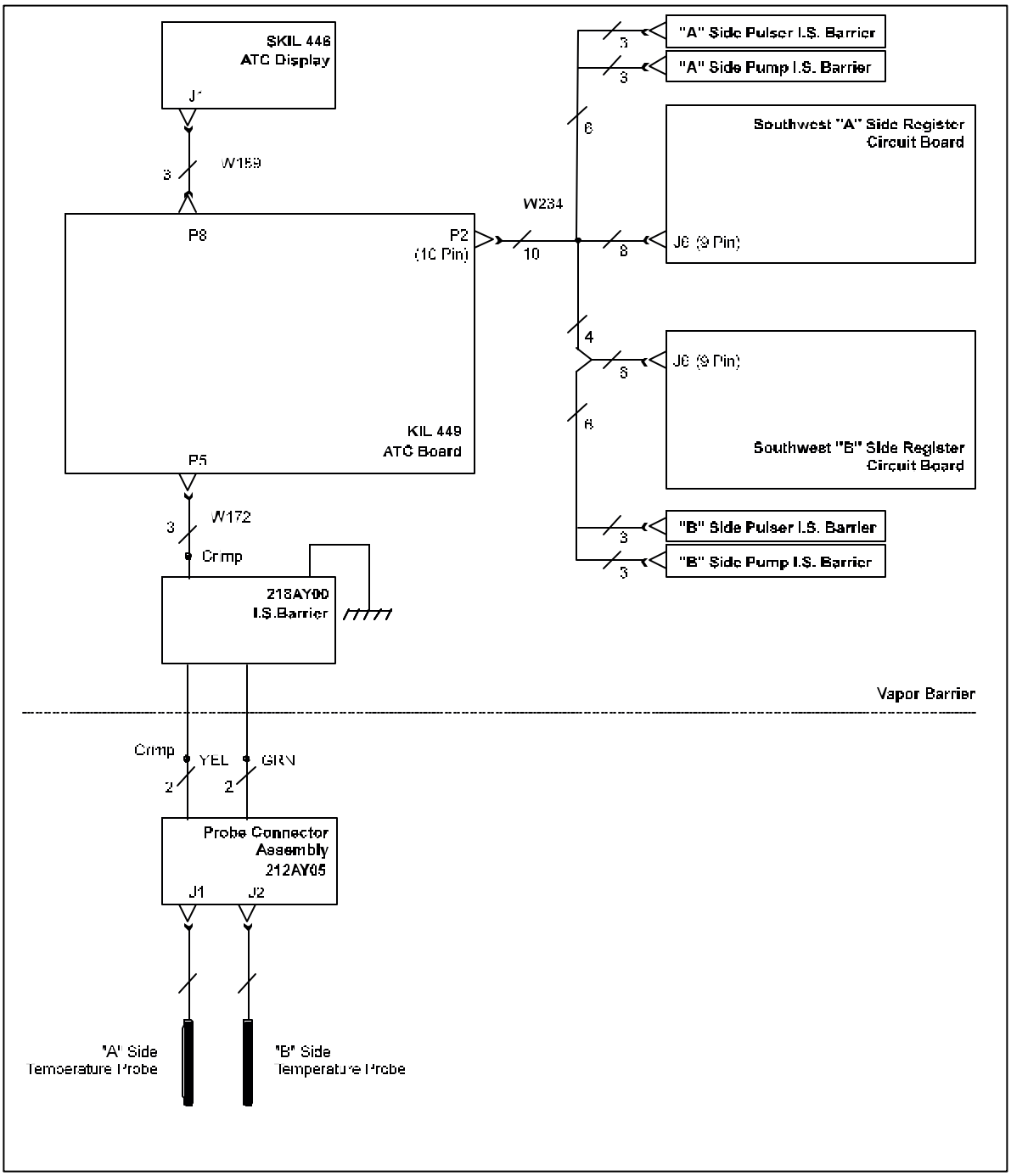

14. Attach the ATC display board to a location suitable for viewing when the pump is being inspected.

15. Connect the 3 pin connector (W189 harness) from the ATC Display board to P8 on the ATC board.

## 2.2 Component Installation

### 2.2.3 ATC Board Installation (Cont'd)

The following diagram shows the wiring connections for the TTC ATC board into Southwest Pumps:

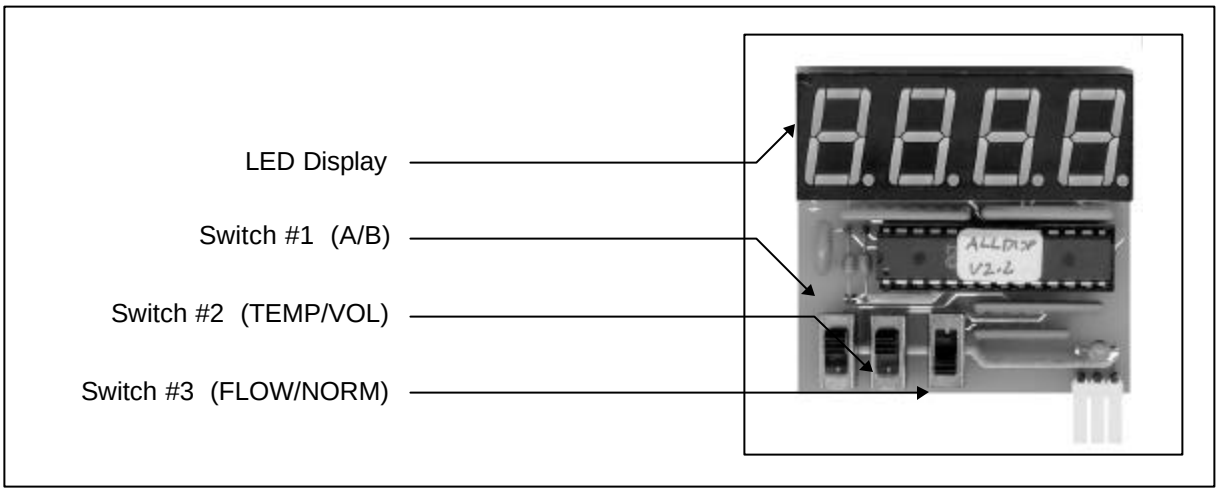


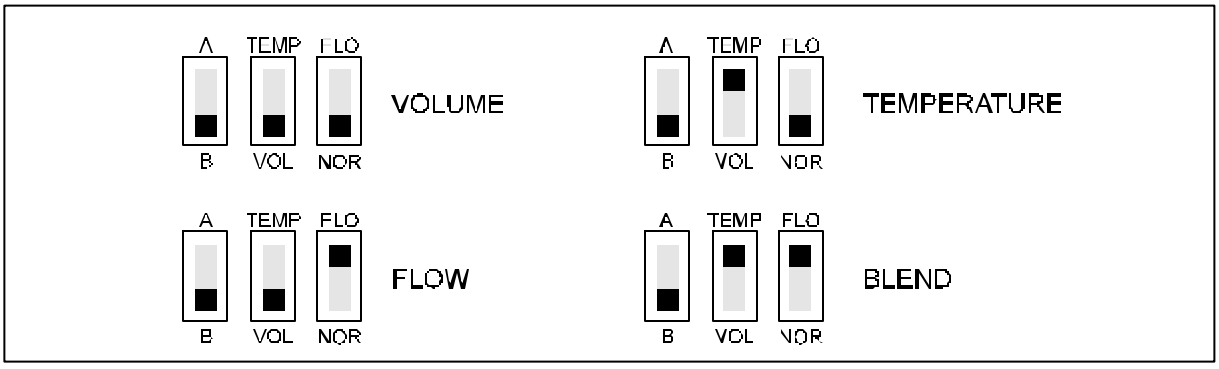
## 2.3 Post Installation

### 2.3.1 ATC Display Board Functions

The three switches on the board (See Figures 8 & 9) determine what information is displayed.

| | | |
|---|---|---|
| **SWITCH 1** | A/B | Selects the temperature and uncompensated volume reading for either **A side or B side**. |
| **SWITCH 2** | TEMP/VOL | Selects between the product **temperature** and uncorrected **volume** of product. (In normal mode) |
| **SWITCH 3** | FLOW/NORM | Selects between having the **flowrate** or the **temperature and volume** (as above) of a product displayed**.**<br><br>Note: The NORM position may be labeled BLEND. |



**Error Messages**

Error message will alternate at 1 second intervals with the information selected by the switches.

| | |
|---|---|
| **A-d** | A/D Converter Error |
| **Prob** | Probe Error |
| **PULS** | Pulser Error |

The priority of errors is as shown above. That is, if there is both a probe and pulser error, only a probe error is reported.

**Status Messages**

*Will show for 1 second when handle switch is turned on. Must be in normal mode.*

With **TEMP** switch selected:

| | |
|---|---|
| **re1.5** | Software Revision Number for the ATC Main Board Controller. |

With **VOL** switch selected:

| | |
|---|---|
| **gas** | Shows product type is gasoline |
| **desl** | Shows product type is diesel |
| **OFF** | ATC Compensation is disabled |

## 2.3 Post Installation

### 2.3.4 Probe Connection Verification

*With the dispenser ready to be tested:*

1. Ensure power is applied to the unit.

2. Ensure ATC is ON (DIP switch #8 is on)

3. Initialize the system as per the Southwest pump requirements.

4. Set the ATC display to show volume for the side being tested.

5. Run a delivery into a test can.

   *The ratio of the net volume on the dispenser and the gross volume on the ATC display should be the correct VCF (Volume Correction Factor) for the temperature displayed and the product selected.*

6. Now unplug the temperature probe for the product being delivered.

   *The pump should stop, and the status on the ATC display should indicate a temperature probe failure.*

7. Repeat the test procedure for each hose.

## 2.3 Post Installation

### 2.3.5 Enabling ATC Function

The ATC function must be disabled with the appropriate DIP switch (DIP Switch #8) until the pump is inspected and the nameplate with the AV number must be applied to the side of the dispenser.

**ATTENTION**

**Before the dispenser can be used in trade, in the ATC mode, it must be inspected by Weights and Measures Canada**

Once the inspector approves the pump, the seal plate may be installed over the ATC board so that the inspector can seal the unit.

The BC256B "VOLUME CORRECTED TO 15° C" labels must also be applied to the faceplates adjacent to the volume displays.

### 2.3.6 Meter Calibration

When the meters are calibrated in a pump with an ATC, it will be necessary to use either the gross volume reading from the ATC display or the mechanical counter. The temperature compensated volume on the pump display can not be used for this purpose.

## 3.1 Components 3.1.1 List of Components

| **Southwest 8200 & 2S** | | **TTC 200-1S** |
|---|---|---|
| QTY | PART # | DESCRIPTION |
| 1 | 229AY01 | TTC 200 ATC board (For Southwest) & Box Assembly |
| 1 | SKIL-446 | ATC Display Board |
| 1 | 218AY00 | Dual Intrinsic Safety Barrier |
| 1 | 212AY05 | Dual Probe Connector Assembly |
| 1 | W172 | 3-wire Harness for I.S. Barrier |
| 1 | W189 | 3-wire Harness for Display Board |
| 1 | W199 | Probe Assembly (2 Probes for Dual) |
| 1 | BC407 | Thermowell (2 Wells for Dual) |
| 1 | BC546 | 120-B 1/8" NPT adapter drilled to 17/64" I.D.(2 Adapters for Dual) |
| 1 | 235-C | Thermowell Plug (2 Plugs for Dual) |
| 1 | 122-B | 1/8" NPT x 1" hex nipple (2 for Dual) |
| 1 | 103-B | 1/8" NPT coupling (2 for Dual) |
| 2 | BC256B | Black "VOLUME CORRECTED TO 15$^{o}$C" label (4 for Dual) |
| 10 | | 18-22 AWG crimp splice |
| 1 | W234 | Southwest ATC Harness |
| 1 | BC1380 | Serialized AV-2322 Nameplate |
| 1 | | 5/16" hex nut |
| 1 | | 5/16" flat washer |
| 1 | BC1518 | Southwest ATC Display Mounting Bracket |
| 1 | BC1519 | Southwest ATC I.S. Barrier Mounting Bracket |
| 1 | 229KT04.INS | TTC 200 Southwest Installation Manual |