Installation and Operating Instructions

Series 506-4000
Multipoint Level Control
using 406-4000 Electronics

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Series 506-4000
Multipoint Level Controller
using 406-4000 Electronics
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1.0 Introduction

The instructions in this manual pertain to the Drexelbrook 506-4000 Series Multipoint™ Level Control System.

1.1 System Description

The Drexelbrook 506-4000 Series multipoint level control includes a 406-4000 Series relay output electronic unit, a 700 Series sensing element, and a 380 Series connecting cable. See Figure 1-1. The center four digits in the system model number refer to the electronic unit series, and the last digits indicate the sensing element model. 506-4000-1 indicates a standard electronic unit with a 700-1-22 sensing element.

The 406-4000, Series instrument is a precision RF (radio frequency), relay output electronic unit. It provides double-pole double-throw relay contact closures when material reaches preset points in a vessel. The relay contacts may be used to operate alarms, solenoid valves, or other low power devices.

Cote-Shield action is designed into each system and enables the instrument to ignore the effect of most build-up or material coating on the sensing element.

The sensing element is mounted vertically in the material being measured and provides a change in RF admittance indicating presence or absence of material. It consists of two elements (center measuring elements and ground reference element. See Figure 1-2.
Introduction

The change in admittance indicated by the sensing element is transmitted to the electronic unit through a Drexelbrook 380 Series Cote-Shield cable.

1.2 Model Available

1.2.1 Electronic Units (See Figure 1-3.)

![Electronic Chassis Diagram]

**FIGURE 1-3**
**ELECTRONIC CHASSIS**

<table>
<thead>
<tr>
<th>DESCRIPTION</th>
<th>ELECTRONIC CHASSIS MODEL #</th>
</tr>
</thead>
<tbody>
<tr>
<td>std. range for 506-4000 syst. (0-4000pF)</td>
<td>406-4X0X</td>
</tr>
<tr>
<td>std. range for 506-4000-1,2&amp;3 systems (0-800pF)</td>
<td>406-4X4X</td>
</tr>
<tr>
<td>low range (0-100pF)</td>
<td>406-4X1X</td>
</tr>
<tr>
<td>expanded range (0-40,000pF)</td>
<td>406-4X2X</td>
</tr>
<tr>
<td>as above with adj. time delay (0-90 sec.)</td>
<td>406-4XX2</td>
</tr>
<tr>
<td>with adjustable differential (dead band)</td>
<td>406-4XX3</td>
</tr>
</tbody>
</table>

1.2.2 Housings

Standard: 406-4000 Series electronics in the standard housing meet the following classifications:

- Nema 1 General-Purpose
- Nema 2 Drip-Tight
- Nema 3 Weather-Resistant
- Nema 4 Waterproof
- Nema 5 Dust-Tight
- Nema 12 Industrial Use

Optional: Explosionproof For Class I, Groups A,B,C,D (Div. 1 or 2)
Class II, Groups E,F,G (Div. 1 or 2)
Housing is FM approved. See Figure 1-4.

![Typical Housing Diagram]

**FIGURE 1-4**
**TYPICAL HOUSING**
1.2.3 Sensing Elements

The following sensing elements are most often recommended for a 506-4000 Series control, according to the application requirements. For identification, the last one or two digits of the sensing element model number are stamped on the mounting gland or flange. This list does not include all of the sensing elements available with the 506-4000 Series controls. If you have additional questions about sensing elements, contact the factory or your local representative. See Section 2.2.

700-1-22 - rigid TFE covered sensing element for general purpose applications like water sumps
(506-4000-1)

700-1-24 - rigid TFE covered sensing element with C.S. concentric shield for thin insulating liquids with minimal solids content.
(506-4000-2)

700-2-22 - rigid TFE covered sensing element for general purpose applications like water sumps, over 10 feet.
(506-4000-3)

700-2-57 - rigid "X" covered sensing element for water-based materials with significant coatings.
(506-4000-4)

1.2.4 Connecting Cables

Typically, the electronic unit and sensing element are connected by a three-terminal coaxial cable. Drexelbrook cables are available in:

General Purpose: 380-XXX-12
High Temperature: 380-XXX-11
Composite: 380-XXX-18
(first 10 ft. high temp)
See Section 2.3.

The XXX in the model number indicates the length of the cable. 5 foot increments up to 25 feet are standard, but cut lengths up to 150 feet are available. Cable can also be purchased in bulk lengths up to 1000 feet. See Figure 1-5.
2.0 Specifications

Notice: Drexelbrook equipment is built with great care, and subjected to rigorous quality control.

Even so, failures of any equipment can and do occur. Sound engineering practice demands that, whenever equipment failure may result in more than an inconvenience, a completely independent backup system be employed so that failure of either the unit or the backup unit will not permit a hazardous condition to occur.

2.1 Electronic Unit

A. Power Requirement
   406-40XX Series: 120 ±25 Vac
   50/60 Hz, 1 watt
   406-43XX Series: 230 ±50 vac, 50/60 Hz, 1 watt

B. Operating Temperature
   -40° to 140°F (-40° to 60°C).

C. Sensitivity (Max. Differential)
   .1% of full scale

D. Operating Point Range
   406-4X0X: 0-4000pF
   406-4X1X: 0-100pF
   406-4X2X: 0-40,000pF
   406-4X4X: 0-800pF

E. Hazardous Areas

   Electronic Unit: NEMA 4 (waterproof) enclosure standard. Explosionproof housing optional.


F. RFI Protection (Built-In)

   Less than 1% of full span shift in operating point for unit in standard housing from 5W field @27 MHz, 150 MHz, or 450 MHz at a distance of 5 ft from exposed sensing element, cable, or power line.

G. Temperature Effect

   Less than 1% of full span shift in operating point for 30°C shift in temperature.

H. Output - DPDT Relay Contact Rating

   120Vac: 5A non-inductive
   3A inductive

   230Vac: 5A non-inductive
   2A inductive

   24Vdc: 5A non-inductive
   1A for inductance up to 300 mH

I. Adjustable Differential Range

   (406-4XX3 Series units)

<table>
<thead>
<tr>
<th>Differential Range</th>
<th>Lo Point Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-100% of full span</td>
<td>0-100% of full span</td>
</tr>
</tbody>
</table>

J. Fail-Safe

   Field-switchable by channel to either Low-Level Fail-Safe (LLFS) or High-Level Fail-Safe (HLFS).
### 2.2 Sensing Elements

<table>
<thead>
<tr>
<th>Model #</th>
<th>Standard Materials of Construction</th>
<th>Sensor Dia. &amp; Mtg</th>
<th>Pressure &amp; Temp Limits</th>
<th>Max Recommended Insertion Length</th>
<th>Sensing Element Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>700-1-22</td>
<td>TFE covered metal rod</td>
<td>3/8&quot; O.D.</td>
<td>1000 psi @ 100°F</td>
<td>6 ft and 10 ft std.</td>
<td>2-terminal rigid</td>
</tr>
<tr>
<td>(506-4000-1)</td>
<td></td>
<td>3/4&quot; NPT</td>
<td>500 psi @ 300°F</td>
<td>20 ft max.</td>
<td></td>
</tr>
<tr>
<td>700-1-24</td>
<td>TFE covered metal rod w/C.S.</td>
<td>1.66&quot; O.D.</td>
<td>1000 psi @ 100°F</td>
<td>20 ft max.</td>
<td>2-terminal rigid</td>
</tr>
<tr>
<td>(506-4000-2)</td>
<td>concentric shield</td>
<td>1 1/2&quot; NPT</td>
<td>500 psi @ 300°F</td>
<td></td>
<td></td>
</tr>
<tr>
<td>700-2-22</td>
<td>TFE covered metal rod</td>
<td>3/4&quot; O.D.</td>
<td>1000 psi @ 100°F</td>
<td>14 ft max.</td>
<td>2-terminal rigid</td>
</tr>
<tr>
<td>(506-4000-3)</td>
<td></td>
<td>3/4&quot; NPT</td>
<td>500 psi @ 300°F</td>
<td></td>
<td></td>
</tr>
<tr>
<td>700-2-57</td>
<td>&quot;X&quot;* insulated w/304 S.S. mtg.</td>
<td>.84&quot; O.D.</td>
<td>1000 psi @ 100°F</td>
<td>20 ft max.</td>
<td>2-terminal rigid</td>
</tr>
<tr>
<td>(506-4000-4)</td>
<td></td>
<td>1&quot; NPT</td>
<td>500 psi @ 250°F</td>
<td>6 ft and 10 ft std</td>
<td></td>
</tr>
</tbody>
</table>

"X" is a fluorocarbon insulation.
2.3 Connecting Cables

Cables up to 150 feet long can be used, depending on the application. (High sensitivity units, i.e. 406-4X2X series, normally use only the shorter cable lengths, typically up to 25 feet max.)

A. General Purpose (380-XXX-12): .51" O.D. at largest point. 160°F temp limit.

B. Composite, first 10 ft. high temp (380-XXX-18): .62" O.D. at largest point. 450°F temp limit for first 10 feet. 160°F temp limit for remainder of cable length.

3.0 Theory of Operation

3.1 Electronic Unit

The 406-4000 Series electronic unit is designed for use with Drexelbrook two-terminal sensing elements, and three terminal coaxial cables.

The electronic unit accepts 120 Vac (optional 230 Vac field changeable) and the internal power supply circuit provides a suitable voltage to operate the rest of the circuitry. See Figure 3-1.

The bridge circuit converts the sensing element admittance (determined by material level) into an ac error signal. The bridge is energized by a 100 KHz RF voltage from the oscillator.

The transformer side of the bridge contains a tap which serves as the bridge reference.

The capacitance side of the bridge circuit contains both the RF admittance information measured at the sensing element, and the operating point adjustment capacitor. The adjustment capacitor is set by the user so that the electronic unit switches states at a preset admittance level, determined by material between the sensing element and ground.

3.2 Sensing Element

The change in admittance measured by the electronic unit is provided by the sensing element. The sensing element is mounted vertically from the top of the vessel.
3.3 Connecting Cables

The Drexelbrook 506-4000 Series point level controls use three-terminal coaxial cables to connect the sensing element to the electronic unit. The center wire of the cable carries the admittance information from the probe to the electronic unit, while the coaxial shield (Cote-Shield) is driven at the same potential. This prevents any current from flowing through the insulation of the cable. Because there is no current flow through the cable capacitance, any change in capacitance due to temperature or change of length in the cable will not change the original calibration.
4.0 Installation

4.1 Unpacking

Carefully remove the contents of the shipping carton and check each item against the packing list before destroying any packing materials. If there is any shortage or damage, report it immediately to the factory.

4.2 Mounting the Electronic Unit

The electronic unit is designed for field mounting, but it should be mounted in a location that is as free as possible from vibration, corrosive atmospheres, and any possibility of mechanical damage. Ambient temperatures should be between $-40^\circ F$ and $140^\circ F$. For convenience at start-up, it is best to install the instrument in a reasonably accessible location. It may be mounted in any position. See Figure 4-1.

4.3 Mounting the Sensing Element

The mounting location of the sensing element often depends on the placement of nozzles or openings into the vessel. It should be mounted vertically from the top of the vessel. See Figure 4-2. In all cases, it is necessary to protect the insulation on the sensing element against cuts and scrapes during installation.

4.4 Wiring the Electronic Unit

All power and relay connections are made to the terminal strips on the electronic chassis. Due to the low power consumption of the instrument (1 watt), the wiring need only follow local electrical codes.

The power connections are made to terminals L1, L2, and GND. See Figure 4-3.

The relays used in these units have double-pole, double-throw contacts. All relay connections must also be made to the terminal strips. The relay serves as a
low power switch and will not provide sufficient current to activate motors or heavy equipment. Refer to Figures 4-3 and 4-4.

![Figure 4-3: Power & Relay Connections](image)

![Figure 4-4: Relay Contact Chart](image)

Only coaxial cables supplied by DREXELBROOK ENGINEERING COMPANY should be used to connect the control unit to the sensing element. For cable lengths greater than 150 feet between sensing element and electronic unit, consult factory for proper installation. No padding of the instrument is required to compensate for cable length.

NEVER splice cables. Do not shorten or reterminate cables without using a Drexelbrook termination kit.

### 4.5 Wiring the Sensing Element

The sensing element cable connections are made to the sensing element after it has been installed in the vessel, with the conduit attached. The shield connection at the conduit must be clipped and insulated so it cannot short to either terminal. See Figure 4-6.

![Figure 4-6: Condoulet](image)

Cable Connections to the Sensing Element
Applications involving insulating granulars and insulating liquids may require extra spark protection against the discharge of static sparks, that can damage the electronic unit. When supplied, heavy duty spark protection is normally mounted in the sensing element conduit, by the customer. See Figure 4-7.

If spark protection is supplied, use the following instructions for installing the spark protector in the sensing element conduit.

A. Connect the green wire from the spark protector to the conduit ground screw.

B. Attach the mounting link on the spark protector to the sensing element center connection screw.

C. Feed the cable into the conduit.

D. Connect the cable centerwire (CW) to the spark protector and the cable ground wire (gnd) to the ground screw as shown.

E. Clip the shield wire at the conduit and tape it so it will not short to anything.

Figure 4-7
Spark Protection at the Sensing Element
5.0 Calibration

This section contains the calibration and operating information for point level controls using the 406-4000 Series electronic units.

5.1 Start-Up

Before applying power to the instrument, be sure that the input power will be 120 Vac 50/60 Hz for 406-4000 Series, 230 Vac 50/60 Hz for 406-4300 Series. Check all the wiring connections. See Sections 4.4 and 4.5.

WARNING - UNITS IN HAZARDOUS AREAS.

Before the explosionproof housing cover is removed to calibrate the unit, the area must be checked and known to be non-hazardous.

When calibration is complete, the cover must be replaced.

Each conduit from the explosion proof case must be equipped with an approved seal fitting.

5.2 Controls

5.2.1 Setpoint Control

There are four adjustments located on the face of the instrument that control the points at which the relays operate. A lighted LED indicates that the relay is energized. Each revolution of the control will change the operating point for that channel according to the sensing element and electronic unit being used. See Table 5-1. Turning the adjustment clockwise will raise the level at which the relay operates, and turning it counterclockwise will lower the level at which the relay operates. Refer to Figure 5-1 and Section 5.3.1.

5.2.2 Time Delay Adjustment

Time delay adjustments are located just to the right of each setpoint adjustment. See Figure 5-1. They are used to help stop an oscillating relay output due to agitation or frothing in the vessel. The standard time delay is 0-90 seconds and is represented by a number 2 in the seventh digit from the left in the model number. Example: 406-4002-XX.
TABLE 5-1
Inches of Change in Operating Point per Turn of the Control
(in Conducting Materials)

<table>
<thead>
<tr>
<th>Sensing Element Model #</th>
<th>Std. Range 406-4X4X (for 506-4000-1,2&amp;3 sys.)</th>
<th>Std. Range 406-4X0X (for 506-4000-4 sys.)</th>
<th>Low Range 406-4X1X</th>
<th>Expanded Range 406-4X2X</th>
</tr>
</thead>
<tbody>
<tr>
<td>700-1-22</td>
<td>6&quot;</td>
<td>30&quot;</td>
<td>.75&quot;</td>
<td>300&quot;</td>
</tr>
<tr>
<td>700-2-22</td>
<td>6&quot;</td>
<td>30&quot;</td>
<td>.75&quot;</td>
<td>300&quot;</td>
</tr>
<tr>
<td>700-2-24</td>
<td>8.6&quot;</td>
<td>43&quot;</td>
<td>1.1&quot;</td>
<td>430&quot;</td>
</tr>
<tr>
<td>700-2-27</td>
<td>1.2&quot;</td>
<td>5.9&quot;</td>
<td>N.A.</td>
<td>59&quot;</td>
</tr>
<tr>
<td>700-2-37</td>
<td>N.A.</td>
<td>1&quot;</td>
<td>N.A.</td>
<td>10&quot;</td>
</tr>
<tr>
<td>700-2-57</td>
<td>1.33&quot;</td>
<td>6.6&quot;</td>
<td>N.A.</td>
<td>66&quot;</td>
</tr>
<tr>
<td>700-5-14</td>
<td>6.9&quot;</td>
<td>34&quot;</td>
<td>N.A.</td>
<td>340&quot;</td>
</tr>
</tbody>
</table>

5.2.3 Adjustable Differential Control

Differential is the hysteresis (dead band) or change in level necessary to switch the electronic unit from one state to another. The 506-4000 Series level control with adjustable differential allows the user to determine the amount of capacitance change (hence level) between a control point and a recovery point. The user can select two separate points on a vertical sensing element where the relay contacts will open at one point and close at the other. The center two channels on the instrument are combined to perform this function.

An adjustable differential option is represented by the number 3 in the seventh digit from the left in the model number. Example: 506-4003-XX.

See Section 2.1 for specific ranges on adjustable differential units.

Both the upper and lower points may be adjusted over the entire range of the instrument.

The differential range corresponds to the differential in level on the sensing element, which depends on the capacitance of the sensing element and the properties of the material being measured. See Figure 5-2 for location of the adjustments. For calibration of adjustable differential units, see Section 5.3.3.
5.2.4 Fail-Safe Selector

Fail-safe describes the level condition which causes the output relay to de-energize.

High-Level Fail-Safe (HLFS) means the relay will de-energize under high level conditions, indicating high level upon loss of power. Low-Level Fail-Safe (LLFS) means the relay will de-energize under low level conditions, indicating low level upon loss of power. The instrument is supplied in the fail-safe requested when the order is placed. (HLFS, if not specified).

The fail-safe for each channel may be field selected by a rocker switch located between the setpoint adjustments for channels 2 and 3. See Figure 5-3.
5.3 Calibration Procedures

All 506-4000 Series controls are calibrated with a vertically mounted insulated sensing element.

5.3.1 Standard Calibration

Note: Be sure to use the insulated calibration tool. See Figure 5-4. Do not force any adjustment past its mechanical stop; damage to the unit will occur. When each green LED is on, it indicates that the corresponding relay is energized, or in the normal condition (not alarm). Each setpoint must be calibrated independently.

A. Be sure each of the four time delay adjustments are in the full counterclockwise (CCW) position (minimum delay time).

B. Starting with one of the four setpoints, set the level at the position on the sensing element where control is desired. See Figure 5-5.

C. With the insulated tool supplied, start from the full counterclockwise (CCW) position and carefully turn the setpoint adjustment slowly clockwise (CW) until the relay just changes states (LED just goes on in HLFS, and LED just goes off in LLFS).

NOTE: All setpoint changes must be made VERY SLOWLY to get proper calibration. Each pulse on the blinking yellow LED indicates that the unit is checking each of the four circuits for an operating point. If you turn the adjustment too quickly, you may go past the actual operating point before the LED changes states. It takes up to one second for the unit to "check" all points.
D. Record the number of turns from the full CCW position for recalibration.

E. Repeat this procedure for each of the four setpoints.

F. After calibration is complete, turn each time delay adjustment clockwise (CW) to the desired delay time.

5.3.2 Recalibration

If the amount of preloading was recorded at the time of initial calibration, it is possible to replace the instrument without experimentally determining the proper amount of preload.

A. Using the procedure in Section 5.3.1, follow steps A and B, then turn the adjustment clockwise (CW) the amount of the recorded preload.

B. Recalibration is complete.

5.3.3 Calibration of Adjustable Differential

A. Put the fail safe switches for both channels 2 and 3 in the HLFS position. Put the Adj. Diff. switch in the Adj. Diff. position. See Figure 5-2.

B. Using the insulated tool supplied, turn the adjustments for both channels 2 and 3 to the full counterclockwise (CCW) position (LED's for 2 and 3 should be off). See Figure 5-4.

C. Adjust the material level to the lower point of the desired control band. See Figure 5-6.
D. Turn the channel 3 adjustment slowly CW until the "Cal. 3" LED just comes on.

E. Raise the material level to the upper point of the desired control band. See Figure 5-6.

F. Slowly turn the channel 2 adjustment CW until the "Cal. 2" LED just comes on. Now turn the adjustment for channel 2 CCW until the "Cal. 2" LED just goes off. All LED's for channels 2 and 3 should now be off.

G. Select the desired fail-safe position for channels 2 and 3.

Note: Both channel 2 and 3 must be in the same fail safe position.

Calibration of the Adjustable Differential band is complete. Calibrate channels 1 and 4 using procedure in Section 5.3.1.
6.0 Troubleshooting

6.1 Introduction

The 506-4000 Series instruments are designed to give years of unattended service. No periodic or scheduled maintenance is required.

There are no specific spare parts that we would recommend be stocked by the user. However, if the application is critical, it is best to have a spare electronic unit available in the event of a component failure. The chassis should be returned to the factory for repair.

If difficulty should occur when operating your level control, divide the system into its component parts and test each part individually for proper operation.

The following troubleshooting procedures should be used in checking out your system. If attempts to solve the difficulty fail, notify your local factory representative, or call the factory direct and ask for the service department.

6.2 Electronic Unit Checkout

A. Disconnect the cable from the center wire (CW), Cote-Shield (SH), and ground (gnd) terminals at the instrument. Leave the power connected. See Figure 6-1. The yellow power LED should be flashing.

Note: If the instrument has the time delay option, turn the time delay control to the full counterclockwise (CCW) position.

B. Starting with the setpoint adjustment for channel 1 in the full counterclockwise (CCW) position, turn the insulated tuning wrench slowly clockwise (CW) until the relay just operates. (Adjust only with the insulated tool supplied). Note: Do not turn the adjustment past its stops. This can damage this unit.

C. Rotate the adjustment slowly back and forth about this point, observing the travel of the pointer between relay pull-in and relay drop-out. Repeat for each channel. The pointer should travel less than 1/8 turn to operate the relay. If so, the instrument is working properly.

D. If the instrument does not function properly, consult the factory for assistance.

6.3 Relay Circuit Checkout

A. The relay circuit consists of double-pole double-throw relay contacts brought out to terminal strips. When the relays are operating properly, two pairs of contacts will be
open with high or low level, and two pairs will be closed with high or low level. See Figure 6-2.

![Relay Contact Chart](image)

**Figure 6-2. Relay Contact Chart**

A. Adjust the instrument as described in the electronics checkout section 6.2.

C. Relay operation may generally be heard as an audible click when the background noise is not too high. Use one of the methods shown in Figure 6-3 to determine if the relay contacts are switching.

D. Difficulty in calibration can often be traced to improper wiring of the relay terminals to an annunciator or other panel device. Check the wiring against the relay chart in Figure 6-2. Be sure to use the diagram for the fail-safe in which the instrument is set.

### 6.4 Sensing Element Checkout

A. With an analog* ohmmeter, check the resistance between the sensing element center and ground terminals with the material level below the probe. See Figure 6-4. Resistance should be infinite. Resistance less than 1 megohm indicates excessive leakage probably due to product or condensation in the conduit, around the gland/packing nut area (consult factory).

B. Check the resistance of the probe to ground with the level above the probe. See Figure 6-5. Resistance readings less than 1 megohm may indicate defects in the probe insulation (consult factory).

*A digital ohmmeter may give misleading readings.
6.5 Cable Checkout

See Figure 6-6.

Note: If there is water or other conductive material in the conduit, it could cause the instrument to fail. If this is the case, it will not be detected by the following test.

1. **DISCONNECT CABLE AT BOTH ENDS. BE SURE ALL TERMINALS ARE STANDING CLEAR.**

   ![Diagram of cable with labels](image)

   **Figure 6-6**

   **SHIELD WIRE (RED)**
   **CENTER (PROBE) WIRE (BLUE)**
   **GROUND WIRE (GRN)**

   **INSTRUMENT END**
   **PROBE END**

   **SHIELD CUT BY FIELD INSTALLER IN MANY APPLICATIONS**

2. **MEASURE RESISTANCE FROM CENTER WIRE TO COTE-SHIELD. RESISTANCE SHOULD BE INFINITY (OPEN CIRCUIT).**

3. **SHORT PROBE & GROUND TERMINALS TOGETHER AT ONE END.**

4. **MEASURE RESISTANCE FROM PROBE TO GROUND TERMINALS AT OTHER END. RESISTANCE SHOULD BE NEAR ZERO OHMS (SHORT CIRCUIT).**

5. **REPEAT STEP 2 FOR COTE-SHIELD AND GROUND TERMINALS.**
7.0 Factory and Field Service

7.1 Telephone Assistance

If you are having difficulty with your Drexelbrook equipment, and attempts to solve the problem have failed, notify your local Drexelbrook representative, or call the factory direct and ask for the service department. Drexelbrook Engineering Company is located at 205 Keith Valley Road, Horsham, Pa. 19044. The telephone number is (215) 674-1234. To help us solve your problem quickly, please have as much of the following information as possible when you call:

Instrument Model #

Probe Model #

P.O. #

& Date

Cable Length

Application

Material being measured

Temperature

Pressure

Agitation

Brief description of the problem

Checkout procedures that failed


7.2 Equipment Return

Do not return equipment without first contacting the factory for a return authorization number. Any equipment being returned must include the following information in addition to that above.

Reason for return

Return Authorization#