CONTENTS

Chapter 1
Description

The Series 5000 is designed as a fully programmable digital temperature indicator and miniature datalogger. The displays are 0.56" in-line red LED type. The menu driven display prompts and 14-segment alphanumeric characters make programming simple. Front panel programming is accomplished through three front panel keys. Degrees F or degrees C are indicated by a green, .4" seven segment LED located to the right of the main display. Resolution is selectable either 1° or 0.1°. A single dash (-) displayed at the left of the readout indicates a negative temperature. Positive readings are inferred (no dash displayed). Overload is indicated by an 'OL' on the display. Plus OL (+OL) indicates a positive over range condition or an open thermocouple. Negative (-OL) indicates a negative over range condition. The 5000 is powered by a 100-240Volt, 50-400Hz AC source and uses a switching power supply for maximum input power flexibility.

The unit will accept, depending upon the model, J, K, E, T, R and S thermocouples or 3/4-wire 100 ohm Platinum RTD's, either .00385 or .00392.

Serial communications is standard RS232. This bi-directional serial port allows the user complete program set-up, programming and operational capability. All controls and features are selectable through the front panel. The front panel lens may be removed to install or remove the program lockout jumper or adjust the analog output if necessary. Power and serial connections to the meter are made to the

rear of the instrument via a removable Euro-style terminal block. Sensor connections are made by screw terminals also on the rear of the instrument.

Minimum and Maximum values are always available for viewing. On the Basic model (no options), the information is accessible through the front panel menu system. Configuration settings are stored in on-board memory and are not affected by power loss.

The following models are available (see list below).

Thermocouple Models

5000T-BA32	basic unit-RS232 standard
5000T-MI32	multiple-input option, single alarm
5000T-AV32	analog out option voltage, dual alarm
5000T-AI32	analog out option current, dual alarm
5000T-AL32	dual alarm

RTD Models

5000R- BA32	basic unit-RS232 standard
5000R- MI32	multiple-input option, single alarm
5000R- AV32	analog out option voltage, dual alarm
5000R- AI32	analog out option current, dual alarm
5000R- AL32	dual alarm

Chapter 2
Installation

Panel Installation

1. Prepare a mounting panel cutout by cutting a rectangular hole (3.62" +0.02/-0.0" X 1.77" + 0.02/-0.0") in the desired location (see Figure following page). The maximum panel thickness is 3/8 inches.

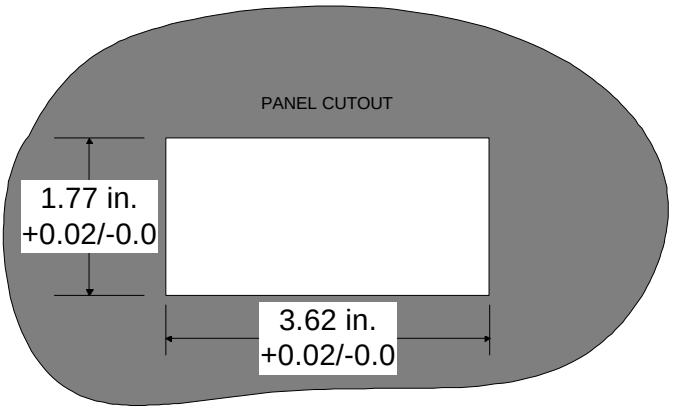
2. Remove the mounting bracket from the instrument housing by removing the two screws on the rear of the indicator..

3. Remove the pluggable terminal block located at the rear of the unit and wire the input power and RS232 wires. If an option board is installed in the indicator, remove the connector and make the appropriate connections (refer to diagrams).

WARNING!

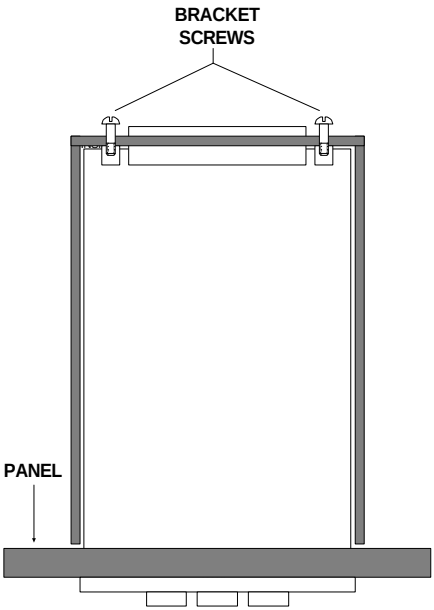
Dangerous voltages are exposed at the screw terminals. Always remove power before working in this area for rewiring, disassembly, and all other activities that involve proximity to electrical

circuitry. Allow at least 10 minutes prior to working on the unit.



4. Install the indicator in the panel cutout from the front side of the panel. Be sure the instrument is right-side-up. See figure on following page.

5. Reinstall the mounting bracket on the indicator. Tighten the bracket screws to achieve a snug fit against the panel. Avoid distorting or cracking the housing by not over- tightening the bracket screws.

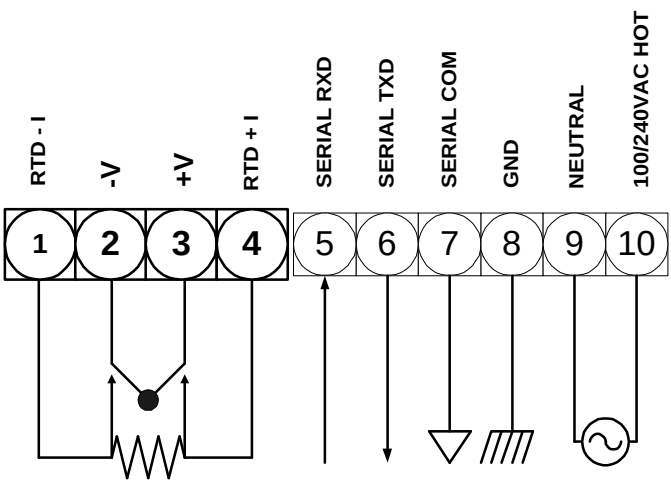

BRACKET
SCREWS
PANEL

Single Channel Wiring

For easy installation, remove the pluggable terminal block located at the rear of the unit. Connect the input power and RS232 wires to the wire entry locations beneath and perpendicular to the plug-in direction according to figure below.

WARNING!

Dangerous voltages are exposed at the screw terminals. Always remove power before working in this area for rewiring, disassembly, and all other activities that involve proximity to electrical circuitry.

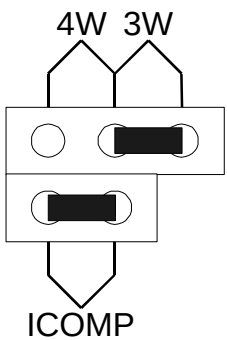


Three Wire RTDs

Note: All RTD units are shipped from the factory configured for 4-wire RTDs unless otherwise requested. To enable the unit to measure 3-wire RTDs, remove the electronics assembly from the housing and complete the following steps. If an option card is installed, remove the top and bottom screws and carefully lift the option card from the main board assembly.

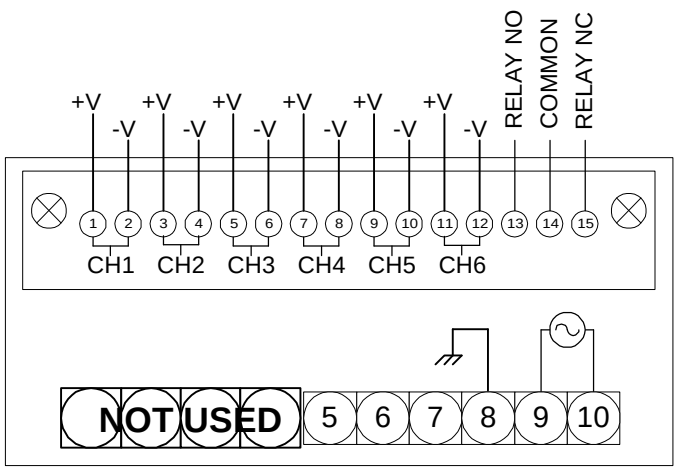
Step 1. Remove the jumper located on the topside on the main board from across pins labeled 4W and install it across the pins labeled 3W.

Step 2. Place the jumper provided across the header labeled ICOMP. This completes the configuration from 4-wire RTD to 3-wire RTD.

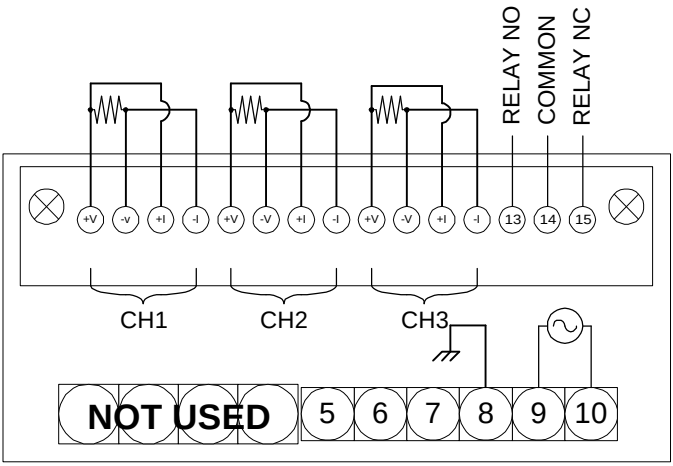


Thermocouple Multiple Input-Wiring

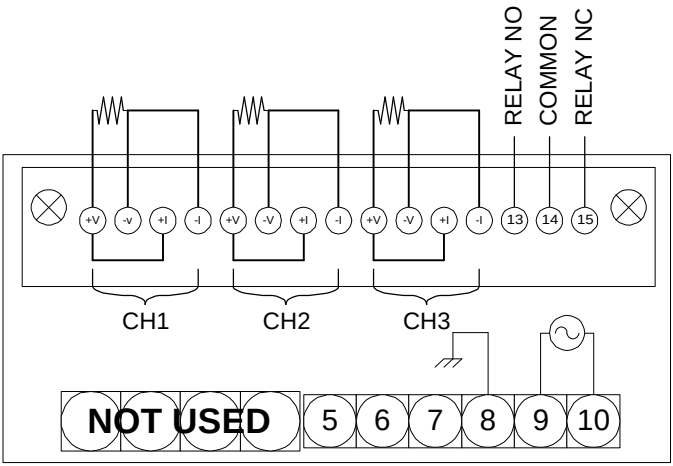
The Multiple Input Option uses a quick disconnect terminal block to facilitate wire installation and servicing. The terminal block engages the printed circuit board (PCB) fingers of the Multiple Input board which fits through the upper slot located at the rear of the unit. The method of attachment is the same as for a PCB edge connector: push on/ pull off. If desired you can use the two screws that are provided for securing the connector to the instrument case. Note that terminal numbers 13, 14 and 15 are provided for limit relay contact access.



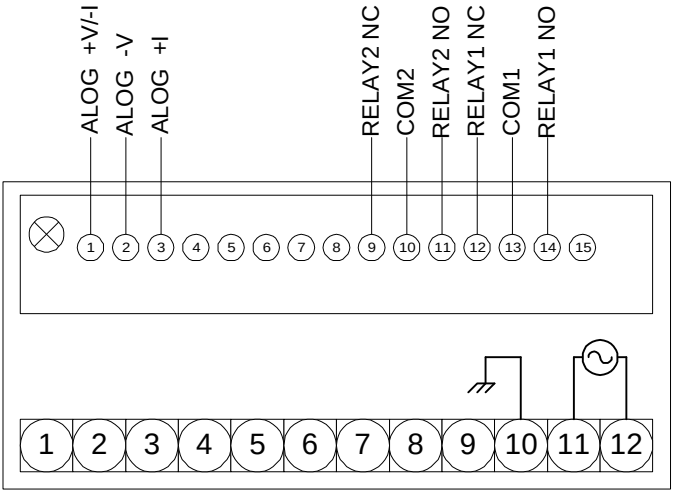
RTD 4-Wire Multiple Input-Wiring



RTD 3-Wire Multiple Input-Wiring

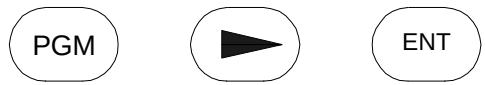


Analog Output/Dual Alarm Wiring



Chapter 3
Operation

Your indicator is programmed by a series of menu driven displays that are operated by three front panel pushbuttons; Program-PGM, Arrow-Δ, and Enter-ENT.



PROGRAM ARROW ENTER

Addressing the main menu items configures the indicator. The indicator has a program lockout jumper located behind the front panel lens. Removing the jumper will prevent any front panel changes of the indicator programming. The indicator may still be programmed via the computer interface. When using the Series 5000 Viewer Software the front panel keyboard is automatically disabled. The basic unit has three main menu items that define the configuration of the indicator and one calibration menu.

1. **INPT:** Sets up sensor type, °F/°C, and 1 deg/0.1 degree resolution.

2. **MATH:** Selection enables viewing of either minimum or maximum value.

3. **CAL:** Used for calibration

.

The following menu items are displayed only when the appropriate option is installed-

5. **ALM1/ALM2:** Sets relay trip points to a programmed value as well as other alarm related parameters

6. **AOUT:** Programs the indicator to translate the display to a proportional analog output signal

7. **MULT:** Configures indicator for multiple same type input sensors

Pressing the PGM key allows you to access any of the menus listed above by placing the indicator in program mode, indicated by a 'P' lit to the right of the display. Placing the indicator in PGM mode will prevent the indicator from performing measurements. Any alarm monitoring will be disabled.

If the PGM key is pressed anywhere within a menu, the menu reverts to the previous menu level. Repeatedly pressing the PGM key will return the indicator to the display mode. Choices within a menu are viewed by pressing the ARROW key. A menu item is selected by pressing the ENT key for selection, or edited by pressing the ARROW key. Generally, the ARROW key allows you to scroll horizontally through a selection of choices while the ENT key enables you to make selections and move down vertically to the next menu item.

If the alarm option is installed and the alarm relays

are set to unlatch manually (‘MAN'), relay #1 may be unlatched by pressing and holding the ARROW key while pressing the PGM key. Pressing and holding the ARROW key while pressing ENT key will unlatch relay #2.

Note: Basic units shipped from the factory are configured for type K thermocouple, °F, 0.1 degree resolution.

Multiple Input models are shipped from the factory with a 5 second scan rate, channel 1 on, all alarms off with the setpoint set LOW at 0000.

Dual Alarm/Analog Output models are shipped with both alarms off, set for LOW and 0000. Deviation value set to 0000. Analog out is set to scale from 0° to 1000° with either 0-10VDC or 4-20Ma out.

Sensor Setup

Example: To select Type K thermocouple, °F, and 0.1° resolution...

STEP 1. Press the PGM button. PGM will appear on the display. The °F/°C LED will change to P (for ‘Program Mode).

STEP 2. Press the Arrow key until INPT appears on the display. Open the Input Menu for programming by pressing the ENT key. One of the seven thermocouple types and two RTD types will appear on the display (J,K,E,T,R,S,392,385).

Scroll through the various sensor types by pressing the Arrow key until a “K” appears on the display. Press the ENT key to select K type thermocouple.

STEP 3. An F or C will appear. Pressing the Arrow key repeatedly will cause C and F to alternate on the display. With F on the display, select degrees F by pressing the ENT key. DCPT will appear. The Arrow key allows you to toggle back and forth between 0.1 and 1.0 degree resolutions.

STEP 4. To select 0.1° resolution, with 0.1 on the display press the ENT key. At this point the display will show the MATH menu item*. To open the MATH menu for programming, press the ENT key. To go back to the mode, press PGM key. In order to scroll through the various menu items press the Arrow key.

**MATH functions are available on units with Multi-channel option installed only through the Doric 5000 Viewer Software.*

Math Function Setup

Example: View the maximum temperature value recorded.

Note: A running record is kept of the minimum, and maximum values of temperature. Nothing is required to initiate this recording. These values are

there whenever you need them. You can display the Minimum or Maximum value by following the steps below.

STEP 1. With the MATH menu on the display, open this menu item by pressing the ENT key. MIN is on the display.

STEP 2. Press the Arrow key to toggle between MIN and MAX. When the display shows MAX, press the ENT key and the display will now indicate the maximum value. The MIN/MAX memory may be reset at this point by pressing the Arrow key. With CLR (CLEAR) on the display, press ENT. His will restart the recording process. To go back to the current temperature display, press the PGM button and the display will indicate the current temperature reading.

Multiple Input

The multiple input option will enable the user to monitor up to 6 same type thermocouple inputs, or 3 three-wire/four-wire RTDs. Any number of channels can be selected manually or scanned automatically. Alarm limits may be assigned to individual channels. One NO/NC 5 amp 115VAC relay contact is available for high or low alarm limit programming.

Two modes are selectable for the multiple input option- manual (MAN), and automatic (AUTO). MAN mode allows the user to view a selected channel. Pressing the arrow key advances the display to the next active channel. The channel number is indicated by a .4" green LED located in the upper left-hand corner of the display. To begin scanning,

select AUTO. The scan rate is selectable in one-second increments between 5 and 20 seconds. The display readout will then sequentially show the temperature of the active channels. Any number of channels may be selected for scanning.

If an alarm limit is exceeded on any displayed channel, the display will flash, and the relay contact will latch. The relay will remain latched until the alarm condition clears. In scanning mode the display will flash on the alarm channel as it scans.

By using the Doric Series 5000 Viewer, the Series 5000 can log and send multiple channel data through the serial port making it a miniature datalogger.

Dual Alarm

The alarm card has two 5 amp/115VAC relays for high, low or deviation setpoints. The alarm card is available by itself or with analog output (either voltage or current). Relay setpoints are programmed through the front panel menu or via the serial port. An alarm limit may be disabled within the alarm menu by selecting OFF at the first menu prompt. If OFF is selected the display will return to the next main menu item for further programming. If ON is selected the menu proceeds down through the alarm menu for further setpoint programming.

The relays can be operated in MAN or AUTO mode. In AUTO mode, the relay unlatches by itself once the alarm limit is no longer exceeded.

In MAN mode the relay is reset manually. However, the display continues to flash until the alarm limit is no longer exceeded.

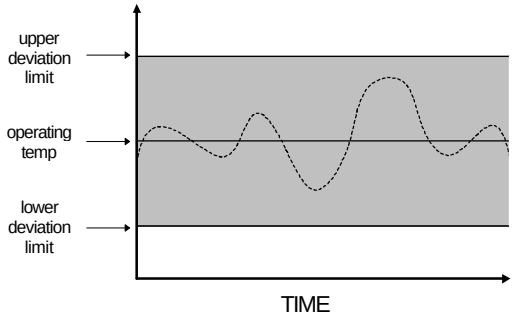
- Pressing and holding the Arrow key and pressing the PGM key resets Relay 1 (ALM1).
- Pressing and holding the Arrow key and pressing the ENT key resets Relay 2 (ALM2)

Note: When the Viewer Software is being used, the front panel keys are disabled. Relays must therefore be reset using the Unlatch buttons on the Viewer control panel.

When HIGH is selected, a temperature greater than or equal to the limit value will cause an alarm. When LOW is selected, a temperature less than or equal to the limit value will cause an alarm.

Using Deviation

Deviation allows the user to assign alarm limits above and below the normal operating points of a process. If the temperature remains within the high and low deviation setpoints no alarm occurs. If the temperature equals or exceeds either the high or low deviation limits an alarm occurs. Hysteresis and delay are also programmable for deviation setpoints (see following explanations). Deviation allows the user to assign two setpoints per alarm relay for a total of four alarm setpoints per alarm option (See drawing below). This could be useful for indicating a warning condition with one relay and an emergency condition for the other relay.



Hysteresis

Hysteresis or deadband is used to delay the unlatching of a tripped relay. Hysteresis may be selected within the alarm menu as either ON or OFF. Hysteresis is selectable from 0-99 degrees in 1° increments. For example, a limit with a hysteresis value of 5 assigned to it means that the display value must return 5° below the alarm setpoint before the alarm condition is cleared (the relay resets). Hysteresis assumes negative values for HIGH limits and positive values for LOW limits.

Delay

Programming the meter for alarm delay prevents an alarm trip for a specified period of time (0-9 seconds). An alarm delay would be used whenever an unstable or noisy input signal is present. By filtering out short duration alarm conditions, alarm delay prevents unnecessary alarms from occurring.

Analog Output

The analog output option translates the indicators' display reading to a proportional analog output signal. There are two versions of the analog output option, either 0-10VDC or 4-20ma. Both voltage and current outputs are scaleable within their ranges and are similarly programmed. Note that the analog output is active only in the display mode. As soon as the indicator is put in the program mode, indicated by a P in the lower right hand corner of the display, the output goes to its zero output value. The display reading can be scaled from -999 to +9999, which enables the user to use only a portion of the full scale if necessary.

Analog Output Setup

Example1: Program the indicator to output 4.0 ma at 32.0° F and 20.0 ma at 500° F...

STEP 1. Press the PGM button. PGM will appear on the display. The °F/°C LED will change to P (for 'Program Mode).

STEP 2. Press the Arrow key until ALOG appears on the display. Open the ALOG Menu for programming by pressing the ENT key.

STEP 3. A LOW or HIGH will appear. Pressing the Arrow key repeatedly will cause LOW and HIGH to alternate on the display. With LOW on the display, select LOW by pressing the ENT key. The digits 0000 will appear with the left most

digit flashing. With the ARROW key select the number 0. Press ENT. The second digit will flash. Enter 0 again with the ARROW key. Continue on until 0032 is on the display with the 2 flashing. Press ENT.

STEP 4. HIGH will appear on the display. Press ENT. Set the first digit to 0 by using the ARROW button. Set the second digit to 5 and so on until 0500 is on the display. With the farthest digit to the right flashing, press ENT. The next menu item appears.

Example2: Program the indicator to output 0.0 VDC at 0°F and 5VDC at 1000°F.

Note: The analog output may be scaled to output various voltages such as 0-2VDC, 1-5VDC etc.

STEP 1. Press the PGM button. PGM will appear on the display. The °F/°C LED will change to P (for 'Program Mode).

STEP 2. Press the Arrow key until ALOG appears on the display. Open the ALOG Menu for programming by pressing the ENT key.

STEP 3. A LOW or HIGH will appear. Pressing the Arrow key repeatedly will cause LOW and HIGH to alternate on the display. With LOW on the display, select LOW by pressing the ENT key. The digits 0000 will appear with the left most digit flashing. With the ARROW key select the number 0.

Press ENT. The second digit will flash. Enter 0 again with the ARROW key. Continue on until 0000 is on the display with the 0 flashing. Press ENT.

STEP 4. HIGH will appear on the display. Press ENT. Set the first digit to 2 by using the ARROW button. Set the second digit to 0 and so on until 2000 is on the display. With the farthest digit to the right flashing, press ENT. The next menu item appears.

Chapter 4

Calibration

Thermocouple Type: Single Channel

Equipment Required:

1. Precision voltage source with a resolution to 1uV and an accuracy of ±0.01% or ±2.0uV.

2. Interconnecting copper wire from the DC source to the indicator.

3. Trimmer adjusting tool.

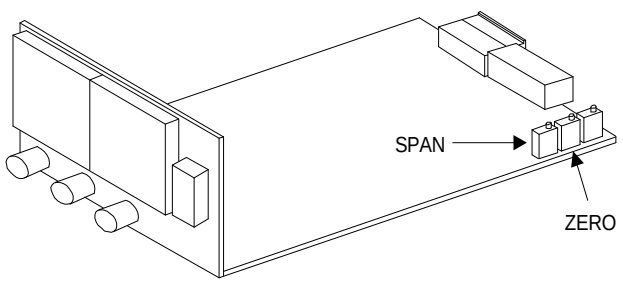
WARNING!-Dangerous voltages exist on charged capacitors even after unit is de-energized. Allow 5 minutes of discharge time before removing unit from case.

STEP 1. Remove power and snap off the front panel lens. Leave the keypad attached to the display board, as it will be required to enter the calibration menu. Remove the rear pluggable connector from the rear of the indicator and slide

the main board electronics out of the case from the front. (Gently lift the display board above the catch located on the bottom of the inside of the plastic housing while pushing on the rear male connector on the rear of the main board assembly.)

STEP 2. Observing polarity, connect the DC voltage source to the thermocouple inputs according to the wiring diagram located on the plastic housing. With the power **OFF,** plug in the wiring connector to the rear of the main board. Turn power on and allow at least a 10-minute warm-up.

STEP 3. Enter the program mode by pressing the PGM key and then the ENT key. The INPT menu appears. Press the Arrow key until the CAL menu appears. Press ENT. Input 0.00 mV and adjust the ZERO potentiometer RV201 (see figure below) for a display of 0.0 ± 0.1.



NOTE: Display readings take up to 10 seconds to respond to changes in the zero and span pots.

STEP 4. Adjust the voltage source output to 39.000 mV. Adjust the SPAN potentiometer RV203 for a display reading of 560.0 ±0.1. Press PGM to exit the calibration mode. Turn the indicator power OFF.

NOTE: The reference junction adjustment is factory set. However if after performing the zero and span calibration the unit is not accurate within factory specifications, an adjustment of the reference junction may be necessary.

STEP 5. Reference Junction Adjust With the power turned OFF, remove the copper wires from the +V and -V input connections and connect a thermocouple simulator with K thermocouple wire, connect the negative lead (red) to terminal 2 and the positive lead to terminal 3.

STEP 6. Turn power on and allow several minutes warm up. Program the indicator for K thermocouple type, °F (see Chap.3 Sensor Setup). Adjust the input source for an output of 32.0°F and adjust RV202 for a display reading of 32.0°F. Allow at least 15 seconds between adjustments. This completes the thermocouple type calibration procedure.

RTD Type:

Equipment Required:

1. Precision resistance decade box with a resolution of 0.01Ω and an accuracy of ±0.02%.

2. Interconnecting copper wire from the resistance source to the indicator.

3. Trimmer adjusting tool.

WARNING!-dangerous voltages exist on charged capacitors even after unit is de-energized. Allow 5 minutes of discharge time before removing unit from case.

STEP 1. Remove power and snap off the front panel lens. Leave the keypad attached to the display board as it will be require to enter the calibration menu. Remove the rear pluggable connector from the rear of the indicator and slide the main board electronics out of the case from the front. (Gently lift the display board above the catch located on the bottom of the inside of the plastic housing while pushing on the rear male connector on the rear of the main board assembly.)

STEP 2. Observing polarity, connect the decade box to the RTD input (+V, -V, +I, -I) to the pluggable connector RTD

inputs according to the wiring diagram located on the plastic housing. With the power **OFF,** plug in the wiring connector to the rear of the main board. Turn power on and allow at least a 10-minute warm-up.

STEP 3. Enter the program mode by pressing the PGM key and then the ENT key. Press the ARROW key to scroll through to the CAL menu. Press ENT. Adjust the zero potentiometer RV201 (see FIG 4.1) for a display of 0.0 ± 0.1.

NOTE: Display readings take up to 10 seconds to respond to changes in the zero and span pots.

STEP 5. Adjust the decade box to 265.00Ω. Adjust the SPAN pot potentiometer RV203 for a display reading of 543.8 ±0.1. Press PGM to exit the calibration mode.
Turn the indicator power OFF, re-install the main board back into the case. Apply power to the instrument and reset the input type to the desired sensor.

Analog Output Current :

NOTE: The Analog Output Current option is calibrated from the factory to output 20.00 ma with 1000° on the display and 4.00 ma with 0.0° on the display. The output may be trimmed to meet your specific application.

Equipment Required:

1. Precision current meter with 0.1% accuracy and 10uA resolution.

2. Interconnecting copper wire from the DC current source to the indicator, +I to terminal 3 and –I to terminal 1 of the 15 position terminal block located at the rear of the unit..

3. Trimmer adjusting tool.

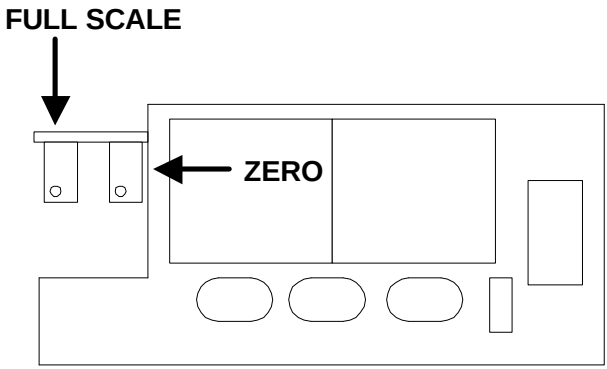
4.Thermocouple simulator for Thermocouple units or Precision resistance decade box with a resolution of 0.01Ω and an accuracy of ±0.02%.

STEP 1. Remove power and snap off the front panel lens. Leave the keypad attached to the display board as it will be required to enter the programming menu.

STEP 2. Apply power to the unit and allow at least a 10 minute warm-up. Program the unit for the appropriate sensor type.

STEP 3. With the input set to correspond with the LOW input, adjust the zero pot to read 4.00ma on the DC Ammeter.

STEP 4. With the input set to correspond with the HIGH or full scale input, adjust the full scale potentiometer to read 20.00ma on the DC Ammeter.



Analog Output Voltage:

NOTE: The Analog Output Voltage option is calibrated from the factory to output 10.00 VDC with 1000° on the display and 0.00 VDC with 0.0° on the display. The output may be trimmed to meet your specific application.

Equipment Required:

1. Precision voltage meter with 0.1% accuracy and 10mVDC resolution.

2. Interconnecting copper wire from the DC current source to the indicator, -V to terminal 3 and +V to terminal 1 of the 15 position terminal block located at the rear of the unit..

3. Trimmer adjusting tool.

4.Thermocouple simulator for Thermocouple units or Precision resistance decade box with a resolution of 0.01Ω and an accuracy of ±0.02%.

STEP 1. Remove power and snap off the front panel lens. Leave the keypad attached to the display board as it will be required to enter the programming menu.

STEP 2. Apply power to the unit and allow at least a 10 minute warm-up. Program the unit for the appropriate sensor type.

STEP 3. With the input set to correspond with the LOW input, adjust the zero pot to read 0.00VDC on the DC voltmeter.

STEP 4. With the input set to correspond with the HIGH or full scale input, adjust the full scale potentiometer to read 10.00VDC on the DC Voltmeter.

Chapter 5

Doric Series 5000 Viewer Overview

Series 5000 Series indicators interface to PC compatible computers through the RS232 port. Configuration of RS232 is accomplished simply by selection of COM port. Baud rate and communications parameters are automatically configured. All Series 5000 series features (Alarm Status, Input Identification, Min/Max Indication, Time Tagged Readings) are presented with a simulated LED display in an on-screen control panel format.

The internal indicator clock is automatically set to your computers time and date each time you launch the Series 5000 Viewer Software. The Doric Series 5000 Viewer enhances the Series 5000 series indicators by adding large volume data logging capability. Data is logged to formatted ASCII text files that are compatible with most modern spreadsheet applications. Data can be logged in increments from 1 minute to 24 hours.

Minimum PC requirements

486 Processor minimum (Pentium recommended)
Windows 95/NT
16 Mb ram (32 recommended)
Mouse
3.5 inch disk drive
9 or 25 pin Serial Communications Port

File Formats

Space delimited ASCII text
DATE TIME AM/PM CHAN TEMP °F/°C

Installation

1. Connect a communications cable between your PC and the meter according to the diagram next page.

2. Start Windows 95.

3. Insert disk into drive A or (B).

4. In Windows 95 chose RUN from the Start menu.

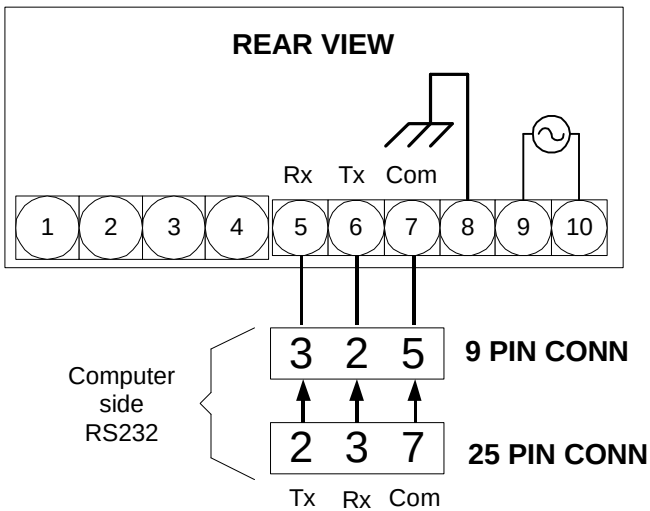
5. Type A:\setup (or B:\setup) and click OK.

5. The Installation Wizard will guide you through the remainder of the installation procedure.

After launching the program, your instrument and PC should communicate. **If your unit is not communicating ensure the serial communications cable is wired correctly and the proper COM port is selected.**

Note: Once communications is established, the PC has control of the instrument and the front panel keys become non-functional. In order to regain control of the front panel the software program

must be closed. If the configuration of the unit has changed e.g. thermocouple type, the software will read and reconfigure itself to match the instrument.



Operation

Alarms- A small box located to the left of the alarm box indicates alarm status. An **L** inside the box indicates a low alarm limit and an **H** indicates a high alarm limit. A grey box with no letter indicates an inactive alarm.

- A green box indicates an active alarm not in an alarm condition
- A flashing red box indicates that the channel is in an alarm condition

If an alarm condition occurs while the Viewer window is minimized, the window will reopen automatically to alert the user that an alarm limit has been exeeded.

Multiple Input Models

- When in MANUAL mode, the instrument can only monitor the selected channel. The selected channel and its' ID is displayed under the simulated display
- The next ***active*** channel may be viewed by pressing the NEXT button located beneath and to the left of the simulated display
- If a selected channel alarms and the next channel is selected, the flashing red indicator turns yellow. This indicates that this channel was in an alarm condition when last viewed.

Logging data

To create a file of logged data, open the preference menu by clicking the Preferences button located in the upper right hand corner of the Viewer window. Open the LOG menu by clicking the LOG button. You may name your file any acceptable Windows 95 name. The default file extension is .dat. The path for your log file will be shown on the main control panel window. Select the interval (between 0-24 hours at 1 minute increments.) at which logs will be taken.

Close the log preference window. To begin logging, click the button on the main control panel labeled OFF. The button will change to ON and the unit will now begin logging.

Chapter 6

General Electrical Specifications

Repeatability +/- 1 Count (single channel only)

Stability with temperature
Zero: 1uV/° C
Span: .01%
Thermocouple Reference Junction Internal, automatic, 0.03 degrees C/degrees C, 5 °C to 45 °C.

Break Detection Upscale ≈ 50nA unit displays OL.

Stability with Time .8°/year

Noise Rejection
NMRR: 60dB @ 50/60 Hz
CMRR: 120dB @ 50/60 Hz (+/-0.1Hz with 250Ω unbalance)

Overload Protection
Power leads to ground: (1500VDC or VAC RMS)
Across inputs, for one minute:
T/C up to 250VDC or VAC, V+ to V-

Input Impedance

Thermocouple: 20MΩ, exclusive of break detect current effects
RTD: 16.9kΩ, V+ input to I input

RTD Lead Wire Error

At 150uA excitation current: 40mΩ/Ω of equal resistance in V+ and V- leads,1Ω of inbalance in V+ or V- leads

Point Update Rate

2 per second nominal (1° readings)
1 per second nominal (.1° readings)

Display

4 Digit, 14-segment red or green .56 in. height LED plus 1 .4 in green °F/°C LED

Enviornmental Ranges

Operating: 0°C to 50°C
Storage: -40°C to +65°C
Humidity: ≤80%RH non-condensing

Multi-input Option Accuracy

Add ±1.0°C/2°F to instrument accuracy specification from 60° To 80°F

Alarm Relay Contact Rating

5A@ 120VAC(non-inductive load) Form C

Power 100-240VAC (±10%), 50-400Hz, switching power supply

Accuracy Specification ± 1 digit

INPUT TYPE	1° Resolution	0.1° Resolution
J,K,T,E thermocouples	1° plus 0.03% rdg	0.5°C or 0.9°F
R and S thermocouples	1° plus 0.03% rdg	1 DEG ONLY
PT100a .00385, PT100a .00392 RTD	1° plus 0.03% rdg	0.5°C or 0.9°F

*Accuracy percentage of reading ±1 digit

RS232 Serial Communications (Standard)

Type: full-duplex voltage, isolated from ground to 500VAC. Complete configuration set-up and message display capability, programmable to transmit current display, set 1°/0.1°resolution, thermocouple type, F°/C° plus alarm status and scanning channel indication in ASCI II code. 9600 bps 8 bits no parity 1 stop bit. Isolation: Isolated between input and internal circuit to 500VAC

Analog Output (Option)

0-10VDC (load current 2ma maximum)

4-20mADC (load resistance 300Ω maximum)

Accuracy: ±0.25% full scale of display value

Resolution: Approximately .0125 Full scale

Isolation: Isolated between input and internal circuit to 500VAC.