RG-4T Installation & Operation Manual

Installation

The RG-4T Gauge is designed to "flush mount" in a standard 2 5/8" (2.625")(67mm) hole or plugged into our versatile Bullet Mount.

NOTE: Even though the T6 Billet Housings are very durable, the silver gauge is susceptible to scratching. If handled with care, (and an annual waxing or polishing), your gauge will be show quality for a lifetime! The Black Anodized Gauges are less likely to scratch. These are Industrial Black Anodized which should last more than 30 years but will still respond to a good waxing or polishing.

Wiring

1) Connect the power leads of the main wiring harness to vehicle power; RED to positive and BLACK to ground.
2) Plug the 15-pin D-Sub connector of the main wiring harness into the bottom male connector on the back of the RG4T gauge.
3) Attach the membrane control switch to the RG4T gauge by connecting its six (6) conductor connector to the six (6) conductor connector on the main wiring harness.
4) If using the option remote warning LED, connect it to the mating 2-conductor connector on the main wiring harness.
5) If or when using the optional RS-232 cable, connect the 9-pin D-sub side of the cable to the desired port on the PC. Connect the other end (3-conductor) to the mating 3-conductor connector on the main wiring harness. A USB to RS-232 cable adapter can be used if your PC does not have a 9 pin RS-232 connector.
6) Connect the female 9-pin D-Sub connector with up to four (4) thermocouples into the top male connector on the back of the RG4T gauge. See Thermocouple Installation Guide.
7) Secure with aluminum bracket and brass thumbscrews.

Operation

When powered on, the RG4T gauge performs a self-diagnostic routine and checks for connected devices such as the remote LED, data logging port, etc. It then displays the measured temperature of thermocouple sensors 1 & 2. The temperature scale (F or C) is also displayed. The temperature of sensors 3 & 4 are displayed by depressing the lower arrow key labeled 3-4 on the remote membrane panel. The display is returned to the first two (2) sensors by depressing the upper arrow key labeled 1-2. The membrane arrow keys are used to alternate the display between thermocouple sensor pairs **1&2** and **3&4.**

A temperature display of "- - -", indicates that the RG4T gauge does not detect a thermocouple on the corresponding input.

User Preset Temperature Alarm/Warning Limits

The RG4T automatically alerts the operator of over-temperature conditions on any of the installed thermocouples. The over-temperature limits can be programmed independently for each thermocouple. When an over-temperature condition is detected, the RG4T automatically switches the LCD display to ensure the offending sensor's temperature is displayed. To alert the operator, the critical temperature will be displayed flashing twice per second. The reading will continue to flash until the temperature drops back below the user over-temperature limit setting. If the optional remote LED is installed, it will be illuminated when an over-temperature condition exists on ANY of the installed thermocouples.

Example: If sensors 1 & 2 are displayed and either sensor 3 or 4 exceed their temperature limit; the RG4T automatically switches the display to the sensor 3 & 4 pair with the offending temperature flashing.

If the display has changed due to an over-temperature condition, the operator can still switch the display back and forth between the 1&2 and 3&4 pairs with the up (1-2) and down (3-4) arrow buttons. The corresponding numbers (i.e. 3 & 4) for the EGT in over-temperature will continue to flash and the optional remote LED remains illuminated until the temperature drops back below the pre-set limit.

NOTE: The RG4T gauge is shipped with a default alarm limit of 1200 degrees Fahrenheit and an 85% backlight setting.

User Settings

The operator can change the following gauge settings:
1) Temperature scale (Fahrenheit or Celsius)
2) Temperature alarm/warning limits in 1 degree increments for each thermocouple. The warning limit can be set to any value in a range of 0 to +1999 degrees (F or C)
3) Backlight illumination from 0 to 100% in 1% percent increments.

These settings are changed using the supplied membrane panel. Setting the values is similar to setting the time on a digital clock.

1) During normal operation, depress and hold the upper arrow key labeled (1-2 /SET) for 2 seconds. The gauge transitions into the SET mode.
2) The current temperature scale ("FAH" or "CEL" and corresponding "F" or "C" icon) is displayed flashing on the LCD.
3) Use the 1-2 (Up) or the 3-4 (Down) arrow keys to change the temperature scale.
4) Press the HOLD button, this sets the temperature scale and advances to setting the temperature alarm/warning limit values.

5) Each digit of all four (4) temperature limits is set by pressing the 1-2 (Up) arrow key (to increment) or the 3-4 (Down) arrow key (to decrement) the digit. When the digit is set to the desired value, depress the HOLD button to advance to the next digit.

6) After setting the last digit of temperature limit number four (4), "bcL" for Backlight will be displayed on the top line with the current illumination percent on the bottom line. Adjust the backlight intensity to the desired level from 0 to 100% in the same manner used for setting the alarm/warning limits. Press the HOLD button when done.

7) Normal temperature display resumes with new settings stored in memory.

Notes:
- While adjusting the operator settings or accidentally going into the SET mode, normal operation will automatically resume if no buttons are pressed for ten (10) seconds. Any changes made to the settings are lost at this point. This is provided to allow the operator to cancel and ignore the changes if a mistake is made during the adjustment.
- When setting the over-temperature limits, the digit in the 1000's place is set in conjunction with setting the digit in the 100's place. Think of it as setting the 100's place digit between 0 and 10. All other digits scroll between 0 and 9.
- The temperature limits are displayed using the currently selected temperature scale. For instance, if they had previously been set in Fahrenheit and the temperature scale is changed to Celsius, the limits are now displayed in Celsius. The temperature scale is always displayed for clarity.
- The arrow icons located in between the 1–3 & 2-4 icons are Reference Designators and are designed to help the user to identify the correct thermocouple location.

HOLD Function

The HOLD function is handy when you want to freeze all four (4) readings for review. To activate, push the HOLD Key. The HOLD icon is displayed indicating that the hold function is active. Scroll between 1&2 and 3&4 with the up / down arrow keys to compare readings. To exit the HOLD function, push the HOLD button again. The HOLD function can be used over and over without interfering with recording or data logger output.

MAX Function

The MAX feature allows the operator to view the maximum temperatures reached on each of the four (4) thermocouples. To initiate, depress and hold the HOLD/$_{MAX}$ button for two seconds. The LCD MAX enunciator will indicate that the MAX function is active. Scroll between 1&2 and 3&4 to review all readings. To clear and return the

gauge to normal operation, simply push the HOLD button again. The max temperatures are reset to the current measured temperatures. The MAX function can be used over and over without interfering with the record function or data logger output.

REC Function

The REC function Records all four (4) temperatures for 3 minutes, 24 seconds at 2 samples per second (2Hz) per channel. To start the record function, press the REC key. The gauge first flashes a recording number for reference. The REC enunciator also comes on and flashes twice per second while the recording is in progress. To stop the recording early, press the REC key again. The REC enunciator remains illuminated indicating that a recording is in memory. To replay the recording, press the REC button again. The Redline Gauges Logo and arrow icons will disappear while the recording is being replayed. As in normal operation, the 1-2 and 3-4 (Up-Down) buttons can be used during playback to review the four (4) temperature readings. Use the HOLD button to freeze and unfreeze the frames while playing back the recording. The gauge will return to normal operation at the end of the recording or by pressing the REC button again. To make another recording the current recording must be "cleared" (see notes below). The gauge indicates that a recording is available for playback when the REC icon is illuminated. To clear the present recording such that another can be recorded, press and hold the REC/$_{CLEAR}$ Key for 2 seconds. The REC enunciator on the LCD will turn off indicating that the gauge is ready for a new recording. The record function can be used over and over without interfering with the data logger output.

REC NOTES:

- Between 17 & 24 Recordings can be stored at one time in the gauge memory. Only the last recording is available for play back on the gauge. The others can be retrieved and plotted on a PC using Console EGT and the optional RS-232 cable. The record number is used to differentiate between these recordings.
- Note: The MAX function is disabled while playing back a recording, however, the gauge continues to monitor and record the maximum measured temperature.

Features:

Main Operation and Capabilities

Measures Four (4) Independent Thermocouples
·Beautiful Remote Membrane Control Used to Program and Control Gauge (Toggle Display Between Thermocouples)
·Operator Selectable Temperature Scale, Celsius or Fahrenheit
·HOLD, MAX, & RECord Functions
·Operator Programmable Temperature Warning Limits for Each Thermocouple
·Monitors Pre-Set Alarm Limits on All Four (4) Thermocouples Simultaneously
·Supports Optional Remote LED to Alert Operator of Alarm (Over-Temperature) Condition
·Supports RS-232 and CAN Bus Interfaces

·Optional RS-232 Cable Can be Purchased at a Minimal Charge and is Supplied with FREE Easy to Use Software (see ConsoleEgt)

Performance

·LCD Resolution of One (1.0) Degree in Selected Temperature Scale (Fahrenheight or Celsius)

·LCD Displayed Measurement Range of -99 to +1999 Fahrenheit or -99 to +1372 Celsius

·RS232 and CAN Bus (Real-Time and Recorded) Resolution of 0.1 Degree Celsius

·RS232 and CAN Bus Measurement Range of -346 to +2501 Degrees Fahrenheit or -210 to +1372 Celsius Readout

·Nominal Accuracy of +/-0.75 Degrees Celsius +/-0.6% of Measured Temperature (Celsius) (at Gauge Temperature of 25C)

·Accuracy of +/-1.0 Degrees Celsius Plus -0.6% to +1.0% of Measured Temperature (Celsius) (at Gauge Temperature of 80C)

·All Channels Are Measured and Displayed at 6.1Hz

·Real-Time Streaming Measurements (RS-232 and CAN) are Also at 6.1Hz Per Channel

·Measurements are Stored at 2Hz Per Channel Via the Record Function

·Internally Temperature Compensated

·Internal AtoD Converter is Calibrated Every 60 Seconds

Mechanical

·2-5/8" (67mm) Diameter 6061 T6 Solid Aluminum Construction

·Beautifully CNC Machined

·Choice of Machined Finish or Black Hard Industrial Anodizing.

·Flush Mount 2.75" (70mm) Diameter Bezel

·2-5/8" (66.7mm) Mounting Hole

·Heavy Duty Construction @ 7.4 Ounces

·High Quality Bora Silica Lens (Pyrex)

·Silicone O-Ring

·Argon Pressure Filled

Miscellaneous

·Powerful Microprocessor and High Performance Electronics

·Software Controlled Digital Filtering Provides Optimal Accuracy

·Built in Diagnostics and Health Management

·Re-Programmable Allowing for Future Enhancements & Upgrades

·Custom UV resistant LCD with High Contrast Dual EGT Readouts

·0.550" Tall X .320" Wide LCD Digits Make Viewing Easy

·Bright, User Adjustable 16 LED Backlight for Night Time Use

·Retains up to 24 Records @ 3.4 Minutes Each or 81.6 Minutes Total

·All Settings are Retained in Memory When Gauge is powered Off

·Reverse Polarity Protected

·DataLogger Compatible Via CAN Bus