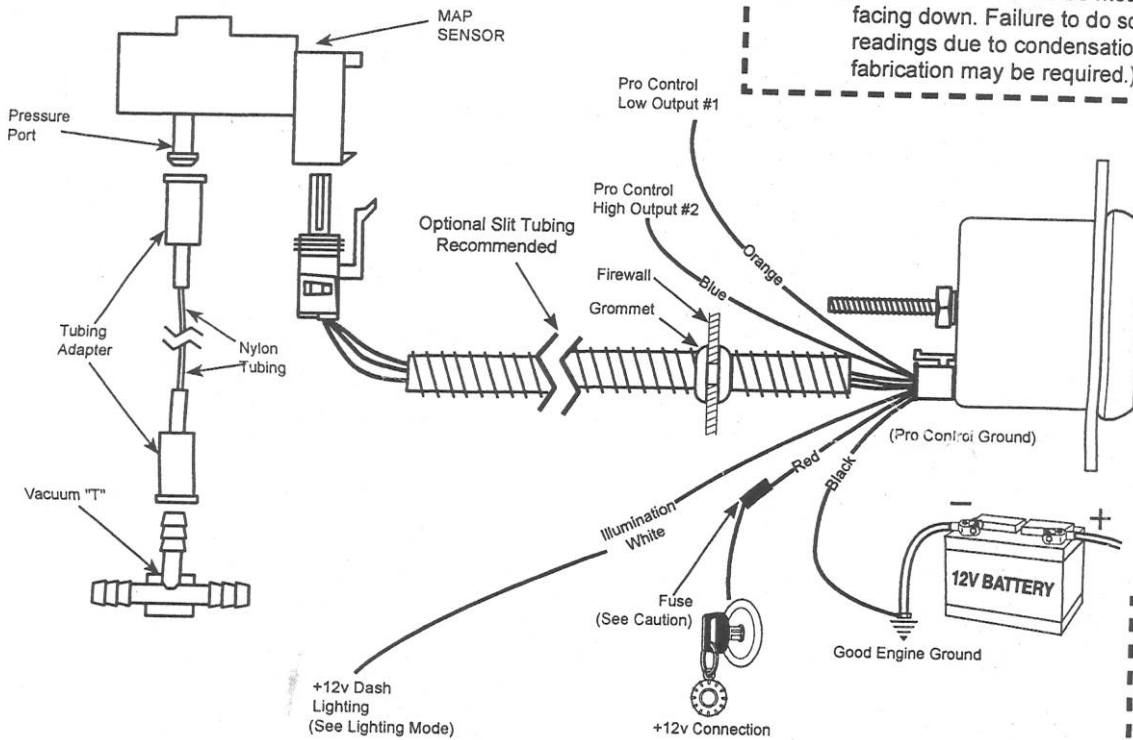


# INSTALLATION INSTRUCTIONS PRO-CONTROL STEPPER MOTOR BOOST/VAC GAUGE

2650-1428-00



**NOTE:** MAP Sensor should be mounted with **PRESSURE PORT** facing down. Failure to do so could result in inaccurate readings due to condensation in the line. (Bracket fabrication may be required.)



**CAUTION!**  
As a safety precaution, the +12V terminal of this product should be fused before connecting to the 12V ignition switch. We recommend using a 1 Amp, 3AG fast-acting type cartridge fuse.

## Installation

1. Check that you have all parts required for installation, and the engine is cool.
2. Disconnect the negative (-) battery cable.
3. Gauge mounts in a 52.4mm hole. Use supplied brackets and nuts to secure gauge to dash.
4. Drill 52.4mm diameter hole where sensor passes through sheet metal (such as firewall) and install rubber grommet provided. (Grommet will require slit.)
5. Securely mount the MAP sensor to the firewall or inner fender with pressure port facing down. (Bracket fabrication may be required.)
6. Install T-Fitting in a manifold vacuum hose. Attach one end of the nylon tubing to the T-Fitting using a tubing adapter. Connect the other end of the nylon tubing to the MAP sensor with the other tubing adapter.
7. Connect the red power wire to a switched +12 volt source, the white wire to dash lighting or switchable 12V light source and the black wire to ground.
8. Reconnect negative (-) battery cable.

## Power-Up

The pointer will move counter clockwise to the stop pin and then moves to the current gauge reading. This procedure is an auto-calibration function and is performed on every power-up. While this test is being performed, the gauge may make a clicking sound. This is normal.

## Peak Recall

Press and hold the **PEAK** button to recall the highest reading since the memory was last cleared. To clear the memory, press and hold the **PEAK** button, and while still holding the **PEAK** button, press the **WARN** button. The pointer will move to the stop pin to indicate that the memory has been cleared. Release the **PEAK** and **WARN** buttons to resume normal operation. The peak recall point is retained when power is removed from the gauge.

## Full Dial Warning

This gauge features full dial warning. When a warning point is reached, the entire dial illuminates in the programmed warning color. This feature is available for both a high and low warning set point. In addition, the warning color will flash when an over warn point is reached.

## Pro Control High Warning Set Point

To adjust the high warning set point, press and release the **WARN** button. The warning light will begin to flash and the pointer will move to the previous high warning set point signifying that warning set mode has been selected. Once in set mode, press the **WARN** button to move the pointer down, or press the **PEAK** button to move the pointer up. Three seconds after the last button press, the warning light will stop flashing and the pointer will return to the current reading. The warning set points are retained when power is removed from the gauge.

## Pro Control High Over Warn Set Point

To adjust the high over warn set point, press and hold the **WARN** button. After three seconds the warning light will begin to flash and the pointer will move to the previous high over warning set point signifying that over warn set mode has been selected. Release the warn button. Once in set mode, press the **WARN** button to move the pointer down, or press the **PEAK** button to move the pointer up. Three seconds after the last button press, the warning light will stop flashing and the pointer will return to the current reading. The over warn set points are retained when power is removed from the gauge.

## Pro Control Low Warning Set Point

To adjust the low warning set point, press and hold the **WARN** button, and while still holding the **WARN** button, press and release the **PEAK** button. The warning light will begin to flash and the pointer will move to the previous low warning set point signifying that warning set mode has been selected. Once in set mode, press the **WARN** button to move the pointer down, or press the **PEAK** button to move the pointer up. Three seconds after the last button press, the warning light will stop flashing and the pointer will return to the current reading. The warning set points are retained when power is removed from the gauge.

## Pro Control Low Over Warn Set Point

To adjust the low over warn set point, press and hold the **WARN** button, and while still holding the **WARN** button, immediately press and hold the **PEAK** button. After three seconds the warning light will begin to flash and the pointer will move to the previous low over warning set point signifying that over warn set mode has been selected. Release both buttons. Once in set mode, press the **WARN** button to move the pointer down, or press the **PEAK** button to move the pointer up. Three seconds after the last button press, the warning light will stop flashing and the pointer will return to the current reading. The over warn set points are retained when power is removed from the gauge.

## Change Backlight Color

**To change the backlight color:**

With power off, press and hold the warning button. Apply power to the gauge. Release the **WARN** button. Press and release the **PEAK** button. The pointer will move to half scale and the dial will illuminate with the current Backlight Color. Press and hold the **PEAK** button to cycle through the available colors. Once you have selected the desired color, release **PEAK** and don't press any buttons for about three seconds. The dial will flicker white several times to indicate the desired setting has been saved and the gauge will return to normal operation with your new color selection. Color selections are saved when power is off.

## Change Low Warn Color

(Region A color)

**Warn Color Set Mode:**

With power off, press and hold the **WARN** button. Apply power to the gauge. Release the **WARN** button. The pointer will be at the stop pin and the dial illumination will be off. Press and release the **WARN** button to cycle between **HIGH** warn color set and **LOW** warn color set modes. In High Warn color set mode, the pointer will move to full scale and the dial will illuminate with the current High Warn color. In Low Warn color set mode, the pointer moves to the minimum position and the dial will illuminate with the current Low Warn color.

**To change Low Warn Color:**

When the Low Warn color set mode has been selected (see above), press and **HOLD** the **WARN** button to cycle through the available colors. Once you have selected the desired color, release the **WARN** button. Don't press any buttons for about three seconds. The dial will flicker white several times to indicate the desired setting has been saved and the gauge will return to normal operation with your new Low Warn color selection. Color selections are saved when power is off.

## Change High Warn Color

(Region C color)

**Warn Color Set Mode:**

With power off, press and hold the **WARN** button. Apply power to the gauge. Release the **WARN** button. The pointer will be at the stop pin and the dial illumination will be off. Press and release the **WARN** button to cycle between **HIGH** warn color set and **LOW** warn color set modes. In High warn color set mode, the pointer will move to full scale and the dial will illuminate with the current High Warn color. In Low Warn color set mode, the pointer moves to the minimum position and the dial will illuminate with the current Low Warn color.

**To change High Warn Color:**

When the High Warn color set mode has been selected (see above), press and hold the **WARN** button to cycle through the available colors. Once you have selected the desired color, release the **WARN** button. Don't press any buttons for about three seconds. The dial will flicker white several times to indicate the desired setting has been saved and the gauge will return to normal operation with your new High Warn color selection. Color selections are saved when power is off.

# Lighting Mode

(Region B Color)

This gauge allows the dial lighting to operate in two modes, Full On or Dimmable. Factory default is Full On.

**Full On:** In this mode, the white lighting wire is ignored. The gauge dial lighting is always on at full brightness. (unless you select NO color when setting the Backlight Color). If using Full On mode, white wire hook-up is not needed.

**Dimmable:** In this mode, the white wire is used to set the intensity of the dial lighting from full brightness down to off.

## To change the Lighting Mode:

With power off, press and hold the **PEAK** button. Apply power to the gauge. Release the **PEAK** button and the dial face will illuminate with either white lighting or blue lighting. Press and release the **PEAK** button to toggle between Full On (dial is illuminated white) and Dimmable (dial is illuminated blue). Once you have selected the desired mode, don't press any buttons for about three seconds. The dial will flicker white several times to indicate the desired setting has been saved and the gauge will return to normal operation with your new mode selection. Mode selections are saved when power is off.

# Gauge Reset

It may be desired to reset the gauge. This clears programmable settings to a system default.

With power off, hold in both buttons. Apply power to the gauge, wait two seconds, and release both buttons. The dial face will flicker white several times and return to normal operation. At this point, the gauge has been reset.

## Reset Settings:

High Warning Set Point: Max Value  
Low Warning Set Point: Lowest Value  
Peak: Lowest Value  
High Warning Color: Red  
Low Warning Color: Green  
Backlighting Color: White  
Lighting Mode: Full On  
High Warning Pro Control State: Active High  
Low Warning Pro Control State: Active Low  
High Over Warn Set Point: Max Value  
Low Over Warn Set Point: Lowest Value

# Pro Control Active States

The active region for Pro Control outputs are user configurable. For example, consider a pressure gauge with a low warning set point at 20 PSI. The gauge can be configured so the associated Pro Control output is active when the pointer falls below the set point [less than 20 PSI] (active low) OR when the pointer is beyond the set point [greater than 20 PSI] (active high). Likewise, consider a pressure gauge with high warning set point at 95 PSI. Again, the gauge can be configured so the associated Pro Control is active when the pointer falls below the set point [less than 95 PSI] (active low) OR when the pointer progresses beyond the set point [greater than 95 PSI] (active high).

## To change the active state:

With power off, press and hold the **PEAK** button. Apply power to the gauge. Release the **PEAK** button. Press and release the **WARN** button. The gauge is now in Active State Set Mode. The pointer will point straight up at the value in the top center of the dial. Press and release the **WARN** button to toggle back and forth between the low and high warning point active state modes. Doing so will cause the dial to change back and forth between green and red. When setting the low warning active state the dial face will be green. When setting the high warning active state the dial face will be red.

Once the designated warning mode is selected (green or red) press and hold the **WARN** button to toggle between active high and active low. As you hold the button the pointer will continuously sweep from the left of center and to the right of center pausing at each side. Left of center is active low and right of center is active high. Release the **WARN** button when the pointer is in the position of the desired active state. Once you have selected the desired state, don't press any buttons for about three seconds. The dial will flicker white several times to indicate the desired setting has been saved and the gauge will return to normal operation with your new state selection. State selections are saved when power is off.

NOTE: The Pro Control Active State does not affect the color of each dial region.

# Pro Control

The Pro Control feature activates a switched ground output at a user defined set point. Pro Control can be used to switch on a relay to activate ignition kill, cooling fans, lamps, alarms, etc. The set points define three regions on the gauge dial, the region below the low set point, between the set points, and above the high set point.

**Low Set Point - ACTIVE STATE LOW (ORANGE WIRE)**

Pointer Region	Pro Control Output #1	Normally Open Contact	Normally Closed Contact	Dial Color
A	Active (ON)	CLOSED (ON)	OPEN (OFF)	Low Warn Color
B	OFF	OPEN (OFF)	CLOSED (ON)	Backlight Color
C	OFF	OPEN (OFF)	CLOSED (ON)	High Warn Color

**Low Set Point - ACTIVE STATE HIGH (ORANGE WIRE)**

Pointer Region	Pro Control Output #1	Normally Open Contact	Normally Closed Contact	Dial Color
A	OFF	OPEN (OFF)	CLOSED (ON)	Low Warn Color
B	Active (ON)	CLOSED (ON)	OPEN (OFF)	Backlight Color
C	Active (ON)	CLOSED (ON)	OPEN (OFF)	High Warn Color

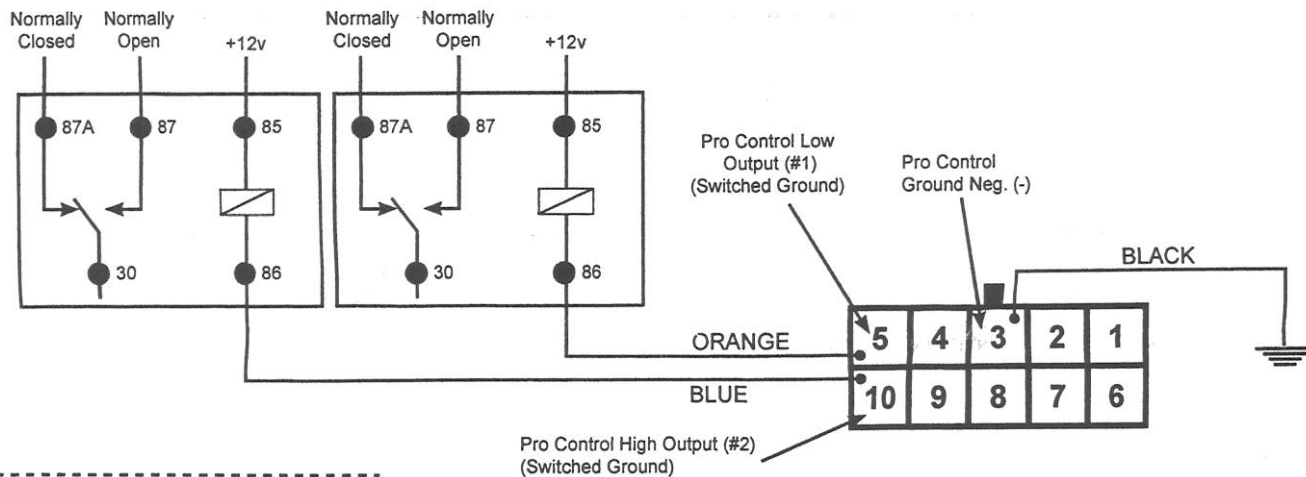
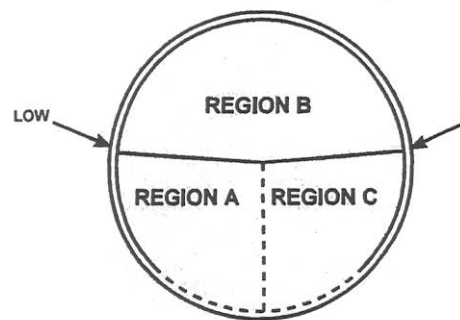
**High Set Point - ACTIVE STATE HIGH (BLUE WIRE)**

Pointer Region	Pro Control Output #2	Normally Open Contact	Normally Closed Contact	Dial Color
A	OFF	OPEN (OFF)	CLOSED (ON)	Low Warn Color
B	OFF	OPEN (OFF)	CLOSED (ON)	Backlight Color
C	Active (ON)	CLOSED (ON)	OPEN (OFF)	High Warn Color

**High Set Point - ACTIVE STATE LOW (BLUE WIRE)**

Pointer Region	Pro Control Output #2	Normally Open Contact	Normally Closed Contact	Dial Color
A	Active (ON)	CLOSED (ON)	OPEN (OFF)	Low Warn Color
B	Active (ON)	CLOSED (ON)	OPEN (OFF)	Backlight Color
C	OFF	OPEN (OFF)	CLOSED (ON)	High Warn Color

**EXAMPLE**



**Warning:** Pro Control outputs shall not exceed 2.0 amps at 12 volts

## Warranty

Stack Limited warrants this product (excepting associated sensors which are consumable items) to be free from defects caused by faulty materials or poor workmanship for 1 year from the date of consumer purchase. This warranty applies only to the original purchaser of product and is non-transferable. All implied warranties shall be limited in duration to the said warranty periods above. Breaking the instrument seal, improper installation, accident, water damage, abuse, unauthorized repairs or alterations voids this warranty. Stack Limited disclaims any liability for consequential damages due to breach of any written or implied warranty on all products manufactured by Stack Limited.

[www.stackltd.com](http://www.stackltd.com)

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# INSTALLATION INSTRUCTIONS PRO-CONTROL STEPPER MOTOR PRESSURE GAUGE

2650-1421-00

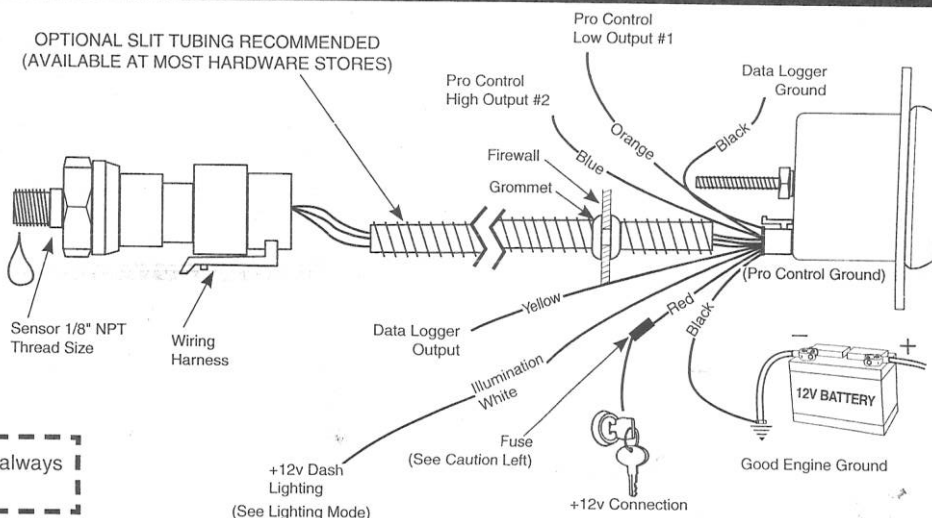


Use teflon sealing compound sparingly where symbol indicates. (Tape not recommended on these threads.)

## CAUTION!

As a safety precaution, the +12V terminal of this product should be fused before connecting to the 12V ignition switch. We recommend using a 1 Amp, 3AG fast-acting type cartridge fuse.

**NOTE:** When the ignition is off the pointer may not always rest at zero.



## Installation - Fuel & Oil Pressure

### WARNING:

The fuel system is pressurized and often retains this pressure for an extended period of time. Properly vent your fuel system before installing the fuel pressure sensor. If you are not familiar with the proper method of venting, you **MUST** have this done by an experienced mechanic.

1. Check that you have all parts required for installation, and the engine is cool.
2. Disconnect the negative (-) battery cable.
3. Gauge mounts in a hole 52.4mm hole. Use supplied brackets and nuts to secure gauge to dash.
4. Drill a 25.4mm diameter hole where wires pass through sheet metal (such as firewall) and install rubber grommet provided. (Grommet will require slit.)
5. Connect the white wire to dash lighting or switchable 12v light source, the red wire to switched +12V source and the black wire to ground. (see diagram for details)

**WARNING:** Not compatible with Nitromethane, Methanol, or 100% MTBE.

6. For oil pressure gauge installation, an optional 1/4" NPT or M10x1 adapter is included. For fuel pressure gauge, install the 1/8" NPT pressure sensor or M10x1 adapter into the fuel system (See caution below). If unit is to be installed on a high vibration application such as a full race engine or engine capable of high RPM, it is strongly recommended that the Sensor be remote mounted to either the footwell or firewall, to insulate from vibration. **Failure to remote-locate pressure Sensors on such an application could result in gauge failure and potential damage to vehicle and/or operator injury.**
7. Reconnect negative (-) battery cable.

**NOTE:** Test all fittings and hoses for any leakage. If any leaks are detected, determine the cause of the leak and repair. Do not operate vehicle if any leaks are detected.

### CAUTION:

If you will be working with the fuel system, take care to insure no sparks or flames occur. Do not smoke while installing the fuel pressure sensor.

## Power-Up

The pointer will move counter clockwise to the stop pin and then moves to the current gauge reading. This procedure is an auto-calibration function and is performed on every power-up. While this test is being performed, the gauge may make a clicking sound. This is normal.

## Peak Recall

Press and hold the **PEAK** button to recall the highest temperature reading since the memory was last cleared. To clear the memory, press and hold the **PEAK** button, and while still holding the **PEAK** button, press the **WARN** button. The pointer will move to the stop pin to indicate that the memory has been cleared. Release the **PEAK** and **WARN** buttons to resume normal operation. The peak recall point is retained when power is removed from the gauge.

## Full Dial Warning

This gauge features full dial warning. When a warning point is reached, the entire dial illuminates in the programmed warning color. This feature is available for both a high and low warning set point. In addition, the warning color will flash when an over warn point is reached.

## Pro Control High Warning Set Point

To adjust the high warning set point, press and release the **WARN** button. The warning light will begin to flash and the pointer will move to the previous high warning set point signifying that warning set mode has been selected. Once in set mode, press the **WARN** button to move the pointer down, or press the **PEAK** button to move the pointer up. Three seconds after the last button press, the warning light will stop flashing and the pointer will return to the current reading. The warning set points are retained when power is removed from the gauge.

## Pro Control High Over Warn Set Point

To adjust the high over warn set point, press and hold the **WARN** button. After three seconds the warning light will begin to flash and the pointer will move to the previous high over warning set point signifying that over warn set mode has been selected. Release the warn button. Once in set mode, press the **WARN** button to move the pointer down, or press the **PEAK** button to move the pointer up. Three seconds after the last button press, the warning light will stop flashing and the pointer will return to the current reading. The over warn set points are retained when power is removed from the gauge.

## Pro Control Low Warning Set Point

To adjust the low warning set point, press and hold the **WARN** button, and while still holding the **WARN** button, press and release the **PEAK** button. The warning light will begin to flash and the pointer will move to the previous low warning set point signifying that warning set mode has been selected. Once in set mode, press the **WARN** button to move the pointer down, or press the **PEAK** button to move the pointer up. Three seconds after the last button press, the warning light will stop flashing and the pointer will return to the current reading. The warning set points are retained when power is removed from the gauge.

## Pro Control Low Over Warn Set Point

To adjust the low over warn set point, press and hold the **WARN** button, and while still holding the **WARN** button, immediately press and hold the **PEAK** button. After three seconds the warning light will begin to flash and the pointer will move to the previous low over warning set point signifying that over warn set mode has been selected. Release both buttons. Once in set mode, press the **WARN** button to move the pointer down, or press the **PEAK** button to move the pointer up. Three seconds after the last button press, the warning light will stop flashing and the pointer will return to the current reading. The over warn set points are retained when power is removed from the gauge.

## Change Backlight Color

### To change the backlight color:

With power off, press and hold the warning button. Apply power to the gauge. Release the **WARN** button. Press and release the **PEAK** button. The pointer will move to half scale and the dial will illuminate with the current Backlight Color. Press and hold the **PEAK** button to cycle through the available colors. Once you have selected the desired color, release **PEAK** and don't press any buttons for about three seconds. The dial will flicker white several times to indicate the desired setting has been saved and the gauge will return to normal operation with your new color selection. Color selections are saved when power is off.

## Change Low Warn Color

(Region A color)

### Warn Color Set Mode:

With power off, press and hold the **WARN** button. Apply power to the gauge. Release the **WARN** button. The pointer will be at the stop pin and the dial illumination will be off. Press and release the **WARN** button to cycle between **HIGH** warn color set and **LOW** warn color set modes. In High Warn color set mode, the pointer will move to full scale and the dial will illuminate with the current High Warn color. In Low Warn color set mode, the pointer moves to the minimum position and the dial will illuminate with the current Low Warn color.

### To change Low Warn Color:

When the Low Warn color set mode has been selected (see above), press and **HOLD** the **WARN** button to cycle through the available colors. Once you have selected the desired color, release the **WARN** button. Don't press any buttons for about three seconds. The dial will flicker white several times to indicate the desired setting has been saved and the gauge will return to normal operation with your new Low Warn color selection. Color selections are saved when power is off.

## Change High Warn Color

(Region C color)

### Warn Color Set Mode:

With power off, press and hold the **WARN** button. Apply power to the gauge. Release the **WARN** button. The pointer will be at the stop pin and the dial illumination will be off. Press and release the **WARN** button to cycle between **HIGH** warn color set and **LOW** warn color set modes. In High warn color set mode, the pointer will move to full scale and the dial will illuminate with the current High Warn color. In Low Warn color set mode, the pointer moves to the minimum position and the dial will illuminate with the current Low Warn color.

### To change High Warn Color:

When the High Warn color set mode has been selected (see above), press and hold the **WARN** button to cycle through the available colors. Once you have selected the desired color, release the **WARN** button. Don't press any buttons for about three seconds. The dial will flicker white several times to indicate the desired setting has been saved and the gauge will return to normal operation with your new High Warn color selection. Color selections are saved when power is off.

# Lighting Mode

(Region B Color)

This gauge allows the dial lighting to operate in two modes, Full On or Dimmable. Factory default is Full On.

**Full On:** In this mode, the white lighting wire is ignored. The gauge dial lighting is always on at full brightness. (unless you select NO color when setting the Backlight Color). If using Full On mode, white wire hook-up is not needed.

**Dimmable:** In this mode, the white wire is used to set the intensity of the dial lighting from full brightness down to off.

## To change the Lighting Mode:

With power off, press and hold the **PEAK** button. Apply power to the gauge. Release the **PEAK** button and the dial face will illuminate with either white lighting or blue lighting. Press and release the **PEAK** button to toggle between Full On (dial is illuminated white) and Dimmable (dial is illuminated blue). Once you have selected the desired mode, don't press any buttons for about three seconds. The dial will flicker white several times to indicate the desired setting has been saved and the gauge will return to normal operation with your new mode selection. Mode selections are saved when power is off.

# Data Logger Output

This gauge is equipped to output the sensor signal to an external data logger system. This feature allows you to use the same sensor for both the gauge and the data logger. With this gauge, it is not necessary to install two sensors to measure the same function.

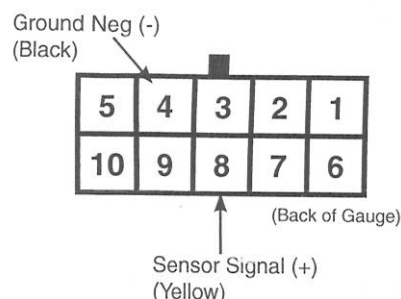
To use this feature, you must have a data logger system installed in the vehicle and connect the data logger output from the gauge to the data logger. Pins number 4 (black wire, ground) and 8 (yellow wire, sensor signal) in the connector on the back of the gauge are the data logger sensor signal and ground connections that must be connected to the data logger. After connecting the gauge to the data logger, refer to your data logger instruction on how to calibrate the data logger to use the signal

# Gauge Reset

It may be desired to reset the gauge. This clears programmable settings to a system default. With power off, hold in both buttons. Apply power to the gauge, wait two seconds, and release both buttons. The dial face will flicker white several times and return to normal operation. At this point, the gauge has been reset.

## Reset Settings:

High Warning Set Point: Max Value  
Low Warning Set Point: Lowest Value  
Peak: Lowest Value  
High Warning Color: Red  
Low Warning Color: Green  
Backlighting Color: White  
Lighting Mode: Full On  
High Warning Pro Control State: Active High  
Low Warning Pro Control State: Active Low  
High Over Warn Set Point: Max Value  
Low Over Warn Set Point: Lowest Value



# Pro Control Active States

The active region for Pro Control outputs are user configurable. For example, consider a pressure gauge with a low warning set point at 20 PSI. The gauge can be configured so the associated Pro Control output is active when the pointer falls below the set point [less than 20 PSI] (active low) OR when the pointer is beyond the set point [greater than 20 PSI] (active high). Likewise, consider a pressure gauge with high warning set point at 95 PSI. Again, the gauge can be configured so the associated Pro Control is active when the pointer falls below the set point [less than 95 PSI] (active low) OR when the pointer progresses beyond the set point [greater than 95 PSI] (active high).

## To change the active state:

With power off, press and hold the **PEAK** button. Apply power to the gauge. Release the **PEAK** button. Press and release the **WARN** button. The gauge is now in Active State Set Mode. The pointer will point straight up at the value in the top center of the dial. Press and release the **WARN** button to toggle back and forth between the low and high warning point active state modes. Doing so will cause the dial to change back and forth between green and red. When setting the low warning active state the dial face will be green. When setting the high warning active state the dial face will be red.

Once the designated warning mode is selected (green or red) press and hold the **WARN** button to toggle between active high and active low. As you hold the button the pointer will continuously sweep from the left of center and to the right of center pausing at each side. Left of center is active low and right of center is active high. Release the **WARN** button when the pointer is in the position of the desired active state. Once you have selected the desired state, don't press any buttons for about three seconds. The dial will flicker white several times to indicate the desired setting has been saved and the gauge will return to normal operation with your new state selection. State selections are saved when power is off.

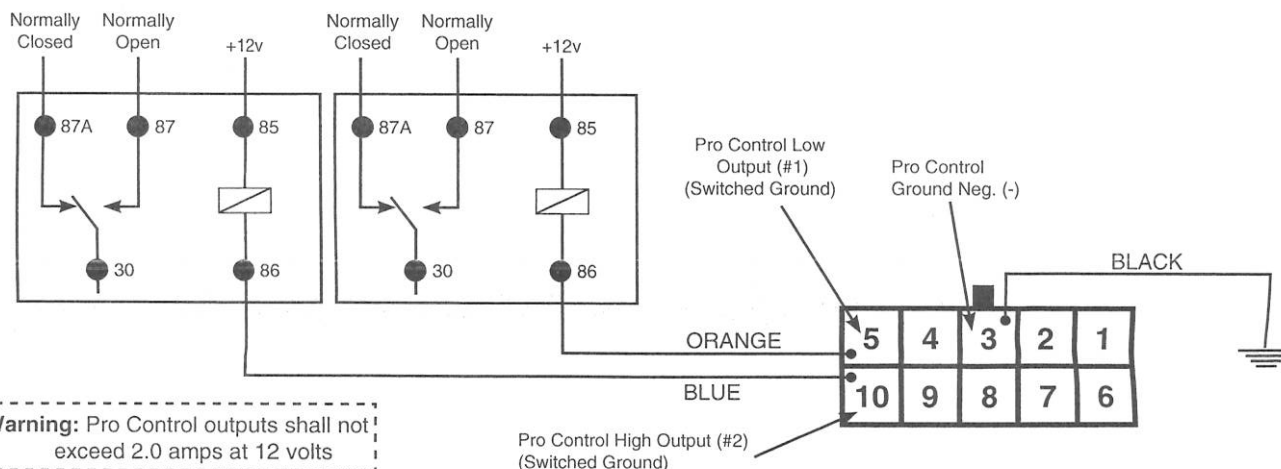
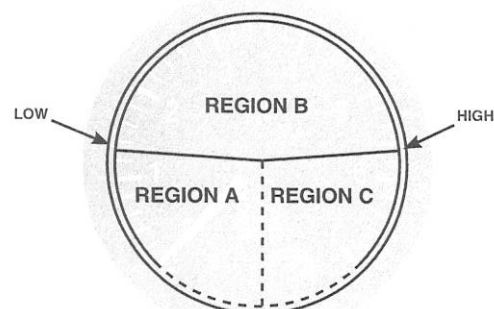
NOTE: The Pro Control Active State does not affect the color of each dial region.

# Pro Control

The Pro Control feature activates a switched ground output at a user defined set point. Pro Control can be used to switch on a relay to activate ignition kill, cooling fans, lamps, alarms, etc. The set points define three regions on the gauge dial, the region below the low set point, between the set points, and above the high set point.

Low Set Point - ACTIVE STATE LOW (ORANGE WIRE)				
Pointer Region	Pro Control Output #1	Normally Open Contact	Normally Closed Contact	Dial Color
A	Active (ON)	CLOSED (ON)	OPEN (OFF)	Low Warn Color
B	OFF	OPEN (OFF)	CLOSED (ON)	Backlight Color
C	OFF	OPEN (OFF)	CLOSED (ON)	High Warn Color
Low Set Point - ACTIVE STATE HIGH (ORANGE WIRE)				
Pointer Region	Pro Control Output #1	Normally Open Contact	Normally Closed Contact	Dial Color
A	OFF	OPEN (OFF)	CLOSED (ON)	Low Warn Color
B	Active (ON)	CLOSED (ON)	OPEN (OFF)	Backlight Color
C	Active (ON)	CLOSED (ON)	OPEN (OFF)	High Warn Color
High Set Point - ACTIVE STATE HIGH (BLUE WIRE)				
Pointer Region	Pro Control Output #2	Normally Open Contact	Normally Closed Contact	Dial Color
A	OFF	OPEN (OFF)	CLOSED (ON)	Low Warn Color
B	OFF	OPEN (OFF)	CLOSED (ON)	Backlight Color
C	Active (ON)	CLOSED (ON)	OPEN (OFF)	High Warn Color
High Set Point - ACTIVE STATE LOW (BLUE WIRE)				
Pointer Region	Pro Control Output #2	Normally Open Contact	Normally Closed Contact	Dial Color
A	Active (ON)	CLOSED (ON)	OPEN (OFF)	Low Warn Color
B	Active (ON)	CLOSED (ON)	OPEN (OFF)	Backlight Color
C	OFF	OPEN (OFF)	CLOSED (ON)	High Warn Color

## EXAMPLE



## WARRANTY

Stack Limited warrants this product (excepting associated sensors which are consumable items) to be free from defects caused by faulty materials or poor workmanship for 1 year from the date of consumer purchase. This warranty applies only to the original purchaser of product and is non-transferable. All implied warranties shall be limited in duration to the said warranty periods above. Breaking the instrument seal, improper use or installation, accident, water damage, abuse, unauthorized repairs or alterations voids this warranty. Stack Limited disclaims any liability for consequential damages due to breach of any written or implied warranty on all products manufactured by Stack Limited.

**FOR COMPLETE OPERATIONS GUIDE PLEASE VISIT: [WWW.STACKLTD.COM](http://WWW.STACKLTD.COM)**

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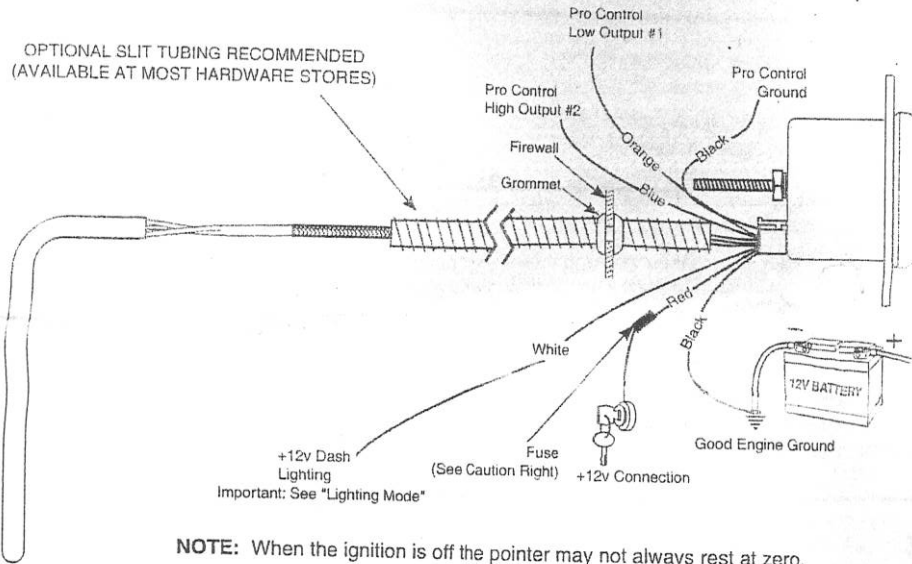
# PRO-CONTROL STEPPER MOTOR EXHAUST GAS TEMPERATURE GAUGE (EGT)

2650-1444-00



## Important

Exhaust Gas Temperature (EGT) gauges are sensitive, high accuracy instruments. They must be handled and installed with care to insure proper performance. Carefully read and follow these instructions, and your EGT gauge will provide you with a long and accurate life.



**NOTE:** When the ignition is off the pointer may not always rest at zero.

**CAUTION:**  
As a safety precaution, the +12V terminal of this product should be fused before connecting to the 12V ignition switch. We recommend using a 1 Amp, 3AG fast-acting type cartridge fuse.

## Installation

1. Check that you have all parts required for installation, and the engine is cool.
2. Disconnect the negative (-) battery cable.
3. Gauge mounts in a 52.4mm hole. Use supplied brackets and nuts to secure gauge to dash.
4. Drill 25.4mm diameter hole where sensor passes through sheet metal (such as firewall) and install rubber grommet provided (Grommet will require slit.)
5. Connect the white wire to dash lighting or switchable 12V light source, black wire to a good engine ground, and red wire to a switched +12V power source.
6. Reconnect negative (-) battery cable.

## Probe Installation

1. Begin by installing the thermocouple in the exhaust, then work back to the gauge. Installing the probe in the proper location will insure optimal temperature readings. For non-turbo engines, install the probe 25mm-50mm from the cylinder head.

For turbo engines, remove the exhaust manifold and install the probe 25mm-50mm from the cylinder head. If the exhaust manifold can not be removed, install the probe 25mm-50mm after the turbo exhaust outlet (Exhaust gas temps could drop over 100°C when installing after the turbo). CLEAN ALL METAL FILINGS out of the exhaust manifold. Metal filings will damage the turbo impeller if they go through the turbo.

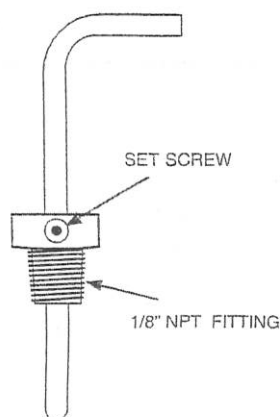
The probe can be mounted in two different ways, so please use the method best suited for your needs.

A) Pre-existing 1/8" NPT Threaded Hole: Simply screw the threaded fitting into the hole, insert the probe, and tighten the set screw snugly onto the probe. (Caution: do not over tighten set screw or damage to probe may occur.) Make sure the probe is oriented so the wires do not come in contact with, or become too close to the manifold or other hot engine parts. See illustration below for details.

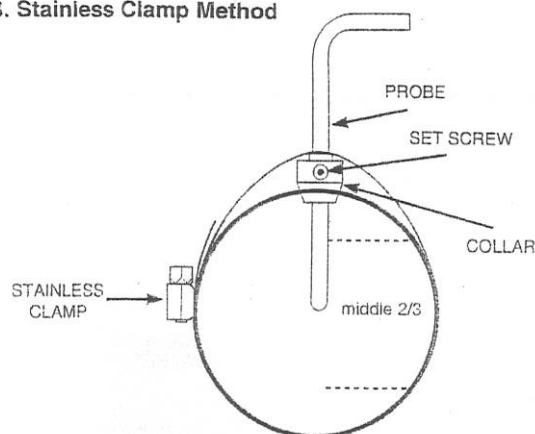
B) Stainless Clamp Method: This method is for applications that require frequent removal of the manifold or header for service, or just faster and easier installation. Drill a 11mm diameter hole approx. 150mm down from the junction of the exhaust pipe to manifold junction. Undo the clamp and slide the probe into the hole in the clamp. Slide the set screw collar onto the probe. Before tightening the collar in position make sure that when inserted, the probe will have its tip in the middle two-thirds of the exhaust stream. Tighten screw collar in position. (Caution: do not over tighten set screw or damage to probe may occur.) Hold the clamp open when inserting the probe into the 11mm hole. Re-join the clamp ends and tighten in position. Make sure the probe is oriented so the wires do not come in contact with, or become too close to the manifold or other hot engine parts. See the illustration below for details.

2. With the probe installed, the wire harness can now be routed to the gauge. The wire harness is an integral part of the EGT gauge calibration. It may not be shortened or lengthened without affecting the gauge calibration. You will need to determine a suitable location to coil the excess wire, and tie it loosely with a wire tie. (Loosely tying the excess coil prevents embrittlement caused by vibration.) Pass the harness through the fire wall using an existing hole, or drill a 25.4mm diameter hole and use the rubber grommet provided to protect the wire from damage.

#### A. Pre-existing 1/8" NPT Threaded Hole



#### B. Stainless Clamp Method



## Power-Up

The pointer will move counter clockwise to the stop pin and then moves to the current gauge reading. This procedure is an auto-calibration function and is performed on every power-up. While this test is being performed, the gauge may make a clicking sound. This is normal.

## Peak Recall

Press and hold the **PEAK** button to recall the highest temperature reading since the memory was last cleared. To clear the memory, press and hold the **PEAK** button, and while still holding the **PEAK** button, press the **WARN** button. The pointer will move to the stop pin to indicate that the memory has been cleared. Release the **PEAK** and **WARN** buttons to resume normal operation. The peak recall point is retained when power is removed from the gauge.

## Full Dial Warning

This gauge features full dial warning. When a warning point is reached, the entire dial illuminates in the programmed warning colour. This feature is available for both a high and low warning set point. In addition, the warning colour will flash when an over warn point is reached.

## Pro Control High Warning Set Point

To adjust the high warning set point, press and release the **WARN** button. The warning light will begin to flash and the pointer will move to the previous high warning set point signifying that warning set mode has been selected. Once in set mode, press the **WARN** button

to move the pointer down, or press the **PEAK** button to move the pointer up. Three seconds after the last button press, the warning light will stop blinking and the pointer will return to the current reading. The warning set points are retained when power is removed from the gauge.

## Pro Control High Over Warn Set Point

To adjust the high over warn set point, press and hold the **WARN** button. After three seconds the warning light will begin to flash and the pointer will move to the previous high over warning set point signifying that over warn set mode has been selected. Release the warn button.

Once in set mode, press the **WARN** button to move the pointer down, or press the **PEAK** button to move the pointer up. Three seconds after the last button press, the warning light will stop blinking and the pointer will return to the current reading. The over warn set points are retained when power is removed from the gauge.

## Pro Control Low Warning Set Point

To adjust the low warning set point, press and hold the **WARN** button, and while still holding the **WARN** button, press and release the **PEAK** button. The warning light will begin to flash and the pointer will move to the previous low warning set point signifying that warning set mode has

been selected. Once in set mode, press the **WARN** button to move the pointer down, or press the **PEAK** button to move the pointer up. Three seconds after the last button press, the warning light will stop blinking and the pointer will return to the current reading. The warning set points are retained when power is removed from the gauge.

## Pro Control Low Over Warn Set Point

To adjust the low over warn set point, press and hold the **WARN** button, and while still holding the **WARN** button, immediately press and hold the **PEAK** button. After three seconds the warning light will begin to flash and the pointer will move to the previous low over warning set point signifying

that over warn set mode has been selected. Release both buttons. Once in set mode, press the **WARN** button to move the pointer down, or press the **PEAK** button to move the pointer up. Three seconds after the last button press, the warning light will stop blinking and the pointer will return to the current reading. The over warn set points are retained when power is removed from the gauge.

## Change Backlight Colour

### To change the backlight colour:

With power off, press and hold the warning button. Apply power to the gauge. Release the **WARN** button. Press and release the **PEAK** button. The pointer will move to half scale and the dial will illuminate with the current Backlight Colour. Press and hold the **PEAK** button to cycle through the

available colours. Once you have selected the desired colour, release **PEAK** and don't press any buttons for about three seconds. The dial will flicker white several times to indicate the desired setting has been saved and the gauge will return to normal operation with your new colour selection. Color selections are saved when power is off.

## Change Low Warn Colour

(Region A colour)

### Warn Colour Set Mode:

With power off, press and hold the **WARN** button. Apply power to the gauge. Release the **WARN** button. The pointer will be at the stop pin and the dial illumination will be off. Press and release the **WARN** button to cycle between **HIGH** warn colour set and **LOW** warn colour set modes. In High Warn colour set mode, the pointer will move to full scale and the dial will illuminate with the current High Warn colour. In Low Warn colour set mode, the pointer moves

to the minimum position and the dial will illuminate with the current Low Warn colour.

### To change Low Warn Colour:

When the Low Warn colour set mode has been selected (see above), press and **HOLD** the **WARN** button to cycle through the available colours. Once you have selected the desired colour, release the **WARN** button. Don't press any buttons for about three seconds. The dial will flicker white several times to indicate the desired setting has been saved and the gauge will return to normal operation with your new Low Warn colour selection. Colour selection are saved when power is off.

## Change High Warn Colour

(Region C colour)

### Warn Colour Set Mode:

With power off, press and hold the **WARN** button. Apply power to the gauge. Release the **WARN** button. The pointer will be at the stop pin and the dial illumination will be off. Press and release the **WARN** button to cycle between **HIGH** warn colour set and **LOW** warn colour set modes. In High warn colour set mode, the pointer will move to full scale and the dial will illuminate with the current High Warn colour. In Low Warn colour set mode,

the pointer moves to the minimum position and the dial will illuminate with the current Low Warn colour.

### To change High Warn Colour:

When the High Warn colour set mode has been selected (see above), press and hold the **WARN** button to cycle through the available colours. Once you have selected the desired colour, release the **WARN** button. Don't press any buttons for about three seconds. The dial will flicker white several times to indicate the desired setting has been saved and the gauge will return to normal operation with your new High Warn colour selection. Color selections are saved when power is off.

## Lighting Mode

(Region B Colour)

This gauge allows the dial lighting to operate in two modes, Full On or Dimmable. Factory default is Full On.

**Full On:** In this mode, the white lighting wire is ignored. The gauge dial lighting is always on at full brightness. (unless you select NO colour when setting the Backlight Colour). If using Full On mode, white wire hook-up is not needed.

**Dimmable:** In this mode, the white wire is used to set the intensity of the dial lighting from full brightness down to off.

### To change the Lighting Mode:

With power off, press and hold the **PEAK** button. Apply power to the gauge. Release the **PEAK** button and the dial face will illuminate with either white lighting or blue lighting. Press and release the **PEAK** button to toggle between Full On (dial is illuminated white) and Dimmable (dial is illuminated blue). Once you have selected the desired mode, don't press any buttons for about three seconds. The dial will flicker white several times to indicate the desired setting has been saved and the gauge will return to normal operation with your new mode selection. Mode selections are saved when power is off.

## Gauge Reset

It may be desired to reset the gauge. This clears programmable settings to a system default. With power off, hold in both buttons. Apply power to the gauge, wait two seconds, and release both buttons. The dial face will flicker white several times and return to normal operation. At this point, the gauge has been reset.

### Reset Settings:

High Warning Set Point: Max Value  
Low Warning Set Point: Lowest Value

Peak: Lowest Value  
High Warning Colour: Red  
Low Warning Colour: Green  
Backlighting Colour: White  
Lighting Mode: Full On  
High Warning Pro Control State: Active High  
Low Warning Pro Control State: Active Low  
High Over Warn Set Point: Max Value  
Low Over Warn Set Point: Lowest Value

## Pro Control Active States

The active region for Pro Control outputs are user configurable. For example, consider a pressure gauge with a low warning set point at 20 PSI. The gauge can be configured so the associated Pro Control output is active when the pointer falls below the set point [less than 20 PSI] (active low) OR when the pointer is beyond the set point [greater than 20 PSI] (active high). Likewise, consider a pressure gauge with high warning set point at 95 PSI. Again, the gauge can be configured so the associated Pro Control is active when the pointer falls below the set point [less than 95 PSI] (active low) OR when the pointer progresses beyond the set point [greater than 95 PSI] (active high).

### To change the active state:

With power off, press and hold the **PEAK** button. Apply power to the gauge. Release the **PEAK** button. Press and release the **WARN** button. The gauge is now in Active State Set Mode. The pointer will point straight up at the value in the top center of the dial. Press and release the **WARN** button

to toggle back and forth between the low and high warning point active state modes. Doing so will cause the dial to change back and forth between green and red. When setting the low warning active state the dial face will be green. When setting the high warning active state the dial face will be red.

Once the designated warning mode is selected (green or red) press and hold the **WARN** button to toggle between active high and active low. As you hold the button the pointer will continuously sweep from the left of center and to the right of center pausing at each side. Left of center is active low and right of center is active high. Release the **WARN** button when the pointer is in the position of the desired active state. Once you have selected the desired state, don't press any buttons for about three seconds. The dial will flicker white several times to indicate the desired setting has been saved and the gauge will return to normal operation with your new state selection. State selections are saved when power is off.

**NOTE:** The Pro Control Active State does not affect the colour of each dial region.

# Pro Control

The Pro Control feature activates a switched ground output at a user defined set point. Pro Control can be used to switch on a relay to activate ignition kill, cooling fans, lamps, alarms, etc. The set points define three regions on the gauge dial, the region below the low set point, between the set points, and above the high set point.

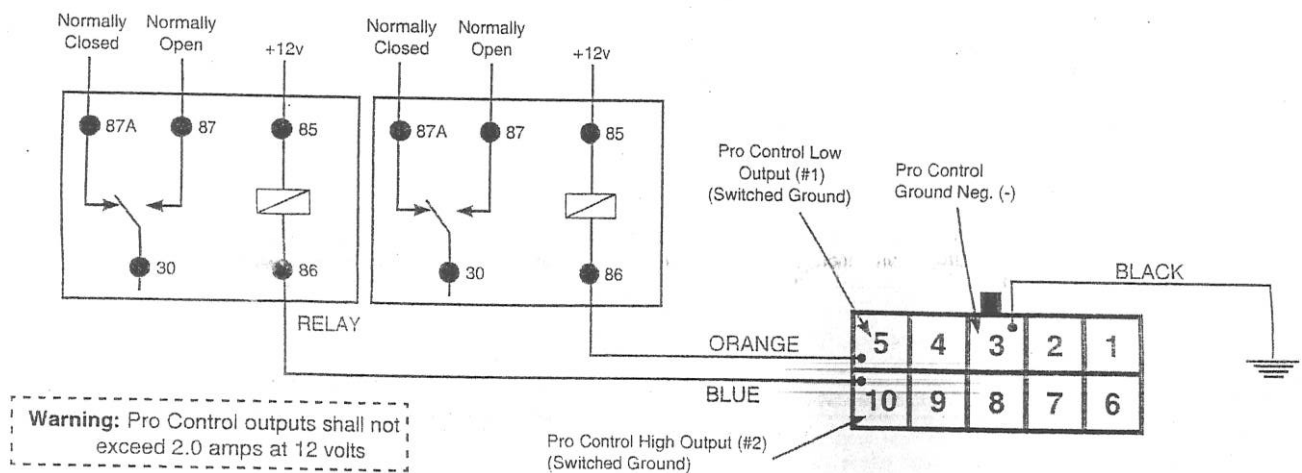
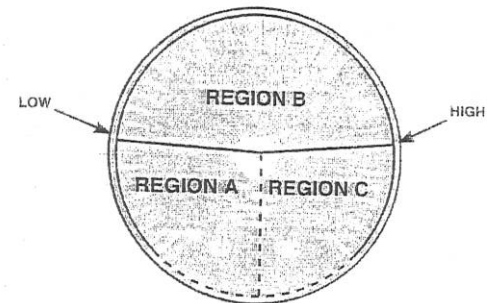
Low Set Point - ACTIVE STATE LOW (ORANGE WIRE)				
Pointer Region	Pro Control Output #1	Normally Open Contact	Normally Closed Contact	Dial Colour
A	Active (ON)	CLOSED (ON)	OPEN (OFF)	Low Warn Colour
B	OFF	OPEN (OFF)	CLOSED (ON)	Backlight Colour
C	OFF	OPEN (OFF)	CLOSED (ON)	High Warn Colour

Low Set Point - ACTIVE STATE HIGH (ORANGE WIRE)				
Pointer Region	Pro Control Output #1	Normally Open Contact	Normally Closed Contact	Dial Colour
A	OFF	OPEN (OFF)	CLOSED (ON)	Low Warn Colour
B	Active (ON)	CLOSED (ON)	OPEN (OFF)	Backlight Colour
C	Active (ON)	CLOSED (ON)	OPEN (OFF)	High Warn Colour

High Set Point - ACTIVE STATE HIGH (BLUE WIRE)				
Pointer Region	Pro Control Output #2	Normally Open Contact	Normally Closed Contact	Dial Colour
A	OFF	OPEN (OFF)	CLOSED (ON)	Low Warn Colour
B	OFF	OPEN (OFF)	CLOSED (ON)	Backlight Colour
C	Active (ON)	CLOSED (ON)	OPEN (OFF)	High Warn Colour

High Set Point - ACTIVE STATE LOW (BLUE WIRE)				
Pointer Region	Pro Control Output #2	Normally Open Contact	Normally Closed Contact	Dial Colour
A	Active (ON)	CLOSED (ON)	OPEN (OFF)	Low Warn Colour
B	Active (ON)	CLOSED (ON)	OPEN (OFF)	Backlight Colour
C	OFF	OPEN (OFF)	CLOSED (ON)	High Warn Colour

## EXAMPLE



## Warranty

Stack Limited warrants this product (excepting associated sensors which are consumable items) to be free from defects caused by faulty materials or poor workmanship for 1 year from the date of consumer purchase. This warranty applies only to the original purchaser of product and is non-transferable. All implied warranties shall be limited in duration to the said warranty periods above. Breaking the instrument seal, improper use, installation, accident, water damage, abuse, unauthorized repairs or alterations voids this warranty. Stack Limited disclaims any liability for consequential damages due to breach of any written or implied warranty on products manufactured by Stack Limited.

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