INSTRUCTIONS
ELECTRIC WATER PUMP / FAN
ENGINE COOLING CONTROLLER

1. OVERVIEW

This compact weather resistant unit controls both an electric water pump and fan providing fully automatic engine cooling for competition vehicles. The Temperature Sensor can be connected to one of three inputs to adjust the fan operating temperature range. The yellow striped TMP1 input selects the coolest engine temperature while the red striped TMP3 input selects the warmest. The range of adjustment is typically 15°F – 20°F.

Two versions of the controller are available depending on the type of fuel, gas or alcohol. Since alcohol engines typically run cooler and develop heat more slowly than gas engines the alcohol version will turn on the fan at a lower temperature than the gas version and turn it off sooner in order to maintain heat in the engine between rounds. The gas version will continue to run the fan until the engine cools down to approximately 120°F. In both versions the water pump turns on sooner and turns off later than the fan to allow smooth engine temperature transitions.

An Override input is designed especially for drag race applications. When the Override is activated, both the water pump and fan will turn on regardless of engine temperature. The water pump and fan will continue to run for 15 seconds after the Override signal is deactivated, making it ideal for competition to provide maximum cooling and consistent electrical loads under race conditions.

The Engine Cooling Controller features automatic detection and indication of Temperature Sensor faults as well as internal over-temperature conditions. In the event that a sensor fault is detected, the water pump and fan will turn on and run continuously in fail-safe mode to prevent over-heating. Fault conditions are indicated by flashing Status LED.

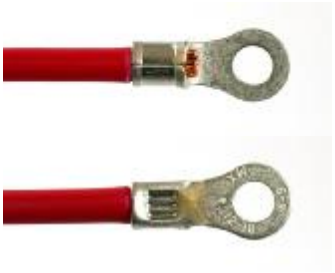
SPECIFICATIONS

Battery Voltage	10 - 20 VDC	
Water Pump Load	8 - 10 amps, typical	
Fan Load	10 - 20 amps, typical	
Combined Total Load	35 amps, Max	
Water Pump Turn On Temp	100°F - 125°F	
Controller Type (Fuel)	Gas Version	Alcohol Version
Fan Turn On Temp	150°F - 170°F	145°F - 160°F
Fan Turn Off Temp	120°F	140°F - 155°F

2. MOUNTING AND GROUNDING

MAKE SURE THE BATTERY IS DISCONNECTED BEFORE PROCEEDING. The Control Unit should be mounted before you begin connecting any wires. Mount the unit as far away from heat sources as possible, especially exhaust headers or manifolds. It is normal for the controller to get a little warm when operating so it should be mounted to a metal panel that can dissipate heat.

All ground connections to the chassis must be clean, free from rust and paint where the connection is made. Refer to the wiring diagram for making all other connections. When finished, install the vinyl caps over the two stud terminals for protection.



Proper Crimp

Crimp Tool

3. TEMPERATURE SENSOR

The Temperature Sensor is built into the 3/8" ring terminal on one end of the Temperature Sensor Cable assembly. The sensor ring terminal should be mounted under a bolt on the end of one of the cylinder heads in order to accurately read engine temperature. If that is not possible, use an intake manifold bolt that's close to a water jacket. **Use a flat washer on top of the ring terminal and hold the sensor to prevent turning and possibly damaging the sensor leads while tightening the bolt.**

Cut the cable to desired length, leaving at least six inches of extra length and connect the wire leads of the Temperature Sensor cable to the Controller as shown on the wiring diagram. Three inputs are provided for fine adjustments to the Fan turn-on temperature. Start by connecting the red Sensor lead to the yellow TMP-1 input. Later you can move to the orange TMP-2 or red TMP-3 input to increase the turn-on temperature. Sensor wire leads can be extended if necessary to lengthen the cable to the Control Unit.

4. TESTING - READ THIS ENTIRE PROCEDURE BEFORE BEGINNING

Once you have completed installation, make sure the Ignition and Water Pump/Fan switches are turned OFF. **Double check Battery polarity then re-connect the Battery.** The engine should be cold.

4.1 Turn on the Water Pump/Fan switch to activate the Controller and verify the Red Status LED illuminates. The water pump and fan should not turn on unless an open or short is detected in the Temperature Sensor cable. This is a fail-safe feature to prevent engine overheating if this type of fault occurs. If a fault is detected, the LED will flash. Count the number of flashes and refer to the table on the wiring diagram to diagnose the Sensor Cable problem.

4.2 Test the override feature by activating the Transbrake or manual override switch. Verify both the water pump and fan turn on and remain on for about 15 seconds after the Transbrake deactivates. If the water pump and fan do not turn on check the Status LED. A rapidly flashing LED indicates no power at the +12V stud terminal. If this occurs turn off all power and check fuse and wiring. A blown fuse may indicate the water pump or fan is stalled or defective.

4.3 If the Status LED is illuminated but not flashing, and if the water pump and fan turn on and off using Override, then you're ready for warm engine testing. Start the engine and allow it to idle while monitoring the Water Temperature gauge. The water pump will turn on first as the engine begins to

warm up (typically around 120 degrees). Let the engine continue to warm up and verify the Fan turns on at a safe temperature.

4.4 Turn off the engine and allow it to cool down until the Fan turns off. Wait for the Water Pump to turn off a short time later, then repeat the previous step to verify the Fan turn-on temperature for the warm engine. If you want to increase the turn-on temperature for the Fan move the red temperature sensor lead from the yellow TMP-1 input to the orange TMP-2 or red TMP-3 input. The TMP-3 input will increase the temperature by 10-20 degrees.

4.5 If the engine temperature gets too hot and the Fan doesn't turn on, turn the Ignition off and check the Controller Status LED for faults and make sure the Temperature Sensor is properly mounted to the cylinder head. Try moving the Sensor to another bolt on the cylinder head, intake manifold, or water pump to adjust the Fan turn-on temperature. **NOTE: Our experience has shown that the temperature difference from one location to another can be significant while the engine is warming up.**

4.6 Double-check all connections and remember to install the vinyl caps over the stud terminals for protection against accidental shorts. Use the heat shrink tubing in the kit to cover and insulate all electrical connections. Installation is complete. Occasionally check the Status LED for faults (power must be turned on to the Controller). Three flashes indicates the Controller is getting too hot. If this occurs the Fan or Water Pump may be drawing too much power, or the Controller is too close to heat sources.

5. TECHNICAL SUPPORT

Free 24/7 tech support is provided online at: www.coachcontrols.com
or call 423-790-7905 M-F, 9am-5pm eastern.

6. 2 YEAR WARRANTY

Coach Controls, Inc. warrants for a period of 2 years to the original purchaser of this product that it shall be free from defects in material and workmanship under normal use and service for which it was intended. Our obligation under this warranty shall be limited to the repair or replacement at our option. Coach Controls, Inc. shall not be liable for any injury, whether to person or property, or for any damages, whether direct, indirect, consequential, or special, or any other damage resulting from the use, or misuse, of this product. Any injury or damage so incurred will be limited to the original purchase price of the product.

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Engine Cooling Controller Wiring Diagram

TEMP SENSOR

Mount under bolt to front of cylinder head

Install flat washer on top of ring terminal and mount to front of cylinder head bolt. Do not allow ring terminal to turn when tightening.

TOTAL POWER 35 AMPS MAX

LED	CONDITION
Constant On	Normal Operation
Blinking Fast	No Battery power at +12v terminal
1 Flash	Temp sensor open circuit
2 Flashes	Temp sensor shorted
3 Flashes	Controller Overtemperature

Move wire to TMP-2 or TMP-3 to increase Fan turn-on temp

FAN | GROUND

#12 #12

WATER PMP | GROUND

#16 #16

TMP-1 - Yel
TMP-2 - Org
TMP-3 - Red
Com - White

TEMP SENSOR LEADS

Either wire may be used for Common

COOLING CONTROLLER

OUT1

OUT2

Optional Override Switch (If No Transbrake)

+12 V

Or

Connect To Positve Wire of Transbrake Solenoid

Note: Override turns on Water Pump and Fan regardless of engine temperature.

OVERRIDE

SWITCHED +12V

GROUND

Water Pump or Fan Switch

#18

Battery

#18

Steel Chassis Ground

+12V

FUSE

40 Amp

#10

Fuse should be mounted as close as possible to Battery