

Temperature Compensation Probe

Model: TP

Installation/Operation Instructions

Note: The TP Temperature Compensation Probe is designed exclusively for use with the following NEWMAR Phase Three charger models: PT-32-30, PT-24-45F, PT-24-95F. (All other models use temp sensor model TCS-12/24.)

Installation

The Temperature Compensation Probe is provided with 25' of cable, with a sensor at one end and a keyed five-pin plug at the other. Installation of the probe proceeds as follows:

- 1) *Ensure a.c. power to the charger is shut off. The charger will go into a shutdown mode if the temperature sensor is installed when power is on.*
- 2) Use a phillips screwdriver to remove the four screw/nylon washer sets which secure the drip shield to the top of the charger. Remove the shield.
- 3) Locate the five-pin keyed receptacle which is recessed in the black internal module. (This may be located beneath a black plastic protective cover which can be removed and discarded.)
- 4) Route the plug through the left side drip shield bracket and insert it firmly into the receptacle. Replace the drip shield.
- 5) The TP is provided with several cable clamps. Secure the cable with these clamps for a neater installation and to route it away from any possible damage in the future.
- 6) The sensor should be mounted on the inside of the battery box, or more ideally, mounted directly on top of one of the batteries using a clamp or a small amount of silicon-type adhesive. It is not necessary for the tip of the probe to touch the battery. Laying the probe on its side will suffice.

Important note: When wiring multiple units in parallel and using the temperature compensation option, you must use a separate probe for each charger. The sensors must also be mounted together in the same battery box or on the same battery for proper load sharing.

Probe Function/Purpose

Because low battery temperature increases resistance to charging and high battery temperature reduces impedance, requiring a lower charge voltage, the ideal charging voltage will vary depending on the temperature of the battery's environment when it is being charged.

If a charger has a fixed output voltage which is ideal at, say 77° F, that same output may cause a battery charged in a consistently high temperature environment to be overcharged, resulting in excessive loss of electrolyte. Conversely, if the batteries are located in a consistently cool environment, they may be chronically undercharged, resulting in sulfation of the battery plates. Either of these two conditions will shorten battery life.



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Therefore, the Phase Three charger is designed to utilize an optional probe which provides automatic temperature compensation. The function of the probe is to signal the charger to fine tune its output voltage so that it is properly optimized for the temperature of the battery or battery environment. The adjustment rate is approximately -5 mV per cell per °C.

To give some idea of the effect of the temperature compensation probe, the chart below lists the charge/float output voltages of the charger when no sensor is installed (or when batteries are at 25° C) and some sample charger output voltages at colder or hotter battery temperatures with the probe installed:

Temperature Compensation Chart

Battery Temperature		Output V d.c : 24 Volt Models				Output V d.c : 32 Volt Model			
		Charge		Float		Charge		Float	
° F	° C	Gel-Cell	Lead Acid	Gel-Cell	Lead Acid	Gel-Cell	Lead Acid	Gel-Cell	Lead-Acid
50	10	28.8	29.2	28.0	27.6	38.3	38.8	37.2	36.7
72	22.2	28.0*	28.4*	27.2*	26.8*	37.3*	37.8*	36.2*	35.7*
90	32.2	27.4	27.8	26.6	26.2	36.4	37.0	35.4	34.8

* Factory pre-set voltages without temperature compensation option installed

Battery Over-Temperature Shutdown

In the event that battery temperature becomes excessive the temperature probe will signal the charger to shut down (at approximately 50°C or 122°F probe temperature). This may be due to extremely high ambient temperature in the battery environment, such as when installed in a hot engine room. It may also be due to a shorted cell in one of the batteries, causing “thermal run-away”. When the battery cools sufficiently, the charger will automatically return to service.

A battery over-temp shutdown condition is indicated by three red flash/beeps or three yellow flashes from the status indicator on the front panel of the charger. (Refer to the Installation/Operation manual provided with the charger for a complete explanation of Status Indicator operation.)

Three Red Flash-Beeps: *Cause:* Battery temperature is too hot and the charger is shut off. *Corrective Action:* Turn charger off. Relocate batteries to a cooler area or improve ventilation and/or check for a shorted cell in each battery—refer to BATTERY CARE TIPS section of the charger manual for procedure or refer to battery manufacturer for recommendations. Turn charger back on to resume normal operation and L.E.D. indications.

Note: This shutdown/warning will also occur if the temperature sensor is plugged in or unplugged while the charger is in operation. If this is the case, make sure the plug is properly inserted and shut the charger off and then back on; normal operation will resume.

Three Yellow Flashes: If the battery cools sufficiently for safe charger operation, the charger will automatically return to service, however the L.E.D. indicator will begin to display a series 3 yellow flashes. Take corrective steps outlined above.



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