INSTRUCTION SHEET

KEPCO An ISO 9001 Company.

TEMPCO
Temperature Probe

TEMPERATURE COMPENSATION PROBE

DESCRIPTION. Temperature compensation can prolong battery life by adjusting the float voltage automatically. The Kepco TEMPCO Model Temperature Compensation Probes allow the output voltage of a Kepco battery charger to be automatically decreased or increased for temperatures above or below 77°F (25°C), respectively, in the 0°C to 35°C range. Beyond this range, the compensation is clamped to 0°C and 35°C for temperatures below 0°C and above 35°C, respectively. Compensation is 3mV/(°F)(cell) or 5.4mV/(°C)(cell) for cells of 2.23V nominal, and can be calculated as follows:

- $dV_T = -(K_T)(Ta - 77)(V_B/2.23)$ where
- V_B = Battery voltage,
- K_T = 0.003V/(°F)(cell),
- Ta = ambient temperature in °F
- 2.23 = cell voltage at 77°F.

Thus, for example, to calculate the float voltage V_F of a 14.5V battery charging at 80°F:

$$\begin{aligned} V_F &= V_B + dV_T \\ &= 14.5 - (0.003)(80-77)(14.5/2.23) \\ &= 14.5 - 0.059 \\ &= 14.441\text{V}. \end{aligned}$$

The TEMPCO Models are identified by the length of the cable attached to the probe. TEMPCO-10 is 10 feet long, TEMPCO-50 is 50 feet long, TEMPCO-100 is 100 feet long and TEMPCO-200 is 200 feet long.

INSTALLATION.

1 Connect the temperature probe cable to the TEMP PROBE connector at the front panel of the Kepco battery charger. For Kepco KES or KRR battery chargers, verify that the TEMP PROBE NOT CONNECTED indicator on the battery charger is not lit.

2 Attach the temperature probe to the negative (–) terminal of the battery being charged. If the threaded stud is long enough, mount the probe on the threaded stud and attach it with another nut. Otherwise, remove the existing nut and use it to attach the temperature probe. In either case observe torque requirements when tightening the nut**.** NOTE: The temperature probe is internally isolated from the battery charger connections, so it may be connected to the (+) terminal of the battery if desired.

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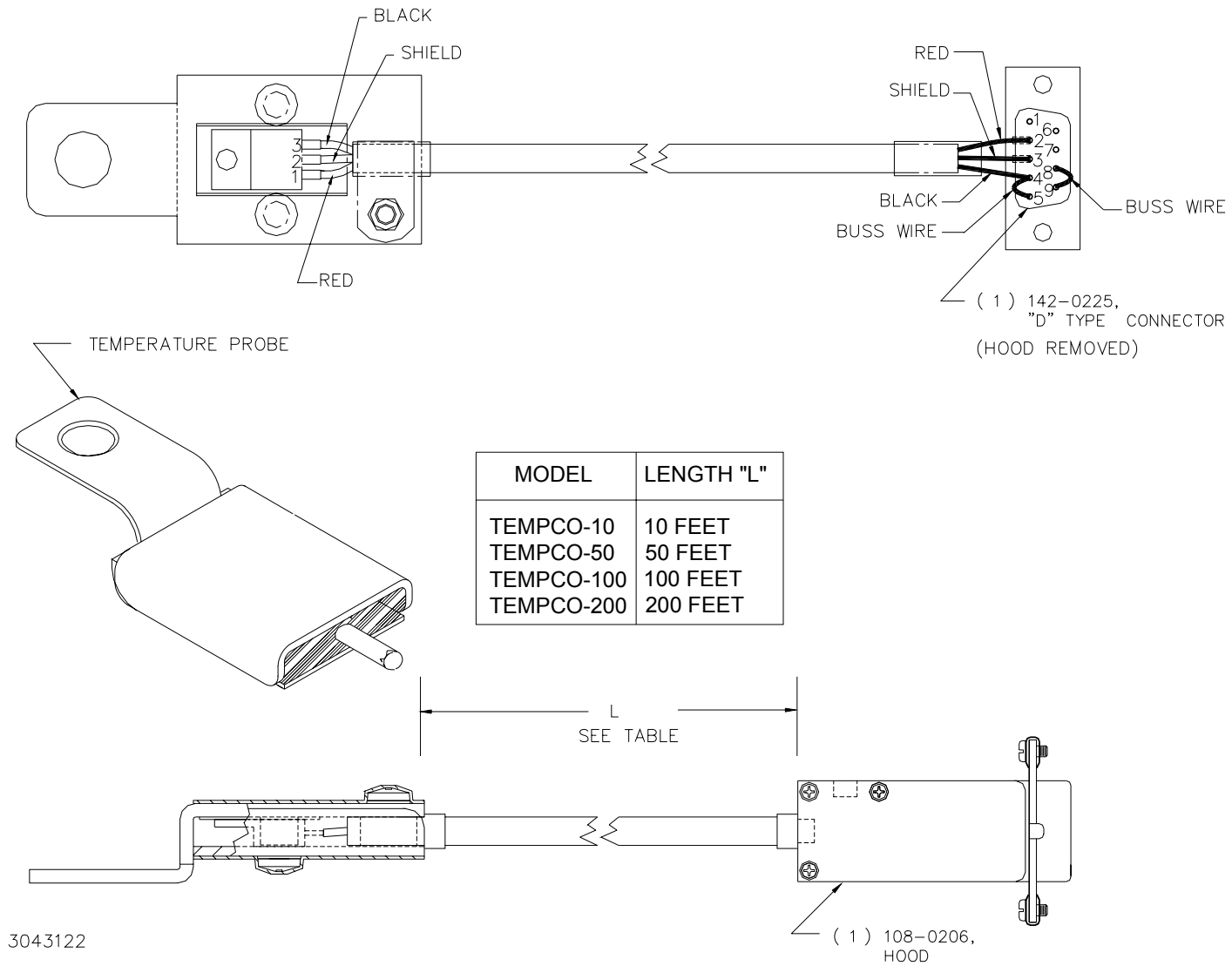

MODEL	LENGTH "L"
TEMPCO-10	10 FEET
TEMPCO-50	50 FEET
TEMPCO-100	100 FEET
TEMPCO-200	200 FEET

FIGURE 1. TEMPERATURE COMPENSATION PROBE

TABLE 1. TEMPCO TEMPERATURE COMPENSATION PROBE SPECIFICATIONS

SPECIFICATION		RATING	CONDITION
Supply Voltage		+5V	Kepco KRR, KES Models
		Range: +4V to +30V	Other Applications
Temperature Range		0°C to 35°C	Kepco KRR, KES Models
		0°C to 100°C	Other Applications
Accuracy		±0.6°C typ., ±1.5°C max.(tested)	T_A = 25°C
		±0.9°C typ., ±2°C max.(by design)	T_A = 100°C, T_A = 0°C
Non-linearity		±0.2°C typ., ±0.5°C max.(by design)	$0°C \leq T_A \leq 100°C$
Sensor gain		Range: +9.8 to 10.2mV/°C, +10.0mV/°C typ.	$0°C \leq T_A \leq 100°C$
Load Regulation		±0.5mV/mA typ., ±5mV/mA max.(by design)	$0 \leq I_L \leq 1mA$, $0°C \leq T_A \leq 100°C$
Line Regulation		±0.02mV/V typ., ±0.2mV/V max.(by design)	$4V \leq V_S \leq 30V$, $0°C \leq T_A \leq 100°C$
Quiescent Current		91.5µA typ., 141µA max.(by design)	V_S = +30V, $0°C \leq T_A \leq 100°C$
Quiescent Current Temperature Coefficient		+0.39µA/°C typ., +0.7µA/°C (by design),	$4V \leq V_S \leq 30V$
Minimum Temperature for Rated Accuracy		0°C	Kepco KRR, KES Models
Long Term Stability		±0.08°C typ.	1000 hours, with junction at T_{Max}
Thermal Resistance		Approximately 65°C/W	Junction - ambient
Resistance	Positive and Output wires	0.05 Ohms/ft max.	T_A = 25°C
	Return wire	0.01 Ohms/ft max	