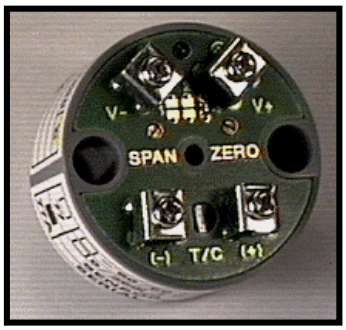
Not Recommended for New Installations.
Please contact Technical Support for more information.

Two-Wire Transmitter
Model 4050TK

The Model 4050TK transmitter converts a k-type thermocouple voltage signal into a 4-20mA process signal. This process signal can then be transmitted without signal degradation over long distances using ordinary and inexpensive copper-wire, eliminating the need for expensive thermocouple extension cable. The transmitter is designed to mount in a standard B connection head (or equivalent).

Features

- Cold junction compensation
- RFI rejection filter
- LED power-on indicator
- Compact size fits small connection heads
- Solder pad selectable temperature range
- Supply voltage polarity protection
- Rugged, epoxy filled casing



1.0 SPECIFICATIONS

Overall Temperature Ranges:

NOTE: The 4050TK has three temperature ranges available to the user. The actual overall range desired is selected via jumpering the appropriate pads on the transmitter. The user can then program the 4-20mA output to represent a narrower range within the overall range using the ZERO and SPAN adjustments (see section 3.0). In the following table the upper ranges separated with a "/" represent the SPAN of each range. For example, the transmitter jumpering pad 1 will enable you to span the 4-20mA to represent a range of 32°F (4mA) to anywhere between 212 and 446°F (20mA).

Overall Range	Type K
1	0-100/230°C 32-212/446°F
2	0-230/517°C 32-446/962°F
3	0-517/1200°C 32-962/2192°F

Span Drift:	0.005%/°C		
Zero Drift:	2.0 µV/°C		
Supply Effect:	0.5 µV/V		
Linearity:	0.1% of input		
Cold Junction Compensation:	-10°C to +70°C	0.05%	0.03%
	-40°C to +85°C	N/A	0.05%
Ambient Temperature Range:	-40°F to +185°F (-40°C to +85°C)		
Output Current:	4-20mA		
Operating Supply Voltage:	12-36 VDC		
Span Control:	25 Turn Potentiometer		
Zero Control:	25 Turn Potentiometer		
Open Circuit Detection:	Up Scale		
Size:	1.7' (43.5mm) Diameter x 0.8' (29.5mm) High		
Weight:	40 grams		

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2.0 WIRING

Figure 1 shows a typical connection of the 4050TK Two-Wire Transmitter. The transmitter is screwed directly inside the connection head. The thermocouple is connected to the T/C+ and T/C- terminals and the power/output wires are connected to the V+ and V- terminals, observing the correct polarities. The length of the connecting wires is limited by its resistance and its size should be able to carry 30mA.

The connected instrument can be a recorder, controller, indicator, datalogger, etc. For instruments without built-in excitation voltage, an external supply voltage should be used. The input impedance of the instrument must be less than or equal to:

$$\frac{Vsup - 10V}{20mA} - Rwire$$

where: Vsup is the supply voltage
Rwire is the total resistance of the wires

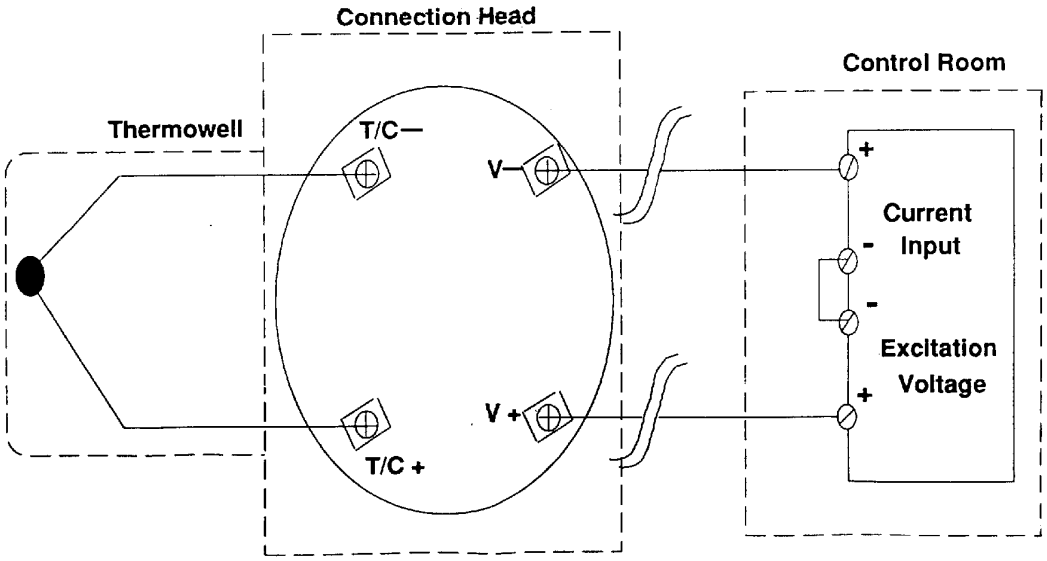

Figure 1

We recommend the use of UNGROUNDED thermocouples to avoid ground loop problems. If a grounded or naked thermocouple is used, the V+ or V- terminals must not be connected to earth ground, to avoid inaccuracies or possible damage to the transmitter.

NOTE: The negative and positive voltage connections of the transmitter are connected to positive input and positive excitation voltage connector.

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3.0 CALIBRATION

The transmitter has been factory calibrated to the input temperature range based on the ordering information. It was calibrated using a supply voltage of 24VDC at an ambient temperature of 26°C ±4°C. Re-calibration is required if a different temperature range is desired. Better supply voltage effect and cold junction drift specifications can also be attained if the transmitter is re-calibrated using the operational supply voltage and near the operational ambient temperature respectively. Re-calibration is done using the following procedures.

3.1. Solder bridge the appropriate range selection pads on top of the transmitter. Only one pair of pads must be soldered, the rest should be unconnected. Please refer to SPECIFICATIONS section for the range number corresponding to the desired temperature range.
3.2. Connect the transmitter as shown in Figure 2. The voltage source must be stable and the T/C simulator must be connected to the transmitter via T/C wires. The ammeter should be accurate to 0.01 mA.
3.3. Set the T/C simulator to 0°C.
3.4. Adjust ZERO Control on the transmitter for the ammeter to read 4.00 mA.
3.5. Set the T/C simulator to the desired maximum temperature.
3.6. Adjust SPAN Control on the transmitter for the ammeter to read 20.00 mA.
3.7. Repeat steps 3.3 to 3.6 until both readings are correct.
3.8. The transmitter is now ready for use.

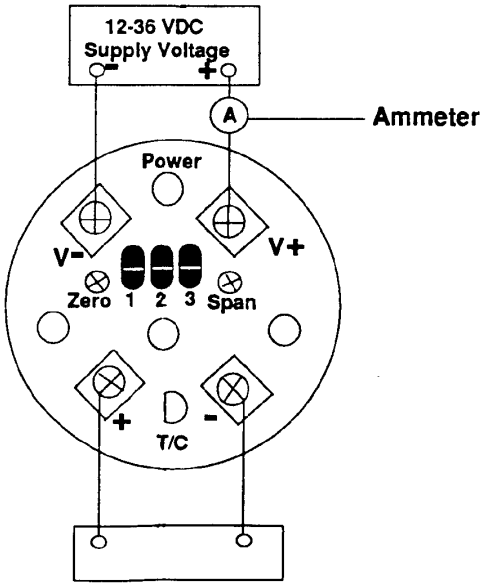

Figure 2

4.0 HINTS

4.1. Avoid air flow through the T/C terminals, as the transmitter is designed to be used in an enclosed environment (head mounted).
4.2. To eliminate supply voltage effect, use the same voltage as will be used in actual operation. It was factory calibrated with a 24 VDC supply.
4.3. To minimize cold junction drift, calibrate near the ambient temperature that the transmitter will be exposed to. It was factory calibrated with an ambient temperature of 26°C ±4°C.

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