

**ADDENDUM TO THE CFW-09
FREQUENCY INVERTER
MANUAL
CFW-09HT LINE -
TEMPERATURE SENSOR
FRAMES 9 AND 10**

07/2003

Series: CFW-09

Software Version: 2.1X

Manual Number/Revision:

0899.4681 E/1

1. CFW-09 WITH TEMPERATURE SENSOR:

- The CFW-09 HT inverter line with temperature sensor has the same mechanical installation, function, programming and performance characteristics of the standard CFW-09 line.
- Each inverter arm (output phase) of the CFW-09 HT inverter has a RTD sensor (PT100 - two wires) on its heatsink. The purposes of these sensors are thermal monitoring and pre-alarming (overtemperature fault). These functions can be achieved with the aid of external circuitry.
- Please, read the CFW-09 Frequency Inverter Manual. This addendum addresses only the temperature sensor feature.

2. ELECTRICAL INSTALLATION:

- Figure 1 shows the thermostat (A) and RTD (B) positions in the heatsink.

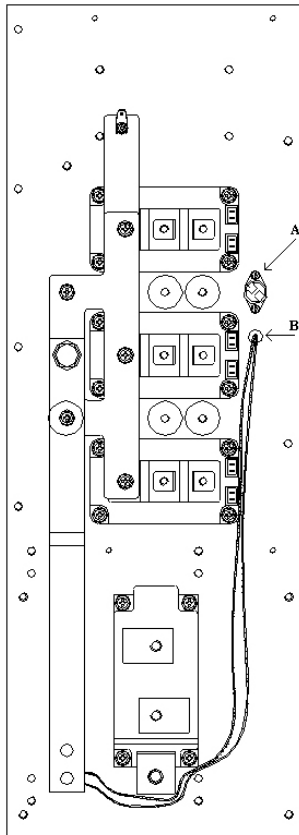


Fig. 1 - Sensor positions

- The thermostat monitors the heatsink temperature and trips the inverter (overtemperature fault) when it is necessary.
- Figure 2 shows the RTD sensor external connections.

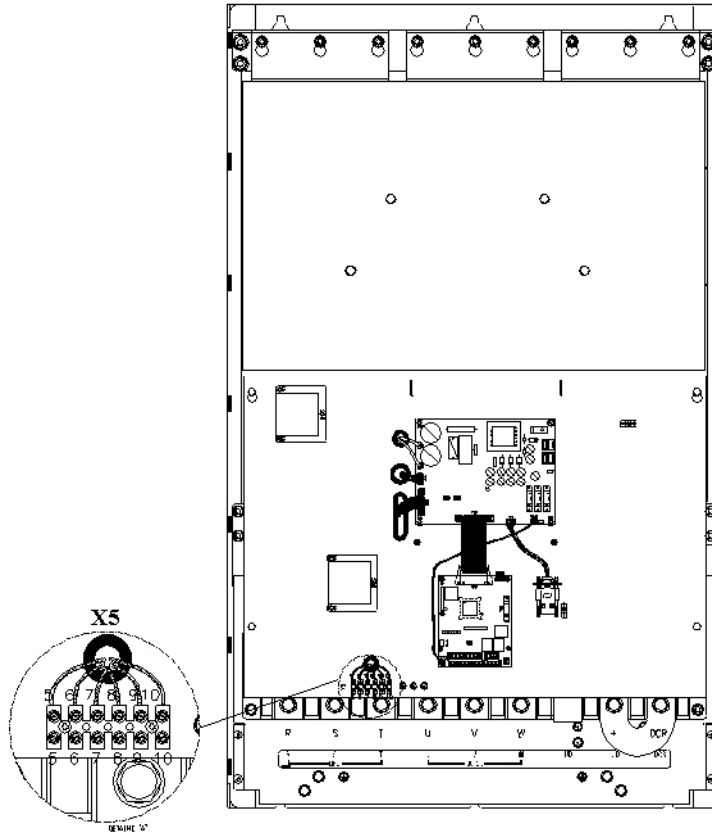


Fig. 2 - Sensors External Connections

- ρ The X5 connector has three pairs of outputs. Each pair has a black wire and a red wire, corresponding to a inverter arm RTD sensor.

3. ABOUT THE SENSORS:

- ρ The overtemperature fault thermostat is "open on rise" with automatic reset. The trip point is 190 F (88°C), with ± 5 F (± 3°C) of tolerance.
- ρ The RTD linearisation equation is:

$$R_t = R_0 \cdot (1 + A \cdot t + B \cdot t^2 + C \cdot (t - 100) \cdot t)$$

where:

- R_t is the measured resistance
 - $R_0 = 100 \Omega$
 - $A = 3.9083E-3$
 - $B = -5.775E-7$
 - $C = -4.183E-12$ (for temperatures below 0°C; above 0°C, $C=0$)
 - $t =$ temperature in °C
- ρ Be aware that for a PT100 sensor, a 1°C temperature change will cause a 0.384Ω change in resistance, so even a small error in the measurement of the resistance (for example, the

resistance of the wires leading to the sensor) can cause a large error in the measurement of the temperature.

- ρ Table I shows some temperature and resistance values.

Temperature (°C)	Resistance (Ω)
-20	92,16
-10	96,09
0	100,00
10	103,90
20	107,79
30	111,67
40	115,54
50	119,40
60	123,24
70	127,07
80	130,89
90	134,70
100	138,50
110	142,29
120	146,06