

Micro Control Systems

APPLICATION NOTE
APP-052

Carrier 5K Temperature Sensors

Revision History

Date	Author	Description
07/09/09	JGW	Created initial version
08/12/09	BCL	Changed Title. Updated Headings on other pages.

Introduction

The Carrier 30 HX chiller package comes equipped with embedded 5K thermistors in the motor. There are two (2) thermistors factory installed in each compressor. There are three (3) terminals for the thermistors. (S1, S2 & C) Motor temperature is measured by leads connected to one of the S terminals and the C terminal. If a compressor motor thermistor fails, verify that there is a true short or open circuit at 1 to S2 or S2 to S1.

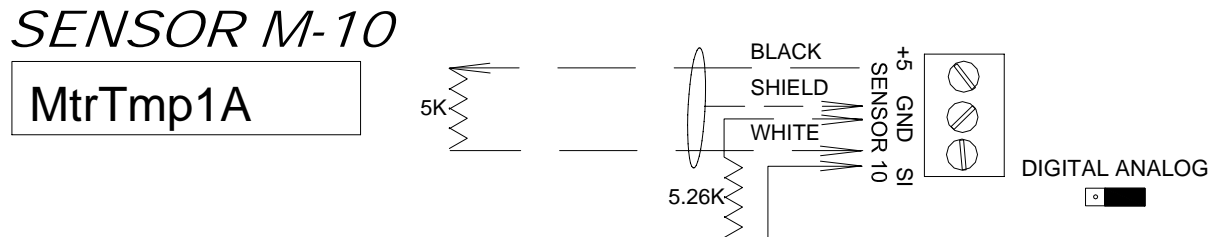
The thermistor's are not field serviceable. If both motor thermistors fail the compressor needs to be replaced.

Requirements

1. Any compressor motor with 5K Ω embedded motor temperature sensors that matches Table 1 on next page.
2. A 5.26K Ω resistor, preferred 1% tolerance.
3. A sensor input terminal on MCS controls.
4. An appropriate length of 2 wire shielded cable.
5. MCS Magnum controller with **Software Version 6.01 Q or later.**
6. MCS-Connect **Software Version 6.01 Q or later.**
7. MCS-Config **Software Version 6.01 X or later.**

MCS Magnum

The motor thermistor is wired to a sensor input on the Magnum or to a sensor input on a MCS-SI16 board. The drawing below shows the actual wiring to MCS Sensor input..



Step by step wiring

Motor End

1. Using black wire connect to terminal C of Motor thermistor.
2. Using white wire connect end to S1 (or S2 if S1 has failed) terminal of thermistor.
3. Cut drain lead of shielded cable at motor end.

Sensor End

1. Connect black wire to + 5 vdc on MCS sensor input.
2. Connect drain lead from shielded cable and one end of 5.26K Ω to grd terminal on MCS sensor.
3. Connect white wire and other side of 5.26K Ω to sensor signal.

MCS Cfg

1. Using the MCS-Cfg specify CARR-5K as the sensor type.

Temperature verses ohms Ω Table 1.0

Temperature	Resistance		Temperature	Resistance
-22	88,480		113	2,184
-13	65,205		122	1,801
-4	48,536		131	1,493
5	35,476		140	1,244
14	27,663		149	1,041
23	21,163		158	876
32	16,325		167	740
41	12,696		176	628
50	9,950		185	535
59	7,856		194	458
68	6,246		203	393
77	5,000		212	339
86	4,028		221	294
95	3,266		230	255
104	2,663		239	222