



APPLICATION NOTE

APP-052

Revision History

Date	Author	Description
07/09/09	JGW	Created initial version
08/12/09	BCL	Changed Title. Updated Headings on other pages.
10-15-20	DEW	Change to new heading

Carrier 5K Temperature Sensors



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 it 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 S1 to S2 or S2 to S1.

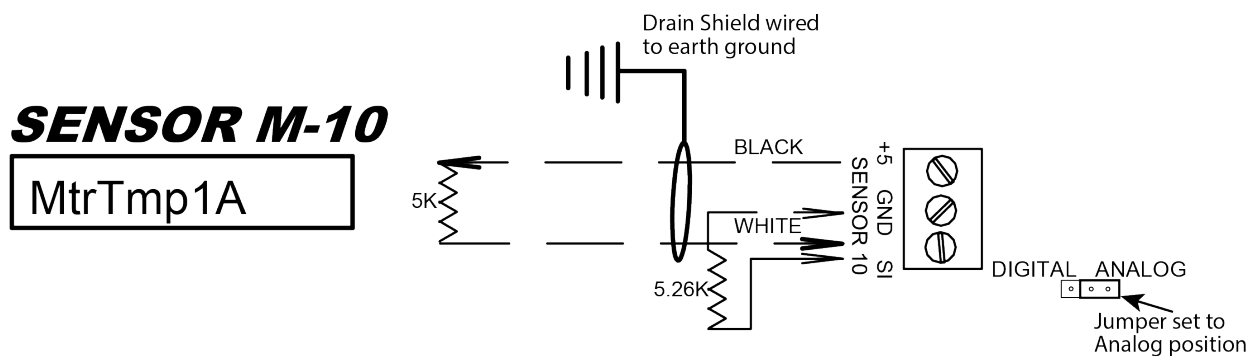
The thermistor's are not field serviceable. If both motor thermistors fail the compressor needs to be replaced.

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-SI expansion 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 one end of 5.26K Ω to ground terminal on MCS sensor.
3. Connect white wire and other side of 5.26K Ω to sensor signal.
4. Connect drain lead from shielded cable to earth ground

MCS Cfg

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

Temperature verses ohms Ω Table 1.0

Temperature	Resistance
-22	88,480
-13	65,205
-4	48,536
5	35,476
14	27,663
23	21,163
32	16,325
41	12,696
50	9,950
59	7,856
68	6,246
77	5,000
86	4,028
95	3,266
104	2,663

Temperature	Resistance
113	2,184
122	1,801
131	1,493
140	1,244
149	1,041
158	876
167	740
176	628
185	535
194	458
203	393
212	339
221	294
230	255
239	222