Service Tips – 30RB Chillers

CONTROL SETUP and CONFIGURATION

1. Setting up pump control of external pump(s), without the hydronic package option
1. Wiring pump feedback contacts
2. Backup pump operation
3. Configuring dual chiller control
4. Using analog inputs (setpoint, demand limit, reset) with the EMM
5. What is the default password?
6. How can I disable a compressor?
7. Where do I select control type and setpoint type?
8. Service test versus QUIC test
9. Siemens Micromaster 420 low ambient fan speed control
10. How do I connect a "Ready" indicator to the RDY output shown on the wiring diagram?
11. How do I connect a "Run" indicator to the RUN output on an EMM board?
14. Mandatory configurations for items ***60HZ*** and ***PD4.D***.

TROUBLESHOOTING

12. Machine is enabled to start, but it just sits there with no alarm indication.
12. The **CAP.S** listing in ***Run Status*** > ***VIEW***
13. **P.28** Electrical Box Thermostat Failure
14. **FC.n0** alarm: Missing Unit Configuration
15. **P.32** or **P.33** cooler pump failure
16. **P.14** no flow alarm
17. Meaning of the emergency stop (**EMSTOP**) variable
18. ***nx*.02** crankcase heater failure
29. Normal, proper oil levels
29. High cooler approach with good suction superheat
30. The Siemens Micromaster display flashes between zero and the setpoint frequency.

31. Nx.01 High Motor Temperature Alarms
32. "Access Denied" message when changing configurations.
33. P.40, P.41, P.42 Alarms (Repeated Low SST)

HARDWARE ISSUES AND UPDATES

1. The resistor at J5-A, terminal 15B
13. Reverse Rotation Board (ref. P.28 alarm)
15. What is the HOA switch shown in the schematics?
18. Scroll Protection Module (SPM) issues
19. The black plastic compressor control covers are cracked or broken.
20. Compressor circuit breaker lug screws strip, are too short
21. EXV electrical cable connectors
22. EXV motor failures
23. Compressor Failure
24. Sightglass moisture indication
25. Broken hail guard latches
26. Pinched off tubes in cooler bundle
27. Why is the unit line breaker rating so high?

PARTS

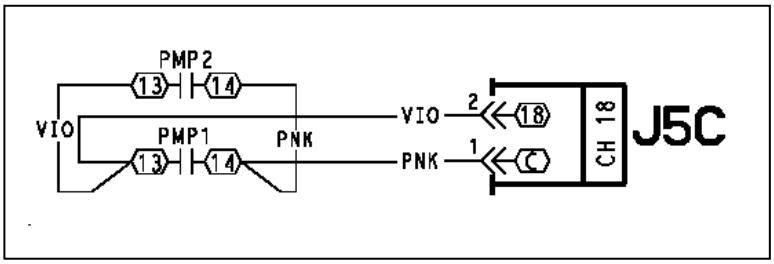
21. EXV electrical cable connectors
23. Compressor replacement
28. Pressure transducers

SOFTWARE

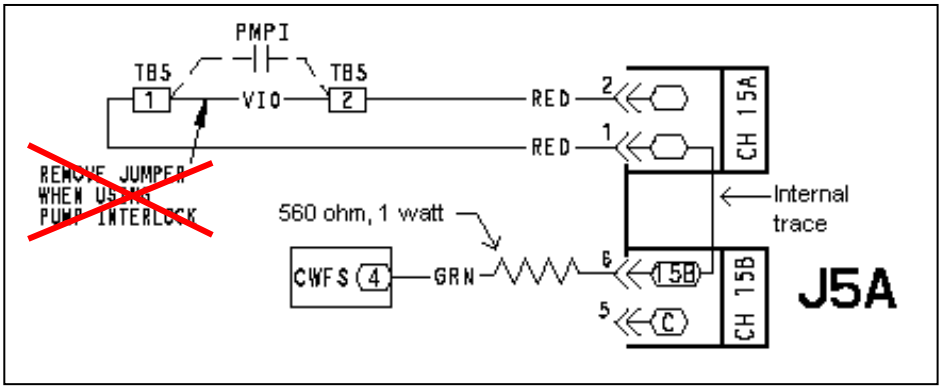
34. Software Change Summary

1. Setting up control of external pump(s), without the hydronic package option

- If you want the chiller to control external water pumps, you *must* wire pump auxiliary contacts (feedback contacts) to MBB J5C (CH 18), *not* to TB-5 terminals. Find pink and violet wires in wire trough. Failure to do this will result in **P.32** or **P.33** pump failure alarms



- Generally you will *not* use anything across TB5 1-2 except the factory provided jumper. If an auxiliary contact is added here, it must be *in addition* to the auxiliary used at J5C Channel 18 shown above. This is different from 30GX/HX and 30XA usage of TB5 1-2. (But if you *do* add an extra auxiliary contact between TB5 1-2, yes, you do have to remove the jumper as the note says.



- Set ***Configuration > OPTN > PUMP*** to **1** to control one external pump (default = **0**). Set ***Configuration > OPTN > P.LOC*** = **Yes** if you want the system to alarm when there is flow when the control is calling for the pump(s) to be off (default = **No**). This input is ignored if pump control is not used (**PUMP** = **0**).

- Note that the output of the chilled water flow switch (CWFS) is 24vac when the switch is "closed". That voltage connects in series with Channel 15A, passing through the TB5 1-2 connection. If that connection is opened, a **P.14** No Flow alarm will be declared. It was found that if TB5 1 is grounded (by an attempt at field wiring, for example), this can cause the CWFS to fail. The 560Ω resistor shown above can be added in the field (and is now added in production) to protect against this possibility. The same resistor is added to the Reverse Rotation Board input at J5A channel 16B as well.

2. Backup Pump Operation

- If you have the dual pump hydronic package, you probably want the second pump to be tried if the first pump is tried and fails, without having to do a manual alarm reset.

- Unless the problem with the first pump is with its contactor (i.e., the pump contactor doesn't close when operation is called for), automatic backup pump operation won't happen with software versions earlier than 1.09. Smartload Version 1.09 (or later) to add the full automatic backup capability.

- This is how it works starting with Version 1.09: If the first pump is tried and no flow is detected (e.g. pump circuit breaker open or pump just doesn't work), **P.14** flow failure is temporarily declared, and **P.32** Pump #1 failure is declared. If Pump #2 is not already faulted, the **P.14** fault is cleared automatically, and Pump #2 is started. If the Pump #2 contactor works and flow is detected, the system will run without requiring any manual alarm reset (although the **P.32** fault will remain active). (The above description assumes that Pump #1 is the first pump in line to run.)

- See also **P.32** and **P.33** Pump Failure faults.

3. Dual Chiller Setup

- The following are configurations applicable to Dual Chiller Operation setup which differ from prior Comfortlink models, such as 30GX or 30HX.

    - Control type (***Operating Mode > SLCT > OPER***) must be set to **2** = CCN Control for the Slave chiller. (The Master can be set at any of the options. Prior Comfortlink chillers required that the control type be set to Switch for the Slave.)

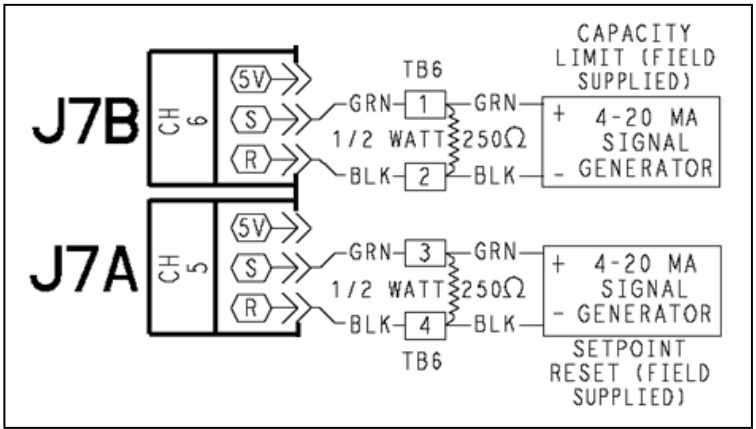
    - *Both* the Master and Slave chillers must have common leaving water temperature sensors connected to their respective MBBs. (Prior Comfortlink chillers only required this for the Master.) Duplex chillers have the sensors and sensor cables already provided and wired up, although obviously not installed.

    - "Lag Unit Pump Select" must be set consistently. If pump control is NOT being used, set ***Configuration > RSET > LAGP*** to **1**. If pump control IS being used, set ***Configuration > RSET > LAGP*** to **0**, which is the default value. This must be set in both the Master and Slave chillers, and it must be consistent in both.

4. EMM Analog Inputs

- Energy Management Board (EMM) analog inputs are used for (a) chilled water reset or auto setpoint, and (b) demand limit.

- The inputs are "advertised" to be for 4 to 20 mA current sources. When used with such a current source, a 250Ω resistor must be installed across the input terminals as shown in the diagram. This resistor converts the current to a 1 to 5 dcv input, which is what the

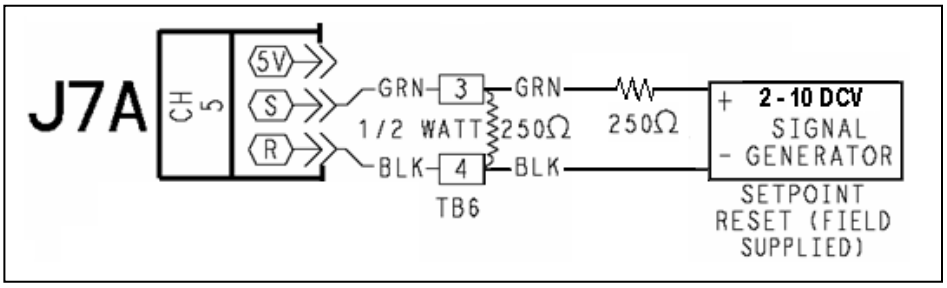


EMM board really looks for.

- For field-installed EMM boards, the resistors must be field-supplied and installed. As of this writing, with factory-installed EMMs the resistors are not being supplied either. So check for this, and expect to install the resistors.

- If the customer prefers to use a dc volt input, it may be applied across the same terminals. Make sure that the operating range of the customer's input is set up to provide 1 to 5, not 0 to 5 volts. Note that a dc volt input should work whether or not the 250Ω resistor is in place. In the configuration set ***Setpoints > COOL > CRV1*** to **4** (mA equivalent to 1 volt with the 250Ω resistor) and ***Setpoints > COOL > CRV2*** to **20** (mA equivalent to 5 volts).

- A 2 to 10 dcv input source may be used if an extra resistor is added to make a voltage divider. (See example below.)



5. Passwords

- The standard Carrier password for 30RB (and 30XA) controls is set to "**0111**".

- If for any reason the custom configuration has been lost or never loaded, try the pre-factory default password of "**0113**".

- See also Loss of Configuration.

6. Disabling Compressors

- The table for disabling compressors is found under ***Run Status***. Look for the table ***Run Status > CP.UN***. Unlike what you might think because of its placement under ***Run Status***, this is not a read-only table. To disable compressor A1, for example, set **A1.UN** to **Yes**. By default these are **No**.

7. Setting Control and Setpoint Type

- Control Type and Setpoint Type selections are found under ***Operating Mode > SLCT*** rather than under ***Configuration***, since these items are only configurable from the local display and NOT via CCN.

- Most sites use Switch Control (***Operating Mode > SLCT > OPER*** = ***0***), which is the default setting.

- The setpoint selections (***Operating Mode > SLCT > SP.SE***) are adequately described in the Troubleshooting Manual.

8. Service Tests

- The 30RB (and 30XA) has two different test modes, TEST (which runs the compressors) and QUIC TEST (which tests discrete outputs with the unit off).

- Manual Test:
  - Set the Remote-Off-Enable (R-O-E) switch to OFF.
  - Enable test by setting a "request": ***Service Test > TEST > T.REQ*** = **ON**.
  - Generally you will need to enter the password first.
  - Now set the R-O-E switch to ENABLE.
  - Turn on compressor(s) as desired: ***Service Test > TEST > CP.A1*** = **ON** (for example).
  - Unit will operate normally with all safeties operational.
  - Ok to escape out of ***Service Test*** to view parameters in other tables

- Quick Test
  - Set the Remote-Off-Enable (R-O-E) switch to OFF.
  - Enable the test by setting a "request": ***Service Test > QUIC > Q.REQ*** = **ON**.
  - Generally you will need to enter the password first.
  - Leave the R-O-E switch in the OFF position.
  - Turn on individual outputs as desired (within the ***QUIC*** table):
    - One output at a time may be operated.
    - Example: ***Service Test > QUIC > PMP.1*** = **ON**
    - "**VARIFAN**" means Micromaster Low Ambient Fan Speed Control (**SPD.A**, for example)
    - For "**FAN.*x***" outputs, "***x***" specifies the fan stage number (which may include more than one fan)
  - Escaping out of QUIC test menu or setting the R-O-E switch to ENABLE will disable Quick Test.
- The service tests will not work if operating mode is set to CCN. Set **Operating Mode > SLCT > OPER** = **0** (local switch control) before doing a service test.

9. Siemens Micromaster 420 Low Ambient Fan Speed Control

- The following is the standard 30RB Setup. Use this procedure after installing a replacement drive in the field.

  ► Disconnect one end of the terminal 5-8 jumper.

  ► Set Access Level parameter **P0003** to **3**.

  ► Enter one "Quick Commissioning" parameter as follows. Skip steps in red font for normal configuration.:

    ► Turn on Quick Commissioning by setting **P0010** to **1**.

► Check that **P0304**, motor voltage, is correct based on the unit selection.

(► Set **P0305**, motor full load amps, to nameplate value.**)**

(► Set **P0307**, motor horsepower, to nameplate value.**)**

(► Check that **P0310**, base frequency, is 60 Hz.**)**

► Set Rated Motor RPM: Set **P0311** to **1140** (rpm). This is used for the 6-pole fan motors used in the 30RB chillers. (Note: The 30XA uses 850 rpm for this parameter if unit has standard fan motors.)

Remember, you have two different ways to increment the value – either with the ▲ key or one digit at a time using **Fn** and the ▲ key.

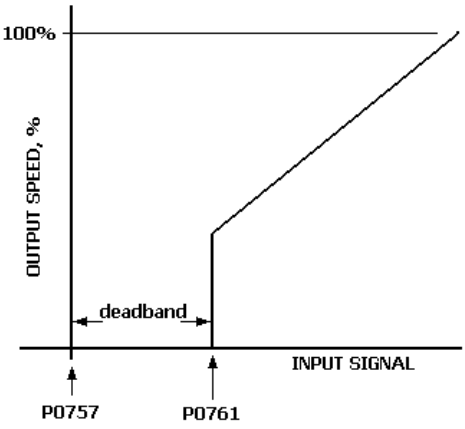
► Turn off Quick Commissioning by setting **P3900** to **1**. Wait for the **P3900** display to reappear before proceeding. Note: Use **P3900** = **1** only after first QC - it resets non-motor parameters to factory defaults. If modifying other parameters later, use **P3900** = **3** to end QC while retaining other settings.

► Check that Access Level parameter **P0003** = **3**.

► Set Auto Restart Behavior parameter **P1210** to **6**.

► Set Continuous Boost parameter **P1310** to **10.0** (%).

► Set Offset **P0757** & **P0761** to **0.50** (volts). This will result in no fan speed with voltage noise up to 0.5 volts. See the figure below.



Output Curve Parameters **P0757** and **P0761**

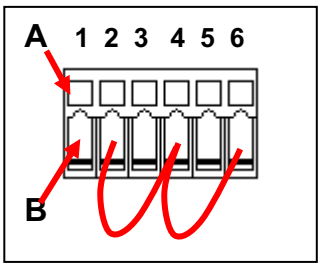
► Reconnect terminal 5-8 jumper.

- If the A0511 Alarm (I^2t motor overload) appears after running:
  - Drive will perform an "autotune" after commissioning to self-calculate stator resistance. You may force this by the following procedure, *after* verifying Quick Commissioning values and terminating QC with **P3900** = **3**:
    - ► Disconnect terminal 5-8 [white] jumper if connected.
    - ► Set parameter **P1910** to **1**. (Alarm **A0541** will appear.)
    - ► Reconnect terminal 5-8 [white] jumper (run command).

► After 3 minutes Autotune is completed. Now disconnect terminal 5-8 jumper to remove run command.

► Reconnect terminal 5-8 jumper (run command).

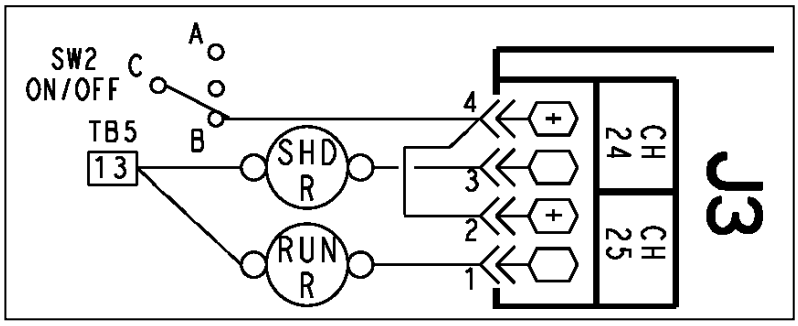
10. Wiring the RDY ("Ready") Indicator Output



- This output is on J3 of the MBB.
- Wiring of an external relay would be wired between TB5-13 (common) and J3 terminal 1. For J3 terminal 1: The sketch shows the view looking into the connector for J3. Pry down with a very narrow screwdriver in hole "A" while inserting (1/4") stripped wire into hole "B". (Terminal plug for J3 is RCD part no. 734-106.)
- Make sure that J3 terminal 2 is jumpered back to J3 terminal 6 and that J3-6 is "hot" (wired to 24 vac at switch SW2).
- The "RDY" output will be energized whenever the chiller is enabled to run and/or at least one circuit is running. It will also be on when the chiller is enabled but will not start due to low suction pressure.

11. Wiring the RUN Indicator Output (with EMM)

- This output is on J3 of the optional EMM (Energy Management Module) board. See Figure for wiring. (Terminal plug for J3 is RCD part no. 734-104.)
- Output will not work unless the "hot" 24vac connection is field wired from switch SW2 to J3-4, and the jumper between J3 pins 2 and 4 is added.



12. Machine Won't Start, No Indications

- The most common cause of this situation is the saturated suction temperature being significantly lower than cooler water temperature. The controls (usually correctly) interpret this as an indication of low charge.
- There is presently no alarm to flag this situation. It is likely that an alarm will be added in a future software version.

- Usually there are three levels of diagnostics related to this situation:
    - The most obvious diagnostic indication is an alarm (and ***Alarm > H.ALM***, Alarm History).
    - If no alarm/alert is present, next check ***Operating Modes*** for an active mode. For example, in the case of low SST, Mode 21 (Circuit A), Mode 22 (B), or Mode 23 (C) might be showing "**ON**".
    - The next level of diagnostic help is found as a one or two digit number in ***Run Status > VIEW > CAP.S***, which indicates capacity control overrides which are active. This table is present in software versions 1.07 and later. Relevant values are shown below.
- See also SMB06-0003.

CAP.S	Meaning	CAP.S	Meaning
1	Water heat exchanger freeze protection	15	Chiller System Manager override
2, 3, 4	Very low saturated suction temperature in cooling (**2** for ckt. A, **3** for ckt. B, **4** for ckt. C)	16, 17, 18	High pressure override (**16** for ckt. A, **17** for ckt. B, **18** for ckt. C)
5, 6	Low water temperatures	19	Standby Override
7	Ramp loading	22	Minimum On time delay
8	Manual service test	23, 24, 25	Circuit capacity increase is held due to low saturated suction temperature in cooling. (**23** for ckt. A, **24** for ckt. B, **25** for ckt. C)
9	Demand limit	26, 27, 28	Compressor envelope high saturated condensing temperature unloading protection (**26** for ckt. A, **27** for ckt. B and **28** for ckt. C)
10	Lock (no water flow) override	29, 30, 31	low saturated suction temperature for more than 3 minutes in cooling (**29** for ckt. A, **30** for ckt. B and **31** for ckt. C)
11, 12	High temperature cooling	32, 33	Compressor envelope low suction unloading in heating protection (**32** for ckt. A, **33** for ckt. B)
13	Minimum On/Off and Off/On time delay	34, 35, 36	Low refrigerant charge - circuit affected is not allowed to start (**34** for ckt. A, **35** for ckt. B and **36** for ckt. C)
14	Slow change override	37, 38, 39	Superheat too low (< 5°F) or too high (> 45°F), (**37** for ckt. A, **38** for ckt. B and **39** for ckt. C)

13. P.28 Electrical Box Thermostat Failure

- This alarm indicates that the Reverse Rotation Board (RRB) contact is open. (The confusing description comes from the fact that, in Europe a thermostat is required in the power enclosure, and there the RRB is in the same circuit.) The 24vac feedback to MBB J5A terminal 16B is absent when checked.

- When the RRB is indicating an alarm, its red LED is blinking or off (case of no power to board).

- Open Reverse Rotation Board contacts may indicate:

    - Phase sequence is reversed.

    - The fan circuit breaker on the line side of this device is open.

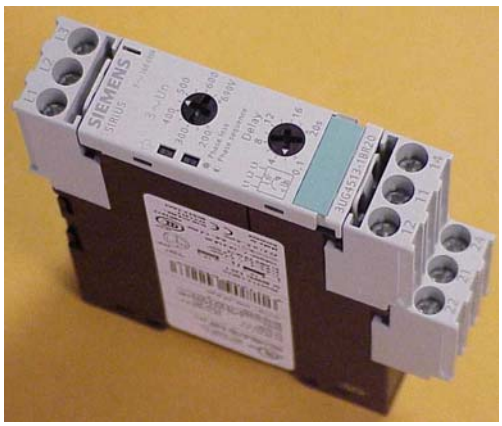
    - Power distribution system is corner-grounded delta. In this case the RRB will never work! A replacement board is being qualified.

- Other notes on the <u>original</u> RRB (HK35AC003, CEPL130444-03):

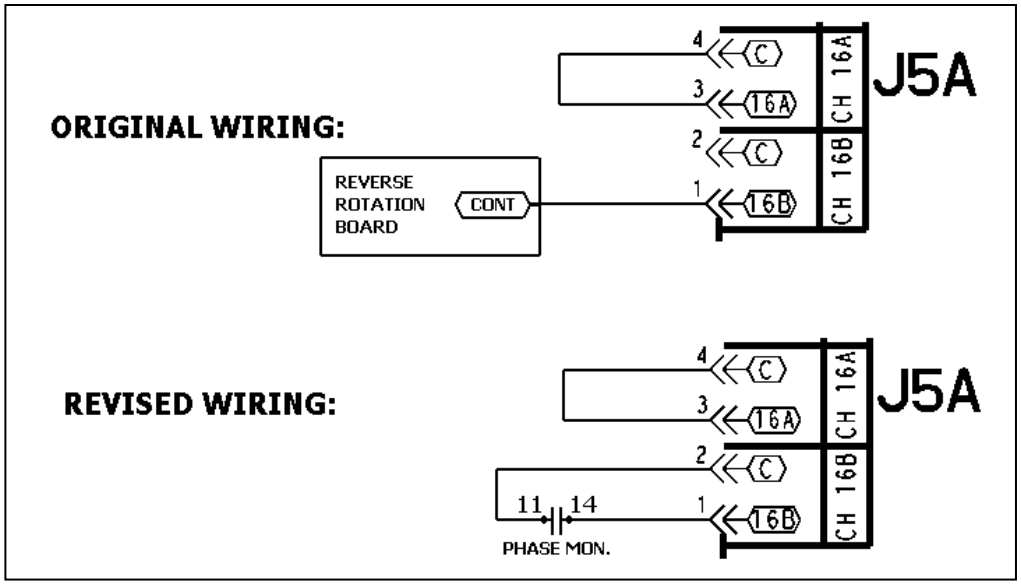
    - It is not really suitable for 575 volt applications, so it may (but not certainly) be damaged by the line voltage.

    - This RRB may not protect the unit in the case of single phasing of the compressors. In this case it has been observed that a back emf fools the RRB such that it does not trip.

- The new/replacement RRB will be Siemens phase monitoring relay 3UG4513-2BR20, implemented into factory production starting with 4006 (week 40 of 2006). RCD has or will have the new relay under part #30RB680036. See figure. This relay is DIN-rail mounted. Wire the relay to the MBB as shown below (across N.O. contacts 11-14).



<u>Siemens 3UG4513 Phase Monitor</u>



October 4, 2007

14. FC.n0 Loss of Configuration

- This alarm usually indicates that all custom configurations have been lost. This is a known but uncommon issue with software versions including 1.09. The root cause is being investigated. It may seen when a new board is purchased from RCD for field installation.

- In order to reenter the valid configurations, the standard password **0111** will not work. Use **0113**.

- Correct the password as follows:

    - Set ***Configuration > UNIT > PAS.E***, password enable, to **NO**.

    - Set ***Configuration > UNIT > PASS***, password, to **0111**.

    - Set ***Configuration > UNIT > PAS.E***, password enable, back to **YES**.

- The following configurations must also be corrected, and they are not particularly obvious:

    - Set ***Configuration > UNIT > 60HZ***, operating frequency, to **YES** (it would have defaulted to **NO**).

    - Set ***Configuration > UNIT > PD4.D***, Pro-dialog display, to **NO** (it would have defaulted to **YES**).

- Now enter all of the more obvious custom configurations, such as unit size.

15. P.32 and P.33 Pump Failure

- This alarm generally indicates that, when pump control is enabled (***Configuration > OPTN > PUMP*** is greater than 0), the feedback contact at J5C Channel 18 does *not* close when the control is calling for the pump to run. See also **Setting Up Pump Control**.

- **P.32** refers to Pump #1 and **P.33** refers to Pump #2.

- As described under **Backup Pump Operation**, a flow failure when the first of two pumps is tried will also result in a **P.32** or **P.33** indication. In that case, the unit will not be prevented from running as long as the second pump works.

- Current production includes a “hand-off-auto” (**HOA**) switch for Pump #1. This switch must be in the Auto position for Pump #1 to be operated by the chiller in pump control mode. Pump #1 may be manually run with the switch in the “**H**” position.

16. P.14 No Flow Alarm

- This alarm generally indicates that flow is not detected (24 vac absent from MBB J5A terminal 15B) when it is expected.

- Also, if ***Configuration > OPTN > P.LOC*** is set to **YES** and pump control is enabled and if the feedback contact at J5C Channel 18 is not open when the control is *NOT* calling for the pump to run, a P.14 Alarm will be declared. ***P.LOC*** is ignored if pump control is not enabled (**PUMP = 0**).

- In the terminology of the controls, "**LOCK**" generally refers to this flow switch input.

- The Troubleshooting manual discusses **P.14** in the context of pump interlock contacts, but this is misleading. The required pump interlock contacts should *not* be connected across TB5 1-2 (in the flow switch circuit). See **Setting Up Pump Control** above.

17. Emergency Stop

- If the unit will not run (it remains in a run status of OFF) and it is connected to a CCN network or translator card, it is possible that the Emergency Stop parameter is being forced via CCN.

- A value of "**DSBL**" indicates a normal non-emergency condition.

- A value of "**ENBL**" for the Scrolling Marquee variable (or "**Enable**" in ComfortView) means that an emergency stop command is in effect, has been forced.

18. Nx.02 Crankcase Heater Failure

- Besides the obvious, this alarm may indicate that the SPM (Scroll Protection Module) is defective.

- Refer to SMB05-0036 which describes problems with the heater current CT on the SPM found in units in Spring 2005. This issue was resolved at that time.

19. Compressor Control Covers Crack

- Original covers exhibited a high incidence of cracking, especially at the upper corners ("ears").

- Refer to bulletins SMB 06-0024, SMB05-0032B, and SMB 05-0029B for more details.

- Root cause of the cracking has been traced to:

    - The plastic material was incompatible with oils, including compressor oil and condenser coil fin die lubricant. Contact with oils will permit residual stresses in the plastic to become cracks quickly.

    - The studs on the compressor were not originally located to be perfectly compatible with the placement of the matching slots in the covers.

- The rotating plastic clips had problems, too: Clips originally had plastic pivots. Clips and pivots broke easily.

Basic Cover

- These covers have undergone several design changes and stages since the original.
    - In mid-2005 the Carrier factory added wide washers and elastic stop nuts to fasten the studs.
    - The plastic clips were retained, but the pivots were changed to metal.


Elastic Stop Nut with Washer


Latch Showing Pivot

    - In early 2006 the basic plastic material was changed, the clips were eliminated, and the slots and ears were redesigned.

- The new design covers were available from RCD beginning the week of April 24, 2006. The part numbers will *not change* from the original.
- Final replacement is covered by SMB06-0024 which includes a Warranty Policy.

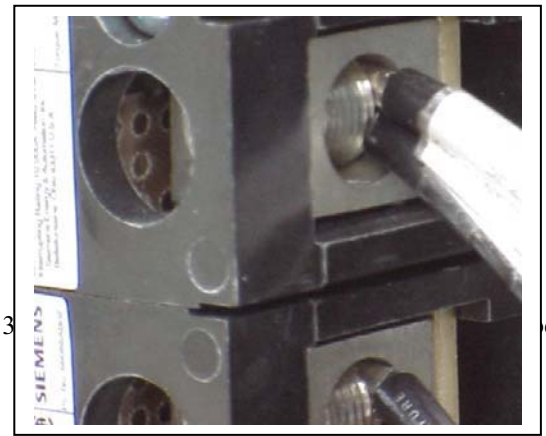

Back of Redesigned "Ear"


New Label

- The new/final cover design can be distinguished from the earlier ones by (a) strengthening ribs behind the upper attachment slots and (b) the label on the right side of the cover which does NOT describe how to attach and remove the cover (half the height of the original labels). See photos above.

20. Compressor Circuit Breaker Lug Screws Strip

- For some 208/230 volt machines (especially units made prior to 3805), compressor circuit breaker wires were not tight. Lug screws seemed to strip when tightened.



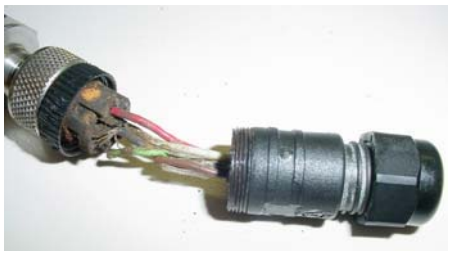
- Root cause was that the breaker lug screws were too short for the combination of large breaker and small wire size.

- The remedy is to replace the lug screws with longer screws. Refer to SMB05-0054 for details.

- Note: There is no charge for replacement lug *screws*, but you will have to pay for replacement *lugs*.

21. EXV and Flow Switch Electrical Cable Connections

- At the cable connection approximately 12" from the EXV or flow switch some connectors have been found to be corroded, resulting in a poor electrical connection. The root cause is a poor seal where the cable enters the connector.



Corroded EXV Cable Connector

New EXV Cable Connector from 30RB660012

- The field fix is to replace the connector and coat the terminals with dielectric grease. The RCD kit number is 30RB660012.

- The factory is replacing these with a molded M12 connector, as shown in the picture to the right.

22. EXV Motor Failures

- There have been a few reports of EXV motor failures, traceable to electrical terminal failure inside the EXV motor assembly.

- The root cause is that, in the manufacturing process, not enough time was allowed for potting to set.

- Beginning with production date 0906Q (approximately), a completely new sealed pin design was implemented to address this issue. See pictures below.

23. Compressor Failure and Replacement

- The majority of compressor failures have been tied to dips in line voltage which often result in welding of the contactors. See also ***Nx*.01**, High Motor Temperature Alarm.

- If a 30RB scroll compressor fails, follow the replacement procedure defined on the instruction sheet included with the new compressor. Refer also to PMB06-075.

- The associated Tubing Kit (including compressor heater, discharge check valve, suction and discharge line sections) must be ordered along with every replacement compressor. RCD has consolidated these kits into only two versions.

- Fill out the compressor failure report form. Return it to TSI Warranty Department

- In order to facilitate removal of excess oil from the system after replacing a compressor, the kit now includes a Schrader valve for installation in the lower oil port on the side of the compressor. (See figure.) From the factory it is fitted with an NPT pipe plug. The addition of the Schrader valve permits oil removal without pumping down the circuit (to less than 5 psig).

Note lower port for oil removal.

24. False Moisture Indications

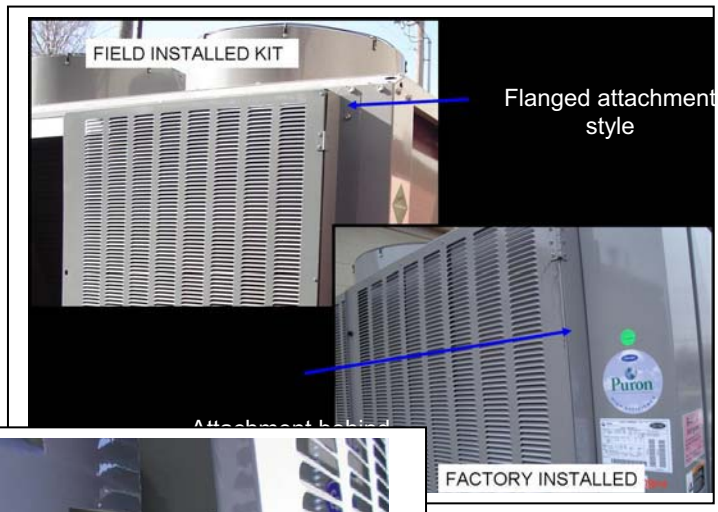
- There have been reports that the Danfoss liquid line moisture indicators fail to change from yellow to green in new systems. The device should turn green when moisture content drops below 20 ppm at 77°F, higher at higher temperatures, as would be expected when the circuit is evacuated and charged in the factory.

- This is believed to be a *false* positive indication of moisture in the system. The root cause is still under investigation with the supplier.

25. Hail Guard Issues

- There have been reports of plastic latches on hail guards breaking. These were Southco part HARHPL-3-1-1.

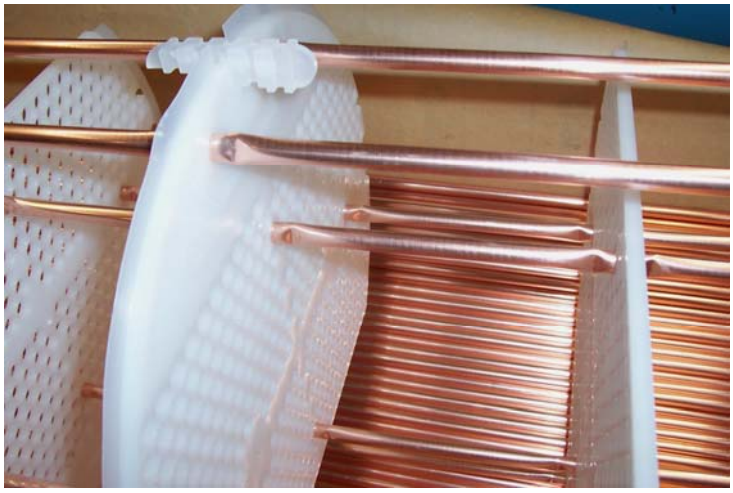
- Unit design has been changed to use metal latches (starting with production week 0606). Unfortunately, these latches are not interchangeable (the cutouts in the panels are different). The metal latches are shown below.



- Through early 2005 hail guards were provided as field-installed accessories, and some were made with a flange attachment style (below). This design was replaced by the design with the attachment behind the corner post (right).

26. Pinched Off Cooler Tubes

- When inspecting the cooler tube bundle from the water inlet or outlet nozzle, you may see several pinched off tubes, as shown in the picture below (taken at our factory in Monterrey, Mexico). This is intentional, and these special tubes serve to locate the baffles within the bundle. These tubes do not extend through the tubesheets.



27. High "Breaker" Current Rating

- The optional NonFused Disconnect is sometimes mistakenly believed to be a unit circuit breaker.

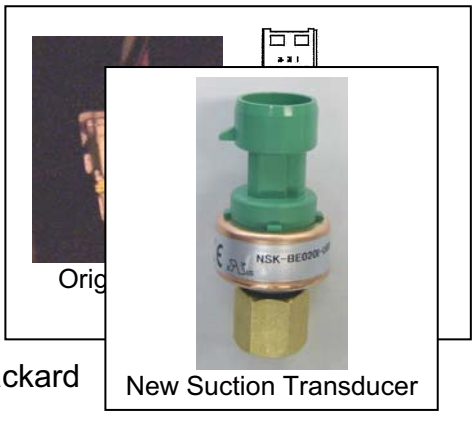
- The current rating marked on the disconnect is typically much higher than the MCA and MOCP ratings for the unit. This is not an error. The switch has its own component current rating, which is high. It is not intended to serve as a current limiting device. The compressor and fan circuit breakers and the software provide unit high current protection.

28. Pressure Transducers

- 30RB pressure transducers are made by Danfoss (Saginomiya), not Texas Instruments as with prior models. Suction and discharge transducers are different, and they are identifiable by different body colors. Refer to the chart below.

- The original 30RB transducers used a connector style (shown on the right) which proved to be difficult to disconnect. In some cases the wires could be accidentally pulled out of the cable side connector when trying to separate the connector parts. The connector was different from the Packard Electric style typically used on earlier Carrier chillers.

- Starting with production week 5005, the transducer connectors were changed to the more familiar Packard



Electric Style. These and their associated cables have different part numbers and body colors as shown in the following chart.

30RB PRESSURE TRANSDUCERS		
	Suction	**Discharge**
	Original Design:	
Transducer	00PPG000002000A (Brown body)	00PPG000003000A (Black body)
Cables	30RB680xxx. Vary with unit and location. Set up in EPIC.	
	After 5005Qxxxxx:	
Transducer	00PPG000030700A (Green body)	00PPG000030600A (Black body)
Cables	SF7032xx. Vary with unit and location. Set up in EPIC.	
Equation:	psi = 72.5V -36.25	psi = 163.125V -67.06

29. Oil Level

- When off (with heater on), equilibrium oil level in each compressor should be 1/2 to 7/8 up the height of the sight glass.
- When running, compressor sight glasses should indicate oil level from bottom to top of sight glass.
- Excess oil will cause high cooler approach (leaving chilled water temperature – saturated suction temperature). Normal approach is approximately 5 to 7°F (chilling fresh water).

30. Flashing Micromaster Display

- Occasionally there have been reports that the display on the Siemens Micromaster (Low Ambient Fan Speed Control option) alternates or flashes between two values. The two values are usually the running and non-running frequencies values.

- Per Siemens literature, this behavior indicates that the run command jumper (between Micromaster terminals 5 and 8) is missing. Refer to Item 9 for proper drive configuration.

- Disconnect and reconnect the jumper between terminals 5 and 8 with the Micromaster powered up to resolve this. CAUTION! HIGH VOLTAGE!

31. High Motor Temperature Alarms

- Alarm ***Nx*.01** (e.g., **A1.01** for compressor A1) indicates high motor temperature.

- In some cases this fault may be declared when ***Nx*.04**, motor temperature out of range, indicating a shorted or open sensor circuit, is more appropriate. This situation can lead to the erroneous conclusion that the compressor has failed.

- Always check the external continuity of the sensor circuit.

- This issue is resolved with version 2.01 MBB software.

32. "Access Denied"

- If you attempt to change a configuration and the control responds with "Access Denied", it usually means that the chiller is not in the OFF mode.

- The chiller must be in the Local/Off mode (using the toggle switch) in order for the control to accept changes to most configurations. We also recommend cycling control power after making a configuration change.

33. P.40, P.41, P.42 Low SST Alarms

- These alarms are described in the 30RB-1T manual as "Circuit *x* Repeated Low Suction Temperature Override in Heating". The "in Heating" and "Not Supported" descriptions are now wrong and should be disregarded.

- Troubleshoot by investigating the usual possibilities for low saturated suction temperature, including low charge, low head pressure, malfunctioning EXV, plugged filter-drier, etc.

- If chilled water system contains glycol for freeze protection, configure fluid type to brine. (*Configuration>SERV>FLUD=2*).

    - Brine freeze setpoint should be set to the freeze point of the antifreeze solution. (*Configuration>SERV>LOSP*).

- Note that this was changed in Version 1.09 sofware. (See Software Change Summary below.)

34. Software Change Summary

- Version 1.07 (baseline)
    - Correctly activates check for 10 psi suction pressure decrease when compressor starts.
- Version 1.09 key changes: SSN 3705Qxxxxx
    - Permits seamless transfer to second (backup) pump in the case of one pump failure.
    - Low saturated suction temperature alerts changed to alarms **P.40**, **P.41**, **P.42**. Logic changed to reduce compressor cycling. (These are not shown in the Troubleshooting manual yet.)
- Version 2.00 key changes: SSN 2906Qxxxxx
    - Fixes occasional loss of configuration (rare).
    - Fixes loss of communication with SPM issue (rare).
    - "Black box" data management improved.
- Version 2.01 key changes: SSN 4406Qxxxxx
    - If the motor temperature sensor is open circuited, alarm ***Nx*.01** will always be declared. Previously sometimes ***Nx*.04** would be declared.
    - Nuisance suction pressure transducer faults **Pr.04**, **Pr.05**, **Pr.06** with the Minimum Load Valve Option have been addressed by delaying activation of the HGBP valve until the startup drop in suction pressure has been tested for.
    - If saturated suction temperature is low, a compressor will not be permitted to run in Service Test.
    - In order to capture Black Box data in the case of welded compressor contacts, the low SST alarms **P.05**, **P.06**, **P.07** will now be declared even if a compressor is not running (per the control).
- Version 3.01 key changes: SSN 1707Qxxxxx
    - Added welded contactor detection and management
        - Welded contactor alarm is generated **(Ct.01,Ct.02,Ct.03)**
        - EXV and Fan control shall go back to normal operation
        - Unit shall shut down and remain at 0% capacity

        - Cooler pump shall be controlled to ON

    - The welded contactor management is cancelled if one of following conditions occur

        - Cooler flow switch failure
        - High pressure trip
        - Cooler freeze protection alarm

    - Modified “Black Box” data management

        - PCDCT ver. 1.5.3 required

    - Improve compressor operating envelope protection.
    - Improve Dual Chiller control

        - If compressor is disabled algorithm will correctly declare it unavailable and allow lag chiller to start.

- Version 4.00 key changes:

    - Improve fan control especially to ensure correct SST at OAT below 57°F
    - Correct a bug on fan controls introduced in version 3.01 which could cause fan cycles at low OAT
    - Added configuration parameters for MCHX exchanger, desuperheater option and Danfoss VFD configuration

        - Desuperheater and Danfoss VFD is not offered at this time

    - Added ability to “force” pump operation from Scrolling Marquee
    - Brine freeze setpoint default value is 34°F instead of 14°F

- Check for the latest of these versions on the HVACPartners.com website.