BULLETIN

Carrier Corporation

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North American Operations

Number: C0008 Date: 7/17/00 Supersedes: Date:
Title: 19XR PIC-II Software, Version 04
Category: *CONTROLS & WIRING* Termination Date:
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Models: CAC: 19XR Series chillers
Affected: BDP:

Purpose:
The bulletin is to inform the field regarding newly-released 19XR PIC-II software Version 04.

Information:
19XR centrifugal chiller PIC-II software Version 04 replaced Version 03 in production shipments beginning in June, 2000.

Version 04 addresses a number of field issues which were present in prior versions, including resolution of oil pressure sensor alarms and communication lockups (rare), plus significant changes in VFD control. This should be considered a "mandatory" software upgrade only for VFD units, 19XR5 units (with variable diffusers) not yet started, and chillers which have experienced problems specifically related to "fixes". Otherwise it is recommended that field retrofit be considered on a case-by-case basis.

When examining a CVC in the field, its hardware versions may be identified from the numbers found on the label on the black mounting plate with the title: "**CVC**, **CESO 130045**". Look there for the **CEPL** and **CEPP** numbers as shown in the table below. Note that, unlike PIC-I PSIO modules which can have software versions universally upgraded by downloading, PIC-II software version upgrades usually require both downloadable software *and* corresponding CVC hardware (the "OTP" One Time Programmable microchip which holds the hard-programmed portion of the software). The **CEPP**# corresponds to the OTP version. The software version can also be read from the **SERVICE, CVC CONFIGURATION** screen in a powered-up CVC.

Mail Keys: 2.33A, 2.33B, 2.33D, 2.40, 2.40A, 2.40B, 2.40D, 2.40M, 2.46A, 5.25G

Software Version:	CESR-131158-03 (Version 03)	CESR-131158-04 (Version 04)
CEPL#	CEPL 130286-02	CEPL 130286-03
CEPP# **With OTP#**	CEPP 130194-04-04-01 With OTP# 54	CEPP 130194-05-04-01 With OTP# 68 Or CEPP130194-06-04-01 With OTP# 69
RCD Part No.	19XR0401-1603	19XR0401-1604

Changes in the New Software:

- The capability to support language translation using the ILT (International Language Translator) has been added.
- For 19XR5 units (with variable diffuser) the controls will now provide protection against rotating stall regardless of whether or not the Variable Diffuser option has been set as ENABLED in the **SETUP2** screen.
- For VFD units, the equation used to predict VFD load side current from line side current (measured by the ISM) and VFD speed has been modified to improve its accuracy.
- For VFD units, a new algorithm similar to standard Demand Limit operation has been added to prevent increases in VFD load side current when that current approaches or exceeds a configured VFD current limit. This takes into account the situation, particularly likely at lower speeds, when VFD load current is higher than the line side current measured by the ISM. With the prior software versions no control was present to inhibit the VFD from entering the operational range where it might shut down based on its own current limit, when ISM current limiting (based on Rated Load Amps) would not be activated.
  On *increasing* predicted VFD load current: at > 98% of the current limit (I_{VL}) capacity control responds the same as it does entering the surge/HGBP region; at > 102% of I_{VL} guide vanes begin closing. On *decreasing* predicted VFD load current: at < 100% of I_{VL} guide vanes stop closing; at < 96% of I_{VL} capacity control returns to normal.
  Also, the ratio of predicted VFD load current to VFD current limit is now displayed in the Control Algorithm CAPACITY screen as "VFD Load Factor".
- For VFD units, when a capacity increase is called for during “normal” operation, VFD speed begins to increase as soon as guide vanes reach their full-open limit. A change has been made such that, when the full open limit is set to 100%, guide vane position is considered to have reached that limit when it is 0.5% below the limit. This allows

normal transition to VFD capacity control even if the guide vanes don't quite reach their full open stop every time .

- Changes in the CVC operating system software have been made (a) to avoid communications lockups which may occur on the CCN bus (found on rare occasions, particularly with 3rd party control interfaces), and (b) to avoid communications lockups which may occur on the SIO bus (in which case the CVC may appear to indicate that the chiller is running with 0 amps although it has, in fact, been shut down). (Note: concurrent changes in Benshaw starter software also address the latter issue. See Service Bulletin #C0005.)
- With prior versions, during temperature-based ramping the guide vanes would close if the chilled water temperature dropped below the "ramp control point", that control point which changes during the ramping process. This has been corrected so that guide vane closing can't occur during normal ramping unless the chilled water temperature goes below the *fixed* control point (usually equal to the setpoint).
- Changes have been made to correct values for "Compressor Starts in 12 Hours" which may previously have shown up as non-zero after time and date were reset well into the future or past. Also, both starts counters are now incremented when "Start Complete" occurs, rather than as soon as the 1CR relay is closed, avoiding counting incomplete startup attempts.
- The minimum allowable control point has been corrected to match the minimum allowable setpoint (10^{o} F or -12.2^{o} C). (Previously it would not go below 20^{o} F or -6.7^{o} C.)
- The set of alarms which may *not* be cleared remotely via CCN has been modified to include: Starts in 12 Hours Exceeded, High Bearing Temperature, Diffuser Position Fault, High Motor Temperature, and Refrigerant Leak Alarm.
- The window for checking and possibly declaring an Oil Pressure Sensor Fault (oil pressure > 4 psi when the pump is off) will now be limited to a brief period immediately before startup. In prior versions this was checked continuously whenever the pump was off. For a variety of reasons (see Bulletin #C0006) this could result in nuisance alarms.
- During an "oil stir cycle" the oil pump will now remain on for 60 seconds. Previously it would be shut off (sooner) based on oil temperature.
- Range and default values for the Head Pressure Reference algorithm settings have been modified such that (a) output is zero when the condenser pump is off, (b) minimum output with the condenser pump on is equal to the “Minimum Output” configured in the OPTIONS table, and (c) the capability has been added to invert the slope of the output to accommodate both direct and reverse acting controllers. Output will now be provided only when the condenser pump is running

(additional dependence on the chilled water pump state has been removed).
- A Chiller Logger report has been corrected to show the correct text to go with oil temperature.
- The Equipment Status table for WSM now correctly shows ON when the chiller is running.

Field Implementation:
Contact field or Syracuse Service Engineering for field retrofit information.