

Title: 3200MP SOFTWARE (EPROM) CHANGES

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Models Affected: ALL 17/19 SERIES SINGLE COMPRESSOR MACHINES  
WITH 3200MP CONTROLS

Supersedes: NEW

Date:

**Purpose:** To provide information on the changes in 3200MP control logic relative to the basic and options EPROMs and to introduce a means of identifying compatible combinations of basic and options EPROMs called versions.

**Background:** Since the shipment of the first machines with microprocessor (3200MP) controls in December 1984, we have effected many changes in the control logic. Most of the changes eliminated faulty control operation; others simply enhanced the control method. Some enhancements caused the machine to operate differently than described in the operating and maintenance manuals. This targeted group of changes has caused confusion and compromised the effectiveness of the recommended procedures and service techniques for troubleshooting the control.

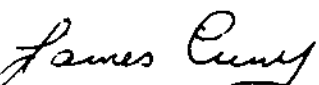
**Basic Software:** The basic EPROM is located on the processor board. This is the only EPROM required if the expanded services panel (ESP) is not installed. If an ESP is installed, the basic EPROM will have the lowest part number (P/N) designation in the version. All basic software identified on the attached chart is valid except for the HK98EZ005. If necessary, the HK98EZ005 can be employed by installing 5K OHM resistors in place of optional sensor 1 and 2 inputs to prevent the display of Code 64. This modification is not necessary if the HK98EZ-005 is used along with the options EPROMs to form the Version VI Package.

#### Memory Expansion (MX) Eprom

The MX EPROM will have the next highest or middle P/N designation in a version. When installed, control functions are performed from this software. For this reason, all changes to the basic EPROM are also included in the MX EPROM. In addition, the MX EPROM contains the software logic for ESP/Options control; thus the name Options Software.

#### ESP EPROM

The ESP EPROM will have the highest P/N designation in a version. This EPROM permits the ESP/Options to be programmed and works with the MX EPROM to execute Options control functions.

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### Options Software Versions

When teamed up in a compatible combination, the Options Software (MX and ESP EPROMs), and the Basic (Processor EPROM) forms a software version. A version is a matched family of EPROMs that has been tested and qualified as a software package to perform certain options functions in a particular manner. These options are listed under each particular version. Example, Version III added return chilled water control and chilled water reset based on  $\Delta T$  which Version II does not have. However, Version III does not have lead lag which was released beginning with Version IV. EPROM combinations outside the compatible version listings may not communicate or may cause improper machine control if used in an options configuration. For this reason, only the Basic/Options EPROM combinations (Versions) listed should be employed.

### Upgrading Software

The decision whether to upgrade software should be based on 1) Version status i.e., Valid/Void, 2) compatibility, and 3) the evaluation of the need for recent enhancements, e.g. A) To permit a machine recycle at 65% RLA vs 50% RLA. B) A longer diffuser wall calibration. C) A means of selecting a motor amps correction factor for improved diffuser wall control or D) Improved lag machine shutdown.

Changing EPROMs - After making the decision to upgrade software, it must be incorporated in the system. This involves physically installing the EPROMs and reinitializing the system. The previous sections identify the boards in which the various EPROMs are to be installed.

After installing a new Basic EPROM, the initialization process takes place automatically when the power is restored. Perform the controls test to verify proper operation.

The installation of new Options EPROMs requires manual initialization to replace the old logic with the new logic and to eliminate Code 76: Follow the procedure outlined below.

- 1) Note the Chiller identification numbers programmed at addresses 1,2 and 3 in the ESP address format..
- 2) Turn off control power to control panel and ESP.
- 3) Change software and change the basic chiller identification numbers(s) (use DIP switches) to numbers different than programmed in ESP addresses 1, 2 or 3. Position L/R switch to local.

- 4) Turn on control power to control panel and ESP. If Code 81 is displayed, clear by initiating a POR on the Basic, then the ESP. Once the 81 is cleared, Code 76 will be displayed indicating that the Basic machine identifications do not match those programmed in addresses 1, 2 and 3.
- 5) Change the Basic chiller identification(s) back to the original dip switch settings then POR the Basic, then the ESP. Process should be complete, if not verify proper programming of machine identification(s) and repeat POR process. Perform controls test to verify proper configuration of Basic chiller identifications.

Alternate method to eliminate Code 76:

- 1) Follow previous steps 2,3 and 4. If new software has already been installed, it is not necessary to change again.
- 2) Change the chiller identification numbers in addressees 1,2 and 3 in the ESP address format to match those configured on the Basic chiller(s).

3200MP SINGLE COMPRESSOR BASIC/OPTIONS SOFTWARE

NOTE: IF AN ESP IS INSTALLED, ALL SOFTWARE MUST BE FROM THE SAME BASIC/OPTIONS VERSION\*

EPROM		VERSION II	VERSION III	VERSION IV	VERSION V	VERSION VI	VERSION VIa	VERSION VII
PROCESSOR BOARD	(BASIC)	HK98EZ-003A	HK98EZ-003A	HK98EZ-004	HK98EZ-004	HK98EZ-005**	HK98EZ-005A	HK98EZ-006
M/X BOARD	(OPTIONS)	HK98EZ-011A	HK98EZ-012	HK98EZ-013	HK98EZ-014	HK98EZ-014C	HK98EZ-014C	HK98EZ-015
ESP BOARD		HK98EZ-020	HK98EZ-021	HK98EZ-022	HK98EZ-022	HK98EZ-023	HK98EZ-023	HK98EZ-023
STATUS** (OPTIONS SOFTWARE)		VALID	VALID	VOID	VOID	VALID	VALID	VALID
CONTROL FEATURES		1) SELF-START AFTER POWER FAILURE 2) CHILLED WATER SETPOINT ADJUSTMENT 3) DEMAND LIMIT SETPOINT ADJUSTMENT 4) RAMP LOADING RATE ADJUSTMENT 5) REMOTE CONTACT ENABLE/DISABLE CAPABILITY 6) READING OPERATING PARAMETERS 7) READING STORED SHUTDOWN STATUS CODES						
CONTROL OPTIONS		1) AUTO CHILLED WATER RESET BASED ON 4-20 Ma INPUT SIGNAL 2) AUTO CHILLED WATER RESET BASED ON A REMOTE TEMP. SENSOR INPUT 3) AUTO POWER DEMAND LIMIT BASED ON CONTACT CLOSURE 4) AUTO POWER DEMAND LIMIT BASED ON 4-20 Ma INPUT SIGNAL 5) RETURN CHILLED WATER CONTROL 6) CHILLED WATER RESET BASED ON $\Delta T$ 7) LEAD-LAG						

\* "VERSION" IMPLIES A SET OF 3 EPROMS COMPRISED OF THE BASIC + OPTIONS SOFTWARE NECESSARY FOR ESP OPERATION

\*\* "STATUS" APPLIES ONLY TO THE OPTIONS SOFTWARE WITHIN A VERSION.  
 IF NO ESP IS INSTALLED, ALL BASIC SOFTWARE SHOWN EXCEPT FOR THE HZ98EZ-005 IS VALID.

**3200MP SINGLE COMPRESSOR BASIC SOFTWARE  
CHANGES/ENHANCEMENTS**

BASIC EPROM	
HK98EZ-003A	<ol style="list-style-type: none"> <li>1) RESOLVED INACTIVE TEMPERATURE CONTROL RESPONSE PROBLEM DURING DEMAND LIMIT PERIOD. (CODE 30)</li> <li>2) RESOLVED A CONTROL "LOCK-UP PROBLEM THAT OCCURRED IN THE EVENT OF A LOCALIZED LOSS OF POWER AT 2J6.</li> <li>3) RESOLVED PROBLEM WHEREBY CODE 74 (FAILURE OF STARTER TO COMPLETE TRANSITION) WOULD BE DISPLAYED RATHER THAN CODE 73 (HIGH CONDENSER PRESSURE), IF THE HIGH CONDENSER PRESSURE SWITCH WAS OPEN DURING A START ATTEMPT.</li> <li>4) INCREASED ALLOWABLE PURGE RUN TIME FROM 15 SECONDS TO 1 MINUTE.</li> <li>5) INCREASED BRINE TEMPERATURE ADJUSTMENT RANGE FROM (0°F - 40°F) TO (0°F - 45°F).</li> <li>6) ADDED 3 DIGIT COMPRESSOR IDENTIFICATION CODES FOR THE 19DM 5 AND 6 DIAMETER COMPRESSORS.</li> <li>7) ADDED CONTROL LOGIC TO SHUT THE MACHINE DOWN (CODE 64) IF A MOTOR CURRENT SIGNAL IS NOT ESTABLISHED WITHIN 1 MINUTE AFTER STARTER TRANSITION OR IF IT IS NOT MAINTAINED BETWEEN THE TIME IT IS ESTABLISHED AND THE TIME ICR IS DE-ENERGIZED.</li> <li>8) ELIMINATED THE ABILITY TO AUTOMATICALLY RESTART A BASIC MACHINE AFTER A POWER LOSS BY USING THE REMOTE CONTACT INPUT (DISPLAY CODE 67)</li> </ol>
HK98EZ-004	<ol style="list-style-type: none"> <li>1) INCREASED NUMBER OF STARTS/12 HOUR PERIOD FROM 3 TO 8.</li> <li>2) INCREASED THE % RLA PERMITTED AT TIME OF MACHINE RECYCLE FROM 50% TO 65% TO COMPENSATE FOR REDUCED POWER FACTOR AT PART LOAD CAUSING CODE 80.</li> </ol>
HK98EZ-005	<ol style="list-style-type: none"> <li>1) CORRECTED PROBLEM WITH 50HZ A/D INTEGRATION TIME.</li> <li>2) INCREASED THE 19DM DIFFUSER WALL CALIBRATION TIME FROM 2 MINUTES TO 4 MINUTES.</li> <li>3) ADDED LOGIC TO INHIBIT OPENING THE DIFFUSER WALL IF MOTOR CURRENT EXCEEDS 105%.</li> </ol>
HK98EZ-005A	<ol style="list-style-type: none"> <li>1) CORRECTED PROBLEM OF DISPLAYING CODE 64 WHEN OPTIONAL SENSORS 1 AND 2 ARE NOT CONNECTED OR FAULTY ON A BASIC MACHINE. (OPTIONAL SENSORS CAN ONLY BE READ WITH DATA LOGGING ON A BASIC MACHINE.)</li> </ol>
HK98EZ-006	<ol style="list-style-type: none"> <li>1) CHANGE 19DM DIFFUSER WALL CALIBRATION TO CLOSE THE WALL FOR 2 MINUTES MINIMUM AND CONTINUE CLOSING THE WALL UNTIL THERE IS LESS THAN A 1% CHANGE IN WALL POSITION OVER A 20 SECOND PERIOD.</li> <li>2) INCLUDES REVISED 19DM DIFFUSER WALL POSITIONING LOGIC WHICH UTILIZES A "COMPRESSOR SELECTION FACTOR" INPUT BASED ON DIP SWITCH SETTING.</li> <li>3) INCLUDES PART LOAD "MOTOR AMPS CORRECTION FACTOR" LOGIC BASED ON DIP SWITCH SETTING. (DOES NOT CORRECT % DISPLAYED)</li> </ol>

**3200MP SINGLE COMPRESSOR OPTIONS SOFTWARE  
CHANGES/ENHANCEMENTS**

<b>OPTIONS EPROMS HX/ESP</b>		
<b>HK98EZ-011A HK98EZ-020</b>		1) CONTAINS ALL CHANGES MADE IN THE HK98EZ-003A BASIC EPROM.
<b>HK98EZ-012 HK98EZ-021</b>		1) ADDED RETURN CHILLED WATER CONTROL. 2) ADDED CHILLED WATER RESET BASED ON $\Delta T$ .
<b>HK98EZ-013 HK98EZ-022</b>	<b>VOID*</b>	1) ADDED "REDUCED TIME" AUTO-RESTART AFTER POWER FAILURES. (STARTS COMPRESSOR WITHIN 3 MINUTES AFTER RESTORATION) 2) CHANGED LOGIC TO TREAT LOW VOLTAGE CONDITION (BROWN OUT) AS A POWER FAILURE. 3) ADDED LEAD LAG 4) INCLUDES CHANGES TO THE HK98EZ-004 BASIC EPROM. *DOES NOT CONSISTENTLY REVERT TO CHILLER AT ADDRESS #1 AS THE OPTIONS CHILLER WHEN LEAD LAG IS DEACTIVATED. *DOES NOT PERMIT AUTO-RESTART AFTER POWER FAILURE IF REMOTE CONTACT IS ACTIVATED. *APPLIES % AMPACITY TO LEAD CHILLER INSTEAD OF CHILLER AT ADDRESS #1. *DOES NOT PERMIT LEAD CHILLER TO SHUT THE LAG DOWN IF AN ACTIVATED REMOTE CONTACT SIGNAL IS APPLIED TO THE LAG.
<b>HK98EZ-014 HK98EZ-022</b>	<b>VOID*</b>	1) CORRECTED AUTO-RESTART PROBLEM ASSOCIATED WITH THE REMOTE CONTACT. 2) CORRECTED PROBLEM OF APPLYING % AMPACITY TO LEAD CHILLER INSTEAD OF CHILLER AT ADDRESS #1. 3) CORRECTED PROBLEM WHEREBY LEAD COULD NOT SHUT DOWN LAG IF THE LAG WAS OPERATING WITH AN ACTIVATED REMOTE CONTACT INPUT 4) CHANGED LOGIC TO APPLY A CORRECTION FACTOR TO THE ACTUAL OR DISPLAYED % MOTOR CURRENT (USES A VALUE LESS THAN DISPLAYED) AT TIME OF RECYCLE AND FOR TURNING OFF THE LAG MACHINE. 5) INCLUDES CHANGES TO THE HK98EZ-005 EPROM. *DOES NOT CONSISTENTLY REVERT TO CHILLER AT ADDRESS #1 AS THE OPTIONS CHILLER. *IF REMOTE CONTACT IS NOT ACTIVATED, CAUSES AN UNWANTED START-UP AFTER A POWER FAILURE OR A POR (REGARDLESS OF WHETHER THE MACHINE WAS RUNNING AT TIME OF POWER FAILURE OR POR).
<b>HK98EZ-014C HK98EZ-023</b>		1) CORRECTED PROBLEM OF INCONSISTENTLY REVERTING TO CHILLER AT ADDRESS #1 AS THE OPTIONS CHILLER WHEN DEACTIVATING LEAD LAG. 2) CORRECTED AUTO-RESTART PROBLEMS 3) DISABLES VANE CONTROL KNOB WHEN UNDER ESP CONTROL.
<b>HK98EZ-015 HK98EZ-023</b>		1) CONTAINS CHANGES MADE TO THE HK98EZ-006 BASIC SOFTWARE.