



ComfortLinkTM

Service Manual

30GXN/GXR Series 4, 5 & 6 Air-Cooled Chillers
30HXA Series 4, 5 & 6 Condenserless Chillers
30HXC Series 4, 5 & 6 Water-Cooled Chillers

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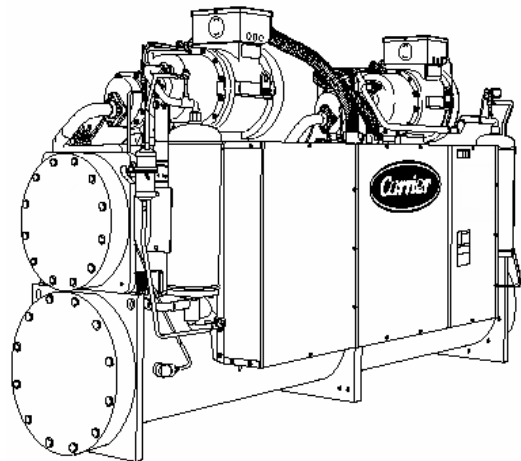
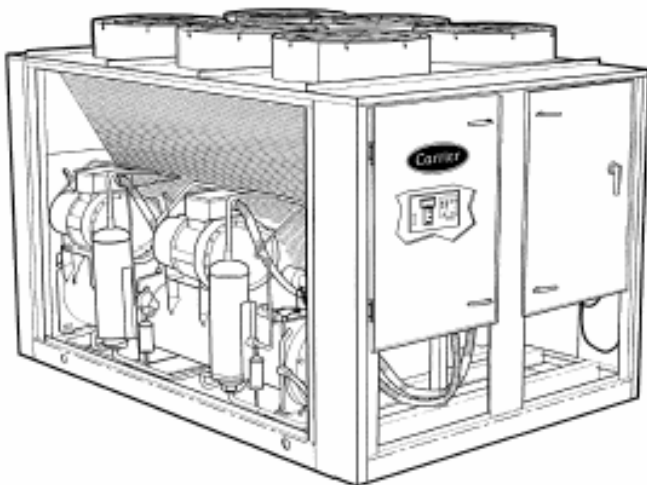


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Not for Distribution

SAFETY CONSIDERATIONS

Installing, starting up, and servicing this equipment can be hazardous due to system pressures, electrical components, and equipment location (roof, elevated structures, etc.). Only trained, qualified installers and service mechanics should install, start-up, and service this equipment.

When working on this equipment, observe precautions in the literature, and on tags, stickers, and labels attached to the equipment and any other safety precautions that apply. Follow all safety codes. Wear safety glasses and work gloves. Use care in handling, rigging, and setting this equipment, and in handling all electrical components.

WARNING

Electrical shock can cause personal injury and death. Shut off all power to this equipment during installation and service. There may be more than one disconnect switch. Tag all disconnect locations to alert others not to restore power until work is complete.

WARNING

This unit uses a microprocessor-based electronic control system. Do not use jumpers or other tools to short out components or to bypass or otherwise depart from recommended procedures. Any short-to-ground of the control board or accompanying wiring may destroy the electronic modules or electrical components.

WARNING

To prevent potential damage to heat exchanger tubes always run fluid through heat exchangers when adding or removing refrigerant charge. Use appropriate brine solutions in cooler and condenser fluid loops to prevent the freezing of heat exchangers when the equipment is exposed to temperatures below 32 °F (0 °C).

DO NOT VENT refrigerant valves within a building. Outlet from relief valves must be vented outdoors in accordance with the latest edition of ANSI/ASHRAE (American National Standards Institute/American Society of Heating, Refrigeration and Air Conditioning Engineers) 15 (Safety Code for Mechanical Refrigeration). The accumulation of refrigerant in an enclosed space can displace oxygen and cause asphyxiation. Provide adequate ventilation in enclosed or low overhead areas. Inhalation of high concentrations of vapor is harmful and may cause heart irregularities, unconsciousness or death. Misuse can be fatal. Vapor is heavier than air and reduces the amount of oxygen available for breathing. Product causes eye and skin irritation. Decomposition products are hazardous.

WARNING

DO NOT attempt to unbraid factory joints when servicing this equipment. Compressor oil is flammable and there is no way to detect how much oil may be in any of the refrigerant lines. Cut lines with a tubing cutter as required when performing service. Use a pan to catch any oil that may come out of the lines and as a gage for how much oil to add to the system. DO NOT re-use compressor oil. DO NOT leave refrigerant system open to air any longer than necessary. Seal circuits being serviced and charge with dry nitrogen to prevent oil contamination when timely repairs cannot be completed.

INTRODUCTION

This information should be used with the Installation Instructions, and the Controls, Start-Up, Operation, Service and Troubleshooting book for these machines. Follow all safety precautions and procedures.

ComfortLink Control Series 4 production began with Serial Number beginning with 3400F.

The high efficiency 30GXN/GXR η machines were introduced beginning with Serial Number 4901F. These models are indicated by a "3" or "8" in position 8 of the unit model number.

30GXN/GXR Series 5 production began with Serial Number 0703F. This series change indicates the changes to a cast cooler head for most coolers.

30GXN/GXR Series 6 production began with Serial Numbers beginning with 0904F. In this series, each compressor is fitted with a discharge gas thermistor. On economized units, the economizer changed from a flash tank economizer to brazed plate heat exchanger with a TXV. The low side expansion device is now a 15,000 step EXV. Discharge superheat controls the cooler level. Additionally, a solenoid pump replaces the mag-drive gear oil pump. The software changed to CESR131344-01-01 (Version 1.1) and is not backward compatible.

The 30HXA/HXC production was moved from McMinnville, TN to Charlotte, NC beginning early in 2001. The full production of the 30HXA/HXC line began 0901Q.

30HXA/HXC Series 5 production began with production late in the week of Serial Number 0903Q. As with the 30GX machines, this series change indicates the changes to a cast cooler head for most coolers.

30HXA/HXC Series 6 production began with Serial Numbers beginning with 5003Q. In this series, each compressor is fitted with a discharge gas thermistor. On economized units, the economizer changed from a flash tank economizer to brazed plate heat exchanger with a TXV. The low side expansion device is now a 15,000 step EXV. Discharge superheat controls the cooler level. Additionally, a solenoid pump replaces

the mag-drive gear oil pump. The software changed to CESR131344-01-01 (Version 1.1) and is not backward compatible.

Model Number Significance

The following chart is a model number breakdown for the ComfortLink Screw Machines.

Not for Distribution

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30GXN/GXR

Position	1-4	5	6-8	9	10	11	12	13	14	15-16
Description	30GX	N	150	-	-	-	6	5	1	KA

Air-Cooled ComfortLink Screw Chiller

Compressor Start Option

N = Across-the-Line (Not available on 208/230-3-60, 230-3-60, or 230-3-50 Volt Units)
 R = Wye-Delta Start

Nominal Capacity

Duplex Identifier

- = Standard Unit
 A = First Module
 B = Second Module
 M = Minus 1 Pass Cooler
 P = Plus 1 Pass Cooler

Control Options

- = Navigator Display
 A = High Ambient Unit, Navigator Display
 E = Navigator Display, Energy Management Module
 F = Option E, High Ambient Unit
 S = Navigator Display, Energy Management Module, Service Port, Ground Fault Interrupter Convenience Outlet (60 Hz Only)
 T = Option S, High Ambient Unit
 U = Navigator Display, Energy Management Module, Service Port
 V = Option U, High Ambient Unit

Condenser Coil Options

- = Copper Tube/Aluminum Fin
 K = Copper Tube/Pre-coated Aluminum Fin
 C = Copper Tube/Copper Fin
 E = Copper Tube/Aluminum Fin w/E-coat
 F = Copper Tube/Copper Fin w/E-coat

Voltage Options

1 = 575-3-60 6 = 460-3-60
 2 = 380-3-60 8 = 230-3-50
 4 = 230-3-60 9 = 380/415-3-50
 5 = 208/230-3-60

Design Series

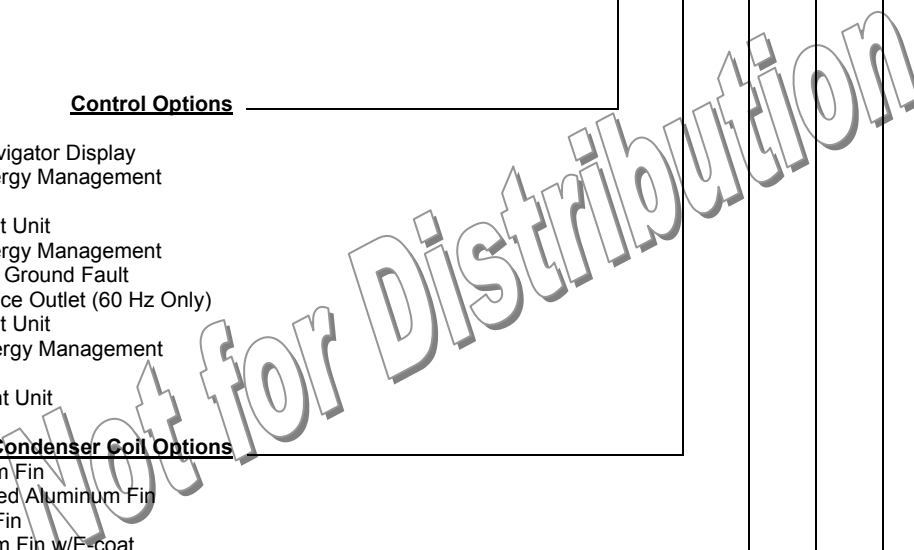
4 = Original Production
 5 = Cast Cooler Heads
 6 = Brazed Plate Economizer, 15,000 step EXV

Packaging/Grille Options

1 = Standard Domestic (Coil Cover)
 2 = Optional Domestic (Coil Cover and Bottom Skid)
 3 = Standard Export (Coil Cover, Top and Bottom Skid, Shipping Bag)
 4 = Full Export Crate
 5 = Option #1 with Factory Installed Security Grilles
 6 = Option #2 with Factory Installed Security Grilles
 7 = Option #3 with Factory Installed Security Grilles
 8 = Option #4 with Factory Installed Security Grilles

Factory Installed Options

See
 30GXN/GXR Factory Installed Option Codes



30GXN/GXR Factory Installed Option Codes

Factory installed options are determined by Positions 15 and 16 of the model number and are based on the following options:

Option Code	Description
2	<u>Brine Operation</u> For use with Leaving Water Temperatures from 15 °F to 40 °F. An inhibited antifreeze solution of the appropriate concentration must be added to the loop. Motormaster V (Option 7 is also required with this option.)
3	<u>Control Transformer</u> This option includes a power transformer to reduce the main power voltage to 115 volt control voltage. This option is not available on 208/230 or 230 volt machines. Control Transformers for these options are different for each voltage. If required, supply this as an accessory or as a Special Order.
5	<u>High Static Fan (0.4" wg/100 Pa)</u>
6	<u>High Static Fan (0.8" wg/200 Pa)</u>
7	<u>Low Ambient Control</u>
8	<u>Suction Service Valves</u> Provides isolation between the cooler and compressor.
9	<u>Minimum Load Control</u> For operation below standard lowest capacity step. Water loop volumes of at least 6-10 gallons per ton are recommended for prolonged operation at low load.
10	<u>Low Ambient Protection</u> This option includes a cooler heater and liquid line solenoid valves to allow for pump out at the end of the cycle to remove liquid refrigerant from the cooler at shutdown and minimize the chance for refrigerant migration.
12	<u>Non-Fused Disconnect</u> This option includes a Non-Fused Disconnect on the machine to isolate the power.

The following FIOP code table is valid for ComfortLink 30GX machines only. The FIOP code table for the PIC 30GX machines was different.

Code	Options	Code	Options	Code	Options	Code	Options
--	None	EW	7,12	KJ	9,10	RM	2,5,8,9
AA	3,5,9,10,12	EX	3,7	KN	2,3,7,9,12	SD	2,7,10
AB	2,10	EY	2,3,5,9	KQ	2,3,7,10,12	SR	8,9,12
AC	3,6,9,10,12	EZ	2,3,7,10	KV	2,9,10	SS	2,3,8
AD	2,5,9,10,12	FA	6	KX	3,5,12	SU	5,8,12
AE	2,6,9,10,12	FB	3,8	KZ	3,9,12	SV	6,8,12
AG	7,8,9	FC	7,10	LD	2,6,8	SW	5,9,12

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Code	Options	Code	Options	Code	Options	Code	Options
AH	3	FD	2,5,8	LF	3,6,12	SY	6,9,12
AJ	3,12	FG	3,7,12	LK	3,5,9	SZ	2,3,8,9
AL	12	FH	2,7,10,12	LS	5,9,10	TB	5,8
AM	2,3,8,10,12	FJ	3,7,8,9	LT	3,5,10	TF	3,8,9,12
AN	2,3,5,9,10,12	FK	2,3,5,10	LV	2,9	TH	2,8,9,12
AS	2,3,10	FL	2,6,9	LX	2,3,5,10,12	TJ	5,8,9,12
AT	3,6,9	FN	2,3,5,12	LZ	2,3,9,10,12	TK	6,8,9,12
AW	3,5,8,10,12	FP	3,9	MC	3,6,8,9,10,12	TL	7,8,9,12
AY	2,3,6,9,10	FQ	3,9,10	MH	3,7,8,9,10,12	TP	2,3,5,8
BA	2	FR	3,8,12	MP	3,6,9,10	TR	2,3,6,8
BB	2,3,6,9,10,12	FU	3,5,10,12	MQ	5,9	TS	2,3,7,8
BC	6,10	FX	3,9,10,12	MV	2,3,9,12	TU	2,3,8,12
BD	3,6,8,10,12	FY	2,7,8,10,12	MW	2,10,12	TV	3,5,8,12
BH	3,7,8,10,12	FZ	3,10	MX	2,5,8,9,10,12	TW	3,6,8,12
BQ	2,3,10,12	GA	7	MZ	2,6,10,12	TY	2,5,8,12
BX	2,3	GH	2,3,5	NB	2,6,8,9,10,12	TZ	2,6,8,12
BY	3,6,10	GK	2,3,9,10	ND	2,6,10	VA	2,5
CB	3,5	GL	2,3,6,12	NE	3,8,9	VF	3,5,9,12
CJ	3,6,8,9	GN	2,3,7,12	NF	5,10,12	VH	3,5,8,9
CL	3,7,9,10	GQ	2,3,6	NG	2,5,10,12	VJ	3,6,9,12
CN	2,7,8,9	GX	2,5,9,10	NJ	2,7,8,9,10,12	VK	2,5,9,12
CR	2,3,6,9	HA	8	NK	2,12	VN	2,6,9,12
CS	2,3,12	HC	8,9	NL	2,3,5,8,10,12	VP	2,3,5,8,9
CT	2,3,6,10,12	HD	2,5,10	NM	6,10,12	VQ	2,3,6,8,9
CX	7,9,10,12	HG	2,3,5,8,9,10	NN	2,5,12	VR	2,3,7,8,9
CY	3,7,9,10,12	HH	2,3,7	NQ	2,6,12	VU	2,3,8,9,12
DB	3,6	HL	3,10,12	NR	2,3,6,8,10,12	VV	3,5,8,9,12
DC	7,8	HP	8,12	NS	7,10,12	VW	3,6,8,9,12
DE	6,9	HS	2,3,6,8,9,10	NU	2,3,7,8,10,12	VX	3,7,8,9,12
DK	2,6,9,10	HU	2,3,7,8,9,10	NY	6,9,10	VY	2,5,8,9,12
DL	2,3,5,9,10	HW	2,7,9,10	PF	5,8,9	VZ	2,6,8,9,12
DR	2,3,6,10	HX	7,9	PK	9,10,12	WA	2,6
DS	7,8,12	HZ	2,3,7,9,10,12	PP	9,12	WB	5,10
DT	7,9,10	JE	3,7,8	PT	10,12	WF	2,7,8,9,12
DW	2,5,8,10,12	JH	2,3,8,9,10,12	PV	2,7,12	WK	2,3,5,8,12
DY	2,3,7,9,10	JJ	2,7,9	QA	2,3,5,8,9,10,12	WM	2,3,6,8,12
EA	5	JM	2,8,9	QD	2,3,6,8,9,10,12	WN	2,3,7,8,12
EE	2,6,8,10,12	JN	2,3,9	QG	2,3,7,8,9,10,12	WQ	2,3,5,9,12
EG	3,7,10,12	JT	2,5,9	QK	2,7,9,10,12	WS	2,3,6,9,12
EK	3,7,9	JU	3,7,8,12	QM	2,7,9,12	WU	2,3,5,8,9,12
EL	3,7,9,12	JW	3,5,8,9,10,12	QQ	5,12	WV	2,3,6,8,9,12
EM	2,7,8	JX	3,6,10,12	QS	6,12	WW	2,3,7,8,9,12
EQ	3,7,10	JZ	3,5,9,10	QW	2,9,10,12	WX	8,10
ET	2,3,7,9	KA	10	QX	2,7,8,12	WY	8,9,10
EU	7,9,12	KD	9	QY	2,9,12	WZ	3,8,10
XA	2,7	XY	2,3,8,10	YU	2,8,12	ZN	2,6,8,9,10
XE	2,8,10	XZ	3,5,8,10	YV	7,8,10,12	ZQ	2,7,8,9,10
XF	6,8,9	YA	2,8	YW	5,9,10,12	ZR	2,8,9,10,12
XG	5,8,10	YB	3,6,8,10	YX	6,9,10,12	ZT	5,8,9,10,12
XK	6,8,10	YD	3,7,8,10	YY	2,3,8,9,10	ZU	6,8,9,10,12
XM	7,8,10	YG	3,8,10,12	YZ	3,5,8,10	ZV	7,8,9,10,12
XN	8,10,12	YH	3,6,8	ZB	6,8	ZW	2,3,5,8,10

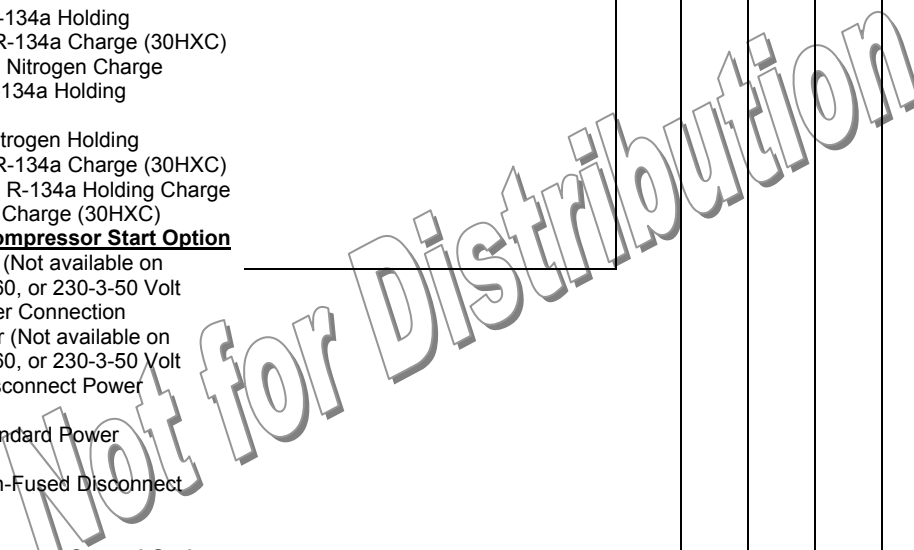
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Code	Options	Code	Options	Code	Options	Code	Options
XQ	3,8,9,10	YK	2,5,8,10	ZD	3,5,8	ZX	2,3,6,8,10
XR	2,8,9,10	YM	2,6,8,10	ZG	3,6,8,9,10	ZZ	2,3,7,8,10
XS	5,8,9,10	YQ	2,7,8,10	ZH	3,7,8,9,10		
XV	6,8,9,10	YR	2,8,10,12	ZK	3,8,9,10,12		
XW	7,8,9,10	YS	5,8,10,12	ZL	2,5,8,9,10		
XX	8,9,10,12	YT	6,8,10,12	ZM	2,6,8,9		

Not for Distribution

30HXA/HXC

Position	1-4	5	6-8	9	10	11	12	13	14	15-16
Description	30HX	C	146	R	Y	E	6	5	1	KA
ComfortLink Screw Chiller	_____									
Condenser Option	_____									
A = Condenserless C = Water-Cooled Condenser										
Nominal Capacity	_____									
Refrigerant/Cooler Pass Option	_____									
L = Minus 1 Pass Cooler, Nitrogen Holding Charge M = Plus 1 Pass Cooler, R-134a Holding Charge (30HXA), Full R-134a Charge (30HXC) N = Standard Pass Cooler, Nitrogen Charge P = Plus 1 Pass Cooler, R-134a Holding Charge Q = Plus 1 Pass Cooler, Nitrogen Holding Charge (30HXA), Full R-134a Charge (30HXC) R = Standard Pass Cooler, R-134a Holding Charge (30HXA), Full R-134a Charge (30HXC)										
Compressor Start Option	_____									
- = Across-the-Line Starter (Not available on 208/230-3-60, 230-3-60, or 230-3-50 Volt Units), Standard Power Connection A = Across-the-Line Starter (Not available on 208/230-3-60, 230-3-60, or 230-3-50 Volt Units), Non-Fused Disconnect Power Connection Y = Wye-Delta Starter, Standard Power Connection Z = Wye-Delta Starter, Non-Fused Disconnect Power Connection										
Control Options	_____									
- = Navigator E = Navigator, Energy Management Module										
Voltage Options	_____									
1 = 575-3-60 6 = 460-3-60 2 = 380-3-60 8 = 230-3-50 4 = 230-3-60 9 = 380/415-3-50 5 = 208/230-3-60										
Design Series	_____									
4 = Original Production 5 = Cast Cooler/Condenser Heads 6 = Brazed Plate Economizer, 15,000 step EXV										
Packaging/Grille Options	_____									
1 = Standard Domestic (Coil Cover) 2 = Optional Domestic (Coil Cover and Bottom Skid) 3 = Standard Export (Coil Cover, Top and Bottom Skid, Shipping Bag) 4 = Full Export Crate										
Factory Installed Options	_____									
See 30HXA/HXC Factory Installed Option Codes										



30HXA/HXC Factory Installed Option Codes

Factory installed options are determined by Positions 15 and 16 of the model number and are based on the following options:

Option Code	Description
1	<u>Minimum Load Control</u> For operation below standard lowest capacity step. Water loop volumes of at least 6-10 gallons per ton are recommended for prolonged operation at low load.
2	<u>Suction Service Valves</u> Provides isolation between the cooler and compressor.
3	<u>Brine Operation</u> For use with Leaving Water Temperatures from 15 °F to 40 °F. An inhibited antifreeze solution of the appropriate concentration must be added to the loop.

Code	Options	Code	Options	Code	Options
AA	1	KA	1,2	ZB	1,2,3
BA	2	LA	1,3		
CA	3	TA	2,3		

APPLICATION

Building Management System Control Interface Devices

Several options are offered as interfaces to other control company interfaces.

Part Number	Description	Approximate Size, in. (mm)	Approximate Weight, lbs. (kg.)
CPNLDLK-01	DataLink Control Panel Assembly. Includes enclosure and power supply. Allows for Two-way read/write interface		30 (16.6)

Cooler Freeze Protection

Freeze protection for the cooler and hydronic package is available as a factory installed option. Since power is sometimes lost for extended periods during winter storms, freeze protection provided by heater tapes will be effective only if a back-up power supply can be assured for the unit's control circuit, heater and cooler pump. If not protected with an antifreeze solution, draining the cooler and outdoor piping is recommended if the system will not be used during freezing weather conditions.

For chillers that must operate during cold weather conditions, the use of antifreeze is highly recommended. Two conditions that must be considered when determining antifreeze concentration are leaving water set point and ambient freeze conditions. These two conditions determine the recommended concentration level. After comparing these conditions, the condition indicating the use of a higher concentration level must be used to adequately protect the machine.

NOTE: Use only antifreeze solutions approved for heat exchanger duty.

Bulletins pertaining to this issue:

- Application TIP122 – Air Cooled Chiller Winterizing: Freeze Protection
This bulletin discussed various freeze protection methods.

Medium Temperature Brine Applications, 15 to 39.9 °F (-9.4 to 4.4 °C)

For applications in which the leaving water temperature set point is less than 40 F (4.4 C), a suitable inhibited antifreeze solution must be used. The solution concentration must be sufficient to protect the chilled water loop to a freeze protection (first crystals) concentration of at least 15° F (8.3° C) below the leaving water temperature set point.

Low Ambient Protection

If the chiller refrigerant or fluid lines are in an area where ambient conditions fall below 34° F (1° C), it is recommended that an antifreeze solution be added to protect the unit and fluid piping to a temperature of 15° F (8.3° C) below the lowest anticipated ambient temperature.

Select concentration based on either burst or freeze protection as dictated by the application. If the chiller does not operate during the winter, nor is a start-up expected, a burst protection concentration is recommended. This concentration may not be high enough to pump the fluid through the system. Burst protection is typically a lower concentration that will provide better performance. If the chiller does operate during winter, a freeze protection concentration is recommended. This concentration will be high enough to keep the fluid in a condition that it can be pumped at low ambient conditions.

<p>IMPORTANT: Adding antifreeze solution is the only certain means of protecting the unit from freeze-up if the cooler heater fails or electrical service is interrupted during low ambient temperatures.</p>
--

Condenser Head Reversal (30HXC Only)

Machines are shipped from the factory with the cooler heads in a given configuration. The cooler heads can be swapped end to end with little work. The cooler tubes may need to be faced to obtain a proper seal at the cooler head division plate to tubesheet.

In Series 4 machines, the head must be rotated to even the number of tubes in a pass.

With the introduction of Series 5 machines, the condenser head did not require rotation, due to a different tube pattern.

Bulletins pertaining to this issue:

- TIP131 – 30HXA,C Head Swap
This bulletin described the process to swap the cooler and condenser heads. It lacks the information regarding the factory supplied thermal dispersion switch.

Cooler Head Reversal

Machines are shipped from the factory with the cooler heads in a given configuration. The cooler heads can be swapped end to end with little work. The cooler tubes may need to be faced to obtain a proper seal at the cooler head division plate to tubesheet.

Bulletins pertaining to this issue:

- TIP115 – 30HXA,HXC Cooler Heads
This bulletin described the process to swap the cooler heads for unit produced without the factory supplied thermal dispersion switch.
- TIP115A – 30HXA,HXC Cooler Heads
This bulletin described the process to swap the cooler heads for unit produced with the factory supplied thermal dispersion switch.

In Series 6 machines, if the heads are reversed, the location of the leaving water sensor relative to the circuit must be configured. See Capacity Control on page 29 for more detail.

Bulletins pertaining to this issue:

- TIP131 – 30HXA,C Head Swap
This bulletin described the process to swap the cooler and condenser heads. It lacks the information regarding the factory supplied thermal dispersion switch.

Duplex Chillers (30GXN,GXR Only)

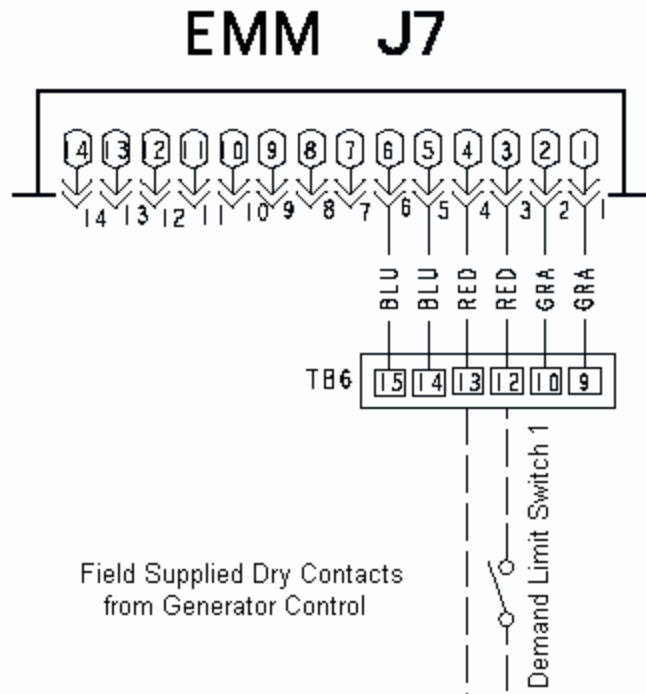
30GXN,GXR	Frequency	Consists of (30GXN,GXR)	
		MODULE A	MODULE B
220	50 Hz only	125	090
240	50 Hz only	125	115
275	50 Hz only	135	135
283	60 Hz & 50 Hz	153	138
300	50 Hz only	160	135
303	60 Hz & 50 Hz	163	138
320	50 Hz only	160	160

30GXN,GXR	Frequency	Consists of (30GXN,GXR)	
		MODULE A	MODULE B
328	60 Hz & 50 Hz	178	153
345	50 Hz only	175	175
353	60 Hz & 50 Hz	178	178
365	50 Hz only	250	135
370	60 Hz only	225	150
373	60 Hz & 50 Hz	253	138
390	60 Hz only	264	135
393	60 Hz & 50 Hz	253	153
395	50 Hz only	264	135
410	50 Hz only	225	205
415	60 Hz only	264	160
418	60 Hz & 50 Hz	268	153
440	50 Hz only	225	225
450	60 Hz only	225	225
453	60 Hz & 50 Hz	228	228
470	50 Hz only	250	225
475	60 Hz only	249	225
478	60 Hz & 50 Hz	253	228
495	50 Hz only	250	250
500	60 Hz only	249	249
503	60 Hz & 50 Hz	253	253
520	50 Hz only	264	264
525	60 Hz only	264	264
528	60 Hz & 50 Hz	268	268

Generator Operation

Frequently, there are specifications for 2-point power connections on air-cooled chillers. This specification stems from the utilization of an undersized generator for back-up power, to provide minimum cooling. Typically, the specification calls for the chiller to have one power feed from the utility and the other supplied from both the utility and a generator with a transfer switch. Carrier can provide the power modification under Quote Control. There are other, more effective solutions to meet this requirement that should be considered.

As an alternative to the dual power supply, Carrier recommends using the Demand Limit function provided by the ComfortLink Control System. The Energy Management Module and a dry switch closure are required for this option to function. Demand Limit is a function that limits the capacity of the machine. This function uses both circuits to achieve the desired cooling limit. When the generator is enabled, a switch closure to the Energy Management Module forces the chiller into a pre-set demand limit level. The benefit of this control scheme is that it does not rely on one circuit to provide the minimum cooling. For example, assume that the chiller's B circuit is connected to the generator. A service technician has the same circuit down for scheduled maintenance, or has faulted due to a problem. During a power failure, the generator starts, but because the circuit is down, no cooling can be provided. Using the Demand Limit function allows the control to start the available circuit and provide the desired minimum cooling requested. Utilizing the Demand Limit function also allows for single point power, reducing the associated costs with supplying an additional power supply.



There are several other items that must be reviewed in order to provide for the requirement.

- The control system runs on a separate power supply. If the control power is absent, the machine will not operate. With the use of the control transformer, control power can be supplied from the main generator feed.
- Chilled Water Pumps must also be operational. Without chilled water flow, the chiller will not operate.

Head Pressure Control

Head Pressure Control depends upon the machine. See below for specific information.

30GXN/GXR080-528

There were several options offered for head pressure control, depending on the production date. Regardless of the device used, in areas where sustained wind velocity

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of 5 mph or greater is expected during low ambient operation, wind baffles must be field-installed. Head pressure control is not to be matched with the high static fans.

Motormaster III

This device was the original head pressure control offering. This device was offered on all machines from the factory from serial numbers starting with 3400F through 0602F.

Unit 30GXN/GXR	Voltage	Accessory Part Number	Quantity Required
080-160, 370B, 390B, 415B	All	30GX-900---053	1
174-350, 370A, 390A, 415A-450A, 440B-450B	All	30GX-900---054	1

575 volt models require an autotransformer circuit to change the operating voltage from 575 to 460 volts. Four (4) --HT-01AH-851 transformers are required to accomplish this circuit.

Motormaster V

This device was introduced on machines with serial numbers starting with 0702F. This is a Variable Frequency Drive device that requires a VFD compatible motor. There were several field-installed packages offered depending on voltage and the number of motors controlled. No additional transformers are required for the 575 volt operation with the Motormaster V.

Unit 30GXN/GXR	Voltage	Accessory Part Number	Quantity Required
080, 083, 090, 093, 106, 108, 114, 115, 125, 128, 136, 138, 150, 160, 283B, 303B, 370B, 373B, 390B, 415B	208/230-3-60 230-3-50	30GX-900---061	1
	380-3-60 380/415-3-50 460-3-60	30GX-900---062	1
	575-3-60	30GX-900---059	1
153, 163, 174, 175, 178, 204, 208, 225, 228, 249, 250, 253, 264, 268, 281, 283A, 301, 303A, 325, 350, 370A, 390A, 415A, 418A/B, 440A/B, 450A/B, 453A/B, 470A/B, 475A/B, 478A/B, 495A/B, 500A/B, 503A/B, 520A/B, 525A/B, 528A/B	208/230-3-60 230-3-50	30GX-900---065	1
	380-3-60 380/415-3-50 460-3-60	30GX-900---066	1
	575-3-60	30GX-900---063	1

These kits were obsoleted by Product Bulletin 111-04-04, Dated: 01/013/04 and Product Bulletin 111-04-02-E, Dated: 01/13/04.

Beginning with serial numbers 4703F, the control of the Motormaster V control was changed to use the Run-Stop contact feature of the Motormaster V. As a result, the packages changed to include this control contact relay. This product change was

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announced in Product Bulletin 111-04-04, Dated: 01/013/04 and Product Bulletin 111-04-02-E, Dated: 01/13/04.

Unit 30GXN/GXR	Voltage	Accessory Part Number	Quantity Required
080, 083, 090, 093, 106, 108, 114, 115, 125, 128, 136, 138, 150, 160, 283B, 303B, 370B, 373B, 390B, 415B	208/230-3-60 230-3-50	30GX-900---072	1
	380-3-60 380/415-3-50 460-3-60	30GX-900---073	1
	575-3-60	30GX-900---071	1
153, 163, 174, 175, 178, 204, 208, 225, 228, 249, 250, 253, 264, 268, 281, 283A, 301, 303A, 325, 350, 370A, 390A, 415A, 418A/B, 440A/B, 450A/B, 453A/B, 470A/B, 475A/B, 478A/B, 495A/B, 500A/B, 503A/B, 520A/B, 525A/B, 528A/B	208/230-3-60 230-3-50	30GX-900---075	1
	380-3-60 380/415-3-50 460-3-60	30GX-900---076	1
	575-3-60	30GX-900---074	1

Refrigerant Circuit Split

The table below indicates an approximate circuit split based on compressor displacement.

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Unit	Hz	Circuit Capacity Split (%)	
		A	B
30GXN/GXR080	60	54	46
30GXN/GXR083	50	54	46
30GXN/GXR090	60	59	41
30GXN/GXR093	50		
30GXN/GXR106	60	63	37
	50		
30GXN/GXR108	60	59	41
	50		
30GXN/GXR114	60	59	41
30GXN/GXR115	50		
30GXN/GXR118	60	54	46
30GXN/GXR125	60	59	41
30GXN/GXR128	50		
30GXN/GXR135	60	55	45
30GXN/GXR138	50		
30GXN/GXR150	60	41	59
30GXN/GXR153	60	59	41
30GXN/GXR160	60	45	55
30GXN/GXR163	60	55	45
30GXN/GXR174	60	50	50
30GXN/GXR178	50		
30GXN/GXR204	60	64	36
30GXN/GXR208	60	71	29
30GXN/GXR220B	60		
30GXN/GXR225	60	61	39
30GXN/GXR228	60	72	28
30GXN/GXR249	60	71	29
30GXN/GXR253			
30GXN/GXR264	60	67	33
30GXN/GXR268			
30GXN/GXR281	60	50	50
30GXN/GXR283A	60		
30GXN/GXR283B	60		
30GXN/GXR301	60	50	50
30GXN/GXR325	60	50	50
30GXN/GXR350	60	50	50
30HXA161	60	59	41
30HXA171	60	46	54
30HXA186	60	50	50
30HXA206	60	57	43
30HXA246	60	63	37
30HXA261	60	65	35
30HXA271	60	67	33

Pressure Relief Valves

Relief Valves are supplied on the cooler and oil separators of the 30GX machines. On the 30HX, pressure relief valves are supplied on the cooler, condenser (30HXC) or oil separator (30HXA) as standard. If a 30HX is supplied with a suction service valve, a separate pressure relief valve is installed on the discharge line between the compressor and the discharge service valve. For specifics on the pressure relief valve, see Pressure Relief Valves on page 231.

The certified prints show the valves, but do not provide exact dimensions. Below is a table with approximate dimensions.

Unit	Cooler	Oil Separator / Condenser	Discharge Line
30GXN/GXR			
118,128, 138,150, 160	25.9" from bottom of unit 11.8" from cooler side of unit 50.5" and 112.3 from control box side of unit.	21.7" from bottom of unit 14.3" from oil separator side of unit 67.7" and 129.5 from control box side of unit.	N/A

Sound Reduction Options

Compressor Sound Blankets

RCD Totaline offers Acoustic Blankets for compressors for the 30GX and 30HX machines as a potential sound reduction option. The blankets are custom designed to fit exactly to the compressors. They are fastened with Velcro and ties.

Bulletins pertaining to this option:

- PMB02-067 – Acoustic Blankets 101 – for 30 Series Applications
This bulletin superceded by PMB02-114.
- PMB02-114 - Acoustic Blankets 101 – Revised
This bulletin listed technical data for the acoustic blankets.

Unit Sound Reduction

Carrier offers sound options for each style of machine. The 30GX machines use field-installed sound hoods. The 30HX machines use a field-installed enclosure.

30GX Sound Hoods

Vibration Isolation

Vibration Isolation Pads

The 30GX Vibration Isolation Pads are made of a synthetic rubber based elastomer that is oil resistant. The pad has a Hardness, Durometer A of 45-60 per ASTM D676. The recommended loading of the vibration pad is 20-70 psi.

30GXN/GXR Vibration Isolation Pads

Below is the dimensional information for the 30GX Vibration Isolations Pads.

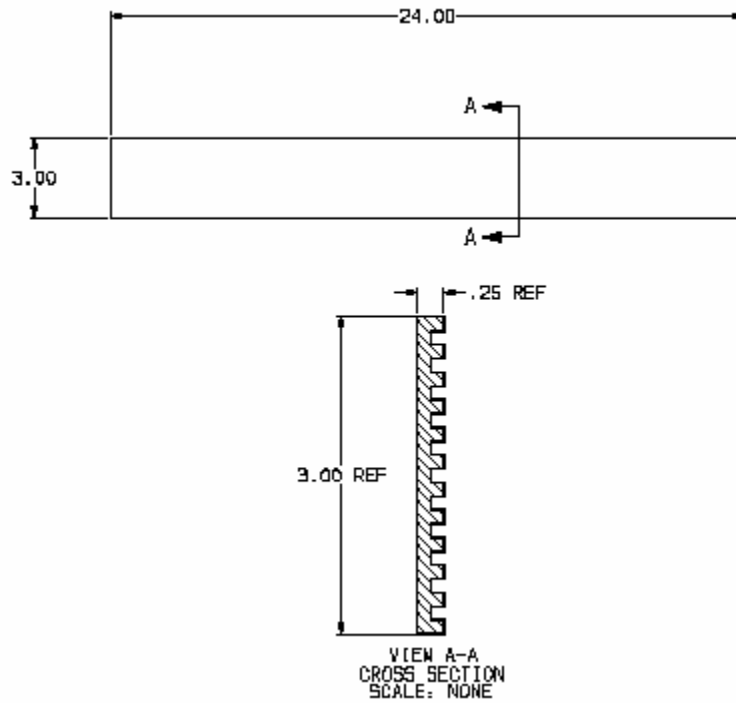


Figure 1 - 30GX Vibration Isolation Pads

30HXA/HXC Vibration Isolation Pads

Below is the dimensional information for the 30GX Vibration Isolations Pads.

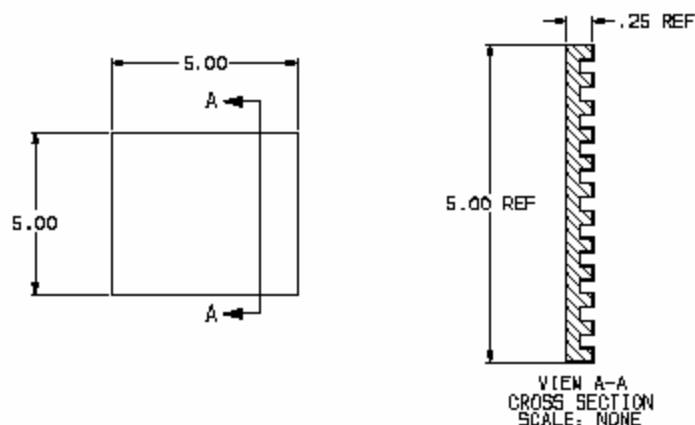


Figure 2- 30HX Vibration Isolation Pads

CONTROLS

Brine Freeze Point

Several control algorithms rely on the field configurable BR.FZ *Brine Freeze Point* (Configuration Mode, Sub-mode SERV) for cooler freeze protection. It is important to set this variable correctly. For all systems that employ a glycol solution either for ambient freeze protection or low leaving water temperatures, BR.FZ should be field modified to the appropriate value, 5 °F (2.7 °C) above the actual brine concentration freeze point. For example, if the brine concentration provides freeze protection to 0 °F (-17.7 °C), set BR.FZ *Brine Freeze Point* to 5 °F (-15.0 °C). The control will use the BR.FZ *Brine Freeze Point* less 6° F (3.3° C) as the freeze point to compare with the Saturated Suction Temperature. The factory default for the Brine Freeze Point is 34 °F (1.1 °C), which means the control will use 28 °F (-2.2 °C) as the freeze point. The brine freeze point is adjustable from -15 to 34 °F (-26.1 to 1.1 °C).

Capacity Control

On Series 6 machines, control of the cooler refrigerant level was controlled by discharge superheat. Thermistors were added to each compressor's discharge line to sense the discharge gas temperature. With the known discharge pressure from the transducer, the control calculates a discharge gas superheat.

Parameters that must be set for the proper operation of the machine are as follows:

- *EVPS Number of Evap Passes* (Configuration Mode, SERV). This is the number of passes for the evaporator. The control uses this to calculate the approach in the cooler. See Cooler Physical Data on page 204 for number of passes.

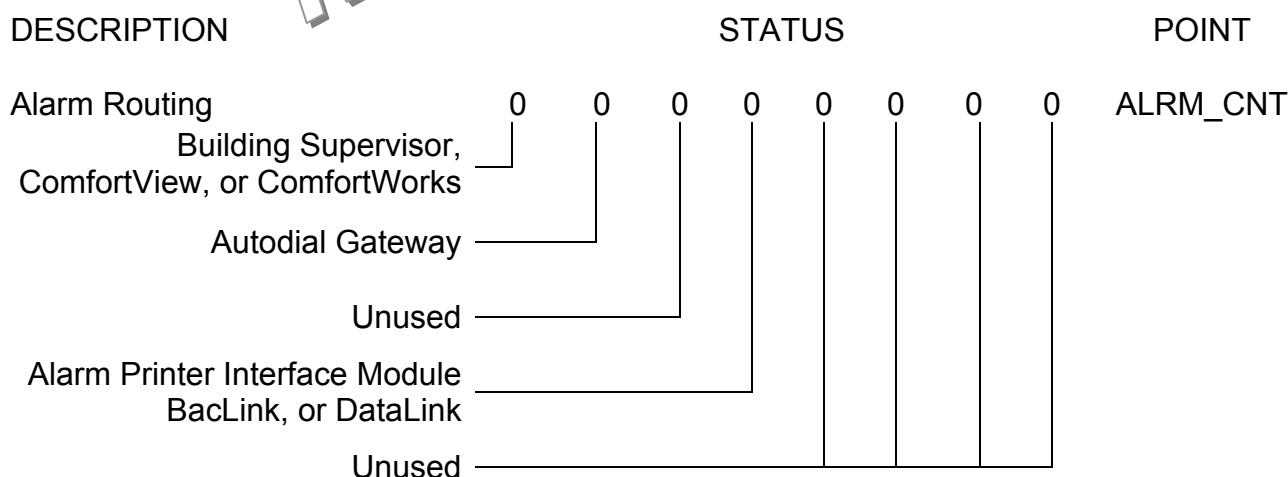
- *LWTC Circuit with LWT Sensor* (Configuration Mode, SERV). For this variable, the circuit that is the closest to the leaving water sensor is to be input. For example, if the chilled water loop enters and leaves on the circuit A side of the machine, then the value for LWTC is “A”. If the chilled water loop enters in circuit A side and leaves out the circuit B side of the cooler, then the value for LWTC is “B”.
- *AP.SP Approach Setpoint* (Configuration Mode, SERV). This variable is used by the control for a cooler approach set point, and is factory defaulted at 3 °F (1.7 °C). This is used for the EXV Control. AP.SP may need to be modified for brine applications.

Carrier Comfort Network

The 30GXN,R/HXA/HXC chiller units can be connected to the CCN, if desired.

Alarm Routing Control

Alarms recorded on the chiller can be routed through the CCN. To configure for this option, the ComfortLink Control must be configured to determine which elements will receive and process alarms sent by the ComfortLink Control. Input for the decision consists of eight digits, each of which can be set to either 0 or 1. Setting a digit to 1 specifies that alarms will be sent to the system element that corresponds to that digit. Setting all digits to 0 disables alarm processing. The factory default is 00000000. This is based on the assumption that the unit will not be connected to a network. If the network does not contain a ComfortView, ComfortWorks, Building Supervisor, AutoDial Gateway or Alarm Printer Interface Module (APIM), enabling this feature will only add unnecessary activity to the CCN Communication Bus.



Network Service Tool is required to configure the ComfortLink Control System of the chiller. With Network Service Tool attached to the chiller, go to:

Modify> Controller>ALARMDEF and change Alarm Routing Control to the desired configuration.

Typical configuration of Alarm Routing is 11010000. This Alarm Routing status will transmit alarms to:

- Building Supervisor, ComfortView, or ComfortWorks;
- Autodial Gateway; and
- BacLink or DataLink

Communication Bus Wiring

The communication bus wiring is a shielded, 3-conductor cable with drain wire and is supplied and installed in the field.

CCN Communication Bus Wiring		
Manufacturer	Part Number	
	Regular Wiring	Plenum Wiring
Alpha	1895	-
American	A21451	A48301
Belden	8205	884421
Columbia	D6451	-
Manhattan	M13402	M64430
Quabik	6130	-

The system elements are connected to the communication bus in a daisy chain arrangement. The positive pin of each system element communication connector must be wired to the positive pins of the system elements on either side of it. This is also required for the negative and signal ground pins of each system element. Wiring connections for CCN should be made at TB3. Consult the CCN Contractor's Manual for further information.

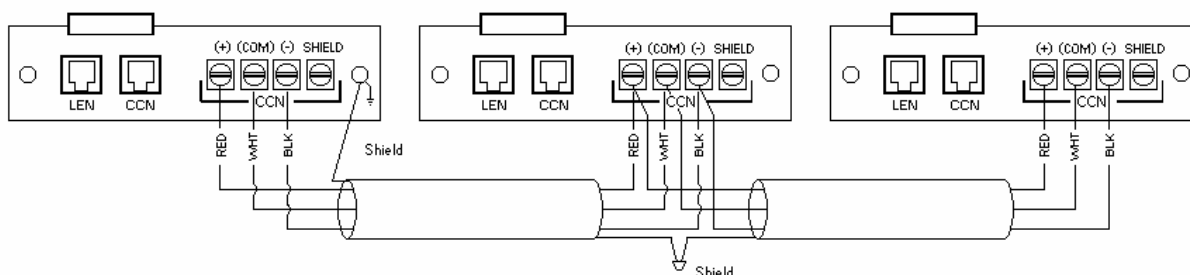


Figure 3 - TB3 - CCN Wiring

A problem with TB3 was uncovered on machines produced between 0102F and 1904F (30GXN/GXR), 0102Q and 1904Q (30HXA/HXC) where the TB3 “-” and Shield were connect by an internal trace connection. If the shield was connected CCN Communication failure alarms were generated. To alleviate this problem, connect the ground to the mounting screw instead of the Shield terminal.

Service Bulletins pertaining to this condition:

- SMB040026 – ComfortLink and CCN Communication Problems
This bulletin described the TB3 ”-“ and Shield internal trace problem.

NOTE: Conductors and drain wire must be 20 AWG (American Wire Gage) minimum stranded, tinned copper. Individual conductors must be insulated with PVC, PVC/nylon, vinyl, Teflon, or polyethylene. An aluminum/polyester 100% foil shield and an outer jacket of PVC, PVC/nylon, chrome vinyl, or Teflon with a minimum operating temperature range of –20 C to 60 C is required. Wire manufactured by Alpha (2413 or 5463), American (A22503), Belden (8772), or Columbia (02525) meets the above mentioned requirements.

It is important when connecting to a CCN communication bus that a color coding scheme be used for the entire network to simplify the installation. It is recommended that red be used for the signal positive, black for the signal negative, and white for the signal ground. Use a similar scheme for cables containing different colored wires. At each system element, the shields of its communication bus cables must be tied together. If the communication bus is entirely within one building, the resulting continuous shield must be connected to a ground at one point only. If the communication bus cable exits from one building and enters another, the shields must be connected to grounds at the lightning suppressor in each building where the cable enters or exits the building (one point per building only). To connect the unit to the network:

1. Turn off power to the control box.
2. Cut the CCN wire and strip the ends of the red (+), white (ground), and black (–) conductors. Substitute appropriate colors for different colored cables.
3. Connect the red wire to (+) terminal on TB3 of the plug, the white wire to COM terminal, and the black wire to the (–) terminal.
4. The RJ14 CCN connector on TB3 can also be used, but is only intended for temporary connection (for example, a laptop computer running Service Tool).

IMPORTANT: A shorted CCN bus cable will prevent some routines from running and may prevent the unit from starting. If abnormal conditions occur, disconnect the machine from the CCN Network. If conditions return to normal, check the CCN connector and cable. Run new cable if necessary. A short in one section of the bus can cause problems with all system elements on the bus.

Carrier Comfort Network Interface Devices

Several options for interfaces to other Building Control Systems exist and are listed below.

BacLink™

BacLink functions as a gateway between a CCN and a BacNet system. Information from the chiller control to support the interface is listed in Appendix A – DataPort™, DataLink™, BAClink™ Object Definition on page 255.

DataLink™

DataLink is an interface device that allows other HVAC control systems to read and change “read/Write” values in system elements connected to a CCN bus. This device requests data from a specified CCN system element and translates this data into ASCII characters off network. Information from the chiller control to support the interface is listed in Appendix A – DataPort™, DataLink™, BAClink™ Object Definition on page 255.

DataPort™

DataPort is an interface device that allow other HVAC control systems to “read only” values in system elements connected to a CCN communication bus. Information from the chiller control to support the interface is listed in Appendix A – DataPort™, DataLink™, BAClink™ Object Definition on page 255.

Cooler Heater (30GXN,GXR Only)

The 30GXN/GXR machines can be equipped with 500 watt immersion heaters in the cooler water heads. The number of heaters depends on the size of the machine. The control system operates the heaters in response to the saturated suction temperature of each circuits as well as Entering and Leaving Water Temperature.

The cooler heater will be energized if the unit is OFF (no mechanical cooling) and either of the following two conditions has been met:

- The Saturated Suction Temperature in either circuit is less than BR.FZ *Brine Freeze Point* (Configuration Mode, Sub-mode SERV), and the unit has been off for more than 30 seconds.
- Entering or Leaving Water Temperature is less than BR.FZ + 3 °F (1.7 °C). The heaters will remain on until both Entering and Leaving Water Temperatures equal or exceed 120 °F (48.9 °C). The heaters will energize again when both water temperatures are below 110 °F (43.3 °C). Cooler flow must be established in order to de-energize the cooler heaters.
- If the Entering or Leaving Water Thermistor has failed, the heaters will stay on.

If after 15 minutes of operation, the Saturated Suction Temperature for both circuits is not greater than BR.FZ + 10 °F (5.6 °C), the Cooler Pump will be commanded ON in attempt to increase the water temperature.

The cooler heaters will be de-energized if the unit is ON (mechanical cooling is ON) or if the Saturated Suction Temperature for both circuits is greater than BR.FZ + 10 °F (5.6 °C) for at least 10 minutes.

The heater resistance is 26.1 to 28.8Ω at 70°F.

Cooler Pump Control

ComfortLink machines are configured from the factory with the *CPC Cooler Pump Control* (Configuration Mode, Sub-mode OPT1) ON. It is recommended that this option be used to control the chilled water pump. If this option is not used, a 10-minute time delay is required before the chilled water pump is turned off. This is required to maintain water flow during the pumpout cycle of the machine.

A field-installed relay, CWPR must be installed and connected between TB5-10 and TB5-12. The relay should have coil voltage should be either 115 or 230 volts, depending on the unit's control voltage. Maximum coil ratings: 75 va sealed, 360 va inrush.

With this option enabled, the cooler pump relay will be energized when the machine enters an occupied period. The Cooler Heater Algorithm as well as the following alarms; T120 - Circuit A Low Saturated Suction Temperature Alert, T121 - Circuit B Low Saturated Suction Temperature Alert, and A207 Cooler Freeze Protection Alarm will energize the cooler pump relay also, as an override even if the option is not enabled.

If the machine enters into a freeze protection mode, and turns the cooler heaters on as described in Cooler Heater (30GXN,GXR Only) on page 33, the cooler pump relay will be energized 15 minutes after the heaters have been energized. When the Entering and Leaving Water Temperature reach 120 °F (48.9 °C), the cooler pump relay will de-energize. The cooler pump relay will energize again if the Entering or Leaving Water Temperature falls to 110 °F (43.3 °C) or below.

Version 4.0 added an algorithm to cycle the cooler water pump when the Saturated Suction Temperature is low, BR.FZ *Brine Freeze Point* (Configuration Mode, Sub-mode SERV) – 6 °F (3.3 °C), but the chilled water temperature is high. Previously, the pump was left on, which was causing some jobs to experience very high water temperatures when the chiller was being started. If the machine is off and entering and leaving water temperatures are both greater than 65.5 °F for 5 continuous minutes, then the pump will be shut off for 30 minutes. The pump will then be re-energized until the water temperatures are both greater than 65.5 °F for five (5) minutes.

For machines in parallel flow without the benefit of isolation valves or machines installed in series, Cooler Pump Control enabled will cause nuisance alarms on the off chiller when it starts. To correct this situation, change the Chilled Water Pump Relay to a Double-pole, single throw, normally open relay. One relay contact should be used to control the Chilled Water Pump; the other should be added in series with the Chilled Water Pump Interlock to open the circuit when the machine is to be off.

For 30HXC brine chillers, a failure of the condenser pump interlock (i.e. open flow switch) will cause the chilled water pump to stop along with the compressors to prevent a potential freeze condition. For these machines with Version 4.0 software and later, the *CPC Cooler Pump Control* is always enabled and cannot be disabled.

Troubleshooting:

If the cooler pump relay is cycling the chilled water pump rapidly, check the chilled water flow switch for a short to ground.

Condenser Pump Control

ComfortLink 30HXC machines can be configured to control the condenser pump.

A field-installed relay, CNP-R must be installed and connected between TB2-7 and TB2-9. The relay should have coil voltage should be either 115 or 230 volts, depending on the unit's control voltage. Maximum coil ratings: 75 va sealed, 360 va inrush. Several control options are available and are enabled with CNPC *Condenser Pump Control* (Configuration Mode, Sub-mode OPT1). Condenser Pump Control is recommended to eliminate nuisance alarms during the pumpdown routine that runs when a circuit stops. The factory default is "NO CONTROL". If NO CONTROL is selected, no signal to start the condenser pump will be sent. If this option is used, external control of the condenser pump is required. At least a ten (10) minute condenser pump off time delay must be used to prevent nuisance alarms during pumpdown, when the unit ends an occupied period. "ON WITH MODE" energizes the condenser pump relay when the unit enters an occupied period. "ON WITH COMPRESSOR(S)" energizes the condenser pump relay when a call for cooling is initiated and a compressor is started. The condenser pump relay will be de-energized when the compressor is stopped. With the implementation of Version 3.1 software the condenser pump relay de-energized ten (10) seconds after the compressor is stopped. With the implementation of Version 4.0 software, the condenser pump time delay to shutdown was changed to depend upon the FLUD *Cooler Fluid* (Configuration Mode, Sub-mode OPT1). If FLUD=Water, the condenser pump relay de-energized ten (10) seconds after the compressor is stopped. If FLUD=Medium Temperature Brine, the condenser pump relay de-energized 30 minutes after the compressor is stopped.

If the control detects a condenser freeze condition an override signal will be sent to the condenser pump relay. This override signal will be sent even if the option is not enabled, on all units TYPE *Unit Type* (Configuration Mode, Sub-mode UNIT) set for Fluid Cooled or Split System with HPCT *Head Pressure Control Type* (Configuration Mode, Sub-mode OPT1) set for Water Cooled.

For 30HXC brine units, there are several additional controls required to insure proper operation. Carrier recommends that a minimum flow of 0.75 gpm/ton (0.14 l/s per kW) be maintained in the condenser to prevent freeze-up where no antifreeze is used in the condenser water loop. With the introduction of Version 4.0 Software, condenser pump control is required. The condenser pump will continue to operate for 30 minutes after the machine shuts down.

Condenser Pump Interlock

ComfortLink 30HXC machines have an option to monitor a condenser water flow switch and auxiliary contact for proof of flow. This option is not recommended for use on machines that utilize a water regulating valve or variable frequency drive pump control for head pressure control. The use of these devices with the Condenser Pump Interlock may result in nuisance condenser flow alarms as the condenser water flow is restricted. The option *CNP.I Condenser Pump Interlock* (Configuration Mode, Sub-mode OPT1) is factory defaulted to OFF. Changing the point to ON enables the option. The *CNPC Condenser Pump Control* (Configuration Mode, Sub-mode OPT1) must be “ON WITH MODE” or “ON WITH COMPRESSOR(S)” for this option to function.

The Condenser Water Flow Switch must be wired to TB2-5 and TB2-6.

With the implementation of Version 4.0 software, on 30HXC brine applications, a condenser flow switch is required. A loss of condenser flow will immediately cause the chilled water pump and compressors to stop. If a condenser water regulating valve is used, the flow switch should be properly adjusted so as not to cause a nuisance trip should the valve travel to its minimum position. Insure that at minimum flow, the flow switch is closed. The installation instructions indicate that a factory-supplied flow switch is shipped with the machine. The flow switch is field-supplied.

Service Bulletins pertaining to this control option:

- SMB01?? – ComfortLink Main Base Board Software
This bulletin addressed the versions of screw software.

Control Displays

The machines are shipped from the factory with the Navigator as the standard display. For remote monitoring, the Remote Enhanced Display is recommended.

Navigator

This display is the standard display used on these machines. The display is a portable hand-held display module with a 4-line by 40-character backlit LCS (liquid crystal diode) screen. Four keys control the display menus which provide clear language descriptions of all menu items, operating modes, configuration points and alarm diagnostics. A coiled extension cord capable of extending to 12 feet (5.6 m) allows the display to be moved around the chiller. Magnets attached to the back of the display hold the display module to any sheet metal panel to allow hands-free operation. Display module has a NEMA 4x housing suitable for use in outdoor environments. The display has a backlight and contrast adjustment for easy viewing in bright sunlight or night conditions. The display module also has raised surface buttons with positive tactile response.

The Navigator module provides a mobile user interface to the ComfortLink control system. The display has up and down arrow keys, an [ENTER] key, and an [ESCAPE] key. These keys are used to navigate through the different levels of the display

structure. Press the [ESCAPE] key until 'Select a Menu Item' is displayed to move through the top 11 mode levels indicated by LEDs on the left side of the display.

Once within a Mode or sub-mode, a ">" indicates the currently selected item on the display screen. Pressing the [ENTER] and [ESCAPE] keys simultaneously will put the Navigator into expanded text mode where full meaning of all sub-modes, items and their values can be displayed. Pressing the [ENTER] and [ESCAPE] keys when the display says 'Select Menu Item' (Mode LED level) will return the Navigator to its default menu of rotating display items (those items in the VIEW sub-mode under the Run Status mode). In addition, the password will be disabled requiring that it be entered again before changes can be made to password protected items. The Service Test function should be used to verify proper protected items. Press the [ESCAPE] key to exit out of the expanded text mode.

NOTE: When the LANG *Language Selection* (Configuration Mode, Sub-mode DISP), variable is changed, all appropriate display expansions will immediately change to the new language. No power-off or control reset is required when reconfiguring languages.

When a specific item is located, the item name appears on the left of the display, the value will appear near the middle of the display and the units (if any) will appear on the far right of the display. Press the [ENTER] key at a changeable item and the value will begin to flash. Use the up and down arrow keys to change the value, and confirm the value by pressing the [ENTER] key.

Two items, OAT *Outside Air Temperature* (Temperature Mode, Sub-mode UNIT) and SPT *Space Temperature* (Temperature Mode, Sub-mode UNIT) can be forced to a value at the Navigator. If one of these two points has been forced, a flashing "f" indicating the force will appear next to the value. To remove the force, select the item. Press the [ENTER] key so that the value is flashing. Press the up and down arrow keys simultaneously and the force will be removed.

Changing item values or testing outputs is accomplished in the same manner. Locate and display the desired item. Press [ENTER] so that the item value flashes. Use the arrow keys to change the value or state of an item and press the key to accept it. Press the [ESCAPE] key to return to the next higher level of structure. Repeat the process as required for other items.

Items in the Configuration and Service Test modes are password protected. The words 'Enter Password' will be displayed when required, with the default password also being displayed. Use the arrow keys to change the number and press [ENTER] to enter the digit. Continue with the remaining digits of the password. The default password is 1111. The password can only be changed at the Navigator or through CCN devices such as ComfortWORKS[®], ComfortView[™] and Service Tool.

Adjusting the Contrast

The contrast of the display can be adjusted to suit ambient conditions. To adjust the contrast of the Navigator, press the [ESCAPE] key until the display reads, "Select a menu item." Using the arrow keys move to the Configuration mode. Press [ENTER] to obtain access to this mode. The display will read:

```
> TEST      OFF
  METR      OFF
  LANG      ENGLISH
```

Pressing [ENTER] will cause the "OFF" to flash. Use the up or down arrow to change "OFF" to "ON". Pressing [ENTER] will illuminate all LEDs and display all pixels in the view screen. Pressing {ENTER} and {ESCAPE} simultaneously allows the user to adjust the display contrast. The display will read:

```
Adjust Contrast
---+-----
```

Use the up or down arrows to adjust the contrast. The screen's contrast will change with the adjustment. Press [ENTER] to accept the change. The Navigator will keep this setting as long as it is plugged in to the LEN bus.

Adjusting the Backlight Brightness

The backlight of the display can be adjusted to suit ambient conditions. The factory default is set to the highest level. To adjust the backlight of the Navigator, press the [ESCAPE] key until the display reads, "Select a menu item." Using the arrow keys move to the Configuration mode. Press [ENTER] to obtain access to this mode. The display will read:

```
> TEST      OFF
  METR      OFF
  LANG      ENGLISH
```

Pressing [ENTER] will cause the "OFF" to flash. Use the up or down arrow keys to change "OFF" to "ON". Pressing [ENTER] will illuminate all LEDs and display all pixels in the view screen. Pressing the up and down arrow keys simultaneously allows the user to adjust the display brightness. The display will read:

```
Adjust Brightness
-----+
```

Use the up or down arrow keys to adjust the brightness. The screen's brightness will change with the adjustment. Press [ENTER] to accept the change. The Navigator will keep this setting as long as it is plugged in to the LEN bus.

Remote Enhanced Display

The remote enhanced display is a network access local interface with a 16-line by 40-character backlit LCD (liquid crystal diode) screen and 4 soft keys for menu driven selections below the display screen. The enhanced display allows the operator to view all key unit operating data on a single screen. The remote enhanced display supplements the standard user interface that is supplied with the 30GX and 30HX chillers. The remote enhanced display is mounted outside of the chiller control box (but inside a building) for convenient viewing and access. The standard user interface that is mounted on the chiller control box does not have to be removed to use the remote enhanced display.

Demand Limit

Demand Limit is a feature that allows the unit capacity to be limited during periods of peak energy usage. There are 3 types of demand limiting that can be configured. The first type is through 2-stage switch control, which will reduce the maximum capacity to 2 user-configurable percentages. The second type is by 4 to 20 mA signal input which will reduce the maximum capacity linearly between 100% at a 4 mA input signal (no reduction) down to the user-configurable level at a 20 mA input signal. The third type uses the CCN Loadshed module and has the ability to limit the current operating capacity to maximum and further reduce the capacity if required.

The 2-stage switch control and 4 to 20 mA input signal types of demand limiting require the Energy Management Module (EMM).

To use Demand Limit, select the type of demand limiting to use. Then configure the Demand Limit set points based on the type selected.

2-Stage Demand Limit

The Energy Management Module is required for this option. To configure Demand Limit for 2-stage switch control set the DMDC *Demand Limit Select* (Configuration Mode, Sub-Mode RSET) to 1. Then configure the two Demand Limit Switch points, DLS1 *Demand Limit Switch 1* and DLS2 *Demand Limit Switch 2* (Configuration Mode, Sub-Mode RSET) to the desired capacity limit. Capacity steps are controlled by two relay switch inputs field wired to TB6. The DLS1 input is wired to TB6-12 and TB6-13. The DLS2 input is wired to TB6-14 and TB6-15.

For Demand Limit by 2-stage switch control, closing the first stage demand limit contact will put the unit on the first demand limit level. The unit will not exceed the percentage of capacity entered as Demand Limit Switch 1 set point. Closing contacts on the second demand limit switch prevents the unit from exceeding the capacity entered as Demand Limit Switch 2 set point. The demand limit stage that is set to the lowest demand takes priority if both demand limit inputs are closed. If the demand limit percentage does not match unit staging, the unit will limit capacity to the closest capacity stage. To disable demand limit configure the DMDC to 0.

4-20 Demand Limit

The Energy Management Module is required for this option. To configure Demand Limit for 4 to20 mA control set the DMDC *Demand Limit Select* (Configuration Mode, Sub-Mode RSET) to 2. Then configure the DM20 *Demand Limit at 20 mA* (Configuration Mode, Sub-Mode RSET) to the maximum loadshed value desired. The control will reduce allowable capacity to this level for the 20 mA signal.

Care should be taken when interfacing with other manufacturer's control systems, due to power supply differences, full wave bridge versus half wave rectification. The two different power supplies cannot be mixed. ComfortLink controls use half wave rectification. A signal isolation device should be utilized if a full wave bridge signal generating device is used.

A software problem was discovered with the Enhanced Screw Software Version 1.1 and 1.2 (CESR-131344-01-01 and CESR-131344-01-02), where the internal input channels for 4-20 mA Demand Limit were accidentally reassigned.. The problem can be corrected by connecting the signal from TB6-1 to EMM-J6-11 as shown in the diagram below.

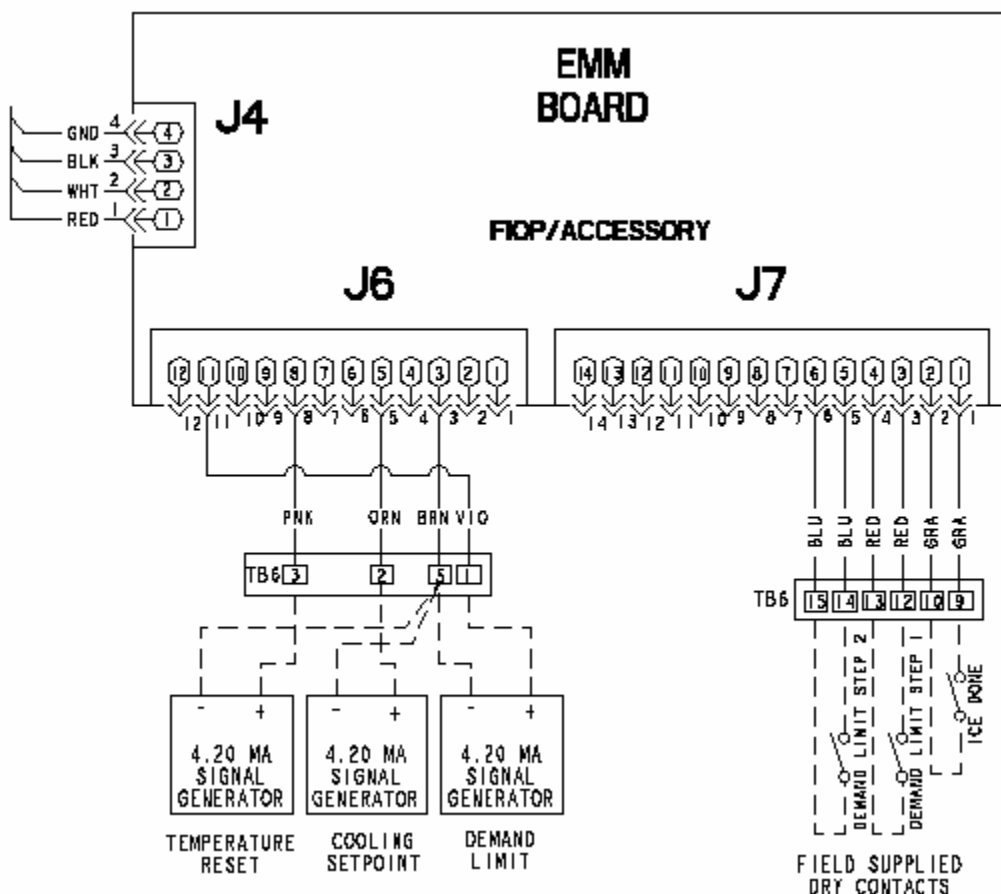


Figure 4 - EMM 4-20 mA Connections (Enhanced Screw Software Versions 1.1 [CESR-131344-01-01] and 1.2 [CESR-131344-01-02] Only)

Service Bulletins pertaining to this condition:

- SMB040031 - 30GX/HX Series 6, 4-20 mA Demand Limit Error
This bulletin described a problem with the Enhanced Screw Software Versions 1.1 and 1.2 (CESR-131344-01-01 and CESR-131344-01-02) in which the control inputs for 4-20 mA inputs for Demand Limit are not read by the controller. The control must be rewired.

CCN Loadshed Demand Limit

To configure Demand Limit for CCN Loadshed control set the DMDC *Demand Limit Select* (Configuration Mode, Sub-Mode RSET) to 3. Then configure the SHNM *Loadshed Group Number* (Configuration Mode, Sub-Mode RSET), SHDL *Loadshed Demand Delta* (Configuration Mode, Sub-Mode RSET), and SHTM *Maximum Loadshed Time* (Configuration Mode, Sub-Mode RSET). The CCN system designer establishes the Loadshed Group number. The Main Base Board (MBB) will respond to a Redline command from the Loadshed control. When the Redline command is received, the current stage of capacity is set to the maximum stages available. Should the loadshed control send a Loadshed command, the MBB will reduce the current stages by the value entered for Loadshed Demand delta. The Maximum Loadshed Time defines the maximum length of time that a loadshed condition is allowed to exist. The control will disable the Redline/Loadshed command if no Cancel command has been received within the configured maximum loadshed time limit.

Dual Chiller Control

ComfortLink allows the two machines to operate as one in either series or parallel flow. Duplex machines are intended for series flow only.

Configuration

Each machine must be configured to operate as in Master/Slave Operation.

Series Flow

For Series Flow, the master chiller must be the downstream machine.

Parallel Flow

For Parallel Flow, either machine can be the Master Chiller.

For Parallel Dual Chiller Operation an additional thermistor must be installed in the common supply water header. The sensor should be located in a straight section of pipe, at least 5 pipe diameters from an elbow or tee to insure proper temperature sensing.

Several thermistor wells are available. All have ¼" NPT fittings for securing the well in the piping. An appropriate fitting must be supplied for the fitting. Select a location that will allow for removal of the thermistor without any restrictions.

Well Part Number	“A” Dimension, in. (mm)	“B” Dimension, in. (mm)
10HB50106801	3.10 (78.7)	1.55 (39.4)
10HB50106802	4.10 (104.1)	1.28 (32.5)

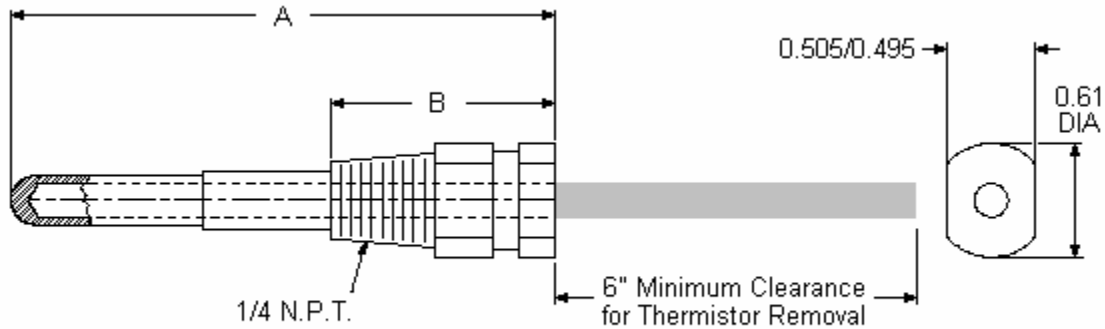


Figure 5 - Dual Leaving Water Thermistor Well

The thermistor should be inserted into the well with a small amount of Heat Sink Compound, 38AQ680001 (Dow Corning #340, or General Electric #641).

Once the well is inserted and the thermistor is in place, it is recommended that a thermistor wire loop be made and secured with a wire tie at the collar of the thermistor well. This will aid in thermistor retention in the well.

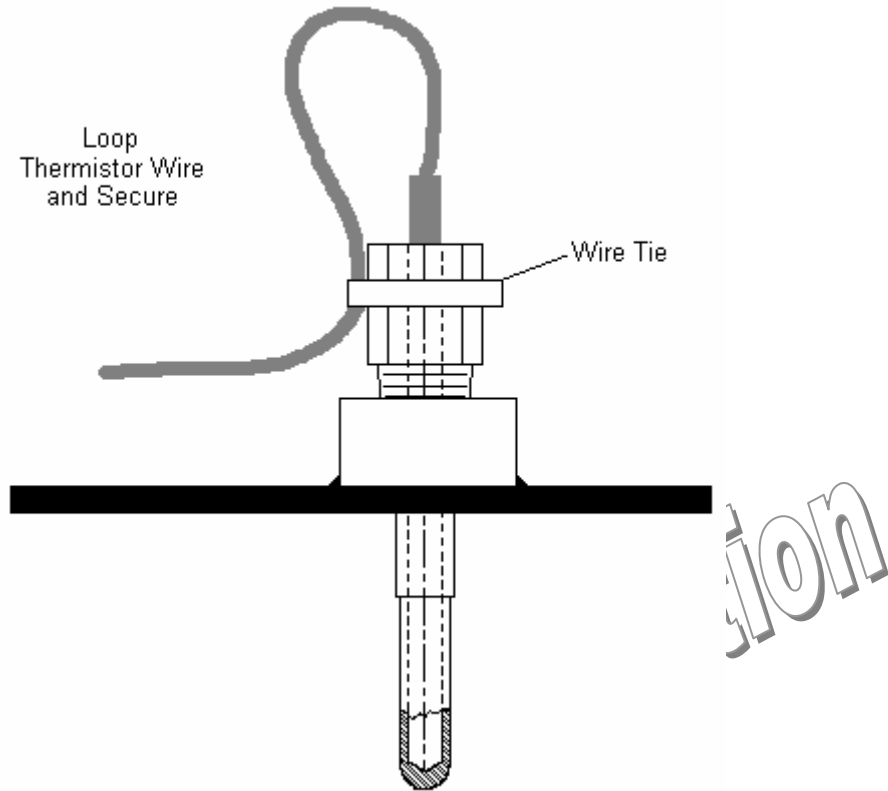


Figure 6 - Dual Leaving Water Thermistor

Sequence of Operation

Series Flow

When the lead machine starts in Master/Slave Control, it will load fully before the lag chiller starts after the LLDY *Lead/Lag Start Delay* (Configuration Mode, Sub-mode RSET). Once the chillers are fully loaded and the load is decreasing, the Master/Slave algorithm will unload lead and lag machine circuits before shutting down a circuit.

Suggested Operating Scheme

CCN Control

With the Master chiller configured for CCN control and the Slave chiller configured for switch control normal operation was observed when the CHIL_S_S point on the Master chiller was toggled from ON to OFF. The only operational point to be concerned about is when the Master chiller had the power turned off the Slave chiller continued to run as a stand alone machine. The only way to stop the Slave at that point was to turn the remote-off-enable switch to off.

If both the Master and Slave Chillers are configured for CCN control both chillers must have the CHIL_S_S enabled and disabled simultaneously in order for the machines to

function properly. This way if communication was lost with the Master chiller the Slave chiller could be disabled via communications.

Only the Master chiller control point should be forced. The Master controls the Slave chiller by changing the control point so a force should not be applied to the Slave chiller.

The most reliable control method to start and stop the chillers is by hard wiring a control relay to the remote start/stop termination points provided on each machine. The master and slave chillers would be started and stopped together by a single relay.

Troubleshooting:

Master/Slave Control does not work.

- Confirm that the machines have been set up properly. Parallel flow configuration requires a dual chiller LWT sensor installed in the common supply header connected to the Master chiller. Series flow requires the Master chiller be the downstream machine.
- Confirm that there is not a temperature set point force imposed by a CCN device. Imposing a force on the set point temperature disables the Master/Slave algorithm and the machines will operate as stand-alone machines.
- Software Versions prior to Main Base Board (MBB) Version 2.0 did not allow for Master/Slave Operation.
- For parallel flow, confirm that the Dual Leaving Water Temperature Thermistor is operational. If this sensor fails, the Master/Slave Algorithm will be disabled and the machines will operate as stand-alone machines.
- Confirm that the CCN wiring between the two machines is correct and functional.
- In MBB Version 2.0 and 3.1 software, any alarm on the Master chiller, both circuits down, will cause the slave chiller to stop also.

Head Pressure Control

The microprocessor controls the condenser fans (30GXN,R) to maintain the saturated condensing temperature to a configurable set point. The 30HXA condenserless units with a 09DK condenser use a combination of factory-supplied fan cycling pressure switches (shipped in the 30HXA control box), temperature switches, and an accessory Motormaster Control to maintain head pressure independent of 30HXA unit control. The 30HXA condenserless units with a 09AZV condenser use a combination of factory-supplied fan cycling pressure switches and an optional head pressure control device to maintain head pressure independent of 30HXA unit control. The fans are staged or speed varied (30GXN,R) or water valve controlled (30HXC) based on each circuit's saturated condensing temperature and compressor status. Water cooled units (30HXC) operating at less than 70 °F (21.1 °C) for entering condenser water require the use of head pressure control. The chiller must be field configured for the options shown below.

Unit	Point Name	Description	Factory Configuration
30GX	HPCT (Configuration Mode, Sub-mode OPT1)	Head Pressure Control Type	Air Cooled (Do not modify)

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Unit	Point Name	Description	Factory Configuration
	FAN.S (Configuration Mode, Sub-mode UNIT)	Fan Staging Select	See Fan Staging Tables on page
	VHPT (Configuration Mode, Sub-mode OPT1)	Variable Head Pressure Select	0 = None 1 = 4 to 20 mA (Motormaster Installed)
30HXA	HPCT (Configuration Mode, Sub-mode OPT1)	Head Pressure Control Type	No Control (30HXA Default) Air-Cooled Common Evaporative Tower Independent Evaporative Tower
	VHPT (Configuration Mode, Sub-mode OPT1)	Variable Head Pressure Select	0 = None 1 = 4 to 20 mA (2 to 10 vdc †) 2 = 0 to 20 mA (0 to 10 vdc †) 3 = 20 to 0 mA (10 to 0 vdc †)
30HXC	HPCT (Configuration Mode, Sub-mode OPT1)	Head Pressure Control Type	Water Cooled (Do not modify)
	VHPT (Configuration Mode, Sub-mode OPT1)	Variable Head Pressure Select	0 = None 1 = 4 to 20 mA (2 to 10 vdc †) 2 = 0 to 20 mA (0 to 10 vdc †) 3 = 20 to 0 mA (10 to 0 vdc †)

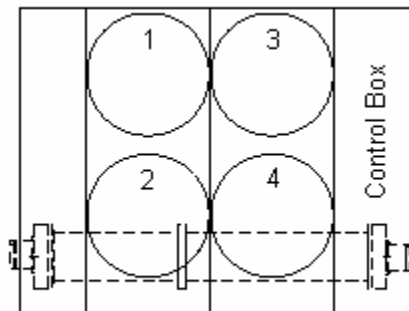
Note: † - A vdc signal can be generated by installing a 500 ohm, ½ watt resistor across the 2 output terminal of the mA signal.

30GXN/GXR

Without Motormaster Control — The first stage of fans are turned on based on compressor status or a Head Pressure Set Point based on Saturated Condensing Temperature (SCT). Additional fan stages are added when the SCT exceeds the Head Pressure Set Point. The Head Pressure Set Point is configurable in the Set Point sub-mode. The default is 113 °F (45 °C). Once a fan stage has been added, the software temporarily modifies the head pressure set point by adding 15 °F (8.3 °C) for 35 seconds. A fan stage will be removed when the Saturated Condensing Temperature has been less than the Head Pressure Set Point minus 35 °F (19.4 °C) for 2 minutes. The control uses the higher of the 2 Saturated Condensing Temperature values for 30GXN,R080-160 units. For the 30GXN,R153, 163-350 units, each circuit's fan stages are independently controlled based on the circuit Saturated Condensing Temperature.

With Motormaster Control — For low-ambient operation, the lead fan in each circuit can be equipped with the optional or accessory Motormaster head pressure controller. If factory installed, the controller will be configured for 4 to 20 mA control. With the VHPT *Variable Head Pressure Select* (Configuration Mode, Sub-mode OPT1) option set to 4 to 20 mA, the MBB module calculates the required output based on Saturated Condensing temperature, Head Pressure set point, and a PID (proportional integral derivative) loop calculation. This 4 to 20 mA output is driven through the SCB. Proportional, Integral, and Derivative gain parameters for air-cooled controls are adjustable and can be found under the Configuration Mode, Sub-Mode SERV. Only certified Carrier Comfort Network technicians should perform checkout and adjustment of the PID loop.

30GXN/GXR080,090 and 220B
 Series 5 (Starting Serial Number ??03F)



Condenser Fan Staging Programming

	Navigator Display	CCN Display †	Description
FAN.S <i>Fan Staging Select</i> (Configuration Mode, Sub-mode UNIT)	1 Stage Common	6	1 st stage compressor status and SCT set point. 2 nd stage common control based on highest SCT.

Navigator/Contactor/Fan Cross Reference

Fan Type	Navigator Point Name	Fan Contactor	Fans Controlled
Standard	Fan 1	FC-1 ‡	1,2
	Fan 2	FC-2	3,4
High Static	Fan 1	FC-1	1
		FC-1A	2
	Fan 2	FC-2	3
		FC-2A	4

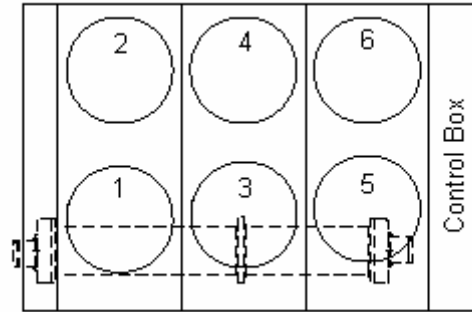
Condenser Fan Staging

Condenser Fan Stage	Energized Fans
1	1,2
2	1,2,3,4

Note: † - Viewable only through CCN Devices.

‡ - Units with Motormaster V (Starting Serial Numbers 4703F) have FC-1 present but not connected. Fans are connected to the Motormaster V device and are controlled by auxiliary contacts on the compressor starter.

30GXN/GXR083,093,106,108,114,115,125,135,365B,390B, and 395B
 Series 5 (Starting Serial Number ??03F)



Condenser Fan Staging Programming

	Navigator Display	CCN Display †	Description
FAN.S <i>Fan Staging Select</i> (Configuration Mode, Sub-mode UNIT)	2 Stage Common	7	1 st stage compressor status and SCT set point. 2 nd and 3 rd stage common control based on highest SCT.

Navigator/Contactor/Fan Cross Reference

Fan Type	Navigator Point Name	Fan Contactor	Fans Controlled
Standard	Fan 1	FC-1 ‡	1,2
	Fan 2	FC-2	3,4
	Fan 3	FC-3	5,6
High Static	Fan 1	FC-1	1
		FC-1A	2
	Fan 2	FC-2	3
		FC-2A	4
	Fan 3	FC-3	5
		FC-3A	6

Condenser Fan Staging

Condenser Fan Stage	Energized Fans
1	1,2
2	1,2,3,4
3	1,2,3,4,5,6

Note: † - Viewable only through CCN Devices.

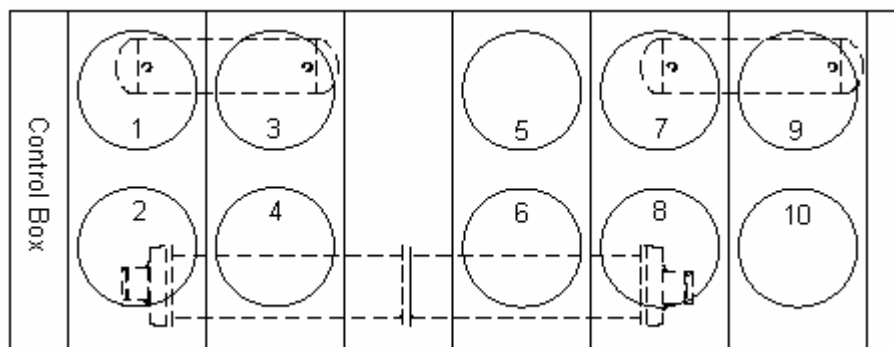
‡ - Units with Motormaster V (Starting Serial Numbers 4703F) have FC-1 present but not connected. Fans are connected to the Motormaster V device and are controlled by auxiliary contacts on the compressor starter.

30GXN/GXR118,128,138,150,160,283B,300A,303B,320A,320B,370B,373B, and 415B Series 5 (Starting Serial Number ??03F)			
Condenser Fan Staging Programming			
	Navigator Display	CCN Display †	Description
FAN.S <i>Fan Staging Select</i> (Configuration Mode, Sub-mode UNIT)	3 Stage Common	8	1 st stage compressor status and SCT set point. 2 nd , 3 rd and 4 th stage common control based on highest SCT.
Navigator/Contactor/Fan Cross Reference			
Fan Type	Navigator Point Name	Fan Contactor	Fans Controlled
Standard	Fan 1	FC-1 ‡	1,2
	Fan 2	FC-2	3,4
	Fan 3	FC-3	5,6
		FC-4	7,8
High Static	Fan 1	FC-1	1
		FC-1A	2
	Fan 2	FC-2	3
		FC-2A	4
	Fan 3	FC-3	5
		FC-3A	6
		FC-4	7
		FC-4A	8
Condenser Fan Staging			
Condenser Fan Stage		Energized Fans	
1		1,2	
2		1,2,3,4	
3		1,2,5,6,7,8	
4		1,2,3,4,5,6,7,8	

Note: † - Viewable only through CCN Devices.

‡ - Units with Motormaster V (Starting Serial Numbers 4703F) have FC-1 present but not connected. Fans are connected to the Motormaster V device and are controlled by auxiliary contacts on the compressor starter.

30GXN/GXR153,174,175,204,205,225,283A,328B,345A,345B,370A,393B,418B,450A,450B, and 475B.
Series 5 (Starting Serial Number ??03F)



Condenser Fan Staging Programming

	Navigator Display	CCN Display	Description
FAN.S <i>Fan Staging Select</i> (Configuration Mode, Sub-mode UNIT)	2 Stage A/ 1 Stage B	4	1 st stage each circuit, compressor status. 2 nd and 3 rd stage circuit A independent. 2 nd stage circuit B independent.

Navigator/Contactor/Fan Cross Reference

Fan Type	Navigator Point Name	Fan Contactor	Fans Controlled
Standard	Compressor B1	FC-1 ‡	1, 2
	Fan 2	FC-2	3, 4
	Fan 3	FC-3	5, 6
	Compressor A1/Compressor A2	FC-4 ‡	7, 8
	Fan 1	FC-5	9, 10
High Static	Compressor B1	FC-1	1
		FC-1A	2
	Fan 2	FC-2	3
		FC-2A	4
	Fan 3	FC-3	5
		FC-3A	6
	Compressor A1/Compressor A2	FC-4	7
		FC-4A	8
	Fan 1	FC-5	9
		FC-5A	10

Condenser Fan Staging

Circuit	Condenser Fan Stage	Energized Fans
A	1	7, 8

30GX/HX ComfortLink Screw Chiller Service Manual

	2	7, 8, 9, 10
	3	5, 6, 7, 8, 9, 10
B	1	1, 2
	2	1, 2, 3, 4

Note: † - Viewable only through CCN Devices.

‡ - Units with Motormaster V (Starting Serial Numbers 4703F) have FC-1 and FC-4 present but not connected. Fans are connected to the Motormaster V device and are controlled by auxiliary contacts on the compressor starter.

30GXN/GXR163,178,303A,328A,353A, and 353B. Series 5 (Starting Serial Number ??03F)			
Condenser Fan Staging Programming			
	Navigator Display	CCN Display †	Description
FAN.S <i>Fan Staging Select</i> (Configuration Mode, Sub-mode UNIT)	2 Stage Indp	2	1 st stage each circuit, compressor status. 2 nd and 3 rd stage each circuit independent.
Navigator/Contactor/Fan Cross Reference			
Fan Type	Navigator Point Name	Fan Contactor	Fans Controlled
Standard			
High Static			
Condenser Fan Staging			
Circuit	Condenser Fan Stage	Energized Fans	

Note: † - Viewable only through CCN Devices.

‡ - Units with Motormaster V (Starting Serial Numbers ??03F) have FC1 present but not connected. Fans are connected to the Motormaster V device and are controlled by auxiliary contacts on the compressor starter.

30GXN/GXR208,228,453A,453B, and 478B. Series 5 (Starting Serial Number ??03F)			
Condenser Fan Staging Programming			
	Navigator Display	CCN Display †	Description
FAN.S <i>Fan Staging Select</i> (Configuration Mode, Sub-mode UNIT)	3 Stage Indp	3	1 st stage each circuit, compressor status. 2 nd and 3 rd stage each circuit independent.
Navigator/Contactor/Fan Cross Reference			
Fan Type	Navigator Point Name	Fan Contactor	Fans Controlled
Standard			
High Static			
Condenser Fan Staging			
Circuit	Condenser Fan Stage	Energized Fans	

Note: † - Viewable only through CCN Devices.
‡ - Units with Motormaster V (Starting Serial Numbers ??03F) have FC1 present but not connected. Fans are connected to the Motormaster V device and are controlled by auxiliary contacts on the compressor starter.

30GXN/GXR249,250,264,390A,415A,475A,500A,500B,525A, and 525B. Series 5 (Starting Serial Number ??03F)			
Condenser Fan Staging Programming			
	Navigator Display	CCN Display †	Description
FAN.S <i>Fan Staging Select</i> (Configuration Mode, Sub-mode UNIT)	3 Stage A/ 2 Stage B	5	1 st stage each circuit, compressor status. 2 nd and 3 rd stage circuit A independent. 2 nd stage circuit B independent.
Navigator/Contactor/Fan Cross Reference			
Fan Type	Navigator Point Name	Fan Contactor	Fans Controlled
Standard			
High Static			
Condenser Fan Staging			
Circuit	Condenser Fan Stage	Energized Fans	

Note: † - Viewable only through CCN Devices.

‡ - Units with Motormaster V (Starting Serial Numbers ??03F) have FC1 present but not connected. Fans are connected to the Motormaster V device and are controlled by auxiliary contacts on the compressor starter.

30GXN/GXR253,268,281,301,325,350,373A,393A,418A,478A,503A,503B,528A,.and 528B and 478B. Series 5 (Starting Serial Number ??03F)			
Condenser Fan Staging Programming			
	Navigator Display	CCN Display †	Description
FAN.S <i>Fan Staging Select</i> (Configuration Mode, Sub-mode UNIT)	3 Stage Indp	3	1 st stage each circuit, compressor status. 2 nd and 3 rd stage each circuit independent.
Navigator/Contactor/Fan Cross Reference			
Fan Type	Navigator Point Name	Fan Contactor	Fans Controlled
Standard			
High Static			
Condenser Fan Staging			
Circuit	Condenser Fan Stage	Energized Fans	

Note: † - Viewable only through CCN Devices.

‡ - Units with Motormaster V (Starting Serial Numbers ??03F) have FC1 present but not connected. Fans are connected to the Motormaster V device and are controlled by auxiliary contacts on the compressor starter.

The early production 30GXN/GXR machines used the MotorMaster III. Beginning with serial numbers 0702F, MotorMaster V starting in production as the head pressure control device.

In software versions prior to Version 4.0, there is no minimum fan speed for the ComfortLink Screw MotorMaster. If the fan speed is less than 25% for 2 minutes, then a fan stage is shut off.

30HXA

The 30HXA has a number of condenser control options to choose from with the ComfortLink Control System.

Two outputs are provided for 30HXA's so a Motormaster or Variable Frequency Drive can be used for each circuit, if desired. This can be configured under *HCPT Head Pressure Control Type* (Configuration Mode, Sub-mode OPT1) to INDEPENDENT TOWER ENABLE.

If a common condenser output is desired, configure the control under *HCPT Head Pressure Control Type* (Configuration Mode, Sub-mode OPT1) to COMMON TOWER ENABLE. With this configuration the control averages the Saturated Condensing Temperatures of both circuits. The control output is on circuit A TB2-14 and TB2-15.

30HXC

The 30HXC can control a condenser water valve from the ComfortLink Control System.

The A circuit variable head pressure output controls the condenser water valve, TB2-14 and TB2-15. A milliamp signal is always provided and can be configured for 4-20 mA, 0-20 mA, or 20-0 mA. The circuit with the lowest condensing temperature has control of the condenser water valve. If either circuit's Saturated Condensing Temperature rises above 105 °F (39 °C) then control of the valve is shifted to that circuit. On 3 compressor machines, if both circuits are running, A circuit is always used. The variable *HD.P.A Head Pressure Setpoint A*, and *HD.P.B Head Pressure Setpoint B* (Set Point Mode, Sub-mode HEAD) is the controlling set point. Original default was 113 °F (45 °C). This has been changed to 85 °F (29 °C).

With the implementation of Version 4.0 software, the condenser control valve operation was modified to add a one minute delay before the Saturated Condensing Temperature of the starting circuit can contribute to the valve position, unless Saturated Condensing Temperature is greater than the running circuit's Saturated Condensing Temperature. This was done to eliminate the nuisance High Head Pressure Trips of the operating circuit. The problem was encountered when a circuit starts while the other is running. The water valve closes, since the starting circuit's head pressure is low. This causes the running circuit to fail on high head pressure.

To minimize the chance for a nuisance low oil pressure alarm, do not set the variable HD.P.A *Head Pressure Setpoint A*, and HD.P.B *Head Pressure Setpoint B* (Set Point Mode, Sub-mode HEAD) below 80 °F (26.7 °C).

Motor Cooling Solenoid

Motor temperature of the compressors is controlled by the motor temperature thermistors within each compressor. For economized compressors, the motor is cooling with the economizer gas, supplemented by liquid injection. The non-economized compressor motors are cooling only by liquid injection.

The compressor motor temperature is controlled to a set point MT.SP *Motor Temp Setpoint* [Configuration Mode, Sub-mode SERV] of 200 °F (93 °C). Beginning with Version 3.1 software, any unit configured for brine operation, FLUD *Cooler Fluid* [Configuration Mode, sub-mode OPT1] set to Medium Temperature Brine will change the MT.SP *Motor Temp Setpoint* [Configuration Mode, Sub-mode SERV] to 170 °F (76.7 °C).

It is not uncommon for an economized compressor to operate in the 150 to 180 °F (65 to 82 °C). For non-economized compressors, typical motor operating temperatures of 180 to 200 °F (82 to 93 °C) can be expected.

At motor temperatures of 210 °F (99 °C) or greater, the motor cooling solenoid will be open all the time. At motor temperatures of 240 °F (116 °C) the machine will alarm and shut down on a motor temperature alarm.

The motor cooling solenoid will also be opened if the discharge gas temperature exceeds 200 °F (93 °C).

Service Bulletins pertaining to this condition:

- SMB990072A – 06N Motor Temperature Operating Limits
This bulletin described the motor cooling solenoid control.

Oil Heaters (30GXN,GXR Only)

All 30GXN/GXR machines are equipped with contact oil heaters on the oil separator. The control system operates the heaters in response to the saturated condensing temperature. The heater will be energized if the Discharge Gas Temperature is less than 105 °F (40.6 °C). The heaters will be de-energized when the Discharge Gas Temperature is above 110 °F (43.3 °C). If the oil level switch for a circuit is open, that circuit's heater will not be energized. If the machine is in Service Test mode [Service Test, Sub-mode Test], the oil heaters will not be active.

The 30G,H-8T Controls & Troubleshooting book and prior revisions incorrectly listed the control point as the saturated condensing temperature.

Operating Modes

ComfortLink controls provide information about capacity control overrides as indicated by Operating Modes.

MD01 – FSM Controlling Chiller

This operating mode indicates that a Flotronic System Manager (FSM) is configured to be in charge of loading the chiller and the controller is responding to these commands. If the FSM stops communicating with the chiller, then the mode is disabled and the chiller will operate as a stand-alone chiller.

The unit's capacity may be reduced while this mode is in effect.

MD02 – WSM Controlling Chiller

This operating mode indicates that a Water System Manager (WSM) is configured to be in charge of loading the chiller and the controller is responding to these commands. If the WSM stops communicating with the chiller, then the mode is disabled and the chiller will operate as a stand-alone chiller.

The unit's capacity may be reduced while this mode is in effect.

MD03 – Master/Slave Control

This operating mode indicates that the local dual chiller algorithm is controlling the chiller. The Master chiller will display this mode at all times, regardless of occupancy. The Slave chiller will display this mode only when the machine is in an occupied period only.

MD04 – Low Source Protection

This operating mode is for heat machines only. In heating mode, if the cooler Leaving Water Temperature (LWT) is less than the smallest LWT set point, then this mode is in effect. A stage will be removed every 30 seconds until the LWT is above the set point.

MD05 – Ramp Load Limited

This operating mode indicates that the unit's capacity is being limited by Ramp Loading. At least one stage must be on and *RL.S Ramp Load Select* (Configuration Mode, Sub-mode SLCT) must be ENBL, for this mode to be in effect. If the Leaving Water Temperature is more than 4 °F (2.2 °C) above the *CTPT Control Point* (Run Status

Mode, Sub-mode VIEW), and the negative rate of change of LWT is greater than CRMP (Configuration Mode, Sub-mode SLCT), no additional stages of capacity will be added.

In the following example, the Ramp Load function is enabled, Cooling Ramp Loading is set for 1.0 °F/minute (0.5 °C/minute), and the Set Point is 44 °F (6.6 °C). At the start of the first stage of capacity, the Leaving Water Temperature is 54 °F (12.2 °C) and 30 seconds later the leaving water temperature is 53.4 °F (12.1 °C). The negative rate of change is 1.2 °F/minute (0.7 °C/minute). In this example, the operating mode will be in effect, and no further stages will be added.

The unit's capacity may be reduced while this mode is in effect.

MD06 – Timed Override In Effect

The operating mode indicates that a Carrier Comfort Network device, such as Building Supervisor or ComfortWorks has initiated a schedule override for a specified period of time. Timed Override cannot be accessed through the Navigator.

MD07 – Low Cooler Suction TempA

MD08 – Low Cooler Suction TempB

This operating mode is a cooler freeze protection control mode.

This operating mode is in effect if during the first three (3) minutes that the circuit is on, the Saturated Suction Temperature is less than the BR.FZ *Brine Freeze Point* (Configuration Mode, Sub-mode SERV). During this condition, no additional stages will be added.

If the saturated suction temperature is less than the BR.FZ *Brine Freeze Point* (Configuration Mode, Sub-mode SERV), then the unit will be put into close control, and the mode will be active. Close control will allow the unit to use stages that otherwise would not be considered valid.

At any time a compressor is on in the circuit and the saturated suction temperature is at least 6 °F (3.3 °C) less than the BR.FZ *Brine Freeze Point* (Configuration Mode, Sub-mode SERV) for 1 minute, then the mode is active. A capacity stage is removed from the circuit. If both circuits have the mode at the same time, a capacity stage is alternately removed every minute. If this condition is not remedied within a specified amount of time, the corresponding T120/T121 Circuit A/B Low Saturated Suction Temperature Alert.

The unit's capacity may be reduced while this mode is in effect.

MD09 – Slow Change Override

This operating mode prohibits the control from adding a capacity stage needlessly. If the Leaving Water Temperature is near the CTPT *Control Point* (Run Status Mode, Sub-mode VIEW), and is not moving rapidly away from the Control Point. This mode will be active and will prohibit the controller from adding a stage needlessly. For instance, if EWT/LWT = 50/44.2, and the Control Point is 44, and the LWT is not changing, then the integrator would eventually call for another stage to be added. Slow change override keeps it off.

MD10 – Minimum Off Time Active

This operating mode indicates that the unit start has been delayed by a configured time period, DELY *Minutes Off Time* (Configuration Mode, Sub-mode OPT2). This parameter does not apply for recycle restarts, but only to the initial startup of a cycle (e.g., when SW1 is changed to Enable).

MD11 – Low Discharge Superheat A

MD12 – Low Discharge Superheat B

This operating mode is a protection mode for the machine. This mode algorithm is active only when the circuit on and has been running for at least 3 minutes. If the discharge superheat is less than 5 degrees and decreasing, then a stage will be removed in an attempt to increase the discharge superheat, unless the control is at the last stage of the circuit. The unit will be placed into close control.

If both circuits are in low discharge superheat, then stages will be alternately removed every 30 seconds.

If there is a request to add a stage of capacity to the circuit, and the discharge superheat is less than 15 degrees, then the stage will not be added.

The unit's capacity may be reduced while this mode is in effect.

MD13 – Dual Setpoint

This operating mode is displayed if the control is configured and operating at a set point other than single set point control, CLSP *Cooling Setpoint Select* (Configuration Mode, Sub-mode SLCT).

The unit's capacity may be reduced while this mode is in effect.

MD14 – Temperature Reset

This operating mode indicates that the unit's capacity will be reduced due to chilled water temperature reset, either by return water, Outdoor Air, Space Temperature or from a temperature reset command from an external building automation system.

The unit's capacity may be reduced while this mode is in effect.

MD15 – Demand Limit In Effect

This operating mode indicates that the unit's capacity will be reduced due to a demand limit command from an external building automation system.

The unit's capacity may be reduced while this mode is in effect.

MD16 – Cooler Freeze Protection

This operating mode occurs at the same time as the A207 - Cooler Freeze Protection Alarm is indicated. This mode is enabled when the cooler entering or leaving water temperature is below BR.FZ, *Brine Freeze Point* (Configuration Mode, Sub-mode SERV) plus 2 °F (1.1 °C). When this condition is encountered, the machine will enter Mode 16, and the Chilled Water Pump relay will be energized, even if the CPC *Cooler Pump Control* (Configuration Mode, Sub-mode OPT1) is OFF. The unit will be shut down or prevented from starting.

The control disables the mode automatically if the leaving chilled water temperature rises above the CSP.1 *Cooling Setpoint 1* (Set Point Mode, Sub-mode COOL) plus 6 °F (3.3 °C).

MD17 – Lo Tmp Cool/Hi Tmp Heat

This mode is not in the ComfortLink software. The actions are taken, but the mode is not displayed.

If the Entering Water Temperature is less than the set point, then a stage of capacity is removed every 30 seconds until the Entering Water Temperature is above the set point.

If,

$$\text{Leaving Water Temperature} < \frac{-2 \times (\text{Entering Water Temperature} - \text{Leaving Water Temperature})}{\% \text{ Total Capacity}} \times 43.75$$

and the rate of change of the Leaving Water Temperature is less than -0.5 °F/minute (-0.28 °C/minute), or

$$\text{Leaving Water Temperature} < \frac{-3 \times (\text{Entering Water Temperature} - \text{Leaving Water Temperature})}{\% \text{ Total Capacity}} \times 43.75$$

and the rate of change of the Leaving Water Temperature is less than 0.0 °F/minute (0.0 °C/minute), a stage will be removed.

MD18 – Hi Tmp Cool/Lo Tmp Heat

This operating mode will be displayed if the Leaving Water Temperature is above the set point and is moving away from the set point rapidly. If this condition is detected, the control will add a stage of capacity every 30 seconds.

There are several conditions that will cause the unit to enter this control mode.

If the Leaving Water Temperature is greater than the Set Point by at least 1 °F (0.6 °C) and the rate of change of the leaving water is greater than 2 °F/min (1.1 °C/min).

Or

If the Leaving Water Temperature is greater than the Set Point by at least 6 °F (3.3 °C) and *RL.S Ramp Load Select* (Configuration Mode, Sub-mode SLCT) is set to DISABLE.

Or

If at least 1 compressor is ON,

If the compressors are OFF,

MD19 – Making Ice

This operating mode indicates that the machine is in the ice building mode. The unit is configured to make ice, *ICE.M Ice Mode Enable* (Configuration Mode, Sub-mode OPT2) set to YES, the unoccupied cooling set point is in effect and the Ice Done Switch is open. When this mode is in effect, *CSP3 Cooling Setpoint 3* (Set Point Mode, Sub Mode COOL), the Ice Making Set Point is in effect.

MD20 – Storing Ice

This operating mode indicates that the machine is in the ice storing mode. The unit is configured to make ice, *ICE.M Ice Mode Enable* (Configuration Mode, Sub-mode OPT2) set to YES, the unoccupied cooling set point is in effect and the Ice Done Switch is closed. When this mode is active, *CSP2 Cooling Setpoint 2* (Set Point Mode, Sub-mode COOL) is in effect.

MD21 – High SCT Circuit A

MD22 – High SCT Circuit B

This operating mode is a protection mode to allow the machine to operate at a limited capacity when the Saturated Condensing Temperature (SCT) approaches a

predetermined limit. This mode will only be checked if the circuit is on. The control will unload the affected circuit and throttle the Saturated Suction. While in this mode, no additional capacity stages will be added to the affected circuit. If the machine is running at the lowest stage, the High SCT mode is not utilized.

The Maximum Condensing Temperature in Software versions prior to CESR-131248-04-00 was a value that is a non-accessible from a LEN device and defined in the table below:

Unit	Maximum Condensing Temperature
30GXN/GXR	154 °F (67.8 °C)
30HXA	152 °F (66.7 °C)
30HXC	122 °F (50.0 °C)

The Maximum Condensing Temperature in Software versions starting with CESR-131248-04-00 and continuing with CESR131344-01-01, is a field configurable value, *MC.SP Max. Cond. Temp Setpoint* (Configuration Mode, sub-mode SERV). The upper limit for the value is the default setting.

Unit	Maximum Condensing Temperature (Default Setting)
30GXN/GXR	152 °F (66.7 °C)
30HXA	145 °F (62.8 °C)
30HXC	118 °F (47.8 °C)

The point can be lowered to adjust the point at which this algorithm starts to take action.

This mode will be enabled if: the Saturated Condensing Temperature (SCT) is greater than (Maximum Condensing Temperature – 12 °F (6.6 °C)) and the capacity is increasing; or Saturated Condensing Temperature (SCT) is greater than (Maximum Condensing Temperature – 4 °F (2.2 °C)) and the Saturated Suction Temperature (SST) is greater than the Maximum Saturated Suction Temperature, 52 °F (11.1 °C). This mode will stay active until both of the conditions above are no longer true.

The control's response depends on a number of conditions. If the SCT is greater than (Maximum Condensing Temperature + 2 °F (1.1 °C)) for one (1) minute, then reduce the capacity by turning off a loader. If the SCT is greater than (Maximum Condensing Temperature + 5 °F (2.8 °C)), turn off a loader if one is on, otherwise stop the circuit and generate the appropriate alert, T126/T127 Circuit A/B High Discharge Pressure Alert.

MD23 – High Motor Current Cir. A

MD24 – High Motor Current Cir. B

This operating mode is a protection mode to allow the machine to operate at a limited capacity when a compressor on a circuit is approaching its Must Trip Amp (MTA) value.

Compressor MTA values are listed CM.A1 *Compressor A1 Must Trip Amps*, CM.A2 *Compressor A2 Must Trip Amps*, CM.B1 *Compressor B1 Must Trip Amps*, and CM.B2 *Compressor B2 Must Trip Amps* (Configuration Mode, Sub-mode UNIT). The mode is enabled when a compressor's current approaches 83% of MTA. The mode will remain in effect until the current drops below 55% of MTA or has not increased over the last 30 minutes. While this mode is in effect, the circuit will not be allowed to stage to a higher level.

If this mode is encountered, check the following items:

- Check CM.A1 *Compr. A1 Must Trip Amps*, CM.A2 *Compr. A2 Must Trip Amps*, CM.B1 *Compr. B1 Must Trip Amps*, CM.B2 *Compr. B2 Must Trip Amps* (Configuration Mode, Sub-Mode UNIT) for the proper MTA settings. Be sure they match the values published in the Controls & Troubleshooting book or as listed in the MTA tables starting on page 144.
- Confirm that the processor is reading the proper percentage of MTA that would trigger the mode, A1.CR *Comp A1 Running Current*, A2.CR *Comp A2 Running Current*, B1.CR *Comp B1 Running Current*, B2.CR *Comp B2 Running Current* (Input Mode, Sub-Mode CRCT).
- Confirm that the correct compressors are enabled,
- If the processor is reading values that correspond to the trigger point,
 - Check the amp reading independently.
 - Check for the operation of the machine.
 - Check the toroid resistance. It should be 64.3-70.4 Ω (30GX502786) or 38.5-42 Ω (30GX504711).
- In some 3-compressor machines with software versions prior to Version 4.0 (CESR-131248-04-00), MD24 has been reported. When the Compressor B1 amp draw is checked it is less than the trip point for the operational mode. If this is the case, increase the value for CM.B2. Upgrade the software to at least Version 4.0 (CESR-131248-04-00).

MD25 – Ckt A Off Ref Flow Delay

MD26 – Ckt B Off Ref Flow Delay

These two modes were added in MBB Version 4.0 software (CESR-131248-04-00).

These modes indicate a Loss of Refrigerant Flow Alert condition was detected by the control. See P998 – Pre-Alert Loss of Refrigerant Flow - Circuit A

T998 – Loss of Refrigerant Flow - Circuit A Alert and P999 – Pre-Alert Loss of Refrigerant Flow - Circuit B

T999 – Loss of Refrigerant Flow - Circuit B Alert on page 137 for alert criteria. These modes indicate that a 15 minute time delay is in effect before another circuit start attempt is initiated.

MD27 – Circuit A Pumping Out

MD28 – Circuit B Pumping Out

This mode was added in MBB Software Version 4.0 is active when the pumpout routine is in control before the circuit is shutdown. See T135 - Circuit A Failure to Pumpout Alert and T136 - Circuit B Failure to Pumpout Alert on page 119 for pumpout criteria.

MD29 – Unit OFF: No Water Flow

This mode was added in MBB Software Version 5.0 and is indicated when an A201 – Cooler Pump Interlock Failure Contacts Open During Normal Operation alarm condition has been detected. See A201 – Cooler Pump Interlock Failure Contacts Open During Normal Operation Alarm on page 132 for alarm criteria. The control will delay indicating an A201 alarm for five (5) minutes for flow to be established again, during which time this mode will be active. If flow has not been established within five (5) minutes, an A201 alarm will be indicated.

Password Protection

The password for the 30GXN/GXR and 30HXA/HXC ComfortLink machines can be changed in the field with the Navigator. The default password is 1111. The procedure for changing the password is outlined below.

1. Enter the correct password under *PASS, Service Password* (Configuration Mode, Sub-mode DISP).
2. Change *PAS.E Password Enable* (Configuration Mode, Sub-mode DISP) to DSBL.
3. Return to the *PASS, Service Password*, and change the password to the desired value. For this example, 2222. Once changed, the screen will show the desired value, 2222.
4. Return to the *PAS.E Password Enable*, and change the value to ENBL.

The password has been changed. If the password is required, the machine will show the default 1111 as the password. Use the up or down arrow keys to change the value to the correct password.

Remote Alarm Relay

The 30GX/HX ComfortLink machines have a remote alarm relay feature. A field-installed relay, ALMR must be installed and connected between TB5-11 and TB5-12. The relay should have coil voltage should be either 115 or 230 volts, depending on the unit's control voltage. Maximum coil ratings: 75 va sealed, 360 va inrush.

Beginning with Version 4.0 software, the alarm relay output is configurable. The factory default setting for the Alarm Relay is for Alerts and Alarms. With this configuration, any alert or alarm will signal the alarm relay. To change the Alarm Relay configuration, access the *ALR.C Alarm Relay Usage* (Configuration Mode, Sub-mode OPT2). For Alert and Alarm definitions, see Alarm and Alert Codes on page 92.

Alarm Relay Configuration

Mode	Sub-mode	Item	Expansion	Value	Req'd
Configuration	OPT2	ALR.C	<i>Alarm Relay Usage</i>	0=Alarms & Alerts 1=Alarms Only 2=Off	No

Service Test

The Service Test function should be used to verify proper operation of the compressors, loaders, pumps, solenoids, fans, heaters, etc. To access the Service Test mode, the Enable/Off/Remote Contact switch must be in the Off position. Use the display keys to enter the Service Test mode and display 'TEST OFF'. Press the [ENTER] key and 'Off' will flash (Enter the password if required). Use either arrow key to change the 'Off' to 'On' and press [ENTER]. Switch the Enable/Off/Remote Contact switch to the Enable position. Both main power and control circuit power must be on. Use the arrow keys to select either sub-mode OUTS or COMP. Test the expansion valves, oil pumps, fans, cooler heaters, cooler/condenser pump relays, remote alarm relay, head pressure control, compressor oil and motor cooling solenoids under the OUTS sub-mode. The condenser-fan motors are NOT started during VH.PA or VH.PB test on 30GXN,R units with Motormaster® control. The only test that can be performed is a measurement of the 4 to 20 mA dc output using a meter in series with violet or pink wire to controller. These discrete outputs are then turned off if there is no keypad activity for 10 minutes. Test the compressors, loaders, minimum load valves and oil heaters under the COMP sub-mode. Compressor loaders, minimum load valve and oil heaters can be tested with compressors on or off. All compressor outputs can be turned on, but the control will limit the rate by staging one compressor per minute. The relays under the COMP sub-mode will stay on for 10 minutes if there is no keypad activity. Compressors will stay on until the operator turns them off. The Service Test mode will remain enabled as long as there is more than one compressor turned on. All safeties are monitored during this test and will turn a compressor, circuit or motor off if necessary. Any other mode or sub-mode can be viewed or changed during the TEST mode. The STAT *Control Mode* (Run Status, Sub-mode VIEW) will display 'SERVICE TEST' as long as the Service mode is enabled. The TEST *Service Test Mode* sub-mode value must be changed back to OFF before the chiller can be switched to Enable or Remote contact for normal operation.

There is a known software problem in software versions prior to CESR-131248-04-00. If the chilled water pump relay is tested, sometimes the service test mode will no longer react to commands from the Navigator. Cycling power to the controls resets the problem and Service Test will work normally.

Software Revisions

There have been a number updates to the 30GX/HX ComfortLink Main Base Board Software. Outlined below is a summary of the changes with its implementation date.

Version 2.0 (CESR-131344-02-00)

Serial Number Start:

Version 1.6 = 2.0 (CESR-131344-01-06, CESR-131344-02-00)

Serial Number Start: Service Release Only – Beta Software

- T140-143 alerts: Added a user-adjustable oil filter pressure drop setpoint. This has been added to allow use of the 06N oil injection kit. (A higher delta P increase will be required for air-cooled machines versus water-cooled.)
- Corrects problem of Lag chiller pump cycling in parallel chiller configurations. (Lag chiller is permitted to start until lead chiller's load is <40% to drop off lag.) Previously when lead calls for Lag chiller, water valves drop perceived load on Lead such that it cancelled the call for the Lag before the Lag actually started but after the Lag's pump started. So Lead load would fluctuate and Lag pump would cycle without ever starting the Lag.
- If flow switch opens more than 2 times in one hour, A201 is generated, which requires a manual reset. (Automatic restart occurs if flow switch opens once, then remakes within 5 min. This is documented as being off by Mode 29.) In prior versions the A201 fault lockout would only occur if the switch was off for more than 5 minutes. Restart delay (minimal) is not affected.
- Energize Motor cooling solenoid (100%) if DGT is greater than 180 °F (82 °C), was 200 °F (93 °C).
- Eliminate pumpdown on 30GX/HXA unit if brine freeze is less than or equal to 25°F (-4 °C).
- Change persistence time from 60 to 15 seconds on T098-2, T099-2 alerts (economizer transducer reading lower than suction transducer).
- Corrected issue that if you disabled a Compressor (Configuration\SERV\EN.A1,EN.A2,EN.B1,EN.B2 = DISABLE) and cycled power the configuration would change back to ENABLE.
- Oil criteria change: Raised criteria for oil pressure passing prestart on third try from 0.5 PSI to 1.5 PSI. This is to prevent compressor from starting without the oil pump running.

Version 1.3 (CESR-131344-01-03)

Serial Number Start: Service Release Only – Beta Software

- Modified the Motor Cooling Algorithm to not energize the motor cooling solenoid if motor temp is more than 60 °F (33.3 °C) below set point. If the motor temperature is between 40 and 60 °F (22.2 and 33.3 °C) below, for high positive rate of change, duty cycle is 1 second out of 8. Previously this was the duty cycle for lower than 40 °F below setpoint and high positive rate of change. This modification addresses issues with low discharge superheat alerts.

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- For economizer pressure less than 12 psi (82.7 kPa) below suction pressure, change the persistence time from 15 seconds to 60 seconds before an alarm is generated (T098-2, T099-2).
- Reassign Energy Management Module channels for 4-20 ma inputs (Demand Limit, Temperature Reset, External Cooling Set point, and Heat Set Point). This corrected the channel assignment problem introduced in Version 1.1 with which Cooling Setpoint and Temperature Reset input channels were swapped.

Version 1.2 (CESR-131344-01-02)

Serial Number Start: 0904F (30GXN/GXR), 1104Q (30HXA/HXC)

- Corrected erroneous alarms T073 – Outdoor Air Temperature Thermistor Failure Alert and T074 – External Reset Temperature Thermistor Failure Alert, when the machine was placed in Test Mode.

Version 1.1 (CESR-131344-01-01)

Serial Number Start: 5003Q (30HXA/HXC)

- Original Release of the software for Series 6 machines. The software is referred to as “Enhanced Screw Software.” This software is not backward compatible.

Version 5.2 (CESR-131248-05-02)

Serial Number Start: Service Release Only

- Pump down routine eliminated at end of cycle on 30GX and 30HXA if brine freeze set point is set to 25F or less. Eliminates high discharge gas temperature alerts that occur during pump-down.

Version 5.1 (CESR-131248-05-01)

Serial Number Start: 4403F (30GXN/GXR), 4503Q (30HXA/HXC)

- Corrected problem of 30HXC or 30HXA reverting to the 30GX default of 152 °F (66.7 °C) upon power cycle. MC.SP *Maximum Condensing Temperature Set Point* (Configuration Mode, Sub-mode SERV). 30HXC to default to 118 °F (47.8 °C), 30HXA defaults to 145 °F (62.8 °C), 30GX defaults to 152 °F (66.7 °C). MC.SP can be lowered (down to 100 °F), but not raised above the default. Unit stops loading at 6 °F below MC.SP for 30HXC water-cooled or 12 °F for 30GX air cooled and 30HXA split (unchanged).

Version 5.0 (CESR-131248-05-00)

Serial Number Start: 4403F (30GXN/GXR), 4403Q (30HXA/HXC)

- Added MC.SP *Maximum Condensing Temperature Set Point* (Configuration Mode, Sub-mode SERV). 30HXC to default to 118 °F (47.8 °C), 30HXA defaults to 145 °F

- (62.8 °C), 30GX defaults to 152 °F (66.7 °C). MC.SP can be lowered (down to 100 °F), but not raised above the default. Unit stops loading at 6 °F below MC.SP for 30HXC water cooled or 12 °F for 30GX air cooled and 30HXA split (unchanged).
- Corrected problem in 4.0 that skipped the check for SST < 9 degrees prior to failing the level sensor. Liquid level sensor failure alarms would occur on med temp brine applications.
 - Corrected problem that if the level sensor is disabled or failed, the DSH control will only override the level sensor calculation if the discharge superheat is +/- 5 degrees away from the set point. The effect of this problem is that the EXV would hunt when in discharge superheat control.
 - Added loading on high temperature override when leaving fluid temperature is greater than 6 °F above set point, unless ramp loading is enabled. Corrects problem with fast load algorithm, and allows ramp loading to work.
 - Variables SIZE_DPX, SIZEADPX, CAPT_DPX, CAPA_DPX (total size of the dual chiller, available size of the dual chiller, total capacity in use by the dual chiller, and available capacity in use by the dual chiller) have been added. They appear in the DUALCHIL table. As with our other dual chiller parameters, they do not appear on the Navigator. The CSM gets these values reported when it is communicating with a master chiller and the master chiller is not in standalone mode. If the master chiller is in standalone mode, then only the master chiller's size and capacities are communicated to the CSM.
 - The 10 minute low discharge superheat timer will not start during the first 3 minutes after a circuit starts. Thus, at startup we won't fail on low discharge superheat for 13 minutes. This helps eliminate some low discharge superheat alarms.
 - Loss of water flow while machine is pumping out is now detected.
 - Motor Master head pressure control algorithm improvement.
 - Alarm history buffer increased to hold 50 alarms. You can now review all 50 alarms from the Navigator.
 - Addition of pre-alarms for compressor no motor current while running (P051, P052, P055, P056). No remote alarm is turned on, no message broadcast on CCN. Alarm is in the current alarms list for two minutes, also in alarm history. Navigator alarm light flashes. After two minutes, the compressor is allowed to restart (return to normal is not sent on CCN). If on the subsequent restart no motor current is detected by the TI board within the first 30 seconds, the failure is treated as an alarm (remote alarm is turned on, messages are broadcast on CCN).
 - The upper limit on current unbalance has been increased from 25 to 30%. The default value has also been increased from 10% to 15%.
 - Alerts T098/T099 (Economizer pressure is less than 12 psi below suction pressure) have the timing changed from 6 to 60 seconds before the alarm occurs. This eliminates some nuisance alarms.
 - Occupancy POC sends the properly formatted NACK message (this was causing problems with Data Port).
 - Welded compressor contactor detection and support added.
 - Cooler pump now allows a backup pump to be energized if primary pump control is lost. Five minutes is allowed for this to occur. MODE 29 occurs while in the 5 minute delay. If flow is reestablished, mode 29 goes away. If flow is not

reestablished, then alarm 200 or 201 occurs (depending on if the original flow loss occurred at startup or while running).

- When the first loss of refrigerant flow occurs, a silent alarm is generated (P998, P999) while the delay for the "second chance" is ongoing.
- The dual chiller data have been moved to the OPTIONS table so Datalink can read them.
- Allow LEN bus scans to occur during EEPROM updates to keep loss of communications errors from occurring.
- A152 is now generated when both circuits are out due to alerts. A152 is not generated if a general alarm takes out the unit (A201, for instance). This will get the ALARM out on CCN and will close the alarm relay if configured for alarms only (ALRMCNFG = 1). There should not be too many complaints about the A152 being in the alarm history, as there should be many fewer than before (when any Alarm caused A152).
- Selecting the next compressor to start based only on run hours, instead of wear factor, which is a function of hour and starts. Run hours for compressors will now be equalized for all units with even number of compressors. For units with three compressors, the single compressor circuit will still tend to accumulate more hours than the compressors in the other circuit.
- No water flow alarm (A201) occurs when in an override situation that has the water pump on (e.g. - SST Freeze). The pump relay stays on when the alarm occurs. The alarm does not occur when CPC = NO, since we might not be wired to the pump. When CPC = NO, the only way the alarm will occur is when STATE = ON and no flow is detected.
- Modified compressor start logic to prevent the compressor from starting without the oil pump running.

Version 4.8 (CESR-131248-04-08)

Serial Number Start: 1603F (30GXN/GXR), 1603Q (30HXA/HXC)

- This is the same as version 4.0. A timing problem was corrected that affected downloading the MBB. None of the changes listed for versions 4.3, 4.5 or 4.7 are included in this version.

Version 4.7 (CESR-131248-04-07)

Serial Number Start: Service Release Only

- Implemented a faster start-up of the Operating System, eliminating the Comm Failure displayed on the Navigator screen at Start-Up. The software is now up and running about 4 seconds after power up.
- Added items EXVSPOSA *EXV Starting Position Circuit A*, EXVSPOSB *EXV Starting Position Circuit B* for starting EXV position, under Configuration Mode, Sub-Mode SERV, and under Diagnostic->Service-Config->Service on the CCN software. This allows field adjustment of the EXV starting position. This is primarily for units with 2

compressors/circuit. The default starting position of 10% on previous versions was too low. This caused T998 & T999 alerts in some cases. The default starting position is 20% for all units.

- Revised the Motor Thermistor Failure algorithm to check for an alarm on motor thermistor failure to avoid high motor temperature alarm when the thermistor has shorted. Many times both alarms were reported.
- Revised the discharge superheat algorithm to allow the discharge superheat to rise to 25 °F (13.9 °C) before a correction is made. Also, the correction was slowed by a factor of 10 when the discharge superheat is above DIS.S *Discharge Super Setpoint* (Configuration Mode, Sub-Mode UNIT), and by a factor of 5 when below setpoint to aid in avoiding some T137/T138 Circuit A/B Low Discharge Superheat Alerts.
- MLV is energized when the lag circuit starts as well as the lead circuit. This will prevent the suction pressure from going too low when the lag circuit starts, thereby generating T998 & T999 alerts. Required for low ambient operation to reduce possibility of compressor failure.

Version 4.5 (CESR-131248-04-05)

Serial Number Start: Service Release Only

- Addition of pre-alarms for compressor no motor current while running. The remote alarm is not turned on, no message on CCN. Alarm is in the current alarm list for two minutes, also in alarm history. Navigator alarm light flashes. After two minutes, the compressor is allowed to restart (return to normal is not sent on CCN). If on the subsequent restart, no motor current is detected by the TI board within the first 15 seconds, the failure is treated as an alarm (remote alarm is turned on, messages are sent on CCN).
- The upper limit on current unbalance has been changed from 25 to 30%.
- Alerts T098/T099 Circuit A/B Economizer Pressure Transducer Failure-2 (Economizer pressure is less than 12 psi below suction pressure) have the timing changed from 6 to 15 seconds before the alarm occurs.
- Occupancy POC sends the properly formatted NACK message (this was causing problems with Data Port).

Version 4.3 (CESR-131248-04-03)

Serial Number Start: Service Release Only

- Variables SIZE_DPX, SIZEADPX, CAPT_DPX, CAPA_DPX (total size of the dual chiller, available size of the dual chiller, total capacity in use by the dual chiller, and available capacity in use by the dual chiller) have been added. They appear in the DUALCHIL table. As with our other dual chiller parameters, they do not appear on the Navigator. The CSM gets these values reported when it is communicating with a master chiller and the master chiller is not in standalone mode. If the master chiller is in standalone mode, then only the master chiller size and capacities are communicated to the CSM.

- Use of the wear factor has been changed to equalize the compressor hours/starts.
- The 10 minute low discharge superheat timer will not start during the first 3 minutes after a circuit starts. Thus, at startup we won't fail on low discharge superheat for 13 minutes.
- Loss of water flow while pumping out will be detected if chilled water pump control is disabled.
- Fixed a bug introduced in 4.0 that skipped the check for SST < 9 degrees prior to failing the level sensor. This eliminates liquid level sensor failure alarms in brine applications.
- Fixed a bug that if the level sensor is disabled or broken, the discharge superheat control will only override the level sensor calculation if the discharge superheat control is +/- 5 degrees away from the setpoint. The effect of this problem is that the EXV would hunt when in DSH control.
- MCT_SP modified for HXC to default to 118, HXA defaults to 145, GX defaults to 152 (unchanged). MCT_SP can be lowered (down to 100 dF), but not raised above the default. Unit stops loading at 6 dF below MCT_SP for HXC and water cooled HXA, 12 dF for GX and air cooled HXA (unchanged). Note: For this and the previous version, make sure that you check MCT_SP. This value will be written by the SCP file on units that leave the factory; that work will be done after the "field qualification" phase.
- Added loading on high temperature override when DT > 6, unless ramp loading is enabled. Makes the fast load algorithm equivalent to Global Chiller fast load algorithm, and allows ramp loading to work (fixes problem Global Chiller had).
- Navigator will now display up to 50 alarms in the alarm history buffer.

Version 4.0 (CESR-131248-04-00)

Serial Number Start: 1302F (30GXN/GXR), 1302Q (30HXA/HXC)

- The machine would not restart after a brief power interruption. This was caused by the MBB not seeing the power loss, while the TI board did. It has been fixed by having the MBB receive information from the TI board that it has seen a power loss. The MBB will then restart the unit. Alarms A184 CPM Module 1 – Module has Experienced too Many Power Cycles and A185 CPM Module 2 – Module has Experienced too Many Power Cycles have been added to the alarm list, and are generated when the CCP experiences more than five (5) power losses in one (1) hour.
- In a dual chiller configuration, the slave chiller was disabled when the master chiller fails. Now, the slave goes into standalone mode when the master chiller fails.
- To accommodate ice storage applications, the following problem is addressed:
 - *The unit unloads when LWT is less than the freeze variable plus two degrees F.* Freeze was previously defined as the lowest of CSP1 and CSP2, without regard to CSP3 (the ice duty set point). This is now defined as BRN_FRZ, the brine freeze set point, which is independent of any of the cooling set points, and can be changed to reflect the amount of antifreeze that has been added to the water loop.

- Illegal configuration descriptions have been changed from providing a number (e.g. “Illegal Configuration – 1”) to providing a text description of the problem (“Illegal Configuration – Invalid Unit Type”). Note that at this time, all illegal configurations except –01 (Invalid Unit Type) have been translated into the three non-English languages that are supported.
- A problem with the oil pump coming on when the compressor alarms on a High Pressure Switch Trip has been addressed. The logic now requires that the compressor feedback be on before the oil pump can be commanded on due to low oil pressure.
- The alarm history buffer size has been increased to 50 and cannot be reset. RHIST has been removed.
- Compressor startup sequence modifications:
 - Delay compressor start for 10 seconds after oil solenoid is energized.
 - Oil pump remains on for two minutes after startup of the lead compressor.
- The STAT point was not being displayed properly when reading point with BEST++.
- On 3 compressor units, stray current readings (<1 amp) on B2 compressor cause high current mode 24 to occur, which did not allow the circuit to stage any higher. Current is now ignored for compressors that are not configured.
- Added a check for both circuits to be on prior to averaging the saturated condensing temperature readings for each circuit when Head Pressure Control Type (HPCT) is configured for COMMON EVAP.
- Algorithm added to cycle the cooler water pump when the SST is low (brine freeze setpoint – 6 °F), but the chilled water temperature is high. Previously, the pump was left on, which was causing some jobs to experience very high water temperatures when the chiller was being started. If the machine is off and entering and leaving water temperatures are both greater than 65.5 °F for 5 continuous minutes, then the pump will be shut off for 30 minutes. The pump will then be re-energized until the water temperatures are both greater than 65.5 °F for 5 minutes.
- The 30 minute OFF, 5 minute ON cycle will be repeated during this mode.
- Clear the Lead/Lag Thermistor Failure Alert (T079) when dual chiller mode is disabled.
- Added maintenance screen with hours and starts that can't be modified. Accessible via CCN.
- Lead/Lag Balance Select (LLBL) and Variable Head Pressure Select (VHPT) show numbers on Navigator, changed to description.
- Active Demand Limit now displayed on Navigator.
- Minutes left for start now displayed on Navigator.
- Minutes off delay now works when last compressor cycles off and power up.
- Failure to Pumpout Alerts (T135 & T136) have been eliminated. Loaders now assist after two minutes of pumpout. No alert generated. Pumpout failure incidences displayed in MISCDATA table. Accessible via CCN.
- A202 (Cooler Pump Interlock Failure Contacts Closed While Pump is OFF) does not occur if CHIL_S_S is toggled from ON to OFF then to ON before the chiller has shut down.

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- Non-CCN jobs cannot configure daylight savings time. Added BCST broadcast configuration to Navigator.
- Return temperature reset now works correctly when METRIC units are selected.
- Default minimum water valve position for brine units is now 25%. (30HXC)
- Keep condenser pump on for brine units even when not running. (30HXC)
- Enable the TI boards appropriately when number of compressor in the circuit is configured.
- Added a “Winterization Required” Alert. Alert is displayed; unit is allowed to run. Configurable (enable/disable). Software logs time of message, time winterization completed, and if the configuration has changed.
- The alarm output is now configurable. Alarm Relay Usage (ALR.C) has been added under Configuration/OPT2. Configuration options, Alerts and Alarms, Alarms only, Off.
- CCN Usage, 0 = Alerts and Alarms energize the relay, 1 = Alarms Only, 2 = Off.
- Oil pressure maximum threshold increased to 5 psi, previously 2.5 psi (to check for leaking oil solenoid).
- Fixed problem when the chiller is configured in the CSM list, but not selected as being active, repeated “FSM Loss of Communication Alert” (A951) would occur.
- Allow liquid level sensor to be disabled. Machine will operate on discharge superheat control when disabled.
- High Oil Filter Pressure Drop alert changed to manual reset. Previously it was automatic so it would not show up under current alarms. Persistence time was increased from 60 seconds to 300 seconds.
- Change FSM references to CSM.
- Default Head Setpoint for 30HXC's was changed from 113 °F to 85 °F.
- When testing compressors water pump never came on, alarm 200 was activated.
- 30HXC units configured for brine, when condenser flow is lost the cooler pump output is immediately de-energized. Condenser interlock must be enabled. A condenser flow switch must be installed. Chilled water pump control is required.
- 30HXC units configured for brine, keep the condenser pump on for 30 minutes after a normal shutdown.
- For brine 30HXC units, liquid line solenoids will be standard equipment. When condenser flow is lost, de-energize the Liquid Line Service Valves (shutting off the compressors and cooler pump simultaneously).
- Modified 30HXC water valve head pressure control algorithm. Added a one minute delay before the SCT of a starting circuit will be able to contribute to the valve position (unless SCT is higher than the running circuit's SCT). When one circuit starts while the other is running the water valve closes, since the starting circuit's head pressure is low. This causes the running circuit to fail on high head pressure.
- Condenser interlock will now function correctly without condenser pump control enabled. When condenser pump control is not enabled and condenser interlock is enabled, 5 minutes is allowed at startup for the flow switch to make. Until the flow switch makes, compressors are not allowed to run. This does not apply for CNPC = 2 (condenser pump on with compressors).

- Add Mode 25 CKT A OFF REF FLOW DELAY & Mode 26 CKT B OFF REF FLOW DELAY to indicate that a loss of refrigerant flow has been detected and a 15 minute delay is in effect.
- Add Mode 27 CIRCUIT A – PUMPING OUT & Mode 28 CIRCUIT B – PUMPING OUT to indicate that circuit is pumping out before shutting down.
- Change wording on VHPT configuration options from (4 – 20 mA, 0 – 10 V, 10 – 0 V) to (4 – 20 mA, 0 – 20 mA, 20 – 0 mA).
- For the first no refrigerant flow failure (T998 & T999), do not generate an alarm. Only generate an alarm if the second failure occurs after a 15 minute delay.
- If a circuit is in low discharge superheat capacity limiting and the MLV (if installed) is on, do not cycle the MLV off until low DSH is no longer in effect.
- Upgrades for Motormaster V. Changes made to head pressure control algorithms to enhance stability. Will be helpful for existing units using Motormaster III.
- Ignore the cooler flow switch for first 15 seconds. Corrected problem where switch would momentarily make then drop out and alarm.
- Mode 1 (CSM CONTROLLING CHILLER) not set when CSM is in control of the chiller.
- Cooler heater is energized if (SST < brine freeze) or (EWT or LWT < brine freeze + 3). This corrects problem of cooler freeze protection alarm being generated before cooler heaters were energized.
- Corrected problem where Alarm 202 would occur if the unit was in SST freeze when the state transitioned from OFF to ON.
- 30HXC units configured for brine will not pump out if the brine freeze point (BR.FZ) is 25 degrees or less.
- Added SMZ to the Navigator Display.
- Added Circuit A Starts & Circuit B Starts to Navigator Display.
- EXV minimum position has been modified so if more than one stage is on in a circuit, the EXV is not allowed to go below the configured minimum position. MLV is not considered a stage, so you have to have at least one loader on (or two compressors) before the minimum is honored.

Version 3.1 (CESR-131248-03-01)

Serial Number Start: 1301F (30GXN/GXR), 2001Q (30HXA/HXC)

- Fast Load Algorithm implemented. This new algorithm allows the machine to stage quicker.
- A No Refrigerant Flow Algorithm was added to the control logic. The logic protects the compressor from no refrigerant flow conditions. The algorithm will shut down the affected circuit if the Saturated Suction Temperature is less than 0 °F (-18 °C) and if the rate of change is negative in 5 second increments between 40 and 90 seconds. If this condition is encountered, the machine will alert on T998 – Circuit A No Flow or T999 – Circuit B No Flow.
- Dual Chiller operation is disabled if the dual leaving chilled water sensor fails.
- Alarm 60-2 was changed to Manual reset.

- If the machine is configured for condenser pump control on with compressors, the condenser pump will remain on for 10 seconds after the compressor(s) have shut off.
- Variable Head Pressure Control algorithm for 0 to 10 vdc and 10 to 0 vdc was corrected.
- If a condenser freeze alarm, A128 (Circuit A Condenser Freeze Protection) or A129 (Circuit B Condenser Freeze Protection) is indicated, the condenser water valve will be commanded to the 100% position.
- If the machine is configured for brine operation, the motor cooling set point is set to 170 °F (76.7 °C). If the machine is changed to water operation, the motor cooling set point is set to 200 °F (93.3 °C).
- If configured for dual chiller, if the Master chiller is commanded down, the slave chiller shuts down also.

Version 2.0 (CESR-131248-02-00)

Serial Number Start: 5100F

- Dual Chiller Operation has been implemented. This control feature allows for the dual chiller operation in parallel or series piping arrangements.
- Brine Freeze Point, BR.FZ (Configuration Mode, Sub-mode SERV) lower limit now matches the Controls and Troubleshooting Guide, -20 °F (-28.8 °C).
- Test mode now allows for the energizing of the minimum load valve when the compressors are on. This is necessary for the proper set-up of the option.
- The pumpout routine has been changed. Pumpout will terminate when the Saturated Suction Temperature (SST) falls by 10 °F (5.5 °C) or reach the Brine Freeze Set Point - 6 °F (3 °C). The control expects this to take place within 360 seconds. If this does not occur, the alarm will not lock out the machine.
- Condenser Freeze Alarms A128 and A129 will no longer be displayed if the machine is configured for brine operation. Condenser Pumps should be running continuously on brine operation machines in accordance with the Installation Instructions.
- Discharge Superheat Set Point, DIS.S (Configuration Mode, Sub-mode UNIT) was changed from °F to ΔF. This was causing a conversion error when the control was switched to metric units.
- Head Pressure Control, 4-20 ma and 0-10 vdc control schemes for Split Systems (30HXA) are now available.
- Revised the available capacity to account for a circuit failure. Revised the Percent Total Capacity, CAP (Run Status Mode, Sub-mode VIEW) to account for the minimum load valve operation.
- Low Oil Level Alerts, T124 and T125 cannot be cleared until the oil level switch closes.
- Alarm 152, Circuit A & B OFF for Alerts, Unit down are no longer posted unless there is an FSM controlling the unit. This was done to increase the alarm history buffer.

- Alerts 98-2 and 99-2 Economizer Pressure Transducer Failure (Economizer Pressure < Suction Pressure -12 psig) is only checked when a compressor on that circuit is active.
- Revised the configuration for split systems to allow for Fan Staging Select, FAN.S (Configuration Mode, Sub-mode UNIT) to be None, as stated in the Controls and Troubleshooting Book.
- When Cooler Pump Control, CPC (Configuration Mode, Sub-mode OPT1) is enabled, the cooler pumps will remain energized for 20 seconds following a compressor shut down.
- Revised the EXV algorithm to improve response to Low Discharge Superheat.
- Revised the Network Alarm Broadcast to include Alerts

Version 1.0 (CESR-131248-01-00)

Serial Number Start: 3400F

Original Software Release.

Temperature Reset

ComfortLink offers several different control options for Temperature Reset. Return Water, 4-20 mA Input, Space or Outside Air Temperature, can control chilled Water Reset. Temperature Reset is programmed with the following variables:

Sub-Mode	Keypad Entry	Item	Display	Item Expansion	Comment
RSET	[ENTER]	CRST	X	Cooling Reset Type	0=No Reset 1=4-20 mA Input 2=Outdoor Air Temperature 3=Return Fluid 4=Space Temperature
	[▼]	CRT1	XXX.X °F (XXX.X °C)	No Cool Reset Temp	Default: 125 °F (51.7 °C) Range: 0 to 125 °F (-17.8 to 51.7 °C)
	[▼]	CRT2	XXX.X °F (XXX.X °C)	Full Cool Reset Temp	Default: 0 °F (17.8 °C) Range: 0 to 125 °F (-17.8 to 51.7 °C)
	[▼]	DGRC	XX.X ΔF (XX.X ΔC)	Degrees Cool Reset	Default: 0 °F (0 °C) Range: -30 to 30 °F (-16.7 to 16.7 °C)

Temperature Reset applies to CSP.1, *Cooling Set Point 1* (Set Point Mode, Sub-mode COOL) and CSP.2 *Cooling Set Point 2* (Set Point Mode, Sub-mode COOL) only. CSP.3 *Cooling Set Point 3* (Set Point Mode, Sub-mode COOL), the ice storage set point is not affected.

4-20 ma Temperature Reset

The Energy Management Module is required for this option. This option is designed for 4-20 ma input. Care should be taken when interfacing with other manufacturer's control systems, due to power supply differences, full wave bridge versus half wave rectification. The two different power supplies cannot be mixed. ComfortLink controls use half wave rectification. A signal isolation device should be utilized if a full wave bridge signal generating device is used.

To program this option, CRST, *Cooling Reset Type* (Configuration Mode, Sub-mode RSET) and DGRC, *Degrees Cool Reset* (Configuration Mode, Sub-mode RSET) must be set. With a 20 ma signal, the machine will reset the temperature to the value specified in DGRC.

For example, at 20 ma, the machine should reset by 10 °F (5.5 °C).

Sub-Mode	Keypad Entry	Item	Display	Item Expansion	Comment
RSET	[ENTER]	CRST	1	Cooling Reset Type	1=4-20 mA Input
	[▼]	CRT1	125.0 °F (51.6 °C)	No Cool Reset Temp	Not required
	[▼]	CRT2	0.0 °F (-17.8 °C)	Full Cool Reset Temp	Not required
	[▼]	DGRC	10.0 ΔF (5.5 ΔC)	Degrees Cool Reset	Amount of Temperature Reset at 20 mA.

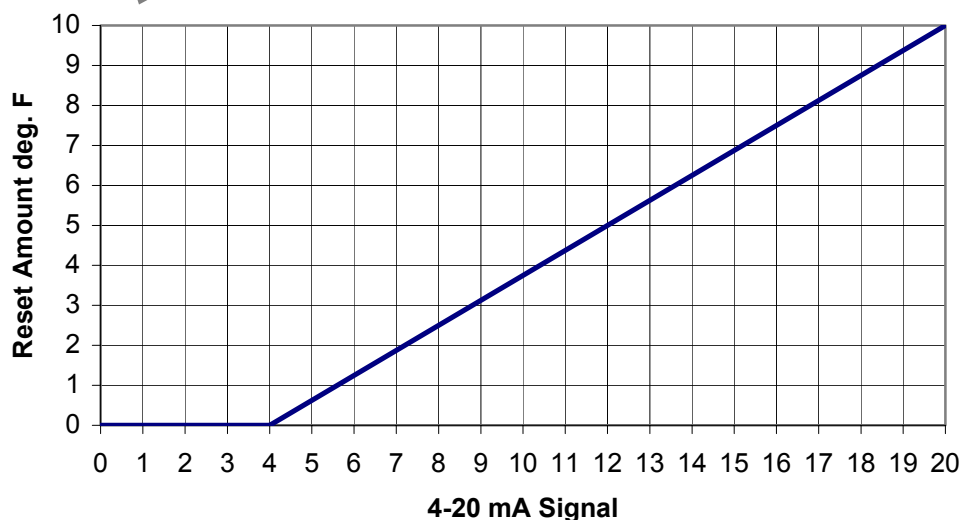


Figure 7 - 4-20 mA Temperature Reset

0-10 or 2-10 vdc inputs cannot be used without further modification. Failure to modify the signal will result in damage to the board. If this is a requirement, a signal converter is recommended. Although the signal converter is recommended, another option is to install a 226 ohm resistor must be installed in series with the input “+” lead. The signal generating control must be limited to 2-10 vdc. A signal lower than 2 vdc will result in an alarm that will terminate reset.

A software problem was discovered with the Enhanced Screw Software Version 1.1 and 1.2 (CESR-131344-01-01 and CESR-131344-01-02), where the internal input channels for 4-20 mA Temperature Reset and 4-20 mA Cooling Set Point were swapped. The problem can be corrected by connecting the Reset signal to TB6-3 and TB6-5.

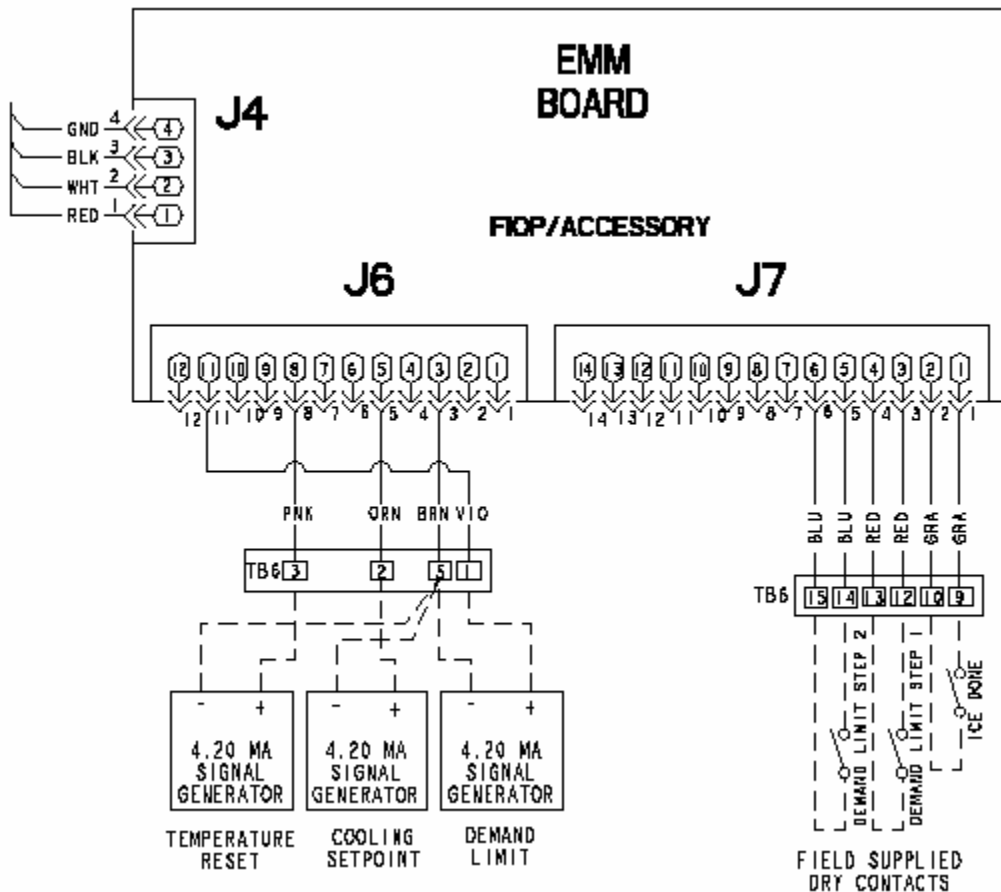


Figure 8 - EMM 4-20 mA Connections (Enhanced Screw Software Versions 1.1 [CESR-131344-01-01] and 1.2 [CESR-131344-01-02] Only)

Bulletins pertaining to this issue:

- SMB040024 - 30GX/HX Series 6, 4-20 mA Temperature Reset and Cooling Set Point

This bulletin described a problem with the Enhanced Screw Software Versions 1.1 and 1.2 (CESR-131344-01-01 and CESR-131344-01-02) in which the control inputs for 4-20 mA inputs for Temperature Reset and Cooling Set Point were

swapped. The function will operate properly if the input signals are sent to the opposite connection point.

- TIP127 – 30 Series ComfortLink Control Input Signals
This bulletin provided information on converting various other control systems signals to the ComfortLink requirement of 4-20 mA.

Return Water Reset

No additional hardware is required for this option. The Energy Management Module is not required for this option. To set up return water reset for this control system, follow these steps:

Under the Configuration Mode, these values must be set:

CRST, *Cooling Reset Type*, (Configuration Mode, Sub-mode RSET)
 CRT1, *No Cool Reset Temp* (Configuration Mode, Sub-mode RSET)
 CRT2, *Full Cool Reset Temp* (Configuration Mode, Sub-mode RSET)
 DGRC, *Degrees Cool Reset Temp* (Configuration Mode, Sub-mode RSET).

The variables CRT1 and CRT2 are based on the temperature difference across the cooler, not the actual fluid temperatures.

The following example uses a reset value of 10 °F (5.5 °C) at full reset. Full reset is at a 2 °F (1.1 °C) temperature difference across the cooler and no reset at 10 °F (5.5 °C) temperature difference across the cooler.

Sub-Mode	Keypad Entry	Item	Display	Item Expansion	Comment
RSET	[ENTER]	CRST	3	Cooling Reset Type	3=Return Fluid
	[▼]	CRT1	10.0 °F (5.5 °C)	No Cool Reset Temp	Entering to Leaving Water Temperature difference that has no reset.
	[▼]	CRT2	2.0 °F (1.1 °C)	Full Cool Reset Temp	Entering to Leaving Water Temperature difference that has full reset.
	[▼]	DGRC	10.0 ΔF (5.5 ΔC)	Degrees Cool Reset	Amount of reset required.

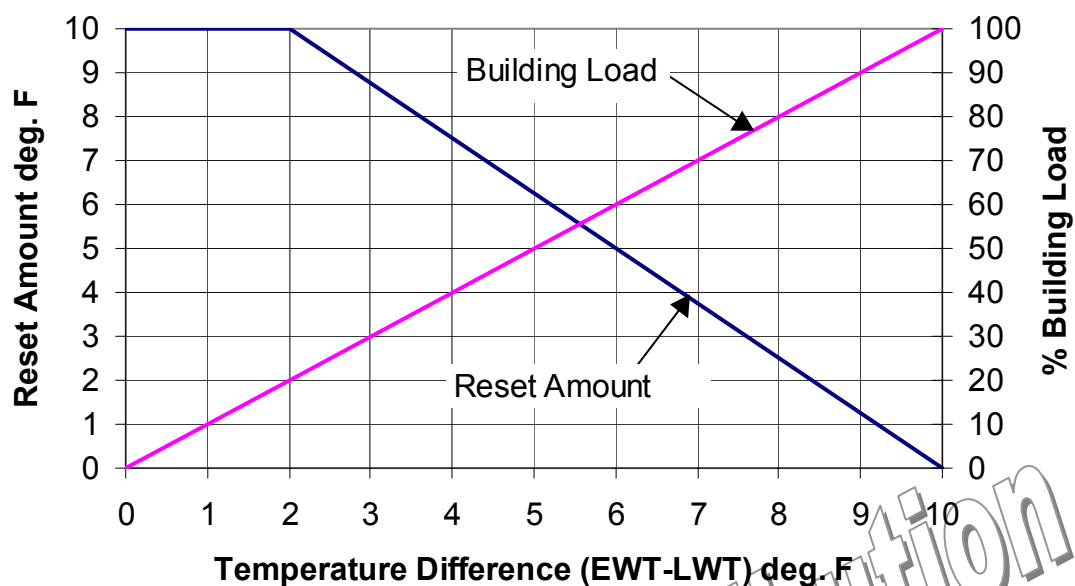


Figure 9 - Return Water Temperature Reset

There is a known problem with the metric conversion for this option. The values for CRT1, and CRT2 are used for Outside Air and Space Temperature Reset. Both values have units of type °F, which for OAT and Space reset is correct, but for return reset the values should be delta F.

Temperature Set Point

There are several options temperature set point options that the ComfortLink control system can utilize. Each option will be addressed independently below with configuration and material required.

Single Set Point/Switch Control

This is the factory default configuration. No other devices are required for this option. For this option, CTRL *Control Method* (Configuration Mode, Sub-mode OPT2) must be set to SWITCH, and CLSP *Cooling Set Point Select* (Configuration Mode, Sub-mode SLCT) set to SINGLE. Any time the Enable-Off-Remote Switch is in the Enable or Remote position with remote contacts closed, the machine will control the set point to CSP.1 *Cooling Setpoint 1* (Set Point Mode, Sub-mode COOL).

Dual Set Point, Switch/Switch Control

This option allows for a dual set point control of the machine, typically an occupied and unoccupied set point. A Dual Switch input is required connected to TB5-3 and TB5-4. For this option, CTRL *Control Method* (Configuration Mode, Sub-mode OPT2) must be set to SWITCH, and CLSP *Cooling Set Point Select* (Configuration Mode, Sub-mode

SLCT) set to DUAL SWITCH. Operation with this option enabled, activates MD13 Dual Setpoint. Any time the Enable-Off-Remote Switch is in the Enable or Remote position with remote contacts closed, and the Dual Switch is closed, the machine will control the set point to CSP.1 *Cooling Setpoint 1* (Set Point Mode, Sub-mode COOL). With the Dual Switch open, the machine will control the set point to CSP.2 *Cooling Setpoint 2* (Set Point Mode, Sub-mode COOL).

Ice Build, Switch/Switch Control

This option allows for a triple set point control of the machine, an ice, occupied and unoccupied set point. A Dual Switch input is required connected to TB5-3 and TB5-4. An Ice Done Switch is required connected to TB6-9 and TB6-10. The Energy Management Module is also required. For this option, CTRL *Control Method* (Configuration Mode, Sub-mode OPT2) must be set to SWITCH, CLSP *Cooling Set Point Select* (Configuration Mode, Sub-mode SLCT) set to DUAL SWITCH, and ICE.M *Ice Mode Enable* (Configuration Mode, Sub-mode OPT2) set to YES. As a result, the EMM *EMM Installed* (Configuration Mode, Sub-mode OPT1) will be set to YES automatically by the controller. Operation with this option enabled activates MD13 - Dual Setpoint. Any time the Enable-Off-Remote Switch is in the Enable or Remote position with remote contacts closed, and the Dual Switch is open, the machine will control the set point to CSP.1 *Cooling Setpoint 1* (Set Point Mode, Sub-mode COOL). With the Dual Switch closed and the Ice Done Switch open, the machine will control the set point to CSP.3 *Cooling Setpoint 3* (Set Point Mode, Sub-mode COOL). This is typically the ice build set point. During operation at this set point, MD19 - Making Ice will be displayed. With the Dual Switch open and the Ice Done Switch closed, the machine will control the set point to CSP.2 *Cooling Setpoint 2* (Set Point Mode, Sub-mode COOL). This is typically the unoccupied set point. During operation at this set point, MD20 - Storing Ice will be displayed.

Single Set Point/7 Day Schedule

This option determines a set point based on an internal schedule that is accessible through the Navigator and CCN devices such as Network Service Tool. There is no option for holiday schedules with this option. No other devices are required for this option. For this option, CTRL *Control Method* (Configuration Mode, Sub-mode OPT2) must be set to 7 DAY SCHEDULE, and CLSP *Cooling Set Point Select* (Configuration Mode, Sub-mode SLCT) set to SINGLE.

To use this option, an occupied and unoccupied schedule for each day must be programmed under (Time Clock Mode, Sub-mode SCHD).

Item	Expansion	Display	Default	Range
MON.O	<i>Monday Occupied Time</i>	XX.XX	00.00	00.00 – 23.59
MON.U	<i>Monday Unoccupied Time</i>	XX.XX	00.00	00.00 – 23.59
TUE.O	<i>Tuesday Occupied Time</i>	XX.XX	00.00	00.00 – 23.59
TUE.U	<i>Tuesday Unoccupied Time</i>	XX.XX	00.00	00.00 – 23.59

WED.O	<i>Wednesday Occupied Time</i>	XX.XX	00.00	00.00 – 23.59
WED.U	<i>Wednesday Unoccupied Time</i>	XX.XX	00.00	00.00 – 23.59
THU.O	<i>Thursday Occupied Time</i>	XX.XX	00.00	00.00 – 23.59
THU.U	<i>Thursday Unoccupied Time</i>	XX.XX	00.00	00.00 – 23.59
FRI.O	<i>Friday Occupied Time</i>	XX.XX	00.00	00.00 – 23.59
FRI.U	<i>Friday Unoccupied Time</i>	XX.XX	00.00	00.00 – 23.59
SAT.O	<i>Saturday Occupied Time</i>	XX.XX	00.00	00.00 – 23.59
SAT.U	<i>Saturday Unoccupied Time</i>	XX.XX	00.00	00.00 – 23.59
SUN.O	<i>Sunday Occupied Time</i>	XX.XX	00.00	00.00 – 23.59
SUN.U	<i>Sunday Unoccupied Time</i>	XX.XX	00.00	00.00 – 23.59

To program a time schedule, access the appropriate day. Enter the edit mode. Change the time to the schedule desired. All times are in programmed as a 24 hour clock. Any day that is to remain unoccupied should have its unoccupied time programmed to 00.00. Using this option, there is no way to avoid at least a 1 minute unoccupied period per day.

For this option to function properly, the HH.MM *Hour and Minute* (Time Clock Mode, Sub-mode TIME) and DAY *Day of Week* (Time Clock Mode, Sub-mode DATE) must be set. The time clock is programmed in a 24 hour format, 00.00 to 23.59. ComfortLink Controls cannot automatically adjust the time for day light savings time.

For example, if an occupied time from 6:00 AM to 8:00 PM is desired from Monday through Friday. Saturday and Sunday are to remain unoccupied.

Item	Expansion	Default
MON.O	<i>Monday Occupied Time</i>	06.00
MON.U	<i>Monday Unoccupied Time</i>	20.00
TUE.O	<i>Tuesday Occupied Time</i>	06.00
TUE.U	<i>Tuesday Unoccupied Time</i>	20.00
WED.O	<i>Wednesday Occupied Time</i>	06.00
WED.U	<i>Wednesday Unoccupied Time</i>	20.00
THU.O	<i>Thursday Occupied Time</i>	06.00
THU.U	<i>Thursday Unoccupied Time</i>	20.00
FRI.O	<i>Friday Occupied Time</i>	06.00
FRI.U	<i>Friday Unoccupied Time</i>	20.00
SAT.O	<i>Saturday Occupied Time</i>	00.00
SAT.U	<i>Saturday Unoccupied Time</i>	00.00
SUN.O	<i>Sunday Occupied Time</i>	00.00
SUN.U	<i>Sunday Unoccupied Time</i>	00.00

During an occupied time and the Enable-Off-Remote Switch is in the Enable or Remote position with remote contacts closed, the machine will control the set point to CSP.1 *Cooling Setpoint 1* (Set Point Mode, Sub-mode COOL).

Dual Set Point/7 Day Schedule

This option determines a set point based on an internal schedule that is accessible through the Navigator and CCN devices such as Network Service Tool. There is no option for holiday schedules with this option. No other devices are required for this option. For this option, CTRL *Control Method* (Configuration Mode, Sub-mode OPT2) must be set to 7 DAY SCHEDULE, and CLSP *Cooling Set Point Select* (Configuration Mode, Sub-mode SLCT) set to DUAL 7 DAY.

To use this option, an occupied and unoccupied schedule for each day must be programmed under (Time Clock Mode, Sub-mode SCHED). Programming the 7 day schedule is shown in Single Set Point/7 Day Schedule.

Operation with this option enabled, activates MD13 Dual Setpoint. During an occupied period with the Enable-Off-Remote Switch in the Enable or Remote position with remote contacts closed, the machine will control the set point to CSP.1 *Cooling Setpoint 1* (Set Point Mode, Sub-mode COOL). During an unoccupied period and the Enable-Off-Remote Switch in the Enable or Remote position with remote contacts closed, the machine will control the set point to CSP.2 *Cooling Setpoint 2* (Set Point Mode, Sub-mode COOL).

Ice Build/7 Day Schedule

This option allows for a triple set point control of the machine, an ice, occupied and unoccupied set point determined by an internal that is accessible through the Navigator and CCN devices such as Network Service Tool. There is no option for holiday schedules with this option. An Ice Done Switch is required connected to TB6-9 and TB6-10. The Energy Management Module is also required. For this option, CTRL *Control Method* (Configuration Mode, Sub-mode OPT2) must be set to 7 DAY SCHEDULE, CLSP *Cooling Set Point Select* (Configuration Mode, Sub-mode SLCT) set to DUAL 7 DAY, and ICE.M *Ice Mode Enable* (Configuration Mode, Sub-mode OPT2) set to YES. As a result, the EMM *EMM Installed* (Configuration Mode, Sub-mode OPT1) will be set to YES automatically by the controller.

To use this option, an occupied and unoccupied schedule for each day must be programmed under (Time Clock Mode, Sub-mode SCHED). Programming the 7 day schedule is shown in Single Set Point/7 Day Schedule.

Operation with this option enabled activates MD13 - Dual Setpoint. During an occupied period, with the Enable-Off-Remote Switch is in the Enable or Remote position with remote contacts closed, the machine will control the set point to CSP.1 *Cooling Setpoint 1* (Set Point Mode, Sub-mode COOL). During an unoccupied period and the Ice Done Switch open, the machine will control the set point to CSP.3 *Cooling Setpoint 3* (Set Point Mode, Sub-mode COOL). This is typically the ice build set point. During operation at this set point, MD19 - Making Ice will be displayed. Still in an unoccupied period and the Ice Done Switch closed, the machine will control the set point to CSP.2

Cooling Setpoint 2 (Set Point Mode, Sub-mode COOL). This is typically the unoccupied set point. During operation at this set point, MD20 - Storing Ice will be displayed.

Single Set Point/Occupancy

This option determines a set point based on an internal schedule that is only accessible through a Carrier Comfort Network (CCN) device. This option allows for holiday schedules. No other devices are required for this option. For this option, CTRL *Control Method* (Configuration Mode, Sub-mode OPT2) must be set to OCCUPANCY, and CLSP *Cooling Set Point Select* (Configuration Mode, Sub-mode SLCT) set to SINGLE.

To use this option, an occupancy schedule for each day and holiday must be programmed.

To program a time schedule, access the appropriate day and change the time to the schedule desired. All times are in programmed as a 24 hour clock. Any day that is to remain unoccupied should have its unoccupied time programmed to 00.00. 24 hour operation can be programmed with this option.

For this option to function properly, the HH.MM *Hour and Minute* (Time Clock Mode, Sub-mode TIME), MNTH *Month*, DOM *Day of Month*, DAY *Day of Week* and YEAR *Year* (Time Clock Mode, Sub-mode DATE) must be set. The time clock is programmed in a 24 hour format, 00.00 to 24.00. Carrier Comfort Network cannot automatically adjust the time for day light savings time.

Eight separate time periods are available, Period 1 through 8. Each period has Monday through Sunday and a Holiday day flag, an occupied and unoccupied time. For the day flags, 1 is enabled, 0 is disabled.

For example, if an occupied time from 6:00 AM to 8:00 PM is desired from Monday through Friday. For Saturday an occupied period from 6:00 AM to 12:00 Noon is desired. Sunday is to remain unoccupied.

Once the machine is loaded, select Modify, Time-Sched, and OCCPC01S will be displayed.

	M	T	W	T	F	S	S	H	Occupied	Unoccupied
Period 1	1	1	1	1	1	0	0	0	06:00	20:00
Period 2	0	0	0	0	0	1	0	0	06:00	12:00
Period 3	0	0	0	0	0	0	0	0	00:00	00:00
Period 4	0	0	0	0	0	0	0	0	00:00	00:00
Period 5	0	0	0	0	0	0	0	0	00:00	00:00
Period 6	0	0	0	0	0	0	0	0	00:00	00:00
Period 7	0	0	0	0	0	0	0	0	00:00	00:00
Period 8	0	0	0	0	0	0	0	0	00:00	00:00

During an occupied time and the Enable-Off-Remote Switch is in the Enable or Remote position with remote contacts closed, the machine will control the set point to CSP.1 *Cooling Setpoint 1* (Set Point Mode, Sub-mode COOL).

Dual Set Point/Occupancy

This option determines a set point based on an internal schedule that is only accessible through a Carrier Comfort Network (CCN) device. This option allows for holiday schedules. No other devices are required for this option. For this option, CTRL *Control Method* (Configuration Mode, Sub-mode OPT2) must be set to OCCUPANCY, and CLSP *Cooling Set Point Select* (Configuration Mode, Sub-mode SLCT) set to DUAL CCN OCCUPIED.

To use this option, an occupied and unoccupied schedule for each day must be programmed with a CCN device. Programming the occupancy schedule is shown in Single Set Point/Occupancy.

Operation with this option enabled, activates MD13 Dual Setpoint. During an occupied period with the Enable-Off-Remote Switch in the Enable or Remote position with remote contacts closed, the machine will control the set point to CSP.1 *Cooling Setpoint 1* (Set Point Mode, Sub-mode COOL). During an unoccupied period and the Enable-Off-Remote Switch in the Enable or Remote position with remote contacts closed, the machine will control the set point to CSP.2 *Cooling Setpoint 2* (Set Point Mode, Sub-mode COOL).

Ice Build/Occupancy

This option allows for a triple set point control of the machine, an ice, occupied and unoccupied set point determined by an internal schedule that is only accessible through a Carrier Comfort Network (CCN) device. This option allows for holiday schedules. No other devices are required for this option. An Ice Done Switch is required connected to TB6-9 and TB6-10. The Energy Management Module is also required. For this option, CTRL *Control Method* (Configuration Mode, Sub-mode OPT2) must be set to OCCUPANCY, CLSP *Cooling Set Point Select* (Configuration Mode, Sub-mode SLCT) set to DUAL CCN OCCUPIED, and ICE.M *Ice Mode Enable* (Configuration Mode, Sub-mode OPT2) set to YES. As a result, the EMM *EMM Installed* (Configuration Mode, Sub-mode OPT1) will be set to YES automatically by the controller.

To use this option, an occupied and unoccupied schedule for each day must be programmed under (Time Clock Mode, Sub-mode SCHD). Programming the 7 day schedule is shown in Single Set Point/Occupancy.

Operation with this option enabled activates MD13 - Dual Setpoint. During an occupied period, with the Enable-Off-Remote Switch is in the Enable or Remote position with remote contacts closed, the machine will control the set point to CSP.1 *Cooling Setpoint 1* (Set Point Mode, Sub-mode COOL). During an unoccupied period and the Ice Done

Switch open, the machine will control the set point to *CSP.3 Cooling Setpoint 3* (Set Point Mode, Sub-mode COOL). This is typically the ice build set point. During operation at this set point, MD19 - Making Ice will be displayed. Still in an unoccupied period and the Ice Done Switch closed, the machine will control the set point to *CSP.2 Cooling Setpoint 2* (Set Point Mode, Sub-mode COOL). This is typically the unoccupied set point. During operation at this set point, MD20 - Storing Ice will be displayed.

4 to 20 mA Input/Switch Control

This option requires the Energy Management Module. Care should be taken when interfacing with other manufacturer's control systems, due to power supply differences, full wave bridge versus half wave rectification. The two different power supplies cannot be mixed. ComfortLink controls use half wave rectification. A signal isolation device should be utilized if a full wave bridge signal generating device is used.

For this option, *CTRL Control Method* (Configuration Mode, Sub-mode OPT2) must be set to SWITCH, and *CLSP Cooling Set Point Select* (Configuration Mode, Sub-mode SLCT) set to 4-20 MA INPUT. As a result, the EMM *EMM Installed* (Configuration Mode, Sub-mode OPT1) will be set to YES automatically by the controller. Any time the Enable-Off-Remote Switch is in the Enable or Remote position with remote contacts closed, the machine will control the set point to *CSP.1 Cooling Setpoint 1* (Set Point Mode, Sub-mode COOL). This option functions on a linear relation between 10 to 80 °F (-12.2 to 26.7 °C). The equations are listed below:

$$^{\circ}F = 4.375(mA) - 7.5 \quad (^{\circ}C = 2.43(mA) - 21.92)$$

The function is limited at the low end depending on the FLUD, *Cooler Fluid* (Configuration Mode, Sub-mode OPT1). If FLUD is set for WATER, the lower limit is 38 °F (3.3 °C). If FLUD is set for MEDIUM TEMPERATURE BRINE or LOW TEMPERATURE BRINE, the lower limit is 12 °F (-11.1 °C). If this option is used, the chilled water loop must be protected to at least 0 °F (-17.1 °C) to protect the loop from freezing if the signal sent incorrectly. The function is also clamped at the upper limit not to exceed 70 °F (21.1 °C).

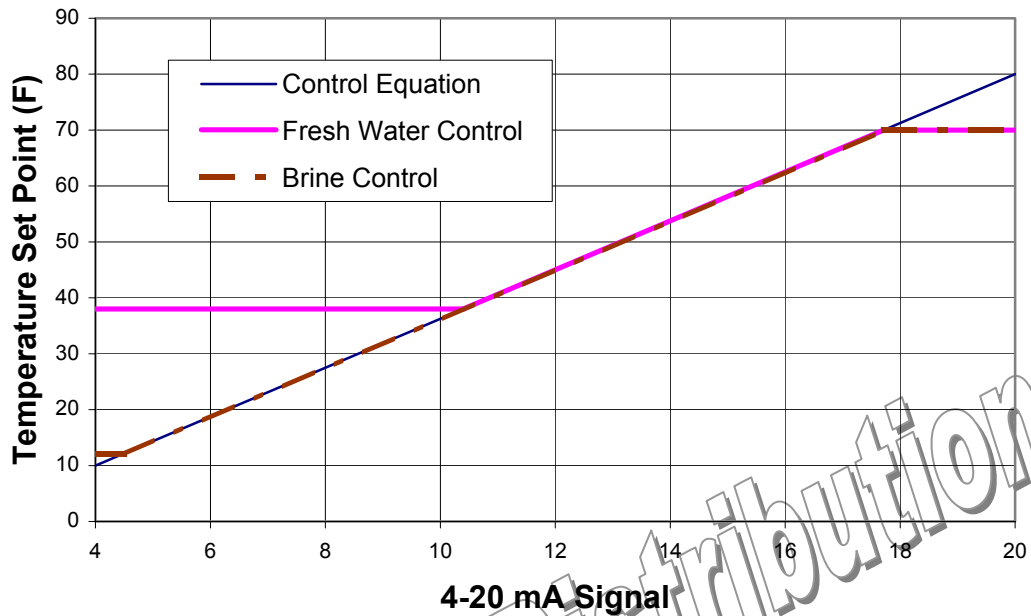


Figure 10 - 4-20 mA Temperature Set Point

A software problem was discovered with the Enhanced Screw Software Version 1.1 and 1.2 (CESR-131344-01-01 and CESR-131344-01-02), where the internal input channels for 4-20 mA Temperature Reset and 4-20 mA Cooling Set Point were swapped. The problem can be corrected by connecting the signal to TB6-2 and TB6-5.

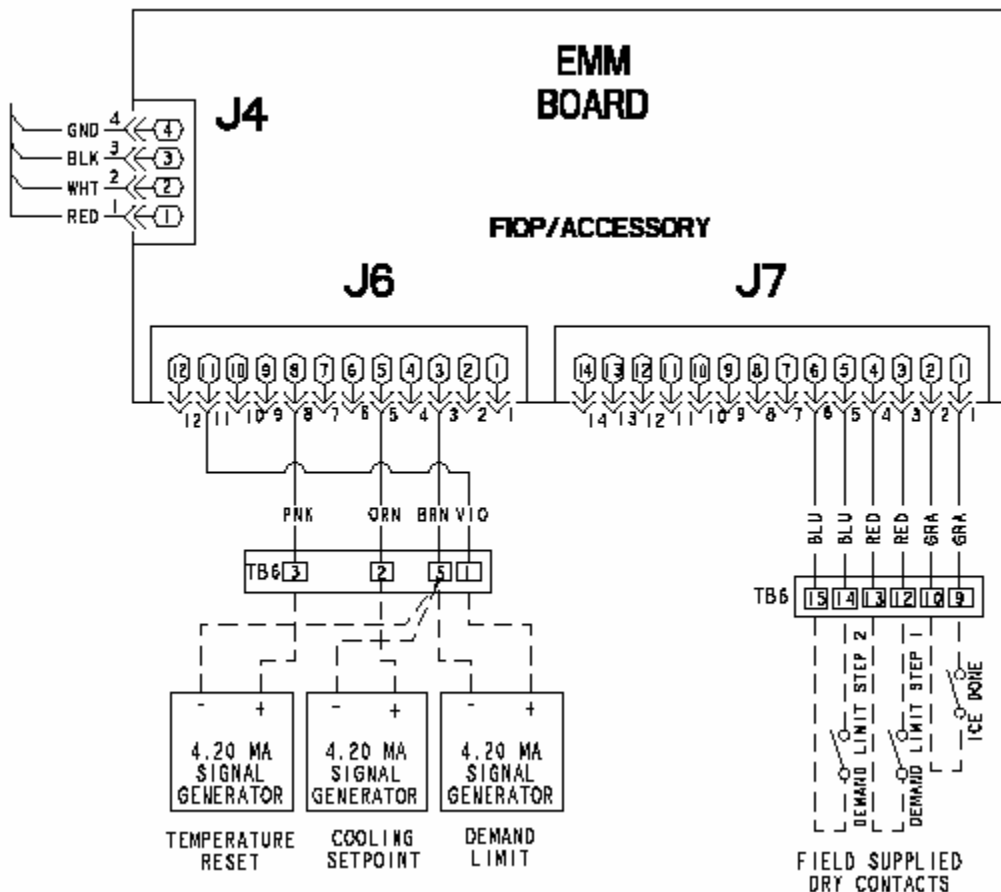


Figure 11 - EMM 4-20 mA Connections (Enhanced Screw Software Versions 1.1 [CESR-131344-01-01] and 1.2 [CESR-131344-01-02] Only)

Bulletins pertaining to this issue:

- SMB040024 - 30GX/HX Series 6, 4-20 mA Temperature Reset and Cooling Set Point
 This bulletin described a problem with the Enhanced Screw Software Versions 1.1 and 1.2 (CESR-131344-01-01 and CESR-131344-01-02) in which the control inputs for 4-20 mA inputs for Temperature Reset and Cooling Set Point were swapped. The function will operate properly if the input signals are sent to the opposite connection point.
- TIP127 – 30 Series ComfortLink Control Input Signals
 This bulletin provided information on converting various other control systems signals to the ComfortLink requirement of 4-20 mA.

LITERATURE

Below is a list of literature for the ComfortLink Screw Compressor machines. Shaded literature is obsolete literature.

30GX/HX ComfortLink Screw Chiller Service Manual

Form Number	Catalog Number	Title	Print Date	Reprint Date	Superseded By
Product Data					
30GXN-1APD		Advance Supplemental Product Data 30GXN/R083-528 High Efficiency Ecologic Air-Cooled Chiller with ComfortLink Controls			30GXN-3PD 30GXN-C1PD
30GXN-1PD	523-061	30GXN,R080-350 Ecologic Air-Cooled Chiller with ComfortLink Controls 50/60 Hz	8/00		30GXN-2PD
30GXN-2PD	523-065	30GXN,R080-450 Ecologic Air-Cooled Chiller with ComfortLink Controls 50/60 Hz	11/00		30GXN-3PD 30GXN-C1PD
30GXN-3PD	523-068	30GXN,R080-450 Ecologic Air-Cooled Chiller with ComfortLink Controls 50/60 Hz	1/02		30GXN-4PD
30GXN-4PD	523-073	Ecologic and Ecologic η 30GXN,GXR083- 528 High-Efficiency Air-Cooled Chillers with ComfortLink Controls 60 Hz	11/02		
30GXN-C1PD	003-099	Ecologic and Ecologic η 30GXN,GXR083- 528 High-Efficiency Air-Cooled Chillers with ComfortLink Controls 50 Hz	2/02		
30HX-5PD	523-060	30HXA076-271, 30HXC076-271 Condenserless and Fluid-Cooled Chillers 50/60 Hz	3/00		30HX-6PD
30HX-6PD	523-064	30HXA076-271, 30HXC076-271 Condenserless and Fluid-Cooled Chillers 50/60 Hz	8/00		30HX-7PD
30HX-7PD	523-071	30HXA076-271, 30HXC076-271 Condenserless and Fluid-Cooled Chillers 50/60 Hz	2/03		30HX-8PD
30HX-8PD	523-076	30HXA076-271, 30HXC076-271 Condenserless and Fluid-Cooled Chillers 50/60 Hz	1/04		
Application Information					
	570-494	Totaline Acoustic Blanket System for 30 Series Chillers	6/02	8/03	
	811-019	Lunch & Learn Series – Environmental Corrosion Protection			
	811-217	Selection Guide: Environmental Corrosion Protection.	9/99		811-20062
	811-10121	Meeting ASHRAE 90.1-1999 (2001) Energy Standard for Buildings - A Reference Guide to Meeting the New Minimum Efficiency Requirements for HVAC Equipment with Carrier Products	12/02		
	811-20062	Selection Guide: Environmental Corrosion Protection.	10/04		
TIP111		30HXC Condenser Water Control Part 1	6/99		
TIP112		30GX Chillers Number of Passes in Coolers	4/99		
TIP115		30HXA/HXC Cooler Head Reversal			TIP115 Rev. A
TIP115 Rev. A		30HXA/HXC Cooler Head Reversal	4/00		
TIP117		Raising or Lowering a 30HX Chiller Vertically	5/00		
TIP119		Multiple Chiller Chilled Water Plant Strategy – More Bang for the Buck, and Better System Efficiency	12/00		
TIP120		30HXA/HXC Brine Chiller Application Guidelines	2/01		
TIP121		For Competitive Advantage, Take Control of the Chiller Plant	3/01		
TIP122		Air Cooled Chiller Winterizing: Freeze Protection	4/01		
TIP123		New! 30GX Electronic Flow Sensor	5/01		

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Form Number	Catalog Number	Title	Print Date	Reprint Date	Superseded By
TIP125		Factory Testing: 30GT, GU, GX, and RA Air-Cooled Chillers	7/01		
TIP127		30 Series ComfortLink Control Input Signals	4/02		
TIP128		30GX,GT Base Rails	8/02		
TIP130		30GX Compressor and Cooler Weights	10/02		
TIP131		30HXA/HXC Head Swap	9/01		
Product Bulletin					
122-01-02		ComfortLink Controls for 30GXN,R and 30HX Ecologic Chillers Service Training	03/02/01		
		New 30HX Phase In/Phase Out	03/2000		
		New! 30HX with ComfortLink Controls	03/2000		
		New 30HX Phase In/Phase Out	04/2000		
111-00-44		Improved Leadtimes for Optional Condenser Coils	05/26/00		
111-00-54		Introducing 30GXN,R Ecologic Chillers with ComfortLink Controls	06/30/00		
111-00-59		New 30GXN,R ComfortLink Chiller Phase In/Phase Out	07/07/00		
111-00-60		Taking Orders: 30HXA & C with ComfortLink Controls	07/14/00		
111-00-75		30GXN,R / 30HX Flow Sensor Change	09/08/00		
111-00-79		30HXA,C Price Page Correction	09/15/00		
111-01-09		30GXN,R Duplex Chiller Literature	02/02/01		
111-01-25		30GXN/R Electrical Data	08/23/01		
111-01-05-E		30GXN/R Electrical Data	03/23/01		
111-01-40		30GX Cooler Heaters / Low Ambient Operation	05/25/01		
111-01-50		New 30GX Price Pages	06/15/01		
111-02-04		New 30GX Eta Chillers	01/18/02		
111-02-50		Freeze Protection Air-Cooled Chillers	07/26/02		
111-02-63		Air Cooled Chiller Global Sourcing	09/27/02		
111-02-25-E		Air Cooled Chiller Global Sourcing	09/27/02		
111-03-05		A/C Cooler Changes	01/20/03		
111-03-06		30HX Water Heads	01/20/03		
111-03-50		30GXN/GXR118,128,138,150 Standard Cooler Connection	09/26/03		
111-03-15-E		30GXN/GXR118,128,138,150 Standard Cooler Connection	09/26/03		
111-04-04		MotorMaster V Low Ambient Control Revision	01/13/04		
111-04-57		Air-Cooled Chiller Product Offering	10/2004		
111-05-22		30GX Phase Out	04/07/05		
111-05-25		Air-cooled Chiller Product Offering	04/29/05		
111-05-05-E		Air-cooled Chiller Product Offering	04/29/05		
111-05-27		30GX Transition Guide	04/26/05		
Promotional Information					
	830-080	30HX Water-Cooled and Condenserless Chillers with ComfortLink Microprocessor Control System	2/00		
	830-081	30GXN,R Air-Cooled Chillers with ComfortLink Microprocessor Control System	6/00		
	848-113	Enviro-Shield Corrosion Protection	8/99		
Submittal Bulletin					
30GXN-1SB		30GXN,R080-350 Air-Cooled Liquid Chillers with ComfortLink Controls 50/60 Hz			30GXN-2SB
30GXN-2SB	513-00000	30GXN,R080-528 Air-Cooled Liquid Chillers with ComfortLink Controls 50/60 Hz	1/02		30GXN-3SB

30GX/HX ComfortLink Screw Chiller Service Manual

Form Number	Catalog Number	Title	Print Date	Reprint Date	Superseded By
30GXN-3SB	513-00001	30GXN,R080-528 Air-Cooled Liquid Chillers with ComfortLink Controls 50/60 Hz	11/02		
30HXA-4SB	513-470	30HXA076-271 Condenserless Liquid Chillers	2/00		30HXA-5SB
30HXA-5SB	513-473	30HXA076-271 Condenserless Liquid Chillers	7/00		30HXA-6SB
30HXA-6SB	513-00002	30HXA076-271 Condenserless Liquid Chillers	2/03		
30HXC-6SB	513-469	30HXC076-271 Water-Cooled Liquid Chillers	2/00		30HXC-7SB
30HXC-7SB	513-474	30HXC076-271 Water-Cooled Liquid Chillers	7/00		30HXC-8SB
30HXC-8SB	513-00003	30HXC076-271 Water-Cooled Liquid Chillers	2/03		
Installation Instructions					
30GX-21SI	533-00003	30GXN,R080-350 Ecologic Air-Cooled Chillers, 50/60 Hz	7/00		30GXN,GXR-1SI
30GXN,GXR-1SI	533-00016	30GXN,R080-450 Ecologic Air-Cooled Chillers, 50/60 Hz	12/00		30GXN,GXR-2SI
30GXN,GXR-2SI	533-00036	30GXN,R080-528 Ecologic Air-Cooled Chillers, 50/60 Hz	1/02	2/02	30GXN,GXR-3SI
30GXN,GXR-3SI	533-00053	30GXN,R080-528 Ecologic Air-Cooled Chillers, 60 Hz	6/03	8/03A	
30HX-8SI	533-012	30HXA,HXC076-271 ComfortLink Fluid-Cooled and Condenserless Chillers, 50/60 Hz	8/00		30HX-10SI
30HX-10SI	533-00032	30HXA,HXC076-271 ComfortLink Fluid-Cooled and Condenserless Chillers, 50/60 Hz	3/01		30HX-11SI
30HX-11SI	533-00051	30HXA,HXC076-271 ComfortLink Fluid-Cooled and Condenserless Chillers, 50/60 Hz	3/03		30HX-12SI
30HX-12SI	533-00060	30HXA,HXC076-271 ComfortLink Fluid-Cooled and Condenserless Chillers, 50/60 Hz, Series 6	1/04		
Controls, Start-Up, Operation, Service and Troubleshooting					
30G,H-7T	533-008	30GXN,R080-450, 30HXA,HXC076-271 Air-Cooled and Fluid Cooled Chillers with ComfortLink Controls, 50/60 Hz, Series 4	6/00		30G,H-8T
30G,H002		30GXN,R080-450, 30HXA,HXC076-271 Supplement to 30G,H-7T (Not Released to Distribution)	5/01		30G,H-8T
30G,H-8T	533-00041	30GXN,R080-450, 30HXA,HXC076-271 Air-Cooled and Fluid Cooled Chillers with ComfortLink Controls, 50/60 Hz, Series 4	2/02	3/02	30G,H-9T
30G,H003		30GXN,R080-528, 30HXA,HXC076-271 Supplement to 30G,H-8T (Not Released to Distribution)	10/03		
30G,H-9T	533-00052	30GXN,R080-450, 30HXA,HXC076-271 Air-Cooled and Fluid Cooled Chillers with ComfortLink Controls, 50/60 Hz, Series 6	1/04		
Accessory Installation Instructions					
30/48/50-4SI	533-00028	ComfortLink Series Units and 30GX080-350, 30HX076-271, 48/50 EJ,EK,EW,EY024-068 Remote Enhanced Display Accessory, 50/60 Hz	6/01		

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Form Number	Catalog Number	Title	Print Date	Reprint Date	Superseded By
30G-25SI	563-064	30GN,GT,GU040-420, 30GTR,GUN,GUR040-420, 30GTN015-420, 30GXN,R080-528, 30GX080-350 Accessory Unit Control Display Access Door	7/00		30G,R-2SI
30G-26SI	533-00000	30GXN,R080-528, 30HXA,C076-271. 30GTN,GTR,GUN,GUR040-420 Ground-Fault Interrupter Convenience Outlet Accessory	7/01		
30G,H-10SI	533-00002	30GXN,R080-450, 30HXA,C076-271 Energy Management Module (EMM) Accessory, 50/60 Hz	7/00		
30G,R-2SI	533-00030	30GN,GT,GU040-420, 30GTR,GUN,GUR040-420, 30GTN015-420, 30RA010-055, 30GXN,R080-528, 30GX080-350 Accessory Unit Control Display Access Door	7/01	1/02	
30GTN-4SI	533-078	30GTN,GTR,GUN,GUR040-420, 30GXN,R080-450 ComfortLink Service Port Connection, 50/60 Hz	7/00		
30GX-22SI	533-00004	30GX080-350, 30GXN,R080-450 Accessory Sound Reduction/Hail Guard/Wind Baffle Hoods	7/00		30GX-28SI
30GX-24SI	533-00006	30GXN,R080-528, 30GX080-350 Vibration Isolation Accessory Kit	7/00	1/02	
30GX-25SI	533-00007	30GXN,R080-450 Accessory Low Ambient Operation Motormaster III Control, 50/60 Hz	7/00		
30GX-26SI	533-00008	30GXN,R080-528, 30GX080-350 Accessory Security Grille Package 50/60 Hz	7/00	2/02	
30GX-27SI	533-00015	30GXN,GXR220-450 Accessory Duplex Trim Kit 50/60 Hz	10/00		
30GX-28SI	533-00033	30GX080-350, 30GXN,R080-528 Accessory Sound Reduction/Hail Guard/Wind Baffle Hoods	6/01	2/02	
30GX-29SI	533-00037	30GXN,R080-528 Accessory Low Ambient Operation Motormaster V Control, 50/60 Hz	2/02		30GX-31SI
30GX-31SI	533-00058	30GXN,R080-528 Accessory Low Ambient Operation Motormaster V Control, 50/60 Hz	9/03	11/03, 11/03A	
30GX,HX-14SI	533-00009	30GXN,R080-528, 30HX076-271 Minimum Load Control Accessory, 50/60 Hz	7/00	1/02	
30GX,HX-15SI	533-00010	30GXN,R080-450, 30HX076-271 Control Transformer Accessory	7/00		30GX,HX-17SI
30GX,HX-16SI	533-00011	30GX080-350, 30GXN,R080-450, 30HX076-271 Accessory Insulation Package	7/00		30GX,HX-19SI
30GX,HX-17SI	533-00035	30GXN,R080-528, 30HX076-271 Control Transformer Accessory	10/01		
30GX,HX-19SI	533-00049	Series 5 30GXN,R080-528, 30HX076-271 Accessory Insulation Package	11/02		
30HX-5SI	533-023	30HX076-271 Vibration Isolation Accessory Kit	10/99		
30HX-9SI	533-019	30HXA,HXC076-271 Accessory Sound Reduction Enclosure	6/00		
Wiring Diagrams					
30GXN-1W	533-00013	30GXN,R Sizes 080-350 Air-Cooled Chillers with ComfortLink Controls, 50/60 Hz	6/00		30GXN-2W
30GXN-2W	533-00040	30GXN,R Sizes 080-528 Air-Cooled Chillers with ComfortLink Controls, 50/60 Hz	3/02		

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Form Number	Catalog Number	Title	Print Date	Reprint Date	Superseded By
30HX-3W	533-037	30HXA,HXC Sizes 076-271 Condenserless and Fluid-Cooled Chillers with ComfortLink Controls, 50/60 Hz	4/00		
Technical Training					
30GX,HX-01A PPT	023-058	30GX,HX Ecologic Liquid Chillers Machine Familiarization (PowerPoint Presentation)		1998	
30GX,HX-02A	023-044	30GX,HX Ecologic Liquid Chillers Machine Familiarization		1998	
30GX,HX-05A PPT	023-060	30GX,HX Refrigeration System (PowerPoint Presentation)		1998	
30GX,HX-06A	023-048	30GX,HX Refrigeration System		1998	
30GX,HX-07A PPT	023-061	30GX,HX 06N Compressor (PowerPoint Presentation)			
30GX,HX-08A	023-050	30GX,HX 06N Compressor		1998	
30GXN,R/HX-01	023-054	30GXN,R Ecologic Chillers with ComfortLink Controls			
30GXN,R/HX-02	023-055	30GXN,R Ecologic Chillers with ComfortLink Controls (PowerPoint Presentation)			
TDP-622C	796-054	Technical Development Program – Air-Cooled Chillers	10/04		

SERVICE

Alarm and Alert Codes

Alarm and Alert Codes are displayed as 4 digit codes. To determine the expansion of the alarm/alert code, press the [ENTER] and [ESCAPE] keys together once the item is selected.

As a general rule, codes preceded by a “T” are alerts indicating that a circuit has been shut down. Codes preceded by an “A” are alarms indicating that the unit has been shut down.

Communication Failure

Action taken by control: Machine is shut down

Reset Method: Automatic once communication is restored (MBB)

This alarm is generated any time the LEN (Local Equipment Network) communication is lost. An A152 may be generated also.

If this condition is encountered, check the following items:

- Check the MBB Instance Jumper. It should be set to “1”. If it is missing or installed on “2”, this alarm will be generated.
- Check the LEN for a wiring error or short to ground.
- Check all Input connections for a short to ground.
- Check the machine grounding.

- Check the power supply for the Main Base Board. It should be 24 vac. Voltages less than 18 can cause this problem.

No alarm can be found in the current alarm bus or in history, but the machine shuts down and indicates an alarm condition.

If this condition is encountered, check the following items:

- For Software Versions prior to Version 5.0 (CESR-131248-05-00) consider upgrading to at least Version 5.0. On units connected to CCN, when a large number of EEPROM instructions were being written, it could cause a loss of communication alarm.

T020 – Compressor A1 High Motor Temperature Alert

T021 – Compressor A2 High Motor Temperature Alert

T022 – Compressor B1 High Motor Temperature Alert

T023 – Compressor B2 High Motor Temperature Alert

Action taken by control: Affected compressor is shut down

Reset Method: Manual (MBB)

This alarm will be generated if the thermistor is read by the control outside of the –40 to 245 °F (-40 to 118 °C) range, for 5 consecutive readings.

If this condition is encountered, check the following items:

- Check for a thermistor failure.
- Check for a thermistor wiring error.
- Check the motor cooling solenoid for proper operation.
- Check the circuit for proper refrigerant charge.
- Check the motor cooling line for any restrictions
- Check the liquid line strainer to be sure that it is free of debris.
- On 2-compressor circuits, check to be sure that the economizer solenoid valve is functioning properly.

T026 – Compressor A1 Low Oil Pressure Alert - 1

T026 – Compressor A1 Low Oil Pressure Alert - 2

T027 – Compressor A2 Low Oil Pressure Alert - 1

T027 – Compressor A2 Low Oil Pressure Alert - 2

T028 – Compressor B1 Low Oil Pressure Alert - 1

T028 – Compressor B1 Low Oil Pressure Alert - 2

T029 – Compressor B2 Low Oil Pressure Alert - 1

T029 – Compressor B2 Low Oil Pressure Alert - 2

Action taken by control: Affected compressor shut down

Reset Method: Manual (MBB)

This alarm is generated if the oil pressure is below the set point for a specified period of time. The “- 1” or “- 2” at the end of the alert indicates what oil set point generated the alert. The “- 1” indicates that the alert was generated by Oil Set Point 1. The “- 2” indicates that the alert was generated by Oil Set Point 2. The alert criteria is listed below:

In the formulas below,

P_D is Discharge Pressure,
 P_E is Economizer Pressure,
 P_O is Oil Pressure,
 P_S is Suction Pressure.

There are 2 set points used for the control of the Low Oil Pressure alert trip criteria.

Oil Set Point 1 is defined as follows:

$P_S < 35$ psig, then Oil Set Point 1 is 10 psig
 $35 \text{ psig} \leq P_S < 51$ psig, then Oil Set Point 1 is 12.5 psig
 $P_S \leq 51$ psig, then Oil Set Point 1 is 15 psig

Oil Set Point 2 is defined as follows.

$(P_D - P_S) < 125$ psig
Oil Set Point 2 = $0.235(P_D - P_S) + 0.588$ psig
 $125 \leq (P_D - P_S) < 165$ psig
Oil Set Point 2 = $2(P_D - P_S) - 220.0$ psig
 $(P_D - P_S) \geq 165$ psig
Oil Set Point 2 = $0.6364(P_D - P_S) + 5.0$ psig

The alert criteria is based on operating time.

On time less than 5 seconds
Oil pressure is ignored

On time between 5 and 120 seconds
The alert will be generated if the following condition is true for 3 consecutive readings.

$$(P_O - P_E) < [15 \text{ psig}/120 \text{ seconds}] \times [\text{Compressor Run Time in seconds}].$$

On time greater than 120 seconds
The alert will be generated if one of the following conditions is true

$(P_O - P_E) < \text{Oil Set Point 1}$ for 15 seconds
 $(P_O - P_S) < \text{Oil Set Point 2}$ for 15 seconds

If this condition is encountered, check the following items:

- On 30HXC machines, consider head pressure control. If the entering condenser water is less than 70 °F (21 °C), the machine should have a water regulating valve installed.
- Check the refrigerant charge. Low charge conditions will reduce the discharge pressure for the machine, thereby lowering the starting point for the oil pressure. On economized machines, this condition compounds the problem by increasing the economizer pressure as hot gas enters the economizer shell from a lack of a liquid seal.
- Check the internal and external oil filter pressure drops. Change as necessary.
- Check all oil line service valves to be sure that they are open.
- Check the operation of oil solenoid valve.
- If the unit is equipped with a suction service valve, check to be sure that the suction service valve is open. Check to be sure that the suction service valve is locked in place.
- If the filters are plugging rapidly, have a filter analyzed for content. There have been reports filters plugging with filter drier media or metal particles from the discharge check valve. The filter drier is a granular design and has been known to disintegrate. A solid core filter drier was installed starting with serial number 5200F.
- Discharge check valve failures can introduce metal filings into the oil, which are collected by the oil filters.
- Check the transducer accuracy. Replace the transducer if necessary. All of the transducers are used in the oil pressure set point selection.

Service Bulletins pertaining to this condition:

- SMB010008 – 06N Internal Oil Filters Plugging
This bulletin described the problem with the motor cooling filter drier disintegrating during operation. A solid core filter drier was installed starting with serial number 5200F.

T030 – Compressor A1 Pre-Start Oil Pressure Alert

T031 – Compressor A2 Pre-Start Oil Pressure Alert

T032 – Compressor B1 Pre-Start Oil Pressure Alert

T033 – Compressor B2 Pre-Start Oil Pressure Alert

Action taken by control: Circuit not allowed to start

Reset Method: Manual (MBB)

This alarm is generated after three attempts at starting. When a call for cooling is received, the oil pressure transducer is read and its value stored. The circuit oil pump is started and operates for 20 seconds. After the 20 second operation, the Oil Pressure Transducer reading is checked again and compared to the initial reading. If the difference between the two readings is 2.5 psi (17 kPa) or less, the oil solenoid is opened. The oil pressure is measured again. The oil pressure prove criteria is 3.5 psi (23.8 kPa) minus the attempt number. So, if at the first attempt the pressure is not greater than 2.5 psi (17 kPa), the oil solenoid is closed and the circuit is reset. The circuit will remain off for 20 seconds. The oil pump is started and the sequence

repeated. On the second attempt, if the oil pressure is not greater than 1.5 psi (10.3 kPa) the oil solenoid is closed and the sequence started again. After the third attempt, if the oil pressure is not greater than 0.5 psi (3.4 kPa) the alarm is generated. This alert algorithm is active for the lead compressor during start-up only.

For lag compressor start-up, the oil pressure is read by the control. The oil solenoid is then opened. To pass the oil pressure prove criteria, the oil pressure rise must be at least 2.5 psi (17 kPa) or greater than the initial pressure reading. If the oil pressure is less than 2.5 psi (17 kPa) compared to the initial oil pressure reading, the alert is generated.

If this condition is encountered, check the following items:

- Check the internal and external oil filter pressure drops. Change as necessary.
- Check to be sure that the bypass check valves at the oil pump are installed correctly. The check valve should allow flow around the pump when the pump is not in operation. *Early Charlotte 30HX production machines were found to have the check valves installed backwards. The machines will not start. They alert on Pre-Start Oil Failure.*
- Check all oil line service valves to be sure that they are open.
- Check the operation of oil solenoid valve.
- There have been reports filters plugging with filter drier media or metal particles from the discharge check valve. The filter drier is a granular design and has been known to disintegrate. A solid core filter drier was installed starting with serial number 5200F.
- Check the calibration of the oil pressure transducer.
- Check for a new Main Base Board. In order for the new board to communicate with the CCP module, it must be activated. See Module Replacement on page 182.
- Check the reading of the oil pressure transducer. If the reading is 0.0 psi (0.0 kPa), check the status of the compressor under Configuration→SERV, EN.A1, EN.A2, EN.B1, EN.B2. The corresponding compressor must be enabled for this oil pressure transducer to read.

Service Bulletins pertaining to this condition:

- SMB010008 – 06N Internal Oil Filters Plugging
This bulletin described the problem with the motor cooling filter drier disintegrating during operation. A solid core filter drier was installed starting with serial number 5200F.

T034 – Compressor A1 Max. Oil Delta P, Check Oil Line Alert

T035 – Compressor A2 Max. Oil Delta P, Check Oil Line Alert

T036 – Compressor B1 Max. Oil Delta P, Check Oil Line Alert

T037 – Compressor B2 Max. Oil Delta P, Check Oil Line Alert

Action taken by control: Affected compressor shut down

Reset Method: Manual (MBB)

This alarm is generated if the difference between the discharge pressure and the oil pressure is greater than 100 psi (683 kPa) for more than 5 seconds.

If this condition is encountered, check the following items:

- Check the internal and external oil filter pressure drops. Change as necessary.
- Check all oil line service valves to be sure that they are open.
- Check the operation of oil solenoid valve.
- There have been reports filters plugging with filter drier media or metal particles from the discharge check valve. The filter drier is a granular design and has been known to disintegrate. A solid core filter drier was installed starting with serial number 5200F.
- Check the transducer accuracy. Replace the transducer if necessary. All of the transducers are used in the oil pressure set point selection.

Service Bulletins pertaining to this condition:

- SMB010008 – 06N Internal Oil Filters Plugging
This bulletin described the problem with the motor cooling filter drier disintegrating during operation. A solid core filter drier was installed starting with serial number 5200F.

T038 – Compressor A1 Failed Oil Solenoid Alert

T039 – Compressor A2 Failed Oil Solenoid Alert

T040 – Compressor B1 Failed Oil Solenoid Alert

T041 – Compressor B2 Failed Oil Solenoid Alert

Action taken by control: Affected compressor shut down

Reset Method: Manual (MBB)

When a call for cooling is received, the Differential Oil Pressure, DOP (Oil Pressure – Economizer Pressure) is read and its value stored, DOP_t . The differential is used to compensate for changing water temperatures. The circuit oil pump is started and operates for 20 seconds. After the 20 second operation, the Oil Pressure Differential reading, DOP_{t+20} is checked again and compared to the initial reading. If the difference between the two readings, $(DOP_{t+20} - DOP_t)$ is greater than **5 psi** (34 kPa), the oil solenoid is assumed to have failed open and the alert is generated. This alert algorithm is active during lead compressor start-up only. It does not apply to the lag compressor of the circuit, once the lead compressor is operational.

If this condition is encountered, check the following items:

- Check the operation of oil solenoid valve. Carlyle had a vendor problem with the oil solenoid manufacturer Parker with compressor date codes 4499J, 0700J, 0800J, 0900J. The suspect solenoid valves have a seal that may allow oil to leak by. Parker production dates close to these serial numbers should also be suspect.
- Check the accuracy of the economizer and oil pressure transducer. Replace the transducer(s) if necessary.

- Check the oil solenoid. If the oil solenoid stem is bent, it may not close or open completely and may or may not allow the oil to enter compressor.

A051 – Circuit A, Compressor 1 Failure Alarm

A052 – Circuit A, Compressor 2 Failure Alarm

A055 – Circuit B, Compressor 1 Failure Alarm

A056 – Circuit B, Compressor 2 Failure Alarm

P051 – Compressor A1 Failure Pre-Alert

P051 – Circuit A, Compressor 1 Pre-Alert

P052 – Compressor A2 Failure Pre-Alert

P052 – Circuit A, Compressor 2 Pre-Alert

P055 – Compressor B1 Failure Pre-Alert

P055 – Circuit B, Compressor 1 Pre-Alert

P056 – Compressor B2 Failure Pre-Alert

P056 – Circuit B, Compressor 2 Pre-Alert

T051 – Compressor A1 Failure Alert

T051 – Circuit A, Compressor 1 Failure

T052 – Compressor A2 Failure Alert

T052 – Circuit A, Compressor 2 Failure

T055 – Compressor B1 Failure Alert

T055 – Circuit B, Compressor 1 Failure

T056 – Compressor B2 Failure Alert

T056 – Circuit B, Compressor 2 Failure

The following alerts are ComfortLink Compressor Protection alerts. They will be displayed as compressor failures. Expanding the alarm will display the cause of the compressor failure.

With the introduction of Version 5.0 (CESR-131248-05-00) and later versions, a pre-alert denoted by a “P”, was added to the algorithm. In this case, the control detected a fault condition and has not the alarm. A second attempt will be tried after a time-out period has elapsed. If the condition has not cleared upon the next attempt, the pre-alert will become an alert, and all alarm actions will be taken.

With the introduction of the Enhanced Screw Software (CESR-131344-XX-XX) the alarm text description changed to the standard text description, “Circuit X, Compressor Y Failure”. The sub-alarms descriptions did not change. The “A” alarms were added in this version also.

High Pressure Switch Trip Alert

Action taken by control: Compressor is shut down

Reset Method: Manual (CCP and MBB)

This alarm is generated when the High Pressure Switch for the compressor opens. The ComfortLink Compressor Protection Module will signal this alarm if the High Pressure Switch is open for at least 250-500 milliseconds.

If this condition is encountered, check the following items:

- Find the cause of high pressure switch trip. For 30GX machines, check the condenser fan operation. For 30HXA machines, check the condenser fan relays and condenser for proper operation. Check to be sure that the correct fan cycling pressure switches are used. Early Charlotte production machines were not supplied with the fan cycling pressure switches. For 30HXC machines, check the operation of the Condenser Water Regulating Valve. Check strainers to insure proper water flow.
- For air systems check the coils for debris or air recirculation.
- Confirm that the machine charge is correct.
- Check for the correct High Pressure Switch. Early 30HXA machines produced with serial numbers between 0501Q and 2701Q, were produced with the water-cooled high pressure switch, rather than the air-cooled high pressure switch.
- Check for proper connection of the High Pressure Switch to the CCP.
- Version 1.0 and 2.0 software has an error with the VHPT, *Variable Head Pressure Selection* (Configuration Mode, Sub-mode OPT1) option 2 (0 to 10 vdc) and option 3 (10 to 0 vdc). When configured for one of these options, the output from the controller has a maximum output of 5 vdc. A temporary fix to this situation is to use a 1,000 ohm, ¼ watt resistor instead of the 500 ohm, ½ watt resistor that would normally be used.
- Confirm the proper value for the HD.P.A and HD.P.B, *Head Pressure Set Point A* and *Head Pressure Set Point B* (Set Point Mode, Sub-mode HEAD). Machines produced prior to 5100F, the factory configuration values were incorrect.
- Check for non-condensables in the circuit.

Service Bulletins pertaining to this condition:

- SMB010007 – ComfortLink 30HXA/HXC Head Pressure Set Point Setting
This bulletin described the correct factory settings in the head pressure set points.

No Motor Current Detected Alert

Action taken by control: Compressor is shut down

Reset Method: Manual (CCP and MBB)

This alarm will be generated if the CCP detects less than 10% Must Trip Amps (MTA) on all three legs for greater than 3 seconds while the compressor status is “On”.

With the introduction of Version 5.0 (CESR-131248-05-00) and later versions, a pre-alarm denoted by a “P”, was added to the algorithm. If the CCP detects a no current condition, the pre-alarm is generated and listed in the current alarms list for two minutes, also in alarm history. The Navigator alarm light flashes. The remote alarm is

not turned on, nor is a message broadcast on CCN. After two minutes, the compressor is allowed to restart (return to normal is not sent on CCN). If on the subsequent restart the no motor current is detected by the CCP within the first 30 seconds, the failure is treated as an alarm (remote alarm is turned on, messages are broadcast on CCN).

If this condition is encountered, check the following items:

- Check the operation of the contactors. If the contactors do not pull in, the alarm can be generated.
- Check the wiring to the CCP modules from Fuse 2. The CCP module should have power to the following points prior to the start of the compressor.

Compressor	Point
Compressor A1	CCP1-J2-2
Compressor A2	CCP2-J2-2
Compressor B1	CCP1-J6-2
Compressor B2	CCP2-J6-2

- Check the Molex connectors from the CCP to the compressor contactors. Loose connections, may create an open electrical circuit prohibiting contactor operation.
- On Wye-Delta starters, check the auxiliary contact for proper operation. The auxiliary contact is responsible for energizing the 2M contactor. Check the contact pads.
- On Wye-Delta starters, be sure the shorting bars on the S contactor are installed.
- Check the Molex connectors from the toroids to the CCP. Loose connections can cause this alarm. Some modules have had conformal coating on the CPM pin connections interfering with the harness connection.
- Check the toroid harness connections. Be sure that the correct toroid is connected to the appropriate CCP connection. A connection problem at the CCP or toroid could cause the alarm.
- Check the toroid resistance. It should be 64.3-70.4 Ω (30GX502786) or 38.5-42 Ω (30GX504711).
- Check for a chattering High Pressure Switch. The High Pressure Switch is in series with the control relays of the CCP board. If the High Pressure Switch opens momentarily, for less than 250-500 milliseconds, the control relay will open, causing the compressor contactors to open. The CCP will detect a no motor current condition and signal that alarm.
- Check to be sure that the correct Current Transformer Module is used. If a $\frac{1}{2}$ current module (30GX504711) is installed on a compressor with a MTA of less than 314 amps, this alarm will be generated.
- Check for a momentary power interruption. The Main Base Board can remain operating with a momentary power interruption, but the contactors can sometimes drop out. With Version 4.7 software and later, the ability to recognize this problem and restart the machine was added to the software.
- For CCP modules prior to 100233-1R3 Rev. 26, consider upgrading the module. With Rev. 26, the No Motor Current timing was increased from 0.6 seconds to 10 seconds.

Current Unbalance Alert

Action taken by control: Circuit is shut down

Reset Method: Manual (CCP and MBB)

If the CCP detects a current imbalance greater than the set point *C.UNB Current Unbalance Set Point* (Configuration Mode, Sub-mode OPT2) for more than 25 minutes, the alarm is generated. The factory default for the machine was 10% for all CCPs. Starting 4400F, the C.UNB was increased to 25% for all ½ current CCP (HN67LM104) from the factory. Beginning with the use of the 30GX504711 current transformer module, the C.UNB was again reduced to 10%.

If this condition is encountered, check the following items:

- Check the voltage imbalance. Voltage imbalance has a strong relation to the current imbalance.
- Check the toroids. The measured resistance should be 64.3-70.4 Ω (30GX502786) or 38.5-42 Ω (30GX504711). Check the toroid wiring. Do not allow the wires to run in parallel with high voltage sources, greater than 30 volts.
- Check all wiring connections at the compressor, contactors, and terminal block. Loose connections can cause current imbalances.
- Dry run the contactors to see that they are pulling in correctly. Inspect the contactor pads for arcing or corrosion. Telemecanique contactors with the date codes 2T01181 (2T is the manufacturing point, 01 is the year, 18 is the week, 1 is the day of the week) through 2T0146x may have a binding spring in the contactor actuator that can cause the contactor not to function properly. Contactors with date codes as early as 2T0025 have also been reported with this problem.
- Check for power devices attached downstream of the toroid other than the compressor.

For ½ current modules, check the following additional items:

- Check for a voltage imbalance to the machine.
- Check to be sure that the parallel leads for each phase originate from the same terminal block stud.
- Check the current draw on all six conductors. Select the three conductors, one from each phase, which has the closest current draw. Route these leads through the toroid to sense the compressor current draw. **CAUTION** – Change only one phase at a time. Mixing the phases could result in the compressor running backwards resulting in a compressor failure. The control system will not detect this condition.
- For units with compressors with MTA greater than 314 that use the ½ current CCP, HN67LM104, converting to the 30GX504711 current transformer module with the full current CCP, HN67LM103 can correct many nuisance alarms. This change was made in production starting with serial numbers 2301F (30GX), and 1002Q (30HXA/HXC).

Service Bulletins pertaining to this condition:

- SMB020027 – 30GX,HX Compressor Contactor Failures

This bulletin described the failure mode of the Telemecanique contactors with the binding actuator.

- SMB020027A – 30GX,HX Compressor Contactor Failures
This bulletin superseded SMB020027. There was no change to the body of the document. The revision clarified the warranty claim procedures.
- SMB020039 – 30GX/HX Ground Fault and Current Imbalance Alarms
This bulletin described the changes required to update the ½ current Compressor Protection Modules to the full current modules and new ½ current toroids.

Single Phase Current Loss Alert

Action taken by control: Circuit is shut down

Reset Method: Manual (CCP and MBB)

This alarm will be generated when the current imbalance reaches a programmed level. The alarm will be generated by one of two conditions. If the running current is less than 50% of MTA and a current imbalance between phases of greater than 50% is measured for 1 second, the alarm will be generated. If the running current is at or greater than 50% of MTA and a current imbalance between phases of 30% is measured for 1 second, the alarm will be generated.

- Check the voltage imbalance. Voltage imbalance has a strong relation to the current imbalance.
- Check the voltage while the compressor is starting. If one phase drops out or is reduced, this alarm can be generated.
- Check the toroids. The measured resistance should be 64.3-70.4 Ω (30GX502786) or 38.5-42 Ω (30GX504711). Check the toroid wiring. Do not allow the wires to run in parallel with high voltage sources, greater than 30 volts.
- Check all wiring connections at the compressor, contactors, and terminal block. Loose connections can cause current imbalances.
- Dry run the contactors to see that they are pulling in correctly. Inspect the contactor pads for arcing or corrosion. Telemecanique contactors with the date codes 2T01181 (2T is the manufacturing point, 01 is the year, 18 is the week, 1 is the day of the week) through 2T0146x may have a binding spring in the contactor actuator that can cause the contactor not to function properly. Contactors with date codes as early as 2T0025 have also been reported with this problem.

Service Bulletins pertaining to this condition:

- SMB020027 – 30GX,HX Compressor Contactor Failures
This bulletin described the failure mode of the Telemecanique contactors with the binding actuator.
- SMB020027A – 30GX,HX Compressor Contactor Failures
This bulletin superseded SMB020027. There was no change to the body of the document. The revision clarified the warranty claim procedures.

High Motor Current Detected Alert

Action taken by control: Compressor is shut down

Reset Method: Manual (CCP and MBB)

This alarm will be generated if the motor current detected by the toroids exceeds the Must Trip Amp (MTA) setting. No alarm will be generated if the current value is 87% of the MTA value. The alarm may be generated if the value read by the toroid is between 97-100% of the MTA value. The alarm will be generated if the value read is 100% or greater for 1 second. There is a 4.0 +/- 0.5 second delay from start-up before this alarm is active to allow for locked rotor inrush.

If this condition is encountered, check the following items:

- Check for compressor operation outside of the operational envelope. Confirm that the compressor is starting unloaded.
- Check all power connections for tightness from the terminal block to the contactors and compressor terminals.
- Check the Must Trip Amp Configuration Header and the appropriate Must Trip Amps, *CM.A1 Compressor A1 Must Trip Amps*, *CM.A2 Compressor A2 Must Trip Amps*, *CM.B1 Compressor B1 Must Trip Amps*, or *CM.B2 Compressor B2 Must Trip Amps*, (Configuration Mode, Sub-mode UNIT), for the proper setting.
- Check the toroid harness to be sure that the harness does not run in parallel with voltage sources greater than 30 vac. This can induce a voltage on a leg of the harness.
- On the ½ current modules, check the power wiring to the toroid. Be sure that only one set of leads goes through the toroid, if configured. Consider upgrading the system to the ½ current toroid and full current CCP.
- Check to be sure that the contactors in a Wye-Delta configuration are properly operating. A delay in the transition can cause the machine to trip on locked rotor current as the compressor starts in an Across-the-Line configuration. For CCP modules prior to 100233-1R3 Rev. 26, consider upgrading the module. With Rev. 26, the transition timing was reduced.
- Check for a bad compressor motor.
- Check for a seized compressor.
- Check for moisture in the refrigerant circuit.
- Check for power devices attached downstream of the toroid other than the compressor.
- On 2 compressors per circuit with Wye-Delta Starters, primarily on 208 volt systems, may stall during the 5 second transition timer if the other compressor of the circuit is operating. This is more common with 80 ton compressors. Beginning with Revision 26 ComfortLink Compressor Protection modules, the Wye-Delta transition timer was reduced from 5 to 2 seconds.
- Consider increasing the Z.GN *Deadband Multiplier* (Configuration Mode, Sub-mode SLCT). Low Z.GN numbers can cause the machine to cycle, which can cause this problem.

Service Bulletins pertaining to this condition:

- SMB020039 – 30GX/HX Ground Fault and Current Imbalance Alarms
This bulletin described the changes required to update the ½ current Compressor Protection Modules to the full current modules and new ½ current toroids.

Compressor Ground Fault Alert

Action taken by control: Compressor is shut down.

Reset Method: Manual (CCP and MBB)

On the full current modules, a Ground Fault alarm will be generated by a current to ground of 2.5 +/- 2.0 amps as measured through the toroid. On the ½ current modules HN67LM104, a Ground Fault alarm will be generated by a current to ground of 7.5 +/- 2.0 amps as measured through the toroid.

With both modules the full and half current modules, current-to-ground is sensed by instantaneously summing each of the three phases together based on the current detected by the toroid for each phase. Current greater than the limits listed above, is assumed to be current-to-ground.

If this condition is encountered, check the following items:

- If either compressor MTA is greater than 314 amps, be sure that the CPM is a ½ current module, HN67LM104.
- Check all connections from the terminal block to the compressor contactor, from the compressor contactor to the compressor. All connections should be tight. Inspect the connections for signs of overheating.
- Check for a grounded compressor motor.
- Check the contactors for arc marks on the contactor pads.
- Be sure the toroid harness has a good connection at both the CCP and the toroid. Some modules have had conformal coating on the CCP pin connections interfering with the harness connection.
- Check the toroid harness to be sure that the harness does not run in parallel with voltage sources greater than 30 vac. This can induce a voltage on a leg of the harness.
- Check the toroid resistance. The resistance for each phase toroid should be between 64.3-70.4 Ω (30GX502786) or 38.5-42 Ω (30GX504711).
- Check for power devices attached downstream of the toroid other than the compressor.
- For CCP modules prior to 100233-1R3 Rev. 26, consider upgrading the module. With Rev. 26, the Ground Fault threshold was increased to 4.5 \pm 2.0 amps.

For ½ current modules, check the following additional items:

- Check for a voltage imbalance to the machine.
- Check to be sure that the parallel leads for each phase originate from the same terminal block stud.
- Check the current draw on all six conductors. Select the three conductors, one from each phase, that have the closest current draw. Route these leads through the

toroid to sense the compressor current draw. **CAUTION** – Change only one phase at a time. Mixing the phases could result in the compressor running backwards resulting in a compressor failure. The control system will not detect this condition.

- For units with compressors with MTA greater than 314 that use the ½ current CCP, HN67LM104, converting to the 30GX504711 current transformer module with the full current CCP, HN67LM103 can correct many nuisance alarms. This change was made in production starting with serial numbers 2301F (30GX), and 1002Q (30HXA/HXC). With the use of the 30GX504711 current transformer module, the ground fault detection DIP Switch #2 should be enabled.

If no problems can be found, turning DIP Switch #2 ON disables the Ground Fault detection algorithm of the module. In order for this change to be registered, the power to the Compressor Protection Module must be cycled. Starting 4400F, all ½ current CCP (HN67LM104) have ground fault disabled from the factory.

Beginning with the use of the 30GX504711 current transformer module the ground fault detection DIP Switch #2 will be re-enabled from the factory.

Service Bulletins pertaining to this condition:

- SMB020039 – 30GX/HX Ground Fault and Current Imbalance Alarms
This bulletin described the changes required to update the ½ current Compressor Protection Modules to the full current modules and new ½ current toroids.

Contactor Failure Alert

Action taken by control: Compressor is unloaded, the other circuit is disabled and further loading of the machine is prohibited. All supporting commands will be running.

Reset Method: Manual (CCP and MBB)

If the CCP detects a compressor current greater than 10% of Must Trip Amps (MTA) while the compressor is off, the alarm is generated. The affected compressor is unloaded, the other circuit is disabled and the further loading of the machine is prohibited. All other compressors and are commanded off. All support functions, oil solenoid, oil pump, EXV, cooler and condenser pumps are supported during this alarm. If the compressor is not operating, it is not uncommon for the machine to alarm on a High Saturated Suction Temperature Alarm.

If this condition is encountered, check the following items:

- Check the compressor contactors to be sure that the contacts are not welded.
- Check for a wiring problem that is applying power to the compressor contactors, other than from the Compressor Protection Module.
- Check the toroid harness to be sure that the harness does not run in parallel with voltage sources greater than 30 vac. This can induce a voltage on a leg of the harness.

- Check the toroid harness connections. Be sure that the correct toroid is connected to the appropriate CCP connection. A connection problem at the CCP or toroid could cause the alarm. If this is the case there should be an additional “No Motor Current Alarm”.
- Check for power devices attached downstream of the toroid other than the compressor.

Current Phase Reversal Alert

Action taken by control: Compressor is shut down.

Reset Method: Manual (CCP and MBB)

The alarm will be triggered if the ComfortLink Compressor Protection (CCP) detecting a current phase reversal of the incoming power supply through the toroids.

This algorithm is the primary means to detect a reverse rotation condition. If the main power to the compressor contactors is absent at start-up, this alarm will also be generated, since phase rotation cannot be sensed.

If this condition is encountered, check the following items:

- If the compressor has not been operational, reverse two of the incoming power leads. Do not change the internal wiring from the terminal block to the compressor contactors and compressors. Changing these wires defeats the control systems protection.
- Check the voltage while the compressor is starting. If one phase drops out or is reduced, this alarm can be generated.
- Check the High Pressure Switch connections to the CCP. The HPS is connected in series with the CCP control relays, which control the compressor contactors. Without the contactor coil energized, the control cannot sense the current rotation.
- Be sure power is available to the compressor contactors. Check the fuses or circuit breakers supplying the machine.
- Check the toroid harness connections. A connection problem at the CCP or toroid could cause the alarm. Some modules have had conformal coating on the CPM pin connections interfering with the harness connection.
- Check the toroid harness to be sure that the harness does not run in parallel with voltage sources greater than 30 vac. This can induce a voltage on a leg of the harness.
- Check to be sure that all of the toroids within the block are installed in the same orientation.

Motor Over Temperature Alert

Action taken by control: Compressor is shut down

Reset Method: Manual (CCP and MBB)

The motor temperature limit is 240 °F (116 °C). If this temperature is sensed by the motor thermistor, the alarm will be generated.

If this condition is encountered, check the following items:

- Check for a thermistor failure.
- Check for a thermistor wiring error.
- Check the motor cooling solenoid for proper operation.
- Check the circuit for proper refrigerant charge.
- Check the motor cooling line for any restrictions.
- Check the economizer inlet screen for debris.
- Check the liquid line strainer to be sure that it is free of debris.
- On 2-compressor circuits, check to be sure that the economizer solenoid valve is functioning properly.

Service Bulletins pertaining to this condition:

- SMB990072A – 06N Motor Temperature Operating Limits
This bulletin described the operating limits for the compressor and the actions taken by the control system at various points.
- SMB010012 – 30HXA/HXC076-146 Liquid Line Strainer Change
This bulletin advised of the new strainer assembly for the 30HXA/HXC076-146 machines.

Open Thermistor Alert

Action taken by control: Compressor is shut down.

Reset Method: Manual (CCP and MBB)

The alarm is generated if the ComfortLink Compressor Protection detects an open circuit for the motor winding thermistor.

If this condition is encountered, check the following items:

- Check for a bad motor thermistor.
- Check for a loose connection in the motor winding thermistor circuit.

Each compressor is equipped with 2 motor winding thermistors connected with a common leg. Before using the back-up thermistor, verify that there is not a wiring error.

MTA Header Fault Alert

Action taken by control: Compressor will not be allowed to start

Reset Method: Manual (CCP and MBB)

This alarm is generated when the CCP detects an erroneous setting of the Must Trip Amps (MTA) Configuration Header, with either all jumpers open or closed. To reset this alarm, the power must be removed from the CCP for a minimum of 5 seconds. The alarm reset button will not clear this alarm.

If this condition is encountered, check the following items:

- Check to be sure that the configuration header is firmly seated in the holder and that all pins are seated into their socket.
- Check to be sure that the configuration header is properly punched.

MTA Alert

Action taken by control: Compressor will not be allowed to start

Reset Method: Manual (CCP and MBB)

This alarm is generated when the ComfortLink Compressor Protection's Must Trip Amp (MTA) value does not match the value stored with the controls for the appropriate compressor. These values are stored under *CM.A1 Compressor A1 Must Trip Amps*, *CM.A2 Compressor A2 Must Trip Amps*, *CM.B1 Compressor B1 Must Trip Amps*, or *CM.B2 Compressor B2 Must Trip Amps*, (Configuration Mode, Sub-mode UNIT).

If this condition is encountered, check the following items:

- Check to be sure that the configuration header is firmly seated in the holder and that all pins are in their socket.
- Check to be sure that the configuration header is properly punched.
- Check to be sure that the proper machine size and voltage was downloaded to the MBB.

Shorted Thermistor Alert

Action taken by control: Compressor is shut down.

Reset Method: Manual (CCP and MBB)

The alarm is generated if the ComfortLink Compressor Protection detects a shorted circuit for the motor winding thermistor.

If this condition is encountered, check the following items:

- Check for a bad motor thermistor.
- Check for a grounded connection in the motor thermistor circuit.

Each compressor is equipped with 2 motor winding thermistors thermistors connected with a common leg. Before using the back-up thermistor, verify that there is not a wiring error.

A060 – Cooler Leaving Water Thermistor Failure - 1 Alarm

A060 – Cooler Leaving Water Thermistor Failure - 2 Alarm

Action taken by control: Machine is shut down.

Reset Method: Automatic (-1 Alarm)

Manual (-2 Alarm)

There are two conditions that will generate this alert.

The “-1” alarm will be generated if the leaving water thermistor read by the control is outside of the -40 to 245 °F (-40 to 118 °C) range.

If this condition is encountered, check the following items:

- Check for a thermistor failure.
- Check for a thermistor wiring error.

The “-2” alarm will be generated if the leaving water temperature is greater than the entering water temperature by at least 5 °F (2.8°C) for at least 15 minutes.

If this condition is encountered, check the following items:

- Check for a thermistor failure.
- Check for a thermistor wiring error.
- Check the chilled water piping arrangement for proper flow. Entering water should be in on the lowest nozzle.

T061 – Cooler Entering Water Thermistor Failure Alert

Action taken by control: Machine continues to operate

Reset Method: Automatic

This alarm will be generated if the thermistor is read by the control outside of the -40 to 245 °F (-40 to 118 °C) range. The machine will continue to operate, with a fixed rise/ton of 0.1 °F/% Total Capacity (0.06 °C/% Total Capacity).

If this condition is encountered, check the following items:

- Check for a thermistor failure.
- Check for a thermistor wiring error.

T062 – Condenser Leaving Water Thermistor Failure Alert

T063 – Condenser Entering Water Thermistor Failure Alert

Action taken by control: Machine continues to operate

Reset Method: Automatic

This alarm will be generated if the thermistor is read by the control outside of the -40 to 245 °F (-40 to 118 °C) range. The machine will continue to operate.

If this condition is encountered, check the following items:

- Check for a thermistor failure.
- Check for a thermistor wiring error.

T070 – Circuit A Discharge Gas Thermistor Failure Alert - 1

T070 – Circuit A Discharge Gas Thermistor Failure Alert - 2

T071 – Circuit B Discharge Gas Thermistor Failure Alert - 1

T071 – Circuit B Discharge Gas Thermistor Failure Alert - 2

Action taken by control: Circuit is shut down.

Reset Method: Manual (MBB)

There are two conditions that will generate this alert.

The “-1” alert will be generated if the thermistor read by the control outside of the –40 to 245 °F (-40 to 118 °C) range.

The “-2” alert is generated if the Discharge Gas Temperature exceeds 210 °F (99 °C) for 30 seconds.

If this condition is encountered, check the following items:

- Check for a thermistor failure.
- Check for a thermistor wiring error.
- Check for a faulty oil heater relay.
- Check the circuit’s refrigerant charge. Low charge can cause higher than normal discharge temperatures.
- Check DIS.S *Discharge Super. Setpoint* (Configuration Mode, Sub-mode UNIT). It should be set for 22 °F (12.2 °C).
- Check the compressor’s internal pressure relief to be sure that it is closed.
- In applications with high compression ratios, the discharge gas temperature will be elevated. In some cases, it has been high enough to trip this alarm. To reduce the occurrence of this situation, lower the MT.SP *Motor Temp Setpoint* (Configuration Mode, Sub-mode SERV) to 150 °F (65.5 °C), or raise the LVL.A *Liquid Level Setpoint A* or LVL.B *Liquid Level Setpoint B* (Set Point Mode, Sub-mode LIQ) to 2.2. Beginning with Version 3.1 software any unit configured for Medium Temperature Brine operation FLUD *Cooler Fluid*, (Configuration Mode, Sub-mode OPT1) will change the Motor Temp Setpoint to 170 °F (76.7 °C).
- Check the compressor rotors. Damage to the compressor rotors can cause an internal bypass, elevating the discharge temperature.

Service Bulletins pertaining to this condition:

- SMB01?? – ComfortLink Main Base Board Software
This bulletin addressed the versions of screw software.

T073 – Outdoor Air Temperature Thermistor Failure Alert

Action taken by control: Machine continues to operate, Outdoor Air Reset is disabled

Reset Method: Automatic

This alarm will be generated if the thermistor is read by the control outside of the –40 to 245 °F (-40 to 118 °C) range. The machine will continue to operate with reset disabled under normal control set points.

If this condition is encountered, check the following items:

- Check for a thermistor failure.
- Check for a thermistor wiring error.
- With Software CESR-131344-01-01 (Version 1.1) when the unit was placed in Service Test mode, both T073 – Outdoor Air Temperature Thermistor Failure and a T074 - External Reset Temperature Thermistor Failure Alerts are generated if no inputs are connected. Upgrade the software or leave Service Test mode.

Service Bulletins pertaining to this condition:

- SMB040025 - 30HX Series 6 - Erroneous T073 – Outdoor Air Thermistor Failure and T074 – External Reset Temperature Thermistor Failure Alerts
This bulletin discusses the software algorithm that when the machine is in Service Test mode and no inputs are connected the corresponding alarm, T073 or T074 is generated. When the unit is removed from Service Test, the alerts are cleared.

T074 – External Reset Temperature Thermistor Failure Alert

Action taken by control: Machine continues to operate, Space Temperature Reset disabled

Reset Method: Automatic

This alarm will be generated if the thermistor is read by the control outside of the –40 to 245 °F (-40 to 118 °C) range. The machine will continue to operate with reset disabled under normal control set points.

If this condition is encountered, check the following items:

- Check for a thermistor failure.
- Check for a thermistor wiring error or poor connection.
- With Software CESR-131344-01-01 (Version 1.1) when the unit was placed in Service Test mode, both T073 – Outdoor Air Temperature Thermistor Failure and a T074 - External Reset Temperature Thermistor Failure Alerts are generated if no inputs are connected. Upgrade the software or leave Service Test mode.

Service Bulletins pertaining to this condition:

- SMB040025 - 30HX Series 6 - Erroneous T073 – Outdoor Air Thermistor Failure and T074 – External Reset Temperature Thermistor Failure Alerts
This bulletin discusses the software algorithm that when the machine is in Service Test mode and no inputs are connected the corresponding alarm, T073 or T074 is generated. When the unit is removed from Service Test, the alerts are cleared.

T075 – Compressor A1 Discharge Gas Thermistor Failure Alert

T076 – Compressor A2 Discharge Gas Thermistor Failure Alert

T077 – Compressor B1 Discharge Gas Thermistor Failure Alert

T078 – Compressor B2 Discharge Gas Thermistor Failure Alert

Action taken by control: Corresponding Compressor is shut down.

Reset Method: Automatic

This alarm will be generated if the thermistor is read by the control outside of the –40 to 245 °F (-40 to 118 °C) range. The machine will continue to operate with available compressors.

If this condition is encountered, check the following items:

- Check for a thermistor failure.
- Check for a thermistor wiring error or poor connection.

T079 – Lead/Lag Thermistor Failure Alert

Action taken by control: Machines continues to operate as stand alone machines

Reset Method: Automatic

This alarm will be generated if the thermistor is read by the control outside of the –40 to 245 °F (-40 to 118 °C) range. The machine will continue to operate with reset disabled under normal control set points.

If this condition is encountered, check the following items:

- Check for a thermistor failure.
- Check for a thermistor wiring error.
- Check the configuration of the machine. If the machine is configured for Master/Slave control and there is no thermistor connected to the master chiller, this alarm will be generated.
- Software Version 3.1 and earlier, a software bug has been found with this alarm. If the machine is configured for dual chiller parallel operation, LLEN *Lead/Lag Enable*, (Configuration Mode, Sub-mode RSET) Enable and PARA *Parallel Configuration* (Configuration Mode, Sub-mode RSET) Yes and the alarm is generated, the alarm cannot be cleared by disabling the parallel dual chiller operation. To clear the alarm, enable dual chiller series control and PARA *Parallel Configuration* (Configuration Mode, Sub-mode RSET) No and then clear the alarm.

T090 – Circuit A Discharge Pressure Transducer Failure Alert

T091 – Circuit B Discharge Pressure Transducer Failure Alert

T092 – Circuit A Suction Pressure Transducer Failure Alert

T093 – Circuit B Suction Pressure Transducer Failure Alert

Action taken by control: Affected circuit is shut down.

Reset Method: Automatic

This alarm will be generated if the voltage ratio ($\text{Voltage}_{\text{Measured}} / \text{Voltage}_{\text{Reference}}$) by the Main Base Board (MBB) is greater than 99.9% or less than 0.5%.

If this condition is encountered, check the following items:

- Check for a faulty transducer.
- Check for a wiring error or problem between transducer and the MBB.
- Check for a faulty power supply from the MBB for the pressure transducers.

T094 – Compressor A1 Oil Pressure Transducer Failure Alert

T095 – Compressor A2 Oil Pressure Transducer Failure Alert

T096 – Compressor B1 Oil Pressure Transducer Failure Alert

T097 – Compressor B2 Oil Pressure Transducer Failure Alert

Action taken by control: Affected compressor is shut down.

Reset Method: Automatic

This alarm will be generated the voltage ratio ($\text{Voltage}_{\text{Measured}} / \text{Voltage}_{\text{Reference}}$) by the Screw Board (SCB) is greater than 99.9% or less than 0.5%.

If this condition is encountered, check the following items:

- Check for a faulty transducer.
- Check for a wiring error or problem between transducer and the SCB.
- Check for a faulty power supply from the SCB for the pressure transducers.

T098 – Circuit A Economizer Pressure Transducer Failure – 1 Alert

T098 – Circuit A Economizer Pressure Transducer Failure – 2 Alert

T099 – Circuit B Economizer Pressure Transducer Failure – 1 Alert

T099 – Circuit B Economizer Pressure Transducer Failure – 2 Alert

Action taken by control: Affected circuit is shut down.

Reset Method: Automatic

There are two conditions that will generate this alert.

The “-1” alert will be generated if the voltage ratio ($\text{Voltage}_{\text{Measured}} / \text{Voltage}_{\text{Reference}}$) by the Screw Board (SCB) is greater than 99.9% or less than 0.5%.

The “-2” alert is generated if the Economizer Pressure is 12 psig (83 kPa) less than the Suction Pressure for 6 seconds. The alarm will reset automatically if the economizer pressure is greater than the suction pressure by 5 psig (34 kPa). MBB Software Versions starting with 4.5 increased the trip time to 15 seconds.

If this condition is encountered, check the following items:

- Check for a faulty transducer.
- Check for a wiring error or problem between transducer and the SCB.

- Check to be sure that the Economizer and Suction Pressure Transducers are not swapped.
- Check for a faulty power supply from the SCB for the pressure transducers.
- Check to be sure that the Suction Service Valve is open, if equipped.
- Check to be sure that the EXV/EXD is opening.
- On non-economized units, consider upgrading the software to at least MBB Version 4.5.

T110 - Circuit A Loss of Charge Alert

T111 - Circuit B Loss of Charge Alert

Action taken by control: Circuit shut down

Reset Method: Manual (MBB)

This alert is generated if the control senses a discharge pressure less than 10 psi (68.3 kPa) for 30 seconds. This alert is active only if a compressor in the circuit is ON.

If this condition is encountered, check the following items:

- Check the discharge pressure transducer accuracy. Replace the transducer if necessary.
- Check the refrigerant charge for the circuit.
- Check for a wiring error or problem between transducer and the MBB.
- Check for a faulty power supply from the MBB for the pressure transducers.

T120 - Circuit A Low Saturated Suction Temperature Alert

T121 - Circuit B Low Saturated Suction Temperature Alert

Action taken by control: Circuit shut down

Reset Method: Manual (MBB)

This alert is generated by one of two conditions. If the Saturated Suction Temperature for the circuit is sustained at 6 °F (3.3 °C) below the BR.FZ, *Brine Freeze Point* (Configuration Mode, Sub-mode SERV) for 3 minutes the alert will be generated. Before the machine alerts, the control will attempt to correct the situation by opening the EXV to allow more refrigerant into the cooler to raise the suction pressure. The other condition to generate this alert is if the Saturated Suction Temperature is less than the BR.FZ - 28 °F (15.6 °C) for 2 minutes. The control will also signal an operational mode, "Low Cooler Suction Temperature". In this mode, the circuit will not load further.

With these two alerts, there is a 1 hour prohibition timer included. The alert cannot be reset until 1 hour has elapsed.

If this condition is encountered, check the following items

- Check the liquid line strainer for restrictions. All machines have cleanable strainers. 30HXA076-146 and 30HXC076-146 use a smaller strainer than the other machines. This has been known to restrict the flow over time at the outlet.

There is very little flow over the outside surface of the basket. To resolve this, a dimple was added to the basket assembly. Starting with serial number 5200F an improved strainer and basket assembly started into production.

- Check the charge of the machine.
- Check the EXV/Economizer operation. Check the EXV/Economizer Cable for shorts.
- In economized circuits, if the motor temperature is cold, check for a sunken float.
- On 30HX machines, be sure that the bubbler tube shut-off valve is open.
- Check the head pressure control method, if the condition occurs during low ambients.
- Check the water flow for the cooler. Low water flow can cause this alarm.
- Check the loop volume and flow rate. Rapid changes in load can cause this alarm. Consider increasing the *Z.GN Deadband Multiplier* (Configuration Mode, Sub-mode SLCT).
- For Brine applications, check the *BR.FZ, Brine Freeze Point* (Configuration Mode, Sub-mode SERV). It should be set slightly above the temperature to which the loop is protected. Brine has poorer heat transfer properties causing the suction temperature to decrease to maintain the capacity.
- For 30HXA machines, check to be sure that the liquid line solenoid valves are operating properly. The solenoids are wired in parallel with the fan relays. The fans are turned on as soon as the compressors are energized.
- Check to be sure that *PRTS Pressure Transducers*, (Configuration Mode, Sub-mode OPT1) are set to YES. If this value is NO, the pressure transducers will not read a suction pressure.
- Check to be sure that the compressor loaders are sequenced properly and are operating, as they should. Compressor Loader 1 is closest to the discharge end of the compressor. Compressor Loader 2 is closest to the gear end of the compressor. The Controls & Troubleshooting Book, 30G,H-7T depicted the loader position incorrectly.
- On 30HXA171 Brine Option machines the Circuit A Economizer was changed to a larger orifice EXD beginning with serial number 3602Q. If trend data indicates that the EXV is open too much, consider replacing the orifice to the new larger one.
- Check the software revision. If the Enhanced Screw Software, CESR-131344-XX-XX is loaded for Series 4 and 5 machines, this alarm will be generated. If the Standard Screw Software, CESR-131248-XX-XX is loaded for a Series 6 machines, this alarm will be generated. In both cases, the EXV driver will not be set correctly due to the change from the 1,500-step to the 15,000-step EXV.

Service Bulletins pertaining to this condition:

- SMB010012 – 30HXA/HXC076-146 Liquid Line Strainer Change
This bulletin advised of the new strainer assembly for the 30HXA/HXC076-146 machines.

T122 - Circuit A High Saturated Suction Temperature Alert

T123 - Circuit B High Saturated Suction Temperature Alert

Action taken by control: Circuit shut down

Reset Method: Manual (MBB)

This alert algorithm is active only after 90 seconds of operation has elapsed. The alert will be generated if the Saturated Suction Temperature is greater than 55 °F (12.8 °C) and the EXV position is less than 1% for 5 minutes.

If this condition is encountered, check the following items:

- Check the EXV for proper operation.
- Check the Liquid Level Sensor for proper operation.
- Check the suction pressure transducer calibration and wiring.
- If a contactor failure alert, a subset of T051, T052, T056 and T057, is indicated but the compressor is not operational, the control will assume the circuit is operational and continues to operate the EXV. Without the compressor operating, the cooler fills with liquid, raising the saturated suction temperature to the alert limit.

T124 - Circuit A Low Oil Level

T125 - Circuit B Low Oil Level

Action taken by control: Circuit shut down

Reset Method: Automatic/Manual (MBB)

The alert is generated when one of two conditions is satisfied. If the circuit is off, the alert will be generated when the oil level switch float opens indicating not enough oil in the sump. The alert will be generated if the circuit is active and the oil level switch opens for 10 seconds.

On 30GXN/GXR units, if the circuit is in this alarm the oil heater will not energize even if the saturated condensing temperature is within the criteria to be on.

The control will allow the machine to reset automatically, if the level switch closes. Up to 3 automatic resets are allowed in an 18 hour period. The alarm is a manual reset if the fourth alarm occurs again within the 18 hour period.

If this condition is encountered, check the following items:

- Check the circuit for rapid cycling. The system will recover the oil in the circuit more efficiently under full load. If the machine is cycling rapidly, increase the Z.GN, *Deadband Multiplier* (Configuration Mode, Sub-mode SLCT). The machine is shipped from the factory at 2.0.
- Check the oil level switch for proper operation.
- Check for a wiring error.
- Check the MBB for a bad monitoring channel.
- On 30GX machines, check the York mesh to be sure that it is not interfering with the operation of the float.

- If the problem occurs at shutdown, check the oil solenoid. If the oil solenoid stem is bent, it may not close completely and will allow the oil to leave the oil separator.

To recover the oil, use the oil recovery procedure outlined in the Service section. Add additional oil to the circuit to close the oil level switch. The added oil may need to be removed from the system later.

If the alert condition continues, consider adding ½ gallon of oil to the circuit. Continue adding oil in ½ gallon increments to a maximum of 1-½ gallons. Do not overcharge the oil system. The extra oil will accumulate in the cooler, fouling the cooler.

Software Version 1.0 allowed the alert to reset prior to the switch closing. Version 3.1 Software corrected this problem. However, Version 3.1 will allow the circuit to start and operate, once for less than 30 seconds if the oil level switch is open.

Service Bulletins pertaining to this condition:

- SMB01?? – ComfortLink Main Base Board Software
This bulletin addressed the versions of screw software

T126 - Circuit A High Discharge Pressure Alert

T127 - Circuit B High Discharge Pressure Alert

Action taken by control: Circuit shut down

Reset Method: Automatic/Manual (MBB)

This alert is generated if the control senses a Saturated Condensing Temperature greater than the Maximum Condensing Temperature Set Point by more than 5 °F (2.8 °C). If the circuit is on, it will be stopped. If the circuit is off, it will not be allowed to start. This alarm will reset automatically if the condition corrects itself the first time. If the alarm is indicated again within 18 hours, the alarm is a manual reset.

If this condition is encountered, check the following items:

- Check the discharge pressure transducer calibration. Replace the transducer if necessary.
- Confirm the proper value for the HD.P.A and HD.P.B, *Head Pressure Set Point* (Set Point Mode, Sub-mode HEAD). Prior to Software Version 2.0, prior Serial Numbers 5100F, the factory configuration values were set incorrectly.
- Check the refrigerant charge for the circuit.
- Check for non-condensables in the circuit.
- Check for an airside restriction for air-cooled chillers. Check fan operation for proper airflow.
- Check for a water flow restriction for water-cooled chillers. Check condenser pump for proper operation.
- In software versions starting with CESR-13128-04-00 and continuing with CESR131344-01-01, the, *MC.SP Max. Cond. Temp Setpoint* (Configuration Mode, sub-mode SERV) is a field configurable value. The point can be lowered

to adjust the point at which this algorithm starts to take action. See MD21 – High SCT Circuit A and MD22 – High SCT Circuit B on page 60 for additional details.

Service Bulletins pertaining to this condition:

- SMB010007 – ComfortLink 30HXA/HXC Head Pressure Set Point Setting
This bulletin described the correct factory settings required for the head pressure set points.

A128 - Circuit A Condenser Freeze Protection Alarm

A129 - Circuit B Condenser Freeze Protection Alarm

Action taken by control: If the circuit is on, the circuit is shutdown. If the circuit is off, it is not allowed to start. In both cases, the condenser pump is turned on.

Reset Method: Automatic

This alarm is valid for 30HXC or 30HXA machines with water cooled condensers only. It is ignored if the chiller is configured for brine duty. The alarm is generated if the control senses the discharge pressure less than or equal to 30 psig (206 kPa) for 4 seconds. This equates to a Saturated Condensing Temperature is less than 34 °F (1 °C). The alarm will reset, if the discharge pressure for the affected circuit is greater than 35 psig (240 kPa).

With the introduction of Main Base Board software Version 3.1, if this condition is encountered, the water regulating valve will be commanded to its 100% open position.

If this condition is encountered, check the following items:

- Check the discharge pressure transducer for accuracy. Replace the transducer if necessary.
- Check the discharge pressure transducer wiring for an error.
- Check the refrigerant charge for the circuit. Loss of refrigerant charge will cause this alarm.
- If this alert has occurred on non-water cooled machine, check the unit configuration for a proper unit type.
- MBB Version 1.0 software did not have the brine exclusion for this alarm. If this condition is encountered, upgrade the software.

T131 - Circuit A Liquid Level Sensor Failure Alert

T132 - Circuit B Liquid Level Sensor Failure Alert

Action taken by control: Circuit continues to run under Discharge Superheat Control

Reset Method: Automatic

This alert is generated if the liquid level sensor thermistors indicate a temperature of greater than 245 °F (118 °C) or –40 °F (-40 °C) with a saturated suction temperature greater than 9 °F (-12.8 °C). If one of these conditions is indicated, the circuit will alert.

The circuit will continue to operate under discharge superheat control. The alert will reset if the liquid level sensor returns to a valid range of -40°F to 245°F (-40 to 118°C).

This alarm may be generated erroneously if the cooler Saturated Suction Temperature is below 9°F (-12.8°C) with all 3 thermistors immersed in liquid refrigerant.

If a Series 6 machine is loaded with CESR-131248-XX-XX software, this alarm will be generated, since there are no liquid level sensors. Series 6 machines should be loaded with CESR-131344-XX-XX software.

If this condition is encountered, check the following items:

- Check for a faulty liquid level sensor, heater or thermistors.
- Check for a wiring error of the liquid level sensor.
- Check the software version.

T135 - Circuit A Failure to Pumpout Alert

T136 - Circuit B Failure to Pumpout Alert

Action taken by control: None – Warning only

Reset Method: Automatic

ComfortLink introduced a pumpout routine at shut down. This routine has changed several times since its introduction. The pumpout criteria is as follows:

Pumpout will terminate when the Saturated Suction Temperature (SST) falls by 10°F (5.5°C), reaches the Brine Freeze Set Point -6°F (3.3°C), or if the Saturated Suction Temperature is less than 10°F (-12.2°C). Pumpout will not be initiated if the Saturated Suction Temperature is less than 10°F (-12.2°C) The control expects this to take place within 360 seconds.

If this condition is encountered, check the following items:

- MBB Version 1.0 Software's criteria for pumpout termination was for the Saturated Suction Temperature must reach -15°F (-26°C) within 180 seconds or reach the Brine Freeze Set Point -6°F (3.3°C) within 180 seconds. This proved to be too short of a time period for brine applications. The original release alert was a manual reset. Beginning 5100F, MBB Version 2.0 increased the time to 360 seconds. Version 2.0 made this alert a warning only. Upgrade the software, if this condition is encountered. Beginning with Version 3.1 the pumpout algorithm does not initiate pumpout if the Saturated Suction Temperature is less than 10°F (-12.2°C). An additional criterion for termination if the Saturated Suction Temperature reaches 10°F (-12.2°C) was added. Version 4.0 removed the alerts and used the compressor loaders after two (2) minutes of pumpout to aid in the routine.
- Check the EXV/EXD operation.

- Check the transducer calibration and wiring that may cause erratic readings. Replace the transducer if necessary.

T137 - Circuit A Low Discharge Superheat Alert

T138 - Circuit B Low Discharge Superheat Alert

Action taken by control: Circuit shut down

Reset Method: Manual (MBB)

This alert is ignored for the first 3 minutes of circuit operation. This alert is generated when the control measures a discharge superheat less than 5 °F (2.8 °C) for 10 minutes.

With Standard Software Version 5.0 (CESR-131248-05-00), the alert timer was increased. The 10 minute low discharge superheat timer will not start during the first 3 minutes after a circuit starts. At start-up, the machine will not on low discharge superheat for 13 minutes.

If this condition is encountered, check the following items:

- Check the Discharge Gas Thermistor for accuracy. Replace the sensor if necessary.
- Check the Discharge Pressure Transducer for accuracy. Replace the transducer if necessary.
- Check the wiring and location of the sensors to be sure that they are wired to the appropriate point, and located correctly.
- Check DIS.S *Discharge Super. Setpoint* (Configuration Mode, Sub-mode UNIT). It should be set for 22 °F (12.2 °C).
- Check the unit charge. An overcharge condition will lead to this problem.
- Check the MT.SP *Motor Temp Set Point*, (Configuration Mode, Sub-mode SERV). It should be set for 200 °F (93 °C) for FLUD *Cooler Fluid*, (Configuration Mode, Sub-mode OPT1) set to Water. Beginning with Version 3.1 any unit configured for brine operation FLUD set to Medium Temperature Brine will change the Motor Temp Setpoint to 170 °F (76.7 °C). The control attempts to control to set point. If the set point is too low, more liquid refrigerant can be sent to the motor than is necessary depressing the discharge superheat and generating this alert.
- Check for a failed open motor cooling solenoid.
- On economized units with suction service valves, check to be sure that the suction service valve is open.
- If antifreeze solution has been added to the chilled water loop, check BR.FZ *Brine Freeze Point* (Configuration Mode, Sub-Mode SERV) to be sure that it is set properly for protection. See Brine Freeze Point on page 29.

On Series 4 and 5 machines, check the following items:

- Check the economizer EXV for proper operation. Overfeeding can cause this alarm.

- Check the economizer for a sunken or stuck float. This causes liquid refrigerant to enter the motor cooling port. There is not enough heat in the motor to vaporize the liquid, depressing the discharge superheat.
- Check the Liquid Level Set Point. The LVL.A *Liquid Level Setpoint A* or LVL.B *Liquid Level Setpoint B* (Set Point Mode, Sub-mode LIQ) is factory defaulted to 1.8. If the level is too high, liquid carry-over can depress the discharge superheat.
- On the 30HXC146, Circuit B is known to generate a T137 Alert. Consider lowering the LVL.B *Liquid Level Setpoint B* (Set Point Mode, Sub-mode LIQ) to 1.0.
- Check the Liquid Level Sensor for proper operation.
- Check the economizer construction. In rare cases on the 8" economizer, the 10" economizer orifice plate was used. The result was a bypass of the EXD due to the gap between the standpipe and orifice plate assembly.
- Consider upgrading the software if it is the Standard Software, prior to version 5.0 (CESR-131248-05-00).

On Series 6 machines, check the following items:

- Check the Economizer TXV superheat setting. It should be 12-15 °F (6-8 °C).

Service Bulletins pertaining to this condition:

- SMB01?? – ComfortLink Main Base Board Software
This bulletin addressed the versions of screw software.

T140 – Compressor A1 High Oil Filter Pressure Drop Alert

T141 – Compressor A2 High Oil Filter Pressure Drop Alert

T142 – Compressor B1 High Oil Filter Pressure Drop Alert

T143 – Compressor B2 High Oil Filter Pressure Drop Alert

Action taken by control: Alert only, no action taken by the control

Reset Method: Manual (MBB)

This alert is generated if the oil filter pressure drop (Discharge Pressure – Oil Pressure) is exceeds 25 psid (172 kPa) for 30HXC machines, or 30 psid (207 kPa) for 30GX and 30HXA machines for 1 minute.

In Version 4.0 Software the time to trip was increased to 5 minutes.

The value FD.A1 *A1 Oil Filter Diff. Press*, FD.A2 *A2 Oil Filter Diff. Press*, (Pressure Mode, Sub-mode PRC.A), FD.B1, *B1 Oil Filter Diff. Press*, FD.B2 *B2 Oil Filter Diff. Press* (Pressure Mode, Sub-mode PRC.B) indicate the pressure drop measured by the control.

If this condition is encountered, check the following items:

- Check the oil filter pressure drops, change as necessary. If the filters are plugging rapidly, have a filter analyzed for content. There have been reports filters plugging with filter drier. The filter drier is a granular design and has been known to disintegrate.

- Check the operation of oil solenoid valve.
- Check the calibration of the discharge and oil pressure transducer.
- If the pressure drop is within acceptable limits, consider upgrading the software to at least Version 4.0. This version increased the time to trip the alert.
- Check the condenser coils for air recirculation or dirty coils. A higher than normal saturated condensing pressure will increase the oil flow and pressure drop. Clean the coils, or investigate recirculation problems.

Service Bulletins pertaining to this condition:

- SMB000060 – 30GX/HX Replacement External Oil Filter History
This bulletin addressed the numerous changes to the external filter.
- SMB010008 – 06N Internal Oil Filters Plugging
This bulletin described the problem with the motor cooling filter drier disintegrating during operation. A solid core filter drier was installed starting with serial number 5200F.

A150 – Unit is in Emergency Stop Alarm

Action taken by control: Machine shut down

Reset Method: CCN/Automatic

This alarm is generated when a CCN command for the machine to shut down is received. This will be displayed in STAT, *Control Mode* (Run Status Mode, Sub-mode VIEW).

If this condition is encountered, check the following items:

- Check for an illegal configuration.
- A CCN command will be required to remove the force.

A151 – Illegal Configuration x Alarm

Action taken by control: Machine not allowed to start

Reset Method: Manual (MBB)

This alarm is generated if control detects an illegal configuration. The error must be corrected before the machine can be started. Within the alarm code will be one of the following codes to indicate the illegal configuration.

Code Number	Illegal Configuration Description
1	TYPE <i>Unit type</i> (Configuration Mode, Sub-mode UNIT) not one of the following: Air Cooled, Fluid Cooled, Split System, Heat Machine, or Heat Reclaim.
2	CMP.A <i>Number Circ A Compressors</i> (Configuration Mode, Sub-mode UNIT) outside the range of 1-2
3	CMP.B <i>Number Circ B Compressors</i> (Configuration Mode, Sub-mode UNIT) outside the range of 1-2
4	Illegal Fan Configuration
5	Air-cooled chiller, TYPE=Air-Cooled with FLUD <i>Cooler Fluid</i> (Configuration Mode, Sub-mode OPT1) set for Low Brine
6	Water-cooled chiller, TYPE=Fluid Cooled configured for HPCT <i>Head Press. Control Type</i> (Configuration Mode, Sub-mode OPT1) to Air-cooled
7	Air Cooled chiller, TYPE=Air Cooled with CNP.I <i>Condenser Pump Interlock</i> (Configuration Mode, Sub-mode OPT1) ON.
8	Air Cooled chiller, TYPE=Air Cooled with CST.S <i>Condenser Fluid Sensors</i> (Configuration Mode, Sub-mode OPT1) YES

If this condition is encountered, check the following items:

- Correct the configuration as noted above.

Service Bulletins pertaining to this condition:

- SMB010011 – 30HXA ComfortLink Remote Condenser Fan Configuration and Operation

This bulletin addressed the configuration steps required to configure the remote condenser fan operation based on software version.

A152 – Unit Down Due to Failure

Action taken by control: None

Reset Method: Automatic

This alarm will be generated if there are 1 or more alerts active on each circuit. Alarms are only sent on the CCN bus. Alerts are not sent on the CCN bus. To broadcast the problem, the alarm was created.

If this condition is encountered, see the individual alerts and correct those conditions that lead to the alert.

With the introduction of Main Base Board Version 2.0, starting Serial Number 5100F, this alarm is only generated if there is a Flotronic System Manager (FSM) controlling the machine. FSM uses the A152 alarm to mark the chiller as off-line.

Service Bulletins pertaining to this condition:

- SMB01?? – ComfortLink Main Base Board Software

This bulletin addressed the versions of screw software.

A153 – Real Time Clock Hardware Failure Alarm

Action taken by control: Occupancy defaults to Occupied
Reset Method: Automatic

This alarm is indicated when the time clock is not initialized or fails to increment. The alarm will reset when the time is initialized or starts incrementing again. If this condition is encountered, replace the Main Base Board.

If this condition is encountered, check the following items:

- Check the HH.MM, *Hour and Minute*, (Time Clock Mode, Sub-mode TIME).

A154 – Serial EEPROM Hardware Failure Alarm

Action taken by control: Machine shuts down
Reset Method: Manual

This alarm is indicated when the internal diagnostics determines an internal failure of the EEPROM.

If this condition is encountered, the Main Base Board will need to be replaced.

A155 – Serial EEPROM Storage Failure Error Alarm

Action taken by control: Machine is shut down.
Reset Method: Manual

This alarm is indicated when an internal diagnostic finds an error on critical data. The following points are critical data items:

- TYPE, *Unit Type* (Configuration Mode, Sub-mode UNIT)
- TONS, *Unit Size* (Configuration Mode, Sub-mode UNIT)
- CMP.A, *Number Circ A Compressor* (Configuration Mode, Sub-mode UNIT)
- CMP.B, *Number Circ B Compressor* (Configuration Mode, Sub-mode UNIT)
- FAN.S, *Fan Staging Select* (Configuration Mode, Sub-mode UNIT)
- FLUD, *Cooler Fluid* (Configuration Mode, Sub-mode OPT1)
- HPCT, *Head Press Control Type* (Configuration Mode, Sub-mode OPT1)
- CNP.I, *Condenser Pump Interlock* (Configuration Mode, Sub-mode OPT1)
- CSP1, *Cooling Set Point 1* (Set Point Mode, Sub-mode COOL)
- HSP1, *Heating Set Point 1* (Set Point Mode, Sub-mode HEAT)

If this condition is encountered,

- Download the software to the module.
- Consider replacing the Main Base Board.

A156 – Critical Serial EEPROM Storage Failure Error Alarm

Action taken by control: Machine is shut down.

Reset Method: Manual

This alarm is indicated when an internal diagnostic finds an error on critical data.

If this condition is encountered,

- Consider replacing the Main Base Board.

A157 – A/D Hardware Failure Alarm

Action taken by control: Machine is shut down.

Reset Method: Manual

This alarm occurs when the Analog to Digital Converter, an internal component on the Main Base Board, fails.

If this condition is encountered,

- Consider replacing the Main Base Board.

A159 – Loss of Condenser Flow Alarm

Action taken by control: Machine is shut down.

Reset Method: Manual

This alarm is tested only when the condenser pump is ON. It is generated if the condenser flow switch fails to close within 1 minute of start-up of the condenser pump, or if it opens for 10 seconds during normal operation. If the alarm is generated, the machine will be shut down, but the condenser pump operation will not be affected.

If a water regulating valve is used, CND.I, *Condenser Pump Interlock* (Configuration Mode, Sub-mode OPT1) should not be used.

The CNPC *Condenser Pump Control* (Configuration Mode, Sub-mode OPT1) must be “ON WITH MODE” or “ON WITH COMPRESSOR(S)” for this algorithm to be active.

With Version 4.0 software and later on 30HXC brine applications, if the condenser water flow switch opens, the chilled water pump will be commanded off simultaneously with the compressors.

If this condition is encountered, check the following items:

- Check for a wiring error to the condenser flow switch.
- Check the condenser flow switch setting.
- Check for low condenser water flow.
- Check for a condenser water pump failure.

A172 – Loss of Communication with EXV Module Alarm

Action taken by control: Machine is shut down.

Reset Method: Automatic

If the Main Base Board loses communication with the EXV Module, the alarm will be tripped.

The alarm will reset automatically, once communication is re-established.

If this condition is encountered, check the following items:

- Check the red LED on the board. All red LEDs should be blinking in unison.
- Check the Local Equipment Network (LEN) for a wiring error.
- Check for a 24 volt supply to the EXV module.
- Check the EXV module address.
- Check for a grounded EXD/Economizer Cable or motor assembly. A short to ground can disable the communications bus.

T173 – Loss of Communications with Energy Management Module Alert

Action taken by control: EMM options are disabled.

Reset Method: Automatic

This alarm is tested only if EMM, *EMM Module Installed*, (Configuration Mode, Sub-mode OPT1) is YES, or an option is configured that requires the EMM. The alert is triggered if the MBB loses communication with the EMM. If the alert is indicated the following actions will be taken by the control:

- CRST, *Cooling Reset Type*, (Configuration Mode, Sub-mode RSET) from external temperature or 4-20 ma input will be disabled.
- DMDC, *Demand Limit Select*, (Configuration Mode, Sub-mode RSET) Demand Limit by Switch Control or 4-20 ma input will be disabled.
- CLSP, *Cooling Set Point Select*, (Configuration Mode, Sub-mode SCLT) Set point by an external switch or 4-20 ma will be ignored. Set point will be controlled by CSP1, *Cooling Set Point 1*, (Set Point Mode, Sub-mode COOL).
- ICE.M, *Ice Mode Enable*, (Configuration Mode, Sub-mode OPT2) Ice Build shall be disabled.

The alert will reset automatically, once communication is re-established.

If this condition is encountered, check the following items:

- Check the red LED on the board. All red LEDs should be blinking in unison.
- Check the Local Equipment Network (LEN) for a wiring error.
- Check for a 24 volt supply to the EMM module.
- Check the EMM module address.

- If there is no EMM board installed, check the configurations that would require the EMM board. If any are enabled, and the EMM is not installed, this alarm will be generated.

T174 – 4-20 mA Cool Setpoint Input Failure Alert

Action taken by control: CSP.1 will be used for set point.

Reset Method: Automatic

This alarm is tested only if EMM, *EMM Module Installed*, (Configuration Mode, Sub-mode OPT1) is YES, and the communication status is good. The alert is triggered if the input signal is less than 2 mA or greater than 22 mA. If the alert is indicated the control will use CSP.1, *Cooling Set Point 1*, (Set Point Mode, Sub-mode COOL).

The alert will reset automatically, once the input signal returns to the normal range of 2-22 mA. Once the signal returns to normal range, the option will function again.

Care should be taken when interfacing with other manufacturer's control systems, due to power supply differences, full wave bridge versus half wave rectification. The two different power supplies cannot be mixed. ComfortLink controls use half wave rectification. A signal isolation device should be utilized if a full wave bridge signal generating device is used.

A software problem was discovered with the Enhanced Screw Software Version 1.1 and 1.2 (CESR-131344-01-01 and CESR-131344-01-02), where the internal input channels for 4-20 mA Temperature Reset and 4-20 mA Cooling Set Point were swapped. The problem can be corrected by connecting the signal to the opposite connection point.

If this condition is encountered, check the following items:

- Confirm the input signal value, CSP, *4-20 mA Cooling Set Point* (Inputs Mode, Sub-mode 4-20). A flashing * indicates an input error.
- Confirm the proper polarity of the 4-20 mA signal.
- Check the input signal wiring.
- In the Enhanced Software Versions CESR-131344-01-01 and CESR-131344-01-02, the channel assignments for 4-20 mA Cooling Set Point and Temperature Reset are swapped. An input on the TB6-3 and TB6-5 as indicated on the wiring diagram is read as a temperature reset input instead of a cooling set point input.

Service Bulletins pertaining to this condition:

- SMB040024 - 30GX/HX Series 6, 4-20 mA Temperature Reset and Cooling Set Point

This bulletin described a problem with the Enhanced Screw Software Versions 1.1 and 1.2 (CESR-131344-01-01 and CESR-131344-01-02) in which the control inputs for 4-20 mA inputs for Temperature Reset and Cooling Set Point were swapped. The function will operate properly if the input signals are sent to the opposite connection point.

T175 – 4-20 mA Heat Setpoint Input Failure Alert

Action taken by control: HSP.1 is used for set point.

Reset Method: Automatic

This alarm is tested only if EMM, *EMM Module Installed*, (Configuration Mode, Sub-mode OPT1) is YES, and the communication status is good. The alert is triggered if the input signal is less than 2 mA or greater than 22 mA. If the alert is indicated the control will use HSP.1, *Heating Set Point 1*, (Set Point Mode, Sub-mode HEAT).

The alert will reset automatically, once the input signal returns to the normal range of 2-22 mA. Once the signal returns to normal range, the option will function again.

Care should be taken when interfacing with other manufacturer's control systems, due to power supply differences, full wave bridge versus half wave rectification. The two different power supplies cannot be mixed. ComfortLink controls use half wave rectification. A signal isolation device should be utilized if a full wave bridge signal generating device is used.

If this condition is encountered, check the following items:

- Confirm the input signal value, HSP, *4-20 mA Heating Set Point* (Inputs Mode, Sub-mode 4-20).
- Confirm the proper polarity of the 4-20 mA signal.
- Check the input signal wiring.

T176 – 4-20 mA Reset Input Failure Alert

Action taken by control: Reset option is disabled.

Reset Method: Automatic

This alarm is tested only if EMM, *EMM Module Installed*, (Configuration Mode, Sub-mode OPT1) is YES, and the communication status is good. The alert is triggered if the input signal is less than 2 mA or greater than 22 mA. If the alert is indicated the control will terminate reset.

The alert will reset automatically, once the input signal returns to the normal range of 2-22 mA, and reset will begin again.

Care should be taken when interfacing with other manufacturer's control systems, due to power supply differences, full wave bridge versus half wave rectification. The two different power supplies cannot be mixed. ComfortLink controls use half wave rectification. A signal isolation device should be utilized if a full wave bridge signal generating device is used.

A software problem was discovered with the Enhanced Screw Software Version 1.1 and 1.2 (CESR-131344-01-01 and CESR-131344-01-02), where the internal input channels for 4-20 mA Temperature Reset and 4-20 mA Cooling Set Point were swapped. The problem can be corrected by connecting the signal to the opposite connection point.

If this condition is encountered, check the following items:

- Confirm the input signal value, RSET, *4-20 mA Reset Signal* (Inputs Mode, Sub-mode 4-20). A flashing * indicates an input error.
- Confirm the proper polarity of the 4-20 mA signal.
- Check the input signal wiring.
- In the Enhanced Software Versions CESR-131344-01-01 and CESR-131344-01-02, the channel assignments for 4-20 mA Cooling Set Point and Temperature Reset are swapped. An input on the TB6-2 and TB6-5 as indicated on the wiring diagram is read as a cooling set point input instead of a temperature reset input.

Service Bulletins pertaining to this condition:

- SMB040024 - 30GX/HX Series 6, 4-20 mA Temperature Reset and Cooling Set Point

This bulletin described a problem with the Enhanced Screw Software Versions 1.1 and 1.2 (CESR-131344-01-01 and CESR-131344-01-02) in which the control inputs for 4-20 mA inputs for Temperature Reset and Cooling Set Point were swapped. The function will operate properly if the input signals are sent to the opposite connection point.

T177 – 4-20 mA Demand Limit Input Failure Alert

Action taken by control: Reset option is disabled.

Reset Method: Automatic

This alarm is tested only if EMM, *EMM Module Installed*, (Configuration Mode, Sub-mode OPT1) is YES, and the communication status is good. The alert is triggered if the input signal is less than 2 mA or greater than 22 mA. If the alert is indicated the control will terminate reset.

The alert will reset automatically, once the input signal returns to the normal range of 2-22 mA, and reset will begin again.

Care should be taken when interfacing with other manufacturer's control systems, due to power supply differences, full wave bridge versus half wave rectification. The two different power supplies cannot be mixed. ComfortLink controls use half wave rectification. A signal isolation device should be utilized if a full wave bridge signal generating device is used.

A software problem was discovered with the Enhanced Screw Software Version 1.1 and 1.2 (CESR-131344-01-01 and CESR-131344-01-02), where the internal input channels

for 4-20 mA Demand Limit were accidentally reassigned.. The problem can be corrected by connecting the signal from TB6-1 to EMM-J6-11.

If this condition is encountered, check the following items:

- Confirm the input signal value, DMND, *4-20 mA Demand Signal* (Inputs Mode, Sub-mode 4-20). A flashing “*” indicates an error on the input.
- Confirm the proper polarity of the 4-20 mA signal.
- Check the input signal wiring.
- For the Enhanced Screw Software Versions 1.1 and 1.2 (CESR-131344-01-01 and CESR-131344-01-02) the control input for 4-20 mA Demand Limit channel assignment is not correct. The wire from EMM-J6-2 must be moved to EMM-J6-11 for the controller to function.

Service Bulletins pertaining to this condition:

- SMB040031 - 30GX/HX Series 6, 4-20 mA Demand Limit Error
This bulletin described a problem with the Enhanced Screw Software Versions 1.1 and 1.2 (CESR-131344-01-01 and CESR-131344-01-02) in which the control inputs for 4-20 mA inputs for Demand Limit are not read by the controller. The control must be rewired.

A178 – Loss of Communication with Screw Chiller Module Alarm

Action taken by control: Machine is shut down.

Reset Method: Automatic

If the Main Base Board loses communication with the Screw Chiller Module (SCB), the alarm will be tripped.

The alarm will reset automatically, once communication is re-established.

If this condition is encountered, check the following items:

- Check the red LED on the board. All red LEDs should be blinking in unison.
- Check the Local Equipment Network (LEN) for a wiring error.
- Check for a 24 volt supply to the SCB module.
- Check the SCB module address.
- For Software Versions prior to Version 5.0 (CESR-131248-05-00) consider upgrading to at least Version 5.0. On units connected to CCN, when a large number of EEPROM instructions were being written, it could cause a loss of communication alarm.

A180 - Loss of Communication with Compressor Protection Module 1 Alarm

A181 - Loss of Communication with Compressor Protection Module 2 Alarm

Action taken by control: Machine is shut down.

Reset Method: Automatic

If the Main Base Board loses communication with the ComfortLink Compressor Protection (CCP) Module, the alarm will be tripped. Any compressor controlled by the affected CCP, will be considered unavailable.

On software versions earlier than 4.0 the machine would not restart after a brief power interruption. This was caused by the MBB not seeing the power loss, while the TI board did. It has been fixed by having the MBB receive information from the TI board that it has seen a power loss. The MBB will then restart the unit.

The alarm will reset automatically, once communication is re-established.

If this condition is encountered, check the following items:

- Check the red LED on the board. All red LEDs should be blinking in unison.
- Check the Local Equipment Network (LEN) for a wiring error.
- Check for a 24 volt supply to the CCP module.
- Check the CCP module address.
- Consider upgrading the software, if the software version is 3.1 or earlier.

T182 – Compressor Protection Module 1 Internal Diagnostic Alert

T183 – Compressor Protection Module 2 Internal Diagnostic Alert

Action taken by control: Affected compressors are shut down.

Reset Method: Manual (CCP, MBB)

This alert is generated if the Main Base Board receives an internal diagnostic alert from a ComfortLink Compressor Protection (CCP) Module. This failure will require the power to the CCP to be removed in order to reset the alert. Clear the alert from the CCP first, before clearing it from the Main Base Board.

If this condition is encountered,

- Check for EMI sources around the module.
- Consider replacing the CCP module if the module continues to trip on this alert.

A184 – CPM Module 1 – Module has Experienced too Many Power Cycles Alarm

A185 – CPM Module 2 – Module has Experienced too Many Power Cycles Alarm

Action taken by control: Unit is shut down.

Reset Method: Manual (MBB)

This alarm was added in Version 4.0 (CESR-131248-04-00) software and continues in the Enhanced Screw software (CESR-13144-XX-XX). This alarm will be generated if the ComfortLink Compressor Protection Module experiences at least five (5) power losses in less than one (1) hour.

Although this is listed as a manual reset alarm, the alarm does not shut the machine down.

If this condition is encountered,

- Check for faulty wiring to the CCP module.
- Check power supply.
- This alarm can be generated if the control power has been interrupted enough times to trigger this alarm while servicing the machine.

A200 – Cooler Pump Interlock Failed at Start-Up

Action taken by control: Unit prevented from starting.

Reset Method: Manual

This alarm is signaled by one of two conditions. If the cooler pump interlock does not close within 5 minutes of the unit transitioning from OFF to ON, or after the start of the cooler pump, the alarm will be generated.

If this condition is encountered, check the following items:

- Check the operation of the cooler pump.
- Check the operation of the chilled water flow switch.
- Check the Flow Switch Relay (FSR) for proper operation. On early 30HX machines produced with the thermal dispersion flow switch, the wiring diagram was incorrect. The diagram showed the ORN wires to FSR connected to terminals FSR-1 and FSR-8 rather than FSR-1 and FSR-3.
- Check the wiring of the chilled water pump interlock, flow switch, auxiliary contacts, etc.
- Check to be sure that any isolation valves are open or are functioning properly.
- Check the chilled water strainer for any restriction.

A201 – Cooler Pump Interlock Failure Contacts Open During Normal Operation Alarm

Action taken by control: Unit shut down.

Reset Method: Manual

This alarm is tested only after the criteria for A200 has been satisfied. This alarm is signaled if the cooler pump interlock opens for 15 seconds continuously.

A new Operating Mode, Mode 29 Unit OFF: No Water Flow was added in MBB Software Version 5.0 (CESR131248-05-00) and is indicated when an A201 – Cooler Pump Interlock Failure Contacts Open During Normal Operation alarm condition has been detected. The control will delay indicating an A201 alarm for five (5) minutes for flow to be established again, during which time this mode will be active. If flow has not been established within five (5) minutes, an A201 alarm will be indicated.

If this condition is encountered, check the following items:

- Check the Flow Switch Relay (FSR) for proper operation.

- Check the chilled water flow switch for proper operation.
- Check the chilled water loop to be sure that it is completely filled with water.
- Check the chilled water pump interlock circuit for proper operation
- Check the pump electrical circuit for power.
- Check the pump circuit breaker
- Check the pump contactor for proper operation.
- Check the chilled water pump for proper operation. Look for overload trips.
- Check the chilled water strainer for a restriction.
- Check to be sure that all isolation valves are open completely.
- Consider upgrading the software if

A202 – Cooler Pump Interlock Failure Contacts Closed While Pump is OFF Alarm

Action taken by control: Unit shut down.

Reset Method: Manual

For this alarm to be checked by the controls, CPC *Cooler Pump Control* (Configuration Mode, Sub-mode OPT1) must be set to ON. This alarm is signaled only if the cooler pump interlock is closed for 10 seconds just before the cooler pump is started.

If this condition is encountered, check the following items:

- Check the operation of the cooler pump. Be sure that it is not in a manual mode, running continuously.
- Check the cooler pump relay and starter for proper operation.
- Check the operation of the chilled water flow switch, or other device installed in series.
- Check the Flow Switch Relay (FSR) for proper operation.
- Check the wiring of the chilled water pump interlock, flow switch, auxiliary contacts, etc.
- In Main Base Board (MBB) Version 2.0 and 3.1 software, if the machine is a duplex module or arranged in parallel flow and pump control is enabled, the machine will alarm when it is started. See Cooler Pump Control on page 34 for information on how to address this situation.

T203 – Loss of Communication with the Slave Chiller Alert

Action taken by control: Master becomes the lead chiller.

Reset Method: Automatic

This alarm is tested only on the master chiller when LLEN, *Lead/Lag Chiller Enable* (Configuration Mode, RSET Sub- mode) is set to ENBL. The master chiller initiates all communication. If there is no response, or the response is no acknowledgement for 3 minutes, the alert will be generated. The master chiller will act as a stand alone machine. The master chiller will continue to re-establish the communication.

The alarm will reset automatically, once communication is re-established.

If this condition is encountered, check the following items:

- Check the Carrier Comfort Network (CCN) wiring.
- Be sure the Slave Chiller has control power.
- Be sure that the Slave Chiller CCNA, *CCN Address* (Configuration Mode, Sub-mode OPT2) matches the SLVA, *Slave Address* (Configuration Mode, Sub-mode RSET) in the Master Chiller.

T204 – Loss of Communication with the Master Chiller Alert

Action taken by control: Slave operates as a stand alone chiller.

Reset Method: Automatic

This alarm is tested only on the master chiller when LLEN, *Lead/Lag Chiller Enable* (Configuration Mode, Sub-mode RSET) is set to ENBL. The master chiller initiates all communication. If there is no communication from the master chiller for 3 minutes, the alert will be generated. The slave chiller will become a stand alone machine. The master chiller will continue to re-establish the communication.

The alarm will reset automatically, once communication is re-established.

If this condition is encountered, check the following items:

- Check the Carrier Comfort Network (CCN) wiring.
- Be sure the Master Chiller has control power.
- Be sure that the Slave Chiller CCNA, *CCN Address* (Configuration Mode, Sub-mode OPT2) matches the SLVA, *Slave Address* (Configuration Mode, Sub-mode RSET) in the Master Chiller.

T205 – Master and Slave Chiller with Same Address Alert

Action taken by control: Dual Chiller control disabled.

Reset Method: Automatic

This alarm is tested only on the master chiller when LLEN, *Lead/Lag Chiller Enable* (Configuration Mode, Sub-mode RSET) is set to ENBL, and MSSL, *Master/Slave Select* (Configuration Mode, Sub-mode RSET) is MAST. The master chiller checks its CCN address, CCNA, *CCN Address* (Configuration Mode, Sub-mode OPT2) against the slave address entered in SLVA, *Slave Address* (Configuration Mode, Sub-mode RSET). If the two addresses are the same, the alert will be generated.

The alarm will reset automatically, once the address conflict is corrected.

If this condition is encountered, check the following items:

- Be sure that the Slave Chiller CCNA, *CCN Address* (Configuration Mode, Sub-mode OPT2) matches the SLVA, *Slave Address* (Configuration Mode, Sub-mode RSET) in the Master Chiller. Check the Master Chiller CCNA, *CCN Address* (Configuration

Mode, Sub-mode OPT2) to be sure that it is not the same as the Slave chiller address.

T206 – High Leaving Chilled Water Temperature Alert

Action taken by control: None

Reset Method: Automatic

The criterion for this alert is checked when the unit is ON and the total available capacity is 100%. The alert is generated when the leaving chilled water temperature is greater than the LCWT, *High LCW Alert Limit* (Configuration Mode, Sub-mode OPT2) plus the control point and the leaving chilled water temperature is higher than it was 1 minute before the current reading. The LCWT is a delta temperature, not an absolute value. The alert will automatically reset when the leaving water temperature is less than the control point, or is less than the control point plus LCWT minus 5 °F (2.8 °C).

If this condition is encountered,

- Check building load
- Check the LCWT, *High LCW Alert Limit* (Configuration Mode, Sub-mode OPT2) value
- Check compressor operation
- Check water flow

A207 – Cooler Freeze Protection Alarm

Action taken by control: Chiller shut down or prevented from starting

Reset Method: Automatic/Manual (MBB)

This alarm will be generated when the entering or leaving water temperature is below BR.FZ, *Brine Freeze Point* (Configuration Mode, Sub-mode SERV) plus 2 °F (1.1 °C). When this condition is encountered, the machine will enter Mode 16, and the Chilled Water Pump relay will be energized, even if the CPC *Cooler Pump Control* (Configuration Mode, Sub-mode OPT1) is OFF. The unit will be shut down or prevented from starting.

The control will allow the machine to reset automatically if the leaving chilled water temperature rises above the CSP.1 *Cooling Setpoint 1* (Set Point Mode, Sub-mode COOL) plus 6 °F (3.3 °C). If the alarm is generated again within an 18 hour period, it shall be a manual reset.

If this condition is encountered, check the following items:

- Check the entering or leaving water thermistor for accuracy.
- Check water flow rate.
- Check for freezing conditions.
- Check the heat tape and other freeze protection means for proper operation.
- Check glycol concentration and adjust BR.FZ accordingly.

T210 – Winterization Required Alert

Action taken by control: None

Reset Method: Manual (MBB)

This alert was added in Version 4.0 software. This alert is generated when the unit is off and the Saturated Condensing Temperature on either circuit is less than 32 °F (0 °C). The Alert is displayed and the unit is allowed to run. The purpose of the alert is to notify the owner of the potential cooler freeze condition. Once the winterization is complete, the alert criteria is reset after 15 consecutive days where the outdoor ambient temperature remains at or above 45 °F (7.2 °C) as sensed by the discharge pressure transducer while the compressor(s) are off.

The trigger point was selected for 32 °F (0 °C) and not the Brine Freeze Point to force the service personnel to check the concentration of glycol to be sure that it is proper for the ambients expected.

If sub-freezing conditions have not been encountered, check the following items:

- Check the Discharge Pressure Transducer calibration, replace as necessary.
- Check the refrigerant charge on the machine.
- If this is a new start-up, or new software has been downloaded, the alert can be generated if the initial pressure scan has not connected with the transducer indicating an open circuit.

In order to reset this alert even if subfreezing conditions have not been encountered, the W.DNE *Winterization Performed* (Configuration Mode, Sub-mode SERV) must be set to YES to reset the alert.

If sub-freezing conditions have been encountered, the following issues must be accomplished.

- The chilled water loop must be winterized, in accordance with the instructions provided in the Controls, Start-Up, Operation and Troubleshooting Book. Once this has been completed, W.DNE *Winterization Performed* (Configuration Mode, Sub-mode SERV) must be set to YES to reset the alert.

This alert is configurable, WM.SG *Winterize Alert Config* (Configuration Mode, Sub-mode OPT2). The factory default is ENBL.

The software logs the date and time of the alert, the time winterization was completed, and if the configuration has changed.

Service Bulletins pertaining to this condition:

T950 – WSM POC Communication Failure Alert

Action taken by control: Unit is allowed to operate as a stand alone machine

Reset Method: Automatic

This alert will be generated if the Main Base Board has not received any communications from the WSM for 5 minutes after a transmission. This is condition is encountered, the WSM forces are removed and the unit is allowed to operate as a stand alone machine.

The alert will reset once communications are re-established.

If this condition is encountered, check the following items:

- Check the configuration of the WSM, be sure that the addresses agree.
- Check the CCN wiring for a proper connection and wiring. Be sure that the plugs are securely seated and connections are tight.
- Check for a faulty WSM or Main Base Board.
- Check for proper power to the devices.

A951 – FSM Loss of Communication Alert

Action taken by control: Unit is allowed to operate as a stand alone machine

Reset Method: Automatic

This alert will be generated if the Main Base Board has not received any communications from the CSM (Chiller System Manager) or FSM (Flotronic System Monitor) for more than 20 seconds. This is condition is encountered, the FSM forces are removed and the unit is allowed to operate as a stand alone machine.

The alert will reset once communications are re-established.

If this condition is encountered, check the following items:

- Check the configuration of the CSM/FSM, be sure that the addresses agree.
- Check the CCN wiring for a proper connection and wiring. Be sure that the plugs are securely seated and connections are tight.
- Check for a faulty CSM/FSM or Main Base Board.
- Check for proper power to the devices.
- If there is no CSM/FSM connected to the machine, check for noise sources on the CCN communication bus.

P998 – Pre-Alert Loss of Refrigerant Flow - Circuit A

T998 – Loss of Refrigerant Flow - Circuit A Alert

P999 – Pre-Alert Loss of Refrigerant Flow - Circuit B

T999 – Loss of Refrigerant Flow - Circuit B Alert

Action taken by control: Circuit is shutdown

Reset Method: Manual

With the introduction of Software Version 3.1 (CESR-131248-03-01), a no refrigerant flow algorithm was added to the software logic. At compressor start, if SST is less than 0 °F (-18 °C) and if Saturated Suction Temperature rate of change is negative (in 5 second increments) at any time between 40 and 90 seconds of runtime, the compressor will shut off. If the circuit started above 0 °F (-18 °C), the algorithm will not start until the circuit goes below 0 °F (-18 °C) for at least 5 seconds and trending negative. After 15 minutes, the compressor start will be attempted again. If the pass criterion is not met, the compressor will be shutdown and the control will generate a no flow alarm.

With Software Version 4.?, (CESR-131248-04-0?) a Pre-alert was implemented. The pre-alert is also in Enhanced Screw Software (CESR-131344-XX-XX). The alert criterion is identical to the T998/T999 criteria for the first start attempt. The Pre-Alert is written to the Alarm History, the appropriate Mode 26 or Mode 27 is initiated as the 15 minute time delay clock is initialized before the second circuit start attempt is made. The alarm LED on the Navigator will blink indicating the alert, but the alarm output will not be activated.

If this condition is encountered, check the following items:

- Check the liquid line strainer to be sure that it is not causing a restriction
- Check the liquid line service valve to be sure that it is open
- Check the liquid line solenoid valves for proper operation, if equipped.
- Check the EXV motor for proper operation.
- Check the Economizer Float/Motor for proper operation.
- Check the circuit refrigerant charge. Low refrigerant charge conditions can lead to this alarm.
- The Close Control Algorithm has sometimes contributed to this alarm. If it is enabled, disable it.
- Check the Suction Pressure Transducer for accuracy.
- Check the Head Pressure Control device for proper operation.

Although this alert was created to protect the compressor, the alert can be disabled. NO.FL, *Enable No Flow Protection*, (Configuration Mode, Sub-mode OPT2) is factory defaulted to "1", Enable. To disable the algorithm, change the value to "0", Disable.

Resetting Alarms and Alerts

The method to reset any alarm or alert depends upon the device that generated the alarm and the type of alarm or alert, automatic or manual. Before any alarm or alert is reset, first find the cause of the alarm or alert and correct the situation

Automatic Alarm or Alert:

An automatic alarm or alert will reset itself, without operator intervention if the condition corrects itself.

Manual Alarm or Alert:

One or more of the following methods must be used to reset the manual alarm or alert.

MBB Alarms and Alerts

To reset a MBB alarm or alert, once the condition has been corrected, from the Navigator. Changing the RCRN *Reset All Current Alarms* (Alarms Mode, Sub-mode RCRN) from NO to YES. Another method is to move the LOCAL-OFF-REMOTE switch from “LOCAL” or “REMOTE” to “OFF” for less than four (4) seconds and back to its original position to reset the alarm or alert.

Alerts T120 Circuit A Low Saturated Suction Temperature and T121 Circuit B Low Saturated Suction Temperature have a 1 hour prohibition timer. Once the alert is generated, 1 hour of time must elapse before the alert can be reset.

ComfortLink Compressor Protection Alarms and Alerts:

Alarms and alerts generated by the ComfortLink Compressor Protection Module (CCP) require an additional step to reset. The alarm must be cleared from the CCP first and then the MBB.

HN67LM103 and HN67LM104 ComfortLink Compressor Protection Module: Correct the condition that caused the alarm or alert first before resetting the alarm.

For all alarms and alerts other than MTA Header Fault – 9.5, press and hold the reset button on the CPM circuit board for a minimum of 3 seconds. This action will clear the alarm or alert from the affected circuit without shutting down the active circuit. Then follow the instructions for resetting the MBB alarm.

For CCP alarm MTA Header Fault – 9.5, move the LOCAL-OFF-REMOTE switch to “OFF”. Turn off the control power for a minimum of 5 seconds. This action will remove power to the CCP. Restore the control power and reset the MBB alert as noted above.

Chilled Water Flow Switch

A factory provided chilled water flow switch has always been part of the ComfortLink machines. A paddle switch was provided for this purpose since its introduction. This paddle switch was required to be field installed and wired.

The factory-supplied, vapor-proof, paddle-type flow switch is preferred over the differential pressure switches. The factory provided flow switch is Carrier Part Number, HR81LG005 (McDonnell & Miller P/N: FS8-W). The switch is rated for waterside pressures of 150 psig (1034 kPa), fluid and ambient temperatures down to 32 °F (0 °C) during operation. This switch is acceptable in lower ambients, if the chilled water loop is drained and winterized. If the application is outside of this range, a different flow switch must be field installed, Carrier Part Number, HR81LG010 (McDonnell & Miller P/N: FS7-4W) with a rating of 300 psig (2068 kPa), fluid and ambient temperatures down to -65 °F (-53 °C) must be purchased and installed. With both switches, the

conduit connection to the flow switch must be sealed. Failure to do so will allow water to accumulate on the switch head. The flow switch still requires that the paddle be trimmed for the appropriate size pipe. See the manufacturer's instructions supplied with the switch.

Beginning with Serial Numbers 1201F71080 (30GXN/GXR), 4401Q (30HXA/HXC) a factory installed and calibrated thermal dispersion flow switch HR81LG015 is supplied. The flow switch is located in the entering water nozzle. The flow switch is connected to the control system by a special cable with a watertight connector. This device uses a triac output that cannot be connected directly to the Main Base Board. As a result, a control relay, HN61KK025 is used to signal the Main Base Board that chilled water flow is detected.

When power is supplied to the device, a warm-up period is initiated. During this period, the right-most green LED is lit and turned off as each LED to the left is successively lit until the left-most red LED is lit. The warm-up period may take up to 30 seconds. When some flow is detected but not enough for machine operation, a red LED at the far left will be illuminated. With increasing flow, successive red LEDs illuminate. When the switch determines flow is present, the amber LED illuminates indicating the output has closed. **This is not an indication of minimum flow.** Increasing flow above the amber LED output indication illuminates the first green LED. Each successive green LED indicates greater flow. The switch closure does not indicate minimum flow for the machine. With one green LED lit, minor fluctuations in water flow may cause nuisance alarms. Additional green LEDs indicate higher flow rates, and can avoid the nuisance alarms.

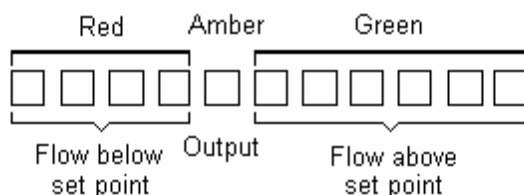


Figure 12 - Chilled Water Flow Switch LED Display

The switch is calibrated to light the amber LED at a fluid velocity of 0.8 ft/sec (0.24 m/sec). The flow rate will depend on the nozzle size.

Schedule 40 Pipe					
Size	O.D., in	Wall Thickness, in	I.D., in	Area, ft ²	GPM (l/s)
4	4.500	0.237	4.026	0.09	32 (2.02)
5	5.563	0.258	5.047	0.14	50 (3.15)
6	6.625	0.280	6.065	0.20	72 (4.54)
8	8.625	0.322	7.981	0.35	125 (7.89)

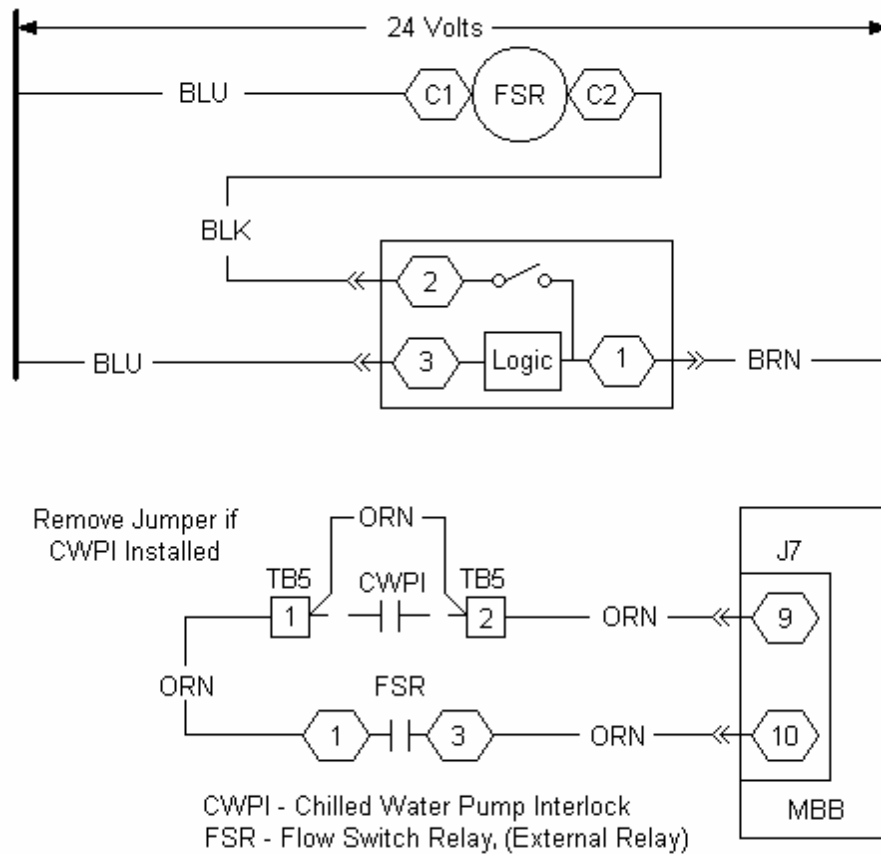


Figure 13 - Chilled Water Flow Switch Simplified Wiring

On early 30HX machines produced with the thermal dispersion flow switch, the wiring diagram was incorrect. The diagram showed the ORN wires to FSR connected to terminals FSR-1 and FSR-8 rather than FSR-1 and FSR-3.

If the switch is removed, tighten the switch in the fitting to 10 ft-lbs (13.55 N-m).

Troubleshooting:

There is very little troubleshooting that can be done with this device. For reference, the cable pin connection is shown below.

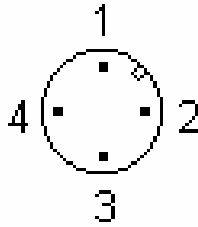


Figure 14 - Chilled Water Flow Switch Cable Pin Designation

No display or output from the flow sensor:

- Check for 24 vac across pins 1 and 3. These are small pins and caution should be used when measuring the voltage in the harness so as not to damage the connector.
- Check flow switch pin connections for damage.

Flow sensor indicates zero flow when flow is present:

- Check for air in the chilled water system.
- Check for 24 vac across pins 1 and 3. These are small pins and caution should be used when measuring the voltage in the harness so as not to damage the connector.
- Check for fouling on the sensor switch, inhibiting the dissipation of heat from the probe.
- Consider replacing the flow switch. It could be out of calibration, the internal heater was damaged from extreme temperatures, pressure or vibration, or mechanical damage to the tip of the device has occurred.

Flow Sensor indicates flow when no flow is present:

- Check for 24 vac across pins 1 and 3. These are small pins and caution should be used when measuring the voltage in the harness so as not to damage the connector. Low voltage can lead to less heat generated by the internal heater.
- Consider replacing the flow switch. It could be out of calibration, the internal heater was damaged from extreme temperatures, pressure or vibration, or mechanical damage to the tip of the device has occurred.

Service Bulletins pertaining to this issue:

- SMB000001 – 30GX/HX Installation Review/Flow Switch
This bulletin provided a installation checklist to check for proper installation of the machines and noted the factory provided flow switch.

ComfortLink Control Boards

All connections to the Comfortlink Control Boards are made with trifurcated crimp terminals in board connectors. Use the following tool to make the crimp connections for the board connector for all connections other than thermistors. For thermistor connections, see Thermistors on page 239.

Description	Manufacturer	Part Number
Crimper, Micro Pin	Packard Electric	3157075
	Paladin Tools	1631

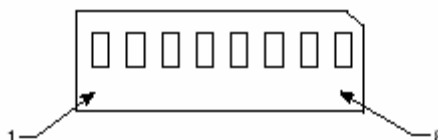
ComfortLink Compressor Protection Module (CCP)

This device monitors the high pressure switch, running current and motor temperature for its compressor. One module is used to control two compressors. The ComfortLink Compressor Protection Module (CCP) controls the compressor contactors, compressor oil solenoid and motor cooling solenoid. The CPM controls the compressor contactors, compressor oil solenoid and motor cooling solenoid.

During the initialization period of the module, the Must Trip Amp (MTA) value as determined by the Configuration Header is transmitted to the Main Base Board as a feedback voltage signal. After the initialization period, the feedback voltage signals an alarm condition. A feedback voltage of zero (0), signals a normal operating condition. The feedback voltage signal can only be accessed through Network Service Tool.

The Must Trip Amp (MTA) value is configured with the use of an eight (8) position programmable header. The header defines a binary equivalent of the MTA value for each compressor based on the following formula and the table below.

$$\text{Header Configuration Value} = \frac{(\text{Must Trip Amps} - 50)}{2}$$



Jumper Position	1	2	3	4	5	6	7	8
Binary Equivalent	2 ⁷	2 ⁶	2 ⁵	2 ⁴	2 ³	2 ²	2 ¹	2 ⁰
Value	128	64	32	16	8	4	2	1

To use an example, Compressor A1 in a 30GXN174-A-540-- has a MTA setting of 522 amps. The punchouts corresponding to 522 amps is 4, 7, and 8. This leaves jumpers 1, 2, 3, 5, and 6 intact.

Manipulating the formula above to find the MTA, results in the following equation:

$$\text{Must Trip Amps} = [(\text{Header Configuration Value}) \times 2] + 50$$

Adding the results of the intact jumpers: $((128+64+32+8+4) + 50) * 2$

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$$\text{Must Trip Amps} = [(128 + 64 + 32 + 8 + 4) \times 2] + 50 = 522$$

$$\text{Must Trip Amps} = 522$$

Table 1 - 30GXN Compressor MTA Settings, 115 °F (46 °C) Ambient

115 °F (46 °C) Ambient (Model Number Position 10: “-”, “E”, “S”, or “U”)									
30GXN 30GXR	Voltage V-Hz	Compressor MTA Header Punch Outs				Compressor MTA			
		A1	A2	B1	B2	A1	A2	B1	B2
080	575-60	1,2,3,5,6	-	1,2,3,4,7,8	-	88	-	74	-
	380-60	1,2,4,6,8	-	1,2,3	-	134	-	112	-
	230-60	1,3,5,7	-	1,3,4,5,6	-	220	-	184	-
	208/230-60	1,4,5,6,7	-	1,3,4,7	-	244	-	204	-
	460-60	1,2,3,8	-	1,2,3,5,7	-	110	-	92	-
	230-50	1,3,8	-	1,3,4,6	-	238	-	200	-
	380/415-50	1,2,4	-	1,2,4,5,6	-	144	-	120	-
083	575-60	1,2,3,4,7,8	-	1,2,3,4,6,7,8	-	74	-	66	-
	380-60	1,2,4,5,6,7,8	-	1,2,3,6,8	-	114	-	102	-
	230-60	1,3,4,5,7	-	1,2,6	-	188	-	168	-
	208/230-60	1,3,4	-	1,3,4,5,7,8	-	208	-	186	-
	460-60	1,2,3,5,8	-	1,2,3,5,6,7	-	94	-	84	-
	230-50	1,3,4,8	-	1,2,7	-	206	-	172	-
	380/415-50	1,2,4,5,8	-	1,2,3,6	-	126	-	104	-
090 220B	575-60	1,2,3	-	1,2,3,4,7,8	-	112	-	74	-
	380-60	1,2,6	-	1,2,3	-	168	-	112	-
	230-60	1,5,6,7	-	1,3,4,5,6	-	276	-	184	-
	208/230-60	2,3,4,5,6,7,8	-	1,3,4,7	-	306	-	204	-
	460-60	1,2,4,7,8	-	1,2,3,5,7	-	138	-	92	-
	230-50	1,6,8	-	1,3,4,6	-	294	-	200	-
	380/415-50	1,3,4,5,6,7,8	-	1,2,4,5,6	-	178	-	120	-
093	575-60	1,2,3,5	-	1,2,3,4,6,7,8	-	96	-	66	-
	380-60	1,2,4	-	1,2,3,6,8	-	144	-	102	-
	230-60	1,3	-	1,2,6	-	240	-	168	-
	208/230-60	1,4,7,8	-	1,3,4,5,7,8	-	266	-	186	-
	460-60	1,2,4,5,6	-	1,2,3,5,6,7	-	120	-	84	-
	230-50	1,4,5,6	-	1,2,7	-	248	-	172	-
	380/415-50	1,2,5,6,8	-	1,2,3,6	-	150	-	104	-
106	575-60	1,2,4,7,8	-	1,2,3,4,7,8	-	138	-	74	-
	380-60	1,3,5,6,7,8	-	1,2,3	-	210	-	112	-
	230-60	2,3,5,6	-	1,3,4,5,6	-	344	-	184	-
	208/230-60	2,4,5,8	-	1,3,4,7	-	382	-	204	-
	460-60	1,2,7	-	1,2,3,5,7	-	172	-	92	-
	230-50	2,3	-	1,3,4,6	-	368	-	200	-
	380/415-50	1,3,5,8	-	1,2,4,5,6	-	222	-	120	-
108	575-60	1,2,4,5,6,8	-	1,2,3,4	-	118	-	80	-
	380-60	1,3,4,5,6,7,8	-	1,2,4,5,6	-	178	-	120	-
	230-60	2,3,4,5,7	-	1,3,4,6	-	316	-	200	-
	208/230-60	2,3,4,6,8	-	1,3,5,8	-	326	-	222	-
	460-60	1,2,5,6,7,8	-	1,2,3,6,7	-	146	-	100	-
	230-50	2,3,4,5,7	-	1,3,4	-	316	-	208	-
	380/415-50	1,3,4,5,7,8	-	1,2,4,5,8	-	186	-	126	-
114	575-60	1,2,4,7,8	-	1,2,3,5,6	-	138	-	88	-
	380-60	1,3,5,6,7,8	-	1,2,4,6,8	-	210	-	134	-
	230-60	2,3,5,6	-	1,3,5,7	-	344	-	220	-
	208/230-60	2,4,5,8	-	1,4,5,6,7	-	382	-	244	-
	460-60	1,2,7	-	1,2,3,8	-	172	-	110	-
115 240B	230-50	2,4,8	-	1,3,5,8	-	398	-	222	-
	380/415-50	1,3	-	1,2,4,6,8	-	240	-	134	-
118	575-60	1,2,4,5,6,8	-	1,2,3,5,8	-	118	-	94	-
	380-60	1,3,4,5,6,7,8	-	1,2,4,8	-	178	-	142	-

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115 °F (46 °C) Ambient (Model Number Position 10: “-”, “E”, “S”, or “U”)									
30GXN 30GXR	Voltage V-Hz	Compressor MTA Header Punch Outs				Compressor MTA			
		A1	A2	B1	B2	A1	A2	B1	B2
	230-60	2,3,4,5,7	-	1,3,7	-	316	-	236	-
	208/230-60	2,3,4,6,8	-	1,4,6,7	-	326	-	260	-
	460-60	1,2,5,6,7,8	-	1,2,4,5,6,8	-	146	-	118	-
	230-50	2,3,4,5,7	-	1,4,5,7,8	-	316	-	250	-
	380/415-50	1,3,4,5,7,8	-	1,2,5,6	-	186	-	152	-
125 220A 240A	575-60	1,2,5,7,8	-	1,2,3,7,8	-	154	-	106	-
	380-60	1,3,7,8	-	1,2,6,7,8	-	234	-	162	-
	230-60	2,4,6,7	-	1,4,6	-	388	-	264	-
	208/230-60	2,7	-	1,6,8	-	428	-	294	-
	460-60	1,3,4,6,7,8	-	1,2,4,6,7	-	194	-	132	-
	230-50	2,4,8	-	1,4	-	398	-	272	-
380/415-50	1,3	-	1,2,6,7	-	240	-	164	-	
128	575-60	1,2,4,6	-	1,2,3,5,8	-	136	-	94	-
	380-60	1,3,4,7	-	1,2,4,8	-	204	-	142	-
	230-60	2,3,5,6,7,8	-	1,3,7	-	338	-	236	-
	208/230-60	2,4,5,6,8	-	1,4,6,7	-	374	-	260	-
	460-60	1,2,7,8	-	1,2,4,5,6,8	-	170	-	118	-
	230-50	2,3,6,7,8	-	1,4,5,7,8	-	354	-	250	-
	380/415-50	1,3,5,6,8	-	1,2,5,6	-	214	-	152	-
138 283B 303B 373B	575-60	1,2,4,6	-	1,2,4,5,6,8	-	136	-	118	-
	380-60	1,3,4,7	-	1,3,4,5,6,7,8	-	204	-	178	-
	230-60	2,3,5,6,7,8	-	2,3,4,5,7	-	338	-	316	-
	208/230-60	2,4,5,6,8	-	2,3,4,6,8	-	374	-	326	-
	460-60	1,2,7,8	-	1,2,5,6,7,8	-	170	-	146	-
	230-50	2,3,6,7,8	-	2,3,4,5,7	-	354	-	316	-
380/415-50	1,3,5,6,8	-	1,3,4,5,7,8	-	214	-	186	-	
153 283A 328B 393B 418B	575-60	1,2,7,8	-	1,2,4,5,6,8	-	170	-	118	-
	380-60	1,4,6,7,8	-	1,3,4,5,6,7,8	-	258	-	178	-
	230-60	2,7	-	2,3,4,5,7	-	428	-	316	-
	208/230-60	3,5,6	-	2,3,4,6,8	-	472	-	326	-
	460-60	1,3,5,6,8	-	1,2,5,6,7,8	-	214	-	146	-
	230-50	3,4,5,6	-	2,3,4,5,7	-	440	-	316	-
	380/415-50	1,4,7,8	-	1,3,4,5,7,8	-	266	-	186	-
163 303A	575-60	1,2,7,8	-	1,2,4,6	-	170	-	136	-
	380-60	1,4,6,7,8	-	1,3,4,7	-	258	-	204	-
	230-60	2,7	-	2,3,5,6,7,8	-	428	-	338	-
	208/230-60	3,5,6	-	2,4,5,6,8	-	472	-	374	-
	460-60	1,3,5,6,8	-	1,2,7,8	-	214	-	170	-
	230-50	3,4,5,6	-	2,3,6,7,8	-	440	-	354	-
	380/415-50	1,4,7,8	-	1,3,5,6,8	-	266	-	214	-
178 328A 353A/B	575-60	1,2,7,8	-	1,2,7,8	-	170	-	170	-
	380-60	1,4,6,7,8	-	1,4,6,7,8	-	258	-	258	-
	230-60	2,7	-	2,7	-	428	-	428	-
	208/230-60	3,5,6	-	3,5,6	-	472	-	472	-
	460-60	1,3,5,6,8	-	1,3,5,6,8	-	214	-	214	-
	230-50	3,4,5,6	-	3,4,5,6	-	440	-	440	-
	380/415-50	1,4,7,8	-	1,4,7,8	-	266	-	266	-
208	575-60	1,2,4,6	1,2,4,6	1,2,4,5,6,8	-	136	136	118	-
	380-60	1,3,4,7	1,3,4,7	1,3,4,5,6,7,8	-	204	204	178	-
	230-60	2,3,5,6,7,8	2,3,5,6,7,8	2,3,4,5,7	-	338	338	316	-
	208/230-60	2,4,5,6,8	2,4,5,6,8	2,3,4,6,8	-	374	374	326	-
	460-60	1,2,7,8	1,2,7,8	1,2,5,6,7,8	-	170	170	146	-
	230-50	2,3,6,7,8	2,3,6,7,8	2,3,4,5,7	-	354	354	316	-
	380/415-50	1,3,5,6,8	1,3,5,6,8	1,3,4,5,7,8	-	214	214	186	-
228 453A/B 478B	575-60	1,2,7,8	1,2,4,6	1,2,4,5,6,8	-	170	136	118	-
	380-60	1,4,6,7,8	1,3,4,7	1,3,4,5,6,7,8	-	258	204	178	-
	230-60	2,7	2,3,5,6,7,8	2,3,4,5,7	-	428	338	316	-
	208/230-60	3,5,6	2,4,5,6,8	2,3,4,6,8	-	472	374	326	-
	460-60	1,3,5,6,8	1,2,7,8	1,2,5,6,7,8	-	214	170	146	-
	230-50	3,4,5,6	2,3,6,7,8	2,3,4,5,7	-	440	354	316	-
	380/415-50	1,4,7,8	1,3,5,6,8	1,3,4,5,7,8	-	266	214	186	-

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115 °F (46 °C) Ambient (Model Number Position 10: “-”, “E”, “S”, or “U”)									
30GXN 30GXR	Voltage V-Hz	Compressor MTA Header Punch Outs				Compressor MTA			
		A1	A2	B1	B2	A1	A2	B1	B2
253 373A 393A 478A 503A/B	575-60	1,2,7,8	1,2,7,8	1,2,4,6	-	170	170	136	-
	380-60	1,4,6,7,8	1,4,6,7,8	1,3,4,7	-	258	258	204	-
	230-60	2,7	2,7	2,3,5,6,7,8	-	428	428	338	-
	208/230-60	3,5,6	3,5,6	2,4,5,6,8	-	472	472	374	-
	460-60	1,3,5,6,8	1,3,5,6,8	1,2,7,8	-	214	214	170	-
	230-50	3,4,5,6	3,4,5,6	2,3,6,7,8	-	440	440	354	-
	380/415-50	1,4,7,8	1,4,7,8	1,3,5,6,8	-	266	266	214	-
268 418A 528A/B	575-60	1,2,7,8	1,2,7,8	1,2,7,8	-	170	170	170	-
	380-60	1,4,6,7,8	1,4,6,7,8	1,4,6,7,8	-	258	258	258	-
	230-60	2,7	2,7	2,7	-	428	428	428	-
	208/230-60	3,5,6	3,5,6	3,5,6	-	472	472	472	-
	460-60	1,3,5,6,8	1,3,5,6,8	1,3,5,6,8	-	214	214	214	-
	230-50	3,4,5,6	3,4,5,6	3,4,5,6	-	440	440	440	-
	380/415-50	1,4,7,8	1,4,7,8	1,4,7,8	-	266	266	266	-

Table 2 - 30GXN Compressor MTA Settings, 125 °F (51.6 °C) Ambient

125 °F (51.6 °C) Ambient (Model Number Position 10: “A”, “F”, “T”, or “V”)									
30GXN 30GXR	Voltage V-Hz	Compressor MTA Header Punch Outs				Compressor MTA			
		A1	A2	B1	B2	A1	A2	B1	B2
080	575-60	1,2,3,5,8	-	1,2,3,4,8	-	94	-	78	-
	380-60	1,2,4,8	-	1,2,4,5,6,8	-	142	-	118	-
	230-60	1,3,6	-	1,3,4,5	-	232	-	192	-
	208/230-60	1,4,6,7,8	-	1,3,5,6,8	-	258	-	214	-
	460-60	1,2,4,5,6,7	-	1,2,3,5	-	116	-	96	-
	230-50	1,4,5,6	-	1,3,4,8	-	248	-	206	-
	380/415-50	1,2,5,6,8	-	1,2,4,5,7	-	150	-	124	-
083	575-60	1,2,3,5,6,7	-	1,2,3,4,6,8	-	84	-	70	-
	380-60	1,2,4,5	-	1,2,3,7	-	128	-	108	-
	230-60	1,3,5,6,7	-	1,2	-	212	-	176	-
	208/230-60	1,3,7,8	-	1,3,4,6,7	-	234	-	196	-
	460-60	1,2,3,7,8	-	1,2,3,5,6	-	106	-	88	-
	230-50	1,3,5	-	1,3,4,5,6,8	-	224	-	182	-
	380/415-50	1,2,4,6,8	-	1,2,3,8	-	134	-	110	-
090 220B	575-60	1,2,4,5,6,7	-	1,2,3,4,8	-	116	-	78	-
	380-60	1,2	-	1,2,4,5,6,8	-	176	-	118	-
	230-60	1,5	-	1,3,4,5	-	288	-	192	-
	208/230-60	2,3,4,5,7,8	-	1,3,5,6,8	-	314	-	214	-
	460-60	1,2,4	-	1,2,3,5	-	144	-	96	-
	230-50	2,3,4,5,6,7	-	1,3,4,8	-	308	-	206	-
	380/415-50	1,3,4,5,7,8	-	1,2,4,5,7	-	186	-	124	-
093	575-60	1,2,3,6	-	1,2,3,4,6,8	-	104	-	70	-
	380-60	1,2,5,8	-	1,2,3,7	-	158	-	108	-
	230-60	1,4,6,7	-	1,2	-	260	-	176	-
	208/230-60	1,5	-	1,3,4,6,7	-	288	-	196	-
	460-60	1,2,4,6,7,8	-	1,2,3,5,6	-	130	-	88	-
	230-50	1,4,7	-	1,3,4,5,6,8	-	268	-	182	-
	380/415-50	1,2,6,7,8	-	1,2,3,8	-	162	-	110	-
106	575-60	1,2,4,7	-	1,2,3,4,8	-	140	-	78	-
	380-60	1,3,5,6,7	-	1,2,4,5,6,8	-	212	-	118	-
	230-60	2,3,5,7	-	1,3,4,5	-	348	-	192	-
	208/230-60	2,4,5	-	1,3,5,6,8	-	384	-	214	-
	460-60	1,2,8	-	1,2,3,5	-	174	-	96	-
	230-50	2,4,5,6,7	-	1,3,4,8	-	372	-	206	-
	380/415-50	1,3,5	-	1,2,4,5,7	-	224	-	124	-
108	575-60	1,2,4,5	-	1,2,3,5,6	-	128	-	88	-
	380-60	1,3,4,6,7,8	-	1,2,4,6,7	-	194	-	132	-
	230-60	2,3,4,5	-	1,3,5,7	-	320	-	220	-

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125 °F (51.6 °C) Ambient (Model Number Position 10: "A", "F", "T", or "V")									
30GXN 30GXR	Voltage V-Hz	Compressor MTA Header Punch Outs				Compressor MTA			
		A1	A2	B1	B2	A1	A2	B1	B2
	208/230-60	2,3,6,7,8	-	1,4,5,6,7	-	354	-	244	-
	460-60	1,2,5	-	1,2,3,8	-	160	-	110	-
	230-50	2,3,4,6,7	-	1,3,6,7	-	324	-	228	-
	380/415-50	1,3,4,7,8	-	1,2,4,7,8	-	202	-	138	-
114	575-60	1,2,4,7	-	1,2,3,5,8	-	140	-	94	-
	380-60	1,3,5,6,7	-	1,2,4,8	-	212	-	142	-
	230-60	2,3,5,7	-	1,3,6	-	348	-	232	-
	208/230-60	2,4,5	-	1,4,6,7,8	-	384	-	258	-
	460-60	1,2,8	-	1,2,4,5,6,7	-	174	-	116	-
115 240B	230-50	2,4,8	-	1,3,6,7	-	398	-	228	-
	380/415-50	1,3	-	1,2,4,7,8	-	240	-	138	-
118	575-60	1,2,4,5	-	1,2,3,6	-	128	-	104	-
	380-60	1,3,4,6,7,8	-	1,2,5,8	-	194	-	158	-
	230-60	2,3,4,5	-	1,4,6,8	-	320	-	262	-
	208/230-60	2,3,6,7,8	-	1,5	-	354	-	288	-
	460-60	1,2,5	-	1,2,4,6,7,8	-	160	-	130	-
	230-50	2,3,4,6,7	-	1,5,6,8	-	324	-	278	-
	380/415-50	1,3,4,7,8	-	1,2,6	-	202	-	168	-
125 220A 240A	575-60	1,2,5,7,8	-	1,2,3,7	-	154	-	108	-
	380-60	1,3,7,8	-	1,2,6,7	-	234	-	164	-
	230-60	2,4,6,7	-	1,4,7	-	388	-	268	-
	208/230-60	2,7	-	1,7,8	-	428	-	298	-
	460-60	1,3,4,6,7,8	-	1,2,4,6,8	-	194	-	134	-
	230-50	2,4,8	-	1,5,6,7	-	398	-	276	-
	380/415-50	1,3	-	1,2,6,8	-	240	-	166	-
128	575-60	1,2,5,7,8	-	1,2,3,6	-	154	-	104	-
	380-60	1,3,7,8	-	1,2,5,8	-	234	-	158	-
	230-60	2,4,6,7	-	1,4,6,8	-	388	-	262	-
	208/230-60	2,7	-	1,5	-	428	-	288	-
	460-60	1,3,4,6,7,8	-	1,2,4,6,7,8	-	194	-	130	-
	230-50	2,4,8	-	1,5,6,8	-	398	-	278	-
	380/415-50	1,3	-	1,2,6	-	240	-	168	-
135 275A/B 300B 365B 390B 395B	575-60	1,2,5,7,8	-	1,2,4,5	-	154	-	128	-
	380-60	1,3,7,8	-	1,3,4,6,7,8	-	234	-	194	-
	230-60	2,4,6,7	-	2,3,4,5	-	388	-	320	-
	208/230-60	2,7	-	2,3,6,7,8	-	428	-	354	-
	460-60	1,3,4,6,7,8	-	1,2,5	-	194	-	160	-
	230-50	2,4,8	-	2,3,4,6,7	-	398	-	324	-
	380/415-50	1,3	-	1,3,4,7,8	-	240	-	202	-
	575-60	1,2,5,7,8	-	1,2,4,5	-	154	-	128	-
138 283B 303B 373B	380-60	1,3,7,8	-	1,3,4,6,7,8	-	234	-	194	-
	230-60	2,4,6,7	-	2,3,4,5	-	388	-	320	-
	208/230-60	2,7	-	2,3,6,7,8	-	428	-	354	-
	460-60	1,3,4,6,7,8	-	1,2,5	-	194	-	160	-
	230-50	2,4,8	-	2,3,4,6,7	-	398	-	324	-
	380/415-50	1,3	-	1,3,4,7,8	-	240	-	202	-
	575-60	1,2,4,5	-	1,3,4,5,7	-	128	-	188	-
150 370B	380-60	1,3,4,6,7,8	-	1,5,8	-	194	-	286	-
	230-60	2,3,4,5	-	3,5,6	-	320	-	472	-
	208/230-60	2,3,6,7,8	-	4,7,8	-	354	-	522	-
	460-60	1,2,5	-	1,3,7	-	160	-	236	-
	230-50	2,3,5,7	-	2,5,6,7	-	348	-	404	-
	380/415-50	1,3,5,6,7,8	-	1,4,5,6,8	-	210	-	246	-
	575-60	1,3,4,5,7	-	1,2,4,5	-	188	-	128	-
153 283A 328B 393B 418B	380-60	1,5,8	-	1,3,4,6,7,8	-	286	-	194	-
	230-60	3,5,6	-	2,3,4,5	-	472	-	320	-
	208/230-60	4,7,8	-	2,3,6,7,8	-	522	-	354	-
	460-60	1,3,7	-	1,2,5	-	236	-	160	-
	230-50	3,6,7	-	2,3,5,7	-	484	-	348	-
	380/415-50	1,6,8	-	1,3,5,6,7,8	-	294	-	210	-
160	575-60	1,2,5,7,8	-	1,3,4,5,7	-	154	-	188	-

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125 °F (51.6 °C) Ambient (Model Number Position 10: "A", "F", "T", or "V")									
30GXN 30GXR	Voltage V-Hz	Compressor MTA Header Punch Outs				Compressor MTA			
		A1	A2	B1	B2	A1	A2	B1	B2
300A 320A/B 415B	380-60	1,3,7,8	-	1,5,8	-	234	-	286	-
	230-60	2,4,6,7	-	3,5,6	-	388	-	472	-
	208/230-60	2,7	-	4,7,8	-	428	-	522	-
	460-60	1,3,4,6,7,8	-	1,3,7	-	194	-	236	-
	230-50	2,4,8	-	3,6	-	398	-	488	-
	380/415-50	1,3	-	1,6,8	-	240	-	294	-
163 303A	575-60	1,3,4,5,7	-	1,2,5,7,8	-	188	-	154	-
	380-60	1,5,8	-	1,3,7,8	-	286	-	234	-
	230-60	3,5,6	-	2,4,6,7	-	472	-	388	-
	208/230-60	4,7,8	-	2,7	-	522	-	428	-
	460-60	1,3,7	-	1,3,4,6,7,8	-	236	-	194	-
	230-50	3,6,7	-	2,4,8	-	484	-	398	-
174	380/415-50	1,6,8	-	1,3	-	294	-	240	-
	575-60	1,3,4,5,7	-	1,3,4,5,7	-	188	-	188	-
	380-60	1,5,8	-	1,5,8	-	286	-	286	-
	230-60	3,5,6	-	3,5,6	-	472	-	472	-
	208/230-60	4,7,8	-	4,7,8	-	522	-	522	-
	460-60	1,3,7	-	1,3,7	-	236	-	236	-
175 345A/B	230-50	3,6	-	3,6	-	488	-	488	-
	380/415-50	1,6,8	-	1,6,8	-	294	-	294	-
178 328A 353A 353B	575-60	1,3,4,5,7	-	1,3,4,5,7	-	188	-	188	-
	380-60	1,5,8	-	1,5,8	-	286	-	286	-
	230-60	3,5,6	-	3,5,6	-	472	-	472	-
	208/230-60	4,7,8	-	4,7,8	-	522	-	522	-
	460-60	1,3,7	-	1,3,7	-	236	-	236	-
	230-50	3,6,7	-	3,6,7	-	484	-	484	-
204	380/415-50	1,6,8	-	1,6,8	-	294	-	294	-
	575-60	1,3,4,5,7	1,2,3,5,7,8	1,2,5,7,8	-	188	90	154	-
	380-60	1,5,8	1,2,4,6	1,3,7,8	-	286	136	234	-
	230-60	3,5,6	1,3,6,7	2,4,6,7	-	472	228	388	-
	208/230-60	4,7,8	1,4,5,7	2,7	-	522	252	428	-
	460-60	1,3,7	1,2,4,5,6,7,8	1,3,4,6,7,8	-	236	114	194	-
205 410B	230-50	2,4,8	1,3,6,7	3,6	-	398	228	488	-
	380/415-50	1,3	1,2,4,7,8	1,6,8	-	240	138	294	-
208	575-60	1,2,5,7,8	1,2,5,7,8	1,2,4,5	-	154	154	128	-
	380-60	1,3,7,8	1,3,7,8	1,3,4,6,7,8	-	234	234	194	-
	230-60	2,4,6,7	2,4,6,7	2,3,4,5	-	388	388	320	-
	208/230-60	2,7	2,7	2,3,6,7,8	-	428	428	354	-
	460-60	1,3,4,6,7,8	1,3,4,6,7,8	1,2,5	-	194	194	160	-
	230-50	2,4,8	2,4,8	2,3,5,7	-	398	398	348	-
225 370A 410A 440A/B 450A/B 470B 475B	380/415-50	1,3	1,3	1,3,5,6,7,8	-	240	240	210	-
	575-60	1,3,4,5,7	1,2,3,7	1,3,4,5,7	-	188	108	188	-
	380-60	1,5,8	1,2,6,7	1,5,8	-	286	164	286	-
	230-60	3,5,6	1,4,7	3,5,6	-	472	268	472	-
	208/230-60	4,7,8	1,7,8	4,7,8	-	522	298	522	-
	460-60	1,3,7	1,2,4,6,8	1,3,7	-	236	134	236	-
228 453A/B 478B	230-50	3,6	1,5,6,7	3,6	-	488	276	488	-
	380/415-50	1,6,8	1,2,6,8	1,6,8	-	294	166	294	-
	575-60	1,3,4,5,7	1,2,5,7,8	1,2,4,5	-	188	154	128	-
	380-60	1,5,8	1,3,7,8	1,3,4,6,7,8	-	286	234	194	-
	230-60	3,5,6	2,4,6,7	2,3,4,5	-	472	388	320	-
	208/230-60	4,7,8	2,7	2,3,6,7,8	-	522	428	354	-
249 475A 500A/B	460-60	1,3,7	1,3,4,6,7,8	1,2,5	-	236	194	160	-
	230-50	3,6,7	2,4,8	2,3,5,7	-	484	398	348	-
	380/415-50	1,6,8	1,3	1,3,5,6,7,8	-	294	240	210	-
	575-60	1,3,4,5,7	1,3,4,5,7	1,2,5,7,8	-	188	188	154	-
	380-60	1,5,8	1,5,8	1,3,7,8	-	286	286	234	-
475A 500A/B	230-60	3,5,6	3,5,6	2,4,6,7	-	472	472	388	-
	208/230-60	4,7,8	4,7,8	2,7	-	522	522	428	-
	460-60	1,3,7	1,3,7	1,3,4,6,7,8	-	236	236	194	-

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125 °F (51.6 °C) Ambient (Model Number Position 10: "A", "F", "T", or "V")									
30GXN 30GXR	Voltage V-Hz	Compressor MTA Header Punch Outs				Compressor MTA			
		A1	A2	B1	B2	A1	A2	B1	B2
250 365A 470A 495A/B	230-50	3,6	2,4,8	3,6	-	488	398	488	-
	380/415-50	1,6,8	1,3	1,6,8	-	294	240	294	-
253 373A 393A 478A 503A 503B	575-60	1,3,4,5,7	1,3,4,5,7	1,2,5,7,8	-	188	188	154	-
	380-60	1,5,8	1,5,8	1,3,7,8	-	286	286	234	-
	230-60	3,5,6	3,5,6	2,4,6,7	-	472	472	388	-
	208/230-60	4,7,8	4,7,8	2,7	-	522	522	428	-
	460-60	1,3,7	1,3,7	1,3,4,6,7,8	-	236	236	194	-
	230-50	3,6,7	3,6,7	2,4,8	-	484	484	398	-
	380/415-50	1,6,8	1,6,8	1,3	-	294	294	240	-
264 390A 395B 415A 520A/B 525A/B	575-60	1,3,4,5,7	1,3,4,5,7	1,3,4,5,7	-	188	188	188	-
	380-60	1,5,8	1,5,8	1,5,8	-	286	286	286	-
	230-60	3,5,6	3,5,6	3,5,6	-	472	472	472	-
	208/230-60	4,7,8	4,7,8	4,7,8	-	522	522	522	-
	460-60	1,3,7	1,3,7	1,3,7	-	236	236	236	-
	230-50	3,6	3,6	3,6	-	488	488	488	-
	380/415-50	1,6,8	1,6,8	1,6,8	-	294	294	294	-
268 418A 528A 528B	575-60	1,3,4,5,7	1,3,4,5,7	1,3,4,5,7	-	188	188	188	-
	380-60	1,5,8	1,5,8	1,5,8	-	286	286	286	-
	230-60	3,5,6	3,5,6	3,5,6	-	472	472	472	-
	208/230-60	4,7,8	4,7,8	4,7,8	-	522	522	522	-
	460-60	1,3,7	1,3,7	1,3,7	-	236	236	236	-
	230-50	3,6,7	3,6,7	3,6,7	-	484	484	484	-
	380/415-50	1,6,8	1,6,8	1,6,8	-	294	294	294	-
281	575-60	1,3,4,5,7	1,2,3,7	1,3,4,5,7	1,2,3,7	188	108	188	108
	380-60	1,5,8	1,2,6,7	1,5,8	1,2,6,7	286	164	286	164
	460-60	1,3,7	1,2,4,6,8	1,3,7	1,2,4,6,8	236	134	236	134
	380/415-50	1,6,8	1,2,6,8	1,6,8	1,2,6,8	294	166	294	166
301	575-60	1,3,4,5,7	1,2,4,5	1,3,4,5,7	1,2,4,5	188	128	188	128
	380-60	1,5,8	1,3,4,6,7,8	1,5,8	1,3,4,6,7,8	286	194	286	194
	460-60	1,3,7	1,2,5	1,3,7	1,2,5	236	160	236	160
	380/415-50	1,6,8	1,3,4,7,8	1,6,8	1,3,4,7,8	294	202	294	202
325	575-60	1,3,4,5,7	1,2,5,7,8	1,3,4,5,7	1,2,5,7,8	188	154	188	154
	380-60	1,5,8	1,3,7,8	1,5,8	1,3,7,8	286	234	286	234
	460-60	1,3,7	1,3,4,6,7,8	1,3,7	1,3,4,6,7,8	236	194	236	194
	380/415-50	1,6,8	1,3	1,6,8	1,3	294	240	294	240
350	575-60	1,3,4,5,7	1,3,4,5,7	1,3,4,5,7	1,3,4,5,7	188	188	188	188
	380-60	1,5,8	1,5,8	1,5,8	1,5,8	286	286	286	286
	460-60	1,3,7	1,3,7	1,3,7	1,3,7	236	236	236	236
	380/415-50	1,6,8	1,6,8	1,6,8	1,6,8	294	294	294	294

Table 3 – 30HXA Compressor MTA Settings

Unit	Voltage V-Hz	Compressor MTA Header Punchouts			Compressor MTA		
		A1	A2	B1	A1	A2	B1
30HXA076	575-60	1,2,3,4	—	1,2,3,4	80	—	80
	380-60	1,2,4,5,7,8	—	1,2,4,5,7,8	122	—	122
	230-60	1,3,4,7,8	—	1,3,4,7,8	202	—	202
	208/230-60	1,3,5	—	1,3,5	224	—	224
	460-60	1,2,3,6,7	—	1,2,3,6,7	100	—	100
	230-50	1,3,5,6,7,8	—	1,3,5,6,7,8	210	—	210
	380/415-50	1,2,4,5,8	—	1,2,4,5,8	126	—	126
30HXA086	575-60	1,2,3,5	—	1,2,3,4	96	—	80
	380-60	1,2,5,6,7,8	—	1,2,4,5,7,8	146	—	122
	230-60	1,4,5,6,7,8	—	1,3,4,7,8	242	—	202

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Unit	Voltage V-Hz	Compressor MTA Header Punchouts			Compressor MTA		
		A1	A2	B1	A1	A2	B1
	208/230-60	1,4,7	—	1,3,5	268	—	224
	460-60	1,2,4,5,6	—	1,2,3,6,7	120	—	100
	230-50	1,4,5,8	—	1,3,5,6,7,8	254	—	210
	380/415-50	1,2,5,7,8	—	1,2,4,5,8	154	—	126
30HXA096	575-60	1,2,4,5,6,8	—	1,2,3,4	118	—	80
	380-60	1,3,4,5,6,7,8	—	1,2,4,5,7,8	178	—	122
	230-60	1,6,8	—	1,3,4,7,8	294	—	202
	208/230-60	2,3,4,6,8	—	1,3,5	326	—	224
	460-60	1,2,5,6,7,8	—	1,2,3,6,7	146	—	100
	230-50	2,3,4,5,6,7	—	1,3,5,6,7,8	308	—	210
	380/415-50	1,3,4,5,7,8	—	1,2,4,5,8	186	—	126
30HXA106	575-60	1,2,4,8	—	1,2,3,4	142	—	80
	380-60	1,3,5,6	—	1,2,4,5,7,8	216	—	122
	230-60	2,3,6,8	—	1,3,4,7,8	358	—	202
	208/230-60	2,4,8	—	1,3,5	398	—	224
	460-60	1,3,4,5,6,7,8	—	1,2,3,6,7	178	—	100
	230-50	2,4,5,6,8	—	1,3,5,6,7,8	374	—	210
	380/415-50	1,3,6,7,8	—	1,2,4,5,8	226	—	126
30HXA116	575-60	1,2,4,8	—	1,2,3,5	142	—	96
	380-60	1,3,5,6	—	1,2,5,6,7,8	216	—	146
	230-60	2,3,6,8	—	1,4,5,6,7,8	358	—	242
	208/230-60	2,4,8	—	1,4,7	398	—	268
	460-60	1,3,4,5,6,7,8	—	1,2,4,5,6	178	—	120
	230-50	2,4,5,6,8	—	1,4,5,8	374	—	254
	380/415-50	1,3,6,7,8	—	1,2,5,7,8	226	—	154
30HXA126	575-60	1,2,4,8	—	1,2,4,5,6,8	142	—	118
	380-60	1,3,5,6	—	1,3,4,5,6,7,8	216	—	178
	230-60	2,3,6,8	—	1,6,8	358	—	294
	208/230-60	2,4,8	—	2,3,4,6,8	398	—	326
	460-60	1,3,4,5,6,7,8	—	1,2,5,6,7,8	178	—	146
	230-50	2,4,5,6,8	—	2,3,4,5,6,7	374	—	308
	380/415-50	1,3,6,7,8	—	1,3,4,5,7,8	226	—	186
30HXA136	575-60	1,2,8	—	1,2,4,5,6,8	174	—	118
	380-60	1,4,6	—	1,3,4,5,6,7,8	264	—	178
	230-60	3,4,5,6,7	—	1,6,8	436	—	294
	208/230-60	3,6,7	—	2,3,4,6,8	484	—	326
	460-60	1,3,5,7,8	—	1,2,5,6,7,8	218	—	146
	230-50	3,4,7	—	2,3,4,5,6,7	460	—	308
	380/415-50	1,5,6,8	—	1,3,4,5,7,8	278	—	186
30HXA146	575-60	1,2,8	—	1,2,4,8	174	—	142
	380-60	1,4,6	—	1,3,5,6	264	—	216
	230-60	3,4,5,6,7	—	2,3,6,8	436	—	358
	208/230-60	3,6,7	—	2,4,8	484	—	398
	460-60	1,3,5,7,8	—	1,3,4,5,6,7,8	218	—	178
	230-50	3,4,7	—	2,4,5,6,8	460	—	374
	380/415-50	1,5,6,8	—	1,3,6,7,8	278	—	226
30HXA161	575-60	1,3,4,6,7	—	1,2,4,6,7	196	—	132
	380-60	1,7,8	—	1,3,4,6	298	—	200
	230-60	3,7,8	—	2,3,4,7,8	490	—	330
	208/230-60	5	—	2,3,8	544	—	366
	460-60	1,4,5,6,8	—	1,2,6,8	246	—	166
	230-50	4,6,8	—	2,3,5,6,8	518	—	342
	380/415-50	2,3,4,5,6	—	1,3,4,8	312	—	206
30HXA171	575-60	1,2,5	—	1,3,4,6,7	160	—	196
	380-60	1,4,5,6,7	—	1,7,8	244	—	298
	230-60	2,5,6,7,8	—	3,7,8	402	—	490
	208/230-60	3,4,5,8	—	5	446	—	544

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Unit	Voltage V-Hz	Compressor MTA Header Punchouts			Compressor MTA		
		A1	A2	B1	A1	A2	B1
	460-60	1,3,4,7,8	—	1,4,5,6,8	202	—	246
	230-50	2,5	—	4,6,8	416	—	518
	380/415-50	1,4,5,7	—	2,3,4,5,6	252	—	312
	575-60	1,3,4,6,7	—	1,3,4,6,7	196	—	196
30HXA186	380-60	1,7,8	—	1,7,8	298	—	298
	230-60	3,7,8	—	3,7,8	490	—	490
	208/230-60	5	—	5	544	—	544
	460-60	1,4,5,6,8	—	1,4,5,6,8	246	—	246
	230-50	4,6,8	—	4,6,8	518	—	518
	380/415-50	2,3,4,5,6	—	2,3,4,5,6	312	—	312
	575-60	1,2,5	1,2,3,5,7,8	1,3,4,6,7	160	90	196
30HXA206	380-60	1,4,5,6,7	1,2,4,6	1,7,8	244	136	298
	230-60	2,5,6,7,8	1,3,6,7,8	3,7,8	402	226	490
	208/230-60	3,4,5,8	1,4,5,7	5	446	252	544
	460-60	1,3,4,7,8	1,2,4,5,6,7,8	1,4,5,6,8	202	114	246
	230-50	2,5	1,3,7	4,6,8	416	236	518
	380/415-50	1,4,5,7	1,2,4,8	2,3,4,5,6	252	142	312
	575-60	1,3,4,6,7	1,2,4,6,7	1,3,4,6,7	196	132	196
30HXA246	380-60	1,7,8	1,3,4,6	1,7,8	298	200	298
	230-60	3,7,8	2,3,4,7,8	3,7,8	490	330	490
	208/230-60	5	2,3,8	5	544	366	544
	460-60	1,4,5,6,8	1,2,6,8	1,4,5,6,8	246	166	246
	230-50	4,6,8	2,3,5,6,8	4,6,8	518	342	518
	380/415-50	2,3,4,5,6	1,3,4,8	2,3,4,5,6	312	206	312
	575-60	1,3,4,6,7	1,2,5	1,3,4,6,7	196	160	196
30HXA261	380-60	1,7,8	1,4,5,6,7	1,7,8	298	244	298
	230-60	3,7,8	2,5,6,7,8	3,7,8	490	402	490
	208/230-60	5	3,4,5,8	5	544	446	544
	460-60	1,4,5,6,8	1,3,4,7,8	1,4,5,6,8	246	202	246
	230-50	4,6,8	2,5	4,6,8	518	416	518
	380/415-50	2,3,4,5,6	1,4,5,7	2,3,4,5,6	312	252	312
	575-60	1,3,4,6,7	1,3,4,6,7	1,3,4,6,7	196	196	196
30HXA271	380-60	1,7,8	1,7,8	1,7,8	298	298	298
	230-60	3,7,8	3,7,8	3,7,8	490	490	490
	208/230-60	5	5	5	544	544	544
	460-60	1,4,5,6,8	1,4,5,6,8	1,4,5,6,8	246	246	246
	230-50	4,6,8	4,6,8	4,6,8	518	518	518
	380/415-50	2,3,4,5,6	2,3,4,5,6	2,3,4,5,6	312	312	312

Table 4 – 30HXC Compressor MTA Settings

Unit	Voltage V-Hz	Compressor MTA Header Punchouts			Compressor MTA		
		A1	A2	B1	A1	A2	B1
30HXC076	575-60	1,2,3,4,5,6,8	—	1,2,3,4,5,6,8	54	—	54
	380-60	1,2,3,5,6,7,8	—	1,2,3,5,6,7,8	82	—	82
	230-60	1,2,4,6	—	1,2,4,6	136	—	136
	208/230-60	1,2,5,6	—	1,2,5,6	152	—	152
	460-60	1,2,3,4,6,7	—	1,2,3,4,6,7	68	—	68
	230-50	1,2,4,8	—	1,2,4,8	142	—	142
	380/415-50	1,2,3,5,6,8	—	1,2,3,5,6,8	86	—	86
30HXC086	575-60	1,2,3,4,6,7,8	—	1,2,3,4,5,6,8	66	—	54
	380-60	1,2,3,6,7	—	1,2,3,5,6,7,8	100	—	82
	230-60	1,2,6,8	—	1,2,4,6	166	—	136
	208/230-60	1,3,4,5,6	—	1,2,5,6	184	—	152
	460-60	1,2,3,5,6,7,8	—	1,2,3,4,6,7	82	—	68

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Unit	Voltage V-Hz	Compressor MTA Header Punchouts			Compressor MTA		
		A1	A2	B1	A1	A2	B1
	230-50	1,2,8	—	1,2,4,8	174	—	142
	380/415-50	1,2,3,6	—	1,2,3,5,6,8	104	—	86
30HXC096	575-60	1,2,3,4	—	1,2,3,4,5,6,8	80	—	54
	380-60	1,2,4,5,7,8	—	1,2,3,5,6,7,8	122	—	82
	230-60	1,3,4,7,8	—	1,2,4,6	202	—	136
	208/230-60	1,3,5	—	1,2,5,6	224	—	152
	460-60	1,2,3,6,8	—	1,2,3,4,6,7	102	—	68
	230-50	1,3,5,6,7,8	—	1,2,4,8	210	—	142
	380/415-50	1,2,4,5,8	—	1,2,3,5,6,8	126	—	86
30HXC106	575-60	1,2,3,6,7,8	—	1,2,3,4,5,6,8	98	—	54
	380-60	1,2,5,6,7	—	1,2,3,5,6,7,8	148	—	82
	230-60	1,4,5,6,8	—	1,2,4,6	246	—	136
	208/230-60	1,4	—	1,2,5,6	272	—	152
	460-60	1,2,4,5,7,8	—	1,2,3,4,6,7	122	—	68
	230-50	1,4,5,7	—	1,2,4,8	252	—	142
	380/415-50	1,2,5,6	—	1,2,3,5,6,8	152	—	86
30HXC116	575-60	1,2,3,6,7,8	—	1,2,3,4,6,7,8	98	—	66
	380-60	1,2,5,6,7	—	1,2,3,6,7	148	—	100
	230-60	1,4,5,6,8	—	1,2,6,8	246	—	166
	208/230-60	1,4	—	1,3,4,5,6	272	—	184
	460-60	1,2,4,5,7,8	—	1,2,3,5,6,7,8	122	—	82
	230-50	1,4,5,7	—	1,2,8	252	—	174
	380/415-50	1,2,5,6	—	1,2,3,6	152	—	104
30HXC126	575-60	1,2,3,6,7,8	—	1,2,3,4	98	—	80
	380-60	1,2,5,6,7	—	1,2,4,5,7,8	148	—	122
	230-60	1,4,5,6,8	—	1,3,4,7,8	246	—	202
	208/230-60	1,4	—	1,3,5	272	—	224
	460-60	1,2,4,5,7,8	—	1,2,3,6,8	122	—	102
	230-50	1,4,5,7	—	1,3,5,6,7,8	252	—	210
	380/415-50	1,2,5,6	—	1,2,4,5,8	152	—	126
30HXC136	575-60	1,2,4,5,6,8	—	1,2,3,4	118	—	80
	380-60	1,3,4,5,6,7,8	—	1,2,4,5,7,8	178	—	122
	230-60	1,6,8	—	1,3,4,7,8	294	—	202
	208/230-60	2,3,4,6,8	—	1,3,5	326	—	224
	460-60	1,2,5,6,7,8	—	1,2,3,6,8	146	—	102
	230-50	2,3,4,5,6,7,8	—	1,3,5,6,7,8	306	—	210
	380/415-50	1,3,4,5,6	—	1,2,4,5,8	184	—	126
30HXC146	575-60	1,2,4,5,6,8	—	1,2,3,6,7,8	118	—	98
	380-60	1,3,4,5,6,7,8	—	1,2,5,6,7	178	—	148
	230-60	1,6,8	—	1,4,5,6,7	294	—	244
	208/230-60	2,3,4,6,8	—	1,4	326	—	272
	460-60	1,2,5,6,7,8	—	1,2,4,5,7,8	146	—	122
	230-50	2,3,4,5,6,7,8	—	1,4,5,7	306	—	252
	380/415-50	1,3,4,5,6	—	1,2,5,6	184	—	152
30HXC161	575-60	1,2,4,5	—	1,2,3,5,6	128	—	88
	380-60	1,3,4,6,7,8	—	1,2,4,6,8	194	—	134
	230-60	2,3,4,5	—	1,3,5,7	320	—	220
	208/230-60	2,3,6,7	—	1,4,5,6,7	356	—	244
	460-60	1,2,5	—	1,2,3,8	160	—	110
	230-50	2,3,4,7,8	—	1,3,6,7,8	330	—	226
	380/415-50	1,3,4,6	—	1,2,4,6	200	—	136
30HXC171	575-60	1,2,3,7,8	—	1,2,4,5	106	—	128
	380-60	1,2,6,7,8	—	1,3,4,6,7,8	162	—	194
	230-60	1,4,7,8	—	2,3,4,5	266	—	320
	208/230-60	1,6	—	2,3,6,7	296	—	356
	460-60	1,2,4,6,8	—	1,2,5	134	—	160
	230-50	1,4	—	2,3,4,7,8	272	—	330

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Unit	Voltage V-Hz	Compressor MTA Header Punchouts			Compressor MTA		
		A1	A2	B1	A1	A2	B1
	380/415-50	1,2,6,7	—	1,3,4,6	164	—	200
30HXC186	575-60	1,2,4,5	—	1,2,4,5	128	—	128
	380-60	1,3,4,6,7,8	—	1,3,4,6,7,8	194	—	194
	230-60	2,3,4,5	—	2,3,4,5	320	—	320
	208/230-60	2,3,6,7	—	2,3,6,7	356	—	356
	460-60	1,2,5	—	1,2,5	160	—	160
	230-50	2,3,4,7,8	—	2,3,4,7,8	330	—	330
	380/415-50	1,3,4,6	—	1,3,4,6	200	—	200
30HXC206	575-60	1,2,3,7,8	1,2,3,4,5,7	1,2,4,5	106	60	128
	380-60	1,2,6,7,8	1,2,3,5,7,8	1,3,4,6,7,8	162	90	194
	230-60	1,4,7,8	1,2,5,6,8	2,3,4,5	266	150	320
	208/230-60	1,6	1,2,6,8	2,3,6,7	296	166	356
	460-60	1,2,4,6,8	1,2,3,4,7,8	1,2,5	134	74	160
	230-50	1,4	1,2,5,7,8	2,3,4,7,8	272	154	330
	380/415-50	1,2,6,7	1,2,3,5,7	1,3,4,6	164	92	200
30HXC246	575-60	1,2,4,5	1,2,3,5,6	1,2,4,5	128	88	128
	380-60	1,3,4,6,7,8	1,2,4,6,8	1,3,4,6,7,8	194	134	194
	230-60	2,3,4,5	1,3,5,7	2,3,4,5	320	220	320
	208/230-60	2,3,6,7	1,4,5,6,7	2,3,6,7	356	244	356
	460-60	1,2,5	1,2,3,8	1,2,5	160	110	160
	230-50	2,3,4,7,8	1,3,6,7,8	2,3,4,7,8	330	226	330
	380/415-50	1,3,4,6	1,2,4,6	1,3,4,6	200	136	200
30HXC261	575-60	1,2,4,5	1,2,3,7,8	1,2,4,5	128	106	128
	380-60	1,3,4,6,7,8	1,2,6,7,8	1,3,4,6,7,8	194	162	194
	230-60	2,3,4,5	1,4,7,8	2,3,4,5	320	266	320
	208/230-60	2,3,6,7	1,6	2,3,6,7	356	296	356
	460-60	1,2,5	1,2,4,6,8	1,2,5	160	134	160
	230-50	2,3,4,7,8	1,4	2,3,4,7,8	330	272	330
	380/415-50	1,3,4,6	1,2,6,7	1,3,4,6	200	164	200
30HXC271	575-60	1,2,4,5	1,2,4,5	1,2,4,5	128	128	128
	380-60	1,3,4,6,7,8	1,3,4,6,7,8	1,3,4,6,7,8	194	194	194
	230-60	2,3,4,5	2,3,4,5	2,3,4,5	320	320	320
	208/230-60	2,3,6,7	2,3,6,7	2,3,6,7	356	356	356
	460-60	1,2,5	1,2,5	1,2,5	160	160	160
	230-50	2,3,4,7,8	2,3,4,7,8	2,3,4,7,8	330	330	330
	380/415-50	1,3,4,6	1,3,4,6	1,3,4,6	200	200	200

There are two modules, a full current (HN67LM103) and a ½ current (HN67LM104) module. The full current module is used if the two compressors have a Must Trip Amps (MTA) rating less than 314 amps. If either compressor's MTA is above 314 amps, the ½ current module is used.

With the implementation of the new current transformer module, all compressors regardless of MTA value use the full current ComfortLink Compressor Protection module, HN67LM103.

A current transformer module, 30GX502786 is used to sense the current phase rotation and over current conditions for each compressor. The device consists of 3 toroids, with a resistance of 64.3-70.4 Ω. A 0-15 vac signal is sent from this module, corresponding to a 0 to 900 amp current value.

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Beginning with Serial Number 2401F (30GXN,R) and 1102Q (30HX), a new current transformer module was used for machines with compressor MTA's greater than 314 amps. The current transformer module, 30GX504711 is used to sense the current phase rotation and over current conditions for each compressor. The device consists of 3 toroids, with a resistance of 38.5-42 Ω . A 0-15 vac signal is sent from this module, corresponding to a 0 to 900 amp current value.

Both current transformer modules have three (3) toroids in a molded plastic case. A four (4) wire board connector, one for each toroid and a common, is used to connect the toroids to the CCP.

DIP Switches 3 and 4 address each module. The addresses are as follows:

Compressor Protection Module	DIP Switch 1	DIP Switch 3	DIP Switch 4
CCP1	L	0	0
CCP2	L	1	1

With the introduction of ComfortLink to the 30GX/HX products, the old CPM was changed to be able to communicate on the LEN bus. The new CPMs were renamed to ComfortLink Compressor Protection (CCP) to note the change. The software label located on the EPROM indicates the software installed. The software is "100233-1R3 V1 REV x" where "x" is the revision listed below.

Revision 22E

- This EPROM is the original production release of the CCP module.

Revision 23

- This EPROM is the original production release of the CCP module, but since the Local Equipment Network (LEN) could not handle the letter suffixes, the EPROM revision was changed to 23.

Revision 26

Serial Number start: 1303F (30GXN/GXR) and 1603Q (30HXA/HXC).

- Increased the ground fault trip level from 2.5 +/- 2.0 amps to 4.5 +/- 2.0 amps.
- Changed Wye-Delta transition timer from 5 to 2.5 seconds.
- The time delay for no motor current alarm active was increased from 0.6 to 10 seconds.
- The oil output solenoid is now interlocked through software with the compressor contactor output.

The new modules, HN67LM103 (full current) and HN67LM104 (1/2 current) modules are backward compatible with the HN67LM101 (full current) and 30GX503191 (1/2 current) modules. In order for a CCP to be used on a non-ComfortLink machine, DIP Switch #1 must be set to "S".

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The following table describes the CPM usage and lead configuration.

Serial Number Reference	30GXN/GXR: 3400F-2301F 30HXA/HXC: 3400F-0702Q					
Unit	Compressor Protection Module		Compressor Lead Configuration (See notes following table)			
	CPM1	CPM2	A1	A2	B1	B2
30GXN,R080---1	HN67LM103	-	A	-	A	-
30GXN,R080---2	HN67LM103	-	A	-	A	-
30GXN,R080---4	HN67LM103	-	A	-	A	-
30GXN,R080---5	HN67LM103	-	A	-	A	-
30GXN,R080---6	HN67LM103	-	A	-	A	-
30GXN,R080---8	HN67LM103	-	A	-	A	-
30GXN,R080---9	HN67LM103	-	A	-	A	-
30GXN,R090---1	HN67LM103	-	A	-	A	-
30GXN,R090---2	HN67LM103	-	A	-	A	-
30GXN,R090---4	HN67LM104	-	C	-	A	-
30GXN,R090---5	HN67LM104	-	C	-	A	-
30GXN,R090---6	HN67LM103	-	A	-	A	-
30GXN,R090---8	HN67LM103	-	B	-	A	-
30GXN,R090---9	HN67LM103	-	A	-	A	-
30GXN,R106---1	HN67LM103	-	A	-	A	-
30GXN,R106---2	HN67LM103	-	A	-	A	-
30GXN,R106---4	HN67LM104	-	C	-	A	-
30GXN,R106---5	HN67LM104	-	C	-	A	-
30GXN,R106---6	HN67LM103	-	A	-	A	-
30GXN,R106---8	HN67LM104	-	C	-	A	-
30GXN,R106---9	HN67LM103	-	A	-	A	-
30GXN,R114---1	HN67LM103	-	A	-	A	-
30GXN,R114---2	HN67LM103	-	A	-	A	-
30GXN,R114---4	HN67LM104	-	C	-	B	-
30GXN,R114---5	HN67LM104	-	C	-	B	-
30GXN,R114---6	HN67LM103	-	A	-	A	-
30GXN,R115---8	HN67LM104	-	C	-	A	-
30GXN,R115---9	HN67LM103	-	A	-	A	-
30GXN,R125---1	HN67LM103	-	A	-	A	-
30GXN,R125---2	HN67LM103	-	A	-	A	-
30GXN,R125---4	HN67LM104	-	C	-	B	-
30GXN,R125---5	HN67LM104	-	C	-	B	-
30GXN,R125---6	HN67LM103	-	A	-	A	-
30GXN,R125---8	HN67LM104	-	C	-	B	-
30GXN,R125---9	HN67LM103	-	A	-	A	-
30GXN,R135---1	HN67LM103	-	A	-	A	-
30GXN,R135---2	HN67LM103	-	A	-	A	-

30GX/HX ComfortLink Screw Chiller Service Manual

Serial Number Reference	30GXN/GXR: 3400F-2301F 30HXA/HXC: 3400F-0702Q					
Unit	Compressor Protection Module		Compressor Lead Configuration (See notes following table)			
	CPM1	CPM2	A1	A2	B1	B2
30GXN,R135---4	HN67LM104	-	C	-	C	-
30GXN,R135---5	HN67LM104	-	C	-	C	-
30GXN,R135---6	HN67LM103	-	A	-	A	-
30GXN,R135---8	HN67LM104	-	C	-	C	-
30GXN,R135---9	HN67LM103	-	A	-	A	-
30GXN,R150---1	HN67LM103	-	A	-	A	-
30GXN,R150---2	HN67LM103	-	B	-	A	-
30GXN,R150---4	HN67LM104	-	C	-	C	-
30GXN,R150---5	HN67LM104	-	C	-	C	-
30GXN,R150---6	HN67LM103	-	A	-	A	-
30GXN,R150---8	HN67LM104	-	C	-	C	-
30GXN,R150---9	HN67LM103	-	A	-	B	-
30GXN,R160---1	HN67LM103	-	A	-	A	-
30GXN,R160---2	HN67LM103	-	B	-	A	-
30GXN,R160---4	HN67LM104	-	C	-	C	-
30GXN,R160---5	HN67LM104	-	C	-	C	-
30GXN,R160---6	HN67LM103	-	A	-	A	-
30GXN,R160---8	HN67LM104	-	C	-	C	-
30GXN,R160---9	HN67LM103	-	A	-	B	-
30GXN,R174---1	HN67LM103	-	A	-	A	-
30GXN,R174---2	HN67LM103	-	A	-	A	-
30GXN,R174---4	HN67LM104	-	C	-	C	-
30GXN,R174---5	HN67LM104	-	C	-	C	-
30GXN,R174---6	HN67LM103	-	A	-	A	-
30GXN,R175---8	HN67LM104	-	C	-	C	-
30GXN,R175---9	HN67LM103	-	A	-	A	-
30GXN,R204---1	HN67LM103	HN67LM103	A	A	A	-
30GXN,R204---2	HN67LM103	HN67LM103	A	A	A	-
30GXN,R204---4	HN67LM104	HN67LM103	C	A	C	-
30GXN,R204---5	HN67LM104	HN67LM103	C	A	C	-
30GXN,R204---6	HN67LM103	HN67LM103	A	A	A	-
30GXN,R205---8	HN67LM104	HN67LM103	C	A	C	-
30GXN,R205---9	HN67LM103	HN67LM103	A	A	A	-
30GXN,R220A--8	HN67LM104	-	C	-	B	-
30GXN,R220A--9	HN67LM103	-	A	-	A	-
30GXN,R220B--8	HN67LM103	-	B	-	A	-
30GXN,R220B--9	HN67LM103	-	A	-	A	-
30GXN,R225---1	HN67LM103	HN67LM103	A	A	A	-
30GXN,R225---2	HN67LM103	HN67LM103	A	A	A	-
30GXN,R225---4	HN67LM104	HN67LM103	C	A	C	-

30GX/HX ComfortLink Screw Chiller Service Manual

Serial Number Reference	30GXN/GXR: 3400F-2301F 30HXA/HXC: 3400F-0702Q					
Unit	Compressor Protection Module		Compressor Lead Configuration (See notes following table)			
	CPM1	CPM2	A1	A2	B1	B2
30GXN,R225---5	HN67LM104	HN67LM103	C	A	C	-
30GXN,R225---6	HN67LM103	HN67LM103	A	A	A	-
30GXN,R225---8	HN67LM104	HN67LM103	C	A	C	-
30GXN,R225---9	HN67LM103	HN67LM103	A	A	A	-
30GXN,R240A--8	HN67LM104	-	C	-	B	-
30GXN,R240A--9	HN67LM103	-	A	-	A	-
30GXN,R240B--8	HN67LM104	-	C	-	A	-
30GXN,R240B--9	HN67LM103	-	A	-	A	-
30GXN,R249---1	HN67LM103	HN67LM103	A	A	A	-
30GXN,R249---2	HN67LM103	HN67LM103	A	A	A	-
30GXN,R249---4	HN67LM104	HN67LM104	C	C	C	-
30GXN,R249---5	HN67LM104	HN67LM104	C	C	C	-
30GXN,R249---6	HN67LM103	HN67LM103	A	A	A	-
30GXN,R250---8	HN67LM104	HN67LM104	C	C	C	-
30GXN,R250---9	HN67LM103	HN67LM103	A	A	A	-
30GXN,R264---1	HN67LM103	HN67LM103	A	A	A	-
30GXN,R264---2	HN67LM103	HN67LM103	A	A	A	-
30GXN,R264---4	HN67LM104	HN67LM104	C	C	C	-
30GXN,R264---5	HN67LM104	HN67LM104	C	C	C	-
30GXN,R264---6	HN67LM103	HN67LM103	A	A	A	-
30GXN,R264---8	HN67LM104	HN67LM104	C	C	C	-
30GXN,R264---9	HN67LM103	HN67LM103	A	A	A	-
30GXN,R275A--8	HN67LM104	-	C	-	C	-
30GXN,R275A--9	HN67LM103	-	A	-	A	-
30GXN,R275B--8	HN67LM104	-	C	-	C	-
30GXN,R275B--9	HN67LM103	-	A	-	A	-
30GXN,R281---1	HN67LM103	HN67LM103	A	A	A	A
30GXN,R281---2	HN67LM103	HN67LM103	A	A	A	A
30GXN,R281---6	HN67LM103	HN67LM103	A	A	A	A
30GXN,R281---9	HN67LM103	HN67LM103	A	A	A	A
30GXN,R300A--8	HN67LM104	-	C	-	C	-
30GXN,R300A--9	HN67LM103	-	A	-	B	-
30GXN,R301---1	HN67LM103	HN67LM103	A	A	A	A
30GXN,R301---2	HN67LM103	HN67LM103	A	A	A	A
30GXN,R301---6	HN67LM103	HN67LM103	A	A	A	A
30GXN,R301---9	HN67LM103	HN67LM103	A	A	A	A
30GXN,R300B--8	HN67LM104	-	C	-	C	-
30GXN,R300B--9	HN67LM103	-	A	-	A	-
30GXN,R320A--8	HN67LM104	-	C	-	C	-
30GXN,R320A--9	HN67LM103	-	A	-	B	-

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Serial Number Reference	30GXN/GXR: 3400F-2301F 30HXA/HXC: 3400F-0702Q					
Unit	Compressor Protection Module		Compressor Lead Configuration (See notes following table)			
	CPM1	CPM2	A1	A2	B1	B2
30GXN,R320B--8	HN67LM104	-	C	-	C	-
30GXN,R320B--9	HN67LM103	-	A	-	B	-
30GXN,R325---1	HN67LM103	HN67LM103	A	A	A	A
30GXN,R325---2	HN67LM103	HN67LM103	A	A	A	A
30GXN,R325---6	HN67LM103	HN67LM103	A	A	A	A
30GXN,R325---9	HN67LM103	HN67LM103	A	A	A	A
30GXN,R345A--8	HN67LM104	-	C	-	C	-
30GXN,R345A--9	HN67LM103	-	A	-	A	-
30GXN,R345B--8	HN67LM104	-	C	-	C	-
30GXN,R345B--9	HN67LM103	-	A	-	A	-
30GXN,R350---1	HN67LM103	HN67LM103	A	A	A	A
30GXN,R350---2	HN67LM103	HN67LM103	A	A	A	A
30GXN,R350---6	HN67LM103	HN67LM103	A	A	A	A
30GXN,R350---9	HN67LM103	HN67LM103	A	A	A	A
30GXN,R365A--8	HN67LM104	HN67LM104	C	C	C	-
30GXN,R365A--9	HN67LM103	HN67LM103	A	A	A	-
30GXN,R365B--8	HN67LM104	-	C	-	C	-
30GXN,R365B--9	HN67LM103	-	A	-	A	-
30GXN,R370A--1	HN67LM103	HN67LM103	A	A	A	-
30GXN,R370A--2	HN67LM103	HN67LM103	A	A	A	-
30GXN,R370A--4	HN67LM104	HN67LM103	C	A	C	-
30GXN,R370A--5	HN67LM104	HN67LM103	C	A	C	-
30GXN,R370A--6	HN67LM103	HN67LM103	A	A	A	-
30GXN,R370B--1	HN67LM103	-	A	-	A	-
30GXN,R370B--2	HN67LM103	-	B	-	A	-
30GXN,R370B--4	HN67LM104	-	C	-	C	-
30GXN,R370B--5	HN67LM104	-	C	-	C	-
30GXN,R370B--6	HN67LM103	-	A	-	A	-
30GXN,R390A--1	HN67LM103	HN67LM103	A	A	A	-
30GXN,R390A--2	HN67LM103	HN67LM103	A	A	A	-
30GXN,R390A--4	HN67LM104	HN67LM104	C	C	C	-
30GXN,R390A--5	HN67LM104	HN67LM104	C	C	C	-
30GXN,R390A--6	HN67LM103	HN67LM103	A	A	A	-
30GXN,R390B--1	HN67LM103	-	A	-	A	-
30GXN,R390B--2	HN67LM103	-	A	-	A	-
30GXN,R390B--4	HN67LM104	-	C	-	C	-
30GXN,R390B--5	HN67LM104	-	C	-	C	-
30GXN,R390B--6	HN67LM103	-	A	-	A	-
30GXN,R395A--8	HN67LM104	HN67LM104	C	C	C	-
30GXN,R395A--9	HN67LM103	HN67LM103	A	A	A	-

30GX/HX ComfortLink Screw Chiller Service Manual

Serial Number Reference	30GXN/GXR: 3400F-2301F 30HXA/HXC: 3400F-0702Q					
Unit	Compressor Protection Module		Compressor Lead Configuration (See notes following table)			
	CPM1	CPM2	A1	A2	B1	B2
30GXN,R395B--8	HN67LM104	-	C	-	C	-
30GXN,R395B--9	HN67LM103	-	A	-	A	-
30GXN,R410A--8	HN67LM104	HN67LM103	C	A	C	-
30GXN,R410A--9	HN67LM103	HN67LM103	A	A	A	-
30GXN,R410B--8	HN67LM104	HN67LM103	C	A	C	-
30GXN,R410B--9	HN67LM103	HN67LM103	A	A	A	-
30GXN,R415A--1	HN67LM103	HN67LM103	A	A	A	-
30GXN,R415A--2	HN67LM103	HN67LM103	A	A	A	-
30GXN,R415A--4	HN67LM104	HN67LM104	C	C	C	-
30GXN,R415A--5	HN67LM104	HN67LM104	C	C	C	-
30GXN,R415A--6	HN67LM103	HN67LM103	A	A	A	-
30GXN,R415B--1	HN67LM103	-	A	-	A	-
30GXN,R415B--2	HN67LM103	-	B	-	A	-
30GXN,R415B--4	HN67LM104	-	C	-	C	-
30GXN,R415B--5	HN67LM104	-	C	-	C	-
30GXN,R415B--6	HN67LM103	-	A	-	A	-
30GXN,R440A--8	HN67LM104	HN67LM103	C	A	C	-
30GXN,R440A--9	HN67LM103	HN67LM103	A	A	A	-
30GXN,R440B--8	HN67LM104	HN67LM103	C	A	C	-
30GXN,R440B--9	HN67LM103	HN67LM103	A	A	A	-
30GXN,R450A--1	HN67LM103	HN67LM103	A	A	A	-
30GXN,R450A--2	HN67LM103	HN67LM103	A	A	A	-
30GXN,R450A--4	HN67LM104	HN67LM103	C	A	C	-
30GXN,R450A--5	HN67LM104	HN67LM103	C	A	C	-
30GXN,R450A--6	HN67LM103	HN67LM103	A	A	A	-
30GXN,R450B--1	HN67LM103	HN67LM103	A	A	A	-
30GXN,R450B--2	HN67LM103	HN67LM103	A	A	A	-
30GXN,R450B--4	HN67LM104	HN67LM103	C	A	C	-
30GXN,R450B--5	HN67LM104	HN67LM103	C	A	C	-
30GXN,R450B--6	HN67LM103	HN67LM103	A	A	A	-
30HXA076---1	HN67LM103	-	A	-	A	-
30HXA076---2	HN67LM103	-	A	-	A	-
30HXA076---4	HN67LM103	-	A	-	A	-
30HXA076---5	HN67LM103	-	A	-	A	-
30HXA076---6	HN67LM103	-	A	-	A	-
30HXA076---8	HN67LM103	-	A	-	A	-
30HXA076---9	HN67LM103	-	A	-	A	-
30HXA086---1	HN67LM103	-	A	-	A	-
30HXA086---2	HN67LM103	-	A	-	A	-
30HXA086---4	HN67LM103	-	A	-	A	-

30GX/HX ComfortLink Screw Chiller Service Manual

Serial Number Reference	30GXN/GXR: 3400F-2301F 30HXA/HXC: 3400F-0702Q					
Unit	Compressor Protection Module		Compressor Lead Configuration (See notes following table)			
	CPM1	CPM2	A1	A2	B1	B2
30HXA086---5	HN67LM103	-	A	-	A	-
30HXA086---6	HN67LM103	-	A	-	A	-
30HXA086---8	HN67LM103	-	A	-	A	-
30HXA086---9	HN67LM103	-	A	-	A	-
30HXA096---1	HN67LM103	-	A	-	A	-
30HXA096---2	HN67LM103	-	A	-	A	-
30HXA096---4	HN67LM104	-	C	-	A	-
30HXA096---5	HN67LM104	-	C	-	A	-
30HXA096---6	HN67LM103	-	A	-	A	-
30HXA096---8	HN67LM104	-	C	-	A	-
30HXA096---9	HN67LM103	-	A	-	A	-
30HXA106---1	HN67LM103	-	A	-	A	-
30HXA106---2	HN67LM103	-	A	-	A	-
30HXA106---4	HN67LM104	-	C	-	B	-
30HXA106---5	HN67LM104	-	C	-	B	-
30HXA106---6	HN67LM103	-	A	-	A	-
30HXA106---8	HN67LM104	-	C	-	A	-
30HXA106---9	HN67LM103	-	A	-	A	-
30HXA116---1	HN67LM103	-	A	-	A	-
30HXA116---2	HN67LM103	-	A	-	A	-
30HXA116---4	HN67LM104	-	C	-	B	-
30HXA116---5	HN67LM104	-	C	-	B	-
30HXA116---6	HN67LM103	-	A	-	A	-
30HXA116---8	HN67LM104	-	C	-	A	-
30HXA116---9	HN67LM103	-	A	-	A	-
30HXA126---1	HN67LM103	-	A	-	A	-
30HXA126---2	HN67LM103	-	A	-	A	-
30HXA126---4	HN67LM104	-	C	-	C	-
30HXA126---5	HN67LM104	-	C	-	C	-
30HXA126---6	HN67LM103	-	A	-	A	-
30HXA126---8	HN67LM104	-	C	-	A	-
30HXA126---9	HN67LM103	-	A	-	A	-
30HXA136---1	HN67LM103	-	A	-	A	-
30HXA136---2	HN67LM103	-	A	-	A	-
30HXA136---4	HN67LM104	-	C	-	C	-
30HXA136---5	HN67LM104	-	C	-	C	-
30HXA136---6	HN67LM103	-	A	-	A	-
30HXA136---8	HN67LM104	-	C	-	A	-
30HXA136---9	HN67LM103	-	A	-	A	-
30HXA146---1	HN67LM103	-	A	-	A	-

30GX/HX ComfortLink Screw Chiller Service Manual

Serial Number Reference	30GXN/GXR: 3400F-2301F 30HXA/HXC: 3400F-0702Q					
Unit	Compressor Protection Module		Compressor Lead Configuration (See notes following table)			
	CPM1	CPM2	A1	A2	B1	B2
30HXA146---2	HN67LM103	-	A	-	A	-
30HXA146---4	HN67LM104	-	C	-	C	-
30HXA146---5	HN67LM104	-	C	-	C	-
30HXA146---6	HN67LM103	-	A	-	A	-
30HXA146---8	HN67LM104	-	C	-	C	-
30HXA146---9	HN67LM103	-	A	-	A	-
30HXA161---1	HN67LM103	-	A	-	A	-
30HXA161---2	HN67LM103	-	A	-	A	-
30HXA161---4	HN67LM104	-	C	-	B	-
30HXA161---5	HN67LM104	-	C	-	B	-
30HXA161---6	HN67LM103	-	A	-	A	-
30HXA161---8	HN67LM104	-	C	-	C	-
30HXA161---9	HN67LM103	-	A	-	A	-
30HXA171---1	HN67LM103	-	A	-	A	-
30HXA171---2	HN67LM103	-	A	-	A	-
30HXA171---4	HN67LM104	-	C	-	C	-
30HXA171---5	HN67LM104	-	C	-	C	-
30HXA171---6	HN67LM103	-	A	-	A	-
30HXA171---8	HN67LM104	-	C	-	C	-
30HXA171---9	HN67LM103	-	A	-	A	-
30HXA186---1	HN67LM103	-	A	-	A	-
30HXA186---2	HN67LM103	-	A	-	A	-
30HXA186---4	HN67LM104	-	C	-	C	-
30HXA186---5	HN67LM104	-	C	-	C	-
30HXA186---6	HN67LM103	-	A	-	A	-
30HXA186---8	HN67LM104	-	C	-	C	-
30HXA186---9	HN67LM103	-	A	-	A	-
30HXA206---1	HN67LM103	HN67LM103	A	A	A	-
30HXA206---2	HN67LM103	HN67LM103	B	A	B	-
30HXA206---4	HN67LM104	HN67LM103	C	B	C	-
30HXA206---5	HN67LM104	HN67LM103	C	B	C	-
30HXA206---6	HN67LM103	HN67LM103	A	A	A	-
30HXA206---8	HN67LM104	HN67LM103	C	B	C	-
30HXA206---9	HN67LM103	HN67LM103	B	A	B	-
30HXA246---1	HN67LM103	HN67LM103	A	A	A	-
30HXA246---2	HN67LM103	HN67LM103	B	A	B	-
30HXA246---4	HN67LM104	HN67LM104	C	C	C	-
30HXA246---5	HN67LM104	HN67LM104	C	C	C	-
30HXA246---6	HN67LM103	HN67LM103	A	A	A	-
30HXA246---8	HN67LM104	HN67LM104	C	C	C	-

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Serial Number Reference	30GXN/GXR: 3400F-2301F 30HXA/HXC: 3400F-0702Q					
Unit	Compressor Protection Module		Compressor Lead Configuration (See notes following table)			
	CPM1	CPM2	A1	A2	B1	B2
30HXA246---9	HN67LM103	HN67LM103	B	B	B	-
30HXA261---1	HN67LM103	HN67LM103	A	A	A	-
30HXA261---2	HN67LM103	HN67LM103	B	B	B	-
30HXA261---4	HN67LM104	HN67LM104	C	C	C	-
30HXA261---5	HN67LM104	HN67LM104	C	C	C	-
30HXA261---6	HN67LM103	HN67LM103	A	A	A	-
30HXA261---8	HN67LM104	HN67LM104	C	C	C	-
30HXA261---9	HN67LM103	HN67LM103	B	B	B	-
30HXA271---1	HN67LM103	HN67LM103	A	A	A	-
30HXA271---2	HN67LM103	HN67LM103	B	B	B	-
30HXA271---4	HN67LM104	HN67LM104	C	C	C	-
30HXA271---5	HN67LM104	HN67LM104	C	C	C	-
30HXA271---6	HN67LM103	HN67LM103	A	A	A	-
30HXA271---8	HN67LM104	HN67LM104	C	C	C	-
30HXA271---9	HN67LM103	HN67LM103	B	B	B	-
30HXC076---1	HN67LM103	-	A	-	A	-
30HXC076---2	HN67LM103	-	A	-	A	-
30HXC076---4	HN67LM103	-	A	-	A	-
30HXC076---5	HN67LM103	-	A	-	A	-
30HXC076---6	HN67LM103	-	A	-	A	-
30HXC076---8	HN67LM103	-	A	-	A	-
30HXC076---9	HN67LM103	-	A	-	A	-
30HXC086---1	HN67LM103	-	A	-	A	-
30HXC086---2	HN67LM103	-	A	-	A	-
30HXC086---4	HN67LM103	-	A	-	A	-
30HXC086---5	HN67LM103	-	A	-	A	-
30HXC086---6	HN67LM103	-	A	-	A	-
30HXC086---8	HN67LM103	-	A	-	A	-
30HXC086---9	HN67LM103	-	A	-	A	-
30HXC096---1	HN67LM103	-	A	-	A	-
30HXC096---2	HN67LM103	-	A	-	A	-
30HXC096---4	HN67LM103	-	A	-	A	-
30HXC096---5	HN67LM103	-	A	-	A	-
30HXC096---6	HN67LM103	-	A	-	A	-
30HXC096---8	HN67LM103	-	A	-	A	-
30HXC096---9	HN67LM103	-	A	-	A	--
30HXC106---1	HN67LM103	-	A	-	A	-
30HXC106---2	HN67LM103	-	A	-	A	-
30HXC106---4	HN67LM103	-	A	-	A	-
30HXC106---5	HN67LM103	-	A	-	A	-

30GX/HX ComfortLink Screw Chiller Service Manual

Serial Number Reference	30GXN/GXR: 3400F-2301F 30HXA/HXC: 3400F-0702Q					
Unit	Compressor Protection Module		Compressor Lead Configuration (See notes following table)			
	CPM1	CPM2	A1	A2	B1	B2
30HXC106---6	HN67LM103	-	A	-	A	-
30HXC106---8	HN67LM103	-	A	-	A	-
30HXC106---9	HN67LM103	-	A	-	A	-
30HXC116---1	HN67LM103	-	A	-	A	-
30HXC116---2	HN67LM103	-	A	-	A	-
30HXC116---4	HN67LM103	-	A	-	A	-
30HXC116---5	HN67LM103	-	A	-	A	-
30HXC116---6	HN67LM103	-	A	-	A	-
30HXC116---8	HN67LM103	-	A	-	A	-
30HXC116---9	HN67LM103	-	A	-	A	-
30HXC126---1	HN67LM103	-	A	-	A	-
30HXC126---2	HN67LM103	-	A	-	A	-
30HXC126---4	HN67LM103	-	B	-	B	-
30HXC126---5	HN67LM103	-	B	-	B	-
30HXC126---6	HN67LM103	-	A	-	A	-
30HXC126---8	HN67LM103	-	A	-	A	-
30HXC126---9	HN67LM103	-	A	-	A	-
30HXC136---1	HN67LM103	-	A	-	A	-
30HXC136---2	HN67LM103	-	A	-	A	-
30HXC136---4	HN67LM104	-	C	-	B	-
30HXC136---5	HN67LM104	-	C	-	B	-
30HXC136---6	HN67LM103	-	A	-	A	-
30HXC136---8	HN67LM104	-	C	-	A	-
30HXC136---9	HN67LM103	-	A	-	A	-
30HXC146---1	HN67LM103	-	A	-	A	-
30HXC146---2	HN67LM103	-	A	-	A	-
30HXC146---4	HN67LM104	-	C	-	B	-
30HXC146---5	HN67LM104	-	C	-	B	-
30HXC146---6	HN67LM103	-	A	-	A	-
30HXC146---8	HN67LM104	-	C	-	A	-
30HXC146---9	HN67LM103	-	A	-	A	-
30HXC161---1	HN67LM103	-	A	-	A	-
30HXC161---2	HN67LM103	-	A	-	A	-
30HXC161---4	HN67LM104	-	C	-	B	-
30HXC161---5	HN67LM104	-	C	-	B	-
30HXC161---6	HN67LM103	-	A	-	A	-
30HXC161---8	HN67LM104	-	C	-	A	-
30HXC161---9	HN67LM103	-	A	-	A	-
30HXC171---1	HN67LM103	-	A	-	A	-
30HXC171---2	HN67LM103	-	A	-	A	-

30GX/HX ComfortLink Screw Chiller Service Manual

Serial Number Reference	30GXN/GXR: 3400F-2301F 30HXA/HXC: 3400F-0702Q					
Unit	Compressor Protection Module		Compressor Lead Configuration (See notes following table)			
	CPM1	CPM2	A1	A2	B1	B2
30HXC171---4	HN67LM104	-	A	-	C	-
30HXC171---5	HN67LM104	-	A	-	C	-
30HXC171---6	HN67LM103	-	A	-	A	-
30HXC171---8	HN67LM104	-	A	-	C	-
30HXC171---9	HN67LM103	-	A	-	A	-
30HXC186---1	HN67LM103	-	A	-	A	-
30HXC186---2	HN67LM103	-	A	-	A	-
30HXC186---4	HN67LM104	-	C	-	C	-
30HXC186---5	HN67LM104	-	C	-	C	-
30HXC186---6	HN67LM103	-	A	-	A	-
30HXC186---8	HN67LM104	-	C	-	C	-
30HXC186---9	HN67LM103	-	A	-	A	-
30HXC206---1	HN67LM103	HN67LM103	A	A	A	-
30HXC206---2	HN67LM103	HN67LM103	A	A	A	-
30HXC206---4	HN67LM104	HN67LM103	B	A	C	-
30HXC206---5	HN67LM104	HN67LM103	B	A	C	-
30HXC206---6	HN67LM103	HN67LM103	A	A	A	-
30HXC206---8	HN67LM104	HN67LM103	B	A	C	-
30HXC206---9	HN67LM103	HN67LM103	A	A	A	-
30HXC246---1	HN67LM103	HN67LM103	A	A	A	-
30HXC246---2	HN67LM103	HN67LM103	A	A	A	-
30HXC246---4	HN67LM104	HN67LM103	C	B	C	-
30HXC246---5	HN67LM104	HN67LM103	C	B	C	-
30HXC246---6	HN67LM103	HN67LM103	A	A	A	-
30HXC246---8	HN67LM104	HN67LM103	C	B	C	-
30HXC246---9	HN67LM103	HN67LM103	A	A	A	-
30HXC261---1	HN67LM103	HN67LM103	A	A	A	-
30HXC261---2	HN67LM103	HN67LM103	A	A	A	-
30HXC261---4	HN67LM104	HN67LM103	C	B	C	-
30HXC261---5	HN67LM104	HN67LM103	C	B	C	-
30HXC261---6	HN67LM103	HN67LM103	A	A	A	-
30HXC261---8	HN67LM104	HN67LM103	C	B	C	-
30HXC261---9	HN67LM103	HN67LM103	A	A	A	-
30HXC271---1	HN67LM103	HN67LM103	A	A	A	-
30HXC271---2	HN67LM103	HN67LM103	A	A	A	-
30HXC271---4	HN67LM104	HN67LM104	C	C	C	-
30HXC271---5	HN67LM104	HN67LM104	C	C	C	-
30HXC271---6	HN67LM103	HN67LM103	A	A	A	-
30HXC271---8	HN67LM104	HN67LM104	C	C	C	-
30HXC271---9	HN67LM103	HN67LM103	A	A	A	-

- Configuration A: 1 set of leads, all through the toroid. See Figure 15 on page 165.
- Configuration B: 2 sets of leads, all through the toroid. See Figure 16 on page 165.
- Configuration C: 2 sets of leads, 1 set through the toroid, the other around it. See Figure 17 on page 165.

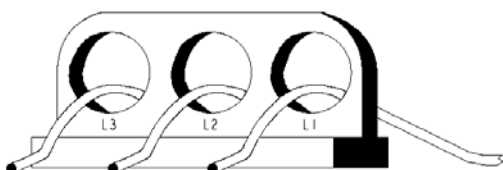


Figure 15 - Configuration A

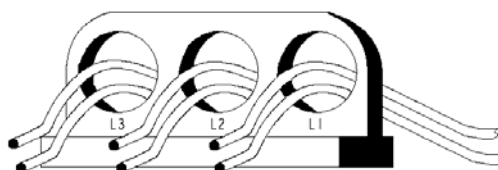


Figure 16 - Configuration B

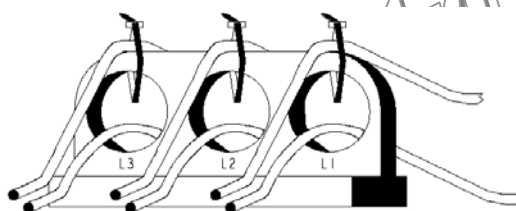


Figure 17 - Configuration C

The following table describes the toroid usage and lead configuration for 30GXN/GXR produced with starting serial number 2401F and 30HXA/HXC produced with starting serial number 0802Q. These units use the HN67LM103 ComfortLink Compressor Protection Module, with the 30GX502783 Compressor Current Toroid for compressors with Rated Load Amps less than 314 amps. For compressors with Rated Load Amps greater than or equal to 314, the 30GX504711 Compressor Current Toroid is used.

If the field conversion to the ½ current Compressor Current Toroid 30GX504711 is made, the Compressor Protection module should be changed to HN67LM103 to lower the ground fault settings.

Serial Number Reference	30GXN/GXR: 2401F 30HXA/HXC: 0802Q							
Unit	Compressor Current Toroid Module				Compressor Lead Configuration (See notes following table)			
	A1	A2	B1	B2	A1	A2	B1	B2
30GXN,R080---1	30GX502786	-	30GX502786	-	A	-	A	-

30GX/HX ComfortLink Screw Chiller Service Manual

Serial Number Reference	30GXN/GXR: 2401F 30HXA/HXC: 0802Q				Compressor Lead Configuration (See notes following table)			
Unit	Compressor Current Toroid Module				A1	A2	B1	B2
	A1	A2	B1	B2				
30GXN,R080---2	30GX502786	-	30GX502786	-	A	-	A	-
30GXN,R080---4	30GX502786	-	30GX502786	-	A	-	A	-
30GXN,R080---5	30GX502786	-	30GX502786	-	A	-	A	-
30GXN,R080---6	30GX502786	-	30GX502786	-	A	-	A	-
30GXN,R080---8	30GX502786	-	30GX502786	-	A	-	A	-
30GXN,R080---9	30GX502786	-	30GX502786	-	A	-	A	-
30GXN,R090---1	30GX502786	-	30GX502786	-	A	-	A	-
30GXN,R090---2	30GX502786	-	30GX502786	-	A	-	A	-
30GXN,R090---4	30GX504711	-	30GX502786	-	B	-	A	-
30GXN,R090---5	30GX504711	-	30GX502786	-	B	-	A	-
30GXN,R090---6	30GX502786	-	30GX502786	-	A	-	A	-
30GXN,R090---8	30GX502786	-	30GX502786	-	B	-	A	-
30GXN,R090---9	30GX502786	-	30GX502786	-	A	-	A	-
30GXN,R106---1	30GX502786	-	30GX502786	-	A	-	A	-
30GXN,R106---2	30GX502786	-	30GX502786	-	A	-	A	-
30GXN,R106---4	30GX504711	-	30GX502786	-	B	-	A	-
30GXN,R106---5	30GX504711	-	30GX502786	-	B	-	A	-
30GXN,R106---6	30GX502786	-	30GX502786	-	A	-	A	-
30GXN,R106---8	30GX504711	-	30GX502786	-	B	-	A	-
30GXN,R106---9	30GX502786	-	30GX502786	-	A	-	A	-
30GXN,R114---1	30GX502786	-	30GX502786	-	A	-	A	-
30GXN,R114---2	30GX502786	-	30GX502786	-	A	-	A	-
30GXN,R114---4	30GX504711	-	30GX502786	-	B	-	B	-
30GXN,R114---5	30GX504711	-	30GX502786	-	B	-	B	-
30GXN,R114---6	30GX502786	-	30GX502786	-	A	-	A	-
30GXN,R115---8	30GX504711	-	30GX502786	-	B	-	A	-
30GXN,R115---9	30GX502786	-	30GX502786	-	A	-	A	-
30GXN,R125---1	30GX502786	-	30GX502786	-	A	-	A	-
30GXN,R125---2	30GX502786	-	30GX502786	-	A	-	A	-
30GXN,R125---4	30GX504711	-	30GX502786	-	B	-	B	-
30GXN,R125---5	30GX504711	-	30GX502786	-	B	-	B	-
30GXN,R125---6	30GX502786	-	30GX502786	-	A	-	A	-
30GXN,R125---8	30GX504711	-	30GX502786	-	B	-	B	-
30GXN,R125---9	30GX502786	-	30GX502786	-	A	-	A	-
30GXN,R135---1	30GX502786	-	30GX502786	-	A	-	A	-
30GXN,R135---2	30GX502786	-	30GX502786	-	A	-	A	-
30GXN,R135---4	30GX504711	-	30GX504711	-	B	-	B	-
30GXN,R135---5	30GX504711	-	30GX504711	-	B	-	B	-
30GXN,R135---6	30GX502786	-	30GX502786	-	A	-	A	-
30GXN,R135---8	30GX504711	-	30GX504711	-	B	-	B	-
30GXN,R135---9	30GX502786	-	30GX502786	-	A	-	A	-
30GXN,R150---1	30GX502786	-	30GX502786	-	A	-	A	-
30GXN,R150---2	30GX502786	-	30GX502786	-	B	-	A	-
30GXN,R150---4	30GX504711	-	30GX504711	-	B	-	B	-
30GXN,R150---5	30GX504711	-	30GX504711	-	B	-	B	-
30GXN,R150---6	30GX502786	-	30GX502786	-	A	-	A	-
30GXN,R150---8	30GX504711	-	30GX504711	-	B	-	B	-

30GX/HX ComfortLink Screw Chiller Service Manual

Serial Number Reference	30GXN/GXR: 2401F 30HXA/HXC: 0802Q				Compressor Lead Configuration (See notes following table)			
Unit	Compressor Current Toroid Module				A1	A2	B1	B2
	A1	A2	B1	B2				
30GXN,R150---9	30GX502786	-	30GX502786	-	A	-	B	-
30GXN,R160---1	30GX502786	-	30GX502786	-	A	-	A	-
30GXN,R160---2	30GX502786	-	30GX502786	-	B	-	A	-
30GXN,R160---4	30GX504711		30GX504711	-	B	-	B	-
30GXN,R160---5	30GX504711		30GX504711	-	B	-	B	-
30GXN,R160---6	30GX502786	-	30GX502786	-	A	-	A	-
30GXN,R160---8	30GX504711		30GX504711	-	B	-	B	-
30GXN,R160---9	30GX502786	-	30GX502786	-	A	-	B	-
30GXN,R174---1	30GX502786	-	30GX502786	-	A	-	A	-
30GXN,R174---2	30GX502786	-	30GX502786	-	A	-	A	-
30GXN,R174---4	30GX504711	-	30GX504711	-	B	-	B	-
30GXN,R174---5	30GX504711	-	30GX504711	-	B	-	B	-
30GXN,R174---6	30GX502786	-	30GX502786	-	A	-	A	-
30GXN,R175---8	30GX504711	-	30GX504711	-	B	-	B	-
30GXN,R175---9	30GX502786	-	30GX502786	-	A	-	A	-
30GXN,R204---1	30GX502786	30GX502786	30GX502786	-	A	A	A	-
30GXN,R204---2	30GX502786	30GX502786	30GX502786	-	A	A	A	-
30GXN,R204---4	30GX504711	30GX502786	30GX504711	-	B	A	B	-
30GXN,R204---5	30GX504711	30GX502786	30GX504711	-	B	A	B	-
30GXN,R204---6	30GX502786	30GX502786	30GX502786	-	A	A	A	-
30GXN,R205---8	30GX504711	30GX502786	30GX504711	-	B	A	B	-
30GXN,R205---9	30GX502786	30GX502786	30GX502786	-	A	A	A	-
30GXN,R220A--8	30GX504711		30GX502786	-	B	-	B	-
30GXN,R220A--9	30GX502786	-	30GX502786	-	A	-	A	-
30GXN,R220B--8	30GX502786	-	30GX502786	-	B	-	A	-
30GXN,R220B--9	30GX502786	-	30GX502786	-	A	-	A	-
30GXN,R225---1	30GX502786	30GX502786	30GX502786	-	A	A	A	-
30GXN,R225---2	30GX502786	30GX502786	30GX502786	-	A	A	A	-
30GXN,R225---4	30GX504711	30GX502786	30GX504711	-	B	A	B	-
30GXN,R225---5	30GX504711	30GX502786	30GX504711	-	B	A	B	-
30GXN,R225---6	30GX502786	30GX502786	30GX502786	-	A	A	A	-
30GXN,R225---8	30GX504711	30GX502786	30GX504711	-	B	A	B	-
30GXN,R225---9	30GX502786	30GX502786	30GX502786	-	A	A	A	-
30GXN,R240A--8	30GX504711	-	30GX502786	-	B	-	B	-
30GXN,R240A--9	30GX502786	-	30GX502786	-	A	-	A	-
30GXN,R240B--8	30GX504711	-	30GX502786	-	B	-	A	-
30GXN,R240B--9	30GX502786	-	30GX502786	-	A	-	A	-
30GXN,R249---1	30GX502786	30GX502786	30GX502786	-	A	A	A	-
30GXN,R249---2	30GX502786	30GX502786	30GX502786	-	A	A	A	-
30GXN,R249---4	30GX504711	30GX504711	30GX504711	-	B	B	B	-
30GXN,R249---5	30GX504711	30GX504711	30GX504711	-	B	B	B	-
30GXN,R249---6	30GX502786	30GX502786	30GX502786	-	A	A	A	-
30GXN,R250---8	30GX504711	30GX504711	30GX504711	-	B	B	B	-
30GXN,R250---9	30GX502786	30GX502786	30GX502786	-	A	A	A	-
30GXN,R264---1	30GX502786	30GX502786	30GX502786	-	A	A	A	-
30GXN,R264---2	30GX502786	30GX502786	30GX502786	-	A	A	A	-
30GXN,R264---4	30GX504711	30GX504711	30GX504711	-	B	B	B	-

30GX/HX ComfortLink Screw Chiller Service Manual

Serial Number Reference	30GXN/GXR: 2401F 30HXA/HXC: 0802Q				Compressor Lead Configuration (See notes following table)			
Unit	Compressor Current Toroid Module				A1	A2	B1	B2
	A1	A2	B1	B2				
30GXN,R264---5	30GX504711	30GX504711	30GX504711	-	B	B	B	-
30GXN,R264---6	30GX502786	30GX502786	30GX502786	-	A	A	A	-
30GXN,R264---8	30GX504711	30GX504711	30GX504711	-	B	B	B	-
30GXN,R264---9	30GX502786	30GX502786	30GX502786	-	A	A	A	-
30GXN,R275A--8	30GX504711	-	30GX504711	-	B	-	B	-
30GXN,R275A--9	30GX502786	-	30GX502786	-	A	-	A	-
30GXN,R275B--8	30GX504711	-	30GX504711	-	B	-	B	-
30GXN,R275B--9	30GX502786	-	30GX502786	-	A	-	A	-
30GXN,R281---1	30GX502786	30GX502786	30GX502786	30GX502786	A	A	A	A
30GXN,R281---2	30GX502786	30GX502786	30GX502786	30GX502786	A	A	A	A
30GXN,R281---6	30GX502786	30GX502786	30GX502786	30GX502786	A	A	A	A
30GXN,R281---9	30GX502786	30GX502786	30GX502786	30GX502786	A	A	A	A
30GXN,R300A--8	30GX504711	-	30GX504711	-	B	-	B	-
30GXN,R300A--9	30GX502786	-	30GX502786	-	A	-	A	-
30GXN,R301---1	30GX502786	30GX502786	30GX502786	30GX502786	A	A	A	A
30GXN,R301---2	30GX502786	30GX502786	30GX502786	30GX502786	A	A	A	A
30GXN,R301---6	30GX502786	30GX502786	30GX502786	30GX502786	A	A	A	A
30GXN,R301---9	30GX502786	30GX502786	30GX502786	30GX502786	A	A	A	A
30GXN,R300B--8	30GX504711	-	30GX504711	-	B	-	B	-
30GXN,R300B--9	30GX502786	-	30GX502786	-	A	-	A	-
30GXN,R320A--8	30GX504711	-	30GX504711	-	B	-	B	-
30GXN,R320A--9	30GX502786	-	30GX502786	-	A	-	A	-
30GXN,R320B--8	30GX504711	-	30GX504711	-	B	-	B	-
30GXN,R320B--9	30GX502786	-	30GX502786	-	A	-	A	-
30GXN,R325---1	30GX502786	30GX502786	30GX502786	30GX502786	A	A	A	A
30GXN,R325---2	30GX502786	30GX502786	30GX502786	30GX502786	A	A	A	A
30GXN,R325---6	30GX502786	30GX502786	30GX502786	30GX502786	A	A	A	A
30GXN,R325---9	30GX502786	30GX502786	30GX502786	30GX502786	A	A	A	A
30GXN,R345A--8	30GX504711	-	30GX504711	-	B	-	B	-
30GXN,R345A--9	30GX502786	-	30GX502786	-	A	-	A	-
30GXN,R345B--8	30GX504711	-	30GX504711	-	B	-	B	-
30GXN,R345B--9	30GX502786	-	30GX502786	-	A	-	A	-
30GXN,R350---1	30GX502786	30GX502786	30GX502786	30GX502786	A	A	A	A
30GXN,R350---2	30GX502786	30GX502786	30GX502786	30GX502786	A	A	A	A
30GXN,R350---6	30GX502786	30GX502786	30GX502786	30GX502786	A	A	A	A
30GXN,R350---9	30GX502786	30GX502786	30GX502786	30GX502786	A	A	A	A
30GXN,R365A--8	30GX504711	30GX504711	30GX504711	-	B	B	B	-
30GXN,R365A--9	30GX502786	30GX502786	30GX502786	-	A	A	A	-
30GXN,R365B--8	30GX504711	-	30GX504711	-	B	-	B	-
30GXN,R365B--9	30GX502786	-	30GX502786	-	A	-	A	-
30GXN,R370A--1	30GX502786	30GX502786	30GX502786	30GX502786	A	A	A	-
30GXN,R370A--2	30GX502786	30GX502786	30GX502786	30GX502786	A	A	A	-
30GXN,R370A--4	30GX504711	30GX502786	30GX504711	-	B	A	B	-
30GXN,R370A--5	30GX504711	30GX502786	30GX504711	-	B	A	B	-
30GXN,R370A--6	30GX502786	30GX502786	30GX502786	-	A	A	A	-
30GXN,R370B--1	30GX502786	-	30GX502786	-	A	-	A	-
30GXN,R370B--2	30GX502786	-	30GX502786	-	B	-	A	-

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Serial Number Reference	30GXN/GXR: 2401F 30HXA/HXC: 0802Q				Compressor Lead Configuration (See notes following table)			
Unit	Compressor Current Toroid Module				A1	A2	B1	B2
	A1	A2	B1	B2				
30GXN,R370B--4	30GX504711	-	30GX504711	-	B	-	B	-
30GXN,R370B--5	30GX504711	-	30GX504711	-	B	-	B	-
30GXN,R370B--6	30GX502786	-	30GX502786	-	A	-	A	-
30GXN,R390A--1	30GX502786	30GX502786	30GX502786	-	A	A	A	-
30GXN,R390A--2	30GX502786	30GX502786	30GX502786	-	A	A	A	-
30GXN,R390A--4	30GX504711	30GX504711	30GX504711	-	B	B	B	-
30GXN,R390A--5	30GX504711	30GX504711	30GX504711	-	B	B	B	-
30GXN,R390A--6	30GX502786	30GX502786	30GX502786	-	A	A	A	-
30GXN,R390B--1	30GX502786	-	30GX502786	-	A	-	A	-
30GXN,R390B--2	30GX502786	-	30GX502786	-	A	-	A	-
30GXN,R390B--4	30GX504711	-	30GX504711	-	B	-	B	-
30GXN,R390B--5	30GX504711	-	30GX504711	-	B	-	B	-
30GXN,R390B--6	30GX502786	-	30GX502786	-	A	-	A	-
30GXN,R395A--8	30GX504711	30GX504711	30GX504711	-	B	B	B	-
30GXN,R395A--9	30GX502786	30GX502786	30GX502786	-	A	A	A	-
30GXN,R395B--8	30GX504711	-	30GX504711	-	B	-	B	-
30GXN,R395B--9	30GX502786	-	30GX502786	-	A	-	A	-
30GXN,R410A--8	30GX504711	30GX502786	30GX504711	-	B	A	B	-
30GXN,R410A--9	30GX502786	30GX502786	30GX502786	-	A	A	A	-
30GXN,R410B--8	30GX504711	30GX502786	30GX504711	-	B	A	B	-
30GXN,R410B--9	30GX502786	30GX502786	30GX502786	-	A	A	A	-
30GXN,R415A--1	30GX502786	30GX502786	30GX502786	-	A	A	A	-
30GXN,R415A--2	30GX502786	30GX502786	30GX502786	-	A	A	A	-
30GXN,R415A--4	30GX504711	30GX504711	30GX504711	-	B	B	B	-
30GXN,R415A--5	30GX504711	30GX504711	30GX504711	-	B	B	B	-
30GXN,R415A--6	30GX502786	30GX502786	30GX502786	-	A	A	A	-
30GXN,R415B--1	30GX502786	-	30GX502786	-	A	-	A	-
30GXN,R415B--2	30GX502786	-	30GX502786	-	B	-	A	-
30GXN,R415B--4	30GX504711	-	30GX504711	-	B	-	B	-
30GXN,R415B--5	30GX504711	-	30GX504711	-	B	-	B	-
30GXN,R415B--6	30GX502786	-	30GX502786	-	A	-	A	-
30GXN,R440A--8	30GX504711	30GX502786	30GX504711	-	B	A	B	-
30GXN,R440A--9	30GX502786	30GX502786	30GX502786	-	A	A	A	-
30GXN,R440B--8	30GX504711	30GX502786	30GX504711	-	B	A	B	-
30GXN,R440B--9	30GX502786	30GX502786	30GX502786	-	A	A	A	-
30GXN,R450A--1	30GX502786	30GX502786	30GX502786	-	A	A	A	-
30GXN,R450A--2	30GX502786	30GX502786	30GX502786	-	A	A	A	-
30GXN,R450A--4	30GX504711	30GX502786	30GX504711	-	B	A	B	-
30GXN,R450A--5	30GX504711	30GX502786	30GX504711	-	B	A	B	-
30GXN,R450A--6	30GX502786	30GX502786	30GX502786	-	A	A	A	-
30GXN,R450B--1	30GX502786	30GX502786	30GX502786	-	A	A	A	-
30GXN,R450B--2	30GX502786	30GX502786	30GX502786	-	A	A	A	-
30GXN,R450B--4	30GX504711	30GX502786	30GX504711	-	B	A	B	-
30GXN,R450B--5	30GX504711	30GX502786	30GX504711	-	B	A	B	-
30GXN,R450B--6	30GX502786	30GX502786	30GX502786	-	A	A	A	-
30HXA076---1	30GX502786	-	30GX502786	-	A	-	A	-
30HXA076---2	30GX502786	-	30GX502786	-	A	-	A	-

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Serial Number Reference	30GXN/GXR: 2401F 30HXA/HXC: 0802Q				Compressor Lead Configuration (See notes following table)			
Unit	Compressor Current Toroid Module				A1	A2	B1	B2
	A1	A2	B1	B2				
30HXA076---4	30GX502786	-	30GX502786	-	A	-	A	-
30HXA076---5	30GX502786	-	30GX502786	-	A	-	A	-
30HXA076---6	30GX502786	-	30GX502786	-	A	-	A	-
30HXA076---8	30GX502786	-	30GX502786	-	A	-	A	-
30HXA076---9	30GX502786	-	30GX502786	-	A	-	A	-
30HXA086---1	30GX502786	-	30GX502786	-	A	-	A	-
30HXA086---2	30GX502786	-	30GX502786	-	A	-	A	-
30HXA086---4	30GX502786	-	30GX502786	-	A	-	A	-
30HXA086---5	30GX502786	-	30GX502786	-	A	-	A	-
30HXA086---6	30GX502786	-	30GX502786	-	A	-	A	-
30HXA086---8	30GX502786	-	30GX502786	-	A	-	A	-
30HXA086---9	30GX502786	-	30GX502786	-	A	-	A	-
30HXA096---1	30GX502786	-	30GX502786	-	A	-	A	-
30HXA096---2	30GX502786	-	30GX502786	-	A	-	A	-
30HXA096---4	30GX504711	-	30GX502786	-	B	-	A	-
30HXA096---5	30GX504711	-	30GX502786	-	B	-	A	-
30HXA096---6	30GX502786	-	30GX502786	-	A	-	A	-
30HXA096---8	30GX504711	-	30GX502786	-	B	-	A	-
30HXA096---9	30GX502786	-	30GX502786	-	A	-	A	-
30HXA106---1	30GX502786	-	30GX502786	-	A	-	A	-
30HXA106---2	30GX502786	-	30GX502786	-	A	-	A	-
30HXA106---4	30GX504711	-	30GX502786	-	B	-	B	-
30HXA106---5	30GX504711	-	30GX502786	-	B	-	B	-
30HXA106---6	30GX502786	-	30GX502786	-	A	-	A	-
30HXA106---8	30GX504711	-	30GX502786	-	B	-	A	-
30HXA106---9	30GX502786	-	30GX502786	-	A	-	A	-
30HXA116---1	30GX502786	-	30GX502786	-	A	-	A	-
30HXA116---2	30GX502786	-	30GX502786	-	A	-	A	-
30HXA116---4	30GX504711	-	30GX502786	-	B	-	B	-
30HXA116---5	30GX504711	-	30GX502786	-	B	-	B	-
30HXA116---6	30GX502786	-	30GX502786	-	A	-	A	-
30HXA116---8	30GX504711	-	30GX502786	-	B	-	A	-
30HXA116---9	30GX502786	-	30GX502786	-	A	-	A	-
30HXA126---1	30GX502786	-	30GX502786	-	A	-	A	-
30HXA126---2	30GX502786	-	30GX502786	-	A	-	A	-
30HXA126---4	30GX504711	-	30GX504711	-	B	-	B	-
30HXA126---5	30GX504711	-	30GX504711	-	B	-	B	-
30HXA126---6	30GX502786	-	30GX502786	-	A	-	A	-
30HXA126---8	30GX504711	-	30GX502786	-	B	-	A	-
30HXA126---9	30GX502786	-	30GX502786	-	A	-	A	-
30HXA136---1	30GX502786	-	30GX502786	-	A	-	A	-
30HXA136---2	30GX502786	-	30GX502786	-	A	-	A	-
30HXA136---4	30GX504711	-	30GX504711	-	B	-	B	-
30HXA136---5	30GX504711	-	30GX504711	-	B	-	B	-
30HXA136---6	30GX502786	-	30GX502786	-	A	-	A	-
30HXA136---8	30GX504711	-	30GX502786	-	B	-	A	-
30HXA136---9	30GX502786	-	30GX502786	-	A	-	A	-

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Serial Number Reference	30GXN/GXR: 2401F 30HXA/HXC: 0802Q				Compressor Lead Configuration (See notes following table)			
Unit	Compressor Current Toroid Module				A1	A2	B1	B2
	A1	A2	B1	B2				
30HXA146---1	30GX502786	-	30GX502786	-	A	-	A	-
30HXA146---2	30GX502786	-	30GX502786	-	A	-	A	-
30HXA146---4	30GX504711	-	30GX504711	-	B	-	B	-
30HXA146---5	30GX504711	-	30GX504711	-	B	-	B	-
30HXA146---6	30GX502786	-	30GX502786	-	A	-	A	-
30HXA146---8	30GX504711	-	30GX504711	-	B	-	B	-
30HXA146---9	30GX502786	-	30GX502786	-	A	-	A	-
30HXA161---1	30GX502786	-	30GX502786	-	A	-	A	-
30HXA161---2	30GX502786	-	30GX502786	-	A	-	A	-
30HXA161---4	30GX504711	-	30GX502786	-	B	-	B	-
30HXA161---5	30GX504711	-	30GX502786	-	B	-	B	-
30HXA161---6	30GX502786	-	30GX502786	-	A	-	A	-
30HXA161---8	30GX504711	-	30GX504711	-	B	-	B	-
30HXA161---9	30GX502786	-	30GX502786	-	A	-	A	-
30HXA171---1	30GX502786	-	30GX502786	-	A	-	A	-
30HXA171---2	30GX502786	-	30GX502786	-	A	-	A	-
30HXA171---4	30GX504711	-	30GX504711	-	B	-	B	-
30HXA171---5	30GX504711	-	30GX504711	-	B	-	B	-
30HXA171---6	30GX502786	-	30GX502786	-	A	-	A	-
30HXA171---8	30GX504711	-	30GX504711	-	B	-	B	-
30HXA171---9	30GX502786	-	30GX502786	-	A	-	A	-
30HXA186---1	30GX502786	-	30GX502786	-	A	-	A	-
30HXA186---2	30GX502786	-	30GX502786	-	A	-	A	-
30HXA186---4	30GX504711	-	30GX504711	-	B	-	B	-
30HXA186---5	30GX504711	-	30GX504711	-	B	-	B	-
30HXA186---6	30GX502786	-	30GX502786	-	A	-	A	-
30HXA186---8	30GX504711	-	30GX504711	-	B	-	B	-
30HXA186---9	30GX502786	-	30GX502786	-	A	-	A	-
30HXA206---1	30GX502786	30GX502786	30GX502786	-	A	A	A	-
30HXA206---2	30GX502786	30GX502786	30GX502786	-	B	A	B	-
30HXA206---4	30GX504711	30GX502786	30GX504711	-	B	B	B	-
30HXA206---5	30GX504711	30GX502786	30GX504711	-	B	B	B	-
30HXA206---6	30GX502786	30GX502786	30GX502786	-	A	A	A	-
30HXA206---8	30GX504711	30GX502786	30GX504711	-	B	B	B	-
30HXA206---9	30GX502786	30GX502786	30GX502786	-	B	A	B	-
30HXA246---1	30GX502786	30GX502786	30GX502786	-	A	A	A	-
30HXA246---2	30GX502786	30GX502786	30GX502786	-	B	A	B	-
30HXA246---4	30GX504711	30GX504711	30GX504711	-	B	B	B	-
30HXA246---5	30GX504711	30GX504711	30GX504711	-	B	B	B	-
30HXA246---6	30GX502786	30GX502786	30GX502786	-	A	A	A	-
30HXA246---8	30GX504711	30GX504711	30GX504711	-	B	B	B	-
30HXA246---9	30GX502786	30GX502786	30GX502786	-	B	B	B	-
30HXA261---1	30GX502786	30GX502786	30GX502786	-	A	A	A	-
30HXA261---2	30GX502786	30GX502786	30GX502786	-	B	B	B	-
30HXA261---4	30GX504711	30GX504711	30GX504711	-	B	B	B	-
30HXA261---5	30GX504711	30GX504711	30GX504711	-	B	B	B	-
30HXA261---6	30GX502786	30GX502786	30GX502786	-	A	A	A	-

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Serial Number Reference	30GXN/GXR: 2401F 30HXA/HXC: 0802Q				Compressor Lead Configuration (See notes following table)			
Unit	Compressor Current Toroid Module				A1	A2	B1	B2
	A1	A2	B1	B2				
30HXA261---8	30GX504711	30GX504711	30GX504711	-	B	B	B	-
30HXA261---9	30GX502786	30GX502786	30GX502786	-	B	B	B	-
30HXA271---1	30GX502786	30GX502786	30GX502786	-	A	A	A	-
30HXA271---2	30GX502786	30GX502786	30GX502786	-	B	B	B	-
30HXA271---4	30GX504711	30GX504711	30GX504711	-	B	B	B	-
30HXA271---5	30GX504711	30GX504711	30GX504711	-	B	B	B	-
30HXA271---6	30GX502786	30GX502786	30GX502786	-	A	A	A	-
30HXA271---8	30GX504711	30GX504711	30GX504711	-	B	B	B	-
30HXA271---9	30GX502786	30GX502786	30GX502786	-	B	B	B	-
30HXC076---1	30GX502786	-	30GX502786	-	A	-	A	-
30HXC076---2	30GX502786	-	30GX502786	-	A	-	A	-
30HXC076---4	30GX502786	-	30GX502786	-	A	-	A	-
30HXC076---5	30GX502786	-	30GX502786	-	A	-	A	-
30HXC076---6	30GX502786	-	30GX502786	-	A	-	A	-
30HXC076---8	30GX502786	-	30GX502786	-	A	-	A	-
30HXC076---9	30GX502786	-	30GX502786	-	A	-	A	-
30HXC086---1	30GX502786	-	30GX502786	-	A	-	A	-
30HXC086---2	30GX502786	-	30GX502786	-	A	-	A	-
30HXC086---4	30GX502786	-	30GX502786	-	A	-	A	-
30HXC086---5	30GX502786	-	30GX502786	-	A	-	A	-
30HXC086---6	30GX502786	-	30GX502786	-	A	-	A	-
30HXC086---8	30GX502786	-	30GX502786	-	A	-	A	-
30HXC086---9	30GX502786	-	30GX502786	-	A	-	A	-
30HXC096---1	30GX502786	-	30GX502786	-	A	-	A	-
30HXC096---2	30GX502786	-	30GX502786	-	A	-	A	-
30HXC096---4	30GX502786	-	30GX502786	-	A	-	A	-
30HXC096---5	30GX502786	-	30GX502786	-	A	-	A	-
30HXC096---6	30GX502786	-	30GX502786	-	A	-	A	-
30HXC096---8	30GX502786	-	30GX502786	-	A	-	A	-
30HXC096---9	30GX502786	-	30GX502786	-	A	-	A	-
30HXC106---1	30GX502786	-	30GX502786	-	A	-	A	-
30HXC106---2	30GX502786	-	30GX502786	-	A	-	A	-
30HXC106---4	30GX502786	-	30GX502786	-	A	-	A	-
30HXC106---5	30GX502786	-	30GX502786	-	A	-	A	-
30HXC106---6	30GX502786	-	30GX502786	-	A	-	A	-
30HXC106---8	30GX502786	-	30GX502786	-	A	-	A	-
30HXC106---9	30GX502786	-	30GX502786	-	A	-	A	-
30HXC116---1	30GX502786	-	30GX502786	-	A	-	A	-
30HXC116---2	30GX502786	-	30GX502786	-	A	-	A	-
30HXC116---4	30GX502786	-	30GX502786	-	A	-	A	-
30HXC116---5	30GX502786	-	30GX502786	-	A	-	A	-
30HXC116---6	30GX502786	-	30GX502786	-	A	-	A	-
30HXC116---8	30GX502786	-	30GX502786	-	A	-	A	-
30HXC116---9	30GX502786	-	30GX502786	-	A	-	A	-
30HXC126---1	30GX502786	-	30GX502786	-	A	-	A	-
30HXC126---2	30GX502786	-	30GX502786	-	A	-	A	-
30HXC126---4	30GX502786	-	30GX502786	-	B	-	B	-

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Serial Number Reference	30GXN/GXR: 2401F 30HXA/HXC: 0802Q				Compressor Lead Configuration (See notes following table)			
Unit	Compressor Current Toroid Module				A1	A2	B1	B2
	A1	A2	B1	B2				
30HXC126---5	30GX502786	-	30GX502786	-	B	-	B	-
30HXC126---6	30GX502786	-	30GX502786	-	A	-	A	-
30HXC126---8	30GX502786	-	30GX502786	-	A	-	A	-
30HXC126---9	30GX502786	-	30GX502786	-	A	-	A	-
30HXC136---1	30GX502786	-	30GX502786	-	A	-	A	-
30HXC136---2	30GX502786	-	30GX502786	-	A	-	A	-
30HXC136---4	30GX504711	-	30GX502786	-	B	-	B	-
30HXC136---5	30GX504711	-	30GX502786	-	B	-	B	-
30HXC136---6	30GX502786	-	30GX502786	-	A	-	A	-
30HXC136---8	30GX504711	-	30GX502786	-	B	-	A	-
30HXC136---9	30GX502786	-	30GX502786	-	A	-	A	-
30HXC146---1	30GX502786	-	30GX502786	-	A	-	A	-
30HXC146---2	30GX502786	-	30GX502786	-	A	-	A	-
30HXC146---4	30GX504711	-	30GX502786	-	B	-	B	-
30HXC146---5	30GX504711	-	30GX502786	-	B	-	B	-
30HXC146---6	30GX502786	-	30GX502786	-	A	-	A	-
30HXC146---8	30GX504711	-	30GX502786	-	B	-	A	-
30HXC146---9	30GX502786	-	30GX502786	-	A	-	A	-
30HXC161---1	30GX502786	-	30GX502786	-	A	-	A	-
30HXC161---2	30GX502786	-	30GX502786	-	A	-	A	-
30HXC161---4	30GX504711	-	30GX502786	-	B	-	B	-
30HXC161---5	30GX504711	-	30GX502786	-	B	-	B	-
30HXC161---6	30GX502786	-	30GX502786	-	A	-	A	-
30HXC161---8	30GX504711	-	30GX502786	-	B	-	A	-
30HXC161---9	30GX502786	-	30GX502786	-	A	-	A	-
30HXC171---1	30GX502786	-	30GX502786	-	A	-	A	-
30HXC171---2	30GX502786	-	30GX502786	-	A	-	A	-
30HXC171---4	30GX502786	-	30GX504711	-	A	-	B	-
30HXC171---5	30GX502786	-	30GX504711	-	A	-	B	-
30HXC171---6	30GX502786	-	30GX502786	-	A	-	A	-
30HXC171---8	30GX502786	-	30GX504711	-	A	-	B	-
30HXC171---9	30GX502786	-	30GX502786	-	A	-	A	-
30HXC186---1	30GX502786	-	30GX502786	-	A	-	A	-
30HXC186---2	30GX502786	-	30GX502786	-	A	-	A	-
30HXC186---4	30GX504711	-	30GX504711	-	B	-	B	-
30HXC186---5	30GX504711	-	30GX504711	-	B	-	B	-
30HXC186---6	30GX502786	-	30GX502786	-	A	-	A	-
30HXC186---8	30GX504711	-	30GX504711	-	B	-	B	-
30HXC186---9	30GX502786	-	30GX502786	-	A	-	A	-
30HXC206---1	30GX502786	30GX502786	30GX502786	-	A	A	A	-
30HXC206---2	30GX502786	30GX502786	30GX502786	-	A	A	A	-
30HXC206---4	30GX502786	30GX502786	30GX504711	-	B	A	B	-
30HXC206---5	30GX502786	30GX502786	30GX504711	-	B	A	B	-
30HXC206---6	30GX502786	30GX502786	30GX502786	-	A	A	A	-
30HXC206---8	30GX502786	30GX502786	30GX504711	-	B	A	B	-
30HXC206---9	30GX502786	30GX502786	30GX502786	-	A	A	A	-
30HXC246---1	30GX502786	30GX502786	30GX502786	-	A	A	A	-

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Serial Number Reference	30GXN/GXR: 2401F 30HXA/HXC: 0802Q							
Unit	Compressor Current Toroid Module				Compressor Lead Configuration (See notes following table)			
	A1	A2	B1	B2	A1	A2	B1	B2
30HXC246---2	30GX502786	30GX502786	30GX502786	-	A	A	A	-
30HXC246---4	30GX504711	30GX502786	30GX504711	-	B	B	B	-
30HXC246---5	30GX504711	30GX502786	30GX504711	-	B	B	B	-
30HXC246---6	30GX502786	30GX502786	30GX502786	-	A	A	A	-
30HXC246---8	30GX504711	30GX502786	30GX504711	-	B	B	B	-
30HXC246---9	30GX502786	30GX502786	30GX502786	-	A	A	A	-
30HXC261---1	30GX502786	30GX502786	30GX502786	-	A	A	A	-
30HXC261---2	30GX502786	30GX502786	30GX502786	-	A	A	A	-
30HXC261---4	30GX504711	30GX502786	30GX504711	-	B	B	B	-
30HXC261---5	30GX504711	30GX502786	30GX504711	-	B	B	B	-
30HXC261---6	30GX502786	30GX502786	30GX502786	-	A	A	A	-
30HXC261---8	30GX504711	30GX502786	30GX504711	-	B	B	B	-
30HXC261---9	30GX502786	30GX502786	30GX502786	-	A	A	A	-
30HXC271---1	30GX502786	30GX502786	30GX502786	-	A	A	A	-
30HXC271---2	30GX502786	30GX502786	30GX502786	-	A	A	A	-
30HXC271---4	30GX504711	30GX504711	30GX504711	-	B	B	B	-
30HXC271---5	30GX504711	30GX504711	30GX504711	-	B	B	B	-
30HXC271---6	30GX502786	30GX502786	30GX502786	-	A	A	A	-
30HXC271---8	30GX504711	30GX504711	30GX504711	-	B	B	B	-
30HXC271---9	30GX502786	30GX502786	30GX502786	-	A	A	A	-

Configuration A: 1 set of leads, all through the toroid. See Figure 15 on page 165.

Configuration B: 2 sets of leads, all through the toroid. See Figure 16 on page 165.

Service Bulletins pertaining to this condition:

- SMB020039 – 30GX/HX Ground Fault and Current Imbalance Alarms
This bulletin described the changes required to update the ½ current Compressor Protection Modules to the full current modules and new ½ current toroids.

Troubleshooting:

Communications

The following table has the design resistance in ohms as measured between the pins of the connector listed. Values to as little as half of the listed resistance can be expected to perform without any problems. All measurements are to be made with power removed from the board and no connections to either the LEN ports. Be sure to allow the board to cool down before attempting to make these measurements.

Part Number		(LEN) Resistance between Pins / Connector		
Carrier	Vendor	Pins 1 to 3	Pins 1 to 2	Pins 2 to 3
HN67LM103	2ACE-1R3	44K Ω	70K Ω	36K Ω
HN67LM104	2ACE-1R4	J10 & J11	J10 & J11	J10 & J11

No Communication with the MBB:

- Check to be sure the DIP Switches are set correctly.
- Consider downloading the MBB software. If the software became corrupt, or was not completely downloaded correctly, this condition can exist. Software corruption, may not result in a A180 - Loss of Communication with Compressor Protection Module 1 Alarm or A181 - Loss of Communication with Compressor Protection Module 2 Alarm. Consider upgrading the Main Base Board software to Version 4.0 or higher. This alarm could be generated with momentary power interruptions to the CCP module.
- Check the resistance of the COMM port pins.

No Outputs to the Solenoids:

- Check for a new Main Base Board. In order for the new board to communicate with the CCP module, it must be activated. See Module Replacement on page 182.

CCP CR1 or CR5 Failure

Chattering relays can cause arcing and burning of the contacts. If this condition is encountered, check the following items:

- Check the High Pressure Switch. If the pressure switch is chattering, consider adding a snubber to the HPS. Replace the HPS. You will need to use the existing fitting, a 1/4" flare to 1/4" NPT and use a 50EQ400532.

CCP FR14 Failure

If this condition is encountered, check the following items:

- If the J3 connection is made 2 pins off toward the relay, it can cause the resistor to fail.
- Check for a grounded high pressure switch.

Interface Devices

Navigator

Cleaning

The Navigator can be cleaned with a mild detergent. Isopropyl alcohol or a glass cleaner can be used on all Navigator surfaces.

Connection Cord/Plug Assembly Replacement

If the RJ14 plug is damaged, it can be replaced. If it is replaced, the wiring to the plug must be as shown below:

	Pin					
	1	2	3	4	5	6
Wire Color	Black	Green	Blue	Yellow	Red	White

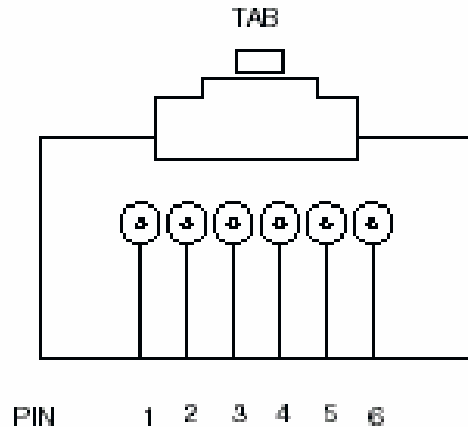


Figure 18 - Navigator Connection Diagram

The connection cable can be replaced if damaged. Replacement cables are available from Replacement Components Division. Remove the Navigator from the LEN connection before proceeding.

1. Remove the 6 screws from the back of the case to gain access to the internal plug for the device, and keep them for installation later.
2. The back cover is connected to the touch pad by a ribbon cable. The ribbon cable is not long enough to allow the two halves to be completely separated. To be able to access the plug connection, slightly offset the back cover. Be careful not to damage the ribbon cable.
3. Unplug the damaged cable.
4. Plug in the new cable.
5. Insert the rubber grommet (included with new cable assembly) into the cable entrance hole.
6. Realign the two halves of the Navigator. Be sure that the grommet is properly seated in the cable entrance hole.
7. Reinstall the 6 screws previously removed.

NOTE: Failure to properly seal the Navigator with the screws and grommet will compromise the watertight integrity of the device.

Troubleshooting:

Communications

The following table has the design resistance in ohms as measured between the pins of the connector listed. Values to as little as half of the listed resistance can be expected

to perform without any problems. All measurements are to be made with power off and no connections to either the LEN or CCN ports. Due to the difficulty in accessing the RJ14 connection, it is recommended the LEN resistance be measured at TB3. With the Navigator plugged into the TB3 RJ14 Port use the TB3 board connector pins after the internal harness has been disconnected to find the resistance.

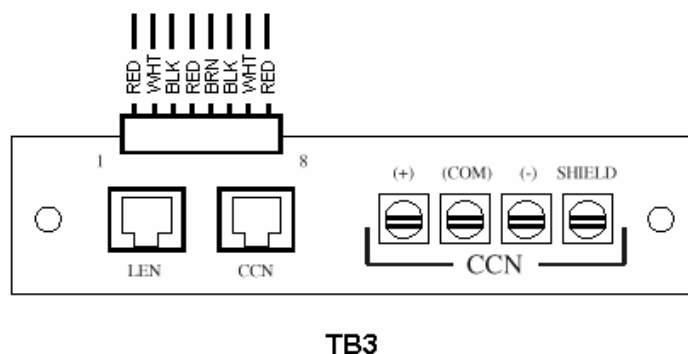


Figure 19 - TB3 Field Connections - LEN/CCN

Part Number			Serial Number	(LEN) Resistance between Pins / Connector		
With Software	Without Software	Vendor		Pins 1 to 3	Pins 1 to 2	Pins 2 to 3
HK50AA033		CEPL130435-01	All	220 Ω TB3	1000 Ω TB3	1000 Ω TB3

Loss of Communication

This failure is identified by a “Communication Failure” on the Navigator and a “COMM FAIL” on the Scrolling Marquee Display.

The Navigator to be very sensitive to the polarity of the 24 vac power connection. If the polarity of the power source is not correct, a Communication Failure will occur. Additionally, check the ground wire at TB3. This wire is a shielded wire and is not connected to the terminal block. It should be trimmed and insulated. If this wire comes in contact with the 24 vac power connection, the same problem can result.

If this condition is encountered, check the following items:

- Check the wiring from the MBB to TB3.
- Check for the proper polarity of the power supply.
- Check the ground wire at TB3. It should be insulated.
- Check the resistance of the Navigator.
- Disconnect all of the remaining Boards from the LEN connection. This will allow for a check of the communication chips of the other control boards. With the Navigator plugged in, check to see if the alarm disappears. If it does, reconnect the devices individually to see which board is suspect.

- Disconnect all inputs to the MBB. A grounded input to the MBB can also cause a communication alarm.

Service Bulletins pertaining to this condition:

- SMB000067 – Navigator Failures
This bulletin described the potential wiring problems that can lead to a Communication Failure.

Remote Enhanced Display

The Remote Enhanced Display or Chiller Visual Controller (CVC) is a network access local interface device with a 16-line by 40-character backlit LCD screen with four buttons or “softkeys” are menu driven and are shown on the display directly above the softkeys. The backlight will automatically turn off after 15 minutes of non-use. The Remote Enhanced Display allows the operator to view all key operating data on a single screen.

To change the contrast of the display, access the adjustment screw on the back of the Remote Enhanced Display.

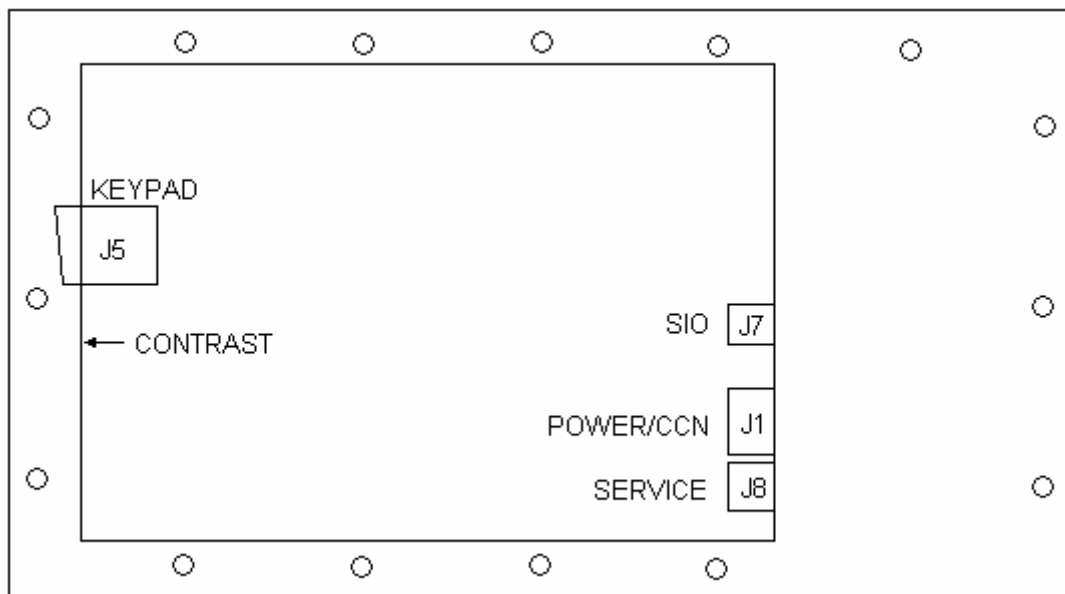


Figure 20 - CVC Contrast Adjustment

Energy Management Board (EMM)

The EMM is available as a factory-installed option or as a field-installed accessory. The EMM receives 4 to 20 mA inputs for the temperature reset, cooling set point reset and demand limit functions. The EMM also receives the switch inputs for the field-installed 2-stage demand limit and ice done functions. The EMM communicates the status of all

inputs with the MBB, and the MBB adjusts the control point, capacity limit, and other functions according to the inputs received.

Addressing

The EMM board has 4-position DIP switch that must be set to “ON” for proper addressing.

Troubleshooting:

Communications

The following table has the design resistance in ohms as measured between the pins of the connector listed. Values to as little as half of the listed resistance can be expected to perform without any problems. All measurements are to be made with power removed from the board and no connections to either the LEN ports.

Part Number			Serial Number	(LEN) Resistance between Pins / Connector		
With Software	Without Software	Vendor		Pins 1 to 3	Pins 1 to 2	Pins 2 to 3
30GT515218	HK50AA028	CEPL130351-01	Prior to 4902N	40K Ω J3 & J4	20K Ω J3 & J4	20K Ω J3 & J4
			Starting 4902N	287K Ω J3 & J4	7.25M Ω J3 & J4	5.9M Ω J3 & J4

EXV Board (EXV)

The EXD board has 2 inputs and 2 outputs. It receives signals from the MBB and operates the electronic expansion devices. The electronic expansion device board also sends the MBB the status of its 2 input channels.

Addressing

The EXV board has 4-position DIP switch that must be set to “ON” for proper addressing.

Troubleshooting:

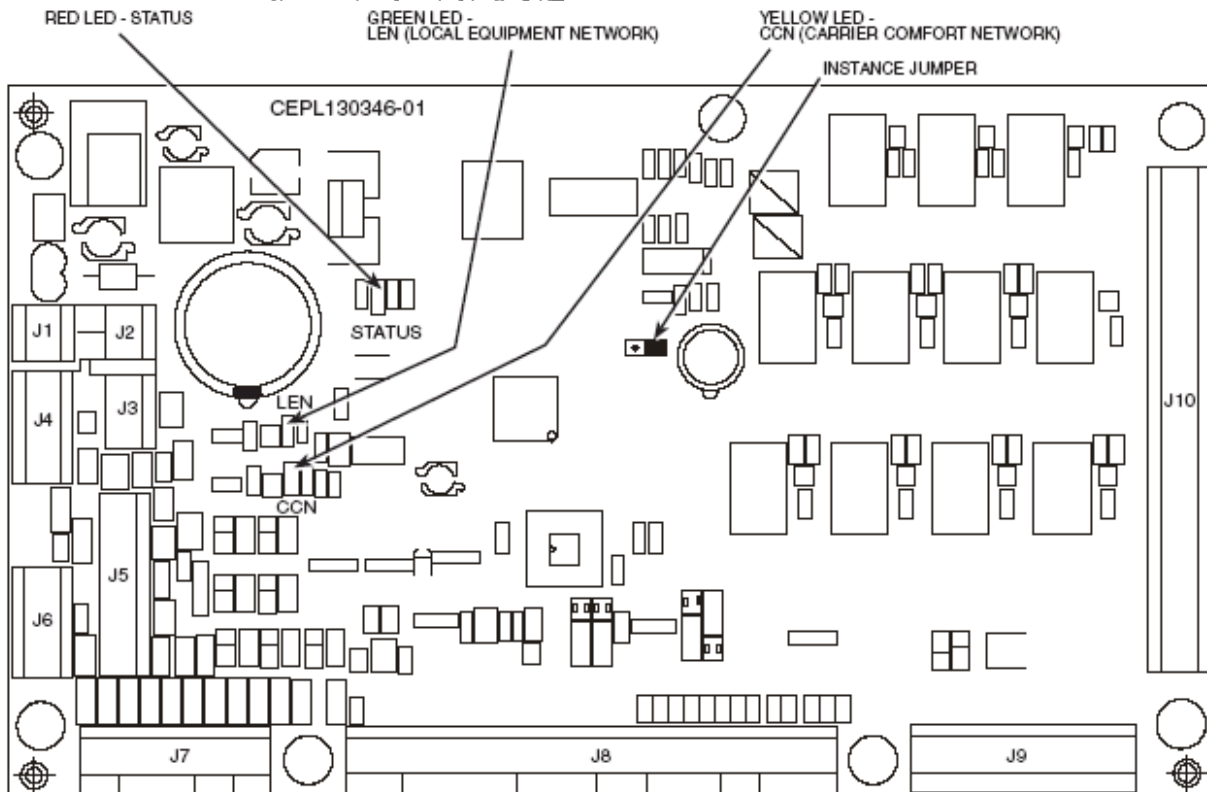
Communications

The following table has the design resistance in ohms as measured between the pins of the connector listed. Values to as little as half of the listed resistance can be expected to perform without any problems. All measurements are to be made with power removed from the board and no connections to either the LEN ports.

Part Number			Serial Number	(LEN) Resistance between Pins / Connector		
With Software	Without Software	Vendor		Pins 1 to 3	Pins 1 to 2	Pins 2 to 3
30GT515217	HK50AA026	CEPL130349-01	Prior to 4802N	40K Ω J3 & J4	20K Ω J3 & J4	20K Ω J3 & J4
			Starting 4802N	287K Ω J3 & J4	7.25M Ω J3 & J4	5.9M Ω J3 & J4

Main Base Board (MBB)

This board contains the majority of the control system operating software and controls the operation of the machine. It has 11 input channels and 11 output channels. The MBB continuously monitors input/output channel information received from all the modules and controls all output signals for all output channels. The processor module also controls the EXD driver module, commanding it to open or close each expansion device in order to maintain the proper refrigerant level in the cooler. Information is transmitted between the MBB; ComfortLink Compressor Protection (CCP) boards, the EXD driver module, the Screw Compressor Board (SCB), the Energy Management Module (EMM) and the Navigator modules through a 3-wire communications bus called the Local Equipment Network (LEN). The remote enhanced display is connected to the MBB through a 3-wire communications bus, but uses a different communication bus called the Carrier Comfort Network (CCN). The CCN bus is also used to communicate to other CCN devices when the unit is installed in a network application.



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For Series 4 and 5, the software is loaded in to the Main Base Board and is listed under the part number 30HX501314.

For Series 6 machines, because the software is different and is not backwards compatible, the part number was changed. The new part number is loaded on the 30GX506748.

Addressing

The Main Base Board (MBB) has an Instance Jumper on the board that must be set to "1".

Troubleshooting:

Communications

The following table has the design resistance in ohms as measured between the pins of the connector listed. Values to as little as half of the listed resistance can be expected to perform without any problems. All measurements are to be made with power removed from the board and no connections to either the LEN or CCN ports.

Part Number			Serial Number	(LEN) Resistance between Pins / Connector		
With Software	Without Software	Vendor		Pins 1 to 3	Pins 1 to 2	Pins 2 to 3
30HX501314	HK50AA029	CEPL130346-01	Prior to 4702N	15K Ω J3, J4, & J5	7.5K Ω J3, J4, & J5	7.5K Ω J3, J4, & J5
			Starting 4702N	18.9K Ω J3, J4, & J5	9.9K Ω J3, J4, & J5	9.9K Ω J3, J4, & J5
30GX506748	HK50AA029	CEPL130346-01	Starting 4702N	18.9K Ω J3, J4, & J5	9.9K Ω J3, J4, & J5	9.9K Ω J3, J4, & J5

Part Number			Serial Number	(CCN) Resistance between Pins / Connector		
With Software	Without Software	Vendor		Pins 5 to 7	Pins 5 to 6	Pins 6 to 7
30HX501314	HK50AA029	CEPL130346-01	Prior to 4702N	15K Ω J5	7.5K Ω J5	7.5K Ω J5
			Starting 4702N	18.9K Ω J5	9.9K Ω J5	9.9K Ω J5
30GX506748	HK50AA029	CEPL130346-01	Starting 4702N	18.9K Ω J5	9.9K Ω J5	9.9K Ω J5

On 30HXA/HXC Series 6 machines, with Serial Number starting with 5003Q-2704Q, the incorrect MBB with software part number sticker was placed on the MBB. The Series 6 software is not backward compatible.

Service Bulletins pertaining to this issue:

- SMB040030 - 30HX Series 6 Main Base Board Part Number

This bulletin described vendor mislabel of the main base board on the 30HXC machines.

Module Replacement

If a Main Base Board is replaced, in order for it recognize the CCP module, the configuration for the number of compressors must be changed. Change CMP.A *Number of Circ A Compressor* (Configuration Mode, Sub-mode UNIT) from 1 to 2, (on 2 compressor machines, or from 2 to 1 (on 3 and 4 compressor machines). Be sure the control accepted the change. Then reset the item to the correct value. This will tell the MBB to look for the CCP Modules. This step must be done, even if the number of compressors were configured from 0 to 1 or 2 when the board was originally installed and configured. These instructions are listed in the Instruction Sheet that comes with the Main Base Board Replacement from RCD.

Troubleshooting:

Loss of Communication

If this condition is encountered, check the following items:

- Check the LEN connections for proper connection.
- If the machine is connected to a CCN network, check the connections to TB3. Be sure that only one end of the CCN wiring is connected.
- Disconnect all external input devices to the MBB. A short on any of these devices can cause the communications to be lost.
- If this does not correct the problem, disconnect the internal input devices on MBB-J6 and MBB-J7. Voltage across any device connection should be between 24 and 27 vac. Placing a jumper across any device pin should be registered by the MBB and can be verified under the Inputs Mode.

Machine does not start.

If this condition is encountered, check the following items:

- Check STAT *Control Mode* (Run Status, Sub-mode VIEW) for the machine status. LOCAL OFF means there is no signal to start. Check the Remote-Off-Enable Switch to be sure that is in the proper position. It must be in Enable even if the machine is controlled by CCN.
- Check the Remote-Off-Enable Switch to be sure it is correctly wired.
- If the Remote-Off-Enable switch is in the Remote position, check the remote contacts for a closure.
- Disconnect all external input devices to the MBB. A short on any of these devices can cause the communications to be lost.
- If this does not correct the problem, disconnect the internal input devices on MBB-J6 and MBB-J7. Voltage across any device connection should be between 24 and 27 vac. Placing a jumper across any device pin should be registered by the MBB and can be verified under the Inputs Mode.

Screw Compressor Board (SCB)

The SCB has 8 inputs along with 2 analog and 5 discrete outputs. The SCB module communicates the status of the inputs with the MBB and operates the oil heater (30GXN,R only), cooler heater (30GXN,R only) and oil pump outputs.

Addressing

The SCB board has 4-position DIP switch that must be set to “ON” for proper addressing.

Troubleshooting:

4-20 mA Output Checkout Procedure

To check out the 4-20 mA outputs for the SCB, disconnect the power to the SCB. Remove the connectors from the SCB-J8. With an ohmmeter, check for continuity between SCB-J8-2 and the ground/stand-off adjacent to the connector. Repeat the procedure for SCB-J8-4 and the ground/stand-off. There should be continuity between the two points. If the circuit is open, replace the board.

Communications

The following table has the design resistance in ohms as measured between the pins of the connector listed. Values to as little as half of the listed resistance can be expected to perform without any problems. All measurements are to be made with power removed from the board and no connections to either the LEN ports.

Part Number			Serial Number	(LEN) Resistance between Pins / Connector		
With Software	Without Software	Vendor		Pins 1 to 3	Pins 1 to 2	Pins 2 to 3
30HX501316	HK50AA032	CEPL130427-01	Prior to 4802N	15K Ω J3 & J4	7.5K Ω J3 & J4	7.5K Ω J3 & J4
			Starting 4802N	18.9K Ω J3 & J4	9.9K Ω J3 & J4	9.9K Ω J3 & J4

Compressor

The 30GX/HX machines use the 06N Geared Twin Screw compressors.

Compressor Model Number Significance

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Description	Position									
	1-3	4	5	6-8	9	10	11	12	13-16	
	06N	A	2	250	S	6	E	A	-A00	
<u>Geared Twin Screw Compressor</u>										
<u>Application</u>										
A – Air-Cooled Condensing W – Water-Cooled Condensing										
<u>Design Revision</u>										
2 – New Production 9 – Remanufactured Compressor										
<u>Compressor CFM @ 60 Hz</u>										
123 – 39 tons (60 Hz) / N/A (50 Hz) 146 – 46 tons (60 Hz) / 39 tons (50 Hz) 174 – 56 tons (60 Hz) / 46 tons (50 Hz) 209 – 66 tons (60 Hz) / 56 tons (50 Hz) 250 – 80 tons (60 Hz) / 66 tons (50 Hz) 300 – N/A (60 Hz) / 80 tons (50 Hz)										
<u>Electrical Characteristics</u>										
S – 460-3-60 or 400-3-50 T – 575-3-60 U – 230-3-50 W – 380-3-60 or 346-3-50 X – 208/230-3-60 or 200-3-50 Z – 200-3-60										
<u>Drive Frequency</u>										
5 – 50 Hz Only 6 – 60 Hz Only 7 – 50/60 Hz										
<u>Motor Cooling</u>										
E – Economized N – Non-Economized/Liquid Cooled										
<u>Packaging</u>										
A – Standard Packaging B – Service Packaging										
No significance										

Service Bulletins pertaining to this issue:

- PMB04-102 – 06NA660013 Accessory Kit Must be Ordered Separately
This bulletin advised of a change to the ordering process for replacement 06N Compressors from RCD. RCD is no longer offering the “B” Service Package option (Position 12). The kit, 06NA660013 must be ordered separately.

Compressor Usage

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Unit	Hz	Compressor			
		A1	A2	B1	B2
30GXN/GXR080	60	06NA2146**N	-	06NA2123**N	-
30GXN/GXR083	50	06NA2174**N	-	06NA2146**N	-
30GXN/GXR090	60	06NA2174**N	-	06NA2123**N	-
30GXN/GXR093	50				
30GXN/GXR106	60	06NA2209**N	-	06NA2123**N	-
	50				
30GXN/GXR108	60	06NA2174**E	-	06NA2123**E	-
	50				
30GXN/GXR114	60	06NA2209**N	-	06NA2146**N	-
30GXN/GXR115	50				
30GXN/GXR118	60	06NA2174**E	-	06NA2146**E	-
30GXN/GXR125	60	06NA2209**E	-	06NA2146**E	-
30GXN/GXR128	50				
30GXN/GXR135	60	06NA2209**E	-	06NA2174**E	-
30GXN/GXR138	50				
30GXN/GXR150	60	06NA2174**E	-	06NA2250**E	-
30GXN/GXR153	60	06NA2250**E	-	06NA2174**E	-
30GXN/GXR160	60	06NA2209**E	-	06NA2250**E	-
30GXN/GXR163	60	06NA2250**E	-	06NA2209**E	-
30GXN/GXR174	60	06NA2250**E	-	06NA2250**E	-
30GXN/GXR178	50				
30GXN/GXR204	60	06NA2250**E	06NA2123**E	06NA2209**E	-
30GXN/GXR205	50	06NA2300**E	06NA2146**E	06NA2250**E	-
30GXN/GXR208	60	06NA2209**E	06NA2209**E	06NA2174**E	-
30GXN/GXR220B	60	06NA2174**N	-	06NA2123**N	-
30GXN/GXR225	60	06NA2250**E	06NA2146**E	06NA2250**E	-
30GXN/GXR228	60	06NA2250**E	06NA2209**E	06NA2174**E	-
30GXN/GXR249	60	06NA2250**E	06NA2250**E	06NA2209**E	-
30GXN/GXR253					
30GXN/GXR264	60	06NA2250**E	06NA2250**E	06NA2250**E	-
30GXN/GXR268					
30GXN/GXR281	60	06NA2250**E	06NA2146**E	06NA2250**E	06NA2146**E
30GXN/GXR283A	60	06NA2250**E	-	06NA2174**E	-
30GXN/GXR283B	60	06NA2209**E	-	06NA2174**E	-
30GXN/GXR301	60	06NA2250**E	06NA2174**E	06NA2250**E	06NA2174**E
30GXN/GXR325	60	06NA2250**E	06NA2209**E	06NA2250**E	06NA2209**E
30GXN/GXR350	60	06NA2250**E	06NA2250**E	06NA2250**E	06NA2250**E
	50	06NA2300**E	06NA2300**N	06NA2300**N	06NA2300**N
30GXN/GXR410B	50	06NA2300**E	06NA2146**E	06NA2250**E	-
30HXA136	60	06NA2250**N	-	06NA2174**N	-
	50	06NA2300**N	-	06NA2209**N	-
30HXA146	60	06NA2250**N	-	06NA2209**N	-
	50	06NA2300**N	-	06NA2250**N	-

Unit	Hz	Compressor			
		A1	A2	B1	B2
30HXA161	60	06NA2250**E	-	06NA2174**E	-
	50	06NA2300**E	-	06NA2209**E	-
30HXA171	60	06NA2209**E	-	06NA2250**E	-
	50	06NA2250**E	-	06NA2300**E	-
30HXA186	60	06NA2250**E	-	06NA2250**E	-
30HXA206	60	06NA2209**E	06NA2123**E	06NA2250**E	-
30HXA246	60	06NA2250**E	06NA2174**E	06NA2250**E	-
30HXA261	60	06NA2250**E	06NA2209**E	06NA2250**E	-
30HXA271	60	06NA2250**E	06NA2250**E	06NA2250**E	-
	50	06NA2300**E	06NA2300**E	06NA2300**E	-
30HXC171	60	06NW2209**E	-	06NW2250**E	-
	50	06NW2250**E	-	06NW2300**E	-
30HXC186	60	06NW2250**E	-	06NW2250**E	-
30HXC206	60	06NW2209**E	06NW2123**N	06NW2250**E	-

Service Bulletins pertaining to this issue:

- SMB020067 – 06N Compressor Return Procedures
This bulletin describes the procedure for field return of 06N compressors and a procedure for a teardown analysis.
- SMB990037 – 06N Replacement Compressors
This bulletin advised of an error printed in the Controls, Start-Up, Operation, Service, and Troubleshooting Book, previous to and including 30G,H-4T, and a sticker on the compressor which advises the servicer to contact Carlyle at a toll free phone number to obtain a replacement compressor. The telephone number listed does not connect the servicer to Carlyle Compressor Company.
- SMB960072 – Carlyle 06N Compressor Failure in 30GX & 30HX Chillers
This bulletin described the field return procedure for the 06N compressors.
- PMB02-105 – Authorized Field Repairs and Parts Kits for 06N Screw Compressors
This bulletin included a description of all authorized field repairs and part numbers.
- PMB04-102 – 06NA660013 Accessory Kit Must be Ordered Separately
This bulletin advised of a change to the ordering process for replacement 06N Compressors from RCD. RCD is no longer offering the “B” Service Package option (Position 12). The kit, 06NA660013 must be ordered separately.

Compressor Replacement

Electrical Connection

06N Power Lead & Jumper Bar Installation

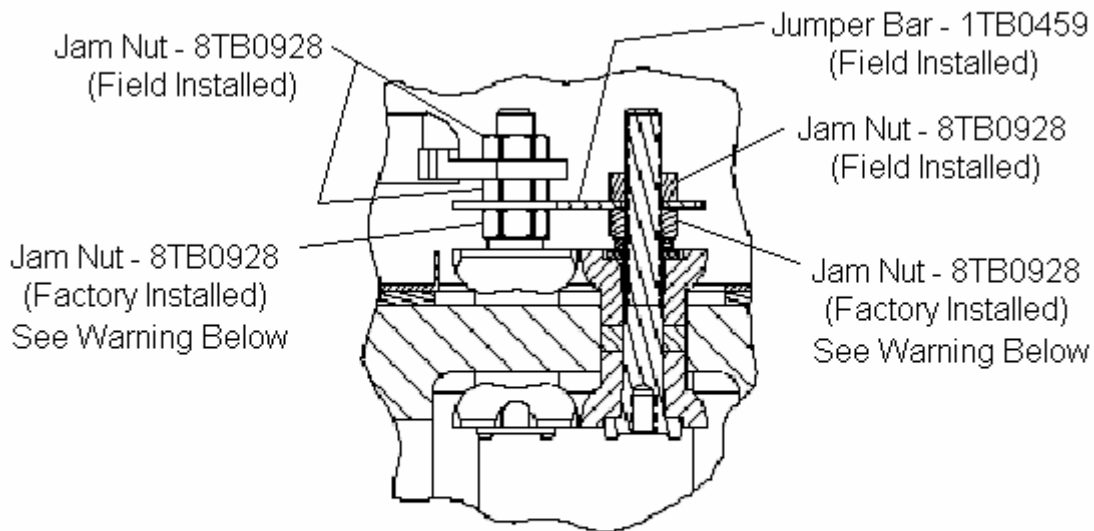
This procedure should be repeated for each power terminal pin to which a power lead and/or jumper bar is attached. The warning on the drawing stating that disturbing this

nut can jeopardize the seal integrity of the terminal pin is the primary concern to follow installation procedure for the terminal power leads and/or jumper bars.

Across-the-Line (XL) compressor wiring

Installation of Jumper Bar

1. Install Jumper Bar 1TB0459 onto factory installed Jam Nut 8TB0928.
2. Install anchoring Jam Nut 8TB0928 onto terminal pin and finger tighten to secure Jumper Bar
3. Position anchoring wrench on factory installed Jam Nut to prevent it from rotating.
4. Torque anchoring Jam Nut to the specified Torque value (15-20 lb-ft, 20-27 N-m) while ensuring that the factory installed Jam Nut never moves.
5. Removal of Jumper Bars is the reverse of the installation procedure with the emphasis on ensuring the factory installed jam nut never moves during the disassembly procedure.



WARNING!

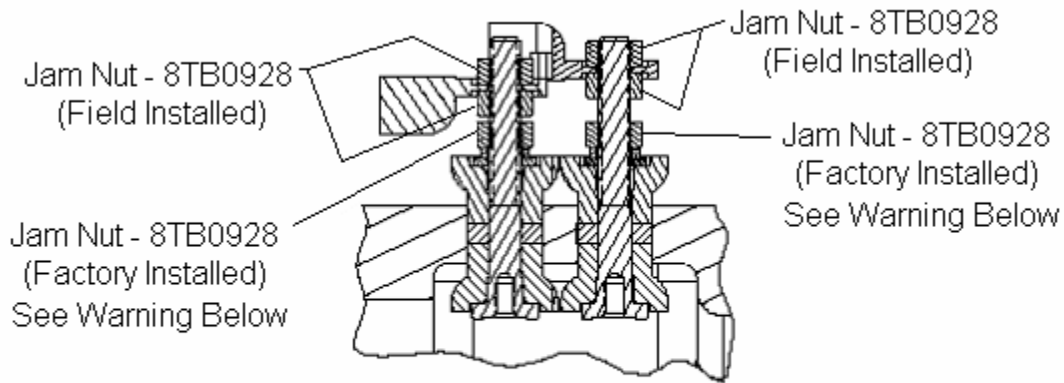
Disturbing this nut can jeopardize the seal integrity of the terminal pin.
DO NOT DISTURB.

Figure 21 - 06N Across-the-Line Wiring

Installation of Power Leads when Jumper Bars are Installed. (See Figure 21)

1. Install power lead eyelet over the terminal pin and onto the Jumper Bar anchoring nut
2. Install anchoring Jam Nut 8TB0928 onto appropriate terminal pins and finger tighten to secure Power Leads.
3. Position anchoring wrench on Jumper Bar anchoring nut to prevent it from rotating.

4. Torque anchoring Jam Nut to the specified Torque value (15-20 lb-ft, 20-27 N-m) while ensuring that the Jumper Bar anchoring nut never moves.
5. Removal of Power Leads is the reverse of the installation procedure with the emphasis on ensuring the factory installed jam nut never moves during the disassembly procedure.



WARNING!

Disturbing this nut can jeopardize the seal integrity of the terminal pin.
DO NOT DISTURB.

Figure 22 - 06N Wye-Delta Wiring

Installation of Power Leads when Jumper Bars are not Installed. (See Figure 22)

1. Install Jam Nut 8TB0928 onto terminal pin and position so that a minimum of at least one full thread separates the Jam nut from the factory installed Jam nut. Do not disturb the bottom jam as per warning.
2. Install power lead eyelet over the terminal pin and onto the properly positioned Jam Nuts
3. Install anchoring Jam Nut 8TB0928 onto appropriate terminal pins and finger tighten to secure Power Leads.
4. Position anchoring wrench on Jam nut that is below the power lead eyelet to prevent it from rotating.
5. Torque anchoring Jam Nut to the specified Torque value (15-20 lb-ft, 20-27 N-m) while ensuring that the anchoring Jam Nut never contacts the factory installed Jam Nut.
6. Removal of Power Leads is the reverse of the installation procedure with the emphasis on ensuring the factory installed jam nut never moves during the disassembly procedure.

Compressor Weights

Compression

Discharge Check Valve

The discharge check valve is located in the muffler casing of the compressor between the discharge port and the muffler assembly. The check valve is installed to prevent pressure equalization through a non-operating compressor.

The check valve is a mushroom-shaped part located in the internal muffler/discharge cavity. It is guided on a hardened dowel via a hole in the stem. The seal is achieved between the spherical top surface of the check valve and a conical seat in the outlet casing.

Troubleshooting:

- Compressor whine at shutdown.
The refrigerant gas spinning the rotors backwards as the system pressures equalize through the compressor causes this whine. This backward rotation, unlike powered reverse rotation, is not detrimental to the compressor. However, in multiple compressor circuits, check valve leakage will significantly reduce capacity.
Check the following items:
 - Check the discharge check valve for wear.
- Rapidly Plugging Oil Filters
See "Compressor whine at shutdown."
- Ticking Noise at the compressor
See "Compressor whine at shutdown."
Check the suction service valve, if equipped to be sure that it is locked in position.

If a worn check valve is encountered, replace the check valve. If there is additional damage to the mating surface, RCD has the bearing cover with all necessary o-rings in a kit for field replacement.

Service Bulletins pertaining to this issue:

- PMB02-105 – Authorized Field Repairs and Parts Kits for 06N Screw Compressors
This bulletin included a description of all authorized field repairs and part numbers.

Suction Screen

Compressors starting with Serial Number 3501J do not include the suction screen. The screen was removed as an efficiency improvement. If a screen is desired, it can be added.

The suction screen was added back to production compressors starting with Serial Number 1002J.

Service Bulletins pertaining to this issue:

- PMB02-105 – Authorized Field Repairs and Parts Kits for 06N Screw Compressors
This bulletin included a description of all authorized field repairs and part numbers.

Electrical

Motor

RCD has set-up compressor motor rebuild kits. These kits however are not intended to allow for jobsite rework of the compressor motor. There are a number of steps that must be accomplished in a motor shop. Contact Service Engineering before attempting to replace the compressor motor.

Service Bulletins pertaining to this issue:

- PMB03-043 – Service Replacement Motor Kits for 06N Screw Compressors
This bulletin introduced the option to replace the compressor motor in the event a motor failure occurred. This bulletin was later retracted.

Motor Terminal Pins

Electrical connections for the motor are made with terminal pins that extend outside of the compressor. There are 2 isolators and a rubber grommet that when pinched together by a lock washer and nut create the seal for the refrigerant circuit.

In rare cases, the compressor motor terminals have loosened to create a small leak. A torque procedure was developed and published under SMB990001 for field repair. In some instances, this procedure would not correct the problem. As a result a Repair Kit was developed with new seals and hardware to resolve the problem. The kit, 06NA6600026 is available through RCD.

Upon start-up, and as part of normal maintenance, all 06N terminals should be inspected for correct installation of compressor motor power leads. It has been reported on 30HX units with Serial Numbers between 0104Q to 2504Q and with Wye-Delta starters, the power leads on terminals 4, 5, & 6 may be installed incorrectly on the terminal pin. This may result in the power lead insulator being damaged by the jam nut on adjoining terminals 1, 2, or 3. A short circuit may occur resulting in irreparable

damage to the compressor. If this is found, it may be required to raise the power leads on terminals 4, 5, & 6 to obtain clearance. See Figure 22 - 06N Wye-Delta Wiring for proper wiring installation.

Service Bulletins pertaining to this issue:

- SMB990001 – 06N Terminal Pin Field Torquing Procedure
This bulletin described the process for the field to follow when tightening the Motor Terminal Pin on the 06N compressors.
- PMB02-105 – Authorized Field Repairs and Parts Kits for 06N Screw Compressors
This bulletin included a description of all authorized field repairs and part numbers.

Lubrication System

Oil Solenoid Valve

An oil solenoid valve on the compressor controls the oil flow to the compressor internal components. The oil solenoid valve has an integral check valve used to allow for the oil filter change without removing the charge.

Service Bulletins pertaining to this issue:

- SMB990003 – 06N Oil Solenoid Valve Changes
This bulletin described the oil solenoid valve changes implemented with the 06N compressors. The bulletin also included the instruction sheet for upgrading to the new style valve.
- PMB02-105 – Authorized Field Repairs and Parts Kits for 06N Screw Compressors
This bulletin included a description of all authorized field repairs and part numbers.

Oil Supply Line

With the introduction of ComfortLink Controls, the oil connection to the compressor changed from a Swagelok fitting to an O-ring Face Seal Connector, 30HX502368. O-rings for the face seal, RA0378-11 and fitting, RA0437-03 are available through RCD. Field fabrication of the mating face seal tube is not recommended. A tubing assembly with the face seal flange fitting, 30GX503489 is available through RCD.

Compressor Mufflers

In all machines there are two mufflers per circuit, one internal to the compressor and the other external.

Internal Muffler

The internal muffler is located in the discharge section of the compressor, downstream of the discharge check valve. The muffler is a plate that is not flat, such that when it is installed, it acts as a spring keeping it in place.

External Muffler

An external muffler added further sound/vibration reduction to the machine. It is a specially designed glass-pack muffler. Two styles of mufflers are used. The original Series 4 muffler served no other purpose other than sound/vibration reduction. This same muffler was used on part of the Series 5 production. In anticipation of change to discharge superheat control, the muffler was modified to add a thermistor well. (Production date to be determined.)

Compressor Starters

There are two starters for the 30GX/HX machines, Across-the-line and Wye-Delta. The Wye-Delta option is the reduced inrush current option.

Beginning with April 2003 production of the 30GX machines (approximate serial number start 1503F) and October 2002 production of the 30HXA/HXC machines (approximate serial number start 4302Q) the starter manufacturer was changed from Square D/Telemecanique to Siemens. Contactors from both suppliers can be rebuilt in the field with new contacts as well as contactor coils. Some parts are available through RCD.

Contactor Part Number	Square D/Telemecanique		Siemens	
	Contactor	Coil Replacement	Contactor	Coil Replacement
HN53EK115		LX1FF092		3RT19555AF31
HN53EK208		LX1FF220		3RT19555AP31
HN53EL115		LX1FF092		3RT19555AF31
HN53EL208		LX1FF220		3RT19555AP31
HN53EP115		LX1FG092		3RT19555AF31
HN53EP208		LX1FG220		3RT19555AP31
HN53EP209		LX1FG184		3RT19555AP31

Across-the-Line Option

The start option is the standard starting option for all 380-3-60, 460-3-60, 380/415-3-50, and 575-3-60 machines.

Service Bulletins pertaining to this condition:

- SMB020027 – 30GX,HX Compressor Contactor Failures
This bulletin described the failure mode of the Telemecanique contactors with the binding actuator.
- SMB020027A – 30GX,HX Compressor Contactor Failures
This bulletin superseded SMB020027. There was no change to the body of the document. The revision clarified the warranty claim procedures.

Wye-Delta Start Option

The preferred method of reduced current starters for the 30GX/HX machines is the Wye-Delta Starter. It is standard starter on all 230-3-60, 208/230-3-60, and 230-3-50 machines. The 30GX/HX machines use an open transition wye-delta starter. The starter consists of 3 contactors: a Shorting Contactor “S”, Run Contactor “1M”, and Delta Contactor “2M”. The contactors “S” and “2M” are mechanically and electrically interlocked, such that they cannot be energized together.

To start the motor, control power to the contactor coils of “S” and “1M” is applied. With these two contactors energized, the motor is connected in a Wye configuration. The motor starts and comes up to operating speed.

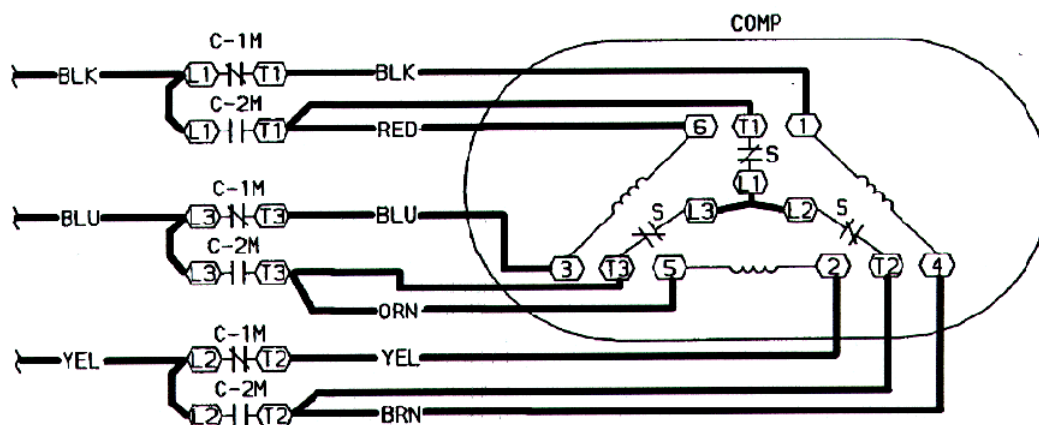


Figure 23 - Wye Start Operation

Approximately five (5) seconds after starting, the “S” contactor is opened. With the change to ComfortLink Compressor Protection Module Revision 26 software, the transition timing changed to 2.5 seconds. The motor is now disconnected from the power supply, yet continues to turn. The motor speed will slow during this transition. The motor should not slow to less than 80% of the operating speed. Within 49 milliseconds, the “2M” contactor is energized. With “1M” and “2M” energized, the motor is configured into a delta configuration.

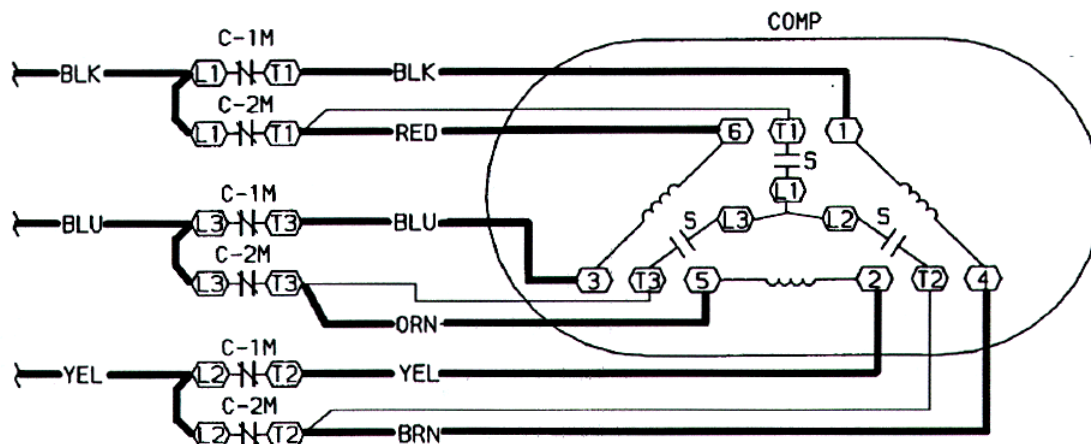


Figure 24 - Delta Operation

Beginning with April 2003 production of the 30GX machines (approximate serial number start 1503F) and October 2002 production of the 30HXA/HXC machines (approximate serial number start 4302Q) the starter manufacturer was changed from Square D/Telemecanique to Siemens. Due to the mechanical interlocks, if a Square D/Telemecanique contactor in the starter fails, it cannot be replaced with a Siemens contactor. Originally, the whole starter must be replaced since the Square D/Telemecanique contactors were unavailable. Beginning January 2004, RCD has set-up the Square D contactors under RCD part numbers. They are listed below. These parts should be confirmed by inspection and EPIC before placing an order for these parts.

Starter Assembly Part Number	Contactor Part Number	RCD Replacement Part Number (Square D/Telemecanique)
30GX400745	HN53EP115	30GX680010
30GX400746	HN53EP208	30GX680011
30GX400747	HN53EL115	30GX680008
30GX400748	HN53EL208	30GX680009
30GX400749	HN53EK115	30GX680006
30GX400750	HN53EK208	30GX680007
30GX400845	HN53EP209	30GX680012

Service Bulletins pertaining to this condition:

- SMB020027 – 30GX,HX Compressor Contactor Failures
This bulletin described the failure mode of the Telemecanique contactors with the binding actuator.
- SMB020027A – 30GX,HX Compressor Contactor Failures
This bulletin superseded SMB020027. There was no change to the body of the document. The revision clarified the warranty claim procedures.

Condenser Air-Cooled (30GXN/GXR Only)

Condenser Coil

Several condenser coil options are offered for corrosion protection.

Position 11 in the model number indicates the coil option

- “-“ Standard Aluminum Fin/Copper Tube Coil
- “C” Copper Fin/Copper Tube Coil
- “E” Aluminum Fin/Copper Tube Coil with E-Coat
- “F” Copper Fin/Copper Tube Coil with E-Coat
- “K” Aluminum Pre-coast Fin/Copper Tube

30GXN/GXR	Condenser Coil Option – Fins/inch				
	-	C	E	F	K
106	17.0				17.0
135			17.0		

Non-E-coat Coil Cleaning

For standard aluminum, copper and pre-coated aluminum fin coils, clean the coils with a vacuum cleaner, fresh water, compressed air, or a bristle brush (not wire). Units installed in corrosive environments should have coil cleaning as part of a planned maintenance schedule. In this type of application, all accumulations of dirt should be cleaned off the coil.

CAUTION

Do not use high-pressure water or air to clean coils — fin damage may result.

E-Coat Coil Cleaning

Follow the outlined procedure below for proper care, cleaning and maintenance of E-coated aluminum or copper fin coils:

Coil Maintenance and Cleaning Recommendations — Routine cleaning of coil surfaces is essential to maintain proper operation of the unit. Elimination of contamination and removal of harmful residues will greatly increase the life of the coil and extend the life of the unit.

Remove Surface Loaded Fibers — Surface loaded fibers or dirt should be removed with a vacuum cleaner. If a vacuum cleaner is not available, a soft brush may be used. In either case, the tool should be applied in the direction of the fins. Coil surfaces can be easily damaged (fin edges bent over) if the tool is applied across the fins. **NOTE:** Use of a water stream, such as a garden hose, against a surface loaded coil will drive the fibers and dirt into the coil. This will make cleaning efforts more difficult. Surface loaded fibers must be completely removed prior to using low velocity clean water rinse.

Periodic Clean Water Rinse — A periodic clean water rinse is very beneficial for coils that are applied in coastal or industrial environments. However, it is very important that the water rinse is made with very low velocity water stream to avoid damaging the fin edges. Monthly cleaning as described below is recommended.

Routine Cleaning of Coil Surfaces — Monthly cleaning with Environmentally Sound Coil Cleaner is essential to extend the life of coils. It is recommended that all coils, including standard aluminum, pre-coated, copper/copper or E-coated coils are cleaned with the Environmentally Sound Coil Cleaner as described below. Coil cleaning should be part of the units regularly scheduled maintenance procedures to ensure long life of the coil. Failure to clean the coils may result in reduced durability in the environment.

Environmentally Sound Coil Cleaner is non-flammable, hypo allergenic, non-bacterial, USDA accepted biodegradable and 100% ecologically safe agent that will not harm the coil or surrounding components such as electrical wiring, painted metal surfaces or insulation. Use of non-recommended coil cleaners is strongly discouraged since coil and unit durability could be affected.

Environmentally Sound Coil Cleaner Application Equipment

- 2-1/2 Gallon Garden Sprayer
- Water Rinse with Low Velocity Spray Nozzle

Environmentally Sound Coil Cleaner Application Instructions:

- Although Environmentally Sound Coil Cleaner is harmless to humans, animals, and marine life, proper eye protection such as safety glasses is recommended during mixing and application.
- Remove all surface loaded fibers and dirt with a vacuum cleaner as described above.
- Thoroughly wet finned surfaces with clean water and a low velocity garden hose being careful not to bend fins.
- Mix Environmentally Sound Coil Cleaner in a 2-1/2 gallon garden sprayer according to the instructions included with the Enzyme Cleaner. The optimum solution temperature is 100 °F (38 °C). NOTE: DO NOT USE water in excess of 130 °F (55 °C) as the enzymatic activity will be destroyed.
- Thoroughly apply Environmentally Sound Coil Cleaner solution to all coil surfaces including finned area, tube sheets and coil headers.
- Hold garden sprayer nozzle close to finned areas and apply cleaner with a vertical, up-and-down motion.
- Avoid spraying in horizontal pattern to minimize potential for fin damage.
- Ensure cleaner thoroughly penetrates deep into finned areas.
- Interior and exterior finned areas must be thoroughly cleaned.
- Finned surfaces should remain wet with cleaning solution for 10 minutes.
- Ensure surfaces are not allowed to dry before rinsing. Reapply cleaner as needed to ensure 10-minute saturation is achieved.
- Thoroughly rinse all surfaces with low velocity clean water using downward rinsing motion of water spray nozzle. Protect fins from damage from the spray nozzle.

CAUTION

Harsh Chemical and Acid Cleaners — Harsh chemical, household bleach or acid cleaners should not be used to clean outdoor or indoors coils of any kind. These cleaners can be very difficult to rinse out of the coil and can accelerate corrosion at the fin/tube interface where dissimilar materials are in contact. If there is dirt below the surface of the coil, use the Environmentally Sound Coil Cleaner as described above.

High Velocity Water or Compressed Air — High velocity water from a pressure washer, garden hose or compressed air should never be used to clean a coil. The force of the water or air jet will bend the fin edges and increase airside pressure drop. Reduced unit performance or nuisance unit shutdown may occur.

Condenser Fan

Several condenser fan options are available for the 30GXN/GXR machines: Standard fans, 0.4 and 0.8 w.g. (100 and 200 Pa) External Static Pressure Fans.

Standard Fan

The 30GX machines use the “Flying Bird Fan”. This fan is made from a UV stable molded plastic with a brass hub. The fan is secured with set screws and a keyway to the motor shaft.

The fan is molded with a date code. Two styles of date codes were used.

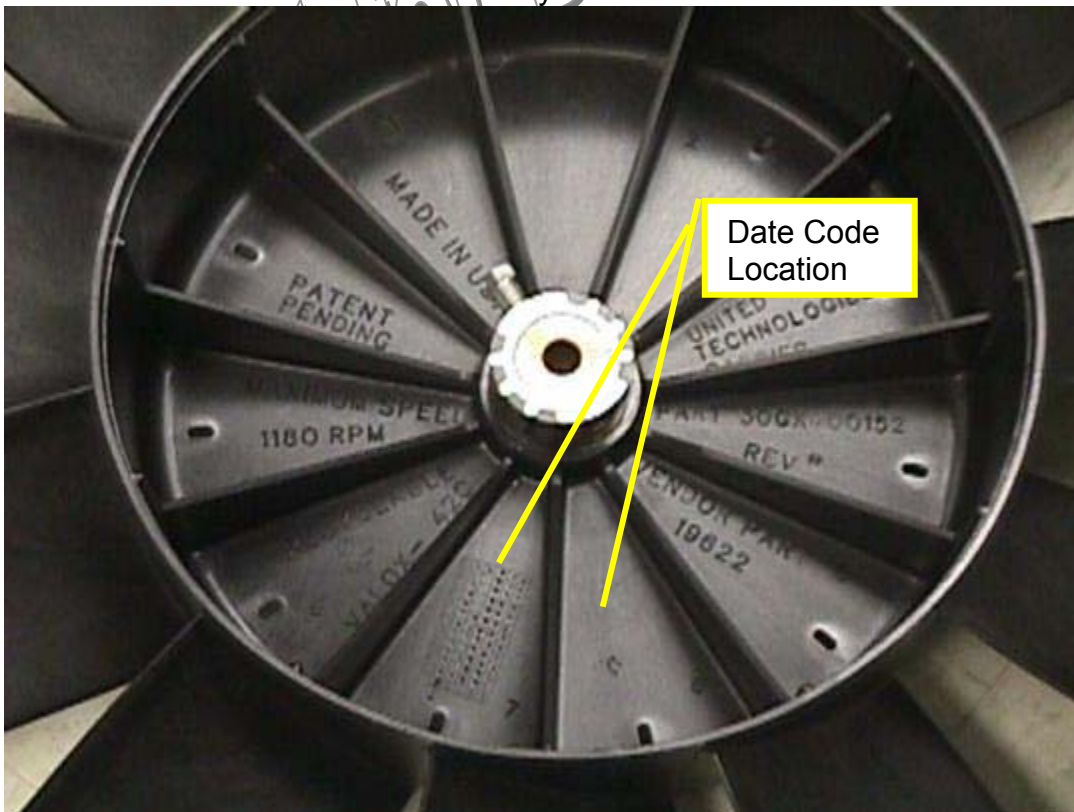


Figure 25 - Flying Bird Fan Date Code Locations

Originally, a grid was used denoting a month and year of production. To determine the production date code, find the last ● punched in the grid style date code that will correspond to a month and year.

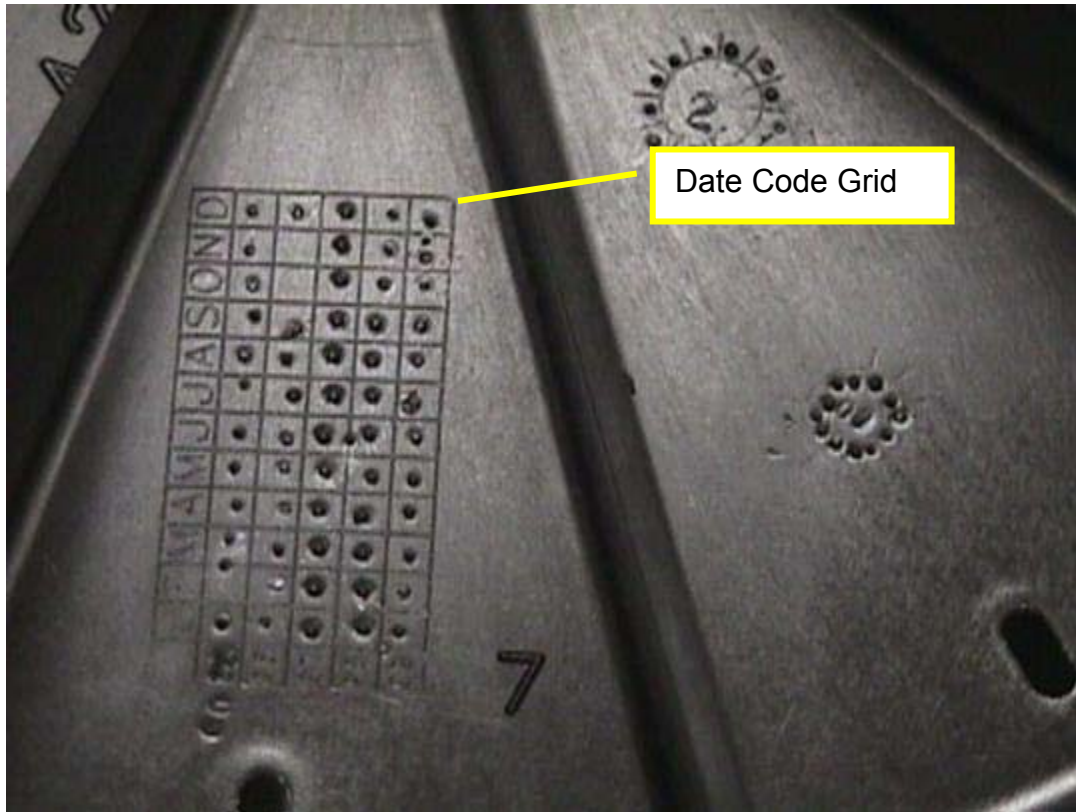


Figure 26 - Flying Bird Fan Grid Style Date Code Format

Flying Bird Grid Style Date Code Format and Example

	J	F	M	A	M	J	J	A	S	O	N	D
00	●	●	●	●								
96	●	●	●	●	●	●	●	●	●			●
97	●	●	●	●	●	●	●	●	●	●	●	●
98	●	●	●	●	●	●	●	●	●	●	●	●
99	●	●	●	●	●	●	●	●	●	●	●	●

Note: ● - Indicates a month the mold produced a fan.

In the above example, the fan was produced in April 2000.

At the end of 2000, this grid was filled completely and a date code wheel was added. The wheel has a number in it corresponding to a year. Once the year is completed another wheel is added with the last digits of the year in the center: 1-2001, 2-2002,

3-2003, etc. Each dot around the perimeter represents a month: 1 dot-January, 2 dots-February, 3 dots-March, etc.

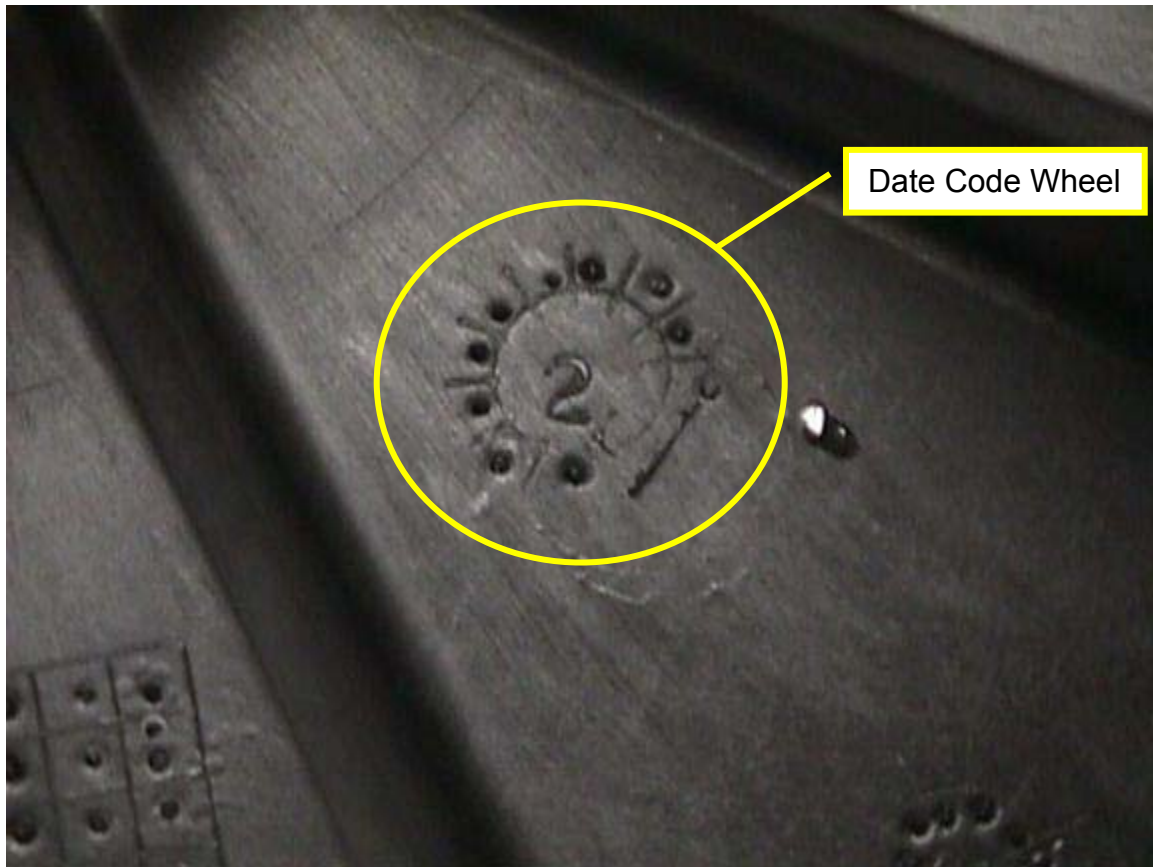


Figure 27 - Flying Bird Fan Wheel Style Date Code

In the above picture, this fan was produced in October 2002 (10 dots and a “2” in the center).

Several modifications have been made to the fan. Starting Serial Numbers are approximations of the implementation of the improvement.

The ComfortLink 30GX machines were being assembled with a spacer was installed between the motor and the fan to stop the fan from sliding down the motor shaft. The part can be obtained from McMaster-Carr, part number 6432K21. This spacer remained in production until the hub improvements noted in 5200F were implemented.

Starting with serial numbers 4200F, additional hub improvements were made. The set screw torque was changed to 240 in-lbs (27.1 N-m).

Beginning with serial numbers 5200F, the hub was redesigned to have pins to better capture the plastic to the hub. A spun-in washer was added to the hub to stop the fan from sliding down the shaft as shown in the figure below.



**Figure 28 - Fan Hub
(Prior Serial Number 5200F)**



**Figure 29 - Fan Hub
(Starting Serial Number 5200F)**

Beginning with the May 2001 fan production, (Approximate Serial Number Start, 1901F), two 3/8" holes were drilled into the fan hub to better capture the plastic during the mold process.

The fan cover was redesigned slightly to secure the cover better. Larger drain holes were molded into the fan as shown below. The view shown is from the under side of the fan.



**Figure 30 - Fan Drain
(Prior Serial Number 5200F)**



**Figure 31 - Fan Drain
(Starting Serial Number 5200F)**

Beginning with Serial Number 4201F, the set screw torque was changed from 160 in-lbs. (14.2 N-m) to 192 in-lbs (17.1 N-m).

High Static Fan

Two options are offered, 0.4 w.g. and 0.8 w.g. External Static Pressure Fans. The 0.4 w.g. (100 Pa) external static fan uses a 12 blade adjustable pitch fan blade with a 5 horsepower fan motor. The fan deck is strengthened to support the extra weight of the

fan motor. The pitch of the fan blades for 50 Hz applications is 15°, 10° for 60 Hz applications. The fan pitch requires a special protractor, available from Chicago Blower. This option uses an external overload for motor protection.

The 30GXN/GXR250 and 264 (230-3-50) models with the 0.4 ESP option were produced with the wrong pitch blades called out on an assembly drawing error.

The 0.8 w.g. (200 Pa) external static fan uses a 12 blade adjustable pitch fan blade with a 5 horsepower fan motor. The fan deck is strengthened to support the extra weight of the fan motor. The pitch of the fan blades for 50 Hz applications is 22°, 12° for 60 Hz applications. The fan pitch requires a special protractor, available from Chicago Blower. This option uses an external overload for motor protection.

The 30GXN/GXR150, 160 and 174 (230-3-60) models and the 30GXN/GXR175 (230-3-50) models with the 0.8 ESP option were produced with the wrong pitch blades called out on an assembly drawing error.

Failure of these blades can be caused by several factors according to the vendor. This list is not inclusive. There may be other factors that contribute to the failure in this area. These are general guidelines and are presented as a starting point for the investigation.

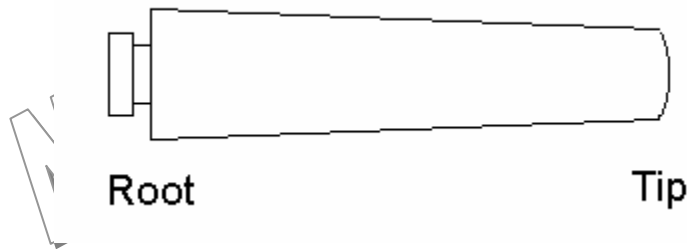


Figure 32 - High Static Fan Blade (with hub removed for clarity)

Failure at the root end – Overload or Shock Load

Check for the following items:

- Check the condenser coil for cleanliness. Too much debris in the coil will load the blade.
- Check for a chattering contact causing the fan to start and stop.

Failure between the root and tip – Resonance

Check for the following items:

Failure at the tip end – Out of Balance

Check for the following items:

- Check for debris on the fan causing the imbalance.

Condenser Fan Motor (30GXN/GXR)

There are several condenser fan options for the 30GXN/GXR machines.

Standard Condenser Fan Motors

These machines started production with a dedicated Motormaster III motor in the lead fan positions, HD52AK652. This is the only motor qualified for this application. These motors continued in production through serial numbers starting with 0702F. The other non-Motormaster III fan motors were HD56AK651. These motors were used in production through serial numbers starting with 4801F.

Early ComfortLink production may have been produced with the HD56AK651 motors being controlled by the Motormaster III controller. As a result, premature failure may occur.

Beginning with serial numbers starting with 4901F, the non-motormaster motors were changed to HD56AK653 in a standardization effort.

With the introduction of Motormaster V, machines starting with serial number 0702F, the motormaster fan motors were changed to HD56AK653. This is a VFD compatible motor.

Condenser Fan Motor Data				
Part Number	Voltage	Approximate Weight, lbs (kg)	Compatibility	
			MotorMaster III	MotorMaster V
HD56AK651			No	No
HD56AK652			Yes	No
HD56AK653	208/230-3-60 230-3-60 460-3-60 380/415-3-50	45.0 (20.3)	No	Yes

High Static Condenser Fan Motors

Condenser Fan Motor Data				
Part Number	Voltage	Approximate Weight, lbs (kg)	Compatibility	
			MotorMaster III	MotorMaster V
HD52AK230	208/230-3-60 230-3-60 460-3-60 380/415-3-50	95.0 (43.2)	No	No
HD60AK380			No	No

Condenser Water-Cooled (30HXC Only)

The Series 4 condensers are produced with Spike Fin II condenser tubes. The condenser heads are fabricated. Condenser heads could be swapped, but head must be rotated so as not to block any of the condenser tubes.

30HXC Condenser (Series 4)							
30HXC	Part Number	Shell O.D.	Tube Number	No. of Tubes	No. of Passes	Nozzle	Liquid Line
076 086	09RX400173	18"	09RX500086	84	2	5"	1-1/8"
096 106	09RX400174	18"	09RX500085	96	2	5"	1-1/8"
116 126	09RX400175	18"	09RX500088	105	2	5"	1-1/8"
136 146	09RX400176	18"	09RX500088	126	2	5"	1-1/8"
161	09RX400177	20"	09RX500088	136	2	5"	1-3/8"
171 186	09RX400178	20"	09RX500087	177	2	5"	1-3/8"
206	09RX400179	22"	09RX500134	197	2	6"	1-5/8"
246 261 271	09RX400180	22"	09RX500134	242	2	6"	1-5/8"

The Series 5 condensers are produced with Spike Fin III condenser tubes. Cast condenser heads in place of the fabricated heads were also added to the machines. Condenser heads can be swapped with no extra pressure drop. Unlike the Series 4 heads, the condenser heads do not need to be rotated to maintain the water flow path. The orientation remains the same.

30HXC Condenser (Series 5 & 6)							
30HXC	Part Number	Shell O.D.	Tube Number	No. of Tubes	No. of Passes	Nozzle	Liquid Line
076 086		18"			2		1-1/8"
096 106		18"			2		1-1/8"
116 126		18"			2		1-1/8"
136 146		18"			2		1-1/8"
161	09RX400261	20"	09RX500268	122	2	6	1-3/8"
171 186		20"			2		1-3/8"
206	09RX400263	22"	09RX500269	177	2		1-5/8"
246 261 271		22"			2		1-5/8"

Cooler

The 30GX/HX product uses a flooded cooler design. Two separate refrigerant circuits are contained within one vessel adjacent to each other. A center tube sheet separates the two circuits. The cooler tubes are rolled into the center tubesheet to create a refrigerant seal.

Series 5 units introduced the cast cooler head on several machines.

Machines are shipped from the factory with the cooler heads in a given configuration. The cooler heads can be swapped end to end with little work. The cooler tubes may need to be faced to obtain a proper seal at the cooler head division plate to tubesheet.

In Series 6 machines, if the heads are reversed, the location of the leaving water sensor relative to the circuit must be configured.

Cooler Physical Data

30GX/HX ComfortLink Screw Chiller Service Manual

30GXN/GXR Cooler – Series 4									
30GXN/ GXR	Pass	No. of Passes	Cooler Part No.	Nozzle Size/ Material	Shell O.D.	Tube P/N 10HX500	No. of Tubes	Water Head	
080 090	-1P	2	10HX400174	4"/Steel	14"	094	116		
	STD	3	10HX400003	4"/Steel					
	+1P	4	10HX400208	4"/Steel					
106 114 115	-1P	2	10HX400176	5"/Steel	16"	094	135		
	STD	3	10HX400009	5"/Steel					
	+1P	4	10HX400212	5"/Steel					
125 135	-1P	2	10HX400178	5"/Steel	16"	094	163		
	STD	3	10HX400014	5"/Steel					
	+1P	4	10HX400217	5"/Steel					
150	-1P	1	10HX400175	5"/Steel	14"	096	116		
	STD	2	10HX400005	4"/Steel					
	+1P	3	10HX400209	4"/Steel					
160 174 175	-1P	1	10HX400177	5"/Steel	16"	096	135		
	STD	2	10HX400011	5"/Steel					
	+1P	3	10HX400214	5"/Steel					
204 205	-1P	1	10HX400171	8"/Steel	18"	142	163		
	STD	2	10HX400170	6"/Steel					
	+1P	3	10HX400223	6"/Steel					
225	-1P	1	10HX400168	8"/Steel	18"	142	187		
	STD	2	10HX400156	6"/Steel					
	+1P	3	10HX400221	6"/Steel					
249 250 264	-1P	1	10HX400169	8"/Steel	18"	142	208		
	STD	2	10HX400157	6"/Steel					
	+1P	3	10HX400222	6"/Steel					
281 301 325 350	-1P	1	10HX400254	8" Steel	20"	259	263		
	STD	2	10HX400252						
	+1P	3	10HX400253						

30GX/HX ComfortLink Screw Chiller Service Manual

30GXN/GXR Cooler – Series 5 & 6									
30GXN/ GXR	Pass	No. of Passes	Part No.	Nozzle Size/ Material	Shell O.D.	Tube P/N 10HX500	No. of Tubes	Water Head	
080 090	-1P	2		4" /Cast	14"	473	109		
	STD	3	10HX400403	4" /Cast					
	+1P	4		4" /Steel					
106 114 115	-1P	2		5" /Cast	16"				
	STD	3		5" /Cast					
	+1P	4		5" /Steel					
118	-1P	1	10HX400465	5" /Steel	14"	477	95		
	STD	2	10HX400464	5" /Cast					
	+1P	3	10HX400466	4" /Cast					
125 135	-1P	2		5" /Cast	16"	473	154		
	STD	3	10HX400412	5" /Cast					
	+1P	4		5" /Steel					
128 138	-1P	1	10HX400462	5" /Steel	14"	477	109		
	STD	2	10HX400461	5" /Cast					
	+1P	3	10HX400463	4" /Cast					
150	-1P	1	10HX400423	5" /Steel	14"	475	109		
	STD	2	10HX400404	5" /Cast					
	+1P	3	10HX400438	4" /Cast					
160 174 175	-1P	1	10HX400425	5" /Steel	16"	475	125		
	STD	2	10HX400409	5" /Cast					
	+1P	3	10HX400433	5" /Cast					
204 205	-1P	1		8" /Steel	18"				
	STD	2		6" /Cast					
	+1P	3		6" /Steel					
225	-1P	1		8" /Steel	18"				
	STD	2		6" /Cast					
	+1P	3		6" /Steel					
249 250 264	-1P	1		8" /Steel	18"	478	195		
	STD	2	10HX400544	6" /Cast					
	+1P	3		6" /Steel					
281 301 325 350	-1P	1		8" /Steel	20"	479	247		
	STD	2	10HX400453	8" /Cast					
	+1P	3		8" /Steel					
283B		1	10HX400467	8" /Steel	14"	477	109		
300A		1	10HX400458	8" /Steel	16"	475	125		

30GX/HX ComfortLink Screw Chiller Service Manual

30GXN/GXR Cooler – Series 5 & 6									
30GXN/ GXR	Pass	No. of Passes	Part No.	Nozzle Size/ Material	Shell O.D.	Tube P/N 10HX500	No. of Tubes	Water Head	
303B		1	10HX400467	8" /Steel	14"	477	109		
320A 320B		1	10HX400458	8" /Steel	16"	475	125		
370B		1	10HX400457	8" /Steel	14"	475	109		
373B		1	10HX400467	8" /Steel	14"	477	109		
415B		1	10HX400458	8" /Steel	16"	475	125		

Certified prints for the Series 5, 30GXN/GXR118, 128, 138 and 150 machine were incorrect for the nozzle connection size for the standard pass machines. The nozzle connection was incorrectly noted as 4".

Not for Distribution

30HXA/HXC Cooler – Series 4							
30HX	Pass	Part No.	Nozzle Size	No. of Passes	Shell O.D.	Tube P/N	No. of Tubes
076 086	-1	10HX400187	4"	2	14"	10HX500095	101
	STD	10HX400001		3			
	+1	10HX400206		4			
96	-1	10HX400189	4"	2	14"	10HX500094	116
	STD	10HX400002		3			
	+1	10HX400207		4			
106	-1P	10HX400193	5"	2	16"	10HX500094	135
	STD	10HX400010		3			
	+1P	10HX400213		4			
116 126	-1P	10HX 400192	5"	1	14"	10HX500105	101
	STD	10HX 400007	4"	2			
	+1P	10HX 400211	4"	3			
136 146	-1P	10HX 400191	5"	1	14"	10HX500105	116
	STD	10HX 400006	4"	2			
	+1P	10HX 400210	4"	3			
161	-1P	10HX 400196	5"	1	16"	10HX500105	135
	STD	10HX 400104		2			
	+1P	10HX 400218		3			
171	-1P	10HX 400194	5"	1	16"	10HX500096	135
	STD	10HX 400012		2			
	+1P	10HX 400215		3			
186	-1P	10HX 400195	5"	1	16"	10HX500096	163
	STD	10HX 400013		2			
	+1P	10HX 400216		3			
206	-1P	10HX 400197	6"	1	18"	10HX500142	187
	STD	10HX 400125		2			
	+1P	10HX 400219		3			
246 261 271	-1P	10HX 400198	6"	1	18"	10HX500142	208
	STD	10HX 400126		2			
	+1P	10HX 400220		3			

30HXA/HXC Cooler – Series 5 & 6							
30HX	Pass	Part No.	Nozzle Size	No. of Passes	Shell O.D.	Tube P/N	No. of Tubes
076 086	-1						
	STD						
	+1						
96	-1						
	STD						

30HXA/HXC Cooler – Series 5 & 6							
30HX	Pass	Part No.	Nozzle Size	No. of Passes	Shell O.D.	Tube P/N	No. of Tubes
	+1						
106	-1P						
	STD						
	+1P						
116 126	-1P						
	STD						
	+1P						
136 146	-1P						
	STD						
	+1P						
161	-1P						
	STD						
	+1P						
171	-1P						
	STD						
	+1P						
186	-1P						
	STD						
	+1P						
206	-1P	10HX400632					
	STD	10HX400631					
	+1P	10HX400633					
246 261 271	-1P						
	STD						
	+1P						

Cooler Weights

The following cooler weights are estimated.

30GXN/GXR – Series 4	
Unit	Cooler Weight lbs. (kg)
080, 083,090,093	1430 (650)
106,108,114,115	1694 (770)
118,128,138	1870 (850)
125,135	1749 (795)
150,153	1650 (750)
160,163,174,175	1925 (875)
178,204,205,208	3300 (1500)
225,228	3740 (1700)

249,253,264,268	3300 (1500)
281,301,325,350	4180 (1900)

Cooler Liquid Level Sensor

In Series 4 and 5 machines, cooler level control was provided by input from a Cooler Liquid Level Sensor. This device provides the control system with an operating level of liquid refrigerant in the cooler. The device uses a thermostatically controlled 18-watt heater to heat three (3) 5 kΩ @ 77 °F (25 °C) thermistors wired in series. The thermostat is set to maintain the device at 110 °F ± 2.8 °F (43.3 °C ± 5.0 °C).

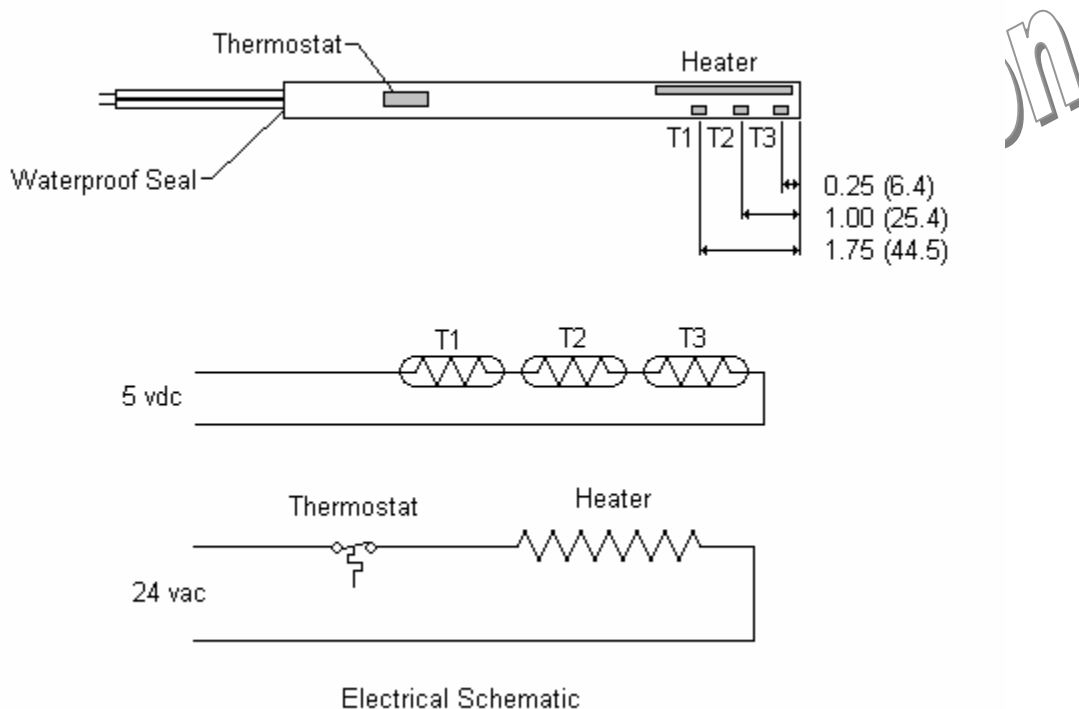


Figure 33 - Liquid Level Sensor

This device was not used in the Series 6 machines. Cooler level control was changed to Discharge Superheat Control.

Troubleshooting:

To check the Cooler Liquid Level Sensor's heater, disconnect the Cooler Liquid Level Sensor from the control system, disabling the internal heater. Measure the heater's resistance. The resistance should be 31.4 Ω.

To check the thermistors, disconnect the Cooler Liquid Level Sensor from the control system, disabling the internal heater. Allow the sensor to come to equilibrium with the cooler. Measure the resistance of the three thermistors. With a refrigerant gage, measure the cooler pressure and convert the pressure to a saturated temperature. On a 5 k Ω thermistor chart, find the resistance corresponding to the saturated temperature and multiply the resistance by 3. The multiplied value should be close to the measured resistance.

Cooler Freeze-Up/Leak Cleaning Procedure

There are several questions that should be asked when investigating the cause of a cooler failure.

1. How is the machine on-off cycle being controlled?
2. How are the pumps controlled?
3. Is there a flow switch installed?
4. Is the flow switch properly located?
5. Is the flow switch wired in to the proper terminals?
6. Is the machine control configured to accept the switch input?
7. What type of switch is installed, differential pressure or paddle?
8. If a differential pressure switch is installed, what was the differential pressure switch set for?
9. Does the chiller have control of the pumps?
10. Are there any isolation valves on the waterside or automatic control valves?
11. What type of fluid is in the chilled water loop?
12. What concentration of brine is used?
13. Are there any refrigerant leaks or a history of refrigerant leaks?
14. What are the design conditions: leaving water temperature, design rise, and water flow rate?
15. What is the loop volume?
16. Is this a simple system or a primary-secondary loop system?
17. Is the water flow variable?
18. Check all thermistors for proper installation in the wells?
19. Check to see if all thermistors are reading properly.
20. Check pressure transducers to make sure they are reading properly and are located in the proper positions.
21. Inspect the economizer plug and replace it if necessary.
22. Is there a strainer in the water system?
23. Where is the water strainer located?
24. What size mesh is the water strainer?
25. For 30HXA and 30HXC machines, is the mechanical room heated to at least 50 °F (10 °C)?

Record or download all the alarm codes in history, and get as many details on the operation and status prior to the failure.

The most important part of this investigation is trying to figure out why the cooler has failed. There have been a number of reasons that have contributed to the cooler failures. In colder climates an ambient freeze is one. There is a lot more refrigerant in these vessels than what everyone is used to as compared with a DX system. With the DX systems, the cooler heaters are in direct contact with the cooler shell. In the 30GX/HX, the cooler heaters are insertion heaters in the heads only. There must be a means to move the heat into the center of the bundle.

Cooler strainers are important and required items for the installation. The machine will run at lower than freezing saturated suctions, which should not be a problem as long as there is the required flow of water. The next is the cooler flow switch. ComfortLink software does not allow for the user to disable the cooler flow switch. A conscious decision to jumper this input must be made. The switch must be installed and properly configured to assure proper flow.

The construction of the cooler is such that one water tube serves both circuits. The freeze failure must be checked to be sure that it does not affect both circuits. If the tube failure is in both circuits, an internal plug must be used to stop a circuit to circuit bypass. It is strongly recommended that an eddy current test be completed to determine the extent of the damage.

So far as the clean-up, other than the normal removing the water and/or glycol, we have been recommending the following:

The system should be dehydrated as soon as possible.

Follow all local, EPA (Environmental Protection Agency, USA) and EH & S (Environmental, Health & Safety) codes when handling and disposing of the discarded materials. Open, lock out and tag the electrical power disconnects for the machine. Follow all other safety warnings in the literature, on tags and labels on the machine.

Determine the number of tubes that have failed. If the number of tubes is less than 10% per pass, plug the tubes. No more than 10% of the total tubes of the vessel should be plugged. If more than the limit of tubes have failed, consider replacing the vessel. Retubing the cooler may be difficult due to the nature of the failure. Freeze bulges can tear away from the tube as it is pulled through the tubesheet leaving sharp debris in the cooler, which eventually could fail another cooler tube. Plug and pin part numbers are listed in the Controls and Troubleshooting book.

If the compressor has been filled with water or glycol it is probably not salvageable. There is no guarantee that the compressor is free of contaminants. Replace the compressor per the instructions in the Controls and Troubleshooting book. Drain the oil from the cooler and oil separator. Replace the sight glass, external muffler, motor cooling filter drier, and the external oil filter.

To aid in the water removal in the system, pierce the low points of the coil headers (30GX) and/or refrigerant lines. Pressurize and blow out the system with dry nitrogen until water droplets stop coming from the holes.

Plug the cooler tubes as required.

Remove the factory installed strainer and install a four core filter drier in the liquid line ahead of the EXV/Economizer. Be sure that the shell includes a strainer and the cores are R-134a and POE compatible. The filter-driers should be removed once the clean-up is complete on 30HXC machines. Failure to remove the filter driers will result in a system performance loss. Check the refrigerant system for leaks. Evacuate and dehydrate the circuit using standard refrigeration techniques.

Recharge the machine with new oil and refrigerant. Change the motor cooling filter drier and the liquid line filter drier cores 24 hours after operation. Obtain an oil sample and test for water. If the system is wet, consider changing the oil again. Oil test limits are listed in the Service Section under Oil on page 223.

Service Bulletins pertaining to this issue:

- SMB990061 –30GX/HX cooler and 30HXC Condenser Tube ID Dimensions
This bulletin noted the incorrect tube post-roll tube dimensions listed in 30G,H-3T.
- SMB000001 – 30GX/HX Installation Review/Flow Switch
This bulletin provided a installation checklist to check for proper installation of the machines and noted the factory provided flow switch.
- SMB000013 - 30GX/HX Cooler and 30HXC Condenser Tube Plug Pin Number
This bulletin noted the incorrect tube plug pin part numbers listed in 30G,H-5T.

Cooler Head Removal

In Series 4 machines, a 1/2-13 x 3/4 deep hole is provided on top of the Cooler Head to allow for installation of an eyebolt.

In Series 5 and 6 machines, a 1.1 in. (27.9 mm) hole is machined into the cast head for a hook lift.

Cooler Heater

For the 30GX machines, the Cooler Protection Option includes both the cooler heaters and the pump out solenoids. This feature was made standard on all machines shipped within North America in Product Bulletin 111-01-50, dated June 15, 2001.

On units with cooler heaters, the number of heaters changes with the number of compressors. On the 30GXN/GXR080-178 and their associated modular units, there are two 500 watt heaters, one in each water head. On all other units, there are four 500 watt heaters, two in each water head.

There are two cooler heaters, based on control voltage.

Cooler Heater	Control Voltage	Resistance @ 70 ± 5 °F	Watts
30GX404235	120 VAC	26.1 – 28.1 ohms	500 ± 5%
30GX404236	240 VAC	104.2 – 115.2 ohms	

Expansion Device

There are two types of expansion devices that are used across the product line, an Electronic Expansion Valve or an Economizer.

Electronic Expansion Valve

In Series 4 and 5 machines, the Electronic Expansion Valve or EXV is used on the 30GXN/GXR080, 083, 090, 093, 106, 114, 220B, 30HXA,HXC076-146. The EXV is the EXV-II style valve. It is a 1500 step, non-bottom seal valve.

Unit	Standard		Brine	
	Circuit A	Circuit B	Circuit A	Circuit B
30HXC076	32GB402434	32GB402434	32GB402474	32GB402474

In Series 6 machines, the Electronic Expansion Valve is the primary expansion device for the 30GXN/GXR080, 083, 090, 093, 106, 114, 220B, 30HXA,HXC076-146. In the remaining units, it is the secondary or low side expansion device after the economizer. In this series of machines, the EXV is a 15,000 step valve.

Unit	Standard		Brine	
	Circuit A	Circuit B	Circuit A	Circuit B
30HXA076	32GB404554	32GB404554	32GB404274	32GB404274
30HXA086	32GB404554	32GB404554	32GB404274	32GB404274
30HXC076			32GB404554	32GB404554
30HXC126	32GB404214	32GB404204	32GB404194	32GB404184
30HXC136	32GB404214	32GB404204	32GB404204	32GB404184
30HXC206	32GB404594	32GB404584	32GB404224	32GB404264

Economizer

In Series 4 and 5 machines, the Economizer is a 2-stage expansion device with an Electronic Expansion Valve and low side float. This device is used on the 30GXN,GXR108,115-528 with the exception of the 220B model, 30HXA/HXC161-271. With the introduction of ComfortLink, the Bubbler tube connection was changed to an O-ring Face Seal fitting.

30GX/HX ComfortLink Screw Chiller Service Manual

The table below is a reference chart for Economizers. Confirm the part number in EPIC before ordering.

Unit	Standard		Brine	
	Circuit A	Circuit B	Circuit A	Circuit B
30GX*125	32GB402804	32GB402784	32GB402794	32GB402814
30GX*204	32GB402854	32GB402384	32GB402884	32GB402844
30GX*301	32GB402864	32GB402914		
30HXA171			32GB403794 *	

Note: * - A change to the 30HXA171 Brine Option Circuit A Economizer was made beginning with serial number 3602Q. The new economizer 32GB403794, has a larger EXD Orifice.

Below is a table showing the EXD and Float Orifice details. These dimensions are for reference only.

Carrier Part Number	Bubbler Tube Assembly	EXD Orifice					Float Stand			
		Assembly P/N (ref.)	Qty	Slot Width ±0.001	Slot Height ±0.001	Stamp No.	Assembly P/N (ref.)	Qty	Slot Width ±0.001	Slot Height ±0.001
32GB402774	B-34714	32GB401494	6	0.078	0.75	804	32GB401444	5	0.118	0.866
32GB402784	B-34714	32GB401684	5	0.047	0.75	764	32GB401444	5	0.118	0.866
32GB402794	B-34714	32GB401514	6	0.047	0.75	774	32GB401444	5	0.118	0.866
32GB402804	B-34714	32GB401524	8	0.047	0.75	794	32GB401444	5	0.118	0.866
32GB402814	B-34714	32GB401694	4	0.047	0.75	754	32GB401444	5	0.118	0.866
32GB402824	B-34714	32GB401784	4	0.078	0.75	874	32GB401444	5	0.118	0.866
32GB402834	B-34714	32GB401494	6	0.078	0.75	804	32GB401444	5	0.118	0.866
32GB402844	B-34714	32GB401784	4	0.078	0.75	874	32GB401444	5	0.118	0.866
32GB402854	B-34714	32GB401764	7	0.078	0.75	864	32GB401724	8	0.177	1.02
32GB402864	B-34714	32GB401794	9	0.078	0.75	824	32GB401724	8	0.177	1.02
32GB402874	B-34714	32GB401744	12	0.078	0.75	844	32GB401724	8	0.177	1.02
32GB402884	B-34714	32GB401934	8	0.047	0.75	794	32GB401724	8	0.177	1.02
32GB402894	B-34714	32GB401944	6	0.078	0.75	804	32GB401724	8	0.177	1.02
32GB402904	B-34714	32GB401954	8	0.078	0.75	894	32GB401724	8	0.177	1.02
32GB402914	B-34714	32GB401794	9	0.078	0.75	824	32GB401724	8	0.177	1.02
32GB402924	B-34714	32GB401944	6	0.078	0.75	804	32GB401724	8	0.177	1.02
32GB402934	B-34714	32GB401744	12	0.078	0.75	844	32GB401724	8	0.177	1.02
32GB402944	B-34714	32GB401954	8	0.078	0.75	894	32GB401724	8	0.177	1.02
32GB402954	B-34713	32GB401784	4	0.078	0.75	874	32GB401444	5	0.118	0.866
32GB402964	B-34713	32GB401504	9	0.078	0.75	824	32GB401444	5	0.118	0.866
32GB402974	B-34713	32GB401524	8	0.047	0.75	794	32GB401444	5	0.118	0.866
32GB402984	B-34713	32GB401494	6	0.078	0.75	804	32GB401444	5	0.118	0.866
32GB402994	B-34713	32GB401784	4	0.078	0.75	874	32GB401444	5	0.118	0.866
32GB403004	B-34713	32GB401684	5	0.047	0.75	764	32GB401444	5	0.118	0.866
32GB403014	B-34713	32GB401494	6	0.078	0.75	804	32GB401444	5	0.118	0.866
32GB403024	B-34713	32GB401504	9	0.078	0.75	824	32GB401444	5	0.118	0.866
32GB403034	B-34713	32GB401514	6	0.047	0.75	774	32GB401444	5	0.118	0.866
32GB403044	B-34713	32GB401734	10	0.078	0.75	834	32GB401724	8	0.177	1.02

30GX/HX ComfortLink Screw Chiller Service Manual

Carrier Part Number	Bubbler Tube Assembly	EXD Orifice					Float Stand			
		Assembly P/N (ref.)	Qty	Slot Width ±0.001	Slot Height ±0.001	Stamp No.	Assembly P/N (ref.)	Qty	Slot Width ±0.001	Slot Height ±0.001
32GB403054	B-34713	32GB401744	12	0.078	0.75	844	32GB401724	8	0.177	1.02
32GB403064	B-34713	32GB401754	15	0.078	0.75	854	32GB401724	8	0.177	1.02
32GB403074	B-34713	32GB401764	7	0.078	0.75	864	32GB401724	8	0.177	1.02
32GB403084	B-34713	32GB401794	9	0.078	0.75	824	32GB401724	8	0.177	1.02

There are two different types of bubbler tubes. These devices allow discharge gas to be metered in under the float to maintain its buoyancy.

O-ring Face Seal Fitting	Description	External O-ring	Face Seal O-ring
B-34713	1/4" O-ring Face Seal Fitting	P-34984	P-34998
B-34714	3/8" O-ring Face Seal Fitting		P-36124

In Series 6, the Economizer changed to a brazed plate heat exchanger and a TXV. A small amount of liquid refrigerant is flashed into one side of the heat exchanger. The remaining liquid refrigerant is passed through the other side of the heat exchanger. The flash gas further subcools the liquid refrigerant as it enters the EXV.

Series 6 Economizer Brazed Plate Heat Exchangers are as follows:

Unit	Circuit A	Circuit B
30GX*174	LL01SB032	LL01SB032
30HXC206	LL01SD011	LL01SD010

Series 6 TXVs for the Economizers are as follows:

Unit	Circuit A	Circuit B
30GX*174	EA02ZF516	EA02ZF516
30HXC206	EA02ZF519	EA02ZF518

In the 30GX machines, an Economizer Line Solenoid Valve controls the TXVs. The economizers are not active until the compressor is fully loaded.

In the 30HXA/HXC machines, the economizer TXV is active at all stages of operation.

The Economizer TXVs control to approximately 10 to 15 °F (8.3 °C) of superheat.

Head Pressure Control

30GXN/GXR

MotorMaster III

ComfortLink machines were introduced with MotorMaster III as the device of choice for head pressure control for these machines.

In January 2004, the vendor for the MotorMaster III discontinued production. It was later re-instated by the vendor. See below for additional information. As a result of the original discontinuation, RCD procured another device to replace the MotorMaster III. This device is larger than the original MotorMaster III and as a result must be mounted on the outside of the control box. There are 2 devices available, based on voltage.

Voltage	RCD Part Number	Horsepower Range
240-3-60	P251-0096	1-3
480-3-60	P251-0097	1-5

This device can be controlled via a thermistor, pressure transducer, 4-20 mA or 0-10 vdc signal.

Bulletins pertaining to this issue:

- PMB04-013 – Three Phase Motor Head Pressure Controllers
This bulletin announced the MotorMaster III discontinuation and that RCD has superseded the MotorMaster to the P251-0096 and P251-0097.

In June 2004, RCD began stocking the original Motormaster III under the part number 32LT660006.

MotorMaster V

MotorMaster V was introduced as the device of choice for head pressure control for these machines starting with serial numbers 0802F.

The drive is configured by the use of a command jumpers connected as follows:

Table 5 - MotorMaster V Configuration Table

Mode	Voltage	Hz	Control Input	Start Jumper	Set Point Jumper	Refrigerant
9	208*/230/ 460/575	60	Internal PI Control, 0-5 V feedback	TB1-TB2	TB12-TB2	R-134a
10	208*/230	60		TB13A-TB2		
11	230	50		TB13B-TB2		
12	380/415	50		TB13C-TB2		

Note: * - At 208 V, the drive can run in either mode.

Beginning with Serial Number 3603F, the control of the MotorMaster V device was changed to use the Run-Stop jumper on the MotorMaster V.

To modify the MotorMaster to use the Run-Stop feature, perform the following steps:

Following are instructions for modification to power the MotorMaster V direct, without using fan contactors. The intent is to keep the capacitors powered to minimize the affect of inrush current.

The Motormaster V control can be enabled and disabled based on the switching of the start command jumper. This modification eliminates the condenser fan contactor(s) and uses a relay(s) powered from the fan contactor coil wires that will make and break the start command jumper to operate the MotorMaster V control.

Early kits were provided with fuses that were too small. Increase the fuse size as indicated. All fuses are KTK-R, Class CC.

Voltage	Low Ambient Kit	MotorMaster V	Original Fuse (Amps)	Recommended Fuse (Amps)
208/230	30GX-900---061	HR46TN004	HY10KB251	HY10KB300
	30GX-900---065		(25A)	(30A)
460	30GX-900---062	HR46TN005	HY10KB151	HY10KB200
	30GX-900---066		(15A)	(20A)
575	30GX-900---059	HR46TN006	HY10KB101	HY10KB200
	30GX-900---063		(10A)	(20A)

- Step 1.** Turn off and lock out all power to the unit.
- Step 2.** Remove power and coil wires from the fan contactor(s) connected to the MotorMaster V. Note phasing for reconnection.
- Step 3.** Remove contactors. Relocate fuse block(s) to contactor location.
- Step 4.** Rewire power wiring from the circuit breaker through the fuse block to the MMV. Be sure to follow the same phasing as original wiring.
- Step 5.** Install relay(s) p/n HN61KK041 in vicinity of the original contactor(s) and connect the fan contactor coil wires to the relay coil.
- Step 6.** Route the start command jumper wire from TB1 on MotorMaster V, through normally open terminals 1 and 3 on the relay and back to TB2 on MotorMaster V. (Note: MotorMaster V start jumper terminals vary with unit voltage, consult MotorMaster V Configuration Table for proper location if other than 230, 460, or 575 volt power).
- Step 7.** Restore power and check for proper operation in Service Test.

Beginning with Serial Number 4303F, the head pressure set point parameter of the Motormaster V, P34 was changed from 18 to 24. This change raised the approximate

setting from 140 psi to 200 psi. However, since the 30GX control sends a 4-20 ma signal to the device, this parameter is ignored.

MotorMaster V requires the use of a jeweler's screwdriver. A standard control screwdriver is too large for the controller's screw terminal block.

Troubleshooting

Condenser Fan speed does not modulate.

If the condenser fan speed does not modulate, check the following items:

- Check the polarity of the drive speed signal.
- Check the transducer to be sure that it is sensing refrigerant pressure on the proper circuit.
- Check the Run-Stop circuit for proper wiring.

Fuses are blowing.

If the fuses are blowing, check the following items:

- Check for the proper size fuse.
- Check for short in the wiring.
- Check the fan motor for a short to ground in the windings.
- If the modifications to use the Run-Stop feature of the Motormaster have not been performed, consider modifying the control. Rapid power cycling of the drive can cause the drive to fail, or blow the fuses.

Machine Assembly

To aid in the communication of leak locations, a bulletin was written with piping diagrams attached.

Service Bulletins pertaining to this condition:

- SMB020059 – 30GX Piping Diagrams
This bulletin included a piping diagram for the 30GX machines.

Motor Cooling Filter Driers

On Series 4 and 5 machines the only drier used was located in the motor cooling line. The original filter driers were a granular pack drier. Beginning with Serial Number 0101F, the filter was changed to a solid core drier. The new drier is available through RCD under the part number ADK305S.

Service Bulletins pertaining to this condition:

- SMB010008 – 06N Internal Oil Filters Plugging
This bulletin described the problem with the motor cooling filter drier disintegrating during operation. A solid core filter drier was installed starting with serial number 5200F.

Liquid Line Strainers (Series 4 & 5)

All ComfortLink 30GX/HX machines use cleanable liquid line strainers. On Series 4 and 5 machines, this was the only liquid line device for cleaning the system.

On 30HXA/HXC076-146 machines produced before 5200F, the strainer frequently filled a small area of the screen with debris causing a restriction of refrigerant flow. This can result in low saturated suction temperature alarms. A factory investigation found insufficient space between the strainer body and screen for annular refrigerant flow. As a result of the low clearance space, all of the refrigerant flow exited the screen through one spot. An early attempt to increase the flow area was made by dimpling the screen. This requires that the screen be properly installed with the dimple at the exit of the strainer body.

As a result, beginning with machines produced with serial number 5200F, the factory began using a new strainer assembly with improved flow characteristics without a part number change. The part number remained KH12HN210. The new part has the same connection points. The only indication of the new strainer is the vendor part number, S-4211 Rev. D, and the machine serial number out-off. The new screen cannot be installed in the old strainer. RCD continued to stock the old replacement screen and gasket assembly, 3-010-310 until the stock is depleted. Additionally, RCD will offer the new screen and gasket assembly replacement for this new strainer assembly. The part number is 3-010-312 and includes the gasket. If the old screen is restricted and cannot be cleaned, replace the screen. Once the screen assemblies are depleted, it will be necessary to replace the entire strainer assembly with the new design.

Replacement Strainer and Gasket Kits have been set-up in RCD. Confirm these part numbers on EPIC before ordering the parts:

Strainer Assembly Part Number	Screen and Gasket Part Number
KH12HN200	3-010-311
KH12HN210 (Henry P/N: S-4211 Rev. C.)	3-010-310
KH12HN210 (Henry P/N: S-4211 Rev. D.)	3-010-312
KH12HN240	3-010-311
KH12HN280	3-010-311

Service Bulletins pertaining to the condition:

- SMB000015 – 30GX/HX Refrigerant Strainers
This bulletin announced the use of cleanable strainers in the 30GX/HX line and listed the replacement screen and gasket part number.

- SMB010012 – 30HXA/HXC076-146 Liquid Line Strainer Change
 This bulletin announced a design change to cleanable strainers in the 30HXA/HXC076-146 machines line and listed the replacement screen and gasket part number for the new style.

Liquid Line Filter Drier/Strainers (Series 6)

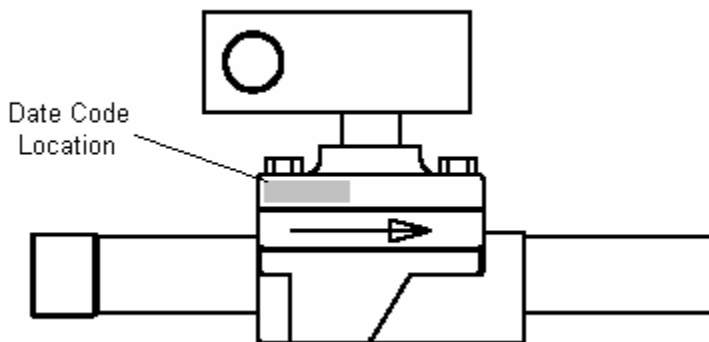
With the introduction of Series 6 machines, a new style filter drier/strainer was used. Each of the devices listed below, accepts the standard refrigerant core filter drier, KH29EZ050.

Strainer Assembly Part Number	Gasket Part Number
KH12HZ200	30GX506808
KH12HZ240	
KH12HZ280	

Liquid Line Solenoid Valve

In 30GX machines with the factory installed cooler heaters, a liquid line solenoid is provided to aid in the prevention of refrigerant migration.

All devices are marked with a Date Code. For the Alco valves, it is engraved on the side of the top cover. The format described below.



Position	1	2-3	4-5
Example	R	03	43
Manufacturing Location			
Last 2 digits of manufacturing year			
Week of manufacture			

Reports of several machines loosing the refrigerant over the winter have been received. The machines are either low on refrigerant or none. The systems can be pressurized, and no leaks were found. In some cases, the problem has been traced to leaking liquid line solenoid valves. Several changes at the vendor have been made by the vendor and were in place starting week 32 of 2003, (Date Codes R0332). If a machine is low on refrigerant, check the solenoid valve. If the solenoid has a date code prior to that listed, consider replacing the liquid line solenoid valve.

Alco also has a gasket rebuild kit, KG10028, which is available through RCD.

Network Service Tool IV

Network Service Tool can be a useful diagnostic tool.

When using Service Tool and incorrect data is displayed, remove and add the current unit. This is especially true if new software has been loaded since the last time the unit was viewed through Service Tool. New versions of software may include table structure changes. In order for the information to be correct, the unit must be removed and added within Service Tool to have the new table structure created. If changes to the program did change the table structure, the software version will be incremented by a whole number, such as 1.0 to 2.0. If changes to the program did not change the table structure, the software will increment by a revision number, such as 2.0 to 2.1.

Troubleshooting:

If communications cannot be established with the control, check the following items:

- Check the B&B Converter.
- Confirm the CCNA *CCN Address* (Configuration Mode, Sub-mode OPT2) and CCNB *CCN Bus Number* (Configuration Mode, Sub-mode OPT2) of the device.
- Confirm the BAUD *CCN Baud Rate* (Configuration Mode, Sub-mode OPT2). It should be set for 3 (9600).

Non-Fused Disconnects

Carrier 30 Series Chillers can be supplied with Non-Fused Disconnects. These are factory installed devices that provide an electrical disconnect at the machine. In accordance with good safety practices and regulations, always check with a voltmeter to insure that the power is OFF to all phases, even though the switch handle may indicate OFF. Electrical shock can cause personal injury and death. All power sources should be open and tagged before any service work is started.

With the Non-Fused Disconnects, the actuating shaft extends from the body to the door where the handle is installed. For proper installation, the Shaft Nut & Screw should be aligned with the 0 – OFF position on the body. The Handle Interlock Pins must be in a horizontal position to engage the handle in the OFF position when installed on the panel door. If the shaft/handle assembly is not installed correctly, the handle can indicate that

the power is OFF, yet the disconnect will still be closed with voltage applied. The Shaft Nut & Screw indicates the status of the Non-Fused Disconnect.

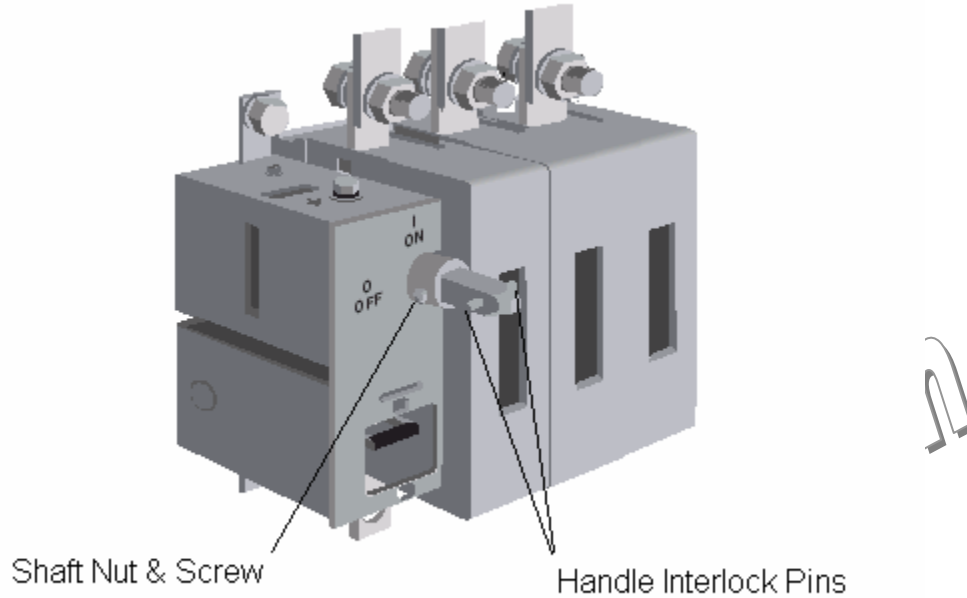


Figure 34 - Non-Fused Disconnect

Oil

Only Carrier-approved POE oil may be used in Carlyle 06N compressors. The only approved oil listed under Carrier Material Specification PP47-32 is Castrol Icematic SW220.

Unit	Circuit A, gal. (l)	Circuit B, gal. (l)
30GXN/GXR080-178	5.0 (18.9)	5.0 (18.9)
30GXN/GXR204-268	7.0 (26.5)	5.0 (18.9)
30GXN/GXR281-350	7.0 (26.5)	7.0 (26.5)
30HXA076-186	5.0 (18.9)	5.0 (18.9)
30HXA206-271	8.0 (30.3)	5.0 (18.9)
30HXC076-186	4.5 (17.0)	4.5 (17.0)
30HXC206-271	7.5 (28.4)	5.0 (18.9)

Approved oil can be obtained from RCD under the following part numbers:

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Quantity	Totaline Part Number	RCD Part Number
1 quart	P903-1225	-
1 gallon	P903-1201	PP23BZ104-001
5 gallons	P903-1205	PP23BZ104-005
55 gallons	-	PP23BZ104-055

RCD was selling under the Totaline brand name as “Screw Compressor Oil.” This oil was less viscous SW68, than the SW220 called out above, and should not be used in the 30GX/HX machines. Be sure to use only Carrier approved oils in these machines.

Since POE oils have an affinity for water, open containers of oil should not be used when recharging or adding oil to the system. Water and heat can reverse the manufacturing process that creates the oil. A by-product of the break down is acid. As a result, three criteria can be used to check the acceptability of the oil. They are: Total Acid Number (TAN), Moisture Content, and Viscosity. The table below shows what Carrier requires for new POE oil, as well as the acceptable limits Carlyle has placed on the oil in an operational system.

The original bulletin, SMB990028, stated a moisture upper limit of 500 ppm. SMB000056 reduced the moisture level to 100 ppm.

Criteria	Specification Requirement*	Acceptable Limit
Total Acid Number (TAN)	0.10 mg KOH/g	≤0.35 mg KOH/g
Moisture	50 ppm	≤100 ppm
Viscosity @ 40 °C	198-242 cSt	198 cSt < Sample Viscosity < 242 cSt

Note: * - The specification requirement refers to the acceptability criteria for new oil based on Carrier Material Specification PP47-32.

Caution must be exercised in preparing an oil sample for testing. Refrigerant dissolved in the oil will dilute the sample reducing its viscosity. If an independent laboratory is contracted to perform the analysis, be sure to inform the laboratory the sample contains refrigerant that must be removed prior to the oil viscosity test.

If any of the parameters are outside of the acceptable limits, the oil should be changed.

RCD does offer a Fluid Analysis Service, should the need arise.

Service Bulletins pertaining to this condition:

- SMB990028 – 06N POE Oil Guidelines
This bulletin was superseded by SMB000056.
- SMB000056 – 06N POE Oil Guidelines
This bulletin advised of the POE oil guidelines.

- SMB990071 – Totaline Fluid Analysis Service
This bulletin announced RCD's Fluid Analysis Service.
- PMB03-024 – Totaline Fluid Analysis Services 2003 Price List
This bulletin describes the services available, with lead times and prices.
- PMB04-037 – Castrol POE Lubricants – Shortage and Excusable Delay Notice
This bulletin describes the shortage of POE lubricants and the RCD hold for review on all shipments of POE orders. The bulletin recommends testing the oil and replacing only when necessary.

Oil Circulation Rate

It is normal to have some oil in circulation. A normal oil circulation rate is 300-500 ppm. A refrigerant sample should have no more than 1000 ppm of oil in circulation.

If higher oil circulation rates are found, check the following items:

- Check for an overcharge of oil. Too much oil in the system will not allow the oil separator to function properly. A history of repeated oil additions might indicate an oil overcharge. A high cooler approach would also indicate excess oil in the circuit.
- Check to be sure that the mesh is in the proper location. This can only be completed with a scope.

Oil Filter

There are 2 oil filters used for the ComfortLink Chillers. Installed in the oil lubrication line is a canister filter, referred to as the external filter. Internal to the compressor is another filter, commonly referred to as the internal filter.

External Oil Filter

The external oil filter is a 4 micron oil filter in line with the oil piping from the oil separator to the compressor.

Internal Oil Filter

The internal oil filter is a 4 micron oil filter located inside of the compressor housing. An RCD kit, 06NA660016 includes the internal oil filter and the o-ring needed for the access cap.

On machines built prior to 0101F, a beaded desiccant motor cooling filter drier was used. On some machines, due to the loading conditions, the desiccant could break down. As a result, the internal oil filter would plug with the desiccant material. A solid core filter drier was used in production starting 0101F.

06NA660016 filter kits assembled during the period May through October 2002, (Date Codes E/2, F/2, G/2, H/2, J/2, and K/2, or may not have a date code) may not have the correct size hole for mounting the filter on to the compressor brass fitting that holds the oil filter. If one of these is encountered, the filter will not slide onto the fitting. All parts were put on hold. A new kit was set-up with the correct filter included. The new kit number is 06NA660028.

After the Internal Oil Filter Kit was changed to the 06NA660028 part number, several filters again exhibited the same problem found in the 06NA660016. Suspect packages have a K-2 date code stamped on the package label in the upper right hand corner. Packages stamped with the K-2 date code printed as part of the label in the lower right hand corner will be correct.

Additionally, several reports were received indicating the oil filter plugs were found leaking during extreme cold weather. These reports indicated that the internal oil filters were changed with the 06NA660016 kits and had been operational for some time without a problem. After an investigation, the oil plug o-ring cross section was found to be undersized. The o-ring should measure 0.118 +/- 0.004". The undersized o-ring was inserted randomly, but it is contained within the 06NA660016 filter kit with no date code. These are the same filter packages that were recalled under PMB02-137. There is an alternate o-ring that can be installed, 8TB0847, available through RCD.

The instruction sheet 99TA516075, packaged with the oil filter kits, 06NA660016 and 06NA660028 incorrectly called out the wrong o-ring for the oil filter access plug. The correct o-ring part number is 8TB0847. This information was corrected on Instruction Sheet 99TA516075, Revision D. As of September 2003, all packages with the older revisions were removed.

Service Bulletins pertaining to this component:

- SMB010008 – 06N Internal Oil Filters Plugging
This bulletin described the problem with the motor cooling filter drier disintegrating during operation. A solid core filter drier was installed starting with serial number 5200F.
- PMB02-137 – Oil Filter Kit Recall Used On 06N Compressors
This bulletin described the problem of the undersized mounting and the new kit part number for the correct filter.

Oil Level Switch

The 30GX/HX machines all use various styles of oil level switches to confirm an oil charge. The 30GX and 30HXA use an insertion float switch installed in the bottom of the oil separator. The 30HXC uses a bottle style float switch installed on the side of the condenser and piped to the oil separator.

An abnormally high number of oil level switches used on the 30GX with serial numbers starting with 1202F through 0903F and 30HXA machines with serial numbers starting with 1202Q through 0903Q developed leaks at the threaded joint between the switch and the separator. In some cases tightening the switch resolve the leak. In other cases the switch was replaced to resolve the leak. As an alternative to replacing the switch, the oil level switch o-ring can be replaced, KK71EW912.

Service Bulletins pertaining to this issue:

- SMB030040 – 30GX & 30HXA Oil Level Switches Leaking
This bulletin described the problem with the oil level switches and how to repair the leak.

Oil Pump

The 30GX/HX Series 4 and 5 machines use an external oil pump to provide pre-start lubrication to the compressor and supplemental pressure assistance during operation. The ComfortLink machines have always used a Magnetic Drive Oil Pump.

For the 30GX machines, the original pump 30GX503303 was used from the initial production run until serial numbers beginning with 1701F. With serial numbers beginning with 1801F, a new pump 30GX504591 was used.

For the 30HX machines, the original pump 30GX503303 was used from the initial production run until serial numbers beginning with 4201Q. With serial numbers beginning with 4301Q, a new pump 30GX504591 was used.

The two pumps are electrically the same. The pump connections are made with o-ring face seal fittings. The only difference between the 30GX503303 and the 30GX504591 pumps are the height of the oil pump connection fittings. The 30GX503303 used the same connection for the oil inlet and outlet. The 30GX504591 used two different height fittings for the oil inlet and outlet. In both cases, the seal of the fitting to pump body is accomplished by an SAE o-ring fitting.

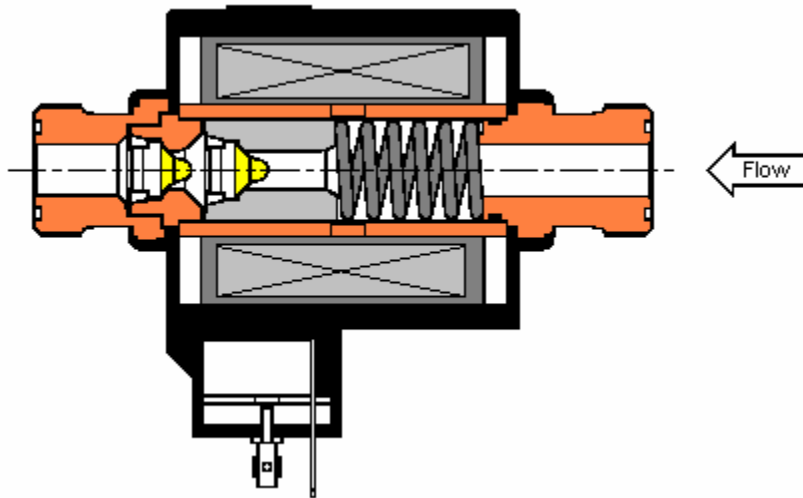
RCD has the oil pump capacitor, 6100-9174 and motor, K30237 for separate replacement. The part numbers given are for reference only, confirm with EPIC before ordering these parts.

Solenoid Piston Pump

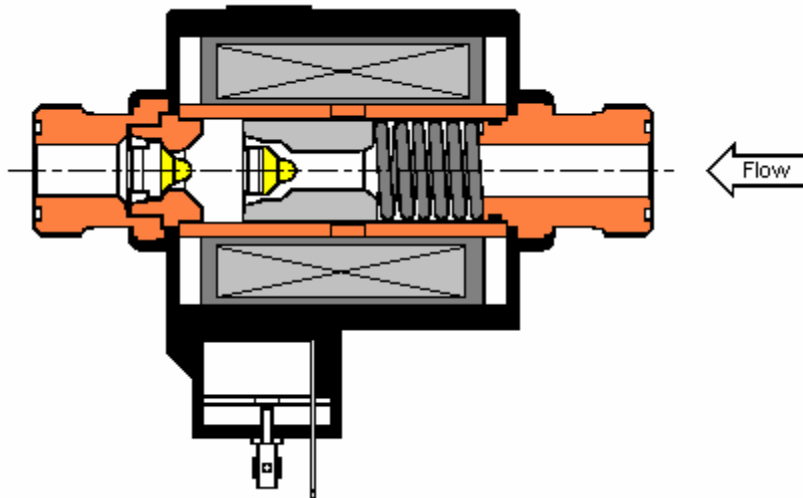
On 30GX/HX Series 6 machines, a solenoid pump is used for pre-start and boost lubrication. The pump, 30GX505673 is an in-line pump. It requires a harness, 30HX404095 for proper connection.

Operation

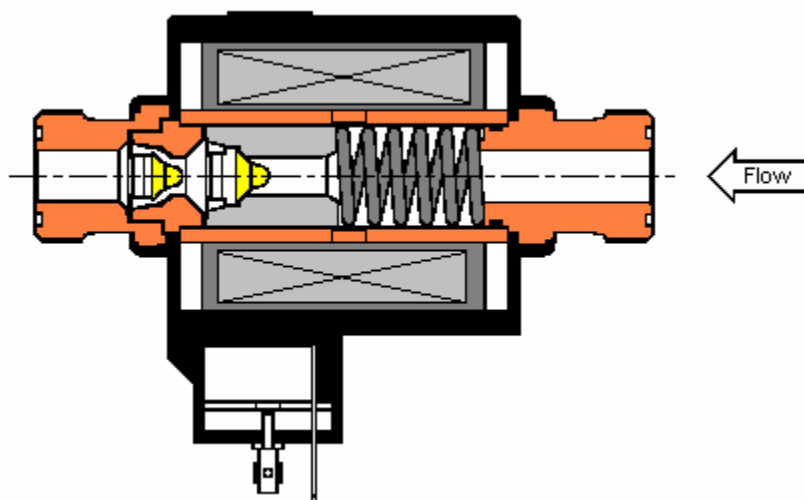
The pump consists of a spring, solenoid valve, piston with a check valve, and a discharge check valve. Flow through this device is through the spring, piston, and discharge check valve.



When the solenoid coil is energized, the spring is compressed as the piston is pulled to the suction end of the pump creating a cavity at the discharge end. The piston check valve is opened to allow the fluid to fill the cavity created by the piston movement. The discharge check valve remains closed to prevent backflow.



When the solenoid coil is de-energized, the spring force pushes the piston forward toward the discharge end of the pump. The piston check valve seats to prevent fluid backflow. The discharge check valve opens to allow the fluid in the cavity to escape.



Service

The connection of the pump to the oil piping is completed with an O-ring Face Seal connection. The parts for the connection are as follows:

Part Number	Description
107302	O-ring, typical each side
110044	Brazing sleeve, typical each side
110045	Nut, typical each side

The parts are available through RCD. Confirm part number with EPIC before ordering any parts.

Inspect the o-ring, brazing sleeve mating surface and groove prior to installation. The brazing sleeve mating surface must be perfectly flat. Any damage to either part is observed it will not allow the joint to seal properly. Lubricate the o-ring with an o-ring lubricant. Seat the o-ring in the groove. Be sure that the o-ring is properly seated, or it will not seal properly. Tighten the nut to 40 ft-lbs using a back-up wrench on the pump fitting.

Oil Separator

Oil separators are used on these machines to collect the oil on the high side of the machine. Separate ASME vessels are used with the 30GX and 30HXA machines. On the 30HXC, the oil separator is internal with the condenser. Two separation techniques are used in these vessels. First, the discharge gas is directed to the wall. The force of the gas striking the wall causes most of the oil to cling to the wall and drain into the reservoir. The secondary method is a York mesh. This is a steel mesh inserted into the vessel. Small airborne droplets of oil collect in the mesh. As the droplets increase in size, they eventually fall into the reservoir.

For oil circulation rates, see Oil Circulation Rate on page 225.

AC&R produced oil separators were used on the 30GX machines until 3602F. Beginning with serial numbers starting with 3102F and fully implemented starting with 3602F, the 30GX oil separators are supplied by Carrier Mexico.

The 30HXA oil separators were always supplied with a flange-mating surface for the back pressure regulating valve. Beginning with 3203Q, the oil separator vessel to flange piping changed slightly. The new vessels come with the piping and flange mounted for the back pressure valve. The old separators were shipped with a stub on the separator. The back pressure valve mating flange and tube assembly had to be brazed in place. The field connection location and orientation for the back pressure regulating valve did not change, but new numbers were assigned to distinguish the two separators. The two separators are interchangeable.

Unit 30HXA	Oil Separator	
	Prior to Serial Number 3203Q	Starting with Serial Number 3203Q
076,086	09RX400217	09RX400271
096,106	09RX400216	09RX400272
116,126,136,141,161	09RX400215	09RX400273
171,186	09RX400214	09RX400274
206-271	09RX400213	09RX400275

If the York mesh breaks free from its mounting, the refrigerant flow through the vessel causes the mesh to move toward the level switch. Eventually, the mesh will cause the float to bind. An external oil level switch can be installed to take the place of the bound level switch.

Troubleshooting:

Caution must be used when confirming an oil level in the separator. Refrigerant will be dissolved in the oil, artificially elevating the level.

Oil Separator Heaters

The 30GX machines use 2 oil separator heaters, one for each circuit. These heaters are flexible strip heaters that are attached to the under side of the oil separator. The heaters have a rating of 500 +5/-10% watts. The heaters are wired for either 120 or 230 vac.

Heater	Voltage, vac	Resistance (ohms) @ 75 °F (24 °C)
HT38KN011	120	28.8 +2.94/-1.47
	230	115.2 +11.76/-5.88
HT38KN012	120	28.8 +2.94/-1.47
	230	115.2 +11.76/-5.88

Paint

All chillers are painted in American Sterling Grey. RCD stocks a touch-up can of paint for this color under the part number, 313974-751.

Pressure Transducers

Discrete high and low pressure transducers are used for pressure sensing on all 30GXN,GXR,HX chillers. The discharge and oil pressure transducers are high-pressure transducers, HK05YZ002 or HK05YZ007. The HK05YZ007 transducers have a brass body for corrosion protection. The suction and economizer pressure transducers are low-pressure transducers (white dot), HK05YZ001. No pressure transducer calibration is required because of the two different style transducers. The transducers operate on a 5 vdc supply, which is generated by the Main Base Board (MBB) for suction and discharge pressure transducers and by the Screw Compressor Board (SCB) for the oil and economizer pressure transducers.

TROUBLESHOOTING

If transducer is suspected of being faulty, first check supply voltage to transducer. Supply voltage should be $5 \text{ vdc} \pm 0.2 \text{ v}$. If supply voltage is correct, compare pressure reading displayed on keypad and display module against pressure shown on a calibrated pressure gage. If the 2 pressure readings are not reasonably close, replace pressure transducer. Low-pressure transducers suction and economizer pressures should be within $\pm 2 \text{ psig}$. Discharge and oil pressures should be within $\pm 5 \text{ psig}$.

Refrigerant Relief Devices

Fusible Plugs

Fusible plugs are installed between the condenser and liquid line service valve on the 30GX machines only.

On 30GX Series 6 machines, fusible plugs were added to the oil line downstream of the oil pump.

Pressure Relief Valves

Pressure relief valves are located on the high and low side of each circuit on every machine. Additionally, on the 30HXA/HXC machines with the suction service valve factory installed option have an additional pressure relief valve between the external muffler and the discharge service valve. Pressure settings and flow rates are listed below. Some local building codes require that the relieved gases be removed, and as a result all relief valves are equipped with connections for conformance to this requirement. Do not use this list as a parts list for the machine. Confirm the correct number with EPIC before placing the order.

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Unit	Location	Part Number	Relief Pressure, psi (kPa) +/- 3%	Flow Capacity, lb. of dry air/min	Connection Size
30GXN	Cooler	EB51LZ221	220 (1517)	31.7	3/4" NPTF
30GXR	Oil Separator	EB51LZ320	320 (2206)	21.6	5/8" SAE Flare
30HXA	Cooler	EB51LZ221	220 (1517)	31.7	3/4" NPTF
	Oil Separator	EB51LZ320	320 (2206)	21.6	5/8" SAE Flare
	Discharge Line†	EB51LW122	350 (2413)	6.3	3/8" SAE Flare
30HXC	Cooler	EB51LZ221	220 (1517)	31.7	3/4" NPTF
	Condenser	EB51LZ221	220 (1517)	31.7	3/4" NPTF
	Discharge Line†	EB51LW122	350 (2413)	6.3	3/8" SAE Flare

Note: † - Used only when the optional suction service valve is installed.

These valves should not be capped. If a valve relieves, it should be replaced. If the valve is not replaced, it may relieve at a lower pressure or leak due to trapped dirt from the system, which may prevent resealing.

Refrigerant

The 30GXN/GXR and 30HXA/HXC machines all use R-134a as the operating refrigerant. 30HX machines have the option to be shipped with a nitrogen holding charge.

Refrigerant Moisture Limit

The upper limit for moisture in a system is based on the water saturation limit at 35 °F (1.6 °C). This was carried through for HFC/POE systems as well. R-134a has a maximum limit of 625 ppm. The POE oil has a max limit of 100 ppm. Since there is a strong POE/water interaction, the refrigerant limit is too high. The refrigerant limit was established to prevent free water freeze up. As a result, the upper limit has been lowered to the upper limit of the POE moisture limit.

Criteria	Specification Requirement*	Acceptable Limit
Moisture	10 ppm	≤100 ppm

Note: * - The specification requirement refers to the acceptability criteria for new oil based on Carrier Material Specification PS10-34.

If higher moisture content is found, check the following:

- Check for a cooler or condenser leak

If a high moisture content condition is found, repair the leak, evacuate and dehydrate the system using standard refrigerant practices.

RCD does offer a Fluid Analysis Service, should the need arise.

Service Bulletins pertaining to this issue:

30GX/HX ComfortLink Screw Chiller Service Manual

- SMB990071 – Totaline Fluid Analysis Service
This bulletin announced RCD's Fluid Analysis Service.
- SMB020064 – Fluid Analysis Requirements for Carrier Commercial Products
This bulletin addressed the need for fluid analysis and interpretations.
- PMB03-024 – Totaline Fluid Analysis Services 2003 Price List
This bulletin describes the services available, with lead times and prices.

Refrigerant Charging

Unit	Refrigerant	Circuit A, lbs. (kg)	Circuit B, lbs. (kg)
30GXN/GXR080	R-134a	106	96
30GXN/GXR083	R-134a	128	123
30GXN/GXR090	R-134a	115	96
30GXN/GXR093	R-134a	135	123
30GXN/GXR106	R-134a	150	123
30GXN/GXR108	R-134a	135	123
30GXN/GXR114	R-134a	160	123
30GXN/GXR115	R-134a	160	123
30GXN/GXR118	R-134a	170	151
30GXN/GXR125	R-134a	160	141
30GXN/GXR128	R-134a	190	151
30GXN/GXR136	R-134a	175	175
30GXN/GXR138	R-134a	190	175
30GXN/GXR150	R-134a	156	228
30GXN/GXR153	R-134a	263	178
30GXN/GXR160	R-134a	181	243
30GXN/GXR163	R-134a	263	220
30GXN/GXR174	R-134a	263	207
30GXN/GXR175	R-134a	163	207
30GXN/GXR178	R-134a	263	263
30GXN/GXR204	R-134a	270	205
30GXN/GXR205	R-134a	240	185
30GXN/GXR225	R-134a	285	215
30GXN/GXR249	R-134a	339	205
30GXN/GXR250	R-134a	310	185
30GXN/GXR253	R-134a	410	205
30GXN/GXR264	R-134a	339	215
30GXN/GXR268	R-134a	410	215
30GXN/GXR281	R-134a	385	385
30GXN/GXR301	R-134a	400	400
30GXN/GXR325	R-134a	415	415
30GXN/GXR350	R-134a	430	430
30HXA206N	Nitrogen		

30HXA206R	R-134a *	5.0 (2.2)	5.0 (2.2)
30HXA246N	Nitrogen		
30HXA246R	R-134a *	5.0 (2.2)	5.0 (2.2)
30HXA261N	Nitrogen		
30HXA261R	R-134a *	5.0 (2.2)	5.0 (2.2)
30HXA271N	Nitrogen		
30HXA271R	R-134a *	5.0 (2.2)	5.0 (2.2)
30HXC206N	Nitrogen		
30HXC206R	R-134a	200 (90.9)	135 (61.3)
30HXC246N	Nitrogen		
30HXC246R	R-134a	220 (100.0)	135 (61.3)
30HXC261N	Nitrogen		
30HXC261R	R-134a	220 (100.0)	135 (61.3)
30HXC271N	Nitrogen		
30HXC271R	R-134a	220 (100.0)	135 (61.3)

Note: * - Holding charge only.

Beginning with production starting around 0802F for the 30GX and 0802Q for the 30HX, the liquid line charging port between the EXV/Economizer and the cooler was changed to a high flow shradder fitting.



Figure 35 - High Flow Shradder with Cap



Figure 36 - High Flow Shradder with Cap Removed

The factory uses this device during the manufacturing process. The fitting is only accessible with a special adapter. RCD has the adapter set-up.

RCD Part Number	Description
A-62PF221	1/4" SAE Flare Coupler Assembly
A-62PF321	3/8" SAE Flare Coupler Assembly

The internal core is replaceable with parts available through RCD. Tighten the core to 20 in-lbs. A special tool is required to tighten the core. Several options are available, and are listed below:

Charging can be accomplished by installing a tee between the suction pressure transducer fitting and cooler suction shradar. Refrigerant charging must be slow. Failure to slowly charge the circuit will result in Economizer Pressure Transducer Alerts.

Beginning with units with serial number 0503F for the 30GX machines, and 0903Q for 30HX machines, the factory added a charging shradar valve on the liquid line in addition to the high flow shradar valve. This is not an exact break in serial numbers due to stocking conditions.

Service Bulletins pertaining to this component:

- SMB030009 – 30GX, 30HX, 30RA Refrigerant Access
This bulletin described the use of the high flow shradar factory access ports and the adapters required to use them.

30HXA Refrigerant Charging

30HXA/09AZ Initial Refrigerant Charging Chart

The following table depicts the approximate amount of charge for the 30HXA and 09AZ combinations with 25 feet of line separation. Additional refrigerant is required for longer line lengths.

30HXA Model	Circuit	Cooler Charge	09AZV Model	Condenser Charge	Liquid Line Size	25 ft. Line Charge	TOTAL Charge (lbs.)
106	A	88	102FE	24	1-3/8	16	128
	B	56		18	1-3/8	16	90
116	A	84	112FE	42	1-3/8	16	142
	B	61		42	1-3/8	16	119
126	A	90	122FE	24	1-3/8	16	130
	B	71		24	1-3/8	16	111
136	A	99	132FE	57	1-3/8	16	172

	B	71		42	1-3/8	16	129
146	A	95	142FE	57	1-3/8	16	168
	B	80		57	1-3/8	16	152
161	A	120	162FE	68	1-3/8	16	204
	B	88		68	1-3/8	16	172
171	A	95	172FE	68	1-3/8	16	179
	B	112		68	1-3/8	16	196
186	A	108	182FE	68	1-3/8	16	192
	B	108		68	1-3/8	16	192
206	A	160	101FA	49	1-5/8	22	231
	B	108	091FA	37	1-3/8	16	160
246	A	176	151FA	113	2-1/8	38	327
	B	108	091FA	37	1-3/8	16	160
261	A	176	171FA	136	2-1/8	38	350
	B	108	091FA	37	1-3/8	16	160
271	A	176	181FA	136	2-1/8	38	350
	B	108	091FA	37	1-3/8	16	160

Service Valves

Several styles of service valves are used on the 30GX/HX machines.

Discharge Service Valves

Discharge Service Valves are ball valves installed between the oil separator and the outdoor coil on the 30GX machines. On the 30HXA, it is installed between the compressor and the oil separator. On the 30HXC, it is installed between the compressor and the condenser.

Economizer Service Valves

Economized units, 30GXN/GXR108, 115-528, with the optional suction service valve, also have installed an economizer service valve for each circuit. On the 30GXN/GXR108,115-178, the valve is located in the economizer line leading to the compressor. On 30GXN/GXR204-350 Series 5 machines, the economizer service valve is located in the line from the economizer to the cooler. On 30GXN/GXR204-350 Series 6 units, the service valve is located in the line between the economizer and the EXV.

Liquid Line Service Valves

Liquid Line Service Valves for earlier machines were angle valves. This style of valve requires additional steps to maintain the refrigerant seal.

For 30GX machines beginning with Serial Numbers 4901F, the angle valve was replaced by a ball valve.

Oil Line Service Valves

There is a single oil line service valve used on the 30HX machines located at the inlet to the external oil filter. This service valve is an angle valve with a Roto-Loc connection. The 30GX machines use this same style at the inlet to the external oil filter. Additionally on the 30GX machines there is an angle valve at each compressor.

Suction Service Valves

Suction Service Valves are factory installed options for both the 30GX and 30HX machines. This device is installed within the suction pipe between the cooler and compressor. An actuator stem protruding from the suction pipe operates the valve. An o-ring seal achieves refrigerant isolation. The actuator opens the valve with a counter-clockwise rotation. A clock-wise rotation will close the valve. The actuator stem has a left-hand thread, locking nut. The locking nut secures the actuator in the position desired.

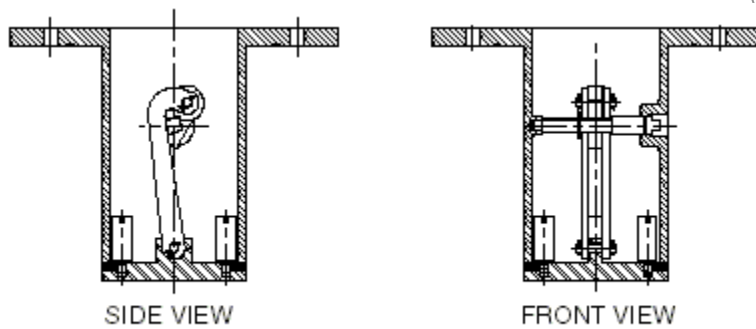


Figure 37 - Suction Service Valve

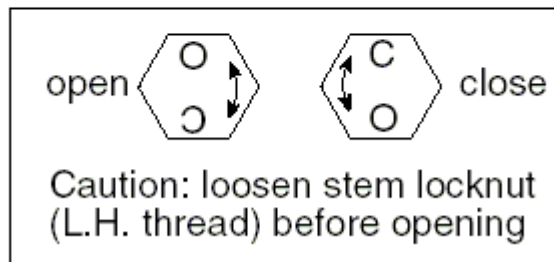
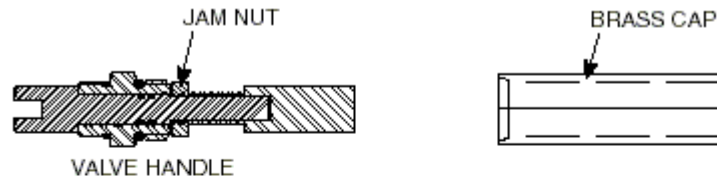


Figure 38 - Suction Service Valve Handle

The original suction service valve, 30HX500752, engaged the service valve actuator with a slot. Beginning approximately 4801F (30GXN/GXR) and 4801Q (30HXA/HXC), the suction service actuator and handle design changed to incorporate a hex actuator. The new service valve handle is 30GX505834.



30HX500752 – Suction Service Valve Handle



30GX505834 – Suction Service Valve Handle

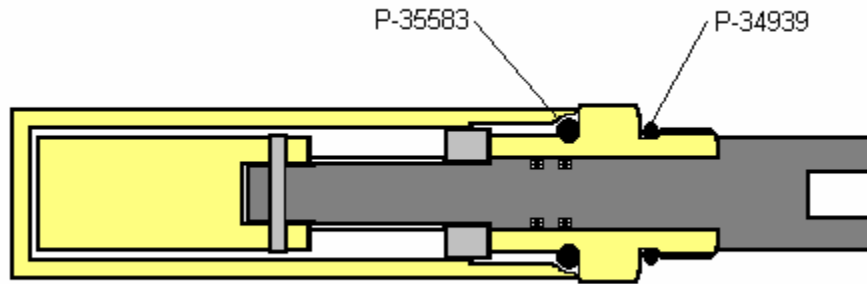
Figure 39 - Suction Service Valve Handle Revisions

Operation:

If factory-installed suction service valves are installed, open the suction service valves in each circuit. Service valve is located below the compressor in the cooler suction connection flange. To operate the valve, first remove the cap. Use a back-up wrench on the packing gland to prevent loosening while removing cap. Loosen the jam nut. Rotating the valve handle clockwise will close valve and counterclockwise will open valve. When closing the valve, the linkage arm must swing past center of the actuator shaft cam to seat and prevent accidental opening of the valve. Tighten the jam nut.

O-Ring Replacement

RCD has the valve handle and cap o-rings available for replacement. The figure below shows the o-rings. The o-rings apply to both styles of handles.



Thermistors

The ComfortLink Control system uses a 5 k Ω @ 77 °F (25 °C) thermistor for the Entering Chilled Water Thermistor, Leaving Chilled Water Thermistor, Discharge Gas Thermistor, Outdoor Air Thermistor, and in Master/Slave parallel flow applications, the Lead/Lag Leaving Fluid Thermistor.

For Space Temperature reset, a 10 k Ω @ 77 °F (25 °C) thermistor is required.

T1 – Cooler Leaving Fluid Sensor - This thermistor is installed in a well in the cooler leaving water nozzle.

T2 – Cooler Entering Fluid Sensor - This thermistor is installed in a well in the cooler entering water nozzle.

T5 and T6 – Circuit A and B Discharge Gas Thermistors – On Series 4 and 5 machines, these thermistors were installed in wells in the oil separator of the respective circuit.

On Series 6 machines, each compressor was given it's own discharge gas thermistor. This thermistor was located in a well after the external muffler on the 30GX machines. It was located in a well in the u-tube between the compressor discharge and the external muffler on the 30HX machines. In the 30HX machines starting with serial numbers 1604Q, the thermistor was removed from the well and strapped to the discharge line for shipping. Before the machine is started, the thermistor must be installed in the well and secured.

T9 – Outdoor Air Temperature Sensor – This sensor is a field-installed thermistor. This sensor cannot be used with Dual Chiller Control.



T9 – Dual Chilled Water Sensor – T9 is an accessory sensor used for dual chiller control. This sensor is connected to TB5-7 and TB5-8. A field installed well for this sensor is recommended in the common header chilled water supply pipe. The thermistor is a 5k Ω thermistor and is connected to the Main Base Board via a terminal block. With Dual Chiller Control the Outdoor Air Temperature Sensor cannot be used.

Figure 40 - 30HX Series 6 Discharge Gas Thermistor

T10 – Remote Space Temperature Sensor - Sensor T10 is an accessory sensor that is remotely mounted in the controlled space and used for space temperature reset. This sensor is connected to TB5-5 and TB5-6. The sensor should be installed as a wall mounted thermostat would be, in the conditioned space where it will not be subjected to either a cooling or heating source or direct exposure to sunlight, and 4 to 5 ft above the floor.

For the above sensors, either voltage drop or resistance can be used to verify accuracy of the thermistors.

The compressor motor thermistors are also 5 kΩ @ 77 °F (25 °C) thermistors, but have a slightly different curve than the thermistors previously discussed. A different temperature vs. resistance chart is required to verify the accuracy of the thermistor. Voltage drop cannot be used to check accuracy for the compressor motor thermistors.

The thermistors are connected to the Main Base Board (MBB) with IDC (Insulation Displacement Connector) connections. The tools required to make these connections are as follows:

Manufacturer	Part Number	Description
Tyco Electronics (Amp)	58580-1	Hand Tool with Terminating Head
	58074-1	Hand Tool (included in 58580-1)
	58247-1	Terminating Head (included in 58580-1)
Ideal Industries	45-165	UTP/Coax Stripper

The cable stripper is easier to strip the gray jacket of the thermistor cable. It is not required.

Water Analysis

To aid in the determination of a root cause for a cooler failure, it is recommended that a water sample be analyzed. If the work is to be performed by an independent laboratory, the following items should be checked:

A water analysis consists of the following tests:

pH
Calcium, ppm as CaCO₃
Magnesium, ppm as CaCO₃
Iron, ppm
Chloride, ppm
Sulfate, ppm as SO₃
M alkalinity, ppm as CaCO₃
P alkalinity, ppm as CaCO₃
Silica, ppm as SiO₂
Nitrate, ppm as NO₃
Suspended Solids, ppm
Appearance/Comments

Additional tests could include:

Phosphate, ppm as PO₄
Fluoride, ppm
Boron, ppm
Sodium, ppm
Potassium, ppm
Ammonia, ppm as NH₄
Aluminum, ppm
Hydrogen Sulfide, ppm as H₂S

RCD does offer a Fluid Analysis Service, should the need arise.

Service Bulletins pertaining to this issue:

- SMB990071 – Totaline Fluid Analysis Service
This bulletin announced RCD's Fluid Analysis Service.
- SMB020064 – Fluid Analysis Requirements for Carrier Commercial Products
This bulletin addressed the need for fluid analysis and interpretations.
- PMB03-024 – Totaline Fluid Analysis Services 2003 Price List
This bulletin describes the services available, with lead times and prices.

MAINTENANCE

Recommended Maintenance Schedule

The following are only recommended guidelines. Job site conditions may dictate that maintenance schedules be performed more often than recommended.

Routine:

For 30GX machines with E-coat Condenser Coils:

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- Check condenser coils for debris, clean as necessary
- Periodic clean water rinse, especially in coastal and industrial applications.

Every month:

- Check Sightglass Dry Eye for moisture. If moisture is indicated, obtain and test an oil sample, change as necessary. Check the chilled water loop for signs of refrigerant, which may indicate a cooler leak.

For 30GX machines with E-coat Condenser Coils:

- Check condenser coils for debris, clean as necessary
- Coil cleaning with Environmentally Sound Coil Cleaner.

Every 3 months:

For all machines:

- Check all refrigerant joints and valves for refrigerant leaks, repair as necessary
- Check oil filter pressure drops, replace as necessary
- Check chilled water flow switch operation

For 30GX machines:

- Check condenser coils for debris, clean as necessary
- Check condenser fan operation

Every 12 months:

For all machines:

- Check all electrical connections for tightness, tighten as necessary.
- Check calibration of all transducers for each circuit, recalibrate/replace as necessary
- Check accuracy of thermistors, replace if greater than ± 2 °F (1 °C)
- Obtain and test an oil sample, change as necessary
- Check cooler approach (Cooler Leaving Water Temperature – Saturated Suction Temperature), clean tubes if appropriate
- Check to be sure that the proper concentration of antifreeze is present in the chilled water loop
- Check to be sure that the proper amount of inhibitor is present in the chilled water loop.
- Check all refrigerant strainers and filter driers for pressure drops, replace/clean as necessary
- Check chilled water strainers, clean as necessary

For 30GX machines:

- Check cooler heater operation

For 30HXC machines:

- Check Condenser Water Regulating Valve operation, if equipped
- Check condenser approach (Saturated Condensing Temperature – Condenser Leaving Water Temperature), clean tubes if appropriate
- Check to be sure that the proper amount of inhibitor is present in the condenser water loop.
- Check condenser water strainers, clean as necessary

Winter Shutdown Preparation

At the end of each cooling season the fluid should be drained from the system. However, due to the cooler circuiting, some fluid will remain in the cooler after draining. To prevent freeze-up damage to the cooler tubes perform the following procedure.

1. If factory-installed cooler heaters have been installed, de-energize the heaters to prevent damage and possible safety hazards when draining, or when there is no liquid in the system. Remove Fuse 1 to de-energize heaters. Drain the fluid from the system.
2. Isolate the cooler from the rest of the system with water shut-off valves.
3. Completely fill the cooler with an appropriate amount of inhibited glycol solution (or other suitable corrosion-inhibitive antifreeze) for 15 °F (8.3 °C) below the expected low ambient conditions, 5 gallons (19 L) minimum.
4. Leave the cooler filled with the antifreeze solution for the winter, or drain if desired. Be sure to de-energize heaters (if installed) as explained in Step 1 to prevent damage. Use an approved method of disposal when removing antifreeze solution.
5. Update item W.DNE *Winterization Performed* (Configuration Mode, Sub-mode SERV) to YES.

Spring Start-Up Preparation

At the beginning of the cooling season, perform the following procedure:

1. Check both refrigerant circuits for pressure. If the system is without charge, locate and repair leaks before filling the chilled water loop.
2. Fill the chilled water loop with water or brine with an appropriate corrosion inhibitor.
3. Re-energize the cooler heater circuit, if equipped.
4. Perform the normal start-up procedure outlined in the Controls and Troubleshooting Book.

RECOMMENDED SPARE PARTS LIST

The following recommended spare parts list is divided into critical and recommended replacement parts. Critical parts are components that, if they fail, will cause the

30GX/HX ComfortLink Screw Chiller Service Manual

equipment to stop functioning, or otherwise fail to deliver the required cooling capacity. Without these parts, the machine cannot be made operational. Recommended parts are components that, if they fail, could cause deterioration of the system performance. If a recommended part fails, the system can be usually made somewhat functional, even if only partial operation, until the correct part can be obtained. If the deterioration of the system performance is not acceptable by the customer, then the recommended, should be treated as critical parts.

Refer to RCD's EPIC 2000 for the appropriate part number and quantity of parts for each machine.

In the Comments Section the following abbreviations are used:

PSN – Prior Serial Number

SSN – Starting Serial Number

30GXN,GXR Spare Parts List

30GXN,GXR Series 4 & 5 Critical Parts:		
Part Number	Description	Comments
HH79NZ029	Thermistor	
HH83ZB001	Circuit Breaker	
HN67LM103	ComfortLink Compressor Protection (Full Current)	See EPIC 2000 for appropriate part number.
HN67LM104	ComfortLink Compressor Protection (1/2-Current)	See EPIC 2000 for appropriate part number.
HR53VK120	Switch	
HR81LG005	Flow Switch, Paddle	
HR81LG015	Flow Switch, Thermal Dispersion	SSN: 1201F
HT01BD121	Transformer	
SC15	Fuse	
30GT515217	EXV Board	w/o Software HK50AA026
30HX501314	Main Base Board	w/o Software HK50AA029
30HX501316	Screw Compressor Board	w/o Software HK50AA032
853002-640	Cooler Tube Plug Ring	Do not plug any more than 10% of the total number of tubes.
853103-1	Cooler Tube Plug Pin	Do not plug any more than 10% of the total number of tubes.

30GXN,GXR Series 4 & 5 Recommended Parts:		
Part Number	Description	Comments
ADK305S	Filter Drier	
EB51LZ221	Pressure Relief Valve	
EB51LZ320	Pressure Relief Valve	
EF19ZE024	Solenoid Coil	

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30GXN,GXR Series 4 & 5 Recommended Parts:		
Part Number	Description	Comments
HK02ZA441	High Pressure Switch	
HK05YZ001	Transducer	
HK05YZ007	Transducer	
HK50AA028	Energy Management Module	No software loaded
HK50AA033	Navigator	
HN52KC015	Oil Pump Contactor	230-3-50, 380/415-3-50 Machines Only
HN52KC016	Oil Pump Contactor	208/230-3-60, 230-3-60, 380-3-60, 460-3-60, 575-3-60 Machines Only
HR46GN001	MotorMaster III Controller	If equipped (PSN: 0802F)
	MotorMaster V Controller	If equipped (SSN: 0802F) See EPIC 2000 for appropriate part numbers
KC21AH005	Tube Brush	
P903-1205	Compressor Oil	5 gallons
06NA660001	Compressor Oil Solenoid Kit	
06NA660011	Compressor Unloader Solenoid	
06NA660028	Compressor Internal Oil Filter	
30GT660010	EXV Motor Kit	30GXN/R080-115, 220B, 240B, Only
30GX503303	Oil Pump	
30GX504025	Oil Level Switch	
30GX660002	Liquid Level Sensor	
32GB401454	Economizer Stepper Motor Assembly	30GXN/R125-204, 220A, 225, 240A, 249-450 Only
32GB401484	Economizer O-ring Kit	30GXN/R125-204, 220A, 225, 240A, 249-450 Only
32GB660017	EXV O-ring Kit	30GXN/R080-115, 220B, 240B, Only
3-010-311	Liquid Line Strainer Screen and Gasket	
S-4004UA	External Oil Filter	
	Compressors	See EPIC 2000 for appropriate part numbers
	Compressor Contactor/Starter	See EPIC 2000 for appropriate part numbers
	Fan Blades	See EPIC 2000 for appropriate part numbers
	Fan Circuit Breaker	See EPIC 2000 for appropriate part numbers
	Fan Contactor	See EPIC 2000 for appropriate part numbers

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30GXN,GXR Series 4 & 5 Recommended Parts:		
Part Number	Description	Comments
	Fan Motor	See EPIC 2000 for appropriate part numbers
	Fan Overload Contactor	See EPIC 2000 for appropriate part numbers. Used only on High Static Fan Options
	Fan Overload Heater	See EPIC 2000 for appropriate part numbers. Used only on High Static Fan Options
	CCP Current Transformer	See EPIC 2000 for appropriate part numbers

30GXN,GXR Series 6 Critical Parts:		
Part Number	Description	Comments
HH79NZ029	Thermistor	
HH83ZB001	Circuit Breaker	
HN67LM103	ComfortLink Compressor Protection (Full Current)	
HR53VK120	Switch	
HR81LG015	Flow Switch, Thermal Dispersion	
HT01BD121	Transformer	
SC15	Fuse	
30GT515217	EXV Board	w/o Software HK50AA026
30GX506748	Main Base Board	w/o Software HK50AA029
30HX501316	Screw Compressor Board	w/o Software HK50AA032
853002-640	Cooler Tube Plug Ring	Do not plug any more than 10% of the total number of tubes.
853103-1	Cooler Tube Plug Pin	Do not plug any more than 10% of the total number of tubes.

30GXN,GXR Series 6 Recommended Parts:		
Part Number	Description	Comments
ADK305S	Filter Drier	
EB51LZ221	Pressure Relief Valve	
EB51LZ320	Pressure Relief Valve	
EF19ZE024	Solenoid Coil	
HK02ZA441	High Pressure Switch	
HK05YZ001	Transducer	
HK05YZ007	Transducer	
HK50AA028	Energy Management Module	No software loaded
HK50AA033	Navigator	
HN52KC016	Oil Pump Contactor	

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30GXN,GXR Series 6 Recommended Parts:		
Part Number	Description	Comments
	MotorMaster V Controller	See EPIC 2000 for appropriate part numbers
KC21AH005	Tube Brush	
P903-1205	Compressor Oil	5 gallons
06NA660001	Compressor Oil Solenoid Kit	
06NA660011	Compressor Unloader Solenoid	
06NA660028	Compressor Internal Oil Filter	
30GB660002	Thermistor, DGT	
32GB403924 32GB404254	EXV Motor Kit	See EPIC 2000 for appropriate part numbers
30GX505673	Oil Pump	
30GX504025	Oil Level Switch	
32GB660017 32GB660018	EXV O-ring Kit	See EPIC 2000 for appropriate part numbers
	Liquid Line Strainer Screen, Filter Drier Core and Gasket	See EPIC 2000 for appropriate part numbers
S-4004UA	External Oil Filter	
	Compressors	See EPIC 2000 for appropriate part numbers
	Compressor Contactor/Starter	See EPIC 2000 for appropriate part numbers
	Fan Blades	See EPIC 2000 for appropriate part numbers
	Fan Circuit Breaker	See EPIC 2000 for appropriate part numbers
	Fan Contactor	See EPIC 2000 for appropriate part numbers
	Fan Motor	See EPIC 2000 for appropriate part numbers
	Fan Overload Contactor	See EPIC 2000 for appropriate part numbers. Used only on High Static Fan Options
	Fan Overload Heater	See EPIC 2000 for appropriate part numbers. Used only on High Static Fan Options
	CCP Current Transformer	See EPIC 2000 for appropriate part numbers

30GXN,GXR Recommended Tools:		
Part Number	Description	Comments
06NA660015	Compressor Service Tool Kit	
30GX680004	Direct Download Cable	Cable Connection for bench top

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30GXN,GXR Recommended Tools:		
Part Number	Description	Comments
		software downloads using SmartLoader.
30GX680005	ComfortLink Power Cube	Power Cube with Connection for bench top software downloads using SmartLoader.
AW24	3/4" Allen Wrench	Required to remove the Compressor Internal Oil Filter Cover. (Snap-On Part Number)
TS429	EXD/EXV Orifice Removal Tool	Designed to remove and replace the EXD/EXV orifice.

30HXA Spare Parts List

30HXA Series 4 & 5 Critical Parts:		
Part Number	Description	Comments
HH79NZ029	Thermistor	
HH83ZB001	Circuit Breaker	
HN67LM103	ComfortLink Compressor Protection (Full Current)	See EPIC 2000 for appropriate part number.
HN67LM104	ComfortLink Compressor Protection (1/2-Current)	See EPIC 2000 for appropriate part number.
HR53VK120	Switch	
HR81LG005	Flow Switch, Paddle	PSN: 4401Q
HR81LG015	Flow Switch, Thermal Dispersion	SSN: 4401Q
HT01BD121	Transformer	
SC15	Fuse	
30GT515217	EXV Board	w/o Software HK50AA026
30HX501314	Main Base Board	w/o Software HK50AA029
30HX501316	Screw Compressor Board	w/o Software HK50AA032
853002-640	Cooler Tube Plug Ring	Do not plug any more than 10% of the total number of tubes.
853103-1	Cooler Tube Plug Pin	Do not plug any more than 10% of the total number of tubes.

30HXA Series 4 & 5 Recommended Parts:		
Part Number	Description	Comments
ADK305S	Filter Drier	
EB51LZ221	Pressure Relief Valve	
EB51LZ320	Pressure Relief Valve	
EF19ZE024	Solenoid Coil	
HK02YB097	Pressure Switch	Fan Cycling Pressure Switch

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30HXA Series 4 & 5 Recommended Parts:		
Part Number	Description	Comments
HK02ZA275	High Pressure Switch	
HK05YZ001	Transducer	
HK05YZ007	Transducer	
HK50AA028	Energy Management Module	No software loaded
HK50AA033	Navigator	
HN52KC015	Oil Pump Contactor	230-3-50, 380/415-3-50 Machines Only
HN52KC016	Oil Pump Contactor	208/230-3-60, 230-3-60, 380-3-60, 460-3-60, 575-3-60 Machines Only
KC21AH005	Tube Brush	
P903-1205	Compressor Oil	5 gallons
06NA660001	Compressor Oil Solenoid Kit	
06NA660011	Compressor Unloader Solenoid	
06NA660028	Compressor Internal Oil Filter	
30GT660010	EXV Motor Kit	30HXA076-146 Only
30GX503303	Oil Pump	
30GX504025	Oil Level Switch	
30GX660002	Liquid Level Sensor	
32GB401454	Economizer Stepper Motor Assembly	30HXA161-271 Only
32GB401484	Economizer O-ring Kit	30HXA161-271 Only
32GB660013	EXV O-ring Kit	30HXA076-146 Only
3-010-310	Liquid Line Strainer Screen and Gasket	30HXA076-146 Only S/N: 3400F-5100F
3-010-311	Liquid Line Strainer Screen and Gasket	30HXA161-271 Only
3-010-312	Liquid Line Strainer Screen and Gasket	30HXA076-146 Only SSN: 5200F
4004TA	External Oil Filter	
	Compressors	See EPIC 2000 for appropriate part numbers
	Compressor Contactor/Starter	See EPIC 2000 for appropriate part numbers
	CCP Current Transformer	See EPIC 2000 for appropriate part numbers

30HXA Series 6 Critical Parts:		
Part Number	Description	Comments
HH79NZ029	Thermistor	
HH83ZB001	Circuit Breaker	

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30HXA Series 6 Critical Parts:		
Part Number	Description	Comments
HN67LM103	ComfortLink Compressor Protection (Full Current)	
HR53VK120	Switch	
HR81LG015	Flow Switch, Thermal Dispersion	
HT01BD121	Transformer	
SC15	Fuse	
30GT515217	EXV Board	w/o Software HK50AA026
30GX506748	Main Base Board	w/o Software HK50AA029
30HX501316	Screw Compressor Board	w/o Software HK50AA032
853002-640	Cooler Tube Plug Ring	Do not plug any more than 10% of the total number of tubes.
853103-1	Cooler Tube Plug Pin	Do not plug any more than 10% of the total number of tubes.

30HXA Series 6 Recommended Parts:		
Part Number	Description	Comments
ADK305S	Filter Drier	
EB51LZ221	Pressure Relief Valve	
EB51LZ320	Pressure Relief Valve	
EF19ZE024	Solenoid Coil	
HK02YB097	Pressure Switch	Fan Cycling Pressure Switch
HK02ZA275	High Pressure Switch	
HK05YZ001	Transducer	
HK05YZ007	Transducer	
HK50AA028	Energy Management Module	No software loaded
HK50AA033	Navigator	
HN52KC015	Oil Pump Contactor	230-3-50, 380/415-3-50 Machines Only
HN52KC016	Oil Pump Contactor	208/230-3-60, 230-3-60, 380-3-60, 460-3-60, 575-3-60 Machines Only
KC21AH005	Tube Brush	
P903-1205	Compressor Oil	5 gallons
06NA660001	Compressor Oil Solenoid Kit	
06NA660011	Compressor Unloader Solenoid	
06NA660028	Compressor Internal Oil Filter	
30GB660002	Thermistor, DGT	
32GB403924 32GB404254	EXV Motor Kit	See EPIC 2000 for appropriate part numbers
30GX505673	Oil Pump	
30GX504025	Oil Level Switch	

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30HXA Series 6 Recommended Parts:		
Part Number	Description	Comments
32GB660017 32GB660018	EXV O-ring Kit	See EPIC 2000 for appropriate part numbers
	Liquid Line Strainer Screen, Filter Drier Core and Gasket	See EPIC 2000 for appropriate part numbers
4004TA	External Oil Filter	
	Compressors	See EPIC 2000 for appropriate part numbers
	Compressor Contactor/Starter	See EPIC 2000 for appropriate part numbers
	CCP Current Transformer	See EPIC 2000 for appropriate part numbers

30HXA Recommended Tools:		
Part Number	Description	Comments
06NA660015	Compressor Service Tool Kit	
30GX680004	Direct Download Cable	Cable Connection for bench top software downloads using SmartLoader.
30GX680005	ComfortLink Power Cube	Power Cube with Connection for bench top software downloads using SmartLoader.
AW24	$\frac{3}{4}$ " Allen Wrench	Required to remove the Compressor Internal Oil Filter Cover. (Snap-On Part Number)
TS429	EXD/EXV Orifice Removal Tool	Designed to remove and replace the EXD/EXV orifice.

30HXC Spare Parts List

30HXC Series 4 & 5 Critical Parts:		
Part Number	Description	Comments
HH79NZ029	Thermistor	
HH83ZB001	Circuit Breaker	
HN67LM103	ComfortLink Compressor Protection (Full Current)	See EPIC 2000 for appropriate part number.
HN67LM104	ComfortLink Compressor Protection (1/2-Current)	See EPIC 2000 for appropriate part number.
HR53VK120	Switch	
HR81LG005	Flow Switch, Paddle	PSN: 4401Q (Cooler), Required for Condenser Flow Protection with Brine Operation

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30HXC Series 4 & 5 Critical Parts:		
Part Number	Description	Comments
HR81LG015	Flow Switch, Thermal Dispersion	SSN: 4401Q
HT01BD121	Transformer	
SC15	Fuse	
30GT515217	EXV Board	w/o Software HK50AA026
30GX506748	Main Base Board	w/o Software HK50AA029
30HX501316	Screw Compressor Board	w/o Software HK50AA032
853002-640	Cooler and Condenser Tube Plug Ring	Do not plug any more than 10% of the total number of tubes.
853103-1	Cooler and Condenser Tube Plug Pin	Do not plug any more than 10% of the total number of tubes.

30HXC Series 4 & 5 Recommended Parts:		
Part Number	Description	Comments
ADK305S	Filter Drier	
EB51LZ221	Pressure Relief Valve	
EF19ZE024	Solenoid Coil	
HK02ZA440	High Pressure Switch	
HK05YZ001	Transducer	
HK05YZ007	Transducer	
HK50AA028	Energy Management Module	No software loaded
HK50AA033	Navigator	
HN52KC015	Oil Pump Contactor	230-3-50, 380/415-3-50 Machines Only
HN52KC016	Oil Pump Contactor	208/230-3-60, 230-3-60, 380-3-60, 460-3-60, 575-3-60 Machines Only
KC21AH005	Tube Brush	
P903-1205	Compressor Oil	5 gallons
06NA660001	Compressor Oil Solenoid Kit	
06NA660011	Compressor Unloader Solenoid	
06NA660028	Compressor Internal Oil Filter	
30GT660010	EXV Motor Kit	30HXC076-146 Only
30GX503303	Oil Pump	
30GX660002	Liquid Level Sensor	
30HX502414	Oil Level Switch	
32GB401454	Economizer Stepper Motor Assembly	30HXC161-271 Only
32GB401484	Economizer O-ring Kit	30HXC161-271 Only
32GB660013	EXV O-ring Kit	30HXC076-146 Only
3-010-310	Liquid Line Strainer Screen and Gasket	30HXC076-146 Only S/N: 3400F-5100F

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30HXC Series 4 & 5 Recommended Parts:		
Part Number	Description	Comments
3-010-311	Liquid Line Strainer Screen and Gasket	30HXC161-271 Only
3-010-312	Liquid Line Strainer Screen and Gasket	30HXC076-146 Only SSN: 5200F
4004TA	External Oil Filter	
	Compressors	See EPIC 2000 for appropriate part numbers
	Compressor Contactor/Starter	See EPIC 2000 for appropriate part numbers
	CCP Current Transformer	See EPIC 2000 for appropriate part numbers

30HXC Series 6 Critical Parts:		
Part Number	Description	Comments
HH79NZ029	Thermistor	
HH83ZB001	Circuit Breaker	
HN67LM103	ComfortLink Compressor Protection (Full Current)	
HR53VK120	Switch	
HR81LG005	Flow Switch, Paddle	Required for Condenser Flow Protection for Brine Operation
HR81LG015	Flow Switch, Thermal Dispersion	
HT01BD121	Transformer	
SC15	Fuse	
30GT515217	EXV Board	w/o Software HK50AA026
30HX501314	Main Base Board	w/o Software HK50AA029
30HX501316	Screw Compressor Board	w/o Software HK50AA032
853002-640	Cooler and Condenser Tube Plug Ring	Do not plug any more than 10% of the total number of tubes.
853103-1	Cooler and Condenser Tube Plug Pin	Do not plug any more than 10% of the total number of tubes.

30HXC Series 6 Recommended Parts:		
Part Number	Description	Comments
ADK305S	Filter Drier	
EB51LZ221	Pressure Relief Valve	
EF19ZE024	Solenoid Coil	
HK02ZA440	High Pressure Switch	
HK05YZ001	Transducer	
HK05YZ007	Transducer	
HK50AA028	Energy Management Module	No software loaded

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30HXC Series 6 Recommended Parts:		
Part Number	Description	Comments
HK50AA033	Navigator	
HN52KC016	Oil Pump Contactor	
KC21AH005	Tube Brush	
P903-1205	Compressor Oil	5 gallons
06NA660001	Compressor Oil Solenoid Kit	
06NA660011	Compressor Unloader Solenoid	
06NA660028	Compressor Internal Oil Filter	
30GB600002	Thermistor, DGT	
32GB403924 32GB404254	EXV Motor Kit	See EPIC 2000 for appropriate part numbers
30GX505673	Oil Pump	
30HX502414	Oil Level Switch	
32GB660017 32GB660018	EXV O-ring Kit	See EPIC 2000 for appropriate part numbers
	Liquid Line Strainer Screen, Filter Drier Core and Gasket	See EPIC 2000 for appropriate part numbers
4004TA	External Oil Filter	
	Compressors	See EPIC 2000 for appropriate part numbers
	Compressor Contactor/Starter	See EPIC 2000 for appropriate part numbers
	CCP Current Transformer	See EPIC 2000 for appropriate part numbers

30HXC Recommended Tools:		
Part Number	Description	Comments
06NA660015	Compressor Service Tool Kit	
30GX680004	Direct Download Cable	Cable Connection for bench top software downloads using SmartLoader.
30GX680005	ComfortLink Power Cube	Power Cube with Connection for bench top software downloads using SmartLoader.
AW24	$\frac{3}{4}$ " Allen Wrench	Required to remove the Compressor Internal Oil Filter Cover. (Snap-On Part Number)
TS429	EXD/EXV Orifice Removal Tool	Designed to remove and replace the EXD/EXV orifice.

APPENDIX A – DATAPORT™, DATALINK™, BACLINK™ OBJECT DEFINITION

30GXN/GXR/HXA/HXC w/ Software Versions 1.0 through 3.1							
CCN Table Name	Description	Status	Units	Point	DataPort	DataLink	BACLink
A_UNIT	GENERAL PARAMETERS						
	Control Mode	0 = Service Test 1 = OFF Local 2 = OFF CCN 3 = OFF Clock 4 = OFF Emergency 5 = ON Local 6 = ON CCN 7 = ON Clock		STAT	RO	RO	RO
	Occupied	No/Yes		OCC	RO	RO	RO
	CCN Chiller	Start/Stop		CHIL_S_S	RO	RW	RW
	Alarm State	Normal/Alert/Alarm		ALM	RO	RO	RO
	Active Demand Limit	0 to 100	%	DEM_LIM	RO	RW	RW
	Override Modes In Effect	No/Yes		MODE	RO	RO	NA
	Percent Total Capacity	0 to 100	%	CAP_T	RO	RO	RO
	Active Setpoint	-20 to 70 (-28.8 to 21.1)	dF (dC)	SP	RO	RO	NA
	Control Point	-20 to 70 (-28.8 to 21.1)	dF (dC)	CTRL_PNT	RO	RW	RW
	Entering Fluid Temp	snnn.n	dF (dC)	EWT	RO	RO	RO
	Leaving Fluid Temp	snnn.n	dF (dC)	LWT	RO	RO	RO
	Emergency Stop	Enable/Emstop		EMSTOP	RO	RW	RW
	Minutes Left for Start	00:00 to 15:00	Minutes	MIN_LEFT	RO	RO	NA
	Heat/Cool Select	Heat/Cool		HEATCOOL	RO	RW	RW
	CIRCADIO	CIRC. A DISCRETE OUTPUTS					
Compressor A1 Relay		Off/On		K_A1_RLY	RO	RO	RO
Compressor A2 Relay		Off/On		K_A2_RLY	RO	RO	RO
Loader A1 Relay		Off/On		LOADR_A1	RO	RO	NA
Loader A2 Relay		Off/On		LOADR_A2	RO	RO	NA
Minimum Load Valve Relay		Off/On		MLV	RO	RO	NA
Oil Heater		Off/On		OILA_HTR	RO	RO	NA
Motor Cooling A1 Solenoid		Off/On		MTRCL_A1	RO	RO	NA
Motor Cooling A2 Solenoid		Off/On		MTRCL_A2	RO	RO	NA
Oil Pump		Off/On		OILPMP_A	RO	RO	NA
Oil Solenoid A1		Off/On		OILSL_A1	RO	RO	NA
Oil Solenoid A2		Off/On		OILSL_A2	RO	RO	NA
CIRC. A DISCRETE INPUTS							
Compressor A1 Feedback		Off/On		K_A1_FBK	RO	RO	NA
Compressor A2 Feedback		Off/On		K_A2_FBK	RO	RO	NA
Oil Level Switch		Close/Open		OILA_SW	RO	RO	NA

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30GXN/GXR/HXA/HXC w/ Software Versions 1.0 through 3.1							
CCN Table Name	Description	Status	Units	Point	DataPort	DataLink	BAClink
CIRCA_AN	CIRCUIT A ANALOG VALUES						
	Percent Total Capacity	0 to 100	%	CAPA_T	RO	RO	RO
	Percent Available Capacity	0 to 100	%	CAPA_A	RO	RO	RO
	Circuit Running Current	0 to 1200	Amps	A_CURR	RO	RO	NA
	Discharge Pressure	nnn.n	PSIG (KPA)	DP_A	RO	RO	RO
	Suction Pressure	nnn.n	PSIG (KPA)	SP_A	RO	RO	RO
	Economizer Pressure	nnn.n	PSIG (KPA)	ECNP_A	RO	RO	NA
	Discharge Superheat Temp	snnn.n	^F (^C)	SH_A	RO	RO	RO
	Discharge Gas Temperature	nnn.n	dF (dC)	DISTMP_A	RO	RO	NA
	Saturated Condensing Temp	snnn.n	dF (dC)	TMP_SCTA	RO	RO	RO
	Saturated Suction Temp	snnn.n	dF (dC)	TMP_SSTA	RO	RO	RO
	EXV% Open	0 to 100	%	EXV_A	RO	RO	NA
	Variable Head Press Pct.	0 to 100	%	VHPA	RO	RO	NA
	Cooler Level Indicator	0 to 3		LEVEL_A	RO	RO	NA
	COMP A1 ANALOG VALUES						
	A1 Oil Pressure Diff.	nnn.n	PSIG (KPA)	DOP_A1	RO	RO	NA
	A1 Oil Pressure	nnn.n	PSIG (KPA)	OP_A1	RO	RO	NA
	A1 Motor Temperature	nnn.n	dF (dC)	TMTR_A1	RO	RO	NA
	Comp A1 Running Current	0 to 600	Amps	A1_CURR	RO	RO	NA
	Comp A1 % Must Trip Amps	0 to 100	%	A1_MTA	RO	RO	NA
	COMP A2 ANALOG VALUES						
	A2 Oil Pressure Diff.	nnn.n	PSIG (KPA)	DOP_A2	RO	RO	NA
	A2 Oil Pressure	nnn.n	PSIG (KPA)	OP_A2	RO	RO	NA
	A2 Motor Temperature	nnn.n	dF (dC)	TMTR_A2	RO	RO	NA
Comp A2 Running Current	0 to 600	Amps	A2_CURR	RO	RO	NA	
Comp A2 % Must Trip Amps	0 to 100	%	A2_MTA	RO	RO	NA	
CIRCB Dio	CIRC. B DISCRETE OUTPUTS						
	Compressor B1 Relay	Off/On		K_B1_RLY	RO	RO	RO
	Compressor B2 Relay	Off/On		K_B2_RLY	RO	RO	RO
	Loader B1 Relay	Off/On		LOADR_B1	RO	RO	NA
	Loader B2 Relay	Off/On		LOADR_B2	RO	RO	NA
	Minimum Load Valve Relay	Off/On		MLV	RO	RO	NA
	Oil Heater	Off/On		OILB_HTR	RO	RO	NA
	Motor Cooling B1 Solenoid	Off/On		MTRCL_B1	RO	RO	NA
	Motor Cooling B2 Solenoid	Off/On		MTRCL_B2	RO	RO	NA
	Oil Pump	Off/On		OILPMP_B	RO	RO	NA
	Oil Solenoid B1	Off/On		OILSL_B1	RO	RO	NA
	Oil Solenoid B2	Off/On		OILSL_B2	RO	RO	NA
	CIRC. B DISCRETE INPUTS						
	Compressor B1 Feedback	Off/On		K_B1_FBK	RO	RO	NA
	Compressor B2 Feedback	Off/On		K_B2_FBK	RO	RO	NA
Oil Level Switch	Close/Open		OILB_SW	RO	RO	NA	

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30GXN/GXR/HXA/HXC w/ Software Versions 1.0 through 3.1

CCN Table Name	Description	Status	Units	Point	DataPort	DataLink	BAClink
CIRCB_AN	CIRCUIT B ANALOG VALUES						
	Percent Total Capacity	0 to 100	%	CAPB_T	RO	RO	RO
	Percent Available Capacity	0 to 100	%	CAPB_A	RO	RO	RO
	Circuit Running Current	0 to 1200	Amps	B_CURR	RO	RO	NA
	Discharge Pressure	nnn.n	PSIG (KPA)	DP_B	RO	RO	RO
	Suction Pressure	nnn.n	PSIG (KPA)	SP_B	RO	RO	RO
	Economizer Pressure	nnn.n	PSIG (KPA)	ECNP_B	RO	RO	NA
	Discharge Superheat Temp	snnn.n	^F (^C)	SH_B	RO	RO	RO
	Discharge Gas Temperature	nnn.n	dF (dC)	DISTMP_B	RO	RO	NA
	Saturated Condensing Temp	snnn.n	dF (dC)	TMP_SCTB	RO	RO	RO
	Saturated Suction Temp	snnn.n	dF (dC)	TMP_SSTB	RO	RO	RO
	EXV% Open	0 to 100	%	EXV_B	RO	RO	NA
	Variable Head Press Pct.	0 to 100	%	VHPB	RO	RO	NA
	Cooler Level Indicator	0 to 3		LEVEL_B	RO	RO	NA
	COMP B1 ANALOG VALUES						
	B1 Oil Pressure Diff.	nnn.n	PSIG (KPA)	DOP_B1	RO	RO	NA
	B1 Oil Pressure	nnn.n	PSIG (KPA)	OP_B1	RO	RO	NA
	B1 Motor Temperature	nnn.n	dF (dC)	TMTR_B1	RO	RO	NA
	Comp B1 Running Current	0 to 600	Amps	B1_CURR	RO	RO	NA
	Comp B1 % Must Trip Amps	0 to 100	%	B1_MTA	RO	RO	NA
	COMP B2 ANALOG VALUES						
	B2 Oil Pressure Diff.	nnn.n	PSIG (KPA)	DOP_B2	RO	RO	NA
	B2 Oil Pressure	nnn.n	PSIG (KPA)	OP_B2	RO	RO	NA
	B2 Motor Temperature	nnn.n	dF (dC)	TMTR_B2	RO	RO	NA
	Comp B2 Running Current	0 to 600	Amps	B2_CURR	RO	RO	NA
	Comp B2 % Must Trip Amps	0 to 100	%	B2_MTA	RO	RO	NA

Not for Distribution

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30GXN/GXR/HXA/HXC w/ Software Versions 1.0 through 3.1							
CCN Table Name	Description	Status	Units	Point	DataPort	DataLink	BAClink
OPTIONS	FANS						
	Fan 1 Relay *	Off/On		FAN_1	RO	RO	RO
	Fan 2 Relay **	Off/On		FAN_2	RO	RO	RO
	Fan 3 Relay	Off/On		FAN_3	RO	RO	RO
	Fan 4 Relay	Off/On		FAN_4	RO	RO	RO
	UNIT ANALOG VALUES						
	Cooler Entering Fluid	snnn.n	dF (dC)	COOL_EWT	RO	RO	RO
	Cooler Leaving Fluid	snnn.n	dF (dC)	COOL_LWT	RO	RO	RO
	Condenser Entering Fluid	snnn.n	dF (dC)	COND_EWT	RO	RO	RO
	Condenser Leaving Fluid	snnn.n	dF (dC)	COND_LWT	RO	RO	RO
	Lead/Lag Leaving Fluid	snnn.n	dF (dC)	DUAL_LWT	RO	RO	NA
	TEMPERTURE RESET						
	4-20 mA Reset Signal	nn.n	ma	RST_MA	RO	RO	RO
	Outside Air Temperature	snnn.n	dF (dC)	OAT	RO	RW	NA
	Space Temperature	snnn.n	dF (dC)	SPT	RO	RW	NA
	DEMAND LIMIT						
	4-20 mA Demand Signal	nn.n	ma	LMT_MA	RO	RO	RO
	Demand Limit Switch 1	Off/On		DMD_SW1	RO	RO	NA
	Demand Limit Switch 2	Off/On		DMD_SW2	RO	RO	NA
	CCN Loadshed Signal	0 = Normal 1 = Redline 2 = Loadshed		DL_STAT	RO	RO	RO
	PUMPS						
	Cooler Pump Relay	Off/On		COOL_PMP	RO	RO	RO
	Condenser Pump Relay	Off/On		COND_PMP	RO	RO	RO
	MISCELLANEOUS						
	Dual Setpoint Switch	Off/On		DUAL_IN	RO	RO	NA
	Cooler Flow Switch	Off/On		COOLFLOW	RO	RO	NA
	Condenser Flow Switch	Off/On		CONDFLOW	RO	RO	NA
	Ice Done	No/Yes		ICE	RO	RO	NA
	Cooler Heater	Off/On		COOL_HTR	RO	RO	NA
	4-20 ma Cooling Setpoint	nn.n	ma	CSP_IN	RO	RO	NA
4-20 ma Heating Setpoint	nn.n	ma	HSP_IN	RO	RO	NA	
SETPOINT	COOLING						
	Cooling Setpoint 1	-20 to 70 (-28.8 to 21.1)	dF (dC)	CSP1	NA	RW	RW
	Cooling Setpoint 2	-20 to 70 (-28.8 to 21.1)	dF (dC)	CSP2	NA	RW	NA
	ICE Setpoint	-20 to 32 (-28.8 to 0.0)	dF (dC)	CSP3	NA	RW	NA
	HEATING						
	Heating Setpoint 1	80 to 140 (26.7 to 60.0)	dF (dC)	HSP1	NA	RW	RW
	Heating Setpoint 2	80 to 140 (26.7 to 60.0)	dF (dC)	HSP2	NA	RW	NA
	RAMP LOADING						
	Cooling Ramp Loading	0.2 to 2.0 (0.1 to 1.1)		CRAMP	NA	RW	NA
	Heating Ramp Loading	0.2 to 2.0 (0.1 to 1.1)		HRAMP	NA	RW	NA
	HEAD PRESSURE						
	Head Pressure Setpoint A	80 to 140 (26.7 to 60.0)	dF (dC)	HSP_A	NA	RW	NA
Head Pressure Setpoint B	80 to 140 (26.7 to 60.0)	dF (dC)	HSP_B	NA	RW	NA	
LIQUID LEVEL							
Liquid Level Setpoint A	0 to 3		LVL_SPA	NA	RW	NA	
Liquid Level Setpoint B	0 to 3		LVL_SPB	NA	RW	NA	

30GX/HX ComfortLink Screw Chiller Service Manual

30GXN/GXR/HXA/HXC w/ Software Versions 1.0 through 3.1							
CCN Table Name	Description	Status	Units	Point	DataPort	DataLink	BAClink
OCCPC01S	Timed Override Hours	0	Hours	OVR-EXT	NA	RW	RW
	Period 1 DOW (MTWTFSSH)	00000000		DOW1	NA	RW	RW
	Occupied Time	00:00		OCCTOD1	NA	RW	RW
	Unoccupied Time	00:00		UNOCTOD1	NA	RW	RW
	Period 2 DOW (MTWTFSSH)	00000000		DOW2	NA	RW	RW
	Occupied Time	00:00		OCCTOD2	NA	RW	RW
	Unoccupied Time	00:00		UNOCTOD2	NA	RW	RW
	Period 3 DOW (MTWTFSSH)	00000000		DOW3	NA	RW	RW
	Occupied Time	00:00		OCCTOD3	NA	RW	RW
	Unoccupied Time	00:00		UNOCTOD3	NA	RW	RW
	Period 4 DOW (MTWTFSSH)	00000000		DOW4	NA	RW	RW
	Occupied Time	00:00		OCCTOD4	NA	RW	RW
	Unoccupied Time	00:00		UNOCTOD4	NA	RW	RW
	Period 5 DOW (MTWTFSSH)	00000000		DOW5	NA	RW	RW
	Occupied Time	00:00		OCCTOD5	NA	RW	RW
	Unoccupied Time	00:00		UNOCTOD5	NA	RW	RW
	Period 6 DOW (MTWTFSSH)	00000000		DOW6	NA	RW	RW
	Occupied Time	00:00		OCCTOD6	NA	RW	RW
	Unoccupied Time	00:00		UNOCTOD6	NA	RW	RW
	Period 7 DOW (MTWTFSSH)	00000000		DOW7	NA	RW	RW
	Occupied Time	00:00		OCCTOD7	NA	RW	RW
	Unoccupied Time	00:00		UNOCTOD7	NA	RW	RW
	Period 8 DOW (MTWTFSSH)	00000000		DOW8	NA	RW	RW
	Occupied Time	00:00		OCCTOD8	NA	RW	RW
Unoccupied Time	00:00		UNOCTOD8	NA	RW	RW	

- Note:
- dC - Degrees Celsius
 - dF - Degrees Fahrenheit
 - ^F - Delta Degrees Fahrenheit
 - ^C - Delta Degrees Celsius
 - NA - Not Available
 - RO - Read Only
 - RW - Read/Write
 - * - Circuit A Condenser Fan Output (30HXA only)
 - ** - Circuit B Condenser Fan Output (30HXA only)

In order to write to any point with DataLink or BAClink, the machine must be configured for CCN control. CTRL *Control Method* (Configuration Mode, sub-mode OPT2) must be set to 3=CCN Control.

30GX/HX ComfortLink Screw Chiller Service Manual

30GXN/GXR/HXA/HXC w/ Software Versions 4.0 through 4.8							
CCN Table Name	Description	Status	Units	Point	DataPort	DataLink	BAClink
A_UNIT	GENERAL PARAMETERS						
	Control Mode	0 = Service Test 1 = OFF Local 2 = OFF CCN 3 = OFF Clock 4 = OFF Emergency 5 = ON Local 6 = ON CCN 7 = ON Clock		STAT	RO	RO	RO
	Occupied	No/Yes		OCC	RO	RO	RO
	CCN Chiller	Start/Stop		CHIL_S_S	RO	RW	RW
	Alarm State	Normal/Alert/Alarm		ALM	RO	RO	RO
	Active Demand Limit	0 to 100	%	DEM_LIM	RO	RW	RW
	Override Modes In Effect	No/Yes		MODE	RO	RO	NA
	Percent Total Capacity	0 to 100	%	CAP_T	RO	RO	RO
	Active Setpoint	-20 to 70 (-28.8 to 21.1)	dF (dC)	SP	RO	RO	NA
	Control Point	-20 to 70 (-28.8 to 21.1)	dF (dC)	CTRL_PNT	RO	RW	RW
	Entering Fluid Temp	snnn.n	dF (dC)	EWT	RO	RO	RO
	Leaving Fluid Temp	snnn.n	dF (dC)	LWT	RO	RO	RO
	Emergency Stop	Enable/Emstop		EMSTOP	RO	RW	RW
	Minutes Left for Start	00:00 to 15:00	Minutes	MIN_LEFT	RO	RO	NA
Heat/Cool Select	Heat/Cool		HEATCOOL	RO	RW	RW	
CIRCADIO	CIRC. A DISCRETE OUTPUTS						
	Compressor A1 Relay	Off/On		K_A1_RLY	RO	RO	RO
	Compressor A2 Relay	Off/On		K_A2_RLY	RO	RO	RO
	Loader A1 Relay	Off/On		LOADR_A1	RO	RO	NA
	Loader A2 Relay	Off/On		LOADR_A2	RO	RO	NA
	Minimum Load Valve Relay	Off/On		MLV	RO	RO	NA
	Oil Heater	Off/On		OILA_HTR	RO	RO	NA
	Motor Cooling A1 Solenoid	Off/On		MTRCL_A1	RO	RO	NA
	Motor Cooling A2 Solenoid	Off/On		MTRCL_A2	RO	RO	NA
	Oil Pump	Off/On		OILPMP_A	RO	RO	NA
	Oil Solenoid A1	Off/On		OILSL_A1	RO	RO	NA
	Oil Solenoid A2	Off/On		OILSL_A2	RO	RO	NA
	CIRC. A DISCRETE INPUTS						
	Compressor A1 Feedback	Off/On		K_A1_FBK	RO	RO	NA
Compressor A2 Feedback	Off/On		K_A2_FBK	RO	RO	NA	
Oil Level Switch	Close/Open		OILA_SW	RO	RO	NA	

30GX/HX ComfortLink Screw Chiller Service Manual

30GXN/GXR/HXA/HXC w/ Software Versions 4.0 through 4.8

CCN Table Name	Description	Status	Units	Point	DataPort	DataLink	BAClink
CIRCA_AN	CIRCUIT A ANALOG VALUES						
	Percent Total Capacity	0 to 100	%	CAPA_T	RO	RO	RO
	Percent Available Capacity	0 to 100	%	CAPA_A	RO	RO	RO
	Circuit Running Current	0 to 1200	Amps	A_CURR	RO	RO	NA
	Discharge Pressure	nnn.n	PSIG (KPA)	DP_A	RO	RO	RO
	Suction Pressure	nnn.n	PSIG (KPA)	SP_A	RO	RO	RO
	Economizer Pressure	nnn.n	PSIG (KPA)	ECNP_A	RO	RO	NA
	Discharge Superheat Temp	snnn.n	^F (^C)	SH_A	RO	RO	RO
	Discharge Gas Temperature	nnn.n	dF (dC)	DISTMP_A	RO	RO	NA
	Saturated Condensing Temp	snnn.n	dF (dC)	TMP_SCTA	RO	RO	RO
	Saturated Suction Temp	snnn.n	dF (dC)	TMP_SSTA	RO	RO	RO
	EXV% Open	0 to 100	%	EXV_A	RO	RO	NA
	Variable Head Press Pct.	0 to 100	%	VHPA	RO	RO	NA
	Cooler Level Indicator	0 to 3		LEVEL_A	RO	RO	NA
	COMP A1 ANALOG VALUES						
	A1 Oil Pressure Diff.	nnn.n	PSIG (KPA)	DOP_A1	RO	RO	NA
	A1 Oil Pressure	nnn.n	PSIG (KPA)	OP_A1	RO	RO	NA
	A1 Motor Temperature	nnn.n	dF (dC)	TMTR_A1	RO	RO	NA
	Comp A1 Running Current	0 to 600	Amps	A1_CURR	RO	RO	NA
	Comp A1 % Must Trip Amps	0 to 100	%	A1_MTA	RO	RO	NA
	COMP A2 ANALOG VALUES						
	A2 Oil Pressure Diff.	nnn.n	PSIG (KPA)	DOP_A2	RO	RO	NA
	A2 Oil Pressure	nnn.n	PSIG (KPA)	OP_A2	RO	RO	NA
	A2 Motor Temperature	nnn.n	dF (dC)	TMTR_A2	RO	RO	NA
	Comp A2 Running Current	0 to 600	Amps	A2_CURR	RO	RO	NA
	Comp A2 % Must Trip Amps	0 to 100	%	A2_MTA	RO	RO	NA
	CIRCB Dio	CIRC. B DISCRETE OUTPUTS					
Compressor B1 Relay		Off/On		K_B1_RLY	RO	RO	RO
Compressor B2 Relay		Off/On		K_B2_RLY	RO	RO	RO
Loader B1 Relay		Off/On		LOADR_B1	RO	RO	NA
Loader B2 Relay		Off/On		LOADR_B2	RO	RO	NA
Minimum Load Valve Relay		Off/On		MLV	RO	RO	NA
Oil Heater		Off/On		OILB_HTR	RO	RO	NA
Motor Cooling B1 Solenoid		Off/On		MTRCL_B1	RO	RO	NA
Motor Cooling B2 Solenoid		Off/On		MTRCL_B2	RO	RO	NA
Oil Pump		Off/On		OILPMP_B	RO	RO	NA
Oil Solenoid B1		Off/On		OILSL_B1	RO	RO	NA
Oil Solenoid B2		Off/On		OILSL_B2	RO	RO	NA
CIRC. B DISCRETE INPUTS							
Compressor B1 Feedback		Off/On		K_B1_FBK	RO	RO	NA
Compressor B2 Feedback		Off/On		K_B2_FBK	RO	RO	NA
Oil Level Switch		Close/Open		OILB_SW	RO	RO	NA

30GX/HX ComfortLink Screw Chiller Service Manual

30GXN/GXR/HXA/HXC w/ Software Versions 4.0 through 4.8

CCN Table Name	Description	Status	Units	Point	DataPort	DataLink	BAClink
CIRCB_AN	CIRCUIT B ANALOG VALUES						
	Percent Total Capacity	0 to 100	%	CAPB_T	RO	RO	RO
	Percent Available Capacity	0 to 100	%	CAPB_A	RO	RO	RO
	Circuit Running Current	0 to 1200	Amps	B_CURR	RO	RO	NA
	Discharge Pressure	nnn.n	PSIG (KPA)	DP_B	RO	RO	RO
	Suction Pressure	nnn.n	PSIG (KPA)	SP_B	RO	RO	RO
	Economizer Pressure	nnn.n	PSIG (KPA)	ECNP_B	RO	RO	NA
	Discharge Superheat Temp	snnn.n	^F (^C)	SH_B	RO	RO	RO
	Discharge Gas Temperature	nnn.n	dF (dC)	DISTMP_B	RO	RO	NA
	Saturated Condensing Temp	snnn.n	dF (dC)	TMP_SCTB	RO	RO	RO
	Saturated Suction Temp	snnn.n	dF (dC)	TMP_SSTB	RO	RO	RO
	EXV% Open	0 to 100	%	EXV_B	RO	RO	NA
	Variable Head Press Pct.	0 to 100	%	VHPB	RO	RO	NA
	Cooler Level Indicator	0 to 3		LEVEL_B	RO	RO	NA
	COMP B1 ANALOG VALUES						
	B1 Oil Pressure Diff.	nnn.n	PSIG (KPA)	DOP_B1	RO	RO	NA
	B1 Oil Pressure	nnn.n	PSIG (KPA)	OP_B1	RO	RO	NA
	B1 Motor Temperature	nnn.n	dF (dC)	TMTR_B1	RO	RO	NA
	Comp B1 Running Current	0 to 600	Amps	B1_CURR	RO	RO	NA
	Comp B1 % Must Trip Amps	0 to 100	%	B1_MTA	RO	RO	NA
	COMP B2 ANALOG VALUES						
	B2 Oil Pressure Diff.	nnn.n	PSIG (KPA)	DOP_B2	RO	RO	NA
	B2 Oil Pressure	nnn.n	PSIG (KPA)	OP_B2	RO	RO	NA
	B2 Motor Temperature	nnn.n	dF (dC)	TMTR_B2	RO	RO	NA
	Comp B2 Running Current	0 to 600	Amps	B2_CURR	RO	RO	NA
	Comp B2 % Must Trip Amps	0 to 100	%	B2_MTA	RO	RO	NA

Not for Distribution

30GX/HX ComfortLink Screw Chiller Service Manual

30GXN/GXR/HXA/HXC w/ Software Versions 4.0 through 4.8							
CCN Table Name	Description	Status	Units	Point	DataPort	DataLink	BAClink
OPTIONS	FANS						
	Fan 1 Relay *	Off/On		FAN_1	RO	RO	RO
	Fan 2 Relay **	Off/On		FAN_2	RO	RO	RO
	Fan 3 Relay	Off/On		FAN_3	RO	RO	RO
	Fan 4 Relay	Off/On		FAN_4	RO	RO	RO
	UNIT ANALOG VALUES						
	Cooler Entering Fluid	snnn.n	dF (dC)	COOL_EWT	RO	RO	RO
	Cooler Leaving Fluid	snnn.n	dF (dC)	COOL_LWT	RO	RO	RO
	Condenser Entering Fluid	snnn.n	dF (dC)	COND_EWT	RO	RO	RO
	Condenser Leaving Fluid	snnn.n	dF (dC)	COND_LWT	RO	RO	RO
	Lead/Lag Leaving Fluid	snnn.n	dF (dC)	DUAL_LWT	RO	RO	NA
	TEMPERTURE RESET						
	4-20 mA Reset Signal	nn.n	ma	RST_MA	RO	RO	RO
	Outside Air Temperature	snnn.n	dF (dC)	OAT	RO	RW	NA
	Space Temperature	snnn.n	dF (dC)	SPT	RO	RW	NA
	DEMAND LIMIT						
	4-20 mA Demand Signal	nn.n	ma	LMT_MA	RO	RO	RO
	Demand Limit Switch 1	Off/On		DMD_SW1	RO	RO	NA
	Demand Limit Switch 2	Off/On		DMD_SW2	RO	RO	NA
	CCN Loadshed Signal	0 = Normal 1 = Redline 2 = Loadshed		DL_STAT	RO	RO	RO
	PUMPS						
	Cooler Pump Relay	Off/On		COOL_PMP	RO	RO	RO
	Condenser Pump Relay	Off/On		COND_PMP	RO	RO	RO
	MISCELLANEOUS						
	Dual Setpoint Switch	Off/On		DUAL_IN	RO	RO	NA
	Cooler Flow Switch	Off/On		COOLFLOW	RO	RO	NA
	Condenser Flow Switch	Off/On		CONDFLOW	RO	RO	NA
	Ice Done	No/Yes		ICE	RO	RO	NA
	Cooler Heater	Off/On		COOL_HTR	RO	RO	NA
	4-20 ma Cooling Setpoint	nn.n	ma	CSP_IN	RO	RO	NA
4-20 ma Heating Setpoint	nn.n	ma	HSP_IN	RO	RO	NA	
Liq. Line Solenoid Valve	Open/Close		LLSV	RO	RO	NA	
SETPOINT	COOLING						
	Cooling Setpoint 1	-20 to 70 (-28.8 to 21.1)	dF (dC)	CSP1	NA	RW	RW
	Cooling Setpoint 2	-20 to 70 (-28.8 to 21.1)	dF (dC)	CSP2	NA	RW	NA
	ICE Setpoint	-20 to 32 (-28.8 to 0.0)	dF (dC)	CSP3	NA	RW	NA
	HEATING						
	Heating Setpoint 1	80 to 140 (26.7 to 60.0)	dF (dC)	HSP1	NA	RW	RW
	Heating Setpoint 2	80 to 140 (26.7 to 60.0)	dF (dC)	HSP2	NA	RW	NA
	RAMP LOADING						
	Cooling Ramp Loading	0.2 to 2.0 (0.1 to 1.1)		CRAMP	NA	RW	NA
	Heating Ramp Loading	0.2 to 2.0 (0.1 to 1.1)		HRAMP	NA	RW	NA
	HEAD PRESSURE						
	Head Pressure Setpoint A	80 to 140 (26.7 to 60.0)	dF (dC)	HSP_A	NA	RW	NA
	Head Pressure Setpoint B	80 to 140 (26.7 to 60.0)	dF (dC)	HSP_B	NA	RW	NA
	LIQUID LEVEL						
	Liquid Level Setpoint A	0 to 3		LVL_SPA	NA	RW	NA
Liquid Level Setpoint B	0 to 3		LVL_SPB	NA	RW	NA	

30GX/HX ComfortLink Screw Chiller Service Manual

30GXN/GXR/HXA/HXC w/ Software Versions 4.0 through 4.8

CCN Table Name	Description	Status	Units	Point	DataPort	DataLink	BAClink
OCCPC01S	Timed Override Hours	0	Hours	OVR-EXT	NA	RW	RW
	Period 1 DOW (MTWTFSSH)	00000000		DOW1	NA	RW	RW
	Occupied Time	00:00		OCCTOD1	NA	RW	RW
	Unoccupied Time	00:00		UNOCTOD1	NA	RW	RW
	Period 2 DOW (MTWTFSSH)	00000000		DOW2	NA	RW	RW
	Occupied Time	00:00		OCCTOD2	NA	RW	RW
	Unoccupied Time	00:00		UNOCTOD2	NA	RW	RW
	Period 3 DOW (MTWTFSSH)	00000000		DOW3	NA	RW	RW
	Occupied Time	00:00		OCCTOD3	NA	RW	RW
	Unoccupied Time	00:00		UNOCTOD3	NA	RW	RW
	Period 4 DOW (MTWTFSSH)	00000000		DOW4	NA	RW	RW
	Occupied Time	00:00		OCCTOD4	NA	RW	RW
	Unoccupied Time	00:00		UNOCTOD4	NA	RW	RW
	Period 5 DOW (MTWTFSSH)	00000000		DOW5	NA	RW	RW
	Occupied Time	00:00		OCCTOD5	NA	RW	RW
	Unoccupied Time	00:00		UNOCTOD5	NA	RW	RW
	Period 6 DOW (MTWTFSSH)	00000000		DOW6	NA	RW	RW
	Occupied Time	00:00		OCCTOD6	NA	RW	RW
	Unoccupied Time	00:00		UNOCTOD6	NA	RW	RW
	Period 7 DOW (MTWTFSSH)	00000000		DOW7	NA	RW	RW
	Occupied Time	00:00		OCCTOD7	NA	RW	RW
	Unoccupied Time	00:00		UNOCTOD7	NA	RW	RW
	Period 8 DOW (MTWTFSSH)	00000000		DOW8	NA	RW	RW
	Occupied Time	00:00		OCCTOD8	NA	RW	RW
Unoccupied Time	00:00		UNOCTOD8	NA	RW	RW	

- Note:
- dC - Degrees Celsius
 - dF - Degrees Fahrenheit
 - ^F - Delta Degrees Fahrenheit
 - ^C - Delta Degrees Celsius
 - NA - Not Available
 - RO - Read Only
 - RW - Read/Write
 - * - Circuit A Condenser Fan Output (30HXA only)
 - ** - Circuit B Condenser Fan Output (30HXA only)

In order to write to any point with DataLink or BAClink, the machine must be configured for CCN control. CTRL *Control Method* (Configuration Mode, sub-mode OPT2) must be set to 3=CCN Control.

30GX/HX ComfortLink Screw Chiller Service Manual

30GXN/GXR/HXA/HXC w/ Software Version 5.0 and 5.1							
CCN Table Name	Description	Status	Units	Point	DataPort	DataLink	BAClink
A_UNIT	GENERAL PARAMETERS						
	Control Mode	0 = Service Test 1 = OFF Local 2 = OFF CCN 3 = OFF Clock 4 = OFF Emergency 5 = ON Local 6 = ON CCN 7 = ON Clock		STAT	RO	RO	RO
	Occupied	No/Yes		OCC	RO	RO	RO
	CCN Chiller	Start/Stop		CHIL_S_S	RO	RW	RW
	Alarm State	Normal/Alert/Alarm		ALM	RO	RO	RO
	Active Demand Limit	0 to 100	%	DEM_LIM	RO	RW	RW
	Override Modes In Effect	No/Yes		MODE	RO	RO	NA
	Percent Total Capacity	0 to 100	%	CAP_T	RO	RO	RO
	Active Setpoint	-20 to 70 (-28.8 to 21.1)	dF (dC)	SP	RO	RO	NA
	Control Point	-20 to 70 (-28.8 to 21.1)	dF (dC)	CTRL_PNT	RO	RW	RW
	Entering Fluid Temp	snnn.n	dF (dC)	EWT	RO	RO	RO
	Leaving Fluid Temp	snnn.n	dF (dC)	LWT	RO	RO	RO
	Emergency Stop	Enable/Emstop		EMSTOP	RO	RW	RW
	Minutes Left for Start	00:00 to 15:00	Minutes	MIN_LEFT	RO	RO	NA
Heat/Cool Select	Heat/Cool		HEATCOOL	RO	RW	RW	
CIRCADIO	CIRC. A DISCRETE OUTPUTS						
	Compressor A1 Relay	Off/On		K_A1_RLY	RO	RO	RO
	Compressor A2 Relay	Off/On		K_A2_RLY	RO	RO	RO
	Loader A1 Relay	Off/On		LOADR_A1	RO	RO	NA
	Loader A2 Relay	Off/On		LOADR_A2	RO	RO	NA
	Minimum Load Valve Relay	Off/On		MLV	RO	RO	NA
	Oil Heater	Off/On		OILA_HTR	RO	RO	NA
	Motor Cooling A1 Solenoid	Off/On		MTRCL_A1	RO	RO	NA
	Motor Cooling A2 Solenoid	Off/On		MTRCL_A2	RO	RO	NA
	Oil Pump	Off/On		OILPMP_A	RO	RO	NA
	Oil Solenoid A1	Off/On		OILSL_A1	RO	RO	NA
	Oil Solenoid A2	Off/On		OILSL_A2	RO	RO	NA
	CIRC. A DISCRETE INPUTS						
	Compressor A1 Feedback	Off/On		K_A1_FBK	RO	RO	NA
Compressor A2 Feedback	Off/On		K_A2_FBK	RO	RO	NA	
Oil Level Switch	Close/Open		OILA_SW	RO	RO	NA	

30GX/HX ComfortLink Screw Chiller Service Manual

30GXN/GXR/HXA/HXC w/ Software Version 5.0 and 5.1

CCN Table Name	Description	Status	Units	Point	DataPort	DataLink	BAClink
CIRCA_AN	CIRCUIT A ANALOG VALUES						
	Percent Total Capacity	0 to 100	%	CAPA_T	RO	RO	RO
	Percent Available Capacity	0 to 100	%	CAPA_A	RO	RO	RO
	Circuit Running Current	0 to 1200	Amps	A_CURR	RO	RO	NA
	Discharge Pressure	nnn.n	PSIG (KPA)	DP_A	RO	RO	RO
	Suction Pressure	nnn.n	PSIG (KPA)	SP_A	RO	RO	RO
	Economizer Pressure	nnn.n	PSIG (KPA)	ECNP_A	RO	RO	NA
	Discharge Superheat Temp	snnn.n	^F (^C)	SH_A	RO	RO	RO
	Discharge Gas Temperature	nnn.n	dF (dC)	DISTMP_A	RO	RO	NA
	Saturated Condensing Temp	snnn.n	dF (dC)	TMP_SCTA	RO	RO	RO
	Saturated Suction Temp	snnn.n	dF (dC)	TMP_SSTA	RO	RO	RO
	EXV% Open	0 to 100	%	EXV_A	RO	RO	NA
	Variable Head Press Pct.	0 to 100	%	VHPA	RO	RO	NA
	Cooler Level Indicator	0 to 3		LEVEL_A	RO	RO	NA
	COMP A1 ANALOG VALUES						
	A1 Oil Pressure Diff.	nnn.n	PSIG (KPA)	DOP_A1	RO	RO	NA
	A1 Oil Pressure	nnn.n	PSIG (KPA)	OP_A1	RO	RO	NA
	A1 Motor Temperature	nnn.n	dF (dC)	TMTR_A1	RO	RO	NA
	Comp A1 Running Current	0 to 600	Amps	A1_CURR	RO	RO	NA
	Comp A1 % Must Trip Amps	0 to 100	%	A1_MTA	RO	RO	NA
	COMP A2 ANALOG VALUES						
	A2 Oil Pressure Diff.	nnn.n	PSIG (KPA)	DOP_A2	RO	RO	NA
	A2 Oil Pressure	nnn.n	PSIG (KPA)	OP_A2	RO	RO	NA
A2 Motor Temperature	nnn.n	dF (dC)	TMTR_A2	RO	RO	NA	
Comp A2 Running Current	0 to 600	Amps	A2_CURR	RO	RO	NA	
Comp A2 % Must Trip Amps	0 to 100	%	A2_MTA	RO	RO	NA	
CIRCB Dio	CIRC. B DISCRETE OUTPUTS						
	Compressor B1 Relay	Off/On		K_B1_RLY	RO	RO	RO
	Compressor B2 Relay	Off/On		K_B2_RLY	RO	RO	RO
	Loader B1 Relay	Off/On		LOADR_B1	RO	RO	NA
	Loader B2 Relay	Off/On		LOADR_B2	RO	RO	NA
	Minimum Load Valve Relay	Off/On		MLV	RO	RO	NA
	Oil Heater	Off/On		OILB_HTR	RO	RO	NA
	Motor Cooling B1 Solenoid	Off/On		MTRCL_B1	RO	RO	NA
	Motor Cooling B2 Solenoid	Off/On		MTRCL_B2	RO	RO	NA
	Oil Pump	Off/On		OILPMP_B	RO	RO	NA
	Oil Solenoid B1	Off/On		OILSL_B1	RO	RO	NA
	Oil Solenoid B2	Off/On		OILSL_B2	RO	RO	NA
	CIRC. B DISCRETE INPUTS						
	Compressor B1 Feedback	Off/On		K_B1_FBK	RO	RO	NA
	Compressor B2 Feedback	Off/On		K_B2_FBK	RO	RO	NA
Oil Level Switch	Close/Open		OILB_SW	RO	RO	NA	

30GX/HX ComfortLink Screw Chiller Service Manual

30GXN/GXR/HXA/HXC w/ Software Version 5.0 and 5.1

CCN Table Name	Description	Status	Units	Point	DataPort	DataLink	BAClink
CIRCB_AN	CIRCUIT B ANALOG VALUES						
	Percent Total Capacity	0 to 100	%	CAPB_T	RO	RO	RO
	Percent Available Capacity	0 to 100	%	CAPB_A	RO	RO	RO
	Circuit Running Current	0 to 1200	Amps	B_CURR	RO	RO	NA
	Discharge Pressure	nnn.n	PSIG (KPA)	DP_B	RO	RO	RO
	Suction Pressure	nnn.n	PSIG (KPA)	SP_B	RO	RO	RO
	Economizer Pressure	nnn.n	PSIG (KPA)	ECNP_B	RO	RO	NA
	Discharge Superheat Temp	snnn.n	^F (^C)	SH_B	RO	RO	RO
	Discharge Gas Temperature	nnn.n	dF (dC)	DISTMP_B	RO	RO	NA
	Saturated Condensing Temp	snnn.n	dF (dC)	TMP_SCTB	RO	RO	RO
	Saturated Suction Temp	snnn.n	dF (dC)	TMP_SSTB	RO	RO	RO
	EXV% Open	0 to 100	%	EXV_B	RO	RO	NA
	Variable Head Press Pct.	0 to 100	%	VHPB	RO	RO	NA
	Cooler Level Indicator	0 to 3		LEVEL_B	RO	RO	NA
	COMP B1 ANALOG VALUES						
	B1 Oil Pressure Diff.	nnn.n	PSIG (KPA)	DOP_B1	RO	RO	NA
	B1 Oil Pressure	nnn.n	PSIG (KPA)	OP_B1	RO	RO	NA
	B1 Motor Temperature	nnn.n	dF (dC)	TMTR_B1	RO	RO	NA
	Comp B1 Running Current	0 to 600	Amps	B1_CURR	RO	RO	NA
	Comp B1 % Must Trip Amps	0 to 100	%	B1_MTA	RO	RO	NA
	COMP B2 ANALOG VALUES						
	B2 Oil Pressure Diff.	nnn.n	PSIG (KPA)	DOP_B2	RO	RO	NA
	B2 Oil Pressure	nnn.n	PSIG (KPA)	OP_B2	RO	RO	NA
	B2 Motor Temperature	nnn.n	dF (dC)	TMTR_B2	RO	RO	NA
	Comp B2 Running Current	0 to 600	Amps	B2_CURR	RO	RO	NA
	Comp B2 % Must Trip Amps	0 to 100	%	B2_MTA	RO	RO	NA

Not for Distribution

30GX/HX ComfortLink Screw Chiller Service Manual

30GXN/GXR/HXA/HXC w/ Software Version 5.0 and 5.1

CCN Table Name	Description	Status	Units	Point	DataPort	DataLink	BAClink	
OPTIONS	FANS							
	Fan 1 Relay *	Off/On		FAN_1	RO	RO	RO	
	Fan 2 Relay **	Off/On		FAN_2	RO	RO	RO	
	Fan 3 Relay	Off/On		FAN_3	RO	RO	RO	
	Fan 4 Relay	Off/On		FAN_4	RO	RO	RO	
	UNIT ANALOG VALUES							
	Cooler Entering Fluid	snnn.n	dF (dC)	COOL_EWT	RO	RO	RO	
	Cooler Leaving Fluid	snnn.n	dF (dC)	COOL_LWT	RO	RO	RO	
	Condenser Entering Fluid	snnn.n	dF (dC)	COND_EWT	RO	RO	RO	
	Condenser Leaving Fluid	snnn.n	dF (dC)	COND_LWT	RO	RO	RO	
	Lead/Lag Leaving Fluid	snnn.n	dF (dC)	DUAL_LWT	RO	RO	NA	
	TEMPERTURE RESET							
	4-20 mA Reset Signal	nn.n	ma	RST_MA	RO	RO	RO	
	Outside Air Temperature	snnn.n	dF (dC)	OAT	RO	RW	NA	
	Space Temperature	snnn.n	dF (dC)	SPT	RO	RW	NA	
	DEMAND LIMIT							
	4-20 mA Demand Signal	nn.n	ma	LMT_MA	RO	RO	RO	
	Demand Limit Switch 1	Off/On		DMD_SW1	RO	RO	NA	
	Demand Limit Switch 2	Off/On		DMD_SW2	RO	RO	NA	
	CCN Loadshed Signal	0 = Normal 1 = Redline 2 = Loadshed		DL_STAT	RO	RO	RO	
	PUMPS							
	Cooler Pump Relay	Off/On		COOL_PMP	RO	RO	RO	
	Condenser Pump Relay	Off/On		COND_PMP	RO	RO	RO	
	MISCELLANEOUS							
	Dual Setpoint Switch	Off/On		DUAL_IN	RO	RO	NA	
	Cooler Flow Switch	Off/On		COOLFLOW	RO	RO	NA	
	Condenser Flow Switch	Off/On		CONDFLOW	RO	RO	NA	
	Ice Done	No/Yes		ICE	RO	RO	NA	
	Cooler Heater	Off/On		COOL_HTR	RO	RO	NA	
	4-20 ma Cooling Setpoint	nn.n	ma	CSP_IN	RO	RO	NA	
	4-20 ma Heating Setpoint	nn.n	ma	HSP_IN	RO	RO	NA	
	Liq. Line Solenoid Valve	Open/Close		LLSV	RO	RO	NA	
	Dual Chiller Size	nnn	Tons	SIZE_DPX	RO	RO	NA	
	Dual Chiller Pct Total Cap	0-100	%	CAPT_DPX	RO	RO	NA	
	Dual Chiller Tons Avail	nnn	Tons	SIZEADPX	RO	RO	NA	
	Dual Chiller Pct Avail Cap	0-100	%	CAPA_DPX	RO	RO	NA	
	SETPOINT	COOLING						
		Cooling Setpoint 1	-20 to 70 (-28.8 to 21.1)	dF (dC)	CSP1	NA	RW	RW
Cooling Setpoint 2		-20 to 70 (-28.8 to 21.1)	dF (dC)	CSP2	NA	RW	NA	
ICE Setpoint		-20 to 32 (-28.8 to 0.0)	dF (dC)	CSP3	NA	RW	NA	
HEATING								
Heating Setpoint 1		80 to 140 (26.7 to 60.0)	dF (dC)	HSP1	NA	RW	RW	
Heating Setpoint 2		80 to 140 (26.7 to 60.0)	dF (dC)	HSP2	NA	RW	NA	
RAMP LOADING								
Cooling Ramp Loading		0.2 to 2.0 (0.1 to 1.1)		CRAMP	NA	RW	NA	
Heating Ramp Loading		0.2 to 2.0 (0.1 to 1.1)		HRAMP	NA	RW	NA	
HEAD PRESSURE								
Head Pressure Setpoint A		80 to 140 (26.7 to 60.0)	dF (dC)	HSP_A	NA	RW	NA	
Head Pressure Setpoint B		80 to 140 (26.7 to 60.0)	dF (dC)	HSP_B	NA	RW	NA	
LIQUID LEVEL								
Liquid Level Setpoint A	0 to 3		LVL_SPA	NA	RW	NA		
Liquid Level Setpoint B	0 to 3		LVL_SPB	NA	RW	NA		

30GX/HX ComfortLink Screw Chiller Service Manual

30GXN/GXR/HXA/HXC w/ Software Version 5.0 and 5.1							
CCN Table Name	Description	Status	Units	Point	DataPort	DataLink	BAClink
OCCPC01S	Timed Override Hours	0	Hours	OVR-EXT	NA	RW	RW
	Period 1 DOW (MTWTFSSH)	00000000		DOW1	NA	RW	RW
	Occupied Time	00:00		OCCTOD1	NA	RW	RW
	Unoccupied Time	00:00		UNOCTOD1	NA	RW	RW
	Period 2 DOW (MTWTFSSH)	00000000		DOW2	NA	RW	RW
	Occupied Time	00:00		OCCTOD2	NA	RW	RW
	Unoccupied Time	00:00		UNOCTOD2	NA	RW	RW
	Period 3 DOW (MTWTFSSH)	00000000		DOW3	NA	RW	RW
	Occupied Time	00:00		OCCTOD3	NA	RW	RW
	Unoccupied Time	00:00		UNOCTOD3	NA	RW	RW
	Period 4 DOW (MTWTFSSH)	00000000		DOW4	NA	RW	RW
	Occupied Time	00:00		OCCTOD4	NA	RW	RW
	Unoccupied Time	00:00		UNOCTOD4	NA	RW	RW
	Period 5 DOW (MTWTFSSH)	00000000		DOW5	NA	RW	RW
	Occupied Time	00:00		OCCTOD5	NA	RW	RW
	Unoccupied Time	00:00		UNOCTOD5	NA	RW	RW
	Period 6 DOW (MTWTFSSH)	00000000		DOW6	NA	RW	RW
	Occupied Time	00:00		OCCTOD6	NA	RW	RW
	Unoccupied Time	00:00		UNOCTOD6	NA	RW	RW
	Period 7 DOW (MTWTFSSH)	00000000		DOW7	NA	RW	RW
	Occupied Time	00:00		OCCTOD7	NA	RW	RW
	Unoccupied Time	00:00		UNOCTOD7	NA	RW	RW
	Period 8 DOW (MTWTFSSH)	00000000		DOW8	NA	RW	RW
	Occupied Time	00:00		OCCTOD8	NA	RW	RW
Unoccupied Time	00:00		UNOCTOD8	NA	RW	RW	

- Note:
- dc - Degrees Celsius
 - dF - Degrees Fahrenheit
 - ^F - Delta Degrees Fahrenheit
 - ^C - Delta Degrees Celsius
 - NA - Not Available
 - RO - Read Only
 - RW - Read/Write
 - * - Circuit A Condenser Fan Output (30HXA only)
 - ** - Circuit B Condenser Fan Output (30HXA only)

In order to write to any point with DataLink or BAClink, the machine must be configured for CCN control. CTRL *Control Method* (Configuration Mode, sub-mode OPT2) must be set to 3=CCN Control.

30GX/HX ComfortLink Screw Chiller Service Manual

30GXN/GXR/HXA/HXC Series 6 w/ Software Version 1.1 and later							
CCN Table Name	Description	Status	Units	Point	DataPort	DataLink	BAClink
A_UNIT	GENERAL PARAMETERS						
	Control Mode	0 = Service Test 1 = OFF Local 2 = OFF CCN 3 = OFF Clock 4 = OFF Emergency 5 = ON Local 6 = ON CCN 7 = ON Clock		STAT	RO	RO	RO
	Occupied	No/Yes		OCC	RO	RO	RO
	CCN Chiller	Start/Stop		CHIL_S_S	RO	RW	RW
	Alarm State	Normal/Alert/Alarm		ALM	RO	RO	RO
	Active Demand Limit	0 to 100	%	DEM_LIM	RO	RW	RW
	Override Modes In Effect	No/Yes		MODE	RO	RO	NA
	Percent Total Capacity	0 to 100	%	CAP_T	RO	RO	RO
	Active Setpoint	-20 to 70 (-28.8 to 21.1)	dF (dC)	SP	RO	RO	NA
	Control Point	-20 to 70 (-28.8 to 21.1)	dF (dC)	CTRL_PNT	RO	RW	RW
	Entering Fluid Temp	snnn.n	dF (dC)	EWT	RO	RO	RO
	Leaving Fluid Temp	snnn.n	dF (dC)	LWT	RO	RO	RO
	Emergency Stop	Enable/Emstop		EMSTOP	RO	RW	RW
	Minutes Left for Start	00:00 to 15:00	Minutes	MIN_LEFT	RO	RO	NA
Heat/Cool Select	Heat/Cool		HEATCOOL	RO	RW	RW	
CIRCADIO	CIRC. A DISCRETE OUTPUTS						
	Compressor A1 Relay	Off/On		K_A1_RLY	RO	RO	RO
	Compressor A2 Relay	Off/On		K_A2_RLY	RO	RO	RO
	Loader A1 Relay	Off/On		LOADR_A1	RO	RO	NA
	Loader A2 Relay	Off/On		LOADR_A2	RO	RO	NA
	Minimum Load Valve	Off/On		MLV	RO	RO	NA
	Oil Heater	Off/On		OILA_HTR	RO	RO	NA
	Motor Cooling A1 Solenoid	Off/On		MTRCL_A1	RO	RO	NA
	Motor Cooling A2 Solenoid	Off/On		MTRCL_A2	RO	RO	NA
	Oil Pump	Off/On		OILPMP_A	RO	RO	NA
	Oil Solenoid A1	Off/On		OILSL_A1	RO	RO	NA
	Oil Solenoid A2	Off/On		OILSL_A2	RO	RO	NA
	CIRC. A DISCRETE INPUTS						
	Compressor A1 Feedback	Off/On		K_A1_FBK	RO	RO	NA
Compressor A2 Feedback	Off/On		K_A2_FBK	RO	RO	NA	
Oil Level Switch	Close/Open		OILA_SW	RO	RO	NA	

30GX/HX ComfortLink Screw Chiller Service Manual

30GXN/GXR/HXA/HXC Series 6 w/ Software Version 1.1 and later								
CCN Table Name	Description	Status	Units	Point	DataPort	DataLink	BAClink	
CIRCA_AN	CIRCUIT A ANALOG VALUES							
	Percent Total Capacity	0 to 100	%	CAPA_T	RO	RO	RO	
	Percent Available Cap.	0 to 100	%	CAPA_A	RO	RO	RO	
	Circuit Running Current	0 to 1200	Amps	A_CURR	RO	RO	NA	
	Discharge Pressure	nnn.n	PSIG (KPA)	DP_A	RO	RO	RO	
	Suction Pressure	nnn.n	PSIG (KPA)	SP_A	RO	RO	RO	
	Economizer Pressure	nnn.n	PSIG (KPA)	ECNP_A	RO	RO	NA	
	Discharge Superheat Temp	snnn.n	^F (^C)	SH_A	RO	RO	RO	
	Discharge Gas Temp	nnn.n	dF (dC)	DISTMP_A	RO	RO	NA	
	Discharge Gas Temp – A1	nnn.n	dF (dC)	DISTMPA1	RO	RO		
	Discharge Gas Temp – A2	nnn.n	dF (dC)	DISTMPA2	RO	RO		
	Saturated Condensing Temp	snnn.n	dF (dC)	TMP_SCTA	RO	RO	RO	
	Saturated Suction Temp	snnn.n	dF (dC)	TMP_SSTA	RO	RO	RO	
	EXV% Open	0 to 100	%	EXV_A	RO	RO	NA	
	Variable Head Press Pct.	0 to 100	%	VHPA	RO	RO	NA	
	COMP A1 ANALOG VALUES							
	A1 Oil Pressure Diff.	nnn.n	PSIG (KPA)	DOP_A1	RO	RO	NA	
	A1 Oil Pressure	nnn.n	PSIG (KPA)	OP_A1	RO	RO	NA	
	A1 Motor Temperature	nnn.n	dF (dC)	TMTR_A1	RO	RO	NA	
	Comp A1 Running Current	0 to 600	Amps	A1_CURR	RO	RO	NA	
	Comp A1 % Must Trip Amps	0 to 100	%	A1_MTA	RO	RO	NA	
	COMP A2 ANALOG VALUES							
	A2 Oil Pressure Diff.	nnn.n	PSIG (KPA)	DOP_A2	RO	RO	NA	
	A2 Oil Pressure	nnn.n	PSIG (KPA)	OP_A2	RO	RO	NA	
	A2 Motor Temperature	nnn.n	dF (dC)	TMTR_A2	RO	RO	NA	
	Comp A2 Running Current	0 to 600	Amps	A2_CURR	RO	RO	NA	
	Comp A2 % Must Trip Amps	0 to 100	%	A2_MTA	RO	RO	NA	
CIRCB Dio	CIRC. B DISCRETE OUTPUTS							
	Compressor B1 Relay	Off/On		K_B1_RLY	RO	RO	RO	
	Compressor B2 Relay	Off/On		K_B2_RLY	RO	RO	RO	
	Loader B1 Relay	Off/On		LOADR_B1	RO	RO	NA	
	Loader B2 Relay	Off/On		LOADR_B2	RO	RO	NA	
	Minimum Load Valve	Off/On		MLV	RO	RO	NA	
	Oil Heater	Off/On		OILB_HTR	RO	RO	NA	
	Motor Cooling B1 Solenoid	Off/On		MTRCL_B1	RO	RO	NA	
	Motor Cooling B2 Solenoid	Off/On		MTRCL_B2	RO	RO	NA	
	Oil Pump	Off/On		OILPMP_B	RO	RO	NA	
	Oil Solenoid B1	Off/On		OILSL_B1	RO	RO	NA	
	Oil Solenoid B2	Off/On		OILSL_B2	RO	RO	NA	
	CIRC. B DISCRETE INPUTS							
	Compressor B1 Feedback	Off/On		K_B1_FBK	RO	RO	NA	
	Compressor B2 Feedback	Off/On		K_B2_FBK	RO	RO	NA	
Oil Level Switch	Close/Open		OILB_SW	RO	RO	NA		

30GX/HX ComfortLink Screw Chiller Service Manual

30GXN/GXR/HXA/HXC Series 6 w/ Software Version 1.1 and later								
CCN Table Name	Description	Status	Units	Point	DataPort	DataLink	BAClink	
CIRCB_AN	CIRCUIT B ANALOG VALUES							
	Percent Total Capacity	0 to 100	%	CAPB_T	RO	RO	RO	
	Percent Available Cap.	0 to 100	%	CAPB_A	RO	RO	RO	
	Circuit Running Current	0 to 1200	Amps	B_CURR	RO	RO	NA	
	Discharge Pressure	nnn.n	PSIG (KPA)	DP_B	RO	RO	RO	
	Suction Pressure	nnn.n	PSIG (KPA)	SP_B	RO	RO	RO	
	Economizer Pressure	nnn.n	PSIG (KPA)	ECNP_B	RO	RO	NA	
	Discharge Superheat Temp	snnn.n	^F (^C)	SH_B	RO	RO	RO	
	Discharge Gas Temp	nnn.n	dF (dC)	DISTMP_B	RO	RO	NA	
	Discharge Gas Temp – B1	nnn.n	dF (dC)	DISTMPB1	RO	RO		
	Discharge Gas Temp - B2	nnn.n	dF (dC)	DISTMPB2	RO	RO		
	Saturated Condensing Temp	snnn.n	dF (dC)	TMP_SCTB	RO	RO	RO	
	Saturated Suction Temp	snnn.n	dF (dC)	TMP_SSTB	RO	RO	RO	
	EXV% Open	0 to 100	%	EXV_B	RO	RO	NA	
	Variable Head Press Pct.	0 to 100	%	VHPB	RO	RO	NA	
	COMP B1 ANALOG VALUES							
	B1 Oil Pressure Diff.	nnn.n	PSIG (KPA)	DOP_B1	RO	RO	NA	
	B1 Oil Pressure	nnn.n	PSIG (KPA)	OP_B1	RO	RO	NA	
	B1 Motor Temperature	nnn.n	dF (dC)	TMTR_B1	RO	RO	NA	
	Comp B1 Running Current	0 to 600	Amps	B1_CURR	RO	RO	NA	
	Comp B1 % Must Trip Amps	0 to 100	%	B1_MTA	RO	RO	NA	
	COMP B2 ANALOG VALUES							
	B2 Oil Pressure Diff.	nnn.n	PSIG (KPA)	DOP_B2	RO	RO	NA	
	B2 Oil Pressure	nnn.n	PSIG (KPA)	OP_B2	RO	RO	NA	
	B2 Motor Temperature	nnn.n	dF (dC)	TMTR_B2	RO	RO	NA	
	Comp B2 Running Current	0 to 600	Amps	B2_CURR	RO	RO	NA	
	Comp B2 % Must Trip Amps	0 to 100	%	B2_MTA	RO	RO	NA	

Not for Distribution

30GX/HX ComfortLink Screw Chiller Service Manual

30GXN/GXR/HXA/HXC Series 6 w/ Software Version 1.1 and later								
CCN Table Name	Description	Status	Units	Point	DataPort	DataLink	BAClink	
OPTIONS	FANS							
	Fan 1 Relay *	Off/On		FAN_1	RO	RO	RO	
	Fan 2 Relay **	Off/On		FAN_2	RO	RO	RO	
	Fan 3 Relay	Off/On		FAN_3	RO	RO	RO	
	Fan 4 Relay	Off/On		FAN_4	RO	RO	RO	
	UNIT ANALOG VALUES							
	Cooler Entering Fluid	snnn.n		dF (dC)	COOL_EWT	RO	RO	RO
	Cooler Leaving Fluid	snnn.n		dF (dC)	COOL_LWT	RO	RO	RO
	Condenser Entering Fluid	snnn.n		dF (dC)	COND_EWT	RO	RO	RO
	Condenser Leaving Fluid	snnn.n		dF (dC)	COND_LWT	RO	RO	RO
	Lead/Lag Leaving Fluid	snnn.n		dF (dC)	DUAL_LWT	RO	RO	NA
	TEMPERTURE RESET							
	4-20 mA Reset Signal	nn.n		ma	RST_MA	RO	RO	RO
	Outside Air Temperature	snnn.n		dF (dC)	OAT	RO	RW	NA
	Space Temperature	snnn.n		dF (dC)	SPT	RO	RW	NA
	DEMAND LIMIT							
	4-20 mA Demand Signal	nn.n		ma	LMT_MA	RO	RO	RO
	Demand Limit Switch 1	Off/On			DMD_SW1	RO	RO	NA
	Demand Limit Switch 2	Off/On			DMD_SW2	RO	RO	NA
	CCN Loadshed Signal	0 = Normal 1 = Redline 2 = Loadshed			DL_STAT	RO	RO	RO
	PUMPS							
	Cooler Pump Relay	Off/On			COOL_PMP	RO	RO	RO
	Condenser Pump Relay	Off/On			COND_PMP	RO	RO	RO
	MISCELLANEOUS							
	Dual Setpoint Switch	Off/On			DUAL_IN	RO	RO	NA
	Cooler Flow Switch	Off/On			COOLFLOW	RO	RO	NA
	Condenser Flow Switch	Off/On			CONDFLOW	RO	RO	NA
	Ice Done	No/Yes			ICE	RO	RO	NA
	Cooler Heater	Off/On			COOL_HTR	RO	RO	NA
	4-20 ma Cooling Setpoint	nn.n		ma	CSP_IN	RO	RO	NA
	4-20 ma Heating Setpoint	nn.n		ma	HSP_IN	RO	RO	NA
	Liq. Line Solenoid Valve	Open/Close			LLSV	RO	RO	NA
Dual Chiller Size	nnn		Tons	SIZE_DPX	RO	RO	NA	
Dual Chiller Pct Total Cap	0-100		%	CAPT_DPX	RO	RO	NA	
Dual Chiller Tons Avail	nnn		Tons	SIZEADPX	RO	RO	NA	
Dual Chiller Pct Avail Cap	0-100		%	CAPA_DPX	RO	RO	NA	
SETPOINT	COOLING							
	Cooling Setpoint 1	-20 to 70 (-28.8 to 21.1)	dF (dC)	CSP1	NA	RW	RW	
	Cooling Setpoint 2	-20 to 70 (-28.8 to 21.1)	dF (dC)	CSP2	NA	RW	NA	
	ICE Setpoint	-20 to 32 (-28.8 to 0.0)	dF (dC)	CSP3	NA	RW	NA	
	HEATING							
	Heating Setpoint 1	80 to 140 (26.7 to 60.0)	dF (dC)	HSP1	NA	RW	RW	
	Heating Setpoint 2	80 to 140 (26.7 to 60.0)	dF (dC)	HSP2	NA	RW	NA	
	RAMP LOADING							
	Cooling Ramp Loading	0.2 to 2.0 (0.1 to 1.1)			CRAMP	NA	RW	NA
	Heating Ramp Loading	0.2 to 2.0 (0.1 to 1.1)			HRAMP	NA	RW	NA
	HEAD PRESSURE							
Head Pressure Setpoint A	80 to 140 (26.7 to 60.0)	dF (dC)		HSP_A	NA	RW	NA	
Head Pressure Setpoint B	80 to 140 (26.7 to 60.0)	dF (dC)		HSP_B	NA	RW	NA	
Approach Setpoint	0.1 to 20.0		dF (dC)	APRCH_SP	NA	RW	NA	

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30GXN/GXR/HXA/HXC Series 6 w/ Software Version 1.1 and later							
CCN Table Name	Description	Status	Units	Point	DataPort	DataLink	BAClink
OCCPC01S	Timed Override Hours	0	Hours	OVR-EXT	NA	RW	RW
	Period 1 DOW (MTWTFSSH)	00000000		DOW1	NA	RW	RW
	Occupied Time	00:00		OCCTOD1	NA	RW	RW
	Unoccupied Time	00:00		UNOCTOD1	NA	RW	RW
	Period 2 DOW (MTWTFSSH)	00000000		DOW2	NA	RW	RW
	Occupied Time	00:00		OCCTOD2	NA	RW	RW
	Unoccupied Time	00:00		UNOCTOD2	NA	RW	RW
	Period 3 DOW (MTWTFSSH)	00000000		DOW3	NA	RW	RW
	Occupied Time	00:00		OCCTOD3	NA	RW	RW
	Unoccupied Time	00:00		UNOCTOD3	NA	RW	RW
	Period 4 DOW (MTWTFSSH)	00000000		DOW4	NA	RW	RW
	Occupied Time	00:00		OCCTOD4	NA	RW	RW
	Unoccupied Time	00:00		UNOCTOD4	NA	RW	RW
	Period 5 DOW (MTWTFSSH)	00000000		DOW5	NA	RW	RW
	Occupied Time	00:00		OCCTOD5	NA	RW	RW
	Unoccupied Time	00:00		UNOCTOD5	NA	RW	RW
	Period 6 DOW (MTWTFSSH)	00000000		DOW6	NA	RW	RW
	Occupied Time	00:00		OCCTOD6	NA	RW	RW
	Unoccupied Time	00:00		UNOCTOD6	NA	RW	RW
	Period 7 DOW (MTWTFSSH)	00000000		DOW7	NA	RW	RW
	Occupied Time	00:00		OCCTOD7	NA	RW	RW
	Unoccupied Time	00:00		UNOCTOD7	NA	RW	RW
	Period 8 DOW (MTWTFSSH)	00000000		DOW8	NA	RW	RW
	Occupied Time	00:00		OCCTOD8	NA	RW	RW
Unoccupied Time	00:00		UNOCTOD8	NA	RW	RW	

- Note:
- dc - Degrees Celsius
 - dF - Degrees Fahrenheit
 - ^F - Delta Degrees Fahrenheit
 - ^C - Delta Degrees Celsius
 - NA - Not Available
 - RO - Read Only
 - RW - Read/Write
 - * - Circuit A Condenser Fan Output (30HXA only)
 - ** - Circuit B Condenser Fan Output (30HXA only)

In order to write to any point with DataLink or BAClink, the machine must be configured for CCN control. CTRL *Control Method* (Configuration Mode, sub-mode OPT2) must be set to 3=CCN Control.

APPENDIX B – RCD SERVICE KITS

RCD Kit Number	Includes the following Items		
06NA660001	Title	Oil Solenoid Valve Kit	
	Used on	30GX/HX	
	Comment		
	Part Number	Qty	Description
	8TB0884	1	Oil Solenoid Valve
	8TB0670	4	Socket Head Cap Screw M8 x 1.25 x 25
	8TB0274	1	O-Ring
	8TB0276	1	O-Ring
	99TA516057	1	Instruction Sheet
	8TB0847	1	Filter Plug, O-Ring
KLE-LLM6	1	6 mm Allen Head Wrench	
06NA660002	Title	06N Terminal Jumper Bar Package	
	Used on	30GX/HX	
	Comment		
	Part Number	Qty	Description
	1TB0459	3	Jumper Bar
	8TB0705	15	Jam Nut
	99TA516059	1	Instruction Sheet
FC024A	1	3/4" Crowsfoot Wrench	
30GT660016	Title	EXV Motor Rebuild Kit	
	Used on	30GXN/GXR, 30HXA/HXC	
	Comment	Series 6 Machines	
	Part Number	Qty	Description
30GT680001	Title	Communication Harness	
	Used on	ComfortLink Machines – 30GTN/GTR, 30GUN/GUR 30GXN/GXR, 30HK/HL, 30HW, 30HXA/HXC, 30RA	
	Comment		
	Part Number	Qty	Description
		1	MBB-J4 to Scrolling Marquee Display Harness
	1	MBB-J5 to TB3 Harness	
30GX660017	Title	Fan Kit	
	Used on	30GX, 30RA	
	Comment		
	Part Number	Qty	Description
	30GX400152	1	Fan Assembly with Cover
09DC507752	1	Motor Spacer	
AS90BD040	4	Speed Clip	

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RCD Kit Number	Includes the following Items		
	99TA520019	1	Instruction Sheet
30GX660025	Title	O-ring Kit (Does not include EXV or Economizer O-rings)	
	Used on	30GX/HX	
	Comment		
	Part Number	Qty	Description
	2-023-001	1	O-ring
	2-023-068	1	O-ring
	5-023-091	1	O-ring
	KK71EW148	1	O-ring
	KK71EW223	1	O-ring
	KK71EW234	1	O-ring
	KK71EW354	1	O-ring
	KK71EW912	1	O-ring
	P-34939	1	O-ring
	P-35013	1	O-ring
	P-35583	1	O-ring
	RA0378-12	1	O-ring
	RA0378-16	1	O-ring
RA0437-06	1	O-ring	
99TA526317	1	Instruction Sheet	
32GB660010	Title	Economizer/EXV Cable	
	Used on	30GT/GU Series 0, 1, and 2, 30GX/HX Series 0, 1, 2, 3, 4 and 5	
	Comment		
	Part Number	Qty	Description
	32GB400332	1	Economizer/EXV Cable
	1	Dielectric Grease	
32GB660018	Title	EXV O-ring Kit	
	Used on	30GX/HX	
	Comment		
	Part Number	Qty	Description