



Submittal Transmittal

Project: DCH - Ambulatory Renewal

Date: 7/20/2021

Transmitted To:	Transmitted By:
Derek Shaw Heapy 1400 W Dorothy Lane Dayton, Ohio 45409 Dashaw@heapy.com	Richie Markwell Danis Building Construction Company One Children's Plaza Dayton, Ohio 45404 Phone: 937-271-7086 richard.markwell@danis.com

Submittal No.	Submitted By:	Contact:
450-236427-00	CINFAB	Jacob Degen

Specification Section	Description	Status
236427	Air Cooled Chillers	OPEN

Submitted For	Copies
Approval	1

Please review & return 1 electronic copy of submittals in accordance with the contract specifications.

Danis Stamp:

REVIEWED by DANIS

Review does not relieve subcontractor or supplier from its obligation to perform its work complete, in strict accordance with the plans, specifications, subcontract, purchase order or other provisions of the contract documents. Review also does not relieve subcontractor or supplier from its responsibility for checking dimensions on the drawings and on the job or the proper matching and fitting of its work with contiguous work and the coordination its work with other work on the construction site.

Date: 7/20/2021 By: Jack Danis

Submittal No. _____

Comments:

Product Data:

A/E Stamps:

REVIEWED BY HEAPY

FOR GENERAL CONFORMANCE WITH INFORMATION PRESENTED IN THE CONTRACT DOCUMENTS ONLY.

APPROVED AS NOTED

BY: Derek Shaw DATE: 7/29/2021

Comments:

- Coordinate required changes in structural supports with new dimensions and weights
- Coordinate required electrical revisions with electrical contractor
- Hot gas bypass shall be provided on at least one (1) refrigeration circuit
- Coordinate BAS interface with chillers. BAS shall provide enable signal to each chiller and shall stage chillers per the control sequences. BAS shall also send chilled water temperature setpoint to the chillers and shall reset setpoint per the sequences. BAS shall also receive any alarms from chillers.



SUBMITTAL DATA

Project: Dayton Children's Hospital Ambulatory

Project No.: 21113841

Construction Manager: Danis Construction

Architect/Engineer: Champlin/Heapy

Submittal For: Air Cooled Screw Chiller

Specification #: 23 64 27 – Rotary Screw Water Chillers (Air Cooled)

Manufacturer: York

Supplier: Johnson Controls

Contact Name: Alexander Jung

The attached submittal data has been reviewed by CINFAB for compliance with the Architect/Engineer's specifications and plan schedule for this project.

In order to maintain the project schedule, we request that this submittal be returned to CINFAB **within 10 days**.

NOTE: Material cannot be released without Architect/Engineer's approval of submittal.

Reviewed By: Jake Degen

Date: 7/16/21

(Please place stamp of approval here)



Equipment Submittal For Approval

Project:

DCH AMBULATORY RENEWAL BP4

YORK Air-cooled Screw Chiller Model YVAA (TAG:CH-1 &2)



DATE:
July 15, 2021

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 - **Submittal Summary**
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 - **Unit Specification**
 - **Installation Checklist & Start-Up Request**

Submittal Summary

Items Included by Johnson Controls

YORK YVAA0308 VSD Screw Air Cooled Chillers

- 296 Tons @ design conditions (57/42 w/30% propylene glycol)
- Refrigerant – R-134a (fully charged)
- At Design
 - Full Load EER – 10.55
 - IPLV – 20.03
 - NPLV – 18.70
 - MCA – 511A
 - MOP – 700A
 - Full Load Sound Pressure @ 30ft – 74dB
- **460/3/60 voltage application**
- Variable Speed Drive Starter (1 for each of the 2 screw compressors)
- Single Point Power Circuit Breaker (w/ 65kA short circuit withstand)
- Actuated suction service valves
- Water box heaters (separate 120v feed required and provided by others)
- One differential pressure flow switch per chiller (installed by others)
- 3-pass evaporator
- Low Sound VSD Condenser Fans
- Louvered condenser section for hail protection
- 25mm deflection steel spring isolators
- 5 year parts, labor, and refrigerant warranty
- Startup by factory certified tech (3 days)
- Wind Load calcs

Items NOT included:

- Hauling, Unloading, Rigging, Installation of Equipment
- Taxes, Delayed Shipment and Storage
- Controls of any type
- Expedited Freight

PERFORMANCE
SPECIFICATION



Air Cooled Screw Chiller Performance Datasheet

Unit Tag	Qty	Model No	Net Cooling Capacity (ton.R)	Nominal Power Volts-Ph-Hz	Refrigerant Type
CH-1-2	2	YVAA0308EVV46BAVBXX	296.0	460-3-60.0	R134a

PIN:

YVAA0308EV	V46BAVBXXX	SAXLXXXX60	42XOTXXV20	9W1SXGA3BM	XV5X1XXXXX	XH5SXX		
....5...105...205...305...405...505...605...705...805...90

Evaporator Data			Evaporator Data (Cont.)		Performance Data	
EWT (°F)	57.00		Fluid Volume (USGAL)	113.1	EER (Btu/W-h)	10.55
LWT (°F)	42.00		Min. Design Flow Rate (USGPM)*	283.0	IPLV.IP (Btu/W-h)	20.03
Design Flow Rate (USGPM)	502.0		Max. Flow Rate (USGPM)	1060	NPLV.IP (Btu/W-h)	18.70
Total Press. Drop (ft H2O)	21.9		Condenser Data		Physical Data	
Fluid	Propylene Glycol (%)	30	Ambient Temp. Design (°F)	95.0	Rigging Wt. (lb)	19899
Fouling Factor (h.ft².F/Btu)	0.000100		Altitude (ft)	0.000	Operating Wt. (lb)	20759
Number Passes	3		Compressor Type	VSD Screw - Semi Hermetic	Refrigerant Charge (lb)	590.9

Electrical Data				
Circuit	1	2	3	4
Compressor kW	173.4	133.7		
Compressor RLA	229	177		
Fan QTY/FLA (each)	10 / 2.4	8 / 2.4		
Field Provided Wiring for Water Box Heaters (one connection per chiller): 120-1-60, 6A.				

Single Point				
Min. Circuit Ampacity	511			
Max. Fuse / CB Rating (A)	700			
Unit Short Circuit Withstand (STD)	65 [kA]			
Wires Per Phase	3			
Wire Range (Lug Size)	3/0 - 400 kcmil			
Displacement Power Factor	0.95			
Control kVA	2			
Operating Condition Electrical Data				
			Compressor kW	307.1
			Total kW	336.5

Notes:

Certified in accordance with the AHRI Air-Cooled Water-Chilling Packages Certification Program, which is based on AHRI Standard 550/590 (I-P) and AHRI Standard 551/591 (SI). Certified units may be found in the AHRI Directory at www.ahridirectory.org. Unit contains freeze protection fluids in the evaporator with a leaving chilled fluid temperature above 32 DEG F [0 DEG C] and is certified when rated per the Standard with water. Auxiliary components included in total KW - Oil heaters, Chiller controls. Auxiliary power is already included in the compressor and fan power



Min DSD (Factory Purpose/Use only): 80 psig
 Use Copper Conductors only
 Displacement Power Factor refers to compressor only. Unit Power Factor depends on fan option selected. Calculated value is available by request.

Minimum and maximum evaporator flow information are for full load ratings with Propylene Glycol.
 Evaporator Passes: 3, Condenser Type: M, Fan Type: V
 Actuated suction service valves ARE selected
 Exclusion of actuated suction service valves will require incorporation of additional freeze protection including use of glycol, pump control or draining the evaporator.
 This unit does not have a coil coating selected.
 Minimum Chilled Water Flow Rate is for full load selections; Variable Primary Flow ratings as low as 50% of the minimum are permitted. Glycol limits are higher. To obtain minimum flow with Variable Primary Flow, run rating with Variable Primary Flow Partload Type.



Air Cooled Screw Chiller Performance Datasheet

ASHRAE Standard 90.1-2010 and ASHRAE Standard 90.1-2013 & 2016 Compliant.



Air Cooled Screw Chiller Performance Datasheet

Part Load Rating Data				
Load %	Ambient (°F)	Capacity (ton.R)	Total kW	Unit Efficiency (Btu/W·h)
100	95.0	296.0	336.5	10.55
75	80.1	222.0	179.0	14.88
50	65.1	148.0	84.51	21.01
25	55.0	74.00	36.92	24.05

Sound Power Levels (In Accordance with AHRI 370)										
Load %	Ambient (°F)	63 Hz (dB)	125 Hz (dB)	250 Hz (dB)	500 Hz (dB)	1 kHz (dB)	2 kHz (dB)	4 kHz (dB)	8 kHz (dB)	LWA
100	95.0	99	99	100	103	100	95	90	86	104
75	80.1	95	95	96	96	97	89	84	80	99
50	65.1	91	91	92	93	90	84	80	76	94
25	55.0	86	86	88	91	91	81	77	73	93

Note: Unit is equipped with Low Sound Fans with Variable Speed Control.

Measurement of sound pressure used to obtain the sound power data presented is based on AHRI-370.

Air-cooled chillers are rated in terms of sound power not sound pressure. Johnson Controls provides estimates of sound pressure, but this is not the rating metric.

For an air-cooled chiller, sound pressure calculated from sound power varies depending on how the chiller is assumed to behave, i.e. the radiation model. In other words, determining sound pressure from sound power requires making assumptions that result in different answers at a given distance from the chiller. The environment also influences sound pressure in the field installation. Sound pressure estimation radiation models pertaining to air-cooled chillers include the 'traditional' hemispherical model, parallelepiped model and equivalent hemispherical model.

Regarding sound power, Johnson Controls references tolerance limits based on ASHRAE guidelines. These are +/- 6dB in the 63Hz octave band, +/- 4dB in all other octave bands and +/- 3dB for the overall dBA.

Tolerance limits are based on uncertainties associated with:

1. Measurement Test Procedure
2. Repeatability
3. Production / Manufacturing Variability

Standard deviation associated with air-cooled chiller sound data is a measure of spread i.e. it indicates the range of probability of sound levels. Note that for operating conditions other than AHRI's Standard Rating Condition, higher levels of uncertainty can be expected.

Lead times for factory performance testing depend on test laboratory availability. Please confirm with Johnson Controls Customer Service.

Estimated Sound Pressure Levels at 30 Feet (Derived from AHRI 370 Sound Power using Hemispherical Method)										
Load %	Ambient (°F)	63 Hz (dB)	125 Hz (dB)	250 Hz (dB)	500 Hz (dB)	1 kHz (dB)	2 kHz (dB)	4 kHz (dB)	8 kHz (dB)	LpA
100	95.0	69	69	70	73	70	65	60	56	74
75	80.1	65	65	66	66	67	59	54	50	69
50	65.1	61	61	62	63	60	54	50	46	64
25	55.0	56	56	58	61	61	51	47	43	63

Performance at AHRI Conditions					
Evaporator Data		Condenser Data		Performance Data	
EWT (°F)	54.00	Ambient Temp. (°F)	95.0	EER (Btu/W·h)	11.29
LWT (°F)	44.00	Altitude (ft)	0.000	IPLV.IP (Btu/W·h)	20.03
Flow Rate (USGPM)	708.4			Net Cooling Capacity (ton.R)	296.0
Pressure Drop (ft H2O)	37.7				
Fluid	Water				
Fouling Factor (h.ft².F/Btu)	0.000100				
Fluid Volume (USGAL)	113.1				

Note: Unit rated at design condition capacity.

Part Load Rating Data at AHRI Conditions
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Air Cooled Screw Chiller Performance Datasheet

Load %	Ambient (°F)	Capacity (ton.R)	Total kW	Unit Efficiency (Btu/W-h)
100	95.0	296.0	314.6	11.29
75	80.0	222.0	169.3	15.73
50	65.0	148.0	78.68	22.57
25	55.0	74.00	33.79	26.28

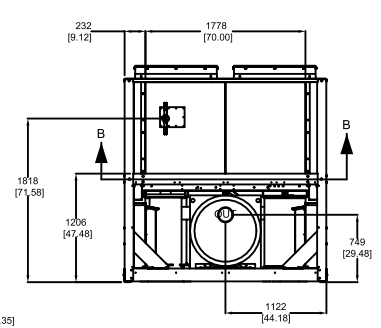
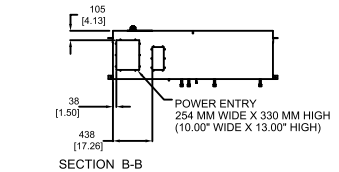
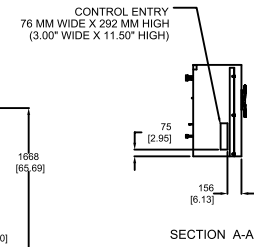
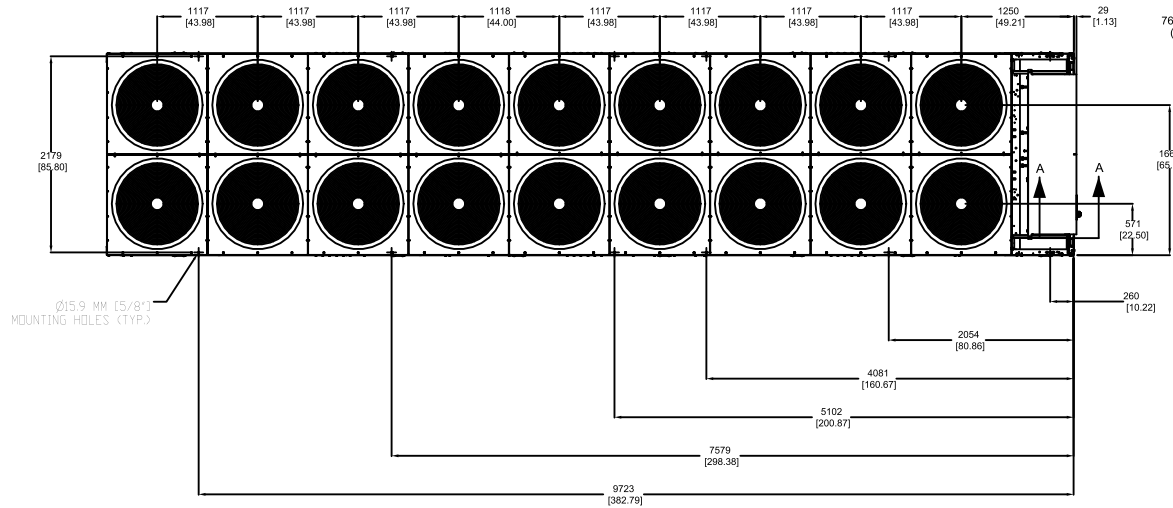
PRODUCT DRAWING

NOTES:
 1. PLACEMENT ON A LEVEL SURFACE FREE OF OBSTRUCTIONS (INCLUDING SNOW, FOR WINTER OPERATION) OR AIR RECIRCULATION ENSURES RATED PERFORMANCE, RELIABLE OPERATION AND EASE OF MAINTENANCE. SITE RESTRICTIONS MAY COMPROMISE MINIMUM CLEARANCES INDICATED BELOW, RESULTING IN UNPREDICTABLE AIR FLOW PATTERNS AND POSSIBLE DIMINISHED PERFORMANCE. YORK'S UNIT CONTROLS WILL OPTIMIZE OPERATION WITHOUT NUISANCE HIGH PRESSURE SAFETY CUTOFF; HOWEVER, THE SYSTEM DESIGNER MUST CONSIDER POTENTIAL PERFORMANCE DEGRADATION. ACCESS TO THE UNIT CONTROL CENTER ASSUMES THE UNIT IS NO HIGHER THAN ON SPRING ISOLATORS. RECOMMENDED MINIMUM CLEARANCES: SIDE TO WALL - 6"; REAR TO WALL - 6"; CONTROL PANEL TO WALL - 4"; TOP - NO OBSTRUCTIONS ALLOWED; DISTANCE BETWEEN ADJACENT UNITS - 10"; NO MORE THAN ONE ADJACENT WALL MAY BE HIGHER THAN THE UNIT.
 2. WEIGHT AND CENTER OF GRAVITY - REFER TO AVM REPORT.
 3. WATER CONNECTIONS ARE GROOVED FOR VICTAULIC CONNECTION.
 4. DIMENSIONS IN mm [INCHES].

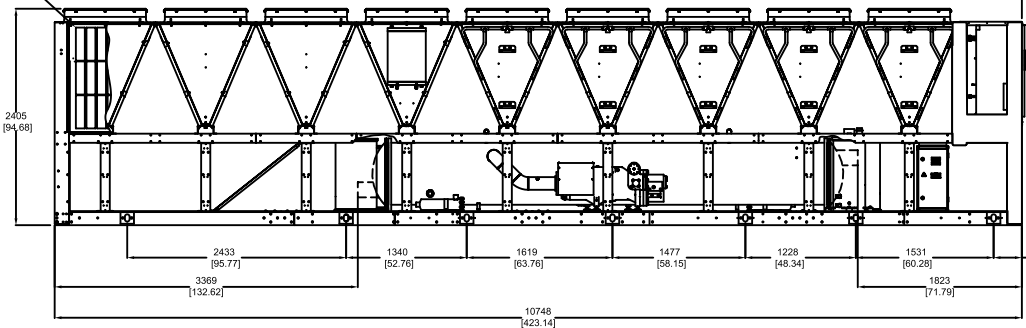
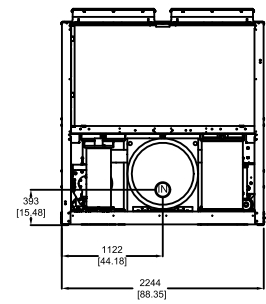
NOZZLE LEGEND

EVAPORATOR INLET LEFT END 3 PASS 6 DIA. (150Psi DWP)
 EVAPORATOR OUTLET RIGHT END 3 PASS 6 DIA. (150Psi DWP)

Victaulic Grooved Nozzles (per ANSI / AWWA C-606)



THIS UNIT IS EQUIPPED WITH LOUVERS WHICH HAVE BEEN HIDDEN FOR CLARITY



PRODUCT DRAWING

YORK YVAA Air Cooled Screw Chiller
 MODEL: YVAA 0308
NOT FOR CONSTRUCTION

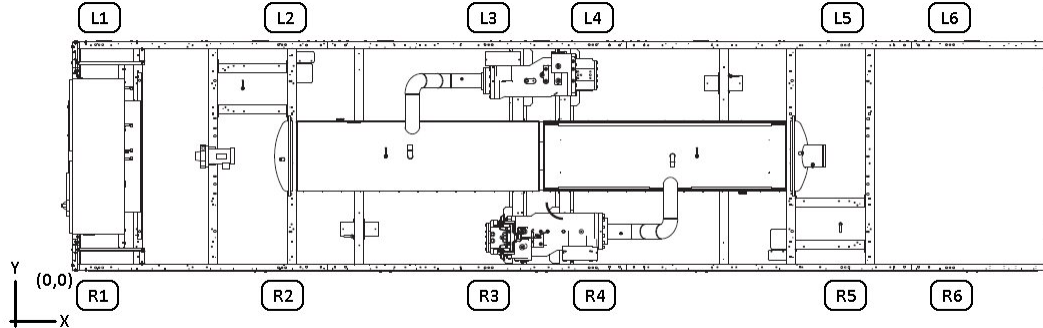
Project Name: DCH Ambulatory Renewal Project
 Location:
 Engineer:
 Contractor:
 For:

Sold To:
 Cust Purch Order#:
 Contract#:
 UNIT
 TAG: **CH-1-2**

Date: June 11, 2021
 Rev. Date: June 15, 2021
 Form No.: 201.28-EG1
 Dwg. Lev.: 0817
 Dwg. Scale: NTS



Project Name	Unit Tag	Date	Chiller Type
DCH Ambulatory Renewal Project	CH-1-2	2021-03-10	Air Cooled VSD Screw Chillers
PIN			Version
YVAA0308EVV46BAVBXXXSAXLXXX6042XOTXXV209W1SXGA3BMXV5X1XXXXXXH5SXX			E.21.1.26276.0-D.90.0042



LOCATION	X Distance (in)	Y Distance (in)	JCI PART NUMBER	SAP NUMBER	COLOUR	Operating Weights (lb)
R1	10.4	1.3	029-25334-008	433997	Dk.Purple	815
R2	81.0	1.3	029-25334-012	434000	White	2173
R3	160.8	1.3	029-25334-012	434000	White	2162
R4	201.0	1.3	029-25334-012	434000	White	2162
R5	298.5	1.3	029-25334-010	433999	Gray	2001
R6	382.9	1.3	029-25334-008	433997	Dk.Purple	953
L1	10.4	87.1	029-25334-008	433997	Dk.Purple	812
L2	81.0	87.1	029-25334-012	434000	White	2137
L3	160.8	87.1	029-25334-012	434000	White	2250
L4	201.0	87.1	029-25334-012	434000	White	2250
L5	298.5	87.1	029-25334-012	434000	White	2092
L6	382.9	87.1	029-25334-008	433997	Dk.Purple	953

Total Weight (lb)		Centre of Gravity (in)	
Operating	20759	Xg	196.9
Shipping	19899	Yg	46.6

All values are de-rated by 15% apart from those which have part number. (029-25334-013 and 029-25336-014: 0% de-rated), (029-25335-004: 10% de-rated), (029-25335-001 and 029-25335-003: 25% de-rated)

JCI METASYS
BACNET POINTS
LIST

YVAA / YVFA Sys 1 & 2

REV K03H

SECTION 1

ELINK

YORK TALK 2

Item	Version	Software P/N	Microboard P/N	Baud	COMMENTS																	
1	C.ACS.20.xx	031-02476-010	031-02478-xxx	4800	Std.: see Elink Installation manual PN 24-10404-9 for wiring instructions; YVAA Chiller with Frame A-D VSD																	
2	C.A03.23.xx	031-02476-013	031-02478-xxx	4800	YVAA Chiller with Frame E-F VSD																	
3	C.ACS.21.xx	031-02476-301	031-02478-xxx	4800	YVAA Chiller with Frame E-F VSD and Quickstart																	
4	C.ACS.27.xx	031-02476-331	031-02478-xxx	4800	YVAA Chiller with Frame A-D VSD and Quickstart																	
5	Y.ACS.20.xx	031-03476-010	031-03478-xxx	4800	YVAA / YVFA Chiller (all Frame sizes, Quickstart, Non-quickstart)																	
6																						
7																						
8																						
9																						
10																						
ENG PAGE Ref	BACnet Object Typ/Ins	Bacnet Object Name	LON Profile Name	LON SNVT Type	N2 Metasys	MODBUS		ENG UNITS		POINT LIST CODE: S = STANDARD O = OPTIONAL N = NOT AVAILABLE										ENG PAGE Ref		
						Address	Scale	Imper	SI	POINT LIST DESCRIPTION												
						see notes 3																
P03	AV1	YT2_S01_P03	nviYTS01p003	SNVT_count f (51)	ADF 1	0001	Div 10	°F	°C	Setpoint (Start command must be active to take effect)										P03		
P04	AV2	YT2_S01_P04	nviYTS01p004	SNVT_count f (51)	ADF 2	0002	Div 10	%	%	ISN Current Limit Start command must be active to take effect										P04		
P05	AV3	YT2_S01_P05	nviYTS01p005	SNVT_count f (51)	ADF 3	0003	Div 10	%	%	ISN Sound Limit (RSL Option must be enabled or this point ignored)										P05		
P06	AV4	YT2_S01_P06	nviYTS01p006	SNVT_count f (51)	ADF 4	0004	Div 10															P06
P07	BV1	YT2_S01_P07	nviYTS01p007	SNVT_switch (95)	BD 1	0061	N/A	0 / 1	0 / 1	Start / Stop Command										P07		
P08	BV2	YT2_S01_P08	nviYTS01p008	SNVT_switch (95)	BD 2	0062	N/A															P08
P09	BV3	YT2_S01_P09	nviYTS01p009	SNVT_switch (95)	BD 3	0063	N/A															P09
P10	BV4	YT2_S01_P10	nviYTS01p010	SNVT_switch (95)	BD 4	0064	N/A	0 / 1	0 / 1	History Buffer 1 Request										P10		
P11	AV5	YT2_S01_P11	nvoYTS01p011	SNVT_count f (51)	ADF 5	0005	X 10	°F	°C	Leaving Chilled Liquid Temp										P11		
P12	AV6	YT2_S01_P12	nvoYTS01p012	SNVT_count f (51)	ADF 6	0006	X 10	°F	°C	Return Chilled Liquid Temp										P12		
P13	AV7	YT2_S01_P13	nvoYTS01p013	SNVT_count f (51)	ADF 7	0007	X 10	°F	°C	VSD Internal Ambient Temp										P13		
P14	AV8	YT2_S01_P14	nvoYTS01p014	SNVT_count f (51)	ADF 8	0008	X 10	°F	°C	Sys 1 Condenser Temperature										P14		
P15	AV9	YT2_S01_P15	nvoYTS01p015	SNVT_count f (51)	ADF 9	0009	X 10	°F	°C	Sys 1 Discharge Temperature										P15		
P16	AV10	YT2_S01_P16	nvoYTS01p016	SNVT_count f (51)	ADF 10	0010	X10	°F	°C	Outside Ambient Air Temperature										P16		
P17	AV11	YT2_S01_P17	nvoYTS01p017	SNVT_count f (51)	ADF 11	0011	X10	°F	°C	Sys 1 Eductor Temperature										P17		
P18	AV12	YT2_S01_P18	nvoYTS01p018	SNVT_count f (51)	ADF 12	0012	X10	PSI	BAR	Sys 1 Oil Pressure										P18		
P19	AV13	YT2_S01_P19	nvoYTS01p019	SNVT_count f (51)	ADF 13	0013	X10	PSI	BAR	Sys 1 Suction Pressure										P19		
P20	AV14	YT2_S01_P20	nvoYTS01p020	SNVT_count f (51)	ADF 14	0014	X10	PSI	BAR	Sys 1 Discharge Pressure										P20		
P21	AV15	YT2_S01_P21	nvoYTS01p021	SNVT_count f (51)	ADF 15	0015	X10	%	%	Sys 1 Compressor % Full Load Amps										P21		
P22	AV16	YT2_S01_P22	nvoYTS01p022	SNVT_count f (51)	ADF 16	0016	X1 *	hrs	hrs	Sys 1 Total Run Hours										P22		
P23	AV17	YT2_S01_P23	nvoYTS01p023	SNVT_count f (51)	ADF 17	0017	X1 *	count	count	Sys 1 Total Number of Starts										P23		
P24	AV18	YT2_S01_P24	nvoYTS01p024	SNVT_count f (51)	ADF 18	0018	X 10	°F	°C	Sys 1 Highest Motor Temp										P24		
P25	AV19	YT2_S01_P25	nvoYTS01p025	SNVT_count f (51)	ADF 19	0019	X 10	°F	°C	Sys 2 Highest Motor Temp										P25		
P26	AV20	YT2_S01_P26	nvoYTS01p026	SNVT_count f (51)	ADF 20	0020	X 10	°F	°C	Sys 2 Eductor Temperature										P26		
P27	AV21	YT2_S01_P27	nvoYTS01p027	SNVT_count f (51)	ADF 21	0021	X 10	PSI	BAR	Sys 2 Oil Pressure										P27		
P28	AV22	YT2_S01_P28	nvoYTS01p028	SNVT_count f (51)	ADF 22	0022	X 10	PSI	BAR	Sys 2 Suction Pressure										P28		
P29	AV23	YT2_S01_P29	nvoYTS01p029	SNVT_count f (51)	ADF 23	0023	X 10	PSI	BAR	Sys 2 Discharge Pressure										P29		
P30	AV24	YT2_S01_P30	nvoYTS01p030	SNVT_count f (51)	ADF 24	0024	X 1	%	%	Sys 2 Compressor % Full Load Amps										P30		
P31	AV25	YT2_S01_P31	nvoYTS01p031	SNVT_count f (51)	ADF 25	0025	X1 *	hrs	hrs	Sys 2 Total Run Hours										P31		
P32	AV26	YT2_S01_P32	nvoYTS01p032	SNVT_count f (51)	ADF 26	0026	X1 *	count	count	Sys 2 Total Number of Starts										P32		
P33	AV27	YT2_S01_P33	nvoYTS01p033	SNVT_count f (51)	ADF 27	0027	X1 *	hz	hz	VSD Output Frequency										P33		
P34	AV28	YT2_S01_P34	nvoYTS01p034	SNVT_count f (51)	ADF 28	0028	X 1	%	%	Sys 1 Condenser Drain Valve % Open										P34		
P35	AV29	YT2_S01_P35	nvoYTS01p035	SNVT_count f (51)	ADF 29	0029	X 10	%	%	Sys 2 Condenser Drain Valve % Open										P35		
P36	BV5	YT2_S01_P36	nvoYTS01p036	SNVT_switch (95)	BD 5	0065	N/A	0 / 1	0 / 1	Chiller Run										P36		
P37	BV6	YT2_S01_P37	nvoYTS01p037	SNVT_switch (95)	BD 6	0066	N/A	0 / 1	0 / 1	Chiller Alarm (0 = no alarm, 1 = alarm)										P37		
P38	BV7	YT2_S01_P38	nvoYTS01p038	SNVT_switch (95)	BD 7	0067	N/A	0 / 1	0 / 1	Evaporator Heater Status										P38		
P39	BV8	YT2_S01_P39	nvoYTS01p039	SNVT_switch (95)	BD 8	0068	N/A	0 / 1	0 / 1	Evaporator Pump Status										P39		
P40	BV9	YT2_S01_P40	nvoYTS01p040	SNVT_switch (95)	BD 9	0069	N/A	0 / 1	0 / 1	Sys 1 Compressor Run Status										P40		
P41	BV10	YT2_S01_P41	nvoYTS01p041	SNVT_switch (95)	BD 10	0070	N/A	0 / 1	0 / 1	Sys 2 Compressor Run Status										P41		
P42	BV11	YT2_S01_P42	nvoYTS01p042	SNVT_switch (95)	BD 11	0071	N/A	0 / 1	0 / 1	Sys 1 VI Step Solenoid Valve 1 Status										P42		

UNIT
SPECIFICATION



Air Cooled Screw Liquid Chiller -YORK YVAA R134a 50Hz & 60Hz

1. GENERAL

1.01. GENERAL REQUIREMENTS

The requirements of this Section shall conform to the general provisions of the Contract, including General and Supplementary Conditions, Conditions of the Contract, and Contract Drawings.

1.02. SCOPE

Provide Microprocessor controlled, twin-screw compressor, air-cooled, liquid chillers of the scheduled capacities as shown and indicated on the Drawings, including but not limited to:

1. Chiller package
2. Charge of refrigerant and oil
3. Electrical power and control connections
4. Chilled liquid connections
5. Manufacturer start-up

1.03. QUALITY ASSURANCE

A. Products shall be Designed, Tested, Rated and Certified in accordance with, and Installed in compliance with applicable sections of the following Standards and Codes:

1. AHRI 550/590 – Water Chilling Packages Using the Vapor Compression Cycle
2. AHRI 370 – Sound Rating of Large Outdoor Refrigerating and Air-Conditioning Equipment
3. ANSI/ASHRAE 15 – Safety Code for Mechanical Refrigeration
4. ANSI/ASHRAE 34 – Number Designation and Safety Classification of Refrigerants
5. ASHRAE 90.1 – Energy Standard for Buildings Except Low-Rise Residential Buildings
6. ANSI/NFPA 70 – National Electrical Code (N.E.C.)
7. ASME Boiler and Pressure Vessel Code, Section VIII, Division 1
8. OSHA – Occupational Safety and Health Act
9. Manufactured in facility registered to ISO 9001
10. Conform to Intertek Testing Services for construction of chillers and provide ETL/cETL Listed Mark

B. Factory Run Test: Chiller shall be pressure-tested, evacuated and fully charged with refrigerant and oil, and shall be factory operational run tested with water flowing through the vessel.

C. Chiller manufacturer shall have a factory trained and supported service organization.

D. Warranty: Manufacturer shall Warrant all equipment and material of its manufacture against defects in workmanship and material for a period of eighteen (18) months from date of shipment or twelve (12) months from date of start-up, whichever occurs first.

1.04. DELIVERY AND HANDLING

A. Unit shall be delivered to job site fully assembled with all interconnecting refrigerant piping and internal wiring ready for field installation and charged with refrigerant and oil by the Manufacturer.

B. Provide protective covering over vulnerable components for unit protection during shipment. Fit nozzles and open ends with plastic enclosures.

C. Unit shall be stored and handled per Manufacturer's instructions.



2. PRODUCTS

2.01. MANUFACTURERS

A. The design shown on the Drawings is based on YORK model YVAA chiller manufactured by Johnson Controls / YORK. Alternate equipment will be acceptable if the manufacturer's equipment meets the scheduled performance and complies with these specifications. If equipment manufactured by a manufacturer other than that scheduled is utilized, then the Mechanical Contractor shall be responsible for coordinating with the General Contractor and all affected Subcontractors to insure proper provisions for installation of the furnished unit. This coordination shall include, but not be limited to, the following:

1. Structural supports for units.
2. Piping size and connection/header locations.
3. Electrical power requirements and wire/conduit and overcurrent protection sizes.
4. Chiller physical size on plant layout.
5. Site noise considerations.

B. The Mechanical Contractor shall be responsible for all costs incurred by the General Contractor, Subcontractors, and Consultants to modify the building provisions to accept the furnished alternate equipment.

2.02. GENERAL

A. Description: Furnish, Install, and Commission factory assembled, charged, and operational run tested air-cooled screw compressor chiller as specified herein and shown on the Drawings. Chiller shall include, but is not limited to: a complete system with multiple independent refrigerant circuits, semi hermetic twin screw compressors, shell and tube hybrid falling film type evaporator, air-cooled condenser, R134a refrigerant, lubrication system, interconnecting wiring, safety and operating controls including capacity controller, control center, motor starting components, and special features as specified herein or required for safe, automatic operation.

B. Operating Characteristics:

1. Provide low and high ambient temperature control options as required to ensure unit is capable of starting and operating from -10°F to 125°F (-23°C to 52°C) ambient temperature.
2. Cabinet: Unit panels, structural elements, control boxes and heavy gauge structural base shall be constructed of painted galvanized steel. All exposed sheet steel shall be coated with baked on powder paint to meet 1000-hour salt spray test in accordance with the ASTM B117 standard.
3. Shipping: Unit shall ship in one piece and shall require installer to provide only a single evaporator inlet and outlet pipe connection. If providing chiller model that ships in multiple pieces, bid shall include all the material and field labor costs for factory authorized personnel to install a trim kit to connect the pieces as well as all interconnecting piping and wiring.

2.03. COMPRESSORS

A. Compressor Motors: Refrigerant suction-gas cooled accessible hermetic compressor motor, full suction gas flow through 0.006" (0.1524 mm) maximum mesh screen, with inherent internal thermal overload protection and external current overload on all three phases.

B. Balancing Requirements: All rotating parts shall be statically and dynamically balanced.

C. Lubrication System: External oil separators with no moving parts, 450 psig (31 barg) design working pressure, and ETL listing shall be provided on the chiller. Refrigerant system differential pressure shall provide oil flow through service replaceable, 0.5 micron, full flow, cartridge type oil filter internal to compressor. Filter bypass, less restrictive media, or oil pump not acceptable.

D. Capacity Control: Compressors shall start at minimum load. Provide Microprocessor control to command compressor capacity to balance compressor capacity with cooling load.



2.04. REFRIGERANT CIRCUIT COMPONENTS

- A. Refrigerant: R-134a. Classified as Safety Group A1 according to ASHRAE 34.
- B. Equipment supplied shall comply with LEED Energy & Atmosphere Credit 4, Enhanced Refrigerant Management.
- C. Each independent refrigerant circuit shall incorporate all components necessary for the designed operation including: liquid line shut-off valve with charging port, low side pressure relief device, removable core filter-drier and sight glass with moisture indicator.
- D. Chiller manufacturer shall provide an independent circuit for each compressor to provide maximum redundancy during chiller operation. If equipment does not have independent circuits per compressor, manufacturer shall provide owner one spare compressor of each unique size.
- E. Discharge lines shall be provided with manual compressor shut-off service valves.

2.05. HEAT EXCHANGERS

A. Evaporator:

1. Evaporator shall be shell and tube, hybrid falling film type with 3 pass arrangement to optimize efficiency and refrigerant charge. Tubes shall be high-efficiency, internally and externally enhanced type copper tubes with 0.035" (0.89 mm) minimum wall thickness at all intermediate tube supports to provide maximum tube wall thickness at the support area. Each tube shall be roller expanded into the tube sheets providing a leak proof seal, and be individually replaceable. Independent refrigerant circuits shall be provided per compressor.
2. Constructed, tested, and stamped in accordance with applicable sections of ASME pressure vessel code for minimum 235 psig (16 barg) refrigerant side design working pressure and 150 psig (10 barg) liquid side design working pressure.
3. Water boxes shall be removable to permit tube cleaning and replacement. Water boxes shall include liquid nozzle connections suitable for ANSI/AWWA C-606 couplings, welding, or flanges.
4. Provide vent and drain fittings, and thermo-statically controlled heaters to protect to -20°F (-28°C) ambient temperature in off-cycle. A separate power connection for evaporator heaters is required and shall be provided by the Contractor.
5. Connection location: Chilled liquid inlet and outlet nozzle connections are located at rear (opposite control panel) end of unit.

B. Air-cooled Condenser:

1. Condenser coils shall be microchannel type, parallel flow aluminum alloy tubes metallurgically brazed as one piece to enhanced aluminum alloy fins. Waterside economizer coil shall be tube and fin type with 3/8" diameter tube for low pressure drop and to avoid clogging. If microchannel economizer coils are provided, contractor is responsible to provide wye-strainer properly sized to avoid economizer coil clogging. Condenser coils shall be designed for 350 psig (24 barg) or higher working pressure. Economizer coils shall be designed for 150 psig (10.3 barg) or higher.
2. Unit shall include Louvered Panels (Condenser Coils): Painted steel to match unit panels, over external condenser coil faces.
3. Low Sound Fans with Variable Speed Drives. All fans shall be powered by VSDs. Fans shall provide vertical air discharge from extended orifices. Fans shall be composed of corrosion resistant aluminum hub and glass-fiber-reinforced polypropylene composite blades molded into a low-noise airfoil section. Fan impeller shall be dynamically balanced for vibration-free operation. Fan guards of heavy gauge, PVC (polyvinyl chloride) coated or galvanized steel.
4. Fan Motors: High efficiency, direct drive, 3-phase, insulation class "F", current protected, Totally Enclosed Air-Over (TEAO), with double sealed, permanently-lubricated ball bearings. Open Drip Proof (ODP) fan motors will not be acceptable.

2.06. INSULATION



- A. Material: Closed-cell, flexible, UV protected, thermal insulation complying with ASTM C 534 Type 2 (Sheet) for preformed flexible elastomeric cellular thermal insulation in sheet and tubular form.
- B. Thickness: 3/4" (19mm).
- C. Thermal conductivity: 0.26 (BTU/HR-Ft²-°F/in) maximum at 75°F mean temperature.
- D. Factory-applied insulation over cold surfaces of liquid chiller components including evaporator shell, water boxes, and suction line. Liquid nozzles shall be insulated by Contractor after pipe installation.
- E. Adhesive: As recommended by insulation manufacturer and applied to 100 percent of insulation contact surface including all seams and joints.

2.07. ACOUSTICAL DATA

- A. Provide acoustical sound power or sound pressure level data in decibels (dB) at the scheduled eight (8) octave band center frequencies. A-weighted sound data alone is not acceptable.
- B. Provide all sound power or sound pressure level data at 100%, 75%, 50%, and 25% load.
- C. Supplied equipment shall not exceed scheduled sound power or sound pressure level data at any load point. The mechanical Contractor shall be responsible for any additional costs associated with equipment deviation.
- D. Acoustical performance ratings shall be in accordance with AHRI Standard 370.

2.08. POWER AND ELECTRICAL REQUIREMENTS

A. Power/Control Panel:

- 1. Factory installed and wired NEMA 3R, powder painted steel cabinets with tool lockable, hinged, latched, and gasket sealed outer doors equipped with wind struts for safer servicing. Provide main power connection(s), compressor starters and fan motor contactors, current overloads, and factory wiring.
- 2. Panel shall include control display access door.

B. Single Point Power:

- 1. Provide single point power connection to chiller, shall be 3 phase of scheduled voltage.
- 2. Single Point Circuit Breaker: A unit-mounted Circuit Breaker with external lockable handle shall be provided at the point of incoming single point connection for field connection, interconnecting wiring to the compressors, and isolating the power voltage for servicing. Incoming power wiring must comply with local codes. Circuit breaker shall be sized to provide the motor branch circuit protection, short circuit protection and ground fault protection for the motor branch-circuit conductors, the motor control apparatus and the motors.

C. Control Transformer: Power panel shall be supplied with a factory mounted and wired control transformer that will supply all unit control voltage from the main unit power supply. Transformer shall utilize scheduled line voltage on the primary side and provide 115V/1Ø on secondary.

D. Short Circuit Withstand Rating of the chiller electrical enclosure shall be (380, 400, & 460V: 65,000 Amps). Rating shall be published in accordance with UL508.

E. Motor Starters: Motor starters shall be Variable Frequency Drive type with zero electrical inrush current. Wye-Delta, Solid State, and Across the Line type starters will not be acceptable.

F. Power Factor:

- 1. Provide equipment with power factor correction capacitors as required to maintain a displacement power factor of 95% at all load conditions.
- 2. The installing contractor is responsible for additional cost to furnish and install power factor correction capacitors if they are not factory mounted and wired.

G. All exposed power wiring shall be routed through liquid-tight, UV-stabilized, non-metallic conduit.

H. Supplied equipment shall not exceed scheduled Minimum Circuit Ampacity (MCA.) The mechanical Contractor shall be responsible for any additional costs associated with equipment deviation.

2.09. CONTROLS

A. General:

1. Provide automatic control of chiller and waterside economizer operation including compressor start/stop and load/unload, anti-recycle timers, condenser fans, evaporator pump, evaporator heater, waterside economizer bypass valve, unit alarm contacts and run signal contacts.
2. Chiller shall automatically reset to normal chiller operation after power failure.
3. Unit operating software shall be stored in non-volatile memory. Field programmed set points shall be retained in lithium battery backed regulated time clock (RTC) memory for minimum 5 years.
4. Alarm contacts shall be provided to remote alert for any unit or system safety fault.

B. Display and Keypad:

1. Provide minimum 80 character liquid crystal display that is both viewable in direct sunlight and has LED backlighting for nighttime viewing. Provide one keypad and display panel per chiller.
2. Display and keypad shall be accessible through display access door without opening main control/electrical cabinet doors.
3. Display shall provide a minimum of unit setpoints, status, electrical data, temperature data, pressures, safety lockouts and diagnostics without the use of a coded display.
4. Descriptions in English (or available language options), numeric data in English (or Metric) units.
5. Sealed keypad shall include unit On/Off switch.

C. Programmable Setpoints (within Manufacturer limits): Display language, chilled liquid cooling mode, local/remote control mode, display units mode, system lead/lag control mode, remote temperature reset, remote current limit, remote sound limit, low ambient temperature cutout enable/disable, leaving chilled liquid setpoint and range, maximum remote temperature reset.

D. Display Data: Chilled liquid leaving and entering temperatures; outside ambient air temperature; lead system; evaporator pump status; active remote control; compressor suction, discharge, and oil pressures per refrigerant circuit; compressor discharge, motor, and oil temperatures per refrigerant circuit; saturation temperatures per refrigerant circuit; compressor speed; condenser fan status; condenser subcooling temperature; condenser drain valve percentage open; compressor capacity in percentage of Full Load Amps; compressor number of starts; run time; operating hours; evaporator heater status; history data for last ten shutdown faults; history data for last 20 normal (non-fault) shutdowns.

E. Predictive Control Points: Unit controls shall avoid safety shutdown when operating outside design conditions by optimizing the chiller controls and cooling load output to stay online and avoid safety limits being reached. The system shall monitor the following parameters and maintain the maximum cooling output possible without shutdown of the equipment: motor current, suction pressure, discharge pressure, starter internal ambient temperature, and starter baseplate temperature.

F. System Safeties: Shall cause individual compressor systems to perform auto-reset shut down if: high discharge pressure or temperature, low suction pressure, low motor current, high/low differential oil pressure, low discharge superheat, high motor temperature, system control voltage.

G. Unit Safeties: Shall be automatic reset and cause compressors to shut down if: high or low ambient temperature, low leaving chilled liquid temperature, under voltage, flow switch operation. Contractor shall provide flow switch and wiring per chiller manufacturer requirements.

H. Manufacturer shall provide any controls not listed above, necessary for automatic chiller operation. Mechanical Contractor shall provide field control wiring necessary to interface sensors to the chiller control system.

2.10. ACCESSORIES AND OPTIONS

Some accessories and options supersede standard product features. All options are factory-mounted unless otherwise noted.

A. CONTROLS OPTIONS:



1. Building Automation System Interface: Chiller to accept BACnet MS/TP, N2 and Modbus protocol from BAS (by others). BACnet to be BACnet Testing Laboratories (BTL) listed and support BACnet Automatic Discovery to eliminate field commissioning of chiller controls.

B. GENERAL OPTIONS:

1. Vibration Isolation (All Options Field Mounted by Contractor):

- a. Provide 1" Deflection Spring Isolators: Level adjustable, spring and cage type isolators for mounting under the unit base rails.

3. EXECUTION

3.01. INSTALLATION

A. General: Rig and Install in full accordance with Manufacturer's requirements, Project drawings, and Contract documents.

B. Location: Locate chiller as indicated on drawings, including cleaning and service maintenance clearance per Manufacturer instructions. Adjust and level chiller on support structure.

C. Components: Installing Contractor shall provide and install all auxiliary devices and accessories for fully operational chiller.

D. Electrical: Coordinate electrical requirements and connections for all power feeds with Electrical Contractor.

E. Controls: Coordinate all control requirements and connections with Controls Contractor.

F. Finish: Installing Contractor shall paint damaged and abraded factory finish with touch-up paint matching factory finish.

INSTALLATION
CHECKLIST &
START-UP REQUEST



MODEL YVAA

EQUIPMENT PRE-STARTUP AND STARTUP CHECKLIST

CUSTOMER: _____ JOB NAME: _____
 ADDRESS: _____ LOCATION: _____
 PHONE: _____ CUSTOMER ORDER NO: _____

JCI TEL NO: _____ JCI ORDER NO: _____ JCI CONTRACT NO: _____

CHILLER MODEL NO: _____ UNIT SERIAL NO: _____

The work (as checked below) is in process and will be completed by: _____ / _____ / _____
Month Day Year

The following work must be completed in accordance with the installation instructions:

PRE-STARTUP

UNIT CHECKS (NO POWER)

The following basic checks should be made with the customer power to the unit switched OFF.

WARNING: Proper electrical lock out and tag procedures must be followed.

Check the system 24 hours prior to initial start:

1. Inspect the unit for shipping or installation damage. Repair as needed.
2. Ensure that all piping has been completed.
3. Assure there are no refrigerant or water piping leaks. Repair as needed.
4. Open each system liquid shut off valve, economizer shut off valve, discharge shut off valve and oil line ball valve.
5. Adjust spring isolators (if installed) and assure they are not bottomed out.
6. Ensure water pumps are on. Check and adjust water pump flow rate preferably using an ultrasonic flow meter. Otherwise adjust pressure drop across the evaporator.

CAUTION: Excessive flow may cause catastrophic damage to the evaporator.

7. Check the control panel to ensure it is free of foreign material (wires, metal chips, tools, documents, etc.). Also check for signs of water or moisture.

8. Visually inspect wiring (power and control). Wiring MUST meet N.E.C., CE, and local codes.
9. Check tightness of the incoming power wiring.
10. Verify the field wiring matches the 3-phase power requirements of the chiller (Refer to the chiller nameplate).
11. Assure a flow switch is connected between Terminals 2 and 13 on the User Terminal Block 1TB in the panel. Throttle back flow to assure the flow switch opens with a loss of flow. It is recommended that auxiliary pump contacts be placed in series with the flow switch for additional protection, if the pump is turned OFF during chiller operation. Whenever the pump contacts are used, the coil of the pump starter should be suppressed with an RC suppressor (031-00808-000).
12. Assure all control wiring is connected correctly to the user input terminals.
13. Apply power to the chiller and assure the compressor heaters are turned on 24 hours prior to system startup.

EQUIPMENT STARTUP CHECKLIST

NOTE: Before proceeding with the following unit checks, verify the heaters have been run for 24 hours prior to starting the unit.

A. UNIT CHECKS (NO POWER)

The following basic checks should be made with the customer power to the unit switched OFF.

WARNING: Proper electrical lock out and tag procedures must be followed.

1. Inspect the unit for shipping or installation damage. Repair as needed.
2. Ensure that all piping has been completed.
3. Ensure there are no refrigerant or water piping leaks. Repair as needed.
4. Open each system liquid shut off valve, economizer shut off valve, discharge shut off valve and oil line ball valve. If optional eductor and suction valves are installed, be sure to open them. Failure to open the eductor valve will result in "Eductor Clog" faults.
5. The oil separator oil level(s) should be maintained so that an oil level is visible in the sight glass when a compressor is running at full speed for 15 to 30 minutes. An oil level may not be visible in the sight glass when the compressor is OFF or running below full speed; and it may be necessary to run the compressor at full speed to obtain a level. In shutdown situations and at some load points, much of the oil may be in the evaporator and the level in the separator may fall below the bottom sight glass.

Sight glasses will vary in type depending upon the manufacturer. One type will have balls that float in the sight glasses to indicate level. Another type will have a bulls' eye glass. The bulls' eye glass will tend to appear to lose the lines in the bulls' eye when the level is above the glass. Be careful when viewing the sight glass not to confuse a full sight glass with an empty sight glass. Oil level should be visible, but not above the top of the sight glass after operating at full speed for 15 to 30 minutes. In the rare situation where oil levels are high, drain the oil to lower the level until it is visible in the sight glass. This should be done while operating at full speed.

Oil levels in the oil separator above the top of the sight glass should be avoided and may cause excessive oil carryover in the system. High oil concentration in the system may cause nuisance trips resulting from low discharge superheat, low solution pressure and incorrect readings from temperature sensors. Temperature sensor errors may result in poor refrigerant control and liquid overfeed to the compressor. Excessive oil will also reduce evaporator performance.

In the unlikely event it is necessary to add oil, connect a YORK oil pump to the charging valve on the oil separator, but do not tighten the flare nut on the delivery tubing. With the bottom (suction end) of the pump submerged in oil to avoid entrance of air, operate the pump until oil drips from the flare nut joint, allowing the air to be expelled, and tighten the flare nut. Open the compressor oil charging valve and pump in oil until it reaches the proper level as described above.

6. Ensure water pumps are ON. Check and adjust water pump flow rate preferably using an ultra sonic flow meter. Otherwise adjust pressure drop across the evaporator.

CAUTION: Excessive flow may cause catastrophic damage to the evaporator.

7. Check the control panel to ensure it is free of foreign material (wires, metal chips, tools, documents, etc.). Also check for signs of water or moisture. Ensure door gasket seals are sealing properly and incoming power wiring conduit is caulked.
8. Visually inspect wiring (power and control). Wiring MUST meet N.E.C., CE, and local codes.
9. Check tightness of the incoming power wiring inside the power panel and inside the motor terminal boxes.
10. Check for proper size fuses in control circuits.
11. Verify that field wiring matches the 3-phase power requirements of the chiller. (Refer to chiller nameplate)
12. Be certain all water temperature sensors are inserted completely in their respective wells and are coated with heat conductive compound.
13. Ensure the liquid line temperature sensor is tightly strapped on the liquid line and insulated.

- 14. Ensure the glycol level in the VSD cooling system is 9 to 15 inches (23 to 28 cm) from the top of the fill tube. This check should be performed prior to running the pump.

CAUTION: Never run the glycol pump without coolant! Running the glycol pump without coolant may damage the pump seals.

Always fill the system with approved YORK coolant (P/N 013-03344-000) to avoid damage to the pump, cooling system heat sinks and the chiller. Overheating of the heat sinks and power panel will also occur.

- 15. Ensure the remote start/stop for Sys #1 on Terminals 2 to 15 and Sys #2 on Terminals 2 to 16 are closed on the User Terminal Block 1TB to allow the systems to run. If remote cycling devices are not utilized, place a wire jumper between these terminals.
- 16. Ensure that the CLK jumper JP2 is in the ON position.
- 17. Ensure a flow switch is connected between Terminals 2 and 13 on the User Terminal Block 1TB in the panel. Throttle back flow to ensure the flow switch opens with a loss of flow at the minimum recommended flow. It is recommended that auxiliary pump contacts be placed in series with the flow switch for additional protection, if the pump is turned OFF during chiller operation. Whenever the pump contacts are used, the coil of the pump starter must be suppressed with an RC suppressor (031-00808-000).

B. STARTUP

**PANEL CHECKS
(POWER ON – BOTH SYSTEM SWITCHES OFF)**

WARNING: You are about to turn power on to this machine. SAFETY IS NUMBER ONE! Only qualified individuals are permitted to service this product. The qualified individual furthermore is to be knowledgeable of, and adhere to, all safe work practices as required by NEC, OSHA, and NFPA 70E. Proper personal protection is to be utilized where and when required.

- 1. Ensure the chiller OFF/ON UNIT switch at the bottom of the keypad is OFF.

CAUTION: DO NOT apply power to the chiller unless the system is filled with water or glycol. If the chiller is equipped with the -20°F option, applying power to an empty chilled liquid system will cause the evaporator immersion heaters to fail.

- 2. Apply 3-phase power to the chiller. Turn ON the optional panel circuit breaker if supplied.....
- 3. Verify the control panel display is illuminated

- 4. To prevent the compressors from starting, ensure that the system switches under the SYSTEM SWITCHES key are in the OFF position. ...

- 5. Verify that the voltage supply corresponds to the unit requirement and is within the limits given in Refer to Section 5 - Technical Data in Form 201.28-NM1.1.

- 6. Ensure the heaters on each compressor are ON using a clamp-on ammeter. Heater current draw is approximately 3A.

- 7. Verify the "Factory Set" overload potentiometers on the VSD Logic Board are set correctly Press the VSD DATA key and using the arrow keys, scroll to the compressor overload settings. Verify the "Factory Set" overload potentiometer(s) on the VSD Logic Board are set correctly. In the unlikely event that they are not set correctly, adjust the potentiometers until the desired values are achieved.

WARNING: The VSD is powered up and live. High voltage exists in the area of the circuit board on the bus bars, VSD Pole Assemblies, and wiring to the input inductor.

Adjust the potentiometers, if needed, using *Table 30 Compressor Motor Overload Settings*. The potentiometers are System 1=R19 and System 2=R64.

CAUTION: Incorrect settings of the potentiometers may cause damage to the equipment.

Record the Overload Potentiometer settings below:

System 1 = _____ Amps
System 2 = _____ Amps

- 8. Press the STATUS key. If the following message appears, immediately contact Johnson Controls Product Technical Support. The appearance of this message may mean the chiller has lost important factory programmed information. The serial number and other important data may need to be reprogrammed.

**UNIT WARNING: INVALID SERIAL NUMBER
ENTER UNIT SERIAL NUMBER**

NOTE: Changing the programming of this feature requires the date and time to be set on the chiller prior to programming. Additional information regarding this message and how to enter the serial number with the factory provided password is outlined in the Serial Number Programming.

9. Program the required options into the Panel for the desired operating requirements (Refer to Section 8 of form 201.28-NM1.1). Record the values below:

Display Language = _____

Chilled Liquid Mode = _____

Local/Remote Mode = _____

Display Units = _____

Lead/Lag Control = _____

Remote Temperature Reset = _____

Remote Current Reset = _____

Remote Sound Limit _____

Low Ambient Cutout _____

CAUTION: Damage to the chiller could result if the options are improperly programmed.

C. PROGRAMMED VALUES

1. Program the required operating values into the microprocessor for cutouts, safeties, etc. and record them below (Refer to Section 8 in Form 201.28-NM1.1)

Suction Pressure Cutout = _____ PSIG (kPa)

Low Ambient Cutout = _____ °F (°C)

Leaving Chilled Liquid Temperature Cutout = _____ °F (°C)

Motor Current Limit = _____ % FLA

Pulldown Current Limit = _____ % FLA

Pulldown Current Limit Time = _____ MIN

Subcooling Setpoint = _____ °F (°C)

Remote Unit ID # = _____

Sound Limit Setpoint = _____ %

Eductor Differential = _____ °F

Eductor Safety Time = _____ MIN

Motor Temp Unload = _____ °F

D. CHILLED LIQUID SETPOINT

Program the Chilled Liquid Setpoint/Range and record: . _____

Local Cooling Setpoint = _____ °F (°C)

Local Cooling Range = _____ to _____ °F (°C)

Maximum Remote Temperature Reset = _____ to _____ °F (°C)

E. DATE/TIME, DAILY SCHEDULE, AND CLOCK JUMPER

1. Set the date and time.....

2. Program the Daily Schedule start and stop times.

3. Place the panel in Service Mode and turn on each fan stage one by one. Ensure the fans rotate in the correct direction, so air flow exits the top of the chiller.....

4. Remove the cap on the fill tube and run the glycol pump to verify the level in the fill tube. Ensure the glycol level in the VSD cooling system is 9 to 15 inches (23 to 28 cm) from the top of the fill tube while running. The pump can be run by placing the chiller in the Service Mode. Be sure to re-install the cap before stopping the glycol pump to avoid overflowing the fill tube when the glycol pump is turned OFF. The glycol system holds about 3.5 to 5.5 gallons of coolant (P/N 013-03344-000).

5. Check the optional fan VSD programming (if equipped).

F. INITIAL STARTUP

After the control panel has been programmed and the compressor heaters have been energized for at least 8 hours (ambient temperature more than 96°F (36°C)) or 24 hours (ambient temperature less than 86°F (30°C)), the chiller may be placed into operation.

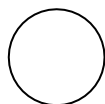
1. Turn on the UNIT switch and program the system switches on the keypad to the ON position.....

2. If cooling demand permits, the compressor(s) will start and a flow of refrigerant will be noted in the sight glass, after the anti recycle timer times out and the precharge of the DC Bus is completed. After several minutes of operation, the bubbles in the liquid line sight glass will disappear and there will be a solid column of liquid when the Condenser Drain (Flash Tank Feed) Valves stabilize.

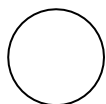
3. Allow the compressor to run a short time, being ready to stop it immediately if any unusual noise or adverse conditions develop. Immediately at startup, the compressor may make sounds different from its normal high-pitched sound. This is due to the compressor coming up to speed and the initial lack of an oil film sealing the clearances in the rotors. This should be of no concern and lasts for only a short time.
4. Check the system operating parameters.

G. REFRIGERANT CHARGE

1. Record the level of refrigerant in the evaporator sight glass with each system operating at full speed for 15 to 30 minutes. A refrigerant level should be visible in each evaporator sight glass.



System #1



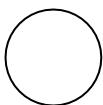
System #2

LD15053

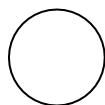
2. Remove charge if the level is above the sight glass and add charge if the level is below the sight glass.

H. OIL LEVELS

Record the oil level in the oil separator sight glass with each system operating at full speed for 15 to 30 minutes. An oil level should be visible in the sight glass, but not above the sight glass.



System #1



System #2

Sight Glass

LD15054

I. LIQUID LINE SUBCOOLING

Record the liquid Line Subcooling from the panel display after operating at full speed for 15 to 30 minutes.

Sys 1 Liquid Subcooling _____ F

Sys 2 Liquid Subcooling _____ F

J. LOG READINGS

Record the following temperatures and pressures from the panel display:

Chilled Liquid Temperature: _____ °F

VSD Frequency: _____ Hz

Sys 1 Oil Pressure: _____ PSI

Sys 1 Discharge Pressure: _____ PSIG

Sys 1 Suction Pressure: _____ PSIG

Sys 1 Condenser Liquid Pressure: _____ PSIG

Sys 1 Oil Temperature: _____ °F

Sys 1 Eductor Temperature: _____ °F

Sys 1 Condenser Liquid Temp: _____ °F

Sys 1 Subcooling: _____ °F

Sys 1 Saturated Liquid Temp: _____ °F

Sys 1 Discharge Temp: _____ °F

Sys 1 Discharge Superheat: _____ °F

Sys 1 SAT Discharge Temp: _____ °

Sys 1 Flash Tank Level: _____ %

Sys 1 Economizer Valve: _____ %

Sys 1 Condenser Subcooling: _____ °F

Sys 1 Condenser Drain Valve: _____ %
 (Flash Tank Feed Valve)

Sys 1 Condenser Fans # ON: _____

SYS 1 VSD Fan Speed: _____ %

Sys 1 VI Step Solenoid 1: _____

Sys 1 VI Step Solenoid 2: _____

Sys 1 Run Time: ___ D ___ HR ___ MIN ___ SEC

Sys 2 Oil Pressure: _____ PSIG

Sys 2 Discharge Pressure: _____ PSIG

Sys 2 Suction Pressure: _____ PSIG

Sys 2 Condenser Liquid Pressure: _____ PSIG

Sys 2 Oil Temperature: _____ °F

Sys 2 Eductor Temperature: _____ °F

Sys 2 Condenser Liquid Temp: _____ °F

Sys 2 Subcooling: _____ °F

Sys 2 Saturated Liquid Temp: _____ °F

Sys 2 Discharge Temp: _____ °

Sys 2 Discharge Superheat: _____ °F

L. LOG READINGS (CONT'D)

Sys 2 SAT Discharge Temp: _____ °F
Sys 2 Superheat: _____ °F
Sys 2 SAT Discharge Temp: _____ °F
Sys 2 Flash Tank Level: _____ %
Sys 2 Economizer Valve: _____ %
Sys 2 Condenser Subcooling: _____ °F
Sys 2 Condenser Drain Valve: _____ %
(Flash Tank Feed Valve)
Sys 2 Condenser Fans # ON: _____
SYS 2 VSD Fan Speed: _____ %
Sys 2 VI Step Solenoid 1: _____
Sys 2 VI Step Solenoid 2: _____
Sys 2 Run Time: ___D___HR___MIN___SEC

K. LEAK CHECKING

1. Leak check compressors, fittings, and piping to ensure there are not any leaks.
If the chiller is functioning satisfactorily during the initial operating period with no safety trips; and the chiller controls chilled liquid temperature; the chiller is now ready to be placed into service.

