For Record Chiller Submittal

Cincinnati VAMC Replace Ozone Depleting Equipment

Multistack Chiller

7/24/23

Triton

Sales Engineer:
Brian Turner
ElitAire
bturner@elitaire.com
513-673-0600 cell

Notes:

7/24/23

- Revised chiller performance data to meet flow rate and water temperatures.

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- 30 Ton Module
- 208/3
- Variable Speed Compressor
- Acoustical Panels included
- 5 Year Compressor Warranty
- Start Up is Included

ER

Job Name	VAMC	Job Number	
Location	OH	Quote Number	QEWATSON04032019-5
Engineer		Representative	Brian Turner
Contractor		Rep Office	Cincinnati

Mechanical Modules: (1) MSS030VCAA+EAA--BBCBCOBAQICA-B
Accessory Modules:

SUMMARY PERFORMANCE DATA

							EVAPORATOR			CONDENSER			
Load	Capacity (tons)	kW	THR (MBtu/h	kW/Ton	EER (Btu/Wh)	COP (kW/kW)	Flow Rate (GPM)	Leaving Temp. °F	ΔP (ft H2O)	Cond Flow (GPM)	Entering Temp. °F	Leaving Temp. °F	ΔP (ft H2O)
100%	23.37	10.86	0.3175	0.4648	25.82	7.560	40.00	42.00	6.000	25.40	45.00	70.00	6.000
75%	17.53	6.886	0.2338	0.3929	30.55	8.950	40.00	42.00	6.000	25.40	45.00	63.75	6.000
50%	11.68	3.824	0.1533	0.3273	36.67	10.74	40.00	42.00	6.000	25.40	45.00	57.50	6.000
25%	5.843	2.036	0.07706	0.3485	34.43	10.09	40.00	42.00	6.000	25.40	45.00	51.25	6.000

The 25 % points have incorporated a cycling penalty per AHRI 550/590.

Cooling COP	Heating COP	Heating and Cooling COP
7.560	N/A	N/A

		kW/Ton	EER (Btu/Wh)	COP (kW/kW)
No Tower Relief	PLV	0.3559	33.72	9.891

EVAPORATOR DESIGN DATA	(Based on Water)
Entering Temperature °F	56.00
Leaving Temperature °F	42.00
Design Flow (GPM)	40.00
Pressure Drop (Full Load)	2.597 PSI / 6.000 ft H2O
Chiller Minimum Flow (GPM)	40.00
Min. GPM For Sizing System Bypass	40.00
Heat Exchanger Style	Brazed Plate
Fouling Factor (h-ft2-°F/Btu)	.000100
Header Size (in.)	6
Header Connection Type	Grooved Coupling

CONDENSER DESIGN DATA	(Based on Water)
Entering Temperature °F	45.00
Leaving Temperature °F	70.00
Design Flow (GPM)	25.40
Pressure Drop (Full Load)	2.597 PSI / 6.000 ft H2O
Chiller Minimum Flow (GPM)	25.40
Min. GPM For Sizing System Bypass	25.40
Heat Exchanger Style	Brazed Plate
Fouling Factor (h-ft2-°F/Btu)	.000250
Header Size (in.)	6
Header Connection Type	Grooved Coupling

3 = 3333

PHYSICAL DATA	Section 1	Section 2
Length (in.)	Multistack for De	
Width (in.)	Multistack for De	
Height (in.)	Multistack for De	
Estimated Dry Weight (lbs.)	2360	
Estimated Operating Weight (lbs.)	2570	
Refrigerant Type	R-410A	
Refrig. Charge (lbs per circuit)	9	

ELECTRICAL DATA (Direct Connect-Per Module)	MCA	MOP		
(1) MSS030V	61	90		
MCA				
MOP				
Voltage	208/60/3			

Dimensions are estimated and do not include frames, J-boxes, Multiflush, etc

CHILLER DATA	
Compressor Description	Variable Speed Scroll
Options	No Tower Relief
Compressor RLA (per comp.)	27.00

*Parallel feeds not required (Assumes no larger than 250 MCM/kcmil wire)

MOUNTING/LIFTING FRAME	
Materials	Option Not Selected
I-Beam Size	Option Not Selected
Bolt together frame - # of pieces	Option Not Selected
End Type	Option Not Selected

Software Version #: 1.0.4435.27651

Performance Run Date: 11/19/2020 12:20:36 PM

Outside the scope of AHRI Standard 550/590 (I-P).

MULTISTACK®

Variable Flow Design Requirements

Chilled Water System (Evaporator)

Ensure a chiller DP transmitter (DP1) is incorporated into the piping design and set to: **2.60 PSI**
DP1 to be installed directly after the chiller with no pressure adding devices between the chiller and DP1. *(mechanical only ΔP)*

Ensure a system DP transmitter(s) (DP2) is incorporated into the piping design

Ensure a system bypass valve(s) (V1) is incorporated into the piping design

Design of system bypass (V1) must be a characterized ball or globe type valve and be pressure dependent

System bypass valve (V1) stroke time needs to be selected for less than 60 seconds

Chiller minimum flow is: **40.00 GPM**

System bypass valve must be design for a minimum of: **40.00 GPM**

Note: this is a minimum requirement for the chiller ONLY! Other system components such as pumps or air handling units may have higher minimum flow requirements and bypass sizing may be adjusted accordingly.

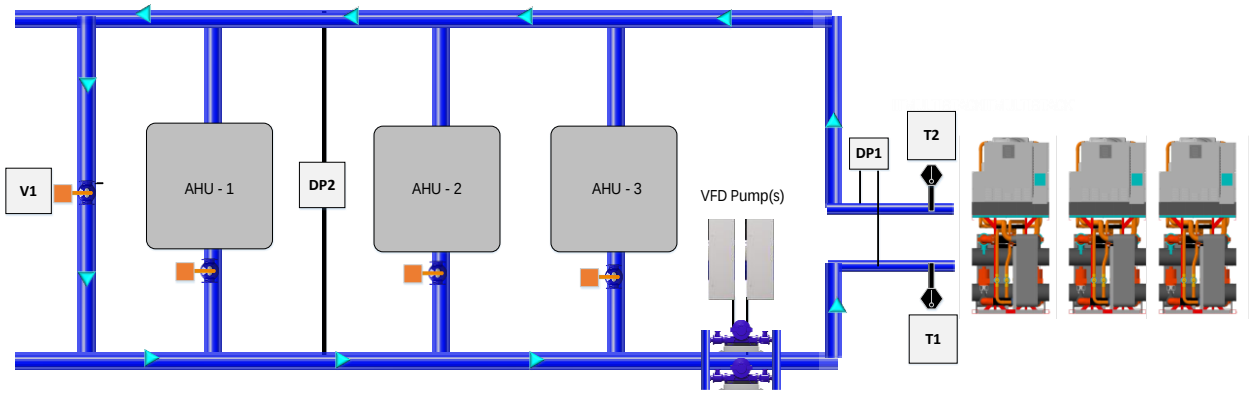
Bypass loop volume (Includes piping between V1 & chiller): **62.3 Gallons**

Note: the bypass loop should be designed for a minimim of a 2 minute loop at all conditions. To obtain ensure the above volume is met.

Refer to Multistack Variable Flow Engineering Bulletin for more details

The pump or the bypass valve must control to maintain chiller DP setpoint, the opposite device (Pump or Bypass Valve) must maintain system DP setpoint.

When a pump module is supplied by Multistack it will be factory configured to control to DP across the chiller unless otherwise specified and noted on the chiller selection.



LEGEND

WIRED & CONTROLLED BY CONTROLS CONTRACTOR
V1 – SYSTEM BYPASS VALVE
DP1 – CHILLER DIFFERENTIAL PRESSURE
DP2 – SYSTEM DIFFERENTIAL PRESSURE
VFD Pump(s)

WIRED TO CHILLER MASTER CONTROLLER
T1 – CHW RETURN TEMP SENSOR
T2 – CHW SUPPLY TEMP SENSOR

SCHEMATIC ONLY – REFER TO JOB SPECIFIC DRAWING FOR CONSTRUCTION

MULTISTACK®

Variable Flow Design Requirements

Condenser Water System

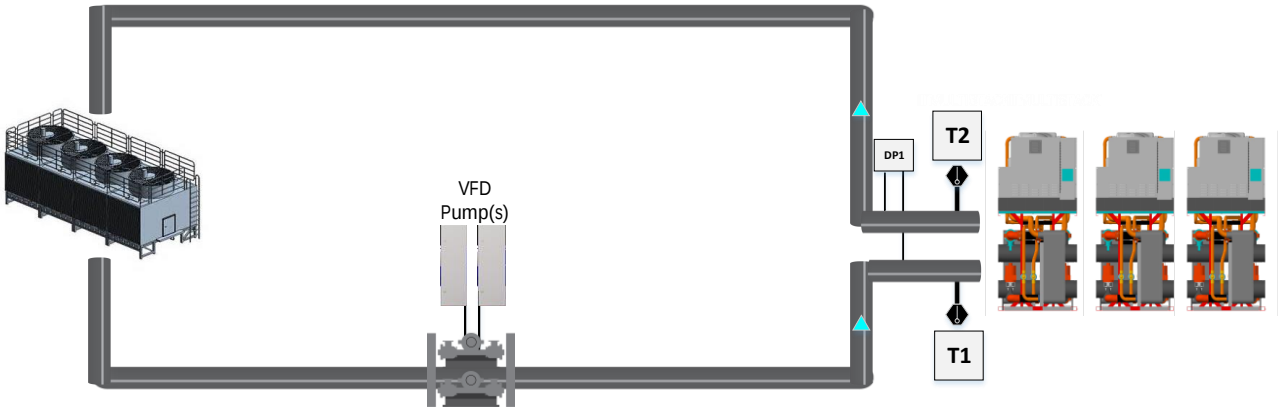
Ensure a chiller DP transmitter (DP1) is incorporated into the piping design and set to: **2.597** **PSI**

DP1 to be installed directly after the chiller with no pressure adding devices between the chiller and DP1.

Chiller minimum flow is: **25.60** **GPM**

Refer to Multistack Variable Flow Engineering Bulletin for more details

The condenser side water valves may be left open at all times in a user seletable number of modules.
This would be to allow for the cooling tower's, fluid cooler's, pump's, etc. minimum flow.
When a pump module is supplied by Multistack it will be factory configured to control to DP across the chiller unless otherwise specified and noted on the chiller selection.



LEGEND

WIRED & CONTROLLED BY CONTROLS CONTRACTOR
DP1 – CHILLER DIFFERENTIAL PRESSURE
VFD Pump(s)

WIRED TO CHILLER MASTER CONTROLLER
T1 – CHW RETURN TEMP SENSOR
T2 – CHW SUPPLY TEMP SENSOR

SCHEMATIC ONLY – REFER TO JOB SPECIFIC DRAWING FOR CONSTRUCTION

Product Overview:

Model Description	Compressor Description
(1) MSS030V	Variable Speed Scroll

Services & Special Features:

- Chiller Waterside Maximum Working Pressure is 150 PSIG
- Heat exchanger maximum working pressure (refrigerant 650 PSI)
- Lead compressor sequencing (24hrs)
- Automatic internal rescheduling if fault occurs
- Multiple, independent refrigeration systems
- Automatic logging of any fault condition
- Electronic chilled water control
- Quick interconnect modular design
- Filters in evaporator and condenser supply headers
- Stainless steel evaporator and condenser inlet header
- Electrical design - Standard
- Electrical tier - Low - A
- R-410A Refrigerant
- 5kA SCCR
- Electrical Connection Type - Direct Connect
- 5 Year Warranty: Compressor and Drive
- 1 Year Warranty: All Parts
- Standard (side by side drives - high voltage one side)
- Power Phase Monitor (for Direct Connect per module)
- Total Access Design w/NEMA2 Var. Flow Actuator (Evap. & Cond.) (C-Steel Valves)
- Multiflush™ (Debris Removal System) - Cond
- Orifice Plates-Evap (to obtain min pressure drop of 6 feet) (MSS030V-1.2 ft)
- Insulate Condenser Side
- Interoperability Web Portal for Mechanicals (BACnet TCP/IP)
- Variable Speed Compressor
- Orifice Plates-Cond (to obtain min pressure drop of 6 feet) (MSS030V-3.3 ft)

Excluded By Multistack:

- ~~Acoustical Panels - indoor rated~~
- Interconnecting piping between sections if two sections exist.
- Multistack recommends a 2-3 minute minimum loop time. Contact Multistack if you have questions regarding system loop time design

MULTISTACK
ORIGINATORS, INNOVATORS, NEVER THE IMITATORS.
1065 MAPLE AVENUE SPARTA, WI 54656

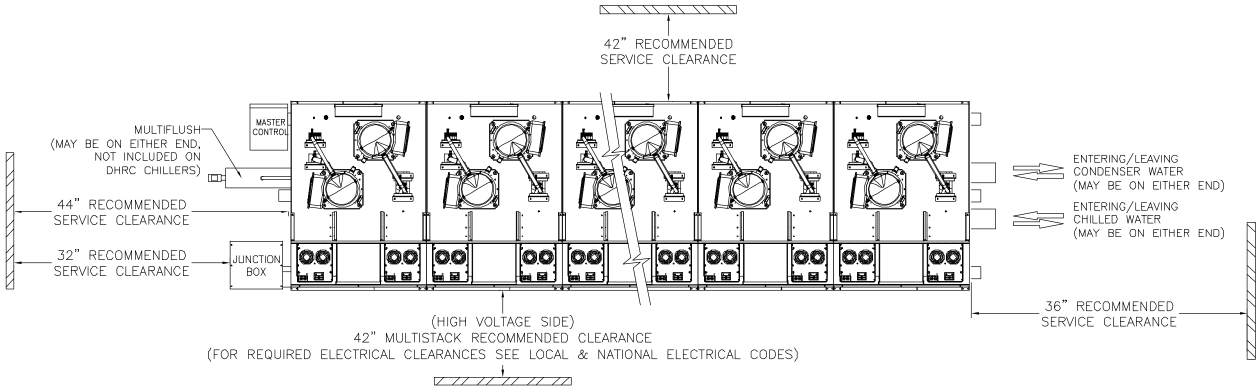
DRAWN BY: RS | DATE: 5/19/20

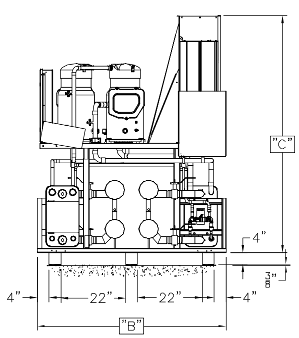
SUBMITTAL 500-0517

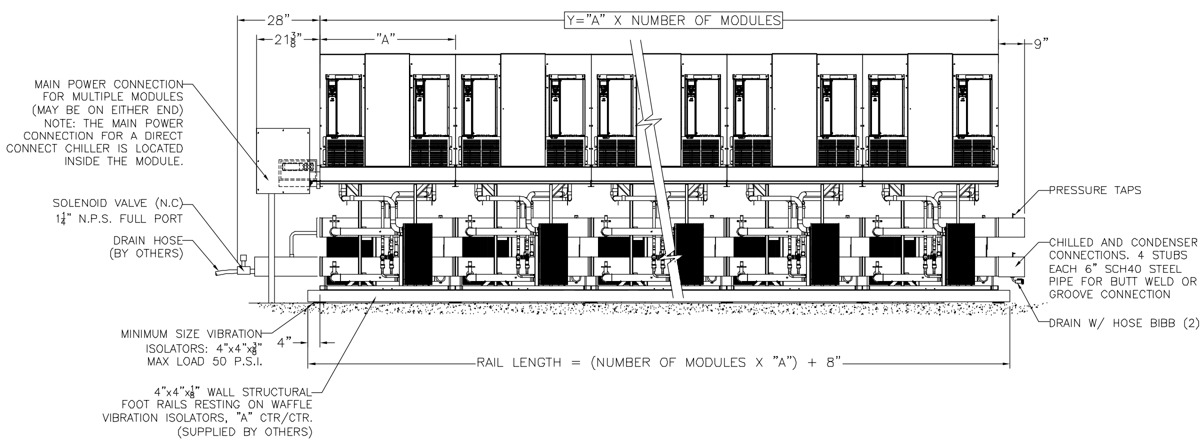
MS030V–MS050V 208–230v
WATER COOLED/DHRC – 6" HEADERS
TOTAL ACCESS – NO PANELS

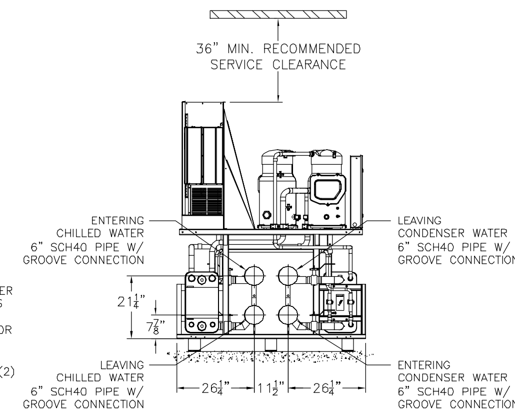
DIMENSIONS & ESTIMATED WEIGHTS

MODULE (VOLTAGE)	A	B	C	SHIPPING (LBS)	OPERATING (LBS)
MS030V (208-230v)	46"	64"	81"	2360	2570
MS040V (208-230v)	46"	64"	85"	2580	2790
MS050V (208-230v)	46"	64"	81"	2775	2985









LAYOUT DRAWINGS ARE FOR REFERENCE ONLY, DIMENSIONAL DATA IS SUBJECT TO CHANGE UPON FINAL DESIGN

February 2021

MULTISTACK

Estimated AHRI 575 Sound Pressure Levels

(1) MSS030V

- Total Access design
- 3333 RPM full load
- Optional indoor acoustic panels

		Average Sound Pressure Level at 1m, dB re 20 µPa	
	Panels	No	Yes
Octave Band (Hz)	63	64.5	63
	125	60.5	58.5
	250	61.5	55
	500	64	52.5
	1000	62.5	50
	2000	63	45.5
	4000	65	50.5
	8000	65	54
Total dBA		**72**	**58.5**

NOTES:

1. Sound levels are estimated per AHRI 575.
2. Octave band levels are linear (non-weighted). Total is A-weighted.