

DGX-118-H32

Unit Performance

Design Conditions					
Elevation (ft)	Summer		Winter (°F)	Supply (CFM)	Outdoor Air (CFM)
	DB (°F)	WB (°F)			
965	93.4	78.4	-6.9	9,376	9,376

Unit Specifications					
Qty	Weight (lb)	Cooling Type	Heating Type	Unit Installation	Unit ETL Listing
1	1,569 (+/- 5%)	None	Direct Gas-Fired	Outdoor/Indoor	ANSI Z83.4 / CSA 3.7

Configuration				
Unit Orientation	Unit Configuration	Outdoor Air Intake	Return Air Intake	Supply Air Discharge
Horizontal	Constant Volume 100% OA	End	-	Bottom

Heating Specifications								
Type	Gas Type	Gas Pressure		Capacity (MBH)		Temperature Rise (°F)	Performance	
		Min (in. wg)	Max (Psi)	Input	Output		EAT (°F)	LAT (°F)
Direct Gas	Natural	12	0.5	800.0	736.0	72.7	-7.0	65.8

Air Performance									
Type	Total Volume (CFM)	External SP (in. wg)	Total SP (in. wg)	RPM	Operating Power (hp)	Fan			
						Qty	Type	Size (in.)	Drive-Type
Supply	9,376	1	1.907	935	7.06	1	Forward Curve	18	Belt-Drive

Motor Specifications					
Motor	Qty	Size (HP)	Enclosure	Efficiency	RPM
Supply Fan Motor	1	7-1/2	ODP	NEMA Premium	1725

Electrical Specifications			
Power Supply	Rating (V/C/P)	MCA (A)	MOP (A)
Unit	460/60/3	14.6	25



CONSTRUCTION FEATURES AND ACCESSORIES

Unit		Accessories	
Unit Installation - Indoor or Outdoor	Std	Factory Installed, Lockable, NEMA 3R Disconnect	Std
Unit Construction - Double Wall	X	Weatherhood - Aluminum Mesh filtered	X
Wall Insulation - 1in. fiberglass - Heat source on	X	Supply Air Filters	
Base Insulation - 1in. fiberglass - entire unit base pan	Std	Outdoor Air Inlet Damper - Low leakage	X
Paneled Bottom - Sheet metal liner for base insulation		Supply Air Outlet Damper	
Corrosion Resistant Fasteners	Std	Return Air Damper	
Access and Connections - Right side when facing intake	X	Diffuser	
Service Access - Hinged access doors	X	Roof Curb	
Unit Finish - Permatector ASTM B117 salt spray 2500 hours	X	Combination Curb	
Finish Color - Concrete Gray (RAL 7023)	X	Electrofin Coil Coating	
Supply Fan - Belt-drive, forward-curved	X	Fan Bearing Extended Lube Lines	
Supply Fan and Motor Vibration isolation - Neoprene	X	Inlet Damper Module	
Controls		Spare Belts	
Unit Controls - Microprocessor	X	Spare Filters	
Remote Panel		Motor with Shaft Grounding	
BMS Communication - Monitoring and control	X	Service Outlet	
BMS Protocol - BACnet MSTP	X	Service Lights	
Temperature Control - Discharge control	X	Gas Heating Accessories	
Supply Fan VFD - VFD by factory	X	Pilot Ignition	Std
Supply Fan Control - Constant Volume	X	Flame Sensing - Flame rod	X
Unoccupied Mode (Night Setback)		Flame Safeguard Display	
Control Accessories		Agency Approval - ETL	Std
Remote display		FM Compliant	X
Heating Inlet Air Sensor	X	High Gas Pressure Switch	
Cooling Inlet Air Sensor		Low Gas Pressure Switch	
Dirty Filter Switch		Visual Indication Valves	
Fire Stat Type III (Ships loose)		Proof of Closure Valve	
120V/24V Smoke Detector (Ships loose)		External Gas Pressure Regulator (Ships loose)	
Inlet Damper End Switch		Carbon Dioxide Sensor (Ships loose)	
External Cooling Lockout Relay		Warranty Options	
Freeze Protection (Supply Air Low Limit)	X	Unit Warranty - 1 Year	X
Auxiliary Supply Starter Contacts		5 Year Compressor Warranty	
Auxiliary Exhaust Starter Contacts		5 Year Burner Warranty	
Airflow Proving Monitoring Contact		10 Year Burner Warranty	

Standard Option	Std
Not Included	
Included	X

Notes

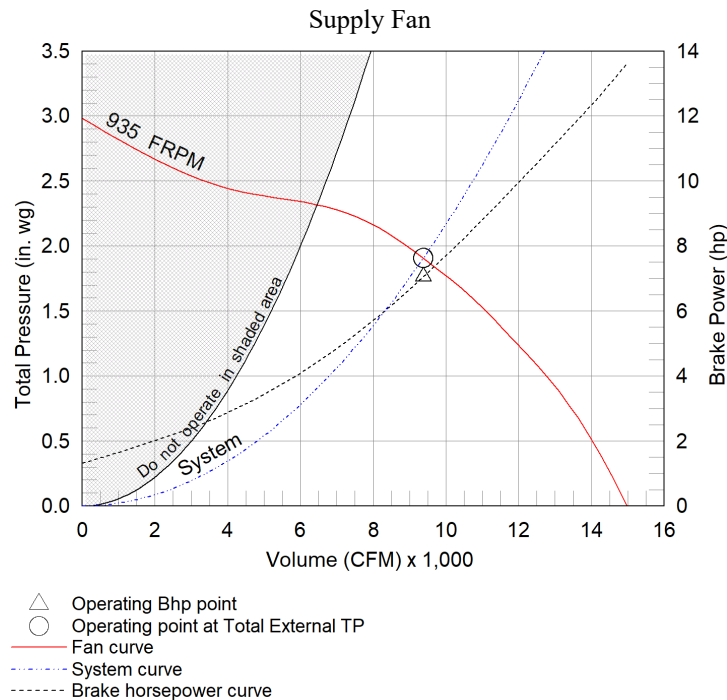
Damper(s) supplied are low leakage, motorized VCD-23 (leakage rate of 3 CFM/ft² @ 1 in.wg), Class 1A
Verify that the correct BMS Protocol has been selected before ordering.

Fan Charts And Performance

Supply Fan Performance									
Total Volume (CFM)	External SP (in. wg)	Total SP (in. wg)	RPM	Operating Power (hp)	Motor		Fan		
					Qty	Size (HP)	Qty	Type	Drive-Type
9,376	1	1.907	935	7.06	1	7-1/2	1	Forward Curve	Belt

Pressure Drop (in. wg)						
Weatherhood	Filter	Damper	Cooling	Heating	External	Total
0.183	-	0.099	-	0.625	1	1.907

Sound Performance in Accordance with AMCA									
Sound Power by Octave Band								Lwa	dBA
62.5	125	250	500	1000	2000	4000	8000		
98	89	85	84	83	82	79	74	89	78
								Sones	
								31	



Heating Specifications

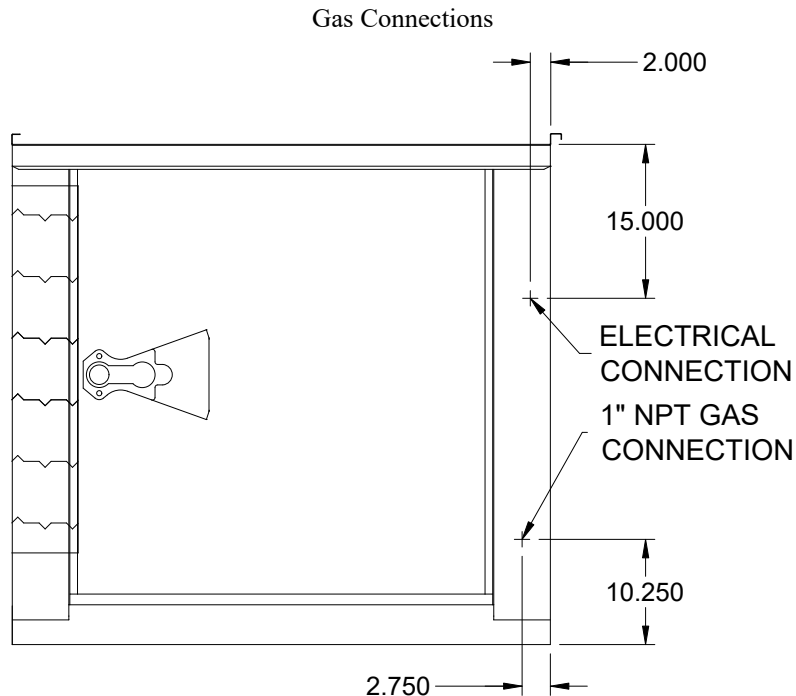
Heating Performance								
Type	Gas Type	Gas Pressure		Capacity (MBH)		Temperature Rise (°F)	Performance	
		Min (in. wg)	Max (Psi)	Input	Output		EAT (°F)	LAT (°F)
Direct Gas	Natural	12	0.5	800.0	736.0	72.7	-7.0	65.8

Gas Train Details							
Redundant Main Valves	Electronic Modulating Valve	Pilot Valve	Internal Regulator	Visual Indication Valve	Proof of Closure Valve	Gas Pressure Switch(es)	External Regulator
Std	Std	Std	Std	-	-	-	-

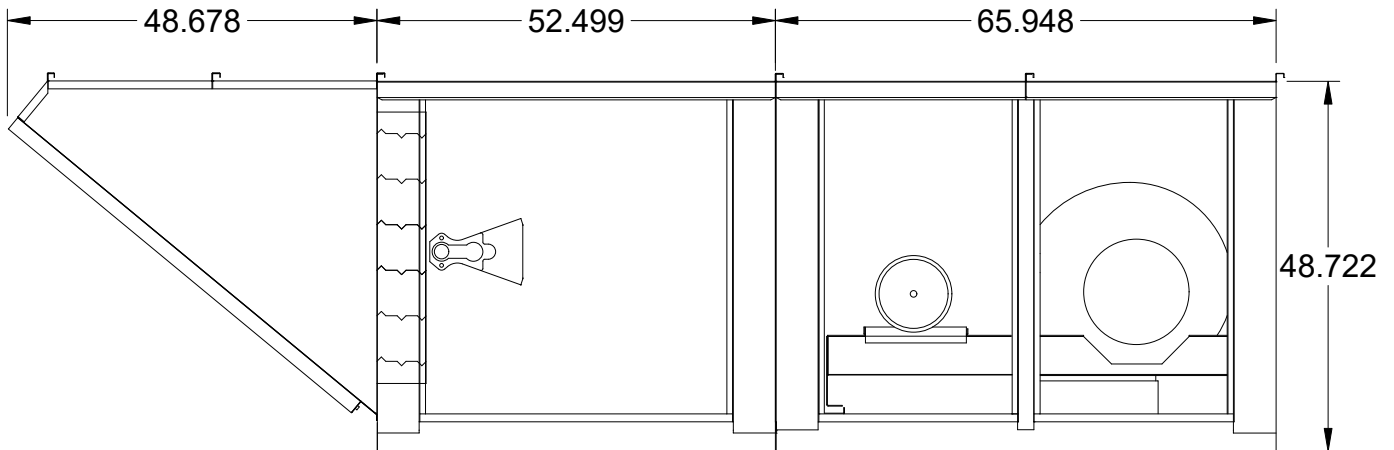
Additional Heating Information						
ETL Approved	FM Compliant	Temperature Control	Flame Sensing	Ignition Control	CO2 Sensor	Flame Safeguard Display
Std	Yes	Discharge	Flame Rod	Pilot	-	-

Unit Details
92% thermal efficiency
Cast aluminum burner manifold with stainless steel mixing plates
Electronic modulation burner control

10 second pre-purge sequence
Low fire start



ELEVATION VIEW



Notes - Elevation View

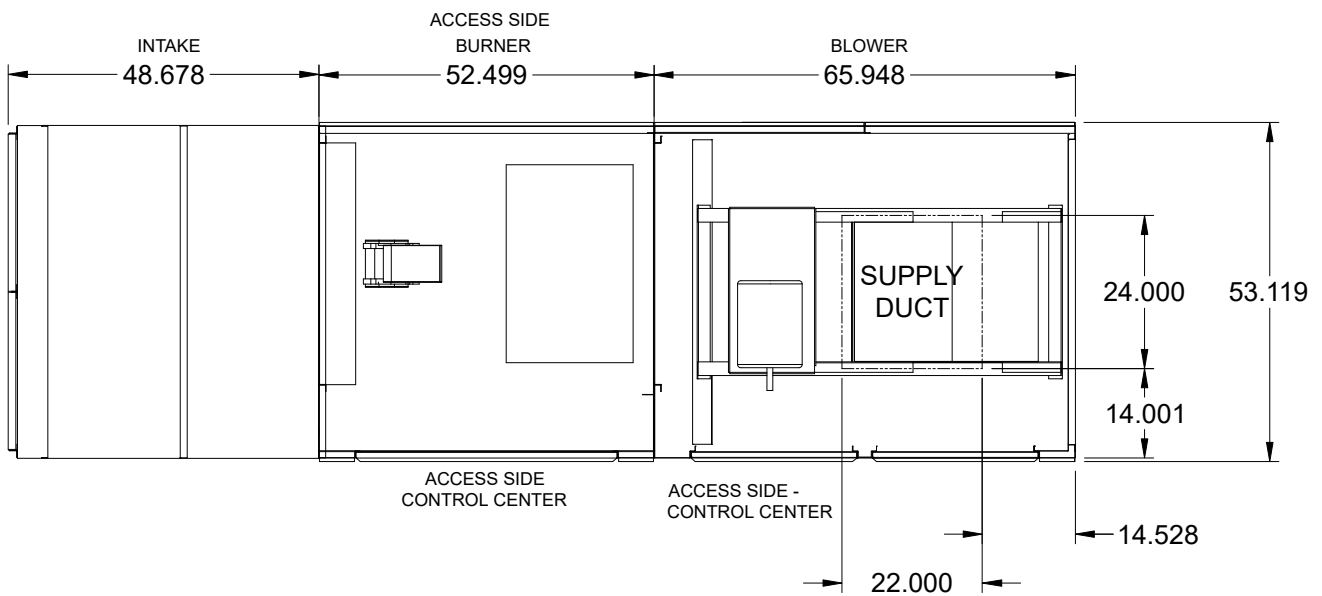
Standard configuration for unit access is on the right-hand side, when looking into the unit intake in the direction of airflow.

Order of unit sections is from intake of unit to discharge of unit.

Sections included on this unit: Weatherhood Section, Heating Section, Blower Section

Insulation: Double Wall, from Burner Section through end of unit.

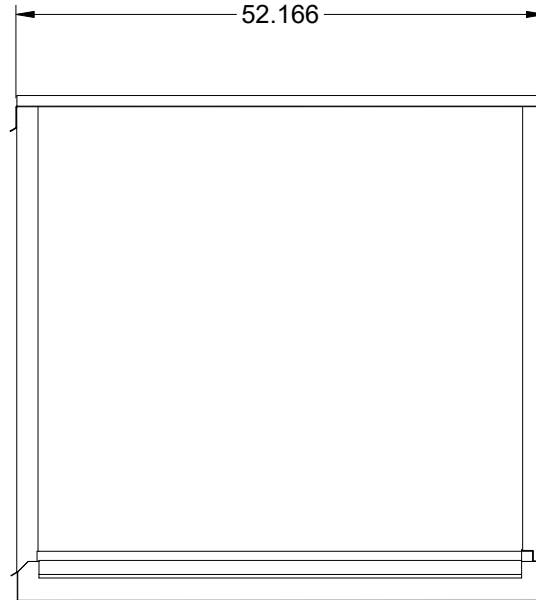
PLAN VIEW



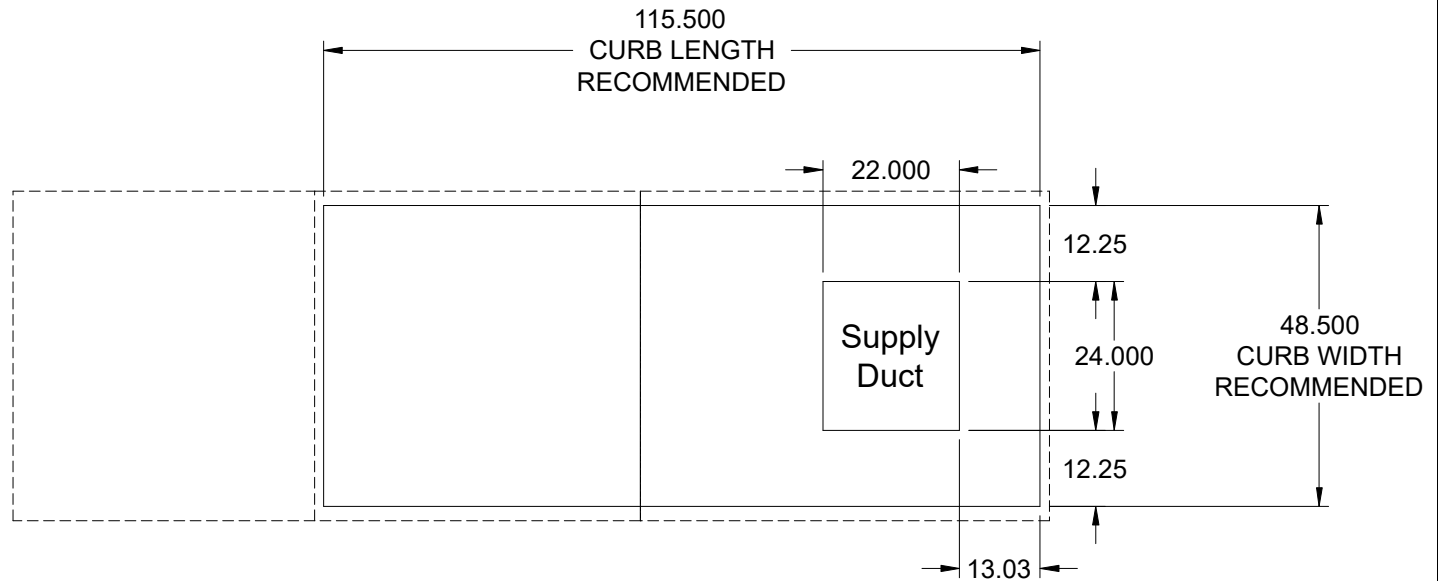
Notes - Plan View

Standard configuration for unit access is on the right-hand side, when looking into the unit intake in the direction of airflow.

END VIEW



FOOTPRINT VIEW



Notes - Footprint View

Minimum Roof Opening: The minimum roof opening size is the illustrated duct diameter plus 0.25 in. on all sides. For example: If the duct size is 14 x 14 in. square, the minimum roof opening size is 14.5 x 14.5 in. square.

Maximum Roof Opening: There must be a minimum perimeter of 1.75 in. between the roof opening and the roof curb. For example: If the roof curb is 75 x 30 in. square, the maximum roof opening is 71.5 x 26.5 in. inches square.

The weatherhood and filter sections of the make-up air unit extend beyond the curb. This is by design, to prevent water infiltration.

Clearance Specifications

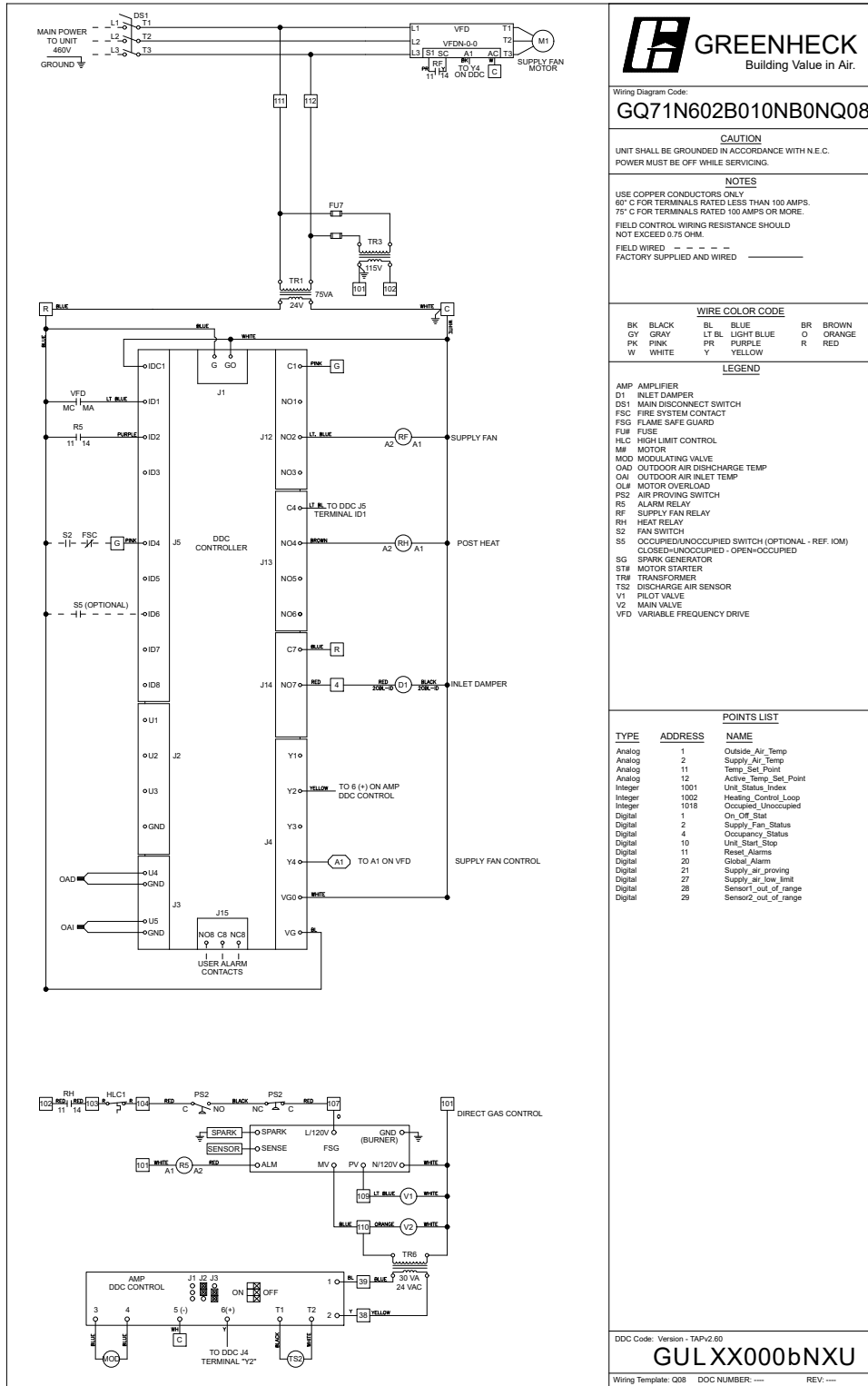
Recommended Minimum Combustible Clearances				
	Floor (in.)	Top (in.)	Sides (in.)	Ends (in.)
Insulated Units	0	0	0	0
Non-Insulated Units	0	6	6	6

Notes - Combustible Clearances
Clearance to combustibles is defined as the minimum distance required between the heating source and the adjacent combustible surfaces to ensure the adjacent surface's temperature does not exceed 90 F above the ambient temperature.

Recommended Minimum Service Clearances	
Housing 32 and less (in.)	Housing 35 and higher (in.)
42 on the controls side of the unit	48 on the controls side of the unit

Notes - Service Clearances
To ensure ample space for component removal (evaporative cooling media, coils, filters, etc.), service clearances should be 6 in. wider than the width of the module itself.

Wiring Diagram

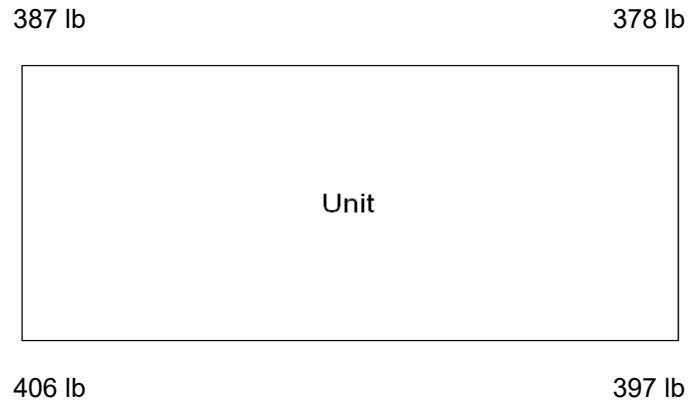


Manufacturer reserves the right to change, modify, or improve this product at anytime

BMS Protocol Points List

Greenheck Monitoring Interface v2.6 Modbus/BACnet Points List											
Type	BACnet Device Instance: 77000 (Default) Analog/Integer = AV, Digital = BV				Modbus-RTU/TCP/IP Network Address: 1		Read (R) Write (W)	Description		Included	
	Instance	Name	Units	Register							
Analog	1	Outside_Air_Temp	degree F	40002		R/W		Outdoor Air Temp (###.# F)			X
Analog	2	Supply_Air_Temp	degree F	40003		R		Supply Air Temp (###.# F)			X
Analog	4	Room_Air_Temp	degree F	40005		R/W		Room AirTemp (if installed) (###.# F)			
Analog	11	Temp_Set_Point	degree F	40012		R/W		Temp. Set Pt (###.# F) (See Controller IOM)			X
Analog	12	Active_Temp_Set_Point	degree F	40013		R		Active Temperature Set Point (###.# F)			X
Integer	1001	Unit_Status_Index	no-units	45003		R		Note 1 (See below)			X
Integer	1002	Heating_Control_Loop	percent	45004		R		Heater output (0-100%)			X
Integer	1003	Cooling_Control_Loop	percent	45005		R		Cooling output (0-100%)			
Integer	1006	CO2_Level	ppm	45008		R		CO2 Levels (ppm)			
Integer	1007	CO2_Set_Point	ppm	45009		R/W		CO2 Set Point (ppm)			
Integer	1008	Supply_VFD_Speed	percent	45010		R		Supply Fan VFD Speed (0-100%)			
Integer	1009	Supply_VFD_SetPt	percent	45011		R/W		Supply Fan VFD Set Point (0-100%)			
Integer	1012	OA_Damper_Position	percent	45014		R		Outdoor Damper Position (0-100%)			
Integer	1013	OA_Damper_SetPt	percent	45015		R/W		Minimum OA Damper Position (0-100%)			
Integer	1014	Duct_Pressure	no-units	45016		R		Supply Duct Pressure (#.###"WC)			
Integer	1015	Duct_Pressure_SetPt	no-units	45017		R/W		Supply Duct Pressure Set Point (value/100=#.###"WC)			
Integer	1016	Building_Pressure	no-units	45018		R		Building Pressure (value/1000 = 0.###"WC)			
Integer	1017	Building_Pressure_SetPt	no-units	45019		R/W		Building Pressure Set Point (value/1000 = 0.###"WC)			
Integer	1018	Occupied_Unoccupied	no-units	45020		R/W		Occupancy command (0=occupied, 1=unoccupied, 2=MWU)			X
Integer	1019	IG_Alarm	no-units	45021		R		IG Alarm - Convert to binary (See chart below)			
			Inactive_Text	Active_Text							
Digital	1	On_Off_Stat	Off	On	10002		R	Unit ON/OFF Status			X
Digital	2	Supply_Fan_Status	Off	On	10003		R	Supply fan status			X
Digital	3	Exhaust_Fan_Status	Off	On	10004		R	Exhaust fan status			X
Digital	4	Occupancy_Status	Unoccupied	Occupied	10005		R	Occupancy Status (0=Unoccupied 1=Occupied)			X
Digital	5	Stage_Compressor1_Status	Off	On	10006		R	Stage Compressor #1 status			
Digital	6	Stage_Compressor2_Status	Off	On	10007		R	Stage Compressor #2 status			
Digital	10	Unit_Start_Stop	Stop	Start	10011		R/W	Unit start/stop command			X
Digital	11	Reset_Alarm	Don't Reset	Reset Alarms	10012		R/W	Reset alarms command			X
Digital	20	Global_Alarm	Off	Alarm	10021		R	Global Alarm Indication (active when there is at least one alarm)			X
Digital	21	Supply_air_proving	Off	Alarm	10022		R	Supply airflow proving alarm			X
Digital	24	Exhaust_air_proving	Off	Alarm	10025		R	Exhaust airflow proving alarm			
Digital	25	Dirty_filter	Off	Alarm	10026		R	Dirty filter alarm			
Digital	26	Compressor_trip	Off	Alarm	10027		R	Compressor trip alarm			
Digital	27	Supply_air_low_limit	Off	Alarm	10028		R	Supply air temperature low limit alarm			X
Digital	28	Sensor1_out_of_range	Off	Alarm	10029		R	Sensor #1 out of range (outside air temperature)			X
Digital	29	Sensor2_out_of_range	Off	Alarm	10030		R	Sensor #2 out of range (supply air temperature)			X
Digital	31	Sensor4_out_of_range	Off	Alarm	10032		R	Sensor #4 out of range (room temperature)			
Digital	34	Sensor7_out_of_range	Off	Alarm	10035		R	Sensor #7 out of range (building pressure sensor)			
Digital	35	Sensor8_out_of_range	Off	Alarm	10036		R	Sensor #8 out of range (duct pressure sensor)			
Digital	36	Sensor#9_out_of_range	Off	Alarm	10037		R	Sensor #9 out of range (CO2 sensor)			
Digital	37	Sensor10_out_of_range	Off	Alarm	10038		R	Sensor #10 out of range (auxiliary temp)			
Unit Status Index											
0	System Off	4	Supply Fan Starting	8	Sys On-Heating	12	Sys On-Dehumid & Reheat	16	Unocc-Cooling	20	Remote Off
1	Initial Delay	5	System On	9	Sys On-Cooling	13	Unocc-Unit Off	17	Unocc-Dehumid	21	Alarm
2	Opening Dampers	6	Defrost Mode Active	10	Sys On-Econ & Cooling	14	Unocc-Unit On	18	Unocc-Dehumid & Reheat		
3	Exhaust Fan Starting	7	Sys On-Economizer	11	Sys On-Dehumidifying	15	Unocc-Heating	19	Manual Override		

Corner Weights



SEQUENCE OF OPERATIONS

Unit Controls

The unit shall be provided from the factory with:

- 24VAC Transformer
- Terminal Strip
- Supply Fan VFD
- Factory mounted and wired outdoor air inlet damper with actuator

Microprocessor Controller

The microprocessor control shall be factory programmed, mounted, wired and tested. Controller shall have a lighted LCD display and keypad for changing set points and monitoring unit operation. The controller shall be equipped with the following sensors:

- Outdoor air temperature sensor
- Supply discharge temperature sensor

Building Management System (BMS) Communication

The microprocessor controller shall be capable of integrating into a building management system (bms) to allow the bms to remotely adjust set points, view unit status points and alarms. the microprocessor shall include the required bms card to communicate over the following protocol:

- BACnet® MSTP

Unit Start Command

A contact closure or jumper wire must be field wired between terminals R and G to enable the unit. When terminal G is energized the unit shall operate as described below. When terminal G is de-energized the unit is disabled.

Internal Time Clock (Schedule)

The microprocessor controller is equipped with an internal 7-day programmable time clock, allowing the user to add up to seven different occupancy schedules. The user may also add up to 15 holidays for additional energy savings.

Occupied/Unoccupied Modes

The microprocessor controller offers the following modes for determining occupancy:

- The internal time clock
- A remote contact (see wiring diagram for details)
- The Building Management System (BMS)

The unit can be temporarily overridden to the occupied mode via a dry contact or the keypad display. After the override time has expired (1 hr, adj) the unit will return to the scheduled occupied/unoccupied mode.

Occupied Mode Unit Start-Up Sequence

- Unit enable input must be closed (contact closure between R and G).
- Initial delay, microprocessor controller initialization sequence.
- Factory mounted and wired outdoor air inlet damper actuator is powered open.
- Supply fan starts after 10 second (adj.) delay.
- Tempering operation begins (see modes below).

Supply Fan Sequence (Occupied)

The unit has been provided with a factory mounted variable frequency drive (VFD). The variable frequency drive shall control the supply fan speed as indicated by the following sequence:

Constant Volume:

The VFD shall be programmed from the factory for a constant supply fan speed. This is to be adjusted for air balancing only and is not to be modulated. The microprocessor controller has no control or monitoring of the supply fan speed.

Heating Control

The heating will be locked out when the outside air is above the heating lockout set point (65 F adj.). When enabled heating will be controlled as follows:

Direct Gas Fired Heating

The microprocessor controller will modulate the direct gas burner to maintain the active supply temperature set point.

Supply Temperature Set Point Control (Occupied)

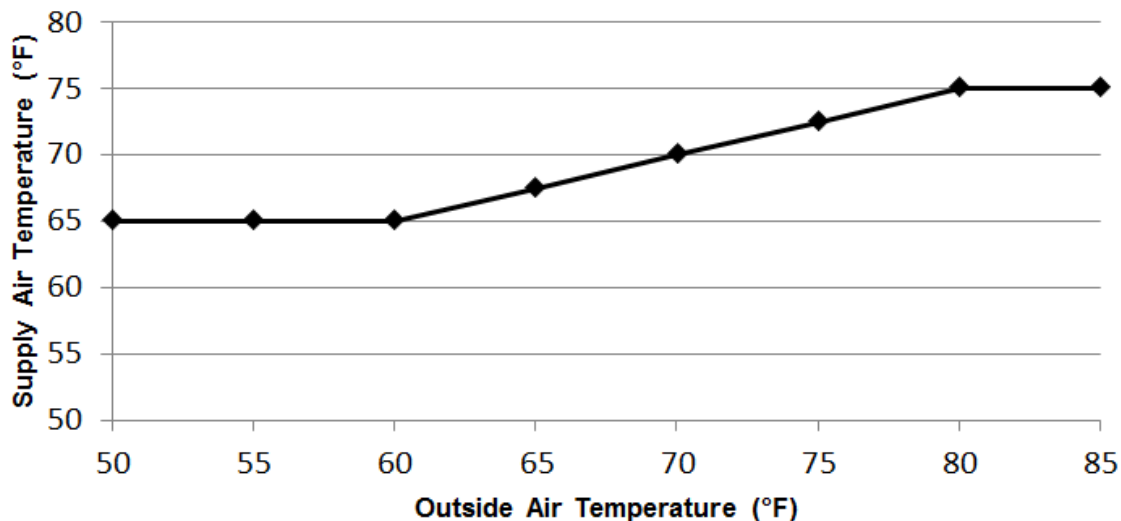
The active supply temperature set point shall be adjusted (field selectable):

- Locally at the controller.
- Remotely by the BMS.
- Reset based upon outside air temperature (field selectable)

Outside Air Reset Sequence

The microprocessor controller monitors the outdoor air temperature and adjusts the desired supply temperature set point accordingly. For example, when the outdoor air is above 80 F, the controller will change the supply set point to 75 F. If the outdoor air is below 60 F, the controller will change the supply set point to 65 F. If the outdoor air temperature is between 60 F and 80 F the supply set point is changed according to the outdoor air reset function. The outside air reset function is field adjustable locally at the controller.

Outdoor Air Reset Function



Unoccupied Mode (Disabled)

- Supply Fan Is OFF
- Factory mounted and wired outdoor air inlet damper actuator is de-energized and spring returns to the closed position.

Supply Air Low Limit

If the supply air temperature drops below 35 F (adj.) for 300 seconds (adj.), the controller will de-energize the unit and generate an alarm.

Alarm Management

The microprocessor controller will monitor the unit status for alarm conditions. Upon detecting an alarm, the

controller will record the alarm description, time, date, available temperatures, and unit status for user review. A digital output is reserved for remote alarm indication.

Alarms are also communicated to the Building Management System (BMS).

Possible Alarms Include:

- **Global Alarm**
Indication that one or more alarms are present.
- **Outdoor Air Inlet Temperature Sensor Alarm**
Outdoor Air Inlet Temperature Sensor Alarm: Failure of the outdoor air inlet temperature sensor.
- **Supply Air Discharge Temperature Sensor Alarm**
Failure of the supply air discharge temperature sensor. Unit is shut down.
- **Supply Air Low Limit Alarm**
Supply air has fallen below 35 F (adj.) for 300 seconds (adj.). Unit is shut down.
- **Direct Gas Burner Alarm**
Indicates an ignition controller flame failure alarm. Requires manual reset at the unit.
- **Supply Fan Alarm**
Indicates the supply fan failed to prove for a 30 second (adj.) period.

Warranty Statement for Make-Up Air

Unit Warranty

Greenheck warrants the equipment to be free from defects in material and workmanship for a period of 1 year (standard) from the shipment date.

DG Burner Extended Warranty

The warranty does not include items deemed as consumable components, including, but not limited to: Igniters, Spark rods, Spark generator, Flame rods, Flame wires, UV eye components, and associated components.

Note: Rust, discoloration of the burner material and cracks or holes smaller than .75 in. is not qualification for a defective burner.

Warranty Notes

Any component which proves defective during the warranty period will be repaired or replaced at Greenheck's sole option when returned to our factory, transportation prepaid. All warranties do not include labor costs associated with troubleshooting, removal, or installation. Greenheck will not be liable for any consequential, punitive, or incidental damages resulting from use, repair, or operation of any Greenheck product. These warranties are exclusive and are in lieu of all other warranties, whether written, oral, or implied, including the warranty of merchantability and the warranty of fitness for a particular purpose. No person (including any agent or salesperson) has authority to expand Seller's obligation beyond the terms of this warranty, or to state that the performance of the product is other than that published by Seller.

As a result of our commitment to continuous improvement, Greenheck reserves the right to change specifications without notice.