

Airedale Vertical HP - Equipment Scope Summary

TWENTY-FIVE (25) AIREDALE VERTICAL GROUND SOURCE HEAT PUMP UNITS, SCHOOLMATE MODEL SMG:

Tag: HP-101, HP-102, HP-103, HP-108, HP-109, HP-110, HP-114, HP-115, HP-116, HP-128, HP-129, HP-133, HP-134, HP-153, HP-155, HP-156, HP-157, HP-162, HP-164, HP-169, HP-170, HP-171, HP-172, HP-176, HP-177, HP-178

- Packaged Geothermal Heat Pump Unit, R454B Refrigerant  provide refrigerant detection and purge option
- 16 Gauge Case Construction with choice of one standard finish
- Solid Door Construction, Side Return Air Openings as scheduled, Acoustic Sound Reduction Package
- Modulating OA Damper with Actuator, Demand Control Ventilation
- Secondary OA Isolation Damper with Actuator
- Supply Fan Assembly with ECM Motor
- Gravity Barometric Relief Damper
- Airedale Factory Control System with BACnet Card - Controller, OA/RA/SA Temp Sensors, CO2 Sensor, Digital Touch-Screen Wall T-Stat
- Hot Gas Reheat Coil - Dehumidification Sequence
- Phase Failure Relay - Sequence, Asymmetry, Over-Under Voltage
- Top Piping Connections with *Internal Copper Piping to Coaxial Coil*
- 3-Way Head Pressure Control Valve, Factory Installed
- Source Circulating Pump - B&G Model PL
- Top 2-Way or 3-Way Discharge Air Plenum - *1 Solid piece construction extending full ceiling height*
- Standard Adjustable Factory Wall Sleeve with Splitter-Plate
- 2" Deep AMCA-Rated Exterior Wall Louver with 70% PVDF Fluoropolymer AAMA 2605 Finish
- Two (2) MERV-8 Supply Air Filters (1 Spare Set Included)
- 5-Year Extended Compressor Warranty
- Factory Startup & Owner Training
- Supply Voltage: 208/60/3

Provide disconnect switch



SchoolMate[®] Water Source Heat Pump Unit

Model SMG24 & SMG36

AIREDALE

MODINE[®]
Always Innovating. Always Improving.



SUBMITTAL SCHEDULE & DATA

Technical Specifications – Single Packaged Vertical Heat Pumps

Unit Tags		<i>HP-102, HP-103, HP-108, HP-109, HP-110, HP-114, HP-115, HP-116, HP-128, HP-129, HP-133, HP-134, HP-153, HP-155, HP-156, HP-170, HP-171, HP-172, HP-176, HP-177</i>	<i>HP-101, HP-157, HP-162, HP-164, HP-169</i>
Model Number		SMG24DDCGABNNA00CN	SMG36DDCGABNNA00GN
Model Type		Ground Source Heat Pump	Ground Source Heat Pump
Refrigerant Type		R-454B	R-454B
Refrigerant Charge	lbs	5.00	5.00
Minimum Room Size (1)	ft ²	271	271
Quantity of Units		20	5
DX COOLING PERFORMANCE (2)			
Outdoor Air Temp (DB/WB)	°F	95.0 / 75.0	95.0 / 75.0
Condenser Airflow (CMD/CMP)	CFM	NA	NA
Coax Coil Entering Fluid Temp (SMG/SMW)	°F	77	77
Coax Coil Fluid Flow Rate (SMG/SMW)	GPM	6	9
Evap Coil Entering Air Temp (DB/WB)	°F	80.0 / 67.0	80.0 / 67.0
Cooling Capacity Total	Btu/hr	25,100	38,700
Cooling Capacity Sensible	Btu/hr	19,200	28,100
Cooling Capacity Latent	Btu/hr	5,900	10,600
Heat of Rejection (models SMG/SMW only)	Btu/hr	30,000	45,600
Cooling Leaving Air Temp (DB/WB)	°F	58.2 / 57.1	56.8 / 55.7
EER		18.00	17.50
IEER		NA	NA
Efficiency Rating Conditions		80.6/66.2°F DB/WB Entering Coil, 77°F Entering Fluid	80.6/66.2°F DB/WB Entering Coil, 77°F Entering Fluid
HEAT PUMP HTG PERFORMANCE (2)			
Outdoor Air Temp (DB)	°F	-10.0	-10.0
Coax Coil Entering Fluid Temp (SMG/SMW)	°F	32	32
Coax Coil Fluid Flow Rate (SMG/SMW)	GPM	6	9
Indoor Coil Entering Air Temp (DB)	°F	68	68
Heating Capacity	Btu/hr	19,400	30,300
Heat of Absorption (model SMG/SMW only)	Btu/hr	14,600	23,200
Heating Leaving Air Temp (DB)	°F	90.5	93.5
COP		3.90	3.80
Efficiency Rating Conditions		68°F DB Entering Coil, 32°F Entering Fluid	68°F DB Entering Coil, 32°F Entering Fluid
SUPPLY FAN			
Fan Type (Quantity 1)		Direct Drive Centrifugal	Direct Drive Centrifugal
Nominal Airflow	CFM	800	1100 (Tap down -15%)
Motor Size	Hp	3/4	3/4
Max External Static Pressure	" WC	0.5	0.5

(1) Minimum Room Size in accordance with UL 60335-2-40 Annex GG based on system refrigerant volume.

(2) Performance shown is based on full load at conditions shown. Heat pump performance only applies to models CMP, SMG, SMW.

(continued next page)



SUBMITTAL SCHEDULE & DATA

Technical Specifications – Single Packaged Vertical Heat Pumps (Continued)

Unit Tags		HP-102, HP-103, HP-108, HP-109, HP-110, HP-114, HP-115, HP-116, HP-128, HP-129, HP-133, HP-134, HP-153, HP-155, HP-156, HP-170, HP-171, HP-172, HP-176, HP-177	HP-101, HP-157, HP-162, HP-164, HP-169	
Model Number		SMG24DDCGABNNA00CN	SMG36DDCGABNNA00GN	
ELECTRICAL DATA				
Supply Voltage		208/60/3	208/60/3	
FLA		10.7	15.6	
MCA		12.3	18.1	
MOP		15.0	25.0	
WEIGHT				
Weight – Unit Only	lbs	650	654	
Weight – Unit + Options/Accessories (5)	lbs	754	758	

- (3) Detailed Performance of Energy Wheel is given later in submittal. Heating + Energy Wheel Capacity is "NA" if no wheel is selected.
- (4) When unit is selected with Energy Wheel, Mixed Air Temp is the mix of Air Off Wheel Temp and Return Air Temp.
- (5) For Heat Pump units (CMP, SMG, and SMW) with two stage electric heat, when in Heat Pump On mode, the electric heat operates on low stage only to provide auxiliary heat. When in Heat Pump Off mode because of low outside ambient, electric heat can operate with both stages for backup heat.
- (6) Weight is Base Unit + Options and Accessories including shipped loose Accessories such as Rear Extensions, Plenums, Filler Panels, Wall Sleeves, Louvers and Condensing Units (if applicable).

PRESSURE DROP:

							PG 25%
							UNIT PSID*
cooling	unit size	eat db	eat wb	ewt	fluid	Gpm	
	2T	80	67	85	25% pg	7	4.9
	3T	80	67	85	25% pg	9	8.1
	4T	80	67	85	25% pg	11	11.8
heating	5T	80	67	85	25% pg	13	15.4
	2T	42.7	-	45	25% pg	7	5.2
	3T	42.7	-	45	25% pg	9	8.5
	4T	42.7	-	45	25% pg	11	12.4
	5T	42.7	-	45	25% pg	13	16.1

*Includes pressure drop through waterside components (coax coil, strainer, modulating valve, holdback valve)



SMG MODEL NOMENCLATURE

Tag: HP-102, HP-103, HP-108, HP-109, HP-110, HP-114, HP-115, HP-116, HP-128, HP-129, HP-133, HP-134, HP-153, HP-155, HP-156, HP-170, HP-171, HP-172, HP-176, HP-177

1,2,3	4,5	6	7	8	9	10	11	12	13	14	15,16	17	18
SMG	24	D	D	C	G	A	B	N	N	A	00	C	N

1, 2, 3 – Product Type

SMG: Airedale SchoolMate Ground Source Heat Pump Unit

4,5 – Nominal Capacity

24: 24 MBH

6 – Supply Voltage

D: 208V/60Hz/3Ph

7 – Generation

D: Fourth Generation, R-454B

8 – Controls

C: Modine Control Systems - With BACnet

**DEMAND CONTROL VENTILATION
[DAMPER TO MODULATE BASED ON CO2]**

9 – Ventilation Configuration

G: Economizer with OA Damper with Gravity Damper

10 – Filtration

A: MERV 8

11 – Case Construction

B: 16 Gauge

12 – Door Mounted Stat ①

N: None

13 – Door Mounted Other Option ①

N: None

14 – Hot Gas Reheat & Condensate Pump Option

A: HGRH Coil, None

15,16 – Heating Option

00: None

17 – Coaxial Coil (SMG/SMW), DX Connections (CMS) Option

C: Copper Coil, Top Right Piping Connections, PL-36 Circ. Pump

18 – Hot Water Piping Package Option

N: None

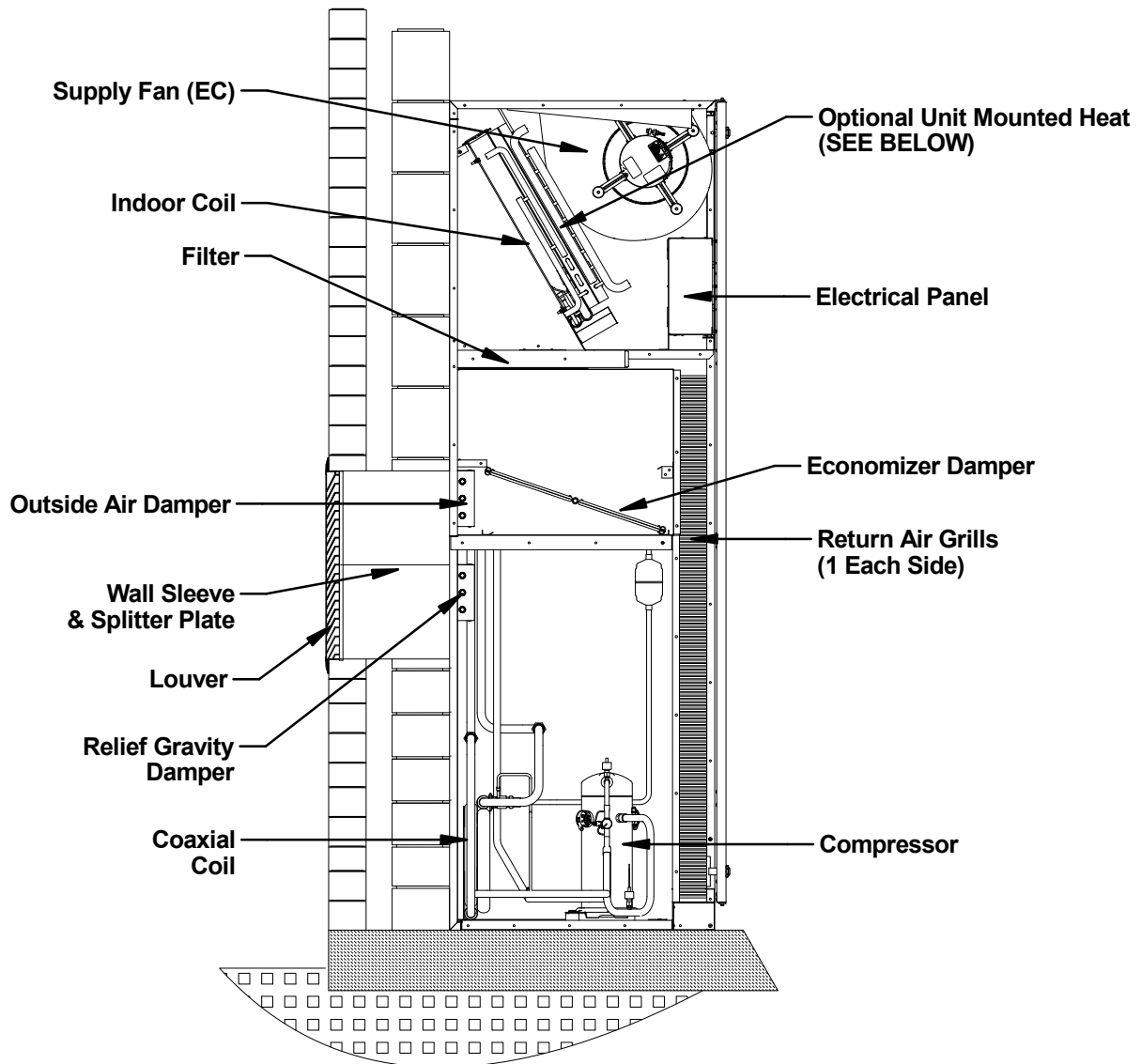
① If option is selected, the door mounted stat and/or other option will be separate line item(s) on the order.



GENERAL ARRANGEMENT

Model SMG24DDCGABNNA00CN - General Arrangement

Tag: HP-102, HP-103, HP-108, HP-109, HP-110, HP-114, HP-115, HP-116, HP-128, HP-129, HP-133, HP-134, HP-153, HP-155, HP-156, HP-170, HP-171, HP-172, HP-176, HP-177



This drawing is for general reference only. The actual unit construction may vary slightly based on the selected configuration.

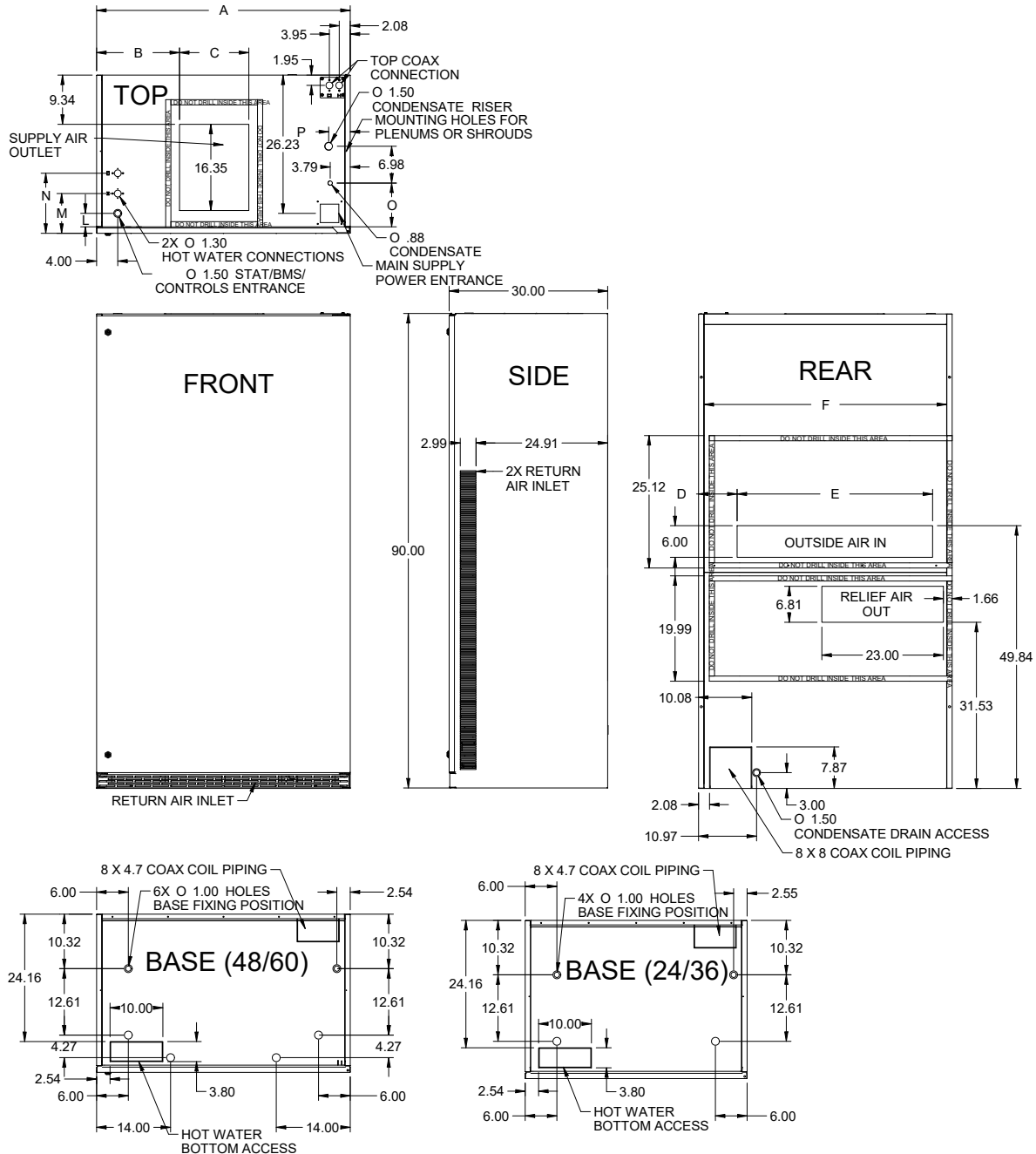
Optional Unit Mounted Heating: HGRH Coil (Dehum mode only)



DIMENSIONS – UNIT

Model SMG24DDCGABNNA00CN Dimensions

Tag: HP-102, HP-103, HP-108, HP-109, HP-110, HP-114, HP-115, HP-116, HP-128, HP-129, HP-133, HP-134, HP-153, HP-155, HP-156, HP-170, HP-171, HP-172, HP-176, HP-177



Unit Size 24 Dimensions (inches)

A	B	C	D	E	F	L	M	N	O	P	Coax Conn.
42.00	13.70	10.52	7.30	31.00	40.00	2.55	7.53	11.39	8.3	4.15	1" NPT Female

Supply Power Opening	Filters - (Qty) Dimensions	Approx. Weight (lbs.)	Relief Option
7/8" hole	(2) 16 x 25	650	Gravity Damper

Refer to the Installation and Service Manual for clearance requirements for service and performance.

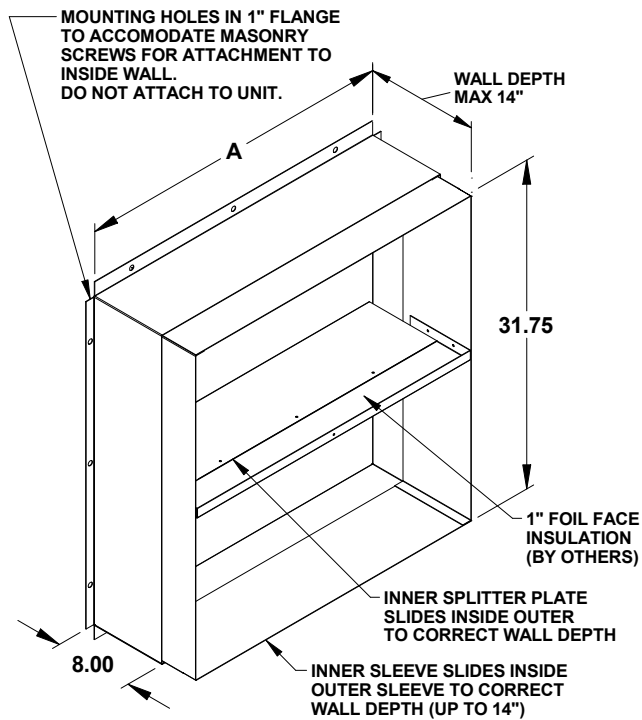


DIMENSIONS – WALL SLEEVE AND LOUVER

Model SMG24DDCGABNNA00CN Dimensions

Tag: HP-102, HP-103, HP-108, HP-109, HP-110, HP-114, HP-115, HP-116, HP-128, HP-129, HP-133, HP-134, HP-153, HP-155, HP-156, HP-170, HP-171, HP-172, HP-176, HP-177

Wall Sleeve

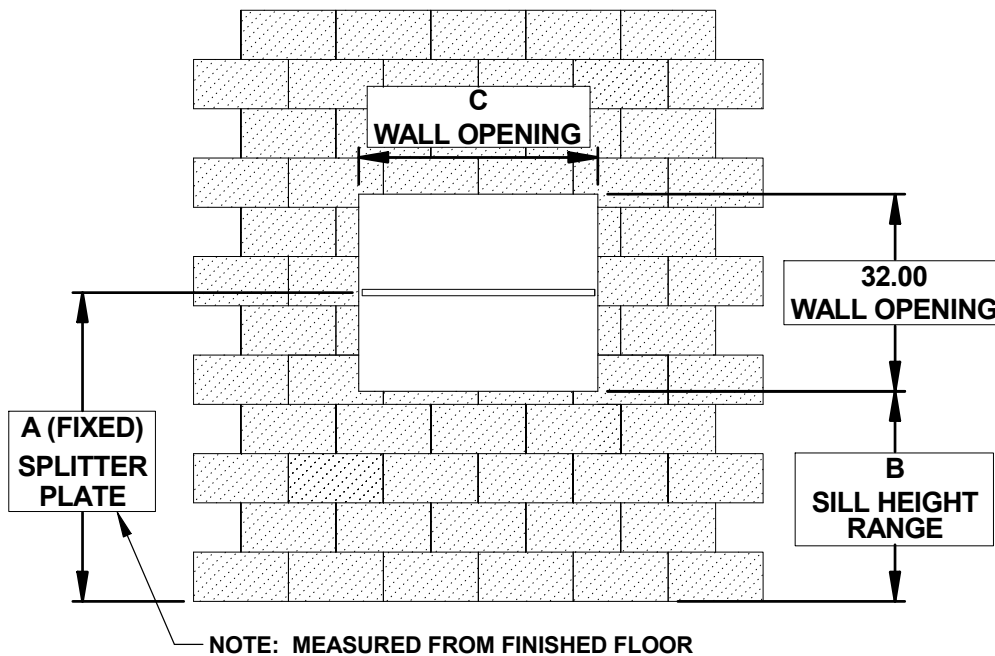


Dimension A: 39.75

DIMENSIONS – WALL OPENING

Model SMG24DDCGABNNA00CN Dimensions

Tag: HP-102, HP-103, HP-108, HP-109, HP-110, HP-114, HP-115, HP-116, HP-128, HP-129, HP-133, HP-134, HP-153, HP-155, HP-156, HP-170, HP-171, HP-172, HP-176, HP-177



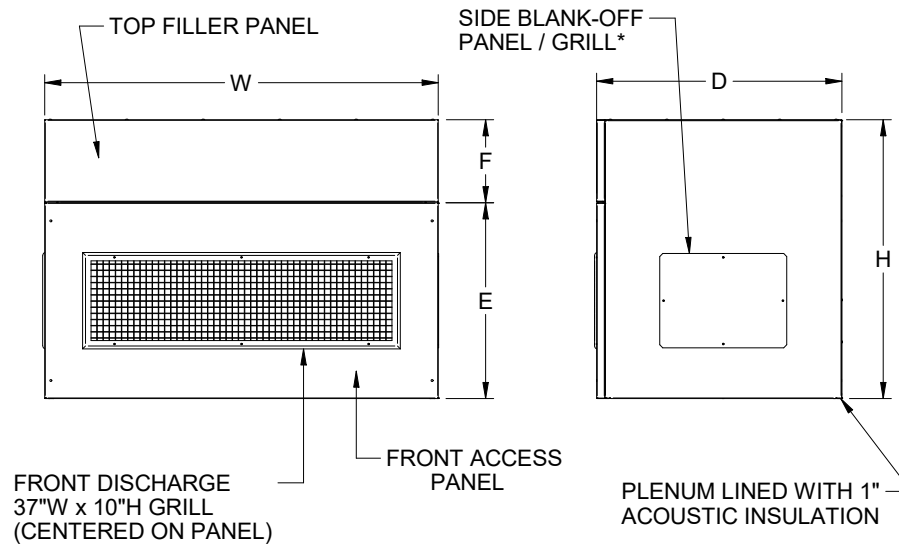
Wall Opening Dimensions (inches)

Splitter Plate A	Sill Height B	Wall Opening C
40.00	31.0" (Unit), 18.50 to 31.00 with Wall Sleeve & Louver	40.00

DIMENSIONS – PLENUM

Model SMG24DDCGABNNA00CN Dimensions – Plenum

Tag: HP-102, HP-103, HP-108, HP-109, HP-110, HP-114, HP-115, HP-116, HP-128, HP-129, HP-133, HP-134, HP-153, HP-155, HP-156, HP-170, HP-171, HP-172, HP-176, HP-177



Plenum Heating Option: None

Plenum Dimensions (inches)

Height H	Width W	Depth D	Front Access Panel E	Top Filler Panel F
24.00	42.00	30.00	18.00	6.00

*Note: Front + 1 Side Discharge plenums include one (1) 14"W x 10"H Side Discharge Grill and one (1) Side Blank-Off Panel. Grill and Panel can be installed on either side of plenum for left or right side discharge. Side Discharge Grill in-line with Front Discharge Grill.



COAXIAL COIL PIPING OPTIONS

Model SMG24DDCGABNNA00CN - General Arrangement

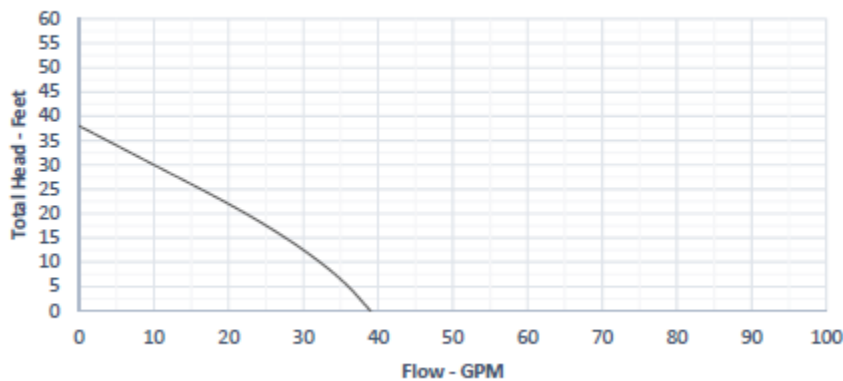
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Piping Components List

Component	Included
Source Circulating Pump PL-36	Yes
3-Way Control Valve (Custom)	Yes

Bell & Gossett PL-36 Performance Curve

Performance Curve



Performance curves are for reference only. Confirm current performance data with Bell & Gossett ESP-Systemwize online selection software.



BUILDING MANAGEMENT SYSTEM VARIABLES¹

Model SMG24DDCGABNNA00CN – Typical BACnet® Variables

Tag: HP-102, HP-103, HP-108, HP-109, HP-110, HP-114, HP-115, HP-116, HP-128, HP-129, HP-133, HP-134, HP-153, HP-155, HP-156, HP-170, HP-171, HP-172, HP-176, HP-177

ANALOG VARIABLES

V3.00

Object Instance	Variable Description	Carel Variable Name	Read/Write Access
1	Return Air Temperature	RA_Temp.Val	R
2	Indoor Coil Temperature	IC_Temp.Val	R
3	Outdoor Coil Temperature	OC_Temp.Val	R
4	Supply Air Temperature	SA_Temp.Val	R
5	Outdoor Air Temperature	OA_Temp.Val	R
6	Mixed Air Temperature	MA_Temp.Val	R
7	Ground Water Temperature	GW_Temp.Val	R
8	Liquid Line Pressure	LL_Pressure.Val	R
9	Current Control Temperature	Cntrl_Temperature	R
10	Occupied Cooling Setpoint from the Controller.	cpCO_Cooling_Setpoint	R/W
11	Offset from Occupied cooling setpoint to heating setpoint	Heating_Offset	R/W
12	Current Control Cooling Setpoint	Cntrl_Cooling_Setpoint	R
13	Current Control Heating Setpoint	Cntrl_Heating_Setpoint	R
14	Cooling setpoint from the pGDx.	pGDx_Cooling_Setpoint	R/W
15	Heating setpoint from the pGDx.	pGDx_Heating_Setpoint	R/W
16	Unoccupied Cooling Setpoint	Unoccupied_Cooling_Setpoint	R/W
17	Unoccupied Heating Setpoint	Unoccupied_Heating_Setpoint	R/W
18	Offset from unoccupied cooling setpoint to heating setpoint	Unoccupied_Heating_Offset	R/W
19	Standby Cooling Setpoint	Standby_Cooling_Setpoint	R/W
20	Standby Heating Setpoint	Standby_Heating_Setpoint	R/W
21	Offset from standby cooling setpoint to heating setpoint	Standby_Heating_Offset	R/W
22	Minimum value of the pGDx cooling setpoint	pGDx_Cooling_Setpoint_Min	R/W
23	Maximum value of the pGDx cooling setpoint	pGDx_Cooling_Setpoint_Max	R/W
24	Minimum value of the pGDx heating setpoint	pGDx_Heating_Setpoint_Min	R/W
25	Maximum value of the pGDx heating setpoint	pGDx_Heating_Setpoint_Max	R/W
26	Economizer cooling min OA setpoint	Econ_Low_Temp_Set	R/W
27	Economizer cooling max OA setpoint	Econ_OA_Temp_Set	R/W
28	Minimum position for the economizer damper at low supply fan speed	Econ_Damper_Min_Low_Fan	R/W
29	Minimum position for the economizer damper at high supply fan speed	Econ_Damper_Min_High_Fan	R/W
30	Max Position for the economizer damper when ventilating due to high space CO2	Econ_Damper_Max_CO2	R/W

1. Points shown are typical for BACnet® interfaced units. Depending on how the unit was configured, some R/W points may not be writable. Contact Modine for further guidance as necessary.

(continued next page)



BUILDING MANAGEMENT SYSTEM VARIABLES¹

Model SMG24DDCGABNNA00CN – Typical BACnet® Variables

Tag: HP-102, HP-103, HP-108, HP-109, HP-110, HP-114, HP-115, HP-116, HP-128, HP-129, HP-133, HP-134, HP-153, HP-155, HP-156, HP-170, HP-171, HP-172, HP-176, HP-177

ANALOG VARIABLES (continued)

Object Instance	Variable Description	Carel Variable Name	Read/Write Access
31	Economizer Damper Position	Econ_Damper.Val	R
32	Hot Water/Steam Valve Position	Hot_Water_Steam_Valve.Val	R
33	Coaxial Coil Valve	Coax_Coil_Valve.Val	R
34	Modulated Baseboard Heat	Baseboard_Heat_Valve.Val	R
35	Outdoor (Condenser/Relief) Fan	Outdoor_Fan.Val	R
36	Final used cooling demand to the unit	Unit_Cooling_Demand_Final	R
37	Final used heating demand to the unit	Unit_Heating_Demand_Final	R
38	ERV Vent Fans	ERV_Vent_Fans.Val	R
39	Baseboard heat demand Final	Baseboard_Heat_Demand_Final	R

DIGITAL VARIABLES

Object Instance	Variable Description	Carel Variable Name	Read/Write Access
1	Supply Fan High Speed	Supply_Fan_High.Val	R
2	Hot Gas Reheat	HGRH.Val	R
3	Reversing Valve	Reversing_Valve.Val	R
4	Compressor Stage One	Compressor_Low.Val	R
5	Compressor Stage Two	Compressor_High.Val	R
6	Supply Fan Low Speed	Supply_Fan_Low.Val	R
7	Electric Heat Stage One	Electric_Heat_Stage_One.Val	R
8	Electric Heat Stage Two	Electric_Heat_Stage_Two.Val	R
9	Outdoor Air Damper	Outdoor_Air_Damper.Val	R
10	ERV Wheel Status Switch	ERV_Switch.Val_D	R
11	ERV Wheel On	ERV_Wheel_On.Val	R
12	Relief Air ERV Vent Fan On	EA_Vent_Fan_On.Val	R
13	Outdoor Air ERV Vent Fan On	OA_Vent_Fan_On.Val	R
14	Relief Fan On	Relief_Fan_On.Val	R
15	Unit In Alarm	Global_Alarm	R
16	Unit On/Off by BMS	OnOffUnit_Mng.Bms_OnOff	R/W
17	Condensate Float Switch	CF_Switch.Val	R
18	Freeze Stat	Freeze_Stat.Val	R
19	Supply Fan Input Status	SF_Status.Val	R
20	Outdoor Fan Status	OF_Status.Val	R

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BUILDING MANAGEMENT SYSTEM VARIABLES¹

Model SMG24DDCGABNNA00CN – Typical BACnet® Variables

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DIGITAL VARIABLES (continued)

Object Instance	Variable Description	Carel Variable Name	Read/Write Access
21	Dirty Filter	Dirty_Filter.Val	R
22	Occupancy Input Status	Occupancy_Input.Val	R
23	Low Pressure Switch	LP_Switch.Val	R
24	High Pressure Switch	HP_Switch.Val	R
25	BACnet Alarm reset	BMS_Reset	R/W
26	Occupancy Signal from BMS	BMS_Occupancy	R/W
27	Dehum required by the system	Dehum	R
28	Defrost Mode Active	Defrost_Mode	R
29	CO2 standby mode required space CO2 reading	Low_CO2_Standby_Req	R
30	Condensate Float Switch - Alarm status	AL_Cond_Float_Sw.Active	R
31	Freeze Stat Alarm - Alarm status	AL_Freeze_Stat.Active	R
32	Supply Fan Status - Alarm status	AL_Supply_Fan.Active	R
33	Condenser Fan Status - Alarm status	AL_Cond_Fan.Active	R
34	Dirty Filter - Alarm status	AL_Dirty_Filter.Active	R
35	Compressor Locked Out - Low Pressure - Alarm status	AL_Low_Pressure.Active	R
36	Compressor Locked Out - High Pressure - Alarm status	AL_High_Pressure.Active	R
37	Low Indoor Coil Temperature - Alarm status	AL_Low_IC_Temp.Active	R
38	Low GW Temperature - Alarm status	AL_Low_GW_Temp.Active	R
39	Exhaust Fan Status - Alarm status	AL_Relief_Fan.Active	R
40	Unit is ON Status	Unit_On	R
41	Unit is in manual override	Unit_Is_In_Manual_Mode	R
42	ERV Vent Fans are on	Vent_Fans_Active	R
43	ERV Wheel Status - Alarm status	AL_ERV_Status.Active	R
44	Ionization Input	Ionization_Input.Val_D	R
45	Ionization Alarm - Alarm status	AL_Ionization.Active	R
46	Condensate purge sequence active	cond_hold_active	R
47	A2L Purge Sequence is Active	A2L_Purge_Required	R
48	A2L Sensor is detecting a leak	Any_A2L_sensor_leak	R
49	A2L Sensor communication error	any_A2L_sensor_comm_error	R
50	A2L Sensor is alarming	AnySensor_inalarm	R
51	Occupancy call from the clock/schedule	Schedule_Occupancy	R

1. Points shown are typical for BACnet® interfaced units. Depending on how the unit was configured, some R/W points may not be writable. Contact Modine for further guidance as necessary.

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BUILDING MANAGEMENT SYSTEM VARIABLES¹

Model SMG24DDCGABNNA00CN – Typical BACnet® Variables

Tag: HP-102, HP-103, HP-108, HP-109, HP-110, HP-114, HP-115, HP-116, HP-128, HP-129, HP-133, HP-134, HP-153, HP-155, HP-156, HP-170, HP-171, HP-172, HP-176, HP-177

INTEGER VARIABLES

Object Instance	Variable Description	Carel Variable Name	Read/Write Access
1	Space CO2	Space_CO2_BMS	R
2	High setpoint for max CO2 ventilation	CO2_Vent_Max_PPM	R/W
3	Low setpoint to begin CO2 ventilation	CO2_Vent_Min_PPM	R/W
4	CO2 setpoint to bring the unit into standby mode	CO2_Standby_Setpoint	R/W
5	ERV fans low vent rate	CFM_Vent_Rate	R/W
6	ERV fans max vent rate	CFM_Vent_Rate_Max	R/W
7	Current Control Humidity	Cntrl_Humidity	R
8	Return air Humidity	RA_Hum_BMS	R
9	Occupied Humidity setpoint from the Controller.	cpCO_Humidity_Setpoint	R/W
10	Occupied Humidity Setpoint from the pGDx.	pGDx_Humidity_Setpoint	R/W
11	Minimum value of the pGDx humidity setpoint	pGDx_Hum_Setpoint_Min	R/W
12	Maximum value of the pGDx humidity setpoint	pGDx_Hum_Setpoint_Max	R/W
13	Unoccupied Humidity Setpoint	Unocc_Hum_Setpoint	R/W
14	Standby Humidity Setpoint	Standby_Hum_Setpoint	R/W
15	Unit On hour count	Unit_On_Hours	R
16	Supply Fan Low hour count	Supply_Fan_Hours	R
17	Supply Fan High hour count	Supply_Fan_High_Hours	R
18	Compressor Low hour count	Comp_Low_Hours	R
19	Compressor High hour count	Comp_High_Hours	R
20	Outdoor Fan hour count	Outdoor_Fan_Hours	R
21	ERV Wheel hour count	ERV_Wheel_Hours	R
22	EA ERV Fan hour count	EA_ERV_Fan_Hours	R
23	OA ERV Fan hour count	OA_ERV_Fan_Hours	R

MULTISTATE INPUT VALUES (UNIT STATUS)

Object Instance	Variable Name	Value	Description
1	Unit_Status	1	Off By Alarm
		2	Off By pGDx
		3	Off By BMS
		4	Not used
		5	Not used
		6	Off By Keypad
		7	Unoccupied
		8	Warmup
		9	Occupied
		10	Standby

1. Points shown are typical for BACnet® interfaced units. Depending on how the unit was configured, some R/W points may not be writable. Contact Modine for further guidance as necessary.