The Whalen Company

PRODUCT DESIGN GUIDE

Closetline® Series

November 2022

Closetline® Series

Category	Position		Option Digit and Description
Brand	1	C	C - Closetline Series
		A	A - Adarondack Aire
Product Family	2	A	A - Small Cabinet
Operating Stages	3	S	S - Single-stage operation
Unit Configuration	4	H	H - Horizontal unit configuration
		V	V - Vertical unit configuration
System Configuration	5	B	B - Cooling Only
		C	C - Air Conditioning and Hydronic Heat
		G	G - Heat Pump (Heating default)
		M	M - Heat Pump (Heating default) with Waterside Economizer
		K	K - Heat Pump (Cooling default) with Hot Gas Reheat (on/Off)
Unit Capacity	6-8	006	006 - 0.50 ton
		009	009 - 0.75 ton
		012	012 - 1.00 ton
		015	015 - 1.25 ton
		018	018 - 1.50 ton
		024	024 - 2.00 ton
		030	030 - 2.50 ton
		036	036 - 3.00 ton
		042	042 - 3.50 ton
		048	048 - 4.00 ton
		054	054 - 4.50 ton
		060	060 - 5.00 ton
		072	072 - 6.00 ton
Revision (Major)	9	B	B - 2nd Generation
Voltage	10	B	B - Unit Voltage: 208/230-60-1
		D	D - Unit Voltage: 265-60-1
		J	J - Unit Voltage: 208/230-60-3
		M	M - Unit Voltage: 460-60-3
		Q	Q - Unit Voltage: 575-60-3
Power Termination	11	X	X - Single Point Power: Without unit disconnect

Category	Position		Option Digit and Description
		A	A - Single Point Power: Unfused unit disconnect
		B	B - Single Point Power: Unit circuit breaker (Fused disconnect to protect unit only)
		Z	Z - Special Power Termination - (Special Engineering Request is required)
Refrigerant Circuit Options	12	1	1 - Standard Coax for WSHP application
		2	2 - Cupro-Nickel Coax for WSHP application
		3	3 - Standard Coax for Geothermal application
		4	4 - Cupro-Nickel Coax for Geothermal application
Revision (Minor)	13	B	B - 2nd Minor Revision
		A	A - 1st Minor Revision
Sound Attenuation	14	X	X - Standard Quiet Construction
		B	B - Compressor Sound Blanket
		C	C - Vibration Isolation Pad
		D	D - Compressor Sound Blanket and Vibration Isolation Pad
Coil Protection	15	C	C - Copper tube / Aluminum fin
		T	T - Tin Dipped Hairpins
		E	E - Epoxy Coating (E-Coating)
Fan	16	D	D - ECM - Constant Torque Motor
		G	G - ECM - Constant Torque Motor
Control Type	17	A	A - Solid State Control with Thermostat
		B	B - Solid State Control with IO Zone 560 DDC Control
		E	E - IO Zone 560 DDC Control with Fan status & Compressor status current switch
		F	F - IO Zone 560 DDC Control with Discharge Air Temperature
		G	G - IO Zone 560 DDC Control with Fault Alarm
		H	H - IO Zone 560 DDC Control with Fan status & Compressor status current switch with Discharge Air Temperature
		J	J - IO Zone 560 DDC Control with Fan status & Compressor status current switch with Fault Alarm
		K	K - IO Zone 560 DDC Control with Fan status & Compressor status current switch, Discharge Air Temperature, and Fault Alarm
		L	L - IO Zone 560 DDC Control with Discharge Air Temperature & Fault Alarm
		Z	Z - Special control configuration - (Special Engineering Request is required)
Water Temperature Sensors	18	A	A - 32°F Freeze Protection with 36°F Low/High Liquid Temp setting

Category	Position		Option Digit and Description
		E	E - 32°F Freeze Protection with 125°F Low/High Liquid Temp setting
		G	G - 20°F Freeze Protection with 20°F Low/High Liquid Temp setting
		N	N - 10°F Freeze Protection with 10°F Low/High Liquid Temp setting
		P	P - 10°F Freeze Protection with 0°F Low/High Liquid Temp setting
Electric Heat	19	X	X - None - No electric heat
Electric Heat Voltage	20	X	X - None - No electric heat
Control Valve	21	X	X - No control valve installed
		A	A - 2-way valve, on/off, 30 psi differential
		B	B - 2-way valve, on/off, 60 psi differential
		C	C - 2-way valve, on/off, 125 psi differential
		J	J - 3-way valve, on/off, 30 psi differential
		2	2 - Two 2-way valve, on/off, 30 psi differential (for use with Closetpack)
		3	3 - Two 2-way valve, on/off, 60 psi differential (for use with Closetpack)
		4	4 -Two 2-way valve, on/off, 125 psi differential (for use with Closetpack)
Flow Control	22	X	X - No flow control device installed
		C	C - Automatic Flow Valve - Griswold K with PT Ports
		D	D - Automatic Flow Valve - Hays
		H	H - Manual Flow Control Valve
		J	J - Internal Circulating Pump (Standard)
Water Flow	23-26	XXXX	XXXX - Manual valve or no flow control device installed
		0100	0100 - 1.0 GPM
		0113	0113 - 1.13 GPM
		0125	0125 - 1.25 GPM
		0150	0150 - 1.5 GPM
		0163	0163 - 1.63 GPM
		0175	0175 - 1.75 GPM
		0200	0200 - 2.0 GPM
		0225	0225 - 2.25 GPM
		0250	0250 - 2.5 GPM
		0300	0300 - 3.0 GPM
		0325	0325 - 3.25 GPM
		0350	0350 - 3.5 GPM
		0400	0400 - 4.0 GPM
		0450	0450 - 4.5 GPM

Category	Position		Option Digit and Description
		0500	0500 - 5.0 GPM
		0550	0550 - 5.5 GPM
		0600	0600 - 6.0 GPM
		0650	0650 - 6.5 GPM
		0700	0700 - 7.0 GPM
		0750	0750 - 7.5 GPM
		0800	0800 - 8.0 GPM
		0900	0900 - 9.0 GPM
		1050	1050 - 10.5 GPM
		1100	1100 - 11.0 GPM
		1200	1200 - 12.0 GPM
		1300	1300 - 13.0 GPM
		1400	1400 - 14.0 GPM
		1500	1500 - 15.0 GPM
		1600	1600 - 16.0 GPM
		1700	1700 - 17.0 GPM
		1800	1800 - 18.0 GPM
		1900	1900 - 19.0 GPM
		2000	2000 - 20.0 GPM
Strainer / Pressure Ports	27	X	X - No Strainer or Pressure Ports Installed
		1	1 - Y-strainer
		2	2 - Y-strainer with blowdown
		3	3 - Pressure Port - Supply
		4	4 - Pressure Port Return
		5	5 - Pressure Port - Supply and Return
		6	6 - Y-strainer with Pressure Port - Supply
		7	7 - Y-strainer with Pressure Port - Return
		A	A - Y-strainer with Pressure Port – Supply & Return
		8	8 - Y-strainer with blowdown and Pressure Port - Supply
		9	9 - Y-strainer with blowdown and Pressure Port - Return
		B	B - Y-strainer with blowdown and Pressure Port – Supply & Return
Airflow Configuration	28		
		1	1 - Horizontal - Left Return / End Supply
		2	2 - Horizontal - Left Return / Right Supply
		5	5 - Horizontal - Right Return / End Supply
		6	6 - Horizontal - Right Return / Left Supply

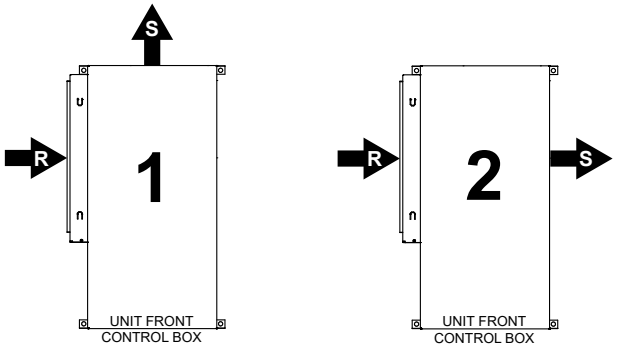
Category	Position		Option Digit and Description
		A	A - Vertical - Left Return / Top Supply
		B	B - Vertical - Right Return / Top Supply
		C	C - Vertical - Left Return / Back Supply
		D	D - Vertical - Right Return / Back Supply
		E	E - Vertical - Left Return / Front Supply
		F	F - Vertical - Right Return / Front Supply
		G	G - Vertical - Left Return / Right Supply
		H	H - Vertical - Right Return / Left Supply
Insulation Option	29	A	A - Fiberglass
		B	B - Foil Face Insulation - Entire Unit
		C	C - Closed Cell Insulation - Entire Unit
Filtration	30	X	X - Field installed / field furnished 1” thick air filters
		A	A - 1” MERV 4 Throwaway
		B	B - 1” MERV 8 Pleated
		C	C - 1” MERV 11 Pleated
		D	D - 1” MERV 13 Pleated
		E	E - 2” MERV 4 Throwaway
		F	F - 2” MERV 8 Pleated
		G	G - 2” MERV 11 Pleated
		H	H - 2” MERV 13 Pleated

Note: The CAS airflow configuration may be built to order or modified on-site to meet installation requirements

CASH 006 – 072

1 - Horizontal - Left Return / End Supply (90 degree)
2 - Horizontal - Left Return / Right Supply (Straight)

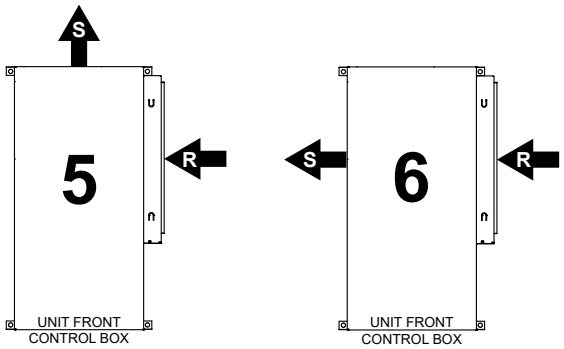
5 - Horizontal - Right Return / End Supply(90 degree)
6 - Horizontal - Right Return / Left Supply (Straight)

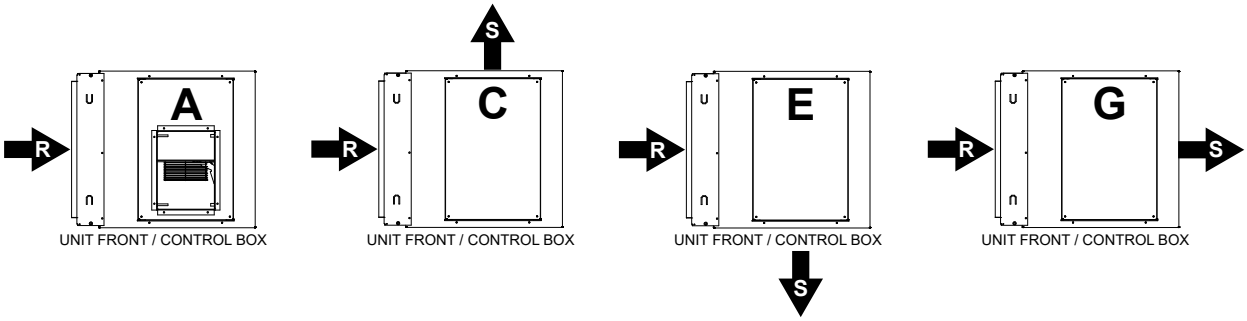


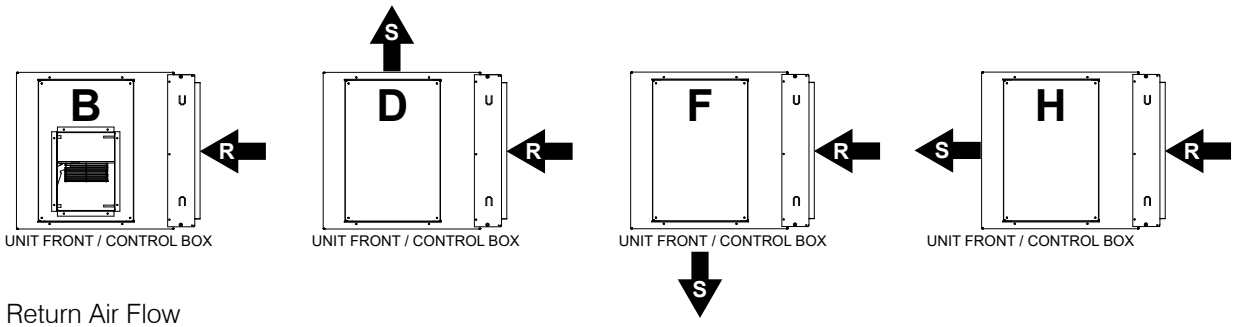
CASV 006 – 072

A - Vertical - Left Return / Top Supply
C - Vertical - Left Return / Back Supply
E - Vertical - Left Return / Front Supply
G - Vertical - Left Return / Right Supply

B - Vertical - Right Return / Top Supply
D - Vertical - Right Return / Back Supply
F - Vertical - Right Return / Front Supply
H - Vertical - Right Return / Left Supply







R = Return Air Flow

S = Supply Air Flow

Table 1: AHRI Performance Ratings – ASHRAE / ANSI / AHRI / ISO Standard 13256-1

Model with EC Motor	CFM	GPM	Water Loop Heat Pump				Ground Water Heat Pump				Ground Loop Heat Pump			
			Cooling 86°F		Heating 68°F		Cooling 59°F		Heating 50°F		Cooling 77°F		Heating 32°F	
			Capacity Btuh	EER Btuh / W	Capacity Btuh	COP	Capacity Btuh	EER Btuh / W	Capacity Btuh	COP	Capacity Btuh	EER Btuh / W	Capacity Btuh	COP
CAS006A**	200	2	6,000	17.0	7,500	5.6	7,100	25.0	6,200	4.5	6,300	19.0	4,600	4.0
CAS009A**	300	2.5	9,000	14.0	11,500	4.4	10,300	22.0	9,500	4.0	9,300	15.5	7,000	3.4
CAS012A**	400	3	12,500	13.5	15,000	4.5	14,500	19.0	12,800	4.0	13,000	14.5	10,000	3.4
CAS015A**	500	3.8	15,000	17.0	18,000	5.6	17,000	25.0	15,400	4.5	15,000	19.0	12,000	4.0
CAS018A**	600	4.5	18,000	17.0	21,600	5.6	21,000	25.0	18,000	4.5	18,500	19.0	13,500	4.0
CAS024A**	800	6.0	24,000	16.4	28,000	5.2	27,400	24.0	23,000	4.3	25,000	18.5	17,000	3.7
CAS030A**	1000	7.5	30,000	16.0	34,000	5.0	32,400	23.0	27,600	4.2	30,000	17.5	23,000	3.6
CAS036A**	1200	9.0	36,000	17.0	43,000	5.0	39,000	25.0	36,000	4.2	36,000	19.0	28,000	3.6
CAS042A**	1400	10.5	42,000	15.0	49,000	4.6	46,700	22.0	41,500	4.1	43,000	17.0	33,000	3.5
CAS048A**	1600	12.0	48,000	15.0	56,000	4.6	53,800	22.0	46,200	4.1	49,000	17.0	35,000	3.5
CAS060A**	2000	15.0	58,000	15.0	72,000	4.6	64,000	22.0	60,000	4.1	59,000	17.0	49,000	3.5
CAS072A**	2200	18.0	71,000	15.0	78,000	4.2	78,000	20.0	66,000	3.7	72,000	17.0	53,000	3.0

Cooling based upon 80.6°F DB, 66.2°F WB entering air temperature

Heating based upon 68°F DB, 59°F WB entering air temperature

Performance based upon 208/60/1 voltage

Features & Benefits

Cabinet Configurations

The CAS compact cabinet is fabricated from heavy gauge G-90 galvanized sheet metal. Two cabinet configurations are available in either a left-hand or right-hand return air arrangement to provide the optimum return air location and service access.

Sound Reduction Package

Provided as standard, the unit has a unique dual-level vibration isolation system. A heavy-gauge mounting plate is isolated from the cabinet via a dense neoprene pad to minimize vibration transfer. The compressor is then isolated from the mounting plate with our standard rubber in shear isolators to enhance the dual-level vibration isolation. The compressor is located in a well-insulated compartment separated from the air stream to minimize sound transmission.

Field Convertible Fan Outlet

Access panels are interchangeable to allow field conversion of the blower to provide maximum flexibility during installation.

Slide-Out Fan Motor & Housing

All sizes provide easy fan and motor removal by sliding the fan assembly in or out along mounting rails. A large panel provides service access to the blower and motor. All blower/motor assemblies have a removable orifice ring on the housing to accommodate motor and blower removal without disconnecting the unit from the ductwork.

Bottom Service Access

Horizontal units include bottom service access where the fan housing, fan motor, expansion valve, reversing valve and filters are easily accessed from the bottom of the unit to allow routine in-place maintenance.

LED Sight Glass

The LED status sight glass allows an instant visual of unit operation for quick troubleshooting and advanced diagnosis without removing the access panel.

Service Port Connections

Two service valves are located inside the compressor access panel – one on the low side and one on the high side of the refrigeration circuit. Easily accessible for routine service.

Water Connections

The water and condensate connections are FPT fittings, securely mounted flush to the corner post to allow for connection to a flexible hose without the use of a back-up wrench for easy installation.

Solid state control board

Freeze protection - Factory set switch for water and water / glycol solution systems initiates a fault when temperatures exceed the selected limit for 30 continuous seconds.

Condensate overflow - The controller is designed to sense when condensate water levels in the drain pan become excessively high. When high condensate water levels are detected during cooling or dehumidification mode, the controller will go into condensate overflow warning mode.

Low pressure switch - A normally closed low refrigerant pressure switch is used to help protect the refrigerant circuit from excessively low refrigerant pressure. The controller will monitor the switch, when the low-pressure switch contacts are open for more than the low-pressure time delay, the controller will go into the low-pressure fault mode.

Low liquid temp - Factory set switch for water and water / glycol solution systems initiates a fault when temperatures exceed the selected limit for 30 continuous seconds.

Stainless steel hoses

Field installed flexible 304 stainless steel hose with internal single braid high strength Kevlar® spiral reinforced rubber. Meets UL-94 VO fire rating..

Constant Torque EC Motor

Are available as an optional on all sizes and provide the efficiency and operability of an ECM at a lower cost than a constant airflow ECM. Constant torque ECMs provide 5 available motor speed settings and will maintain a constant motor torque as external static pressure in the system increases. As the system static pressure increases, reduction in fan airflow with a constant torque ECM is minor.

Unfused disconnect

Units are available with an optional non-fused disconnect switch. The disconnect switch is used to break power to the unit for ease of field.

Circuit breaker

Units are available with an optional circuit breaker (HACR breaker). The circuit breaker is used to break power to the unit for ease of field.

T-stats

See thermostat table.

Condensate pump

A field installed condensate pump allows the unit to be located virtually wherever desired. The condensate pump serves as an effective means for disposing of condensate generated during heat pump operation. A condensate pump should be designed and installed at the unit to pump condensate to a building drain.

Vibration isolation pad

Vibration isolator pads dampen vibration from the compressor and fan motors. The ½" thick neoprene isolation pads are attached to the bottom of the cabinet at the factory eliminating any additional field labor.

2-way valve

Available internally factory mounted on all sizes, 2-way valves are used for a variety of pumping applications when more than one unit is installed on a common loop. These valves are also used to shut off flow when the unit is not operating. On a call for cooling or heating the valve opens providing full water flow prior to compressor operation. A 24 volt control wire harness is included with the factory provided control valve option. Factory mounted on all sizes of CAS(H/V)-C models.

Automatic flow control

Available internally factory mounted on all sizes, an automatic flow control device includes a ball valve cast in the valve body and is located on the return water pipe. The flow control valve consists of a stainless steel/ brass flow cartridge and a contoured orifice plate. As the pressure drop increases, the flow cartridge will move into the contoured orifice plate to decrease the flow. This flexing action provides a constant flow, independent of pressure (2-80 psi), makes it difficult to clog and resistant to cavitation damage. This valve sets flow through the coil without any action required by a system balancer.

Manual flow control

A manual flow control valve, acts as both a flow setting device and a stop valve, taking the place of a ball valve. This valve allows water flow through the unit and can be set quickly and accurately.

Ball valve

Ball valves allow the unit to be shut off for servicing purposes. They have a low resistance to water flow, operate easily. These valves have a compact handle that rotates 90 degrees to a fully open position. The valve body is forged brass and the ball is polished brass with Teflon seats and seals. Ball valves are included on both the supply and return water pipes.

Memory stop

Adjustable Memory Stop provides both balancing and shutoff in one valve. With the memory stop locked in place, the valve can be closed and then reopened to the same balanced position.

Pete's plug

An accessible port where pressure and temperature can be measured. Accepts standard 1/8" gauge adapter or thermometer stem.

Strainer

The Y-type strainer body is constructed of brass with a 16 mesh 304 stainless steel screen. Used for removal of small particles from the water supply pipe during normal system operation. The strainer helps protect the coil and minimizes the chance of control valves clogging. Screens should be regularly removed and cleaned as part of a routine maintenance schedule.

High Efficiency Air Filters

Units come standard with a one or two-inch glass fiber throwaway filter. High efficiency MERV 8, MERV 11, and MERV 13 pleated filters as well as a washable aluminum mesh filter are also available as an option.

Cu-Ni Coaxial Heat Exchanger

The optional cupronickel tube-in-tube coaxial heat exchanger used in vertical stack water source heat pumps is designed for maximum heat transfer at normal and low water flow rates with minimum pressure drop. The inside tube is deeply fluted to enhance heat transfer and minimize fouling. All coaxial coils are tested to 400 psig on the water side and 600 psig on the refrigerant side. The extended range chassis has coil and piping insulation to protect against condensation

in low-temperature geothermal applications.

Compressor Sound Blanket

Available as a factory installed option, all sizes are available with a sound attenuating compressor blanket to further reduce sound transmission.

Waterside Economizer

The waterside economizer option helps to reduce energy consumption by using existing cold loop water temperature to condition a space without utilizing mechanical cooling. The waterside economizer ships factory installed on the return air opening, upstream of the evaporator coil. When entering water temperature is between 60°F and 45°F, a call for cooling will divert the cold water to the economizer coil.

Hanging Bracket

The hanging brackets are factory mounted to shorten job installation requirements. Isolation for the hanging bracket is provided with a rubber-in-shear grommet. This isolation device helps prevent sound vibration from reaching the structural support of the building during unit operation. Field supplied spring isolators may also be used provided appropriate weight calculations are preformed.

Hot Gas Reheat

The hot gas reheat mode is designed to dehumidify the conditioned space with minimal change to the indoor air temperature and is controlled by a thermostat with an integral humidistat. The leaving air dry-bulb temperature is typically within 5°F of the return air temperature to maintain occupant comfort. While in dehumidification mode, operation will occur until the humidistat is satisfied or until there is a call for heating or cooling.

The moisture removal capacity of each heat pump will depend on the entering water temperature and the entering air dry-bulb and wet-bulb temperatures. Details can be found in the published performance specifications for the hot gas reheat mode.

Cooling Mode - The thermostat with its integrated humidistat is monitoring both room temperature and humidity. On a call for cooling, the compressor is energized, the reversing valve is positioned for cooling, and the unit operates in normal cooling mode. When the space temperature is satisfied, the compressor is turned off. If the humidity setpoint is not satisfied, the unit will continue to operate in dehumidification mode.

Dehumidification Mode - On a call for dehumidification, the compressor is energized, the reversing valve is positioned for cooling, and the hot gas reheat valve opens to allow compressor discharge gas into the hot gas reheat coil. With dehumidification mode activated, the unit will cool and dehumidify the air through the evaporator coil, and then reheat the air back to room temperature using the hot gas reheat coil. When the humidity setpoint is satisfied, the hot gas reheat valve is closed, and the compressor is turned off. If there is a call for cooling, the hot gas reheat valve is closed, and the unit continues to operate in cooling mode.

Heating Mode - The thermostat with its integrated humidistat is monitoring both room temperature and humidity. On a call for heating, the compressor is energized, the reversing valve is positioned for heating, the unit operates in normal heating mode. When the heating setpoint is reached, the compressor is turned off.

Hydronic Hybrid Heating

The hydronic heat option helps to reduce energy consumption by using warm loop water temperatures to condition a space without energizing mechanical heating. The hydronic heating coil ships factory installed on the return air opening, upstream of the evaporator coil. A call for heating will divert the warm water to the hydronic coil providing heat to the occupied space.

Table 2: Closetline Thermostats for Standalone Operation

				
Feature		**SCI SC2010L**	**SCI SC4011**	**SCI SC5011**
Mounting Style	Electrical Box			
	Drywall	•	•	•
Display	Backlit LCD	•	•	•
	Temperature & Setpoint	•	•	•
	Operating Mode	•	•	•
	Fan Status	•	•	•
	Remote Setback	•	•	•
Operation	Non-programmable	•	•	
	Programmable			7 day
	Sensing	Local or Remote	Local or Remote	Local or Remote
	Setpoint Range	45°F to 90°F	45°F to 90°F	45°F to 90°F
	Changeover	Manual	Automatic	Manual or Automatic
Operating Modes	System Settings	Heat - Cool - Auto - Off	Heat - Cool - Auto - Off	Heat - Cool - Auto - Off
	Fan Settings	On - Auto	On - Auto	On - Auto
	Fan Speeds	1	1	1
Stages	Heating	1	1	1
	Cooling	1	1	1
Voltage	Operating Voltage	20 - 30 VAC	20 - 30 VAC	20 - 30 VAC

Unit Protections & LED Fault Status Annunciation

Refrigerant Circuit High Pressure Protection

A normally closed high (compressor discharge) pressure switch is used to help protect the refrigerant circuit from excessively high pressure. If the high pressure switch opens twice within 1 hour, the control board will initiate a hard lockout and the alarm contact will energize.

Refrigerant Circuit Low Pressure Protection

A normally closed low (compressor suction) refrigerant pressure switch is used to help protect the refrigerant circuit from excessively low refrigerant pressure. If the low pressure switch opens twice within 1 hour, the control board will initiate a hard lockout and the alarm contact will energize.

Condensate Overflow Sensor

The control is designed to sense when condensate water levels in the drain pan become excessively high. When high condensate water levels are detected, the controller will go into condensate overflow warning mode. If the condensate overflow sensor detects liquid twice within 1 hour, the control board will initiate a hard lockout and the alarm contact will energize.

Heat Exchanger Low Temperature Protection

The control is designed to sense when the refrigerant temperature drops to a temperature where it is possible to freeze the air coil or the coaxial heat exchanger. The threshold temperature is field selectable for 10°, 20°, or 32°F. If the Freeze Sensor drops below the set temperature twice within 1 hour, the control board will initiate a hard lockout and the alarm contact will energize.

Low water temperature

The control is designed to sense when the leaving water temperature drops to a temperature where it is possible to freeze the coaxial heat exchanger or raises to a temperature high enough to cause possible damage to the compressor. The threshold

temperature is field selectable for 0°, 10°, 20°, 36°, or 125°F. If the sensor drops below (or above 125°) the set temperature twice within 1 hour, the control board will initiate a hard lockout and the alarm contact will energize.

Low Voltage (Brownout) Protection

The solid state control will monitor the 24 volt power input supplied to the board. If the supply voltage drops below 18 VAC, the control module will shut down the unit to protect electrical components from low line voltage conditions.

Soft Lockout Reset

This feature is used to minimize nuisance trips of safeties caused by temporary conditions that might inhibit the unit from performing normal functions. When a safety trip occurs, it is counted and the alarm is cleared when the condition returns to normal. If the alarm occurs two times within a 1-hour period, the heat pump remains off (locked out) until the unit is checked and the alarm is manually cleared.

The Whalen Company water source heat pumps are available with a factory installed multi-protocol communication module that is designed to communicate with a building automation system (BAS). The I/O Zone 560 DDC controller is designed to allow the integration of Whalen water source heat pump equipment into DDC systems. The I/O Zone 560 DDC controller has the ability to communicate through a choice of three widely used protocols: BACnet MS/TP, Johnson Controls N2, and Modbus. The protocol of choice for the particular system is selected by simply configuring DIP switches on the DDC control. This flexibility allows one controller to be used in a multitude of buildings which use any of these three common protocols. The control serves as a node of information processing between the Whalen heat pump and the DDC network.

Features & Benefits

- Multi-Protocol communications provides DDC system flexibility.
- Supports native BACnet MS/TP communications – the ASHRAE standard protocol for interoperability.
- Supports Johnson Controls N2 communications – for integration into Johnson Controls Metasys DDC systems.
- Supports Modbus communications for integration into Modbus DDC networks.
- Four baud rate levels offer flexible communications speeds of 9600, 19.2k, 38.4k, or 76.8k baud. Enables building operators to easily upgrade firmware in the future.
- Removable field wiring connectors for ease of field service.
- Five (5) digital outputs.
- Six (6) inputs.
- Stand-alone or BAS integrated operational modes.

Hardware Specification

Power:	24Vac +-10%, 50 or 60Hz, 18VA power consumption, 26Vdc, Single Class 2 source only, 100 VA or less.
Physical size:	5-1/16” [129mm] width x 5-11/16” [144mm] height x 1-1/2” [38mm] (minimum panel depth).
Housing material:	Rugged GE C2905HG Cycoloy plastic housing – complies with UL 94 V-O.
Environmental:	0 to 130 degrees F, 10% to 95% non-condensing.
Protection:	Built-in surge transient protection circuitry. Module protected by Internal solid state Polyswitches on incoming power and network connections.
Digital Outputs:	5 digital outputs, relay contacts rated at 1 A resistive @ 24 Vac, configured as dry contact, normally open.
Universal inputs:	6 universal inputs. Inputs 1-6 configurable as thermistor or dry contact; inputs 1 and 2 also configurable as 0-5 Vdc type inputs.
Communication ports:	*Port 1:* Jumper configurable for ARCNET or EIA-485 communication. In ARCNET mode, the port speaks BACnet (at 156k bps). In EIA-485 mode, the communication protocol and baud rate desired are DIP switch selectable between BACnet MS/TP, Modbus RTU, or N2. *Rnet port:* Interface with a BACview5, BACview6 , RS sensors, or local laptop.
Optional card port:	LonWorks Option Card for connection to Free Topology LON networks (TP/FT-10 Channel).

Table 3: Physical Data Table

Component	Models											
	CAS**006A	CAS**009A	CAS**012A	CAS**015A	CAS**018A	CAS**024A	CAS**030A	CAS**036A	CAS**042A	CAS**048A	CAS**060A	CAS**072A
Nominal Tonnage	**0.5**	**0.75**	**1.0**	**1.25**	**1.5**	**2.0**	**2.5**	**3.0**	**3.5**	**4.0**	**5.0**	**6.0**
COOLING PERFORMANCE												
Capacity (MBTUH)	6.0	9.0	12.5	15.0	18.0	24.0	30.0	36.0	42.0	48.0	58.0	71.0
EER (Btuh/W)	17.0	14.0	13.0	17.0	17.0	16.4	16.0	17.0	15.0	15.0	15.0	15.0
Entering Water Temp (°F)	86	86	86	86	86	86	86	86	86	86	86	86
Water Flow (GPM)	2.0	2.5	3.0	3.8	4.5	6.0	7.5	9.0	10.5	12.0	15.0	18.0
Rated CFM	200	300	400	500	600	800	1000	1200	1400	1600	2000	2200
Refrigerant type	R410A	R410A	R410A	R410A	R410A	R410A	R410A	R410A	R410A	R410A	R410A	R410A
Horizontal Refrigerant charge (oz)	18.0	18.0	19.0	34.0	36.0	50.0	56.0	62.0	70.0	78.0	80.0	144.0
Vertical Refrigerant charge (oz)	22.0	20.0	22.0	36.0	34.0	48.0	54.0	60.0	68.0	76.0	78.0	152.0
HEATING PERFORMANCE												
Capacity (MBTUH)	7.5	11.5	15.0	18.0	21.6	28.0	34.0	43.0	49.0	56.0	72.0	78.0
COP (W/W)	5.6	4.4	4.4	5.6	5.6	5.2	5.0	5.0	4.6	4.6	4.6	4.2
Entering Water Temp (°F)	68	68	68	68	68	68	68	68	68	68	68	68
Water Flow (GPM)	2.0	2.5	3.0	3.8	4.5	6.0	7.5	9.0	10.5	12.0	15.0	18.0
DIMENSIONS - VERTICAL (inches)												
Width	19	19	19	22	22	22	25	25	25	25	25	26
Depth	19	19	19	22	22	22	26	26	26	32	32	32
Height	24	24	24	36	36	40	40	45	45	45	45	61
DIMENSIONS - HORIZONTAL (inches)												
Width	20	20	20	22	22	22	22	22	22	25	25	28
Depth	34	34	34	43	43	45	45	55	55	55	55	67
Height	11.5	11.5	11.5	17	17	17	17	19	22	22	22	24
OPERATING WEIGHT (lbs.)												
Horizontal	125	128	130	180	190	230	235	280	320	325	340	400
Vertical	135	138	140	185	195	235	255	280	290	320	340	450
SHIPPING WEIGHT (lbs.)												
Horizontal	140	143	145	205	215	255	260	308	348	353	368	455
Vertical	163	166	168	213	223	263	310	335	345	375	395	505
COMPRESSORS												
Type	Rotary	Rotary	Rotary	Rotary	Rotary	Scroll	Scroll	Scroll	Scroll	Scroll	Scroll	Scroll
Quantity	1	1	1	1	1	1	1	1	1	1	1	1
EVAPORATOR COIL DATA												
Rows	3	3	3	3	3	3	3	3	3	3	3	4
Refrigerant control	TXV	TXV	TXV	TXV	TXV	TXV	TXV	TXV	TXV	TXV	TXV	TXV

Table 3: Physical Data Table (continued)

Component	Models											
	CAS**006A	CAS**009A	CAS**012A	CAS**015A	CAS**018A	CAS**024A	CAS**030A	CAS**036A	CAS**042A	CAS**048A	CAS**060A	CAS**072A
Nominal Tonnage	**0.5**	**0.75**	**1.0**	**1.25**	**1.5**	**2.0**	**2.5**	**3.0**	**3.5**	**4.0**	**5.0**	**6.0**
SUPPLY FAN DATA												
Quantity	1	1	1	1	1	1	1	1	1	1	1	1
Fan Size (D x W) - Horizontal	8.5 x 4	8.5 x 4	8.5 x 4	7.12 x 8	7.12 x 8	10.62 x 6	9.5 x 7	9.87 x 7	10.75 x 7.75	10.75 x 7.75	10.75 x 10.5	11.62 x 10.5
Fan Size (D x W) - Vertical	8.5 x 4	8.5 x 4	8.5 x 4	7.12 x 8	7.12 x 8	10.62 x 6	9.5 x 7	9.87 x 7	10.75 x 7.75	10.75 x 7.75	11.62 x 8	11.62 x 10.5
Fan type	Centrifugal	Centrifugal	Centrifugal	Centrifugal	Centrifugal	Centrifugal	Centrifugal	Centrifugal	Centrifugal	Centrifugal	Centrifugal	Centrifugal
Maximum E.S.P. - ECM Motor - CT	0.65	0.65	0.60	0.80	0.80	0.90	0.60	0.90	0.80	0.90	0.80	0.90
CONSTANT TORQUE ECM HP - VERTICAL												
Voltage - 208-230/1/60	1/4	1/4	1/4	1/4	1/4	1/2	1/2	1/2	3/4	3/4	1	1
Voltage - 265/1/60	1/4	1/4	1/4	1/4	1/4	1/2	1/2	1/2	3/4	3/4	1	1
Voltage - 208-230/3/60	1/4	1/4	1/4	1/4	1/4	1/2	1/2	1/2	3/4	3/4	1	1
Voltage - 460/3/60	1/4	1/4	1/4	1/4	1/4	1/2	1/2	1/2	3/4	3/4	1	1
CONSTANT TORQUE ECM HP - HORIZONTAL												
Voltage - 208-230/1/60	1/4	1/4	1/4	1/4	1/4	1/2	1/2	1/2	3/4	3/4	3/4	1
Voltage - 265/1/60	1/4	1/4	1/4	1/4	1/4	1/2	1/2	1/2	3/4	3/4	3/4	1
Voltage - 208-230/3/60	1/4	1/4	1/4	1/4	1/4	1/2	1/2	1/2	3/4	3/4	3/4	1
Voltage - 460/3/60	1/4	1/4	1/4	1/4	1/4	1/2	1/2	1/2	3/4	3/4	3/4	1
WATER CONNECTIONS (inches)												
Entering Water	3/4	3/4	3/4	3/4	3/4	3/4	3/4	3/4	1	1	1	1
Leaving Water	3/4	3/4	3/4	3/4	3/4	3/4	3/4	3/4	1	1	1	1
RETURN AIR DUCT CONNECTION												
Size (Vertical)	15.3 x 9.5	15.3 x 9.5	15.3 x 9.5	19.3 x 17.4	19.3 x 17.4	19.3 x 17.4	23.3 x 17.4	23.3 x 21.4	23.3 x 21.4	29.3 x 21.4	29.3 x 21.4	29.3 x 34.4
Size (Horizontal)	16.0 x 8.5	16.0 x 8.5	16.0 x 8.5	23.0 x 14.0	23.0 x 14.0	26.0 x 14.0	26.0 x 14.0	34.0 x 16.0	34.0 x 19.0	34.0 x 19.0	34.0 x 19.0	46.1 x 21.0
FILTERS												
Size (Vertical)	12 x 16	12 x 16	12 x 16	20 x 20	20 x 20	20 x 20	20 x 24	24 x 24	24 x 24	24 x 30	24 x 30	30 x 36
Quantity (Vertical)	1	1	1	1	1	1	1	1	1	1	1	1
Size (Horizontal)	10 x 18	10 x 18	10 x 18	16 x 25	16 x 25	16 x 28	16 x 28	18 x 36	20 x 36	20 x 36	20 x 36	22 x 24
Quantity (Horizontal)	1	1	1	1	1	2	2	1	1	1	1	2

Table 4: Unit Voltage Limitations

Voltage	Minimum	Maximum
208-230/1/60	197	253
265/1/60	239	292
208-230/3/60	197	253
460/3/60	414	506
575/3/60	518	633

Table 5: CAS Continuous Operating Limits

Mode	Ambient Air °F		Entering Air °F				Entering Fluid °F			
	Minimum	Maximum	Minimum		Maximum		Standard Range		Extended Range	
	DB	DB	DB	WB	DB	WB	Min	Max	Min	Max
Cooling	60	100	75	63	100	83	60	120	30	120
Heating	60	80	60	–	80	–	60	90	20	90

Note: Extended Range requires insulated risers, correct control jumper setting, and design condition antifreeze solution

Table 6: CAS Start-up Operating Limits

Mode	Ambient Air °F		Entering Air °F				Entering Fluid °F			
	Minimum	Maximum	Minimum		Maximum		Standard Range		Extended Range	
	DB	DB	DB	WB	DB	WB	Min	Max	Min	Max
Cooling	50	100	50	42	100	83	50	120	30	120
Heating	50	80	50	–	80	–	50	90	20	90

Note: Extended Range requires insulated risers, correct control jumper setting, and design condition antifreeze solution

Standard Range Units:

Units are designed to start in an ambient of 50°F (10°C) with entering air at 50°F (10°C), with entering water at 50°F (10°C), with nominal air flow and water flow (3.0 GPM/Ton), for initial start-up in heating and cooling mode.

Note: This is not a normal or continuous operating condition. It is assumed that such start-up is for the purpose of bringing the building space up to occupancy temperature and operating for extended periods of time.

Extended Range Units:

Units are designed to start in an ambient of 50°F (10°C) with entering air at 50°F (10°C), with entering water at 20°F (-7°C), with nominal air flow and water flow (3.0 GPM/Ton), for initial start-up in heating.

Units are designed to start in an ambient of 50°F (10°C) with entering air at 50°F (10°C), with entering water at 30°F (-1°C), with nominal air flow and water flow (3.0 GPM/Ton), for initial start-up in cooling.

Note: This is not a normal or continuous operating condition. It is assumed that such start-up is for the purpose of bringing the building space up to occupancy temperature and operating for extended periods of time.

Environment

This equipment is designed for indoor installation only. Unconditioned locations such as attics, garages, etc., generally will not provide sufficient protection against extremes in temperature and/or humidity, and equipment performance, reliability, and service life may be adversely affected.

Power supply

A voltage variation of +/-10% of nameplate voltage is acceptable.

Table 7: Closetline® Cooling Performance

Cooling Performance

Size (Tons)	EWT (°F)	GPM	Entering Air - 80°F / 67°F					Entering Air - 78°F / 65°F					Entering Air - 75°F / 63°F				
			TC (Btu/hr)	SC (Btu/hr)	kW	HR (Btu/hr)	Liquid Temp Rise (°F)	TC (Btu/hr)	SC (Btu/hr)	kW	HR (Btu/hr)	Liquid Temp Rise (°F)	TC (Btu/hr)	SC (Btu/hr)	kW	HR (Btu/hr)	Liquid Temp Rise (°F)
CAS**006A (0.5)	86	1.00	5.88	4.22	0.37	7.13	14.26	5.61	3.90	0.38	6.89	13.78	5.33	3.29	0.39	6.65	13.31
		1.25	5.94	4.25	0.36	7.17	11.47	5.67	3.93	0.37	6.92	11.08	5.39	3.32	0.38	6.68	10.70
		2.00	6.12	4.35	0.34	7.28	7.28	5.84	4.02	0.35	7.02	7.02	5.55	3.39	0.36	6.78	6.78
CAS**009A (0.75)	86	1.50	8.99	5.93	0.67	11.26	15.01	8.68	5.75	0.67	10.96	14.61	8.38	4.85	0.67	10.66	14.21
		1.88	9.04	5.96	0.65	11.26	12.02	8.73	5.78	0.65	10.96	11.69	8.43	4.87	0.65	10.66	11.37
		2.50	9.13	6.00	0.63	11.28	9.02	8.82	5.82	0.63	10.97	8.78	8.51	4.91	0.63	10.67	8.53
CAS**012A (1.0)	86	2.00	12.28	8.91	0.98	15.62	15.62	11.91	8.58	0.98	15.25	15.25	11.56	7.44	0.98	14.91	14.91
		2.50	12.48	9.08	0.96	15.76	12.61	12.10	8.74	0.96	15.38	12.31	11.74	7.58	0.96	15.03	12.03
		3.00	12.67	9.25	0.94	15.89	10.59	12.29	8.90	0.94	15.51	10.34	11.93	7.72	0.94	15.15	10.10
CAS**015A (1.25)	86	2.50	14.87	10.67	0.91	17.97	14.37	14.36	10.16	0.91	17.47	13.97	13.83	8.72	0.91	16.94	13.56
		3.13	15.04	10.73	0.89	18.07	11.56	14.53	10.22	0.89	17.56	11.24	13.99	8.77	0.89	17.03	10.90
		3.75	15.22	10.80	0.86	18.17	9.69	14.69	10.28	0.87	17.66	9.42	14.15	8.82	0.87	17.12	9.13
CAS**018A (1.5)	86	3.00	17.94	12.74	1.09	21.66	14.44	17.36	12.23	1.09	21.09	14.06	16.79	10.47	1.09	20.51	13.68
		3.75	18.09	12.78	1.07	21.73	11.59	17.51	12.26	1.07	21.15	11.28	16.93	10.50	1.06	20.57	10.97
		4.50	18.24	12.82	1.04	21.79	9.68	17.66	12.30	1.04	21.21	9.43	17.08	10.53	1.04	20.62	9.16
CAS**024A (2.0)	86	4.00	24.00	17.20	1.50	29.12	14.56	23.26	16.53	1.50	28.38	14.19	22.57	14.24	1.50	27.69	13.85
		5.00	24.16	17.39	1.47	29.16	11.67	23.41	16.71	1.47	28.42	11.37	22.72	14.40	1.47	27.73	11.09
		6.00	24.32	17.59	1.43	29.21	9.74	23.57	16.90	1.43	28.45	9.48	22.87	14.57	1.43	27.76	9.25
CAS**030A (2.5)	86	5.00	30.02	21.30	1.88	36.62	14.65	29.14	20.45	1.89	35.57	14.23	28.25	17.64	1.89	34.69	13.88
		6.25	30.20	21.60	1.84	36.48	11.68	29.31	20.74	1.85	35.61	11.39	28.42	17.89	1.85	34.72	11.11
		7.50	30.37	21.90	1.80	36.52	9.74	29.48	21.03	1.80	35.64	9.50	28.58	18.14	1.81	34.75	9.27
CAS**036A (3.0)	86	6.00	35.98	25.76	2.10	43.41	14.47	34.88	24.88	2.11	42.07	14.02	33.82	21.44	2.10	40.99	13.66
		7.50	36.23	25.80	2.06	43.26	11.54	35.12	24.92	2.06	42.16	11.24	34.05	21.47	2.06	41.08	10.95
		9.00	36.47	25.84	2.02	43.36	9.64	35.36	24.96	2.02	42.25	9.39	34.28	21.50	2.02	41.16	9.15
CAS**042A (3.5)	86	7.00	42.28	28.41	2.88	52.10	14.89	40.92	28.02	2.89	50.78	14.51	39.61	24.23	2.90	49.50	14.14
		8.75	42.43	28.42	2.80	51.97	11.88	41.07	28.03	2.81	50.65	11.58	39.75	24.24	2.82	49.36	11.28
		10.50	42.58	28.44	2.71	51.84	9.87	41.22	28.04	2.72	50.51	9.62	39.89	24.25	2.73	49.21	9.37
CAS**048A (4.0)	86	8.00	48.57	32.80	3.31	59.85	14.96	46.56	31.57	3.32	57.90	14.48	44.58	27.11	3.34	55.96	13.99
		10.00	48.70	32.96	3.21	59.65	11.93	46.68	31.72	3.23	57.70	11.54	44.69	27.24	3.24	55.75	11.15
		12.00	48.82	33.11	3.12	59.46	9.91	46.80	31.87	3.13	57.50	9.58	44.81	27.37	3.15	55.54	9.26
CAS**060A (5.0)	86	10.00	57.61	40.46	3.90	70.91	14.18	55.89	39.28	3.90	69.20	13.84	54.18	33.85	3.92	67.55	13.51
		12.50	58.16	40.78	3.79	71.11	11.38	56.42	39.59	3.80	69.39	11.10	54.70	34.12	3.81	67.72	10.83
		15.00	58.72	41.10	3.69	71.31	9.51	56.96	39.90	3.70	69.58	9.28	55.22	34.38	3.71	67.88	9.05
CAS**072A (6.0)	86	12.00	69.97	53.66	5.02	87.09	14.53	67.58	56.38	5.00	84.66	14.12	65.15	51.08	4.99	82.17	13.71
		15.00	70.80	53.94	4.88	87.46	11.66	68.37	56.67	4.87	85.00	11.33	65.91	51.34	4.86	82.49	11.00
		18.00	71.61	54.21	4.75	87.84	9.76	69.16	56.96	4.74	85.35	9.48	66.68	51.61	4.73	82.81	9.20

Table 8: Closetline® Heating Performance

Heating Performance

Size (Tons)	EWT (°F)	GPM	Entering Air - 65°F db				Entering Air - 70°F db				Entering Air - 75°F db			
			HC (Btu/hr)	kW	HE (Btu/hr)	Liquid Temp Drop (°F)	HC (Btu/hr)	kW	HE (Btu/hr)	Liquid Temp Drop (°F)	HC (Btu/hr)	kW	HE (Btu/hr)	Liquid Temp Drop (°F)
CAS006A (0.5)**	68	1.00	6.84	0.38	5.56	11.11	6.81	0.40	5.45	10.89	6.79	0.43	5.33	10.67
		1.25	6.99	0.38	5.71	9.13	6.96	0.40	5.59	8.95	6.94	0.43	5.48	8.77
		2.00	7.45	0.38	6.15	6.15	7.42	0.41	6.04	6.04	7.39	0.43	5.92	5.92
CAS009A (0.75)**	68	1.50	10.81	0.72	8.34	11.12	10.78	0.76	8.19	10.92	10.75	0.80	8.03	10.71
		1.88	10.95	0.73	8.47	9.03	10.92	0.76	8.31	8.86	10.89	0.80	8.15	8.70
		2.50	11.18	0.73	8.67	6.94	11.15	0.77	8.51	6.81	11.12	0.81	8.35	6.68
CAS012A (1.0)**	68	2.00	14.44	0.84	11.58	11.58	14.42	0.88	11.43	11.43	14.41	0.92	11.28	11.28
		2.50	14.66	0.84	11.79	9.43	14.64	0.88	11.64	9.31	14.63	0.92	11.49	9.19
		3.00	14.88	0.84	12.01	8.00	14.86	0.88	11.85	7.90	14.84	0.92	11.70	7.80
CAS015A (1.25)**	68	2.50	17.44	0.89	14.39	11.51	17.21	0.95	13.98	11.19	16.98	1.00	13.58	10.86
		3.13	17.73	0.90	14.67	9.39	17.49	0.95	14.26	9.12	17.26	1.00	13.85	8.86
		3.75	18.02	0.90	14.95	7.97	17.78	0.95	14.53	7.75	17.54	1.00	14.12	7.53
CAS018A (1.5)**	68	3.00	20.99	1.08	17.29	11.53	20.72	1.14	16.83	11.22	20.45	1.20	16.37	10.91
		3.75	21.33	1.08	17.64	9.41	21.06	1.14	17.17	9.16	20.79	1.20	16.70	8.91
		4.50	21.68	1.08	17.98	7.99	21.40	1.14	17.51	7.78	21.13	1.20	17.04	7.57
CAS024A (2.0)**	68	4.00	27.41	1.49	22.32	11.16	27.03	1.57	21.68	10.84	26.66	1.65	21.03	10.52
		5.00	27.79	1.50	22.67	9.07	27.41	1.58	22.01	8.81	27.03	1.66	21.36	8.54
		6.00	28.17	1.51	23.01	7.67	27.78	1.59	22.35	7.45	27.39	1.67	21.69	7.23
CAS030A (2.5)**	68	5.00	33.74	1.86	27.40	10.96	33.30	1.95	26.64	10.66	32.85	2.04	25.88	10.35
		6.25	33.99	1.87	27.62	8.84	33.54	1.96	26.86	8.59	33.09	2.05	26.10	8.35
		7.50	34.24	1.87	27.85	7.43	33.78	1.96	27.08	7.22	33.33	2.06	26.31	7.02
CAS036A (3.0)**	68	6.00	41.84	2.34	33.86	11.29	41.33	2.44	32.99	11.00	40.82	2.55	32.13	10.71
		7.50	42.55	2.36	34.51	9.20	42.03	2.46	33.63	8.97	41.50	2.56	32.76	8.74
		9.00	43.26	2.37	35.16	7.81	42.73	2.48	34.28	7.62	42.19	2.58	33.39	7.42
CAS042A (3.5)**	68	7.00	47.91	2.93	37.90	10.83	47.31	3.07	36.83	10.52	46.72	3.21	35.75	10.21
		8.75	48.59	2.95	38.53	8.81	47.98	3.09	37.44	8.56	47.38	3.23	36.36	8.31
		10.50	49.27	2.96	39.16	7.46	48.65	3.10	38.06	7.25	48.04	3.25	36.96	7.04
CAS048A (4.0)**	68	8.00	54.62	3.37	43.12	10.78	53.94	3.53	41.90	10.48	53.25	3.68	40.68	10.17
		10.00	55.49	3.39	43.92	8.78	54.79	3.55	42.69	8.54	54.09	3.70	41.45	8.29
		12.00	56.36	3.41	44.72	7.45	55.65	3.57	43.47	7.25	54.94	3.73	42.22	7.04
CAS060A (5.0)**	68	10.00	70.44	4.24	55.96	11.19	69.66	4.43	54.52	10.90	68.87	4.63	53.09	10.62
		12.50	71.41	4.27	56.83	9.09	70.62	4.47	55.38	8.86	69.82	4.66	53.93	8.63
		15.00	72.39	4.30	57.70	7.69	71.58	4.50	56.24	7.50	70.77	4.69	54.77	7.30
CAS072A (6.0)**	68	12.00	71.49	4.56	55.93	9.33	71.09	4.80	54.73	9.13	70.69	5.03	53.53	8.93
		15.00	71.97	4.57	56.36	7.51	71.57	4.81	55.16	7.35	71.17	5.04	53.95	7.19
		18.00	72.44	4.59	56.79	6.31	72.04	4.82	55.58	6.18	71.64	5.06	54.38	6.05

Table 9: Closetline® Reheat Performance

Cooling Performance

Size (Tons)	EWT (°F)	GPM	Entering Air - 80°F / 67°F					Entering Air - 78°F / 65°F					Entering Air - 75°F / 63°F				
			TC (Btu/hr)	SC (Btu/hr)	kW	HR (Btu/hr)	Liquid Temp Rise (°F)	TC (Btu/hr)	SC (Btu/hr)	kW	HR (Btu/hr)	Liquid Temp Rise (°F)	TC (Btu/hr)	SC (Btu/hr)	kW	HR (Btu/hr)	Liquid Temp Rise (°F)
CAS**006A (0.5)	86	1.00	1.53	0.22	0.39	2.87	5.75	1.29	0.12	0.39	2.64	5.27	1.06	-0.18	0.39	2.39	4.79
		1.25	1.61	0.29	0.39	2.94	4.71	1.36	0.16	0.39	2.69	4.31	1.12	-0.24	0.39	2.44	3.90
		2.00	1.72	0.35	0.39	3.04	3.04	1.46	0.19	0.39	2.77	2.77	1.20	-0.28	0.38	2.50	2.50
CAS**009A (0.75)	86	1.50	4.04	1.47	0.74	6.56	8.74	3.61	1.39	0.74	6.12	8.16	3.19	0.62	0.74	5.71	7.61
		1.88	4.24	1.55	0.73	6.72	7.17	3.78	1.47	0.73	6.26	6.68	3.35	0.66	0.73	5.83	6.22
		2.50	4.46	1.74	0.72	6.92	5.54	3.98	1.65	0.72	6.44	5.15	3.53	0.74	0.72	5.99	4.79
CAS**012A (1.0)	86	2.00	6.08	2.60	1.03	9.59	9.59	5.55	2.50	1.03	9.05	9.05	5.02	1.49	1.02	8.52	8.52
		2.50	6.26	2.87	1.02	9.73	7.79	5.71	2.76	1.01	9.17	7.34	5.17	1.64	1.01	8.63	6.90
		3.00	6.60	2.91	1.01	10.04	6.69	6.01	2.79	1.01	9.45	6.30	5.44	1.67	1.01	8.87	5.92
CAS**015A (1.25)	86	2.50	5.01	1.82	0.87	7.97	6.38	4.33	1.50	0.87	7.29	5.83	3.69	0.34	0.87	6.66	5.33
		3.13	5.21	2.03	0.86	8.14	5.21	4.51	1.67	0.86	7.44	4.76	3.85	0.38	0.86	6.78	4.34
		3.75	5.22	2.15	0.85	8.13	4.34	4.51	1.77	0.85	7.42	3.96	3.85	0.41	0.85	6.76	3.61
CAS**018A (1.5)	86	3.00	6.59	2.25	1.22	10.74	7.16	5.85	2.12	1.22	10.00	6.67	5.14	0.80	1.21	9.28	6.18
		3.75	6.85	2.47	1.20	10.96	5.84	6.09	2.33	1.20	10.19	5.43	5.34	0.88	1.20	9.44	5.03
		4.50	7.11	2.49	1.20	11.20	4.98	6.32	2.35	1.20	10.40	4.62	5.54	0.88	1.20	9.62	4.28
CAS**024A (2.0)	86	4.00	10.24	4.21	1.45	15.19	7.60	9.36	3.68	1.44	14.29	7.15	8.50	1.64	1.44	13.41	6.70
		5.00	10.83	4.54	1.43	15.73	6.29	9.91	3.97	1.43	14.78	5.91	9.00	1.77	1.42	13.84	5.54
		6.00	10.93	4.86	1.42	15.79	5.26	10.00	4.24	1.42	14.83	4.94	9.08	1.89	1.41	13.88	4.63
CAS**030A (2.5)	86	5.00	7.80	2.73	1.91	14.32	5.73	6.95	2.24	1.88	13.36	5.34	6.02	0.16	1.83	12.28	4.91
		6.25	8.13	3.15	1.89	14.58	4.66	7.24	2.59	1.86	13.58	4.35	6.27	0.18	1.81	12.46	3.99
		7.50	9.44	3.37	1.88	15.87	4.23	8.41	2.77	1.85	14.73	3.93	7.28	0.20	1.81	13.46	3.59
CAS**036A (3.0)	86	6.00	10.82	3.49	2.07	17.88	5.96	9.35	3.17	2.05	16.36	5.45	7.98	0.42	2.04	14.95	4.98
		7.50	11.32	3.72	2.05	18.30	4.88	9.79	3.38	2.03	16.72	4.46	8.35	0.45	2.02	15.25	4.07
		9.00	12.03	3.85	2.04	18.98	4.22	10.40	3.50	2.02	17.31	3.85	8.87	0.46	2.01	15.74	3.50
CAS**042A (3.5)	86	7.00	15.52	5.07	2.93	25.53	7.29	13.81	4.75	2.91	23.73	6.78	12.14	1.64	2.88	21.98	6.28
		8.75	16.26	5.57	2.87	26.06	5.96	14.46	5.22	2.85	24.18	5.53	12.72	1.80	2.82	22.35	5.11
		10.50	16.52	5.76	2.87	26.30	5.01	14.70	5.40	2.84	24.39	4.65	12.92	1.87	2.82	22.54	4.29
CAS**048A (4.0)	86	8.00	13.48	1.20	3.30	24.75	6.19	10.96	0.80	3.38	22.51	5.63	8.56	-2.17	3.45	20.34	5.08
		10.00	13.77	1.28	3.28	24.95	4.99	11.20	0.86	3.36	22.66	4.53	8.74	-2.32	3.43	20.44	4.09
		12.00	13.88	1.37	3.27	25.03	4.17	11.29	0.92	3.35	22.71	3.79	8.81	-2.48	3.42	20.47	3.41
CAS**060A (5.0)	86	10.00	23.17	8.06	4.51	38.56	7.71	20.90	7.88	4.66	36.80	7.36	18.42	2.10	4.77	34.68	6.94
		12.50	23.80	7.78	4.49	39.14	6.26	21.47	7.60	4.65	37.32	5.97	18.92	2.02	4.75	35.13	5.62
		15.00	25.90	7.54	4.47	41.15	5.49	23.36	7.37	4.62	39.12	5.22	20.58	1.96	4.72	36.70	4.89
CAS**072A (6.0)	86	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Table 10: Closetpack® Cooling Performance

Cooling Performance

Size (Tons)	EWT (°F)	GPM	Entering Air - 80°F / 67°F					Entering Air - 78°F / 65°F					Entering Air - 75°F / 63°F				
			TC (Btu/hr)	SC (Btu/hr)	kW	HR (Btu/hr)	Liquid Temp Rise (°F)	TC (Btu/hr)	SC (Btu/hr)	kW	HR (Btu/hr)	Liquid Temp Rise (°F)	TC (Btu/hr)	SC (Btu/hr)	kW	HR (Btu/hr)	Liquid Temp Rise (°F)
CAS**006A (0.5)	86	1.00	5.88	4.22	0.37	7.13	14.26	5.61	3.90	0.38	6.89	13.78	5.33	3.29	0.39	6.65	13.31
		1.25	5.94	4.25	0.36	7.17	11.47	5.67	3.93	0.37	6.92	11.08	5.39	3.32	0.38	6.68	10.70
		2.00	6.12	4.35	0.34	7.28	7.28	5.84	4.02	0.35	7.02	7.02	5.55	3.39	0.36	6.78	6.78
CAS**009A (0.75)	86	1.50	8.98	5.93	0.67	11.26	15.01	8.68	5.75	0.67	10.96	14.61	8.38	4.85	0.67	10.66	14.21
		1.88	9.04	5.96	0.65	11.26	12.01	8.73	5.78	0.65	10.96	11.69	8.43	4.87	0.65	10.66	11.37
		2.50	9.13	6.00	0.63	11.28	9.02	8.82	5.82	0.63	10.97	8.78	8.51	4.91	0.63	10.67	8.53
CAS**012A (1.0)	86	2.00	12.28	8.91	0.98	15.62	15.62	11.90	8.57	0.98	15.25	15.25	11.56	7.44	0.98	14.91	14.91
		2.50	12.47	9.08	0.96	15.76	12.60	12.10	8.74	0.96	15.38	12.31	11.74	7.58	0.96	15.03	12.03
		3.00	12.67	9.25	0.94	15.89	10.59	12.29	8.90	0.94	15.51	10.34	11.93	7.72	0.94	15.15	10.10
CAS**015A (1.25)	86	2.50	14.87	10.67	0.91	17.96	14.37	14.36	10.16	0.91	17.47	13.97	13.83	8.71	0.91	16.94	13.55
		3.13	15.04	10.73	0.89	18.07	11.56	14.53	10.22	0.89	17.56	11.24	13.99	8.77	0.89	17.03	10.90
		3.75	15.21	10.79	0.87	18.16	9.69	14.69	10.28	0.87	17.65	9.42	14.15	8.82	0.87	17.12	9.13
CAS**018A (1.5)	86	3.00	17.94	12.74	1.09	21.66	14.44	17.36	12.23	1.09	21.09	14.06	16.79	10.47	1.09	20.51	13.67
		3.75	18.09	12.78	1.07	21.73	11.59	17.51	12.26	1.07	21.15	11.28	16.93	10.50	1.06	20.56	10.97
		4.50	18.24	12.82	1.04	21.79	9.68	17.66	12.30	1.04	21.21	9.43	17.08	10.53	1.04	20.62	9.16
CAS**024A (2.0)	86	4.00	24.00	17.20	1.50	29.12	14.56	23.25	16.53	1.50	28.38	14.19	22.57	14.24	1.50	27.69	13.85
		5.00	24.16	17.39	1.47	29.16	11.66	23.41	16.71	1.47	28.42	11.37	22.72	14.40	1.47	27.72	11.09
		6.00	24.32	17.59	1.43	29.20	9.73	23.56	16.90	1.43	28.45	9.48	22.87	14.57	1.43	27.76	9.25
CAS**030A (2.5)	86	5.00	30.02	21.30	1.88	36.45	14.58	29.14	20.45	1.89	35.57	14.23	28.25	17.64	1.89	34.69	13.88
		6.25	30.20	21.60	1.84	36.48	11.67	29.31	20.74	1.85	35.60	11.39	28.41	17.88	1.85	34.72	11.11
		7.50	30.37	21.90	1.80	36.52	9.74	29.48	21.03	1.81	35.64	9.50	28.58	18.14	1.81	34.75	9.27
CAS**036A (3.0)	86	6.00	35.98	25.76	2.11	43.16	14.39	34.88	24.88	2.11	42.07	14.02	33.81	21.44	2.10	40.99	13.66
		7.50	36.22	25.80	2.06	43.26	11.54	35.12	24.92	2.06	42.16	11.24	34.04	21.47	2.06	41.08	10.95
		9.00	36.47	25.84	2.02	43.36	9.64	35.36	24.96	2.02	42.25	9.39	34.27	21.50	2.02	41.16	9.15
CAS**042A (3.5)	86	7.00	42.27	28.41	2.88	52.10	14.89	40.92	28.02	2.89	50.78	14.51	39.60	24.23	2.90	49.49	14.14
		8.75	42.42	28.42	2.80	51.97	11.88	41.07	28.03	2.81	50.64	11.58	39.74	24.24	2.82	49.35	11.28
		10.50	42.58	28.43	2.71	51.84	9.87	41.21	28.04	2.72	50.51	9.62	39.89	24.25	2.73	49.21	9.37
CAS**048A (4.0)	86	8.00	48.57	32.80	3.31	59.85	14.96	46.56	31.57	3.32	57.90	14.48	44.58	27.11	3.34	55.96	13.99
		10.00	48.69	32.95	3.21	59.65	11.93	46.68	31.72	3.23	57.70	11.54	44.69	27.24	3.24	55.75	11.15
		12.00	48.82	33.11	3.12	59.46	9.91	46.80	31.87	3.13	57.50	9.58	44.81	27.37	3.15	55.54	9.26
CAS**060A (5.0)	86	10.00	57.611	40.460	3.897	70.908	14.18	55.887	39.282	3.903	69.205	13.84	54.184	33.850	3.917	67.549	13.51
		12.50	58.163	40.779	3.795	71.113	11.38	56.422	39.592	3.801	69.393	11.10	54.703	34.117	3.815	67.719	10.84
		15.00	58.716	41.097	3.692	71.315	9.51	56.959	39.901	3.699	69.579	9.28	55.223	34.383	3.711	67.887	9.05
CAS**072A (6.0)	86	12.00	69.974	53.659	5.016	87.090	14.53	67.578	56.377	5.005	84.655	14.12	65.149	51.078	4.990	82.174	13.71
		15.00	70.796	53.937	4.884	87.462	11.66	68.372	56.669	4.873	85.000	11.33	65.914	51.343	4.858	82.491	11.00
		18.00	71.614	54.213	4.754	87.836	9.76	69.162	56.960	4.743	85.347	9.48	66.676	51.606	4.729	82.811	9.20

Table 11: Closetpack® Heating Performance

Heating Performance

Size (Tons)	EWT (°F)	GPM	Entering Air - 65°F db				Entering Air - 70°F db				Entering Air - 75°F db			
			HC (Btu/hr)	kW	HE (Btu/hr)	Liquid Temp Drop (°F)	HC (Btu/hr)	kW	HE (Btu/hr)	Liquid Temp Drop (°F)	HC (Btu/hr)	kW	HE (Btu/hr)	Liquid Temp Drop (°F)
CAS*C006A (0.5)	105	1.00	6.60	0.06	6.39	12.79	5.70	0.06	5.50	10.99	4.73	0.06	4.53	9.06
		1.25	6.96	0.06	6.75	10.80	6.01	0.06	5.81	9.29	4.99	0.06	4.79	7.66
		2.00	7.46	0.06	7.25	7.25	6.44	0.06	6.24	6.24	5.35	0.06	5.14	5.14
CAS*C009A (0.75)	105	1.50	9.22	0.09	8.91	11.88	7.96	0.09	7.65	10.20	6.61	0.09	6.30	8.40
		1.88	9.67	0.09	9.36	9.98	8.35	0.09	8.04	8.58	6.93	0.09	6.63	7.07
		2.50	10.13	0.09	9.82	7.86	8.75	0.09	8.44	6.75	7.27	0.09	6.96	5.57
CAS*C012A (1.0)	105	2.00	11.52	0.12	11.11	11.11	9.95	0.12	9.54	9.54	8.26	0.12	7.85	7.85
		2.50	12.07	0.12	11.66	9.33	10.42	0.12	10.01	8.01	8.65	0.12	8.24	6.59
		3.00	12.45	0.12	12.04	8.03	10.75	0.12	10.34	6.89	8.93	0.12	8.52	5.68
CAS*C015A (1.25)	105	2.50	16.40	0.15	15.89	12.71	14.17	0.15	13.66	10.93	11.77	0.15	11.26	9.01
		3.13	17.18	0.15	16.67	10.67	14.84	0.15	14.33	9.17	12.33	0.15	11.82	7.56
		3.75	17.70	0.15	17.19	9.17	15.29	0.15	14.78	7.88	12.70	0.15	12.19	6.50
CAS*C018A (1.5)	105	3.00	19.48	0.18	18.86	12.58	16.82	0.18	16.21	10.80	13.97	0.18	13.35	8.90
		3.75	20.31	0.18	19.70	10.51	17.54	0.18	16.93	9.03	14.56	0.18	13.95	7.44
		4.50	20.88	0.18	20.26	9.01	18.03	0.18	17.42	7.74	14.97	0.18	14.36	6.38
CAS*C024A (2.0)	105	4.00	24.00	0.24	23.18	11.59	20.73	0.24	19.91	9.96	17.22	0.24	16.40	8.20
		5.00	25.17	0.24	24.35	9.74	21.74	0.24	20.92	8.37	18.06	0.24	17.24	6.89
		6.00	25.98	0.24	25.16	8.39	22.44	0.24	21.62	7.21	18.64	0.24	17.82	5.94
CAS*C030A (2.5)	105	5.00	28.49	0.30	27.47	10.99	24.60	0.30	23.58	9.43	20.42	0.30	19.40	7.76
		6.25	29.83	0.30	28.81	9.22	25.76	0.30	24.74	7.92	21.39	0.30	20.36	6.52
		7.50	30.78	0.30	29.76	7.94	26.58	0.30	25.56	6.82	22.07	0.30	21.04	5.61
CAS*C036A (3.0)	105	6.00	34.81	0.36	33.58	11.19	30.06	0.36	28.83	9.61	24.96	0.36	23.73	7.91
		7.50	36.57	0.36	35.34	9.42	31.58	0.36	30.35	8.09	26.22	0.36	25.00	6.67
		9.00	37.81	0.36	36.58	8.13	32.65	0.36	31.42	6.98	27.11	0.36	25.88	5.75
CAS*C042A (3.5)	105	7.00	36.95	0.42	35.51	10.15	31.90	0.42	30.47	8.70	26.48	0.42	25.05	7.16
		8.75	38.71	0.42	37.27	8.52	33.42	0.42	31.99	7.31	27.74	0.42	26.31	6.01
		10.50	39.95	0.42	38.51	7.34	34.49	0.42	33.06	6.30	28.63	0.42	27.20	5.18
CAS*C048A (4.0)	105	8.00	43.30	0.48	41.66	10.41	37.39	0.48	35.75	8.94	31.05	0.48	29.41	7.35
		10.00	45.53	0.48	43.89	8.78	39.32	0.48	37.68	7.54	32.65	0.48	31.01	6.20
		12.00	47.14	0.48	45.50	7.58	40.71	0.48	39.07	6.51	33.80	0.48	32.17	5.36
CAS*C060A (5.0)	105	10.00	50.78	0.60	48.74	9.75	43.85	0.60	41.80	8.36	36.40	0.60	34.35	6.87
		12.50	53.33	0.60	51.28	8.21	46.05	0.60	44.00	7.04	38.23	0.60	36.18	5.79
		15.00	55.16	0.60	53.11	7.08	47.63	0.60	45.58	6.08	39.54	0.60	37.49	5.00
CAS*C072A (6.0)	105	12.00	69.18	0.72	66.72	11.22	60.81	0.72	58.35	9.81	52.45	0.72	49.99	8.41
		15.00	72.05	0.72	69.59	9.36	63.31	0.72	60.85	8.19	54.58	0.72	52.12	7.01
		18.00	74.02	0.72	71.57	8.02	65.03	0.72	62.57	7.01	56.04	0.72	53.59	6.01

Table 12: VP Blower EC Constant Torque Performance Table

Unit	Rated CFM	Min. CFM	Fan Option	CFM at External Static Pressure (in wg.)												
				Speed	0.0	0.05	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
CASH*006ABA**	200	140	EC Constant Torque	HI	340	333	326	308	287	261	232	200	163			
				MED HI	321	314	306	286	261	231	196	156				
				MED	292	285	276	252	221	183						
				MED LO	253	241	228	196	157							
				LOW	213	199	181									
CASH*009ABA**	300	210	EC Constant Torque	HI	443	435	427	408	388	366	343	318	291	263	233	
				MED HI	420	412	403	383	361	337	312	284	255	223		
				MED	396	387	378	357	333	306	277	245	210			
				MED LO	368	356	344	317	287	255	220					
				LOW	343	330	317	287	254	217						
CASH*012ABA**	400	280	EC Constant Torque	HI	531	526	520	506	490	471	450	426	400	371	339	306
				MED HI	509	504	498	483	466	445	422	396	367	335	300	
				MED	495	487	477	458	436	412	386	359	329	298		
				MED LO	471	464	455	437	415	391	364	335	302			
				LOW	435	425	415	391	366	337	305					
CASH*015ABA**	500	350	EC Constant Torque	HI	864	847	828	788	744	695	642	585	524	458	389	
				MED HI	808	788	768	722	671	613	551	482	408			
				MED	752	732	710	658	598	529	452	365				
				MED LO	672	652	628	567	492	401						
				LOW	604	573	538	459	365							
CASH*018ABA**	600	420	EC Constant Torque	HI	915	900	884	851	814	773	729	682	632	578	520	460
				MED HI	860	843	826	788	746	700	649	594	536	473		
				MED	811	792	771	727	679	626	568	506	439			
				MED LO	748	727	704	653	597	534	466					
				LOW	688	663	636	577	512	440						
CASH*024ABA**	800	560	EC Constant Torque	HI	1035	1021	1007	979	952	925	898	872	846	820	795	770
				MED HI	984	969	954	924	895	866	837	808	779	751	723	695
				MED	894	878	861	829	797	766	735	704	674	645	616	588
				MED LO	845	828	811	777	744	711	679	648	618	588		
				LOW	775	758	741	707	674	641	609	577				
CASH*030ABA**	1000	700	EC Constant Torque	HI	1130	1125	1119	1104	1085	1063	1037	1008	975	939	899	856
				MED HI	1076	1086	1094	1100	1094	1076	1047	1005	952	887	810	721
				MED	1092	1086	1080	1065	1048	1029	1007	983	956	928	896	863
				MED LO	1056	1051	1046	1032	1016	997	976	951	923	893	860	824
				LOW	1017	1012	1007	994	980	963	945	925	903	879	853	825
CASH*036ABA**	1200	840	EC Constant Torque	HI	1394	1382	1369	1344	1318	1292	1265	1239	1212	1184	1156	1128
				MED HI	1357	1344	1332	1306	1280	1254	1227	1200	1172	1144	1115	1086
				MED	1324	1311	1298	1272	1245	1218	1190	1162	1134	1105	1076	1046
				MED LO	1285	1271	1257	1229	1201	1173	1145	1116	1088	1059	1031	1002
				LOW	1252	1237	1223	1194	1165	1136	1107	1078	1049	1020	991	962
CASH*042ABA**	1400	980	EC Constant Torque	HI	1591	1581	1571	1550	1528	1505	1480	1454	1426	1397	1367	1335
				MED HI	1542	1532	1522	1501	1478	1454	1428	1401	1373	1344	1313	1281
				MED	1485	1473	1461	1436	1411	1384	1356	1328	1298	1267	1236	1203
				MED LO	1433	1423	1412	1390	1366	1341	1314	1285	1254	1222	1188	1153
				LOW	1412	1405	1397	1379	1358	1334	1307	1277	1244	1207	1168	1126
CASH*048ABA**	1600	1120	EC Constant Torque	HI	1804	1787	1771	1740	1709	1680	1652	1624	1598	1574	1550	1527
				MED HI	1776	1760	1744	1714	1684	1655	1627	1600	1574	1549	1525	1501
				MED	1748	1731	1715	1684	1654	1624	1596	1568	1542	1516	1491	1468
				MED LO	1688	1671	1655	1623	1592	1563	1534	1506	1480	1454	1430	1406
				LOW	1625	1607	1590	1557	1525	1494	1464	1435	1408	1381	1356	1332
CASH*060ABA**	2000	1400	EC Constant Torque	HI	2209	2194	2179	2149	2118	2087	2056	2024	1992	1960	1927	1894
				MED HI	2136	2121	2106	2077	2049	2022	1995	1970	1945	1922	1899	1877
				MED	2076	2060	2045	2016	1988	1960	1933	1908	1883	1859	1836	1814
				MED LO	2009	1996	1982	1955	1929	1903	1877	1852	1827	1803	1779	1755
				LOW	1951	1936	1921	1892	1864	1836	1810	1783	1758	1733	1710	1686
CASH*072ABA**	2200	1540	EC Constant Torque	HI	2530	2510	2490	2450	2411	2371	2332	2293	2254	2216	2178	2140
				MED HI	2475	2455	2434	2393	2351	2310	2269	2229	2188	2147	2107	2067
				MED	2412	2389	2367	2321	2276	2232	2188	2144	2101	2058	2016	1975
				MED LO	2350	2330	2309	2269	2228	2187	2146	2105	2063	2021	1979	1937
				LOW	2273	2253	2233	2192	2150	2108	2066	2023	1980	1937	1893	1849

Table 13: Closetline® CASH Electrical Data - EC Constant Torque Motor

Size (Tons)	Compressor				Supply Blower Motor		Single Point Power	
	Voltage		LRA	QTY	FLA	HP	MCA	MOPD
CASH*006A***A (0.50)	208-230/1/60	2.5	17.7	1	2.2	1/4	5.3	15
	265/1/60	2.1	13.5	1	2.2	1/4	4.8	15
	208-230/3/60	Not Available					Not Available	
	460/3/60	Not Available					Not Available	
	575/3/60	Not Available					Not Available	
CASH*009A***A (0.75)	208-230/1/60	4.0	22.2	1	2.2	1/4	7.2	15
	265/1/60	3.3	18.8	1	2.2	1/4	6.3	15
	208-230/3/60	Not Available					Not Available	
	460/3/60	Not Available					Not Available	
	575/3/60	Not Available					Not Available	
CASH*0012A***A (1.00)	208-230/1/60	5.6	29.0	1	2.2	1/4	9.2	15
	265/1/60	4.6	20.0	1	2.2	1/4	8.0	15
	208-230/3/60	Not Available					Not Available	
	460/3/60	Not Available					Not Available	
	575/3/60	Not Available					Not Available	
CASH*015A***A (1.25)	208-230/1/60	4.8	26.0	1	2.2	1/4	8.2	15
	265/1/60	4.2	25.0	1	2.2	1/4	7.5	15
	208-230/3/60	Not Available					Not Available	
	460/3/60	Not Available					Not Available	
	575/3/60	Not Available					Not Available	
CASH*018A***A (1.50)	208-230/1/60	7.7	38.0	1	2.2	1/4	11.8	15
	265/1/60	7.1	30.0	1	2.2	1/4	11.1	15
	208-230/3/60	Not Available					Not Available	
	460/3/60	Not Available					Not Available	
	575/3/60	Not Available					Not Available	
CASH*024A***A (2.00)	208-230/1/60	13.5	58.3	1	4.6	1/2	21.5	30
	265/1/60	9.0	54.0	1	3.2	1/2	14.5	20
	208-230/3/60	7.1	55.4	1	4.6	1/2	13.5	20
	460/3/60	3.5	28.0	1	3.2	1/2	7.6	15
	575/3/60	Not Available					Not Available	
CASH*030A***A (2.50)	208-230/1/60	14.1	73.0	1	4.6	1/2	22.2	30
	265/1/60	11.2	60.0	1	3.2	1/2	17.2	20
	208-230/3/60	8.9	58.0	1	4.6	1/2	15.7	20
	460/3/60	4.2	28.0	1	3.2	1/2	8.5	15
	575/3/60	Not Available					Not Available	
CASH*036A***A (3.0)	208-230/1/60	14.1	77.0	1	4.6	1/2	22.2	30
	265/1/60	12.2	72.0	1	3.2	1/2	18.5	30
	208-230/3/60	9.0	71.0	1	4.6	1/2	15.9	20
	460/3/60	5.6	38.0	1	3.2	1/2	10.2	15
	575/3/60	Not Available					Not Available	
CASH*042A***A (3.50)	208-230/1/60	17.9	112.0	1	6.3	3/4	28.7	40
	265/1/60	16.0	87.0	1	3.9	3/4	23.9	30
	208-230/3/60	13.5	88.0	1	6.3	3/4	23.2	30
	460/3/60	6.0	44.0	1	3.9	3/4	11.4	15
	575/3/60	Not Available					Not Available	
CASH*048A***A (4.00)	208-230/1/60	21.8	117.0	1	6.3	3/4	33.6	50
	265/1/60	16.3	98.0	1	3.9	3/4	24.3	40
	208-230/3/60	13.7	83.1	1	6.3	3/4	23.4	30
	460/3/60	6.2	41.0	1	3.9	3/4	11.7	15
	575/3/60	Not Available					Not Available	
CASH*060A***A (5.00)	208-230/1/60	26.3	134.0	1	6.3	3/4	39.2	50
	265/1/60	19.9	128.0	1	3.9	3/4	28.8	40
	208-230/3/60	15.6	110.0	1	6.3	3/4	25.8	40
	460/3/60	7.8	52.0	1	3.9	3/4	13.7	20
	575/3/60	Not Available					Not Available	
CASH*072A***A (6.00)	208-230/1/60	30.8	178.0	1	6.6	1	45.1	50
	265/1/60	Not Available					Not Available	
	208-230/3/60	19.6	136.0	1	6.6	1	31.1	40
	460/3/60	8.2	66.1	1	6.0	1	16.3	20
	575/3/60	Not Available					Not Available	

Table 14: Closetline® CASV Electrical Data - Constant Torque EC Motor

Size (Tons)	Compressor				Supply Blower Motor		Single Point Power	
	Voltage		LRA	QTY	FLA	HP	MCA	MOPD
CASV*006A***A (0.50)	208-230/1/60	2.5	17.7	1	2.2	1/4	5.3	15
	265/1/60	2.1	13.5	1	2.2	1/4	4.8	15
	208-230/3/60	Not Available					Not Available	
	460/3/60	Not Available					Not Available	
	575/3/60	Not Available					Not Available	
CASV*009A***A (0.75)	208-230/1/60	4.0	22.2	1	2.2	1/4	7.2	15
	265/1/60	3.3	18.8	1	2.2	1/4	6.3	15
	208-230/3/60	Not Available					Not Available	
	460/3/60	Not Available					Not Available	
	575/3/60	Not Available					Not Available	
CASV*0012A***A (1.00)	208-230/1/60	5.6	29.0	1	2.2	1/4	9.2	15
	265/1/60	4.6	20.0	1	2.2	1/4	8.0	15
	208-230/3/60	Not Available					Not Available	
	460/3/60	Not Available					Not Available	
	575/3/60	Not Available					Not Available	
CASV*015A***A (1.25)	208-230/1/60	4.8	26.0	1	2.2	1/4	8.2	15
	265/1/60	4.2	25.0	1	2.2	1/4	7.5	15
	208-230/3/60	Not Available					Not Available	
	460/3/60	Not Available					Not Available	
	575/3/60	Not Available					Not Available	
CASV*018A***A (1.50)	208-230/1/60	7.7	38.0	1	2.2	1/4	11.8	15
	265/1/60	7.1	30.0	1	2.2	1/4	11.1	15
	208-230/3/60	Not Available					Not Available	
	460/3/60	Not Available					Not Available	
	575/3/60	Not Available					Not Available	
CASV*024A***A (2.00)	208-230/1/60	13.5	58.3	1	4.6	1/2	21.5	30
	265/1/60	9.0	54.0	1	3.2	1/2	14.5	20
	208-230/3/60	7.1	55.4	1	4.6	1/2	13.5	20
	460/3/60	3.5	28.0	1	3.2	1/2	7.6	15
	575/3/60	Not Available					Not Available	
CASV*030A***A (2.50)	208-230/1/60	14.1	73.0	1	4.6	1/2	22.2	30
	265/1/60	11.2	60.0	1	3.2	1/2	17.2	20
	208-230/3/60	8.9	58.0	1	4.6	1/2	15.7	20
	460/3/60	4.2	28.0	1	3.2	1/2	8.5	15
	575/3/60	Not Available					Not Available	
CASV*036A***A (3.0)	208-230/1/60	14.1	77.0	1	4.6	1/2	22.2	30
	265/1/60	12.2	72.0	1	3.2	1/2	18.5	30
	208-230/3/60	9.0	71.0	1	4.6	1/2	15.9	20
	460/3/60	5.6	38.0	1	3.2	1/2	10.2	15
	575/3/60	Not Available					Not Available	
CASV*042A***A (3.50)	208-230/1/60	17.9	112.0	1	6.3	3/4	28.7	40
	265/1/60	16.0	87.0	1	3.9	3/4	23.9	30
	208-230/3/60	13.5	88.0	1	6.3	3/4	23.2	30
	460/3/60	6.0	44.0	1	3.9	3/4	11.4	15
	575/3/60	Not Available					Not Available	
CASV*048A***A (4.00)	208-230/1/60	21.8	117.0	1	6.3	3/4	33.6	50
	265/1/60	16.3	98.0	1	3.9	3/4	24.3	40
	208-230/3/60	13.7	83.1	1	6.3	3/4	23.4	30
	460/3/60	6.2	41.0	1	3.9	3/4	11.7	15
	575/3/60	Not Available					Not Available	
CASV*060A***A (5.00)	208-230/1/60	26.3	134.0	1	6.6	1	39.5	50
	265/1/60	19.9	128.0	1	6.0	1	30.9	50
	208-230/3/60	15.6	110.0	1	6.6	1	26.1	40
	460/3/60	7.8	52.0	1	6.0	1	15.8	20
	575/3/60	Not Available					Not Available	
CASV*072A***A (6.00)	208-230/1/60	30.8	178.0	1	6.6	1	45.1	50
	265/1/60	Not Available					Not Available	
	208-230/3/60	19.6	136.0	1	6.6	1	31.1	40
	460/3/60	8.2	66.1	1	6.0	1	16.3	20
	575/3/60	Not Available					Not Available	

Table 15: Closetline® CASH Sound Data - Standard Construction

Size (Tons)	Model	Ducted Discharge Sound Rating[1] (dB-A)	Ducted Discharge Octave Bands (Hz) 63	125	250	500	1000	2000	4000	8000	Free Inlet Combined with Casing Radiated Sound Rating1 (dB-A)	Free Inlet Combined with Casing Radiated Octave Bands (Hz) 63	125	250	500	1000	2000	4000	8000
CASH006 (.50)	Fan Only - Low	53.3	71.9	62.8	51.4	49.3	46.7	42.2	33.8	24.6	44.9	56.7	55.7	47.7	42.9	35.1	26.1	21.5	19.6
	Fan Only - High	61.0	78.3	70.1	58.4	56.3	55.0	51.0	47.0	39.4	52.1	63.3	62.5	54.8	50.0	43.8	34.9	31.7	22.7
	Cooling - Low	56.7	81.6	63.8	52.1	49.5	47.3	46.0	33.4	24.5	49.1	61.0	61.2	50.9	44.4	38.9	35.6	31.2	32.3
	Cooling - High	61.6	81.3	70.1	58.4	56.4	55.1	51.2	47.3	39.8	52.6	63.8	63.4	54.5	50.4	44.1	37.4	33.4	32.8
	Heating - Low	55.8	78.3	63.3	52.5	50.1	48.1	44.6	35.4	29.8	50.4	61.9	62.8	50.5	44.7	42.1	37.1	34.6	36.1
	Heating - High	61.6	79.3	70.3	59.6	56.5	55.8	51.4	47.0	39.5	53.1	63.5	64.3	55.3	50.3	44.8	37.3	33.9	32.9
CASH009 (.75)	Fan Only - Low	63.3	80.2	72.0	61.4	58.2	57.7	53.1	50.0	43.3	53.0	63.0	61.8	55.4	51.5	45.8	36.7	32.9	24.5
	Fan Only - High	71.0	86.4	80.0	70.7	65.0	65.0	60.7	58.8	54.1	60.4	69.1	69.2	64.3	58.2	52.7	44.0	42.2	35.8
	Cooling - Low	62.8	81.4	72.0	60.4	57.9	56.4	52.2	49.1	42.2	58.7	68.2	73.1	56.6	52.2	48.1	38.6	34.6	31.4
	Cooling - High	70.9	86.7	80.0	70.3	64.7	64.6	60.6	58.8	54.1	62.0	70.6	74.1	64.1	58.4	53.3	44.3	42.3	37.0
	Heating - Low	63.4	81.5	72.5	61.5	57.9	57.8	52.6	49.2	42.6	56.8	70.2	69.4	57.7	53.2	47.9	39.1	35.8	35.0
	Heating - High	70.9	86.6	79.8	70.8	65.0	65.0	60.5	58.5	54.0	61.7	71.4	72.4	65.3	58.9	53.2	44.3	42.8	39.2
CASH012 (1.0)	Fan Only - Low	64.3	77.3	74.7	63.4	58.0	57.4	55.6	53.9	48.4	54.4	65.4	64.1	57.0	51.4	47.9	39.6	35.2	27.3
	Fan Only - High	69.9	84.8	81.1	70.5	62.8	62.3	60.3	58.6	54.4	57.7	67.2	67.2	60.3	54.4	51.2	44.2	40.0	33.6
	Cooling - Low	64.7	85.8	74.9	62.9	57.1	56.0	54.6	52.6	46.6	57.1	76.4	67.6	59.5	51.9	48.1	40.3	36.5	30.5
	Cooling - High	68.3	86.5	78.6	67.2	60.9	60.7	59.0	57.8	53.6	59.1	76.5	69.1	61.6	54.7	51.2	44.3	40.8	34.5
	Heating - Low	65.8	88.4	74.9	63.0	57.8	57.5	55.4	53.4	47.6	58.2	80.4	67.3	59.9	52.6	48.8	40.5	37.3	41.4
	Heating - High	70.5	90.1	81.4	70.3	62.8	62.3	60.1	58.2	53.9	59.6	79.5	68.6	62.3	54.8	51.5	44.2	40.4	41.1
CASH015 (1.25)	Fan Only - Low	62.4	80.3	70.2	59.9	57.2	56.5	52.5	50.7	43.9	52.6	65.2	60.1	56.1	50.0	42.2	40.9	38.3	27.5
	Fan Only - High	68.1	84.2	75.4	66.6	63.9	61.7	58.0	56.6	53.2	59.1	69.1	66.1	62.8	56.5	48.8	47.3	45.1	38.8
	Cooling - Low	61.8	80.2	69.1	59.8	56.9	55.9	52.0	50.3	43.0	54.1	67.4	62.5	57.4	50.8	45.4	41.4	38.6	34.8
	Cooling - High	67.9	84.7	74.6	66.4	63.7	61.5	57.9	56.8	53.4	59.6	70.1	67.4	63.1	56.8	49.8	47.6	45.2	39.3
	Heating - Low	63.9	87.0	69.2	59.4	57.3	56.4	52.2	49.9	42.5	55.1	66.6	64.7	56.9	52.8	46.2	42.0	39.3	33.3
	Heating - High	68.4	87.7	75.0	66.0	63.7	61.9	57.9	56.1	52.9	60.3	70.1	69.2	63.4	57.2	50.6	47.9	45.5	39.8
CASH018 (1.5)	Fan Only - Low	63.5	81.3	71.5	61.5	58.4	57.2	53.7	52.0	46.9	55.2	66.6	63.4	58.7	51.6	45.0	43.9	41.4	33.6
	Fan Only - High	69.7	85.5	76.8	68.5	65.2	63.2	60.0	58.6	55.3	60.6	69.9	68.2	64.6	56.1	50.4	49.9	47.7	41.8
	Cooling - Low	64.4	86.0	71.5	62.0	58.5	56.8	53.4	51.6	46.3	56.0	71.3	63.9	59.5	51.9	46.2	43.8	41.0	34.4
	Cooling - High	69.8	88.0	76.7	68.3	64.9	63.0	59.8	58.4	55.0	60.7	71.9	68.2	64.6	56.3	51.0	49.8	47.3	41.3
	Heating - Low	67.0	91.4	71.4	62.9	59.3	57.9	53.8	51.4	46.3	57.1	66.6	66.9	60.5	53.2	47.1	43.7	41.5	37.2
	Heating - High	70.0	88.7	77.0	68.6	64.7	63.6	60.0	58.0	54.8	60.5	69.7	68.1	64.5	55.9	50.3	49.9	47.6	41.8
CASH024 (2.0)	Fan Only - Low	59.0	73.1	63.2	54.2	55.0	54.8	50.3	46.0	36.7	52.4	64.2	57.0	52.4	50.9	47.9	39.2	32.3	23.3
	Fan Only - High	65.6	79.1	69.3	60.3	61.4	60.7	57.6	54.8	46.8	57.9	67.9	62.8	58.1	55.3	53.0	47.4	41.9	31.1
	Cooling - Low	60.6	82.4	64.5	55.7	55.1	54.5	50.6	46.6	37.6	57.2	71.1	69.5	56.4	52.0	50.5	42.6	36.0	33.5
	Cooling - High	66.0	82.5	69.9	60.7	61.4	60.6	57.9	55.4	47.7	60.0	70.8	68.8	59.7	56.7	54.1	49.8	44.8	36.4
	Heating - Low	60.3	78.3	66.5	55.7	55.7	55.5	50.8	46.4	37.1	62.9	71.1	77.8	58.9	55.5	50.9	42.7	37.8	37.7
	Heating - High	66.2	80.5	70.8	60.9	62.0	61.2	57.9	55.0	47.2	62.3	70.7	76.0	60.2	56.1	54.2	48.0	43.1	37.2

Table 15: Closetline® CASH Sound Data - Standard Construction

Size (Tons)	Model	Ducted Discharge									Free Inlet Combined with Casing Radiated								
		Sound Rating[1] (dB-A)	Octave Bands (Hz)								Sound Rating1 (dB-A)	Octave Bands (Hz)							
			63	125	250	500	1000	2000	4000	8000		63	125	250	500	1000	2000	4000	8000
CASH030 (2.5)	Fan Only - Low	63.0	79.2	66.7	57.5	59.9	57.5	54.1	51.7	43.8	55.0	66.0	61.2	56.2	52.4	50.3	41.9	37.5	25.6
	Fan Only - High	70.3	85.1	73.6	64.9	65.0	65.7	61.6	60.2	54.6	61.2	70.0	67.6	62.8	56.7	56.9	49.7	46.8	38.4
	Cooling - Low	63.5	81.9	70.0	58.3	59.3	57.5	54.3	52.0	44.2	59.2	67.2	72.0	57.8	54.6	51.9	44.1	38.6	32.5
	Cooling - High	70.6	85.9	74.5	65.3	64.8	66.0	62.2	60.7	55.3	62.2	70.4	72.0	63.6	57.4	56.8	50.0	47.0	39.4
	Heating - Low	65.0	82.8	74.8	59.9	60.4	58.3	54.3	51.9	44.5	61.7	65.9	75.5	59.4	57.0	52.4	44.7	40.9	39.3
	Heating - High	70.8	86.4	76.2	65.5	65.3	66.3	61.9	60.4	55.2	63.1	69.9	74.5	64.1	58.0	57.2	49.5	46.9	40.7
CASH036 (3.0)	Fan Only - Low	64.0	81.9	69.4	60.2	61.5	57.8	54.5	52.3	45.2	58.5	70.4	67.2	61.4	56.7	48.9	44.4	41.2	30.0
	Fan Only - High	71.3	84.2	75.5	68.3	68.3	66.0	61.9	60.9	56.0	63.8	74.9	71.2	66.8	60.6	55.9	52.3	49.7	40.8
	Cooling - Low	63.9	83.0	69.3	59.9	61.4	57.3	54.1	51.8	44.6	59.9	73.0	71.3	61.5	56.6	50.8	45.6	42.2	35.4
	Cooling - High	71.0	85.5	75.1	68.3	67.6	65.4	62.0	60.8	55.8	64.2	75.1	73.0	66.9	60.6	56.4	52.6	49.8	41.6
	Heating - Low	64.6	82.6	73.1	60.7	61.3	58.3	54.0	51.6	44.4	61.7	71.7	73.8	63.3	58.7	51.6	46.0	41.9	39.0
	Heating - High	71.3	84.6	76.3	68.4	68.0	66.2	61.7	60.4	55.6	65.0	75.2	75.0	67.7	61.2	56.3	52.3	49.5	42.3
CASH042 (3.5)	Fan Only - Low	61.6	77.6	65.2	56.7	59.9	55.5	52.0	51.0	43.7	54.4	64.8	60.2	55.0	53.0	47.3	44.1	40.0	28.6
	Fan Only - High	69.7	83.6	72.7	63.9	65.3	65.6	60.4	60.4	55.1	61.6	70.9	66.7	62.0	58.4	56.0	52.4	49.3	40.6
	Cooling - Low	61.4	78.4	66.5	56.8	58.9	55.1	52.3	51.2	43.7	58.9	67.6	71.8	58.1	54.1	50.6	45.4	40.9	34.2
	Cooling - High	69.8	83.8	73.1	65.1	64.6	65.6	60.8	60.8	55.3	63.4	72.4	74.3	63.0	58.6	56.8	53.0	49.6	40.8
	Heating - Low	62.1	77.4	67.3	58.3	60.2	56.0	52.0	50.8	44.0	62.2	68.1	76.4	59.2	56.1	52.5	46.8	43.6	40.8
	Heating - High	70.0	82.9	73.1	64.5	65.6	66.0	60.6	60.4	55.5	64.2	70.6	76.1	63.6	59.5	56.7	52.8	49.9	42.4
CASH048 (4.0)	Fan Only - Low	63.8	77.1	65.6	58.2	61.8	58.7	54.4	53.6	46.9	55.7	66.0	61.7	57.5	53.1	49.0	45.6	41.8	30.5
	Fan Only - High	72.0	81.7	72.7	67.2	67.4	68.6	62.7	62.5	57.3	63.0	72.1	67.5	65.3	58.6	57.8	53.4	50.5	42.0
	Cooling - Low	64.1	76.3	66.2	59.2	61.7	59.0	54.9	54.3	47.8	63.7	68.4	78.7	60.0	54.9	52.3	47.9	43.5	37.1
	Cooling - High	72.4	82.2	73.0	66.9	67.4	68.8	63.4	63.2	58.3	66.0	72.2	78.5	67.1	59.3	58.8	54.0	50.9	43.1
	Heating - Low	64.6	77.0	71.4	58.5	62.1	59.4	54.5	53.6	47.4	68.6	69.3	84.0	62.1	57.6	54.9	52.0	49.4	49.6
	Heating - High	72.3	82.0	74.6	66.0	67.7	68.9	62.8	62.5	57.8	69.0	73.3	83.3	65.0	60.0	59.1	56.2	53.7	50.1
CASH060 (5.0)	Fan Only - Low	67.7	80.4	71.8	63.7	64.6	63.4	58.3	56.5	49.3	58.8	72.1	66.7	61.4	55.9	51.3	48.2	44.4	33.8
	Fan Only - High	75.5	85.7	76.8	70.6	70.8	71.7	66.8	65.7	60.5	65.4	77.1	71.9	67.9	61.9	58.0	56.2	53.0	44.4
	Cooling - Low	68.0	83.8	74.1	63.9	64.5	62.8	58.7	56.7	49.6	64.4	73.1	78.9	62.5	57.0	52.4	49.4	45.3	37.1
	Cooling - High	75.5	87.9	78.3	70.9	70.8	71.2	67.0	65.8	60.5	67.9	77.7	79.8	68.7	62.2	58.6	57.1	54.1	45.9
	Heating - Low	69.9	83.3	81.5	64.2	64.9	64.0	58.7	56.7	50.0	68.6	73.7	84.1	62.9	57.5	53.2	50.4	46.4	45.0
	Heating - High	76.1	85.3	80.7	71.4	71.1	72.3	67.1	65.9	60.9	69.7	77.0	83.7	68.8	62.3	58.5	56.7	53.3	46.5

1. Rated in accordance with ANSI/AHRI standard 260.

2. Contact factory for sound attenuation options

Table 16: Closetline® CASH Sound Data - Quiet Construction

Size (Tons)	Model	Ducted Discharge									Free Inlet Combined with Casing Radiated								
		Sound Rating[1] (dB-A)	Octave Bands (Hz)								Sound Rating1 (dB-A)	Octave Bands (Hz)							
			63	125	250	500	1000	2000	4000	8000		63	125	250	500	1000	2000	4000	8000
CASH006 (.50)	Fan Only - Low	55.1	77.4	63.7	51.5	49.7	46.9	42.6	34.6	25.2	43.9	57.3	53.4	47.2	41.9	34.1	24.4	22.4	20.8
	Fan Only - High	61.6	79.7	70.4	58.6	56.6	55.3	51.3	47.4	39.8	51.1	62.5	60.3	53.8	49.5	42.9	33.8	30.3	22.1
	Cooling - Low	53.6	72.2	62.9	51.4	49.4	46.9	42.6	34.6	25.2	52.0	69.3	65.1	51.4	44.8	40.3	38.1	34.9	35.7
	Cooling - High	61.2	78.5	70.4	58.6	56.4	55.2	51.2	47.3	39.9	53.4	67.4	65.0	54.3	50.7	43.8	38.4	34.8	35.5
	Heating - Low	54.0	71.5	63.6	52.7	49.6	47.8	44.6	35.2	29.4	53.5	76.5	63.1	51.4	46.1	43.3	38.5	36.3	37.1
	Heating - High	61.3	77.1	70.8	59.7	56.4	55.8	51.7	47.0	39.7	54.6	74.2	64.4	55.7	51.0	45.6	39.1	36.0	33.0
CASH009 (.75)	Fan Only - Low	63.2	80.7	71.9	61.5	58.1	57.3	52.8	49.7	43.1	53.2	62.8	62.0	55.7	51.8	46.0	37.1	33.2	24.1
	Fan Only - High	70.8	87.0	79.6	70.3	64.9	64.8	60.5	58.8	54.1	60.4	68.6	68.9	64.4	58.3	52.7	44.1	42.4	35.4
	Cooling - Low	63.9	81.9	74.6	61.4	58.0	57.0	52.7	49.6	42.8	59.9	70.0	74.7	58.4	51.9	47.4	38.6	36.3	35.3
	Cooling - High	70.8	87.2	79.8	70.3	64.7	64.6	60.5	58.8	54.0	62.6	71.3	75.3	64.8	58.4	52.9	44.2	42.6	38.1
	Heating - Low	64.5	85.1	74.6	62.0	57.8	57.6	52.6	49.1	42.4	58.1	72.8	71.6	58.2	52.5	47.1	39.0	37.0	36.7
	Heating - High	71.1	88.0	80.3	70.7	64.7	64.8	60.4	58.6	54.1	62.0	72.7	73.6	65.2	58.4	52.6	44.2	42.7	37.6
CASH012 (1.0)	Fan Only - Low	63.9	77.4	75.0	63.1	57.4	56.8	55.3	53.3	47.6	54.2	64.4	64.0	56.4	51.3	47.7	39.3	35.3	28.4
	Fan Only - High	70.1	85.8	81.4	70.9	62.6	62.2	60.3	58.6	54.4	57.7	67.3	67.2	60.2	54.2	51.4	43.9	40.3	34.4
	Cooling - Low	64.6	84.2	75.2	63.4	57.5	56.3	54.9	53.0	47.2	60.2	81.6	71.3	60.8	52.7	49.5	44.4	39.7	33.9
	Cooling - High	68.5	86.1	78.7	67.4	61.1	61.1	59.3	58.1	54.0	61.4	82.3	71.9	62.5	55.0	52.1	46.0	41.9	35.9
	Heating - Low	67.9	92.8	76.0	63.5	57.7	57.3	55.2	53.1	47.3	61.6	82.0	72.7	63.1	53.5	49.5	44.3	41.3	43.0
	Heating - High	71.2	92.6	81.9	70.8	62.8	62.3	60.0	58.2	53.9	62.2	81.9	72.9	63.9	55.7	51.9	46.1	43.2	43.7
CASH015 (1.25)	Fan Only - Low	61.9	80.5	69.3	59.7	56.9	55.9	52.1	50.3	43.0	53.5	66.1	60.9	56.8	51.2	43.1	41.6	39.1	28.9
	Fan Only - High	68.0	84.5	75.3	66.6	63.6	61.5	58.0	56.8	53.5	59.0	69.2	66.0	62.5	56.3	48.9	47.4	45.1	38.9
	Cooling - Low	63.0	85.5	69.3	59.7	56.6	55.6	51.8	50.2	42.9	54.1	66.7	63.3	57.2	50.8	45.3	41.7	38.6	33.8
	Cooling - High	68.0	86.9	75.0	66.6	63.0	61.1	57.7	56.7	53.2	59.7	74.8	67.7	62.7	56.4	49.9	47.6	45.2	39.2
	Heating - Low	64.5	88.5	69.6	59.3	57.2	56.3	52.0	49.6	42.2	55.6	67.8	65.1	57.1	53.8	46.3	41.8	39.1	34.5
	Heating - High	68.3	87.7	75.2	66.1	63.6	61.6	57.8	56.0	52.8	59.9	70.2	67.7	63.4	56.8	50.4	47.9	45.6	39.7
CASH018 (1.5)	Fan Only - Low	63.7	81.5	71.7	61.7	58.8	57.5	53.8	52.0	46.9	54.5	65.6	62.8	58.0	50.8	44.2	43.2	40.7	32.5
	Fan Only - High	69.6	84.8	76.9	68.2	64.6	63.5	60.1	58.6	55.4	60.4	70.1	68.1	64.3	55.7	50.2	49.9	47.6	41.7
	Cooling - Low	64.4	86.1	71.4	62.2	58.4	56.8	53.4	51.6	46.2	55.4	72.0	63.4	58.7	50.9	45.6	43.4	40.8	34.3
	Cooling - High	69.7	87.9	76.5	68.3	65.0	62.9	59.7	58.3	54.8	60.5	73.3	68.1	64.4	55.8	50.7	49.7	47.4	41.4
	Heating - Low	65.2	87.5	71.7	62.6	59.2	57.8	53.7	51.1	45.9	57.1	66.7	67.2	60.3	52.9	47.6	44.1	41.6	37.4
	Heating - High	69.5	84.6	76.6	68.3	64.6	63.5	59.9	58.0	54.7	61.1	70.1	70.0	64.8	56.6	50.9	49.8	47.6	42.4
CASH024 (2.0)	Fan Only - Low	59.2	73.6	63.0	54.4	55.1	54.9	50.7	46.6	37.6	52.2	62.7	56.4	52.1	50.4	48.1	39.1	32.4	23.0
	Fan Only - High	65.9	79.5	69.6	60.6	61.6	60.9	57.9	55.4	47.9	58.3	68.1	63.5	58.3	55.8	53.5	47.8	42.4	31.0
	Cooling - Low	59.2	76.5	64.2	55.0	54.8	54.4	50.4	46.3	37.4	56.1	68.9	63.3	55.2	52.9	51.5	45.0	40.1	34.8
	Cooling - High	65.6	80.2	69.2	60.1	61.5	60.3	57.6	55.1	47.5	60.1	70.3	65.5	58.9	56.4	55.1	51.5	47.5	40.9
	Heating - Low	60.3	74.2	69.7	55.3	55.6	55.3	50.6	46.2	37.0	61.1	68.7	75.4	60.4	53.9	51.1	42.3	37.9	38.2
	Heating - High	66.2	79.2	71.6	60.9	62.0	61.3	58.0	55.0	47.4	60.9	70.2	72.5	60.4	56.2	54.7	47.9	43.0	37.6

Table 16: Closetline® CASH Sound Data - Quiet Construction

Size (Tons)	Model	Ducted Discharge									Free Inlet Combined with Casing Radiated								
		Sound Rating[1] (dB-A)	Octave Bands (Hz)								Sound Rating1 (dB-A)	Octave Bands (Hz)							
			63	125	250	500	1000	2000	4000	8000		63	125	250	500	1000	2000	4000	8000
CASH030 (2.5)	Fan Only - Low	63.3	78.9	66.7	57.9	59.9	57.9	54.5	52.4	44.9	55.2	66.3	61.3	56.1	52.6	50.6	41.9	38.2	26.8
	Fan Only - High	70.7	85.5	73.4	65.5	65.1	66.2	62.2	60.9	55.7	61.3	70.3	67.4	62.9	56.9	57.2	49.4	46.7	37.9
	Cooling - Low	63.9	83.5	69.7	58.9	59.5	57.6	54.4	52.1	44.3	57.6	70.4	68.3	57.2	53.8	51.7	43.2	38.9	31.5
	Cooling - High	70.6	85.8	74.0	65.9	65.0	66.1	62.1	60.8	55.4	61.8	73.1	70.2	63.0	57.1	57.0	49.7	46.9	38.4
	Heating - Low	65.9	86.5	75.1	61.9	60.5	58.4	54.2	51.8	44.4	60.9	69.6	73.1	62.2	56.2	52.1	44.6	41.0	39.1
	Heating - High	71.0	88.3	76.1	65.9	65.3	66.2	61.8	60.4	55.2	62.6	71.7	72.5	64.1	57.7	57.4	49.3	46.9	41.2
CASH036 (3.0)	Fan Only - Low	63.9	81.2	69.1	60.1	61.7	57.7	53.9	51.7	44.3	56.2	69.3	64.8	58.4	54.0	47.1	44.1	40.1	28.7
	Fan Only - High	71.0	84.2	75.5	67.5	67.9	65.6	61.4	60.3	55.2	63.1	73.2	70.2	66.5	59.8	54.6	52.1	49.0	40.0
	Cooling - Low	64.0	82.7	69.2	60.1	62.0	57.3	54.2	51.8	44.5	59.4	72.9	70.9	60.9	55.8	50.8	45.1	41.1	33.7
	Cooling - High	71.0	85.5	75.3	67.7	67.8	65.7	61.9	60.5	55.5	64.3	75.0	74.1	66.8	60.6	55.8	52.2	49.2	40.6
	Heating - Low	64.4	81.9	70.5	60.6	61.8	58.3	54.1	51.8	44.6	61.9	71.9	73.8	63.9	59.4	51.4	46.1	42.1	39.3
	Heating - High	71.3	84.6	75.7	67.8	68.0	66.1	61.6	60.5	55.6	64.7	74.5	74.6	67.5	61.0	56.0	52.2	49.4	42.1
CASH042 (3.5)	Fan Only - Low	61.8	79.1	65.7	56.6	59.7	55.5	52.2	51.3	44.0	54.6	64.5	60.5	55.2	53.2	47.5	44.4	40.3	29.1
	Fan Only - High	70.0	84.0	73.4	64.5	65.2	65.9	60.9	60.9	55.7	61.9	70.5	66.8	62.7	58.6	56.4	52.7	49.7	41.2
	Cooling - Low	61.6	77.5	64.9	56.7	59.4	55.7	52.4	51.4	44.1	61.2	71.5	75.9	57.8	54.2	49.8	45.1	40.9	35.0
	Cooling - High	70.0	83.9	73.6	65.5	64.9	65.8	60.9	60.8	55.3	64.2	74.1	76.5	62.8	58.8	56.8	52.9	49.7	41.2
	Heating - Low	62.1	77.2	66.8	58.1	60.3	56.0	51.9	50.7	43.9	62.8	69.5	77.4	59.1	56.0	52.5	46.5	43.6	40.8
	Heating - High	70.1	83.6	73.3	64.8	65.7	66.0	60.6	60.5	55.7	64.5	72.9	77.0	64.1	59.0	56.4	52.7	49.8	42.4
CASH048 (4.0)	Fan Only - Low	64.1	77.3	66.6	58.7	61.7	58.9	54.8	54.1	47.9	56.3	66.6	62.2	58.8	53.5	49.6	46.1	42.5	31.4
	Fan Only - High	72.4	83.3	73.5	67.3	67.6	68.7	63.4	63.0	58.2	63.8	72.7	68.2	66.6	59.2	58.5	54.1	51.2	42.9
	Cooling - Low	63.9	78.3	67.5	59.2	61.3	58.6	54.7	53.7	46.8	62.9	68.0	77.6	59.6	54.5	51.9	47.8	43.6	37.4
	Cooling - High	72.1	83.5	74.0	67.2	67.0	68.5	63.2	62.7	57.5	65.5	73.4	77.0	67.2	59.4	58.6	54.1	51.2	43.4
	Heating - Low	64.5	78.6	69.7	58.9	62.1	59.4	54.6	53.6	47.4	69.2	69.7	84.7	60.4	57.6	54.3	52.1	49.7	49.2
	Heating - High	72.5	82.8	74.9	66.8	67.9	68.9	63.0	62.6	57.9	68.7	73.5	83.2	64.7	59.8	58.6	54.8	52.0	48.0
CASH060 (5.0)	Fan Only - Low	68.0	81.3	71.0	63.6	64.9	63.6	58.9	57.1	50.3	59.3	72.5	67.2	61.6	56.2	51.9	48.7	44.9	34.2
	Fan Only - High	76.0	86.2	77.0	70.9	71.2	72.1	67.5	66.4	61.3	66.2	76.9	73.1	68.8	62.2	58.6	56.9	53.5	45.2
	Cooling - Low	68.3	85.3	74.6	63.5	64.6	63.1	58.8	56.9	49.9	63.3	73.7	77.4	61.6	56.9	52.8	49.3	45.3	36.5
	Cooling - High	75.7	87.5	78.6	70.6	70.8	71.6	67.2	66.0	60.8	67.7	77.6	79.4	68.6	62.4	58.7	57.0	53.9	45.0
	Heating - Low	70.2	82.8	82.4	64.0	64.9	64.1	58.7	56.8	50.1	69.9	73.3	85.6	63.3	58.6	53.5	51.0	47.3	44.8
	Heating - High	76.3	86.0	80.9	71.5	71.2	72.4	67.2	66.0	61.1	69.6	76.9	83.6	68.5	62.3	58.4	56.8	53.4	46.3

1. Rated in accordance with ANSI/AHRI standard 260.

2. Contact factory for sound attenuation options

Table 17: Closetline® CASV Sound Data - Standard Construction

Size (Tons)	Model	Ducted Discharge									Free Inlet Combined with Casing Radiated								
		Sound Rating[1] (dB-A)	Octave Bands (Hz)								Sound Rating1 (dB-A)	Octave Bands (Hz)							
			63	125	250	500	1000	2000	4000	8000		63	125	250	500	1000	2000	4000	8000
CASV006 (.50)	Fan Only - Low	57.0	77.1	66.6	55.0	52.6	49.6	45.3	38.8	29.8	48.1	60.8	58.4	50.2	46.2	39.4	33.1	26.0	20.6
	Fan Only - High	63.5	81.1	72.7	66.7	57.4	55.8	51.7	47.4	40.5	53.0	64.7	63.3	55.7	50.4	45.1	38.1	33.8	25.2
	Cooling - Low	57.9	78.5	68.3	55.8	52.7	49.5	45.1	38.7	29.1	50.7	69.9	60.7	51.4	45.9	39.9	36.8	37.2	38.8
	Cooling - High	63.5	81.3	72.7	67.2	57.3	55.7	51.6	47.4	40.3	54.6	73.2	63.7	56.5	50.3	45.4	40.6	40.8	41.8
	Heating - Low	58.6	80.5	68.4	56.8	52.9	50.9	45.9	39.0	30.4	53.4	76.7	64.4	51.1	46.8	40.5	36.5	34.2	33.1
	Heating - High	63.8	82.1	74.2	63.7	57.5	57.3	52.2	47.8	41.0	54.7	75.8	65.0	55.7	50.3	45.2	38.6	35.2	28.9
CASV009 (.75)	Fan Only - Low	64.5	82.2	74.8	63.2	57.9	58.3	53.2	49.0	42.3	52.6	64.2	63.0	55.4	49.1	44.6	38.2	33.2	25.7
	Fan Only - High	70.9	86.6	81.3	71.2	63.4	64.5	59.6	56.5	51.4	58.9	69.2	69.1	63.0	54.5	49.9	43.9	40.8	33.5
	Cooling - Low	65.7	87.9	75.9	61.9	57.8	57.1	52.4	48.3	41.4	54.6	70.3	66.3	56.6	50.1	44.3	38.5	34.8	35.1
	Cooling - High	70.9	89.4	81.4	70.3	62.7	63.6	59.1	56.3	51.1	58.9	72.5	69.7	62.2	54.2	49.6	43.6	40.6	36.6
	Heating - Low	65.8	87.6	76.1	63.9	57.5	58.4	52.8	48.3	41.5	54.9	70.8	65.8	58.3	50.3	46.0	39.7	34.8	32.6
	Heating - High	71.0	88.8	81.4	71.8	62.9	64.4	59.3	56.1	51.1	59.4	71.1	69.8	64.0	54.8	50.1	43.7	40.7	35.0
CASV012 (1.0)	Fan Only - Low	63.5	76.5	72.3	62.2	57.4	57.9	55.2	52.9	47.2	52.8	61.9	60.7	53.0	49.9	47.4	41.8	37.1	28.0
	Fan Only - High	69.1	79.7	76.6	68.0	62.3	63.8	60.9	59.4	55.7	58.9	66.1	65.6	58.2	58.1	52.9	47.7	43.7	36.6
	Cooling - Low	62.4	76.8	71.6	61.9	56.9	56.1	53.7	51.2	44.9	53.6	65.9	62.4	55.2	50.4	47.3	41.8	36.5	29.0
	Cooling - High	68.3	80.8	75.8	67.6	61.7	62.7	60.0	58.6	54.6	58.5	67.4	65.7	58.9	55.7	52.8	47.9	44.4	39.7
	Heating - Low	63.6	79.6	72.6	61.8	57.3	57.9	54.9	52.3	46.5	55.6	69.7	63.0	56.6	52.2	49.6	44.2	40.2	38.9
	Heating - High	69.1	80.1	77.0	67.7	62.1	64.0	60.8	59.2	55.5	59.3	68.8	65.9	59.7	57.5	53.5	48.4	45.4	42.3
CASV015 (1.25)	Fan Only - Low	62.2	83.4	71.6	60.0	56.9	54.6	49.7	47.3	40.6	53.0	69.6	64.4	55.8	47.8	40.3	37.1	32.9	24.1
	Fan Only - High	68.3	86.5	77.5	66.9	64.3	61.3	56.4	55.0	51.1	58.7	73.8	69.5	62.3	52.9	46.2	43.8	40.7	32.5
	Cooling - Low	63.7	87.1	72.1	62.4	56.6	54.1	49.5	47.3	40.5	54.6	71.0	66.4	57.7	48.5	44.3	36.8	32.6	26.1
	Cooling - High	68.7	89.9	77.3	67.6	63.8	60.9	56.3	54.9	51.1	59.2	75.2	70.5	62.5	53.1	47.7	43.6	40.7	33.0
	Heating - Low	64.7	88.6	72.1	61.8	57.8	55.4	50.2	47.1	40.6	55.2	73.1	66.6	57.1	50.1	45.6	38.2	33.7	31.3
	Heating - High	69.2	89.4	77.6	66.8	64.9	62.0	56.7	54.7	51.0	59.6	75.5	70.6	62.8	54.4	48.3	44.1	40.8	33.1
CASV018 (1.5)	Fan Only - Low	59.8	73.2	66.8	56.9	56.2	54.2	50.8	47.9	40.3	49.7	63.3	57.8	51.7	46.5	40.5	39.9	33.8	23.5
	Fan Only - High	64.7	76.2	70.1	61.0	61.1	59.3	55.8	54.6	49.0	54.0	65.5	61.6	55.3	50.7	45.6	45.1	40.5	30.1
	Cooling - Low	62.9	87.4	66.2	56.9	55.2	53.0	49.9	46.7	38.7	55.8	78.2	66.2	56.3	47.3	45.0	39.4	33.4	26.4
	Cooling - High	68.1	92.3	72.8	61.4	60.6	58.8	55.1	53.7	48.1	57.2	77.4	66.9	59.4	50.9	47.2	44.7	40.0	29.8
	Heating - Low	66.5	92.0	70.6	58.3	56.1	54.3	50.2	47.0	39.3	58.9	79.2	71.8	58.9	49.1	47.0	41.8	37.3	32.3
	Heating - High	67.9	91.8	72.8	61.6	60.8	59.1	55.3	53.9	48.3	60.0	80.7	72.2	59.4	52.4	48.4	45.9	41.7	34.1
CASV024 (2.0)	Fan Only - Low	65.2	80.4	72.3	59.9	61.6	59.6	56.3	53.7	46.6	56.6	65.5	65.0	55.9	53.7	50.3	48.5	41.1	29.3
	Fan Only - High	66.1	80.2	72.3	60.8	62.9	60.6	57.3	55.1	48.5	57.4	65.5	65.4	59.5	54.0	50.3	48.7	41.4	29.8
	Cooling - Low	65.2	80.8	71.6	59.5	61.8	59.6	56.5	53.7	46.5	57.4	69.9	66.1	57.2	54.1	50.9	48.9	41.9	32.3
	Cooling - High	66.1	82.0	72.4	60.6	62.4	60.4	57.4	55.0	48.0	57.9	70.0	66.2	57.7	54.6	51.4	49.9	43.1	33.2
	Heating - Low	65.7	80.3	72.2	61.2	62.8	60.3	56.1	53.6	46.4	58.7	67.2	69.3	58.8	55.9	51.8	49.8	43.0	35.6
	Heating - High	66.6	80.8	72.8	62.3	63.3	61.3	57.3	54.8	48.0	59.0	67.4	69.4	58.3	55.9	51.3	48.8	41.8	35.1

Table 17: Closetline® CASV Sound Data - Standard Construction

Size (Tons)	Model	Ducted Discharge									Free Inlet Combined with Casing Radiated								
		Sound Rating[1] (dB-A)	Octave Bands (Hz)								Sound Rating1 (dB-A)	Octave Bands (Hz)							
			63	125	250	500	1000	2000	4000	8000		63	125	250	500	1000	2000	4000	8000
CASV030 (2.5)	Fan Only - Low	62.5	82.0	69.8	58.1	60.0	55.1	52.5	50.7	44.1	52.6	66.4	59.6	55.0	49.7	44.3	42.5	37.4	26.9
	Fan Only - High	69.6	86.3	75.8	65.6	66.0	63.8	60.0	59.0	55.4	58.8	71.0	65.3	61.3	54.3	51.5	49.8	45.5	37.9
	Cooling - Low	62.2	80.4	70.3	57.9	59.6	54.9	52.4	50.4	43.3	55.1	69.6	64.3	58.5	50.9	46.5	43.1	37.8	31.4
	Cooling - High	69.5	85.7	77.1	67.0	65.6	63.6	59.8	58.8	54.9	59.9	73.5	66.7	63.3	55.0	52.5	50.5	45.9	38.4
	Heating - Low	63.1	82.0	70.6	58.0	61.2	55.4	51.8	49.7	42.7	57.9	69.6	69.7	60.4	53.3	46.8	44.2	39.5	37.7
	Heating - High	69.0	83.7	75.7	63.8	65.8	63.3	59.1	58.0	54.3	60.2	72.2	68.3	62.6	55.8	52.5	50.5	46.3	40.2
CASV036 (3.0)	Fan Only - Low	64.0	76.6	66.9	56.4	62.2	58.2	54.6	54.4	49.2	53.2	65.3	59.1	55.1	49.6	46.4	44.5	39.7	29.8
	Fan Only - High	71.6	82.6	74.2	63.5	67.7	66.8	62.6	62.7	60.0	60.5	71.3	67.1	61.7	54.7	54.0	52.5	47.8	40.0
	Cooling - Low	64.0	79.1	67.5	56.4	62.2	58.0	54.4	54.3	48.8	55.8	67.0	66.2	57.7	50.2	48.1	46.1	40.2	32.9
	Cooling - High	71.5	83.9	75.4	63.3	67.4	66.7	62.6	62.7	59.6	61.2	71.3	69.6	62.4	55.1	54.3	52.7	47.7	40.2
	Heating - Low	64.4	80.0	70.7	57.9	62.2	58.5	54.1	53.5	48.7	60.8	67.6	75.4	58.4	53.1	48.9	47.5	42.8	37.7
	Heating - High	71.5	82.3	76.1	63.6	67.5	66.8	62.1	62.0	59.4	62.1	70.9	73.6	62.3	55.6	54.2	52.5	47.9	41.2
CASV042 (3.5)	Fan Only - Low	62.9	80.0	71.0	59.3	60.0	56.5	52.4	50.7	42.6	54.7	69.1	64.4	56.8	50.2	47.1	43.9	37.4	25.8
	Fan Only - High	70.7	86.7	78.0	67.7	66.7	65.3	60.5	59.7	54.2	62.0	75.4	69.4	65.6	56.6	54.6	52.0	46.6	37.9
	Cooling - Low	62.8	79.4	70.6	59.9	59.5	56.4	52.7	51.0	42.7	58.3	70.3	65.2	58.9	53.7	54.3	46.8	39.2	31.2
	Cooling - High	71.1	88.3	78.2	68.8	66.5	65.3	61.1	60.5	54.9	63.4	75.3	70.2	66.3	58.0	57.5	53.7	47.7	39.5
	Heating - Low	64.5	79.6	73.3	66.2	60.6	57.4	52.6	50.6	43.0	62.5	71.0	71.6	68.7	55.4	51.2	46.9	41.1	44.3
	Heating - High	71.3	87.1	78.9	68.4	67.4	66.0	60.8	59.8	54.7	64.4	76.3	75.9	66.6	57.9	56.4	52.5	47.0	41.0
CASV048 (4.0)	Fan Only - Low	63.8	76.0	68.1	58.0	61.8	58.4	54.4	52.7	46.2	55.0	66.2	61.5	56.5	51.1	48.3	46.2	41.0	31.0
	Fan Only - High	72.1	80.9	74.9	64.8	67.4	69.2	62.4	61.3	56.6	61.8	72.4	65.8	62.5	56.3	56.7	53.9	49.5	41.8
	Cooling - Low	63.5	78.1	67.7	57.4	61.2	57.9	54.2	53.0	46.9	56.9	70.4	65.0	58.3	52.6	50.1	47.3	42.2	33.1
	Cooling - High	72.1	82.2	74.7	64.8	66.8	69.2	62.6	61.8	57.1	62.5	73.6	66.7	62.9	57.3	57.6	54.6	49.9	41.7
	Heating - Low	64.5	77.4	70.1	58.5	62.6	59.2	54.6	52.8	47.0	58.4	71.8	69.2	58.4	53.0	51.7	47.6	43.0	40.2
	Heating - High	72.4	81.9	74.6	65.8	67.8	69.6	62.6	61.5	57.2	62.9	74.4	71.0	63.1	57.0	57.3	54.3	50.1	43.2
CASV060 (5.0)	Fan Only - Low	67.9	80.0	69.6	61.2	64.8	62.3	58.9	59.5	55.0	58.6	69.6	62.6	59.7	53.3	52.7	50.8	47.3	39.8
	Fan Only - High	75.7	87.5	77.5	68.3	70.5	70.9	67.0	67.4	64.9	65.8	75.9	69.2	65.6	60.7	59.8	58.7	55.0	49.3
	Cooling - Low	68.1	81.5	71.7	61.4	65.0	62.1	59.2	59.8	55.3	62.0	73.1	74.6	61.0	55.0	54.0	51.5	47.9	40.6
	Cooling - High	75.8	87.9	77.3	69.0	70.4	70.9	67.4	67.8	65.1	66.8	77.8	74.3	66.8	59.9	60.9	59.2	55.6	49.3
	Heating - Low	69.6	80.8	80.5	62.1	64.8	63.3	59.3	59.5	55.6	68.6	75.8	84.1	62.1	55.3	55.5	52.0	48.8	45.2
	Heating - High	76.1	86.8	79.3	68.9	70.5	71.7	67.3	67.6	65.4	68.4	77.8	80.5	66.3	61.5	60.4	59.1	55.5	50.3

1. Rated in accordance with ANSI/AHRI standard 260.

2. Contact factory for sound attenuation options

Table 18: Closetline® CASV Sound Data - Quiet Construction

Size (Tons)	Model	Ducted Discharge									Free Inlet Combined with Casing Radiated								
		Sound Rating[1] (dB-A)	Octave Bands (Hz)								Sound Rating1 (dB-A)	Octave Bands (Hz)							
			63	125	250	500	1000	2000	4000	8000		63	125	250	500	1000	2000	4000	8000
CASV006 (.50)	Fan Only - Low	57.1	76.4	67.0	55.3	52.5	49.6	45.3	38.8	30.0	47.1	59.7	57.2	49.5	45.2	38.3	31.5	24.7	20.3
	Fan Only - High	63.5	81.7	73.6	64.9	57.3	56.2	51.9	47.7	40.6	53.0	64.5	62.6	57.6	49.6	44.1	37.3	32.9	24.0
	Cooling - Low	58.1	79.5	68.3	55.3	52.6	49.5	45.0	38.5	29.1	53.8	78.4	62.4	51.6	46.2	38.7	32.3	26.8	22.0
	Cooling - High	63.5	81.9	72.8	66.6	57.4	55.7	51.5	47.4	40.4	56.0	77.9	64.8	59.6	50.3	43.7	37.3	32.6	24.4
	Heating - Low	60.8	85.5	69.1	57.1	52.6	50.9	45.9	38.7	30.2	56.5	81.8	66.3	53.6	48.6	41.6	34.1	29.5	26.7
	Heating - High	64.8	87.5	73.6	63.0	57.1	56.9	51.8	47.2	40.4	56.5	80.0	65.9	56.5	50.6	45.3	37.9	33.4	24.8
CASV009 (.75)	Fan Only - Low	63.7	82.0	73.9	61.9	57.6	57.4	52.5	48.2	41.4	52.3	64.7	62.8	54.8	49.0	44.2	38.0	32.9	24.4
	Fan Only - High	70.4	86.7	80.7	70.5	62.9	63.8	59.2	56.2	51.2	58.7	69.4	69.2	62.6	54.3	49.6	43.4	40.3	32.8
	Cooling - Low	64.3	85.4	73.6	61.4	57.7	57.0	52.4	48.2	41.2	54.5	72.1	64.2	57.3	50.2	44.9	37.9	33.3	29.3
	Cooling - High	70.5	88.2	80.8	70.2	62.9	63.7	59.2	56.3	51.1	59.4	73.7	69.6	62.8	55.1	50.0	43.9	40.7	34.1
	Heating - Low	64.6	84.3	75.1	63.5	57.3	58.1	52.7	48.0	41.1	55.9	75.6	65.9	58.9	50.5	45.2	38.5	33.8	31.3
	Heating - High	70.8	87.4	81.1	71.9	62.8	64.2	59.2	55.9	50.9	59.9	75.0	70.5	64.0	54.9	50.0	43.7	40.7	34.5
CASV012 (1.0)	Fan Only - Low	62.9	75.5	72.0	61.4	57.0	57.2	54.6	52.2	46.2	52.4	62.9	60.5	52.4	49.3	47.1	41.6	36.7	27.8
	Fan Only - High	68.8	80.0	76.0	67.6	62.0	63.5	60.7	59.2	55.5	57.7	66.3	65.0	57.6	54.2	52.8	47.5	43.5	36.4
	Cooling - Low	62.7	80.1	71.5	61.6	56.8	56.3	53.9	51.4	45.1	54.2	65.9	65.2	56.1	50.0	46.6	40.9	35.8	27.8
	Cooling - High	68.5	82.0	76.1	67.5	61.8	62.8	60.1	58.8	54.9	58.1	67.7	67.1	58.8	54.3	52.4	47.2	43.0	35.6
	Heating - Low	64.8	87.0	72.6	61.6	57.3	58.2	55.0	52.5	46.7	55.9	72.7	67.3	56.7	50.6	48.4	42.7	38.1	37.5
	Heating - High	69.3	85.7	77.0	67.9	61.9	63.9	60.6	59.0	55.3	58.6	70.0	67.2	59.8	54.5	53.1	47.5	43.6	39.2
CASV015 (1.25)	Fan Only - Low	63.0	84.1	72.2	60.8	58.0	55.4	50.6	48.4	42.4	52.2	68.9	63.6	55.2	47.2	39.7	36.4	31.8	23.4
	Fan Only - High	68.7	87.4	77.8	66.9	64.8	61.7	56.5	54.9	51.3	58.3	73.9	69.2	61.9	52.5	46.0	43.5	40.4	32.7
	Cooling - Low	62.3	84.1	72.4	60.5	56.8	54.2	49.6	47.4	40.8	55.7	74.2	68.3	56.8	49.7	43.1	36.5	32.2	25.6
	Cooling - High	68.2	88.3	77.3	67.3	63.8	60.9	56.2	54.9	51.0	60.0	75.5	72.5	62.3	53.7	47.5	43.5	40.3	32.5
	Heating - Low	62.6	83.9	71.5	60.2	57.8	55.4	50.2	47.3	40.7	57.5	72.5	71.1	57.0	51.8	45.6	39.3	35.7	32.0
	Heating - High	68.7	86.6	77.7	66.9	64.7	62.0	56.6	54.7	50.9	60.2	75.5	72.3	62.5	54.5	48.0	44.1	41.5	35.8
CASV018 (1.5)	Fan Only - Low	59.1	73.5	66.3	56.7	55.3	53.4	50.2	46.8	38.8	48.9	62.5	57.2	50.8	45.7	39.6	39.4	33.2	23.2
	Fan Only - High	64.3	77.0	69.3	60.5	60.6	58.7	55.6	54.2	48.6	53.6	64.6	60.8	54.6	50.5	45.2	44.8	40.1	29.6
	Cooling - Low	63.0	87.3	67.3	59.3	55.1	53.1	49.9	46.7	38.7	57.3	80.0	69.2	55.0	47.6	43.6	39.3	33.8	26.9
	Cooling - High	65.8	87.1	70.2	61.7	60.6	58.6	55.4	54.2	48.4	58.3	79.7	69.4	57.4	51.4	47.0	44.5	39.8	29.6
	Heating - Low	65.6	91.0	70.9	58.9	55.8	53.9	49.9	46.5	38.6	58.2	74.9	72.0	57.8	49.6	47.0	40.9	39.6	26.4
	Heating - High	67.6	91.3	72.3	61.3	60.8	59.0	55.3	53.8	48.0	59.2	76.8	72.2	59.2	52.0	47.3	45.2	40.8	31.3
CASV024 (2.0)	Fan Only - Low	65.7	79.7	71.1	60.4	63.2	60.0	56.4	53.9	47.0	57.6	65.5	65.4	59.5	54.0	50.3	48.7	41.4	29.8
	Fan Only - High	66.6	79.7	71.6	61.6	63.8	61.1	57.6	55.2	48.5	58.9	66.0	65.7	61.7	54.7	51.0	49.7	42.7	31.7
	Cooling - Low	65.3	81.3	71.7	60.1	62.0	59.5	56.4	53.6	46.4	57.3	67.1	66.1	57.3	54.0	50.8	49.0	41.9	31.7
	Cooling - High	66.1	80.8	72.1	60.9	62.6	60.5	57.4	54.9	47.9	60.7	67.4	66.9	64.1	56.4	52.5	50.2	43.3	33.0
	Heating - Low	66.1	80.3	73.1	61.6	63.3	60.4	56.3	53.6	46.4	59.3	66.4	70.9	59.2	55.9	51.0	48.9	41.9	34.1
	Heating - High	66.9	80.6	73.7	62.8	64.0	61.3	57.4	55.0	48.1	59.5	66.5	70.7	59.5	56.1	51.5	49.7	42.9	34.6

Table 18: Closetline® CASV Sound Data - Quiet Construction

Size (Tons)	Model	Ducted Discharge									Free Inlet Combined with Casing Radiated								
		Sound Rating[1] (dB-A)	Octave Bands (Hz)								Sound Rating1 (dB-A)	Octave Bands (Hz)							
			63	125	250	500	1000	2000	4000	8000		63	125	250	500	1000	2000	4000	8000
CASV030 (2.5)	Fan Only - Low	62.2	79.1	70.3	57.9	60.4	54.8	51.9	50.2	43.5	53.6	66.8	60.1	56.8	50.3	44.1	42.2	37.3	26.6
	Fan Only - High	68.9	82.1	74.8	63.3	66.0	63.1	59.5	58.5	54.9	59.3	70.5	65.8	62.0	54.7	51.7	50.0	45.7	38.2
	Cooling - Low	62.5	81.2	71.3	58.5	59.8	54.8	52.2	50.3	43.4	55.0	69.1	64.5	59.0	50.4	45.5	42.6	37.3	28.8
	Cooling - High	69.3	83.9	76.0	65.8	65.7	63.4	59.9	58.9	55.0	61.1	72.4	67.1	65.3	55.7	52.1	50.1	45.6	38.1
	Heating - Low	63.2	81.9	71.4	58.3	61.1	55.3	52.0	50.1	43.4	59.4	68.2	71.7	62.2	54.1	46.2	44.1	39.5	38.7
	Heating - High	69.4	83.9	76.2	64.6	65.9	63.7	59.6	58.5	55.1	60.1	71.3	69.1	62.3	55.6	52.0	50.3	46.1	40.8
CASV036 (3.0)	Fan Only - Low	64.1	78.4	67.3	56.9	62.3	58.0	54.4	54.4	49.4	53.2	65.9	59.1	55.2	49.5	46.3	44.4	39.8	30.4
	Fan Only - High	71.5	82.5	75.0	63.4	67.3	66.8	62.6	62.8	59.8	60.2	70.0	66.0	62.3	54.6	53.7	52.3	47.7	40.5
	Cooling - Low	63.9	78.7	68.0	57.6	62.1	57.7	54.3	54.1	48.5	56.0	67.9	67.0	58.3	50.1	47.7	45.8	40.0	32.1
	Cooling - High	71.4	83.2	74.8	63.7	67.3	66.6	62.5	62.6	59.4	60.9	71.0	68.0	63.1	55.0	54.0	52.5	47.6	40.2
	Heating - Low	64.8	77.7	73.8	58.1	62.5	58.6	54.2	53.7	48.9	61.4	66.9	76.1	58.8	54.4	48.4	47.0	42.4	36.2
	Heating - High	71.6	82.1	75.2	63.5	67.7	66.9	62.3	62.2	59.5	62.4	70.5	74.6	62.0	55.6	53.8	52.4	47.9	41.0
CASV042 (3.5)	Fan Only - Low	63.1	79.0	70.9	59.6	60.3	56.7	52.9	51.1	43.2	54.9	69.6	64.5	57.3	50.4	47.3	44.1	37.6	26.0
	Fan Only - High	71.2	87.9	78.7	68.4	67.1	65.6	61.2	60.2	55.0	62.2	75.9	69.6	65.8	56.8	54.8	52.2	46.8	38.2
	Cooling - Low	62.8	78.9	70.9	59.7	59.7	56.4	52.7	51.0	42.8	58.0	69.8	65.4	59.8	53.8	52.7	47.2	40.1	31.2
	Cooling - High	71.6	88.7	78.9	69.1	67.3	65.7	61.7	60.8	55.4	63.2	75.6	70.6	66.0	57.8	57.3	53.3	47.4	39.1
	Heating - Low	65.1	79.2	75.6	66.6	61.1	57.5	52.7	50.7	43.1	64.7	70.3	79.1	65.6	56.6	52.7	48.1	42.3	42.5
	Heating - High	71.6	87.8	79.5	68.8	67.6	66.2	61.1	60.1	55.0	64.4	76.7	74.7	68.2	58.2	55.6	52.6	47.2	40.7
CASV048 (4.0)	Fan Only - Low	63.9	77.0	68.7	58.0	61.6	58.5	54.7	53.3	47.4	55.5	66.3	63.1	56.8	51.3	48.7	46.6	41.5	31.6
	Fan Only - High	72.4	82.1	74.7	65.4	67.3	69.4	62.9	61.9	57.7	62.3	73.0	65.8	63.1	56.8	57.2	54.4	50.1	42.4
	Cooling - Low	63.7	78.7	68.4	57.7	61.3	58.1	54.5	53.1	46.7	56.8	69.4	64.1	58.7	52.9	49.6	47.2	42.3	33.5
	Cooling - High	72.3	82.6	74.7	65.2	67.2	69.5	62.7	61.8	57.2	62.5	74.0	66.6	63.3	57.1	57.5	54.6	50.0	41.7
	Heating - Low	64.6	78.2	70.3	59.2	62.5	59.2	54.6	52.8	47.1	61.0	71.0	73.2	60.9	54.4	55.2	47.7	43.2	38.5
	Heating - High	72.7	83.1	75.2	66.2	68.0	69.7	63.0	61.9	57.7	62.8	73.5	71.2	63.5	57.1	57.0	54.2	49.9	42.6
CASV060 (5.0)	Fan Only - Low	68.3	81.2	70.3	61.2	65.1	62.8	59.4	59.9	56.1	59.1	70.5	62.9	60.3	53.7	53.2	51.3	47.8	40.6
	Fan Only - High	76.2	87.6	77.2	69.0	70.7	71.5	67.7	67.9	65.6	66.4	76.6	69.6	66.2	61.2	60.4	59.2	55.6	50.0
	Cooling - Low	68.2	81.8	71.8	61.2	64.9	62.0	59.2	59.8	55.6	62.2	73.5	75.2	60.3	54.5	53.7	51.4	47.8	40.6
	Cooling - High	75.8	88.2	77.4	68.7	70.6	70.8	67.4	67.8	65.2	66.8	77.4	74.7	66.2	60.9	60.6	59.1	55.5	49.7
	Heating - Low	70.4	80.5	82.8	62.1	64.8	63.5	59.4	59.6	55.6	70.7	74.7	86.9	62.4	56.6	55.0	52.0	48.6	44.3
	Heating - High	76.2	87.0	80.3	69.1	70.5	71.8	67.4	67.7	65.4	69.2	77.2	82.5	65.9	61.7	60.2	59.0	55.4	50.2

1. Rated in accordance with ANSI/AHRI standard 260.

2. Contact factory for sound attenuation options

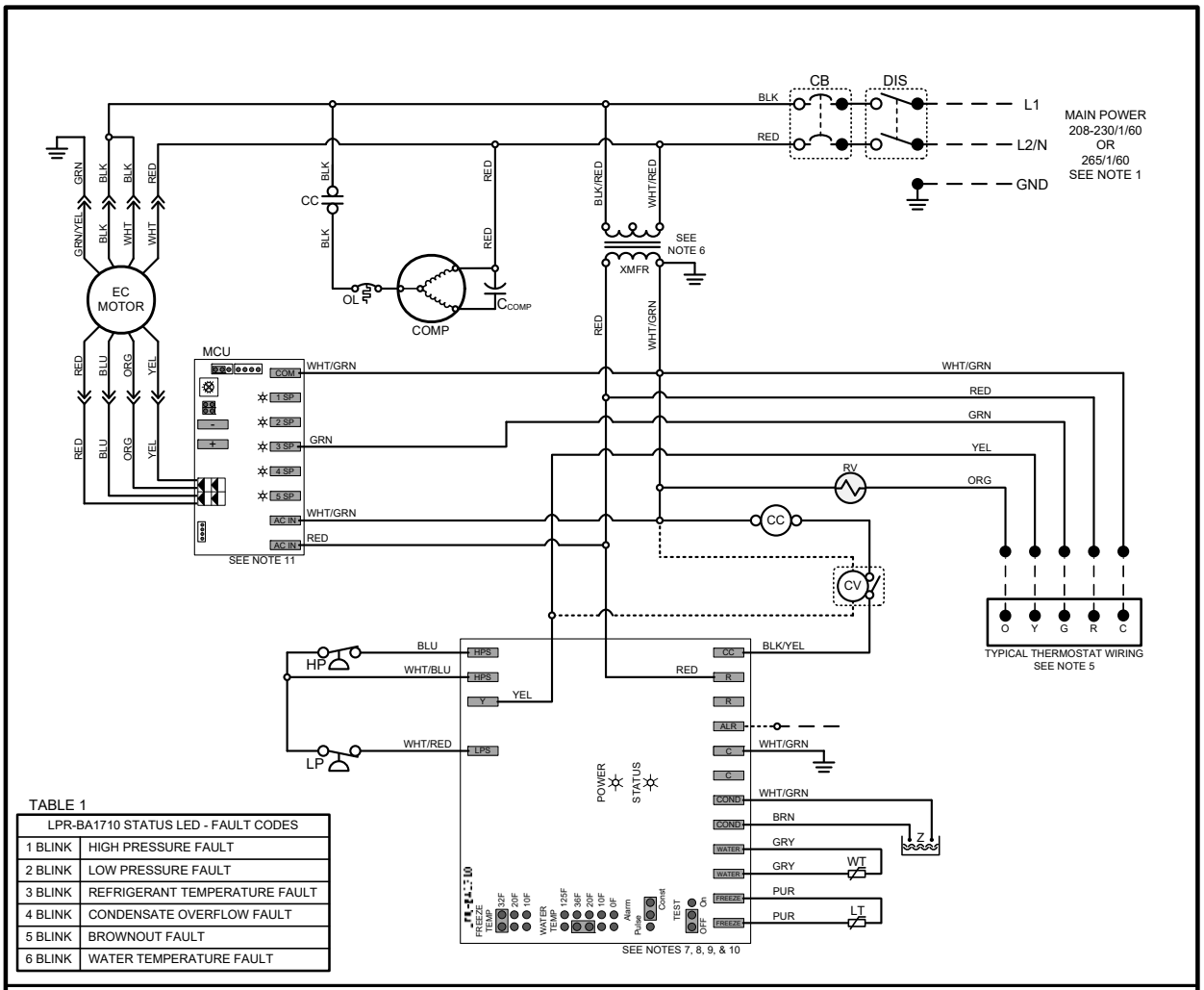


TABLE 1

LPR-BA1710 STATUS LED - FAULT CODES	
1 BLINK	HIGH PRESSURE FAULT
2 BLINK	LOW PRESSURE FAULT
3 BLINK	REFRIGERANT TEMPERATURE FAULT
4 BLINK	CONDENSATE OVERFLOW FAULT
5 BLINK	BROWNOUT FAULT
6 BLINK	WATER TEMPERATURE FAULT

LEGEND:

- CC - COMPRESSOR CONTACTOR
- C_{COMP} - COMPRESSOR CAPACITOR
- MCU - FAN MOTOR CONTROLLER
- RV - REVERSING VALVE
- HP - HIGH PRESSURE LIMIT
- LT - LOW TEMPERATURE LIMIT
- XFMR - 24VAC TRANSFORMER; 40 VA
- OL - COMPRESSOR OVERLOAD (See Note 4)
- Z - CONDENSATE OVERFLOW SENSOR
- WT - WATER TEMPERATURE LIMIT
- LP - LOW PRESSURE LIMIT
- ☐ WV - WATER CONTROL VALVE (See Note 12)
- ☐ DIS - DISCONNECT SWITCH
- ☐ CB - CIRCUIT BREAKER (See Note 3)

- —— - FACTORY WIRING
- — — - FIELD WIRING
- ------ - OPTIONAL WIRING/ACCESSORY
- - QUICK CONNECTION
- ○ - FACTORY CONNECTION
- ● - FIELD CONNECTION
- - LIGHT EMITTING DIODE INDICATOR
- - HIGH PRESSURE SWITCH
- - LOW PRESSURE SWITCH
- - THERMISTOR
- - CONDENSATE DRAIN PAN
- - RELAY COIL
- - NORMALLY OPEN RELAY CONTACTS
- - NORMALLY CLOSED RELAY CONTACTS
- - SOLENOID COIL
- - GROUND CONNECTION

NOTES:

1. Use copper conductors only.
2. LEFT INTENTIONALLY BLANK
3. If used, CB replaces DIS
4. OL may be internal or external to compressor depending on unit size.
5. Thermostat is field installed and may be remote mounted.
6. For 208-230V units, transformer is factory wired for operation at 230V. For 208V operation, move lead to 208V terminal.
7. STATUS LED blinks to indicate fault; reference Table 1 for fault condition
8. FREEZE TEMP jumper shown in default location. When using antifreeze fluid mixture, refer to IOM for correct setting.
9. WATER TEMP jumper shown in bypass position when WT sensor is not equipped. When WT sensor is equipped, refer to IOM for correct fluid mixture protection setting.
10. TEST mode is for diagnostic purposes only. When ON, anti-short cycle protection is reduced from 300 seconds to 5 seconds. After board has been powered for 60 minutes in TEST mode, normal operation is resumed; regardless of jumper position. Cycling unit power will reset operation.
11. MCU shown with typical fan speed connections. Actual speeds may vary by unit size.
12. If equipped, water valve contains end switch.

CLOSETLINE® WATER SOURCE HEAT PUMP	WIRING DIAGRAM
THE WHALEN COMPANY EASTON, MARYLAND	MODELS: CAS(H/V)(A/G)006A(B/D)**A**G, CAS(H/V)(A/G)009A(B/D)**A**G, CAS(H/V)(A/G)012A(B/D)**A**G, CAS(H/V)(A/G)015A(B/D)**A**G, and CAS(H/V)(A/G)018A(B/D)**A**G

1 June, 2018

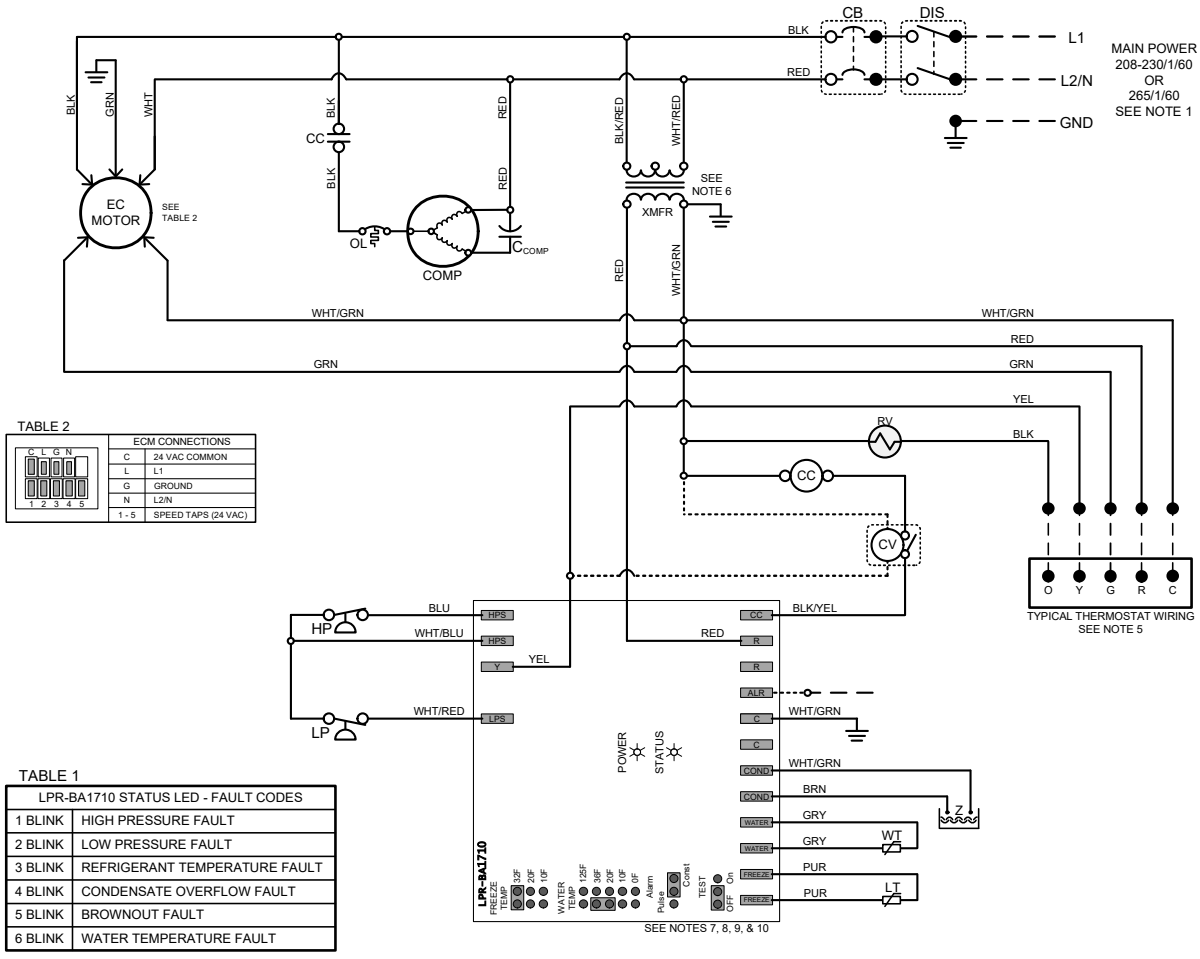


TABLE 2

ECM CONNECTIONS	
C	24 VAC COMMON
L	L1
G	GROUND
N	L2/N
1 - 5	SPEED TAPS (24 VAC)

TABLE 1

LPR-BA1710 STATUS LED - FAULT CODES	
1 BLINK	HIGH PRESSURE FAULT
2 BLINK	LOW PRESSURE FAULT
3 BLINK	REFRIGERANT TEMPERATURE FAULT
4 BLINK	CONDENSATE OVERFLOW FAULT
5 BLINK	BROWNOUT FAULT
6 BLINK	WATER TEMPERATURE FAULT

LEGEND:

- CC - COMPRESSOR CONTACTOR
- C_{COMP} - COMPRESSOR CAPACITOR
- RV - REVERSING VALVE
- HP - HIGH PRESSURE LIMIT
- LT - LOW TEMPERATURE LIMIT
- XFMR - 24VAC TRANSFORMER; 40 VA
- OL - COMPRESSOR OVERLOAD (See Note 4)
- Z - CONDENSATE OVERFLOW SENSOR
- WT - WATER TEMPERATURE LIMIT
- LP - LOW PRESSURE LIMIT
- ☐ WV - WATER CONTROL VALVE (See Note 11)
- ☐ DIS - DISCONNECT SWITCH
- ☐ CB - CIRCUIT BREAKER (See Note 3)

- —— - FACTORY WIRING
- — — - FIELD WIRING
- ------- - OPTIONAL WIRING/ACCESSORY
- - QUICK CONNECTION
- - FACTORY CONNECTION
- - FIELD CONNECTION
- - LIGHT EMITTING DIODE INDICATOR
- - HIGH PRESSURE SWITCH
- - LOW PRESSURE SWITCH
- - THERMISTOR
- - CONDENSATE DRAIN PAN
- - RELAY COIL
- - NORMALLY OPEN RELAY CONTACTS
- - NORMALLY CLOSED RELAY CONTACTS
- - SOLENOID COIL
- - GROUND CONNECTION

NOTES:

1. Use copper conductors only.
2. LEFT INTENTIONALLY BLANK
3. If used, CB replaces DIS
4. OL may be internal or external to compressor depending on unit size.
5. Thermostat is field installed and may be remote mounted.
6. For 208-230V units, transformer is factory wired for operation at 230V. For 208V operation, move lead to 208V terminal.
7. STATUS LED blinks to indicate fault; reference Table 1 for fault condition
8. FREEZE TEMP jumper shown in default location. When using antifreeze fluid mixture, refer to IOM for correct setting.
9. WATER TEMP jumper shown in bypass position when WT sensor is not equipped. When WT sensor is equipped, refer to IOM for correct fluid mixture protection setting.
10. TEST mode is for diagnostic purposes only. When ON, anti-short cycle protection is reduced from 300 seconds to 5 seconds. After board has been powered for 60 minutes in TEST mode, normal operation is resumed; regardless of jumper position. Cycling unit power will reset operation.
11. If equipped, water valve contains end switch.

CLOSETLINE® WATER SOURCE HEAT PUMP

THE WHALEN COMPANY

EASTON, MARYLAND

WIRING DIAGRAM

MODELS: CAS(H/V)(A/G)024A(B/D)**B**D, CAS(H/V)(A/G)030A(B/D)**B**D, CAS(H/V)(A/G)036A(B/D)**B**D, CAS(H/V)(A/G)042A(B/D)**B**D, CAS(H/V)(A/G)048A(B/D)**B**D, CAS(H/V)(A/G)054A(B/D)**B**D, CAS(H/V)(A/G)060A(B/D)**B**D, and CAS(H/V)(A/G)072A(B/D)**B**D

13 October, 2022

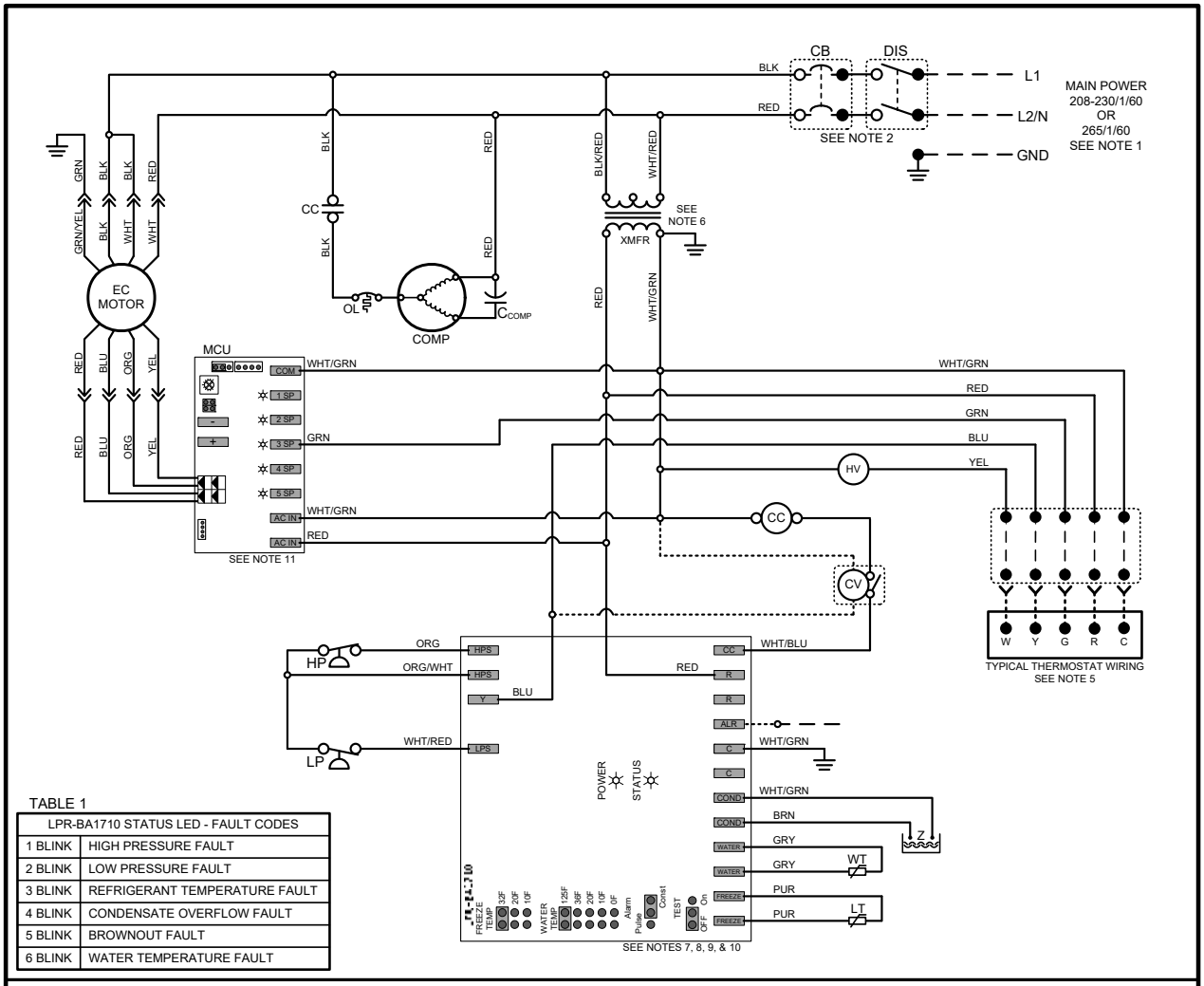


TABLE 1

LPR-BA1710 STATUS LED - FAULT CODES	
1 BLINK	HIGH PRESSURE FAULT
2 BLINK	LOW PRESSURE FAULT
3 BLINK	REFRIGERANT TEMPERATURE FAULT
4 BLINK	CONDENSATE OVERFLOW FAULT
5 BLINK	BROWNOUT FAULT
6 BLINK	WATER TEMPERATURE FAULT

LEGEND:

- CC - COMPRESSOR CONTACTOR
- C_{COMP} - COMPRESSOR CAPACITOR
- MCU - FAN MOTOR CONTROLLER
- RV - REVERSING VALVE
- HP - HIGH PRESSURE LIMIT
- LT - LOW TEMPERATURE LIMIT
- XFMR - 24VAC TRANSFORMER; 40 VA
- OL - COMPRESSOR OVERLOAD (See Note 4)
- ☐ CV - COOLING WATER CONTROL VALVE
- HV - HEATING WATER CONTROL VALVE
- WT - WATER TEMPERATURE LIMIT
- Z - CONDENSATE OVERFLOW SENSOR
- LP - LOW PRESSURE LIMIT
- ☐ DIS - DISCONNECT SWITCH
- ☐ CB - CIRCUIT BREAKER (See Note 3)

- ——— - FACTORY WIRING
- — — - FIELD WIRING
- ------- - OPTIONAL WIRING/ACCESSORY
- ≫ - QUICK CONNECTION
- ○ - FACTORY CONNECTION
- ● - FIELD CONNECTION
- ☼ - LIGHT EMITTING DIODE INDICATOR
- - HIGH PRESSURE SWITCH
- - LOW PRESSURE SWITCH
- - THERMISTOR
- - CONDENSATE DRAIN PAN
- - RELAY COIL
- - NORMALLY OPEN RELAY CONTACTS
- - NORMALLY CLOSED RELAY CONTACTS
- - SOLENOID COIL
- - GROUND CONNECTION
- - CONTROL VALVE END SWITCH

NOTES:

1. Use copper conductors only.
2. DPST switch for 208V applications only.
3. If used, CB replaces DIS
4. OL may be internal or external to compressor depending on unit size.
5. Thermostat is field installed and is remote mounted.
6. For 208-230V units, transformer is factory wired for operation at 230V. For 208V operation, move lead to 208V terminal.
7. STATUS LED blinks to indicate fault; reference Table 1 for fault condition
8. FREEZE TEMP jumper shown in default location. When using antifreeze fluid mixture, refer to IOM for correct setting.
9. WATER TEMP jumper set for cooling mode high fluid temperature protection.
10. TEST mode is for diagnostic purposes only. When ON, anti-short cycle protection is reduced from 300 seconds to 5 seconds. After board has been powered for 60 minutes in TEST mode, normal operation is resumed; regardless of jumper position. Cycling unit power will reset operation.
11. MCU shown with typical fan speed connections. Actual speeds may vary by unit size.

CLOSETPACK® WATER SOURCE AIR CONDITIONER WITH HYDRONIC HEATING

THE WHALEN COMPANY

EASTON, MARYLAND

WIRING DIAGRAM

MODELS: CAS(H/V)C006A(B/D)**A**G, CAS(H/V)C009A(B/D)**A**G, CAS(H/V)C012A(B/D)**A**G, CAS(H/V)C015A(B/D)**A**G, and CAS(H/V)C018A(B/D)**A**G

6 August, 2018

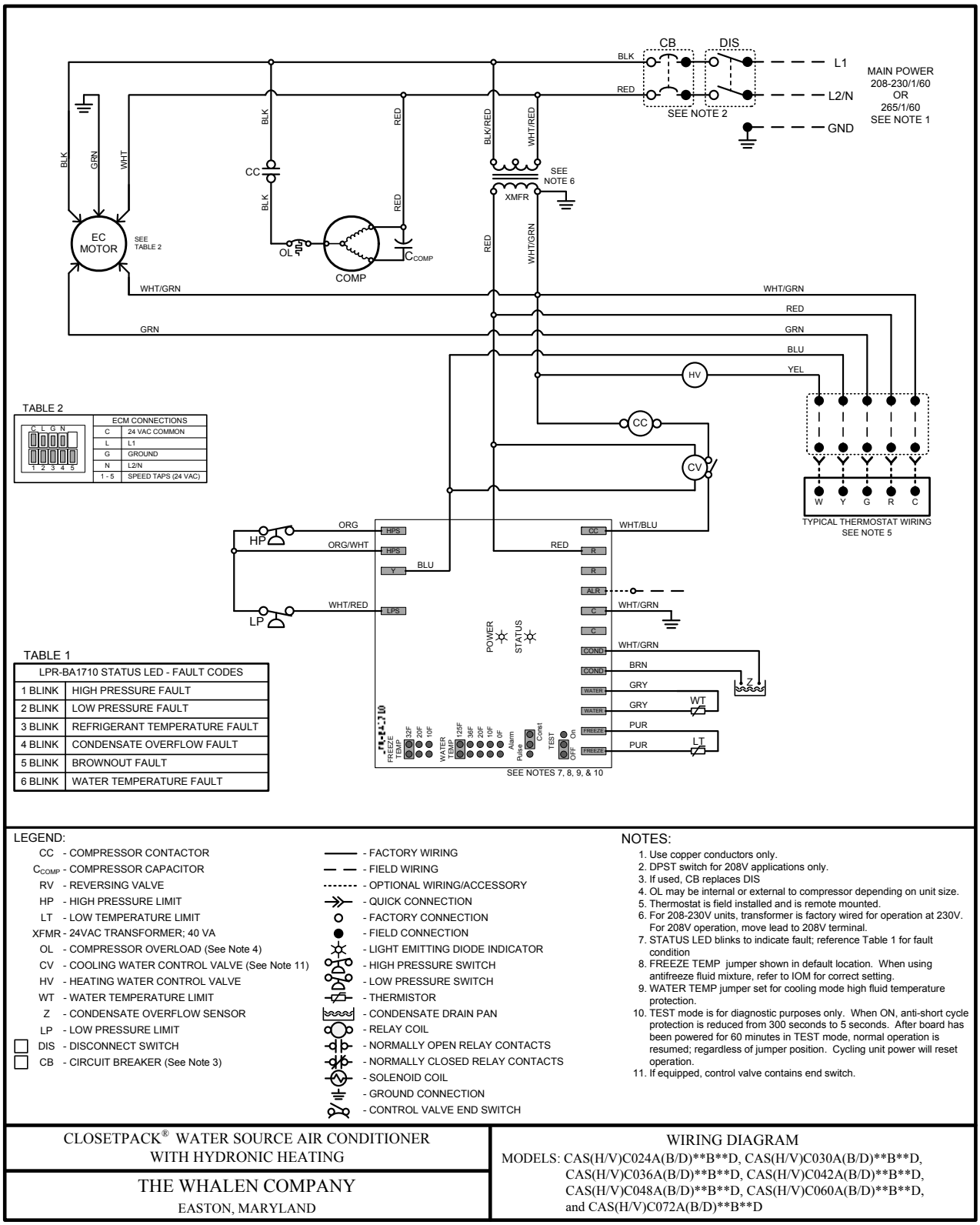


TABLE 2

C L G N	ECM CONNECTIONS	
1 2 3 4 5	C	24 VAC COMMON
	L	L1
	G	GROUND
	N	L2/N
	1 - 5	SPEED TAPS (24 VAC)

TABLE 1

LPR-BA1710 STATUS LED - FAULT CODES	
1 BLINK	HIGH PRESSURE FAULT
2 BLINK	LOW PRESSURE FAULT
3 BLINK	REFRIGERANT TEMPERATURE FAULT
4 BLINK	CONDENSATE OVERFLOW FAULT
5 BLINK	BROWNOUT FAULT
6 BLINK	WATER TEMPERATURE FAULT

LEGEND:

- CC - COMPRESSOR CONTACTOR
- C_{COMP} - COMPRESSOR CAPACITOR
- RV - REVERSING VALVE
- HP - HIGH PRESSURE LIMIT
- LT - LOW TEMPERATURE LIMIT
- XFMR - 24VAC TRANSFORMER; 40 VA
- OL - COMPRESSOR OVERLOAD (See Note 4)
- CV - COOLING WATER CONTROL VALVE (See Note 11)
- HV - HEATING WATER CONTROL VALVE
- WT - WATER TEMPERATURE LIMIT
- Z - CONDENSATE OVERFLOW SENSOR
- LP - LOW PRESSURE LIMIT
- ☐ DIS - DISCONNECT SWITCH
- ☐ CB - CIRCUIT BREAKER (See Note 3)

- —— - FACTORY WIRING
- — — - FIELD WIRING
- ------ - OPTIONAL WIRING/ACCESSORY
- - QUICK CONNECTION
- ○ - FACTORY CONNECTION
- ● - FIELD CONNECTION
- - LIGHT EMITTING DIODE INDICATOR
- - HIGH PRESSURE SWITCH
- - LOW PRESSURE SWITCH
- - THERMISTOR
- - CONDENSATE DRAIN PAN
- - RELAY COIL
- - NORMALLY OPEN RELAY CONTACTS
- - NORMALLY CLOSED RELAY CONTACTS
- - SOLENOID COIL
- - GROUND CONNECTION
- - CONTROL VALVE END SWITCH

NOTES:

1. Use copper conductors only.
2. DPST switch for 208V applications only.
3. If used, CB replaces DIS
4. OL may be internal or external to compressor depending on unit size.
5. Thermostat is field installed and is remote mounted.
6. For 208-230V units, transformer is factory wired for operation at 230V. For 208V operation, move lead to 208V terminal.
7. STATUS LED blinks to indicate fault; reference Table 1 for fault condition
8. FREEZE TEMP jumper shown in default location. When using antifreeze fluid mixture, refer to IOM for correct setting.
9. WATER TEMP jumper set for cooling mode high fluid temperature protection.
10. TEST mode is for diagnostic purposes only. When ON, anti-short cycle protection is reduced from 300 seconds to 5 seconds. After board has been powered for 60 minutes in TEST mode, normal operation is resumed; regardless of jumper position. Cycling unit power will reset operation.
11. If equipped, control valve contains end switch.

CLOSETPACK® WATER SOURCE AIR CONDITIONER
WITH HYDRONIC HEATING

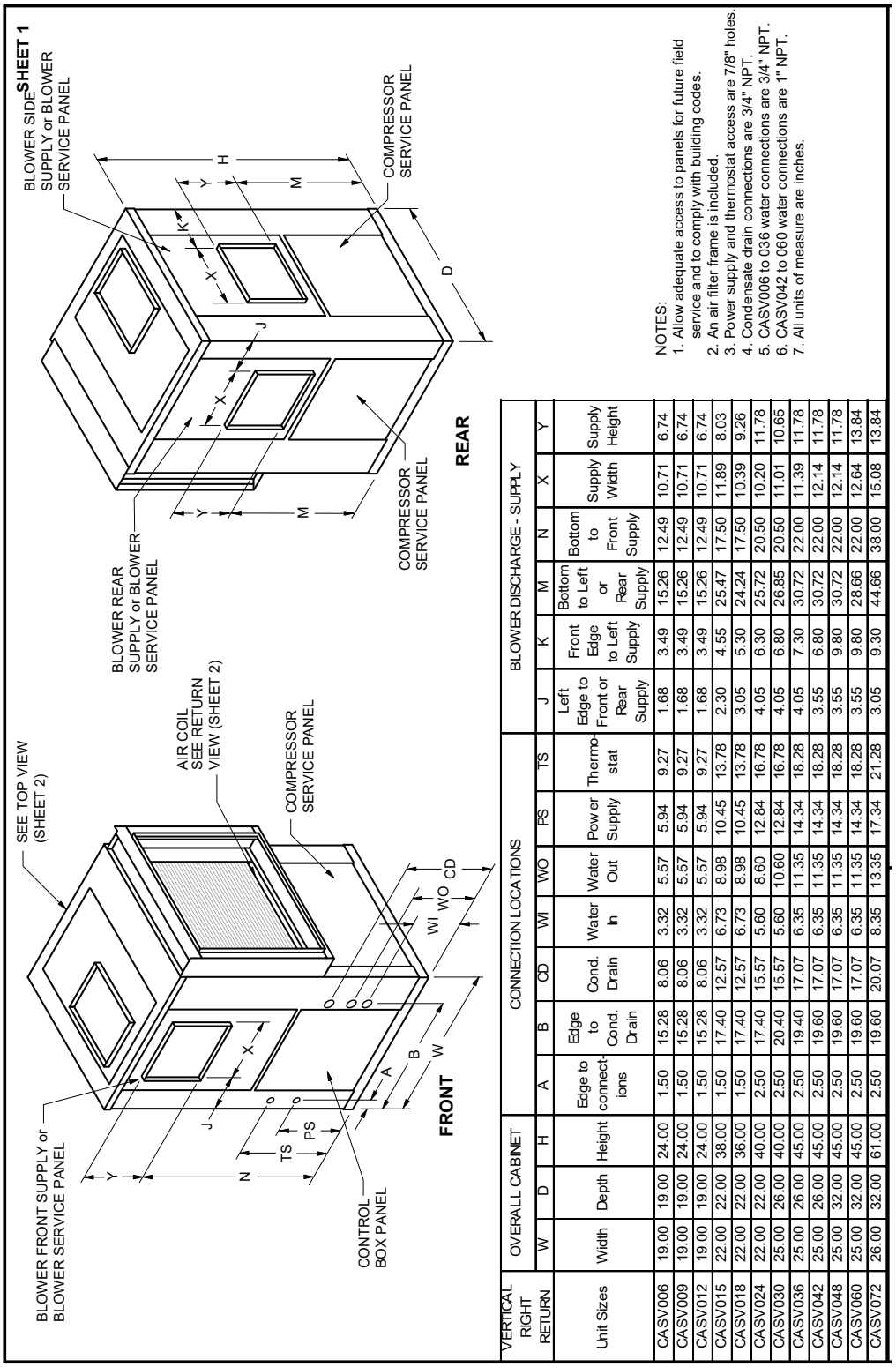
THE WHALEN COMPANY
EASTON, MARYLAND

WIRING DIAGRAM

MODELS: CAS(H/V)C024A(B/D)**B**D, CAS(H/V)C030A(B/D)**B**D, CAS(H/V)C036A(B/D)**B**D, CAS(H/V)C042A(B/D)**B**D, CAS(H/V)C048A(B/D)**B**D, CAS(H/V)C060A(B/D)**B**D, and CAS(H/V)C072A(B/D)**B**D

13 October, 2022

Vertical Unit with Right Return



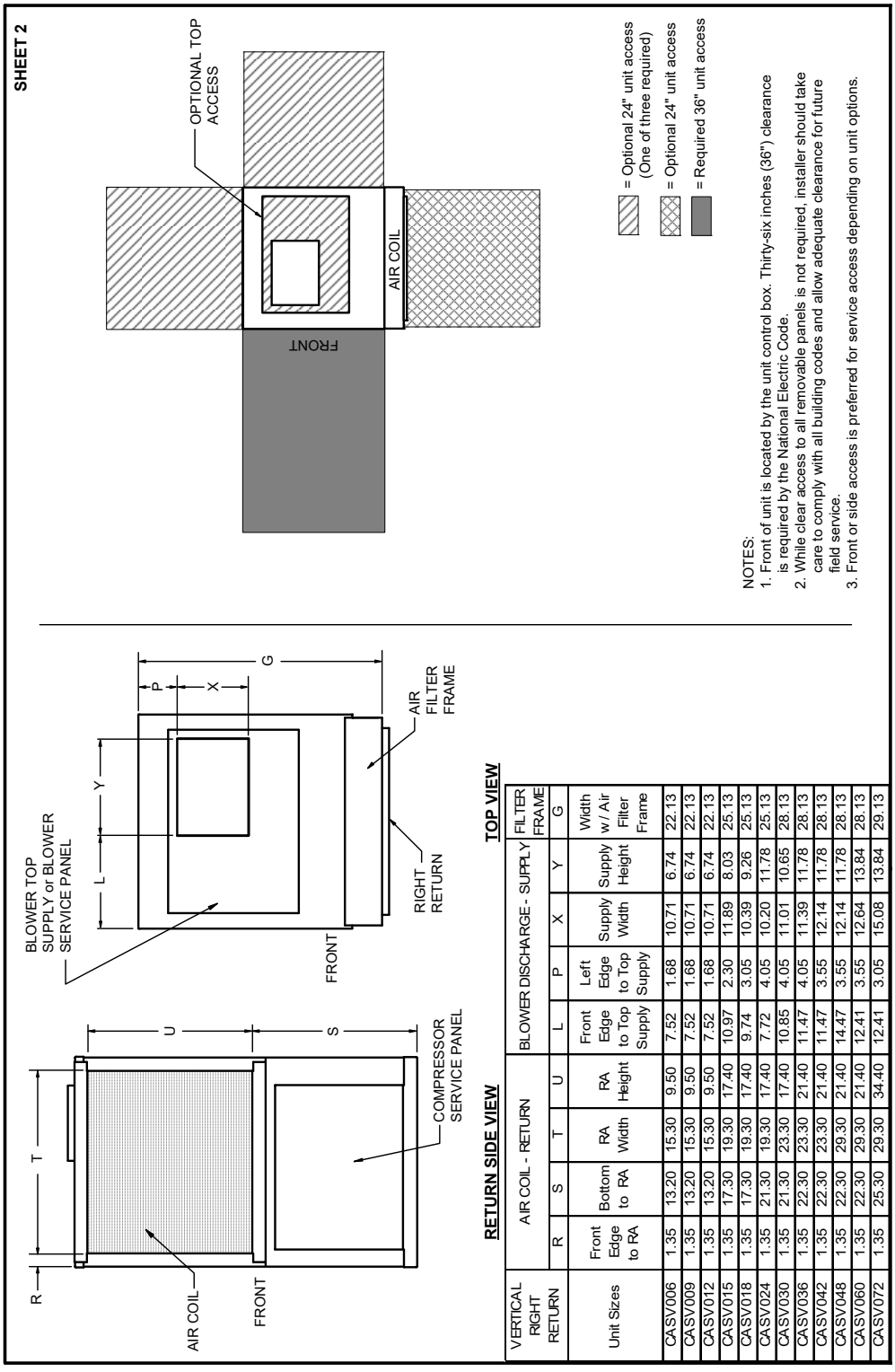
NOTES:
1. Allow adequate access to panels for future field service and to comply with building codes.
2. An air filter frame is included.
3. Power supply and thermostat access are 7/8" holes.
4. Condensate drain connections are 3/4" NPT.
5. CASV006 to 036 water connections are 3/4" NPT.
6. CASV042 to 060 water connections are 1" NPT.
7. All units of measure are inches.

VERTICAL RIGHT RETURN	OVERALL CABINET			CONNECTION LOCATIONS							BLOWER DISCHARGE - SUPPLY					
Unit Sizes	W Width	D Depth	H Height	A Edge to connect-ions	B Edge to Cond. Drain	CD Cond. Drain	WI Water In	WO Water Out	PS Power Supply	TS Thermo-stat	J Left Edge to Front or Rear Supply	K Front Edge to Left Supply	M Bottom to Left or Rear Supply	N Bottom to Front Supply	X Supply Width	Y Supply Height
CASV006	19.00	19.00	24.00	1.50	15.28	8.06	3.32	5.57	5.94	9.27	1.68	3.49	15.26	12.49	10.71	6.74
CASV009	19.00	19.00	24.00	1.50	15.28	8.06	3.32	5.57	5.94	9.27	1.68	3.49	15.26	12.49	10.71	6.74
CASV012	19.00	19.00	24.00	1.50	15.28	8.06	3.32	5.57	5.94	9.27	1.68	3.49	15.26	12.49	10.71	6.74
CASV015	22.00	22.00	38.00	1.50	17.40	12.57	6.73	8.98	10.45	13.78	2.30	4.55	25.47	17.50	11.89	8.03
CASV018	22.00	22.00	36.00	1.50	17.40	12.57	6.73	8.98	10.45	13.78	3.05	5.30	24.24	17.50	10.39	9.26
CASV024	22.00	22.00	40.00	2.50	17.40	15.57	5.60	8.60	12.84	16.78	4.05	6.30	25.72	20.50	10.20	11.78
CASV030	25.00	26.00	40.00	2.50	20.40	15.57	5.60	10.60	12.84	16.78	4.05	6.80	26.85	20.50	11.01	10.65
CASV036	25.00	26.00	45.00	2.50	19.40	17.07	6.35	11.35	14.34	18.28	4.05	7.30	30.72	22.00	11.39	11.78
CASV042	25.00	26.00	45.00	2.50	19.60	17.07	6.35	11.35	14.34	18.28	3.55	6.80	30.72	22.00	12.14	11.78
CASV048	25.00	32.00	45.00	2.50	19.60	17.07	6.35	11.35	14.34	18.28	3.55	9.80	30.72	22.00	12.14	11.78
CASV060	25.00	32.00	45.00	2.50	19.60	17.07	6.35	11.35	14.34	18.28	3.55	9.80	28.66	22.00	12.64	13.84
CASV072	26.00	32.00	61.00	2.50	19.60	20.07	8.35	13.35	17.34	21.28	3.05	9.30	44.66	38.00	15.08	13.84

DRAWING NUMBER CASV-RRd

OCTOBER 2022

Vertical Unit with Right Return

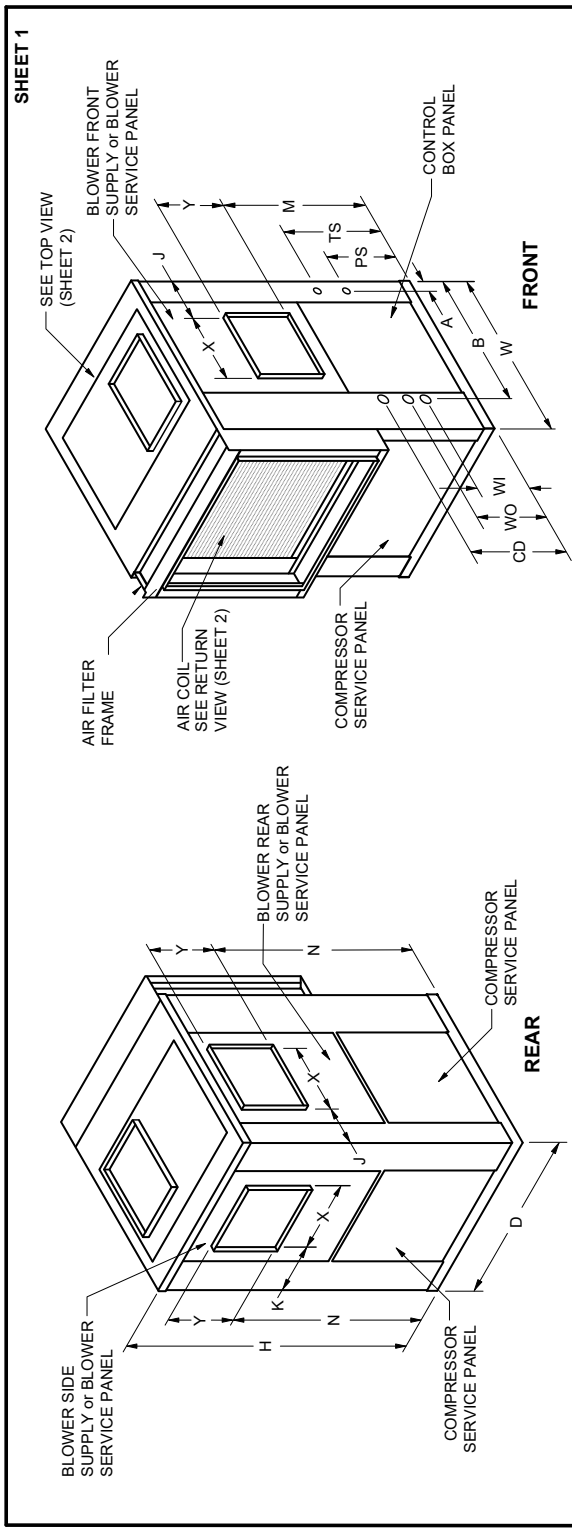


VERTICAL RIGHT RETURN	AIR COIL - RETURN				BLOWER DISCHARGE - SUPPLY				FILTER FRAME
Unit Sizes	R Front Edge to RA	S Bottom to RA	T RA Width	U RA Height	L Front Edge to Top Supply	P Left Edge to Top Supply	X Supply Width	Y Supply Height	G Width w/ Air Filter Frame
CASV006	1.35	13.20	15.30	9.50	7.52	1.68	10.71	6.74	22.13
CASV009	1.35	13.20	15.30	9.50	7.52	1.68	10.71	6.74	22.13
CASV012	1.35	13.20	15.30	9.50	7.52	1.68	10.71	6.74	22.13
CASV015	1.35	17.30	19.30	17.40	10.97	2.30	11.89	8.03	25.13
CASV018	1.35	17.30	19.30	17.40	9.74	3.05	10.39	9.26	25.13
CASV024	1.35	21.30	19.30	17.40	7.72	4.05	10.20	11.78	25.13
CASV030	1.35	21.30	23.30	17.40	10.85	4.05	11.01	10.65	28.13
CASV036	1.35	22.30	23.30	21.40	11.47	4.05	11.39	11.78	28.13
CASV042	1.35	22.30	23.30	21.40	11.47	3.55	12.14	11.78	28.13
CASV048	1.35	22.30	29.30	21.40	14.47	3.55	12.14	11.78	28.13
CASV060	1.35	22.30	29.30	21.40	12.41	3.55	12.64	13.84	28.13
CASV072	1.35	25.30	29.30	34.40	12.41	3.05	15.08	13.84	29.13

DRAWING NUMBER CASV-RRd

OCTOBER 2022

Vertical Unit with Left Return

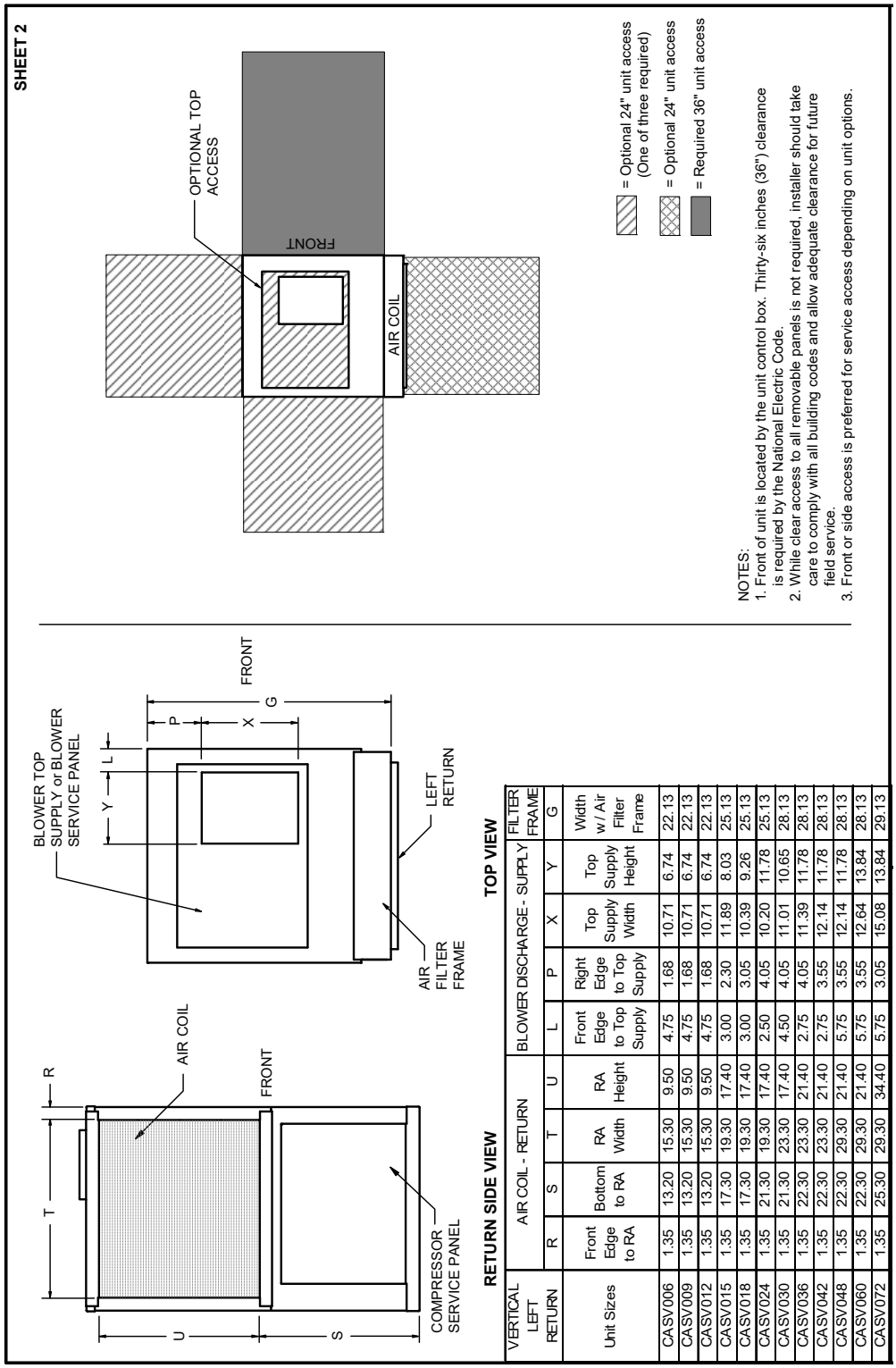


VERTICAL LEFT RETURN	OVERALL CABINET			CONNECTION LOCATIONS							BLOWER DISCHARGE - SUPPLY					
Unit Sizes	W	D	H	A	B	CD	WI	WO	PS	TS	J	K	M	N	X	Y
	Width	Depth	Height	Edge to connect-ions	Edge to Cond. Drain	Cond. Drain	Water In	Water Out	Pow er Supply	Thermo-stat	Edge to Front or Rear Supply	Edge to Right Supply	Bottom to Front Supply	Bottom to Right or Rear	Supply Width	Supply Height
CASV006	19.00	19.00	24.00	1.50	15.28	8.06	3.32	5.57	5.94	9.27	1.68	3.49	12.49	15.26	10.71	6.74
CASV009	19.00	19.00	24.00	1.50	15.28	8.06	3.32	5.57	5.94	9.27	1.68	3.49	12.49	15.26	10.71	6.74
CASV012	19.00	19.00	24.00	1.50	15.28	8.06	3.32	5.57	5.94	9.27	1.68	3.49	12.49	15.26	10.71	6.74
CASV015	22.00	22.00	36.00	1.50	17.40	12.57	6.73	8.98	10.45	13.78	2.30	4.55	17.50	25.47	11.89	8.03
CASV018	22.00	22.00	36.00	1.50	17.40	12.57	6.73	8.98	10.45	13.78	3.05	5.30	17.50	24.24	10.39	9.26
CASV024	22.00	22.00	40.00	2.50	17.40	15.57	6.23	9.23	12.84	16.78	4.05	6.30	20.50	25.72	10.20	11.78
CASV030	25.00	26.00	40.00	2.50	20.40	15.57	6.23	11.23	12.84	16.78	4.05	6.80	20.50	26.85	11.01	10.65
CASV036	25.00	26.00	45.00	2.50	19.40	17.07	7.35	12.35	14.34	18.28	4.05	7.30	22.00	30.72	11.39	11.78
CASV042	25.00	26.00	45.00	2.50	19.60	17.07	7.35	12.35	14.34	18.28	3.55	6.80	22.00	30.72	12.14	11.78
CASV048	25.00	32.00	45.00	2.50	19.60	17.07	7.35	12.35	14.34	18.28	3.55	9.80	22.00	30.72	12.14	11.78
CASV060	25.00	32.00	45.00	2.50	19.60	17.07	7.35	12.35	14.34	18.28	3.55	9.80	22.00	28.66	12.64	13.84
CASV072	26.00	32.00	61.00	2.50	19.60	20.07	9.35	14.35	17.34	21.28	3.05	9.30	38.00	44.66	15.08	13.84

NOTES:
1. Allow adequate access to panels for future field service and compliance with building codes.
2. An air filter frame is included.
3. Power supply and thermostat access are 7/8" holes.
4. Condensate drain connections are 3/4" NPT.
5. CASV006 to 036 water connections are 3/4" NPT.
6. CASV042 to 060 water connections are 1" NPT.
7. All units of measure are inches.

DRAWING NUMBER CASV-LRe
OCTOBER 2022

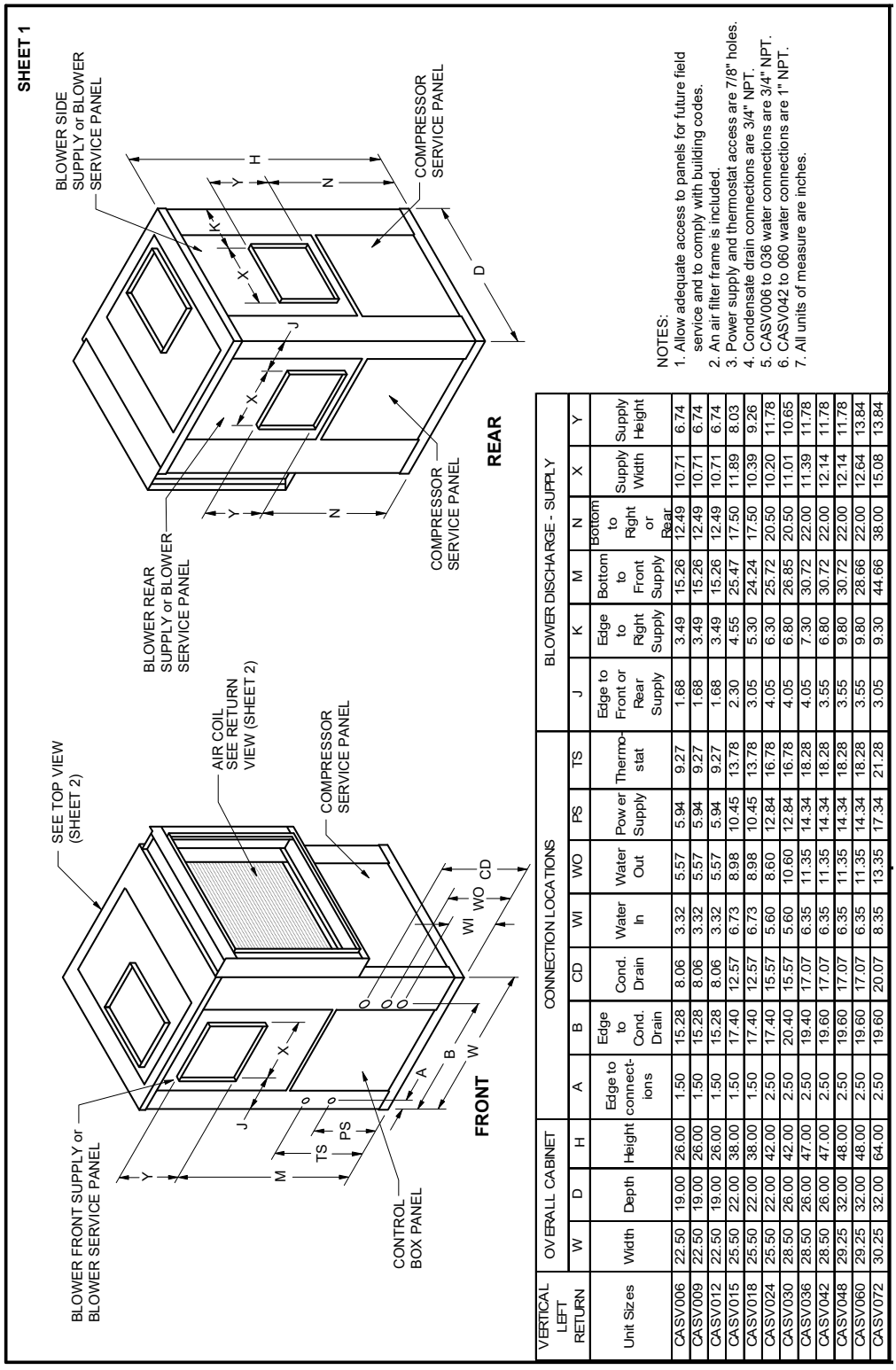
Vertical Unit with Left Return



VERTICAL LEFT RETURN	AIR COIL - RETURN					BLOWER DISCHARGE - SUPPLY					FILTER FRAME
Unit Sizes	R	S	T	U	L	P	X	Y	G
	Front Edge to RA	Bottom to RA	RA Width	RA Height	Front Edge to Top Supply	Right Edge to Top Supply	Top Supply Width	Top Supply Height	Width w / Air Filter Frame
CASV006	1.35	13.20	15.30	9.50	4.75	1.68	10.71	6.74	22.13
CASV009	1.35	13.20	15.30	9.50	4.75	1.68	10.71	6.74	22.13
CASV012	1.35	13.20	15.30	9.50	4.75	1.68	10.71	6.74	22.13
CASV015	1.35	17.30	19.30	17.40	3.00	2.30	11.89	8.03	25.13
CASV018	1.35	17.30	19.30	17.40	3.00	3.05	10.39	9.26	25.13
CASV024	1.35	21.30	19.30	17.40	2.50	4.05	10.20	11.78	25.13
CASV030	1.35	21.30	23.30	17.40	4.50	4.05	11.01	10.65	28.13
CASV036	1.35	22.30	23.30	21.40	2.75	4.05	11.39	11.78	28.13
CASV042	1.35	22.30	23.30	21.40	2.75	3.55	12.14	11.78	28.13
CASV048	1.35	22.30	29.30	21.40	5.75	3.55	12.14	11.78	28.13
CASV060	1.35	22.30	29.30	21.40	5.75	3.55	12.64	13.84	28.13
CASV072	1.35	25.30	29.30	34.40	5.75	3.05	15.08	13.84	29.13

DRAWING NUMBER CASV-LRe
OCTOBER 2022

Hydronic Heat - Vertical Unit with Right Return

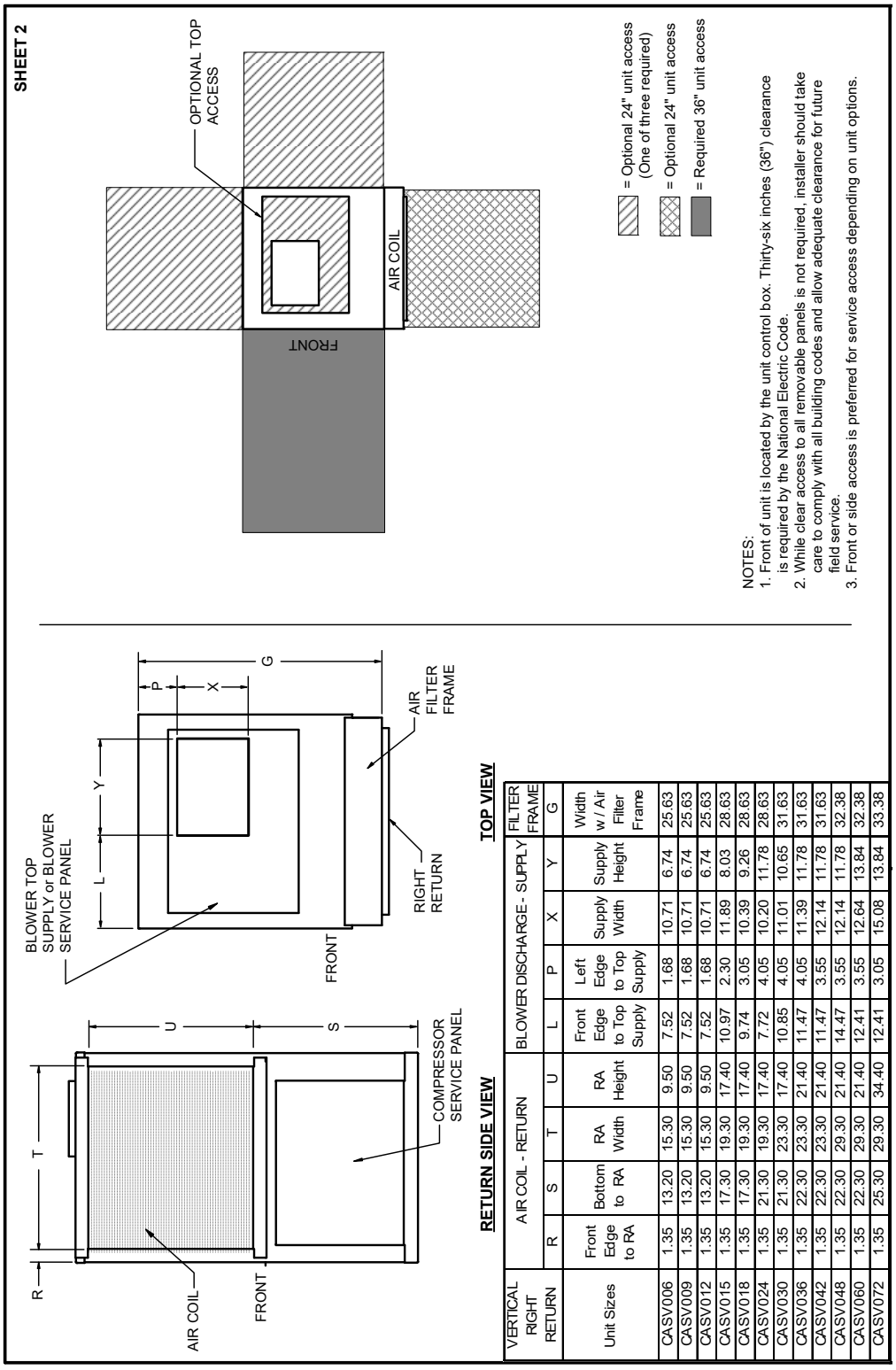


NOTES:
1. Allow adequate access to panels for future field service and to comply with building codes.
2. An air filter frame is included.
3. Power supply and thermostat access are 7/8" holes.
4. Condensate drain connections are 3/4" NPT.
5. CASV006 to 036 water connections are 3/4" NPT.
6. CASV042 to 060 water connections are 1" NPT.
7. All units of measure are inches.

VERTICAL LEFT RETURN	OVERALL CABINET			CONNECTION LOCATIONS							BLOWER DISCHARGE - SUPPLY						
Unit Sizes	W Width	D Depth	H Height	A Edge to connect-ions	B Edge to Cond. Drain	CD Cond. Drain	WI Water In	WO Water Out	PS Power Supply	TS Thermo-stat	J Edge to Front or Rear Supply	K Edge to Right Supply	M Bottom to Front Supply	N Bottom to Right or Rear	X Supply Width	Y Supply Height
CASV006	22.50	19.00	26.00	1.50	15.28	8.06	3.32	5.57	5.94	9.27	1.68	3.49	15.26	12.49	10.71	6.74
CASV009	22.50	19.00	26.00	1.50	15.28	8.06	3.32	5.57	5.94	9.27	1.68	3.49	15.26	12.49	10.71	6.74
CASV012	22.50	19.00	26.00	1.50	15.28	8.06	3.32	5.57	5.94	9.27	1.68	3.49	15.26	12.49	10.71	6.74
CASV015	25.50	22.00	38.00	1.50	17.40	12.57	6.73	8.98	10.45	13.78	2.30	4.55	25.47	17.50	11.89	8.03
CASV018	25.50	22.00	38.00	1.50	17.40	12.57	6.73	8.98	10.45	13.78	3.05	5.30	24.24	17.50	10.39	9.26
CASV024	25.50	22.00	42.00	2.50	17.40	15.57	5.60	8.60	12.84	16.78	4.05	6.30	25.72	20.50	10.20	11.78
CASV030	28.50	26.00	42.00	2.50	20.40	15.57	5.60	10.60	12.84	16.78	4.05	6.80	26.85	20.50	11.01	10.65
CASV036	28.50	26.00	47.00	2.50	19.40	17.07	6.35	11.35	14.34	18.28	4.05	7.30	30.72	22.00	11.39	11.78
CASV042	28.50	26.00	47.00	2.50	19.60	17.07	6.35	11.35	14.34	18.28	3.55	6.80	30.72	22.00	12.14	11.78
CASV048	29.25	32.00	48.00	2.50	19.60	17.07	6.35	11.35	14.34	18.28	3.55	9.80	30.72	22.00	12.14	11.78
CASV060	29.25	32.00	48.00	2.50	19.60	17.07	6.35	11.35	14.34	18.28	3.55	9.80	28.66	22.00	12.64	13.84
CASV072	30.25	32.00	64.00	2.50	19.60	20.07	8.35	13.35	17.34	21.28	3.05	9.30	44.66	38.00	15.08	13.84

DRAWING NUMBER CASV-HH-RRd
OCTOBER 2022

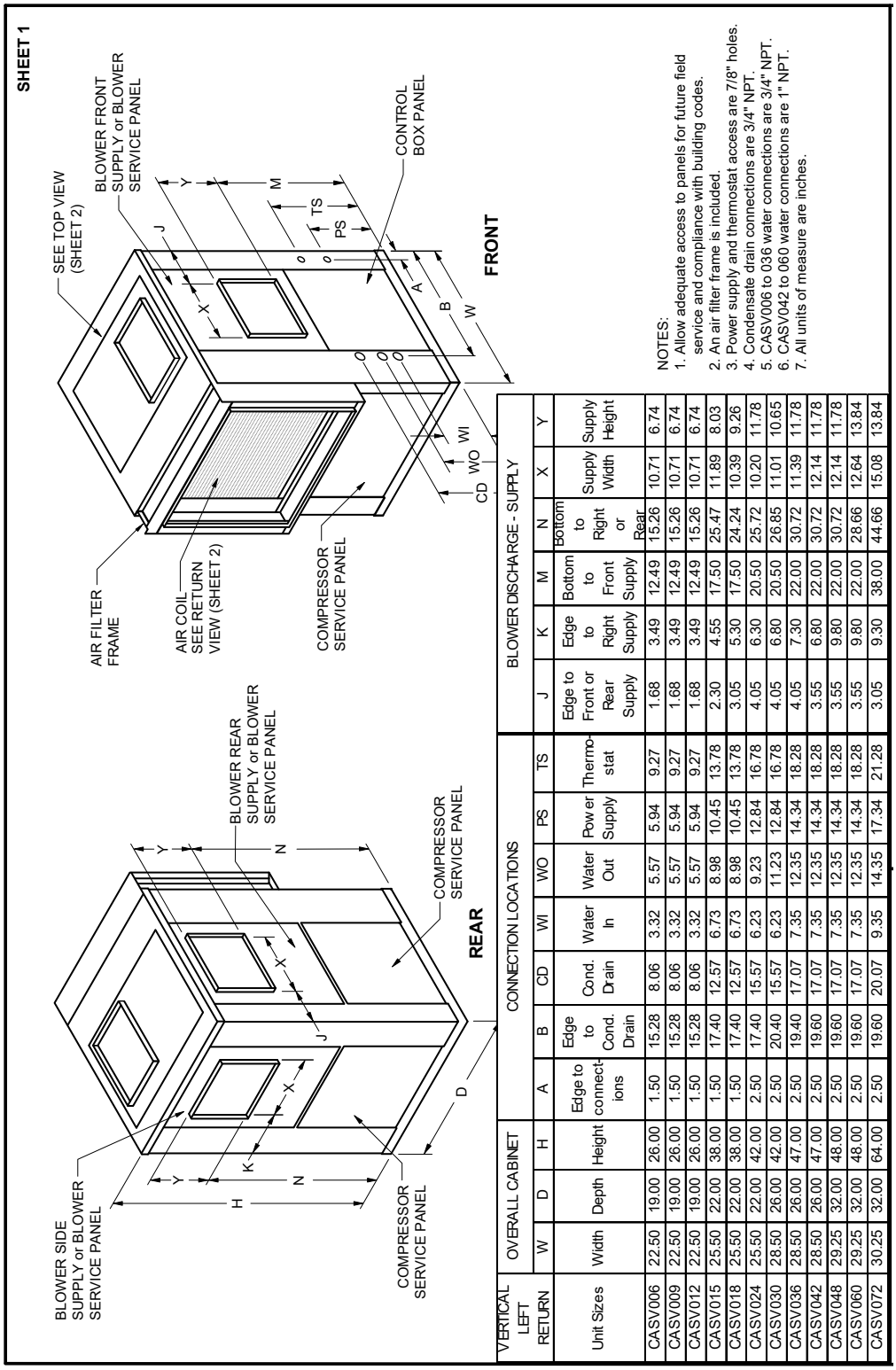
Hydronic Heat - Vertical Unit with Right Return



VERTICAL RIGHT RETURN	AIR COIL - RETURN					BLOWER DISCHARGE - SUPPLY				FILTER FRAME
Unit Sizes	R	S	T	U	L	P	X	Y	G
	Front Edge to RA	Bottom to RA	RA Width	RA Height	Front Edge to Top Supply	Left Edge to Top Supply	Supply Width	Supply Height	Width w / Air Filter Frame
CASV006	1.35	13.20	15.30	9.50	7.52	1.68	10.71	6.74	25.63
CASV009	1.35	13.20	15.30	9.50	7.52	1.68	10.71	6.74	25.63
CASV012	1.35	13.20	15.30	9.50	7.52	1.68	10.71	6.74	25.63
CASV015	1.35	17.30	19.30	17.40	10.97	2.30	11.89	8.03	28.63
CASV018	1.35	17.30	19.30	17.40	9.74	3.05	10.39	9.26	28.63
CASV024	1.35	21.30	19.30	17.40	7.72	4.05	10.20	11.78	28.63
CASV030	1.35	21.30	23.30	17.40	10.85	4.05	11.01	10.65	31.63
CASV036	1.35	22.30	23.30	21.40	11.47	4.05	11.39	11.78	31.63
CASV042	1.35	22.30	23.30	21.40	11.47	3.55	12.14	11.78	31.63
CASV048	1.35	22.30	29.30	21.40	14.47	3.55	12.14	11.78	32.38
CASV060	1.35	22.30	29.30	21.40	12.41	3.55	12.64	13.84	32.38
CASV072	1.35	25.30	29.30	34.40	12.41	3.05	15.08	13.84	33.38

DRAWING NUMBER CASV-HH-RRd
OCTOBER 2022

Hydronic Heat - Vertical Unit with Left Return

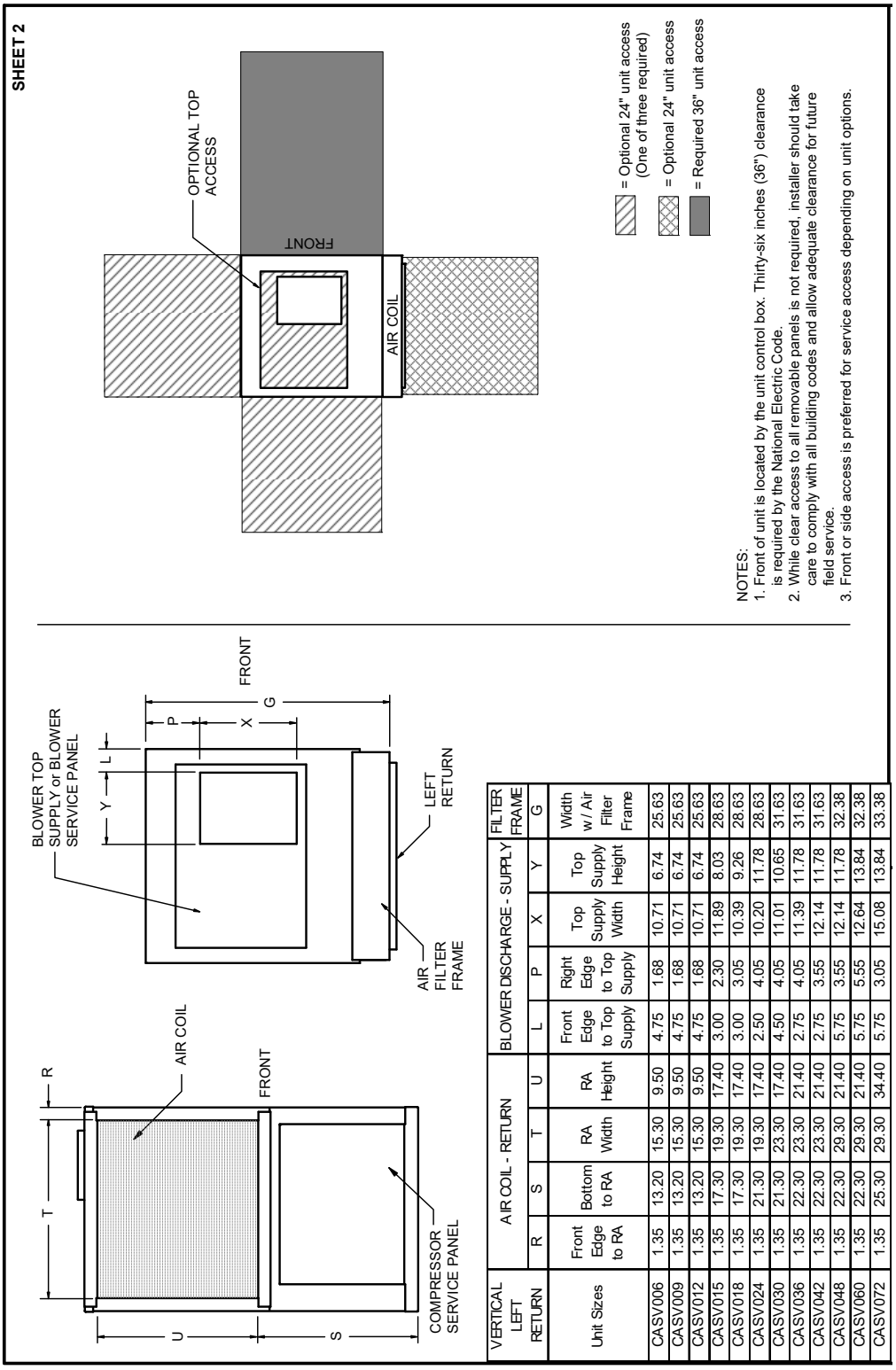


VERTICAL LEFT RETURN	OVERALL CABINET			CONNECTION LOCATIONS							BLOWER DISCHARGE - SUPPLY					
Unit Sizes	W Width	D Depth	H Height	A Edge to connect-ions	B Edge to Cond. Drain	CD Cond. Drain	WI Water In	WO Water Out	PS Power Supply	TS Thermo-stat	J Edge to Front or Rear Supply	K Edge to Right Supply	M Bottom to Front Supply	N Bottom to Right or Rear	X Supply Width	Y Supply Height
CASV006	22.50	19.00	26.00	1.50	15.28	8.06	3.32	5.57	5.94	9.27	1.68	3.49	12.49	15.26	10.71	6.74
CASV009	22.50	19.00	26.00	1.50	15.28	8.06	3.32	5.57	5.94	9.27	1.68	3.49	12.49	15.26	10.71	6.74
CASV012	22.50	19.00	26.00	1.50	15.28	8.06	3.32	5.57	5.94	9.27	1.68	3.49	12.49	15.26	10.71	6.74
CASV015	25.50	22.00	38.00	1.50	17.40	12.57	6.73	8.98	10.45	13.78	2.30	4.55	17.50	25.47	11.89	8.03
CASV018	25.50	22.00	38.00	1.50	17.40	12.57	6.73	8.98	10.45	13.78	3.05	5.30	17.50	24.24	10.39	9.26
CASV024	25.50	22.00	42.00	2.50	17.40	15.57	6.23	9.23	12.84	16.78	4.05	6.30	20.50	25.72	10.20	11.78
CASV030	28.50	26.00	42.00	2.50	20.40	15.57	6.23	11.23	12.84	16.78	4.05	6.80	20.50	26.85	11.01	10.65
CASV036	28.50	26.00	47.00	2.50	19.40	17.07	7.35	12.35	14.34	18.28	4.05	7.30	22.00	30.72	11.39	11.78
CASV042	28.50	26.00	47.00	2.50	19.60	17.07	7.35	12.35	14.34	18.28	3.55	6.80	22.00	30.72	12.14	11.78
CASV048	29.25	32.00	48.00	2.50	19.60	17.07	7.35	12.35	14.34	18.28	3.55	9.80	22.00	30.72	12.14	11.78
CASV060	29.25	32.00	48.00	2.50	19.60	17.07	7.35	12.35	14.34	18.28	3.55	9.80	22.00	28.66	12.64	13.84
CASV072	30.25	32.00	64.00	2.50	19.60	20.07	9.35	14.35	17.34	21.28	3.05	9.30	38.00	44.66	15.08	13.84

NOTES:
1. Allow adequate access to panels for future field service and compliance with building codes.
2. An air filter frame is included.
3. Power supply and thermostat access are 7/8" holes.
4. Condensate drain connections are 3/4" NPT.
5. CASV006 to 036 water connections are 3/4" NPT.
6. CASV042 to 060 water connections are 1" NPT.
7. All units of measure are inches.

DRAWING NUMBER CASV-HH-LRd
OCTOBER 2022

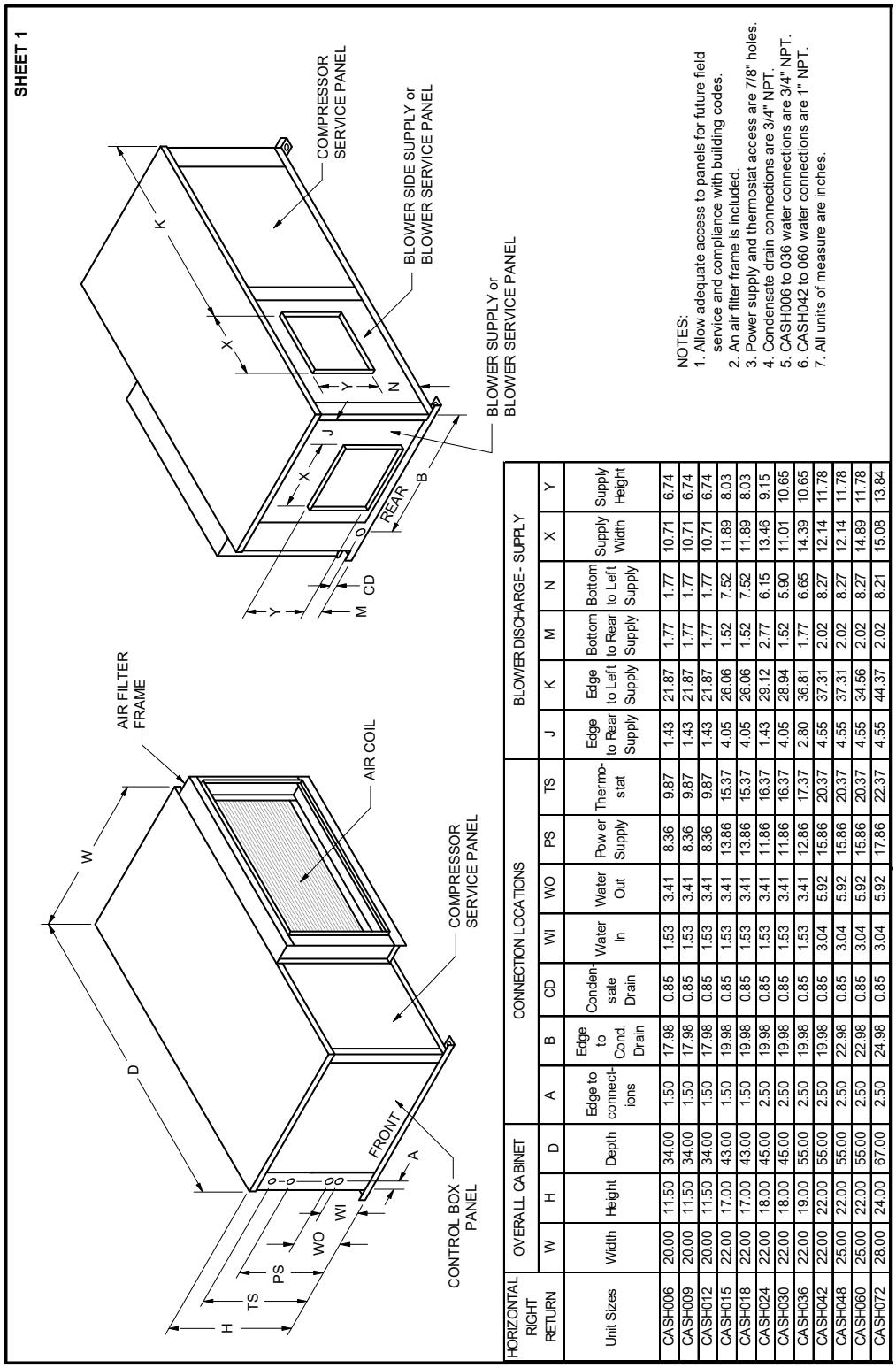
Hydronic Heat - Vertical Unit with Left Return



VERTICAL LEFT RETURN	AIR COIL - RETURN					BLOWER DISCHARGE - SUPPLY					FILTER FRAME
Unit Sizes	R	S	T	U	L	P	X	Y	G
	Front Edge to RA	Bottom to RA	RA Width	RA Height	Front Edge to Top Supply	Right Edge to Top Supply	Top Supply Width	Top Supply Height	Width w/ Air Filter Frame
CASV006	1.35	13.20	15.30	9.50	4.75	1.68	10.71	6.74	25.63
CASV009	1.35	13.20	15.30	9.50	4.75	1.68	10.71	6.74	25.63
CASV012	1.35	13.20	15.30	9.50	4.75	1.68	10.71	6.74	25.63
CASV015	1.35	17.30	19.30	17.40	3.00	2.30	11.89	8.03	28.63
CASV018	1.35	17.30	19.30	17.40	3.00	3.05	10.39	9.26	28.63
CASV024	1.35	21.30	19.30	17.40	2.50	4.05	10.20	11.78	28.63
CASV030	1.35	21.30	23.30	17.40	4.50	4.05	11.01	10.65	31.63
CASV036	1.35	22.30	23.30	21.40	2.75	4.05	11.39	11.78	31.63
CASV042	1.35	22.30	23.30	21.40	2.75	3.55	12.14	11.78	31.63
CASV048	1.35	22.30	29.30	21.40	5.75	3.55	12.14	11.78	32.38
CASV060	1.35	22.30	29.30	21.40	5.75	5.55	12.64	13.84	32.38
CASV072	1.35	25.30	29.30	34.40	5.75	3.05	15.08	13.84	33.38

DRAWING NUMBER CASV-HH-LRd
OCTOBER 2022

Horizontal Unit with Right Return

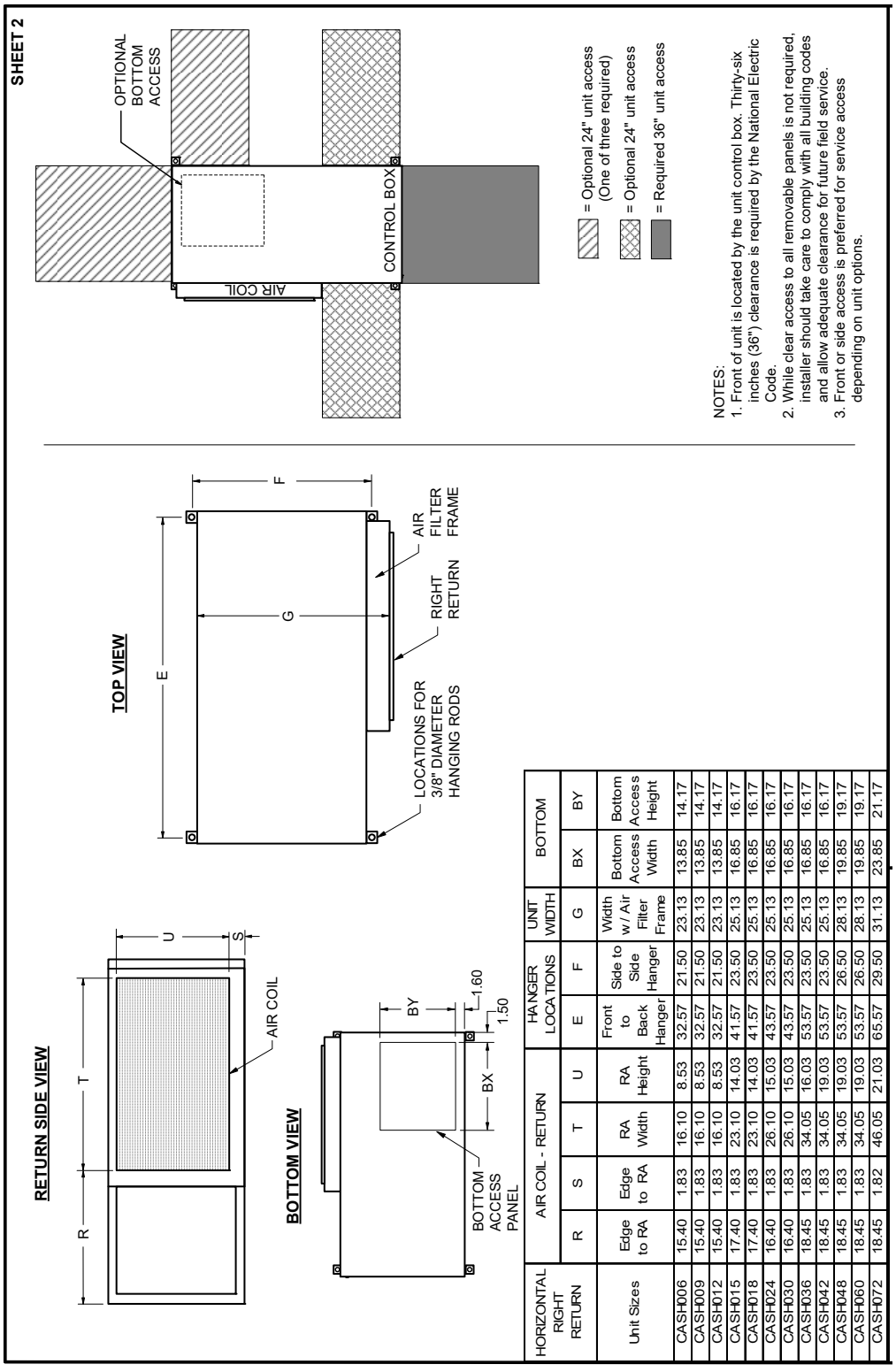


NOTES:
1. Allow adequate access to panels for future field service and compliance with building codes.
2. An air filter frame is included.
3. Power supply and thermostat access are 7/8" holes.
4. Condensate drain connections are 3/4" NPT.
5. CASH006 to 036 water connections are 3/4" NPT.
6. CASH042 to 060 water connections are 1" NPT.
7. All units of measure are inches.

HORIZONTAL RIGHT RETURN	OVERALL CABINET				CONNECTION LOCATIONS							BLOWER DISCHARGE - SUPPLY							
Unit Sizes	W Width	H Height	D Depth	A Edge to connect-ions	B Edge to Cond. Drain	CD Conden-sate Drain	WI Water In	WO Water Out	PS Power Supply	TS Thermo-stat	J Edge to Rear Supply	K Edge to Left Supply	M Bottom to Rear Supply	N Bottom to Left Supply	X Supply Width	Y Supply Height
CASH006	20.00	11.50	34.00	1.50	17.98	0.85	1.53	3.41	8.36	9.87	1.43	21.87	1.77	1.77	10.71	6.74
CASH009	20.00	11.50	34.00	1.50	17.98	0.85	1.53	3.41	8.36	9.87	1.43	21.87	1.77	1.77	10.71	6.74
CASH012	20.00	11.50	34.00	1.50	17.98	0.85	1.53	3.41	8.36	9.87	1.43	21.87	1.77	1.77	10.71	6.74
CASH015	22.00	17.00	43.00	1.50	19.98	0.85	1.53	3.41	13.86	15.37	4.05	26.06	1.52	7.52	11.89	8.03
CASH018	22.00	17.00	43.00	1.50	19.98	0.85	1.53	3.41	13.86	15.37	4.05	26.06	1.52	7.52	11.89	8.03
CASH024	22.00	18.00	45.00	2.50	19.98	0.85	1.53	3.41	11.86	16.37	1.43	29.12	2.77	6.15	13.46	9.15
CASH030	22.00	18.00	45.00	2.50	19.98	0.85	1.53	3.41	11.86	16.37	4.05	28.94	1.52	5.90	11.01	10.65
CASH036	22.00	19.00	55.00	2.50	19.98	0.85	1.53	3.41	12.86	17.37	2.80	36.81	1.77	6.65	14.39	10.65
CASH042	22.00	22.00	55.00	2.50	19.98	0.85	3.04	5.92	15.86	20.37	4.55	37.31	2.02	8.27	12.14	11.78
CASH048	25.00	22.00	55.00	2.50	22.98	0.85	3.04	5.92	15.86	20.37	4.55	37.31	2.02	8.27	12.14	11.78
CASH060	25.00	22.00	55.00	2.50	22.98	0.85	3.04	5.92	15.86	20.37	4.55	34.56	2.02	8.27	14.89	11.78
CASH072	28.00	24.00	67.00	2.50	24.98	0.85	3.04	5.92	17.86	22.37	4.55	44.37	2.02	8.21	15.08	13.84

DRAWING NUMBER CASH-RRd
OCTOBER 2022

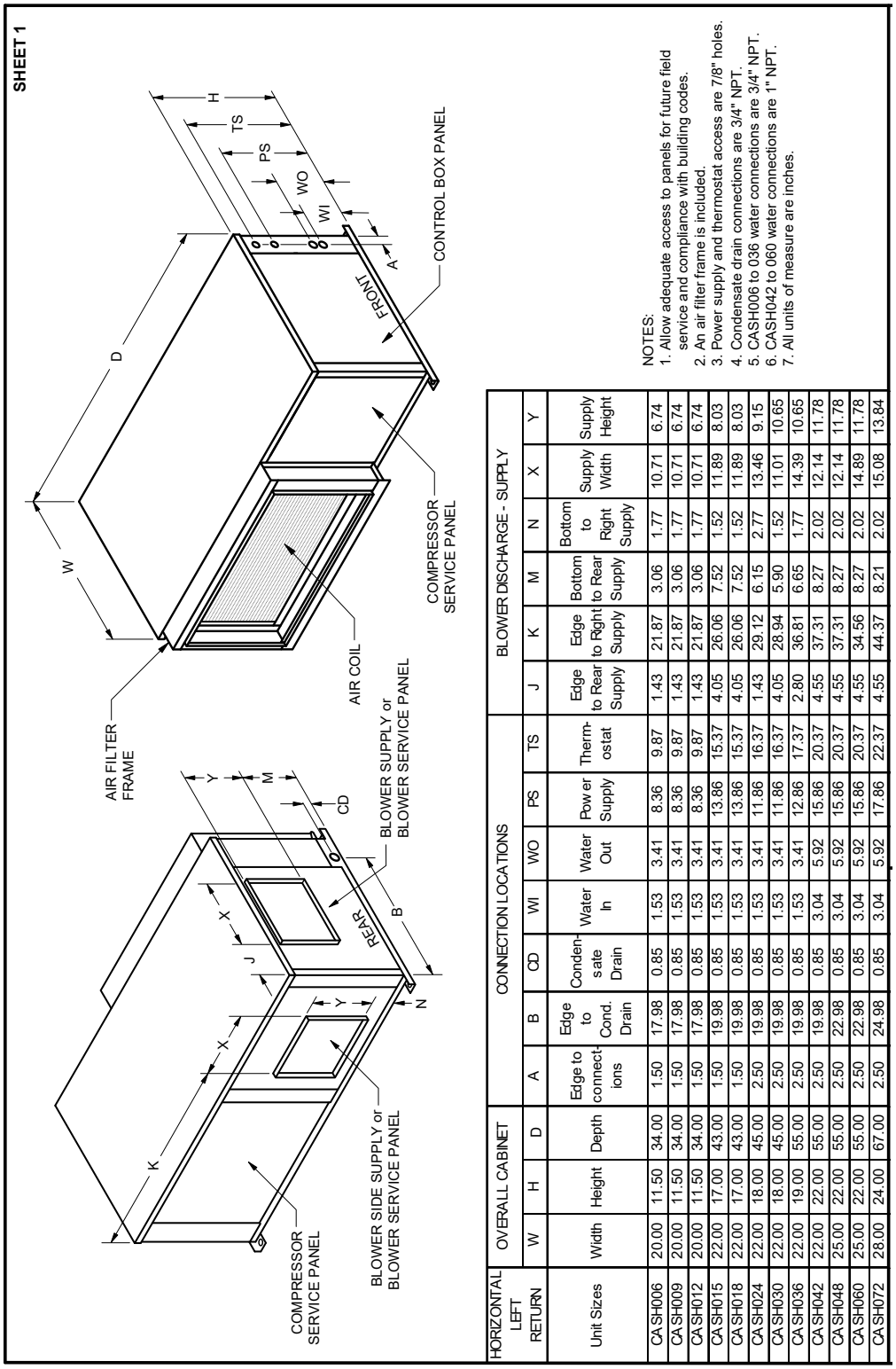
Horizontal Unit with Right Return



HORIZONTAL RIGHT RETURN	AIR COIL - RETURN					HANGER LOCATIONS		UNIT WIDTH	BOTTOM	
Unit Sizes	R	S	T	U	E	F	G	BX	BY
	Edge to RA	Edge to RA	RA Width	RA Height	Front to Back Hanger	Side to Side Hanger	Width w / Air Filter Frame	Bottom Access Width	Bottom Access Height
CASH006	15.40	1.83	16.10	8.53	32.57	21.50	23.13	13.85	14.17
CASH009	15.40	1.83	16.10	8.53	32.57	21.50	23.13	13.85	14.17
CASH012	15.40	1.83	16.10	8.53	32.57	21.50	23.13	13.85	14.17
CASH015	17.40	1.83	23.10	14.03	41.57	23.50	25.13	16.85	16.17
CASH018	17.40	1.83	23.10	14.03	41.57	23.50	25.13	16.85	16.17
CASH024	16.40	1.83	26.10	15.03	43.57	23.50	25.13	16.85	16.17
CASH030	16.40	1.83	26.10	15.03	43.57	23.50	25.13	16.85	16.17
CASH036	18.45	1.83	34.05	16.03	53.57	23.50	25.13	16.85	16.17
CASH042	18.45	1.83	34.05	19.03	53.57	23.50	25.13	16.85	16.17
CASH048	18.45	1.83	34.05	19.03	53.57	26.50	28.13	19.85	19.17
CASH060	18.45	1.83	34.05	19.03	53.57	26.50	28.13	19.85	19.17
CASH072	18.45	1.82	46.05	21.03	65.57	29.50	31.13	23.85	21.17

DRAWING NUMBER CASH-RRd
OCTOBER 2022

Horizontal Unit with Left Return

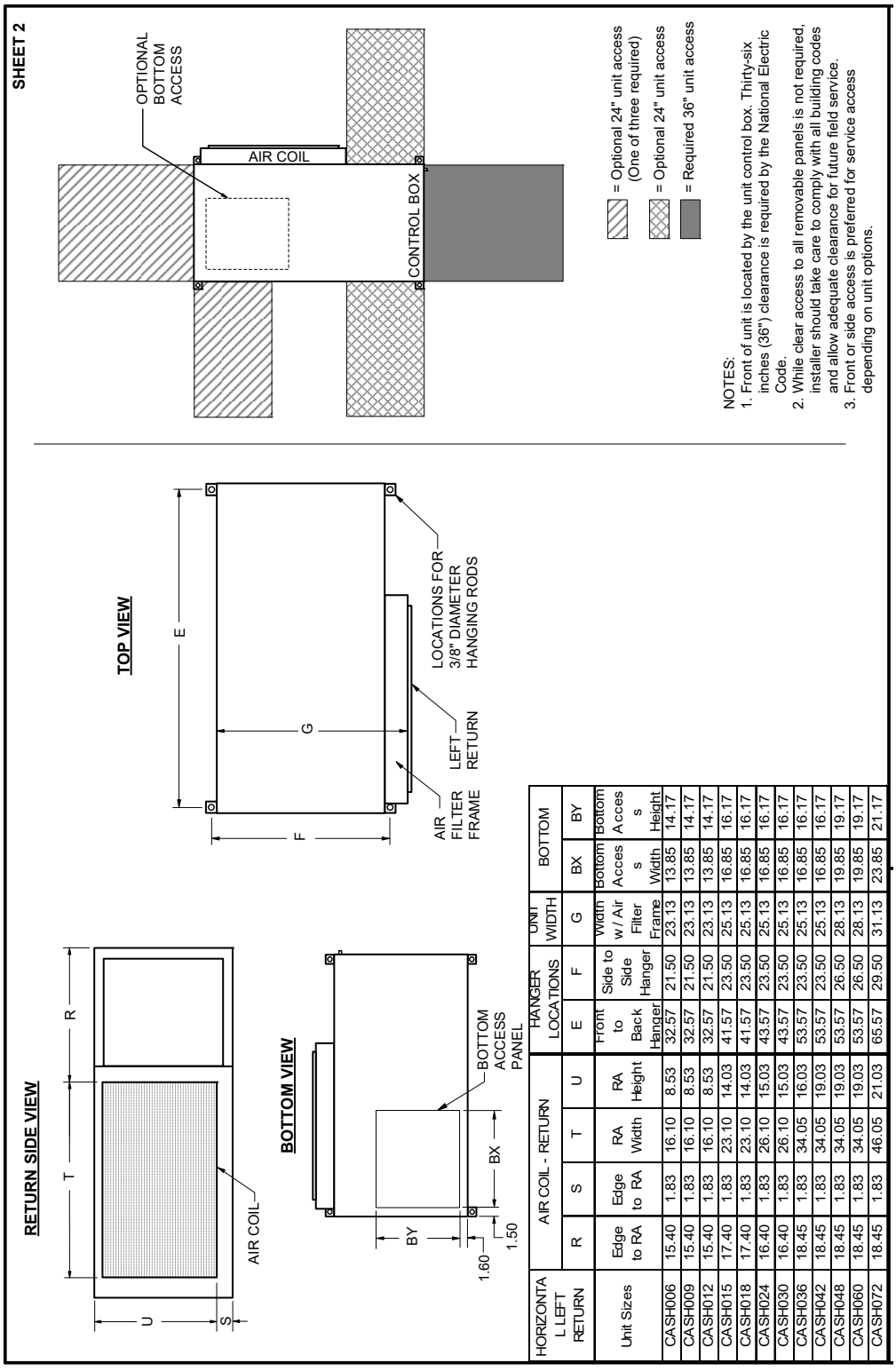


NOTES:
1. Allow adequate access to panels for future field service and compliance with building codes.
2. An air filter frame is included.
3. Power supply and thermostat access are 7/8" holes.
4. Condensate drain connections are 3/4" NPT.
5. CASH006 to 036 water connections are 3/4" NPT.
6. CASH042 to 060 water connections are 1" NPT.
7. All units of measure are inches.

HORIZONTAL LEFT RETURN	OVERALL CABINET			CONNECTION LOCATIONS							BLOWER DISCHARGE - SUPPLY						
Unit Sizes	W Width	H Height	D Depth	A Edge to connections	B Edge to Cond. Drain	CD Condensate Drain	WI Water In	WO Water Out	PS Power Supply	TS Thermostat	J Edge to Rear Supply	K Edge to Right Supply	M Bottom to Rear Supply	N Bottom to Right Supply	X Supply Width	Y Supply Height
CASH006	20.00	11.50	34.00	1.50	17.98	0.85	1.53	3.41	8.36	9.87	1.43	21.87	3.06	1.77	10.71	6.74
CASH009	20.00	11.50	34.00	1.50	17.98	0.85	1.53	3.41	8.36	9.87	1.43	21.87	3.06	1.77	10.71	6.74
CASH012	20.00	11.50	34.00	1.50	17.98	0.85	1.53	3.41	8.36	9.87	1.43	21.87	3.06	1.77	10.71	6.74
CASH015	22.00	17.00	43.00	1.50	19.98	0.85	1.53	3.41	13.86	15.37	4.05	26.06	7.52	1.52	11.89	8.03
CASH018	22.00	17.00	43.00	1.50	19.98	0.85	1.53	3.41	13.86	15.37	4.05	26.06	7.52	1.52	11.89	8.03
CASH024	22.00	18.00	45.00	2.50	19.98	0.85	1.53	3.41	11.86	16.37	1.43	29.12	6.15	2.77	13.46	9.15
CASH030	22.00	18.00	45.00	2.50	19.98	0.85	1.53	3.41	11.86	16.37	4.05	28.94	5.90	1.52	11.01	10.65
CASH036	22.00	19.00	55.00	2.50	19.98	0.85	1.53	3.41	12.86	17.37	2.80	36.81	6.65	1.77	14.39	10.65
CASH042	22.00	22.00	55.00	2.50	19.98	0.85	3.04	5.92	15.86	20.37	4.55	37.31	8.27	2.02	12.14	11.78
CASH048	25.00	22.00	55.00	2.50	22.98	0.85	3.04	5.92	15.86	20.37	4.55	37.31	8.27	2.02	12.14	11.78
CASH060	25.00	22.00	55.00	2.50	22.98	0.85	3.04	5.92	15.86	20.37	4.55	34.56	8.27	2.02	14.89	11.78
CASH072	28.00	24.00	67.00	2.50	24.98	0.85	3.04	5.92	17.86	22.37	4.55	44.37	8.21	2.02	15.08	13.84

DRAWING NUMBER CASH-LRd
OCTOBER 2022

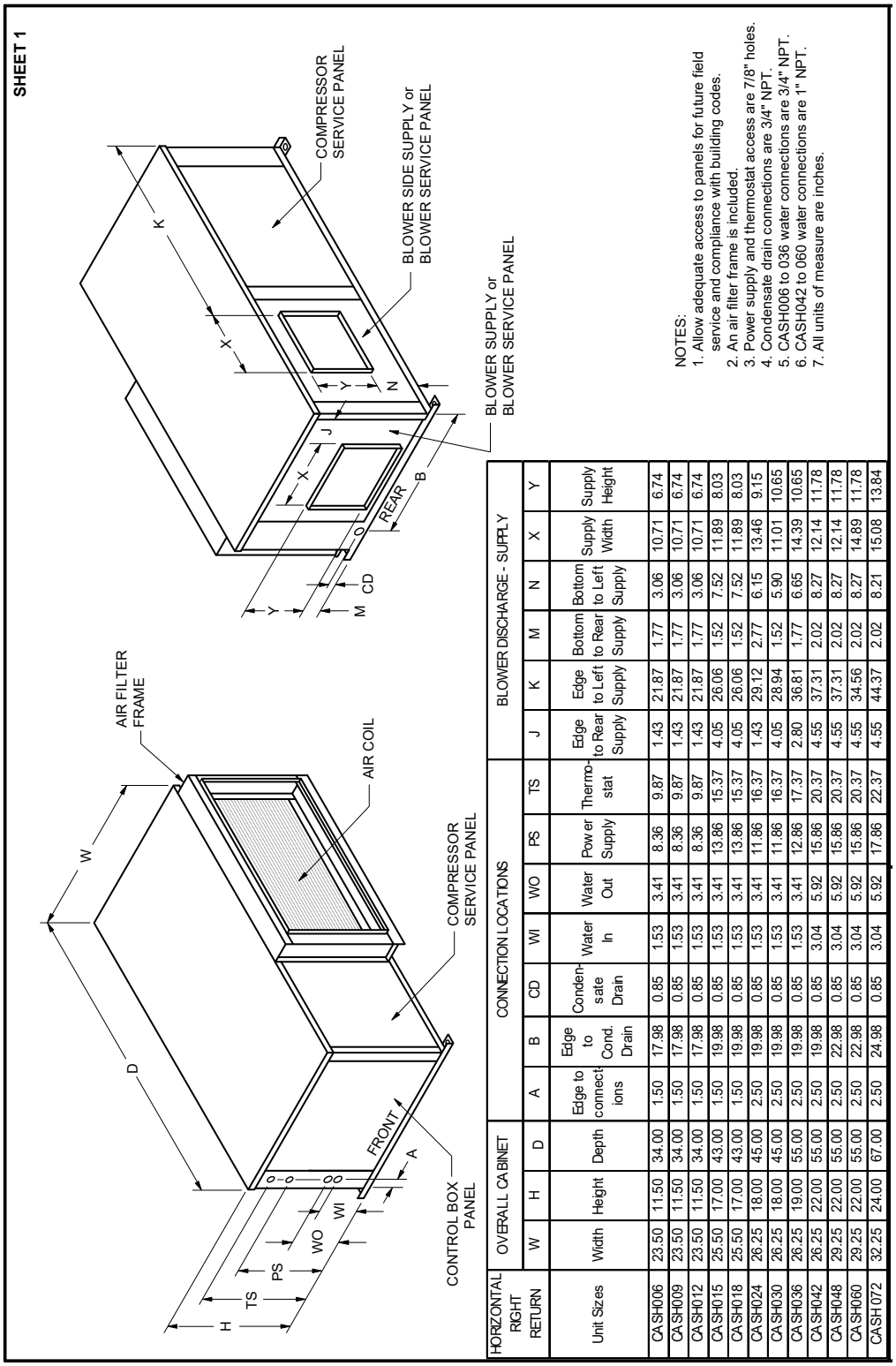
Horizontal Unit with Left Return



HORIZONTAL LEFT RETURN	AIR COIL - RETURN					HANGER LOCATIONS		UNIT WIDTH	BOTTOM	
Unit Sizes	R	S	T	U		E	F	G	BX	BY
	Edge to RA	Edge to RA	RA Width	RA Height		Front to Back Hanger	Side to Side Hanger	Width w/ Air Filter Frame	Bottom Access Width	Bottom Access Height
CASH006	15.40	1.83	16.10	8.53		32.57	21.50	23.13	13.85	14.17
CASH009	15.40	1.83	16.10	8.53		32.57	21.50	23.13	13.85	14.17
CASH012	15.40	1.83	16.10	8.53		32.57	21.50	23.13	13.85	14.17
CASH015	17.40	1.83	23.10	14.03		41.57	23.50	25.13	16.85	16.17
CASH018	17.40	1.83	23.10	14.03		41.57	23.50	25.13	16.85	16.17
CASH024	16.40	1.83	26.10	15.03		43.57	23.50	25.13	16.85	16.17
CASH030	16.40	1.83	26.10	15.03		43.57	23.50	25.13	16.85	16.17
CASH036	18.45	1.83	34.05	16.03		53.57	23.50	25.13	16.85	16.17
CASH042	18.45	1.83	34.05	19.03		53.57	23.50	25.13	16.85	16.17
CASH048	18.45	1.83	34.05	19.03		53.57	26.50	28.13	19.85	19.17
CASH060	18.45	1.83	34.05	19.03		53.57	26.50	28.13	19.85	19.17
CASH072	18.45	1.83	46.05	21.03		65.57	29.50	31.13	23.85	21.17

DRAWING NUMBER CASH-LRd
OCTOBER 2022

Hydronic Heat - Horizontal Unit with Right Return

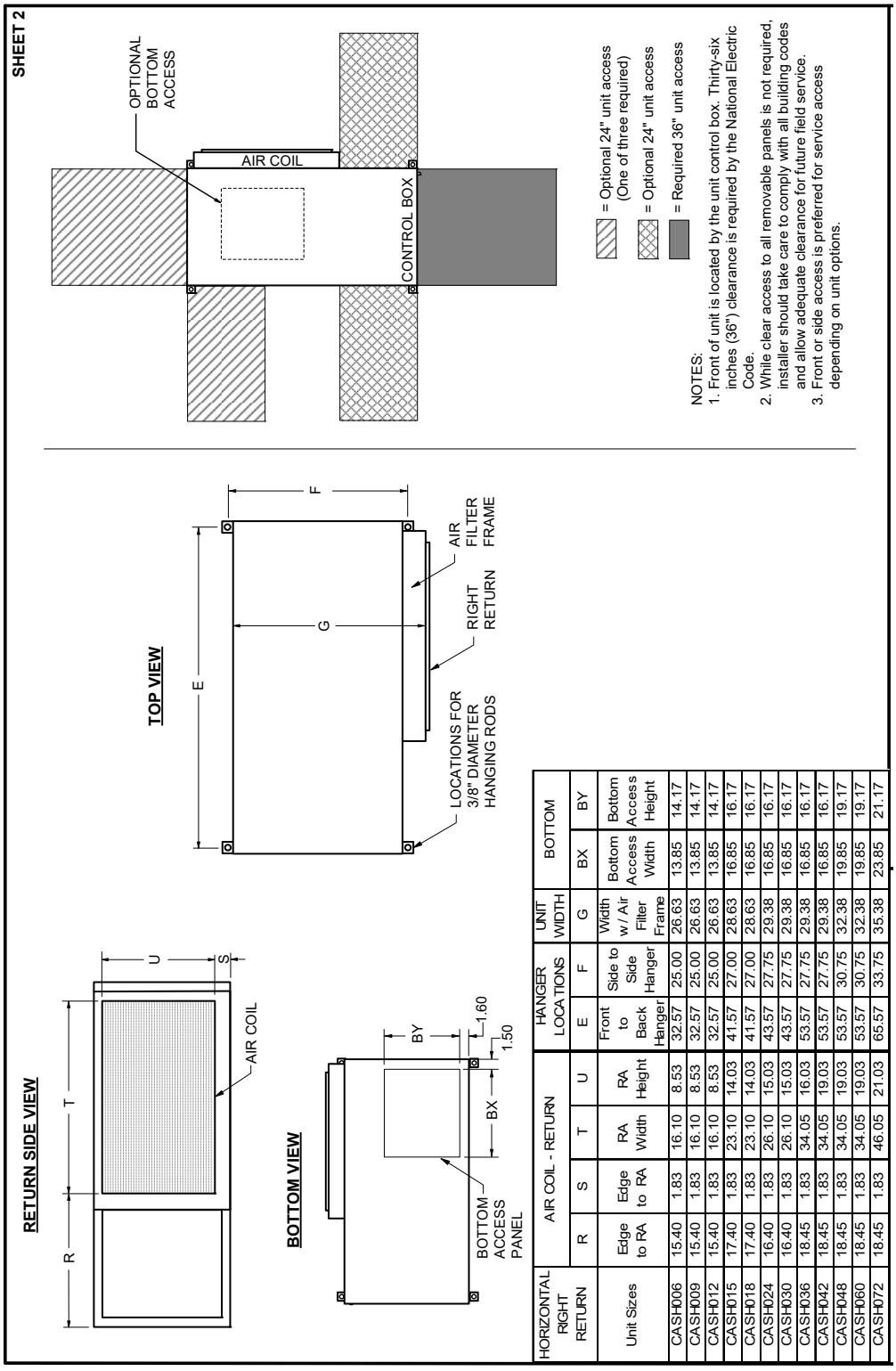


NOTES:
1. Allow adequate access to panels for future field service and compliance with building codes.
2. An air filter frame is included.
3. Power supply and thermostat access are 7/8" holes.
4. Condensate drain connections are 3/4" NPT.
5. CASH006 to 036 water connections are 3/4" NPT.
6. CASH042 to 060 water connections are 1" NPT.
7. All units of measure are inches.

HORIZONTAL RIGHT RETURN	OVERALL CABINET			CONNECTION LOCATIONS								BLOWER DISCHARGE - SUPPLY						
Unit Sizes	W Width	H Height	D Depth	A Edge to connections	B Edge to Cond. Drain	CD Condensate Drain	WI Water In	WO Water Out	PS Power Supply	TS Thermostat	J Edge to Rear Supply	K Edge to Left Supply	M Bottom to Rear Supply	N Bottom to Left Supply	X Supply Width	Y Supply Height
CASH006	23.50	11.50	34.00	1.50	17.98	0.85	1.53	3.41	8.36	9.87	1.43	21.87	1.77	3.06	10.71	6.74
CASH009	23.50	11.50	34.00	1.50	17.98	0.85	1.53	3.41	8.36	9.87	1.43	21.87	1.77	3.06	10.71	6.74
CASH012	23.50	11.50	34.00	1.50	17.98	0.85	1.53	3.41	8.36	9.87	1.43	21.87	1.77	3.06	10.71	6.74
CASH015	25.50	17.00	43.00	1.50	19.98	0.85	1.53	3.41	13.86	15.37	4.05	26.06	1.52	7.52	11.89	8.03
CASH018	25.50	17.00	43.00	1.50	19.98	0.85	1.53	3.41	13.86	15.37	4.05	26.06	1.52	7.52	11.89	8.03
CASH024	26.25	18.00	45.00	2.50	19.98	0.85	1.53	3.41	11.86	16.37	1.43	29.12	2.77	6.15	13.46	9.15
CASH030	26.25	18.00	45.00	2.50	19.98	0.85	1.53	3.41	11.86	16.37	4.05	28.94	1.52	5.90	11.01	10.65
CASH036	26.25	19.00	55.00	2.50	19.98	0.85	1.53	3.41	12.86	17.37	2.80	36.81	1.77	6.65	14.39	10.65
CASH042	26.25	22.00	55.00	2.50	19.98	0.85	3.04	5.92	15.86	20.37	4.55	37.31	2.02	8.27	12.14	11.78
CASH048	29.25	22.00	55.00	2.50	22.98	0.85	3.04	5.92	15.86	20.37	4.55	37.31	2.02	8.27	12.14	11.78
CASH060	29.25	22.00	55.00	2.50	22.98	0.85	3.04	5.92	15.86	20.37	4.55	34.56	2.02	8.27	14.89	11.78
CASH072	32.25	24.00	67.00	2.50	24.98	0.85	3.04	5.92	17.86	22.37	4.55	44.37	2.02	8.21	15.08	13.84

DRAWING NUMBER CASH-HH-RRc
OCTOBER 2022

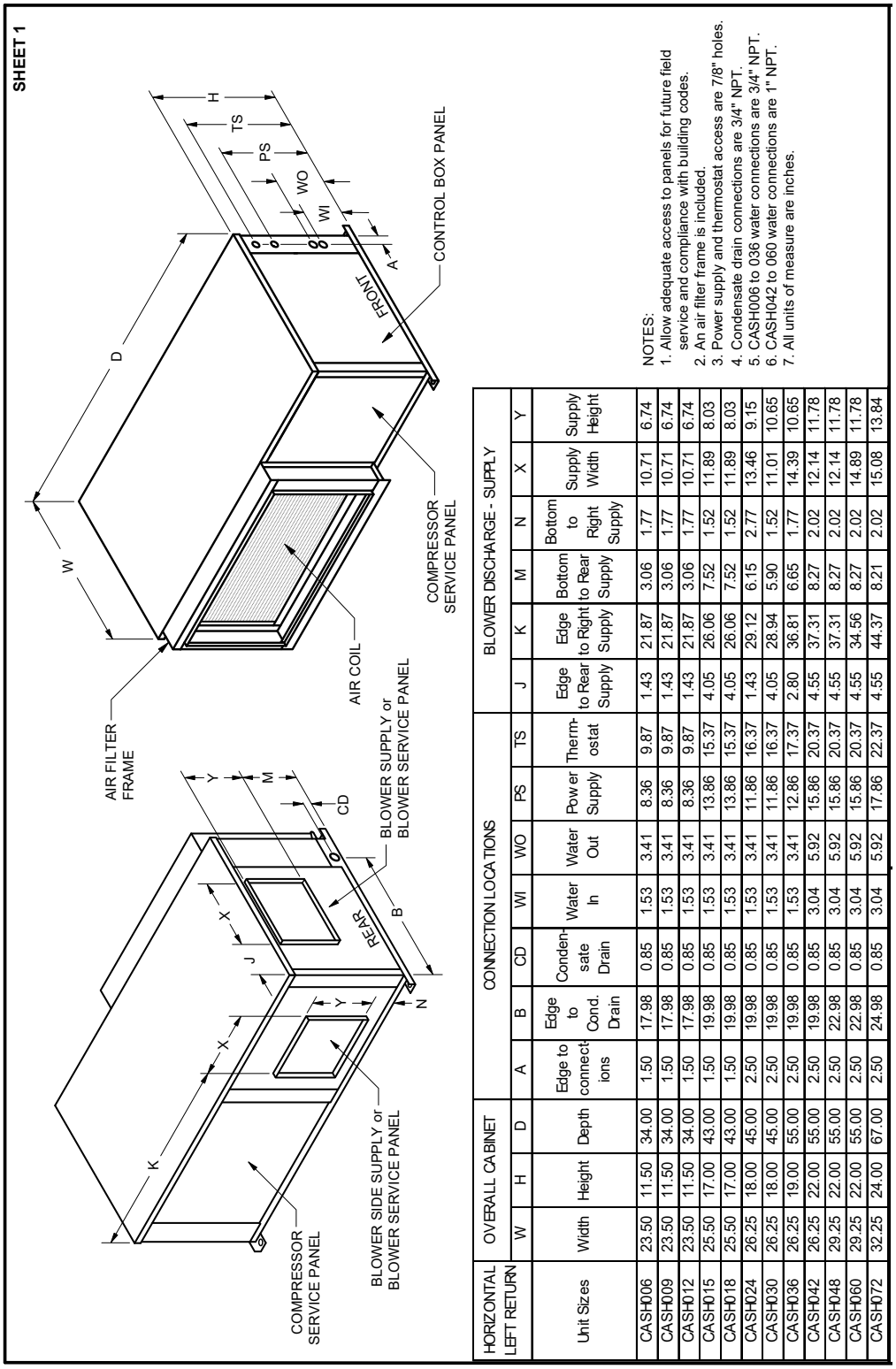
Hydronic Heat - Horizontal Unit with Right Return



HORIZONTAL RIGHT RETURN	AIR COIL - RETURN					HANGER LOCATIONS		UNIT WIDTH	BOTTOM	
Unit Sizes	R	S	T	U	E	F	G	BX	BY
	Edge to RA	Edge to RA	RA Width	RA Height	Front to Back Hanger	Side to Side Hanger	Width w/ Air Filter Frame	Bottom Access Width	Bottom Access Height
CASH006	15.40	1.83	16.10	8.53	32.57	25.00	26.63	13.85	14.17
CASH009	15.40	1.83	16.10	8.53	32.57	25.00	26.63	13.85	14.17
CASH012	15.40	1.83	16.10	8.53	32.57	25.00	26.63	13.85	14.17
CASH015	17.40	1.83	23.10	14.03	41.57	27.00	28.63	16.85	16.17
CASH018	17.40	1.83	23.10	14.03	41.57	27.00	28.63	16.85	16.17
CASH024	16.40	1.83	26.10	15.03	43.57	27.75	29.38	16.85	16.17
CASH030	16.40	1.83	26.10	15.03	43.57	27.75	29.38	16.85	16.17
CASH036	18.45	1.83	34.05	16.03	53.57	27.75	29.38	16.85	16.17
CASH042	18.45	1.83	34.05	19.03	53.57	27.75	29.38	16.85	16.17
CASH048	18.45	1.83	34.05	19.03	53.57	30.75	32.38	19.85	19.17
CASH060	18.45	1.83	34.05	19.03	53.57	30.75	32.38	19.85	19.17
CASH072	18.45	1.83	46.05	21.03	65.57	33.75	35.38	23.85	21.17

DRAWING NUMBER CASH-HH-RRc
OCTOBER 2022

Hydronic Heat - Horizontal Unit with Left Return

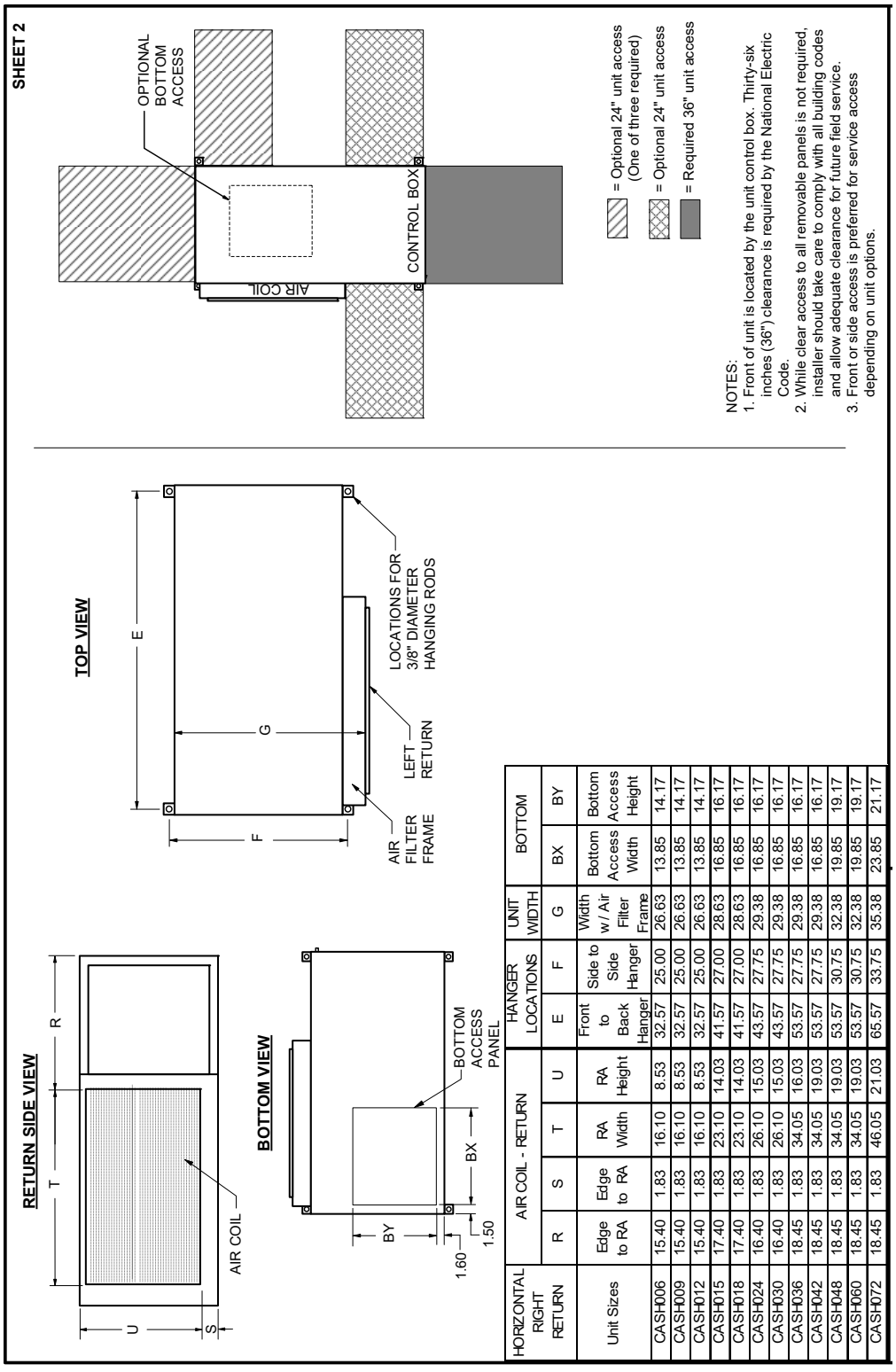


HORIZONTAL LEFT RETURN	OVERALL CABINET			CONNECTION LOCATIONS							BLOWER DISCHARGE - SUPPLY						
Unit Sizes	W Width	H Height	D Depth	A Edge to connections	B Edge to Cond. Drain	CD Condensate Drain	WI Water In	WO Water Out	PS Power Supply	TS Thermostat	J Edge to Rear Supply	K Edge to Right Supply	M Bottom to Rear Supply	N Bottom to Right Supply	X Supply Width	Y Supply Height
CASH006	23.50	11.50	34.00	1.50	17.98	0.85	1.53	3.41	8.36	9.87	1.43	21.87	3.06	1.77	10.71	6.74
CASH009	23.50	11.50	34.00	1.50	17.98	0.85	1.53	3.41	8.36	9.87	1.43	21.87	3.06	1.77	10.71	6.74
CASH012	23.50	11.50	34.00	1.50	17.98	0.85	1.53	3.41	8.36	9.87	1.43	21.87	3.06	1.77	10.71	6.74
CASH015	25.50	17.00	43.00	1.50	19.98	0.85	1.53	3.41	13.86	15.37	4.05	26.06	7.52	1.52	11.89	8.03
CASH018	25.50	17.00	43.00	1.50	19.98	0.85	1.53	3.41	13.86	15.37	4.05	26.06	7.52	1.52	11.89	8.03
CASH024	26.25	18.00	45.00	2.50	19.98	0.85	1.53	3.41	11.86	16.37	1.43	29.12	6.15	2.77	13.46	9.15
CASH030	26.25	18.00	45.00	2.50	19.98	0.85	1.53	3.41	11.86	16.37	4.05	28.94	5.90	1.52	11.01	10.65
CASH036	26.25	19.00	55.00	2.50	19.98	0.85	1.53	3.41	12.86	17.37	2.80	36.81	6.65	1.77	14.39	10.65
CASH042	26.25	22.00	55.00	2.50	19.98	0.85	3.04	5.92	15.86	20.37	4.55	37.31	8.27	2.02	12.14	11.78
CASH048	29.25	22.00	55.00	2.50	22.98	0.85	3.04	5.92	15.86	20.37	4.55	37.31	8.27	2.02	12.14	11.78
CASH060	29.25	22.00	55.00	2.50	22.98	0.85	3.04	5.92	15.86	20.37	4.55	34.56	8.27	2.02	14.89	11.78
CASH072	32.25	24.00	67.00	2.50	24.98	0.85	3.04	5.92	17.86	22.37	4.55	44.37	8.21	2.02	15.08	13.84

NOTES:
1. Allow adequate access to panels for future field service and compliance with building codes.
2. An air filter frame is included.
3. Power supply and thermostat access are 7/8" holes.
4. Condensate drain connections are 3/4" NPT.
5. CASH006 to 036 water connections are 3/4" NPT.
6. CASH042 to 060 water connections are 1" NPT.
7. All units of measure are inches.

DRAWING NUMBER CASH-HH-LRc
OCTOBER 2022

Hydronic Heat - Horizontal Unit with Left Return



HORIZONTAL RIGHT RETURN	AIR COIL - RETURN					HANGER LOCATIONS		UNIT WIDTH	BOTTOM	
Unit Sizes	R	S	T	U	E	F	G	BX	BY
	Edge to RA	Edge to RA	RA Width	RA Height	Front to Back Hanger	Side to Side Hanger	Width w / Air Filter Frame	Bottom Access Width	Bottom Access Height
CASH006	15.40	1.83	16.10	8.53	32.57	25.00	26.63	13.85	14.17
CASH009	15.40	1.83	16.10	8.53	32.57	25.00	26.63	13.85	14.17
CASH012	15.40	1.83	16.10	8.53	32.57	25.00	26.63	13.85	14.17
CASH015	17.40	1.83	23.10	14.03	41.57	27.00	28.63	16.85	16.17
CASH018	17.40	1.83	23.10	14.03	41.57	27.00	28.63	16.85	16.17
CASH024	16.40	1.83	26.10	15.03	43.57	27.75	29.38	16.85	16.17
CASH030	16.40	1.83	26.10	15.03	43.57	27.75	29.38	16.85	16.17
CASH036	18.45	1.83	34.05	16.03	53.57	27.75	29.38	16.85	16.17
CASH042	18.45	1.83	34.05	19.03	53.57	27.75	29.38	16.85	16.17
CASH048	18.45	1.83	34.05	19.03	53.57	30.75	32.38	19.85	19.17
CASH060	18.45	1.83	34.05	19.03	53.57	30.75	32.38	19.85	19.17
CASH072	18.45	1.83	46.05	21.03	65.57	33.75	35.38	23.85	21.17

DRAWING NUMBER CASH-HH-LRc
OCTOBER 2022

Mechanical Specifications

SERIES CAS CLOSETLINE (WATER SOURCE) (GROUND SOURCE) HEAT PUMPS

PART 1 GENERAL

1.01 SECTION INCLUDES
A. Horizontal and Vertical Packaged Water Source Heats

1.02 RELATED SECTIONS

1.03 REFERENCES
A. ETL Listed under Underwriters Laboratories Standard for Safety UL1995 for heat pumps.
B. AHRI ISO Standard 13256-1

1.04 DELIVERY, STORAGE AND HANDLING
A. Deliver products to site, store and protect from the weather and construction debris and be tagged with model number, configuration, and (OPTION) site location.

1.05 ENVIROMENTAL REQUIREMENTS
A. Protect units from construction debris by covering all openings prior to start-up of the equipment. Units must not be used for heating, cooling, or ventilation prior to the start-up of equipment for permanent use. Use of the equipment for the temporary heating, cooling or ventilation is prohibited.

1.06 FACTORY TESTING
A. All units shall be factory tested at normal operating conditions. Cabinets and fans shall be tested to verify proper fan and control operation. Refrigeration chassis shall be factory tested with cataloged water flow rates and sequenced to verify the proper operation of safety controls. Testing without utilizing cataloged water flow rates is unacceptable.

1.07 SUBMITTAL DOCUMENTATION
A. Standard submittals shall include capacities, drawings, electrical data, installation, operation and maintenance manuals and other details.

PART 2 PRODUCTS

2.01 TYPE
A. Vertical and Horizontal (Water Source) (Ground Source) Heat Pump with, discharge arrangements, hose kits, and all accessories. Units shall be (water source 60°F to 95°F (15.6°C to 35°C)) (ground source 20ºF to 120ºF (–6.7ºC to 48.9ºC)) entering fluid temperature for (water source) (ground source) heat pump applications.

2.02 CAPACITY
A. Shall be as indicated on the drawings, which are based on Whalen units. Capacities shall be certified under AHRI ISO Standard 13256-1.

2.03 CABINETS
A. The unit cabinet shall be fabricated of 18 Gauge G60 galvanized steel, and service panels shall be fabricated of 22 Gauge G60 galvanized steel. All welded assemblies are treated to prevent corrosion.
B. The cabinet shall be insulated with 1/2-inch thick 2-pound density thermal and acoustical fiberglass insulation

meeting material standard ASTM-C1071 and have an integral water repellent. The insulation shall have a fungi and bacteria resistant barrier with no growth conforming to ASTM-C1338, ASTM G21 and ASTM G22 and meet fire safety standards under NFPA90A and NFPA90B. (OPTION 1) 1/2-inch 1-1/2-pound density foil faced thermal and acoustical fiberglass insulation. (OPTION 2) 1/2-inch closed cell thermal and acoustical fiberglass insulation

C. Cabinet return and discharge air openings shall be factory cut and flanged on all sides. .
D. Hanging brackets shall be provided on all horizontal units and shall be integral to unit construction. Screw on style brackets are not acceptable.
E. (OPTION) A factory installed vibration isolation pad shall be installed on the bottom of vertical units.

2.04 REFRIGERATION SYSTEM

A. The refrigeration system consists of the compressor, air coil, water coil, reversing valve, expansion device, filter-drier, and safety controls. System components shall be designed for easy field service accessibility
B. The compressor shall be the sealed hermetic type approved and tested for reverse cycle operation. Internal thermal overload protection shall be provided. The compressor shall be internally dual isolated. Compressor motors shall be permanent split capacitor (PSC) type.
C. The air coils shall be copper tubes mechanically bonded to aluminum fins, multi-circuited to insure maximum coil distribution and effectiveness. The coil shall be rated to withstand 600 psig refrigerant working pressure. Face velocity shall not exceed 400 feet per minute to insure quiet operation and positive condensate drainage.
D. The water coils shall incorporate an electro-coated steel outer tube and a copper inner tube. The inner tube shall be spirally fluted and bonded to the outer tube to insure controlled refrigerant velocity and distribution. The coil shall be rated to withstand 650 psig refrigerant and 400 psig fluid working pressures. (OPTION) Provide Cu-pro-nickel COAX coil.
E. The reversing valve shall be 4-way electric type, pilot operated for quiet reversal.
F. (OPTION) Automatic flow control valve – An automatic flow control valve shall be provided with each unit and be factory preset for a fixed flow rate regardless of system pressure. Each automatic balancing valve shall be capable of operation over a pressure differential range of 2 to 80 PSID and be easily accessible for cleaning and maintenance.
G. (OPTION1) Standard Two-way, two-position (On/Off) control valve (30 psi differential pressure) – A two-way, two-position (On/Off) electric control valve may be factory or field mounted and wired unit.
(OPTION2) High Pressure Two-way, two-position (On/Off) control valve (60 psi differential pressure) – A two-way, two-position (On/Off) electric control valve may be factory or field mounted and wired unit.

2.05 WATER CONNECTIONS

A. Entering water, leaving water, and condensate drain connections shall be FNPT.
B. (OPTION 1) Water connections shall be accomplished via an Insta-Lock™ quick connect accessory hose kit consisting of synthetic yarn-reinforced EPDM core hose surrounded by a 304 stainless-steel braid. Hose kit shall have brass fittings with stainless-steel locking balls and EPDM seals. Hose ends shall have colored bands to indicate supply or return water as well as colored indicator to verify locking status which connects to Insta-Lock™ fitting on entering water and leaving water connections. Threaded connections with or without sealing washers are not permitted. The hose kit shall be rated for maximum working pressure of 750 psi and minimum burst pressure rating of 2250 psi.

2.06 DRAIN PAN

A. The drain pan shall collect and drain condensate that may form from any component internal to the heat pump and shall be fabricated of welded and soldered 20 Ga. 304 stainless steel. Vertical equipment is internally trapped, horizontal equipment require an external trap, the copper condensate drain shall be rolled and soldered into the pan.

2.07 FANS

A. The fan shall be slow speed forward curved centrifugal type capable of two fan speeds, and shall be accessiblfor

removal and maintenance through the service panels.

2.08 MOTORS

A. Fan motors shall be of the permanently lubricated PSC standard, as required; suitable for the current characteristics shown on the drawings, and shall have built-in thermal overload protection.
B. (OPTION: fan motors shall be of the permanently lubricated constant-torque ECM type, suitable for the current characteristics shown on the drawings, and shall have built-in overload protection.
C. Motors shall be plug-in, multi-speed type.

2.09 SUPPLY GRILLES

A. The supply grilles shall be of the single deflection type fabricated of clear anodized aluminum. All supply openings shall be painted black with a damper assembly and sight baffle provided when one unit is serving two separate rooms.

(OPTION 1) The supply grilles shall be of the single deflection type fabricated of (factory white painted extruded aluminum) or (custom painted extruded aluminum) (SELECT ONE). All supply openings shall be painted black with a damper assembly and sight baffle provided when one unit is serving two separate rooms.

(OPTION 2) The supply grilles shall be of the double deflection type fabricated of (clear anodized extruded aluminum), (factory white painted extruded aluminum) or (custom painted extruded aluminum) (SELECT ONE). All supply openings shall be painted black with a damper assembly and sight baffle provided when one unit is serving two separate rooms.

2.10 FILTERS

B. (STANDARD) Filters shall be 1” thick disposable fiberglass media, MERV 4.
(OPTION 1) Filters shall be 1” thick disposable pleated media, MERV 8.
(OPTION 2) Filters shall be 1” thick disposable pleated media, MERV 11
(OPTION 3) Filters shall be 1” thick disposable pleated media, MERV 13
(OPTION 4) Filters shall be 2” thick disposable pleated media, MERV 8
(OPTION 5) Filters shall be 2” thick disposable pleated media, MERV 11
(OPTION 6) Filters shall be 2” thick disposable pleated media, MERV 13.

2.11 POWER SUPPLY

A. Single point field power connection is made to unit junction box through either of the 7/8” knockouts located on the side of the cabinet as shown on the drawings.

(OPTION 1) Each unit shall include a non-fused disconnect switch, factory mounted and wired.

(OPTION 2) Each unit shall include a supplemental overcurrent protection switch, factory mounted and wired.

2.12 CONTROLS

A. Unit shall include a solid-state control board as part of the unit control system incorporating these features:
a. Random start compressor protection. Anti-short cycle compressor minimum OFF time delay. Safety controls that protect the compressor from the following conditions:
i. High pressure
ii. Low pressure (Loss of Charge Protection)
iii. Low airflow
iv. Low liquid flow
v. Low entering air temperature

vi. Brown-out power conditions
vii. Condensate Overflow Protection
viii. Low liquid temperature protection with three different settings based on liquid properties.

b. Status LED indicating the device causing a fault condition.
c. Soft lockout feature that provides for an automatic reset prior to the initiation of a hard lockout.
d. Test mode capability with shortened time delays for servicing.

2.13 THERMOSTAT

A. The heat pump manufacturer shall provide a 24-volt manual changeover wall thermostat with a HEAT-OFF-COOL system switch and AUTO-ON fan selector switch.
B. Thermostats shall be remote mounted and wired in the field. (OPTION: factory wired thermostat extension permitting thermostat installation by plugging into the control wiring with a polarized male-female plug after the walls are finished when unit mounted. High voltage, return air thermostats with remote bulbs subject to damage during routine service will not be accepted.

2.14 SPARE PARTS

A. Intentionally Left Blank

PART 3 EXECUTION

3.01 INSTALLATION

A. Furnish as shown on the drawings and as specified herein, vertical and horizontal (water source) (ground source) heat pumps, and with capacity and electrical characteristics as scheduled. Units shall be Series CAS as manufactured by The Whalen Company of Easton, MD.
B. Install in accordance with manufacturer's installation instructions and maintain manufacturer's recommended clearances for the unit and accessories.
C. Follow manufacturer's recommendations for cleaning and flushing.

Mechanical Specifications

SERIES CAS CLOSETLINE WATER SOURCE AIR CONDITIONER WITH HYDRONIC HEAT

PART 1 GENERAL

1.01 SECTION INCLUDES
A. Horizontal and Vertical Packaged Water Source Air Conditioner with Hydronic Heat

1.02 RELATED SECTIONS

1.03 REFERENCES
A. ETL Listed under Underwriters Laboratories Standard for Safety UL1995 for heat pumps.
B. AHRI ISO Standard 13256-1

1.04 DELIVERY, STORAGE AND HANDLING
A. Deliver products to site, store and protect from the weather and construction debris and be tagged with model number, configuration, and (OPTION) site location.

1.05 ENVIROMENTAL REQUIREMENTS
A. Protect units from construction debris by covering all openings prior to start-up of the equipment. Units must not be used for heating, cooling, or ventilation prior to the start-up of equipment for permanent use. Use of the equipment for the temporary heating, cooling or ventilation is prohibited.

1.06 FACTORY TESTING
A. All units shall be factory tested at normal operating conditions. Cabinets and fans shall be tested to verify proper fan and control operation. Refrigeration chassis shall be factory tested with cataloged water flow rates and sequenced to verify the proper operation of safety controls. Testing without utilizing cataloged water flow rates is unacceptable.

1.07 SUBMITTAL DOCUMENTATION
A. Standard submittals shall include capacities, drawings, electrical data, installation, operation and maintenance manuals and other details.

PART 2 PRODUCTS

2.01 TYPE
A. Vertical and Horizontal Water Source Air Conditioner with integral risers, hot water heating coil, discharge arrangements, hose kits, and all accessories (ADD SPECIFIC OPTIONS HERE). Units shall be standard operating range 75°F to 120°F (23.9°C to 48.9°C) entering fluid temperature for water source air conditioning applications.

2.02 CAPACITY
A. Shall be as indicated on the drawings, which are based on Whalen units. Capacities shall be certified under AHRI ISO Standard 13256-1.

2.03 CABINETS
A. The unit cabinet shall be fabricated of 18 Gauge G60 galvanized steel, and service panels shall be fabricated of 22 Gauge G60 galvanized steel. All welded assemblies are treated to prevent corrosion.

B. The cabinet shall be insulated with 1/2-inch thick 2-pound density thermal and acoustical fiberglass insulation meeting material standard ASTM-C1071 and have an integral water repellent. The insulation shall have a fungi and bacteria resistant barrier with no growth conforming to ASTM-C1338, ASTM G21 and ASTM G22 and meet fire safety standards under NFPA90A and NFPA90B. (OPTION 1) 1/2-inch 1-1/2-pound density foil faced thermal and acoustical fiberglass insulation. (OPTION 2) 1/2-inch closed cell thermal and acoustical fiberglass insulation
C. Cabinet return and discharge air openings shall be factory cut and flanged on all sides.
D. Hanging brackets shall be provided on all horizontal units and shall be integral to unit construction. Screw on style brackets are not acceptable.
E. (OPTION) A factory installed vibration isolation pad shall be installed on the bottom of vertical units.

2.04 REFRIGERATION SYSTEM

A. The refrigeration system consisting of the compressor, air coil, water coil, expansion device, receiver, filter-drier, hot water heating air coil and safety controls shall be slide-rail base mounted in the cabinet, and shall be designed for easy removal after disconnecting the two hoses and a polarized electrical power plug.
B. The compressor shall be the sealed hermetic type. Internal thermal overload protection shall be provided. The compressor shall be internally dual isolated. Compressor motors shall be permanent split capacitor (PSC) type.
C. The air coils shall be copper tubes mechanically bonded to aluminum fins, multi-circuited to insure maximum coil distribution and effectiveness. The coil shall be rated to withstand 600 psig refrigerant working pressure. Face velocity shall not exceed 400 feet per minute to insure quiet operation and positive condensate drainage.
D. The water coils shall incorporate an electro-coated steel outer tube and a copper inner tube. The inner tube shall be spirally fluted and bonded to the outer tube to insure controlled refrigerant velocity and distribution. The coil shall be rated to withstand 650 psig refrigerant and 400 psig fluid working pressures. (OPTION) Provide Cu-pro-nickel COAX coil.
E. The hot water heating air coil shall be copper tubes mechanically bonded to the aluminum fins, multi-circuited to insure maximum coil distribution and effectiveness and a minimum of two rows deep. Face velocity shall not exceed 400 feet per second to insure quiet operation. The refrigeration circuit shall not operate on a call for heating.
F. (OPTION) Automatic flow control valve – An automatic flow control valve shall be provided with each unit and be factory preset for a fixed flow rate regardless of system pressure. Each automatic balancing valve shall be capable of operation over a pressure differential range of 2 to 80 PSID and be easily accessible for cleaning and maintenance.
G. Provide two, two-way, two-position (On/Off) electric control valves (30 psi differential pressure) for variable flow systems. The valves shall factory mounted and wired into the refrigeration chassis to prevent fluid flow to the unit when a call for cooling or heating is not present.
H. (OPTION1) A three-way, two-position (On/Off) electric control valve (30 psi differential pressure) shall be factory mounted and wired into the refrigeration chassis to divert fluid flow between the water to refrigerant coil and hot water heating air coil.
I. (OPTION2) High Pressure Two-way, two-position (On/Off) control valve (60 psi differential pressure).

2.05 WATER CONNECTIONS

A. Entering water, leaving water, and condensate drain connections shall be FNPT.
B. (OPTION 1) Water connections shall be accomplished via an Insta-Lock™ quick connect accessory hose kit consisting of synthetic yarn-reinforced EPDM core hose surrounded by a 304 stainless-steel braid. Hose kit shall have brass fittings with stainless-steel locking balls and EPDM seals. Hose ends shall have colored bands to indicate supply or return water as well as colored indicator to verify locking status which connects to Insta-Lock™ fitting on entering water and leaving water connections. Threaded connections with or without sealing washers are not permitted. The hose kit shall be rated for maximum working pressure of 750 psi and minimum burst pressure rating of 2250 psi.

2.06 DRAIN PAN

A. The drain pan shall collect and drain condensate that may form from any component internal to the heat pump and shall be fabricated of welded and soldered 20 Ga. 304 stainless steel. Vertical equipment is internally trapped, horizontal equipment require an external trap, the copper condensate drain shall be rolled and soldered into the pan.

2.07 FANS

A. The fan shall be slow speed forward curved centrifugal type capable of two fan speeds, and shall be accessible for removal and maintenance through the service panels.

2.08 MOTORS

A. Fan motors shall be of the permanently lubricated constant-torque ECM type, suitable for the current characteristics shown on the drawings, and shall have built-in overload protection.
B. Motors shall be plug-in, multi-speed type.

2.09 FILTERS

B. (STANDARD) Filters shall be 1” thick disposable fiberglass media, MERV 4.
(OPTION 1) Filters shall be 1” thick disposable pleated media, MERV 8.
(OPTION 2) Filters shall be 1” thick disposable pleated media, MERV 11
(OPTION 3) Filters shall be 1” thick disposable pleated media, MERV 13
(OPTION 4) Filters shall be 2” thick disposable pleated media, MERV 8
(OPTION 5) Filters shall be 2” thick disposable pleated media, MERV 11
(OPTION 6) Filters shall be 2” thick disposable pleated media, MERV 13.

2.10 POWER SUPPLY

A. Single point field power connection is made to unit junction box through either of the 7/8” knockouts located on the side of the cabinet as shown on the drawings.

(OPTION 1) Each unit shall include a non-fused disconnect switch, factory mounted and wired.

(OPTION 2) Each unit shall include a supplemental overcurrent protection switch, factory mounted and wired.

2.11 CONTROLS

A. Unit shall include a solid-state control board as part of the unit control system incorporating these features:
a. Random start compressor protection. Anti-short cycle compressor minimum OFF time delay. Safety controls that protect the compressor from the following conditions:
i. High pressure
ii. Low pressure (Loss of Charge Protection)
iii. Low airflow
iv. Low liquid flow
v. Low entering air temperature
vi. Brown-out power conditions
vii. Condensate Overflow Protection
viii. Low liquid temperature protection with three different settings based on liquid properties.
b. Status LED indicating the device causing a fault condition.
c. Soft lockout feature that provides for an automatic reset prior to the initiation of a hard lockout.
d. Test mode capability with shortened time delays for servicing.

2.12 THERMOSTAT

A. The heat pump manufacturer shall provide a 24-volt manual changeover wall thermostat with a HEAT-OFF-COOL system switch and AUTO-ON fan selector switch.
B. Thermostats shall be remote mounted and wired in the field. (OPTION: factory wired thermostat extension permitting thermostat installation by plugging into the control wiring with a polarized male-female plug after the walls are finished when unit mounted. High voltage, return air thermostats with remote bulbs subject to damage during routine service will not be accepted.

2.13 SPARE PARTS

A. Intentionally Left Blank

PART 3 EXECUTION

3.01 INSTALLATION

A. Furnish as shown on the drawings and as specified herein, vertical and horizontal (water source) (ground source) heat pumps, and with capacity and electrical characteristics as scheduled. Units shall be Series CAS as manufactured by The Whalen Company of Easton, MD.
B. Install in accordance with manufacturer's installation instructions and maintain manufacturer's recommended clearances for the unit and accessories.
C. Follow manufacturer's recommendations for cleaning and flushing.

The Whalen Company
Limited Express Warranty
Water-to-Air Heat Pump Standard Warranty

The Whalen Company warrants to the purchaser each water-to-air heat pump to be free from original defects in materials and workmanship.

Where inspection by an authorized representative of The Whalen Company confirms such defects to be present, for a period of eighteen months from date of shipment, Whalen will furnish replacement components or materials to the original purchaser without charge.

This Limited Express Warranty is intended to cover original equipment defects only and does not cover or apply to: (1) Air filters, refrigerant, fluids, oil; (2) Equipment relocated after initial installation; (3) Any portion or component of any system that is not supplied by The Whalen Company, regardless of the cause of the failure of such portion or component; (4) Equipment on which the unit identification tags or labels have been removed or modified; (5) Equipment which have defects or damage which result from improper installation, wiring, electrical imbalance characteristics or maintenance; or are caused by accident, misuse or abuse, fire, flood, acts of God, alteration or misapplication of the product; (6) Equipment used as temporary heating or cooling while the facility is still under construction is considered misuse and as such, will void all warranty coverage regardless of the cause of failure; (7) Equipment which have defects or damage which result from a contaminated or corrosive air or liquid supply, operation at abnormal temperatures, or unauthorized opening of refrigerant circuit; (8) Mold, fungus or bacteria damages; (9) Equipment subjected to corrosion or abrasion; (10) Equipment manufactured or supplied by others; (11) Equipment which have been operated in any manner contrary to The Whalen Company printed instructions; or (12) Equipment which have defects, damage or insufficient performance as a result of insufficient or incorrect system design or the improper application of The Whalen Company products.

The Whalen Company neither assumes nor authorizes any person to assume for it any obligation or warranty other than those stated herein.

This Limited Express Warranty does not cover labor charges associated with making repairs, inspection and diagnosis of malfunctions, all field labor in connection with repair or replacement of parts, all field labor in connection with removal and transportation to and from a repair facility and all field labor in connection with reinstallation after repairs are completed. However, The Whalen Company at its sole discretion may provide a labor allowance in cases of DOA (Dead on Arrival) equipment for replacement or repair of defective components within 30-days of start-up or 90-days from factory shipment, whichever comes first. After this period only the Limited Express Warranty will apply. Labor will be paid per The Whalen Company Warranty Labor Allowance schedule.

Replacement or repair under this warranty will not extend the warranty time periods defined above.

Whalen shall not, in any event, have any liability under this warranty unless and until it has been paid in full for the equipment supplied. The warranty period shall commence on the date of shipment, however, whether or not payment has been made.

This warranty applies only to Whalen heat pump installations in the fifty United States and in Canada. There are no warranties outside those areas.

The Whalen Company has no liability for incidental or consequential damages arising out of the ownership, use, or operation of Whalen heat pumps.

THERE ARE NO WARRANTIES WHICH EXTEND BEYOND THE DESCRIPTION ON THE FACE HEREOF. NO IMPLIED WARRANTY OR MERCHANTABILITY SHALL ACCOMPANY THE SALE OF THIS EQUIPMENT, AND THIS EXPRESS WARRANTY IS INTENDED TO AND DOES REPLACE ANY IMPLIED WARRANTY OF MERCHANTABILITY.

This warranty, its limitations and its exclusions are to be governed by the laws of Maryland. Although some warranties may vary in their effect and coverage from locality to locality, this warranty, its effects, coverage and remedies are only those available in Maryland.

Rev: 12/2020

Date	Description
11/02/2022	Added size 072
03/09/2022	Updated Cabinet Dimensional Drawings
06/01/2021	Updated Cabinet Nomenclature
05/17/2021	Updated AHRI Performance Ratings, Physical Data Tables & Performance Data Tables
03/2/2021	Added Sound Data
01/10/2021	Updated Warranty Certificate
09/10/2020	Updated Mechanical Specifications
08/03/2020	Added Hot Gas Reheat to Features and Benefits
05/07/2020	Added Hot Gas Reheat Performance Table
04/13/2020	Added Airflow Configurations
03/29/2019	Updated CASV Cabinet Drawings
11/26/2018	Updated Nomenclature, Physical Data and Cabinet Drawings
08/31/2018	Updated Nomenclature
08/06/2018	Features & Benefits, Cabinet Drawing and Performance Data Updated
08/2018	New Release of document

The Whalen Company

8900 Glebe Park Drive
Easton, MD 21601
Tel, 410.822.9200 • 410.822.8926
whalencompany.com