



## W3VH and W5VH Variable Speed WALL-MOUNT™ with Inverter Technology

Looking for a high performance solution to keep your indoor environment comfortable all year round? Look no further than the W3VH and W5VH Variable Speed Wall-Mount with Inverter Technology! These self-contained systems are designed with energy efficiency in mind, providing accurate capacity control based on your cooling and heating needs. With enhanced inverter compressor refrigeration technology, you'll enjoy top-notch performance even in the most extreme outdoor conditions. Additional unit features, including quiet mode, provide low indoor sound levels for the ideal learning environment where focus and concentration are necessary. Boost mode provides additional cooling when indoor heat loads are high in the summer and additional heating capacity in the winter with minimal electric heater use. The Bard WVH Series provides energy-efficient inverter compressor cooling and heating, ventilation, optional hot gas reheat dehumidification, and building management all in one easy-to-install package!

- Complies with efficiency requirements of ANSI/ASHRAE/IES 90.1-2019.
- Certified to ANSI/AHRI Standard 390-2021 for SPVU (Single Package Vertical Units).
- Bard is an ISO 9001:2015 Certified Manufacturer.
- Intertek ETL Listed to Standard for Safety of Household and Similar Electrical Appliances ANSI/UL STD 60335-1 & ANSI/UL STD 60335-2-40/ CSA STD C22.2 No. 60335-1 & CSA STD C22.2 No. 60335-2-40 Fourth Edition.

- The AHRI Certified® mark indicates Bard Manufacturing Company participation in the AHRI Certification program. For verification of individual certified products, go to [www.ahrirectory.org](http://www.ahrirectory.org).
- Commercial Product - Not intended for residential applications.



[BARDHVAC.COM](http://BARDHVAC.COM)

FORM NO. S3629-1123



Climate Control Solutions

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# WALL-MOUNT NOMENCLATURE

Digit #	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	W	3	V	H	Y	-	R	O	Z	X	P	X	X	X	X

**UNIT SERIES**  
Wall-Mount

**NOMINAL CAPACITY**

**3V** - 3.0 Ton Inverter  
**5V** - 5.0 Ton Inverter

**UNIT TYPE**

**H** - Heat Pump

**REVISION**

**Y** - Revision

**PLACEHOLDER**

- - Standard Unit  
**D** - Dehumidification Unit

**VOLTAGE**

**R** - 208/230V-1PH-60Hz, 200/220-1PH-50Hz  
**S** - 208/230V-3PH-60Hz, 200/220-3PH-50Hz  
**T** - 460V-3PH-60Hz, 415V-3PH-50Hz

**ELECTRIC HEAT**

**00** - 0Kw with Lug Connection  
**0Z** - 0Kw with Circuit Breaker  
**05 to 15** - Kw Electric Heat  
*See Electrical Specs for further details*

**Notes:**

- All units have an external data tag with the model and serial number on the left side of the unit. A secondary data tag with the model and serial number is located inside the control panel area on or near the low voltage terminal box.
- Stainless steel and aluminum cabinet finishes not available in units with recessed cabinet top.

**ACCESSORIES AND CONTROLS OPTIONS**

**X** - Standard controls (HPS,LPS,ALR, LAC, ODT)

**COIL & UNIT COATING OPTIONS**

**X** - Standard Copper/Aluminum coils.  
**1** - Coated Evaporator coil.  
**2** - Coated Condenser coil.  
**3** - Coated Evaporator and Condenser coils.  
**4** - Coated coils and unit condenser section.  
**5** - Coated coils and inside/outside of unit.

**SUPPLY OUTLET**

**X** - Standard cabinet, blow thru cond. fan  
**D** - Standard cabinet, draw thru cond. fan  
**J** - Recessed top, blow thru cond. fan  
**N** - Recessed top, draw thru cond. fan

**COLOR AND CABINET FINISH**

**X** - Standard Beige baked enamel finish  
**1** - White baked enamel finish  
**4** - Buckeye Gray baked enamel finish  
**5** - Desert Brown baked enamel finish  
**8** - Dark Bronze baked enamel finish  
**S** - Stainless Steel  
**A** - Aluminum

**FILTER**

**X** - Standard 1" MERV2 Disposable Filter  
**W** - 1" MERV2 Washable Filter  
**P** - 2" MERV8 Disposable Filter  
**M** - 2" MERV11 Disposable Filter  
**N** - 2" MERV13 Disposable Filter  
**A** - UVC with 2" MERV13 Filter  
**B** - NPBI with 2" MERV13 Filter

**VENT PACKAGE**

**X** - Standard Fresh Air Damper (Intake only)  
**A** - Fresh Air Damper w/Exhaust  
**B** - Block Off Plate  
**E** - Full Flow Economizer/CRV  
**R** - Energy Recovery Ventilator (ERV)





- 7 Built-in Circuit Breakers: Standard on all electric heat versions of single (208/230 volt) and three-phase (208/230 volt) equipment. Toggle disconnects are standard on all electric heat versions of three-phase (460-volt) equipment.
- 8 Easy Filter Access: A separate door is provided for ease of filter access during routine unit maintenance. 1" and 2" filters are available with a rating of up to MERV13. See the filter section for further details.
- 9 Reliable, Easy-to-Use Controls: Easily accessible through the front control panel location. A lockable hinged access cover to circuit protection is provided. Electrical entrances are provided through the back and side areas.
- 10 Enclosed ECM Condenser Motor: An enclosed casing variable speed condenser motor with ball bearings is used for reliable operation and extended motor life. Enclosed condenser motors are standard on all units.

**Cooling Operation:**

Bard WVH Series products use inverter technology to offer true variable capacity compressor cooling operation using R410A refrigerant. Standard copper tube/Aluminum hydrophilic green fin evaporator coils provide high efficiency and easy serviceability. Scroll compressor technology delivers years of quiet, reliable operation. Economizer vent options are available for increased energy efficiency during cooling operations when outdoor conditions are favorable.

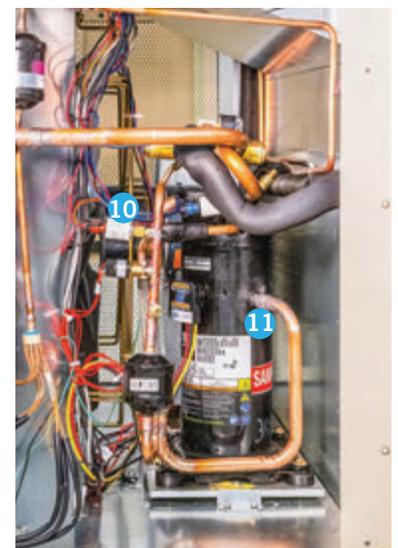
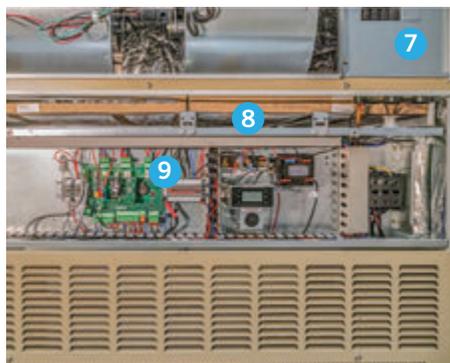
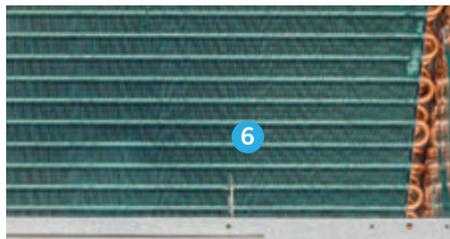
**Heating Operation:**

Bard WVH Series products use inverter technology to offer increased variable capacity heat pump heating using boost mode, optional single or two-stage resistance heaters are also available for supplemental heat during defrost and additional heating capacity. Circuit breaker disconnect protection is standard in all 200 thru 230V units equipped with electric heat. 415V and 460V units with electric heat are equipped with a toggle or rotary disconnect switch.

**Ventilation:**

The Bard WVH Series products provide the perfect platform to cool and heat an indoor area and bring outdoor air into the building. By including ventilation in the Wall-Mount, expensive costs associated with additional outdoor air systems can be avoided. The Bard WVH Series products offer optional ventilation operation that brings outdoor air into the structure, and vents can be factory or field installed. Ventilation can bring in outdoor air for occupants, save energy by using outdoor air for free cooling, or positively pressurize a structure. Exhaust air options allow room air to be vented outdoors when fresh air is brought into the system. Energy recovery option is available for occupied structures to save energy when ventilation is necessary, regardless of outdoor temperature.

- 1 Non-Fiberglass Foil Faced Insulation: Environmentally friendly high "R" value non-fiberglass insulation made with recycled denim and cotton materials used with a FSK foil face that is durable and cleanable.
- 2 Durable Cabinet Construction: Multiple cabinet construction options are available for outdoor conditions. Optional cabinet coatings may be ordered for extreme outdoor environments. See the cabinet finish and coatings section for further details.
- 3 ECM Indoor Motor Technology: Variable speed constant airflow dual shaft motor provides quiet, constant airflow operation when used with a twin blower assembly—motor overload protection standard on all models.
- 4 Supplemental Electric Strip Heat: Reliable, comfortable heater packages feature an automatic limit and thermal cut-off safety control. Heater packages may be factory or field installed. See optional electric heat section for further details.
- 5 Field or Factory Installed Vents: Multiple ventilation options are available to provide outdoor air for ventilation and energy savings. Ventilation options may be factory or field-installed. See the vent section for further details.
- 6 Green Fin Hydrophilic Evaporator Coil: Green fin stock improves condensate drainage, is anti-microbial, and inhibits mold growth. Green fin also provides protection against corrosive particulates in the air stream and helps prevent coil fin oxidization.



## ///// Unit Modes of Operation (Cont)

### Filtration and Indoor Air Quality:

The best air filtration solution is essential to occupants and equipment inside a room or structure. Bard offers several filter options based on MERV filtration and other solutions to improve indoor air quality.

### Moisture Removal Operation:

Capacity control paired with ECM variable speed indoor motor control offer increased latent moisture removal capacity during hot, humid days. Optional hot gas reheat dehumidification is also available for humid days when cooling is not required.

### Low Outdoor Temperature Cooling Operation:

High heat load cooling including computers, servers, and equipment often requires indoor areas to remain conditioned regardless of outdoor temperature. If your application involves the operation of the compressor to provide cooling below 65° outdoor conditions, a low ambient control mode of operation is used. As temperatures decrease outdoors, ECM outdoor fan speed will adjust to maintain system pressure. Applications that require cooling functionality from 0°F to -40°F outdoor temperatures must use an economizer cooling operation.

### High and Low Outdoor Temperature Cooling and Heating:

The Bard WVH Series products are designed and tested to function in higher outdoor temperature areas. Wall-Mount products utilize large, efficient condenser coils with high airflow condenser fan systems to save energy and lower high-side refrigerant pressures. Variable speed compressor technology and the ECM outdoor fan adapts to outdoor temperatures to maintain cooling when outdoor temperatures increase. It is always essential to follow all clearance guidelines supplied in the unit dimension section of this specification and additional information provided in the user manual. Properly cleaning the condenser coil using a regular maintenance schedule and filter changes will help maintain unit operation during high outdoor ambient temperature use.

## ///// VARIABLE SPEED INVERTER SCROLL COMPRESSOR FEATURES

### Energy Efficiency:

Using inverter technology, Bard WVH Series products offer year-round energy efficiency. By providing incremental cooling and heating capacity to match the room load, the WVH Series products provide energy efficient operation year round. Extended heat pump capacity using boost mode allows for efficient compressor operation with reduced need for electric heat use.

### Improved Indoor Comfort:

Longer run times along with reduced part load cooling and heating provide comfortable conditions inside a classroom or other indoor area. By matching indoor fan speeds to cooling capacity loads, humidity levels can be maintained throughout unit operation. Precise indoor temperature control is maintained by varying unit capacity throughout all modes of operation. Optional hot gas reheat dehumidification is also available to provide humidity control when cooling is not necessary.

### Quiet Operation:

Quiet mode reduces indoor sound levels. Compressor and indoor and outdoor fan speeds are reduced when additional capacity is not required. A compressor sound cover, isolated compressor base, copper tubing vibration absorbers, and discharge muffler are some of the additional added features to provide a quiet environment inside a classroom or other occupied area.

### Extended Product Life:

By varying the cooling and heating capacity, the WVH Series products reduce compressor starts and stops. Continuous operation reduces wear and tear on components like motors, compressors, relays, and switches.

### Low Starting Amp Draw (Locked Rotor Amps):

Inverter compressor technology provides for “soft compressor startups” reducing amp draw during the beginning of the cooling cycle.

### Phase Monitoring:

Compressor inverter controls provide built-in phase monitoring to avoid reverse rotation.

### Fault Protection and Diagnostics:

The logic board and motor control drive include advanced diagnostic capability along with the PLD Pro display for system status and troubleshooting. Advanced fault protection provides safety to electronics at the job site.

### Stator Heat:

Variable speed compressor technology allows for a small amount of compressor heating when the unit is not operating without the use of a crankcase heater. Stator heat helps prevent refrigerant migration during winter use.



The **Unit Logic Board** provides information to the Inverter Drive including capacity needs of the indoor space. It also supplies signals to the indoor and outdoor fan motors, ventilation options, valves, and sensors.

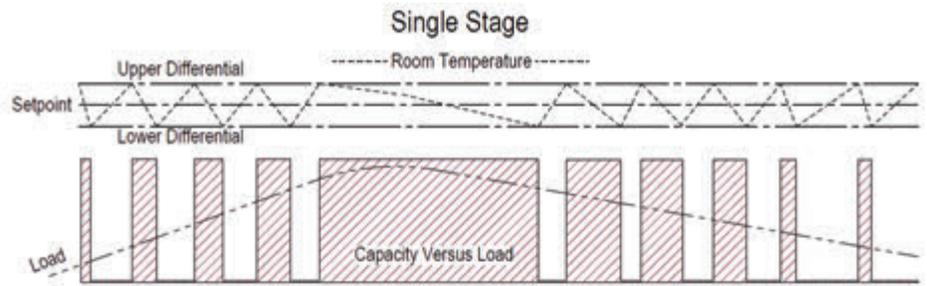
The **Inverter Drive** converts incoming AC power to DC power for the compressor. By varying power to the compressor, the drive is able to adjust capacity based on signals from the logic board.

The **Variable Speed Scroll Compressor** receives power from the inverter drive and varies refrigerant flow throughout the system. The compressor runs at only the speed necessary to cool or heat the indoor space.



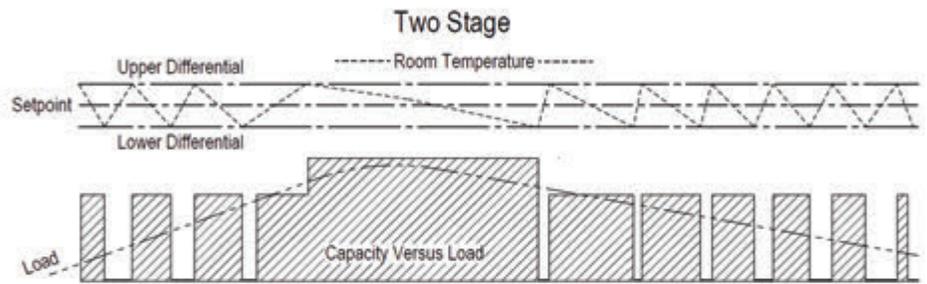
**Standard Thermostat with a Single-Stage Compressor**

A standard single-stage compressor unit operates by turning on and off based on signals from a thermostat. The thermostat is programmed with differentials that determine when the unit should start cooling or heating and when it should stop. In cooling mode, the unit typically starts cooling two degrees above the thermostat's temperature setting and shuts off two degrees below the setpoint. This cooling and heating cycle continues to maintain the room temperature. The cycles may become more frequent if the room has more occupants or a higher heat load. Single-stage systems have less room temperature control but are more economical in terms of the system and thermostat cost.

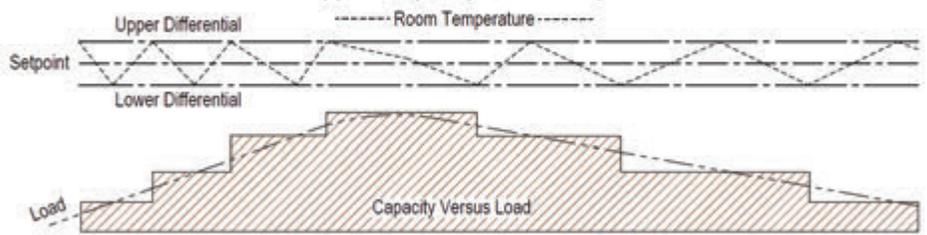


**Two-Stage Thermostat with a Two-Stage Compressor**

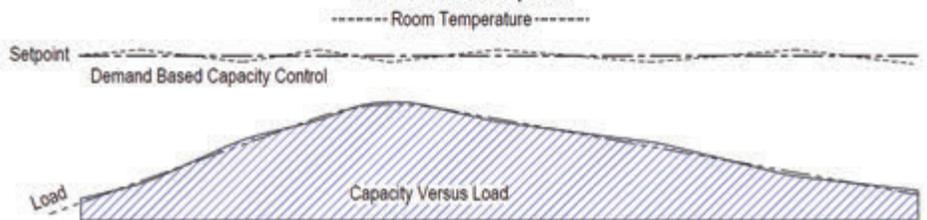
A two-stage compressor unit operates similarly but uses two staging signals from the thermostat to cycle on and off. The first stage, called part load, provides a lower capacity than the second stage, which is full capacity. The system uses the part load initially during a call for cooling. Running times are extended when fewer occupants or a lower heat load is in the room. Two-stage thermostats use differentials to cycle unit operation, like a standard single-stage thermostat. Two-stage systems provide longer runtimes, less system cycling, and gradual temperature swings but require a slightly higher investment in the cost of the unit and thermostat.



**Stepped Capacity Variable Speed**



**True Variable Speed**



**Two-Stage Thermostat with a Variable Speed Compressor**

Units using variable speed compressor technology run consistently if the room has occupants or a heat load. When used with a two-stage thermostat, the unit will receive two staging signals from the thermostat that will signal the unit when cooling is needed. Differentials are used to define when the thermostat signals to cycle unit operation. Compressor output is often limited to multiple stages or steps to control room temperature. When the thermostat no longer calls for cooling or heating, unit operation stops. Variable compressors and drives provide many features not available with single or two-stage products but often require advanced controls at a higher price point.

**BrightStat Advanced Controller with a Variable Speed Compressor**

The Bard Variable Speed Wall-Mount™ with Inverter Technology uses true inverter-driven variable speed technology. Pairing the variable speed compressor with the BrightStat controller allows for complete dynamic temperature control. The BrightStat communicates with the unit using a 0 to 100% cooling or heating demand signal. By sending the unit room temperature information in small increments, cooling or heating continues to run if the room is occupied or a heat load is present. Constant unit operation based on signals from the BrightStat means that the unit provides only the amount of cooling or heating necessary for comfortable conditions in the room while keeping energy usage and sound levels at a minimum. It also extends runtime to reduce indoor moisture levels. When paired with optional hot gas reheat dehumidification for periods when cooling is not necessary, humidity levels are reduced during all seasons of the year.



## ////// CAPACITY AND EFFICIENCY RATINGS

MODELS	W3VH*R	W3VH*S	W3VH*T	W5VH*R	W5VH*S	W5VH*T
Total Cooling Capacity (BTUH) certified in accordance with ANSI/AHRI Standard 390 - 2021	35,600	35,600	35,600	51,000	51,000	51,000
Energy Efficiency Ratio (EER) certified in accordance with ANSI/AHRI Standard 390 - 2021	11.0	11.0	11.0	11.0	11.0	11.0
Integrated Part Load Value (IPLV) certified in accordance with ANSI/AHRI Standard 390 - 2021	17.5	17.5	16.0	17.0	17.0	16.0
High Temp Heating (HTH) Capacity certified in accordance with ANSI/AHRI Standard 390 - 2021	31,400	31,400	31,400	49,500	49,500	49,500
HTH Coefficient of Performance (COP) certified in accordance with ANSI/AHRI Standard 390 - 2021	3.3	3.3	3.3	3.3	3.3	3.3

## ////// GENERAL UNIT SPECIFICATIONS W3VH (3 TON) THROUGH W5VH (5 TON)

MODELS	W3VH*R	W3VH*S	W3VH*T	W5VH*R	W5VH*S	W5VH*T
<b>Unit Voltage Rating - Phase - 60Hz</b>	230/208 - 1	230/208 - 3	460 - 3	230/208 - 1	230/208 - 3	460 - 3
60Hz Operating Voltage Range	197-253 V	197-253 V	414-506 V	197-253 V	197-253 V	414-506 V
Short Circuit Current Rating	5ka	5ka	5ka	5ka	5ka	5ka
<b>Unit Voltage Rating - Phase - 50Hz</b>	220/200 - 1	220/200 - 3	415 - 3	220/200 - 1	220/200 - 3	415 - 3
50Hz Operating Voltage Range	180-240 V	180-240 V	374-456 V	180-240 V	180-240 V	374-456 V
Short Circuit Current Rating	5ka	5ka	5ka	5ka	5ka	5ka
<b>Compressor Specifications</b>						
Max Input Current Amps (RMS)	24.0	24.0	24.0	36.0	36.0	36.0
Branch Circuit Selection Current	15.4	10.3	6.4	23.1	14.1	8.3
Lock Rotor Amps (Does not apply)	N/A	N/A	N/A	N/A	N/A	N/A
Compressor Type	Inverter Scroll					
Speed Range (RPM)	900-7000	900-7000	900-7000	900-7000	900-7000	900-7000
Compressor Sound Cover	Standard	Standard	Standard	Standard	Standard	Standard
Stator Sump Heat	Standard	Standard	Standard	Standard	Standard	Standard
<b>Refrigerant System</b>						
R410A Unit Charge - Std and Dehum. Models	7.625 lbs.	7.625 lbs.	7.625 lbs.	10.500 lbs.	10.500 lbs.	10.500 lbs.
Expansion Device	Electronic (EEV)					
<b>Outdoor Fan Motor &amp; Condenser Fan</b>						
Outdoor Motor Type	Enclosed ECM					
Outdoor Fan Motor Horsepower - RPM	1/2HP - VAR					
Outdoor Fan Motor - Amps	4.5 A	4.5 A	2.3 A	4.1 A	4.1 A	2.1 A
Outdoor Fan--Diameter and Max. CFM	24" - 3200CFM	24" - 3200CFM	24" - 3200CFM	24" - 3400CFM	24" - 3400CFM	24" - 3400CFM
<b>Indoor Blower Motor &amp; Indoor Airflow</b>						
Indoor Blower Motor - HP - Speeds	1/2HP- VAR	1/2HP- VAR	1/2HP- VAR	3/4HP - VAR	3/4HP - VAR	3/4HP - VAR
Indoor Blower Motor - Amps	2.2 A	2.2 A	1.1 A	2.8 A	2.8 A	1.4 A
Indoor Motor Type	Const. Air. ECM					
Rated indoor CFM and static pressure (ESP) with wet coil and Standard filter	1050 - .15	1050 - .15	1050 - .15	1550 -.20	1550 -.20	1550 -.20
Filter Size inches (cm) standard filter listed, 2 Required per Unit.	20" x 20" x 1" (51 x 51 x 3)	20" x 20" x 1" (51 x 51 x 3)	20" x 20" x 1" (51 x 51 x 3)	20" x 20" x 1" (51 x 51 x 3)	20" x 20" x 1" (51 x 51 x 3)	20" x 20" x 1" (51 x 51 x 3)
<b>Basic Unit Weight without Vent lbs. (Kg)</b>	580 (263)	580 (263)	630 (286)	610 (276)	610 (276)	660 (300)
X - Barometric Fresh Air Damper	13 (5.9)	13 (5.9)	13 (5.9)	13 (5.9)	13 (5.9)	13 (5.9)
A - Barometric Damper w/ Exhaust	16 (7.3)	16 (7.3)	16 (7.3)	16 (7.3)	16 (7.3)	16 (7.3)
B - Blank-Off Plate	14 (6.4)	14 (6.4)	14 (6.4)	14 (6.4)	14 (6.4)	14 (6.4)
E - Economizer	44 (20)	44 (20)	44 (20)	44 (20)	44 (20)	44 (20)
R - Energy Recovery Ventilator	87 (39.5)	87 (39.5)	87 (39.5)	87 (39.5)	87 (39.5)	87 (39.5)



## ////// WVH SERIES CAPACITY RANGE - COOLING

When it comes to keeping your indoor space cool and comfortable, Bard Variable Speed Wall-Mounts with Inverter Technology have you covered with their various capacity ranges. The **boost mode capacity** range is a lifesaver during scorching hot days or when there's a sudden surge in indoor heat loads. This range ensures that your indoor space remains cool and comfortable even during the hottest afternoons. Plus, it provides extra cooling capacity for those temporary events when there's a sudden influx of people in the room.

For normal day-to-day operation, the **Standard Capacity** range is energy-efficient and quiet, providing reliable cooling, ventilation, and humidity control. You can enjoy the comfort of a cool indoor environment without worrying about high energy bills or noise disruptions.

During mild outdoor conditions or times when there's minimal occupancy and low indoor heat loads, the **Minimum Capacity** range ensures consistent cooling throughout the day. The unit operates at the lowest indoor sound levels while keeping humidity at a comfortable level. And if there's no cooling load at all, you can always use the optional dehumidification feature to remove excess moisture without impacting the room temperature.

MODEL	MODE	INDOOR RETURN AIR (DB/WB)	COOLING CAPACITY (BTUH)	DRY BULB OUTDOOR AIR TEMPERATURE ENTERING UNIT CONDENSER AREA										
				75°F 23.9°C	80°F 26.6°C	85°F 29.4°C	90°F 32.2°C	95°F 35°C	100°F 37.8°C	105°F 40.5°C	110°F 43.3°C	115°F 46.1°C	120°F 48.8°C	125°F 51.6°C
3-Ton W3VH	Boost Capacity Limit	75/62°F 23.8/16.6°C	Total Cooling	57,500	53,900	50,400	47,200	44,200	41,200	38,600	36,000	33,500	31,200	29,000
			Sensible Cooling	41,700	40,000	38,300	36,600	35,100	33,500	32,000	30,500	29,000	27,500	26,100
		80/67°F 26.6/19.4°C	Total Cooling	61,400	58,700	56,000	53,300	50,700	48,000	45,500	42,900	40,300	37,800	35,300
			Sensible Cooling	40,400	39,200	37,900	36,600	35,400	34,100	32,800	31,500	30,200	28,800	27,500
		85/72°F 29.4/22.2°C	Total Cooling	82,900	73,100	68,600	64,300	60,200	56,300	52,500	49,100	45,700	42,400	39,300
			Sensible Cooling	44,500	41,400	39,800	38,100	36,400	34,700	33,000	31,300	29,600	27,800	26,000
	Standard Capacity	75/62°F 23.8/16.6°C	Total Cooling	39,900	37,300	35,000	32,900	31,000	29,500	28,100	26,900	25,900	25,000	24,300
			Sensible Cooling	30,600	29,200	28,000	26,900	25,900	25,100	24,300	23,600	23,200	22,800	22,400
		80/67°F 26.6/19.4°C	Total Cooling	42,600	40,600	38,800	37,200	35,600	34,300	33,100	32,000	31,100	30,300	29,600
			Sensible Cooling	29,700	28,600	27,700	26,900	26,100	25,500	24,900	24,400	24,100	23,800	23,600
		85/72°F 29.4/22.2°C	Total Cooling	50,800	47,500	44,600	42,000	39,600	37,500	35,700	34,100	32,700	31,500	30,500
			Sensible Cooling	30,400	29,100	27,900	26,700	25,600	24,700	23,800	22,900	22,200	21,500	20,900
Minimum Capacity Limit	75/62°F 23.8/16.6°C	Total Cooling	25,400	22,900	20,700	18,800	17,200	15,900	14,900	14,100	13,700	13,400	13,300	
		Sensible Cooling	15,000	15,000	15,000	14,900	14,800	14,700	14,400	14,100	13,700	13,400	13,000	
	80/67°F 26.6/19.4°C	Total Cooling	27,100	24,900	22,900	19,700	19,700	18,500	17,500	16,800	16,400	16,200	16,200	
		Sensible Cooling	14,500	14,700	14,800	14,900	14,900	14,900	14,700	14,600	14,300	14,000	13,600	
	85/72°F 29.4/22.2°C	Total Cooling	32,300	29,100	26,300	21,900	21,900	20,300	18,900	17,900	17,300	16,900	16,700	
		Sensible Cooling	14,900	15,000	14,900	14,700	14,700	14,500	14,000	13,700	13,200	12,700	12,100	
5-Ton W5VH	Boost Capacity Limit	75/62°F 23.8/16.6°C	Total Cooling	72,500	69,200	65,800	62,400	58,800	55,100	51,300	47,400	43,300	39,100	34,800
			Sensible Cooling	56,000	52,900	51,300	49,500	47,700	45,800	43,800	41,800	39,700	37,600	35,300
		80/67°F 26.6/19.4°C	Total Cooling	77,400	75,400	73,100	70,500	67,500	64,200	60,500	56,500	52,100	47,400	42,400
			Sensible Cooling	51,300	50,300	49,000	47,700	46,200	44,600	42,900	41,000	39,100	36,900	34,700
		85/72°F 29.4/22.2°C	Total Cooling	92,200	88,200	83,900	79,600	75,000	70,200	65,200	60,100	54,800	49,300	43,600
			Sensible Cooling	52,500	51,100	49,200	47,400	45,300	43,200	40,900	38,400	36,000	33,300	30,700
	Standard Capacity	75/62°F 23.8/16.6°C	Total Cooling	55,000	52,100	49,400	46,800	44,400	42,200	40,200	38,300	36,600	34,900	33,400
			Sensible Cooling	43,200	41,600	40,200	38,800	37,600	36,500	35,400	34,500	33,600	32,800	32,100
		80/67°F 26.6/19.4°C	Total Cooling	58,700	56,800	54,800	52,900	51,000	49,200	47,400	45,700	44,000	42,300	40,700
			Sensible Cooling	41,900	40,800	39,800	38,800	37,900	37,100	36,300	35,600	34,900	34,300	33,800
		85/72°F 29.4/22.2°C	Total Cooling	69,900	66,400	62,900	59,700	56,700	53,800	51,100	48,600	46,200	44,000	41,900
			Sensible Cooling	42,900	41,400	40,000	38,600	37,200	35,900	34,600	33,400	32,200	31,000	29,900
Minimum Capacity Limit	75/62°F 23.8/16.6°C	Total Cooling	27,100	25,600	24,300	23,000	21,900	20,900	20,000	19,200	18,600	18,000	17,500	
		Sensible Cooling	19,700	19,000	18,200	17,600	17,100	16,500	16,100	15,800	15,600	15,400	15,300	
	80/67°F 26.6/19.4°C	Total Cooling	28,900	27,900	26,900	26,000	25,100	24,300	23,600	22,900	22,300	21,800	21,300	
		Sensible Cooling	19,100	18,600	18,000	17,600	17,200	16,800	16,500	16,300	16,200	16,100	16,100	
	85/72°F 29.4/22.2°C	Total Cooling	34,500	32,600	30,900	29,400	27,900	26,600	25,500	24,400	23,500	22,700	21,900	
		Sensible Cooling	19,600	18,900	18,100	17,500	16,900	16,300	15,800	15,300	15,000	14,600	14,300	



## ////// WVH SERIES CAPACITY RANGE - HEATING

When it comes to keeping your indoor space warm and comfortable, Bard Variable Speed Wall-Mounts with Inverter Technology have you covered with their various capacity modes. The **boost mode capacity** range is a lifesaver during bitter cold winter days with minimal electric heat use. This mode ensures that your indoor space remains warm and comfortable even during the coldest evenings.

For normal day-to-day operation, the **Standard Capacity** range is energy-efficient and quiet, providing reliable heating, ventilation, and humidity control. You can enjoy the comfort of a warm indoor environment without worrying about high energy bills from extensive electric heat use.

During mild outdoor conditions or times when there's minimal occupancy and low indoor heat loads, the **Minimum Capacity** range ensures consistent indoor warmth throughout the day. Little to no electric heat use is required, and the unit operates at the highest efficiency and lowest sound levels.

MODEL	MODE	UNITS	DRY BULB OUTDOOR AIR TEMPERATURE ENTERING UNIT CONDENSER AREA													
			0°F -17.7°C	5°F -15°C	10°F -12.2°C	15°F -9.4°C	20°F -6.6°C	25°F -3.8°C	30°F -1.1°C	35°F 1.6°C	40°F 4.4°C	45°F 7.2°C	50°F 10°C	55°F 12.7°C	60°F 15.5°C	65°F 18.3°C
3-Ton W3VH  70°F (21°C) INDOOR TEMP.	Boost	BTUH	24800	28118	31293	34321	35490	37200	39930	42512	44945	47230	49,367	50180	51355	53195
		Watts	5447	5447	5439	5424	5416	5402	5372	5335	5290	5238	5178	5152	5111	5037
		COP	1.33	1.51	1.69	1.85	1.92	2.02	2.18	2.33	2.49	2.64	2.79	2.85	2.94	3.09
		CFM	1,400	1,400	1,400	1,400	1,400	1,400	1,400	1,400	1,400	1,400	1,400	1,400	1,400	1,400
	Standard	BTUH	12100	13900	15700	17600	18400	19600	21600	32700	25900	28100	30300	31200	32700	35000
		Watts	2720	2730	2740	2750	2760	2760	2770	2780	2790	2790	2800	2800	2800	2800
		COP	1.30	1.49	1.68	1.88	1.95	2.08	2.28	2.50	2.72	2.95	3.17	3.26	3.42	3.66
		CFM	570	640	700	770	840	900	970	1,040	1,100	1,173	1,230	1,280	1,350	1,400
	Minimum	BTUH	8600	8288	8199	8329	8442	8678	9245	10031	11035	12259	13700	14338	15361	17240
		Watts	3504	3144	2818	2527	2420	2270	2048	1860	1707	1588	1504	1480	1454	1439
		COP	0.72	0.77	0.85	0.97	1.02	1.12	1.32	1.58	1.89	2.26	2.67	2.84	3.09	3.51
		CFM	400	400	400	400	420	440	460	490	520	540	580	620	660	700
5-Ton W5VH  70°F (21°C) INDOOR TEMP.	Boost	BTUH	35100	38609	42031	45384	48666	51879	55022	58094	61097	64030	66893	69686	72409	75062
		Watts	6696	6637	6583	6535	6492	6454	6421	6393	6371	6354	6342	6335	6334	6338
		COP	1.54	1.70	1.87	2.03	2.20	2.36	2.51	2.66	2.81	2.95	3.09	3.22	3.35	3.47
		CFM	1,850	1,850	1,850	1,850	1,850	1,850	1,850	1,850	1,850	1,850	1,850	1,850	1,850	1,850
	Standard	BTUH	17200	20900	24600	28300	31800	35300	38600	41900	45200	48300	51400	54400	57300	60100
		Watts	3690	3780	3860	3940	4010	4070	4130	4180	4220	4260	4290	4310	4320	4330
		COP	1.37	1.62	1.87	2.10	2.32	2.54	2.74	2.94	3.14	3.32	3.51	3.70	3.89	4.07
		CFM	530	640	750	850	950	1,070	1,180	1,300	1,400	1,500	1,600	1,650	1,730	1,800
	Minimum	BTUH	7200	8635	10151	11701	13286	14905	16559	18247	19970	21728	23520	25346	27207	29103
		Watts	2361	2313	2268	2228	2192	2161	2134	2111	2092	2078	2068	2063	2061	2064
		COP	0.89	1.09	1.31	1.54	1.78	2.02	2.27	2.53	2.80	3.06	3.33	3.60	3.87	4.13
		CFM	400	400	400	400	425	460	5	550	600	640	680	740	800	850

- Data includes defrost operation below 45° outdoor temperature.
- Supplemental Electric heaters are recommended for applications requiring heating below a 15°F outdoor temperature.
- 1000 BTUH = .29307 kW
- Outdoor air temperatures provided are an average of the condenser inlet air temperature.
- Heating mode uses a minimum blower speed and targets a predetermined Delta T across the indoor coil.



///// ELECTRICAL SPECIFICATIONS: 3-TON W3VH UNITS

Model No. Prefix	Model No. Suffix	Nom. Heat KW	Nominal 60Hz Voltage and Phase	Nominal 50Hz Voltage and Phase	Connection or Circuit Protection	No. of Field Power Circuit Conn.	Standard Single Circuit. Breaker Bar Installed if Dual Breakers are used.		Optional Dual Circuit. Remove Breaker Bar.			
							Minimum Circuit Ampacity (MCA)	Maximum External Fuse or Ckt. Brkr. (MOCP)	Minimum Circuit Ampacity (MCA)		Maximum External Fuse or Ckt. Breaker (MOCP)	
									Ckt A	Ckt B	Ckt A	Ckt B
W3VHY-	R0Z	0 Kw	230/208V - 1P	200/220V - 1P	C. Breaker	1	29	35				
W3VHY-	R05	5 Kw	230/208V - 1P	200/220V - 1P	C. Breaker	1	55	60				
W3VHY-	R10	10 Kw	230/208V - 1P	200/220V - 1P	C. Breaker	1 or 2	81	90	29	52	35	60
W3VHY-	R15	15 Kw	230/208V - 1P	200/220V - 1P	C. Breaker	1 or 2	84	90	32	52	35	60
W3VHY-	S0Z	0 Kw	230/208V - 3P	200/220V - 3P	C. Breaker	1	22	25				
W3VHY-	S05	5 Kw	230/208V - 3P	200/220V - 3P	C. Breaker	1	37	40				
W3VHY-	S09	9 Kw	230/208V - 3P	200/220V - 3P	C. Breaker	1	49	50				
W3VHY-	S15	15 Kw	230/208V - 3P	200/220V - 3P	C. Breaker	1	51	60				
W3VHY-	T0Z	0 Kw	460V - 3P	415V - 3P	Disconnect	1	13	15				
W3VHY-	T05	5 Kw	460V - 3P	415V - 3P	Disconnect	1	21	25				
W3VHY-	T09	9 Kw	460V - 3P	415V - 3P	Disconnect	1	27	30				
W3VHY-	T15	15 Kw	460V - 3P	415V - 3P	Disconnect	1	27	30				
<b>"D" Model Mechanical Reheat Dehumidification Units</b>												
W3VHYD	R0Z	0 Kw	230/208V - 1P	200/220V - 1P	C. Breaker	1	30	35				
W3VHYD	R05	5 Kw	230/208V - 1P	200/220V - 1P	C. Breaker	1	56	60				
W3VHYD	R10	10 Kw	230/208V - 1P	200/220V - 1P	C. Breaker	1 or 2	82	90	30	52	35	60
W3VHYD	R15	15 Kw	230/208V - 1P	200/220V - 1P	C. Breaker	1 or 2	86	90	34	52	35	60
W3VHYD	S0Z	0 Kw	230/208V - 3P	200/220V - 3P	C. Breaker	1	24	30				
W3VHYD	S05	5 Kw	230/208V - 3P	200/220V - 3P	C. Breaker	1	39	40				
W3VHYD	S09	9 Kw	230/208V - 3P	200/220V - 3P	C. Breaker	1	51	60				
W3VHYD	S15	15 Kw	230/208V - 3P	200/220V - 3P	C. Breaker	1	53	60				
W3VHYD	T0Z	0 Kw	460V - 3P	415V - 3P	Disconnect	1	14	20				
W3VHYD	T05	5 Kw	460V - 3P	415V - 3P	Disconnect	1	21	25				
W3VHYD	T09	9 Kw	460V - 3P	415V - 3P	Disconnect	1	27	30				
W3VHYD	T15	15 Kw	460V - 3P	415V - 3P	Disconnect	1	27	30				

Minimum Circuit Ampacity (MCA) values are to be used when sizing field power conductors. Refer to the National Electrical code (latest version), Article 310 for power conductor sizing. CAUTION: When more than one field power circuit is run through one conduit, the conductors must be derated. Pay special attention to note 8 of Table 310 regarding Ampacity Adjustment Factors when more than three (3) current carrying conductors are in a raceway.

Maximum Over Current Protection (MOCP) to be used to determine maximum size of the time delay fuse or circuit breaker for protection of unit and field wiring conductors.

5Kw, 9Kw and 10Kw electric heat operation is 1-Stage. Electric heat is supplemental to Heat Pump Operation and may operate concurrently. See manual for further details.

15Kw electric heat operation is 2-Stage. 10Kw 1st stage and 5Kw 2nd stage. 2nd stage electric heat does not operate concurrently with heat pump operation.

3-phase equipment uses a Delta configuration (3 power wires and a ground).

Review installation instructions, service manual, and unit serial plate for additional electrical information.



///// ELECTRICAL SPECIFICATIONS: 5-TON W5VH UNITS

Model No. Prefix	Model No. Suffix	Nom. Heat KW	Nominal 60Hz Voltage and Phase	Nominal 50Hz Voltage and Phase	Connection or Circuit Protection	No. of Field Power Circuit Conn.	Standard Single Circuit. Breaker Bar Installed if Dual Breakers are used.		Optional Dual Circuit. Remove Breaker Bar.			
							Minimum Circuit Ampacity (MCA)	Maximum External Fuse or Ckt. Brkr. (MOCP)	Minimum Circuit Ampacity (MCA)		Maximum External Fuse or Ckt. Breaker (MOCP)	
									Ckt A	Ckt B	Ckt A	Ckt B
W5VHY-	R0Z	0 Kw	230/208V - 1P	200/220V - 1P	C. Breaker	1	38	45				
W5VHY-	R05	5 Kw	230/208V - 1P	200/220V - 1P	C. Breaker	1 or 2	64	70	38	26	45	30
W5VHY-	R10	10 Kw	230/208V - 1P	200/220V - 1P	C. Breaker	1 or 2	90	90	38	52	45	60
W5VHY-	R15	15 Kw	230/208V - 1P	200/220V - 1P	C. Breaker	1 or 2	90	90	38	52	45	60
W5VHY-	S0Z	0 Kw	230/208V - 3P	200/220V - 3P	C. Breaker	1	27	35				
W5VHY-	S05	5 Kw	230/208V - 3P	200/220V - 3P	C. Breaker	1	42	45				
W5VHY-	S09	9 Kw	230/208V - 3P	200/220V - 3P	C. Breaker	1	54	60				
W5VHY-	S15	15 Kw	230/208V - 3P	200/220V - 3P	C. Breaker	1	54	60				
W5VHY-	T0Z	0 Kw	460V - 3P	415V - 3P	Disconnect	1	16	20				
W5VHY-	T05	5 Kw	460V - 3P	415V - 3P	Disconnect	1	23	25				
W5VHY-	T09	9 Kw	460V - 3P	415V - 3P	Disconnect	1	29	30				
W5VHY-	T15	15 Kw	460V - 3P	415V - 3P	Disconnect	1	29	30				
<b>“D” Model Mechanical Reheat Dehumidification Units</b>												
W5VHYD	R0Z	0 Kw	230/208V - 1P	200/220V - 1P	C. Breaker	1	40	50				
W5VHYD	R05	5 Kw	230/208V - 1P	200/220V - 1P	C. Breaker	1 or 2	66	70	40	26	50	30
W5VHYD	R10	10 Kw	230/208V - 1P	200/220V - 1P	C. Breaker	1 or 2	92	100	40	52	50	60
W5VHYD	R15	15 Kw	230/208V - 1P	200/220V - 1P	C. Breaker	1 or 2	92	100	40	52	50	60
W5VHYD	S0Z	0 Kw	230/208V - 3P	200/220V - 3P	C. Breaker	1	29	35				
W5VHYD	S05	5 Kw	230/208V - 3P	200/220V - 3P	C. Breaker	1	44	45				
W5VHYD	S09	9 Kw	230/208V - 3P	200/220V - 3P	C. Breaker	1	56	60				
W5VHYD	S15	15 Kw	230/208V - 3P	200/220V - 3P	C. Breaker	1	56	60				
W5VHYD	T0Z	0 Kw	460V - 3P	415V - 3P	Disconnect	1	16	20				
W5VHYD	T05	5 Kw	460V - 3P	415V - 3P	Disconnect	1	24	25				
W5VHYD	T09	9 Kw	460V - 3P	415V - 3P	Disconnect	1	30	30				
W5VHYD	T15	15 Kw	460V - 3P	415V - 3P	Disconnect	1	30	30				

Minimum Circuit Ampacity (MCA) values are to be used when sizing field power conductors. Refer to the National Electrical code (latest version), Article 310 for power conductor sizing. CAUTION: When more than one field power circuit is run through one conduit, the conductors must be derated. Pay special attention to note 8 of Table 310 regarding Ampacity Adjustment Factors when more than three (3) current carrying conductors are in a raceway.

Maximum Over Current Protection (MOCP) to be used to determine maximum size of the time delay fuse or circuit breaker for protection of unit and field wiring conductors.

5Kw, 9Kw and 10Kw electric heat operation is 1-Stage. Electric heat is supplemental to Heat Pump Operation and may operate concurrently. See manual for further details.

15Kw electric heat operation is 2-Stage. 10Kw 1st stage and 5Kw 2nd stage manually energized. 2nd stage electric heat does not operate concurrently with heat pump operation.

3-phase equipment uses a Delta configuration (3 power wires and a ground).

Review installation instructions, service manual, and unit serial plate for additional electrical information.



HEATER PACKAGES - FIELD KITS FOR W3VH TO W5VH STANDARD UNITS

• Designed for adding Electric Heat to 0 KW Units			• ETL US & Canada Listed			
• Circuit Breaker Standard on 230/208V and 220/200V Models			• Toggle Disconnect Standard on 460V and 415V Models			
Standard Air Conditioner Models	R00 Models 230/208-1, 220/200-1		S00 Models 230/208-3, 220/200-3		T00 Models 460-3, 415-3	
	Heater Model #	KW	Heater Model #	KW	Heater Model #	KW
W3VHY Standard 3-Ton	WMCBC-05A	0Z	WMCBC-03B	0Z	WMCBC-06C	0Z
	EHVH036A-R05	05	EHVH036A-S05	05	EHCH036A-C05	05
	EHVH036A-R10	10	EHVH036A-S09	09	EHCH036A-C09	09
	EHVH036A-A15	15	EHVH036A-S15	15	EHCH036A-C15	15
W5VHY Standard 5-Ton	WMCBC-07A	0Z	WMCBC-05B	0Z	WMCBC-06C	0Z
	EHCH060A-A05	05	EHVH060A-S05	05	EHCH060A-C05	05
	EHCH060A-A10	10	EHCH060A-B09	09	EHCH060A-C09	09
	EHCH060A-A15	15	EHCH060A-B15	15	EHCH060A-C15	15

HEATER PACKAGES - FIELD KITS FOR W3VHD TO W5VHD DEHUMIDIFICATION UNITS

• Designed for adding Electric Heat to 0 KW Units			• ETL US & Canada Listed			
• Circuit Breaker Standard on 230/208V and 220/200V Models			• Toggle Disconnect Standard on 460V and 415V Models			
Dehumidification Air Conditioner Models	R00 Models 230/208-1, 220/200-1		S00 Models 230/208-3, 220/200-3		T00 Models 460-3, 415-3	
	Heater Model #	KW	Heater Model #	KW	Heater Model #	KW
W3VHYD Dehumidification 3-Ton	WMCBC-05A	0Z	WMCBC-03B	0Z	WMCBC-06C	0Z
	EHVH036A-R05	05	EHVH036A-S05	05	EHCH036A-C05	05
	EHVH036A-R10	10	EHVH036ADS09	09	EHCH036A-C09	09
	EHCH036A-A15	15	EHVH036A-S15	15	EHCH036A-C15	15
W5VHYD Dehumidification 5-Ton	WMCBC-08A	0Z	WMCBC-05B	0Z	WMCBC-06C	0Z
	EHVH060ADR05	05	EHVH060A-S05	05	EHCH060A-C05	05
	EHVH060ADR10	10	EHCH060A-B09	09	EHCH060A-C09	09
	EHVH060ADR15	15	EHCH060A-B15	15	EHCH060A-C15	15

60HZ ELECTRIC HEAT TABLE - REFER TO ELECTRICAL SPECIFICATIONS FOR AVAILABILITY BY UNIT MODEL

ELECTRIC HEAT NOMENCLATURE	NOMINAL KW	60Hz Total Kw and BTUH @ Field Supplied Voltage										
		AT 208V - 60HZ				AT 230V - 60HZ				AT 460V - 60HZ		
		KW	1-PH AMPS	3-PH AMPS	BTUH	KW	1-PH AMPS	3-PH AMPS	BTUH	KW	3-PH AMPS	BTUH
05	5.0	3.8	18.0	10.4	12,800	4.6	20.0	11.5	15,700	4.6	5.8	15,700
09	9.0	6.8		18.7	23,000	8.3		20.8	28,300	8.3	10.4	28,300
10	10.0	7.5	36.1		25,600	9.2	40.0		31,400			
15	15.0	11.3	54.1	31.2	38,400	13.8	60.0	34.6	47,100	13.8	17.3	47,100

50HZ ELECTRIC HEAT TABLE - REFER TO ELECTRICAL SPECIFICATIONS FOR AVAILABILITY BY UNIT MODEL

ELECTRIC HEAT NOMENCLATURE	NOMINAL KW	50Hz Total Kw and BTUH @ Field Supplied Voltage										
		AT 200V - 50HZ				AT 220V - 50HZ				AT 415V - 50HZ		
		KW	1-PH AMPS	3-PH AMPS	BTUH	KW	1-PH AMPS	3-PH AMPS	BTUH	KW	3-PH AMPS	BTUH
05	5.0	3.5	17.3	10.0	11,800	4.2	19.1	11.0	14,300	3.8	5.2	12,800
09	9.0	6.2		17.9	21,200	7.6		19.8	25,800	6.8	9.4	23,000
10	10.0	6.9	34.5		23,500	8.4	38.2		28,700			
15	15.0	10.4	51.8	29.9	35,300	12.6	57.3	33.1	43,000	11.3	15.7	38,400



////// VENTILATION OPTION SELECTION CHART

VENT CODE	FIELD INSTALLED KIT PART NUMBER	UNIT MODEL NUMBER	VENT OPERATION	VENT USE
X	<a href="#">FAD-NE5</a>	ALL UNITS	Barometric Intake Damper, No Room Exhaust	Outdoor air intake damper that may be used to provide slight building positive pressurization or bring an adjustable amount of outdoor air into a structure. The damper opens during indoor blower operation and provides intake air only.
A	<a href="#">FAD-BE5</a>	ALL UNITS	Barometric Intake Damper with Room Exhaust	Outdoor air intake damper that may be used to bring an adjustable amount of outdoor air into a structure. The damper opens during indoor blower operation and an exhaust damper provides barometric room pressure relief.
B	<a href="#">BOPLATE-5</a>	ALL UNITS	No ventilation, provides best protection against water, dirt, and debris infiltration.	Insulated plates are installed over the vent intake and exhaust openings. When used, the plates provide a degree of protection from splashing water and dirt/debris entry into the unit.
E	<a href="#">ECON-WD5V</a>	ALL UNITS	Motorized Intake Damper with Room Exhaust. Logic control board allows for dry bulb, enthalpy, or dew point control outdoor air measurement to decide when to economize. Occupancy ventilation is controlled by the logic control board based on a motion sensor, CO2 amount in the room, or a schedule.	The economizer logic allows for multiple methods of deciding when outdoor conditions are acceptable to economize. Vent option provides up to 100% outdoor air intake based on outdoor temperature and humidity or temperature only. It also provides room pressure relief. Motor uses linkage to operate damper blades and springs closed when power to the damper motor is removed. No intake hood is required for all models.
R	<a href="#">ERV-FA5</a>	208/230VAC voltage units	The Energy Recovery Ventilator Provides a solution to condition intake air entering the room while exhausting room air to minimize room pressurization. Heat is transferred from the entering air into the exhaust air during cooling seasons. Heat is transferred from the air being exhausted from the room into the air intake during heating seasons. This is accomplished using energy recovery wheels, an intake blower assembly, and exhaust blower assembly. Operation is controlled by the logic control board based on occupancy, CO2, or a schedule.	The Energy Recovery Ventilator is often used to provide ventilation for an occupied area that requires outdoor air intake regardless of outdoor conditions. Vent option provides outdoor air intake and room pressure relief with optimal energy efficiency during warm or cool outdoor conditions. Intake and exhaust blower assemblies have 3 independent adjustable speed selections. No intake hood is required for all models.
	<a href="#">ERV-FT5</a>	460VAC voltage units		



## ////// VENTILATION SPECIFICATIONS

### “X” Vent Code Option – Standard Barometric Fresh Air Damper without Exhaust (FAD-NE5)

The barometric fresh air damper without exhaust is a standard feature on all models and can be ordered pre-installed from Bard or field installed with the FAD-NE5 vent kit. Fresh air dampers are typically used when a small amount of outdoor air is required in a room or structure when the indoor blower is on. The intake damper opens when the indoor blower is operational, and negative pressure in the vent area of the unit pulls the blade open. When the blade is open, the damper allows outdoor air into the structure. Pins are provided that allow for airflow adjustment. See FAD-NE airflow charts provided in this specification for airflow amounts. Room air exhaust is not supplied with the FAD-NE vent.

The barometric fresh air damper without exhaust includes the following options:

- The damper opens when the indoor blower is operational.
- The vent provides up to 25% of the total airflow rating of the unit.
- Adjustable blade pins allow different amounts of outside air to be introduced into the building and can be easily pinned closed if required.
- The ventilation exhaust air path is sealed with an insulated block-off plate.
- Slight room pressurization is achieved during indoor blower operation.



Fresh Air Damper Intake (FAD-NE and FAD-BE)

### “A” Vent Code Option – Standard Barometric Fresh Air Damper with Barometric Exhaust (FAD-BE5)

The barometric fresh air damper with the exhaust is an optional feature on all models and can be ordered pre-installed from Bard or field installed with the FAD-BE vent kit. Fresh air dampers are typically used when a small amount of outdoor air is required in a room or structure when the indoor blower is on. The intake damper opens when the indoor blower is operational, and negative pressure in the vent area of the unit pulls the blade open. The damper allows outdoor air into the structure when the blade is open. Blade stops are provided that would enable intake airflow adjustment. See the FAD-BE airflow charts provided in this specification for airflow amounts. Room air exhaust using room air pressure is supplied with a separate assembly. This allows room air to pass through the vent area and out of the unit. Blade stops allow for adjustment of exhaust air amounts. The operation of the damper is dependent on room pressurization to open the exhaust blade and let room air leave the structure.

The barometric fresh air damper without exhaust includes the following options:

- The damper opens when the indoor blower is operational.
- The vent provides up to 25% of the total airflow rating of the unit.
- Adjustable blade pins allow different amounts of outside air to be introduced into the building and can be easily locked and closed if required.
- Adjustable room exhaust is provided through secondary exhaust damper assembly.
- Room pressurization is adjustable during indoor blower operation.



Fresh Air Damper Exhaust (FAD-BE only)

### “B” Vent Code Option – Block off Plate (BOP)

The block-off plate is an optional feature on all models and can be ordered pre-installed from Bard or field-installed with the BOP vent kit. The block-off plate option can seal the intake and exhaust air openings. This will provide the best protection from splashing water, dust, and dirt entering the unit and reduce air infiltration.

The block-off plate includes the following options:

- Insulated plates are installed to cover vent intake and exhaust openings.
- Plate installation protects from air, water, dirt, and dust infiltration.

### “E” Vent Code Option – Economizer with Bard Supplied Controls (ECON-WD5V)

An economizer controlled by the standard unit logic board is an optional feature on all models and can be ordered pre-installed from Bard or field-installed with the ECON-NC vent kit. Economizers are designed to provide free cooling when outdoor conditions are acceptable and provide a small amount of outdoor air intake for a room or structure if required. The intake damper opens and closes based on a 2-10VDC signal supplied by the logic board. An outdoor temperature and humidity sensor is supplied with the economizer assembly. A 24VAC actuator motor and blade linkage operate the damper blade. Air exhaust is provided that allows room air to pass through the vent area and out of the unit. Room pressure forces air out of the exhaust. Exhaust damper linkage controls the exhaust air amount and air intake amount simultaneously.

The economizer without Bard-supplied controls includes the following options:

- The intake and exhaust damper opens when a 2-10VDC signal is received from the logic board in the unit control panel.
- A temperature and humidity outdoor sensor is supplied with the vent option assembly.
- A return, mixed air, and supply sensor (10k) control economizer functionality inside the unit.
- Spring closed motorized damper closes within 30 seconds when unit power is removed.
- When completely open, the vent provides outdoor air intake of the total airflow rating of the unit.
- Room exhaust is provided through the ventilation assembly, reducing room pressure.
- Economizer assembly, including damper seals and linkage, meets 4cfm per ft<sup>2</sup> leakage requirements.

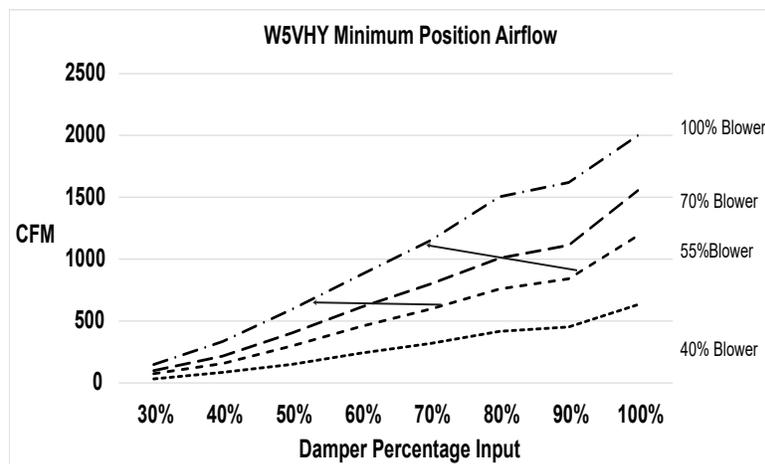
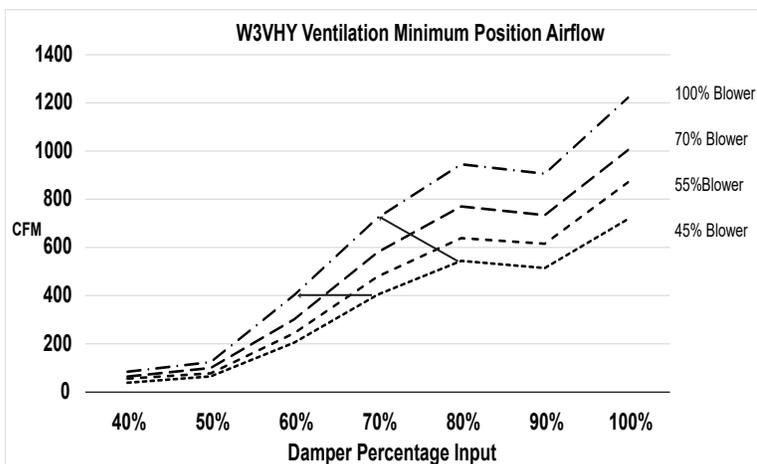
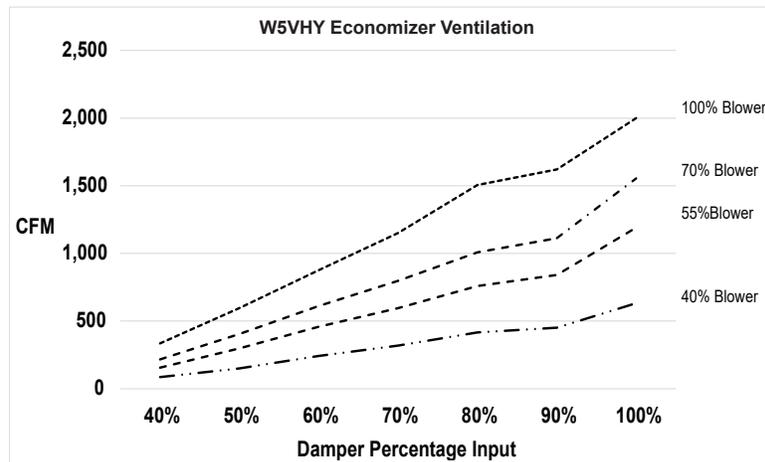
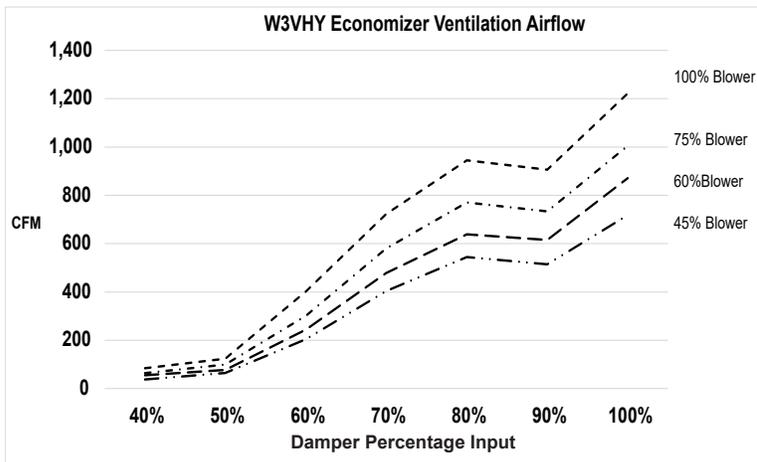


Economizer Assembly



///// ECONOMIZER AIRFLOW CHARTS FOR W3VH - W5VH UNITS

**"E" (ECON-WD5V) Economizer Vent Code Options**



# ENERGY RECOVERY VENTILATOR (ERV-FA5 AND ERV-FT5)

## "R" Vent Code Option – Energy Recovery Ventilator with Bard Supplied Controls (ERV-FA5 and ERV-FT5)

The Energy Recovery Ventilator is an optional feature on all models, and can be ordered pre-installed from Bard or may be field installed with the ERV vent kit. Energy Recovery Ventilators are designed to improve efficiency and comfort levels in a room when it is necessary to bring in outdoor air regardless of outdoor weather conditions. This saves energy and reduces compressor run time extending the life of the cooling equipment components. The ERV ventilation option has an intake and an exhaust air path that uses a separate intake and exhaust fan system. Both the intake and exhaust fans draw air through a rotary energy recovery cassette. The cassette transfers heat from one air path into the other.

- ERV use during warmer outdoor weather months: Heat is transferred from the intake air stream to the exhaust air stream. This operation allows heat to be removed from the outdoor air before entering the room.
- ERV use during cooler outdoor weather months: Heat is transferred from the exhaust air stream to the intake air stream. This operation allows heat to be added to the outdoor air before entering the room.
- The indoor and outdoor fan systems used in the ERV each have three user selectable speeds of operation. The rotary energy recovery cassette is easily removed and disconnected from power for service and cleaning. The cassette wheel media is cleanable with a mild soap/cleaning agent and water.
- ERV intake and exhaust airflow and energy efficiency charts are provided for ERV models based on Wall-Mount unit size.
- Up to 25% heating or cooling load reduction during ventilation operation by pre-conditioning the outdoor air being brought into the room.



### SUMMER COOLING PERFORMANCE (INDOOR DESIGN CONDITIONS 75°DB/62°WB)

AMBIENT O.D.	VENTILATION RATE -- 450 CFM 63% EFFICIENCY							VENTILATION RATE -- 375 CFM 64% EFFICIENCY							VENTILATION RATE -- 300 CFM 65% EFFICIENCY						
	DB/WB	F	VLT	VLS	VLL	HRT	HRS	HRL	VLT	VLS	VLL	HRT	HRS	HRL	VLT	VLS	VLL	HRT	HRS	HRL	
105	75	21465	14580	6884	13952	9477	4475	17887	12150	5737	11805	8018	3786	14310	9720	4590	9587	6512	6512	3075	
	70	14580	14580	0	9477	9477	0	12150	12150	0	8018	8018	0	9720	9720	0	6512	6512	0	0	
	65	14580	14580	0	9477	9477	0	12150	12150	0	8018	8018	0	9720	9720	0	6512	6512	0	0	
100	80	31590	12150	19440	20533	7897	12635	26325	10125	16200	17374	6682	10692	21060	8100	12960	14110	5427	8683		
	75	21465	12150	9314	13952	7897	6054	17997	10125	7762	11805	6682	5123	14310	8100	6210	9587	5427	4160		
	70	12352	12150	202	8029	7897	131	10293	10125	168	6793	6682	111	8235	8100	135	5517	5427	90		
	65	12150	12150	0	7897	7897	0	10125	10125	0	6682	6682	0	8100	8100	0	5427	5427	0	0	
	60	12150	12150	0	7897	7897	0	10125	10125	0	6682	6682	0	8100	8100	0	5427	5427	0	0	
95	80	31590	9720	21870	20533	6318	14215	26325	8100	18225	17374	5345	12028	21060	6480	14580	14110	4341	9768		
	75	21465	9720	11744	13952	6318	7634	17887	8100	9787	11805	5345	6459	14310	6480	7830	9587	4341	5246		
	70	12352	9720	2632	8029	6318	1711	10293	8100	2193	6793	5345	1447	8235	6480	1755	5517	4341	1175		
	65	9720	9720	0	6318	6318	0	8100	8100	0	5345	5345	0	6480	6480	0	4341	4341	0	0	
	60	9720	9720	0	6318	6318	0	8100	8100	0	5345	5345	0	6480	6480	0	4341	4341	0	0	
90	80	31590	7290	24300	20533	4738	15794	26325	6075	20250	17374	4009	13365	21060	4860	16200	14110	3256	10854		
	75	21465	7290	14175	13952	4738	9213	17887	6075	11812	11805	4009	7796	14310	4860	9450	9587	3256	6331		
	70	12352	7290	5062	8029	4738	3290	10293	6075	4218	6793	4009	2784	8235	4860	3375	5517	3256	2261		
	65	7290	7290	0	4738	4738	0	4050	6075	0	4009	4009	0	4860	4860	0	3256	3256	0		
	60	7290	7290	0	4738	4738	0	4050	6075	0	4009	4009	0	4860	4860	0	3256	3256	0		
85	80	31590	4860	26730	20533	3159	17374	26325	4050	22275	17374	2672	14701	21060	3240	17820	14110	2170	11939		
	75	21465	4860	16605	13952	3159	10793	17887	4050	13837	11805	2672	9132	14310	3240	11070	9587	2170	7416		
	70	12352	4860	7492	8029	3159	4870	10293	4050	6243	6793	2672	4120	8235	3240	4995	5517	2170	3346		
	65	4860	4860	0	3159	3159	0	4050	4050	0	2672	2672	0	3240	3240	0	2170	2170	0		
	60	4860	4860	0	3159	3159	0	4050	4050	0	2672	2672	0	3240	3240	0	2170	2170	0		
80	75	21465	2430	19035	13952	1580	12372	17887	2025	15862	11805	1336	10469	14310	1620	12690	9587	1085	8502		
	70	12352	2430	9922	8029	1580	6449	10293	2025	8268	6793	1336	5457	8235	1620	6615	5517	1085	4432		
	65	4252	2430	1822	2764	1580	1184	3543	2025	1518	2338	1336	1002	2835	1620	1215	1899	1085	814		
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75	70	12352	0	12352	8029	0	8029	10293	0	10293	6793	0	6793	8235	0	8235	5517	0	5517		
	65	4252	0	4252	2764	0	2764	3543	0	3543	2338	0	2338	2835	0	2835	1899	0	1899		
	60	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		

### WINTER HEATING PERFORMANCE (INDOOR DESIGN CONDITIONS 70°F DB)

AMBIENT O.D.	VENTILATION RATE					
	450 CFM 80% EFF.		375 CFM 81% EFF.		300 CFM 82% EFF.	
DB/°F	WVL	WHR	WVL	WHR	WVL	WHR
65	2430	1944	2025	1640	1620	1328
60	4860	3888	4050	3280	3240	2656
55	7290	5832	6075	4920	4860	3985
50	9720	7776	8100	6561	6480	5313
45	12150	9720	10125	8201	8100	6642
40	14580	11664	12150	9841	9720	7970
35	17010	13608	14175	11481	11340	9298
30	19440	15552	16200	13122	12960	10627
25	21870	17496	18225	14762	14580	11955
20	24300	19440	20250	16402	16200	13284
15	26730	21384	22275	18042	17820	14612

#### LEGEND:

- VLT = Ventilation Load - Total
- VLS = Ventilation Load - Sensible
- VLL = Ventilation Load - Latent
- HRT = Heat Recovery - Total
- HRS = Heat Recovery - Sensible
- HRL = Heat Recovery - Latent
- WVL = Winter Ventilation Load
- WHR = Winter Heat Recovery

NOTE: Sensible performance only is shown for winter application.



## UNIT FILTER OPTIONS

Unit filter options for the Bard Wall-Mount provide multiple solutions for air filtration and indoor air quality improvement. Filter options allow room air to pass through the unit and outdoor air provided by ventilation options to be cleaned before entering the indoor environment. Various filter types are available between MERV2 and MERV13 ratings. It is important to review application requirements, state and local codes, and ASHRAE recommendations to provide a clean, safe indoor area for occupants or heat-generating equipment. Filter cleaning or replacement is an important part of ensuring that your Bard equipment operates at optimal performance and at the lowest indoor sound levels. A routine filter maintenance program based on room conditions is important, and higher MERV-rated filters will normally require frequent filter changes. Filter trays are built into the unit with a low filter bypass. Filter switch options are available that will help indicate when filter replacement or cleaning is necessary when used, with a thermostat option to indicate filter change maintenance is needed.

### “X” Filter Code Option – 1” Disposable MERV2 Filter

The 1” disposable non-pleated MERV2 filter is a standard feature on all models and is normally used for low dust level areas where minimal filtration is required. Media material is typically polyester/fiberglass with a chipboard or cardboard frame. When maintenance is required, the filter is replaced. This option offers minimal filtration, low air resistance, and low maintenance costs.

### “W” Filter Code Option – 1” Permanent MERV2 Filter

The 1” permanent non-pleated MERV2 filter is an optional feature on all models and is normally used for low dust level areas where minimal filtration is required. Media material is typically foam with a plastic frame. When maintenance is required, the filter is cleaned and reused. If the filter media becomes damaged, the filter needs to be replaced. This option offers minimal filtration, low air resistance, and low maintenance costs.

### “P” Filter Code Option – 2” Disposable MERV8 Filter

The 2” disposable pleated MERV8 filter is an optional feature on all models and is normally used for moderate dust-level areas where standard filtration is required. Fiber-based media material provides high performance with an extended surface area that offers low-pressure drop. When maintenance is required, the filter is replaced. This option offers standard filtration, minimal air resistance, and average maintenance costs.

### “M” Filter Code Option – 2” Disposable MERV11 Filter

The 2” disposable pleated MERV11 filter is an optional feature on all models and is normally used for moderate to high filtration requirements. Fiber-based media material provides high performance with an extended surface area that offers low-pressure drop. When maintenance is required, the filter is replaced. This option offers higher filtration, minimal air resistance, and average maintenance costs.

### “N” Filter Code Option – 2” Disposable MERV13 Filter

The 2” disposable pleated MERV13 filter is an optional feature on all models and is normally used for high filtration requirements. MERV13 filters are typically used where filtration of small particulates is required to offer a high level of indoor air quality. Often, these filters are used in occupied areas, including classrooms, gymnasiums, cafeterias, and other areas where filtration is highly important. Fiber-based media material provides high performance with an extended surface area that offers low-pressure drop. Filter replacement in 3-month or less intervals is recommended for the best filter and unit performance.

### “A” Filter Code Option – 2” Disposable MERV13 Filter with Long Life UV-C Light

The 2” disposable pleated MERV13 filter is an optional feature on all models and is normally used for high filtration requirements. MERV13 filters are typically used where filtration of small particulates is required to offer a high level of indoor air quality. Often, these filters are used in occupied areas, including classrooms, gymnasiums, cafeterias, and other areas where filtration is highly important. Fiber-based media material provides high performance with an extended surface area that offers low-pressure drop. Filter replacement in 3-month or less intervals is recommended for the best filter and unit performance. A UV-C light is factory installed in the indoor evaporator coil area. The UV-C light uses LED for a 5+ year lifespan (30,000 hours). Offers continuous disinfection of surfaces exposed to UV sources.

### “B” Filter Code Option – 2” Disposable MERV13 Filter with Needlepoint Bipolar Ionizer Device

The 2” disposable pleated MERV13 filter is an optional feature on all models and is normally used for high filtration requirements. MERV13 filters are typically used where filtration of small particulates is required to offer a high level of indoor air quality. Often, these filters are used in occupied areas, including classrooms, gymnasiums, cafeterias, and other areas where filtration is highly important. Fiber-based media material provides high performance with an extended surface area that offers low-pressure drop. Filter replacement in 3-month or less intervals is recommended for the best filter and unit performance. A Bipolar ionization device is factory installed downstream of the MERV13 filter and operates on 24VAC power from the unit. A set of normally open contacts is also available when wired directly to the device to indicate when it is operational.

## FILTER REPLACEMENT PART NUMBER CHART

UNIT MODEL	FILTER CODE	FILTER MERV RATING	NUMBER OF FILTERS USED	BARD PART NUMBER	FILTER SIZE	FILTRATION LEVEL
W3VH, W5VH	X	MERV 2	2	7004-012	20 x 20 x 1	Low Filtration, 1” Thickness Disposable Media.
	W	MERV 2	2	7003-085	20 x 20 x 1	Low Filtration, 1” Thickness Permanent Media.
	P	MERV 8	2	7004-052	20 x 20 x 2	Average Filtration, 2” Thickness Pleated Disposable Media.
	M	MERV 11	2	7004-060	20 x 20 x 2	Above Average Filtration, 2” Thickness Pleated Disposable Media.
	N, A, B	MERV 13	2	7004-063	20 x 20 x 2	High Filtration, 2” Thickness Pleated Disposable Media.



## /////// CABINET FINISHES AND CONSTRUCTION

Unit cabinet finish options provide a way to have the Bard Wall-Mount blend in with existing building colors, provide additional corrosion protection, or reduce unit product weight. Unit top, structural sides, and front service panels are constructed using 20 gauge materials. Base is constructed using 16 gauge galvanized steel. Cabinet components are insulated with a non-fiberglass formaldehyde free insulation that has a high “R” value, is easy to clean with a FSK foil backing, and resists de-lamination.

### Painted Steel Finish

This cabinet option uses zinc coated steel panels that are cleaned, rinsed, sealed and dried before a polyurethane primer is applied. The cabinet paint coating is comprised of a baked on textured enamel. The resulting finish is designed to withstand over 1000 hours of salt spray tests per ASTM B117-03.

The following painted steel colors are available:

- “X” Cabinet Finish Option – Beige
- “1” Cabinet Finish Option – White
- “4” Cabinet Finish Option – Gray
- “5” Cabinet Finish Option – Desert Brown
- “8” Cabinet Finish Option – Dark Bronze

### Stainless Steel Finish

Exterior Stainless Steel finish cabinets are often selected for corrosion and chemical resistance. Higher grades of stainless steel are often specified to meet the requirements of harsh or corrosive environments. The Bard stainless steel unit offers a high quality stainless steel grade enclosure and fasteners for years of operation in these conditions. Not available with recessed top cabinet.

#### Features of stainless steel “S” cabinet finish option:

- Sides, doors, grilles, back panels, and top are 316 grade stainless steel.
- Base, condenser partition, and fan shroud are 304 grade stainless steel.
- Stainless steel exterior cabinet screws, washers, nuts, and bolts, are used.
- Stainless steel outdoor motor mount and motor mount hardware.
- Compressor mounting hardware is stainless steel and hex no-spin rivet nuts are used in the unit base.
- Corrosion resistant coating is applied to fan blade.

### Aluminum Finish

Aluminum external cabinet finish option “A” units are constructed of ASTM B 209 grade .06” thickness panels with a stucco appearance. Not available with recessed top cabinet.



X—Beige



1—White



4—Gray



5—Desert



8—Bronze



S—Stainless



A—Aluminum

## /////// EVAPORATOR COIL, CONDENSER COIL, AND CABINET COATINGS

Unit condenser and evaporator coils are designed, manufactured, and tested by Bard. A rifled copper hairpin design provides enhanced unit performance when used with a stamped aluminum fin for excellent heat transfer. End plate design includes extruded collars for hairpin tube protection. All coils are pressure tested before use and leak tested after unit construction. A copper tube and aluminum fin design coil is easy to clean and maintain through the life of the unit.

### “X” Code Option – Standard Evaporator and Condenser Coils

Standard products include a green protective coating applied to the aluminum fin stock used for the evaporator coil. The evaporator coil coating is hydrophilic (attracts water) and allows for proper condensate drainage along with mild corrosion protection. Resistance to corrosive agents include ammonia, sodium hydroxide, sodium chloride, acidic solutions and solvents. Condenser coil construction is a copper hairpin with aluminum fin design that is easy to clean and maintain.

### “1” Code Option – Corrosion Resistance Coated Evaporator and Standard Condenser Coil

Option includes a Technicoat AA protective coating applied to the entire evaporator coil. Dehumidification units also include a coated hot gas reheat coil. Standard condenser coil construction is a copper hairpin with aluminum fin design that is easy to clean and maintain. This option provides the best indoor coil protection when harmful chemicals or agents may be present in the indoor air stream. The exterior and interior unit cabinet is not coated with this option.



## ///// EVAPORATOR COIL, CONDENSER COIL, AND CABINET COATINGS (CONTINUED)

### **“2” Code Option – Standard Evaporator and Corrosion Resistance Coated Condenser Coil**

Option includes a green protective coating applied to the aluminum fin stock used for the evaporator coil. The evaporator coil coating is hydrophilic (attracts water) and allows for proper condensate drainage along with mild corrosion protection. Resistance to corrosive agents include ammonia, sodium hydroxide, sodium chloride, acidic solutions and solvents. A Technicoat AA protective coating is applied to the entire condenser coil. This option provides the best outdoor coil protection when harmful chemicals or agents may be present in the outdoor air stream. Also provides a level of protection when units are installed in applications near salt water. The exterior and interior unit cabinet is not coated with this option.

### **“3” Code Option – Corrosion Resistance Coated Evaporator and Corrosion Resistance Coated Condenser Coil**

Option includes a Technicoat AA protective coating applied to the entire evaporator and condenser coil. Dehumidification units also include a coated hot gas reheat coil. This provides the best coil resistance to corrosive agents, and the coating process ensures the core of the aluminum fin pack is covered. The exterior and interior unit cabinet is not coated with this option.

### **“4” Code Option – Corrosion Resistance Coated Evaporator and Condenser Coil, Condenser Section Only Coating**

Option includes a Technicoat AA protective coating applied to the entire evaporator coil and condenser coil. Dehumidification units also include a coated hot gas reheat coil. This provides the best coil resistance to corrosive agents, and the coating process ensures the core of the aluminum fin pack is covered. The interior of the lower unit condenser section is corrosion coated for additional protection including the unit base, compressor, and condenser area copper tubing, filter/drier, and condenser fan.

### **“5” Code Option – Corrosion Resistance Coated Evaporator and Condenser Coil, Interior/Exterior Unit Coating**

Option includes a Technicoat AA protective coating applied to the entire evaporator and condenser coil. Dehumidification units also include a coated hot gas reheat coil. This provides the best coil resistance to corrosive agents, and the coating process ensures the core of the aluminum fin pack is covered. The entire exterior of the unit including the lower condenser section is coated along with all copper tubing, refrigeration, and air moving components. The interior components of the unit are also coated for the best cabinet component corrosion protection available.

## ///// EVAPORATOR COIL AND CONDENSER COIL COATINGS RESISTANCE LIST

The Technicoat AA coil coating provides a robust corrosion protection solution designed for indoor evaporator and outdoor condenser coils. Both field and lab testing results show no deterioration in harsh environments including refineries, mining operations, paper/pulp processing plants, and wastewater treatment facilities. ASTM B-117 testing includes over 10,000 hours with over 3,000 hours of SWAAT test time.

Chemical resistance includes the following:

- Alkalies including Ammoniac solution, Potassium Hydroxide, Calcium Hydroxide, and Magnesium Hydroxide.
- Alcohols including Isopropanol, Butanol, Amyl Alcohol, Benzyl Alcohol, Diacetone Alcohol, Glycerin, Propanol, and Pentanol
- Aliphatic Hydrocarbons including White Spirit, Shellsol, Bitumen, Isopar G, and Paraffin.
- Amines including Triethanolamine, Aniline Sulphate, Hexamethylenetetraamine, Phenylamine, Triethylamine, and Methylamine.
- Inorganic Compounds including Hydrogen Carbonate, Hydrogen Sulfide, Nitrous Acid, Sulphuric Acid, and Selenic Acid.
- Aromatic Hydrocarbons including Xylene, Toluene, Asphalt, Anthracene, Benzapherene, Gumlac, Benzine, and Naphtha.
- Fuels and Oils including Diesel, Fuel Oil, Petrol, Super Petrol, Lubricating Oils, Kerosene, Spheric Oils, LPG, and Mineral Oil.
- Ethers including Enthrlic Oils, Vegetable Oils, Butane, Acetylene, and Methane.
- Halogenated Hydrocarbons including Amyl Acetate, Propyl Acetate, Ethyl Oxalate, Butyl Acetate, and Butyl Propionate.
- Softeners including Palatinol C, Chloroparaffine 5XX, Dioctylphosphate, Desavin, Mesamol, and Dibutylphosphate.
- Organic Compounds including Benzoic Acid, Lactic Acid, Phenols, Fatty Acids, Malic Acid, and Picric Acid.
- Salts and water solutions including Sodium, Potassium, Calcium, Aluminum, Ammonium, Barium, Copper, Lead, and Lithium.
- Many other agents including Phosphor, Zinc, Glucose Syrup, Sulfur, Urea, Menthol, Antimony, Hydrogen, Rubber, and Shellac.

Special Properties:

- Anti-Odor
- Hydrophilic / Hydrophobic
- Anti-Corrosive

EXPOSURE CONDITIONS INCLUDE: Food Processing & Storage, Airports, Office Buildings, Hotels, Schools, Warehouses, Water Treatment, Breweries, Paper Mills, Refineries, Power Plants, Meat Processing Industries, Automotive Industries and other locations near shorelines and salt water.

Contact your local Bard distributor or representative for a list of all chemicals and additional chemical resistance information.



## ////// CABINET AND CLEARANCE DIMENSIONS - W3VH TO W5VH SERIES UNITS

### CLEARANCES REQUIRED FOR SERVICE ACCESS AND ADEQUATE CONDENSER INLET AIRFLOW

MODELS	LEFT SIDE	RIGHT SIDE
W3VH, W5VH	20"	20"

- 1.) Follow all national, state, and local codes and regulations regarding the installation of heating and cooling equipment regarding Single Packaged Vertical Units (SPVU) including electrical access clearances.
- 2.) Field ventilation installation with the unit installed requires 40" on the left or right side of the unit.
- 3.) Bard recommends a minimum of 10 ft. between the unit front condenser air outlet and solid objects including fences, walls, bushes, and other airflow obstructions.
- 4.) Bard recommends a minimum of 15 ft. between the condenser air outlets of 2 units that are facing each other.
- 5.) Bard recommends a minimum clearance of 4" under the unit cabinet for condenser defrost drainage during heat pump operation.

### MINIMUM CLEARANCES REQUIRED TO COMBUSTIBLE MATERIALS

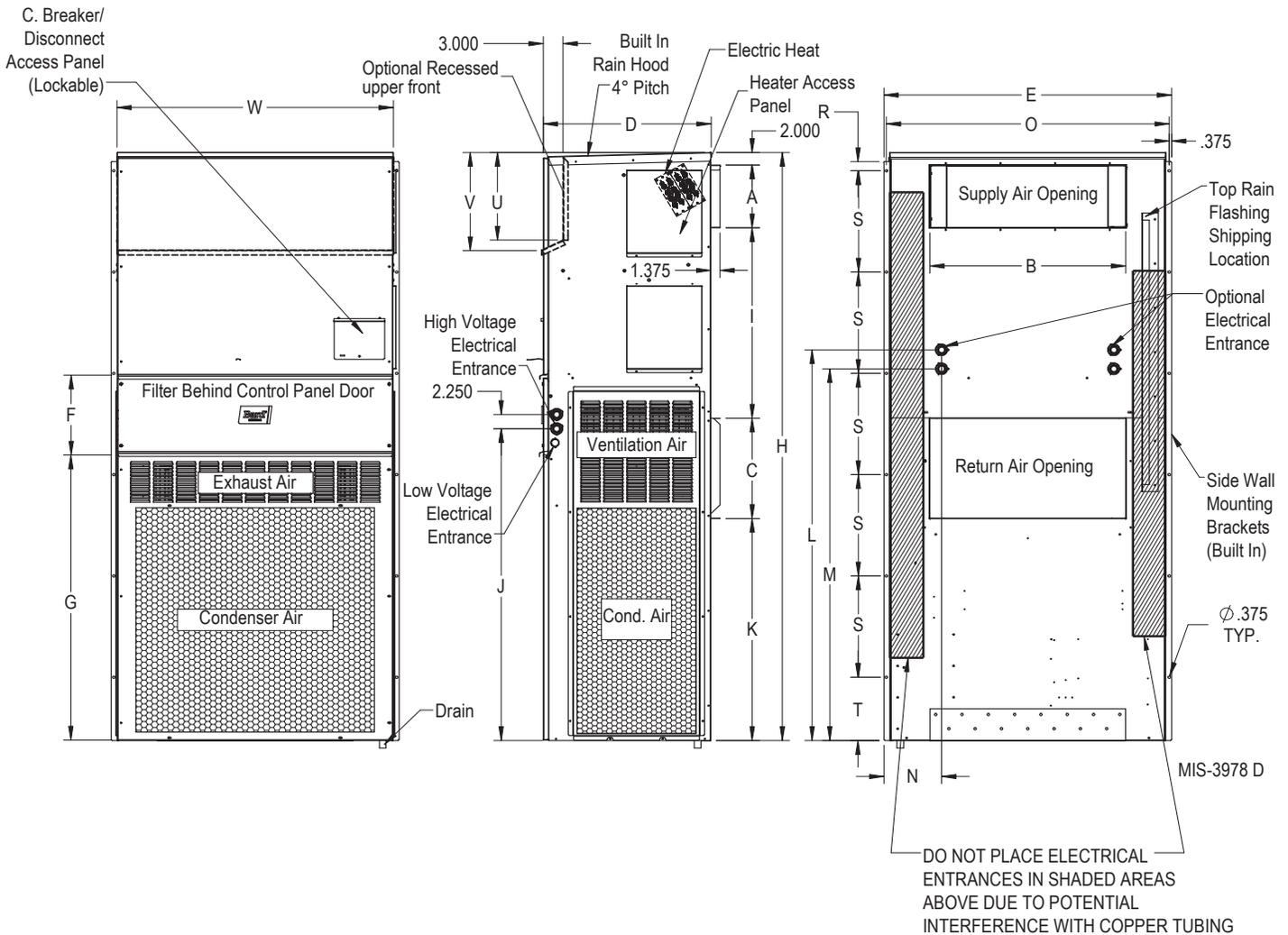
MODELS ①	SUPPLY AIR DUCT FIRST THREE FEET	CABINET
W3VH, W5VH	1/4"	0"

① Refer to the Installation Manual for additional information.

### DIMENSIONS OF W3VH - W5VH BASIC UNIT FOR ARCHITECTURAL & INSTALLATION REQUIREMENTS (NOMINAL)

MODEL	WIDTH (W)	DEPTH (D)	HEIGHT (H)	SUPPLY			RETURN															
				A	B	C	B	E	F	G	I	J	K	L	M	N	O	R	S	T	U	V
W3VH	42	25.52	84.88	9.88	29.88	15.88	29.88	43.88	12.63	39.06	30	53.75	26.94	55.59	52.59	8.82	43	1.438	16	1.88	10.50	12.00
W5VH	42	25.52	93.00	9.88	29.88	15.88	29.88	43.88	12.63	45	30	59.75	35.06	61.72	58.72	8.82	43	1.438	16	10.00	13.88	15.43

① Wall mounting holes in side flanges are 0.375.



## ////// OPTIONAL SHIPPING CRATES

Optional crates are available to help protect your valuable Wall-Mount investment during shipping. Constructed from OSB sheathing with steel corner posts, and sized for standard truck transportation.

CRATE NO.	UNIT MODELS	DESCRIPTION
8620-304	W3VH	Standard Unit Crate, all ventilation options
8620-305	W5VH	Standard Unit Crate, all ventilation options



## ////// NON-DUCTED SUPPLY AND RETURN GRILLES

Supply and return louver grilles are of a brushed aluminum finish. 2" flange versions are recommended for standard installations to allow grille attachment when large wall openings are present. Return filter grilles are available for filter access from an indoor area. Filter grilles do not include a filter, and are not recommended for unit with ventilation due to filter location. A manual damper return grille is available for all models. The manual damper is adjustable, and is only recommended for installations where increased return duct static pressure is required.

GRILLE NO.	UNITS USING GRILLE	DESCRIPTION OF LOUVER GRILLE
<b>SG-5W</b>	ALL UNITS	10" x 30" with 2" Flange 4 way deflection supply grille. <b>Use for standard installations</b>
<b>RG-5W</b>	ALL UNITS	16" x 30" with 2" Flange return grille. <b>Use for standard installations.</b>
<b>RFG-5W</b>	ALL UNITS	16" x 30" with 2" Flange return grille with filter bracket.*
<b>RGDK-5W</b>	ALL UNITS	16" x 30" manual shutter style damper that is mounted in the return duct behind the return grille (sold separately). Adjustable to restrict return air from room.

\* Not recommended to provide primary filtration with units that will bring in outdoor air.

## ////// NON-DUCTED SUPPLY GRILLES - SPREAD AND THROW CHARACTERISTICS

One of the most important setup procedures for non-ducted supply applications is to adjust the 4 way supply grille blade positions. Placement of equipment, occupants, the thermostat, and room size can all play an important role in deciding how the conditioned supply air must be directed in an indoor area. The chart below may be used as a reference tool to help with this process.

SUPPLY GRILLE	AIRFLOW CFM	DEFLECTION	VELOCITY	TOTAL PRESSURE	THROW
<b>SG-5W</b>	1450 CFM	0°	968	.073" WC	51-73 ft.
		22.5°	1071	.103" WC	39-56 ft.
		45°	1331	.169" WC	28-40 ft.
	2000 CFM	0°	1336	.130" WC	61-86 ft.
		22.5°	1477	.188" WC	54-65 ft.
		45°	1835	.335" WC	33-46 ft.



## BRIGHTSTAT ADVANCED CONTROLLER OVERVIEW

The Bard BrightStat provides precise temperature and humidity measurements to the variable speed heat pump unit. The color touchscreen interface is user-defined, with many display options. It includes occupancy scheduling, ventilation settings, optional motion sensing, economizer control, Automated Demand Response (ADR) energy-saving features, customizable LUA scripting, BACnet/IP and ZigBee Pro wireless communication, and multi-language support. All unit control uses a 4-wire connection between the unit and controller for easy installation and replacement of existing equipment.

### Feature Highlights:

- 4-wire connection between the BrightStat and WVH unit for easy installation.
- Precise temperature and humidity control when paired with variable speed compressor technology.
- User-definable color touchscreen interface.
- Occupancy scheduling for setback temperatures and ventilation.
- Economizer setting configuration.
- Compressor and electric heat lockout based on the outdoor temperature.
- BACnet/IP communication with Building Management Systems (BMS).
- Optional motion sensing for occupancy temperature and ventilation control.
- Optional CO2 ventilation control.
- Optional ZigBee wireless for wireless sensors including CO2, temperature, humidity, switches, and motion.



## BRIGHTSTAT ADVANCED CONTROLLER SPECIFICATIONS

### Dimensions

12cm/4.72in (H) x 8.6cm/3.38in (W) x 2.5cm/1in (D)

### Power Requirements

Input: 24Vac ±15%, 50/60Hz

Device consumption: 6 VA

Maximum rating: 100 VA, 4.17 A

### Output Ratings

Maximum total output: 94 VA

Relay rating: 28 Vac 50/60Hz, 1.0 Amp., in-rush = 3.0 Amps; pins 1, 2, 3, 4, 5, 8, 9

Digital optomos output rating: 28 Vac 50/60Hz, 0.3 Amp., in-rush = 1.5 Amps; pins 9, 10, 11, 12

Analog: 0 - 10 Vdc in 2 kilo-ohm resistance minimum load (maximum 5 mA); pins 9, 10, 11, 12

### Operating Conditions

0 °C - 50 °C (32 °F - 122 °F)

0% - 95% R.H. non-condensing

### Storage Conditions

-30 °C - 50 °C (-22 °F - 122 °F)

0% - 95% R.H. non-condensing

### Temperature Sensor

Local 10 K NTC type 2 thermistor

### Temperature Sensor Resolution

± 0.1 °C (± 0.2 °F)

### Temperature Control Accuracy

± 0.5 °C (± 0.9 °F) @ 21 °C (70 °F) typical calibrated

### Humidity Sensor and Calibration

Single point calibrated bulk polymer type sensor

### Humidity Sensor Precision

Reading range from 10-90 % R.H. non-condensing

10 to 20% precision: 10%

20% to 80% precision: 5%

80% to 90% precision: 10%

### Humidity Sensor Stability

Less than 1.0 % yearly (typical drift)

### Dehumidification Setpoint Range

30% - 95% R.H.

### Occ, Stand-By and Unocc Cooling Setpoint Range

12.0 - 37.5 °C (54 - 100 °F)

### Occ, Stand-By and Unocc Heating Setpoint Range

4.5 °C - 32 °C (40 °F - 90 °F)

### Room and Outdoor Air Temperature Display Range

-40 °C - 50 °C (-40 °F - 122 °F)

### Proportional Band for Room Temperature control

Cooling and Heating: Default: 1.8 °C (3.2 °F)

### Analog Inputs

Modulating 0-10 vdc across UI19 to Common

### Binary Inputs

Dry contact across terminals UI16, UI17 and UI19 to Common

### Remote Temperature Sensor Requirements

10 K NTC type 2 thermistor

### Wire Gauge

Power supply: 18 gauge or larger,

Communications: 24 gauge or larger

### Approximate Shipping Weight

0.34 kg (0.75 lb)

### Safety Standards All Models

LVD Directive 2006/95/EC

EN 60950-1:2006/A2:2013UL 873

CSA C22.2 No. 24-93

### EMC Standards All Models

EMC Directive 2004/108/EC

IEC 61326-1:2005

FCC 15 Subpart B

ICES-003

### Radio Standards (Wireless Models)

R&TTE Directive 1999/5/EC

ETSI EN 300 328 V1.8.1

ETSI EN 301 489-1 V1.9.2

ETSI EN 301 328 V1.8.1

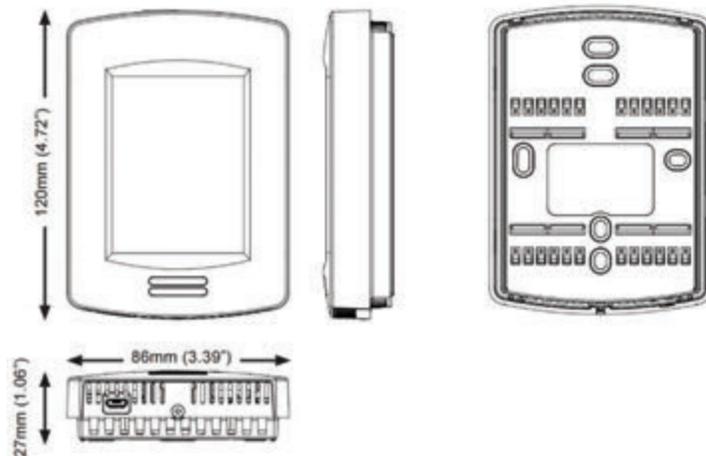
FCC 15 Subpart C

RSS 210

THIS DEVICE COMPLIES WITH PART 15 OF THE FCC RULES. OPERATION IS SUBJECT TO THE FOLLOWING TWO CONDITIONS: (1) THIS DEVICE MAY NOT CAUSE HARMFUL INTERFERENCE, AND (2) THIS DEVICE MUST ACCEPT ANY INTERFERENCE RECEIVED, INCLUDING INTERFERENCE THAT MAY CAUSE UNDESIRABLE OPERATION.



Check with your local government for instruction on disposal of these products.



## ////// BRIGHTSTAT MODELS

BARD PART #	DESCRIPTION
8403-081	BrightStat with Temperature, Humidity, Motion Sensor, and (1) expansion card slot
8403-083	BrightStat with Temperature, Humidity, and (1) expansion card slot
8403-098	BrightStat with Temperature, Humidity, Motion Sensor, ZigBee Pro, and (1) expansion card slot

## ////// BRIGHTSTAT EXPANSION CARDS

BARD PART #	DESCRIPTION
8612-052	Easy Installation ZigBee Pro plug-in card (required for wireless sensors unless using 8403-098)
8612-074	Easy installation CO2 plug-in card for modulating ventilation.
8403-099	Easy installation Wi-Fi plug-in card for wireless Building Management Systems (BMS)

## ////// BRIGHTSTAT WIRED SENSORS

BARD PART #	DESCRIPTION
8612-058	Wired wall-mounted temperature sensor. 10k. 5000ft max. wire length. Up to 3 sensors for averaging.
8612-059	Wired wall-mounted temp and occ sensor. 5000ft max. wire length. Up to 3 sensors for averaging.

## ////// BRIGHTSTAT WIRELESS SENSORS

BARD PART #	DESCRIPTION
8612-053	ZigBee wireless 2-piece magnetic window/door switch (open/close). CR2450 battery.
8612-057	ZigBee wireless wall sensor for occupancy. Lithium battery.
8612-075	ZigBee wireless wall sensor for temperature and humidity. Lithium battery.
8612-076	ZigBee wireless wall sensor for CO2, temperature, and humidity. Lithium battery.
8612-077	ZigBee wireless ceiling sensor for motion, temperature, and humidity. (2) AAA size Lithium batteries.
8612-078	ZigBee wireless water sensor. Leak detection device. (2) AAA size Lithium batteries.



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Due to our continuous product improvement policy,  
all specifications subject to change without notice.

