



Marine
Marvair
AIRXCEL™, Inc.

Marvair
Indoor Air Handlers with Compressors
MVS60-90-120-144 and MVW60-90-120-144

General Description

The Marvair Marine self-contained water and air cooled air conditioners are designed for both new installations and for replacement of older, less efficient units in marine applications. The air conditioners are available in cooling capacities of 5, 7½, 10 and 12 tons (60,000, 90,000, 120,000 & 144,000 BTUH's) and are controlled by a conventional 24 VDC wall mounted, HVAC type thermostat. The vertical configuration minimizes floor space and blends into a variety of working environments. The cool, dry air can be discharged directly into the room or ducted into adjacent rooms. All service and maintenance is performed from the front or side of the unit- no need to move the unit for service or maintenance. To ensure years of dependable performance, all components are housed in a superior corrosion resistant steel cabinet. The galvanneal steel is bonderized and followed by a heat cured enamel neutral gray finish.



Model MVS144

MEMBER
ABYC
Setting Standards for Safer Boating



Air Cooled Units

The MVS air cooled units have an indoor air mover, coil, compressor and controls. A remote condenser (not provided by Marvair) connects to the MVS unit with field installed refrigerant lines. The units are shipped with a dry nitrogen charge and may be used with either R-22 or R-407c refrigerant.

Water Cooled Units

The MVW water cooled air conditioners are packaged units shipped from the factory with R-407c refrigerant and an internal condenser and ready to run. The coaxial tube-in-tube condenser is constructed of corrosion resistant cupronickel water tubing and copper refrigerant tubing for use in either fresh or sea water.

High Efficiency

The latest in scroll compressor technology combine with a lanced fin and rifled tube evaporator coil for low power consumption.

The 10 and 12 ton air conditioners have two compressors, allowing for staged operation. The dual compressors can be programmed to start sequentially, minimizing start-up amps. In addition to better humidity control and comfort, the dual compressors provide back-up protection, increased operating efficiencies and energy savings. The MVW water source units use a heat exchanger constructed of an eight volute, multi-lead cupronickel inner tubing. The convolutions increase transfer and refrigerant turbulence, further enhancing the thermal performance while inhibiting the accumulation of deposits in the water tubing.

Ease of installation and maintenance

The units are pre-piped and wired, minimizing installation time. The readily accessible control center contains all the control components. On the MVS (air cooled) units, a 24 VAC relay is included for the condenser fans. Two condensate drain locations allow the installer to best match the location of the drain to the condensate openings. A secondary drain is standard, provides protection against a clogged primary drain and may eliminate the requirement of a drain pan under the unit.

Rotolock valves on the compressor permit the compressor to be removed and replaced without brazing or recharging the system. Shut-off isolation valves with flare connections on the discharge and liquid lines on air source units facilitate the connection of the remote condenser.

Washable return air filters are conveniently located behind the return air grille.

Engineered for Reliability

The air conditioners are designed for years of dependable operation. High and low pressure switches with a lock out relay protect the compressors under abnormal operating conditions. A three minute delay on make safeguards the compressors from destructive short cycling. The evaporator coils have a baked polyester coating rated to 1,000 hours salt spray test.

Electronic Control Board

The internal control board in the air conditioners simplifies wiring, consolidates several of the electrical functions onto one device and improves the reliability of the air conditioner. In addition, the control board has LED's that indicate operational status and fault conditions.

COLOR	TYPE	STATUS	DESCRIPTION
Green	Power	Constant On	24 VAC power has been applied
Red	Status	Constant On	Normal Operation
		1 Blink	High Pressure Switch has opened twice
		2 Blinks	Low Pressure Switch has opened twice
		3 Blinks	Freeze sensor (optional) indoor coil temperature is below 35°F (1°C)

Modes of Operation

Normal Start-up: On a call for cooling, and the with the high pressure switch closed, the cooling system (compressor, indoor blower motor and outdoor fan motor) will be energized. (Note: See the Delay on Make feature. Outdoor fan motor on air source units only). The cooling system will remain energized during the three minute low pressure switch bypass cycle. If the low pressure is closed, the cooling system will continue to operate after the three-minute bypass. If the low pressure switch is open after the three minute bypass, the cooling system will be de-energized.

Lockout Mode: If either the high or low pressure switch opens twice on the same call for cooling, the control board enters into the lockout mode. In the lockout mode, the compressor is turned off, the alarm output is energized and the status LED's will blink to indicate which fault has occurred. If there is a call for air flow, the indoor blower will remain energized. When the lockout condition has cleared, the unit will reset if the demand of the thermostat is removed or when power is reset. The MVS and MVW air conditioners are factory wired for normally open contacts. The user can now have normally closed contacts by moving a wire on the control board.

Delay on Make: On initial power up or on resumption of power, the air conditioner will wait .03 to 10 minutes (field adjustable) from a call for cooling before allowing the contactor to energize.

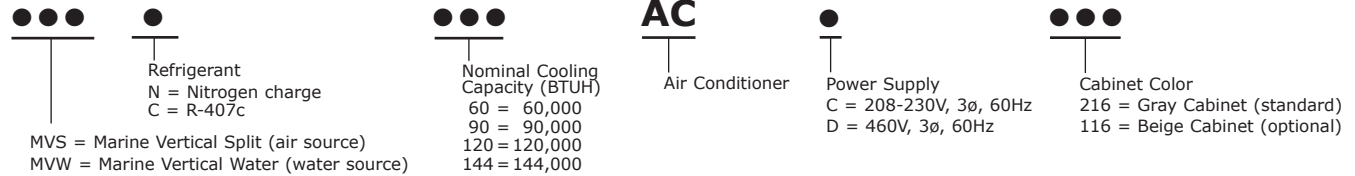
Built in compliance with UL standards

The MVS and MVW air conditioners are built in compliance with UL standard 1995, 2nd edition and CAN/CSA C22, No. 236-5, 2nd edition. The MVS and MVW air conditioners are marine units and are not intended for use in residential applications.

Field Installed Accessories

Thermostat: To control the 10 and 12 ton air conditioners with dual compressors, we recommend the Marvair 50107 digital thermostat. This thermostat is designed for control of 2-stage air conditioners and is 7 day programmable. The thermostat allows for either continuous fan or fan operation only when the compressor is operating. It has status LED's, a backlit display and non-volatile program memory. For air conditioners with a single compressor (the 5 and 7½ ton units) we recommend the Marvair 50123 digital thermostat.

Model Identification



Nominal Cooling Capacity

Model	Nominal Cooling (BTUH)
MVS/MVW60	60,000
MVS/MVW90	90,000
MVS/MVW120	120,000
MVS/MVW144	144,000

Electrical Characteristics - MVSxxxAC Indoor Air Handlers with Compressors (Air cooled)

MODEL	COMPRESSOR					INDOOR BLOWER MOTOR				
	Type	Qty	VOLTS-HZ-PH	RLA ¹	LRA ²	Qty	VOLTS-HZ-PH	RPM ³	FLA ⁴	HP ⁵
MVS60ACC	Scroll	1	200/230-60-3	17.3	123.0	1	230/60/1	1500	4.3	3/4
MVS90ACC	Scroll	1	200/230-60-3	18.6	156.0	2	208-230/60/1	1075	4.8	3/4
MVS120ACC	Scroll	2	200/230-60-3	17.3	123.0	2	208-230/60/1	1075	7.2	1
MVS144ACC	Scroll	1	200/230-60-3	17.3	123.0	2	208-230/60/1	1075	7.2	1
	Scroll	1	200/230-60-3	18.6	156.0					
MVS60ACD	Scroll	1	460-60-3	8.2	62.0	1	230/60/1	1500	4.3	3/4
MVS90ACD	Scroll	1	460-60-3	9.0	75.0	2	208-230/60/1	1075	4.8	3/4
MVS120ACD	Scroll	2	460-60-3	8.2	62.0	2	208-230/60/1	1075	7.2	1
MVS144ACD	Scroll	1	460-60-3	8.2	62.0	2	208-230/60/1	1075	7.2	1
	Scroll	1	460-60-3	9.0	75.0					

¹RLA = Rated Load Amps ²LRA = Locked Rotor Amps ³RPM = Revolutions per Minute

⁴FLA = Full Load Amps ⁵HP = Horse Power

All 460 v. units have a step down transformer for 230v. motors.

This chart should only be used as a guideline for estimating conductor size and overcurrent protection. For the requirements of specific units, always refer to the data label on the unit.

Summary Ratings (Wire Sizing) Amps - MVSxxxAC Indoor Air Handlers with Compressors (Air cooled)

MODEL	CIRCUIT #1		CIRCUIT #2	
	MCA	MFS	MCA	MFS
MVS60ACC	25.9	40	n/a	n/a
MVS90ACC	32.9	50	n/a	n/a
MVS120ACC	28.8	45	28.8	45
MVS144ACC	30.5	45	28.8	45
MVS60ACD	12.4	20	n/a	n/a
MVS90ACD	16.1	25	n/a	n/a
MVS120ACD	13.9	20	13.9	20
MVS144ACD	14.9	20	13.9	20

MCA = Minimum Circuit Ampacity MFS = Maximum Fuse or HACR circuit breaker.
MFS & MCA calculated at 240v. For 460v. models ("D" models), MCA & MFS calculated at 460v.
All 460 v. units have a step down transformer for 230v. motors. This chart should only be used as a guideline for estimating conductor size and overcurrent protection. For the requirements of specific units, always refer to the data label on the unit.

Electrical Characteristics - MVWxxxAC (Water cooled air conditioners)

MODEL	COMPRESSOR					INDOOR BLOWER MOTOR				
	Type	Qty	VOLTS-HZ-PH	RLA ¹	LRA ²	Qty	VOLTS-HZ-PH	RPM ³	FLA ⁴	HP ⁵
MVW60ACC	Scroll	1	200/230-60-3	17.3	123.0	1	230/60/1	1500	4.3	3/4
MVW90ACC	Scroll	1	200/230-60-3	18.6	156.0	2	208-230/60/1	1075	4.8	3/4
MVW120ACC	Scroll	2	200/230-60-3	17.3	123.0	2	208-230/60/1	1075	7.2	1
MVW144ACC	Scroll	1	200/230-60-3	17.3	123.0	2	208-230/60/1	1075	7.2	1
	Scroll	1	200/230-60-3	18.6	156.0					
MVW60ACD	Scroll	1	460-60-3	8.2	62.0	1	230/60/1	1500	4.3	3/4
MVW90ACD	Scroll	1	460-60-3	9.0	75.0	2	208-230/60/1	1075	4.8	3/4
MVW120ACD	Scroll	2	460-60-3	8.2	62.0	2	208-230/60/1	1075	7.2	1
MVW144ACD	Scroll	1	460-60-3	8.2	62.0	2	208-230/60/1	1075	7.2	1
	Scroll	1	460-60-3	9.0	75.0					

¹RLA = Rated Load Amps ²LRA = Locked Rotor Amps ³RPM = Revolutions per Minute
⁴FLA = Full Load Amps ⁵HP = Horse Power

All 460 v. units have a step down transformer for 230v. motors.

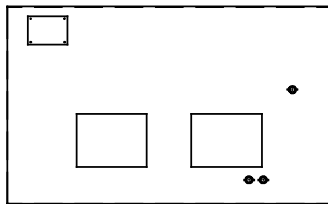
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Summary Ratings (Wire Sizing) Amps - MVWxxxAC (Water cooled air conditioners)

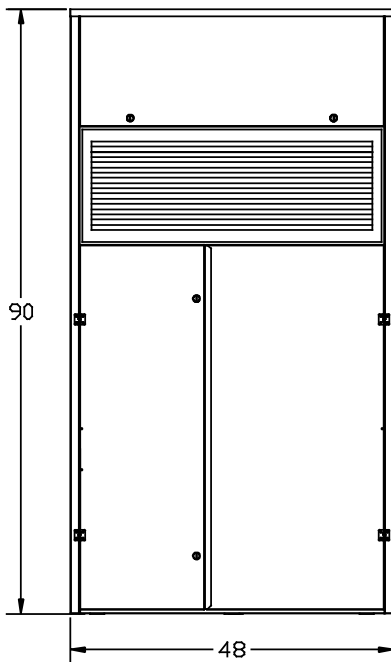
MODEL	CIRCUIT #1		CIRCUIT #2	
	MCA	MFS	MCA	MFS
MVW60ACC	25.9	40	n/a	n/a
MVW90ACC	32.9	50	n/a	n/a
MVW120ACC	28.8	45	28.8	45
MVW144ACC	30.5	45	28.8	45
MVW60ACD	12.4	20	n/a	n/a
MVW90ACD	16.1	25	n/a	n/a
MVW120ACD	13.9	20	13.9	20
MVW144ACD	14.9	20	13.9	20

MCA = Minimum Circuit Ampacity MFS = Maximum Fuse or HACR circuit breaker.
MFS & MCA calculated at 240v. For 460v. models ("D" models), MCA & MFS calculated at 460v.
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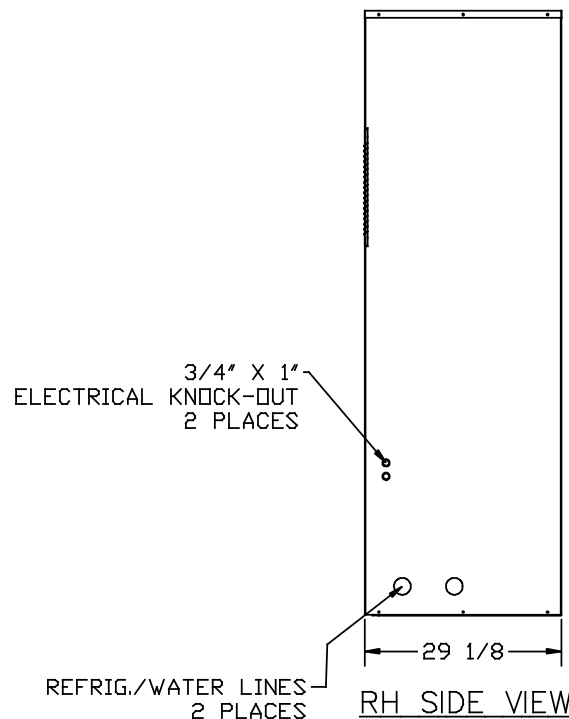
Dimensional Drawings - MVx60



TOP VIEW

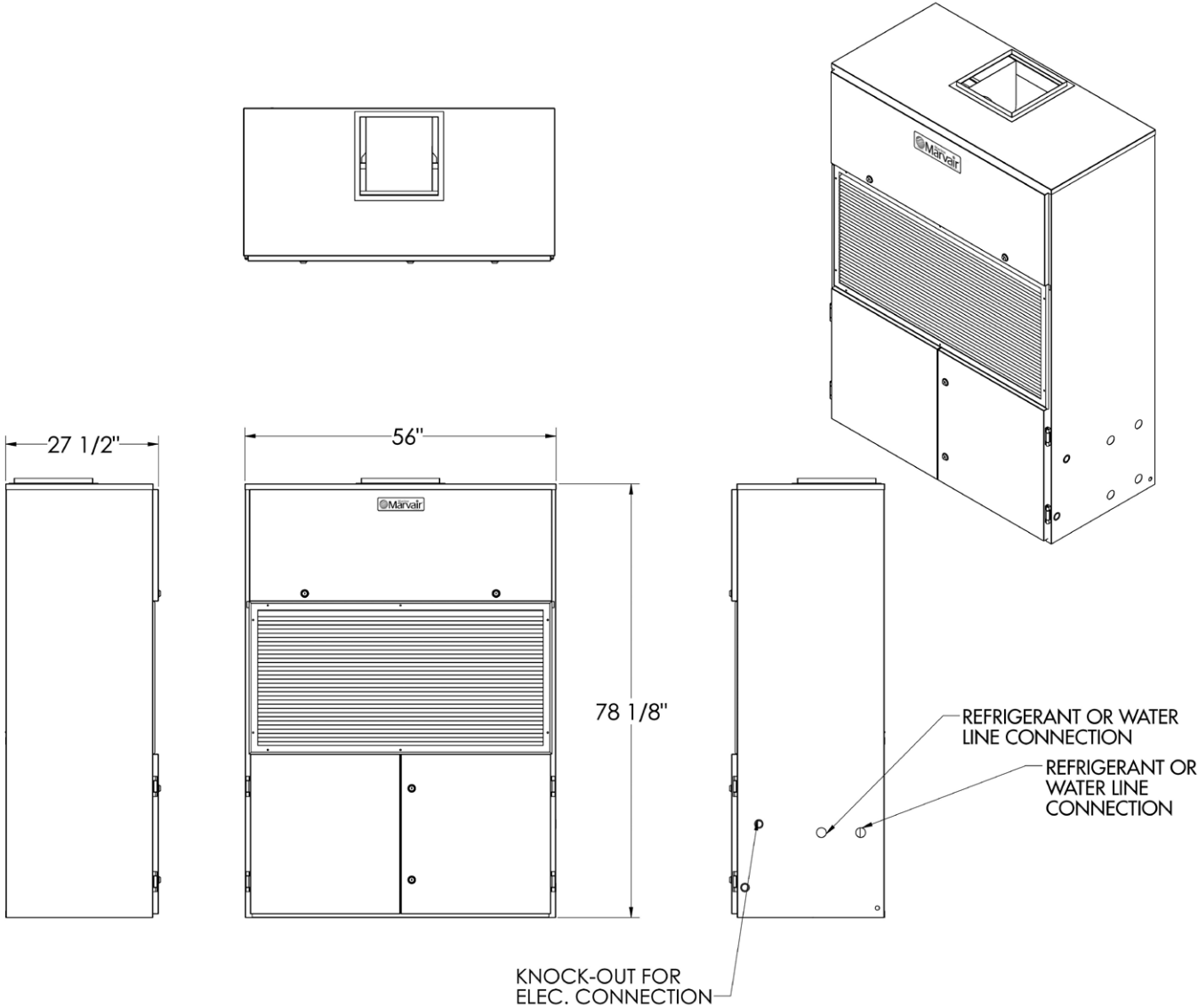


FRONT VIEW

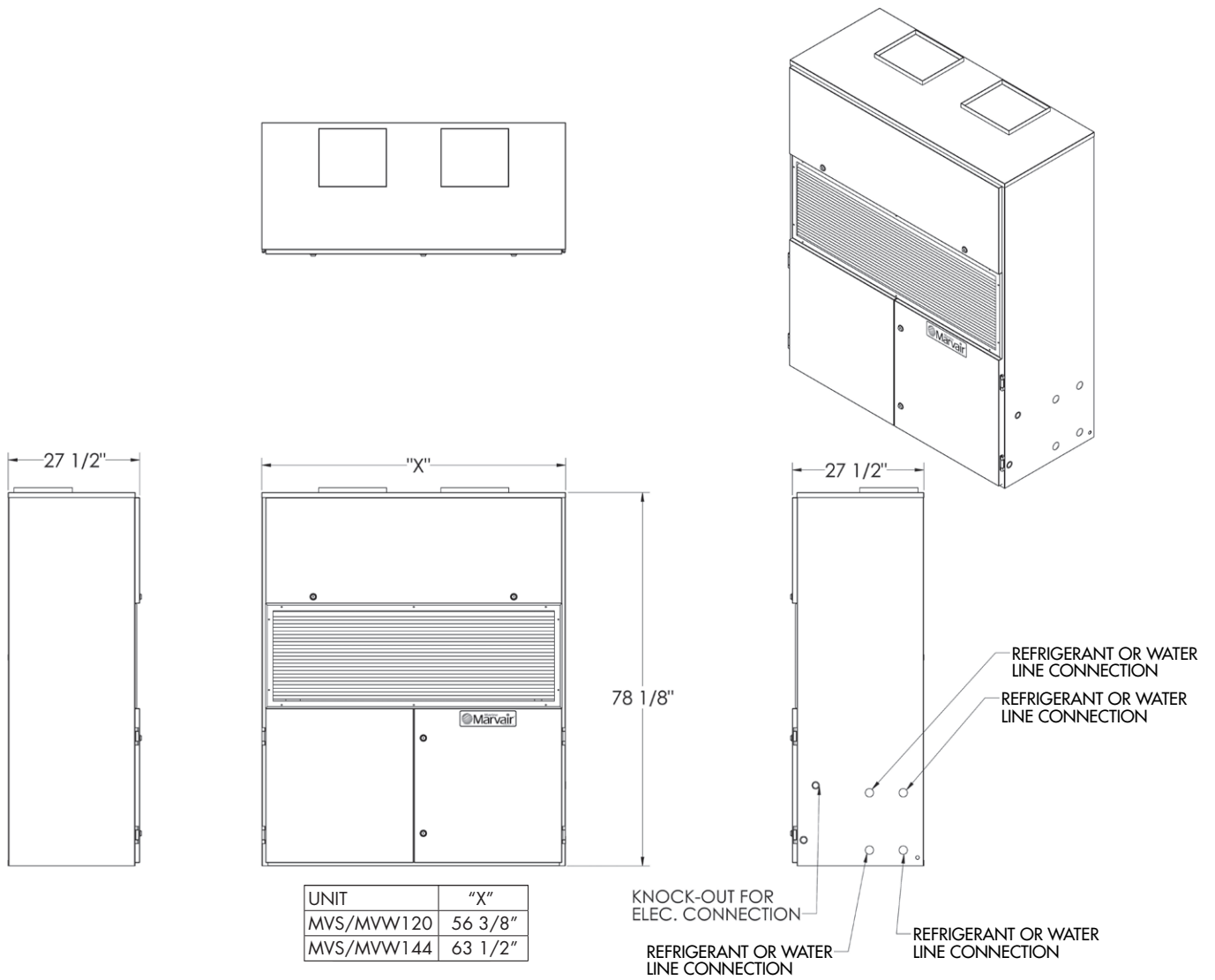


RH SIDE VIEW

Dimensional Drawings - MVx90



Dimensional Drawings - MVx120/144



Notes

Please consult the Marvair website at www.marvair.com for the latest product literature. Detailed dimensional data is available upon request. A complete warranty statement can be found in each product's Installation or Owner's manual, on the website or by contacting Marvair. As part of the Marvair Continuous improvement program, all specifications are subject to change without notice.

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