

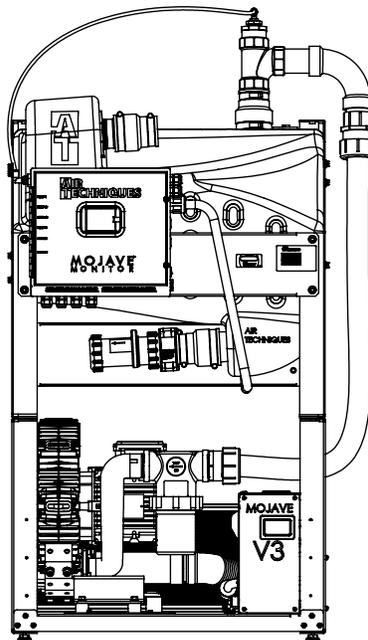
# MOJAVE<sup>®</sup> MONITOR

DRY VACUUM SYSTEM

PART NUMBERS:

V3M, V5M, V7M, 2V3M, 2V3MCT, 2V5M, 2V5MCT, 2V7M, 3V5M AND 4V5M

## USER'S AND INSTALLATION MANUAL



**AIR**  
**TECHNIQUES** equipped for life<sup>®</sup>



**Monarch CleanStream** is the ONLY vacuum line cleaner Air Techniques recommends for daily use to ensure the highest performance and longevity of your Mojave Monitor.

# **TABLE OF CONTENTS**

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<b><u>Description</u></b>	<b><u>Page</u></b>
Congratulations . . . . .	4
Safety Summary . . . . .	4
Purpose of this Manual . . . . .	5
Sizing Guide . . . . .	5
Specifications . . . . .	6
Product Description . . . . .	7
Installation Information . . . . .	10
MOJAVE System Configurations . . . . .	14
Installation . . . . .	15
V3M, V5M and V7M System Installation . . . . .	16
Master Controller Controller Assembly and Washout Solenoid . . . . .	
Optional Mounting . . . . .	17
2V3M, 2V3MCT, 2V5M, 2V5MCT and 2V7M System Installations . . . . .	20
3V5M and 4V5M System Installation . . . . .	23
Electrical Connections . . . . .	26
Operating Information . . . . .	29
Touchscreen Controls . . . . .	31
Operation . . . . .	37
Troubleshooting . . . . .	38
Vision Monitor, Remote Monitoring Solution . . . . .	40
Maintenance . . . . .	41
Replacement Parts . . . . .	43
Accessories/Options . . . . .	44
Warranty . . . . .	44
Online Warranty Registration . . . . .	44

## ***LIST OF ILLUSTRATIONS***

<b><u>Figure</u></b>	<b><u>Description</u></b>	<b><u>Page</u></b>
1	Main System Components . . . . .	8
2	Typical MOJAVE Functional Flow Diagram . . . . .	9
3	MOJAVE System Component Dimensions. . . . .	11
4	V3M, 2V3M, 2V3MCT, V5M, V7M, 2V5M, 2V5MCT, 2V7M, 3V5M and 4V5M System Floor Plan . . . . .	13
5	MOJAVE System Configuration Layouts . . . . .	14
6	Stacking the MT10-M Tank on Top of a MOJAVE Pump Hardware Detail. .	15
7	Stacking Two MOJAVE Pumps Hardware Detail . . . . .	15
8	MOJAVE Master Controller Assembly and Washout Solenoid Optional Mounting . . . . .	17
9	MOJAVE V3M/V5M/7VM Pump and MT10-M Tank Connection Diagram, Sheet 1 . . . . .	18
9	MOJAVE V3M/V5M/V7M Pump and MT10-M Tank Connection Diagram, Sheet 2 . . . . .	19
10	MOJAVE Dual Pump and CT20-M Tank Connection Diagram, Sheet 1 . .	21
10	MOJAVE Dual Pump and CT20-M Tank Connection Diagram, Sheet 2 . .	22
11	Pump/Tank Connection Manifold Fabrication . . . . .	24
12	3V5M or 4V5M System Connection Detail Using Accessory Kit. . . . .	25
13	MOJAVE Pump Power Connection . . . . .	26
14	Master Controller Wiring Diagram . . . . .	26
15	Remote Switch Connection Options. . . . .	27
16	CleanStream Dispenser Cap Adaptor Locations . . . . .	42

## CONGRATULATIONS

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Congratulations on the purchase of your new **MOJAVE** Monitor Dry Vacuum System that provides state of the art regenerative side channel vacuum technology. This vacuum system is designed for reliable operation in the modern dental facility. The system uses a 100% oil-less Vacuum Pump to produce the high-volume air flow required for multiple simultaneous users, while the Separator Tank ensures that no liquids enter the pump.

In addition, the system incorporates an efficient energy management system. This is accomplished using a Variable Frequency Drive (VFD) for each Vacuum Pump, which is controlled by a Master Controller. This controller automatically adjusts the frequency of the pumps to maintain the required vacuum level depending on the needs of your dental facility. With this balanced system, each user always has the flow rate necessary to do the job while conserving electricity and prolonging the life of your pumps. The **MOJAVE** Monitor Dry Vacuum System is hereafter referred to as **MOJAVE** in this manual.

## SAFETY SUMMARY

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Use of **MOJAVE** not in conformance with the instructions specified in this manual may result in permanent failure of the unit.

**WARNING:** To prevent fire or electrical shock, do not expose this appliance to rain or moisture.  
All user serviceable items are described in the maintenance section.

### ATTENTION USERS:

**Markings.** The following terms or symbols are used on the equipment or in this manual to denote information of special importance:



Alerts users to important Operating and Maintenance instructions. Read carefully to avoid any problems.



Warns users of hot surfaces. There is a danger of burns. Work near these surfaces only after they have cooled down.



Warns users that uninsulated voltage within the unit may be of sufficient magnitude to cause electric shock.



Identifies the name of the manufacturer.



Indicates the ON and OFF position for the Equipment power switch.



Indicates date of manufacture



Indicates protective Earth Ground for the Equipment power switch.



Air Techniques, Inc.  
1295 Walt Whitman Road  
Melville, New York, USA 11747- 3062



MEDICAL ELECTRICAL EQUIPMENT

WITH RESPECT TO ELECTRICAL SHOCK, FIRE, MECHANICAL  
AND OTHER SPECIFIED HAZARDS ONLY  
IN ACCORDANCE WITH UL 60601-1, CAN/CSA C22.2 No. 601.1  
66CA

## **PURPOSE OF THIS MANUAL**

This manual provides installation, operation and maintenance instructions for the support of the eight available **MOJAVE** system configurations listed below. Although not listed, each system also includes a Master Controller. Review and follow the guidelines included in this User Manual to ensure that the system provides the highest level of service.

<b>System</b>	<b>Description</b>	<b>Maximum Users</b>
V3M	One V3M Dry Vacuum Pump and an MT10-M Tank	5
V5M	One V5M Dry Vacuum Pump and an MT10-M Tank	7
V7M	One V7M Dry Vacuum Pump and an MT10-M Tank	10
2V3M	Two V3M Dry Vacuum Pumps and an MT10-M Tank	10
2V3MCT	Two V3M Dry Vacuum Pumps and a CT20-M Tank	10
2V5M	Two V5M Dry Vacuum Pumps and an MT10-M Tank	14
2V5MCT	Two V5M Dry Vacuum Pumps and a CT20-M Tank	14
2V7M	Two V7M Dry Vacuum Pumps and an CT20-M Tank	20
3V5M	Three V5M Dry Vacuum Pumps and a CT20-M Tank	20
4V5M	Four V5M Dry Vacuum Pumps and a CT20-M Tank	25

## **-sizing GUIDE**

Choosing the right configuration of **MOJAVE** for your practice depends on the number of vacuum users and the anticipated demand. To ensure optimum operation, the demands should not exceed the number of vacuum users shown below. The chart lists the number of simultaneous High Volume Evacuators (HVEs) and Saliva Ejectors (SEs) that can be used in specific **MOJAVE** system configurations.

**Recommended Number of Simultaneous HVE/SE Users**

V3M		V5M		V7M		2V3 or 2V3CT		2V5M or 2V5MCT		2V7M		3V5M		4V5M	
HVE	SE	HVE	SE	HVE	SE	HVE	SE	HVE	SE	HVE	SE	HVE	SE	HVE	SE
5	+ 0	7	+ 0	10	+ 0	10	+ 0	14	+ 0	20	+ 0	20	+ 0	25	+ 0
4	+ 2	6	+ 2	9	+ 2	9	+ 2	13	+ 2	18	+ 4	18	+ 4	20	+ 10
2	+ 6	5	+ 4	7	+ 6	7	+ 6	12	+ 4	13	+ 14	13	+ 14	18	+ 14
0	+ 10	4	+ 6	5	+ 10	5	+ 10	9	+ 10	10	+ 20	10	+ 20	13	+ 24
		0	+ 14	3	+ 14	3	+ 14	6	+ 16	8	+ 24	8	+ 24	10	+ 30
<b>Note:</b> 1 HVE = 2 SE's 1 HVE = 2 Nitrous Scavengers				1	+ 18	1	18	2	+ 24	5	+ 30	5	+ 30	8	+ 34
				0	+ 20	0	20	0	+ 28	0	+ 40	0	+ 40	0	+ 50

## SPECIFICATIONS

Master Controller Electrical Specifications		
Voltage (Volts AC Single Phase $\pm$ 10%)	120 (See Note)	220 (See Note)
Full Load Current (Amps AC)	5	5
Input Frequency (Hz)	60	50/60

**Notes:**  
 120V MMC-M used with MT10-M & CT20-M  
 220V MMC-M used with MT12-M & CT22-M

Pump Electrical Specifications	V3M	V5M	V7M	2V3M & 2V3MCT	2V5M & 2V5MCT	2V7M	3V5M	4V5M
Voltage (Volts AC $\pm$ 10%)	220	220	220	220	220	220	220	220
Full Load Current (Amps AC)	12	15	18	24	30	36	45	60
Input Frequency (Hz)	50/60	50/60	50/60	50/60	50/60	50/60	50/60	50/60
Preset Vacuum Level (InHg)	8	8	8	8	8	8	8	8
Horsepower	1.6	1.9	2.1	3.2	3.8	4.2	5.7	7.6

Tank Specifications	V3M, V5M, V7M, 2V3M & 2V5M	2V3MCT, 2V5MCT, 2V7M, 3V5M & 4V5M
Working Liquid Capacity	MT10-M Tank 10 gallon maximum capacity	CT20-M Continuum Tank infinite volume capacity
Tank Material (All systems)	Rotomolded Plastic	Rotomolded Plastic

### Water usage in Gallons Per Minute (GPM) at different facility water pressures.

Water Pressure (PSI)	Total gallons used in 2 minute washout cycle	
	MT10-M	CT20-M
20	7.4	14.8
30	9.0	18.0
40	10.4	20.8
50	11.6	23.2
60	12.7	25.4
80	14.7	29.4
100	16.4	32.8

### System Environmental Conditions (All Systems)

Operating Temperature	40 to 104°F or 10 to 40°C
Storage and Transport Temperature	32 to 158°F or 0 to 70°C
Operating Relative Humidity	80%, no condensation
Storage and Transport Relative Humidity	90%, no condensation

### UL60601-1 CLASSIFICATION

Protection against electrical shock (5.1, 5.2) Class I, Transportable, Continuous Operation. No applied parts. Protection against ingress of liquids-Ordinary Equipment not suitable for use in the presence of flammable anaesthetic mixture with air or with oxygen or nitrous oxide.

All MOJAVE vacuum pumps comply with NFPA 99C level 3 requirements.

As shown by Figure 1, **MOJAVE** consists of the major components listed below.

### **Vacuum Pump Assemblies V3M, V5M or V7M.**

- A single-stage pump, where all of the wetted metal parts are nickel plated or stainless steel.
- A metal electrical enclosure that houses a VFD, circuit breaker, Cooling Fan and an interface PCB.
- An aluminum heat exchanger to cool the exhaust air from the pump before it travels through the exhaust vent. (Heat exchanger not included with -NHE models).
- A metal chassis for mounting components.

### **10 Gallon Separation Tank Assembly MT10-M.**

- A molded plastic tank that is capable of holding 10 gallons of liquid.
- An internal float switch that signals the Master Controller to turn the vacuum pump OFF if the liquid level exceeds the preset level.
- A washout port with internal nozzle that is used to rinse the interior of the tank during the automatic Washout Cycle.
- A metal chassis for mounting components.

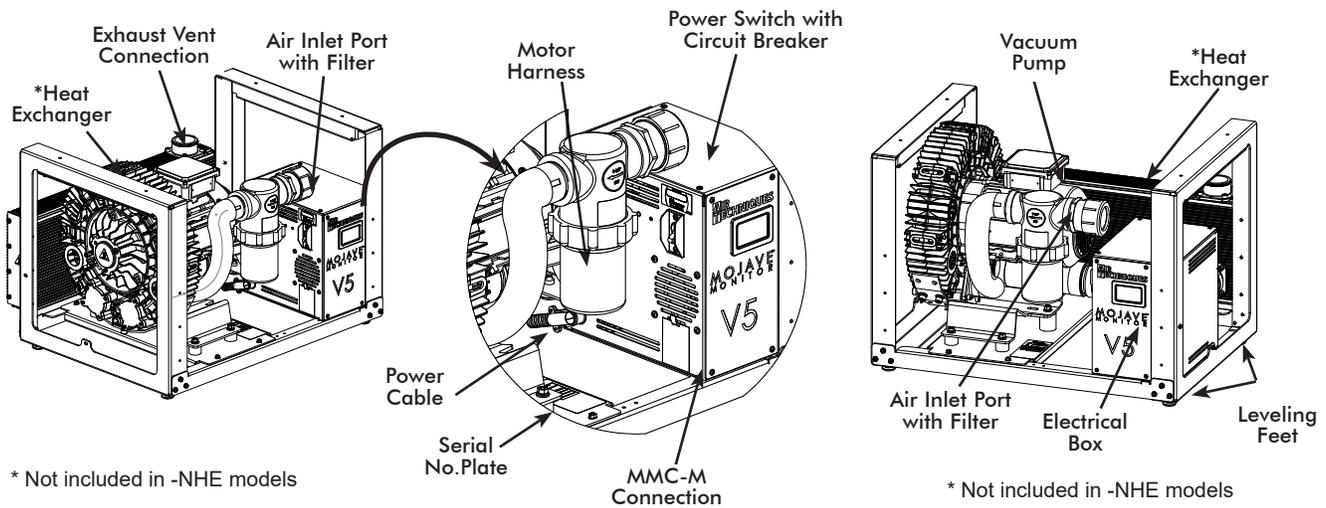
### **Continuum Separation Tank Assembly CT20-M.**

- The continuum tank combines two molded plastic tanks connected via a check valve and two solenoid valves. This tank is capable of handling an infinite volume of liquid because one tank section drains as the other tank section fills, while maintaining a preset vacuum level.
- Each tank has an internal float switch that signals the Master Controller to toggle the state of the tank and air solenoid.
- Solenoids keep the liquid moving through the tanks by controlling the venting and pressurization of each tank.
- Each tank has a washout port with internal nozzle that is used to rinse the interior of the tank during the automatic Washout Cycle.
- A metal chassis for mounting components.

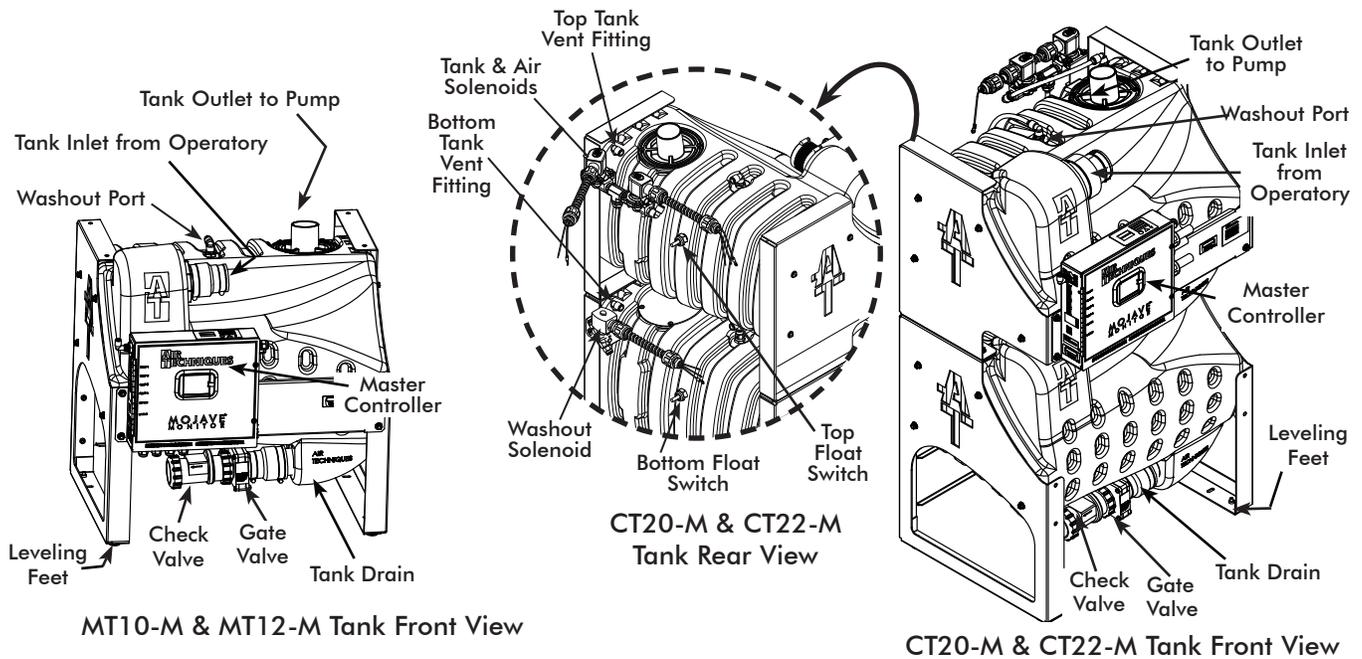
**Master Controller.** This self-contained metal enclosure is mounted on the front of the MT10-M or CT20-M tank chassis. The unit includes a Main PCB, a LCD Display and Touchscreen that provides the following system functions:

- Provides the operational user interface for the **MOJAVE** system.
- Monitors and displays the frequency, vacuum level and temperature.
- Records the run time, in hours, of up to 4 connected pumps.
- Balances the vacuum load equally across all running pumps.
- Displays any error/fault codes.
- Controls the Washout function.

# PRODUCT DESCRIPTION

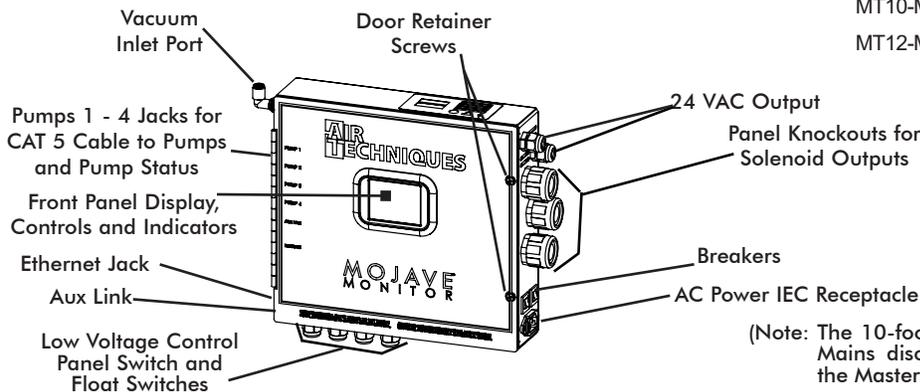


V3M, V5M and V7M Vacuum Pumps



**Notes:**

MT10-M & CT20-M used with 120V MMC-M  
 MT12-M & CT22-M used with 220V MMC-M



(Note: The 10-foot Line Cord is the Mains disconnect device for the Master Controller.)

MOJAVE Master Controller

Figure 1. Main System Components



Any time the power to the MOJAVE is turned OFF the tanks will automatically drain.

**Vacuum System Operation.**

Air, water, and solids from the operatory are pulled into the separator tank. Air is expelled out through the pump exhaust while liquids and solids fall to the bottom of the tank. The vacuum in the tank keeps the check valve to the drain closed and the tank gradually fills.

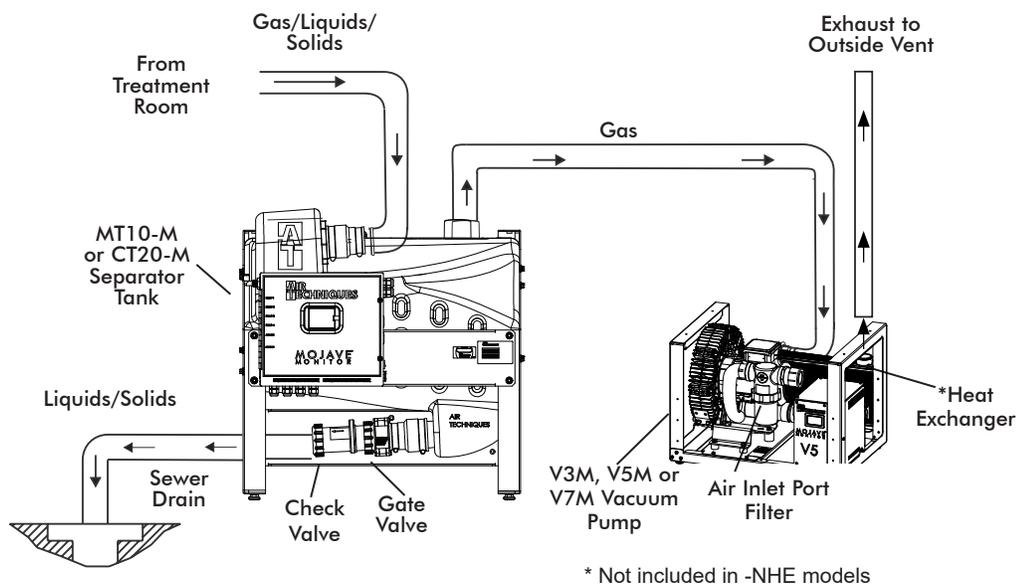
In single tank (MT10-M) configurations, if the rising fluid level actuates the float switch, the Master Controller stops the operation of all connected pumps and an optional drain pump (sold separately) is turned on for one minute. With pump operation idle, the vacuum is no longer being maintained and the check valve of the tank drain opens allowing liquids and solids to drain from the separator tank. Once the tank drains, the Master Controller automatically restarts the primary pump.

Systems using the continuum tank (CT20-M), which is capable of handling infinite liquid volume capacities, operate differently. Each tank has an internal float switch. The tanks also use two 2-way solenoids. The float switches control the state of the two solenoids to allow the filling and draining of each tank, keeping the liquid moving through the tanks. When the top tank is filling, the bottom tank is draining and when a bottom tank is filling, the top tank is draining. The preset vacuum level is maintained in either state. If the top float switch is active, the Master Controller stops the operation of all connected pumps. Once the tank drains, the Master Controller automatically restarts the primary pump.

When an instrument (suction tip) has been opened, the Master Controller senses an increase in vacuum demand and will instruct the VFD to speed up the motor.

Conversely, when an instrument (suction tip) has been closed, the Master Controller will instruct the VFD to slow motor operation down due to decreased vacuum demand. The Master Controller can also turn on and off up to 4 connected pumps to regulate the vacuum level.

Additionally, the Master Controller initiates a 2-minute tank washout cycle when the system has been in Standby for 5 minutes.



**Figure 2. Typical MOJAVE Functional Flow Diagram**

## INSTALLATION INFORMATION



Grounding reliability can only be achieved when the Master Controller is connected to a HOSPITAL GRADE receptacle.

**General.** For new installations it is recommended to follow the following guidelines:

- Make sure to install the system in accordance with all local electrical and plumbing codes.
- Sizes of each suction line from the operatories differ between **MOJAVE** systems. See Site Requirements provided on page 12.
- The suction line should not have any sharp right angle bends and must be sloped a minimum of ¼ inch for every 10 feet toward the separation tank.
- The drain on the base of the separation tank must be connected to a vented or an open floor drain capable of handling 10 gallons in 30 seconds. Drain pipe size 1 ½ inch schedule 40.
- The drain line should be a short run with a minimum slope of ¼ inch for every 10 feet toward the drain (avoid any sharp right angle bends).
- Vent line requirements differ among **MOJAVE** systems. See Site Requirements.
- Make sure to install the supplied exhaust vent assembly to the bottom end of the facility vent line.
- The vent should be sloped ¼ inch per 10 feet towards the pump. Vent lines must be capable of handling vapors and liquids.
- The outside vent must be protected from rain and animals.
- A flexible air exhaust hose is provided to connect to the 2 inch diameter vent pipe and heat exchanger. Hose clamps are provided to secure hose to heat exchanger and pipe.
- Wash-out water supplied via ½ inch copper tubing terminated with a ½ inch FNPT shut-off valve providing water pressure between 20 and 100 psi.
- Wash-out port on the tank top is a ¾ inch push to connect elbow that connects to the water supply via supplied 10 foot ¾ inch Poly tubing and ½ MNPT x ¾ inch push to connect adapter.
- As shown by Figure 1, the Master Controller is delivered mounted on the front chassis of the fully assembled MT10-M or CT20-M tank associated with the system. In addition to the water connection at the washout solenoid, electrical and vacuum connections must also be made.
- Accessory packs and system installation kits shipped with associated **MOJAVE** systems are listed below. Refer to the Installation Section for a listing of components supplied with each kit and the instructions necessary to install specific **MOJAVE** systems.
- Run a network cable into the room where you will set up your Mojave to allow connection to the Vision Monitor.
- Constant power **MUST** be supplied to the system at all times. Applications where power cannot be constantly provided, such as in many mobile dentistry environments, are not recommended for use with this system and will void the warranty.

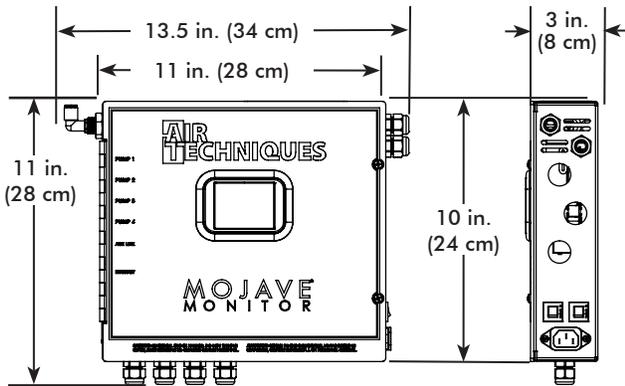
### MOJAVE Accessory Packs and System Installation Kits

Part No.	Description	Included With
H5210	MT10-M 120V Tank Accessory Pack	Ships with every 120V MT10-M tank
H5479	MT12-M 220V Tank Accessory Pack	Ships with every 220V MT12-M tank
H5170	MOJAVE V3M, V5M and V7M Pump Accessory Pack	Ships with every V3M Pump, V5M Pump and V7M Pump
H5307	MOJAVE V3M, V5M, V7M without Heat Exchanger Pump Accessory Pack"	Ships with every V3M Pump, V5M Pump and V7M Pump
MIK2	MOJAVE Dual System Installation Kit	Ships with every 2V3M, 2V5, 2V7M, 2V3MCT and 2V5MCT System
MIK4	MOJAVE Triple and Quad System Installation Kit	Ships with every 3V5M and 4V5M System
H5243	CT20-M 120V Tank Accessory Pack	Ships with every 120V CT20-M tank
H5289	CT22-M 220V Tank Accessory Pack	Ships with every 220V CT22-M tank

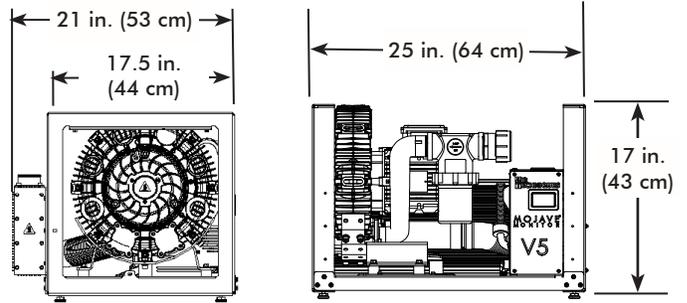
# INSTALLATION INFORMATION

## Physical Characteristics

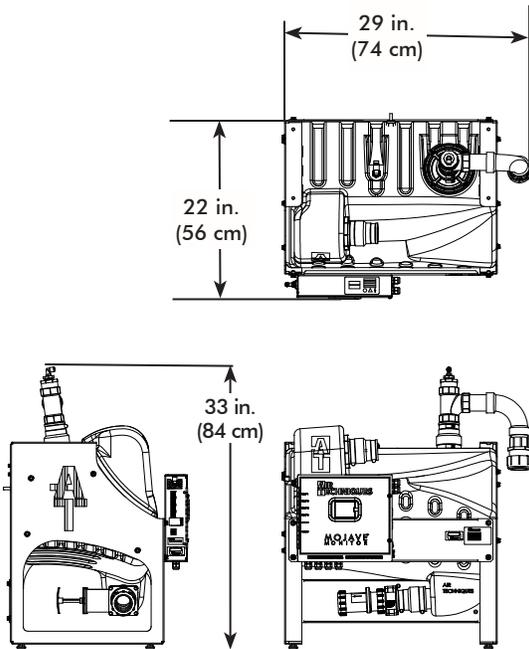
	Master Controller	Tank		One V3M, V5M or V7M Pump	Two V3M, V5M or V7M Pumps Stacked	Three V5M Pumps Stacked	Four V5M Pumps (Two Stacked Side by Side)
		MT10-M 10 Gallon	CT20-M Continuum				
Width	13.5 in. (34 cm)	29 in. (74 cm)	25 in. (64 cm)	25 in. (64 cm)	25 in. (64 cm)	25 in. (64 cm)	54 in. (138 cm)
Depth	3 in. (8 cm)	22 in. (56 cm)	23 in. (58 cm)	21 in. (53 cm)	21 in. (53 cm)	21 in. (53 cm)	21 in. (53 cm)
Height	11 in. (28 cm)	33 in. (84 cm)	50 in. (127 cm)	17 in. (43 cm)	34 in. (86 cm)	51 in. (130 cm)	34 in. (86 cm)
Weight	13 Lbs. (6 kg)	75 Lbs. (34 kg)	150 Lbs. (68 kg)	145 Lbs (66 kg)	290 Lbs (132 kg)	435 Lbs (197 kg)	580 Lbs (263 kg)



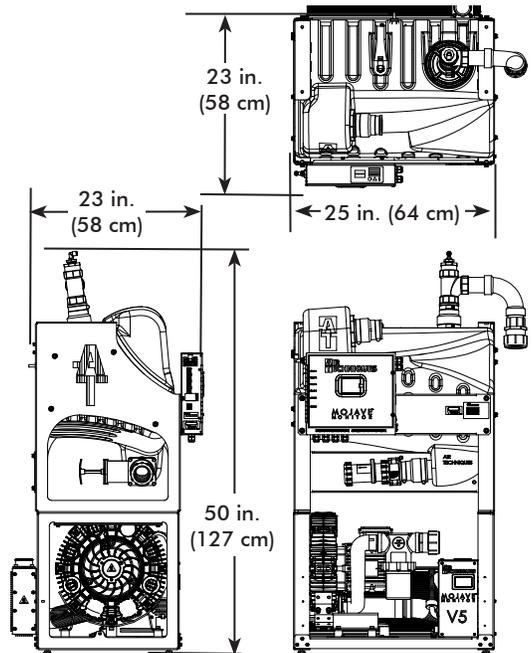
Master Controller Dimensions



V3M, V5M and V7M Vacuum Pump Dimensions



MT10-M 10 Gallon Tank Dimensions



CT20-M Continuum Tank Dimensions

Figure 3. MOJAVE System Component Dimensions

# INSTALLATION INFORMATION

## Site Requirements

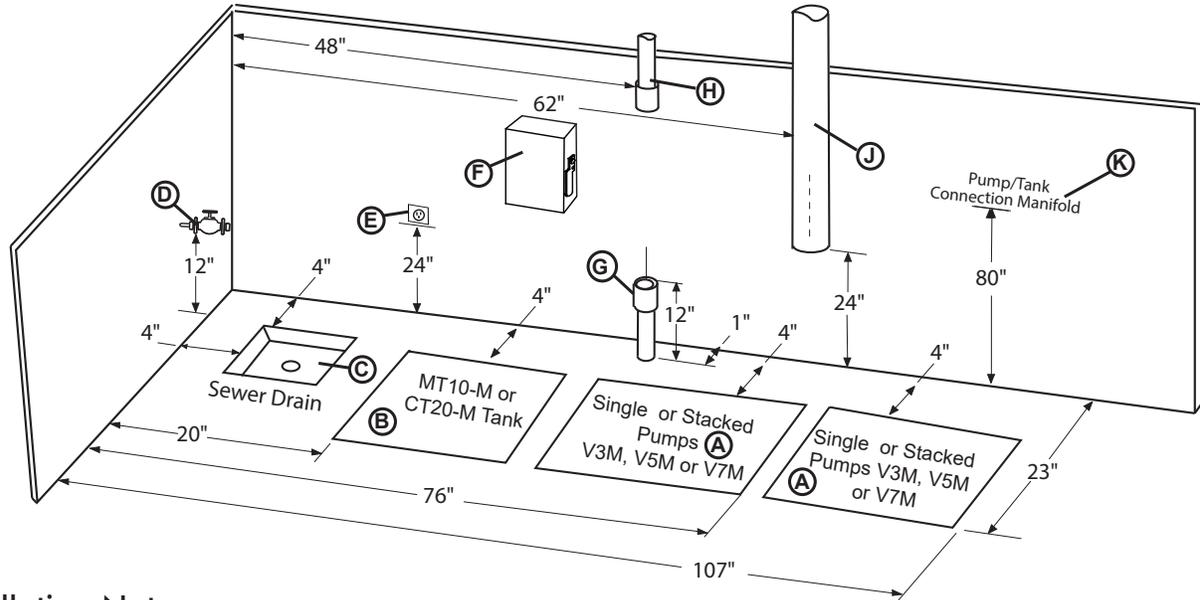
Electrical	V3M & V5M	V7M	2V3M & 2V3MCT	2V5M & 2V5MCT	2V7M	3V5M	4V5M	Master Controller
Voltage Rating Volts AC	All pumps 220 Volts Single Phase AC, 60 Hz							120 or 220
Voltage Minimum/Maximum	198/242 Volts AC All pumps							108/132 Volts AC or 198/242 Volts AC
Wire Size AWG Minimum Gauge	#12 AWG (Qty 1)	#10 AWG (Qty 1)	#12 AWG (Qty 2)	#12 AWG (Qty 2)	#10 AWG (Qty 2)	#12 AWG (Qty 3)	#12 AWG (Qty 4)	#14 AWG
Minimum Panel Breaker Rating	20A	30A	20A (Qty 2)	20A (Qty 2)	30A (Qty 2)	20A (Qty 3)	20A (Qty 4)	15A
Incoming Power	Hard wire Connection (Each pump is supplied a 6 foot BX cable)							NEMA 5-15R for 120V NEMA 6-15R for 220V (Supplied 10-ft. line cord)
Remote (Low Voltage Wiring)	#18 AWG (Qty 4) Wire Connection between the MMC-M and the Remote Switch Panel . (See Figure 14, page 26.)							
Optional Buck Boost Transformer	67002	67000-1	2X 67002		2X 67000-1	3X 67002	4X 67002	67002 for 220V or 67005 for 120V

Plumbing	V3M	V5M	V7M	2V3M	2V3MCT	2V5M	2V5MCT	2V7M	3V5M	4V5M
Exhaust Vent Pipe Using Heat Exchanger	2" PVC Sch. 40	2" PVC Sch. 40	2" PVC Sch. 40	One 3" or two 2" PVC Sch. 40		One 3" or two 2" PVC Sch. 40		One 3" or two 2" PVC Sch. 40	One 4" or three 2" PVC Sch. 40	Two 3" or four 2" PVC Sch. 40
Exhaust Vent Pipe Not Using Heat Exchanger (See note 1)	2" Metal Pipe	2" Metal Pipe	2" Metal Pipe	One 3" or two 2" Metal Pipe		One 3" or two 2" Metal Pipe		One 3" or two 2" Metal Pipe	One 4" or three 2" Metal Pipe	Two 3" or four 2" Metal Pipe
Minimum Suction Line Pipe	1" PVC Sch. 40	1 1/2" PVC Sch. 40	2" PVC Sch. 40	1 1/2" PVC Sch. 40		2" PVC Sch. 40		3" PVC Sch. 40	3" PVC Sch. 40	3" PVC Sch. 40
Maximum Suction Line Pipe (See note 2)	1 1/2" PVC Sch. 40	2" PVC Sch. 40	2 1/2" PVC Sch. 40	2" PVC Sch. 40		2 1/2" PVC Sch. 40		4" PVC Sch. 40	4" PVC Sch. 40	4" PVC Sch. 40
Riser Pipe	1/2" PVC Sch. 40	1/2" PVC Sch. 40	1/2" PVC Sch. 40	1/2" PVC Sch. 40		1/2" PVC Sch. 40		1/2" PVC Sch. 40	1/2" PVC Sch. 40	1/2" PVC Sch. 40
Vacuum Line Termination	1 1/2" FNPT	1 1/2" FNPT	2" FNPT	2" FNPT	3" FNPT	2" FNPT	3" FNPT	3" FNPT	3" FNPT	3" FNPT
Branch Line Pipe	Size requirement of Branch piping differs by the number of operatories being serviced. Up to three operatories use 1" PVC Schedule 40. Three to six operatories use 1 1/2" PVC Schedule 40. More that six operatories use 2" PVC Schedule 40									
Drain Line Pipe	1 1/2" PVC Schedule 40									
Wash-Out Water Line	1/2" FNPT Shut-off Valve									

## NOTES

- Recommended pipe used with models without a heat exchanger includes wrought iron pipe (black & galvanized) or copper pipe type M. Insulate metal pipe in utility room to avoid adding heat to the room. Insulation must be rated for a minimum of 300°F continuously.
- Use maximum internal diameter for the main line when preparing any new installation.

**Installation Layout Space.** Figure 4 shows the requirements for the installation of the various **MOJAVE** model configurations. Please note that all units are shipped with leveling feet set to lowest position. Heights can be increased by 1 inch by adjusting the leveling feet. Refer to Figure 5 for the recommended configuration arrangements.



## Installation Notes.

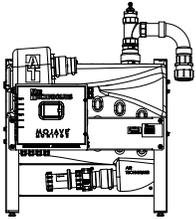
- A. PUMP INSTALLATION SPACE** - Area for stacked V3M, V5M or V7M pumps in typical side by side installations. Only stack up to 2 pumps in one area.
- B. TANK INSTALLATION SPACE** - Area for MT10-M or CT20-M tank in typical side by side installations. Never install the CT20-M tank on top of a pump.
- C. SEWER DRAIN** - Provide a drain for the removal of waste liquids from the MOJAVE tank. Use an open drain pipe (1 1/2 inch P-Trap with 1 inch air gap or floor sink) or a closed vented drain. See Figure 8, sheet 2.
- D. TANK WASHOUT** - Provide a water source terminated with a 1/2 inch FNPT shut-off valve providing water pressure between 20 and 100 psi for daily tank washout. Valve location must be no more than 10 feet from the tank installation to allow connection of supplied 10-foot 3/8-inch Poly tubing to the tank washout port. Provisions for backflow prevention may be required. Check local code requirements.
- E. MASTER CONTROLLER ELECTRIC OUTLET** - Master Controller requires a dedicated standalone 120 or 220V, hospital grade grounded receptacle. The supplied 10-foot line cord is the Mains disconnect device for the unit.
- F. PUMP ELECTRIC SERVICE** - Each MOJAVE pump is wired directly with a dedicated 220V, 20 AMP, (or 30 AMP for the V7) single phase 50/60 Hz circuit. If Main Circuit panel is not located in equipment room, a disconnect box with approved ground is needed for each pump. Disconnect boxes should be mounted no more than 3 feet of each other and 3 feet of installation center line.
- G. SUB FLOOR INSTALLATION VACUUM LINE** - See Plumbing Requirements for connection to tank inlet via supplied hose.
- H. OVERHEAD INSTALLATION VACUUM LINE** - See Plumbing Requirements for connection to tank inlet via supplied hose.
- J. HEAT EXHAUST** - See Plumbing Requirements for the exhaust vent line required for specific **MOJAVE** configurations. Use metal pipe on systems whenever the Heat Exchanger is removed. Schedule 40 pipe can normally be used on typical **MOJAVE** configuration installations with a Heat Exchanger. When installing two pumps, a reducing Y adapter (See Figure 10.) is needed to connect both vent tubes to a common 3-inch exhaust vent line.
- K. PUMP/TANK MANIFOLD** - User fabricated to connect 3 or 4 pumps to a tank. Used with 3V5M and 4V5M systems. See Figures 11, 12 and 13.

**Figure 4.**

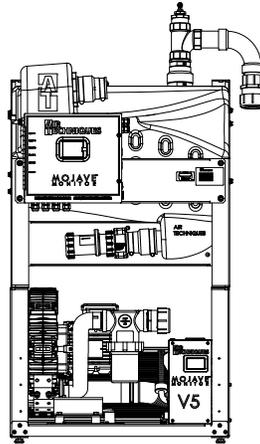
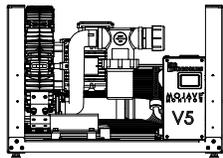
**V3M, V5M, V7M, 2V3M, 2V3MCT, 2V5M, 2V5MCT, 2V7M, 3V5M and 4V5M System Floor Plan**

# MOJAVE SYSTEM CONFIGURATIONS

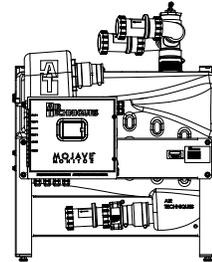
**Important:** Side by side installation of pump and tank is preferred. Stack a MT10-M tank on top of one V3M, V5M or V7M pump only if space is a problem. V3M, V5M or V7M pumps should only be stacked two high in all other system configurations as shown. All units are shipped with leveling feet set to lowest position.



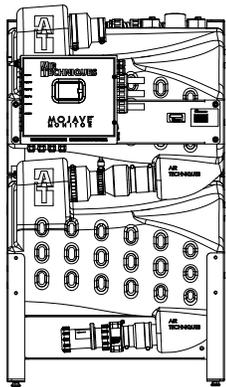
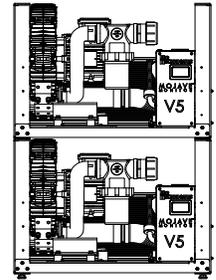
V3M, V5M or V7M System Side by Side Installation



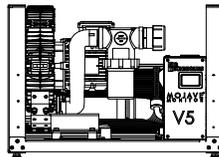
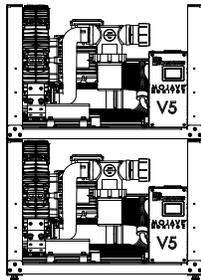
V3M, V5M or V7M System Stacked



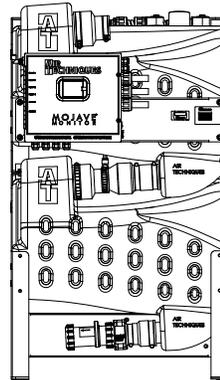
2V3M, 2V5M or 2V7M System Installation Recommended Stacked Pumps with Tank on Side (2V7M, 2V3MCT & 2V5MCT configurations use the CT20-M tank.)



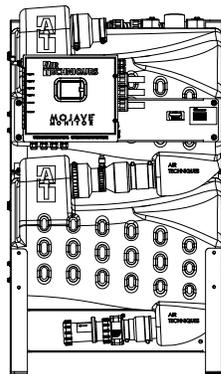
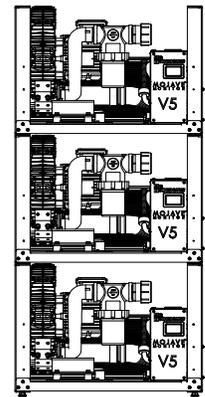
Recommended One Pump, a Stack of two Pumps & a CT20-M Tank



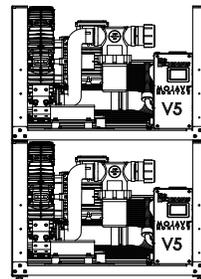
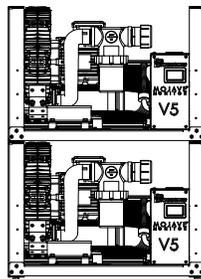
3V5M System Installation



Alternate Stack Three Pumps & a CT20-M Tank (Use only to meet space requirements.)



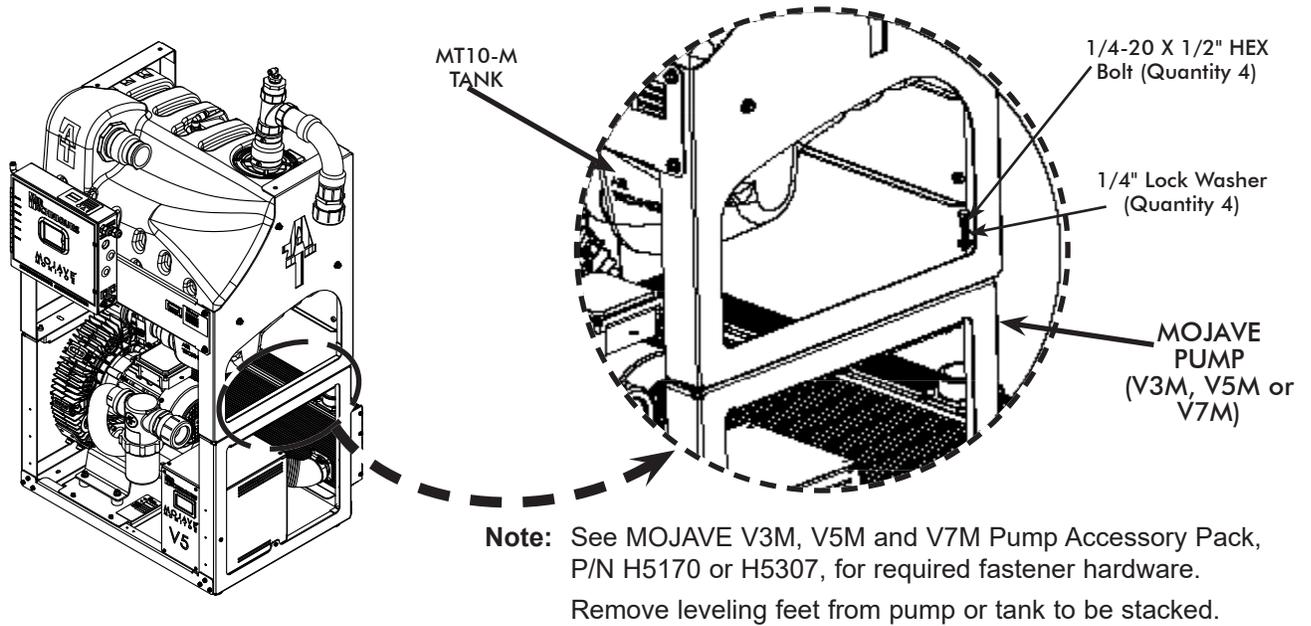
4V5M System Installation



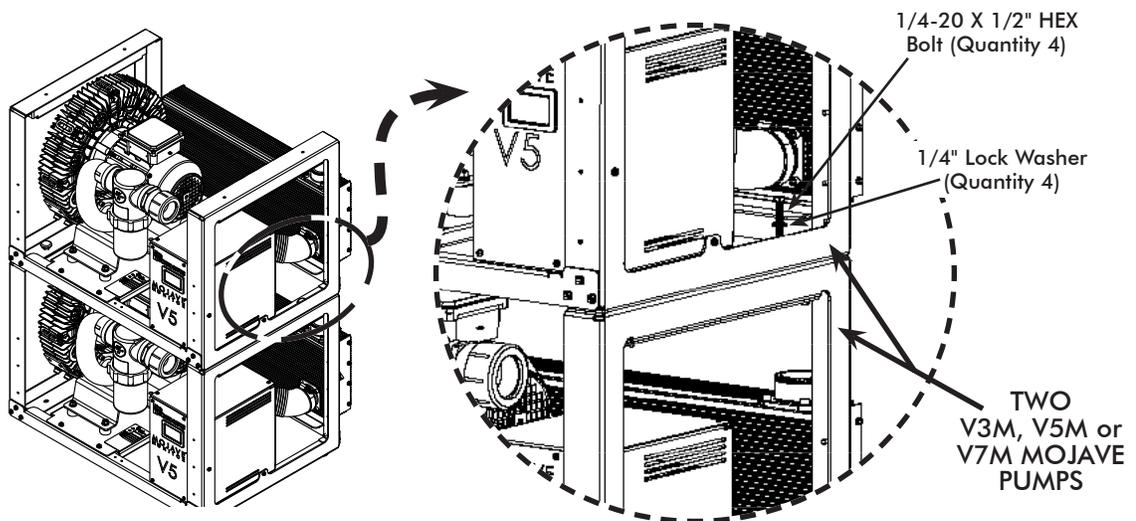
Recommended Two Side by Side Stacks of Two Pumps and a CT20-M Tank

Figure 5. MOJAVE System Configuration Layouts

**Important:** **DO NOT connect new interface board, H5336, into old MMC.** The board requires the new MMC-M with a touch screen. Install the new interface board by disconnecting power from the units and swapping the old interface board for the new one before powering the unit again. For more details, follow the instructions H5548 in the interface board upgrade Kit H5547.



**Figure 6. Stacking the MT10-M Tank on Top of a MOJAVE Pump Hardware Detail**



**Figure 7. Stacking Two MOJAVE Pumps Hardware Detail**

# INSTALLATION

## V3M, V5M and V7M System Installation.

**Note:** Each kit provides the required hoses, clamps and adapters.  
No schedule 40 PVC pipe is included.

**Installation Accessory Packs.** Figure 9, sheets 1 and 2, shows the hose connections required for all V3M, V5M and V7M **MOJAVE** System configuration installations using accessory packs that provide the required hoses, clamps and adapters as follows:

- ❑ **MOJAVE V3M, V5M and V7M Pump Accessory Pack, P/N H5170 or H5307** - supplied with each pump and is used as follows.
  - Secure the MT10-M Tank on top of the associated **MOJAVE** pump as shown by Figure 6.
  - Connect the pump exhaust to the facility vent line, connection item (4) on Figure 9, sheet 2.
- ❑ **MT10-M Tank Accessory Pack, P/N H5210 or H5479** - used to make the following connections:
  - Between the suction line and tank inlet. Item (1) on Figure 9, sheet 1.
  - Between the tank air outlet and pump inlet. Item (2) on Figure 9, sheet 1.
  - Install exhaust vent assembly to the facility vent line, connection item (3) on Figure 9, sheet 2.
  - The tank outlet drain to the facility sewer drain. Item (5) on Figure 9, sheet 2.
  - Washout port to the washout solenoid or water shutoff valve. Item (6) on Figure 9, sheet 2.

**Accessory Pack Supplied Components.** The supplied components of accessory packs (P/Ns H5170 or H5307 and H5210 or H5479) are listed below. Verify that all listed items were received. If any item is missing, notify your dealer.

### V3M, V5M and VM Pump Accessory Pack, P/N H5170

Part No.	Description	Qty
56057	Vent Hose, 2-1/4" ID X 17" Long 1" W Cuff	1
89324	Hose Clamp 1-9/16"- 2-1/2" Maximum	2
419342	10 Foot CAT5e Network Cable	1

Part No.	Description	Qty
30914	Bolt 1/4-20 X 1/2, HEX Head,18-8	4
30958	1/4" Flat Washer	4
30920	1/4" Split Lock Washer	4

### V3-NHE, V5-NHE and V7-NHE Pump Accessory Pack, P/N H5307

Part No.	Description	Qty
54184	Vent Hose, 2-1/4" ID X 36" Long 1" W Cuff	1
89324	Hose Clamp 1-9/16"- 2-1/2" Maximum	2
419342	10 Foot CAT5e Network Cable	1

Part No.	Description	Qty
30914	Bolt 1/4-20 X 1/2, HEX Head,18-8	4
30958	1/4" Flat Washer	4
30920	1/4" Split Lock Washer	4

### MT10-M 120 V Tank Accessory Pack, P/N H5210 or MT12 220 V Tank Accessory Pack, P/N H5479

Part No.	Description	Qty
54521	1 1/2" ID, Clear Hose with Blue Helix 15 Feet	1
H5206	Tank Outlet Assembly; Single Pump	1
51453	Urethane Tubing, 1/4 OD 15 Feet	1
19271	Poly Tubing, 3/8" OD 10 Feet	1
57238	1 1/2" Flexible Coupling Connector	1
77243 (See Note)	Mojave Master Controller Line Cord 10 Feet, 18 GA., IEC X North America, Hospital Grade, 120V	1
117527 (See Note)	Mojave Master Controller Line Cord 10 Feet, 14 GA., IEC X North America, Hospital Grade, 220V	1

Part No.	Description	Qty
30936	Plastic Screw Anchor, #10-12 X 1"	4
30295	#10 X 3/4, Type A, Plated Slot Pan Head Screw	4
56194	Connector Adapter, 1/2 MNPT X 3/8 PUSH	1
H5302	Exhaust Vent Assembly	1
54509	PVC Tubing; 10mm x 6.5mm, 10 feet	1
53202-1	Switch Assembly; Push Button, Panel Mount, GRN/YEL, 6V LED	1
H5153	Users Manual for V3M, V5M, V7M, 2V3M, 2V3MCT, 2V5, 2V5MCT, 2V7M, 3V5M & 4V5M	1

**Note:**

The MT10-M 120V tank requires a 120-Volt line cord, PN 77243, provided by accessory pack, PN H5210.

The MT12-M 220V tank requires a 220-Volt line cord, PN 117527 provided by accessory pack, PN H5479.

**Installation Setup.** Installation of a V3M, V5M and V7M **MOJAVE** system configuration consists of placing the equipment in the proper installation space and making connections between a MT10-M tank and a V3M, V5M or V7M pump. Use standard industry guidelines for working with electrical circuits, plumbing and on electronic equipment as necessary.

1. Refer to Figures 4 and 5 and determine the installation footprint dimensions and connection requirements. Place the tank and pump in position as shown by Figure 4.
2. If installing side-by-side configuration, proceed to step 4. If stacking, perform step 3.
3. When stacking the MT10-M tank on top of a pump, refer to Figure 6 and secure the tank to pump using hardware supplied by the Pump Accessory Pack, P/N H5170 or H5307.

**Note:** If more of the 1 ½" ID, Clear Hose hose is needed, order P/N 54521 by the foot.

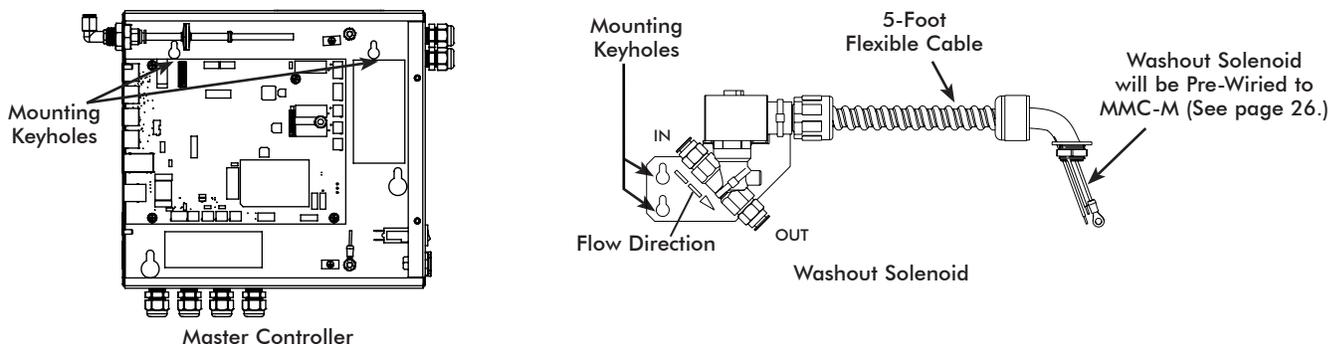
4. Measure and record distance between each connection point. Cut the supplied hose to the length required for each connection.

**Master Controller and Washout Solenoid Installation Options.** The Master Controller is delivered installed on the front of the tank (MT10-M or CT20-M) chassis associated with the **MOJAVE** system being installed. The water connections for the washout solenoid must be made. The Washout Solenoid is delivered wired to the Master Controller with 3/8 inch poly tubing cut to length for mounting on the rear of either the MT10-M tank or the bottom CT20-M tank using two Washer Head Screws, P/N 30711 (already installed on the tank).

Although not recommended, both the controller and solenoid can be installed on the equipment room wall. The solenoid should be located between the facility water supply and the Master Controller. Securing hardware consisting of Plastic Screw Anchors, P/N 30936 and Plated Slot Pan Head Screws, P/N 30295 are provided by the accessory pack for the associated tank configuration listed below.

Part No.	Description	Part No.	Description
H5210	MT10-M 120V Tank Accessory Pack	H5243	CT20-M 120V Tank Accessory Pack
H5479	MT12-M 220V Tank Accessory Pack	H5289	CT22-M 220V Tank Accessory Pack

**Note:** Recommended installation is to mount the solenoid on the rear of the associated MT10-M or CT20-M tank and keep the master controller mounted on the front of the tank.



**Figure 8. MOJAVE Master Controller and Washout Solenoid Optional Mounting**

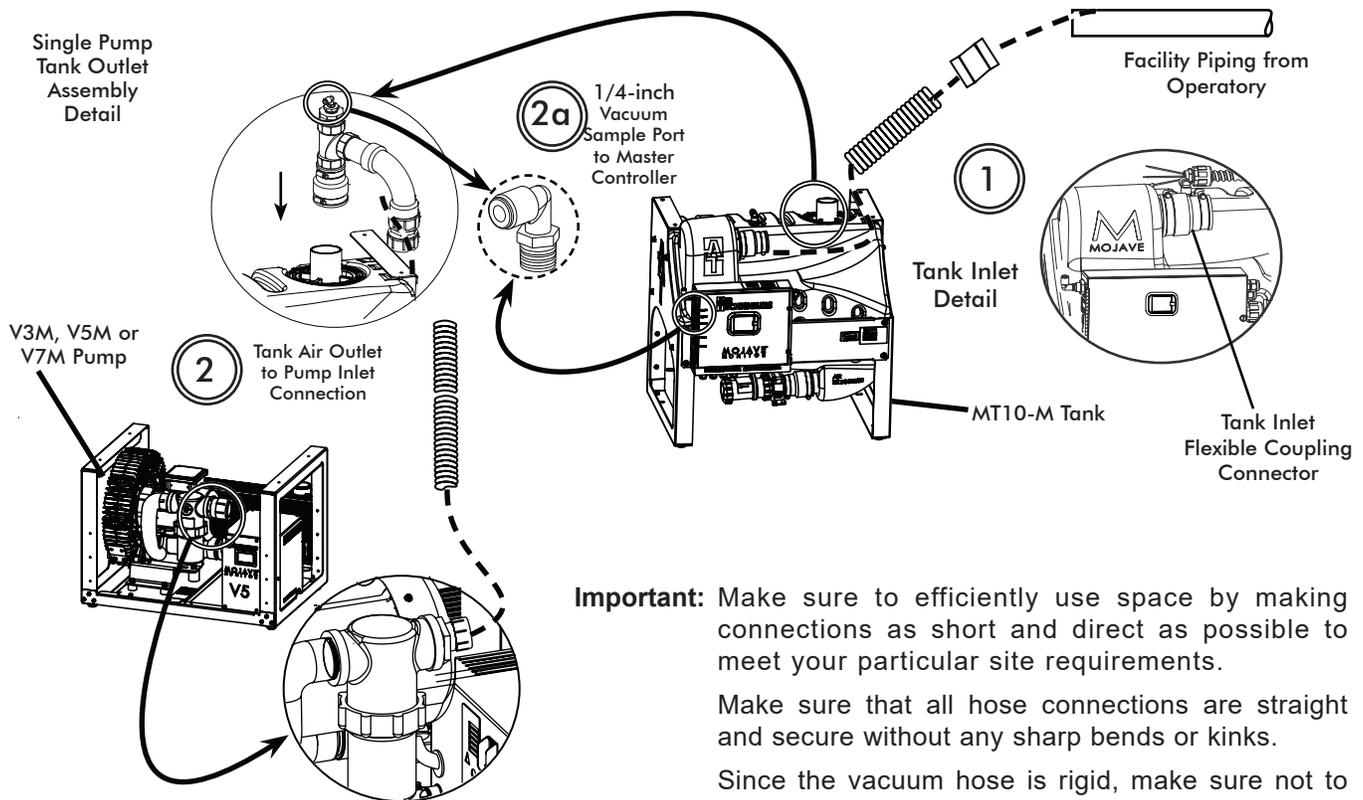
# INSTALLATION

**V3M, V5M and V7M Connection Procedure.** Using industry standard techniques, make the connections between the tank and pump with supplied components of accessory packs (P/Ns H5170 & H5210 or H5479). Refer to Figure 9, sheets 1 and 2 for the connection diagram and perform the following procedure.

1. **Suction Line to Tank Inlet Connection.** Refer to Figure 9, item (1) .
  - a. Install one 1½" flexible coupling connector (P/N 57238) to the pipe from the operator.
  - b. Install the 1½" ID, clear hose (P/N 54521) cut for installation between the operator suction line and tank inlet and secure with two hose clamps on each flexible coupling.

**Note:** If more of the 1/4 inch OD Urethane Tubing is needed, order P/N 51453 by the foot.

2. **Tank Air Outlet to Pump Inlet Connection.** Refer to Figure 9, item (2) .
  - a. Install the Single Pump Tank Outlet Assembly (P/N H5206) onto the tank outlet port and secure with the hose clamp on the base of the single pump tank outlet assembly. The outlet assembly is provided with MT10-M or MT12-M Tank Accessory Pack (P/N H5210 or H5479).
  - b. Connect 1½" ID, clear hose (P/N 54521) cut for installation between the compression connector of the Single Pump Tank Outlet Assembly and pump air inlet filter. Secure by tightening compression nut.
  - c. Install a length of 1/4 inch OD Urethane Tubing (P/N 51453) between the vacuum sample port and the vacuum inlet port of the Master Controller. See Figure 9, item (2a.)



**Important:** Make sure to efficiently use space by making connections as short and direct as possible to meet your particular site requirements.

Make sure that all hose connections are straight and secure without any sharp bends or kinks.

Since the vacuum hose is rigid, make sure not to stress connections especially at the pump inlet.

Figure 9. MOJAVE V3M/V5M/V7M Pump and MT10-M Tank Connection Diagram, Sheet 1

3. **Exhaust Vent Assembly Installation.** Install the Exhaust Vent Assembly (P/N H5302) to the bottom end of the facility vent line. Install a length of 1/4 inch OD Urethane Tubing (P/N 51453) between the vent condensation drain port and facility sewer drain. See Figure 9, item (3).
4. **Heat Exhaust Vent Connection.** Refer to Figure 9, item (4) and connect the vent hose (P/N 56057) between the pump heat exchanger and the facility vent line. Secure with two hose clamps (P/N 89324). On systems without heat exchangers (-NHE models), the vent hose is connected directly to the pump exhaust.
5. **Tank Drain to Facility Sewer Connection.** Connect the last section of 1 1/2" ID, clear hose cut for installation to the tank outlet drain. Secure by tightening each check valve compression nut. Connect unconnected hose end to the facility sewer drain as necessary. See Figure 9, item (5).
6. **Tank Washout Port to Facility Water Connection.** Refer to Figure 9, item (6) and install a length of 3/8 inch tubing (P/N 19271) between the washout port and the water solenoid then to water shutoff valve. The tubing is provided with MT10-M or MT12-M Tank Accessory Pack, P/N H5210 or H5479.
7. **System Electrical Connections.** Refer to the Electrical Connections section and connect the pump and Master Controller to facility power.

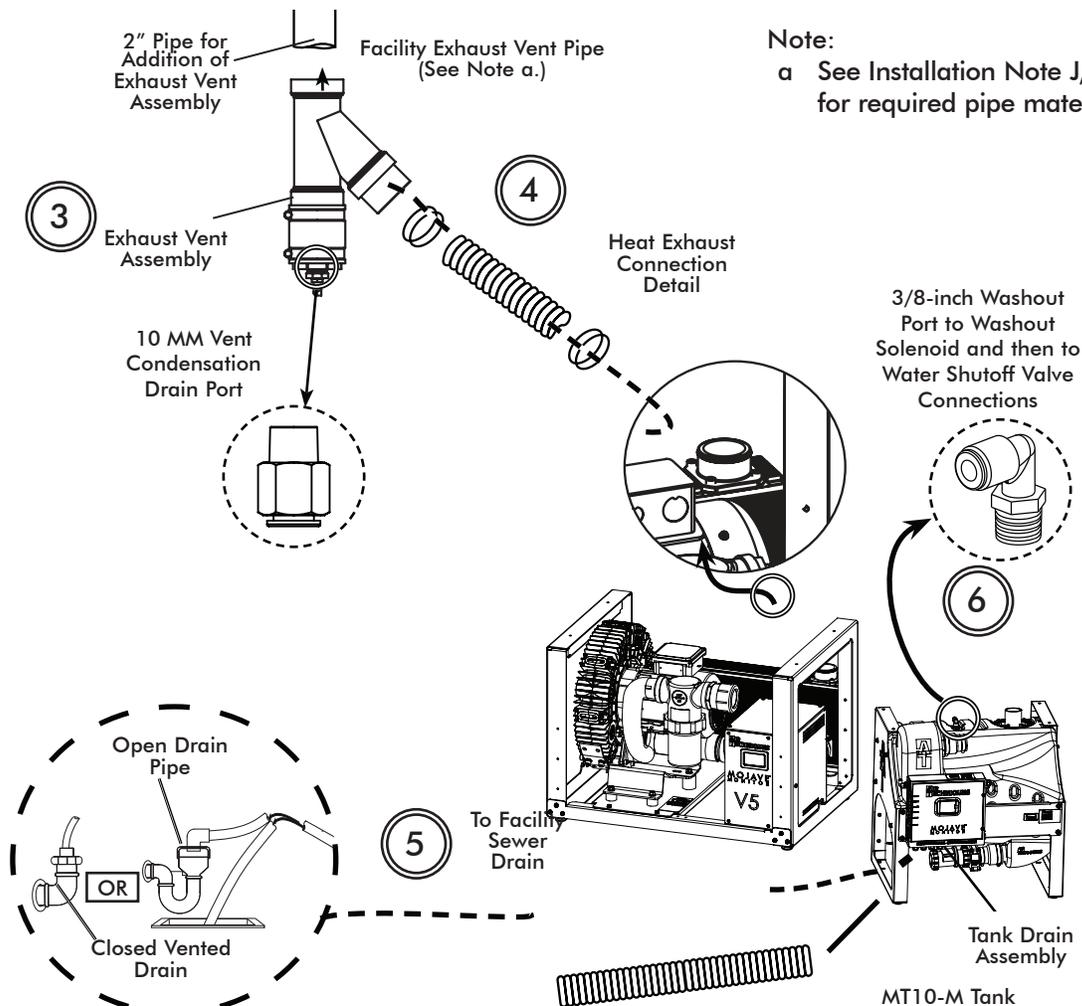


Figure 9. MOJAVE V3M/V5M/V7M Pump and MT10-M Tank Connection Diagram, Sheet 2

# INSTALLATION

## 2V3M, 2V3MCT, 2V5M, 2V5MCT and 2V7M System Installations.

**Note:** Each kit provides the required hoses, clamps and adapters. No schedule 40 PVC pipe is included.

**Installation Accessory Packs.** Figure 10 shows the hose connections required for all dual **MOJAVE** system configuration installations using accessory packs that provide the required hoses, clamps and adapters as follows:

- ❑ **MOJAVE V3M, V5M and V7M Pump Accessory Pack, P/N H5170 or H5307** - supplied with each pump and is used as follows.
  - Stack the associated **MOJAVE** pumps as shown by Figure 7.
  - Connect each pump to the facility vent line, connection item (4) on Figure 10, sheet 2.
- ❑ **MT10-M Tank Accessory Pack, P/N H5210 or H5479** - used to make the following connections:
  - Between the suction line and tank inlet. Item (1) on Figure 10, sheet 1.
  - Install the Exhaust Vent Assembly to the facility vent line, connection item (3) on Figure 10, sheet 2.
  - The tank outlet drain to the facility sewer drain. Item (5) on Figure 10, sheet 2.
  - The washout port to the washout solenoid or water shutoff valve. Item (6) on Figure 10, sheet 2.
- ❑ **MOJAVE Dual System Installation Kit, MIK2** - used to make the following connections:
  - Between the tank air outlet and each pump inlet. Item (2) on Figure 10, sheet 1.

**Supplied Components.** The supplied components of the Dual System Installation Kit (P/N MIK2) are listed below. The supplied components of accessory packs( P/Ns H5170 or H5307 & H5210 or H5479) are provided on page 16. Verify that all listed items were received. If any item is missing, notify your dealer.

MOJAVE Dual System Installation Kit, MIK2

Part No.	Description	Qty
H5176	Tank Outlet Assembly; Dual Pump Installation	1
54521	1 ½" ID, Clear Hose with Blue Helix 6 FT	1
54512	2" ID, Clear Hose with Blue Helix 4 FT	1
54138	Check Valve Modified	2
H5234	2" Flexible Coupling Connector	2
54224	1 ½" Conduit Clamp	2

**Installation Setup.** Installation of a dual pump **MOJAVE** system configurations consist of placing the equipment in the proper installation space and making connections between a tank and pump. Use standard industry guidelines for working with electrical circuits, plumbing and on electronic equipment as necessary.

1. Refer to Figures 4 and 5 and determine the installation footprint dimensions and connection requirements. Place the tank and pumps in position as shown by Figure 4.
2. If installing side-by-side configuration, proceed to step 4. If stacking, perform step 3.
3. When stacking pumps, refer to Figure 6 and secure the pumps using hardware supplied by the Pump Accessory Pack, P/N H5170 or H5307.

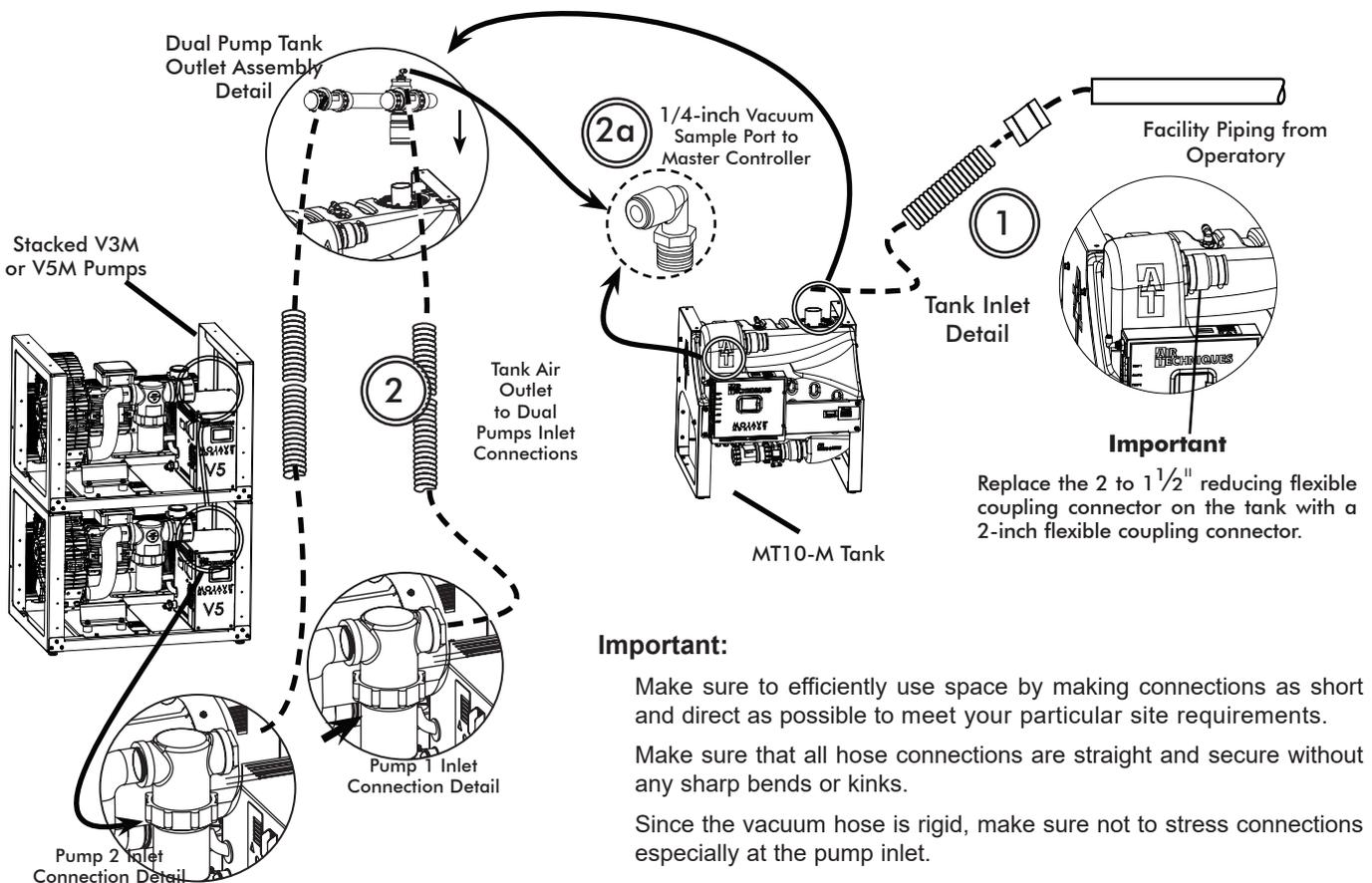
**Note:** If more of the 1 ½" ID, Clear Hose hose is needed, order P/N 54521 by the foot.

4. Measure and record distance between each connection point. Cut the supplied hose to the length required for each connection.

**2V3M, 2V3MCT, 2V5M, 2V5MCT and 2V7M Connection Procedure.** Using industry standard techniques, make the connections between the tank and pumps with supplied components of accessory packs (P/Ns H5170 or H5307 & H5210) and Dual System Installation Kit (P/N MIK2). Refer to Figure 10, sheets 1 and 2, for the connection diagram and perform the following procedure.

1. **Suction Line to Tank Inlet Connection.** Refer to Figure 10, item (1) .
  - a. Install 2" flexible coupling connector (P/N H5234), provided with Dual System Installation Kit (P/N MIK2), to the pipe from the operator.
  - b. Replace the reducing flexible coupling connector on the tank with 2" flexible coupling connector (P/N H5234) provided in the Dual System Installation Kit.
  - c. Install the 2" ID, clear hose (P/N 54512) between the operator suction line and tank inlet and secure by tightening band clamp on the 2" flexible couplings.
2. **Tank Air Outlet to Pump Inlets Connection.** Refer to Figure 10, item (2) .
  - a. Install the Dual Pump Tank Outlet Assembly (P/N H5176) onto the tank outlet port and secure with hose clamp at the base of the assembly. The outlet assembly is provided with Dual System Installation Kit (P/N MIK2).
  - b. Connect 1½" ID, clear hose (P/N 54521) cut for installation between the check valves of the Dual Pump Tank Outlet Assembly and the air inlet filter of each pump. Secure by tightening the compression nut.
  - c. Install a length of 1/4 inch OD Urethane Tubing (P/N 51453) between the vacuum sample port and the vacuum inlet port of the Master Controller. See Figure 10, item (2a.)

**Note:** If more than 15 feet of the 1/4 inch OD Urethane Tubing is needed, order P/N 51453 for additional 15 foot lengths.



**Important:**

Make sure to efficiently use space by making connections as short and direct as possible to meet your particular site requirements.

Make sure that all hose connections are straight and secure without any sharp bends or kinks.

Since the vacuum hose is rigid, make sure not to stress connections especially at the pump inlet.

# INSTALLATION

3. **Exhaust Vent Assembly Installation.** Install the Exhaust Vent Assembly (P/N H5302) to the bottom end of the facility vent line. Install a length of 1/4 inch OD Urethane Tubing (P/N 51453) between the vent condensation drain port and facility sewer drain. See Figure 10, sheet 2, item (3).
4. **Heat Exhaust Vent Connection.** Refer to Figure 10, sheet 2, item (4) and connect the vent hose (P/N 56057) between the pump heat exchanger and the facility vent line. Secure with two hose clamps (P/N 89324). On systems without heat exchangers (-NHE models), the vent hose is connected directly to the pump exhaust.
5. **Tank Drain to Facility Sewer Connection.** Connect the last section of 1 1/2" ID, clear hose cut for installation to the adapter. Secure by tightening the check valve compression nut. Connect unconnected hose end to the facility sewer drain as necessary. See Figure 9, item (5).
6. **Tank Washout Port to Facility Water Connection.** Refer to Figure 9, item (6) and install a length of 3/8 inch tubing (P/N 19271) between the washout port and the washout solenoid, then to water shutoff valve. The tubing is provided with MT10-M or MT12-M Tank Accessory Pack, P/N H5210 or H5479.
7. **System Electrical Connections.** Refer to the Electrical Connections section and connect each pump and Master Controller to facility power.

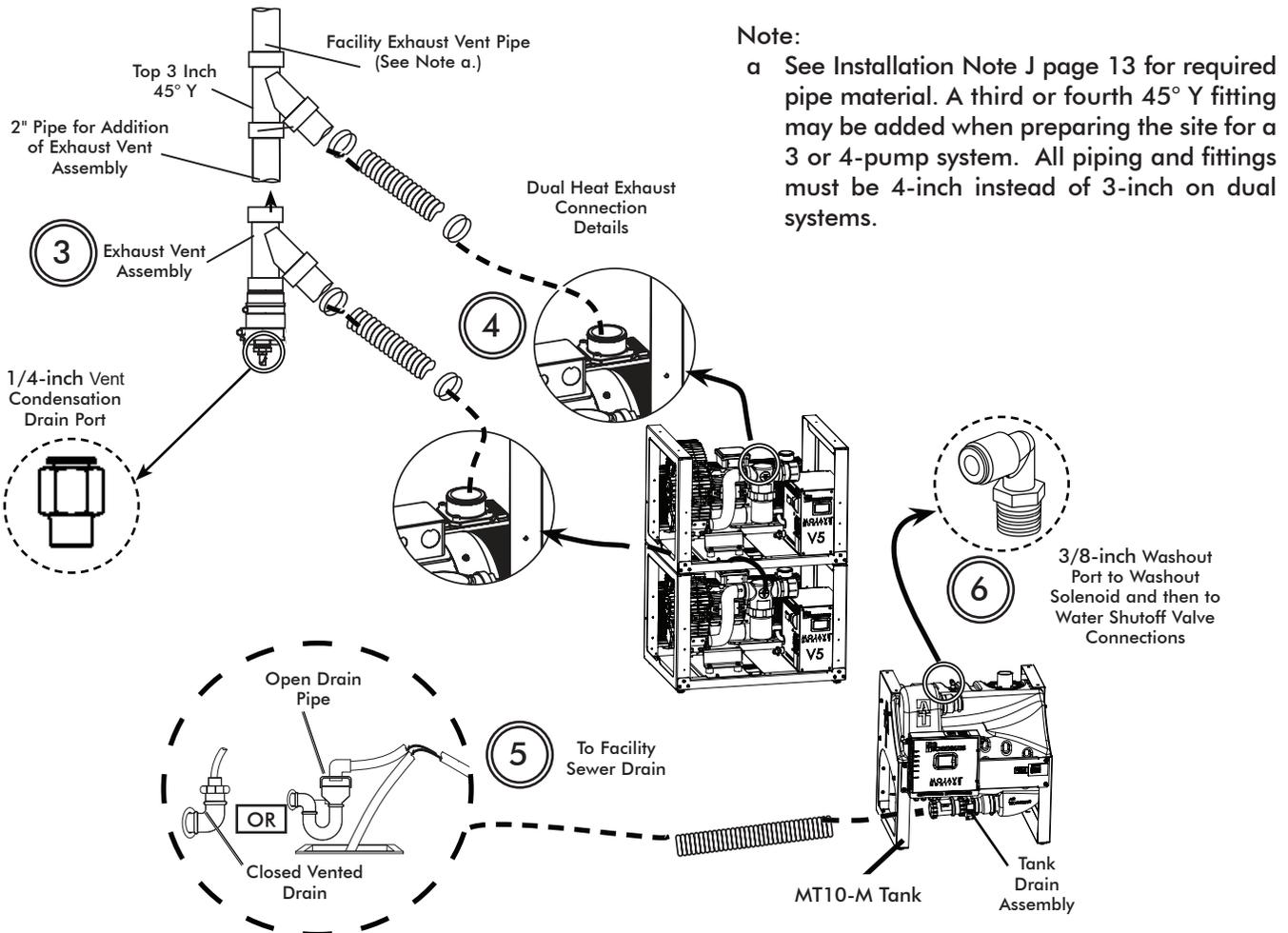


Figure 10. MOJAVE Dual Pump and Tank Connection Diagram, Sheet 2

**3V5M and 4V5M System Installations.**

**Note:** Each kit provides the required hoses, clamps and adapters. No schedule 40 PVC pipe is included.

**Installation Accessory Packs.** Figure 11 shows the hose connections required for 3V5M and 4V5M **MOJAVE** system configuration installations using accessory packs that provide the required hoses, clamps and adapters as follows:

- ❑ **MOJAVE V3M and V5M Pump Accessory Pack, P/N H5170 or H5307** - use as follows.
  - Stack the associated **MOJAVE** pumps as shown by Figure 7.
  - Connect each pump to the facility vent line, connection item (4) on Figure 10, sheet 2.
- ❑ **CT20-M Tank Accessory Pack, P/N H5243 or H5289** - used to make the following connections:
  - Between the suction line and tank inlet. Item (1) on Figure 10, sheet 1.
  - Install the Exhaust Vent Assembly to the facility vent line, connection item (3) on Figure 10, sheet 2.
  - The tank outlet drain to the facility sewer drain. Item (5) on Figure 10, sheet 2.
  - The washout port to the washout solenoid or water shutoff valve. Item (6) on Figure 10, sheet 2.
- ❑ **MOJAVE Triple & Quad System Installation Kit, P/N MIK4** - used to fabricate a manifold to make the connections between a CT20-M or CT22-M tank and three or four V5M pumps.
- ❑ **CT20-M or CT22-M Dual Tank Accessory Pack, P/N H5243 or H5289** - used to install a CT20-M or CT22-M tank and make connections to the Master Controller assembly.

**Supplied Components.** The supplied components of kits P/N MIK4, and H5243 or H5289 are listed below. The supplied components of accessory pack (P/N H5170 or H5307) is provided on page 16. Verify that all listed items were received. If any item is missing, notify your dealer.

**MOJAVE Triple & Quad System Installation Kit,  
(P/N MIK4), Contents**

Part No.	Description	Qty
54138	Check Valve Modified	4
54512	2" ID, Clear Hose with Blue Helix 4 FT	1
H5234	2" Flexible Coupling Connector	2
54521	1½" ID, Clear Hose with Blue Helix 30 FT	1

**Note:**

The CT20-M 120V tank requires a 120-Volt line cord, PN 77243, provided by accessory pack, PN H5243.

The CT22-M 220V tank requires a 220-Volt line cord, PN 117527 provided by accessory pack, PN H5289.

**CT20-M 120V Tank Accessory Pack, P/N H5243  
and  
CT22-M 220V Tank Accessory Pack, P/N H5289**

Part No.	Description	Qty
51453	Urethane Tubing, 1/4 OD, 5 Feet	1
H5302	Exhaust Vent Assembly	1
77243 (See Note)	Mojave Master Controller Line Cord 10 Feet, 18 GA., IEC X North America, Hospital Grade, 120V	1
117527 (See Note)	Mojave Master Controller Line Cord 10 Feet, 14 GA., IEC X North America, Hospital Grade, 220V	1
19271	Poly Tubing, 3/8" OD 10 Feet	1
30936	Plastic Screw Anchor, #10-12 X 1"	4
30295	#10 X 3/4, Type A, Plated Slot Pan Head Screw	4
56194	Connector Adapter, 1/2 MNPT X 3/8 PUSH	1
54509	PVC Tubing; 10mm x 6.5mm, 10 feet	
53202-1	Switch Assembly; Push Button, Panel Mount, GRN/YEL, 6V LED	1
H5153	Users Manual for - V3M, V5M, V7M, 2V3M, 2V3MCT, 2V5M, 2V5MCT, 2V7M, 3V5M & 4V5M	1

# INSTALLATION

**Installation Setup.** Installation of triple and quad **MOJAVE** system configurations consist of placing the equipment in the proper installation space, fabricating a Pump/Tank Connection Manifold and an inlet tee connector.

1. Refer to Figures 4 and 5 and determine the installation footprint dimensions and connection requirements. Place the CT20-M or CT22-M tank and V3M, V5M pumps in position.
2. If installing side-by-side configuration, proceed to step 4. If stacking, perform step 3.
3. When stacking pumps, refer to Figure 7 and secure the pumps using hardware supplied by the Pump Accessory Pack, P/N H5170 or H5307. When stacking any system component higher than two, make sure to secure installation with wall mount bracket kit available from your dealer.
4. Using check valves supplied in the **MOJAVE** Triple & Quad System Installation Kit, MIK4, fabricate a Pump/Tank Connection Manifold per the instructions supplied in the kit.
5. Using customer-supplied 3/4 inch and 2 inch pipe, fabricate an inlet tee connector as shown by Figure 12. Install an 1/4-inch elbow connector to the 3/4 inch riser of the tee connector using an 3/4 inch bushing. Both the elbow connector and bushing are provided in accessory pack H5243 or H5289.
6. Fabricate additional reducing Y or tee adapters to connect each pump vent tube to the common 4-inch exhaust vent line. See Figure 10, sheet 2.
7. Using at least 3 pipe supports, hang the Pump/Tank Connection Manifold. See Figure 11.

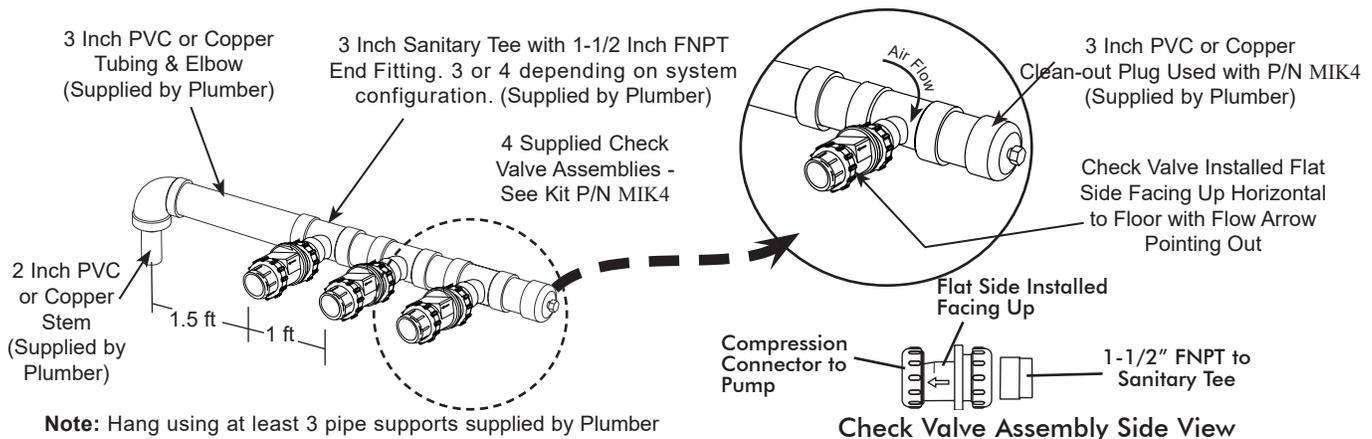
**Note:** If more of the 1 1/2" ID, Clear Hose hose is needed, order P/N 54521 by the foot.

8. Measure and record distance between each connection point as shown in the corresponding connection detail diagram, Figure 12.
9. Cut the supplied hose to the length required for each connection.

**3V5M and 4V5M Connection Procedure.** Using industry standard techniques, make the connections between the tank and pumps with supplied components of accessory packs (P/Ns H5170 or H5307 & H5243 or H5289) and Triple & Quad System Installation Kit, (P/N MIK4). Refer to Figures 4 through 12 as necessary and perform the following procedure.

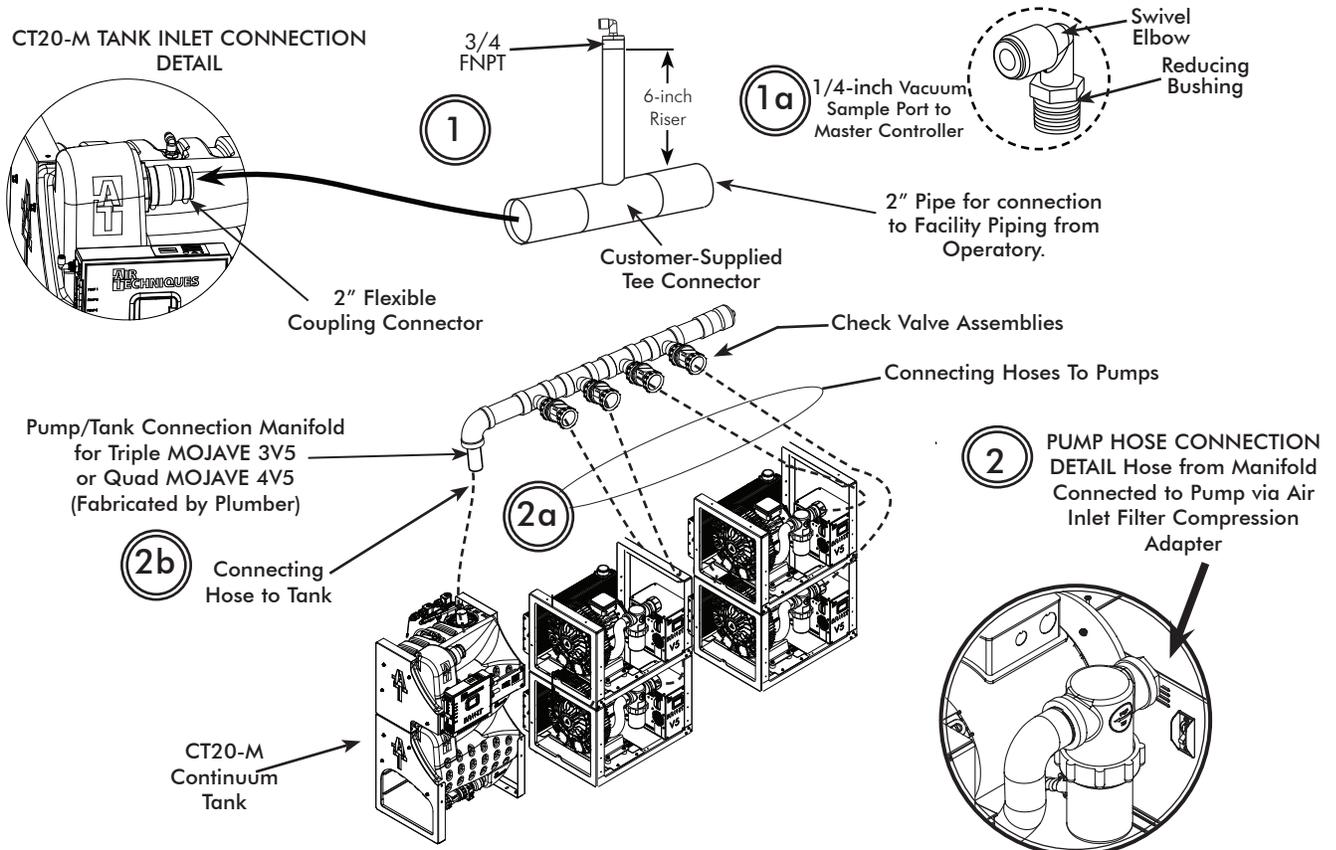
**Note:** If more of the 1/4 inch OD Urethane Tubing is needed, order P/N 51453 by the foot.

1. **Suction Line to Tank Inlet Connection.** Refer to Figure 12, item (1).
  - a. Using the 2-inch flexible coupling connector (P/N H5159), installed in the inlet of the CT20-M tank, install the fabricated tee connector into the inlet of the CT20-M tank.
  - b. Install 2" flexible coupling connector (P/N H5234) supplied in the MIK4 kit to the pipe from the operator.
  - c. Install the 2" ID, clear hose (P/N 54512) between the operator suction line and tank inlet and secure with 2" flexible coupling connector (P/N H5234)
  - d. Install a length of 1/4 inch OD Urethane Tubing (P/N 51453) supplied in the MIK4 kit between the vacuum sample port and the vacuum inlet port of the Master Controller. See Figure 12, item (1a).



**Figure 11. Pump/Tank Connection Manifold Fabrication**

2. **Tank Air Outlet to Pump Inlets Connection.** Refer to Figure 12, item (2).
  - a. Connect 1 1/2" ID, clear hose (P/N 54521) cut for installation between the compression connectors of the Pump/Tank Connection Manifold check valves and the air inlet filter of each pump. Secure by tightening the compression nuts.
  - b. Connect 1 1/2" ID, clear hose (P/N 54521) cut for installation between the tank outlet port and the Pump/Tank Connection Manifold. Secure by tightening the hose clamps of the 2" flexible couplings. See Figure 12, item (2b).
3. **Exhaust Vent Assembly Installation.** Install the Exhaust Vent Assembly (P/N H5302) to the bottom end of the facility vent line. Install a length of 1/4 inch OD Urethane Tubing (P/N 51453) between the vent condensation drain port and facility sewer drain. See Figure 10, sheet 2, item (3).
4. **Heat Exhaust Vent Connection.** Refer to Figure 10, item (4) and connect the vent hose (P/N 56057) between the pump heat exchanger and the facility vent line via fabricated reducing Y or tee adapters. Secure with hose clamps (P/N 89324). On systems without heat exchangers (-NHE models), the vent hose is connected directly to the pump exhaust.
5. **Tank Drain to Facility Sewer Connection.** Connect the last section of 1 1/2" ID, clear hose cut for installation to the adapter. Secure by tightening the check valve compression nut. Connect unconnected hose end to the facility sewer drain as necessary. See Figure 10, sheet 2, item (5).
6. **Tank Washout Port to Facility Water Connection.** Refer to See Figure 10, sheet 2, item (6) and install a length of 3/8 inch tubing (P/N 19271) between the washout port and the washout solenoid and then to water shutoff valve. The tubing is provided with CT20-M or CT22-M Tank Accessory Pack, P/N H5243 or H5289.
7. **System Electrical Connections.** Refer to the Electrical Connections section and connect each pump and Master Controller to facility power.



**Figure 12. 3V5M or 4V5M System Connection Detail Using Accessory Kit**

# ELECTRICAL CONNECTIONS



Remove all power to the system prior to working within the electrical box. Contacting high voltage can cause serious injury or even death.



All systems must be wired directly from an electrical box that complies with local electrical codes.

## MOJAVE Pump Direct Power Connection.

Each pump is wired directly to an dedicated 220V, 20 AMP (30 AMP for V7M) single phase 50/60 Hz circuit via a disconnect box with approved ground. Disconnect boxes should be mounted no more than 3 feet of each other and 3 feet of installation centerline.

Figure 13 shows the wiring of the electrical BX cable used to connect each pump directly to facility input power.

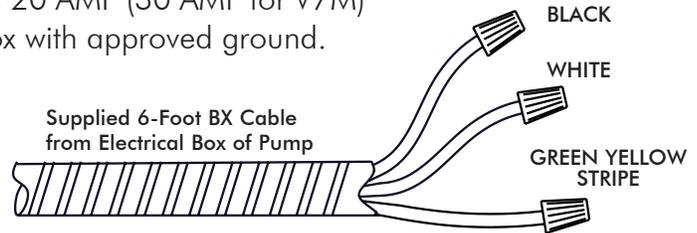
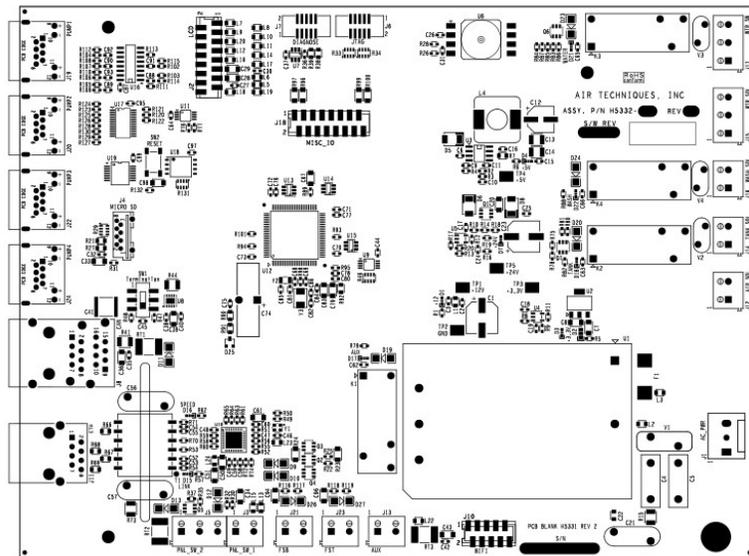


Figure 13. MOJAVE Pump Power Connection

**Master Controller Connections.** The Master Controller is connected to a dedicated 120V or 220V, hospital grade grounded receptacle using a supplied Hospital Grade line cord. Refer to Figure 14 with associated connection list and make the necessary connections required for your specific **MOJAVE** system.

**Note:** Use 18 Gauge for interconnect cable to connect between unit and remote switch.

**Remote Switch Connection Options.** The Master Controller is connected to a dedicated 120V or 220V, hospital grade grounded receptacle using remote switch installation. Refer to Figure 15 with associated connection list and make the necessary connections required for your specific **MOJAVE** system.



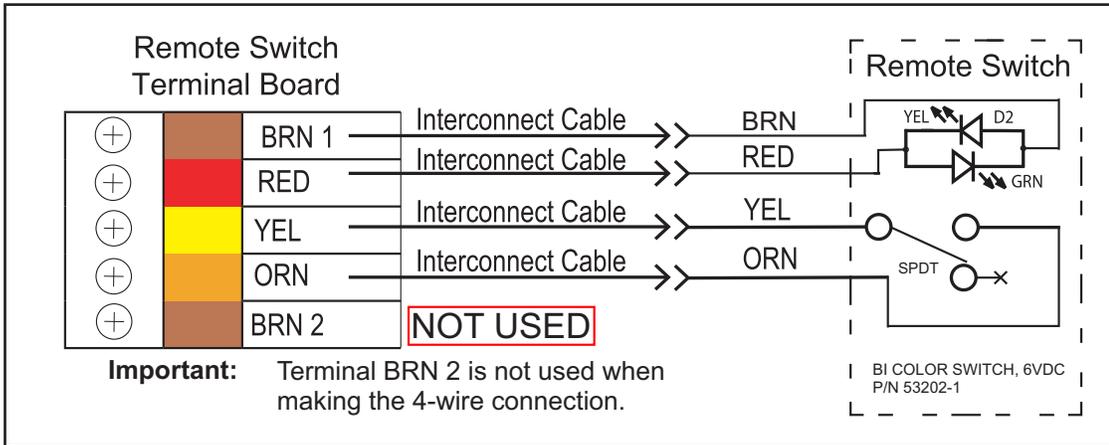
**Note 1:** The 10-foot Line Cord is the Mains disconnect device for the Master Controller.

**Note 2:** (2) and (3) refers to old style Air Techniques rocker switches. Do not connect (4).

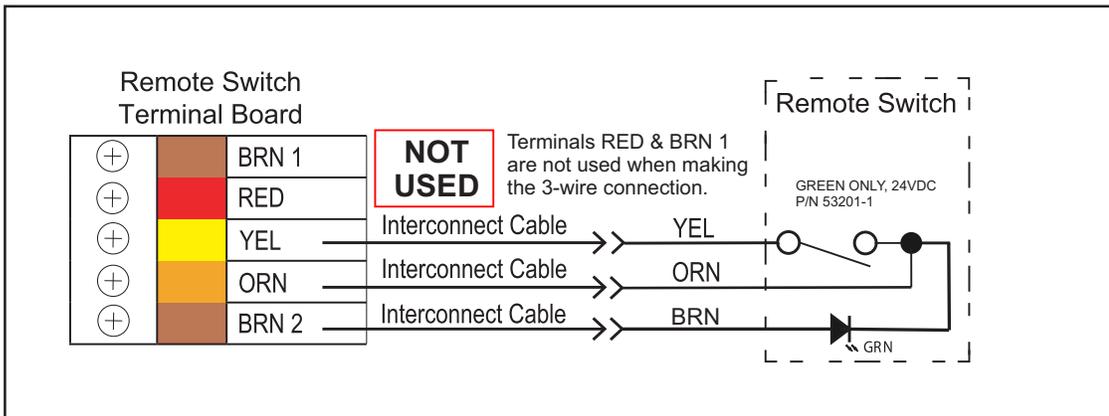
**Note 3:** Although Air Techniques supplies a remote panel switch (#53202-1) for use with the MMC-M, any remote switch can be used connected to MMC-M J13 only. All remote system status indication is lost when using switches other than switch #53202-1 provided. The 4 to 3 wire conversion only works with the supplied switch, #53202-1.

Connector	Function	Connector	Function
J17	Main Water Panel Switch (optional)	J21	Float Switch Bottom (CT20-M only - pre-wired)
J15	Main Water Solenoid (optional)	J23	Float Switch Top MT10-M Tank & CT20-M Tank (pre-wired)
J16	Washout Solenoid (pre-wired)		
J7	Tank Solenoid (CT20-M only - pre-wired)	J19, J20,	10-foot CAT 5 Cable to each Pump
J14	Air Solenoid (CT20-M only - pre-wired)	J22, J24	
J13	AUX - Alarm	J11	Ethernet Jack
J8	AUX - Jack (future use)		

Figure 14. Master Controller Wiring Diagram

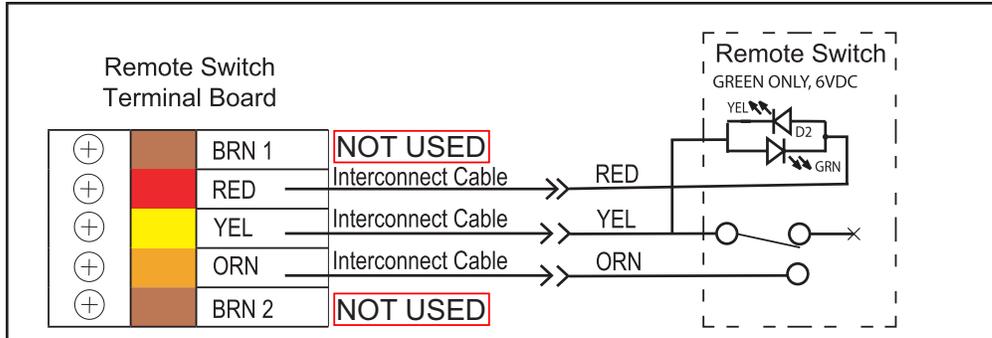


**View A. 4-Wire Green & Yellow Indicators 6 VDC Remote Switch Installation**



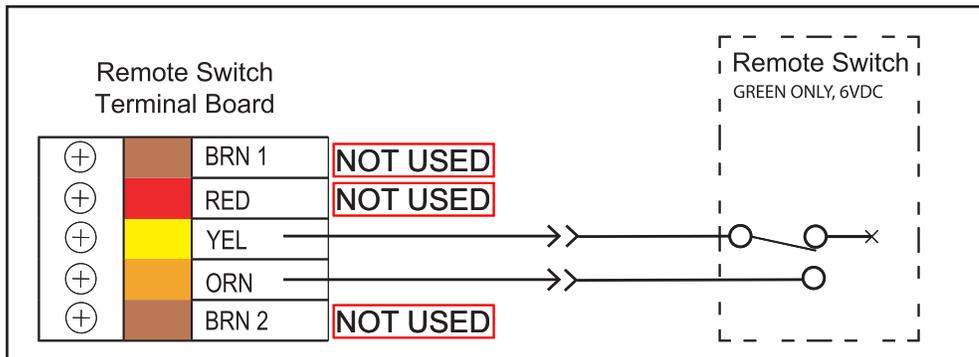
**View B. 3-WIRE GREEN INDICATOR ONLY 24 VDC REMOTE SWITCH INSTALLATION**

**Figure 15. Remote Switch Connection Options (Sheet 1)**



**Important:** Terminals BRN 1 & 2 are not used when making the 3-wire connection.

**View C. 3-WIRE GREEN INDICATOR ONLY 6 VDC REMOTE SWITCH INSTALLATION**



**Important:** Terminals RED, BRN 1 & BRN 2 are not used when making the connection.

**View D. 2-WIRE NO INDICATOR DRY CONTACT REMOTE SWITCH INSTALLATION**

Figure 15. Remote Switch Connection Options (Sheet 2)

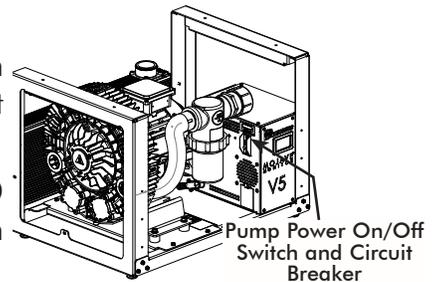
### General.

- ❑ The vacuum level is factory preset at 8 InHg. This vacuum set point is adjustable from 8.0 to 10.0 inHg in increments of 0.5 inHg via the Master Controller.
- ❑ System operation is automatically controlled via the Master Controller and the Variable Frequency Drive (VFD) of each pump.
- ❑ The system is capable of running continuously and may be turned OFF when not in use.
- ❑ Designation of the Primary Pump is cycled through all pumps in the system to evenly distribute run time across all pumps in the system.
- ❑ The system may be turned ON or OFF from a single, convenient location within the dental office using an optional Remote Control Panel switch.
- ❑ The default setting for the number of tanks is set at the factory to single.
- ❑ Each tank has been designed to collect the fluids evacuated during a normal operating day.
- ❑ An internal float switch interrupts the pump operation and automatically drains the tank when an excessive amount of fluids are collected in the tank.
- ❑ All liquids drain from the separation tank when the power is turned OFF.

### Pump Power On/Off Switch with Circuit Breaker.

As the Mains power disconnect of the associated pump, this combination switch and circuit breaker controls application of the connected input power and protects the pump from overloads and short circuits.

When set to the up (1) position, it applies input power to the internal VFD electronics and the associated pump and must be set in the up (1) position to allow the pump to operate via the Master Controller.



**Activation.** Whenever the Master Controller starts running, a system pump will start operation. The Master Controller state (Standby or Running) is controlled by either the Standby button on the touch screen or the Master Controller Remote Panel switch located on the optional remote panel. This first operating pump is designated the Primary Pump for the system. The selection of the Primary Pump changes among the available pumps each time the Master Controller is activated (Running). This cycling of the primary pump designation is designed to distribute the wear across all pumps of the system. The pump's VFD control the frequency of the active (primary) pump to maintain the vacuum set point. If the system vacuum level falls below 1 inHg of the Set Point for 15 seconds the next pump in the series is automatically activated. Additional pumps are automatically turned on as necessary to maintain the vacuum level required for the dental office. Using this balanced system approach, each user has the vacuum level necessary to do the job while conserving electricity and prolonging the life of the pumps.

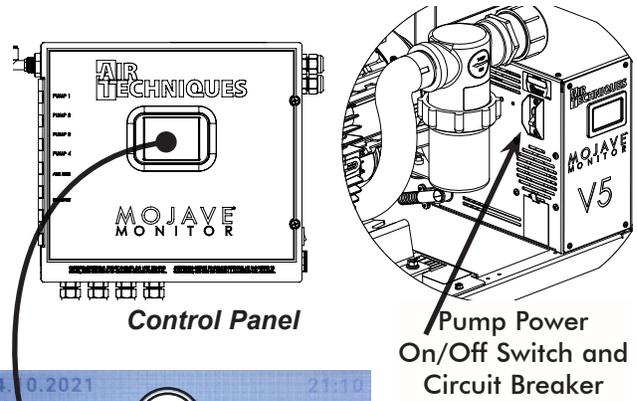
**De-Activation.** When the frequency of the Primary Pump is below approximately 60 Hz for 15 seconds, the last pump turned ON shuts down. If this condition remains, then each additional pump in the system also is automatically turned OFF in the reverse order of their activation until only the Primary Pump is left operating.

**Washout Cycle.** A Washout Cycle is initiated 5 minutes after the system transitions into Standby. The Facility Main Water and the Washout Solenoid are then activated. The Washout Cycle will run for 2 minutes as long as the system remains in Standby. The Washout and Water Solenoids will be turned OFF, and not allowed to be turned ON again until after the system comes out of the Standby condition.

# OPERATING INFORMATION

## START UP BY TOUCH SCREEN

1. Set the motor **Mains Circuit Breaker** in the **ON** position.
2. Observe that the color touch screen illuminates and depress the blue **Standby** button.
3. Observe that the **Standby** button changes to a green **Running** button, that the unit is running and the **Vacuum** widget shows increasing pressure.



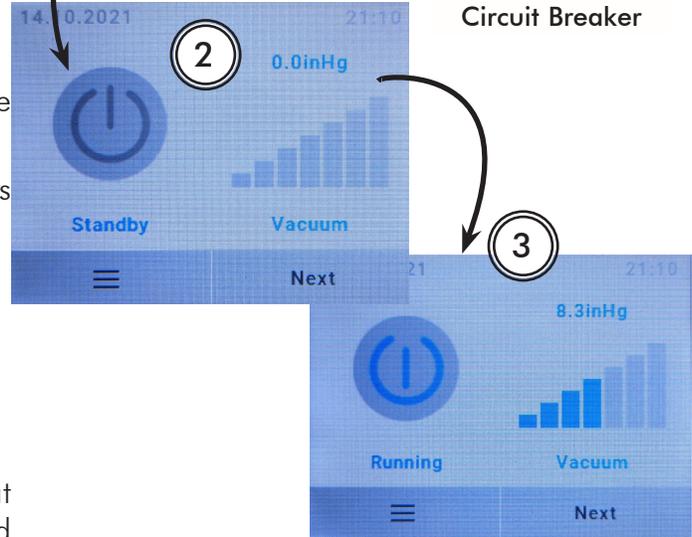
## START UP BY OPTIONAL REMOTE SWITCH

1. Set the motor **Mains Circuit Breaker** to the **ON** position.
2. Observe that the when in **Standby** with no errors the push button indicator is extinguished.

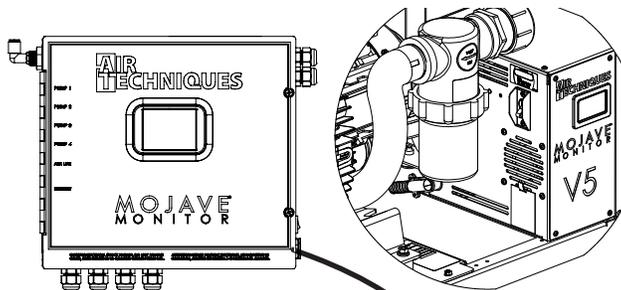
**Note a:** Depending on the site installation, the remote switch can be either a Bi-Color LED 6VDC switch (included) or a single green LED 24 VDC switch.

Refer to the tables below for the LED conditions for each switch during operation.

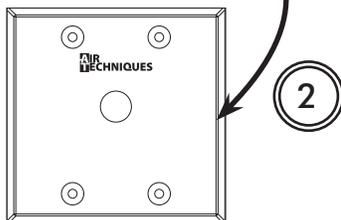
3. Depress the push button switch and observe that the associated indicator illuminates as listed for the corresponding switch.



**Color LCD Touch Screen Display**



**Control Panel**



**Optional Remote Control Panel**

6V DC Bi-Color Green / Yellow Indicators (See Note a.)		
Bi-Color LED Condition	Run State	Condition Description
None	Standby	No errors
Solid Green	Running	No errors
Flashing Yellow	Standby	Error present
Alternating Green / Yellow	Running	Error present

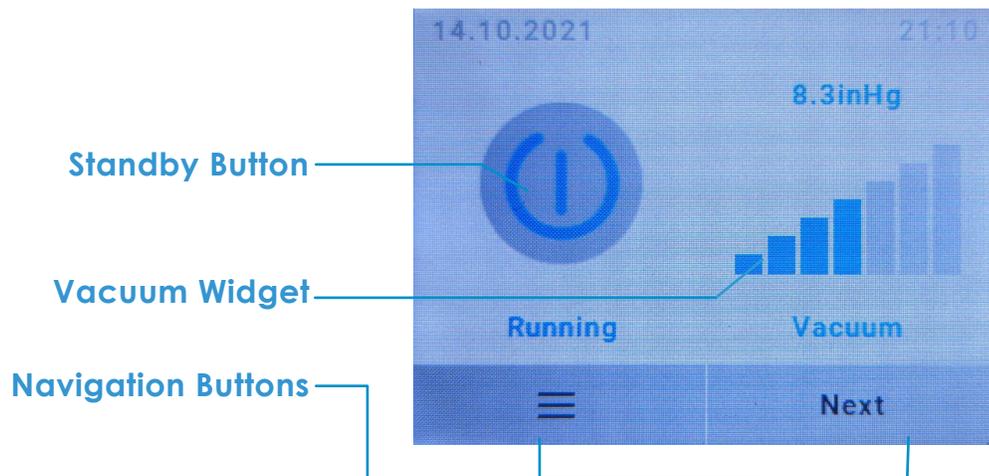
24V DC Green Indicator Only (See Note a.)		
Green LED Condition	Run State	Condition Description
None	Standby	No errors
Solid Green	Running	No errors
Flashing Green – Slow	Standby	Error present
Green – Fast	Running	Error present

**Note:** The motor power circuit breaker must be kept in the **ON** position to operate the color LCD touch screen display. See Operating Information on page 15.

All **MOJAVE** units have a color LCD touch screen display located on the front control box panel. This display is used to start the unit and show system operating status. It also serves as an input for controlling operation and adjusting system parameters.

The display shows two screens during normal operation; a Home Screen and a Settings Screen. The Home Screen is used to start and monitor operation of the **MOJAVE**, while the Settings Screen allows changes to operating parameters.

The screens are comprised of operation Buttons, Navigation Buttons and Widgets as described below.



## Operation Buttons

**Standby Button** - Home Screen Standby Button that when blue, indicates the system is in the "Standby" mode. When pressed, this switch starts the compressor operation.

**Running Button** - Home Screen Standby Button that when green indicates the system is in the "Running" mode. When pressed, this switch stops **MOJAVE** operation and returns to the "Standby" (blue button) mode.

**Error Button** - Home Screen Standby Button that when red indicates an error is present causing the **MOJAVE** to shut down operation.

**Navigation Buttons** - located on the bottom of the screen these buttons allow the user to migrate within a screen by going to the next screen level or to transfer between the Home Screen and a Settings Screen.

**Widget** - an element of a graphical user interface (gui) that is used to display information during vacuum operation. The Home Screen normally shows the Vacuum Widget while the Motor Frequency, Separator RPMs, Voltage and Temperature widgets are accessed by pressing the **Next** Navigation Button.

# TOUCHSCREEN CONTROLS

## 1. HOME SCREEN

### a. STANDBY BUTTON / VACUUM SCREEN

#### i. Standby Button

- Running: Motor and separator run to maintain the set vacuum level of 8.0 to 10.0 inHg.
- Standby: Motor and separator are not running.
- Error: Motor and separator do not run.

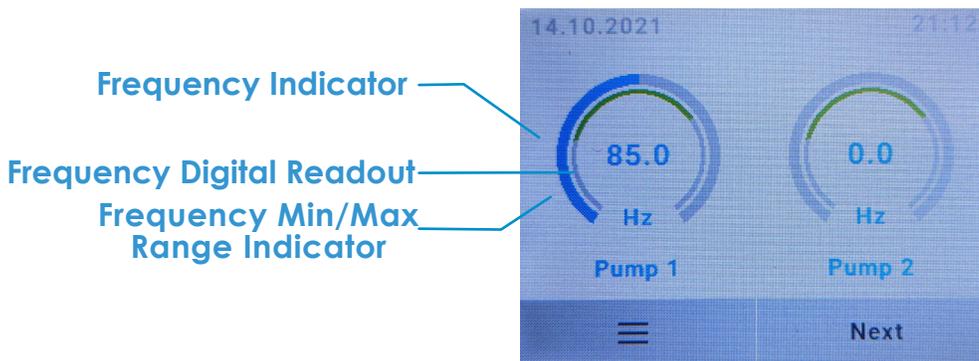
#### ii. Vacuum Widget - Displays current vacuum level.



### b. PUMP / SEPARATOR SCREEN

#### i. Pump Frequency Widget - Displays current frequency level with min/max range indicator.

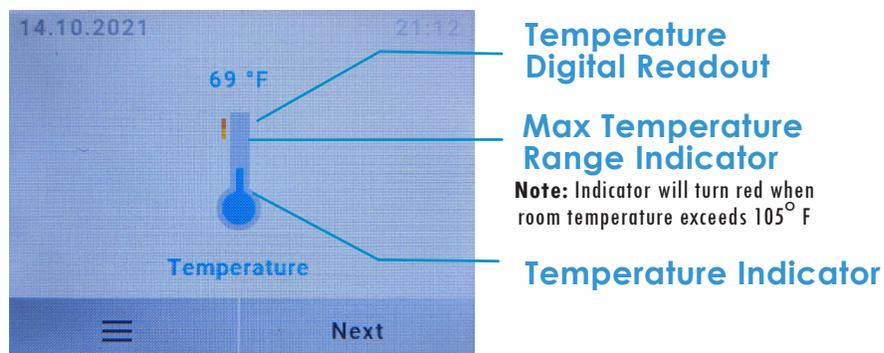
#### ii. Separator RPM Widget - Displays current RPM value with min/max range indicator.

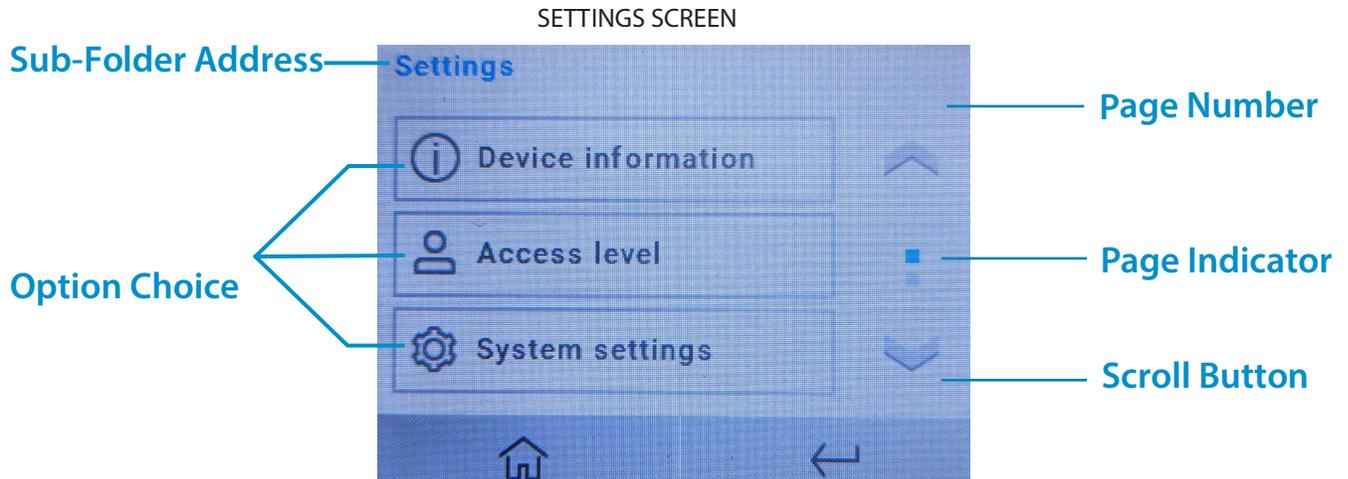


### c. VOLTAGE / TEMPERATURE SCREEN

#### i. Voltage (V) Widget - Current line voltage with min/max range indicator.

#### ii. Temperature (°F) Widget - Current ambient temperature of room with max temperature limit indicator.





## 2. SETTINGS SCREEN

### a. INFORMATION

- i. **Model** - Air Techniques model number.
- ii. **SN** - Unit serial number.
- iii. **PCB** - Indicates control board serial number.
- iv. **Firmware** - Indicates latest installed firmware and revision.
- v. **VFD Code** - Indicates VFD Code number.

### b. ACCESS

- i. **User** - Default setting on startup, this access level should be used when unit is not being serviced by a technician. Set level by pressing the radio button.
- ii. **Technician** - This access level is used when unit is being serviced by a technician to access all option choices. Set level by pressing the radio button.

**Note:** Access will save on exit by either HOME or BACK buttons

### c. PARAMETERS

- i. **Set Point** - Sets vacuum level between 8-10 inHg in 0.5 inHg increments by pressing up or down arrows. Press the **SAVE** button to accept setting.
- ii. **Tank Config** - Configures system tank as single or dual.
- iii. **System Config** - Select pump types as either (V3M, V5M or V7M) or V15M

### d. DATE / TIME

- i. **Date** - Sets to current date. Set date by pressing up or down arrows above or below each digit, then press the **SAVE** button.
 

**Note:** When the time zone (UTC) is reset, the time setting may need to be set to match location.
- ii. **Time** - Sets current time for selected time zone. Set time by pressing up or down arrows above or below each digit, then press the **SAVE** button.
- iii. **Time Zone** - Sets time zone. Set appropriate UTC (see table) by pressing up or down arrows above or below each digit. Press the **SAVE** button and then power cycle (power off then on) device to save setting. After completing power cycle, verify the time matches location.

Time Zones Currently Being Used in United States			
Time Offset	Time Zone		Example City
	Abbreviation	Name	
UTC - 5	EST	Eastern Standard Time	New York
UTC - 6	CST	Central Standard Time	Chicago
UTC - 7	MST	Mountain Standard Time	Salt Lake City
UTC - 8	PST	Pacific Standard Time	Los Angeles
UTC - 9	AKST	Alaska Standard Time	Anchorage
UTC - 10	HAST	Hawaii-Aleutian Standard Time	Honolulu

e. NETWORK 

- i. **Hint:** - Password "Hint"
- ii. **DHCP:** - Indicates DHCP enabled for connected network
- iii. **IP-Address:** - Indicates IP-Adress of connected network
- iv. **Netmask:** - Indicates Netmask of connected network
- v. **Gateway:** - Indicates Gateway of connected network
- vi. **MAC Address:** - Indicates MAC address of unit

f. STATISTICS 

- i. **On-Time** - Shows time that system has been powered on (hours)
- ii. **Run-Time** - Shows time that system has been running (hours)

g. ALARM HISTORY 

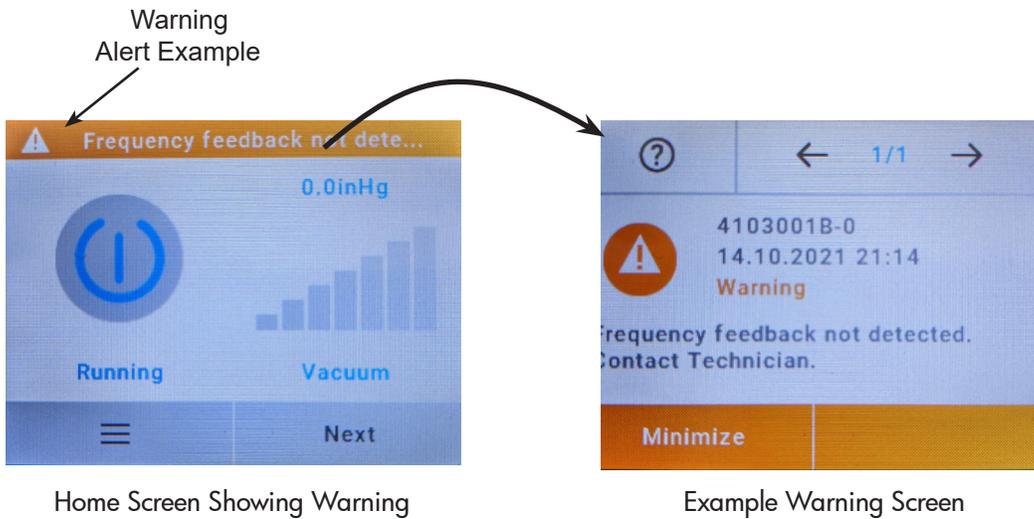
Shows the last forty (40) alarms triggered. Push any listed **ALARM** button to get details of alarm, such as suggested tasks and date alarm was triggered.

**ALARMS**

**MOJAVE** checks operation via the Intelligent Monitoring System and alerts the user to problems by displaying Warnings or Errors in the upper left corner of the Home Screen. Warnings notify the user of conditions effecting operation while Errors are critical problems disabling operation. As shown below, explanation of the Warning or Error is expanded by pressing the displayed alert. Also refer to TROUBLESHOOTING, page 38, to correct additional problems.

a. WARNINGS 

- i **Low Vacuum** Vacuum level is less than 0.5 inHg for 1 minute.
- ii **High Temp** Room temperature too high is above 130°F.
- iii **Low Temp** Room temperature too low is below 40°F.
- iv **Aux Link** Link between Control and Auxiliary unit has been lost.
- v **Feedback** Frequency feedback not detected.  
Loss of serial Communication Link.



# TOUCHSCREEN CONTROLS

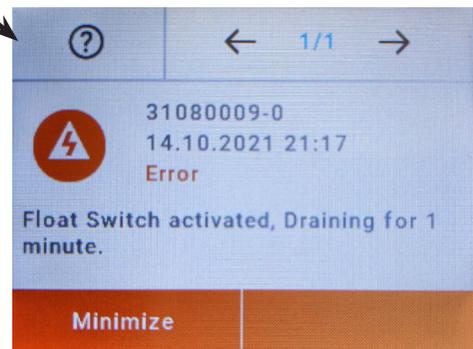
## b. ERRORS

- i Pressure Sensor Pressure sensor is malfunctioning. Readings are consistently negative.
- ii High Vacuum The Vacuum level has been 1 inHg above the set-point for 1 minute.
- iii VFD A Pump VFD has reported an error via its relay contact.
- iv Control A Pump is running that the Master Controller did not instruct to run.
- v Tank A Float Switch has been tripped to prevent water from entering the Pumps.
- vi Drain Tripped Floats that caused an Active Drain condition are still tripped after the 1 Minute Active Drain delay.
- vii Critical Temp The Room Temperature is above 150 °F.
- viii Connection No pumps are connected to the Master Controller.

Pressure Sensor Malfunction Alert Example



Home Screen Showing Error



Example Error Screen

**Initial System Startup.** Start the **MOJAVE** system for the first time by referring to the Operating Information section and performing the following procedure.

**Important:** Make sure that each facility electrical disconnect box controlling the 220V, 20 AMP single phase 50/60 Hz circuit to the corresponding pump is set to the ON position.

1. Apply facility operating power to each pump by placing the Pump Power Switch with Circuit Breaker in the up (1) position.
2. Connect CAT5 cable between all pumps and the Master Controller.
3. Connect the supplied line cord between the Mains outlet and the AC Power IEC Receptacle of the Master Controller. The Master Controller is now in the Standby mode. Observe the following:
  - a. Touchscreen is illuminated showing the default Normal Display Mode view.
  - b. The Master Controller shows Standby (idle).
  - c. Pump Status Indicator corresponding to the connected pump or pumps **Quick Flash Green** designating that the pumps are connected but not operating. Pump Status Indicators associated with no connected pump will be extinguished.
4. Start system operation by pressing the Standby button located on the Master Controller Touchscreen. This places the Master Controller in the Running mode where at least one Pump is operating. Observe the following.
  - a. Touchscreen Standby button turns **Solid Green** designating that the Master Controller is Running (at least one pump is operating in multi pump systems).
  - b. Pump Status Indicator associated with the operating pump illuminates **Solid Green** designating that a pump is operating (spinning) and no error is present.
5. Press the Touchscreen Standby button to stop the pump operation and return the Master Controller to the Standby mode (idle). If operating a system with only one pump, proceed to step 6. When operating a multi pump system, repeat steps 3 and 4 for each pump and observe that the next pump in the system starts operation each time the PUMP ON/OFF button is pressed.
6. Navigate to **Access Menu** item by pressing the SETTINGS button and select
7. Proceed to step 8 if the system has a MT10-M tank. When using systems with a CT20-M tank change the **Tank Config** as follows:
  - a. Navigate to the **Tank Config** top menu item by pressing the SETTINGS button.
  - b. Press the Parameters button then press the **Tank Config** button.
  - c. Finally, select **Dual Tanks**.
8. If using a V15 System
  - a. Navigate to the **System Config** menu item by pressing the SETTINGS button.
  - b. Press the Parameters button then press the **System Config** button.
  - c. Finally, select V15 then press the **Home** button.

**Note:** The optional Remote Control Panel switch may be used instead of the Touchscreen Standby button.

**Normal Operation.** The **MOJAVE** system is normally operated by simply pressing the Touchscreen Standby button located on the front panel of the Master Controller. This places the Master Controller in the Running mode to control system operation via the Variable Frequency Drive (VFD) electronics of each pump. During operation the controller automatically starts pump operation, adjusts the frequency of the pumps to maintain the required vacuum level as needed. Additionally the Master Controller constantly monitors the system operation status, performs self diagnostics and reports errors.

## TROUBLESHOOTING

**Automated Self Diagnostic Feature.** Every 2 hours each pump in the system that is not ON will be turned ON for 6 seconds and then turned OFF, one at a time. By constantly checking the status of all pumps in the system this feature makes sure that each is ready for operation and may be helpful in preventing locked rotors.

**Error Reporting.** The Master Controller constantly monitors the system operation and immediately records and reports any errors found. Some errors clear automatically as soon as the operating issues are resolved; other errors have to be manually reset. The table below lists the types of errors reported along with their causes, affects on the system, and details on how the error can be reset.

Alert	Alert Type	What Caused the Alert?	How is System Affected?	Warning / Error Condition(s) Reset Method(s)
Low Vacuum	Warning	Vacuum Level is below 0.5 inHg for 1 minute	<ul style="list-style-type: none"> <li>Warning message displayed</li> </ul>	<ul style="list-style-type: none"> <li>Automatic, once the vacuum level returns to the normal range</li> <li>Cycle System "Running" Status</li> <li>Cycle. MMC-M Power</li> </ul>
High Temp	Warning	The Room Temperature is above 130°F	<ul style="list-style-type: none"> <li>Warning message displayed</li> </ul>	<ul style="list-style-type: none"> <li>Automatic, once the room temperature returns to the normal range</li> </ul>
Low Temp	Warning	The Room Temperature is below 40°F	<ul style="list-style-type: none"> <li>Warning message displayed</li> </ul>	<ul style="list-style-type: none"> <li>Automatic, once the room temperature returns to the normal range</li> </ul>
Aux Link	Warning	Link between a Control and Auxiliary unit has been lost	<ul style="list-style-type: none"> <li>Warning message displayed</li> </ul>	<ul style="list-style-type: none"> <li>Automatic, once the link is re-established</li> </ul>
Feedback	Warning	Frequency feedback not detected. Loss of serial Communication Link.	<ul style="list-style-type: none"> <li>If this pump is also the Primary it is shutdown.</li> <li>Warning message displayed</li> </ul>	<ul style="list-style-type: none"> <li>Automated Self Diagnostic Function</li> <li>Disconnect Pump</li> <li>Cycle. MMC-M Power</li> </ul>
Pressure Sensor	Error	The Pressure sensor is Malfunctioning. Readings are consistently negative.	<ul style="list-style-type: none"> <li>All running pumps are shutdown</li> <li>Error message displayed</li> </ul>	<ul style="list-style-type: none"> <li>Cycle System "Running" Status</li> <li>Cycle. MMC-M Power</li> </ul>
High Vacuum	Error	The Vacuum level has been 1 inHg above the set-point for 1 minute	<ul style="list-style-type: none"> <li>All running pumps are shutdown</li> <li>Error message displayed</li> </ul>	<ul style="list-style-type: none"> <li>Cycle System "Running" Status</li> <li>Cycle. MMC-M Power</li> </ul>
VFD	Error	A Pump VFD has reported an error via its relay contact	<ul style="list-style-type: none"> <li>This pump is shutdown</li> <li>Error status is displayed</li> </ul>	<ul style="list-style-type: none"> <li>Automatic, once the fault is diagnosed and resolved.</li> </ul>
Control	Error	A Pump is running that the Master Controller did not instruct to run	<ul style="list-style-type: none"> <li>Error message displayed</li> </ul>	<ul style="list-style-type: none"> <li>Automatic, once the fault is diagnosed and resolved</li> <li>Disconnect Pump</li> </ul>
Tank	Error	A Float Switch has been tripped to prevent water from entering the Pumps	<ul style="list-style-type: none"> <li>All running pumps are shutdown</li> <li>Error status is displayed</li> </ul>	<ul style="list-style-type: none"> <li>Automatic, after a 1 Minute "Active Drain" delay.</li> </ul>
Drain	Error	Tripped Floats that caused an Active Drain condition are still tripped after the 1 Minute Active Drain delay.	<ul style="list-style-type: none"> <li>Error status is displayed</li> </ul>	<ul style="list-style-type: none"> <li>Automatic, once an active float switch deactivates.</li> <li>Cycle. MMC-M Power</li> </ul>
Critical Temp	Error	The Room Temperature is above 150 °F	<ul style="list-style-type: none"> <li>All running pumps are shutdown</li> <li>Error status is displayed</li> </ul>	<ul style="list-style-type: none"> <li>Automatic, once room has cooled.</li> </ul>
Connection	Error	No pumps are connected to the Master Controller	<ul style="list-style-type: none"> <li>Error status is displayed</li> </ul>	<ul style="list-style-type: none"> <li>Automatic, once a pump is connected</li> </ul>

<b>Problem</b>	<b>Possible Cause</b>	<b>Possible Solutions</b>
1. Tank does not drain.	<ul style="list-style-type: none"> <li>a. Gate Valve in closed position.</li> <li>b. Drain check valve clogged.</li> <li>c. Clogged drain.</li> <li>d. Separator tank is full and will not drain.</li> </ul>	<ul style="list-style-type: none"> <li>a. Open Gate Valve fully.</li> <li>b. Call your authorized dealer for repair service.</li> <li>c. Call your local plumber.</li> <li>d. Tank must be hooked up to an open drain. If hooked to an open drain and tank won't drain call your authorized dealer for repair service.</li> </ul>
2. No suction.	<ul style="list-style-type: none"> <li>a. Master Controller not turned on.</li> <li>b. Pump not turned on.</li> <li>c. Pump not running.</li> <li>d. Kinked or collapsed suction hose.</li> </ul>	<ul style="list-style-type: none"> <li>a. Turn Master Controller on.</li> <li>b. Turn pump main power switch to ON.</li> <li>c. See problem 5 below.</li> <li>d. Make sure all hoses are properly connected. Check the suction line from the unit to the separation tank and the separation tank to the operatory line. If clogged, collapsed or kinked call your authorized dealer for repair service.</li> </ul>
3. Poor or low suction	<ul style="list-style-type: none"> <li>a. Restricted air exhaust.</li> <li>b. Restricted air suction.</li> </ul>	<ul style="list-style-type: none"> <li>a. Check air exhaust pipe to make sure it conforms to specifications. Check and clear possible restrictions in exhaust line.</li> <li>b. Check the suction line from the unit to the separation tank and the separation tank to the operatory line. If clogged , collapsed or kinked call your authorized dealer for repair service.</li> </ul>
4. Excessive suction	<ul style="list-style-type: none"> <li>a. Clogged or restricted vacuum inlet line to Master Controller.</li> <li>b. Malfunctioning Master Controller.</li> </ul>	<ul style="list-style-type: none"> <li>a. Check and clear any clogs or restrictions, and/or fluid from vacuum inlet line.</li> <li>b. Call your authorized dealer for repair service.</li> </ul>
5. Pump does not run.	<ul style="list-style-type: none"> <li>a. Site circuit breaker is "OFF".</li> <li>b. Pump circuit breaker is "OFF".</li> <li>c. Master Controller circuit breaker is tripped.</li> <li>d. Low voltage Remote Control Panel Switch turned "OFF", or not connected properly.</li> <li>e. Electrical problem.</li> </ul>	<ul style="list-style-type: none"> <li>a. Turn "ON" the site circuit breaker.</li> <li>b. Turn "ON" the pump circuit breaker.</li> <li>c. If the white section of the circuit breaker is visible, it is tripped. Flip this section back in to reset breaker.</li> <li>d. Make sure remote switch is turned "ON" and wired properly.</li> <li>e. Call your authorized dealer for repair service.</li> </ul>

## Vision Monitor Remote Monitoring Solution

Vision Monitor is a cloud based remote monitoring solution that provides valuable, real-time status information from your network connected Mojave Monitor directly to any internet devices via the web interface or mobile app. Connect your equipment to allow service technicians to quickly diagnose problems, update parameters remotely, check usage history, and minimize downtime. Vision Monitor will also notify you when the equipment requires maintenance to ensure optimal performance and reliability year over year from your Mojave Monitor.

## System Requirements

Vision Monitor software server installation requirements for a server or practice computer network:

Operating system:	Windows Server 2016 Microsoft Windows 10, 64-bit
Graphics board:	Resolution <sup>3</sup> 1280 x 1024 (recommended)
Interface:	Ethernet, DHCP/dynamic allocation of IP addresses Internet
Ports required:	502, 512, 514, 45123 - 45126, 50123
Additionally required software:	Mozilla Firefox, Google Chrome or Microsoft Edge (in the current version)
Peripheral equipment required:	Sound board, loudspeaker



Just a browser is needed for the user interface of the cloud.  
The network connection of the devices needs to be stable, e.g. via LAN or via a stable WLAN  
For stability reasons the use of e.g. PowerLAN is not recommended.

## Installation

Please review the Vision Monitor Installation Instruction at <https://www.airtechniques.com/wp-content/uploads/2203V002.pdf> for the complete guide on connecting and installing your Mojave Monitor to Vision Monitor.

The Vision Monitor software that must be installed at the dental practice can be downloaded from this link: <https://www.airtechniques.com/en/drivers/>

## Initial Maintenance.

After installation, clean the vacuum lines with CleanStream Cleaner. This is especially necessary when a new system is being installed into existing dental system piping. Using CleanStream Cleaner helps the **MOJAVE** system to remove any built up deposits in the piping system. Perform the initial cleaning by performing the daily maintenance procedure provided below.

## Maintenance-Free MOJAVE Pumps.

All **MOJAVE** pumps are designed for maintenance-free operation. The pump features a powerful 3-phase motor. The motor is completely water and oil-free and provides a dependable operation requiring no scheduled maintenance.

## Preventive Maintenance.

Whenever a service technician fulfills a repair call at the customer site routine checks should also be performed to detect general overall wear, and replacement of parts should be made if necessary before a failure causes a prolonged shut-down. This preventive maintenance program will aid in dependable equipment operation and help reduce breakdown.

## Scheduled Maintenance.

Since a well-organized maintenance program aids dependable equipment operation and reduces breakdown to a minimum, it is essential that the maintenance instructions be followed completely. The routine cleaning will remove any built up deposits in the piping system and the tank inspection will verify proper drainage before a failure causes a prolonged shut-down.

- Daily**
1. Clean drain lines from the operatory to the separator tanks with CleanStream Cleaner by performing the procedure provided on the next page.
  2. A Washout Cycle is automatically initiated when the system has been in Standby for 5 minutes. During this cycle the Facility Main Water and the Washout Solenoids are activated and the tank is rinsed with water for 2 minutes via the wash-out fitting on the top of the tank. The Washout Cycle runs for 2 minutes as long as the system remains in Standby and will not be started again until after the system comes out of the Standby.
- Weekly**
1. Check for noise and leaks.
  2. Clean exterior surfaces
  3. Make sure that no flammable, corrosive, or combustible materials are stored in the equipment room (especially in the area around the equipment).
- Monthly**
1. Check tubing for kinks or cracks.
  2. Check drip leg for liquids on exhaust line.

**Important:** Evidence of buildup at the base drain or liquids reaching the float assembly most likely means that a stricter adherence to the daily maintenance procedure is required.

If problems are found during tank inspection, perform the daily maintenance Tank Washout procedure as necessary to remove buildup at the base drain. Reinspect to verify proper tank drainage. If the tank is leaking and needs to be replaced, order the appropriate Tank Replacement Kit (part numbers: H5510, H5512, H5515, H5520 or H5522). Follow instructions with kit and **DO NOT** send used contaminated tank back to ATI.

- Semi-Annually**
1. Check the inlet filter on each pump assembly for buildup. The filter should be dry and clean. The presence of any liquid or debris means that the installation or the tank is incorrect.
  2. Check for buildup at the base of the tank entering the drain to verify proper drainage.
  3. On CT20-M Continuum tanks, check for buildup at the check valve connecting the two tank sections to verify proper liquid flow.



**WARNING!**

Always use the proper personal protective equipment when in contact with biohazard waste.

**Caution:** The use of the following materials will result in equipment damage, loss of system performance and/or will void the warranty. **DO NOT USE:**

- Foaming cleaners
- Household cleaning agents
- Instrument cleaners/disinfectants
- Cleaning agents containing chlorine
- Abrasive Cleaners
- Solvents like acetone

**Daily Maintenance - Clean Vacuum Lines**

Clean all vacuum lines in the vacuum system with CleanStream Cleaner daily as part of the overall preventive maintenance program. This helps to maintain the cleanliness of the tank as well as the vacuum lines and tubing throughout the system. Using the 2.5 liter bottle of CleanStream Cleaner, PN 57850 and the CleanStream dispenser system, PN 57665.

Required - Not Supplied	
Part No.	Description
57850	2.5 Liter Bottle CleanStream Cleaner (125 applications)
57665	Monarch CleanStream Dispenser System w/Vortex Technology



Part No. 57850

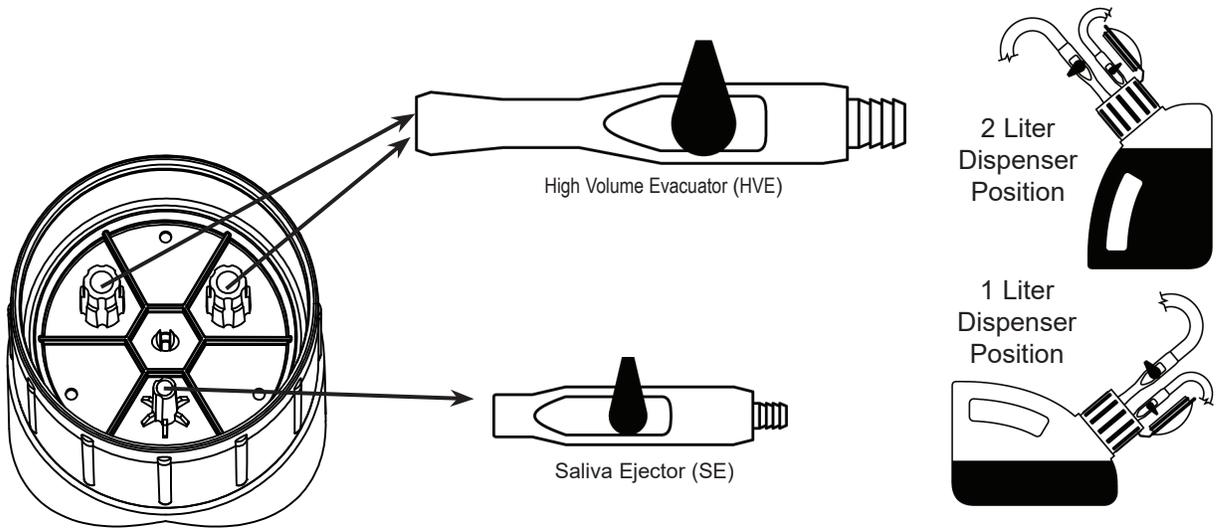


Monarch CleanStream Dispenser System w/Vortex Technology, Part No. 57665

**Procedure.** Prepare the cleaning solution and clean the system daily by performing the following steps.

**Note:** The CleanStream Dispenser can hold a maximum of 2 liters of solution for cleaning up to 2 operatories. Mix solution quantity as necessary.

1. Fill the CleanStream dispenser with tap water as applicable;
  - a. to the line marked 1 L for 1 operator
  - b. to the line marked 2 L for 2 operatories
2. Using the 20ml measuring line in the CleanStream Cleaner bottle cap, add the CleanStream Cleaner concentrate to the dispenser as applicable;
  - a. for 1 operator, add 20ml of CleanStream concentrate to the 1 liter of water
  - b. for 2 operatories, add 40ml of CleanStream concentrate to the 2 liters of water
3. As shown by Figure 16, the interior of the CleanStream dispenser bottle cap is configured with three holes for the insertion of HVEs and SEs via provided adapters as follows.
  - a. attach saliva ejector to smallest atomizing adapter
  - b. attach 1 or 2 high volume ejectors to respective adapter(s)
4. Refer to Figure 16 and place dispenser in the 2-liter vertical position or the 1-liter horizontal position as necessary.
5. With the vacuum pump on and handpiece valves open, aspirate the CleanStream solution from dispenser.
6. After each cleansing procedure, disconnect the hand pieces and rinse the dispenser.



**Figure 16. CleanStream Dispenser Cap Adaptor Locations**



**Important Information**  
**Tank Disposal**

- DO NOT send used contaminated tank back to ATI.
- Every contaminated tank must be disposed of in accordance with local codes, regulations and guidelines for biohazard material handling and disposal.

**REPLACEMENT PARTS**

**Tank Replacement.** If the tank is leaking and needs to be replaced, order the appropriate Tank Replacement Kit (part numbers: H5510, H5512, H5515, H5520 or H5522). Follow instructions provided with kit and **DO NOT** send used contaminated tank back to ATI.

System Part No.	Replacement Part No.	
	Pump Only	Power Module
V3M, V3M-NHE	H5613	H5713
V5M, V5M-NHE	H5615	H5715
V7M, V7M-NHE	H5617	H5717

## ***ACCESSORIES/OPTIONS***

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**Accessories/Equipment Options.** The following lists the ordering number and description for accessory components available to maintain the **MOJAVE** product family. Contact an authorized Air Techniques' dealer for information.

<b>Part No.</b>	<b>Description</b>
53020, 53021, 53170 & 53173	Remote Water Control Valve Systems
H5217	V3M / V5M / V7M Replacement Bowl, Screen and Gasket for Inlet Filter
56650	XL Utility Stack Rack
56600	Utility Stack Rack Mini

## ***WARRANTY***

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The **MOJAVE** is warranted to be free from defects in material and workmanship from the date of installation for a period as follows

Standard Warranty: 5 years (60 months) for the complete unit.

Any item returned to our factory through an authorized distributor, will be repaired or replaced at our option at no charge provided that our inspection shall indicate it to have been defective. Dealer labor, shipping and handling charges are not covered by this warranty.

This warranty does not apply to damage due to shipping, misuse, careless handling or repairs by other than authorized service personnel. Warranty is void if equipment is installed or serviced by other than dealer service personnel authorized by Air Techniques. Air Techniques, Inc. is not liable for indirect or consequential damages or loss of any nature in connection with this equipment.

This warranty is in lieu of all other warranties expressed or implied. No representative or person is authorized to assume for us any liability in connection with the sale of our equipment.

## ***ONLINE WARRANTY REGISTRATION***

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Quickly and easily register your new **MOJAVE** online. Just have your product model and serial numbers available. Then go to the Air Techniques web site, [www.airtechniques.com/dental](http://www.airtechniques.com/dental), click the **warranty registration** link and complete the registration form. This on-line registration ensures a record for the warranty period and helps Air Techniques keep you informed of product updates and other valuable information.







For over 50 years, Air Techniques has been a leading innovator and manufacturer of dental products. Our priority is ensuring complete satisfaction by manufacturing reliable products and providing excellent customer and technical support. Whether the need is digital imaging, utility room equipment or merchandise, Air Techniques can provide the solution via our network of authorized professional dealers. Proudly designed, tested and manufactured in the U.S., our products are helping dental professionals take their practices to the next level.

Air Techniques' family of quality products for the dental professional include:

- ☐ **Digital Imaging**
  - Digital Radiography
  - Intraoral Camera
  - Caries Detection Aid
  - Intraoral X-ray
  - Panoramic X-ray
  - Film Processors
  
- ☐ **Utility Room**
  - Dry Vacuums
  - Wet Vacuums
  - Air Compressors
  - Amalgam Separator
  - Utility Accessories
  - Utility Packages
  
- ☐ **Merchandise**
  - Surface Disinfectant
  - Enzymatic Cleaner
  - Hand Sanitizer and Lotion
  - Waterline Cleaner
  - Evacuation System Cleaner
  - Imaging Accessories
  - Chemistry
  - Processor Accessories

[www.airtechniques.com](http://www.airtechniques.com)



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