CustomAir

Dual Wet Vacuum System

Installation, Operation and Care Manual

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CustomAir

This manual contains installation, operation, care and repair instructions and user service information for the CustomAir® Dual Wet Vacuum System (MC-201/MC-202).

The Dual Wet Vacuum System is designed to provide trouble-free service when installed, operated and cared for according to the procedures set forth in this manual.

Specifications

	MC-201	MC-202
Motor		
Power Rating:	1 HP	2 HP
Amps (each motor):	7.5	15
Running Speed:	3450 RPM	
Ambient Temperature:	40°C/104°F	
Voltage:	208/230	
Cycle:	60 Hz.	
Phase:	Single	
Max. Oper. Noise Level:	70-75 dB	
Vacuum		
Mercury Pull (Sealed Sys.):	Approx. 20-25" Hg. Adjust.	
One Pump Operation Usable CFM:	15	30
Use factor (Number of high-volume hoses open simultaneously):	1.5	3
Two Pump Operation Usable CFM:	30	60
Use factor (Number of high-volume hoses open simultaneously):	3	6
Dimensions		
Height:	23"	
Width:	24"	
Depth:	15-5/8"	
Shipping Weight:	180 lbs.	210 lbs.
Approvals:	CE	
Standard Models, 115 VAC only:		
UL Listed:	File E34585	
CSA Certified:	File LR67707	

Features/Benefits

- **Spread Voltage** — The Dual Wet Vacuum system can be wired directly to 208 and 230 VAC electrical circuits, eliminating the need for buck and boost transformers.
- **Swing Check Valve —** Eliminates the need for inconvenient manual shut-off valves and provides a positive seal for one pump operation.
- **Secondary Filter —** Traps any materials too large to pass through the pump and features easy-to-clean convenience.
- **Pump Controls —** For convenience, all controls are located on the outside front of the unit. Dual-lighted switches allow for individual activation of each pump. Vacuum adjustments can be easily made and checked with the adjustment control and gauge.
- **External Vacuum Adjustment —** For convenient and accurate vacuum adjustment when needed.
- **Rugged Frame and Enclosure —** Designed for strength and easy access to all assemblies.
- **Instrumentation —** Vacuum level at a glance.
- **Two Quiet-Running Motor/Pump Assemblies —** For back-up protection. Motors are designed for continuous operation and long life. Pumps are solid brass castings, precision machined for long and trouble-free service — not affected by modern dentistry chemicals. 1 HP and 2 HP motors are available. Both pumps can be operated during peak work periods.
- **Pre-Wired for Remote Switch —** Allows quick pick-up of third wire for a remote lighted operatory switch.
- **Easy Disconnect —** Designed for easy servicing — all connections to motor/pump assembly can be easily removed for fast service.
- **Two-Year Warranty —** Longer warranty reduces maintenance cost.

The following Pre-installation information will assist in making a quick, easy and quality installation. However, if there are any questions, contact a CustomAir technical service representative at **1-866-DTE-INFO**.

Site Requirements

Before the Dual Wet Vacuum System can be properly installed, the following utilities must be supplied:

Electrical

All electrical supply lines and control wiring should be supplied and installed by a licensed electrician according to local building codes. **The Dual Wet Vacuum System requires two separate circuits** (one for each pump motor) of the correct voltage for the system ordered. In addition to the thermal overload protection built into the motors, each circuit must be provided with a circuit breaker, time delay fuse or standard fuse. See the Motor Protection Chart below for recommended breaker or fuse amperage.

Motor Protection Chart

Protection Type (each motor)	MC-201 230V	MC-202 230V
Circuit Breaker	20 Amps	30 Amps
Time Delay Fuse	12 Amps	20 Amps
Standard Fuse	25 Amps	40 Amps

Low Voltage Control Line (Optional)

If remote low voltage is desired, a licensed electrician should install 18-3 thermostat wire for lighted switch or 18-2 thermostat wire for non-lighted switch from the pump location to the operatory switch located up to 150 feet away. If the operatory switch is over 150 feet away from the pump location, use 16-3 thermostat wire for lighted switch or 16-2 thermostat wire for non-lighted switch.

— IMPORTANT —

All vacuum systems must be installed according to local building and electrical codes.

Water

Water line must be installed by a plumber according to local building codes. Terminate water line in 1/2" FIP gate valve.

Waste

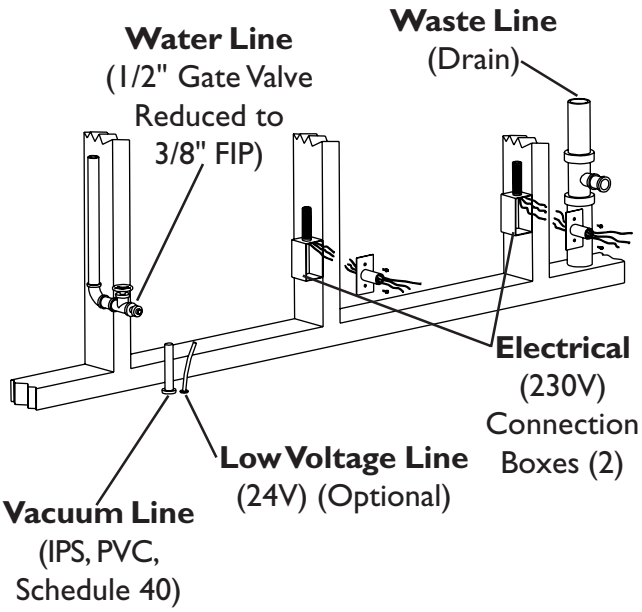
— CAUTION —

A free-flowing discharge system is required for proper operation of the vacuum system. Dual pump systems may leak at the anti-siphon valve if the discharge system is restricted. Ensure the vacuum system is installed and cleaned in accordance to the instructions in this manual.

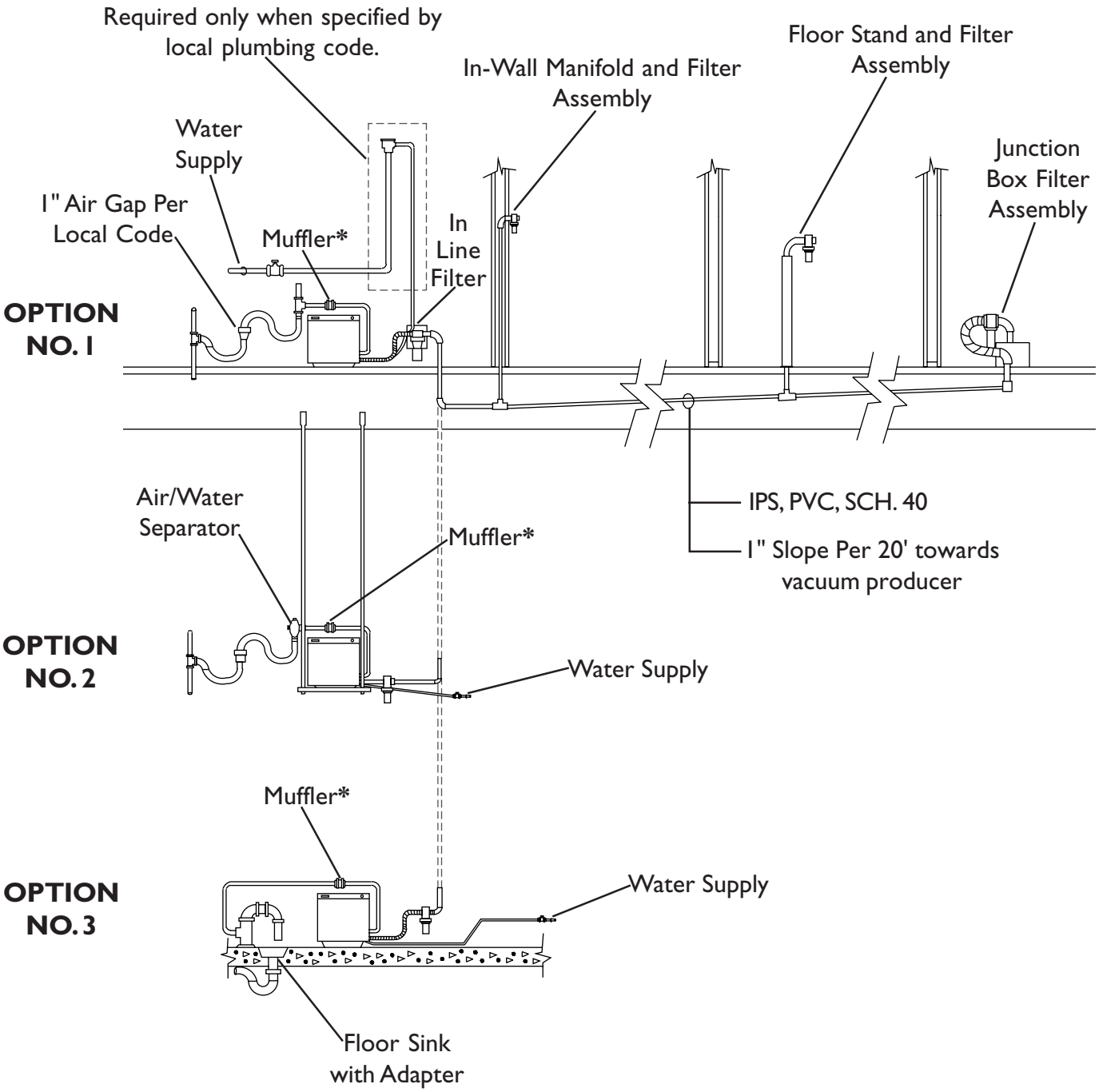
Waste line must be installed by a plumber according to local building codes. For requirements, see Typical Installation Options, Page 4 and Waste Line, Page 6.

Vacuum Lines

Vacuum lines be installed by a plumber according to local building codes. Vacuum lines and risers to be IPS, PVC, Schedule 40, unless local codes require another material such as copper. Slope all vacuum lines toward the vacuum producer 1 inch for every 20 foot run. Make all vacuum line connections using long radius sweep fittings.



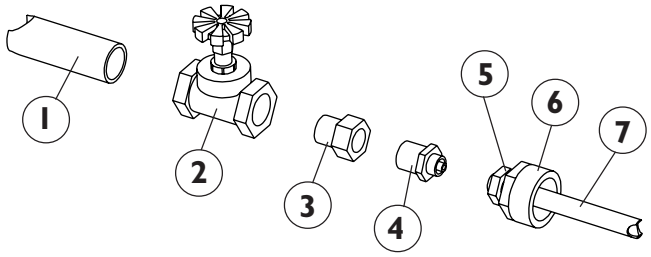
Typical Installation Options



**Position of muffler shown for illustration clarity only.*

Water Supply Line

The water going to the unit acts as a pump sealant and cooling agent. When the Vacuum System is in operation, the water supply must be on at all times. The plumber supplies and installs a 1/2" gate valve on the water supply line. Connect the 3/8" nylon tubing and fittings, which are supplied with the unit, as illustrated.



No.	Qty.	Part No.	Description
1	1	*	Water Line
2	1	*	Valve, Gate, Brass, 1/2"
3	1	64516041	Bushing, Brass, 1/2" MIP x 3/8" FIP
4	1	64504067	Adapter, Brass, 3/8" MIP x 3/8" Tube
5	1	64610007	Sleeve, Compression, Brass, 3/8"
6	1	64579027	Nut, Brass, 3/8", Nylon Tube
7	4 ft.	64618046	Tube, Nylon, 3/8"

* Plumber Supplies

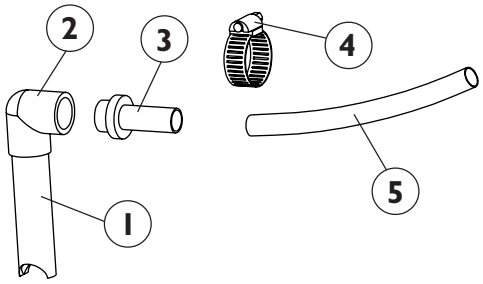
Vacuum Line

Vacuum lines must be installed by a local plumber according to local building codes. All vacuum lines and risers are recommended to be IPS, PVC, SCH. 40. Type "M" copper should be used if local code does not allow the use of PVC.

Care should be taken to slope the lines 1" for every 20' of run toward the vacuum pump(s). This allows waste and liquids to flow with gravity, contributing to the efficiency of the vacuum system.

Make all connections using long radius sweep fittings. To promote unrestricted flow of air and waste liquids through the vacuum lines, directional flow connections should be used.

Using 45° elbows for turns or avoiding obstructions is best; however, do not make a trap in the line, doing so will decrease the efficiency of the system.



All elbows and tees should be sized for the main line and sized down with busing reducers to accommodate smaller lines.

Avoid sagging lines, which cause the formation of traps in the system and prevent good air and waste liquid flow.

Connect the evacuation system to the vacuum line using the hose and fittings supplied in the installation kit. The vacuum line can be installed from the right or left side of the cabinet.

No.	Qty.	Part No.	Description
1		*	Vacuum Line, IPS, PVC, SCH. 40
2		*	Elbow, IPS, PVC, SCH. 40
3	1 or 1	64504102 64504101	Adapter, PVC 1" MIP x 1-1/2" Shank Adapter, PVC, 1-1/2" MIP x 1-1/2" Shank
4	1	64527004	Clamp, 1-1/2" Hose
5	6 ft.	64562019	Hose, 1-1/2"

* Plumber Supplies

Waste Line

The waste line carries water and liquid waste from the operatory to the building's sewer system.

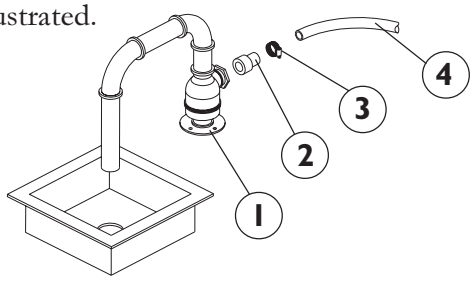
The waste line should follow the most direct path to the sewer connection with a minimum of bends and elevations, and must be installed according to local building and plumbing codes.

The waste line can be installed from the right or left side of the cabinet.

The exhaust connection should be made by either of two methods, floor sink connection or direct connection to "P" trap, depending on local code and building facilities.

FLOOR SINK CONNECTION

Use floor sink adapter SA-200, Part No. 6-4504-013. Install as illustrated.



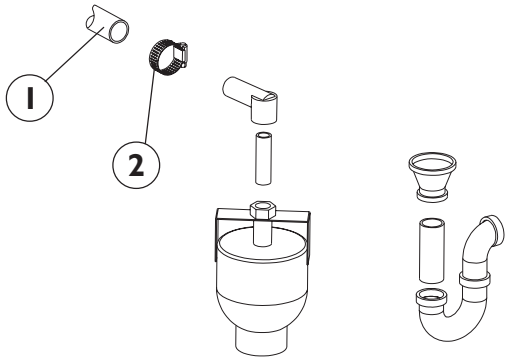
No.	Qty.	Part No.	Description
1	1	64504013	Adapter, PVC, Floor Sink, 1" Barbed Insert
2	1	64504102	Adapter, PVC, 1" MIP x 1-1/2" Shank
3	1	64527003	Clamp, Stainless Steel, 1-1/2"
4	6 ft.	64562019	Hose, Exhaust, 1-1/2"

— IMPORTANT NOTE —

No part of the waste line should be more than three (3) feet above the level of the waste connection on the vacuum pump.

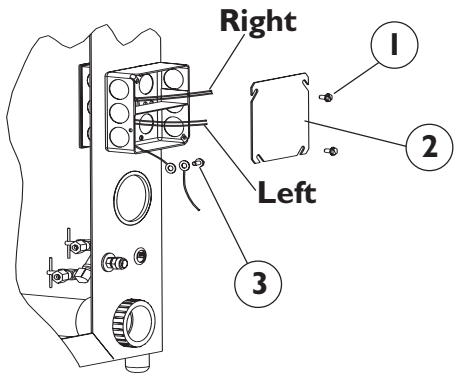
DIRECT CONNECTION TO "P" TRAP

Use "P" trap-air gap, if required by local code. Install as illustrated.



No.	Qty.	Part No.	Description
1	6 ft.	64562019	Hose, Exhaust, 1-1/2"
2	1	64527003	Clamp, Stainless Steel, 1-1/2"
3	1	*	Elbow 1-1/2"
4	1	*	Nipple, 1-1/2"
5	1	*	Adapter, Air Gap, 2"
6	1	*	Reducer, Bell, 2" x 1-1/2"
7	1	*	Nipple, 1-1/2" x Close
8	1	*	Trap, "P", 1-1/2"

Electrical Connection Assembly



Complete the electrical hook-up as the electrical codes require through the 1/2" conduit knockouts in the outer box.

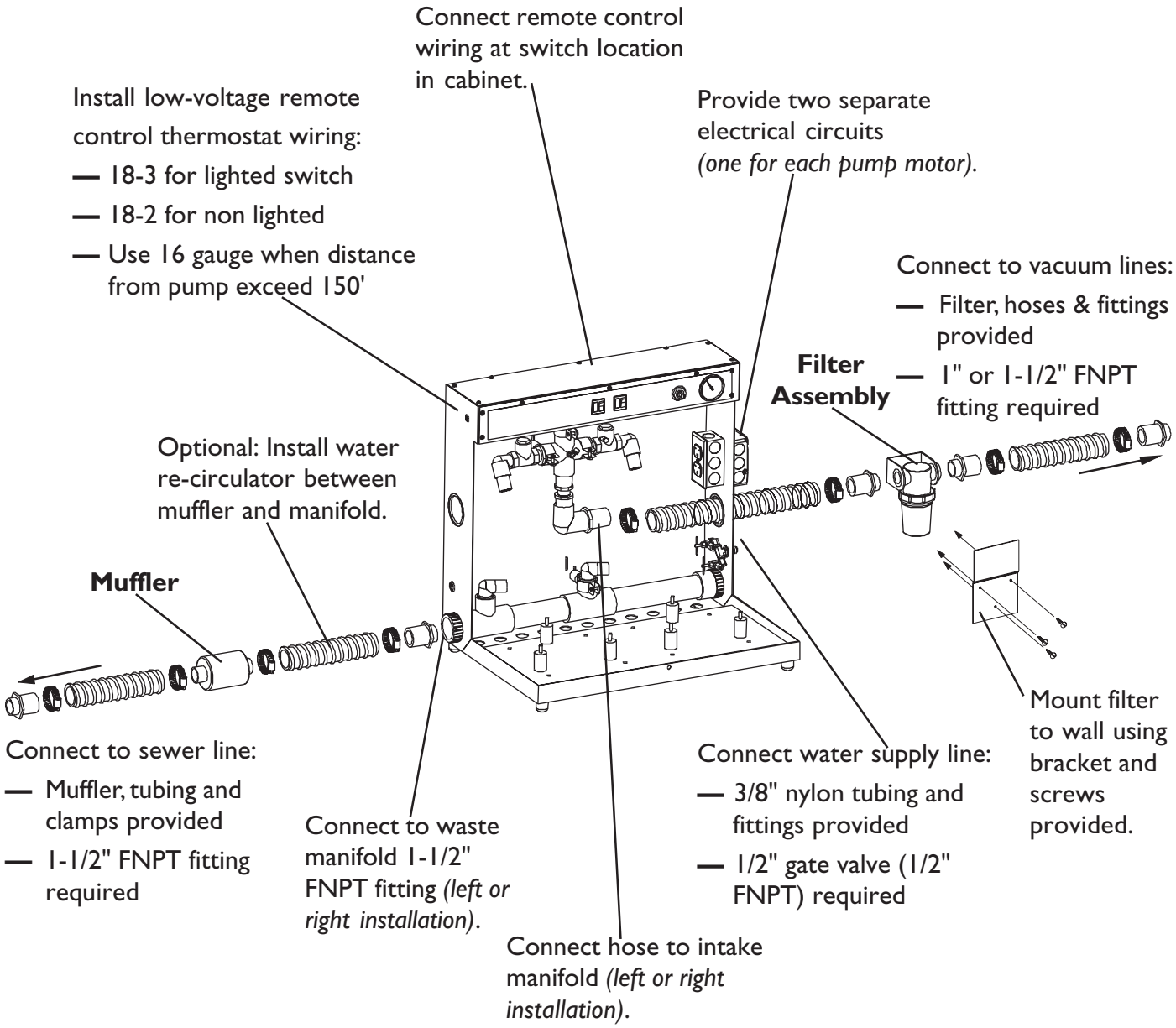
No.	Qty.	Part No.	Description
1	1	64513021	Cover Plate Screw
2	1	62584484	Cover Plate, J-Box
3	1	64611060	Ground Screw

Intake/Exhaust Hose Connections

Evaluate the installation site and determine which side the various hoses will enter the pump frame and the location for the water supply connector.

Place the hoses on their appropriate manifold hose adapters and secure them using the hose clamps.

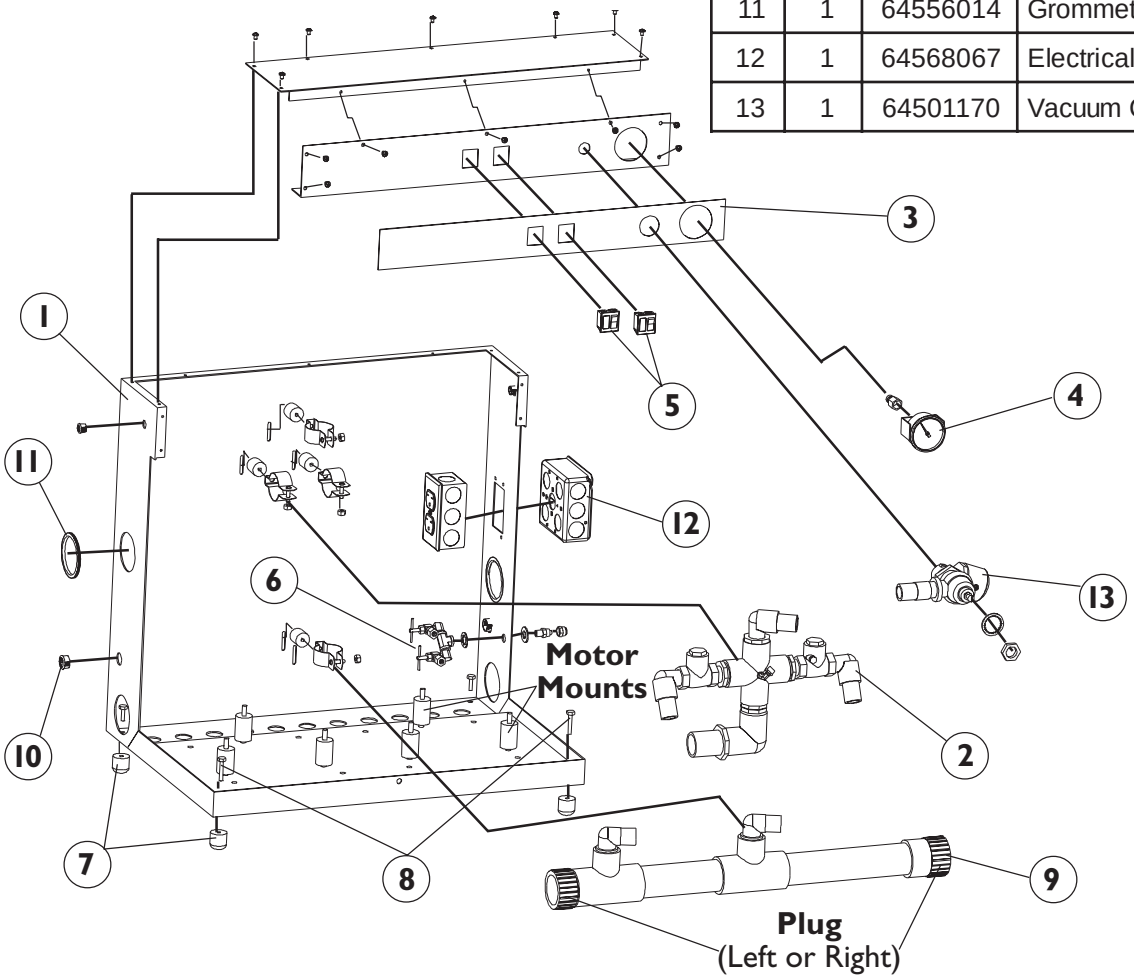
Complete the water supply hook-up using the poly flow tubing and fittings supplied in the installation kit.



Cabinet Assembly

The various assemblies of the CustomAir Dual Wet Vacuum System are attached to the frame, back panel and control panel of the cabinet, forming a self-contained vacuum system. The table identifies each assembly and the drawing indicates its location in the cabinet.

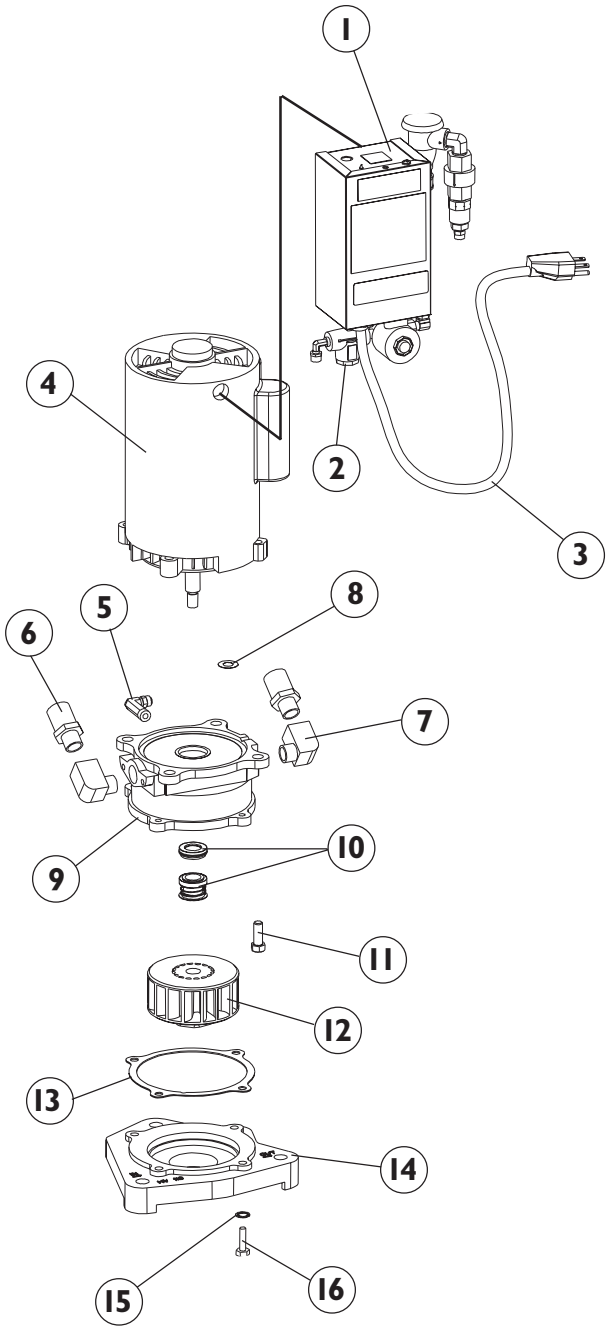
No.	Qty.	Part No.	Description
1	1	64528005	Enclosure, complete
2	1	64501106	Intake Manifold Assembly
3	1 1	64529199 64529200	MC 201 Decal or MC 202 Decal
4	1	64568134	Vacuum Gauge
5	2	64568132	Rocker Switch
6	1	64568163	Water Manifold Assembly
7	4	64568161	Dual PVC Foot
8	2	64611027	Front Dual Screw, 1-1/4"
8a	2	64611025	Rear Dual Screw, 3/4"
9	1	64568162	Waste Manifold Assembly
10	2	64556002	Grommet, 5/8"
11	1	64556014	Grommet, Extruded, Black
12	1	64568067	Electrical Installation Kit
13	1	64501170	Vacuum Control Assembly



1 HP Dual Pump Assembly

The CustomAir Dual Wet Vacuum System is powered by two water injected, impeller type vacuum pumps. This type of vacuum producer runs quietly and generates a high mercury pull, which is adjustable from a normal operating range of 10 to 12 inches of mercury to a high range of 18 to 20 inches of mercury for surgical applications. There are two vacuum pump sizes: the 1 HP (model MC-201) and the 2 HP (model MC-202, *illustrated on Page 10*). The dual pump back-up system and the choice of vacuum power ranges, make this a highly reliable and versatile evacuation system.

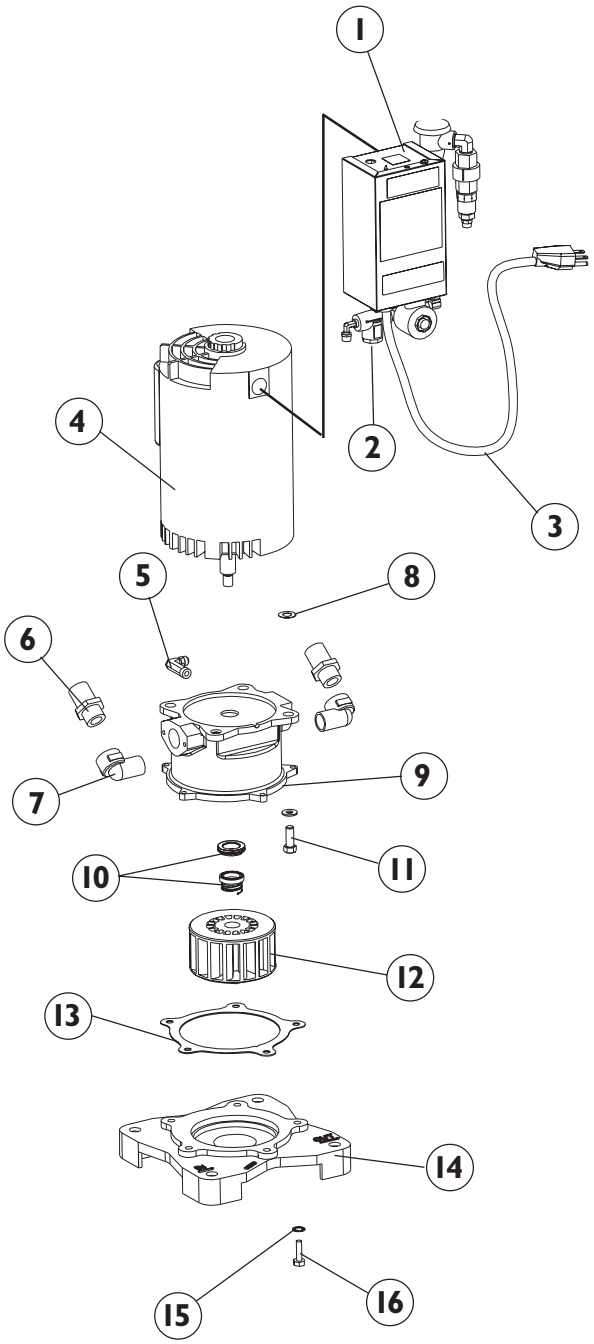
No.	Qty.	Part No.	Description
	1	64586801R	Dual Pump Assembly, 1 HP
1	1	64501153	Relay Unit, 230V
2	1	64568196	Water Manifold, 1/2 gallon
3	1	64532008	Electric Cord Assy., 230V
4	1	64568165	Motor, 1 HP
5	1	64568155	Elbow, Brass, 1/4" x 1/4"
6	2	64568143	Adaptor, Brass, 1" hose x 1/2" MIP
7	2	64568139	Elbow, Brass, 1/2" Street
8	As Req.	64604001 64604002 64604003 64604004 64604005	Shim, Steel .005 Thick Shim, Steel .031 Thick Shim, Steel .015 Thick Shim, Steel .002 Thick Shim, Steel .010 Thick
9	1	64568199	Housing, Brass, 1 HP
10	1	64568123	Rotary Water Seal (gasket included)
11	4	64611006	Cap Screw, 3/8" -- 16 x 1"
12	1	64568198	Impeller, Brass, Balanced, 1 HP
13	1	64568127	Housing Gasket, Fiber
14	1	64568167	Base Plate, Brass, 1 HP
15	4	64624016	Internal Star Washer, 5/16"
16	4	64611044	Cap Screw, 5/16" -- 18 x 1"
*	1	64568125	Lower Rebuild Kit, 1 HP



***NOTE:** *Lower Rebuild Kit, PN 64568125 (1 HP) include reference numbers 8 - 16.*

NOTE: *See the Operation/Maintenance section of this manual for detailed information on hookup and care of the Dual Wet Vacuum System.*

2 HP Dual Pump Assembly



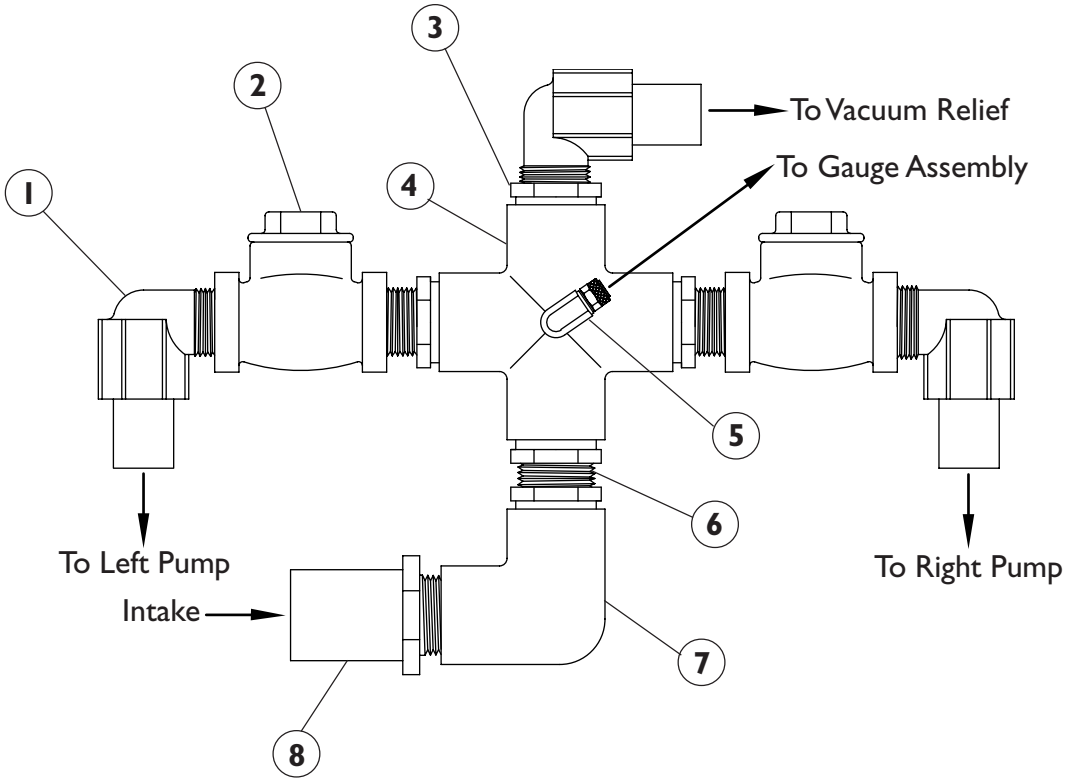
No.	Qty.	Part No.	Description
	1	64586802R	Dual Pump Assembly, 2 HP
1	1	64501157	Relay Unit, 230V
2	1	64572024	Water Manifold, 1 Gallon
3	1	64532008	Electric Cord Assy., 230V
4	1	64568166	Motor, 2 HP
5	1	64568155	Elbow, Brass, 1/4" x 1/4"
6	2	64504087	Adaptor, Brass, 1" hose x 3/4" MIP
7	2	64568144	Elbow, Brass, 3/4" Street
8	As Req.	64604001 64604002 64604003 64604004 64604005	Shim, Steel .005 Thick Shim, Steel .031 Thick Shim, Steel .015 Thick Shim, Steel .002 Thick Shim, Steel .010 Thick
9	1	64568200	Housing, Brass, 2 HP
10	1	64568124	Rotary Water Seal (gasket included
11	4	64611006	Cap Screw, 3/8" -- 16 x 1"
12	1	64568189	Impeller, Brass, Balanced, 2 HP
13	1	64568128	Housing Gasket, Fiber
14	1	64568168	Base Plate Brass, 2 HP
15	5	64624016	Internal Star Washer, 5/16"
16	5	64611044	Cap Screw, 5/16" -- 18 x 1"
*	1	64568126	Lower Rebuild Kit, 2 HP

***NOTE:** *Lower Rebuild Kit, PN 64568126 (2 HP) include reference numbers 8 - 16.*

Intake Manifold Assembly, Dual

The intake manifold swing-check valves provide automatic isolation for the back-up pump when it is not operating. This prevents vacuum loss through the exhaust of the standby pump. When both pumps are operating, the swing-check valves open to allow maximum air flow. The manifold is constructed of PVC and the valves are brass. Both materials are not affected by chemical disinfectants.

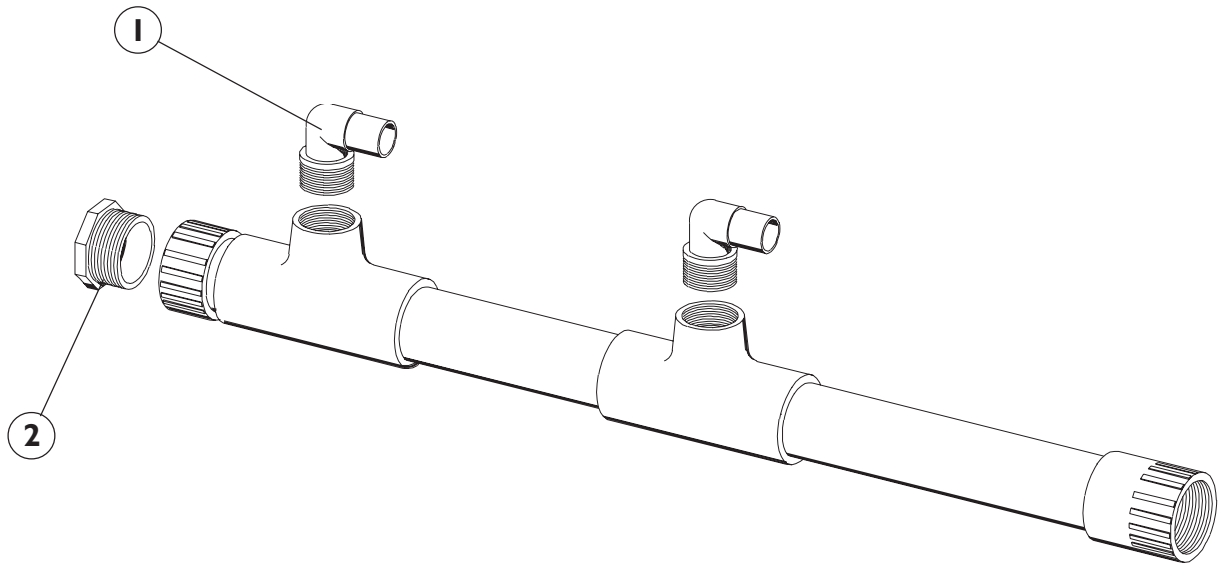
No.	Qty.	Part No.	Description
	1	64501111	Intake Manifold Assembly
1	3	64541117	Elbow, 3/4" NPT x 1" Shank
2	2	64568191 64568193	Swing Check Valve, 3/4" Swing Check Valve, 1"
3	5	64516006	Bushing, Reducer 1" Slip x 3/4" FIP
4	1	64537006	Cross, PVC 1" Slip
5	1	64541004	Elbow, Brass, 1/4" Tube x 1/8" MIP
6	3	64568142	Nipple, Brass, 3/4" Close
7	1	64541082	Elbow, PVC 1" Slip x 1" FIP
8	1	64568153	Adaptor, 1-1/2" MIP x 1-1/2" Shank



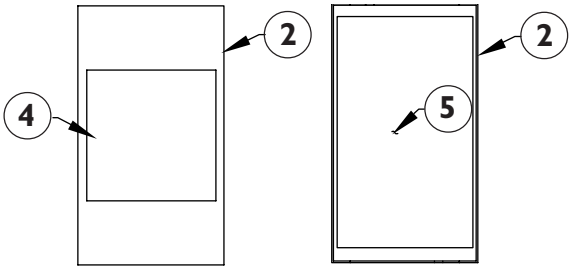
Waste Manifold Assembly, Dual

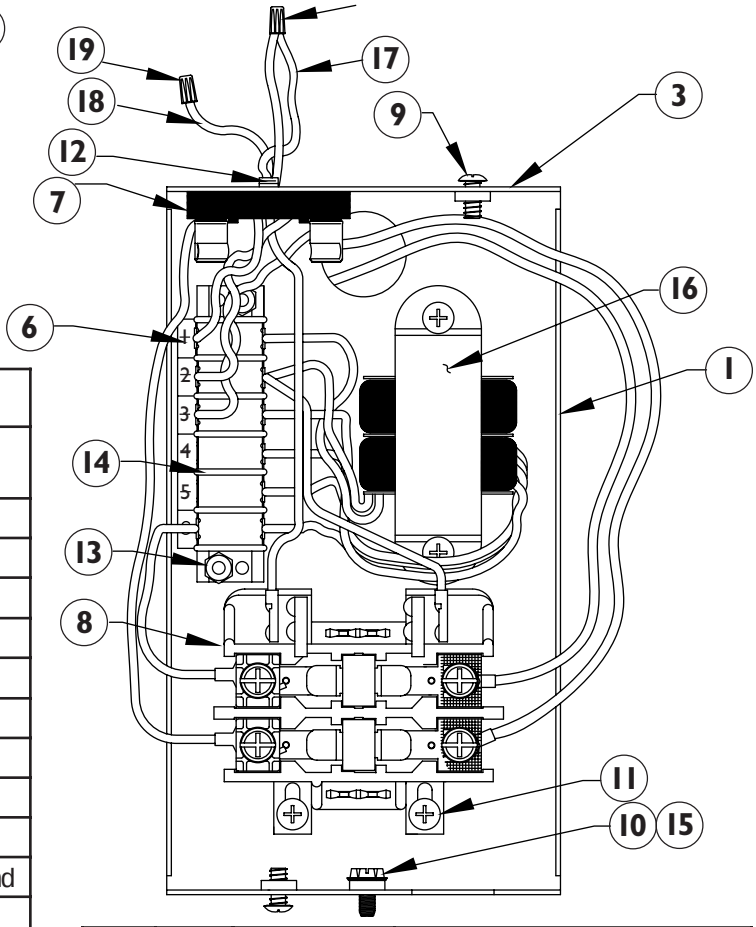
The waste manifold delivers liquid waste materials from both pumps to the waste line. The manifold is constructed of PVC to prevent chemical corrosion and buildup of organic and mineral wastes. The exhaust muffler connected to the waste line outside the cabinet assures quiet operation.

No.	Qty.	Part No.	Description
	1	64568162	Waste Manifold Assembly
1	2	64568141	Elbow, PVC, 1" MIP x 1" Shank
2	1	64584024	Plug, PVC, 1-1/2" MIP



Electrical Box





No.	Qty.	Part No.	Description
	1	64501150	Electrical Box Assembly, 115V or 230V
1	1	64513011	Control Box Chassis
2	1	64513011B	Control Box Cover
3	1	64529027	Decal, Low, 24V
4	1	64529174	Decal, Fire/Shock Warning
5	1	64529182	Decal, D V Elec. Diagram
6	1	64529185	Decal, D V Terminal Block
7	1	64561004	Fuse Clip Holder
8	1	64568133	Relay, 30 AMP Capacity
9	2	1623-054	Screw, 10-32 x 1/2"
10	1	64611060	Screw, 10-32 Green, Ground
11	4	64611085	Screw, 8 x 1/4" Phillips
12	1	64611119	Screw, 6-32 x 5/16", Fuse Holder
13	2	64611120	Screw, 6-32, Terminal Board
14	1	64615020	Terminal Board, 6 Quik Connect
15	1	1636-026	Lock Washer, #10 Int'l star
16	1	64568195	Primary Transformer, 115/230V
17	1	64529025	Decal, Caution Low Volts
18	1	64529203	Tag, Wire Usage Warning
19	1	64626003	Wire Nut, Ideal, 71-B Gray
	1	64618068	Conduit, Black
	1	64624058	Washer, 7/8"
	2	64578001	Nipple, Chase, 1/2"
*	1	64501153	Electrical Box Assembly Kit, 115/230V (1HP)
*	1	64501158	Electrical Box Assembly Kit, 230V (2 HP)

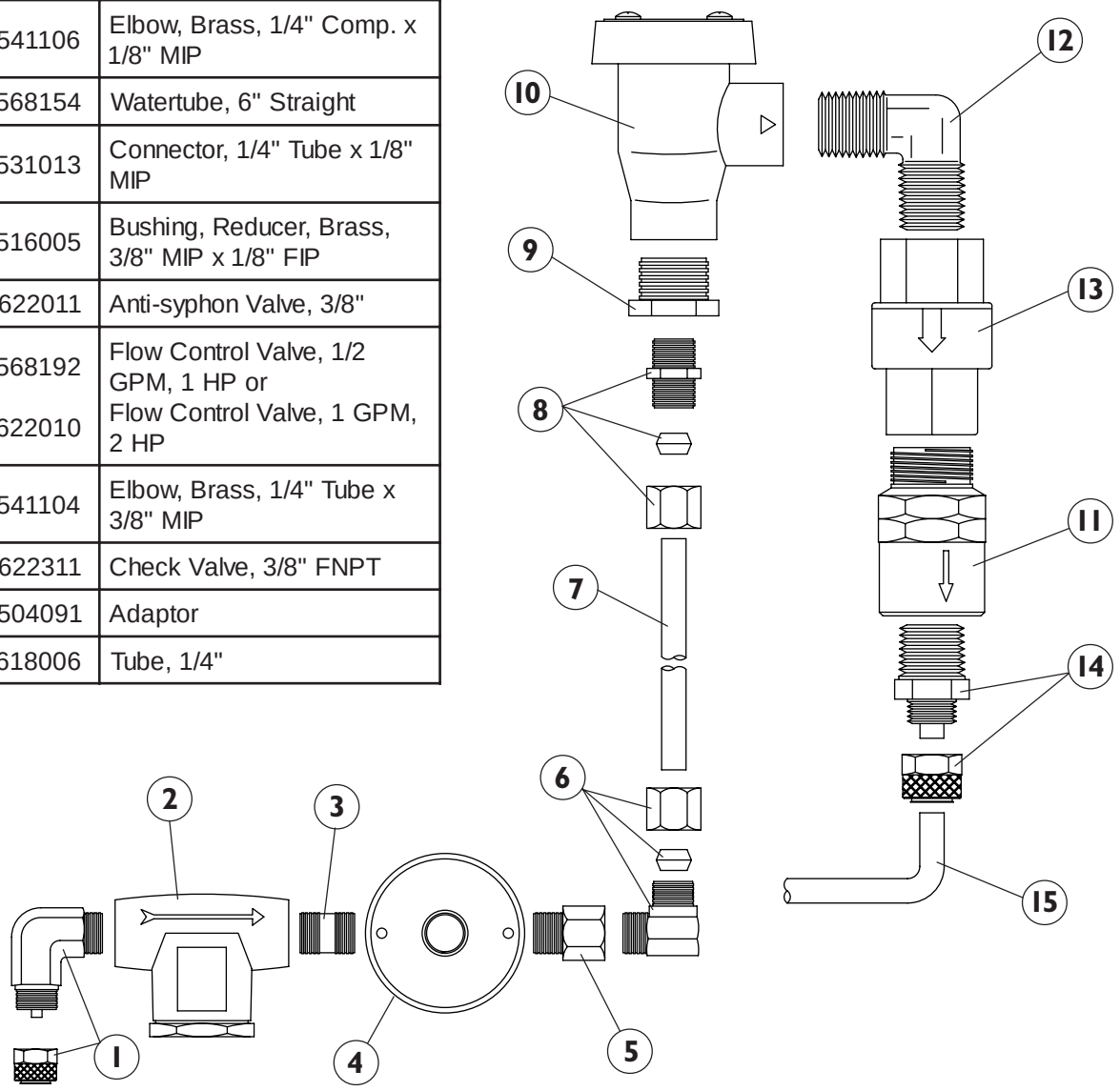
No.	Qty.	Part No.	Description
	1 1	64532003 64532008	Cord, 115V or Cord, 230V
	1 1	64529186 64529187	Decal, Fuse Replacement 3/10A, 115V or Decal, Fuse Replacement 15/100A, 230V
	1 1	64529125 64529126	Decal, 230V, 7.5A, 60 Hz (1 HP Dual) or Decal, 230V, 15A, 60 Hz (2 HP)
	1	64531025	Connector, Snap-in, Black
	1	64579001	Nut, Locking, 1/2"
	1 1	64568131 64568130	Fuse, 3/10 Amp, Slo-Blo, 115V (pkg. of 4) or Fuse, 15/100 Amp, Slo-Blo, 230V (pkg. of 4)

***NOTE:** *Electrical Box Assembly Kits: Part Nos. 64501153, 115/230V (1 HP) and PN 64501158, 230V (2 HP) are complete with water manifold attached.* *(See Page 14.)*

Water Control Assembly

No.	Qty.	Part No.	Description
	1 1	64572023 64572024	Water Control Assy., 1 HP Water Control Assy., 2 HP
1	1	64541004	Elbow, Brass, 1/4" Tube x 1/8" MIP
2	1	64568135	Water Filter, 1/8"
3	1	64578002	Nipple, Brass, 1/8" MIP
4	1	64568156	Solenoid Valve
5	1	64504072	Adapter, Brass, 1/8" MIP x 1/8" FIP
6	1	64541106	Elbow, Brass, 1/4" Comp. x 1/8" MIP
7	1	64568154	Watertube, 6" Straight
8	1	64531013	Connector, 1/4" Tube x 1/8" MIP
9	1	64516005	Bushing, Reducer, Brass, 3/8" MIP x 1/8" FIP
10	1	64622011	Anti-syphon Valve, 3/8"
11	1	64568192 64622010	Flow Control Valve, 1/2 GPM, 1 HP or Flow Control Valve, 1 GPM, 2 HP
12	1	64541104	Elbow, Brass, 1/4" Tube x 3/8" MIP
13	2	64622311	Check Valve, 3/8" FNPT
14	1	64504091	Adaptor
15	1	64618006	Tube, 1/4"

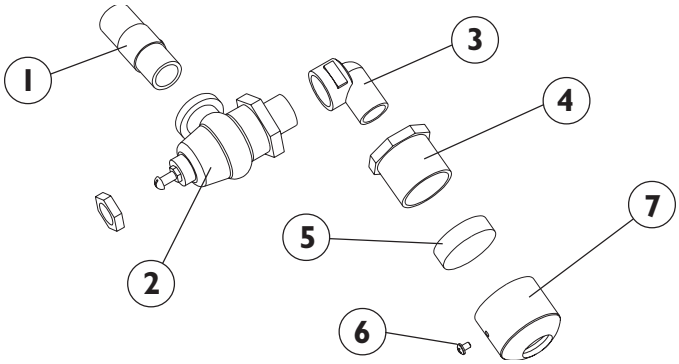
The water control system of the CustomAir Dual Wet Vacuum System provides the pumps with the water flow required for proper suction and cooling. Automatic and independent water control is provided for each pump. Filters protect the system from damage due to solid materials in the water supply. Flow valves control the amount of water supplied to each pump.



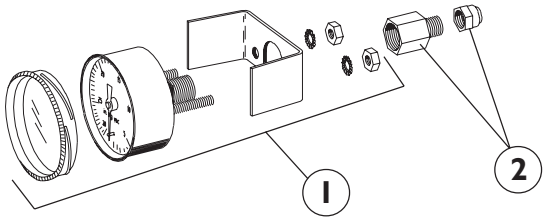
Vacuum Control Assembly

No.	Qty.	Part No.	Description
	1	64501170	Vacuum Control Assembly
1	1	64504104	Adapter, PVC 3/4" MIP x 1" Shank
2	1	64622001	Vacuum Relief Valve
3	1	64541016	Elbow, Brass, Street 3/4"
4	1	64516008	Bushing, PVC, 1-1/4" Slip x 3/4" FIP
5	1	64568145	Filter Element, Vacuum Relief Valve
6	1	64611085	Screw, 8 x 1/4" Phillips
7	1	64521009	Cap, PVC, 1-1/4"

The vacuum control assembly is attached to the central section of the front control panel. The valve in this assembly provides automatic regulation of the vacuum flow in the system. The vacuum level can be adjusted for different system requirements. The vacuum gauge is connected to a fitting on this assembly.



Vacuum Gauge and Adapter

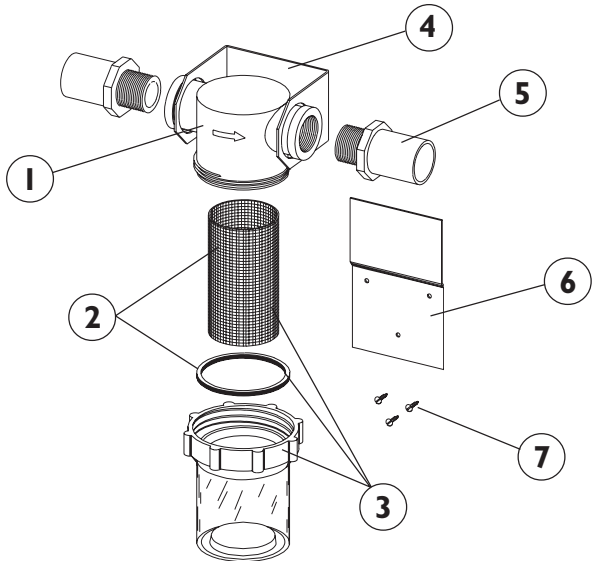


No.	Qty.	Part No.	Description
1	1	64568134	Vacuum Gauge Assembly
2*	1	64531008	Adapter, 1/4" FIP x 1/4" Poly

NOTE: **Not included in assembly.*

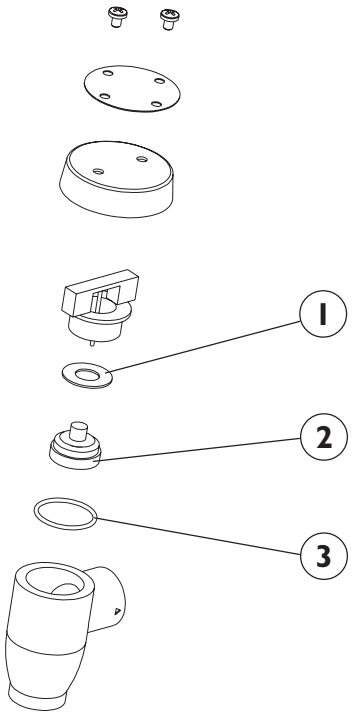
In-Line Filter Assembly, 1"

No.	Qty.	Part No.	Description
	1	64501940	In-LIne Filter Assembly, 1"
1	1	64509017	In-Line Filter Body, 1"
2	1	64568121	Screen, 1", 20 Mesh, 2-1/4" D x 4-1/4" L, & Gasket
3	1	64568122	Screen, 1", 20 Mesh, 2-1/4" D x 4-1/4" L, Gasket & Bowl, 1" In-Line Filter, Clear
4	1	64514041	Bracket, 1" In-Line Filter, older
5	2 2	64568153 64504103	Adapter, PVC 1" MIP x 1-1/2" Shank or Adapter, PVC 1" MIP x 1" Shank
6	1	64514042	Bracket, In-Line Filter Wall Mount
7	3	64611007	Screw, 10 x 1/2" Pan Slot



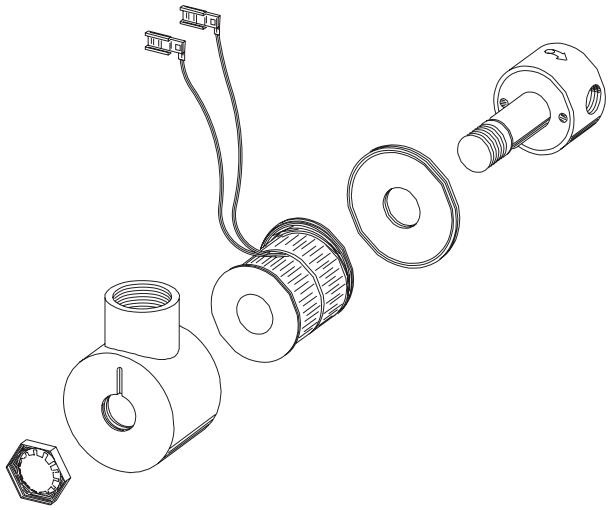
Anti-Siphon Valve Assembly

No.	Qty.	Part No.	Description
	1	64622011	Anti-Siphon Valve Assembly
1,2,3	1	64568016	Anti-Siphon Repair Kit



Water Solenoid Valve Assembly

No.	Qty.	Part No.	Description
	1	64568156	Water Solenoid Valve Assembly



General Operation

CustomAir® vacuum pumps are designed to provide a vacuum source for use by dental professionals in the dental operatory. The main purpose of the vacuum is to evacuate the oral cavity.

The Dual Wet Vacuum System can be operated from the operatory using an optional low-voltage conversion kit and low-voltage switches making a convenient way to turn the pumps on or off as needed, plus saving water and electricity.

In some installations, where two or more doctors are using the vacuum system, it may be necessary to leave the evacuator on throughout the working day. The pumps are designed to handle heavy work loads and are rated for continuous operation. If the evacuator operates for extended periods of time, proper ventilation is important.

Installations in small, confined areas should be supplied with a ventilation system capable of keeping the air temperature around the pump at 40ºC/104ºF.

Maintenance Schedule

— WARNING —

Prior to performing any maintenance, proper precautions should be taken to reduce the possibility of contact with infectious substances.

A minimum amount of maintenance is required to keep the Dual Wet Vacuum System in top running condition. The motor and pump assemblies require no lubrication. For best performance results, adhere to the following maintenance schedule:

Daily Maintenance

Flush Vacuum Plumbing System

Before the system is turned off at the end of the day, it is recommended that the hoses in the operatory be flushed with fresh water and vacuum system cleaner. VAC-U-EZ Liquid Cleaner is recommended for the Dual Wet Vacuum System.

— CAUTION —

Use of detergent-based or foaming-type solutions will greatly restrict vacuum performance and void the warranty.

When used daily as directed, VAC-U-EZ will keep the system sanitary and fresh smelling. VAC-U-EZ Liquid dissolves organic materials, such as blood and tissue, before they clog the vacuum lines. Its unique enzyme formula neutralizes odors within the evacuator system.

VAC-U-EZ Liquid is also ideal for cleaning organic material from surgical instruments prior to autoclave or cold sterilization.

— NOTICE —

VAC-U-EZ liquid cleaner (PN: 64522006) can be ordered through any authorized DentalEZ® dealer.

VAC-U-EZ USER DIRECTIONS:

Add one (1) ounce VAC-U-EZ Liquid to one (1) quart of water. Stir until completely dissolved. *One quart of solution is enough to clean four (4) hoses.*

Evacuate approximately one (1) quart of VAC-U-EZ solution through all hoses in each operatory.

Turn Off Water Supply

— VERY IMPORTANT —

At the end of each working day, turn off the water supply to the unit by closing the gate valve on the water supply line. Or, if an optional remote control panel is installed, push the water button to the **OFF** position. Then close the gate valve on the water supply line.

NOTE: *Although, the water supply to the vacuum system is normally turned off electrically when the system is turned off, it is possible that a solenoid valve may malfunction allowing water to flow through the valves and into the vacuum system.*

— WARNING —

Before starting cleaning procedures, make certain to put on eye protection, a mask and puncture-resistant nitrile gloves.

Weekly Maintenance

Clean In-Line Filter

Turn **OFF** the pump motors.

Carefully unscrew the lower bowl from the filter top and lift out the screen.

Using water, flush the bowl assembly and any contaminated sediment.

Submerge the screen/bowl assembly into a high-level chemical disinfectant solution. *Follow the disinfectant manufacturer's recommendation for time interval required to achieve disinfection.*

Remove the screen/bowl assembly from the disinfectant solution and rinse using tap water.

Properly dispose of the contaminated sediment and disinfectant solution waste.

Replace the screen and make sure the gasket is in place before replacing the bowl.

Check all connecting vacuum, waste and water lines for tightness.

Inspect Operatory Filters

Check and clean all operatory and secondary filters weekly. *Follow the equipment manufacturer's recommendations.*

Inspect Vacuum System

Check the system weekly for water leaks and loose or broken connections.

Monthly Maintenance

Check Vacuum Level

The vacuum level of the CustomAir Dual Wet Vacuum System is preset at the factory. If it becomes necessary to adjust this setting, the following steps can be taken:

NOTE: *Turn On one pump — vacuum level adjustments are made with only one pump operative.*

Turn the lock nut counterclockwise to loosen.

For greater vacuum level, turn the screw clockwise; for less vacuum level, turn screw counterclockwise.

Set to desired vacuum level and tighten locknut.

Recommended Operating Vacuum Levels:
10" Hg. General Dentistry
19" Hg. Surgery

NOTE: *The evacuator should be left **ON** when setting the vacuum level. Also, make sure all hoses in the operatory are closed.*

Service Instruction

The following troubleshooting charts should be used when attempting to isolate CustomAir Dual Wet Vacuum System operational problems.

If the problem is not addressed in the trouble shooting chart or cannot be isolated by performing the suggested procedures, contact your local DentalEZ full-service dealership.

Be prepared to supply the following product information:

- Model Name_____
- Model Number_____
- Serial Number_____
- Installation Date_____

Vacuum Pump

Symptom	Possible Cause(s)	Solution
Pump will not run	Check all wires for loose or broken connections. Check fuse. Check low voltage leads *(yellow and black wires)* for 24 volts.	If voltage is not present, replace the transformer or fuse. *(Also see Electrical Problems Chart.)*
	Turn power on and off watching to see if relay breaker bar operates properly.	If relay not operating properly, and assuming all other parts are good, replace the relay. *(Also see Electrical Problems Chart.)*
	Test solenoid valve by loosening brass nut on right side. If water flows out with power on, turn power off. Water flow should stop. **Caution: Do not** operate the pump for an extended time, because running the pump without water could cause internal damage.	If water flow does not stop with power off, replace the solenoid valve.
Motor stops or will not start	Circuit breaker, main cut-off and low-voltage operatory switches are in the **OFF** position.	Place switches in **ON** position.
	Unit is not plugged in.	Plug in unit.
	Loose or broken wires.	Tighten, repair or replace wires.
	Motor hums indicating a bad capacitor.	Replace capacitor.
	Tight or noisy motor.	Check bearings. Make sure pump is properly shimmed to the motor. Or, remove any debris in the pump.
	Motor is overheating.	Make sure the vacuum relief valve is adjusted properly and the motor has sufficient ventilation and water supply. Check for low line voltage.

Vacuum Pump (Continued)

Symptom	Possible Cause(s)	Solution
Low or no vacuum	Dirty filter	Clean operatory and secondary filters if necessary.
	Water control assembly clogged not allowing water to go through pump.	Turn pump **OFF** immediately to prevent internal damage. Then unclog water control assembly.
	Loose or broken vacuum line connections.	Tighten, repair or replace vacuum line connections.
	Swing check valves clogged allowing pump to suction through the other pump.	Take off the top of the valve and, if possible, remove debris. Otherwise, the valve should be replaced.
	Pump is worn out.	Refer to pump repair section.
	Insufficient water supply.	Check supply where it connects to the cabinet. Then, check the water control valve. The water control solenoid valve opens when the pump is turned on. Check this function by disconnecting the water line that enters the vacuum housing and by holding a container under the valve. Then, trun on the pump. There should be a steady stream of water. **CAUTION: DO NOT** LEAVE THE PUMP RUNNING WITHOUT WATER! If there is no water flow, replace the water control solenoid valve.

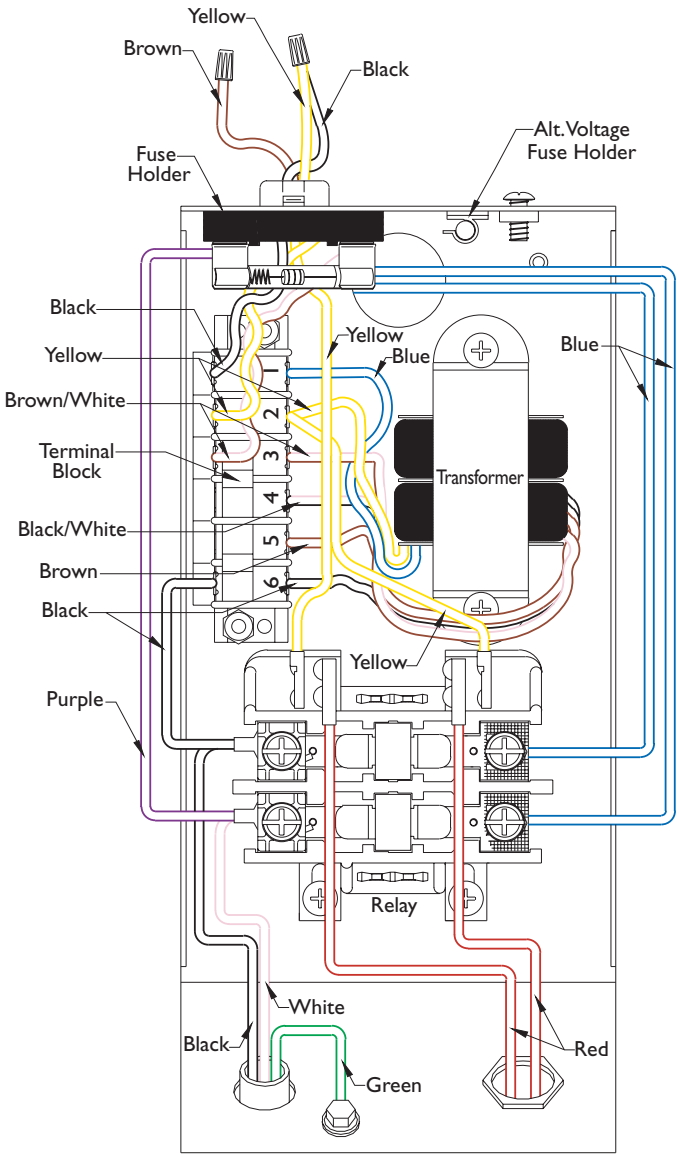
Electrical System

Symptom	Possible Cause(s)	Solution
Pump not running because of suspect electrical problem	Main power supply has blown fuse or circuit breaker.	Replace blown fuse or reset circuit breaker.
	Power not reaching pump or incorrect voltage.	Check connection box on the side of the dual cabinet to verify power is reaching the pump and main power supply is the correct voltage.
	Blown fuse in the control box.	Replace the fuse with the same rated capacity as the one from the factory.
	Loose connections inside the control box.	Remove the control box cover and visually inspect for loose connections. *(Refer to the schematic inside the control box cover for the components and wiring scheme for that particular box.)*

Electrical System (Continued)

Symptom	Possible Cause(s)	Solution
Motor does not start by switch	Defective transformer or coil in the relay.	Using a non-conductive device, push in the tabs on the relay to determine if the motor will start. Then using electrical test equipment, verify the voltage coming out of the secondary side of the transformer. If it is less than 21V, replace the transformer. If it is more than 21V, replace the relay.

Relay Box



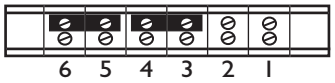
Alternate Voltage Connection

NOTE: *To be used for* ***MC 201 only.***

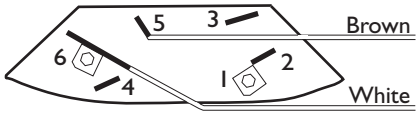
115 Volt

Fuse replacement: Use BUSS MDL or MDQ 3/10 A, Littlefuse 314 3/10 A Slo-blo.

Jumper Connection



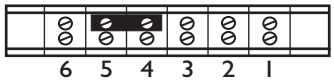
Motor Connection



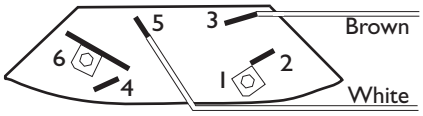
230 Volt

Fuse replacement: Use BUSS MDL or MDQ 15/100 A, Littlefuse 313 15/100 A Slo-blo.

Jumper Connection



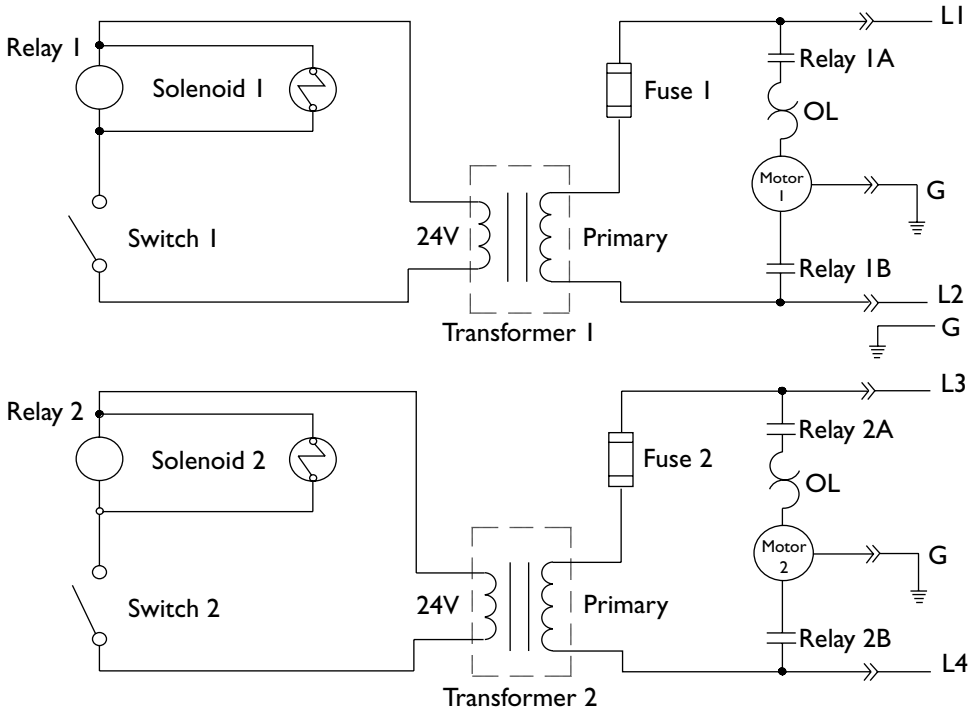
Motor Connection



— WARNING —

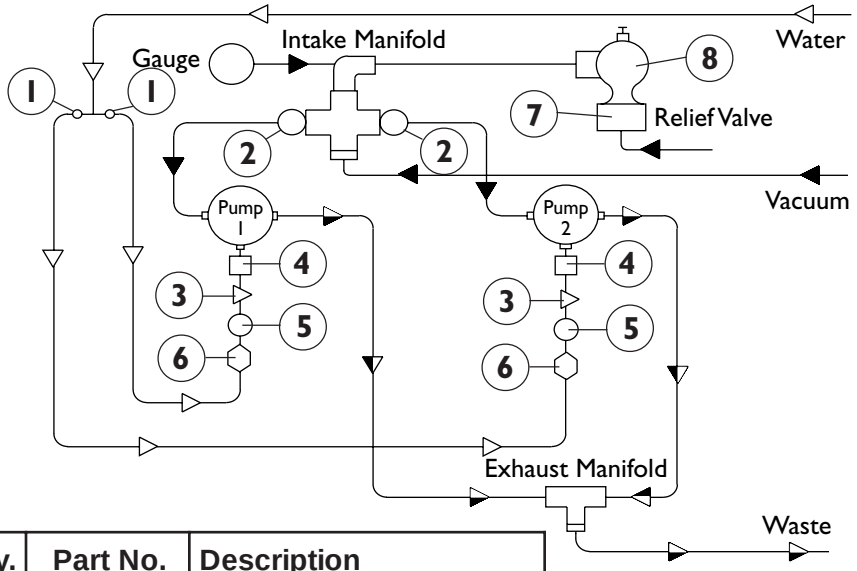
For continued protection against fire hazard: Jumper, motor and fuse **must be set** for input 115 volts or 230 volts.

Wiring Schematic



The Dual Wet Vacuum electrical control system is a low-voltage (24V) circuit, designed to provide two totally independent control systems for each pump unit. This system also provides automatic control of the water supply system for each pump. The wiring schematic shows for electrical rough-in. *(Refer to the Installation section of this manual.) (See Pages 3 and 4 for further information on rough-in and final hook-up locations.)*

Air/Water Flow Circulation Diagram



The circulation diagram shows the relationship of all the major assemblies to the total system. All connecting lines are marked with a symbol to indicate their function: vacuum line, water line or waste line. The assemblies are individually broken down and further explained in other sections of this manual.

No.	Qty.	Part No.	Description
1	2	64622012	Valve, Water Shutoff
2	2	64622008	Valve, Swing Check
3	2	64622011A	Valve, Anti-Siphon
4A	2	64622009	Valve, Flow Regulator--1 HP
4B	2	64622010	Valve, Flow Regulator--2 HP

No.	Qty.	Part No.	Description
5	2	64622088	Valve, Solenoid (Only)
6	2	64545002	Filter, Water
7	1	64577001	Muffler, Vacuum Relief
8	1	64622001	Valve, Vacuum Relief

Pump Removal

If the motor does not start after checking through the troubleshooting charts, the motor may be defective. If the pump must be removed for factory repair or replacement, perform the following steps:

1. Unplug the electrical supply cord.
2. Using the manual valve, turn **OFF** the water supply.
3. Disconnect the water line to the pump being removed.
4. Disconnect the waste and input lines from the pump being removed and cap off the lines using the closure plugs provided.
5. Disconnect the low voltage wires from the remove switch circuit.
6. Remove the wing nuts.

Vacuum Pump System Repair Procedure

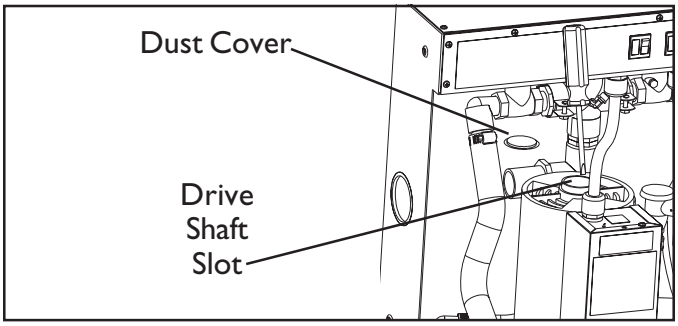
Tools Required:

- Wire Stripper/Crimper
- 1/4", 5/16", 11/32" and 3/8" Nut Driver
- 7/16", 1/2", 9/16" and 15/16" Open-end Wrench
- 1-3/4" Socket and Torque Wrench
- 15/16" Socket with Ratchet
- Hammer
- Flat-blade Screwdriver
- Wire Cutter
- Needle-nose Pliers
- Channel-lock Pliers
- Paint Scraper
- Pump Motor Holding Fixture: DTE# 64546001
- Pop Riveter
- Bench Vise
- Bearing Seal Lubricant
- Red Loctite/Pipe Sealant: Item# 57141

Test Procedure — Diagnostic

Determine if the required repair procedure is electrical or mechanical.

1. **Disconnect** the pump electrical cords from the receptacles.
2. At the needle valves, turn **OFF** the main water supply to the cabinet.
3. Remove the dust cover located at the top center of the motor.

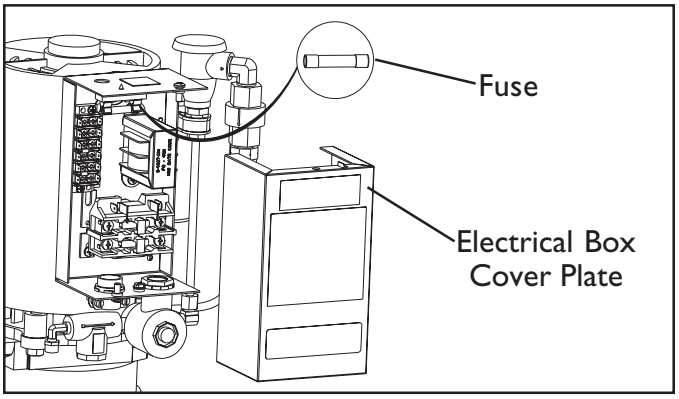


4. Using a flat-blade screwdriver, engage the slot in the drive shaft and rotate the shaft to check for free movement:
   - If the shaft moves smoothly, proceed to **Electrical Box Removal**.
   - If the shaft is difficult to turn or is jammed, proceed to **Pump Disassembly**.

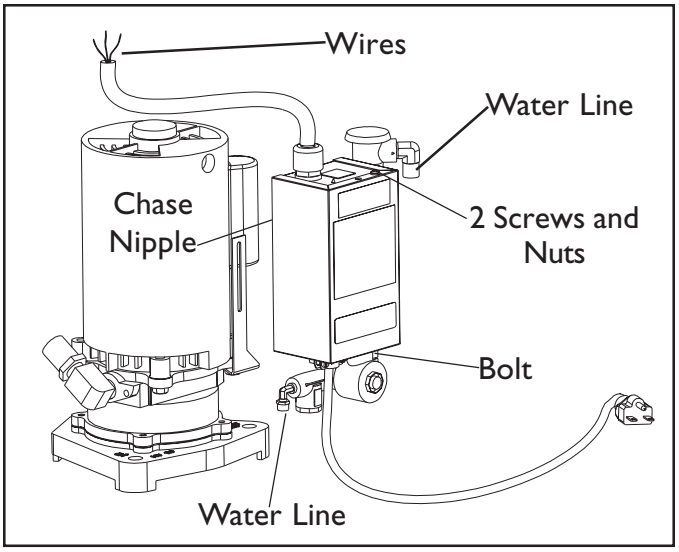
Electrical Box Removal

NOTE: *Most electrical repairs can be performed without removing the pump from the cabinet.*

1. Remove the electrical box cover plate.
2. Check the wire leads to the motor for breaks or bad connections.



3. Check the fuse and check for loose or broken wires in the electrical box.
4. Disconnect the wires from behind the face-plate of the cabinet and pull through the box.
5. Remove the two water lines from the water manifold.



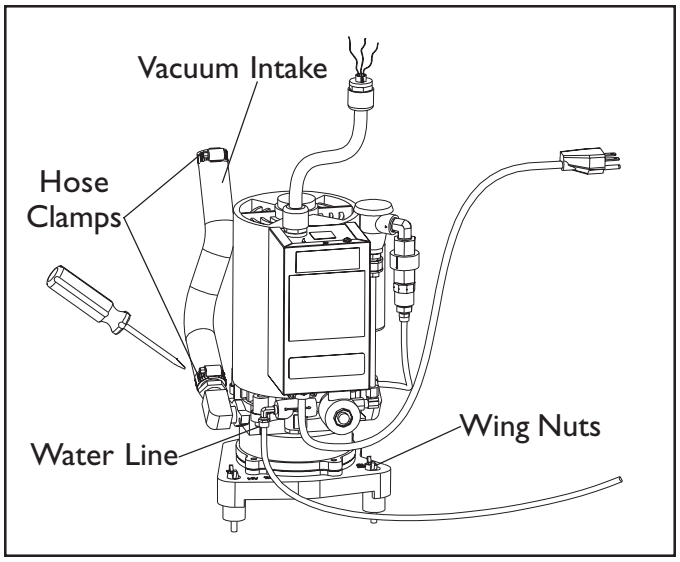
6. Remove the bolt from the bottom of the box where the bracket is attached.
7. Remove the two screws and nuts from the terminal board located at the top of the electrical box.
8. Remove the chase nipple from inside the box where it screws to the motor.

Pump Disassembly

1. Remove the motor cover plate *(top of motor)*.
2. Remove the front plate from the cabinet.
3. Remove the nut from the vacuum relief valve.
4. Disconnect the three electrical box wires from the switch located behind the faceplate of the cabinet.

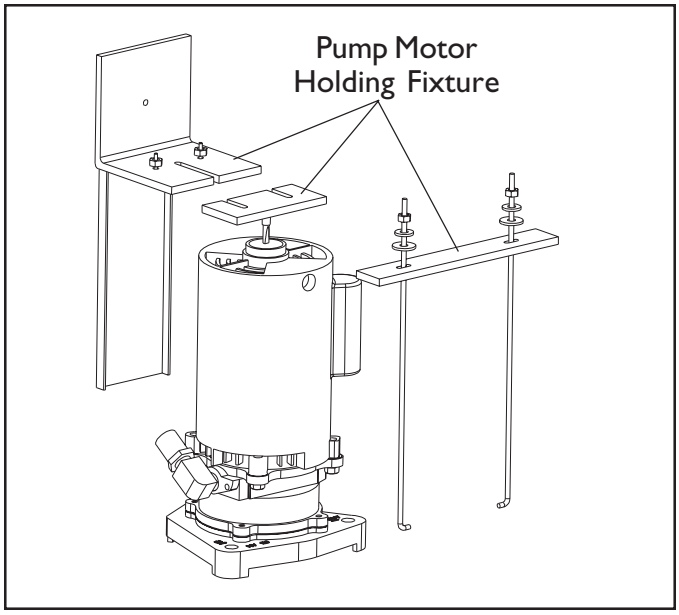
Motor Pump Assembly Removal

1. Disconnect the pump's vacuum and exhaust lines and install line closure plugs.
2. Disconnect the pump's water line.

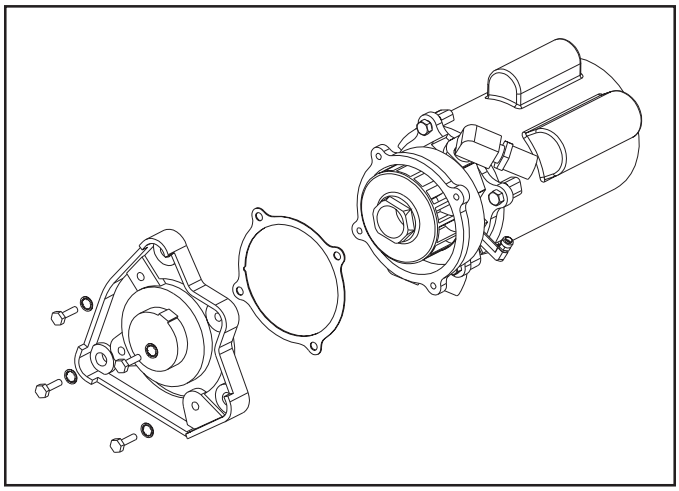


3. Shut **OFF** the valve at the water control manifold.
4. Remove the wing nuts from the pump's base. *(four nuts - 2 HP pump; three nuts - 1 HP pump)*

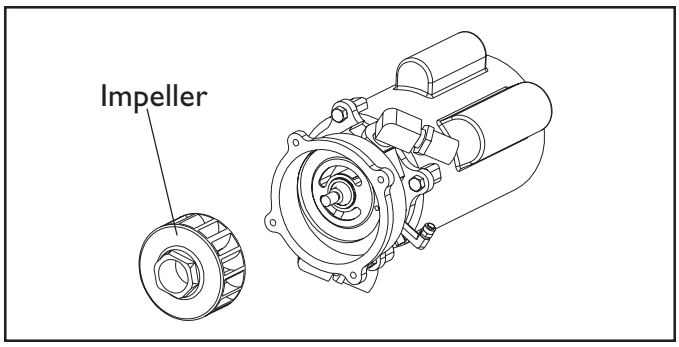
5. Disconnect the two motor wire leads from the electrical terminal.



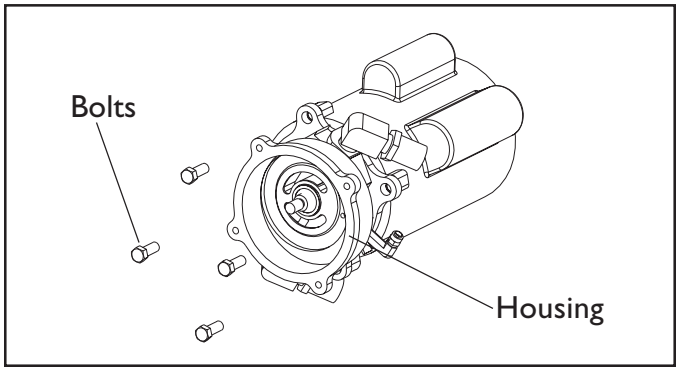
6. Mount the motor in the pump motor holding fixture *(DTE# 64546001)* by aligning the slot in the motor's shaft to the holding blade. Then connect the hold down brackets and tighten so the motor will not rotate in the fixture.



7. Take off the base by Removing the bolts that secure it to the housing. Then inspect the base for excessive scoring or side wear.



8. Remove the impeller by unscrewing counterclockwise. Then inspect the impeller for any pitting or scoring.



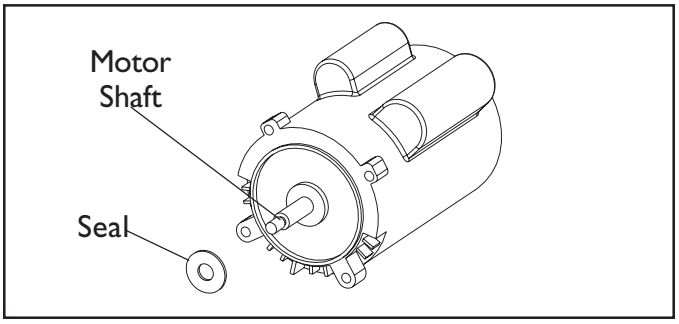
9. Remove the housing bolts and take off the housing by pulling it off the shaft.

10. Remove the water seal spring assembly.

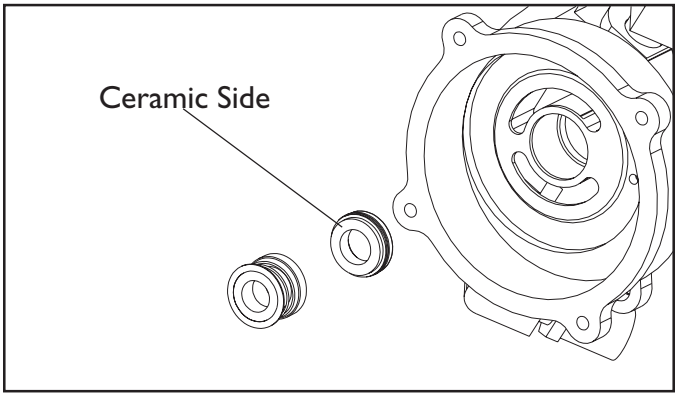
11. Inspect the housing for pitting or scoring.

Pump to Motor Assembly

1. Apply lubricating oil to the motor shaft, seal and housing.



2. Press the seal into the housing with the ceramic side facing outward.



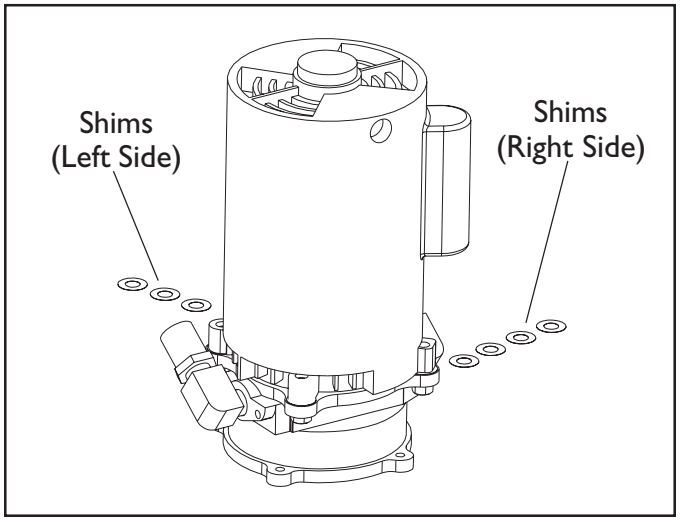
3. Carefully install the housing onto the motor shaft.
4. Install the black spring seal with the nylon side in contact with the ceramic washer.

   NOTE: *Lubrication of shaft will ease installation.*

5. Apply loctite to the threads of the motor shaft.
6. Screw the impeller onto the shaft with the flat side facing the motor.
7. Torque the impeller to 27 in. lbs.
8. Align the housing so that the small elbow is opposite the electrical box mounting hole in the motor.

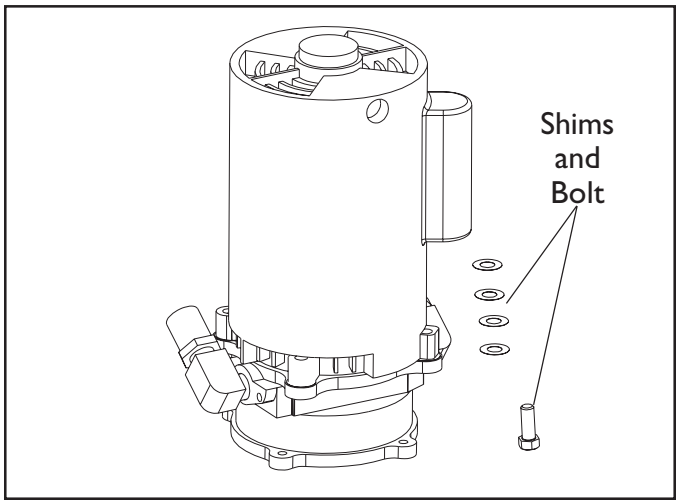
Housing/Impeller Spacing

1. To properly space the impeller to the housing, slide two or three .031" shims between the housing and the motor at one corner.



2. Slide other shims of various sizes diagonally across from the corner in Step 1, until the impeller is snug with the housing.
3. Remove and add up all the sizes of the shims used. EXAMPLE: A total of .100" is used, divide that by 2 to obtain .050". Use this amount minus an additional .005" from 1 HP pumps and .010" from 2 HP for each corner.

   NOTE: *For further explanation, see Shimming Procedure.*



SHIMMING PROCEDURE

A. Insert shims between the motor and the housing at two opposite mounting legs until snug.

B. Remove and add up the total thickness of the shims from both sides.

EXAMPLE:	Left Side Shims	+	Right Side Shims
	.031		.031
	+.015		+.031
	+.015		+.005
	.061		.067

.061 + .067 = **.128**

C. Divide the total by 2 and subtract:
.005 for 1 HP motor
.010 for 2 HP motor

EXAMPLE: .128 ÷ 2 = **.064**
.064 −.005 = **.059**

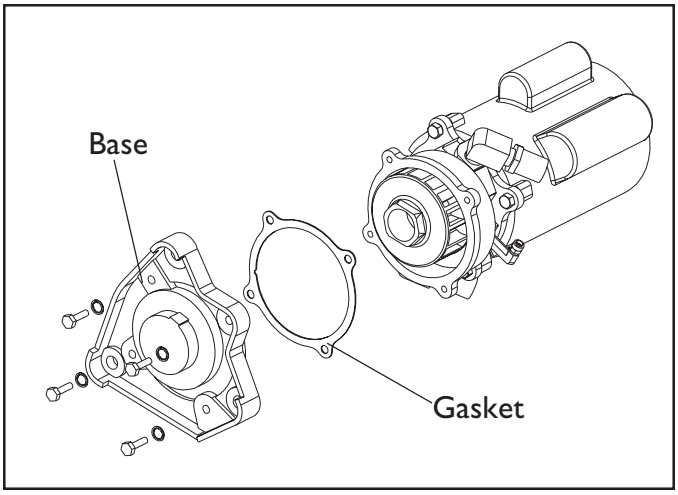
D. Use the best combination of shims for the required shim dimension.

EXAMPLE: Required Shim Dimension	Combine Shims
.059	.031
	+.015
	+.010
	+.002
	.058

E. Install a bolt and equal shim combinations at all four locations.

4. Install the bolts and required shims.

5. Tighten and check for free spin of the impeller by removing the motor from the fixture and rotating the impeller. *(For proper fit, shims may need to be added or deleted.)*



6. Install the base with the gasket by aligning the intake and discharge ports. Then tighten the bolts *(**do not** over tighten)*.

7. Set the pump upright and insert a screwdriver into the slot on top of the motor.

8. Check for free spin and smooth operation of the pump.

Vacuum Pump Operation Testing

1. To check for proper operation of the vacuum pump, connect to an electrical source, water and waste line.

2. Start the pump, then block the suction side of the pump and the vacuum relief valve. *The vacuum level should read between 20 -25 in hg. Shims may need to be added or deleted for proper vacuum reading. (Refer to the Housing/Impeller Spacing Section.)*

3. Operate the pump for approximately one hour continuously.

4. Check for any water leaks, electrical problems and consistent vacuum level.

DentalEZ Group
CustomAir Division
Dual Wet Vacuum System

The DentalEZ Group and its employees are proud of the products we provide to the dental community. We stand behind these products with a warranty against defects in material and workmanship as provided below and have our own in-house repair facility to service our products..

In the event that you experience difficulty with the application or operation of any of our products, please contact our customer service department at our expense at (866) DTE-INFO.

If we cannot resolve the issue by telephone, we will arrange for a representative to contact you or suggest that the product be returned to our factory for inspection.

If product return or repair is required, we will provide you with a **Return Authorization** number and shipping instructions to return the product to the proper facility. If the product is under warranty, we will ask you to provide proof of purchase, such as a copy of your invoice. Please be sure to include the **Return Authorization** number on the package you are returning. **Products returned without a Return Authorization number cannot be repaired.**

Freight costs for product returns are the responsibility of the customer. Products under warranty will be repaired or replaced, at our sole discretion, and returned at our expense. Products outside the warranty limits will be repaired and returned with costs invoiced to the customer. We are not responsible for shipping damages. We will, however, help you file a claim with the freight carrier. Written repair estimates are available.

DentalEZ warrants the Dual Wet Vacuum System to be free of defects in material and workmanship, under normal usage, for a period of two (2) years from date of installation.*****

Please note the following additional terms of our warranty and return policy:

- Warranties cover manufacturing defects only and do not cover defects resulting from abuse, improper handling, cleaning, care or maintenance, normal wear and tear or non-observance of operating, maintenance or installation instructions. **Failure to use authorized parts or an authorized repair facility voids this warranty**.
- **Liability is limited to repair or replacement of the defective product at our sole discretion**. **All other liabilities**, **in particular liability for damages**, **including, without limitation**, **consequential or incidental damages are excluded**.
- THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. NO EMPLOYEE, REPRESENTATIVE OR DEALER IS AUTHORIZED TO CHANGE THIS WARRANTY IN ANY WAY OR TO GRANT ANY OTHER WARRANTY.

WARRANTY REPAIRS: Parts repaired or replaced on a product that is in warranty will be warranted for the duration of that product's original warranty.

NON-WARRANTY REPAIRS: The warranty on parts either repaired or replaced on an out-of-warranty product will cover the repaired part only and will be for the time frame of a new parts warranty period.

PRODUCT RETURN: Opened products or product returns more than a year old cannot be returned for credit. There will be a 15% ($25.00 minimum) restocking charge on all items authorized for return.

*****Provided conditions defined in the instruction manual are met.

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Printed in USA