

AIR RITE

**... the answer to
an efficient, complete, aircharging system
for Hydropneumatic Tanks!**

Distinctive Features Include:

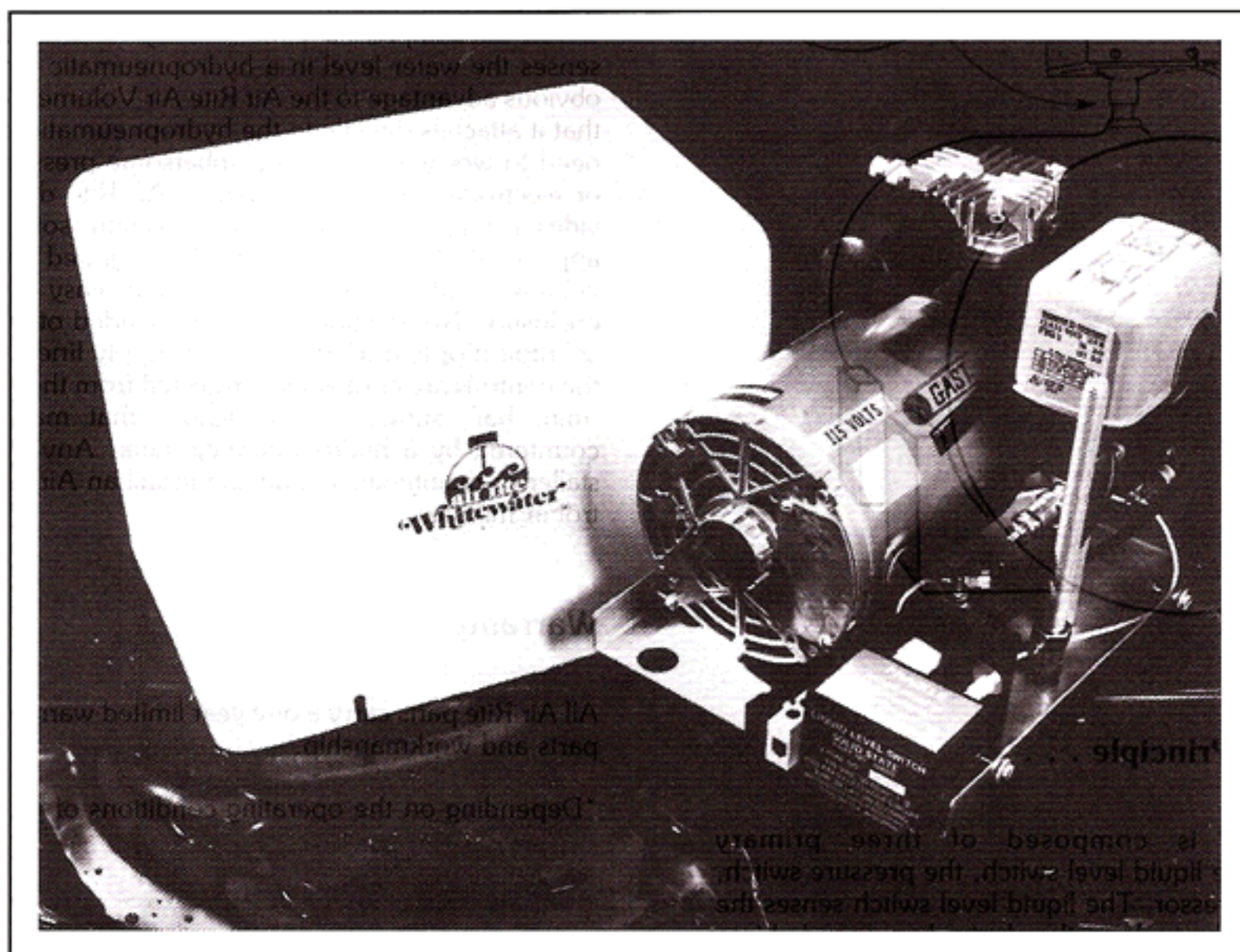
Dual Voltage

Solid State Liquid Level Switch

Long Life Oil-less Compressor - Adjustable Pressure Switch

Fast Simple Installation - One Year Warranty

**Backed by technical advice
from our trained management staff**



Whitewater

MFG. Co., P.O. Box 148, Whitewater, WI 53190 (262) 473-3100 FAX (262) 473-4324

Easy to install, maintenance free...

Important Features . . .

The Air Rite Air Volume Control is a completely self contained air charging system. The control has only three basic components: an oil-less air compressor, an encapsulated solid state liquid level switch (with isolated electrode circuit and time delay), and a pressure switch. All of the components are enclosed in a fiberglass cover rendering the entire unit weather-proof. This patented design makes it possible to install the control in a fraction of the time that it takes to install an air volume control system utilizing a separate air compressor. Water containing minerals creates no special problem for the control because the only contact with the water is via the stainless steel corrosion resistant electrode. The control requires very little maintenance, providing years of trouble-free service.

the tank from the controls base. At the same time the pressure switch monitors the air pressure in the tank. If the water level begins to rise above the electrode and the air pressure in the tank is below the setting on the pressure switch the compressor will begin to pump air into the tank. The compressor will continue to pump air until an adequate air pressure is reached or until the water level falls below the electrode. A time delay in the liquid level switch prevents waves in the tank from causing rapid cycling of the compressor. Since the air in the tank is lost rather slowly by absorption into the water, the control is continuously monitoring the air charge in the tank and the optimum air charge is maintained. Continual monitoring of tank pressure is very important because pressure changes result from both air to water absorption and changing water levels.

Advantages over other types of Air Charging Systems . . .

Experienced water supply system designers agree that no type of air volume control is better than a motor driven air compressor controlled by an electrode that senses the water level in a hydropneumatic tank. One obvious advantage to the Air Rite Air Volume Control is that it attaches directly to the hydropneumatic tank. No need to worry about long cumbersome pressure hoses or electrode wires. The patented Air Rite design provides a complete motor driven air compressor (good for approx. 4000 working hours)* integrated in an air volume control system all in one easy to install enclosure. No additional parts are needed other than a 2" pipe nipple and an electrical supply line. Lastly, the controls are completely protected from the elements - rain, hail, snow, ice, or wind - that may be encountered by a hydropneumatic tank. Any pump installer or maintenance man can install an Air Rite Control in minutes.

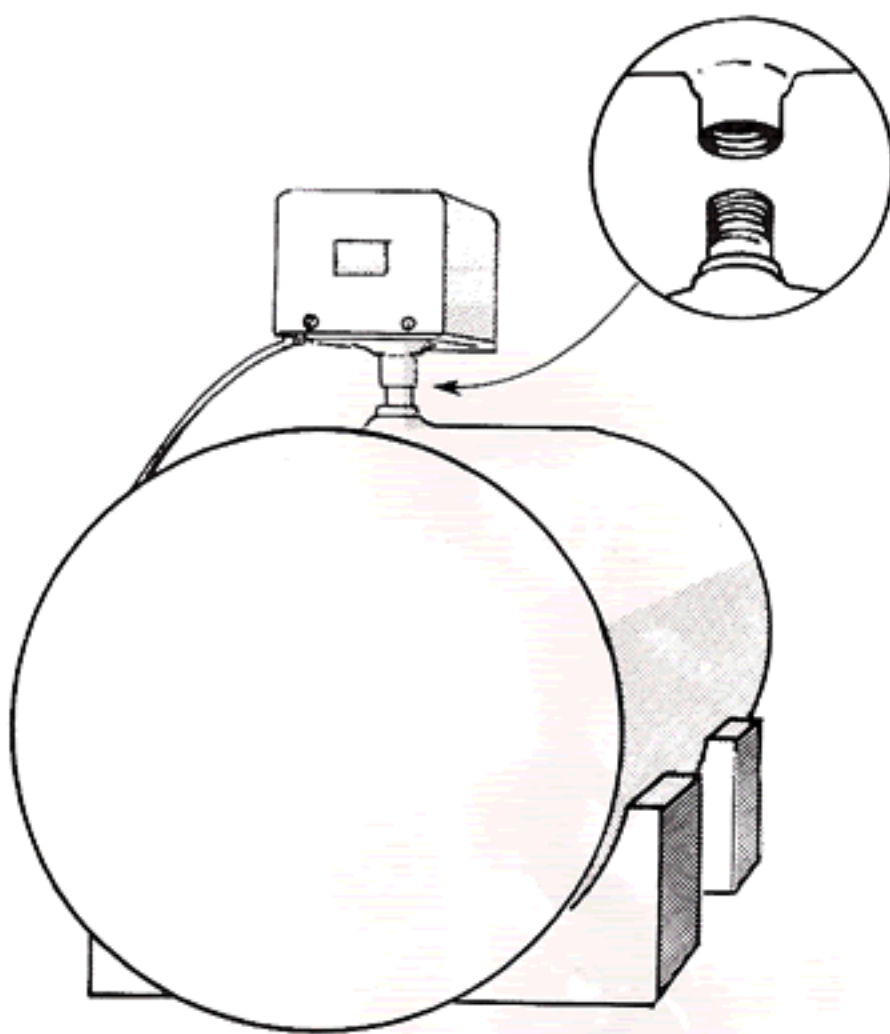
Warranty . . .

All Air Rite parts carry a one year limited warranty on all parts and workmanship.

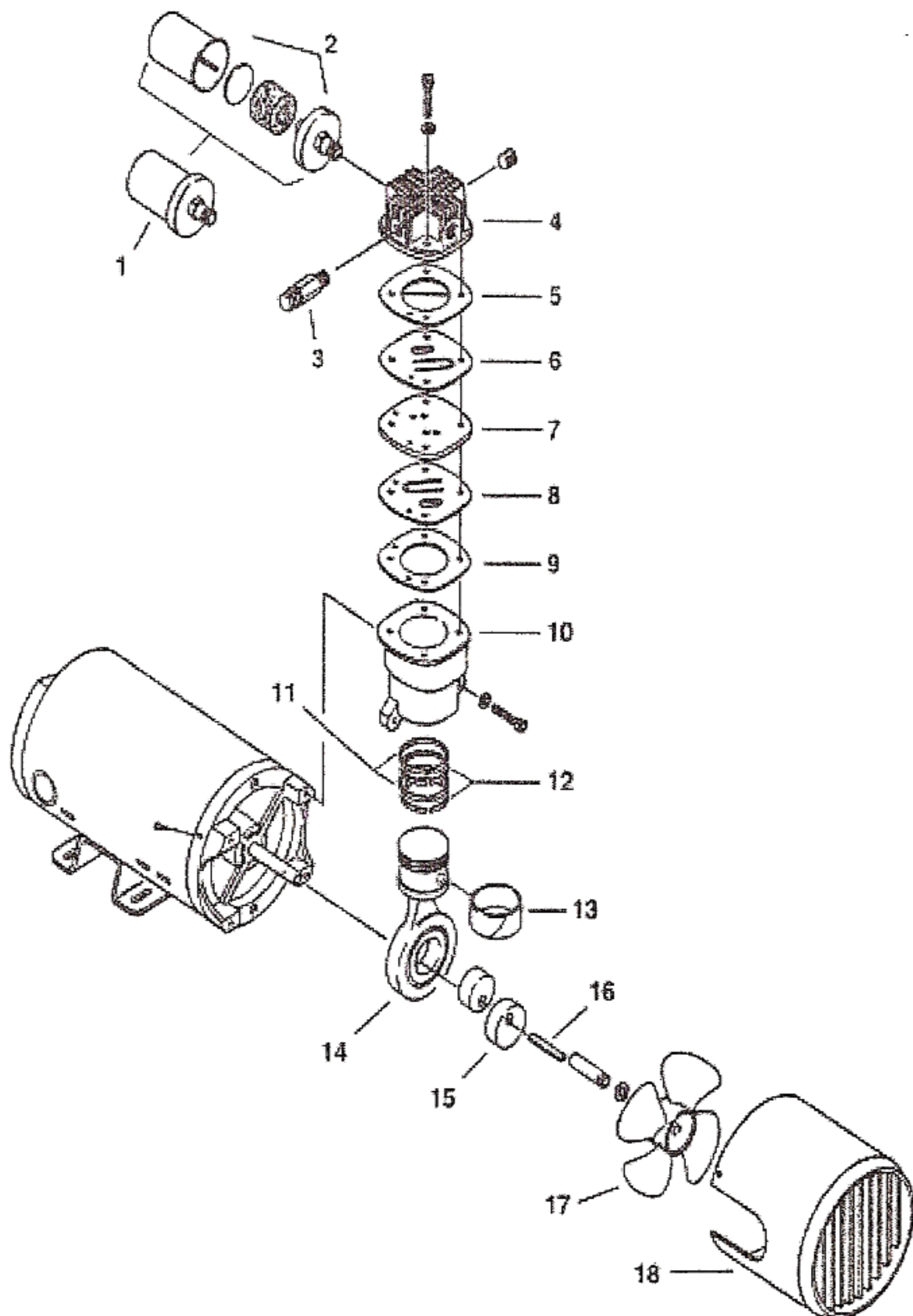
*Depending on the operating conditions of your unit.

Operating Principle . . .

The control is composed of three primary elements: the liquid level switch, the pressure switch, and the compressor. The liquid level switch senses the water level in the tank via the electrode suspended into



EXPLODED PRODUCT VIEW — MODEL 1HAB



Air receiver loses pressure:

1. Check for system leaks through pipes, fittings and seals.
2. Inspect the check valve to see if it is allowing air pressure to leak back into unit.
3. Pressure pumps will have bubbles around head assembly during operation. Stop operating the pump for a few minutes and check for air leaks at pump.
4. Vacuum systems should have the check valve removed and inspected for dirt buildup. It may be necessary to need an AV460 filter installed prior to tank to eliminate contaminants.

A leak is located at the unit:

1. Vent all pressure from inside the air receiver until gauge reads 0 PSI.
2. Inspect check valve for dirt buildup, wear and proper operation.
3. Replace check valve if necessary.

PARTS & ORDERING INFORMATION

Please reference the exploded view on the opposite page for the following model and parts table.

1HAA / 1HAB SERIES

REF	DESCRIPTION	QTY	1HAA	1HAB	1HAE	1LAA	1VAF	2HAH	2LAF	3HEB	3HEE	3LEM
1	INLET FILTER ASSEMBLY	1	B300A	B300A	B300A	B300A	B300A	B300A	B300F	B300F	B300F	B300F
2 ⊗	FELT	1	B344A	B344A	B344A	B344A	B344A	B344A	B344A	B344A	B344A	B344A
3	SAFETY VALVE	1	AS100E	AS100G	AS100G	AS100C	—	AS100G	AS100C	AS100G	AS100G	AS100C
4	CYLINDER HEAD	1	AF508	AF508	AF508	AF508	AF508	AF508	AF508	AH691	AH691	AH691
5 ⊗	HEAD GASKET	1	AF518	AF518	AF518	AF518	AF518	AF518	AF518	AF520A	AF520A	AF520A
6 ⊗	OUTLET VALVE	1	AF531	AF531	AF531	AF531	AF531	AF531	AF531	AF545	AF545	AF545
7	PLATE VALVE	1	AF529	AF529	AF529	AF529	AF529	AF529	AF529	AK779	AK779	AK779
8 ⊗	INLET VALVE	1	AF530	AF530	AF530	AF530	AF530	AF530	AF530	AF544	AF544	AF544
9 ⊗	CYLINDER GASKET	1	AF519A	AF519A	AF519A	AF519A	AF519A	AF519A	AF519A	AF521	AF521	AF521
10	CYLINDER	1	AF510	AF510	AF510	AF510	AF510	AF510	AF510	AF509	AF509	AF509
11 ⊗	PISTON RING	2	AF527	AF527	AF527	AF527	AF527	AF527	AF527	AF541	AF541	AF541
12 ⊗	PISTON SEAL	2	AF526	AF526	AF526	AF526	AF526	AF526	AF526	AF540	AF540	AF540
13 ⊗	RIDER RING	1	AF594	AF594	AF594	AF594	AF594	AF594	AF594	AF595	AF595	AF595
14	PISTON ROD ASSEMBLY	1	AF560A	AF560B	AF560E	AF560A	AF560F	AF560H	AF560F	AK893B	AK893E	AK893M
15	COUNTER WEIGHT	1	AF517A	AF517B	AF517E	AF517A	AF517D	AF517C	AF517D	AT780B	AK780E	AK780A
16	FLAT KEY	1	AF524	AF524	AF524	AF524	AF524	AF524	AF524	AB136	AB136	AB136
17	FAN	1	AF533	AF533	AF533	AF533	AF533	AF547	AF547	AF547	AF547	AF547
18	SHROUD	1	AF534	AF534	AF534	AF534	AF534	AF534	AF534	AT343	AT343	AT343
***	TANK ASSEMBLY	1	—	AF599	—	AF599AA-1	—	AF599	—	—	—	—
***	SERVICE KIT	1	K264	K264	K264	K264	K264	K264	K264	K514A	K514A	K514A

Model 1HAB shown.

*** Item not shown.

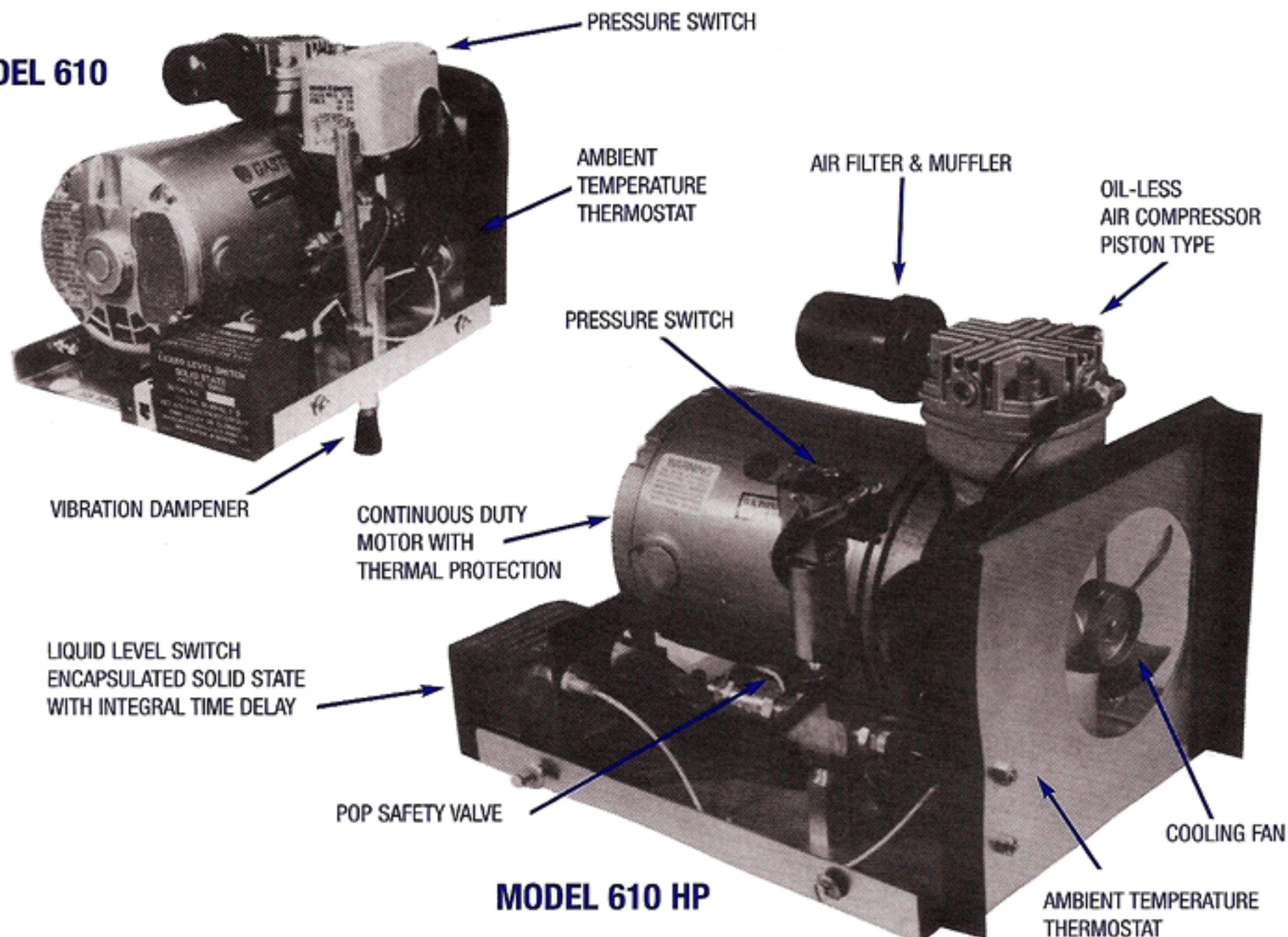
⊗ Denotes parts included in the Service Kit.

Parts listed are for stock models. For specific OEM models, please consult the factory.

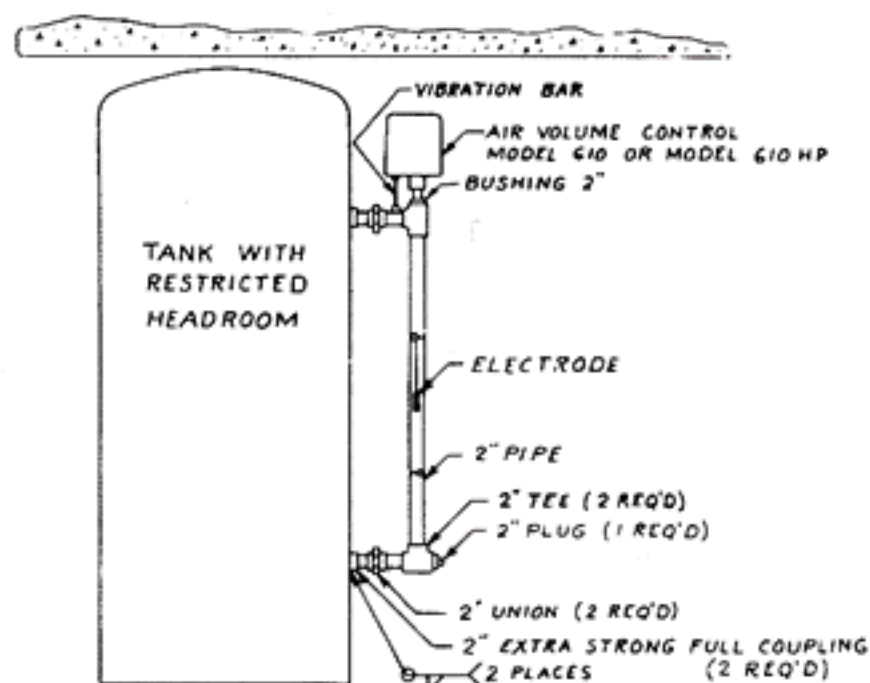
When corresponding or ordering parts, please give complete model and serial numbers.

AIR RITE Air Volume Controls

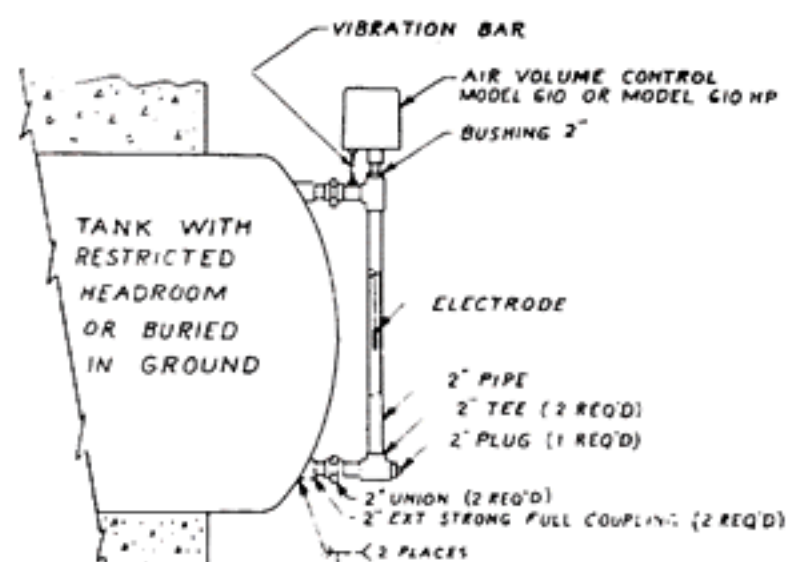
MODEL 610



SIDE MOUNTING ON VERTICAL TANK



END MOUNTING ON HORIZONTAL TANK



TECHNICAL DATA

Air Rite Control Model Number
 Maximum Tank Size in Gallons
 Maximum Tank Pressure in PSI
 Operating current in amperes for 115/230 volt
 Control pressure switch factory setting in PSI (shut off)

610**	610HP**
15,000*	15,000*
80*	110*
3.4/2	3.4/2
50	80/81
adjust	adjust
2"NPT	2"NPT

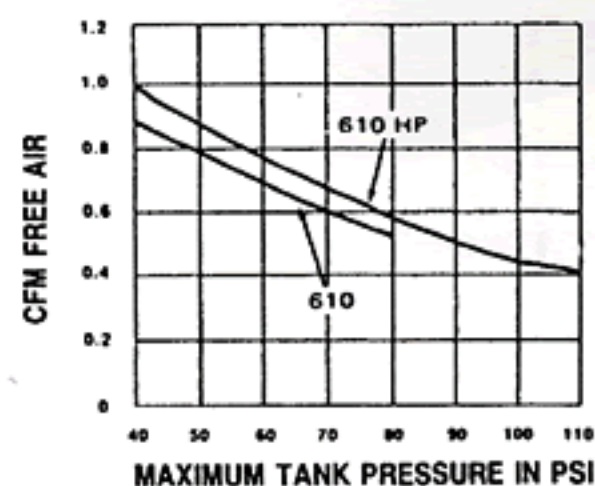
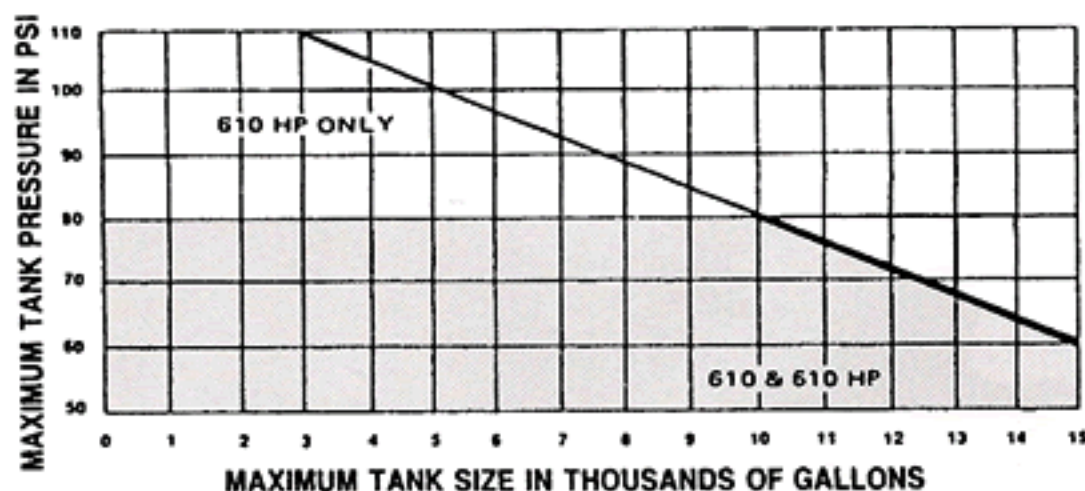
Tank connector size
 Space required over top of tank; Length x Width x Height in inches (Note:
 Fiberglass cover must be in place at all times - inside and out - for air move-
 ment)
 Shipping wt. in lbs.

10x14x17	10x14x17
35	35

*See trade-off graph for maximum tank pressure
 which can be used with a particular tank size.

**All models are single phase, and dual voltage.

Min. Pressure 40 PSI For 610 HP.



TRADE OFF GRAPH

EXAMPLE 1: If the water pump capacity is greater than 10% of the Tank capacity you must use a 610 HP.

EXAMPLE 2: A 610 can be used on a 2,000-10,000 gallon tank with a maximum working pressure of 80 PSI.

EXAMPLE 3: A 12,000 gallon tank could be operated at a pressure of up to 72 PSI - either the 610 or 610 HP would work.

EXAMPLE 4: If the pump must operate in the range of 80/100 PSI, maximum tank size is 5,300 gallons and only the 610 HP would work.

SPECIFY: Air Rite and save time, money and worry. Procurement, installation and maintenance are reduced to an absolute minimum when you use Air Rite Air Volume Controls.

COMPRESSOR DELIVERY

THIS DATA IS BASED UPON A DIFFERENTIAL OF 20 PSI BETWEEN WATER PUMP "START" AND "STOP" PRESSURE.

MODEL 610 has a pumping differential of 14 PSI between stop and start.

MODEL 610 HP has a pumping differential of 9 PSI between stop and start.

DISTRIBUTED BY:

INSTALLATION INSTRUCTIONS

MODEL D610 and D610HP AIR VOLUME CONTROLS

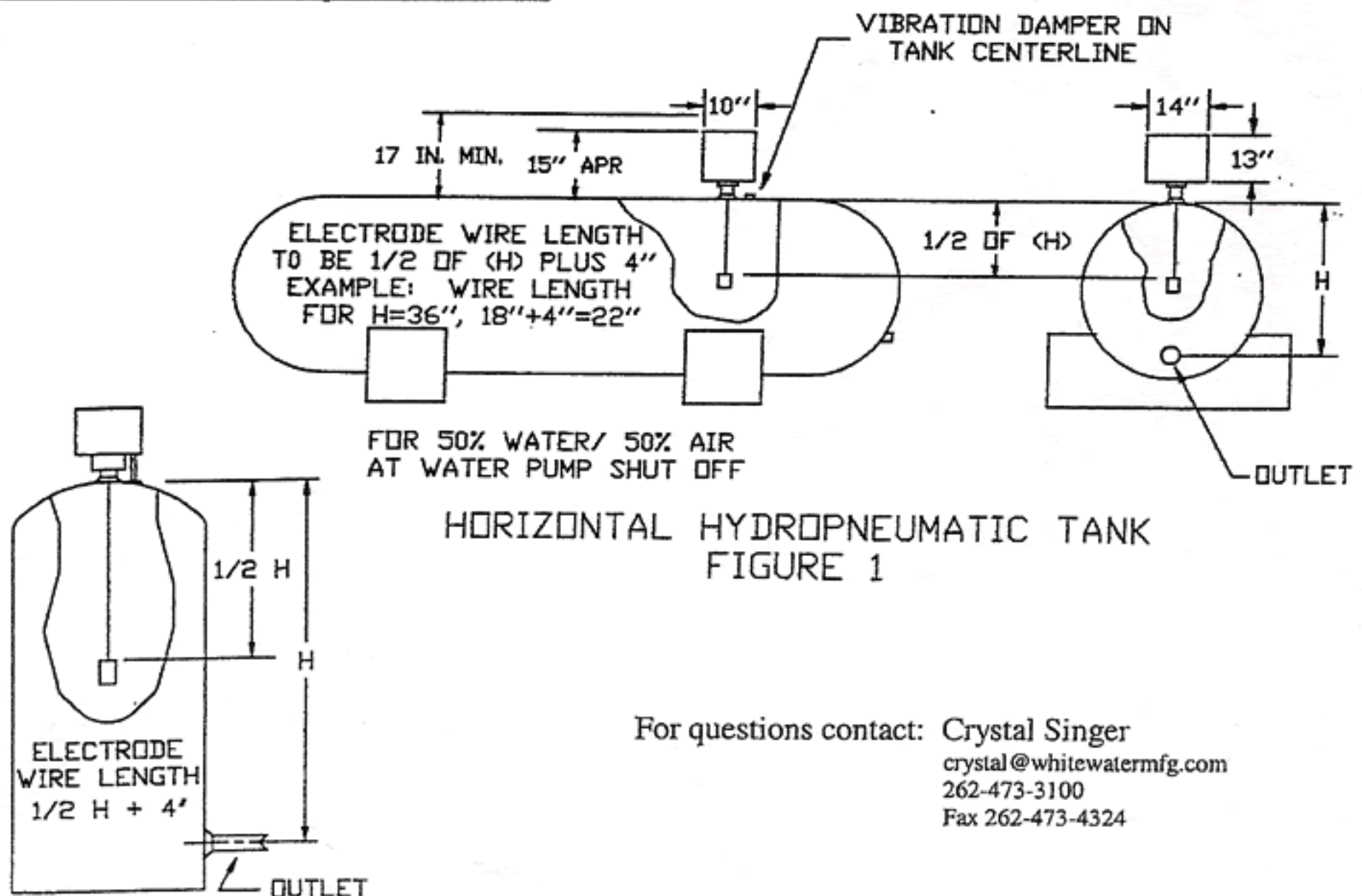
1. Cut electrode wire to the proper length as shown in Figure 1.
2. Connect electrode wire to control base connector and install electrode on wire end. Pull on electrode to insure that connections are tight. Do not apply excessive torque to base connector screw or it will shear the wire.
3. If tank is epoxy or glass lined, you will need to cut an additional wire the same length as the electrode wire. Strip insulation from end approximately 1" from end. Attach the other end to the green screw located in coupling of the air-rite.
4. **DO NOT USE PLASTIC FOR MOUNTING OF AIR-RITE.** Attach control to top of tank using a 2" nipple, which is 3" long. The threads must be sealed airtight. The vibration damper must line up with the tank centerline.
5. Remove control cover. Secure vibration damper bar against tank and install power line to the control. The air-rite must be wired **INDEPENDENTLY FROM THE WATER PUMP**. In NO way should it be connected electrically to the water pump.
6. After adjusting the Liquid Level Switch to the proper voltage by sliding the switch, rewire the motor to 115 volt. The unit comes set for use with 230 volt.
7. Turn on the power to both the water pump and the control. Adjust the control pressure switch to open (shut off) 5 lbs before the water pump stops (opens). *Example – If the water pump is set on a 40-60 setting, the air-rite must be adjusted to shut off at 55 lbs. THE AIR-RITE MUST SHUT OFF 5 LBS BEFORE THE WATER PUMP SHUTS OFF.*

ADDITIONAL INFORMATION

- A. **LOCATION** – The control should be located near the center of the tank if possible and should not be located over the inlet pipe.
- B. **PIPE NIPPLE** – Use a 3" pipe nipple – 2" in diameter to attach unit to tank.
- C. **THREAD SEAL** – Seal the threads with Loctite (pipe sealant with Teflon) or Teflon tape. Ordinary pipe dope will work but doesn't seal air as well and makes future disassembly difficult. Check for all leaks with a leak detector.
- D. **PRESSURE SWITCH PRESET** – The controls pressure switch is preset at the factory. Model D610 is set to shut off at 50 PSI. *IT WILL ONLY WORK WITH A WATER PUMP SET ON A 35-55 LB SETTING.* If your water pump operates on anything other than this setting you must readjust the air-rite pressure switch to shut off at 5 lbs before the water pump shuts off. The model D610HP is adjusted to shut off at 80 PSI. *IT WILL ONLY WORK WITH A WATER PUMP SET ON A 65-85 LB SETTING.*

- E. If your water pump operates on anything other than this setting, you must readjust the air-rite pressure switch to open 5 lbs before the water pump opens. In both the D610 and D610HP you must turn the adjustment knob to change the pressure setting. **THE AIR-RITE MUST SHUT OFF 5 LBS BEFORE THE WATER PUMP SHUTS OFF.**
- F. PRESSURE SWITCH MODEL D610HP – The only difference between the D610 and D610HP pressure switch is that the HP has only a 9 lb differential whereas the D610 has a 14 lb differential. By this we mean the HP pressure switch (when set to shut off at 80 lbs) will come on at about 71 lbs. REMEMBER there is a 15 to 20 second time delay built into the system and a 9 lb pressure drop in the tank will cause the D610HP to come on and a 14 lb pressure drop is required to turn on the D610.
- G. THERMOSTAT – The control contains a thermostat, which will prevent the compressor from running when the temperature is high. If high temperature prevents the compressor from running when the power is turned on, the thermostat may be overridden by shorting across its terminals. Allow time for the liquid level switch time delay to work after shorting across that thermostat. DO NOT force the compressor to run more than a minute at a time when hot.
- H. The pressure switch on the air-rite must be in a closed or run position and the electrode must have water on it for the air-rite to run. Please remember there is a 30 second time delay on the liquid level switch when performing tests.

It is important that the control has its' own power line from the main entrance switch. NEVER wire the control in a parallel to the motor, as the surge voltage produced when the motor is turned off will ruin the controls' liquid level switch.



HORIZONTAL HYDROPNEUMATIC TANK
FIGURE 1

For questions contact: Crystal Singer
 crystal@whitewatermfg.com
 262-473-3100
 Fax 262-473-4324

WARRANTY REGISTRATION
Air Rite Air Volume Control

NAME _____

Address _____

City, State, Zip _____

Model No. _____ Serial No. _____ Date Purchased _____

Dealer's Name _____

Address _____

TYPE OF INSTALLATION

_____Municipal	_____Mobile Home Park	_____Golf Course
_____Resort	_____Industrial	_____Forest Camp
_____Farm	_____High Rise Bldg.	_____Waste Treatment Plant

SIZE OF HYDROPNEUMATIC TANK

Diameter _____ Length _____

OR: Capacity in Gallons _____



**WHITEWATER
MANUFACTURING**

A Reflection of Quality

1108 Bluff Rd./E. Milwaukee St. P.O. Box 148
Whitewater, WI 53190-0148 USA

262-473-3100
fax: 262-473-4324

Quick tests for the Air Rite

Be sure the ground strap is connected from the motor to the frame.

Be sure the Liquid Level Switch is bolted to the frame.

Be sure the Liquid Level Switch is set for the correct voltage.

With the Pressure switch in a closed position (use a small screw driver) lay the screw driver across the thermostat {which is on the front of the frame of the unit it has two yellow wires on each side} and touch the tip of the driver to the frame so that all three points are in contact, hold that for 35 seconds if the unit starts running you need to look for a grounding problem or the electrode which is in the tank is corroded or has fallen off.

If you have any other question please call Crystal at (866) 950-0459

Whitewater

MFG. Co., P.O. Box 148, Whitewater, WI 53190, 262-473-3100

FAX 262-473-4324

Email: crystal@whitewatermfg.com

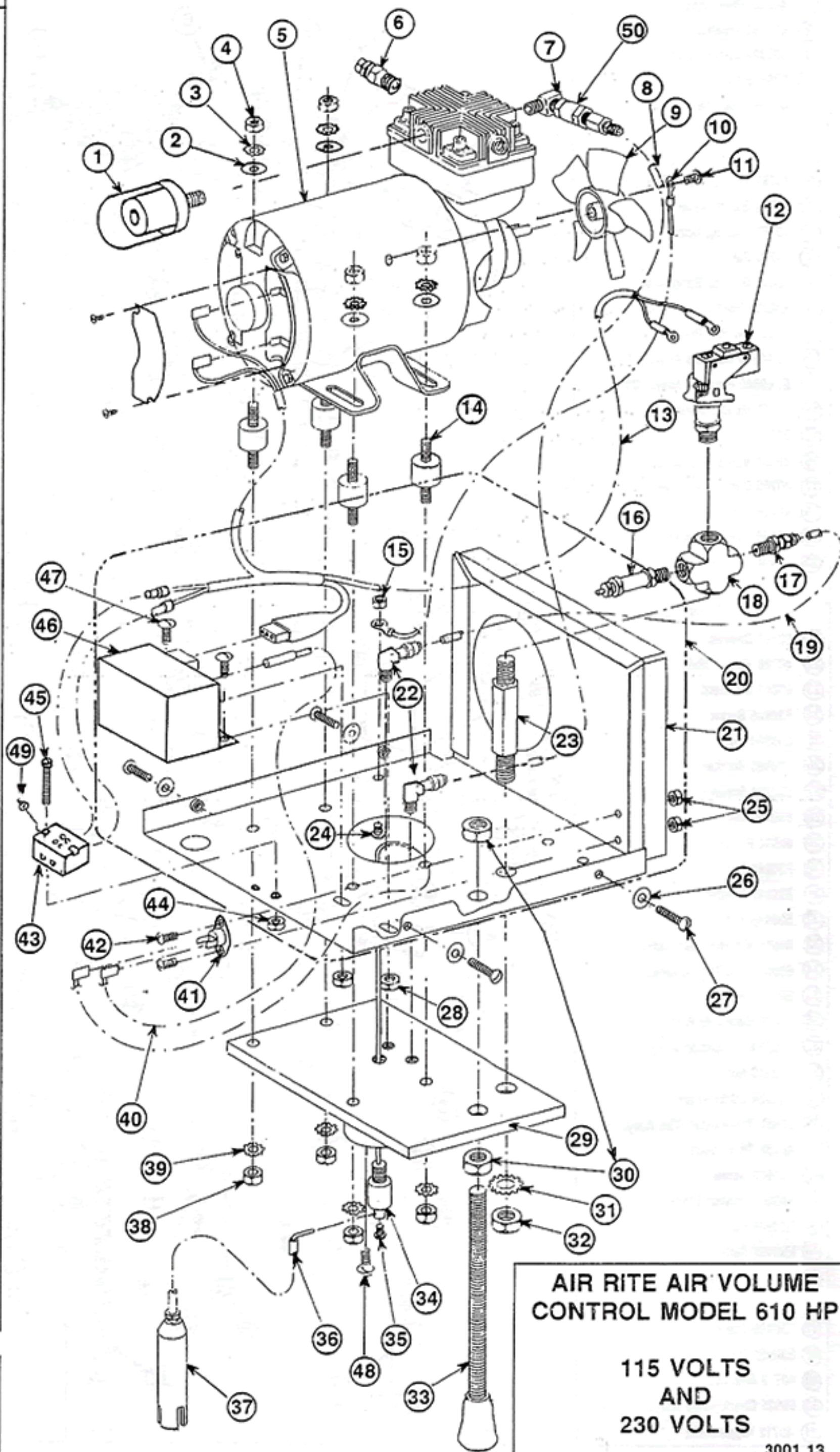
Repair Parts For AirRite

Part No.	Description
40003	Pressure Switch 610
40004	Pressure Switch 610HP
40007	Thermostat
40021A	Electrode & Wire Assembly (6' Wire Length) Tank Probe
40028	Tube Nylon Blk 1/4 per foot
40036	Grommet
40040	Motor Mount 5/16 610/610HP
40051	Beldon Shielding per foot
40051037	Beldon 3 7/8" w/terminals
40056	Pop off safety 125 PSI
40703	Female Connector
40705	Connector Male
40706	Male Elbow
40712	Nipple Hex
40718	90° Street Elbow
40729	Cross 1 1/4 2205P4
40775	Ground Wire Terminal
40790	Fan
40791	Pop Safety Valve
40792	Filter Assembly
40795	Tubing lower 9"
40796	Tubing lower 8.5"
40797	Tubing upper 13"
60057	Feed Thru Connector Assembly
60527	Base Assembly 610 & 610HP

Part No.	Description
605401	Rubber Tip
E30948M	Vibration Bar Assembly
60625	Check Valve Assembly
60632	Ground Strap Assembly
60636	Electrode Wire per foot
60637	Thermostat Wire Assembly 610 & HP
60639	Pressure Switch Wire Assembly
60642	Standard 610 & 610HP
60670	Dual Voltage Liquid Level Switch
60679	Harness Assembly 115v & 230v
40680D	Compressor Dual Voltage
60536	Cover Assembly - All
60699	Terminal Block
6K264	Service Kit 264
E30903	40018 Screw, 4-40 x 1/4" lg.
E30904	40738 Nut, 4-40 - self-locking
E30906	40013 Screw, 8-32 x 3/8" lg. - S.S.
E30907	40015 Screw, 8-32 x 1 1/4" lg. - Phil. Hd.
E30908	40740 Nut, 8-32 - self-locking
E30910	40072 Screw, 5/16-18 x 3/4" - Cap
E30912	40030 Screw Cap, 1/4-20 x 5/8" lg.
E30913	40743 Nut, 1/4-20 - self-locking
E30914	40073 Washer, 1/4" - Star
E30916	40756 Nut, 5/16-18 - Plain-Hex
E30917	40744 Nut, 5/16-18 - self-locking
E30922	40022 Screw, 1/4-20 x 3/8" lg., R.H.
E30924	40762 Lockwasher, 5/16 - Star
E30945	40760 Nut, 1/2-13 - Plain-Hex
E30947	40009 Washer, 1/2" - Lock - Plated
E30953	40041 Washer, 1/4" - Plain
E30960	40012 Screw, 10-32 x 1/2" lg.
E30961	40016 Screw, 10-24 x 3/4" lg. - Pan Hd.
E30962	40742 Nut, 10-32 - self-locking
E30963	40008 Washer, Bartite
E30964	40017 Screw, 10-24 x 1" lg. - Pan Hd.

Parts List

- ① 40792 Filter Assy.
- ② E30953 Washer
- ③ E30924 Lockwasher
- ④ E30916 Nut
- ⑤ Compressor Assy.
- ⑥ 40791 Valve, Pop Safety
- ⑦ 40718 Elbow, Male
- ⑧ 40797 Tubing, Upper
- ⑨ 40790 Fan
- ⑩ 60632 Ground Strap Assy.
- ⑪ E30922 Screw
- ⑫ 40004 Switch, Pressure
- ⑬ A. 60679 Harness Assy. 115V
B. 60680 Harness Assy. 230V
- ⑭ 40040 Mount, Motor
- ⑮ E30908 Nut
- ⑯ 40056 Valve, Pop Safety
- ⑰ 40705 Connector, Male
- ⑱ 40729 Cross
- ⑲ 40795 Tubing, Lower
- ⑳ Cover
- ㉑ 60695 Chassis
- ㉒ 40706 Elbow, Male
- ㉓ 60642 Standard
- ㉔ E30906 Screw
- ㉕ E30908 Nut
- ㉖ E30963 Washer
- ㉗ E30964 Screw
- ㉘ E30962 Nut
- ㉙ 60534 P Base
- ㉚ E30945 Nut
- ㉛ E30947 Washer
- ㉜ E30945 Nut
- ㉝ 60544 Vibration Bar Assy.
- ㉞ 60057 Feed Thru Connector
- ㉟ E30906 Screw
- ㊱ 60636 Electrode Wire
- ㊲ 40021A Electrode Assy.
- ㊳ E30916 Nut
- ㊴ E30924 Lockwasher
- ㊵ 60637 Thermostat Wire Assy.
- ㊶ 40007 Thermostat
- ㊷ E30906 Screw
- ㊸ 60699 Terminal Block
- ㊹ E30908 Nut
- ㊺ E30907 Screw
- ㊻ E30960 Screw
- ㊼ E30959 Grd. Screw
- ㊽ 40775 Grd. Lug
- ㊾ 60625 Check Valve Assy.

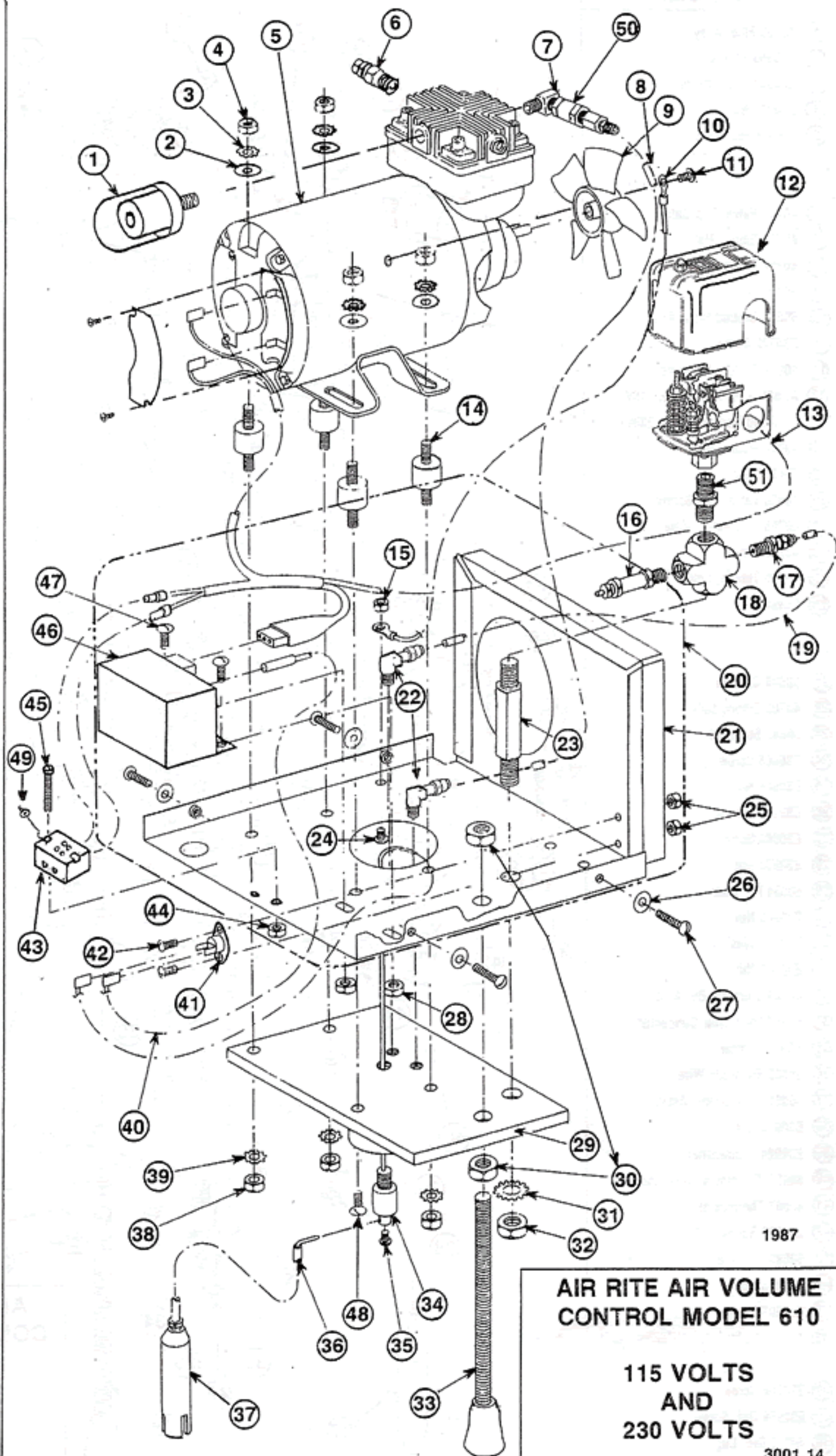


**AIR RITE AIR VOLUME
CONTROL MODEL 610 HP**

**115 VOLTS
AND
230 VOLTS**

Parts List

- ① 40792 Filter Assy.
- ② E30953 Washer
- ③ E30924 Lockwasher
- ④ E30916 Nut
- ⑤ Compressor Assy.
- ⑥ 40791 Valve, Pop Safety
- ⑦ 40718 Elbow, Male
- ⑧ 40797 Tubing, Upper
- ⑨ 40790 Fan
- ⑩ 60632 Ground Strap Assy.
- ⑪ E30922 Screw
- ⑫ 40003 Switch, Pressure
- ⑬ A. 60679 Harness Assy. 115V
B. 60680 Harness Assy. 230V
- ⑭ 40040 Mount, Motor
- ⑮ E30908 Nut
- ⑯ 40055 Valve, Pop Safety
- ⑰ 40705 Connector, Male
- ⑱ 40729 Cross
- ⑲ 40795 Tubing, Lower
- ⑳ Cover
- ㉑ 60695 Chassis
- ㉒ 40706 Elbow, Male
- ㉓ 60642 Standard
- ㉔ E30906 Screw
- ㉕ E30908 Nut
- ㉖ E30963 Washer
- ㉗ E30964 Screw
- ㉘ E30962 Nut
- ㉙ 60534 P Base
- ㉚ E30945 Nut
- ㉛ E30947 Washer
- ㉜ E30945 Nut
- ㉝ 60544 Vibration Bar Assy.
- ㉞ 60057 Feed Thru Connector
- ㉟ E30906 Screw
- ㊱ 60636 Electrode Wire
- ㊲ 40021A Electrode Assy.
- ㊳ E30916 Nut
- ㊴ E30924 Lockwasher
- ㊵ 60637 Thermostat Wire Assy.
- ㊶ 40007 Thermostat
- ㊷ E30906 Screw
- ㊸ 60699 Terminal Block
- ㊹ E30908 Nut
- ㊺ E30907 Screw
- ㊻ E30960 Screw
- ㊼ E30959 Grd. Screw
- ㊽ 40775 Grd. Lug
- ㊾ 60625 Check Valve Assy.
- ㊿ 40712 Nipple, Hex



1987

**AIR RITE AIR VOLUME
CONTROL MODEL 610**

**115 VOLTS
AND
230 VOLTS**

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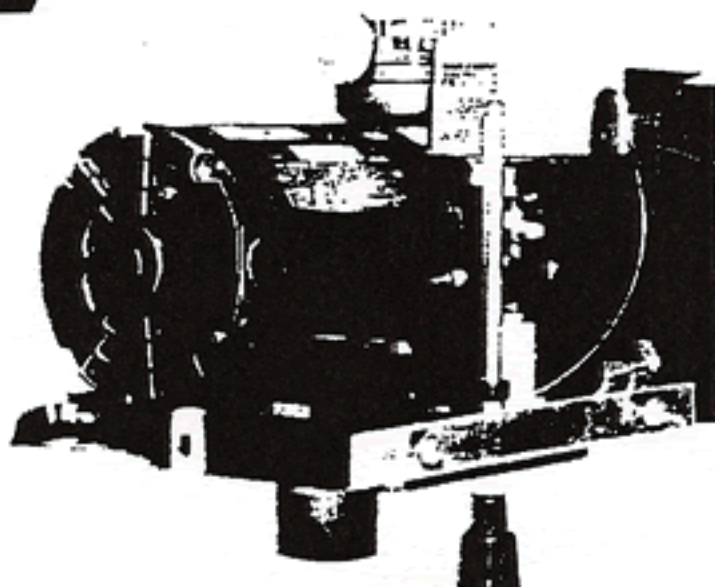


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1108 Bluff Rd./E. Milwaukee St. P.O. Box 148
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262-473-3100



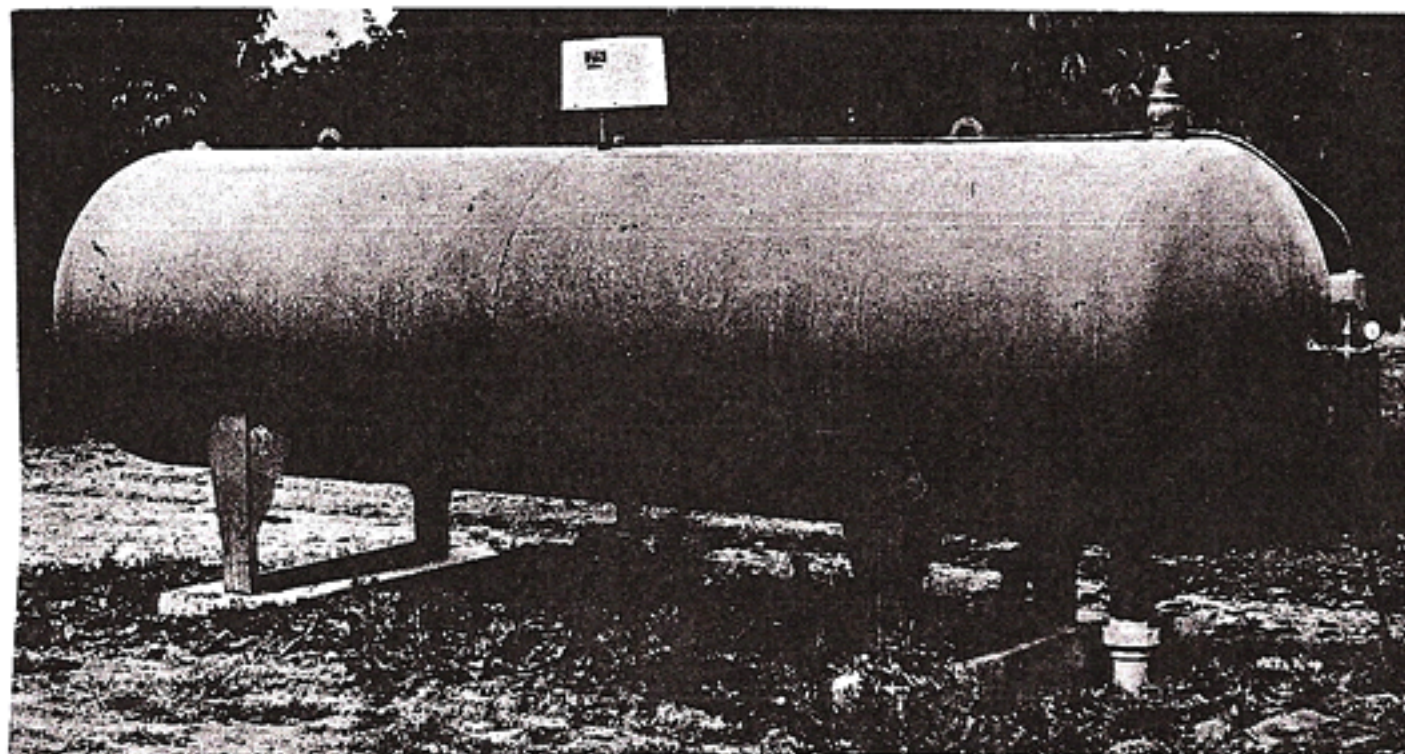
Air Rite Control Model Number	610	610HP
Maximum tank size in gallons	15,000	15,000
Maximum tank pressure in PSI	80	110
Operating current in amperes for 115 volt rating ...	3.4	3.4
Operating current in amperes for 230 volt rating ...	2	2
Control pressure switch factory setting in PSI	50	80
	adjustable	adjustable
Tank connection size	2" NPT	2" NPT
Space required over top of tank	10x14x17	10x14x17
Shipping weight in pounds	35	35

AIR-RITE AIR VOLUME CONTROL										
DRAWDOWN			GALLONS			LARGE HYDROPNEUMATIC TANKS				
Water/Air Pump Cut-Out	Pump Pressure Switch Setting		TANK SIZE GALLONS							
	On	Off	500	750	1,000	2,000	3,000	5,000	10,000	15,000
50% Water 50% Air	20	40	144	216	288	576	864	1,440	2,880	4,320
	30	50	112	168	224	448	672	1,120	2,240	3,360
	40	60	91	137	182	364	546	910	1,820	2,730
	40	65	114	171	228	456	684	1,140	2,280	3,420
	50	70	77	116	154	308	462	770	1,540	2,310
	50	75	97	145	193	414	579	965	1,930	2,895
	50	80	118	176	235	470	705	1,175	2,380	3,525
	60	90	101	151	201	402	603	1,005	2,010	3,015
	70	100	90	135	180	360	540	900	1,800	2,700
	90	120	71	107	142	284	426	710	1,420	2,130
45% Water 55% Air	20	40	160	239	319	638	957	1,595	3,190	4,785
	30	50	124	186	248	496	738	1,240	2,480	3,720
	40	60	101	152	202	404	606	1,010	2,020	3,030
	40	65	132	190	253	506	759	1,265	2,530	3,795
	50	70	85	128	170	340	510	850	1,700	2,550
	50	75	102	159	212	424	636	1,060	2,120	3,180
	50	80	130	195	260	520	780	1,300	2,600	3,900
	60	90	113	169	225	450	675	1,125	2,250	3,375
	70	100	100	150	200	400	600	1,000	2,000	3,000
	90	120	79	118	157	314	471	785	1,570	2,355
40% Water 60% Air	30	50	134	201	268	536	804	1,340	2,680	4,020
	40	60	111	167	222	444	666	1,110	2,220	3,330
	40	65	104	209	278	556	834	1,390	2,780	4,170
	50	70	99	149	198	396	594	990	1,980	2,970
	50	75	116	174	232	464	696	1,160	2,320	3,480
	50	80	141	212	282	564	846	1,410	2,800	4,230
	60	90	123	184	245	490	735	1,225	2,450	3,675
	70	100	109	164	218	436	654	1,090	2,180	3,270
	90	120	85	128	170	340	510	850	1,700	2,550

AIR RITE

AUTOMATIC AIR VOLUME CONTROLS

Principle of Operation and Important Features



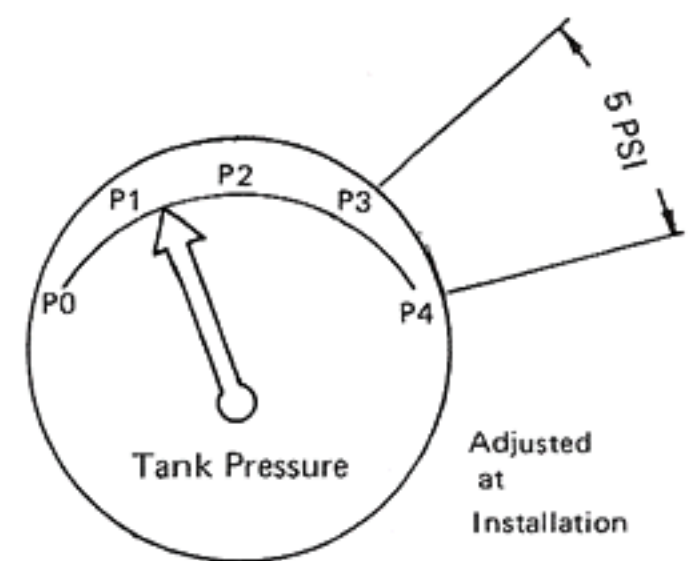
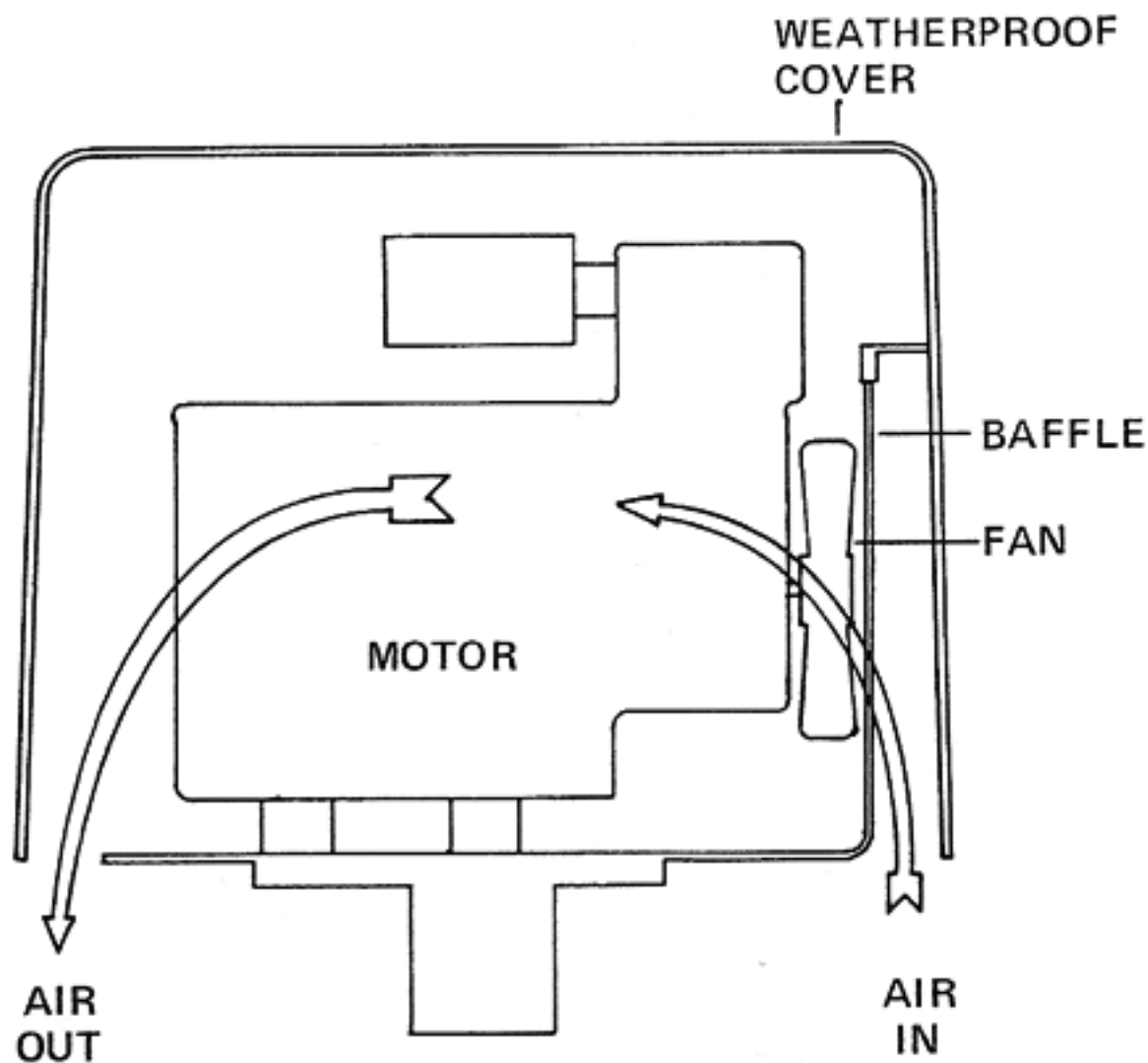
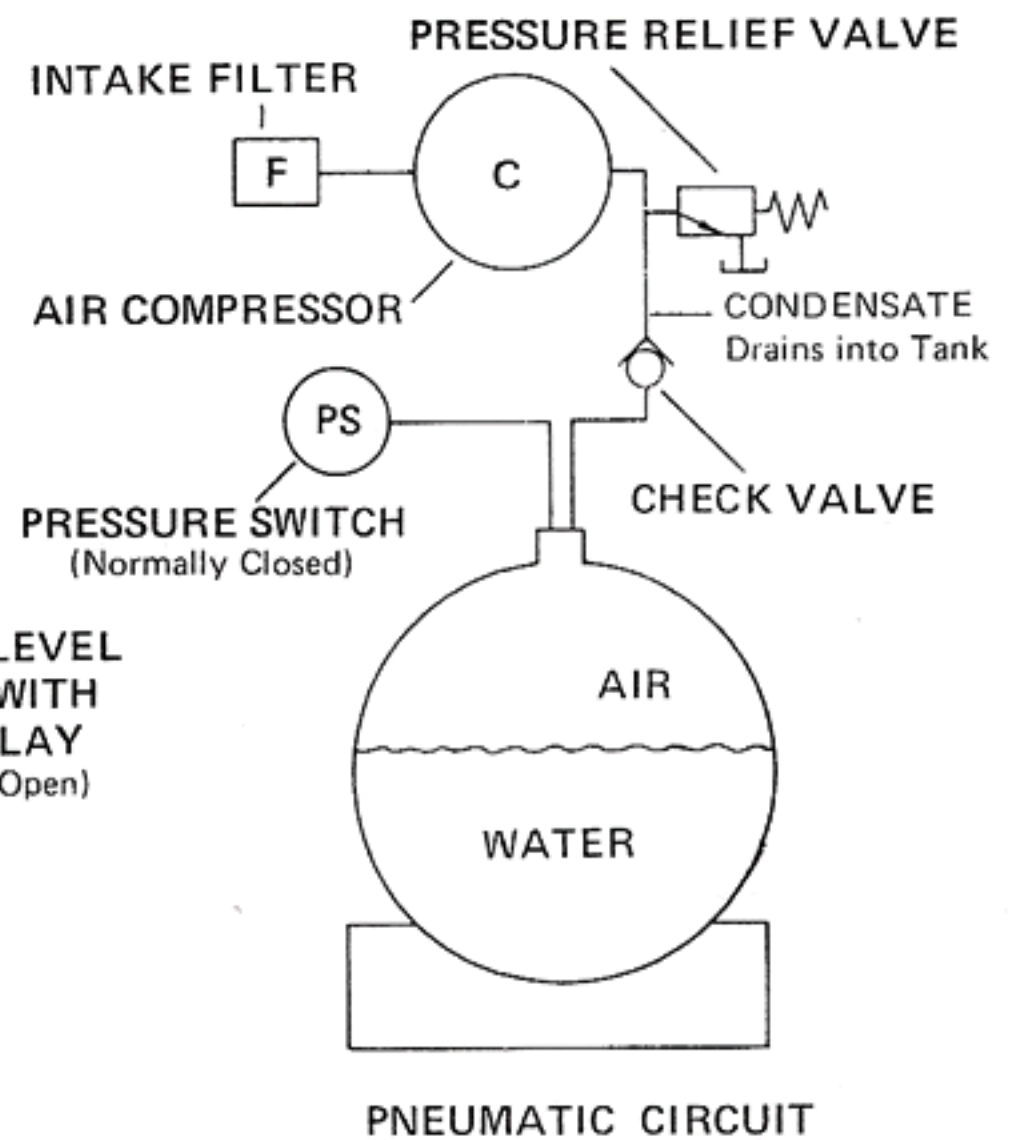
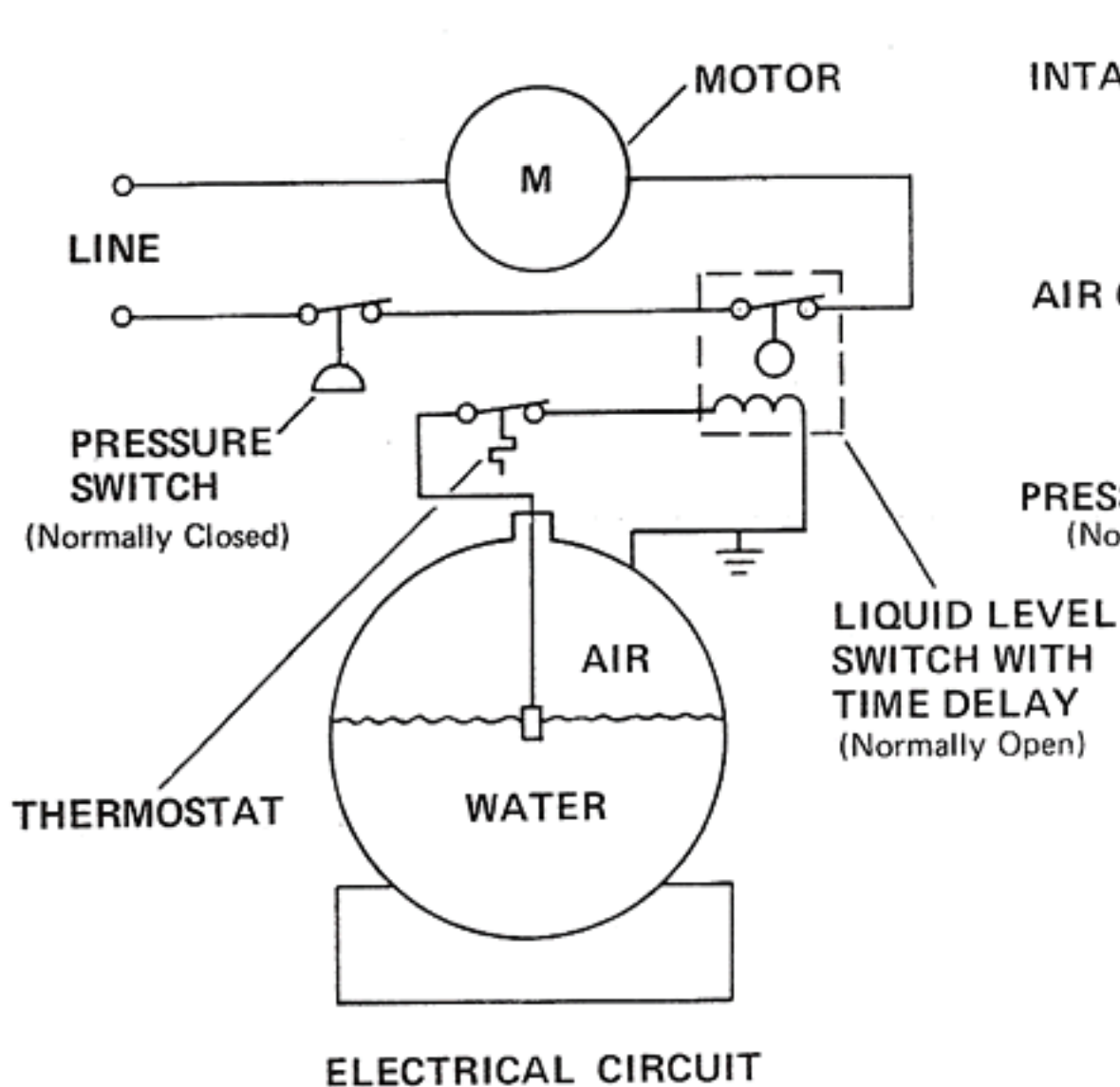
The AIR RITE Integral Compressor Air Volume Control is a unitized air charging system for hydropneumatic tanks. This patented design consists of an air compressor, liquid level switch and pressure switch arranged in one weatherproof enclosure which mounts to the top of the tank. Operation is completely automatic and no maintenance is required. The air volume control operates from its own branch circuit and is completely independent from the water pump electrical circuit. This arrangement greatly simplifies the wiring of the pump station, allows use of off-the-shelf motor starters for the water pump, etc., and expedites any electrical work that may be performed later because the electrician can quickly understand the pump station wiring arrangement. Some of the advantages of using the AIR RITE control are: complete immunity from corrosion from the water, complete weather protection, high reliability, low installation cost, safety (no exposed drive belts, etc.) and very neat appearance.

Most water system design engineers agree that the most effective way to maintain the proper air charge in a large hydropneumatic tank is by the use of an air compressor. This method allows the air charge to be maintained positively and reliably under varying operating conditions. The installation of an air compressor type air charging system is somewhat complex and tedious if it is done properly. The tank must be equipped with an electrode fitting and electrode to sense water level, a pressure switch to sense pressure and a flange fitting above water level for the air line. The air line should be equipped with a check valve, a pop safety valve, an unloader valve, a filter and a condensate drain. The compressor and motor must be securely anchored to the floor or some suitable base. If the compressor is located outside, it must be equipped with a ventilated weatherproof cover. If high ambient temperature is experienced, a thermostat cut-out switch is very desirable (if not essential) to protect the compressor from damage. If located indoors, the compressor drive belt should have a guard for safety purposes. A liquid level switch and, perhaps, a magnetic starter are required on the switch panel. In many installations, it is almost mandatory to incorporate a time delay relay in the compressor's motor circuit to prevent turbulence (waves) in the tank (caused by the water pump discharge into the tank) from causing the compressor motor to start and stop rapidly. Electric lines must be installed to connect the electrode fitting, the pressure switch and the motor to the switch panel. Obviously, the amount of skilled labor required and the number of miscellaneous parts required is considerable.

Contrasted to the above, the procedure for installing an AIR RITE control is simply to screw the entire control onto a flange fitting on the top of the tank and connect the line terminals to the switch panel. The installation job is completed quickly and satisfactory operation is assured.

The extremely simple and reliable design of the AIR RITE controls is explained in detail overleaf.

PRINCIPLE OF OPERATION OF THE AIR RITE, AIR VOLUME CONTROL



- | | |
|----|-----------------------|
| P1 | WATER PUMP STARTS |
| P2 | AIR COMPRESSOR STARTS |
| P3 | AIR COMPRESSOR STOPS |
| P4 | WATER PUMP STOPS |

EFFICIENCY OF TANKS AND PUMPS

All water supply systems consist of a distribution network and a source of supply of water under pressure. There are three general types of pressurized water supplies; (1) an elevated tank which is periodically refilled by pumping from a reservoir or well, (2) a variable delivery pump which draws from a reservoir or well and supplies only enough water to meet the instantaneous requirement of the distribution network and (3) a hydropneumatic tank which is periodically recharged by pumping from a reservoir or well. The most efficient of these three types of systems is the elevated tank-conventional pump combination. The reason for this is that the pump size and tank size can be selected to supply a widely varying demand and still allow the pump to work at near maximum efficiency for protracted periods of time; i.e., long pumping cycles. Elevated tanks provide economical storage of water if they can be located on a hill where land cost is not high. If a tower is required, or if the land cost is very high, the elevated tank loses its economic advantage. Water supply systems which have a heavy demand for much of the 24 hour day can use variable delivery pumps to advantage. The variable delivery pump produces the maximum amount of water for the least amount of space for the pumping plant. Generally speaking, the variable delivery pump systems is more expensive than a tank system in both initial cost and maintenance cost. Installations which have moderate to heavy demand for part of a 24 hour day and very light demand for the rest of the time are best served by a tank system. If land cost or space are at a premium, the hydropneumatic tank is the best choice here. The overall economy of a hydropneumatic tank system is dependent upon proper sizing of the tank and pump and upon maintenance of the proper charge of air in the tank.

Size of Hydropneumatic Tank

Initial cost of both the tank and pump is directly related to size. The efficiency of the system is directly related to tank size up to a certain point. The minimum size of the pump is determined by the average demand of the distribution network. A pump will utilize electrical energy more efficiently if the pump runs continuously as opposed to frequent starting and stopping. All pump motors require a heavy surge of current to get them up to speed and it takes some period of time after the pump reaches full speed for water to flow into the tank at maximum flow rate. All of the electrical energy that is required to start the pump and to get the water moving is wasted because none of this energy actually pumps water into the tank. For deep well pumps this start up period can be quite lengthy so, unless the pump is allowed to run for a long period after starting, the overall efficiency will be poor. Obviously then, the hydropneumatic tank must have enough effective storage capacity to allow the water pump to run a period of time that is many times longer than the start-up period. On medium to large size water supply systems, the only practical type of hydropneumatic tank is a large pressure vessel with an external air volume control system.

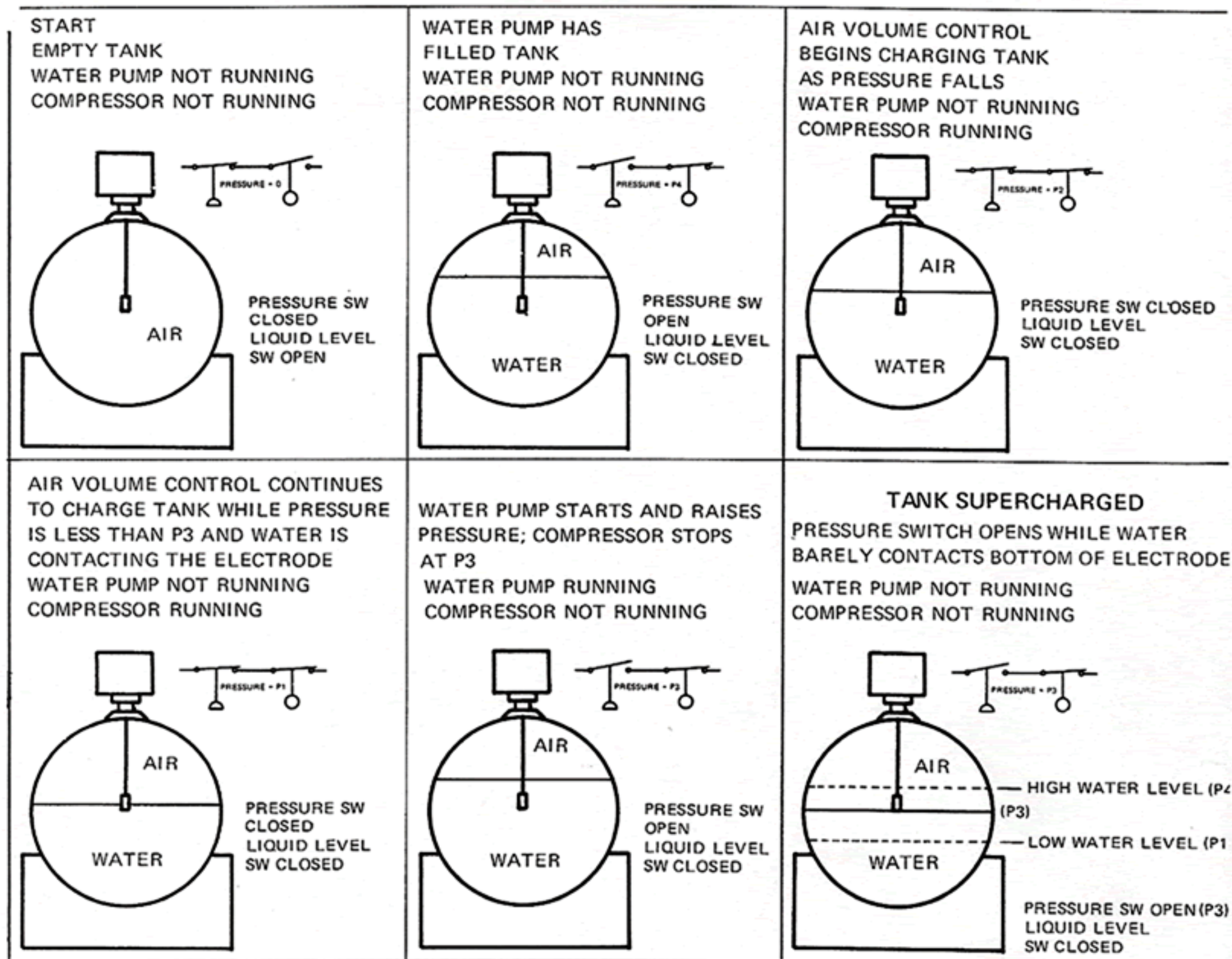
Air Charge in a Hydropneumatic Tank

The effective storage capacity of a hydropneumatic tank varies directly as the volume of air in the tank at the time the water pump starts. Thus, for maximum storage capacity, a tank would contain no water when the pump started but would contain air at a pressure equal to the water pump "START" pressure. Conversely, if the tank was completely full of water when the pump started, the effective storage capacity would be zero. For practical purposes, most hydropneumatic tanks contain about 25% water and 75% air at the pressure at which the pump starts. The water which remains in the tank at the time the pump starts reduces the rate of air absorption into the water and provides a reserve of water in the event of electrical power failure. It is imperative that the pre-selected air charge be maintained by an air volume control to maintain the pump efficiency and prevent damage to the pump from rapid cycling. The accuracy of the air volume control is important because, under the best of conditions, the effective storage capacity of the tank is only about 20% of its volume. Inaccuracy of the control system could easily reduce this to 10% of volume, or less, with a consequent loss of effective storage capacity of 50% or more. In summary then, the overall efficiency of the tank-pump system is very much affected by the efficiency of the air volume control system.

Whitewater Mfg. Co.

1108 E. Milwaukee St.
Whitewater, Wisconsin 53190
(414) 473-3100

AIR VOLUME CONTROL SWITCHING SEQUENCE



The electrical circuit shows that the compressor motor, the liquid level switch and the pressure switch are connected in series so that the motor will run only when both switches are closed. The liquid level switch electrode circuit is a low voltage isolated circuit. The thermostat prevents the motor from running if the temperature under the control's cover is so high that the compressor would be damaged if forced to run at this temperature.

The Pneumatic Circuit shows how the compressor, valves and pressure switch are arranged to perform their function. The compressor is isolated from the tank pressure by the check valve so that the compressor starts unloaded and so that air can't leak back through the compressor when the compressor isn't running. The Pressure Relief Valve protects the tank from overpressurization if the pressure switch should ever fail to open.

A very important feature of the control is that no condensate drain valve is required because condensate from the compressor discharge runs downward through the air line into the tank. If no provision were made to dispose of the condensate (pure distilled water), the compressor valves would be damaged by corrosion. All air compressors should be equipped with a means to remove condensate.

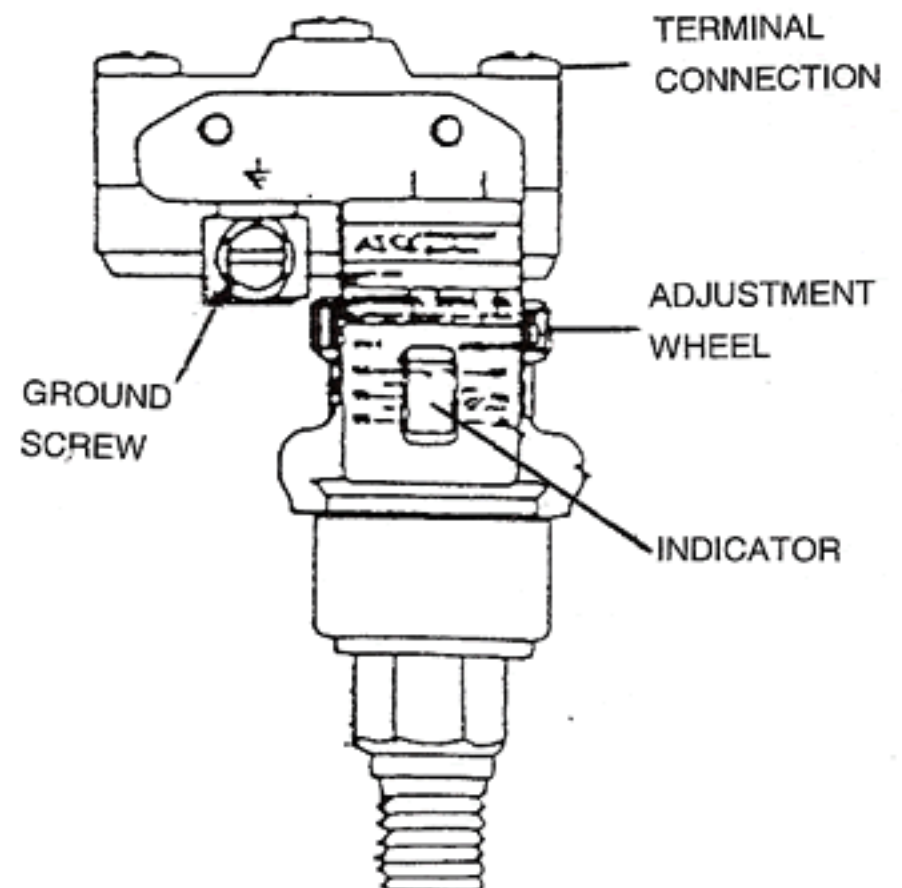
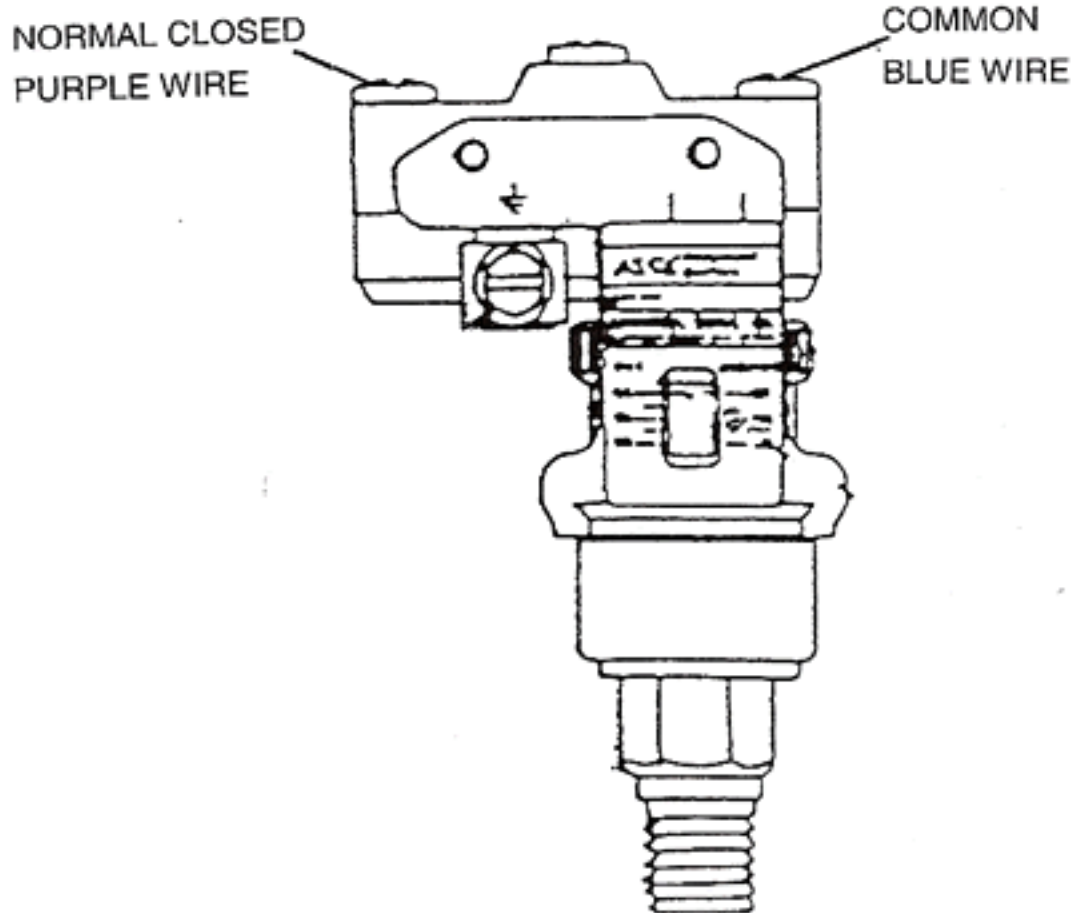
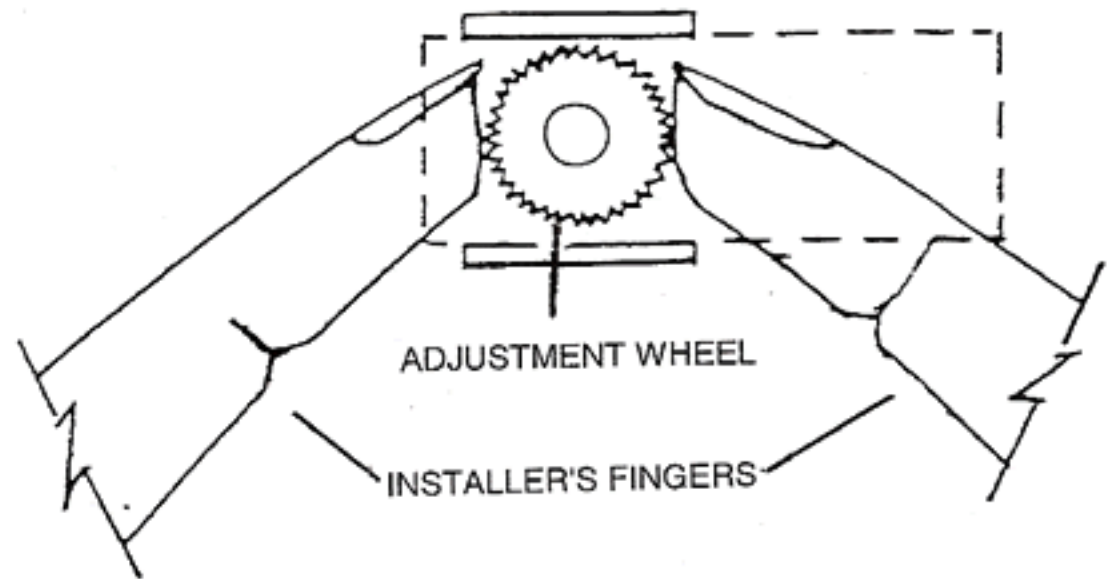
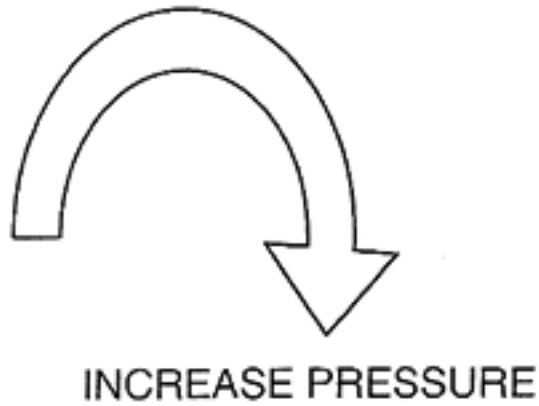
The Cooling Air Flow Path drawing shows how the air is drawn upward into the control at one end and exhausted downward at the other end. The fan serves the dual purpose of cooling the compressor and of circulating air through the control. The cover has no holes or vents in the sides so that rain cannot blow into the unit.

The pressure gauge shows the pressures at which the water pump and air compressor switch on and switch off.

The sequence of six tank drawings shows how the switches operate as the tank water level and pressure vary. The air compressor runs only when water is contacting the electrode and the pressure is less than P3. The maximum volume of air in the tank obtains when the pressure equals P3 and water has just contacted the electrode.

MODEL D610 HP

PRESSURE SWITCH ADJUSTMENT AND WIRING DIAGRAM



The air-rite model D610HP air volume control is equipped with a ASCO TRIPOINT "H" series skeleton pressure switch which is adjustable by thumbwheel. This procedure permits the adjustment to be made with minimum effort. This switch has a range of 40 to 100 PSI and a differential of 9 PSI.

THIS SKETCH NOT TO SCALE

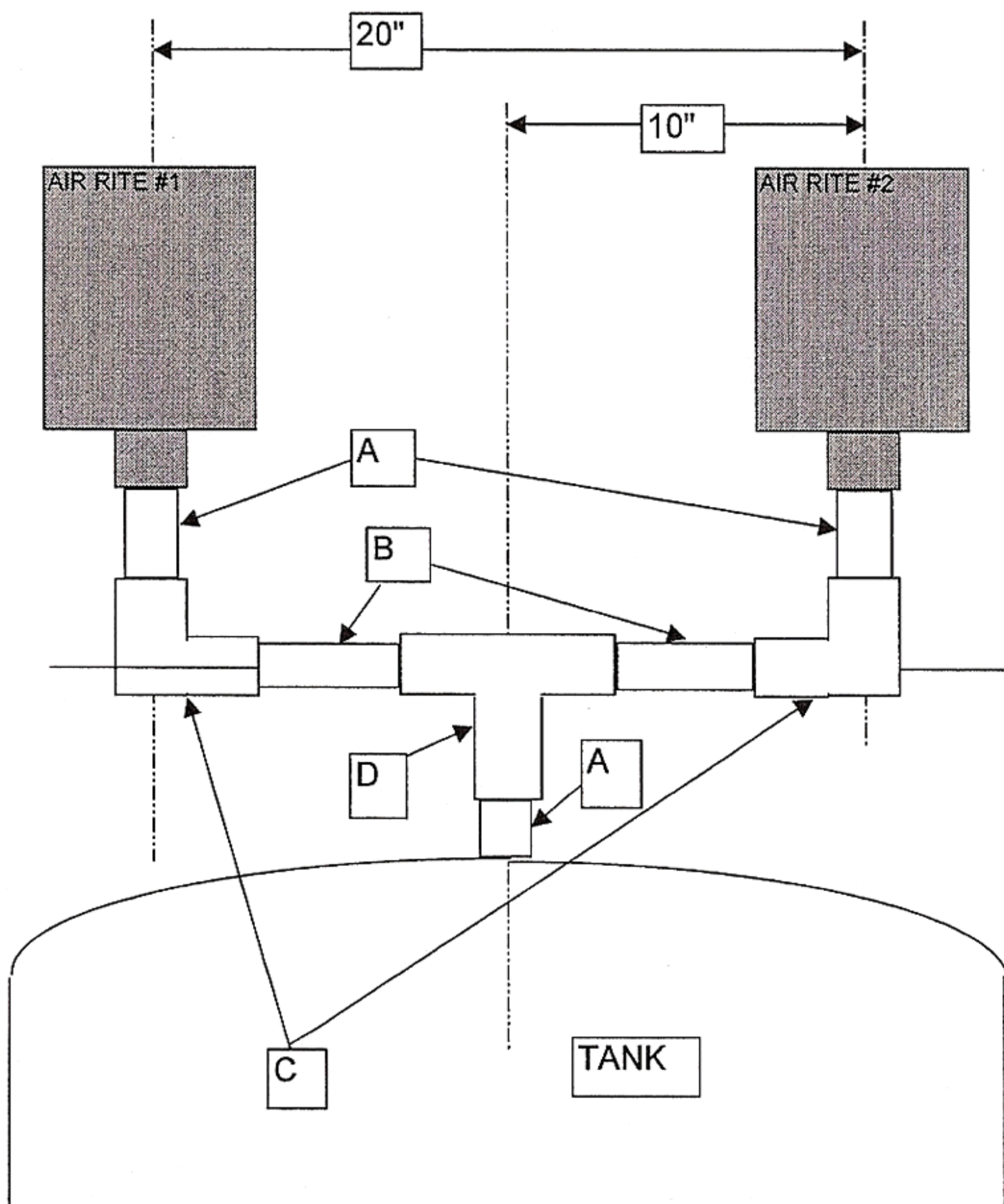
A = THREE (3) 2" PIPE NIPPLES - 4" LONG

B = TWO (2) 2" PIPE NIPPLES OF EQUAL LENGTH
TO MAINTAIN THE 20" BETWEEN CENTERS AFTER ASSEMBLY

C = TWO (2) 2" ELBOWS

D = ONE (1) 2" TEE

DO NOT USE PLASTIC FOR ANY OF THE FITTINGS.



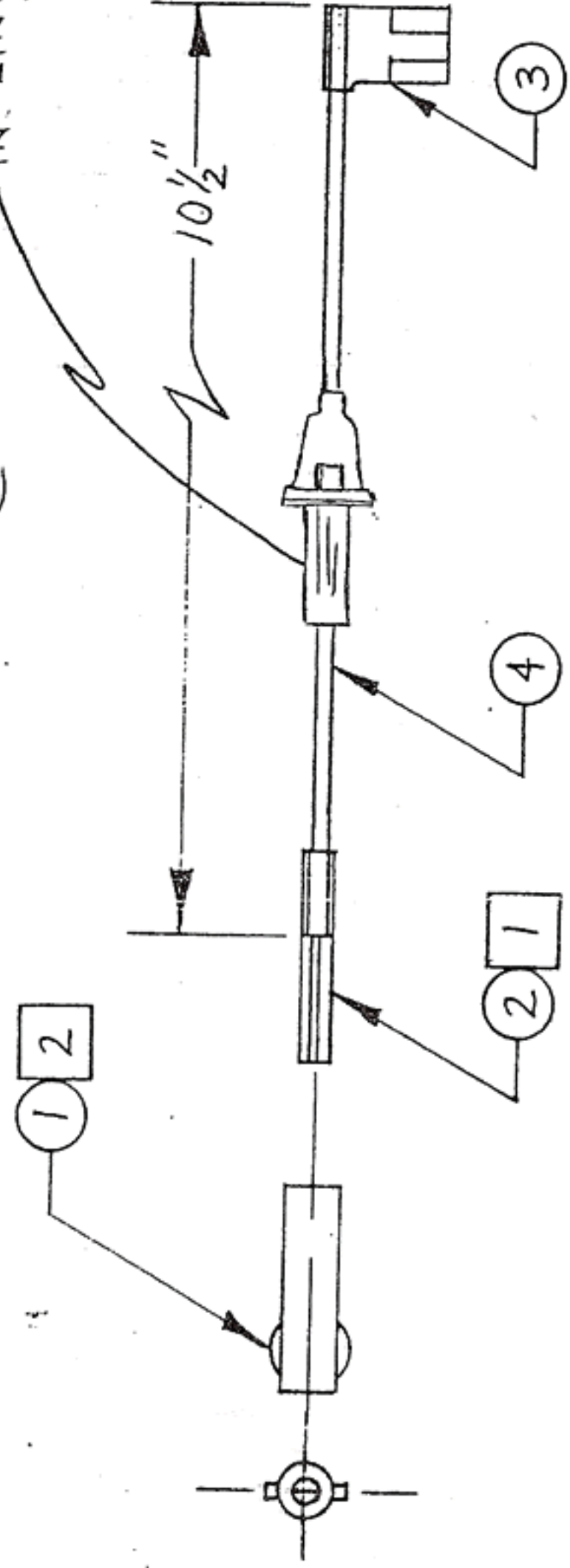
ITEM	QTY	PART NO.	DESCRIPTION
1	1	40778	WALDOM CONNECTOR 03-09-1011
2	1	40782	WALDOM FEMALE PIN 02-09-1103
3	1	40785	HOLLINGSWORTH TERMINAL SO 9405
4	10 1/2"	40063	WIRE, ALPHA TYPE 3075, 18 GA. (16/30) YELLOW

Wire From ULS to

Thermostate

9-11-85
IN. LINE FUSE HOLDER
5 AMP

(ARIZ. AREA)
SANDY SOIL
PROTECT
U.L.S.



NOTES:

- 1 USE WALDOM CRIMPING TOOL HT1919
- 2 ORIENTATE CONNECTOR AS SHOWN

DO NOT SCALE

-SPECIAL-

WHITEWATER MFG. CO.	
AIR-RITE AIR VOLUME CONTROL	
THERMOSTAT WIRE ASSY. MOD. 610 & 610HP	
DRAWN BY: J.R.	DATE 2.15.77
MATERIAL	APP'D 60637



WHITEWATER
MANUFACTURING

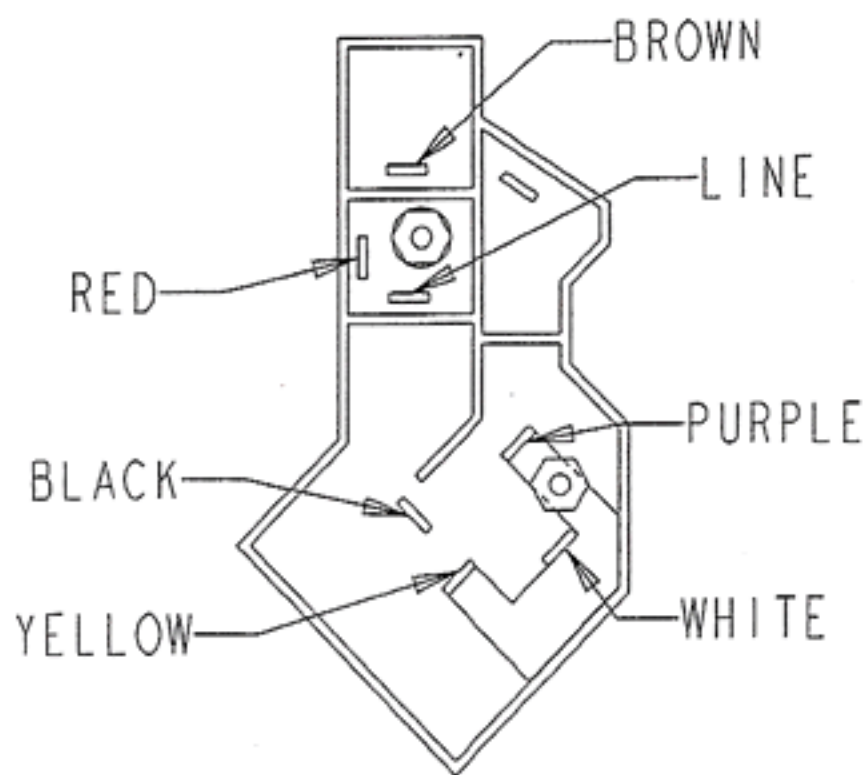
A Reflection of Quality

1108 Bluff Rd./E. Milwaukee St. P.O. Box 148
Whitewater, WI 53190-0148 USA

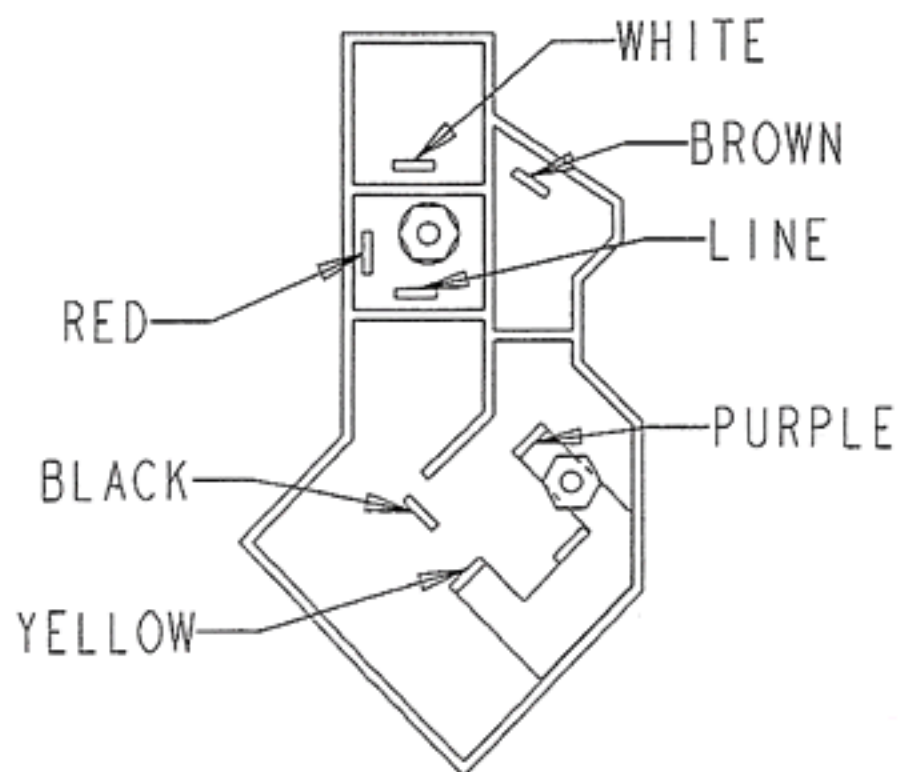
262-473-3100
fax: 262-473-4324

MARATHON / GENERAL ELECTRIC
MODEL 5KH33GNB130X
A-C MOTOR, THERMALLY PROTECTED
HP 1/6V 115/230 HZ 60
RPM 1725 PH 1
A 3.6/1.8 CODE T
SFA 4.0/2.0 SF 1.35
AMB 40 C FR48Y
TIME RATING - CONT

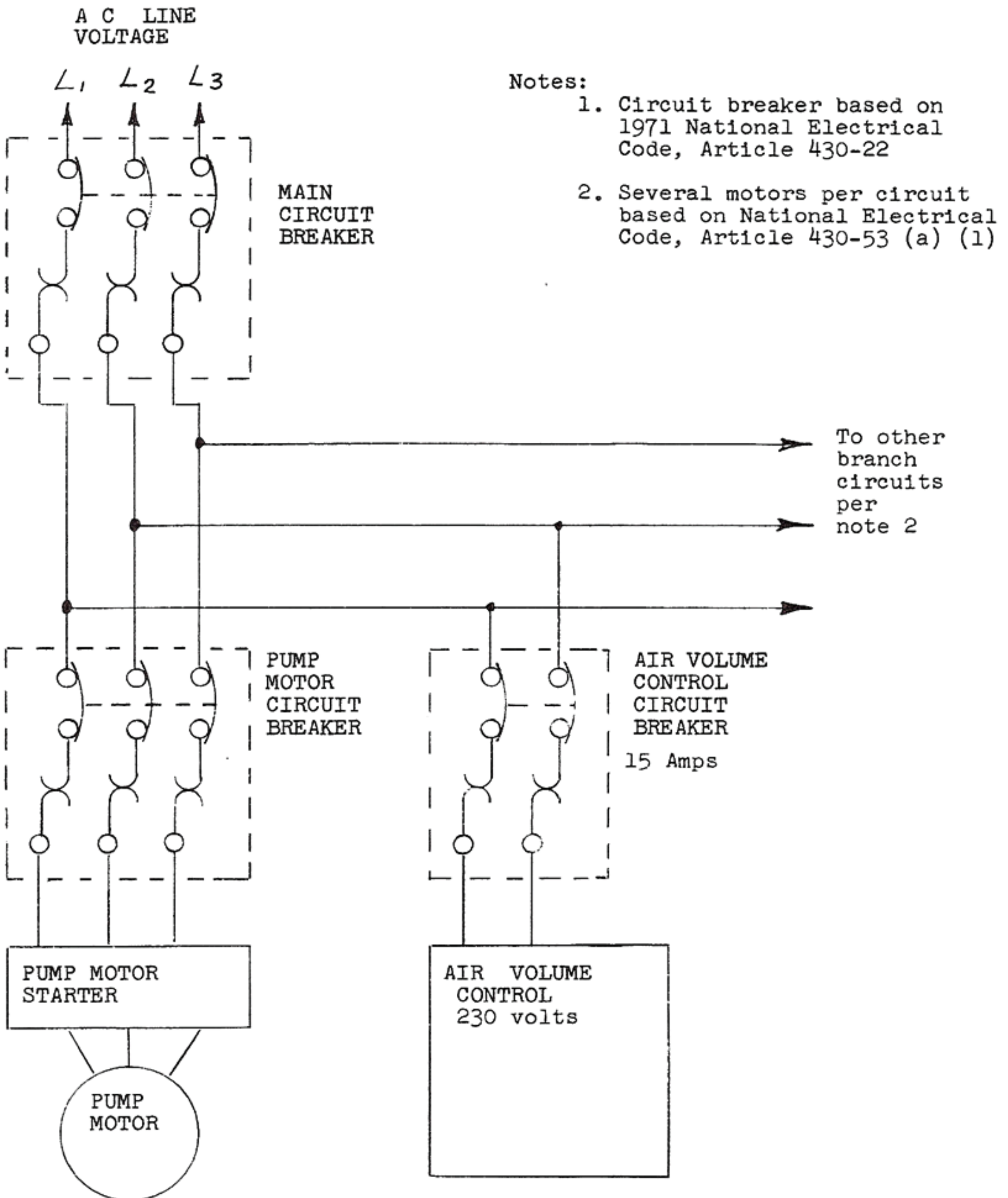
LOW VOLTS
(115 VOLTS)



HIGH VOLTS
(230 VOLTS)



AIR VOLUME CONTROL WIRING DIAGRAM
3 PHASE LINE, 230 VOLTS



AIR VOLUME CONTROL WIRING DIAGRAM SINGLE PHASE, SOLID NEUTRAL

