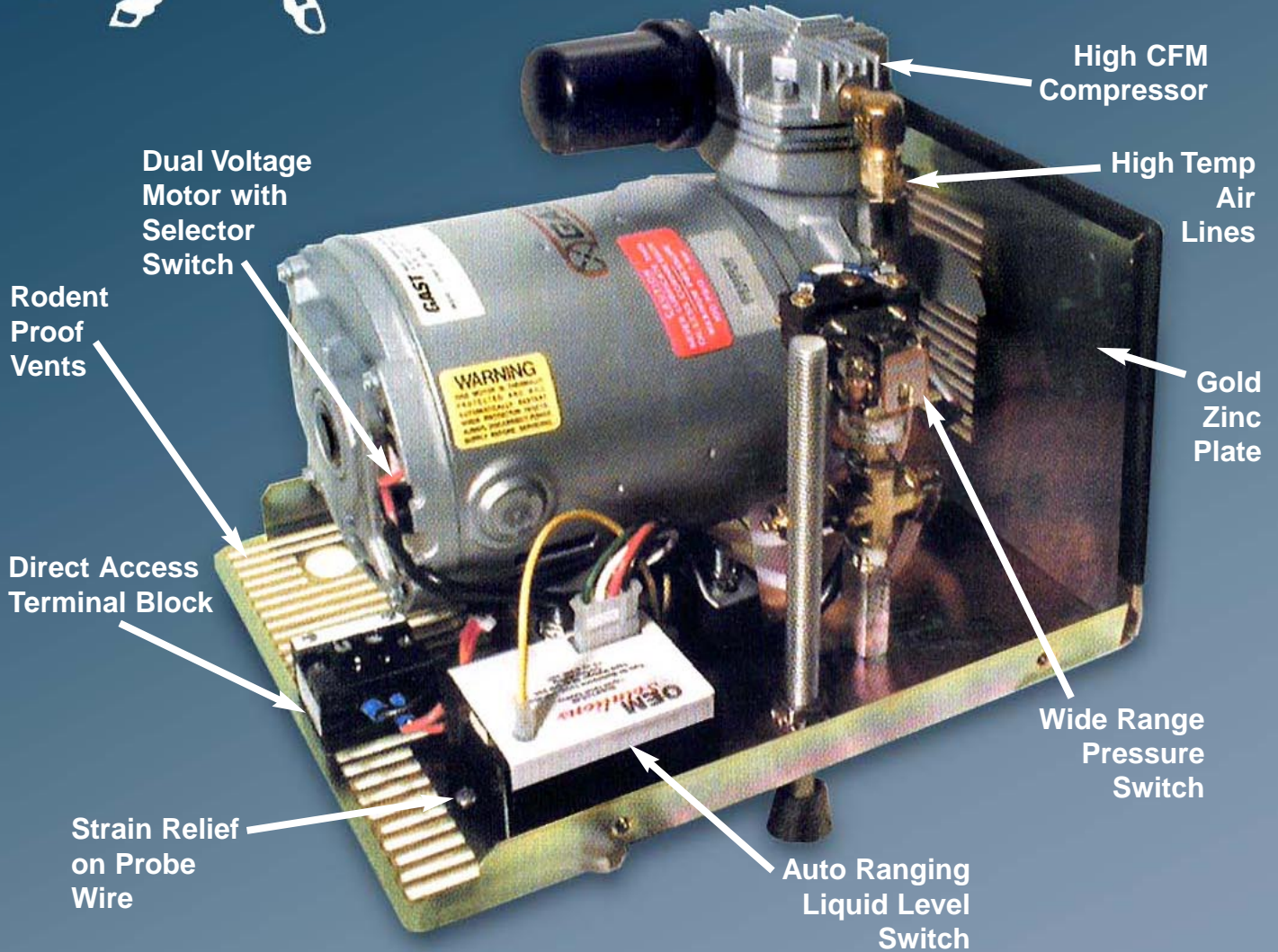




CHARGE AIR 2000

*Universal Aircharging System
for Hydropneumatic Tanks*



These innovative features and more, page 2.



MADE in the USA

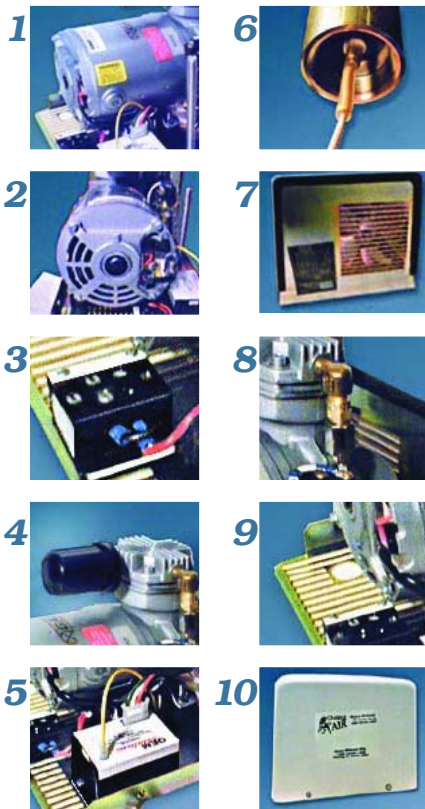
MAASS
MIDWEST

MANUFACTURERS OF QUALITY WATER WELL ACCESSORIES

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ChargeAir 2000 *Universal Aircharging System for Hydropneumatic Tanks* *Manufactured by MAASS Midwest Mfg.*

11283 DUNDEE ROAD • HUNTLEY, IL 60142-0547



- 1** Dual voltage motor, auto ranging 115v/230v liquid level control, and wide pressure range which means one unit does it all, reducing inventory requirements.
- 2** **NEW** Dual voltage selector switch allows for easy voltage selection 115v/230v.
- 3** Direct access terminal block means faster installation.
- 4** High capacity compressor means faster tank charging and larger tank capacity.
- 5** **NEW** More durable liquid level switch increasing switch life.
- 6** Strain relief on probe connection means no call backs from cables broken by waves into the tank.
- 7** Stainless steel fasteners and gold zinc plating means longer life in harsh environmental conditions.
- 8** **NEW** Improved air lines to handle higher temperatures and pressures.
- 9** Rodent proof air vents means no down time from chewed wires or air hoses.
- 10** Heavy cover means your CA2000 will hold up better to sun exposure and harsh environments.

ChargeAir 2000

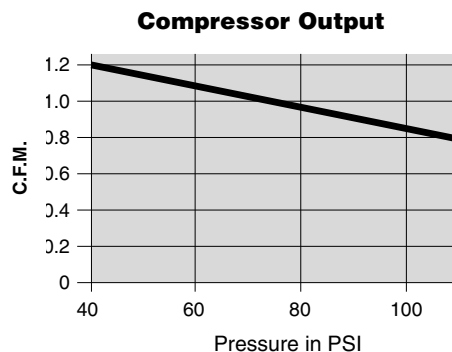
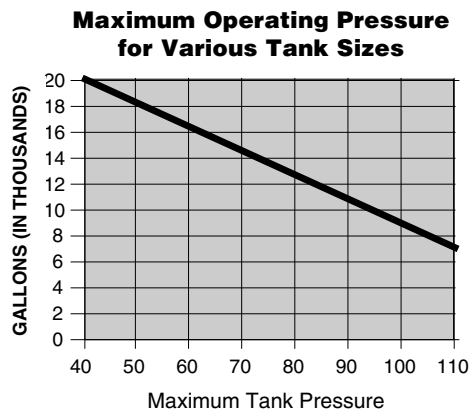
Model: CA 2000
Part Number: 992000
Description: 115/208/230 Volt, 50/60 Hz, single phase

SPECIFICATIONS

Maximum tank size20,000 Gallons
 Pressure range (adjustable)40 to 110 PSI
 Pressure Switch factory setting45 PSI cut-off
 Operating current at 115 volts.....6 amps
 Operating current at 208 volts3.5 amps
 Operating current at 230 volts.....3 amps
 Tank Connection2" FPT
 Size (LxWxH)14" x 10" x 17"
 Shipping weight37 lbs.

SPARE PARTS

DESCRIPTION	PART NUMBER
Compressor	000131
Cover	000133
Switch, liquid level - complete	000151



MANUFACTURERS OF QUALITY WATER WELL ACCESSORIES
 P. O. Box 547, 11283 Dundee Road, Huntley, IL 60142-0547
 (800) 323-6259 • IL AREA (847) 669-5135 • FAX (847) 669-3230
www.maassmidwest.com



Universal Aircharging System for Hydropneumatic Tanks

- ✓ *Dual Voltage System (115-240 VAC Single Phase)*
- ✓ *Auto Ranging Solid State Liquid Level Control*
- ✓ *Oil-less Long Life Compressor*
- ✓ *Adjustable Pressure Switch (40-110 PSI)*
- ✓ *One Year Warranty*

CHARGE AIR 2000 Standard Features....

Charge Air is an entirely self-contained dual voltage air charging system. All components are mounted on a corrosion resistant gold zinc plated base using stainless steel fasteners and enclosed within a heavy gauge high density polyethylene, weatherproof outer shell. The protected components include a long life oil-less compressor, auto ranging solid state liquid level control with isolated electrode circuit and time delay, and an adjustable 40 to 110 P.S.I. pressure switch.

CHARGE AIR 2000 Operation....

Charge Air utilizes three primary components: a liquid level switch, a pressure switch, and an air compressor. Through an electrode suspended into the tank from the Charge Air system, the liquid level control continuously monitors the water level of the tank. Simultaneously, the pressure switch monitors the air pressure in the tank. When the water level is above the electrode and the air pressure in the tank drops below its setting, the compressor will start and continue to run until the proper air pressure is reached or the water level drops below the electrode. This constant monitoring guarantees the optimum air charge is maintained.

MEMBER:



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MANUFACTURERS OF QUALITY WATER WELL ACCESSORIES

Trouble shooting guide for CA2000

Theory of Operation – The CA2000 is an air charging system that uses a pressure switch and water level probe to maintain the proper air charge in a hydro pneumatic tank. The unit is designed to turn on towards the end of the pump cycle to add a small amount of air just before the pump pressure switch turns off the pump. This is accomplished by setting the CA2000 pressure switch turn off setting 5-PSI below the pump pressure switch turn off setting.

As air is absorbed into the water, the air/water interface in the tank slowly raises over time. Eventually, toward the end of a pump cycle, water will touch the CA2000 probe. If the tank pressure has not yet exceeded the turn off setting of the CA2000 pressure switch, the compressor will turn on for a short period of time until it's pressure switch is satisfied, adding a small amount of air to the tank. During the next pump cycle, if water again touches the probe, more air will be added to the tank. Eventually, enough air will have been added that the water level does not reach the probe by the end of the pump cycle, and the compressor will not come on.

Trouble shooting

∞ Unit puts too much air into tank

- o Symptoms - The water level in the tank drops low enough to allow air to escape from the tank into the piping system.
- o Background – In order to the compressor to run, two conditions must be met.
 - The tank pressure must be below the upper set point of the CA2000 pressure switch (the turn off setting.)
 - The tank probe must be in contact with the water.
- o Possible causes leading to too much air in the tank.
 - Probe set to low – The probe should be installed near the center of the tank. If it is set too low in the tank it is possible of the tank to essentially run out of water before the pump turns on allowing air to enter the water piping system. Raise the probe.
 - Bad pressure switch – If the CA2000 pressure switch does not switch off the compressor when its set point is reached, the compressor will continue to run and the tank pressure will reach the set point of the pressure relief valve, about 125 PSI. This runaway pressure condition could only occur if water was not drawn from the tank after the pump turned off because the probe would have to be in contact with the water for the compressor to keep running.
 - Short in the probe wiring – This would fool the water level monitor into thinking the probe was in contact with the water.
 - Bad water level monitor – The relay contacts in the water level monitor could become stuck closed due to a lightning strike or similar high voltage condition causing the compressor to come on even though the probe is not in contact with the water.
- o Tests and solutions
 - Check the tank pressure gauge. If it reads a higher pressure than the setting of the pump pressure switch, replace the CA2000 Pressure switch.
 - Remove the yellow wire from the water level module while the compressor is running. If the compressor stops immediately, the probe is either in the water or the yellow wire is shorted to the tank. To determine which condition exists, perform the following test.
 - Measure the resistance between the yellow wire and the tank. If you get a reading close to 0 ohms, the yellow wire is shorted. A reading from 1,000 to 20,000 ohms means the probe wire is OK and the probe is in contact with water. A reading of infinity (no needle movement) means the probe is not in contact with water and the yellow wire is not shorted.
 - If the compressor does not stop running when the yellow wire is removed from the module, the module is defective and must be replaced.

∞ Not enough air in the tank

- o Symptoms – Tank becomes water logged as indicated by the pump short cycling.
- o Background



MANUFACTURERS OF QUALITY WATER WELL ACCESSORIES

- The compressor output is about .8 CFM at 100 PSI.
- A 1000-gallon tank half full of air would have about 65 CF of air in it.
- It would take about 1.5 hours for a CA2000 completely charge a 1000-gallon hydro pneumatic tank half full of water.
- Under normal conditions, the compressor should only run for a minute or so at a time to keep the tank charged, depending on the pumping rate vs. the water usage rate.
- The tank can only become water logged if the air charging system does not pump enough air into the tank. If it does become water logged, either there is an air leak or the compressor does not run long enough because the probe is set too high or the CA2000 pressure switch is set too low or the compressor does not run at all.
- o Possible causes
 - There is a small air leak in the tank or CA2000 plumbing, which exceeds the charging capacity of the CA 2000 compressor.
 - Test – Isolate the tank by closing the tank outlet valves and look for a drop in pressure over time. If the pressure drops with not water draw there is an air leak in the tank or air charging system. Use a listening device or soap solution to locate the leak.
 - The water level probe is set too high. It should be set as the mid point of the tank. Adjust as necessary.
 - The compressor is not coming on because the circuit from the water level probe to the water level module is faulty. This would most likely occur due to the probe wire breaking inside the tank.
 - Test - Remove the yellow wire from the module and use a small jumper wire to create a short circuit between the CA2000 chassis and the socket where the yellow wire connects to the module. If the pressure in the tank is below the turn off setting of the CA2000 pressure switch, the compressor should come on approximately 15 seconds after the connection is made. (There is a 15-second delay built into the water level module circuitry to prevent the compressor from short cycling due to waves in the tank). If it does come on there is an open circuit in the probe wire circuit.
 - Solution - Check the integrity of the yellow wire from the module to the bulkhead connection where it enters the tank under the compressor. If the yellow wire looks to be intact, remove the CA2000 from the tank and check the rest of the circuit to the probe.
 - The compressor does not come on because the pressure switch is set too high or is defective.
 - Double check, the tank pressure is well below the turn off setting of the CA2000 pressure switch. Run a jumper wire across the two pressure switch terminals. If the compressor starts in 15 seconds, the pressure switch is either defective or is set above the present tank pressure. If the pressure setting is correct, replace the pressure switch.
 - The compressor does not come on because the compressor motor is not wired properly or is defective.
 - Check the wiring in the back of the compressor motor to make sure it is properly connected for the voltage being used and that the spade connectors are snug. If it is properly connected go on to the next test.
 - The compressor does not come on because the water level module is defective.
 - Double check, the tank pressure is well below the turn off setting of the CA2000 pressure switch. If it is, and the preceding checks have been successfully performed, the module may be defective.
 - Test - Run a jumper wire from either terminal on the pressure switch to where the back wire connects to the terminal block, thus by passing the module. If the motor starts immediately, the module is defective. If it does not and the preceding tests have been successfully performed, the compressor motor is defective and must be replaced.

ONE YEAR LIMITED WARRANTY

www.maassmidwest.com

CA 2000 PARTS LIST AND COST

Part # (Unit Complete)	Part # (Level 1)	Part # (Level 2)	Part # (Level 3)	Part # (Level 4)	Part Description	Qty / Unit	Price Ea. (List)
992000					CHARGE AIR MODEL 2000	1 ea	\$ 1,838.60
992000-R					CHARGE AIR MODEL 2001 (Refurbished)	1 ea	\$ 1,287.00
	000142				Nut, 18-8 ss jam 1/2-13	2 ea	\$ 0.56
	000126				Rod, threaded 1/2-13 x 9	1 ea	\$ 4.73
	000170				Foot, rubber	1 ea	\$ 1.00
	000144				Washer, 18-8 ss ext tooth lock 1/2"	2 ea	\$ 0.20
	000163				Label, #1 cover 4 x 5	1 ea	\$ 2.24
	000133				Cover	1 ea	\$ 198.75
	000130				Box, Cardboard & Foam	1 ea	\$ 64.26
	000172				Screw, pan head 18-8 ss 1/4-20 x 1/2	4 ea	\$ 0.24
	713000				Kit, probe assembly	1 ea	\$ 69.04
		000166			Electrode, ss 3W2	1 ea	\$ 46.86
		000132			Wire, Electrode (6' Length)	1 ea	\$ 0.20
		000171			Kit, Splice (2-splices, 1-tube)	1 ea	\$ 2.25
	713020				Chassis Assembly	1 ea	\$ 1,523.60
		000167			Rubber U-Channel 19" long	1 ea	\$ 2.24
		000161			Chassis Formed	1 ea	\$ 44.10
		000139			Screw, 18-8 ss pan head 8-32 x 1/4	1 ea	\$ 0.20
		000162			Base Mounting plate	1 ea	\$ 58.91
		000157			Elbow 90 1/8 mpt x 1/4 tube (brass)	2 ea	\$ 8.90
		000160			Tubing 1/4 od ptfte teflon 1/8 id (1.25 ft)	1 ea	\$ 4.40
		000169			Rubber motor mount	2 ea	\$ 3.30
		000144			Washer, 18-8ss ext tooth lock 1/2"	1 ea	\$ 0.20
		000142			Nut, 18-8ss jam 1/2-13	1 ea	\$ 0.56
		000149			Harness for liquid level switch	1 ea	\$ 18.48
		000150			Liquid Level Switch	1 ea	\$ 157.80
		000137			Screw, 18-8 ss pan head 8-32 x 7/8 mach	1 ea	\$ 0.12
		000136			Screw, 18-8 ss pan head 8-32 x 7/16 mach	3 ea	\$ 0.10
		000140			Nut, 18-8 ss nylon lock-nut	5 ea	\$ 0.12
		000128			Block, terminal	1 ea	\$ 13.06
		000138			Screw, 18-8 ss pan head 8/32 x 1-1/4 mach	2 ea	\$ 0.13
		000146			Tie, cable mount	1 ea	\$ 0.45
		000147			Tie, cable	2 ea	\$ 0.20
		000143			washer, 18-8 ss ext tooth lock 5/16	6 ea	\$ 0.10
		000141			Nut, 18-8 ss jam 5/16-18	6 ea	\$ 0.21
		017510			Washer, 18-8 ss flat 5/16	2 ea	\$ 0.10
		000164			Label, #2 Schematic 115V / 230V (1 x 2)	1 ea	\$ 0.96
		000165			Label, #3 Schematic (2.5 x 3.5)	1 ea	\$ 1.44
		017515			Washer, ss 3/8	2 ea	\$ 0.21
	713015				Compressor unit assembly	1 ea	\$ 991.35
			000131		Compressor, motor	1 ea	\$ 935.00
				000131-1	Muffler, Compressor	1 ea	\$ 28.82
				000131-2	Valve, pressure releif AT517	1ea	\$ 21.40
				000131-3	Fan Blade, Compressor	1ea	\$ 11.50
			000129		Valve, check with viton seal (800 psi max)	1 ea	\$ 35.09
			000159		Adapter, 1/4 fpt x 1/4 tube brass	1 ea	\$ 8.56
			000169		Mount, motor rubber	2 ea	\$ 3.30
			000145		Washer, 18-8 ss flat 5/16	4 ea	\$ 0.10
			000143		Washer, 18-8 ss ext tooth lock 5/16	2 ea	\$ 0.10
			000141		Nut, 18-8 ss jam 5/16-18	2 ea	\$ 0.21
			017510		Washer, 18-8 ss flat 5/16	2 ea	\$ 0.10
			017515		Washer, ss 3/8	2 ea	\$ 0.21
	713010				Probe connection assembly	1 ea	\$ 32.55
			000151		Housing, delrin	1 ea	\$ 5.40
			000152		Conductor, brass	1 ea	\$ 5.19
			000168		O-ring, rubber 1/4 id .064 wall #10	1 ea	\$ 0.10
			000136		Screw, 18-8 ss pan head 8-32 x 7/16 mach	1 ea	\$ 0.10
			000132		Wire, Electrode (.5' length)	1 ea	\$ 0.20
			000173		Tube, splice .045 clear	2 ea	\$ 1.23
			000134		Pin, spring, zinc plated 5/64 x 3/4	1 ea	\$ 0.12
	713005				Tower, pressure switch assembly	1 ea	\$ 224.00
			000127		Switch, Pressure	1 ea	\$ 179.77
			000153		Post, Aluminum	1 ea	\$ 7.00
			000154		Cross, Forged brass 1/4	1 ea	\$ 18.13
			000158		Elbow, 90 1/4 mpt x 1/4 tube brass	1 ea	\$ 8.79
	713025				CA2000 AIR LINE KIT WITH FITTINGS		\$ 42.77
			000160		Tubing 1/4 od ptfte teflon 1/8 id (1.25 ft)	1.25 ft.	\$ 4.44
			000157		Elbow 90 1/8 mpt x 1/4 tube (brass)	2 ea	\$ 8.90
			000159		Adapter, 1/4 fpt x 1/4 tube brass	1 ea	\$ 8.56
			000158		Elbow, 90 1/4 mpt x 1/4 tube brass	1 ea	\$ 8.79