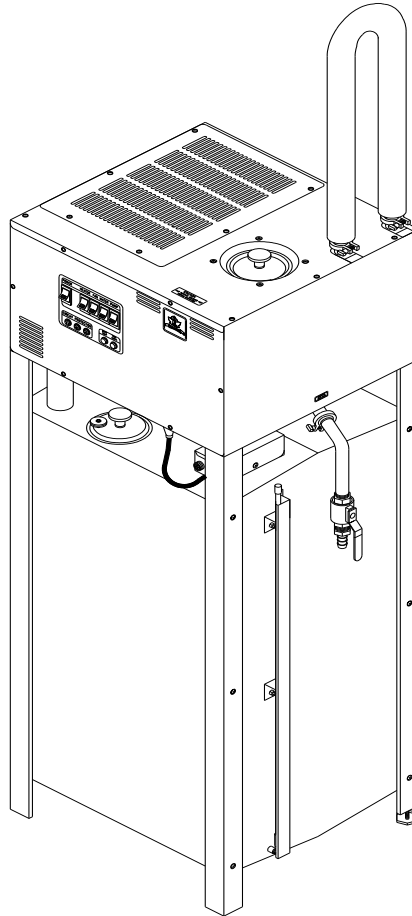


POLAR BEAR

Water Distillers Mfg. Co. Ltd.

Commercial Water Distiller Operators Manual



This manual applies to:

Model
PBD 200-L

Series
0001

Part #
108001



OWNERS' GUIDE

POLAR BEAR DISTILLER WARRANTY

POLAR BEAR WATER DISTILLERS MFG. CO. LTD. warrants to the original purchaser, their products against defects in materials for a period of one (1) full year on all electrical components, other parts and labor, and stainless steel parts.

If the product is found to have defective parts within the first year, the parts will be repaired or replaced at no cost to the customer. If the product is found to have been consumer damaged or abused, the warranty does not obligate POLAR BEAR WATER DISTILLERS MFG. CO. LTD. to bear any transportation charges in connection with the repair or replacement of defective parts.

This warranty is invalid if the damage or defect is caused by accident, act of God, customer abuse, unauthorized alteration or repair, vandalism or misuse.

This warranty is made in lieu of any other express warranty and except for the foregoing warranty which is exclusive, there is no other express warranty being made.

The purchaser is responsible for all shipping charges to and from the service center. The manufacturer, dealer or service center are not responsible for damages incurred during shipping.

POLAR BEAR WATER DISTILLERS MFG. CO. LTD. believes the information contained in this manual to be accurate. Parts, specifications, and instructions are subject to change without notice.

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DISTILLER INFORMATION

Model: PBD-200-L

Series: _____

Serial Number: _____

Purchase Date: _____

Purchased From: _____

Telephone: _____

Installation Date: _____

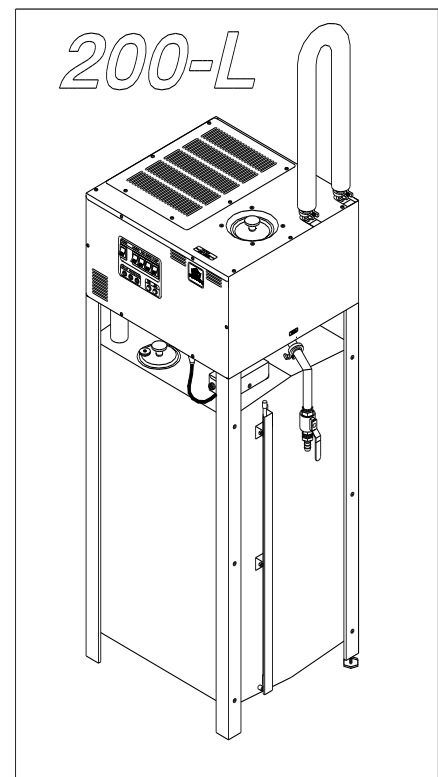
Installed By: _____

Shipping Weight.....XX Kg (XX lb.)
Machine WeightXXX Kg (XX lb.)
Machine Height~2007 mm (~79")
Machine Width~1067 mm (~42")
Machine Depth~712 mm (~28")
Electrical Ratings:

220 Volts, XX Amps, XXXX Watts

Power required is 220 V Single Phase 2 Wire plus Ground.
Check with your local electrical standards or electrician to
determine appropriate ratings and connection.

Distilling Capacity:1200 Litres/Day
or 300 US Gal./Day
(Based on 24 hours continuous operation under ideal
conditions - actual production may vary)



To obtain the optimum performance capability engineered into your **Polar Bear** water distiller, please follow instructions and guidelines carefully. Please keep this guide in a safe place for your reference.

INTRODUCTION

Congratulations! You are now the owner of one of the many fine products manufactured by **Polar Bear Water Distillers Mfg. Co. Ltd.**, a world leader in the water purification industry. We take pride in our solid reputation for product quality and industry-proven performance.

This product has been carefully inspected to comply with rigid factory quality control standards, as well as, where applicable, those of the Canadian Standards Association(CSA). We are sure that, with reasonable care, it will provide you with years of reliable performance.

Polar Bear Water Distillers Mfg. Co. Ltd. compliments you on your choice - and know you will enjoy the purest and healthiest water available, because...

"We care about the water you drink!"

DISTILLER FEATURES

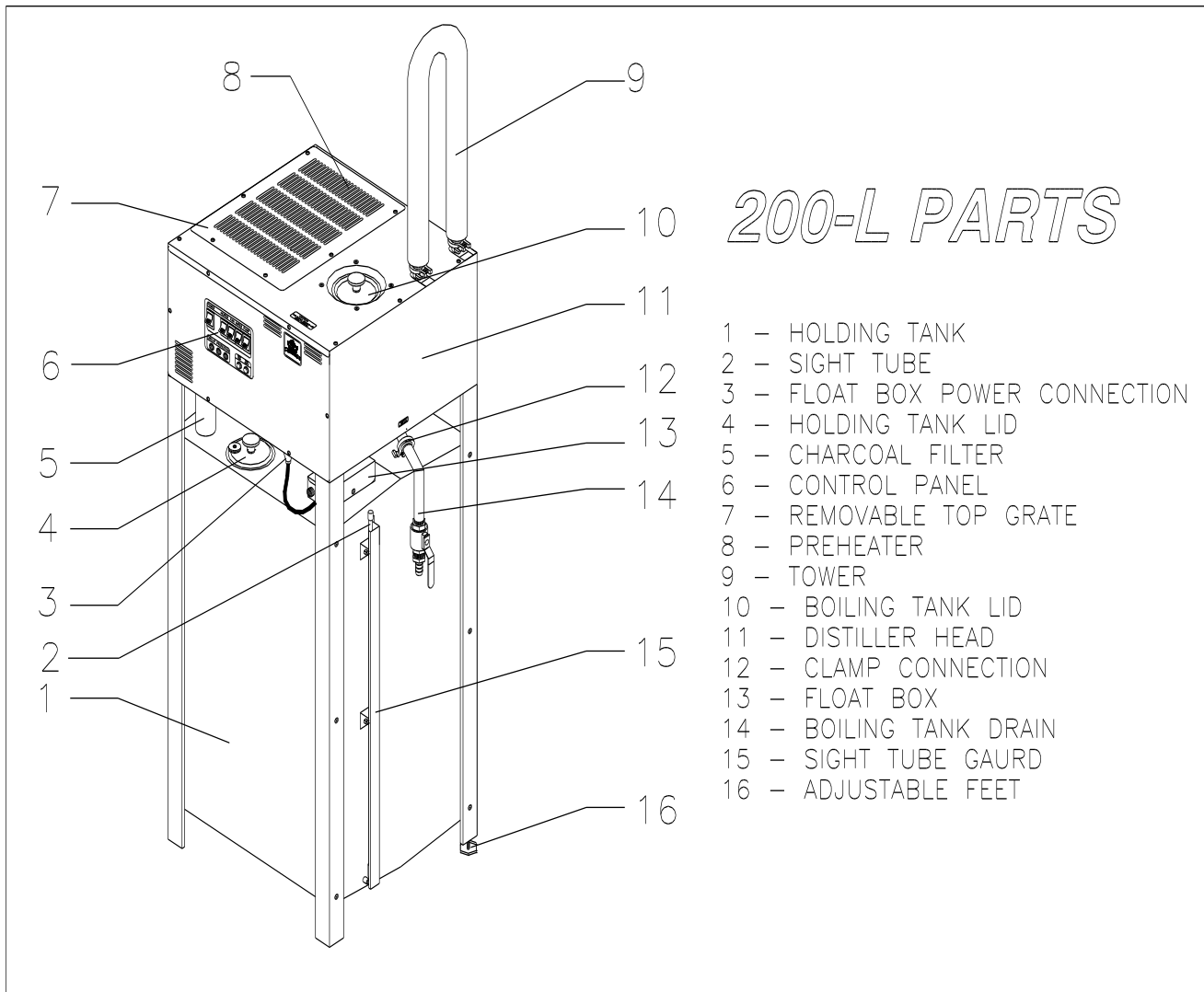
- * Energy saving system - The 1200-L is the most efficient model yet in the **Polar Bear** distiller line. Our vapor compression system coupled with a new and more effective water preheating process recycles up to xx% of the energy in the distillation process.
- * Baffle system in the diffuser requires higher steam rise therefore providing purer water.
- * Continuous flow of softened water through boiler prevents scale build-up. Therefore leaving your boiler virtually self-cleaning.
- * All pure water contact parts are surgical stainless steel or food grade certified materials.
- * All parts required for automatic water feed are included.
- * Control lights and status indicators show you what your distiller is doing.
- * Safety switch for overheating.
- * One year parts and labour warranty - please see warranty notice at the end of this manual.
- * Less waste water is produced in comparison to other high volume distillers.

AS YOU BEGIN...

1. It is important to fill out and return the warranty card in this manual. The information is necessary should parts or repairs be needed during the warranty period.
2. Each distiller is operated at the factory and tested for leaks and proper operation.
3. Distilled water may have a different taste. This is not a "taste", but a lack of taste. You will become accustomed to this the same way you did to the water in your area.

KNOW YOUR DISTILLER

Use this picture as a reference throughout this manual.



DISTILLED WATER - BENEFITS, USES, & QUESTIONS

You have made an excellent choice in using distilled water. To help answer some questions of your own, or those of others, here are some of the benefits, uses, and answers to common questions about distilled water.

There is also a section on how distilled water is made.

Benefits

- Provides the *purest drinking water* - with reduction of certain chemicals, impurities, pollutants, and bad taste.
- Distillation does not rely on physical barriers which can break down or fail. The prolonged boiling process in water distillers is critical for killing and eliminating bacteria and viruses. No other process is as effective or as reliable.
- Eliminates scale build-up on pots, tea kettles, coffee pots, humidifiers, vaporizers, steam irons, etc.
- Produces less waste water than reverse osmosis.
- Distillers are not affected by low or varying water pressures, temperatures, or pH. Consistent, high quality water will be produced for the life of the Distiller.
- **Polar Bear** water distillers are extremely durable, trouble-free appliances that require a minimum of service and maintenance for efficient and complete operation.

NOTE: Distilled water often appears mildly acidic (6) when tested using a pH meter. This is normal. Since the water is very pure it will react with carbon dioxide in the air to create a very mild acid.

Uses

- Drinking – Distilled water is an excellent drink all on its own.
- Ice cubes - not only are they more shiny due to the absence of impurities in the water, but they are also harder.
- Tea and coffee. When you use distilled water to make coffee or tea, try approximately 1/3 less grounds or tea leaves. There will be a somewhat light color, but just as rich flavor, as well as a less-bitter taste.
- Juices and drinks. Try adding about 25% more water. Because the distilled water is free from chlorine, there will be no interaction between the chlorine and the Vitamin C.
- Cooking and baking - for standard results from favorite recipes. Flavors come through naturally, baked goods have a better texture. *Pasta products* will absorb more distilled water than tap water, producing better texture and flavor, as well as less tendency to cling together. Canning fruits and vegetables - not only do they retain a more natural color, but the flavor is better.
- Infant care and formulas. (Be sure to follow your Doctor's advice on sterilizing water for infants)
- Wine making or mixing drinks.
- Drinking water for pets and for topping off aquariums.
- Automobile care - for batteries, as well as windshield washers - leaves no spotting.
- Photographic equipment and laboratories.
- Watering plants.
- Water based paints.
- All types of cleaning – less streaking on mirrors, windows, etc.

Answers to Some Frequent Questions
Question: Is tap water really safe for drinking?

Answer: Many tap water supplies are, for the most part, safe in terms of being free of disease-causing bacteria. There are tests of water supplies throughout the world that now show varying degrees of contamination by modern chemical pollutants. In many cases, the chlorine used to rid water of bacteria is now interacting with these chemicals, creating additional pollutants. Water supplies may also be contaminated by asbestos, copper, cadmium and lead from water pipes. Drinking water from untested wells can be very unreliable, particularly when located on ½ - acre plots where it is almost impossible to keep seepage from the cesspool or septic tank out of the well.

Question: Why is distilled water the safest water to drink?

Answer: Distillation is more effective than any other purification system in removing bacteria, chemicals, and minerals from the water. Independent test results show a greater than 99% efficiency removal of contaminants, such as chlorine, nitrate and sodium, when water is distilled using a Polar Bear water distiller*. Distilled water is virtually pure H₂O and the safest of all drinking water.

Question: Does distillation remove minerals from water that our bodies need?

Answer: Distillation does remove minerals from water, however these minerals are inorganic and cannot be used by the body. The body assimilates the organic minerals which are abundant in the foods we eat.

Question: Are water softeners considered water purifiers?

Answer: No. Water softeners do not kill bacteria or take out any contaminants. Rather, they add salts to the water. No one on a sodium (salt) restricted or sodium-free diet should drink softened water.

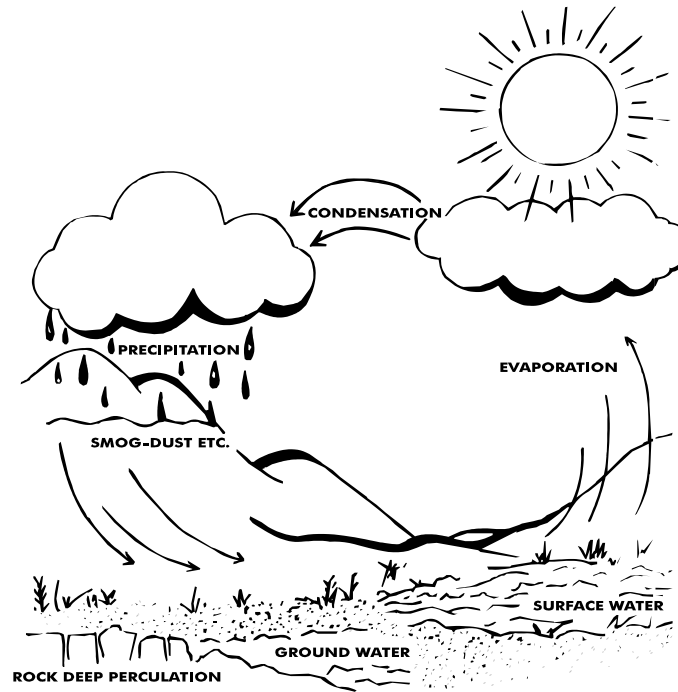
Question: Are there any other benefits of distilled water?

Answer: Food has more flavor. A glass of cold, distilled water tastes 'clean'. Everything remains pure, as there is nothing left in the water to interfere with or change the original natural flavor.

* Results from: *An Evaluation of Polar Bear Water Distillers For Removing Toxic Industrial and Agricultural Contaminants*. 'Enviro-Test Laboratories', September 28, 1987, Ref. No. 762.REP.

The Process of Distilling Water

The process of distillation duplicates Nature's hydrologic cycle:



1. In nature, the heat of the sun vaporizes the surface water and draws it into the atmosphere, leaving the impurities behind.
2. As the vapor cools, it condenses and falls back to Earth as rain or snow.
3. As it falls back towards Earth through smog and dust, the water can pick up many forms of contamination.
4. Even more contamination is absorbed through ground contamination.

Distillers are designed to duplicate Nature's hydrological cycle, but they take it a step further by producing high purity water in a chamber, essentially free from pollution. Distillers boil the feed water, creating steam. The steam rises, leaving almost all of the impurities behind in the Boiling Tank. The steam is collected and condensed as clean, distilled water and stored in a stainless steel Holding Tank. The impurities that remain in the Boiling Tank are then expelled to a drain or sewer.

Distillation is the only water treatment process that does not rely on physical barriers to separate good, clean water from contaminants. With proper maintenance, Polar Bear distillers will reject contaminants just as effectively ten years after installation as they do the day they are purchased.

Our distillers also include a charcoal filter, designed to handle the contaminants that boil at lower temperatures than the boiling point of water.

SECTION 6 - ASSEMBLY INSTRUCTIONS

The model 1200-L is shipped in two boxes (one contains the **Distiller** , the other, the distiller **Parts Box**.)

1. First unpack the boxes and inspect for shipping damage. Save everything until the distiller is in operation. It is a good idea to save the boxes should the distiller someday require factory servicing.
2. Confirm the contents of the boxes is as follows:
 - Distiller

Distiller Installation

Distiller Venting

Install the 1200-L in an area approximately 4 times the size of the distiller (excluding height) to allow for the motor to draw adequate air. Also, this permits easy access to your distiller for servicing, if necessary.

Drain Line Connection:

- Take the white drain line and push one end into the distiller's drain water quick connect fitting as far as it will go. The drain line must be cut square so it makes a good seal.

Connection to Water Line:

Make sure the power switches on side of distiller is 'OFF' (down), and plug distiller into suitable approved power receptacle. If you are not sure, check with a local certified electrician.

- *The water feed connection for Model 1200-L is located on the left side panel.*
- Take the white direct feed line and push one end into the distiller's water feed quick connect fitting as far as it will go. The water feed line must be cut square so it makes a good seal.

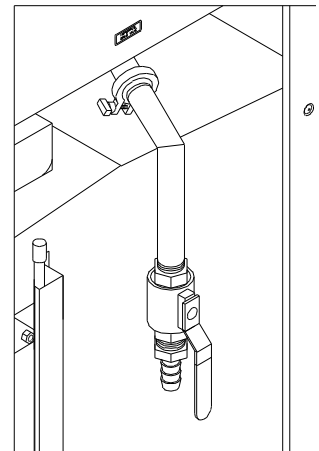
Connection to Distilled Water Line:

- Take the white distilled water line and push one end into the distiller's distilled water quick connect fitting as far as it will go. The distilled water line must be cut square so it makes a good seal.

Connection to Hardness Monitor:

Connection to Main Distilled Water Holding Tank Level Controls:

SECTION 7 - OPERATION



General Notes:

1. It is important to fill out and return the warranty card in this manual. The information is necessary should parts or repairs be needed during the warranty period.
2. Each distiller is checked at the factory for leaks, proper working procedure, etc. Testing is done by the actual running of the unit.
3. Distilled water may have a different taste. This is not a "taste", but a lack of taste. You will become accustomed to this the same way you did to the water in your area.
- 4- Initial operation of the 1200-L will require at least a two hour start up process.

Sterilization:

The first operation with a new distiller is sterilization. This will remove any dust, cleaning solutions, etc. from the distiller. After this is accomplished, the distiller may be put into service.

1. Turn **Power** switch to 'ON'.
2. Allow distiller to run for at least 6 hours during which treat distilled water as waste.
3. Continually take T.D.S. measurements (Total Dissolved Solids) until a reading of less than 2 PPM is reached.

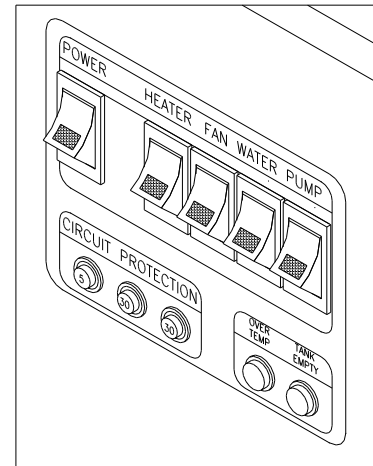
After initial sterilization, the process should be repeated if the distiller has been out of production for a long period of time, contaminated in anyway or undergone repairs.

Running the Distiller:

The distiller is now ready for water production.

During normal operation, the control panel should be set as follows:

Power Switch: ON
Manual Boiler Drain Switch: OFF
Manual Waste Tank Switch: OFF
Manual Distilled Tank Switch: OFF
Heater Light: ON or OFF, Dependent upon boiler pressure.
Initial Degasser Light: OFF
Feed Valve Light: ON or OFF, Dependent upon water level in tank.



A description of the control panel and their associated circuits follows:

Main Power Switch:

This switch is the main power control for the entire distiller. When this switch is on, power may be applied through the other switches and functions.

Turning off this switch will immediately cut all functions of the distiller off, INCLUDING THE WATER PUMPS.

The light on this switch should come on whenever this switch is in the 'ON' position.

Manual Boiler Drain Switch:

This switch works simultaneously with the manual waste water switch. The boiler drain switch opens the solenoid valve to the boiler and at the same time the waste water pump is turned on. Depress and hold both the boiler drain switch and the waste tank switch until the boiler and waste tank is empty. This can be determined: visually by checking the water lines or audibly by the pump dry running. Caution: Do not excessively run pump when lines are dry or pump may become damaged.

Manual Waste Tank Switch:

Polar Bear Water Distillers

This switch turns the pump on which drains the waste water tank. Depress and hold the switch until waste tank is empty. This can be determined: visually by checking the lines or audibly by the pump dry running. Caution: Do not excessively run pump when lines are dry or pump may become damaged.

Manual Distilled Tank Switch:

This switch turns the pump on which drains the distilled water tank. Depress and hold the switch until distilled tank is empty. This can be determined: visually by checking the lines or audibly by the pump dry running. Caution: Do not excessively run pump when lines are dry or pump may become damaged.

Heater Light:

This light indicates power to the heaters in the boiling tank. The heaters will turn on when there is sufficient water in the boiling tank and will stay on during normal operation.

Initial Degasser Light:

This light indicates the initial degasser valve is open. This light will remain 'ON' until the boiler reaches operating temperature and this valve closes.

Feed Valve Light:

This light indicates the feed valve is open and will remain on until there is a sufficient water level in the boiler.

This light will operate only when water is being fed into the boiling tank.

Circuit Protection:

There are two 30 Amp circuit breakers on the control panel to protect the distiller.

All of these should be pressed in. Should any one of these breakers pop out, distiller operation will cease. In this event, the cause of the breaker trip out should be determined before resetting and resuming operation.

SECTION 8 - MAINTENANCE AND CLEANING

Cleaning the Boiling Tank:

1. There is no need to clean your boiler due to the fact that only softened water is running through the distiller.

Disabling the hardness monitor may result in boiler scaling and require machine disassembly.

Water Quality:

The model 1200-L is designed to provide many years of high quality water. However, like all machinery, there exists the possibility of problems. Some of the problems can lead to degraded water quality.

It is recommended that a distiller operating in a commercial environment, or in other areas where high quality water is especially important, that the operator own a T.D.S. meter (Total Dissolved Solids) to detect any such problems early.

T.D.S. meters are relatively inexpensive, and can assure owners and customers that the product is superior. They also serve well to compare the 'before' water (or customer samples) to show the sometimes extreme mineral content of modern water supplies.

SECTION 9 - TROUBLESHOOTING

There are three switches in the boiler of the 1200-L distiller. The low safety shutoff switch operates the heaters. The next two switches control the water solenoid valve. When the water level turns the upper switch on water flow in is stopped. If the water level falls below the middle switch water solenoid is opened. There is also a three float system in the distilled and waste water holding tanks and they control the water pump. There are upper, lower and overflow safety shutdown switches. ALL FLOAT SWITCHES ARE PRESET AT THE FACTORY AND SHOULD NOT REQUIRE ADJUSTMENT.

Caution: Distiller parts become very hot during operation and may remain hot for several hours after distillation stops. Use caution when working on or troubleshooting distiller problems.

Problem:	The system is overflowing the boiler chamber and distilled water is contaminated (high TDS).
Cause/Solution:	- Shutdown your distiller. - Check your float switches because they are probably not working.
Problem:	Pump out tank is overflowing:
	- Check that power plug is twisted 100%. - Check for loose electrical connections.
Problem:	Low distilled water production.
Cause/Solution:	- Ensure all fittings are secure. - Check all bolts on gaskets are tight. - Check seals for leaks.
Problem:	No Boiling or very little heat.
Cause/Solution:	- Heating element may be defective. - Defective Relay, Reset switch, Breaker.
Problem:	Distiller will not operate
Cause/Solution:	- Check main power connection. - Check power light is 'ON'. - Distiller has overheated. Contact qualified serviceman.

Should problems arise that are not covered here, please refer to a qualified service person.

SECTION 10 - ACCESSORIES & SUPPLIES

• 300 GALLON HOLDING TANK

A 300 Gallon Holding Tank is available for your dispenser. Many of these tanks may be hooked-up in succession for larger storage capacity.

Polar Bear Water Distillers

- **HARDNESS MONITOR** (Standard Equipment)

Hardness monitor is situated after the water softener to regulate the water entering your machine. If the water leaving the water softener has not be treated adequately the hardness monitor will close the valve; not allowing water flow. Once water flow has ceased the machine will shutdown.

- **WATER DISPENSER**

2SS, 3SS or 2DS Dispensers may be hooked up to your 1200-L.

- **WATER SOFTENER** (Standard Equipment)

A Water Softener adds salt to the water tying up calcium and other minerals. This process eliminates the substances that create scale build-up in your boiler. When most water softeners back flush you do not receive softened water. To prevent this, our water softener has dual tanks that lets one tank to back flush and the other to provide softened water. Therefore you are always guaranteed softened water entering your distiller.

SECTION 11 - HOW TO ORDER REPAIR PARTS

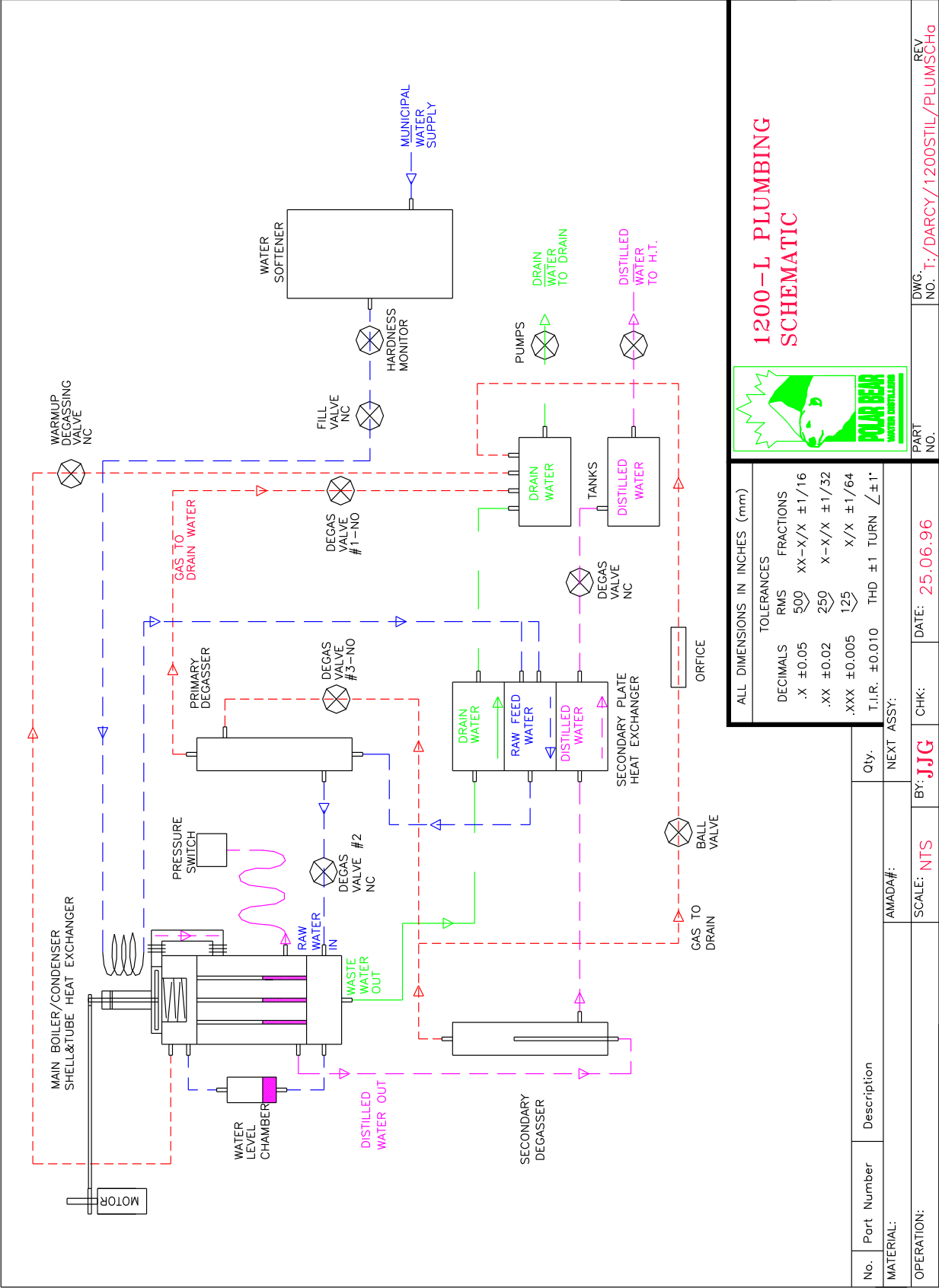
Distiller repair parts may be ordered by contacting your Polar Bear Water Distiller representative, your Polar Bear Water Distiller area dealer, or the manufacturing plant.

Be sure to include the Model Number, Serial Number, Series number and a brief description of the problem.

Please refer to the warranty on page 2 for coverage by the manufacturer.

SECTION 12 - TECHNICAL INFORMATION

Distiller Parts:



DEALER INFORMATION

For Dealer Information, Please Contact:

POLAR BEAR WATER DISTILLER MFG. CO. LTD.

P.O. BOX 113, Pickardville, Alberta

TOG 1W0

Canada

Telephone (403) 349-4872

Fax:(403) 349-5904