



# USER MANUAL

## DB100G



UNI-RAM CORPORATION • ONTARIO • CANADA

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## INTRODUCTION

Uni-ram holds many patents on designs used in its innovative products. Every machine is tested for compliance with Quality Assurance standards. Follow the instructions on preparation, use and operation to operate this machine safely and effectively. Ensure that this manual is readily available to the operator at all times. If you have any questions about the operation of this machine, contact:

North America:  
Uni-ram Technical Service  
1-800-417- 9133  
Other Continents:  
Contact Your Supplier

## SAFETY APPROVALS

This unit is certified under UL standard 2208 and CSA standards C22.2 No. 30 and No. 88 for use in non-hazardous locations as well as for use in hazardous locations Class 1, Division 1, Group D – T2A and Class 1, Division 2, Group D -T2A.

## CAUTIONS AND WARNINGS

- The operator should wear protective clothing in accordance with local safety and environmental regulations, with a minimum of face goggles and gloves along with an apron and respirator if required.
- Always disconnect the power source before performing maintenance.
- DO NOT SMOKE OR USE THIS EQUIPMENT NEAR A POTENTIAL SOURCE OF IGNITION SUCH AS SPARKS OR AN OPEN FLAME. This unit must be located at least 6 feet (1.8 m) from all potential sources of ignition including electrical receptacles, switches, pilot lights, fixtures and contacts when installed in a non - hazardous locations.
- The ambient temperature must be between 5°C (41°F) to 35°C (95°F).
- DO NOT RECYCLE NITROCELLULOSE WHICH IS EXTREMELY VOLATILE. IT AUTOMATICALLY IGNITES AT 135 °C TO 166 °C (275°F TO 330 °F). Do not install, operate or maintain this equipment where the auto ignition temperature of the solvent is lower than 250 °C (482°F).
- Do not install, operate or maintain this equipment where the auto ignition temperature of the hazardous atmosphere(s) is lower than 250 °C (482°F).
- Solvents that are recycled can be flammable. Establish and follow safe practices to store and handle solvents.
- Units must be installed by a qualified electrician.
- Install on a dedicated circuit with sufficient current capacity (see specifications section).

## FEATURES AND SPECIFICATIONS

All Uni-ram Solvent Recyclers feature **rapid-start** direct electric heating of solvent as well as high-efficiency condensers, air cooled with a motor driven fan.

### Safety Features:

- **Explosion proof construction** and intrinsically safe electric circuitry.
- **Computer controlled** with many built-in safety programs including temperature control of all critical points including tank, condenser and fan motor. Power is cut when the temperature at any of these points rises above a pre-set level. Operation also terminates when other abnormal conditions exist (eg: boiling does not start on time or the distillation process takes too long).
- **Automatic pressure relief** lid system prevents pressure in the Distillation Tank from exceeding 0.5 to 1.0 psi. (0.035 to 0.070 kg/cm<sup>2</sup>).
- **Self Diagnostic** error messages are displayed on the Display Panel.
- **Dual lid** cover system.
- **Compact, enclosed cabinet** for safe storage of the Solvent Receiving Container inside the cabinet.

### Operating Features:

- **Rapid-start** due to direct electric heating of solvent.
- **Short cool-down time.** High efficiency condenser, air cooled with motor driven fan.

Warranty: 1 year on unit, 2 years on pump.

SPECIFICATIONS	
VOLTAGE (V) - SINGLE PHASE	220/240
BRANCH CIRCUIT AMPS	20
MAX TEMPERATURE SET POINT	240°C
TIME TO RECYCLE	10-12 HOURS
TANK CAPACITY	20 US GAL (80L)
LID GASKET	VITON
SHIPPING DIMENSIONS (WDH)	47" X 27" X 50"
WEIGHT (LB/KG)	450/205

## SOLVENT REQUIREMENTS

Dirty solvent to be distilled must meet **each requirement** described below. The MSDS (Material Solvent Data Sheet) provides data on the properties of the virgin solvent.

- The BP (Boiling Point) of the dirty solvent must be less than 200°C (392°F). BP increases with greater contamination. **Note:** Recycle recently contaminated solvent only. Standing solvent can become acidic over time.
- The auto-ignition temperature of the solvent to be distilled must be higher than 250°C (482°F) for safe operation. Do not recycle Nitrocellulose. The auto ignition temperature is 135°C (275°F).
- For good water separation to occur, the organic (oil-based) component of the solvent mixture must be **non-miscible** in water and have a specific gravity of 0.85 or less.

### Definitions

Flash Point: The lowest temperature at which the vapor of a solvent can be made to ignite momentarily in air.  
 Auto-ignition temperature (often referred to as "ignition temperature" or "ignition point"): the temperature at which solvent ignites by itself.

**INSTALLATION AND SETUP:****Delivery Inspection**

- Carefully inspect the shipping carton for any sign of transport damage.
- Carefully remove the unit from the shipping carton.
- Check the unit for damage. **Report any transport damage immediately to the carrier and your vendor. Initiate a freight claim with the carrier. The manufacturer is not responsible for freight damage.**
- Check the Accessory Kit for the parts listed below. If any parts are missing, contact your supplier. Additional consumables and accessories are also listed.
- Level the unit using the adjustable feet and install the Door Handle (included in the ACCESSORY KIT).

**ACCESSORY KIT  
CONTENTS**

Manual
Door Handle & 2 Screws
Filler & Agitation Hose Assembly
Lid Gasket, Viton

**LOCATION**

This unit is certified for use in non-hazardous and hazardous locations Class 1, Division 1 Group D and Class 1, Division 2, Group D.

- **Non-hazardous Locations:**

If using a non-hazardous plug, the unit must be located outside of a hazardous location. In a non-hazardous location, we recommend that you use a receptacle located a minimum of 6 feet from the unit and a minimum of 3 feet from the floor. We also recommend that the unit be located at least 6 feet from electrical receptacles, switches, pilot lights, fixtures etc. To clarify the definition of an appropriate location, contact your local authority. This unit must be connected to the power supply only by a qualified electrician in accordance with an appropriate Electrical Code.

- **Hazardous Location:**

In hazardous locations (Class 1, Division 1, Group D and Class 1, Division 2, Group D), the power cord must be connected to the main power supply only by a qualified electrician, in accordance with the National Electrical Code. This equipment must be properly connected to an explosion proof outlet (receptacle or hard wired).

**Select a Location That Meets EACH AND EVERY Requirement, Described Below.**

- 1) Comply with the instructions in the section: CAUTIONS AND WARNINGS.
- 2) Position the solvent recycler in a location so that there is at least 6 inches (15 cm) of space all around the unit. Ensure that the safety lid and door freely opens fully. The unit must be in a location where people or equipment cannot disturb the cable or connection. The cord must be connected directly to the main power supply; an extension cord cannot be used.

## CONNECTIONS

### POWER

Connect the unit to a dedicated, single phase 220/240V, 20 Amp branch circuit using either a plug or hard wired connection. On first power up and when the unit is ready to begin a new cycle, the Display Panel shows

“READY S.P. = XXX°C”. (SP = Set Point, XXX is the set point temperature).

### HOSES AND CONTAINERS

- Place the drum/container with the dirty solvent to be distilled close to the unit.
- Connect the **Solvent In Hose** to the **Solvent In** port of the unit and insert the other end (with the Tank Filler Suction Pipe) into the drum/container.
- Connect the alligator clamp at the end of the Ground Strap to the container with dirty solvent.
- Place the drum/container for the clean solvent close to the unit.
- Connect the **Solvent Out Hose** to the **Solvent Out** port of the unit and insert the other end with the Outlet Tube into the drum/container.
- Connect the **Water Out Hose** to the **Water Out** port of the unit and insert the other end with the Outlet Tube into the drum/container.
- If the pail is metal, connect the alligator clamp of the Ground wire to the rim of the drum/container.

### AIR

- This unit is equipped with air operated Dual Diaphragm pumps and requires a supply of clean, dry air of at least 85 PSI (6 kg/cm<sup>2</sup>). **Note: If necessary, install a Moisture Filter.**
- Apply teflon tape to the Air Inlet Fitting located at the right side of the unit and connect the Moisture filter to it, if necessary. Connect the air supply to Filter. Make sure that there are no leakages at the connections. Also, make sure that the air is free of dust, rust and other contaminants. Drain the Moisture Filter before each recycling.

## COMPUTER SETUP

The computer is pre-set at the factory according to the intended application and can be adjusted in SETUP MODE by the user if necessary.

### Conditions to consider before starting Setup:

#### Minimize Temperature Set Point

After recycling there will be a small amount of solvent, about 1/8 US gal (500 ml), remaining in the distillation tank due to condensation. Select the lowest Temperature Set Point that recycles the solvent to this level.

#### Estimate Boiling Point

Add 45°C (81°F) to the boiling point of the pure solvent as shown on the MSDS (Material Safety Data Sheet) or another reliable source.

#### Minimize Contamination

The boiling point of the solvent mixture increases with the level of contamination. To reduce the boiling point of the solution, recycle more often.

**SETUP MODE**

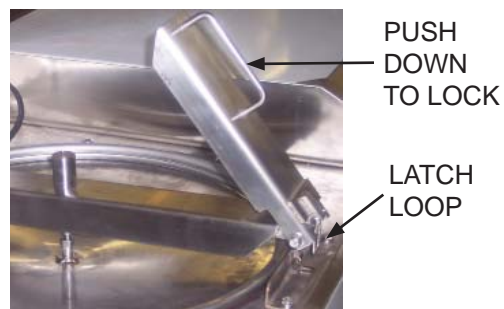
Press and hold the SETUP key and, while still holding, press and release the START key. The display will read "SET-UP MODE". Press the SETUP key to move from step to step.

STEP	DISPLAY	KEY TO ADJUST	KEY TO ACCEPT	DESCRIPTION
1	READY S.P. = 210°C	NA		Indicates unit is ready and set to 210°C
2	SET-UP MODE	NA		Indicates SETUP mode is active.
3	SET-PT = 210°C	+ OR -	OK	Estimated Boiling Point (BP) of waste mixture
4	POWER = 100%	+ OR -	OK	Boiling may be too vigorous. If one or more of the following conditions exists, decrease by one increment and repeat the recycling operation. <ul style="list-style-type: none"> <li>• vapour leaks at the Lid Gasket</li> <li>• clean solvent comes out too hot</li> <li>• waste material is carried into the condenser</li> </ul>
5	FILL TIME = 10M	+ OR -	OK	Turns the filling pump off automatically. The appropriate setting will depend on the waste mixture's viscosity, the distance between the waste container and the recycler etc. If not set correctly, the filling operation will have to be interrupted manually by pressing the STOP key or repeated such that the correct liquid level in the Distillation Tank has been reached (3" below the Retainer Ring).
6	MIXING TIME = 5 (MINUTES)	+ OR -	OK	Mixing the components of the waste mixture improves the efficiency of the distillation.
7	READY S.P. = 210°C	+ OR -	OK	Indicates unit is ready and set to 210°C



**LID CLOSURE**

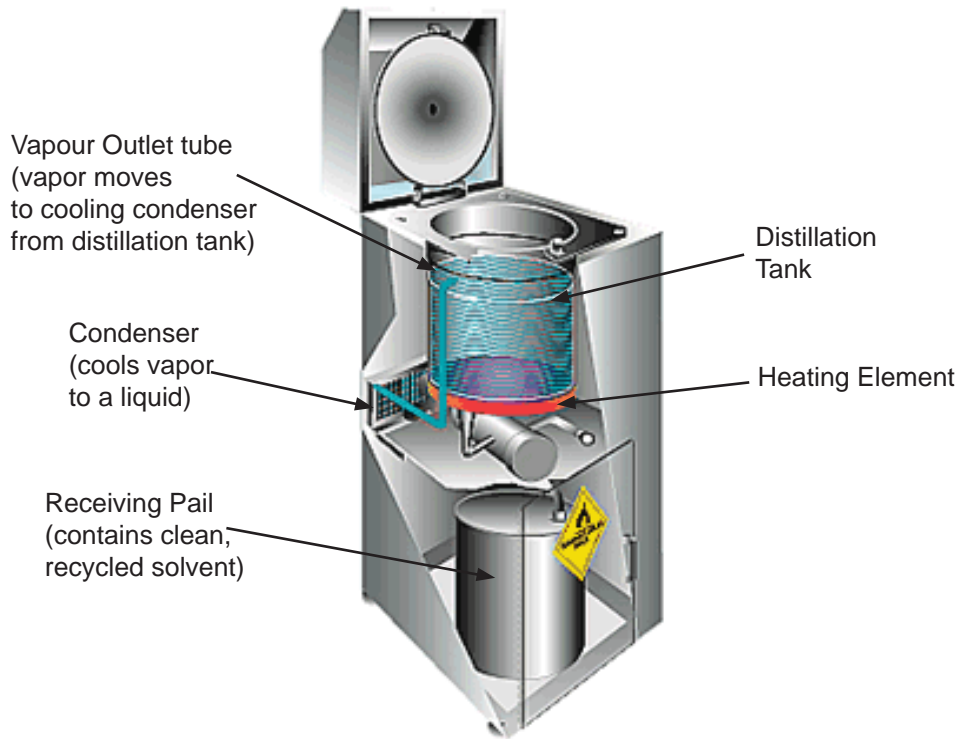
SLIP LATCH LOOP UNDER HOOK AND PUSH DOWN TO LOCK IN CLOSED POSITION



**THEORY OF OPERATION - DISTILLATION PROCESS**

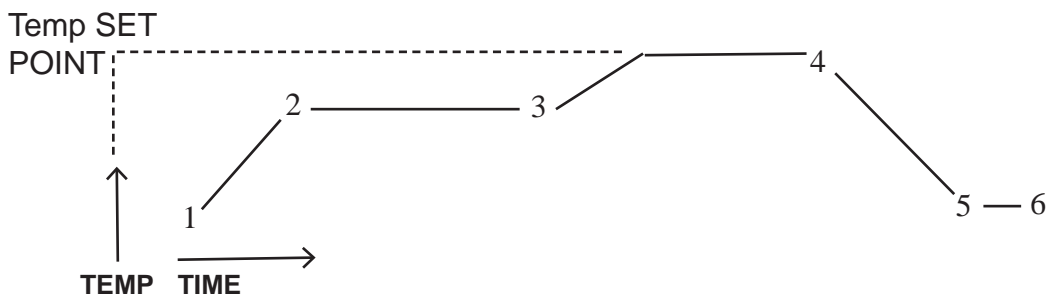
Waste solvent consists of the original solvent plus liquid and solid materials picked up during use of the solvent. Recycling separates the original solvent from the waste materials. During the recycling process, the distillation tank fills with dirty solvent and the heating element heats the mixture. The solvent mixture boils and the vapour passes through a cooling condenser where purified, clean solvent, ready for use condenses out. Waste materials in the dirty solvent boil at a temperature substantially above the Temperature Set Point so they remain in the distillation tank for disposal.

**Solvent Recycling**



**Distillation Cycle**

1. Heating starts, temperature rises
2. Vapourization starts
3. Vapourization ends, AUTO SHUT-OFF / BAKE TIME starts (see SETUP)
4. Baking finishes, cooling begins
5. Cooling is complete
6. Separation occurs





**TROUBLE SHOOTING GUIDE**

Carry out each action step until a solution is found. If the recommended actions do not solve the problem call Uni-ram Service in North America or contact a qualified Service Technician.

**Caution: Disconnect the power supply before conducting maintenance or service.**

PROBLEM	CAUSE	ACTION STEPS
Unit is plugged in, power light is off, Display Panel is not working.	Power is not getting to the unit.	Reset breaker or replace fuse. If power is still not getting to the unit, call a Qualified Service Technician. Ensure that the unit is the only device on a circuit with sufficient capacity.
Unit is plugged in, power light is on, Display Panel is not working.	Power board or computer board not functioning.	Call Uni-ram Service
Recycled solvent is not clear	1) The solvent is reacting chemically.	1) Run SETUP and lower the Temperature Set Point.
	2) The solvent flow path is dirty. One cause is overfilling the distillation tank.	2) To clean the path, follow Service Procedure 2 and then recycle 3 gal of clean solvent.
Dirty solvent remains in Distillation Tank after recycling  <b>Note:</b> 1/8 Gal (500 ml) of recycled solvent is expected due to condensation.	1) Poor heat transfer due to dirt and debris left in the tank.	1) Clean the tank, replace the Liner Bag, recycle with pure solvent to test. If successful, the problem is due to a dirty tank, debris left in the tank or the solvent is too contaminated. Adjust accordingly. Follow Operating Procedures closely. If the level of contamination is too high, recycle more often.
	2) Boiling point of solvent is above Temperature Set Point.	2) Run SETUP, raise the Temperature Set Point and repeat the recycling operation. The Temperature Set Point should be the BP of pure solvent (as determined from the MSDS or other source) plus 45°C (113°F) to allow for contamination. If the boiling point is above the maximum Temperature Set Point for your model (either 200°C or 240°C), dirty solvent cannot be recycled in this unit.

PROBLEM	CAUSE	ACTION STEPS
Solvent vapor leaks from the Lid Gasket	1) The Lid Gasket has excessive wear as indicated by cracks, shrinkage, hardness etc	1) Replace the Lid Gasket (See Operating Procedure 11).
	2) The Solvent flow path is blocked.	2) Follow Service Procedure 2.
	3) Lid Tension is not adequate	3) Follow Service Procedure 4.
	3) The Lid is not seated correctly.	3) Follow Service Procedure 5.
	4) The temperature SET-PT is too high, resulting in excessively high solvent vapour pressure	4) Run SETUP, reduce the Temperature Set Point and repeat the recycling operation. If successful, continue to recycle using the lower Temperature Set Point. If not, reduce the POWER %.

### TEST MODE

Use this mode as part of your troubleshooting procedures.

1. Make sure the Display Panel shows "READY SP = XXX °C".
2. Press and hold the OK key while pressing the "-" key for about 3 seconds or until the display shows "TEST MODE" and the testing cycle starts.

### TESTING CYCLE

- Display shows "SET-PT = XXX °C" then, after 5 seconds, changes to "FAN ON".
  - Cooling Fan should run for 5 seconds. If not, either Fuse "F5" or "F6" may be defective.
  - Display changes to "HEAT ON".
  - The Heater comes on and runs until the computer detects a 3°C increase in temperature, then the display should change to "HEATER TEST OK".
3. If the display does not show "HEATER TEST OK" and stays at "HEAT ON", there is a problem in the heater circuit such as a defective Heater TRIAC, Heater Element or Fuse "F3" or "F4".
  4. Press the "STOP" key twice and the display will return to "READY SP = XXX °C".

**ERROR MESSAGES**

If an abnormal condition is detected by the unit's Self-diagnostic System, the Display Panel shows one of the following error messages:

<b>MESSAGE</b>	<b>POSSIBLE CAUSE</b>	<b>ACTION</b>
READY TIME OUT	Recycling was not completed within 16 hours and/or dirty solvent remains in the Tank.	If dirty solvent remains in the Tank, see the Troubleshooting Guide.
RESET OCCURRED	The computer has been reset due to a power interruption or drop in voltage during the recycling operation.	Press the "SET-UP" key twice to restore the message: "READY-SP = XXX° C".
CONDSR OVER-HEAT	Over-heating occurred at the Condenser.	The Condenser is dirty or the Fan stopped for another reason (see below). Clean the Condenser. When the Fan Motor has recovered (4-5 min), this message will disappear and normal operation will resume.
CHECK FAN	Appears 10 min after the message above if the problem is a loose fan blade, blown fuse (F3 or F4) or other fan-related problem. Also appears if the condenser is dirty.	Clean the Condenser. Run TEST MODE to check for defective fan motor. If necessary, check for a loose fan blade or blown fuse (see next section).
CHK HEATER FUSES	Appears if the computer does not detect a rise in tank temperature after 15 minutes.	There may be a short circuit in the Heater circuit causing fuse F3 and/or F4 to blow or poor electrical contact in the Heater circuit. Check circuit condition with a tester. Correct as required.
<b>WARNING! VERY IMPORTANT! IF TRIAC IS FAULTY, DISCONTINUE USE IMMEDIATELY!</b>		
CHK HEATER TRIAC	Short circuit in the TRIAC (a switching transistor that controls heater power, located on the Power Control Board).	To confirm, first disconnect and re-connect the power supply. If the Distillation Tank becomes hot to the touch and the Fan Light is off, the TRIAC is defective. <b>Disconnect the power supply immediately and do not use again until the Power Control Board has been replaced.</b>

## SERVICE PROCEDURES

### 1) CLEAN CONDENSER

Remove the 2 screws at the back of the Computer Cover and carefully move the small Back Cover forward just enough to reach the front of the condenser with a vacuum. Using a brush attachment, vacuum the front of the condenser where most of the dust accumulates and then vacuum the back if necessary. Put the Cover back into position and re-install the screws.

### 2) CLEAR BLOCKED SOLVENT FLOW PATH

**CAUTION:** WEAR SAFETY GOGGLES.

A blockage in the solvent flow path (Vapour Outlet - Condenser - Solvent Outlet Tube) can cause solvent to leak. To determine the location of the blockage, first check the Solvent Outlet Tube and the Vapour Outlet Fitting for visible signs of blockage or damage. If the problem is not in either of these locations, the Condenser is probably blocked. For instructions or help to clear the condenser, call for service.

### 3) REPLACE FUSES

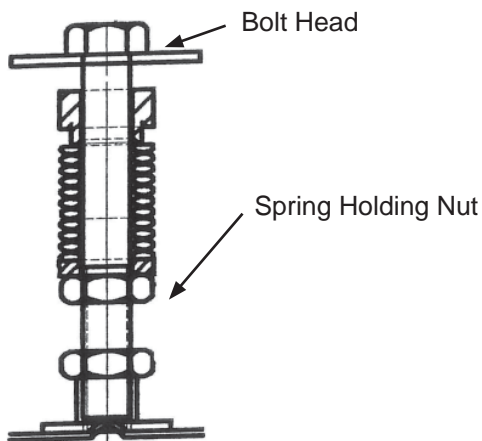
Fuses are located on the Power Control Board inside the explosion proof Motor Housing.

**WARNING: DO NOT TRY TO REPLACE A FUSE YOURSELF - CALL FOR SERVICE.**

## 4) IF LID LEAKS SOLVENT, INCREASE LID TENSION (BY ADJUSTING THE SPRING BOLT)

**CAUTION:**

SHOULD BE DONE ONLY AS A LAST RESORT - FIRST CHECK FOR A WORN LID GASKET, A BLOCKAGE IN THE SOLVENT FLOW PATH, LOOSE HINGE BOLTS OR A SET POINT THAT IS TOO HIGH FOR THE SOLVENT BEING RECYCLED.



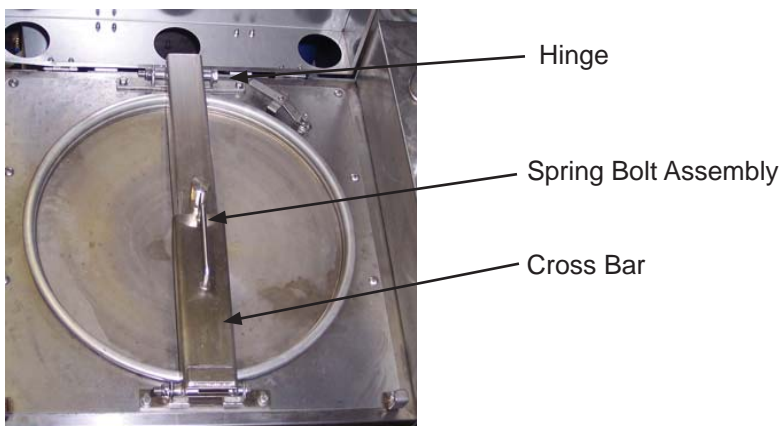
Spring Bolt Assembly

This procedure tightens the Lid by increasing the tension on the spring attached to the Lid Bar Spring Bolt Assembly. The Lid and Bolt Assembly is carefully designed as a Safety Pressure Relief system to prevent a dangerous build up of pressure inside the closed tank. **Do not adjust the Spring Holding Nut by more than 2 full turns maximum.** If 2 full turns do not solve the problem, call for service.

- While holding the Bolt Head with a wrench, turn the Spring Holding Nut no more than a 1/2 turn at a time. Turn in a counter-clockwise direction (as you look down on it).
- After each 1/2 turn, operate the unit normally and check for leaks.

## 5) REPOSITION LID and TIGHTEN HINGE BOLTS

The Hinge bolts can loosen over time, causing the lid to shift off center. This can lead to an inadequate seal and leaking around the Gasket. Loosen the bolts, reposition the lid and re-tighten the bolts.



## 6) RECOMMENDED 6-MONTH MAINTENANCE

- Vacuum the condenser (see Service Procedure 1).
- Clean the solvent flow path by recycling 3 Gal of clean solvent.
- Inspect Distillation Tank for debris, pitting and/or other damage.
- Inspect Lid Gasket for wear or damage (see Operating Procedure 11).

**REPLACEMENT PARTS**

DESCRIPTION	PART NO.
SAFETY COVER	960-3310
KEYPAD	900-3461
DIAPHRAGM PUMP	UDP4TA
DOOR HANDLE & 2 SCREWS	120-318F & 99-404S
FILLER & AGITATION HOSE ASSEMBLY	960-8240
LID GASKET, VITON	965-2150V
WATER SEPARATOR	UWS80E



### **Full Product Warranty**

These Uni-ram products have been engineered and manufactured to high performance standards. Each unit has been subjected to detailed factory testing before shipment.

This product comes with a one-year full warranty from the date of purchase. Uni-ram Corporation reserves the right to repair or replace the unit, free of charge, to the original purchaser if a part is found to be defective in material or workmanship as determined by factory service personnel. The items listed below under "Conditions of Warranty" as consumables are not covered.

Uni-ram reserves the right to direct the customer to ship the unit collect to the Uni-ram factory or to an approved Service Center for repair using the Uni-ram Return Goods Procedure or to repair the unit on-site. To prevent damage in transport, the purchaser must ship the unit in the original packaging or use alternate adequate packaging. All units must be shipped clean and free of solvent.

#### Conditions of Warranty:

As Uni-ram Corporation has no control over the working conditions or circumstances under which the purchaser stores, handles or uses the product, Uni-ram makes no warranty or claim, either expressed or implied with respect to this product's fitness for any purpose or the result to be obtained from its use. This condition applies to the sale of all products and no representative or distributor of Uni-ram Corporation has the authority to waive or change these conditions.

This warranty applies only to the original purchaser and does not apply if the unit has been misused, overloaded, neglected, altered or used for any purpose other than those specified in the operating and installation instructions. Deterioration due to normal wear is not covered by this warranty. Damage due to accident, transportation, fire, floods or acts of God is also not covered. Units whose serial numbers have been altered or removed are not covered. The warranty is invalid if unauthorized abrasives are used in this unit. Unauthorized attempts at self-repair or alterations by the owner also invalidate this warranty. Interior or exterior finishes are not covered by this warranty.

Consumable Items are not covered by this warranty.

This warranty replaces all other warranties expressed or implied by statute or otherwise.

To make a claim, call Uni-ram Service at 1-800-417-9133 and quote the serial number of the unit.

**USE ONLY GENUINE UNI-RAM LINER BAGS WHICH ARE 2 MIL THICK, LIGHT BLUE IN COLOUR WITH A SAWTOOTH EDGE AND A 3/16" WELD.**

**THEY ARE SPECIALLY MANUFACTURED TO BE STRONG, HEAT RESISTANT AND CHEMICAL RESISTANT.**

**USE OF A NON-UNI-RAM LINER BAG MAY VOID THE WARRANTY.**