

## **WASTE RECOVERY SERVICES**

For the most part, repair and service facilities in all industries still clean dirty, oily spare parts and dispose of the solvent-waste in the same way they did twenty-five years ago...most of them use a "Waste-Recovery Service" which provides a "sink-on-a-drum (SOD)" type manual parts washer and a periodic solvent replacement service. There are more than one million SODs currently in use in North America. SOD or similar parts washers are used all over the world.

The sink-on-a-drum, as shown on the right, is a metal sink that sits on a metal drum which works as a storage container of the mineral-spirit cleaning solvent. There is a pump that brings the solvent up from the drum to the sink, and a hose which is used to rinse the dirty parts while the technician brushes them. Some has a Flow-through brush attached to the end of hose as shown in this example.

The dirty, contaminated solvent then drains back into the storage drum to be reused again and again. Some general parts washers may have a filter to remove particles, but the solvent itself is always dirty...and it becomes more dirty and ineffective with each use. The filter must also be replaced periodically and disposed of Waste Recovery Company adding cost the operation.

Waste recovery companies charge Clients a monthly for the "sink-on-a-drum" and the periodic "waste recovery service", whereby they replace contaminated waste-solvent with clean solvent. In most states and provinces in North America, the contaminated waste solvent is classified as "hazardous material" and transporting the hazardous waste-solvent to distant refineries for recovery poses more risk to environment.

The "solvent replacement cycle" varies from 4 to 12 weeks, depending largely upon what the Clients are willing to pay. The more frequently the dirty solvent is removed and replaced, the more the Clients must pay.



## **ENVIRONMENTAL HAZARDS**

The recovery service works as follows:

- ◆ The truck driver of the waste recovery company first lifts off heavy and dirty sink from the top of drum and places it on the floor. He inserts suction hose to draw up contaminated solvent to the Waste Solvent Storage Tank of his truck and pumps in clean solvent from Clean Solvent Tank of his truck. However, there are some unavoidable troubles associated from this service.
  1. Some sink unit is very heavy and slippery with oil making lifting it off the drum much dangerous and tiring task, thus possibly causing health hazard for truck driver.
  2. Most sink is very dirty and contains residue of dirty solvent and contaminants. Placing it on the work floor even for a short time necessitates cleaning afterward and it is objectionable to most customers.

3. Since inside wall of drum and sink unit are still dirty with residue and contaminant, the new clean solvent supplied is already half dirty for cleaning to start with and then becomes increasingly contaminated and in the meantime, cleaning operation is inefficient and unpleasantly time consuming until the truck driver shows up again after 4 to 12 weeks.
4. The waste recovery company transports the Clients' contaminated solvent in small vans or trucks to a local transfer station for storage and consolidation.
5. The consolidated, hazardous waste solvent is then loaded into large tanker trucks for transportation to a distant refinery recovery by distillation.
6. The recycled solvent is then loaded into other tanker trucks and transported back to the local transfer station.
7. The clean solvent is transferred to the smaller trucks and vans and is then delivered back to the Clients' sink-on-a-drum...where it again starts out half-dirty, and becomes increasingly dirty and contaminated with each use.
8. The unfortunate technician then continues to clean dirty parts with increasingly dirty solvent, losing time and wasting money.
9. The largest waste-recovery company promotes its waste recovery service as a "closed-loop" system, and they advertise that they handle, transfer, and transport millions of gallons of toxic, hazardous waste every year. Obviously this "closed loop" system with so many millions of tons of hazardous waste on the nation's roads is an environmental nightmare, full of potential environmental disasters.
10. The Clients are often classified as hazardous waste generators solely because of the sink-on-a-drum parts washer provided by waste recovery service.

## **THE CLIENT'S DILEMMA**

Clients using sink-on-a-drum provided by the waste recovery services face very serious problems:

1. The m is a very ineffective parts cleaning tool, because the service technician wastes valuable time trying to clean spare parts with solvent that is, itself, always dirty and contaminated. This inefficient cleaning method greatly increases unproductive "cleaning" time and reduces valuable productive revenue generating "repair" time, which significantly adds to the Clients' labor costs and reduces the Clients' profits.

*As an analogy, imagine washing dishes at home many times a day, day-after-day and week-after-week, without ever changing the water. The dishes stay dirty, a lot of valuable time is wasted, and you generate some horrendously filthy and contaminated water.*

2. To compensate for the fact they must reuse the solvent over and over again, the technicians must often use two or more sinks and clean in two or three stages...first cleaning off heavy grime with the dirtiest solvent and then using "less dirty solvent" to do a second or third cleaning. For important applications that require truly clean parts, the technicians will also do a "finish cleaning" using new solvent or a brake cleaning spray. These additional cleaning stages waste even more valuable time and money.
3. The sink-on-a-drum parts washer generates large amounts of contaminated hazardous solvent-waste for which the Clients are responsible, and there are very strict regulations with severe penalties governing the storage and disposal of this hazardous waste.
4. The Clients are frequently labeled with high hazardous waste generators status due to generating high volume of hazardous waste solvent produced by the sink-on-a-drum parts washers.
5. The Clients always remain responsible and liable for any damages and claims resulting from their

hazardous waste solvent. By law, waste generators have “cradle-to- grave” responsibility for their hazardous waste, and they can always be taken to court and held accountable, even if the waste recovery service provides them with some type of indemnification.

**The Client’s dilemma, therefore, is that with the sink-on-a-drum parts washers provided by waste recovery company.**

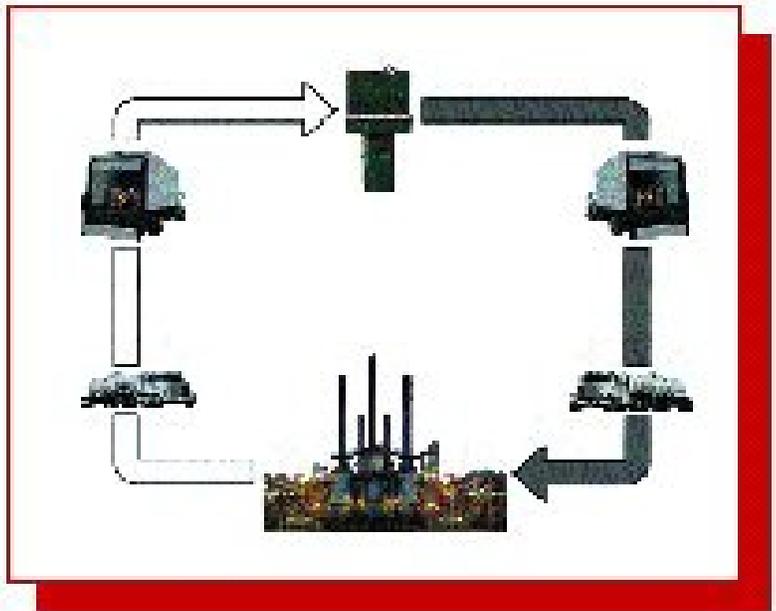
**...they lose considerable time and money because their technicians waste valuable time trying to clean parts with increasingly dirty solvent.**

**...the inefficient sinks-on-drum parts washers generate large volumes of hazardous waste, necessitating the Clients to register as “hazardous waste generators” and to conform to stringent environmental regulations.**

**...the Clients are forever responsible and liable for the hazardous waste generated by the use of waste recovery services.**

**Summary: The waste recovery companies provide sinks-on-drum parts washers which are highly unproductive, inefficient, and costly....whose major purpose seems to be generating increasing amounts of toxic, hazardous waste for the waste recovery services to transport and recycle.**

**Obsolete  
Technology**



**We, Uni-ram Corporation, have a solution.**



# Uni-ram 23NL

Parts Washer with Recycler Overview of Operations, Specifications, Features and Benefits

*Uni-ram 23NL will ultimately remove hundreds of millions of tons of hazardous solvent-waste from the world's roads and from the earth's environment.*

## Uni-ram 23NL Recycling Parts Washers

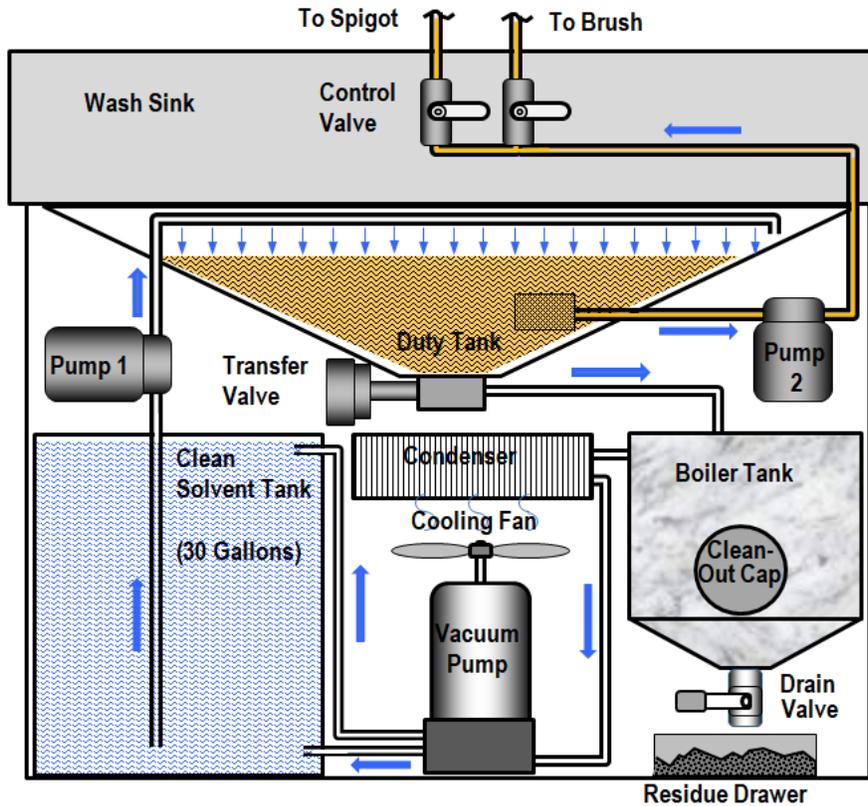
Uni-ram 23NL Recycling Parts Washers, like other general parts washers, cleans with solvent and has a pump, flexible spigot and flow-through brush to deliver the solvent to the cleaning basin.

Uni-ram 23NL differs remarkably over all other parts washers in that it is both a very efficient parts washer and a self-contained mini-refinery. The Uni-ram 23NI RECYCLING parts washer is built with innovative technology that RECYCLES the solvent internally and eliminates almost all of the hazardous waste. (Patented and patent pending)

1. By a simple push of a button, 23NL replaces the contaminated used solvent with clean solvent. The contaminated used solvent is then distilled through a low temperature, vacuum distillation and returned to the Clean Solvent Tank. Dirt, oil, grease and other contaminants are easily removed from drain valve by just turning a valve handle. The minimal waste in the residue drawer is the only waste that will need disposal.
2. With 23NL, service technicians can clean dirty parts and components efficiently with clean solvent in shorter period of time, reducing labor costs and significantly reducing solvent costs.
3. 23NL effectively eliminates generation of hazardous waste and the associated legal liabilities of this waste.
4. 23NL yields an excellent return on investment.
5. 23NL has been fully certified by ETL under UL2208 for use in non-hazardous location.



## OPERATION OF UNI-RAM 23NL



### CLEANING OPERATION

1. Push of a button sends the solvent from Duty Tank to spigot or flow-through brush or both.
2. Flow from each tool is adjustable to desired level.

### REFILLING DUTY TANK

1. Contaminated solvent is drained to Boiler Tank.
2. Duty Tank is rinsed twice by clean solvent.
3. Duty Tank is filled with 5 gallons of clean solvent.

### DISTILLATION PROCESS

1. Dirty solvent is heated in Boiler Tank under vacuum.
2. Solvent vapor liquidifies flowing through Condenser.
3. Vacuum Pump sends distilled solvent into Clean Solvent Tank.
4. Perfectly clean solvent is stored in Clean Tank.

### Fluid Flow

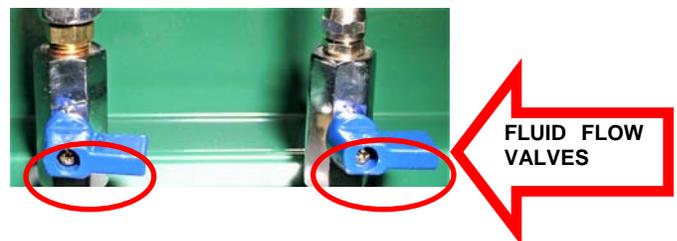
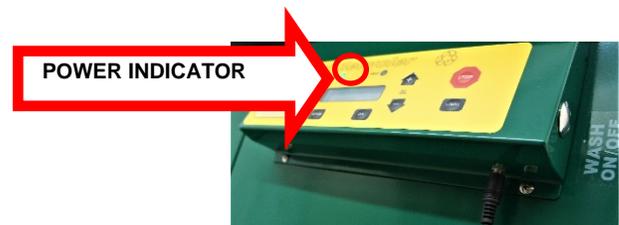
Once your machine is set up in a well ventilated, secure area and filled with recommend solvents Flash Point above **100°F (37.8°C)**, Auto-ignition Temperature higher than **392°F (200°C)**, and Boiling Point lower than **374°F (190°C)**.

Plug in machine and you will note the power LED lights up when the unit has power. See display.

YOU ARE READY TO BEGIN.

The fluid flow button is on the right side of the control panel. Press button to start and stop flow of solvent into the wash sink for cleaning operation.

Control valves will allow you to decide the amount Of fluid flow you wish to be released from either valve.



## Clean Tank

Clean Tank of 23NL is made of **304 STAINLESS STEEL** for long rust free life. This tank has a capacity of 30 US Gallons.

For convenience of service, the Clean Tank may be removed without emptying solvent. When the solvent in the wash sink becomes too dirty to effectively clean parts, the technician simply presses the Start Button on Key panel.



## Wash Sink and Duty Tank

The Cleaning Sink is provided with two cleaning tools; a Flexible Spigot and a Flow-through Brush. The tools are equipped with independent flow control valves. Flow-through Brush is connected to a tube with a One-touch fitting so that replacement of worn brush is quick and easy.

The wash sink has a lid. Lid should be down when not in use to prevent solvent evaporation. In the unlikely event of a fire when the lid is in the up position, the fusible link will melt and cause the lid (safety panel) to drop and cover the wash sink and suffocate the flames.



The Duty tank located under the removable panel in the wash sink holds about 5 Gallons of cleaning solvent. When the WASH BUTTON is pressed, the Wash pump (Pump 2) is activated for 15 minutes. It may be stopped anytime by simply pressing Wash Button or Foot Pedal (optional accessory) again.



The Filter Screen and Cartridge Filter are also located inside the Duty Tank under the removable tray. In order to avoid contamination by dirty solvent, Wash Pump is installed under the Duty Tank and accessible easily by removing Rear Panel.



### A. The Boiler Tank and Cooling System

When the cleaning solvent in the Wash Sink becomes too dirty to effectively clean parts, the technician pushes the START button on Key Panel as shown in photo on the This initiates two operations:

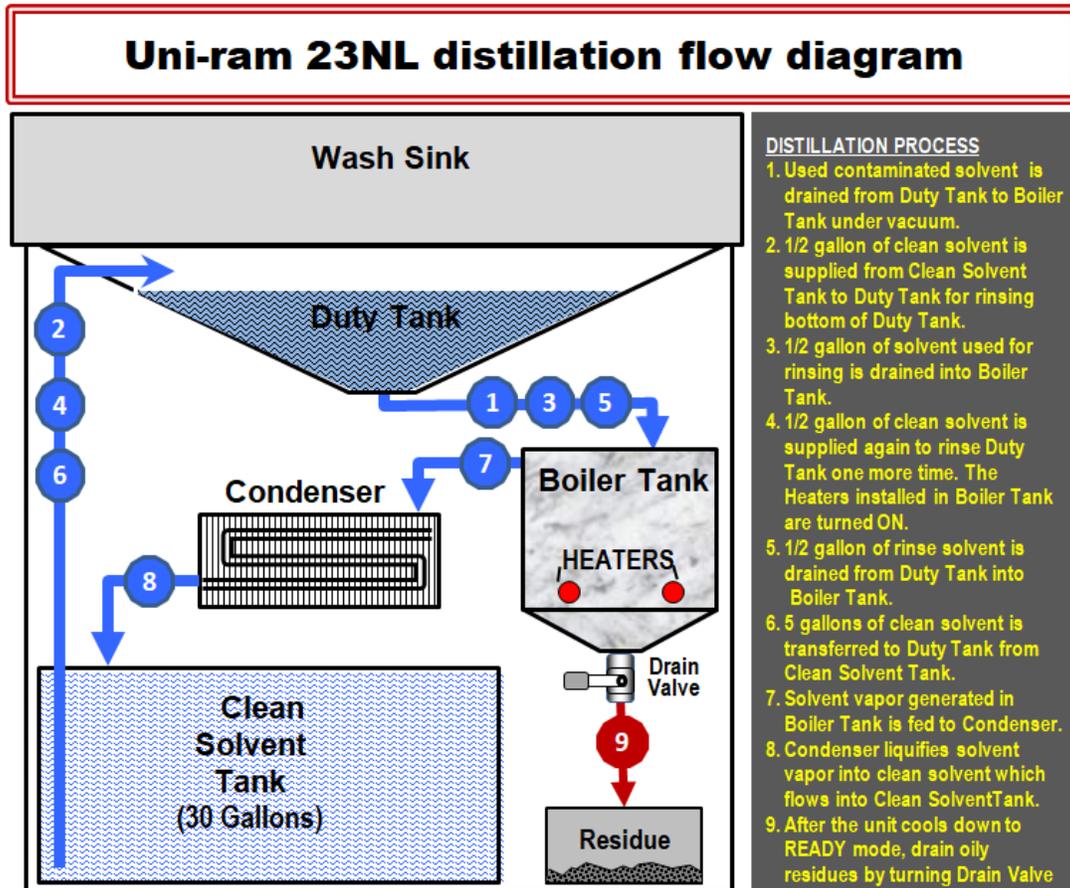


#### 1. Replacement of contaminated solvent:

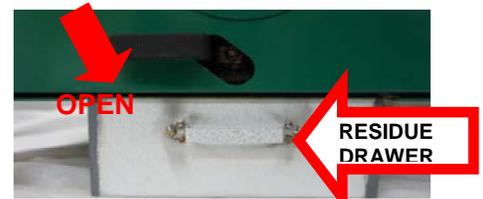
When the Start button is pressed, the vacuum pump is activated, and when the vacuum reaches 21"Hg, the transfer valve (below of duty tank) is opened to transfer dirty solvent into the Boiler Tank. This activates the transfer pump which spray-rinses the tank with ½ gallon of clean solvent. The Duty Tank is now being filled with 5 gallons of clean solvent. Six gallons of dirty solvent is placed in the Boiler tank.

**The solvent replacement process takes only four minutes. You must wait for this to finish before continuing to use the Wash Sink**

2. **Distillation of contaminated solvent:**



When the Start Button is pushed, two heaters in the Boiler Tank start heating the dirty solvent under vacuum pressure. The LCD on control panel starts showing the temperature of the Boiler Tank and the temperature of the vapor passage tube alternatively for 5 seconds each. The solvent vaporizes, leaving behind only a “residue” of dirt, oil and other impurities that were removed from the dirty parts. When computer detects the end of distillation, heaters are turned off and cooling period starts. The vaporized solvent then passes through the fan cooled condenser, that condenses the vapor, turning it back to liquid solvent which then returns to the clean solvent tank.



When computer detects the end of distillation process, the vacuum pump and cooling fan are turned off and LCD shows cooling mode message.

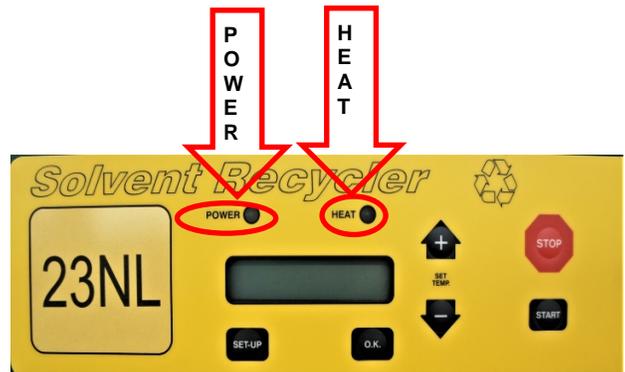


Upon the temperature of Boiler Tank dropping down to the pre-set value, LCD shows READY status. Residue Drain Valve located at the bottom of the Boiler Tank may be opened to drain all oily residues into Residue Drawer as shown in the photo.

The distillation and cool down which take about 4 to 5 hours are totally independent and do not interfere with the cleaning work of technicians.

### UNI-RAM 23NL RECYCLING PARTS WASHER:

Distillation in the Uni-ram 23NL recycling parts washers functions automatically, at the touch of a button, as all operations are controlled and monitored by the computer throughout the process. There are two LEDs on the Key Panel as shown in the photo on the right. The left Power LED is lit when electric power is supplied. The right LED is lit when Heaters are turned on.



The heater LED flashes when computer starts adjusting heater power.



The liquid crystal display (LCD) located in Key Panel (shown on the left) displays variety of messages of up to 32 characters (16 characters in two lines). These messages are vital communication to operator as well as to service technician and include process status messages, relevant temperature data, user set-up messages, Manual Mode messages, Test Mode messages, Factory Set-up messages, error and caution messages, Data logging messages, etc.

LCD shows

**READY TO WASH  
PUSH WASH BUTTON**

**READY TO RECYCLE  
PUSH START 3 SEC**

alternatively for 5 seconds each,

indicating 23NL is ready for parts cleaning operation and for distillation process.

Upon pressing START button on Key Panel or Optional Foot Switch, the solvent replacement and distillation process starts in the following sequence

- A. **Vacuum Generation:** When the START button is pressed, the vacuum pump starts generating and LCD shows **VACUUM BUILDING UP**. The vacuum pump continues to run until the computer detects the end of distillation process.
- B. **Draining Duty Tank:** Upon computer detecting the vacuum reaching the pre-set level (21”Hg), Wash Pump (Pump 1) is disabled. **Parts cleaning operation cannot be performed during this period which lasts about 4 minutes.** Computer sounds a beep and also LCD shows **WASHPUMP DISABLE FOR 4 MINUTES** to notify operator. Transfer Valve opens allowing all contaminated used solvent drained into the Duty Tank to be transferred into Boiler Tank by vacuum force.
- C. **Rinsing Duty Tank:** Transfer Pump (Pump 1) is activated to spray about a half-gallon of clean solvent to rinse the Duty Tank. The Transfer Valve then opens to drain the solvent used for rinsing into Boiler Tank. The Duty Tank is rinsed and emptied one more time in the same way.
- D. **Filling Duty Tank:** The Transfer Pump is activated to fill Duty Tank with about 5 Gallons of clean solvent from the Clean Solvent Tank.
- E. **Distillation process:** The heaters located at the bottom of the Boiler Tank are turned on and

start heating the contaminated solvent. The heater LED on Key Panel is lit and LCD in the Key Panel shows the temperatures of Boiler Tank and the solvent vapor passage alternatively for 5 seconds each. Upon the Boiler Tank temperature reaching the boiling point of the

contaminated solvent under vacuum, solvent vapor starts flowing from Boiler Tank to Condenser, where vapor is liquefied to become pure solvent. The Vacuum Pump continuously feeds the distilled solvent to Clean Solvent Tank. The distillation process takes about 4 hours

under normal environment. When computer detects the end of distillation, the heater LED is turned off and LCD shows **DISTILLATION COMPLETED** and the vacuum pump is turned off after 2 minutes.

- F. **Cooling cycle:** When Cooling Cycle begins, LCD in the Kay Panel shows “**COOLING T** **COOLING T=xxx°C**” (T=the temperature of Boiler Tank). When the temperature of Boiler Tank falls down to the pre-set value (70°C), display changes to **READY** message.

This cooling cycle takes about 1 to 2 hours depending on boiling point of the solvent and the room temperature.

### **MAINTENANCE SERVICE:**

Uni-ram 23NL is designed and constructed to provide long trouble free operation with many built-in safety features. Uni-ram 23NL is also examined, tested and certified by ETL under UL2208. However, it is important 23NL is operated and maintained correctly according to the instruction in user manual and elsewhere on the unit. Cautions and warnings provided in the user manual and on the unit must be understood and adhered to.

The residue of oil, grease and dirt which is left in the Boiling Tank after the completion of distillation process is drained easily by opening Drain Valve. If the residue is not liquid enough, it may be necessary to remove residue by removing Clean-out Cap.

The interior walls of Boiler Tank remain clean without residue since the solvent vapor functions as a degreaser.

In heavy-use applications, Uni-ram 23NL can be recycled every day, or twice a day if needed. **As a part of safety measure, the next distillation process may not be started until the current distillation process has been completed and LCD shows READY status.**



Uni-ram 23NL has been designed and constructed to assure ease of service as a top priority as demonstrated by the following examples:

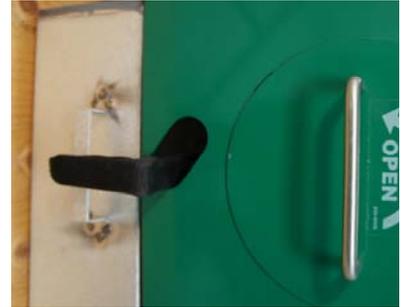
- For the ease of replacement and for longer service life, Wash Pump is not installed inside sink. By applying a supplied plug to the wash pump suction port, Duty Tank (Sink) does not have to be drained for replacement of Wash Pump. Remove Rear Panel and Wash Pump may be removed by unplugging its plug from receptacles and removing one mounting screw.
- For the ease of replacement and for longer service life, Transfer Valve is not installed inside sink. By applying a supplied plug to the bottom opening, Duty Tank (Sink) does not have to be drained for replacement of Transfer Valve. Transfer Valve may be removed simply by unscrewing its body, after removing rear panel.

- Clean Solvent Tank made of Stainless Steel is provided with two shut-off valves for the convenience of service. With both shut-off valves closed, Clean Solvent tank may be removed without draining solvent inside after disconnecting few pipes.
- Boiler Tank may be removed without draining or removing Duty Tank (Sink). Boiler Tank removal requires removing two mounting screws and disconnecting heater wires and other connections, disengaging from drain block and condenser.
- Vacuum Pump can be removed 1st by disconnecting two electric wires and the loosening three tube connections. Draining Clean solvent Tank and Duty Tank are not required.

## **DRAINING THE “RESIDUE”**

Initially, the operator should drain the oily residue daily. The frequency may be reduced according to the amount of residue normally produced in each distillation process.

The residue must not be drained while Uni-ram 23NL parts washer is in distillation process, because the drain-valve and its handle get very hot during the distillation process, and vacuum will be lost when drain valve is opened.



The procedure to drain oily residue is easy and simple.

- Make sure the Residue Drawer is not full and is fully inserted into a slot in Cabinet as shown in the right photo.
- The Handle is in horizontal position when Drain Valve is closed. To open Drain Valve and drain oily residue into Residue Drawer, turn the handle counter-clockwise to vertical position.
- Periodically check the level of residue in Residue drawer and empty the drawer as necessary.

## **THE SOLVENT**

The recommended solvent for Uni-ram 23NL is any Mil-Spec PD-680 Type II or its equivalent. This solvent can be used for all metal-parts cleaning applications, it cleans very effectively and its high 140° F flashpoint makes it very safe. It is only classified as “combustible solvent”, as opposed to “flammable solvent”, for which flashpoint is 100° F or below.

## **REPLENISHING EVAPORATED SOLVENT**

In normal parts cleaning operations, the Uni-ram 23NL recycling parts washer will lose about 1 to 3 gallons of solvent per month. Some solvent is carried away with cleaning cloth or other tool. Since the Clean Solvent Tank holds 30 gallons, the lost solvent need to be replaced approximately every three or four months.

## **ADDITIONAL INFORMATION ON OPERATION OF 23NL**

- It is important to remember that unlike all other parts washers Uni-ram 23NL does not “generate” or “produce” any waste whatsoever, neither hazardous solvent-waste or non-hazardous waste. Uni-ram 23NL just cleans dirty parts and then recovers the clean solvent by separating it from the dirty oil and other contaminants that were removed from the parts. The

dirty, oily residue that is left from Uni-ram 23NL's refining process is not "generated" by 23NL...it was always there, but before it was on the dirty parts.

- The Clean Solvent Tank is equipped with a float switch that provides an audible notification of low solvent levels and automatically prevents the Transfer Pump from working when the solvent level in the Clean Solvent Tank becomes too low. LCD also shows error message to urge to fill Clean Solvent Tank.
- Uni-ram 23NL can actually recycle every six hours if required.
- The oily residue should usually be drained daily.
- For applications where heavy grease is cleaned from the parts, the Uni-ram 23NL parts washer should be recycled daily to prevent the heavy grease from settling and building up in the cleaning tank.
- The solvent in the Clean Solvent Tank never needs "changing", because it is always newly refined and clean. It is only necessary to replenish evaporated solvent every few months.
- The Uni-ram 23NL parts washer draws approximately 14 amps of current during the recycling period of about 4 hours and about 1 amps during cooling period of 1 to 2 hours. Total electricity consumption is estimated at about 7Kw a day or 150Kw a month for distillation activity, based on 5 days a week usage.
- Depending on the degree of contamination and the length and the frequency of parts cleaning operation, daily distillation may not be required.

If, during the recycling operation, there is a power outage or the parts washer is unplugged, when the power is restored Uni-ram 23NL will resume from where it was halted and complete the distillation process.

*When this happens, the User must wait approximately six hours for the recycling and cooling process to complete, then drain the residue and recycle again.*