

# Model LS-Jr. Vacuum Attachment

## Installation and Maintenance Instructions

### INTRODUCTION

The LS-Jr. with vacuum attachment provides for safe in-house reclamation of contaminated solvents with boiling points of 200° to 500°F (93° to 260°C). Most solvents conform easily and safely to this thermal distillation process. However, because most SOLVENTS ARE COMBUSTIBLE, EXTREME CAUTION must be exercised when operating the unit. When properly installed and operated, the LS-JrV provides long, trouble-free service, reclaiming 3 to 4 gallons (11-15 liters) of solvent in 6 to 8 hours. For your safety, reclamation is limited by design to this rate.

### PRINCIPLES

The LS-JrV utilizes breakthrough technology to reclaim higher boiling solvents. A unique vertical solvent pump and JetVac are immersed in a single reservoir and used to create a vacuum in the distillation unit.

Solvent in the reservoir tank is circulated by the solvent pump through the high-velocity JetVac. This high-speed circulation produces a vacuum in the distillation unit. A cooling coil in the reservoir tank maintains solvent temperature. As additional solvent is recovered and cooled, it is gravity fed from the vacuum unit to a 5-gallon distillate pail.

### WARRANTY

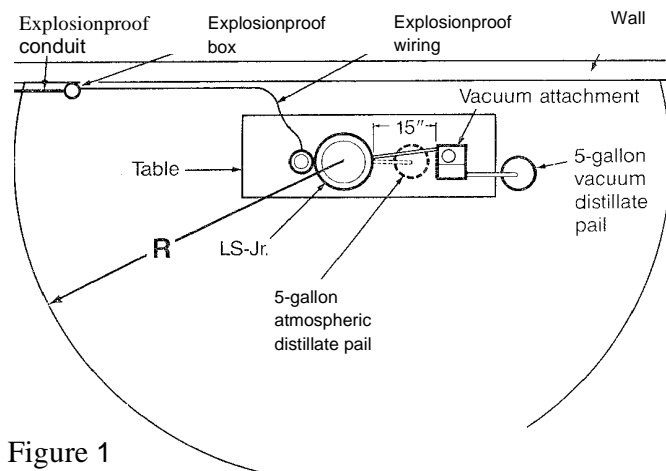
See page 5 for detailed warranty information.

### INSTALLATION SITE

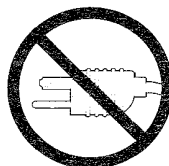
Install in a well-ventilated area in accordance with Articles 500 and 501, Class I, Division 1, Group D of the National Electric Code (explosion proof installation). Installation should be by a qualified electrician and inspected by your insurance company.

The area surrounding the LS-JrV should be inspected carefully to insure an explosionproof area. The LS-JrV must not be installed in an area where open flame, sparks or electrical arcing are present.

You must determine dimension R (see Figure 1). It illustrates the largest area where explosive mixtures can be present. In a well-ventilated area, R is often less than 10 ft. (3m). However, R can also be more than 10 ft.



**Figure 1**  
Ignition of explosive mixtures can result from various items causing "hot spots." Because of this, in the area defined by R, the following are ABSOLUTELY ESSENTIAL.



All electricals must be explosionproof hard conduit and explosion proof boxes.



No potential for sparks can be present (for example, non-explosion proof outlets and electrical switches, coffeepots and other appliances, static electricity sources, etc.).



No flames can be present (for example, torches, furnaces, cigarettes, etc.).

Your qualified electrician can answer any questions you may have for selecting the best LS-Jr. and vacuum attachment installation site and regarding applicable electrical codes.

**WARNING:** The LS-Jr. is a boiling vessel, not a reaction vessel. Chemical reactions within the unit must not be permitted to occur. The user must know the composition of the waste material to be processed. Most contaminated solvents are recommended for the thermal distillation process. However, reactive materials must not be processed in the LS-Jr. distilling unit. You must read and understand the caution printed on the lid of the unit prior to operation, it reads: "**CAUTION: Dangerous health and safety problems will occur if reactive materials (example: lacquers with nitrocellulose) are processed.**"

## INSTALLATION

The LS-Jr. vacuum attachment should be installed on the distillate discharge side of the LS-Jr. with 20 in. (51 cm) of clearance behind and 15 in. (38 cm) between the units. Enough clearance must remain on floor level to the right of the vacuum unit for a 5-gallon (19 liter) vacuum distillate receiving pail.

The LS-Jr. and vacuum attachment require 6 to 13 gallons (23-49 liters) of tap water per hour for cooling. Water enters and exits via hoses on the rear of the units. Two valves are recommended between the water supply and the unit; one for on/off operation, the other set to the desired flow rate. Water flow must be confirmed prior to operation.

The LS-JrV requires an additional 115V, 1 phase, 60 Hz, 4 amps with a separate ground or a 220V, 1 phase, 60 Hz, 2 amp unit is available. All wiring must be connected to a suitable power supply in accordance with the National Electric Code for Class I installations (see Figure 2).

After installation, check the unit's ground. If the resistance between the unit and the transformer's earth ground exceeds 1 ohm, a separate ground must be installed from the unit to the earth ground. The ground wire must be installed to insure safe operation and to eliminate static spark hazard.

## ASSEMBLY

Assembly of the vacuum attachment and connection to the LS-Jr. reclaimer requires a few simple steps. Proper assembly and connection is necessary for operation. The following steps and Figures 4 and 5 serve as assembly guidelines.

1. Remove the discharge hose and fitting from the reclaimer (Item 8). Do not loosen or remove the connecting distillate pipe from the unit.
2. Screw the quick-disconnect coupling onto the reclaimer distillate pipe.
3. Screw the discharge hose and fitting (removed in Step 1) onto the nipple assembly provided for future atmospheric distillation.
4. **For LS-Jr.V installation to an existing LS-Jr.:** Remove the cooling water inlet hose (Item 5) from the back of the reclaiming unit and connect to the vacuum unit cooling water discharge (Item 15).

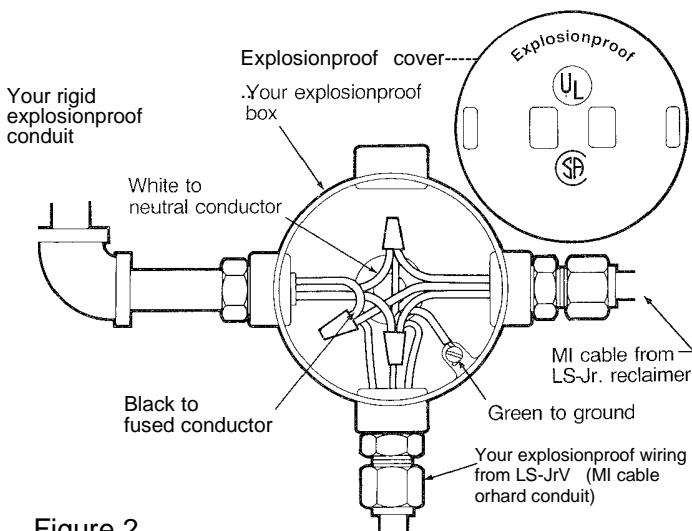


Figure 2

## For simultaneous LS-Jr. and LS-Jr.V installation:

Incoming water is supplied to the LS-Jr.V cooling water inlet (Item 14) on the rear of the vacuum unit. Connect a separate hose from the distillation unit cooling water discharge (Item 6) to a drain.

5. Install the cooling water connection hose between the reclaimer and the vacuum unit. Slide one end of the hose over the barbed fittings of the reclaimer's cooling water inlet (Item 5) and the other end to the vacuum unit's cooling water discharge (Item 15).
6. Screw the vacuum distillate discharge hose (Item 10) into the coupling (Item 24) provided on the side of the LS-JrV reservoir tank. Place a receiving pail next to the table and cut the discharge hose to proper length.
7. Screw the flame-check assembly (Item 19) into the coupling provided on the back of the vacuum attachment reservoir tank.
8. Install a grounding cable (Item 23) between the distillation and vacuum units. To install, remove the bottom left screw from the distillation unit hinge bracket, connect the grounding cable and replace the screw. On the vacuum unit, remove the screw between the cooling water discharge (Item 15) and the flame check (Item 19), connect the grounding cable and replace the screw.

## OPERATION

The LS-Jr.V requires minimal operator attention. The following steps serve as operation guidelines.

### For atmospheric distillation:

Atmospheric distillation allows reclamation of solvents with boiling points to 300°F (149°C). To distill solvents atmospherically, connect the short distillate discharge hose to the reclaimer unit with the quick-disconnect coupling. Then follow Steps 1-11 in the LS-Jr. Installation and Operating Instructions (F86-180-QP).

### For vacuum distillation:

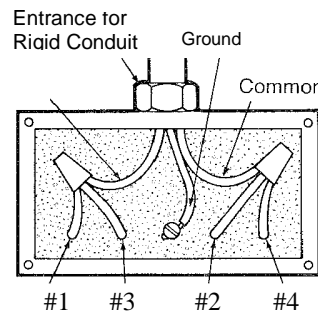
Vacuum distillation allows reclamation of solvents with boiling points with a minimum temperature of 200°F (93°C) and a maximum temperature of 500°F (260°C). To distill solvents in this temperature range under a vacuum:

1. Ground all filling and receiving containers, wiring static ground clamps provided (Items 2 and 17).

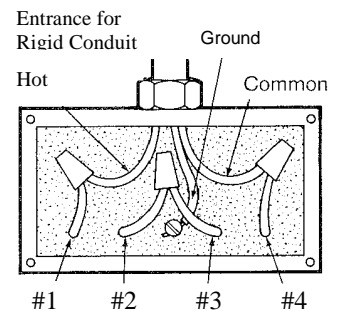
## Vacuum attachment motor wiring

Incoming Power  
(115V, 1 phase, 60 Hz,  
with separate ground)

Incoming Power  
(220V, 1 phase, 60 Hz,  
with separate ground)



For 115V Wiring



For 220V Wiring

2. Install a STILGASKET for each batch processed, following procedures in the LS-Jr. Installation and Operating Instructions. If an optional STILBAG is used, carefully insert bag, making sure no air pockets are present. Position the retainer ring prior to filling.
3. Pump or pour 3 to 4 gallons (11-19 liters) of contaminated solvent from a grounded container into the reclaimer unit's boiling vessel. Stampings on the inside wall of the boiling chamber indicate fill lines. Some solvents may expand and "foam over" during the distillation process. Experience will dictate largest batch size to be processed.
4. Carefully position the reclaimer unit lid, lifting approximately 30° to avoid touching the STILGASKET. When in position, lower the lid slowly, matching flange to flange. Secure the spring release latch.
5. Insert the vacuum distillate hose (Item 25) into the quick disconnect coupling (Item 8) on the reclaimer unit lid.
6. Remove the access lid (Item 18) on the vacuum unit and fill tank with 3 gallons (11 liters) of clean solvent. Clean solvent should be the same as solvent to be reclaimed. Replace access lid on the vacuum unit tank.
7. Place a five-gallon pail on the floor beneath the vacuum unit distillate discharge hose. Ground receiving vessel with static ground clamp.
8. Turn on condenser water. (Operation experience will determine proper adjustment of cooling water flow rate. Generally it can be reduced until distillate temperature increases.)
9. Push distillation unit (Item 1) start/stop button. Red light turns on.
10. Turn on vacuum unit motor (Item 20). After approximately 1 1/2 hours, solvent should be flowing through the discharge hose into the receiving pail. When distillate flow stops, the material has been reclaimed.
11. Push distillation unit start/stop button. Red light turns off.
  12. Remove vacuum-connection discharge hose from the quick-disconnect coupling. Vacuum pressure should return to 0 on vacuum gauge. (Note: Failure to disconnect vacuum-connection hose will result in reclaimed solvent being drawn into the distillation unit.)
13. Turn off vacuum motor.
14. After approximately half an hour, turn off cooling water.
15. Allow unit to cool overnight. Unsecure lid and slowly lift 30° vertically to break seal. Swing lid to back of unit.
16. Remove residue using STILSCRAPER or similar plastic utensil. (If optional STILBAG is used, remove retainer ring and take out residue-filled STILBAG.)

## INSTRUMENTATION AND MAINTENANCE

### Solvent reservoir tank

Contains clean solvent, cooling coils, a solvent pump and a JetVac pump. An overflow pipe carries reclaimed distillate to a receiving pail. Each component in the reservoir tank is used for either creating the required vacuum or condensing reclaimed solvent.

After every 40-60 hours of operation, clean the inside of the reservoir tank. Drain solvent from the tank and clean the tank by wiping with a clean, dry cloth. Refill the reservoir tank with 3 gallons (11 liters) clean solvent.

### Solvent pump

Pressurizes recycled solvent from the reservoir tank to provide a primary (motive) fluid to the JetVac pump.

### JetVac pump

Creates a vacuum in the distillation unit by combining a high-velocity primary jet stream of solvent with a secondary stream of leak-air and condensate from the distillation unit. The JetVac pump also elevates solvent vapors to near-atmospheric conditions and assists in the condensing process.

### Check valve

Used for short intervals, the check valve prevents reclaimed solvent from re-entering the reclaimer unit.

### Y-strainer

Prevents plugging of the vacuum unit should a carry-over occur by trapping large particles. After every 40-60 hours of operation, clean the screen within the V-strainer by removing and rinsing.

### Cooling coils

Water circulation within the cooling coils cools solvent and removes heat from compression, condensation and fluid friction.

### Flame-check

Prevents possible back-flash of flame into the reservoir tank.

### Vacuum relief valve

Allows adjustment to the vacuum, if necessary. Adjustment is rarely necessary and factory settings will usually be satisfactory. To adjust, loosen nuts to decrease vacuum, tighten nuts to increase vacuum. During adjustment, vacuum pressure is indicated on the vacuum gauge.

Solvent boiling points under vacuum

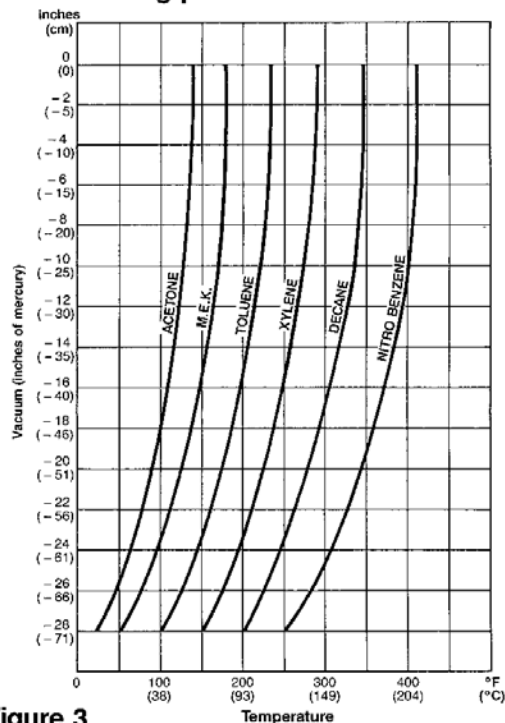


Figure 3

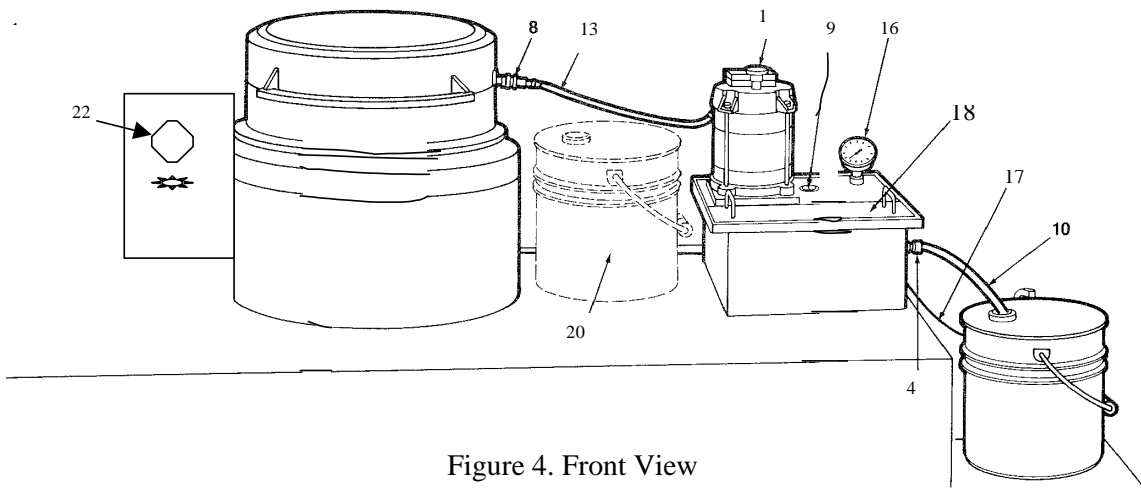


Figure 4. Front View

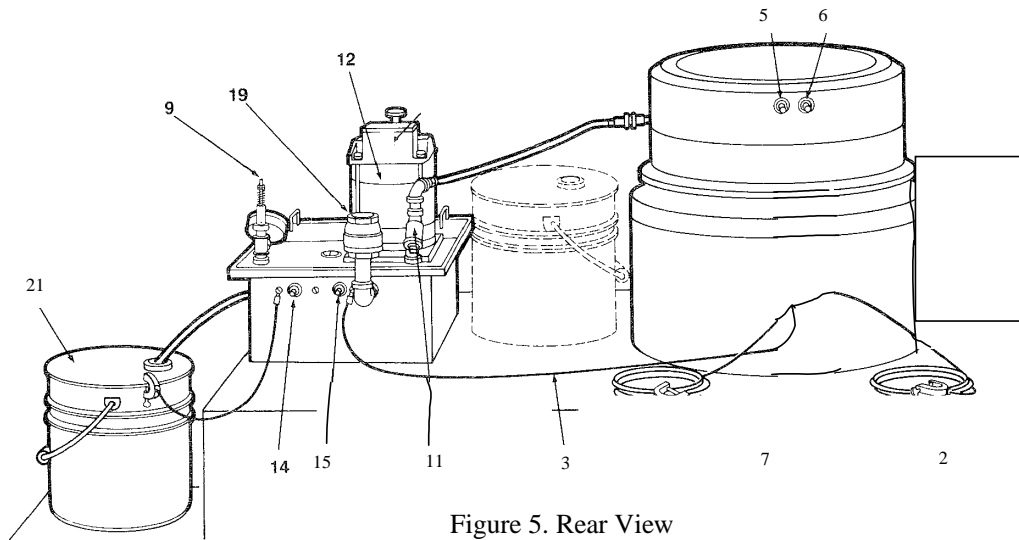


Figure 5. Rear View

Item	Description	Item	Description
1	Vacuum unit on/off switch	14	Vacuum unit cooling water inlet
2	Grounding cable for waste solvent container	15	Vacuum unit cooling water discharge (to No.5)
3	Grounding cable between units	16	Vacuum gauge
4	Distillate hose coupling	17	Grounding cable for vacuum distillate pail
5	Cooling water inlet to condenser (from No. 15)	18	Reservoir access door
6	Cooling water discharge to drain	19	Flame check
7	Grounding cable for atmospheric distillate pail	20	Receiving pail for atmospheric distillation
8	Quick-disconnect coupling	21	Receiving pail for vacuum distillation
9	Adjusting valve	22	Lighted start/stop button (LS-Jr.)
10	Vacuum distillate discharge hose		
11	V-strainer		
12	Explosionproof motor with on/off switch		
13	Vacuum-connection hose		

## CHEMICAL REACTION DISCLAIMER

The user must exercise primary responsibility in selecting the product's materials of construction, which are compatible with the fluid(s) that come(s) in contact with the product. The user may consult Finish Thompson, Inc. (manufacturer) and a manufacturer's representative/distributor agent to seek a recommendation of the product's material of construction that offers the optimum available chemical compatibility.

However neither manufacturer nor agent shall be liable for product damage or failure, injuries, or any other damage or loss arising out of a reaction, interaction or any chemical effect that occurs between the materials of the product's construction and fluids that come into contact with the product's internals.

## WARRANTY

Finish Thompson, Inc (manufacturer) warrants this product to be free of defects in materials and workmanship for a period of 3 years plus lifetime on the LS heater from date of purchase by original purchaser. If a warranted defect, which is determined by manufacturer's inspection, occurs within this period, it will be repaired or replaced at the manufacturer's option, provided (1) the product is submitted with proof of purchase date and (2) transportation charges are prepaid to the manufacturer. Liability under this warranty is expressly limited to repairing or replacing the product or parts thereof and is in lieu of any other warranties, either expressed or implied. This warranty does apply only to normal wear of the product or components. This warranty does not apply to products or parts broken due to, in whole or in part, accident, overload, abuse, chemical attack, tampering, or alteration. The manufacturer accepts no responsibility for product damage or personal injuries sustained when the product is modified in any way. If this warranty does not apply, the purchaser shall bear all cost for labor, material and transportation.

Manufacturer shall not be liable for incidental or consequential damages including, but not limited to process down time, transportation costs, costs associated with replacement or substitution products, labor costs, product installation or removal costs, or loss of profit. In any and all events, manufacturer's liability shall not exceed the purchase price of the product and/or accessories.



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