Baron•Blakeslee

Maintenance and Operation

Instruction Manual

MODEL XLE

VAPOR SPRAY IMMERSION DEGREASER

INSTRUCTION MANUAL
XLE Degreaser
Low Emission,Immersion/Vapor/Spray
Electrically Heated, Refrigeration Cooled
S=Ultrasonics Option

Model and Serial Number_____

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SCOPE OF MANUAL

The information presented in this manual and its attachments are intended by Baron-Blakeslee to provide information to install, start-up, operate, and maintain the equipment described. This manual requires a skill level of its readers and practitioners equivalent to a journeyman status. It recognizes the local code(s), specifications, and other use requirements may be beyond the scope of this manual. The information is intended to be accurate and complete, and is presented in good faith. It is not to be construed as guarantees or warranties, expressed or implied, regarding performance results, comprehensiveness, or merchantability. Nor does this manual imply any recommendations to infringe any patent or an offer of license under any patent.

No person(s) involved directly or indirectly with the installation, use, or operation of Baron-Blakeslee manufactured and distributed equipment or products shall proceed with installation, use, or operation before studying and understanding thoroughly the contents of this publication, and all other publications pertaining to the equipment and any materials used with or in the equipment, such as material safety data sheets. The purchaser retains all responsibility in regards to "right to know" laws, O.S.H.A. and E.P.A. regulations; for any local, state, national code(s), specifications, and other use requirements for any contractor or employee involved.

Baron-Blakeslee reserves the right to make manufacturing changes which may not be included in this manual. Specific options or changes made for your systems application may not be included in this manual. Your Baron-Blakeslee Representative can discuss these items at installation. Refer to notes you take during discussion for specific information on your system which may be contradictory to, or not covered by this manual.

This manual contains Baron-Blakeslee proprietary information. No PART of this manual may be disclosed by others for any purpose, including manufacturing, without prior knowledge and written permission from:

Baron-Blakeslee, Inc.
1905 Mines Road
Pulaski, TN 38478

IMPORTANT MESSAGE

Included as PART of the maintenance and operations manual for your Baron-Blakeslee cleaning system is a Recommended Spare Parts List and/or a standard assembly drawing for your machine.

We suggest that your maintenance personnel review the information and then place an order for the required spare parts. Several items, such as "O" rings, seals, gaskets, etc., must be periodically replaced as a result of normal use. If your machine has the filtering system option, the filter element or cartridge must be replaced on a regular basis to attain satisfactory cleaning results. Stocking the recommended spare parts will insure minimum down time if a component should fail or require replacement during maintenance.

Baron-Blakeslee appreciates the opportunity to be of service, and looks forward to assisting you with your new equipment, as well as any future cleaning requirements.

IMPORTANT RULES FOR VAPOR DEGREASING

No drafts at entrance and exit of equipment. DRAFTS=SOLVENT LOSS.

The equipment should be up to temperature (condensation of heated solvent at cooling coils) before processing any work..

Speed of travel for work entering, leaving, or while in vapor zone is 12 feet per minute maximum. The main reasons are lower solvent losses and cleaner dryer parts.

If spray is required, only spray in vapor zone.

Parts should be arranged so that solvent drains readily. If this is not done, parts can trap solvent and bring solvent vapors out of Degreaser, creating a possible health hazard and undesired solvent losses.

Never lift parts above vapor zone when transferring from one sump to another.

Never let liquid level get below top of heat source. Keep an adequate supply of solvent on hand. The equipment should always be filled to proper operating levels.

Size and type of load to be processed can be critical to efficient operation of the Degreaser. If vapor line lowers rapidly and requires extra time to recover, the load is too great for machine and should be reduced to machine's design limits.

Machine maintenance: a clean-out schedule should be established for the removal of contamination (sludge) from the boil sump(s) at regular intervals to eliminate undesired and unsafe conditions, and to maintain efficient cleaning operation.

Never locate a Degreaser near open flames, baking ovens, or any arc welding operations.

Never place hands below vapor line! Use hooks or long handled baskets to place parts in solvent. Do not use absorbent materials such as cloth, wood, rope, etc., to handle work in a Degreaser.

SECTION 1

XLE DEGREASERS - EQUIPMENT USED FOR SOLVENT CLEANING

(1) What is an XLE Degreaser?

A solvent cleaning system consisting of a heated sump, and rinse sump and a hot vapor sump, with refrigerated primary and freeboard cooling , in a tank with a heating system to bring solvent to the boiling point, and has some means of controlling the vapors in the upper section.

(2) What does it do?

If the solvent is properly selected, contamination will be removed from the PART being cleaned by solvent action.

(3) How does it work?

The selected solvent is heated within the tank, which will generate a vapor. The vaporized solvent is maintained in the tank by means of a cold area which condenses the vapor back to a liquid. The liquid solvent is collected in a trough and directed to a water separator (to remove free water) and returned to the tank.

(4) How does it clean?

The articles to be cleaned are suspended in the air-free zone of solvent vapors, which condense on the cool parts to dissolve the contaminate and give a continuous rinse in clean solvent. As the condensed solvent drains from the PART, it carries off the contaminate and returns to the boiling liquid. The vapor treatment is often augmented by mechanical action such as liquid immersion, or spraying the work with liquid (distillate) solvent in the vapor zone. The work is placed in the Super Heated Vapor Sump for drying. This step will eliminate solvent dragout. The articles should then be slowly withdrawn from the machine. The process is a safe, rapid, economical procedure for preparing dry, clean articles for subsequent finishing or fabricating steps, usually without further treatment. Ultrasonics may be applied to further enhance the cleaning capability of the Degreaser. By adding ultrasonics to a liquid immersion sump, holes and crevices on a part that cannot normally be cleaned by solvent action alone should be penetrated to make the part thoroughly clean.

SECTION 2

SAFETY*

1. Any Degreaser pit two feet deep or more should be exhausted at a minimum rate of twice its air volume per minute. Ventilate at least 10 minutes before entering.

2. Allow solvent to cool before draining. Make sure that all solvent and vapor have been removed before entering or welding in/on a Degreaser. DO NOT enter this machine unless all cleanout doors have been removed. All solvent must be expelled and the unit purged with air by using fan forced or compressed air from above. ENTER ONLY with a life line and NIOSH/MESA approved breathing apparatus, and then ONLY when another man similarly equipped is watching you.

3. Do not smoke in the vicinity of a Degreaser.

4. IF SOLVENT GETS INTO EYE, hold eye open, flush with water for at least 15 minutes, and call a physician. If solvent contacts skin, immediately flush with plenty of water.

5. IF SOLVENT SHOULD SOAK CLOTHING, remove such clothing at once and aerate thoroughly. Use soap and water to wash parts of the body that have been wet with solvent , and then apply a lanolin type cream. Remove contaminated shoes.

6. IF SOLVENT IS SWALLOWED, induce vomiting by sticking finger down throat, or by giving soapy water, or strong salty water to drink (1 TBS. per glass). Repeat until vomit is clean. NEVER induce vomiting or give anything by mouth to an unconscious person, or a person having convulsions.

7. IF A PERSON IS OVERCOME BY EXCESSIVE EXPOSURE, remove patient to fresh air. Call a doctor. If breathing stops, give artificial respiration. When patient starts to breathe again, give oxygen. HIGH VAPOR CONCENTRATION CAN CAUSE UNCONSCIOUSNESS OR DEATH.

NOTE TO PHYSICIAN: Overexposure to many of the chlorinated solvents, especially if accompanied by anoxia, may temporarily increase cardiac irritability. Maintain adequate oxygenation until recovery. Avoid sympathomimetic amines, such as epinephrine, which may precipitate arrhythmia.

SECTION 2

SAFETY (CONTINUED)

8. Stop distillation before heating element surfaces become exposed (liquid level never lower than the top of the heating elements).

9. Never add solvent to hot oil solvent mixtures. Sudden expansion can splash solvent out of the Degreaser and possibly harm the operator.

***** Consult your local solvent supplier for the MATERIAL SAFETY DATA SHEET for the specific solvent you are using in your equipment.

PERSONAL PROTECTION*

Specific requirements deemed necessary for personal protection are listed:

INSTRUCTION:

"All employees working in and around open-surface tank operations must be instructed as to the hazards of their respective jobs, and in the personal protection and first aid procedures applicable to these hazards."

FILLING:

Whenever there is a danger of splashing, for example, when additions are made manually to the tanks, or when acids and chemicals are removed from the tanks, the employees so engaged shall be required to wear either tight fitting chemical goggles or an effective face shield.

EMERGENCIES:

"When, during emergencies, workers must be in areas where concentrations of air contaminants are greater than the threshold limit of solvent, or oxygen concentrations are less than 19.5 percent, they shall be required to wear respirators adequate to reduce their exposure to a level below these limits, or to provide adequate oxygen. Such respirators shall also be provided in marked, quickly accessible storage compartments for the purpose, when there exists the possibility of an accidental release of hazardous concentrations of air contaminants. Respirators shall be approved by the U.S. Bureau of Mines, U.S. Department of the Interior (see 30 CFR Part 11) and shall be selected by a competent industrial hygienist or other technically qualified source. Respirators shall be used in accordance with Section 1910.134 (a), (b), and (c), and persons who may require them shall be trained in their use."

SPLASHING:

"Near each tank containing a liquid which may burn, irritate, or otherwise be harmful to the skin if splashed upon the worker's body, there shall be a supply of clean cold water. The water pipe (carrying a pressure not exceeding 25 pounds) shall be provided with a quick opening valve, and least 48 inches of hose not smaller than 3/4", so that no time may be lost in washing off liquids from the skin or clothing. Alternatively, deluge showers and eye flushes shall be provided in cases where harmful chemicals may be splashed on parts of the body."

*From the Occupational Safety and Health Act.

OPERATION*

--Avoid excessive speed of work in and out of vapor

--Prevent liquid drag-out by entrapment in parts

--Avoid contamination of solvent with water and other materials

--Keep proper heat balance

SPRAY CLEANING AND DEGREASING:

In vapor degreasing, spraying takes place in an air-free atmosphere below the vapor blanket so that evaporative losses due to the mixing of solvent and air are negotiable. However, care should be taken to always emerge parts dry.

COVERS:

We recommend suitable covers for Degreasers to reduce vapor emissions when the Degreasers are not operating, and condenser coils are not functioning. For large machines, roll top covers or power operated covers are available to facilitate their use. Freeboard Chillers are very helpful in reducing solvent emissions. The principle used in this case is the creation of a heavy, cold air blanket over the solvent vapor by means of refrigeration devices.

WELDING IN VICINITY:

"Degreasing or other cleaning operations involving chlorinated hydrocarbons shall be so located that no vapors from these operations will reach or be drawn into the atmosphere surrounding any welding operation. In addition, Trichloroethylene and Perchloroethylene should be kept out of atmospheres penetrated by the ultraviolet radiation of gas shielded by welding operations."

*From the Occupational Safety and Health Act.

SECTION 3

GENERAL

The BARON-BLAKESLEE Precision Cleaning equipment covered by this operating manual is specifically designed for use with , HCFC-225, HFC, HFE and chlorinated solvents.

Models with an "S" in the suffix, such as XLE-18-12-12S are equipped with ultrasonics.

The basic machine is a three sump unit with a clean condensate reservoir equipped with a solvent pump for final spray rinsing. One sump contains the heaters for solvent boiling, while the second sump contains the clean solvent overflow from the spray reservoir, and may be equipped with an ultrasonic transducer bottom, the third sump is super heated for flash drying parts. The condensed vapors are collected in a trough below the condensing coil, and are directed into the gravity type water separator. The clean solvent is stored in the spray reservoir with the overflow directed into the clean solvent sump. Finally, the clean solvent sump overflows into the boiling sump to complete the closed recirculating system. Safety controls (High Temperature and Safety Vapor) are incorporated to turn the boiling sump OFF in the event of either low solvent level in the boiling sump, or high vapor level in the freeboard area.

These models are supplied with a thermostatically controlled refrigeration system energized at all times when the electrical power is connected. The refrigeration unit operates periodically, even when the boiling sump heat is turned OFF to provide a cold blanket of air in the freeboard area covering the solvent. The result is a savings in solvent, due to evaporation, of almost 50% as compared to typical tap water cooled machines.

DO NOT TURN OFF the Refrigeration System while solvent is in the machine. These devices must be "ON" continuously.

SECTION 4

INSTALLATION

A. LOCATION:

Among the considerations in selecting the cleaning system location is providing a work area free of dirt or contamination in the air, and a means of filling and draining the tank when changing solvent solutions. Care must also be taken not to locate the system near blowers, drafts, fans, open windows, doors, open flames, baking ovens, or arc-welding operations. These refrigeration cooled machines require only electrical connections for operation, and are easily moved (if equipped with casters).

When locating these refrigeration cooled machines, it is important that the particular location selected does not restrict the flow of cooling air to the refrigeration condensing unit. In addition, the refrigerated Degreaser must not be operated in a small room without ventilation, since the condensing unit produces heat that would eventually heat up the room air used for cooling the condensing unit.

B. ELECTRICAL CONNECTIONS:

Check the nameplate located on the machine and electrical schematic diagram in the back of the manual for proper voltage, current, and frequency of the input power requirements. Check the electrical schematic for proper connections. A fused disconnect switch must be supplied for the main input power line, if required by local electrical code.

SECTION 4

INSTALLATION (CONTINUED)

D. SETTING SAFETY CONTROLS:

The equipment covered by this manual is protected by built-in safety controls:
Safety Vapor Control (SVC)
High Temperature Control - 1 (HTC-1)
High Temperature Control - 2 (HTC-2)
Liquid Temperature Control (LTC)
Low Level Control (LLC)
Refrigeration Temperature Control (RT)
Vapor Up Control (TH-1)
Hot Oil Temperature Control (TH-2)

The **Safety Vapor Control (SVC)** turns OFF the heat in the event of high vapor level, and must be set at 15°F. below the boiling point of the solvent being used.

The **High Temperature Control (HTC-1)** turns OFF the heat in the event of low solvent level in the boiling sump, and must be set about 25°F. above the boiling point of the solvent used. The controls are manual reset type and must be reset after the fault is corrected, and before the heat can be turned ON. When first turning ON the machine, check controls by pushing the reset buttons in until the switch resets and check solvent level.

The **High Temperature Control 2 (HTC-2)** turns off the Superheat Sump Oil Heaters in the event of low thermal oil level in the Hot Oil tank. The set point should be about 50°F above the Hot Oil temperature Control (TH-2) set point. The controls are manual reset type and must be reset after the fault is corrected, and before the heat can be turned ON. When first turning ON the machine, check controls by pushing the reset buttons in until the switch resets and check solvent level.

The **Liquid Temperature Control (LTC)** is similar to the HTC and is set at 10°F. above the boiling point of the solvent being used. A 10°F. rise in the boiling point indicates that the boiling sump has accumulated the equivalent oil solution of 30% by weight. Along with any other contaminates continued operation may be hazardous.

The **Refrigeration Control (RT)** regulates the temperature of the cooling coils.

The **Vapor Up Control (TH-1)** turns on an indicator light when the solvent vapors are up to proper level on the cooling coils. This indicates the equipment is ready to operate. It also inhibits the spray pump(s) when the vapor line is below the normal operating level. The proper temperature setting 3-5 °F. below the boiling point of the solvent being used.

Refer to Bulletin #1 on Zytron Temperature Controls for Technical Information on the above temperature controllers.

The **Low Level Control (LLC)** is a safety control to turn the heat off if the liquid level falls below a safe level.

The **Hot Oil Temperature Control (TH-2)** with Digital Readout regulates the circulated hot oil temperature but does not directly control the amount of super heat in the vapor sump. i.e. A hot oil temperature of 260°F. may equal a super heat of 140°F. with a solvent that has a 125°F. Boiling Point.

To establish a desired super heat of a given solvent, estimate the necessary Super Heat required to dry your parts. A general range 20°F. to 50°F. of Super Heat (vapor temperature above the Boiling Point temperature) may be used. Using the example above, you decide that the necessary Super Heat is 35°F. or 160°F. vapor temperature. With the hot oil temperature of 260°F. producing a vapor temperature of 140°F., adjust the **Hot Oil Temperature Control (TH-2)** upward approximately 20°F. Some small additional adjustment may be necessary to maintain this amount of Super Heat. While trying to set the degree of Super Heat do not induce any heat loading to this vapor zone. Keep the machine in a steady state mode while making any Super Heat adjustments.

ZYTRON CONTROLS SETTINGS
FOR AK-225 SOLVENT BOILS A 128.0F

SVC	045075	Safety Vapor Control	115°F.
HTC-1	045075	High Temperature Control, Boil Sump ✓	145°F.
HTC-2	045058	High Temperature Control, Hot Vapor Sump	275°F.
LTC	045075	Liquid Temperature Control	140°F.
RT	045076	Refrigeration Control ✓	40°F.
TH-1	045086	Vapor Up Control	125°F.
TH-2	045239	Hot Oil Temperature Control with Digital Readout	250°F.

SECTION 5

OPERATION

A. FILLING PROCEDURE:

Before filling the cleaning system with solvent, be sure that you have checked for possible leaks in the piping. Also check that all drain valves are closed, and drain plugs are installed tightly. Be sure that the cooling media is flowing through the solvent condensing apparatus. Then fill both sumps with the selected solvent to a level even with the divider between the two sumps. Do not attempt to pour solvent into the spray reservoir. After the machine is turned ON and the spray reservoir fills with clean condensate, additional solvent will have to be added to the boiling sump. To charge and seal off the water separator tank after the spray reservoir is full of condensate, pour approximately four cups of clean water into the condensate trough and allow it to run into the water separator tank. Water will drip out of the water separator "water outlet" when fully charged with water. NOTE: Do not pour water into the water separator until solvent overflows from the spray reservoir into the rinse sump.

NOTE: DO NOT add water to a Desiccant Dryer system. This tank contains a dryer media which absorbs water from the distillate solvent. Adding water to this tank defeats its purpose.

TURN ON PROCEDURE:

The Hot Oil Sump should be turned "ON "for 20 minutes before turning the Heat "ON". The temperature may be monitored by the digital readout temperature control located in the Control Panel

The refrigeration system will turn ON automatically as soon as the main power is applied. Until the heat switch is turned ON, the refrigeration system will cycle to maintain an air temperature of approximately 50°F. in the freeboard area above the solvent. After turning ON the heat, the solvent vapors will rise, and the refrigeration system will run continuously to maintain a constant vapor height.

SECTION 5

OPERATION (CONTINUED)

B. CLEANING PROCEDURE:

Never use hands for placing work in machine. Cleaning may begin as soon as the boiling sump starts boiling, and the condensed vapors are dripping off the condensing coil. For ease of handling, large parts may be placed in the cleaning tank directly with long handled hooks or tongs, while small parts are best placed in a basket. (Stainless steel baskets are recommended.) If a basket is used, rack the parts for best drainage and minimum solvent entrapment. Best cleaning will result when the number of parts being cleaned at one time is kept at a minimum. Lower the contaminated work into the boiling sump slowly, and allow to set for several minutes.

The exact time will depend on the kind and amount of contamination, and is best determined by experiment. Next, transfer the work slowly into the clean solvent sump to rinse for several minutes, while moving the part(s) around. Never bring work above the vapor line when transferring. If the clean solvent tank is equipped with ultrasonics, additional surface cleaning will take place. The work can then be raised into the solvent vapor for a spray rinse, if desired, and a final vapor rinse.

C. THE FINAL DRY STAGE:

Super heated vapor is produced in the area above the liquid levels and below the primary cooling coils. The heating source for the super heat come from the right hand sump. This sump is a dry sump with hot oil finned tube heat exchangers located along side the end walls. Intimate contact of the saturated vapor to this heated finned tube super heats the vapor. Super heating means that the vapor temperature is elevated above the its saturated temperature without increasing the pressure. This principal will apply to any given vapor degreasing grade solvent.

The preferred method of vapor drying your work load is to insert the work into the bottom of the right hand drying chamber. Drying time is a system variable, trial and error will be the most effective method to test the time necessary to drain and dry. Be aware that the variables will be Mass, Shape, Area, Material, and Total Weight. Once a time has been establish to dry a particular type part and quantity, the work load needs to timed in the dry step to assure consistently dry parts.

To test for dryness, use a sensitive scale to weight the part just out of the machine and then again in approximately 30 minutes. After completing the cleaning operation, the stainless steel cover should be moved into place to conserve solvent whether the boiling sump is ON or OFF.

D. USING ULTRASONICS:

See Baron-Blakeslee's Ultrasonic Equipment Manual.

E. VAPOR TRAP:

NOTE: The VAPORTRAP should be operated continuously when solvent is in the degreaser. The only exceptions are when performing complete clean out of the unit or during maintenance on the VAPORTRAP.

The following controls on the VAPORTRAP system have been factory set and should not require adjustment under normal conditions:

* Hi-Lo Pressure Switch
* Defrost Pressure Switch
* Hot Gas Bypass Valve
* Expansion Valve

VAPORTRAP MELT SEPARATOR

Precharge the water separator for the VAPORTRAP before operation. Solvent and water must be added manually to this separator in order for the VAPORTRAP to be effective in reducing solvent losses.

Add solvent to the separator by filling indirectly through the upper trough, not the lower condensate trough. Pour slowly allowing the liquid to drain out of the trough into the separator. Finally add the water. This seals the solvent layer of the separator so the solvent does not have an interface with air.

SOLVENT REQUIRED: 3.0 liters
WATER REQUIRED: 1.0 liters

DEFROST CYCLE TIMER

During normal operation, the defrost timer allows the system to operate. When the defrost cycle is activated, the timer switch contacts, which turns the condenser cooling fan "OFF" and de-energizes the liquid line solenoid, causing it to close. At the same time, the defrost pressure switch is energized and the Hot-Gas solenoid valve is opened. Hot refrigerant gas flows through the coils to melt any frost that has formed. Since refrigerant temperature and pressure are in direct proportion, the pressure sensed by the defrost pressure switch begins to increase as the amount of frost available to adsorb the heat of the refrigerant gas decreases. When the pressure switch reaches the "CUT-IN" setpoint, the defrost cycle terminates by closing the Hot-Gas solenoid valve, turning the condenser fan "ON" and opening the liquid line solenoid valve. **When the defrost cycle has terminated and the system begins to operate in its normal mode, the defrost timer MUST be reset before the "CUT-OUT" setting is reached on the defrost pressure switch. If it does not, the system will begin cycling into and out of defrost, which will damage the compressor.**

The defrost cycle is preset at the factory for 1 (one) defrost/hour. The maximum number of cycles/hour would be 2 (two), but this is not recommended, since the unit would not be as effective in controlling solvent losses. DO NOT increase the defrost duration on the timer. This will not enhance the defrost capabilities of the unit, and will cause damage to the compressor. If a severe frosting condition exists that cannot be corrected by a maximum defrost of two cycles/hour, the unit should be shut down and allowed to defrost. The circumstances found to be causing this condition should be corrected. The timer has two dials which set the defrost cycle activation and duration times. The upper dial sets the time period for defrost cycle activation (i.e. one hour would result in one defrost cycle per hour) and the lower dial sets the defrost duration. The time has three selectable ranges of seconds, minutes or hours which may be changed by rotating the screw located on the left hand side.

For equipment protection, automatic compressor shut-down is provided by the motor overloads or the Hi-Lo Pressure switch. Possible reasons for a shut-down include:

1. Increased ambient heat sources.
2. Lack of refrigerant in the system (leaks)
3. Malfunctioning expansion valve (Capillary bulb/tube nicked or broken, valve contamination)
4. Leaking (not fully closed, contaminated) hot gas by-pass valve.

5. Compressor cooling fan not operating.
6. Lack of cooling water to the refrigeration condenser.
7. Lack of cooling water to the degreaser cooling coils/water jacket.

Before a shut-down occurs, the above items will reduce the efficiency of the VAPORTRAP and it will not achieve the 0 F or less reading on the refrigeration thermometer.

VAPORTRAP MAINTENANCE:
The VAPORTRAP system requires minimum maintenance.

-The condensing unit includes a refrigerant sight glass (with white plastic cover). During normal operation, the sight glass may indicate a loss of refrigerant charge. Improper charge will affect the efficiency and life of the system.

-Keep the refrigeration condensing coil area clean. Periodically vacuum the coils, fan, and surrounding area. If you notice a heavy, greasy build-up on the coils, disconnect the power and clean with water and mild detergent.

-Adjust the defrost cycle timing if humidity conditions change. Use the minimum number of cycles required to prevent heavy ice build-up on the coils or in the trough.

SECTION 6
MAINTENANCE

A. REFRIGERATION SYSTEM:

At weekly intervals, or sooner if operating conditions demand, the refrigeration condensing unit heat exchanger must be thoroughly cleaned with compressed air or a vacuum cleaner to remove all dirt, dust or other material that would reduce the heat transfer effectiveness. In the event that the dirt and dust is not removed, the compressor discharge pressure will become too high with a resultant overheating of the compressor motor. Safety controls in the form of a high pressure and thermal overload switch are incorporated in the machine to protect it. A sight glass is included in the high pressure refrigeration liquid line to check the refrigeration system operation. Under normal operating conditions, the sight glass will be clear, without the presence of bubbles. In the event the sight glass contains bubbles, or no liquid refrigerant, the refrigeration system is operating incorrectly due to either a dirty condenser, defective expansion valve, or low refrigerant level as a result of a leak. Under such conditions, the system should not be operated until the faults are corrected.

REFRIGERATION TIMERS:

The dual refrigeration and Vaportrap is controlled by one refrigeration unit operated by three timers.

Timer 2 (TR2) is the timer for controlling the main refrigeration coil (or the bottom primary coil). Set T1 at 2 HRS and T2 at 10 minutes.

Timer 1 (TR1) is the upper Vaportrap coil. Set T1 at 4 HRS and T2 at 10 minutes.

Timer 3 (TR3) is the middle Vaportrap coil (or lower Vaportrap coil). Set T1 at 4 HRS and T2 at 10 minutes.

B. SAFETY VAPOR CONTROL:

At least once a month, check operation of Safety Vapor Control thermostat. This can be done by bringing unit up to heat (vapor condensing on cooling coils).

SECTION 6

MAINTENANCE (CONTINUED)

Open disconnect switch. Wait until vapors are at the top of the cooling coils and clo disconnect switch. Refrigeration will start immediately. Heating elements should n be energized, due to the SVC turning off the heating system. After vapors drop belo the cooling coils (none, or very little vapor condensing on cooling coils) turn heat swit OFF. Re-set Safety Vapor Control, and turn the heat switch to the ON position Heating elements should be energized.

Malfunctioning of Safety Vapor Control can be caused by miscalibration, improper setting, or defective control. (See "Bulletin #1 Zytron Controls" at back of manual.)

C. CLEANING TANK:

The Degreaser tank requires very little maintenance other than an occasional drain and cleaning. The boiling sump can be cleaned by turning ON the heat, and draining th clean condensate from the reservoir tank as it is produced. As soon as the boiling sum level is down to the heaters, the heat switch must be turned OFF. Then the dirt an sludge may be removed through the boiling sump drain valve (small units), or throug the cleanout door opening (large units), before refilling with clean solvent. (Se "Safety" section.)

Mild non-scratching abrasives in powder form (Bon-Ami, or other household cleaner and soap can be used to clean the stainless steel tank. Steel brushes and sponges shoul not be used to clean stainless steel as they may leave particles embedded in the stainles steel surface, which would lead to rusting.

D. SOLVENT MAINTENANCE:

A Degreaser removes oil, chips, and most organic soils. In most Degreasers, the boilin sump collects the majority of contamination. Solvent normally flows from condensin coils to gravity water separator, to spray reservoir, to rinse sump, to boil sump. Th solvent counter-flows the travel of work to provide the purest solvent for rinsi (either by spray or immersion).

SECTION 6

MAINTENANCE (CONTINUED)

CAUTION: Contaminated solvents can be flammable, due to the nature of contamination.

The degree of solvent contamination governs the degree of part cleanliness. Briefly, a "CLEAN DEGREASER" produces "CLEAN PARTS". Oil contamination increases boiling temperature of solvent. When the normal boiling temperature is exceeded by 7°F., machine should be cleaned out.

Contact your local solvent supplier for specific application.

E. HOT OIL SYSTEM

1. Check oil level once per month
2. Check oil temperature. It should never exceed 350° F.
   If you smell burnt oil , check for leaks and proper oil level.

CAUTION! OIL IS EXTREMELY HOT. NEVER TOUCH THE PIPING.

INSTRUCTIONS FOR LIQUID TEMPERATURE SENSOR (LIQUID TEMPERATURE CONTROL)

Baron-Blakeslee has added a thermostat to the boil sump of some Degreasers or Stills, to sense the temperature of the liquid in the boil sump. This thermostat is called a Liquid Temperature Sensor (LTS) (sometimes called a Liquid Temperature Control (LTC). The LTS or LTC is a manual reset thermostat, and must be reset before machine heat can be restarted.

Due to solvent alcohol blends, it is possible to gain alcohol in the boil sump of a Degreaser or in a Solvent Recovery Still. As the alcohol builds up, the boiling point of the solvent gets higher, and if not monitored, can result in a solvent vapor that is flammable.

The LTS should be set at 130°F. for fluorocarbon-alcohol blends. When the LTS shuts off machine heat, the boil sump should be cooled and drained, and the solvent should be disposed of in a proper manner. Then the Degreaser may be filled to proper level with fresh solvent, the LTS should be reset, and the machine heat can be turned back on.

For chlorinated solvent with alcohol, the LTS should be set at 10°F. above the normal boiling point of the solvent.

Thermostats should be checked and calibrated frequently. Refer to Bulletin #1 Zytron Controls.

THERMOSTATS:

045-075	Manual Reset (SVC,HTC1,HTC2,LTC)
045-076	Refrigeration Thermostat
045-086	Vapor-Up Control Thermostat

THERMOCOUPLES:

045-077	6" Long Thermocouple with Polarized Male Connector (SVC, LTC, V.U.)
045-094	18" Long Thermocouple (RT, HTC1,HTC2)
045-093	12" Long Thermocouple (RT)

COMBINATION WATER SEPARATOR/DRYER INSTRUCTIONS

Degreasing solvents are heavier than water. Water will float to the top section of the water separator. Dryer section fills to overflow level with de-watered solvent. This section may contain a cotton bag of Molecular Sieve drying agent.

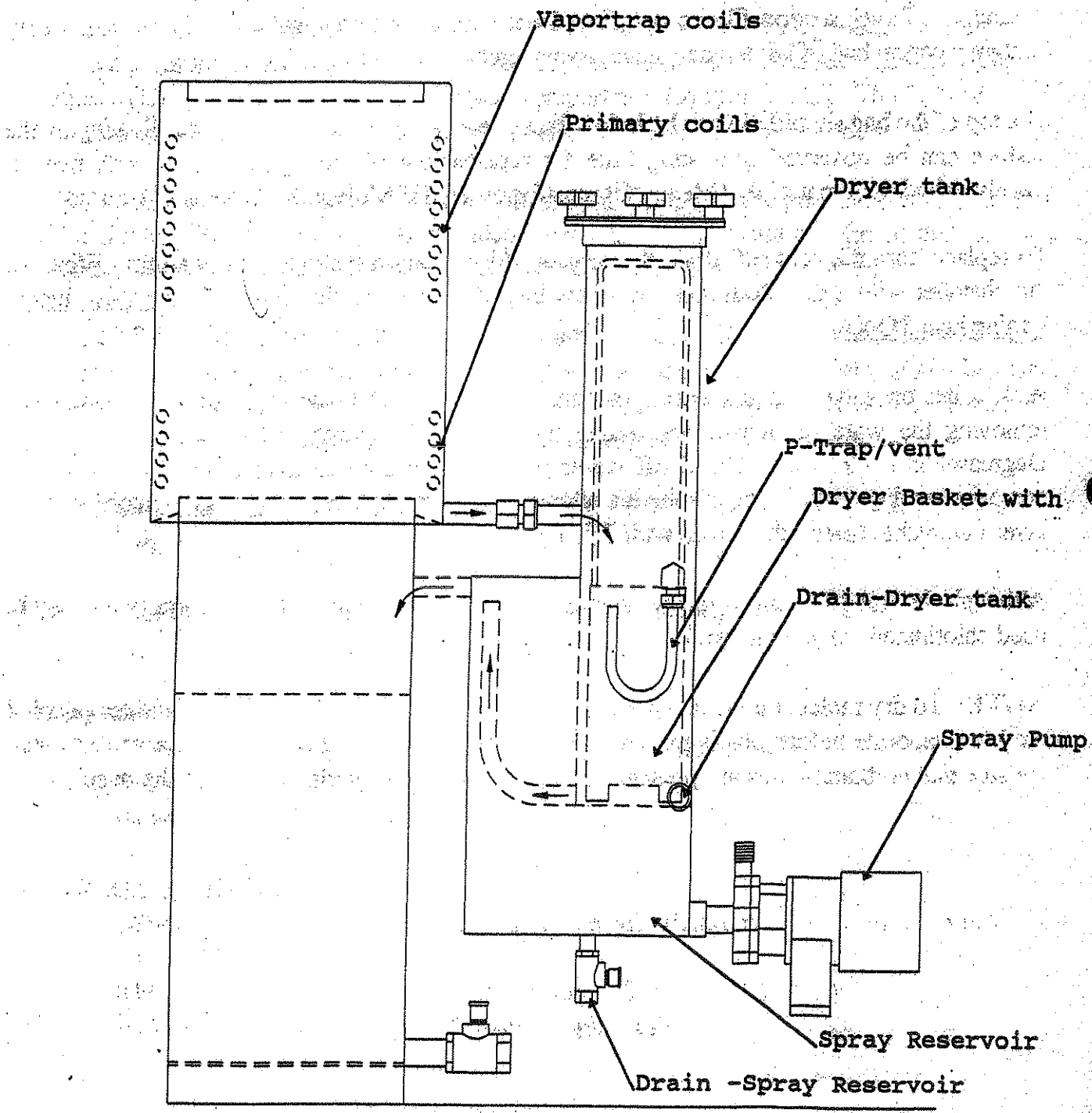
The top of the bag should always be below liquid level so that droplets of water floating on the surface can be observed indicating time for replacement of the drying agent with new or freshly dehydrated material. (Media Kit must be ordered if Molecular Sieve is to be used).

To replace, turn the heat off, drain the separator/dryer, and transfer to vapor sump. Wipe out the chamber with a dry cloth and put a new bag of media into the dryer. Close valve before turning heat **"ON"**.

Bulk water on solvent in the gravity section will if allowed to accumulate. We recommend removing the water at least once a day by opening the purge valve part-way while the Degreaser is up to heat. Bleed off water before it has time to accumulate and develop a corrosive acidity. Also, water solubles allowed to accumulate too long may render the water layer flammable (particularly true with TE, TP, and TA).

Although designed for use with fluorinated solvents, this combination separator/dryer may be used chlorinated solvents as well.

NOTE: To dry molecular sieve, spread it out in a pan to allow solvent and additives (alcohol, etc.) to evaporate before placing in an oven. Dry at 475°F. for three hours in a vented oven. Be sure that no flammables are present before placing the molecular sieve into the oven.


Vaportrap coils
Primary coils
Dryer tank
P-Trap/vent
Dryer Basket with
Drain-Dryer tank
Spray Pump
Spray Reservoir
Drain -Spray Reservoir

Bulletin No. 2312.56
Rev. 2/86

VAPOR-UP CONTROL

Standard Baron-Blakeslee Degreaser operation requires that the sprays never be operated above the vapor blanket in the Degreaser. Doing so will result in excessive solvent emissions, which are costly and create unpleasant working conditions.

To prevent this condition Baron-Blakeslee Model XLE includes the Vapor-Up Control, also known as the spray safety switch. The primary component of the control is a thermostat with probe. The probe is installed in the Degreaser just below the normal vapor level. When properly adjusted, the control will prevent operation of the spray pump until the unit is fully up to heat and the vapor level is established.

During normal operation, if heat is lost or if the unit is overloaded with work, the vapor line will drop causing the Vapor-Up Control to disable the spray pump.

When the vapor line has been re-established, the control will automatically reset, allowing spray to function.

To set the control, set the temperature adjustment above the boiling point of the solvent being used in the Degreaser. Wait until solvent is condensing on the cooling coils. Slowly move the temperature adjustment lower until the Vapor-Up light is illuminated. This will set the thermostat at the vapor temperature. ~~will drop causing the Vapor-Up Control to disable the spray pump.~~

~~When the vapor line has been re-established, the control will automatically reset, allowing spray to function.~~

To set the control, set the temperature adjustment above the boiling point of the solvent being used in the Degreaser. Wait until solvent is condensing on the cooling coils. Slowly move the temperature adjustment lower until the Vapor-Up light is illuminated. This will set the thermostat at the vapor temperature.

REFRIGERATION TROUBLE SHOOTING
(USE ONLY QUALIFIED REFRIGERATION REPAIR SERVICE)

PROBLEM: COMPRESSOR WILL NOT START OR TRY TO RUN

PROBABLE CAUSE	SYMPTOM	REMEDY
Power failure due to blown fuse, open circuit breaker, open disconnect switch, or service switch.	Electrical circuit test shows no power on line side of start relay.	Replace fuse, check load on fuse. Determine why circuit breaker or disconnect switch is open. If no reason, close breaker or switch.
Defective Start Relay.	Test for burned out or open holding coil and broken contacts.	Repair or replace.
Open Control Circuit.	Start relay coil not energized.	Check pressure switch (on 3 H.P. and up) reset switch. Check reason for either too low or too high pressure.
Defective compressor.	Compressor will not run.	Replace defective compressor.
Low voltage.	Electrical circuit tester glows, but not at full brilliance, wiggey moves, but not up to proper voltage.	Check with volt meter, if low internal power source, loose connections, etc. Call power company.
Low oil pressure.	Compressor will restart upon resetting oil pressure switch.	Check oil level, add oil if necessary, check pressure control and wiring.

PROBLEM: CONDENSER STARTS AND STOPS WITH MACHINE HEAT ON

PROBABLE CAUSE	SYMPTOM	REMEDY
Dirty condensing coil.	Condenser shuts off on overload	Clean condensing coil (vacuum, do not brush dirt in).

PROBLEM: CONDENSER STARTS AND STOPS WITH MACHINE HEAT ON - Continued

PROBABLE CAUSE	SYMPTOM	REMEDY
Condenser fan defective.	High head pressure shuts off on overload or pressure switch (if furnished).	Replace defective fan.
Defective run or start capacitor.	Humming on start-up.	Replace defective capacitor.
Defective start relay.	Frequent start-stops.	Replace defective start relay.
Low oil pressure.	Compressor will restart upon resetting oil pressure switch (if furnished).	Check oil level, add oil if necessary, check control wiring, replace control if necessary.

PROBLEM: COOLING COILS FROSTING (NORMAL FOR CHLORINATED SOLVENTS AND LOW AMBIENT CONDITIONS WITH FLUORINATED SOLVENTS)

PROBABLE CAUSE	SYMPTOM	REMEDY
Refrigeration Thermostat (RT) set too low.	Frosting and ice on cooling coils.	Reset Refrigeration Thermostat (RT)to 45°F. Recalibrate if necessary.

PROBLEM: INSUFFICIENT COOLING WITH HEAT "ON"

PROBABLE CAUSE	SYMPTOM	REMEDY
Dirty condensing coils or obstructed air flow over condenser.	Unit heat shuts off on safety vapor thermostat.	Clean condensing coil. Clear air flow over condenser.
System low on refrigerant.	Bubbles in system sight glass.	Repair leak and charge system

PROBLEM: INSUFFICIENT COOLING

PROBABLE CAUSE	SYMPTOM	REMEDY
Restricted line strainer, dryer or expansion valve.	Temperature change in line after restriction (frosting)*. Unit heat shuts off on safety vapor thermostat.	Replace restricted part or adjust expansion valve (if adjustable) to proper super heat setting 8°/12°F.
High ambient temperature, room temperature too high to remove enough heat from condensing coil.	Temperature change in line after restriction (frosting)*. Unit heat shuts off on safety vapor thermostat.	Do not operate equipment until ambient temperature drops.

PROBLEM: COMPRESSOR NOISY WHEN STARTING

PROBABLE CAUSE	SYMPTOM	REMEDY
Check hold down bolts.	Noise from condenser.	Spring mounted compressors - loosen hold down bolts. Check 1/2 H.P. condensing unit base bolts, if too long, shorten them.
Liquid returning to compressor.	Noisy on start-up.	Check R.T. thermostat bulb location, if not on bottom of coil and tight, relocate and tighten.

*NOTE: Frosting at suction accumulator is normal.

PROBLEM: STRONG SOLVENT ODOR AROUND DEGREASER (ALSO SEE HIGH VAPOR CONCENTRATION BELOW)

PROBABLE CAUSE	REMEDY
Cover open.	Keep machine cover closed except when loading, unloading, or hand spraying in the Degreaser.
Drafts over open top Degreasers cause vapor to be disturbed.	Remove fans, air make-up units, etc., from Degreaser area where they can cause air currents over open top Degreasers.

PROBLEM: AIR MAKE-UP UNIT AND GAS FIRED SPACE HEATER CORROSION

PROBABLE CAUSE	REMEDY
Drafts over Degreaser pulling out solvent vapors, solvent vapors decomposing and corroding units.	It may be necessary to put up partitions to block air currents over open top Degreasers. Space heaters require special flue gas venting.

PROBLEM: HIGH VAPOR CONCENTRATION AROUND MACHINE/HIGH SOLVENT USAGE (ALSO SEE SOLVENT ODOR ABOVE)

PROBABLE CAUSE	REMEDY
Work being processed too fast through machine.	Reduce speed - never exceed eleven (11) feet per minute vertical travel. Wait until parts (work) looks dry before removing from machine.
Parts (work) cupping (holding) solvent because of part configuration.	Proper part orientation for complete drainage. Tilt or rotate parts to promote draining.

PROBLEM: HIGH VAPOR CONCENTRATION AROUND MACHINE/HIGH SOLVENT USAGE

PROBABEE CAUSE	REMEDY
Parts cupping solvent.	Tumble parts in vapor to spill out solvent before they are removed from Degreaser.
	(Use rotation basket conveyorized machine, or rotary plating basket that can withstand solvent).
	If none of the above solve the problem, process may require drying tunnel or section with a Carbon Adsorption system. Check with Baron-Blakeslee Representative or Applications Manager at the Factory.
Too high spray pressure or spraying at or above the vapor line.	Reduce spray pressure.
	Do not spray at or just below the vapor line.
	Spray as far below the vapor line as possible.
	See instructions on Degreaser assembly print for vapor line location.
Too large or heavy loads. Vapor line drops with load and takes 5 minutes or more to recover (return to proper level). This pumps a vapor air mixture from machine when vapor line recovers.	Reduce weight or surface area per load to reduce heat requirement.
Solvent leakage or spills.	Use all safety precautions. Evacuate area if necessary. Be sure to notify proper agencies of any reportable release. Correct or repair leaks, clean up any pools of liquid solvent.

	Air out area. Check for safe working conditions before resuming production.
	Always tighten clean-out door gaskets from center out to edges. Use a teflon or teflon filled pipe compound when making up joints in solvent piping. Never use galvanized pipe for solvent.
	Do not use aluminum or any white metal for pumps, fittings, or piping.
Solvent not up to proper temperature, vapor line too low.	Wait until solvent is condensing on cooling coils before processing work.

PROBLEM: PARTS NOT DEGREASING PROPERLY

PROBABLE CAUSE	REMEDY
Solvent too contaminated. High boiling point 9°F. or higher above fresh solvent boiling point. Very little solvent vapor being condensed on cooling coils. Very little condensed solvent coming from Still.	Boil down boiling or vapor sump (see instructions of Degreaser assembly print). Do not expose heating surfaces. Drain boil sump. If boil sump has solids, metal fines, etc., drain entire machine (if Degreaser has more than one sump). Using all safety precautions, clean out machine and refill with fresh degreasing grade solvent.
Improper cleaning cycle. Parts wet when removed from Degreaser. Too fast a cycle.	Increase immersion or time in vapor spray and let dry before removing. Lengthen time and/or immersion in Degreaser.
	Check with Baron-Blakeslee Sales Engineer for proper cleaning process for parts.
Temperature of ultrasonic sump too high - solvent boiling (units with heater/cooler package).	Set heater/cooler thermostat lower - if thermostat non-functional - replace thermostat. See Ultrasonic section of manual for proper cavitating temperature of solvent being used.
No recirculating of heater/cooler package. Too much particulate matter in the Ultrasonic sump.	Replace filter cartridge in recirculating system.

Too much recalculation tends to upset proper ultrasonic operation.	Partially close valve on discharge side of recalculation pump.
Adjustable power control turned down. No ultrasonic activity in sump.	Turn up adjustable power control. Turn up slowly and check parts being processed.

PROBLEM: PARTS NOT DEGREASING PROPERLY

PROBABLE CAUSE	REMEDY
Ultrasonic sump not degassed. Ultrasonic sump must be degassed before proper cavitation for parts cleaning.	Bring sump up to temperature. Turn on Ultrasonic generators. Set half/full wave switch to full.
	Wait for high pitch sound, and until ultrasonic sump surface is peaking with ultrasonic cavitation.

PROBLEM: ULTRASONIC GENERATOR NOT WORKING

Remedy: See trouble shooting in ultrasonic section of manual.

PROBLEM: SPRAY PUMP NOT PUMPING SOLVENT. NO SOLVENT COMING OUT OF SPRAY WAND

PROBABLE CAUSE	REMEDY
Spray reservoir empty.	Reduce amount of spraying. Spraying too much for solvent being condensed.
Not enough solvent being condensed.	Check boiling point of solvent. Maybe too much contamination for proper vapor generation. Drain and replace with fresh solvent.
Condensed solvent overflowing trough back into boil sump.	Clean piping from trough to separator, clean separator and piping to spray reservoir.

Spray filter/strainer clogged.	Replace cartridge filters/clean strainers.
Metal fines in spray pump (especially magnetic drive pump).	Remove metal fines, provide strainer before pump or replace pump with direct drive pump.

PROBLEM: SPRAY PUMP WILL NOT START

PROBABLE CAUSE	REMEDY
Vapor-up thermostat not sensing vapor. Vapor-up light not illuminated.	Machine heat must be on and vapor at proper level to start spray pump.
Vapor-up thermostat out of adjustment.	Re-adjust Vapor-up thermostat. (Calibrate thermostat if necessary, see instruction sheet 2391.7).
Vapor-up Thermostat not functioning.	Replace Vapor-up thermostat.

PROBLEM: SPRAY PUMP WORKS FINE UNTIL SOLVENT (1,1,1 TRICHLOROETHANE OR TRICHLOROETHYLENE) IS HOT WHEN IT IS PUMPED

PROBABLE CAUSE	REMEDY
Magnetic drive spray pump 030-027 and 030-028. Shaft pin on high side of tolerance and impeller I.D. on low side of tolerance.	Enlarge impeller I.D. slightly, or reduce shaft pin OD

PROBLEM: SPRAY PUMP LEAKING SOLVENT

PROBABLE CAUSE	REMEDY
Shaft seal bad. Front end plate loose. (Suction and discharge plate.)	Replace shaft seal(s). Tighten end plate. For Pumpaks see instructions 2391.2, for Tuseal Pumps, see 2391.29.

PROBLEM: SPRAY PUMP ON NO SPRAY, OR UNEVEN SPRAY

PROBABLE CAUSE	REMEDY
Spray nozzle(s) clogged or partially clogged.	Clean spray nozzle(s) if spray headers located in machine - observe all safety precautions - drain and air out machine if necessary.

PROBLEM: HEAT SHUTS OFF BECAUSE OF HIGH TEMPERATURE CONTROL OR LOW LEVEL CONTROL

PROBABLE CAUSE	REMEDY
Liquid level too low in boil sump.	Add fresh degreasing grade solvent until proper level is reached in the boil sump. See Degreaser assembly print.

PROBLEM: HEAT SHUTS OFF BECAUSE OF LIQUID TEMPERATURE CONTROL

PROBABLE CAUSE	REMEDY
Too much alcohol in boil sump when using fluorinated solvent mixes like Blaco-Tron, TMS+, TE, TA, etc. Maximum setting 130°F.	Drain boil sump and fill with fresh solvent through spray reservoir. Dispose of drained solvent properly.
Too much oil in chlorinated solvent. 9 to 10°F. above fresh solvent boiling point.	Drain boil sump and fill with fresh solvent through spray reservoir. Dispose of drained solvent properly.

PROBLEM: HEAT SHUTS OFF BECAUSE OF HIGH TEMPERATURE CONTROL

PROBABLE CAUSE	REMEDY
Metal fines, lint, etc. collecting around thermostat capillary bulb.	Drain sump clean material away from capillary bulb and all solids from sump. Observe all safety precautions when cleaning out boil sump.

PROBLEM: ELECTRIC HEATING ELEMENT BURNT OUT

PROBABLE CAUSE	REMEDY
High contamination in boil sump or Still. Too many solids, oil, etc.	Drain machine, pull clean-out door, clean or replace heating element(s). Observe all safety precautions.

PROBLEM: SOLVENT TAKES A LONG TIME TO HEAT UP. LITTLE CONDENSING OF SOLVENT ON COOLING COILS

PROBABLE CAUSE	REMEDY
Boiling point 9°F. or higher than fresh solvent.	Clean out sump. Observe all safety precautions when cleaning out machine.

PROBLEM: DISTILLATE FLOW SIGHT SHOWS VERY LITTLE FLOW

REMEDY: Refill with fresh degreasing grade solvent.

PROBLEM: PARTS, ESPECIALLY ALUMINUM PARTS, DISCOLORING. TOXIC FUMES, SHARP PUNGENT ODORS. CORROSION ON COOLING COILS, DISCOLORED TANK INTERIOR. CONVEYOR RUSTING.

PROBABLE CAUSE	REMEDY
Acidic solvent, too much aluminum or white metal fines in solvent. Too much water getting into solvent (inhibitors immescible in water).	Stop production. Check pH of solvent (see instructions). Check acid acceptance of solvent. If solvent acidic, see instructions for cleaning acid degreaser - observe all safety precautions. See instructions 2391.16, pages 1,2,3, & 4.

PROBLEM: SAFETY VAPOR CONTROL SHUTS OFF HEAT

PROBABLE CAUSE	REMEDY
Not proper temperature setting.	Calibrate per instruction sheet 2391.7 and readjust. It may be necessary to set a little higher to prevent nuisance shut downs.
Safety vapor control not functioning.	Replace safety vapor control.

SOLVENT CONDENSING IN HEAT SUMP

PROBABLE CAUSE	REMEDY
Not pressing Super Heat button prior to turning "ON" machine.	Always start the Super Heat at least 20 minutes prior to turning machine "ON".
Zytron Controller not properly set.	Check calibration of controllers.
Contactors not working.	

LOW OIL SHUTS OFF HTC2

FLOW SWITCH IN HOT OIL LINE MALFUNCTION

PUMP NOT TURNING ON

HEATER BURNED OUT

OMRON

Check Proper Operation of Safety Vapor Control Weekly

PROBLEM: MACHINE HEAT STAYS ON AND VAPORS COME OUT OF MACHINE

PROBABLE CAUSE	REMEDY
Heat contactor(s) stuck closed.	Turn off main line disconnect (unless Degreaser does not have electric heat and exhaust is required for breathable atmosphere).
Safety vapor control not functioning.	Check for proper setting and calibration (see instruction sheet 2391.7). Replace if necessary.
Acidic Degreaser.	See instructions for cleaning acid Degreaser in this manual.

PROBLEM: MACHINE HEAT OR CONTROL CIRCUIT WILL NOT ENERGIZE

PROBABLE CAUSE	REMEDY
Main line disconnect off.	Turn on main line disconnect.
Fuse(s) blown.	Check fuse(s), find reason for fuse(s) blowing, repair, then replace fuse(s) with proper size (see electrical print).
Control transformer not functioning.	Replace control transformer.
Non functioning pilot light(s), push button(s), or switch(es).	Replace not functioning pilot light(s), push button(s), or switch(es).

PROBLEM: MACHINE HEAT WILL NOT COME ON

PROBABLE CAUSE	REMEDY
Low liquid level.	Add fresh degreasing grade solvent to spray reservoir or distillate tank until level in boil sump is up to proper level.

PROBLEM: SAFETY VAPOR, HIGH TEMPERATURE, OR LIQUID TEMPERATURE CONTROL TRIPPED

PROBABLE CAUSE	REMEDY
Low cooling, dirty boil sump, contaminated or too high boil point of solvent.	Correct condition, reset control.

PROBLEM: GHOST VAPOR (FOGGY WHITE) IN DEGREASER OR STILL

PROBABLE CAUSE	REMEDY
Excess water in solvent.	Check water separator - be sure solvent is flowing through separator and water outlet on separator is free.

WHEN WORKING ON OR NEAR DEGREASING EQUIPMENT, NEVER USE OPEN FLAMES OR ARCS (SUCH AS WELDING) WHEN SOLVENT IS PRESENT IN DEGREASER. ALWAYS DRAIN DEGREASER AND THOROUGHLY AIR OUT AREA BEFORE ATTEMPTING ANY WELDING AND/OR WORK WITH TORCHES. SOME SOLVENT VAPOR AIR CONCENTRATIONS CAN BE IGNITED.

Baron-Blakeslee Technical Bulletin

Equipment Model: M-Line Degreasers	Bulletin Number: 3
Subject: Tuseal Pump (Teflon Seal)	Date: November, 1989

General Description

Baron-Blakeslee Tuseal Pump
Part number 030-250 and 030-255

Models of the M-Line degreasers may use this pump for various functions. Refer to the General Assembly print on your machine for possible applications, as described below.

A Tuseal pump provides solvent transfer from a Degreaser unit to a Solvent Recovery Still. The pump in the Degreaser transfers contaminated solvent from its vapor sump to the Still. The Still then distills this solvent. The distilled solvent then pumps or gravity flows to the cleanest tank of the Degreaser.

Tuseal Pumps are an option for the spray pump. This pump provides a higher pressure or volume of solvent than the standard magnetic drive pump. We use this pump mostly with fixed spray headers.

Tuseal Pumps are an option for the recirculation system. They pump a greater volume of solvent through the heater/cooler and/or filtration system.

The Baron-Blakeslee Tuseal pumps are designed specifically for the application of pumping volatile solvents (readily vaporizable at a relatively low temperature) which are heated near their boiling point and include suspended contaminates. These pumps (030-250 and 030-255) use a Teflon seal, which is most resistant to these solvents. All wetted metal parts are of type 304 stainless steel. The standard motor uses C flange permanently lubricated ball bearings. See a separate bulletin (page 27 in M-Line Manual) on other Tuseal Pumps (030-007 and 030-100).

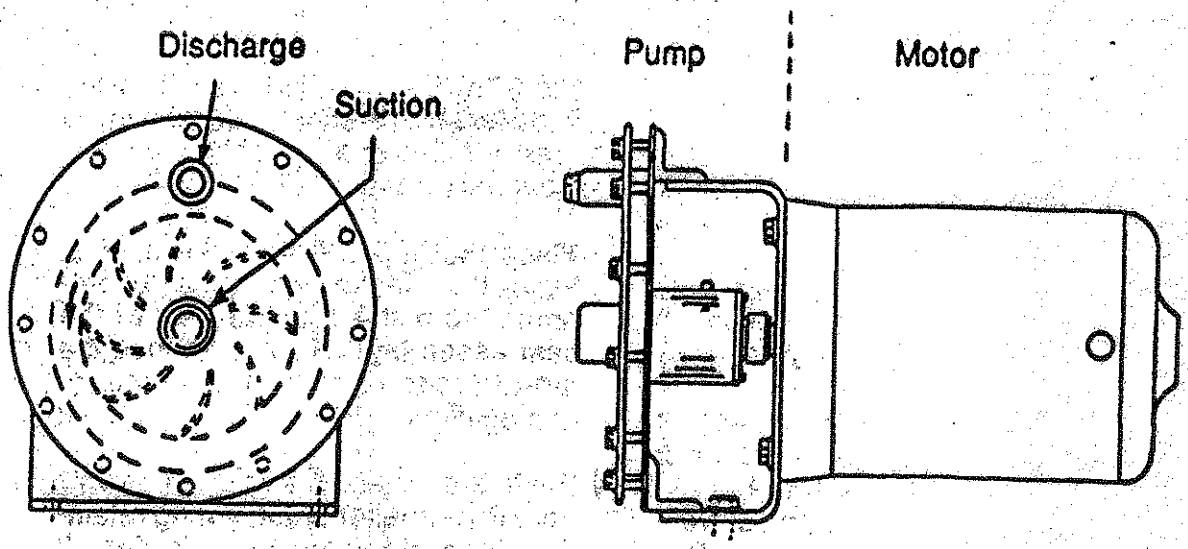


Figure 1 Tuseal Pump

Maintenance

This pump assembly requires very little maintenance. A wet or dark spot on the floor under the pump may indicate a leaking seal. Use the following procedure for field replacement of the Teflon seal assembly. The numbers next to components refer to those shown in figures 2 and 3.

WARNING
DISCONNECT ALL POSSIBLE SOURCES OF ELECTRICAL POWER TO THE PUMP MOTOR BEFORE PROCEEDING.

NOTE: This procedure can vary slightly with different applications for the pump. Refer to prints on your equipment for application, valve location and electrical connections.

1. Close the valves on the pumps suction and discharge sides, or drain solvent from the sump to a level below the pump.

2. With main electrical power off, disconnect the motor leads. Assure the wires are numbered or re-number them for proper reconnection.

3. Position a pan under the suction (inlet) union of the pump. Loosen and disconnect the union from the pump. Allow the trapped solvent to drain into the pan. Empty the pan in the vapor sump of the cleaner or Still.

4. Disconnect the union on the discharge side of the pump. Some applications connect a tube from a fitting on the seal housing (2) and the discharge side of the system. This keeps the seal wetted and thereby cooled. If equipped, disconnect this tube fitting.

5. Remove the pump support bracket (1) mounting bolts. Remove the pump and motor from the machine as an assembly. Drain any trapped solvent from the pump into a pan or vapor sump.

6. Loosen the set screws in the set collar (7). Remove the 4 bolts securing the motor to the support bracket, and the motor.

7. Remove the 12 bolts and cover plate (8). Remove the set collar from the impeller (3) shaft. Remove the impeller.

8. Remove the two socket head screws and the seal housing cover (5). Discard the "O" ring (6) and the ceramic seat with Teflon backing (stationary part of item 4).

9. Loosen the 3 set screws and remove the rotating seal (rotating part of item 4) from the impeller shaft.

10. Clean all pump parts. Lubricate the seal housing cover (5) with a light, clean mineral oil.

11. Remove the stationary seat (white) with cardboard facing, from the packaging. Align a notch in the ceramic of the stationary seat with the roll pin in the cover (5). This pin assures that the stationary seat will not rotate. Press the Teflon (red marked side) into the seal housing cover (leave cardboard on seal face). Use special care to press the stationary seat in place so that it is square, flat and tight against the seal housing cover. Remove the cardboard facing and apply a coat of oil on the face of the seat.

12. Clean the impeller and shaft (3). If the impeller shaft is scored, polish it in the area for the seal. Apply a coat of clean oil on the shaft.

13. Place the impeller face down. Remove the plastic packing and cardboard from the rotating part of the seal assembly. Do not remove the tape from the seal or the spring retaining clips.

14. Push the rotating seal part evenly onto the impeller shaft, spring retaining clip end toward the impeller. If your pump includes a seal spacer, press it against the back of the impeller plate and press the seal against the spacer. If your pump does not

include the spacer, position the front edge (spring clip end) of the rotating seal part next to the groove in the shaft, and/or use callipers to position it for 29/32 inch (.906") between the back of the impeller plate and the spring clip end of the seal part. Tighten the 3 set screws in the rotating seal part. Remove the tape and spring clips from the rotating seal part. Coat the carbon face with clean oil.

15. Coat the new "O" ring (6) with clean oil. Assemble the "O" ring onto the seal housing cover. Reassemble the seal housing cover onto the seal housing and tighten its two mounting screws.

16. Assemble the motor on the support bracket. Properly position the motor for alignment of electrical connections. Position the motor flush with the mounting bracket. Assemble and tighten the 4 mounting bolts. Assemble the set collar over the motor shaft.

17. Insert the impeller shaft with the rotating seal part, into the impeller/seal housing. Insert the impeller assembly until the machined step on the shaft extends beyond the seal housing cover (over the motor shaft) and the larger diameter of the shaft is flush with the cover.

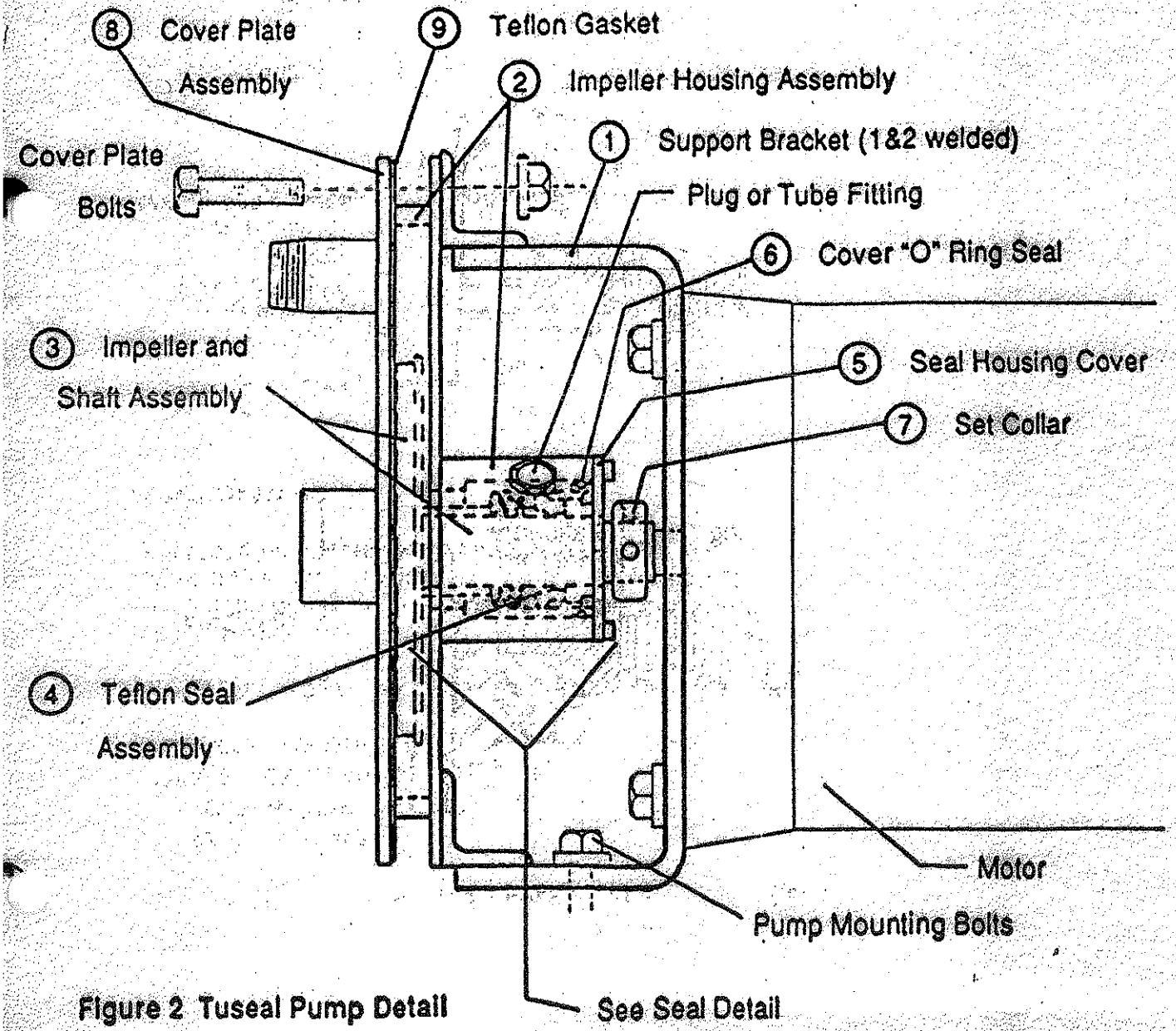


Figure 2 Tuseal Pump Detail

18. Position the set collar on the impeller shaft. Align the collar so the two set screws position, bridge the slot in the impeller shaft. Assure that the collar does not rub on the seal housing cover. Tighten the set screws to clamp the impeller shaft to the motor shaft. Check for free rotation of the impeller. If it does not turn, rubs or binds (scraping sounds), loosen the set collar and slightly move the impeller away from the motor. Verify free rotation. Retighten the set collar screws.

19. Assemble the new gasket (9) to align with the cover plate (8). Assemble the cover plate and gasket to the impeller housing (2) and bracket (1) assembly with the 12 mounting bolts. Center the gasket (check the entire perimeter). Tighten all bolts evenly in a cross pattern.

20. Re-check for free rotation of the impeller (turn at the set collar). Loosen the set collar and slightly move the impeller, if necessary. Verify free rotation. Retighten the set collar screws.

21. Reassemble the pump assembly into the machine. Reconnect piping and wiring. Open the suction and discharge valves and inspect for leaks. Verify proper rotation of the pump.

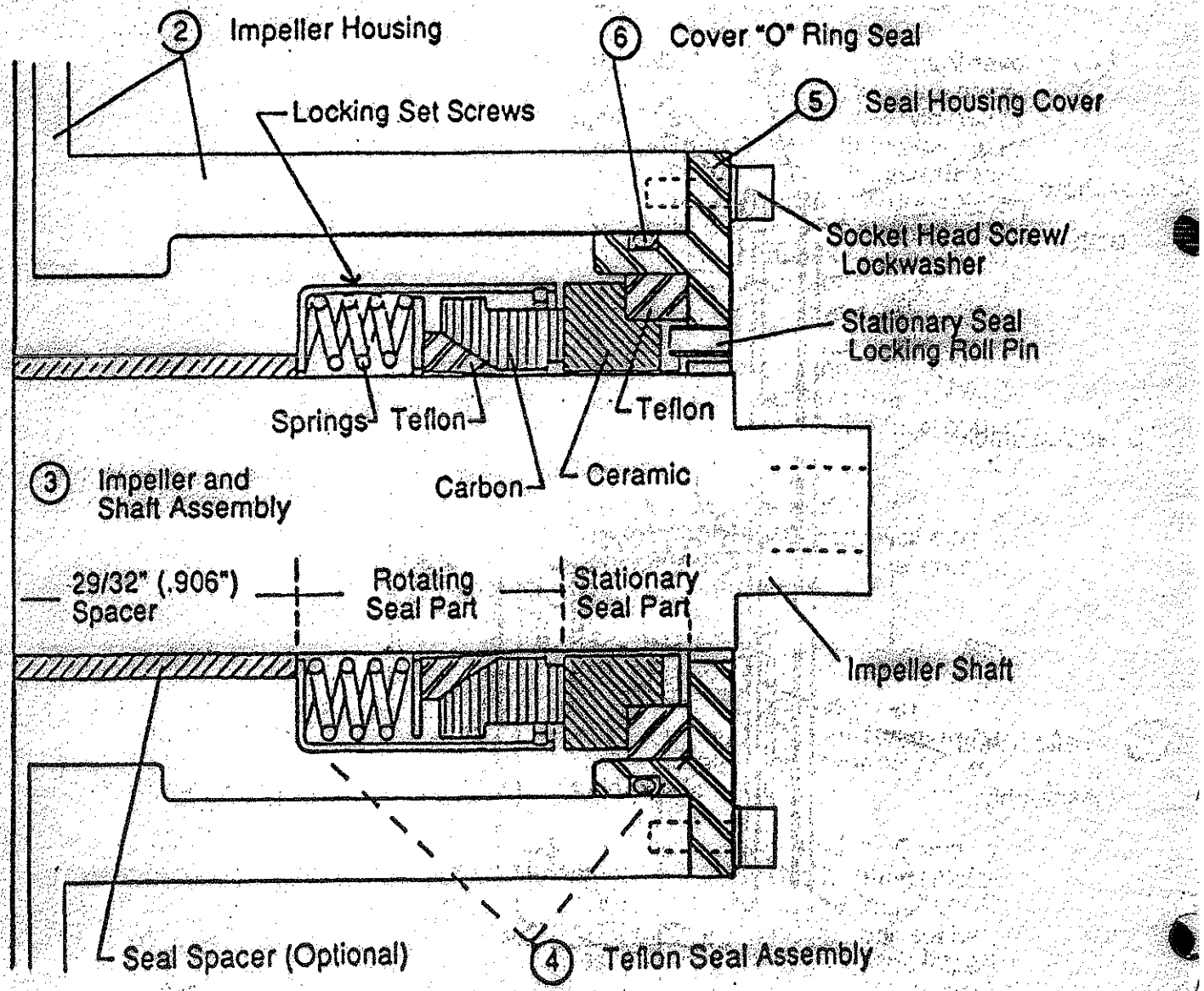


Figure 3 Teflon Seal Detail

Parts List

Pump- A - All wetted parts are of type 304 stainless steel, Teflon seal and gaskets, 1" FPT suction, 1/2" MPT discharge;
B - Same as Pump A, except 1.25" FPT suction, 1" MPT discharge.

NOTE:Item numbers refer to those listed in Figures 2 and 3.

Item#	Part#	Description	Quantity
A	030-250	Tuseal Pump 1 x 1/2	
1	-	Support Bracket (1&2 welded)	1
2	-	Impeller Housing Assembly (1&2 welded)	1
3	-	Impeller and Shaft Assembly	1
*4	032-145	Teflon Seal Assembly	1
	-	Seal Spacer (Optional)	1
5	-	Seal Housing Cover	1
	LP	#8-32 x 3/8" Socket Head Screw	2
	LP	#8 Lockwasher	2
	LP	Seal Locking Roll Pin, 3/32"D x 3/16"L	1
*6	032-144	Teflon encapsulated "O" Ring (cover seal)	1
7	059-381	Set Collar (with 2 socket head set screws)	1
8	032-099	Cover Plate Assembly (with pipe fittings)	1
	LP	5/16 - 18 x 1 1/4" Hex Head Cap Screw	12
	LP	5/16 Hex Nut (Keps)	12
*9	059-027	Teflon housing gasket	1
B	030-255	Tuseal Pump 1.25 x 1	
8	032-124	Cover Plate Assembly (with pipe fittings)	1

All other parts with numbers are interchangeable with Pump (A).

LP = Local Purchase (common hardware items)
* = Recommended spares

Parts Ordering

We recommend that you maintain spare parts inventory to reduce production down time. If this time is critical, order the complete pump assembly. Also order parts to rebuild the pump. When ordering, please provide the model and serial number of your equipment.

Write, fax or call your Customer Service Representative at:

1500 WEST 16TH STREET
LONG BEACH, CA 90813
(310) 491-1228
FAX: (310) 491-1091

Phone: (800) 548-4422

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A DOVER DIVERSIFIED COMPANY

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2391.29 DOUBLE SEAL REPLACEMENT – TUSEAL PUMP

INSTRUCTION BULLETIN

FIELD REPLACEMENT OF DOUBLE SEALS ON THE BARON-BLAKESLEE TUSEAL PUMP

CAUTION: BEFORE BEGINNING REPAIRS, READ THESE INSTRUCTIONS THOROUGHLY AND REVIEW THE SAFETY PROCEDURES FOUND IN YOUR EQUIPMENT'S INSTRUCTIONS MANUAL. TURN OFF ALL ELECTRICAL POWER TO THE MACHINE.

1. Unless there is adequate working space around the pump, we suggest you disconnect the pump from the discharge and suction piping. CAUTION: Before breaking these connections, the solvent flow to the pump must be turned off. Unless provided with isolating valves on the suction and discharge, the tank solvent level must be lowered below the piping tank connections to prevent flow. Residual solvent must be allowed to cool to room temperature, then drained and stored in a suitable container for re-use. All spills should be cleaned-up immediately. Set the pump and motor on end, with the pump at the top.

2. Remove the twelve (12) bolts securing the face plate to the pump. Set aside the bolts and face plate. Loosen the two (2) set screws on the set collar.

3. Carefully pull the impeller straight out from the pump and seal housing, and inspect the impeller shaft. If the shaft has been scored, use emery cloth to remove the marks before re-assembly.

4. Seperate the pump from the motor by removing the four bolts in the pump frame. Lay the pump flat, with the seal housing at the top.

5. Remove the two (2) socket head cap screws securing the seal housing cover and remove.

6. Remove the old seal assembly and clean the seal housing.

7. Oil the seal with a light machine oil and install it with the white side up. Tap down with handle of screw driver to seat.

8. Oil the impeller shaft and slide into place.

9. Oil one (1) carbon seal and install by pushing down with a piece of pipe of 1 1/8" O.D. copper tubing.

10. Oil and install the spring and other carbon seal.

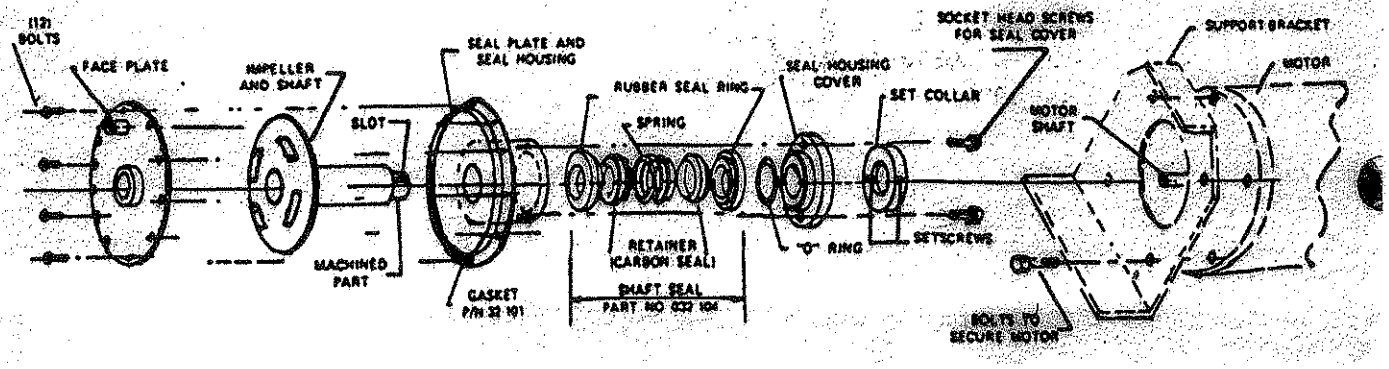
11. Inspect and oil and install the rear seal into the seal housing cover. Install the O-Ring (replace if nicked or distorted) on the cover and screw down the housing cover.

12. Push impeller shaft onto motor shaft until 1/16 inch of machined part of impeller shaft is showing between the set collar and the back of the pump. Tighten set screws – one on each side of the slot in the impeller shaft.

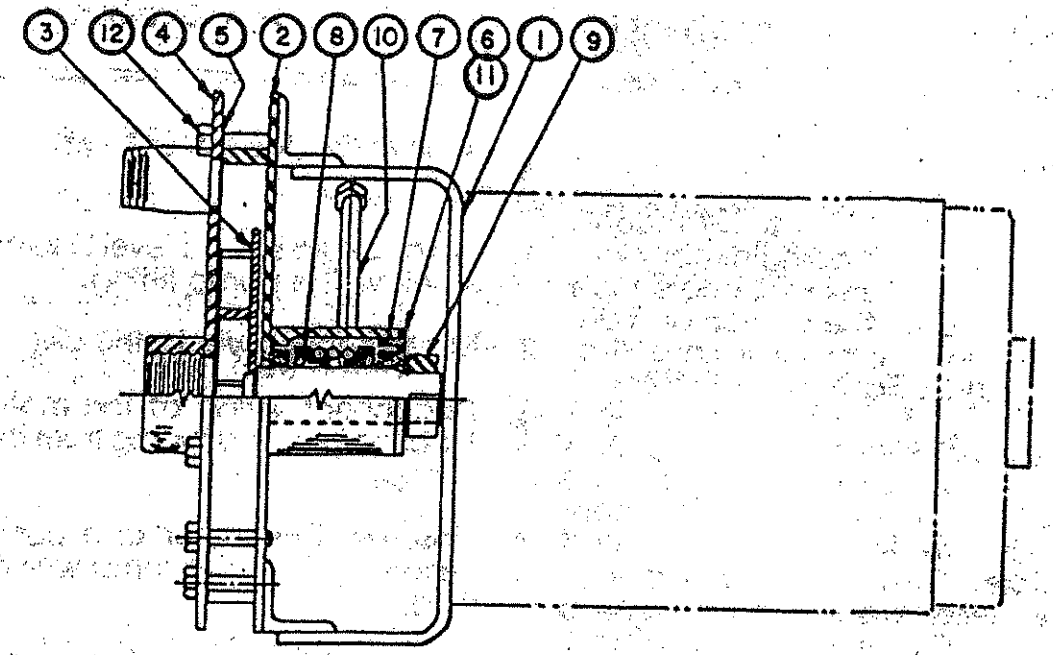
13. Examine the pump case gasket and replace if necessary. Re-assemble the face plate and gasket to the pump.

14. Check for free rotation and rubbing sounds. If the impeller does not turn or if there is a scraping sound, repeat step 12.

15. Remove oil filler plug and air dome. Fill housing with Shell Donax #10 T-6 oil or equal automotive automatic transmission oil. Do not overfill. Allow for oil expansion.



TUSEAL PUMP PARTS LIST



1"X 1/2" PUMP P/N 30-007 — 1 1/4" X 1" PUMP P/N 030-100

ITEM NO.	B.B.I. NUMBER	DESCRIPTION	DWG. NO	USED ON
1	032-090	SUPPORT BRACKET	3-71356-C	1"X 1/2" 1 1/4" X 1" PUMP(S)
2	032A-091 / 032-120	IMPELLER HOUSING	3-75386	1"X 1/2" PUMP
			3-74796	1 1/4 X 1" PUMP
3	032A-095 / 032-121	IMPELLER	2-75385	1"X 1/2" PUMP
			2-74798	1 1/4 X 1" PUMP
4	032-099 / 032-124	PLATE (FOR SUCTION & DISCH.)	3-71357-A	1"X 1/2" PUMP
			3-74801	1 1/4" X 1" PUMP
5	032-101	GASKET	7 7/8" O.D x 7" I.D.	BOTH PUMPS
6	032-102	COVER (FOR SEAL HOUSING)	1-71792	BOTH PUMPS
7	032-103	"O" RING	17507-132	BOTH PUMPS
8	032-104	DOUBLE SEAL	T-21XP-171	BOTH PUMPS
9	059-381	SET COLLAR	3/4" DIA.	BOTH PUMPS
10	032-105	FILLER PLUG & AIRDOME	1-71725	BOTH PUMPS
11		NO. 8-32 X 3/8" FIL. HD. MACH. SCR.	2- REQD.	BOTH PUMPS
12		5/16-18 X 1 1/4" LG. MACH SCR. & LWRS.	12- REQD.	BOTH PUMPS

NOTE: Fill seal housing with Shell Donax T-6 oil or equal.

Baron-Blakeslee Technical Bulletin

Equipment Model: General | Bulletin Number: 2

Subject: Magnetic Drive Solvent Pump | Date: October, 1989

General Description

This pump assembly usually mounts on the unit by threading directly into a fitting on the tank wall (male pipe threads on both the suction and discharge fittings). It is used in rinse filtration and in distillate spray systems.

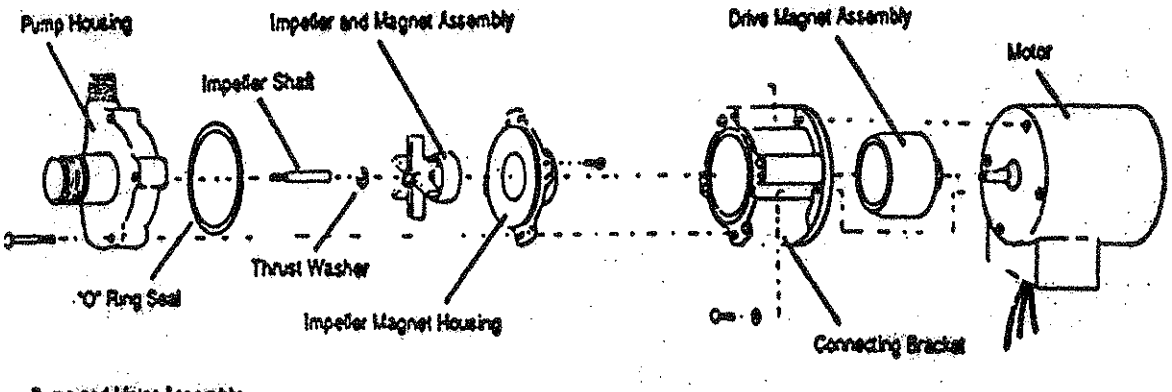
A magnetic drive pump allows for a more reliable seal against solvent leaks. The motor shaft does not connect directly to the impeller and therefore, does not require a seal. The impeller assembly contains a magnet which "floats" in a cup housing. A cup shaped magnet connects to the motor shaft. This magnet fits over the impeller housing. As the motor and magnet rotate, it magnetically turns the impeller. This arrangement normally creates a positive drive from the motor to the impeller. However, if the impeller binds or stalls, it does not cause a bind and overheating of the motor. Note that if the solvent temperature exceeds 200°F (Perchlorethylene), the magnets loose their function. The impeller temporarily stalls until the magnets cool. Use a different pump or cool the solvent prior to the pump.

To Remove/Replace the Pump Assembly

1. Drain/ assure solvent level in sump is below the pump fitting,
2. Disconnect power to the unit,
3. Disconnect wiring at the motor junction box and piping from the pump,
4. Unscrew the motor and pump assembly from the sump wall fitting,
5. Reassemble the new pump in reverse of removal - use new Teflon tape or Teflon based pipe thread compound on the fittings.

Preventive Maintenance

The only routine maintenance required on this assembly is lubrication of the motor, and observing the assembly for solvent leaks and proper output. Each six (6) months, add several drops of S.A.E. 20 wt. oil in the motor lubrication tube. If a leak is noticed, replace the "O" ring seal. If



Pump and Motor Assembly

output volume/ pressure is decreasing, clean the pump assembly. Contaminations in the solvent, particularly metal fines, can collect around the magnet and cause the impeller to bind.

Pump Cleaning/ Repair

1. Remove the pump assembly from the unit,
2. Remove the four (4) screws securing the pump housing to the connecting bracket (see illustration),
3. Remove the four (4) screws securing the impeller magnet housing to the pump housing (4 hex nuts on the S-S model),
4. Remove the impeller/magnet from the housing and clean all parts,
5. Install a new "O" ring and reassemble in reverse order of disassembly. Tighten the screws evenly and in a cross pattern.

NOTE:
You may prefer to leave the pump housing attached to the sump fitting, and remove the rest of the assembly from the housing.

Motor Wiring Connections :

115 Volt operation		230 Volt operation	
white black	line	white	line
		black blue	
red blue	line	red	line
green/yellow	ground	green/yellow	ground

Parts Ordering

We recommend that you maintain spare parts inventory to reduce production down time. If this time is critical, order the complete pump assembly. Also order parts to rebuild the pump. When ordering, please provide the model and serial number of your equipment.

Write, fax or call your Customer Service Representative at:

Allied/Baron-Blakeslee
Customer Service Department
2001 North Janice Avenue
Melrose Park, Illinois 60160

Fax: (708) 450-3884
Phone: (800) 548-4422, or (708) 450-3909

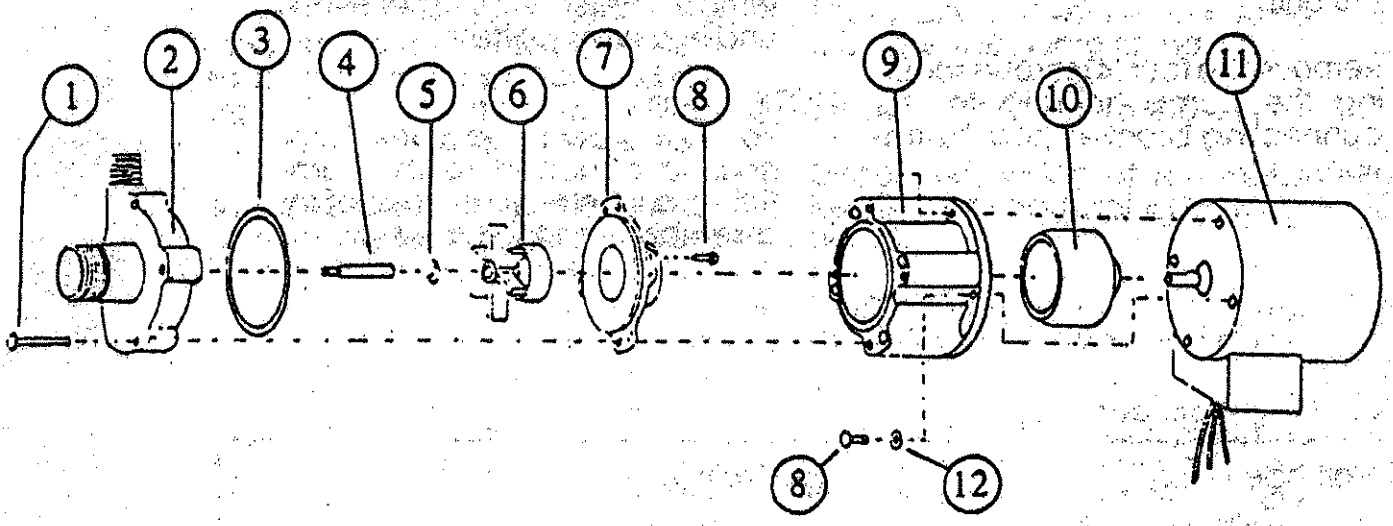
Magnetic Drive Solvent Pump

Specifications:

Motor- 115/230 Volts, Single Phase, 50/60 Hertz, 1.4/.70 Amp., 3050 R.P.M., 1/25 H.P., Continuous Duty.

Pump- A - Bronze Housing, Ryton Impeller, Viton Seal, Center Inlet, 3/4" MPT Suction, 1/2" MPT Outlet;

B - Same as Pump A, except all wetted parts are ~~of Type 304 Stainless Steel~~ and "O" Ring Seal is Teflon. Electroless Nickle Plated



Parts List

Item#	Parts	Description	Quantity
A	030-027	Bronze Pump and Motor Assembly	
1	LP	#8 X 1 1/4" Long Round Head Screw	4
2	032-270	Pump Housing	1
*3	032-143	"O" Ring Seal - Viton (2.5 inch O.D.)	1
	033-055	"O" Ring Seal - Teflon Encapsulated	1
4	032-273	Impeller Shaft threaded, 032-279 Flatten	1
5	032-274	Thrust Washer	1
*6	032-272	Impeller and Magnet Assembly	1
7	032-275	Impeller Magnet Housing	1
8	LP	#8 X 3/8" Long Round Head Screw	
9	032-276	Connecting Bracket	1
10	032-277	Drive Magnet Assembly	1
11	NA	Motor	1
12	LP	#8 Flat Washer	4
B	030-028	/ Motor Assembly (Teflon Seal)	
1	LP	#8 X 1 1/16" Long S-S Round Head Screw	4
2	032-271	S-S Pump Housing	1
8	LP	#8 S-S Hex Nut (for Remain Screws in HSG.)	4
3-7 and 9-12		Parts are interchangeable with the Bronze Pump (A).	

NOTE: LP = Local Purchase (common hardware items)

* = Recommended spares

INSTRUCTION BULLETIN

HOW TO START UP AND CLEAN BARON BLAKESLEE SINGLE COLUMN CARTRIDGE FILTERS

WHEN TO SERVICE:

As the filter cartridge removes contamination, the pressure drop across the unit will slowly rise. You can determine this by mounting a pressure gauge upstream from the filter or by mounting a gauge in the vent opening with a T, so that the filter can still be vented.

Experience with your particular application will determine the pressure rise indicative of a dirty filter. Without pressure gauges, too low a flow rate will indicate when new cartridges are required.

HOW TO SERVICE:

When filter cartridges need replacement:

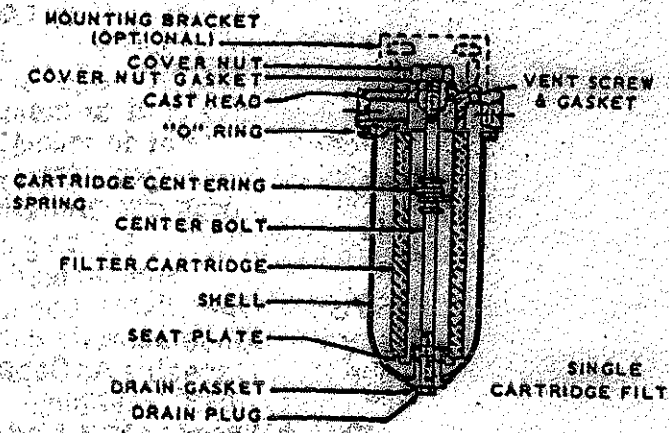
1 - Close inlet and outlet valves to unit.
2 - Open bottom drain plug and loosen vent screw to drain unit.
3 - Unscrew cover nut while supporting bottom assembly with hand.
4 - Remove and discard used cartridge.
5 - Clean all parts.
6 - Inspect, clean, and replace, if necessary, head and base gaskets or "O" ring as required by the particular filter unit being serviced.
7 - In two and three cartridge units, insert cartridge connector in one cartridge, then place second cartridge over other end -- being careful that spacer is between the cartridges. (Should tension between cartridge and connector weaken, spread connector with fingers.)
8 - Place new filter cartridge over boss in shell.
9 - Raise entire shell assembly to filter head until the cartridge guide engages in the cartridge center core.
10 - Rescrew cover nut and tighten until metal to metal contact is made on "O" ring unit; 15 ft.-lbs. of torque on flat gasket unit. Do not exceed this limit in either case.

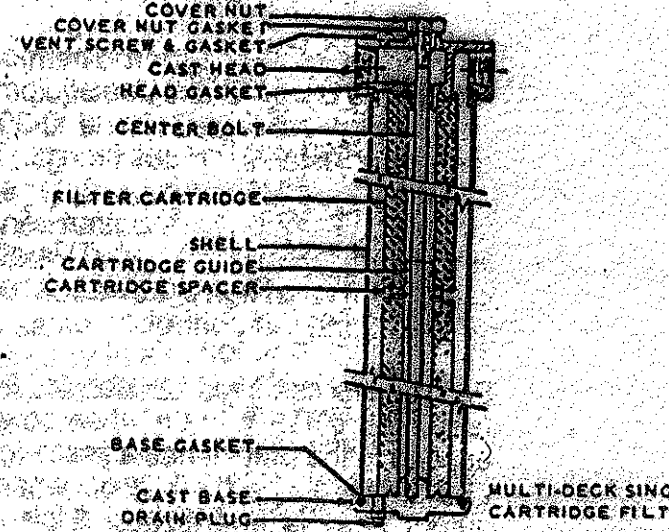
HOW TO OPERATE:

1 - Open inlet valve to filter slowly, checking for gasket leak.

> CAUTION: These units incorporate either "O" ring seals or flat gaskets. If leakage occurs, open the unit; clean and inspect the "O" ring or flat gasket. Replace if stretched or otherwise damaged. On "O" ring units, the cover should be bolted until metal to metal contact is made. Further tightening will stretch the bolt without improving the seal. Filter cartridges will compress about 1/4" - 3/8".

2 - Loosen vent screw to bleed trapped air.
3 - Tighten when liquid appears around vent opening.





Baron·Blakeslee

Baron-Blakeslee Technical Bulletin

Equipment Model: General | Bulletin Number: 1

Subject: Zytron Temperature Control | Date: October, 1989

General Description

Baron-Blakeslee uses different models of the Zytron Thermostat control for different functions. The next section describes each functional use for the thermostat. In general, a thermostat circuit monitors or controls the temperature in one area of the machine. It reads a thermocouple sensor input to determine that temperature. It then opens and closes the circuit between output terminals as the sensed temperature goes above or below the operator adjustable set point temperature. We use this thermostat output to turn heating or cooling circuits on and/or off.

Baron-Blakeslee changed to the solid state Zytron thermostat in mid-1986. There are distinct advantages of the Zytron over the previously used electro-mechanical type thermostat.

- Solid State Operation
- Faster Response Time
- Probe Is Replaceable As Separate Unit
- No Field Calibration Required

All models of the Zytron Thermostat, used in the Baron-Blakeslee equipment, are factory calibrated for a 0-300°F, operator adjustable, set point range. They require a Type "J" Thermocouple sensor for input. They provide output connections from a SPDT Relay. This allows using them for a High or Low Limit control or an On and Off control.

Each control has a red LED labeled Power (see Figure 1). It is on when power is applied to the unit. It has a yellow/green LED labeled Load. It is on when the output relay is energized. It also has adjusting pots labeled Span and Offset (OFST.). These are factory adjusted and should not require recalibration.

The control has a sensitive input amplifier stage. It provides amplification and automatic ambient compensation of the thermocouple sensor input voltage. It compares this amplified input voltage to a reference voltage. By adjusting the temperature set point pot, you set this reference voltage level.

When the temperature at the thermocouple sensor is below the set point temperature, the amplified input voltage is less than the set point reference voltage. The comparator circuit keeps the output relay energized. When the sensor temperature goes above the set point temperature, the amplified thermocouple voltage exceeds the set point reference voltage. The comparator circuit de-energizes the output relay.

We use the High Limit control for areas of safety, such as for SVC and HTC (see next section). In normal operation, the thermostat output relay remains energized. Its closed "NO" contacts create a series circuit for the heaters. If the temperature at the sensed area increases above the set point, the output relay contacts open the circuit and turn off the heaters. Even after the temperature returns to a normal value, the relay will not re-energize until you press the manual Reset switch.

We use the On-Off control on refrigeration cooling units. During night time operation, this control causes the refrigeration compressor to turn on and off to maintain a consistent temperature at the cooling coils. The output relay automatically resets as the sensed temperature goes above and below the set point temperature. When the temperature reaches the set point, the compressor

turns on. When the temperature decreases below the set point by a differential amount, the compressor turns off. This on/off differential is adjustable between 3-7°F by the Hyst/BW (hysterisis) pot on the side of this controller.

Function and Adjustment

NOTE: Your equipment will not use all of the optional controls described in this section. Refer to your General Assembly and/or Wiring prints to determine which ones do apply. The listed temperature settings are typical. They can vary with different applications.

1. Proper adjustment and function of the safety vapor control (SVC) is extremely important. The vapor line (where top of vapor blanket meets air) is usually half way up the solvent condensing (cooling) coils. See the General Assembly print for your equipment. The safety vapor control turns off the heat if the solvent vapors rise above the condensing coils. The SVC trips if the cooling coils do not maintain a temperature cold enough to condense the solvent vapors. This control helps prevent the hazards associated with solvent vapors escaping into the atmosphere.

   The proper temperature setting for the SVC is about 15°F below the normal boiling temperature of the chosen solvent. Refer to solvent specification sheet for the boiling point of solvent used in your system. Use the following test procedure to determine the specific temperature setting required to allow proper operation.

   Periodically (monthly) verify the operation of the safety vapor control. Turn the cooling off until: (a) the SVC turns off machine heat, or (b) the vapors rise above the condensing coils. Do not allow vapor to reach the top of the tank. Re-adjust the safety vapor control if heat does not shut off as vapors reach the top of the condensing coils. Set the control for a lower temperature. Repeat checking the SVC operation until you obtain the proper setting. You should not operate the equipment with a faulty safety vapor control.

2. The cleaner is equipped with a high temperature control (HTC). The proper temperature setting is 20°F above the solvent boiling temperature. The H.T.C. will turn off the heat if the solvent level drops below the top of the heater elements. This helps prevent burning out the elements if you let the solvent level get too low in the tank. Check this level daily.

3. The optional Vapor Up (VU) thermostat turns on an indicator light when the solvent vapors are up to proper level on the cooling coils. This indicates the equipment is ready to operate. It also inhibits the spray pump(s) when the vapor line is below normal operating level. Proper temperature setting is 3-5°F below the solvent boil temperature. This control indicates vapor up when the heat of rising vapors reach the cooling coils and the VU sensor. A long heat up time can indicate contaminated solvent or a defective heating element.

4. The optional liquid temperature control (LTC) senses the temperature of the solvent in the boil sump. Contamination or alcohol build up in the boil sump will cause the boiling point temperature to increase. The LTC will shut off the heat if the boiling point raises to an undesirable degree. When using an alcohol blend solvent, the alcohol level could increase to a flammable point. The same condition applies when parts carry in alcohol or other flammable liquids into the cleaner. This control should turn off the heat before the solvent blend becomes flammable. It is set at approximately 7°F above the boiling point of the solvent. When the LTC trips, you should drain the boil sump and recharged with fresh solvent. Dis-

pose of contaminated solvent in the proper manner.

5. The optional water temperature thermostat (WTH) may be included in models with water cooled condensing coils. This control shuts off the heat input if the cooling water is above adjusted temperature. See prints with degreaser/cleaner for specifications. Vanify the water valve is open, the "Y" strainer is not clogged, and the water pressure and temperature are within specifications. Insufficient cooling will cause a trip of the safety vapor control circuit also.

6. The refrigeration thermostat (RT) is used on units with refrigeration cooled coils. It functions to control the operation of the compressor. It automatically resets as temperature at the probe (connected to the cooling coil) changes. During night time operation of the refrigeration system, this control causes the compressor to turn on when the coil temperature increases to the set point temperature. The compressor runs until the coil cools down to the differential point below the set point. During machine operation, the heat load of the solvent vapors on the coils (and sensor) prevents the temperature from reaching the shut off point. The compressor should continue running as long as vapor is up in the machine.

Testing/Troubleshooting
(See Figure 1)

While recalibration is not normally required, it may be necessary to replace the unit at some time. Here are some brief tests that you can perform to determine if the defective part is the thermostat or the probe.

Normal operation for the safety thermostats will have the green "load" indicator lamp on. When the control trips because of an unsafe condition, the "load" indicator will go off.

If the "load" indicator stays on all the time, even when the thermostat dial is turned to low end of the scale, replace the thermostat.

The more likely condition is that the "load" indicator will be off and can not be reset. The following procedure should assist in troubleshooting and identifying the problem.

1. Short the Reset switch (terminals 12 and 13). If the indicator lamp comes on, replace the switch. If the lamp stays off, go to next step.

NOTE: In normal operation, you must press and hold the Reset switch a few seconds before the thermostat will reset.

2. Remove probe leads from the thermostat and short the terminals with a 14 gauge jumper (paper clip). If the "load" light comes on, replace the probe. If the lamp stays off, replace the thermostat.

Erratic operation can be caused by a failing thermostat or a misplaced or dirty probe. The probes are tip sensitive, which means that only 1/8"-1/4" of the probe tip is a sensing surface. For contact probes, like those used on the H.T.C. or RT, the tip must be in close contact with the component being sensed (heating element or cooling coil). Contamination or sludge around the tip can cause a loss of sensitivity.

To check operation of the thermostat, remove the probe leads and short between the terminals with a paper clip as previously described. Turn the dial down until the thermostat trips ("load" light goes out). The indicated temperature should be close to the ambient temperature in the control panel. Turn the dial back up, reset the thermostat and repeat the step. If this step can be repeated several times with no more variation than 1°F indicated, the thermostat is probably good and the probe should be replaced. On rare occasion, the wire connecting the probe and thermostat may require replacement. Use type "J" thermocouple wire. Replace full length. Do Not Splice.

Thermostat Troubleshooting Chart

PROBLEM	* POSSIBLE CAUSE	* CORRECTION
Red "POWER" indicator **not lit**	* Power interruption	* Determine cause of interruption and correct
Green "LOAD" indicator **not lit**	* Safety has tripped	* Reset safety
	* Probe lead disconnected	* Check/clean/re-make connection at probe or thermostat
	* Probe defective	* Replace
	* Thermostat defective	* Replace
Safety will not reset	* Defective thermostat	* Replace
	* Reset switch defective	* Replace
	* Probe defective	* Replace
Erratic operation	* Thermostat defective	* Replace
	* Probe out of position (H.T.C.)	* Probe tip must be clean and in contact with what is being sensed

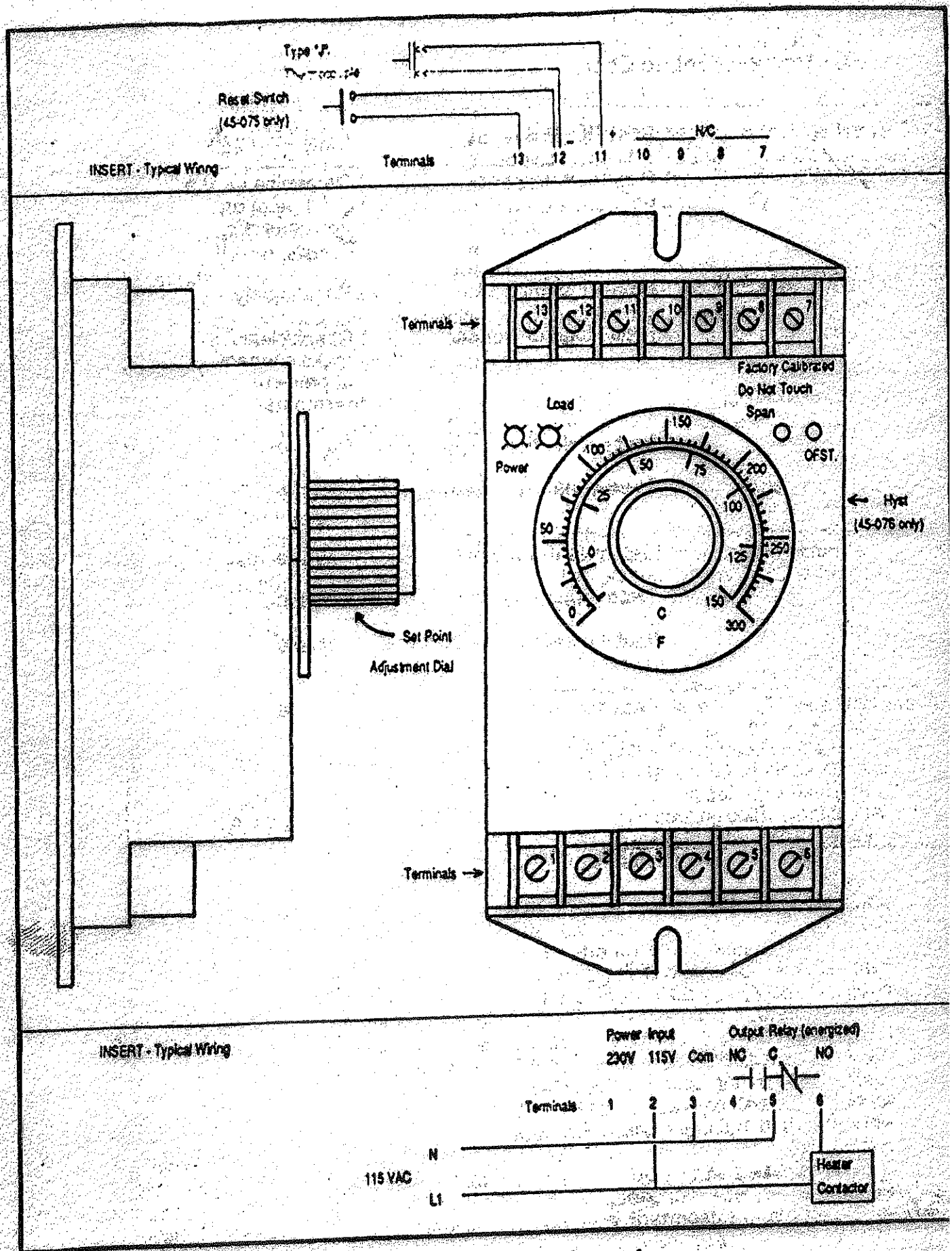
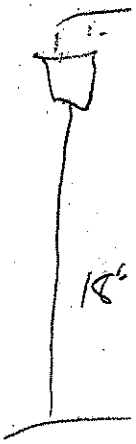


Figure 1 Thermostat Layout

[redacted] Number Listing

[redacted]er to text for description of parts. The functions listed in (parenthesis) are typical. They can [redacted]ry with application. Refer to prints on your equipment.



[redacted]HERMOSTATS

[redacted]045-075	Manual Reset, no hysterisis (SVC, HTC, LTS/C, WTH) 165.
[redacted]45-086	Automatic Reset, sight hysterisis (VU)
[redacted]45-076	Automatic Reset, adjustable hysterisis (RT)

[redacted]hermostats (24 Volt Control LE Models)

[redacted]045-073	Manual Reset, (HTC, SVC, LTC) 193.
[redacted]45-072	Refrigeration Thermostat, Vapor-Up Control Thermostat 206.

[redacted]HERMOCOUPLES (Type "J") LE and Non-LE Models

[redacted]045-077	6" Long with Polarized Male Connector (SVC,LTC, [redacted] Option)
[redacted]45-078	36" Long with Polarized Male Connector
[redacted]45-094	18" Long with Polarized Male Connector (HTC,RT) 85. or 045084 18.00

[redacted]cellaneous Hardware

[redacted]417396	Type "J" Thermocouple Wire (Per foot, do not splice)
[redacted]045-081	Type "J" Thermocouple Connector (Polarized female)
[redacted]45-084	Compression Fitting, Stainless Steel, 1/8" NPT
[redacted]45-080	Momentary Switch (Reset) with Black button

We recommend that you maintain at least one each type thermostat and thermocouple used in your equipment. When ordering spare parts, please include the model and serial number of the equipment. Write, fax, or phone your Customer Service Representative at the following:

Baron-Blakeslee, Inc.
1905 Mines Road
Pulaski, TN 38478

John

COMBINATION WATER SEPARATOR/DRYER INSTRUCTIONS

Degreasing solvents, being heavier than water, settle out in the lower portion of the gravity section from where they flow into the dryer section through openings near the bottom. Dryer section fills to overflow level with de-watered solvent. This section may contain a cotton bag of Molecular Sieve drying agent.

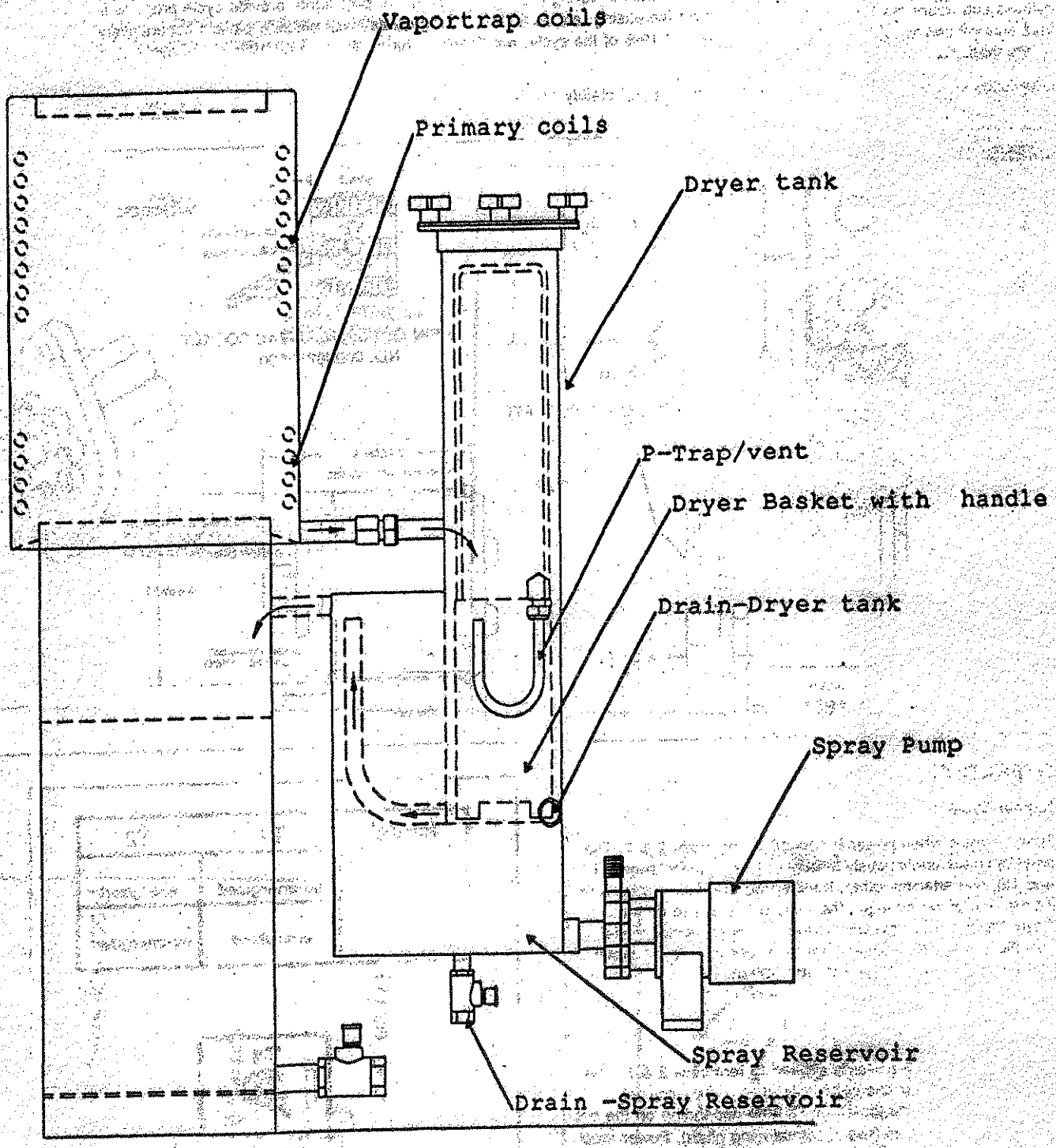
The top of the bag should always be below liquid level so that droplets of water floating on the surface can be observed as they indicate time for replacement of the drying agent with new or freshly dehydrated material. (Media Kit must be ordered if Molecular Sieve is to be used).

To replace, turn the heat off, drain the separator/dryer, and transfer to vapor sump. Wipe out the chamber with a dry cloth and put a new bag of media into the dryer. Close valve before turning heat "ON".

Bulk water on solvent in the gravity section will run out of water overflow if allowed to accumulate. However, we recommend removing the water at least once a day by opening the purge valve part-way while the Degreaser is up to heat. Bleed off water before it has time to accumulate and cause water solubles to come out, or develop a corrosive acidity. Also, water solubles allowed to accumulate too long may render the water layer flammable (particularly true with TE, TP, and TA).

Although designed for use with fluorinated solvents, this combination separator/dryer can often be used to advantage with the chlorinated solvents as well.

NOTE: To dry molecular sieve, spread it out in a pan to allow solvent and additives (alcohol, etc.) to evaporate before placing in an oven to drive off water. Dry at 475°F. for three hours. Dry in a vented oven. Be sure that no flammables are present before placing the molecular sieve into the oven.


Vaportrap coils
Primary coils
Dryer tank
P-Trap/vent
Dryer Basket with handle
Drain-Dryer tank
Spray Pump
Spray Reservoir
Drain -Spray Reservoir

BBI Part No. 044186C

422 FLIP-FLOP TIMER

INSTALLATION INSTRUCTIONS
MAY, 1995

0422 000 0100

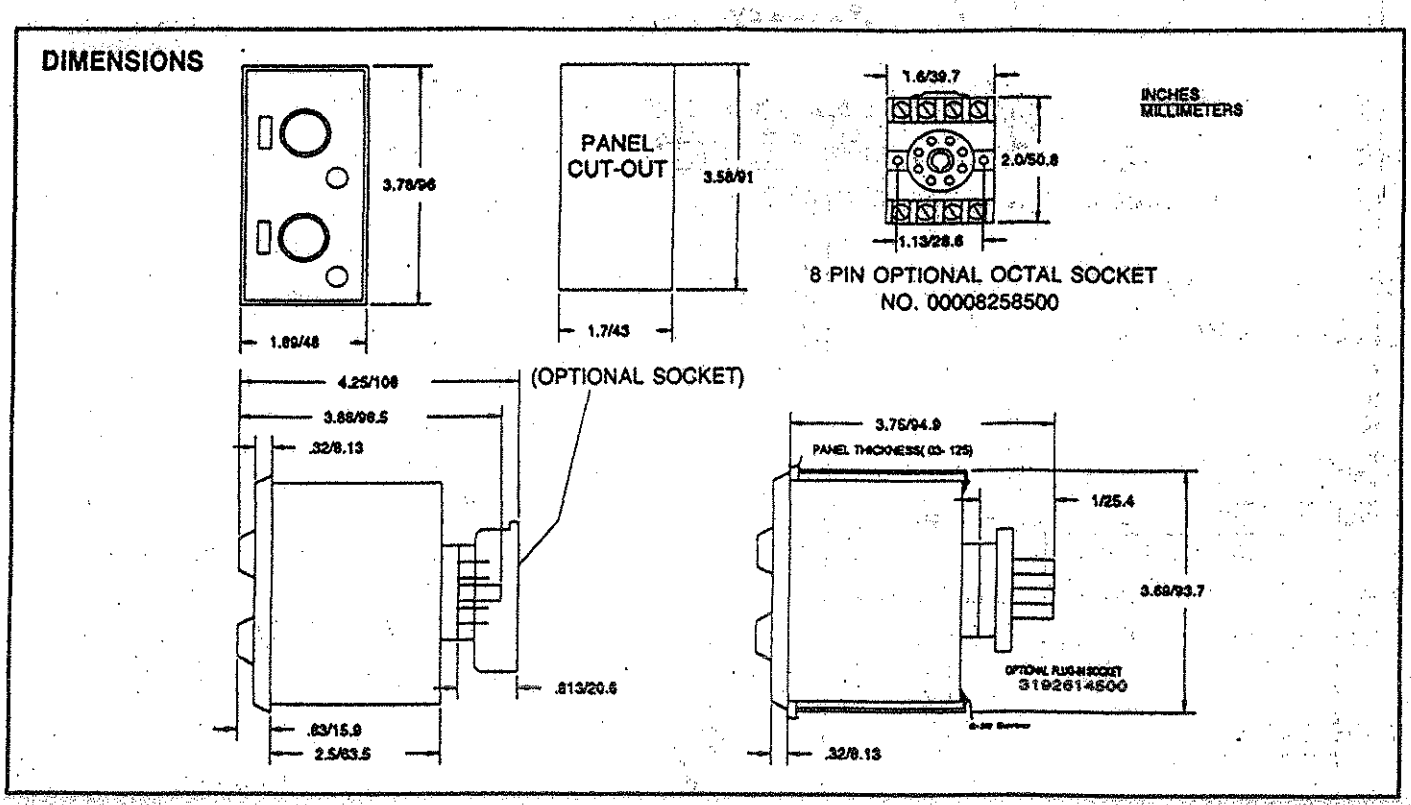
DESCRIPTION:

The 422 is a Flip-Flop timer that is available in both repeat cycle and single cycle versions. In addition, each version can be ordered so that the DPDT relay will energize during either the first (T1) or second (T2) timing period.

The 422 also features ATC's unique cycle progress indication. During the timing cycles, two pilot lights provide cycle progress indication in the minutes and hours ranges, by blinking at an ever increasing rate as the cycle progresses. This blinking pattern occurs every 3 1/2 seconds and will consist of one "blink" during the first 10% of the cycle, two "blinks" during the second 10% of the cycle, three "blinks" during the third, etc.

In the seconds ranges, the pilot light is off before timing and steady on during timing.

DIMENSIONS



OPERATION

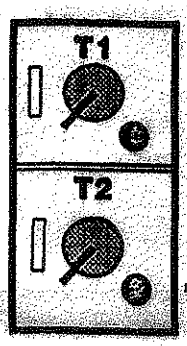
Repeat Cycle

Timing begins when power is applied to terminals 2 & 7. The timer operates continuously through its two timing ranges (T1 and T2), one after the other, transferring the relay contacts as it times out of each range. The relay will energize during either the T1 or T2 time depending on the particular model specified (see accompanying chart). There is no start circuit and the timer resets on power interruption.

Single Cycle

Timing begins when power is applied to terminals 2 & 7. The timer will operate for one cycle only, that is the relay will energize during either the T1 or T2 time depending on the particular model specified (see accompanying chart). Power must be removed from terminal 2 or 7 to reset the timer. The timer will reset on power interruption.

Model	T1	T2
...F1...	de-energized	energized
...F3...	energized	de-energized



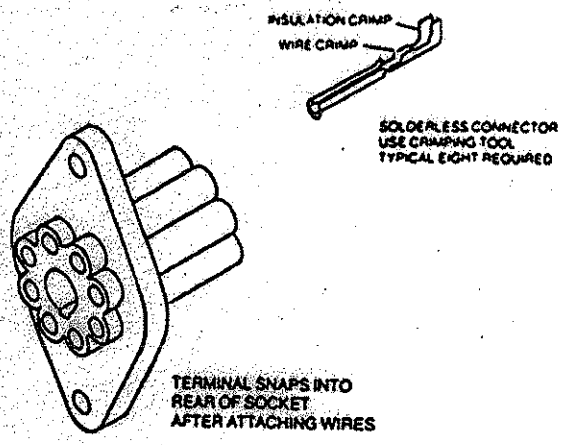
INSTALLATION INSTRUCTION 422 FLIP-FLOP

PANEL MOUNTING:

To panel mount, cut a 1.7" × 3.58" cutout.

1. Insert the 422 through the panel from the front with the plug going through the cutout first.
2. While holding the 422 in place, push the mounting bracket over the 422 from the back and snap into place as shown in the panel mounting dimensions drawing.
3. When using the 422 in a panel mounted configuration, the optional 03192614500 plug-on socket can be used. See illustration below.

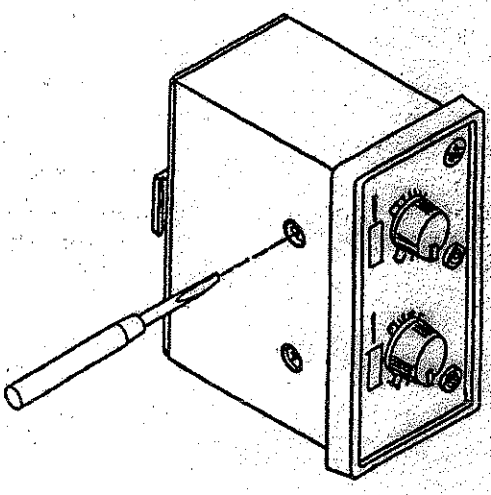
Wire Attachment Instructions



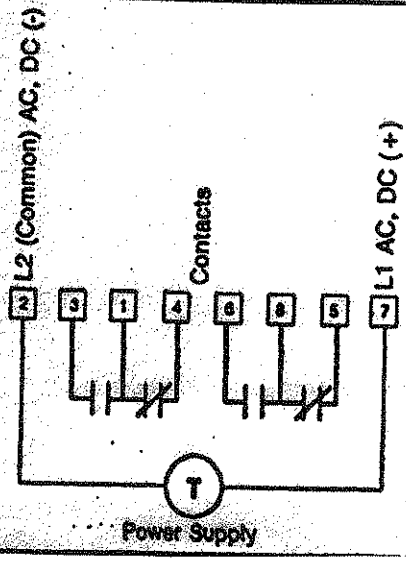
SETTING THE RANGE:

Refer to the drawing. Using a small screwdriver inserted into the adjusting slot as shown, rotate the range adjusting switch. The range selected will appear through the window at the top of the dial face.

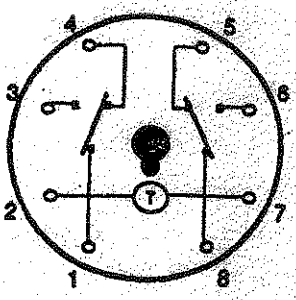
NOTE: To prevent a hazard to personnel or property, change range with electrical power off.



WIRING



TERMINAL WIRING



Bottom view of timer

SPECIFICATIONS

RANGE
Model 422A100... (1 or 10 SEC/MIN/HRS)
Model 422A500... (5 or 50 SEC/MIN/HRS)

CONTACT RATING
Rated 10 AMPS resistive at 30 VDC or 250 VAC (or less)
1/8 HP @ 120 VAC
1/4 HP @ 240 VAC
240 VA @ 240 VAC

LIFE: 10 million operations with no load
100,000 operations with:
10 AMPS at 30 VDC (or less) or
10 AMPS at 250 VAC (or less)

CONTACT MATERIAL:
Silver Cadmium Oxide

TEMPERATURE RATING
–18°C to 60°C (0° to 140°F)

NOISE IMMUNITY
Showering ARC per NEMA ICS 2-230
In addition, the 422A will withstand a voltage surge of 4500 volts for 50 usec. without damage.

WEIGHT
7 ounces

MOUNTING
Plug-in octal base

Options: Surface mounting socket
- DIN rail mounting socket
- Plug-on socket kit (8 pin)
- Panel mounting kit
- 8 pin panel socket w/rear facing terminals

POWER REQUIREMENTS
Universal power supply.
Unit will accept power from 19.2 to 264 volts AC (50 or 60 Hertz) or 19.2 to 28.8 Volts DC.

AC: Inrush – 1.5 Amps
Power required – 1.2 watts

DC: Maximum ripple at 60 Hz – 5%
Current required – 50mA
Power required – 1.2 watts

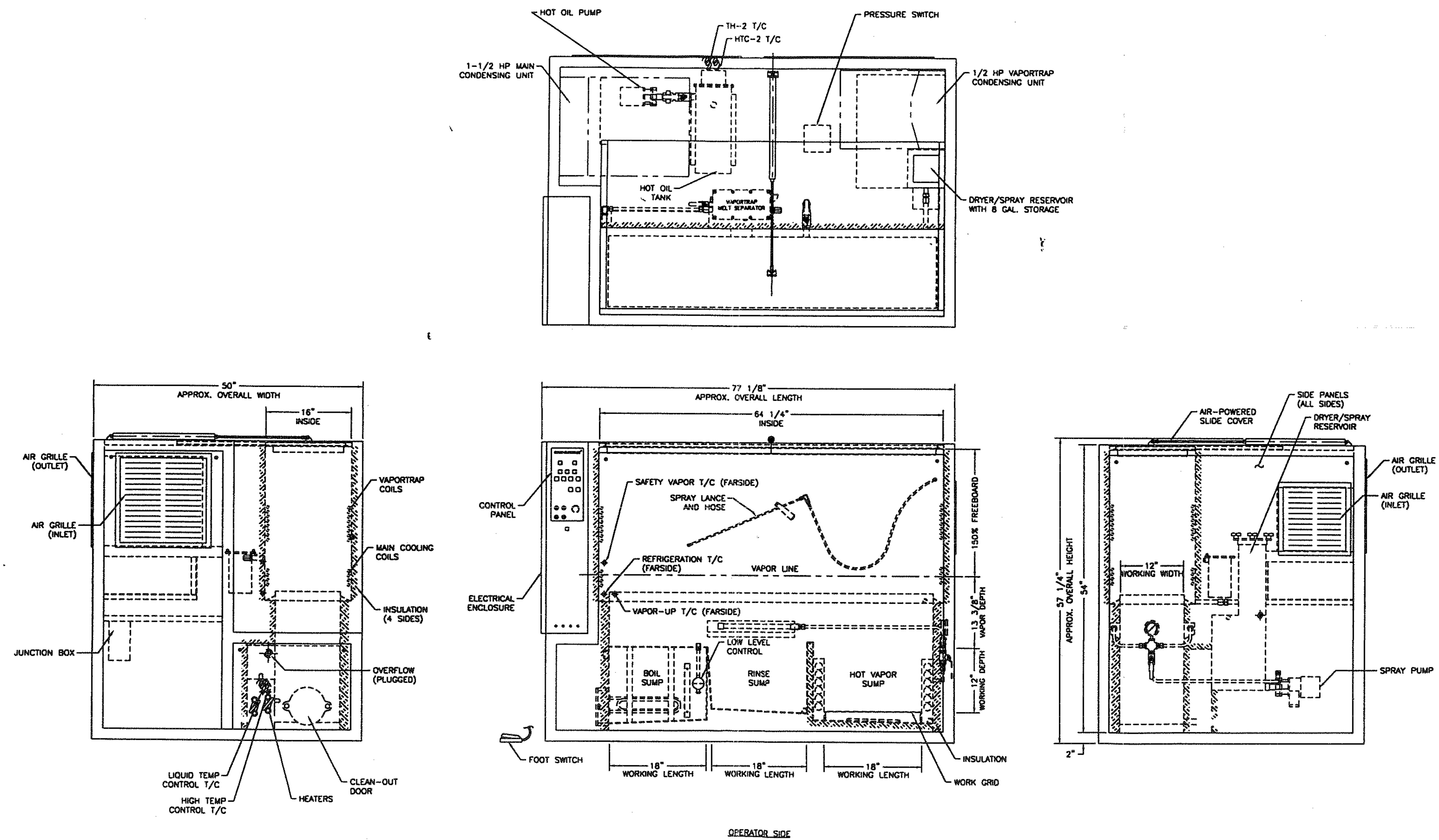
MINIMUM SETTING
2% of range, with the exception of 50 msec on the seconds range.

SETTING ACCURACY
+/–5% of range.

REPEAT ACCURACY
Varies as a function of temperature.
Any voltage (constant temperature):
+/– 0.5%*
Any voltage (32° F to 140° F):
+/–1.5%*
Any voltage (0° F to 140° F):
+/–2.0%*

*Variation from average actual time.

RESET
a. 0 to 20 msec power interruption: guaranteed no reset.
b. 20 to 65 msec; it may reset (40 msec typical reset).
c. Over 65 msec guaranteed to reset.



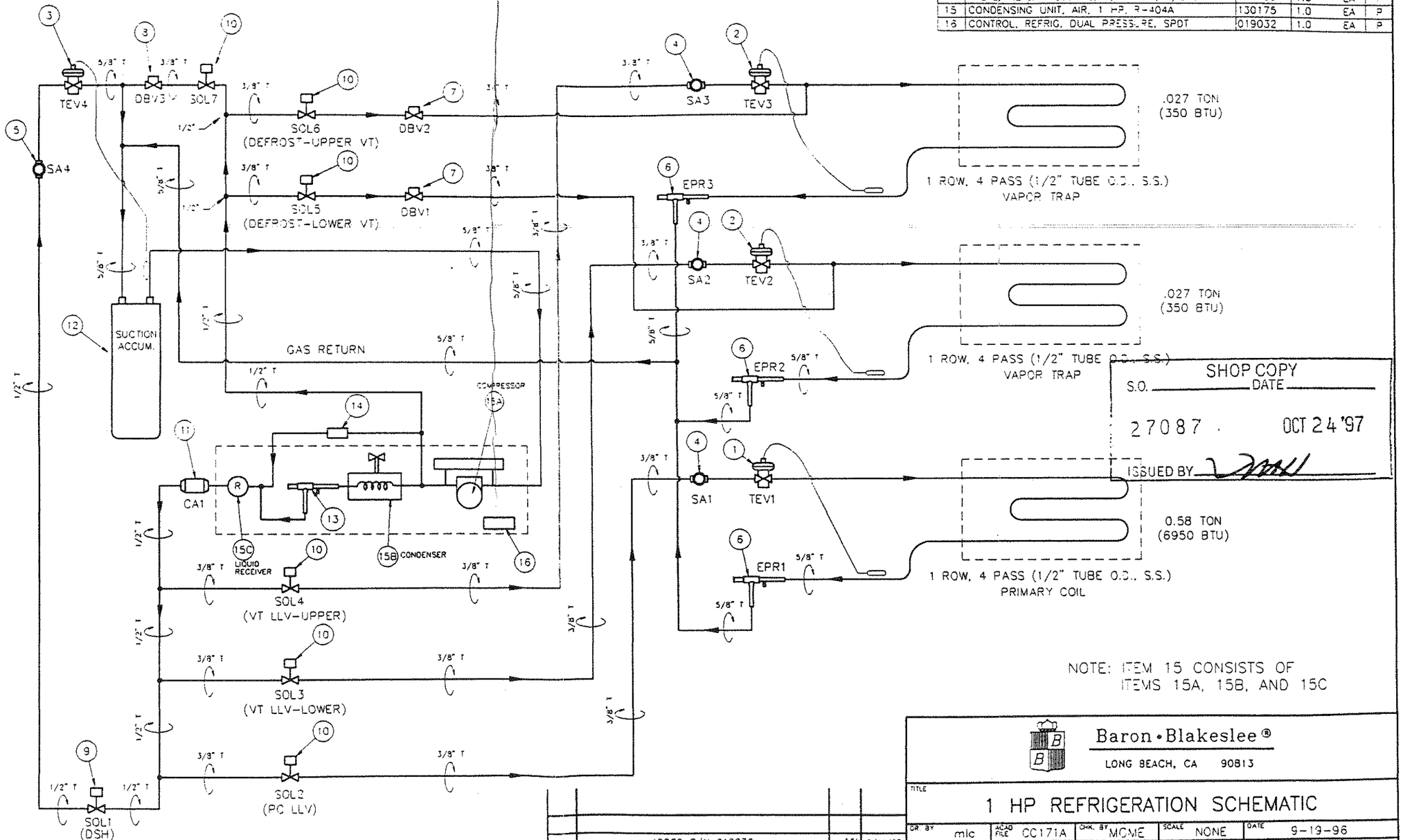
B	REMOVED HANDLES TO COVER	PTS	6/18/98
A	ADDED SPRAY LANCE, 8 GAL. STORAGE TANK MOVED HOT OIL TANK	PTS	6/1/98

Baron·Blakeslee®
LONG BEACH, CA 90813

GENERAL ASSEMBLY
W/ LOW PROFILE SPRAYS

REF. 0C3908	SCALE 1/8	DATE 3/15/97				
S.O. 26905	XLE-181212S	D	131390	B	1 of 1	

1	VALVE, EXP. 0.43 TON, 3/8 IN X 1/2	130192	1.0	EA	P
2	VALVE, EXP. 1/8-1/3 TON, 3/8 IN X 1/2	130193	2.0	EA	P
3	VALVE, EXPANSION, 1/2 IN X 5/8 OUT	130194	1.0	EA	P
4	INDICATOR, LIQUID, 3/8	130082	3.0	EA	P
5	INDICATOR, LIQUID, 1/2ODF SWEAT	130010	1.0	EA	P
6	EPR VALVE, 5/8" ODF, 1/30 DRIT-6	130332	3.0	EA	P
7	VALVE, DIS. BYPASS, ADRIE-[illegible]4-0/55-3/8		2.0	EA	P
8	VALVE, DIS. BYPASS, ADRI-[illegible]4-0/55-3/8		1.0	EA	P
9	VALVE, SOLENOID, 1/2" ODF, [illegible]0 V	130016	1.0	EA	P
10	SOLENOID VALVE, 3/8", 120V	130333	6.0	EA	P
11	FILTER-DRIER, 1/2" ODF, 3 CU. IN	130190	1.0	EA	P
12	SUCTION ACCUMULATOR, 5/8", 2.3 CU. IN	130068	1.0	EA	P
13	VALVE, HEAD PRESSURE, 1/2 PORT, 5/8 ODF	130198	1.0	EA	P
14	VALVE, HEAD PRESSURE, 3/4 PORT, 5/8 ODF	130199	1.0	EA	P
15	CONDENSING UNIT, AIR, 1 HP, R-404A	130175	1.0	EA	P
16	CONTROL, REFRIG, DUAL PRESSURE, SPDT	019032	1.0	EA	P



SHOP COPY
S.O. _____ DATE _____
27087 · OCT 24 '97
ISSUED BY

NOTE: ITEM 15 CONSISTS OF ITEMS 15A, 15B, AND 15C

SYM.	DESCRIPTION	BY	DATE
A	ADDED P/N 019032	MLL	2/11/97

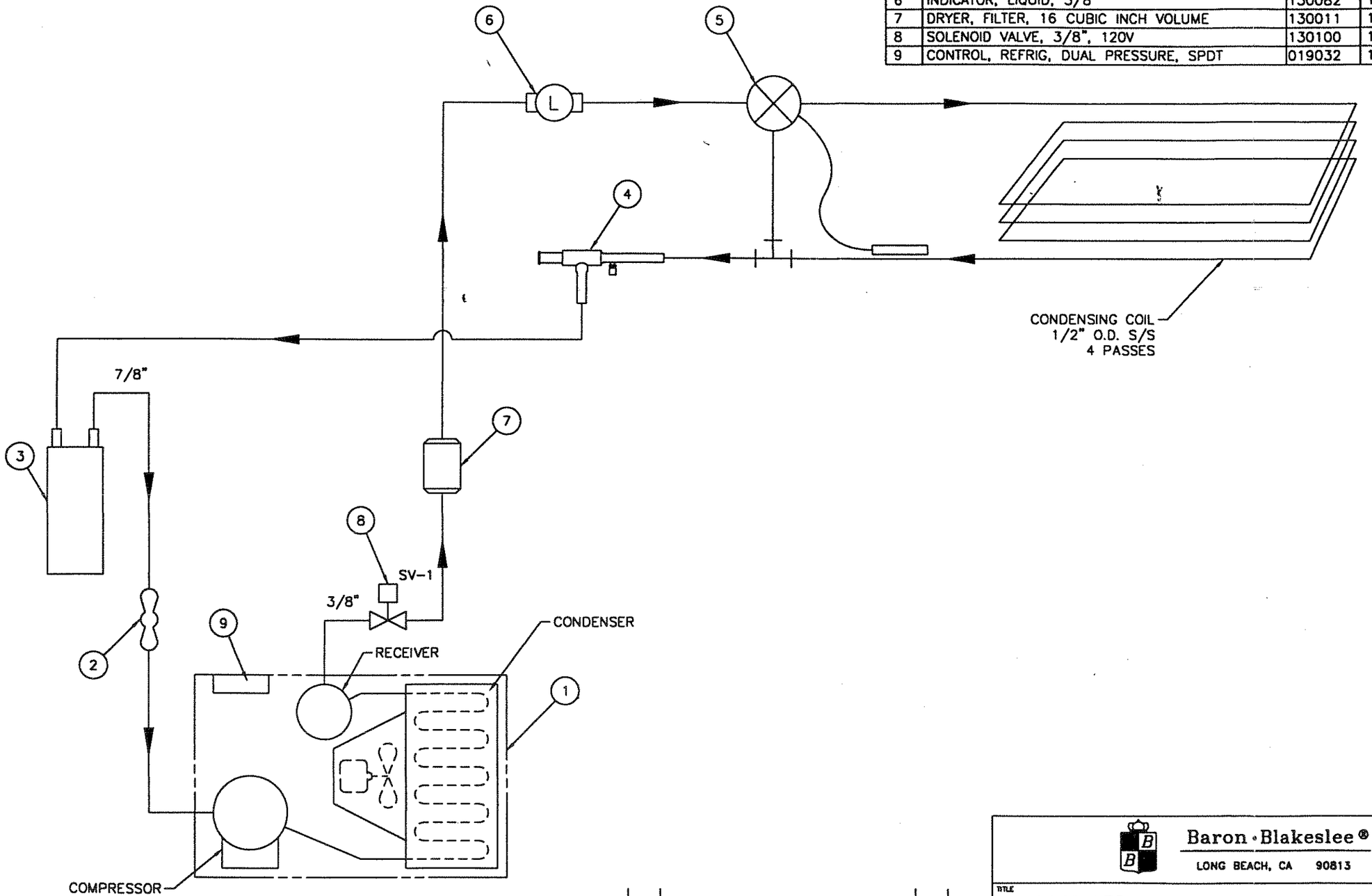
Baron • Blakeslee®
LONG BEACH, CA 90813

TITLE: 1 HP REFRIGERATION SCHEMATIC

DR. BY	ACAD FILE	CHK. BY	SCALE	DATE
mlc	CC171A	MCME	NONE	9-19-96

FIRST MADE FOR	MACHINE MODEL	SIZE	DWG. NO.	REV.	SHT. NO.
S.O. STANDARD	XLE-12[illegible]010	C	131171	A	1 of 1

NO.	DESCRIPTION	PART NO.	QTY	C/P
1	CONDENSING UNIT, AIR, 1-1/2 HP, 230/1/60	130074	1.0 EA	P
2	VIBRATION ELIMINATOR, 7/8 OD X 11-1/2	130020	1.0 EA	P
3	SUCTION ACCUMULATOR, 7/8", 7.7 CU. IN	130335	1.0 EA	P
4	VALVE, EPR, 7/8" ODF, 30/100	130184	1.0 EA	P
5	VALVE, EXPANSION, 1 TON, 5/8	130115	1.0 EA	P
6	INDICATOR, LIQUID, 3/8	130082	1.0 EA	P
7	DRYER, FILTER, 16 CUBIC INCH VOLUME	130011	1.0 EA	P
8	SOLENOID VALVE, 3/8", 120V	130100	1.0 EA	P
9	CONTROL, REFRIG, DUAL PRESSURE, SPDT	019032	1.0 EA	P



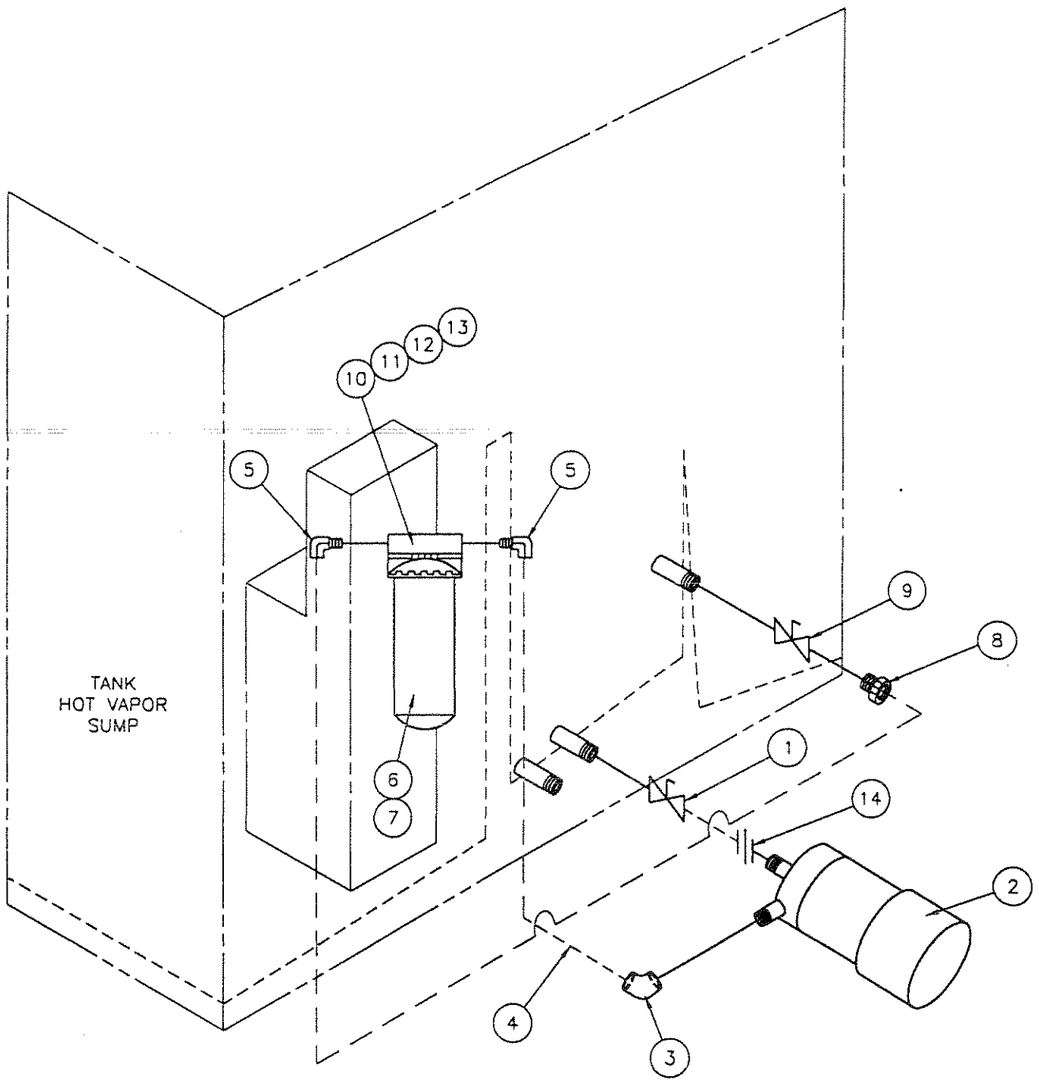
B	REVISED PER NCR # 98-087	CM	8/17/98
A	ADDED 019032, 130335 WAS 130068	MEL	1/28/97
SYM.	DESCRIPTION	BY	DATE

Baron • Blakeslee ®
LONG BEACH, CA 90813

TITLE: REFRIGERATION SCHEMATIC – 1 1/2 HP

DR. BY	ACAD FILE	CHK. BY	SCALE	DATE
	CC257A	*	NONE	11/25/96

FIRST MADE FOR	MACHINE MODEL	SIZE	DWG. NO.	REV.	SHT. NO.
S.O. STANDARD	(X)LE-181212	C	131257	B	1 OF 1



ITEM NO.	DESCRIPTION	PART NO.	QTY	C/P
1	VALVE, BALL, S/S, 3/4	066153	1.0 EA	P
2	PUMP, 3/4" X 1/2", 1/25 HP, NI PLATE	030028	1.0 EA	P
3	FITTING, ELBOW, 90 D, 1/2T TO 1/2 FPT	062988	1.0 EA	P
4	TUBING, S/S, T-304, 20 GA, 1/2	060152	10.0 FT	P
5	FITTING, ELBOW, 90 D, 1/2T TO 3/4MPT	062971	2.0 EA	P
6	FILTER, CASE, S/S, W/VITON SHELL O-RING	033064	1.0 EA	P
7	FILTER, CARTRIDGE, 100 MICRON, ORLON	033011A	1.0 EA	P
8	FITTING, S/S T-316, 1/2 TUBE TO 3/8MPT	062953	1.0 EA	P
9	VALVE, BALL, S/S, 3/8, TEFLON	066151	1.0 EA	P
10	FILTER, BRACKET	033084	1.0 EA	P
11	WASHER, S/S, SPLIT LOCK, MED DUTY, 1/4	5415483	2.0 EA	P
12	SCREW, S/S, HEX HEAD CAP, 1/4-20 X 5/8	5415377	2.0 EA	P
13	NUT, S/S, ACORN CAP, 1/4-20	5415169	2.0 EA	P
14	UNION, S/S T-304, 3/4	062165	1.0 EA	P

NOTE:

1. INLET & OUTLET OF FILTER CASING SHOULD BE MOUNTED ABOVE LIQUID LEVEL IN TANK.
2. ALL SOLVENT PIPING IS TO BE STAINLESS STEEL

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SYM.	DESCRIPTION	BY	DATE
A	ADDED 3/4" UNION	MLL	11/5/96

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LONG BEACH, CA 90813

TITLE: RECIRCULATION SYSTEM – STAINLESS STEEL

DR. BY	ACAD FILE	CHK. BY	SCALE	DATE
Haydon	CC163A	*	NONE	9/18/96

FIRST MADE FOR	MACHINE MODEL	SIZE	DWG. NO.	REV.	SHT. NO.
S.O. STANDARD	XLE-121010	C	131163	A	1 OF 1