12589

LED
Ultrasonic Vapor Degreaser

Rev A

BRANSON Precision Cleaning
41 Eagle Road
Danbury, CT 06813-1961
(203) 796-0400

Instruction Manual

SH 1_1_11

BRANSON PRECISION CLEANING
SELF-HELP BULLETIN
General Subjects

SH 1.1.11 Regenerating Desiccant

1. Remove the bag containing desiccant from the water separator.

2. Immerse full bag in clean water and soak for 30 minutes.

Warning: **Desiccant which is fully loaded with water may trap alcohol or other flammable solvent blending agents which will not evaporate at room temperature. They may ignite or explode in the drying oven or decompose into toxic, corrosive substances. Soaking in water frees the blending agents so that they will evaporate during the air drying process.**

3. Remove the bag and desiccant from the water and allow to drain.

4. Immerse in clean water and again soak for 30 minutes.

5. Remove the bag and desiccant from the water and allow to drain.

6. Empty the contents of the bag and spread out in a layer no more than one (1) inch deep in a flat container and allow the solvent and blending agents to evaporate overnight.

Warning: ***Never* put the desiccant into the oven until the solvent and blending agents have evaporated completely. They can become corrosive or explosive when exposed to high temperatures.**

7. Remove the water by baking in an atmospheric oven at 400°F for about 4 hours.

Post-it™ brand fax transmittal memo 7671 | # of pages ▸ 1

To DENNIS	From JIM
Co. STD	Co. BRANSON
Dept.	Phone # 203-796-2238
Fax # 281-344-5895	Fax #

Limited Warranty

Each product manufactured by Branson is guaranteed to be free from defects in workmanship and material for twelve(12) months from the date of invoice. This warranty does not apply to any product which has been subjected to misuse, misapplication, neglect (including without limitation, inadequate maintenance), accident, or improper installation, modification, adjustments or repair. Products supplied by Seller, but manufactured by others, are warranted only to the extent of the manufacturer's warranty. The guarantee period for certain product lines will be extended at the discretion of Branson. All products are warranted F.O.B. Point of Manufacture.

This warranty does not apply to cavitation erosion of the tank and transducers surfaces.

NOTE: This information applies to products purchased in the United States. For warranty information on units purchased outside the U.S., contact your local representative.

Disclaimer of Warranty

The foregoing warranty constitutes Seller's only warranty in connection with this sale, and is in lieu of all other warranties expressed or implied, written or oral: THERE ARE NO IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS OF ANY PRODUCT FOR A PARTICULAR PURPOSE.

Exclusive Remedy

SELLER'S LIABILITY SHALL BE LIMITED TO REPAIRING OR REPLACING THE PRODUCT FOUND BY SELLER TO BE DEFECTIVE OR NON-CONFORMING, OR, AT SELLER'S OPTION, TO REFUNDING THE PURCHASE PRICE OF SUCH PRODUCT. At Seller's request, Buyer shall send, at Buyer's expense, any allegedly defective product to the factory where it was manufactured.

The remedy set forth above is exclusive. The repair or replacement of the product, or refund of the purchase price, constitutes fulfillment of all liabilities of Seller to Buyer under the warranties above-mentioned, whether based on contract, negligence of any kind, strict liability or tort, or otherwise with respect to or arising out of product furnished hereunder.

October 17, 2008

STD
75 Mill Street
Stoughton, MA 02072

Attn.: Mr. Bill Hartery

Re.: Preventative Maintenance Program

Dear Bill,

Thank you for your courtesies extended to Air Energy, Inc. Per our conversation, we would like to present you this proposal for our preventative maintenance contract. We are confident it would be ideal for your application. Please review at your convenience.

The compressed air required to operate your business is your fourth utility, fully as essential to your facility as fuel, electricity and water. The unique characteristic of compressed air is that you generate it yourself. You cannot buy it from a utility source. This means that you are responsible for the maintenance and operation of your compressed air equipment to ensure that your fourth utility has the same degree of reliability as the other three.

To assist you in this vital function, Air Energy, Inc., has initiated a Preventive Maintenance Service Agreement in which our trained service personnel will monitor your compressed air equipment and provide you with a written report of its conditions. We will also make minor adjustments and recommend repairs of modifications to increase the reliability of the equipment.

We look forward to initiating a long-term relationship with your facility. Please contact us if you have any questions regarding this issue.

Sincerely,

Mathew P. Mazanec
Air Energy, Inc.

6 Norfolk Avenue
South Easton, MA 02375

Phone: 508-230-9445
Fax: 508-230-9446

Warning:

1. Keep the covers closed when not processing parts through the cleaner.

2. Always wear eye protection, gloves and protective clothing when handling solvents. Do not allow solvent to come into contact with the body. Solvent above 140°F (60°C) can cause burns. With prolonged or frequent contact, solvent removes natural oils from the skin.

3. Do not inhale or take solvent internally - either could be fatal.

4. All solvents are toxic to some degree. Do not allow solvent vapors to exceed the threshold limit value stated in Section V of the applicable OSHA Material Safety Data Sheet.

5. Never enter or lean into a degreaser. Solvent vapors will be present even if the degreaser appears empty. Solvent vapors displace air and may cause death by asphyxiation. Use cleanout doors when cleaning the degreaser.

6. Before adding solvent, be certain that the solvent to be added is the same as the solvent already in the cleaner.

7. Do not expose any halogenated solvent or its vapors to the high temperatures existing in open flames or exposed electric heating elements, or the solvent may decompose to toxic or corrosive substances.

8. Do not use solvents which have become over-contaminated. High contamination levels may result in fire hazards or solvent breakdown and equipment damage.

9. Do not bring solvent into contact with highly reactive metals such as sodium, potassium and barium. The solvent can quickly break down to form toxic and corrosive compounds.

10. Solvents can break down and become acidic when exposed over prolonged periods to reactive metals such as magnesium, aluminum, zinc and beryllium. When cleaning parts made of these materials, analyze the solvent frequently to determine if it has broken down. Failure to comply with this recommendation will result in damage to the equipment and will void the warranty covering it.

11. Never operate the cleaner with the countertop removed. The covers are a pinch hazard under this condition.

Printed in U.S.A.
Rev A 12/97

LED
Ultrasonic Vapor
Degreaser

BRANSON Precision Cleaning
41 Eagle Road
Danbury, CT 06813-1961
(203) 796-0400

Table of Contents

Rev A

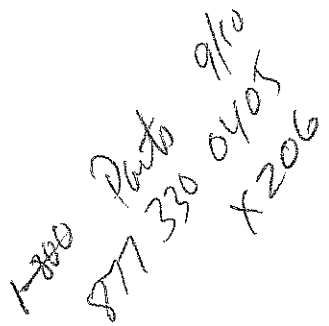
Printed in U.S.A.
Rev A 12/97

Appendix A: Parts Lists and Drawings

Appendix B: Obtaining Further Assistance

Printed in U.S.A.
Rev A 12/97

LED
Ultrasonic Vapor
Degreaser



BRANSON Precision Cleaning
41 Eagle Road
Danbury, CT 06813-1961
(203) 796-0400

Introduction

1.1 About This Manual

This manual contains instructions for installing, operating and maintaining the LED degreaser.

At the back of the manual you will find Appendices containing documentation including wiring and plumbing schematics and assembly drawings.

The following definitions apply in this manual:

Note: **Inconvenience only if disregarded - no damage or personal injury.**

Caution: **Equipment damage may occur, but not personal injury.**

Warning: **Personal injury may occur - DO NOT DISREGARD.**

PN indicates Part Number.

Part(s) indicates your workpiece or component to be cleaned.

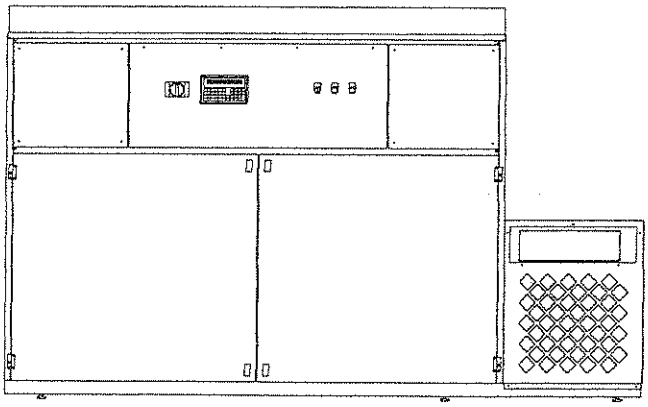
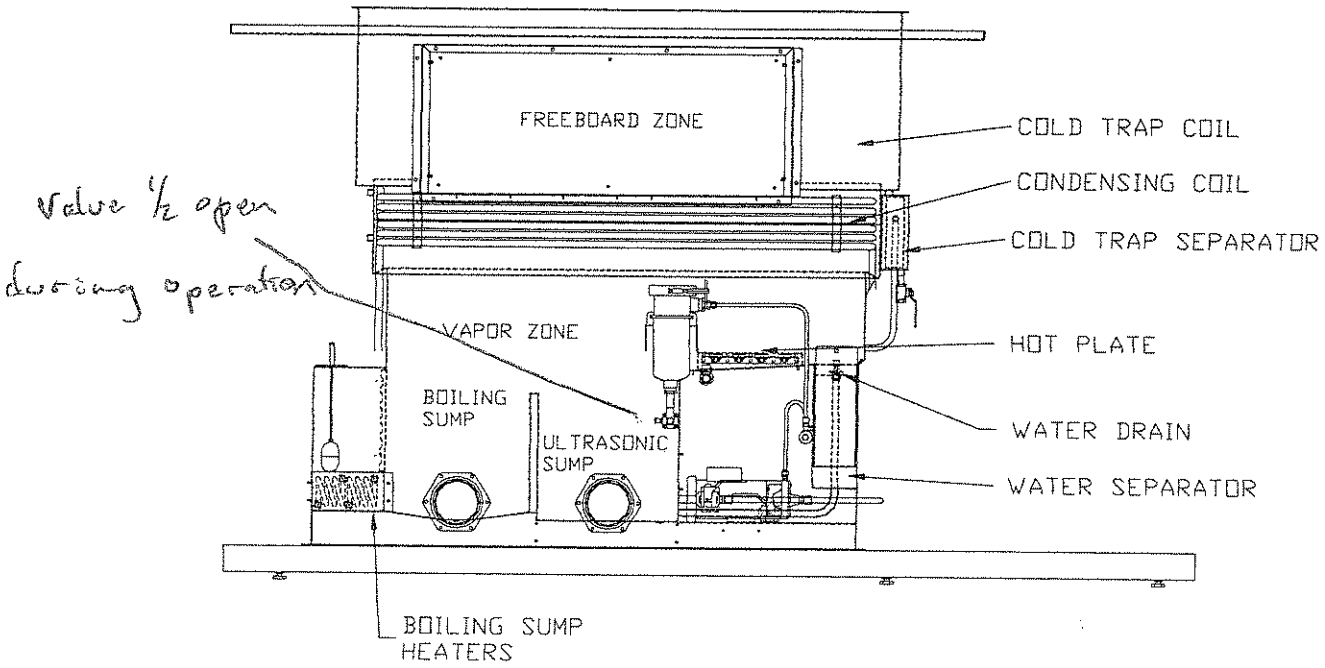


Figure 1-1
LED

1.5 How the Cleaner Works

Figure 1-2
LED



1. The boiling sump heater boils the solvent
2. Solvent vapors fill the vapor zone.
3. Some vapors condense on parts; dirty solvent drips into the boiling sump.
4. Remaining vapors condense on condensing coils and mix with water extracted from the atmosphere.
5. Water and condensate collect in the trough and pass into the water separator/desiccator.
6. Water is removed by the water separator/desiccator.
7. Pure solvent overflows into the ultrasonic sump.
8. Solvent mixes with the dirt removed by ultrasonic cleaning.
9. Dirty solvent overflows into the boiling sump so that all dirt ends up in the boiling sump.
10. Cold Trap coil extracts solvent vapors from air in freeboard zone.
11. Hot Plate conductively transfers heat to parts to vaporize solvent residues and reduce emissions.

LED
Ultrasonic Vapor
Degreaser

BRANSON Precision Cleaning
41 Eagle Road
Danbury, CT 06813-1961
(203) 796-0400

Controls

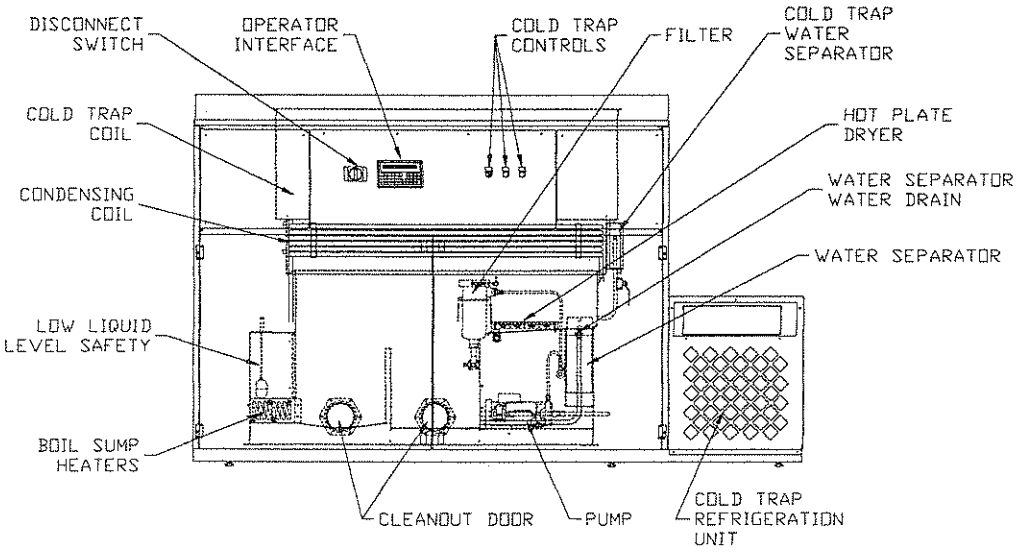
Rev A

2.1 Introduction - Component Identification and Specifications

This chapter describes the LED components, controls and specifications.

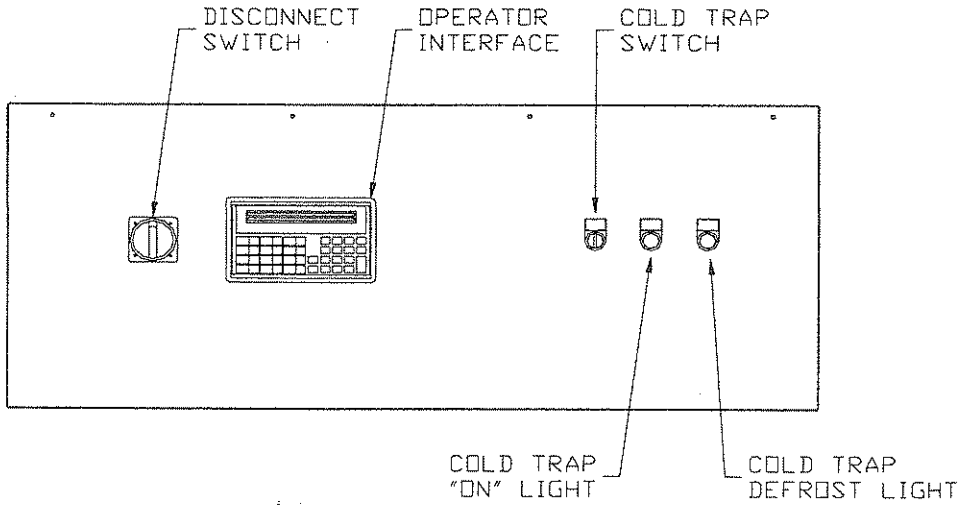
2.2 Component Identification

Figure 2-1
LED
Front View



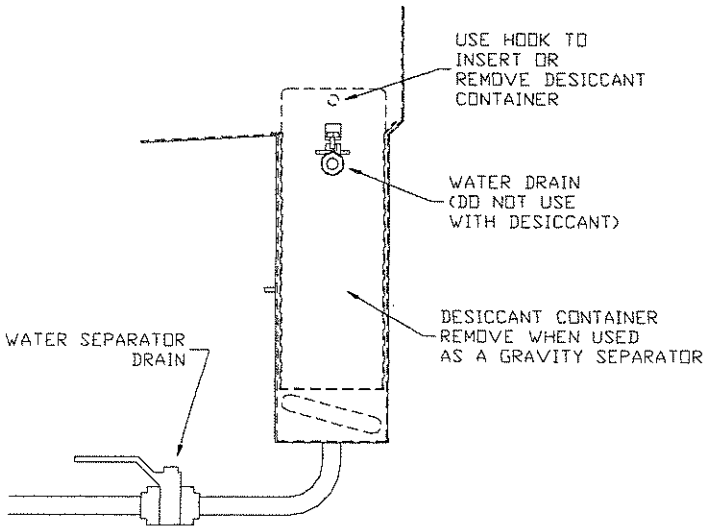
2.3 Control Identification

Figure 2-3
LED
Controls



3.7 Water Separator

Figure 3-3
Water Separator



Consult the solvent manufacturer to determine if the solvent requires desiccant to control the water in the degreaser.

To use the separator/desiccator as a separator, do not install the desiccator insert. Drain the water floating on top of the separator when its depth exceeds 2 inches. To drain the water, open the water drain valve and allow the water to drain until the flow stops. Close the water drain valve.

To use the separator/desiccator as a desiccator, install a filter bag, Part Number CPN-163-019 (LED 1216), CPN-163-020 (LED 1620), or CPN-163-021 (LED 2024), into the desiccant container and fill with desiccant. Consult your solvent supplier to determine the proper desiccant. Install the desiccant container into the water separator/desiccator.

BRANSON PRECISION CLEANING

QATP

LED

DRAFT

Table 1

Factory Settings For Listed Solvents
(at Sea Level with an Ambient Temperature of 70°F/21°C)

CAUTION: Use Degreaser Grade (Inhibited) Solvents Only
Uninhibited Grades May Be Unstable

Solvent	Boiling Point	BP Diff	US Temp	Low Vap Diff	High Vap Diff	Cond Coil Temp	Hot Plate Temp	Cover Time Delay
* Vertrel® XMS	96°F	7°F	76°F	20°F	20°F	60°F	250°F	6 sec
Freon® TMC	97°F		78°F					
Genesolv® DM	98°F		78°F					
Genesolv® DMC	97°F		77°F					
* Vertrel® MCA	99°F		79°F					
Vertrel® SMT	99°F		79°F					
Vertrel® MCA	102°F		82°F					
Methylene Chloride	103°F		83°F					
* Freon® TMS	103°F		83°F					
* AK225ATMS	104°F		84°F					
* HFE71DE	106°F		86°F					
* Freon® TA	110°F	8°F	90°F	20°F	20°F	65°F	250°F	6 sec
* Freon® TE	112°F		92°F					
* Freon® TES	112°F		92°F					
* Genesolv® DA	112°F		92°F					
* Genesolv® DE	112°F		92°F					
* Genesolv® DES	112°F		92°F					
Freon® TF	118°F		98°F					
Genesolv® DD	118°F		98°F					
* Vertrel® XM	118°F		98°F					
* Vertrel® XE	126°F	9°F	106°F	20°F	20°F	65°F	250°F	6 sec
AK225	128°F		108°F					
* AK225AES	129°F		109°F					
Vertrel® XF	130°F	9°F	110°F	20°F	20°F	65°F	250°F	6 sec
KCD9542	130°F		110°F					
PFC5060	132°F		112°F					
Vertrel® Xsi	134°F		114°F					
FE 7100	140°F		120°F					
(none available)								
Abzol®	160°F	11°F	140°F	30°F	30°F	65°F	250°F	6 sec
111 Trichloreothane	162°F		142°F					
Chlorethene® VG	165°F		145°F					
Prelete®	164°F		144°F					
Hypersolv®	160°F		140°F					
Trichloroethylene	188°F	13°F	158°F	30°F	30°F	70°F	250°F	6 sec
Perchloroethylene	250°F	17°F	210°F	30°F	30°F	80°F	350°F	6 sec

* Requires desiccant dryer option. Water causes alcohol extraction and possible stabilizer extraction.

DRAFT

a. Operator Interface Navigation

Key	When	In Order To
F1	Any Mode	Change to Operational Mode
F2	Any Mode	Change to Night Cool Mode
F3	Any Mode	Change to Set-up Mode. A password is required to enter the set-up mode
F4	Operational or Night Cool Mode with covers in Manual configuration	Open or close left cover
F5	Operational or Night Cool Mode with covers in Manual configuration	Open or close right cover
F6	Operational or Night Cool Mode	Turn cooling on or off
F7	Operational Mode	Turns ultrasonic sump heat on or off
F8	Operational Mode	Turn boiling sump and ultrasonic sump heaters on or off
F9	Operational Mode	Turn recirculation pumps on or off
F10	Operational Mode with Ultrasonics in manual configuration	Turns ultrasonics on or off
F11	Operational Mode	Turns hot plate heater on or off
F12	Any Mode	Reset cleared Emergency Stop errors to allow restarting of the process
PAGE-UP	Set-up Mode, Operational Mode in status view	Go to the next item
PAGE-DOWN	Set-up Mode, Operational Mode in status view	Go to the previous item
TOGGLE	Operational Mode, Set-up Mode	Toggle on/off or AUTO/MAN
Enter	Set-up Mode	Enter new numerical data in field
Clear	Set-up Mode	Clear numerical data from field
Number	Set-up Mode	

Note: There are two methods which may be used to change a setting:

- **To increment the setting up or down: Press Δ+ to increase the setting or Δ- to decrease the setting. Repeat until the desired setting is reached.Press ENTER to complete the entry.**
- **To enter a new setting: Press CLEAR, then enter the new value using the number keys. Press ENTER to complete the entry.**

- If the temperature is wrong, either increment the temperature up or down or enter a new value as described above.

Note: Press PAGE UP to move to the previous screen or PAGE DOWN to move to the next screen from any location within the set-up sequence.

```
SETUP MODE
ENTER BOIL SUMP TEMP DIFFERENTIAL  15
```

- The boil sump temp differential is the amount above the pure solvent boiling point that may be reached before a BOIL SUMP OVERTEMPERATURE ALARM is shown. The maximum value is 30 degrees Fahrenheit. A typical setting is 5% above the clean solvent boiling temperature. Consult the solvent manufacturer for the recommended setting for the solvent and soil which you will be using.

Warning: Setting the boil sump temp differential too high may result in flammable concentrations of oils in the boiling sump.

```
SETUP MODE
ENTER U/S TEMPERATURE SETPOINT 100
```

- Enter the temperature which you want the ultrasonic sumps to operate at. Normally, they will operate at 15 to 20 degrees Fahrenheit below the pure solvent boiling temperature. If they are set too low, solvent action will be reduced and vapor generation will be reduced because of condensation on the tank surfaces. If they are set too high, the final vapor rinse will be reduced. All ultrasonic tanks are set to operate at the same temperature.

```
SETUP MODE
ENTER LOW VAPOR TEMP DIFFERENTIAL  20
```

- The low vapor temp differential is the amount below the pure solvent boiling point that may be reached before a NOT READY message is displayed. This message indicates that the vapor

seconds. It should be set long enough to allow the cover to move to the extreme position.

```
SETUP MODE
ENTER DEFROST INTERVAL MINUTES: 60
```

Enter the number of minutes between defrost cycles. 60 minutes is recommended. Allowable values are 15 to 500 minutes.

```
SETUP MODE
ENTER DEFROST DURATION SECONDS: 180
```

Enter the number of seconds that defrost may operate before automatic termination. Allowable values are 0 to 250 seconds. Set the duration to 0 to skip defrost. The defrost cycle will terminate when the coil temperature at the coil outlet rises above freezing. Defrost automatically terminates at the end of the defrost interval even when the coil does not no reach the termination temperature.

```
SET-UP MODE|*PAGE UP/DOWN FOR SELECTION
or select: |OPERATION=F1**NIGHT COOL=F2
```

- The set-up process is now complete. Press F1 to go to the operational mode or F2 to go to the Night Cooling Mode.

3.9 Programming the TDR

Note: Refer to the TDR manual for general programming instructions.

a. Set vertical speed to no greater than 11 feet per minute.

Caution: Moving into or out of a degreaser too quickly will disrupt the vapor zone and increase solvent losses. 11 feet per minute is the maximum allowed by the EPA.

b. Opening and closing covers.

The countertop is arranged so that there are moveable covers over the boiling sump and over the hot plate. The center of the countertop is slotted so that the TDR may move from tank to tank without opening the covers. The covers only need to be opened when the TDR is entering or leaving the degreaser.

seconds. It should be set long enough to allow the cover to move to the extreme position.

```
SET-UP MODE|*PAGE UP/DOWN FOR SELECTION
or select: |OPERATION=F1**NIGHT COOL=F2
```

- The set-up process is now complete. Press F1 to go to the operational mode or F2 to go to the Night Cooling Mode.

3.9 Programming the TDR

Note: **Refer to the TDR manual for general programming instructions.**

a. Set vertical speed to no greater than 11 feet per minute.

Caution: **Moving into or out of a degreaser too quickly will disrupt the vapor zone and increase solvent losses. 11 feet per minute is the maximum allowed by the EPA.**

b. Opening and closing covers.

The countertop is arranged so that there are moveable covers over the boiling sump and over the hot plate. The center of the countertop is slotted so that the TDR may move from tank to tank without opening the covers. The covers only need to be opened when the TDR is entering or leaving the degreaser.

- Turn on output 1 (Code 26011) to open the left cover if the covers are configured for automatic operation.
- Turn off output 1 (Code 26010) to close the left cover if the covers are configured for automatic operation.
- Turn on output 2 (Code 26021) to open the right cover if the covers are configured for automatic operation.
- Turn off output 2 (Code 26020) to close the right cover if the covers are configured for automatic operation.

c. Preventing Crashes with the Covers

- Before moving in or out of the left cover opening, enter a "STOP 8" (Code 20008). This will cause the TDR to wait until the left cover is open before moving through the left cover opening.

- Connect a switch (mechanical, proximity, photo cell etc.) between wire 15 (+24VDC) and PLC I/O Module 2 input 9. The switch contacts should be open (not-passing) when the TDR is to wait.
- Program a " STOP 5" (Code 20005) at the point in the TDR cycle where the TDR is to pause and wait for a signal.

i. Using Multi-program Option

The multi-program option uses the same connections as the TDR restart lines. Since the LED uses restarts 4-8, only 3 programs are available for use with the multi-program option.

Additional programs may be made available by disconnecting output wires on the PLC. They must be disconnected in the order shown below.

To enable a fourth program, disconnect wires 44 and 45 from PLC slot 3 output 6. The fault interruption feature (3.9g) will not be available.

To enable a fifth program, disconnect wires 36 and 37 from PLC slot 3 output 4. The external switch interruption feature (3.9h) will not be available.

To enable a sixth program, disconnect wires 34 and 35 from PLC slot 3 output 3. The not ready interruption feature (3.9f) will not be available.

Caution: **Closing multi-program option switches 7 or 8 will cause the TDR to think that the LED covers are open. This effectively disables the cover interlock feature (3.9c) and may result in crashes with the covers and damage to the equipment. Recommend that the multi-program option switches 7 and 8 be disabled (disconnected) when used with an LED.**

3.10 Checking Pump Rotation

The pump rotation direction must be in the direction shown on the face of the pump.

To check pump rotation:
- Prepare the degreaser for operation. Fill it with solvent.
- Remove the back panel from the degreaser.

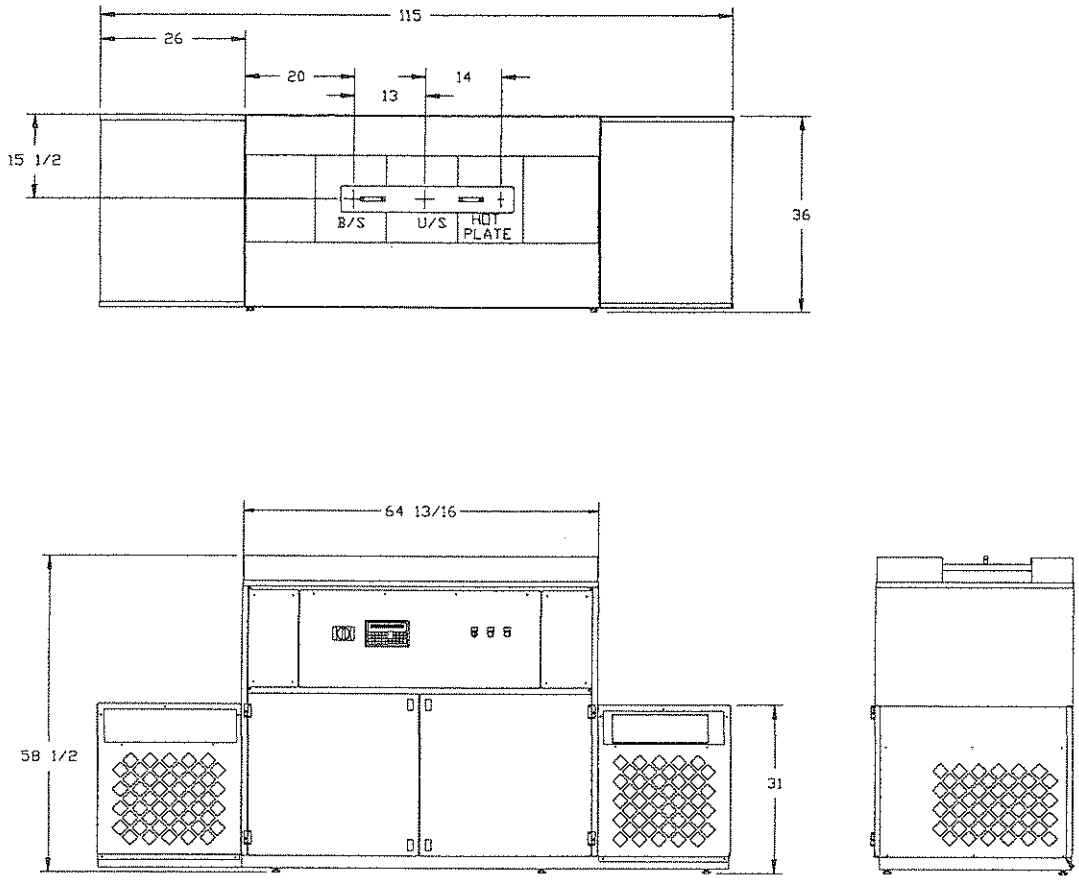
LED
Ultrasonic Vapor
Degreaser

BRANSON Precision Cleaning
41 Eagle Road
Danbury, CT 06813-1961
(203) 796-0400

Operation

Rev A

Figure 2-4
LED 1216 R
Dimensions



b. **LED 1620**

Overall Dimensions:	Length L to R	109"
	Width F to B	40"
	Height	67 1/2"
Working Dimensions	Left to Right	16"
	Front to Back	20"
	Depth	14 1/2"
Working Capacity:	20 gallons	
Total Solvent Capacity:	50 gallons	
Vapor Zone Dimensions	Left to Right	57 1/4"
	Front to Back	23 1/4"
	Depth	14 1/2"
Freeboard Zone	Left to Right	61 1/4"
	Front to Back	27 1/4"
	Depth	24" (120%)

Voltage: 208-240 VAC, 3 phase, 50/60 Hz, 53 Amps

Water Requirements: 3.5 gpm @ 50°F

Freeboard Chiller: [redacted] D50C

TDR (if purchased)

Voltage: 120 VAC, 1 phase, 60hz, 7 Amps

Branson BC300 Chiller

Voltage: 208-240 VAC, 3 phase, 50/60hz, 18 Amps

c. **LED 2024**

Overall Dimensions:	Length L to R	139"
	Width F to B	43 3/8"
	Height	73 1/2"
Working Dimensions	Left to Right	20"
	Front to Back	24"
	Depth	16"
Working Capacity:	33 gallons	
Total Solvent Capacity:	87 gallons	
Vapor Zone Dimensions	Left to Right	69 1/4"
	Front to Back	27 1/4"
	Depth	16"
Freeboard Zone	Left to Right	73 1/4"
	Front to Back	31 1/4"
	Depth	29" (120%)

Voltage: 208-240 VAC, 3 phase, 50/60 Hz, 69 Amps

Water Requirements: 6 gpm @ 50°F

Freeboard Chiller: Ultrakool

TDR (if purchased)

Voltage: 120 VAC, 1 phase, 60hz, 7 Amps

Branson BC500 Chiller

Voltage: 208-240 VAC, 3 phase, 50/60hz, 31 Amps

LED
Ultrasonic Vapor
Degreaser

BRANSON Precision Cleaning
41 Eagle Road
Danbury, CT 06813-1961
(203) 796-0400

Installation

Rev A

3.1 Unpacking and Handling

Use reasonable precautions when unpacking and handling your system. To avoid damage, use the shipping container when transporting the equipment.

Inspect all external controls and surfaces prior to setup to detect possible shipping damage. Report any damage at once to the carrier.

Note: **The carrier is responsible for damage to equipment during shipment. If damage has occurred, notify the carrier immediately. Retain packing materials for inspection.**

Caution: **Lift the degreaser near the control side leveling feet and near the center leveling feet. Failure to support the center section may damage the sheet metal panels.**

3.2 Public Utility Requirements

See specifications.

3.3 Location

Locate the LED in a well ventilated area. Provide space all around for control, filling and making connections.

Locate away from direct air currents.

Warning: **Do not install near welding operations, exposed electrical heating elements or open flames. Solvent vapors may decompose when exposed to high temperatures or ultraviolet light and form toxic and corrosive compounds.**

3.4 Leveling

Level the degreaser using the leveling feet.

Note: **Leveling adjustments may alter door alignment. Adjust the cold trap (right side) feet to restore alignment.**

- Connect the chiller to a fused disconnect in accordance with the chiller manual.
- Set the chiller Local/Remote switch to "REM".
- Fill the chiller with antifreeze in accordance with the operator's manual instructions.

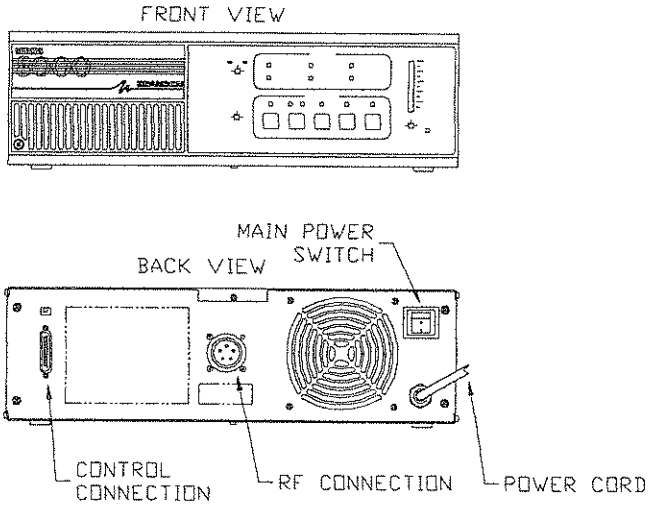
Caution: **Connect the chiller to the power source at least 6 hours before initial start-up to prevent damage to the compressor.**

b. Ultra-Kool Cold Trap Module

The Ultra-Kool cold trap is fully installed at the factory. No field connections are required.

c. Ultrasonic Generator

Figure 3-2
Ultrasonic Power Supply



Note: Refer to the S8000 Manual for general instructions regarding the installation and operation of the Series 8000 Power Supplies

4.1 Introduction

Before preparing the LED for operation, read the following warnings. Failure to follow these warnings may result in property damage, serious personal injury or death.

Anyone using the LED should read and thoroughly understand this manual, as well as familiarize themselves with the precautionary instructions pertaining to using and handling chemicals. If necessary, contact the chemical manufacturer for recommendations regarding the use and handling of the manufacturer's products.

Warning:

1. Keep the covers closed when not processing parts through the cleaner.

2. Always wear eye protection, gloves and protective clothing when handling solvents. Do not allow solvent to come into contact with the body. Solvent above 140°F (60°C) can cause burns. With prolonged or frequent contact, solvent removes natural oils from the skin.

3. Do not inhale or take solvent internally - either could be fatal.

4. All solvents are toxic to some degree. Do not allow solvent vapors to exceed the threshold limit value stated in Section V of the applicable OSHA Material Safety Data Sheet.

5. Never enter or lean into a degreaser. Solvent vapors will be present even if the degreaser appears empty. Solvent vapors displace air and may cause death by asphyxiation. Use cleanout doors when cleaning the degreaser.

6. Before adding solvent, be certain that the solvent to be added is the same as the solvent already in the cleaner.

7. Do not expose any halogenated solvent or its vapors to the high temperatures existing in open flames or exposed electric heating elements, or the solvent may decompose to toxic or corrosive substances.

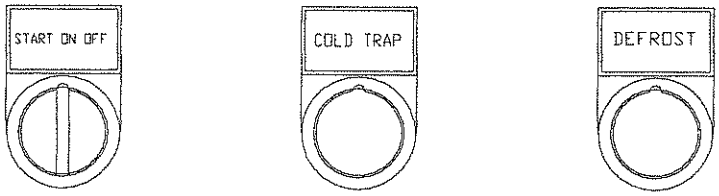
8. Do not use solvents which have become over-contaminated. High contamination levels may result in fire hazards or solvent breakdown and equipment damage.

START (the green light will turn on), hold for 5 seconds and release (the switch will move to the ON position.) The green light will normally turn off and then turn on after a short delay.

Note: **If power is disconnected while the coils are cold, the compressor may not start until the coils warm up.**

The cold trap will defrost approximately once per hour. The frost on the cold trap coil will melt and the liquid will be collected in the trough and flow into the reservoir. The DEFROST light will be on during the defrost cycle.

Figure 4-1
Cold Trap Controls



a. Cold trap operation

Initial condition

- START-ON-OFF switch is OFF.
- Hi-low pressure switch causes the compressor to cycle occasionally for a few seconds to maintain the low pressure condition. The GREEN light will light when this occurs.

Caution: Do not disconnect from power for long periods (4 hours or more.) Pressure will build up a may damage the compressor due to liquid migration.

4.6 Starting the Degreaser

a. Operational Mode

Turn the Disconnect to ON ('1' will be displayed in the switch window.) The PLC will display the following message on initial start-up: (ST-01)

```
*****LED ULTRASONIC VAPOR DEGREASER****
PLC SOFTWARE REV:6  MAPLE SOFTWARE REV:6
```

This screen will disappear after 4 seconds and be replaced by the following screen: (ST-02)

```
**********OPERATIONAL MODE=F1*********
NIGHT COOL MODE=F2******SET UP MODE=F3
```

- Press F1 to enter the Operational Mode. (OP-01)

```
BOIL SUMP TEMP= 75deg.NOT READY!VPR&US-T
HOT PLATE TEMP= 75deg.U/S TEMP= 75deg.
```

Note: Press F12 to return to the OP-01 screen directly from any operational screen

b. Turn on Cooling, B/S Heat, U/S Heat, Pump and Hot Plate Heat

- Press F6,F7,F8,F9 or F11 or press PAGE UP from screen OP-01. (OP-02)

```
COOLING:OFF  U-S HTR:OFF  RECIRC PUMP:OFF
B-S HTR:OFF  U-SONIC:OFF  HOT PLATE:OFF
```

1) **Cooling**
   Press F6 to turn on COOLING:
   The screen will change to show "COOLING: ON".
   The chiller (if equipped) will turn on.

Note: With screen OP-02 displayed, pressing a function key will toggle the function from OFF to ON or ON to OFF.

2) Boiling Sump Heat
   Press F8 to turn on the Boiling Sump Heat.
   The screen will change to show "B-S HTR: ON"
   The boil sump heaters will turn on.

- Press F9 to turn on the Recirculation Pump.
  The screen will change to show "RECIRC PUMP: ON"
  The recirculation pump will turn on.
- Loosen the Filter Air Bleed Fitting until liquid is expelled from the fitting. Tighten the fitting.

Pressing F9 toggles the Recirculation Pump ON and OFF.

5) **Hot Plate Heat**
Press F11 to turn on the Hot Plate Heat.
The screen will change to show "HOT PLATE: ON"
The hot plate heaters will turn on.

4.7 Turning Ultrasonics On and Off

Note: **Refer to the S8000 manual for detailed instructions regarding setup and operation of the power supplies.**

- See Section 3.5c. for generator set-up instructions.
- Press F10. (OP-03)

U/S GENERATOR:MANUAL MODE***ULTRASONIC**
Toggle To Change Mode *****GEN:OFF

- Press TOGGLE to toggle the setting between TDR and MANUAL modes.
- From the Manual Mode, press F10 to toggle the ultrasonics between OFF and ON.
- Pressing F10 has no effect when the TDR mode is active.

Note: **Ultrasonics will not operate unless the boiling sump heat is operating.**

- Press F12 to return to screen OP-01.

Continuous operation of the ultrasonics may cause the ultrasonic sump temperature to rise above the set point. Operate ultrasonics only when parts are being cleaned to avoid performance degradation from operating too near the boiling point of the solvent.

4.10 Forcing Covers Open

The covers are spring loaded and may be forced open manually. The springs exert a maximum of 5 pounds force and will open easily. They must be held open by hand. The open limit switches are not activated when the covers are forced open.

Warning: **Return covers to the closed position slowly. The momentum of the covers if released from the open position may cause injury.**

4.11 Ready Status

If the vapor zone has been established and the Ultrasonic Sump Temperature is greater than 10 degrees below the set point, screen OP-01 will display a ready message. (OP-01a)

```
BOIL SUMP TEMP=159deg. *SYSTEM IS READY*
HOT PLATE TEMP=250deg.U/S TEMP=120deg.
```

If the vapor zone is established but the ultrasonic sump temperature is not greater than 10 degrees below the set point, screen OP-01 will read "NOT READY!U/S HTR." (OP-01b)

```
BOIL SUMP TEMP=159deg. *NOT READY!U/S HTR
HOT PLATE TEMP=250deg.U/S TEMP= 80deg.
```

If the ultrasonic sump temperature is greater than 10 degrees below the set point but the vapors have not activated the Vapor Up sensor, screen OP-01 will read "NOT READY!VAPOR UP." (OP-01c)

```
BOIL SUMP TEMP=159deg.NOT READY!VAPOR UP
HOT PLATE TEMP=250deg.U/S TEMP= 80deg.
```

If the ultrasonic sump temperature is not greater than 10 degrees below the set point and the vapors have not activated the Vapor Up sensor, screen OP-01 will read "NOT READY!VPR&US-T." (OP-01d)

```
BOIL SUMP TEMP=159deg.NOT READY!VPR&US-T
HOT PLATE TEMP=250deg.U/S TEMP= 80deg.
```

4.14 Night Cool Mode

Press F2 to turn on the night cool mode. The heat, pumps and ultrasonics will turn off. (NC-01)

```
NIGHT COOL|"ON">>PAGE UP/DOWN FOR STATUS
 Or Select|**OPERATION=F1****SET-UP=F3
```

Press PAGE DOWN to see the Cooling Status. (NC-02)

```
NIGHT COOL MODE
COOLING IS OFF
```

The chiller or refrigeration will continue to operate if it was turned on. If it was not on, turn it on by pressing F6. The display will change to show "COOLING IS ON".

Press PAGE DOWN to see the cold trap temperature. (NC-03)

```
NIGHT COOL MODE
SUBCOOLING TEMPERATURE=- 20 degF
```

Press PAGE DOWN to see the condensing coil temperature. (NC-04)

```
NIGHT COOL MODE
CONDENSING COIL TEMPERATURE= 40 degF
```

Press PAGE UP or PAGE DOWN to move between the Night Cool screens.

Leave the Cold Trap on whenever solvent is in the degreaser.

Press F1 to return to the Operational Mode. The operation will return to the state it was in before Night Cool Mode was entered.

4.15 Shut Down

- Turn off all functions and close the covers.
- If complete shutdown is required, turn the disconnect switch to OFF ('0' will be displayed in the switch window.)

c. Boil Sump Low Level Alarm

The liquid level in the boiling sump is low. (ES-02)

EMERGENCY SHUT DOWN!
BOIL SUMP LOW LEVEL ALARM: **ON**

This could allow the heaters to become exposed and overheat causing damage to the heaters and breakdown the solvent.

Add solvent to clear the fault.

d. Boil Sump Over Temperature Alarm

The solvent in the boiling sump is too hot. This is caused by excessive amounts of soluable contamination. (ES-03)

EMERGENCY SHUT DOWN!
BOIL SUMP OVER TEMPERATURE ALARM: **ON**

Drain the boiling sump and refill with clean solvent to reset the alarm.

e. High Vapor Level Alarm

The solvent vapors have risen above the condensing coil. This is a sign of cooling failure. (ES-04)

EMERGENCY SHUT DOWN!
HIGH VAPOR LEVEL ALARM: **ON**

Check the cooling system.

This fault may also be caused by poor operating procedures such as moving baskets too quickly into or out of the LED.

Reset this fault by correcting the problem with the cooling system.

f. Condensing Coil Temperature Alarm

The cooling water leaving the condensing coil is too hot. (ES-05)

EMERGENCY SHUT DOWN!
CONDENSING COIL TEMPERATURE ALARM: **ON**

On initial start-up, a Chiller Interlock alarm may occur if the LED is used with plant water or a non-Branson chiller and the jumper is not installed from wire 15 to I/O Module 2, Input 14.

j. Thermocouple Open Alarm

A thermocouple Open Alarm will occur if a thermocouple wire is broken or disconnected. (ES-09)

EMERGENCY SHUT DOWN!
(**********)THERMOCOUPLE OPEN WIRE

The specific thermocouple will be identified in the (***) section.

Replace or reconnect the thermocouple to reset.

k. Cover Timeout Fault

The cover did not arrive at its destination within the allocated time. (ES-10)

COVER LID MOTOR FAULTED TO ITS POSITION
PRESS FUNCTION KEY "F12" TO RESET FAULT

A cover timeout fault may result from:

- motor failure
- improper brake adjustment
- broken belt
- loose pulley
- track obstruction
- overcurrent protection opening
- limit switch failure

A cover timeout fault shuts the cover motor off. It does not shut off the boiling sump heat.

Identify the cause of the failure, press F12 to reset the fault and continue operation.

LED
Ultrasonic Vapor
Degreaser

BRANSON Precision Cleaning
41 Eagle Road
Danbury, CT 06813-1961
(203) 796-0400

Maintenance

Rev A

5.1 Routine Inspection

Loosening of plumbing connections is common during shipment and use. Check all connections during the initial startup of the degreaser and routinely thereafter. Leaks in solvent systems may be difficult to detect because the solvent evaporates so quickly.

Feel for dampness or cold spots caused by evaporative cooling.

There are dyes that can be added to the solvent to assist in leak detection, however, these dyes may be difficult to remove when the degreaser is later used for cleaning.

5.2 Draining Water From Water Separator

To use the separator/desiccator as a separator, do not install the desiccator container.

At least once each day, open the water separator water drain and collect the discharge into a container. When the flow stops, close the drain. The discharge will contain some dissolved or suspended solvent. Dispose of this residue in accordance with local regulations.

5.3 Changing Desiccant

Desiccant must be tested routinely and changed when necessary. It may be regenerated and reused; check with the desiccant manufacturer for regeneration instructions.

a. Testing Frequency

The rate of desiccant exhaustion is determined by the amount of water introduced by the parts, the ambient humidity and the temperature of the condensing and cold trap coils.

Note: **For maximum solvent and equipment life, do not allow the desiccant to become fully loaded with water. Change the desiccant before the desiccant test shows positive.**

Use the following guidelines to determine testing frequency for your local conditions. The guidelines also detail how to obtain the maximum life from the desiccant.

2. Suspend the container above the separator until all dripping stops.

3. Remove the container from the degreaser and empty the desiccant bag. Follow the manufacturer's recommendations for regenerating desiccant.

4. Replace the desiccant bag in the container. Fill with desiccant.

5. Using the hook, replace the desiccant container in the separator.

5.4 Draining Cold Trap Water Separator

The Cold Trap Water Separator collects water and solvent from the cold trap. Drain the Cold Trap Water Separator at least once per shift.

- Drain the water by opening the water drain valve. Collect the water in a suitable container. Dispose of the water in accordance with local regulations. Close the water drain valve.

5.5 Cleanout Procedure

It is vitally important that solvent equipment be kept clean for the safety of the operator, the economy of the operation and the effectiveness of the cleaning.

Warnings:

1. **Never enter or lean into a degreaser. Solvent vapors will be present even if the degreaser appears empty. Solvent vapors displace air and may cause death by asphyxiation. Use cleanout doors when cleaning the degreaser.**

2. **Unplug or electrically "lock-out" the degreaser before cleaning unit.**

3. **Always consult the solvent manufacturer for contamination information, safe handling practices and proper storage procedures.**

6. Brush out the condensate trough and make sure that there are no obstructions to condensate flow. Take care to avoid damage to corrosion resistant finishes.

7. Brush the condensing coils, walls and tank bottoms to remove all accumulated residues.

8. If the solvent tested positive for acid, follow acid cleanout procedures.

9. Close the drain valves and refill with previously drained solvent. Add new solvent as required.

10. Check for leaks.

11. Restart following initial startup procedures.

5.6 Acid Cleanout Procedures

A degreaser which has gone acid can be neutralized and repassivated. Complete removal of all solid residue from the cleaner and associated plumbing is essential to avoid recurrence of the acid condition.

All exposed surfaces of the cleaner, pipes, fittings and valves must be neutralized with special attention being given to corners and seams. To do so:

a. Using a medium stiff bristle brush, scrub the interior of the degreaser with a 5% baking soda and water solution (approximately 1/2 lb. per gallon.)

b. Thoroughly rinse the system, including all plumbing and associated equipment, with water and flush out all residue.

c. Scrub the unit (especially corners and weld seams) with STA-CLEAN* or a solution of one part OAKITE 33* to six parts water.

Warning: OAKITE 33 contains acid. Avoid contact with eyes and skin. Wear appropriate eye protection, gloves and protective clothing.

d. Flush the solution through all the pipes, fittings and valves.

LED
Ultrasonic Vapor
Degreaser

BRANSON Precision Cleaning
41 Eagle Road
Danbury, CT 06813-1961
(203) 796-0400

Parts Lists

Rev A

PART NO.SPC-LED-16P
DESCRIPTION: LED 1620 BASIC
PROJECT ENGINEER: BALDWIN/BRIDGES

REVISION R	DESCRIPTION	BY	DATE
A	RELEASED TO MFG.	RWB	02-03-98

ITEM	R	PART NUMBER	DWG NUMBER	QTY	UOI	DESCRIPTION
SPC-LED-16A						
			A24-12271	1.00	DW	CONDENSING COIL LED 1620
			B24-12272	6.00	DW	BRACKET CONDENSING COIL
			B24-12276	1.00	DW	FRAME TANK SUPPORT LED 1620
			B24-12335	1.00	DW	WATER SEPARATOR COLD TRAP
			B24-12392	1.00	DW	BRACKET COLD TRAP COIL
			B24-12684	1.00	DW	BRACKET FILTER BAG
			B29-2901	1.00	DW	TANK DETAIL LED 1620
		000-127-132		6.00	EA	WELDSTUD SS 1/4-20 X 3/4
		000-127-135		23.00	EA	WELDSTUD SS 1/4-20 X 1-1/4
		000-127-140		12.00	EA	WELDSTUD SS 6-32 X 1/2
		000-127-147		20.00	EA	WELDSTUD SS 10-32 X 1/2
		000-185-240		6.00	SH	METAL SHT 304L-2B 14 GA
		000-185-242		1.25	SH	METAL SHT 304L-2B 12 GA
		000-348-064		4.00	EA	SCREW MS 6-32X1 BH SS
		000-501-112		.15	FT	PIPE 304SS 1/2 SCH 40
		000-501-112		3.00	FT	PIPE 304SS 1/2 SCH 40
		000-501-116		1.00	FT	PIPE 304SS 3/4 SCH 40
		000-503-110		55.00	FT	TUBE 304SS .750 OD .049 STR
		000-505-203		1.00	EA	ROD THREADED 1/4-20 X 6
		000-519-124		2.00	EA	BUSHING 304SS 1M X 1/2F

PART NO.SPC-LED-16P
DESCRIPTION: LED 1620 BASIC
PROJECT ENGINEER: BALDWIN/BRIDGES

REVISION R	DESCRIPTION	BY	DATE
A	RELEASED TO MFG.	RWB	02-03-98

ITEM	R	PART NUMBER	DWG NUMBER	QTY	UOI	DESCRIPTION
SPC-LED-16A						
156		000-175-048		2.20	SF	ADHESIVE FILM 12" WIDE
157		000-802-167		24.00	EA	TRANSDUCER KIT 40KHZ
158		000-400-093		18.00	EA	TERM SPLICE PRL 14-16 NON-INS
159		000-400-094		5.00	EA	TERM SPLICE PRL 10-12 NON-INS
160		200-103-074		2.00	EA	TERMINAL GND LUG #6 14-18AWG
161		000-352-202		1.00	EA	NUT HEX 6-32 SS
162		000-680-405		48.00	EA	TUBE TEFLON 14TW 3.5
176		000-490-078		2.50	FT	WIRE TEF 14-19/27 RED
177		000-490-080		6.00	FT	WIRE HKP 18G TEF NB RED
178		000-490-081		6.00	FT	WIRE HKP 18G TEF NB BLACK
179		000-490-077		3.75	FT	WIRE TEF 14-19/27 BLK
180		000-400-095		10.00	EA	TERM SPLICE 8
181		200-065-508		1.00	EA	LABEL CABLE BLANK
SPC-LED-16B						
			B24-12293	1.00	DW	SKIRT LED 1620 LEFT
			B24-12294	1.00	DW	SKIRT LED 1620 RIGHT
			B24-12295	1.00	DW	SKIRT LED 1620 FRONT
			B24-12296	1.00	DW	SKIRT LED 1620 ACCESS PANEL
			B24-12297	1.00	DW	SKIRT LED 1620 BACK LEFT
			B24-12298	1.00	DW	SKIRT LED 1620 BACK RIGHT

PART NO.SPC-LED-16P
DESCRIPTION: LED 1620 BASIC
PROJECT ENGINEER: BALDWIN/BRIDGES

REVISION R	DESCRIPTION	BY	DATE
A	RELEASED TO MFG.	RWB	02-03-98

ITEM	R	PART NUMBER	DWG NUMBER	QTY	UOI	DESCRIPTION
SPC-LED-16C						
			B24-12310	1.00	DW	GENERATOR SUPPORT LED 1620
			B24-12603	2.00	DW	BRACKET C'BOX LED 1216 & 1620
			B24-12686	1.00	DW	PLATE COVER DRIVE
		000-127-147		6.00	EA	WELDSTUD SS 10-32 X 1/2
		000-185-204		.30	SH	METAL SHT 304-4 22GA
		000-185-206		.75	SH	METAL SHT 304-4 16GA
		000-185-242		1.00	SH	METAL SHT 304L-2B 12 GA
SPC-LED-16D						
			B24-12265	1.00	DW	COVER LEFT LED 1620
			B24-12266	1.00	DW	COVER RIGHT LED 1620
			B24-12269	1.00	DW	CONTAINER DESICCANT
			B24-12285	1.00	DW	INSERT COVER
			B24-12288	1.00	DW	COUNTERTOP FRONT
			B24-12289	1.00	DW	COUNTERTOP BACK
			B24-12301	1.00	DW	CONTROL BOX
			B24-12687	1.00	DW	TRACK COVER LED 1620
		000-127-147		8.00	EA	WELDSTUD SS 10-32 X 1/2
		000-185-204		.33	SH	METAL SHT 304-4 22GA
		000-185-206		2.00	SH	METAL SHT 304-4 16GA
		000-185-238		.33	SH	METAL SHT 304L-2B 16 GA

PART NO.SPC-LED-16P
DESCRIPTION: LED 1620 BASIC
PROJECT ENGINEER: BALDWIN/BRIDGES

REVISION R	DESCRIPTION	BY	DATE
A	RELEASED TO MFG.	RWB	02-03-98

ITEM	R	PART NUMBER	DWG NUMBER	QTY	UOI	DESCRIPTION
SPC-LED-16P						
4		CPN-060-001		4.00	EA	THERMOCOUPLE J 3/16X12 10 FT OMEGA TJ120-ICIN-316G-12
5		CPN-099-272		1.00	EA	SWITCH LEVEL LED1620
6		CPN-087-014		1.00	EA	O-RING TEFLON 2-229
7		000-352-110		39.00	EA	NUT HEX 10-32 SS
8		000-354-033		43.00	EA	WASHER LOCK #10 IT ZPS
10		000-400-053		19.00	EA	LUG HEATER 10P
11		000-593-108		2.00	EA	SEALTITE ADAPT STR 3/4
12		000-509-006		15.00	FT	SEALTITE 3/4
13		000-651-218		1.00	EA	GUARD HEATER BSD/BLD 1620 C15289
14		CPN-657-408		2.00	EA	DOOR CLEAN OUT, DOUBLE B REV A
15		CPN-087-015		2.00	EA	O-RING TEFLON 2-357
16		000-348-186		12.00	EA	BOLT HEX 5/16-18X1 ZPS
17		000-352-114		44.00	EA	NUT HEX 5/16-18 ZPS
18		000-354-065		28.00	EA	WASHER LOCK 5/16 ST ZPS
19		CPN-065-038		1.00	EA	LABEL PLC FUNCTION LED
20		200-114-185		64.00	EA	WASHER FLAT M8
21		000-559-103		3.00	EA	VALVE BALL 316 SS 1/4
22		000-535-116		3.00	EA	NIPPLE 304SS 1/4 X 1-1/4
23		000-503-106		6.00	FT	TUBE 304SS .375 OD .028 STR
24		000-593-122		6.00	EA	SEALTITE ELBOW 90 1/2
25		000-593-106		5.00	EA	SEALTITE ADAPT STR 1/2

PART NO.SPC-LED-16P
DESCRIPTION: LED 1620 BASIC
PROJECT ENGINEER: BALDWIN/BRIDGES

REVISION R	DESCRIPTION	BY	DATE
A	RELEASED TO MFG.	RWB	02-03-98

ITEM	R	PART NUMBER	DWG NUMBER	QTY	UOI	DESCRIPTION
SPC-LED-16P						
48		000-490-238		24.00	FT	WIRE HEATER 14
49		000-127-140		1.00	EA	WELDSTUD SS 6-32 X 1/2
50		100-240-136		1.00	EA	RF CABLE ASSY 15 FT - 8000
51		000-030-238		1.00	EA	CONNECTOR C-H CGB195
52		000-348-199		4.00	EA	BOLT HEX 3/8-16X1.5
53		CPN-073-006		4.00	EA	NUT HEX 3/8-16 SS MCMASTER 91845A031
54		000-354-060		4.00	EA	WASHER FLAT 3/8 ZPS
55		200-114-100		4.00	EA	WASHER LOCK 3/8 SS
56		CPN-098-012		89.00	EA	SCREW MS 10-32X.5 PAN PHL SS
57		100-116-030		16.00	EA	WHEEL ROLLER TDR 1-9/16
58		000-348-198		16.00	EA	BOLT HEX 5/16-18X1.5
59		CPN-114-002		8.00	EA	WASHER FLAT #10 SS
60		CPN-095-002		2.00	EA	SPRING SASH 3.5-4.5 LBF MCMASTER 1053A13
61		CPN-069-002		1.00	EA	GEARMOTOR 32.7RPM 230/1 1/20HP GRAINGER 1L523
62		CPN-069-003		1.00	EA	GEARMOTOR BRAKE GRAINGER 5X400 (FOR CPN-069-002 GEARMOTOR)
63		CPN-069-004		1.00	EA	SOL BRAKE 230/60 K040021-002 PARTS CO. OF AMERICA
64		CPN-069-005		1.00	EA	GEARMOTOR CONDUIT BOX 2A754 GRAINGER
65		000-595-302		4.00	EA	NUT WIRE #73 ORANGE
66		CPN-176-002		1.00	EA	PULLEY TIME 16T 3/8P 3/4W 1/2B BROWNING 16LF075-1/2
67		CPN-175-002		25.00	FT	BELT TIMING 3/8P 3/4W ROLL BROWNING
68		CPN-091-001		1.00	EA	SHAFT IDLER OMN POW C A25-2500

Led 1620 S/N 6-2652-02

PART NO.SPC-LED-16P
DESCRIPTION: LED 1620 BASIC
PROJECT ENGINEER: BALDWIN/BRIDGES

REVISION R	DESCRIPTION	BY	DATE
A	RELEASED TO MFG.	RWB	02-03-98

ITEM	R	PART NUMBER	DWG NUMBER	QTY	UOI	DESCRIPTION
SPC-LED-16P						
90		CPN-011-010		1.00	EA	LIGHT PILOT 24V GREEN SPRECHER+SHUH, DL3R-G-E-24V
91		CPN-099-244		3.00	EA	SWITCH LEGEND CAR SM RND BTM SPRECKER 424-52
92		000-594-102		12.00	FT	DUCT WIRE 91020
93		000-594-101		12.00	FT	DUCT WIRE COVER 90011
94		CPN-107-015		1.00	EA	XFMR CTRL 250VA 208-480 X 24 ACME TA-2-81325
95		000-350-026		41.00	EA	SCREW MS 8-32X.25 PH SS
96		000-354-035		41.00	EA	WASHER LOCK #8 IT ZPS
97		CPN-103-007		1.00	EA	BLOCK TERM DIST 16021 BUSSMANN
98		CPN-103-005		22.00	EA	TERMINAL BLOCK W/ REJECT FUSE ENTRELEC P/N 116 298.27
99		CPN-049-002		4.00	EA	FUSE FNQ-R 2.25A 500V SB BUSS FNQ-R-2 1/4
100		CPN-049-033		1.00	EA	FUSE FNQ 8A 500V SB BUSS FNQ-8
102		000-135-106		7.00	EA	FUSE BAN 10A 250V FB BUSS BAN-10
103		000-135-112		4.00	EA	FUSE BAN 25A 250V FB BUSS BAN-25
104		000-135-118		3.00	EA	FUSE FNQ 3.5A 500V SB BUSS FNQ-3.5
105		CPN-049-031		3.00	EA	FUSE FNQ-R 15A 500V SB BUSS FNQ-R-15
106		CPN-104-001		1.00	EA	TIMER REPEAT SPDT 220/24 AC/DC SYRELEC BDR U 220A
107		000-404-126		5.00	EA	TERM BLK 10MM GND 165 115.10 ENTRELEC
108		CPN-084-007		3.00	EA	CONTACTOR 25A CA3-9-10-24-NO NO DWG S&S
109		CPN-084-003		3.00	EA	CONTACTOR 12A, 3POLE+NO/AUX SPRECHER CA4-9-10-24-NO
110		000-310-142		3.00	EA	RELAY DPDT 10A LY2-US-24V
111		CPN-093-001		3.00	EA	SOCKET RELAY OMRON PTF08A-E

PART NO.SPC-LED-16P
DESCRIPTION: LED 1620 BASIC
PROJECT ENGINEER: BALDWIN/BRIDGES

REVISION R	DESCRIPTION	BY	DATE
A	RELEASED TO MFG.	RWB	02-03-98

ITEM	R	PART NUMBER	DWG NUMBER	QTY	UOI	DESCRIPTION
SPC-LED-16P						
137		000-127-054		6.00	EA	FOOT LEVELING PSD
138		000-127-030		1.00	EA	BUTTON SNAP 1-1/8
139		SPP-007-280		1.00	EA	PLC AB 1746-N2 SLOT FILLER A/B #1746-N2
140		SPP-005-423		14.00	EA	TERM BLK 6MM GREY 115 116.07 ENTRELEC
141		000-348-103		6.00	EA	SCREW MS 10-32X.625 FH SS
142		SPP-006-552		1.00	EA	POWER SUPPLY SOLA 24VDC/1.2A NEWARK 89F1262
150		CPN-087-016		1.00	EA	O-RING FOR-RBXA TEFLON ENCAPSU AMERICAN FELT 423 TEFLON-ENCAP
155		SPP-007-069		1.00	EA	PLC AB 1747 CPU 12K 5/03 A/B #1747-L532
164		CPN-826-070		1.00	EA	HEAT EXCHANGER LED
165		CPN-826-068		1.00	EA	PUMP ASSY S25 WELDED TEFLON
186		CPN-121-005		2.00	EA	ADAPTER NYL 3/4MPT x 3/4H ELBO McMASTER 5373K33
187		000-559-213		1.00	EA	VALVE BALL BR 3/4
188		000-535-162		1.00	EA	NIPPLE 304SS 3/4 X CL
235		SPP-007-270		1.00	EA	CONTACT BLOCK SW N.C. SPRECHER D5-3X01
236		SPP-007-279		2.00	EA	ADAPTER 5/8C X 3/4F WROT CU
237		000-507-300		8.00	FT	HOSE RUBBER 3/4 ID
238		000-075-025		8.00	EA	CLAMP HOSE 3/4 - 1 1/2
239		SPP-007-265		50.00	FT	INSUL FOAM POLYETH ADH 1/4X54 MCMASTER 8722K65 OR EQUIV
240		000-513-003		12.00	FT	INSUL PIPE 3/4 IDX6L
241		200-040-091		1.00	EA	ELBOW NYLON 3/4H X 1/2 MNPT
242		CPN-159-008		2.00	EA	COUPLING 5/8C

LED
Ultrasonic Vapor
Degreaser

BRANSON Precision Cleaning
41 Eagle Road
Danbury, CT 06813-1961
(203) 796-0400

Assistance

Rev A

Calling the Local Branson Representative

If you have a problem call the local Branson field sales or service representative, who will know you, your needs and your applications. He may have a critical replacement part in stock that will return your machine to operation in the shortest possible time. Before you call, take the following steps:

1. Have this manual with you.

2. Know how your system has been set up and equipped, including any software versions in the system.

3. Describe the problem.

4. List the steps you have already taken.

5. Have a list of service spares on hand.

6. Enter the name and phone number of your Branson Representative here:

   Name:_____
   Phone_____

Calling Branson, Danbury

If the local Branson representative is unavailable, and you do not have the direct dial number for that individual, call Branson in Danbury at (203) 796-0400 and follow the automated voice system to the area you need.

You can also call after 5:00 P.M. or before 8:00 A.M. (Eastern Standard Time), or at any time during weekends and holidays and leave a message in the Corporate Mailbox. This message will be relayed to the correct department and answered during the next working day.

Federal Regulations for Returning Cleaning Equipment

Under Federal Regulations, Department of Transportation (DOT) 49CFR, Parts 100-177 and Occupational Safety and Health Administration (OSHA) 3084 "Right to Know" section of the "Chemical Hazard Communication" (29 CFR 1910, 1200), the following steps must be taken before returning equipment that uses Hazardous Chemicals.

1. Check Material Safety Data Sheets (MSDS) for solvents, solutions or contaminants used with your equipment.

2. In the following sources, check if your solvent is considered hazardous:

   - 29 CFR 1910, Sub part Z, Toxic and Hazardous Substances, (OSHA), and
   - Threshold Limit Values for Chemical Substances and Physical Agents in the Work Environment, American Conference of Governmental Industrial Hygienists (ACGIH).

   If so, report this to the carrier and to Branson.

3. In the following sources, check if your solvent is either a suspect or confirmed carcinogen:

   - National Toxicology Program (NTP), Annual Report on Carcinogens,
   - International Agency for Research on Cancer (IARC), Monographs, and
   - 29 CFR 1910, Sub part Z, Toxic and Hazardous Substances, OSHA.

   If so, report this to the carrier and to Branson.

4. **Completely** drain solvent from all equipment including plumbing.

5. Clean out all residues.

6. Include the MSDS for all solvents, solutions and contaminants which were in the equipment.

Both the carrier and Branson Ultrasonics Corporation have the right to refuse to accept delivery of the equipment unless these steps are taken.

LED
Ultrasonic Vapor
Degreaser

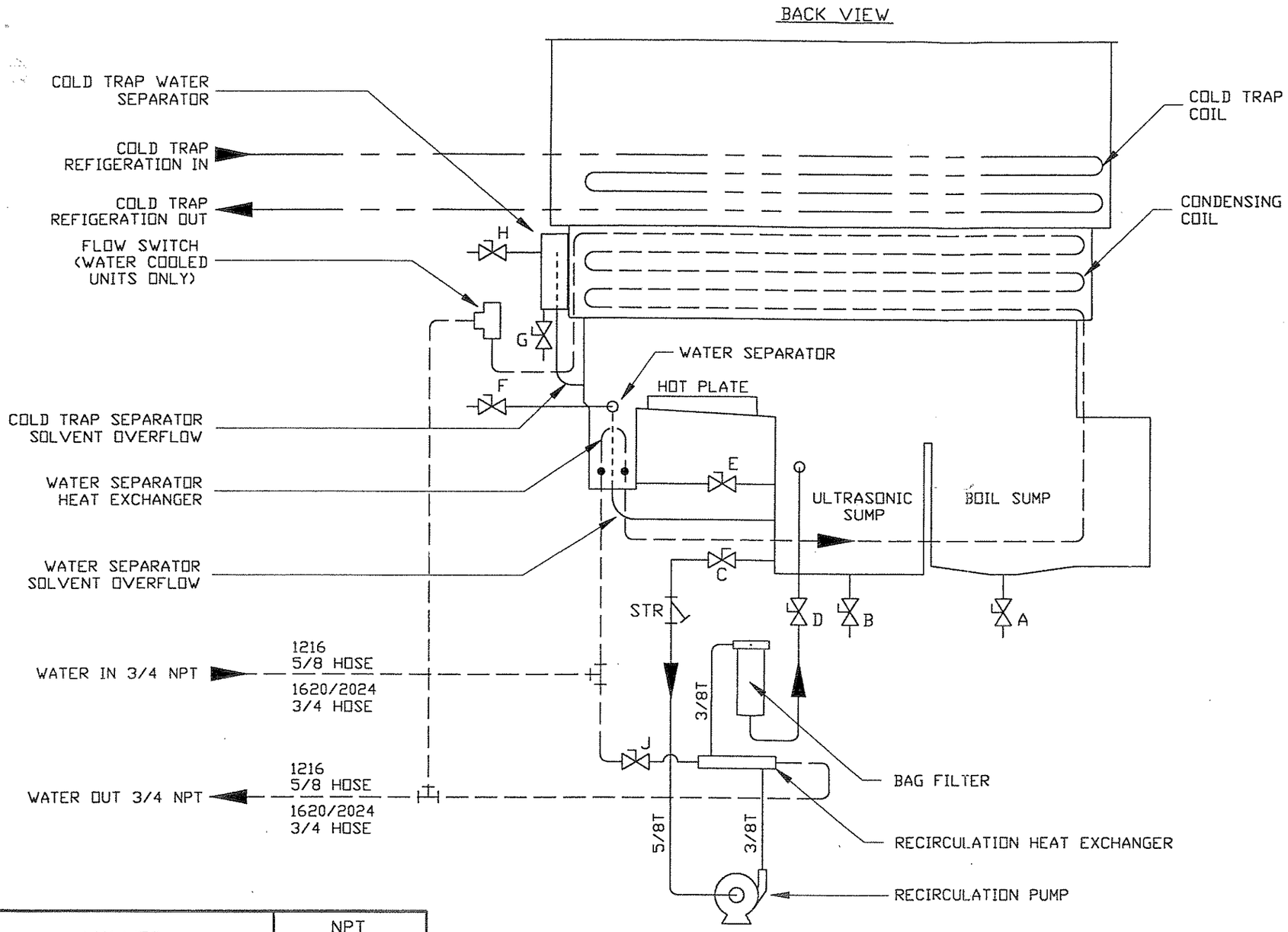
BRANSON Precision Cleaning
41 Eagle Road
Danbury, CT 06813-1961
(203) 796-0400

Drawings

Rev A

REVISIONS

REV.	DESCRIPTION	DATE	E.C.N. BY/APPR.
A	CHANGE FLOW DIRECTION, FILTER	03-13-97	RSB
B	ADDED COOLING WATER FLOW CONTROL VALVE	02-06-98	RWB/.RSB



VALVES		NPT		
		1216	1620	2024
A	BOIL SUMP DRAIN	1/2	3/4	1
B	ULTRASONIC SUMP DRAIN	1/2	3/4	1
C	RECIRC PUMP SHUTOFF	1/2	1/2	1/2
D	FILTER SHUTOFF	1/2	1/2	1/2
E	WATER SEPARATOR DRAIN	1/2	1/2	1/2
F	WATER SEPARATOR WATER DRAIN	1/4	1/4	1/4
G	COLD TRAP SEPARATOR DRAIN	1/4	1/4	1/4
H	COLD TRAP WATER DRAIN	1/4	1/4	1/4
J	HEAT EXCHANGER FLOW CONTROL	3/4	3/4	3/4

THIS DRAWING IN. DIMENSIONED IN INCHES MM.

DIMENSIONAL TOLERANCE UNLESS OTHERWISE SPECIFIED
.XX ±.015
.XXX ±.005
ANGLE ±1°

MAT'L

FINISH

QTY

	APP.	DATE
DRW	RWB	04-30-96
CHK	RSB	05-01-96
PRJ ENG	RSB	05-01-96

BRANSON PRECISION CLEANING
BRANSON 41 EAGLE ROAD DANBURY,CT 06813-1961 (203)796-0400

TITLE: PLUMBING SCHEMATIC LED

USED ON	SIZE	DWG NO.	REV
LED	B	55-1282	B

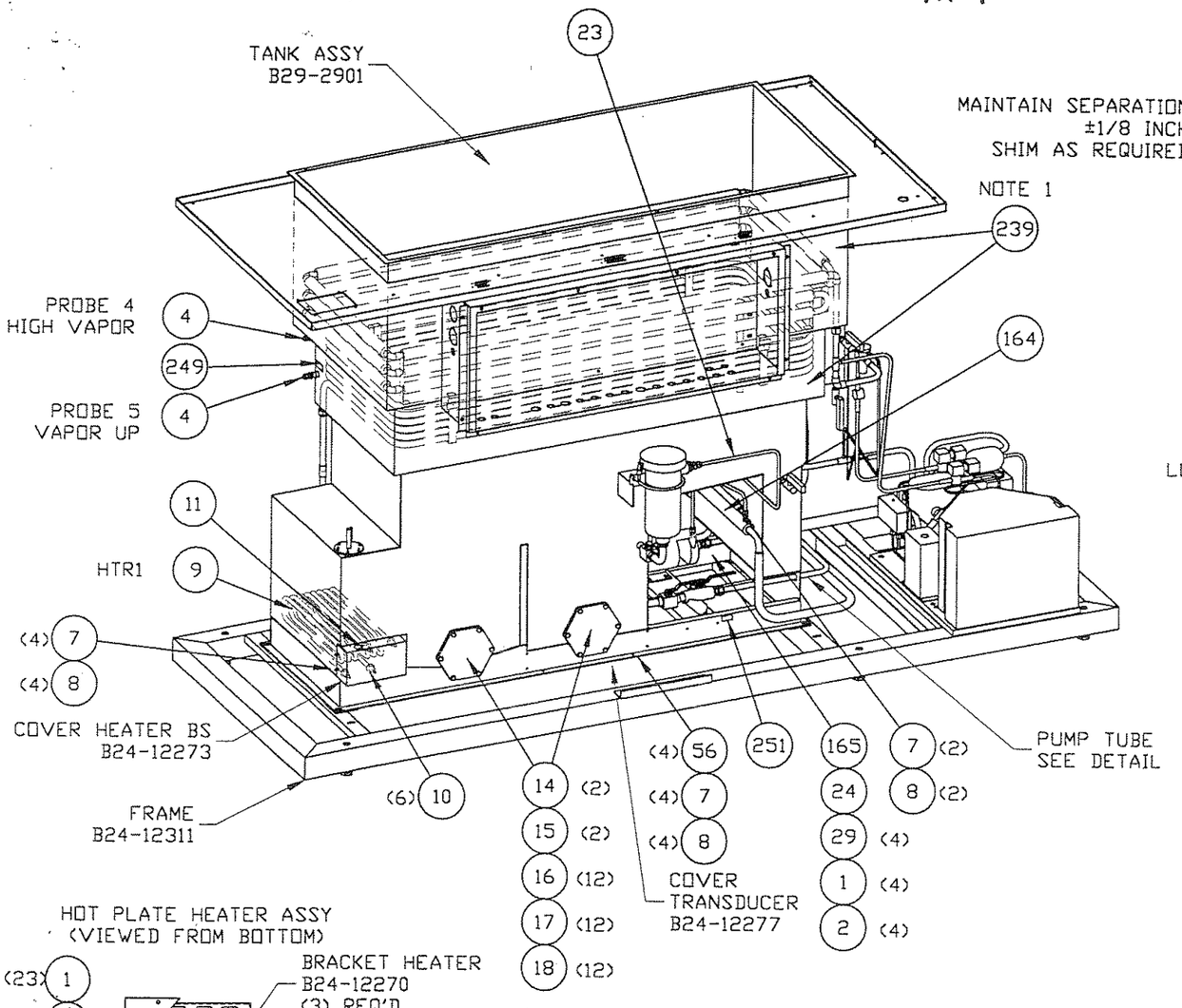
SCALE	PART NO.	SHEET
NONE		1 OF 1

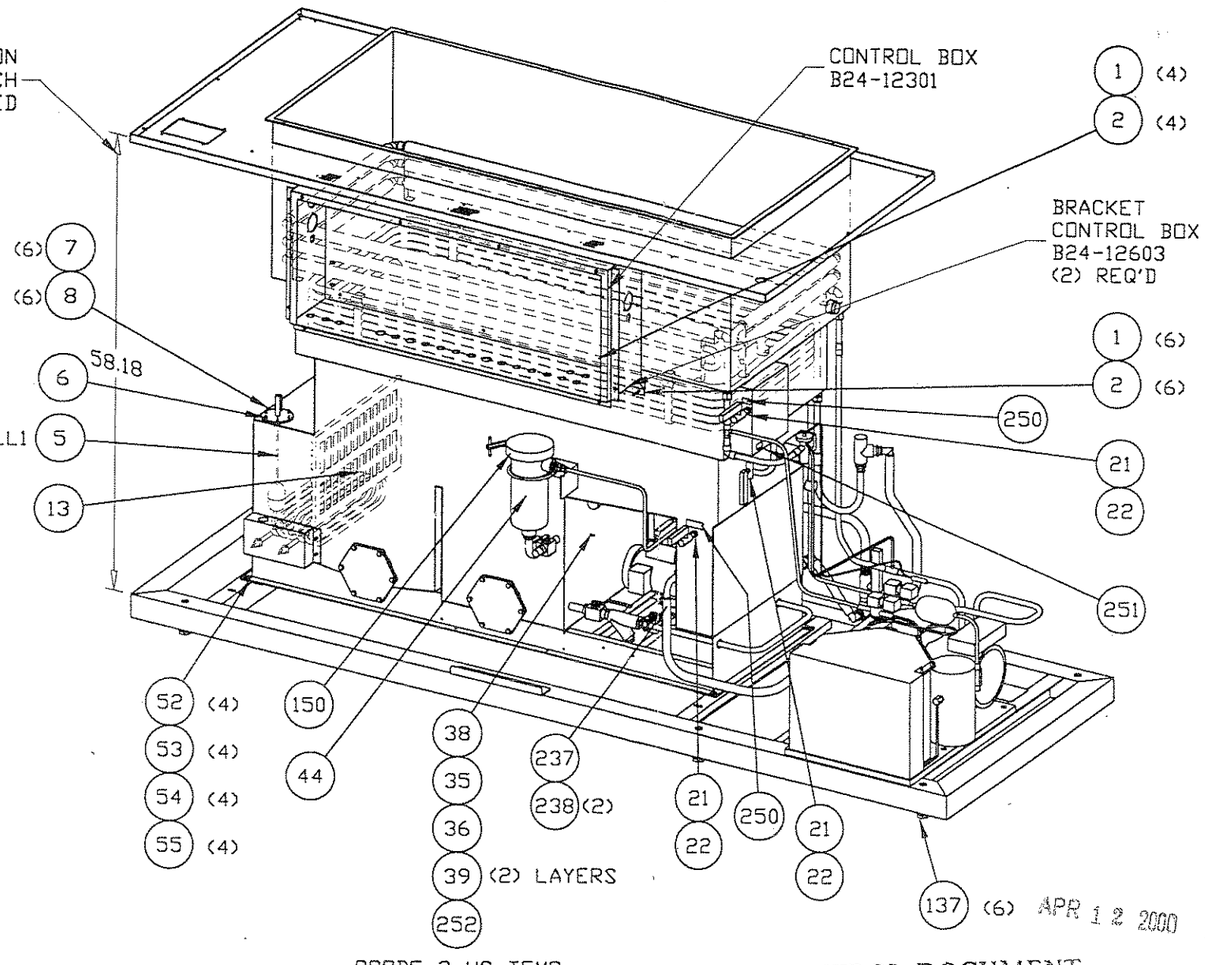
filename=1282 1B

NOTE:
INSULATE COLD TRAP AND
VAPOR ZONE INCLUDING TROUGHS
BEFORE INSTALLING
CONTROL BOX.

#38 CPN-060-018
56.85
#4

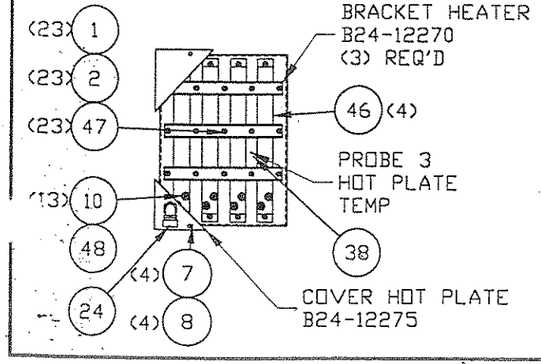
REVISIONS			
REV.	DESCRIPTION	DATE	E.C.N. BY/APPR.
I	SC99-074	07-29-99	RSB

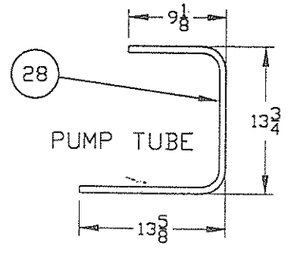




PROBE 2 US TEMP

HOT PLATE HEATER ASSY
(VIEWED FROM BOTTOM)





APR 12 2000

THIS DRAWING IN. DIMENSIONED IN INCHES MM.

DIMENSIONAL TOLERANCE UNLESS OTHERWISE SPECIFIED
.XX ±.015
.XXX ±.005
ANGLE ±1°

MAT'L SEE DWG
FINISH NONE
QTY (1)
3RD ANGLE PROJ.

	APP.	DATE
DRW RSB		04-19-96
CHK RSB		04-19-96
PRJ ENG RSB		04-19-96

BRANSON PRECISION CLEANING
BRANSON 41 EAGLE ROAD DANBURY, CT 06813-1961 (203)796-0400

TITLE FINAL ASSY LED 1620

USED ON	SIZE	DWG NO.	REV
LED1620	B	100-3740	I

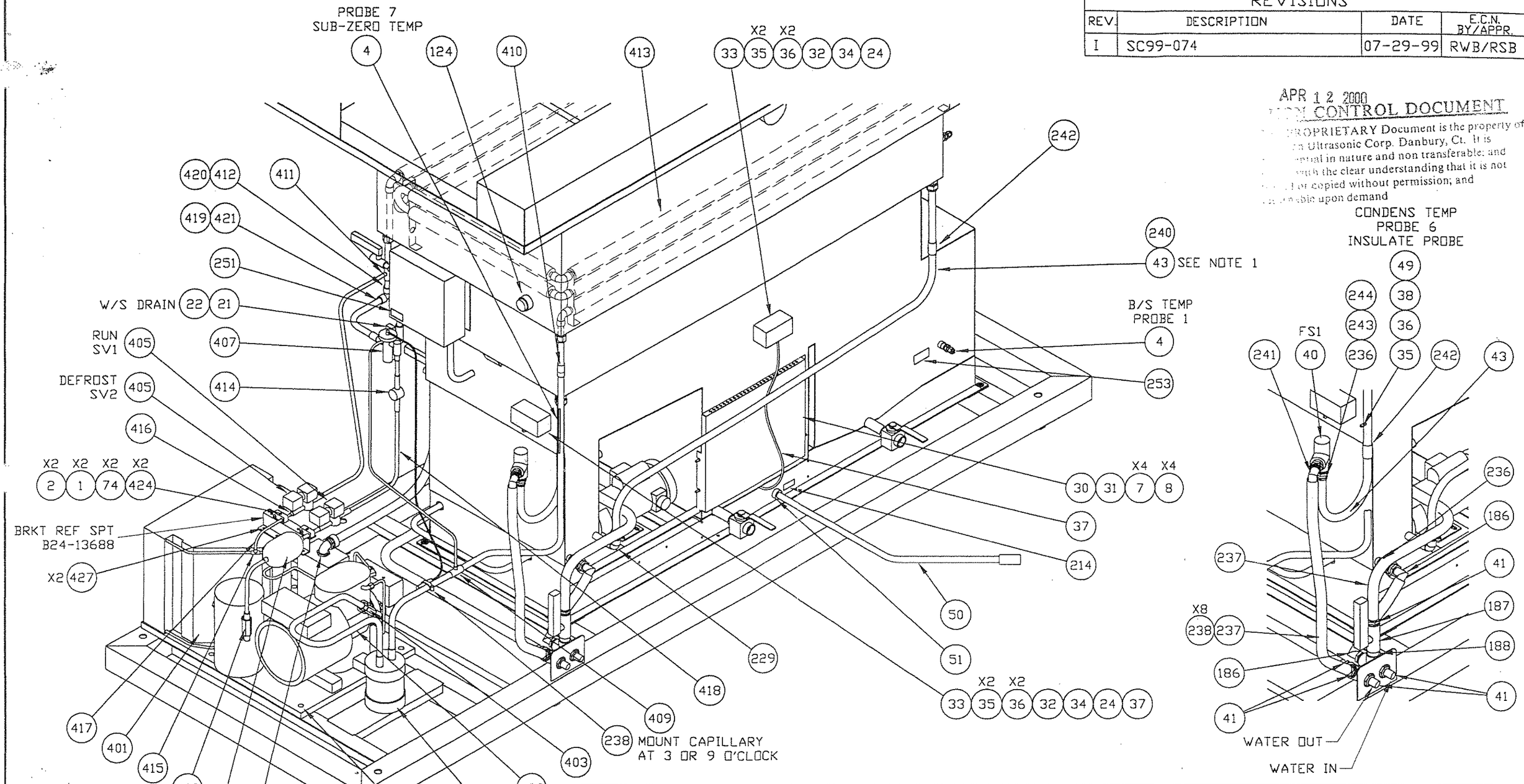
SCALE	PART NO.	SHEET
NA	SPC-LED-16P	1 OF 5

Parts# 203-796-0494

filename= 3740_1I

REVISIONS			
REV.	DESCRIPTION	DATE	E.C.N. BY/APPR.
I	SC99-074	07-29-99	RWB/RSB

APR 1 2 2000
CONTROL DOCUMENT



NOTES:
1. INSULATE ALL TUBING CARRYING WATER EXCEPT HOSE.
2. INSULATE COLD TRAP SUCTION PLUMBING WITH PIPE INSULATION 000-513-001 AND TAPE CPN-101-030.

THIS DRAWING IN. DIMENSIONED IN INCHES MM.

DIMENSIONAL TOLERANCE UNLESS OTHERWISE SPECIFIED
.XX ±.015
.XXX ±.005
ANGLE ±1°

MAT'L SEE DWG
FINISH NONE
QTY (1)
3RD ANGLE PROJ.

	APP.	DATE
DRW	RSB	04-19-96
CHK	RSB	04-19-96
PRJ ENG	RSB	04-19-96

BRANSON PRECISION CLEANING
BRANSON 41 EAGLE ROAD DANBURY,CT 06813-1961 (203)796-0400

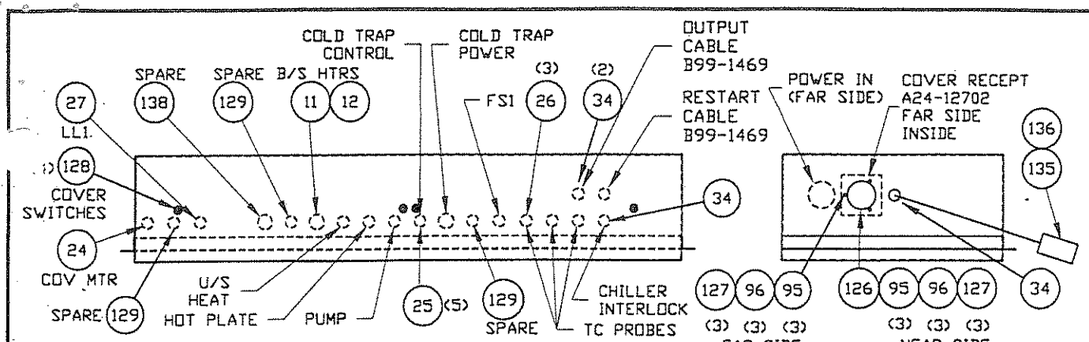
TITLE: FINAL ASSY LED 1620

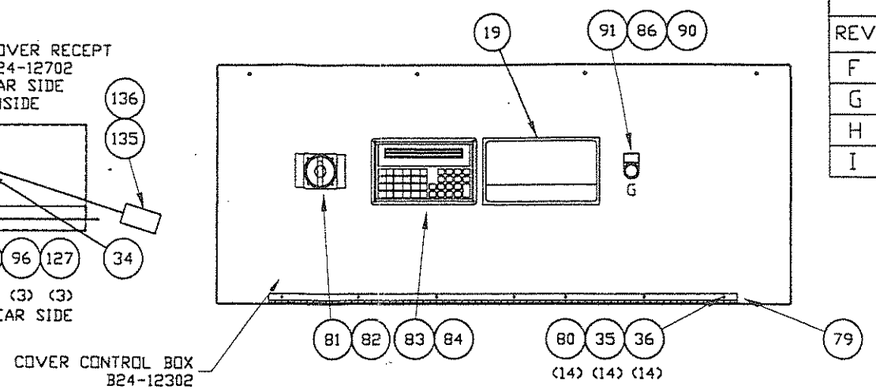
USED ON	SIZE	DWG NO.	REV
LED1620	B	100-3740	I

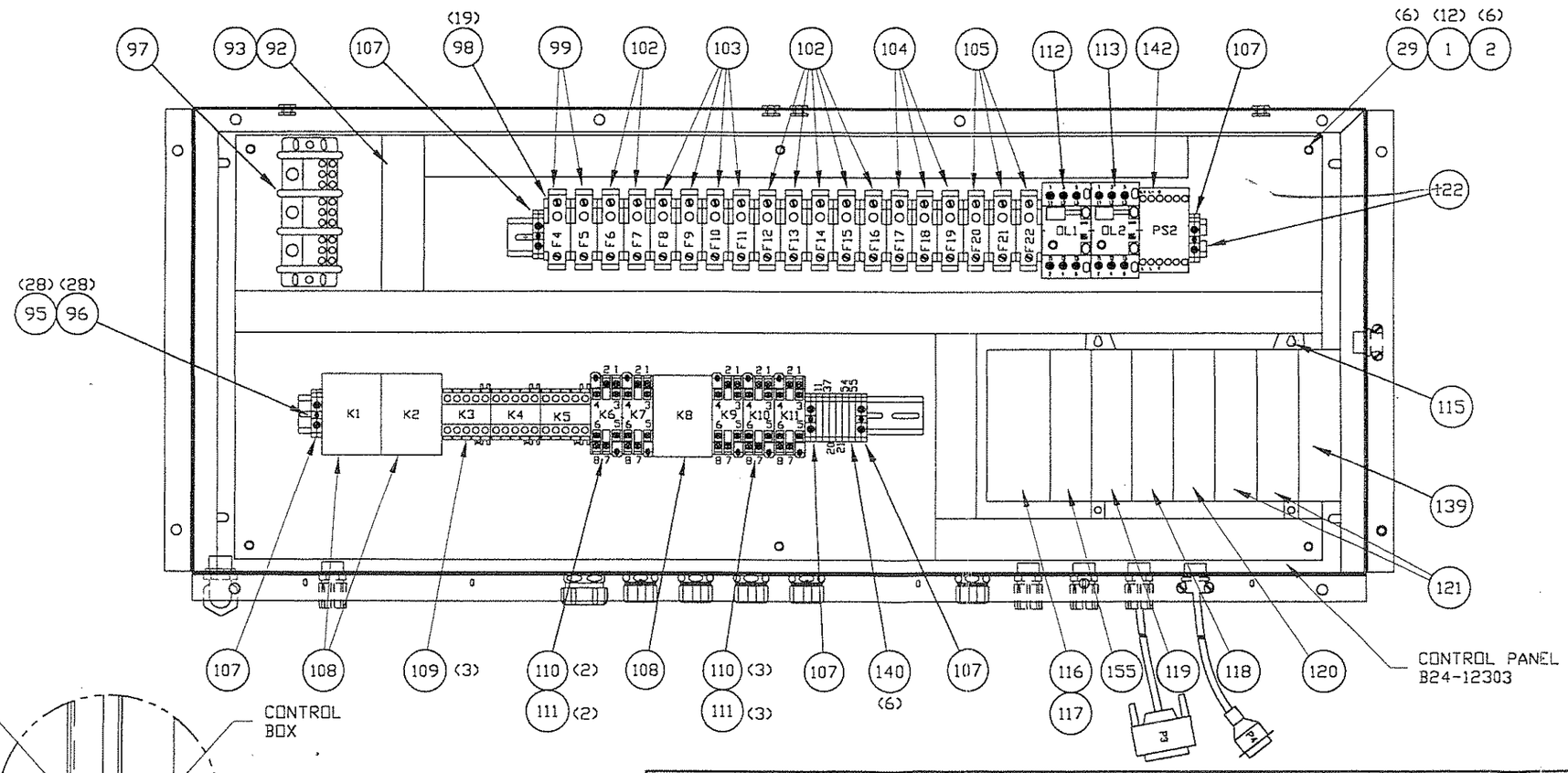
SCALE	PART NO.	SHEET
NA	SPC-LED-16P	2 OF 5

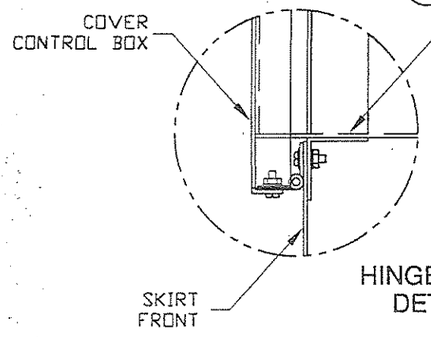
filename= 3740_21

REVISIONS			
REV.	DESCRIPTION	DATE	E.C.N. BY/APPR.
F	SEE OTHER SHEETS.	04-03-98	RWB/RSB
G	SEE SHT 3	06-30-98	RWB/RSB
H	ADDED HINGE ASSY DETAIL	02-15-99	RWB/RSB
I	SC99-074	07-16-99	RWB/RSB









HINGE ASSY DETAIL

THIS DRAWING IN. DIMENSIONED IN INCHES MM.

DIMENSIONAL TOLERANCE UNLESS OTHERWISE SPECIFIED
.XX ±.015
.XXX ±.005
ANGLE ±1°

MAT'L SEE DWG
FINISH NONE
QTY

	APP.	DATE
DRW	RSB	04/19/96
CHK	RSB	04/25/96
PRJ ENG	RSB	04/26/96

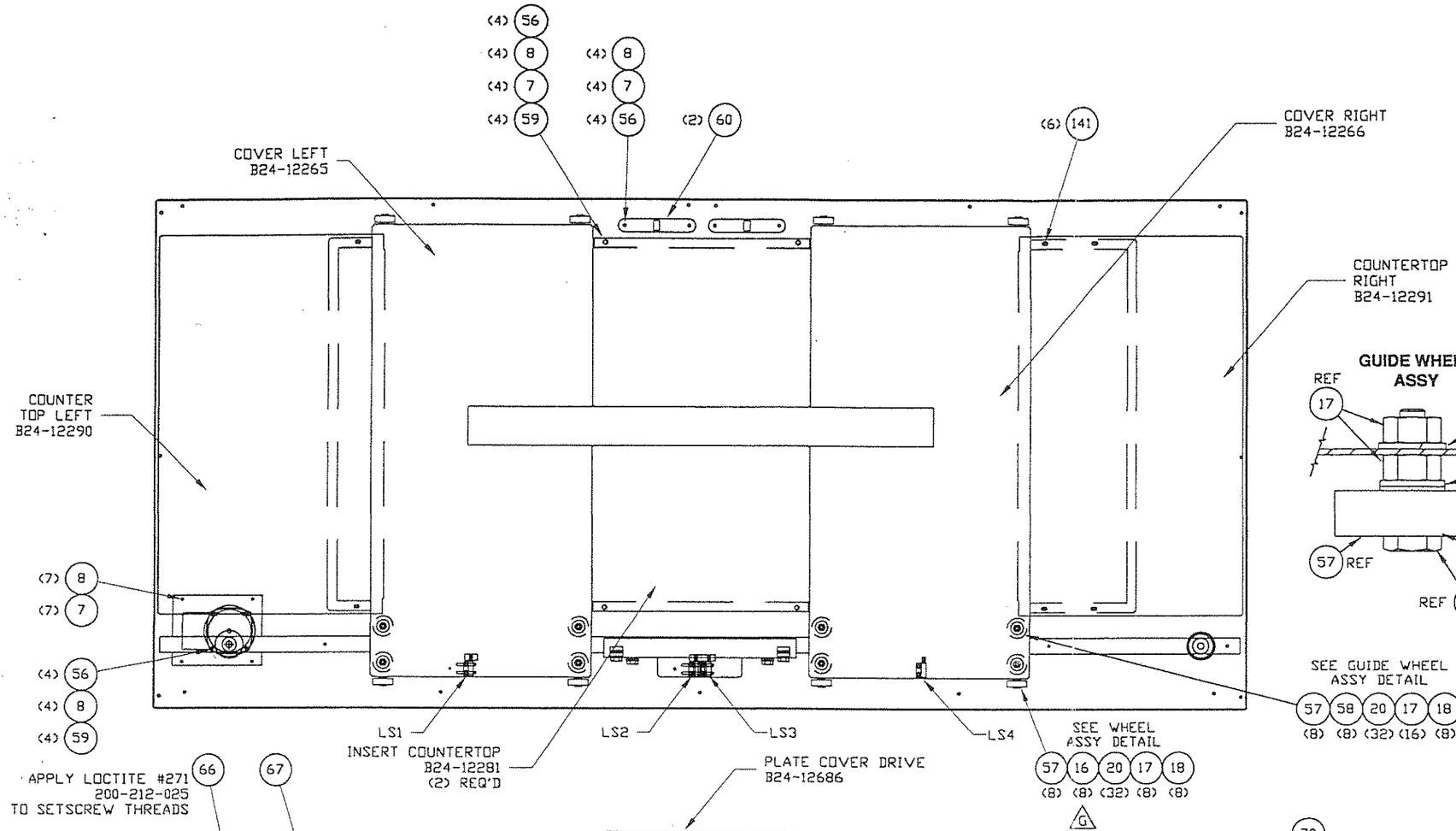
BRANSON PRECISION CLEANING
BRANSON 41 EAGLE ROAD DANBURY,CT 06813-1961 (203)796-0400

TITLE: FINAL ASSY LED 1620 (CONTROLS)

USED ON: LED1620 | SIZE: B | DWG NO.: 100-3740 | REV: I
SCALE: 1 :20 | PART NO.: SPC-266-515 | SHEET: 3 OF 5

filename= 3740_3I

REVISIONS			
REV.	DESCRIPTION	DATE	E.C.N. BY/APPR.
E	ADDED MOTOR BRAKE DETAIL SEE SHT 2.	01-06-98	RWB/RSB
F	ADDED WHEEL WASHERS.	04-06-98	RWB/RSB
G	ADDED ITEM 114, QTY (8)	06-30-98	RWB/RSB
H	SEE SHT 2	02-15-99	RWB/RSB
I	SC99-074	07-03-99	RWB/RSB



THIS PROPRIETARY DOCUMENT IS THE SOLE PROPERTY OF BRANSON PRECISION CLEANING, DANBURY, CT. IT IS CONFIDENTIAL IN NATURE, NON-TRANSFERRABLE, AND ISSUED WITH THE CLEAR UNDERSTANDING THAT IT IS NOT TRACED OR COPIED WITHOUT PERMISSION; AND IS RETURNABLE UPON DEMAND.

THIS DRAWING IN. DIMENSIONED IN INCHES MM.

DIMENSIONAL TOLERANCE UNLESS OTHERWISE SPECIFIED
.XX ±.015
.XXX ±.005
ANGLE ±1°

MAT'L SEE DWG
FINISH NONE
QTY

	APP.	DATE
DRW	RSB	04/19/96
CHK	RSB	05-01-96
PRJ ENG	RSB	05-01-96

BRANSON PRECISION CLEANING
BRANSON 41 EAGLE ROAD DANBURY,CT 06813-1961 (203)796-0400

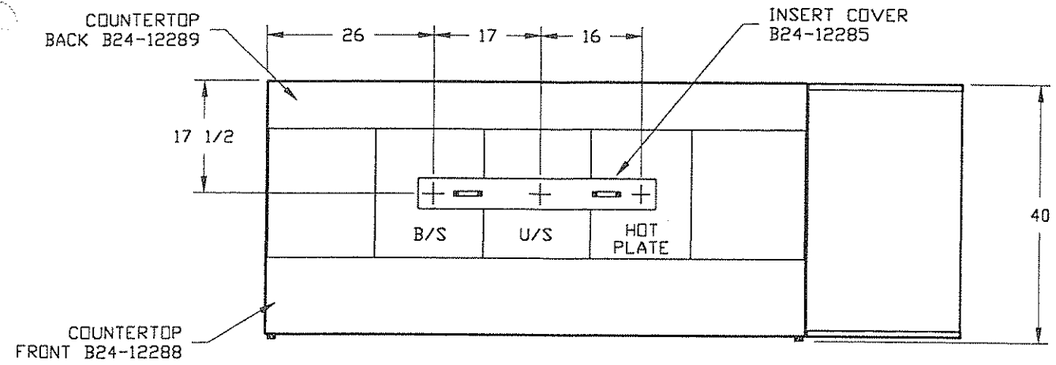
TITLE: FINAL ASSY LED 1620 (COVER)

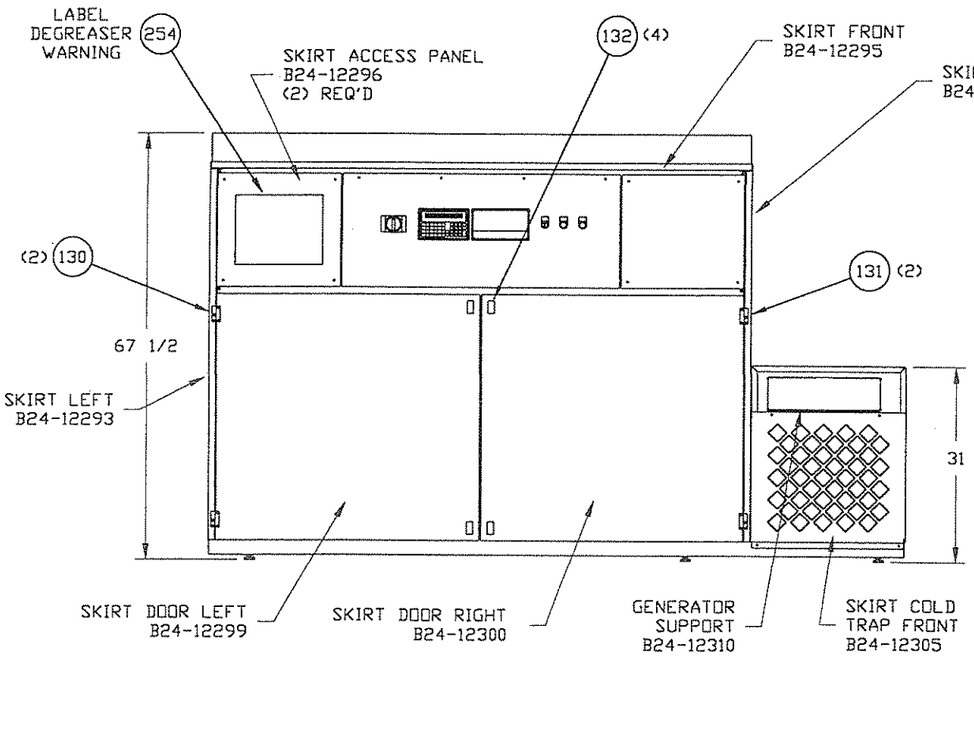
USED ON	SIZE	DWG NO.	REV
LED1620	B	100-3740	I

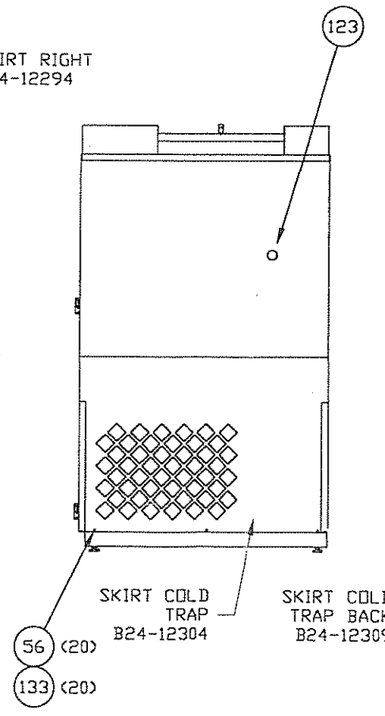
SCALE	PART NO.	SHEET
1 :20	SPC-266-515	4 OF 5

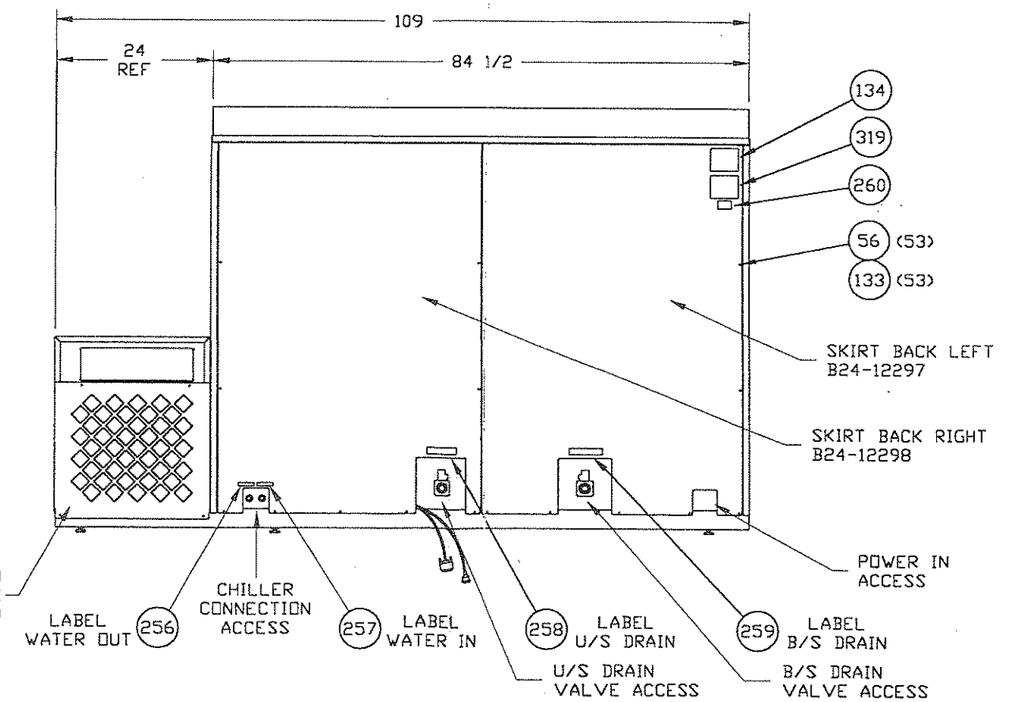
filename= 3740_4I

REVISIONS			
REV.	DESCRIPTION	DATE	E.C.N. BY/APPR.
A	SEE SHT 1.	5/24/96	RSB
B	SEE SHT 1.	11/20/96	RWB/RSB
C	SEE SHT 1.	03-19-97	RSB
D	ADDED LABELS. SEE SHTS 1, 2 & 3.	06-12-97	RWB/RSB
E	ADDED ITEM 319. SEE SHTS 2 AND 3.	01-06-98	RWB/RSB
F	SEE OTHER SHTS.	04-06-98	RWB/RSB
G	SEE SHT 3	06-30-98	RWB/RSB
H	SEE SHT 2	02-15-99	RWB/RSB
I	SC99-074	08-04-99	RWB/RSB









THIS DRAWING IN. DIMENSIONED IN INCHES MM.

DIMENSIONAL TOLERANCE UNLESS OTHERWISE SPECIFIED
.XX ±.015
.XXX ±.005
ANGLE ±1°

MAT'L SEE DWG
FINISH NONE
QTY

	APP.	DATE
DRW	RSB	04/19/96
CHK	RSB	03-19-97
PRJ ENG	RSB	03-19-97

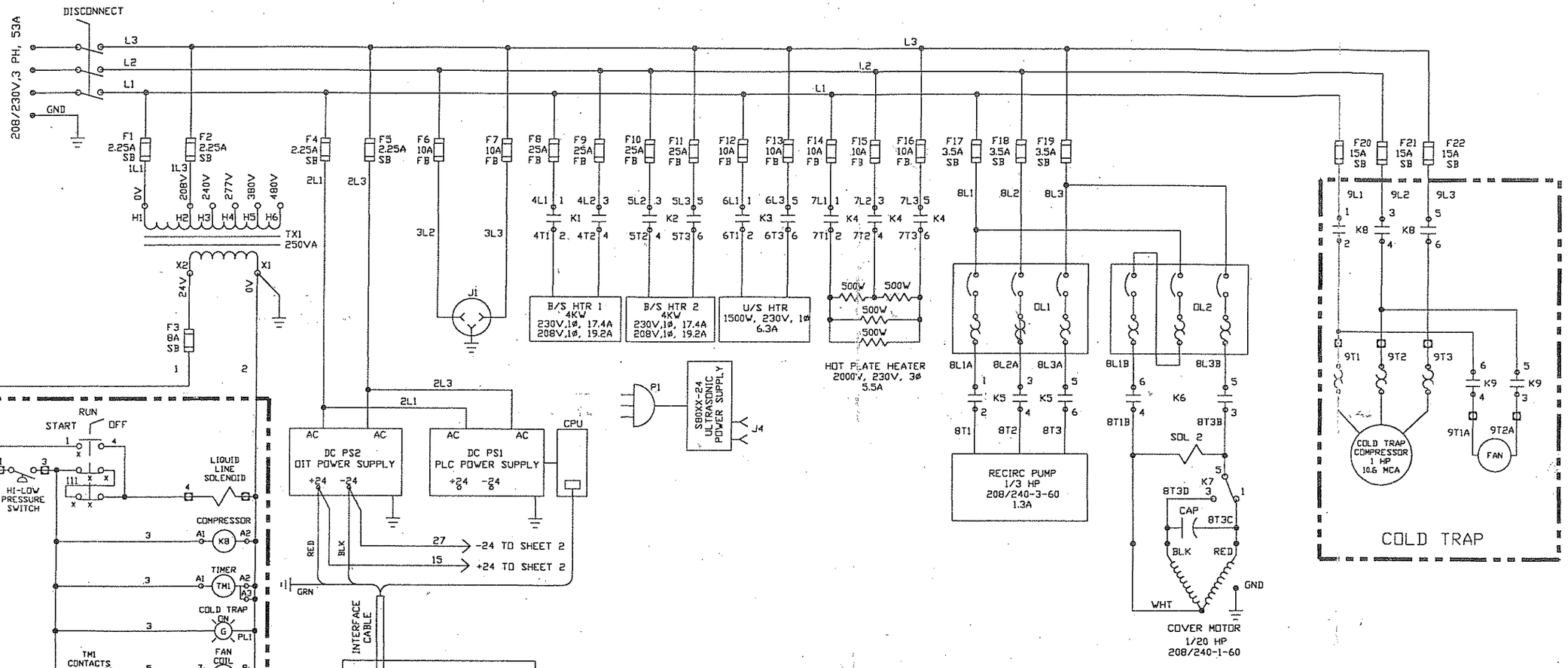
BRANSON PRECISION CLEANING
BRANSON 41 EAGLE ROAD DANBURY,CT 06813-1961 (203)796-0400

TITLE: FINAL ASSY LED 1620 (SKIRTS)

USED ON	SIZE	DWG NO.	REV
LED1620	B	100-3740	I

SCALE	PART NO.	SHEET
1 :20		5 OF 5

REVISIONS			
REV.	DESCRIPTION	DATE	E.C.N. BY/APPR.
C	J2-8 WAS J2-9. (SHT 2)	12/26/96	RWB/RSB
D	PLC INTERFACE,TIMER	03-14-97	RSB
E	ADDED OIT POWER SUPPLY & CPU	06-16-97	RWB/RSB
F	SEE SHT 2	11-19-97	RWB/RSB
G	F3 WAS 10A, F4&F5 WERE 2A-FB.	01-13-98	RWB/RSB



THIS DRAWING IN. DIMENSIONED IN INCHES MM.

DIMENSIONAL TOLERANCE UNLESS OTHERWISE SPECIFIED

.XX	±.015
.XXX	±.005
ANGLE	±1°

MAT'L

FINISH

QTY

	APP.	DATE
DRW	RWB	04-09-96
CHK	RSB	04-23-96
PRJ ENG	RSB	04-23-96

BRANSON PRECISION CLEANING

BRANSON 41 EAGLE ROAD DANBURY,CT 06813-1961 (203)796-0400

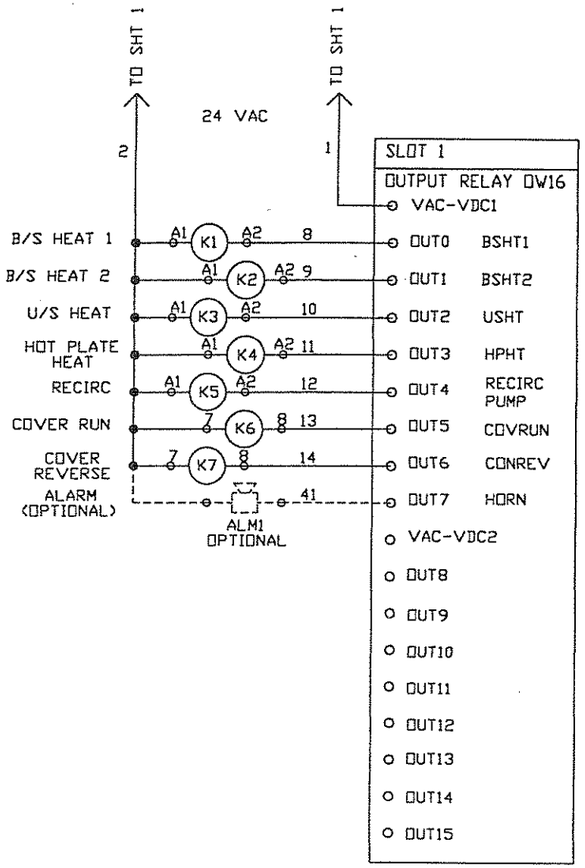
TITLE: WIRING SCHEMATIC LED 1620

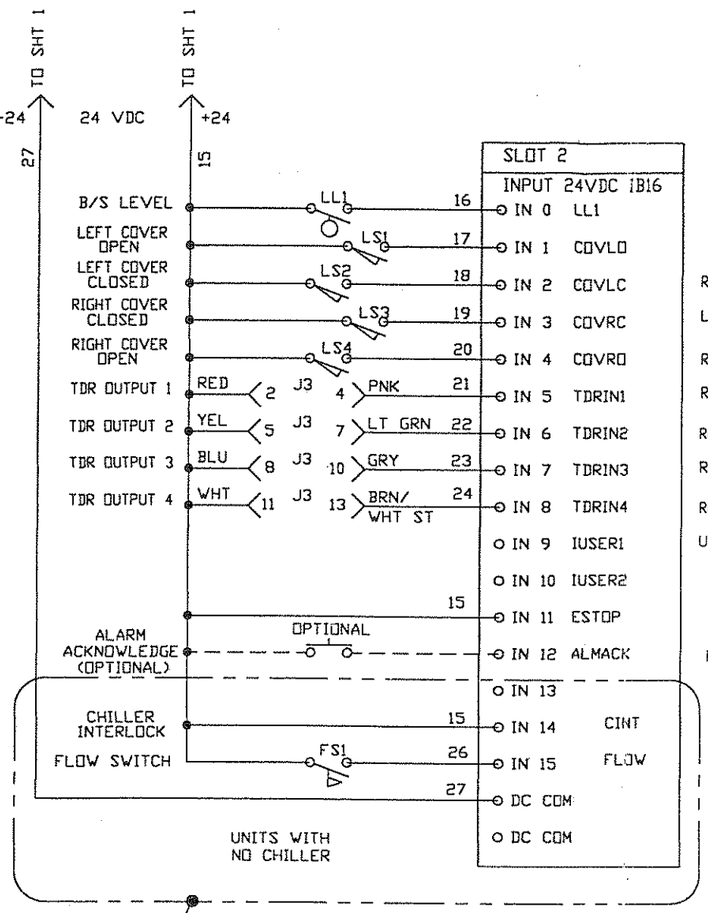
USED ON	SIZE	DWG NO.	REV
LED1620	B	51-3198	G

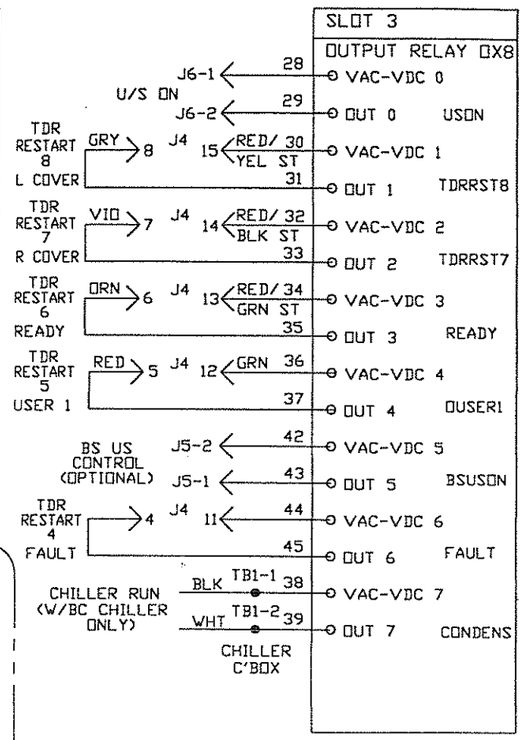
SCALE	PART NO.	SHEET
NONE		1 OF 2

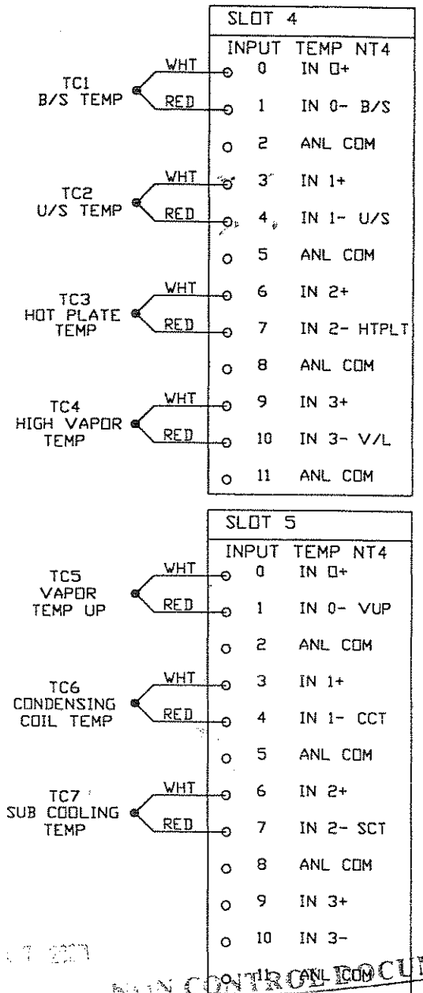
filename= 3198 1G

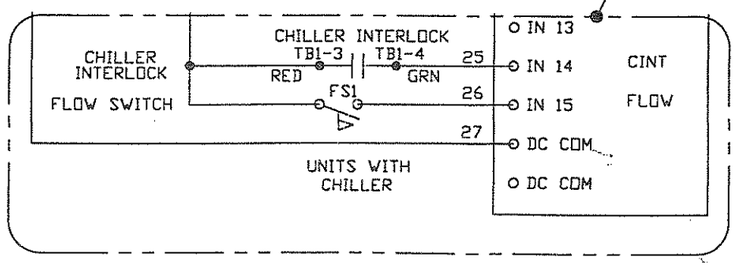
REVISIONS			
REV.	DESCRIPTION	DATE	E.C.N. BY/APPR.
A	CHANGE TO ALLEN BRADLEY PLC	03-14-97	RSB
E	SEE SHT 1.	06-16-97	RWB/RSB
F	ADD ESTOP,CH CHILL INT	11-19-97	RWB/RSB
G	SEE SHT 1	01-13-98	RWB/RSB











THIS PROPRIETARY DOCUMENT IS THE SOLE PROPERTY OF BRANSON PRECISION CLEANING.,DANBURY, CT. IT IS CONFIDENTIAL IN NATURE, NON-TRANSFERRABLE, AND ISSUED WITH THE CLEAR UNDERSTANDING THAT IT IS NOT TRACED OR COPIED WITHOUT PERMISSION; AND IS RETURNABLE UPON DEMAND.

THIS DRAWING IN. DIMENSIONED IN INCHES MM.

DIMENSIONAL TOLERANCE UNLESS OTHERWISE SPECIFIED
.XX ±.015
.XXX ±.005
ANGLE ±1°

MAT'L
FINISH
QTY

	APP.	DATE
DRW	RSB	03-05-97
CHK	RSB	03-05-97
PRJ ENG	RSB	03-05-97

BRANSON PRECISION CLEANING
41 EAGLE ROAD DANBURY,CT 06813-1961 (203)796-0400

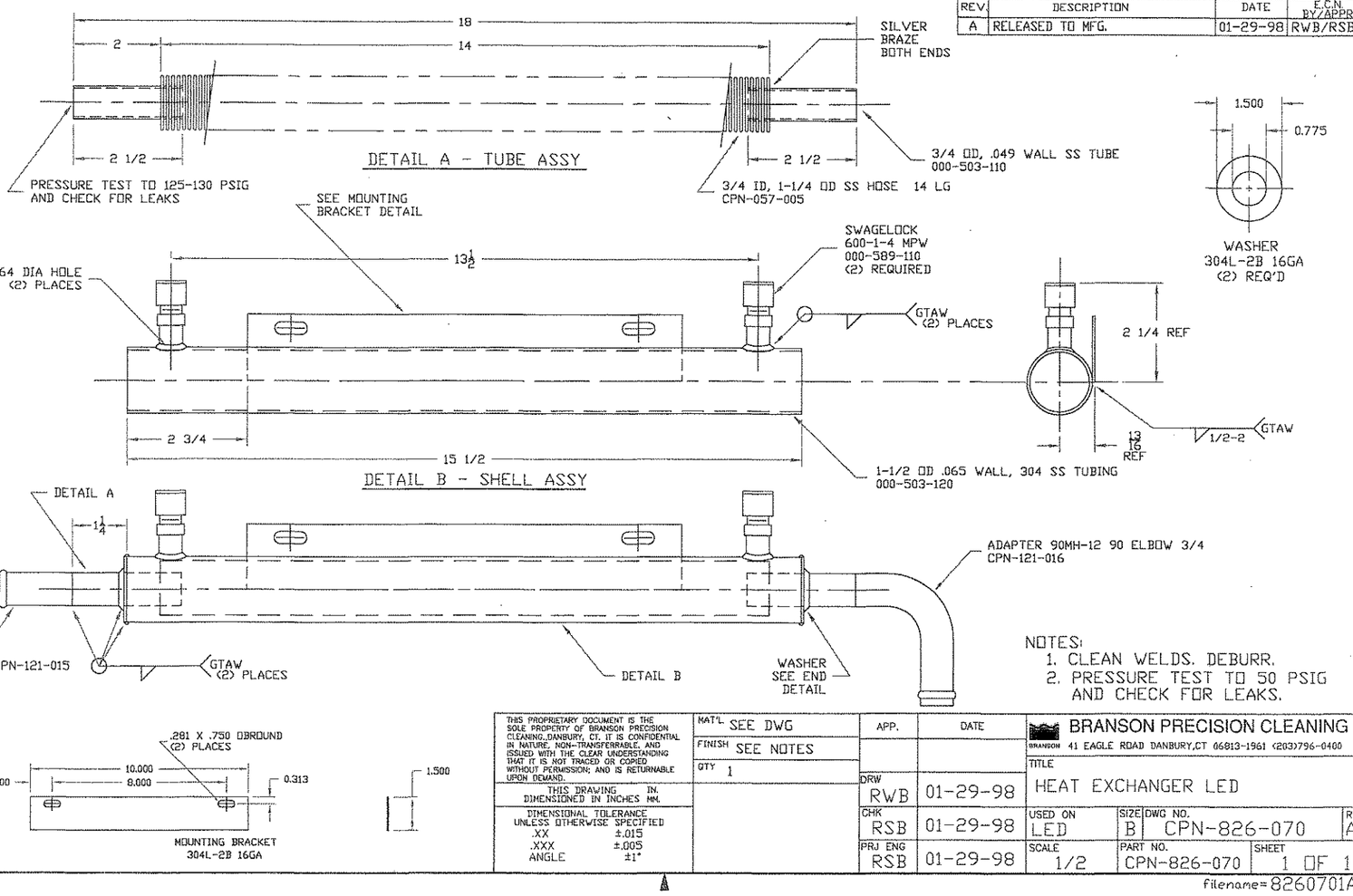
TITLE: WIRING SCHEMATIC LED 1620

USED ON	SIZE	DWG NO.	REV
LED1620	B	51-3198	G

SCALE: NONE | PART NO. | SHEET: 2 OF 2

filename=3198-2G

REVISIONS			
REV.	DESCRIPTION	DATE	E.C.N. BY/APPR.
A	RELEASED TO MFG.	01-29-98	RWB/RSB



NOTES:
1. CLEAN WELDS. DEBURR.
2. PRESSURE TEST TO 50 PSIG AND CHECK FOR LEAKS.

THIS DRAWING IN. DIMENSIONED IN INCHES MM.

DIMENSIONAL TOLERANCE UNLESS OTHERWISE SPECIFIED
XX ±.015
.XXX ±.005
ANGLE ±1°

MAT'L	SEE DWG
FINISH	SEE NOTES
QTY	1

	APP.	DATE
DRW	RWB	01-29-98
CHK	RSB	01-29-98
PRJ ENG	RSB	01-29-98

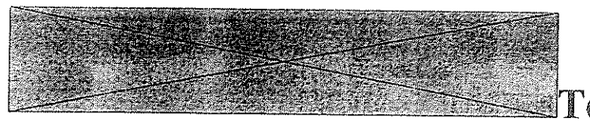
BRANSON PRECISION CLEANING
BRANSON 41 EAGLE ROAD DANBURY,CT 06813-1961 (203)796-0400

TITLE: HEAT EXCHANGER LED

USED ON	SIZE	DWG NO.	REV
LED	B	CPN-826-070	A

SCALE	PART NO.	SHEET
1/2	CPN-826-070	1 OF 1

filename= 8260701A



Technical Bulletin

LENIUM* ES and LENIUM GS

Acid Acceptance Test Procedure

Part I – Blank Determination

Caution: It is imperative that the solution bottle caps and kit droppers are kept separate to their respective test solutions to avoid cross contamination that would yield inaccurate results. It is recommended that the cap and dropper used with the acid acceptance solution be marked (colored sticker, marker, tape, etc.) in a manner different from the caustic soda solution as means to identify and separate the caps and droppers.

1. Insure graduated test tube and cap are clean and dry. If necessary, both should be rinsed with water and dried thoroughly with a clean paper towel.
2. Add 2 mL of acid acceptance solution to the graduated test tube.
3. Add the caustic soda solution two drops (two drops equal approximately 0.1 mL) at a time (counting each drop) until a blue color appears in the tube. Cap and shake between additions.
4. The number of drops added is the acid acceptance blank value, **B**.
5. The blank determination should be done each day a LENIUM sample is tested to insure that the B value has not changed since the last determination.

Part II – Acid Acceptance Determination

1. Place a solvent sample from the spray wand or rinse sump into a clean container. Allow solvent sample to equilibrate to the temperature of test kit solutions (ambient temperature).
2. Insure graduated test tube and cap are clean and dry. If cleaning is necessary, both should be rinsed with solvent and dried thoroughly with a clean paper towel.
3. Add 2 mL of the test solvent to the graduated test tube.
4. Add 2.2 mL of the acid acceptance solution. (Total volume in the graduated tube will be 4.2 mL.)
5. Place the cap tightly on the graduated test tube and shake vigorously.
6. Allow the sample to stand for 5 minutes.
7. Remove the cap. Add the caustic soda solution two drops at a time (counting each drop) to the sample until a blue color appears. Shake between additions. The number of drops added to the graduated test tube is the acid acceptance value, **S**.
8. Calculate "delta" () for the sample as follows: = **B** – **S**

* LENIUM is a registered trademark of Petroferm Inc.

9. Determine quantity of nPB Stabilizer Booster to add to degreaser from the table below. Stabilizer booster should be added as outlined in the following procedure steps in Part III.

Note: Addition of stabilizer booster, as indicated in the table below, is given in gallons of nPB Stabilizer Booster per gallon of solvent in the degreaser. For example, if the vapor degreaser capacity is 45 gallons and the value is 10, then the addition is 0.072 x 45 gallons, or 3.2 gallons of nPB Stabilizer Booster.

Value	Stabilizer Addition (gallon/gallon)
16	0.056
10	0.072
6	0.082
<6	System Clean-out*

* Solvent should be removed from the vapor degreaser. Consult Petroferm Technical Service (904-261-8286) for guidance on re-use of this fluid.

Part III - Adding Stabilizer

1. Turn off heat in vapor degreaser and allow solvent and system to cool before adding stabilizer. **Safety Note**: nPB Stabilizer Booster is rich in stabilizers and has a flash point of -10°F (refer to the MSDS for safe handling and storage). After the stabilizer is mixed with the LENIUM ES or GS, the mixture is non-flammable.
2. Pour nPB Stabilizer Booster into the rinse (clean) sump of the equipment. Turn on the heat and allow the stabilizer to equilibrate with the solvent for at least two hours.
3. Re-analyze the solvent system.
4. Resume cleaning.

Availability

nPB Stabilizer Booster is available in one-gallon containers (8 lb) and five-gallon containers (40 lb) from Petroferm Inc. or from your distributor of LENIUM products.
Important Note: nPB Stabilizer Booster is formulated for use only in LENIUM ES and LENIUM GS. Petroferm Inc. assumes no responsibility or liability if this product is added to other n-Propyl Bromide-containing products.

Revised: August 2000

Petroferm Inc.
2416 Lynndale Road Fernandina Beach, Florida 32034 USA
Telephone: 904-261-8286 Facsimile: 904-261-6994

www.petroferm.com
Petroferm products are available worldwide.

accepted at recipient's sole risk. No guarantee of the accuracy of the information is made and the products discussed are sold without conditions or warranties expressed or implied. Purchasers should make their own tests and determine suitability of the product for their particular purposes. Nothing contained herein shall be considered a recommendation for any use that may infringe upon patent rights.