



TECHNICAL MANUAL

Installation, Operation and Maintenance Instructions

COMMANDER 18-5

HIGH TEMPERATURE DOOR TYPE

COMMANDER 18-5

COMMADNER 18-5C

COMMANDER 18-5H

Insinger Machine Company
6245 State Road
Philadelphia, PA 19135-2996

800-344-4802
Fax: 215-624-6966
www.insingermachine.com



Thank you for purchasing this quality Insinger product.

On the space provided below please record the model, serial number and start-up date of this unit:

Model: _____

Serial Number: _____

Start-Up Date: _____

When referring to this equipment please have this information available.

Each piece of equipment at Insinger is carefully tested before shipment for proper operation. If the need for service should arise please contact your local Authorized Insinger Service Company.

A Service Network Listing is provided on our web site, www.insingermachine.com or call Insinger at 800-344-4802 for your local authorized servicer.

For proper activation of the *Insinger Limited Warranty* a SureFire™ Start-Up & Check-Out Service should be completed on your machine. Refer to the Introduction section in this manual for an explanation of Insinger SureFire™ Start-Up & Check-Out Program.

Please read the Insinger Limited Warranty and all installation and operation instructions carefully before attempting to install or operate your new Insinger product.

To register your machine for warranty by phone, fax or the internet or for answers to question concerning installation, operation, or service contact our Technical Services Department:

| TECHNICAL SERVICE CONTACTS | |
|----------------------------|------------------------------------|
| Toll-Free | 800-344-4802 |
| Fax | 215-624-6966 |
| E-mail | service@insingermachine.com |
| Web | www.insingermachine.com |

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Item # _____

COMMANDER 18-5 AUTOMATIC SINGLE TANK DOOR TYPE DISHWASHER

CSI - 11400



DESIGN

Automatic door type, single tank dishwasher with timed wash and rinse cycle. Fully automatic operation with power on/off button. A selector switch allows you to start the wash cycle with a manual start button or by closing the door. Capacity is 60 - 20" X 20" racks per hour, or 1500 dishes per hour. Designed for straight through operation. Corner model available for right angle operation.

STANDARD EQUIPMENT

- Space saving compact design
- Door safety switch
- Detergent connection provision
- Fully automatic operation
- Single scrap screen design
- Non-proprietary commercially available pump motor
- Easily removable pump suction strainer
- Tank heat: 3KW electric immersion heater or steam injector
- SureFire™ Start-Up and Check-Out Service
- Vacuum breaker
- Capillary thermometer for wash
- In-line thermometer for final rinse
- Manual start button
- Selector switch
- Single point electrical connection: motor, controls, heater and built-in booster (only)
- Top-mounted NEMA 12 control panel
- "Easy Clean" front-mounted wash tank
- Manifold cleanout brush
- Inspection door
- S/S frame, legs and feet
- Automatic tank fill
- Low water protection
- Override switch for delimiting or extended wash cycle
- Vent fan connection provision

OPTIONAL ACCESSORY EQUIPMENT

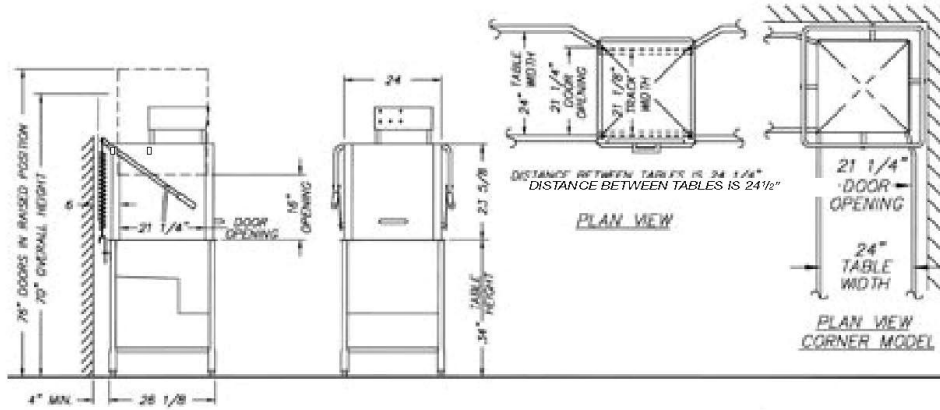
- Pressure reduction valve and line strainer
- Stainless steel steam coil tank heat
- Steam booster
- Built-in electric booster
- Remote electric booster
- Security package
- Totally enclosed motor
- Door activated drain closer
- Plastic 20" x 20" racks (plate or silver)
- S/S front panel
- 0.5, 2, 4, 6 minute wash timer



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www.insingermachine.com



CSI - 11400



Note: For all rough in connections see Installation and Layout Detail Drawing.

SPECIFICATIONS

CONSTRUCTION - Hood and tank constructed of 16 gauge type 304 S/S. Hood unit of all welded seamless construction. S/S frame, legs and feet. All internal castings are non-corrosive lead free nickel alloy or bronze.

DOORS - A front inspection/cleanout door and two simultaneously opening operating doors. Operating doors have fingertip control, balanced by externally mounted springs. (Corner model available with 2 doors at right angles.) Extra large die formed type 304 S/S doors ride in all S/S channels. A triple ply leading edge on the door channels made of S/S with no plastic or nylon sleeves or liners used.

PUMP - Centrifugal type "packless" pump with a brass petcock drain. Construction includes ceramic seal and a balanced cast impeller on a precision ground stainless steel shaft. All working parts mounted as an assembly and removable as a unit without disturbing pump housing. One 1 HP motor, standard horizontal C-face frame, drip proof, internally cooled with ball-bearing construction.

CONTROLS - Top-mounted control cabinet, NEMA 12 rated, housing motor controls and overload protection, transformer, contactors and all dishwasher integral controls.

SPRAY SYSTEM - Wash and rinse spray systems made of type 304 stainless steel pipe threaded into cast hub assemblies. Upper and lower wash and rinse spray assemblies are removable without the use of tools.

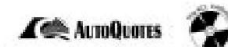
WASH - 2 power spinning wash arms above and 2 power spinning wash arms below. On top, each wash arm is designed with 8 nozzles (16 total). On the bottom, each wash arm is designed with 4 slots (8 total). The slots are precision milled for water control and produce a fan spray.

FINAL RINSE - 2 power spinning rinse arms above and 2 power spinning rinse arms below. On top, each rinse arm is designed with 2 nozzles (4 total). On the bottom, each rinse arm is designed with 4 nozzles (8 total). The nozzles produce a fan spray reducing water consumption, maximizing heat retention.

DRAIN - Drain valve externally controlled. Overflow assembly with skimmer cap is removable without use of tools for drain line inspection. Heater protected by low water level control.

| Capacity per hour | Tank capacity | Motor size | Electric usage | Steam consumption at 20 psi min. | Final rinse peak flow at 20 psi min. | | | | | | | | | | | | | | | | |
|---|--------------------------|----------------------|--|---|--------------------------------------|----------------------|------------------------------|--------------------|--------------------|------|------|------|------|-----|-----|------|------|------|------|------|------|
| 60 racks 1500 dishes 75-150 meals | 6.4 gals. | 1 hp (wash) | 3.0 kw wash tank 13.5 kw b.i.booster 40° or 70° rise 6.0 kw rem. booster 40° rise 12.0 kw rem. booster 70° rise | 11 lbs./hr tank 24 lbs./hr booster 40° rise 42 lbs./hr booster 70° rise | 3.0 gals./min. | | | | | | | | | | | | | | | | |
| Final rinse consumption at 20 psi min. | Exhaust hood requirement | Peak rate drain flow | Shipping weight | Current draw amps | Steam/gas | Electric w/o booster | Electric w/ built-in booster | | | | | | | | | | | | | | |
| 60 gals./hr. 1.0 gal./rack | 100 CFM | 9 gals./min. | 400 lbs. | 208/1/60 9.3 | 208/3/60 5.1 | 240/1/60 8.1 | 240/3/60 4.2 | 380/3/50 2.8 | 480/3/60 2.3 | 23.7 | 13.4 | 20.6 | 11.8 | 7.4 | 5.9 | 81.7 | 50.9 | 76.9 | 44.3 | 27.9 | 22.1 |

3M 02/05 PRINTED IN USA
Information and specifications subject to change without notice





Item # _____

CSI - 11400

COMMANDER 18-5H

AUTOMATIC SINGLE TANK DOOR TYPE WAREWASHER & TRAY/UTENSIL WASHER



DESIGN

Automatic door type, single tank dishwasher with timed wash and rinse cycle. Fully automatic operation with power on/off button. A selector switch allows you to start the wash cycle with a manual start button or by closing the door. Capacity is 60 - 20" X 20" racks per hour, or 1500 dishes per hour. The 18-5H can also handle mixer agitators, 18" X 26" sheet pans, utensils and mixing bowls up to 60 quarts! Designed for straight through operation. Corner model available for right angle operation.

STANDARD EQUIPMENT

- Space saving compact design
- Door safety switch
- Detergent connection provision
- Fully automatic operation
- Single scrap screen design
- Non-proprietary commercially available pump motor
- Easily removable pump suction strainer
- Tank heat: 5KW electric immersion heater or steam injector (6KW corner)
- SureFire™ Start-Up and Check-Out Service
- Vacuum breaker
- Capillary thermometer for wash
- In-line thermometer for final rinse
- Single point electrical connection: motor, controls, heater and built-in booster (only)
- Manual start button
- Selector switch
- Top-mounted NEMA 12 control panel
- "Easy Clean" front-mounted wash tank
- Manifold cleanout brush
- Inspection door
- S/S frame, legs and feet
- Automatic tank fill
- Low water protection
- Override switch for delimiting or extended wash cycle
- Vent fan connection provision

OPTIONAL ACCESSORY EQUIPMENT

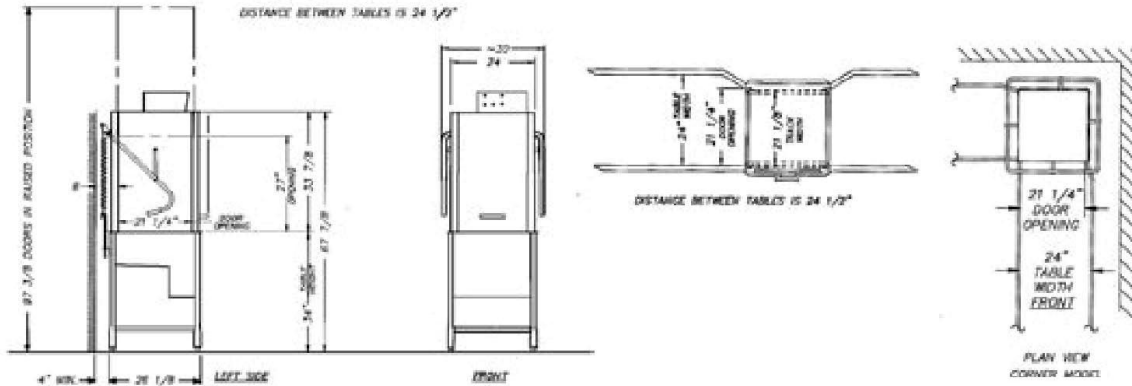
- Pressure reduction valve and line strainer
- Stainless steel steam coil tank heat
- Steam booster
- Built-in electric booster
- Remote electric booster
- Security package
- Totally enclosed motor
- Door activated drain closer
- Plastic 20" x 20" racks (plate or silver)
- S/S front panel
- 0.5, 2, 4, 6 minute wash timer



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Note: For all rough in connections see Installation and Layout Detail Drawing.

SPECIFICATIONS

CONSTRUCTION - Hood and tank constructed of 16 gauge type 304 S/S. Hood unit of all welded seamless construction. S/S frame, legs and feet. All internal castings are non-corrosive lead free nickel alloy or bronze.

DOORS - A front inspection/cleanout door and two simultaneously opening operating doors. Operating doors have fingertip control, balanced by externally mounted springs. (Corner model available with 2 doors at right angles.) Extra large die formed type 304 S/S doors ride in all S/S channels. A triple ply leading edge on the door channels made of S/S with no plastic or nylon sleeves or liners used.

PUMP - Centrifugal type "packless" pump with a brass petcock drain. Construction includes ceramic seal and a balanced cast impeller on a precision ground stainless steel shaft. All working parts mounted as an assembly and removable as a unit without disturbing pump housing. One 2 HP motor, standard horizontal C-face frame, drip proof, internally cooled with ball-bearing construction.

CONTROLS - Top-mounted control cabinet, NEMA 12 rated, housing motor controls and overload protection, transformer, contactors and all dishwasher integral controls. All controls safe low voltage 24 VAC.

SPRAY SYSTEM - Wash and rinse spray systems made of type 304 stainless steel pipe threaded into cast hub assemblies. Upper and lower wash and rinse spray assemblies are removable without the use of tools.

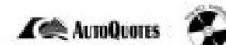
WASH - 2 power spinning wash arms above and 2 power spinning wash arms below. On top, each wash arm is designed with 8 nozzles (16 total). On the bottom, each wash arm is designed with 4 slots (8 total). The slots are precision milled for water control and produce a fan spray.

FINAL RINSE - 2 power spinning rinse arms above and 2 power spinning rinse arms below. On top, each rinse arm is designed with 2 nozzles (4 total). On the bottom, each rinse arm is designed with 4 nozzles (8 total). The nozzles produce a fan spray reducing water consumption, maximizing heat retention.

DRAIN - Drain valve externally controlled. Overflow assembly with skimmer cap is removable without use of tools for drain line inspection. Heater protected by low water level control.

| Capacity per hour | Tank capacity | Motor size | Electric usage | Steam consumption at 20 psi min. | |
|---|--|--------------------------|---|---|---------------------------------------|
| 60 racks 1500 dishes 75-150 meals | 6.4 gals. | 2 hp (wash) | 5.0 kw wash tank (straight) 6.0 kw wash tank (corner) 13.5 kw b.i. booster 40° or 70° rise 6.0 kw rem. booster 40° rise 12.0 kw rem. booster 70° rise | 18 lbs./hr tank 24 lbs./hr booster 40° rise 42 lbs./hr booster 70° rise | |
| Final rinse peak flow at 20 psi min. | Final rinse consumption at 20 psi min. | Exhaust hood requirement | Peak rate drain flow | Shipping weight | |
| 3.0 gals./min. | 60 gals./hr. 1.0 gal./rack | 100 CFM | 9 gals./min. | 600 lbs. | |
| Current draw amps | Steam | Electric w/o booster | Electric w/ built-in booster | Electric w/o booster - corner | Electric w/ built-in booster - corner |
| 208/1/60..... | 13.7..... | 37.7..... | 95.7..... | 42.5..... | 100.5..... |
| 208/3/60..... | 8.0..... | 21.9..... | 59.4..... | 24.6..... | 62.1..... |
| 240/1/60..... | 11.9..... | 32.7..... | 89.0..... | 36.9..... | 93.2..... |
| 240/3/60..... | 7.2..... | 19.2..... | 51.7..... | 21.6..... | 54.1..... |
| 380/3/50..... | 4.4..... | 12.0..... | 32.5..... | 13.6..... | 34.1..... |
| 480/3/60..... | 3.6..... | 9.6..... | 25.8..... | 10.8..... | 27.0..... |

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Commander 18-5 Series

INTRODUCTION

Purpose

The purpose of this technical manual is to provide installation, operation, cleaning and maintenance directions.

A section is provided for replacement parts.

Scope

This manual contains all pertinent information to assist in the proper installation, operation, cleaning, maintenance, and parts ordering for Commander 18-5 series dishwashers.

The **installation instructions** are intended for qualified equipment installers. The **operation and cleaning instructions** are intended for the daily users of the equipment. The **maintenance and parts sections** are intended for qualified service and/or maintenance technicians. Replacement parts may be ordered directly from our factory or from your local Insinger Authorized Service Agency. You can speak to the **Insinger Technical Services Department, 800/344-4802**, or e-mail us at **service@insingermachine.com**. When calling for warranty information or replacement parts please provide the model and serial number of your Insinger Equipment. These important numbers should be noted in this manual on the spaces provided on the opening page.

Surefire™ Start-up & Check-out Program
Insinger is proud to offer our exclusive Surefire™ Start-up & Check-out Program to our commercial customers. This service is included in the purchase price of your new Insinger dishwasher. We will provide an authorized factory service technician for the initial start-up of your new Insinger dishwasher to ensure it is running at optimum levels from the very first pass. Please call the factory or your local Insinger Sales Representative to schedule this service.

NSF 3-2003 requirements for detergent and chemical sanitizer dispensers.

This machine must be operated with an automatic detergent dispenser and, if applicable, an automatic chemical sanitizer feeder, including a visual means to verify that detergents and sanitizers are delivered or a visual or audible alarm to signal if detergents and sanitizers are not available for delivery to the respective washing and sanitizing systems. Please see instructions for electrical and plumbing connections located in this manual and in the feeder equipment manual.

Definitions

Throughout this guide you will find the following terms: WARNING, CAUTION, & NOTE.

WARNING indicates potential physical danger.
CAUTION indicates potential equipment damage.
NOTE indicates helpful operating hints or tips.

You will visually be able to identify each as shown below:



WARNING:
Indicates potential physical danger.



NOTE:
Indicates helpful operating hints or tips.

CAUTION:

Indicates potential equipment damage.

Door Type Dishwashing Machine

Safety Summary

The following are general safety precautions that are not related to any specific procedures. These are recommended precautions that personnel must understand and apply during many phases of operation and maintenance.

Keep Away From Live Circuits

Operating personnel must at all times observe all safety regulations. Do not replace components or make adjustments inside the equipment with the high voltage supply turned on. Under certain conditions, dangerous potentials may exist when the power control is in the off position. To avoid casualties, always remove power, red tag machine and ground a circuit before touching it.

Do Not Service or Adjust Alone

Under no circumstances should any person reach into or enter the enclosure for the purpose of servicing or adjusting the equipment except in the presence of someone who is capable of rendering aid.

Resuscitation

Personnel working with or near high voltages should be familiar with modern methods of resuscitation. Such information may be obtained from the Bureau of Medicine and Surgery.

INSINGER MACHINE COMPANY LIMITED WARRANTY

Insinger Machine Company, Inc. (Insinger) hereby warrants to the original retail purchaser of this Insinger Machine Company, Inc. product, that if it is assembled and operated in accordance with the printed instructions accompanying it, then for a period of either 15 months from the date of shipment from Insinger or 1 year (12 months) from the date of installation, that said Insinger product shall be free from defects in material and workmanship. Whichever one of the two aforesaid limited warranty time periods is the longest shall be the applicable limited warranty coverage time period.

Insinger may require reasonable proof of your date of purchase; therefore, you should retain your copy of invoice or shipping document.

This limited warranty shall be limited to the repair or replacement of parts which prove defective under normal use and service and which on examination shall indicate, to Insinger's satisfaction, they are defective. Any part that is claimed to be defective and covered by this limited warranty must be returned to Insinger, this may be done through an Authorized Service Agency. Furnish serial number of machine with shipment and send to:

*Insinger Machine Company
6245 State Road
Philadelphia, PA 19135-2996*

If Insinger's inspection confirms the defect and the claim, Insinger will repair or replace such part without charge and return it to you freight or postage prepaid.

This limited warranty does not cover any failure or accident, abuse, misuse, alteration, misapplication, improper installation, fire, flood, acts of God or improper maintenance or service, or failure to perform normal and routine maintenance as set out in

the instruction booklet (operating instructions) or for improper operation or failure to follow normal operating instructions (as set out in the instruction booklet). Insinger is not responsible nor liable for any conditions of erosion or corrosion caused by corrosive detergents, acids, lye or other chemicals used in the washing and or cleaning process.

Service must be done by either Insinger Appointed Service Agencies or agencies receiving prior authorization from Insinger.

All warranty work must be done during normal working hours, unless purchaser receives prior authorization from Insinger.

There are no other express warrants except as set forth herein and any applicable implied warranties of merchantability and fitness are limited in duration to the period of coverage of this express written limited warranty. This limited warranty supersedes all other express warranties, implied warranties of merchant-ability and fitness or limited warranties as of this date, January 1, 1998. Some states do not allow limitation on how long an implied warranty lasts so this limitation may not apply to you.

Insinger is not liable for any special, indirect or consequential damages. Some states do not allow the exclusion or limitation of incidental or consequential damages, so this limitation nor exclusion may not apply to you.

Insinger does not authorize any person or company to assume for it any other obligation or liability in connection with the sale, installation, use, removal, return or replacement of its equipment: and no such representations are binding on Insinger.

**INSINGER MACHINE COMPANY LIMITED WARRANTY
COMMERCIAL MARINE USE**

Insinger Machine Company, Inc. (Insinger) hereby warrants to the original retail purchaser of this Insinger Machine Company, Inc. product, that if it is assembled and operated in accordance with the printed instructions accompanying it (installation manual), then for a period of 18 months from the date of installation on board the vessel, that said Insinger product shall be free from defects in material and workmanship.

Insinger may require reasonable proof of your date of equipment install, therefore, you should retain your copy of invoice or shipping document.

This limited warranty shall be limited to the replacement of parts which prove defective under normal use and service and which on examination shall indicate, to Insinger's satisfaction, they are defective. Any part that is claimed to be defective and covered by this limited warranty must be returned to Insinger. Furnish serial number of machine with shipment and send to:

*Insinger Machine Company, Inc.
6245 State Road
Philadelphia, PA 19135-2996*

If Insinger's inspection confirms the defect and the claim, Insinger will repair or replace such part without charge and return it to you freight or postage prepaid. If part damages are not covered, Insinger will contact the customer and advise.

If a factory trained authorized technician is required to repair or replace defective parts or material during the 18 month warranty period, the cruise line will be responsible for the payment of travel expense and a minimum of four hours labor.

Labor will be billed to the customer at a reduced rate of \$40.00 per hour. If sailing with a vessel is required, then an eight hour per day minimum will apply.

This limited warranty does not cover accident, abuse, misuse, alteration, misapplication, improper installation, fire, flood, or improper maintenance or service, or failure to perform normal and routine maintenance as set out in the instruction booklet (operating instructions) or for improper operation or failure to follow normal operating instructions (as set out in the instruction booklet).

Insinger is not responsible nor liable for any conditions of erosion or corrosion caused by corrosive detergents, acids, lye or other chemicals used in the washing, caring and or cleaning process.

Warranty service must be done by either Insinger Appointed Service Agencies or agencies, customers galley engineers receiving prior authorization from Insinger.

There are no other express warrants except as set forth herein and any applicable implied warranties of merchantability and fitness are limited in duration to the period of coverage of this express written limited warranty. This limited warranty supersedes all other express warranties, implied warranties of merchantability and fitness or limited warranties as the above date.

Insinger does not authorize any person or company locally or overseas to assume for it any other obligation or liability in connection with the sale, installation, use, removal, return or replacement of its equipment; and no such representations are binding on Insinger.

INSTALLATION INSTRUCTIONS
Commander 18-5 Series & CS Series

Placement

Carefully uncrate machine. Take caution not to damage components which may be mounted on the top or sides of the machine. Set unit in place and adjust the feet to level the machine.

Fasten the tables to the load and unload side of the machine. Most installations require fastening the turn-down lip of the dish tables to the side of the machine with flathead countersunk screws. The table design should provide horizontal clearance of 30" for servicing.

Electrical Connections

Connect electrical lines sized for the correct voltage, current and phase of the machine. These should agree with the machine requirements indicated on the nameplate and labels on the control panel.

A single-point electrical connection is provided for the pumps, control circuit, and wash tank heater.

If an electric booster is provided, connect power directly to the booster.

If the Insinger Self-Contained booster is provided the machine comes standard with a Single-Point Connection (to include the booster).

| CAUTION: |
|--|
| <p>Connections must be made to a circuit breaker or fused disconnect as provided by the end-user and required by local codes.</p> <p>A laminated wiring diagram is inside the control panel.</p> |

| Fuse Sizing Chart | | | | | |
|--|-----------|-----------|-----------|-----------|-----------|
| Model | 208VAC/3È | 230VAC/3È | 380VAC/3È | 460VAC/3È | 220VAC/1È |
| 18-5(C) steam heat | 6A | 6A | 6A | 6A | 15A |
| 18-5(C) electric heat | 15A | 15A | 10A | 10A | 30A |
| 18-5(C) electric heat Insinger SCB | 60A | 50A | 35A | 25A | 100A |
| 18-5H steam heat | 15A | 10A | 6A | 6A | 25A |
| 18-5H electric heat | 25A | 25A | 15A | 15A | 45A |
| 18-5H electric heat Insinger SCB | 70A | 60A | 40A | 30A | 110A |

CAUTION:

As with any 3 phase system, an electrician must check all motors for proper phasing, i.e., Pump motors must be running in direction indicated by arrow on housing.

Mechanical Connections

Connect 140° water lines for tank fill/booster as tagged and noted on the installation drawings. If machine is provided with steam heat connect the steam lines and steam condensate lines as tagged and noted on installation drawings. Connect the drain line.

CAUTION:

Drain lines must be as specified on installation drawings.

Drain line should be properly vented and should have fall of not less than 1/4" to the foot of proper flow. Some area plumbing codes require drains to flow into an open gap with an opening twice the diameter of the pipe.

Check with your local plumbing codes for the type of drain connection required.

CAUTION:

All lines must be flushed prior to use to remove debris.

CAUTION:

Do not reduce the size of lines as specified in installation drawings. All Lines are sized to facilitate necessary flows, pressures, etc.

HVAC

Ventilation system must be sized to provide adequate ventilation per machine specs. Refer to spec sheet.

Chemicals

Upon the completed installation of the dishwasher, contact a local detergent/chemical supplier for the correct chemicals for your soil load and geographical area.

Electrical connection points for the detergent dispenser and rinse injector are located inside the control panel. Refer to the wiring diagram for this machine for the proper connection points.

Dispensers may be connected on either the primary voltage side of the machine or the 24VAC control voltage side.

CAUTION:

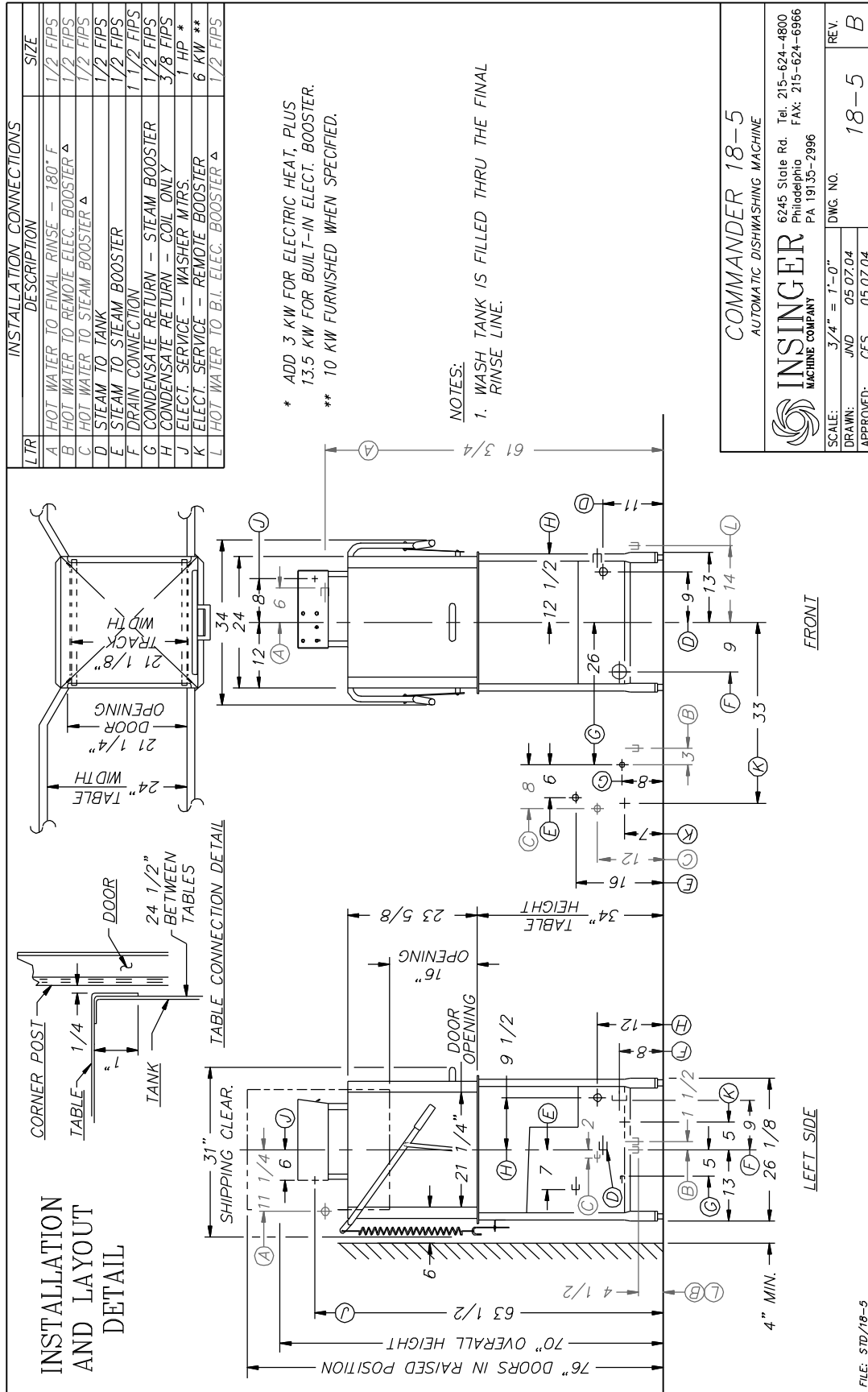
When connecting on the 24VAC control voltage side of the transformer, total VA must not exceed 50VA.

The detergent density probe should be installed in the hole provided & labeled in the wash tank. A switch on the control panel labeled "Wash Cycle" is provided for de-liming the machine. When activated, this switch will keep the machine in an indefinite wash cycle. This feature can also be used to wash heavily soiled ware on an extended wash cycle.

Tabling

Load and unload tables should be pitched towards the machine to return excess water into the machine.

Insinger dishmachines are user-friendly, making them easy to operate and maintain. By following the operation procedure and general cleaning procedures your Insinger dishwasher will give you years of trouble free service.



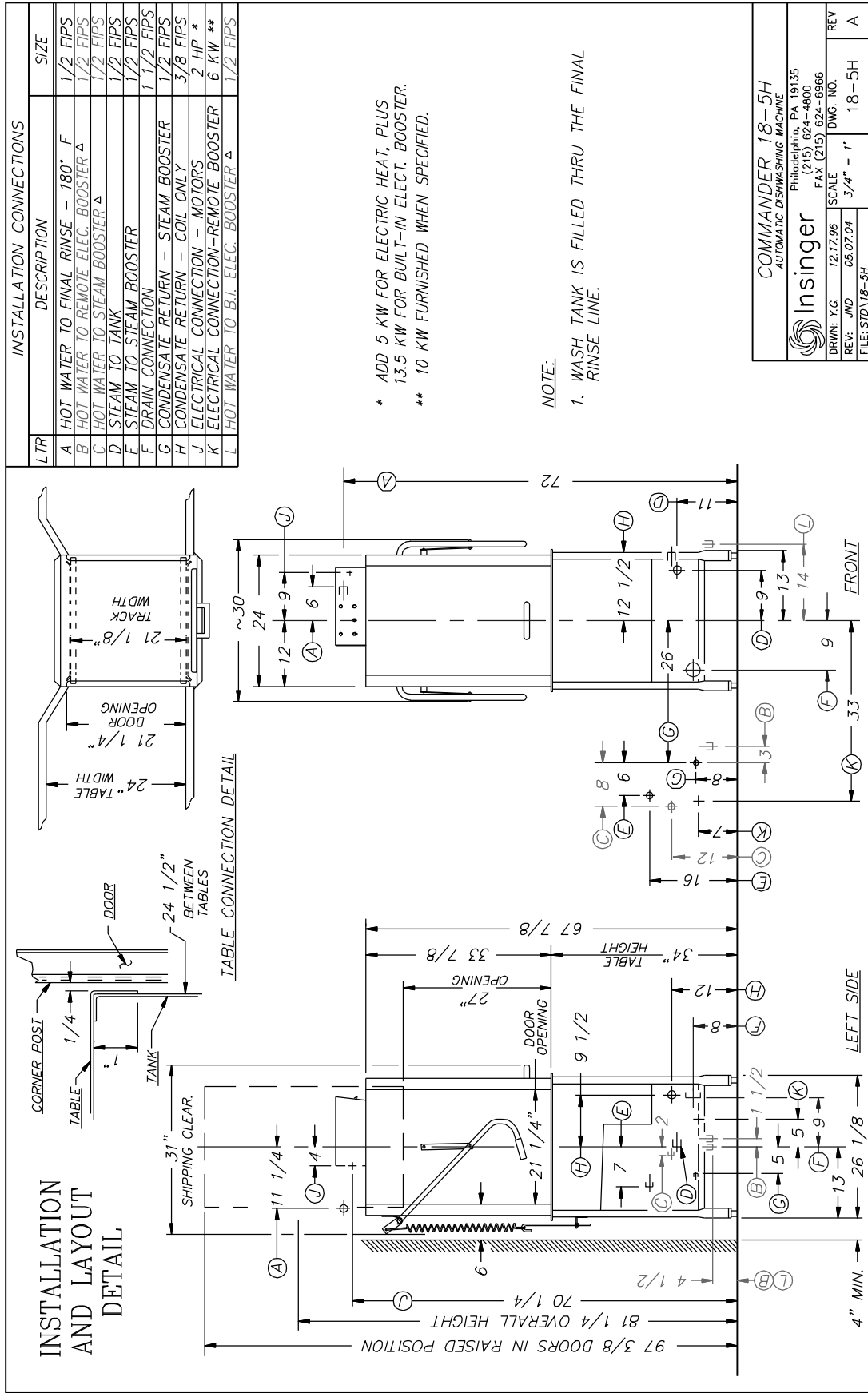
COMMANDER 18-5
 AUTOMATIC DISHWASHING MACHINE

INSINGER MACHINE COMPANY
 6245 State Rd. Philadelphia PA 19135-2996
 Tel. 215-624-4800
 FAX: 215-624-6966

SCALE: 3/4" = 1'-0"
 DRAWN: JND 05.07.04
 APPROVED: CES 05.07.04

DWG. NO. 18-5
 REV. B

FILE: STD/18-5



COMMANDER 18-5H
 AUTOMATIC DISHWASHING MACHINE

Philadelphia, PA 19135
 (215) 624-4800
 FAX (215) 624-6966

Insinger

DRWN: Y.G. 12.17.96
 REV: JMD 05.07.04
 FILE: STD\18-5H

SCALE 3/4" = 1'
 DWG. NO. 18-5H
 REV. A

Insinger dishmachines are user-friendly, making them the easiest dishmachines on the market to operate and maintain.

By following these operating procedures your Insinger dishwasher will give you years of trouble free service.

OPERATION INSTRUCTIONS

1. Ensure drain overflow tube is in place. Close all tank drain valves. One drain is provided for each tank of the dishmachine.
2. Check for proper installation and cleanliness of all internal, removable components such as suction strainers, scrap screens, and spray manifolds.
3. Ensure all water & steam lines are open. Ensure electrical circuits are on.
4. Close machine doors.
5. Move the power toggle switch to the ON position. The machine will fill the tank, run through a complete wash/rinse cycle and shut-off.
6. When the tanks are full the tank heat will operate automatically. Proper wash tank temperature is 156°F minimum. Proper final rinse temperature is 180°F minimum at 20 PSI, while in the final rinse cycle.

CAUTION:

To ensure proper operation of the auto tank fill feature and the tank heaters, the tank level floats **MUST** be cleaned daily.

7. Open doors.
8. Insert a rack of soiled dishware in machine and lower doors. Depress the cycle start button, machine will wash and rinse automatically. When the rinse indicator light goes off the machine cycle is complete

CAUTION:

Overloading racks will minimize the proper cleaning of ware.

WARNING:



Do not open the doors during the wash/rinse cycle as hot water is being sprayed. An interlock is provided to stop the wash/rinse cycle if the doors are opened but hot water may spray out if doors are opened too quickly.

9. Open doors and remove rack of clean ware. For continuous operation repeat steps 2B19 & 2B10
10. Upon completion of ware cleaning move the power toggle switch to the "OFF" position.
11. Refer to the cleaning procedures for proper clean-up of the dishmachine.
12. A switch on the control panel labeled "Wash Cycle" is provided for use when de-liming the machine. When activated, this switch will keep the machine in an indefinite wash cycle. This feature can also be used to wash heavily soiled ware on an extended wash cycle.
13. Report any unusual occurrences to qualified service personnel.

The following cleaning procedures should be done daily, at the end of the shift.

Cleaning Procedures, Daily

1. Remove all internal removable parts including spray manifolds, scrap screens, drain overflow tube and suction strainer.
2. Remove the end caps from the spray manifolds and clean with the brush provided. Flush the manifolds.
3. Flush scrap screens
4. Clean drain overflow tube.

NOTE:



V-cup seal on the drain overflow tube may become gummed not allowing the overflow tube to seal. This will cause the drain to leak water. Remove any build-up on the V-cup seal. When the seal becomes worn, replace with part # D2-557.

CLEANING PROCEDURES (CONTINUED)

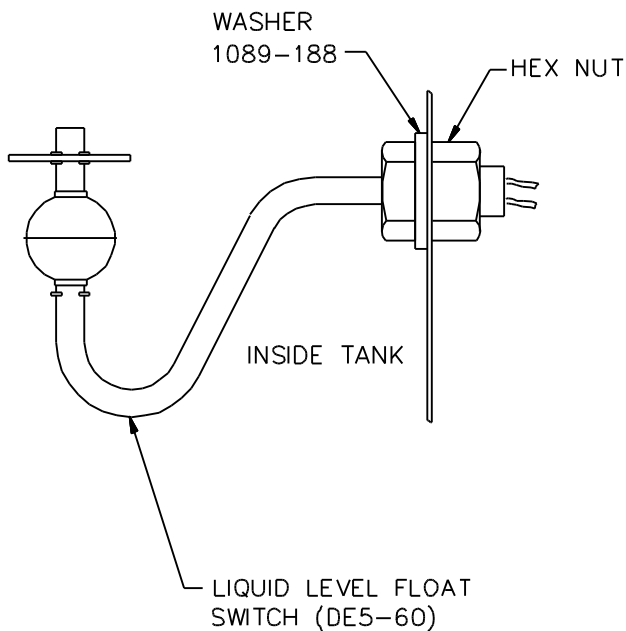
5. Clean suction strainers of build-up.

p

NOTE:

Improper cleaning of the suction strainers will cause the pumps to cavitate. This will cause poor washing results.

6. Clean the tank level float with a plastic abrasive pad (do not use steel wool).


CAUTION:

Level floats must be cleaned daily. Build-up of grease and dirt will cause faulty operation of the tank fill heating system.

p

NOTE:

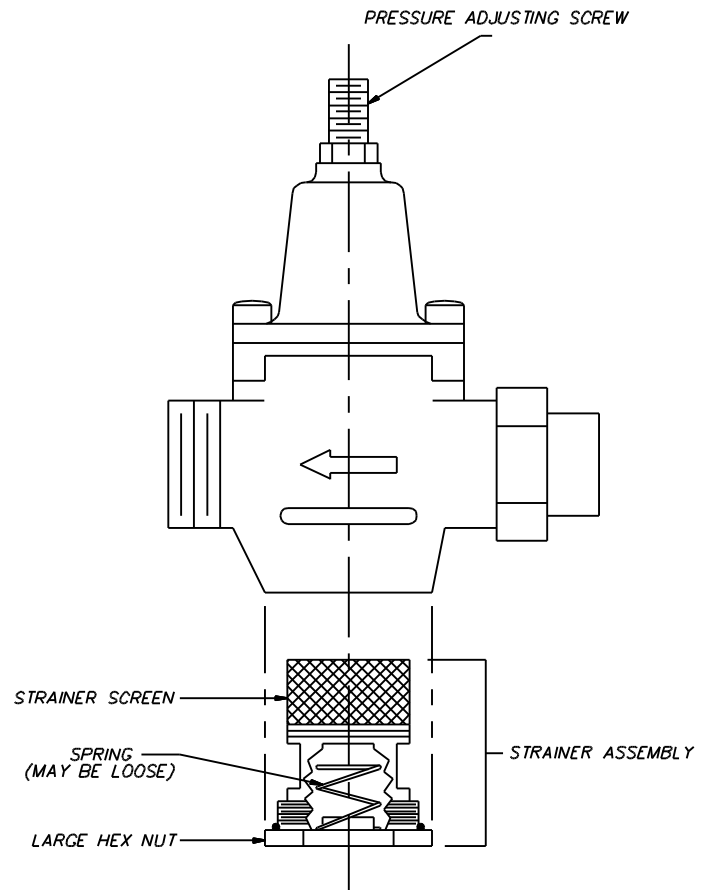
Upper & lower wash & rinse pipes are not the same.

7. Final rinse nozzles should be cleaned of matter clogging the jet spray.

8. A door should be left open to allow drying of interior surfaces.

PRESSURE ADJUSTMENT

Pressure in the final rinse must be maintained at 20 ± 2 psi. Adjustment of the pressure is made with the adjusting screw on the pressure reducing valve.



SKETCHA\SK-4689 PRESSURE REDUCING VALVE

If there are flow or pressure problems with the pressure reducing valve, CAREFULLY remove the strainer assembly and clean the strainer screen. Be careful not to damage the Hex nut o-ring

The following is a basic guide for the repair and replacement of common dishwasher parts. Refer to the Basic Services Guide for troubleshooting tips.

MAINTENANCE REQUIREMENTS

Daily

1. Refer to the operations and cleaning instructions provided in this manual for daily cleaning procedures.

Weekly

1. The entire machine should be wiped down using an industrial grade stainless steel cleaner.
2. Under the supervision of your detergent supplier the machine interior must be properly de-limed.

p

NOTE:

The water quality in some areas requires de-liming to be done more frequently. Contact your detergent supplier for recommended de-liming frequency.

Quarterly

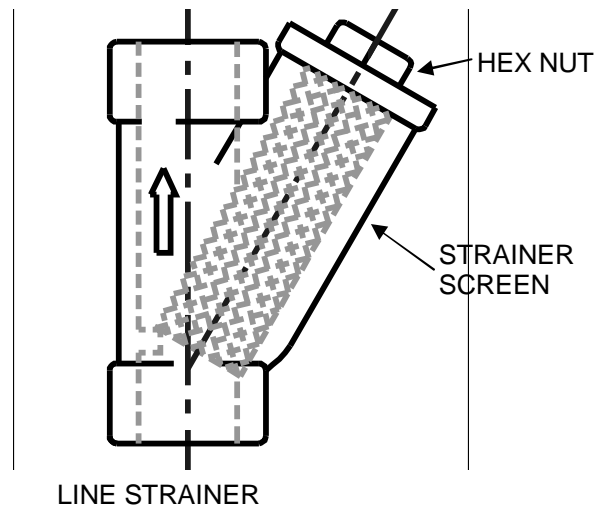
1. Remove and clean the strainer screens on the water and steam lines. If the screens cannot be cleaned, replace.
2. Inspect the condition of the solenoid valve seats, and diaphragms. Replace where necessary.
3. Inspect drain O-Rings for leakage. Replace where necessary.
4. Check door spring tension and adjust where necessary.
5. Check wash and rinse hub bushing/bearing and replace where necessary.

MAINTENANCE PROCEDURES

Solenoid Valve Disassembly (See dwg. SK-4692)

1. Disconnect the power supply to the machine. Turn off the water supply.

2. Remove cap on top of the coil. Remove the coil.
3. Remove the 4 hex bolts and lift bonnet from valve body. Note positioning of spring and plunger.
4. Remove main piston.
5. Inspect for dirt, wear or lime build-up. Clean or replace as required.
6. Reassemble in reverse of disassembly.



Liner Strainer Disassembly

1. Shut off water or steam supply.
2. Remove large hex nut on bottom of strainer body.
3. Remove strainer screen. Inspect and clean or replace as necessary.
4. Reassemble in reverse of disassembly. Water flow must be same direction as arrow on line strainer body. Use new gaskets to insure a tight seal.

Pump Disassembly

1. Before disassembling pump ensure there are no obstructions in the pump intake. Remove and clean the suction strainer (inside tank). See dwg. SK-2456 & SK-2923

p

NOTE:

It is not necessary to remove the pump housing from the machine to disassemble

Pump Disassembly (Continued)

2. Remove the pump motor and impeller by removing the 4 hex bolts attaching them to the pump housing.
3. Repair or replace the pump parts as required.
4. Reassemble in reverse of disassembly.

Immersion Heater Replacement

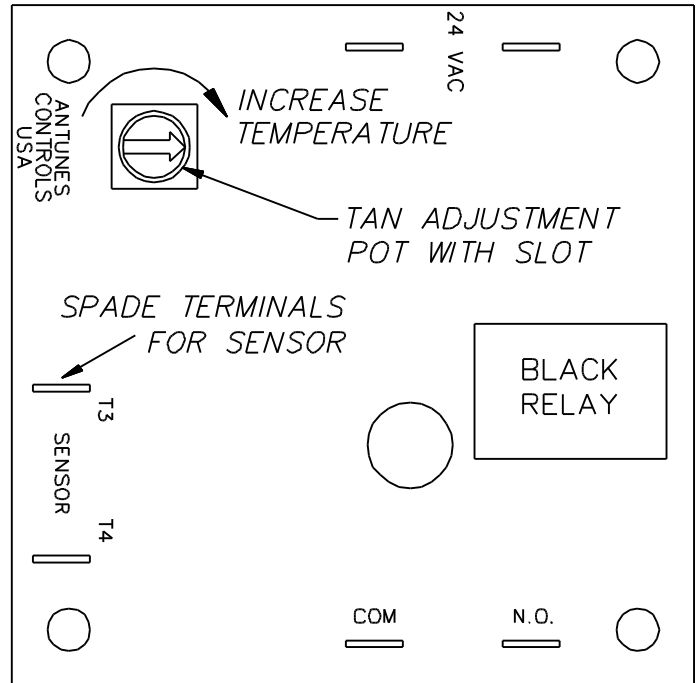
See dwg. #SK-4703

1. The immersion heater **MUST** be completely submerged at all times. If this is not the case contact a qualified service technician. The heated surface should never be in contact with sludge. See dwg. SK-4703.
2. Remove the housing covering the wiring terminations. Disconnect the immersion heater wires.
3. Remove the immersion heater by loosening and removing the large hex nut.

p **NOTE:**
Use plumbers putty as gasketing around the immersion heater to minimize leaks.

Tank Heat Temperature Adjustment

1. A temperature control board is provided in the control panel for easy adjustment of tank temperature. Though tank temperature is adjusted during the machines factory test it is sometimes necessary to re-adjust the temperature at start-up.
2. Locate the temperature control board. Use the control panel layout drawing located in Section 4, Electrical Schematic and Replacement Parts.
3. Adjust the tank temperature to the desired temperature by turning the potentiometer located on the temperature control board. An arrow on the potentiometer indicates increase.
4. If the temperature does not change refer to Troubleshooting Tank Temperatures in the next section.



TANK TEMPERATURE CONTROL BOARD
(DE9-251)

Troubleshooting Tank Temperatures

Electric Heat

1. If temperature does not change check the temperature control board (P/N DE9-251) proper operation. If the temperature control board is faulty, replace.
2. Verify tank heat contactor is working correctly. If not, replace.
3. Verify all immersion heaters are working properly and not limed. If not, replace.

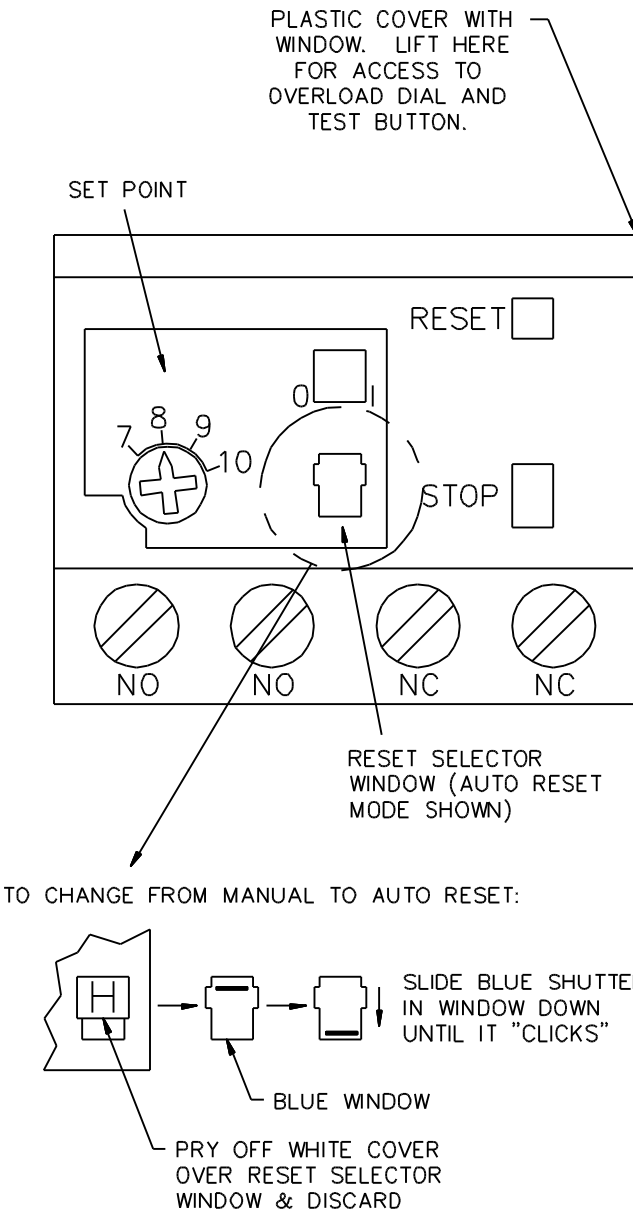
Steam Heat

1. If temperature does not change check the temperature control board (P/N DE9-251) proper operation. If the temperature control board is faulty, replace.
2. Verify steam pressure per machine specifications.
3. Verify steam trap is not clogged. If so, replace.

Motor Overloads

All motors used on Insinger Machines are provided with motor overloads. Motor overloads are adjusted when the machines are factory tested. Should it be necessary to adjust the motor overloads in the field first verify the motor current draw for the voltage the machine is using.

Using the Control Panel Component Layout Dwg. located in Section 3 to identify the overload adjust by turning the dial to the appropriate AMP draw.



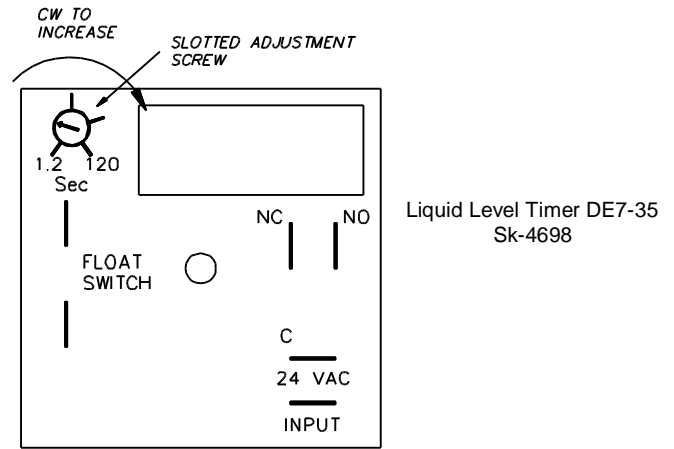
SKETCHA\SK-3829 OVERLOAD RELAY

Level System

The level control system consists of one overflow timer (P/N DE7-35) and one level float (P/N DEF-60) per tank.

When the system is powered-up, the tank(s) will begin to fill (assuming no water is in the tanks).

When the level float is actuated, the overflow timer begins to time-out and continues the filling process until the tank(s) is full.



NOTE:
The overflow timer **MUST** be adjusted during initial start-up. Adjustment depends on water fill pressure. The water level **MUST** be 1/4" below the lip of the overflow tube. Adjust by increasing or decreasing the potentiometer on the level timer.

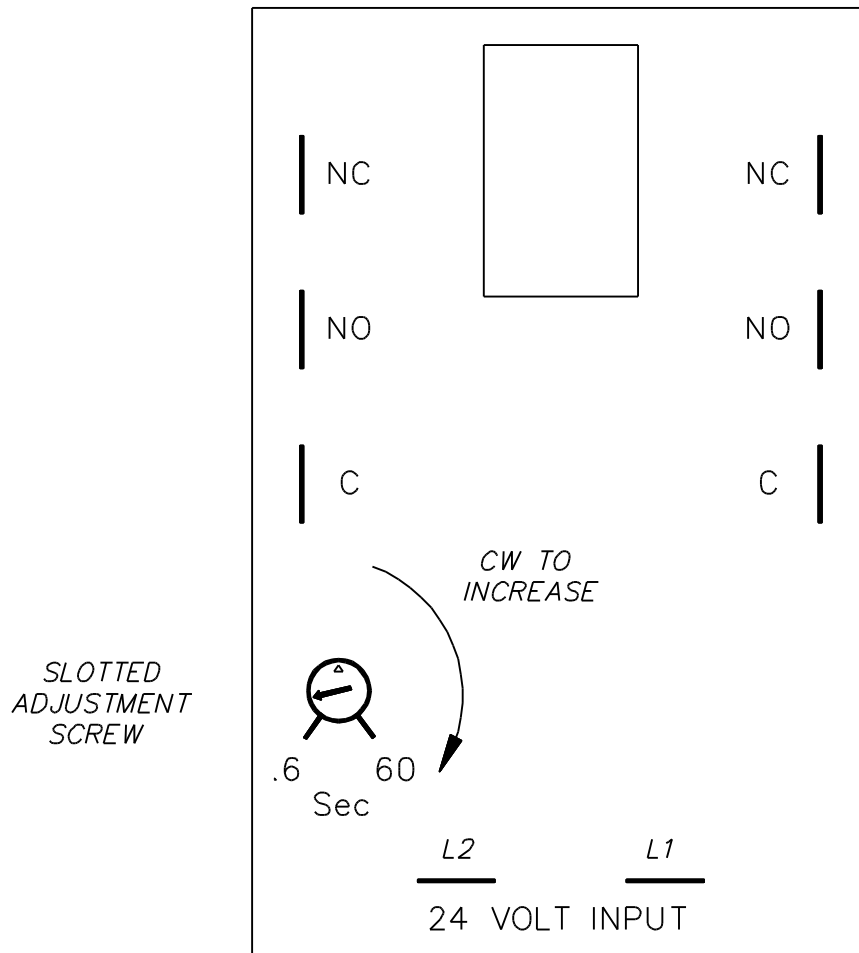
NOTE:
Dirty level floats will cause the tank heat to energize with no water in the tanks. **LEVEL FLOATS MUST BE CLEANED DAILY.**

Cycle Timers

If your machine is controlled by timing boards instead of a PLC, timing boards are used to determine wash time, rinse time and dwell time.

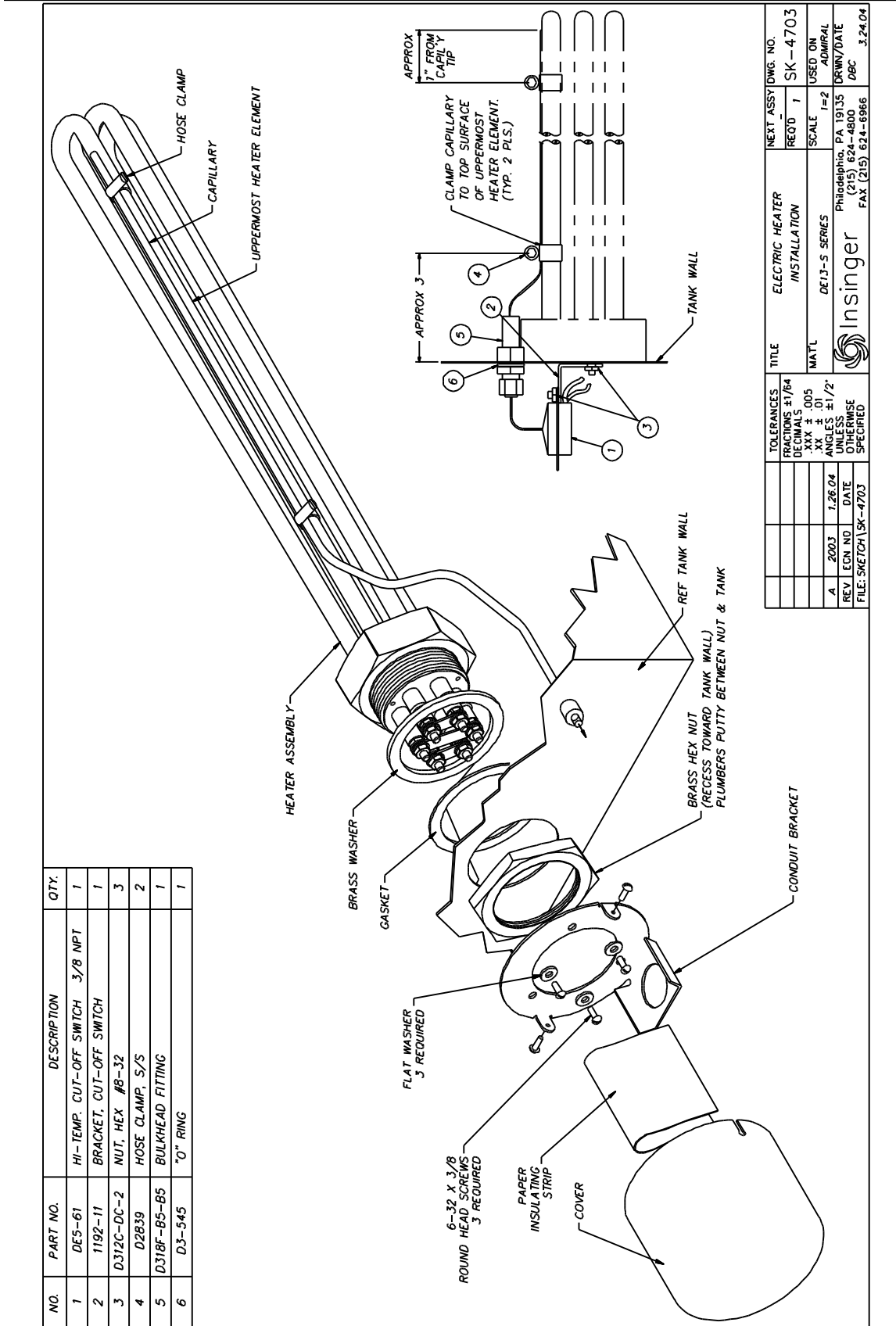
See drawing SK-3490, item no. 8. The potentiometer control – see below – increases or decreases the sequence time. Turn the potentiometer with a small slotted screwdriver clockwise to increase time and counterclockwise to decrease time.

The board labeled with a 'W' is for the wash cycle, the 'R' represents the rinse cycle, and the 'L' stands for the dwell cycle – the time at the end of the wash cycle where the amber light is on for a few seconds to ensure the dishes are sanitized and to prevent dishmachine operators from getting splashed with water still flinging off the wash and rinse arms at the end of the cycle. Do not open the machine before the light goes out.



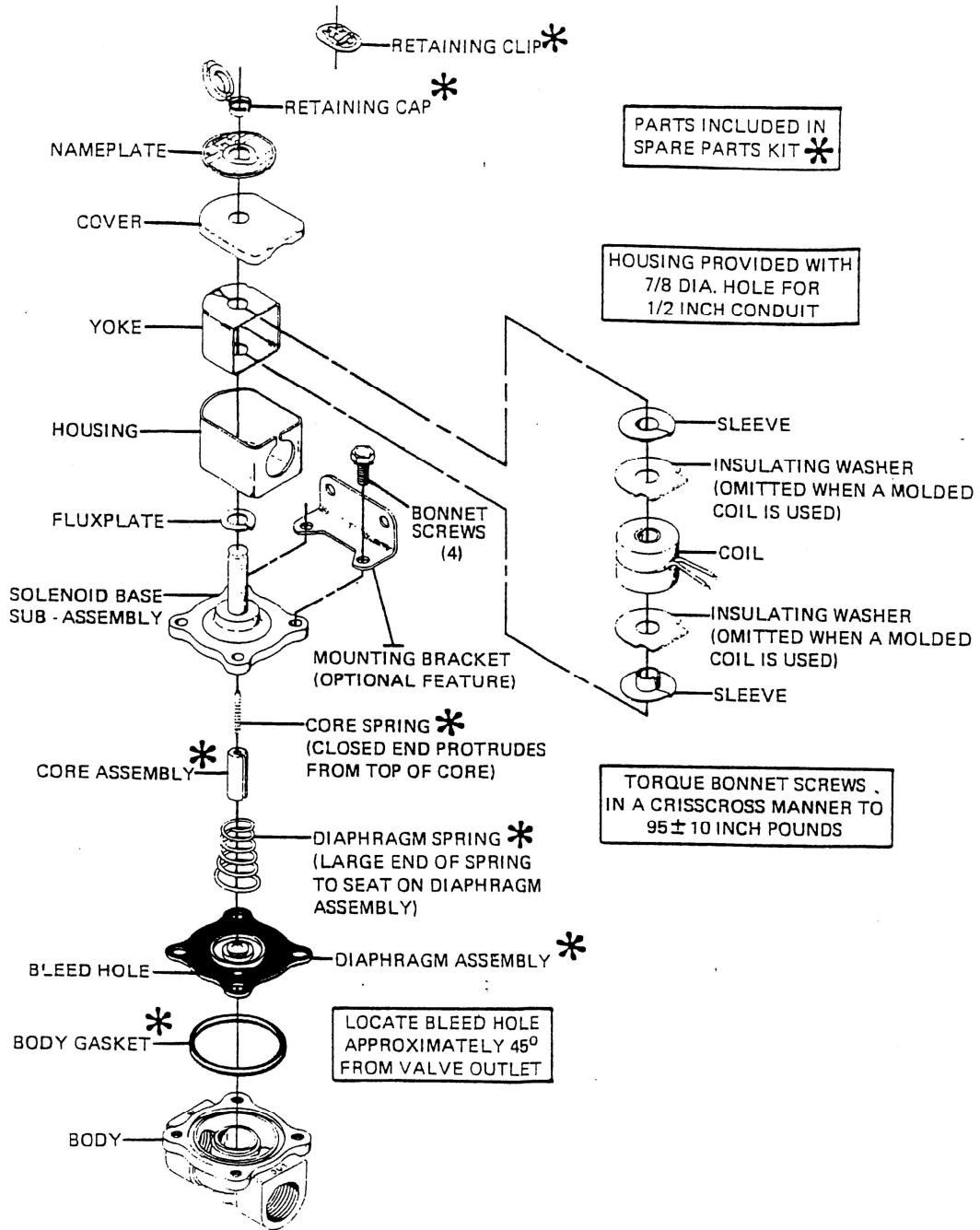
WASH & RINSE TIMER DE7-27

SKETCHA\SK-4708



| NO. | PART NO. | DESCRIPTION | QTY. |
|-----|-------------|---------------------------------|------|
| 1 | DES-61 | HI-TEMP. CUT-OFF SWITCH 3/8 NPT | 1 |
| 2 | 1192-11 | BRACKET, CUT-OFF SWITCH | 1 |
| 3 | D312C-DC-2 | NUT, HEX #8-32 | 3 |
| 4 | D2839 | HOSE CLAMP, S/S | 2 |
| 5 | D318F-B5-B5 | BULKHEAD FITTING | 1 |
| 6 | D3-545 | "O" RING | 1 |

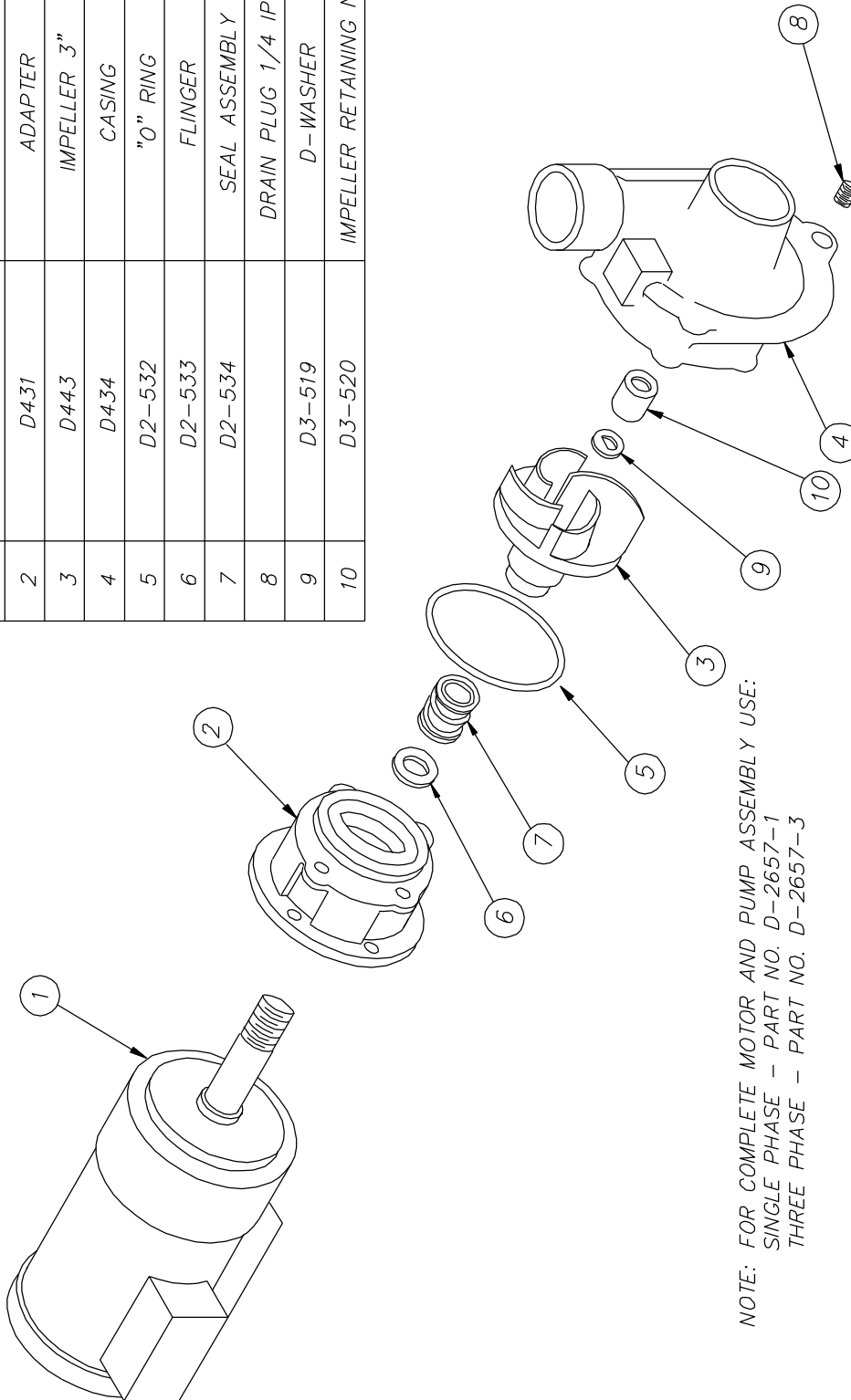
| | | | | | | | | |
|------------|------------------------------|------------------------|--------------------|----------------|--------------|------------------------|----------------------------|---------|
| TOLERANCES | FRACCTIONS ±1/64 | DECIMALS | .XXX ± .005 | .XX ± .01 | ANGLES ±1/2° | UNITS | UNLESS OTHERWISE SPECIFIED | |
| REV | A | 2003 | 1.26.04 | DATE | 1.26.04 | FILE: SKETCH\SK-4703 | | |
| TITLE | ELECTRIC HEATER INSTALLATION | | NEXT ASSY DWG. NO. | SK-4703 | RECD | 1 | SCALE | 1=2 |
| MATL | DEL3-S SERIES | | USED ON | ADMIRAL | DRWN/DATE | Philadelphia, PA 19135 | | 28C |
| Insinger | | Philadelphia, PA 19135 | | (215) 674-8606 | | FAX (215) 624-8966 | | 3.24.04 |



SOLENOID VALVE
 FINAL RINSE
 6-17

SKETCHA\SK-4692

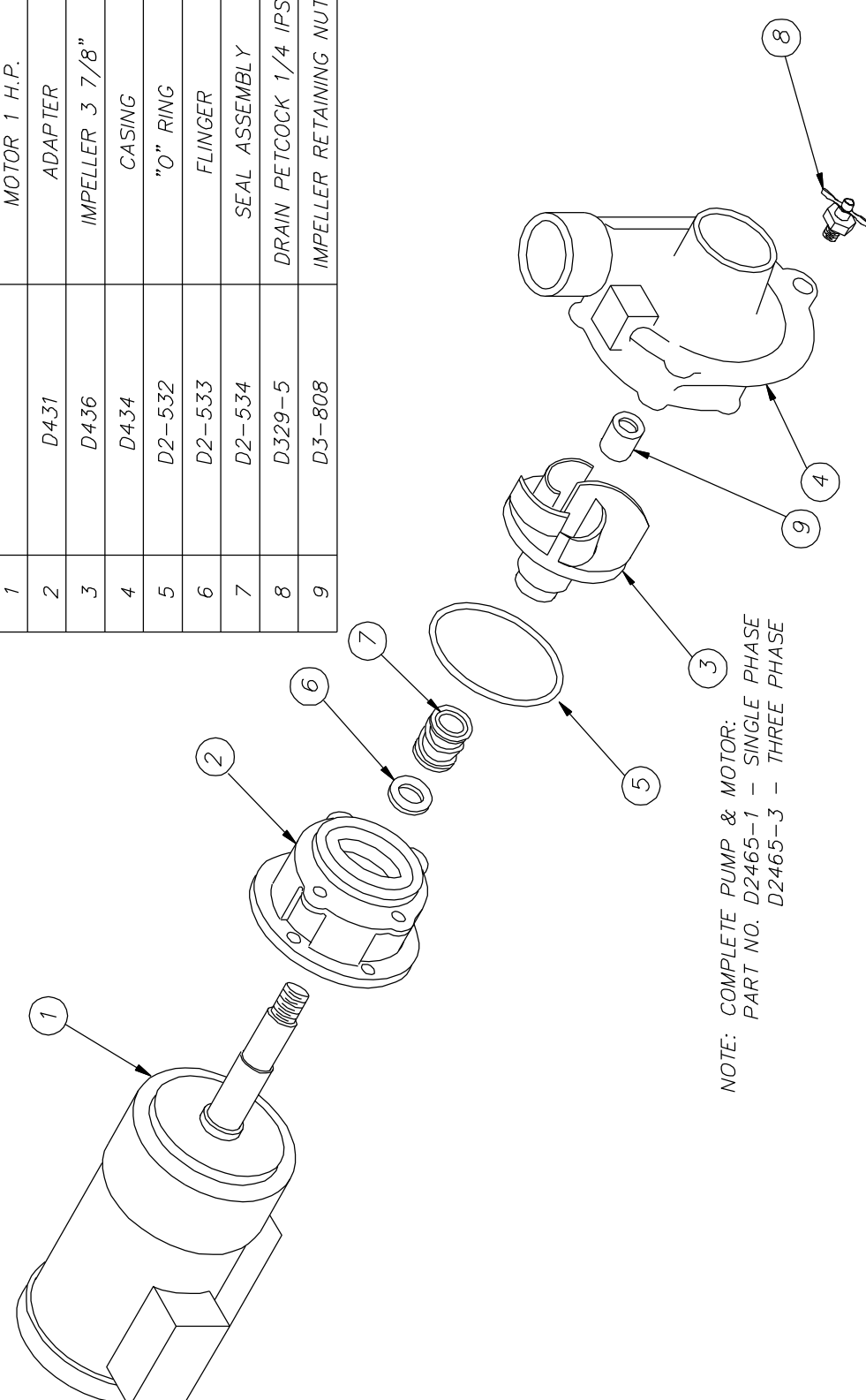
| ITEM | PART NO. | DESCRIPTION | QTY. |
|------|----------|------------------------|------|
| 1 | | MOTOR 2 H.P. | 1 |
| 2 | D431 | ADAPTER | 1 |
| 3 | D443 | IMPELLER 3" | 1 |
| 4 | D434 | CASING | 1 |
| 5 | D2-532 | "O" RING | 1 |
| 6 | D2-533 | FLINGER | 1 |
| 7 | D2-534 | SEAL ASSEMBLY | 1 |
| 8 | | DRAIN PLUG 1/4 IPS | 1 |
| 9 | D3-519 | D-WASHER | 1 |
| 10 | D3-520 | IMPELLER RETAINING NUT | 1 |



NOTE: FOR COMPLETE MOTOR AND PUMP ASSEMBLY USE:
 SINGLE PHASE - PART NO. D-2657-1
 THREE PHASE - PART NO. D-2657-3


| TOLERANCES | TITLE | PARTS LIST | NEXT ASSY | DWG. NO. |
|----------------------------|---------------------------------|------------|-----------|-----------|
| FRACTIONS ±1/64 | 2 H.P. PUMP | - | REQ'D | SK-2923 |
| DECIMALS .XXX ± .005 | | | SCALE | USED ON |
| .XX ± .01 | MAT'L | | | VARIOUS |
| ANGLES ±1/2° | Insinger Machine Company | | 19135 | DRWN/DATE |
| UNLESS OTHERWISE SPECIFIED | Philadelphia, PA (215) 624-4800 | | MAM | 11.11.93 |
| | FILE: SKETCHA \ SK-2923 | | | |
| | REV | ECN NO | DATE | |
| | A | 966 | 10.29.93 | |

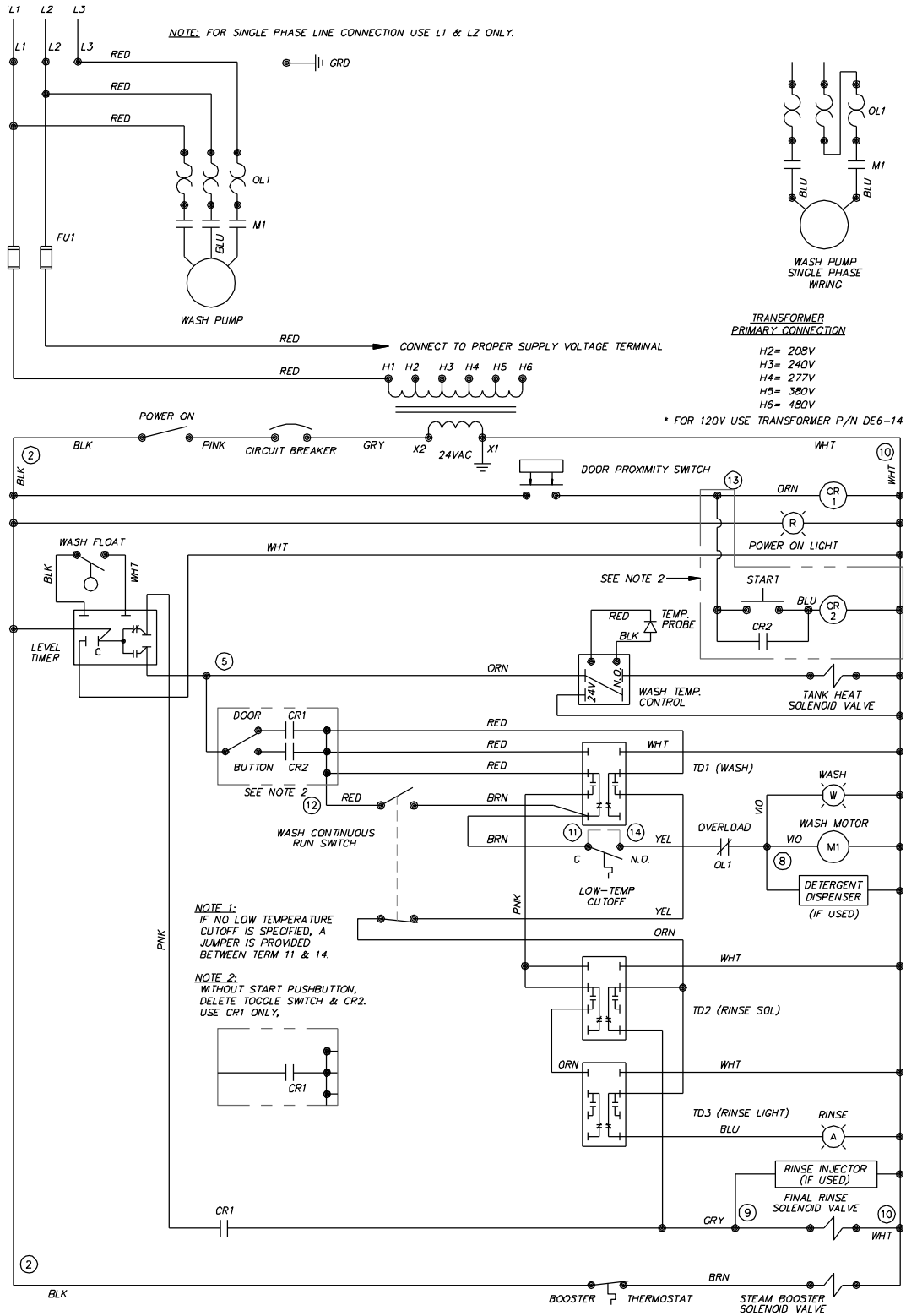
| ITEM | PART NO. | DESCRIPTION | QTY. |
|------|----------|------------------------|------|
| 1 | | MOTOR 1 H.P. | 1 |
| 2 | D431 | ADAPTER | 1 |
| 3 | D436 | IMPELLER 3 7/8" | 1 |
| 4 | D434 | CASING | 1 |
| 5 | D2-532 | "O" RING | 1 |
| 6 | D2-533 | FLINGER | 1 |
| 7 | D2-534 | SEAL ASSEMBLY | 1 |
| 8 | D329-5 | DRAIN PETCOCK 1/4 IPS | 1 |
| 9 | D3-808 | IMPELLER RETAINING NUT | 1 |



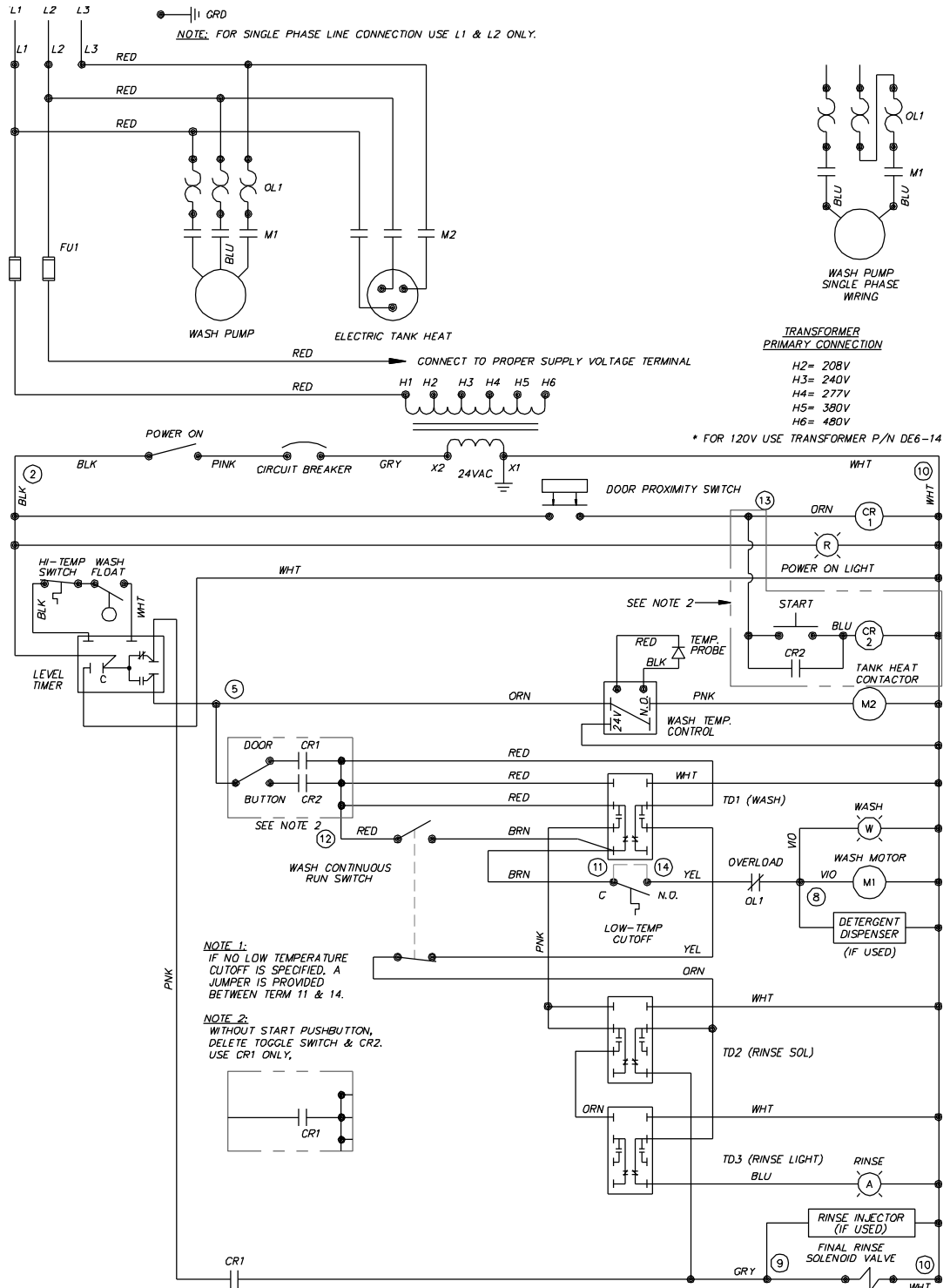
NOTE: COMPLETE PUMP & MOTOR:
PART NO. D2465-1 - SINGLE PHASE
D2465-3 - THREE PHASE

| TOLERANCES | | NEXT ASSY DWG. NO. | |
|----------------------------|-------------|--------------------|---------|
| FRACTIONS | ±1/64 | REQ'D | SK-2462 |
| DECIMALS | .XXX ± .005 | SCALE | USED ON |
| | .XX ± .01 | | VARIOUS |
| ANGLES | ±1/2° | | |
| UNLESS OTHERWISE SPECIFIED | | | |
| REV | ECN NO. | DATE | |
| C | 2007 | 3.25.04 | |
| B | 1761 | 5.5.00 | |
| A | 1005 | 4.26.94 | |

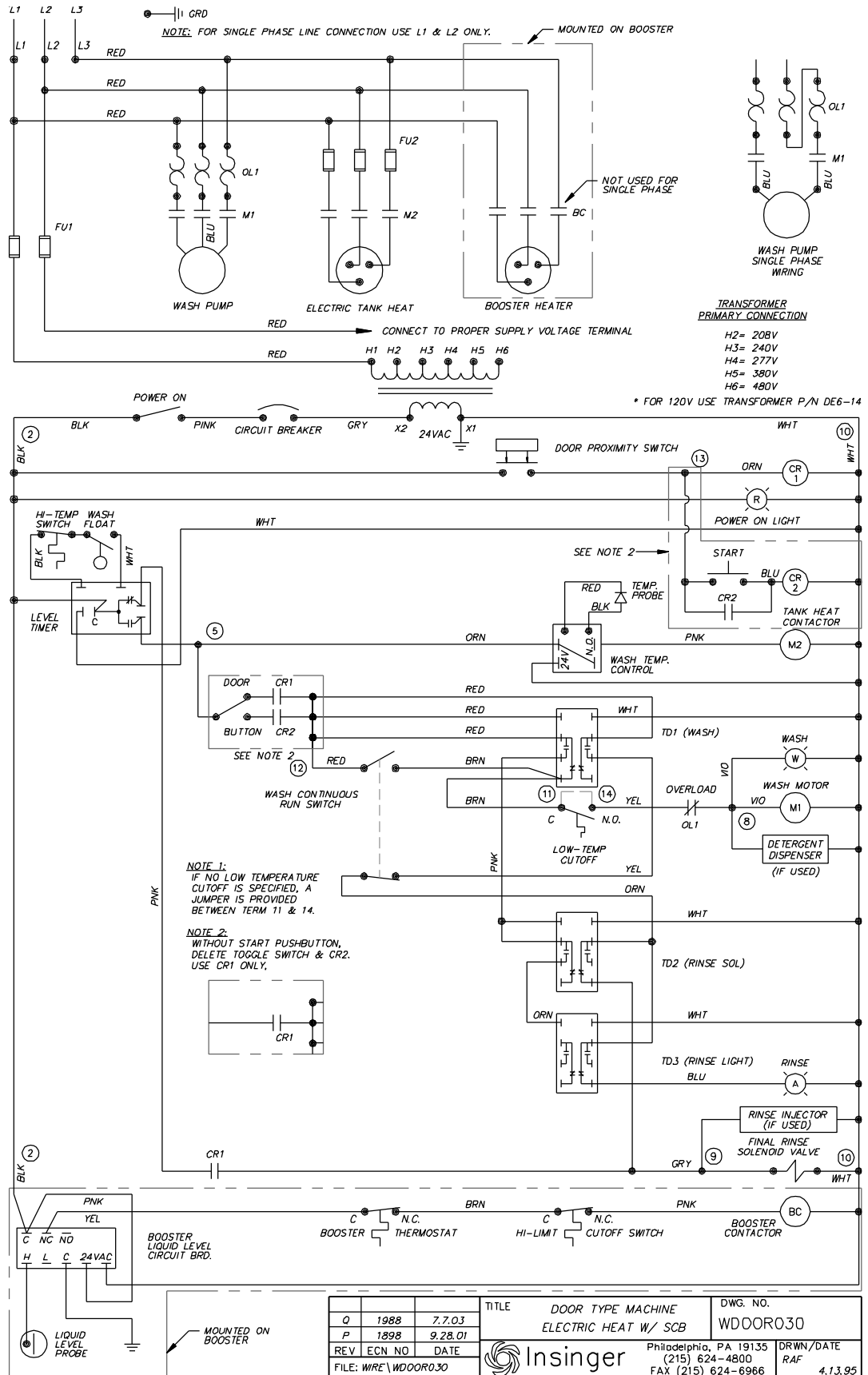
| | | | |
|---|------------|--|----------|
| TITLE | PARTS LIST | NEXT ASSY DWG. NO. | |
| MATT | 1 HP PUMP | REQ'D | SK-2462 |
| | - | SCALE | USED ON |
| | - | | VARIOUS |
|  Insinger | | Philadelphia, PA 19135 (215) 624-4800 FAX (215) 624-6966 | |
| | | DRWN/DATE | 11.11.93 |
| | | MAM | |

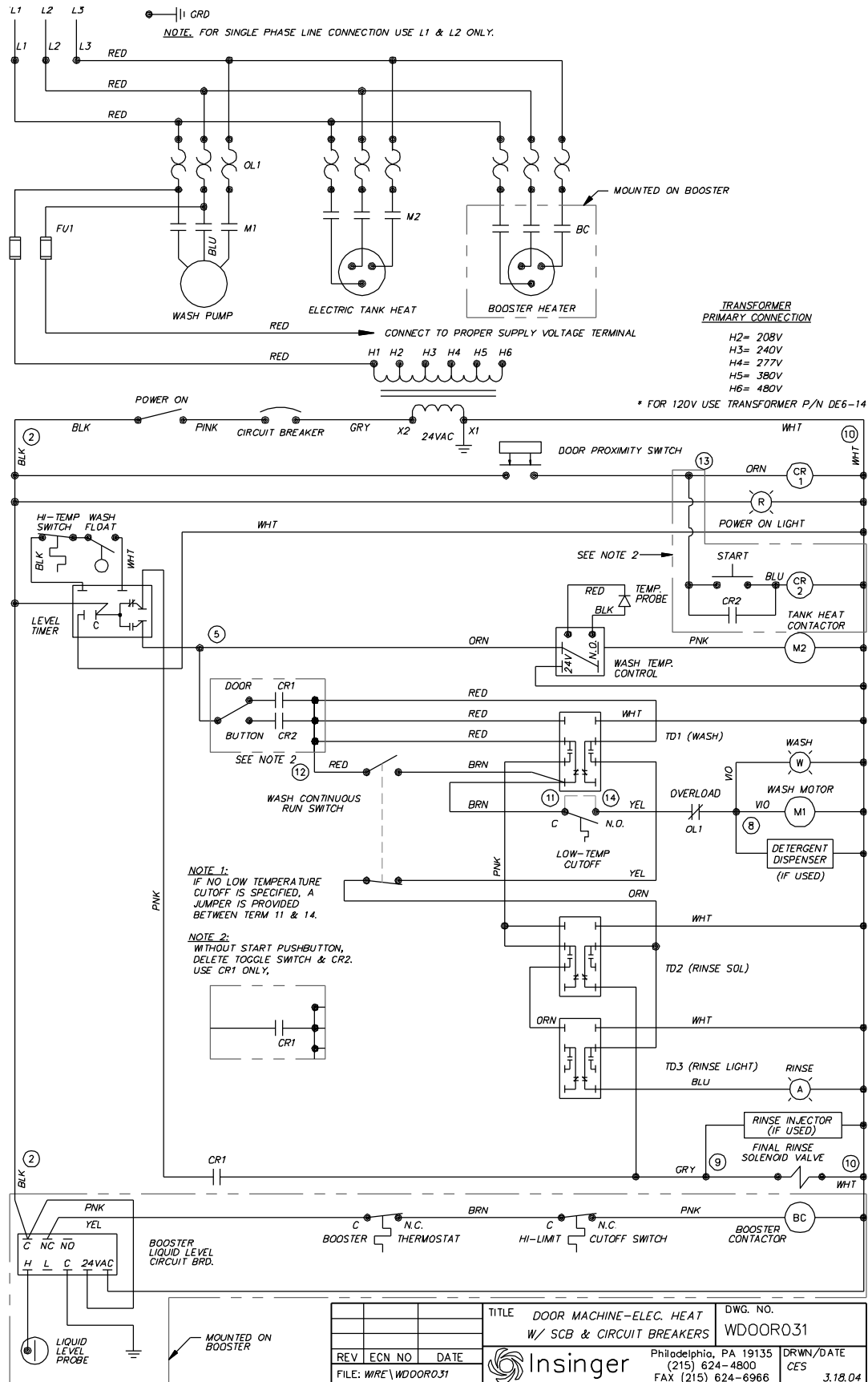


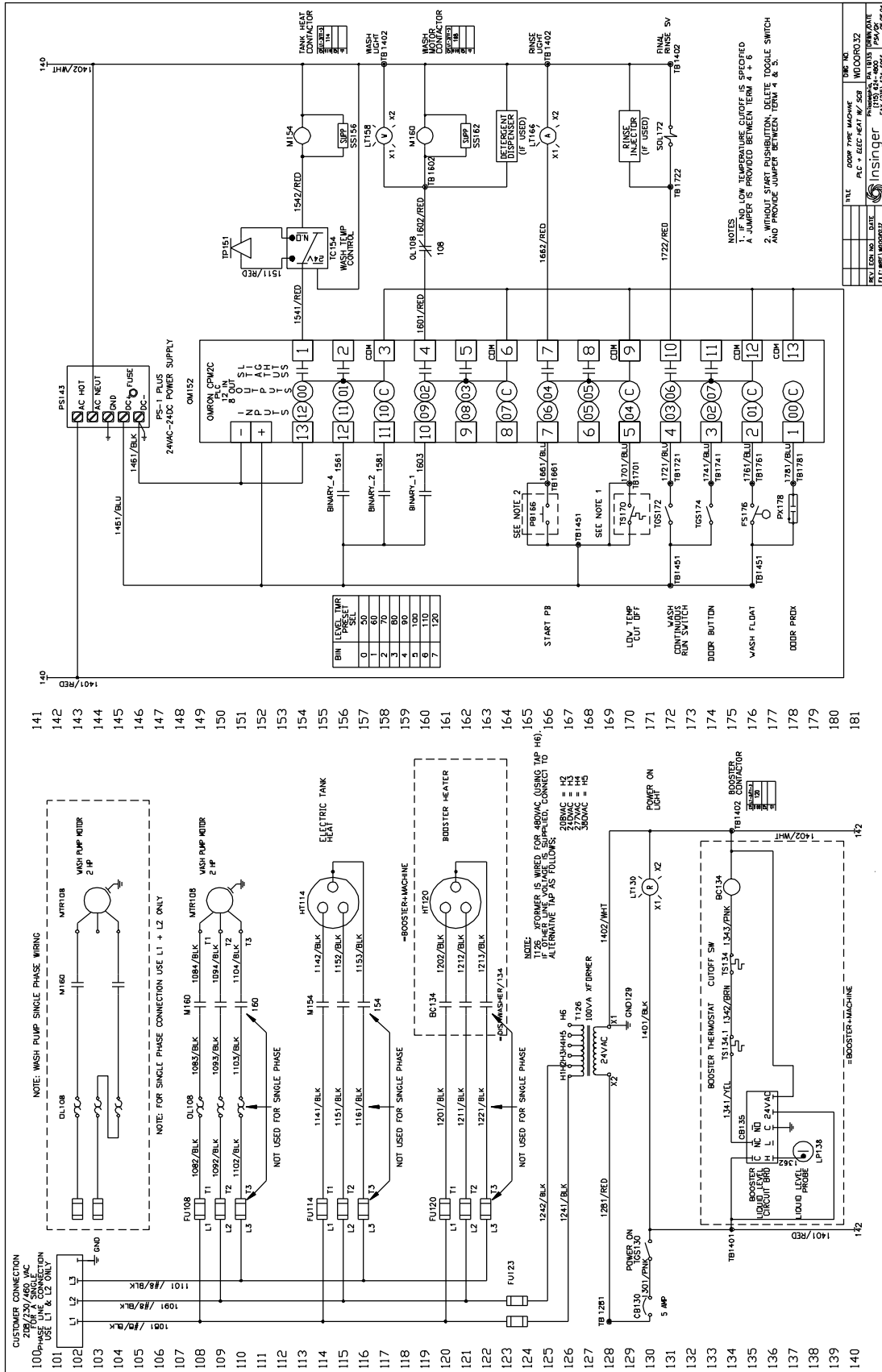
| | | | | | | |
|-----------------------|------|---------|--|---------------------------------|----------|-----------|
| M | 1898 | 9.28.01 | TITLE | DOOR TYPE MACHINE STEAM HEAT | DWG. NO. | WDOOR010 |
| L | 1619 | 8.1.98 | REV | ECN NO | DATE | DRWN/DATE |
| | | | | | | RAF |
| FILE: WIRE \ WDOOR010 | | | Philadelphia, PA 19135 (215) 624-4800 FAX (215) 624-6966 | | 4.11.95 | |



| | | | | | | |
|---------------------|--------|---------|----------|-------------------|------------------------|-----------|
| M | 1988 | 7.7.03 | TITLE | DOOR TYPE MACHINE | DWG. NO. | WDDOOR20 |
| L | 1898 | 9.28.01 | | ELECTRIC HEAT | | |
| REV | ECN NO | DATE | Insinger | | Philadelphia, PA 19135 | DRWN/DATE |
| FILE: WIRE\WDDOOR20 | | | | | (215) 624-4800 | RAF |
| | | | | | FAX (215) 624-6966 | 04.12.95 |







NOTES
1. IF A LOW TEMPERATURE CUTOFF IS SPECIFIED AND A JUMPER IS PROVIDED BETWEEN TERM 4 + 6 WITHOUT START PUSHBUTTON, DELETE TOGGLE SWITCH AND PROVIDE JUMPER BETWEEN TERM 4 & 5.

| REV. | NO. | DATE | BY | CHKD. | DESCRIPTION |
|------|-----|------|----|-------|-----------------------|
| 1 | 1 | | | | ISSUED FOR PRODUCTION |

INSINGER
FALLON, NV 89411-1099

| ITEM | DESCRIPTION | PART NO. | QTY | ITEM | DESCRIPTION | PART NO. | QTY | ITEM | DESCRIPTION | PART NO. | QTY |
|------|---------------------------|----------|-----|------|-----------------------------------|-------------|-----|------|-----------------------------------|----------|-----|
| 19 | DATA DECAL | SK-3715 | 1 | 31 | GROUNDING STUD, 1/4-20 | D309C-GC-4G | 1 | 39 | FUSE (W/ 3 PH SCB) 6 KW TANK HEAT | DE9-193 | 3 |
| 20 | TIMER (LIQUID LEVEL) | DE7-35 | 1 | 32 | LOCK WASHER, 1/4 | D313C-G5 | 1 | | KTK-R-10 | DE9-194 | |
| 21 | TERMINAL BLOCK ASSY | DE3-9 | 1 | 33 | HEX NUT, 1/4-20 | D312C-GC-2 | 1 | | KTK-R-15 | DE9-195 | |
| 22 | TERMINAL BLOCK ASSY | DE3-3 | 1 | 34 | CONTROL BOX | 1089-194 | 1 | | KTK-R-20 | DE9-195 | |
| | 208-460 V, 3 PHASE | DE3-3 | | 35 | CONTROL BOX COVER | 1089-193 | 1 | | KTK-R-20 | DE9-185 | 1 |
| | 220 SINGLE PHASE | DE3-3 | | 36 | GASKET | 9007-001 | 1 | | KTK-R-20 | DE9-185 | 1 |
| 23 | DECAL - PUSHBUTTON START | SK-4502 | 1 | 37 | NUT | D312C-EF-5 | 4 | 40 | FUSE BLOCK, 2 POLE (W/ 1 PH SCB) | DE9-195 | 2 |
| | DECAL - NO PB START (REF) | SK-3662 | | 38 | FUSE BLOCK, 3 POLE (W/ 3 PH SCB) | DE9-186 | 1 | 41 | FUSE (W/ 1 PH SCB) 3 KW TANK HEAT | DE9-195 | 2 |
| 24 | SWITCH, DPDT (POWER ON) | DE5-11 | 1 | 39 | FUSE (W/ 3 PH SCB) 3 KW TANK HEAT | DE9-192 | 3 | | KTK-R-6 | DE9-207 | 2 |
| 25 | PILOT LIGHT (RED) | DE9-107 | 1 | | 460 V | DE9-192 | | | KTK-R-6 | DE9-207 | |
| 26 | PILOT LIGHT (WHITE) | DE9-108 | 1 | | 380 V | DE9-192 | | | KTK-R-25 | DE9-189 | 2 |
| 27 | PILOT LIGHT (AMBER) | DE9-109 | 1 | | 230 V | DE9-193 | | | KTK-R-30 | DE2-60 | 1 |
| 28 | CIRCUIT BREAKER (SA) | DE5-43 | 1 | | 208V | DE9-194 | | 42 | OVERLOAD BASE | DE9-22 | 1 |
| 29 | SWITCH (AUTO - MANUAL) | DE5-11 | 1 | | FUSE (W/ 3 PH SCB) 5 KW TANK HEAT | DE9-194 | 3 | | DE9-22 | SK-4513 | 1 |
| 30 | BOOT | DE9-13 | AR | | 460 V | DE9-193 | | | SK-4513 | | |
| | | | | | 380 V | DE9-193 | | | | | |
| | | | | | 230 V | DE9-194 | | | | | |
| | | | | | 208V | DE9-195 | | | | | |

| ITEM | DESCRIPTION | PART NO. | QTY |
|------|-----------------------------------|----------|-----|
| 39 | FUSE (W/ 3 PH SCB) 6 KW TANK HEAT | DE9-193 | 3 |
| 40 | FUSE BLOCK, 2 POLE (W/ 1 PH SCB) | DE9-195 | 2 |
| 41 | FUSE (W/ 1 PH SCB) 3 KW TANK HEAT | DE9-195 | 2 |
| 42 | OVERLOAD BASE | DE9-22 | 1 |
| 43 | SWITCH, SPDT | SK-4513 | 1 |
| 44 | LABEL, SELECTOR SWITCH | SK-4513 | 1 |

NOT SHOWN

| ITEM | DESCRIPTION | PART NO. | QTY |
|--------------------------|---------------------------|-----------|-----|
| 3 | 3 KW | DE13-SC73 | 5 |
| 5 | 5 KW | DE13-SD73 | 1 |
| 3 KW | ELECTRIC IMMERSION HEATER | 440-480/3 | 1 |
| 380/3 | | DE13-SC53 | 1 |
| 220-240/3 | | DE13-SC43 | 1 |
| 240/1 | | DE13-SC41 | 1 |
| 220/1 | | DE13-SC31 | 1 |
| 208/3 | | DE13-SC23 | 1 |
| 208/1 | | DE13-SC21 | 1 |
| TEMPERATURE SENSOR | | DE9-252 | 1 |
| START PUSHBUTTON STATION | | DE9-76 | 1 |
| BRACKET, PUSHBUTTON | | 1434-10 | 1 |

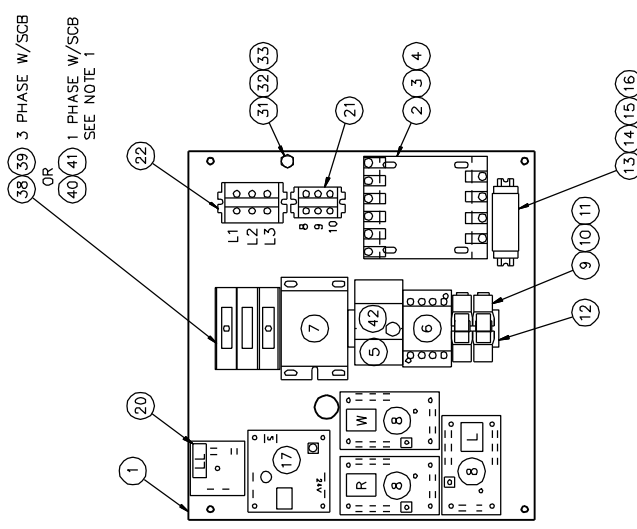
SHEET 2 OF 2

18-5
CONTROL PANEL LAYOUT

Insinger
Philadelphia, PA 19135 DRWN/DATE
(215) 674-4600 MFJ 5.24.95
FAX (215) 624-6966
FILE: SKEETCH LSR-3490

| | | |
|-------|----------|---------|
| SCALE | DWG. NO. | |
| 1"=4" | SK-3490 | |
| REV | ECN NO | DATE |
| X | 2024 | 12.1.04 |
| W | 1945 | 7.17.02 |

| ITEM | DESCRIPTION | PART NO. | QTY | ITEM | DESCRIPTION | PART NO. | QTY | ITEM | DESCRIPTION | PART NO. | QTY |
|------|---------------------------|----------|-----|------|---------------------------------|----------|-----|------|---|----------|-----|
| 13 | DIN RAIL (15 mm) | DE3-42 | 1 | 8 | TIME DELAY BOARD (WASH & RINSE) | DE7-27 | 3 | 1 | COMPONENT MTG PLATE (13.5 x 12.69) | SK-3749 | 1 |
| 14 | TERMINAL SECTION | DE3-39 | 14 | 9 | RELAY BASE | DE2-37 | 1 | 2 | TRANSFORMER (100 VA, 24 VAC) | DE6-6 | 1 |
| 15 | TERMINAL END COVER PLATE | DE3-40 | 1 | 10 | RELAY | DE2-38 | 1 | | ALL VOLTAGES EXCEPT 120 V | DE6-14 | |
| 16 | TERMINAL END CLAMP | DE3-41 | 2 | 11 | RELAY HOLD DOWN SPRING | DE3-43 | 1 | 3 | FUSE BLOCK KIT (100 VA XFMR) | DE9-163 | 1 |
| 17 | TEMPERATURE CONTROL BOARD | DE9-251 | 1 | 12 | DIN RAIL (35 mm) | DE9-84 | 1 | | FOR DE6-6 | DE9-191 | |
| | | | | | | | | 4 | FUSE (100 VA TRANSFORMER PRIMARY) | DE9-166 | 2 |
| | | | | | | | | | 460 V FNO-R-.75 | DE9-166 | |
| | | | | | | | | | 380 V FNO-R-.75 | DE9-166 | |
| | | | | | | | | | 220 - 230 V FNO-R-1.4 | DE9-168 | |
| | | | | | | | | | 208 V FNO-R-1.5 | DE9-200 | |
| | | | | | | | | | 115 V FNO-R-2.8 | DE9-201 | |
| | | | | | | | | 5 | OVERLOAD RELAY (1 HP PUMP) | DE2-52 | 1 |
| | | | | | | | | | 460/3/60 1.6-2.5 A | DE2-52 | |
| | | | | | | | | | 380/3/50 1.6-2.5 A | DE2-52 | |
| | | | | | | | | | 230/3/60 2.5-4 A | DE2-53 | |
| | | | | | | | | | 220/3/50 2.5-4 A | DE2-53 | |
| | | | | | | | | | 220/1/60 5.5-8 A | DE2-55 | |
| | | | | | | | | | 208/3/60 2.5-4 A | DE2-53 | |
| | | | | | | | | | 115/1/60 12-18 A | DE2-58 | |
| | | | | | | | | | OVERLOAD RELAY (2 HP PUMP) | DE2-53 | 1 |
| | | | | | | | | | 460/3/60 2.5-4 A | DE2-53 | |
| | | | | | | | | | 380/3/50 2.5-4 A | DE2-53 | |
| | | | | | | | | | 230/3/60 4-6 A | DE2-54 | |
| | | | | | | | | | 220/3/50 4-6 A | DE2-54 | |
| | | | | | | | | | 220/1/60 9-13 A | DE2-57 | |
| | | | | | | | | | 208/3/60 5.5-8 A | DE2-55 | |
| | | | | | | | | | 115/1/60 16-24 A | DE2-61 | |
| | | | | | | | | 6 | CONTACTOR (PUMP) SP4 | DE1-93 | 1 |
| | | | | | | | | | CONTACTOR (ELECT TANK HEAT, 3, 5 OR 6 KW) | DE1-109 | 1 |
| | | | | | | | | | 30 A RES | DE1-109 | |
| | | | | | | | | | ALL 3 PHASE | DE1-109 | |
| | | | | | | | | | ALL 220-240 V, 1 PH | DE1-109 | |
| | | | | | | | | | 3 KW 30 A RES | DE1-109 | |
| | | | | | | | | | 115-120 V, 1 PH | DE1-110 | |
| | | | | | | | | | 5 KW 50 A RES | DE1-110 | |
| | | | | | | | | | 6 KW 65 A RES | DE1-111 | |



NOTES:
1. A FUSE BLOCK FOR TANK HEATERS (ITEM 38 OR 40) IS USED ONLY WHEN A SELF-CONTAINED BOOSTER IS PROVIDED.

| | | |
|----------|------------------------|----------------------|
| TITLE | 18-5 | CONTROL PANEL LAYOUT |
| INSINGER | Philadelphia, PA 19135 | DRWN/DATE |
| | (215) 674-4800 | MFJ 5.24.95 |
| | FAX: (215) 624-8866 | |
| | FILE: SRETOR\SR-3490 | |
| | SCALE | DWG. NO. |
| X 1024 | 7.1.04 | |
| W 1945 | 7.17.02 | |
| REV | ECN NO | DATE |
| | 1=4 | |
| | | SK-3490 |

SHEET 1 OF 2

| ITEM | DESCRIPTION | PART NO. | QTY | ITEM | DESCRIPTION | PART NO. | QTY | ITEM | DESCRIPTION | PART NO. | QTY |
|------|---------------------------|----------|-----|------|---|---------------|-----|------|--|--|-----|
| 13 | DIN RAIL (15 mm) | DE3-42 | 1 | 8 | FUSE BLOCK, 3 POLE (LITTELFUSE) | L60060C-3C | 1 | 1 | COMPONENT MTC PLATE (13.5 x 12.69) | SK-3749 | 1 |
| 14 | TERMINAL SECTION | DE3-39 | 14 | 9 | FUSE (W/ 3 PH SCB) FOR 1.35 KW BOOSTER HEATER | | 3 | 2 | TRANSFORMER (100 VA, 24 VAC) ALL VOLTAGES EXCEPT 120 V 120 V | DE6-6 DE6-14 | 1 |
| 15 | TERMINAL END COVER PLATE | DE3-40 | 1 | 10 | OMRON PLC | CPM2C-20CDR-D | 1 | 3 | FUSE BLOCK KIT (100 VA XFMR) FOR DE6-6 FOR DE6-14 | DE9-163 DE9-191 | 1 |
| 16 | TERMINAL END CLAMP | DE3-41 | 2 | 11 | DCPS 24VDC POWER SUPPLY | DCPS | 1 | 4 | FUSE (100 VA TRANSFORMER PRIMARY) | DE9-166 DE9-166 DE9-168 DE9-200 | 2 |
| 17 | TEMPERATURE CONTROL BOARD | DE9-251 | 1 | 12 | DIN RAIL (.35 mm) | DE9-84 | 1 | 5 | OVERLOAD RELAY (1 HP PUMP) | DE9-201 | 1 |
| 18 | LEVEL TMR PRESET SELECT | 75-1 | 1 | | | | | | | | |

| ITEM | DESCRIPTION | PART NO. | QTY |
|------|---|----------|-----|
| 1 | 3 PHASE FUSE BLOCKS | | 1 |
| 2 | 3 PHASE 208-240VAC | | 1 |
| 3 | 3 PHASE 380-460VAC | | 1 |
| 4 | SINGLE PHASE FUSE BLOCKS | | 1 |
| 5 | 1 PHASE 208-240VAC | | 1 |
| 6 | CONTACTOR (PUMP) SP4 | | 1 |
| 7 | CONTACTOR (ELECT TANK HEAT, 3, 5 OR 6 KW) | | 1 |

3 PHASE FUSE BLOCKS
 OR
 3 PHASE 208-240VAC
 3 PHASE 380-460VAC
 SINGLE PHASE FUSE BLOCKS
 1 PHASE 208-240VAC
 FUI20 FUI14 FUI14
 POWER SUPPLY PS143
 OMRON PLC OM152
 M154 M160
 MAIN TERMINAL BLOCK WIRE NUMBER
 TB 10 1781
 TB 9 1761
 TB 8 1741
 TB 7 1721
 TB 6 1701
 TB 5 1661
 TB 4 1451
 TB 3 1401
 TB 2 1402
 TB 1 1281
 CHEMICAL DISPENSE CONNECTION
 WIRE NUMBER/FUNCTION
 TB 1A 1602 DETERGENT
 TB 2A 1402 RINSE LIGHT
 TB 3A 1281 RINSE INJECTOR
 DETERGENT DISPENSE TO TERMINALS 1A AND 2
 RINSE INJECTOR TO TERMINALS 3A AND 2

SHEET 1 OF 2

| | | | |
|----------|--------|---|---------------------------|
| TITLE | | 18-5 FLC CONTROL CONTROL PANEL LAYOUT | |
| Insinger | | Philadelphia, PA 19135 DRWN/DATE (215) 624-4800 PSA 06.04.04 FAX (215) 624-6966 FILE: SKETCH SK-4674 | |
| REV | ECN NO | DATE | |
| | | | SCALE 1=4 DWG. NO SK-4674 |

| ITEM | DESCRIPTION | PART NO. | QTY | ITEM | DESCRIPTION | PART NO. | QTY | ITEM | DESCRIPTION | PART NO. | QTY |
|------|---------------------------|----------|-----|------|-----------------------------------|-------------|-----|------|---|-------------|-----|
| 19 | DATA DECAL | SK-3715 | 1 | 31 | GROUNDING STUD, 1/4-20 | D309C-GC-4G | 1 | 39 | FUSE (W/ 3 PH SCB) 6 KW TANK HEAT | DE9-193 | 3 |
| 20 | TIMER (LIQUID LEVEL) | DE7-35 | 1 | 32 | LOCKWASHER, 1/4 | D313C-G5 | 1 | | 460 V | KTK-R-10 | |
| 21 | TERMINAL BLOCK ASSY | DE3-9 | 1 | 33 | HEX NUT, 1/4-20 | D312C-GC-2 | 1 | | 380 V | KTK-R-15 | |
| 22 | TERMINAL BLOCK ASSY | DE3-9 | 1 | 34 | CONTROL BOX | 1089-194 | 1 | | 230 V | KTK-R-20 | |
| | 208-460 V, 3 PHASE | DE3-3 | 1 | 35 | CONTROL BOX COVER | 1089-193 | 1 | | 208V | KTK-R-20 | |
| | 220 SINGLE PHASE | DE3-3 | 1 | 36 | GASKET | 9007-001 | 1 | 40 | FUSE BLOCK, 2 POLE (W/ 1 PH SCB) | DE9-185 | 1 |
| | 220 SINGLE PHASE W/SCB | DE3-154 | 1 | 37 | NUT | D312C-EF-5 | 4 | 41 | FUSE (W/ 1 PH SCB) 3 KW TANK HEAT | DE9-195 | 2 |
| 23 | DECAL - PUSHBUTTON START | SK-4502 | 1 | 38 | FUSE BLOCK, 3 POLE (W/ 3 PH SCB) | DE9-186 | 1 | | 220 V | KTK-R-20 | |
| | DECAL - NO PB START (REF) | SK-3862 | 1 | 39 | FUSE (W/ 3 PH SCB) 3 KW TANK HEAT | DE9-192 | 3 | | 220 V | KTK-R-25 | |
| 24 | SWITCH, DPDT (POWER ON) | DE5-11 | 1 | | 460 V | DE9-192 | | | 220 V | KTK-R-30 | |
| 25 | PILOT LIGHT (RED) | DE9-107 | 1 | | 380 V | DE9-192 | | 42 | OVERLOAD BASE | DE9-189 | 1 |
| 26 | PILOT LIGHT (WHITE) | DE9-108 | 1 | | 230 V | DE9-193 | | | DE2-60 | DE2-63 | 1 |
| 27 | PILOT LIGHT (AMBER) | DE9-109 | 1 | | 208V | DE9-194 | | 43 | SWITCH, SPDT | DE5-22 | 1 |
| 28 | CIRCUIT BREAKER (5A) | DE9-43 | 1 | | FUSE (W/ 3 PH SCB) 5 KW TANK HEAT | DE9-194 | 3 | 44 | LABEL, SELECTOR SWITCH | SK-4513 | 1 |
| 29 | SWITCH (AUTO - MANUAL) | DE5-11 | 1 | | 460 V | DE9-193 | | 45 | DIGITAL TEMPERATURE METER | K37L-TA18-C | 1 |
| 30 | BOOT | DE9-13 | AR | | 380 V | DE9-194 | | 46 | FUSE (W/ 3 PH SCB) 2HP WASH PUMP | DE9-192 | 3 |
| | | | | | 230 V | DE9-195 | | | 460 V | KTK-R-6 | |
| | | | | | 208V | DE9-195 | | | 380 V | KTK-R-6 | |
| | | | | | | | | | 230 V | KTK-R-10 | |
| | | | | | | | | | 208V | KTK-R-10 | |
| | | | | | | | | | FUSE (W/ 1 PH SCB) 2 HP WASH PUMP | DE9-195 | 2 |
| | | | | | | | | | 208-230 V | KTK-R-20 | |
| | | | | | | | | | FUSE BLOCK, 2 POLE (LITTELFUSE) | L60060C-2C | 1 |
| | | | | | | | | | FUSE (W/ 1 PH SCB) FOR 13.5 KW BOOSTER HEATER | CCMR 50 | 2 |
| | | | | | | | | | 230 V | CCMR 60 | |
| | | | | | | | | | 208V | | |

| ITEM | DESCRIPTION | PART NO. | QTY |
|------|-----------------------------------|-------------|-----|
| 31 | GROUNDING STUD, 1/4-20 | D309C-GC-4G | 1 |
| 32 | LOCKWASHER, 1/4 | D313C-G5 | 1 |
| 33 | HEX NUT, 1/4-20 | D312C-GC-2 | 1 |
| 34 | CONTROL BOX | 1089-194 | 1 |
| 35 | CONTROL BOX COVER | 1089-193 | 1 |
| 36 | GASKET | 9007-001 | 1 |
| 37 | NUT | D312C-EF-5 | 4 |
| 38 | FUSE BLOCK, 3 POLE (W/ 3 PH SCB) | DE9-186 | 1 |
| 39 | FUSE (W/ 3 PH SCB) 3 KW TANK HEAT | DE9-192 | 3 |
| | 460 V | DE9-192 | |
| | 380 V | DE9-192 | |
| | 230 V | DE9-193 | |
| | 208V | DE9-194 | |
| | FUSE (W/ 3 PH SCB) 5 KW TANK HEAT | DE9-193 | 3 |
| | 460 V | DE9-193 | |
| | 380 V | DE9-193 | |
| | 230 V | DE9-194 | |
| | 208V | DE9-195 | |

| ITEM | DESCRIPTION | PART NO. | QTY |
|------|---|-------------|-----|
| 40 | FUSE BLOCK, 2 POLE (W/ 1 PH SCB) | DE9-185 | 1 |
| 41 | FUSE (W/ 1 PH SCB) 3 KW TANK HEAT | DE9-195 | 2 |
| | 220 V | DE9-195 | |
| | 220 V | DE9-207 | |
| | FUSE (W/ 1 PH SCB) 5 KW TANK HEAT | DE9-189 | 2 |
| | 460 V | DE9-189 | |
| | 380 V | DE2-60 | |
| | 230 V | DE2-63 | |
| | 208V | DE5-22 | |
| | OVERLOAD BASE | SK-4513 | 1 |
| | OVERLOAD BASE (DE2-61 ONLY) | K37L-TA18-C | 1 |
| | SWITCH, SPDT | DE9-192 | 3 |
| | LABEL, SELECTOR SWITCH | DE9-192 | |
| | DIGITAL TEMPERATURE METER | DE9-192 | |
| | FUSE (W/ 3 PH SCB) 2HP WASH PUMP | DE9-192 | |
| | 460 V | DE9-192 | |
| | 380 V | DE9-192 | |
| | 230 V | DE9-193 | |
| | 208V | DE9-193 | |
| | FUSE (W/ 1 PH SCB) 2 HP WASH PUMP | DE9-195 | 2 |
| | 208-230 V | DE9-195 | |
| | FUSE BLOCK, 2 POLE (LITTELFUSE) | DE9-195 | |
| | FUSE (W/ 1 PH SCB) FOR 13.5 KW BOOSTER HEATER | L60060C-2C | 1 |
| | 230 V | L60060C-2C | |
| | 208V | CCMR 50 | |
| | | CCMR 60 | |

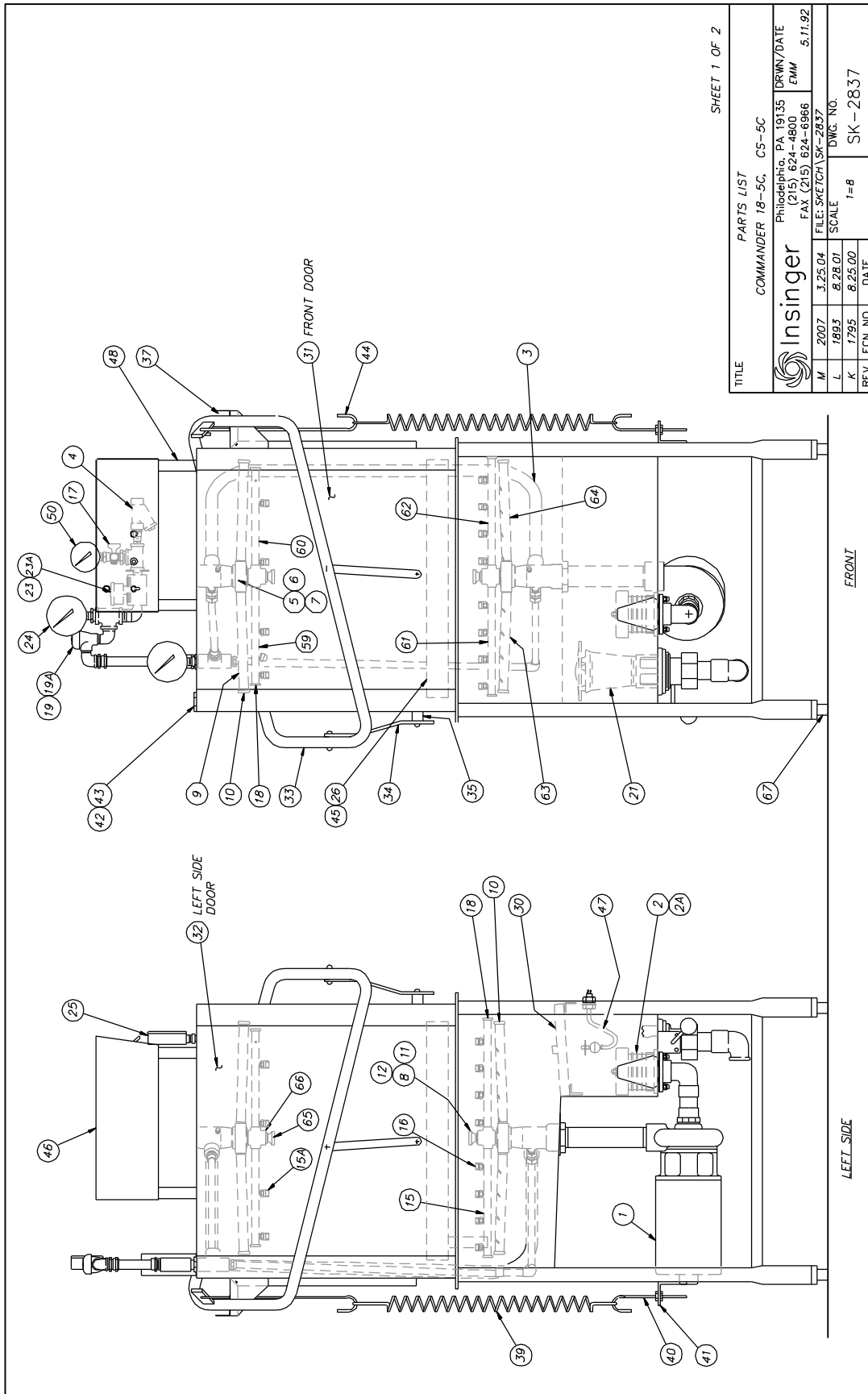
NOT SHOWN

| ITEM | DESCRIPTION | PART NO. | QTY |
|------|---|-------------|-----|
| 43 | SWITCH, SPDT | DE9-193 | 1 |
| 44 | LABEL, SELECTOR SWITCH | SK-4513 | 1 |
| 45 | DIGITAL TEMPERATURE METER | K37L-TA18-C | 1 |
| | FUSE (W/ 3 PH SCB) 2HP WASH PUMP | DE9-192 | 3 |
| | 460 V | DE9-192 | |
| | 380 V | DE9-192 | |
| | 230 V | DE9-193 | |
| | 208V | DE9-193 | |
| | FUSE (W/ 1 PH SCB) 2 HP WASH PUMP | DE9-195 | 2 |
| | 208-230 V | DE9-195 | |
| | FUSE BLOCK, 2 POLE (LITTELFUSE) | DE9-195 | |
| | FUSE (W/ 1 PH SCB) FOR 13.5 KW BOOSTER HEATER | L60060C-2C | 1 |
| | 230 V | L60060C-2C | |
| | 208V | CCMR 50 | |
| | | CCMR 60 | |

| ITEM | DESCRIPTION | PART NO. | QTY |
|------|---|------------|-----|
| 46 | FUSE (W/ 3 PH SCB) 2HP WASH PUMP | DE9-192 | 3 |
| | 460 V | DE9-192 | |
| | 380 V | DE9-192 | |
| | 230 V | DE9-193 | |
| | 208V | DE9-193 | |
| | FUSE (W/ 1 PH SCB) 2 HP WASH PUMP | DE9-195 | 2 |
| | 208-230 V | DE9-195 | |
| | FUSE BLOCK, 2 POLE (LITTELFUSE) | DE9-195 | |
| | FUSE (W/ 1 PH SCB) FOR 13.5 KW BOOSTER HEATER | L60060C-2C | 1 |
| | 230 V | L60060C-2C | |
| | 208V | CCMR 50 | |
| | | CCMR 60 | |

| ITEM | DESCRIPTION | PART NO. | QTY |
|------|---|------------|-----|
| 47 | FUSE (W/ 1 PH SCB) 2 HP WASH PUMP | DE9-195 | 2 |
| | 208-230 V | DE9-195 | |
| 48 | FUSE BLOCK, 2 POLE (LITTELFUSE) | L60060C-2C | 1 |
| 49 | FUSE (W/ 1 PH SCB) FOR 13.5 KW BOOSTER HEATER | L60060C-2C | 2 |
| | 230 V | L60060C-2C | |
| | 208V | CCMR 50 | |
| | | CCMR 60 | |

| ITEM | DESCRIPTION | PART NO. | QTY |
|------|----------------------|----------|-----|
| 50 | DATA DECAL | SK-3715 | 1 |
| 51 | TIMER (LIQUID LEVEL) | DE7-35 | 1 |
| 52 | TERMINAL BLOCK ASSY | DE3-9 | 1 |
| 53 | TERMINAL BLOCK ASSY | DE3-9 | 1 |
| 54 | TERMINAL BLOCK ASSY | DE3-9 | 1 |
| 55 | TERMINAL BLOCK ASSY | DE3-9 | 1 |
| 56 | TERMINAL BLOCK ASSY | DE3-9 | 1 |
| 57 | TERMINAL BLOCK ASSY | DE3-9 | 1 |
| 58 | TERMINAL BLOCK ASSY | DE3-9 | 1 |
| 59 | TERMINAL BLOCK ASSY | DE3-9 | 1 |
| 60 | TERMINAL BLOCK ASSY | DE3-9 | 1 |
| 61 | TERMINAL BLOCK ASSY | DE3-9 | 1 |
| 62 | TERMINAL BLOCK ASSY | DE3-9 | 1 |
| 63 | TERMINAL BLOCK ASSY | DE3-9 | 1 |
| 64 | TERMINAL BLOCK ASSY | DE3-9 | 1 |
| 65 | TERMINAL BLOCK ASSY | DE3-9 | 1 |
| 66 | TERMINAL BLOCK ASSY | DE3-9 | 1 |
| 67 | TERMINAL BLOCK ASSY | DE3-9 | 1 |
| 68 | TERMINAL BLOCK ASSY | DE3-9 | 1 |
| 69 | TERMINAL BLOCK ASSY | DE3-9 | 1 |
| 70 | TERMINAL BLOCK ASSY | DE3-9 | 1 |
| 71 | TERMINAL BLOCK ASSY | DE3-9 | 1 |
| 72 | TERMINAL BLOCK ASSY | DE3-9 | 1 |
| 73 | TERMINAL BLOCK ASSY | DE3-9 | 1 |
| 74 | TERMINAL BLOCK ASSY | DE3-9 | 1 |
| 75 | TERMINAL BLOCK ASSY | DE3-9 | 1 |
| 76 | TERMINAL BLOCK ASSY | DE3-9 | 1 |
| 77 | TERMINAL BLOCK ASSY | DE3-9 | 1 |
| 78 | TERMINAL BLOCK ASSY | DE3-9 | 1 |
| 79 | TERMINAL BLOCK ASSY | DE3-9 | 1 |
| 80 | TERMINAL BLOCK ASSY | DE3-9 | 1 |
| 81 | TERMINAL BLOCK ASSY | DE3-9 | 1 |
| 82 | TERMINAL BLOCK ASSY | DE3-9 | 1 |
| 83 | TERMINAL BLOCK ASSY | DE3-9 | 1 |
| 84 | TERMINAL BLOCK ASSY | DE3-9 | 1 |
| 85 | TERMINAL BLOCK ASSY | DE3-9 | 1 |
| 86 | TERMINAL BLOCK ASSY | DE3-9 | 1 |
| 87 | TERMINAL BLOCK ASSY | DE3-9 | 1 |
| 88 | TERMINAL BLOCK ASSY | DE3-9 | 1 |
| 89 | TERMINAL BLOCK ASSY | DE3-9 | 1 |
| 90 | TERMINAL BLOCK ASSY | DE3-9 | 1 |
| 91 | TERMINAL BLOCK ASSY | DE3-9 | 1 |
| 92 | TERMINAL BLOCK ASSY | DE3-9 | 1 |
| 93 | TERMINAL BLOCK ASSY | DE3-9 | 1 |
| 94 | TERMINAL BLOCK ASSY | DE3-9 | 1 |
| 95 | TERMINAL BLOCK ASSY | DE3-9 | 1 |
| 96 | TERMINAL BLOCK ASSY | DE3-9 | 1 |
| 97 | TERMINAL BLOCK ASSY | DE3-9 | 1 |
| 98 | TERMINAL BLOCK ASSY | DE3-9 | 1 |
| 99 | TERMINAL BLOCK ASSY | DE3-9 | 1 |
| 100 | TERMINAL BLOCK ASSY | DE3-9 | 1 |




SHEET 1 OF 2

| | | | |
|------------------------|--|-----------------------|--|
| TITLE | | PARTS LIST | |
| COMMANDER 18-5C, CS-5C | | Phitolephio, PA 19135 | |
| Insinger | | (215) 624-4800 | |
| M 2007 3.25.04 | | FILE: SKETCH\SK-2837 | |
| L 1893 8.28.01 | | SCALE | |
| K 1795 8.25.00 | | DWG. NO. | |
| REV EGM. NO. | | 1=B SK-2837 | |
| DATE | | | |

| ITEM | MACHINE | PART No. | DESCRIPTION | REQ. |
|------|--|-------------------------------------|--|------|
| 1 | 18-5, CS-5 18-5H, CS-5H | 1089-19 1089-19A | PUMP & MOTOR ASS'Y (1 H.P. - SPECIFY VOLTAGE) PUMP & MOTOR ASS'Y (2 H.P. - SPECIFY VOLTAGE) | 1 |
| 2 | | | | |
| 3 | | D2483A | "Y" STRAINER, 1/2 | 1 |
| 4 | | 1084-76 | SPRAY HUB - WASH | 2 |
| 5 | | D2-563 | O-RING | 2 |
| 6 | | 952-27 | BUSHING, PLASTIC (WASH ARM HUB) | 2 |
| 7 | | 1089-178 | BUSHING, PLASTIC (RINSE ARM HUB) | 1 |
| 8 | | 1463-29 | SUPPORT ASS'Y UPPER HUB | 1 |
| 9 | | D2-554-2 | PLUG, 3/4-10 UNC-2A (WASH ARM) | 4 |
| 10 | | D2-584 | LOCKING SCREW | 1 |
| 11 | | 1084-22 | HUB-LOWER RINSE ARM | 1 |
| 12 | | - | - | 1 |
| 13 | | 1434-9 | LOWER SPRAY PIPE ASS'Y. - RINSE | 1 |
| 14 | | 1434-8 | UPPER SPRAY PIPE ASS'Y. - RINSE | 1 |
| 15 | | D2867 | SPRAY NOZZLE - UPPER & LOWER RINSE ARM | 12 |
| 16 | | 1434-5 | UPPER WASH PIPE | 2 |
| 17 | | D2497 | PETCOCK | 1 |
| 18 | | D2-554-1 | PLUG, 9/16-12 UNC-2A | 4 |
| 19 | | D2241A | VACUUM BREAKER, 1/2 | 1 |
| 20 | | D2914RK | VACUUM BREAKER REPAIR KIT | 1 |
| 21 | | 1463-18 | FINAL RINSE ASSEMBLY (W/ PARTS LIST) | 1 |
| 22 | | SK-3028 | DRAIN ASSEMBLY (W/PARTS LIST) | 1 |
| 23 | | D2606 | SOLENOID VALVE, 1/2 | 1 |
| 24 | | D2641 | SOLENOID VALVE REPAIR KIT | 1 |
| 25 | | D2495 | THERMOMETER - FINAL RINSE | 1 |
| 26 | | D2390 | THERMOMETER | 1 |
| 27 | | 1084-14A | TRACK ASS'Y | 2 |
| 28 | | D2-541 | SUCTION STRAINER | 1 |
| 29 | | 1089-10 | SCRAP SCREEN | 1 |
| 30 | 18-5, CS-5 18-5H, CS-5H 18-5HC, CS-5HC | 1089-208B 1089-208G 1089-208K | DOOR - RIGHT SIDE | 1 |
| 31 | 18-5, CS-5 18-5H, CS-5H 18-5HC, CS-5HC | 1089-208A 1089-208F 1089-208J | DOOR - LEFT SIDE | 1 |
| 32 | 18-5, CS-5 18-5H, CS-5H 18-5HC, CS-5HC | 1084-25 1463-9 1463-9 | DOOR ARM | 1 |
| 33 | 18-5, CS-5 18-5H, CS-5H | 1084-38 1463-8 | LINK, ARM-DOOR | 2 |
| 34 | 18-5, CS-5 18-5H, CS-5H | 957-26 1463-7 | SPACER, DOOR LINK | 2 |
| 35 | | D2245 | GRIP - DOOR HANDLE | 2 |
| 36 | | SK-2294A-001 | SPRING | 2 |
| 37 | 18-5, CS-5 18-5H, CS-5H | 957-27 1463-14 | SPRING EXTENSION - LOWER | 2 |
| 38 | 18-5, CS-5 | 1440-7 | POST - CONTROL BOX | 4 |
| 39 | | DE5-37 | SWITCH, MAGNETIC | 1 |
| 40 | | DE5-37A | MAGNET | 1 |
| 41 | 18-5, CS-5 18-5H, CS-5H 18-5HC, CS-5HC | 1089-208C 1089-208H 1089-208L | DOOR - FRONT | 1 |
| 42 | | D2099 | HANDLE, FRONT DOOR | 1 |
| 43 | | 1089-59 | FRONT DOOR HANGER LATCH | 1 |
| 44 | | SK-3490 | CONTROL BOX ASS'Y | 1 |

PARTS LIST: 18-5, 18-5H, 18-5HC
CS-5, CS-5H, CS-5HC

| | | | | |
|--------------|----------|---------|----------------------------|------------|
| G | 2007 | 3.25/04 | FRACTIONS ±1/64 | TOLERANCES |
| F | 1895 | 9.18/01 | DECIMALS ±1/64 | |
| E | 1795 | 8.25/00 | XXX ± .005 | |
| D | 1781 | 5.3/00 | ANGLES ±1/2° | |
| REV | ECN NO | DATE | UNLESS OTHERWISE SPECIFIED | |
| FILE: SKETCH | SK-99972 | | | |


Insinger
 Philadelphia, PA 19135
 (215) 624-4800
 FAX (215) 624-6966

SHEET 2 OF 3
 NEXT ASSY DWG. NO.
 REQ'D - SK-3897
 SCALE 1=1
 USED ON
 DERN/DATE
 EMM
 5.11.92

| ITEM | MACHINE | PART No. | DESCRIPTION | REQ. |
|------|---------|----------|---------------------------|------|
| 45 | | | | |
| 46 | | | | |
| 47 | | SK-1433 | PRESSURE GAUGE | 1 |
| 48 | | DE5-60 | LIQUID LEVEL FLOAT ASS'Y. | 1 |
| 49 | | 1434-7A | UPPER RINSE PIPE | 1 |
| 50 | | 1434-7B | UPPER RINSE PIPE | 1 |
| 51 | | 1434-7C | LOWER RINSE PIPE | 1 |
| 52 | | 1434-7D | LOWER RINSE PIPE | 1 |
| 53 | | 1089-23A | LOWER WASH PIPE | 1 |
| 54 | | 1089-23B | LOWER WASH PIPE | 1 |
| 55 | | 1463-25 | RINSE HUB-UPPER | 1 |
| 56 | | D2874 | BULLET FOOT | 4 |

PARTS LIST: 18-5, 18-5H, 18-5HC
 CS-5, CS-5H, CS-5HC

| REV | ECN NO | DATE | TOLERANCES |
|-----|--------|---------|---------------------|
| G | 2007 | 3.25.04 | FRACTIONS ±1/64 |
| F | 1803 | 9.18.01 | DECIMALS |
| E | 1793 | 8.23.00 | .XXX ± .005 |
| D | 1761 | 3.3.00 | .XX ± .01 |
| | | | ANGLES ±1/2° |
| | | | OTHERWISE SPECIFIED |

| TITLE | FILE | SCALE | DRWN/DATE |
|------------|---------|-------|-------------|
| PARTS LIST | SK-3897 | 1=1 | EMM 5.11.92 |

SHEET 3 OF 3

| ITEM | PART NO. | DESCRIPTION | QTY. |
|----------|--------------|-------------------------------------|------|
| 40° RISE | 1192-1 | SELF CONTAINED BOOSTER ASSY | 1 |
| 70° RISE | 1463-1 | SELF CONTAINED BOOSTER ASSY | 1 |
| | D2396 | BURNING THERMOSTAT | 1 |
| | D322F-C1-E2 | HEX RED. 3/4 MIPS x 3/8 MIPS | 1 |
| | D2339 | BALL VALVE 1/2 IPS | 1 |
| | D316F-D1-D2 | 90° ST. ELL. 1/2 IPS | 1 |
| | D314F-DC-00 | CLOSE NIPPLE 1/2 IPS | 3 |
| | D2508A | PRESS. REG. & STRAINER 1/2 IPS | 1 |
| | D320F-D1D1D1 | TEE 1/2 IPS | 2 |
| | D328F-20-A | SQUARE HEAD PLUG 1/2 IPS | 2 |
| | | | |
| | D317A-D3-D2 | ADAPTER 1/2 C X 1/2 MIPS | 1 |
| | D316A-D3-D3 | 90° ELL. 1/2 C | 1 |
| | D316A-E1-D3 | 90° ST. ELL. 3/4 MIPS x 1/2 C | 2 |
| 40° RISE | D314F-ES-16 | NIPPLE 3/4 IPS x 2" LG | 1 |
| 70° RISE | D314F-EC-00 | CLOSE NIPPLE 3/4 IPS | 1 |
| | D2693 | TEMP. & PRESS. RELIEF VALVE 3/4 IPS | 1 |
| | D316F-E1-E2 | 90° ST. ELL. 3/4 IPS | 2 |
| 40° RISE | D314F-ES-40 | NIPPLE 3/4 IPS x 5 LG | 1 |
| 70° RISE | D314F-ES-24 | NIPPLE 3/4 IPS x 3 LG | 1 |
| | D319A-D3-D3 | 90° UNION ELL. 1/2 C | 2 |
| | D319A-D3-D2 | 90° UNION ELL. 1/2 MIPS x 1/2 C | 1 |
| | D322F-B1-C2 | HEX RED. 3/8 MIPS x 1/4 MIPS | 1 |
| | D329-5 | DRAIN VALVE 1/4 IPS | 1 |
| 40° RISE | D207A-B4-13 | COPPER TUBING 1/2 CTS X 3 1/4 LG | 1 |
| 70° RISE | D207A-B4-19 | COPPER TUBING 1/2 CTS X 4 3/4 LG | 1 |
| 40° RISE | D207A-B4-XX | COPPER TUBING 1/2 CTS X 5 1/8 LG | 1 |
| 70° RISE | D207A-B4-XX | COPPER TUBING 1/2 CTS X 6 1/8 LG | 1 |
| 40° RISE | D207A-B4-XX | COPPER TUBING 1/2 CTS X 7 7/8 LG | 1 |
| 70° RISE | D207A-B4-XX | COPPER TUBING 1/2 CTS X 8 7/8 LG | 1 |
| 40° RISE | D207A-B4-178 | COPPER TUBING 1/2 CTS X 44 1/2 LG | 1 |
| 70° RISE | D207A-B4-XX | COPPER TUBING 1/2 CTS X 41 11/16 LG | 1 |
| | D207A-B4-XX | COPPER TUBING 1/2 CTS X 2 5/8 LG | 1 |
| | 925-49 | BRACKET | 1 |

| TOLERANCES | 4.28.04 | 4.24.03 | 4.24.03 | 4.24.03 |
|---------------------|---------|---------|---------|---------|
| FRACTIONS ± 1/64 | | | | |
| DECIMALS | | | | |
| XXX ± .005 | | | | |
| UNLESS ± 1/2° | | | | |
| OTHERWISE SPECIFIED | | | | |

| TITLE | SELF-CONTAINED BOOSTER INSTALLATION | NEXT ASSY DWG. NO. |
|-----------------------|-------------------------------------|--------------------|
| REV | | |
| ECON NO | | |
| DATE | | |
| FILE: PARTS \1089-199 | | |

| MATL | SCALE | USED ON |
|------|-------|----------|
| | 1-8 | 1089-199 |
| | 1-8 | 18-5 |

Philadelphia, PA 19135
 (215) 624-4800
 (215) 624-6966
 CES 3.20.96

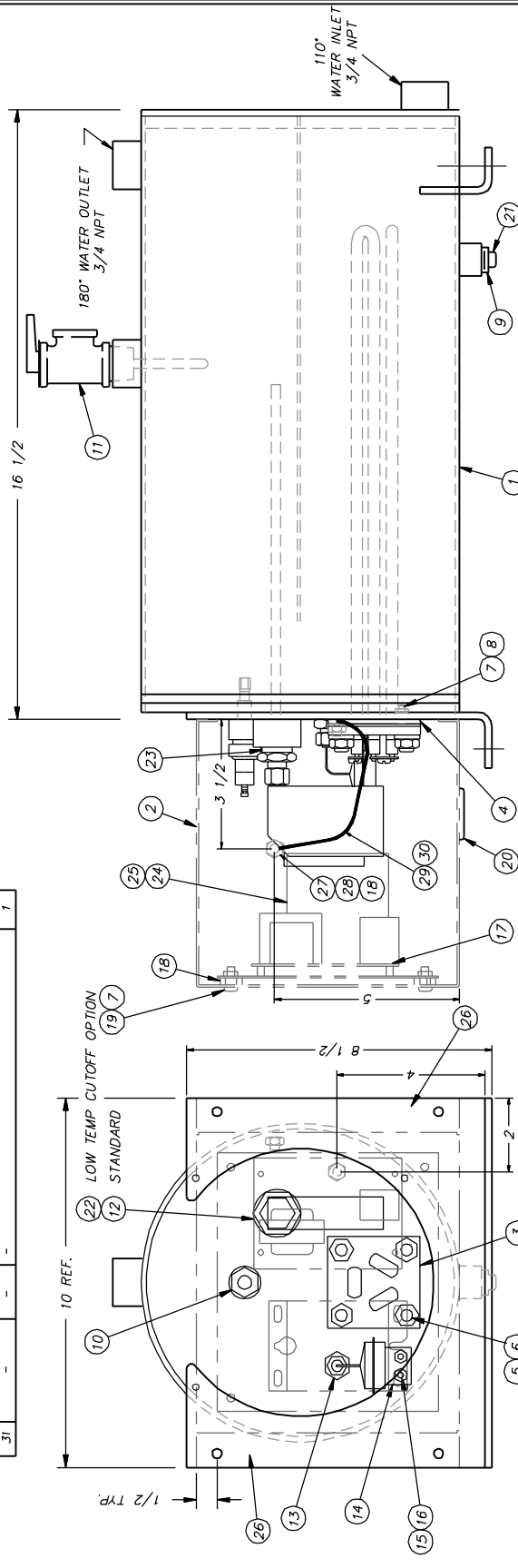
| ITEM | PART NO. | DESCRIPTION | QTY. |
|------|--------------|-------------------------------------|------|
| 1 | 1192-1 | SELF-CONTAINED BOOSTER ASSY. | 1 |
| 2 | 1452-1 | SELF-CONTAINED BOOSTER ASSY. | 1 |
| 3 | D322F-C1-E2 | BURNING THERMOSTAT | 1 |
| 4 | D2339 | HEX RED. 3/4 MIPS x 3/8 RIPS | 1 |
| 5 | D316F-D1-D2 | BALL VALVE 1/2 IPS | 1 |
| 6 | D314F-DC-00 | 90° ST. ELL. 1/2 IPS | 1 |
| 7 | D2308A | CLOSE NIPPLE 1/2 IPS | 3 |
| 8 | D320F-D1D1D1 | PRESS. REG. & STRAINER 1/2 IPS | 1 |
| 9 | D328F-20-A | TEE 1/2 IPS | 2 |
| 10 | D318A-D3-D3 | SQUARE HEAD PLUG 1/2 IPS | 2 |
| 11 | D318F-D2-D3 | UNION 1/2 C X 1/2 C | 1 |
| 12 | D316A-D3-D3 | ST. UNION 1/2 MIPS x 1/2 C | 1 |
| 13 | D316A-D3-E1 | 90° ELL. 1/2 C | 2 |
| 14 | D314F-EC-00 | 90° ST. ELL. 3/4 FIPS x 1/2 C | 2 |
| 15 | D2883 | CLOSE NIPPLE 3/4 IPS | 1 |
| 16 | D316F-E1-E2 | CLOSE NIPPLE 3/4 IPS | 1 |
| 17 | D314F-ES-28 | TEMP. & PRESS. RELIEF VALVE 3/4 IPS | 1 |
| 18 | D314F-ES-16 | 90° ST. ELL. 3/4 IPS | 2 |
| 19 | D319A-D3-D3 | NIPPLE 3/4 IPS x 3 1/2 LG | 1 |
| 20 | D322F-B1-C2 | NIPPLE 3/4 IPS x 2" LG | 1 |
| 21 | D329-5 | 90° UNION ELL. 1/2 C | 1 |
| 22 | D2-7A-B4-13 | 90° UNION ELL. 1/2 C | 1 |
| 23 | D207A-B4-19 | COPPER TUBING 1/2 CTS x 3 1/4" LG | 1 |
| 24 | D207A-B4-66 | COPPER TUBING 1/2 CTS x 4 3/4" LG | 1 |
| 25 | D207A-B4-66 | COPPER TUBING 1/2 CTS x 16 1/2 LG | 1 |
| 26 | D207A-B4-62 | COPPER TUBING 1/2 CTS x 15 1/2 LG | 1 |
| 27 | D207A-B4-6 | COPPER TUBING 1/2 CTS x 2" LG | 1 |
| 28 | D207A-B4-177 | COPPER TUBING 1/2 CTS x 1 1/2 LG | 1 |
| 29 | D207A-B4-167 | COPPER TUBING 1/2 CTS x 4 1/4 LG | 1 |
| 30 | D207A-B4-5 | COPPER TUBING 1/2 CTS x 44 1/4 LG | 1 |
| 31 | D207A-B4-8 | COPPER TUBING 1/2 CTS x 1 1/4" LG | 1 |
| 32 | D207A-B4-8 | COPPER TUBING 1/2 CTS x 2 LG | 1 |
| 33 | 925-49 | SUPPORT BRACKET | 1 |
| 34 | D207A-B4-20 | COPPER TUBING 1/2 CTS x 5 LG | 1 |

| TOLERANCES: | 1978 | 1972 | 1959 | 1634 |
|---------------------|-------------|-----------|----------------------------|----------|
| FRACTIONS ±1/64 | 4.24.03 | 3.17.03 | 2.20.01 | 10.23.98 |
| DECIMALS | .XXX ± .005 | .XX ± .01 | UNLESS OTHERWISE SPECIFIED | |
| ANGLES ±1/2° | | | | |
| DATE | | | | |
| REV | | | | |
| ECN NO. | | | | |
| DATE | | | | |
| FILE:PARTS\1089-203 | | | | |

| TITLE | SELF-CONTAINED BOOSTER ASSEMBLY | NEXT ASSY DWG. NO. | 1089-203 |
|---------------------|---------------------------------|--------------------|----------|
| MATL | NOTED | SCALE | 1"=8" |
| USED ON | | 18-9C | |
| Phidelpo, PA 19135 | | DRWN/DATE | CZS |
| FAX: (215) 624-6866 | | | 8.15.96 |

| NO. | PART NO. | SIZE | DESCRIPTION | QTY. |
|-----|-------------|------|-------------------------------------|------|
| 1 | 04-10883 | B | HUBBELL 1/4 4 GAL. VESSEL ASSEMBLY | 1 |
| 2 | 1192-7 | B | COVER, SATELLITE CONTROL BOX | 1 |
| 3 | SEE TABLE | - | HEATER, IMMERSION | 1 |
| 4 | DE9-136 | A | GASKET, HEATER | 1 |
| 5 | D312C-JC-2 | - | NUT, HEX 3/8-16 UNC-2B | 4 |
| 6 | D313C-J2 | - | LOCKWASHER 3/8 | 4 |
| 7 | D312C-EF-2 | - | NUT, HEX #10-32 UNF-2B | 8 |
| 8 | D313C-E2 | - | LOCKWASHER #10 | 8 |
| 9 | D322F-C2-B1 | - | REDUCER 3/8 MIPX X 1/4 FIPS | 1 |
| 10 | DE9-144 | - | LIQUID LEVEL PROBE | 1 |
| 11 | D2683 | - | TEMP.-PRESSURE RELIEF VALVE 3/4 NPT | 1 |
| 12 | D2396 | - | THERMOSTAT LESS ENCL (STANDARD) | 1 |
| 13 | DE5-61 | - | HI-TEMP. CUT-OFF SWITCH 3/8 NPT | 1 |
| 14 | 1192-11 | A | BRACKET, CUT-OFF SWITCH | 1 |
| 15 | D312C-DC-2 | - | NUT, HEX #8-32 | 3 |

| NO. | PART NO. | SIZE | DESCRIPTION | QTY. |
|-----|-------------|------|---|------|
| 16 | D309C-DC-2G | - | WELD STUD #8-32 X 1/4 LG. | 2 |
| 17 | 1192-13 | B | CONTROL BOARD ASSY | 1 |
| 18 | D312C-GC-2 | - | NUT HEX 1/4-20 | 6 |
| 19 | D309C-EF-4D | - | PAN HD SCREW #10-32 X 1/2 LG | 4 |
| 20 | D2759 | - | SNAP-ON VENT PLUG | 1 |
| 21 | D329-5 | - | DRAIN COCK 1/4 IPS | 1 |
| 22 | D3201 | - | THERMOSTAT LESS ENCL (LOW TEMP CUTOFF OPTION) | 1 |
| 23 | D323F-E2-C1 | - | BUSHING, 3/4 TO 3/8 | 1 |
| 24 | DE1-110 | - | CONTACTOR (ALL 3 PH) 50 A RES | 1 |
| 25 | DE1-111 | - | CONTACTOR (220 V, 1 PH) 65 A RES | 1 |
| 26 | 1452-B | A | CONTROL BOX MOUNTING ANGLES | 2 |
| 27 | D309C-GC-5G | - | GROUNDING STUD, 1/4-20 X 5/8 | 2 |
| 28 | D313C-G5 | - | LOCKWASHER, 1/4, INT TOOTH | 2 |
| 29 | EW137 | - | #8 STR WIRE, 24" LG. | 1 |
| 30 | DE3-151 | - | RING LUG, 88-1/4R | 2 |
| 31 | - | - | - | 1 |



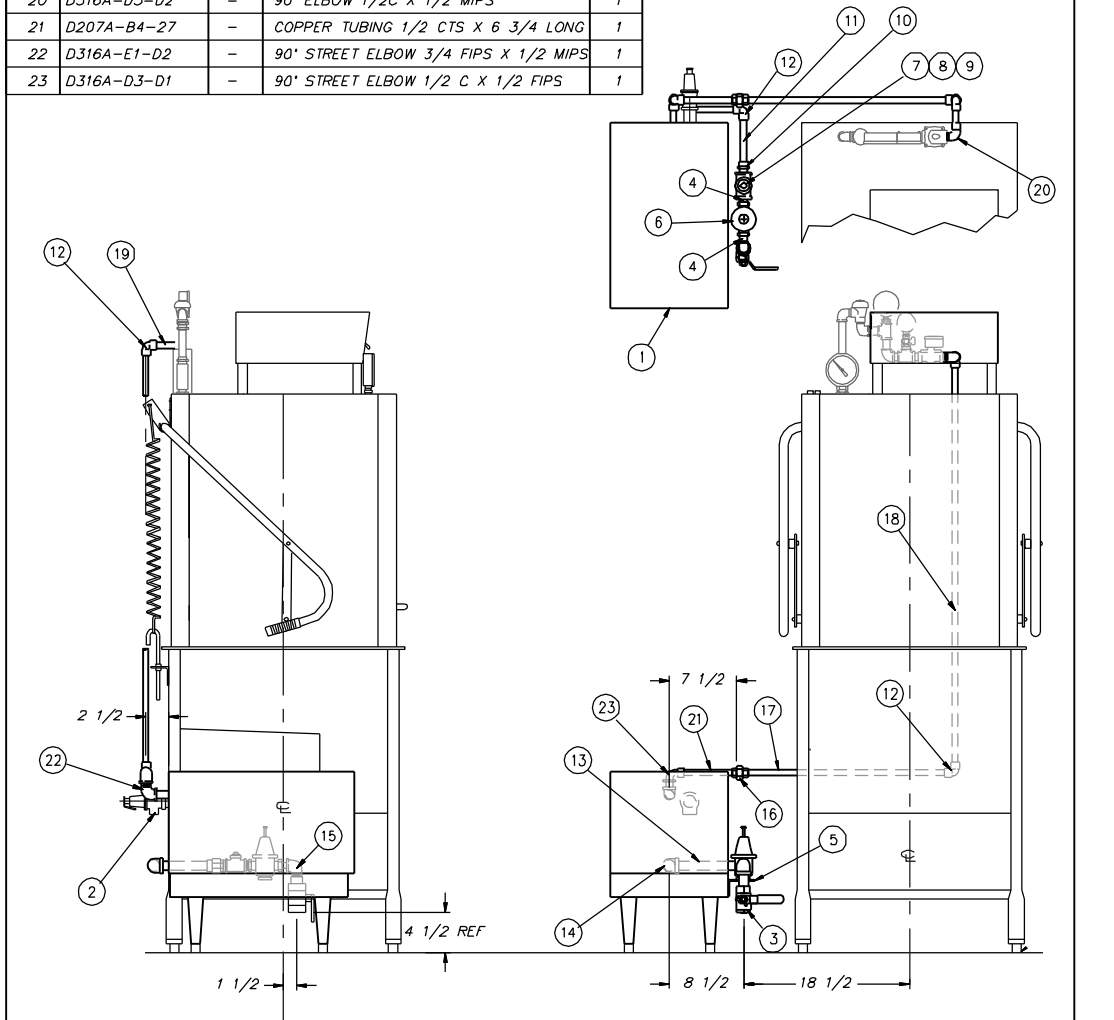
| REV | ECN NO. | DATE | OTHERWISE SPECIFIED |
|-----|---------|---------|---------------------|
| F | 2033 | 3.15.05 | |
| E | 1995 | 9.17.03 | FRACTIONS ±1/64 |
| D | 1758 | 4.28.00 | DIMENSIONS ±.005 |
| C | 1579 | 10.1.97 | XX ±.01 |
| B | 1573 | 8.11.97 | ANGLES ±1/2° |

| TOLERANCES | FILE: PARTS11452-1 |
|----------------------------|--------------------|
| UNLESS OTHERWISE SPECIFIED | |

| TITLE | 70° RISE SELF-CONTAINED BOOSTER ASSEMBLY |
|-----------|--|
| MATL | NOTED |
| SCALE | 3/8 |
| USED ON | 18-5 |
| DRWN/DATE | Philadelpho, PA 19135 |
| CES | (215) 624-4800 |
| | FAX (215) 624-6966 |
| | 1.22.96 |

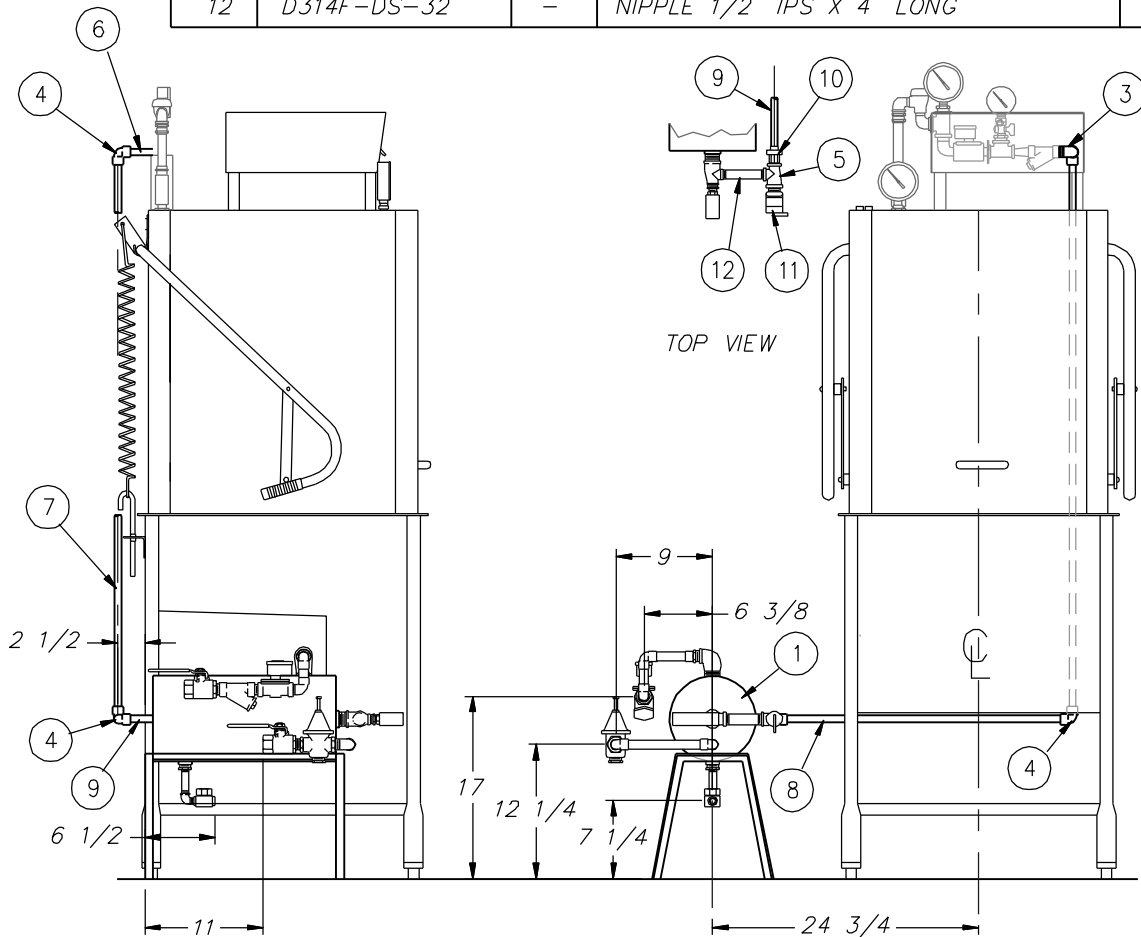
| ITEM | PART NO. | WATTAGE/VOLTAGE | ITEM | PART NO. | WATTAGE/VOLTAGE |
|------|-----------|--------------------|------|-----------|--------------------|
| 3 | DE13-BG23 | 13.5 KW / 208V-3PH | | DE13-BG73 | 13.5 KW / 480V-3PH |
| | DE13-BG43 | 13.5 KW / 240V-3PH | | DE13-BG31 | 13.5 KW / 220V-1PH |
| | DE13-BG53 | 13.5 KW / 380V-3PH | | DE13-BG41 | 13.5 KW / 240V-1PH |

| ITEM | PART NO. | SIZE | DESCRIPTION | QTY. |
|------|----------------|------|--------------------------------------|------|
| 1 | G6, G12 | - | BOOSTER ASSEMBLY | 1 |
| 2 | HA03-01-005 | - | RELIEF VALVE (HATCO) | 1 |
| 3 | D2339 | - | BALL VALVE 1/2" IPS | 1 |
| 4 | D314F-DG-00 | - | CLOSE NIPPLE 1/2" IPS | 2 |
| 5 | 925-49 | A | BRACKET | 1 |
| 6 | D250BA | - | PRESS. REG. & STRAINER 1/2" IPS | 1 |
| 7 | D320F-D1-D1-D1 | - | TEE 1/2 FIPS X 1/2 FIPS X 1/2 FIPS | 1 |
| 8 | D322F-D2-B1 | - | REDUCER 1/2 MIPS X 1/4 FIPS | 1 |
| 9 | D328F-B2A | - | PIPE PLUG 1/4 MIPS | 1 |
| 10 | D317A-D3-D2 | - | ADAPTER 1/2 C X 1/2 MIPS | 1 |
| 11 | D207A-B4-26 | - | COPPER TUBING 1/2 CTS X 6 1/2 LONG | 1 |
| 12 | D316A-D3-D3 | - | 90° ELBOW 1/2 C X 1/2 C | 3 |
| 13 | D207A-B4-30 | - | COPPER TUBING 1/2 CTS X 7 1/2 LONG | 1 |
| 14 | D316A-E1-D3 | - | 90° ELBOW 1/2 C X 3/4 FIPS | 1 |
| 15 | D316A-D1-D2 | - | 90° STREET ELBOW 1/2 FIPS X 1/2 MIPS | 1 |
| 16 | D318A-D3-D3 | - | UNION 1/2 C X 1/2 C | 1 |
| 17 | D207A-B4-90 | - | COPPER TUBING 1/2 CTS X 22 1/2 LONG | 1 |
| 18 | D207A-B4-163 | - | COPPER TUBING 1/2 CTS X 40 3/4 LONG | 1 |
| 19 | D207A-B4-12 | - | COPPER TUBING 1/2 CTS X 3" LONG | 1 |
| 20 | D316A-D3-D2 | - | 90° ELBOW 1/2C X 1/2 MIPS | 1 |
| 21 | D207A-B4-27 | - | COPPER TUBING 1/2 CTS X 6 3/4 LONG | 1 |
| 22 | D316A-E1-D2 | - | 90° STREET ELBOW 3/4 FIPS X 1/2 MIPS | 1 |
| 23 | D316A-D3-D1 | - | 90° STREET ELBOW 1/2 C X 1/2 FIPS | 1 |



| | | | | | | |
|-------|---------------|---------|----------------------------|--|-----------|--------------|
| | | | TOLERANCES | TITLE | NEXT ASSY | DWG. NO. |
| | | | FRACTIONS ±1/64 | ELECTRIC BOOSTER ASSEMBLY | REQ'D 1 | 1089-B7 |
| | | | DECIMALS | | | |
| C | 2007 | 3.25.04 | XXX ± .005 | MATL | SCALE | USED ON 18-5 |
| B | 1859 | 2.20.01 | XX ± .01 | NOTED | 1"=1'-0" | 50-20 N2-NSU |
| A | 1761 | 6.20.00 | ANGLES ±1/2° | | | |
| REV | ECN NO. | DATE | UNLESS OTHERWISE SPECIFIED | Philadelphia, PA 19135 (215) 624-4800 FAX (215) 624-6966 | | |
| FILE: | PARTS/1089-87 | | | | DRWN/DATE | 3-23-88 |

| ITEM | PART NO. | SIZE | DESCRIPTION | QTY. |
|------|--------------|------|-------------------------------------|------|
| 1 | 1394-1 | B | BOOSTER ASSEMBLY | 1 |
| 2 | D319A-D3-D3 | - | 90° UNION ELBOW 1/2" C | 1 |
| 3 | D319A-D3-D2 | - | 90° UNION ELBOW 1/2" C X 1/2" MIPS | 1 |
| 4 | D316A-D3-D3 | - | 90° ELBOW 1/2" C | 3 |
| 5 | D317A-D3-D2 | - | ADAPTER 1/2" C X 1/2" MIPS | 1 |
| 6 | D207A-K4-12 | - | COPPER TUBING 1/2" CTS X 3" LONG | 1 |
| 7 | D207A-K4-172 | - | COPPER TUBING 1/2" CTS X 43" LONG | 1 |
| 8 | D207A-K4-86 | - | COPPER TUBING 1/2" CTS X 21 1/2" LG | 1 |
| 9 | D207A-K4-72 | - | COPPER TUBING 1/2" CTS X 18" LONG | 1 |
| 10 | D320FE1D1E1 | - | TEE 3/4 FIPS X 1/2 FIPS X 3/4 FIPS | 1 |
| 11 | D2507 | - | PRESSURE RELIEF VALVE 3/4 MIPS | 1 |
| 12 | D314F-DS-32 | - | NIPPLE 1/2" IPS X 4" LONG | 1 |



| | | | | | | |
|----------------------|--------|---------|----------------------------|--|-----------|--------------|
| | | | TOLERANCES | TITLE | NEXT ASSY | DWG. NO. |
| | | | FRACTIONS $\pm 1/64$ | SIDE MOUNT STEAM BOOSTER TO FINAL RINSE PIPING ASS'Y | REQ'D 1 | 1089-179 |
| | | | DECIMALS | | | |
| B | 1916 | 2.22.02 | .XXX \pm .005 | MAT'L | SCALE | USED ON 18-5 |
| A | 1761 | 6.19.00 | .XX \pm .01 | NOTED | 1/16 | 50-20N2-NSU |
| REV | ECN NO | DATE | ANGLES $\pm 1/2^\circ$ | Philadelphia, PA 19135 (215) 624-4800 FAX (215) 624-6966 | DRWN/DATE | |
| | | | UNLESS OTHERWISE SPECIFIED | | RFN | |
| FILE: PARTS\1089-179 | | | | | | 6-5-90 |

| NO. | DESCRIPTION | PART NO. | QTY. |
|-----|------------------------------------|-------------|------|
| 1 | STEAM INJECTOR | D942 | 1 |
| 2 | LOCKNUT 1/2 IPS | D326F-D2 | 2 |
| 3 | NIPPLE 1/2 IPS x 1 1/2" LG. | D314F-DA-12 | 1 |
| 4 | 90° STREET ELL 1/2 MIPS x 1/2 FIPS | D314F-D1-D2 | 2 |
| 5 | CHECK VALVE 1/2 IPS | D2453 | 1 |
| 6 | CLOSE NIPPLE 1/2 IPS | D314A-DCL | 2 |
| 7 | "Y" STRAINER 1/2 IPS | D2483A | 1 |
| 8 | SOLENOID 1/2 IPS | D2594 | 1 |

FRONT

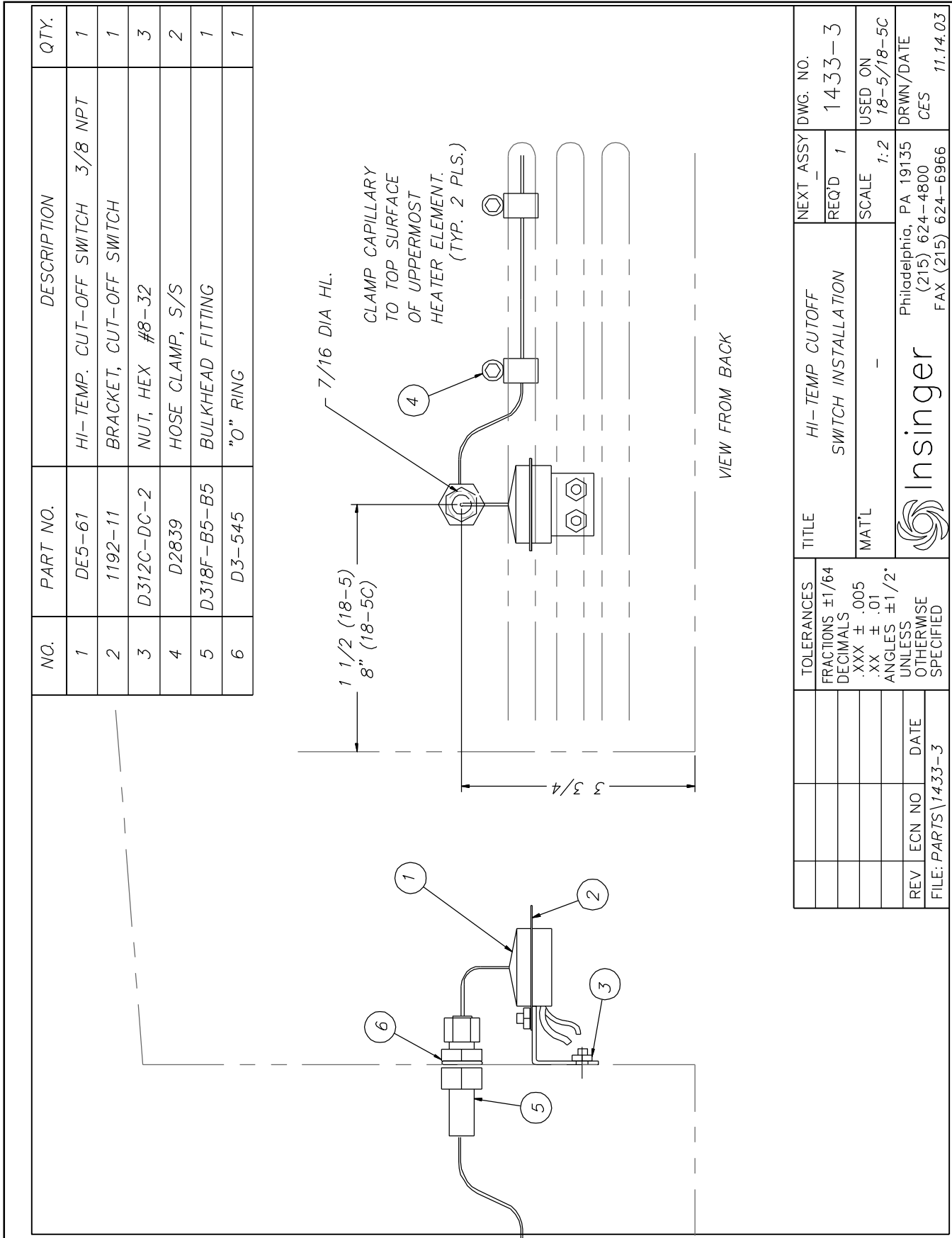
REAR VIEW

SECTION A - A

1089-189 LIQUID LEVEL FLOAT

| | | | | | | |
|---------------------|-----------------|----------|-------------|-----------|--------------|----------------------------|
| TOLERANCES | FRACTIONS ±1/64 | DECIMALS | .XXX ± .005 | .XX ± .01 | ANGLES ±1/2° | UNLESS OTHERWISE SPECIFIED |
| REV | 1583 | ECN NO | 12.1.97 | DATE | | |
| FILE: PARTS\1089-81 | | | | | | |

| | | | |
|-----------------|--|--------------------|---|
| TITLE | STEAM INJECTOR, DIODE & LIQUID LEVEL FLOAT LOCATIONS | NEXT ASSY DWG. NO. | 1089-81 |
| MAT'L | | SCALE | 1=8 |
| | | USED ON | 18-5, 18-5C |
| Insinger | | DRWN/DATE | Philadelphia, PA 19135 (215) 624-4800 MAM |
| | | FAX | (215) 624-6966 |
| | | | 7.24.92 |



| ITEM | PART NO. | DESCRIPTION | QTY. |
|------|--------------|-----------------------------------|------|
| 1 | D2-541 | SUCTION STRAINER | 1 |
| 2 | D309C-JC-9A | HEX HD. S/S SCREW 3/8-16 x 1 1/8" | 4 |
| 3 | D313A-J1 | COPPER WASHER 3/8 | 4 |
| 4 | D312C-JC-5 | LOCKNUT 3/8-16 | 4 |
| 5 | D514 | GASKET, PUMP FLANGE | 1 |
| 6 | D134 | PUMP FLANGE | 1 |
| 7 | D316E-H3-H4 | ELBOW 90° 1 1/2"C X 1 1/2 C FTG | 1 |
| 8 | D207E-K12-13 | 1 1/2 CU TUBE X 3 1/4 LG | 1 |
| 9 | D317E-H3-H2 | ADAPTER 1 1/2"C X 1 1/2"M | 1 |
| 10 | D314F-HT-72 | NIPPLE 1 1/2 IPS x 9" LG. LOE | 1 |
| 11 | D326F-H1 | LOCKNUT 1 1/2 IPS | 1 |

* ELECTROLESS NICKEL PLATE REQUIRED

* * *

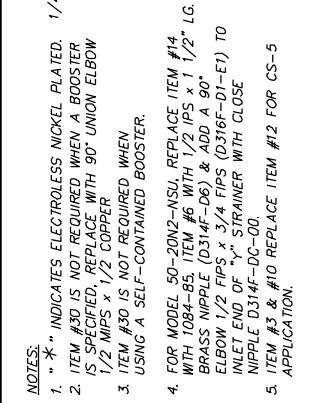
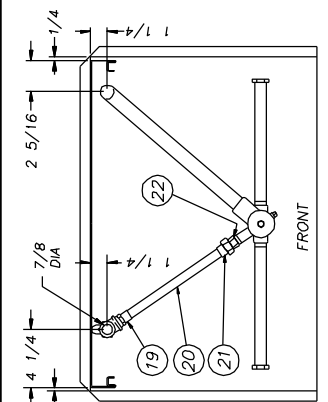
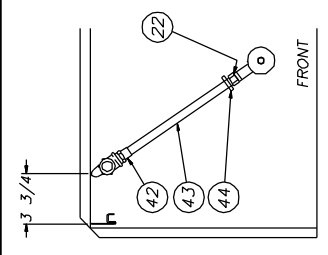
#51 PUMP
 1 HP (3 7/8 IMP) 18-5
 2 HP (3 7/8 IMP) 18-5H
 1 HP 18-5 INTERNATIONAL

| | | | |
|----------------------------|---|-----------|-----------------------|
| TOLERANCES | TITLE | NEXT ASSY | DWG. NO. |
| FRACTIONS ±1/64 | PUMP, MOTOR, & SUCTION ASSY | REQ'D | 1089-19 |
| DECIMALS | | SCALE | USED ON |
| .XXX ± .005 | MAT'L | 1=4 | 185, CS-5 |
| .XX ± .01 | <p>Philadelphia, PA 19135 (215) 624-4800 FAX (215) 624-6966</p> | | |
| ANGLES ±1/2° | | | |
| UNLESS OTHERWISE SPECIFIED | DRWN/DATE RFN 9.3.91 | | |
| REV | ECN NO | DATE | FILE: PARTS \ 1089-19 |
| F | 1972 | 3.12.03 | |
| E | 1634 | 10.9.98 | |
| D | 1458 | 8.30.96 | |

| NO. | DESCRIPTION | PART NO. | QTY. |
|-----|-----------------------------|--------------|------|
| 1 | LOCKWASH. HEX | D356-D1 | 1 |
| 2 | NIPPLE, CLOSE | D314F-DC-00 | 9 |
| 3 | TEE | D30F-D1D1D1 | 3 |
| 4 | PLUG, PIPE | D326-D2A | 1 |
| 5 | UNION, STRAIGHT | D30F-D1-D1 | 1 |
| 6 | NIPPLE, PIPE | D314F-DS-36 | 1 |
| 7 | ELBOW, 90° STREET | D316F-D1-D2 | 2 |
| 8 | BREACER, VACUUM | D3014 | 2 |
| 9 | NIPPLE, PIPE | D314F-DS-16 | 1 |
| 10 | REDUCER, HEX | D32C-02-B1 | 2 |
| 11 | GAUGE, TEMPERATURE | D2495 | 1 |
| 12 | ELBOW, 90° | D30F-D1-D1 | 1 |
| 13 | VALVE, SOLENOID (WATER) | D2606 | 1 |
| 14 | BRACKET, PIPING SUPPORT | 951-79 | 1 |
| 15 | PETCOCK | D2497 | 1 |
| 16 | GAUGE, PRESSURE | SK-1433 | 1 |
| 17 | TEE | D320L-D1D1D1 | 1 |
| 18 | ADAPTER | D317C-D3-D2 | 2 |
| 19 | TUBING, S/S | D207C-84-36 | 2 |
| 20 | UNION | D318C-D3-D1 | 2 |
| 21 | REDUCER, FLUSH | D323L-D2-C1 | 2 |
| 22 | FOR 18-5S: TUBING, S/S | D207C-84-112 | 1 |
| 23 | FOR 18-5H: TUBING, S/S | D207C-84-153 | 1 |
| 24 | TUBING, S/S | D316C-D3-D3 | 1 |
| 25 | TUBING, S/S | D207C-84-39 | 1 |
| 26 | LOWER WASH PIPE ASSY | 1089-25 | 1 |
| 27 | O-RING | D2-563 | 2 |
| 28 | SCREW, LOCKING | D2-584 | 1 |
| 29 | UPPER RINSE SPRAY PIPE ASSY | D2483A | 1 |
| 30 | UPPER RINSE SPRAY PIPE ASSY | 1434-8 | 1 |
| 31 | LOWER RINSE SPRAY PIPE ASSY | 1434-9 | 1 |
| 32 | NIPPLE, PIPE | D314F-DA-12 | 1 |
| 33 | SUPPORT ASSY UPPER HUB | 1463-29 | 1 |
| 34 | UPPER WASH PIPE ASSY | 1434-6 | 1 |
| 35 | ADAPTER | D329-2 | 1 |
| 36 | CPVC TUBING | D207C-84-16 | 1 |
| 37 | CLOSE NIPPLE CPVC | D314C-DC-00 | 1 |
| 38 | HEX REDUCER, CPVC | D322C-D2-A1 | 1 |
| 39 | TEE, CPVC | D320C-D10101 | 2 |
| 40 | ADAPTER, CPVC | D207C-84-33 | 1 |
| 41 | TUBING, CPVC | D207C-84-80 | 1 |
| 42 | CLAMP, CPVC | D2-577-1 | 1 |
| 43 | ELBOW, CPVC | D316C-D3-D3 | 1 |
| 44 | TUBING, CPVC | D207C-84-42 | 1 |
| 45 | MELD STUD | D309C-FC-36 | 2 |
| 46 | NIPPLE, PIPE | D314F-DS-14 | 1 |

| J | 1893 | 8.28.01 | TOLERANCES | TITLE | FINAL RINSE ASS'Y | NEXT ASSY | DWG. NO. |
|-----|---------|----------|----------------------------|--|-------------------|-----------|----------|
| H | 1859 | 2.20.01 | FRACTIONS 1/64 | 18-5 (ALL) | 1463-1 | 1463-18 | |
| G | 1675 | 5.3.99 | XX ± .005 | MAT'L | SCALE | USED ON | |
| F | 1653 | 2.12.99 | .XX ± .01 | | 1-8 | 18-5,CS-5 | |
| E | 1634 | 10.12.98 | ANGLES ±1/2° | | | | |
| REV | ECN NO. | DATE | UNLESS OTHERWISE SPECIFIED | Philadelphia, PA 19135 DRWN/DATE (215) 624-4800 FAX (215) 624-6966 | | | |

| J | 1893 | 8.28.01 | TOLERANCES | TITLE | FINAL RINSE ASS'Y | NEXT ASSY | DWG. NO. |
|-----|---------|----------|----------------------------|--|-------------------|-----------|----------|
| H | 1859 | 2.20.01 | FRACTIONS 1/64 | 18-5 (ALL) | 1463-1 | 1463-18 | |
| G | 1675 | 5.3.99 | XX ± .005 | MAT'L | SCALE | USED ON | |
| F | 1653 | 2.12.99 | .XX ± .01 | | 1-8 | 18-5,CS-5 | |
| E | 1634 | 10.12.98 | ANGLES ±1/2° | | | | |
| REV | ECN NO. | DATE | UNLESS OTHERWISE SPECIFIED | Philadelphia, PA 19135 DRWN/DATE (215) 624-4800 FAX (215) 624-6966 | | | |



NOTES:
 1. * * * INDICATES ELECTROLESS NICKEL PLATED.
 2. ITEM #30 IS NOT REQUIRED WHEN A BOOSTER IS SPECIFIED, REPLACE WITH 90° UNION ELBOW 1/2" MPS, 1/2" COPPER.
 3. ITEM #30 IS NOT REQUIRED WHEN USING A SELF-CONTAINED BOOSTER.
 4. FOR MODEL 50-20N2-NSU, REPLACE ITEM #14 WITH 1084-83, ITEM #6 WITH 1/2" IPS X 1 1/2" LG. BRASS NIPPLE (D314F-DB) & ADD A 90° ELBOW 1/2" FIPS X 3/4" FIPS (D316F-D1-E1) TO INLET END OF Y-STRAINER WITH CLOSE NIPPLE D314F-DC-00.
 5. ITEM #3 & #10 REPLACE ITEM #12 FOR CS-5 APPLICATION.

CS-5

SEE NOTES 2 & 3

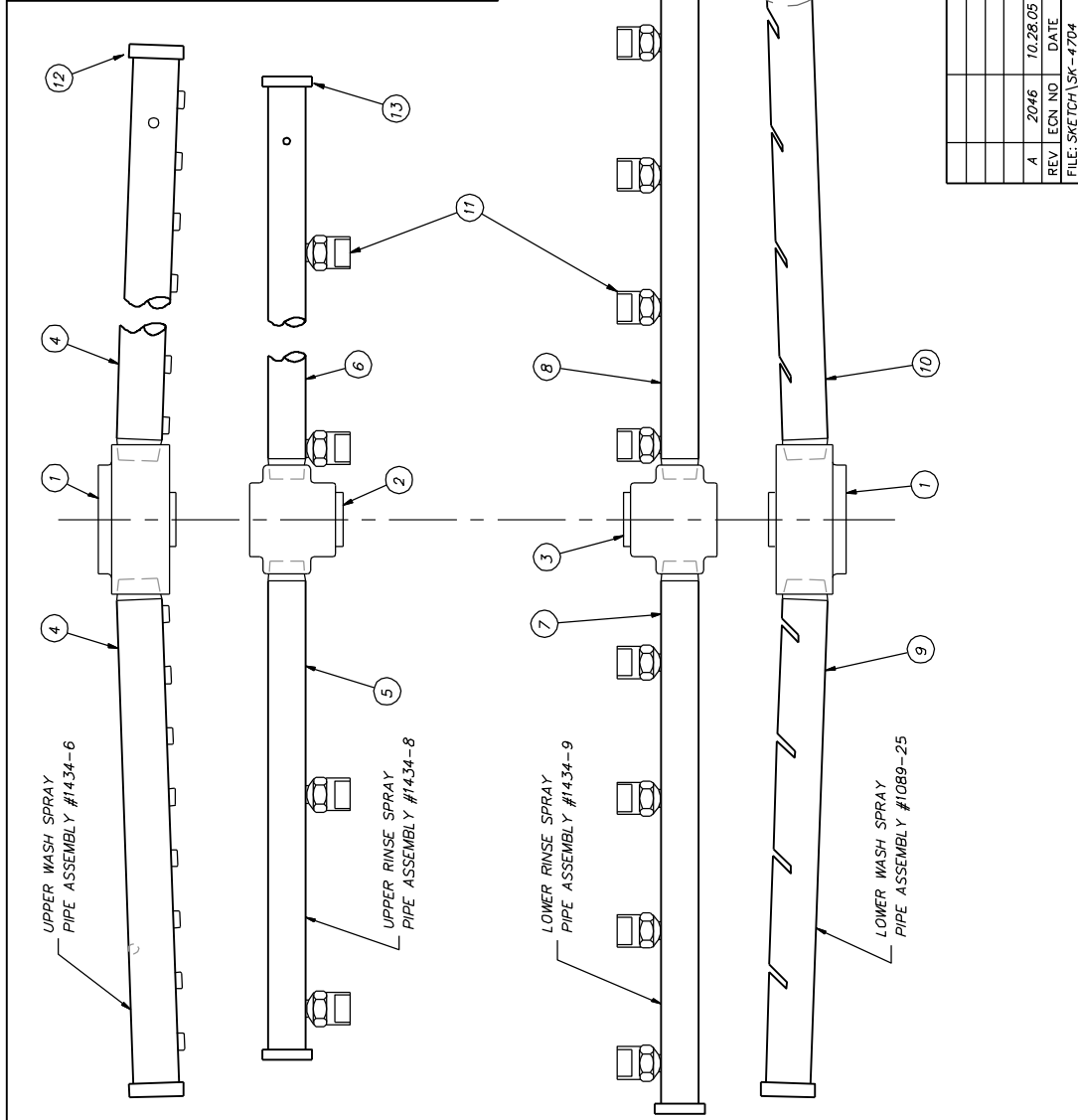
DISCHARGE LINE ASSY 1463-16

29 3/8 REF (18-5 MACHINE)

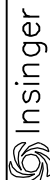
39 1/2 REF (18-5H MACHINE)

18-5
18-5H

| ITEM | PART NO. | DESCRIPTION | QTY. |
|------|-------------|--------------------------------|------|
| 1 | 1084-76 | WASH HUB | 2 |
| 2 | 1463-25 | UPPER RINSE HUB | 1 |
| 3 | 1084-22 | LOWER RINSE HUB ASSEMBLY | 1 |
| 4 | 1434-5 | UPPER WASH PIPE | 2 |
| 5 | 1434-7A | UPPER RINSE PIPE | 1 |
| 6 | 1434-7B | UPPER RINSE PIPE | 1 |
| 7 | 1434-7C | LOWER RINSE PIPE | 1 |
| 8 | 1434-7D | LOWERR RINSE PIPE | 1 |
| 9 | 1089-23A | LOWER WASH PIPE | 1 |
| 10 | 1089-23B | LOWER WASH PIPE | 1 |
| 11 | D2867 | NOZZLE | 12 |
| 12 | D2-554-1 | PLUG - 9/16-12 UNC-2A | 4 |
| 13 | D2-554-2 | PLUG - 3/4-10 UNC-2A | 4 |
| 14 | SK-4753-1 | WIRE ROPE SUB ASSY X 3 1/2" LG | 8 |
| 15 | D309-CC-2C | WELD STUD, S/S, #6-32 X 1/4 | 8 |
| 16 | D312C-CC-5 | SEAL NUT, #6-32 | 16 |
| 17 | D309C-CC-4Q | PAN HD. SCREW, #6-32 X 1/2 | 8 |



| | | | | |
|----------------------|------------------------------------|----------------|--------------|---------------------|
| TOLERANCES | FRACTIONS ±1/64 | DECIMALS ±.005 | ANGLES ±.01° | OTHERWISE SPECIFIED |
| REV | A | 2046 | 10.28.05 | DATE |
| FILE: SKETCH\SK-4704 | | | | |
| TITLE | SPRAY PIPE INSTALLATION ASSEMBLIES | | | |
| MATL | NOTED | | | |
| SCALE | I=2 | | | |
| RECD | SK-4704 | | | |
| NEXT ASSY DWG. NO. | USED ON | | | |
| | JB-5 | | | |
| | DRWN/DATE | | | |
| | JBC | | | |
| | 3.24.04 | | | |



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| ITEM | PART NO. | DESCRIPTION | QTY. | ITEM | PART NO. | DESCRIPTION | QTY. |
|------|-------------|----------------------------|------|------|----------|----------------------------|------|
| 7 | 1084-76 | WASH HUB | 1 | 1 | D2-584A | KNOB - LOWER | 1 |
| 8 | D2-563 | "0" RING 1 3/4 OD X 3/32 W | 1 | 2 | 1089-178 | INSERT BUSHING - RINSE HUB | 1 |
| 9 | D309C-EF-2H | #10-32 X 1/4" SETSCREW | 1 | 3 | 1089-177 | BUSHING - RINSE HUB | 1 |
| 10 | D328A-A2 | PIPE PLUG 1/8 IPS | 1 | 4 | 372-52 | HUB MACHINING | 1 |
| 11 | 1084-34 | SHAFT ASSEMBLY | 1 | 5 | 1084-35 | BUSHING - RINSE HUB | 1 |
| 12 | 1089-16 | DISCHARGE TEE - LOWER | 1 | 6 | 952-27 | BUSHING - WASH HUB | 1 |
| 13 | D314C-C-20 | NIPPLE 3/8 IPS X 2 1/2 LG. | 1 | | | | |

| | | | |
|---|--|---|---|
| <p>* LOWER RINSE HUB ASSEMBLY #1084-22 CONSISTS OF:</p> <p>(1) #372-52 HUB MACHINING (1) #1084-35 BUSHING (1) #1089-177 BUSHING (1) #1089-178 BUSHING</p> | | <p>TOLERANCES</p> <p>FRACTIONS ±1/64 DECIMALS .XXX ± .005 .XX ± .01 ANGLES ±1/2° UNLESS OTHERWISE SPECIFIED</p> | <p>REV</p> <p>ECN NO</p> <p>DATE</p> <p>FILE: SKETCHA \ SK-4703</p> |
| <p>18-4 & 18-5 LOWER MANIFOLD ASSY</p> | | <p>SCALE 1=1</p> <p>USED ON 18-4 & 18-5</p> | <p>DRWN/DATE DBC 3.24.04</p> |

| ITEM | PART NO. | DESCRIPTION | QTY. | ITEM | PART NO. | DESCRIPTION | QTY. |
|------|------------|----------------------------|------|------|-------------|-----------------------------|------|
| 7 | 1084-34 | SHAFT ASSEMBLY | 1 | 1 | 1463-29 | SUPPORT ASSY - UPPER HUB | 1 |
| 8 | D328A-A2 | PIPE PLUG, 1/8 IPS | 1 | 2 | 1463-25 | RINSE HUB - UPPER | 1 |
| 9 | 1089-15C | DISCHARGE TEE - UPPER | 1 | 3 | 952-27 | BUSHING - WASH HUB | 1 |
| 10 | 1089-28 | PLUG (PRESS FIT) | 1 | 4 | 1084-76 | WASH HUB | 1 |
| 11 | D314C-C-20 | NIPPLE 3/8 IPS X 2 1/2 LG. | 1 | 5 | D2-563 | "O" RING, 1 3/4 OD X 3/32 W | 1 |
| | | | | 6 | D309C-EF-2H | #10-32 X 1/4" SETSCREW | 1 |

* ITEM #1 SUB-ASSEMBLY
CONSISTS OF:

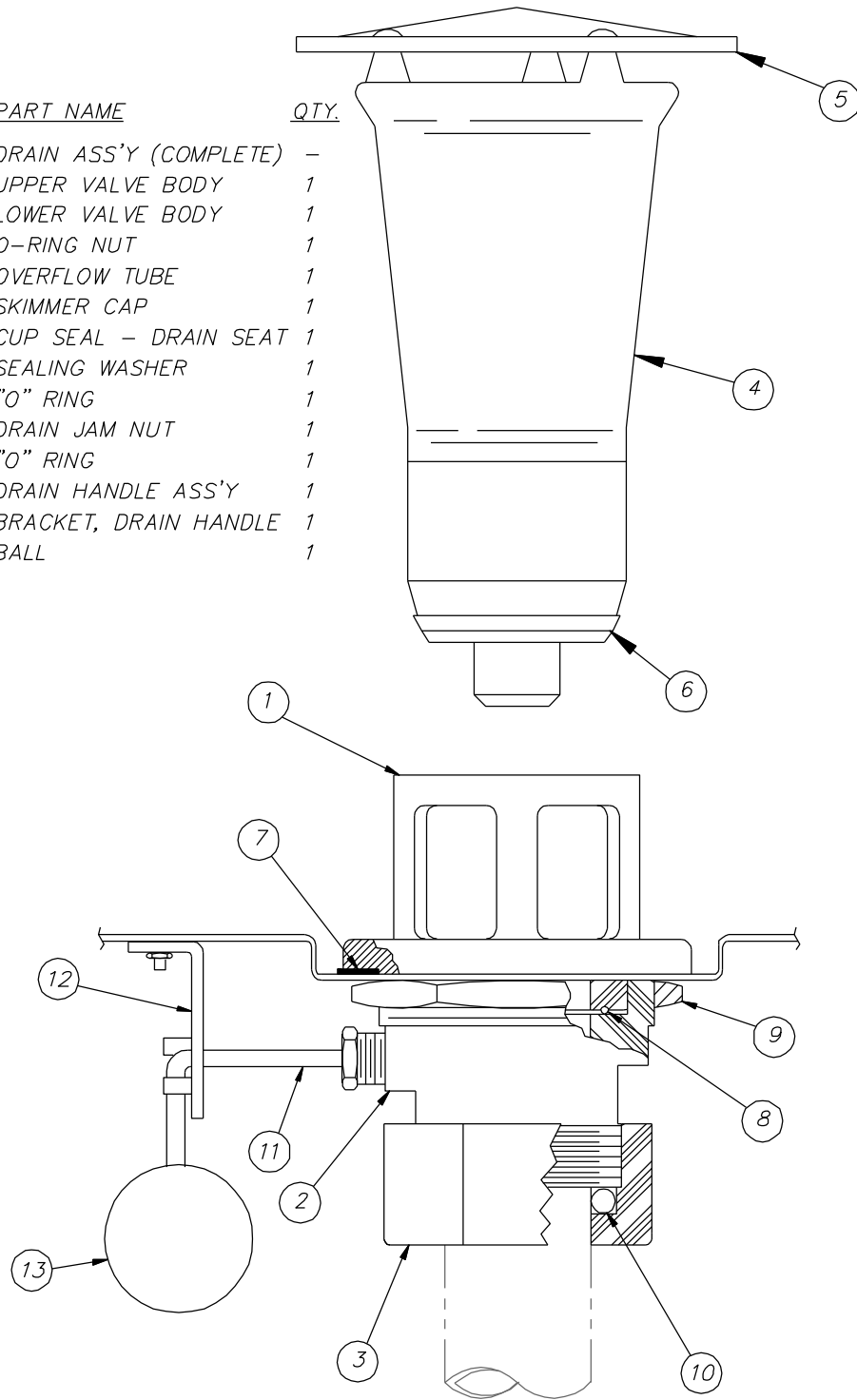
- #1463-26 BEARING BOSS
- #1463-27 THRUST COLLAR
- #1463-28 KNURLED KNOB
- D309C-GC-8A 1/4-20 X 1 LG
HHCS

| | | | | | |
|------------|-------------------|----------------------|-----------|--------------|----------------------------|
| TOLERANCES | FRACTIONS ±1/64 | DECIMALS .XXX ± .005 | .XX ± .01 | ANGLES ±1/2° | UNLESS OTHERWISE SPECIFIED |
| REV | A | ECN NO | 2007 | DATE | 3.25.04 |
| FILE: | SKETCHA \ SK-4073 | | | | |

| | | | |
|-------|-------------------------|--------------------|---------|
| TITLE | UPPER MANIFOLD ASSEMBLY | NEXT ASSY DWG. NO. | 1463-18 |
| MAT'L | NOTED | REQ'D | 1 |
| | NEW STYLE 18-5 | SCALE | FULL |
| | | USED ON | 18-5 |

| | |
|--|--|
| <p>Insinger Machine Company</p> | Philadelphia, PA 19135 (215) 624-4800 FAX (215) 624-6966 |
| DRWN/DATE CES 11.18.98 | |

| ITEM | PART NO. | PART NAME | QTY. |
|------|-----------|------------------------|------|
| | 954-50 | DRAIN ASS'Y (COMPLETE) | - |
| 1 | 954-50A | UPPER VALVE BODY | 1 |
| 2 | 954-50B | LOWER VALVE BODY | 1 |
| 3 | 954-50C | O-RING NUT | 1 |
| 4 | 1169-179D | OVERFLOW TUBE | 1 |
| 5 | D193 | SKIMMER CAP | 1 |
| 6 | D2-557 | CUP SEAL - DRAIN SEAT | 1 |
| 7 | 954-9 | SEALING WASHER | 1 |
| 8 | D2-549 | "O" RING | 1 |
| 9 | D305A | DRAIN JAM NUT | 1 |
| 10 | D2-550 | "O" RING | 1 |
| 11 | 1100-79A | DRAIN HANDLE ASS'Y | 1 |
| 12 | 954-8C | BRACKET, DRAIN HANDLE | 1 |
| 13 | D2-507 | BALL | 1 |



SK-3028

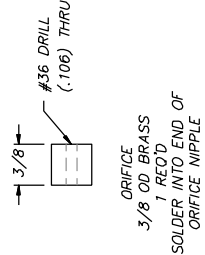
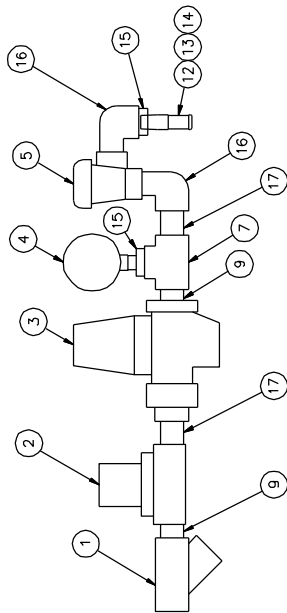
△ D ECN# 1989 7.7.03
 △ C ECN# 1761 5.5.00
 △ B ECN# 1512 12.20.96

FILE: SKETCHA\SK-3028

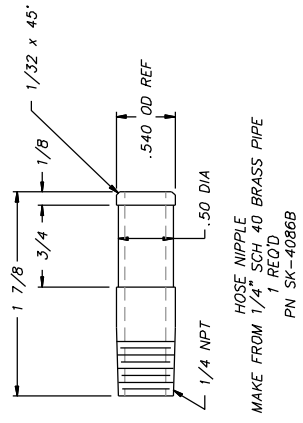
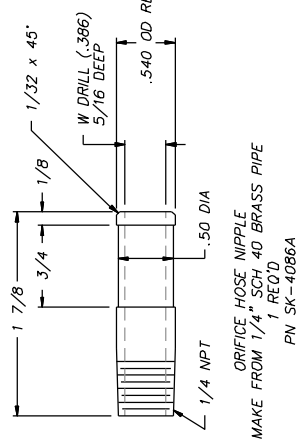
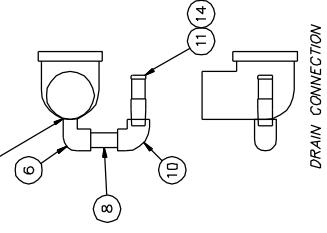
MAM 2.11.93


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| ITEM | PART NO. | SIZE | DESCRIPTION | QTY. |
|------|--------------|------|-------------------------------------|------|
| 1 | D2483A | - | Y STRAINER, 1/2" | 1 |
| 2 | D2606 | - | SOLENOID VALVE, 1/2", 24 VAC | 1 |
| 3 | D2508A | - | PRESSURE REGULATOR, 1/2", 10-35 PSI | 1 |
| 4 | SK-1433 | - | PRESSURE GAUGE, 1/4", 1-100 PSI | 1 |
| 5 | D2241A | - | VACUUM BREAKER, 1/2" | 1 |
| 6 | D316F-B1-B2 | - | STREET ELBOW, 1/4" | 1 |
| 7 | D320F-D1D1D1 | - | TEE, 1/2" | 1 |
| 8 | D314F-BS-12 | - | NIPPLE, 1/4" X 1 1/2 | 1 |
| 9 | D314F-DC-00 | - | NIPPLE, 1/2" CLOSE | 2 |
| 10 | D316F-B1-B1 | - | 90° ELBOW, 1/4" | 1 |
| 11 | SK-4086A | - | ORIFICE HOSE NIPPLE | 1 |
| 12 | SK-4086B | - | HOSE NIPPLE | 1 |
| 13 | D2865 | - | 1/2" ID REINFORCED PVC HOSE | AR |
| 14 | D2864 | - | HOSE CLAMP, 1/2 - 7/8 | 2 |
| 15 | D322F-D2-B1 | - | HEX REDUCER, 1/2 - 1/4 | 2 |
| 16 | D316F-D1-D2 | - | STREET ELBOW, 1/2" | 2 |
| 17 | D314F-DS-14 | - | NIPPLE, 1/2 X 1 3/4 | 2 |
| 18 | SK-4087 | A | WIRING DIAGRAM | 1 |
| 19 | EM-259 | - | 3/4" CONDUIT CLAMP | 2 |



1/4" NPT TAP INTO DRAIN
SOLDER IN PLACE



| PRESSURE | GPM |
|----------|------|
| 5 | 0.75 |
| 10 | 1.0 |
| 15 | 1.4 |
| 20 | 1.5 |
| 25 | 1.6 |
| 30 | 1.7 |
| 35 | 1.8 |
| 40 | 1.9 |

| TOLERANCES | TITLE | DRAIN COOL DOWN ASSY | NEXT ASSY DWG. NO. |
|----------------------------|-------|----------------------|--------------------|
| FRACTIONS ±1/64 | REOD | 1 | SK-4086 |
| DECIMALS ±.005 | SCALE | USED ON | 18-5 |
| XX ±.01 | MATL | I=4 | |
| XX ±.01 | | | |
| ANGLES ±1/2° | | | |
| UNLESS OTHERWISE SPECIFIED | | | |

| REV | ECN NO | DATE |
|-----|--------|--------|
| C | 1990 | 8.8.03 |
| B | 1939 | 6.5.02 |
| A | 1863 | 3.1.01 |

FILE:SKETCH\SK-4086

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