TECHNICAL MANUAL
For
DOOR TYPE DISHWASHING MACHINE

Commander 18-5
Commander 18-5C
Commander 18-5H
Commander 18-5CH

Installation, Operation, and Maintenance Instructions

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 deliming 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

ETL NSF

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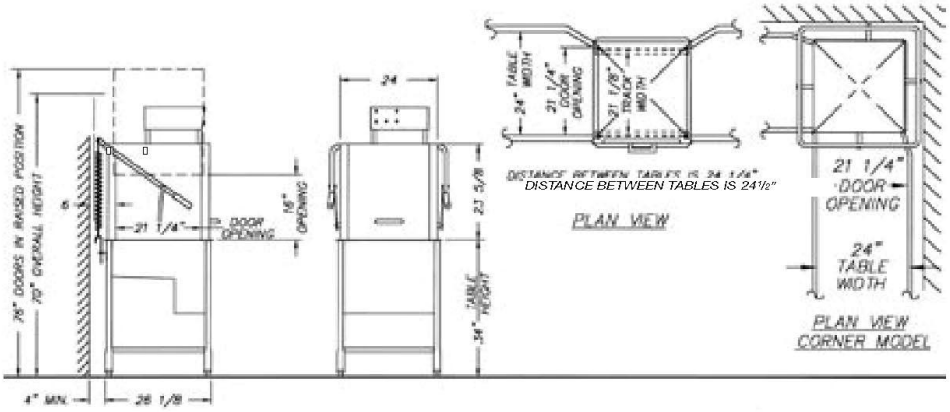
SUREFIRE™ START-UP & CHECK-OUT SERVICE

CSI - 11400

Insinger® COMMANDER 18-5



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	23.7	81.7
				208/3/60	5.1	13.4	50.9
				240/1/60	8.1	20.6	76.9
				240/3/60	4.2	11.8	44.3
				380/3/50	2.8	7.4	27.9
				480/3/60	2.3	5.9	22.1

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Information and specifications subject to change without notice

Insinger®

Item #_____

COMMANDER 18-5H

AUTOMATIC SINGLE TANK DOOR TYPE WAREWASHER & TRAY/UTENSIL WASHER

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. 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 deliming 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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SUREFIRE™ START-UP & CHECK-OUT SERVICE

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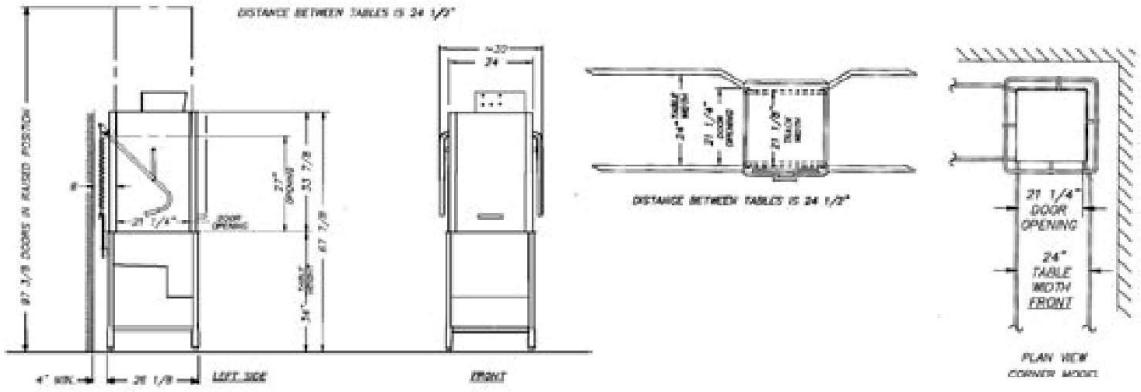
COMMANDER 18-5H

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 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 aforestated 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:

Connections must be made to a circuit breaker or fused disconnect as provided by the end-user and required by local codes.

A laminated wiring diagram is inside the control panel.

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 140º 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.

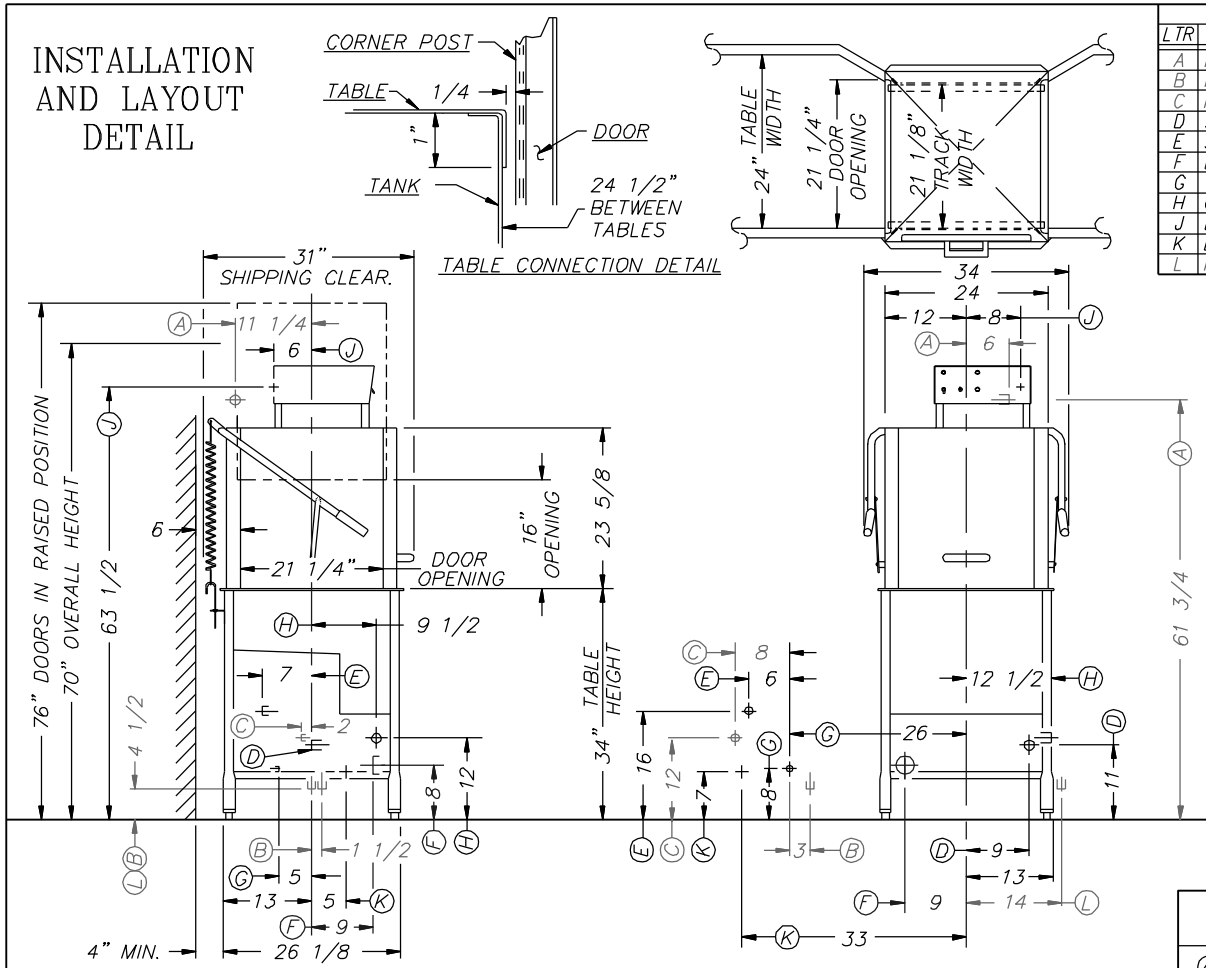
The detergent density probe should be installed in the hole provided & labeled in the wash tank. A switch on the control panel labeled "Wash Cycle" is provided for de-liming the machine. When activated, this switch will keep the machine in an indefinite wash cycle. This feature can also be used to wash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

INSTALLATION AND LAYOUT DETAIL



INSTALLATION CONNECTIONS		
LTR	DESCRIPTION	SIZE
A	HOT WATER TO FINAL RINSE – 180° F	1/2 FIPS
B	HOT WATER TO REMOTE ELEC. BOOSTER △	1/2 FIPS
C	HOT WATER TO STEAM BOOSTER △	1/2 FIPS
D	STEAM TO TANK	1/2 FIPS
E	STEAM TO STEAM BOOSTER	1/2 FIPS
F	DRAIN CONNECTION	1 1/2 FIPS
G	CONDENSATE RETURN – STEAM BOOSTER	1/2 FIPS
H	CONDENSATE RETURN – COIL ONLY	3/8 FIPS
J	ELECT. SERVICE – WASHER MTRS.	1 HP *
K	ELECT. SERVICE – REMOTE BOOSTER	6 KW **
L	HOT WATER TO B.I. ELEC. BOOSTER △	1/2 FIPS

* ADD 3 KW FOR ELECTRIC HEAT, PLUS 13.5 KW FOR BUILT-IN ELECT. BOOSTER.

** 10 KW FURNISHED WHEN SPECIFIED.

NOTES:

1. WASH TANK IS FILLED THRU THE FINAL RINSE LINE.

FILE: STD/18-5

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"		DWG. NO. 18-5	REV. B
DRAWN:	JND	05.07.04		
APPROVED:	CES	05.07.04		

INSTALLATION AND LAYOUT DETAIL

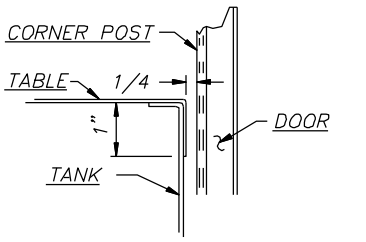
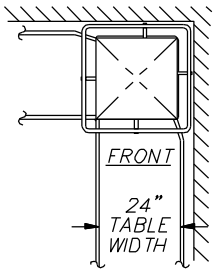
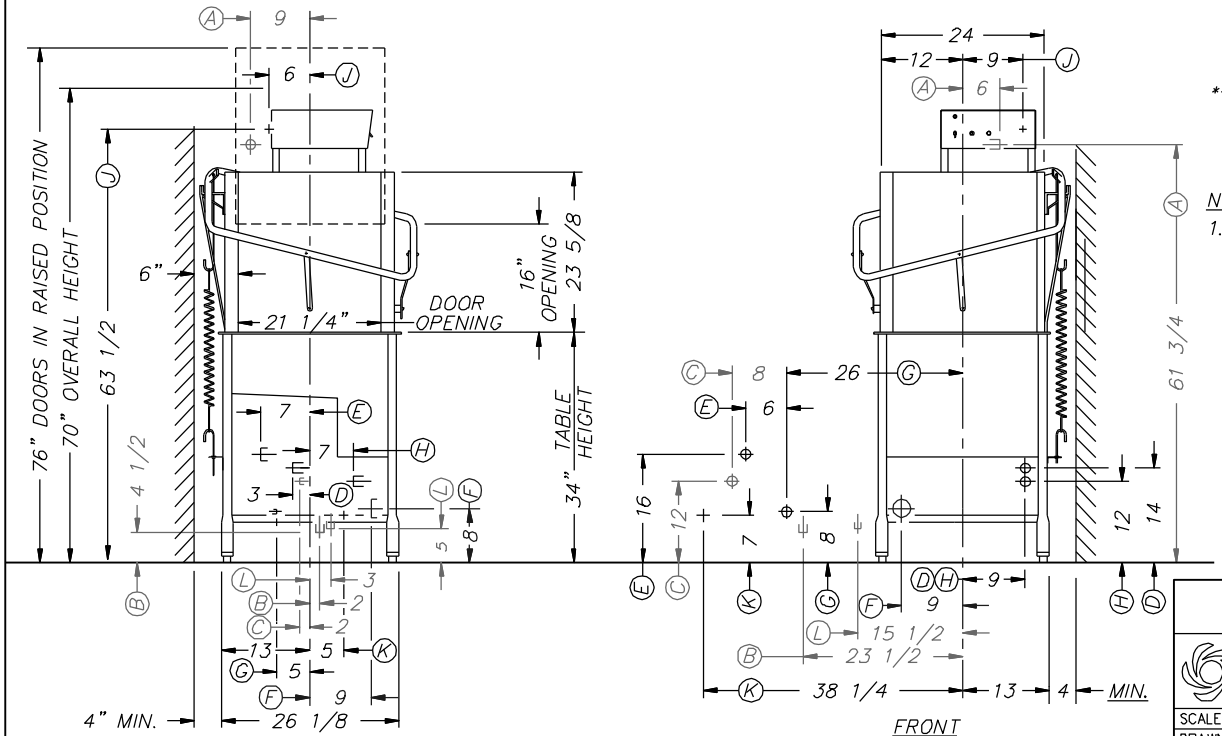


TABLE CONNECTION DETAIL



INSTALLATION CONNECTIONS		
LTR	DESCRIPTION	SIZE
A	HOT WATER TO FINAL RINSE – 180° F	1/2 FIPS
B	HOT WATER TO REMOTE ELEC. BOOSTER △	1/2 FIPS
C	HOT WATER TO STEAM BOOSTER △	1/2 FIPS
D	STEAM TO TANK	1/2 FIPS
E	STEAM TO BOOSTER	1/2 FIPS
F	DRAIN CONNECTION	1 1/2 FIPS
G	CONDENSATE RETURN – STEAM BOOSTER	1/2 FIPS
H	CONDENSATE RETURN – COIL ONLY	3/8 FIPS
J	ELECT. SERVICE – WASHER MTRS.	1 HP *
K	ELECT. SERVICE – REMOTE BOOSTER	6 KW **
L	HOT WATER TO B.I. ELECT. BOOSTER △	1/2 FIPS



LEFT SIDE

FRONT

* ADD 3KW FOR ELECTRIC HEAT, PLUS 13.5 KW FOR BUILT-IN ELECT. BOOSTER.

** 10 KW FURNISHED WHEN SPECIFIED.

NOTES:

1. WASH TANK IS FILLED THRU THE FINAL RINSE LINE.

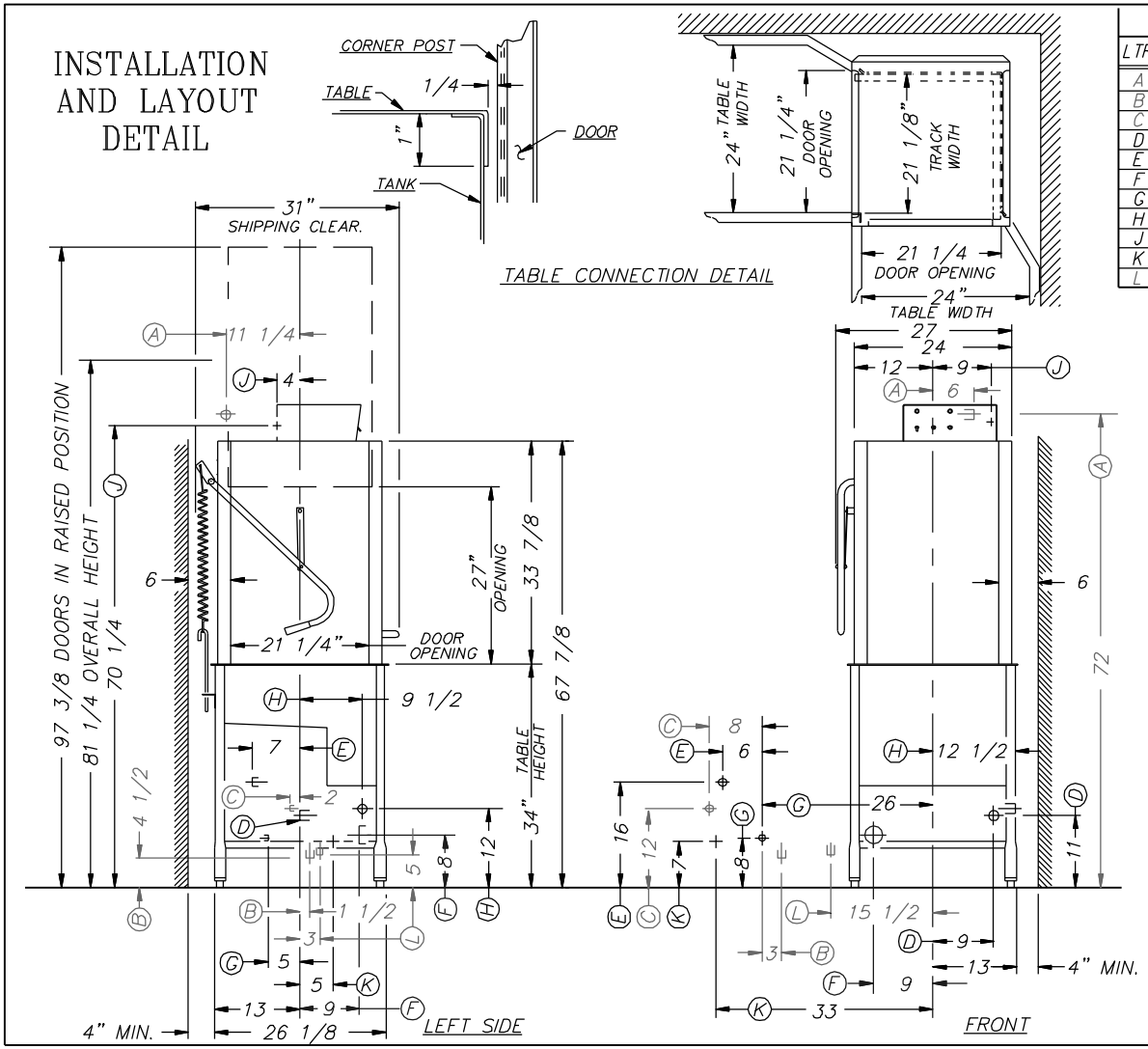
FILE: STD/18-5C

COMMANDER 18-5C
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"		DWG. NO. 18-5C	REV. B
DRAWN:	JND	05.07.04		
APPROVED:	CES	05.07.04		

INSTALLATION AND LAYOUT DETAIL



INSTALLATION CONNECTIONS		
LTR	DESCRIPTION	SIZE
A	HOT WATER TO FINAL RINSE – 180° F	1/2 FIPS
B	HOT WATER TO REMOTE ELEC. BOOSTER Δ	1/2 FIPS
C	HOT WATER TO STEAM BOOSTER Δ	1/2 FIPS
D	STEAM TO TANK	1/2 FIPS
E	STEAM TO STEAM BOOSTER	1/2 FIPS
F	DRAIN CONNECTION	1 1/2 FIPS
G	CONDENSATE RETURN – STEAM BOOSTER	1/2 FIPS
H	CONDENSATE RETURN – COIL ONLY	3/8 FIPS
J	ELECTRICAL CONNECTION – MOTORS	2 HP *
K	ELECTRICAL CONNECTION–REMOTE BOOSTER	6 KW **
L	HOT WATER TO B.I. ELEC. BOOSTER Δ	1/2 FIPS

* ADD 5 KW FOR ELECTRIC HEAT, PLUS 13.5 KW FOR BUILT-IN ELECT. BOOSTER.

** 10 KW FURNISHED WHEN SPECIFIED.

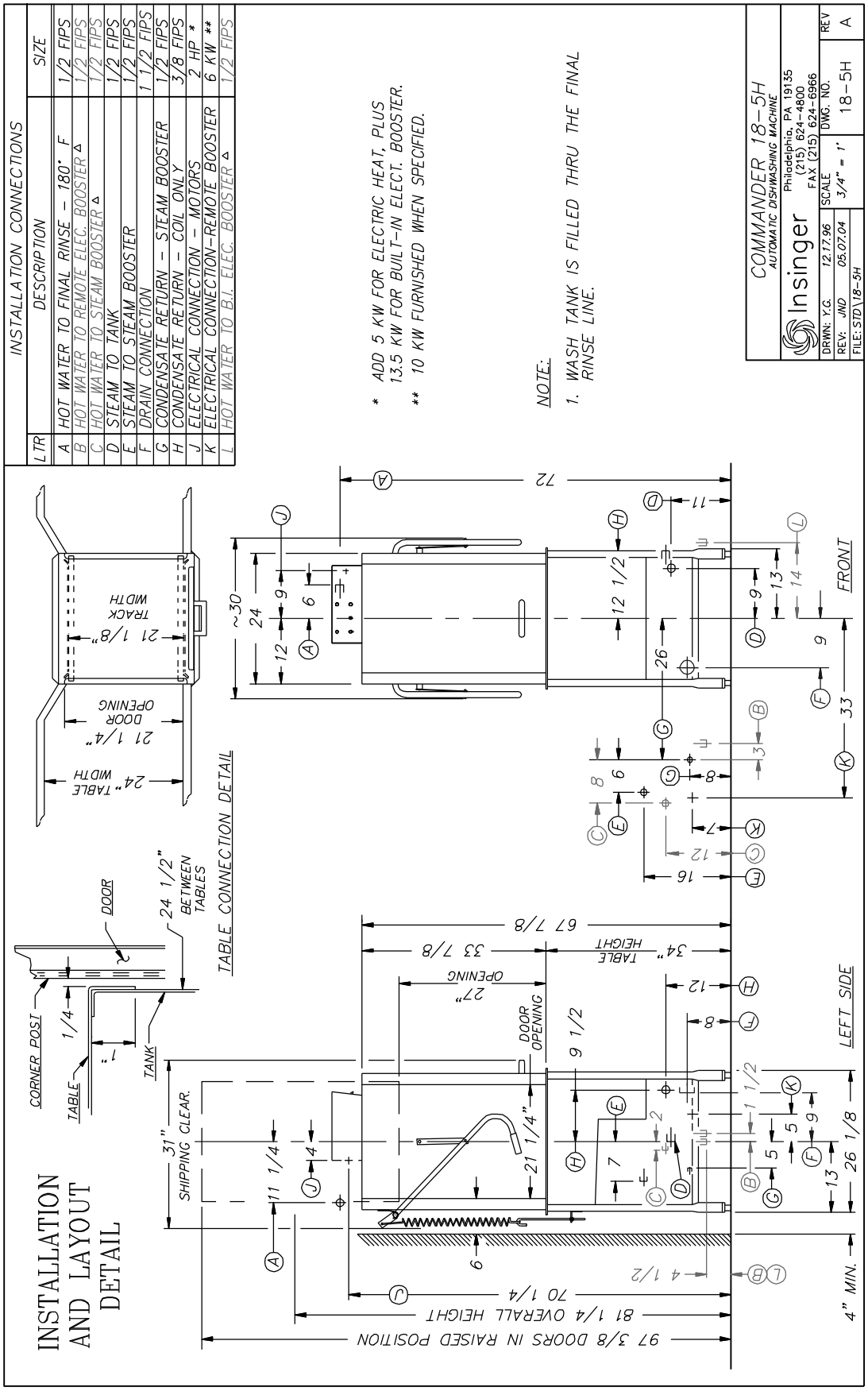
NOTE:

1. WASH TANK IS FILLED THRU THE FINAL RINSE LINE.

COMMANDER 18–5HC
AUTOMATIC DISHWASHING MACHINE

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

DRWN: PG 02.13.98	SCALE	DWG. NO.	REV
REV: JND 05.07.04	3/4" = 1'	18–5HC	A
FILE: STD\18–5HC			


INSTALLATION CONNECTIONS
LTR DESCRIPTION SIZE
A HOT WATER TO FINAL RINSE – 180° F 1/2 FIPS
B HOT WATER TO REMOTE ELEC. BOOSTER Δ 1/2 FIPS
C HOT WATER TO STEAM BOOSTER Δ 1/2 FIPS
D STEAM TO TANK 1/2 FIPS
E STEAM TO STEAM BOOSTER 1/2 FIPS
F DRAIN CONNECTION 1 1/2 FIPS
G CONDENSATE RETURN – STEAM BOOSTER 1/2 FIPS
H CONDENSATE RETURN – COIL ONLY 3/8 FIPS
J ELECTRICAL CONNECTION – MOTORS 2 HP *
K ELECTRICAL CONNECTION–REMOTE BOOSTER 6 KW **
L HOT WATER TO B.I. ELEC. BOOSTER Δ 1/2 FIPS
* ADD 5 KW FOR ELECTRIC HEAT, PLUS 13.5 KW FOR BUILT–IN ELECT. BOOSTER.
** 10 KW FURNISHED WHEN SPECIFIED.
NOTE:
1. WASH TANK IS FILLED THRU THE FINAL RINSE LINE.
COMMANDER 18–5H
AUTOMATIC DISHWASHING MACHINE
Insinger
Philadelphia, PA 19135
(215) 624-4800
FAX (215) 624-6966
DRWN: Y.G. 12.17.96
REV: JND 05.07.04
FILE: STD\18-5H
SCALE 3/4" = 1'
DWG. NO. 18–5H
REV A
INSTALLATION AND LAYOUT DETAIL
TABLE CONNECTION DETAIL
LEFT SIDE
FRONT
72
~30
24
12
9
6
12 1/2
11
26
33
16
67 7/8
33 7/8
34" TABLE HEIGHT
27" OPENING
DOOR OPENING
9 1/2
21 1/4"
31" SHIPPING CLEAR.
11 1/4
4
70 1/4
81 1/4 OVERALL HEIGHT
97 3/8 DOORS IN RAISED POSITION
4" MIN.
4 1/2
26 1/8
21 1/8" TRACK WIDTH
21 1/4" DOOR OPENING
24" TABLE WIDTH
24 1/2" BETWEEN TABLES
DOOR
CORNER POST
TABLE
TANK
1/4
1"

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 156ºF minimum. Proper final rinse temperature is 180ºF 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:

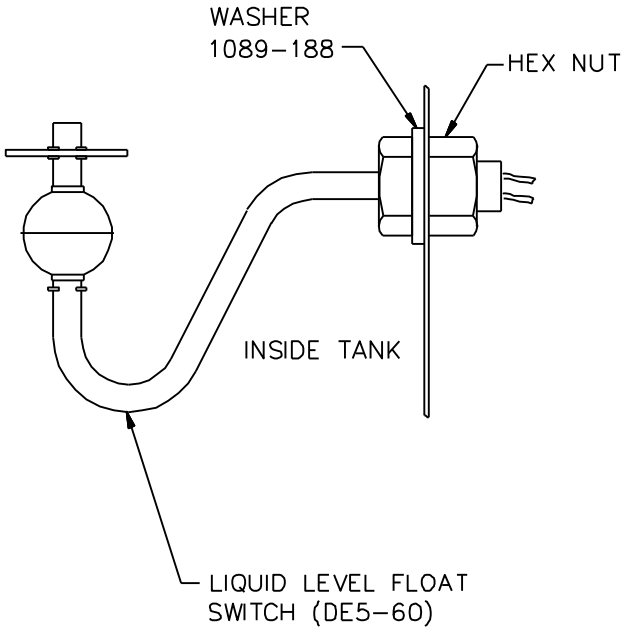
V-cup seal on the drain overflow tube may become gummed not allowing the overflow tube to seal. This will cause the drain to leak water. Remove any build-up on the V-cup seal. When the seal becomes worn, replace with part # D2-557.

CLEANING PROCEDURES (CONTINUED)

5. Clean suction strainers of build-up.

> **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.

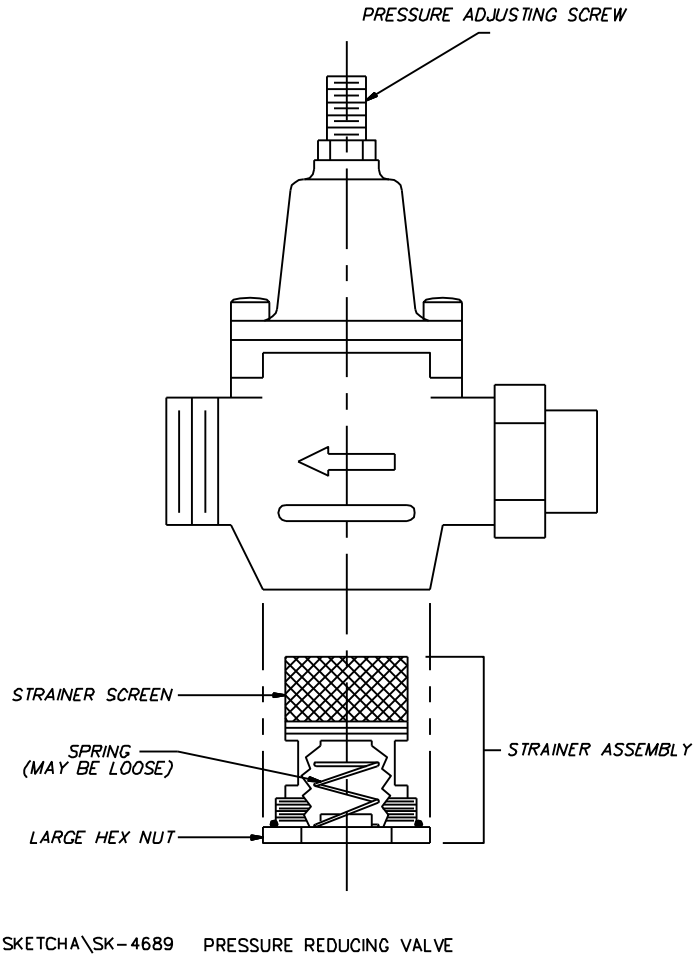
> **NOTE:**
> Upper & lower wash & rinse pipes are not the same.

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.

> **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

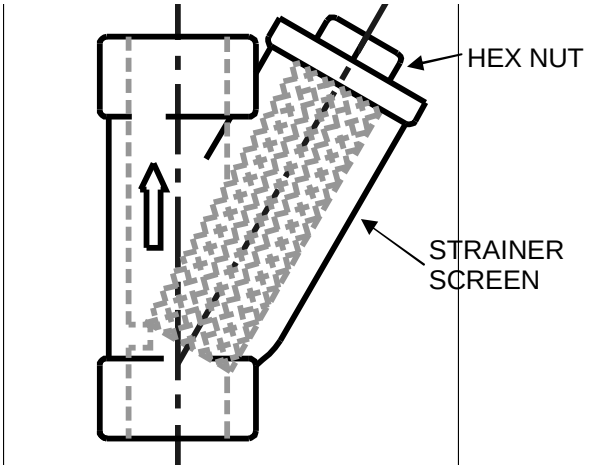
1. Remove and clean the strainer screens on the water and steam lines. If the screens cannot be cleaned, replace.
2. Inspect the condition of the solenoid valve seats, and diaphragms. Replace where necessary.
3. Inspect drain O-Rings for leakage. Replace where necessary.
4. Check door spring tension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



LINE STRAINER

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

> **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

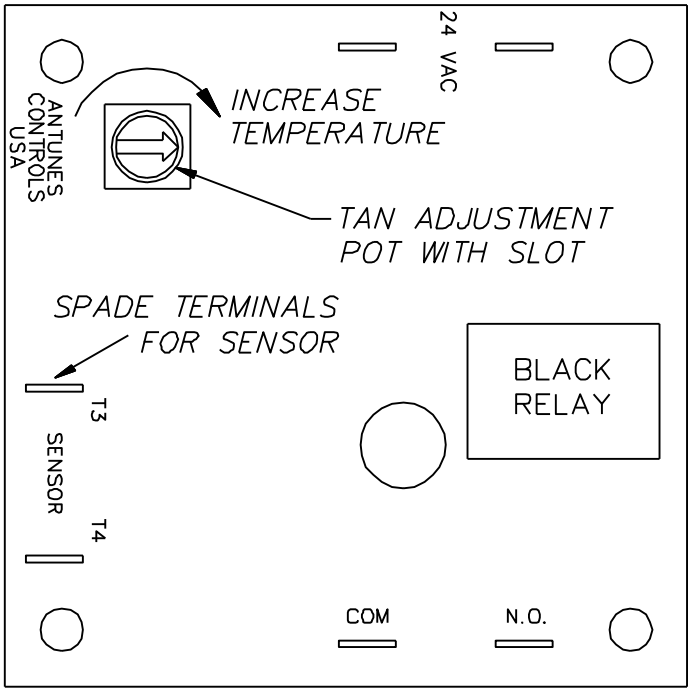
See dwg. #SK-4703

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.

> **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.

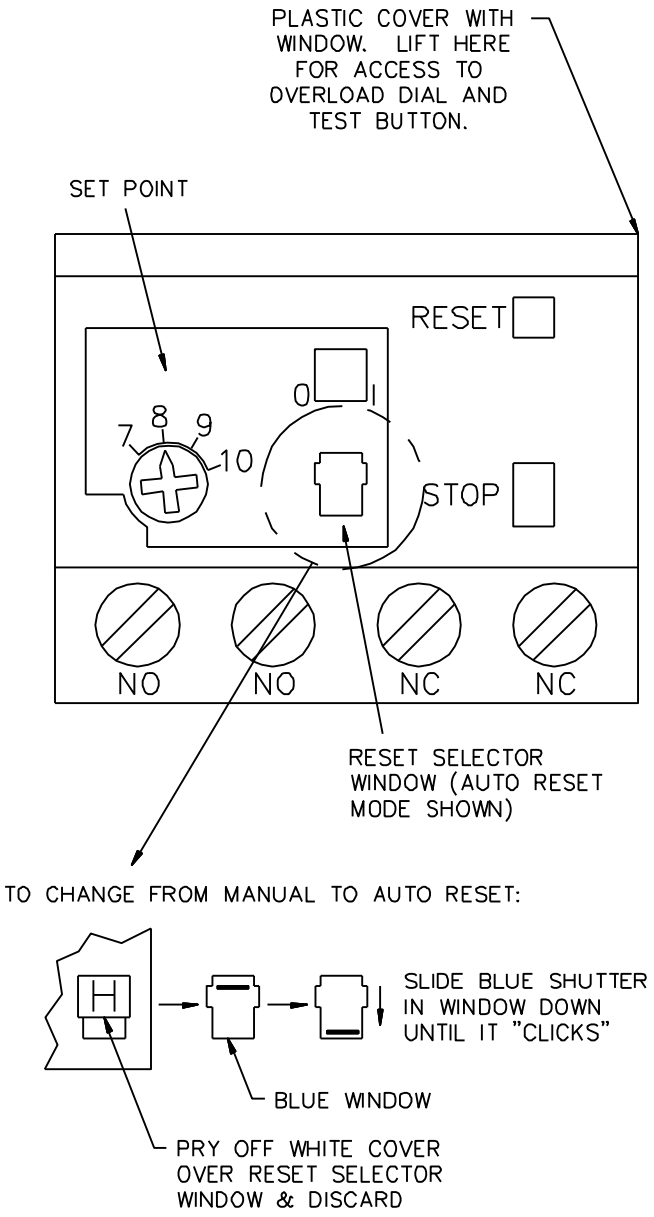
Steam Heat

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.



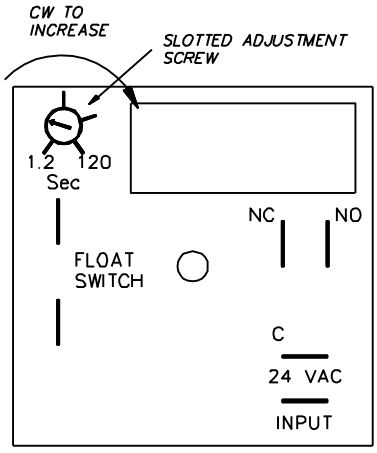
SKETCHA\SK-3829 OVERLOAD RELAY

Level System

The level control system consists of one overfill 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 overfill timer begins to time-out and continues the filling process until the tank(s) is full.



Liquid Level Timer DE7-35
Sk-4698

NOTE:
The overfill 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.

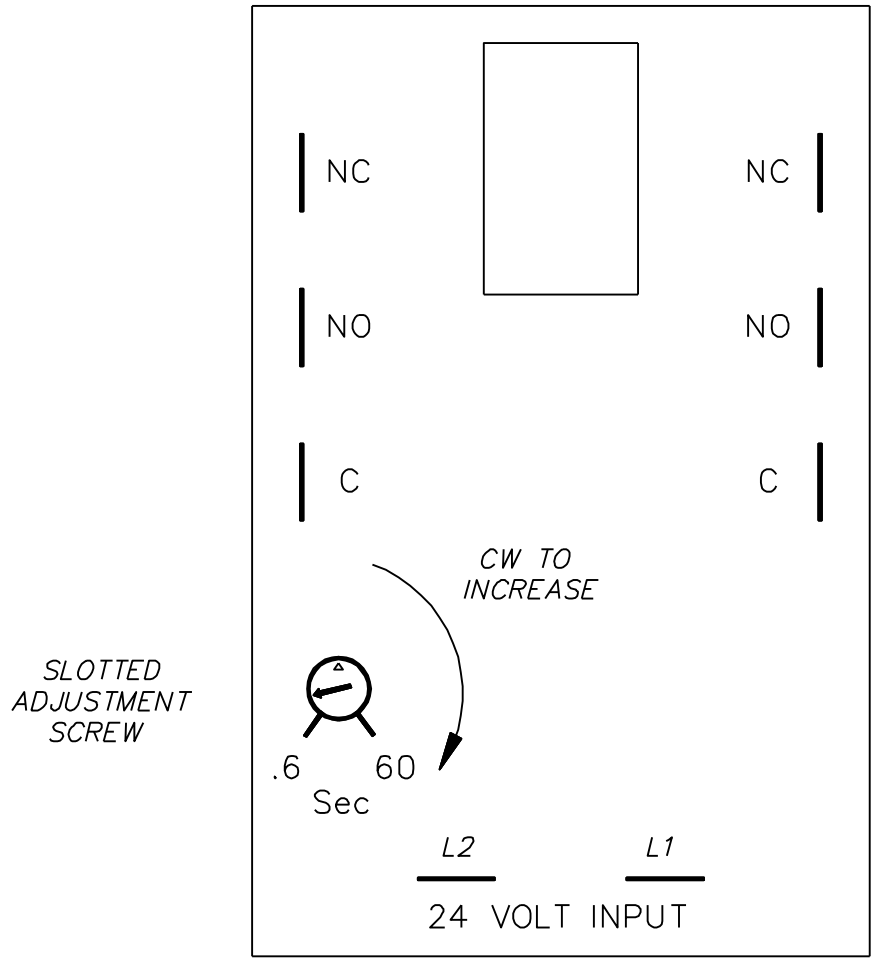
NOTE:
Dirty level floats will cause the tank heat to energize with no water in the tanks. LEVEL FLOATS MUST BE CLEANED DAILY.

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.

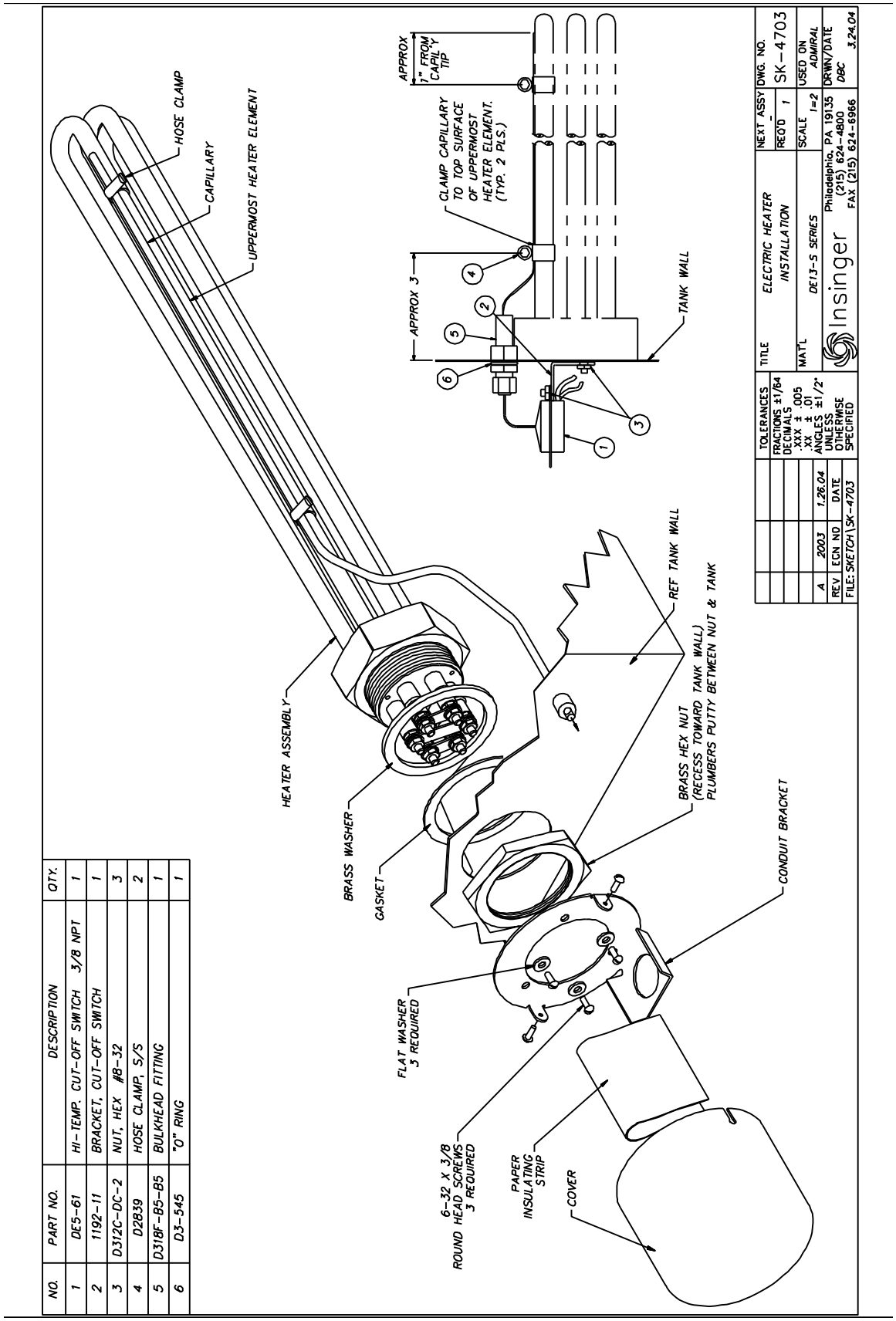
See drawing SK-3490, item no. 8. The potentiometer control – see below – increases or decreases the sequence time. Turn the potentiometer with a small slotted screwdriver clockwise to increase time and counterclockwise to decrease time.

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.

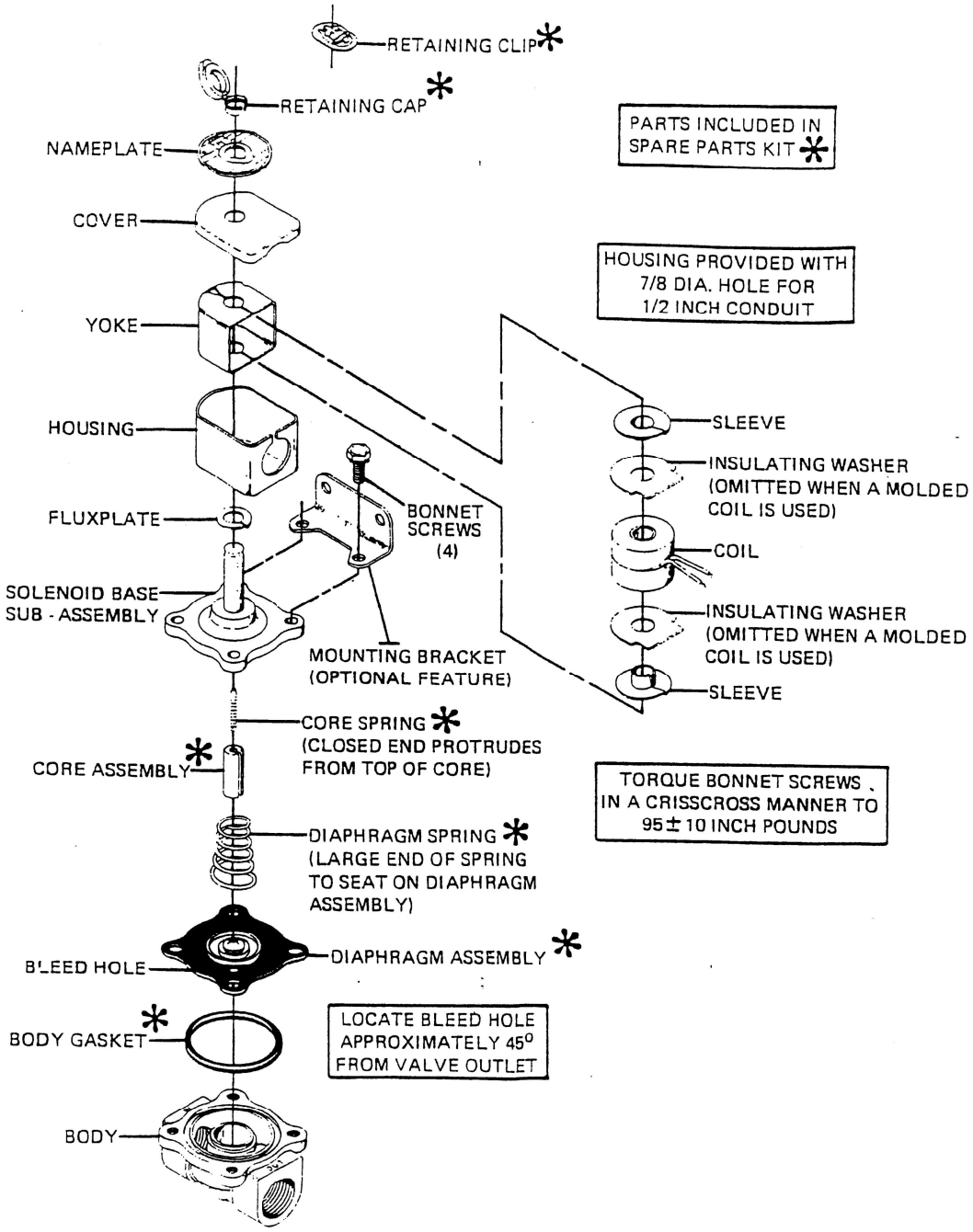


WASH & RINSE TIMER DE7-27

SKETCHA\SK-4708



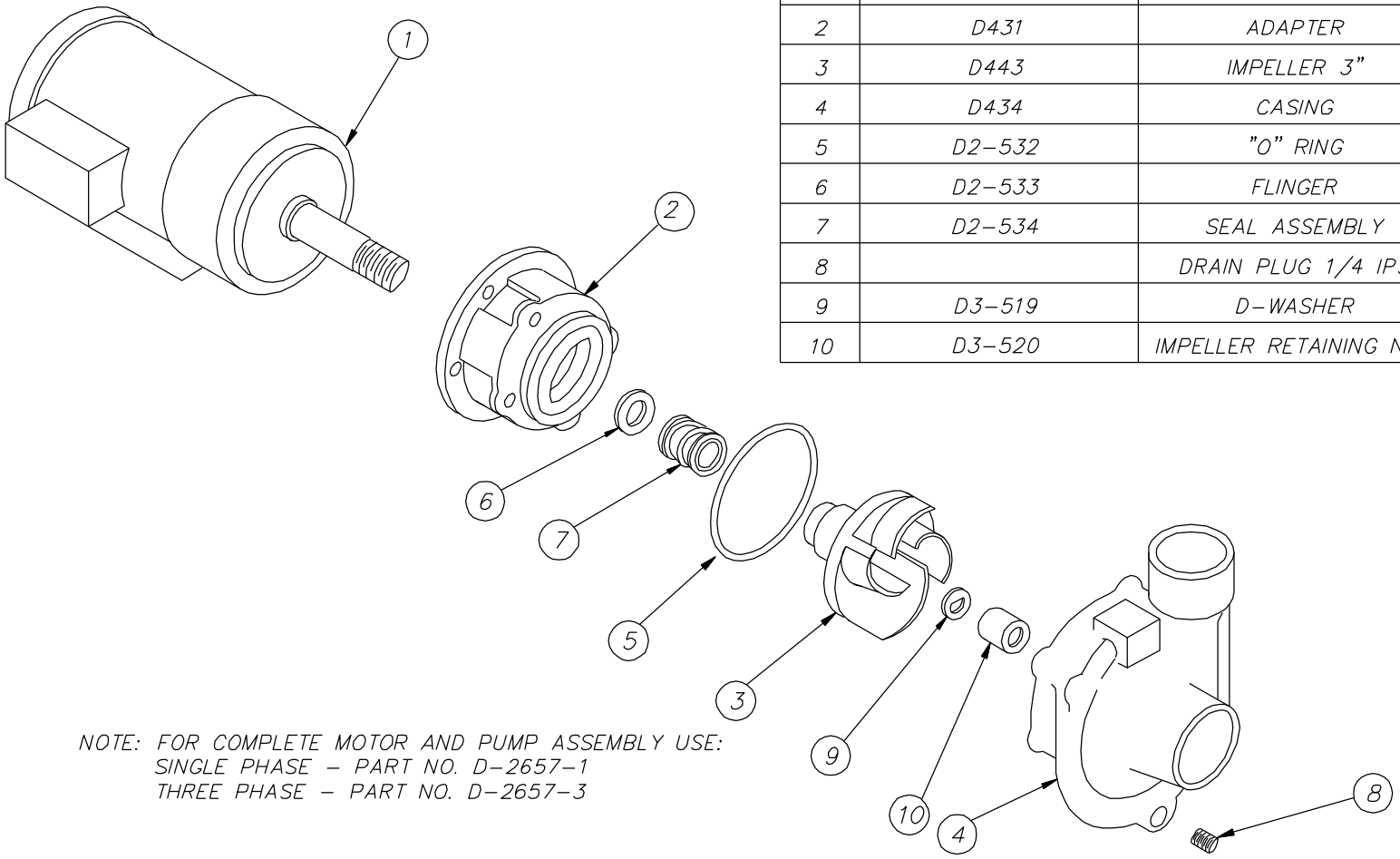
NO.	PART NO.	DESCRIPTION	QTY.
1	DE5-61	HI-TEMP. CUT-OFF SWITCH 3/8 NPT	1
2	1192-11	BRACKET, CUT-OFF SWITCH	1
3	D312C-DC-2	NUT, HEX #8-32	3
4	D2839	HOSE CLAMP, S/S	2
5	D318F-B5-B5	BULKHEAD FITTING	1
6	D3-545	"O" RING	1



SOLENOID VALVE
FINAL RINSE
6–17

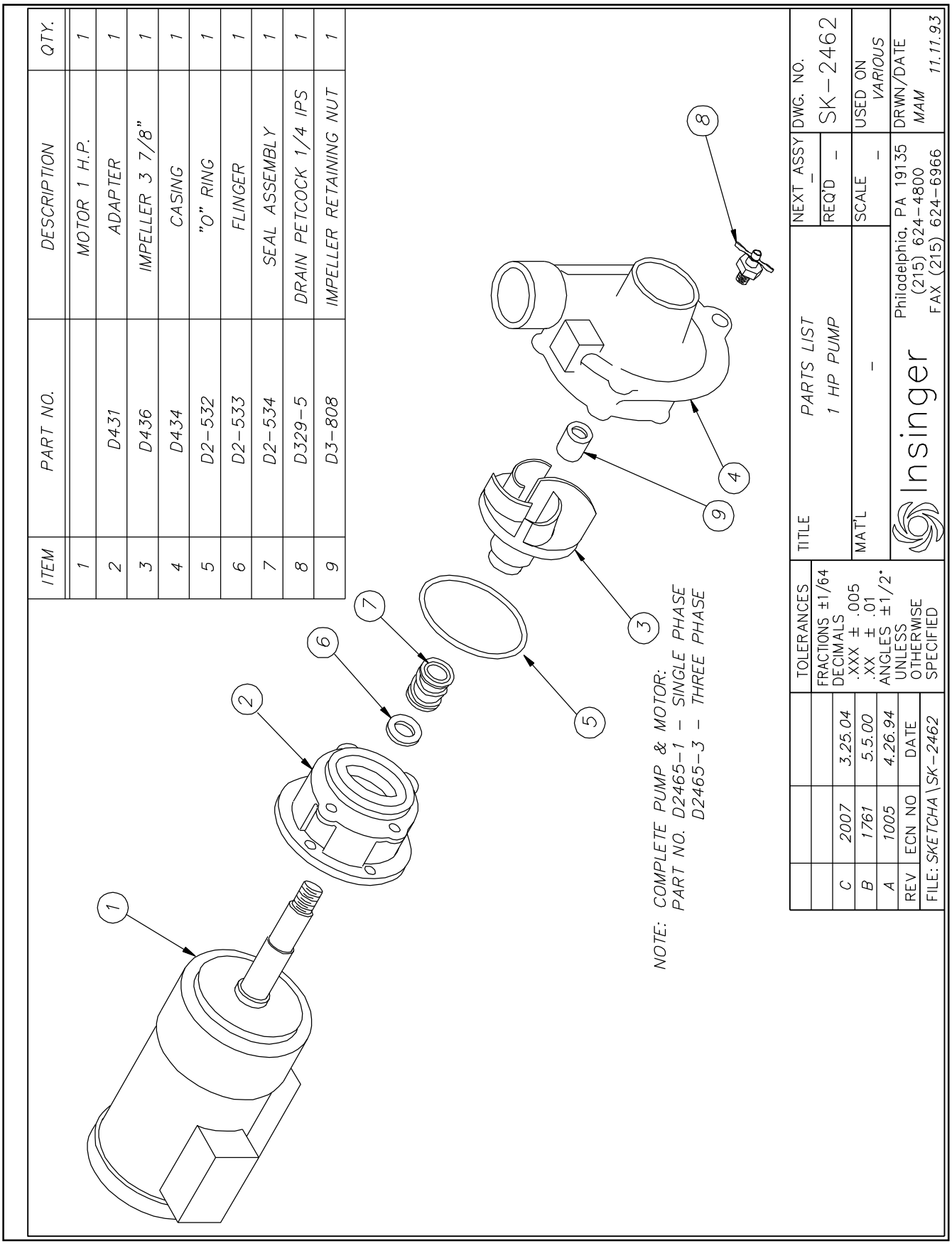
SKETCHA\SK–4692

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	NEXT ASSY	DWG. NO.
			FRACTIONS ±1/64 DECIMALS .XXX ± .005 .XX ± .01 ANGLES ±1/2° UNLESS OTHERWISE SPECIFIED	PARTS LIST 2 H.P. PUMP	– REQ'D –	SK-2923
				MAT'L –	SCALE –	USED ON VARIOUS
A	966	10.29.93		Insinger Machine Company Philadelphia, PA 19135 (215) 624-4800 FAX (215) 624-6966		DRWN/DATE MAM 11.11.93
REV	ECN NO	DATE				
FILE: SKETCHA\SK-2923						



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

REV	ECN NO	DATE
C	2007	3.25.04
B	1761	5.5.00
A	1005	4.26.94

FILE: SKETCHA\SK-2462

TOLERANCES
FRACTIONS ±1/64
DECIMALS
.XXX ± .005
.XX ± .01
ANGLES ±1/2°
UNLESS OTHERWISE SPECIFIED

TITLE
PARTS LIST
1 HP PUMP

MAT'L -

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

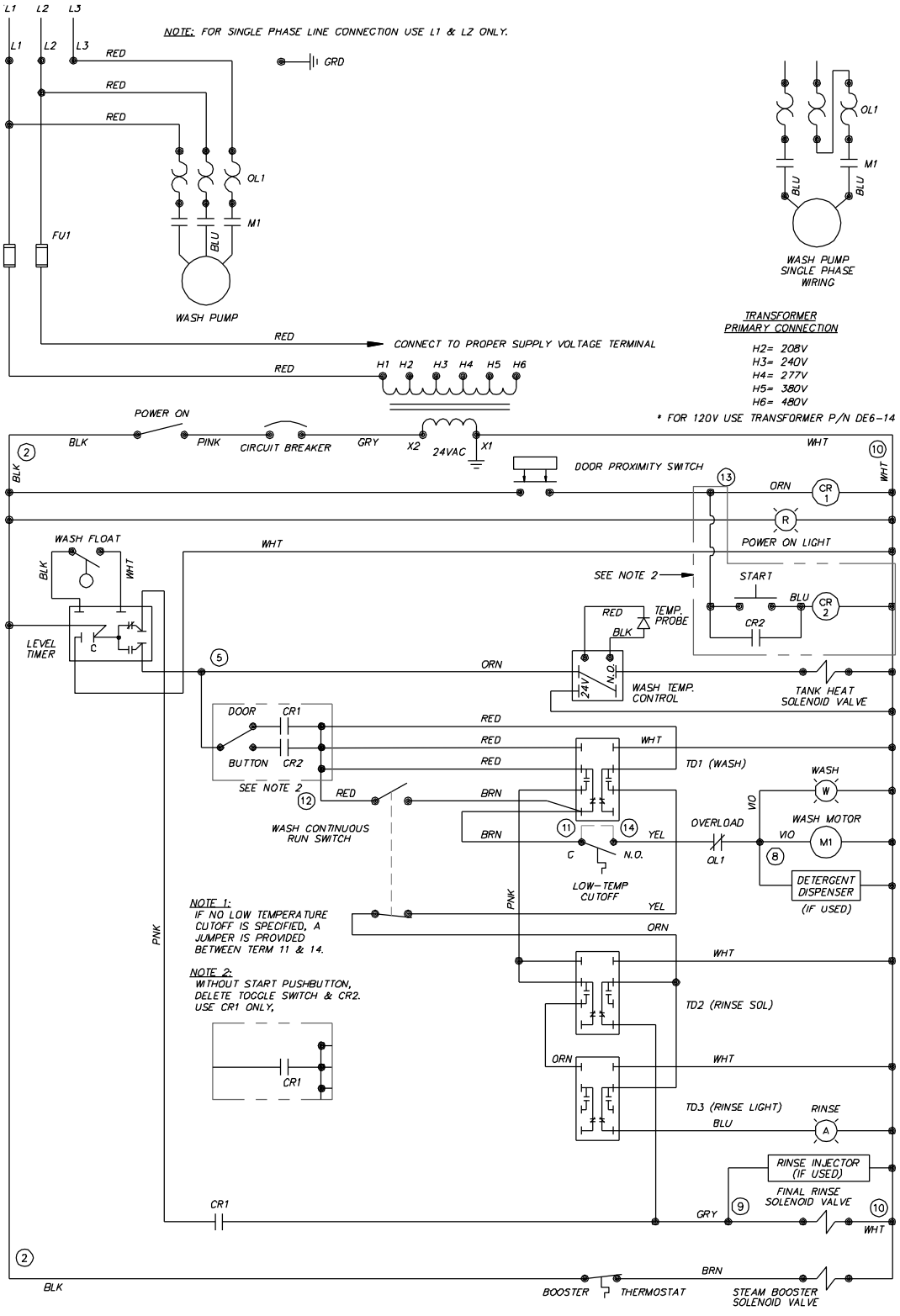
NEXT ASSY _
REQ'D -

SCALE -

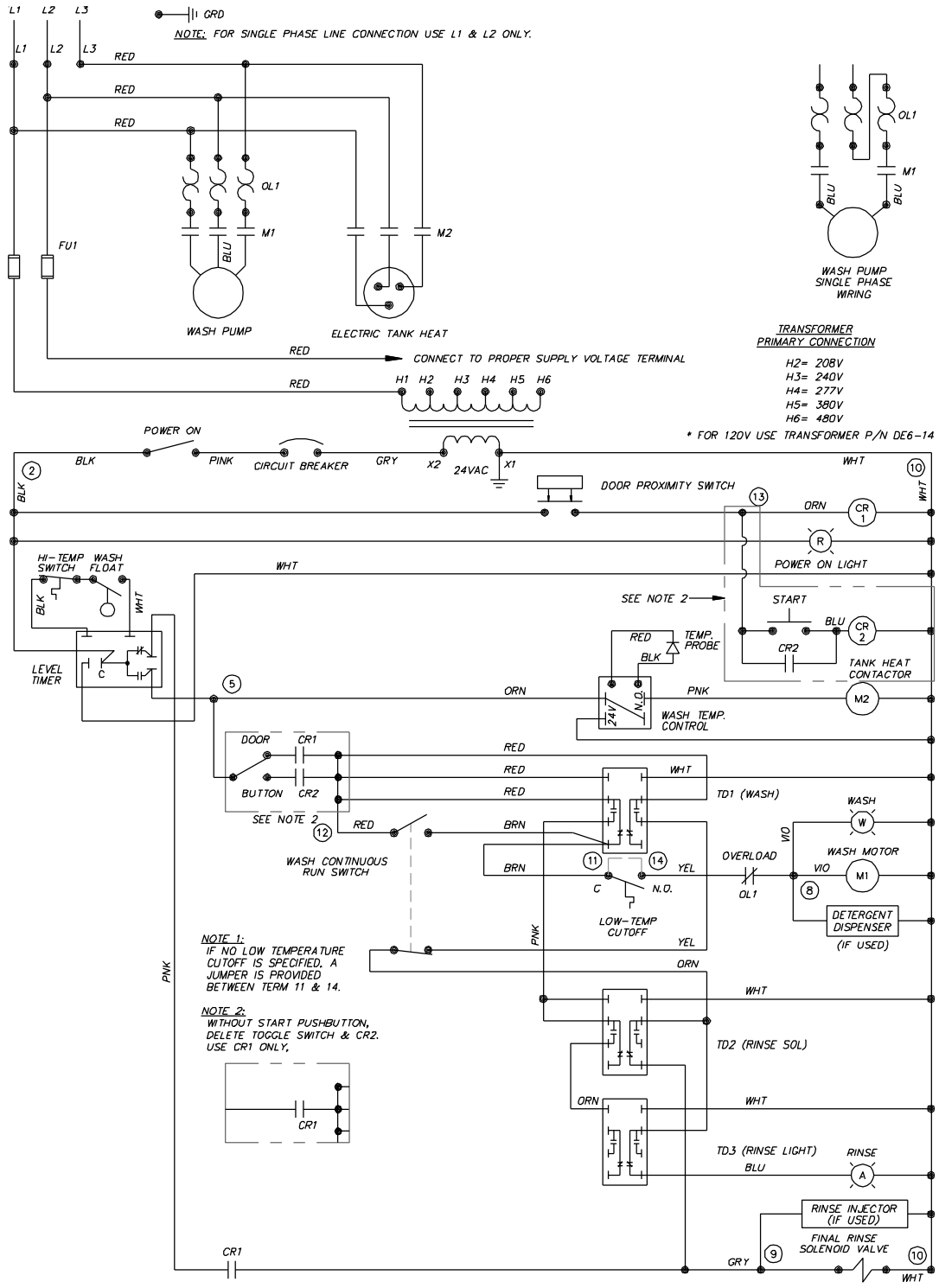
DWG. NO. SK-2462

USED ON VARIOUS

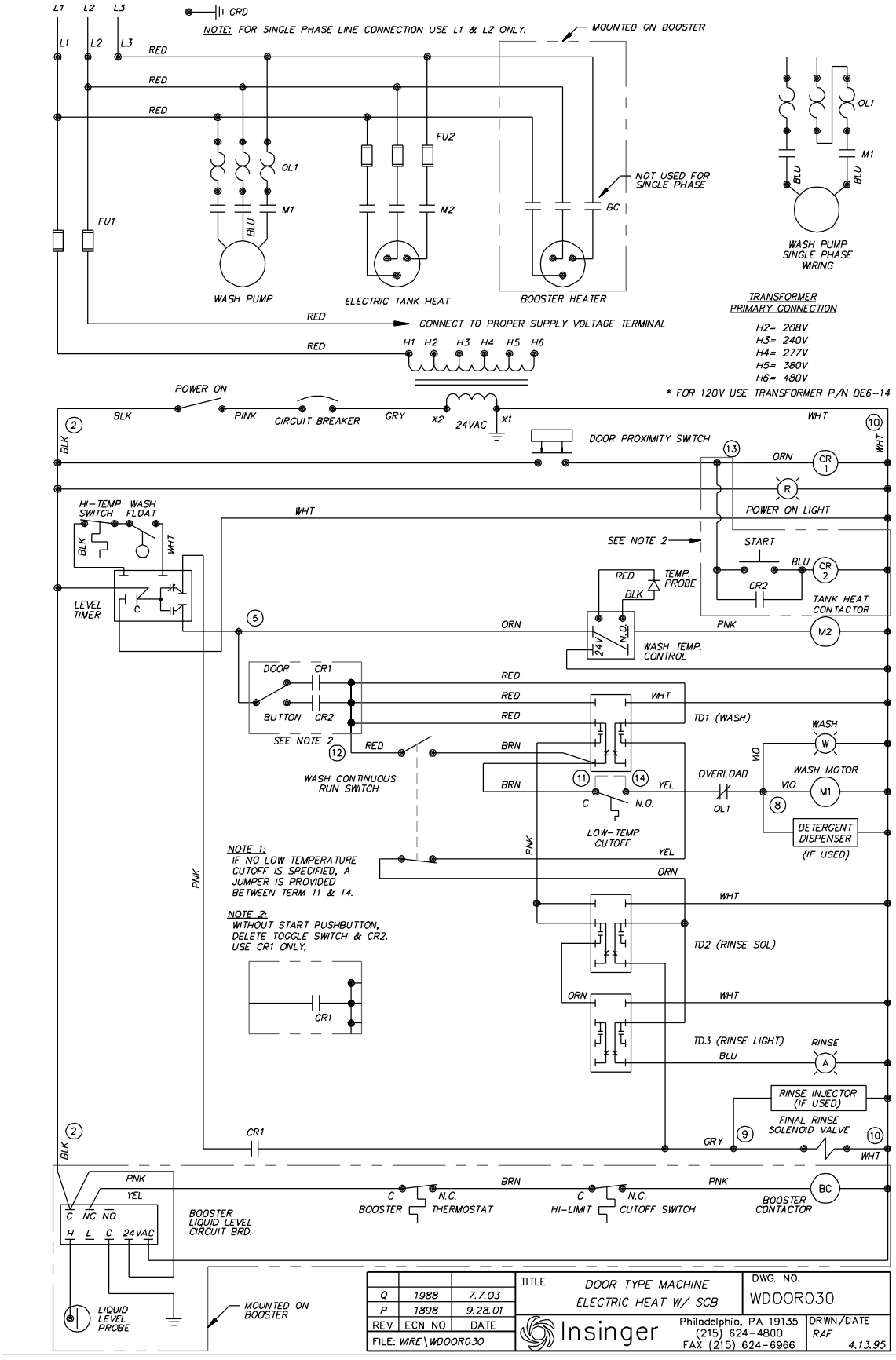
DRWN/DATE MAM 11.11.93

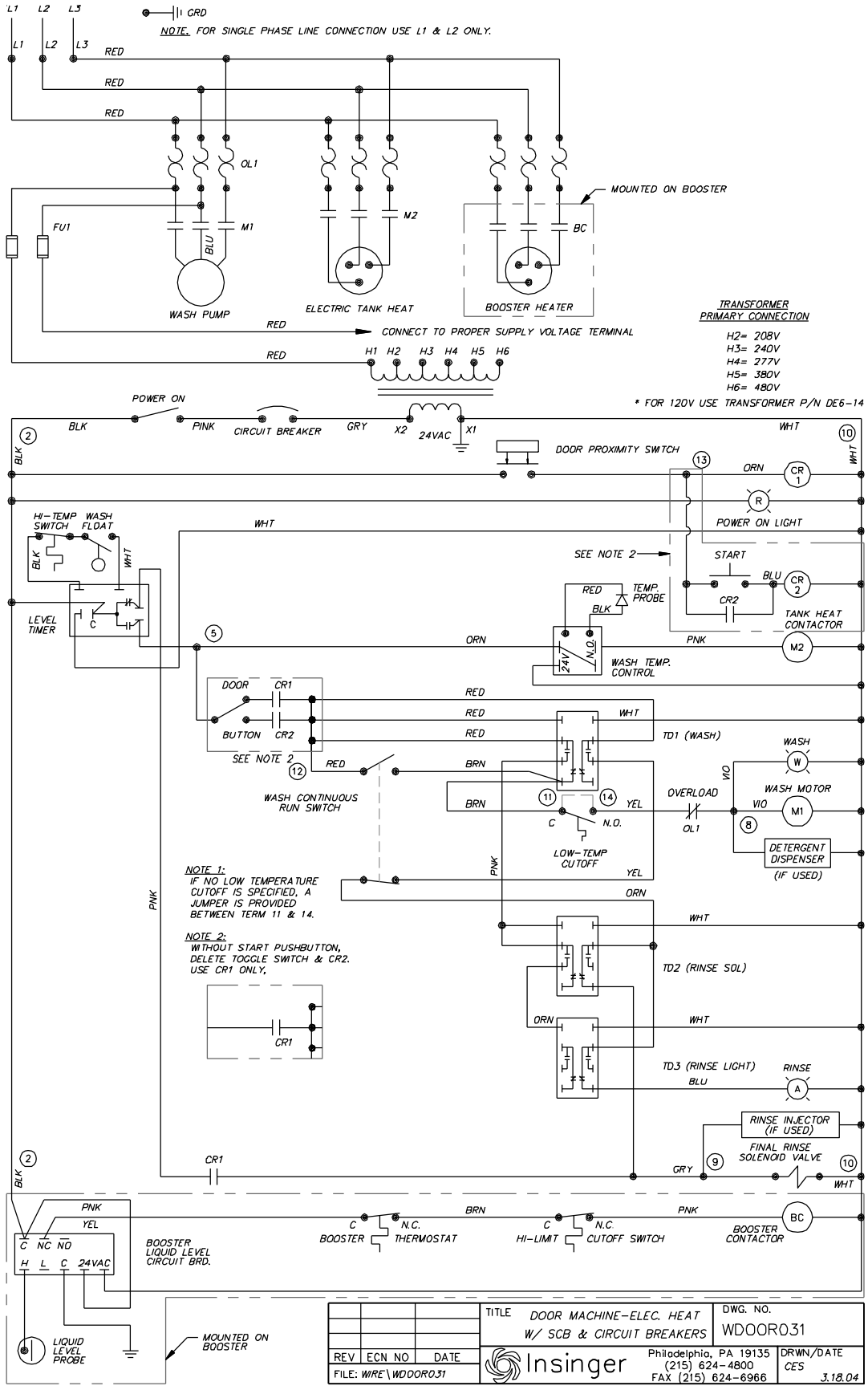


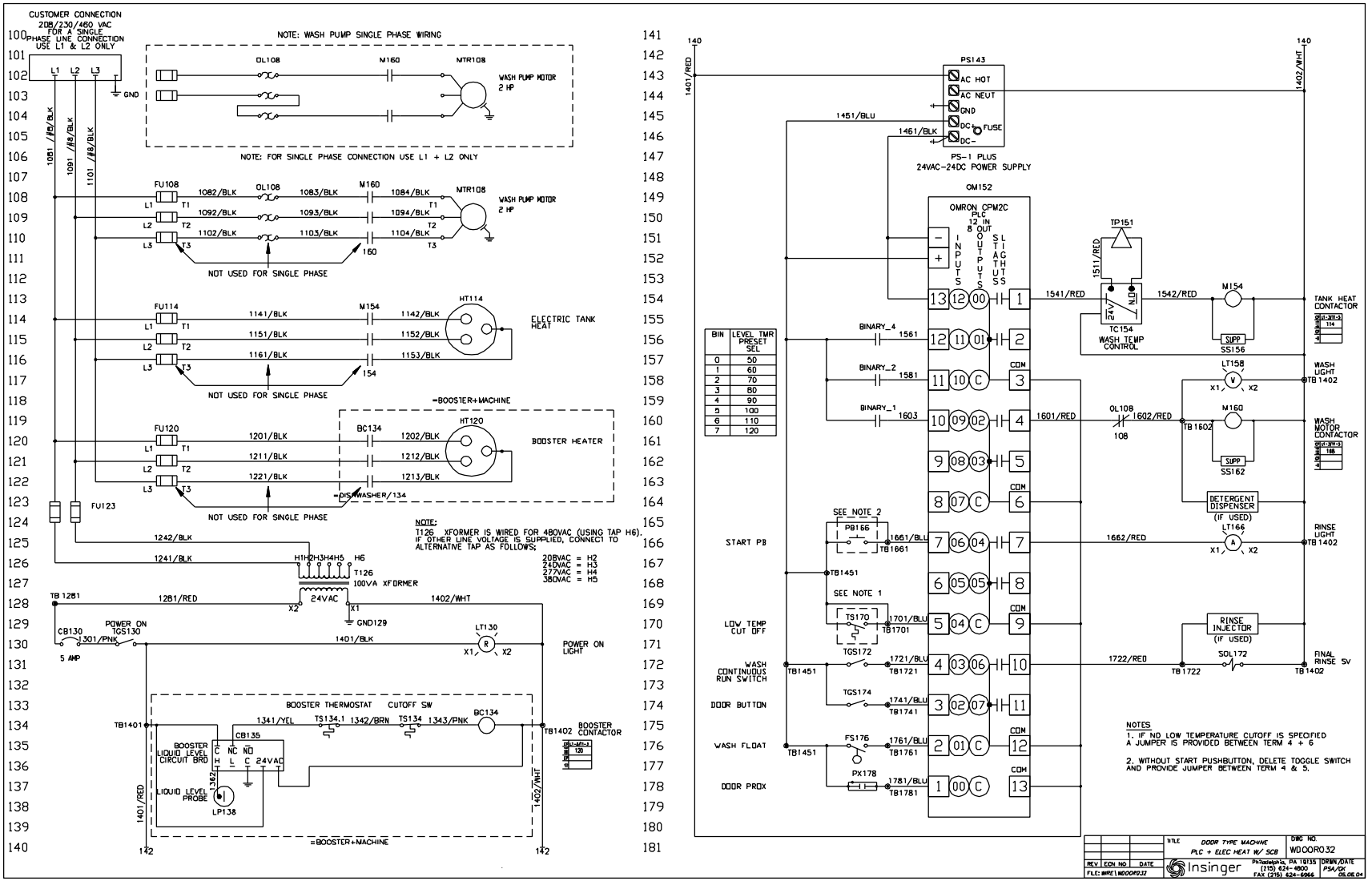
			TITLE: DOOR TYPE MACHINE STEAM HEAT	DWG. NO. WDOOR010
M	1898	9.28.01		
L	1619	6.1.98		
REV	ECN NO	DATE	Insinger Philadelphia, PA 19135 (215) 624-4800 FAX (215) 624-6966	DRWN/DATE RAF 4.11.95
FILE: WIRE\WDOOR010				



			TITLE: DOOR TYPE MACHINE ELECTRIC HEAT	DWG. NO. WDOOR020
M	1988	7.7.03		
L	1898	9.28.01		
REV	ECN NO	DATE	Insinger Philadelphia, PA 19135 (215) 624-4800 FAX (215) 624-6966	DRWN/DATE RAF 04.12.95
FILE: WIRE\WDOOR020				


L1 L2 L3
GRD
NOTE: FOR SINGLE PHASE LINE CONNECTION USE L1 & L2 ONLY.
MOUNTED ON BOOSTER
RED
FU1
FU2
OL1
M1
M2
BC
NOT USED FOR SINGLE PHASE
BLU
WASH PUMP
ELECTRIC TANK HEAT
BOOSTER HEATER
WASH PUMP SINGLE PHASE WIRING
TRANSFORMER PRIMARY CONNECTION
H2= 208V
H3= 240V
H4= 277V
H5= 380V
H6= 480V
* FOR 120V USE TRANSFORMER P/N DE6-14
CONNECT TO PROPER SUPPLY VOLTAGE TERMINAL
H1 H2 H3 H4 H5 H6
POWER ON
BLK
PINK
CIRCUIT BREAKER
GRY
X2
24VAC
X1
WHT
DOOR PROXIMITY SWITCH
ORN
CR 1
R
POWER ON LIGHT
HI-TEMP WASH SWITCH
FLOAT
LEVEL TIMER
SEE NOTE 2
START
CR 2
TEMP. PROBE
TANK HEAT CONTACTOR
WASH TEMP. CONTROL
DOOR BUTTON
WASH CONTINUOUS RUN SWITCH
TD1 (WASH)
WASH
WASH MOTOR
OVERLOAD
LOW-TEMP CUTOFF
N.O.
DETERGENT DISPENSER
(IF USED)
NOTE 1:
IF NO LOW TEMPERATURE CUTOFF IS SPECIFIED, A JUMPER IS PROVIDED BETWEEN TERM 11 & 14.
NOTE 2:
WITHOUT START PUSHBUTTON, DELETE TOGGLE SWITCH & CR2. USE CR1 ONLY.
TD2 (RINSE SOL)
TD3 (RINSE LIGHT)
RINSE
RINSE INJECTOR (IF USED)
FINAL RINSE SOLENOID VALVE
BOOSTER LIQUID LEVEL CIRCUIT BRD.
BOOSTER THERMOSTAT
HI-LIMIT CUTOFF SWITCH
BOOSTER CONTACTOR
LIQUID LEVEL PROBE
MOUNTED ON BOOSTER
TITLE
DOOR TYPE MACHINE
ELECTRIC HEAT W/ SCB
DWG. NO.
WDOOR030
Insinger
Philadelphia, PA 19135
(215) 624-4800
FAX (215) 624-6966
DRWN/DATE
RAF
4.13.95
Q 1988 7.7.03
P 1898 9.28.01
REV ECN NO DATE
FILE: WIRE\WDOOR030

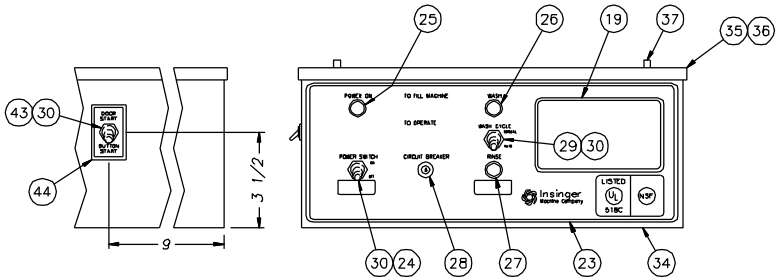

L1 L2 L3
GRD
NOTE. FOR SINGLE PHASE LINE CONNECTION USE L1 & L2 ONLY.
RED
OL1
M1
M2
BC
MOUNTED ON BOOSTER
FU1
BLU
WASH PUMP
ELECTRIC TANK HEAT
BOOSTER HEATER
CONNECT TO PROPER SUPPLY VOLTAGE TERMINAL
H1 H2 H3 H4 H5 H6
TRANSFORMER PRIMARY CONNECTION
H2= 208V
H3= 240V
H4= 277V
H5= 380V
H6= 480V
* FOR 120V USE TRANSFORMER P/N DE6-14
POWER ON
BLK
PINK
CIRCUIT BREAKER
GRY
X2
24VAC
X1
WHT
DOOR PROXIMITY SWITCH
ORN
CR 1
POWER ON LIGHT
HI-TEMP WASH SWITCH
FLOAT
LEVEL TIMER
SEE NOTE 2
START
CR 2
TEMP. PROBE
CR2
TANK HEAT CONTACTOR
WASH TEMP. CONTROL
DOOR
BUTTON
CR1
TD1 (WASH)
WASH CONTINUOUS RUN SWITCH
WASH
WASH MOTOR
OVERLOAD
OL1
DETERGENT DISPENSER
(IF USED)
LOW-TEMP CUTOFF
N.O.
NOTE 1:
IF NO LOW TEMPERATURE CUTOFF IS SPECIFIED, A JUMPER IS PROVIDED BETWEEN TERM 11 & 14.
NOTE 2:
WITHOUT START PUSHBUTTON, DELETE TOGGLE SWITCH & CR2. USE CR1 ONLY.
TD2 (RINSE SOL)
TD3 (RINSE LIGHT)
RINSE
RINSE INJECTOR (IF USED)
FINAL RINSE SOLENOID VALVE
BOOSTER LIQUID LEVEL CIRCUIT BRD.
C NC NO
H L C 24VAC
BOOSTER THERMOSTAT
HI-LIMIT CUTOFF SWITCH
BOOSTER CONTACTOR
LIQUID LEVEL PROBE
MOUNTED ON BOOSTER
TITLE DOOR MACHINE-ELEC. HEAT W/ SCB & CIRCUIT BREAKERS
DWG. NO. WDOOR031
REV ECN NO DATE
FILE: WIRE\WDOOR031
Insinger
Philadelphia, PA 19135
(215) 624-4800
FAX (215) 624-6966
DRWN/DATE CES 3.18.04


CUSTOMER CONNECTION
208/230/460 VAC
FOR A SINGLE
PHASE LINE CONNECTION
USE L1 & L2 ONLY
NOTE: WASH PUMP SINGLE PHASE WIRING
WASH PUMP MOTOR
2 HP
NOTE: FOR SINGLE PHASE CONNECTION USE L1 + L2 ONLY
NOT USED FOR SINGLE PHASE
ELECTRIC TANK HEAT
=BOOSTER+MACHINE
BOOSTER HEATER
=DISHWASHER/134
NOTE:
T126 XFORMER IS WIRED FOR 480VAC (USING TAP H6).
IF OTHER LINE VOLTAGE IS SUPPLIED, CONNECT TO
ALTERNATIVE TAP AS FOLLOWS:
208VAC = H2
240VAC = H3
277VAC = H4
380VAC = H5
100VA XFORMER
24VAC
GND129
POWER ON
TGS130
5 AMP
POWER ON LIGHT
BOOSTER THERMOSTAT CUTOFF SW
BOOSTER CONTACTOR
LIQUID LEVEL CIRCUIT BRD
LIQUID LEVEL PROBE
LP138
PS143
AC HOT
AC NEUT
GND
DC+
DC-
FUSE
PS-1 PLUS
24VAC-24DC POWER SUPPLY
OM152
OMRON CPM2C
PLC
12 IN
8 OUT
INPUTS
OUTPUTS
SLIAGTHTUSS
TC154
WASH TEMP CONTROL
TANK HEAT CONTACTOR
WASH LIGHT
WASH MOTOR CONTACTOR
DETERGENT DISPENSER
(IF USED)
RINSE LIGHT
RINSE INJECTOR
(IF USED)
FINAL RINSE SV
START PB
LOW TEMP CUT OFF
WASH CONTINUOUS RUN SWITCH
DOOR BUTTON
WASH FLOAT
DOOR PROX
BIN LEVEL TMR PRESET SEL
0 50
1 60
2 70
3 80
4 90
5 100
6 110
7 120
NOTES
1. IF NO LOW TEMPERATURE CUTOFF IS SPECIFIED A JUMPER IS PROVIDED BETWEEN TERM 4 + 6
2. WITHOUT START PUSHBUTTON, DELETE TOGGLE SWITCH AND PROVIDE JUMPER BETWEEN TERM 4 & 5.
DOOR TYPE MACHINE
PLC + ELEC HEAT W/ SCR
WD00R032
Insinger
Philadelphia, PA 19135
(215) 624-4800
FAX (215) 624-6966

ITEM	DESCRIPTION	PART NO.	QTY
19	DATA DECAL	SK-3715	1
20	TIMER (LIQUID LEVEL)	DE7-35	1
21	TERMINAL BLOCK ASSY	DE3-9	1
22	TERMINAL BLOCK ASSY		1
	208-460 V, 3 PHASE	DE3-3	
	220 SINGLE PHASE	DE3-3	
	220 SINGLE PHASE W/SCB	DE3-154	
23	DECAL - PUSHBUTTON START	SK-4502	1
	DECAL - NO PB START (REF)	SK-3862	
24	SWITCH, DPDT (POWER ON)	DE5-11	1
25	PILOT LIGHT (RED)	DE9-107	1
26	PILOT LIGHT (WHITE)	DE9-108	1
27	PILOT LIGHT (AMBER)	DE9-109	1
28	CIRCUIT BREAKER (5A)	DE9-43	1
29	SWITCH (AUTO - MANUAL)	DE5-11	1
30	BOOT	DE9-13	AR

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			3
	460 V	KTK-R-6	DE9-192	
	380 V	KTK-R-6	DE9-192	
	230 V	KTK-R-10	DE9-193	
	208V	KTK-R-15	DE9-194	
	FUSE (W/ 3 PH SCB) 5 KW TANK HEAT			3
	460 V	KTK-R-10	DE9-193	
	380 V	KTK-R-10	DE9-193	
	230 V	KTK-R-15	DE9-194	
	208V	KTK-R-20	DE9-195	

ITEM	DESCRIPTION		PART NO.	QTY
39	FUSE (W/ 3 PH SCB) 6 KW TANK HEAT			3
	460 V	KTK-R-10	DE9-193	
	380 V	KTK-R-15	DE9-194	
	230 V	KTK-R-20	DE9-195	
	208V	KTK-R-20	DE9-195	
40	FUSE BLOCK, 2 POLE (W/ 1 PH SCB)		DE9-185	1
41	FUSE (W/ 1 PH SCB) 3 KW TANK HEAT			2
	220 V	KTK-R-20	DE9-195	
	FUSE (W/ 1 PH SCB) 5 KW TANK HEAT			2
	220 V	KTK-R-25	DE9-207	
	FUSE (W/ 1 PH SCB) 6 KW TANK HEAT			2
	220 V	KTK-R-30	DE9-189	
42	OVERLOAD BASE		DE2-60	1
43	SWITCH, SPDT		DE5-22	1
44	LABEL, SELECTOR SWITCH		SK-4513	1



NOT SHOWN

ELECTRIC IMMERSION HEATER	3 KW	5 KW	1
440-480/3	DE13-SC73	DE13-SD73	
380/3	DE13-SC53	DE13-SD53	
220-240/3	DE13-SC43	DE13-SD43	
240/1	DE13-SC41	DE13-SD41	
220/1	DE13-SC31	DE13-SD31	
208/3	DE13-SC23	DE13-SD23	
208/1	DE13-SC21	DE13-SD21	
TEMPERATURE SENSOR		DE9-252	1
START PUSHBUTTON STATION		DE5-76	1
BRACKET, PUSHBUTTON		1434-10	1

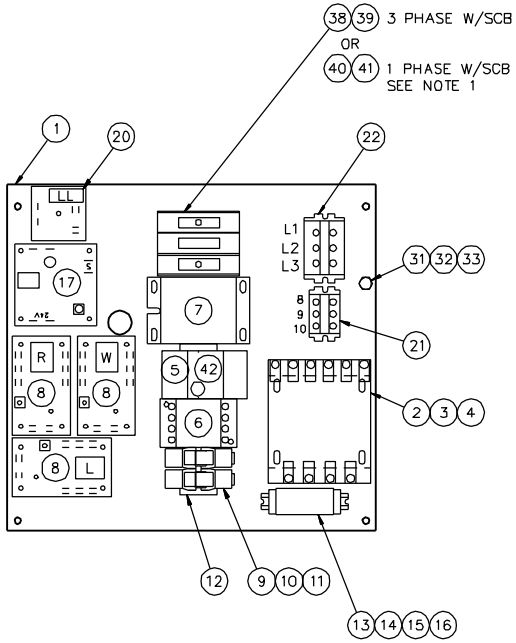
SHEET 2 OF 2

TITLE: 18-5 CONTROL PANEL LAYOUT				
Insinger	Philadelphia, PA 19135 (215) 624-4800 FAX (215) 624-6966		DRWN/DATE MFJ 5.24.95	
			FILE: SKETCH\SK-3490	
X	2024	12.1.04	SCALE 1=4	DWG. NO. SK-3490
W	1945	7.17.02		
REV	ECN NO	DATE		

ITEM	DESCRIPTION	PART NO.	QTY
13	DIN RAIL (15 mm)	DE3-42	1
14	TERMINAL SECTION	DE3-39	14
15	TERMINAL END COVER PLATE	DE3-40	1
16	TERMINAL END CLAMP	DE3-41	2
17	TEMPERATURE CONTROL BOARD	DE9-251	1

ITEM	DESCRIPTION	PART NO.	QTY
8	TIME DELAY BOARD (WASH & RINSE)	DE7-27	3
9	RELAY BASE	DE2-37	1
10	RELAY	DE2-38	1
11	RELAY HOLD DOWN SPRING	DE3-43	1
12	DIN RAIL (35 mm)	DE9-84	1

ITEM	DESCRIPTION		PART NO.	QTY
1	COMPONENT MTG PLATE (13.5 x 12.69)		SK-3749	1
2	TRANSFORMER (100 VA, 24 VAC)			1
	ALL VOLTAGES EXCEPT 120 V		DE6-6	
	120 V		DE6-14	
3	FUSE BLOCK KIT (100 VA XFMR)			1
	FOR DE6-6		DE9-163	
	FOR DE6-14		DE9-191	
4	FUSE (100 VA TRANSFORMER PRIMARY)			2
	460 V	FNQ-R-.75	DE9-166	
	380 V	FNQ-R-.75	DE9-166	
	220 - 230 V	FNQ-R-1.4	DE9-168	
	208 V	FNQ-R-1.5	DE9-200	
	115 V	FNQ-R-2.8	DE9-201	
5	OVERLOAD RELAY (1 HP PUMP)			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)			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
7	CONTACTOR (ELECT TANK HEAT, 3, 5 OR 6 KW)			1
	ALL 3 PHASE	30 A RES	DE1-109	
	ALL 220-240 V, 1 PH	30 A RES	DE1-109	
	115-120 V, 1 PH	3 KW 30 A RES	DE1-109	
		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.

SHEET 1 OF 2

TITLE	18-5 CONTROL PANEL LAYOUT		
Insinger	Philadelphia, PA 19135 (215) 624-4800 FAX (215) 624-6966	DRWN/DATE	MFJ 5.24.95
		FILE: SKETCH\SK-3490	
X 1024 12.1 04		SCALE	DWG. NO.
W 1945 7.17.02		1=4	SK-3490
REV ECN NO DATE			

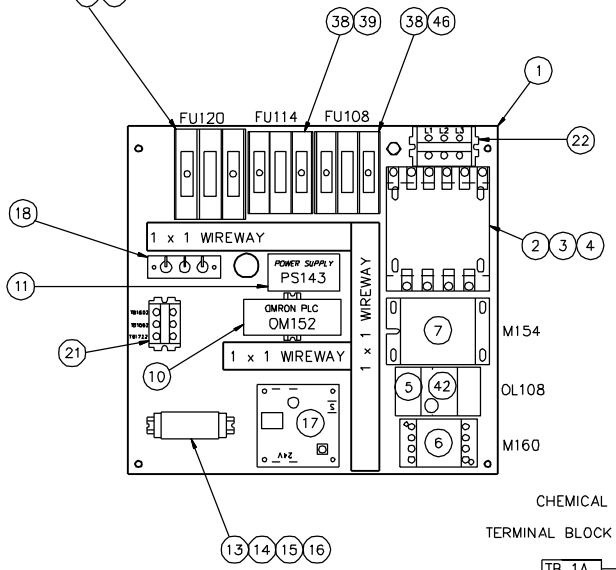
ITEM	DESCRIPTION	PART NO.	QTY
13	DIN RAIL (15 mm)	DE3-42	1
14	TERMINAL SECTION	DE3-39	14
15	TERMINAL END COVER PLATE	DE3-40	1
16	TERMINAL END CLAMP	DE3-41	2
17	TEMPERATURE CONTROL BOARD	DE9-251	1
18	LEVEL TMR PRESET SELECT	TS-1	1

ITEM	DESCRIPTION	PART NO.	QTY
8	FUSE BLOCK, 3 POLE (LITTELFUSE)	L60060C-3C	1
9	FUSE (W/ 3 PH SCB) FOR 13.5 KW BOOSTER HEATER		3
	460 V	KTK-R-20	
	380 V	KTK-R-25	
	230 V	CCMR 40	
	208V	CCMR 45	
10	OMRON PLC	CPM2C-20CDR-D	1
11	DCPS 24VDC POWER SUPPLY	DCPS	1
12	DIN RAIL (35 mm)	DE9-84	1

ITEM	DESCRIPTION		PART NO.	QTY
1	COMPONENT MTG PLATE (13.5 x 12.69)		SK-3749	1
2	TRANSFORMER (100 VA, 24 VAC)			1
	ALL VOLTAGES EXCEPT 120 V		DE6-6	
	120 V		DE6-14	
3	FUSE BLOCK KIT (100 VA XFMR)			1
	FOR DE6-6		DE9-163	
	FOR DE6-14		DE9-191	
4	FUSE (100 VA TRANSFORMER PRIMARY)			2
	460 V	FNQ-R-.75	DE9-166	
	380 V	FNQ-R-.75	DE9-166	
	220 - 230 V	FNQ-R-1.4	DE9-168	
	208 V	FNQ-R-1.5	DE9-200	
	115 V	FNQ-R-2.8	DE9-201	
5	OVERLOAD RELAY (1 HP PUMP)			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)			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	17-25 A	DE2-61	
6	CONTACTOR (PUMP)	SP4	DE1-93	1
7	CONTACTOR (ELECT TANK HEAT, 3, 5 OR 6 KW)			1
	ALL 3 PHASE	30 A RES	DE1-109	
	ALL 220-240 V, 1 PH	30 A RES	DE1-109	
	115-120 V, 1 PH	3 KW 30 A RES	DE1-109	
		5 KW 50 A RES	DE1-110	
		6 KW 65 A RES	DE1-111	

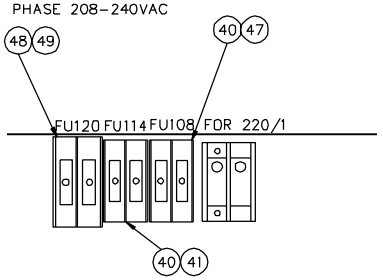
3 PHASE FUSE BLOCKS

8 9 3 PHASE 208-240VAC
OR
38 9 3 PHASE 380-460VAC



SINGLE PHASE FUSE BLOCKS

1 PHASE 208-240VAC



MAIN TERMINAL BLOCK

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 4	
TB 4	
TB 3	1401
TB 2	1402
TB 2	
TB 2	
TB 1	1281

CHEMICAL DISPENSE CONNECTION

TERMINAL BLOCK	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

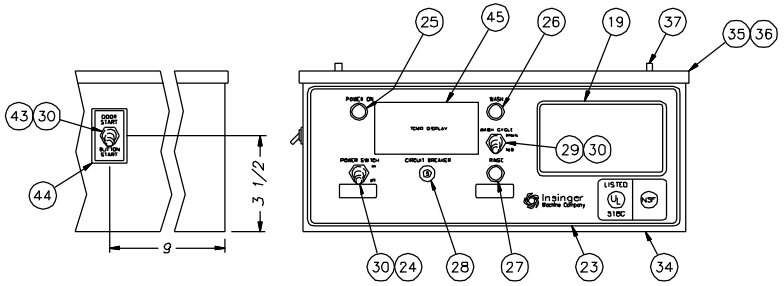
SHEET 1 OF 2

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

ITEM	DESCRIPTION	PART NO.	QTY
19	DATA DECAL	SK-3715	1
20	TIMER (LIQUID LEVEL)	DE7-35	1
21	TERMINAL BLOCK ASSY	DE3-9	1
22	TERMINAL BLOCK ASSY		1
	208-460 V, 3 PHASE	DE3-3	
	220 SINGLE PHASE	DE3-3	
	220 SINGLE PHASE W/SCB	DE3-154	
23	DECAL - PUSHBUTTON START	SK-4502	1
	DECAL - NO PB START (REF)	SK-3862	
24	SWITCH, DPDT (POWER ON)	DE5-11	1
25	PILOT LIGHT (RED)	DE9-107	1
26	PILOT LIGHT (WHITE)	DE9-108	1
27	PILOT LIGHT (AMBER)	DE9-109	1
28	CIRCUIT BREAKER (5A)	DE9-43	1
29	SWITCH (AUTO - MANUAL)	DE5-11	1
30	BOOT	DE9-13	AR

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		3
	460 V KTK-R-6	DE9-192	
	380 V KTK-R-6	DE9-192	
	230 V KTK-R-10	DE9-193	
	208V KTK-R-15	DE9-194	
	FUSE (W/ 3 PH SCB) 5 KW TANK HEAT		3
	460 V KTK-R-10	DE9-193	
	380 V KTK-R-10	DE9-193	
	230 V KTK-R-15	DE9-194	
	208V KTK-R-20	DE9-195	

ITEM	DESCRIPTION	PART NO.	QTY
39	FUSE (W/ 3 PH SCB) 6 KW TANK HEAT		3
	460 V KTK-R-10	DE9-193	
	380 V KTK-R-15	DE9-194	
	230 V KTK-R-20	DE9-195	
	208V KTK-R-20	DE9-195	
40	FUSE BLOCK, 2 POLE (W/ 1 PH SCB)	DE9-185	1
41	FUSE (W/ 1 PH SCB) 3 KW TANK HEAT		2
	220 V KTK-R-20	DE9-195	
	FUSE (W/ 1 PH SCB) 5 KW TANK HEAT		2
	220 V KTK-R-25	DE9-207	
	FUSE (W/ 1 PH SCB) 6 KW TANK HEAT		2
	220 V KTK-R-30	DE9-189	
42	OVERLOAD BASE	DE2-60	1
	OVERLOAD BASE (DE2-61 ONLY)	DE2-63	1
43	SWITCH, SPDT	DE5-22	1
44	LABEL, SELECTOR SWITCH	SK-4513	1
45	DIGITAL TEMPERATURE METER	K37L-TA1B-C	1
46	FUSE (W/ 3 PH SCB) 2HP WASH PUMP		3
	460 V KTK-R-6	DE9-192	
	380 V KTK-R-6	DE9-192	
	230 V KTK-R-10	DE9-193	
	208V KTK-R-10	DE9-193	
47	FUSE (W/ 1 PH SCB) 2 HP WASH PUMP		2
	208-230 V KTK-R-20	DE9-195	
48	FUSE BLOCK, 2 POLE (LITTELFUSE)	L60060C-2C	1
49	FUSE (W/ 1 PH SCB) FOR 13.5 KW BOOSTER HEATER		2
	230 V CCMR 50		
	208V CCMR 60		

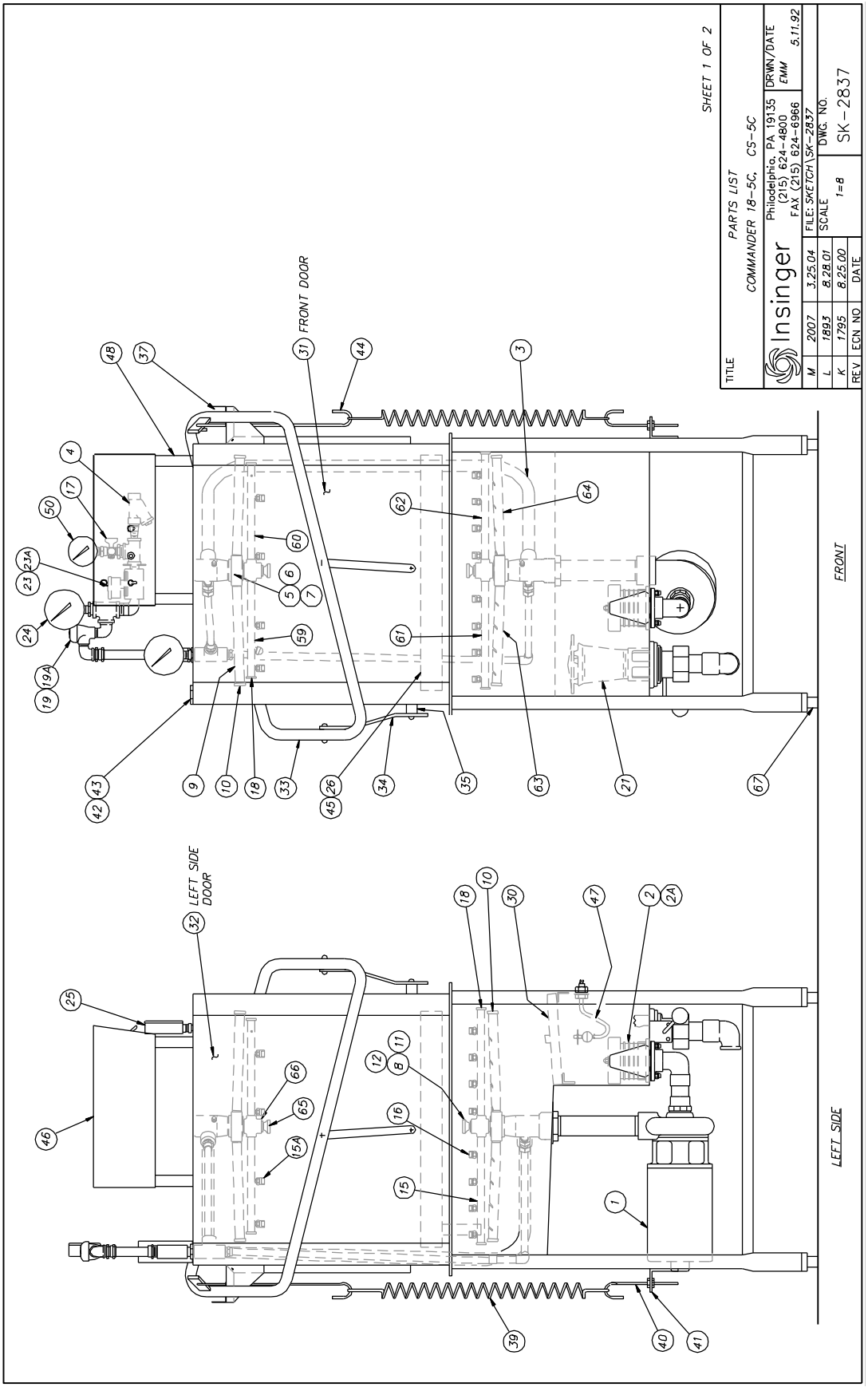


NOT SHOWN

ELECTRIC IMMERSION HEATER	3 KW	5 KW	1
440-480/3	DE13-SC73	DE13-SD73	
380/3	DE13-SC53	DE13-SD53	
220-240/3	DE13-SC43	DE13-SD43	
240/1	DE13-SC41	DE13-SD41	
220/1	DE13-SC31	DE13-SD31	
208/3	DE13-SC23	DE13-SD23	
208/1	DE13-SC21	DE13-SD21	
TEMPERATURE SENSOR		DE9-252	1
START PUSHBUTTON STATION		DE5-76	1
BRACKET, PUSHBUTTON		1434-10	1

SHEET 2 OF 2

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


SHEET 1 OF 2
TITLE
PARTS LIST
COMMANDER 18-5C, C5-5C
Insinger
Philadelphia, PA 19135
(215) 624-4800
FAX (215) 624-6966
DRWN/DATE
EMM 5.11.92
M 2007 3.25.04
L 1893 8.28.01
K 1795 8.25.00
REV ECN NO DATE
FILE: SKETCH\SK-2837
SCALE 1=8
DWG. NO. SK-2837
FRONT DOOR
LEFT SIDE DOOR
FRONT
LEFT SIDE

PARTS LIST: 18-5C, CS-5C

ITEM	PART NO.	DESCRIPTION	REQ.
1	1089-19	PUMP & MOTOR ASS'Y (1 H.P. - SPECIFY VOLTAGE)	1
2	D2-541	SUCTION STRAINER	1
2A	D3-825	SUCTION STRAINER SPRING	1
3	1463-16	DISCHARGE LINE ASS'Y	1
4	D2483A	"Y" STRAINER, 1/2	1
5	1084-76	SPRAY HUB - WASH	2
6	D2-563	O-RING	2
7	952-27	BUSHING, PLASTIC (WASH ARM HUB)	2
8	1089-178	BUSHING, PLASTIC (RINSE ARM PLUG)	1
9	1434-5	UPPER WASH SPRAY PIPE	2
10	D2-554-2	PLUG, 3/4-10 UNC-2A (WASH ARM)	4
11	D2-584	LOCKING SCREW	1
12	1084-22	SPRAY HUB - RINSE	1
15	1463-21	RINSE, LOWER SPRAY PIPE ASS'Y	1 SET
15A	1463-20	RINSE, UPPER SPRAY PIPE ASS'Y	1 SET
16	D2867	SPRAY NOZZLES - UPPER & LOWER RINSE ARM	12
17	D2497	PETCOCK	1
18	D2-554-1	PLUG, 9/16-12 UNC-2A	4
19	D2241A	VACUUM BREAKER, 1/2	1
19A	D2914RK	VACUUM BREAKER REPAIR KIT	1
21	SK-3028	DRAIN ASS'Y (WITH PARTS LIST)	1
23	D2606	SOLENOID VALVE, 1/2	1
23A	D2641	SOLENOID VALVE REPAIR KIT	1
24	D2495	TEMPERATURE GAUGE - FINAL RINSE	1
25	D2390	TEMPERATURE GAUGE	1
26	1089-107	TRACK ASS'Y	2
29	-	-	-
30	1089-10	SCRAP SCREEN	1
31	1089-208E	DOOR - FRONT	1
32	1089-208A	DOOR - LEFT SIDE	1
33	1084-126	DOOR ARM	1
34	1084-119	LINK - DOOR	2
35	957-26	SPACER - DOOR ARM LINK	2
36	-	-	-
37	D2-551	PIVOT BALL	1
39	SK-2294A-001	SPRING	2
40	957-27	SPRING EXTENSION - LOWER	2
41	1089-118	SPRING BRACKET	1
42	DE5-37	SWITCH, MAGNETIC	1
43	DE5-37A	MAGNET	1
44	957-49	SPRING EXTENSION - UPPER	2
45	1089-108	CORNER TRACK	1
46	SK-3490	CONTROL BOX ASS'Y	1
47	DE5-60	LIQUID LEVEL FLOAT ASS'Y.	1
48	1440-7	CONTROL BOX POST	4
49	-	-	-
50	SK-1433	PRESSURE GAUGE	1
52	-	-	-
53	-	-	-
54	-	-	-
55	-	-	-
56	-	-	-
57	-	-	-
58	-	-	-
59	1434-7A	UPPER RINSE PIPE	1
60	1434-7B	UPPER RINSE PIPE	1
61	1434-7C	LOWER RINSE PIPE	1
62	1434-7D	LOWER RINSE PIPE	1
63	1089-23A	LOWER WASH PIPE	1
64	1089-23B	LOWER WASH PIPE	1
65	1463-29	SUPPORT ASS'Y UPPER HUB	1
66	1463-25	RINSE HUB-UPPER	1
67	D2874	BULLET FOOT	4

SHEET 2 OF 2

W	2007	3.25.04
L	1893	8.28.01
K	1795	8.25.00
J	1761	5.4.00
REV	ECN NO	DATE

FILE: SKETCH\SK-2837

TOLERANCES: FRACTIONS ±1/64; DECIMALS .XXX ± .005, .XX ± .01; ANGLES ± 1/2°; UNLESS OTHERWISE SPECIFIED

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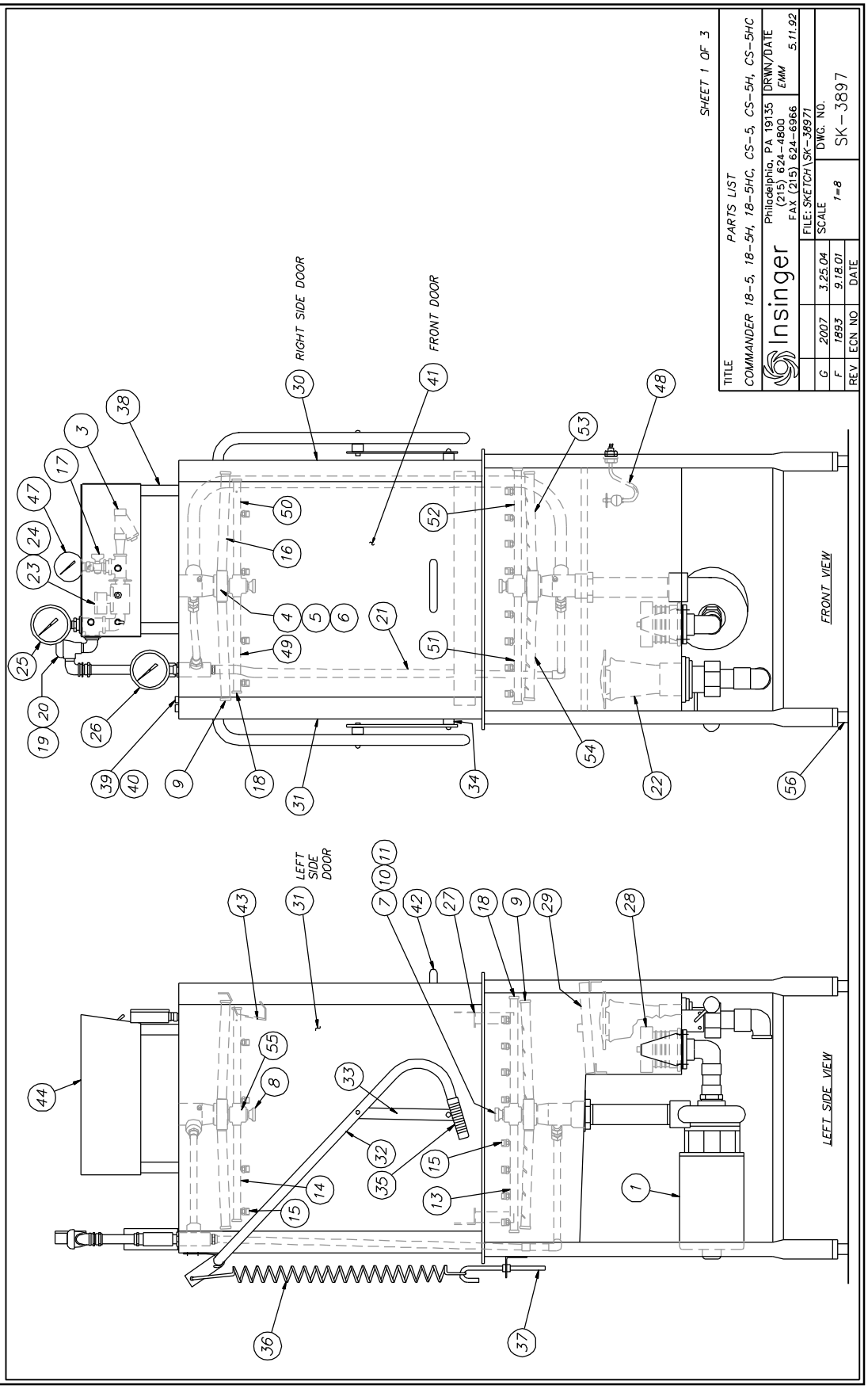
FAX (215) 624-6966

TITLE: PARTS LIST 18-5C, CS-5C
MAT'L: -
SCALE: 1=1
DRWN/DATE: EMM 5.11.92
NEXT ASSY: REQD -
USED ON
DWG. NO.: SK-2837


SHEET 1 OF 3
TITLE
PARTS LIST
COMMANDER 18-5, 18-5H, 18-5HC, CS-5, CS-5H, CS-5HC
Insinger
Philadelphia, PA 19135
(215) 624-4800
FAX (215) 624-6966
DRWN/DATE
EMM 5.11.92
FILE: SKETCH\SK-3897
SCALE 1=8
DWG. NO.
SK-3897
REV
ECN NO
DATE
G 2007 3.25.04
F 1893 9.18.01
RIGHT SIDE DOOR
FRONT DOOR
FRONT VIEW
LEFT SIDE DOOR
LEFT SIDE VIEW

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

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

SHEET 2 OF 3

REV	ECN NO.	DATE
G	2007	3.25.04
F	1893	9.18.01
E	1795	8.25.00
D	1761	5.3.00

FILE: SKETCH\SK-3897Z

TOLERANCES
FRACTIONS ±1/64
DECIMALS .XXX ± .005
.XX ± .01
ANGLES ±1/2°
UNLESS OTHERWISE SPECIFIED

TITLE: PARTS LIST

MAT'L: -

SCALE: 1=1

USED ON

NEXT ASSY DWG. NO.: SK-3897

REQ'D: -

DRWN/DATE: EMM 5.11.92

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

ITEM	MACHINE	PART No.	D E S C R I P T I O N	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

G	2007	3.25.04
F	1893	9.18.01
E	1795	8.25.00
D	1761	5.3.00
REV.	ECN NO	DATE

FILE: SKETCH\SK-38972

TOLERANCES
FRACTIONS ±1/64
DECIMALS .005
XXX ± .01
XX ± .03
ANGLES ±1/2°
UNLESS OTHERWISE SPECIFIED

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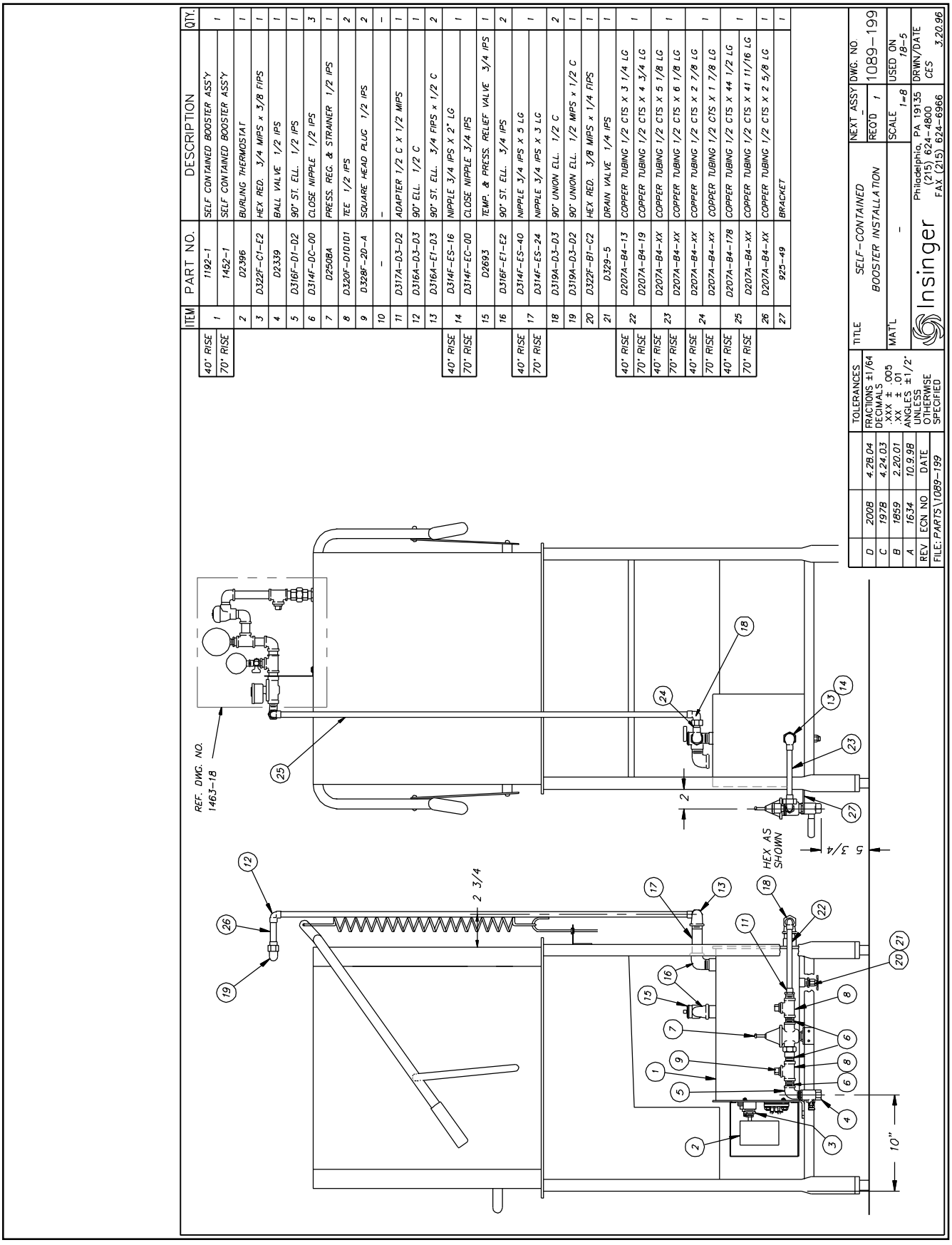
TITLE: PARTS LIST
MATL: -

NEXT ASSY: -
REQ'D: -
SCALE: 1=1
USED ON:
DWG. NO.: SK-3897
DRWN/DATE: EMM 5.11.92

SHEET 3 OF 3


ITEM | PART NO. | DESCRIPTION | QTY.
40" RISE / 70" RISE | 1 | 1192-1 | SELF CONTAINED BOOSTER ASS'Y | 1
1452-1 | SELF CONTAINED BOOSTER ASS'Y
2 | D2396 | BURLING THERMOSTAT | 1
3 | D322F-C1-E2 | HEX RED. 3/4 MIPS x 3/8 FIPS | 1
4 | D2339 | BALL VALVE 1/2 IPS | 1
5 | D316F-D1-D2 | 90° ST. ELL. 1/2 IPS | 1
6 | D314F-DC-00 | CLOSE NIPPLE 1/2 IPS | 3
7 | D2508A | PRESS. REG. & STRAINER 1/2 IPS | 1
8 | D320F-D1D1D1 | TEE 1/2 IPS | 2
9 | D328F-2D-A | SQUARE HEAD PLUG 1/2 IPS | 2
10 | – | – | –
11 | D317A-D3-D2 | ADAPTER 1/2 C X 1/2 MIPS | 1
12 | D316A-D3-D3 | 90° ELL. 1/2 C | 1
13 | D316A-E1-D3 | 90° ST. ELL. 3/4 FIPS x 1/2 C | 2
40" RISE / 70" RISE | 14 | D314F-ES-16 | NIPPLE 3/4 IPS X 2" LG | 1
D314F-EC-00 | CLOSE NIPPLE 3/4 IPS
15 | D2693 | TEMP. & PRESS. RELIEF VALVE 3/4 IPS | 1
16 | D316F-E1-E2 | 90° ST. ELL. 3/4 IPS | 2
40" RISE / 70" RISE | 17 | D314F-ES-40 | NIPPLE 3/4 IPS X 5 LG | 1
D314F-ES-24 | NIPPLE 3/4 IPS X 3 LG
18 | D319A-D3-D3 | 90° UNION ELL. 1/2 C | 2
19 | D319A-D3-D2 | 90° UNION ELL. 1/2 MIPS x 1/2 C | 1
20 | D322F-B1-C2 | HEX RED. 3/8 MIPS x 1/4 FIPS | 1
21 | D329-5 | DRAIN VALVE 1/4 IPS | 1
40" RISE / 70" RISE | 22 | D207A-B4-13 | COPPER TUBING 1/2 CTS X 3 1/4 LG | 1
D207A-B4-19 | COPPER TUBING 1/2 CTS X 4 3/4 LG
40" RISE / 70" RISE | 23 | D207A-B4-XX | COPPER TUBING 1/2 CTS X 5 1/8 LG | 1
D207A-B4-XX | COPPER TUBING 1/2 CTS X 6 1/8 LG
40" RISE / 70" RISE | 24 | D207A-B4-XX | COPPER TUBING 1/2 CTS X 2 7/8 LG | 1
D207A-B4-XX | COPPER TUBING 1/2 CTS X 1 7/8 LG
40" RISE / 70" RISE | 25 | D207A-B4-178 | COPPER TUBING 1/2 CTS X 44 1/2 LG | 1
D207A-B4-XX | COPPER TUBING 1/2 CTS X 41 11/16 LG
26 | D207A-B4-XX | COPPER TUBING 1/2 CTS X 2 5/8 LG | 1
27 | 925-49 | BRACKET | 1
REF. DWG. NO. 1463-18
HEX AS SHOWN
2 3/4
5 3/4
2
10"
REV | ECN NO | DATE
D | 2008 | 4.28.04
C | 1978 | 4.24.03
B | 1859 | 2.20.01
A | 1634 | 10.9.98
FILE: PARTS\1089-199
TOLERANCES
FRACTIONS ±1/64
DECIMALS
.XXX ± .005
.XX ± .01
ANGLES ±1/2°
UNLESS OTHERWISE SPECIFIED
TITLE
SELF-CONTAINED BOOSTER INSTALLATION
MAT'L -
NEXT ASSY -
REQ'D 1
SCALE 1=8
DWG. NO. 1089-199
USED ON 18-5
DRWN/DATE CES 3.20.96
Insinger
Philadelphia, PA 19135
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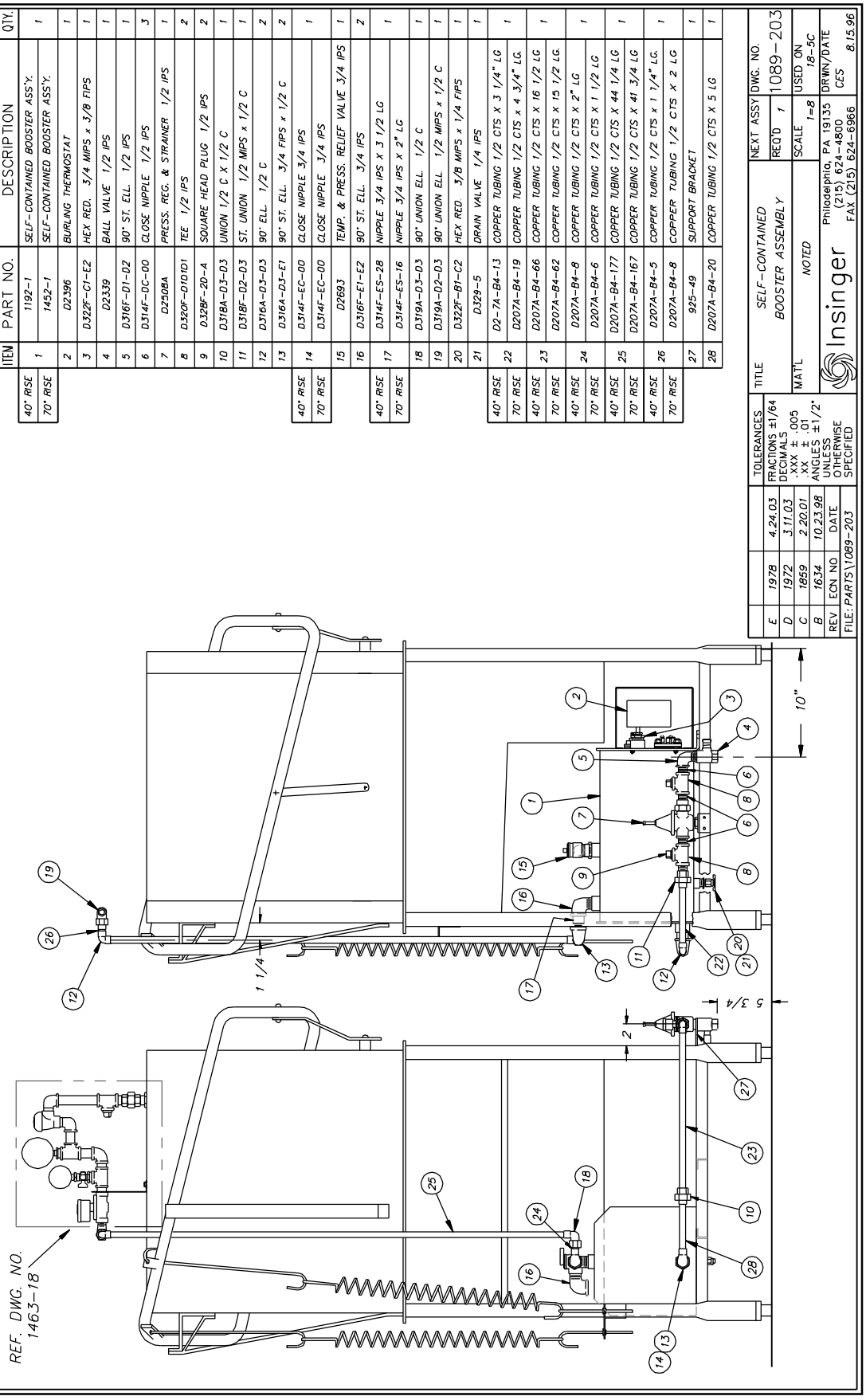
FAX (215) 624-6966


ITEM | PART NO. | DESCRIPTION | QTY.
40" RISE | 1 | 1192-1 | SELF-CONTAINED BOOSTER ASS'Y. | 1
70" RISE | | 1452-1 | SELF-CONTAINED BOOSTER ASS'Y. | 1
2 | D2396 | BURLING THERMOSTAT | 1
3 | D322F-C1-E2 | HEX RED. 3/4 MIPS x 3/8 FIPS | 1
4 | D2339 | BALL VALVE 1/2 IPS | 1
5 | D316F-D1-D2 | 90° ST. ELL. 1/2 IPS | 1
6 | D314F-DC-00 | CLOSE NIPPLE 1/2 IPS | 3
7 | D2508A | PRESS. REG. & STRAINER 1/2 IPS | 1
8 | D320F-D1D1D1 | TEE 1/2 IPS | 2
9 | D328F-2D-A | SQUARE HEAD PLUG 1/2 IPS | 2
10 | D318A-D3-D3 | UNION 1/2 C X 1/2 C | 1
11 | D318F-D2-D3 | ST. UNION 1/2 MIPS x 1/2 C | 1
12 | D316A-D3-D3 | 90° ELL. 1/2 C | 2
13 | D316A-D3-E7 | 90° ST. ELL. 3/4 FIPS x 1/2 C | 2
40" RISE | 14 | D314F-EC-00 | CLOSE NIPPLE 3/4 IPS | 1
70" RISE | | D314F-EC-00 | CLOSE NIPPLE 3/4 IPS |
15 | D2693 | TEMP. & PRESS. RELIEF VALVE 3/4 IPS | 1
16 | D316F-E1-E2 | 90° ST. ELL. 3/4 IPS | 2
40" RISE | 17 | D314F-ES-28 | NIPPLE 3/4 IPS X 3 1/2 LG | 1
70" RISE | | D314F-ES-16 | NIPPLE 3/4 IPS X 2" LG |
18 | D319A-D3-D3 | 90° UNION ELL. 1/2 C | 1
19 | D319A-D2-D3 | 90° UNION ELL. 1/2 MIPS x 1/2 C | 1
20 | D322F-B1-C2 | HEX RED 3/8 MIPS x 1/4 FIPS | 1
21 | D329-5 | DRAIN VALVE 1/4 IPS | 1
40" RISE | 22 | D2-7A-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. |
40" RISE | 23 | D207A-B4-66 | COPPER TUBING 1/2 CTS X 16 1/2 LG | 1
70" RISE | | D207A-B4-62 | COPPER TUBING 1/2 CTS X 15 1/2 LG. |
40" RISE | 24 | D207A-B4-8 | COPPER TUBING 1/2 CTS X 2" LG | 1
70" RISE | | D207A-B4-6 | COPPER TUBING 1/2 CTS X 1 1/2 LG |
40" RISE | 25 | D207A-B4-177 | COPPER TUBING 1/2 CTS X 44 1/4 LG | 1
70" RISE | | D207A-B4-167 | COPPER TUBING 1/2 CTS X 41 3/4 LG |
40" RISE | 26 | D207A-B4-5 | COPPER TUBING 1/2 CTS x 1 1/4" LG. | 1
70" RISE | | D207A-B4-8 | COPPER TUBING 1/2 CTS X 2 LG |
27 | 925-49 | SUPPORT BRACKET | 1
28 | D207A-B4-20 | COPPER TUBING 1/2 CTS X 5 LG | 1
REF. DWG. NO. 1463-18
10"
1 1/4
5 3/4
2
E 1978 4.24.03
D 1972 3.11.03
C 1859 2.20.01
B 1634 10.23.98
REV ECN NO DATE
FILE: PARTS\1089-203
TOLERANCES
FRACTIONS ±1/64
DECIMALS
.XXX ± .005
.XX ± .01
ANGLES ±1/2°
UNLESS OTHERWISE SPECIFIED
TITLE
SELF-CONTAINED BOOSTER ASSEMBLY
MATL
NOTED
Insinger
Philadelphia, PA 19135
(215) 624-4800
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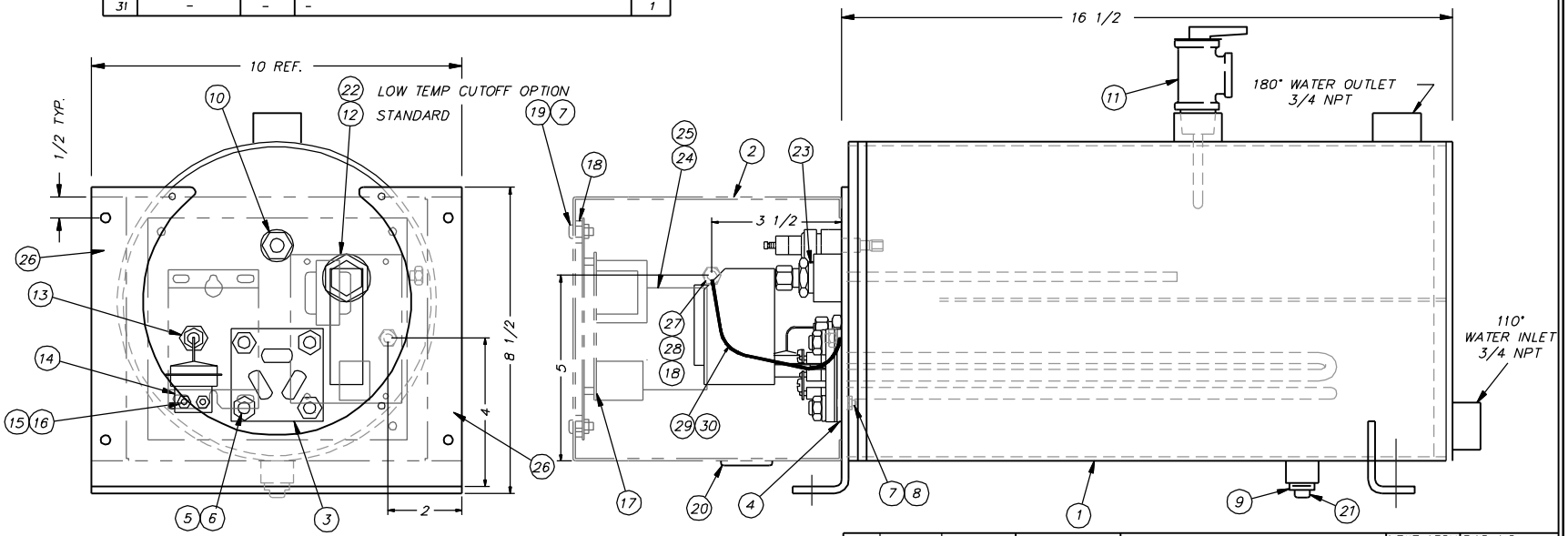
NEXT ASSY
REQ'D 1
SCALE 1=8
DWG. NO. 1089-203
USED ON 18-5C
DRWN/DATE CES 8.15.96

NO.	PART NO.	SIZE	DESCRIPTION	QTY.
16	D309C-DC-2G	–	WELDSTUD #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	D2301	–	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	1452-8	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 SIR WIRE, 24" LG.	1
30	DE3-151	–	RING LUG, B8-1/4R	2
31	–	–	–	1

NO.	PART NO.	SIZE	DESCRIPTION	QTY.
1	04-10883	B	HUBBELL J4 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	4
9	D322F-C2-B1	–	REDUCER 3/8 MIPS X 1/4 FIPS	1
10	DE9-144	–	LIQUID LEVEL PROBE	1
11	D2693	–	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



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

REV	ECN NO	DATE
F	2033	3.15.05
E	1995	9.17.03
D	1758	4.28.00
C	1579	10.1.97
B	1573	8.11.97

FILE: PARTS\1452-1

TOLERANCES
FRACTIONS ±1/64
DECIMALS
.XXX ± .005
.XX ± .01
ANGLES ±1/2°
UNLESS OTHERWISE SPECIFIED

TITLE: 70° RISE SELF-CONTAINED BOOSTER ASSEMBLY
MAT'L: NOTED
NEXT ASSY: –
REQ'D: 1
SCALE: 3/8
DWG. NO.: 1452-1
USED ON: 18-5
DRWN/DATE: CES 1.22.96

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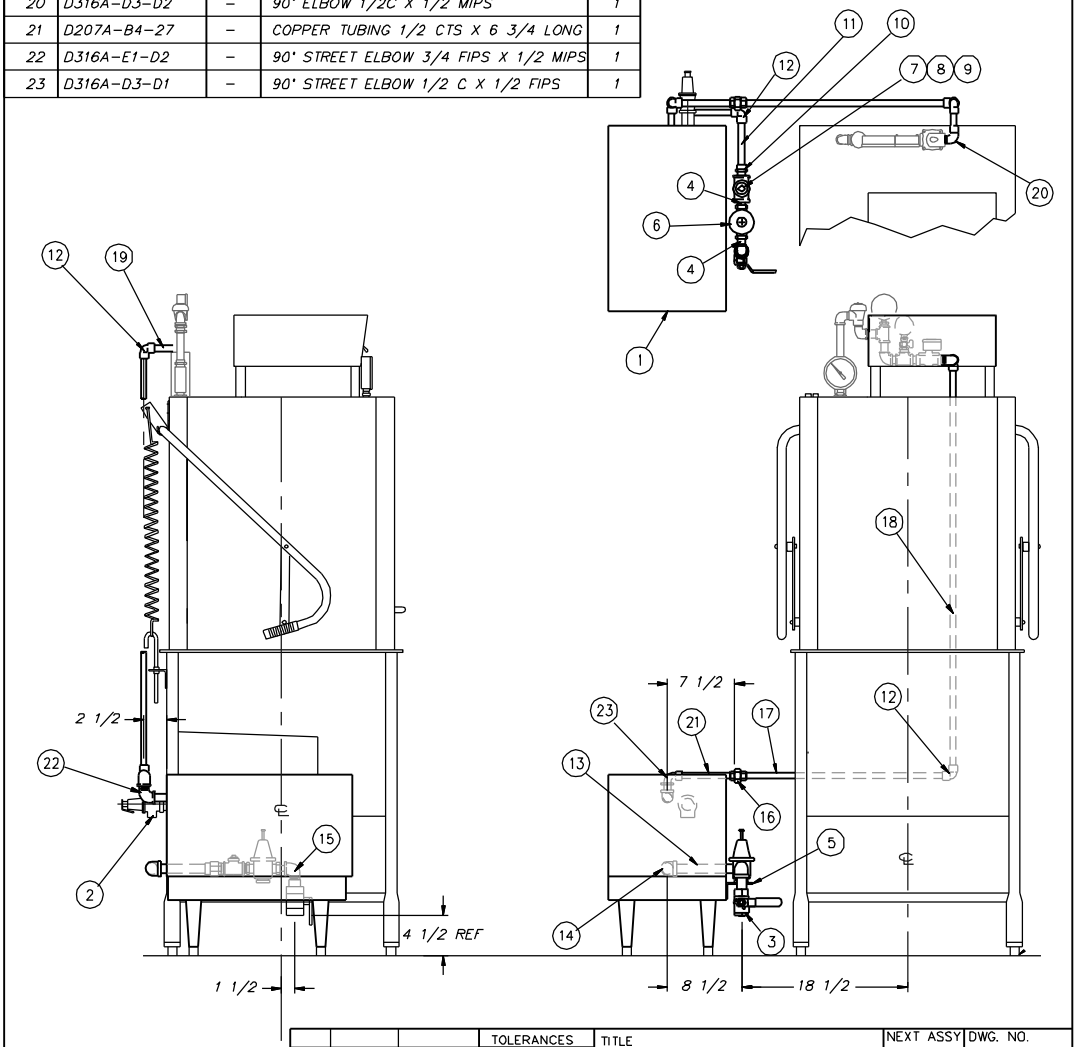
ITEM	PART NO.	SIZE	DESCRIPTION	QTY.
1	C6, C12	–	BOOSTER ASSEMBLY	1
2	HA03–01–005	–	RELIEF VALVE (HATCO)	1
3	D2339	–	BALL VALVE 1/2" IPS	1
4	D314F–DG–00	–	CLOSE NIPPLE 1/2" IPS	2
5	925–49	A	BRACKET	1
6	D2508A	–	PRESS. REG. & STRAINER 1/2" IPS	1
7	D320F–D1–D1–D1	–	TEE 1/2 FIPS X 1/2 FIPS X 1/2 FIPS	1
8	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



REV	ECN NO	DATE
C	2007	3.25.04
B	1859	2.20.01
A	1761	6.20.00

FILE: PARTS/1089–87

TOLERANCES
FRACTIONS ±1/64
DECIMALS
.XXX ± .005
.XX ± .01
ANGLES ±1/2°
UNLESS OTHERWISE SPECIFIED

TITLE: ELECTRIC BOOSTER ASSEMBLY
MAT'L: NOTED
NEXT ASSY
REQ'D 1
DWG. NO. 1089–87
SCALE 1"=1'–0"
USED ON 18–5 50–20 N2–NSU
DRWN/DATE ESP 3–23–88

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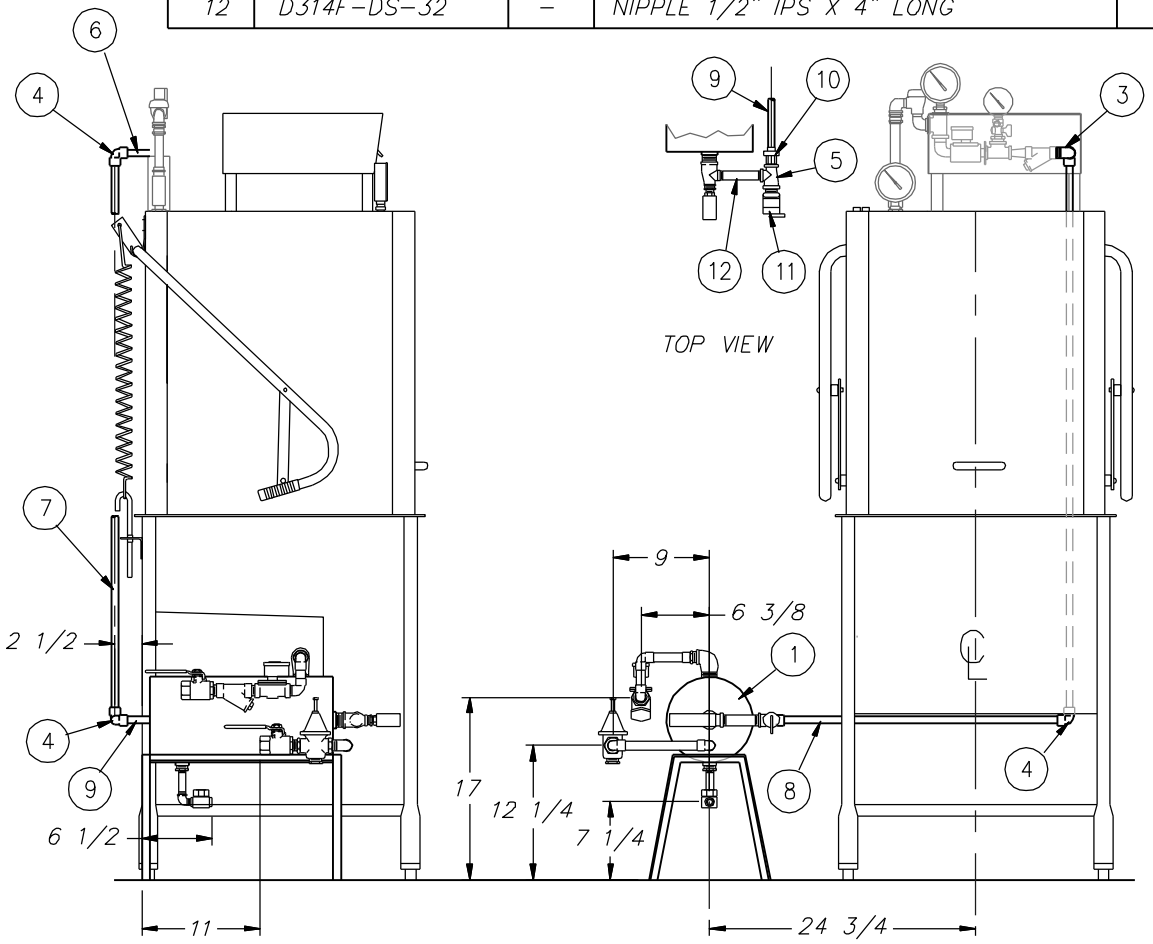
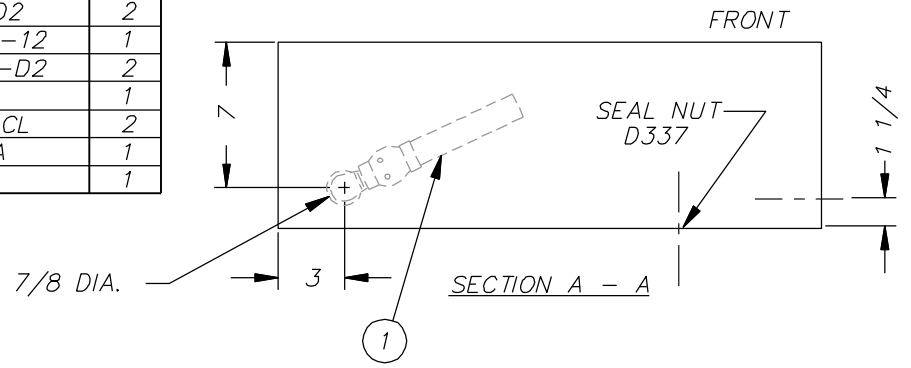
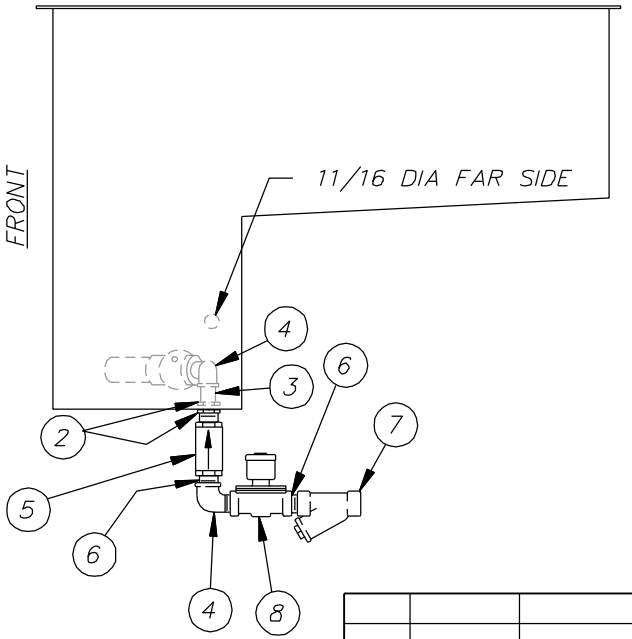
ITEM	PART NO.	SIZE	DESCRIPTION	QTY.
1	1394-1	B	BOOSTER ASSEMBLY	1
2	D319A-D3-D3	–	90° UNION ELBOW 1/2" C	1
3	D319A-D3-D2	–	90° UNION ELBOW 1/2" C X 1/2" MIPS	1
4	D316A-D3-D3	–	90° ELBOW 1/2" C	3
5	D317A-D3-D2	–	ADAPTER 1/2" C X 1/2" MIPS	1
6	D207A-K4-12	–	COPPER TUBING 1/2" CTS X 3" LONG	1
7	D207A-K4-172	–	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

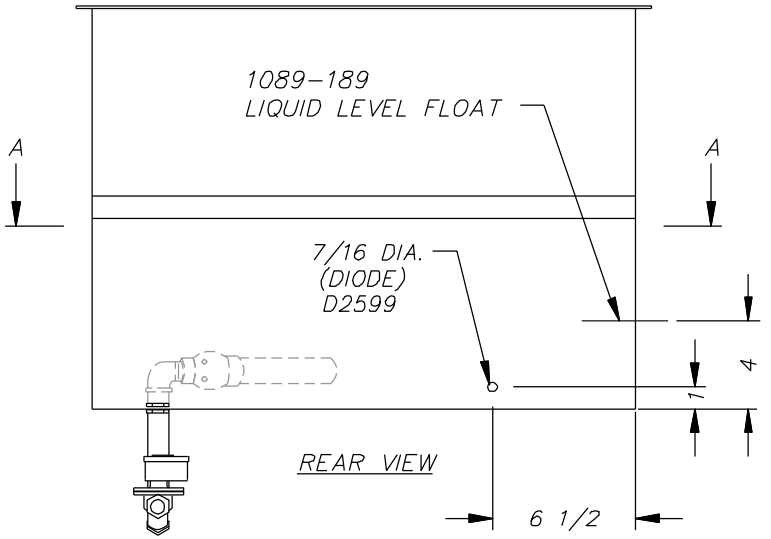


			TOLERANCES	TITLE	NEXT ASSY	DWG. NO.
			FRACTIONS ±1/64 DECIMALS .XXX ± .005 .XX ± .01 ANGLES ±1/2° UNLESS OTHERWISE SPECIFIED	SIDE MOUNT STEAM BOOSTER TO FINAL RINSE PIPING ASS'Y	REQ'D 1	1089-179
B	1916	2.22.02		MAT'L NOTED	SCALE 1/16	USED ON 18-5 50-20N2-NSU
A	1761	6.19.00		Insinger Philadelphia, PA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

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







E	1583	12.1.97
REV	ECN NO	DATE
FILE: PARTS\1089-81		

TOLERANCES
FRACTIONS ±1/64
DECIMALS
.XXX ± .005
.XX ± .01
ANGLES ±1/2°
UNLESS OTHERWISE SPECIFIED

TITLE: STEAM INJECTOR, DIODE & LIQUID LEVEL FLOAT LOCATIONS

MAT'L: –

NEXT ASSY: –
REQ'D: –
SCALE: 1=8
USED ON: 18-5, 18-5C
DWG. NO.: 1089-81
DRWN/DATE: MAM 7.24.92

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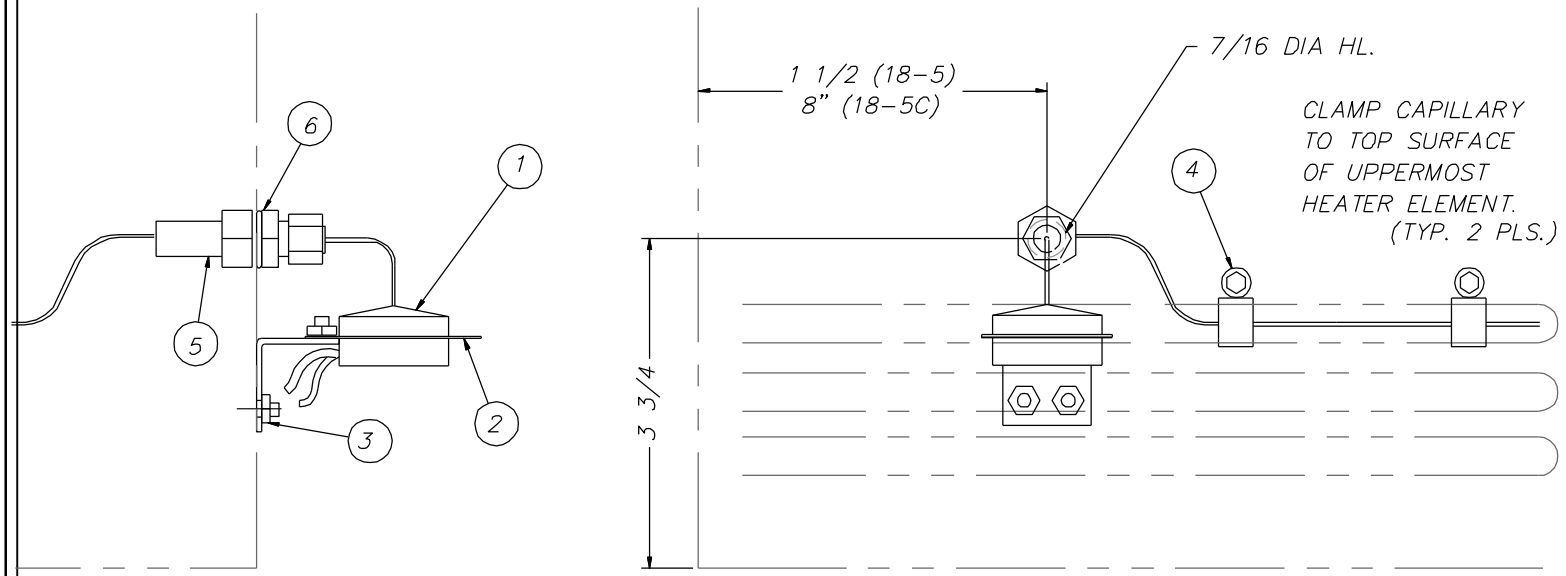
NO.	PART NO.	DESCRIPTION	QTY.
1	DE5-61	HI-TEMP. CUT-OFF SWITCH 3/8 NPT	1
2	1192-11	BRACKET, CUT-OFF SWITCH	1
3	D312C-DC-2	NUT, HEX #8-32	3
4	D2839	HOSE CLAMP, S/S	2
5	D318F-B5-B5	BULKHEAD FITTING	1
6	D3-545	"O" RING	1



VIEW FROM BACK

REV	ECN NO	DATE

FILE: PARTS\1433-3

TOLERANCES
FRACTIONS ±1/64
DECIMALS
.XXX ± .005
.XX ± .01
ANGLES ±1/2°
UNLESS OTHERWISE SPECIFIED

TITLE: HI-TEMP CUTOFF SWITCH INSTALLATION

MAT'L: -

NEXT ASSY: -
REQ'D: 1
SCALE: 1:2
DWG. NO.: 1433-3
USED ON: 18-5/18-5C
DRWN/DATE: CES 11.14.03

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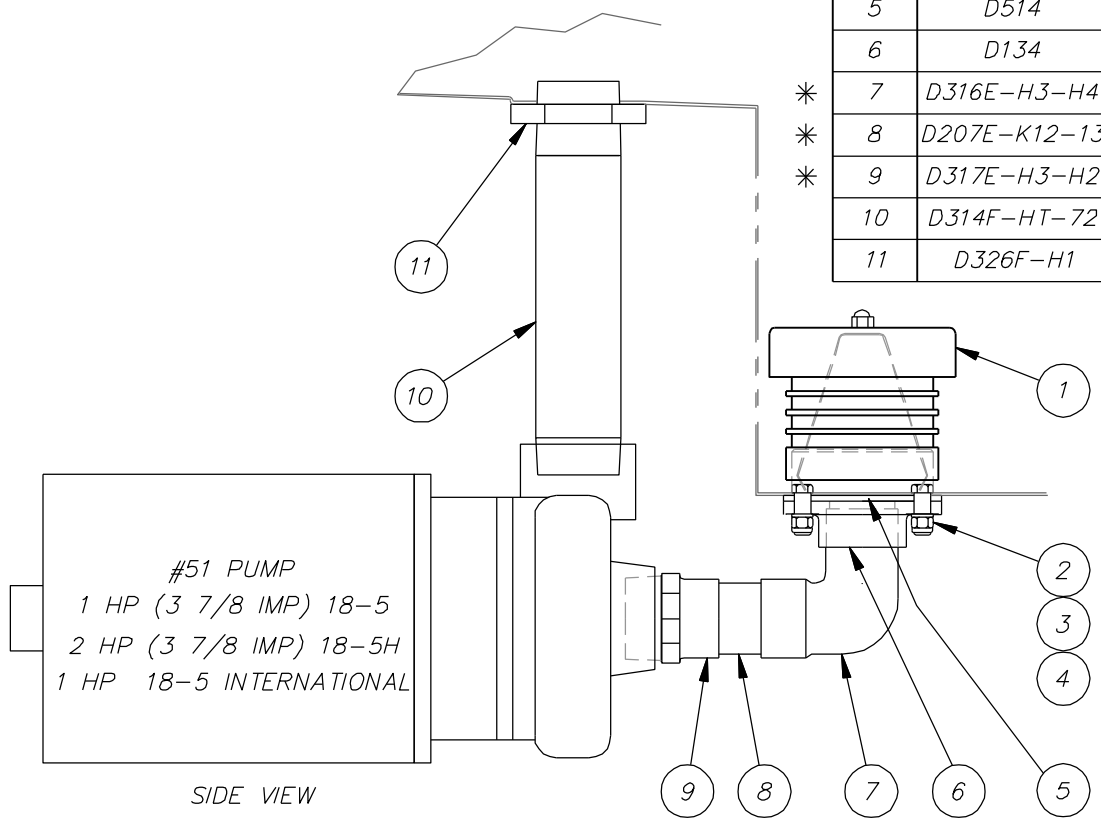
✳ ELECTROLESS NICKEL PLATE REQUIRED

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



SIDE VIEW

F	1972	3.12.03
E	1634	10.9.98
D	1458	8.30.96
REV	ECN NO	DATE
FILE: PARTS\1089-19		

TOLERANCES
FRACTIONS ±1/64
DECIMALS
.XXX ± .005
.XX ± .01
ANGLES ±1/2°
UNLESS OTHERWISE SPECIFIED

TITLE: PUMP, MOTOR, & SUCTION ASSY
MAT'L
NEXT ASSY
REQ'D 1
SCALE 1=4
DWG. NO. 1089-19
USED ON 185, CS-5
DRWN/DATE RFN 9.3.91

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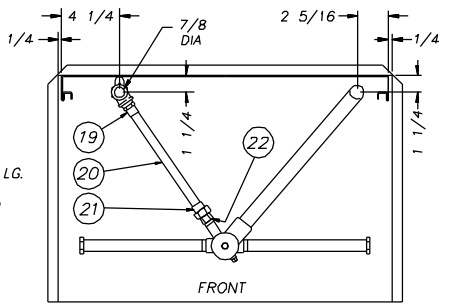
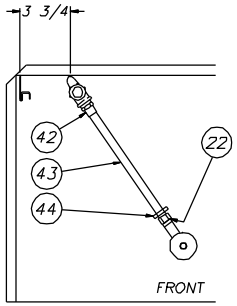
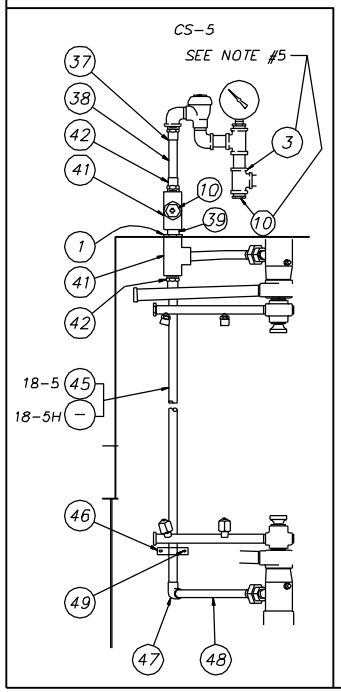
NOTES:

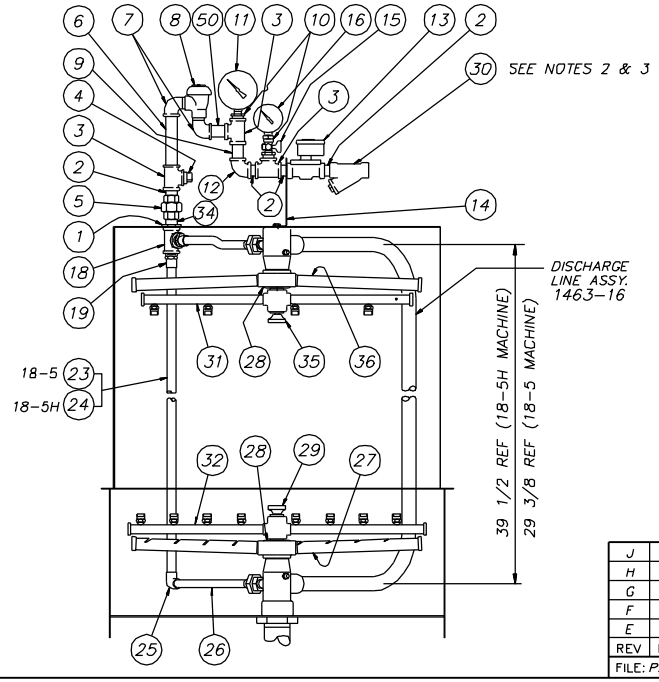
1. " * " INDICATES ELECTROLESS NICKEL PLATED.
2. ITEM #30 IS NOT REQUIRED WHEN A BOOSTER IS SPECIFIED, REPLACE WITH 90° UNION ELBOW 1/2 MIPS x 1/2 COPPER
3. ITEM #30 IS NOT REQUIRED WHEN USING A SELF-CONTAINED BOOSTER.
4. FOR MODEL 50-20N2-NSU, REPLACE ITEM #14 WITH 1084-85, ITEM #6 WITH 1/2 IPS x 1 1/2" LG. BRASS NIPPLE (D314F-D6) & 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.





NO.	DESCRIPTION		PART NO.	QTY.
1	LOCKNUT, HEX	1/2 IPS	D326F-D1	1
2	NIPPLE, CLOSE	1/2 IPS	D314F-DC-00	5
3	TEE	1/2 IPS	D320F-D1D1D1	3
4	PLUG, PIPE	1/2 IPS	D328F-D2A	1
5	UNION, STRAIGHT	1/2 IPS	D318F-D1-D1	1
6	NIPPLE, PIPE	1/2 IPS x 4 1/2" LG.	D314F-DS-36	1
7	ELBOW, 90° STREET	1/2 IPS	D316F-D1-D2	2
8	BREAKER, VACUUM	1/2 IPS	D2914	1
9	NIPPLE, PIPE	1/2 IPS x 2" LG.	D314F-DS-16	1
10	REDUCER, HEX	1/2 MIPS x 1/4 FIPS	D322F-D2-B1	2
11	GAUGE, TEMPERATURE	1/4 IPS	D2495	1
12	ELBOW, 90°	1/2 IPS	D316F-D1-D1	1
13	VALVE, SOLENOID (WATER)	1/2 IPS	D2606	1
14	BRACKET, PIPING SUPPORT		951-79	1
15	PETCOCK	1/4 IPS	D2497	1
16	GAUGE, PRESSURE	1/4 IPS	SK-1433	1
18	TEE	1/2 IPS *	D320J-D1D1D1	1
19	ADAPTER	1/2 C x 1/2 MIPS *	D317E-D3-D2	2
20	TUBING, S/S	1/2 CTS x 9" LG.	D207C-B4-36	1
21	UNION	1/2 FIPS x 1/2 C *	D318E-D3-D1	2
22	REDUCER, FLUSH	1/2 MIPS x 3/8 FIPS *	D323J-D2-C1	2
23	FOR 18-5: TUBING, S/S	1/2 CTS x 28" Lg.	D207C-B4-112	1
24	FOR 18-5H: TUBING, S/S	1/2 CTS x 38 1/4" Lg.	D207C-B4-153	1
25	ELBOW, 90°	1/2 C *	D316E-D3-D3	1
26	TUBING, S/S	1/2 CTS x 9 3/4" LG	D207C-B4-39	1
27	LOWER WASH PIPE ASSY		1089-25	1
28	O-RING		D2-563	2
29	SCREW, LOCKING		D2-584	1
30	STRAINER, "Y" 1/2 IPS	(SEE NOTES 2 & 3)	D2483A	1
31	UPPER RINSE SPRAY PIPE ASSY		1434-8	1
32	LOWER RINSE SPRAY PIPE ASSY		1434-9	1
33	-		-	-
34	NIPPLE, PIPE	1/2 IPS x 1 1/2" LG. ALL THREAD	D314F-DA-12	1
35	SUPPORT ASS'Y UPPER HUB		1463-29	1
36	UPPER WASH PIPE ASSY		1434-6	1
37	ADAPTER	1/2 CPVC x 1/2 MIPS	D329-2	1
38	CPVC TUBING	1/2 CPVC x 4" LG	D207G-B4-16	1
39	CLOSE NIPPLE CPVC	1/2 IPS	D314G-DC-00	1
40	HEX REDUCER, CPVC	1/2 MIPS X 1/8 FIPS	D322G-D2-A1	1
41	TEE, CPVC	1/2 IPS	D320G-D1D1D1	2
42	ADAPTER, CPVC	1/2 CPVC X 1/2 MIPS	D317G-D3-D2	3
43	TUBING, CPVC	1/2 CPVC X 8 1/4" LG	D207G-B4-33	1
44	ADAPTER	1/2 CPVC x 1/2 FIPS *	D329-1	2
45	TUBING, CPVC	1/2 CPVC X 22 1/2" LG	D207G-B4-90	1
46	CLAMP, CPVC	1/2 C	D2-577-1	1
47	90° ELBOW, CPVC	1/2 CPVC	D316G-D3-D3	1
48	TUBING, CPVC	1/2 CPVC X 10 1/2" LG	D207G-B4-42	1
49	WELD STUD		D309C-EC-3G	2
50	NIPPLE, PIPE	1/2 IPS X 1 3/4 LG	D314F-DS-14	1





REV	ECN NO	DATE
J	1893	8.28.01
H	1859	2.20.01
G	1675	5.3.99
F	1653	2.12.99
E	1634	10.12.98

FILE: PARTS\1463-18

TOLERANCES
FRACTIONS ±1/64
DECIMALS
.XXX ± .005
.XX ± .01
ANGLES ±1/2°
UNLESS OTHERWISE SPECIFIED

TITLE: FINAL RINSE ASS'Y 18-5 (ALL)

MAT'L

NEXT ASSY

REQ'D

DWG. NO. 1463-18

SCALE 1=8

USED ON 18-5,CS-5

DRWN/DATE YG 12.2.96

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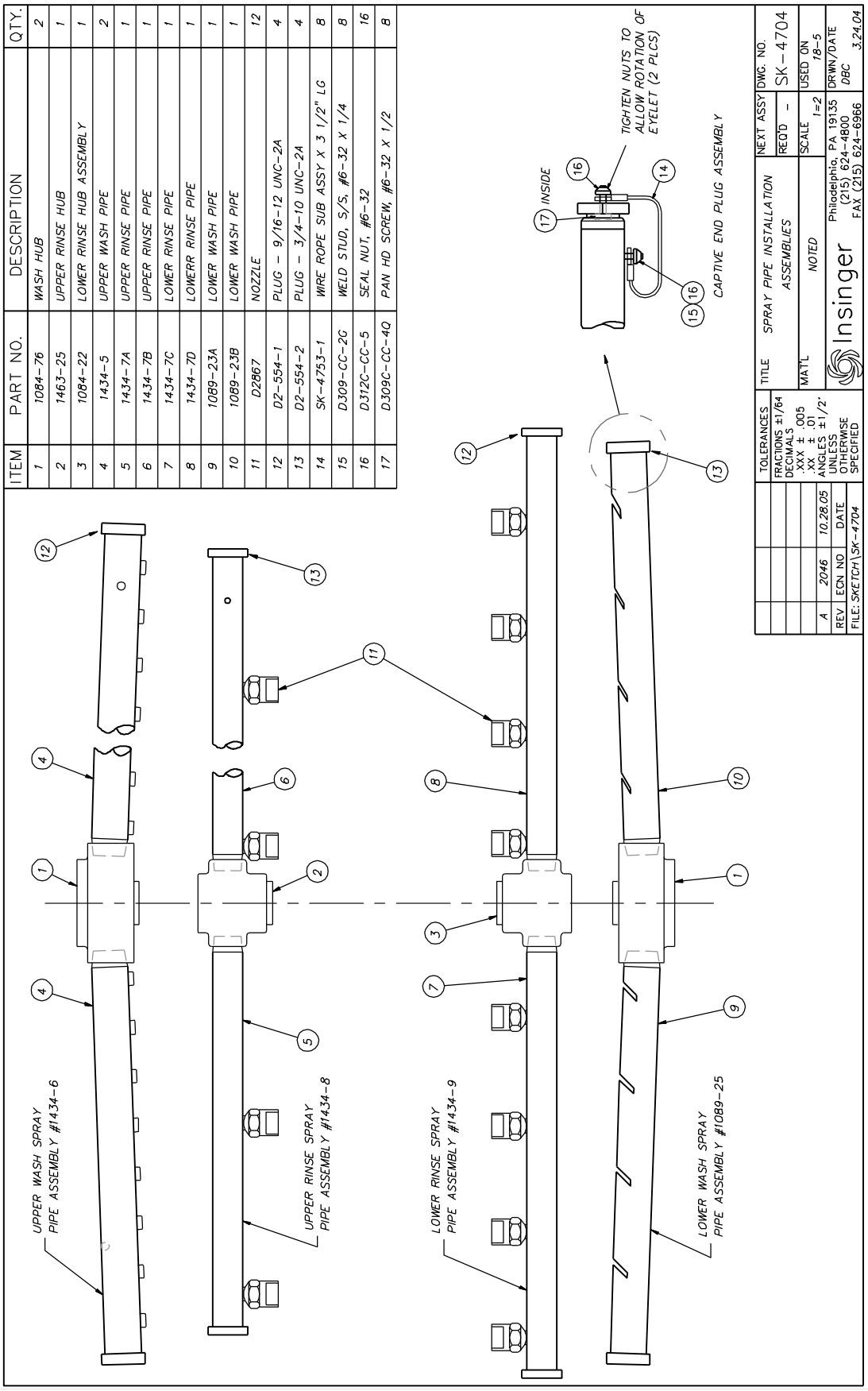
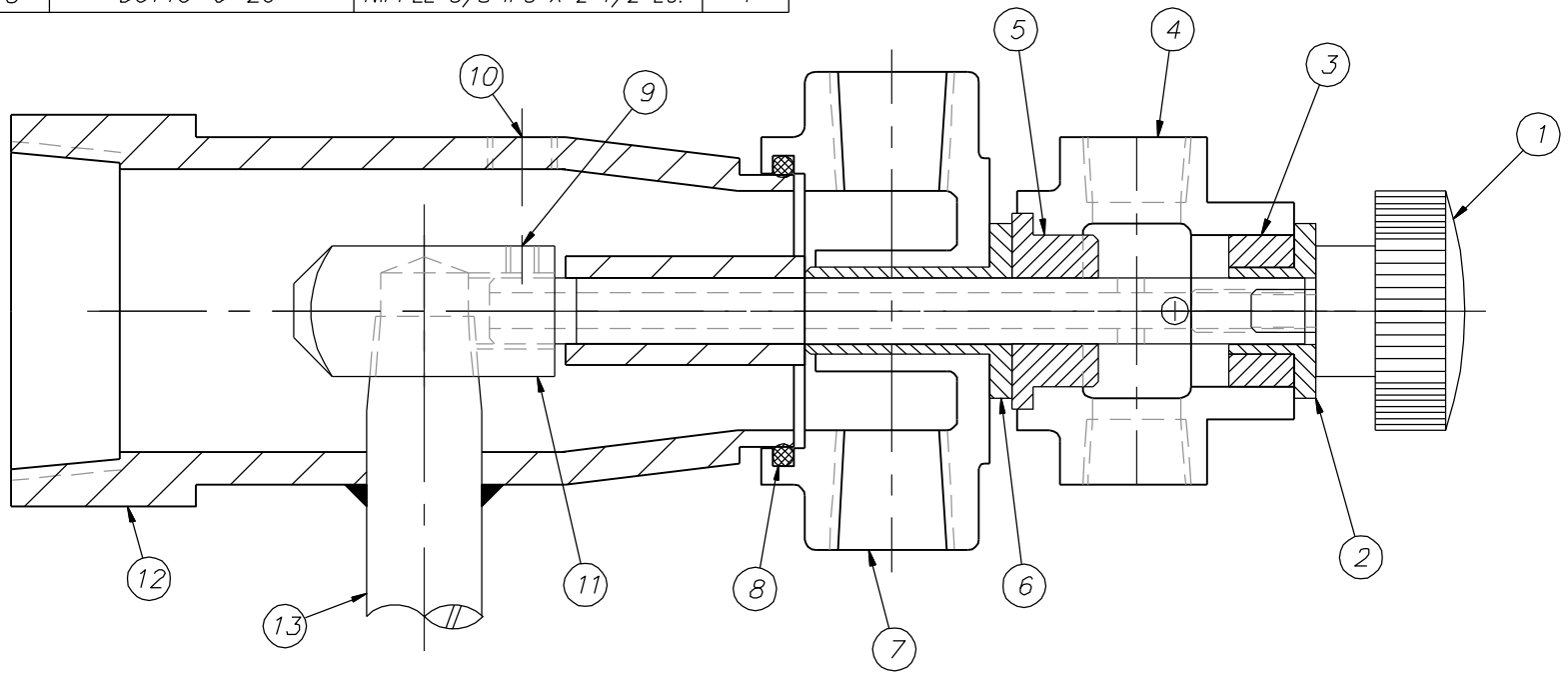

ITEM | PART NO. | DESCRIPTION | QTY.
1 | 1084-76 | WASH HUB | 2
2 | 1463-25 | UPPER RINSE HUB | 1
3 | 1084-22 | LOWER RINSE HUB ASSEMBLY | 1
4 | 1434-5 | UPPER WASH PIPE | 2
5 | 1434-7A | UPPER RINSE PIPE | 1
6 | 1434-7B | UPPER RINSE PIPE | 1
7 | 1434-7C | LOWER RINSE PIPE | 1
8 | 1434-7D | LOWERR RINSE 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-2G | 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
TIGHTEN NUTS TO ALLOW ROTATION OF EYELET (2 PLCS)
INSIDE
CAPTIVE END PLUG ASSEMBLY
UPPER WASH SPRAY PIPE ASSEMBLY #1434-6
UPPER RINSE SPRAY PIPE ASSEMBLY #1434-8
LOWER RINSE SPRAY PIPE ASSEMBLY #1434-9
LOWER WASH SPRAY PIPE ASSEMBLY #1089-25
TOLERANCES
FRACTIONS ±1/64
DECIMALS
.XX ± .005
.XXX ± .001
ANGLES ±1/2°
UNLESS OTHERWISE SPECIFIED
TITLE
SPRAY PIPE INSTALLATION ASSEMBLIES
MATL
NOTED
NEXT ASSY
REQ'D -
SCALE 1=2
DWG. NO.
SK-4704
USED ON
18-5
DRWN/DATE
DBC 3.24.04
Insinger
Philadelphia, PA 19135
(215) 624-4800
FAX (215) 624-6966
REV | ECN NO | DATE
A | 2046 | 10.28.05
FILE: SKETCH\SK-4704

ITEM	PART NO.	DESCRIPTION	QTY.
7	1084-76	WASH HUB	1
8	D2-563	"0" RING 1 3/4 OD X 3/32 W	1
9	D309C-EF-2H	#10-32 X 1/4" SETSCREW	1
10	D328A-A2	PIPE PLUG 1/8 IPS	1
11	1084-34	SHAFT ASSEMBLY	1
12	1089-16	DISCHARGE TEE - LOWER	1
13	D314C-C-20	NIPPLE 3/8 IPS X 2 1/2 LG.	1

	ITEM	PART NO.	DESCRIPTION	QTY.
	1	D2-584A	KNOB - LOWER	1
*	2	1089-178	INSERT BUSHING - RINSE HUB	1
*	3	1089-177	BUSHING - RINSE HUB	1
*	4	372-52	HUB MACHINING	1
*	5	1084-35	BUSHING - RINSE HUB	1
	6	952-27	BUSHING - WASH HUB	1



* LOWER RINSE HUB ASSEMBLY #1084-22 CONSISTS OF:
(1) #372-52 HUB MACHINING
(1) #1084-35 BUSHING
(1) #1089-177 BUSHING
(1) #1089-178 BUSHING

REV	ECN NO	DATE

FILE: SKETCHA\SK-4703

TOLERANCES
FRACTIONS ±1/64
DECIMALS
.XXX ± .005
.XX ± .01
ANGLES ±1/2°
UNLESS OTHERWISE SPECIFIED

TITLE: 18-4 & 18-5 LOWER MANIFOLD ASSY

MAT'L: -

NEXT ASSY: -
REQ'D: -
SCALE: 1=1
DWG. NO.: SK-4705
USED ON: 18-4 & 18-5
DRWN/DATE: DBC 3.24.04

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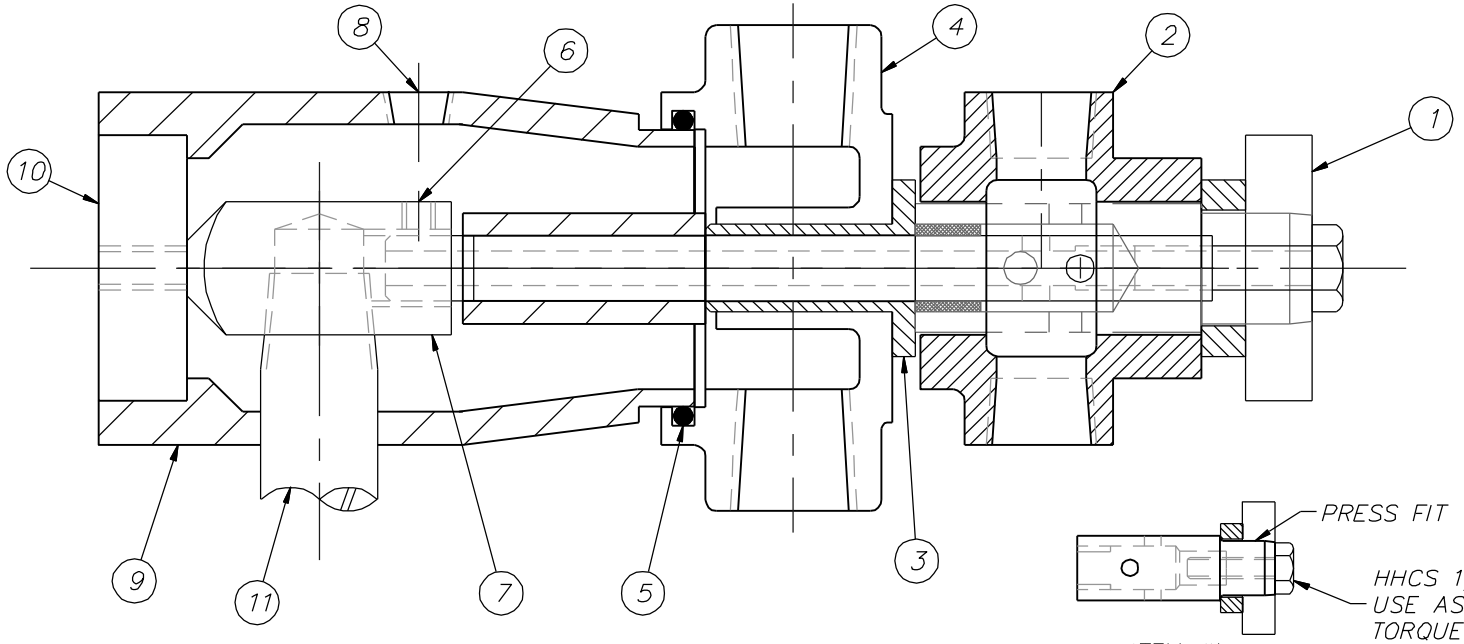
ITEM	PART NO.	DESCRIPTION	QTY.
7	1084-34	SHAFT ASSEMBLY	1
8	D328A-A2	PIPE PLUG, 1/8 IPS	1
9	1089-15C	DISCHARGE TEE - UPPER	1
10	1089-28	PLUG (PRESS FIT)	1
11	D314C-C-20	NIPPLE 3/8 IPS X 2 1/2 LG.	1

	ITEM	PART NO.	DESCRIPTION	QTY.
✳	1	1463-29	SUPPORT ASSY - UPPER HUB	1
	2	1463-25	RINSE HUB - UPPER	1
	3	952-27	BUSHING - WASH HUB	1
	4	1084-76	WASH HUB	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

SCALE: 1/2

✳ 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

A	2007	3.25.04
REV	ECN NO	DATE
FILE: SKETCHA\SK-4073		

TOLERANCES
FRACTIONS ±1/64
DECIMALS
.XXX ± .005
.XX ± .01
ANGLES ±1/2°
UNLESS OTHERWISE SPECIFIED

TITLE: UPPER MANIFOLD ASSEMBLY NEW STYLE 18-5

NEXT ASSY: 1463-18
REQ'D: 1
DWG. NO.: SK-4073
MAT'L: NOTED
SCALE: FULL
USED ON: 18-5

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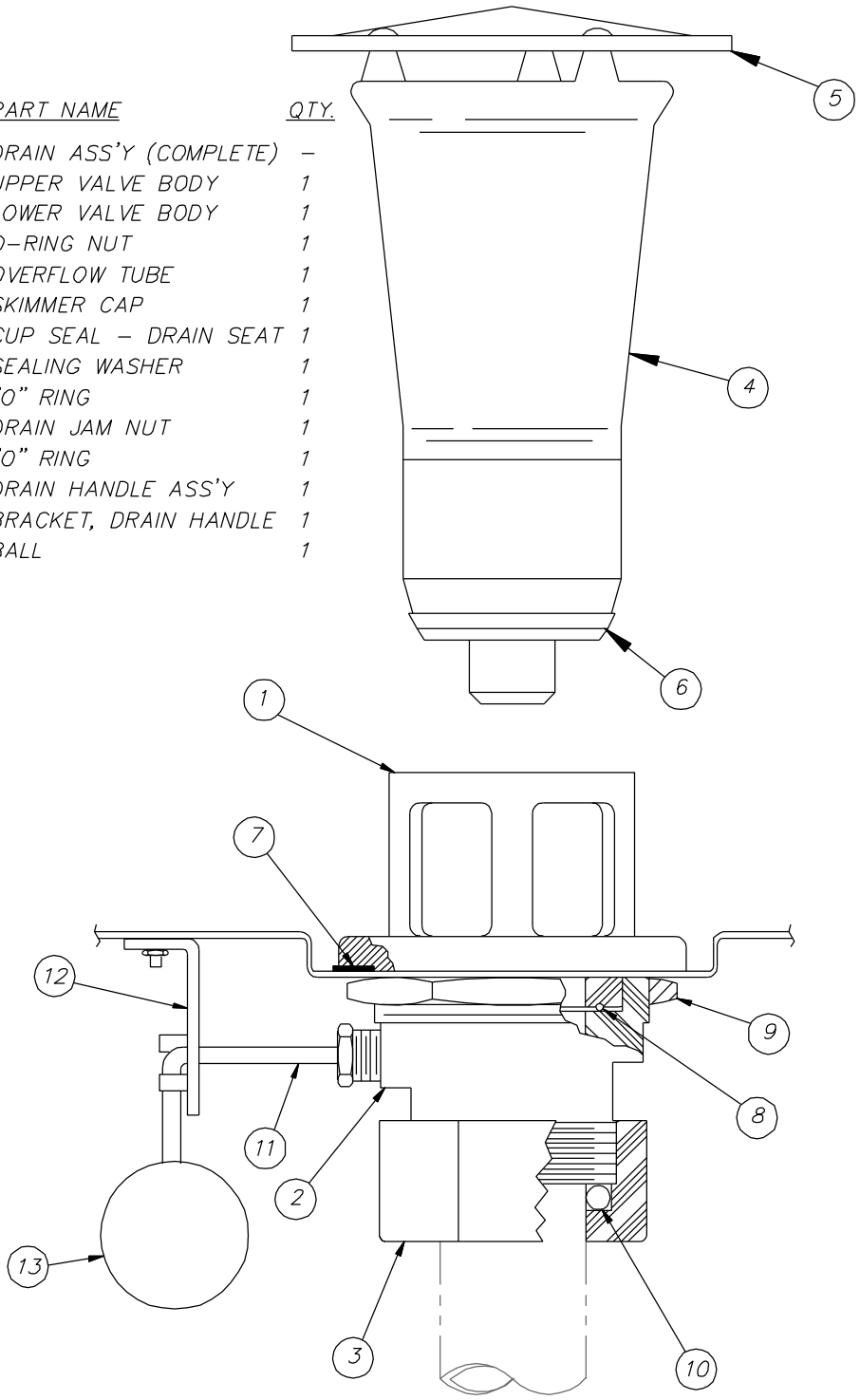
DRWN/DATE: CES 11.18.98

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



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

SK-3028

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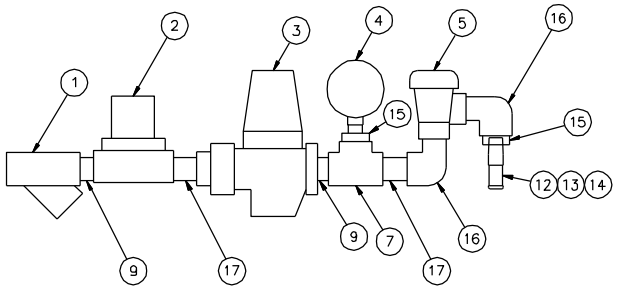
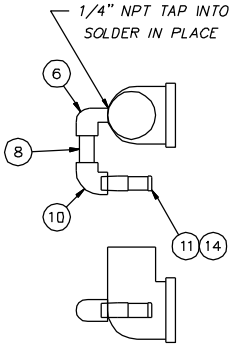
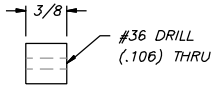


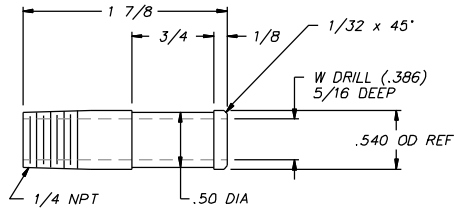
ITEM	PART NO.	SIZE	DESCRIPTION	QTY.
1	D2483A	–	Y STRAINER, 1/2"	1
2	D2606	–	SOLENOID VALVE, 1/2", 24 VAC	1
3	D2508A	–	PRESSURE REGULATOR, 1/2", 10–35 PSI	1
4	SK–1433	–	PRESSURE GAUGE, 1/4", 1–100 PSI	1
5	D2241A	–	VACUUM BREAKER, 1/2"	1
6	D316F–B1–B2	–	STREET ELBOW, 1/4"	1
7	D320F–D1D1D1	–	TEE, 1/2"	1
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



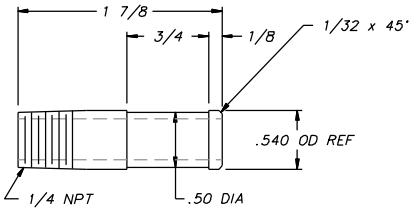
DRAIN CONNECTION



ORIFICE
3/8 OD BRASS
1 REQ'D
SOLDER INTO END OF
ORIFICE NIPPLE



ORIFICE HOSE NIPPLE
MAKE FROM 1/4" SCH 40 BRASS PIPE
1 REQ'D
PN SK–4086A



HOSE NIPPLE
MAKE FROM 1/4" SCH 40 BRASS PIPE
1 REQ'D
PN SK–4086B

PRESSURE PSI	GPM ø.106
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	NEXT ASSY	DWG. NO.
			FRACTIONS ±1/64	DRAIN COOL DOWN ASSY	–	
			DECIMALS	–	REQ'D 1	SK–4086
C	1990	8.8.03	.XXX ± .005	MAT'L	SCALE	USED ON
B	1939	6.5.02	.XX ± .01	–	1=4	18–5
A	1863	3.1.01	ANGLES ±1/2°	Insinger Philadelphia, PA 19135 (215) 624–4800 FAX (215) 624–6966		DRWN/DATE
REV	ECN NO	DATE	UNLESS OTHERWISE SPECIFIED			MFJ 1.16.98
FILE: SKETCH\SK–4086						

6245 State Road
Philadelphia, PA 19135-2996

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