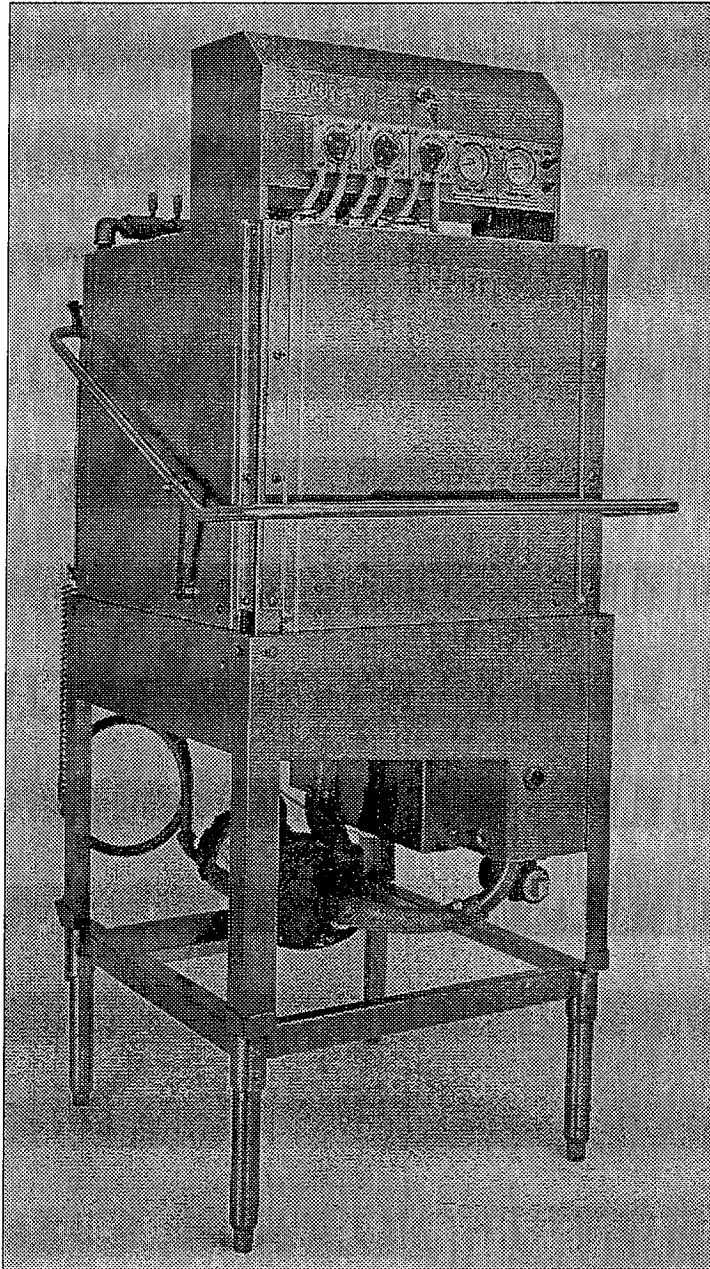


# **KNIGHT**

**IDEX**  
IDEX CORPORATION



## **KLE-112 H/L SINGLE RACK HIGH/LOW TEMPERATURE DISHMACHINE INSTRUCTION MANUAL**

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## INTRODUCTION

The KLE-112 H/L is a combination high temperature low temperature single rack dishmachine that will provide many years of trouble free service. This machine is configured as an automatic start dishmachine, meaning that the machine starts automatically when the doors are closed. The KLE-112 H/L is a totally convertible dishmachine. It can work in a corner or straight through operation and as a high or low temperature dishmachine. All KLE-112 H/L come with three chemical dispensers that are electronically controlled so you can sanitize the dishes with a chemical sanitizer and 130°F water or with 180°F water in a high temperature application. Some standard features with this machine are fresh water rinse, 60-second cycle, adjustable rinse time and a specially designed wash tank to reduce chemical and water usage on each cycle. The wash tank's powerful 3000 watt thermostatically controlled heater will maintain the five U.S. Gallon wash tanks' temperature. The wash tank is also equipped with a low water safety float so the heater works only when the machine is full of water.

## INSTALLATION

### ▲ CAUTION ▲

**Access into electrical enclosures must be performed by authorized personnel.**

- 1) Inspect the machine upon initial receipt. Lift the door arm and examine the accessory package located inside the machine. Note: the accessory package includes spray arms and other equipment required for installation.
- 2) Examine the location where the machine is to be operated. Ensure that all electrical and plumbing connections, as well as dish table placement, have been considered for installation.
- 3) Place dishmachine in the desired location. Level dishmachine by using adjustable "bullet feet" at bottom of the machine legs. Install spray arms included in the accessory box.
- 4) Connect 3/4" hot water supply to the rear of the machine at the line strainer. ensure water supply is MINIMUM 180°F for high temperature applications and 130°F for low temperature. Flow pressure should be between 20 and 25 PSI (in excess of 25 PSI install a pressure reducing valve prior to dishmachine inlet). For customers with low pressure the rinse cycle can be increased to maximize rinse application. Ensure the thermostat is adjusted in wash tank at 160°F for high temperature and 130°F for low temperature (See settings section for instructions). Make 1.5" NPT drain connection at drain tee following local plumbing codes as required.
- 5) **AUTHORIZED PERSONNEL ONLY:** Make proper electrical connection (220/60/1 with proper ground connection to a 30-Amp breaker) to the labeled barrier located at the inside back of the control box. Run all electrical wire through suitable conduit and ensure all connections are made in accordance with local wiring codes. We recommend that the circuit breaker powering the machine has **NO OTHER ELECTRICAL DEVICES** connected.
- 6) Attach prewash and drying tables to the dishmachine ensuring sufficient space is provided for the machine operator. Ensure the table legs are adjusted for proper water drainage and the tabling does not interfere with the operation of the dishmachine doors.
- 7) **AUTHORIZED PERSONNEL ONLY:** If installing an external detergent dispenser, a 24 volt DC signal can be obtained by connecting wires to points 22 and 23 located on the circuit board PL-1000 (see wire diagram page 6). Detergent charge and recharge is controlled by adjusting the pots on the circuit board.

## INITIAL OPERATION

- 1) Seat the drain ball in the drain by lowering the drain ball lifting arm. Install the pans over the sump area of the wash tank. **THE SOLID PAN IS ALWAYS AT THE FRONT OF THE MACHINE.** Close the doors.
- 2) Turn master power switch ON (mounted at the rear of control box) and leave the front "ON/OFF" switch OFF. The master power switch will energize the heating element if water is present in the tank.
- 3) With the doors in the closed position hold down the fill switch (located on front of the control box) and fill the tank until water level is visible through sight glass on front of the tank.

4) With doors in closed position turn "ON/OFF" switch ON. Dishmachine will start and detergent will dispense. Allow dishmachine to complete at least one full cycle of operation (60 seconds). Inspect the following equipment during wash cycle to ensure proper operation:

- Detergent pump injected sufficient chemicals.
- Wash pump motors ran approximately 45 seconds.
- Fresh water rinse solenoids opened for at least 11 seconds.
- Rinse pump ran during rinse cycle (along with a sanitizer pump if low temperature).
- Spray arms are turning, clear of obstructions and not touching anything.

5) After cycle completion, leave doors closed until WASH TEMPERATURE reaches 160°F for high temp and 130°F for low temp.

6) Open doors of dishmachine and push dish rack in. Close door and cycle will start automatically. The detergent pump will pump when new wash cycle starts. This is called recharge and is required to bring detergent solution up to proper concentrate after each fresh water rinse (see settings section for charge and recharge explanation).

7) **AUTHORIZED PERSONNEL ONLY:** Adjust the rinse cam timer for a minimum of 11 seconds of rinse water at 20 PSI. If pressure is lower than 20 PSI, the rinse cycle can be extended to 15 seconds to ensure adequate rinsing. If 180°F is not being maintained on the final rinse gauge, be sure to add a sanitizer to the middle chemical pump for proper sanitation in the rinse cycle.

8) Approximately five seconds after the end of the cycle, lift the doors to the dishmachine and check for leaks and proper fill level. Spray arms should still be in motion indicating proper water pressure. If water level is too low, check to be sure the drain is seated properly. If necessary refill the tank with the fill switch until water reaches ½ the level of the sight lenses.

## **NORMAL OPERATION**

1) Manually remove food debris from wares being washed before putting in the dishmachine.

2) Load wares in the correct rack for washing and pre rinse for best results. Ensure that the glasses, bowls and cups are face down.

3) With the master switch and front "ON/OFF" switch in the ON position and the machine filled with water and heated to the correct temperature, close the doors. The dishmachine will start and run a full cycle, which will take one minute.

## **CLEANING PROCEDURE**

1) At the end of each meal period, shut the front "ON/OFF" and master switch at the rear of the machine OFF. Clear dish tables of all soil. **NOTE:** Master power switch at rear of machine controls heating element. The front switch will not de-energize the heating element.

2) Open dishmachine doors, scrape all remaining soil to screen over sump. Drain machine by lifting drain arm and allowing water to empty out. Remove and clean solid and strainer screens. Remove and clean pump intake screen. Remove any debris from bottom of lower tank.

3) Check wash and rinse arms for obstructions and proper rotation.

4) Reinstall lower pump screen, solid screen and strainer screen; then close doors. Follow INITIAL OPERATION procedure for start up.

## **SETTINGS**

### **▲ CAUTION ▲**

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**DETERGENT PUMP:** The detergent pump (leftmost on control box) is controlled by the PL-1000 circuit board. Detergent volume is monitored by the amount of time the pump is on. There are two settings that control the running time of the detergent pump, charge and recharge. Charge is activated by the "ON/OFF" switch on front of the control box. Adjust the charge pot for proper mixture of detergent and five U.S. gallons of fresh water. Recharge is activated by the pump motor relay signal. Each time the pump motor starts after every wash cycle, a recharge signal is given. Adjust the recharge pot to maintain proper detergent and wash water rinse (each rinse cycle uses 1.25 gallons of water @ 20 PSI flow pressure).

**RINSE PUMP AND SANITIZER PUMP:** The rinse pump and sanitizer pump is controlled by the DSC 1000 circuit board. Rinse and sanitizer volume is controlled by pump motor speed and the time of the rinse cam setting. Determine rinse time cam setting (from 11 to 15 seconds) then adjust rinse and sanitizer volume. Adjust pump motor speed by turning pots on the DSC 1000 circuit board. The sanitizer pump can be turned off for high temperature mode by the switch located between the detergent and delime switch.

**RINSE TIMER CAM:** Rinse cam switch determines the amount of time fresh rinse water is dispensed into machine. When cam switch arm is down rinse solenoid valve is opened. Rinse cycle starts approximately one to three seconds after wash pump motor shuts off and one to three seconds before end of wash cycle.

**RELAY TIMER CAM:** Relay cam switch controls the cubed relay functions and should be set identical to the "ON/OFF" cam switch.

**THERMOSTAT:** The thermostat controls the dishmachine wash water temperature. Thermostat can be set by removing the cover on the back of the wash tank and turning the slotted screw on back of thermostat. C.W. lowers temperature and C.C.W. raises water temperature. Dishmachines are factory set at 160 ° F for high temp mode.

**WATER LEVEL SWITCH:** Always set to normally open when no water is in the tank (Float down).

**DELIME SWITCH:** The delime switch controls the cam timer motor. By turning the switch off the machine will remain in its state of operation.

**SANI SWITCH:** The sanitizer switch controls the middle chemical pump on the control box. By turning this switch OFF the chemical pump can be turned off for high temperature cleaning.

**DET SWITCH:** The detergent switch controls the detergent pump. Press button to add detergent to wash water or use when priming pump.

## **PERIODIC MAINTENANCE**

NOTE: Before performing periodic maintenance ensure water supply valve is off and circuit breaker is off.

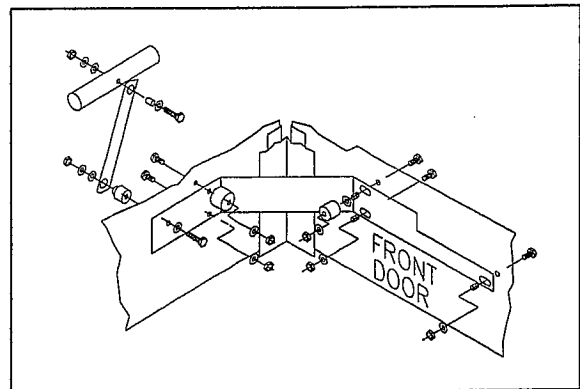
- 1) Remove and clean the line strainer screen in the "Y" line strainer located at the water inlet.
- 2) Remove upper and lower wash arms and check for obstructions. Clean as necessary by removing the end plugs and flushing arms. Remove the lower rinse arm and repeat this procedure. Remove the upper spray jets, clean and then replace.

## **CONVERSION**

**INLINE OR CORNER:** Conversion from inline to corner can be done by changing the location of the tray stop on the tray rails and installing door conversion bracket in the accessory kit. To make the conversion two 7/16" wrenchs will be needed.

- 1) Remove the two bolts/nuts securing the tray rail stop located on the tray rail and reposition to desired configuration.
- 2) For corner configuration, install conversion bracket per diagram (at right). Install conversion bracket first, then disconnect left side door link that connects handle to door at the handle bolt.

All machines are shipped from the factory in the inline configuration.



### **▲ CAUTION ▲**

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**HIGH OR LOW TEMPERATURE CLEANING:** Conversion from high temperature cleaning to low temperature cleaning requires two steps. Units are shipped from the factory for high temperature cleaning and can be converted by changing the following:

1) switch the sanitizer switch "ON" (located inside the control box), hook up the chlorine sanitizer pump and install supplied plastic check valve in the fresh water manifold.

(2) adjust the thermostate switch to 130°F (160°F for high temperature wash) the thermostate switch can be adjusted by removing the electrical box cover located on the back of the wash tank sump and turning the slotted screw located on the back of the thermostate switch. Clock wise will lower the temperature and counter clock wise will increase temperature.

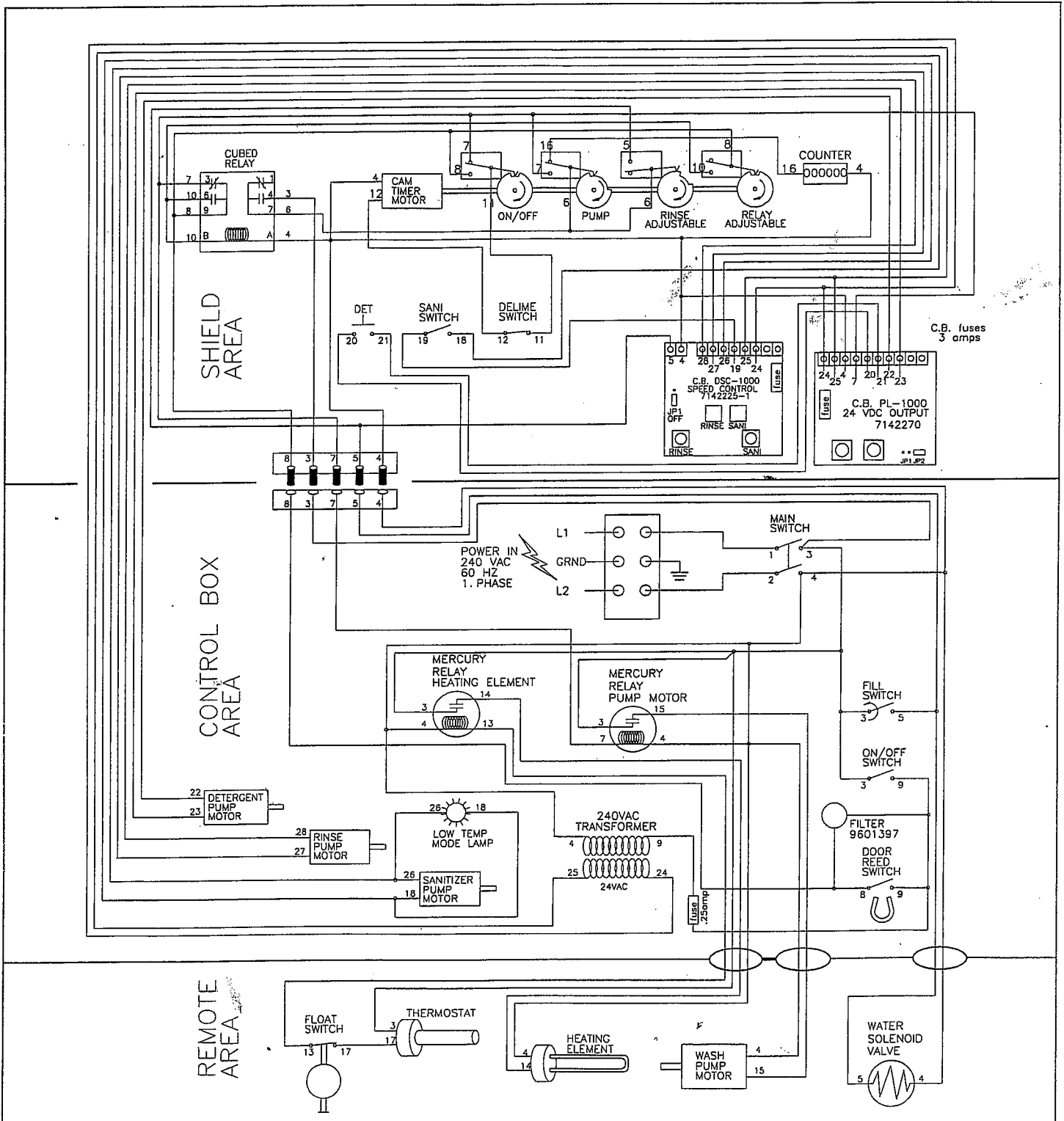
## TROUBLESHOOTING

### ▲ CAUTION ▲

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PROBLEM	POSSIBLE CAUSE	REMEDY
POOR WASH PRESSURE	1) IMPELLER OBSTRUCTION 2) WASH ARM OBSTRUCTION	1) CLEAR IMPELLER 2) CLEAR WASH ARM
LOW WASH WATER IN TANK	1) MISSING DRAIN O-RING 2) NOT FILLED ENOUGH 3) DEFECTIVE SOLENOID	1) CHECK DRAIN O-RING 2) CHECK FILL SWITCH 3) CHECK RINSE SOLENOID
POOR RINSE PRESSURE	1) OBSTRUCTED LINE STRAINER 2) DEFECTIVE SOLENOID 3) POOR INLET PRESSURE 4) OBSTRUCTED RINSE ARM 5) DEFECTIVE RINSE BEARING	1) CLEAR LINE STRAINER 2) REPLACE SOLENOID 3) INSTALL WELL-X-TROL IN RINSE LINE 4) CLEAN RINSE ARM 5) CLEAN OR REPLACE BEARING
MACHINE WILL NOT SHUT OFF	1) MERCURY RELAY COIL BAD 2) DELIME SWITCH ON	1) REPLACE MERCURY RELAY 2) SHUT DELIME SWITCH OFF
MACHINE WILL NOT START	1) RELAY CAM ON TIMER CRACKED OR OUT OF ADJUSTMENT 2) NO POWER 3) DELIME SWITCH	1) REPLACE OR ADJUST RELAY CAM 2) CHECK REAR MASTER SWITCH AND FRONT ON/OFF SWITCH CHECK INCOMING POWER FOR 220 VOLTS 3) TRY SWITCH IN ON/HER POSITION
PUMP MOTOR NOT RUNNING	1) JAMMED IMPELLER 2) CAPACITOR ON MOTOR DEFECTIVE 3) NO POWER TO MOTOR	1) REMOVE PUMP FACE AND CLEAR/CLEAN IMPELLER 2) REPLACE MOTOR CAPACITOR 3) CHECK CAM TIMER, DOOR SWITCH, MERCURY RELAY AND CUBE RELAY FOR PROPER OPERATION
MACHINE WILL NOT FILL	—	SEE POOR RINSE PRESSURE
CHEMICAL INJECTION PROBLEM	1) OUT OF PRODUCT 2) DEFECTIVE SQUEEZE TUBE 3) CHEMICAL CONTROL BOARD INCORRECTLY ADJUSTED	1) REPLACE PRODUCT 2) REPLACE SQUEEZE TUBE 3) ADJUST BOARD AS REQUIRED SEE "SETTINGS"
TANK WILL NOT HOLD WATER	1) DRAIN O-RING 2) DRAIN BALL NOT SEATED	1) CLEAN OR REPLACE 2) CLEAN DRAIN SEAT
NOT MAINTAINING FINAL HOT WATER RINSE AT 180° F	BOOSTER	HAVE BOOSTER SERVICED OR ADD SANITIZER TO FINAL RINSE

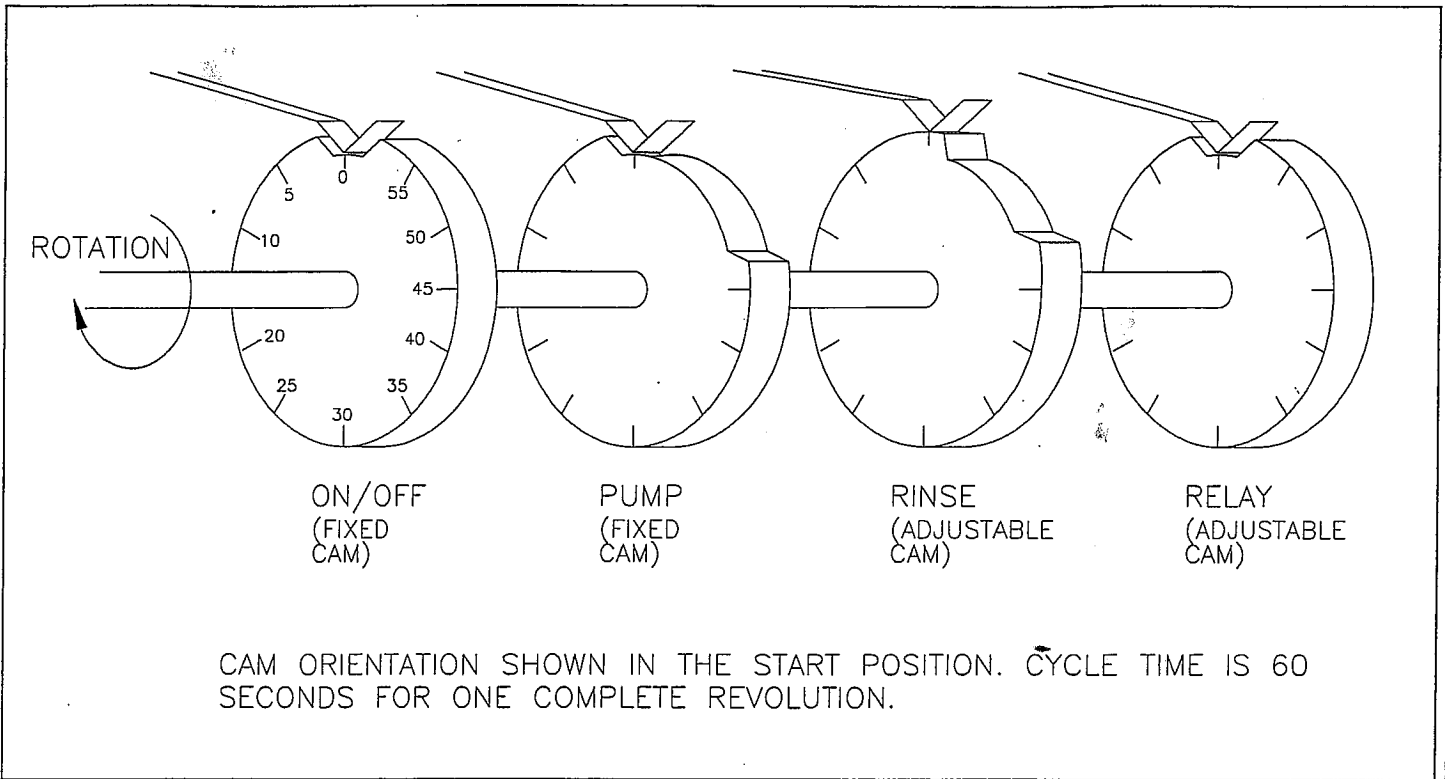
# WIRING DIAGRAM



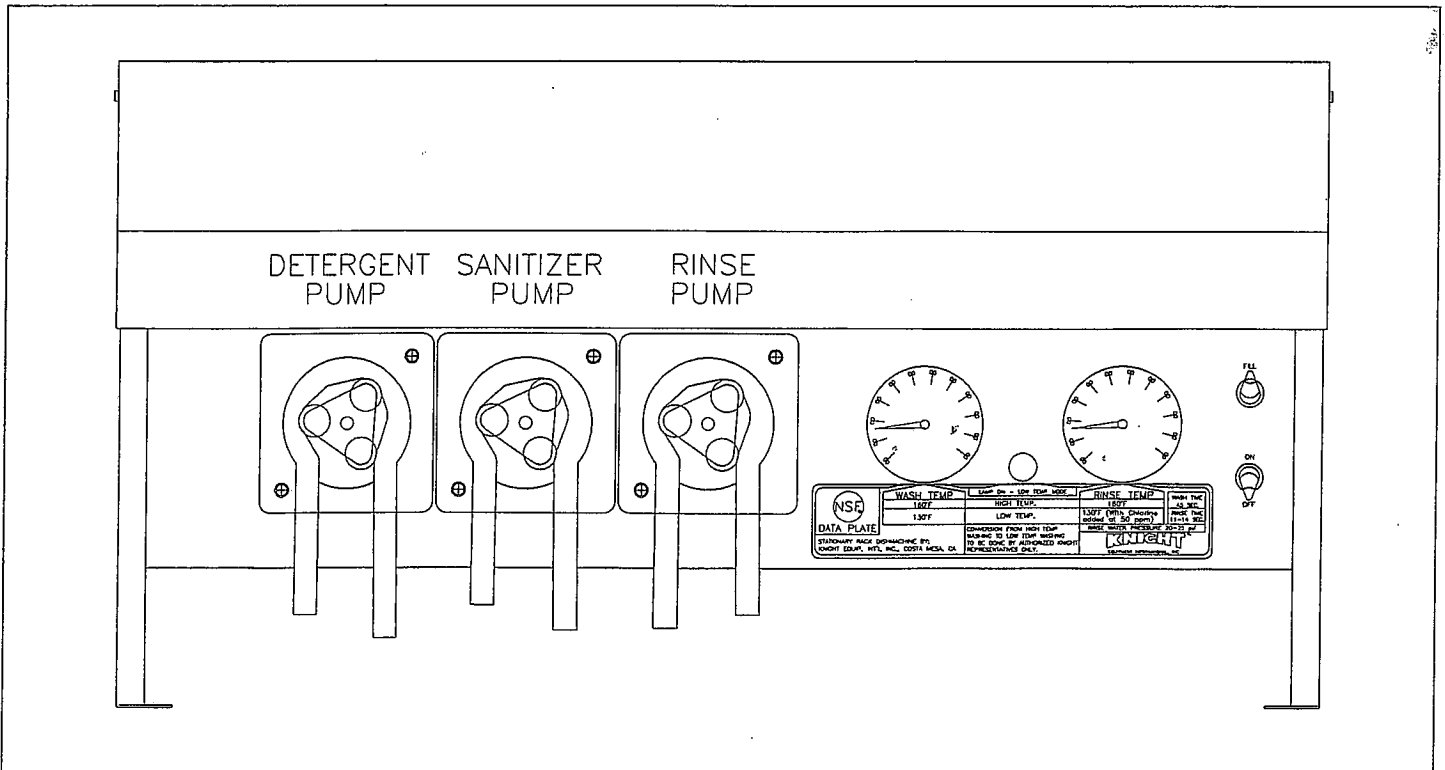
## WIRE COLORS

1 BLACK	5 BLUE/WHITE	9 ORANGE	13 RED	17 YELLOW TO WHITE	21 BROWN	25 RED
2 WHITE	6 YELLOW	10 BLACK	14 BLACK	18 YELLOW	22 BLACK	26 BLACK
3 RED OR BLACK	7 PINK OR BLACK	11 BLACK	15 BLACK	19 BLACK	23 BROWN	27 BLUE
4 WHITE	8 GRAY	12 BLACK	16 BLACK	20 BROWN	24 YELLOW	28 BLACK

# CAM TIMER SETTINGS



# PUMP DESIGNATIONS



## FEATURES AND SPECIFICATIONS

This machine features all stainless steel parts and a number of standard features which make it the best buy on the market today. Our specially designed wash tank and low water usage rinse cycle allows this machine to use minimal water and chemical and still maintain excellent results. The KLE-112H/L 60-second cycle allows you to gain more productivity due to its quick cycle.

### STANDARD FEATURES

- Converts easily from inline to corner operation
- Converts easily from high temp to low temp (connect switch for sanitizer pump and adjust wash thermostat)
- Automatic Start/Stop
- Extra large 17 3/8" door opening
- Thermostatically Controlled 3000 watt heater with low water protection for heater
- Fresh water rinse
- Probeless controlled chemical injection
- All stainless steel construction including chemical injection points
- Top mounted thermometers for easy reading of wash and rinse temperatures
- Removable, adjustable legs
- Five gallon wash tank capacity
- Specially designed wash tank to save water and chemicals
- An adjustable rinse cycle to allow low pressure areas to extend rinse cycle

### SPECIFICATIONS

Operating capacity .....	55 racks per hour
Operating cycle .....	60 seconds
Wash time .....	45 seconds
Rinse time .....	11 - 15 seconds
Dwell time .....	1 - 4 seconds
Wash tank capacity .....	5 U.S. gallons
Wash pump capacity .....	57 gallons/min.
Rinse capacity per cycle .....	1.25 gallons
Thermometers wash temperature .....	160F high/130F low
Thermometers rinse temperature .....	180F high/130F low
Water inlet .....	3/4"
Drain .....	1 1/2" I.P.S.
Washpump motor .....	1 horsepower
Max. clearance for dishes .....	17 3/8"
Standard dishrack .....	19 3/4" X 19 3/4"
Shipping weight .....	215 lbs.(app)
Electrical rate (volts) .....	220/60/1
Load amps .....	23

### DISCLAIMER

Knight Equipment International does not accept responsibility for the mishandling, misuse, or non-performance of the described items when used for purposes other than those specified in the instructions. For hazardous materials information consult label, MSDS, or Knight Equipment International.

### WARRANTY

All Knight controls and pump systems are warranted against defects in material and workmanship for a period of ONE year. All electronic control boards have a TWO year warranty. Warranty applies only to the replacement or repair of such parts when returned to factory with a Knight Return Authorization (KRA) number, freight prepaid, and found to be defective upon factory authorized inspection. Bearings and pump seals or rubber and synthetic rubber parts such as "O" rings, diaphragms, squeeze tubing, and gaskets are considered expendable and are not covered under warranty. Warranty does not cover liability resulting from performance of this equipment nor the labor to replace this equipment. Product abuse or misuse voids warranty.