KHT-14B
High-Temp Dishmachine
OPERATION & SERVICE MANUAL

CONTENT

KNIGHT HIGH-TEMP DISHMACHINE

Model KHT-14B

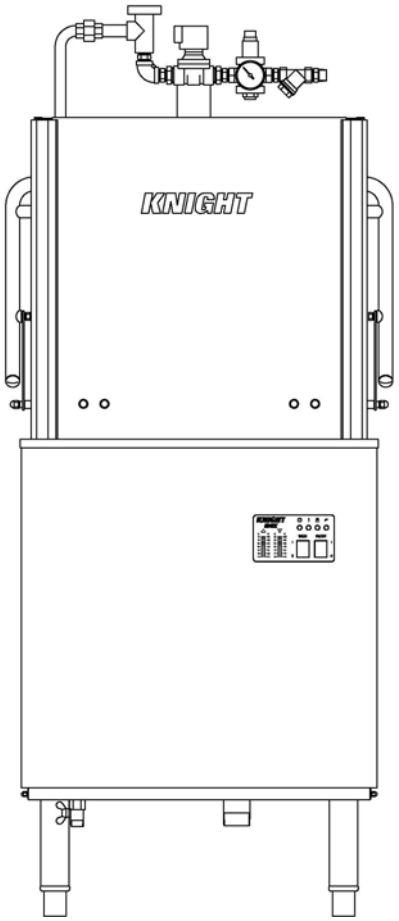
Installation，Operation & Maintenance

Please keep this manual for reference

OVERVIEW

The Knight Dishmachine is a single rack automatic dishwashing machine. All three doors lift for loading or unloading the rack. When the wash tank is filled up to the required water level, as the door is closed, the machine will automatically run wash and rinse cycles. If the tank water level is low, water will be automatically filled into the tank until the normal water level is reached. Each time the door is closed, The KHT-14B starts to run another complete cycle.

The working height to load the KHT-14B and attach a table is **34 inches or 860 mm**. The machine has a 2x7 KW rinse water booster and a 5 KW wash tank maintenance heater. Incoming water is pressure reducing valve controlled with inline gauge and solenoid. All operations of the KHT-14B are controlled from the front display panel



INSTALLATION

Before installation, please read the specification tag placed on the right hand side of the machine, and make sure to verify the electrical power supply. Immediately after unpacking the dishmachine, please examine the machine for any damage caused during transportation. Please inform the supplier immediately of any damages.

Select the right place for installation

It is important to put the dishwasher at the right place for installation., Please consider the connection of the power supply, water supply, drainage, S.S. working tables and detergent dispenser (to be provided), as long as the required space for daily maintenance and ceiling height for opening machine door. (See diagram 1) for dimension specification （mm/inches）

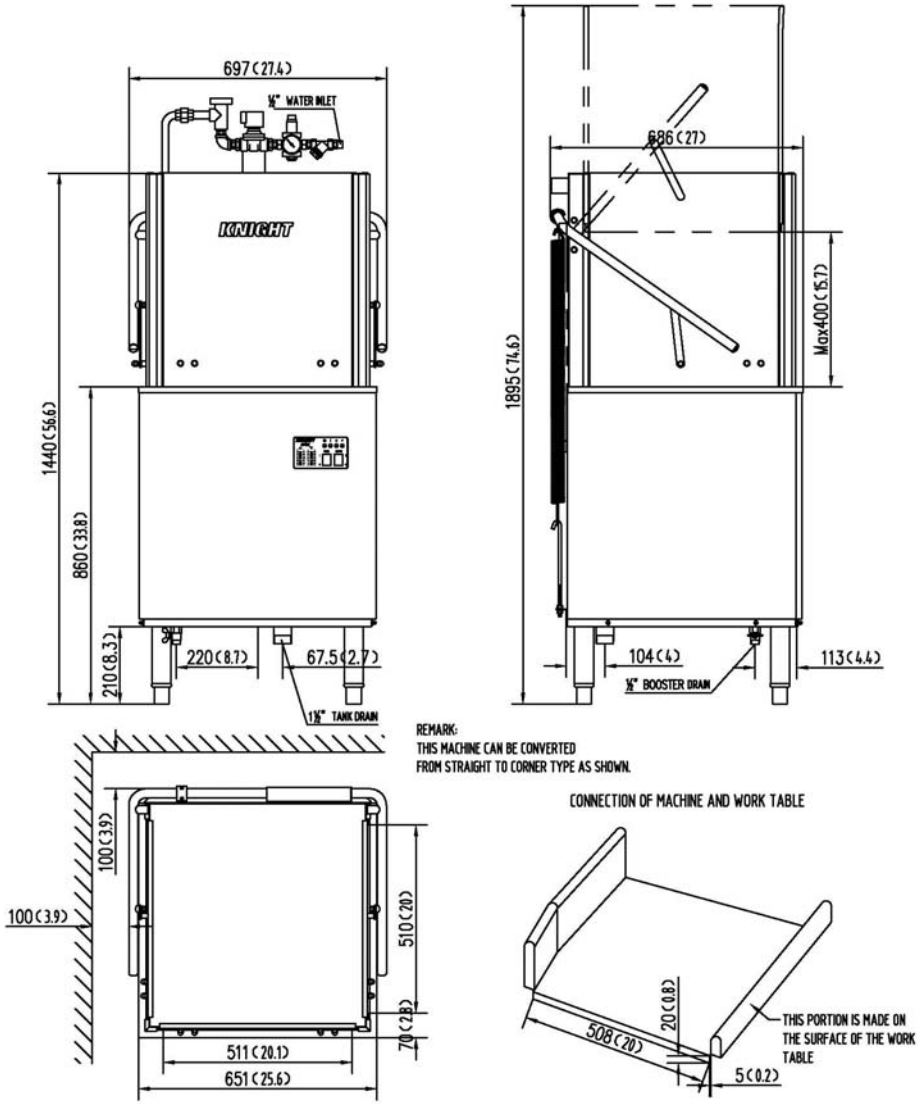


Diagram 1

The KHT-14B must be horizontally placed for all electrical and water connections. To reach the desired height level and maintain balance, turn the adjustable legs accordingly.

S.S. working tables should be hung on machine shall (see diagram 2), and sealed with silicon to avoid leakage.

Local regulation may require the install of an exhaust hood or ventilator (not provided). If needed, the required exhaust airflow should be at least 2.8m^3/min.

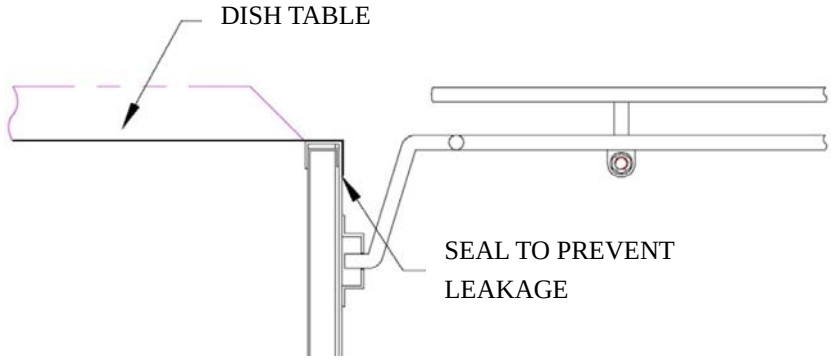


Diagram 2

CONVERT FROM STRAIGHT-THROUGH TO CORNER OPERATION

For corner operation, remove the rack guide and baffle (Diagram.3) from the front, of the rack guide and use screw to re-install the baffle in the front.

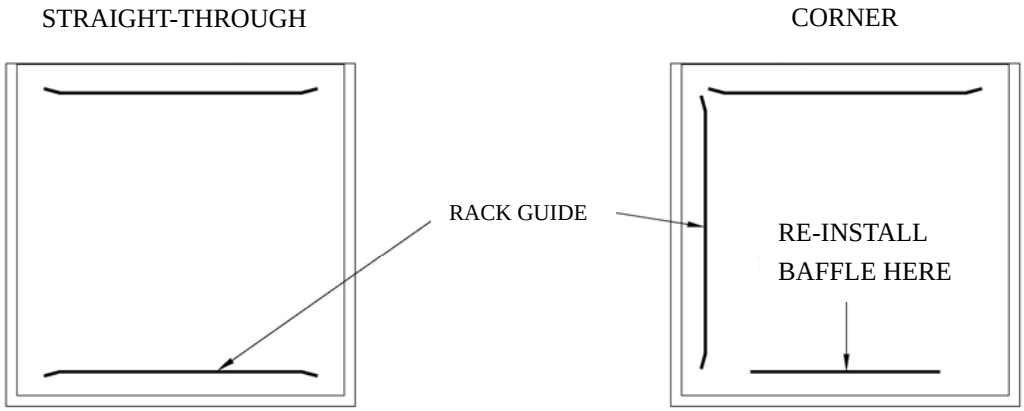


Diagram 3

Electrical connection

Warning: This dish machine must be installed in accordance with the local electrical codes, or in the absence of local codes, installed in accordance with the applicable requirements in ***NFPA 70, the National Electrical Code, CSA C22.1, (Part 1) the Canadian Electrical Code,*** **and** ***NFPA 96, Standard for Ventilation Control and Fire Protection of Commercial Cooking Operations.***

All connection of electricity and grounding must comply with any applicable ordinance of the national or local electrical requirements.

↗ **Warning**: Shut off power supply, and lock box, to alert anyone **NOT** to turn power on. Please read carefully the electrical wiring diagram as shown on the machine case. Properly connect power cables with the designated terminals.

Power cable for machine is prepared and has been inserted into a sized at 1" flexible conduit with 1.36" size connectors in both ends.
Connections are as following :-
1/ Yellow/green color wire sized at 10 AWG marked with **G** (max. loading 30 Amp) as ground wire for the machine.
2/ Red color wire sized at 6 AWG, marked with **L1** as live wire 1 (208v AC, max. loading 55 Amp) for power supply to machine.
3/ White color wire sized at 6 AWG, marked with **L2** as live wire 2 (208v AC, max. loading 55 Amp) for power supply to machine.
4/ Blue color wire sized at 6 AWG, marked with **L3** as live wire 3 (208v AC, max. loading 55 Amp) for power supply to machine.
Connect above wires to the isolated (not provided with this machine) mounted on the wall.

Check motor direction

Running direction of the motor must match the arrow sign marked on the pump case. In case the motor movement is wrong, power off first, then randomly exchange the connections of any two main cables, start the machine again and check the motor direction is correct.

↗ **Warning**: After the first installation, it is a must to check the pump direction. Damage may occur from the pump running backwards for an extended period of time

Detergent dispenser connection **(This is 220/60/1 and is live when main power turned on)**

The detergent dispenser power cable is already attached. It supplies a main power connection, detergent connection and rinse connection to operate a Knight warewash dispenser. The machine is also equipped with a dispenser bracket that can be mounted on the water supply bracket to hold the dispenser

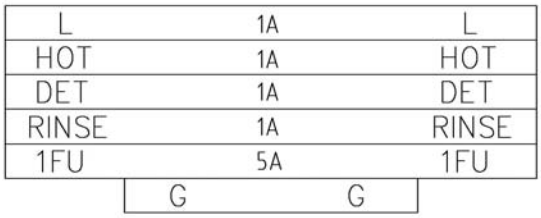
Supplied Electrical Power for Dispenser Legend

1/ Black（PWR）& HOT for constant supply to chemical dispenser
2/ White (Common) to constant, detergent and rinse
3/ Orange is detergent power and is active when main pump is on
4/ Purple is rinse power and is active during rinse and fill

Each power loading must not exceed 5A. Please refer to the electrical wiring diagram attached on the machine front panel.

- **Attention**: The pull out distance of the electrical box should be put into consideration for all the wire connections, to prevent wires from loosening.
- **Attention**: Use 600V sealed electrical wire.

Diagram 4



A cable for dispenser power is prepared and has been inserted into a sized at 0.5” flexible conduit with 0.866” size connectors in both ends.

Connections are as follow:

1/ Yellow/green color wire sixed at 18 AWG marked with **G** as ground wire for chemical dispenser.

2/ White color wire sized at 18 AWG marked with **HOT (L21)** as common wire for chemical dispenser.

3/ Black color wire sized at 18 AWG marked with **L (L11)** as constant supply with 208v AC 1 Amp for chemical dispenser

4/ orange color wire sized at 18 AWG marked with **DET (33)** as detergent signal with 208v AC 1 Amp for chemical dispenser.

5/ purple color wire sized at 18 AWG marked with **RINSE (21)** as rinse signal with 208v AC 1 Amp for chemical dispenser

Water connection

↯ Warning:Water pipe connection must comply with relative local plumbing codes and safety ordnances.

Water supply

Connect the water inlet hose (1/2”thread) with water supply valve.

Requirement of Water Supply

Relative heating power	Water inlet temp.		Water flow pressure
	°C	°F	PSI
14kW rinse heating	40-50	100-120	15～25

Caution: check water inlet pressure after connection, if flowing pressure below 15 PSI, a booster pump is needed to increase the water pressure to the required range. If flowing pressure is higher than 25 PSI, adjust the pressure regulator to the required water pressure as recommended.

Drainage

Connection the drain pipe ($1^1/_2$”) under the wash tank with an appropriate drainage (drain capacity should be at least 95.5 L/min.)

Injection of drying agent

There are two injection points for the rinse additive on the upper left of the booster heater. Left one is to inject the rinse additive directly into the booster heater and the centre one is to the rinse arms. Use an Allen key to take out the hole plug and connect the rinse additive injection valve, then tightened.(Injection fitting supplied with dispenser)

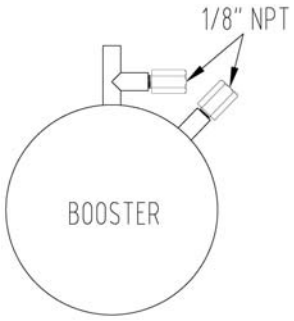


Diagram 5

OPERATION

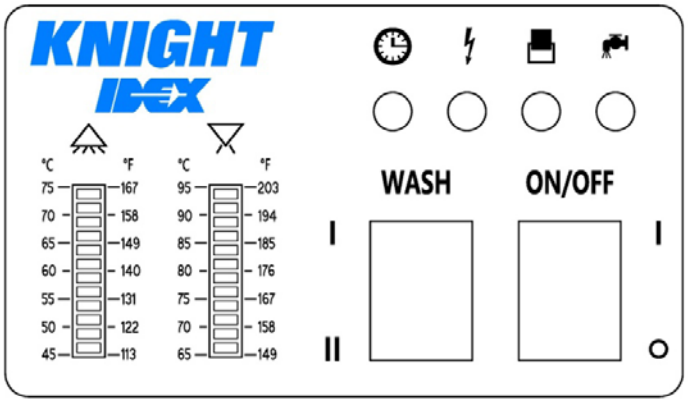
Control panel

On/OFF I / 0

Press switch to I, power light (ϟ) on, indicates power connected & control panel is ready to go for next step. When wash tank water level is lower than required or empty, fill starts and light is on. When water level reaches setting, fill light goes off & machine is in standby mode.

Wash Indicating light

It goes on when machine is in wash cycle



Power light

Indicating machine's on/off switch has been switched to on position

Door Light

It goes on when doors are open. Light will go off when doors closed

Fill light

It goes on when wash tank is filling.

Cycle Time Selection (WASH I or II)

Press the left button marked Wash I or II to select 60 or 90 seconds wash/rinse time during standby mode. Note (for cold water connections 90 second cycle is recommended)

Temp. Light

Left indication shows wash temp. ( ), Right indication shows rinse temp. ( ), green lights on indicate present working temp.

Recommended operating temperature

Main wash temp.	65 °C -75 °C（150 °F -158 °F）
Final rinse temp.	82 °C -95 °C（180 °F -203 °F）

Preparation for Operation

- Properly place the scrap trays and basket into the machine and plug-in the overflow drain pipe.
- Close the door and turn on power, water auto-fill starts. Machine will start first wash once full to charge machine with detergent
- Once water is full, open door and check water level. Insure both detergent and rinse additive activated during cycle. (chemical supplier will correctly set the correct amounts)
- Wait until wash / rinse temperature reaches proper range before starting to wash. .
- Close the door, then wash and rinse programs will automatically start.

Washing-up procedures

- Scrap off food residues from dishes and pre-rinse.
- Select wash cycle of 60, or 90 seconds according to soil load.
- Property load tableware into racks, by the manner that all the surfaces of every piece of tableware should have adequate exposure for water flushing. Dishes are to be vertically inserted, and bowls should be inversely put into flat racks. Cutlery should be loaded into san open rack, and glasses must into compartment rack.
- When a rack is fully loaded, open the door put in rack and close the door. The wash and rinse will proceed automatically. Wash cycle starts as the door is closed, and rinse cycle will follow when after 4 seconds delay right after the wash has finished.
- When wash & rinse cycles are ended, wait for a second until cycle light is off. Open the door and pull out the washed rack. Repeat procedure until all soiled tableware is completed.
- Whenever cycle starts, door should not be opened; there is a danger of hot water splashing. After each cycle, wait until cycle light is off. The main wash water in the machine should be changed after each meal period for best operation

Cleaning the machine

We recommend cleaning thoroughly all interior parts of the machine after each use. (every meal or at least once a day)

Cleaning procedures:

1. Shut off power.

2. Open the door.
3. Lift up overflow pipe to drain tank water.
4. Pre rinse tables to remove any soil before removing scrap trays in dish machine
5. Remove scrape trays, basket and pump intake screen, dump the residues (but do not smash baskets. Poorly shaped baskets will reduce water straining ct) and could create pump blockage
6. Flush to clean the interior of the machine, thoroughly wash inside the machine.
7. Put screen straining equipment back in place.
8. Check if wash arms and rinse arms are rotating freely.
9. Check every upper and lower spray jets for clogging, if there is any, use a narrow pin to clear obstruction or remove the spray arms to clean.
10. At end of day leave doors open to let air machine air dry.

MAINTENANCE

Warning: Shut off power supply, display caution sign nearby, to alert anyone **NOT** to power on.

Wash and rinse arms

Both upper and lower wash and rinse arms could be rotated freely for a few seconds by gently swinging. Turn off the machine before testing, and remove obstruction if present.

If the straining equipment is not in place, then the wash arms and jets may be clogged. If necessary, remove the wash and rinse arms for cleaning.

To remove the wash and rinse arms, just unlock the end caps, between the bearings of both arms.

Attention: the O-ring seat of the lower wash arm should not be removed.

When unloading the upper arms, hold the arm tightly during unlocking the end caps, to avoid dropping.

Upper and lower arms can be exchanged as they are the same

TROUBLE SHOOTING

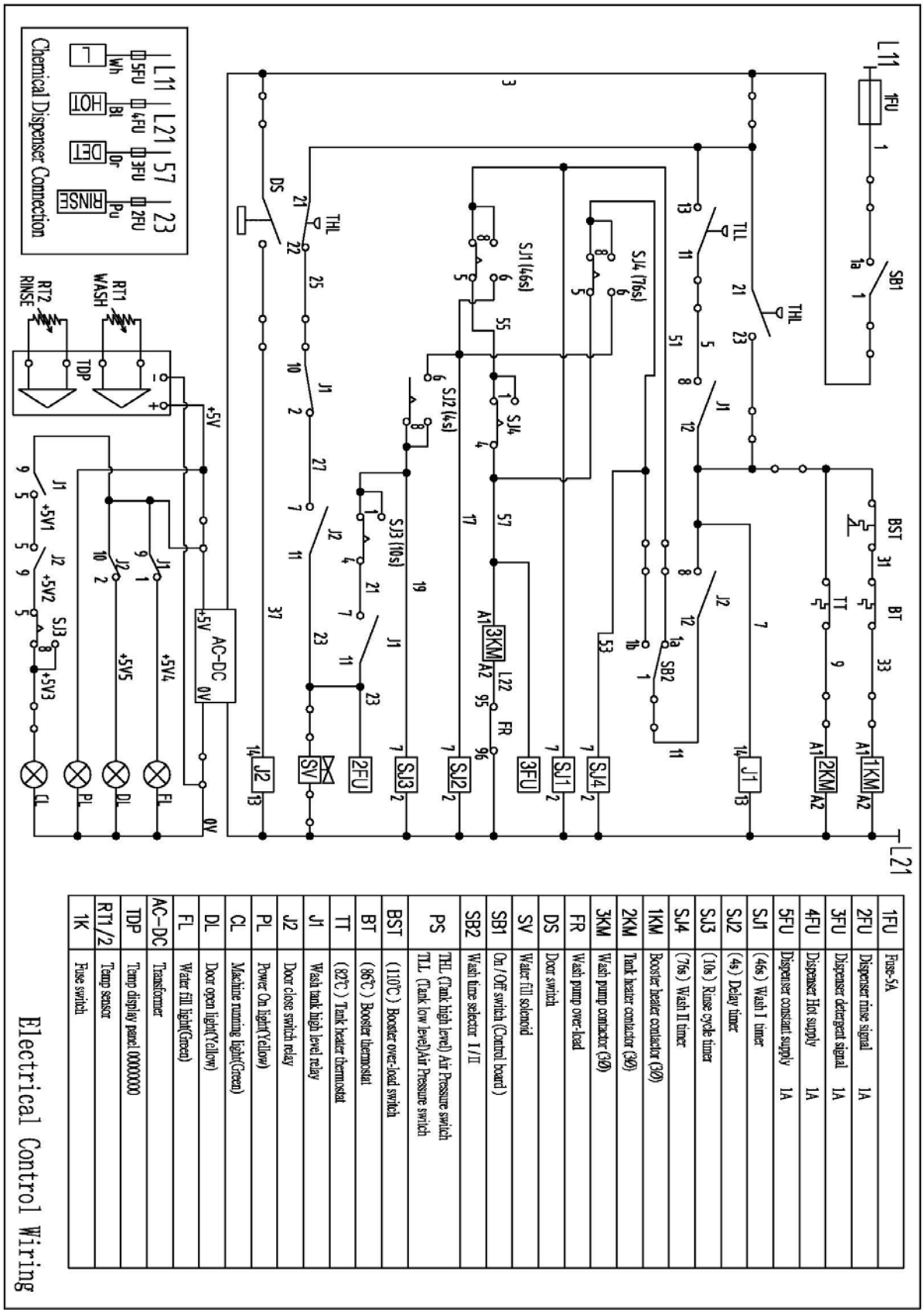
This chapter only provides some general methods for problem solving. If problem persists, please contact the supplier.

Common problems	Possible reasons and easy solutions
Machine cannot be started	1. Check to see if door light is off 2. Check the 1FU fuse in the control circuit. 3. Check door magnet switch
Will not start or stop filling	1. Check pressure switch hose connection for water and drain and let dry.
Rinse remains at low	1. Thermostat incorrectly set or damaged. Booster heater is

temp.	defective 2. Water fill pressure or flow volume is too low, cause low water level in booster heater. 3. Check water inlet strainer and solenoid valve or water supply
Poor wash results	1. Incorrect pump direction. 2. Wash spray is too weak due to pump intake is clogged. Power off and drain tank water, check wash pump intake for any obstruction. 3. Wash temp. is too low. Inadequate pre-heating time, or check the thermostat and heating elements. 4. Improper detergent dosage, please contact the detergent supplier. 5. Excessive lime build-up, needs to be de-limed.
Streaks found on ware washed	1. Improper racking. 2. Rinse temp. is high or too low. 3. Poor rinse or no rinse 4. Abnormal water hardness. 5. Wash detergent does not suit local water quality. 6. Rinse drying agent not suit local water quality. 7. Improper dosage of the cleaning chemicals.
Inadequate rinse pressure	1. Clogged water inlet strainer, causes slow water flow. Close the water supply, remove the strainer between inlet hose and solenoid valve, clean the strainer screen. 2. Water supply pressure is too low or water supply is turned off. 3. Solenoid valve defected.
Continue fill or cannot fill water	1. Tiny obstruction entered the fill solenoid valve, resulting in abnormal functioning. Caution: detail checking right after installation is very important, small chips may go inside into the piping and being stuck inside valve. Power off, open the solenoid valve and clean all the interior parts, then replace 2. Water supply too low or shut off. 3. Pressure regulator is not activating due to low incoming water pressure 4. Solenoid valve defected. 5. Air vent inside the wash tank clogged

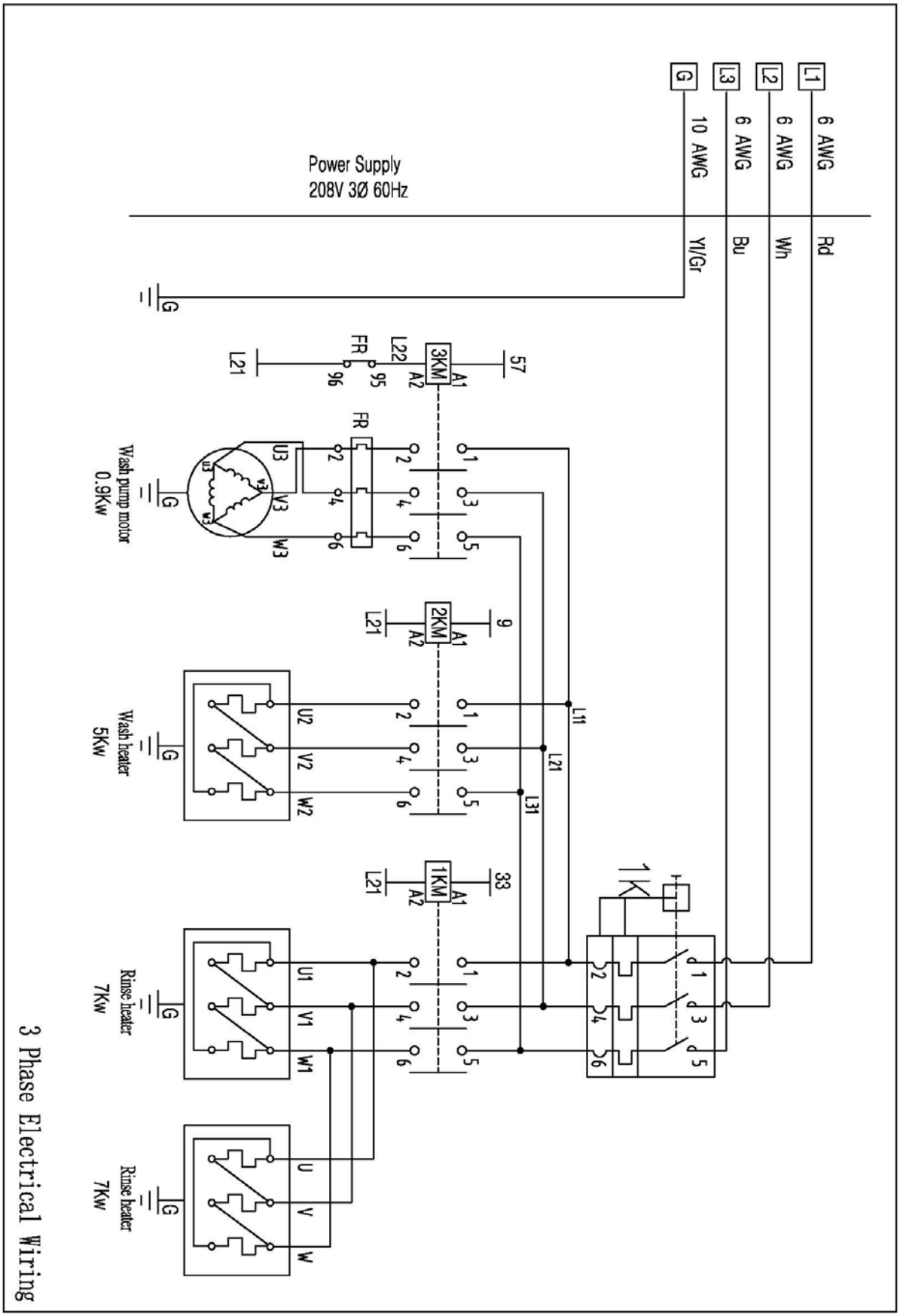
REPAIRING

If the machine needs repairing or adjustment, please contact the supplier or local authorized dealer.

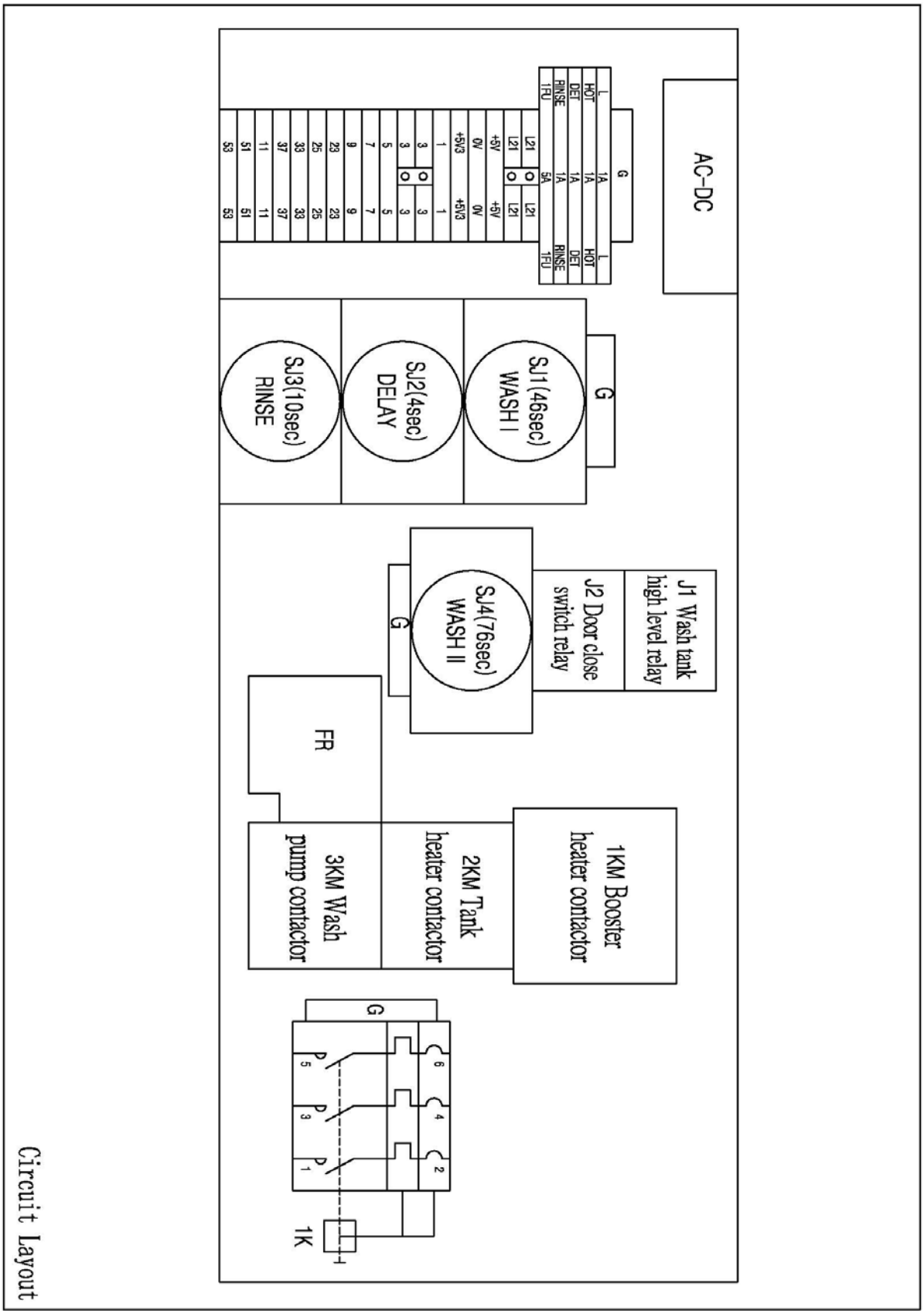


1FU	Fuse-5A
2FU	Dispenser rinse signal 1A
3FU	Dispenser detergent signal 1A
4FU	Dispenser Hot supply 1A
5FU	Dispenser constant supply 1A
SJ1	(46s) Wash I timer
SJ2	(4s) Delay timer
SJ3	(10s) Rinse cycle timer
SJ4	(76s) Wash II timer
1KM	Booster heater contactor (3Ø)
2KM	Tank heater contactor (3Ø)
3KM	Wash pump contactor (3Ø)
FR	Wash pump over-load
DS	Door switch
SV	Water fill solenoid
SB1	On / Off switch (Control board)
SB2	Wash time selector I / II
PS	THL (Tank high level) Air Pressure switch TLL (Tank low level)Air Pressure switch
BST	(110℃) Booster over-load switch
BT	(86℃) Booster thermostat
TT	(82℃) Tank heater thermostat
J1	Wash tank high level relay
J2	Door close switch relay
PL	Power On light(Yellow)
CL	Machine running light(Green)
DL	Door open light(Yellow)
FL	Water fill light(Green)
AC-DC	Transformer
TDP	Temp display panel 00000000
RT1/2	Temp sensor
1K	Fuse switch

Electrical Control Wiring



3 Phase Electrical Wiring



Circuit Layout

DISCLAIMER

Knight LLC 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 LLC. Knight products are not for use in potentially explosive environments. Any use of our equipment in such an environment is at the risk of the user, Knight does not accept any liability in such circumstances.

WARRANTY

All stainless steel components have a three year limited warranty from date of purchase against manufacturers defects. Warranty replacement for component parts purchased by Knight are limited to warranty by the manufacturer. 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.

FOOTNOTE

The information and specifications included in this publication were in effect at the time of approval for printing. Knight, LLC reserves the right, however, to discontinue or change specifications or design at any time without notice and without incurring any obligation whatsoever.

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