

K-TRONIC SERIES



High Temperature Sanitizing Rack Conveyor Dishwashers
(USA Version)

OWNER'S INSTALLATION, OPERATION AND MAINTENANCE MANUAL

Models:

- K-200
- K-200 LPW
- K-200 PW
- K-400
- K-400 PW
- K-400 LPW





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AN ELECTRICAL WIRING DIAGRAM IS LOCATED INSIDE THE CONTROL BOX OF THIS MACHINE.

MEIKO K-SERIES RACK CONVEYOR DISHWASHERS HAVE BEEN DESIGNED EXCLUSIVELY FOR THE WASHING OF DISHES, GLASSWARE, CUTLERY, KITCHEN UTENSILS AND TRAYS IN A COMMERCIAL OR INSTITUTIONAL SETTING AND MUST NOT BE USED FOR ANY OTHER PURPOSE WITHOUT THE WRITTEN PERMISSION OF MEIKO.

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1 INTRODUCTION

1.1 Overview of Equipment

Meiko K-Tronic series rack conveyors are commercial dishwashers designed for cleaning dishes, glassware, trays, cutlery and kitchen utensils with a minimum of employee intervention or supervision.

A control keypad allows easy selection of three different conveyor speeds to accommodate different levels of soiling. A digital display permits easy monitoring of operation.

Operation is fully automatic. When a rack is pushed into the opening of the machine, the pawl bar drive is activated. The internal Mike 3 electronic controller automatically activates the prewash (if so equipped), wash and rinse zones, while maintaining proper tank temperatures.

During idle periods, the wash and rinse pumps are deactivated to conserve water, energy and chemicals, while steam coil or electric tank heaters maintain the water temperature for quick recovery.

Other features of the unit that affect operation include:

Mike 3 electronic control system - Automatically monitors and regulates tank temperatures. A digital display allows monitoring of tank temperatures, conveyor speed, and other information.

Internal booster heater - to ensure constant final rinse temperatures.

Pumped final rinse - A final rinse pump ensures constant pressure for the final rinse, for consistent, outstanding results.

Pumped auxiliary rinse - Final rinse water is captured and recirculated over the ware as a pumped pre-rinse, conserving water and chemicals.

Side-drive system - Racks are advanced through the machine using pawl bars at the sides of the rack rails. This provides an unobstructed wash pattern.

Wash arm manifolds - Wash arms are pre-assembled into easily-removed manifolds for faster cleaning. The nozzles are slotted and

concave to minimize clogging. Wash arm end caps are captivated to prevent their loss during cleaning.

External drain levers - Foot-operated drain levers empty the machine quickly and safely.

Front-sloping, V-shaped wash tanks - For faster draining and easier cleaning.

Double-wall, insulated construction - Improves operator safety, conserves energy, and reduces heat loss into the environment.

Waste Air Heat Recovery System - Utilizes the waste heat generated by the machine to pre-heat the incoming rinse water, reducing energy consumption and allowing hot-water sanitization from a cold water supply.

For efficient and SAFE operation, be sure to follow the installation and operating instructions provided in this manual. In particular, all safety symbols and notices on the equipment and in the supplied documentation must be followed.

IMPORTANT

Meiko K-Tronic series rack conveyors have been designed exclusively for the washing of dishes, glassware, trays, cutlery and kitchen utensils in a commercial or institutional setting and must not be used for any other purpose.

1.2 General Safety Information

The following symbols and headings are used throughout this manual to indicate possible hazards to persons or to the equipment. The symbols and headings are shown in order of importance. The descriptive text following these headings is *italicized* for easy recognition.



WARNING! *Possible hazard to persons, such as from electrical shock, crushing, or hot surfaces.*

CAUTION

Possible hazard to the dishwasher or to other equipment.

IMPORTANT

Vital information or tips for the installer or operator.

NOTE

Information or tips for the installer or operator.

2 TRANSPORT AND SHIPPING

IMPORTANT

- *Observe any notices on the crating material that pertain to shipping.*
- *Use care when transporting the equipment.*
- *As you unpack the equipment, check that all components shown on the shipping invoice are present and intact. Be sure to check for shipping damage. If shipping damage is present, call Meiko Customer Service at 1-800-868-3840, providing full details on the customer, serial number and extent of damage present. Meiko will file a freight claim based on this information.*



WARNING!

In NO EVENT should a damaged appliance be installed or operated!

3 INSTALLATION

3.1 Overview of Installation

Prior to installation, the factory will supply engineering drawings detailing the machine. Details include dimensions and complete utility requirements.

All installations of new Meiko K-Tronic series rack conveyors will include a factory representative as a supervisor and advisor. The factory representative will be able to advise the installer of special installation requirements that are outside the scope of this Manual.

The owner should contract with qualified personnel to move the appliance to the installation location, unpack it, and prepare it for final utility connections.

In most cases, local codes prevent the final utility connections from being made by any party other than a licensed electrician, plumber and/or steam fitter.

IMPORTANT

It is the responsibility of the owner to ensure that all aspects of the installation comply with all applicable local and national codes.

IMPORTANT

The appliance's warranty is not valid until a Meiko Authorized Service Agent performs a Performance and Installation Inspection.

Installation of the dishwasher involves the following steps:

- Verifying that the utility connections are present, are appropriate for the appliance, and comply with all applicable local and national codes.
- Unwrapping the appliance (leaving the shipping skid in place for easier movement) and checking for shipping damage.
- Moving the appliance to the installation location, removing the skid, and leveling the feet.
- Connecting the machine to tabling.

- Routing the ventilation system in accordance with the factory-supplied engineering drawings and all applicable local and national codes.
- Connecting the water supply.
- Connecting the electrical supply.
- Connecting the steam supply line (for machines with steam heating).
- Connecting the steam condensate return line, and routing it to either a floor drain or a building condensate return line (for machines with steam heating).
- Connecting the drain line, and routing it to a floor drain or building drain.
- Installing the chemical dispensing system (if so equipped), following the manufacturer's instructions AND the instructions in Section 3 of this Manual.
- Contacting your Meiko Authorized Service Agent to perform a Performance and Installation Inspection for the machine. This step also validates the machine's warranty.

Meiko may be able to arrange for an Authorized Service Agent to be present at the conclusion of the installation process. Consult your Authorized Sales Representative for details.

3.2 Requirements Before Installation

Before the installer can uncrate and move the appliance to the installation location, the following conditions MUST be met:

- **INSTALLATION AREA REQUIREMENTS**
 - The area MUST be frost-free. Freezing temperatures (32°F/0°C or lower) inhibit proper operation and can damage internal components.
 - The area MUST have a firm floor surface. It is possible to compensate for uneven flooring by adjusting the feet.
 - The area should be away from appliances, furniture or surfaces that can be damaged by steam. If this is

not possible, these items should be protected from the steam that is released during normal operation of the dishwasher.

- **UTILITY CONNECTION REQUIREMENTS**
 - Connections must be present and ready for hookup to the appliance. All utility supplies must comply with the electrical information labels, with the information on the data plate, and with all applicable local and national codes.
 - Electrical leads, water supply line(s), drain line, and the steam supply and condensate return lines (if so equipped) must be present.
 - The electrical supply must match the voltage and amperage requirements specified on the data plate. Circuit breakers/disconnects (lockout/tagout is strongly recommended) must be installed in accordance with all local and national codes. If the machine includes multiple electrical connections, each supply must include a dedicated circuit breaker/disconnect.
 - The water supplies must match the temperatures, pressures and flow rates specified on the data plate. For best operation, it should also match the water hardness specified on the engineering drawings.
 - The steam supply (if so equipped) must match the pressure and volume specified on the data plate.
 - The ventilation system must be present and in accordance with the factory-supplied engineering drawings and all applicable local and national codes.
 - For units using a chemical dispensing system, appropriate dispensers or containers should be installed and ready for connection to the appliance.
- **GENERAL REQUIREMENTS**

Authorized personnel should be available to perform the actual utility connections.

3.3 Uncrating, Positioning and Leveling

IMPORTANT

Most K-Tronic series machines are shipped in a single section, with wiring and plumbing connections already in place from the factory. The Installation section of this manual describes the installation of these pre-assembled machines.

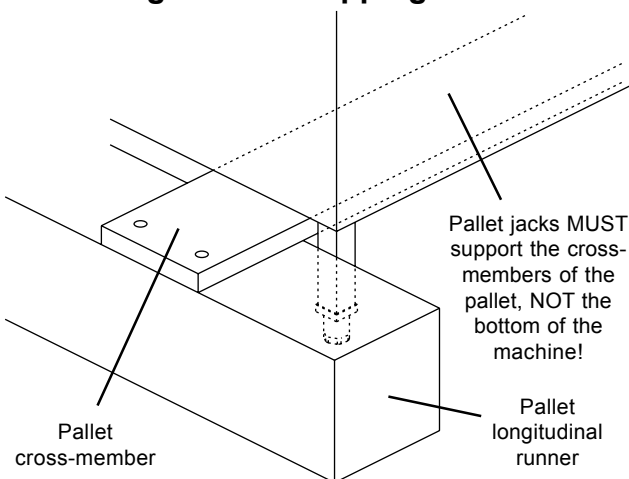
Due to space limitations at some installation sites, it may be necessary for the machine to be shipped in sections. If this is the case, assembling the sections is outside the scope of this Manual. Follow the on-site directions of the Meiko factory representative to assemble the sections.

1. Remove all shipping and packaging material from the appliance, including supports and wrappings. Leave the shipping skid in place at this time to allow for easier movement to the installation location.
2. Check for shipping damage as described in Section 2, "Transport and Shipping." If damage is present, call Meiko Customer Service at **1-800-868-3840**, providing full details on the customer, serial number and extent of damage present. Meiko will file a freight claim based on this information.
3. Move the appliance to the installation area using proper moving equipment.

CAUTION

When moving the machine, ALWAYS support it from both ends - not the center.

Figure 3-1: Shipping skids



CAUTION

Be sure that the moving equipment is positioned underneath the SKID and not the MACHINE. Some components of the machine extend down from the frame and can be damaged if the machine is improperly lifted. See Figure 3-1.

CAUTION

If the pallet is removed, the frame of the dishwasher can be damaged by improper lifting. The machine's weight must always be distributed properly using cross-members to protect the frame.

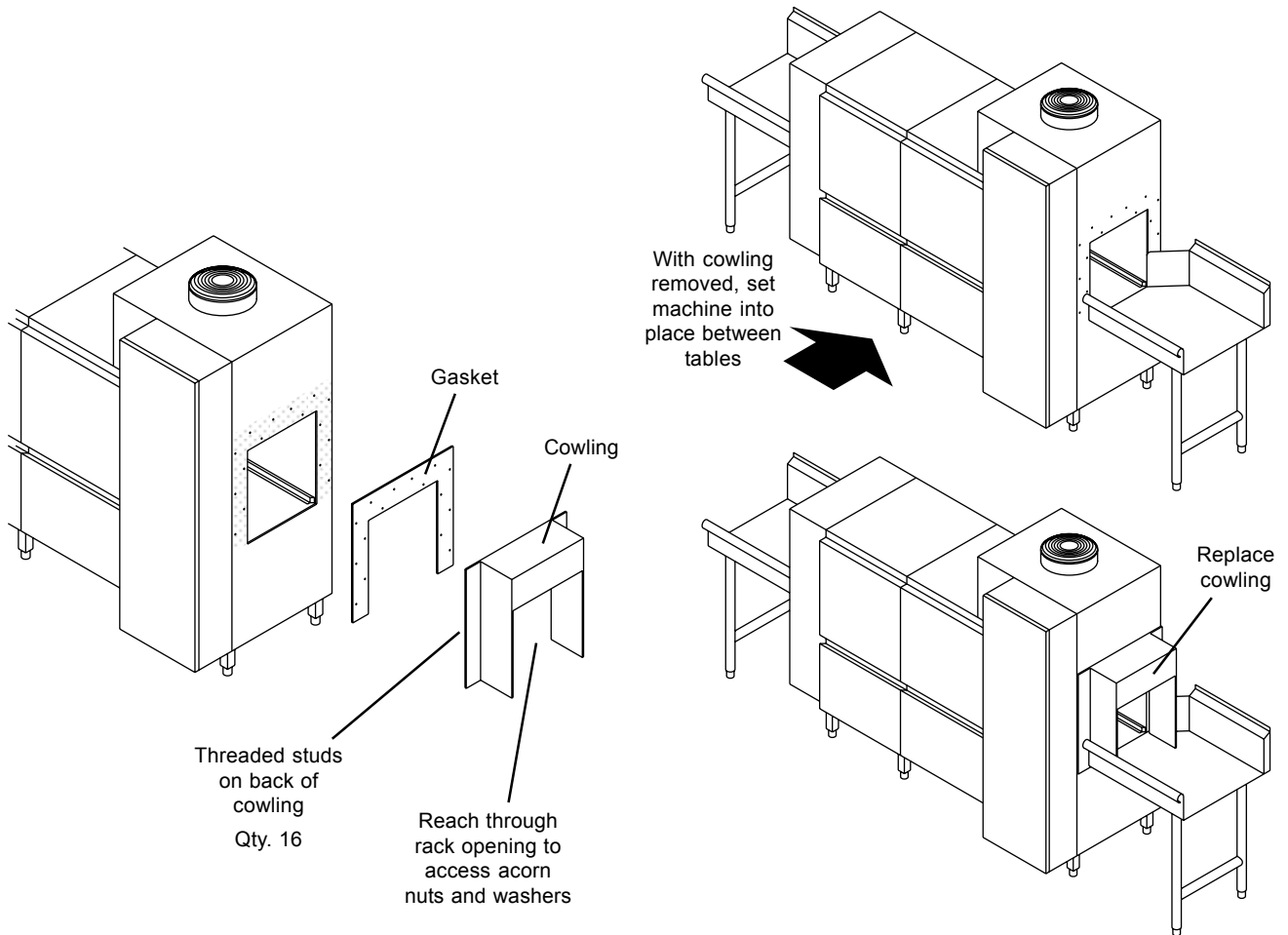
4. After the machine is moved to the correct location, lower the jacks to the floor, but leave them in place.
5. Remove the hardware attaching the raised cross-members of the pallet to the large runners that rest on the floor. To remove the hardware, you will need the following tools:
 - Torx TX 20 screwdriver
 - Torx TX 25 screwdriver
 - Wrench with 10mm hex socket
 - #3 Phillips-head screwdriver
6. With the hardware removed, slowly raise the jacks. The cross-members will lift free, while the large runners remain on the floor.
7. Remove the runners and lower the jacks. Then, remove the cross-members.
8. The machine can be moved for a SHORT distance by carefully sliding it on the floor.

CAUTION

Be careful not to damage the legs on tile gaps, gratings, or other irregularities in the floor.

9. Machines that are not equipped with a blower dryer include a cowling at the exit end of the machine. If dish tables are already in place, it may be necessary to temporarily remove the cowling to install the machine. See Figure 3-2.

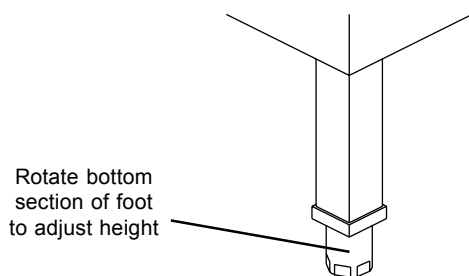
The cowling is held in place by 8mm hex head acorn nuts on the inside of the machine. For easy access to the acorn nuts, simply lift the front access door(s).

Figure 3-2: Removing the end cowling (if required)


10. Using a spirit level on the conveyor track, check that the appliance is level in both directions (front-to-back AND side-to-side). If necessary, level the appliance by rotating the bottom section of each foot as necessary using a 27mm open-ended wrench. See Figure 3-3.

CAUTION

The dishwasher **MUST** be level for proper operation.

Figure 3-3: Leveling


11. Check the tension on each foot section to ensure that the legs are sharing the load evenly. An unbalanced section may cause water leaks, incorrect operation (by allowing the machine to shift position), and/or damage the legs.

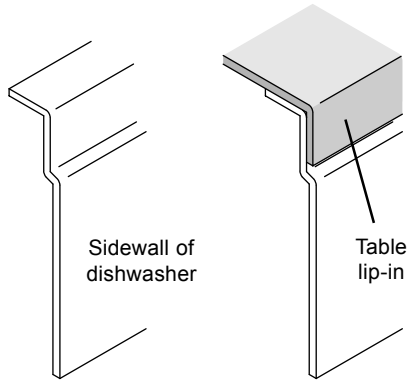
12. If you removed a cowling from the machine in Step 9, replace it on the machine at this time. Be sure to check that the rubber gasket that fits between the cowling and the body of the machine is properly seated.

13. Run a fine bead of clear silicone sealant along the top edge of the seam between the cowling and the machine.

3.4 Tabling Attachment

1. Position the table lip-in at both ends of the machine, as shown in Figure 3-4. Be sure to seat the lip-in against the inner face of the sidewall of the dishwasher.

**Figure 3-4:
Tabling
attachment**



2. Position the dishwasher and tables as follows:
 - Check that the centerline at the opening of each table is aligned with the centerline of the rack track of the dishwasher.

- Check that the surface height of each table matches the height of the rack track of the dishwasher, to ensure a smooth transition. The standard table surface height is 34" (864mm).
- Check that the dishmachine is level.

The height of the dishmachine, and of most tables, can be adjusted by rotating the feet at the end of the legs.

CAUTION

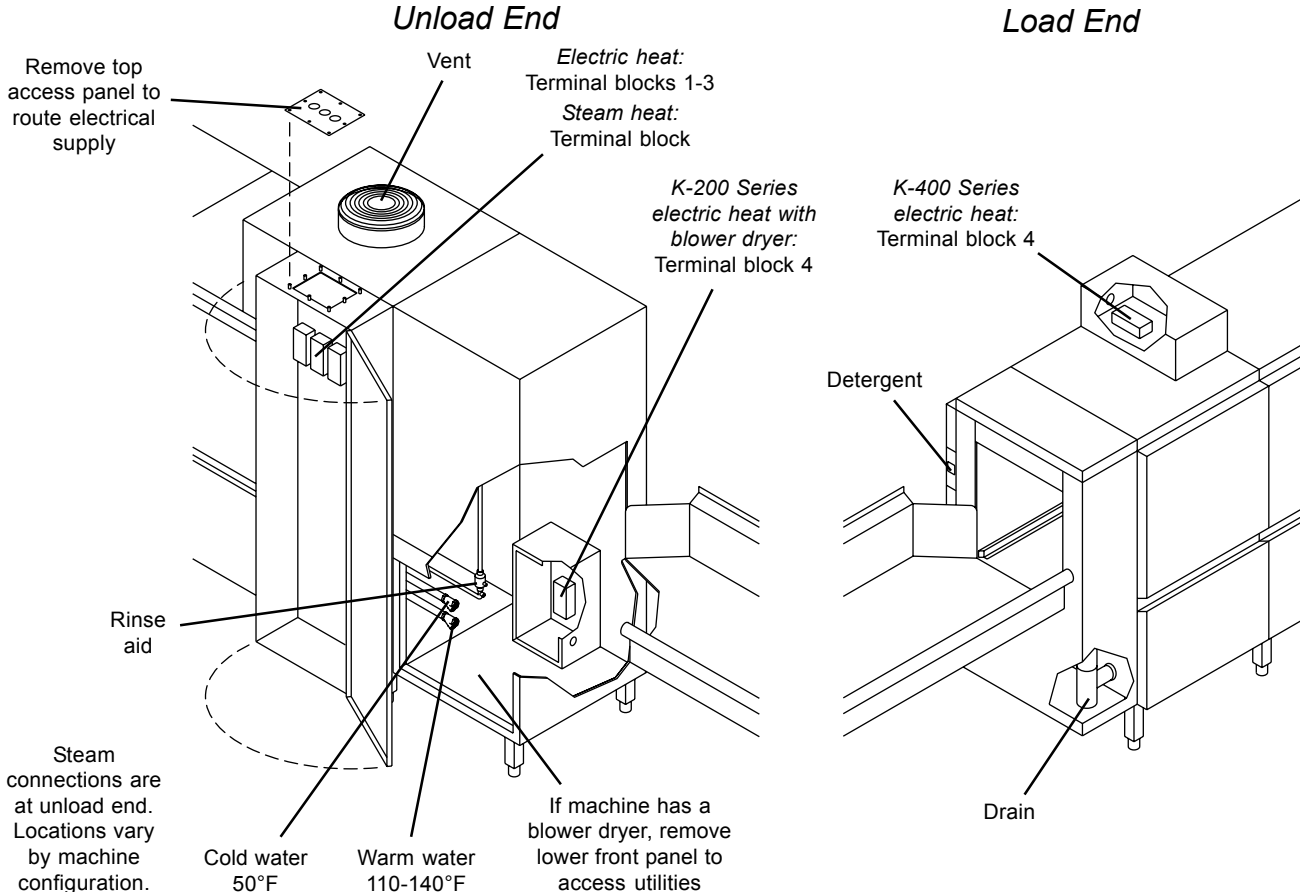
After adjusting the height of the dishmachine, always check that it is level to ensure proper operation.

3. After the tables have been positioned correctly, secure them to the dishwasher using silicone sealant.

3.5 Accessing the Utility Connections

The utility connections for the machine are shown in Figure 3-5.

Figure 3-5: Accessing utility connections



3.6 Vent Connection

IMPORTANT

In some cases, local codes dictate that ventilation connections be made only by a certified HVAC professional.

CAUTION

All aspects of the ventilation system must be corrosion-resistant, frost-free and protected against freezing temperatures (32°F/0°C or lower). Freezing temperatures inhibit proper operation and can damage internal components.

Meiko K-Tronic series warewashers are designed for use with a single-point, indirect ventilation connection. The machine includes a powered vent that is adequate for short, vertical runs (10'/3m or less). For longer runs, it is necessary to provide a powered fan for the system (for instance, mounted on the roof) to provide adequate airflow.

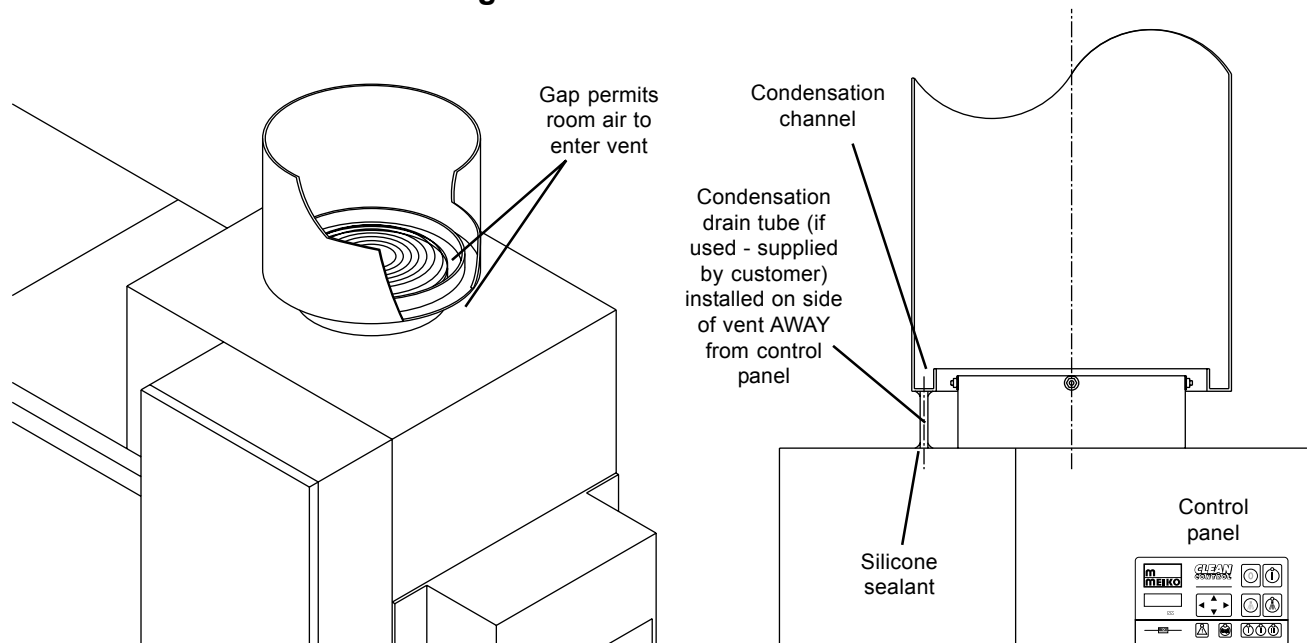
CFM ratings for the vent system, as well as construction details, are provided on the engineering drawings supplied with the machine. At the time of installation, the vent should be in place.

1. Check that the exhaust vent is correctly positioned above the machine's fan. See Figure 3-6. Note that the vent should NOT be connected directly to the machine so that room air can be drawn into the vent.
2. If the exhaust vent is powered, check the airflow using an airflow meter/anemometer. The CFM rating of the vent should match the CFM rating specified on the factory-supplied engineering drawings.
3. If the vent is constructed according to the engineering drawings, it will include a 1" (25mm)-wide "gutter" along the bottom edge to collect condensation. If desired, this condensation can be drained directly through the top panel of the machine at the location shown in Figure 3-6.

A 1/4" dia. stainless steel tube is recommended for this purpose. Note that the drainage tube should be installed on the side of the vent AWAY from the control panel as shown in Figure 3-6.

After installation, the seams between the tube, vent and machine should be sealed with silicone sealant.

Figure 3-6: Vent connection





3.7 Main Electrical Supply Connection

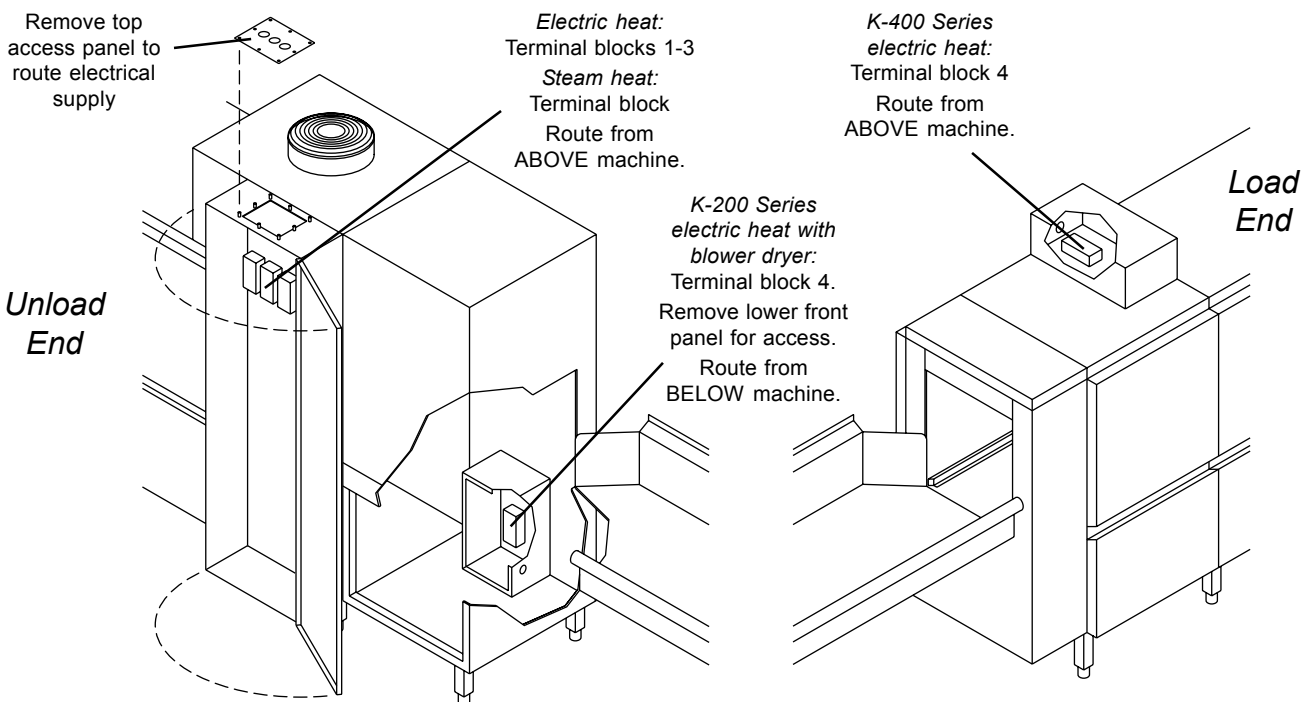
WARNING!
 Check that the circuit breaker/fused disconnect is in the OFF position and that the unit is switched off before making the electrical utility connections.

IMPORTANT
 In some cases, local codes dictate that electrical supply connections be made only by a certified professional.

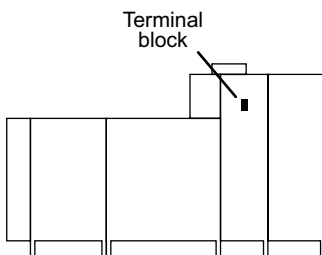
1. Refer to Figure 3-7. Determine the locations of the electrical terminal blocks as follows:
 - All steam-heated machines use a single terminal block inside the control compartment.

- Electrically-heated machines have either 3 or 4 terminal blocks. Terminal Blocks 1-3 are located inside the control compartment.
- K-200 electrically-heated machines that are NOT equipped with a blower dryer use only these three terminal blocks.
- K-200 electrically-heated machines that are equipped with a blower dryer have a fourth terminal block (Terminal Block 4) located inside a secondary electrical box underneath the blower dryer.
- All K-400 electrically-heated machines have a fourth terminal block (Terminal Block 4) located inside a secondary electrical box on top of the wash tank.

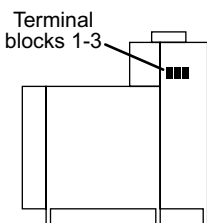
Figure 3-7: Electrical connections



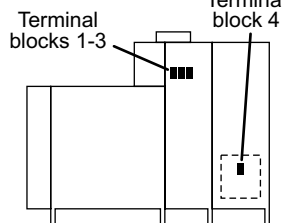
K-200 or K-400 series with steam heat



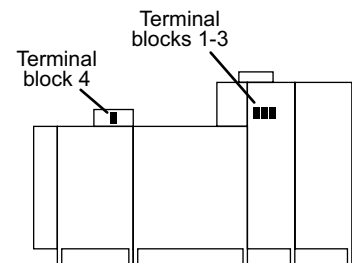
K-200 series with electric heat, no blower dryer



K-200 series with electric heat, with blower dryer



K-400 series with electric heat



2. Check that the incoming power leads are of sufficient rating for the appliance's current draw. Amperage and minimum supply wire specifications are shown on the wiring diagram, the serial plate and the electrical information label(s) next to each terminal block.
3. Remove the top access panel from the control compartment as shown in Figure 3-7.
4. Fit seal-tight fittings or strain reliefs into the holes in the access panel for the electrical supply wires as necessary. Three holes are provided. Each electrical supply should be routed through its own strain relief.
5. Route the electrical leads to the control compartment. All electrical supplies that will be connected to terminal blocks inside the control compartment should be routed from ABOVE the machine, if possible.
6. Refer to the electrical wiring diagram and the electrical information labels next to the terminal block(s). Connect the power supply and ground leads to the terminal block(s) inside the control compartment as indicated.
7. If the machine is equipped with a fourth electrical power supply terminal block, access it as shown in Figure 3-7. A seal-tight fitting is provided on the side of the box that contains the terminal block.
For K-200 series machines equipped with a fourth terminal block, route the supply from BELOW the machine. For K-400 series machines equipped with a fourth terminal block, route the supply from ABOVE the machine.
8. Adjust all seal-tight fittings/strain reliefs to fasten the wiring in place. You should leave enough slack in the wiring to prevent stress on the terminal connections.

3.8 Dispensing System Overview

K-Series rack conveyor dishwashers are designed for use with a liquid rinse additive, and either solid or liquid detergents. Detergent and rinse additive injection is supplied by external dispensing systems (supplied by others).

Figure 3-8: Detergent connection

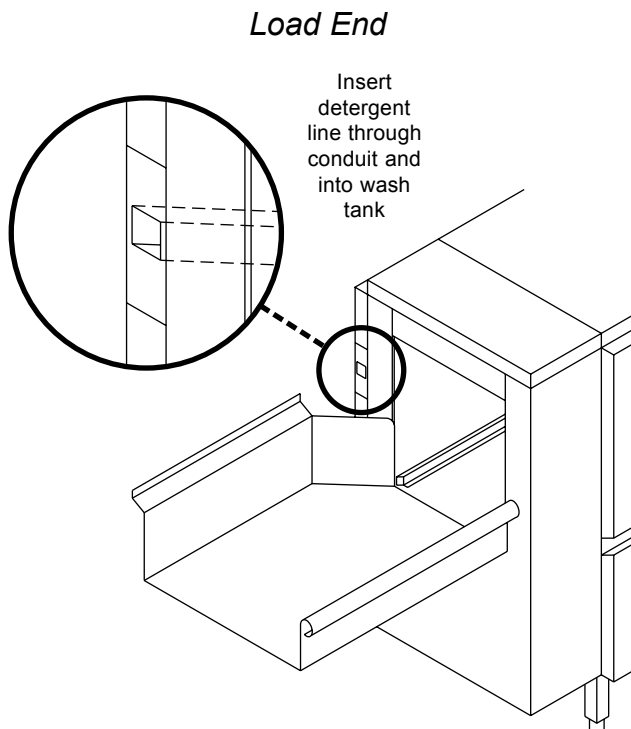
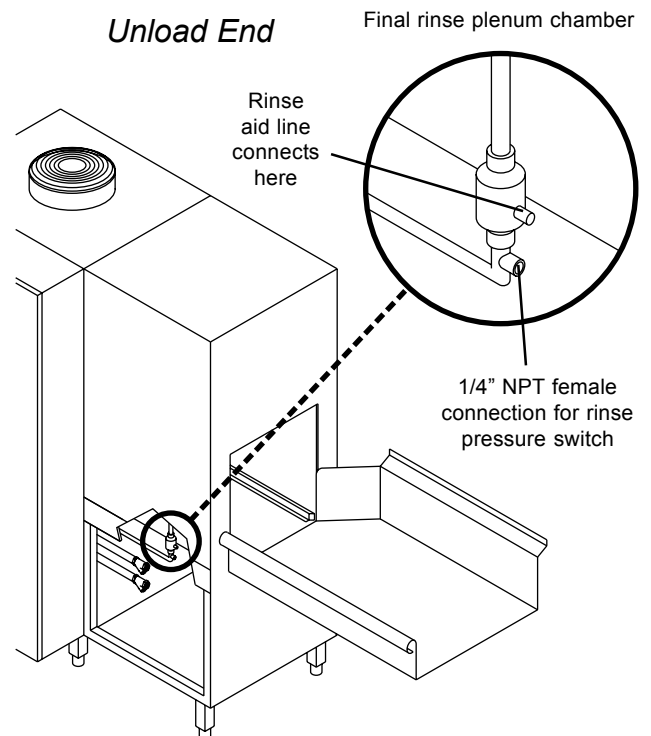


Figure 3-9: Rinse aid connection



The machine is equipped with:

- A pre-plumbed tubing raceway exiting the machine at the load end of the machine (see Figure 3-8). The raceway is routed to deliver detergent into the wash tank. Solid or liquid detergent lines can be routed down the raceway and into the tank.
- A dummy plug in the floor of the wash tank that permits the installation of a detergent concentration probe.
- A final rinse plenum chamber with a fitting for a liquid rinse aid line (see Figure 3-9). A threaded pipe connection just below the plenum allows the installation of a final rinse pressure switch.

A dispensing system terminal block inside the control box of the machine provides contacts for two **line voltage** relays. These relays, when closed, provide a “window” for external pump systems to activate.

Pump activation can be controlled as follows:

- Solid detergent systems should use a probe installed in the wash tank to measure detergent concentration and allow activation of the external pump. A dummy plug in the bottom of the wash tank provides an installation location for the probe.
- Liquid detergent systems can use EITHER a detergent concentration probe, OR a timer system. A detergent concentration probe is **HIGHLY RECOMMENDED**.
- Liquid rinse aid systems should use a rinse line pressure switch so that rinse aid is dispensed only when the final rinse is in operation. A 1/4” NPT female threaded connection is provided in the rinse aid line just below the final rinse plenum chamber. The pressure switch should be installed at this location.

3.9 Installing an External Solid or Liquid Detergent System

1. Locate the detergent line connection at the load end of the machine. See Figure 3-8.
2. Route the detergent supply line to the opening, completely down the raceway and into the wash tank.

CAUTION

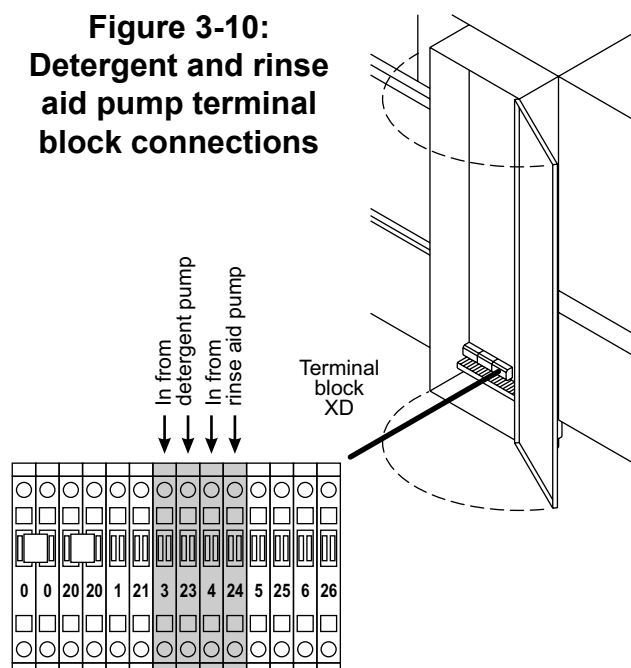
Make sure that the detergent line runs completely down the raceway to the wash tank. The raceway is NOT watertight, and is NOT intended to be a tube for chemicals!

3. Fasten the line in place and seal the connection.
4. If a detergent concentration probe will be used, remove the dummy plug in the bottom of the wash tank. Then, install the detergent concentration probe and seal the connection.
5. Check that the pump is correctly installed according to the manufacturer’s instructions.

3.10 Installing an External Liquid Rinse Aid System

1. Route the rinse aid supply line to the fitting on the side of the final rinse plenum chamber and fasten it in place. See Figure 3-9. Check that the connection is secure and seal it.
2. Install a rinse pressure switch to the 1/4” NPT female pipe connection just below the final rinse plenum chamber.
3. Check that the pump is correctly installed according to the manufacturer’s instructions.

**Figure 3-10:
Detergent and rinse aid pump terminal block connections**



3.11 Wiring External Chemical Dispensing Systems

IMPORTANT

Some local codes dictate that electrical connections be made only by a certified professional.

1. Locate the chemical dispenser circuit breakers inside the control box of the machine. See Figure 3-10.
2. Thread the incoming leads from the chemical pumps into the control box and to the chemical dispenser circuit breakers.
3. Connect the wiring for the external chemical dispensing system(s) as follows:
 - The terminals marked **XD3 and XD23** provide a **line voltage** signal to the external detergent pump. When the machine is turned on, one leg has continuous line voltage; the other closes ONLY when the wash pump(s) are operating, and completes the circuit.
 - The terminals marked XD4 and XD24 provide a **line voltage** signal to the external rinse aid pump. When the machine is turned on, one leg has continuous line voltage; the other closes ONLY when the rinse pump is in operation, and completes the circuit.
 - For both sets of terminals, **check if it is necessary to install a transformer** to convert the line voltage supply for use with the dispensing systems. Refer to the dishwasher's serial plate and to the documentation for the dispensing systems.
 - Both connections should be grounded. A ground terminal is located next to the connections.
 - To control the activation of the detergent pump, wire the detergent concentration probe or timer system (as appropriate) according to the manufacturer's instructions.
 - To control the activation of the rinse aid pump, wire the rinse line pressure switch according to the manufacturer's instructions.

3.12 Connecting Chemical Containers or Dispensers

This section applies to units with either internal or external chemical dispensing pumps.

1. Check that the rinse additive and detergent are compatible with the unit. In particular, a commercial (not a domestic) detergent **MUST** be used.
2. Check that the containers/dispensers are correctly installed according to the manufacturer's instructions.

3.13 Fresh Water Supply Connections

CAUTION

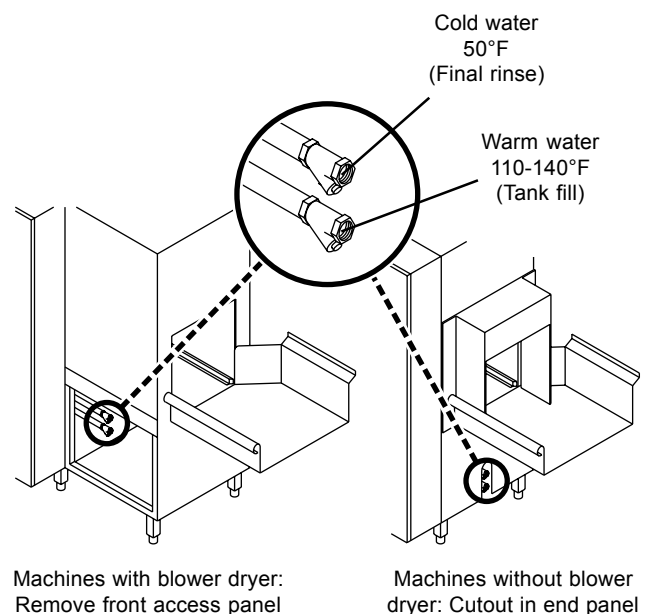
Before connecting the water supply lines, they **MUST** be flushed clean of all debris, including (but not limited to) pipe sealant, metal particles, solder, etc. This debris can damage the appliance.

IMPORTANT

In some cases, local codes dictate that water supply connections be made only by a certified professional.

The water supply connections for the dishwasher are located behind an access panel on the unload end of the machine. Both connections are 3/4" female NPT. See Figure 3-11.

Figure 3-11: Water connections



Machines with blower dryer:
Remove front access panel

Machines without blower dryer:
Cutout in end panel

1. Check that iron or other metal particles cannot contaminate the fresh water supplied to the dishwasher.
2. Check the incoming water temperature.
 - The final rinse line should be approximately 50°F for optimal operation. This water is circulated through the machine's waste air heat recovery system and routed to the internal booster heater for the final rise to 180°F.
 - The tank fill line should be 110-140°F to reduce the machine's preheat time.
3. Check the incoming water hardness. Meiko recommends a hardness of 4 grains per U.S. gallon (7 DH German hardness).
4. Check that the water flow on the final rinse line is adequate. All K-Tronic series machines have a final rinse flow rate of 1.42 U.S. gallons per minute (84.7 gallons/hour).
5. Because the water inlets incorporate line strainers, additional traps are unnecessary unless required by local, national or international codes.
6. Connect the customer-supplied water lines to the appropriate connections. Both connections are 3/4" NPT female.

3.14 Steam System Connections

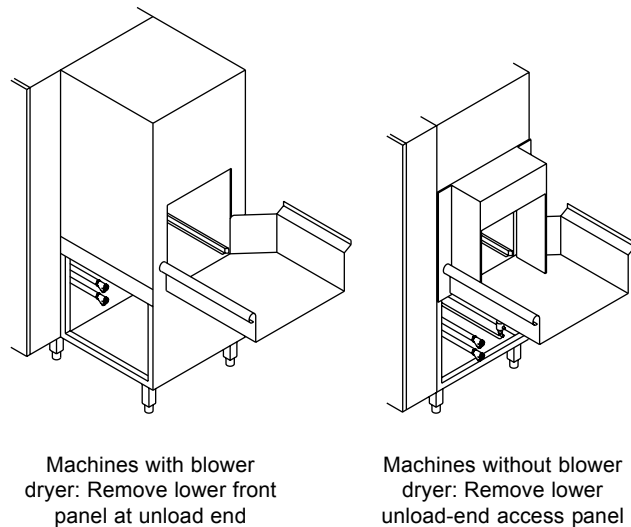
IMPORTANT

In some cases, local codes dictate that steam system connections be made only by a certified professional.

The steam supply and condensate return connections are located at the unload end of the machine. Their exact position depends upon the machine configuration.

For machines with a blower dryer, the connections are accessed by removing the lower front panel at the unload end of the machine. For machines without a blower dryer, they are accessed by removing the lower unload-end panel. See Figure 3-12.

Figure 3-12: Accessing the steam connections



Note that the condensate return is *only* for the steam system of the dishmachine. If the steam supply line has an upward slope, it will require its own condensation removal system (moisture trap, pump, etc.) that is in compliance with all applicable local codes.

1. Check the incoming steam pressure. At the machine connection, pressure should be 10-29 psi and **constant**.
2. Check that the volume of steam delivered is sufficient for proper operation.
 - K-200 Series dishmachines require 187 lbs./hr. (51kW) of steam for proper operation.
 - K-400 Series dishmachines require 253 lbs./hr. (69 kW) of steam for proper operation.

Note that a blower dryer will not add to the steam consumption - all blower dryers use 3kW electric heaters.

3. Connect the customer-supplied steam line to the machine's steam connection. The machine's connection is 2" NPT male.
4. Plumb the condensate return connection to a floor drain, or to a building condensate return line, as per local codes. The machine's condensate return connection is 1" NPT male.

3.15 Drain Connection

IMPORTANT

In some cases, local codes dictate that drain connections be made only by a certified professional.

The machine is equipped with a 2-15/16" (75mm) OD vertical, gravity-fed drain. The machine requires a 4" or larger floor drain. See Figure 3-13.

1. In some cases, a grease trap (supplied by others) must be fitted into the waste water line. If a trap is required for your installation, check that it is present.
2. If possible, the machine drain can simply be positioned directly above a floor drain, as shown in Figure 3-13.
3. If a floor drain is not directly beneath the machine drain, or if local codes require a trap, a drain line can be attached using the supplied rubber boot and clamp. Using the boot and clamp, the machine drain can be connected either to a 3" OD drain line, or to a 3" NPT pipe (using the supplied 3" NPT adapter). Choose a piping material that:
 - Complies with any applicable local and national codes.
 - Is rated for use with water temperatures up to 180°F.
 - Is rated for 3-12 pH to accommodate detergents and rinse aid in the drain water.

3.16 Final Assembly



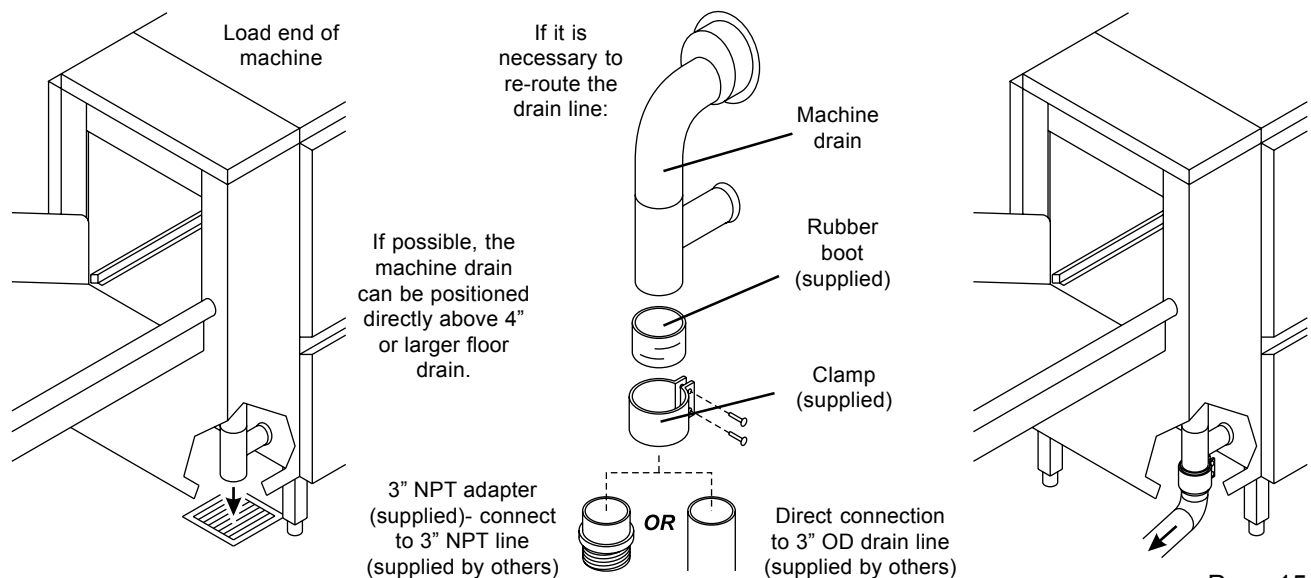
1. Check and tighten all electrical terminal screws.
2. Check that all tools, hardware, metal shavings or filings, etc. are removed from inside the machine.
3. Replace all panels onto the warewasher.
4. Check that the wash arm manifolds, scrap screens, curtains, and all other removable components are correctly installed in the machine.
5. Check that the front access door(s) are closed.
6. Switch the circuit breaker/fused disconnect to the ON position.
7. Press the  button. Allow the machine to fill.
8. Wait for the LCD display to show "Ready for operation," showing that the tanks are filled and heated.
9. Press  to start the wash pumps. As the water circulates through the machine, the final rinse water will heat to the correct temperature.
10. When the LCD display reads "Cycle Pause," load several empty racks into the machine.

Figure 3-13: Drain connection

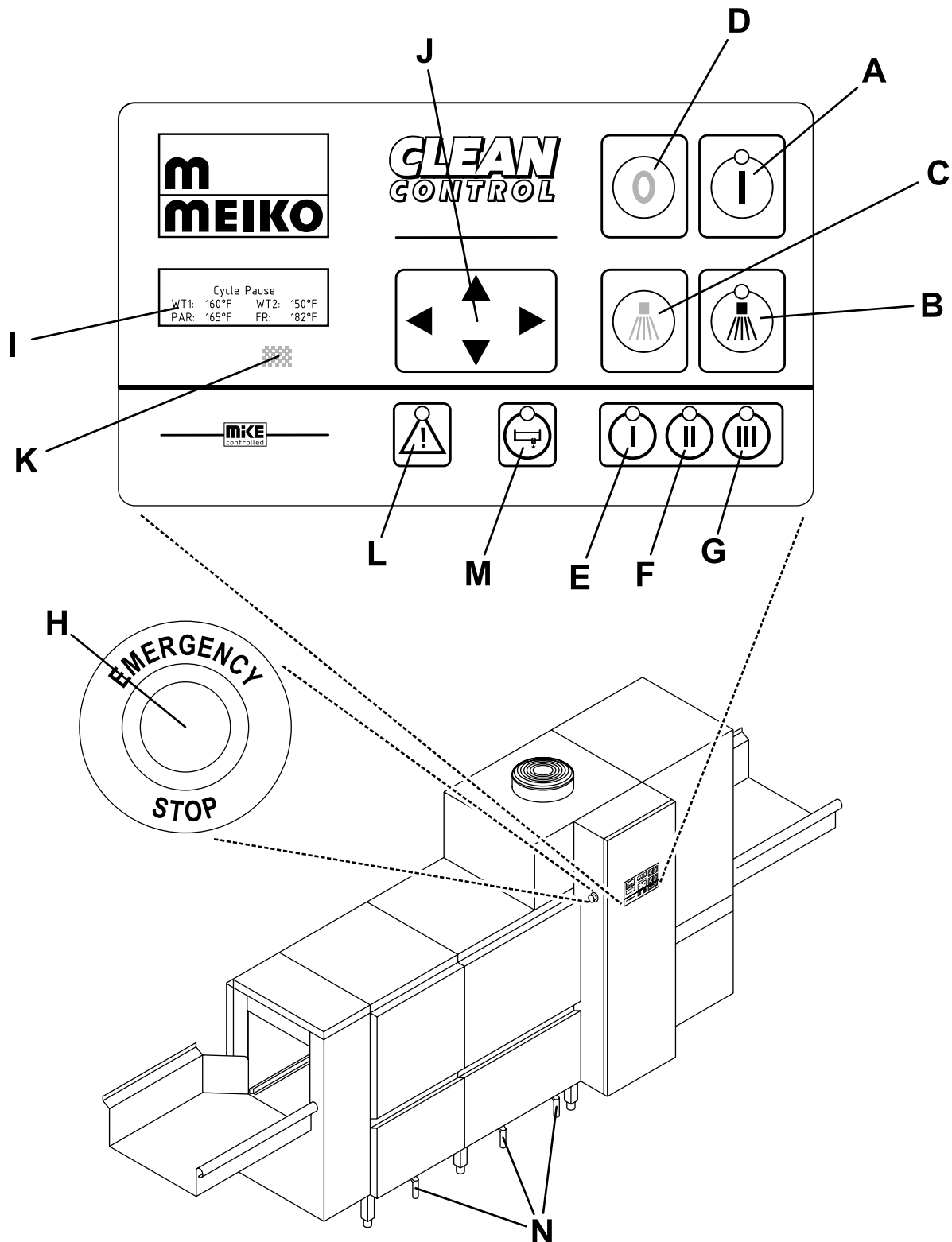




4 OPERATION

4.1 Location and Description of Controls

The dishwasher controls are on the control box. See Figure 4-1.





A - POWER ON button

Switches the machine on and begins the filling and heating process.



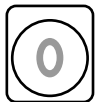
B - START OPERATION button

Starts the conveyor drive and wash pumps in operation. This button also begins to circulate water through the machine to allow the Waste Air Heat Recovery System to operate.



C - STOP OPERATION button

Press during idle periods to shut off the wash pumps and conveyor drive. The tank heaters will maintain tank temperature to allow for fast recovery.



D - POWER OFF button

Switches off the machine.

E, F, G - CYCLE SELECT keys

Each key selects a different conveyor speed to accommodate different levels of soiling:



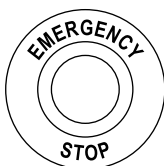
Fast - for typically soiled items



Medium - for items with greater amounts of soiling



Slow - for very heavily soiled items



H - EMERGENCY STOP button

Stops the conveyor and wash pumps immediately. Once it is pressed, the emergency stop button must be reset (by pulling it back out) before the machine can return to operation.

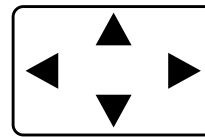
Cycle		Pause	
WT1: 160°F	WT2: 150°F	WT1: 165°F	WT2: 182°F
PAR: 165°F	FR: 182°F		

I - LCD Display

Provides information about the dishwasher, including operating status, tank temperatures, etc.

The temperatures shown in the display are:

- **WT1** - Wash Tank 1
- **WT2** - Wash Tank 2 (K-400 series only)
- **PAR** - Pumped Auxiliary Rinse zone
- **FR** - Final Rinse zone



J - Directional keypad

Only used by service agents during programming and diagnostics.

K - Infrared communications port

Only used by service agents during programming and diagnostics.



L - ERROR light

Illuminates (red) if a problem occurs with the dishwasher. An error code and description of the problem will appear in the LCD display.

M - Not used



N - Drain handles

Open and close the machine drain. Each tank (prewash, 1-2 wash tanks, auxiliary rinse tank) has its own drain handle that feeds into the single-point machine drain. The tanks can be drained individually if desired.

4.2 Startup

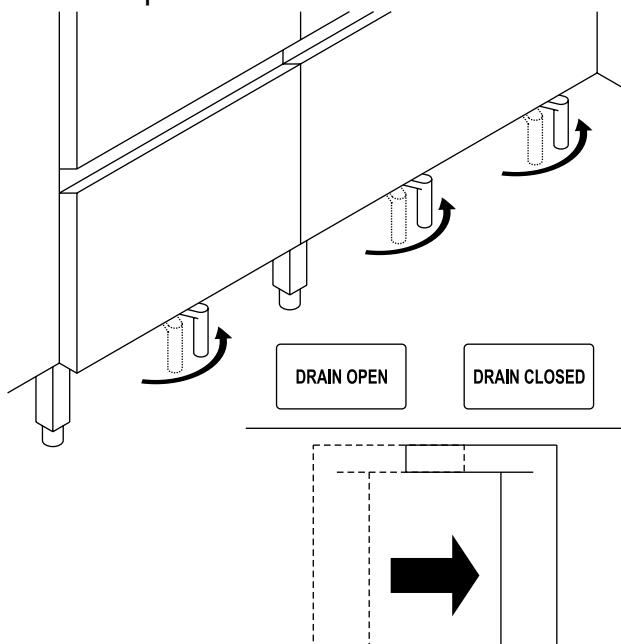
Check the level of the external detergent and rinse aid dispensers. If necessary, replace or refill the dispensers.

Check that the wash arm manifolds, scrap screens, curtains, and all other removable components are correctly installed in the machine.

Check that the front access door(s) are closed.

Switch the master circuit breaker/fused disconnect to the ON position.

Check that the drain handles are in the DRAIN CLOSED position.



Press the POWER ON button. The light above the button will begin to flash.

Ready for operation			
WT1: 160°F	WT2: 150°F	PAR: 165°F	FR: 92°F

The machine will begin to fill. When the LCD display shows "Ready for operation," and the light above the POWER ON button stops flashing and stays on, the tanks are filled and heated.

- **WT1** = Wash Tank 1
- **WT2** = Wash Tank 2 (K-400 Series only)
- **PAR** = Pumped Auxiliary Rinse zone
- **FR** = Final Rinse zone

IMPORTANT

Note that while the tanks are heated, the final sanitizing rinse (FR) has not yet heated to the correct temperature (180°F minimum).



Press the START OPERATION button to start the wash pumps. The light above the button will illuminate.

As the water circulates through the machine, the final rinse water will begin to heat to the correct temperature.

Ready for operation			
WT1: 160°F	WT2: 150°F	PAR: 165°F	FR: 171°F

The wash pumps will operate for one rack cycle (usually 1-2 minutes).

When the wash pumps stop, check the final rinse temperature (FR). If the temperature has not reached 180°F, load an empty rack into the machine. Water will again circulate through the machine and the final rinse temperature will continue to rise.

Cycle Pause			
WT1: 160°F	WT2: 150°F	PAR: 165°F	FR: 182°F

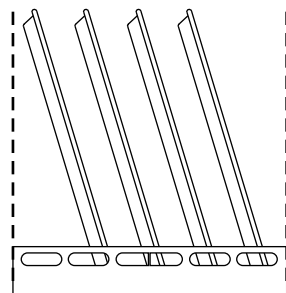
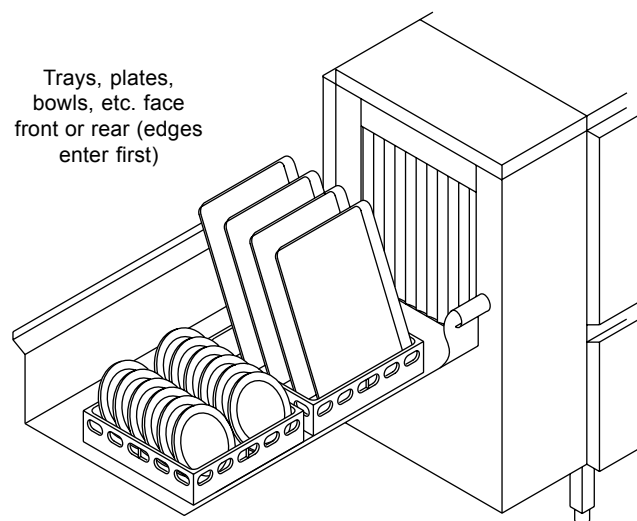
When the final rinse (FR) has heated to 180°F, wait for the wash pumps to stop operating. The display will read "Cycle Pause" instead of "Ready for Operation."

Racks can now be loaded into the machine for washing.

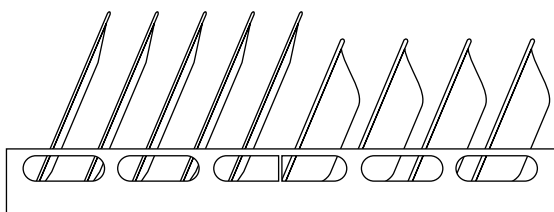
4.3 Loading

The loading guidelines shown here will lead to faster, more efficient cleaning of your dishware.

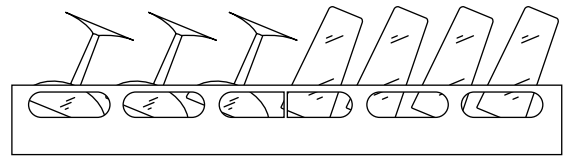
Ware such as trays, plates and bowls should be loaded into the racks facing front or rear - so that the edges enter the machine first. If they are loaded facing the sides (so that the large front or rear faces enter the machine first), they may bind on the curtains or shift in the racks as they touch the curtains. Items should not extend past the edges of the rack.



Load plates, soup bowls, etc. at an angle with the inside face pointing up. Ensure that water cannot pool in the bottom of bowls.

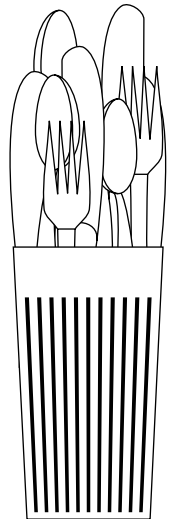


Load hollow or concave dishware (glasses, large bowls, etc.) upside-down and at an angle. This allows water to drain more quickly, preventing stains.



For greater efficiency in loading cutlery, you can use cutlery holders. When loading them:

- Do not overload the cutlery holders.
- Always load knives, forks and spoons with the handle DOWN.
- Do not load identical ware into any given holder. Instead, load an assortment of knives, forks and spoons into each holder. Identical ware is often too closely spaced for effective cleaning.



Do not stack items in a rack, such as plates, glasses, etc. Stacked items require multiple cleaning cycles because the wash water cannot reach the food residue. It is more efficient to load each rack with fewer items to ensure effective water coverage on the first wash.

Always try to run many racks together, rather than loading single racks individually over time. Operating the machine at full capacity for a short time is more economical and requires less preheating time than running a few racks at a time with frequent idle periods.

4.4 Operation

Operation of the dishwasher is fully automatic. Simply push a rack into the entrance end of the dishwasher until the rack conveyor drive engages.

The dishwasher features three conveyor speeds to accommodate varying levels of soiling. Simply press the appropriate button to select a conveyor speed:



Fast - for typically soiled items



Medium - for items with greater amounts of soiling

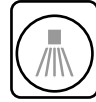


Slow - for very heavily soiled items

As the rack is pulled through the machine, water jets will activate at each zone - prewash (if so equipped), wash, auxiliary rinse and final rinse. Curtains between the zones prevent splashing of soiled water into the next zone. After the final rinse (and blower dryer, if so equipped), the rack exits the machine.

If the machine is equipped with an optional table limit switch, the conveyor drive will stop if the switch at the end of the clean dishtable is engaged. When the racks are removed from the table, operation can continue normally.

4.5 Idle Periods



During idle periods, press the STOP OPERATION button. This stops the conveyor and wash pumps while automatically maintaining water temperature in the tanks, allowing for a faster recovery.



After the idle period, press the START OPERATION. The wash pumps will activate and water will begin to circulate through the machine.

The wash pumps will operate for one rack cycle (usually 1-2 minutes).

When the wash pumps stop, check the final rinse temperature (FR). If the temperature has not reached 180°F, load an empty rack into the machine. Water will again circulate through the machine and the final rinse temperature will continue to rise.

Cycle Pause			
WT1:	160°F	WT2:	150°F
PAR:	165°F	FR:	182°F

When the final rinse (FR) has heated to 180°F, wait for the wash pumps to stop operating. The display will read "Cycle Pause" instead of "Ready for Operation."

Racks can now be loaded into the machine for washing.

4.6 Clearing Jams

Under normal operating conditions, racks will not jam as they move through the machine. However, improper loading or improper curtain installation may cause a rack to jam.

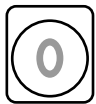


If the conveyor jams, the ERROR light will begin flashing and the machine will stop operating.

To clear a jam:



Press the ERROR button to acknowledge the error. The flashing light above the button should turn off.



Press the POWER OFF button.

Open the front door(s) to access the jammed rack(s).



WARNING!

When the front access doors are opened, steam will escape the interior of the machine.






WARNING!

Before clearing a jam, ALWAYS press the POWER OFF button.

IMPORTANT

Once a conveyor jam is detected and the ERROR light begins to flash, the error cannot be cleared unless the machine is turned off briefly. This is intended to discourage operators from leaving the machine in operation while clearing a jam.

If the ERROR light remains flashing after a jam has cleared, briefly press , then , then  to reset the machine.

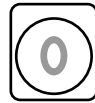
After the jam has been cleared, restart the machine normally following the procedure in Section 4.2, *Startup*.

4.7 Shutdown

Check that the last rack has exited the machine.

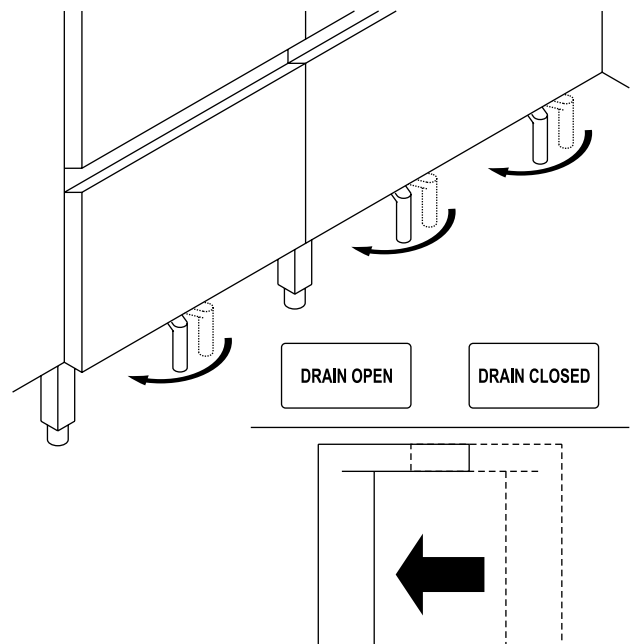


Press the STOP OPERATION button.



Press the POWER OFF button.

Move the drain handles to the DRAIN OPEN position.



Switch the master circuit breaker/fused disconnect to the OFF position.

Open the front access door(s). Clean the machine as described in Section 5, *Cleaning*. Meiko recommends that the door of the dishwasher be left open overnight to allow it to air thoroughly.



WARNING!

When the front access doors are opened, steam will escape the interior of the machine.



WARNING!

For your safety, allow the interior of the machine to cool before cleaning.

5 CLEANING



WARNING!

Before ANY cleaning, check that the circuit breaker/fused disconnect is in the OFF position and that the unit is switched off.



WARNING!

When the front access doors are opened after operation, steam will escape the interior of the machine.



WARNING!

For your safety, allow the interior of the machine to cool before cleaning.

IMPORTANT

The headings *Daily Cleaning* and *Weekly Cleaning* in this section are general recommendations based on typical soiling.

If soil begins to accumulate, the unit should be cleaned more frequently. Extensive food soil deposits inside the machine work against optimal performance. Some items may not be cleaned as effectively, resulting in the need for either a slower conveyor speed or repeat washing. In addition, heavy soiling in the wash water increases detergent consumption.

5.1 Daily Cleaning (or as required)

Once per day, or as required, perform the following steps:

- Open the front access doors.
- If the machine is equipped with a CSS Top section, remove the front access panel as shown in Figure 5-1.
- Remove the curtains. Clean them thoroughly using a brush and warm water.
- Using a low-pressure hose or spray nozzle, spray the interior of the dishwasher to wash any soil and debris onto the scrap screens.

CAUTION

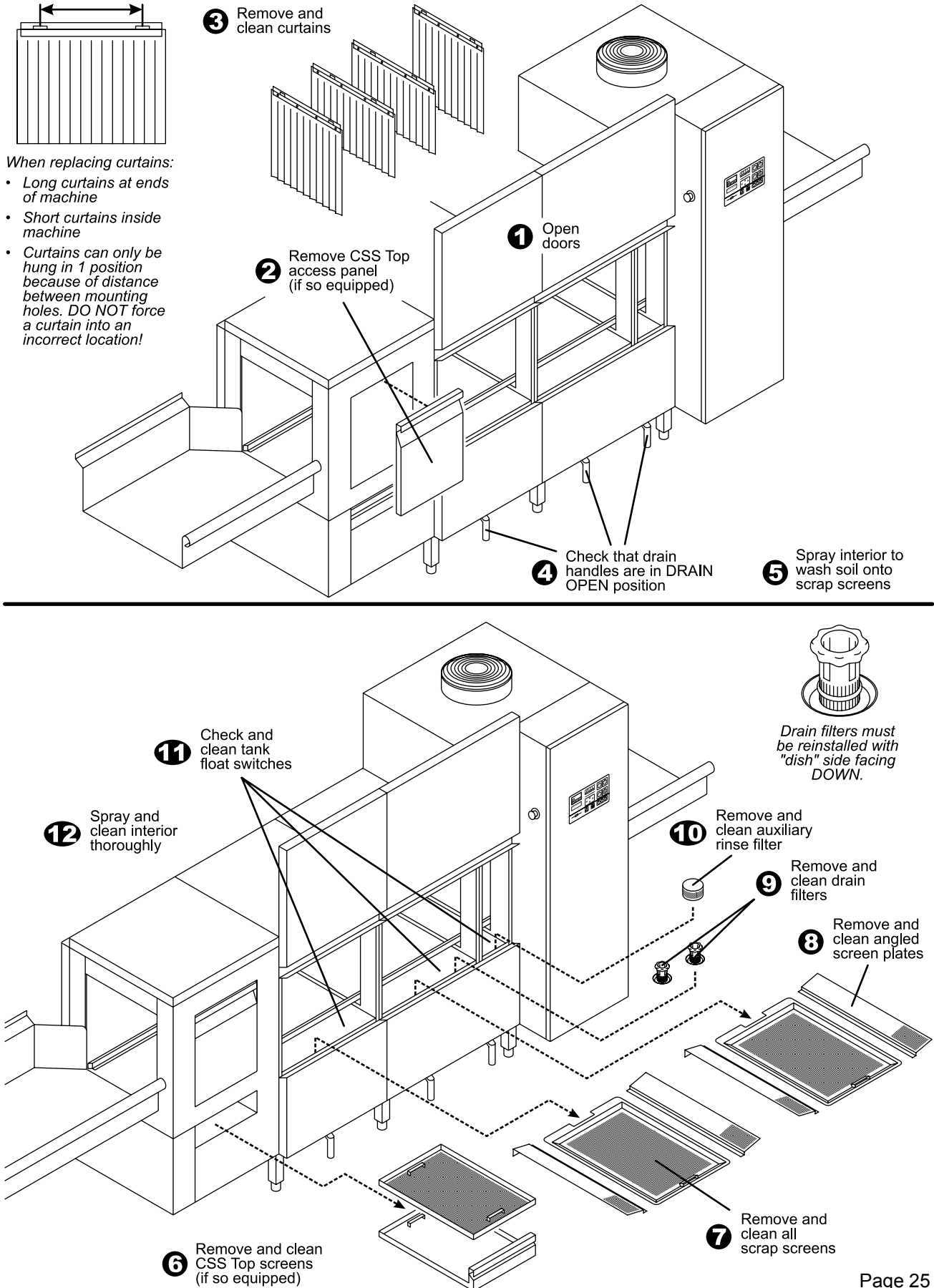
Never use a high-pressure water spray when cleaning the machine.

- If the machine is equipped with a CSS Top section, remove the two-piece CSS Top

scrap screen as shown in Figure 5-1. Discard any food particles, scraps or bones. Then, clean the screen using a brush and warm water.

- Remove the scrap screens from the prewash, wash and rinse sections. Discard any food particles, scraps or bones. Then, clean the screens using a brush and warm water.
- Remove the angled screen plates on each side of the prewash and wash tank scrap screens. Clean the screen plates using a brush and warm water.
- Remove the drain filters. Clean them thoroughly using a brush and warm water. Be sure to use care to avoid damaging the filter screens.
- Remove the auxiliary rinse tank filter. Clean it thoroughly using a brush and warm water.
- Check that the tank float switch assemblies are clean.
- Check the interior of the machine for any remaining food particles or debris. Thoroughly wash the interior with the low-pressure spray nozzle or hose. The tanks slope to the front for easier cleaning.
- Leave the doors of the machine open. Allow the interior of the machine, as well as all scrap screens and baskets, to air dry thoroughly overnight.
- Reassemble all components into the dishwasher before operation.
 - When reinstalling the curtains, note that each curtain can only be hung in one specific position because of the distance between the mounting holes. DO NOT force a curtain into an incorrect location. See Figure 5-1.
 - When reinstalling the drain filters, be sure to replace them as shown with the “dish” side facing down. See Figure 5-1.

Figure 5-1: Daily cleaning disassembly





5.2 Weekly Cleaning (or as required)

Once per week, or as required, perform the following steps:

- With the scrap screens removed from the machine, remove the wash arm manifolds. See Figure 5-2. If the machine is equipped with a prewash section, the arms and manifolds can also be removed at this time.

IMPORTANT

Upper and lower manifolds are NOT interchangeable. However, some machines may have prewash manifolds that are identical to the wash arm manifolds. In these machines, the manifolds are interchangeable for easy replacement into the machine.

- Rotate each end cap counterclockwise to remove it from the end of its wash arm. The tether prevents the loss of the cap during cleaning.
- Clean the inside and outside of the manifolds, arms and end caps thoroughly with a brush and warm water.
- Remove the upper and lower auxiliary rinse and final rinse arms as shown in Figure 5-1.

IMPORTANT

Upper and lower rinse arms are NOT interchangeable. However, the arms are designed so that they cannot be reinstalled in the wrong location.

- Clean the inside and outside of the arms thoroughly using a brush and warm water.
- Allow all arms, manifolds and end caps to air dry thoroughly overnight.
- Reassemble all components into the dishwasher before operation.

5.3 Exterior cleaning (as required)

CAUTION

When cleaning the exterior of the dishwasher, be sure to follow these guidelines:

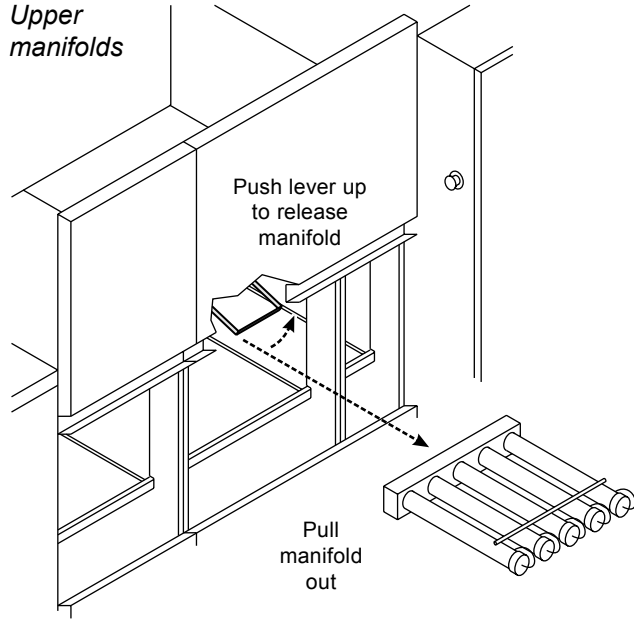
- A commercial stainless steel cleaner can be used on exterior body panels. Follow the manufacturer's directions.
- Meiko strongly recommends using detergent, instead of a stainless steel cleaner, when cleaning the control panel of the unit. These chemicals can damage the gauges, lights and labels.
- Never use abrasive cleaners or pads when cleaning the exterior of the dishwasher. These can scratch the surface of the unit.



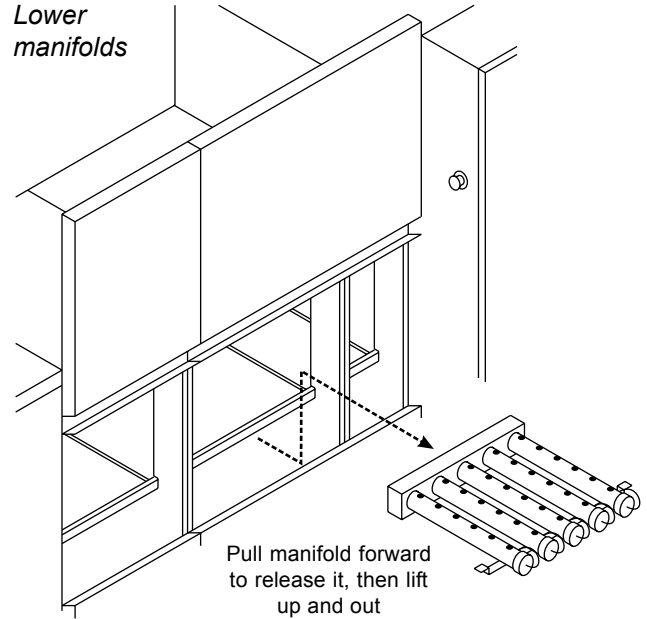
WARNING!

Ensure that detergents and stainless steel cleaners are kept out of the interior of the dishwasher. If the interior of the unit requires cleaning, refer to the delimiting procedures (Section 5.4).

Figure 5-2: Arm removal

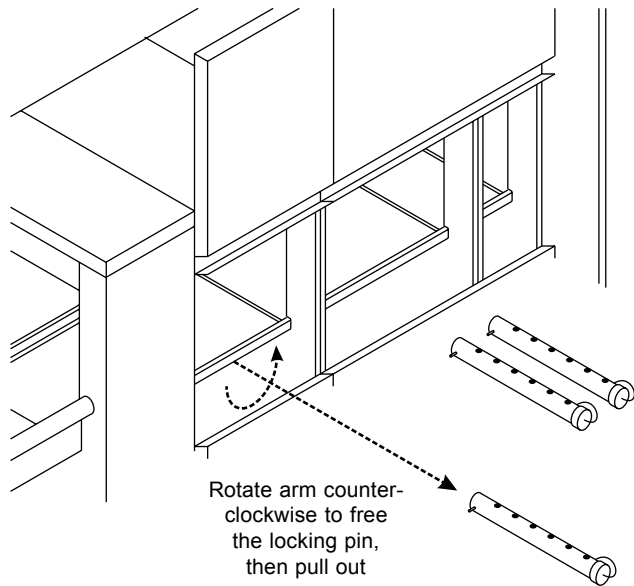


To reinstall, seat the water inlet at the back of the manifold firmly onto the water supply tube. Then, push the front of the manifold up until it snaps into place.

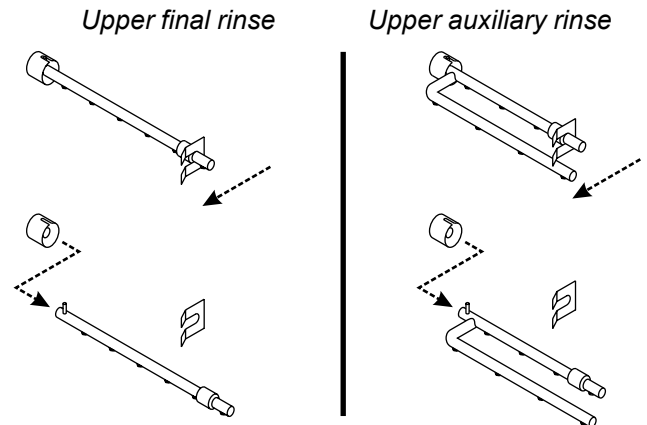


To reinstall, slide the manifold into its track, checking that the front support clips are seated properly on their rails. Then, push the manifold back until it snaps into place.

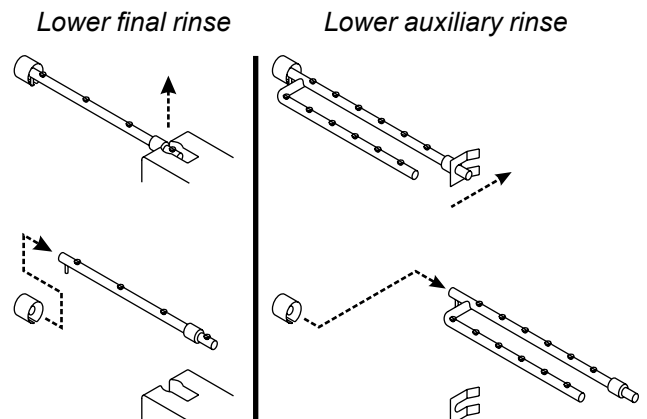
Single or dual upper or lower prewash arms (K-200 PW, K-400 PW only)



To reinstall, seat the back end of the arm in its socket, then rotate it clockwise to lock it in place.



To reinstall, seat back of each arm in its socket, then push front into place. Arms shown are for a Left-to-Right machine. Right-to-Left arms are a mirror image.



To reinstall, seat back of each arm in its socket, then push front into place. Arms shown are for a Left-to-Right machine. Right-to-Left arms are a mirror image.




5.4 Deliming (as required)

Lime scale deposits will occur over time on the interior of the dishwasher if it is operated using a hard water supply. Meiko recommends a hardness of 4 grains per U.S. gallon (7 DH German hardness).

A deliming or de-scaling process can be used to remove these deposits, as well as any accumulated food residue.

When deliming the interior, be sure to follow these guidelines:

- Use deliming agents designed for use with commercial dishwashers.
 - Follow the instructions for the deliming agent that is used.
 - Start the machine as described in Section 4, *Operation*.
 - After the deliming procedure, continue to run the dishwasher for at least 10 minutes to rinse the interior thoroughly. Cycle empty racks through the machine as necessary to keep the pumps in operation.
 - Press  to shut off the machine. Switch the circuit breaker/fused disconnect to the OFF position.
 - Move the drain handles to the DRAIN OPEN position.
 - Remove all scrap screens, wash arm manifolds, prewash arms (if so equipped), auxiliary rinse and final rinse arms. Clean them as described in Sections 5.1 and 5.2 of this Manual.
- Inspect the interior for any remaining deliming agent residue. If residue is present, remove it using a soft cloth and hot water.
 - Thoroughly flush the interior of the dishwasher using warm water from a low-pressure hose or spray nozzle.

CAUTION

Never use a high-pressure water spray when cleaning the machine.

- Leave the doors of the machine open to allow the interior to air dry thoroughly.
- Reassemble all components into the dishwasher before operation.



WARNING!

Ensure that ALL residue of the deliming agent is removed. Residue from the agent can:

- Pose a health hazard;
- Damage seals and plastic components inside the dishwasher.

6 TROUBLESHOOTING

If the dishwasher encounters a problem, check this Troubleshooting Guide. Some simple problems can be quickly resolved, allowing the dishwasher to be returned to operation faster than placing a service call.

Problem	Action
Machine does not fill	<ul style="list-style-type: none"> • Check that all drain filters are correctly installed and that the drain handles are in the DRAIN CLOSED position. • Check that the water supply is turned on. • Check the dirt trap(s) in the water inlet(s) and clean them if necessary. • Check the float switches in the tank(s). If the switch(es) are dirty or coated with chemicals or lime deposits, they may not function correctly. If they are dirty, clean or delime the interior.
Final rinse does not activate	<ul style="list-style-type: none"> • Check that the water supply is turned on. • Check the line strainer in the cold (rinse) water inlet and clean it if necessary. • Check for lime scale deposits on the final rinse arms. These deposits can clog the final rinse nozzles. Delime if necessary.
Tank temperatures are too low	<ul style="list-style-type: none"> • Check that the curtains are correctly installed. • Check that the tank float switch assemblies are clean. • Check the steam supply (if so equipped). The machine is set up to operate correctly with the steam volume and pressure that are present during installation. Low pressure and/or volume may affect performance.
Steam escapes the machine during operation	<p>All rack conveyor dishwashers release some steam at the ends of the machine. However, if steam is excessive, check the following:</p> <ul style="list-style-type: none"> • Check that the curtains are correctly installed. • Check the final rinse temperature on the digital display (FR) to ensure that it is operating at the correct temperature.
Water leaks around front access door seams during operation	<ul style="list-style-type: none"> • Check that the end caps are correctly installed at the end of all prewash and wash arms. • Check that all auxiliary rinse and final rinse arms are correctly installed.
Stripes/smears on ware	<ul style="list-style-type: none"> • Check that the curtains are installed properly. • Check that the ware is correctly loaded. Refer to the Operation section of this Manual. • Check for correct detergent and rinse aid concentration. • Check for excessive mineral content in the water supply. Meiko recommends a hardness of 4 grains per U.S. gallon.
Foaming in the wash tank	<ul style="list-style-type: none"> • Check that commercial (not domestic) detergents and rinse aids are being used. • Check for correct detergent and rinse aid concentration. • Check that heavily soiled ware is being correctly pre-scraped. Excessive amounts of grease or soiling in the wash tank can cause foaming. • Check that the tank temperatures shown on the digital display are correct. WT1 = Wash Tank 1; WT2 = Wash Tank 2; PAR = Pumped Auxiliary Rinse zone; FR = Final Rinse zone.

Contact your Meiko Authorized Service Agent if you cannot correct the problem.

An Authorized Service Agency Listing was supplied with your dishwasher. If you do not have the listing, call 1-800-868-3840 for assistance, or visit Meiko's website at www.meiko.us.

If you need service...



Meiko warewashers are designed for solid reliability as much as for outstanding ware-cleaning ability. With proper care, your warewasher should provide years of trouble-free operation.

If service is necessary, contact your local Meiko Authorized Service Agent. With factory training, OEM parts and direct support from the factory, Meiko's nationwide service network is highly qualified to quickly restore your warewasher to regular operation.

An Authorized Service Agency Listing is supplied with this Manual. If you do not have the listing, call 1-800-868-3840 for assistance.



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