

Micro-Pro II MP-200 / MP-300 Series



NOTES:

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CAUTION: All electrical connections to the Micro-Pro II system should first be verified with a meter. Application of incorrect voltage will permanently damage the unit and is not covered under warranty. Avoid wiring to any power source that has large fluctuations in voltage and/or is prone to surges. Refer to the wiring diagram in this manual for all power and signal connections.



CAUTION: Do not mount the unit in the direct path of steam. This can short circuit and permanently damage the unit. Mounting the unit on the side, on the back, or on the vents of the dishwasher may cause thermal overload and damage or hinder the performance of the unit.

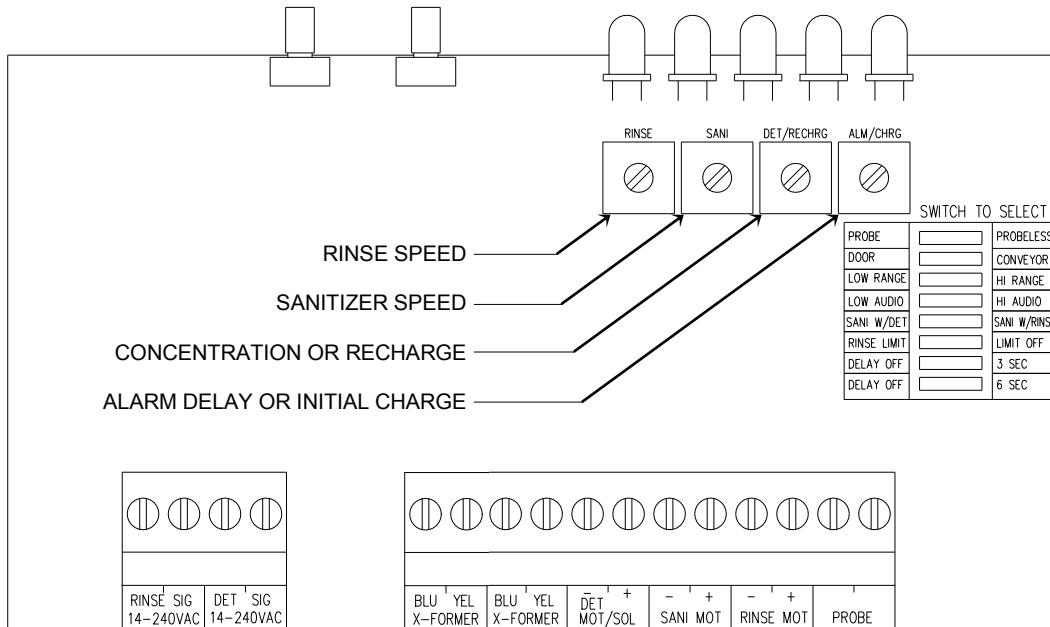


CAUTION: The Micro-Pro II has high voltage connected to the transformer(s). Always disconnect power when servicing the unit.

INTRODUCTION

Micro-Pro II warewash systems provide the versatility of probe or probeless detergent control through advanced microprocessor design. With the capability of controlling up to three products, with the choice of liquid or dry detergent, virtually any warewash application can be accommodated.

The Micro-Pro II warewash control features simplicity and versatility.



POTENTIOMETER SETTINGS

- **Rinse Speed Pot:** Adjust the speed at which the rinse pump runs.
- **Sanitizer Speed Pot:** Adjust the speed at which the sanitizer pump runs.
- **Concentration or Recharge Pot:** In “probe mode” sets detergent concentration strength. In “probeless mode” sets the pump time necessary to recharge the detergent concentration.
- **Alarm Delay or Initial Charge Pot:** In “probe mode” sets the time before the alarm sounds if the probe senses low detergent concentration. In “probeless mode” sets the pump time necessary to initially charge the detergent concentration.

SLIDE SWITCH SETTINGS

- **Probe/Probeless Switch:** Allows you to select operation with or without a probe
- **Door/Conveyor Switch:** Sets alarm delay range for probe mode. Sets initial charge timing range for probeless mode.
- **Low/High Range Switch:** Used if operating in probe mode. Selects concentration ranges.
- **Low/High Audio Switch:** Sets the alarm volume.
- **Sanitizer Select Switch:** Sets the sanitizer pump to run with rinse feed, or detergent feed.
- **On/Off Rinse Limit Switch:** When on, stops the rinse pump after 30 seconds.
- **3-Second Rinse Delay Switch:** When on, delays the rinse pump for three seconds.
- **6-Second Rinse Delay Switch:** When on, delays the rinse pump for six seconds.

NOTE: If the 3-second and 6-second rinse delay switches are both on, the rinse pump will be delayed for nine seconds.

INSTALLATION

Mount the unit on a nearby wall (using suitable hardware) or on top of the dishwasher if desired. Try to keep the unit within three feet from the final rinse line to avoid long tubing runs.

CAUTION: Do not mount the unit in the direct path of steam. This can short circuit and permanently damage the unit. Mounting the unit on the side, on the back, or on the vents of the dishwasher may cause thermal overload and damage or hinder the performance of the unit.

Check all applicable plumbing and electrical codes before proceeding with the installation. This will help to ensure that the system is installed in safe and suitable manner. A wiring schematic of the dishwasher should be used as reference for making electrical connections — this is typically provided by the dishwasher manufacturer if one cannot be located on the machine itself.

PLUMBING

RINSE & SANITIZER PLUMBING

The following installation steps apply for rinse and sanitizer pumps alike.

- (1) Install the provided 1/4" tube x 1/8" NPT injection fitting into the side or bottom of the dishwasher rinse line between the rinse solenoid valves and the rinse jets. If necessary, drill a 11/32" hole and tap to 1/8" NPT. Use of a saddle clamp may be desired on copper rinse line for better support.
- (2) Cut a suitable length of 1/4" OD poly tubing and connect between the discharge (right) side of the pump's squeeze tube and the injection fitting.
- (3) Cut a suitable length of 1/4" OD poly tubing and connect between the suction (left) side of the pump's squeeze tube and the pickup tube provided. Be sure to draw tubing through the end of the pickup tube.
- (4) Hand-tighten the compression nuts on both the injection fitting and pickup tube. Plastic ties can be used to cinch around the connections where the poly tubing is inserted into the pump's squeeze tube.

PRESSURE SWITCH PLUMBING (optional)

Install pressure switch kit. Thread the male end of the "tee" fitting into the rinse line on the dishwasher, and connect the poly tubing from the rinse pump into the end opposite the male threads, using the checkvalve provided. Thread the pressure switch into the remaining opening on the tee, perpendicular to the male threaded end.

LIQUID DETERGENT PLUMBING

- (1) Install the provided bulkhead fitting through a wall of the wash tank (above water level). If an existing mounting hole cannot be located, use of a 7/8" hole saw or punch may be desired.
- (2) Cut a suitable length of 1/4" OD poly tubing and connect between the discharge (right) side of the detergent pump's squeeze tube and the bulkhead fitting.
- (3) Cut a suitable length of 1/4" OD poly tubing and connect between the suction (left) side of the detergent pump's squeeze tube and the pickup tube provided. Be sure to draw tubing through the end of the pickup tube.
- (4) Hand-tighten the compression nuts on both the bulkhead fitting and pickup tube. Plastic ties can be used to cinch around the connections where the poly tubing is inserted into the pump's squeeze tube.

DRY DETERGENT PLUMBING

- (1) A powder or solid type feeder (not provided) should be used for dispensing dry detergent products. Follow the instructions included with the detergent feeder for installation, and recommended water temperature/pressure.
- (2) Cut a suitable length of 1/4" OD copper tubing (not provided) and connect between the input side of the water solenoid and the water source. Maximum recommended water temperature is 140°F (60°C).
- (3) Cut a suitable length of 1/4" OD copper tubing (not provided) and connect between the output of water solenoid to a powder or solid detergent feeder.
- (4) Carefully tighten the compression nuts on the water solenoid — over tightening may cause solenoid to leak. Tighten connections to the water source and detergent feeder as needed.

PROBE INSTALLATION (if required)

- (1) Install the probe in the wash tank below the water level. It should be away from incoming water supplies, near the recirculating pump intake, and 3 to 4 inches from corners, heating elements, or the bottom of the tank. If an existing mounting hole cannot be located, use of a 7/8" hole saw or punch may be desired.
- (2) Connect leads from the terminals on the probe to the "probe" terminals on the circuit board.
- (3) For best results, use 18 AWG multi-stranded copper wire for the probe connection. Avoid running the wire near high voltage AC lines.

ELECTRICAL



Turn off all power before wiring the control. Check with a voltmeter to ensure power is off.

MAIN POWER CONNECTION

Connect the high voltage side to any 115/208/230 VAC power source that is "on" when the dishmachine is "on" (i.e. mains switch on dishmachine).

NOTE: The transformer provides power to both the detergent and rinse circuits. The Micro-Pro II will only operate detergent or rinse when electrically signaled.

To wire main power connection:

- (1) Check the voltage of the main power source and make sure that it matches one of the three available input voltages (115/208/230 VAC) of the transformer inside the Micro-Pro II.
- (2) Remove all power from the dishwasher.
- (3) Connect leads from the main power source to the appropriate wires on the transformer.

* CAUTION: The Micro-Pro II unit has high voltage connected to the transformer. Always disconnect main power when servicing the unit.

DETERGENT POWER SIGNAL

A detergent power signal is required to activate the detergent probe sensing or probeless initial charge.

Check the dishwasher for a power source that is active during the washcycle only (example: the magnetic contactor that controls the washpump motor) and verify voltage.

- (1) Remove all power from the dishwasher.
- (2) Connect leads from the detergent signal source to the detergent signal terminals on the circuit board . The Micro-Pro II circuit board will accept a detergent power signal of 14 - 240 VAC.

RINSE POWER SIGNAL

In addition to running the rinse pump, the rinse power signal also triggers the detergent "recharge" injection if probeless mode is selected

- (1) Check the dishwasher for a power source that is active during the rinse cycle only (example: rinse solenoid or rinse cycle light) and verify voltage. If a direct signal can't be located on the dishwasher, a pressure switch can be used to provide a signal (see next section below).
- (2) Remove all power from the dishwasher.
- (3) Connect leads from the rinse signal source to the rinse signal terminals on the circuit board. The Micro-Pro II circuit board will accept a signal of 14 - 240 VAC.

PRESSURE SWITCH RINSE ACTIVATION

An optional remote pressure switch kit is available for dishwashers that do not have a rinse power signal. The pressure switch provides a rinse power signal when the switch is activated by pressure in the dishwasher's rinse line.

- (1) Remove all power from the dishwasher and the dispenser.
- (2) See wiring diagram on Page 10 for how to connect the power switch.

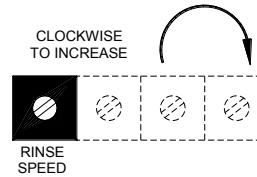
RINSE OPERATION

The rinse pump will operate whenever the rinse power signal is applied to the circuit board, whether directly from the dishwasher, or by using a pressure switch. A rinse delay feature and rinse limit feature maximize the rinse pump operating capabilities.

A prime button, located on the front cover, will allow the rinse pump to run at full speed, regardless of the rinse potentiometer setting. Power must be applied to the system to prime the pump.

RINSE SPEED SETTING

- (1) Turn the rinse potentiometer clockwise to increase speed of the rinse pump
- (2) Adjust as needed to achieve the best sheeting action.



RINSE DELAY SETTING

This feature delays the operation of the rinse pump for a programmed time once the rinse power signal is received. This function is typically used to conserve rinse agent injection on door-type dishwashers (using with conveyor machines is not recommended). The rinse delay settings are 3, 6, or 9 seconds.

- (1) Slide the upper rinse delay switch to the right to delay the rinse for 3 seconds.
- (2) Slide the lower rinse delay switch to the right to delay the rinse for 6 seconds.
- (3) Slide both rinse delay switches to the right to delay the rinse for 9 seconds.

PROBE	<input type="checkbox"/>	PROBELESS
DOOR	<input type="checkbox"/>	CONVEYOR
LOW RANGE	<input type="checkbox"/>	HI RANGE
LOW AUDIO	<input type="checkbox"/>	HI AUDIO
SANI W/DET	<input type="checkbox"/>	SANI W/RINSE
RINSE LIMIT	<input type="checkbox"/>	LIMIT OFF
DELAY OFF	<input type="checkbox"/>	3 SEC
DELAY OFF	<input type="checkbox"/>	6 SEC

SLIDE RIGHT TO ACTIVATE

RINSE LIMIT SETTING

This feature will stop the rinse pump after 30 seconds of continuous rinse power signal, conserving rinse agent on dishmachines that fill through the rinse valve.

Slide switch to "rinse limit" to activate.

PROBE	<input type="checkbox"/>	PROBELESS
DOOR	<input type="checkbox"/>	CONVEYOR
LOW RANGE	<input type="checkbox"/>	HI RANGE
LOW AUDIO	<input type="checkbox"/>	HI AUDIO
SANI W/DET	<input type="checkbox"/>	SANI W/RINSE
RINSE LIMIT	<input checked="" type="checkbox"/>	LIMIT OFF
DELAY OFF	<input type="checkbox"/>	3 SEC
DELAY OFF	<input type="checkbox"/>	6 SEC

SLIDE LEFT TO ACTIVATE

SANITIZER OPERATION

A selector switch sets the sanitizer pump to operate with detergent feed, or with rinse feed. The sanitizer pump will run simultaneously with detergent or rinse, whether using probe or probeless mode, rinse delay or rinse limit.

A prime button, located on the front cover, will allow the sanitizer pump to run at full speed, regardless of the sanitizer potentiometer setting. Main power must be applied to the system to prime the pump, a signal is not necessary.

SELECTING SANITIZER OPERATION

- Sanitizer with detergent: When the control is set to this mode, the sanitizer pump will run simultaneously with the detergent pump (or solenoid).
- Sanitizer with rinse: Injecting sanitizer into the rinse line is required for low temperature dishwasher applications. When the control is set to this mode, the sanitizer pump will run simultaneously with the rinse pump.

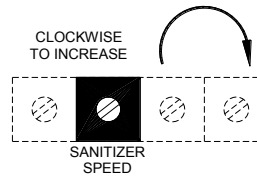
Choose if you want the sanitizer pur detergent, or rinse. Slide the switch I your choice.

SANITIZER SPEED SETTING

- (1) Turn the sani potentiometer cloc speed of the sanitizer pump
- (2) Adjust as needed to achieve the amount.

PROBE	<input type="checkbox"/>	PROBELESS
DOOR	<input type="checkbox"/>	CONVEYOR
LOW RANGE	<input type="checkbox"/>	HI RANGE
LOW AUDIO	<input type="checkbox"/>	HI AUDIO
SANI W/DET	<input checked="" type="checkbox"/>	SANI W/RINSE
RINSE LIMIT	<input type="checkbox"/>	LIMIT OFF
DELAY OFF	<input type="checkbox"/>	3 SEC
DELAY OFF	<input type="checkbox"/>	6 SEC

SLIDE LEFT OR RIGHT TO ACTIVATE



PROBE OPERATION

- With the detergent power “on”, the conductivity probe senses detergent concentration. When concentration drops below the setpoint, the control automatically turns on detergent feed.
- Low and high concentration ranges allow easy setting on all types of water conditions.
- When the detergent concentration is within 15% of the setpoint, the control automatically pulse feeds (3 seconds on / 2 seconds off) to prevent over-use of chemical.
- An “out of product” alarm will automatically sound if the detergent setpoint is not reached in a specific time period.

CONCENTRATION SETPOINT ADJUSTMENT

- (1) With low range selected, slowly adjust the detergent concentration pot clockwise a few degrees. Detergent will pulse feed, then stop.
- (2) Using a chemical titration kit, test detergent concentration of the wash water. Continue to increase the pot until the desired setpoint.
- (3) If at full clockwise position of concentration pot and wash water concentration is not strong enough, turn pot back full counter-clockwise. Switch to high range.
- (4) Slowly adjust pot clockwise until detergent feed begins, then stops. Using chemical titration kit, continue adjusting pot until desired concentration setpoint is reached.

ALARM DELAY SETTING

If the detergent setpoint is not achieved within the time set on the alarm delay pot, the alarm will sound and the unit will continue to feed. If the detergent setpoint is still not reached within a second time frame (double the first) the alarm will stay on, and detergent feed will stop.

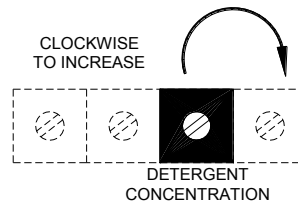
- (1) Delay time settings are:
 Door 1 to 64 seconds
 Conveyor 1 to 128 seconds
- (2) For conveyor type dishwashers, adjust the alarm delay to be slightly longer than the time it takes for the unit to achieve the setpoint with a fresh tank of water.
- (3) For door type dishwashers, the alarm setting should be calibrated to 5 - 10 seconds less than the washcycle timing.
- (4) Select low or high volume for the alarm.

PROBE		PROBELESS
DOOR		CONVEYOR
LOW RANGE		HI RANGE
LOW AUDIO		HI AUDIO
SANI W/DET		SANI W/RINSE
RINSE LIMIT		LIMIT OFF
DELAY OFF		3 SEC
DELAY OFF		6 SEC

SLIDE LEFT TO ACTIVATE

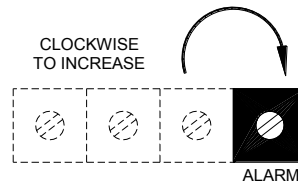
PROBE		PROBELESS
DOOR		CONVEYOR
LOW RANGE		HI RANGE
LOW AUDIO		HI AUDIO
SANI W/DET		SANI W/RINSE
RINSE LIMIT		LIMIT OFF
DELAY OFF		3 SEC
DELAY OFF		6 SEC

SLIDE LEFT TO ACTIVATE



PROBE		PROBELESS
DOOR		CONVEYOR
LOW RANGE		HI RANGE
LOW AUDIO		HI AUDIO
SANI W/DET		SANI W/RINSE
RINSE LIMIT		LIMIT OFF
DELAY OFF		3 SEC
DELAY OFF		6 SEC

SLIDE RIGHT TO ACTIVATE



PROBE		PROBELESS
DOOR		CONVEYOR
LOW RANGE		HI RANGE
LOW AUDIO		HI AUDIO
SANI W/DET		SANI W/RINSE
RINSE LIMIT		LIMIT OFF
DELAY OFF		3 SEC
DELAY OFF		6 SEC

PROBELESS OPERATION

- Controls detergent concentration without a probe, based on timed detergent feed.
- Initial charge time feeds detergent to the concentration setpoint when dishmachines are initially filled.
- Recharge time feeds detergent to maintain detergent setpoint as rinse water dilutes the dishmachine.
- Door or conveyor switch selection probeless operation for different ty dishwashers.

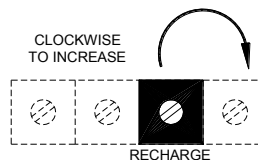
PROBE	<input type="text"/>	PROBELESS
DOOR	<input type="text"/>	CONVEYOR
LOW RANGE	<input type="text"/>	HI RANGE
LOW AUDIO	<input type="text"/>	HI AUDIO
SANI W/DET	<input type="text"/>	SANI W/RINSE
RINSE LIMIT	<input type="text"/>	LIMIT OFF
DELAY OFF	<input type="text"/>	3 SEC
DELAY OFF	<input type="text"/>	6 SEC

INITIAL CHARGE DETERGENT

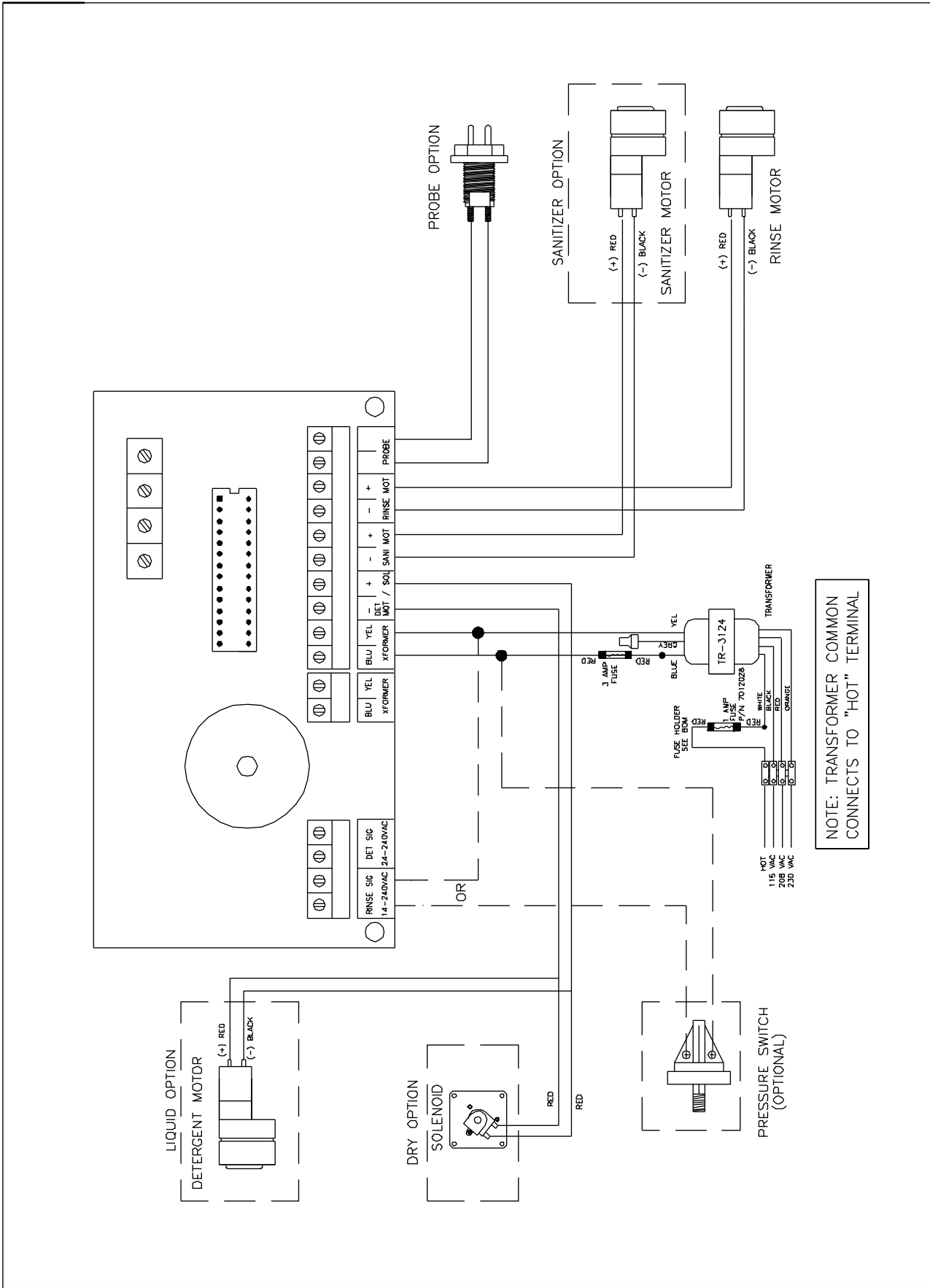
- (1) Select door or conveyor setting.
- (2) For dishmachines that fill through detergent signal is not necessar the control is set to door. The cc rinse signal when the rinse has l seconds and runs the detergent charge amount.
- (3) For all other types of machines, amount will be dispensed each l signal is applied.
- (4) Adjust the charge potentiometer amount needed to initially charge detergent. The ranges are:
 Door 1 to 64 seconds
 Conveyor 1 to 128 seconds

RECHARGE DETERGENT SET

- (1) Adjust the recharge potentiomet detergent needed for one rack. The range is 0 – 10 seconds.
- (2) With door selected, the recharge will be dispensed one time wher received.
- (3) With conveyor selected, the recl amount will be dispensed after a continuous rinse signal. It will cc every 12 seconds if the rinse sig two racks in a conveyor train, tw recharges).



WIRING DIAGRAM





Certificate of Compliance

Certificate: 1074148

Master Contract: 170302 (LR 39492)

Edition: 1

Date Issued: June 25, 2001

Issued to: Knight, Inc.
20531 Crescent Bay Drive
Lake Forest, CA 92630-6007
USA

The products listed below are eligible to bear the CSA Mark shown



Issued by: Vincent Dang, B.A.Sc.

Signature:

PRODUCTS

CLASS 9091 01 - MISCELLANEOUS

PART A: Detergent and Rinse control, permanently connected, models as follows:

"ULTRA-MICRO PRO", Model UMP with additional suffixes, rated 120 V, 208 V, or 240 V ac, 60 Hz, 0.21 A, 20 W max. The additional suffixes denote the following: -100L, -100D, -200L and -200D

- 200 - Two output loads (100 for one output load)
- D - Dry warewash control system with a solenoid valve.
- L - Liquid warewash control system with a pump.

PART B: Detergent and Rinse control, permanently connected, models as follows:

"MICRO-PRO II", Model MPIO with additional suffixes, rated 120 V, 208 V, or 240 V ac, 60 Hz, 0.27 A, 26 W max. The additional suffixes denote the following: -200L, -200D, -300L and -300D

- 300 - Three output loads (200 for two output loads)
- D - Dry warewash control system with a solenoid valve.
- L - Liquid warewash control system with a pump.

Certificate: 1074148



Master Contract: 170302 (LR 39492)

Edition: 1

Date: June 25, 2001

PART C: Detergent and Rinse control, permanently connected, models as follows:

"ON-PREMISE PLUS", Model OP-PLUS with additional suffixes, rated 120 V, 208 V, or 240 V ac, 60 Hz, 0.27 A, 27 W max. The additional suffixes denote the following: -503, -504, -505, -506, -803, -804, -805 and -806.

- 503 - Warewash control system with three pumps. (504 for four pumps, 505 for five pumps and 506 for six pumps)
- 803 - Warewash control system with three pumps. (804 for four pumps, 805 for five pumps and 806 for six pumps)

PART D: Detergent and Rinse control, permanently connected, models as follows:

"ON-PREMISE", Model OP with additional suffixes, rated 120 V, 208 V, or 240 V ac, 60 Hz, 0.26 A, 26 W max. The additional suffixes denote the following: -503, -504, -505, -506, -803, -804, -805 and -806.

- 503 - Warewash control system with three pumps. (504 for four pumps, 505 for five pumps and 506 for six pumps)
- 803 - Warewash control system with three pumps. (804 for four pumps, 805 for five pumps and 806 for six pumps)

PART E: Detergent and Rinse control, permanently connected, models as follows:

"ON-PREMISE", Model OP with additional suffixes, rated 120 V, 208 V, or 240 V ac, 60 Hz, 0.32 A, 32 W max. The additional suffixes denote the following: -501, -502 and -802.

- 502 - Warewash control system with two pumps. (501 for one pump)
- 802 - Warewash control system with two pumps.

Notes:

1. The above systems described in part A to Part E are Certified as component only, their suitability in the end application is to be determined by CSA International.
2. The maximum duty cycle operation for system in part C and D is 255 seconds 'ON' and 15 minute 'OFF' (two pumps maximum each time)

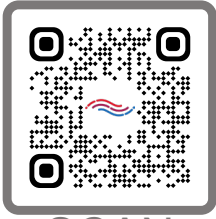
APPLICABLE REQUIREMENTS

- CSA Standard C22.2 No 0-M1982 - General Requirements - Canadian Electrical Code, Part II
- 0.4-M1982 - Bonding and Grounding of Electrical Equipment (Protective Grounding)
- 142-M1987 - Process Control Equipment

NOTES:

WARRANTY

For complete product terms and conditions scan the QR code below or enter the following URL into your browser:
<http://cfstech.info/t-and-c>



SCAN



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