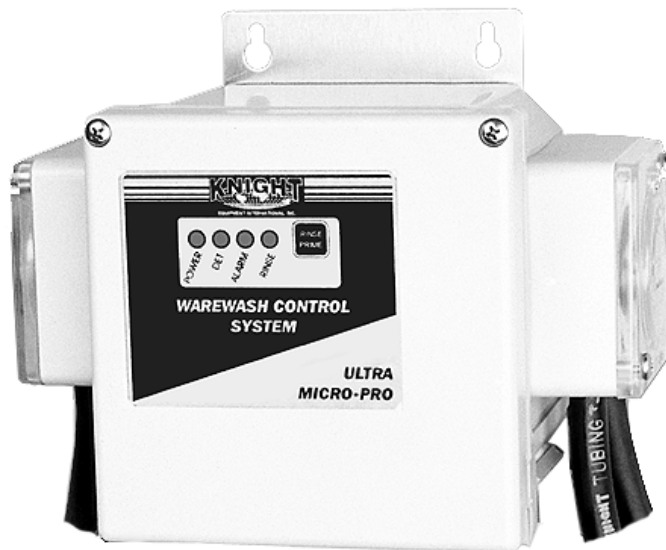

KNIGHT
IDEX
IDEX CORPORATION



Ultra Micro-Pro
UMP 100 / 200 Series
Instruction Manual

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EQUIPMENT RATINGS

This includes equipment supply, description of I/O connections, duty cycle and operating environmental conditions.

- Pollution degree 2;
- Installation category 2;
- Altitude 2000 m;
- Humidity 50% to 80%
- Electrical supply 120, 208, or 240 Vac, 50/60 Hz;
- Indoor use statement;
- Temperature 5°C to 40°C;
- Statement advising that mains supply voltage fluctuations are not to exceed 10 percent of the nominal supply voltage.



CAUTION: Wear protective clothing and eyewear when dispensing chemicals or other materials. Observe safety handling instructions (MSDS) of chemical mfrs.



CAUTION: To avoid severe or fatal shock, always disconnect main power when servicing the unit.



CAUTION: When installing any equipment, ensure that all national and local safety, electrical, and plumbing codes are met.



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EC – DECLARATION OF CONFORMITY

Equipment Description: Chemical Dispenser Equipment

Type/Model Number: UMP Classic

The signing legal authorities state that the above mentioned equipment meets the requirements for emission, immunity and safety according to.

Application of Council Directives:

Electromagnetic compatibility

(EMC) Directive 2004/108/EC (and former Directive 89/336/EEC as amended by 92/31/EEC and 93/68/EEC)

Standards to Which Conformity Is Declared: **EN 61326-1: 2006** Electrical Equipment Measurement, Control & Laboratory Use (Normal Environment)

For Information: The "Electromagnetic Test" took place at the DNB Engineering, Riverside, CA, U.S.A

Electrical Safety

Low Voltage Directive (LVD) 2006/95/EC (and former Directive 73/23/EEC)

Standards to Which Conformity Is Declared: **EN 61010-1 (2nd Edition)** - Safety Requirements for Electrical Equipment for Measurement, Control, and Laboratory Use - Part 1: General Requirements

For Information: The "Electrical Safety Test" took place at the CSA International, Irvine, CA, U.S.A

Signature of representative of manufacturer:

Name: Comiskey, Brian

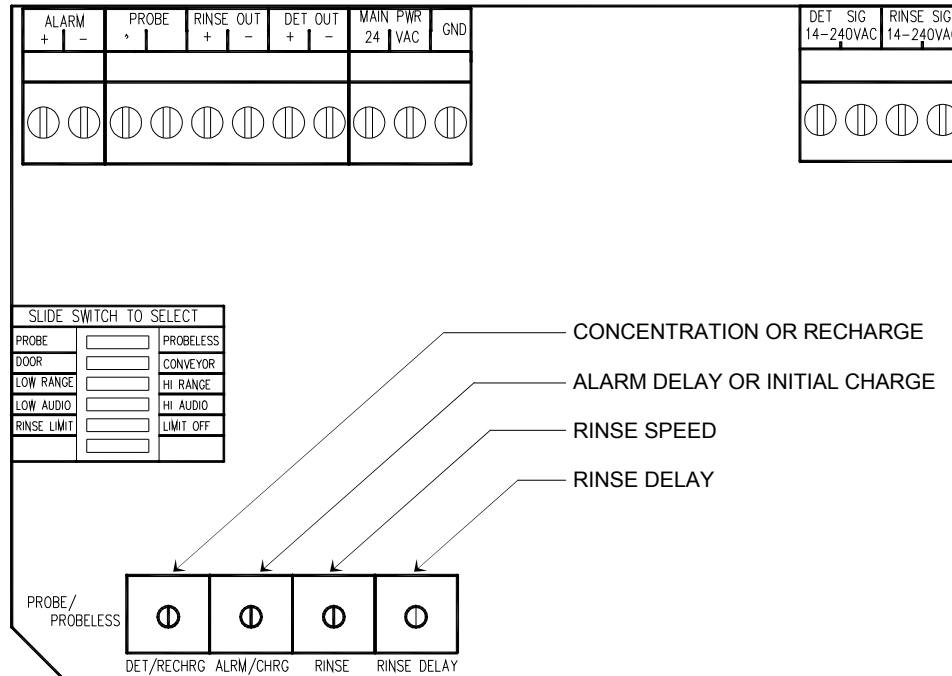
Position: Vice President, Engineering

Date: August 28, 2008

INTRODUCTION

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

The UMP Series warewash control features simplicity and versatility.



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.
- **On/Off Rinse Limit Switch:** When on, stops the rinse pump after 30 seconds.

POTENTIOMETER SETTINGS

- **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.
- **Rinse Speed Pot:** Adjust the speed at which the rinse pump runs.
- **Rinse Delay Pot:** Delays the rinse pump from 0 to 14 seconds.

INSTALLATION

Mount the unit (using suitable hardware) with the provided bracket in the accessory kit. 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 PLUMBING

- (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 1 1/32" 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 rinse 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 rinse 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 rinse 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

One step-down transformer is provided with the UMP control. Connect the high voltage side, through a switch or circuit breaker in close proximity to the equipment and marked UMP, 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 UMP 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 Ultra Micro-Pro.
- (2) Remove all power from the dishwasher.
- (3) Connect leads from the main power source to the appropriate wires on the transformer.

* CAUTION: The UMP unit has high voltage connected to the transformer. Always disconnect main power when servicing the unit.

REMOTE ALARM

A remote 3 - 28 VDC alarm may be wired to the "alarm" terminals on the circuit board. See wiring diagram on page 10.

DETERGENT POWER SIGNAL

A detergent power signal is required to activate the detergent probe sensing or probeless initial charge. Detergent power can be jumpered from main power.

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

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: the rinse solenoid or rinse cycle light) and verify voltage. The Ultra Micro-Pro circuit board will accept a signal of 14 - 240 VAC. 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.

PRESSURE SWITCH RINSE ACTIVATION

An optional remote pressure switch kit is available for applications where a rinse power signal can't be located on the dishwasher. The pressure switch is used to provide a rinse power signal to the Ultra Micro-Pro's circuit board when the switch is activated by pressure in the dishwasher's rinse line. This is done by using power from the system's transformer as the signal voltage *source*, and simply letting the pressure switch make/break the connection. To use a pressure switch:

- (1) Remove all power from the dishwasher and the dispenser.
- (2) Wire the pressure switch terminals as shown in the wiring diagram on page 10.

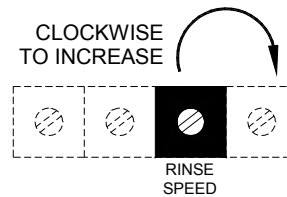
RINSE OPERATION

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 operating capabilities of the rinse pump.

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

RINSE SPEED SETTING

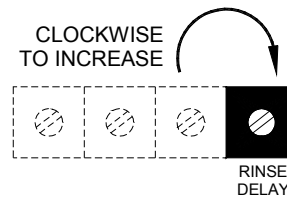
- (1) Turn the rinse potentiometer clockwise to increase speed of the rinse pump
- (2) Adjust as needed to achieve the best sheeting action.



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 range is 0 - 14 seconds.

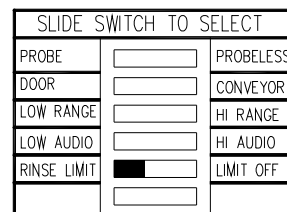
- (1) Turn the rinse delay potentiometer clockwise to increase.
- (2) Turning the setting to full minimum shuts off this feature.



RINSE LIMIT SETTING

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

Slide switch to "rinse limit" 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.

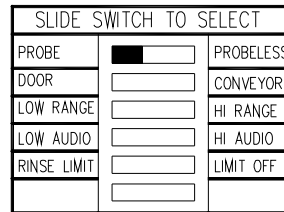
CONCENTRATION SETPOINT ADJUSTMENT

- (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.

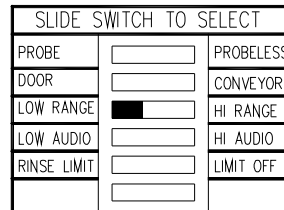
ALARM DELAY SETTING

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.

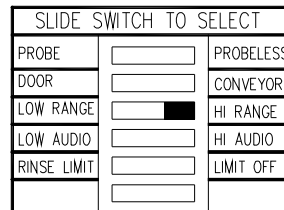
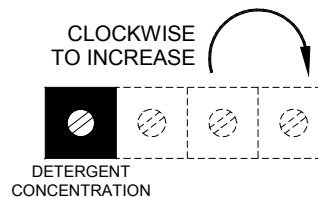
- (1) Delay time settings are:
 Door 1 to 64 seconds
 Conveyor 1 to 128 seconds
- (2) For conveyor type dishwashers, adjust the alarm delay to be slightly longer than the time it takes for the unit to achieve the setpoint with a fresh tank of water. For door type dishwashers, the alarm setting should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



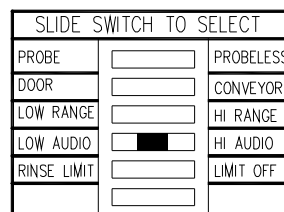
SLIDE LEFT TO ACTIVATE



SLIDE LEFT TO ACTIVATE



SLIDE RIGHT TO ACTIVATE



SLIDE LEFT OR RIGHT TO ACTIVATE

PROBELESS OPERATION

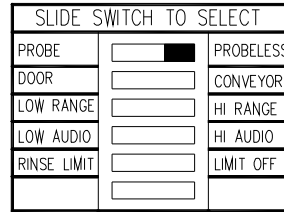
- Controls detergent concentration without a probe, based on timed detergent feed.
- Initial charge time feeds detergent to the concentration setpoint when dishmachines are initially filled.
- Recharge time feeds detergent to maintain detergent setpoint as rinse water dilutes the dishmachine.
- Door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

INITIAL CHARGE DETERGENT SETTINGS

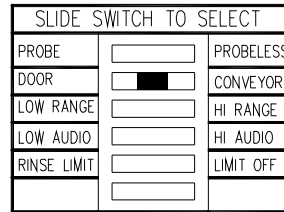
- (1) Select door or conveyor setting.
- (2) For dishmachines that fill through the rinse valve, a detergent signal is not necessary for initial charge if the control is set to door. The control senses by the rinse signal when the rinse has been on over 30 seconds and runs the detergent for the initial charge amount.
- (3) For all other types of machines, the initial charge amount will be dispensed each time a detergent signal is applied.
- (4) Adjust the charge potentiometer clockwise for the amount needed to initially charge the washtank with detergent. The ranges are:
 Door 1 to 64 seconds
 Conveyor 1 to 128 seconds

RECHARGE DETERGENT SETTINGS

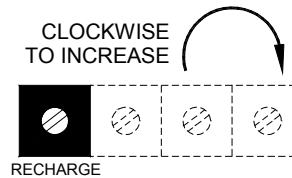
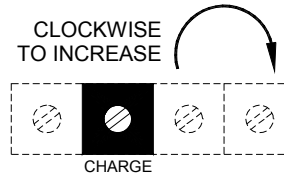
- (1) Adjust the recharge potentiometer to the amount of detergent needed for one rack. The range is 0 – 10 seconds.
- (2) With door selected, the recharge detergent amount will be dispensed one time when a rinse signal is received.
- (3) With conveyor selected, the recharge detergent amount will be dispensed after a 12 second continuous rinse signal. It will continue to dispense every 12 seconds if the rinse signal remains on (i.e. two racks in a conveyor train, two detergent recharges).



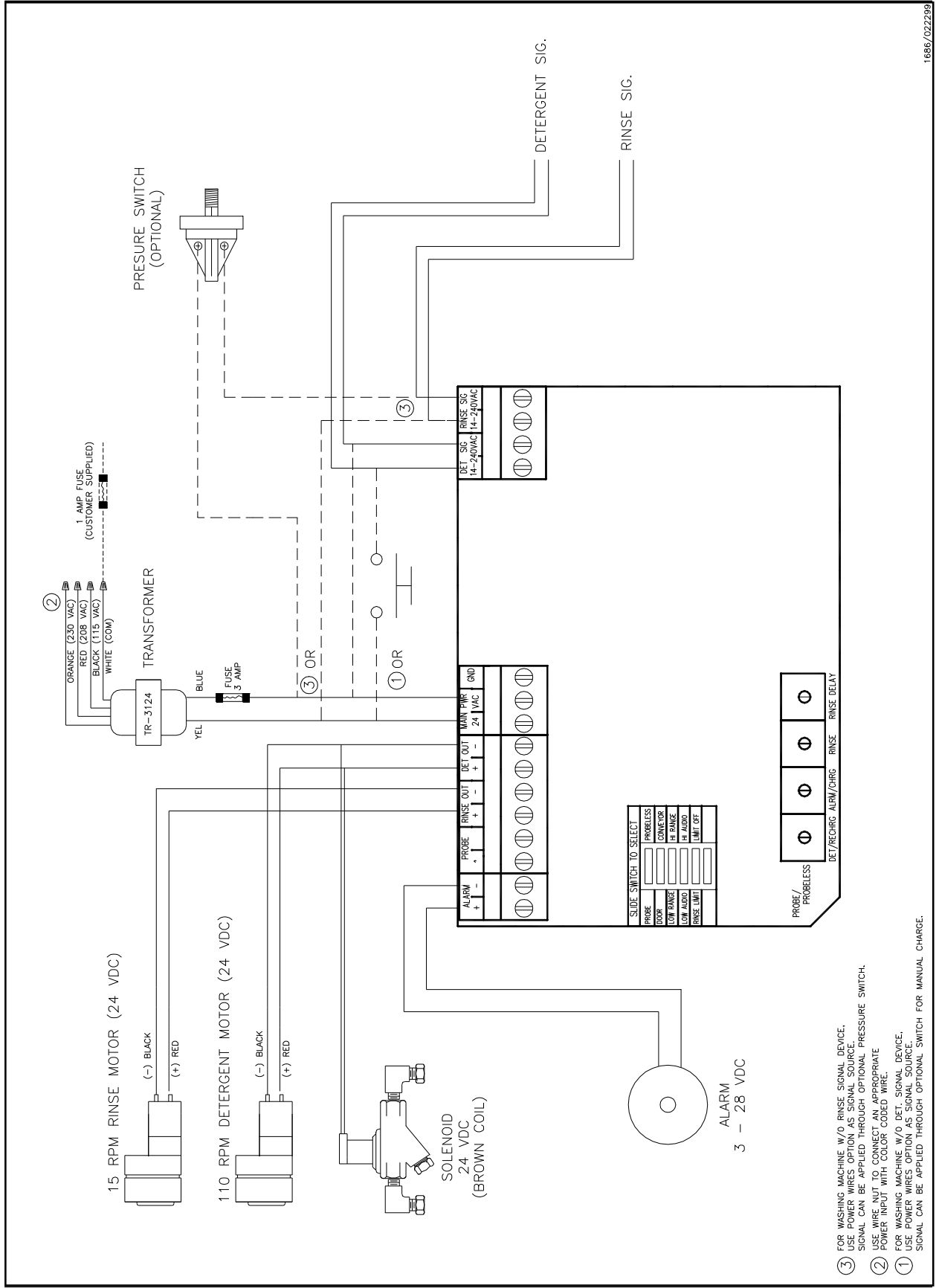
SLIDE RIGHT TO ACTIVATE



SLIDE LEFT OR
RIGHT TO ACTIVATE



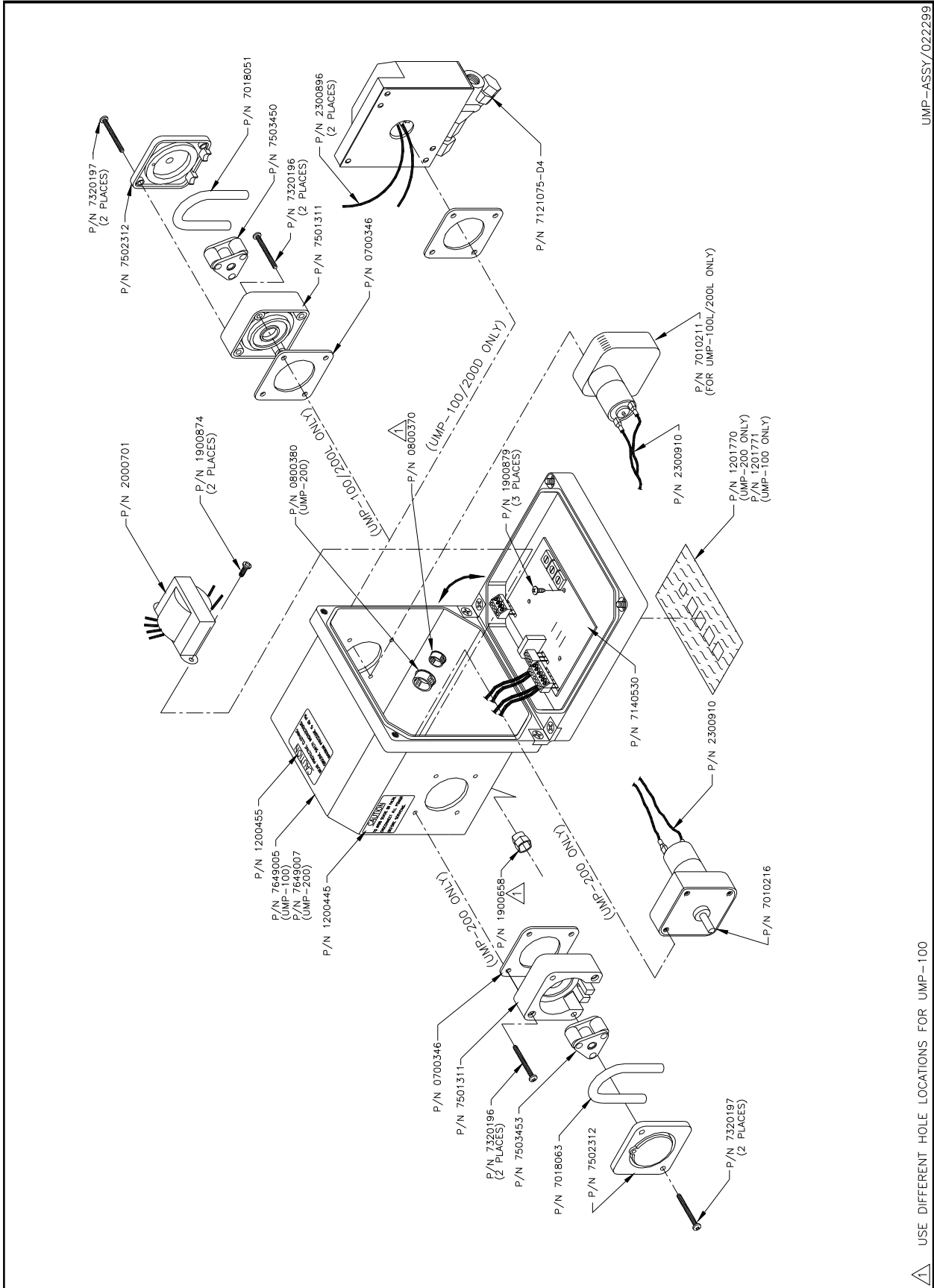
WIRING DIAGRAM



1666/02299

- ③ FOR WASHING MACHINE W/O RINSE SIGNAL DEVICE, USE POWER WIRES OPTION AS SIGNAL SOURCE. SIGNAL CAN BE APPLIED THROUGH OPTIONAL PRESSURE SWITCH.
- ② USE WIRE NOT TO CONNECT AN APPROPRIATE POWER INPUT WITH COLOR CODED WIRE.
- ① FOR WASHING MACHINE W/O DET. SIGNAL DEVICE, SIGNAL CAN BE APPLIED THROUGH OPTIONAL SWITCH FOR MANUAL CHARGE.

ASSEMBLY DIAGRAM



UMP-ASSY/022299

USE DIFFERENT HOLE LOCATIONS FOR UMP-100

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

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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