



NOVA CONTROLS
LEADING THE WAY
A Hydro Systems Company

SPRITE WAREWASH

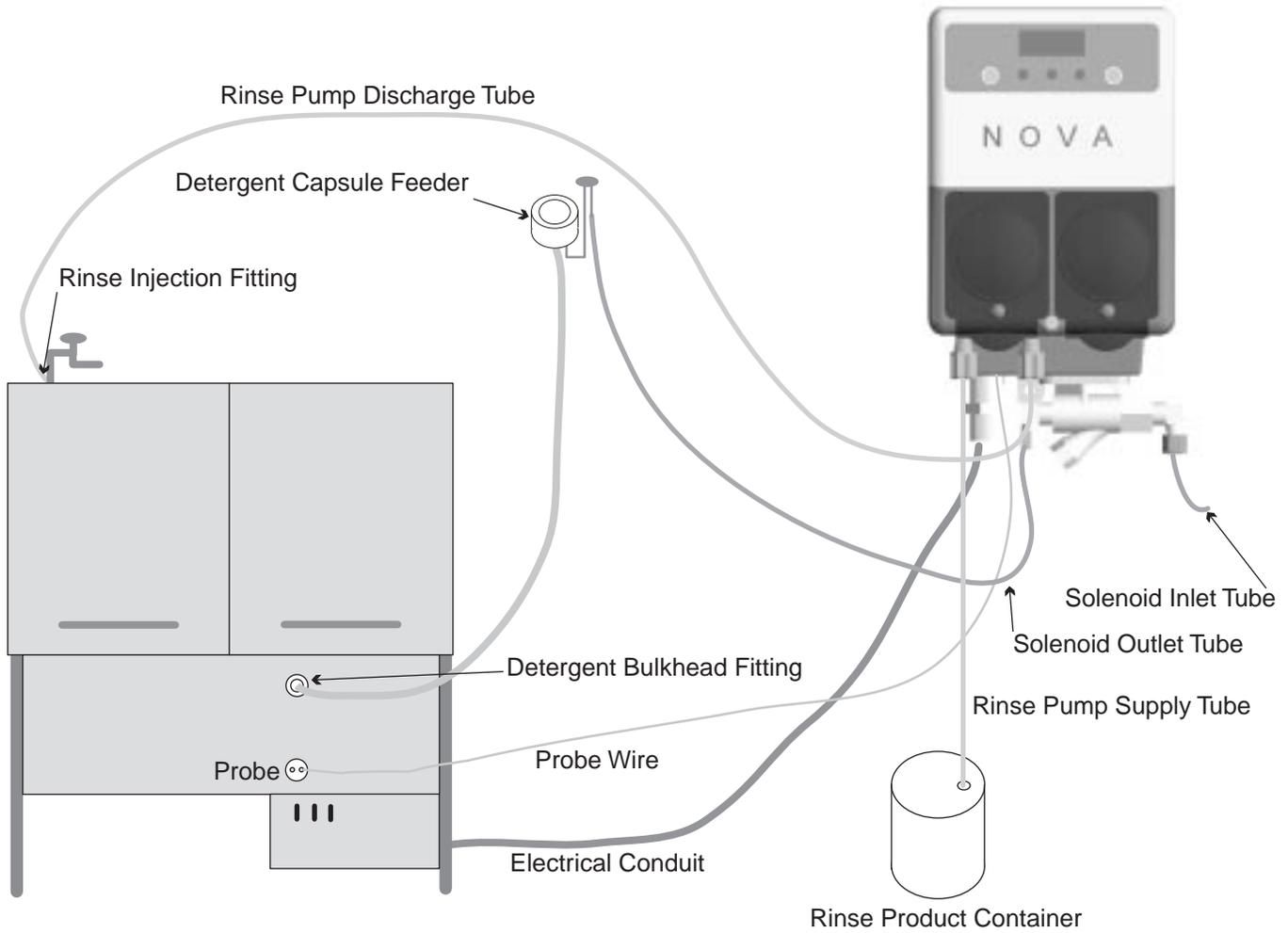
DISPENSING SYSTEM



Reference Manual

DM-400 Series

System Diagram



1.0 DESCRIPTION OF FEATURES

- **Advanced Design**

The SPRITE uses miniaturized electronics to provide powerful features in a small package. A digital readout allows simple three button programming of all options.

- **Reliable**

The gasketed enclosure on the SPRITE Warewash Dispenser is highly water resistant and the electronics are further protected within the enclosure. The readout gives confirmation of detergent and rinse feed.

- **Versatile**

The SPRITE can be configured as a conductivity probe controlled unit or as a probe-less, time based dispenser. It can accept a 90 to 130 VAC or 200 to 249 VAC main power input at 50 or 60 hz. Rinse and Detergent control signal inputs are via universal “machine interface” type inputs that are capable of accepting any voltage from 24 to 240 VAC. It can control either powder or liquid detergents.

- **Save Money**

A special Rinse Saver Feature prevents rinse additive wastage during fills of the washer, digital electronics ensure accurate detergent control and minimize overuse.

- **Intelligent**

The SPRITE includes a rack counter as a “standard” feature. A unique “De-Lime” mode allows for safe washer cleaning without detergent wastage.

- **Fully Featured**

A full range of programmable options are included such as rinse delay, variable alarm volume, and manual prime for both rinse and detergent.

- **Easy Service/Repair**

The SPRITE features convenient front access for all servicing. No internal access to the cabinet is required for installation and routine maintenance. In the unlikely event repairs are required, spare parts are available in modular form for fast and convenient service.

2.0 DESCRIPTION OF CONTROLS

The SPRITE makes good use of only 3 buttons and a 3-digit LED display for all dispenser operation and programming. Each key function is described in this section.

2.1 Key Descriptions

Next Key—Move to the next item or task.

User Mode: Move through the (up to five) available User Mode screens.

Program Mode: Move through Program Mode menu screens.

Input Screens: Move blinking digit to the right.

Scroll Key—Change the blinking digit value.

User Mode: Change values of blinking digits (Password entry). Activates Probe-less Manual Initial Detergent Charge.

Program Mode: Change values of blinking digits.

Input Screens: Change values of blinking digits.

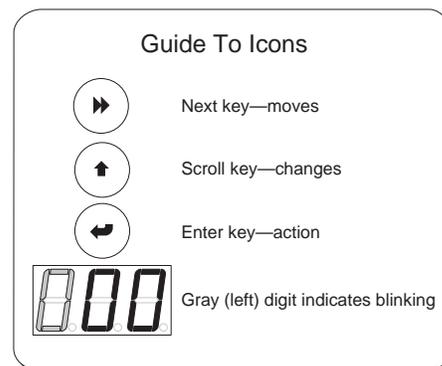
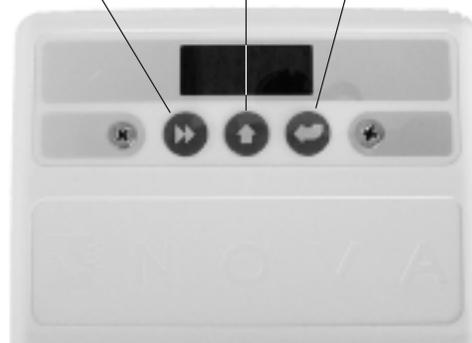
Enter Key—Perform a task or set a value.

User Mode: Press and hold 2 seconds to access Password input screen. Starts and stops rinse pump and detergent prime. Performs actions as prompted in User Mode menu screens.

Program Mode: Access all input screens from main menu loop screens (selected with the Next key).

Input Screens: Set the displayed value in all input screens (selected with the Scroll key), and exit back to main menu loop.

Next Key Scroll Key Enter Key



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3.0 MECHANICAL INSTALLATION

CAUTION: The Sprite dispensing system is intended to be installed by experienced installers in accordance with all applicable electrical and plumbing codes. All dish machine and dispenser power is to be disconnected during installation and/or any time the dispenser cabinet is opened.

The unit mounting location should be at a convenient height for maintenance. Locate the unit away from any direct sources of steam, water spray, and high temperatures. Locate the unit close enough to the dish machine electrical control panel to allow dispenser wiring without use of an external junction box (not provided) wherever possible.

3.1 Unit Mounting—Wall

For mounting on horizontal surfaces, i.e. washer top, please refer to instructions provided with the optional Horizontal Mounting Bracket Kit.

- 3.1.a Using mounting bracket as a template, mark holes to drill into mounting surface. For sheet metal mounting with screws and nuts, drill 1/4" (6 mm) holes. For wall anchors drill holes as appropriate for wall anchors used.
- 3.1.b Attach mounting bracket to mounting surface with hardware provided.
- 3.1.c Hang unit on bracket.
- 3.1.d If desired, drill hole and attach lower mounting hole to mounting surface.

3.2 Probe Mounting (Probe Mode Operation Only)

The probe senses the detergent concentration. Correct probe placement is critical for accurate detergent concentration control. Always use the new probe provided with the dispenser. The probe is to be in a location that is always immersed in the wash tank solution, has good flow of solution, and is close to the product entry point. Many dish machines will have knockouts provided for probe installation and/or existing probes. Previously punched probe holes are typically suitable but always confirm that the location is suitable.

If probe hole is present, skip step 3.2.a.

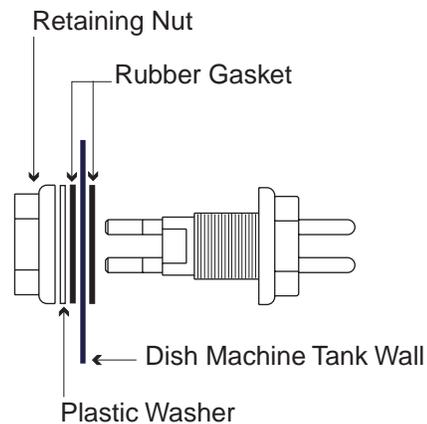
- 3.2.a Drill a 3/8" hole in the center of the probe location. Use a Greenlee (or similar) 7/8" hole punch to cut the final hole.
- 3.2.b Remove the probe retaining nut and insert probe with rubber gasket into hole from inside the dish machine tank.
- 3.2.c Install probe retaining nut and tighten finger-tight.

CAUTION: Do not over tighten retaining nut!

Figure 3.1
Unit Mounting—Wall



Figure 3.2
Probe Mounting (Probe Mode Operation Only)



3.3 Rinse Injection Fitting

The rinse injection fitting typically is to be installed at least 6" below the dish machine rinse plumbing vacuum breaker to conform to plumbing codes. The injection fitting threads into 1/8" NPT female threads. If the dish machine rinse plumbing is thin-wall pipe, use a saddle clamp with a 1/8" NPT threaded hole. If optional pressure switch is to be used, thread injection fitting into one side of the pressure switch water source fitting pipe tee. The dish machine may already have a tapped hole present to accommodate the fitting; if this is the case, skip steps 3.3a and 3.3b.

- 3.3.a Drill a 7/32" hole in the rinse plumbing injection location. This location should be at least 6" downstream from the solenoid valve and vacuum breaker. On continuous rack, flight, or conveyor machines, be sure this location is downstream from any rinse makeup water.
- 3.3.b Tap the hole drilled in step 3.3.a with a 1/8" NPT tap.
- 3.3.c Install the injection fitting. Use teflon tape to ensure a leak-free assembly.

3.4 Detergent Bulkhead Fitting (Liquid Detergent Only)

NOTE: Follow instructions provided with your solid, powder, or slurry feed system for solenoid equipped units instead of the following section.

Correct detergent bulkhead fitting placement is critical for accurate detergent concentration control (probe mode only). The detergent bulkhead fitting is to be located above the water line in the tank close to the probe location when possible. Be sure that the detergent discharge location is not on top of any shelf areas or other obstacles that could prevent detergent from falling directly into the wash tank. Previously punched probe holes are typically suitable but always confirm that the location is suitable. If a hole is present, skip step 3.4.a.

- 3.4.a Drill a 3/8" hole in the center of the probe location. Use a Greenlee (or similar) 7/8" hole punch to cut the final hole.
- 3.4.b Remove the detergent bulkhead fitting retaining nut and insert into hole with rubber gasket from inside the dish machine tank.
- 3.4.c Install retaining nut and tighten finger-tight.

CAUTION: Do not over tighten retaining nut!

Figure 3.3
Rinse Injection Fitting

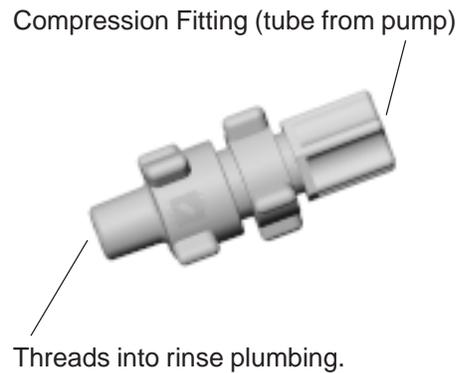
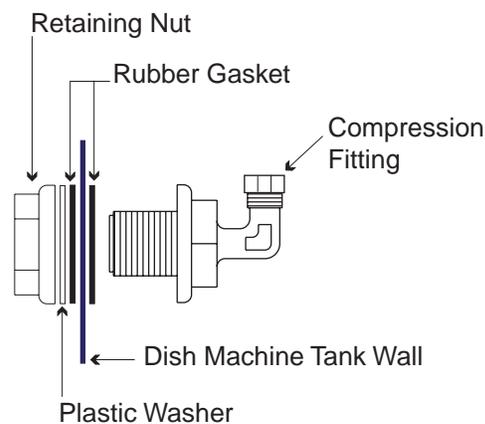


Figure 3.4
Detergent Bulkhead Fitting (Liquid Detergent Only)



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3.5 Rinse and Detergent Supply and Discharge Tubes (Not Included)

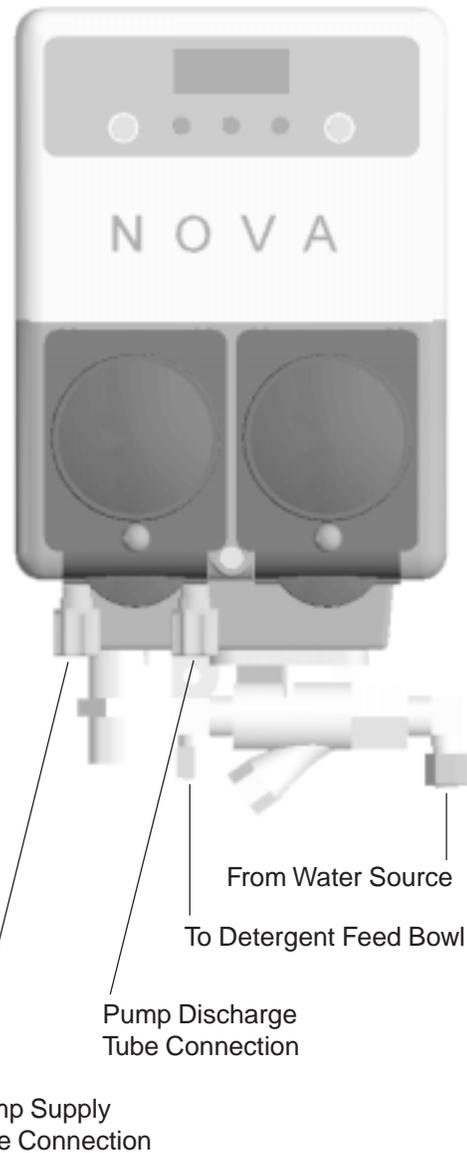
- 3.5.a Route pump supply tubes from supply containers to the inlet sides (left) of each respective pump. Slip into compression fittings and tighten.
- 3.5.b Route pump discharge tubes to the outlet sides (right) of each respective pump. Slip into compression fittings and tighten.
- 3.5.c Route other end of rinse pump discharge tube to rinse injection fitting installed in step 3.3. Slip into compression fitting and tighten.
- 3.5.d Route other end of detergent pump discharge tube to the detergent bulkhead fitting installed in step 3.4. Slip into compression fitting and tighten.

3.6 Solenoid Water Feed (Solenoid Equipped Units Only)

If you are using a solid, powder, or slurry type feed system you will need a water source for the dispenser solenoid valve. This water supply may be hot or cold, but for safety reasons should not come from the boosted temperature rinse water line on high temperature dish machines. The dispenser solenoid valve fittings are 1/4" (6 mm on metric units) compression. Typically a saddle clamp is used for the solenoid valve water source. If the plumbing is steel or brass, you can drill a 7/32" hole and tap for 1/8" NPT threads.

CAUTION: Only use copper tubing if the water source is hot!

- 3.6.a Install petcock valve to water source plumbing. Connect 1/4" copper or plastic tube to the valve.
- 3.6.b Route tube to the dispenser solenoid valve. Slide tube into water inlet side compression fitting and tighten.
- 3.6.c Connect another 1/4" tube to the outlet side of the dispenser solenoid valve and route to the water inlet connection for the feed system.
- 3.6.d Confirm all compression fittings are tight. Be sure to turn on water source valve prior to adjusting dispenser settings.



4.0 ELECTRICAL INSTALLATION

All electrical connections except the probe are to be done either in the dish machine control circuit panel or an external junction box. The dispenser is pre-wired with a multiconductor electrical cable that is to be run through a conduit to the location where hard-wired connections are made on the dish machine. Use a 1/2" (13 mm) ID water tight conduit meeting all local and national codes. A conduit fitting is present on the bottom of the dispenser where the power cable exits. The probe wire is also pre-wired and is to be routed to the probe location and cut to length.

4.1 Probe Wiring

- 4.1.a Route probe wire to probe location and cut to fit. If you need to extend the probe wire, be sure to use high quality corrosion resistant (or better yet waterproof) butt splices with a good quality crimping tool.
- 4.1.b Strip wire ends and crimp on the ring lugs provided.
- 4.1.c Connect the ring lugs to the probe with nuts and star washers provided. Be sure that connections are tight and secure.

4.2 Main Power Wiring

Main power is separate from any signal input to the dispenser, and must not be interrupted during the normal operation of the dish machine. Main power may be 90 to 130 VAC or 200 to 249 VAC. Maximum current draw is 0.5 amps at 115 VAC. The ideal circuit for main power is a circuit that is shut off when the dish machine is shut off. Barring that, pick up main power wherever it is convenient in the dish machine control circuitry (i.e. L1 and L2 of incoming power). 460/480 VAC dishwashers will require a step-down transformer. Always verify voltages you are connecting to with a meter!

- 4.2.a Connect gray/violet and black colored wires to 115 VAC main power source, or gray/violet and brown colored wires to 208/230 VAC main power source. Cap off and insulate the unused main power wire.

NOTE: 230 VAC export units only have two main power wires. The wire colors are light blue and brown. Main power input may be between 200 and 249 VAC for these versions.

CAUTION: Only two of the three main power source wires are to be connected. The third wire is for the alternate voltage option and is live! Be sure to insulate and cap this wire off to protect it from coming into contact with anything inside the dish machine control panel!

4.3 Detergent Signal Wiring-Probe Mode

The detergent signal input is an optically isolated signal input that draws no more than 20 ma. The detergent signal input is a universal AC voltage input that accepts any voltage between 24 and 240 VAC, or 24 VDC. Typical wiring locations are dispenser detergent power source or the wash motor contactors in the dish machine control panel. This power source is on when the dishwasher is running the wash pump.

- 4.3.a Connect yellow (DC +) and white/yellow (DC -) colored wires to the detergent power source.

4.4 Detergent Signal Wiring (Probe-less Mode)

On conveyor type dishwashers the rinse signal must occur only once per dish machine fill/drain occurrence, beginning when the dish machine fills. Typical wiring locations are an "on light" or an electrical tank heat circuit between the tank heater switch and the thermostat. Each time this power source comes on, the dispenser will feed the detergent initial charge amount (with probe-less and automatic initial charge modes set).

On door type dishwashers connect this signal input to the dispenser detergent power source or the wash motor contactors in the dish machine control panel. This power source is on when the dishwasher is running the wash pump.

- 4.4.a Connect yellow (DC +) and white/yellow (DC -) colored wires to the initial charge power source.

4.5 Rinse Signal Wiring

The rinse signal input is an optically isolated signal input that draws no more than 20 ma. The rinse signal input is a universal AC voltage input that accepts any voltage between 24 and 240 VAC, or 24 VDC. Typical wiring locations are dispenser rinse power source or the rinse solenoid valve circuit in the dish machine control panel. This power source is to be live whenever the dishwasher is rinsing. When no suitable rinse signal connection is available an optional pressure switch may be used with a constant power source instead.

- 4.5.a Connect violet (DC +) and white/violet (DC -) colored wires to the rinse (or constant power for pressure switch installations) power source.

NOTE: Certain designs of dishwashers require that rinse aid be dispensed upon the detergent signal rather than the rinse signal. In this case you still must connect the rinse signal input to either the fill solenoid or the rinse solenoid circuit of the dishwasher to enable automatic initial charge function in probeless mode.

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5.0 USER MODE OPERATION

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NOTE: Please refer to illustrations on the next page.

In User Mode the SPRITE display indicates the operating status of the dispenser. This display indicates the following conditions:

DESCRIPTION OF CONTROLS

Idle Home Screen:

Dash in center digit indicating power is on.

Rinse Pump On:

Left digit segments blink in a clockwise pattern.

Detergent Feed On:

Right digit segments blink in a clockwise pattern.

MECHANICAL INSTALLATION

Low Detergent Visual Alarm (Probe Mode Only):

Bottom segments of all three digits blink.

Combinations of these display indicators will occur during normal operation.

ELECTRICAL INSTALLATION

5.1 User Mode Menus

Press the Next key to access and move through the User Mode menu loop. All menu screens are numeric; no text appears in any menu screens. This menu loop is circular so you can always return if you accidentally pass by the desired screen. The User Mode menu will automatically return to the home screen after 30 seconds of inactivity. There is no exit function since the time limit is short.

USER MODE OPERATION

5.1.a Rack Counter (Screen 11)

Press the Next key to display 11. Press the Enter key to display racks washed. The rack counter counts by tens. Press the Enter key to return to the main menu loop, or wait 30 seconds for the display to automatically return to the home screen.

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From the rack counter screen you may also access the system RAM check and "Max Det Time" screens by pressing the Next key. At the Ram check screen press the enter key and a 1 will display if the RAM check is okay. Press the Enter key at the "Max Det Time" screen to display the longest amount of time that detergent feed has run to satisfy the setpoint (probe mode only). It is a good idea to make note of this time after a new installation. See the Troubleshooting section for more information on using this feature.

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5.1.b Detergent Prime (Screen 12)

Press the Next key to display 12. Press the Enter key to start detergent feed. Press the Enter key again to stop detergent feed and return to the main menu loop.

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5.1.c Rinse Prime (Screen 13)

Press the Next key to display 13. Press the Enter key to start the rinse pump. Press the Enter key again to stop the rinse pump and return to the main menu loop.

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NOTE: Prime functions automatically stop after 30 seconds.

5.1.d De-Lime (Screen 14)

Press the Next key to display 14. Press the Enter key to start the De-Lime Cycle time (10 minutes). During the De-Lime Cycle time all dispenser operation is stopped.

Press the Enter key to stop the De-Lime Cycle early, and return to the main menu loop.

5.2 Password Access to Program Mode

Press and hold the Enter key for 2 seconds to access the Password input screen. The password factory setting is 123. Press the Scroll key to change the blinking digit to the desired value. Press the Next key to move the blinking digit. Press the Enter key when the desired number is present in all digits to enter Program Mode. An incorrect password entry returns you to the home screen.

5.3 Low Detergent Alarm (Probe Mode Only)

The low detergent alarm (audible and visual indicators) comes on whenever the detergent concentration does not rise when the detergent feeds within a preset number of racks washed (as programmed in the Low Detergent Alarm Delay menu screen, screen 34, of Program Mode).

The lower lines of the LED display flashing indicate the visual alarm. The audible alarm will beep three times per rack. The low detergent alarm is self-resetting once the dispenser senses a rise in detergent concentration in the wash tank.

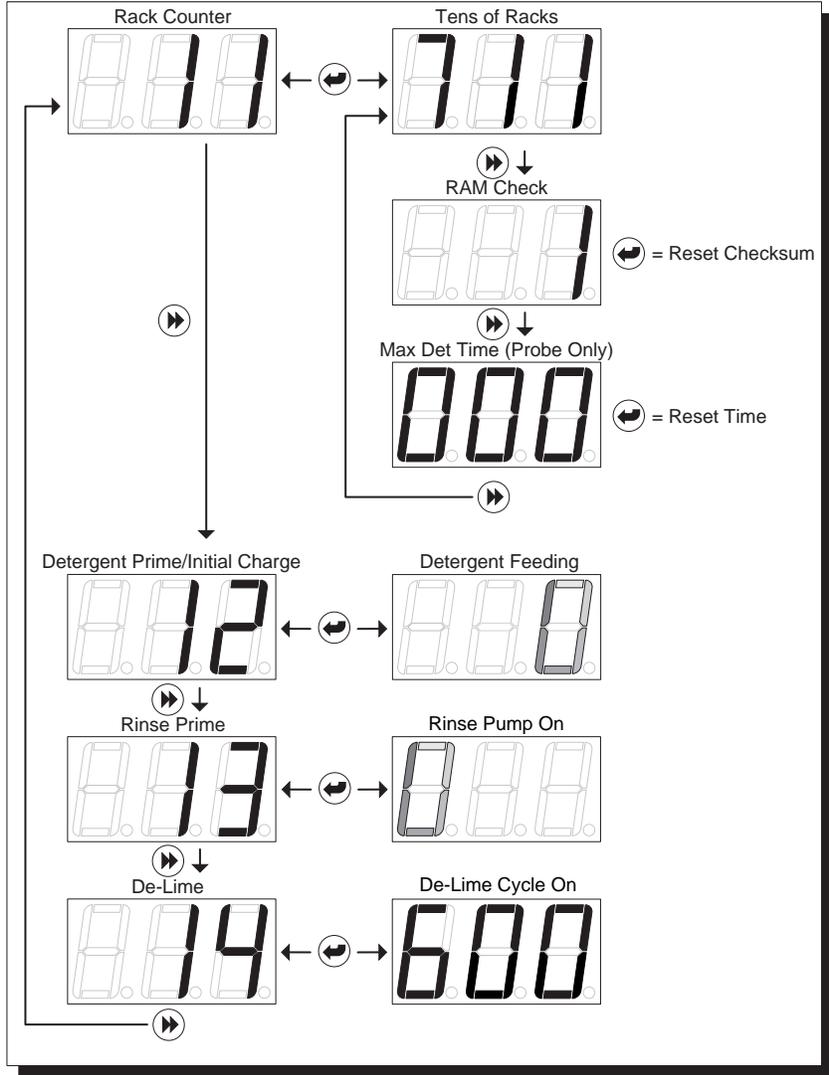
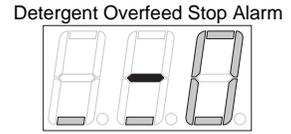
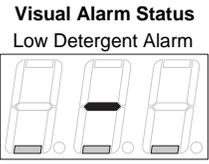
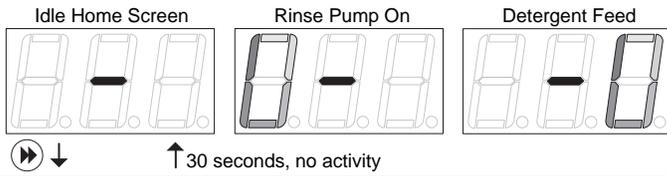
5.4 Detergent Overfeed Stop Alarm (Probe Mode Only)

If a low detergent alarm condition remains present for twice the preset number of racks washed (as programmed in the Low Detergent Alarm Delay menu screen, screen 34, of Program Mode) detergent feed is stopped and the audible and visual alarm changes to indicate a detergent overfeed stop condition.

The lower lines and the right zero of the LED display flashing visually indicate overfeed stop. The audible alarm will sound continually in bursts of three beeps. Overfeed stop can be reset (to initiate detergent feed after changing the product container for example) by pressing any key.

5.5 Manual Initial Charge (Probe-less Mode, Manual Initial Charge Setting Only)

From the home screen, press the Scroll key to activate manual initial charge. Press the Scroll key again to terminate manual initial charge early.



↑ Activates Manual Initial Charge
(Probe-less Mode,
Manual Initial Charge Set)

Guide To Icons



Next key—moves



Scroll key—changes



Enter key—action



Gray (left) digit indicates blinking

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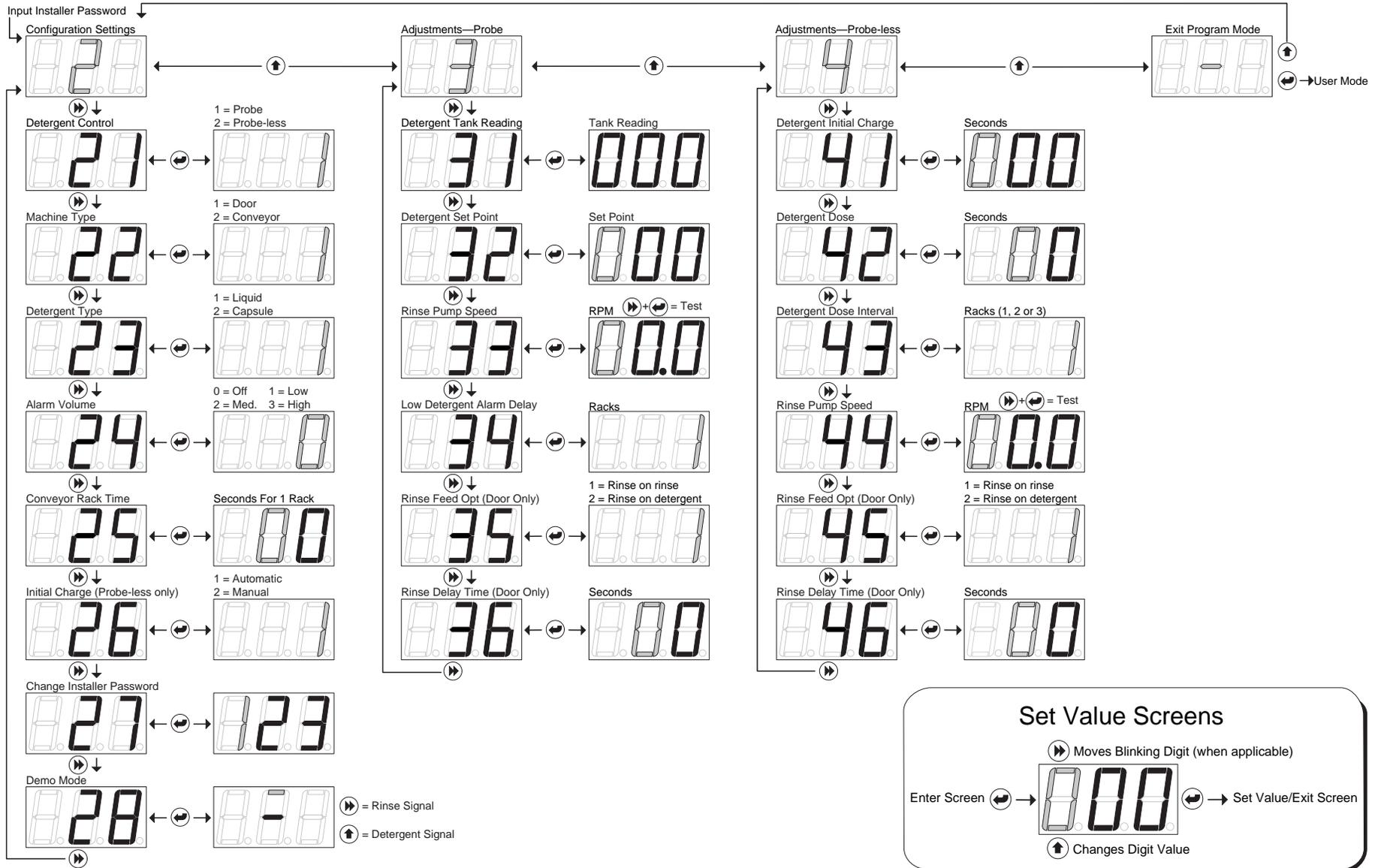
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6.0 PROGRAM MODE

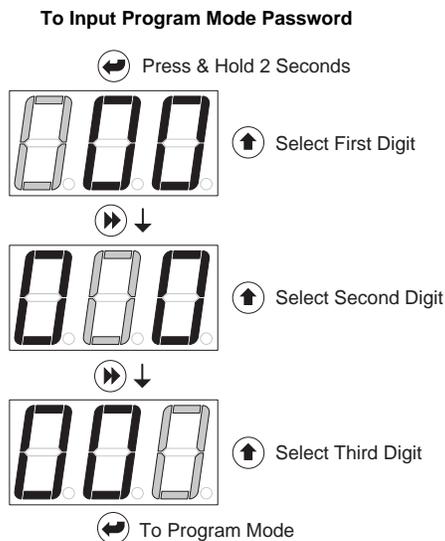
Program Mode consists of three circular main menu loops. The Configuration Settings loop (2) is always available. There are two adjustment main menu loops, probe and probe-less. To simplify programming, only one adjustment main menu loop is accessible as determined by Detergent Control selection (Probe or Probe-less) in the Configuration Settings Machine Type menu screen (screen 21). When programming the dispenser for a new installation, always set the Configuration Settings first. Next, setup the dispenser adjustments in the available adjustment main menu loop (probe or probe-less). Later maintenance adjustments will typically be performed in the adjustment main menu loop.

6.1 Program Mode Access

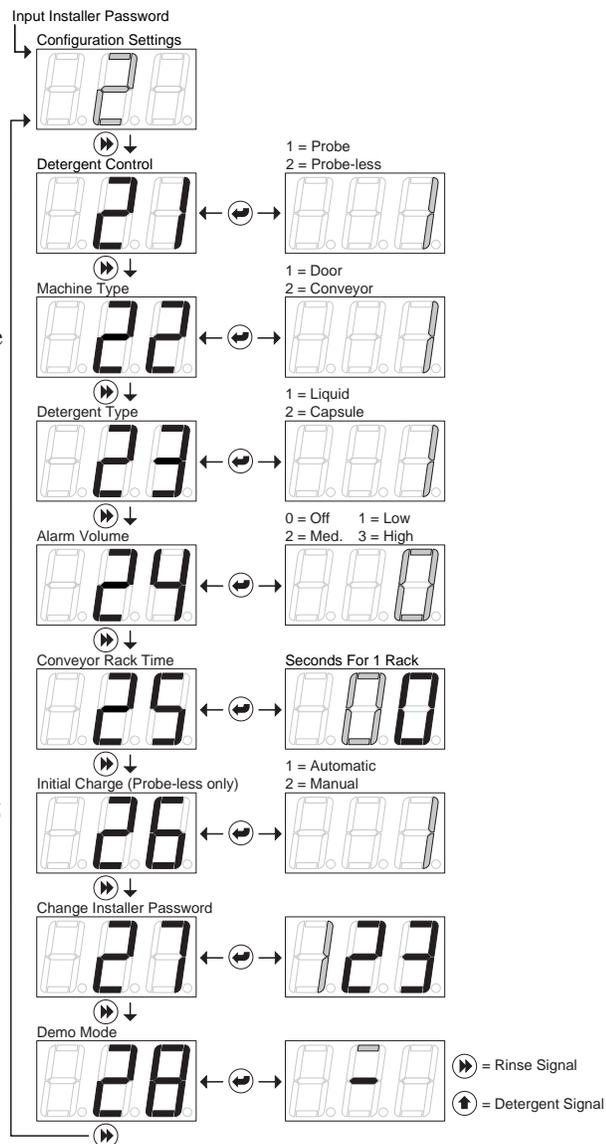
Input the Installer Password as described in section 5.2 of the User Mode section.

Press the Scroll key to change the blinking digit value from 2 (Configuration Settings), to 3 (Adjustments—Probe) *or* 4 (Adjustments—Probe-less), to a dash (Exit Program Mode).

Press the Next key to move through main menu loops 2, 3 and 4. Press the Enter key to exit Program Mode at the blinking dash screen (Exit Program Mode). Program Mode is automatically exited after 5 minutes of inactivity.



6.2 Configuration Settings (screen 2)



6.2.a Detergent Control (screen 21)

Press the Enter key to view/change this setting. Press the Scroll key to select between 1 (Probe) and 2 (Probe-less) detergent control. Press the Enter key to set the value and return to the main menu loop.

NOTE: This selection determines which adjustment main menu screen is available for use (probe or probe-less).

6.2.b Machine Type (screen 22)

Press the Enter key to view/change this setting. Press the Scroll key to select between 1 (Door) and 2 (Conveyor) machine type. Press the Enter key to set the value and return to the main menu loop.

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6.2.c Detergent Type (screen 23)

Press the Enter key to view/change this setting. Press the Scroll key to select between 1 (Liquid) and 2 (Capsule) detergent. This sets the feed and read ratio for differing product types when the concentration is within 20% of set point (3 seconds on/3 seconds off for liquid, 2 seconds on/6 seconds off for capsule). Press the Enter key to set the value and return to the main menu loop.

NOTE: If 1 (Liquid) is selected and the unit is equipped with a solenoid valve, the display will indicate a pump jam condition and not activate the solenoid valve.

6.2.d Alarm Volume (screen 24)

Press the Enter key to view/change this setting. Press the Scroll key to select between 0 (Off), 1 (Low), 2 (Medium), or 3 (High) alarm volume. A half-second beep will sound for each level as the Scroll key is pressed. Press the Enter key to set the value and return to the main menu loop.

6.2.e Conveyor Rack Time (screen 25)

NOTE: This setting only applies to conveyor type dishwashers. To determine the time value to input in this screen, time (and make note of) the amount of time (seconds) the dish machine conveyor takes to move one rack a single rack length's distance. This setting is used for rack counting and for determining detergent dose intervals if set to probe-less mode.

Press the Enter key to view/change this setting. Press the Scroll key to change the value of the blinking center (tens) digit. Press the Next key to move the blinking digit to the right (ones). Press the Scroll key to change the value of the blinking right (ones) digit. The range of this adjustment is 0 - 29 seconds. Press the Enter key to set the value and return to the main menu loop.

6.2.f Initial Charge, Probe-less Only (screen 26)

NOTE: This setting only applies to probe-less detergent control and has no effect when probe detergent control is selected in screen 21.

Door Type Dishwasher Automatic Initial Charge occurs each time the dispenser receives a rinse signal that was not preceded by a detergent signal within 90 seconds prior (i.e. on an initial fill). Under this condition the dispenser detects an Automatic Initial Charge, disables the rinse feed, and feeds detergent for the preset time as set in screen 41 (Detergent Initial Charge). Normal rinse signal activations (within 90 seconds after a detergent signal) will not generate an initial charge. A 5 minute lockout timer begins at the start of initial charge to prevent an additional initial charge activation from occurring in the event of multiple rinse signals being detected during fill.

Conveyor Type Dishwasher Automatic Initial Charge occurs each time the dispenser detects a detergent signal input. Upon this detection, the rinse pump is turned off for 90 seconds (or Detergent Initial Charge time if longer), and the detergent feeds for the preset time as set in screen 41 (Detergent Initial Charge). It is important to note that this will occur each time a detergent signal occurs so the source of this signal must remain on for the duration of time the tank is full, or not occur more than one time per machine fill (see Electrical Installation for more information).

Press the Enter key to view/change this setting. Press the Scroll key to select between 1 (Automatic) and 2 (Manual) initial detergent charge. Press the Enter key to set the value and return to the main menu loop.

6.2.g Change Installer Password (screen 27)

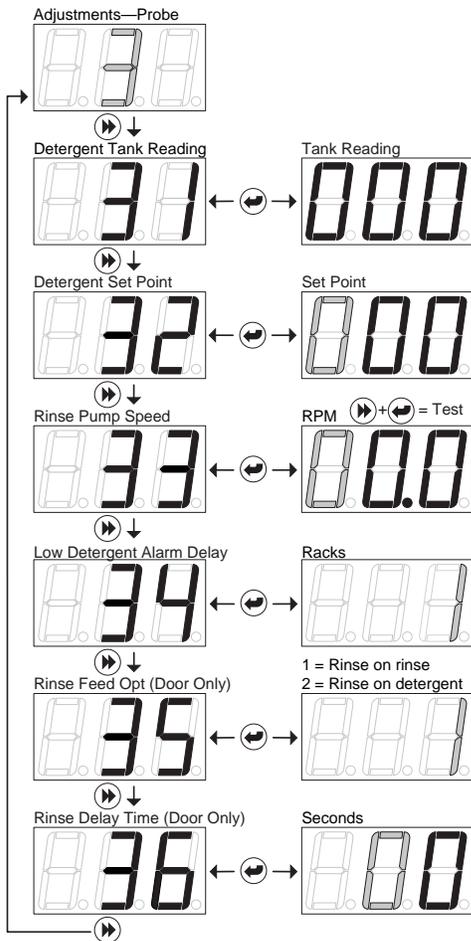
Press the Enter key to view/change this setting. Any three-digit number may be input. Press the Scroll key to change the blinking digit to the desired value. Press the Next key to move the blinking digit. Repeat for all digits. Press the Enter key to set the value and return to the main menu loop.

CAUTION: Be sure to make note of any password changes different from the factory setting (123).

6.2.h Demo Mode (screen 28)

Press the Enter key to access demo mode. Once in demo mode use the Next key to simulate Rinse Signal and the Scroll key to simulate Detergent Signal to test and/or demonstrate dispenser functions. Press the Enter key to exit demo mode.

6.3 Adjustments—Probe



NOTE: This menu loop is only available when screen Detergent Control (21) is set to 1 (Probe).

The adjustments—probe main menu loop contains all adjustments for probe mode dispenser operation.

6.3.a Detergent Tank Reading (screen 31)

NOTE: Prepare for this reading by manually adding product to proper concentration, testing via titration or measured volume. The dishwasher tank solution must be well mixed (wash pump running) and at operating temperature. The number displayed is an averaged number that is updated every 0.1 seconds.

Press the Enter key to view this screen. Make note of the tank reading displayed. This is your set point.

6.3.b Detergent Set Point (screen 32)

Press the Enter key to view/change this setting. Input the number noted in the previous step. Press the Scroll key to change the blinking digit to the desired value. Press the Next key to move the blinking digit. Repeat for all three digits. The range of this adjustment is 0 - 999. Press the Enter key to set the value and return to the main menu loop.

NOTE: It is a good practice to run a few racks through the dish machine and retest concentration with a titration kit. If you find that the concentration is not at the desired level, adjust accordingly.

6.3.c Rinse Pump Speed (screen 33)

NOTE: Adjust rinse pump speed for the appropriate amount of product required to produce good results on wares. This may be achieved by determining the amount of rinse product per unit of water (check the dish machine specifications for rinse water flow rate per minute), or by observing the sheeting action of the product on wares. With the standard rise pump tube the Sprite will dispense 0.5 ml per revolution.

To test run/view the rinse pump speed press and hold the Next key followed by the Enter Key and the pump will run at the current speed setting.

Press the Enter key to view/change this setting. Press the Scroll key to change the blinking digit to the desired value. Press the Next key to move the blinking digit. Repeat for all digits. The range of this adjustment is from 0 to 59.5 RPM in 0.5 RPM steps. Press the Enter key to set the value and return to the main menu loop.

6.3.d Low Detergent Alarm Delay (screen 34)

Press the Enter key to view/change this setting. Press the Scroll key to select the number of racks allowable (from 1 – 9) to be run with a low detergent concentration. Press the Enter key to set the value and return to the main menu loop.

NOTE: The low detergent alarm will only occur when there is no change in detergent concentration and the unit is below set-point for the number of racks set. The low detergent alarm self resets upon detecting a rise in detergent concentration.

6.3.e Rinse Feed Option (screen 35)

Press the Enter key to view/change this setting. Press the Scroll key to select rinse feed option (1 or 2). Select option 1 to run rinse pump each time the rinse signal activates (for the duration of time the signal is present). Select option 2 to run the rinse pump for a fixed time of 12 seconds each time the detergent signal activates. Press the Enter key to set the value and return to the main menu loop.

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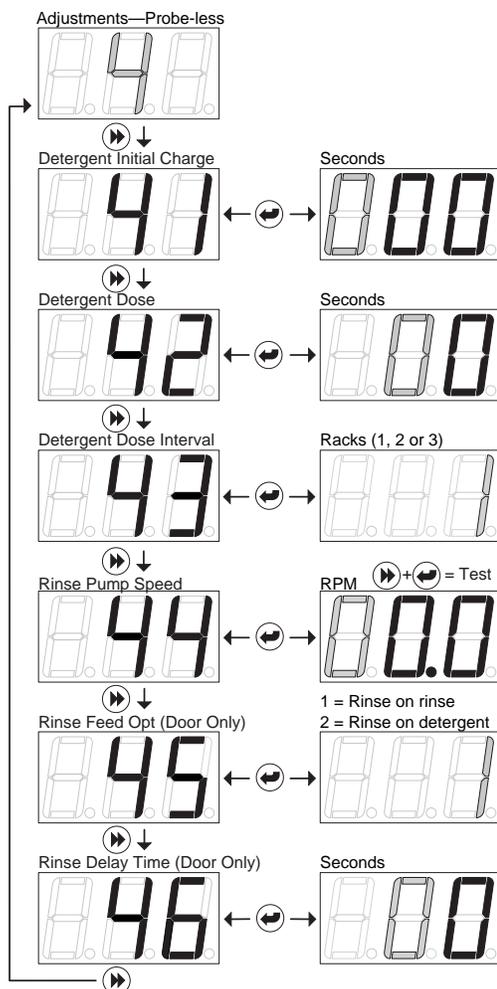
SPECIFICATIONS

6.3.f Rinse Delay Time (screen 36)

NOTE: This menu option is only available when 1 (Door) is selected in screen 22 (Machine Type) and rinse feed option is set to 1 in screen 35. Use this feature to minimize rinse product wastage by injecting product only during the last few seconds of each rack.

Press the Enter key to view/change this setting. Press the Scroll key to change the blinking digit to the desired time in seconds. Press the Next key to move the blinking digit. Repeat for both digits. The range of this adjustment is from 0 to 19 seconds. Press the Enter key to set the value and return to the main menu loop.

6.4 Adjustments—Probe-Less



NOTE: This menu loop is only available when screen Detergent Control (21) is set to 2 (Probe-less).

The adjustments—probe-less main menu loop contains all adjustments for probe-less mode dispenser operation.

6.4.a Detergent Initial Charge (screen 41)

NOTE: Prepare for this reading by determining the detergent feed time (in seconds) required to charge the wash tank to concentration on an initial fill.

Press the Enter key to view/change this setting. Input the initial charge detergent feed time. Press the Scroll key to change the blinking digit to the desired value. Press the Next key to move the blinking digit. Repeat for all three digits. The range of this adjustment is from 0 to 199 seconds. Press the Enter key to set the value and return to the main menu loop.

6.4.b Detergent Dose (screen 42)

NOTE: The amount of detergent dose time required depends on the detergent dose interval you will set in the next step. The available dose intervals are every rack, every second rack, or every third rack.

Press the Enter key to view/change this setting. Input the detergent recharge dose feed time. Press the Scroll key to change the blinking digit to the desired value. Press the Next key to move the blinking digit. Repeat for all three digits. The range of this adjustment is from 0 to 19 seconds. Press the Enter key to set the value and return to the main menu loop.

6.4.c Detergent Dose Interval (screen 43)

Press the Enter key to view/change this setting. Press the Scroll key to select the rack interval between detergent doses (1, 2 or 3 racks). Press the Enter key to set the value and return to the main menu loop.

6.4.d Rinse Pump Speed (screen 44)

NOTE: Adjust rinse pump speed for the appropriate amount of product required achieving good results on wares. This may be achieved by determining the amount of rinse product per unit of water (check the dish machine specifications for rinse water flow rate per minute), or by observing the sheeting action of the product on wares. With the standard size rinse pump tube the Sprite will dispense 0.5 ml per revolution.

To test run/view the rinse pump speed press and hold the Next key followed by the Enter Key and the pump will run at the current speed setting.

Press the Enter key to view/change this setting. Press the Scroll key to change the blinking digit to the desired value. Press the Next key to move the blinking digit. Repeat for all digits. The range of this adjustment is from 0 to 59.5 RPM in 0.5 RPM steps. Press the Enter key to set the value and return to the main menu loop.

6.3.e Rinse Feed Option (screen 45)

Press the Enter key to view/change this setting. Press the Scroll key to select rinse feed option (1 or 2). Select option 1 to run rinse pump (and detergent dose on the selected dose intervals) each time the rinse signal activates (for the duration of time the signal is present). Select option 2 to run the rinse pump for a fixed time of 12 seconds (and detergent dose on the selected dose intervals) each time the detergent signal activates. Press the Enter key to set the value and return to the main menu loop.

6.4.f Rinse Delay Time (screen 46)

NOTE: This menu option is only available when 1 (Door) is selected in screen 22 (Machine Type) and rinse feed option is set to 1 in screen 35. Use this feature to minimize rinse product wastage by injecting product only during the last few seconds of each rack.

Press the Enter key to view/change this setting. Press the Scroll key to change the blinking digit to the desired time in seconds. Press the Next key to move the blinking digit. Repeat for both digits. The range of this adjustment is from 0 to 19 seconds. Press the Enter key to set the value and return to the main menu loop.

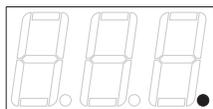
7.0 TROUBLESHOOTING

7.1 Preliminary Checks

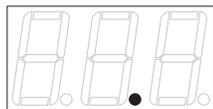
If unit is dead, no display, go directly to troubleshooting section for dead unit. The display indicates the following information which will be useful for troubleshooting:

NOTE: All other display indications omitted for clarity.

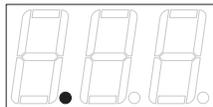
Detergent Signal On:



Probe Mode On:



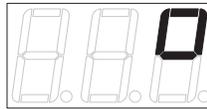
Rinse Signal On:



Rinse Pump Jammed:



Detergent Pump Jammed:



7.2 Dead, No Display

Confirm main power connection voltage with a volt meter. Check fuse if optional fuse kit is installed. Substitute transformer followed by the printed circuit board to determine fault.

7.3 No Detergent Feed

NOTE: Confirm that detergent type (screen 27) is set correctly.

7.3.1 Probe Mode

Temporarily disconnect probe wire with detergent signal on to force detergent feed.

If detergent feeds, check for probe scaling and check detergent setpoint setting.

If detergent does not feed, substitute pump motor (or solenoid coil) followed by the printed circuit board to determine fault.

7.3.2 Probe-less Mode

Confirm that unit is in a detergent feed condition as determined by rinse/initial charge signal inputs and initial charge/dose adjustments.

If detergent does not feed, substitute pump motor (or solenoid coil) followed by the printed circuit board to determine fault.

7.4 Excess Detergent Consumption

7.4.1 Probe Mode

Check probe for scaling, and measure wash solution via titration kit or other means. If detergent is at proper concentration, troubleshoot the dish machine for clogged drains, excessive fresh water feedback, etc.

7.4.2 Probe-less Mode

Confirm that initial charge is dispensed only one time per initial fill. If you experience multiple initial charge feeds (Automatic/Conveyor mode only) review initial charge wiring connection.

All other modes, adjust initial charge and dose adjustments accordingly.

7.5 No Rinse Feed

Rinse feed is locked out under the following conditions:

Probe-less/Door/Automatic Initial Charge modes—Rinse is locked out after Initial Charge begins until the following rack (rinse signal) occurs.

Probe Mode—detergent signal did not occur within 90 seconds prior to rinse signal (Rinse Saver feature).

If not in one of the above conditions and rinse does not feed, substitute pump motor followed by the printed circuit board to determine fault.

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8.0 MAINTENANCE & SERVICE

DESCRIPTION OF FEATURES

Routine maintenance on the Sprite unit includes keeping the probe clean (probe mode operation only), keeping pump tubes fresh, and keeping the unit clean.

DESCRIPTION OF CONTROLS

Repairs to the unit involve modular component replacements. This minimizes spare parts inventory requirements and speeds up the service process in the field.

MECHANICAL INSTALLTION

8.1 Every Maintenance Visit

Titrate wash tank solution to verify unit is holding accurate concentration. Clean the probe if required. Clean the unit cabinet with a damp cloth. Check pump tube condition.

ELECTRICAL INSTALLATION

8.2 Pump Tube Replacement

Replace pump tubes on regular maintenance intervals. Replacement should be well before the tube fails and ruptures. In the event the tube does rupture, clean all product from pump with a damp cloth.

USER MODE OPERATION

8.2.a Loosen the pump front captive screw and remove pump front.

8.2.b Remove old tube with barbed connectors.

PROGRAM MODE

8.2.c Install new tube with barbed connectors oriented with flat sides facing towards the front. Insert new tube from the left side of the pump with pump spinner oriented in an 11/1 O'clock position. Turn the spinner clockwise using a screwdriver as you press the pump tube in place.

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8.3 Service Disassembly

The Sprite service parts are comprised of three major assemblies, pump parts and tubes, and the solenoid valve. The three major field replacement assemblies are:

Upper Cabinet Front—includes printed circuit board, cabinet front, and cables

Lower Cabinet Front—includes pump motor(s)

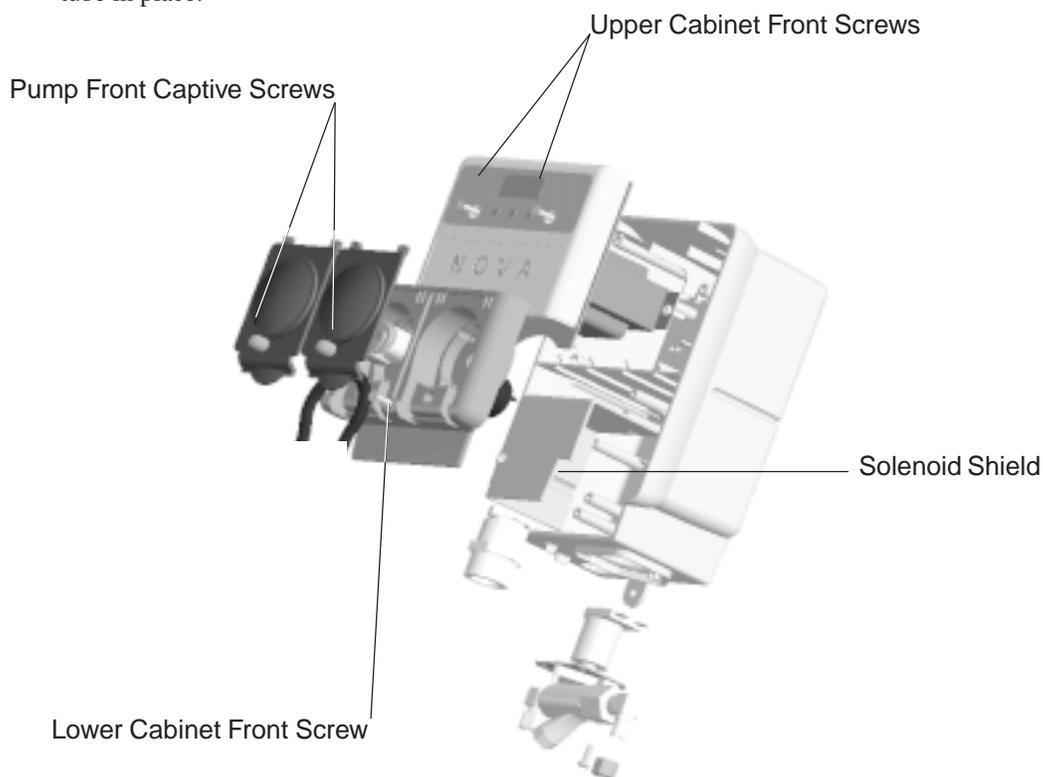
Cabinet Rear—includes power transformer

8.3.1 Lower Cabinet Front Removal

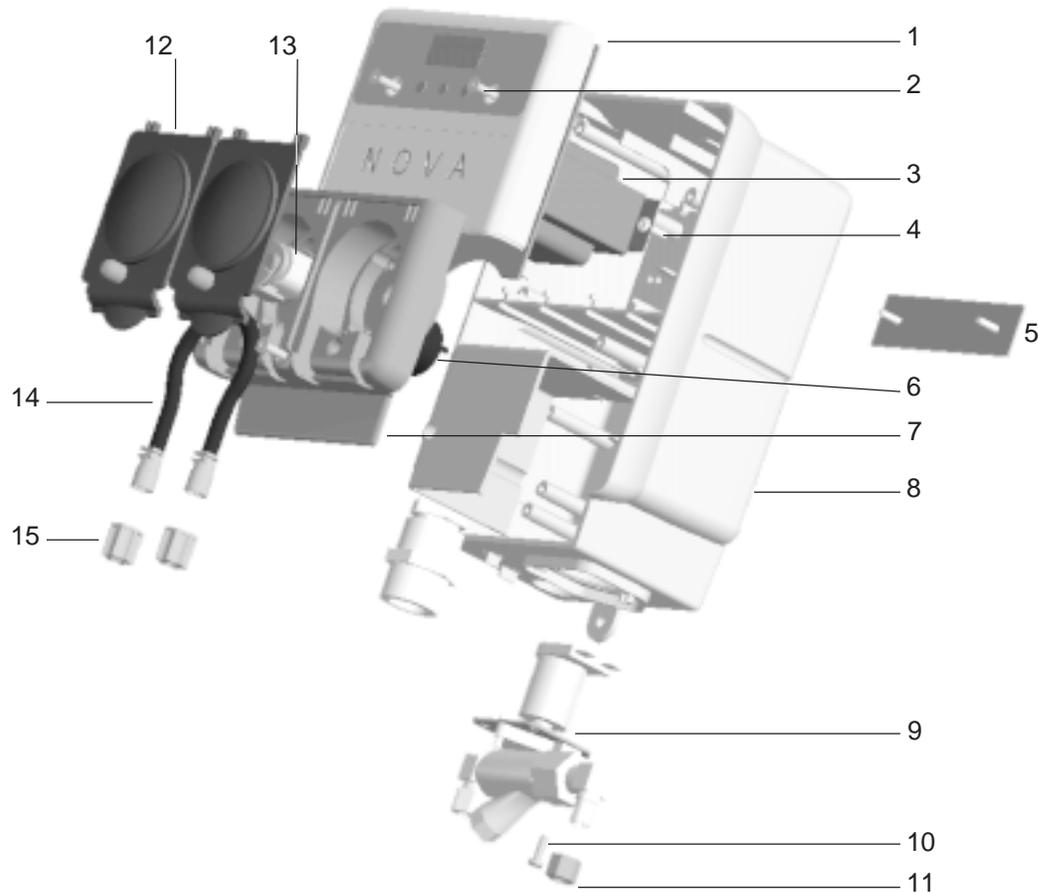
Remove the lower front phillips head screw. Remove lower cabinet front by hinging up by pulling out at the bottom. Disconnect motor wire plug(s) from the printed circuit board and remove Lower Cabinet Front.

8.3.2 Upper Cabinet Front Removal

Remove 3 front phillips head screws. Lift upper cabinet front off of unit complete with power and probe wires. (Disconnect solenoid valve plug from printed circuit board on solenoid equipped units.) Unplug power transformer plug from printed circuit board. Remove upper cabinet front.



9.0 SPARE PARTS LISTING



DESCRIPTION OF FEATURES

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ITEM	DESCRIPTION	PART NUMBER
1	Printed Circuit Board, includes Cabinet Front and Terminal Barriers	13-06393-00
	Printed Circuit Board (EU), includes Cabinet Front and Terminal Barriers	13-06393-01
2	Cabinet Front Screw	30-06358-0832
3	Transformer	13-06394-00
4	Transformer Screw	30-06359-0605
5	Wall Mount Bracket	23-06209-00
6	Pump Motor, Rinse	13-06523-00
	Pump Motor, Detergent	13-06524-00
7	Lower Cabinet Front (Pump Housing Front)	13-06525-00
8	Cabinet Rear (No On/Off Switch)	13-06526-00
	Cabinet Rear (With On/Off Switch)	13-06527-00
9	Solenoid Valve Kit, 1/4" Fittings	13-06397-00
	Solenoid Valve Kit, 6 mm Fittings	13-06397-01
	Solenoid Valve Kit, 5/16" (8 mm) Fittings	13-06397-02
10	Solenoid Valve Screw	30-06359-0605
11	Solenoid Valve Nut w/ Sleeve, 1/4"	13-06528-00
	Solenoid Valve Nut w/ Ferrule, 6mm	13-06528-01
	Solenoid Valve Nut w/ Sleeve, 5/16" (8 mm)	13-06528-02
12	Pump Front (Includes Captive Screw)	13-06398-00
13	Pump Spinner	13-06396-00
14	Pump Tube, Rinse, EPDM (Includes 1/4" Barb Fittings)	13-06395-01
	Pump Tube, Rinse, EPDM (Includes 1/4" and 1/8" Barb Fittings)	13-06395-02
	Pump Tube, Rinse, EPDM (Includes 1/8" Barb Fittings)	13-06395-03
	Pump Tube, Rinse, Silicone (Includes 1/4" Barb Fittings)	13-06928-01
	Pump Tube, Rinse, Silicone (Includes 1/4" and 1/8" Barb Fittings)	13-06928-02
	Pump Tube, Rinse, Silicone (Includes 1/8" Barb Fittings)	13-06928-03
	Pump Tube, Detergent, EPDM (Includes Barb Fittings)	13-06399-01
15	Pump Tube Compression Nut w/ Sleeve, 1/4" (10 pack)	13-06563-00
	Pump Tube Compression Nut w/ Sleeve, 6 mm (10 pack)	13-06563-01
	Pump Tube Compression Nut and Ferrule, 1/8" or 3 mm (10 pack)	13-06563-02
	* Rinse Injection Fitting, Straight, Kynar, 1/8" NPT x 1/4"	13-06529-00
	* Rinse Injection Fitting, Straight, Kynar, 1/8" NPT x 1/8" (3 mm)	13-06529-01
	* Rinse Injection Fitting, Straight, Kynar, 1/8" NPT x 6 mm	13-06529-02
	* Rinse Injection Fitting, Elbow, Kynar, 1/8" NPT x 1/4"	13-06531-00
	* Rinse Injection Fitting, Elbow, Kynar, 1/8" NPT x 1/8" (3 mm)	13-06531-01
	* Rinse Injection Fitting, Elbow, Kynar, 1/8" NPT x 6 mm	13-06531-02

* Denotes items not shown.

10.0 SPECIFICATIONS DM-400 SERIES

DESCRIPTION OF
FEATURES

10.0.1 Dimensions

Size: 6.0" (15.24 cm) wide X 10.75" (27.31 cm) high (with solenoid) 4.88" (12.38 cm) deep

Weight: 5.98 lbs. (2.71 kilos)

Temperature: 120° F Maximum

DESCRIPTION OF
CONTROLS

10.0.2 Power Requirements

Total amperage draw during operation is:

90 to 130 VAC, 50/60 Hz. 0.5 amps (max).

200 to 249 VAC, 50/60 Hz. 0.3 amps (max).

NOTE: All specifications subject to change without notice.

MECHANICAL
INSTALLTION

10.0.3 General Specifications

Rinse Pump Flow Rate: 0.5 mls/revolution

Detergent Pump Flow Rate 5.25 oz/minute (156 mls/minute)

ELECTRICAL
INSTALLATION

10.1 Limited Warranty

SELLER warrants solely to BUYER the Products will be free from defects in material and workmanship under normal use and service for a period of one year from the date of completion of manufacture. This limited warranty does not apply to (a) hoses; (b) and products that have a normal life shorter than one year; or (c) failure in performance or damage caused by chemicals, abrasive materials, corrosion, lightening, improper voltage supply, physical abuse, mishandling or misapplication. In the event the Products are altered or repaired by BUYER without SELLER'S prior written approval, all warranties will be void.

USER MODE
OPERATION

NO OTHER WARRANTY, ORAL, EXPRESS OR IMPLIED, INCLUDING ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE, IS MADE FOR THESE PRODUCTS, AND ALL OTHER WARRANTIES ARE HEREBY EXPRESSLY EXCLUDED.

SELLER'S sole obligation under this warranty will be, at SELLER'S option, to repair or replace F.O.B. SELLER'S facility in Santa Cruz, California any Products found to be other than as warranted.

PROGRAM MODE

10.2 Limitation of Liability

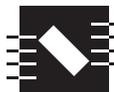
SELLER'S WARRANTY OBLIGATIONS AND BUYERS REMEDIES ARE SOLELY AND EXCLUSIVELY AS STATED HERIN. SELLER SHALL HAVE NO OTHER LIABILITY, DIRECT OR INDIRECT, OF ANY KIND, INCLUDING LIABILITY FOR SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES OR FOR ANY OTHER CLAIMS FOR DAMAGE OR LOSS RESULTING FROM ANY CAUSE WHATSOEVER, WHETHER BASED ON NEGLIGENCE, STRICT LIABILITY, BREACH OF CONTRACT OR BREACH OF WARRANTY.

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NOVA CONTROLS
LEADING THE WAY

A Hydro Systems Company

250 NATURAL BRIDGES DRIVE
SANTA CRUZ
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