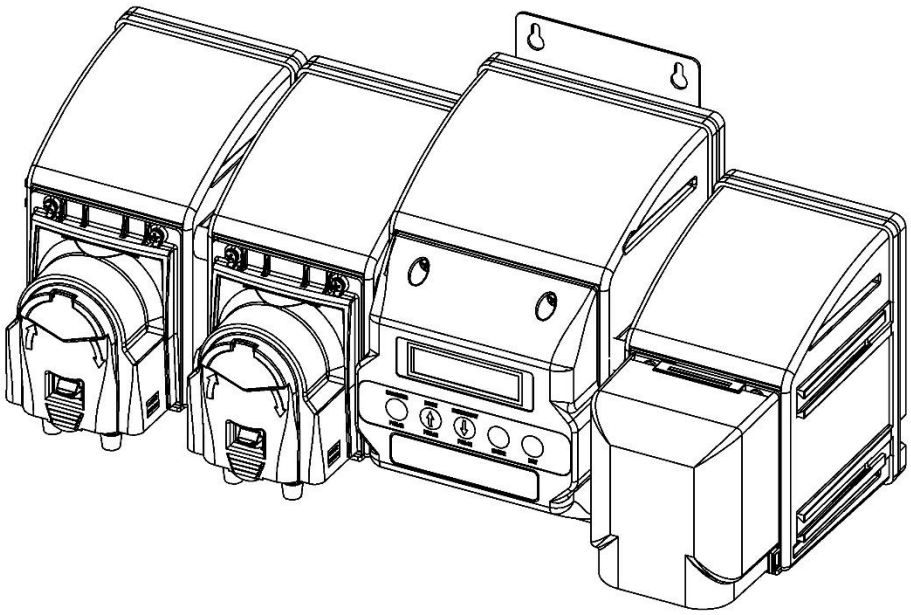
DEMA Nitro Plus
Ware Wash Chemical Dispensing



Overview

The DEMA® Nitro Plus is a digital ware wash dispenser designed to dispense cleaning chemicals into ware wash and dish machines. The unit is triggered by a ware wash machine. The Nitro Plus is programmed via the front panel.

Warnings

Installation of DEMA products must meet all applicable electrical codes and regulations established by national, city, county, parish, provincial or other agencies. It is possible that electrical codes and regulations require that a certified electrical contractor or engineer perform the electrical installation. For questions, contact a certified electrician.

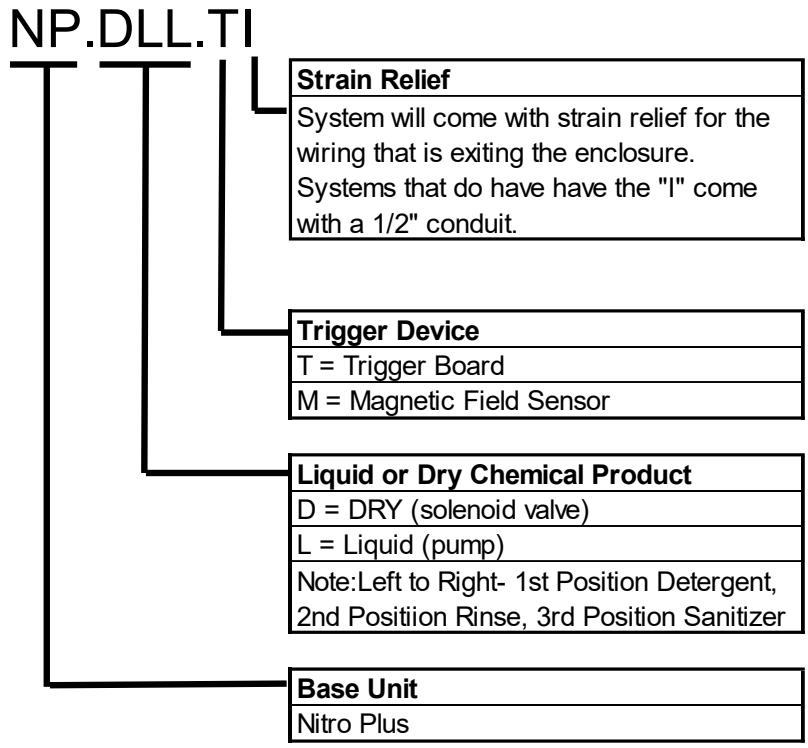
All installations must conform to local plumbing codes and use approved backflow prevention devices. A pressure indicating tee is to be installed with existing faucets according to local plumbing codes in the state of Wisconsin and any other state that requires the use of a pressure indicating tee.

ALWAYS WEAR PROTECTIVE CLOTHING AND EYEWEAR WHEN WORKING WITH CHEMICAL PRODUCTS.

Nitro Express Models

Nitro Plus can be built in a number of configurations. The following applies to all systems.

- Prewired with power, trigger and probe cables.
- Mounting bracket assembled to the Nitro Plus and ready to use.
- Appropriate installation kit items that include, fittings, tubing, etc. (see Packout Kit section)



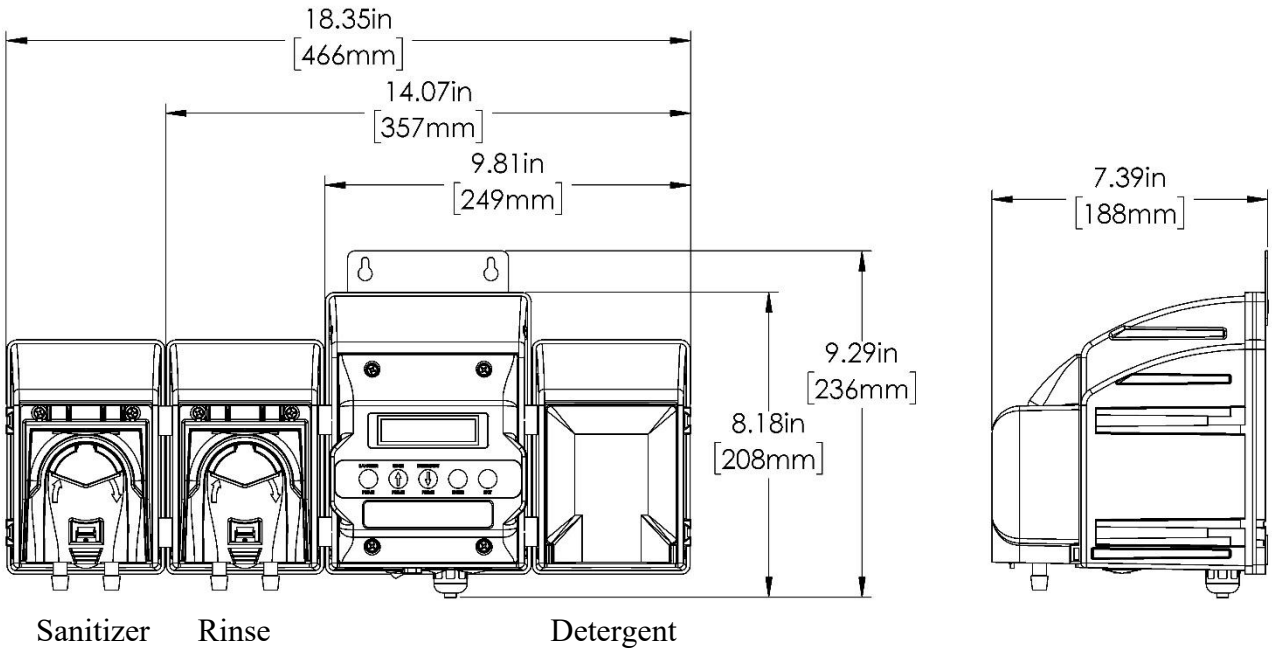
Packing Kit List

Nitro Plus Installation Kit					
Part Number	Description	Qty/Model			
		NP.DL.T	NP.LL.T	NP.DLL.T	NP.LLL.T
904.JG	Rinse Check Valve Kit (Stainless Steel) w/ JG Elbow	1	1	1	1
904.8KY	Sanitizer Check Valve (Kynar)			1	1
80.55	Liquid Detergent Bulkhead Fitting		1		1
58.5	Dry Detergent Bulkhead Fitting	1		1	
C.12VIK	Conductivity Probe (Flip Probe)	1	1	1	1
25.68.20	1/4" OD LDPE Tubing - 20ft	1	1	1	1
100.12.SV1	Vinyl Rinse Tube - 16ft	1	1	2	2
81.312.1	Split Pickup Tube Stiffener	1	2	2	3
81.182.1	1/4" x 1/4" Push-On Fittings (for pump)	2	4	4	6
81.16.1	Tie Wraps 8" Long	5	5	8	8
I-1205	Instruction Sheet	1	1	1	1

Operational Requirements

FOR INDOOR USE ONLY		
Main Power	100-265VAC 50/60 Hz 1.5A	
Trigger Inputs	24-480 V 50/60 Hz	
Motor/Solenoid Rating	24VDC	
Enclosure Material	ABS	
Product Weight	1.8 kg	4 lbs

Overall Size



Installation

WARNING: INSTALLATION OF DEMA PRODUCTS MUST MEET ALL APPLICABLE ELECTRICAL CODES AND REGULATIONS ESTABLISHED BY NATIONAL, CITY, COUNTY, PARISH, PROVINCIAL OR OTHER AGENCIES. IT IS POSSIBLE THAT ELECTRICAL CODES AND REGULATIONS REQUIRE THAT A CERTIFIED ELECTRICAL CONTRACTOR OR ENGINEER PERFORM THE ELECTRICAL INSTALLATION. FOR QUESTIONS, CONTACT A CERTIFIED ELECTRICIAN.

ALL ELECTRICAL POWER MUST BE TURNED OFF TO THE HEATING ELEMENTS AND DISH MACHINE PRIOR TO BEGINNING INSTALLATION

UNIT MUST BE GROUNDED (EARTHED).

Mounting the Nitro Plus

1. Determine a suitable location that will accommodate the length of the preinstalled wiring for both the main power and trigger signals. (Main power is typically connected to a known source in the dish machine).
2. Using the mounting bracket hang the Nitro Plus using appropriate screws and wall anchors.

Setting up the Nitro Plus and the Dish Machine

1. Locate the electrical connection point. The input power may be 100V – 265 V 50/60 Hz. Check with the manufacturer of the machine to determine if there are dedicated terminals available for installation.
2. Properly ground the dispenser to earth ground.
3. If the Nitro Plus will be operating in the concentration mode, locate the proper position for the DEMA C-12VIK probe or the DEMA Inductive Probe (82.28.1) in the wash tank. The probe must be installed below the water level, normally 1-2” from the bottom of the tank, and must be kept away from heating elements, pump intake, drains and incoming water supply.
4. Install the detergent injection bulkhead fitting (80-55) above the probe (if a probe is used) to obtain a rapid reading of all chemicals entering the wash tank.
5. Install the rinse line injection fitting (904-8T) into the rinse line tap provided by the manufacturer of the machine. If a tap is not provided, follow the manufacturer’s recommendations for installing this fitting.
6. Install the sanitizer injection fitting (904-8KY) (if sanitizer is used) into the rinse line tap provided by the manufacturer of the machine. If a tap is not provided follow the manufacturer’s recommendations for installing this fitting.

Connecting the Chemical Tubing to the Nitro Plus

1. After mounting the dispenser, measure the length of tubing needed to go from the dispenser to the chemical containers. The detergent tubing (25.68.20) is opaque in color and has a larger inside diameter than the rinse and sanitizer tubing (100.12.SV1) which is clear in color and has a small inside diameter.
2. Cut the tubing to the length required and, if desired, place the pickup tube on the tubing before placing in the chemical container.
3. Measure the length of tubing needed to go from the dispenser to the chemical injection point on the machine.
4. Cut the tubing to the length required to reach the bulkhead fitting or chemical injection point on the machine.

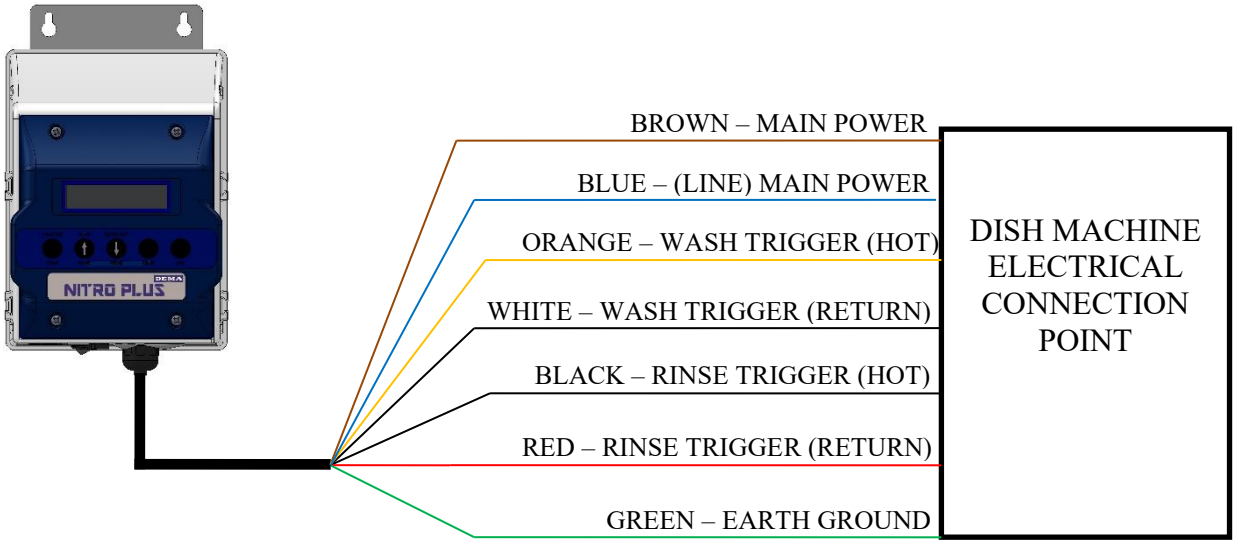
Wiring the Nitro Plus to the Dish Machine

The following diagram is included to help to install the wires in the correct places for proper power for the unit.

WARNING: For safety purposes disconnect main power to the dish machine before wiring trigger signals to the Nitro Plus. Connect power to the Nitro Plus per the dish machine manufacturer’s recommendations.
UNIT MUST BE GROUNDED (EARTHED).

The following steps will help to insure the proper wiring of the unit. The unit should be triggered to power on from the dish machine that it is being used in conjunction with. DEMA Engineering does not recommend powering the unit separately from the dish machine. The following steps will ensure that the unit only receives power when it is necessary to have power to run the setup that is programmed in the unit.

Flux Sensors - If trigger connection points cannot be established, the magnetic field readers (82.23.1) may be used in place of the trigger board and cable. The magnetic field readers or flux sensors connect directly to the control board in the trigger wires spots as shown on the wiring diagram. The magnetic field readers or flux sensors can be placed on wash motors or rinse valves to measure a magnetic field when the motors or valves are activated which will trigger the proper pump or valve on the dispenser.



1. Connect the (blue and brown wires) to the main power output as recommended by the dish machine manufacture.
2. Connect the wash trigger (white and orange wires) to the appropriate wash trigger output (between 24 and 480 V 50/60Hz) as recommended by the dish machine manufacturer.
3. Connect the rinse trigger (black and red wires) to the appropriate rinse trigger output (between 24 and 480 V 50/60 Hz) as recommended by the dish machine manufacturer.
4. Make sure to connect the earth ground (green wire) to the ground connection on the dish machine as recommended by the dish machine manufacturer.

Main Power should be applied any time there is power to the dish machine. The main power cable will come out of the conduit fitting with the trigger cable and be hooked up near the same electrical connection point on the dish machine.

If there is ever any question about the main power or trigger cable connection to the dish machine, please check with the dish machine manufacturer to see where the proper trigger connection points are located before installing the trigger connection wires.

Initial Programming

The programming of this unit is done through the control board, display, and buttons on the front of the unit. Programming of the unit is as follows:

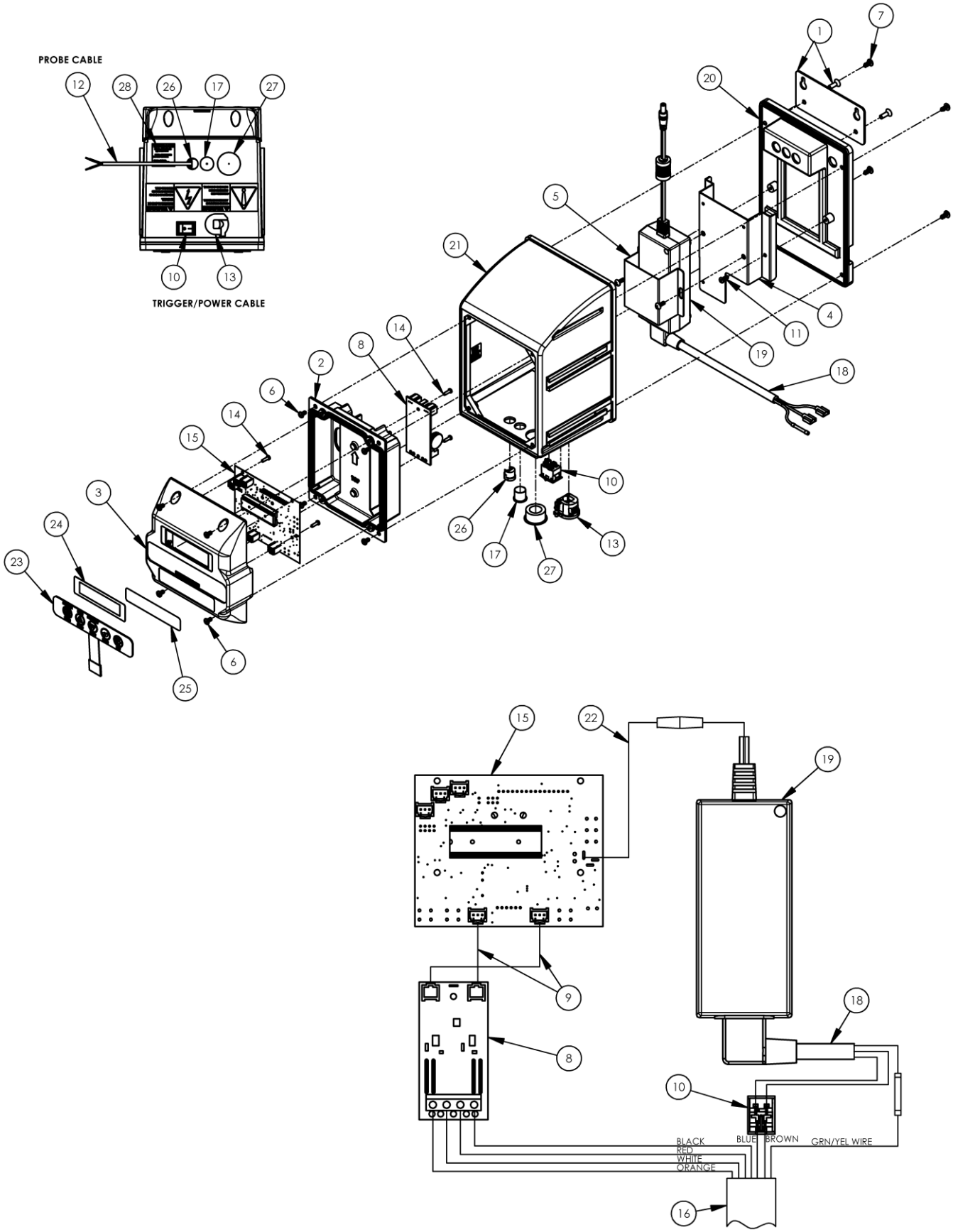
Company Name	*Press and hold "Enter" Button for 3 Seconds until backlight comes on*				
Press ⬇					
Language	*English, Spanish, French, Portuguese*				
Press ⬇					
Rack Count	*Show Rack count*				
Press ⬇					
Det. SP Input	*Det. C = Concentration or P = Probeless SP= Set point Input & probe reading*				
Press ⬇					
New Program	*Press Enter*				
Control Mode	*Press Enter, then select using arrows Concentration (Probe) or Probe-less*				
Press ⬇					
Machine Type	*Press Enter, then select using arrows Conveyor or Door*.				
Press ⬇					
Trigger Mode	*Press Enter, then select Detergent/Rinse or Rinse Only or Detergent Only*				
Press ⬇					
When Concentration is chosen		***When Probeless Door is chosen***		***When Probeless Conveyor is chosen***	
Concentration Set Point	*0-1000*	**Recharge Time**	*1s – 5 min*	**Recharge Time**	*1s – 5min*
Press ⬇		Press ⬇		Press ⬇	
Feed Rate	*0-10*	**Dead Cycles**	*0-5*	**Dwell Time**	*1s – 10 min*
Press ⬇		Press ⬇		Press ⬇	
Feed Limit	*5s – 10 min*	**Initial Charge**	*1s – 10 min*	**Initial Charge**	*1s – 10 min*
Press ⬇		Press ⬇		Press ⬇	
Alarm Delay	*5s - 10 min*	**Charge Activate**	*Off-60s*	**Charge Clock**	*5 min – 16 hrs*
Press ⬇		**Initial Charge Activate** will determine the length of the rinse trigger that instigates an initial charge while in probe-less mode.		**Charge Clock –** If no triggers are received for this length of time, the next wash trigger will give an initial charge.	
Alarm Volume	*0-10*				
Press ⬇					
Rinse Speed	*0-100%*				
Press ⬇					
Rinse Delay	*0-15s*	*Door Mode Only*			
Press ⬇					
Rinse Limit	*15s - 30s*	*Door Mode Only*			
Press ⬇					
Rinse Length	*5s-75s*	*Conveyor and Door/Detergent Trigger only Modes*			
Press ⬇					
Sanitizer Speed	*0-100%*				
Press ⬇					
Company Name	*Press Enter, use arrows to change characters, use sanitizer prime and exit to move cursor left and right.*				
Press ⬇					
Rack Count	*Press Enter, then Exit to Reset Rack Count*				
Press ⬇					
Enter New Code	*Enter 4 digit code, use sanitizer prime button to move cursor*				
Press ⬇					
Control Mode	*Reverts back to beginning of programming*				

Inductive Probe – With the inductive probe there are a several settings that can be further changed to help make the inductive probe more useful. For detailed information on those settings, please see instruction sheet I889 that comes with the Inductive Probe Kit (82.28.1). For further assistance contact DEMA Technical Service.

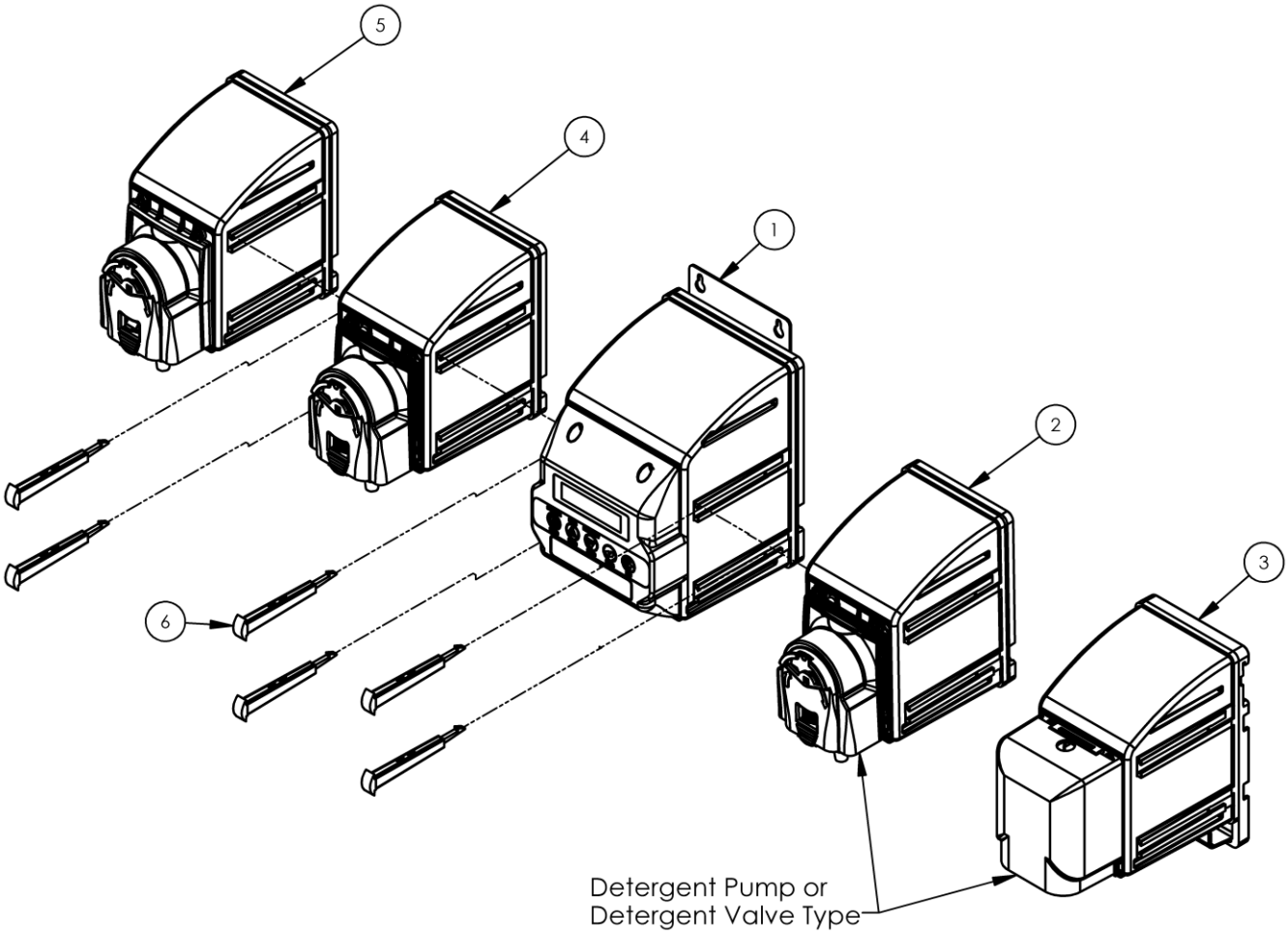
Modify Programming

When modifying the programming of the unit. Use the flow chart below for modifications. The menus change slightly when modifying the programming.

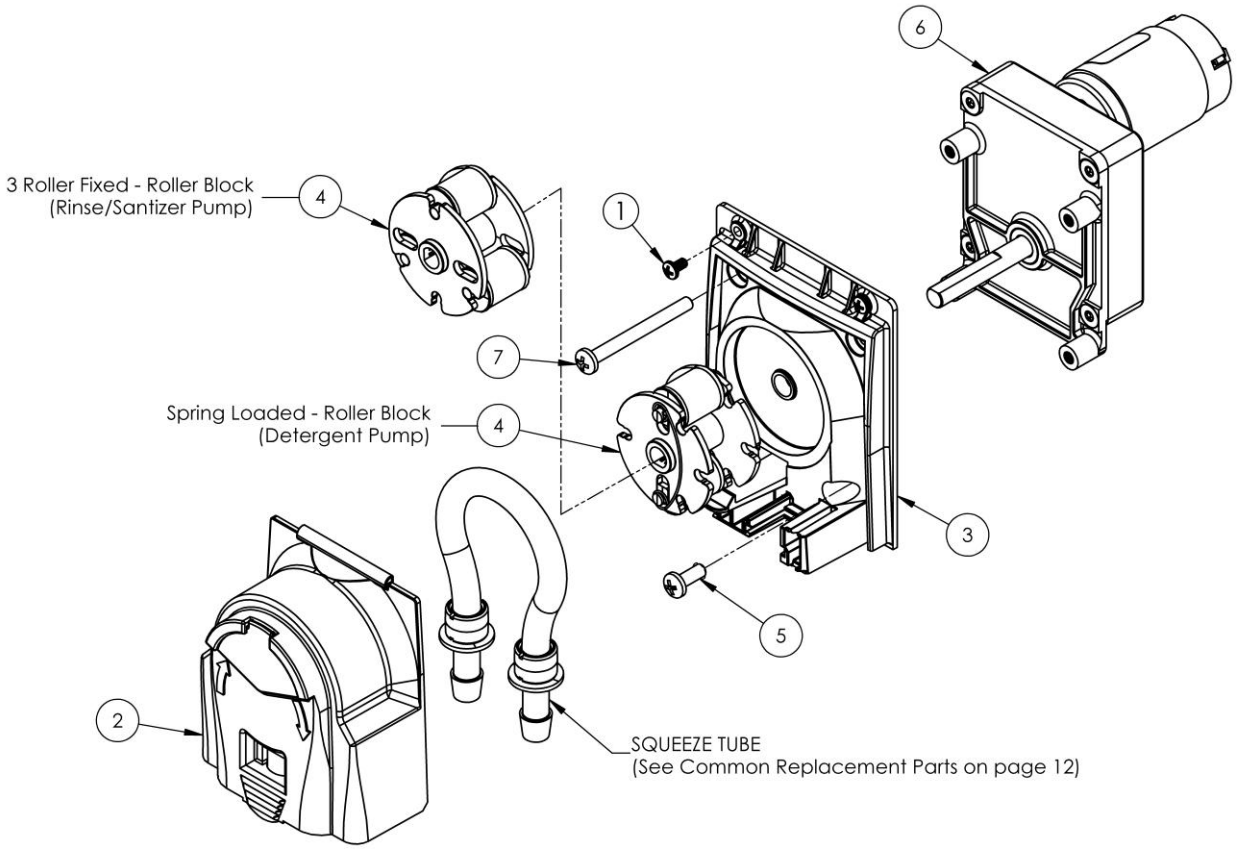
Company Name	*Press and hold "Enter" Button for 3 Seconds until backlight comes on*				
Press ⬇					
Language	*English, Spanish, French, Portuguese*				
Press ⬇					
Rack Count	*Show Rack count*				
Press ⬇					
Det. SP Input	*Det. C = Concentration or P = Probeless SP= Set point Input & probe reading*				
Press ⬇					
Modify Program	*Enter Code*				
When Concentration is chosen		***When Probeless Door is chosen***		***When Probeless Conveyor is chosen***	
Concentration Set Point	*0-1000*	**Recharge Time**	*1s – 5 min*	**Recharge Time**	*1s – 5min*
Press ⬇		Press ⬇		Press ⬇	
Feed Rate	*0-10*	**Dead Cycles**	*0-5*	**Dwell Time**	*1s – 10 min*
Press ⬇		Press ⬇		Press ⬇	
Feed Limit	*5s – 10 min*	**Initial Charge**	*1s – 10 min*	**Initial Charge**	*1s – 10 min*
Press ⬇		Press ⬇		Press ⬇	
Alarm Delay	*5s - 10 min*	**Charge Activate**	*Off-60s*	**Charge Clock**	*5 min – 16 hrs*
Press ⬇		**Initial Charge Activate** will determine the length of the rinse trigger that instigates an initial charge while in probe-less mode.		**Charge Clock -** If no triggers are received for this length of time, the next wash trigger will give an initial charge	
Alarm Volume	*0-10*				
Press ⬇					
Rinse Speed	*0-100%*				
Press ⬇					
Rinse Delay	*0-15s*	*Door Mode Only*			
Press ⬇					
Rinse Limit	*15s - 30s*	*Door Mode Only*			
Press ⬇					
Rinse Length	*5s-75s*	*Conveyor and Door/Detergent Trigger only Modes*			
Press ⬇					
Sanitizer Speed	*0-100%*				
Press ⬇					
Control Mode	*Press Enter, then select using arrows Concentration (Probe) or Probe-less*				
Press ⬇					
Machine Type	*Press Enter, then select using arrows Conveyor or Door.*				
Press ⬇					
Trigger Mode	*Press Enter, then select Detergent/Rinse or Rinse Only or Detergent Only*				
Press ⬇					
Company Name	*Press Enter, use arrows to change characters, use sanitizer prime and exit to move cursor left and right.*				
Press ⬇					
Rack Count	*Press Enter, then Exit to Reset Rack Count*				
Press ⬇					
Enter New Code	*Enter 4 digit code, use sanitizer prime button to move cursor*				
Press ⬇					
Control Mode	*Reverts back to beginning of programming*				


PROBE CABLE
TRIGGER/POWER CABLE
BLACK
RED
WHITE
ORANGE
BLUE
BROWN
GRN/YEL WIRE

Nitro Plus Control Module Replacement Parts		
Item No.	**DEMA Kit No.**	**Description**
1	81.1	Mounting Bracket Kit (includes 2pcs, 81.19.1, #8 Flat Head Screw)
2	81.501	Mounting Panel (for trigger board)
3	81.499	Control Panel Cover
4	84.500	Base Bracket (for power supply)
5	84.501	Cover Bracket (for power supply)
6	41.40.2	#6-32 x 1/2" Screw
7	44.116.2	#8 x 1/2" Hi Lo Screw (for plastic)
8	81.118.11.2	Trigger Board Kit
9	81.118.12	Trigger Cable Kit (trigger board to control board, 2pcs in kit)
10	81.163.1	Power Switch
11	81.18.1	#6 x 3/8" Hi Lo Screw (for plastic)
12	81.181.2.KIT	Probe Cable
13	84.176.1	Strain Relief
14	81.20.2	#4 x 3/8" Hi Lo Screw
15	81.316.12	Nitro Control Board
16	81.320.4	Power/Trigger Cable Assembly (external power & trigger)
17	81.47.1	1/2" Hole Plug
18	84.125.4	Power Supply Cable
19	84.65.90	Power Supply 115/230VAC, 24VDC, 2.5A 60W
20	84.195.3	Enclosure Back
21	84.206.3	Enclosure
22	84.298.1	24VDC Power Adapter (barrel jack to modular connector)
23	L1955	Membrane Label
24	L1954	Display Label
25	L1715	Nitro Plus Label
26	84.183.7	Cable Strain Relief
27	81.47.4	7/8" Hole Plug
28	L947.4	Trigger Wire Colors Label

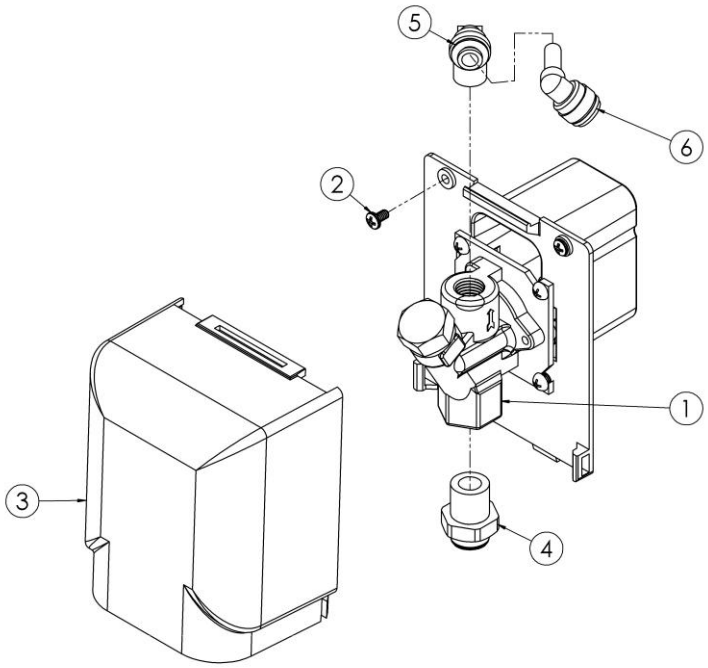


Nitro Plus Control Module Replacement Kits (includes module mounting pins)		
Item No.	**DEMA Kit No.**	**Description**
1	81.118.43	Nitro Plus Control Module
2	81.118.40.1	Detergent Pump Module Kit
3	81.118.40	Detergent Valve Module Kit
4	81.118.41	Rinse Module Kit
5	81.118.18	Sanitizer Pump Module Kit
6	81.144.1	Side Module Joint
Nitro Plus Control Module include prewired power and trigger cables and 4 side module joints.		
Pump Module Kits include side module joints, prewired with cable, necessary pump or valve fittings, rinse or sanitizer check valves and necessary pickup and discharge tubing.		



Detergent Pump Parts		
Item No.	**DEMA Kit No.**	**Description**
1	41.40.2	#6-32 x 1/2" Stainless Steel Screw
2	81.174.1	Blue Pump Cover
3	81.128.2	Blue Pump Base
4	81.118.28.1	Spring Loaded Roller Block Assembly
5	25.85.2	#10-32 x 1/2" Stainless Steel Screw
6	80.59.60MK.1	60 RPM Detergent Pump Motor Kit
7	25.85.19	#10-32 x 2" Stainless Steel Screw
8	81.47.1	1/2" Hole Plug (not shown, plugs unused 1/2" holes on back of enclosures)
9	81.118.15	Det Pump Kit - Blue Pump Parts & Roller Block Assy, no motor

Rinse/Sanitizer Pump Parts		
Item No.	**DEMA Kit No.**	**Description**
1	41.40.2	#6-32 x 1/2" Stainless Steel Screw
2	81.174.1	Blue Pump Cover
3	81.128.2	Blue Pump Base
4	81.118.28.2	3 Roller Fixed - Roller Block Assembly
5	25.85.2	#10-32 x 1/2" Stainless Steel Screw
6	80.59.15MK.1	15 RPM Rinse/Sanitizer Pump Motor Kit
7	25.85.19	#10-32 x 2" Stainless Steel Screw
8	81.47.1	1/2" Hole Plug (not shown, plugs unused 1/2" holes on back of enclosures)
9	81.118.16	Rinse/Sani Pump Kit - Blue Pump Parts & Roller Block Assy, no motor



Detergent Valve Parts		
Item No.	**DEMA Kit No.**	**Description**
1	81.204.1	Detergent Valve/Bracket Assembly
2	41.40.2	#6-32 x 1/2" Stainless Steel Screw
3	81.146.1	Valve Cover
4	58.103.2	1/4" MPT x 1/4" Push-On JG Fitting
5	58.104.3	1/4"MPT x 1/4" Push-On Elbow JG Fitting
6	81.195.1	1/4" Stem x 1/4" Push-On Elbow JG Fitting

Squeeze Tube & Common Replacement Parts	
DEMA Kit No.	**Description**
81.177.1	Squeeze Tube - Detergent EPDM - Default squeeze tube with Nitro Plus
81.177.4	Squeeze Tube - Detergent Silicone
81.177.2	Squeeze Tube - Rinse/Sani EPDM - Default squeeze tube with Nitro Plus
81.177.22	Squeeze Tube - Rinse/Sani Silicone
81.182.1	1/4" x 1/4" Push-On Union JG (connects pickup & discharge tubes to pump)
904.JG	Stainless Steel Rinse Check Valve w/ JG Elbow Kit (not suitable with chlorine products)
904.8KY	Kynar Sanitizer Check Valve (suitable with chlorine products)
80.55	Liquid Detergent Bulkhead Fitting
58.5	Dry Detergent Bulkhead Fitting
C.12VIK	Conductivity Probe (Flip Probe)
25.68.20	1/4" OD LDPE Tubing - 20ft
25.75	1/4" OD LDPE Tubing - 100ft
100.12.SV1	Vinyl Rinse Tube 1/4" OD x 1/16" ID - 16Ft
100.12.SV3	Vinyl Rinse Tube 1/4" OD x 1/16" ID - 100Ft
81.312.1	Split Pickup Tube Stiffener
81.17.5	Silicone Grease Pack - 1oz

Troubleshooting

(Some models may not include all items listed below)

Symptom	Probable Cause	Remedy
No power is being supplied to the unit	1. Trigger Cables connected to the wrong place on the machine. 2. Switch on bottom of unit is turned off. 3. Power is not cycling on the machine properly. 4. Trigger/Power cable is damaged from installation.	1. Check wiring diagram for proper connection and contact dish machine manufacturer for correct trigger placement. 2. Make sure switch is turned on. 3. Check with the dish machine manufacturer if all power should have been restored to the unit to see if there is an issue with the machine. 4. Turn power to the dish machine off and inspect the cable for any possible damage done.
Pumps are not priming like they should be or not holding a prime	1. Hole in the tubing from the chemical container to the pump head. 2. Hole in the squeeze tube in the pump head. 3. Fitting is not tight on the tubing	1. Check the tubing from the chemical container to the pump head for leaks by feeling the tubing for chemical that has leaked out. Replace the tube if necessary. 2. Replace the squeeze tube after inspecting it for a possible hole or leak. 3. Check both the inlet and outlet fitting and tighten if necessary, to create a good seal.
Pump over feeding	1. If in concentration or probe mode, feed rate may not be set correctly. 2. If in concentration or probe mode, probe cable may not be connected properly. 3. If a probe is being used, scale could be built up on the probe. 4. Range of set point is too low.	1. Check the programming for the feed rate. 2. Check the probe cable connection points and make sure it is connected properly. 3. Clean Probe. 4. Check set point in programming.
Pump under feeding	1. If in concentration or probe mode, the probe cable may be shorted. 2. If a probe is being used, scale would be build up on the probe. 3. Range of set point is too high.	1. Check the probe cable for any possible shorts and correct the issue where necessary. 2. Clean Probe. 3. Check set point in programming.
Rinse/Sanitizer pump not running	1. Speed turned off.	1. Check the programming to see the speed setting and make sure it is on the proper setting.

Warranty

Merchandise Returns

No Merchandise will be Returned for Credit Without DEMA'S Written Permission. Returned Merchandise Authorization Number is Required in Advance of Return.

Product Warranty

DEMA products are warranted against defective material and workmanship under normal use and service for one year from the date of manufacture. This limited warranty does not apply to any products that have a normal life shorter than one year or failure and damage caused by chemicals, corrosion, physical abuse, or misapplication. Rubber and synthetic rubber parts such as "o"-rings, diaphragms, PVC tubing, and gaskets are considered expendable and are not covered under warranty. This warranty is extended only to the original buyer of DEMA products. If products are altered or repaired without prior approval of DEMA, this warranty is void.

Defective units or parts should be returned to the factory with transportation prepaid. If inspection shows them to be defective, they will be repaired or replaced without charge, F.O.B. factory. DEMA assumes no liability for damages. Return merchandise authorization number must be granted in advance of returned units for repair or replacement (See "Merchandise Returns" above).