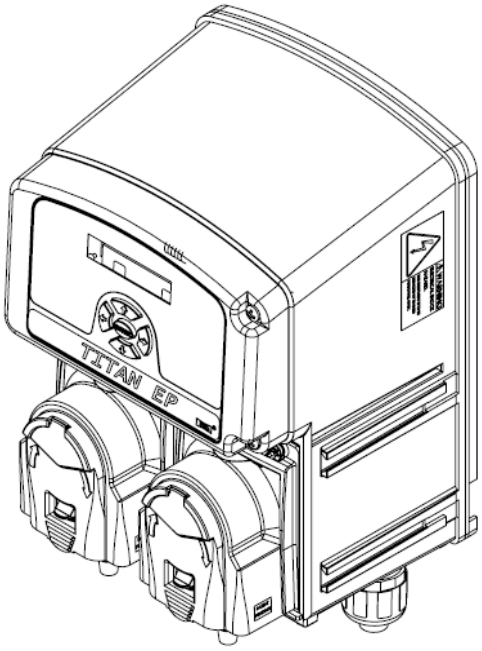
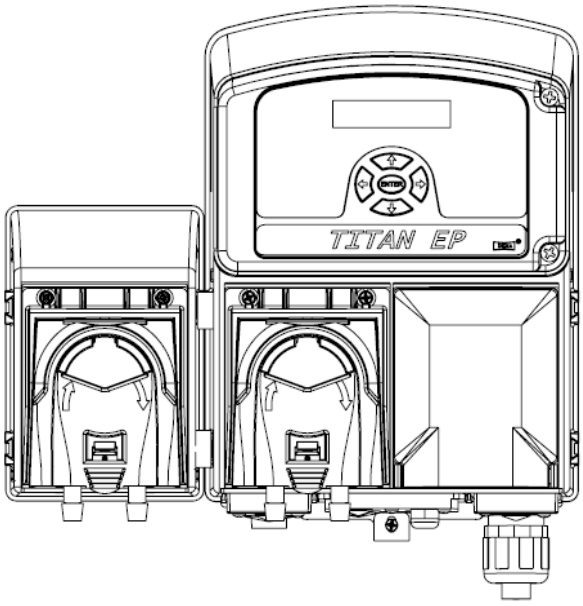
DEMA *TITAN EP II*™ WAREWASH CONTROL
TE.812 & TE.813 SERIES





Overview

The *Titan EP™* ware wash system controls all chemical delivery functions for dish machines and similar warewash applications. The system has an advanced power supply that will accept 100V–250V 50/60Hz. The *Titan EP™* responds to detergent and rinse triggers in the range of 20V–500V 50/60Hz. The *Titan EP™* has been designed for simple installation, set up, and operation. The *Titan EP*™ may be programmed for either Concentration or Probeless operation.

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 ELECTRICAL POWER MUST BE TURNED OFF TO THE DISPENSER AND TO THE APPLIED MACHINE.

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.

Specifications

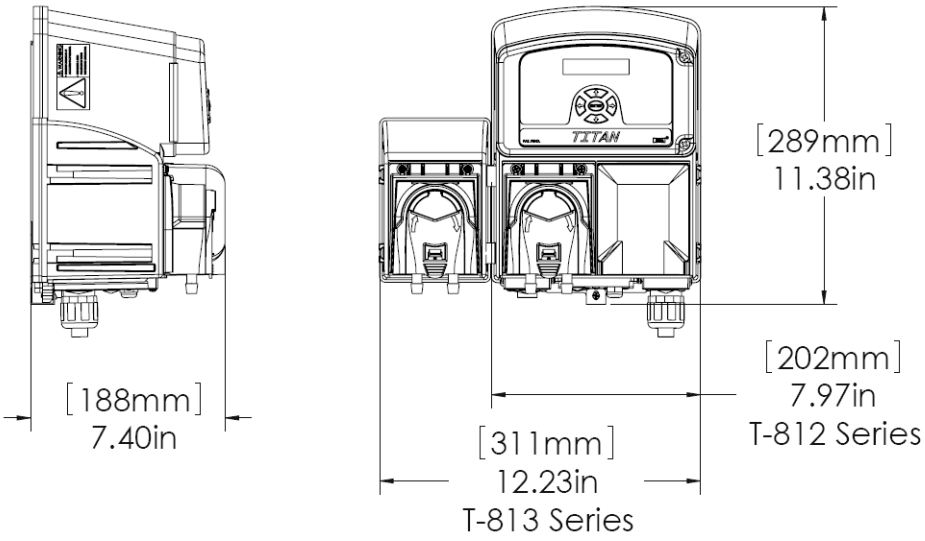
Packing List

PART NO.	DESCRIPTION	TE-812-LL	TE-812-DL	TE-813-LLL	TE-813-DLL
904-8T	Rinse Check Valve	1	1	1	1
80-55	Bulkhead Fitting with Liquid Feed Injection Elbow ¼”	1		1	
58-5	Overflow Elbow Kit		1		1
81-16-1	Tie Wrap 8” lg.	5	5	8	8
81-312-3	Pickup Tube Assembly 17”	2	1	3	2
81-182-1	¼” x ¼” JG Union	4	2	6	4
25-68-20	20 ft. x 1/8”ID LDPE (detergent)	1	1	1	1
100-12-SV1	16 ft. x 1/16”ID Vinyl (rinse/san)	1	1	2	2
C-12VIK	Conductivity Cell	1	1	1	1
904-8KY	Sanitizer Check Valve			1	1

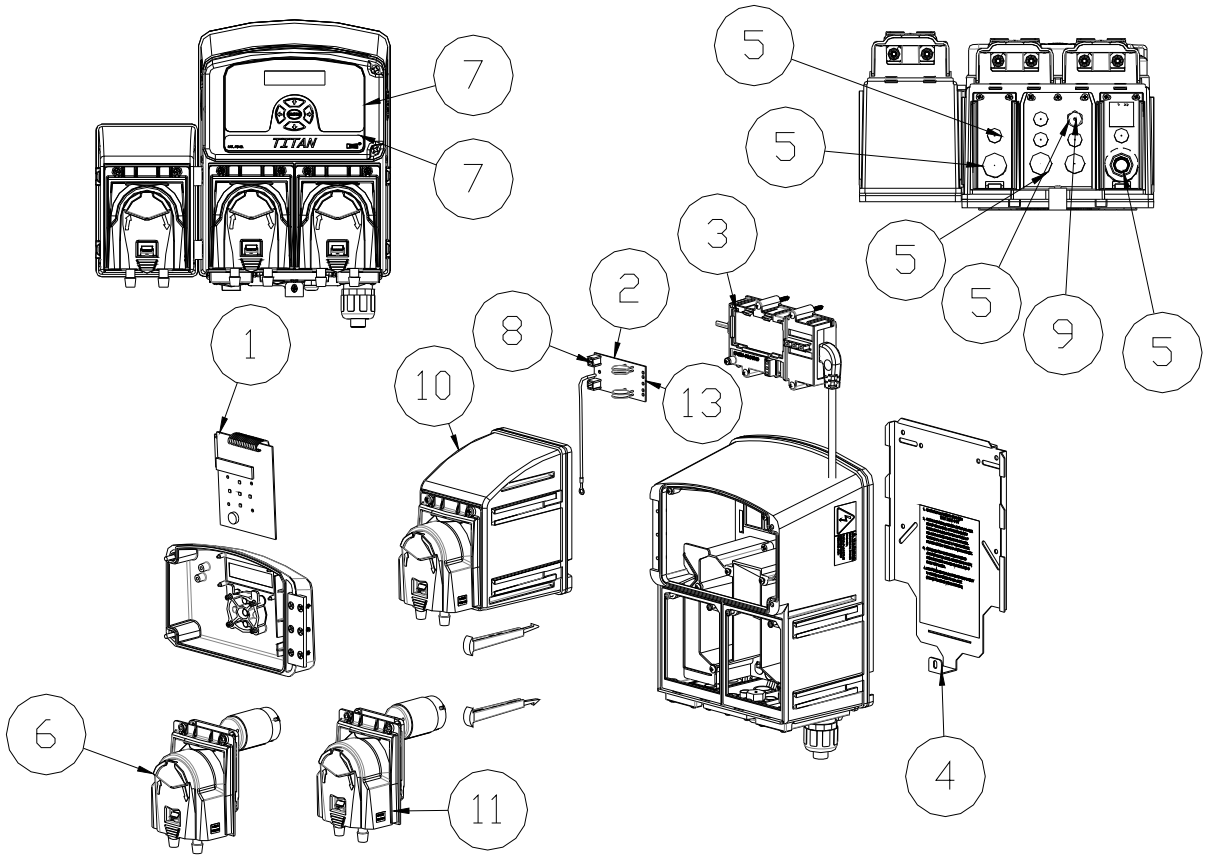
Operational Requirements

For Indoor Use Only		
Main Power	100 VAC – 250 VAC	50/60 Hz 1.5 A
Trigger Signals	20V – 500V	50/60 Hz
Motors/Solenoid Valves	24VDC	
Case Material	ABS	
Weight	3.8 kg	8.5 lbs
Max. Altitude	2000 M	6500 ft
Environmental Temp	0-40°C	32-104°F
Installation Category	II	
Pollution Category	II	

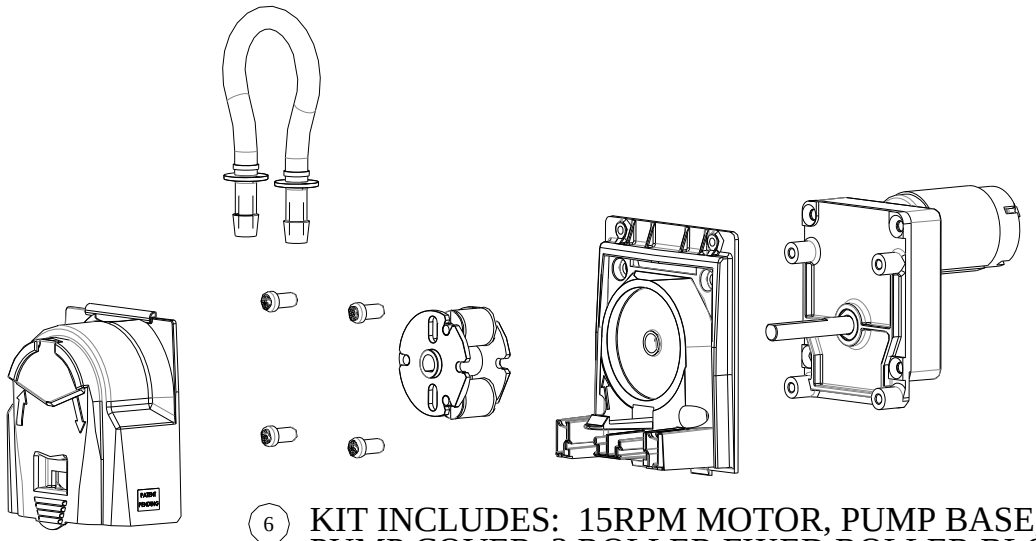
Overall Size



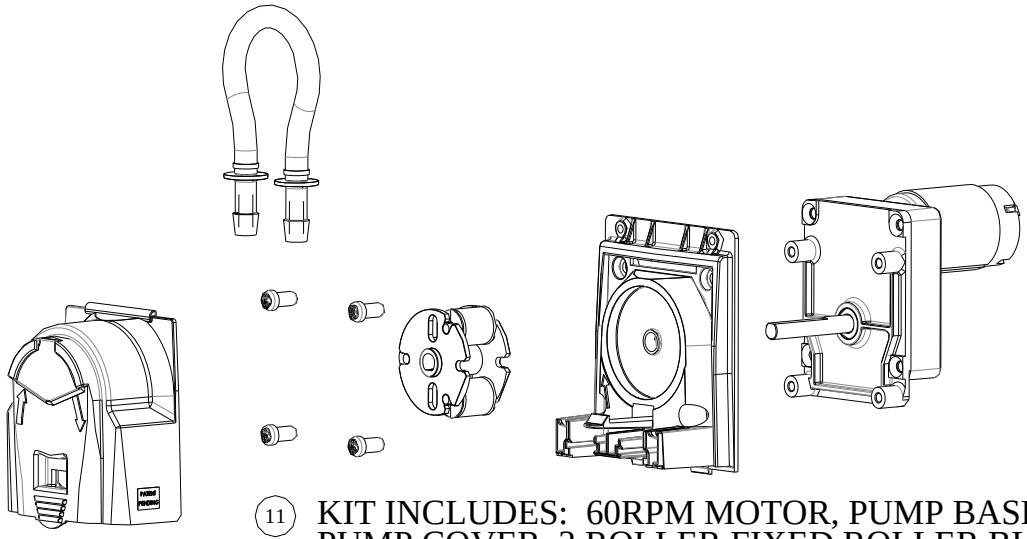
Parts List



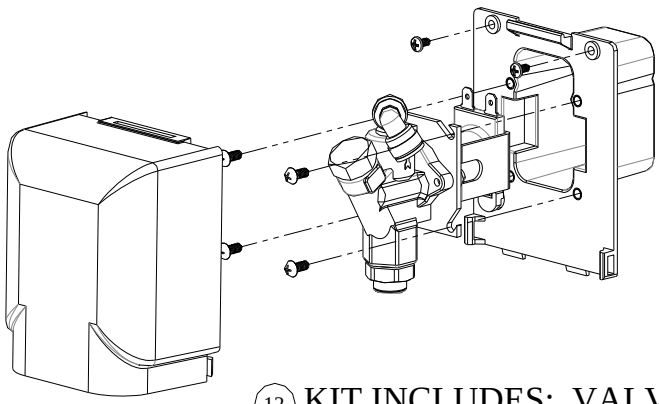
NO.	QTY.	DEMA NO.	DESCRIPTION
1	1	81-118-32	CONTROL BOARD AND DISPLAY ASSY.
2	1	81-118-11-2	TRIGGER BOARD WITH TERMINAL BLOCK
3	1	81-118-35	POWER SUPPLY (includes 84-125-7 power supply cable)
4	1	81-187-1	MOUNTING BRACKET
5	1	81-359-1	TITAN II HOLE PLUG AND FITTING KIT
6	1	81-118-29-2	RINSE PUMP AND MOTOR ASSEMBLY - 15 RPM
7	1	81-360-2	TITAN II EP LABEL KIT
8	1	81-118-12	TRIGGER CABLE REPLACEMENT KIT
9	1	81-181-2	PROBE CABLE – 15' Lg.
10	1	81-118-18	PUMP MODULE ASSY. - SANITIZER (For T-812-LLL, T-812-DLL)
11	1	81-118-29-1	MOTOR AND DETERGENT PUMP HEAD ASSEMBLY - 60 RPM
12	1	81-118-19	SOLENOID VALVE KIT (For T-811-D, T-812-DL, T-813-DLL)
13	1	81-118-11-4	TRIGGER CABLE – SOURCE TO BOARD
14	NOT SHOWN	82-23-1	MAGNETIC FIELD READER KIT (SEE PAGE 5 FOR INFO)
15	NOT SHOWN	82-28-1	INDUCTIVE PROBE KIT (SEE PAGE 5 FOR INFO)



(6) KIT INCLUDES: 15RPM MOTOR, PUMP BASE, PUMP COVER, 3 ROLLER FIXED ROLLER BLOCK AND EPDM SQ. TUBE



(11) KIT INCLUDES: 60RPM MOTOR, PUMP BASE, PUMP COVER, 3 ROLLER FIXED ROLLER BLOCK AND EPDM SQ. TUBE



(12) KIT INCLUDES: VALVE, BRACKET, COVER, AND MOUNTING SCREWS

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 PROPERLY GROUNDED (EARTHED).

Dish Room Survey

Prior to installation, take a complete survey of the dish room. Determine the desired placement of the Titan EP™ and chemicals. Also, determine how the electrical connections will be made. Main power and trigger cords must run through a nonmetallic ½" conduit system.

Mounting the Titan EP

1. Remove the Mounting Bracket from the dispenser.
2. Mount the bracket in an appropriate place on the wall, away from splashing and steam from the machine.
3. Slide the dispenser onto the bracket and attach the secure screw on the bottom of the dispenser.

Setting up the Titan EP and the Dish Machine

1. Locate the electrical connection point. The input power may be 100V – 250V 50/60Hz. Check with the manufacturer of the machine to determine if there are dedicated terminals available for this installation.
2. Properly ground the dispenser to Earth ground.
3. If the Titan EP™ will be operating in the concentration mode locate the proper position for the DEMA C-12VIK probe or the 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 (80-55) fitting 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 Titan EP

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. Cut the tubing to the length required to reach the chemical injection point on the machine.

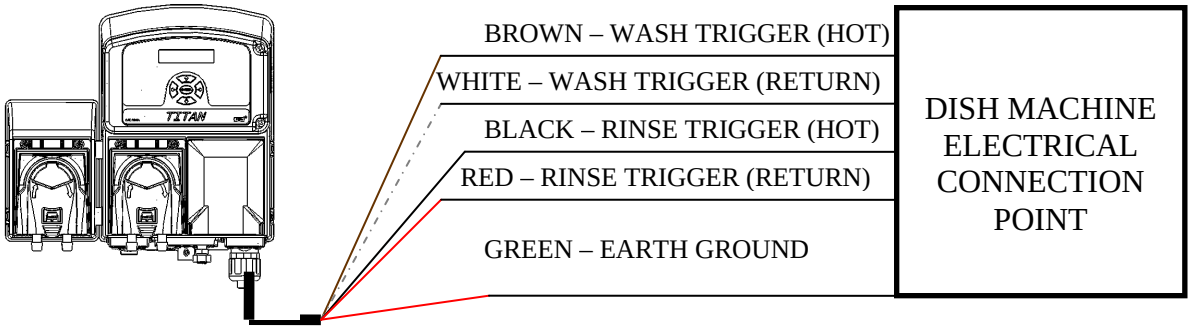
Wiring the Titan EP to the Dish Machine

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. Connect power to the Titan EP per the dish machine manufacturer's recommendations. UNIT MUST BE GROUNDED (EARTHED).

Magnetic Field Sensors - If trigger connection points cannot be established, the magnetic field sensors (82.23.1) may be used in place of the trigger board and cable. The magnetic field sensors connect directly to the control board in the trigger wire spots as shown on the wiring diagram. The magnetic field sensors can be placed on wash motors

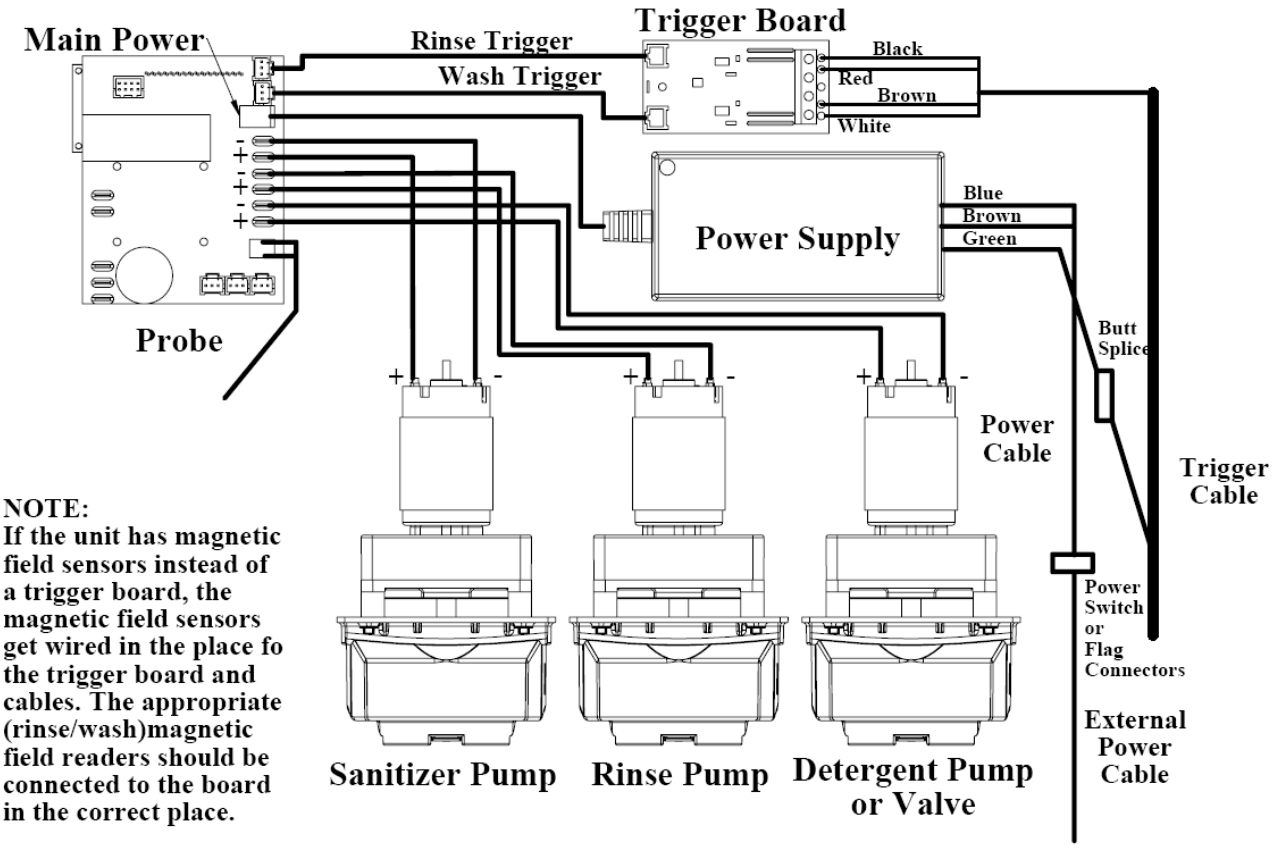
or rinse valves to measure a magnetic field when the motors or valves are activated which will trigger the proper pump or valve on the dispenser.



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 three steps will insure that the unit only receives power when it is necessary to have power to run the setup that is programmed in the unit.

1. Connect power to the Titan EP™ per the dish machine manufacturer's recommendations. Constant power should be supplied to the Titan EP™ anytime the dish machine power is on.
   Power to the Titan EP™ should not be supplied via the wash motor on the dish machine.
2. Connect the **detergent trigger** (brown and white wires) to the dish machine per the dish machine manufacturer's recommendations. The Titan EP™ should receive a detergent trigger any time the wash motor is running.
3. Connect the **rinse trigger** (black and red wires) to the dish machine per the dish machine manufacturer's recommendations. The Titan EP™ should receive a rinse trigger any time the rinse solenoid is powered.

The following is an internal wiring diagram for the unit.



Initial Programming

Following in **bold** is the initial programming menu as it will appear in the display window. Pressing any key will display the company name and illuminate the backlight. Use ⬆ and ⬇ to step between the options in the first (**bold**) column and then use enter to select the option and ⬇ to step through the option selections to the right. Press enter again to select the new option. If a key is not pressed within 10 seconds the company name will be displayed and the backlight will turn off. For helpful Titan EP Tips, see page 16. I902 lists the programmable values for all settings

DEMA Engineering
St. Louis, MO

DETERGENT PRIME* ➡ *DET. PRIME PRIMING* *DET. PRIME STOPPED*

⬇

RINSE PRIME* ➡ *RINSE PRIME PRIMING* *RINSE PRIME STOPPED*

⬇

SANITIZER PRIME* ➡ *SANITIZER PRIMING* *SANITIZER STOPPED*

* A default timer of two minutes will stop the pump if it is not stopped manually.

⬇

DET SP INPUT *** ➡ *DETERGENT STATUS DISPLAY*

*** See explanation on page 8.

⬇

NEW PROGRAM * ➡ *MODIFY PROGRAM* (*MODIFY PROGRAM* cannot be entered until after NEW PROGRAM is completed)

CONTROL MODE *CONTROL MODE*
PROBELESS *CONCENTRATION*

⬇

MACHINE TYPE ➡ *MACHINE TYPE* (This allows the selection of Door or Conveyor
CONVEYOR *DOOR* mode. The status may only be changed in Programming mode. Conveyor is the default.)

TRIGGER MODE ➡ *TRIGGER MODE* *TRIGGER MODE*
DETERGENT/RINSE DETERGENT ONLY RINSE ONLY

NOTE: Three trigger options are available. DETERGENT/RINSE allows the traditional two trigger input. RINSE ONLY, requires only a rinse trigger. Rinse functions operate normally and detergent functions occur during the rinse trigger. DETERGENT ONLY, requires only a detergent trigger. The detergent operates normally. In conveyor mode, the rinse runs with the trigger. In door mode, the rinse additive is dispensed following the loss of the detergent trigger. DETERGENT/RINSE is the default mode.

CONC. SET POINT * (Concentration set point default is 50)
50 0 – 1000

FEED RATE * (Controls the rate of approach to the set point to help control overshoot.
5 1 – 10 The default is 5.)

ALARM DELAY* (The time delay before a detergent alarm will sound in concentration mode. It
05:00 mm:ss starts when the concentration is below the set point and is not increasing. It may be set from 5 seconds to 10 minutes. The default setting is 5 minutes.)

RECHARGE TIME ** (This is the time detergent will be dispensed in probeless mode after the initial
00:01 mm:ss charge is dispensed. This time is not used in the no trigger door mode. It may be set from 1 sec to 5 min. The default is 1 second.)

(Either **DEAD CYCLES** or **DWELL TIME** will display depending on Machine Type selected earlier)

DEAD CYCLES**
1 0-10
(**Door machine only**. Set for how many 'dead cycles' (or door closings) where no detergent is dispensed. Detergent will dispense on the first cycle after the last dead cycle. The default is 1 dead cycle.)

DWELL TIME**
01:30 mm:ss
(**Conveyor machine only.** Set for how long the machine will run before adding a recharge. The default is 90 seconds.)

INITIAL CHARGE**
00:15 mm:ss
(This is the dispense time of the initial charge in probeless mode. The time is triggered by a main dispenser power interruption, the rinse limit being reached, or the charge clock time being reached. It may be set from 1 sec to 10 min. The default is 15 sec.)

CHARGE CLOCK**
01:00 hh:mm
(Set this to how long the dish machine should be 'off' before an 'initial charge is dispensed. It may be from 5 minutes to 16 hours. The default is 1 hour.)

*Only displayed if control mode is set to concentration
**Only displayed if control mode is set to probeless

RINSE SPEED
50 0 – 100%
(The speed of the rinse motor may be set from 0 to 100. The motor runs during during adjustment. The default is 50.)

RINSE DELAY***
0 0 – 15s
(This is the time from when a rinse trigger is received until the rinse pump starts. It may be set from 0 seconds to 15 seconds. The default is 0 sec.)

RINSE LIMIT***
-- 15 – 70s
(This is the maximum time the rinse pump will be allowed to run. If the limit is active and reached it will cause the next charge in probeless mode to be an initial charge. It may be set from 15 sec to 30 sec. Advancing beyond 30 sec causes the rinse limit to be inactive. The default for door machines is 18 seconds. The default for conveyor machines is inactive.)

RINSE LENGTH****
12 5 – 75s
(The length of the rinse cycle for one rack. In a conveyor machine this is used for the Rack Counter. Every time the rinse runs for this time a rack is counted. In a door machine using only a detergent trigger, this is the length of the rinse cycle following the loss of the trigger. The default is 12 seconds.)

***Only displayed if machine type is set to door
****Only displayed if machine type is set to door and tripper type is set to detergent only.

RINSE ALARM INACTIVE *RINSE ALARM ACTIVE*
Note: When RINSE ALARM is active, use a DEMA 82.15.1 low level probe connected to the rinse input.

SANITIZER SPEED
5 0 – 100%
(The sanitizer speed may be set from 0 to100. The sanitizer pump is active during adjustment. Setting the speed to 0 will cause other sanitizer settings to be skipped and the prime function will not be available.)

SANITIZER ALARM**** **INACTIVE** *SANITIZER ACTIVE*
Note: When the sanitizer alarm is active, use a DEMA 82.15.1 Low Level Probe connected to the sanitizer input.

COMPANY NAME ←

DEMA Engineering St. Louis, MO

(Insert your company name here.)

NOTE: Pressing "ENTER" displays the current company name and allows it to be changed, letter by letter, with the ⬆ and ⬇ keys (press and hold down to 'fast cycle'). The empty 'space' is between the← and ! symbols. Press enter to save.

ALARM VOLUME
5 0 – 10

ENTER NEW CODE *ENTER PROG CODE 0000* ← *LEFT ACCEPTS 0000 OTHER TO REJECT* *NEW CODE SAVED*

******Only displayed if sanitizer speed is not zero.

COMMENTS AND CLARIFICATIONS

MODIFY PROGRAM
This option will only be displayed if the dispenser has already been programmed. Press ENTER. You will be prompted for an access code. If no key is pressed for 30 minutes, MODIFY PROGRAM mode will be exited, the company logo will be displayed and all entries will be saved.

Code Reset
This is not a menu option and cannot be done from the keypad. If, for any reason, the codes are forgotten, the access codes can be cleared. Turn the power to the dispenser off. Open the front cover of the dispenser. Take the four screws out to lift the board out. There are two solder points on the back of the board. Connect them together with an insulated wire and turn on the power. Next, turn the power back off. Remove the connection from the two solder points. When the power is turned back on, the prompts will ask for a NEW PROGRAM. All of the program previously input will be retained. When the Programming code is requested, it will default to 0000 and may be reentered.

NOTE: All previous programs will NOT be erased.

Press ⬅ at any of the submenu options to get to the System Access Menu.

External Alarm, (Aux. Alarm)
There are two .250" (6.4mm) spade terminals on the left side of the control board. There is a 24VDC output for an external alarm (buzzer, relay, etc.). (+) is the top terminal, (-) is the bottom terminal.

When sitting idle, the control will display the company logo with the backlight off. When triggers are received, they will be displayed with the backlight on for five seconds and then replaced with the company logo. The trigger message(s) will be replaced with any alarm messages if alarms occur. The alarm messages will remain, with the backlight on, until the alarms are cleared. An audible alarm will sound if there is an alarm condition and a trigger is present. Pressing any key will mute the alarm until the next trigger. The alarm will automatically mute when triggers are lost.

Modify Program

For helpful Titan EP Tips, see page 16. I902 also has all programmable values for all settings listed.

NOTE: TO MODIFY PROGRAMMING, PRESS ENTER ON THE OPTION NEEDING MODIFICATION, USE THE ARROWS TO GET TO THE SELECTION DESIRED THEN PRESS ENTER TO ACCEPT CHANGES.

DEMA Engineering St. Louis, MO

DETERGENT PRIME * *DET. PRIME PRIMING DET. PRIME STOPPED*

RINSE PRIME * *RINSE PRIME PRIMING RINSE PRIME STOPPED*

SANITIZER PRIME * *SANITIZER PRIMING SANITIZER STOPPED*

*A default timer of two minutes will stop the pump if it is not stopped manually.

DET SP INPUT
C + 0398 0000

(This screen displays the detergent status. The first character in the second line is "P" if the dispenser is in probeless mode and "C" for concentration mode. The next character is only displayed when a trigger is present. When a trigger is present "I" is displayed during an initial charge, "D" during a dwell or dead cycle, "T" during a recharge, "+" when the pump is running in concentration mode, or "-" when the pump is not running during concentration mode. The next number is the set point in concentration mode or the alarm point in probeless mode. The other number is the detergent sensor or probe reading.)

MODIFY PROGRAM (NOTE: MODIFY PROGRAM cannot be entered until <u>after</u> NEW PROGRAM is completed.)

CONC. SET POINT* (Concentration set point default is 50)
398 0 – 1000

FEED RATE*
5 1 – 10

ALARM DELAY* (5 seconds to 10 minutes)
02:00 mm:ss

RECHARGE TIME** (1 second to 5 minutes)
00:01 mm:ss

(Either **DEAD CYCLES** or **DWELL TIME** will display depending on weather DOOR or CONVEYOR was selected earlier under MACHINE TYPE)

DEAD CYCLES** (Door machine only.)
1 0-10

DWELL TIME** (Conveyor machine only.)
01:30 mm:ss

INITIAL CHARGE** (1 second to 10 minutes)
00:15 mm:ss

CHARGE CLOCK** (10 minutes to 16 hours)
01:00 hh:mm

*Only displayed if control mode is set to concentration
**Only displayed if control mode is set to probeless

RINSE SPEED
50 0 – 100%

RINSE DELAY***
1 0 – 15s
RINSE LIMIT***
-- 15 – 70s

RINSE LENGTH**** (The length of the rinse cycle for one rack.)
12 5- 75s
***Only displayed if machine type is set to door
****Only displayed if machine type is set to door and trigger type is set to detergent only.

RINSE ALARM *RINSE ALARM* Note: When RINSE ALARM is active, use a DEMA
INACTIVE *ACTIVE* 82.15.1 low level probe connected to the rinse input.

SANITIZER SPEED
5 0 – 100%

SANITIZER ALARM****** *SANITIZER ALARM*
INACTIVE *ACTIVE*
*****Only displayed if sanitizer speed is not set to zero.

CONTROL MODE *CONTROL MODE*
PROBELESS *CONCENTRATION*
⬇
MACHINE TYPE ➡ *MACHINE TYPE* (This allows the selection of Door or Conveyor
CONVEYOR *DOOR* mode. The status may only be changed in Programming mode. Conveyor is the default.)

TRIGGER MODE ➡ *TRIGGER MODE* *TRIGGER MODE*
DETERGENT/RINSE DETERGENT ONLY RINSE ONLY

NOTE: Three trigger options are available. DETERGENT/RINSE allows the traditional two trigger input. RINSE ONLY, requires only a rinse trigger. Rinse functions operate normally and detergent functions occur during the rinse trigger. DETERGENT ONLY, requires only a detergent trigger. The detergent operates normally. In conveyor mode, the rinse runs with the trigger. In door mode, the rinse additive is dispensed following the loss of the detergent trigger. DETERGENT/RINSE is the default mode.

COMPANY NAME ← DEMA Engineering
St. Louis, MO (Insert <u>your</u> company name here.)

NOTE: Pressing "ENTER" displays the current company name and allows it to be changed, letter by letter, with the ⬆ and ⬇ keys (press and hold down to 'fast cycle'). The empty 'space' is between the← and ! symbols. Press enter to save.

ALARM VOLUME
6 0 – 10

ENTER NEW CODE *ENTER PROG CODE* ← *LEFT ACCEPTS 0000* *NEW CODE SAVED*
0000 *OTHER TO REJECT*

END PROGRAMMING?
PRESS ENTER

Helpful Tips on the Titan EP Warewash System

Inductive Probe: The inductive probe is particularly useful for situations where the C-12VIK probe is experiencing considerable scale build up. The inductive probe is not affected by the scale build-up that the C-12VIK would experience in a typical wash tank and does not need regular cleaning. There is also a temperature adjustment feature on the probe that can be set to change the amount of soap for the temperature of the water. See instruction sheet I-889 for more information.

Magnetic Field Sensors: If trigger connection points cannot be established, the magnetic field sensors (82.23.1) may be used in place of the trigger board and trigger wires. The magnetic field sensors connect directly to the control board as shown on the wiring diagram. The magnetic field 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. See instruction sheet I-888 for more information.

Alarm Delay – There are several detergents that are used by chemical companies that do not mix well with water and will drop out of solution and settle at the bottom of the tank. When the machine is cycled again, the Titan EP will read the higher concentration solution and turn the alarm delay off. It will then see no increase in concentration, since the INPUT reading is below the set point. This is not a defect in the unit. It is due to the detergent. The Alarm Delay setting should be changed to a few seconds before the end of the cycle to insure it will alarm.

Troubleshooting

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. (Some units may not have a switch) 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).