



# IMPORTANT

## READ FIRST

**BEFORE DETERMINING PLACEMENT OF INVERTER, PLEASE NOTE IT IS CRITICAL NOT TO INSTALL INVERTER IN A LOCATION WHERE WATER OR MOISTURE MAY BE PRESENT. INTERNAL DAMAGE OR FAILURE TO INVERTER DUE TO WATER OR MOISTURE IS NOT COVERED UNDER WARRANTY.**

**IT IS CRITICAL INSTALLERS READ AND FOLLOW THE FUJI INSTALLATION GUIDELINES TO AVOID WARRANTY ISSUES.**

**THE MANUFACTURER'S WARRANTY DOES NOT COVER NEGLIGENCE OR MISUSE OF INVERTER WHICH INCLUDES WATER, CHEMICAL, DUST, DIRT OR ANY OTHER FOREIGN MATTER OR ENVIRONMENT-RELATED MATERIAL GETTING INSIDE THE INVERTER.**





# ***INTRODUCTION***

The **REFLEX** unit was designed by NuPulse Inc. **REFLEX** senses the vacuum level in the milking system and controls the speed (RPM) of the electric motor driving the pump. The pump runs just fast enough to produce the needed air flow at the set vacuum level. As the need for air flow is introduced by the attachment and detachment of milker units, and activation of takeoffs, the Controller causes the vacuum pump to change speed accordingly. The result is a smooth, quiet vacuum pump operation which maintains a very stable level in the system and costs considerably less to operate. On farm experience has shown as much as 70% reduction in electrical usage by the vacuum pump. The payback for the system depends on the size of the pump and the number of hours per day of operation. Generally, an operation with a milking time of 10 hours per day will realize a payback within 2 years.

There are other benefits besides energy savings and quick payback. The system greatly reduces the noise of the vacuum pump and extends its life. With the built-in illuminated digital vacuum gauge you can easily see the vacuum stability and fast response time. The vacuum level is held steady and true.







### ***PARTS INCLUDED***

- 1      **REFLEX** Controller
- 1      Inverter (If Purchased Complete)
- 24"    Clear tubing- 3/16" I.D.
- 1      Brass Barb (3/8" Drill bit required) and hardware for mounting circuit board and vacuum tubing

### ***PARTS NEEDED***

- 1. 4, 8, 12 gauge VSD Shielded Cable to connect the Inverter to the electric motor and from the main electrical panel to the Inverter.
- 2. 18 gauge 2 conductor shielded cable.
- 3. This needs to be long enough to run from the **REFLEX** Controller to the Inverter.
- 4. Mounting hardware for the Inverter and **REFLEX** Controller.
- 5. 18 gauge 3 conductor cable to wire from the switch of the automatic pipeline washer to the **REFLEX** Controller.
- 6. Vacuum relief valve.

### ***MOUNTING THE REFLEX CIRCUIT BOARD***

In order to ensure no damage occurs to the **REFLEX** circuit board during shipping, it is packaged separately. It has to be mounted inside the enclosure upon installation of the system. Standoffs are already mounted in the back portion of the box to which the circuit board attaches.



1. Remove the **REFLEX** cover from the box.
2. Remove the package of hardware from the box. Hardware includes:
  - 4 x Mounting Screws
  - 4 x Nylon Washers
  - 2 x Tie Straps
  - 1 x 3 connector plug
  - 1 x 2 connector plug
  - 4 x #6 x 3/8" screws
  - 4 x #6 nylon washers
  - 1 x Brass Barb
3. Remove the circuit board from bubble-wrap.
4. Connect the portion of the clear vacuum tube that is inside the box to the transducer nipple. (The transducer is the black plastic rectangular shaped object on the back of the board.)

The nylon washers should be installed between the bolt heads and the circuit board.

Secure the vacuum tubing to the transducer nipple with one of the zip ties.

5. Fasten the circuit board to the standoffs in the back of the box using the 4 screws and nylon washers provided.
6. Install the 36" length of vacuum tubing on the brass barb.
7. This completes the circuit board mounting. There is no need to reinstall the **REFLEX** cover as it needs to be removed later for wiring.

### ***TOOLS NEEDED BEYOND THE BASICS***

When installing a **REFLEX** variable drive system there is a digital vacuum gauge that is displayed on the front of the **REFLEX** Controller. This gauge should be calibrated so that the system vacuum is accurate. In order to do this properly it should be compared to a Mercury Gauge or equivalent.



## **WHERE TO PLACE COMPONENTS**

The **REFLEX** Controller is designed to be mounted in the parlor so that the vacuum gauge can be seen while milking. It is in a Nema 4 enclosure that is water resistant. It should not be sprayed directly with a pressure hose. The tap for sensing the vacuum should be placed 24" to 48" from the sanitary trap on the vacuum pump side. The **REFLEX** Controller should be mounted higher than the tap hole and no further away than 36" away from the tap hole. This will allow moisture in the sensing tube to drain back into the vacuum line.

The Inverter is **NOT** in a wash down enclosure. It should be placed in a dry area as it is **NOT** water resistant. We would recommend in the utility or pump room and next to the Vacuum Pump..

With these points in mind, layout where the components of the system will be placed and mounting hardware that will be needed.

## **MOUNTING THE COMPONENTS**

1. Find a clean dry area close to the vacuum pump to mount the Inverter. The Inverter is very heavy and should be bolting into something secure. Follow the points listed below. Violating the conditions listed may void the warranty of the Inverter.
  - a. Do not install the Inverter in a place subject to high temperature (over 100 F), high humidity, or excessive vibration.
  - b. Mount the Inverter vertically and do not restrict the air flow to the heat sink fans.
  - c. The Inverter generates heat. Allow sufficient space around the Unit for air circulation. (More than 12 inches in all directions.)
  - d. Do not mount the Inverter above heat generating equipment or in direct sunlight.
  - e. If mounted in an area that may have occasional dripping, precautions must be made to prevent moisture from falling on the inverter as it is **NOT** in a water resistant enclosure.
2. Mount the **REFLEX** enclosure in the parlor so it can be seen by the milkers, since there is a digital vacuum gauge that shows the system vacuum level. This enclosure is water resistant, but should not be sprayed directly.

## **WIRING THE INVERTER**

1. Remove the cover of the Inverter. Use a Philips screwdriver to loosen the screws located on the upper left and right corners of the cover. Pull the top towards you to unsnap the cover off the Inverter. The lid is designed to prevent accidental removal.
2. The Inverter has a 2 x 18 position control terminal blocks. Cut a length of the 18/2 gauge wire that will run from the Inverter to the **REFLEX** Controller in the parlor. Since we are dealing with D.C. power one wire will be positive and the other negative. Connect the positive to the terminal labeled "C1" and the negative to the "11" .



#### Control circuit terminals

30A	Y5A	CMY	Y3	Y1	C1	FMA	FMP	PLC	X1	X2	X3	X4	X5	X6	X7	X8	X9
30C	30B	Y5C	Y4	Y2	11	12	13	V2	CM	CM	FWD	REV	P24	P24	DX-	DX+	SD

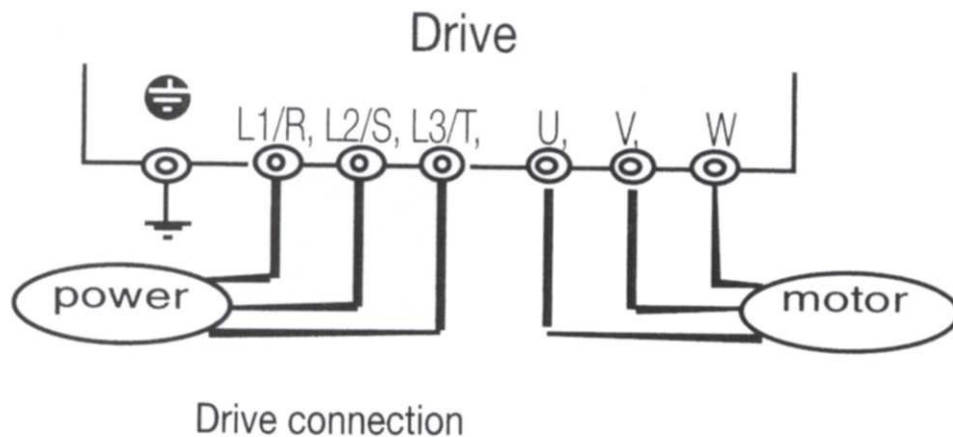
#### *WARNING*

**Disconnect electrical supply before servicing the electrical system**

3. Connect wires from the main electrical panel to the Inverter. If you are using three phase 220 volt power, wire all three legs into L1, L2, and L3 and the ground into either of the GND terminals. If you are wiring single phase 220 volt power you will use L1, L2 and GND terminals.
4. Drive output terminals (U, V, W)

Connect these terminals to a 3-phase motor in the correct phase sequence. If the direction of motor rotation is incorrect, exchange any two of the U, V, and W phases.

**Example:** Match the T1, T2, T3 on the Motor Plate to the corresponding U, V, W on the inverter







## WIRE CONNECTIONS TO THE INVERTER

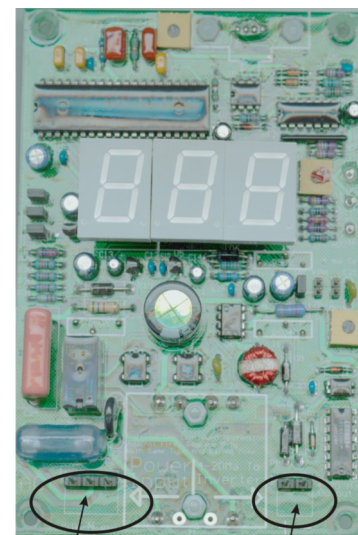
1. Re the Reflex's 4 to 20 milliamp signal, the "+" hooks to the control terminal labeled "C1" and the "-" hooks to the terminal labeled "11".
2. Wire the Inverter to a constant power source. Refer to Fuji Inverter Manual, page 2 - 16 for electrical wiring specifications. i.e. recommended cable size, circuit protection, tightening torque, etc.
3. For connecting to Single Phase Input Power, use input terminals "L1" and "L2", leaving "L3" empty. When powered on, disable the Phase Drop Off Protection by changing parameter U48 to a "2". Failure to do this may result in phase loss faults.
4. It is not recommended to switch power on and off to the inverter. If it is necessary to do so, the following should be done.
  - Install a wire jumper between "CM" and "FWD" on the control circuit terminal strip.
  - Change the "F02" program parameter from "0" to "1".

### NOTE

With a jumper wire connected between "C" and "FWD" as noted above. Parameters "F01", "F02", "F42", "H08" and "U48" cannot be changed. If it is necessary to change these parameters, disconnect the jumper wire and reconnect after change is made.

## WIRING AND CONNECTING THE REFLEX

1. Remove the four screws in the front cover of the **REFLEX** enclosure.
2. An 18/2 gauge cable must be run from the Inverter to the Reflex controller. If the Reflex is installed in a parlor with an ID system use 18/2 shielded cable in order to keep the RF emissions from interfering with other equipment. At the Reflex, run the cable up through the water tight connector in the bottom of the enclosure and connect to the terminal block labeled **"To Inverter"**. Connect the wire from "C1" at the inverter to "+" at the Reflex and from "11" at the inverter to "-" at the Reflex. If using shield wire, the shield drain wire must be grounded to an earth ground



Milk N Wash		
1	2	3

Control	
+	-
1	2



at **BOTH** ends to dissipate the RF emissions. At the inverter, earth ground should be the green ground terminal. At the Reflex controller, a single conductor wire should be connected to the shield drain wire with a wire nut and routed through the water tight connector to an earth ground within 6 feet of the Reflex enclosure - the shorter the better. Ideally this would be a ground rod but aside from new installations, this may not be possible. In existing installations, metal water piping or stallworks may work as an earth ground. If connecting to water piping, use a commercially available ground clamp. If connected to stallworks, it is preferred to drill and tap a hole for a ground lug (available at electrical supply outlets) to ensure a long term positive connection versus using a hose clamp or strap.

3. Run a 3 conductor, 16 gauge wire from the washer control or a master control panel to the Reflex controller. This wire will provide a 120 VAC signal to the Reflex controller to tell it whether the milking system is in a “wash” or “milk” mode. The Reflex will then control the vacuum to the preset level for the mode being used. Run the wire up through the water tight connector and connect to the terminal block labeled “Power Input”. Connect the white wire to the “N” terminal, the Black wire to the “Milk” terminal and the remaining conductor to the terminal marked “Wash”. Connection to the washer or master control panel will be covered in a later section.
4. Drill a 3/8” hole in the vacuum pipe that comes from the vacuum pump to the sanitary trap. The hole should be located 24” to 48” from the sanitary trap on the vacuum pump side. Since there is 24” of tubing provided, it should be no more than 24” from the **REFLEX** Controller.
5. Thread the brass tap into the hole that you just drilled. Connect the tubing from the **REFLEX** Controller onto the tap.

## ***WIRING TO YOUR WASHER***

The **REFLEX** needs a 120 volt power from the washer. The power is separated for wash and milking. This will tell the Controller when to run at the wash cycle vacuum level and at the milking vacuum setting.

Wiring between the washer switch and **REFLEX** Controller should be such that 120 volts A.C. is sent to the Controller “**Milk**” terminal when the switch is in milk position and 0 volts to the “**Wash**” terminal. With the washer switch in Wash position, 120 volts A.C. should be sent to the Controller “**Wash**” terminal and 0 volts to the “**Milk**” terminal.



## ***SETTING UP AND RUNNING***

Before running the system, note the following considerations:

1. On 440 volt AC Inverters, the operating parameters have not been set at the factory. 440 volt AC Inverters will have to be programmed on site. For instructions on how to program operating parameters, refer to Parameter Settings for the Fuji AF-300 P11 Drives on Page 15 and 16 in this manual.
2. Enter the motor amp rating from the motor name plate into parameter "F11".
3. With single phase input power, change parameter "U48" to a "2". **FAILURE TO DO THIS MAY RESULT IN PHASE LOSS FAULTS.**
4. With three phase input power with a line reactor, change parameter "U48" to a "1".

### **NOTE**

For complete instructions on how to operate the inverter keypad to make changes in parameters as noted above, refer to the Fuji manual Section 4 Page 1 "Keypad Panel".

With all the wiring complete the system will automatically turn "ON" with the automatic pipeline washer switch or power switch. Leave the existing vacuum controller in the system for a safety feature but set it at a higher vacuum level, or install a relief valve.

### **NOTE**

Prior to powering on the reflex controller, the Inverter mode has to be changed from **STOP** Mode to **RUN** Mode.



When power is applied to the Inverter for the first time or any subsequent times, you will have to change the Inverter from the **STOP** mode to the **RUN** mode. This will also apply after resetting any alarm faults on the Inverter. Pressing the 'FWD' key on the panel will change the LCD display from **STOP** to **RUN** and illuminate a green light labeled RUN.

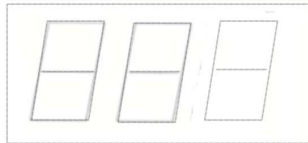
Turn power on to the REFLEX Controller in the "MILK" position.

The "SOFT START" timing control will cause the vacuum pump to start slow and gradually increase speed until the system vacuum level is reached or until the time has elapsed.

The "SOFT START" factory setting is 15 seconds. This setting can be changed as follows:

### SETTING THE "SOFT START" TIMING

J1 ☐  
J2 ☐  
J3 ☐



MINUTES Rev. D Boards	SECONDS Rev. D1/E Boards	J1	J2	J3
1	15	X	X	X
2	30		X	X
3	45			X
4	60	X	X	
5	75	X		
6	90			

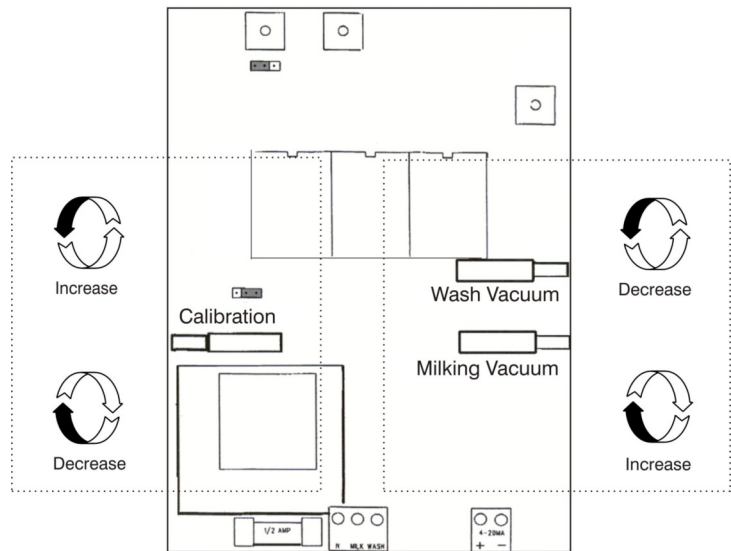
X = Jumper On

1. There are 3 jumper connections located on the front side of the **REFLEX** circuit board, on the left side of the digital display. The position of these jumpers control the amount of time it takes for the pump to come to full speed potential, i.e. could go to 60 Hz if demand was there. The mode of operation for the "SOFT START" feature is that when power is turned on to the **REFLEX** Controller, the signal sent to the AC Inverter is such that it makes the motor start slowly and build speed gradually over the set time. After the time elapses, the operation is normal. The "SOFT START" timing sequence is reset each time power is turned off to the **REFLEX** Controller.
2. Select the "SOFT START" timing sequence which best fits the system configuration by placing jumpers as shown in the diagram on the left.

### CALIBRATING THE DIGITAL VACUUM GAUGE

1. Connect a mercury gauge or equivalent to the system to set the vacuum level and calibrate the vacuum gauge on the Controller.
2. Turn the switch to the Milking Position and the pump will start running.

3. With the **REFLEX** facing you, remove the cap on the left side. After the cap is removed; there is an adjustment screw on the circuit board. With a small screw driver, turn the screw clockwise to decrease the displayed number and counter clock wise to increase the number. See the figure at right for clarification.



### **SETTING THE MILKING VACUUM LEVEL**

1. After the “SOFT START” timing sequence has elapsed, set the desired milking vacuum with the bottom adjusting screw on the right side of the Controller. See the above figure for clarification. Factory setting is 12.5" Hg.
2. Replace the plug in the hole.

### **SETTING THE WASH VACUUM LEVEL**

Turn power on to the REFLEX Controller in the “WASH” position.

1. After the “SOFT START” timing sequence has elapsed, and with milker units and air injector shut off, set the desired washing vacuum with the top adjusting screw on the right side of the Controller. See the above figure for clarification.
2. Factory setting is 14.0" Hg.
3. Replace the plug in the hole.



## FUJI INVERTER FUNCTIONS AND FEATURES

The following are highlights from the Fuji Manual.

With the inverter in the STOP Mode you can scroll up or down in the Data Check Section and set all parameters and view all settings, and lock them out from accidentally being changed. Lockout can be done quick and easy by programming function "F00" to a 1. All functions showing an "\*" have been changed from factory settings and should match the function data chart in the NuPulse manual.

Section 4 also shows you how to access all the parameters that are useful for service and maintenance. You can check the input of the Reflex Controller's "C1 Terminal" current, the motor's current draw and use the Hour meter for maintenance of the vacuum pump. This section also shows you how to access the alarm code faults in memory.

If the Inverter trips on an alarm, refer to "Protective Operations", Section 6, of the Fuji manual for a description of the alarm fault. Once you determine what the alarm is referring to, go the "Troubleshooting", Section 7. This will have suggestions on how to Troubleshoot and solve the problem that caused the alarm. To reset an alarm, press the reset key and the alarm will be reset and stored into the memory of the Inverter for future reference.

Maintenance and Inspection is covered in Section 8 of the Fuji manual.



Display on keypad panel  
at power-on

## INVERTER PROGRAM MENU SCREEN

To enter and view the Inverter's Program menu Screen press the 'PRG' key. This will illuminate the LCD and a list of nine different Functions. The Inverter will scroll instructions on the bottom of the LCD to show what keys to press to Enter, Exit and View the functions.

The functions are as follows:

1. **DATA SET** - mainly used for engineering purposes and a quick way to view the parameter's functions without referring to a manual. Entering the parameter number by pressing the 'FUNC/DATA' key will display the parameter's settings.
2. **DATA CHECK** - a quick way to view what's been programmed in the Inverter's parameters and make changes to them. Parameter numbers followed by an "\*" have been changed from the factory settings. The numbers on the right show what the parameter is set at. Pressing the FUNC/DATA key will display the parameter's setting along with a description of its function.



3. **OPR MNTR** - This is a good place to view and monitor the Output Frequency, Output Current and the Output Voltage to the electric motor all at once. Pressing the 'FUNC/DATA' key will display this feature.
4. **I/O CHECK** - You can view and monitor the 4 to 20 milliamp input from the Reflex Controller and its DC voltage to the Inverter.  
  
Pressing the 'FUNC/DATA' key will enter the I/O Check screen area. Press the down 'w' key 3 times to advance to the 4<sup>th</sup> screen and 'V2=' value will display the voltage reading from the Reflex Controller. Pressing the down 'w' again will advance to the 5<sup>th</sup> screen to display the "C1=" value to display what current is coming from the Reflex Controller.
5. **MAINTENANCE** - shows how many cumulative hours the Inverter have been in service and how many total hours the Reflex System's vacuum pump has been running.  
  
Pressing the 'FUNC/DATA' key will enter the first screen. The "Time=" shows the cumulative hours the Inverter has been in service. Press the down 'w' key twice to advance to the 3<sup>rd</sup> screen. The "TCAP=" will show the hours of actual run time of the Reflex System's vacuum pump.
6. **LOAD FCTR** - you can run a timed test for up to 3600 seconds to see what the maximum and average output current to the electric motor during Milking or Wash.
7. **ALM INF** - displays 9 screens of alarm information to help you trouble shoot the system. You will be able to see the time, frequency, voltage, current and a description of the alarm occurrence.
8. **ALM CAUSE** - shows the history and cause of all alarms.  
  
For more information on the Alarm Causes, refer to pages 6-1 and 4-11 in the Fuji manual.
9. **DATA COPY** - for storing and sending program data from the Keypad to the Inverter or visa versa. Refer to the Fuji manual for its use.

**Note\*** The inverter display must be in the Local mode to operate with the Reflex controller. Also the "FWD" key must be activated to show "Run" also. After a power outage or an Alarm Code reset, the Inverter must be reset to "Run" by depressing the FWD key.



#### **NOTE**

***The Inverter must be in the unlocked mode to be able to program parameter settings. Also some settings can not be changed while the Inverter is in the run mode. Press "STOP" key to enter the STOP mode.***

### **PROGRAMMING PARAMETER SETTINGS FOR ALL INVERTERS**

1. Turn power on to the unit.
2. Press program key.
3. "DATA SET" will appear on the LCD.
4. Scroll down 'w' and highlight "DATA CHECK".
5. Press 'FUNC/DATA' key on keypad.
6. Parameter setting will appear.
7. Use the up 'v' or down 'w' key to select parameters which are listed on Pages 15 & 16 0 "Parameter Settings for the FUJI Drives".
8. When the parameter is selected to be changed, press the "FUNC/DATA" key.
9. Use the Up 'v' or down 'w' keys to select the change desired.
10. Press "FUNC/DATA" key to store setting.
11. Follow the same procedure to make changes in any parameters.
12. To exit out of the programming mode, press the reset twice.
13. Press "FWD" key to return to RUN Mode.

### **QUICK WAY TO SCROLL IN THE DATA SET AND DATA CHECK PROGRAMMING**

Depressing the Shift Key and the Up 'v' or Down 'w' key at the same time will advance you to the next group of parameters without having to scroll through them all.





## PARAMETER SETTINGS FOR FUJI P11 DRIVES

Parameter settings in the DATA CHECK area show an “\*” after they have been changed from the factory settings. There are 188 parameter settings in the Inverter, we are only using 23 of them.

<b>Parameter Settings for the FUJI P11 Drives</b> <b>The following are preset on Units when shipped from NuPulse</b>			
	<b>Parameter #</b>	<b>NuPulse Settings</b>	<b>Parameter Function</b>
1	F01*	2	4-20mA Current Input
2	F07*	1.00s	Acceleration Time
3	F08*	.75s	Deceleration Time
4	F10*	2	Forced Air Motor O/L
5	F14*	3	Ride Through Momentary Power Drops
6	F26*	8 KHz	Motor Frequency (Noise)
7	F40*	150%	Torque Limit
8	F41*	0%	Prevents OU2 trip of Braking Torque
9	F42*	1	Torque Vector Active
10	E01*	10	X1 & CM Terminals to Run at C20 Setting
11	C20*	30 Hz	Hertz to Run at with X1 & C1 Contacted
12	H04*	5	Auto Reset for OU Alarms
13	H06*	1	Auto Fan Enabled
14	H08*	1	Reverse Lock Active
15	H10*	0	Energy Savings Inactive
16	H11*	1	Coast to Stop
17	U01*	300	Compensation Freq. Braking
18	U60*	1	Regeneration Avoidance



The following parameters need to be set on all Inverters on Site.

	Parameter #	Settings	Parameter Function
19	F11*	See setting instructions on Page 14 of this manual.	Motor Name Plate Current
20	F00*	1 - Lockout 0 - Unlocked	Data protection
21	U48	0 or 1 or 2*	Phase Drop off Protection
22	C33*	.05 to .15	Set ONLY if needed to smooth out the pulsation response.

The following is only to be used if you want to clear the settings and start over with factory settings. All of the above parameters would have to be reprogrammed if used. You can use the Data Copy function to restore the data from the keypad memory. These settings are the same as programmed by NuPulse unless changed in the field.

	Parameter #	Reset Settings	Parameter Function
23	H03	1	Press Stop & Up Key , then Function Data Key resets all parameters to factory default settings.

### **CHANGING THE MAIN DISPLAY MONITOR**

The main display is factory set to show the output frequency. There are 12 other functions which can be selected to display, i.e. RPM of the motor, output voltage to the motor, output current to the motor and input power consumption display in kilowatts. To change the displayed function, enter into parameter E43 and change the program to correspond with the function of your choice. You can step through and view the functions by pressing the “FUNC/ DATA” key.

**E-Zee NuPulse has no responsibility for any Inverter NOT purchased from E-Zee NuPulse but connected to the NuPulse REFLEX Controller. Please read your Inverter manual.**



# ***ALTERNATE SET-UP OPTIONS***

## ***REFLEX AND THE WASH CYCLE***

The Reflex has a separate vacuum control level adjustment for the Wash Cycle.

Some installations prefer not to run Variable Speed during Wash and prefer to run off a Vacuum Regulator.

To get the Vacuum Regulator to kick in during Wash, adjust the Reflex Wash vacuum level setting higher than that of the Vacuum Regulator.

This will make the Vacuum Pump System run wide open and be controlled by the Vacuum Regulator.

## ***REFLEX TOO RESPONSIVE TO THE PULSATION SYSTEM***

Some Pulsation systems turn all the Pulsators on at the same time and leak large volumes of air quickly and then close off the air admissions just as fast. Because the Reflex is so responsive in maintaining the proper vacuum level, it can be a little jerky in its response to following the large air admissions on those type of Pulsation Systems. If this is the case, adjust the Parameter listed below.

Parameter C33—REF Filter—Factory set at .05 set to .15

This will dampen the response to the pulsation thus smoothing out the jerkiness and sound on the Vacuum Pump. Settings of Parameter C33 higher than “.15” can make it seem even better, but if set too high the Reflex may start to hunt and not lock in the vacuum level as quickly if there is a large air admission that is quickly closed off. (Example: Two milker units leaking in air from a fall off, then shut off or are reattached.)

**\*NOTE: Keep in mind the Reflex must follow the response to the air leaked into the system to properly maintain Milking Vacuum level.**



## ***REFLEX CONTROLLER BYPASS***

**To pre rig the system to run the vacuum pump system automatically without the Reflex Controller, do the following.**

1. You need a 120 volt Relay with a normally open set of contacts SPST. (Our part# R03524NP)
2. Supply the Relay with the same 120v power you are sending to the Reflex Controller.  
If you have a separate signal for Milk and Wash. you will need two (2) Relays.
3. Connect the normally open contacts of the Relay to Inverter's input terminals "CM" and "FWD".
4. Change the "F02" parameter of the Inverter from a "0" to a "1".
5. Now if the Reflex Controller is disconnected from the Inverter, you will be able to run at full speed off a vacuum regulator.
6. In order to do this, until you get a replacement Reflex Circuit Board, you must program parameter "F01" from a "2" to a "7".
7. Start it up and set your Vacuum Controller to the proper milking vacuum level.  
(Note this is normally set before at 1"hg higher than the wash vacuum level of the Reflex System.)



## ***CONNECTING 1 REFLEX CONTROLLER TO 2 INVERTERS***

**The Reflex Controller's 4-20 milliamp output (terminals 1 & 2) can be connected in series to two different Inverters.**

- The wire coming from the Reflex Control terminal number 1 (positive) connects to first Inverter's (Inverter #1) control circuit terminal "C1".
- The wire coming from the Reflex Control terminal number 2 (negative) connects to second Inverter's (Inverter #2) control circuit terminal "11".
- In order to finish the Reflex connections to run the two Inverters in series, you must run a wire from the Inverter #1's number "11" terminal to the Inverter #2's "C1" terminal.





## **TECHNICAL SUPPORT**

### **E-Zee NuPulse**

Tel: 800-233-6878

### **Fuji Electric Corp of America**

Contact: Seto Yuzo

Tel: 847-397-8034

### **24-Hour Service (Inverter ONLY)**

**Monday through Friday**

**Tel: 888-900-FUJI (3854)**

