KLEEN FLO™

REFLEX II

REFLEX II / VFD System

MEGA G2 & MEGA G1 Drives

REFLEX II

DELUXE VFD PACKAGE

MEGA G2

MEGA G1

Installation & Operation Manual

STOP

READ FIRST

BEFORE installing Drive or calling Customer Service for assistance, read this Manual in full. There are very few questions, problems or complaints when Manual is read and followed.

Thank you.

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IMPORTANT

Thank you for purchasing the **REFLEX II** System.

It is required to read the FUJI Frenic Mega Instruction Manual's Preface referring to safety and warnings PRIOR to installation.

This REFLEX II Manual is a GUIDE ONLY and covers most of the main parts of a normal installation and setup of the REFLEX II System. It is important to refer to the Frenic Mega Instruction Manual for more details on installation instructions and information.

Thank you.

Prior to Installation... Determining Placement

Before determining placement of the Inverter System, please note it is critical to NOT install the Inverter on a flammable surface OR in a location where water or moisture may be present. Internal damage or failure to Inverter resulting from failing to follow precautions is NOT COVERED UNDER WARRANTY.

READ AND FOLLOW THE FUJI INSTALLATION GUIDELINES TO PREVENT VOIDING THE MANUFACTURER'S WARRANTY.

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.

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Prior to Installation... Check Existing Power

Fuji recommends a balanced 3 phase power with voltages very close to the same on all 3 phases. Measure the voltages across all legs: L1, L2 & L3.

If the 3 Phase power is imbalanced, it is recommended to order a Single Phase system. With a Single Phase system it is required to double the HP rating of the VFD drive from the motor. (Example: 10 HP motor needs a 20 HP drive.)

*** * * I M P O R T A N T * * ***

Determine power needs BEFORE quoting because pricing will be different from a Single to a 3 Phase REFLEX II system.

Introduction

The **REFLEX II (**Part# 29300) vacuum controller senses the vacuum level in the milking system and controls the speed (RPM) of the electric motor driving the pump. The pump adjusts accordingly to closely maintain the preset vacuum level. As the milking units are attached and detached, the vacuum fluctuates and the Controller increases and decreases the vacuum pump 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 a 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 of operation per day . 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 LCD backlit digital vacuum gauge the vacuum stability and rapid response time can be easily seen.

Deluxe Inverter in Cabinet

Stand-Alone Inverter WITH NEMA 1 Kit

REFLEX II Controller

Included with both Stand-Alone and Deluxe Units.

Reflex II works with Mega G1 and Mega G2

Electrical Specifications

I M P O R T A N T

All electrical connections must meet the installation site's compliance standard for that area.

All Systems

18/2 Shielded Control Cable– For low voltage 4-20 ma connection of the **REFLEX II** Controller to the Frenic Fuji Inverter. The Cable must be routed away from other electrical wiring.

Optional for Reflex II: 18/4 Shielded Control Cable– May be used if a VFD run command signal is required. (See page 11)

18/3 Cable or wire– For the 120 volt AC signal from the main System's Milk/Wash Switch (Washer Panel). If only one vacuum pump signal is available or to be used an 18/2 Cable or wire can be used instead.

Signal Voltage– Milk/Wash signal voltage to the Reflex II may be any voltage from 100-277VAC.

See pages 34-35 for illustrations of Cable Configurations.

Following specifications are for estimated high voltage cable & wiring of the Inverter:

Check Electrical codes for the area for wire sizing! All electrical connections must meet the installation site's compliance standard for that area.

It is recommended to use a VFD rated Cable on the Inverter Output

230 Volt Single Phase Systems

Power Cable or wire from Breaker Panel to Inverter input

5HP - 8 AWG, 3 Conductors, 55A Cont

7.5 HP- 6 AWG, 3 Conductors, 70A Cont

10 HP- 4 AWG, 3 Conductors, 95A Cont

15 HP- 2 AWG, 3 Conductors, 130A Cont

VFD Power Cable from Inverter output to Electric 3 Phase Motor

5, 7.5 &10 HP- VFD Cable 12 AWG, 4 Conductor, 30A Cont

15 HP - VFD Cable 8 AWG, 4 Conductor, 55A Cont

230 Volt Three Phase Systems

Power Cable or wire from Breaker Panel to Inverter input

5HP- 14 AWG, 4 Conductors, 25A Cont

7.5HP - 12 AWG, 4 Conductors, 30A Cont

10 HP- 10 AWG, 4 Conductors, 40A Cont

15 HP- 8 AWG, 4 Conductors, 55A Cont

20 HP- 6 AWG, 4 Conductors, 70A Cont

25 HP- 4 AWG, 4 Conductors, 95A Cont

30 HP- 2 AWG, 4 Conductors, 130A Cont

VFD Power Cable from Inverter output to Electric 3 Phase Motor

5, 7.5 &10 HP- VFD Cable 12 AWG, 4 Conductor, 30A Cont

15 & 20 HP - VFD Cable 8 AWG, 4 Conductor, 55A Cont

25 & 30 HP- VFD Cable 4 AWG, 4 Conductor, 95A Cont

460 Volt Three Phase Systems

Power Cable or wire from Breaker Panel to Inverter input

5HP- 14 AWG, 4 Conductors, 25A Cont

7.5HP- 14 AWG, 4 Conductors, 25A Cont

10 HP- 14 AWG, 4 Conductors, 25A Cont

15 HP- 12 AWG, 4 Conductors, 30A Cont

20 HP- 10 AWG, 4 Conductors, 40A Cont

25 HP- 8 AWG, 4 Conductors, 55A Cont

30 HP- 6 AWG, 4 Conductors, 70A Cont

VFD Power Cable from Inverter output to Electric 3 Phase Motor

5, 7.5, 10 & 15 HP- VFD Cable 12 AWG, 4 Conductor, 30A Cont

20, 25 & 30 HP - VFD Cable 8 AWG, 4 Conductor, 55A Cont

FUJI Frenic Inverter Current Ratings

Power to the Inverter must have a designated Circuit Breaker from the electrical panel.
(not shared with other equipment)

Below are the VFD System's Maximum Input Current Ratings for each package. Install the proper Circuit Breaker for these current ratings.

Note * *All electrical connections must meet the installation site's compliance standard for that area.*

These ratings do not reflect the actual operating current or average power consumption of the system. They reflect the peak currents that could occur during startup and what the Inverter is capable of handling for current draw. An undersized Circuit Breaker for the system may cause problems. The Inverter has an electric motor name plate current setting that will be selected when programming drive parameters after the installation is complete. When set, this will protect the electric motor.

240 Volt Single Phase Systems Input Current

5HP - 37 Amps

7.5 HP - 53 Amps

10 HP - 70 Amps

15 HP – 95 Amps

240 Volt Three Phase Systems Input Current

5 HP- 20 Amps

7.5 HP- 27 Amps

10 HP 37 Amps

15 HP- 53 Amps

20 HP- 70 Amps

25 HP- 84 Amps

30 HP- 95 Amps

480 Volt Three Phase Systems Input Current

5 HP- 10 Amps

7.5 HP- 15 Amps

10 HP- 21 Amps

15 HP- 28 Amps

20 HP- 36 Amps

25 HP- 42 Amps

30 HP- 50 Amps

Stand-alone Inverters

CHOOSING SYSTEM LOCATION FOR STAND-ALONE INVERTER

The Inverters are NOT in a wash down enclosure. Install in a dry area as they are NOT water resistant. Place the system next to the Vacuum Pump in the pump room or in the utility room.

The drive should be installed in a conditioned cabinet or a ventilated enclosure. The Deluxe **REFLEX II** System is a fan-cooled and ventilated NEMA 4 rated enclosure. Fuji Drives have NEMA 1 enclosures which are suitable for clean areas only. If something such as delicate paperwork cannot be left in the immediate vicinity of the drive, a NEMA 1 drive should not be placed there either. Check with the Fuji Drive Manual for other routine service requirements and environmental specifications.

W A R N I N G

Install the inverter on a base made of metal or other non-flammable material.

***DO NOT place flammable object nearby* AS FIRE COULD OCCUR.**

While the Fuji Inverters are one of the most durable and reliable Inverters made, a small percentage of Inverters fail in the first 10 years. Of the failures in that time period, the overwhelming majority failed due to water or moisture damage within the first 2 years of installing them. About 40% of them were damaged during cleaning when a hose was used nearby, or when another device sprung a leak on them. The other 60% failed from moisture dripping down on top of the unit from above. This moisture may be condensation or "sweat" from the ceiling or from other equipment mounted above the Drive. An equipment room may seem like a dry and safe location, however, condensation can still form on the ceiling or on equipment above, so there is always a possibility for droplets of water to form and drip. Because of the conductivity of water, especially with high voltage, the shorting of the circuitry in the Inverter often causes damage beyond repair.

Water or moisture damage is NOT covered under Warranty.

There is a Shroud kit (Part# P19700NP) available to prevent this damage. This kit is included by standard with all Stand-Alone or non-Deluxe REFLEX II Systems to help eliminate the possibility of moisture from above damaging the unit and potentially destroying the Inverter.

For extra protection, install a shroud kit if there are existing units in the field that do not currently have one. See photos for proper placement of the Shroud above the Inverter

IMPORTANT

If the Milk/Wash Room is the only option for placement, choose a Deluxe **REFLEX II** Package for the installation. The chemical steam or mist can affect the air drawn into the Deluxe Box, so it is recommended to install a dry fresh air line to the intake vent on the Deluxe Cabinet, similar to duct work found on a clothes dryer.

Components for Installation

1. Mounting hardware for the Inverter or the Deluxe Box and the **REFLEX II** Controller
2. Vacuum relief valve
3. Electrical Conduit
4. Circuit Breaker
5. Cable and Wire

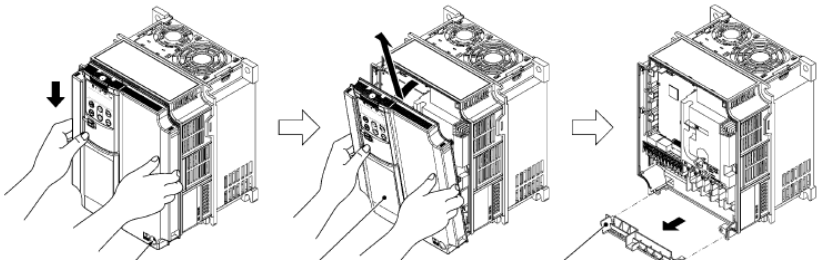
Mount the REFLEX II enclosure in a visible area of the parlor, so the vacuum level is easily viewed. This enclosure is water resistant, but should not be sprayed directly. See pages 15-16 for mounting and wiring instructions.

Mounting The Stand-Alone Fuji Mega Inverter

1. Area of mounting should be clean, dry, and close to the vacuum pump. The Inverter system is very heavy and should be bolted onto a secure surface. Failing to follow the conditions listed below may void the warranty of the Inverter.
    - Never install the Inverter in a place subject to high temperature (over 100F), high humidity, or excessive vibration.
    - Mount Inverter system vertically; do not restrict air flow to the heat sink fans.
    - The Inverter generates heat. Allow sufficient space around the system for air circulation. (More than 12 inches in all directions)
    - Do not mount the Inverter system above heat-generating equipment or in direct sunlight.
    - Mounting Stand-Alone Drive 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.

Wiring The Stand-Alone Fuji Mega Inverter

1. Loosen the front cover fixing screw, slide the cover downward holding both sides, tilt it forward, and pull upward. See below. While pressing the wiring guide upward, pull it forword. For wiring:
   MEGA G2- see Section 2.2.3 through 2.2.6 in the FRENIC MEGA G2 VFD Manual.
   MEGA G1- see Sections 2.3.2 through 2.3.6 in the FRENIC MEGA G1 VFD Manual.
   Reinstall cover in reverse order after wiring.



2. Wire the Inverter to a constant power source. Refer to pages 6-8 for electrical wiring specifications, i.e. recommended cable size, circuit protection, etc. See next page for torque requirements,
3. For connecting to Single Phase Input Power, use input terminals “L1” and “L3”, leaving “L2” empty. When powered on, disable the Phase Drop Off Protection by changing parameter “H98” to “00010001”. 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 power must be cycled, the following can be done:

   Option #1. Wire “CM” and “FWD” from the drive to the Reflex II circuit board terminal “VFD Run Command”. This is a Dry Contact, therefore it is not polarity specific.

   Option #2. Install a wire jumper between “CM” and “FWD” on the Frenic terminal strip. See pictures on next page.

IMPORTANT: For either option, change the “F02” program parameter on the drive from “0” to“1”.

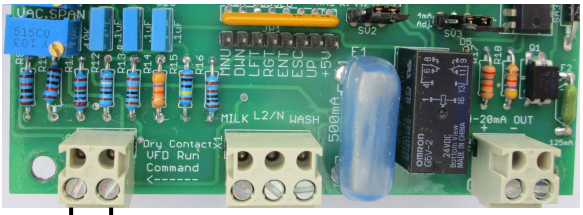
NOTE

If using the Reflex II controller run command, it must be powered down to change parameters “F01”, “F02”, “F42”, “H08” and “H98”.

If using only a jumper wire connecting “CM” and “FWD” instead of the Reflex II option, disconnect the jumper to change parameters “F01”, “F02”, “F42”, “H08” and “H98. Reconnect after change is made.

CM and FWD Connections

Reflex II



VFD Run Command

VFD

Jumper

FUJI FRENIC VFD Power Input/Output Terminal Torque Recommendations

The wire terminals “L1”, “L2”, “L3” and “U”, “V”, “W” on the Inverter must be tightened with a Torque Wrench to the specifications listed below. If these connections are not tight enough, the heat generated from a loose connection will cause these terminals to overheat and melt both the terminal and wire connection.

- 5HP Inverters: Torque to 1.8 N·m
- 7.5, 10 and 15HP Inverters: Torque to 3.5 N·m
- 20, 25 and 30HP Inverters: Torque to 5.8 N·m

N·m = in. lb. x 0.113	Torque Conversions	In. lb. = N·m x 8.85
N·m = ft. lb. x 1.356		Ft. lb. = N·m x 0.737

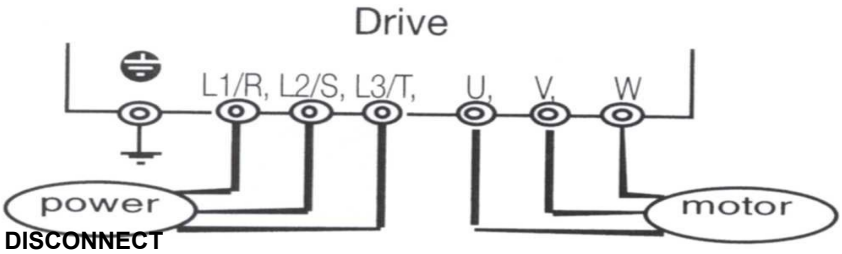
WARNING

Disconnect electrical supply before servicing the system

5. Drive output terminals (U, V, W)

   Connect these terminals to a three 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 to the corresponding U, V, W on the inverter. See torque requirements above.



POWER FROM DISCONNECT SWITCH WITH DELUXE

Drive connection

Deluxe System Mounting

Mounting For The Deluxe System

1. Area of mounting should be clean, dry, and close to the vacuum pump. The Inverter system is very heavy and should be bolted onto a secure surface. Failing to follow the conditions listed below may void the warranty of the Inverter.
    - Never install the Inverter in a place subject to high temperature (over 100F), high humidity, or excessive vibration.
    - Always mount the Deluxe cabinet vertically.
    - The Deluxe Inverter Unit generates heat. Allow sufficient space around the system for air circulation. (More than 4 inches in all directions)
    - Do not mount the Deluxe Inverter cabinet above heat-generating equipment or in direct sunlight.
    - If mounting Deluxe Inverter cabinet in an area that may have high moisture or condensation, duct the intake air from a dry, clean air source using flexible exhaust tubing, similar to a household dryer.
2. Mount the REFLEX II enclosure in a visible area of the parlor, so vacuum level is easily viewed. This enclosure is water resistant, but should not be sprayed directly. See page 15-16 for mounting and wiring instructions.

Deluxe Optional Equipment

Installing Optional Equipment In The Deluxe Cabinet

Mounting

Mark the mounting holes, then drill and tap threads to bolt the items to the back plate.
Warning!! Do not allow metal particles to drop into the Fuji Inverter.

Install the Line Reactor and RFI Filter as shown above. Confirm proper grounding to backplate.

Wiring

1. Disconnect the wires at the Disconnect Switch going to the Inverter.
2. Install a new set of wires from the Disconnect Switch to the input of the Line Reactor, then from the output of the Line Reactor to the Input of the RFI Filter.
3. Reconnect the wires removed in step 1 to the output of the RFI filter.
4. Power wires should be connected as pictured below.

Follow torque recommendations on page 12.
Illustration depicts 3 phase installation. For single phase applications, use L1 & L3 (L2 not used)

Reflex II Controller Installation

Choosing Reflex II Controller Location

The **REFLEX II** 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, however, it should NOT be sprayed directly with a pressure hose. The barbed fitting for sensing the vacuum should be placed 24" to 48" from the sanitary trap on the vacuum pump side. The **REFLEX II** Controller should be mounted higher than the tap hole and no further away than 36" away from the barbed fitting. This will allow moisture in the sensing tube to drain back into the vacuum line.

Mounting the Reflex II Controller

IMPORTANT!

Whenever front cover needs to be removed, use caution to not tear the ribbon cable that connects the keypad to the circuit board. Gently remove the ribbon cable connector by grasping the end of the ribbon cable and pulling straight out.

1. Remove the front cover to expose the 4 mounting holes, one in each corner, and mount in desired location.
2. Drill a 3/8" hole in the vacuum pipe that comes from the vacuum pump to the sanitary trap and thread with a 1/8th NPT tap. The hole should be located 24" to 48" from the sanitary trap on the vacuum pump side, and be no more than 36" from the REFLEX II Controller.
3. Thread the 1/8th NPT brass barb fitting into the hole and connect the tubing from the REFLEX II Controller.

Wiring the Reflex II Controller

The **REFLEX II** requires 100-277VAC power from the Master Control/Washer. The power is separated for wash and milking. This signals the Controller when to run at the wash cycle vacuum level or the milking vacuum level.

The signals between the washer switch and **REFLEX II** Controller should be wired so that the voltage is sent to the **REFLEX II** Controller "**Milk**" terminal when the switch is in milk position and to the "**Wash**" terminal when the washer switch is in Wash position.

> ***NOTE***
>
> For assistance with wiring, refer to pages 34-35 for wiring configurations.

1. When wiring for an independent Wash and Milk Signal, install a 3 conductor, 18 gauge wire from the Washer Control or a Master Control panel to the **REFLEX II** Controller terminal block labeled "INPUT". Connect the white wire to the "L2/N" terminal, the Black wire to the "Milk" terminal and the remaining conductor to the terminal marked "Wash". This 100-277 VAC signal to the **REFLEX II** Controller determines whether the system is in "Wash" or "Milk" Mode. The **REFLEX II** adjusts the vacuum to the preset level for the mode being used.
2. If only one vacuum pump signal is available from the Washer/Master Controller, an 18/2 wire is sufficient. Connect only to the Milk and "L2/N" terminals.
3. Install an 18/2 or 18/4 gauge shielded cable from the **REFLEX II** Controller terminal labeled "4-20mA OUT" to the VFD Inverter 4-20mA analog input. For Frenic MEGA inverter installations, connect "+" to "C1" of the inverter and "-" to "11" of the inverter.

For VFD drives other than Frenic MEGA, refer to 4-20mA analog input instructions provided for the drive being used.

IMPORTANT! Polarity MUST be correct. NEVER apply AC voltage to the "OUTPUT" terminal of the Reflex II circuit board! Board will be damaged and need to be replaced.

Return damaged boards to E-ZEE Milking Equipment LLC for repair.

EMI (electromagnetic) Interference Solutions

It is recommended to leave the drain wire of the 4-20mA shielded cable disconnected from earth ground unless RF interference causes problems.

If RF Interference problems are suspected:

1. Connect the drain wire of the shielded cable to the ground at the inverter.
2. If RF Interference problems persist, also connect the drain wire to earth ground close to the Reflex II Controller.

REFLEX II Set-up and Operation

FAILURE TO FOLLOW INSTRUCTIONS BELOW MAY RESULT IN PHASE LOSS ALARM FAULTS.

Before starting the system:

1. Access parameter “F11" and enter the motor amp rating from the motor name plate. Note: (Multiply the Motor Name Plate “F.L.A” current by 1.15 (Ex: FLA = 20A x 1.15 = **23**)
2. If input power is single phase, change parameter “H98" to “00010001".

The operating parameters of the Mega Inverters are preset for Reflex II systems. Using the Inverter keypad, additional reprogramming may be necessary depending on the type of installation, see pages 22-29 for instructions. Note: (There is a one section for Mega G1 and one for Mega G2)

NOTE

In the event of a power outage, alarm code, or prior to powering the **REFLEX II** Controller in a new system, change the Inverter mode from **STOP** to **RUN** using the FWD key on the Inverter keypad.

With the Inverter displaying “RUN”, power the Reflex II and the vacuum pump should start.

Built in Soft Start:

The Reflex II controller has a fixed 15 second soft start feature. Any time the unit is powered down and restarted it will take approximately 15 seconds to ramp up from stopped to full speed. The only exception to this is when performing autotune.

Vacuum Calibration Check:

Although unit is factory calibrated , for optimal performance vacuum readings should be compared with a reliable vacuum measuring tool. If vacuum level displayed deviates from levels displayed on the test equipment, perform a vacuum recalibration.

Vacuum Recalibration procedure:

Calibrate the gauge using the vacuum zero and vacuum span pots. (See illustration on page 20) With no vacuum applied the Screen should display 0.00” Turn zero pot clockwise to increase, counterclockwise to decrease. Apply 12” or higher of vacuum, use a calibrated vacuum meter to verify the vacuum level. Adjust span to match known level, clockwise to increase, counterclockwise to decrease. Repeat procedure until display is accurate at 0.00” and at high vacuum.

Note: Both of these potentiometers are multi-turn (25 turn) pots and do not have built-in stops.

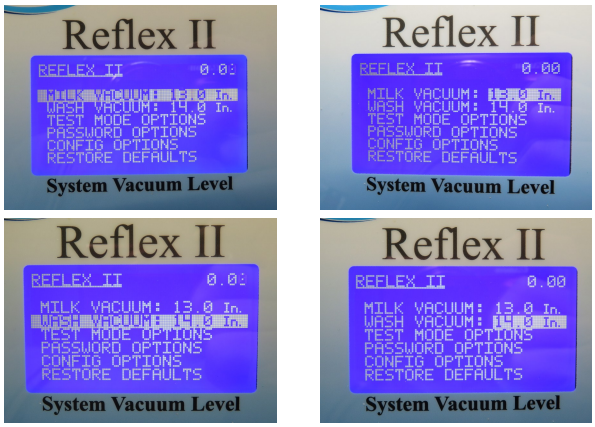
Reflex II Setup

Setting Milk and Wash Vacuum Levels:

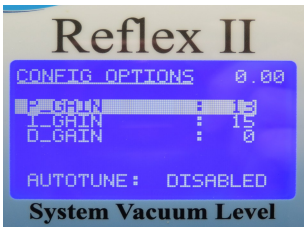
Press menu to enter the parameter settings screen. Press up or down to highlight the parameter to be changed. Press enter to highlight the setpoint. Press up or down to increase or decrease the setpoint. Press enter to confirm.

IMPORTANT: For optimal performance, system should be autotuned any time Milk vacuum is modified or after the vacuum pump or motor is replaced. See below

Default Values



Autotuning the system:



Prepare the vacuum system as if starting a milking session, confirm milk vacuum level is set to desired setpoint and turn Milk/Wash switch to “Milk”. Vacuum pump should start. Highlight Config Options and press enter, then scroll to “Autotune: Disabled” and press enter. “Disabled” should be highlighted. Press up or down arrow and controller will automatically start autotune. The vacuum pump should stop and vacuum will decay to “0”, then the vacuum pump will start again without soft start. The P Gain number should increase until a certain level is reached, then autotune sets the P Gain and starts increasing the I Gain until the desired level is reached.

Upon completion of Autotune the new P Gain and I Gain configuration numbers should be displayed. D Gain stays at 0 and can only be changed manually. D Gain set to 0 is sufficient for most systems. If autotune fails, P Gain can be set to 13 and I Gain can be set to 15. This configuration should be sufficient to milk with until problems can be resolved and the system autotunes properly.

Total autotuning procedure shouldn’t exceed 20 seconds. If performance is satisfactory, installation is complete.

IMPORTANT: For optimal performance, system should be autotuned any time Milk vacuum is modified or after the vacuum pump or motor is replaced.

QUICK START IN THE EVENT OF AN EMERGENCY

In the event of needing to milk immediately, a vacuum system with a properly sized vacuum pump and drive motor with minimal abnormal leakage will likely be sufficiently stable with the default PID setting of P=13, I=15 and D=0. Perform the autotune procedure after emergency milking is finished.

If the system responds too slowly to fluctuations, increase P gain by one or two increments at a time, then retest.

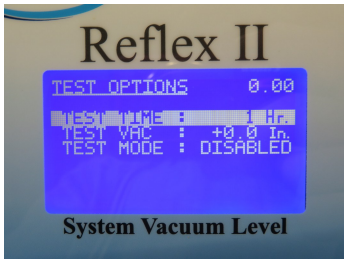
If the system struggles to reach the desired level, increase I gain by one or two increments at a time, then retest.

If vacuum pump oscillates, decrease P gain by one or two increments at a time, then retest. If vacuum pump still oscillates, decrease I gain by one or two increments at a time, then retest.

Reflex II Functions & Features

Setting Test Day Vacuum Level and Timer:

To enter the Test Options Screen, highlight Test Day Options and press enter. Set test time for the amount of the time vacuum level needs to be elevated. Test vac is an add on to the set milk vacuum level.

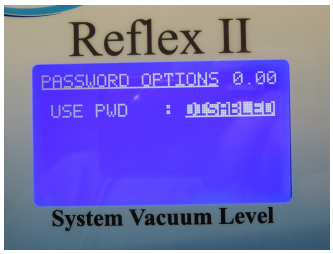


Example: Milk Vacuum Level = 13.0 and Test vacuum = +0.3 will raise the vacuum level to 13.3" for the duration of Test Time.

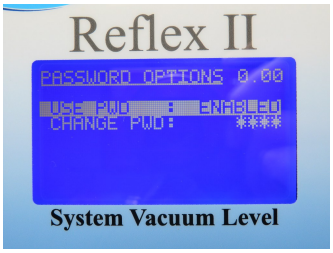
To activate Test Day, highlight Test Mode, press enter to highlight "Disabled", press UP to display "Enabled", then press enter. After test day time expires, unit automatically reverts to normal milking vacuum level.

Activating and Changing Password (Optional)

Highlight "Password Options" then press enter. Press enter again to choose "password enabled", and press enter. "Verify password" will be displayed. Using the keypad, set to factory default "AAAA" then press enter.



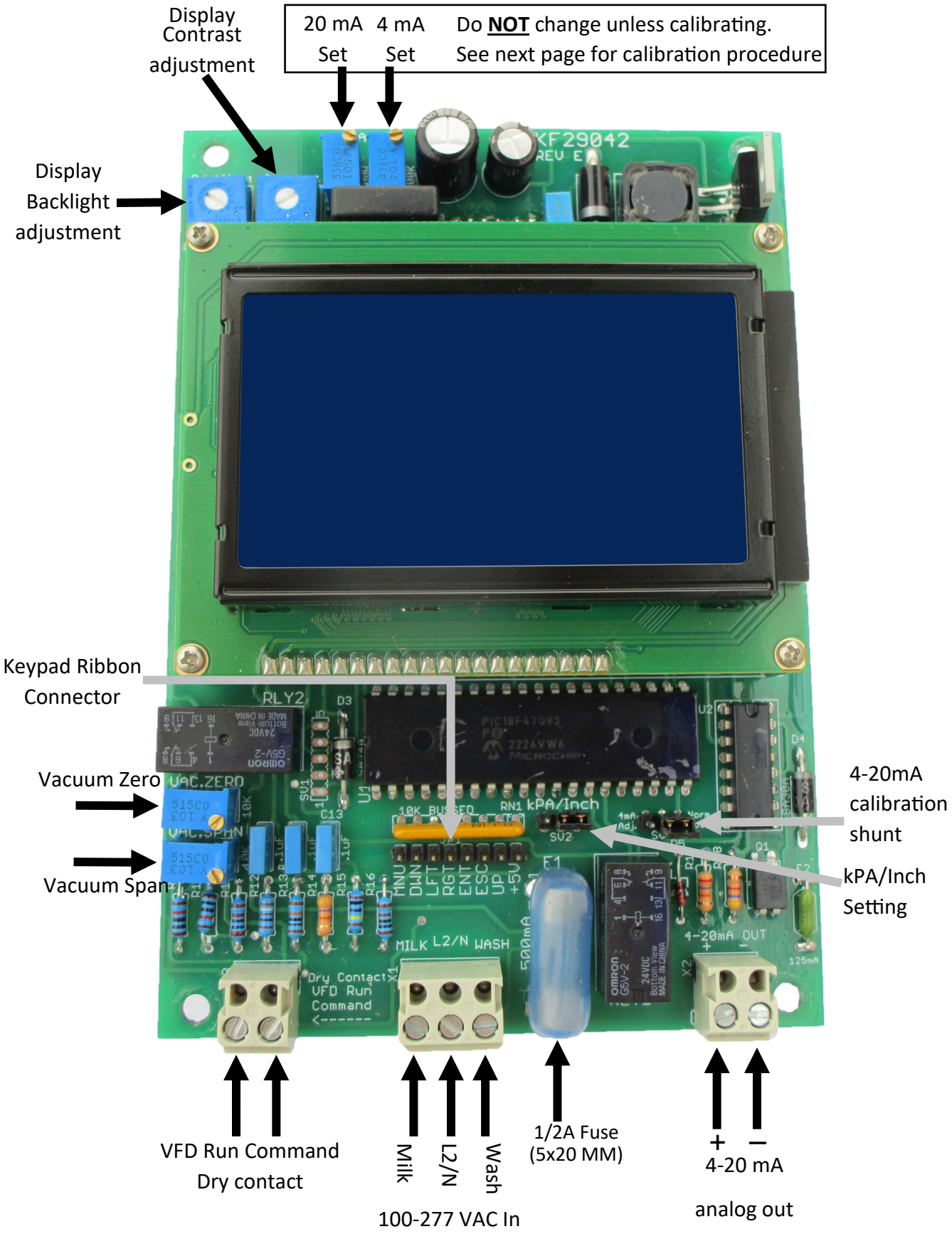
If a password other than the factory default is desired, return to the password options and select "Change password". Enter the new desired 4 digit password , then press enter. "Verify password" will be displayed. Enter the new password again, press enter, and the display should now be in the main parameter screen.



Write the new password down and store it in a safe place as it will be required for future parameter changes. Parameters remain accessible for 10 minutes after password is entered. Cycling the power of the controller locks the parameters.

In the event of a lost password contact tech support:
610-273-7016. After hours: 920-602-6724

Reflex II PCB Illustration



Additional Reflex II Options

Display Readability Adjustments:

Adjust display backlight potentiometer to desired backlight level. Turn clockwise for brighter and counterclockwise for dimmer backlight.

Adjust display contrast potentiometer to desired contrast level. Turn clockwise for increased and counterclockwise for decreased contrast.

Note: Both of these potentiometers are single turn pots. **Do not force past the built-in stops.**

4-20mA analog output calibration procedure:

Controller is factory calibrated and should not require adjustment.

Remove the terminal connector from the 4-20mA analog out connection. Set an accurate ammeter to read 20mA. Connect the red probe to + and the black probe to –. Apply power to the MILK and L2/N terminals and wait 15 seconds for soft start time to expire.

With vacuum level at "0" the ammeter should display 20mA. If adjustment is needed, turn the "20mA set" potentiometer clockwise to increase and counterclockwise to decrease until the ammeter displays 20mA. Leaving the ammeter attached, move the 4-20mA calibration shunt (jumper) from the "Normal" position to "4mA adjust". The ammeter should display 4mA. If adjustment is needed, turn the "4mA set" potentiometer clockwise to increase and counterclockwise to decrease until the ammeter displays 4mA. Return the shunt to "Normal" position and recheck 20mA. Repeat this procedure until the ammeter displays 20mA with the shunt in "Normal" and 4mA with the shunt in "4mA Adjust"

Note: Both of these potentiometers are multi-turn (25 turn) pots and do not have built-in stops.

Restoring Factory Default:

To perform a reset using the "Restore Defaults":

If problems are encountered and parameters are scrambled, the controller can be reset to default parameters.

Press menu to enter the parameters screen. Highlight Restore Defaults and press enter, then press enter to confirm or escape to cancel.

If controller is reset to factory defaults:

All parameters will be reset to default settings and it is important to note the following:

- Password will revert to AAAA.
- If vacuum levels differ from the default values, they need to be reprogrammed.
- Configuration settings will revert to default as well.
- Always perform the autotune procedure after defaults are restored.

Programming Parameters For Mega G2

NOTE

The Inverter must be in the UNLOCKED Mode to be able to program parameter settings. Also, some settings cannot be changed while the Inverter is in the RUN Mode. Press 'STOP' to enter the STOP Mode.

Programming Parameter Settings For All Mega G2 Inverters

1. Power the VFD, press 'PRG' and the Menu screen will display.

   (Menu Screen options shown on next 2 pages)

1. Highlight #0 "Favorite Param" and press 'Set'. This will display the E-ZEE default parameters.
2. Use 'Λ' or 'V' to select parameters (See list on pages 27-28).
3. Select the parameter to be changed and press 'Set'.
4. Use 'Λ' or 'V' to select the correct option and < or > to change a specific number.
5. Press 'Set' to save the setting. ('Reset' can be used to go back)
6. Follow the same procedure to make additional parameter changes.
7. Press 'PRG' or 'Reset' to exit Programming Mode.
8. Press 'FWD' to return to RUN Mode.

If the full list of VFD parameters is desired:

1. Scroll down to #2 "Function Codes", press 'Set', then to #2 "DATA CHECK" and press 'Set' again.
2. Function code groups will be displayed, select desired group and press 'Set'.
3. All VFD parameter settings for that group will be listed.

FUJI FRENIC MEGA G2 Parameters

NOTE: Inverter must be in STOP mode to view or modify Parameters.

All parameters in **2-3 "Changed Data"** have been modified from Fuji factory settings and should match the parameter settings chart listed on pages 27-28. Changed parameters will also show an * in Data Set and Data Check.

Inverter Program Menu Screen

To enter and view the Inverter's Program Menu Screen press 'PRG' to display following menus:

(To make changes, highlight **#0 Favorite Param.** and press 'Set'. This will display the E-Z default parameters. If the full list of VFD parameters is desired, scroll down to #2 "Function Codes", and press 'Set' . See previous page for detailed programming instructions).

Functions:

0. Favorite Parameter - Displays the EZEE default parameters

1. Start-up

- **1-1 Language**
- **1-2 App select**
- **1-3 Date/Time**
- **1-4 Disp Setting**
- **1-5 Bluetooth**

2.Function Code

- **2-1 Data Set -** Modify parameters.
- **2-2 Data Check** - View and/or modify parameters.
- **2-3 Changed Data** - View all parameters that have been modified from FUJI factory default.
- **2-4 Data Copy** - For storing and sending program data from the Keypad to the Inverter or vice versa. See page 38 or refer to the Fuji Manual for its use.
- **2-5 Schedule Set.** -
- **2-6 Initialize** -

3. INV Info

- **3-1 Energy Monitor** -
- **3-2 Op Monitor** - Monitor the Output Frequency, Current, and Voltage to the motor.
- **3-3 I/O Check** - Monitor the voltage and the 4 -20mA input from the **REFLEX II** Controller (scroll to 4th screen down) "V2=" displays the voltage reading from the **REFLEX II** Controller. "C1=" displays the current coming from the **REFLEX II** Controller.
- **3-4 Maintenance** - Cumulative VFD hours and Reflex II system hours.
- **3-5 Unit Info** -
- **3-6 Destination** -

cont. on next page

MEGA G2 Parameters & FUJI Manual Links

Functions cont.

4. Alarm Info

4-1 Alarm History - For more information on the Alarm Causes, refer to Section 6 in the Fuji Inverter Manual. See QR codes below.

4-2 Warn. History -

4-3 Retry History -

5. User Config

5-1 Select Favos - Choose which functions are displayed in '**0.Favorite Parameter'**

5-2 Password -

6. Tools

6-1 PID Monitor -

6-2 Multi-Op Mon -

6-3 Resonant Avd. -

6-4 Load Factor - Tests max and average output current to the electric motor during Milk or Wash (Max time 3600 seconds)

6-5 COM Debug -

KP Update

Fuji Manual

Complete FRENIC MEGA G2 Manual

https://www.fujielectric.com/products/inverter/frenic-megag2/download/_pr/

Chapter 5 FUNCTION CODES

Scan for Individual PDF lists of more information for each Function Code Group

https://www.fujielectric.com/products/inverter/frenic-megag2/download/_pr1/

Chapter 6 ALARM CODES

Scan for PDF of more information on Function codes list

https://www.fujielectric.com/products/inverter/frenic-megag2/download/_pr2/

Programming Parameters For Mega G1

NOTE

The Inverter must be in the UNLOCKED Mode to be able to program parameter settings. Also, some settings cannot be changed while the Inverter is in the RUN Mode. Press 'STOP' to enter the STOP Mode.

Programming Parameter Settings For All Mega G1 Inverters

1. Power the VFD.
2. Press 'PROGRAM' and Menu screen will display. (Menu Screen options shown on next page)
3. Scroll down, highlight "DATA CHECK", and press 'FUNC/DATA'.
4. Parameter settings will appear.
5. Use 'Λ' or 'V' to select parameters. (See list on Pages 27-28).
6. Select the parameter to be changed and press 'FUNC/DATA'.
7. Use 'Λ' or 'V' to select the correct option or press shift to change a specific number.
8. Press 'FUNC/DATA' to save setting.
9. Follow the same procedure to make additional parameter changes.
10. To exit PROGRAMMING Mode, press 'RESET' twice.
11. Press 'FWD' to return to RUN Mode.

Advancing Through Function Code Groups in "DATA CHECK" and "DATA SET"

Press the 'SHIFT' Key and the 'Λ' or the 'V' Key simultaneously to advance through the function code groups without having to scroll through each parameter.

FUJI FRENIC MEGA G1 Parameters

NOTE: Inverter must be in STOP mode to view or modify Parameters.

All parameters showing an * have been modified from Fuji factory settings and should match the parameter settings chart listed on pages 27-28.

Inverter Program Menu Screen

To enter and view the Inverter's Program Menu Screen, press 'PRG'. The LCD will illuminate and show a list of nine different Functions. See previous page for detailed programming instructions.

Display on keypad panel

Functions:

0. **QUICK SET**
1. **DATA SET** - Modify parameters.
2. **DATA CHECK** - View and/or modify parameters.
3. **OPR MNTR** - Monitor the Output Frequency, Current, and Voltage to the electric motor.
4. **I/O CHECK** - Monitor the voltage and the 4 -20mA input from the **REFLEX II** Controller.
   "V2=" displays the voltage reading from the **REFLEX II** Controller.
   "C1=" displays the current coming from the **REFLEX II** Controller.
5. **MAINTENANCE**– Cumulative VFD hours and Reflex II system hours.
   "Time=" Shows the cumulative hours the Inverter has been in service.
   "TCAP=" shows total hours the **REFLEX II** System's vacuum pump has been running.
6. **ALM INF** - Displays 9 screens of alarm information to troubleshoot the system. The time, frequency, voltage, current, and a description of the alarm occurrence will be displayed.
7. **ALM CAUSE** - Shows the history and cause of all alarms.
   For more information on the Alarm Causes, refer to Section 6 in the Fuji Inverter Manual.
8. **DATA COPY** - For storing and sending program data from the Keypad to the Inverter or vice versa. Refer to the Fuji Manual for its use.
9. **LOAD FCTR** - Tests max and average output current to the electric motor during Milk or Wash (Max time 3600 seconds)
10. **USER SET**
11. **COM DEBUG**

Fuji Manual

Section 5: Fuji VFD's full parameters.

Section 6: Alarm codes & Troubleshooting . 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.

Section 7: Maintenance and Inspection.

E-ZEE Default Parameter Settings

See ' 0. Favorite Parameters' for a list of just the following E-ZEE Default Parameters. (Only on Mega G2) Parameter settings in "DATA CHECK" show an * after being modified from Fuji factory settings. 21 of the 700 +parameter settings in the Inverter are used. The "E-ZEE Settings" are preprogrammed into the drives shipped from EZ.

IMPORTANT! #7 (Motor Specifications) Must be set in every installation.

The six Parameters marked Optional may be adjusted for farm specific preferences. The others should not need to be adjusted.

E-ZEE Default Parameter settings for the Fuji MEGA Drives

	Parameter #	E-ZEE Settings	Parameter Function
1 Optional	F00*	0= Unlocked	Data protection 1=Lockout (Use to prevent unauthorized changes.)
2	F01*	2	4-20mA Current Input
3 Optional	FO2	0	0= Keypad (Operate drive using FWD and STOP on the keypad) 1= Run Command to "CM" and "FWD"
4	F07*	1.00s	Acceleration Time
5	F08*	.75s	Deceleration Time
6	F10*	2	Forced Air Motor O/L
7	F11*	**Field Set Required** Motor Specifications	**Must be set with every installation to protect the motor and inverter.** Multiply the Motor Name Plate "F.L.A" current by 1.15 (Ex: FLA = 20A x 1.15 = **23**)
8	F14*	3	Ride Through Momentary Power Drops
9	F26*	8 KHz	Motor Frequency (Noise)
10	F40*	150%	Torque Limit
11	E01	1009	Enables an alarm if Deluxe Cabinet's SPD is blown
12 Optional	C33	.05	Must be set at .05 to perform autotune with the Reflex II Modify ONLY if needed to smooth out the pulsation response. Max adjustment:.05 to .15

Parameters continued on next page

E-ZEE Default Parameter cont.

	Parameter #	E-ZEE Settings	Parameter Function
13	H04*	5	Auto Reset for OU Alarms
14	H06*	1	Auto Fan Enabled
15	H08*	1	Reverse Lock Active
16	H11*	1	Coast to Stop
17	H12*	0	Instantaneous Overcurrent Limiting “Disable”
18	H96*	0	Disable ER-6 Fault Alarms
19 Optional	H98*	01010001 For all 3 Phase applications	Detect Braking Disable NOTE: H98 is a binary number setting used for multiple functions. With the MEGA G1, use ‘SHIFT’ to move the cursor left and right.
19 Optional	H98*	00010001 For all Single Phase applications	Phase Drop off Protection Disable **Set to this only for single phase inputs.**
20 Optional	K08	0: Disable	Displays the status message. (Only valid for Mega G2)

The following parameter will perform a full reset to Fuji defaults. All E-ZEE and field required parameters will need to be reprogrammed.

The Data Copy function can be used to restore the data from the Keypad settings which are E-ZEE factory defaults, unless field changed parameters have been uploaded to the keypad (If using MEGA G1).

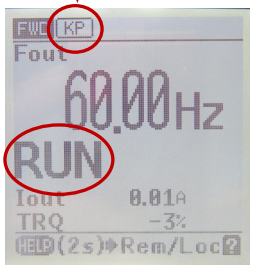
The MEGA G2 Keypad can store 3 programs. See page 38 for MEGA G2 data copy instructions.

	Parameter #	Reset Settings	Parameter Function
21	H03	1	Press ‘STOP’ and ’Λ’ Key simultaneously, then press ‘SET’ (‘FUNC/DATA’ for Mega G1) to reset all parameters to Fuji factory default settings.

The Inverter display **MUST** be in the 'REM' (Remote) Mode to operate with the REFLEX II Controller. Ensure VFD is in "RUN" mode. After a power outage or an Alarm Code reset, the Inverter must be reset to "RUN" by pressing 'FWD'.

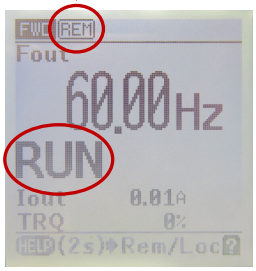
MEGA G2 VFD

CORRECT



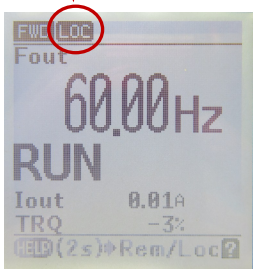
In Remote mode, using the Keypad 'FWD' and 'STP' to Start and Stop

CORRECT



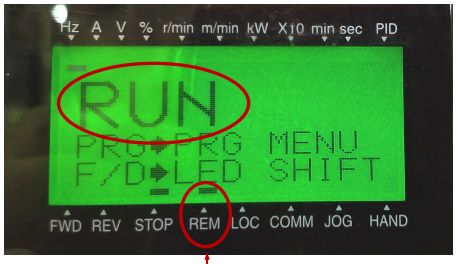
In Remote mode, using the VFD Run command from the Reflex II, or with a jumper installed from "CM" to "FWD"

INCORRECT

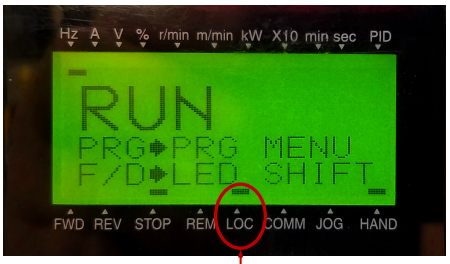


Unit will display the output frequency by default. From the main display press 'Set' then use up or down to scroll through the 10 different display options. Output current, output voltage, etc.

MEGA G1 VFD



CORRECT



INCORRECT

Changing the Top Numerical Display Monitor

The top numerical display shows the output frequency by default. There are 12 selectable options in parameter E43 to display: RPM of the motor, Output voltage to the motor, Output current to the motor and Input power consumption in kilowatts, etc. Enter parameter E43 and press the 'FUNC/DATA' Key, then scroll and view the options.

E-Zee Milking Equipment LLC is not responsible for any Inverter NOT purchased from E-Zee Milking Equipment LLC *even if using the REFLEX II* Controller. Read the Inverter Manual for directions on set-up, features, maintenance and troubleshooting.

REFLEX II System Maintenance

Terminals Torque Check

Variable Frequency Drives (VFD) require minimal maintenance, but the following should be checked:

- After several hours of operation on a new installation, check the terminals to ensure they remained tight. See torque settings below.
- Recheck periodically, especially on the drive output terminals.

IMPORTANT Loose terminals can cause excess vibration, which creates excessive heat and can cause premature failure of the drive. If loose terminals are a continuing occurrence, ensure that the surface which the VFD is mounted to does not have excessive vibration.

- 5HP Inverters: Torque to 1.8 N·m
- 7.5, 10 and 15HP Inverters: Torque to 3.5 N·m
- 20, 25 and 30HP Inverters: Torque to 5.8 N·m

N·m = in. lb. x 0.113	Torque Conversions	In. lb. = N·m x 8.85
N·m = ft. lb. x 1.356		Ft. lb. = N·m x 0.737

Cooling & Airflow

Clean airflow through the VFD's heatsinks via the fan is critical for cooling. Ensure the heatsinks are kept free of dust and dirt. Accumulation of debris in the heat sink can cause localized hot spots in the Drive and premature component failure. If the heat fins require frequent cleaning, the drive may be located in an unsuitable environment.

Hour Meter

View parameter "H94" on the inverter for the system maintenance Hour Meter. After maintenance is complete, the hours can be reset to "0".

With Deluxe REFLEX II Systems

Check the Intake and Exhaust Filters, clean or replace as necessary. Also check terminal connections on the Disconnect Switch, optional Line Reactor and RFI Filter.

Replacing Etron PMII With Reflex II

Remove power to the system.

Mounting the Controller

Install the Reflex II in place of the Etron. Since the analog output from the Reflex II is 4-20mA instead of 0-10V,it can be mounted in any location. (Out in the parlor, etc.) The Reflex II can also be mounted at the same location as the Etron if desired.

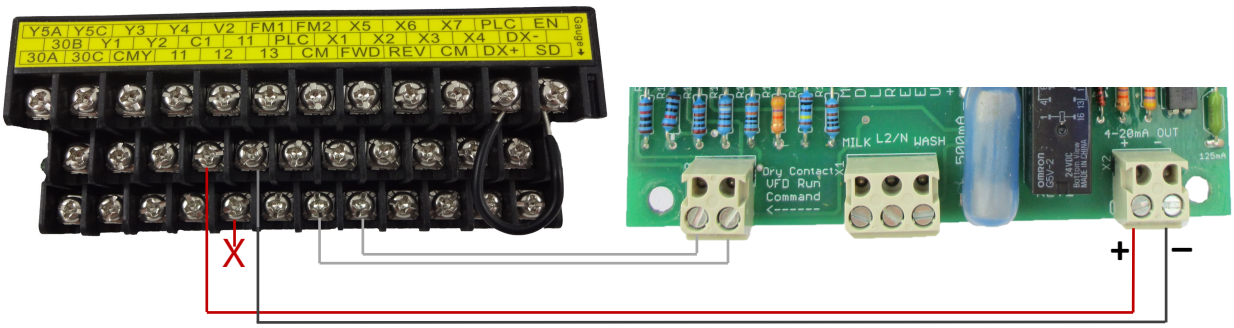
IMPORTANT The 4-conductor communication cable from the controller to the VFD must be shielded.

Disconnect the Etron Board 120 VAC Input wires and reconnect to the Reflex II VAC Input terminals.

To power the Reflex II with independent Milk and Wash Signals:

1. Connect the “Wash” signal (terminal 16 of Etron) to the “Wash” input of the Reflex II.
2. Connect the “Run” signal (terminal 18 of Etron) to the “Milk” input of the Reflex II.
3. Connect L2/N (terminal 22 of Etron) to the center of the 3 pin terminal.

Note: Cut and cap the Etron power wire (terminal 20) as it is no longer needed.



Parameter changes on Fuji Drive

- Change Parameter F01 from 1 to 2. (Changes drive from 0-10 VDC Input to 4-20mA Input).
- Connect the Reflex II 4-20 mA Output + Signal Wire to terminal # C1 (instead of 12) and the Negative to terminal #11 on the Fuji VFD.
- Connect FWD & CM terminal wires from the Fuji Drive to the VFD Run Command Connecter on the Reflex II (not polarity specific).

Alternate Set-up Options

Reflex II and the Wash Cycle

The **REFLEX II** has a "Wash" vacuum setpoint.

To utilize the manual regulator in Wash, set the Reflex II controller "Wash" vacuum higher than the manual regulator. (This exercises the safety regulator daily)

Inverter Soft Start

If the fixed soft start of 15 seconds on the Reflex II is insufficient, the VFD soft start can be utilized.

Setting Soft Start on the Inverter:

1. Parameter "F23": Starting frequency 1, (0.0 to 60.0 (Hz).
   - Defines the inverter starting frequency when a run command is received.
2. Parameter "F24": Starting frequency 1 Holding time, (0.00 to 10.00 s)
   - The amount of time the inverter holds parameter "F23" setpoint before accelerating.

Following parameters are suggested starting point. Modify until satisfactory.

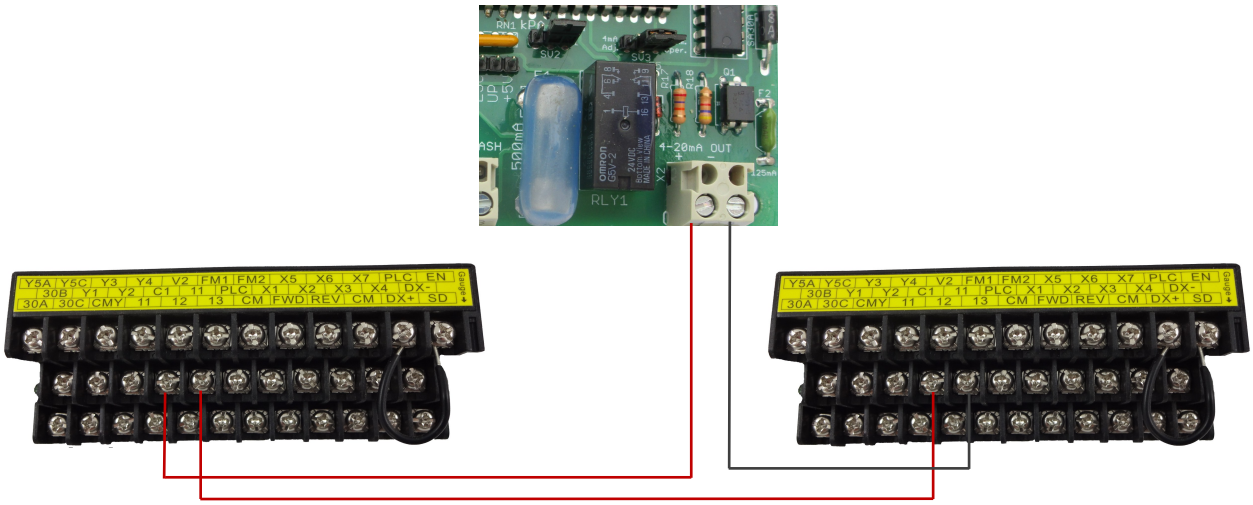
- "F23" to 20 HZ
- "F24" to 10 seconds

Note: Set Inverter Soft start if power to the Inverter is cycled with the Main Milk/Wash Switch.

Connecting one Reflex II Controller to 2 Inverters

The REFLEX II Controller's 4-20 milliamp output (terminals 1 & 2) can be connected in series to a dual Inverter system.

- Connect the wire from the REFLEX II 4-20mA Out #1 (positive) to Inverter #1 control circuit terminal "C1".
- Connect a wire from Inverter #1 control circuit terminal "11" to Inverter #2 control circuit terminal "C1".
- Connect the wire from the REFLEX II 4-20mA Out #2 (negative) to Inverter #2 control circuit terminal "11".



Connecting 1 MEGA Inverter to 2 Motors

- Determine the HP rating from the spec plate of each electric motor.

For 3 Phase Incoming Power:

Match the HP rating of the inverter to the combined HP rating of the two motors.

(example: 2 - 5HP motors require 1 - 10HP Inverter.)

For Single Phase Incoming Power:

Double the HP rating of the inverter from the combined HP rating of the two motors.

(example: 2 - 5HP motors require 1 - 20HP Inverter.)

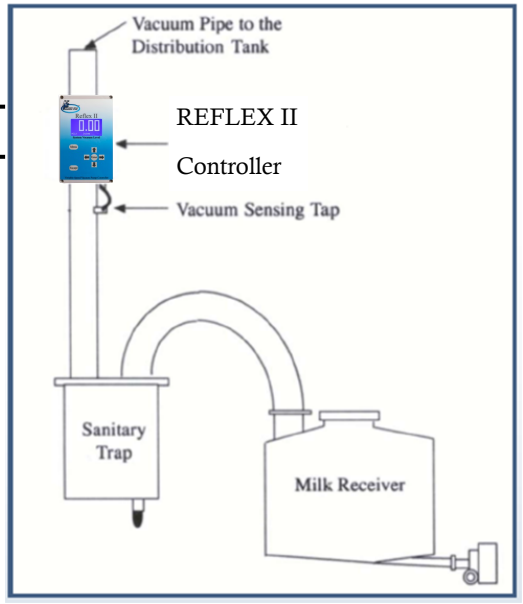
It is recommended to install a power distribution box to connect the two motor power cables to one Inverter. An improper dual connection can result in overheating and permanently damage the terminal block of the inverter.

Cable Configurations

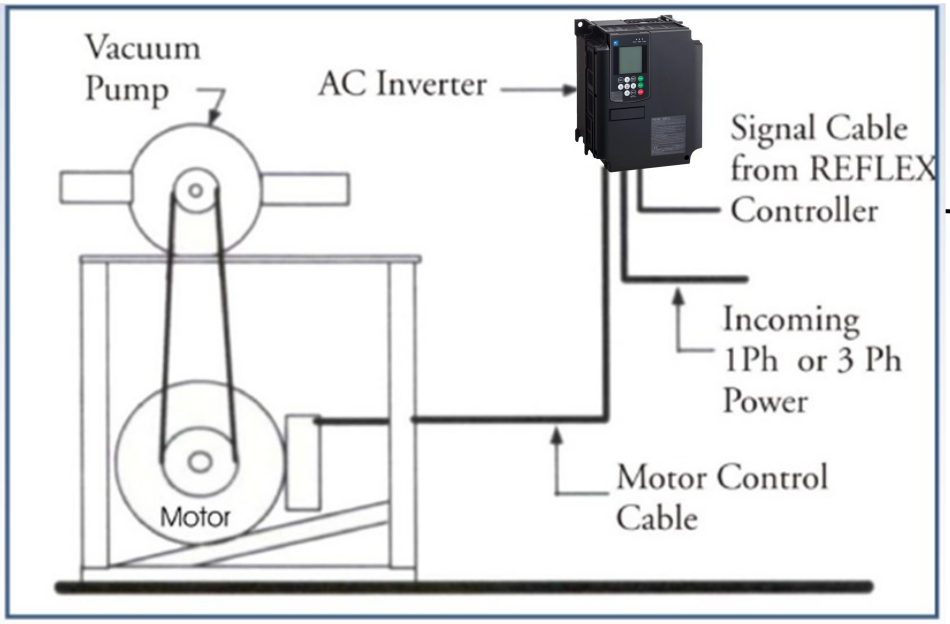
Reflex II Cable Configurations for Stand-Alone Unit

Milk/Wash Controller

18/3 or 18/2 Cable or Wire



18/2 or 18/4 Shielded Cable

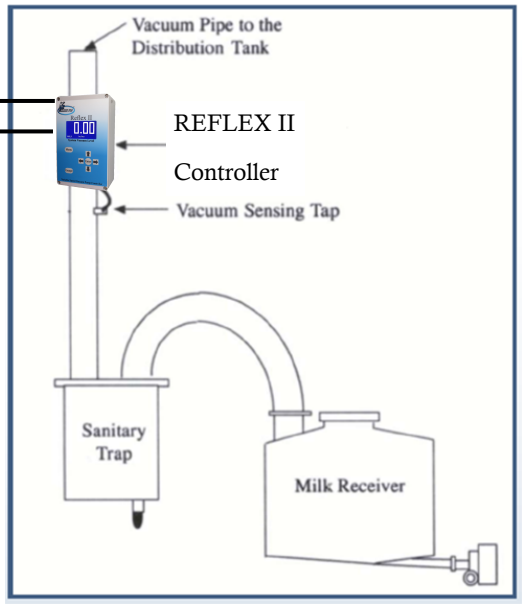


See Pages 6-7 for sizing.

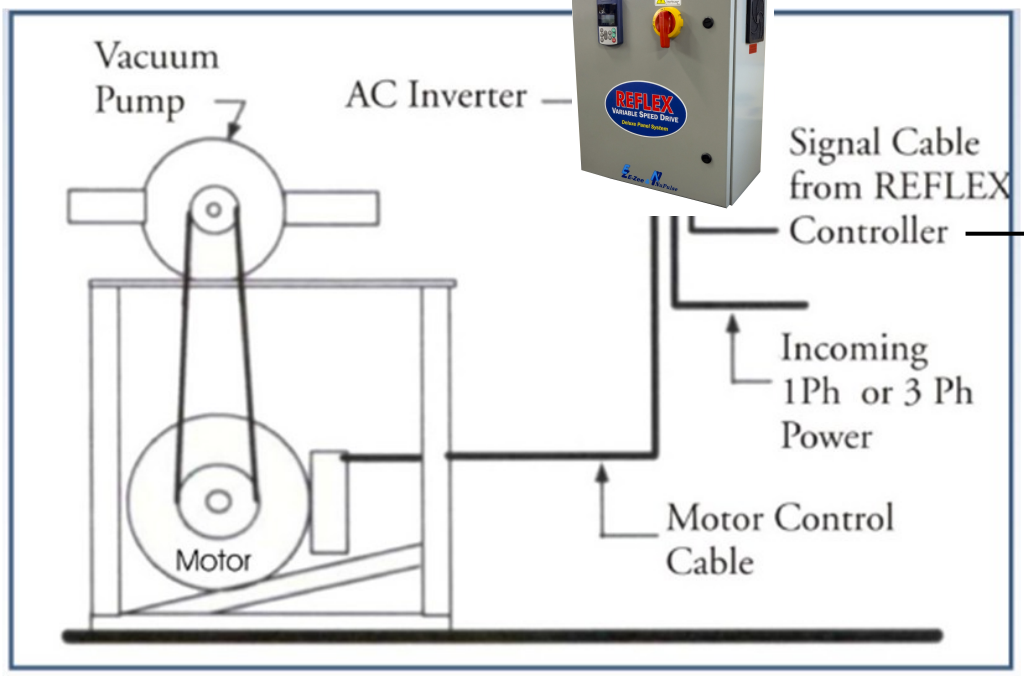
Reflex II Cable Configurations for Deluxe Unit

Milk/Wash Controller

18/3 or 18/2 Cable or Wire



18/2 or 18/4 Shielded Cable



See Pages 6-7 for sizing.

TROUBLESHOOTING

NOTE

The Inverter **MUST** be in the 'REM' (Remote) Mode to operate with the REFLEX II Controller. Inverter must also be in "RUN" mode. After a power outage or an Alarm Code reset, the Inverter must be reset to "RUN" by pressing the 'FWD' Key.

Reflex II Too Responsive to the Pulsation System

Parameter C33—REF Filter—Factory set at .05. (Increase in small increments to a max of .15)

NOTE: The REFLEX II responds accordingly to air leaked into the system to properly maintain Milking Vacuum level. The higher C33 is set, the slower the response of the VFD.

If Pump Doesn't Run and Inverter Doesn't Trip Any Alarm Codes

- If pump spins freely by hand but doesn't run with voltage applied, the motor windings may be faulty.
- With the **REFLEX II** System powered and the Motor leads from the Inverter disconnected, measure the voltage across the Inverter's Output. If motor voltage is present, the inverter is functioning properly and the motor is probably faulty.
- For ease of use, when troubleshooting a deluxe system, the inverter keypad may be removed from the cover and inserted directly into the keypad port of the inverter.

Alarm Codes

In most cases, the VFD will trigger an Alarm Code to indicate if there is a problem. Refer to Section 6 in the Fuji Inverter Manual for Alarm Code descriptions and possible solutions.

For Mega G2: see page 24 (**#4**), for Mega G1: see page 26 (**#6 and #7**) of this Manual for where to view Alarms and Alarm History.

Voltage and Wiring

Check for proper incoming voltages to the **REFLEX II** Controller and the Inverter. Inspect all wiring and connections.

The 4-20mA signal from the **REFLEX II** Controller can be viewed on the Inverter, refer to page 23 (**#3-3**) with MEGA G2, and page 26 (#4 "**I/O Check"**) with MEGA G1.

Programming Verification

A **REFLEX II** System that is not operating properly should have the Parameters checked or reinstalled before determining that a component is at fault.

Verify that the parameters match the settings recommended on pages 27-28.

Note: All parameters changed from FUJI factory settings will display an * after the parameter number.

With the Mega G2, see 'Changed Data' for a list of all the parameters that have been changed.

If any parameters other than the 21 E-ZEE parameters are modified, refer to Section 5 in the Fuji Inverter Manual and set back to FUJI default.

If multiple parameters are incorrect, the drive can be reset to factory defaults. See below.

NOTE: If reset is performed, all parameters will revert to FUJI defaults. All E-ZEE parameters need to be re-entered. E-ZEE parameters are listed on page 27-28.

The Data Copy function can be used to restore the data from the Keypad settings which are E-ZEE factory defaults, unless field changed parameters have been uploaded to the keypad (If using MEGA G1).

The MEGA G2 Keypad can store 3 programs. See next page for data copy instructions.

Parameter #	Reset Settings	Parameter Function
H03	1	Press 'STOP' and 'Λ' Key simultaneously, then press 'FUNC/DATA' Key to reset all parameters to Fuji factory default settings.

Data Copy using the Frenic MEGA G2 Keypad

With the keypad showing the main screen, press “PRG”.

Scroll down to **2.Function Code and** press “Set”.

Now scroll down to **4. Data Copy** and press “Set”.

The following list will be displayed:

1. KP→INV **I. Write** :

2. INV→KP **Read** : Copies the parameters from the drive to the keypad.

3. KP→INV **Write** : Copies the parameters from the keypad to the drive.

4. KP ←→INV **Verify** : Verifies that the keypad and the drive parameters match. It will display any parameters that do not match.

5. KP **Data Check** : View the parameter settings for any of the 3 programs that are on the keypad.

Select **3. KP→INV** and press ‘SET’.

With the Mega G2 keypad, 3 different programs can be saved. Choose KP1 (EZ default) and press ‘SET’. Display shows Start? Press ‘SET’ again to start the process.

Note: If saving a farm specific program, save to KP2 or KP3.

For Emergency Operation of the VFD without a Reflex II Controller

For Manual Vacuum Pump operation using 'FWD' and 'STOP':

Remove any existing wires from "CM" and "FWD" on the VFD.

FOR MEGA G2:

Press 'STOP' on the Inverter Keypad, then 'PRG' to enter menus.

Select **0.Favorite Parameters,** press set to enter, then select parameter "F01".

Change "F01" from "2" to "0", then 'Set' to enter.

Press 'PRG' to exit programming mode, then press and hold 'Help' to switch the drive to Local mode.

Prepare to adjust the mechanical Vacuum Regulator to the Milking Vacuum level

Use Λ to ramp the Hz from "0 Hz" to "60 Hz", then Press 'FWD' to start the Vacuum Pump.

Set the mechanical Vacuum Regulator to the Milking Vacuum level.

To stop the Vacuum Pump, press 'STOP'

FOR MEGA G1:

Press 'STOP' on the Inverter Keypad, then 'PRG', and "DATA CHECK" will appear.

Scroll down and highlight "DATA CHECK", then press 'FUNC/DATA' to enter.

Use 'V' or 'Λ' to scroll through the parameters, select parameter "F01" and press 'FUNC/DATA' to enter

Using 'V' or 'Λ', change "F01" from "2" to "0", then press 'FUNC/DATA' to store setting .

Press 'RESET' twice to exit programming mode, , then press and hold REM/LOC to switch to Local mode.

Prepare to adjust the mechanical Vacuum Regulator to the Milking Vacuum level

Use 'Λ' to ramp the Hz in the LED display from "0 Hz" to "60 Hz", press 'FWD' to start the Vacuum Pump.

Set the mechanical Vacuum Regulator to the Milking Vacuum level.

To stop the Vacuum Pump, press 'STOP'

Unusual Vacuum Fluctuations

If the **REFLEX II** Controller is not displaying or running at the proper vacuum level and unit doesn't respond correctly to vacuum level fluctuations: autotune the controller.

If problems persist follow the instructions below to determine if the problem is being caused by electrical interference:

Check if the shield/drain wire in the 18/2 or 18/4 cable from the **REFLEX II** Controller to Inverter is connected to earth grounds. If connected, disconnect the shield drain wire from the grounds at each end to see if the vacuum levels go back to normal and/or it is possible to adjust them. If problem is corrected, this indicates the system was picking up interference from the grounds and back-feeding into the **REFLEX II** Controller Circuit. To avoid this interference, leave the shield drain wire disconnected from any grounds and trim the excess back to prevent any shorting.

Reflex II Controller Bypass (Optional)

Option 1. FOR IMMEDIATE MILKING

For Manual Bypass of the Reflex II controller without a relay:

(For stand-alone VFD using the Inverter keypad)

1. Remove any existing wires from “CM” and “FWD” on the VFD.
2. Set parameter “F02” to “0”.
3. Change parameter “F01" from “2” to “0”.
4. Exit programming mode and press up to select the speed (HZ) of the motor. (For maximum capacity, select 60 HZ).
5. Start the system and set the Manual Vacuum Controller to the proper milking vacuum level.

Option 2.

For Manual Bypass of the Reflex II controller using a relay:

1. Power a relay using the same source that normally powers the Reflex II. (120 or 240VAC)
2. Install 2 relays if using separate signals for Milk and Wash.
3. Connect “common” and “normally open” of the Relay(s) to the Inverter’s input terminals “CM” and “FWD”.
4. Change parameter “F02" of the Inverter from “0" to “1".
5. With manual bypass the VFD will run when the relay is powered.

ALARM CODE 'ECF'

On the Frenic MEGA Inverters, if the "ECF" Alarm Code appears, follow the steps below to reset and restart.

1. Verify that the wiring at the VFD output and the motor is not **grounded** or **shorted.**
2. Verify the Inverter Control PCB **Connectors** are securely connected.
3. Press 'RESET' as an attempt to reset the alarm. If the alarm does not reset, cycle power to the drive.
4. If cycling power does not successfully reset the error, change the hidden parameter **u13** from 0 to 2. See below:

To perform the **ECF reset** using the hidden **u codes** -

Mega G2:

1. Press **PRG** to Enter Programming Mode.
2. Navigate to **1. Data Set** and press **SET**.
3. Navigate to **F00 DATA PRTC** and press **SET** to enter.
   - While inside the F00 parameter, **press and hold UP and DOWN simultaneously for 2-3 sec.**
   - The screen will change to **u:USER** when unlocked.
   - Scroll down to **u13** and press **SET**.
   - While **holding STOP**, press the **UP** arrow to change the value to **2**.
   - Press **SET** to save. If successful, the screen will jump to **u17**.
   - Press **PRG** to exit, then cycle power (ensure drive powers down completely before restarting)

Mega G1:

1. Press 'PRG' to display keypad menu.
2. Select '1' Data Set and press 'FUNC/DATA'.
3. Select F00 , press 'FUNC/DATA' Key, then press up and down simultaneously for 2-3 sec.
4. "u00" should be displayed. If not, repeat Step #3 again.
5. Scroll to "u13", press 'FUNC/DATA' to enter, use Λ or V while pressing STOP to change from "0" to "2".

Technical Support

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E-Zee Electronics
610-273-7016

After Hours
Gert Mogensen
920-602-6724

Fuji Electric Corp of America
Technical Support
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Fuji Answering Service (Inverter ONLY)
Tel: 888-900-FUJI (3854)

Fuji Outside of USA
Tel: 510-440-1060 Monday - Friday 8:00 am - 7:00 pm (CST)
Tel: 510-870-3338 After Hours

Additional REFLEX II Manuals can be downloaded at:

www.ezmilking.com/customer/manuals

Notes

Mega REFLEX II

Installation & Operation Manual

Rev 5.26

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