

Installation, Operation and Maintenance Instructions



N12-G & HW SERIES FREQUENCY CONTROLLERS 115/230 VAC FOR 30, 40, 50 & 60 HZ ELECTROMAGNETIC FEEDERS

ERIEZ HEADQUARTERS: 2200 ASBURY ROAD, ERIE, PA 16506-1402 U.S.A.
WORLD AUTHORITY IN SEPARATION TECHNOLOGIES

CE COMPLIANT CONTROLLERS

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⚠ WARNING

This control is capable of variable output voltage over a wide range of frequencies. This model should only be run at the factory set frequency. If modification in output frequency is needed, we suggest that the user contact Eriez first. After switching unit off, some components may still be charged due to capacitance. Wait at least five (5) minutes before opening the cover to allow capacitors to discharge.

General Description

This control is a variable voltage frequency controller. A front panel display and keypad make set-up and operation an easy task. This control can be used for manual or remote set point control. Other features include amplitude regulation and track control. Control of the vibratory feeder is accomplished by using sinusoidal waveform impulses (modulated). This method results in quiet operation.

Technical Data

DESCRIPTION	FREQUENCY CONTROL (RE)
Input Voltage	115/230 V 50/60 Hz
Output voltage	0-110 or 0-220 VAC
Output current	12.0 A max.
Soft start	0-4 sec.
Sensor supply	24 V, 25Ma
Switch on time delay	0-10 sec.
Switch off time delay	0-10 sec.
Empty time	30-1 80 sec.
Set point source	Keys/ 0-10 V, 0(4)-20mA DC
Enable	12-24 V, DC/ Switch
Status relay	Form "C" 250V, 1A
Operating temperature	0-113 degrees F

Installation

Mounting

The controller should be mounted in a reasonably dry, minimum dust area, if possible, where the ambient temperature does not exceed 100°F. It is designed for vertical mounting. Refer to the supplied schematic and outline drawing for mounting dimensions. The mounting site should be relatively free of vibration or steps should be taken to isolate the unit.

Wiring

Refer to the supplied schematic and outline drawing for connections. The installation of a fused safety switch or branch circuit breaker ahead of the controller is recommended.

Connections

Input Cable 120/230 VAC supply voltage

Output Cable Output - Eriez feeder

Set-up

Using the buttons and the LED display located on a touch plate on the front panel sets up this unit. The feeder throughput adjustment and setting of other parameters can be carried out by using these components. The control can also be operated by external means, such as potentiometers and signal sources. The parameters can be changed by scrolling through the menu, which is accessed by a user password. The various functions within the menu are identified with capital letters for ease of recognition. Enable and fault contacts are located inside the control enclosure along with other user connection points. The output power is shown in percent (%) on the LED display during normal operation. Changed settings are saved when leaving programming mode or after a 100 second delay from when the last key was pressed.

Adjustments

- Soft start ramp up time 0,1-4 Sec.
- Soft stop ramp down time 0,1-4 Sec.
- Maximum control limit (Umax)
- Minimum control (Umin)
- Changeover for using an external set point source 0-10VDC (or potentiometer)/0-20mA, 4-20mA
- Switch on time delay (for track control)
- Switch off time delay (for track control)
- Invert sensor function
- Empty time delay, if the material sensor does not see product
- Return to factory settings

Installation (cont.)

Parameter Adjustment Procedure

1. Amplitude adjustment

Press the programming Mode key (P)
Observe a "C 000" in the display
Using Cursor keys select "C 002"
Press P key, observe "A 000"
Now an amplitude setting in percent can be entered
Press P key to return controller to normal operation

2. Other feeder values

Press P key, using cursor key move to "C 096"
Press P key to select required parameter
"A 000" = Amplitude (Feeder) [%]
"P 000" = Maximum control limit [%],
adjustable 20-100%
"T 000" = Soft start time
"L 000" = Soft stop time [sec.], operates when unit
switched off by track sensor
Press P key to return to programming mode

3. Set source and output waveform

Press P key, using cursor key move to "C 003"
Press P key to select required parameter
"E.S.P." = external set point, 0 for keys,
1 for external
If 1 is selected, control will operate with
potentiometer. If remote potentiometer is used
SET Amplitude "A" to 0%. Bias upward by raising
amplitude level.
If 1 is selected, press P key and select "4.20 0"
Select 1 for set point values 0-10 v, dc or 0-20mA
Select 0 for set point values 4-20mA DC
Press P key to select "SP.2 0" for track control mode
and "SP.2 1" for dual set point operation
Output waveform is factory set and should
not be adjusted
Please consult Eriez for more information
concerning Track Control.

4. Return to saved settings

Press P key, using cursor key move to "C 210"
Press P key to select required parameter
"FAC" = factory settings, using cursor key select
"SAFE" (loads factory settings)
Press P key to observe "USPA", using cursor key
select "SAFE" (return to user parameters)
Press P key to return to normal operating model

5. Storing user parameters

Press P key, using cursor key move to "C 143"
Press P key to select required parameter
"PUSH" = save parameters, using cursor key select
"SAFE" (parameters are saved)
Press P key to return to normal operating model

6. When an "OFF" is displayed and will not clear

Go to code "003" and select EN=1
If control is wired for remote, the remote switch
should be closed or a jumper placed between term's
5 and 6 (user enable).



Control Elements

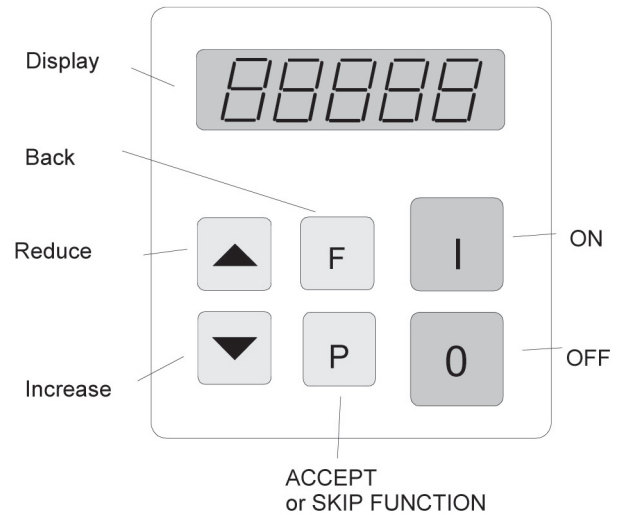
Settings

The six buttons and a LED display found in the front panel are used for operating and setting up the unit. All operating methods and adjustable parameters can be set up through this panel. The “I” and “O” buttons are used for switching the unit ON and OFF, however, **these do not provide mains isolation**, they simply inhibit the power semiconductors.

The “P”, “F” and “Cursor Buttons” are used for parameter adjustment. Parameters are set by using menu controls, which are called up by entering operator codes. The functions are described in greater detail in the section on setting instructions. The display value can be increased or decreased by units, or tenths of units, by a short press of the cursor buttons. Holding the buttons down will cause the display to change in units of ten.

To prevent accidental or unauthorized adjustment, the adjustment parameters in the user menus are protected. A code must be entered to open the user menus. There are different pass codes for each function group.

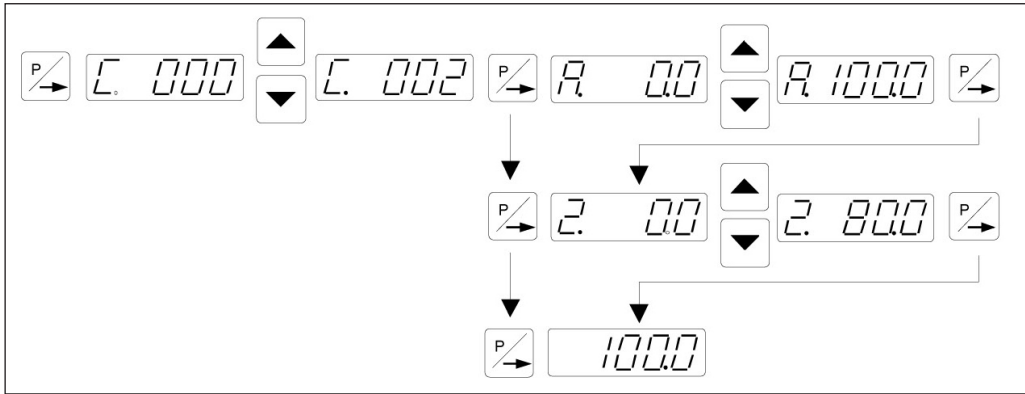
Setting adjustments are automatically saved upon leaving the programming mode or if no button is pressed for a period of 100 seconds.



Control Elements (cont.)

Settings (cont.)

All setting routines are commenced by pressing the programming button “P”. The following diagram should clarify the sequence in which keys are pressed:



1. Press the “P” key.
2. Select the code number with the cursor keys.
3. Press the “P” key. This displays the first menu point. The required menu point can be found by repeatedly pressing the “P” key (scrolling).
4. The value in the menu point can be changed with the cursor keys.
5. Scroll to the next menu point or to the end of the menu, which returns the display to the set point value, by pressing the “P” key. To exit the menu and return back to the normal display, quickly depress the “P” key for 5 seconds.
6. To return back to the previous position in the menu, press the “F” key.

Commissioning

Preliminary Steps

- Check that the unit is correct for the local mains supply (rating plate information) and that it is correctly rated for the feed system.
- Connect the controller according to the connection diagram.

Important Points



Using the control units described in this document, it is possible to adjust the feed system so that it runs at resonance. In this condition, it is possible to obtain excessive output for a very low set point setting. Therefore, extreme care should be taken to avoid causing damage to the drive coil through hammering.

In practice, it is not possible to run at resonant frequency without accelerometer feedback because the system would be unstable and uncontrollable. The system must be set safely off resonance i.e. either above or below the natural frequency.

Resonant frequency: Depending on the spring and mass design of the feeder system, it is possible to have resonance at more than one frequency. These additional resonance points are multiples of the main frequency. For this reason, in critical situations, it is possible that the automatic frequency search will not find true resonance and in such cases the natural frequency must be determined manually.

Operating Frequency of the Feeder Coil

It is possible that the current flowing through the coil will increase for a small frequency adjustment. So this should be checked with a true RMS instrument for each new application as well as monitoring the coil for heat build-up.

The coil should be designed for the correct operating frequency to prevent excessive current draw and the consequential overloading of the coil.

Measurement of the Output Voltage and Current

The voltage and current cannot be measured with a regular instrument because the controller output uses an electronic inverter with a pulse width modulation signal. An effective measuring instrument such as a moving iron meter (analog) must be used. It is recommended that an analog instrument is used rather than an electronic multi-meter which will give a misleading reading.

Putting the Equipment into Operation

1. Establish the vibrating frequency.
2. Establish the power of the feed system (maximum permissible current draw).

For a new feeder where settings are unknown (see also comments below).

Without connecting the feeder, select parameter FAC in menu C210 (reset factory settings), press the cursor key to reset (SAFE) and press the P key to leave the menu. The factory settings are listed in the table in section 7, headed settings.

It is possible that a special parameter set, for a machine manufacturer, has been pre-stored under a user code and these can be recalled. In such instances, specific machine settings will be loaded and so the next steps are not relevant.

Basic settings:

- Connect feeder.
- Set frequency (refer to feeder data sheet). Menu C096 parameter F.
- Check current limit (refer to feeder data sheet). Menu C040 parameter I (shows the current limit as a percentage of maximum). If applicable, use service menu for setting.
- Increase set point, observe feeder, check running.
- Increase set point to maximum and check if power needs limiting (hammering). If necessary, adjust the limit as follows:
- Adjust set point to zero.
- Set parameter P (maximum limit) in Menu C096 to 50.
- Adjust set point A to 100%.
- Increase the maximum limit P from 50% until the required amplitude is reached.
- The full set point range of 0-100% can now be used.

Additional settings e.g. soft start, time delays etc. can be set to suit the particular equipment.

Commissioning (cont.)

Determining the output frequency (vibrating frequency)

It is essential that the output frequency is adjusted with the set point set at a low frequency, otherwise on hitting the resonant frequency, it is possible to achieve a high amplitude with a low output voltage. An analog, effective value, current indicating unit (moving iron meter) must be connected into the output circuit.

Resonant is reached when there is a maximum amplitude for a minimum output current. To achieve a stable feed system, there must be an offset between the vibrating frequency and resonance (approx. 1-2Hz). This offset must be determined by the user because different feeders have different running characteristics.

Setting Instructions

User Enable, Remote ON/OFF

To turn the feeder or conveyor ON/OFF remotely with a contact:

Refer to the control schematic on page 23 of this IOM.

The wire jumper between terminal 5 and 6 should be removed.

Dry contact to be connected between terminals 5 and 6.

Manual switch on face plate of controls to be in ON position.

To turn the feeder or conveyor ON/OFF remotely with a 24V DC signal:

Refer to the control schematic on page 23 of this IOM.

The wire jumper between terminal 5 and 6 should be removed.

24V DC signal to be connected to terminal 5 and ground to terminal 4.

Manual switch on face plate of control to be in ON position.

Setting Instructions (cont.)

User Adjustment of Throughput

Code C. 000

Feeder amplitude set point
0-100 %

Running mode

A further set point code can be found under C002
(for use in coarse/fine operation)

Feeder amplitude set point
0-100%

2nd Feeder amplitude set point
0-100%
(only if "SP.2. = 1)

Running mode

Tuning the Feed System Feeder Settings

Code C. 020, 096

Max. output 100-5%

Vibration frequency [Hz]

Soft start 0-5 Sek.

Soft stop 0-5 Sek.

Running mode

Setting the maximum limit

1. Adjust set point to zero
2. Set parameter P (maximum limit) to 50
3. Adjust set point to 100%
4. Increase the limit P from 50% until the required amplitude is reached
5. The full set point range of 0-100% can now be used

Setting Instructions (cont.)

Track Control

Code C. 007, 167

P C. 000 C. 167 P I 00 I 50 P On time delay 0-5 sec.

P O 00 O 50 P Off time delay 0-5 sec.

F ↑ P -SE 0 -SE 1 P Invert sensor
I = Invert

P 1000 Running mode

Sensor Time Out

Code C. 015

P C. 000 C. 015 P EE 0 EE 1 P 0 = Sensor time out not active
I = Sensor time out active

E 180 E 240 P E. = Sensor time out [sec.]

P 1000 Running mode

Set Point Source

Code C. 003

P C. 000 C. 003 P ESP 0 ESP 1 P 0 = Set point using display
I = External set point

420 0 420 1 P 0 = External set point 0-+10 V
I = External set point 4-20 mA

POT 0 POT 1 P 0 = 0-10 V/ 0(4)-20 mA
I = Potentiometer

F ↑ P SP2 0 SP2 1 P 0 = Level sensor control
I = 2nd set point active

P -En 0 -En 1 P 0 = Enable
I = Invert Enable

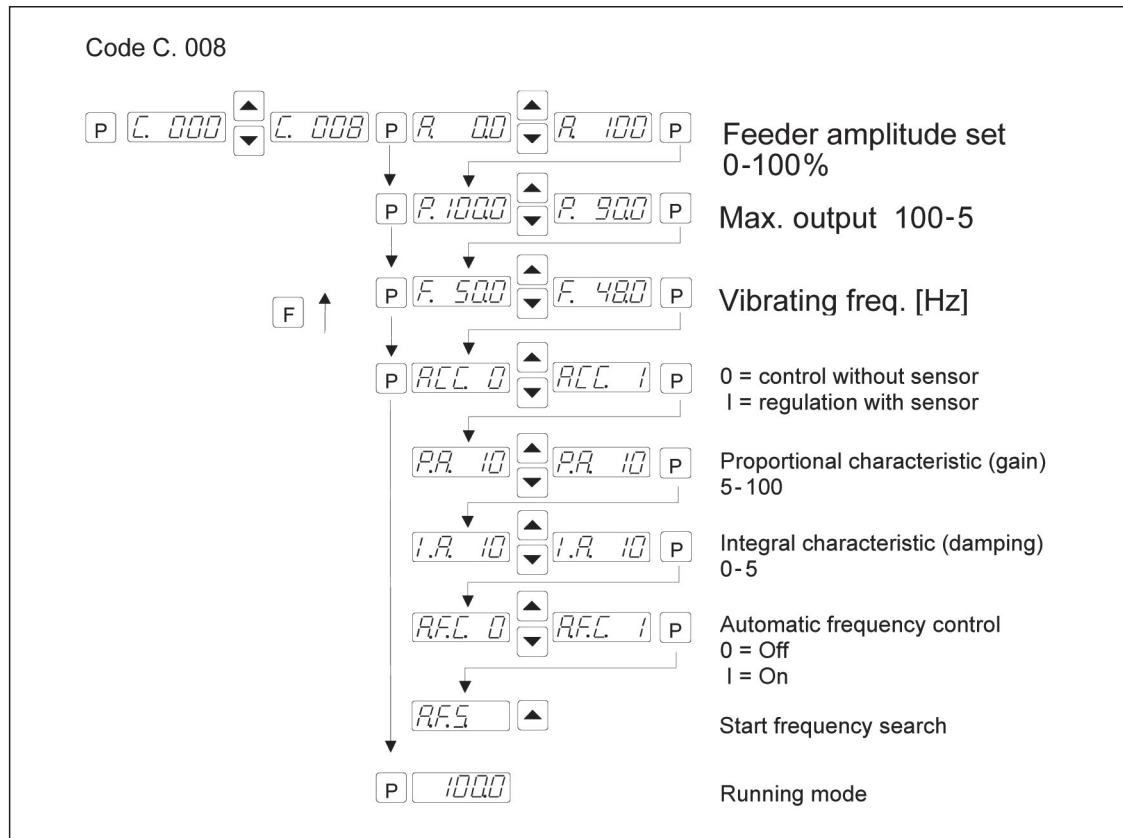
P 1000 Running mode

POT is not available on 16A units



Setting Instructions (cont.)

Regulation Mode



Instruction for Regulation Mode

- An accelerometer e.g. SW11 must be fitted to the vibratory feeder in order to run in regulation mode. The accelerometer should have a frequency range corresponding to that of the feeder.
- All vibratory signals, that are picked up by the accelerometer, are used by the regulator circuit. Stray signals generated by neighboring machinery, a flimsy accelerometer mounting, or an unstable support frame, can cause incorrect regulation to occur. It is especially important to ensure that there are no external influences of this type during the automatic frequency search routine.

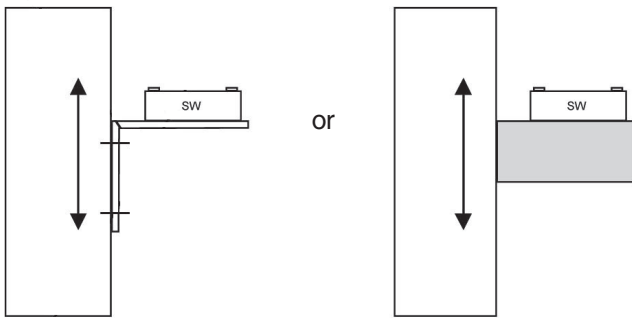
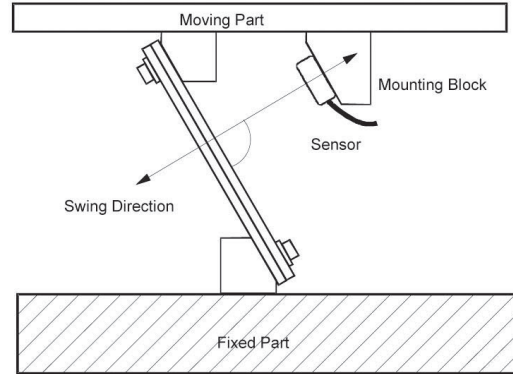
- Resonant frequencies: It is possible to have several vibrating frequencies, where resonance occurs, depending on the springing and masses of the system. The additional resonant points are at multiples of the dominant resonant frequency. Under extreme circumstances, the automatic frequency search may be unable to differentiate between these frequencies and so in these instances, the frequency must be set manually.

Setting Instructions (cont.)

Mounting the Accelerometer

The accelerometer should generate signals for the movement and acceleration of the feeder, which are fed back to the regulator circuit of the control unit. Therefore, it is very important that no other extraneous vibration signals are picked up by the sensor.

The sensor should be positioned so that it moves in the same direction as the feeder, ideally in the same plane as the springs, and it should be fitted on a solid block that will not generate vibration signals.



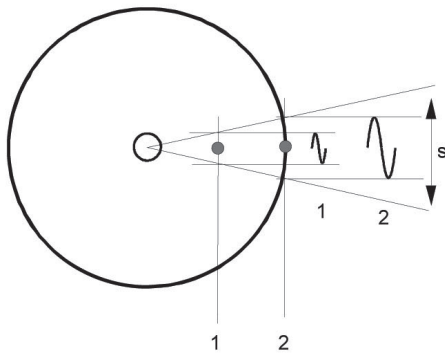
Bracket Mount
(must be rigid and not flex)

Block Mount

In regulation mode the magnitude of the output signal has a direct affect on the maximum amplitude of the feeder.

On bowl feeders, it is advisable to fit the sensor as near as possible to the outside diameter and in this position, it will be subjected to the greatest movement.

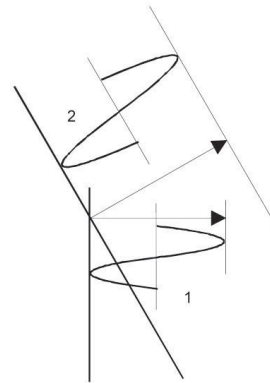
The control range of the set point will be considerably reduced when the sensor signal is weak.



s = deflection

Mounting position 1 = small deflection
Mounting position 2 = large deflection

The controller, together with the sensor fitted on the feeder, produces a feedback loop, whereby the signal generated from the sensor determines the control range of the set point i.e. the regulator controls the feeder so that the effective value (feeder power or intensity of vibration) relates to the provided set point value. Because the effective value is dependent on the feeder (frequency, acceleration and amplitude) and in addition depends on the mounting position of the sensor, the regulator must be adapted to suit the output control range.



Linear Feed Example

1. Small amplitude because sensor is mounted vertically.
2. Larger amplitude because sensor is mounted in the same plane as the springs.

This is achieved by using the parameter P in Menu C 008. The measured sensor signal range is adjusted by changing this value. In most instances, a value of less than 100 must be entered, so that the set point can reach 100% or can go as high as possible. When it is not possible to achieve an acceptable range, the accelerometer should be mounted in the location which gives the greatest movement (see the bowl feeder example).

The importance of scaling this value is demonstrated when, for example, a feeder takes a very long time to ramp up, after it has been switched on.



Setting Instructions (cont.)

Relationship Between Acceleration and Amplitude

The sensor measures the momentary acceleration of the feeder. It generates a sinusoidal output voltage signal. The acceleration gets higher as the frequency increases. The sensor signal is greater for a higher frequency and lower amplitude than for a low frequency with a higher amplitude.

Acceleration

$$a = \omega^2 s \quad \text{where} \quad \omega = 2 \pi f$$

In practice the acceleration is influenced by gravitational force and the applied amplitude is measured in mm and so this gives the following formula:

$$a[g] = \frac{2^2 \pi^2 f^2 [\text{Hz}]^2 s_n [\text{mm}]}{9,81 \cdot 2 \cdot 10^3} = \frac{f^2 [\text{Hz}]^2 s_n [\text{mm}]}{497}$$

a[g] = Acceleration (with respect to gravitational acceleration of 9.81 m/s²)
 S_n[mm] = Applied amplitude

In practice where 497 is approximated to 500 this gives, for example:

1.
 Vibrating frequency 50Hz
 Amplitude 3mm

$$a = \frac{50^2 \cdot 3}{\approx 500} = 15 g$$

Or

2.
 Vibrating frequency 33Hz Amplitude 5mm

$$a = \frac{33^2 \cdot 5}{\approx 500} = 10,89 g$$

Using an accelerometer with an output signal of 0.3 V/g the sensor generates a peak voltage of 4.5V for a peak acceleration of 15g (Example 1), corresponding to a 3.18V RMS value.

Example 1: => 15 g => 4,5 V => 3, 18 Veff.

Example 2: => 11 g => 3,3 V => 2, 33 Veff.

Because of the vastly different acceleration values of various feeders, there is a big difference in the feedback signals, which makes scaling necessary.

Instructions for Setting up the Controller in Regulation Mode

- Connect control unit.
- Install sensor and connect to controller.

Determining the Resonant Frequency Manual setting of the vibrating frequency

It is essential that the output frequency is adjusted with the set point set at a low frequency, otherwise on hitting the resonant frequency it is possible to achieve a high amplitude with a low output voltage. An analog, effective value, current indicating unit (moving iron meter) must be connected into the output circuit. **Resonant frequency is reached when there is a maximum amplitude for a minimum output current.**

Automatic frequency search

- The feeder should be empty for a frequency search.
- Adjust the set point to zero.
- Select regulation mode (Menu C 008, Parameter ACC = I).
- The optimum frequency of the feeder is found automatically by initiating the frequency search (Menu C 008, Parameter A.F.S.). When this has been found, the controller resets the set point back to its original value (0).

Optimizing Controller in Regulation Mode Setting the control range:

1. In Menu C. 096 set parameter P (Max Limit) to 50%.
2. Set A (Feeder throughput) to 100%.
3. Increase limit P from 50% until the required maximum feeder throughput is achieved.

The full set point adjustment range of 0-100% can now be used.

Optimizing regulation: For unwanted feeder oscillation (hunting) or inadequate feedback regulation for load changes

The response of the regulation circuit can be adjusted in menu C008 using the parameter PA (Proportional characteristic or circuit gain) and IA (Integral characteristic).

In menu C008 reduce PA until the oscillations are reduced.

Parameter IA should be set to 100 if possible.

Setting Instructions *(cont.)*

Displays



1. The maximum output power of the controller has been reached. The feedback signal from the sensor (acceleration) is too low in comparison with the set point. Reduce parameter P in Menu C096 or C008.
2. The maximum current setting has been reached.



The feedback signal from the sensor (acceleration) is too high.

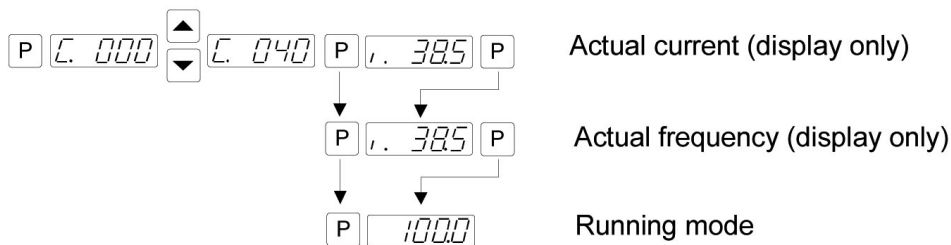


Changing display:
The regulator oscillates too quickly.
Reduce parameter PA in Menu C008.



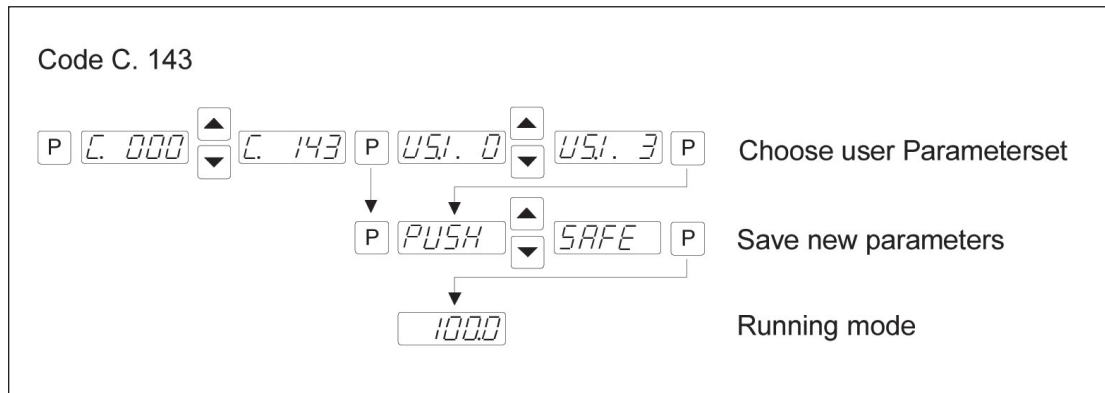
Display Actual Current and Frequency

Code C. 040

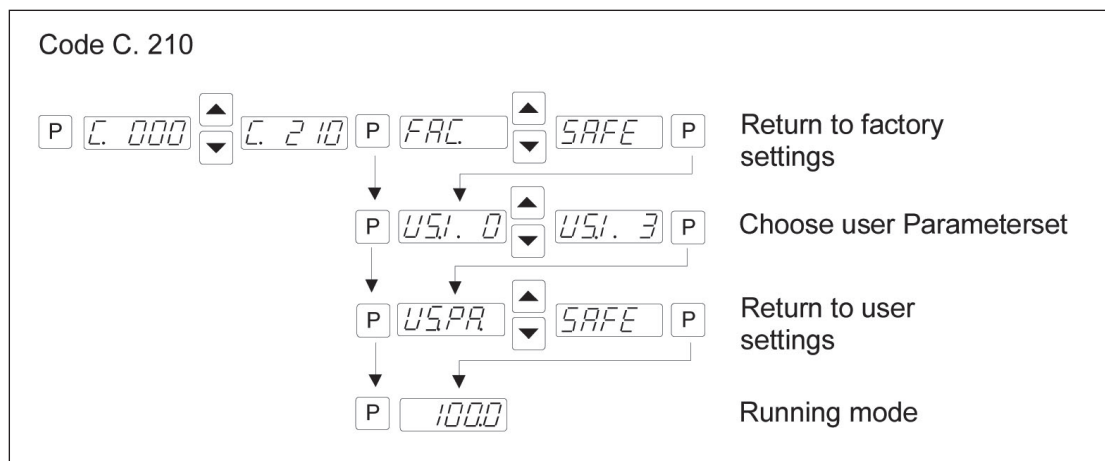


Setting Instructions (cont.)

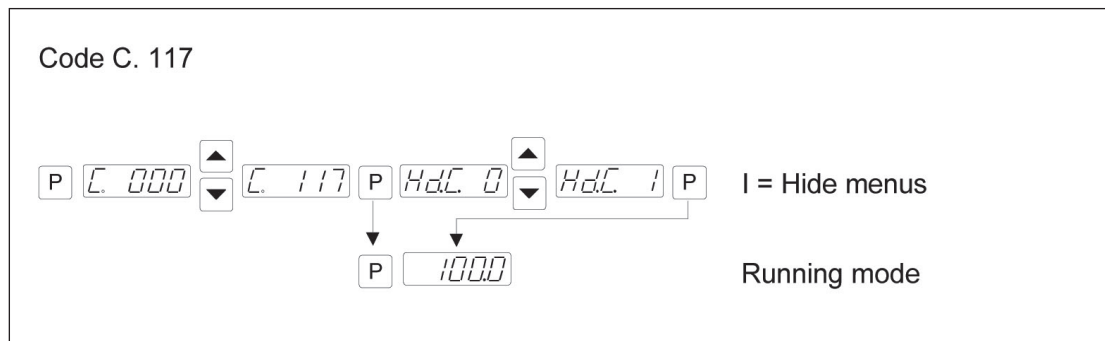
Save Selected Parameters



Recall User or Factory Settings



Hide Parameter Menus



Error Messages / Error Reset

Errors are indicated by an alternating code and Error display.



Overload limit

Output level exceeded e.g. incorrect frequency setting, coil air-gap to wide.



Short circuit trip

Faulty coil, short circuit or defective cable.



Over voltage

Supply voltage too high or back EMF from the coil at lower frequencies.



Current spike limit

Frequency set too low for installed coil or frequency altered too rapidly during setting up.



Sensor fault (only when regulation mode is selected)

Accelerometer not working or faulty.

Error Reset through Menu C009



Sensor time out

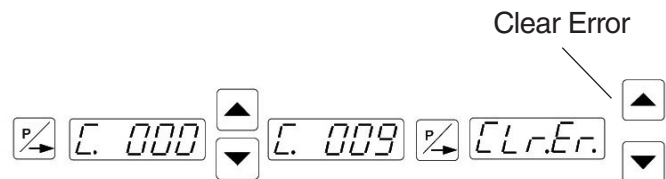
After sensor time out has elapsed.

Error Reset is achieved by pressing touch panel keys 0 or 1 during normal operation or by using Menu C009.

In the event of an error check that this is not caused by incorrect wiring or cable faults. The error message, Error ACC, can also occur if regulation mode is chosen (in Menu C008) and an accelerometer is not connected, for example.

Reset the error in the following manner:

Error Reset



Fault Troubleshooting

Troubleshooting - Frequency Controllers

PROBLEM		POSSIBLE REASON	REMEDY
Feeder does not vibrate		Incorrect frequency setting	Resonate frequency search
Feeder hammers when throughput is set high.		<ul style="list-style-type: none"> • Feeder is working too close to its resonate frequency. • Air gap too small. 	<ul style="list-style-type: none"> • Adjust frequency. • Reduce maximum limit [P] (Menu "C 096"). • Check air gap (Caution: too big an air gap increases the current).
Magnet gets warm.		<ul style="list-style-type: none"> • Frequency setting is too low for the coil type. • Air gap is too large. 	<ul style="list-style-type: none"> • Adjust to a higher frequency or fit a more suitable coil. • Reduce the air gap.
"OFF" displayed and feeder does not run.		<ul style="list-style-type: none"> • No enable signal. 	<ul style="list-style-type: none"> • Provide enable signal using contacts of 24VDC signal. • Fit a link between enable terminals. • Or invert parameter "-En".
After running for a short time the feeder stop and "Error SE" flashes in the display.		<ul style="list-style-type: none"> • Sensor time out has been activated, no material available. • No track sensor fitted. • Defective track sensor. 	<ul style="list-style-type: none"> • Cancel sensor time out parameter "EE". • Check sensor. • Check sensor.
After enabling the feeder or calling from a sensor, it only runs slowly, even though the soft start is set at "0". (applies to regulation mode only)		<ul style="list-style-type: none"> • Maximum limit [P] in Menu "C 008" or "C 096" has not been set correctly. 	<ul style="list-style-type: none"> • Set the maximum limit to match the amplitude.
Maximum amplitude is achieved with a very low throughput setting.		<ul style="list-style-type: none"> • The mounting position of the sensor has a small deflection. • Maximum limit [P] has not been set for the feeder. 	<ul style="list-style-type: none"> • Reduce maximum limit [P] (Menu "C096"). • Reduce maximum limit [P] (Menu "C096").
ERROR MESSAGE	TYPE OF FAULT		
ERROR - OL	Output power too high	Coil power too high.	Controller with a higher power rating required.
		Selected frequency too low.	Increased frequency.
		Air gap too large.	Reduce air gap.
		Short circuit.	Check circuit and drive coil.
ERROR - OC	Over current	Output short circuit due to drive coil failure.	Check circuit and drive coil.
ERROR - OU	Over voltage in DC link	Supply voltage too high.	Check mains voltage.
		Back emf from drive coil (possible at lower frequencies).	Control unit may have to be changed for another type – contact manufacturer.
ERROR - ACC	Sensor fault	Sensor failure. Defective sensor.	Test sensor.
ERROR - SE	Sensor time out exceeded	Sensor time out is activated but not required.	Switch off sensor time out in Menu "C 167".
		The sensor has detected no product.	Check mechanical system.
ERROR - EEP	Memory failure	Component problems.	Contact manufacturer.

Tray Regulation Mode Setup with Local Setpoint

OPERATION	RESULT (OR DISPLAY)
Turn the green power switch "ON"	Control is energized
Press the red "O"	Feeder is turned "off" (STOP)
Press "P"	C 000
Press ▲ scroll to	C 003
Press "P"	ESP 0
Press "P"	SP2 0
Press "P"	EN 0
Press "P"	STOP
Press "P"	C 000
Press ▲ scroll to	C 008
Press "P"	A 0.0 (set A to 0.0 using arrow keys)
Press "P"	P 100.0 (set P to 100.0 using arrow keys)
Press "P"	F ** (should be factory set to operating frequency)
Press "P"	ACC 1 (set ACC to 1 using arrow keys)
Press "P"	PA 40 (set PA to 40 using arrow keys)
Press "P"	IA 50 (set IA to 50 using arrow keys)
Press "P"	STOP
Press "P"	C 008
Press ▼	C 000
Press "P"	A 0.0

The controller can now be operated in the regulation mode by pressing the green "I" to turn the controller on. Press the ▲ to set the desired amplitude of the feeder. Read the amplitude sticker on the feeder to confirm the displacement.

External Setpoint Mode with Remote 4-20mA Setpoint

OPERATION	RESULT (OR DISPLAY)
Press green "I"	Feeder is energized
Press "P"	A 0.0
Press ▲ scroll to	A 100.0 (This is full amplitude of the feeder and should be noted)
Press red "O"	Feeder is turned "off" (STOP)
Turn the green power switch "OFF", disconnect the power supply, and make sure controller is wired for an external signal for the setpoint (ie 4-20mA) Turn the power source back on.	
Turn the green power switch "ON"	Control is energized
Press the red "O"	Feeder is turned "off" (STOP)
Press "P"	C 000
Press ▲ scroll to	C 003
Press "P"	ESP 1 (set ESP to 1 using arrow keys)
Press "P"	4.20.1 (set 4.20 to 1 using arrow keys)
Press "P" repeatedly until	EN 1 (set EN to 1 using arrow keys)
Press "P"	C 003
Press ▼ scroll to	C 000
Press "P"	A 100.0
Press ▼ scroll to	A 0.0
Press "P"	STOP
Press green "I"	Enables controller (0.0)
Using minimum external signal (i.e. 4mA) Feeder is energized. Increase signal to maximum slowly (i.e. 20mA) Maximum feeder output 100.0 on display.	
Press "P"	C 000
Press ▲ scroll to	C 008
Press "P" repeatedly until	P 100.0 (set P to 100.0 using arrow keys)
Press ▼	To achieve maximum federate desired or leave at 100.0 (A = max)
Reduce external signal to minimum (i.e. 4mA) Minimum federate (A = min)	
Press "P" repeatedly until	A 0.0
Press ▲	To achieve minimum federate desired or leave at 0.0
Press "P"	C 008
Press ▼	C 000
Press red "O"	To turn feeder off (C 000)
Press "P" repeatedly until	(STOP)



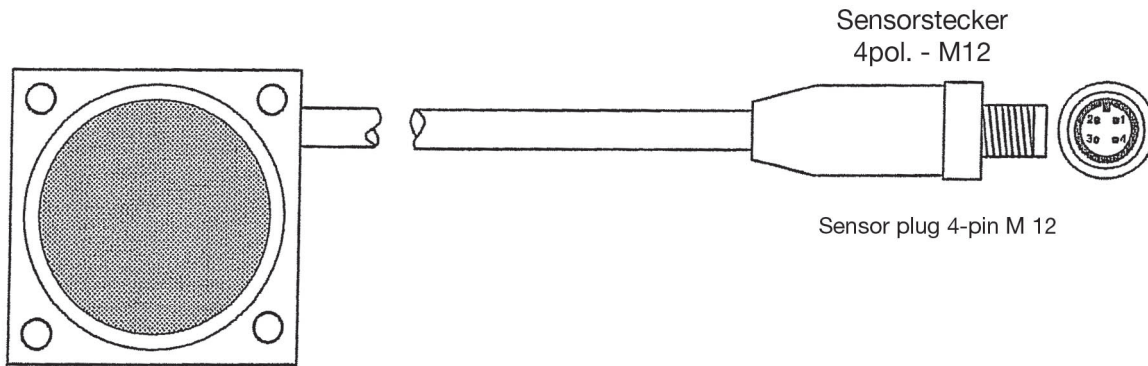
Tray Regulation Mode with Remote 4-20mA Setpoint

Perform the setup for external 4-20mA setpoint. Connect accelerometer to the socket in the bottom of the control.

OPERATION	RESULT (OR DISPLAY)
Press "P"	C 000
Press ▲ scroll to	C 008
Press "P" repeatedly until	ACC 1 (set ACC to 1 using arrow keys)
Press "P"	PA 40 (set PA to 40 using arrow keys)
Press "P"	IA 50 (set IA to 50 using arrow keys)
Press "P"	STOP
Press green "I"	Enable controller (0.0)
Apply minimum signal (4mA)	Feeder is energized (A = min)
Increase signal to max (20mA) slowly	100.0 (A = max) (maximum amplitude set in C 008 of External Setpoint Mode procedure)
Press "P" repeatedly until	P 100.0
Press ▼ repeatedly until	Amplitude starts to decrease. Confirm by reading amplitude sticker
Press "P" repeatedly until	100.0 NOTE: if – is displayed or flashing in upper lefthand corner, reduce "P" parameter until gone.
Press "P" repeatedly until	C 008
Press ▼ scroll to	C 000
Press "P" repeatedly until	99.0-100.0 or maximum amplitude is achieved
Reduce signal to minimum (4mA)	0.0 or minimum federate set in C 008 of External Setpoint procedure
Adjust external signal to achieve the desired feed rate.	

Technical Drawings

Connection Acceleration Sensor range SW - on Plug M12



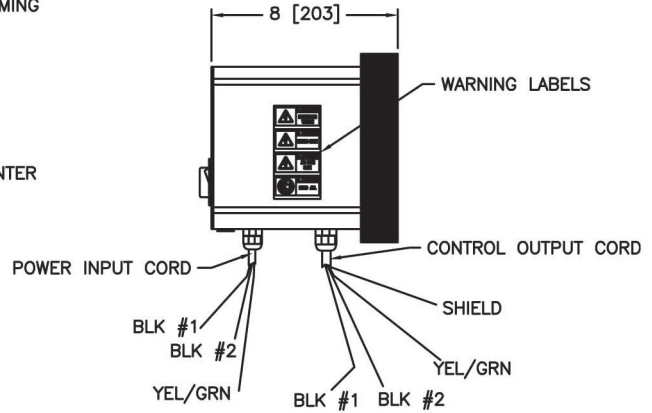
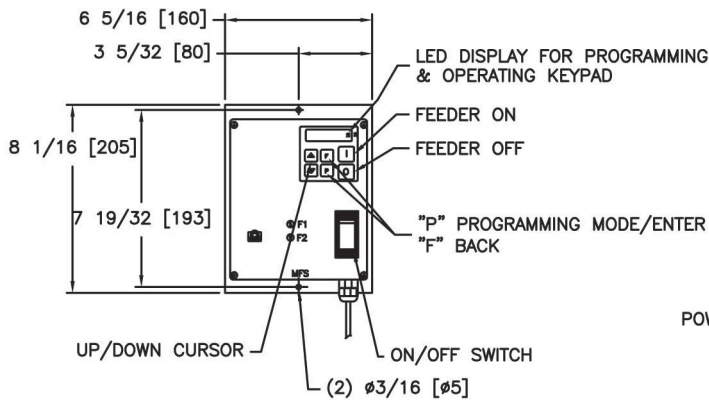
Sensor wire color to pin correlation:

PIN NO	LEADWIRE COLOR
1	Red
2	Orange
3	Black
4	Brown

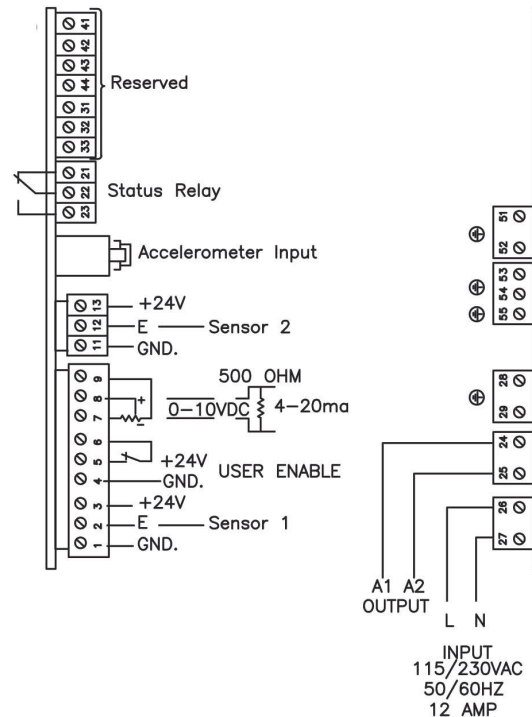
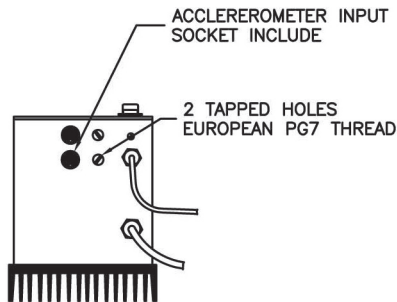
Previous plug design included the following sensor wire to pin correlation:

PIN NO	LEADWIRE COLOR
1	Brown
2	White
3	Blue
4	Black

Technical Drawings (cont.)



NEMA 12, IP 54 ALUMINUM HOUSING



* OUTPUT FREQUENCY IS FACTORY SET AND SHOULD NEVER BE ALTERED WITHOUT CONSULTING ERIEZ FIRST.

PROGRAMMING

- AMPLITUDE
PRESS KEY P, SELECT C 002
PRESS P ONCE MORE AN "A" IS DISPLAYED
SELECECT MAX. AMPLITUDE A 100 = 100% AMPLITUDE
- FEEDER PARAMETERS
PRESS P, SELECT C 096
MAXIMUM POWER P 100 = 100% POWER OUTPUT
SOFT START TIME U = 2, 2 SECOND RAMP UP TIME
SOFT STOP TIME d = 2, 2 SECOND RAMP DOWN TIME
- THESE SETTINGS WILL REPRESENT "FACTORY" SETTINGS FOR FURTHER PLEASE SEE IOM FOR MORE FEATURES.
- PLEASE CONSULT ERIEZ FOR PROBLEMS CONCERNING FEEDER TUNING.

STAMP NAME PLATE	
MODEL: W12-630Hz/115 (HS)	STYLE: 9623302
VOLTS IN: 115 VAC	IN: 12.0
OUTPUT: 0-105 VAC	AMP OUT: 12.0
CYCLES: 50/60	PHASE SINGLE
OTHER RATINGS: 30 Hz FEEDER CONTROL, IP 54	

STAMP NAME PLATE	
MODEL: W12-630Hz/230 (HS)	STYLE: 9623302
VOLTS IN: 230 VAC	IN: 12.0
OUTPUT: 0-220 VAC	AMP OUT: 12.0
CYCLES: 50/60	PHASE SINGLE
OTHER RATINGS: 30 Hz FEEDER CONTROL, IP 54	

CONNECTIONS

BROWN = +120/230VAC
BLUE = -120/230VAC
YEL/GRN = GROUND

SPECIFICATIONS

INPUT 115/230 VAC
INPUT FREQ. 50/60 Hz
INPUT CURRENT 12.0 AMP
OUTPUT 0-105/0-220 VAC
OUTPUT FREQ. FACTORY SET@ 30Hz*
OUTPUT CURRENT 12.0 AMP

Note: Some safety warning labels or guarding may have been removed before photographing this equipment.
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