

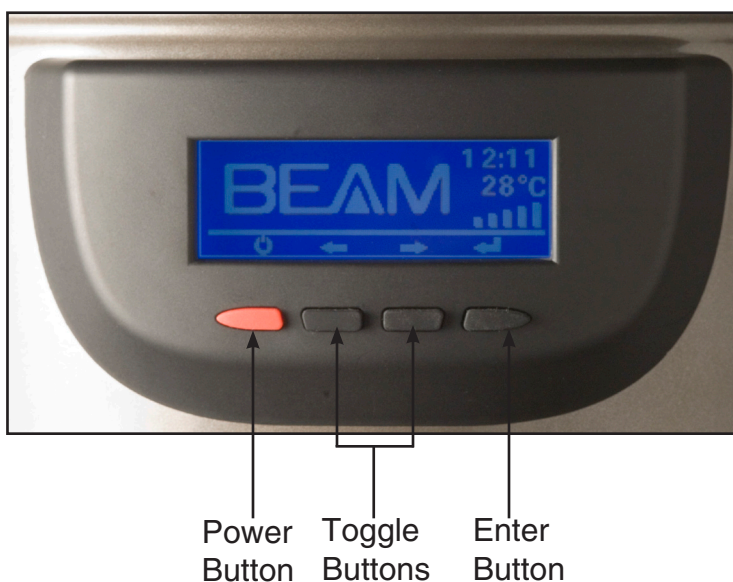
K A L D Q X M P J U Y  
P O W E R F U L L R U  
C L E A N I N G N G L  
I N N O V A T I O N K  
L C D R E W G W N E C  
P B N S E R V I C E R  
M U Q Y D M X P Z E J  
I T J B U M A N U A L  
W Y K N T R A N S T O  
E T Y U Y I S Q C W S  
O Q M M L D Q X V I V  
P F X O D F X C W U X  
Z J Z E W E I O L H R  
B E A M A O B B R M G  
F Q I Z B Y A R N F M  
D E L E C T R O L U X  
M C P U K V G T R G J  
L V L O D B T S N E Z

***Beam LCD Service Manual***

# Introduction

This manual has been created as a guide for servicing the Beam Serenity\_3.0 LCD series. The following pages provide a step by step review of the LCD interface. Contained within this manual you will find the servicability benefits that have been engineered into this power unit. The detailed information provided by the ECS components will benefit you in diagnosing any issues that are affecting the power unit's performance. Additionally, included at the end of this manual, you are provided an LCD Service Value Sheet. The LCD Service Value Sheet is provided as a tool and can be completed for every residence where the product is installed.

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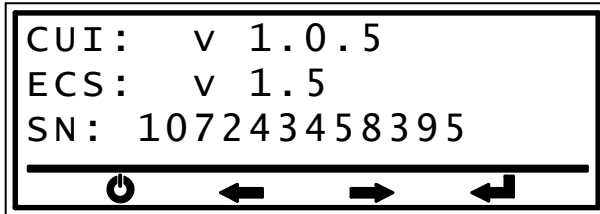
The purpose of the LCD screen from the service perspective is that it allows you to obtain an in-depth look at the power unit and the performance of the ECS components. Referring to the picture above, you will notice that there are four buttons below the LCD screen. These buttons relate to the symbols shown directly above them on the LCD screen. To enter the service mode of the LCD press and hold both toggle buttons (middle two buttons as shown above) at the same time for 10 seconds. Once you have completed this you will notice the screen has changed to the **Service Screen View**, as seen on page 2. The **Service Screen View** is described in detail on page 2.



# LCD Service Screen

The LCD feature of the power unit provides several detailed measurements of performance. The service screen has multiple options to choose from. The following chart shows all of the screens, abbreviations, and definitions.

## Service Screen View



**CUI:** LCD Interface version

**ECS:** Current version of the electronic card in the power unit

**SN:** Serial number of the power unit.

**Navigation of the Service Screen View:** Below is a table listing the Service Screen Menu. You are able to navigate from screen to screen by using the toggle buttons. (← →) The right toggle button (→) moves you forward in the menu, down in the order of the table shown below. The left toggle button (←) moves you back in the menu, up in the order of the table shown below. To exit the Service Screen View press the Red Power Button at anytime.

## Service Screen Menu Items

Service Measures	Abbreviations
Motor Status	ms
Motor Runtime Hours	rn
Motor Runtime Seconds	rs
Measured Voltage	vt
Measured Motor Current	ct
Measured Line Frequency	ft
Performance Level	pf
Operating Voltage	ov
Motor On/Off Cycles	cy
Number of Reboots/Repower	bt
Number of Overvoltage	hv
Number of Undervoltage	lv
Number of Overcurrents	oc
Max Voltage Measured	vm
Min. Voltage Measured	vn
Max Current Measured	am
Min. Current Measured	an
Office Current	oc
Sealed Current	sc
Factory Settings Screen	-
Contrast	con

## Service Measure Definitions

**Motor Status:** The measurement of the speed in which the motor is running. If the power unit is off, the display will read 0. When the power unit is turned on it will display possible values of 1-5.

**Motor Runtime Hours:** Displays the total number of hours the machine has ran. This measurement can be reset after the motor has been serviced or replaced if desired. The Runtime Reset process that follows later, describes how this is done.

**Motor Runtime Seconds:** Shows the number of seconds that the power unit has ran up to 3600 seconds (1 hour). Once 3600 seconds has been measured it will reset to 0 and 1 hour will be added to the Motor Runtime Hours screen. The Runtime Reset process that follows later, describes how this is done.

**Measured Voltage:** A realtime number showing voltage supplied to the power unit.

**Measured Motor Current:** A realtime number measuring the amount of current being supplied to the power unit.

**Measured Line Frequency:** The measured line frequency that was supplied to the power unit during its last runtime cycle.

**Performance Level:** The performance level that has been programmed at the factory.

**Operating Voltage:** Factory setting of the voltage to be supplied to the machine.

**Motor On/Off Cycles:** Number of times the power unit has been turned on/off. This number will increase everytime the power unit complete a cycle from on to off.

**Number of Reboots/Repower:** Number of times the power unit has been disconnected from electricity either by unplugging or occurrence of a power outage. This number will increase by 1 with each occurrence.

**Number of Overvoltages:** Number of times the voltage has exceeded the maximum accepted voltage. This number will increase by 1 with each occurrence.

**Number of Undervoltage:** Number of times the voltage has fallen below the minimum accepted voltage. This number will increase by 1 with each occurrence.

**Number of Overcurrent:** Number of times the current has exceeded the maximum accepted current. This number will increase by 1 with each occurrence.

**Max Voltage Measured:** Maximum voltage measured by the power unit. This number will show the highest voltage measured by the power unit until the power unit settings have been reset by the Clear Stats process.

**Min Voltage Measured:** Minimum voltage measured by the power unit. This number will show the lowest voltage measured by the power unit until the power unit settings have been reset by the Clear Stats process.

**Max Current Measured:** Maximum current measured by the power unit. This number will show the maximum current measured by the power unit until the power unit settings have been reset by the Clear Stats process.

**Min Current Measured:** Minimum current measured by the power unit. This number will show the minimum current measured by the power unit until the power unit settings have been reset by the Clear Stats process.

**Office Current:** Factory set current at a 19mm (3/4") office.

**Sealed Current:** Factory set current for a sealed office.

**Factory Settings Screen:** Reference table for setting of the power unit. This screen has no functional features intended for use by a service technician.

**Contrast:** If the LCD screen seems faint or dark, enter the service screen in the LCD screen options by following Contrast Adjustment steps described later in the manual.

# Motor Recalibration

Residential voltages vary worldwide, therefore factory performance calibration is set at 240 volts. Depending on the line voltage, the unit may need to be recalibrated to a lower voltage at the units installation to show full performance at a 19mm (3/4") orifice. The following process will instruct you on how to recalibrate the motor. Please read through the process to understand the steps involved before beginning.

## Step 1

A 19mm (3/4") orifice needs to be created for the recalibration process. (The orifice can be created by connecting a short piece of pipe and pipe cap. A 19mm (3/4") hole needs to be drilled in the cap) Now insert the pipe into the intake leave it in place until the end of the process. Make sure all other intakes are sealed. (1.1)

## Step 2

Press and hold both toggle buttons (← →) for 10 seconds to get into the service screen of the LCD. (2.1, 2.2)

## Step 3

Once you have scrolled through the service menu to either of these two screens press the enter button (↵). (3.1, 3.2)

## Step 4

After the enter button is pushed from Step 3, there are 2 options:

### Option 1

Press the enter button (↵) while the "N" is highlighted and you will exit the recalibration option. (4.1)

### Option 2

Push the left toggle button (←) to highlight the "Y" and the enter button (↵) to begin the recalibration process. (4.2)

## Step 5

Once the "Orifice Measurement" screen appears press the enter button (↵). (5.1)

After the enter button has been pressed screen 5.2 will appear followed by 5.3.

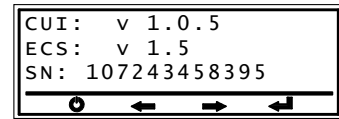
After the orifice size has been read, the motor will slow down to low speed.



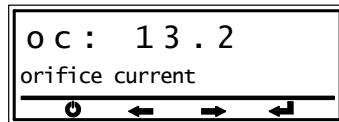
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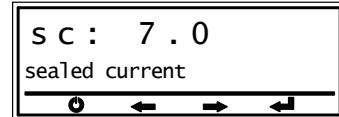
2.1



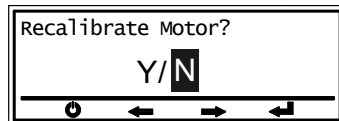
2.2



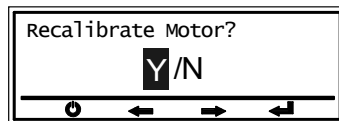
3.1



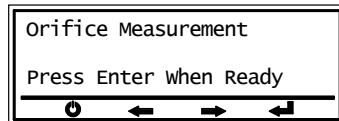
3.2



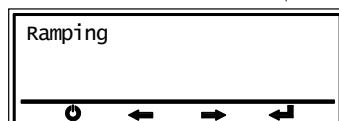
4.1



4.2



5.1



5.2



5.3

Continued on next page

# Motor Recalibration Continued

## Step 6

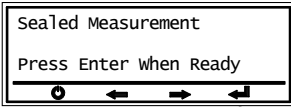
When the motor has slowed down to low speed seal the orifice. You can seal the orifice by covering it with your hand. (6.1)



6.1

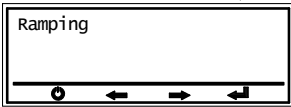
## Step 7

Once you have sealed the orifice with the motor running in low speed (6.1) press the enter button (↵) on the "Sealed Measurement" screen. (7.1)



7.1

Continue with the orifice sealed while the calibration is being measured. (7.2, 7.3)



7.2

The motor will shut-off when the calibration is complete.



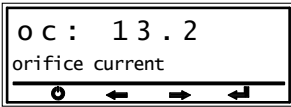
7.3

## Step 8

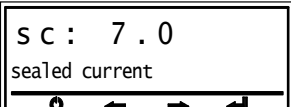
When the motor has stopped, press the enter button (↵) to accept the new calibration values. (8.1) The LCD screen will then return to **oc** or **sc**. (8.2, 8.3) Press the red power button (⏻) to return to the main LCD screen.



8.1



8.2



8.3

## Step 9

From the main screen you can test the recalibration process you completed. Turn the power unit on by pressing the red power button (⏻).

To review the performance level with the new calibration specifications in place, perform the following:

With 19mm (3/4") orifice in the intake and the machine turned on the performance bars should read between 4-5 bars for an open 3/4 (19mm) orifice. (9.1)



9.1

By sealing 19mm (3/4") orifice the performance bars should read 0 bars. (9.2)



9.2

After reviewing the performance levels from recalibration you can remove the 19mm (3/4") orifice and install the power unit back to its appropriate location.

END

# Runtime Reset

After the power unit has ran for 500 hours the main LCD screen will indicate that is is time for a service call. At this time, it is recommended that the motor brushes be changed as preventative maintenance.

In the case that the motor needs to be replaced or the motor brushes replaced, the “runtime” timer needs to be reset. This is accomplished by following the steps below.

It is highly recommended that the LCD Service Values page is used to record the history of the service.

Service call indicator on the main LCD screen.

## Step 1

Press and hold both toggle buttons (← →) for 10 seconds to enter the Service Screen View. (1.1)

## Step 2

Once you have scrolled through the Service Menu to either of these two screens press the enter button (↵). (2.1, 2.2)

## Step 3

Once you have pressed the enter button (↵) you have 2 options:

### Option 1

Press the enter button (↵) when the “N” is highlighted and you will exit the runtime reset. (3.1)

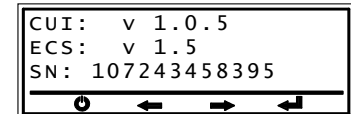
### Option 2

Press the left toggle button (←) to highlight the “Y” and then press the enter button (↵). (3.2)

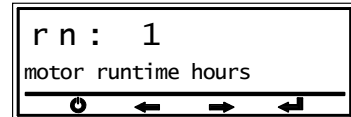
## Step 4

After the enter button (↵) has been pressed in step 3 above, the screen will look like 4.1, 4.2, and 4.3.

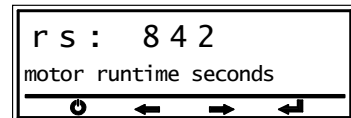
Once it is confirmed that the runtime has been reset press the enter button (↵) to exit the service screen and go back to the main screen. (4.4)



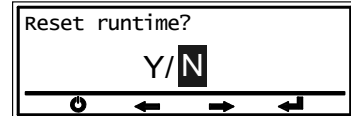
1.1



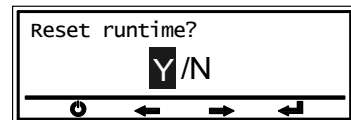
2.1



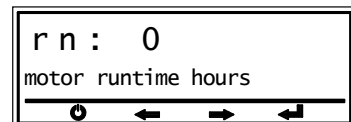
2.2



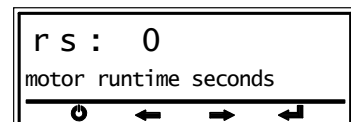
3.1



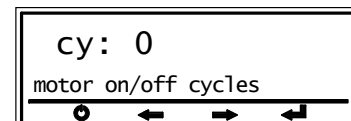
3.2



4.1



4.2



4.3



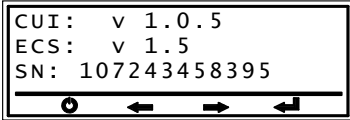
4.4

# Contrast Adjustment

If the LCD screen seems faint or dark, enter the Service Screen in the LCD screen options by following the steps below.

### Step 1

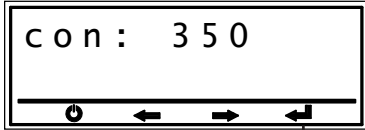
Press and hold both toggle buttons (← →) for 10 seconds to get into the service screen of the LCD. (1.1)



1.1

### Step 2

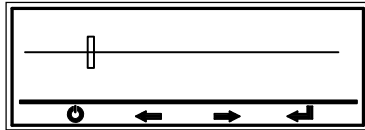
After you have scrolled through the service screen options to the contrast screen (con) press the enter button (↵). (2.1)



2.1

### Step 3

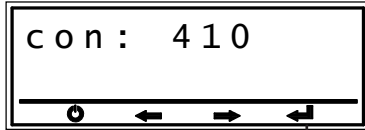
Press either the left or right toggle button (← →) to adjust the contrast of the LCD screen. (3.1)



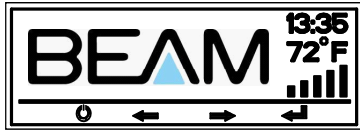
3.1

### Step 4

After you have adjusted the contrast to your specifications press the enter button (↵) to exit back to the main LCD screen. (4.1)



4.1



END

# Clear Stats

There will be times when troubleshooting that it is necessary to clear the historical data of the power unit. Before clearing the machine of all history it is recommended that you record the values on the LCD Service Values sheet. All values should be recorded and cleared after a motor service as well.

Follow the step below to clear all historical data of the power unit.

## Step 1

Press and hold both toggle buttons (← →) for 10 seconds to get into the service screen of the LCD. (1.1)

## Step 2

It is important to note that the “clear stats” screen can be entered through any of the following LCD service screens:

number of reboots/repower	bt
number of overvoltage	hv
number of undervoltage	lv
number of overcurrents	oc
max voltage measured	vm
min voltage measured	vn
max current measured	am
min current measured	an

Enter any of the above LCD service screens and press the enter button (↵) to access the “clear stats” screen. (2.1, 2.2)

## Step 3

Once you have pressed the enter button you have 2 options.

### Option 1

Press the enter button (↵) when the “N” is highlighted and you will exit the “clear stats”. (3.1)

### Option 2

Press the left toggle button (←) to highlight the “Y” and then press the enter button (↵). (3.2)

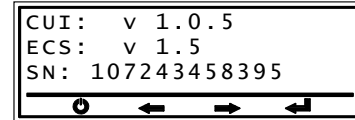
## Step 4

After you have pressed the enter button (↵) all of the above LCD service screens should read 0 or 0.0. (4.1, 4.2)

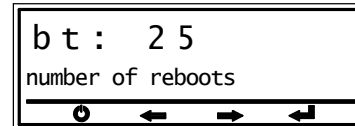
## Step 5

After all of the LCD service screens have been cleared of their stats press the enter button (↵) to return to the main LCD screen. (5.1)

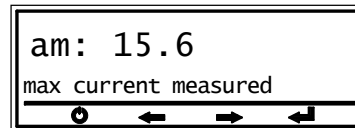
END



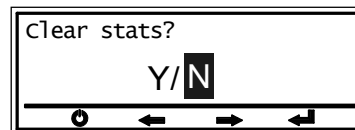
1.1



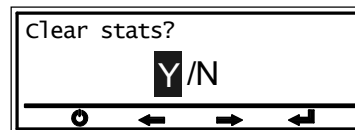
2.1



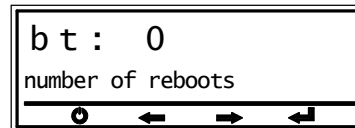
2.2



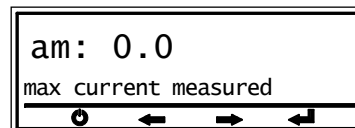
3.1



3.2



4.1



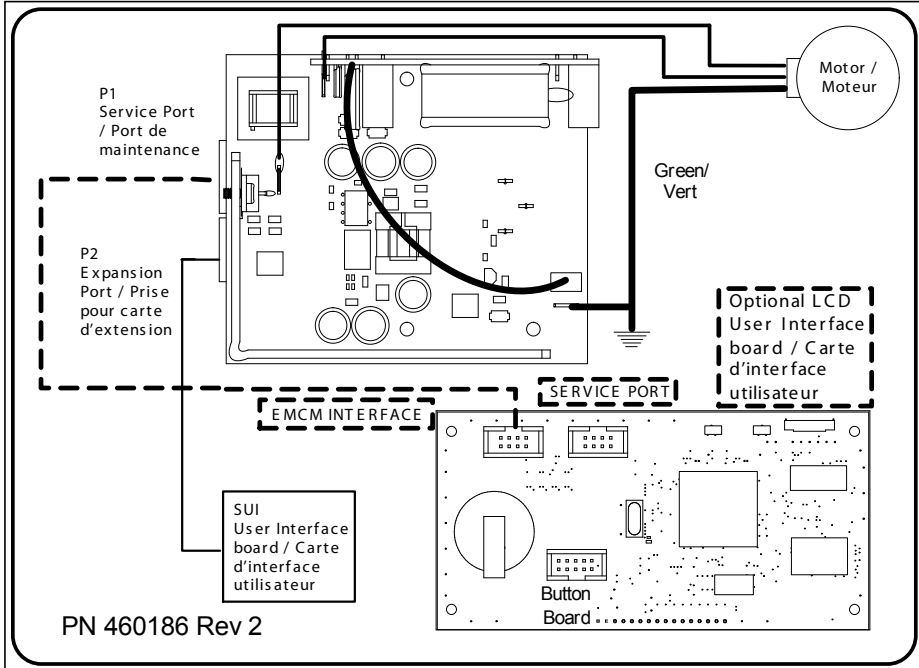
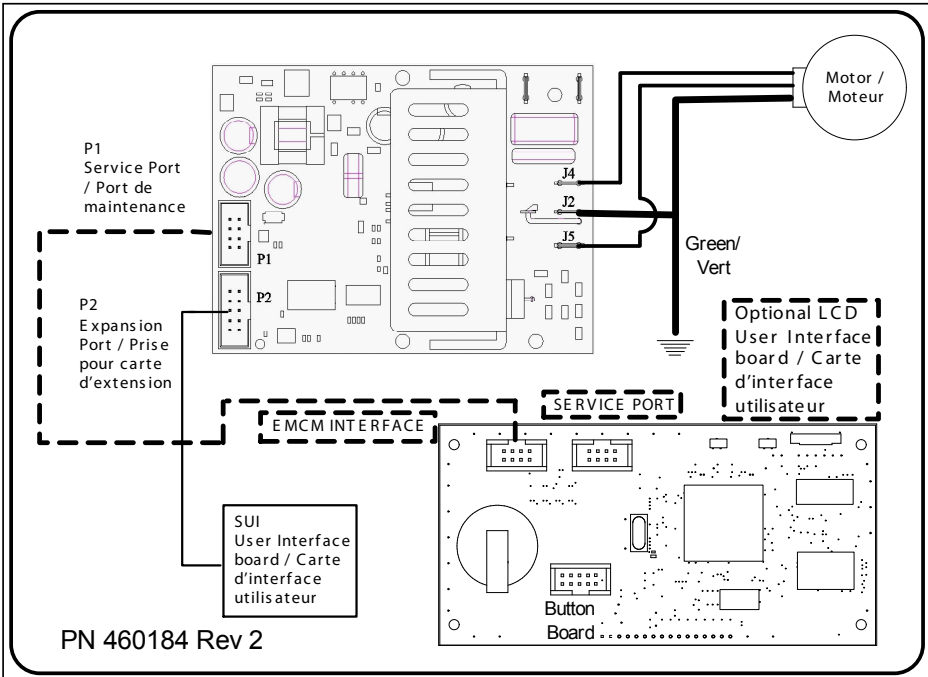
4.2



5.1



# Wiring Diagrams



# LCD Service Value Sheet

















\*To enter the service mode of the LCD press and hold both toggle buttons at the same time for 10 seconds. This sheet is provided as a record keeping tool for a single power unit.

Model:	Dealer:	Customer:
CUI version:	ECS version:	Serial Number:

Date when values recorded (day/month/year)			
/	/	/	/

motor status	ms*				
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\* The power unit must be **ON** to show a motor status number higher than zero. (1-5 motor speed) If the power unit is **OFF** the motor status will be zero.

Motor Alerts shown on LCD screen	Service Codes	Service Code Definitions
LCD screen is flashing  	250	Fuse fault/motor wire disconnect/broken. This code will appear as a constant in Service mode.
LCD screen shows   then flashing <b>BEAM</b>	251	Overcurrent shutdown (power unit will automatically reset in 15 seconds) This code will appear only when the error is occurring. This error will also increment 1 to the over current counter.
LCD screen shows   then flashing <b>BEAM</b>	252	Motor timeout (30 minutes of continuous use) This code will appear when the error is taking place. When the power unit is turned OFF then ON it will clear the error.
LCD screen shows   then flashing <b>BEAM</b>	253	Overcurrent (power unit will automatically reset in 15 seconds) This code will appear only when the error is taking place. This error will also increment 1 to the over current counter
LCD screen shows   then flashing  	254	Invalid line frequency This code will appear when the error is occurring.
LCD screen shows   then flashing  	255	High line voltage This code will appear when the error is occurring and will increment 1 to the over voltage counter. (It will reset automatically once voltage drops 5 volts below allowable range

**NOTE:**

motor runtime hours	rn					Counter is reset upon completion of run time reset
motor runtime seconds	rs					Counter is reset upon completion of run time reset
measured voltage	vt					Real time measurement
measured motor current	ct					Real time measurement
measured line frequency	ft					Real time measurement
performance level	pf					Factory setting
operating voltage	ov					Factory setting
motor on/off cycles	cy					Counter is reset upon completion of run time reset
number of reboot/repower	bt					Counter is reset upon completion clear stats
number of overvoltage	hv					Counter is reset upon completion clear stats
number of undervoltage	lv					Counter is reset upon completion clear stats
number of overcurrents	oc					Counter is reset upon completion clear stats
max voltage measured	vm					Counter is reset upon completion clear stats
min voltage measured	vn					Counter is reset upon completion clear stats
max current measured	am					Counter is reset upon completion clear stats
min current measured	an					Counter is reset upon completion clear stats
orifice current	oc					Reset during calibration
sealed current	sc					Reset during calibration
factory settings	o_l	o_h	s_l	d_l	d_h	
contrast	con					