INSTRUCTIONS

for the

Evolution RC Software Upgrade Kit
(Catalog No. 73339)

Parts Included

Quantity	Part #	Description
1 ea	73375	Evolution RC Software Update Disk
1 ea	73344	Installation Instructions

Tools and Other Items Required

- 3mm Allen Wrench
- Null Modem Cable (73827)
- Computer (Windows 98 or higher)
- Flash card reader

Warning:

This kit provides operating system software to be installed on the SORVALL ® Evolution™ RC Centrifuge. In the process, files will be downloaded to centrifuge memory. Follow the procedure provided exactly and in its entirety. Failure to do so can cause the centrifuge to exhibit problems, or render it inoperable. These instructions assume the installer is familiar with using a computer running an MS Windows ® operating system.

Note:

Connecting the Null Modem Interface cable will cause the LCD Touch Screen to become inactive with no display.

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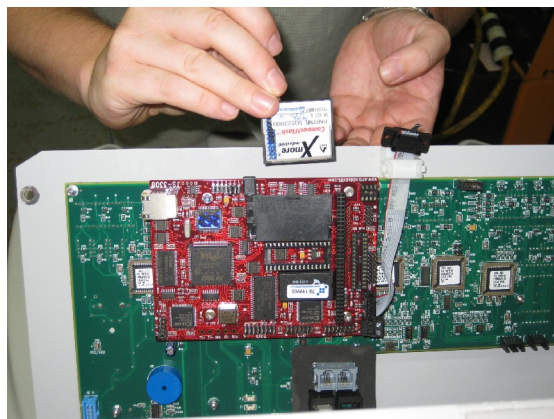### (Catalog No. 73339)

Instructions

Note:

Two methods for installing the Evolution software are included. Method A uses a flash card reader and is the easiest and quickest method. Method B utilizes the hyperterminal software included on a laptop computer. Method B is the only method that can be used on older units that have a physical hard drive. Method A <u>or</u> B can be used on units that have the old PC104 using a 16MB flash card (see photo below). In this case, choose Method A or B, but not both. Units that have the new PC104, which uses a 128MB flash card, can only be reprogrammed using Method A. Note that the new PC104 cannot be used on units with LCD screen (AFM module). **Regardless of the method used to install the software, the configuration detailed in Section C will still need to be completed. The table below summarizes which methods apply for the different unit configurations.**

	Method A	Method B	Section C
Units with hard drive		**X**	**X**
Units with old PC104 controller board (uses a 16MB CF card)	**X** OR	**X**	**X**
Units with new PC104 controller board (uses a 128 MB CF card)	**X**		**X**

Old PC104 with 16MB CF card

New PC104 with 128MB CF card

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A. Software Installation – Flash Card Reader Method

Note:

It is strongly recommended that all files on the unit's compact flash be backed up onto a directory on the laptop hard drive before overwriting or deleting any files.

1. Set the centrifuge main POWER switch to the OFF (O) position.

2. From the behind the control console, use a 3 mm Allen wrench to remove the four screws (one from each corner) that secure the bezel in position on the control panel, and remove the bezel.

3. Remove the 4 screws (3mm) holding the control panel to the housing.

4. Remove the flash card from its holder.

5. Insert the flash card into the flash card reader that is connected to the laptop.

6. It is strongly recommended that all files on the unit's compact flash be backed up onto a directory on the laptop hard drive before overwriting or deleting any files. Create a backup directory on the laptop's hard drive and copy all the files from the flash card to the backup directory. This is a precautionary step in case the files are need to be returned to the unit.

7. Insert the *Evolution™ RC Software Upgrade* CD into the CDROM drive of the laptop

8. Navigate to the files contained on the CD.

9. Select all the files on the CD and copy the files.

Note: The files **"Evolution Diag."** and **"Evolution Download"** do not need to be copied to the compact flash card. However, the files can be copied to the compact flash card with no effect on the machine's performance. These files are not used by the centrifuge controller.

10. Paste the files onto the compact flash. Select "Yes to All" when prompted to overwrite the files.

11. Safely remove the compact flash from the reader and reinstall the flash card into the unit. The software is now loaded into the machine.

12. Reinstall the panel using the 4 screws removed earlier but leave the bezel off. The software configuration still needs to be completed. Skip to section Section C. System Configuration.

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B. Software Installation – Hyperterminal Method

1. Set the centrifuge main POWER switch to the OFF (O) position.

2. From the behind the control console, use a 3 mm Allen wrench to remove the four screws (one from each corner) that secure the bezel in position on the control panel, and remove the bezel.

3. Locate the interface ribbon cable, marked 73389, that is stowed inside the top of the control console, behind the control panel SPEED display. Draw the loose end of the ribbon cable forward.

4. If the unit <u>does not</u> have the Advanced Features Option (LCD Touch Screen), then plug one end of the null modem cable into the ribbon cable connector.

5. On centrifuges that have the Advanced Features Option (LCD Touch Screen), connect the Null Modem Interface Cable (73903) (located in a cable clamp attached to the bottom interior of the control console) to the ribbon cable. Then plug one end of the null modem cable into the other end of the 73903 cable connector.

6. Connect the other end of the null modem cable to the laptop computer serial port.

7. Turn the laptop computer ON, wait for the start-up routine to finish so that the desktop appears, then insert the *Evolution™ RC Software Upgrade* CD (supplied) into the computer's disk drive.

8. Locate and open the disk drive on the computer desktop to access the files on the disk, then double-click on the **"Evolution Diag."** file. This will launch HyperTerminal at a baud rate of 9600 and enable the computer to connect to the centrifuge.

9. If the **"Evolution Diag."** or **"Evolution Download"** Hyperterminal icons are not present on the Evolution RC software update disk open the Hyperterminal program and set the following parameters for each window.

> **Evolution Diag:**
> Bits per second: 9600
> Data Bits: 8
> Parity: none
> Stop bits: 1
> Flow control: Hardware

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Evolution Download:

Bits per second: 57600
Data Bits: 8
Parity: none
Stop bits: 1
Flow control: Hardware

Note:
On centrifuges that use software revision #41 (or higher) skip steps 10 Through 13 and resume at step #14.

10. Set the centrifuge main POWER switch to the ON (I) position, place your fingers in a ready position over the computer **"Ctrl"** and **"C"** keys, and watch the computer screen as the centrifuge goes into its start-up routine. Text will scroll upward and, shortly after **"C:\>ECHO OFF**" appears, **"C:\>evol"** will appear. Immediately after **"C:\>evol"** appears, interrupt the start up routine by pressing the **"Ctrl"** and **"c"** keys simultaneously.

```
HOT cable detected, Serial Loader starting.
Press ESC to abort Hard disk boot
Booting Hard Drive
Loading...
DR DOS Release #
Copyright (c) year. All rights reserved.
C:\>ECHO ON
C:\>evol
```

11. Type **"Y"** and the **"c:\>"** prompt will appear. If this process does not work and values appear in the centrifuge display, **"Ctrl"** and **"c"** were not pressed in time to interrupt start-up, set the centrifuge main POWER switch to the OFF (O) position, then go back to step 9.

12. Delete the Autoexec.bat file by typing **"erase autoexec.bat"**, then press the **"ENTER"** (return) key. A new autoexec.bat file will be downloaded later.

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13. Set the centrifuge main POWER switch to the OFF (O) position, then turn it back ON (I); the computer will show the centrifuge start-up process, then will stop scrolling and prompt to enter the date. Press the **"ENTER"** key twice, the first time to bypass the **"Enter date"** prompt, then a second time to bypass the **"Enter time"** prompt.

```
HOT cable detected, Serial Loader starting.
Press ESC to abort Hard disk boot
Booting Hard Drive
Loading...
DR DOS Release #
Copyright (c) year. All rights reserved.
Date: Sat 3-17-2001
Enter date (mm-dd-yy):
Time: 4:00:54.87
Enter time:
```

14. On centrifuges using software revision #41 (or higher), turn the power ON and type **"T"** on the connected PC after the centrifuge has booted. This will cause the centrifuge software to stop and the **"c:\>"** will be displayed on the PC screen.

15. If not already deleted, delete the Autoexec.bat file by typing **"erase autoexec.bat"**, then press the **"ENTER"** (return) key. A new autoexec.bat file will be downloaded later.

Warning:
Erase only the files that are listed in steps #15 & #16. Erasing files other than the files that are listed can cause the file transfer process to not operate properly and will render the centrifuge inoperable.

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Note:
Deleting the remaining system files will ensure that no conflicts occur when downloading the new system files.

16. Delete the remaining system files following the procedure that is out-lined in step 15.

> **evol.exe**
> **faults.txt**
> **rotors50**
> **rotors60**
> **egavga.bgi**
> **enghflts.lng**
> **English.lng**
> **frchflts.lng**
> **French.lng**
> **German.lng**
> **grmnflts.lng**
> **Spanish.lng**
> **Spnhflts.lng**
> **Lcdfile**
> **Password**

17. At the **"C:\>"** prompt that appears, type **"msk315m"** then press the **"Enter"** key. This will run a program that is required to change the centrifuge baud rate from 9,600 to 57,600. When finished, text will stop scrolling up on the screen and garbled text/characters will be at the bottom of the screen.

18. Quit HyperTerminal. A dialog box will appear to ask if you **"are sure you want to disconnect now"**, click **"YES"** to quit.

19. Double-click on the **"Evolution Download"** file located in the **"disk drive"** window. This will connect HyperTerminal at a 57,600 baud rate.

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20. Download the **"autoexec.bat"** file. From the toolbar, click **"Transfer"** then **"Send File"**. In the filename dialog box that appears, type **"D:\autoexec.bat".** Alternatively, the file can be located using the **Browse** button. Make sure the **"KERMIT"** protocol is selected in the lower box, then click **"SEND"**. The file will be downloaded from the disk to the centrifuge.

Note: The example in step #20 uses the "**D:**" drive. If the software update disk is located in another drive that drive should be referenced. For example **"E:\autoexec.bat".**

21. Repeat the process for the following files.

> **evol.exe**
> **faults.txt**
> **rotors50**
> **rotors60**
> **egavga.bgi**
> **enghflts.lng**
> **English.lng**
> **frchflts.lng**
> **French.lng**
> **German.lng**
> **grmnflts.lng**
> **Spanish.lng**
> **Spnhflts.lng**
> **Lcdfile**
> **Password**

22. After all required files have been downloaded, quit HyperTerminal. A dialog box will appear and ask if you **"are you sure that you want to disconnect now?".** Click **"YES"** to quit.

23. Turn the centrifuge power OFF. Now complete the system configuration in Section C

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C. System Configuration

1. If Method B was used to install the software, a connection between the laptop and the machine has already been established. In this case skip to step 9. Otherwise continue to the next step to establish a connection with the laptop computer.

2. Set the centrifuge main POWER switch to the OFF (O) position.

3. Remove the bezel if not already done. From the behind the control console, use a 3 mm Allen wrench to remove the four screws (one from each corner) that secure the bezel in position on the control panel, and remove the bezel.

4. Locate the interface ribbon cable, marked 73389, that is stowed inside the top of the control console, behind the control panel SPEED display. Draw the loose end of the ribbon cable forward.

5. If the unit <u>does not</u> have the Advanced Features Option (LCD Touch Screen), then plug one end of the null modem cable into the ribbon cable connector. Go to step 7.

6. On centrifuges that have the Advanced Features Option (LCD Touch Screen), connect the Null Modem Interface Cable (73903) (located in a cable clamp attached to the bottom interior of the control console) to the ribbon cable. Then plug one end of the null modem cable into the other end of the 73903 cable connector.

7. Connect the other end of the null modem cable to the laptop computer serial port.

8. Turn the laptop computer ON, wait for the start-up routine to finish so that the desktop appears, then insert the *Evolution™ RC Software Upgrade* disk (supplied) into the computer's disk drive.

9. Double-click on the **"Evolution Diag."** file on the software CD. This will connect HyperTerminal at a 9600 baud rate.

10. Set the centrifuge main POWER switch to the ON (I) position. The centrifuge should boot up normally.

11. Using the connected computer type the letter **"d"** to enter the system diagnostics. If this is not successful, stop the program by typing **"t"** or by pressing **"Ctrl"** and **"c"** at the same time. Then type "**evol d**" to run the diagnostics at the "C:\" prompt.

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12. At the main diagnostic screen select **"configuration"** by typing the letter **"c"**.

```
MAIN MENU
_____
c) configuration
d) diagnostic tests
s) Service Menu(s)
a) exit menus (start application)
e) exit application
_____
your choice: c
```

13. At the configuration menu select **"panel"** by typing the letter **"p"**.

```
SYSTEM CONFIGURATION MENU
_____
p) panel
m) miscellaneous configuration
b) back to main menu
_____
your choice: p
```

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14. At the panel configuration screen select **"knob panel"** by typing the letter **"k"** if the centrifuge panel has knobs. Select **"button panel"** by typing the letter **"b"** if the centrifuge panel has buttons.

```
CURRENT PANEL CONFIGURATION

current state: NVRAM: knobs = 1
NVRAM: LCD = 0
NVRAM: KeBoard = 1
NVRAM: KeValue = 9.400
NVRAM: KeGain = 1.250
NVRAM: Temp. gain = 0.0000000 Temp. offset = 0.0000000
NVRAM: Sensor Slope = -0.0133040 Sensor offset = 0.6832100
NVRAM: Compressor Type = 60 Hertz
knob panel
k) knob panel
b) button panel
l) LCD present
n) LCD NOT present
e) exit panel configuration

your choice:
```

15. At the panel configuration screen select **"LCD present"** by typing the letter **"l"** if the centrifuge has a LCD Touch Screen. Select **"LCD NOT present"** by typing the letter **"n"** if the centrifuge does not have the LCD Touch Screen.

```
CURRENT PANEL CONFIGURATION

current state: NVRAM: knobs = 1
NVRAM: LCD = 0
NVRAM: KeBoard = 1
NVRAM: KeValue = 9.400
NVRAM: KeGain = 1.250
NVRAM: Temp. gain = 0.0000000 Temp. offset = 0.0000000
NVRAM: Sensor Slope = -0.0133040 Sensor offset = 0.6832100
NVRAM: Compressor Type = 60 Hertz
knob panel
k) knob panel
b) button panel
l) LCD present
n) LCD NOT present
e) exit panel configuration

your choice: n
```

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16. Select **"exit panel configuration"** by typing the letter **"e "**.

```
CURRENT PANEL CONFIGURATION
_____

current state: NVRAM: knobs = 1
NVRAM: LCD = 0
NVRAM: KeBoard = 1
NVRAM: KeValue = 9.400
NVRAM: KeGain = 1.250
NVRAM: Temp. gain = 0.0000000 Temp. offset = 0.0000000
NVRAM: Sensor Slope = -0.0133040 Sensor offset = 0.6832100
NVRAM: Compressor Type = 60 Hertz
knob panel
k) knob panel
b) button panel
l) LCD present
n) LCD NOT present
e) exit panel configuration
_____

your choice: e
```

17. Select **"back to main menu"** by typing the letter **"b"**.

```
SYSTEM CONFIGURATION MENU
_____

p) panel
m) miscellaneous configuration
b) back to main menu
_____

your choice: b
```

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18. Select **"service menu(s)"** by typing the letter **"s"**.

```
MAIN MENU
_____

c) configuration
d) diagnostic tests
s) Service Menu(s)
a) exit menus (start application)
e) exit application
_____

your choice: s
```

Note:

If you are unsure as to whether the centrifuge contains a KE Board remove the centrifuge lower front panel and look for the KE Board that should be located on the lower right side of the centrifuge frame (behind the autotransformer).

19. Generally, on centrifuges with serial numbers 10300735 and below select **"KE Board Present"** by typing the letter **"p"**. On centrifuges with serial numbers 10300736 and above or on older centrifuges that have had the motor upgraded to the Servo Magnetics motor select **"KE Board Not Present"** by typing the letter **"n"**.

```
SERVICE MENU
 Ke-Board is installed
_____

p) KE Board Present
n) KE Board not Present
k) Read and Store Ke Value
r) Read and Store Ke Adjustment Ratio
m) Machine Temp Gain and Offset
d) Display Temp Sensor Data
a) Accelerometer menu
c) Compressor Selection
l) Calibrate LCD Touch Panel
b) back to Main
_____

your choice:
```

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20. Select **"Read and Store Ke Value"** by typing the letter **"k"**. The computer should automatically read this value. However, if a numeric value is not present enter 8.5

SERVICE MENU
Ke-Board is installed
_____

p) KE Board Present
n) KE Board not Present
k) Read and Store Ke Value
r) Read and Store Ke Adjustment Ratio
m) Machine Temp Gain and Offset
d) Display Temp Sensor Data
a) Accelerometer menu
c) Compressor Selection
l) Calibrate LCD Touch Panel
b) back to Main
_____

read and store ke value
KE value read is 8.7
Enter new value
b) back to menu
8.7
Completed

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21. Select **"Read and Store Ke Adjustment Ratio"** by typing the letter **"r"**. The computer will display the current adjustment ratio (1.325 for software revision #37 or 1.250 for software revision #41 or higher). Enter the value **"1.250"** to correspond with the new software revision. Entering the wrong Ke adjustment ratio will result in poor centrifuge performance.

```
SERVICE MENU
Ke-Board is installed
_____

p) KE Board Present
n) KE Board not Present
k) Read and Store Ke Value
r) Read and Store Ke Adjustment Ratio
m) Machine Temp Gain and Offset
d) Display Temp Sensor Data
a) Accelerometer menu
c) Compressor Selection
l) Calibrate LCD Touch Panel
b) back to Main
_____

your choice: r
read and store Adjustment Ratio value
KE Adjustment Ratio value read is 1.250
Enter new value
b) back to menu
1.250
Completed
```

22. Select **"Machine Temp Gain and Offset"** by typing the letter **"m"**. Enter a value of **0.0** for both the gain and offset.

```
SERVICE MENU
Ke-Board is installed
_____

p) KE Board Present
n) KE Board not Present
k) Read and Store Ke Value
r) Read and Store Ke Adjustment Ratio
m) Machine Temp Gain and Offset
d) Display Temp Sensor Data
a) Accelerometer menu
c) Compressor Selection
l) Calibrate LCD Touch Panel
b) back to Main
_____
```

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23. Select **"Compressor Selection"** by typing the letter **"c"**.

```
SERVICE MENU
Ke-Board is installed
_____

p) KE Board Present
n) KE Board not Present
k) Read and Store Ke Value
r) Read and Store Ke Adjustment Ratio
m) Machine Temp Gain and Offset
d) Display Temp Sensor Data
a) Accelerometer menu
c) Compressor Selection
l) Calibrate LCD Touch Panel
b) back to Main
_____

your choice: c
```

24. Select **"60 Hertz"** by typing numeral **"1"** if the line power of the installed centrifuge is 60 Hz. Select **"50 Hertz"** by typing the numeral **"2"** if the line power of the installed centrifuge is 50 Hz.

```
CURRENT Compressor CONFIGURATION
 60 Hertz
1) 60 Hertz
2) 50 Hertz
3) 50 Hertz single phase
4) 50 Hertz polyphase
b) back to menu
_____

your choice: 1
```

25. Select **"back to menu"** by typing the letter **"b"** to return to the main menu.

```
SERVICE MENU
Ke-Board is installed
_____

p) KE Board Present
n) KE Board not Present
k) Read and Store Ke Value
r) Read and Store Ke Adjustment Ratio
m) Machine Temp Gain and Offset
d) Display Temp Sensor Data
a) Accelerometer menu
c) Compressor Selection
l) Calibrate LCD Touch Panel
b) back to Main
_____

your choice: b
```

26. Set the centrifuge main POWER switch to the OFF (O) position, then turn it back ON (I); the centrifuge will now start up normally (during start-up, the new software revision **(REL)** number will momentarily appear in the Temperature display). No calibrations are required. The preexisting Ke value and imbalance calibration remain in memory.

27. Open the chamber door, install a rotor, then verify that the instrument operates correctly.

28. If the centrifuge operates correctly, quit HyperTerminal. A dialog box will appear to ask **"you are sure you want to disconnect now"**; click **"YES"** to quit.

29. Set the centrifuge main POWER switch to the OFF (O) position, remove the system software disk from the computer, and shut down the computer.

30. Disconnect the modem cable from the computer, and from the centrifuge interface ribbon cable, return the ribbon cable to its original location inside the top of the control console, behind the SPEED display, positioned so that the connector pins will not contact p.c. board circuits.

31. On centrifuges with the Advanced Features Option (LCD Touch Screen) disconnect the Null Modem Interface Cable (73903) from the pigtail that is connected to the PC-104 processor and tuck the cable into the cable clamp located inside the console assembly. (Failure to disconnect the interface cable will cause the LCD Touch Screen to be disabled.)

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32. Reinstall the bezel on the control console using the four screws re-moved in step 2, and tighten using a 3 mm Allen wrench.

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