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Operation Manual

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Evolution Dissolution Test System

Operation Manual

Document # 3861-0001

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Notice

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C	October 2004	Updated for Firmware Rev. 2.13. See Distek Change Notice 0456.
D	June 2005	Updated Appendix A: Spare Parts & Accessories. See Distek Change Notice 0508.
E	September 2005	Removed Certificate of Compliance from Manual. Certificate is a separate file on manual CD. See Change Notice 0516. Page B-1: Step # 5.3 – change "0.3V" to "2.0 V" and "0.5 V" to "3.0 V" Page D-2 and D-3 – add note to bottom of page - "Asterisk (*) in Temperature Profiles denotes out of USP specification"
F	May 2007	See Distek Change Notice 0580. Updated for FW Rev. 2.15.

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About this Manual

About This Manual includes information about what is contained in this manual and the conventions used.

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Purpose

This manual covers the installation, routine operation, maintenance and repair of your Evolution Dissolution Test System. It has information regarding the commands, menus, indicators and controls. Chapter 1 provides an overview of the system. Chapter 2 covers unpacking, installation, and qualification of the system. Chapter 3 has operation and programming information. Chapters 4 and 5 cover maintenance and troubleshooting. Please read Chapters 1, 2 and 3 before proceeding.

Audience

This manual is written for any person responsible for maintaining, operating or troubleshooting the Distek Evolution Dissolution Test System.

Contents

This manual is divided into chapters. The pages of the manual are numbered providing easy navigation to assist in finding information quickly.

The following list describes the material covered in each chapter:

Chapter 1 - Introduction	Provides a general overview and warnings about the instrument.
Chapter 2 - Installation	Describes how to unpack and properly install the unit.
Chapter 3 - Operation	Describes the functionalities of the system and how to run the unit.
Chapter 4 - Maintenance	Explains the steps necessary to maintain the unit.
Chapter 5 - Troubleshooting	Provides a troubleshooting chart and description of error messages to assist the user if a problem arises.
Appendix A – Spare Parts and Accessories	Provides a table of recommended and optional spare parts.
Appendix B - Pre-Installation Considerations: Electrical Power Supply	Recommendation information pertaining to electrical power supply.
Appendix C - CE Declaration of Conformity	CE Declaration of Conformity certificate.
Appendix D - Certificate of Compliance	Certificate of Compliance
Appendix E - Sample Printouts from Parallel Printer	Sample printouts for a parallel printer.

Prerequisites

This manual assumes that you understand the principles of dissolution testing.

Documentation

This manual contains important information regarding the safe operation, maintenance and repair of your Distek Evolution Dissolution Test System.

Conventions

The following table contains Warnings, Cautions and Notes that are used throughout the document for your protection. Please read this section before using the Evolution Dissolution Testing System.

	**"WARNING"** statements are used in this manual to prevent injury to personnel.
	"**CAUTION: Risk of Electric Shock**" statements are used to prevent injury when high voltage is present.
	**"CAUTION"** statements are used to prevent damage to equipment.
	**"NOTES"** contain helpful information.
REQUIRED ACTION	**"REQUIRED ACTION"** is used where necessary to distinguish the action needed from Warnings, Cautions and Notes.

1 Introduction

The Distek Evolution Dissolution Test System is a state of the art instrument. This chapter will provide an overview of the unit and system specific specifications.

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Overview

Distek is once again setting the standard by which all dissolution systems will be measured. The new Evolution Series is taking dissolution testing to the next level by advancing the state of the art design of its predecessor, the highly successful Premiere Model 5100.

The Evolution Series is designed to meet today's demanding standards for accurate temperature control and test result reporting. The enhanced user interface offers a rich array of features and functionality, greatly improving the dissolution chemist's productivity and control over the dissolution test. The Evolution has menu driven navigation for ease of setup, manager and user log-in levels, 100 sorted methods and up to 40 test report storage.

Specification

Table 1-1: Evolution Specifications

	Evolution 6100 Bathless	Evolution 6300 Water Bath
Dissolution Vessels	Six Standard/ Up to Seven Vessels	Six Standard/ Up to Seven Vessels
Volume	500mL - 1000mL programmable	500mL - 1000mL programmable
Vessel Heating Rate	Approx. 1.5˚C per minute	Approx. 0.3˚C per minute
RPM Control Range	25-300 RPM, digitally controlled, closed loop	25-300 RPM, digitally controlled, closed loop
Resolution	0.1 RPM	0.1 RPM
Accuracy	±0.2 RPM	±0.2 RPM
Display	LED's, .75” (19mm) high	LED's, .75” (19mm) high
Motor	High Torque, Permanent Magnet	High Torque, Permanent Magnet
Vessel Temperature Control	Independently controlled two-zone heater jackets	TCS Thermocirculator
Display Resolution	0.01 ˚C	0.01 ˚C
Accuracy	±0.25 ˚C*	±0.25 ˚C at 37.0 ˚C
Calibration	Built-in Calibration Probe	Built-in Calibration Probe

	Evolution 6100 Bathless	Evolution 6300 Water Bath
Shaft Wobble	Less than 0.010" (0.254mm) Total Indicator Runout	Less than 0.010" (0.254mm) Total Indicator Runout
Program Modes	Manual (Individual Vessel Control)	Manual (Individual Vessel Control)
	Automatic (Up to 100 Pre-Programmed Methods)	Automatic (Up to 100 Pre-Programmed Methods)
	External (produKEY™ Memory Device)	External (produKEY™ Memory Device)
Interface Ports	RS-232 (2), RS-485 (1), Parallel Printer (1)	RS-232 (2), RS-485 (1), Parallel Printer (1)
Construction Materials	Cast Aluminum, Stainless Steel, Acid resistant solid state heating elements, Engineered Plastics	Cast Aluminum, Stainless Steel, 316 Stainless Steel heating elements, Engineered Plastics
Dimensions	26"(W) x 39"(H) x 20"(D) (66cm x 99cm x 51cm)	26"(W) x 39"(H) x 20"(D) (66cm x 99cm x 51cm) TCS: 7" w x 16" h x 7" d (18cm x 41 cm x 18 cm)
Weight	150 lb. (67.5 kg)	150 lb. (67.5 kg) (Empty Water Bath) TCS: 16 lb. (7.3 kg)
Electrical Power	115V ± 15V 50/60Hz 15A ***or*** 230V ± 15V 50/60Hz 9A (Operating voltage pre-set at factory)	115V ± 15V 50/60Hz 3A ***or*** 230V ± 15V 50/60Hz 3A (Operating voltage pre-set at factory) TCS: 115V ± 15V 50/60Hz 8A ***or*** 230V ± 15V 50/60Hz 5A

* Test Setting: Paddles, 900 mls, 50 RPM

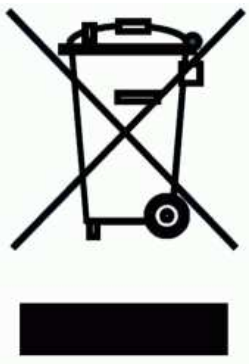
Physical Site Considerations

The dimensional requirements specified below are adequate for the installation of the Evolution Dissolution System:

1. The minimum bench depth (front edge of bench to the back splash or wall) needed is 22” (0.56m). However, the minimum recommended bench depth is 23” (0.59m). For manual sampling, 29” (0.74m) is recommended to allow room in front for the receiving flasks or tubes into which the measured volumes of sample are to be collected.
2. The minimum linear bench space requirement is 33” (0.84m). Distek recommends that at least 39” (1.0m) be allocated whenever manual operations are required to be performed adjacent to the system.
3. There must be no obstruction (cabinet, shelf, or outlet) that intrudes into the minimum footprint of the unit up to a height of 40” (1.02m) above the bench surface where the unit is to be installed.
4. The bench must be capable of sustaining the weight of the unit and all of its accessory parts without significant bending. Because the entire mass of the unit is transferred to the bench surface through three (3) circular padded, adjustable leveling feet, the bench surface should be strong enough to withstand a load of 60 pounds per square inch (4 kilograms per square centimeter).
5. Because of the limitation in travel of the leveling feet, the bench slope should be less than 0.75” (1.9cm) from front to back or from side to side over the unit’s foot print.

Environmental Considerations

Distek & the WEEE Directive (Waste Electrical & Electronic Equipment)



Distek, Inc. is committed to protecting the environment and understands the importance of proper recycling. The "crossed out wheelie bin" symbol on the product or on its packaging indicates that this product must not be disposed of with domestic household waste. Instead, it is the user's responsibility to dispose of their waste equipment by handing it over to a designated collection point for the recycling of electrical and electronic equipment waste. The separate collection and recycling of your waste equipment at the time of disposal will help to conserve natural resources and ensure that it is recycled in a manner that protects human health and the environment.

For more information about where you can drop off your waste equipment for recycling, please contact your local city office, your local distributor or Distek, Inc.

Ambient Laboratory Temperatures

Distek recommends that the laboratory temperature control system fans be kept on at all times. This should improve set point control, and minimize short-term excursion range.

Maximum Conditions:

1. To achieve the full range of controlled operation (30 to 45°C) within specified tolerances the Evolution Dissolution System is designed to be installed and operated in laboratories where the maximum operating temperature does not exceed 25°C.
2. The maximum allowable ambient operation temperature is 30°C.

Operating environments above 25°C limit the range for satisfactory operation of system to between 35 and 45°C.

Minimum Conditions:

To assure controlled operation within specified tolerances, the Evolution System is designed to be operated in laboratories where minimum operating temperatures do not drop below 15°C.

Variability or Short Term Fluctuations:

To assure controlled operation within specified tolerances, the system used to control the temperature of the laboratory where the Evolution System is installed must be able to maintain the ambient air temperature within ±2.5°C of set point (worst case).

Thermal Loading:

For laboratories where temperature control is critical, installation of several dissolution units may require that the system be re-balanced. Thermostats may need to be relocated to maintain temperature uniformity in the lab.

1. Each unit contributes an average thermal load of about 0.6 kW when operating. The lab's cooling systems must have sufficient excess cooling capacity to handle the aggregate thermal load for all systems installed.
2. The heating system must also be able to respond to the increased loading from the units by appropriately throttling back.

Ambient Laboratory Humidity

Distek recommends that the laboratory humidity control system fans be kept on at all times if possible. This should result in better set point control and reduce the short term excursion range.

Maximum:

The Evolution System may add to the humidity of the laboratory during operation. The bathless design (6100 only) reduces humidity compared to other models, but any vessels filled and left uncovered can raise humidity levels. Water vapor and/or hydrogen chloride vapor, from dissolution media, can cause serious effects when condensed on electrical components and contacts. The lab's environmental controls should maintain the humidity level below the dew point, to minimize the risk of condensation.

Minimum:

The Evolution System utilizes solid-state semiconductor devices. It is important that the humidity level be kept at or above 30% relative humidity, to minimize the risk of damage to control circuits caused by static discharge.

Air Quality Considerations

Distek dissolution systems are designed to be operated in a lab environment that has no visible dust problem, and with organic solvent vapor levels as low as possible. Operation is not recommended in dusty lab environments, or in labs with significant chlorinated or reactive solvent vapor levels. These dust or vapor levels may have serious effects on system components. Absorption of vapors into dissolution media may bias test results. Some dissolution tests may require dissolution and drug release media prepared from USP quality water. Absorbed vapors may cause difficulty in complying with USP requirements.

Operation Warnings and Notes

	**For your safety, the information in this manual must be followed to minimize the risk of fire or explosion, electrical shock, or to prevent property damage, personal injury or loss of life.** **Use this equipment only for its intended purpose as described in this Operation Manual.**
	**Never attempt to operate this instrument if it is damaged, malfunctioning, partially disassembled, or has missing or broken parts, including a damaged cord or plug.**
	**Improper servicing or adjustment practice can cause equipment failure or serious physical injury. This equipment must be adjusted and serviced by qualified electrical maintenance personnel who are familiar with the construction and operation of the equipment and the hazards involved. Take diligent care during adjustment. All exposed points on the control circuit boards are electrically hot with respect to earth ground.**
	**HIGH VOLTAGE IS EXPOSED WHEN THE LOWER REAR PANEL IS OPENED ON THE DISSOLUTION SYSTEM. Dangerous voltages exist on the circuit boards when powered. Disconnect AC power from the system while troubleshooting. Be alert. High voltage can cause serious or fatal injury.**
	All Distek Evolution 6100 heaters have thermostatic protection. In the event of a malfunction (or if no liquid in vessel), the heater will cut off at approximately 150◦C. Thermostat automatically resets after cooling down.
	**Take proper precautions when handling dissolution media. Liquid in vessel may be HOT. Wear splash protection to avoid exposure to scalding, acidic, caustic, or pharmaceutical hazards. Bacteria have been shown to thrive in certain media, especially at test temperatures.**

	**The heating of aggressive media can cause explosion, implosion, release of toxic or flammable gases. Appropriate cautions should be taken.**
	The Evolution Dissolution System is capable of utilizing all of the commonly used dissolution media such as 0.1 HCL, phosphate buffers and sodium lauryl sulphate.
	**In the event of a hazardous material spill on the external surface of the instrument, the unit can be cleaned with a disposable cloth or paper wipe, then rinsed and dried with water. The same approached can be used for internal spill but the power must be disconnected first!** **Before using any cleaning or decontamination method recommended by the manufacturer, users should check with the manufacturer that the purpose method will not damage the equipment.**
	**Heater surfaces may be HOT. Do not touch vessel heater assemblies when 6100 is in operation. Injury may result.**
	**Improper remote PC control of the Evolution system may lead to unexpected motor and/or heater operation.**
	**To avoid glass breakage and injury:** • **Do not heat vessel empty.** • **Do not clean with materials that scratch.** • **Do not bump.** **Discard vessels if cracked, scratched or excessively heated empty.**
	The Evolution system incorporates a height sensor to stop rotation and adjust heating whenever the drive unit is raised well above operating position. This feature helps to prevent overheating and addresses safety issues.
	Operation Manual user interface screen shots may vary from actual instrument interface screens.

CAUTION: TO AVOID DAMAGING THE INSTRUMENT

- DO NOT OPERATE 6100 HEATERS WITH LESS THAN 500mL LIQUID IN EACH VESSEL.
- THE STIRRING ELEMENT (Paddle or Basket) MUST BE IMMERSED INTO THE LIQUID AND ROTATING WHEN HEATERS ARE OPERATING.
- USE ONLY GLASS VESSELS SUPPLIED FOR THE EVOLUTION SYSTEM BY Distek.
- CONNECT THIS UNIT TO THE SPECIFIED AC SUPPLY. OBSERVE PROPER GROUNDING.

♦ FAILURE TO OBSERVE THESE PRECAUTIONS MAY DAMAGE THE HEATER ASSEMBLIES AND/OR VESSELS.

The Evolution System is supplied with proper heaters and settings for the specified operating voltage (see label for information). Do not attempt to convert unit to another mains supply without contacting Distek's factory first!

Take care when removing or replacing vessel heaters. Turn off unit and disconnect power from 6100. Do not use metal tools or sharp objects to mount heater. Heater failure and/or injury could result.

External cables (excluding power cable) are limited to less than 3 meters length in order to maintain electromagnetic compliance.

Some forms of electromagnetic interference may cause unexpected operation. If this occurs, the unit will return to normal operation once the interference is removed.

General Instrument Overview

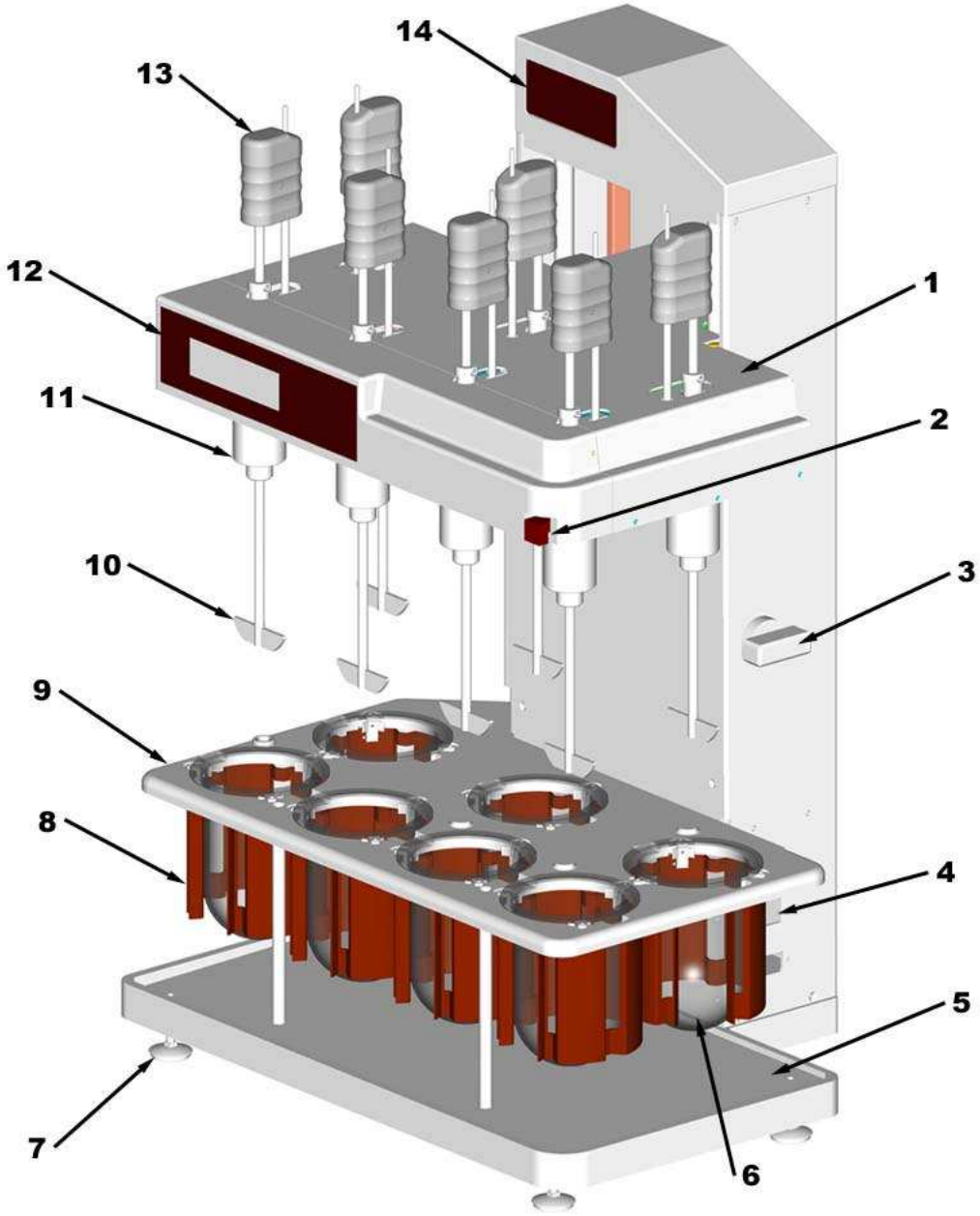


Figure 1-1: Distek Evolution 6100

1. Drive Unit
2. Brake Release
3. Height Adjustment Knob
4. Power Switch
5. Base Plate
6. Glass Vessel
7. Leveling Feet
8. Heater Assembly
9. Vessel Support Plate
10. Paddle Blade
11. Spindle Assembly
12. Front LCD Display
13. Shaft Handle
14. Top LED Display

2 Installation

This chapter will describe the steps necessary to properly unpack and install the instrument.

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Unpacking

Please take a few moments when unpacking the Distek Evolution Dissolution Testing System to check for all items indicated on packing list. Notify Distek or your shipper immediately of any discrepancies or damage to cartons or contents in transit.

To avoid injury, two people should remove the Evolution System from its carton.

Do not bump or disturb built-in paddle shafts as this may affect shaft runout.

The drive unit is locked in place during shipping.

Packing must be removed before operating this instrument. To remove packing:

1. Cut through the tape at the top of the carton. Open the four top flaps.
2. Carefully remove the packing inserts and lift the instrument from the shipping carton. See warning and cautions above.
3. If the drive unit is locked in place, tie-wraps are visible from the front of the unit, above the bearings (see Figure 2-1).
4. Identify and cut the tie-wraps on the guide rods above the bearings and remove the split tubing (see Figure 2-1).
5. Remove the split washer (Figure 2-1) from the top of each bearing.
6. Press the brake release button (see Figure 2-3) and gently raise drive unit.
7. Remove shaft protection tubes.
8. Let go of the brake release button to set the drive unit at the desired height.
9. The power cord is shipped in a separate carton from the main unit. Connect the power cord supplied to the Evolution System below the power switch (see Figure 2-3). Locate the proper outlet for the Evolution System. See Appendix C for electrical power requirements.

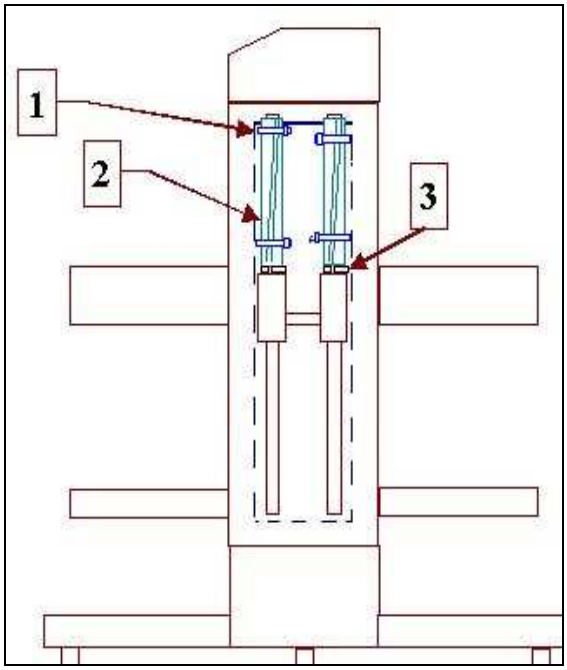

Figure 2-1: Rear View - Inside

Leveling the Evolution System

To level the unit on the bench:

1. Trained personnel should lift the unit onto the bench and slide it into position.
2. Make certain the two stabilizers under the rear of the base are not touching the bench.
3. Loosen locking nuts on the front leveling feet using the appropriate (1/2") wrench.
4. Observe the permanently mounted circular level on vessel support plate. Level unit from front to back and side to side by adjusting the two front leveling feet under the instrument base. See Figure 2-2.

Do not loosen the rear levelling foot. Level the unit by adjusting the front levelling feet.

---

5. Required Action: Tighten the locking nut on each foot at this time.
6. After leveling, adjust the two stabilizers under the rear of the instrument base so that they just touch the bench.
7. Mark the location of the leveling feet on the bench to prevent changes in level due to moving the unit. Check the level after completing installation,

or after moving the Evolution System to a new location. Verify the accuracy of the built-in circular level by placing a 6-9" carpenter's level on the vessel plate leveling bosses (see Figure 2-2). Check level from front to back and side to side.

⊖ Connect this unit to the specified ac supply. Observe proper grounding.

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8. Plug the Evolution unit into the proper electrical outlet provided.

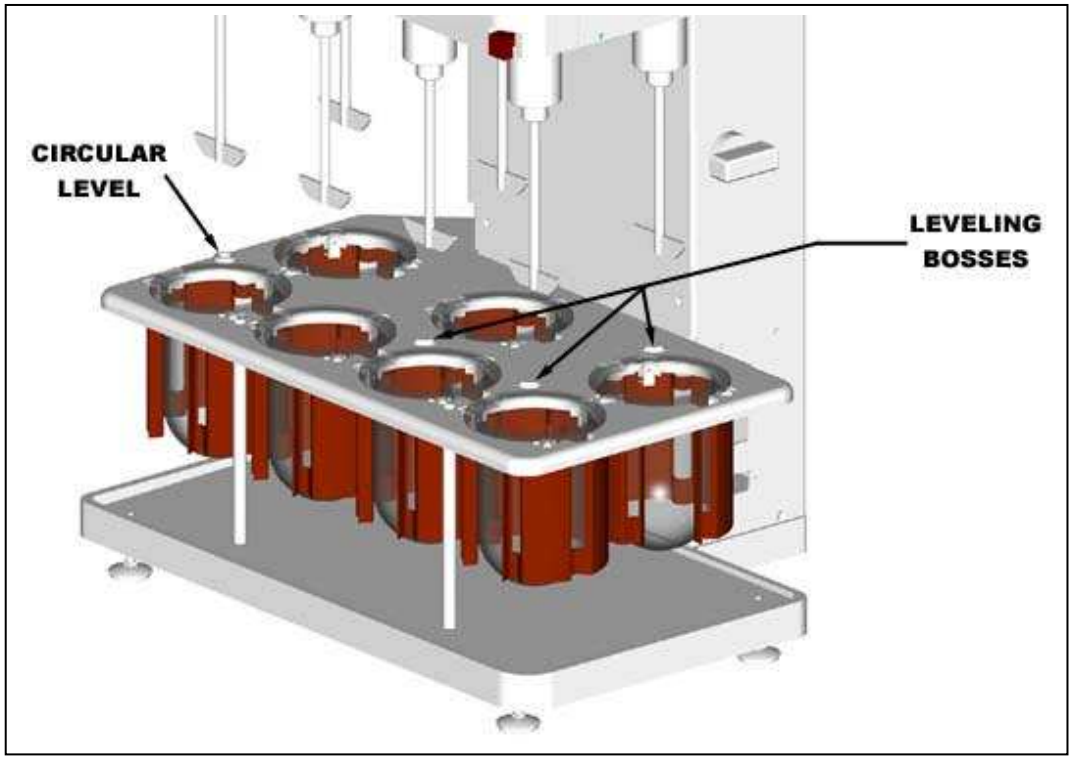

Figure 2-2: Leveling the Evolution System

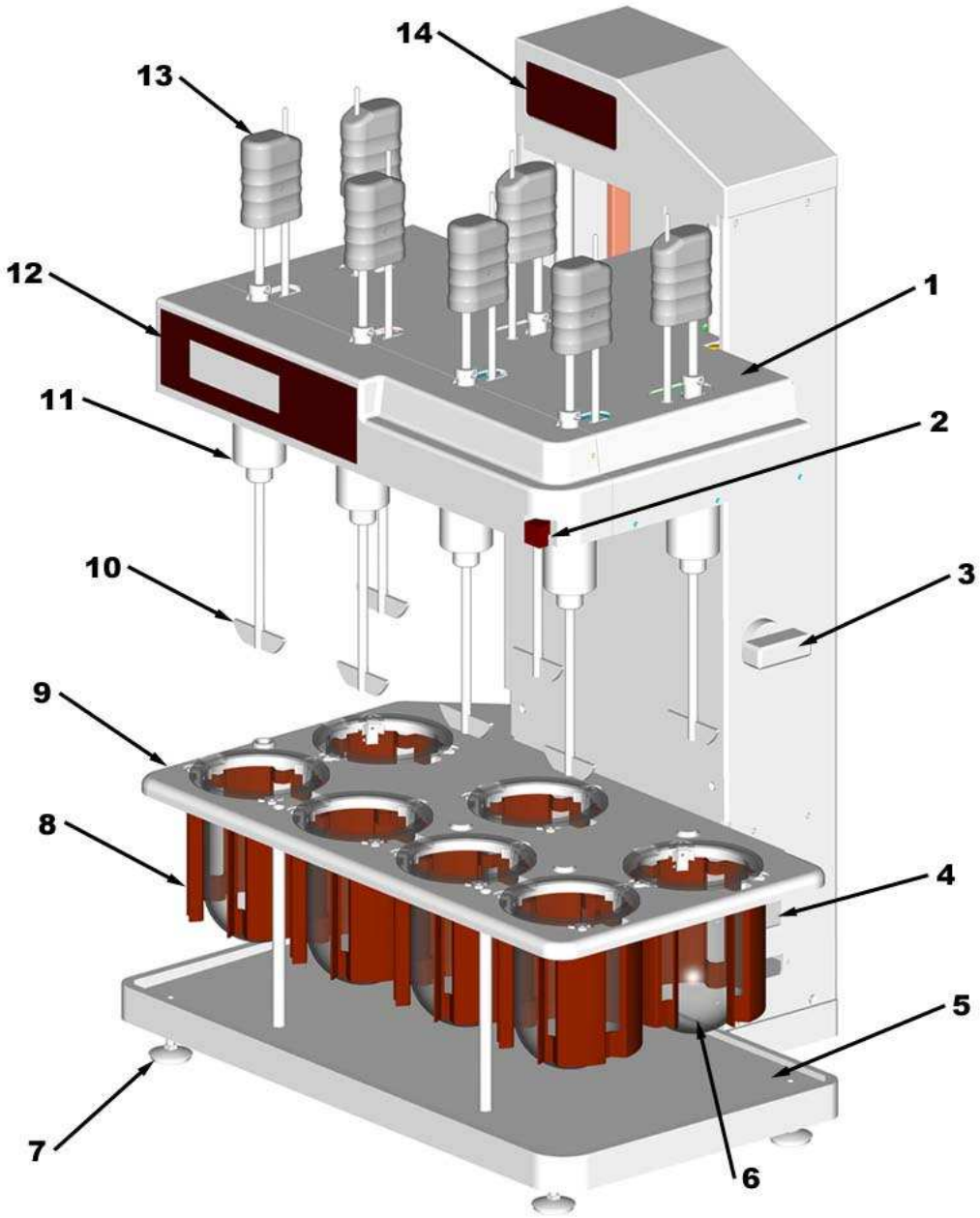

Figure 2-3: Evolution Dissolution System

1. Drive Unit
2. Brake Release
3. Height Adjustment Knob
4. Power Switch
5. Base Plate
6. Glass Vessel
7. Leveling Feet
8. Heater Assembly
9. Vessel Support Plate
10. Paddle Blade
11. Spindle Assembly
12. Front LCD Display
13. Shaft Handle
14. Top LED Display

Installing the Thermocirculator (Evolution 6300 Only)

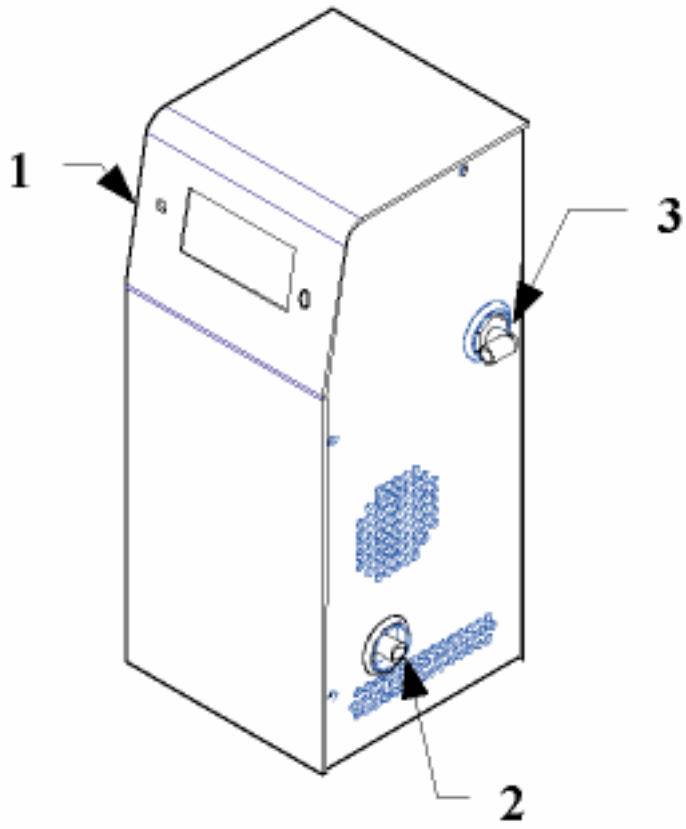

Figure 2-4: Model TCS-0200C Thermocirculator

1. Thermocirculator Housing
2. Pump Inlet
3. Pump Outlet

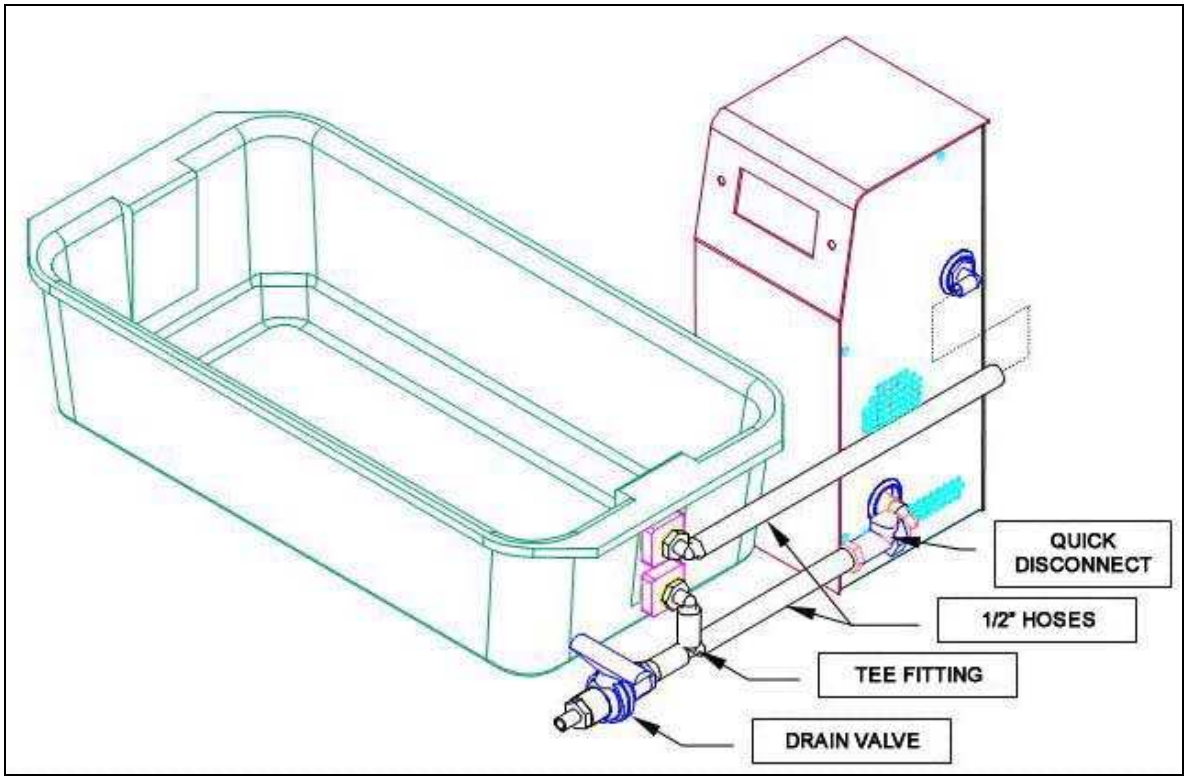

Figure 2-5: Thermocirculator Connections

Placement and Connections

1. Install the TCS-0200C behind the right side of the Evolution bath.
2. Place TCS-0200C Thermocirculator on bench and at the same level as Evolution, or below.

Thermocirculator TCS-0200C is normally placed on same level as Evolution bath, or below, in order for pump to be primed properly. Contact Distek for special instructions if pump needs to be installed higher than bath. Failure to install and prime the Thermocirculator as specified may result in damage to heater and/or pump, and void the warranty.

3. Make sure ventilation holes on both sides of TCS-0200C are not obstructed.
4. Connect power cord to back of TCS unit.
5. Place a hose clamp loosely on inlet and outlet hoses.
6. Connect the water bath inlet hose (1/2" I.D.) to the pump outlet as shown in Figure 2-5 (upper connection on the bath and pump).

7. Connect water bath outlet hose (5/8" I.D.) to the pump inlet using quick disconnect coupling (lower connection on the bath and pump). Push the coupling together until it clicks.
8. Make sure all hoses are installed fully onto fittings.
9. Place the hose clamps over fittings, with locking portion on right side of fitting.
10. Tighten hose clamps snugly with pliers. Adjust position of unit so TCS does not touch the Evolution bath, to avoid transmitting vibration.

Filling the Water Bath

1. Wipe the inside of water bath with damp cloth to remove any debris that might lodge inside and damage pump.
2. Make sure the power switch on the upper rear panel of TCS-0200C is off (press "0"). Plug the TCS into proper outlet.
3. Place temperature probe from TCS-0200C in bath location next to center rear vessel.
4. Make sure bath drain valve is closed (handle should be perpendicular to drain hose as shown in Figure 2-5).
5. Fill bath to midway between the top bath inlet fitting and the lower outlet fitting (see Figure 2-7).

Priming the Pump

1. Attach a 3 ft. (1m) long x 5/8" (~16mm) ID drain tubing to drain valve.
2. Raise drain tubing: Raise the drain tubing to vertical position as shown in Figure 2-6. Drain valve should be tilted up.
3. Open drain valve. Allow pump inlet tubing to fill with water (5-10 sec.).
4. See Figure 2-7 below. While trying not to spill, slowly lower drain tubing to allow tubing to fill with water as shown. Fill as much as possible.
5. Close drain valve.
6. Again lift drain tubing to vertical position (see Figure 2-6 above).
7. While holding drain tubing vertical, open drain valve for 5 seconds.
8. Repeat above steps #4 (SLOWLY lower drain tubing …) through #7.
9. Close drain valve.
10. With valve closed dispense residual water from drain tubing into a bucket.
11. Turn on TCS power and run TCS for 15 seconds. (Power switch is on upper rear panel of TCS.) If priming is successful, water should flow rapidly from bath inlet within 15 seconds. If not, turn off TCS immediately and go back to step #7, "Raise Drain Tubing".
12. Re-check the instrument level again (see Figure 2-2) with water in the bath. Adjust leveling feet if necessary.
13. Tighten the locking nuts on each leveling foot.
14. Check all fittings for leaks for next five minutes.

15. Momentarily turn pump on to verify that pump is primed and flow is steady.

⊖	DO NOT RUN PUMP WHEN DRY. If pump is not primed properly, internal thermal safety switch will trip.

16. If water in bath is not circulating, stop the pump. Go back to "Raise Drain Tubing".
17. When flow is steady, turn on TCS-0200C and set the temperature (see page 3-33).

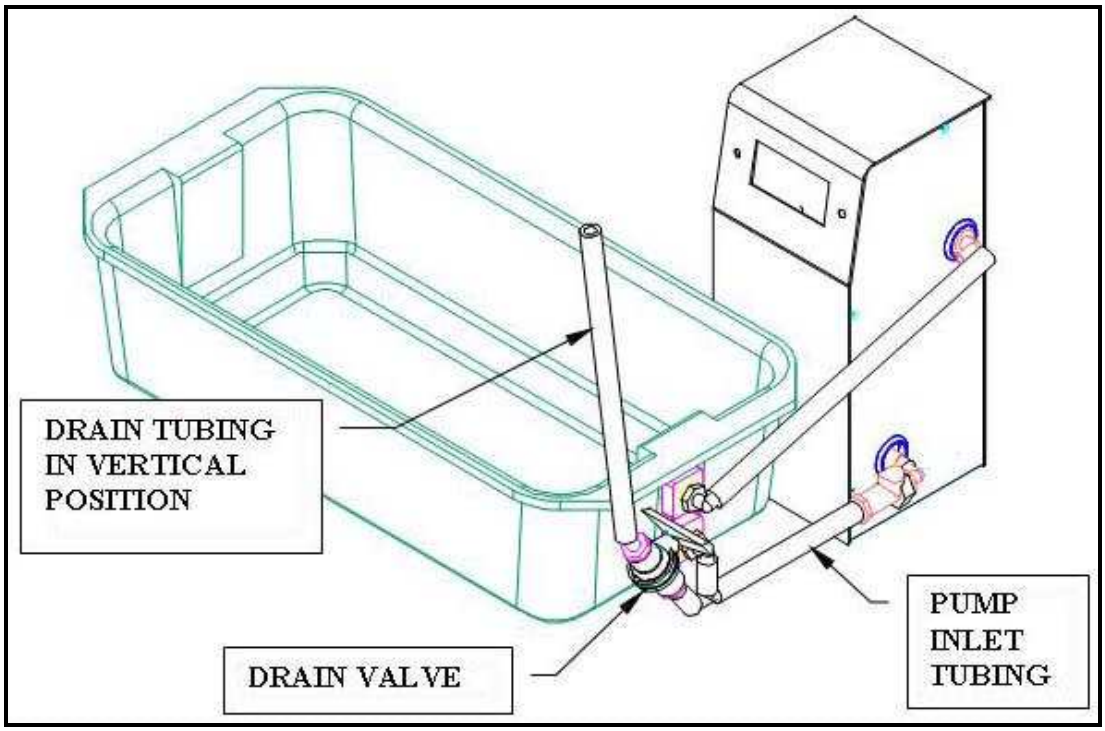

Figure 2-6: Drain Tubing in Vertical Position

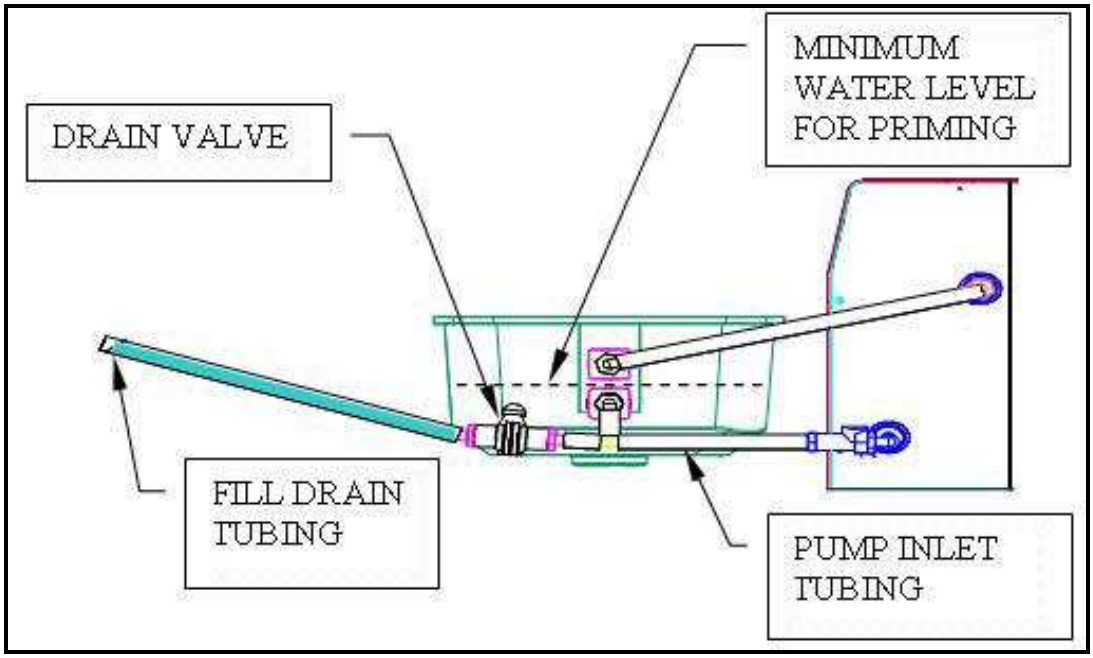

Figure 2-7: Drain Tubing Filled with Water

Positioning the Vessels

To install vessels in vessel plate:

1. Raise the drive unit.
2. Insert a vessel in each position on the vessel plate.
3. Slide vessel through vessel clips until it can go no further.

The top of at least one vessel clip should contact the bottom of the vessel flange.

Distek supplies highly uniform vessels that fit properly into the 6100 heater assemblies. Use of vessels other than those supplied by Distek for the 6100 may result in unsatisfactory operation or heater damage and void the warranty.

Paddle and Basket Installation

Paddle Blade Installation

1. Carefully screw a paddle blade onto bottom of each shaft. Assemble finger-tight.

Do not grasp basket by mesh screen when installing or removing. ALWAYS GRASP BASKETS BY UPPER RIM. Proper handling will prevent basket distortion and RESULTING wobble.

Basket Installation

1. Carefully screw a basket adapter onto the bottom of each shaft. Assemble finger-tight. (See Figure 2-8).
2. Vessel pre-heat may be performed at a higher RPM depending on test parameters. Baskets are not installed during pre-heat.
3. Always place a tablet or capsule into a dry, empty basket before the test.
4. When the vessel stabilizes at test temperature, lift the shaft out of the vessel.
5. Place the basket, open end up, in palm with thumb and fingers grasping knurled grip. (See Caution above.)
6. Raise basket until inside of the upper ring just contacts the O-ring shown in Figure 2-8.
7. Twist and push the basket onto the adapter.
8. When removing the basket, grasp only on the knurled grip. Pull down and twist.

Upon completion of each test, rinse baskets and shafts thoroughly with distilled water. DO NOT ALLOW ACIDS OR BUFFERS TO DRY ON THE METAL SURFACES.

Handle paddle blades and optional baskets carefully to avoid bending or damage. Store carefully in original container to prevent damage.

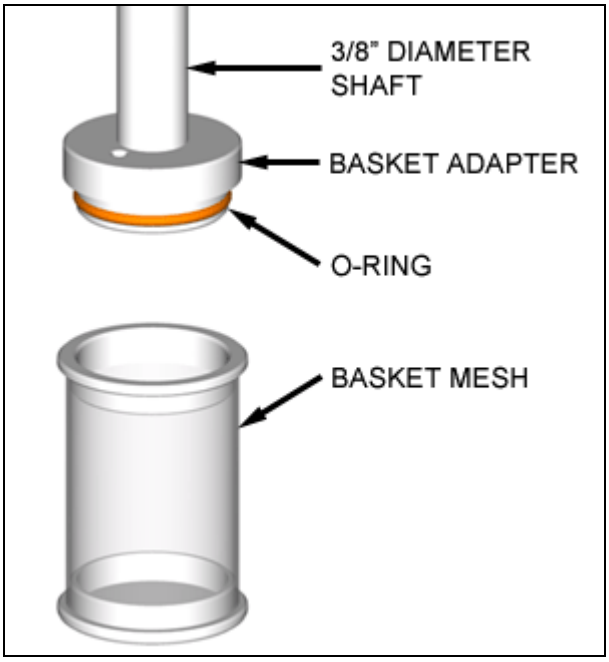

Figure 2-8: Installing Basket on Shaft

Checking Paddles, Baskets and Shafts for Straightness

Use instruments such as Distek's Wobble Meter, ShaftChek, or other means to verify straightness of stirring shafts, blades and baskets. Check shaft wobble near bottom end of shaft. Check basket wobble at bottom rim of basket. Record values at 25 and 250 RPM.

Checking Shaft Centering

Use Distek CenterChek or other means to verify shaft centering with respect to vessels. Follow instructions included with CenterChek for accurate results.

"Basket" refers to USP Dissolution Apparatus 1.
"Paddle" refers to USP Dissolution Apparatus 2.

Paddles and Basket Height Adjustment

The paddle and basket height is configured at Distek's factory and should not have to be changed unless the height is out of calibration. The following procedure describes how to properly adjust the height setting. This procedure should only be

used to set the initial height. Once the unit's height is calibrated the Quick Change Height Adjustment Knob (Paddles or Baskets) procedure should be followed to switch between paddles and baskets.

Initial Height Setting for Paddles and Baskets:

1. Press brake release button and raise drive unit.
2. Turn height adjustment knob (see Figure 2-9) to either horizontal position.
3. Loosen shaft locking collars so they slide freely on shafts. Use 7/64" Allen (hex) wrench.
4. Raise shafts slightly by pulling up on protective covers (gray handles).
5. **IMPORTANT:** Install paddle blades on all shafts, even if baskets will be used for testing. **Paddle blades must be used to set shaft collars!**
6. Lower drive unit slowly to lowest position so drive plate extension rests on height adjustment knob.
7. While applying slight downward pressure on drive unit, let go of brake release button to lock drive unit in place. Make sure drive plate extension touches height adjustment knob.
8. Lower shaft gently until paddle blades touch the bottom of each vessel.
9. Lock each shaft collar using 7/64" Allen wrench.
10. Raise the drive unit approximately six inches.
11. Turn the height adjustment knob to "PADDLES" position as seen from the front of the unit (see Figure 2-9).
12. Lower drive unit gently until it comes to rest on height adjustment knob and release brake button.
13. Check paddle or basket height using Distek HeightChek or other means. Verify and record distance from bottom of each paddle or basket to bottom of vessel. **(Do not change the position of the shaft collars.)**
14. To switch to baskets, raise the drive unit and install baskets on the shafts.
15. Turn the knob to "BASKETS" position (see Figure 2-9).
16. Lower drive unit gently until it comes to rest on height knob and release brake button.
17. Check paddle or basket height using Distek HeightChek or other means. Verify and record distance from bottom of each paddle or basket to bottom of vessel.

If shafts do not slide up smoothly, a **very thin** film of lubricant may be applied to shaft, only to area just below spindle. Wipe off any excess grease. Move shaft up and down gently to distribute lubricant. If necessary, Distek recommends Dow Corning High Vacuum Grease. Do not use a lubricant which may affect your test results.

Quick Change Height Adjustment Knob (Paddles or Baskets)

After completing the previous setup procedure (if applicable), it should not be necessary to move the shaft collars when switching back and forth from baskets to paddles. Simply rotate the height adjustment knob as shown in Figure 2-9. The extension block compensates for the difference in height paddles and baskets.

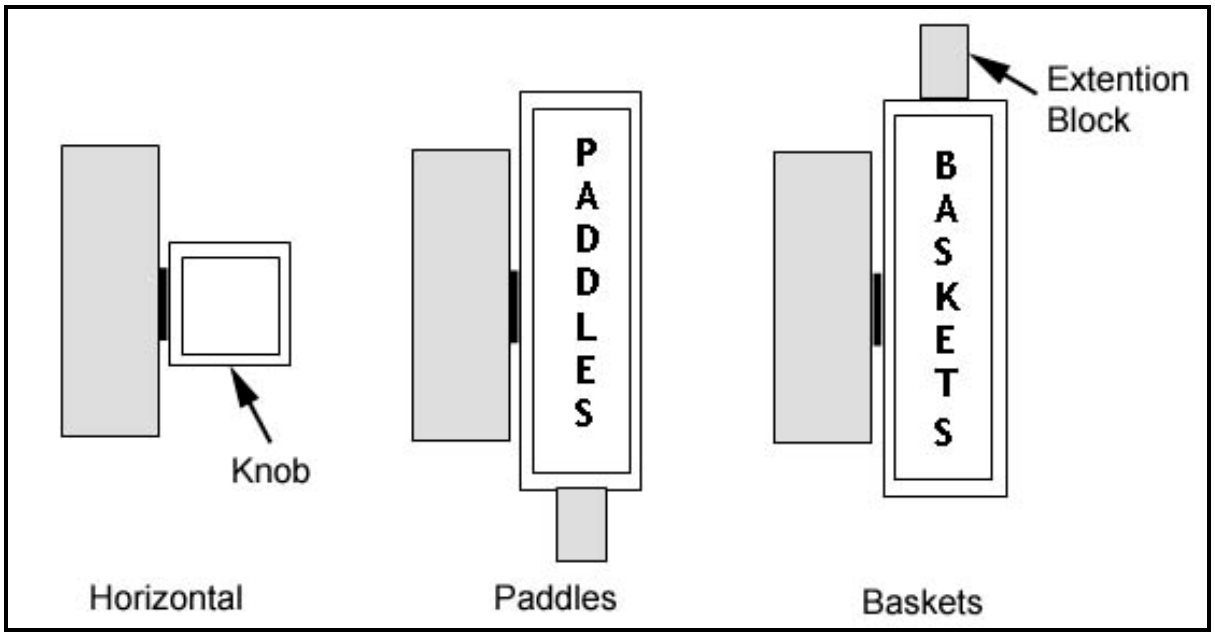

Figure 2-9: Quick Height Change Diagram

Installing the Calibration Probe

1. Make sure the serial number of the hand-held calibration probe matches the serial number of the 6100/6300.
2. Plug in the calibration probe at the rear of the unit.
3. Place probe in holder (see Figure 2-10).

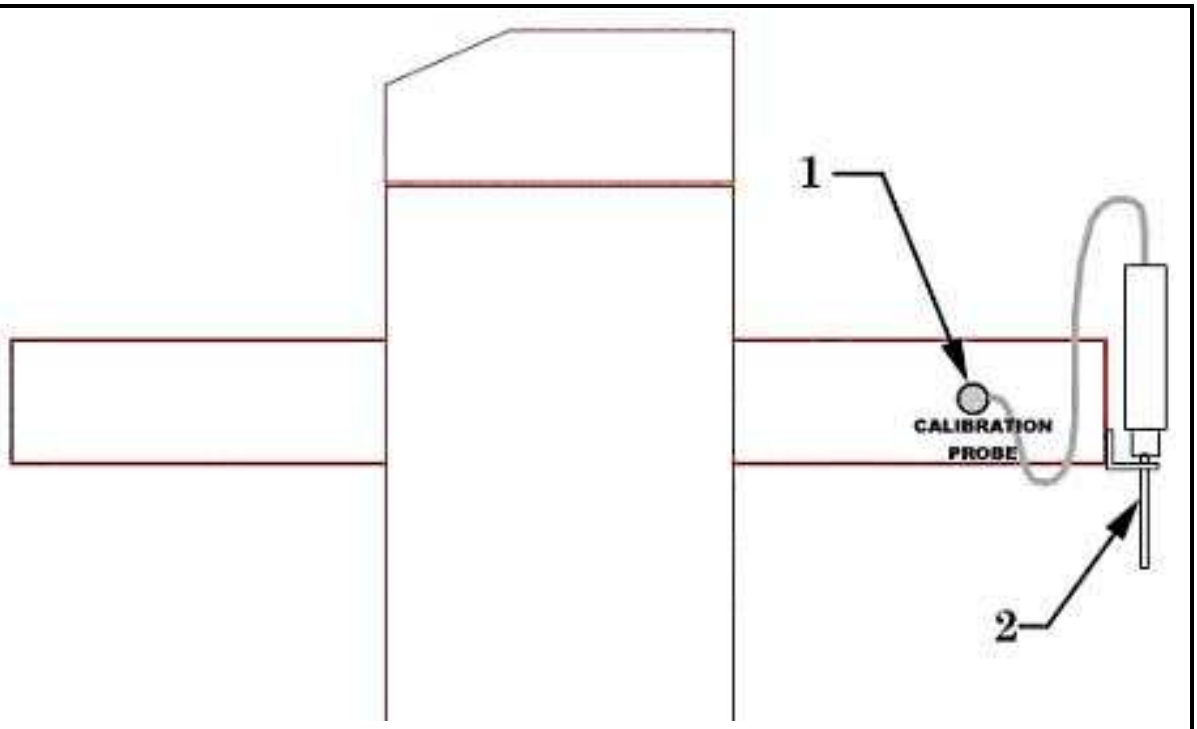

Figure 2-10: Drive Unit (Rear View)

1. Calibration Probe Port 2. Holder with Probe

Installation Checkout

Your instrument has been tested thoroughly before shipment. To detect any problems caused by shipping and handling, Distek recommends a careful check of all crucial operating parameters after complete installation of the dissolution system.

RPM Control

Check and record RPM display accuracy at 50, 100, 150 and 250 RPM using a calibrated tachometer such as Distek RPMChek.

Test Duration

Check and record timing accuracy at test RPM using a calibrated stopwatch. Test should be run over a range of expected usage. For example, if test durations and sample times range from 15 minutes to 12 hours, testing should measure intervals of 10 minutes, 1 hour, and 24 hours.

Temperature Control

1. Install paddle blades.
2. Raise drive assembly.
3. Fill each vessel with 900ml of DI water at 18-22°C.
4. Turn height adjust knob to “Paddles” position.
5. Lower drive assembly and paddles fully.
6. Cover all vessels with vessel covers provided.
7. Place a calibrated reference temperature probe, such as Distek TempChek, in one of front center vessels.
8. Record vessel temperature and time.
9. Set rotation to 150RPM (see Controlling All Vessels on page 3-32).
10. Set operating temperature.
11. Highlight START HT/STIR button and press ***ENTER***.
12. Monitor temperature and time until vessel temperature stabilizes.
13. Adjust temperature set-point so that vessel temperature stabilizes at required vessel temperature (such as 37.0°C).
14. Record set-point required to achieve required vessel temperature.
15. Verify & record temperature calibration of calibration probe and each vessel probe using external reference thermometer at approximately 37°C.

Time and Date

Verify that the system time and date are correct.

1. From the Main screen select SYSTEM SETUP.
2. Select SYSTEM CONFIG.
3. Verify that the time and date parameters are correct.
4. Make changes if necessary.

3 Operation

The chapter will describe the user interface screens and system administration for the instrument. It will also provide step-by-step instructions to perform many of the instrument's common tasks.

Operation Manual user interface screen shots may vary from actual instrument interface screens.

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Control Keypad

The control keypad is shown in Figure 3-1:

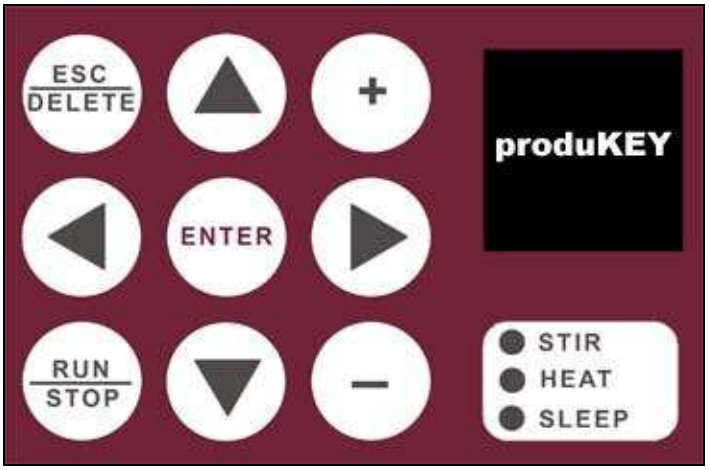

Figure 3-1: Control Keypad

The function of the buttons is as follows:

ESC/DEL Button

The ESC/DEL button will allow the operator to navigate back to the higher level menu screen within the interface. This button can also be used to delete certain items that are in a list such as methods, sample time points and users.

RUN/STOP Button

The RUN/STOP button is used to start a method running while in the method screen. If a method is already running, this button can be used to abort a method.

Arrow Keys

The ARROW keys are used to navigate through the menus and displays.

ENTER Button

The ENTER button locks in menu selections and settings made with the ARROW, + and – keys.

+ Button

The + button will toggle through available options depending on what field is selected. For example, when modifying the test temperature in a saved method these buttons will scroll through numeric values.

- Button

The - button works in conjunction with the + button to scroll in the opposite direction.

Stir LED

This LED will be activated when the instrument shafts are rotating at a set RPM.

Heat LED

This LED will be activated when the heaters are active (heater jackets for the bathless model or the TCS for the bath based system).

Sleep LED

This LED will be activated when the unit is set to sleep mode. Sleep mode turns off the display in order to extend the life of the unit's backlight.

produKEY

This receptacle is used with the produKEY. See page 3-36 for more information on using the produKEY.

Startup Screens

The following initialization screen will appear on the front LCD when turning the unit on:

Figure 3-2: Initialization Screen

This screen will disappear when the system has booted up and the following screen will be displayed:

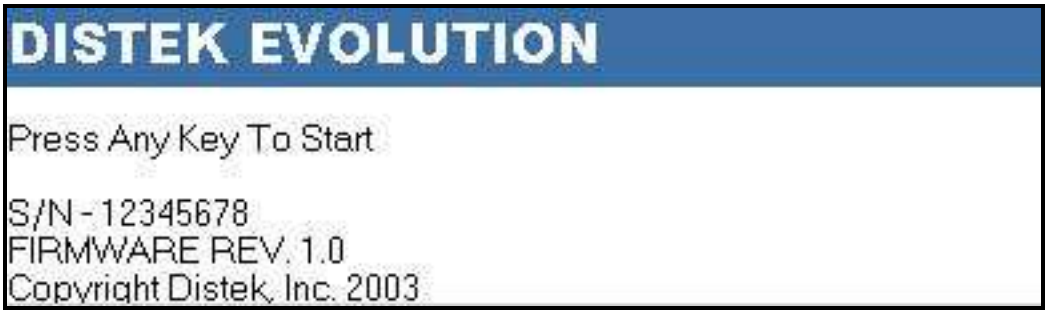

Figure 3-3: Welcome Screen

The serial number and firmware revision is displayed along with a message: "PRESS ANY KEY TO START…" The system will proceed to the login screen after a key is pressed or will automatically go to the login screen after about 10 seconds (see Login Procedures on page 3-13).

After logging in to the system the Main menu will be displayed:

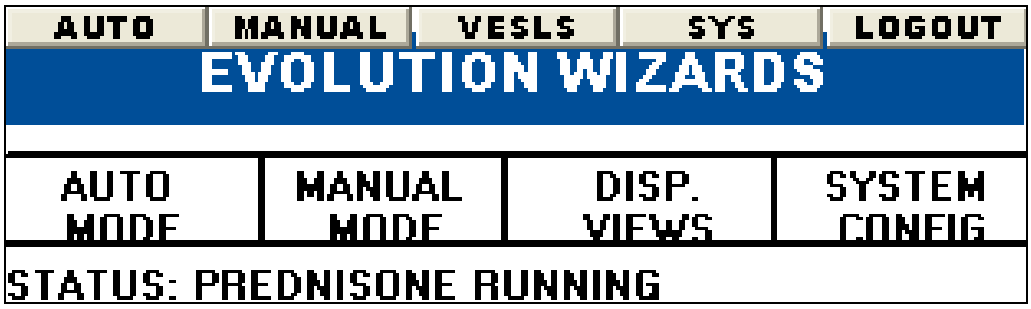

Figure 3-4: Main Screen

The menu bar at the top of the screen contains 5 buttons used to navigate through the system. This format is consistent throughout the interface.

System Administration

The system section ("SYS" on the menu bar) of the unit allows access to system setup, USER/MANAGER administration and calibration of the instrument.

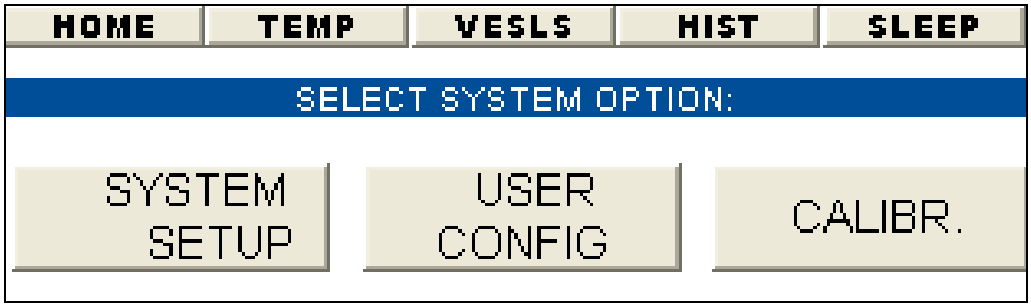

Figure 3-5: System Administration Wizard

The Evolution System is equipped with login access to allow for USER and MANAGER group settings. A USER can only view and select a method to run. A MANAGER is able to create/modify methods, change system configuration settings, calibrate the unit and has user administration privileges.

System Setup

Only a MANAGER will be able to modify the setting found in the system administration section. A USER will only be able to view these settings.

Upon selecting the "SYSTEM SETUP" button on the system administration wizard the user will be taken to the screen shown in Figure 3-6.

The following settings are listed on this screen:

Setting	Description
Validated By:	The name of the person who validated the unit. This can be up to 8 characters.
Date:	The date the unit was last validated.
MM:DD:YY:	Current date.
Format:	The date can be set to US or EURO format. For example: US: Jan.16, 2003 EURO: 16 Jan. 2003
Time:	Current time.
Time Format:	The time can be set to AMPM or 24HR.
USP Tolerance Check:	This option monitors the temperature and RPM range when running a method. The valid settings are ALERT, ABORT or OFF. If either of these 2 parameters go outside the USP limit the system will either ALERT the user but continue running, ABORT the method or not monitor these parameters if set to OFF.
Address:	This is the unit address which can be used for external control.

Setting	Description
Printer (Evolution 6100 Only):	The printer settings are L or XX. 'L' should be used when a printer is connected directly to the unit (local printing). 'XX' represents the unit address for remote printing (printer sharing). See Printer Sharing Configuration on page 3-11 for more information.

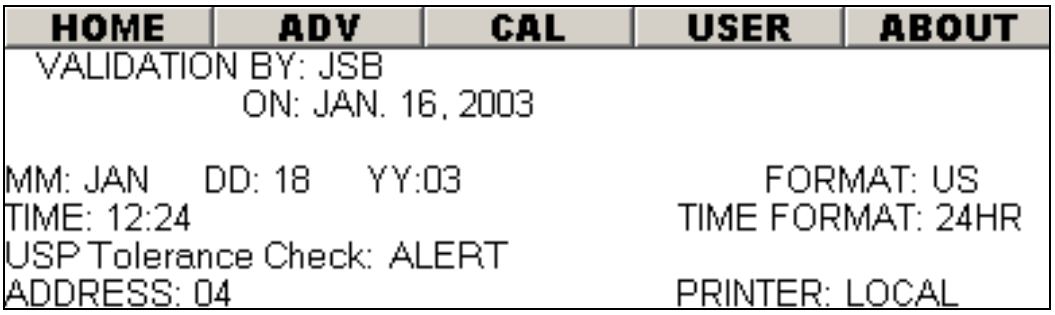

Figure 3-6: System Setup Screen

Advanced Options

When selecting the ADV button the unit will prompt the use for a password. The password is 'EVOADV' and only will be accepted if the user logged in to the system has Manager priveleges. Because these option are not frequently used and can cause system errors, this added level of security was implemented.

The system setup screen contains a menu entitled “ADV”. The settings for Validation By, Validation Date, Unit Address and TCS address (Evolution 6300 only), Beep and Height Switch can only be modified in the ADV screen. When a user selects this option the system will prompt the user to enter a password. This ensures that these critical parameters are not easily modified.

Unit Address

The following procedure describes the steps necessary to change the unit address:

1. From the 'SYS CONFIG' screen select the 'ADV' menu.
2. Enter the password for this screen.
3. Highlight the ADDRESS field.
4. Using the + and - button set to the desired address.

TCS Address (Evolution 6300 Only)

Distek instruments that are connected to the unit (i.e. 4300, 6300, etc.) must be turned off or disconnected (remove communication cables) temporarily while changing the address. This avoids inadvertently changing the addresses of the other connected instruments.

For the Evolution 6300 it is necessary to establish communications with the TCS. The screen shown in Figure 3-6 will contain a field for 'TCS'. This represents the TCS address. This option is only selectable via the 'ADV' screen.

To establish communication for the first time or the change the TCS address, follow the procedure below:

1. Disconnect any Distek instrument that is currently connected to this unit (i.e. 4300, 6300, etc.) by removing the RS-485 cable. (Do not remove the RS-485 going from the main unit to the TCS, only remove the cable going from this unit to the external devices.)
2. From the 'SYS CONFIG' screen select the 'ADV' menu.
3. Enter the password for this screen.
4. Highlight the TCS address field.
5. Using the + and - button set to the desired address.
6. Press ***ENTER***.
7. A warning message will be displayed. Select 'YES' to accept the change.
8. Exit out of the ADV screen for the change to take affect.

Preheat (Evolution 6300 Only)

During preheat the unit will display the temperature ready screen only when it determines that the vessel temperatures are stable. In order to verify the unit's stability the system checks each vessel repeatedly during preheat. Each vessel must meet the following criteria during a two minute period in order for the test to begin:

Test Temperature ± Preheat Range

The preheat setting allows the user to set the Temperature Range from 0.2-0.5ºC. The default value is 0.2ºC.

For example, if the test temperature is 37.0ºC and the preheat setting is 0.2ºC the temperature ready screen will not be displayed until all vessels are in the range 37.0 ± 0.2ºC for two minutes. If one vessel falls outside the criteria the two minute clock will be reset.

In general, a larger preheat value will allow for a faster preheat time, but might not provide as much temperature stability as a lower setting.

Temperature Control (Evolution 6300 Only)

The Evolution 6300 has three modes of temperature control:

- Shafts: This is the default setting. In this mode the temperature is controlled by the embedded sensor in the RTD shafts. This is the recommended mode of operation unless mini-vessels are used.

- TCS: The temperature will be controlled by the TCS (not the RTD shafts). The calPROBE must be placed into the water bath. The bath temperature will be controlled by the TCS and the feedback of the bath temperature from the calPROBE. Individual vessel temperature will still be reported; however, the control of temperature will be handled by the TCS.

- Mini: This setting is for mini-vessels. The RTD shafts will be disabled and only the bath temperature (using the calPROBE) will be reported. The calPROBE must be placed into the water bath. The bath temperature will be controlled by the TCS and the feedback of the bath temperature from the calPROBE. The minimum vessel volume when creating methods will be adjusted to accommodate smaller volumes. All references to individual vessel temperatures will be removed from the user interface and reports.

Beep Mode

Disabling Beep mode eliminates audible operator prompts from unit, but still provides verification beep whenever any key is pressed. To disable this option set Beep to 'OFF'.

Height Switch Setting

Disabling the height switch causes the system to ignore the height sensor for the drive head. This allows the shafts to continue stirring when the drive head is raised. This feature is particularly useful for measuring basket wobble during mechanical validation of the unit.

To disable the height switch turn the setting to 'OFF'.

The height sensor is an important feature of the unit and should be turned back on as soon as the validation has been completed.

Printer Sharing Configuration (Evolution 6100 Only)

The Evolution 6100 is equipped to have up to four units share one printer. This option is configured by the printer setting located on the Advanced Option screen in System Setup (see Figure 3-6).

The operator logged into the system must be part of the Manager group to create a new user.

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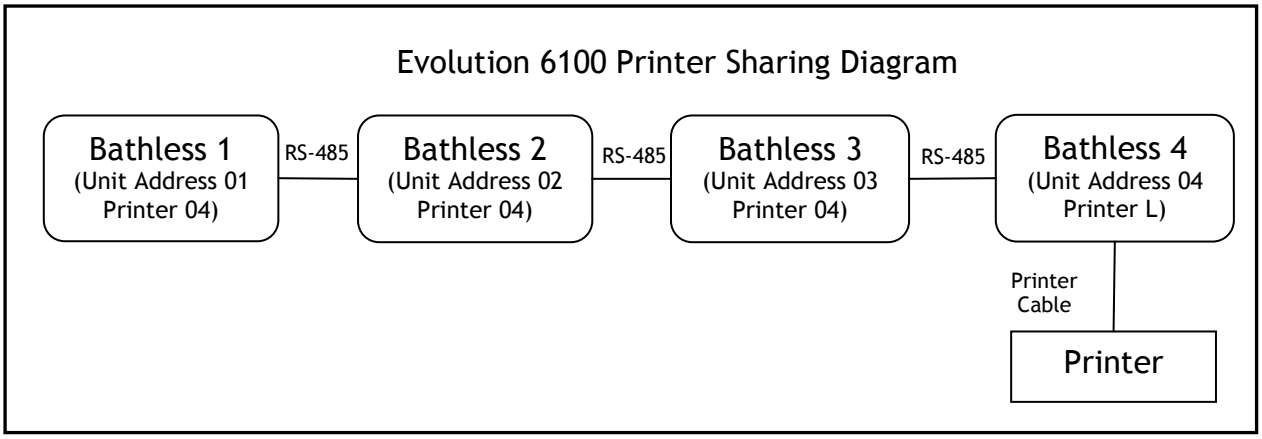
1. All units must be connected via an RS-485 cable. See diagram below.



2. Highlight the SYS. menu or SYSTEM CONFIG button from the Main screen and press ***ENTER*** (see Figure 3-4).
3. Highlight the SYSTEM SETUP button and press ***ENTER*** (see Figure 3-11).
4. Highlight the ADV menu and press ***ENTER***.
5. Highlight the PRINTER field and using the + and - keys scroll to the desired value representing the address of the system which is directly connected to the printer. Select 'L' if the printer is directly connected to the unit. For example in the diagram above, Bath 1 will be set to 04, Bath 2 will be 04, Bath 3 will be 04 and Bath 4 will be L.

About Window

Within the System Configuration section, selecting the ABOUT menu item (see Figure 3-6) will display the window shown in the figure below. This screen displays the following information:

S/N	Unit's serial number
TCS S/N	TCS's serial number (only valid for a 6300 and a the TCS FW Rev. 1.53 or higher)
PROGRAM	Default or Waters
TEMPERATURE	Normal or Hi-Temp
VERSION	Firmware revision
COPYRIGHT	Distek, Inc.
PH.	Company phone number

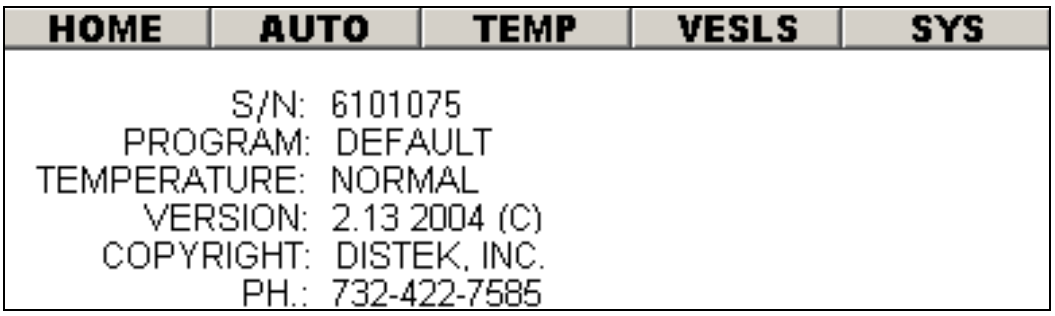


Figure 3-7: About Window

User Configuration

Selecting 'SYSTEM CONFIG' from the Main Screen, then selecting the 'USER CONFIG' button on the System Administration Wizard screen (see Figure 3-5) will open the following window:

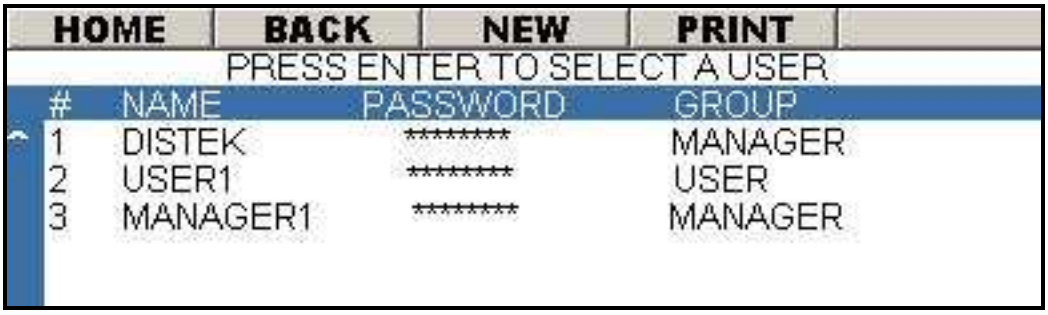


Figure 3-8: User Configuration Screen

Login Procedures

After the system boots up or after an operator logs out, the Login screen will appear:

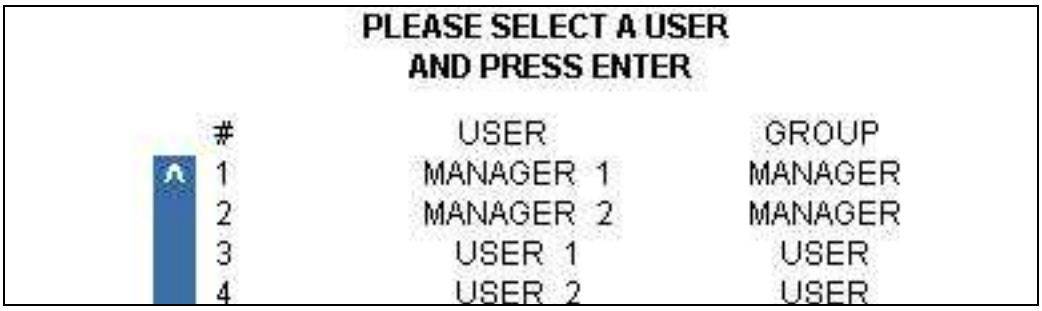


Figure 3-9: Login Screen

1. Move through the user list using the ***arrow*** buttons on the keypad.
2. Once the desired user is selected press the ***ENTER*** button.
3. The virtual keyboard screen will be displayed (see Figure 3-10). Enter the password using the keyboard. Use the ***arrow*** keys to navigate through the keyboard and press ***ENTER*** to select an alphanumeric value.
4. Once the password is entered navigate to the OK button and press ***ENTER***.
5. If the password is correct the unit will produce an audible beep and proceed to the main menu (see Figure 3-4).

Figure 3-10: Virtual Keypad

Creating a New Account

The operator logged into the system must be part of the Manager group to create a new user.

A maximum of 25 accounts can be created.

1. Highlight the SYS. menu or SYSTEM CONFIG button from the Main screen and press ***ENTER*** (see Figure 3-4).
2. Highlight the USER CONFIG button and press ***ENTER*** (see Figure 3-11).

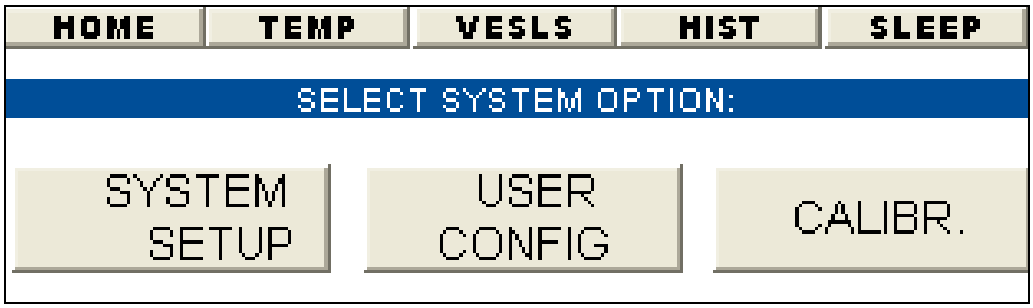


Figure 3-11: System Configuration Wizard

3. Highlight NEW from the menu bar and press ***ENTER*** (see Figure 3-12).

Figure 3-12: User Configuration Screen

4. The virtual keyboard screen will be displayed. Enter the username using the keyboard. Use the ***arrow*** keys to navigate through the keyboard and press ***ENTER*** to select an alphanumeric value (maximum of 8 characters).
5. Once the username is entered navigate to the OK button and press ***ENTER***.

6. The new user will now be added to the user list. The default password will be the same as the username.
7. The "PASSWORD" field will now be active. To change the default password, press ***ENTER*** to activate the virtual keypad.
8. Enter the password using the keyboard. Use the ***arrow*** keys to navigate through the keyboard and press ***ENTER*** to select an alphanumeric value (maximum of 8 characters).
9. Once the password is entered navigate to the OK button and press ***ENTER***.
10. To change the "GROUP" setting, navigate to this field using the ***arrows*** keys. Set the desired group privilege for the user by using the + and - buttons to toggle between “USER” and “MANAGER”.

Changing the Privileges of an Existing Account

The operator logged into the system must be part of the Manager group to modify an existing user.

1. Using the ***arrow*** keys scroll through the fields until the “GROUP” field is highlighted for the desired user. Toggle between USER and MANAGER using the + or - buttons.

Changing a Password

The operator logged into the system must be part of the Manager group to change a password.

1. Using the ***arrow*** keys scroll through the fields until the “PASSWORD” field is highlighted for the desired user.
2. Press ***ENTER***.
3. The virtual keyboard screen will be displayed. Enter the username using the keyboard. Use the ***arrow*** keys to navigate through the keyboard and press ***ENTER*** to select an alphanumeric value (maximum of 8 characters).
4. Once the username is entered navigate to the OK button and press ***ENTER***.

Deleting an Account

The operator logged into the system must be part of the Manager group to delete a user.

1. Highlight a user from the user list (highlight the Password or Group field).
2. Press the ***DEL*** key from the keypad.
3. The system will display a message box: "USER: USER_NAME CONFIRM DELETION?" Select YES to confirm the deletion.

Temperature Calibration

When selecting the CALIBR button the unit will prompt the use of a password. The password is 'EVOCAL' and only will be accepted if the user logged into the system has Manager priveleges. Because calibration of the unit can cause serious performance issues, this added level of security was implemented.

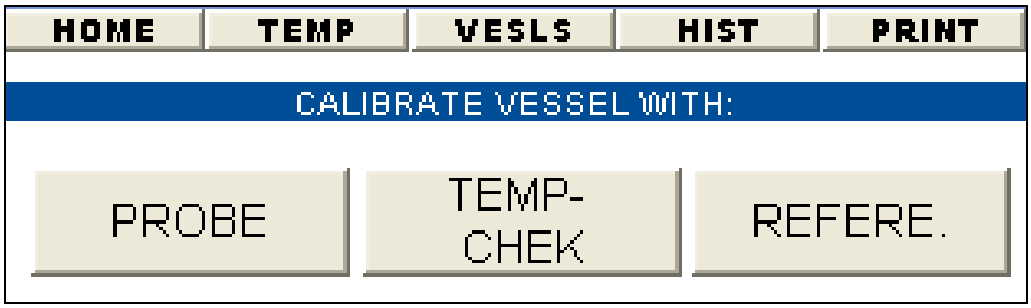


Figure 3-13: Main Calibration Screen

Accurate calibration of the temperature probes is essential for proper operation of the Distek Evolution Dissolution System. Factory calibration provides accuracy within ±0.1°C. Care must be taken when re-calibrating in the field, in order to realize the full accuracy and range of the temperature sensing system.

All installed temperature probes are factory-calibrated using an NIST-traceable digital reference thermometer, the Distek TempChek. Distek recommends a 6-month calibration cycle, during which each probe is checked and adjusted by this

method to the specified accuracy. Only qualified personnel should adjust the unit's calibration.

Interim temperature checks can be made in two ways:

A. The calibration probe supplied with the Evolution unit can be compared using the TempChek or any calibrated glass thermometer readable to 0.01°C and accurate to ±0.02°C. Each vessel temperature probe can then be checked (and re-calibrated if needed) using the calibration probe.
B. Alternatively, each vessel probe can be checked and re-calibrated with TempChek, or any calibrated thermometer.

The Evolution System will automatically detect whether a High-Temperature Calibration or a Low-Temperature Calibration will be performed based on the temperature of the probe. If the temperature of the probe is below 25°C and 15°C below the last high-temperature calibration a Lo-Cal will be performed. If the temperature of the probe is above 25.05°C and 15°C higher than the last low-temperature calibration a Hi-Cal will be performed. Use 700-1000ml water in each vessel. It is suggested to use cool water between 18° and 22° C to perform Low-Temperature Calibration and warm water between 38° and 42° C to perform High-Temperature Calibration. There must be a difference of at least 15° between the Lo-Cal temperature and the Hi-Cal temperature in order for the calibration procedure to work properly.

For accurate calibration use PADDLES. Basket stirring is not adequate for precise calibration. Calibration settings are saved in non-volatile memory and are retained after the unit is powered down.

Verify accuracy of low temperature calibration (18-22° C) before performing High-Temperature Calibration.

Heaters turn off automatically when the Calibration screen is accessed. The reason is to stabilize vessel temperature during the calibration procedure by preventing the high-powered heaters from raising temperatures rapidly.

Calibrate Using Evolution Calibration Probe

⊖	Check Evolution System calibration probe against a calibrated reference before performing this procedure. Check at low and high temperatures. Probe is factory-calibrated.
⊖	Each original probe, including the calibration probe, was factory calibrated before your Evolution System was shipped. Low-Temperature Calibration is only needed if the calibration values are deleted, or a new probe is installed. Otherwise, proceed to High-Temperature Calibration.

The following steps describe the procedure for calibration:

1. Install 7 vessels with 900 mls of water.
2. Install all Paddle blades.
3. Place the calibration probe in the vessel to be calibrated.
4. Set the vessel number on the screen using the + or - button (See Figure 3-14).
5. Wait for both calibration probe and vessel temperatures to stabilize.
6. Press ***START*** to calibrate the vessel.
7. Move calibration probe to next vessel to be calibrated.
8. Repeat step 2 through 5 until all vessels have been calibrated.

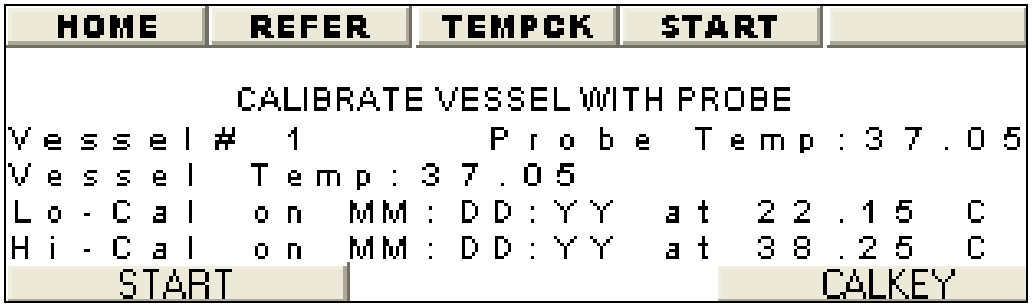


Figure 3-14: Calibrate with Calibration Probe

Calibrate Using TempChek Digital Thermometer

Each original probe, including the calibration probe, was factory calibrated before your Evolution System was shipped. Low-Temperature Calibration is only needed if the calibration values are deleted, or a new probe is installed. Otherwise, proceed to High-Temperature Calibration.

The following steps describe the procedure for calibration:

1. Install 7 vessels with 900 mls of water.
2. Install all Paddle blades.
3. Connect TempChek to RS-232 port (located on the side of unit) using Distek-supplied cable.
4. Place TempChek probe in vessel to be calibrated.
5. Set vessel number on the screen using the + or - button (See Figure 3-15).
6. Wait for both TempChek and vessel temperatures to stabilize.
7. Press ***START*** to calibrate.
8. Move the TempChek probe to next vessel to be calibrated.
9. Repeat step 2 through 6 until all vessels have been calibrated.

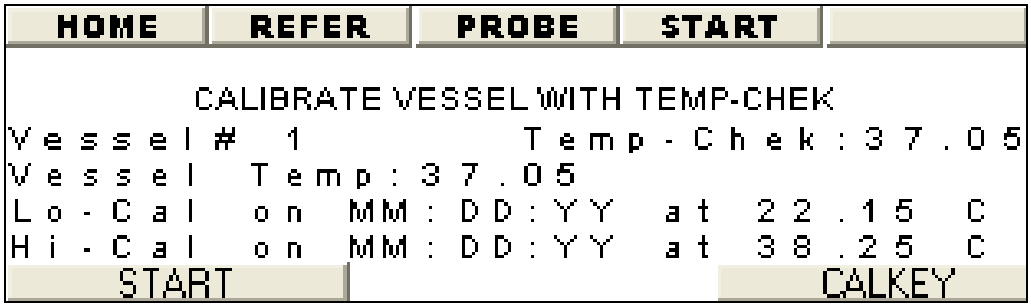


Figure 3-15: Calibrate using TempChek

Calibrate Using NIST-Traceable Reference Thermometer

Each original probe, including the calibration probe, was factory calibrated before your Evolution System was shipped. Low-Temperature Calibration is only needed if the calibration values are deleted, or a new probe is installed. Otherwise, proceed to High-Temperature Calibration.

The following steps describe the procedure for calibration:

1. Install 7 vessels with 900 mls of water.
2. Install all Paddle blades.
3. Place reference thermometer in the vessel to be calibrated.
4. Set vessel number on screen using the + or - button (See Figure 3-16).
5. Wait for both reference and vessel temperatures to stabilize.
6. Read temperature directly from reference thermometer.
7. Highlight the Ref. Temp. field and adjust the temperature value using the + or - buttons.
8. When Ref. Temp. on the screen matches actual reference reading, press ***START*** to calibrate.
9. Move reference thermometer to next vessel to be calibrated.
10. Repeat step 2 through 6 until all vessels have been calibrated.

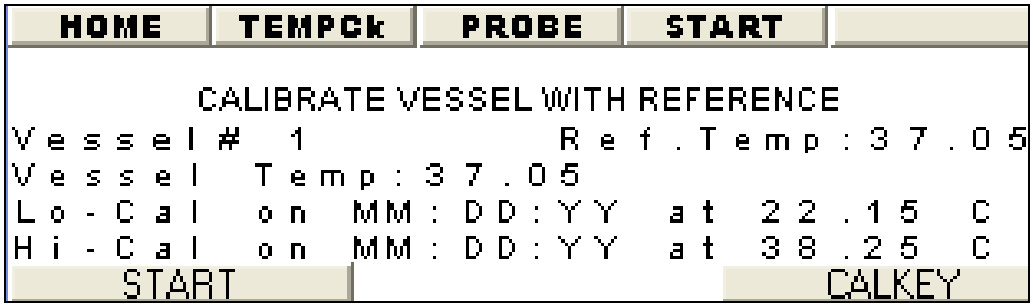


Figure 3-16: Calibrate using Reference

Calibrate calPROBE Using TempChek Digital Thermometer

1. Connect TempChek to RS-232 port (located on the side of unit) using Distek-supplied cable.
2. Place TempChek probe and the calibration probe in the same vessel.
3. Using the + or - button set vessel number on the screen to 8.
4. Wait for both TempChek and vessel temperatures to stabilize.
5. Press ***START*** to calibrate.

Calibrate calPROBE Using NIST-Traceable Reference Thermometer

1. Place reference thermometer and the calibration probe in the same vessel.
2. Using the + or - button set vessel number on the screen to 8.
3. Wait for both reference and vessel temperatures to stabilize.
4. Read temperature directly from reference thermometer.
5. Highlight the Ref. Temp. field and adjust the temperature value using the + or - buttons.
6. When Ref. Temp. on the screen matches actual reference reading, press ***START*** to calibrate.

Display Screens

All Display screens are accessible while in Manual Mode or Auto Test Mode. Use menu bar along the top of the screen or the wizards from the Main screen to scroll through the various Display screens as shown in the following sections.

Temperature Screen

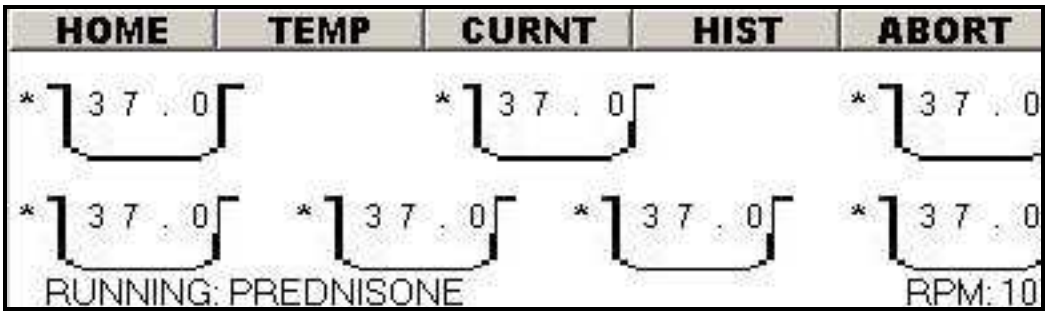


Figure 3-17: Vessel Temperature Display Screen

- Figure 3-17 shows the temperatures (in Celsius) in vessels 1 through 7.
- The indication at the lower left of the screen shows the name and status of the automatic test currently running. This will indicate "Manual Mode" while running in manual mode. The valid status options are: Idle, Pre-Heat and Running.
- The RPM will be displayed in the lower right of the screen.
- In Figure 3-18 and Figure 3-19, the asterisk to the left of the vessel number indicates the vessel heater is enabled. The two figures show vessels 1 through 7 are enabled. Temperature probe 8 is the built-in calibration probe.
- The TEMP button on the menu bar will toggle between Figure 3-17 and Figure 3-18.

Temperature and RPM Screen

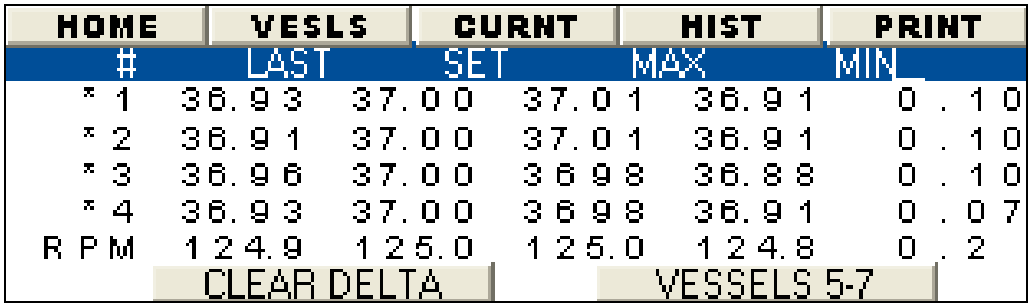


Figure 3-18: Temperature and RPM Monitor (Vessels 1-4)

- The screen in Figure 3-18 shows temperatures in vessels 1-4 and RPM values. The "LAST" column shows the current value and the "SET" column indicated the temperature set point.
- The "MAX" and "MIN" columns record the temperature and RPM range during a test. "DEL" is short for delta, which is the difference between the MAX and MIN values.
- To reset all DEL values to zero in Manual Mode, press the "CLEAR DELTA" button. The elapsed time indicator on the top LED will be reset to zero. This is only possible when running in Manual Mode!
- Selecting the button labeled "Vessel 5-7" will display another temperature and RPM monitor screen showing the same values for the other vessels.
- The TEMP button on the menu bar will toggle between Figure 3-17 and Figure 3-18.

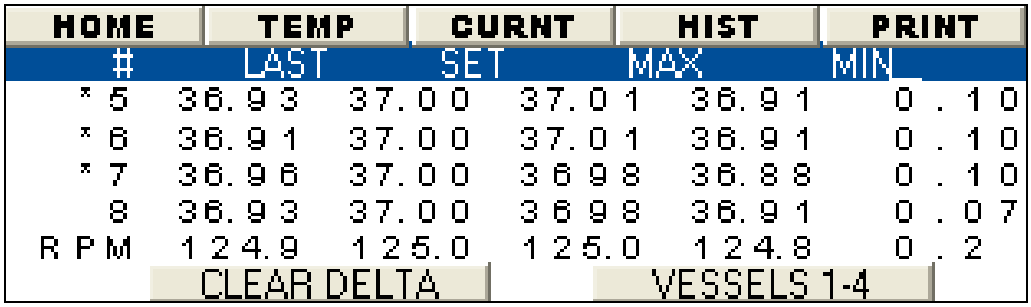


Figure 3-19: Temperature and RPM Monitor (Vessels 5-7)

Current Method

The display screen in Figure 3-20 summarizes the settings in use for the current Auto Test method. Vessels 1-7 are enabled. Test temperature is set to 37.0°C and the RPM is set to 100.

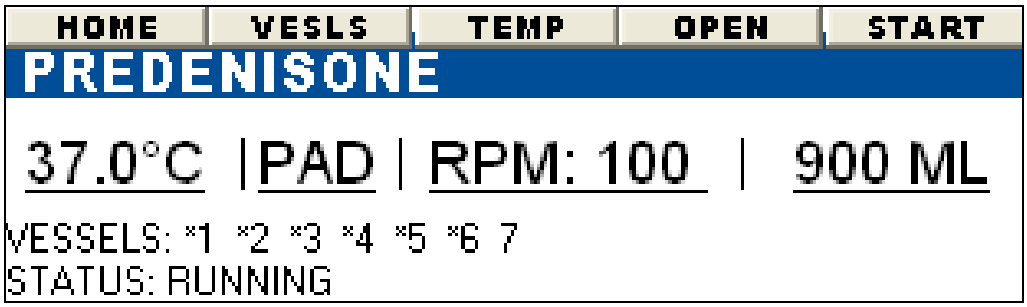


Figure 3-20: Current Method Details

Report History

The report history screen is accessed by selecting the "HIST" button on the menu bar. This button is found on several screens throughout the user interface such as the AUTO MODE wizard screen (see Figure 3-22), the MANUAL MODE wizard (see Figure 3-27) and most of the Display View screens.

Figure 3-21 lists the last 40 Automatic Tests that have been run on the unit. Tests which were aborted will display "Aborted" in the "Completed" column.

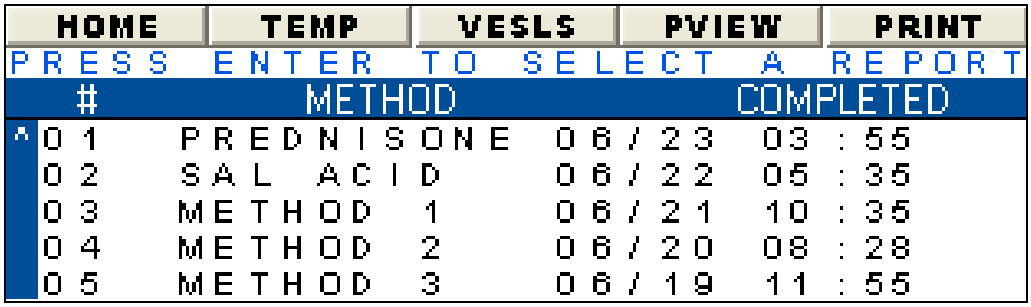


Figure 3-21: Report History

Printing a Saved Report

A printer must be connected to the unit via the parallel port in order to produce a printout.

A maximum of 40 reports can be created.

1. Navigate to a screen that contains a HIST button on the menu bar such as the AUTO MODE wizard screen (see Figure 3-23), the MANUAL MODE wizard (see Figure 3-27) or most of the Display View screens.
2. Highlight the HIST menu and press ***ENTER***.
3. The report screen (see Figure 3-21) will display the stored reports that have been run on the instrument (maximum of 16 stored reports). Highlight the desired method from the list using the ***arrows*** keys and press ***ENTER***.
4. Highlight the PRINT menu and press ***ENTER***.

Working with Methods (Automatic Mode)

The Evolution Dissolution System is capable of storing 100 methods. These pre-programmed methods allow for quick and easy operation of the unit. While in automatic mode the operator can perform the following method actions: new, open, run, view current and print.

Figure 3-22: Auto Mode Wizard

Selecting a Method to Run

1. From the main screen (see Figure 3-4) select either the menu bar option AUTO (go to step 3) or the AUTO MODE wizard button (display Figure 3-23).
2. Select RUN. The screen displayed will be similar to one in Figure 3-23.
3. Using the up or down ***arrow*** keys highlight a method from the method list.
4. Press the ***RUN/STOP*** or ***ENTER*** key to run the method.
5. Select YES from the displayed message.

Figure 3-23: Auto Mode Screen

Sorting the Method List

The method list shown in Figure 3-23 can be sorted by method name or date. Simply highlight the METHOD field or DATE field and click ***ENTER*** on the keypad. Clicking ***ENTER*** will toggle between sorting A-Z and Z-A on the METHOD column or ascending and descending on the DATE column.

Programming a New Method

The operator logged into the system must be part of the manager group to create a new method.

A maximum of 100 methods can be created.

1. From the main screen (see Figure 3-4) select either the menu bar option AUTO (go to step 3) or the AUTO MODE wizard button.
2. Select NEW.
3. Enter the method name using the virtual keyboard. Use the ***arrow*** keys to navigate through the keyboard and press ***ENTER*** to select an alphanumeric value (maximum of 16 characters).
4. Once the method name is entered navigate to the OK button and press ***ENTER***. The screen in Figure 3-24 will be displayed.
5. Using the ***arrow*** keys highlight the TEST TEMP field. Press the + or - button to set the desired value.
6. Using the ***arrow*** keys highlight the VOL field. Press the + or - button to set the desired value.
7. Using the ***arrow*** keys highlight the STIR ELEM field. Press the + or - button to toggle between PADDLE and BASKET.
8. Using the ***arrow*** keys highlight the TEST RPM field. Press the + or - button to set the desired value.
9. Using the ***arrow*** keys highlight the DUR field. Press the + or - button to set the desired value.

10. Using the ***arrow*** keys highlight the space to the left of the VESSEL number. Press the ***ENTER*** button toggle between a blank space or a ******. An * represents enabling a vessel.
11. Using the ***arrow*** keys highlight the MORE OPTIONS button and press ***ENTER***. The screen in Figure 3-25 will be displayed.
12. Using the ***arrow*** keys highlight the INF RPM field. Press the + or - button to set the desired value.
13. Using the ***arrow*** keys highlight the DUR field. Press the + or - button to set the desired value.
14. Using the ***arrow*** keys highlight the Staggered Drop field. Press the + or - button to set the desired delayed drop time in seconds.
15. Using the ***arrow*** keys highlight the Report field. Press the + or - button to toggle between ON or OFF.
16. Using the ***arrow*** keys highlight the SAMPLE LIST button and press ***ENTER***. The sample list screen in Figure 3-26 will be displayed.
17. With the highlighted field in the sample list press ***ENTER*** to add a new sample timepoint. Highlight the INSERT button and press ***ENTER*** to insert a timepoint in the sample list.
18. Highlight the time values in the list and use the + or - button to make the necessary modifications.
19. Highlight the BACK button and press ***ENTER***.
20. Highlight the SAVE button and press ***ENTER***.

When running a staggered drop test it is possible to have a conflict between a sampling time point and a tablet drop event (i.e. a short staggered drop interval and a quick first time point). If this occurs the Evolution unit will prioritize the sampling event and extend the staggered drop interval.

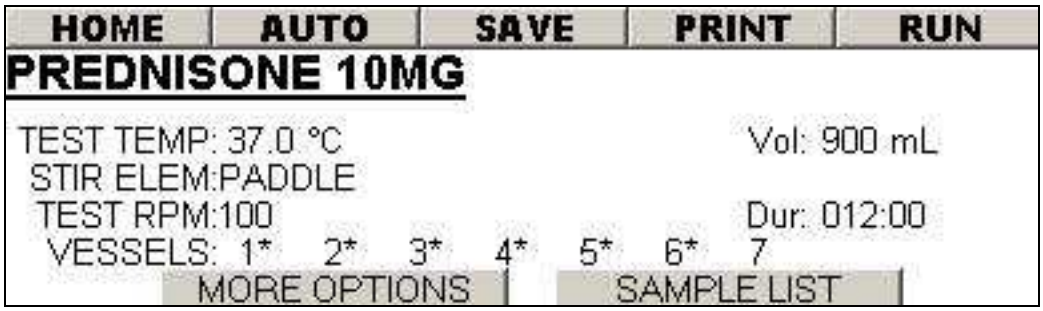


Figure 3-24: Method Screen

Figure 3-25: Method Screen – More Options

Figure 3-26: Method Screen – Sample List

Running a Simultaneous Drop with Paddles

1. Run the method (see Selecting a Method to Run on page 3-24).
2. After the unit has completed pre-heating the following message will be displayed:
   VESSEL TEMP HAS BEEN REACHED.
   PRESS ENTER AND DROP
   DOSAGE FORM.
3. Press the ***ENTER*** key. The following message will be displayed
   PLEASE DROP DOSAGE FORM
   STIRRING BEGINS IN XX SECONDS
   OR PRESS ENTER TO START TEST.

   The RPM will pause for 20 seconds to enable introduction of the dosage form.
4. Introduce the dosage form into each vessel.
5. The test will begin once the 20 second has expires or press ***ENTER*** to begin immediately.

Running a Simultaneous Drop with Baskets

1. Run the method (see Selecting a Method to Run on page 3-24).
2. After the unit has completed pre-heating the following message will be displayed:
   VESSEL TEMP HAS BEEN REACHED.
   RAISE STAGE, ATTACH BASKETS AND
   LOWER STAGE TO START TEST.
3. Raise the stage board (drive plate) and attach all the baskets to the shafts.
4. Lower the stage board and the test will automatically begin.

Running a Staggered Drop with Paddles

1. Run the method (see Selecting a Method to Run on page 3-24).
2. After the unit has completed pre-heating the following message will be displayed:
   VESSEL TEMP HAS BEEN REACHED.
   CONTINUE?
3. Select YES.
4. The following message will be displayed:
   HOLD SHAFT #X, DROP DOSAGE FORM
   RELEASE SHAFT THEN PRESS ENTER.
   where X represents the vessel number
5. Hold the shaft securely to prevent the paddle from spinning and introduce the dosage form.
6. Release the shaft and press ***ENTER***.
7. The unit will cycle through all the vessel positions based on the staggered drop interval time.

Running a Staggered Drop with Baskets

1. Run the method (see Selecting a Method to Run on page 3-24).
2. After the unit has completed pre-heating the following message will be displayed:
   VESSEL TEMP HAS BEEN REACHED.
   CONTINUE?
3. Select YES.
4. The following message will be displayed:
   RAISE SHAFT #X
   AND ATTACH BASKET.
   where X represents the vessel number
5. The unit will automatically detect the shaft is raised and display the following message:
   LOWER SHAFT #X
   TO START.

6. The system will automatically detect the lowering of the shaft and begin the test. There will be a very slight delay due to the response of the unit prior to the test starting. If this is not acceptable press ***ENTER*** at any time after the shaft has been lower to begin the test immediately.

Open/View an Existing Method

If the operator is logged into the system with Manager group privileges then the menu bar will contain a selection for OPEN. If the operator is logged in with USER group privileges then the menu bar will contain a selection for VIEW because a USER does not have access to modify a method.

There are 2 ways to open a method:

Method 1: Using the Auto Mode Wizard

1. From the main screen (see Figure 3-4) highlight the AUTO MODE wizard button and press ***ENTER***.
2. Highlight OPEN and press ***ENTER***. The screen in Figure 3-23 will be displayed.
3. Use the ***arrow*** keys to highlight the method from the method list and press ***ENTER***.
4. Highlight the menu bar item OPEN and press ***ENTER***.

Method 2: Using the menu

1. From the main screen (see Figure 3-4) highlight the menu bar option AUTO and press ***ENTER***. The screen in Figure 3-23 will be displayed.
2. Use the ***arrow*** keys to highlight the method from the method list and press ***ENTER***.
3. Highlight the menu bar item OPEN and press ***ENTER***.

Modify a Saved Method

The operator logged in to the system must be part of the Manager group to modify a method.

The method name of a saved method cannot be modified. Modifying the method name will create a new method using the modified name.

1. From the main screen (see Figure 3-4) select either the menu bar option AUTO (go to step 3) or the AUTO MODE wizard button.
2. Highlight the button OPEN and press ***ENTER***.
3. Highlight the method to be modified from the method list and press ***ENTER***.
4. Highlight the menu bar item OPEN and press ***ENTER***.
5. Make the necessary modification to the method. See Figure 3-24, Figure 3-25 and Figure 3-26.
6. Upon completion of modification highlight SAVE on the menu bar and press ***ENTER***.

Deleting a Method

The operator logged into the system must be part of the Manager group to delete a method.

1. From the main screen (see Figure 3-4) select either the menu bar option AUTO (go to step 3) or the AUTO MODE wizard button.
2. Highlight the button OPEN and press ***ENTER***.
3. Highlight the method to be deleted from the method list and press ***ESC/DELETE***.

Copy a Saved Method to a New Name

1. From the main screen (see Figure 3-4) select either the menu bar option AUTO (go to step 3) or the AUTO MODE wizard button.
2. Highlight the button OPEN and press ***ENTER***.
3. Highlight the method to be modified from the method list and press ***ENTER***.
4. Highlight the menu bar item OPEN and press ***ENTER***.
5. Highlight the method name field and press ***ENTER***.
6. A virtual keypad will be displayed (see Figure 3-10). Use the ***arrow*** keys to navigate through the keyboard and press ***ENTER*** to select an alphanumeric value (maximum of 16 characters).

7. Once the method name is entered navigate to the OK button and press ***ENTER***.
8. Make the necessary modification to the method. See Figure 3-24, Figure 3-25 and Figure 3-26.
9. Upon completion of modification highlight the menu bar item SAVE and press ***ENTER***.

Printing Method Parameters

The system is capable of storing a method audit trail that is saved with the method. This feature will display all the method changes for the past fifty saved changes. After fifty changes have occurred the system will prompt the user that older changes will be overwritten with the new changes. If this is not acceptable, the user should copy this method to a new name which will then reset the method history. See Appendix E for sample printouts.

1. From the main screen (see Figure 3-4) select either the menu bar option AUTO (go to step 3) or the AUTO MODE wizard button.
2. Highlight the button OPEN and press ***ENTER***.
3. Highlight the method to be modified from the method list and press ***ENTER***.
4. Highlight the menu bar item PRINT and press ***ENTER***.

Working in Manual Mode

As an alternative to running in Automatic Mode the user is able to operate the Evolution Dissolution System in Manual Mode. This mode allows for a simplified technique of running the dissolution system when it is not necessary to program a method.

Manual Mode is capable of operating the system by controlling all vessels or each vessel individually. Figure 3-27 displays the available operation in Manual Mode for an Evolution 6100 and Figure 3-28 shows the available action for an Evolution 6300.

Individual vessel control is only applicable to the Evolution 6100 Bathless Dissolution System.

Figure 3-27: Manual Mode Wizard - Evolution 6100

Figure 3-28: Manual Mode Wizard - Evolution 6300

Controlling Vessels Individually (Evolution 6100 Only)

This procedure is only valid for the Evolution 6100 Bathless Dissolution System.

The Evolution 6100 Bathless Dissolution System is capable of setting test parameters individually for each vessel. The temperature, vessel volume and stirring element can all be varied independently for each vessel (the RPM cannot be individually set).

1. From the main screen (see Figure 3-4) select the MANUAL MODE wizard button.
2. Select INDIV VESSELS. Figure 3-29 will be displayed.
3. Highlight the desired vessel icon and press ***ENTER***.
4. Figure 3-30 will now be displayed.
5. Highlight the TEMP field. Using the + and - keys change to the desired test temperature.
6. Highlight the STIR field. Using the + and - keys change to the desired stirring element (PAD for paddles or BAS for baskets).
7. Highlight the VOL field. Using the + and - keys change to the desired test volume.

8. Highlight the RPM field. Using the + and - keys change to the desired test RPM.
9. Highlight the ON/OFF field. Using the + and - keys change to the desired value (on or off).
10. To change setting for other vessels follow one of the two following methods:
    a. Highlight the VESSEL # position and using the + and - keys change to the desired vessel number. Follow steps 5-9 to modify the test settings.
    b. Highlight the BACK button and press ***ENTER***. Select the vessel to modify from the screen displayed in Figure 3-29. Follow steps 5-9 to modify the test settings.
11. Highlight the BACK button and press ***ENTER***.
12. Highlight the START button on the menu bar and press ***ENTER***.

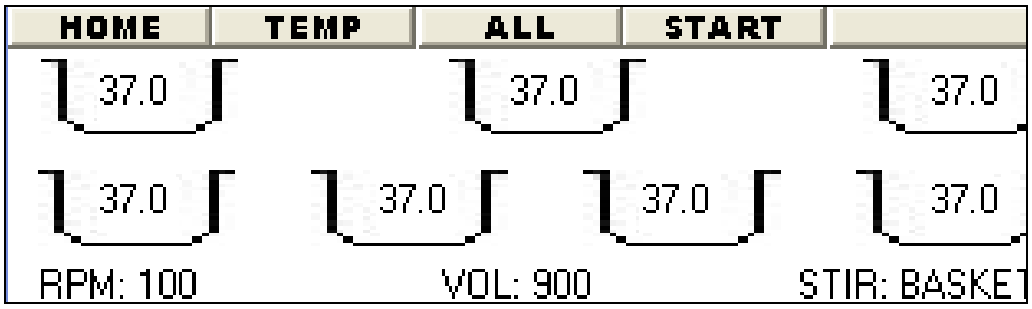


Figure 3-29: Manual Mode, Individual Vessel Control

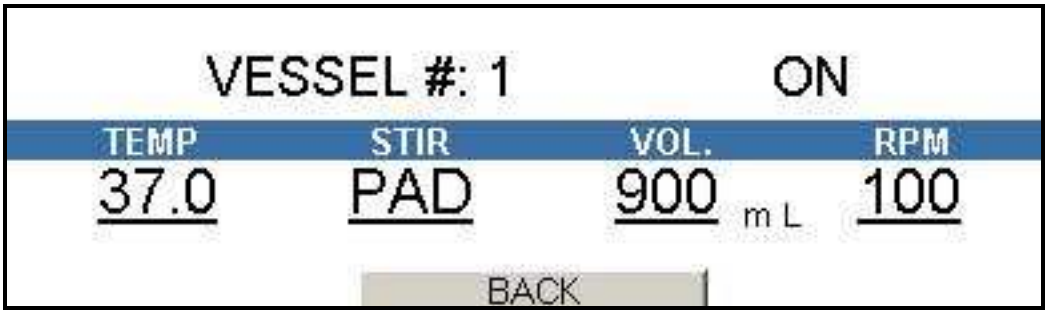


Figure 3-30: Manual Mode, Individual Vessel Control Settings

Controlling All Vessels

1. From the main screen (see Figure 3-4) select either the menu bar option MANUAL (go to step 3) or the MANUAL MODE wizard button.
2. If using the wizard, select ALL VESSELS. Figure 3-31 will be displayed.
3. Highlight the higher vessel number listed on the first line.
4. Using the + and - keys change to the desired vessel number. For example if the screen displays "VESSELS # 1 – 6" and you only need to run vessels 1

through 4, highlight 6 and change this value to 4. The screen will now display "VESSELS # 1 – 4".

5. Highlight the TEMP field. Using the + and - keys change to the desired test temperature.
6. Highlight the STIR field. Using the + and - keys change to the desired stirring element (PAD for paddles or BAS for baskets).
7. Highlight the VOL field. Using the + and - keys change to the desired test volume.
8. Highlight the RPM field. Using the + and - keys change to the desired test RPM.
9. Highlight the START HT/STIR button and press the ***ENTER*** key to begin heating and stirring. (This will activate the heater jackets on the Evolution 6100 or set the TCS temperature on the Evolution 6300.) The following table lists the available button functions:

Evolution 6100	
START HT/STIR	STAR STIR
STOP HEATERS	STOP HT/STIR
START HEATERS	STOP STIR
Evolution 6300 (Only One Button)	
START HT/STIR	
STOP STIR	

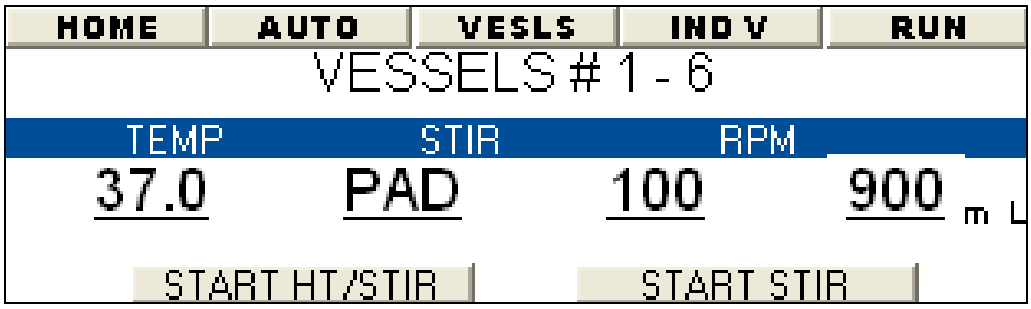


Figure 3-31: Manual Mode, All Vessels

TCS Activation (Evolution 6300 Only)

This procedure is only valid for the Evolution 6300 Dissolution System.

The Evolution 6300 is capable of detecting if the TCS heater has been initialized. Every time the TCS's power is reset the heater becomes inactive. This is a safety feature that limits the possibility of heating problems caused by an unprimed pump (no water inside pump). This feature only functions as a warning to the user, it does not actually prime the pump.

The Manual Mode Wizard will display an appropriate button depending on the TCS status: TCS ACTIVE or TCS INACTIVE (see Figure 3-28).

If the TCS is inactive simply click the TCS INACTIVE button to display a warning message. If the pump is properly primed select 'YES'. If it is not primed follow the procedure entitled Priming the Pump on page 2-8.

If the TCS is active then no action is required.

TCS activation is only required after the TCS's power has been reset and the user wants to start heating the bath without running a method. The unit will also automatically check the TCS status when a method is started.

Running a Manual Mode Test

The Evolution System is capable of running a Manual Mode test which will start a timer and reset the temperature and RPM deltas displayed on the TEMP/RPM Monitor screen (see Figure 3-18). These results can be printed out using the INSTAPRINT function.

1. Follow steps 1-9 in the Section entitled Controlling All Vessels on page 3-33.
2. Once the temperature has equilibrated (remains stable at the set temperature for several minutes), from the main screen (see Figure 3-4) select either the menu bar option MANUAL (go to step 3) or the MANUAL MODE wizard button.
3. If using the wizard, select ALL VESSELS. Figure 3-31 will be displayed.
4. Select the RUN button on the menu bar.

Using the produKEY

The Evolution Dissolution System comes standard with data access keys referred to as a produKEY. These keys allow methods to be quickly copied to multiple units without having to reprogram method settings. They also provide a way to backup calibration data in case of a unit failure.

The unit comes with two produKEYs: one to store methods and another for saving calibration data. Additional produKEYs are available from Distek. Each produKEY is capable of storing up to five methods.

Saving a Method to the produKEY

The following procedure explains how to save a method from the instrument to the produKEY.

The operator logged into the system must be part of the Manager group to save a method to the produKEY.

1. Insert the produKEY into the slot to the right of the control keypad. Turn the key clockwise ¼ turn. The unit will produce an audible beep.
2. Return to the Main screen.
3. Open the method to be saved to the produKEY: From the Main screen select the Auto Mode Wizard (see Figure 3-4). Next select Open (see Figure 3-22) to display the Method Listing screen (see Figure 3-23). Highlight the method to open, select ***ENTER*** and then OPEN from the menu bar.
4. Select the MORE OPTIONS button on the bottom of the screen (see Figure 3-24).
5. Select the PRODUKEY button on the bottom of the screen (see Figure 3-25).
6. Select YES from the message window to store the information to the produKEY. A long beep confirms the action.
7. Rotate the produKEY counterclockwise a ¼ turn then clockwise a ¼ turn.
8. The screen shown in Figure 3-32 will be displayed showing the methods stored on the produKEY.

Figure 3-32: produKEY Method Listing Screen

Viewing Methods on the produKEY

1. Insert the produKEY into the slot to the right of the control keypad. Turn the key clockwise 1/4 turn. The unit will produce an audible beep.
2. The screen shown in Figure 3-32 will be displayed.
3. Highlight the method from the list and select ***ENTER*** from the keypad.
4. Highlight the OPEN menu bar item and select ***ENTER***.

Saving a Method from the produKEY to the Instrument

1. Insert the produKEY into the slot to the right of the control keypad. Turn the key clockwise 1/4 turn. The unit will produce an audible beep.
2. The screen shown in Figure 3-32 will be displayed.
3. Highlight the method from the list and select ***ENTER*** from the keypad.
4. Highlight the SAVE menu bar item and select ***ENTER***.

Running a Method from the produKEY

The procedure below describes how to run a method directly from the produKEY without saving the method to the instrument.

1. Insert the produKEY into the slot to the right of the control keypad. Turn the key clockwise 1/4 turn. The unit will produce an audible beep.
2. The screen shown in Figure 3-32 will be displayed.
3. Highlight the method from the list and select ***ENTER*** from the keypad.
4. Highlight the RUN menu bar item and select ***ENTER***.

Deleting Methods from the produKEY

1. Insert the produKEY into the slot to the right of the control keypad. Turn the key clockwise 1/4 turn. The unit will produce an audible beep.
2. The screen shown in Figure 3-32 will be displayed.
3. Highlight the method from the list and select ***ESC/DELETE*** from the keypad.

Printing a Method from the produKEY

1. Insert the produKEY into the slot to the right of the control keypad. Turn the key clockwise 1/4 turn. The unit will produce an audible beep.
2. The screen shown in Figure 3-32 will be displayed.
3. Highlight the method from the list and select ***ENTER*** from the keypad.
4. Highlight the PRINT menu bar item and select ***ENTER***.

Using a Premiere 5100 produKEY

It is only possible to read from a Premiere 5100 produKEY (a method cannot be written to the key).

The Evolution is capable of utilizing existing produKEYs that were previously used on the Premiere 5100 Dissolution System.

1. Insert the produKEY into the slot to the right of the control keypad. Turn the key clockwise 1/4 turn. The unit will produce an audible beep.
2. The screen shown in Figure 3-32 will be displayed.
3. Follow the above procedures for saving, opening, running and printing methods.

Using the calKEY

The Evolution Dissolution System comes with a calKEY that is configured at Distek's factory with the unit's original calibration data. In the case of a failure where the calibration data is lost, the unit can easily restore its calibration data to the factory settings.

Storing Calibration Data

The following procedure describes how to save current calibration data to the calKEY.

1. From the Main screen select SYSTEM CONFIG.
2. From the SYSTEM screen select CALIBR.
3. Enter the valid password.
4. Insert the calKEY into the slot to the right of the control keypad. Turn the key clockwise 1/4 turn. The unit will produce an audible beep.
5. The following message will be displayed:
   UPDATE CALIBRATION
   DATA FROM CALKEY.
   Select NO.
6. A screen displaying the various calibration methods will be displayed (Probe, TempChek or Reference). Select the appropriate method.
7. Select the calKEY button located on the bottom of screen.
8. The following message will be displayed:
   CONFIRM SAVING OF CALIBRATION
   DATA TO THE CALKEY.
   Select YES.

Restoring Calibration Data

In case the calibration data is corrupted or lost, the following procedure describes how to restore the data.

1. From the Main screen select SYSTEM CONFIG.
2. From the SYSTEM screen select CALIBR.
3. Enter the valid password.
4. Insert the calKEY into the slot to the right of the control keypad. Turn the key clockwise 1/4 turn. The unit will produce an audible beep.
5. The following message will be displayed:
   UPDATING CALIBRATION
   DATA FROM THE CALKEY.
   Select YES.

Printouts

The Evolution Series contains several types of printouts. The unit is capable of printing real-time test reports, saved reports, InstaPrint, method settings, user settings and calibration data. See Appendix E for sample printouts.

To configure printing simply connect a printer cable from the printer port located on the side of the system to the printer. If multiple units will be sharing one printer see Printer Sharing Configuration on page 3-9.

InstaPrint can be selected any time the heaters and RPM are enabled. The units will printout applicable information depending on whether an AUTO test or MANUAL test is running. Printouts are created by pressing the PRINT menu bar item located on several screens throughout the user interface.

Serial Port Control

AA represents the unit address.

Command	Response	Function
[AA CONT:VESL:TEMP NNN]	[NNN]	Set temperature (NN.N°C) for all enable vessels
[AA CONT:VESL:TEMP X,NNN]	[X,NNN]	Set temperature (NN.N°C) for vessel X
[AA CONT:VESL:ELEM 'TYPE']	[PADDLE] or [BASKET]	Set stir type for all vessels, where 'TYPE' is PADDLE or BASKET.
[AA CONT:VESL:ELEM X,'TYPE']	[X,PADDLE] or [X,BASKET]	Set stir type for vessel X, where 'TYPE' is PADDLE or BASKET.
[AA CONT:VESL:VOL NNNN]	[NNNN]	Set volume (NNNN mls) for all vessels
[AA CONT:VESL:VOL X,NNNN]	[X,NNNN]	Set volume (NNNN mls) for vessel X
[AA CONT:VESL:STAT X, ON]	[X,ON]	Enable vessel X.
[AA CONT:VESL:STAT X, OFF]	[X,OFF]	Disable vessel X.
[AA CONT:VESL:ENBL 1234567]	[!]	Enable vessel 1, 2 3, 4, 5, 6 & 7.
[AA CONT:VESL:ELEM?]	[PADDLE] or[BASKET]	Report the stirring type for all vessels.
[AA CONT:VESL:ELEM? X]	[PADDLE] or[BASKET]	Report the stirring type for vessel X.
[AA CONT:VESL:TEMP?]	[NNN]	Report the set point temperature (NN.NN°C) for all vessels.
[AA CONT:VESL:TEMP? X]	[NNN]	Report the set point temperature (NN.NN°C) for vessel X.
[AA CONT:MOTO:SET NNNN]	[NNNN]	Set the RPM (NNNN).
[AA CONT:MOTO:STAT ON]	[ON]	Turn the motor on.
[AA CONT:MOTO:STAT OFF]	[OFF]	Turn the motor off.

Command	Response	Function
[AA CONT:MOTO:STAT?]	[ON] or [OFF]	Report the status of motor.
[AA CONT:MOTO:SET?]	[NNN]	Report the setting of RPM (NNN).
[AA CONT:HEAT:STAT ON]	[ON]	Turn the heaters on.
[AA CONT:HEAT:STAT OFF]	[OFF]	Turn the heaters off.
[AA CONT:TEST:ABORT]	[!]	Abort the current test.
[AA CONT:TEST:CLR]	[!]	Reset the delta.
[AA CONT:TEST:START]	[!]	Start the current activated method.
[AA MEAS:ALL]	[a1,a2, ….a11]	Report rpm, max rpm, min rpm, temp at V1, V2 … V8.
[AA MEAS:RPM]	[NNNN]	Report RPM (NNN.N).
[AA MEAS:RPM:MAX]	[NNNN]	Report max RPM (NNN.N).
[AA MEAS:RPM:MIN]	[NNNN]	Report min RPM (NNN.N).
[AA MEAS:TEMP:AVG]	[NNNN]	Report the averaged temperature of all enabled vessels
[AA MEAS:TEMP:CUR X]	[NNNN]	Report the current temperature of vessel X.
[AA MEAS:TEMP:MAX X]	[NNNN]	Report the max temperature of vessel X.
[AA MEAS:TEMP:MIN X]	[NNNN]	Report the min temperature of vessel X.
[AA MEAS:TEMP:MAX]	[a1,a2, ….a7]	Report the max temperatures of vessels 1, 2 … 7.
[AA MEAS:TEMP:MIN]	[a1,a2, ….a7]	Report the min temperatures of vessels 1, 2 … 7.
[AA SYST:DATE YYYY,MM,DD]	[YY,MM,DD]	Set the system date.
[AA SYST:TIME HH,MM,SS]	[HH,MM,SS]	Set the system time.
[AA SYST:DATE?]	[YY,MM,DD]	Report the current date.
[AA SYST:TIME?]	[HH,MM,SS]	Report the current system time.
[AA SYST:CAL?]	[iiii,ssss,iiii,ssss, …,iiii,ssss]	Report cal settings: intercept iiii and slop ssss of each vessel.
[AA SYST:ETIME?]	[HH,MM]	Report the elapsed time as hours and minutes.
[AA SYST:ADDR?]	[AA]	Report the address of the unit.
[AA SYST:SLEEP]	[!]	Puts the system in sleep mode.
[AA SYST:ADDR AA,PP,TT]	[!]	Set the addresses for the unit, printer and TCS
[AA SYST:PRNT:REQ BB]	[PRNT DD]	The unit BB requests a printer service from unit AA. Valid DD responses: • 0: the request is allowed • 1: the printer of the unit AA is off or offline • 2: the printer of the unit AA is out of paper • 3: the printer of the unit AA has an error • 4: the printer of the unit AA is busy. Please wait • 5: the unit AA doesn't have a local printer

Command	Response	Function
[BB NEXT]	[ssssss …..sssss]	Tell the unit BB to send a string to print. Where sssss…sssss is a string (must be less than 81 characaters) to be printed.
[AA *IDN?]	[6100/6300,SSSSSSS,PVRev NNN]	Report the bath type, serial number (SSSSSSSS) and Firmware Rev (NNN).
[AA HCOP:IMM]	[!]	Print an instant report.
[AA PKGT:METH:HEAD NNNNNNNNNNNNNNN HHHH MM HHHH MM DDD S TTT RRR iii LLL E P	[!]	Set the header of a new method and saves the header. The following variables can be set: • Name: NNNNNNNNNNNNNNN • Test Length: HHHH (hours) MM (min.) • IRPM Length: HH (hours) MM (min.) • Delayed Drop: DDD seconds • Report Switch: 0 (Off) or 1 (On) • Temperature: TT.T°C • RPM: RRR • IRPM: iii • Volume: LLL mls • Enable Vessels: E: Bit X: Vessel X (1: enable, 0: Disable) • Stirrer Type: P for PADDLE & B for BASKET
[AA PKGT:METH:SAMP l, HHHH MM HHHH MM HHHH MM HHHH MM HHHH MM HHHH MM HHHH MM HHHH MM]	[!]	Set the list of sample time points (from i*8) and saves the list. The max number of time points of each command is 8. Total number of time points of each method is 16
[AA PKGT:METH:HEAD?]	[NNNNNNNNNNNNNNN HHHH MM]	Report the method header.
[AA PKGT:METH:SAMP? l]	[HHHH MM]	Report the time points from l*8.

4 Maintenance

This chapter gives a very brief overview of properly maintaining the Evolution Dissolution System. To ensure consistent performance a Preventive Maintenance/Operational Qualification (PM/OQ) should be conducted periodically. Contact Distek for more information.

General Information 4-2
Emptying the Water Bath & TCS (Evolution 6300 Only) 4-3
Removing the Water Bath (Evolution 6300 Only)..... 4-4
Re-installing the Water Bath (Evolution 6300 Only) 4-5
Replacing the Water Bath and TCS Tubing (Evolution 6300 Only) 4-5

General Information

1. Unit should be cleaned periodically by wiping with a slightly damp cloth. Do not use any harsh chemicals or detergents.

2. Electronics require no customer attention. In the event of a malfunction, please call the factory before attempting any repairs.

3. Turn off unit and unplug power cord. Remove drive cover. Apply small amount of Dow Corning High Vacuum Grease to top and bottom of both drive belts. (This should be done every 6 months.) Replace cover. Drive motor and bearings are permanently lubricated. Belt tension is factory adjusted.

4. Clean guide posts every three months with alcohol and wipe dry with clean cloth or paper towel. Do not lubricate posts.

5. Temperature calibration probe should be cleaned off and stored in holder on left rear side of drive unit when not in use.

6. Vessel support plate requires extra care. Do not allow acids or buffers to remain on the plate for extended periods of time. WIPE THE PLATE CLEAN AFTER USE. DO NOT SCRATCH OR SCORE PAINTED SURFACE.

7. TCS Fuse Replacement:

110V	Fast Blow 5x20mm – 8A 250V
230V	Fast Blow 5x20mm – 5A 250V

Do not clean plastic and rubber parts with organic solvents.

Emptying the Water Bath & TCS (Evolution 6300 Only)

1. Turn the unit off.
2. Attach the drain tube to the end of the drain valve (black & orange fitting, see Figure 4-1).
3. Place drain tube into a large bucket.
4. Open valve to drain media from the bath.
5. Once all the media has been drained disconnect the CPC quick connect fitting on the entry port of the TCS.
6. Disconnect the top tube on the exit port of the TCS.
7. Empty the remaining media from the TCS by turning the unit upside down.
8. Remove the CPC fitting and tube from the exit port and empty the remaining media.
9. Wipe the bath clean of remaining media.

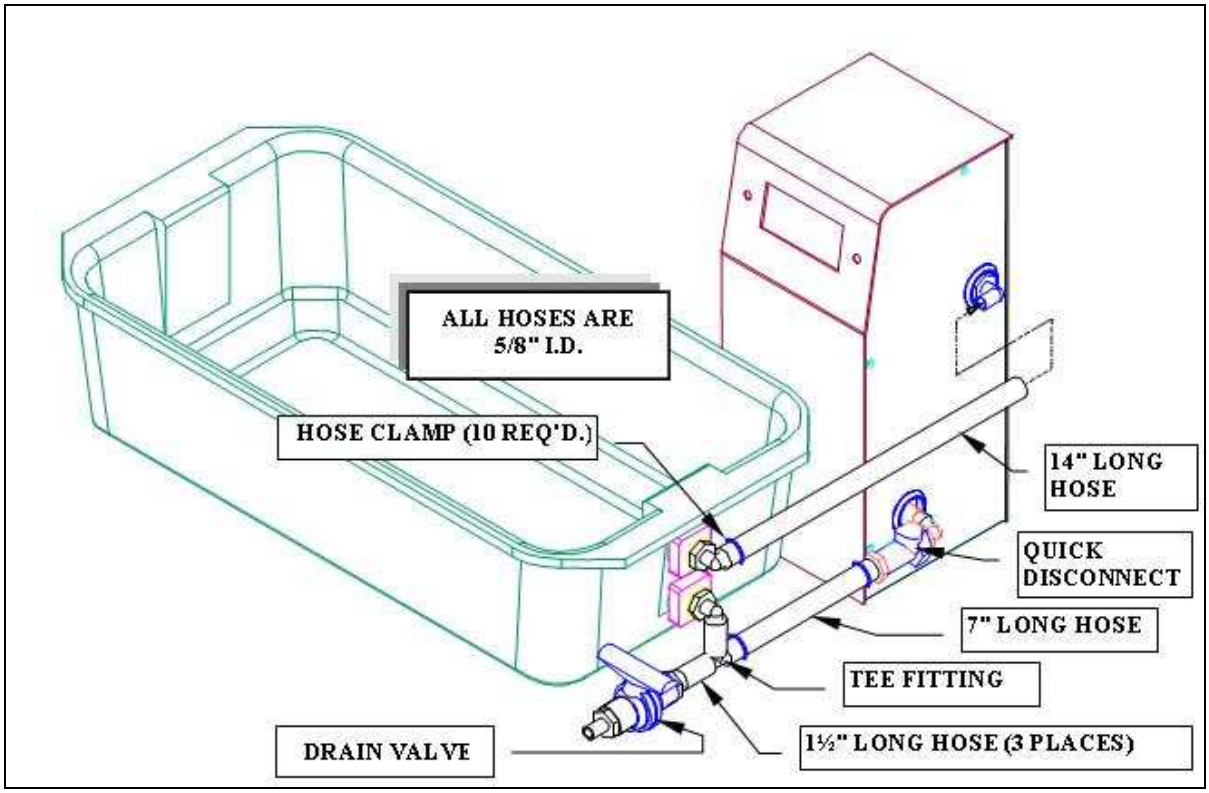


Figure 4-1: TCS Connections

Removing the Water Bath (Evolution 6300 Only)

1. Drain the water bath as described in the previous section.
2. Lower the water bath supports (see Figure 4-2) to its lowest position.
3. Push down the four bath corners to free it from the vessel plate.
4. Loosen the thumbscrew and turn the "bath lock" plate located on the front of the vessel plate to an up position.
5. Remove the bath.

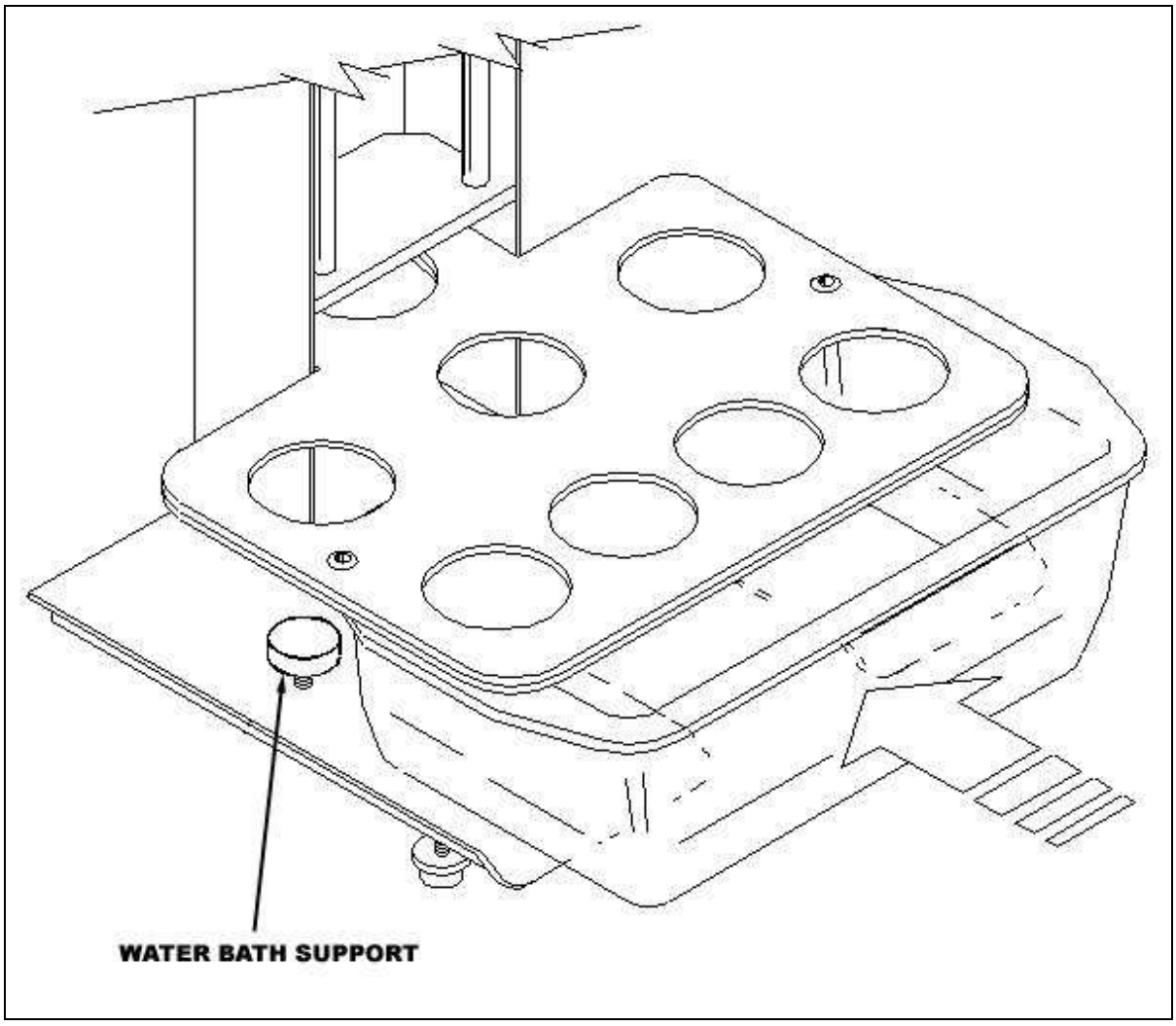


Figure 4-2: Water Bath Removal

Re-installing the Water Bath (Evolution 6300 Only)

Do not over-tighten supports. The foam seal strip under the vessel plate should not be compressed any thinner than 3/16" if possible.

Always recheck the level after installing and filling the water bath.

1. Lower the water bath supports (see Figure 4-2) to their lowest point.
2. Slide the water bath into position and center it under the vessel support plate.
3. Raise the supports until the water bath lip makes good contact with the seal under the vessel support plate.
4. Return the "bath lock" plate to a down position and tighten the thumbscrew.
5. Connect hoses to TCS as shown in Figure 4-1.
6. Tighten all hose clamps.
7. Follow the procedures described in the Filling the Water Bath and Priming the Pump on page 2-8 to fill the water bath and prime the TCS.

Replacing the Water Bath and TCS Tubing (Evolution 6300 Only)

The tubing connecting the Water bath and TCS should be replaced as needed. With routine unit usage the tubing can get very dirty, thus requiring replacement. Contact Distek to obtain a tubing replacement kit. The following procedure describes how to change the tubing lines.

Figure 4-3: Tubing Replacement Diagram

1. Remove the 3 tube clamps with pliers (see Figure 4-3).
2. Remove the 3 tubes from the fittings.
3. Disconnect the CPC fitting by pressing the dark grey button located on the fitting (see Figure 4-3).
4. Connect the new tubing as shown in Figure 4-3.
5. Attach the 3 hose clamps using pliers.

Upon completion the TCS should be tested to ensure there are no leaks. This is done by simply running the TCS.

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5 Troubleshooting

This chapter provides troubleshooting information to identify the most common problems and their solution.

Troubleshooting 5-2
Error Messages 5-15
Warning Messages 5-17
General Messages 5-18
Service 5-19

Troubleshooting

Before performing any procedure in this section, please disconnect AC power from the unit.

Improper servicing or adjustment practice can cause equipment failure or serious physical injury. This equipment must be adjusted and serviced by qualified electrical maintenance personnel who are familiar with the construction and operation of the equipment and the hazards involved. Take diligent care during adjustment. All exposed points on the control circuit boards are electrically hot with respect to earth ground.

HIGH VOLTAGE IS EXPOSED WHEN THE LOWER REAR PANEL IS OPENED ON THE SYSTEM. Dangerous voltages exist on the circuit boards when powered. Disconnect AC power from the unit while troubleshooting. Be alert. High voltage can cause serious or fatal injury.

The Evolution 6100 and TCS are supplied with proper heaters and settings for the specified operating voltage (see label for information). Do not attempt to convert unit to another power supply without contacting the factory first!

Display/Keypad

PROBLEM		*POSSIBLE SOLUTION*	
LCD DISPLAY	*Blurred display*	Adjust display contrast	Locate and adjust by turning the multi-turn potentiometer on the stage board.
		Display cable	Check the ribbon cable that goes from the LCD connector to the stage board for any loose wires or crimps.
		LCD display	Make sure that the display assembly is mounted securely on the bezel. Replace the LCD display.
		Stage board	Check that all socket chips are inserted properly. **Note:** Make sure you do not bend the leads when removing and reinstalling the chip.
	Horizontal line across the LCD display	Display contrast	Locate and adjust by turning the multi-turn potentiometer on the stage board.
		Display cable	Check the ribbon cable that goes from the LCD connector to the stage board for any loose wires and crimps.
		LCD display	Make sure that the display assembly is mounted securely on the bezel. Replace the LCD display.
	No display	Display contrast	Locate and adjust by turning the multi-turn potentiometer on the stage board.
		Display Cable	Check the ribbon cable that goes from the LCD connector to the stage board for any loose wires or crimps.
		LCD display	Make sure that the display assembly is mounted securely on the bezel. Replace the LCD display.
		Stage board	Check that all socket chips are inserted properly. **Note:** Make sure you do not bend the leads when removing and reinstalling the chip. Replace the stage board if necessary.
	Scrambled LCD screen	Power Supply	Cycle the main power off for at least 1 minute then turn it on again.
		LCD display	Check the ribbon cable that goes from the LCD connector to the stage board. Make sure that the display assembly is mounted securely on the bezel.
		Stage board	Check that all socket chips are inserted properly. **Note:** Make sure you do not bend the leads when removing and reinstalling the chip.

Display/Keypad

PROBLEM		*POSSIBLE SOLUTION*	
DRIVE MOTOR	*Shaft not rotating-unit heats properly*	Fuse	Check if the 0.5 amp fuse located on the 5151 PCB is blown. Replace is needed.
		Cable connectors	Check drive motor connection on 5151 PCB at location "J6" (see figure 3) for loose wire connection or damage pins. Repair as necessary. Check motor drive connection on the drive motor itself for loose wire connection or damaged pins.
	Shaft rotate-not heating properly	Re-cycle power	Turn instrument off. Wait approximately 2 minutes and restart unit.
		LCD display	Make sure that the display assembly is mounted securely on the bezel. Replace the LCD display.
		Stage board	Check that all socket chips are inserted properly. **Note:** Make sure you do not bend the leads when removing and reinstalling the chip. Replace the stage board if necessary.
LED DISPLAY	*LED display not scrolling/ locking up*	LED display cable	Check the LED cable going from the 5150 board to the LED board (5104) for any loose wires on the crimp connector.
		Cabling Connection	Check wiring from the PC board to the 5154 (stage board).
		LED board	Replace the 5104 LED board display.
		Interface board	Replace the 5150- interface board that causes the LED board not to function.
	No LED display	LED display cable	Check the ribbon cable that goes from the LED connector to the 5150 board for any loose wires or crimps.
		LED display (seven segment)	Check for any loose or shorted connection on the LED display board.
		LED display board	Replace the LED display board.
		Interface board	Replace the interface board (5150).
	Some LED display digits missing	LED display cable	Check the LED cable going from the 5150 board to the LED board (5104) for any loose wires on the crimped connector.
		LED display	Replace the LED seven-segment display if necessary.
		LED board	Replace the 5104 LED board display.
		Interface board	Replace the 5150 interface board that causes the LED board not to function properly.

Display/Keypad

PROBLEM		*POSSIBLE SOLUTION*	
KEYPAD	*Not heat light indicator*	LED indicator	Defective LED. Replace the keypad overlay.
	Not responding	Keypad connection	Check that the keypad connector is securely inserted into stage board J11 connector.
		Cabling Connection	Check wiring from the PC board to the 5154 (stage board).
		Stage board	Replace the 5154-stage board that causes the keypad to malfunction.
		Keypad	Replace the keypad membrane for probable short on the circuit.
	No stir light indicator when pressed	LED indicator	Defective LED. Replace the keypad overlay.

Power Supply

PROBLEM		*POSSIBLE SOLUTION*	
AC SUPPLY	*Main circuit keeps tripping*	Short circuit on the unit	Check the unit for any shortages starting from the power switch, transformer, wiring and the system circuit boards.
	No main power	Underrated main circuit	Check that the circuit breaker for that particular line outlet is not underrated as specified.
		Main circuit breaker	Check that the circuit breaker for that particular line outlet is turned on.
		Main outlet	Check that the unit is plugged in a regular outlet without ground fault interrupters (this will cause the outlet to trip during heating due to overload). Check with an electrician.
	No low voltage ac (secondary) from the transformer	No power	Measure if there is input voltage coming into the transformer primaries (115v or 2202v).
		I/O board voltage selector	Check that the transformer wirings are securely fastened into the I/O connector.
	Power switch keeps tripping	Short circuit on the unit	Check the unit for any shorts starting from the power switch, power supply, transformer, wiring and the system circuit boards.

Power Supply

PROBLEM		*POSSIBLE SOLUTION*	
		Underrated power switch	Check that the power switch is rated for that particular unit (see Specification section in Chapter 1).
DC SUPPLY	No +5V No +12V	Switcher Power Supply	Measure the output voltage coming from the power supply.
		Wiring harness	Check that the wiring is securely connected into the power supply terminals. Also, check the connector that supplies the interface board (5150) for any loose connections.
		Interface board	Replace the defective interface board (5150).
	No +6V No -5V	Switcher Power Supply	Measure the output voltage coming from the power supply at +12V and -12V.
		Wiring harness	Check that the wiring is securely soldered into the power supply terminals. Also, check the connector that supplies the interface board (5150) for any loose connections.
		Interface board	Replace the defective interface board (5150).
	No high voltage (HV)	Transformer secondary	Measure if there is output voltage coming out the transformer secondary. If there is no AC voltage coming out of the secondary, replace the transformer.
		Wiring harness	Check that the transformer wiring is securely soldered into the transformer terminals. Also check the connector that supplies the motor/heater board for any connections.
		Interface board	Replace the defective interface board (5150).

Heating/Speed

PROBLEM		*POSSIBLE SOLUTION*	
HEATERS	*"Abnormal Heating Profile"*	Triacs	Check for any defective triacs that stays off all the time when heaters are enabled.
		Heaters	Check for heater unplugged or any loose wiring from the heater especially where the connectors meet. Check the resistance of the heater(s) is not infinite or open.
		Calibration	Check and verify the calibration of the unit. Check the low calibration at room temperature and the high calibration between 37 to 40 degrees centigrade. Perform calibration if necessary.
		Volume settings	Check that a specific vessel position(s) is set to the right volume setting (this can be done through manual parameter settings or auto test).
		Motor/heater board	Replace the defective motor/heater board.
		Vessels	The vessel is empty. Cool & fill with liquid.
		Stirring element	Stirring element is out of vessel; lower and stir.
		Probe	Vessel probe may have failed; test and replace.
		Power	Turn off main power switch, wait 10 seconds and turn back on to reset.
		Stage board	Stage board failure. Replace board.
	No heat	Triacs	Check for any defective triac(s) that stays off all the time when heaters are enabled. Replace the defective triac(s) if found faulty.
		Heaters	Check for heater unplugged or any loose wiring from the heater especially where the connectors meet. Check that the resistance of the heater(s) is not infinite or open.
		Program disabled heater	Check that a specific vessel position(s) is enabled (this is done through manual parameter settings or auto test). **Note:** An asterisk symbol next to vessel number (*1) means vessel #1 is on.

Heating/Speed

PROBLEM		*POSSIBLE SOLUTION*	
		Motor/heater board	Replace the defective motor/heater board.
	Slow heating on one or more vessel position	Triacs	Check for any defective triacs that stays off all the time when heaters are enabled.
		Heaters	Check for any loose wirings from the heaters harness especially where the connectors meet. Check that the resistance of the heaters(s) is not infinite or open.
		Programmed volume settings	Check that a specific vessel position(s) is set to the right volume setting (with 500mls settings only the lower part of the heater will be enabled). Change the volume settings through manual parameter settings or auto test.
		Motor/heater board	Replace the defective motor/heater board if necessary.
	When heat/start key pressed-heat indicator lights up momentarily-heater will not turn on	Height switch	Check that the height switch is engaged when the drive head is lowered. Adjust the switch position until it triggers the switch with the cylinder of the gas spring.
		Wiring	Check that the wiring of the height switch is intact and the connector end is plugged into J4 of the interface PCB (5150).
DRIVE MOTOR	*No stirring*	Motor fuse	Check that the fuse (F5) for the motor on the motor/heater board is not faulty. Replace if found faulty.
		Height switch	Check that the height switch is engaged when the drive head is lowered. Check that the wiring of the height switch is intact and the connector end is plugged into J4 of the interface PCB (5150).
		Motor cable wiring harness	Check that the cable is intact and make sure all connectors are plugged into their respective mates from the drive motor to the motor/heater board.

Heating/Speed

PROBLEM		*POSSIBLE SOLUTION*	
		Defective drive motor	Check the drive motor for any shorts and faulty wiring. When the drive motor is turned by hand the rotation should be smooth and without binding.
		No high voltage supply	Refer to problem “No high voltage”.
		Motor board	Replace the defective motor/heater board.
	Speed goes to maximum speed	Motor cable wiring harness	Check that the cable is intact and make sure all connectors are plugged into their respective mates.
		Magnetic pick up gap	Check that the distance between the magnetic pick-up and the rotating gear is at 0.008 inch.
		Magnetic pick up	Check that the magnetic pick-up is securely fastened with the bracket. Check the magnetic pick-up shorts or faulty wiring. Replace if found defective.
		Motor/heater board	Replace the defective motor/heater board.
	Stir key pressed-indicator lights up momentarily-drive motor will not turn on.	Height switch	Check that the height switch is engaged when the drive head is lowered. Adjust the switch position until it touches the cylinder of the gas spring.
		Wiring	Check that the wiring of the height switch is intact and the connector end is plugged into J4 of the interface PCB (5150).

*I/O Communication

PROBLEM		*POSSIBLE SOLUTION*	
PRINTER	*No printout*	I/O cable	Check the cable for any faulty connections. Replace the cable if necessary.
		Printer cable	Check the IEEE printer cable for any faulty connections especially with bent pins.
		Printer	Make sure that the printer is on and has enough paper. Set the printer’s carriage return to

*I/O Communication			
PROBLEM		***POSSIBLE SOLUTION***	
			enable. This can be done through the printer's software.
		Program setting	Under "SYSTEM SETUP" make sure that the printer settings are configured properly. ('L' for local or '#' for Printer Sharing.)
		I/O board	Check the board for any faulty or short connections. Replace the I/O board if necessary.
RS232	*No communication (handshaking)*	I/O cable	Check the cable for any faulty connections.
		RS232 cable	Check the RS232 cable for any faulty connections especially bent pins.
		Systems address	Make sure that the system address is set right.
		PC or Master controller	Make sure that the setting of the controller matches the systems protocol. Use COM1-COM4 at 9600-baud rate.
		I/O board	Check the board for any faulty connections. Replace the I/O board if necessary.
RS485	*No communication*	I/O cable	Check the cable for any faulty connections.
		RS485	Check the RS485 cable for any faulty connections especially bent pins.
		System address	Make sure that the system address is set right.
		PC or master controller	Make sure that the setting of the controller meets the systems protocol. Use COM1-COM4 at 9600-baud rate.
		I/O board	Check the board for any faulty connections. Replace the I/O board if necessary.

Temperature, abnormal display

PROBLEM		*POSSIBLE SOLUTION*	
DISPLAY	*Temperature seems locked/not changing*	+6 volts dc not present	Refer to no +6 volts dc.
		-5 volts dc not present	Refer to no -5 volts dc.
		RTD wiring harness	Check the harness for any faulty wiring and connections.
		A/D board	Replace the A/D board.
RTDs/CalProbe	*Abnormal display reading*	RTD	Check the RTD(s) for any shorts or higher resistance readings.
		RTD cable harness	Check the harness for any faulty connections.
		A/D board	Replace the A/D board.

Calibration

PROBLEM		*POSSIBLE SOLUTION*	
PROBE	*No response from calibration probe*	Cal Probe	Check the calibration probe for any shorts.
		RTD wiring harness	Check the harness for any faulty connections.
		A/D board	Replace the A/D board.

Mechanical

PROBLEM		*POSSIBLE SOLUTION*	
BATH LEVEL	*Level*	Leveling feet	By using the bubble level as a guide, level the unit from front to back and side to side by adjusting front leveling feet under instrument base.
		Rear stabilizers	Adjust rear stabilizers so they just barely touch the bench.

Mechanical			
PROBLEM		***POSSIBLE SOLUTION***	
SHAFT WOBBLE/RUNOUT	*RTD shafts*	RTD shafts	With the unit at its operating position (paddles or baskets) use a run out gauge to validate the shaft wobble. Mount the gauge base with a clamp on the vessel support plate (next to the shaft to be checked). Move the tip of the gauge until it contacts the shaft tolerably. Raise the drive head until the tip of the gauge is just less than 1 inch above the apparatus. Rotate a spindle that is not under test manually until you reach the high-end deflection of the gauge's readout. Gradually push the shaft with your thumb near the meter shaft, away from the gauges adjustable tip. Start stirring at 25 rpm and check the shaft wobble. Do this until you meet the specifications.
SHAFT CENTERING	*Spindles*	Spacers and Inserts	Check the spacers and inserts for defects. Replace if necessary.
		Adjustments	Attach CenterChek as per instruction on the position in question. Rotate a spindle that is not under test manually. Note the whole deflection of the CenterChek.
			Rotate the gauge until you reach the high-end deflection of the gauge's pointer (counter clockwise movement) then stop the rotation.
			Open the drive assembly cover.

Mechanical			
PROBLEM		***POSSIBLE SOLUTION***	
			Loosen the screws (big) slightly until you get a slight movement of the spindle in question. Loosen or tighten one of the setscrews until you can set the pointer of the gauge between the low and high deflection of the meter. Carefully start tightening the big screws making sure that the pointer of the gauge only moves slightly.
	Shaft wobble/run out Vessels	Shaft	Refer to "Shaft wobble/run out".
		Non-Distek vessels	Replace non-Distek vessels (Distek vessels have a tighter inside diameter tolerance).
	Vessel centering arm assembly	Mounting	Check the installation of the centering arm making sure that the plastic nylon post is flush with the arm.
		Centering arm	Replace if centering arm is broken or has defects.
APPARATUS HEIGHT ADJUSTMENT	*Paddle and basket height*	Height block	Refer to manual for "Paddle and Basket Height Adjustment".
	Shaft collars	Locking collars	Make sure that when locking the shaft collars the shaft does not move (slightly push down the shaft while locking the collars).
	Vessels	Non-Distek vessels	Replace non-Distek vessels (Distek vessels have a tighter inside diameter tolerance).
DRIVE HEAD MOVEMENT DIFFICLUT TO RAISE AND LOWER	*Brake tension*	Tension	Adjust the tension of the brake assembly.
	Drive posts	Guide posts	Clean drive post. Use cloth dampened with alcohol and wipe dry.
	Gas Spring	Gas Spring	Replace if gas spring is found defective (pressure leakage).
NOISE IN DRIVE ASSEMBLY	*Drive belts*	Drive belts tension	Check for drive belts tension. Adjust if necessary.
	Drive motor	Brushes	Check the drive motor's conductive brushes for wear. Replace the brushes if necessary.

Mechanical			
PROBLEM		***POSSIBLE SOLUTION***	
	Idler wheels	Idler wheels	Inspect the idler wheels especially the bearings for any sign of wear. Lubricate the bearings if necessary. Replace the idler wheel assembly.
	Pulleys	Pulleys	Inspect the pulleys for any cracks that may cause the setscrews to loosen up. This will cause the pulley to rotate around the spindle shaft.
EXCESS VIBRATION	*Drive belts*	Drive belts tension	Check drive belts tension. Adjust if necessary.
		Lubrication	Lubricate the drive belts with vacuum grease.
		Drive belts	Replace the drive belts if necessary.
	Drive motor	Brushes	Check the drive motor's conductive brushes for wear. Replace the brushes if necessary.
	Idler wheels	Idler wheels	Inspect idler wheels especially bearings for any sign of wear. Lubricate bearings if necessary. Replace idler wheel assembly.
	Other equipment	Instruments and equipment	Make sure that there are no units that can produce excessive vibration when they are turned on (filtration systems, shakers, etc.).
	Pulleys	Pulleys	Inspect the pulleys for any cracks that may cause the setscrews to loosen up (this will cause the pulley to rotate around the spindle shaft). Replace cracked or defective pulleys.

Error Messages

The following messages may appear on the front LCD display.

Message	*Possible Cause*	*Solution*
HI-CAL MEDIA TEMP IS TOO LOW. INCREASE MEDIA TEMP ABOVE XX°C.	The vessel temperature is too low to perform a high temperature calibration.	Increase media temperature.
LO-CAL MEDIA TEMP IS TOO HIGH. DECREASE MEDIA TEMP BELOW XX°C.	The vessel temperature is too high to perform a low temperature calibration.	Decrease media temperature.
CANNOT ADD NEW USER. USER LIMIT HAS BEEN EXCEEDED.	Trying to add a new user when the maximum number of users has already been reached.	Delete a user prior to adding a new user.
ONLY A MANAGER CAN ADD NEW USERS!	A person with USER privileges is logged into the system. A USER does not have correct access to add users.	Logout of system and have a manager log in to add a new user.
ONLY A MANAGER CAN DELETE A USER!	A person with USER privileges is logged into the system. A USER does not have correct access to delete users.	Logout of system and have a manager log in to delete a user.
ONLY A MANAGER CAN MODIFY USER ACCOUNTS!	A person with USER privileges is logged into the system. A USER does not have correct access to modify users.	Logout of system and have a manager log in to modify a user.
USER: USER_NAME EXISTS. ENTER NEW USERNAME.	Attempting to add a user with the same username as an existing user.	Enter a different username.
SYSTEM DOES NOT ALLOW SELF DELETION!	The user was trying to delete the login profile that they are currently logged in as.	You cannot delete a login if it is currently being used. Log out and log back in using a different user and then delete the user.
ONLY A MANAGER HAS CALIBRATION PRIVELEGES.	A person with USER privileges is logged into the system. A USER does not have correct access to calibrate the system.	Logout of system and have a manager log in to calibrate the system.

Message	*Possible Cause*	*Solution*
ONLY A MANAGER CAN MODIFY OR CREATE A METHOD.	A person with USER privileges is logged into the system. A USER does not have correct access to modify a method.	Logout of system and have a manager log in to modify the method.
PRINTER IS OFF OR OFFLINE. PLEASE CHECK PRINTER.	The printer is either offline (not ready) or powered off.	Either set the printer to be online or turn the power on.
PRINTER IS OUT OF PAPER. PLEASE ADD PAPER.	Printer is out of paper.	Add paper to the printer.
PRINTER ERROR. PLEASE CHECK THE PRINTER.	This is a generic error message.	Check printer operation manual.
PRINTER IS BUSY. PLEASE WAIT.	Printer is currently busy.	Wait until the printer is back online.
PLEASE INSERT A CALKEY	Trying to read or write data to calKEY without inserting a key into the receptacle.	Insert calKEY into receptacle and repeat procedure.
CALKEY DETECTED. PLEASE INSERT A PRODUKEY.	Trying to save method data to a calKEY. Once a key is set as a calKEY it cannot be used as a produKEY.	Remove calKEY, insert produKEY then repeat procedure.
THIS PRODUKEY IS FULL. PLEASE DELETE METHODS ON THIS PRODUKEY.	Trying to save a method to a produKEY that has already reached maximum capacity (5 methods max.).	Delete a method from the produKEY and then repeat procedure to save a method to the key.
ABNORMAL HEATING PROFILE IN VESSEL # X.	The unit has detected an incorrect heating profile (rate of temperature increase). Could be caused by heating a vessel with no media, heater problem or shaft sensor malfunction.	Check vessel causing problem and make sure the vessel contains media. Restart test. If problem persists contact Distek Customer Service.

Warning Messages

Message	*Reason*
IF YOU ARE READY TO PERFORM HI-CAL PRESS OK.	Confirming high temperature calibration of vessel position.
IF YOU ARE READY TO PERFORM LOW-CAL PRESS OK.	Confirming low temperature calibration of vessel position.
YOU ARE ABOUT TO DELETE METHOD: METHOD_NAME ARE YOU SURE?	Confirming deletion of method.
METHOD: METHOD_NAME CURRENTLY EXISTS. DO YOU WANT TO OVERWRITE?	Warning that method currently exists and selecting YES will overwrite saved method.
CALIBRATION CANNOT PROCEED WHILE A TEST METHOD IS RUNNING	Unable to calibrate the unit while a test is running.
CHANGES TO THIS PARAMETER CANNOT BE MADE WHILE A TEST METHOD IS RUNNING.	This parameters cannot be changed while a test is running.
METHOD: METHOD_NAME START TEST?	Confirm starting of test.
SELECT A METHOD TO RUN.	Attempting to run a method when no method is active. Activate method from the Method Listing screen.
METHOD: METHOD_NAME IS RUNNING. ABORT AND START METHOD: METHOD_NAME	A method is currently running. Accepting 'YES' will abort current method and start new method.
METHOD: METHOD_NAME HAS BEEN CHANGED. SAVE CHANGES?	Confirm saving changes made to method settings.
METHOD NAME: METHOD_NAME MODIFICATION HISTORY IS FULL. OVERWRITE OLDEST HISTORY?	The maximum of fifty saved modification histories has been exceeded. Selecting OK will overwrite the oldest modification. Selecting Cancel will revert to original method.
YOU ARE ABOUT TO ABORT THE TEST. PLEASE CONFIRM.	Confirm aborting method.
YOU ARE ABOUT TO ABORT THE MANUAL TEST. PLEASE CONFIRM.	Confirm aborting manual mode.
INCORRECT PASSWORD! PLEASE TRY AGAIN.	Wrong password was entered.
USER: USER_NAME CONFIRM DELETION?	Confirm user deletion.
CANNOT LOGOUT WHILE SYSTEM IS BUSY.	Unable to logout while the system is running (manual mode or a test method).

Message	*Reason*
ABORT MANUAL MODE TEST. START METHOD: METHOD_NAME	Manual mode is currently running. Confirm aborting manual mode and start test method.
ARE YOU SURE YOU WANT TO LOG OFF?	Confirm logging out.
ONLY A MANGER CAN MODIFY SYSTEM PARAMETERS.	Only a manager has privileges to modify system parameters.
VESSEL TEMP HAS BEEN REACHED. RAISE STAGE, ATTACH BASKETS AND LOWER STAGE TO START TEST. (NOTE: FOR SIMULTANEOUS BASKET DROP ONLY)	Prompt when beginning a simultaneous drop basket test.
CANNOT PRINT WHEN SYSTEM IS IDLE.	InstaPrint is not available while the system is idle.
HOLD SHAFT # X, DROP DOSAGE FORM, RELEASE SHAFT THEN PRESS ENTER.	Prompt for vessel position X when starting a staggered drop paddle test.
RAISE SHAFT # X, ATTACH BASKET, LOWER SHAFT THEN PRESS ENTER TO CONTINUE.	Prompt for vessel position X when starting a staggered drop basket test.
VESSEL TEMP HAS BEEN REACHED CONTINUE?	Prompt to begin test (after pre-heat has completed).
IS THE TCS PROPERLY PRIMED? SELECT YES TO INITIALIZE THE HEATER.	The main unit will detect if the TCS has gone through a power cycle (turn off then back on). If so this warning reminds the user to make sure the TCS has been primed. See Priming the Pump on page 2-8 for more information.

General Messages

Message	*Reason*
METHOD: METHOD_NAME HAS BEEN SUCCESSFULLY SAVED!	Confirmation of saving method settings.
CALKEY DETECTED. PLEASE ENTER CLAIBRATION WINDOW TO READ OR WRITE TO CALKEY.	User inserted calKEY on a screen other than the Calibration section. Enter Calibration section and reinsert the calKEY.
UPDATE CALIBRATION DATA FROM CALKEY?	Confirm updating unit calibration data from the calKEY.
CONFIRM SAVING OF CALIBRATION DATA TO CALKEY	Confirm updating calKEY from unit calibration data.

THE TCS HEATER IS CURRENTLY INITIALIZED.	This message is displayed when selecting the 'TCS ACTIVE' button from the manual mode wizard. This means that the TCS has already been primed and initialized.

Service

If you have a problem with the instrument or need parts information, contact the Distek Service Department by e-mail at support@distekinc.com or call our toll-free number (888)234-7835.

Items returned for repair or exchanges require an R.A. #. Please contact the Distek Service Department to obtain an R.A.

Please send the return or repair to:

Distek, Inc.
Service Department
121 North Center Drive
North Brunswick, NJ 08902
Attention: R.A. # _____

Appendix A : Spare Parts and Accessories

Baskets	
2800-0032	40 Mesh Basket
2800-0032-6	40 Mesh Basket, Gold Coat
2800-0032-H	40 Mesh Basket, Hard-Coat
2800-0032-SN	40 Mesh Basket, Serialized
2800-0032-T	40 Mesh Basket, Teflon Coated
2800-0138	40 Mesh Basket and Adapter (No Shaft)
2800-0041	10 Mesh Basket
2800-0041-G	10 Mesh Basket, Gold Coat
2800-0041-H	10 Mesh Basket, Hard Coat
2800-0041-SN	10 Mesh Basket, Serialized
2800-0042	20 Mesh Basket
2800-0042-G	20 Mesh Basket, Gold Coat
2800-0042-H	20 Mesh Basket, Hard Coat
2800-0042-SN	20 Mesh Basket, Serialized
2800-0043	100 Mesh Basket
2800-0043-G	100 Mesh Basket, Gold Coat
2800-0043-H	100 Mesh Basket, Hard Coat
2800-0043-SN	100 Mesh Basket, Serialized
2800-0044	150 Mesh Basket
2800-0044-G	150 Mesh Basket, Gold Coat
2800-0044-H	150 Mesh Basket, Hard Coat
2800-0044-SN	150 Mesh Basket, Serialized
2800-0045	200 Mesh Basket
2800-0045-G	200 Mesh Basket, Gold Coat
2800-0045-H	200 Mesh Basket, Hard Coat
2800-0045-SN	200 Mesh Basket, Serialized
2800-0046	250 Mesh Basket
2800-0046-G	250 Mesh Basket, Gold Coat
2800-0046-H	250 Mesh Basket, Hard Coat
2800-0046-SN	250 Mesh Basket, Serialized
2800-0047	300 Mesh Basket
2800-0048	400 Mesh Basket

Basket Adapters & Clips	
3200-0038	Adapter for Evolution Basket (Includes O-Ring)
3100-0017	Detachable Snap-on Basket Clip

Capsule Sinkers	
0500-0467	Basket with Clip on Lid, 316SS (Large)
0500-0468	Basket with Clip on Lid, 316SS
0500-0473	6 Turn Spiral, Magnetic Sinker, Epoxy Coated
0500-0474	6 Turn Spiral, 316 SS
0500-0475	Sinker, XL, Teflon Coated
0500-0476	"S" Shaped Sinker, 316 SS
0500-0477	5 Turn, 316 SS
0500-0478	4 Turn, SS, Inert Coated
0500-0479	5 Turn, SS, Inert Coated
5000-0011	3 Prong Black Plastic Sinker
5000-0012	3 Prong Metallic Core Encased in Inert Plastic Sinker, Magnetic

Cables & Cords	
4952-0013	Cable, RS-232, 12 Ft. Long, Male to Female
4952-0012	Cable, RS-232, 6 Ft. Long, Male to Female
2400-0004	Cable, RS-485
4955-0001	Power Cord, 6 Ft., 13 Amps, 125V
4955-0002	Power Cord, 6 Ft., 15 Amps, 125V

Filter Disks	
5720-0203	Filter Disks, 10 Micron, 1000 per pack
5720-0275	Filter Disks, 45 Micron, 1000 per pack

Fittings & Connectors	
5720-1009	Coupling, 1/4 x 28 Thread
5720-9074	Elbow , Male to Female
5720-9059	Luer Adapter, Female
5720-9060	Luer Adapter, Male

Kits & Accessories	
2800-0066-1	Intrinsic Dissolution Apparatus - Paddle Over Stationary Disk. Includes 1 each of the following: Flat bottom glass vessel 1L, acculign ring, punch, die/plunger/cap assembly, wrench, and surface plate for pellet pressing.

2800-0066-6	Intrinsic Dissolution Apparatus - Paddle Over Stationary Disk. Includes 6 each of the following: Flat bottom glass vessel 1L, acculign ring, punch, die/plunger/cap assembly, and 1 ea. wrench and surface plate for pellet pressing.
4960-0003	E-Z Press Hydraulic Lab Press, 2 Ton
2421-0173	Back Light Kit
2800-0205	VisiChek for Enhanced Visual Perspective and Observation of Tablets.
3861-0001	Operation Manual for Evolution Dissolution Test Systems
3861-0002	Quick Start Instructions for Evolution Dissolution Test Systems

Paddle Blades	
3251-1051	Paddle Blade,
3251-1051-SN	Paddle Blade, Serialized
2800-0077	Paddle Blade, Hard Coat
3251-1084	Paddle Blade, Plastic
2800-0073	Paddle Blade, Teflon Coat

Printer & Printer Cables	
4000-0337	Printer Cable, Parallel Port, 6 ft
6687-0015	Printer, HP InkJet - requires printer cable p/n 4000-0337

Pulleys	
3251-1079	Pulley, 1/2" ID
3221-0039	Pulley, 5/8" ID Black

Sampling Probes	
2910-0250	250mL Sampling Probe
2910-0500	500mL Sampling Probe
2910-0504	500mL Sampling Probe, for use with 2L Vessel
2821-0265	500mL Sampling Probe, Hard Coat
2910-0502	500mL Sampling Probe, Lower Portion,
2910-0506	500mL Sampling Probe, Solid Housing
2910-0750	750mL Sampling Probe
2910-0754	750mL Sampling Probe, for use with 2L Vessel
2910-0752	750mL Sampling Probe, Lower Portion Only
2910-0756	750mL Sampling Probe, Solid Housing
2910-0900	900mL Sampling Probe
2821-0205	900mL Sampling Probe, Hard Coat
2910-0904	900ml Sampling Probe, for use with 2L Vessel
2821-0205-6	900mL Sampling Probe, Hard Coat, set of 6

2910-0902	900mL Sampling Probe, Lower Portion Only
2910-0906	900mL Sampling Probe, Solid Housing
2910-1000	1000mL Sampling Probe
2910-1004	1000mL Sampling Probe, for use with 2L Vessel
2910-1002	1000mL Sampling Probe, Lower Portion Only
5570-8032	O-ring for Sampling Probe
2910-0003	Probe Plug with O-ring
2910-0001	Return probe

Service Parts	
0707-6011	Hinge with screw for vessel cover
2400-5150	Interface Board – 6x00
2400-5151	Motor/Heater Board - 6100
2400-5152	Motor/Heater Board - 6300
2400-5153	Communication Board – 6x00
2821-0290	Idler Assembly
2851-0004	Height Knob for 6x00, 5100 and 2100C
2851-0015	Heater Enclosure Assembly, 110V
2851-0016	Vessel Centering Arm Assembly
2851-0024	Heater Enclosure Assembly, 220V
3250-0019	Block for Vessel Cover with O-ring
3250-0102	Extension Block for Quick-change Height Adjustment Knob, 6x00, 5100 and 2100C
3251-1109	Spring, Extension for Heater Jacket
3500-0001	Temperature Calibration Probe
4675-0001	PC/104 – Embedded PC Board
4675-0002	Disk on Chip, 8MB
4681-0008	produKEY/calKEY for 6x00
4810-1004	Magnetic Pickup & Gear
5000-6065	Adjustable Leveling Foot
5351-8033	Drive Belt - Long
5351-8047	Drive Belt - Short (Motor to Seventh Position)
5531-6061	Ball Used on Cover/Door, SS, Pack of 4
5570-8003	O-ring for Center Cap of Vessel Cover
5570-8007	O-Ring for Basket Adapter
5720-8019	Rubber Grommet Used on Calibration Probe Holster

Shafts & Paddles	
2651-0023	Shaft Assembly, Includes bearing for unit
2651-0123	Shaft Assembly, Teflon Coated, Includes bearing
2651-0124	Shaft Assembly, Hard Coating Coated, Includes bearing

Shaft Collars	
5570-6077	Shaft Collar with Allen Key Locking

Validation Tools	
0500-0281	CenterChek Model 170
5000-0013	Flat Tip Adapter for Wobble Meter Runout Gauge
0500-4078	Height Adjustment Ball 2.5cm
0500-0300	HeightChek Model 180
6220-0004	Reflective Stickers for Use with Optical Tachometer, Price Per Foot
0500-0301	ShaftChek
0500-1044	Tachometer, Contact
0500-1045	Tachometer, Optical
0500-0298	TempChek
3250-0046	Tip, Nylon for CenterChek
8100-0001	Validation Kit: Includes Contact Tachometer, CenterChek, HeightChek, and Wobblemeter
8100-0602	Validation Kit: Includes Optical Tachometer, CenterChek, HeightChek, and Wobblemeter
0500-0299	VesselChek
0500-0319	VibraChek
0500-0273	Wobblemeter Runout Gauge

Vessels	
3010-0096	Vessel, Premiere, Serialized, 1L Clear Glass
3010-0023	Vessel, Amber, 1L
3010-0023-6	Vessel, Amber, 1L set of 6
3010-0022	Vessel for Intrinsic Dissolution Apparatus, Flat Bottom

Vessel Covers	
3250-0089	Vessel Cover, Clear Acrylic with 3 Probe Holes, Small Center Hole
3250-0089-6	Vessel Cover, Clear Acrylic with 3 Probe Holes, Small Center Hole, Set of 6
3250-0070	Vessel Cover, Clear Acrylic with Three Probe Holes and Large Center Hole for Basket and Shaft. Includes Center Cap and O-ring
3250-0070-6	Vessel Cover, Clear Acrylic with Three Probe Holes and Large Center Hole for Basket and Shaft. Includes Center Cap and O-ring, Set of 6
3250-0254	Vessel Cover, Black Polypropylene
3250-0254-6	Vessel Cover, Black Polypropylene Set of 6
5720-4037	Vessel Cover Hole Plug

Appendix B : Pre-Installation Considerations: Electrical Power Supply

1. Locations using 115V, 60-cycle AC should provide a separate 20-A circuit for each Distek Evolution Dissolution System that they intend to install. In cases where additional modules (sampling, monitoring, and printing) are being installed, separate 20-A circuits are necessary.
2. Similarly if 220V, 50 cycle AC systems are being installed, each system should be wired to a separate 15-A circuit.
3. Because of the extensive use of microprocessor technology, it is recommended, where possible, that 12-gauge stranded-copper wiring be used for all circuit wiring. In cases where the distance from the circuit breaker sub-panel to the outlet exceeds 500 feet (150m), 12-gauge wire is the minimum that should be used. The use of larger diameter wiring reduces the voltage drop in the wiring, helps reduce power consumption, and increases the inductive impedance of the circuit which helps smooth voltage fluctuations.
4. In addition, if possible, an isolated ground wire should be used and the site should be wired in a 3-phase, 4-wire configuration with an approximate load balancing among the phases. In sites where many systems are being installed, the number of systems wired to each phase should be balanced as much as possible.
5. To minimize the risk of damage to a system from electrical system problems:

   5.1 Verify that the power wiring configuration is proper.

   5.2 Verify that the mains voltage ("supply" to "neutral") is within 7% of the nominal supply voltage.

   5.3 Verify that the common-mode voltage between "neutral" and "ground" is: less than 2.0 V AC in 115V AC installations or less than 3.0 V in 230V AC installations.

   5.4 If possible, verify the current dissipation capacity of the "ground" and the "neutral" lines in the circuit wiring.

   5.5 Building mains should be protected with "lightning suppressors" and, ideally, each circuit should be terminated by the appropriate "surge protection" receptacle. (In the United States, suitable receptacles are supplied by Hubbell, Inc. Alternately, a sized computer-grade surge-suppression accessory with the appropriate current rating can be added to existing circuits.)

   5.6 For those users who require protection from voltage drop-outs, short term power interruptions, and supply voltage reductions, a suitable standby Uninterruptible Power Supply (UPS) should be installed between the supply and the dissolution system.

   5.7 For those sites whose power quality is compromised either by the nature of the generation source or imposed fluctuations and pulses, an isolation transformer or an on-line UPS may be needed.

Although the Distek Evolution System is designed with internal surge protection, failure to follow these recommendations may compromise the operation of the system and, should the system be damaged by power surges, lightning or other significant power fluctuations, such system damage is not covered by Distek's warranty.

Appendix C : CE Declaration of Conformity

CE DECLARATION OF CONFORMITY

NOT TRANSFERABLE

Responsible Company:	Distek, Inc. 121 North Center Dr. North Brunswick, NJ. 08902
Equipment Type & Model:	Distek Dissolution Systems: Evolution 6100 Evolution 6300 (with TCS) Distek Autosamplers: DS 4300 Evolution 4300 Syringe Pump
Equipment Classification:	Electrical equipment for measurement, control and laboratory use.
Declared Compliance & Test Standards:	EMC Directives 89/336/EEC/93/68/EEC IEC 61326:2002 EN 61000-3-2 EN 61000-3-3 EN 61010-1:2001 (2nd Edition) IEC 1010-2-010:92 (as applicable) UL 61010A-1 CAN/CSA 1010.1-92

Jeff Brinker
Engineering Manager
November 11, 2003

Appendix D : Sample Printouts from Parallel Printer

Actual printouts may vary from samples shown.

Method Printout

```
DISTEK EVOLUTION Firmware V1.20    4/02/03 01:41:19PM    Page 1 of 1

METHOD PRINTOUT FOR: DISTEK
-------------------------------------------------------------------
SERIAL NUMBER: 6100001
   LOT NUMBER: ___________
 BATCH NUMBER: _________
         DATE: 04/02/03
         TIME: 12:48:27PM
   PRINTED BY: DISTEK

                TEST PARAMETERS FOR METHOD: DISTEK
  TEMPERATURE: 37.0 C                          IRPM: 250
     DURATION: 0:10                 IRPM DURATION: 0:03
          RPM: 100              STAGGERED INTERVAL: 0 SECONDS
STIRRING TYPE: BASKET              VESSELS ENABLED: 1 2 3 4 5 6
   VESSEL VOL: 900 ml

                  STEP   TIME          STEP   TIME
                    1    000:00         9    002:00
                    2    000:15        10    002:15
                    3    000:30        11    002:30
                    4    000:45        12    002:45
                    5    000:60        13    003:00
                    6    001:15        14    003:15
                    7    001:30        15    003:30
                    8    001:45        16    003:45

                MODIFICATION HISTORY - AUDIT TRAIL:
  CREATED ON: 04/01/03 04:10:52          BY: DISTEK
 MODIFIED ON: 04/10/03 02:15:56          BY: DISTEK
     Stir element changed from BASKET to PADDLE
     Temperature changed from 37.0 C to 37.5 C.
 MODIFIED ON: 10/13/04 03:05:40          BY: LABMANAGER
     Infinity RPM duration changed from 01:00 to 00:00.
     Stagger drop changed from 15 seconds to 0 seconds.
```

Saved Report & Real Time Test Printout

DISTEK EVOLUTION Rev. 1.20

4/02/03 01:41:19PM Page 1 of 1

Test Summary Printout for Method: DISTEK

SERIAL NUMBER: 6105023
LOT NUMBER: _____
BATCH NUMBER: _____
START TEST AT: 11:48:27AM 04/02/03
TEST ENDED AT: 12:48:27PM 04/02/03
EXECUTED BY: DISTEK
PRINTED BY: DISTEK

TEST PARAMETERS

TEMPERATURE:	37.0 C	IRPM:	250
DURATION:	0:10	IRPM DURATION:	0:03
RPM:	100	STAGGERED INTERVAL:	0 SECONDS
STIRRING TYPE:	BASKET	VESSELS ENABLED:	1 2 3 4 5 6
VESSEL VOL:	900 ml		

SAMPLE LIST:

STEP	TIME	V1	V2	V3	V4	V5	V6	V7	RPM
1	000:00	36.88	36.91	36.91	36.88	36.89	36.86	36.96	100.0
2	000:15	36.88	36.86	36.91	36.90	36.84	36.83	36.91	100.0
3	000:30	36.91	36.89	36.93	36.90	36.89	36.83	36.96	99.9
4	000:45	36.91	36.96	36.91	36.90	36.91	36.88	36.94	99.9
5	000:60	36.88	36.89	36.96	36.93	36.91	36.88	36.99	100.0

TEMPERATURE PROFILES:

VESSEL NUMBER	MAX. TEMP	MIN. TEMP	DELTA (MAX-MIN)
1	36.96	36.86	0.10
2	36.96	36.83	0.13
3	36.96	36.88	0.08
4	36.95	36.85	0.10
5	36.96	36.81	0.15
6	36.88	36.78	0.10
7	36.99	36.89	0.10

RPM RESULTS:

	LAST	MAX. RPM	MIN. RPM	DELTA(MAX-MIN)
RPM	100.0	100.0	99.8	0.2
IRPM	250.0	250.0	250.0	0.0

Note: Asterisk (*) in the Temperature Profiles denotes out of USP specification.

InstaPrint Sample

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InstaPrint for Method: PAD 900
(If Manual Mode: InstaPrint for Manual Mode)

SERIAL NUMBER: 6105023
LOT NUMBER: _____
BATCH NUMBER: _____
START TEST AT: 11:48:27AM 04/02/03
TEST ENDED AT: In Progress (InstaPrint)
EXECUTED BY: DISTEK
PRINTED BY: DISTEK

TEST PARAMETERS

TEMPERATURE:	37.0 C	IRPM:	250
DURATION:	0:10	IRPM DURATION:	0:03
RPM:	100	STAGGERED INTERVAL:	0 SECONDS
STIRRING TYPE:	BASKET	VESSELS ENABLED:	1 2 3 4 5 6
VESSEL VOL:	900 ml		

SAMPLE LIST:

STEP	TIME	V1	V2	V3	V4	V5	V6	V7	RPM
1	000:00	36.88	36.91	36.91	36.88	36.89	36.86	36.96	100.0
2	000:15	36.88	36.86	36.91	36.90	36.84	36.83	36.91	100.0

TEMPERATURE PROFILES:

VESSEL NUMBER	MAX. TEMP	MIN. TEMP	DELTA (MAX-MIN)
1	36.96	36.86	0.10
2	36.96	36.83	0.13
3	36.96	36.88	0.08
4	36.95	36.85	0.10
5	36.96	36.81	0.15
6	36.88	36.78	0.10
7	36.99	36.89	0.10

RPM RESULTS:

	LAST	MAX. RPM	MIN. RPM	DELTA(MAX-MIN)
RPM	100.0	100.0	99.8	0.2
IRPM	PENDING			

Note: Asterisk (*) in the Temperature Profiles denotes out of USP specification.

User Configuration Printout

```
                    DISTEK EVOLUTION Rev. 1.20
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                              USER LIST
------------------------------------------------------------------------
SERIAL NUMBER: 6105023

   DATE: 04/02/03

   TIME: 02:01:55

   USER: DISTEK


       USER             GROUP
----------------------------------------
      DISTEK           MANAGER
      USER1            USER
      MANAGER1         MANAGER
----------------------------------------
```