
Hardware Manual for the Wyatt Orbit Recycling System



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M1020 Revision A

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A variety of U.S. and foreign patents have been issued and/or are pending on various aspects of the apparatus and methodology implemented by this instrumentation.

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1

Introduction

1.1 Overview

Automate, save solvent, and save time with the Orbit Recycle System.

The Orbit integrates with any HELEOS, TREOS, Optilab rEX, or ViscoStar, and even certain third-party instruments, to direct the eluent from your flowing system to a waste bottle or back to the solvent reservoir.

Program the Orbit (using ASTRA) to place your system in “recycle” mode at the end of a sample set, and your flowing system will be equilibrated and ready upon your return without wasting large quantities of your mobile phase. This automated recycling functionality is critical for chromatography systems whose mobile phases may be costly to purchase, prepare, or dispose of, and whose column equilibrations could take hours.

A bright LED on the Orbit front panel clearly indicates the current solvent flow path—recycle or waste. The unit may be controlled manually via a Wyatt instrument front panel interface, or automated within an ASTRA sample set.

- LED On—Sample sent to WASTE
- LED Off—Sample sent to RECYCLE



1.2 Firmware Requirements

The Wyatt instrument controlling the Orbit must be running firmware (software) with the version number listed below or higher. To view the Wyatt instruments current **Firmware Version** number, tab to the System page on the instrument's front panel.

Wyatt Instrument	Firmware version
rEX	5.1.1.3
ViscoStar	3.2.0.4
HELEOS, HELEOS II, or TREOS	2.2.0.18

1.3 About This Manual

The *Hardware Manual for the Orbit Recycle System* describes how to set up and use the Orbit Recycle System.

The chapters in this manual are organized as follows:

Chapter 1: “Introduction” introduces the Orbit Recycle System and this manual, and describes the support options available from Wyatt Technology.

Chapter 2: “Installation and Use” takes you through the necessary first steps for unpacking, connecting, and testing the instrument.

1.4 How to Contact Wyatt Technology Corporation

We solicit and encourage questions and comments about this manual and the Orbit Recycle System. Please contact:

Wyatt Technology Corporation
6300 Hollister Ave.
Santa Barbara, CA, 93117

Telephone: (805) 681-9009
FAX: (805) 681-0123
E-mail: support@wyatt.com

1.4.1 Technical Support

Wyatt Technology Corporation offers a variety of support options to help you get the most from your Orbit Recycle System.

If you are not in the U.S., you can also contact the Wyatt Technology Distributor in the country where you purchased your product.

Before contacting technical support, try to resolve any problems through this manual and the ASTRA V for Windows on-line help system.

Internet

You can use the Internet to ask questions and receive answers via e-mail, as well as visit Wyatt Technology's world-wide-web site.

World-Wide-Web URL: <http://www.wyatt.com>

Electronic mail address: support@wyatt.com

1.5 Where to Go from Here

Continue to Chapter 2: "Installation and Use" to check your shipment and make some necessary initial checks.



2

Installation and Use

This chapter contains information regarding unpacking, testing, and connecting your Orbit.

2.1 Unpacking the Instrument

Please read the shipping parts list (packing slip) included with your instrument shipment and check that everything arrived in good condition.

1. Carefully examine the shipping container. If it is damaged or shows signs of mishandling, contact Wyatt Technology immediately.
2. Unpack the instrument.
3. Place the Orbit on a level surface and inspect the instrument for damage. If you see any damage, contact Wyatt Technology immediately.
4. A packing list enclosed in the shipment indicates which accessories were shipped with the Orbit. Verify that all items were included and arrived safely.

2.2 Installing the Orbit Recycle System

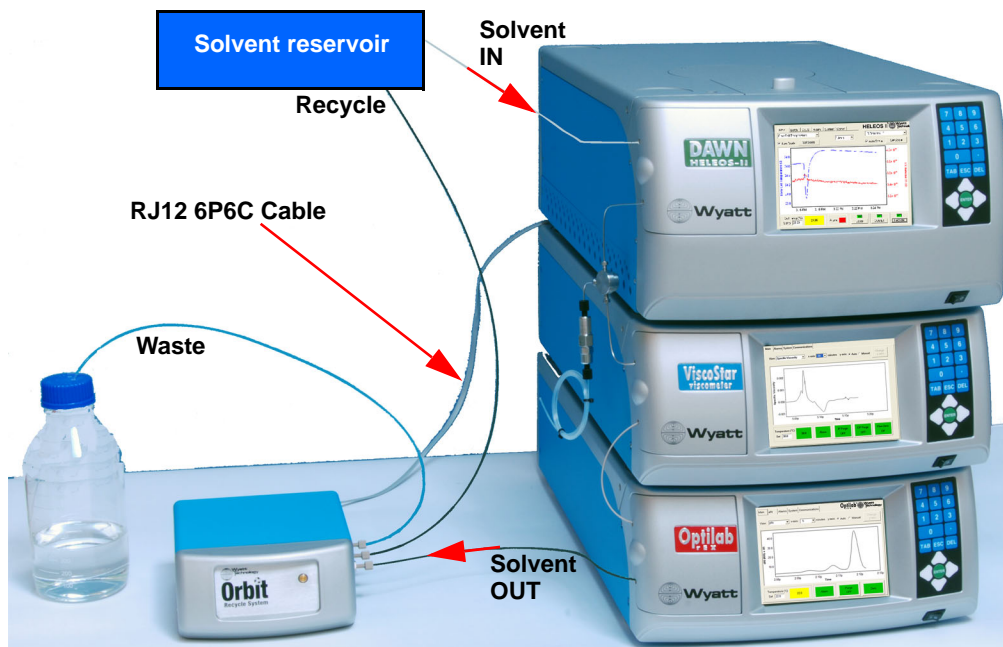


Figure 2-1: Orbit with Instruments

To install the Orbit, do the following:

1. In order to facilitate plumbing, it is recommended that you place the Orbit to the left of the last instrument in the flow path (see Figure 2-1). If you are using a third-party instrument, refer to “Using the Orbit Recycle System with Third-party Instruments” on page 2-6.

Note: The Orbit Recycle System is shipped filled with isopropanol.

2. Make fluid line connections using standard HPLC 10-32 threaded fittings for 1/16” O.D. tubing. It is strongly recommended that you use 0.030” I.D. tubing.

- a. Connect the OUT port of the instrument to the IN port of the Orbit.
- b. Direct the flow from the RECYCLE port of the Orbit to the solvent reservoir.
- c. Direct the flow from the WASTE port of the Orbit to a waste bottle.



Figure 2-2: Side panel

3. Using the provided RJ12 6P6C cable, connect the connector on the back of the Orbit Recycle System to the Recycle Out connector on the back of the Wyatt instrument, for example, HELEOS, TREOS, rEX, or ViscoStar. See Figure 2-4.

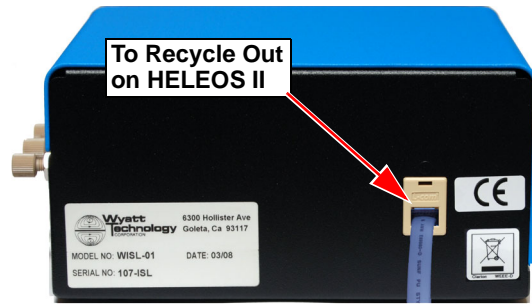


Figure 2-3: Back panel

4. On the display of the Wyatt instrument connected to the Orbit, toggle the **Recycle/Waste** button.
5. Verify that the LED indicator on the front of the Orbit is on when the display of the Wyatt instrument indicates **Waste**; and that the LED indicator is off when the display of the Wyatt instrument indicates **Recycle**.
6. Verify that all the fittings are secure.

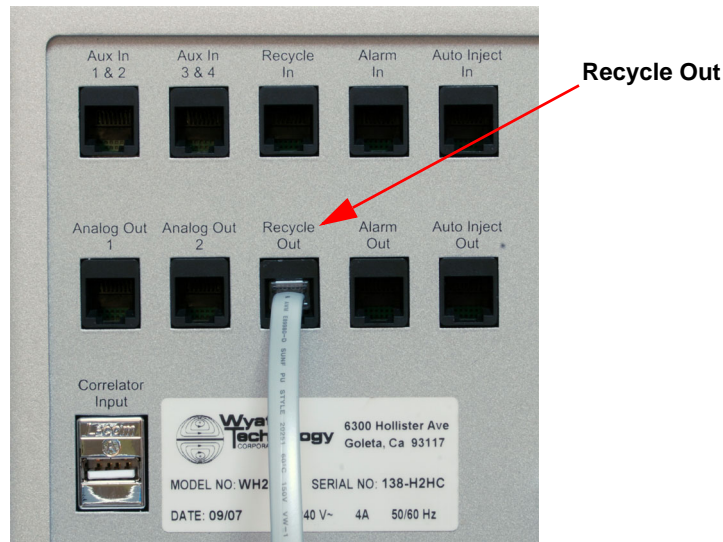


Figure 2-4: Wyatt instrument back panel

The Orbit is now installed and ready to use.


2.3 Using the Orbit

Before the first use of the Orbit, verify that the mode will toggle according to the LED state.

LED On—Sample sent to WASTE;

LED Off—Sample sent to RECYCLE.

The following procedure verifies the Orbit modes using a Wyatt instrument. (Refer to the *ASTRA V for Windows Users Guide* for instructions for controlling the Orbit as a part of an experiment template.)

1. Verify that the LED on the front of the Orbit is off and solvent is being directed to the solvent reservoir (recycle). 
2. On the main screen of the Wyatt instrument, press the tab button on the front panel until **Recycle** is selected.
3. Once **Recycle** is selected, press the enter button and the tab should switch to **Waste**. (see Figure 2-5).
4. Verify that the LED on the Orbit is now on and that the sample is being sent to the waste bottle.

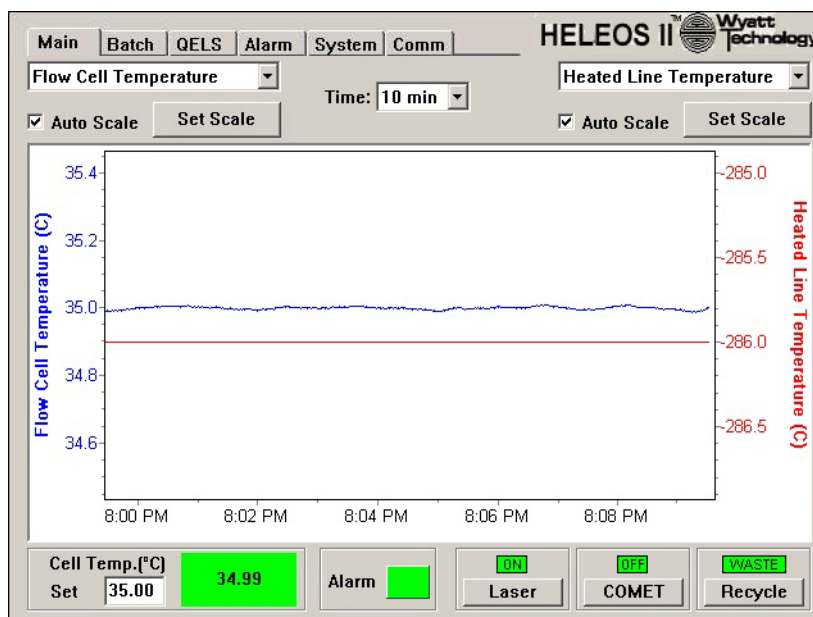


Figure 2-5: Wyatt instrument set to Waste

2.4 Storing the Orbit

Store the Orbit filled with an alcohol such as isopropanol. Always flush the Orbit stepwise with pure, co-miscible solvents. Salt solutions should be considered separate steps from pure solvents.

1. Verify on the main screen of the Wyatt instrument that **Recycle** is selected on the front panel display.
2. Connect the WASTE and RECYCLE ports of the Orbit Recycle System to a waste bottle.
3. Flush solvent through the IN port until it comes out of the RECYCLE port.



Note: Inject at least 5mL of solvent to ensure that the fluid path is completely flushed.

4. On the main screen of the Wyatt instrument select **Waste** on the front panel display.
5. Flush isopropanol through the IN port until it comes out of the WASTE port.



Note: Inject at least 5mL of solvent to ensure that the fluid path is completely flushed.

6. On the main screen of the Wyatt instrument, ensure that **Recycle** is selected.
7. Once system has been flushed, it may be disconnected and stored.

2.5 Operational Guidelines

- Periodically flush the Orbit in both Recycle and Waste modes when using salt or buffer solutions to prevent crystal formation in valve.

Wetted surfaces:

- Teflon (valve); PEEK (tubing & fittings)

Maximum temperature: 80°C

Maximum pressure: 30 psi

Isolation valve solenoid:

- RJ12 6P6C cable, pins 1 (+12V), 2 (GND); 12V, at 320 mA

2.6 Using the Orbit Recycle System with Third-party Instruments

- Connect the plumbing according to the instructions provided with the third-party instrument.
- To transmit power from a third-party instrument to the Orbit, connect the RJ12 6P6C cable to the back panel of the Orbit, and connect the white and black wires to the power terminals on the third-party instrument. The white and black wires correspond to pins 1 and 2 respectively on the RJ12 6P6C cable. The isolation valve solenoid and LED are energized by 12V running through pin 1 and ground through pin 2.
- Verify that the third-party instrument is compatible with all of the Orbit system operational guidelines as described in paragraph 2.5.