

QAI C Dissolution Systems Suitability Station

Operator's Manual



Agilent Technologies

Notices

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Safety Notices

CAUTION

A **CAUTION** notice denotes a hazard. It calls attention to an operating procedure, practice, or the like that, if not correctly performed or adhered to, could result in damage to the product or loss of important data. Do not proceed beyond a **CAUTION** notice until the indicated conditions are fully understood and met.

WARNING

A **WARNING** notice denotes a hazard. It calls attention to an operating procedure, practice, or the like that, if not correctly performed or adhered to, could result in personal injury or death. Do not proceed beyond a **WARNING** notice until the indicated conditions are fully understood and met.

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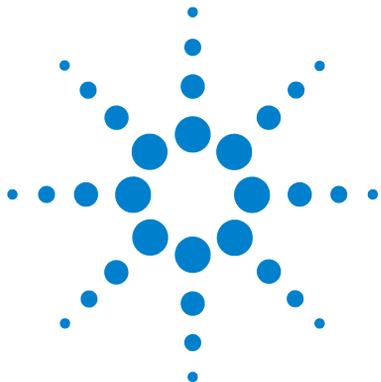
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1 Safety

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WEEE Directive 14

The QAII C Station has been carefully designed so that when used properly you have an accurate, fast, flexible, and safe instrument.

If the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

The QAII C Station is operated in conjunction with equipment that uses aqueous liquids. Unskilled, improper, or careless use of this instrument can create shock hazards, fire hazards, or other hazards which can cause death, serious injury to personnel, or severe damage to equipment and property.

Information on safety practices is provided with your instrument and operation manuals. Before using your instrument or accessories, you must thoroughly read these safety practices.

Observe all relevant safety practices at all times.

Electrical Hazards

The QAII C Station contains electrical circuits, devices, and components operating at dangerous voltages. Contact with these circuits, devices, and components can cause death, serious injury, or painful electric shock.

Panels or covers that are retained by fasteners which require the use of a tool for removal may be opened only by Agilent-trained, Agilent-qualified, or Agilent-authorized service engineers. Consult the manuals or product labels supplied with the QAII C Station to determine which parts are operator-accessible.



1 Safety

Application of the wrong supply voltage, connection of the instrument to an incorrectly wired supply outlet, or lack of proper electrical grounding can create a fire hazard or a potentially serious shock hazard and could seriously damage the instrument and any attached ancillary equipment.

Always use a three-wire outlet with ground connection which is adequately rated for the load. The installation must comply with local, state, and federal safety regulations.

Do not connect the instrument to the main power supply until you have made sure that the operating voltage is correctly set for the main power supply in the specific outlet in your laboratory to which the equipment will be connected.

Warning

WARNING

A 'Warning' message appears in the manual when failure to observe instructions or precautions could result in death or injury.

Read all warnings and cautions carefully and observe them at all times.

Caution

CAUTION

A 'Caution' message appears in the manual when failure to observe instructions could result in damage to equipment (Agilent supplied and / or other associated equipment).

Note

NOTE

A 'Note' appears in the manual to give advice or information.

Information Symbols

I

Switches main power on

0

Switches main power off

Indicates single-phase alternating current



Indicates the product complies with the requirements of one or more European Union (EU) directives



Indicates specific equipment meets consensus-based standards of safety to provide assurance, required by OSHA, that these products are safe for use in the workplace for North America



Indicates that this product must not be disposed of as unsorted municipal waste

General

CE Compliant Products

The QAI C has been designed to comply with the requirements of the Electro-magnetic Compatibility (EMC) Directive and the Low Voltage Directive (LVD) of the EU.

Agilent, Inc. has confirmed that each product complies with the relevant directives by testing a prototype against the prescribed European Norm (EN) standards.

Proof that a product complies with the directives is indicated by:

- the CE marking appearing on the rear of the product.
- the documentation package that accompanies the product containing a copy of the declaration of conformity. This declaration is the legal declaration by Agilent, Inc. that the product complies with the directives and also shows the EN standards to which the product was tested to demonstrate compliance. The declaration of conformity is signed by the representative of the manufacturing plant.

cTUVus - U.S. and Canadian Product Approvals

The QAI C has been designed to comply with North American safety requirements.

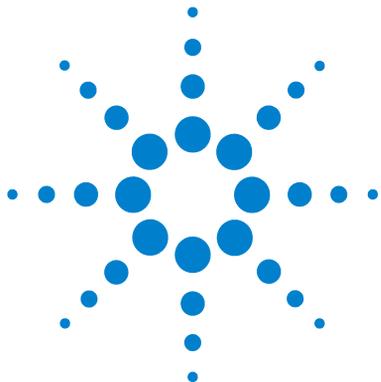
This product has been tested and certified for the North American market by TUV Rheinland of North America, Inc. The TUVus mark signifies that this product has been tested to U.S. standards and certified for the U.S. market. The cTUV mark signifies that this product has been tested to Canadian standards and certified for the Canadian market. When the two marks are coupled, the cTUVus mark signifies that this product has been tested to standards and certified for both markets.

WEEE Directive

All Agilent products that are subject to the WEEE directive shipped after August 13, 2005 are compliant with the WEEE marking requirements. Such products are marked with the “crossed out wheellie bin” WEEE symbol shown on page 12 in accordance with European Standard EN 50419.

This symbol on the product or on its packaging indicates that this product must not be disposed of as unsorted municipal 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 on collection, reuse, and recycling systems, please contact your local/regional waste administration, your local distributor, or Agilent, Inc.



2 Introduction

Base Unit 16

Conventions Used in this Manual 17

The QAII C Station is designed to help you easily check the critical physical parameters specified in the USP General Chapters <711> Dissolution and <724> Drug Release.

The QAII C Station tests and documents the parameters of the following variables:

- shaft wobble (also known as runout)
- instrument level
- vessel temperature
- spindle speed
- vibration

Regulatory authorities emphasize these factors since they can lead to major variances in your dissolution results.

The QAII C Station can be used as a standalone data acquisition and printing station. Test data can be printed via the Report Center Printer or, if desired, downloaded via RS232 to a spreadsheet application for storage on a personal computer. The QAII C Station records the instrument identification numbers of the apparatus, shafts, and vessels in addition to test values.

The built-in printer provides a detailed hard-copy report listing all parameter values for each vessel position. If you use serialized paddles or basket shafts, you can have these numbers print on the report as well.



Base Unit

The QAI C Station base unit contains the keypad, display screen, and Report Center Printer. The five remote sensors plug into the keyed jacks on the rear panel. The base unit has a rechargeable battery for portable use and its own AC power supply for printing or charging the battery. There is a power switch on the left side panel that controls the battery power to the unit and there is a power switch on the back panel that controls AC power to the unit. You must operate under AC power in order to print via the Report Center Printer.



Figure 1 QAI C Station

CAUTION

Panels or covers that are retained by fasteners which require the use of a tool for removal may be opened only by Agilent-trained, Agilent-qualified, or Agilent-authorized service engineers.

Conventions Used in this Manual

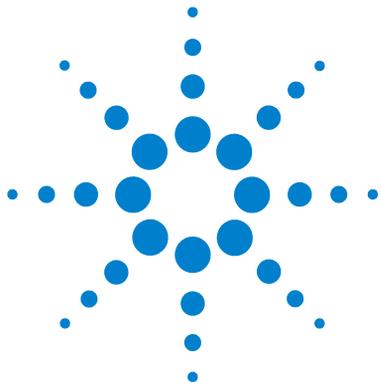
- Items you are asked to press are in bold. For example, “press **H** on the keypad”.

NOTE

Remember to return the warranty card supplied with this manual. Completing and returning the card ensures your right to protection under the terms and conditions of your warranty. It also enables us to better assist you in the event of any problems. Additionally, it guarantees you will be informed of any issues that arise concerning your equipment, such as upgrades, retrofits, or regulatory changes.

2 Introduction

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3 Setting Up the QAII C

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Unpacking Your Equipment

- 1 Open each carton and check the contents for damage which may have occurred during shipping. Shipping damage rarely occurs, but if it does contact both the carrier who delivered the instruments and the Dissolution Systems Service Department. Though claims for damage should be filed with the carrier, we can help you file a claim.
- 2 Carefully remove the QAII C and accessories from the shipping carton.
- 3 Check for items which may have come loose during shipping. Be sure to remove all parts before discarding or storing the packaging.
- 4 Place the unit on a clean, dry, level section of the bench top or table.

WARNING

The electrical connection at the back of the instrument is the primary disconnect. The instrument should be positioned to allow accessibility to the power cord for easy disconnection.

QAI C Attachments

The QAI C comes with attachments necessary to measure and document individual spindle speeds, shaft wobble, shaft perpendicularity, temperature, instrument level, and vibration.

Digital Wobble Gauge

Mounted on a self-aligning bracket (the EaseAlign mounting bracket), the wobble gauge has a built-in display screen and shows wobble in terms of inches or millimeters. A power switch preserves the life of the lithium battery. The ORIGIN button makes it easy to zero the gauge prior to starting the spindles. A cable transmits the gauge reading to the QAI C Station base unit.

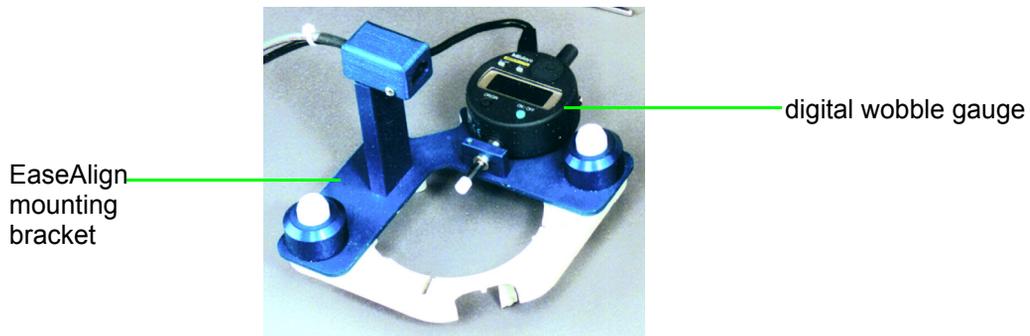


Figure 2 Digital Wobble Gauge

Magnetic Tachometer Sensor

The magnetic tachometer sensor is also mounted on the EaseAlign mounting bracket. The sensor detects the rotations per minute of the paddle or basket shaft with the use of a magnetic clip.

3 Setting Up the QAII C

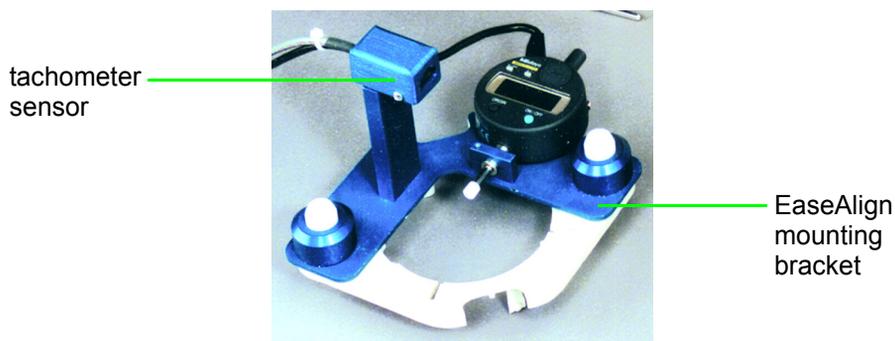


Figure 3 Magnetic Tachometer Sensor

Magnetic Clip

The magnetic clip is used in conjunction with the magnetic tachometer sensor. Each time the magnet passes the sensor, one rotation is counted.



Figure 4 Magnetic Clip

Universal Adapter

The supplied universal adapter allows the QAII C Station to be used in conjunction with any Agilent dissolution apparatus, including older models, or with any non-Agilent dissolution apparatus. The adapter provides locating pegs to secure the EaseAlign mounting bracket with wobble gauge and tachometer sensor to the dissolution apparatus vessel.

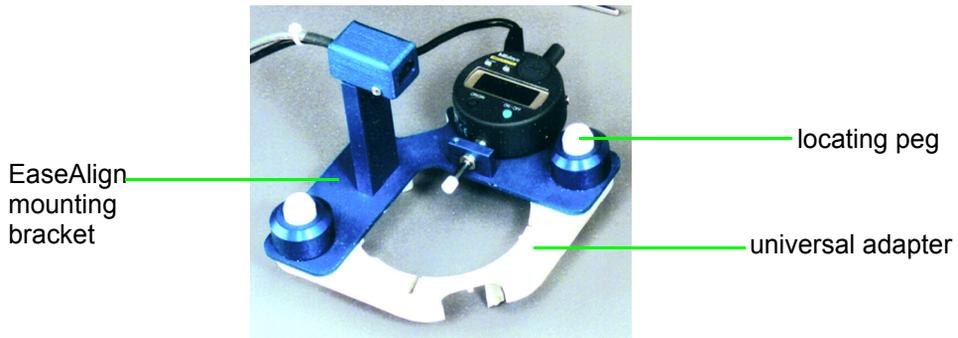


Figure 5 Universal Adapter

Electronic Level Sensor

The electronic level sensor allows you to check the level of the vessel plate and drive unit as well as the perpendicularity of each shaft from side-to-side and front-to-back simultaneously. The sensor has a range of -9.9 to 9.9 degrees.

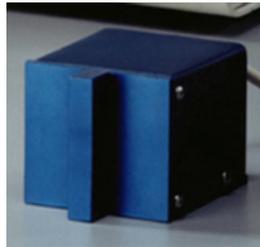


Figure 6 Electronic Level Sensor

Electronic Vibration Sensor

The vibration sensor can be placed either on the vessel table or on the drive unit in the upright position to obtain readings. The sensor can be used to measure vibration on the X, Y, and Z axes individually.

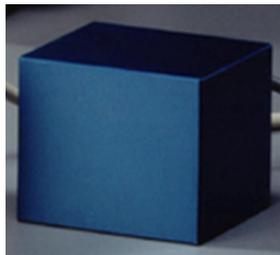


Figure 7 Electronic Vibration Sensor

Temperature Probe

The temperature probe allows you to measure the temperature of the medium in the vessel. The temperature probe can also be used to measure the temperature of the water in the water bath or any other aqueous-based solutions.



Figure 8 Temperature Probe

WARNING

The QAI C Station contains electrical circuits, devices, and components operating at dangerous voltages. Contact with these circuits, devices, and components can cause death, serious injury, or painful electric shock.

Power Switch Functions

WARNING

Ensure the AC power setting is at the correct voltage for your power supply. The power setting is displayed on the back of the instrument on the line fuse holder located next to the power switch. To change the voltage, see “[Fuse Replacement](#)” on page 72.

The electrical connection at the back of the instrument is the primary disconnect.

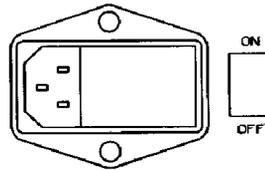


Figure 9 Line Fuse Holder and Main Power Switch

The QAII C Station has a main power switch and a battery power / charge switch.

The main power switch is located on the back panel. See [Figure 10](#), “QAII C Station Rear Panel,” on page 26. With the switch in the ON position, the QAII C Station is on and you can charge the battery and print.

The battery power / charge switch is on the left side panel. When AC power is not present, such as when the power cord is not attached or when the main switch is off, the battery power /charge switch allows battery power for data collection and monitoring. If the AC power is on, the battery power / charge switch is used to charge the battery only.

It is recommended that you fully discharge the battery before the next charge to extend the battery life. When the power is weak, leave the battery switch on overnight without AC power. This drains the

remaining power so that it can be recharged. Each charge period takes five to six hours. Note that the Report Center Printer can be operated only with AC power.

Setting up the QAII C

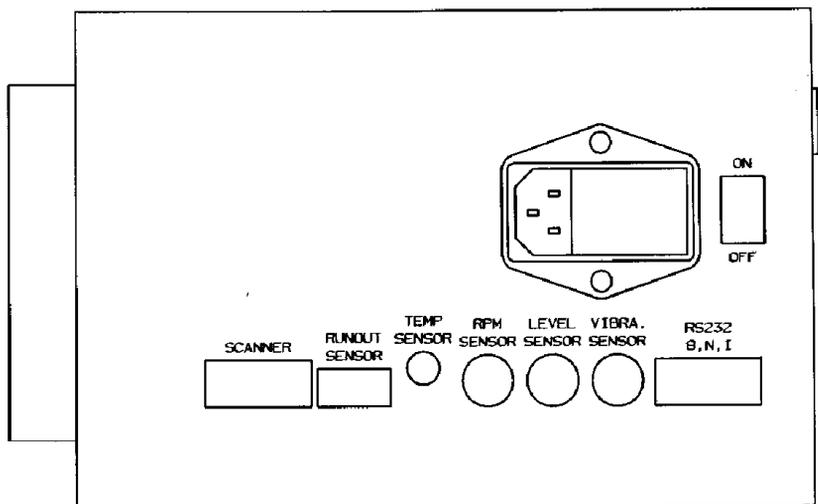


Figure 10 QAII C Station Rear Panel

WARNING

Ensure the AC power setting is at the correct voltage for your power supply. The power setting is displayed on the back of the instrument on the line fuse holder located next to the power switch. To change the voltage, see [“Fuse Replacement” on page 73](#).

The electrical connection at the back of the instrument is the primary disconnect.

- 1 Ensure the main power switch and the side panel power switch are in the off positions.
- 2 Connect the cables between the remote sensors and their corresponding jacks on the QAI C rear panel. See Figure 10, “QAI C Station Rear Panel,” above. Each cable has a different kind of connector, making it impossible to plug it into the wrong jack.
- 3 Connect the RS232 cable between the RS232 port on the QAI C rear panel and the serial / com01 port on the back of the PC.
- 4 Connect the AC power cord between the power receptacle on the QAI C rear panel and an AC electrical outlet of the appropriate voltage.

NOTE

AC power is necessary for battery charging or printing.

- 5 Turn on the QAI C. The following screen displays for three seconds:

AGILENT
QAI C TEST STATION
PROGRAM REV.x.xx
03/25/2011 15:37:37

- 6 The firmware version displays. This is the only time the firmware revision level displays. Record the number below and refer to it if you need to call the Dissolution Systems Service Department.

Firmware version	
-------------------------	--

- 7 The monitor screen displays.

RPM xxx.xx	TEMP xx.x
WOB xx.xx	VIB x.xxx
LV-X xx.x	LV-Y xx.x
mm/dd/yyyy	hh:mm:ss

Spreadsheet Installation

NOTE

For the spreadsheet to install and operate correctly, it is necessary to have Microsoft Office 2000 or greater installed as the operating system on the target PC.

To install the QAIIC spreadsheet, complete the following steps:

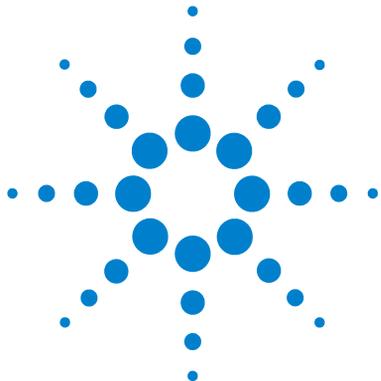
- 1 Insert the CD-ROM into the CD drive (typically D:\).
- 2 If the D: screen displays, double-click **setup.exe**. The welcome screen displays.

If the D: screen does not display, click **Start** on the Windows task bar and select **Run**. Click **Browse**, go to the correct directory on the CD based on your operating system, select **setup.exe**, and click **Open**. Ensure the proper path displays in the Open line of the Run screen and click **OK**. The welcome screen displays.

- 3 Click **OK** to close the welcome screen.
- 4 By default, the spreadsheet loads into the following directory:

C:\Program Files\Agilent\QAIIC

- 5 Follow the remaining on-screen instructions to complete the installation.
- 6 Click **OK** when the installation is complete.



4 Operating the QAII C

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The QAII C Station can be used in conjunction with any Agilent dissolution apparatus, including older models, or with any non-Agilent dissolution apparatus.

For dissolution apparatus that do not have EaseAlign centering rings, the QAII C Station comes with a universal adapter. This adapter mounts to the dissolution apparatus vessel in the same manner as the EaseAlign centering rings. Once this adapter is in place, the procedures for using the QAII C Station are the same for all dissolution apparatus. The purpose of the adapter is to provide the locating pegs to secure the EaseAlign mounting bracket to the dissolution apparatus (see “locating pegs” in [Figure 11 on page 30](#)).



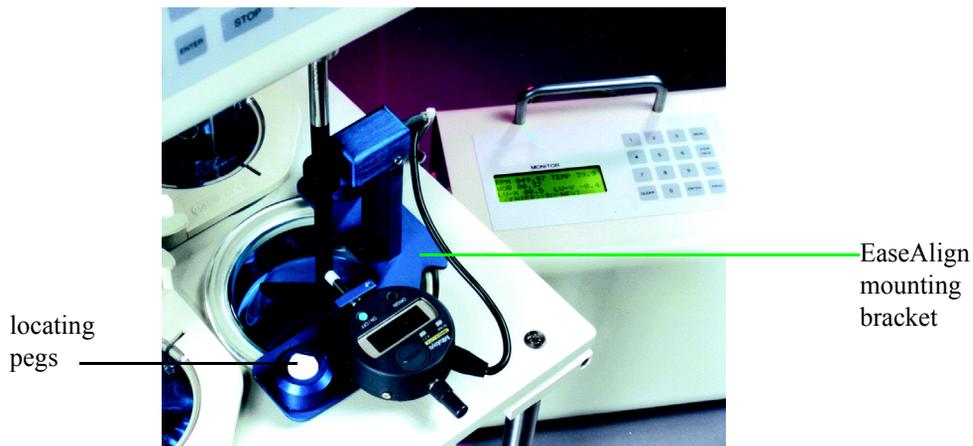


Figure 11 EaseAlign Mounting Bracket Secured to Dissolution Apparatus

Placing the Universal Adapter on Apparatus without EaseAlign Centering Rings

NOTE

Before beginning operation, the dissolution apparatus must be set up with the paddles or basket shafts at their proper operating heights.

- 1 Raise the dissolution apparatus drive unit.
- 2 Position the universal adapter over the vessel and push down gently so the adapter is held in place by the short legs that rest against the inside of the vessel. The bracket should fit without having to be forced and it should sit flat on the dissolution apparatus vessel plate.

Operating the QAII C Station

- 1 Ensure the power switch is in the OFF position.
- 2 Ensure all accessories are connected to the QAII C Station rear panel. See “Setting up the QAII C” on page 25.
- 3 Turn on the QAII C Station. The following screen displays for three seconds:

AGILENT	
QAII C TEST STATION	
PROGRAM REV.4.20	
03/25/2011	15:37:37

- 4 The monitor screen displays (see page 26).
- 5 Press **MENU** to display the QAII C Main Menu screen.

QAII C MAIN MENU	
1 SETUP	2 VIBRATION
3 SET CLOCK	
03/25/2011	15:37:37

Following is a description of the QAII C Main Menu screen options:

Table 1 QAII C Main Menu

Option	Response
1 Setup	See “Main Menu Option 1, Setup” on page 33.
2 Vibration	See “Main Menu Option 2, Vibration” on page 35.
3 Set Clock	The QAII C Main Menu screen displays the date and time of day (in 24-hour format). For example: 14:55 indicates 2:55 pm; 09:05 indicates 9:05 am. To change or correct the date or time of day, select option 3 , Set Clock. The date displays. Press ENTER to accept the current date or enter the new date and press ENTER . The time displays. Press ENTER to accept the current time of day or enter the correct time in 24-hour format and press ENTER . The QAII C Main Menu screen displays.

Main Menu Option 1, Setup

From the QAII C Main Menu screen, select option **1**, Setup. The System Setup screen displays.

SYSTEM SETUP	
1 TEST SETUP	
2 PRINT SETUP	3 UNIT
4 DATE FORMAT	5 COMM

Following is a description of the System Setup screen options:

Table 2 System Setup Screen

Option	Response
1 Test Setup	Select option 1 , Test Setup, to select the test parameters. See “ System Setup Option 1, Test Setup ” on page 33.
2 Print Setup	Select option 2 , Print Setup, to print the system setup report. The Test Setup Report screen displays. Select option 1 to print the report (see “ Printing Test Setup ” on page 63). Optionally, select option 2 to cancel and return to the System Setup screen.
3 Unit	Select option 3 , Unit, to select the measurement unit. Press 1 for metric or 2 for imperial. The System Setup screen displays.
4 Date Format	Select option 4 , Date Format, to select the date format. Select option 1 for mm/dd/yyyy, 2 for dd/mm/yyyy, or 3 for yyyy/mm/dd. The System Setup screen displays.
5 COMM	Select option 5 , Comm, to select the communication configuration. See “ System Setup Option 5, Comm ” on page 35.

Press **MENU** to return to the QAII C Main Menu screen.

System Setup Option 1, Test Setup

After selecting option 1, Test Setup, from the System Setup screen, complete the following steps:

- 1 Enter the number of spindle positions to be tested on the dissolution apparatus and press **ENTER**. The RPM screen displays.
- 2 To skip RPM, select option **2**, No, and continue to Step 6.

To include RPM in the test, select option **1**, Yes. The following screen displays:

```
# SPD (1-4): _  
  
03/25/2011                15:37:37
```

- 3 The QAII C allows you to test each spindle location at up to 4 user-defined speeds (RPM). Enter the number of speed levels to test (1 - 4) and press **ENTER**. The following screen displays:

```
SPD LVL1: _  
*ENTER 15 TO 250*  
  
03/25/2011                15:37:37
```

- 4 Enter the RPM to test as level 1 and press **ENTER**.
- 5 Repeat Step 4 for each subsequent speed level as entered in Step 3. After entering the final speed level, the Wobble screen displays.
- 6 To skip wobble, select option **2**, No, and continue to Step 8. To include wobble in the test, select option **1**, Yes. The Bskt Wobble screen displays.
- 7 Select option **1**, Rim and Shaft, to measure wobble on the basket rim and shaft for Apparatus 1 (baskets) or to measure paddle shaft wobble for Apparatus 2 (paddles). To measure wobble on the basket rim only for Apparatus 1, select option **2**, Rim Only. The Shaft Perpend screen displays.
- 8 To skip shaft perpendicularity, select option **2**, No. To include shaft perpendicularity in the test, select option **1**, Yes. The Temperature screen displays.
- 9 To skip temperature, select option **2**, No. To include temperature in the test, select option **1**, Yes. The Level Vessel Table screen displays.
- 10 To skip level of the vessel table, select option **2**, No. To include level of the vessel table in the test, select option **1**, Yes. The Vib Vessel Table screen displays.

- 11 To skip vibration of the vessel table, select option 2, No. To include vibration of the vessel table in the test, select option 1, Yes. The Vib Drive Unit screen displays.
- 12 To skip vibration of the drive unit, select option 2, No. To include vibration of the drive unit in the test, select option 1, Yes. The System Setup screen displays.

System Setup Option 5, Comm

After selecting option 5, Comm, from the System Setup screen, complete the following steps:

- 1 From the Comm Config screen, select option 1, Com ID.
- 2 Enter the communication port identification number and press **ENTER**. If you are running the supplied spreadsheet application, the communication port identification number must be set to 1. The Comm Config screen displays.
- 3 Select option 2, Baud Rate. The Set Baud Rate screen displays.

SET BAUD RATE	
1 1200	2 2400
3 4800	4 9600
03/25/2011	15:35:30

- 4 Select the appropriate baud rate. If you are running the supplied spreadsheet application, the baud rate must be set to 9600. The Comm Config screen displays.
- 5 Press **MENU** twice to return to the QAI C Main Menu screen.

Main Menu Option 2, Vibration

The QAI C monitor screen displays the “g” value only. To display all other values associated with the vibration reading, select option 2, Vibration, from the QAI C Main Menu screen. Ensure the vibration sensor is in place prior to selecting this option. See [Figure 18](#), “Vibration Sensor,” on page 57.

4 Operating the QAII C

Select option **2**, Vibration, from the QAII C Main Menu screen. The Vibration Analysis screen displays.

```

                                *VIBRATION ANALYSIS*
g 0.000                                FRQ 000.00Hz
VELOCITY xx.xx mm/S
DISPLACEMNT 0.000MIL (<PRINT> TO PRINT)

```

- “g” represents acceleration expressed in mm/sec² or in/sec².
- “FRQ” represents frequency expressed in Hz.
- “Velocity” is expressed in mm/sec or in/sec.
- “Displacement” is expressed in mm or mils.

Press **PRINT** to print the current values.

Press **MENU** to return to the QAII C Main Menu screen.

Opening the Spreadsheet (optional)

To use the spreadsheet in conjunction with the QAI C, complete the following steps to open the spreadsheet on your PC prior to beginning a test:

- 1 Ensure the spreadsheet has been installed (see “[Spreadsheet Installation](#)” on page 27).
- 2 Click Start on the Windows toolbar and select **Programs > Agilent > QAI C > QAI C Template** to open the file. Microsoft Excel opens. The Microsoft Excel window displays.
- 3 Click **Enable Macros**.

Running a Test

To run a test, complete the following steps:

- 1 From the monitor screen, press **TEST**. The Save As window displays.
- 2 If applicable, select a file location. Enter a file name and click **Save**. The following screen displays:

Enter Apparatus ID: xxxxxxxxxx 03/25/2011 15:37:37
--

- 3 Enter the dissolution apparatus identification number and press **ENTER**. The Test Menu screen displays.

TEST MENU 1 PHYSICAL PARAMETER 2 TEMPERATURE 03/25/2011 15:37:37

Entering Physical Parameters, Baskets

If you are using paddles, see “[Entering Physical Parameters, Paddles](#)” on page 48.

- 1 From the Test Menu screen, select option **1**, Physical Parameter. The following screen displays:

```

ENTER APPARATUS TYPE
1 BASKET
2 PADDLE
03/25/2011                15:37:37
  
```

- 2 Select option **1**, Basket. The following screen displays:

```

SHAFT ID: _
FOR POSITION #

03/25/2011                15:37:37
  
```

- 3 Enter the identification number for the basket shaft in position 1 and press **ENTER**. The following screen displays:

```

VESSEL ID: _
FOR POSITION #

03/25/2011                15:37:37
  
```

- 4 Enter the identification number for the vessel in position 1 and press **ENTER**. The following screen displays:

```

SPEED LVL 1 (xx RPM)
@POS # IS xxx.xx RPM
<PRINT> TO ACCEPT
<CLEAR> TO SKIP
  
```

- 5 Continue to “[Measuring RPM, Basket](#)” below.

Measuring RPM, Basket

NOTE

Before beginning operation, the dissolution apparatus must be set up with the basket shafts at their proper operating heights.

NOTE

If using a 7000 / 7010, raise the drive unit to remove the EaseAlign centering rings from the vessels to be tested.

- 1 Lower the drive unit until there is a distance of approximately 1 cm from the bottom rim of the basket to the top of the vessel or adapter.
- 2 Place the QAII C mounting bracket with the magnetic tachometer sensor and digital wobble gauge on the first vessel position to be tested. The locating holes in the self-aligning mounting bracket slip over the locating pegs (see “locating pegs” in [Figure 11 on page 30](#)).
- 3 Press down until the mounting bracket is level and firmly seated.
- 4 The tip of the wobble gauge pointer should be positioned against the shaft of the basket assembly.
- 5 Place the magnetic clip on the basket shaft being checked (see [Figure 12, “Placement for RPM Reading, Basket,”](#) below). To avoid damage to the basket shaft, place the clip at or near the top of the shaft, just below the spindle chuck or drive unit, then slide it down into its operating position in front of the tachometer sensor.



magnetic clip in
front of tachometer
sensor

Figure 12 Placement for RPM Reading, Basket

- 6 On the dissolution apparatus, set the shafts to rotate at the desired speed and activate the spindles.
- 7 Press **CLEAR** to skip this reading and move to the next speed value or press **PRINT** to print the speed reading. The value freezes on the screen, prints on the Report Center Printer, and if applicable is transmitted to the spreadsheet. The following screen displays:

```
SPEED LVL 1 (xx RPM)
@POS # IS xxx.xx RPM
<ENTER> TO CONTINUE
<CLEAR> TO re-measure
```

- 8 Press **CLEAR** to re-measure this speed reading. Repeat Step 8. Optionally, press **ENTER** to continue to the next speed reading. The following screen displays the next speed reading:

```
SPEED LVL 2 (xx RPM)
@POS # IS xxx.xx RPM
<PRINT> TO ACCEPT
<CLEAR> TO SKIP
```

- 9 On the dissolution apparatus, set the RPM to the next desired speed and activate the spindles.
- 10 Repeat steps 8 - 10 for all speed readings.
- 11 After the last value prints, the following screen displays:

```
BASKET SHAFT WOBBLE
POSITION # = xx.xx mm
<PRINT> TO ACCEPT
<CLEAR> TO SKIP
```

- 12 Continue to “[Measuring Wobble, Basket](#)” on page 42.

Measuring Wobble, Basket

NOTE

For highest accuracy, runout readings should be recorded with shafts turning at 50 RPM or less.

The basket shaft wobble value, as measured by the wobble gauge in either millimeters or inches, is the absolute difference between high and low values. After zeroing the gauge, the reading on the gauge’s display screen may be negative or positive since there is no way for the unit to determine whether you placed the gauge pointer on the shaft’s high point, low point or somewhere in between. For example, if the reading ranges between - 0.05 mm and + 0.1 mm, the QAI C Station displays the runout value as 0.15 mm.

Complete the following steps to record the shaft or basket rim wobble:

- 1 Press **ON/OFF** on the wobble gauge. The display screen activates.
- 2 Press **in/mm** on the gauge key to select inches or millimeters as the measurement unit.

- 3 Press and hold briefly **ORIGIN** to zero the gauge. The screen displays 0.0000 in. or 0.00 mm.

NOTE

It is not necessary to zero the wobble gauge before measuring and recording runout, since the value recorded is the absolute difference between the high and low values.

- 4 Ensure the wobble gauge is properly positioned with the tip of the wobble gauge pointer positioned against the basket shaft.
- 5 On the dissolution apparatus, set the desired speed and activate the spindles.
- 6 Press **CLEAR** to skip the basket shaft wobble for this vessel position or press **PRINT** to print the basket shaft wobble. The value freezes on the screen, prints on the Report Center Printer, and if applicable is transmitted to the spreadsheet. The following screen displays:

```
BASKET SHAFT WOBBLE
POSITION # = xx.xx mm
<ENTER> TO CONTINUE
<CLEAR> TO re-measure
```

- 7 Press **CLEAR** to re-measure the basket shaft wobble. Repeat Step 6. Optionally, press **ENTER** to continue. The following screen displays:

```
BASKET RIM WOBBLE
POSITION # = xx.xx mm
<PRINT> TO ACCEPT
<CLEAR> TO SKIP
```

- 8 Stop the spindles.
- 9 Reposition the wobble gauge with the tip of the wobble gauge pointer positioned against the bottom rim of the basket. See

Figure 13, “Wobble Gauge with Basket,” on page 44.

CAUTION

When using Apparatus 1, it is necessary to reposition the runout gauge pointer to the bottom rim of the basket before obtaining a reading. Take extra care to avoid damage to the runout gauge pointer. When repositioning the drive unit for proper alignment with the lower rim of the basket, use a thin ruler to hold the pointer safely away from your fingers.

10 Activate the spindles.



Figure 13 Wobble Gauge with Basket

11 Press **CLEAR** to skip the basket rim wobble for this vessel position or press **PRINT** to print the basket rim wobble. The value freezes on the screen, prints on the Report Center Printer, and if applicable is transmitted to the spreadsheet. The following screen displays:

```
BASKET RIM WOBBLE
POSITION # = xx.xx mm
<ENTER> TO CONTINUE
<CLEAR> TO re-measure
```

- 12 Press **CLEAR** to re-measure the basket rim wobble. Repeat Step 11. Optionally, press **ENTER** to continue. The following screen displays:

```
BASKET SHAFT PERPEND
POS # X=xx.x Y=xx.x
<PRINT> TO ACCEPT
<CLEAR> TO SKIP
```

- 13 Continue to “[Measuring Shaft Verticality, Basket](#)” on page 45.

Measuring Shaft Verticality, Basket

This accessory is used in conjunction with a centering tool to verify proper shaft alignment. Complete the following steps to record the shaft verticality:

- 1 Stop the spindles.
- 2 Hold the level sensor flush against the shaft. The perpendicular groove of the sensor should be placed high up on the shaft, approximately 1 inch or 25.4 mm below the bottom of the dissolution apparatus drive unit. This sensor measures in degrees the verticality or perpendicularity of the shaft from side-to-side and front-to-back simultaneously. See [Figure 14](#), “[Electronic Level Sensor Placement](#),” below.



Figure 14 Electronic Level Sensor Placement

- 3 Press **CLEAR** to skip the basket shaft perpendicularity for this vessel position or press **PRINT** to print the basket shaft

perpendicularity. The values freeze on the screen, print on the Report Center Printer, and if applicable are transmitted to the spreadsheet. The following screen displays:

```
BASKET SHAFT PERPEND
POS # X= xx.x Y= xx.x
<ENTER> TO CONTINUE
<CLEAR> TO re-measure
```

- 4 Press **CLEAR** to re-measure the basket shaft perpendicularity. Repeat Step 3. Optionally, press **ENTER** to continue. The following screen displays:

```
TEMP @POS #
xx.x°C
<PRINT> TO ACCEPT
<CLEAR> TO SKIP
```

- 5 Continue to [“Measuring Temperature, Basket”](#) below.

Measuring Temperature, Basket

Complete the following steps to record the vessel medium temperature:

- 1 Ensure the temperature probe is in the vessel being measured.
- 2 Press **CLEAR** to skip the vessel temperature for this vessel position or press **PRINT** to print the vessel temperature. The value freezes on the screen, prints on the Report Center Printer, and if applicable is transmitted to the spreadsheet. The following screen displays:

```
TEMP @POS #
xx.x°C
<ENTER> TO CONTINUE
<CLEAR> TO re-measure
```

- 3 Press **CLEAR** to re-measure the vessel temperature. Repeat Step 2. Optionally, press **ENTER** to continue. The following screen displays:

SHAFT ID: _	
FOR POSITION #	
09/30/2003	15:37:37

- 4 Repeat this entire procedure from Step 3 under “[Entering Physical Parameters, Baskets](#)” on page 39 for each vessel position.
- 5 After the last value prints, the following screen displays:

VESSEL TABLE LEVEL	
LV-X xx.x	LV-Y xx.x
<PRINT> TO ACCEPT	
<CLEAR> TO SKIP	

- 6 Continue to “[Measuring Vessel Plate \(Table\) Level](#)” on page 56.

Entering Physical Parameters, Paddles

If you are using baskets, see “Entering Physical Parameters, Baskets” on page 39.

- 1 From the Test Menu screen, select option **1**, Physical Parameter. The following screen displays:

```
ENTER APPARATUS TYPE
1 BASKET
2 PADDLE
09/30/2003          15:37:37
```

- 2 Select option **2**, Paddle. The following screen displays:

```
SHAFT ID: _
FOR POSITION #
09/30/2003          15:37:37
```

- 3 Enter the identification number for the paddle shaft in position 1 and press **ENTER**. The following screen displays:

```
VESSEL ID: _
FOR POSITION #
09/30/2003          15:37:37
```

- 4 Enter the identification number for the vessel in position 1 and press **ENTER**. The following screen displays:

```
SPEED LVL 1 (xx RPM)
@POS # IS xxx.xx RPM
<PRINT> TO ACCEPT
<CLEAR> TO SKIP
```

- 5 Continue to “Measuring RPM, Paddle” below.

Measuring RPM, Paddle

CAUTION

To avoid damage to the EaseAlign mounting bracket, check the clearance between the paddle blade and the bottom of the mounting bracket before running the test.

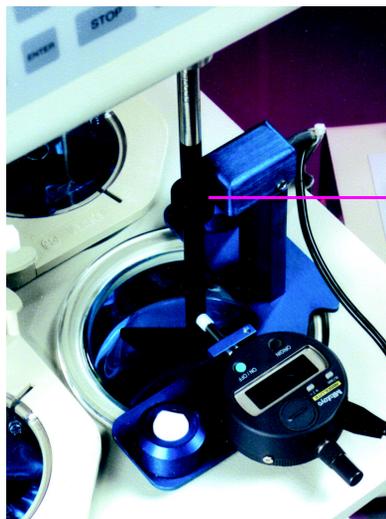
NOTE

Before beginning operation, the dissolution apparatus must be set up with the paddle shafts at their proper operating heights.

NOTE

If using a 7000 / 7010, raise the drive unit to remove the EaseAlign centering rings from the vessels to be tested.

- 1 Lower the drive unit until there is a distance of approximately 1 cm from the top of the paddle blade to the top of the vessel or adapter.
- 2 Place the QAI C mounting bracket with the magnetic tachometer sensor and digital wobble gauge on the first vessel position to be tested. The locating holes in the self-aligning mounting bracket slip over the locating pegs (see “locating pegs” in [Figure 11 on page 30](#)).
- 3 Press down until the mounting bracket is level and firmly seated.
- 4 The tip of the wobble gauge pointer should be positioned against the paddle shaft.
- 5 Place the magnetic clip on the paddle shaft being checked (see [Figure 15, “Placement for RPM Reading, Paddle,”](#) below). To avoid damage to the paddle shaft, place the clip at or near the top of the shaft, just below the spindle chuck or drive unit, then slide it down into its operating position in front of the tachometer sensor.



magnetic clip in front of tachometer sensor

Figure 15 Placement for RPM Reading, Paddle

- 6 On the dissolution apparatus, set the shafts to rotate at the desired speed and activate the spindles.
- 7 Press **CLEAR** to skip this reading and move to the next speed value or press **PRINT** to print the speed reading. The value freezes on the screen, prints on the Report Center Printer, and if applicable is transmitted to the spreadsheet. The following screen displays:

```
SPEED LVL 1 (xx RPM)
@POS # IS xxx.xx RPM
<ENTER> TO CONTINUE
<CLEAR> TO re-measure
```

- 8 Press **CLEAR** to re-measure this speed reading. Repeat Step 8. Optionally, press **ENTER** to continue to the next speed reading. The following screen displays the next speed reading:

```
SPEED LVL 2 (xx RPM)
@POS # IS xxx.xx RPM
<PRINT> TO ACCEPT
<CLEAR> TO SKIP
```

- 9 On the dissolution apparatus, set the RPM to the next desired speed and activate the spindles.
- 10 Repeat steps 8 - 10 for all speed readings.
- 11 After the last value prints, the following screen displays:

```
PADDLE SHAFT WOBBLE
POSITION # = xx.xx mm
<PRINT> TO ACCEPT
<CLEAR> TO SKIP
```

- 12 Continue to [“Measuring Wobble, Paddle”](#) on page 51.

Measuring Wobble, Paddle

NOTE

For highest accuracy, runout readings should be recorded with shafts turning at 50 RPM or less.

The paddle shaft wobble value, as measured by the wobble gauge in either millimeters or inches, is the absolute difference between high and low values. After zeroing the gauge, the reading on the gauge’s display screen may be negative or positive since there is no way for the unit to determine whether you placed the gauge pointer on the shaft’s high point, low point or somewhere in between. For example, if the reading ranges between - 0.05 mm and + 0.1 mm, the QAI C Station displays the runout value as 0.15 mm.

Complete the following steps to record the paddle shaft wobble:

- 1 Press **ON/OFF** on the wobble gauge. The display screen activates.
- 2 Press **in/mm** on the gauge key to select inches or millimeters as the measurement unit.

4 Operating the QAII C

- 3 Press and hold briefly **ORIGIN** to zero the gauge. The screen displays 0.0000 in. or 0.00 mm.

NOTE

It is not necessary to zero the wobble gauge before measuring and recording runout, since the value recorded is the absolute difference between the high and low values.

- 4 Ensure the wobble gauge is properly positioned with the tip of the wobble gauge pointer positioned against the paddle shaft. See [Figure 16, “Wobble Gauge with Paddle,”](#) below.

CAUTION

To avoid damage to the EaseAlign mounting bracket when using Apparatus 2, check the clearance between the paddle blade and the bottom of the mounting bracket before rotating the shafts.

- 5 On the dissolution apparatus, set the desired speed and activate the spindles.

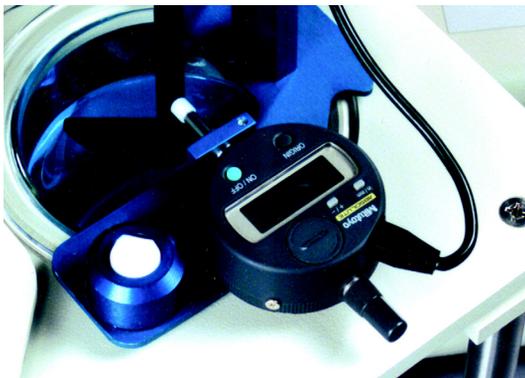


Figure 16 Wobble Gauge with Paddle

- 6 Press **CLEAR** to skip the paddle shaft wobble for this vessel position or press **PRINT** to print the paddle shaft wobble. The value freezes

on the screen, prints on the Report Center Printer, and if applicable is transmitted to the spreadsheet. The following screen displays:

```
PADDLE SHAFT WOBBLE
POSITION # = xx.xx mm
<ENTER> TO CONTINUE
<CLEAR> TO re-measure
```

- 7 Press **CLEAR** to re-measure the paddle shaft wobble. Repeat Step 6. Optionally, press **ENTER** to continue. The following screen displays:

```
PADDLE SHAFT PERPEND
POS # X=xx.x Y=xx.x
<PRINT> TO ACCEPT
<CLEAR> TO SKIP
```

- 8 Continue to [“Measuring Shaft Verticality, Paddle”](#) below.

Measuring Shaft Verticality, Paddle

This accessory is used in conjunction with a centering tool to verify proper shaft alignment. Complete the following steps to record the shaft verticality:

- 1 Stop the spindles.
- 2 Hold the level sensor flush against the shaft. The perpendicular groove of the sensor should be placed high up on the shaft, approximately 1 inch or 25.4 mm below the bottom of the dissolution apparatus drive unit. This sensor measures in degrees the verticality or perpendicularity of the shaft from side-to-side and front-to-back simultaneously. See [Figure 17, “Electronic Level Sensor Placement,”](#) below.

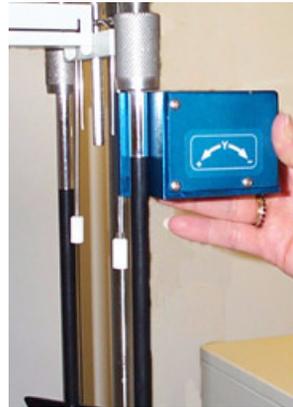


Figure 17 Electronic Level Sensor Placement

- 3 Press **CLEAR** to skip the paddle shaft perpendicularity for this vessel position or press **PRINT** to print the paddle shaft perpendicularity. The values freeze on the screen, print on the Report Center Printer, and if applicable are transmitted to the spreadsheet. The following screen displays:

```
PADDLE SHAFT PERPEND
POS # X=xx.x Y=xx.x
<ENTER> TO CONTINUE
<CLEAR> TO re-measure
```

- 4 Press **CLEAR** to re-measure the paddle shaft perpendicularity. Repeat Step 3. Optionally, press **ENTER** to continue. The following screen displays:

```
TEMP @POS #
xx.x°C
<PRINT> TO ACCEPT
<CLEAR> TO SKIP
```

- 5 Continue to [“Measuring Temperature, Paddle”](#) below.

Measuring Temperature, Paddle

Complete the following steps to record the vessel medium temperature:

- 1 Ensure the temperature probe is in the vessel being measured.
- 2 Press **CLEAR** to skip the vessel temperature for this vessel position or press **PRINT** to print the vessel temperature. The value freezes on the screen, prints on the Report Center Printer, and if applicable is transmitted to the spreadsheet. The following screen displays:

```
TEMP @POS #
xx.x°C
<ENTER> TO CONTINUE
<CLEAR> TO re-measure
```

- 3 Press **CLEAR** to re-measure the vessel temperature. Repeat Step 2. Optionally, press **ENTER** to continue. The following screen displays:

```
SHAFT ID: _
FOR POSITION #

09/30/2003          15:37:37
```

- 4 Repeat this entire procedure from Step 3 under “[Entering Physical Parameters, Paddles](#)” on page 48 for each vessel position.
- 5 After the last value prints, the following screen displays:

```
VESSEL TABLE LEVEL
LV-X xx.x LV-Y xx.x
<PRINT> TO ACCEPT
<CLEAR> TO SKIP
```

- 6 Continue to “[Measuring Vessel Plate \(Table\) Level](#)” on page 56.

Measuring Vessel Plate (Table) Level

Complete the following steps to record the vessel table level:

- 1 Place the level sensor in the upright position on the vessel plate. The sensor measures in degrees the level from side-to-side and front-to-back simultaneously.
- 2 Press **CLEAR** to skip this reading or press **PRINT** to print the vessel table level. The values freeze on the screen, print on the Report Center Printer, and if applicable are transmitted to the spreadsheet. The following screen displays:

```
VESEL TABLE LEVEL
LV-X xx.x LV-Y xx.x
<ENTER> TO CONTINUE
<CLEAR> TO re-measure
```

- 3 Press **CLEAR** to re-measure the vessel table level. Repeat Step 2. Optionally, press **ENTER** to continue. The following screen displays:

```
VESEL TABLE VIB X
g x.xxx FRQ xxx.xx Hz
V xx.xx mm/S DS .xxxx mm
<PRINT> TO ACCEPT (<CLEAR> TO SKIP)
```

- 4 Continue to [“Measuring Vessel Plate \(Table\) Vibration”](#) on page 57.

Measuring Vessel Plate (Table) Vibration

Complete the following steps to record the vessel plate vibration:

- 1 Place the vibration sensor on the vessel plate as shown below to obtain readings.



Figure 18 Vibration Sensor

- 2 On the dissolution apparatus, set the shafts to rotate at the desired speed and activate the spindles.

NOTE

For highest accuracy, vessel table vibration should be read with the drive unit in the operating position and the shafts rotating at 100 RPM. And if possible, the vessels should be filled with 900 mL of dissolution medium.

- 3 Position the sensing arrow in the direction of the x axis.
- 4 Press **CLEAR** to skip the x axis vibration reading or press **PRINT** to print the vessel table vibration along the X axis. The values freeze on

the screen, print on the Report Center Printer, and if applicable are transmitted to the spreadsheet. The following screen displays:

```
VESSEL TABLE VIB X
g x.xxx FRQ xxx.xx Hz
V xx.xx mm/S DS .xxxx mm
<CLEAR> TO re-measure (<ENTER> TO CONTINUE)
```

- 5 Press **CLEAR** to re-measure the vessel table vibration along the X axis. Repeat Step 4. Optionally, press **ENTER** to continue. The following screen displays:

```
VESSEL TABLE VIB Y
g x.xxx FRQ xxx.xx Hz
V xx.xx mm/S DS .xxxx mm
<PRINT> TO ACCEPT (<CLEAR> TO SKIP)
```

- 6 Position the sensing arrow in the direction of the y axis.
- 7 Press **CLEAR** to skip the y axis vibration reading or press **PRINT** to print the vessel table vibration along the Y axis. The values freeze on the screen, print on the Report Center Printer, and if applicable are transmitted to the spreadsheet. The following screen displays:

```
VESSEL TABLE VIB Y
g x.xxx FRQ xxx.xx Hz
V xx.xx mm/S DS .xxxx mm
<CLEAR> TO re-measure (<ENTER> TO CONTINUE)
```

- 8 Press **CLEAR** to re-measure the vessel table vibration along the Y axis. Repeat Step 7. Optionally, press **ENTER** to continue. The following screen displays:

```
VESSEL TABLE VIB Z
g x.xxx FRQ xxx.xx Hz
V xx.xx mm/S DS .xxxx mm
<PRINT> TO ACCEPT (<CLEAR> TO SKIP)
```

- 9 Position the sensing arrow in the direction of the z axis.

- 10 Press **CLEAR** to skip the z axis vibration reading or press **PRINT** to print the vessel table vibration along the Z axis. The values freeze on the screen, print on the Report Center Printer, and if applicable are transmitted to the spreadsheet. The following screen displays:

VESSEL TABLE VIB Z
 g x.xxx FRQ xxx.xx Hz
 V xx.xx mm/S DS .xxxx mm
 <CLEAR> TO re-measure (<ENTER> TO CONTINUE)

- 11 Press **CLEAR** to re-measure the vessel table vibration along the Z axis. Repeat Step 10. Optionally, press **ENTER** to continue. The following screen displays:

DRIVE UNIT VIB X
 g x.xxx FRQ xxx.xx Hz
 V xx.xx mm/S DS .xxxx mm
 <PRINT> TO ACCEPT (<CLEAR> TO SKIP)

- 12 Stop the spindles.
 13 Continue to “[Measuring Drive Unit Vibration](#)” on page 59.

Measuring Drive Unit Vibration

Complete the following steps to record the drive unit vibration:

- 1 Place the vibration sensor on the drive unit.
- 2 On the dissolution apparatus, set the shafts to rotate at the desired speed and activate the spindles.

NOTE

For highest accuracy, drive unit vibration should be read with the drive unit in the operating position and the shafts rotating at 100 RPM. And if possible, the vessels should be filled with 900 mL of dissolution medium.

- 3 Position the sensing arrow in the direction of the x axis.
- 4 Press **CLEAR** to skip the x axis vibration reading or press **PRINT** to print the drive unit vibration along the X axis. The values freeze on

the screen, print on the Report Center Printer, and if applicable are transmitted to the spreadsheet. The following screen displays:

```
DRIVE UNIT VIB X
g x.xxx  FRQ xxx.xx Hz
V xx.xx mm/S DS .xxxx mm
<CLEAR> TO re-measure (<ENTER> TO CONTINUE)
```

- 5 Press **CLEAR** to re-measure the drive unit vibration along the X axis. Repeat Step 4. Optionally, press **ENTER** to continue. The following screen displays:

```
DRIVE UNIT VIB Y
g x.xxx  FRQ xxx.xx Hz
V xx.xx mm/S DS .xxxx mm
<PRINT> TO ACCEPT (<CLEAR> TO SKIP)
```

- 6 Position the sensing arrow in the direction of the y axis.
- 7 Press **CLEAR** to skip the y axis vibration reading or press **PRINT** to print the drive unit vibration along the Y axis. The values freeze on the screen, print on the Report Center Printer, and if applicable are transmitted to the spreadsheet. The following screen displays:

```
DRIVE UNIT VIB Y
g x.xxx  FRQ xxx.xx Hz
V xx.xx mm/S DS .xxxx mm
<CLEAR> TO re-measure (<ENTER> TO CONTINUE)
```

- 8 Press **CLEAR** to re-measure the drive unit vibration along the Y axis. Repeat Step 7. Optionally, press **ENTER** to continue. The following screen displays:

```
DRIVE UNIT VIB Z
g x.xxx  FRQ xxx.xx Hz
V xx.xx mm/S DS .xxxx mm
<PRINT> TO ACCEPT (<CLEAR> TO SKIP)
```

- 9 Position the sensing arrow in the direction of the z axis.

- 10** Press **CLEAR** to skip the z axis vibration reading or press **PRINT** to print the drive unit vibration along the Z axis. The values freeze on the screen, print on the Report Center Printer, and if applicable are transmitted to the spreadsheet. The following screen displays:

DRIVE UNIT VIB Z
 g x.xxx FRQ xxx.xx Hz
 V xx.xx mm/S DS .xxxx mm
 <CLEAR> TO re-measure (<ENTER> TO CONTINUE)

- 11** Press **CLEAR** to re-measure the drive unit vibration along the Z axis. Repeat Step 10. Optionally, press **ENTER** to continue. The following screen displays:

PRESS <ENTER>
 TO COMPLETE TEST

- 12** Press **ENTER**. The report footer prints. The monitor screen displays (see [page 26](#)).
- 13** Stop the spindles.

Printing Temperatures for Vessel Positions

- 1 From the Test Menu screen, select option **2**, Temperature. The following screen displays:

```
VESSEL ID: _  
FOR POSITION #  
  
09/30/2003                15:37:37
```

- 2 Enter the identification number for the vessel in position 1 and press **ENTER**. The following screen displays:

```
TEMP @POS #  
xx.x°C  
<PRINT> TO ACCEPT  
<CLEAR> TO SKIP
```

- 3 Ensure the temperature probe is in the vessel being measured.
- 4 Press **CLEAR** to skip the vessel temperature reading for position 1 and move to the next position. The Enter Vessel ID screen displays. Repeat steps 2 - 3 for the next vessel position.

Optionally, press **PRINT** to print the vessel temperature reading. The value freezes on the screen, prints on the Report Center Printer, and if applicable is transmitted to the spreadsheet. The following screen displays:

```
TEMP @POS #  
xx.x°C  
<ENTER> TO CONTINUE  
<CLEAR> TO re-measure
```

- 5 Press **CLEAR** to re-measure the vessel temperature for this position. Repeat Step 4. Optionally, press **ENTER** to continue to the next vessel position. The Enter Vessel ID screen displays. Repeat steps 2 - 4.
- 6 Repeat this procedure for each vessel position. After the final vessel temperature is measured, the monitor screen displays (see [page 26](#)).

Printing Test Setup

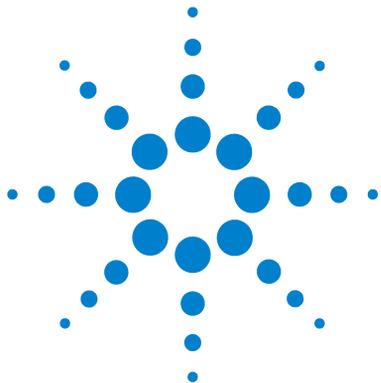
To print the test setup, complete the following steps:

- 1 Ensure the QAI C Station is plugged into AC power with the main (rear panel) power switch in the ON position.
- 2 From the monitor screen, press **MENU**. The QAI C Main Menu screen displays.
- 3 Select option **1**, Setup. The System Setup screen displays.
- 4 Select option **2**, Print Setup. The Test Setup Report screen displays.
- 5 Select option **1**, Print. The QAI C System Setup Report prints.

The QAI C Test Report, QAI C Temperature Report and QAI C Vibration Analysis Report print only as they are acquired. Data is not stored on the QAI C for future printing.

4 Operating the QAI C

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5 Troubleshooting and Maintenance

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Periodic Maintenance

WARNING

The QAI C contains electrical circuits, devices, and components operating at dangerous voltages. Contact with these circuits, devices, and components can cause death, serious injury, or painful electric shock.

Periodic maintenance intervals may vary depending on frequency of instrument usage.

Calibration

We recommend the QAI C Station be calibrated at six-month intervals. However, based on your own SOPs, this can be extended for up to a year. Call the Dissolution Systems Service Department for a quote, packing instructions, and a Return Authorization Number before sending your unit for recalibration.

Report Center Impact Printer

The following is helpful information for using your impact printer.

Installing the Cartridge Ribbon

If the printer is used infrequently, the print impression sometimes becomes weak because the ribbon dries out. If the printed material is difficult to read and you suspect this is the cause of the problem, advance to a new section of the ribbon by pressing the printer toggle switch to the *Paper feed* position. If the printing is still faint, replace the cartridge.

To install the cartridge:

- 1 Toggle the printer off line by pressing the printer toggle switch to the *OnLine / Off Line* position. When the printer is off line, the Ready LED does not illuminate.
- 2 Four small grooves are embossed on the printer cover. Gently push on these grooves to tilt the cover. When the printer cover is tilted up, you can lift it off completely.
- 3 Push down on the right side of the ribbon cartridge (marked PUSH) and remove the old cartridge.
- 4 Install the new cartridge. If there is already paper in the printer, hold the cartridge between your thumb and index finger, slide it over the paper and into the printer compartment. Ensure the paper is between the ribbon cartridge and the ink ribbon. Ensure the ink cartridge is inserted firmly to prevent weak or irregular printing. The cartridge must be properly seated and aligned for the best printing.
- 5 Turn the cartridge knob (marked by an arrow) clockwise to stretch the ribbon taut.
- 6 Replace the cover.
- 7 Toggle the printer online by pressing the printer toggle switch to the *OnLine / Off Line* position. The Ready LED illuminates.
- 8 Replace the paper if necessary.

If you get ribbon ink on the printer's plastic cover, remove it immediately. Once dried, it is difficult to remove.

Replacing the Paper Roll

- 1 Toggle the printer off line by pressing the printer toggle switch to the *OnLine / Off Line* position. When the printer is off line, the Ready LED does not illuminate.
- 2 Grasp the paper roll cover firmly by the grooves on the side and the front edge. Pull outward to remove the cover.
- 3 Press the printer toggle switch to *Paper feed* to advance the paper approximately one inch beyond the paper cutter.
- 4 Using scissors, cut the paper feeding to the printer and remove the paper roll.
- 5 Pull the remaining paper through the printer mechanism. *Pull the paper from the front (paper cutter side)*. Pulling the paper out of the back of the printer will damage the print mechanism.
- 6 Unroll several inches of paper on the new roll.
- 7 If it is jagged, cut a straight edge on the paper roll to facilitate the entry of the paper into the printer.
- 8 Slide the paper through the slot connecting the paper compartment and the printer compartment. You can slide it in approximately 1/4 inch before it stops.
- 9 While holding the paper in place, press the printer toggle switch to the *Paper feed* position and hold until approximately one inch of paper has emerged from the top of the printer.

CAUTION

Ensure the roll of paper feeds squarely. If it does not, the paper can jam and possibly damage the printer mechanism.

-
- 10 Release the printer toggle switch.
 - 11 Turn the paper roll to take up any slack in the paper feeding to the printer.
 - 12 Place the paper roll into the paper compartment.

- 13 Replace the paper roll cover. If the cover is difficult to remove or replace, the left and right edges can be trimmed or shaved with a utility knife allowing the cover to slide easier.
- 14 Toggle the printer online by pressing the printer toggle switch to the *OnLine / Off Line* position. The Ready LED illuminates.

Toggling Your Printer Online

Complete these steps to toggle your printer online:

- 1 Toggle the printer online by pressing the printer toggle switch to the *OnLine / Off Line* position. When the printer is off line, the Ready LED does not illuminate.
- 2 Release the switch and it returns to the center position. The Ready LED illuminates and a READY message prints if the PRINT READY command has not been turned off. See “[Printer Configuration](#)” on page 70 for instructions on turning on and off the PRINT READY command. When you first turn on the instrument, it prints a READY message to assure you that the built-in microprocessor is operating properly.

When you turn off the printer, wait at least three seconds before turning it on again.

Printer Self Test

You can test the print head and ribbon only *after* inserting paper. Do not attempt to print without paper. Follow these steps to perform a printer self test:

- 1 Turn off the QAII C Station.
- 2 Press and hold the printer toggle switch in the *Paper feed* position.
- 3 Turn on the QAII C Station.
- 4 Hold the printer toggle switch until printing begins. The printer prints a list of the current configuration settings and performs a continuous print test.

- 5 Press the printer toggle switch to the *OnLine / Off Line* position to stop the printing operation.
- 6 The printer is ready to resume normal operation.

Printer Configuration

NOTE

The printer configuration is set by the factory. This procedure should be performed only if the printer displays erroneous characters. Contact the Dissolution Systems Service Department for assistance, if necessary.

- 1 Turn off the QAII C Station.
- 2 Press and hold the printer toggle switch in the *OnLine / Off Line* position while turning on the instrument. Hold the printer toggle switch in the *OnLine / Off Line* position for six seconds after the instrument is turned on, then release the switch.
- 3 The printer should print: ***** SETUP MENU ***** and **CONFIGURE...** [NEXT/OK]. If this message does not print, repeat steps 1 through 3.

- 4 The printer toggle switch is used to complete the configuration. Pressing the left side of the printer toggle switch selects NEXT to advance to the next menu item. Pressing the right side of the printer toggle switch selects OK to accept what is stated on this line of the menu item. Each time the switch is pressed, another part of the menu prints. Allow the printer to finish printing before pressing the switch again. See the table of commands below.

NOTE

The printout is easier to read if the printer cover is removed.

*** SETUP MENU***		
CONFIGURE	[NEXT/OK]	Press NEXT to avoid configuration
CUSTOM	[NEXT/OK]	Press OK to enter custom mode
CUSTOM MENU		
PRINT CUSTOM SETUP	[NEXT/OK]	Press NEXT
AUTO SEQ = NO	[NEXT/OK]	Press OK
ZERO = Ø	[NEXT/OK]	Press OK
POUND SIGN = #	[NEXT/OK]	Press OK
_(UNDERSCORE)	[NEXT/OK]	Press OK
ONLINE/OFFLINE = YES	[NEXT/OK]	Press OK
EXT CH SET = NO	[NEXT/OK]	Press OK
PRINT READY = YES	[NEXT/OK]	Press NEXT
PRINT READY = NO	[NEXT/OK]	Press OK
READY...		

Your printer is now configured correctly.

Fuse Replacement

WARNING

The QAI C Station contains electrical circuits, devices, and components operating at dangerous voltages. Contact with these circuits, devices, and components can cause death, serious injury, or painful electric shock.

Panels or covers that are retained by fasteners which require the use of a tool for removal may be opened only by Varian-trained, Varian-qualified, or Varian-authorized service engineers.

The fuse compartment is located beside the power cord receptacle on the QAI C rear panel. See [Figure 10](#), “QAI C Station Rear Panel,” on page 25.

- 1 To check or replace the fuse, remove the power cord from the QAI C.
- 2 A release tab is located on the right side of the fuse compartment. Insert a slotted screwdriver under the tab. A slight application of pressure forward releases the door.
- 3 The fuses are located in the removable holders marked with an arrow on the top of each. The QAI C uses one 500 mAmp, metric (5 x 20 mm) standard fuse for each holder.
- 4 Replace the fuse in the holder and insert the fuse holder into the fuse compartment with the arrows pointing toward the bottom of the compartment.
- 5 The holder is designed for multiple voltages. The voltage displays through a window in the fuse compartment door. To change the voltage, gently pull the wheel to remove it from the holder. Rotate the wheel and snap it back in place displaying the correct voltage.
- 6 Push the fuse compartment door closed. It snaps into place.
- 7 Replace the power cord.

Troubleshooting

The Dissolution Systems Service Department can assist you if you experience problems or have questions concerning your QAI C. Many problems can be traced to simple sources and are easily solved.

Following is a troubleshooting guide which may help you. The Dissolution Systems Service Department can be reached at 800.229.1108 (inside the US) or 919.677.1108 (outside the US). Optionally, you can send a fax to 919.677.1138. You can also e-mail the Dissolution Systems Service Department at dissolution.service@agilent.com.

Symptom	Probable Cause	Suggested Solution
The unit does not respond when the main power switch is turned on.	There is a blown fuse.	Replace the fuse. See “Fuse Replacement” on page 72.
	The unit is not plugged in.	Check the rear panel AC power cord receptacle. Plug in the power cord.
The unit does not respond when the battery switch is turned on.	The battery is dead.	Recharge the battery. See “Power Switch Functions” on page 24.
The Report Center Printer does not function.	The printer is disabled.	Ensure the Report Center Printer is online and the Ready LED is illuminated. See “Toggling Your Printer Online” on page 69.
	The QAI C is not plugged in or the main power switch is not turned on.	Plug the instrument into a wall outlet and ensure the main (rear panel) power switch is in the ON position.
The Report Center Printer is active but nothing prints.	The ribbon needs to be replaced.	Install a replacement ribbon cartridge. See “Installing the Cartridge Ribbon” on page 67.
The RPM readings are erratic.	The reflective clip is not registering.	Align the clip with the sensor.
The RPM sensor is not reading.	The sensor is not plugged into the QAI C rear panel or has come loose.	Restore connections.

5 Troubleshooting and Maintenance

Symptom	Probable Cause	Suggested Solution
The wobble gauge is not reading.	The sensor is not plugged into the QAI C rear panel or has come loose.	Restore connections.
	The pointer is not touching the shaft or rim of the basket.	Realign the mounting bracket.
	The wobble gauge is not turned on.	Turn on the wobble gauge.
The level sensor is not reading.	The sensor is not plugged into the QAI C rear panel or has come loose.	Restore connections.
The level sensor displays erratic readings.	The sensor is not in the upright position.	Correct the positioning.
The vibration sensor is not reading.	The sensor is not plugged into the QAI C rear panel or has come loose.	Restore connections.
There is excessive wobble.	The paddle or basket shaft is damaged.	Verify the spindle wobble is within specifications using the certified calibration shaft.
The shaft verticality or perpendicularity is excessive.	The paddle or basket shaft is damaged.	Verify the spindle perpendicularity is within specifications using the certified calibration shaft.
	The drive unit is not level.	Contact the Dissolution Systems Service Department.
	The spindle is not centered.	Contact the Dissolution Systems Service Department.

QAII C Default Values

The default value prints for any sensor which is not plugged into the unit during testing. The values listed below apply for both standard and metric units (see “[Measuring Wobble, Basket](#)” on page 42, “[Measuring Wobble, Paddle](#)” on page 52, and “[Main Menu Option 1, Setup](#)” on page 32 for instructions on selecting inches or millimeters for wobble and vibration respectively).

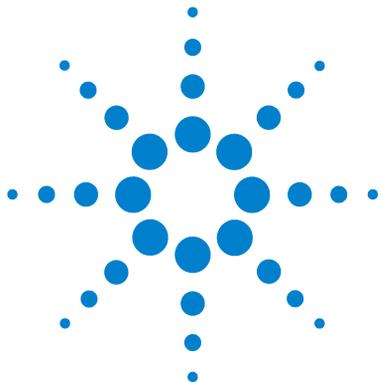
NOTE

If any of the following default values display, ensure all connections are tight.

Variable	Default Values
RPM	000.00
Wobble	00.00
Temp	-1.5
Shaft-X	-6.8
Shaft-Y	-6.8
Table-X	-6.8
Table-Y	-6.8
Vibration-X	0.000
Vibration-Y	0.000
Vibration-Z	0.000
Frequency	000.00
Velocity	00.00
Displacement	.0000

5 Troubleshooting and Maintenance

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6 Service and Warranty

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The warranty is provided by Agilent Technologies, Inc. or one of its authorized representatives.



Service and Warranty Information

Agilent dissolution products carry a one-year warranty on parts and labor. The Dissolution Systems Service Department (or one of its representatives) will, at its option, either repair or replace any mechanical and electrical components in your instrument which prove to be defective. During the first year of warranty coverage, there is no charge for the labor to repair your unit. The Dissolution Systems Service Department (or one of its representatives) will determine the best site to repair the unit, either onsite or returned to Agilent Technologies, Inc. Any onsite warranty services are provided only at the initial installation point. Installation and onsite warranty services are available only in Dissolution Systems service travel areas.

Exclusions and Limitations

Excluded from this warranty are expendable or consumable items such as, but not limited to, paddles, baskets, vessels, and acrylic water baths. Also excluded are defects from improper or inadequate maintenance by the customer, user-induced chemical action or contamination, unauthorized modification or misuse, and improper site preparation and maintenance.

Operation of software is not warranted to be uninterrupted or error-free.

Obtaining Warranty Service

To obtain warranty service in the United States, contact the Dissolution Systems Service Department at 800.229.1108 to obtain authorization to return units for repair. At the option of the customer, onsite warranty service is available, but travel charges may be incurred. The customer should prepay all shipping charges for products returned to the Dissolution Systems Service Department (unless otherwise authorized), and Agilent Technologies, Inc. will pay all charges for return to the customer.

Warranty Limitations

Agilent Technologies, Inc. makes no other warranty, either express or implied, with respect to this product. Specifically disclaimed are any implied warranties of merchantability and fitness for a particular use. In no event will Agilent Technologies, Inc. be liable for any indirect, incidental, or consequential damages arising from the use of this product. This warranty gives you specific legal rights which may vary from state to state or province to province, so you may have other rights and some of these exclusions may not apply to you.

Exclusive Remedies

The remedies provided herein are the customer's sole and exclusive remedies. In no event shall Agilent Technologies, Inc. or its representatives be liable for any direct, indirect, special, incidental, or consequential damages, whether based on contract, tort, or any other legal theory. Some states or provinces do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you.

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