Congratulations on the purchase of your Hanson Vision® G2 dissolution tester. While we are certain you will enjoy the Hanson Vision experience, we also understand that from time to time you may have a question or technical issue requiring our assistance. Please feel free to contact us at any time. We’re happy to help!

Online:  www.hansonresearch.com
Tech Support Request Form: www.hansonresearch.com/tsr
E-Mail:  techsupport@hansonresearch.com
Phone:  800.821.8165 or 818.882.7266
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<td>A</td>
<td>Initial Release</td>
</tr>
<tr>
<td>9 May 2012</td>
<td>B</td>
<td>Correction to 4.10.4</td>
</tr>
<tr>
<td>29 Oct 2012</td>
<td>C</td>
<td>• Improved priming information&lt;br&gt;• Added information on how to drain the tester&lt;br&gt;• Added Appendix A with common operator errors&lt;br&gt;• Added Appendix B on basic network configurations&lt;br&gt;• Added Appendix C on Waters Transfer Module&lt;br&gt;• Improved information on archiving and checksums for protocols</td>
</tr>
<tr>
<td>01 Jul 2013</td>
<td>D</td>
<td>• Added leveling procedure to installation&lt;br&gt;• Added ADD cover for Vision to vessel covers&lt;br&gt;• Corrected vessel cover names&lt;br&gt;• Added information on new Probe Error message and --.-- throughout User Guide&lt;br&gt;• Added information on firmware updates when booting up instrument</td>
</tr>
<tr>
<td>20 May 2014</td>
<td>E</td>
<td>• Added Quick Start test&lt;br&gt;• Added Appendix D (Reports)&lt;br&gt;• Updated new features for firmware update ver. 2.20</td>
</tr>
</tbody>
</table>
1.1. General Safety Considerations

This equipment contains moving parts, which have the potential to pinch or jam.

The installation category (overvoltage category) for this instrument is Level II. The Level II category pertains to equipment that receives its electrical power from a local level, such as an electrical wall outlet.

This instrument must be connected to a grounded electrical outlet.

Never work on the electrical components in the system while there is power to the unit. **Disconnect power before servicing the instrument.**

Review all safety and environmental precautions pertaining to any chemicals that are to be used in conjunction with this equipment.

1.2. CSA Safety Considerations

- For indoor use only
- Maximum altitude up to 2,000 meters
- Environmental operating temperature 5 °C to 40 °C
- Operating relative humidity 80% for temperatures up to 31 °C, decreasing linearly to 50% relative humidity at 40 °C
- Mains supply ratings 100-240 V~, 50-60 Hz, 1.5 A
- Mains supply voltage fluctuations not to exceed ±10% of the nominal voltage
- Installation Category II (overvoltage categories)
- Pollution Degree 2
- See Installation section for lifting instructions
- Additional hazards may exist if the equipment is not used correctly per the User Guide

1.3 Canadian Emissions Notice

This digital apparatus does not exceed the Class A limits for radio noise emissions from digital apparatus set forth in the Radio Interference Regulations of the Canadian Department of Communications.

Le présent appareil numérique n’émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques de la classe A prescrites dans les réglementations sur le brouillage radioélectrique édictées par le Ministère des Communications du Canada.
2. Introduction

Hanson Vision® "G2" (second generation) dissolution instruments are designed for the 21st century, with state-of-the-art electronics, mechanics, and quality throughout. These systems are power-packed for the demands of today's pharmaceutical scientist, from research, to formulations, to quality assurance. We have applied 60 years of innovation and expertise to the design and manufacture of these quality test systems.

At Hanson Research, we combine art with science and engineering. We apply elegant design and instrument ergonomics to the rigors and everyday challenges of scientific investigation, research, and analysis. Every dissolution test operator requirement is evaluated and simplified for ease of use and fast results. Our test systems are designed for the dissolution laboratory with a tight schedule and a heavy workload.

2.1 Definitions

**Vision® G2**
Hanson Vision® “G2” dissolution instruments represent a significant upgrade from the original Vision Testers introduced in 2008. Our new G2 operating platform includes full-color touchscreens for instrument programming, extensive programming menus, up to 100 operating protocols, a security configuration which supports 21CFR11-compliance, a convenient flash drive for instrument uploads and downloads, and 32-bit digital technology.

**Vision® AutoPlus™**
The redesigned Hanson autosampler series (either Maximizer or DissoScan) with stepper motor driven syringes.

**Maximizer™**
The autosampler with 4-way solenoid valves per syringe to direct fluid flow. The Maximizer provides 4 fluid lines (A, B, C, and D). Up to 3 testers, or 2 testers with media replace can be connected to a Maximizer.

**DissoScan™**
The autosampler with one 3-way solenoid valve per syringe to direct fluid flow. The DissoScan provides 2 fluid lines (A and D). One tester can be connected to a DissoScan.

**AutoFill™**
The redesigned sample collection instrument built in to the top of the Vision AutoPlus.

**Vision® AutoFilter™**
A programmable filter changing instrument which uses 25 mm in-line syringe filters.

**ADD™ Cover**
A vessel cover with a sealed chamber for the dosage. The chamber protects the dosage from environmental conditions and can be triggered by an AutoMag™ to automatically start a test.

**Easi-Lock™**
The system used by Vision vessels that allows them to be locked into place. It allows for consistent centering and prevents chipping of the edges of the vessel.
Protocol
The parameters that are entered into the instrument that determine the operation and steps that are to be accomplished for a given test.

Occurrence
The dictated time at which a function is performed.

Recurrence
The dictated time at which a function repeats.

Detect
Determine a sample's absorbance.

Classic 6™
A rugged compact six-position dissolution test station with a unique two-across, three-deep design. The workhorse unit ideal for manual test routines, space-limited laboratories, and budget-minded programs.

Elite 8™
An eight-position high-performance machine built for automation and extended applications.

AutoMag™
An automated mechanism that can be installed on the Vision Elite 8 dissolution tester to automate raising and lowering of the sample probes and Digital Temperature Probes (DTPs).

SuperMag™
An automated mechanism capable of accommodating 1-liter, Small Volume (SV), and Chinese Small Volume (CSV) vessels that can be installed on the Vision Elite 8 dissolution tester to automate raising and lowering of the sample probes and Digital Temperature Probes (DTPs).

Spindle Shaft
The shaft that passes through the drive head of a Vision dissolution tester. There are 6 spindle shafts on the Classic 6 and 8 on the Elite 8. Basket shafts, paddles, and other apparatus can be screwed into the spindle shafts.

Shaft Clamp
The knob at the top of the spindle shaft. It is used to easily manipulate or remove the spindle shaft.

Fixed Probe
A stationary vessel mount sampling probe mounted to the vessel cover for connection to an automated sampler.

Retrieval Reservoir
The Retrieval Reservoir is an optional accessory placed on the AutoFill. This accessory enables the AutoPlus to return rinse volume back to vessel(s) in multiple tester applications. This method will accommodate one or two testers with media replace or three testers without media replace.
Vessel Rings
The rings that snap into the Vision dissolution tester vessel plates. The rings hold the Vision Easi-Lock vessels securely in place.

Waters Transfer Module
The Waters Transfer Module is a syringe-based sampling system connected to a Waters HPLC. It allows for full automation of dissolution systems with HPLC analysis.

2.2 Features
The new Vision G2 dissolution testers take the next step in dissolution testing with a streamlined new design and increased functionality. Here are some of the new features:

<table>
<thead>
<tr>
<th>Classic 6</th>
<th>Elite 8</th>
<th>Standard features</th>
</tr>
</thead>
<tbody>
<tr>
<td>✓</td>
<td></td>
<td>Fixed drive head</td>
</tr>
<tr>
<td>✓</td>
<td></td>
<td>6 Precision drive spindles with spindle shafts</td>
</tr>
<tr>
<td>✓</td>
<td></td>
<td>6-Position Easi-Lock™ vessel plate</td>
</tr>
<tr>
<td>✓</td>
<td></td>
<td>Compact footprint (2 across &amp; 3 deep)</td>
</tr>
<tr>
<td>✓</td>
<td></td>
<td>Easi-Lift™ moveable drive head with multi-lock positions</td>
</tr>
<tr>
<td>✓</td>
<td></td>
<td>8 Precision drive spindles with spindle shafts (use 6, 7, or 8)</td>
</tr>
<tr>
<td>✓</td>
<td></td>
<td>8-Position Easi-Lock™ vessel plate (use 6, 7, or 8 vessels)</td>
</tr>
<tr>
<td>✓</td>
<td></td>
<td>Standard footprint (4 across &amp; 2 deep)</td>
</tr>
<tr>
<td>✓</td>
<td></td>
<td>Automation-ready (with optional AutoMag™ &amp; SuperMag™)</td>
</tr>
<tr>
<td>✓</td>
<td>✓</td>
<td>Precision control for speed 25-250 rpm, temperature 25-55 ºC</td>
</tr>
<tr>
<td>✓</td>
<td>✓</td>
<td>Elegant, ergonomic design with workhorse performance</td>
</tr>
<tr>
<td>✓</td>
<td>✓</td>
<td>Minimal user adjustments for easy set up and go</td>
</tr>
<tr>
<td>✓</td>
<td>✓</td>
<td>Independent Vision® Vision Heater system</td>
</tr>
<tr>
<td>✓</td>
<td>✓</td>
<td>Rugged molded waterbath with fast heat-up &amp; low level drain</td>
</tr>
<tr>
<td>✓</td>
<td>✓</td>
<td>Digital temperature probe (1) for use in bath and vessels</td>
</tr>
<tr>
<td>✓</td>
<td>✓</td>
<td>Full color touchscreen with intuitive menus and programming</td>
</tr>
<tr>
<td>✓</td>
<td>✓</td>
<td>Up to 100 protocols (create, manage and save routines)</td>
</tr>
<tr>
<td>✓</td>
<td>✓</td>
<td>Upload &amp; download programs with flash drive</td>
</tr>
<tr>
<td>✓</td>
<td>✓</td>
<td>Electronics and firmware include 32-bit digital technology</td>
</tr>
<tr>
<td>✓</td>
<td>✓</td>
<td>Print to both serial and PostScript network printers</td>
</tr>
<tr>
<td>✓</td>
<td>✓</td>
<td>Alarms for sampling, maintenance and calibration</td>
</tr>
<tr>
<td>✓</td>
<td>✓</td>
<td>ISO 9001 quality certified</td>
</tr>
<tr>
<td>✓</td>
<td>✓</td>
<td>Security system supports 21 CFR Part 11 compliance</td>
</tr>
<tr>
<td>✓</td>
<td>✓</td>
<td>USP / FDA / ASTM / EP / JP compliant</td>
</tr>
<tr>
<td>✓</td>
<td>✓</td>
<td>CE / CSA / RoHS compliant, includes Earth-friendly packing</td>
</tr>
</tbody>
</table>
2.3 Vision G2 Tester Identification

Fig. 2.1 Identification: Vision Classic 6

Fig. 2.2 Identification: Vision Elite 8
2.4 Learning the Interface

The Vision G2 dissolution tester software was designed to be intuitive and easy to use. A user is able to interact and program the unit using the touchscreen interface. The touchscreen can be used with fingers or with a stylus. The interface has the following forms of input:

**Buttons:** In order to use a button, touch it with your finger or a stylus. Buttons may appear as having text or as icons.

**Sliders:** In order to use a slider, place a finger on the slider button and slide the finger right or left to place the slider in the desired position. Sliders are found for display and audio settings on the unit.

**Text Keypad:** Text keypads are used for text entry into the unit. Text fields are typically restricted to 25 characters.

To enter a letter, touch the button for the letter. To delete a letter, use the del button. To finish entering text, touch the OK button. To cancel out of the screen, touch the ESC button.

*NOTE: touching the (X) in the input line clears in the whole line.*
**Numeric Keypad:** The numeric keypads are used for numeric entry into the unit.

Unlike the text keypads, numeric keypads often have limits or specific formats which must be observed when entering information. These limits and formats are stated in the upper left corner of the screen below the field name. For example, the IP address of the Vision tester must be entered in a numerical format as follows: xxx.xxx.xxx.xxx. If the wrong format is entered, the Vision tester will produce an error sound and reset the field so the correct value can be entered.

*NOTE: Some numeric keypads have preset entry buttons for commonly used values, such as the instrument's speed and temperature.*

**Calendar:**

When setting dates, a calendar screen will be displayed. Touch the arrows located at the bottom of the calendar screen to select the month. Touch the day of the date displayed to select that date.

**Tab:**

The tab buttons are located on the left side of the screen and allow access to different parts of a section of the software. For example, the Edit Alarms screen has 4 tabs that allow the editing of the Preheat Alarm, Sampling Alarms, User Alarms, and Calibration Alarms.
Field:

When touched, these will allow the user to edit the settings for that field. Depending on the field, the values will be toggled, or a data entry screen (text keypad, numeric keypad, calendar) will appear, allowing the user to edit the data accordingly.

Send:

The Send button allows the user to print the displayed logs to the printer, or upload them to a USB flash drive. This is a common button on many of the screens of the Vision tester.

NOTE: For ease of reading, it is recommended to open logs in a word processor. Text editors (e.g., Windows Notepad) may place all the information on one line.

Exit:

The Exit button allows the user to return to the main menu. This button is typically located in the lower right corner of the screen.

After the initialization sequence completes, the unit remains at the home screen. The home screen displays the motor speed (rpm), motor speed set point, temperature, temperature set point, elapsed test time, and a countdown until the next event. If no test is running, the times will be listed as 0:00.00. The motor speed and temperature are displayed on the left side of the screen.
To adjust the motor speed, touch the **RPM SETPOINT** field and a numeric keypad will appear.

Enter the desired motor speed and touch **OK**. This will start the motor spinning at the desired speed. Preset buttons are available for **50**, **75**, and **100** rpm. The **OFF** button will stop the motor. The **Quick Start** button will hold the value for a quick test.

Touch the **Elapsed Time** field to set a test length for a Quick Start test. For starting a quick test, see section 6.2.

**NOTE:** If a Quick Start speed is not set, the **Elapsed Time** field will not respond when touched.

To adjust the temperature, touch the current temperature on the home screen and a numeric keypad will appear. If there is a problem with the external temperature probe, “**Probe Error**” will be displayed.

Enter the desired temperature and touch **Ok**. The pump will start and the temperature should begin to rise. There are preset buttons for **32 °C** and **37 °C**. The **PUMP** button starts the pump if it is off, or stops it if it is running. The temperature will automatically be set to 0 if the pump is turned off. The **OFF** button turns off the pump and sets the temperature to 0.

**NOTE:** As a safety feature, manual control of the pump is only active when the set temperature is 0.
Touching the **Vessels** button brings up the Vessels screen, which displays the current temperature in the vessels. On the left side of the Vessels screen, you have the option of raising or lowering the probes using the **Raise** or **Lower** arrows (if AutoMag or SuperMag is installed), and/or printing the vessel temperatures using the **Print** button. If there is an error with one of the vessel temperature probes, “--.--” will be displayed in place of the temperature.

The **Start** button is located on the bottom right of the home screen and is used for starting tests. The time and date of the system are displayed at the bottom center of the screen.

The menu is accessed by touching the **Menu** button located in the bottom left corner of the screen.

If a protocol is already loaded, the protocol name will appear in the upper left corner of the screen, and when touched it will be opened for editing. If no protocol is loaded, **Select Protocol** will appear in the corner; when touched, the Vision dissolution tester will allow the user to select a protocol for testing. When a Quick Start test is running, the words “Quick Start” will appear.
Protocol list screen:

If security features are enabled, the current user is displayed in the upper right corner of the screen. If no user is logged on, and security features are enabled, **Please Log In** appears in the corner. If security features are not enabled, a user can log on by touching the same corner of the screen. **Security Off** appears in the corner of the screen and when the corner is touched, the **Security Configuration** screen appears.

The main menu provides access to all the functions of the Vision tester. To return to the home screen, touch the bar at the bottom of the menu with the house icon.
3.1 Vision G2 Classic 6 Specifications

**Weight:**
- Main unit, dry: 29.5 kg (65 lbs.)
- Main unit, bath and vessels filled with water: 49 kg (108 lbs.)

**Size:**
- Height: 67.3 cm (26.5 in.)
- Width: 39.4 cm (15.5 in.)
- Depth: 58.4 cm (23.0 in.)

**Bath Capacity:**
- With 6 vessels: 13.3 liters (3.5 gallons)

**Power:**
- Input: 24 VDC, 3.75 A, 90 W.
- Only use external power supply (listed below)

3.2 Vision G2 Elite 8 Specifications

**Weight:**
- Main unit, dry: 63.5 kg (140 lbs.)
- Main unit, bath and vessels filled with water: 90.8 kg (200 lbs.)

**Size:**
- Height: 87.6 cm (34.5 in.)
- Width: 67.3 cm (26.5 in.)
- Depth: 58.5 cm (23.0 in.)

**Bath Capacity:**
- With 8 vessels: 19 liters (5 gallons)

**Power:**
- Input: 100 - 230 V ± 10%, 50-60 Hz, 1.5 A max.
- Output: 24 VDC, 3.75 A, 90 W

3.3 Vision G2 Heater Specifications

**Weight:** 4.1 kg (9 lbs.)

**Size:**
- Height: 22.9 cm (9.0 in.)
- Width: 24.1 cm (9.5 in.)
- Depth: 16.5 cm (6.5 in.)
3.4 Vision G2 Dissolution Tester General Specifications

**Power:**
Input: \(100 - 230 \text{ V} \pm 10\%, 50-60 \text{ Hz}\)
Power: \(700-1200 \text{ W}\)

**Spindle Speed:**
Range: 25 to 250 rpm
Accuracy: \(\pm 1 \text{ rpm}\)
Displayed Resolution: 0.1 rpm

**Temperature:**
Programmable Temperature Range: 25.0 to 55.0 °C
Accuracy: \(\pm 0.5 \text{ °C}\)
Control: \(\pm 0.1 \text{ °C}\)

**Digital Temperature Probes (all probes):**
Range: 10 to 60 °C
Accuracy: \(\pm 0.1 \text{ °C} \text{ from 30 - 55 °C}\)
Displayed Resolution: 0.01 °C
Minimum Submersion Depth: 25 mm
Response Time: < 45 seconds (normally 30 sec.)
### 3.5 Wetted Materials

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
<th>Wetted Materials</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Varies)</td>
<td>Tubing Harness</td>
<td>PTFE, ETFE, PVDF</td>
</tr>
<tr>
<td>(Varies)</td>
<td>AutoMag</td>
<td>PVDF, PTFE, PEEK, ETFE</td>
</tr>
<tr>
<td>74-104-230</td>
<td>Digital Temperature Probes</td>
<td>316 Stainless Steel</td>
</tr>
<tr>
<td>74-105-201</td>
<td>Spin-Paddle PVDF</td>
<td>PTFE</td>
</tr>
<tr>
<td>74-105-202</td>
<td>Spin-Paddle 316 SS</td>
<td>316 Stainless Steel</td>
</tr>
<tr>
<td>74-105-351</td>
<td>Spin-Paddle PVDF 2L</td>
<td>PTFE</td>
</tr>
<tr>
<td>74-105-361</td>
<td>Spin-Paddle 316 SS 2L</td>
<td>316 Stainless Steel</td>
</tr>
<tr>
<td>74-105-203</td>
<td>Mini Spin-Paddle PTFE</td>
<td>PTFE</td>
</tr>
<tr>
<td>74-105-204</td>
<td>Mini Spin-Paddle 316 SS</td>
<td>316 Stainless Steel</td>
</tr>
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<td>74-105-290</td>
<td>Mini Spin-Paddle 316 SS CSV</td>
<td>316 Stainless Steel</td>
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<tr>
<td>74-105-252</td>
<td>Basket 40 mesh USP</td>
<td>316 Stainless Steel</td>
</tr>
<tr>
<td>74-105-251</td>
<td>Spin-Basket 316 SS</td>
<td>316 Stainless Steel</td>
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<td>74-105-371</td>
<td>Spin-Basket 316 SS 2L</td>
<td>316 Stainless Steel</td>
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<tr>
<td>74-105-221</td>
<td>Mini Spin-Basket Shaft 316 SS</td>
<td>316 Stainless Steel, Viton</td>
</tr>
<tr>
<td>74-105-240</td>
<td>App. 6 Rotating Cylinder</td>
<td>316 Stainless Steel</td>
</tr>
<tr>
<td>74-105-241</td>
<td>App. 6 Rotating Cylinder with extension</td>
<td>316 Stainless Steel</td>
</tr>
<tr>
<td>74-105-220</td>
<td>Mini Basket 40 Mesh 316 SS</td>
<td>316 Stainless Steel</td>
</tr>
<tr>
<td>74-104-101</td>
<td>Vessel Easi-Lock Glass 1 Liter</td>
<td>Borosilicate Glass, CPVC (rim)</td>
</tr>
<tr>
<td>74-104-102</td>
<td>Vessel Easi-Lock Glass Amber 3 Liter</td>
<td>Borosilicate Glass, CPVC (rim)</td>
</tr>
<tr>
<td>74-104-111</td>
<td>Vessel Easi-Lock Glass 2 Liter</td>
<td>Borosilicate Glass, CPVC (rim)</td>
</tr>
<tr>
<td>74-104-112</td>
<td>Vessel Easi-Lock Glass Amber 2 Liter</td>
<td>Borosilicate Glass, CPVC (rim)</td>
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<td>250 mL Clear Glass Vessel Round Bottom CSV</td>
<td>Borosilicate Glass</td>
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<td>250 mL AmberGlass Vessel Round Bottom CSV</td>
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<td>74-104-151</td>
<td>Easi-Lock Vessel Cover</td>
<td>CPVC</td>
</tr>
<tr>
<td>74-105-131</td>
<td>Vision ADD Cover</td>
<td>PVC, Silicone</td>
</tr>
<tr>
<td>74-107-012</td>
<td>Vision G2 Easi-Lock Cover</td>
<td>PVC</td>
</tr>
<tr>
<td>74-107-013</td>
<td>Vision G2 ADD Cover</td>
<td>PVC, Silicone</td>
</tr>
<tr>
<td>74-104-163</td>
<td>Small Volume Vessel Cover</td>
<td>PVC</td>
</tr>
<tr>
<td>74-104-173</td>
<td>CSV Vessel Cover</td>
<td>PVC</td>
</tr>
<tr>
<td>91-430-026</td>
<td>Tapered Stopper</td>
<td>EPDM</td>
</tr>
<tr>
<td>74-104-201</td>
<td>Manual Sampling Canula 1/8&quot; Probe</td>
<td>PEEK</td>
</tr>
<tr>
<td>74-105-307</td>
<td>Auto-Probe PEEK 1/8&quot;</td>
<td>PEEK</td>
</tr>
<tr>
<td>74-104-204</td>
<td>1/16&quot; 316 Stainless Steel Probe</td>
<td>316 Stainless Steel</td>
</tr>
<tr>
<td>74-105-370</td>
<td>Stainless Steel 316 Probe</td>
<td>316 Stainless Steel</td>
</tr>
<tr>
<td>74-104-205</td>
<td>Return Port Fitting</td>
<td>PVC</td>
</tr>
<tr>
<td>74-105-360</td>
<td>Manual Sampling Cannula 2L</td>
<td>PEEK</td>
</tr>
<tr>
<td>95-590-001</td>
<td>Manual Sampling Cannula 500mL.7.75&quot; 316 SS</td>
<td>316 Stainless Steel</td>
</tr>
<tr>
<td>95-590-002</td>
<td>Manual Sampling Cannula 900mL.4.75&quot; 316 SS</td>
<td>316 Stainless Steel</td>
</tr>
<tr>
<td>95-590-005</td>
<td>Manual Sampling Cannula 900mL.4.75&quot; PEEK</td>
<td>PEEK</td>
</tr>
<tr>
<td>27-101-087</td>
<td>Sample Tip Filters</td>
<td>Polythenele</td>
</tr>
<tr>
<td>27-101-101</td>
<td>1/8&quot; Sample Filter 10 Micron PVDF</td>
<td>PVDF</td>
</tr>
<tr>
<td>91-450-062</td>
<td>5 Micron In Line Filter</td>
<td>Hydrophilic Acrylic</td>
</tr>
<tr>
<td>74-104-301</td>
<td>Cartridge Filters</td>
<td>Polythenele</td>
</tr>
<tr>
<td>61-105-030</td>
<td>Sample Block</td>
<td>PVC</td>
</tr>
<tr>
<td>65-190-011</td>
<td>Sinkers</td>
<td>316 Stainless Steel</td>
</tr>
<tr>
<td>91-700-050</td>
<td>Stainless Steel wire</td>
<td>316 Stainless Steel</td>
</tr>
<tr>
<td>95-590-021</td>
<td>.90&quot; x 0.37&quot; Spiral Coated Sinker</td>
<td>PTFE</td>
</tr>
<tr>
<td>95-590-022</td>
<td>.90&quot; x 0.37&quot; Spiral Uncoated Sinker</td>
<td>316 Stainless Steel</td>
</tr>
<tr>
<td>95-590-023</td>
<td>1.02&quot; x 0.38&quot; Spiral Coated Sinker</td>
<td>316 Stainless Steel</td>
</tr>
<tr>
<td>95-590-024</td>
<td>1.02&quot; x 0.38&quot; Spiral Uncoated Sinker</td>
<td>316 Stainless Steel</td>
</tr>
<tr>
<td>95-590-025</td>
<td>3 Prong Sinker</td>
<td>Nylon / Polypropylene</td>
</tr>
<tr>
<td>95-590-026</td>
<td>Japanese Pharmacoepoea Cage Sinker</td>
<td>316 Stainless Steel</td>
</tr>
<tr>
<td>91-030-132</td>
<td>Syringe 10 mL</td>
<td>Polypropylene, Latex-Free Elastomer, Silicone</td>
</tr>
</tbody>
</table>

**Table 3.1 Wetted Materials**
4.1 Location

This section provides information on determining if a location is suited to a Vision G2 dissolution tester. Consideration should be made as to the final system layout design prior to placing any equipment on the bench.

**Environmental Requirements**

The location should be clean and free of any issues which may influence dissolution testing. Issues which may affect dissolution results include vibration, significant heat, or significant cold.

**Space Requirements**

See the Specifications section to determine space requirement based on the size of the equipment.

The bench should be level and flat.

The bench should be capable of supporting the full weight (including water) of each machine as laid out in the Specifications section.

The first Vision G2 dissolution instrument should be placed to the left of an autosampler, if used. Additional testers should go to the right of the autosampler.

**Electrical Requirements**

Each Vision G2 dissolution tester requires two grounded outlets within 1 meter (3 ft) of the location of the system; one for the dissolution unit and one for the heater.

The Vision G2 testers are available in one configuration, 100 V through 240 V. The voltage is automatically set when the voltage is supplied to the external power supply.

Power cords should meet the following specifications: IEC 320-C13 connector; SJT 18AWG3C, 2 x 0.824 mm², 60 °C, 300 V. Note that USA-style power cords are provided with the equipment. It is the responsibility of the end user to provide power cords that meet that country's electrical connection requirements. The power cords also meet or exceed the above specifications.

4.2 Unpacking and Inspection

This section provides instructions on unpacking and setting up the Vision G2 dissolution tester.

*NOTE: Moving, lifting, and carrying Hanson dissolution testers requires 2 people to prevent damage to the instrument. Lift the instrument by the frame below the vessel plate while supporting the back of the tester to prevent it from tipping. DO NOT lift the instrument by the chrome handle.*

1. Unpack the Vision tester from the shipping container.
   a. Note any damage to the shipping container. If container is damaged, contact Hanson Research immediately.
   b. Place shipping container near installation location.
c. Remove straps from the container.

d. Open container and remove any accessory boxes.

e. Carefully remove the Vision tester from the shipping container. Remove protective bag and cut the strap holding the support block.

2. Place the Vision tester on the bench.

a. The Vision tester should be placed at a 90° angle from the desired operating position to allow access to the back of the tester during installation. Once the installation is complete, the Vision tester can be placed in its final position.

b. If installing the Elite 8, the two locking bolts should be removed from the weight using the included hex wrench. There are no locking bolts on the Classic 6, as the drive head is fixed and not adjustable.

![Fig. 4.1 Remove Locking Bolts](image1)

3. Level the dissolution tester.

a. Place a bubble level in the center of the vessel plate.

b. Adjust the feet of the dissolution tester until the bubble level indicates the vessel plate is level.

![Fig. 4.2 Elite 8 Release Lever](image2)
4. Installation

Fig. 4.3 Bubble Level on a Leveled Tester

i. For the Classic 6, adjust all 4 feet as necessary.

ii. For the Elite 8 adjust the 2 front feet and the foot located underneath the mast. When the tester is level, adjust the 2 back feet for added support.

4. Place a vessel in each of the locking rings.
   a. Lower the vessel into place in the vessel ring.
   b. Rotate until the keys on the vessel slide into the holes on the vessel ring.
   c. Rotate the vessel clockwise to lock it into place.

5. Plug the temperature probe into the port labeled "Temp Probe" on the back of the tester. Place the probe in one of the holes located in the vessel plate.

4.3 Electrical Connections

Figure 4.4 Vision G2 (Classic 6 and Elite 8) Back Panel Ports
This section provides instructions on making the power connections to the Vision tester.

1. Ensure the power switch located on the right side of the Vision tester is in the off (O) position.
2. Connect the power supply to the port labeled Input on the back panel of the Vision tester, and the other end to a power source.
3. Ensure the power switch located on the back of the heater is in the off (O) position.
4. Insert the power cable into the back of the heater, and the other end to a power source.

4.4 Vision Heater Installation

1. Place the Vision Heater to the right rear side of the tester.
2. Connect the tubing as shown in figure 4.6 or 4.7.
3. Ensure hose clamps are on straight. Tighten the clamps 3 to 5 clicks to prevent leaks. **NOTE: A pair of pliers is required for proper tightening of the hose clamps.**
4. Connect the tester to the heater by plugging an RS-232 cable into the Temp Control ports on the tester and heater.
4.5 Priming the Waterbath

**Method 1**

**WARNING:** Do not set a temperature during this procedure. Doing so may result in damage to the Vision Heater.

1. Fill the waterbath to the line on the sticker located at the center front of the bath.
2. Go to the Temperature Setpoint screen and touch the PUMP button.

![Temperature Setpoint screen]

**WARNING:** Do not set a temperature during this procedure. Doing so may result in damage to the Vision Heater.

3. Completely fill the syringe with bath water.

4. Insert the end of the syringe assembly into the bath fitting that is mounted to the bottom of the bath.

**NOTE:** Push the end of the syringe assembly down as far as possible. If the end of the assembly is too high, the water will not be pushed into the tubing.
5. Dispense the syringe. Watch the fitting on the side of the bath to ensure bubbles are being pushed out. If no bubbles are pushed out, push the tubing down farther into the fitting.

6. Repeat steps 2 through 4 until only water is pushed out.

7. Place your hand in front of the fitting on the side of the bath and ensure water is flowing.

8. Check for leaks.

Method 2

**WARNING:** Do not set a temperature during this procedure. Doing so may result in damage to the Vision Heater.

1. Fill the waterbath to the line on the sticker located at the center front. See Fig. 4.8.

2. Connect the drain hose to the Vision Heater output. Ensure the other end of the drain hose is in a large container.

3. Go to the Temperature Setpoint screen and touch the PUMP button.

**WARNING:** Do not set a temperature during this procedure. Doing so may result in damage to the Vision Heater.

4. Wait for consistent flow from the drain hose. When the pump has been primed, the noise from the Vision Heater should decrease.
5. Disconnect the drain hose and reconnect the heater output to tubing that leads to the waterbath. It is not necessary to stop the pump during this step.

6. Place your hand in front of the fitting on the side of the bath and ensure water is flowing.

4.6 Draining the Waterbath (not required for installation)

**WARNING:** Do not set a temperature during this process. Doing so may result in damage to the Vision Heater.

1. Remove a vessel over the bath output fitting.

2. Insert the drain plug into the bath output fitting. This will allow the bath to drain completely.

![Fig. 4.10 Drain plug in the bath output fitting (viewed from above)](image)

![Fig. 4.11 Drain plug in bath output fitting (viewed from the side)](image)
3. Connect the drain hose to the heater output.
4. Go to the Temperature Setpoint screen and touch the PUMP button.

5. When the bath is completely drained, touch the PUMP button again to stop the pump.

4.7 Guidelines for Cleaning the Waterbath

This section provides only guidelines for cleaning the waterbaths of the Classic 6 and Elite 8.

1. Use only a soft cloth when wiping down the waterbath. Coarse materials may scratch the bath material.

2. Use only warm water when cleaning the bath.

**WARNING:** The use of chemicals may damage the waterbath and will not be covered by the warranty.

3. The bath can be cleaned in place or removed for cleaning.
   a. The vessel rings should be removed when removing the bath for cleaning.
   b. For the Elite 8, the bulkhead fitting on the side of the bath must be removed in order to remove the bath.

4.8 Verification of Manual Controls

This section provides instructions on how to test the manual controls to ensure the tester can perform basic functions.

1. Turn on (I) the Vision Heater with the power switch located on the back.
2. Turn on (I) the tester using the power switch on right side of the drive head.
3. Once the tester has reached the home screen, touch the current motor speed (0.0) and the motor speed screen should appear.
4. Touch the **50** button to set the motor speed to 50 rpm. Observe the spindles and ensure that they spin.
5. Touch the current temperature and the temperature set point screen should appear.
6. Touch the **37** button to set the bath temperature to 37 °C.
7. Observe the temperature on the home screen and ensure that the temperature begins to rise.
4.9 Vision Tester Communication Connections

This section provides instructions on how to make the communication connections between the Vision tester and a serial (validation) printer, an autosampler or a network (including a PostScript capable network printer, if applicable).

NOTE: For more information on TCP/IP communications, refer to Appendix B. For connecting to a Waters Alliance Dissolution System, refer to Appendix C.

1. Use an RS-232 cable to connect a serial (validation) printer to the Serial Printer port on the tester.

2. Use a network cable to connect the LAN port of the tester to an autosampler, a network switch, or a port of the local network, as appropriate.

3. From the home screen, touch the **Menu** button to bring up the tester menu screen.

4. Touch the **Time** button to bring up the Edit Alarms Screen.

5. The Edit Alarms screen will appear. Touch the **Time/Date** button at the bottom of the screen.

6. The Edit Time/Date screen will appear. Touch the **System Date** field to set the current date. Enter the date in the DD-MM-YYYY format, and touch **OK** when done.
7. The Edit Time/Date screen will reappear. Touch the System Time field to enter the current time. Enter the time in 24hr format. For example if it is 2:30 pm, enter 14:30. Touch OK to return to the Edit Time/Date screen.

8. Touch the Exit button at the bottom right corner of the screen to return to the main menu.

9. Touch the Config button to bring up the system configuration screens.

10. The first tab is Instrument. Touch the Instrument I.D. field to edit the instrument ID for the tester. This ID will appear on printouts and in applicable software packages. When touched, a alphanumeric keypad appears. Use the keypad to enter the appropriate system ID. Touch the OK button when complete.
11. Touch the **IP Address** field to edit the IP address. A numeric keypad will appear to allow the entry. The IP address must take the form of ###.###.###.###. To ensure proper communication, the first 3 sections of the IP address must match between the tester and sampler or printer. Touch **OK** when finished.

For example, if the tester has the IP Address 192.168.1.20, then the IP address of the printer must begin with 192.168.1. For more information on configuring IP addresses, refer to Appendix B.

12. Touch the **Gateway Address** field to edit the gateway address. Once again a numeric keypad will appear and the gateway address must take the form of ###.###.###.###.

13. Touch the **Subnet Mask** field to enter the subnet mask. Once again a numeric keypad will appear and the subnet mask must take the form of ###.###.###.###. The value of 255.255.255.0 is recommended.

14. When all the fields on the Device Setup screen have been updated, touch the exit button located in the lower right corner of the screen.

### 4.10 Liquid Line Connections

Sample line connections are made by connecting the six or eight liquid tubes from the Vision AutoPlus/AutoFill or other autosampler to the dissolution tester. These are numbered and color-coded for easy identification. They can be connected with nuts, unions, and ferrules as shown in the figure below:

![Liquid Line Connections Diagram](image)

<table>
<thead>
<tr>
<th>Position</th>
<th>Fitting Color</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Black</td>
</tr>
<tr>
<td>2</td>
<td>Red</td>
</tr>
<tr>
<td>3</td>
<td>White</td>
</tr>
<tr>
<td>4</td>
<td>Yellow</td>
</tr>
<tr>
<td>5</td>
<td>Green</td>
</tr>
<tr>
<td>6</td>
<td>Blue</td>
</tr>
<tr>
<td>7</td>
<td>Clear</td>
</tr>
<tr>
<td>8</td>
<td>Purple</td>
</tr>
</tbody>
</table>

*Fig. 4.12 Liquid Line Connections*
4.11 Security

The Vision tester can be configured to require users to log in and allows for tracking of any changes made to the protocol. The security system allows for two levels of users (managers and operators) and can accommodate up to 25 users.

Managers are given full access to the unit and allowed to make any changes to the system as required, with all of these changes being tracked by the software. All users can be configured as managers for full control of the Vision tester. One manager is required by the software. Hanson is installed as a manager from the factory. The default password for the Hanson manager is 0000.

Operators are permitted to run tests but are not allowed to make changes to protocols or other system settings. Not all users can be configured as operators; the software requires at least one user be configured as a manager.

To configure security settings, begin by selecting the Security button from the main menu and the Security Configuration screen will appear.

**Status:** Enables or disables the security feature (touch this field to toggle between these options).

**Inactivity Timeout:** The amount of time of the instrument sitting without user input before the system requires a user to log in. The range is 0 to 1:00 (hh:mm). Entering 0:00 disables the timeout function.

Only managers can display the **User List.** The users are listed alphabetically and displayed in groups of 5 per page (4 groups of 5) over 2 pages within the interface. Maximum 25 users.

To select a user, first select the group the user is in.
Select the user from the list that appears.

When the user is selected, the following can be changed:

- **Name**: The name of the user.
- **Type**: Toggles the type of user. The options are operator or manager; the default is operator.
- **Status**: The user's status. The options are locked or unlocked. An unlocked user has access to the system, a locked user does not and must be unlocked by a manager.

On the **Security** screen the following options are available to the manager:

- **Config**: Allows access to the Security Configuration screen
Archive: Allows the manager to use backup or restore functions as follows:

- **Backup:** Allows a manager to create and send a backup of the instrument’s security configuration (including the users and corresponding profiles) to a flash drive in the USB port. The security configuration is in a single file under the filename `security.bak`.

  *NOTE: The backup function will overwrite all users previously saved on the flash drive.*

- **Restore:** Allows a manager to restore the instrument’s security configuration (including users and corresponding profiles) from a flash drive in the USB port from the `security.bak` file.

  *NOTE: The Restore function restores only user profiles from the backup file, but clears all users’ passwords. All users not in the backup file will be erased.*

**Password:** Allows the user who is currently logged in to change their password.

**Add:** Allows a manager to create a new user. The screen that appears is identical to the Edit User Profile screen.

**Log Out:** Logs out the current user

With security enabled, a user can log on either by touching the upper right of the home screen where **Please Log In** or the name of the user who is logged in is displayed. Additionally, if any other input is attempted, the Vision tester will prompt the user to log in.

### 4.12 Drive Head Movement (Elite 8 Only)

The Vision G2 Elite 8 drive head can be moved by pulling the lock release lever on the left underside of the drive head (behind the handle bar), then moving the drive head up or down. Release the lever when the drive head is near the desired location. Move the drive head slightly up or down until it locks in place.

### 4.13 Paddle and Basket Installation

The spindle shaft is factory-adjusted to provide the correct height for baskets and paddles. The precision design of the Easi-Lock vessels, the shaft components, and the test unit itself are intended to reduce user adjustments and settings. It should not be necessary to adjust the position of the spindle shafts to obtain the proper height spacing between the bottom of the apparatus and the vessel. If adjustment is needed, refer to the Troubleshooting section of this user guide.

To install paddles or baskets:

1. Ensure the spindle shaft is in place.

  *NOTE: The tension of the spindle shafts can be adjusted by the application of silicone grease. If the shafts become too loose after the application of grease, they can be tightened by wiping the shaft with ethanol.*
2. Insert the threaded end of the paddle or basket shaft into the threaded opening at the bottom of the spindle shaft.

3. Rotate the paddle or basket shaft counter clockwise until the outer rim of the paddle or basket shaft contacts the spindle shaft. Turn slightly past the point of contact to ensure that the shaft will stay in place.

4. To release the paddle or basket shaft, grasp the shaft clamp, then rotate the paddle or basket shaft clockwise out of the spindle shaft. If the shaft releases with a slight pop it has been properly tightened.

When the tester is in operation, ensure that the key of the shaft clamp and the key on the spindle itself are at the same level so that they will lock together.

Fig. 4.13 Shaft Clamp and Key in Position

4.14 Vessel Cover Installation

Easi-Lock Cover

Fig. 4.14 Easi-Lock Cover 74-104-151

To install the hinged Easi-Lock vessel cover, with the drive head down (Elite 8) and shafts in place:

1. Fold the cover so that a space can be created for the spindle shaft to slide through. If an AutoMag or SuperMag is installed, align the cover with the sample probes.
2. Slide the cover so that the spindle shaft is located in the center hole and unfold the cover. The cover should rest on the vessel rim such that the notches fit around the raised keys of the vessel rim.

**ADD Cover for Vision**

![ADD Cover for Vision](image)

**Fig. 4.15 ADD Cover for Vision 74-104-152**

To install the hinged ADD Cover for Vision testers, with the drive head down (Elite 8) and shafts in place:

1. Fold the cover so that a space can be created for the spindle shaft to slide through. If an AutoMag is installed, align the cover with the sample probes.

   **NOTE: This ADD cover is compatible with the AutoMag, but NOT the SuperMag.**

2. Slide the cover so that the spindle shaft is located in the center hole and unfold the cover. The cover should rest on the vessel rim such that the notches fit around the raised keys of the vessel rim.

3. Raise the cover and ensure the door that holds the sample is closed. Once the door has been closed lower the ADD Cover for Vision into place.

4. At the appropriate time open the cap covering the sample chamber and place the sample inside.

5. Apply the cap to the sample chamber to protect the sample from moisture.

6. Ensure the push pin is installed in the cover.
To install the ADD vessel cover, with the drive head down (Elite 8) and shafts in place:

1. Open the cover and slide it around the shaft so that the spindle shaft is in the center of the cover. If an AutoMag or SuperMag is installed, align the cover with the sample probes.

   **NOTE: This ADD cover is compatible with SuperMag or AutoMag.**

2. Raise the cover and ensure the door that holds the sample is closed. Once the door has been closed, lower the ADD vessel cover back to the rim of the vessel.

3. At the appropriate time, open the cap covering the sample chamber, and place the sample inside.

4. Close the cap to ensure the sample remains sealed from moisture.

To install the clam shell cover with the drive head down (Elite 8) and shafts in place:

1. Open the cover and slide it around the shaft so that the spindle shaft is in the center of the cover. If an AutoMag is installed, align the cover with the sample probes.

   **NOTE: This cover is compatible with AutoMag or SuperMag.**

2. Close the cover around the spindle shaft and probes.

The installation of the Vision G2 dissolution tester is now complete.
5.1 Diagnostics

The **Diagnostics** button on the main menu screen launches the Vision tester diagnostic procedure. When the **Diagnostics** button is touched, a confirmation pop-up appears asking the user if they wish to run diagnostics. If **OK** is touched, the diagnostics will run. If **Cancel** is touched, the diagnostics will not run, and the operator will be returned to the menu.

This procedure performs a self test to check functionality and test the connections of the configured equipment. Failures are shown in red text on the screen. The failures of the diagnostics tests are also stored in the error log located in the **Info** screen (from main menu).

**NOTE:** For a list of errors, refer to Appendix A of this user guide.

5.2 Information

The **Info** button allows access to various system logs and other basic information about the Vision tester. Touching **Info** brings up the **Versions** screen.
The **Versions** screen provides information on the software installed on the Vision tester. This screen is also accessed by touching the **About** button located at the bottom of the info screen.

**Tester Firmware**: Version number of the tester firmware.

**Auxiliary CPU Firmware**: Version number of the auxiliary CPU firmware.

**Bootloader Firmware**: Version number of the bootloader firmware used to upgrade the tester firmware.

**Temp Controller Firmware**: Version number of the Vision Heater firmware.

**Touch Screen Firmware**: Indicates the firmware revision of the touchscreen.

**PCB Revision**: Indicates the revision of the PCB main board hardware.

**PCB Identifier**: Unique PCB identifier.

**Magazine Firmware**: Version number of the magazine firmware.

The **Instrument Logs** screen can be accessed by touching the **Logs** button at the bottom of the **Info** screen, and provides access to the event, test, and error logs by touching the respective tabs at the left side of the screen. All log screens have large, semi-transparent up and down arrows on the right side which allow the user to scroll up and down.

**Event Log**: This log provides information on what was done on the unit. This includes, but is not limited to, powering on, powering off, running diagnostics, changes to settings, or editing of protocols. The log will store the last 543 events.

**Test Log**: This log lists all the actions that occurred during the last test. It is overwritten when a new test is started.

**NOTE**: This function is equivalent to "Print Last Test" on legacy testers.
**Error Log:** This log lists all the errors that occur on the unit. This can include communication issues, diagnostic failures, or other errors. The log will store the last 331 errors. For a list of errors, refer to Appendix A.

**Test History Log:** This tab provides access to the last 8 tests run. It allows the user to select the test based on protocol name, time, and date, and to reprint the test.

The **Serial Numbers** screen allows the user to enter the serial numbers of the components connected to the Vision tester. To change the serial number, touch the field and enter the serial number. All serial numbers are limited to 9 characters. If security features are enabled these items may only be edited by a manager.

**Instrument tab:**

**Dissolution Tester:** This is the serial number for the dissolution tester itself.

**Temperature Controller:** This is the serial number for the Vision Heater.

**External Temperature Probe:** The serial number of the external temperature probe. This is read by the software directly from the probe and cannot be changed.

**Printer:** This is the serial number of the printer connected to the Vision tester, this is generally reserved for serial (validation) printers that are directly connected to the Vision tester, not through a network.

**Network Switch:** This is the serial number of the communications switch used for network communications between multiple dissolution instruments and a PostScript capable network printer.

**Apparatus tab:** All fields on the apparatus tab open up subscreens for the item. Each sub-screen has 8 fields for each of the corresponding vessel positions, which appear when the field is touched. The first few serial numbers are displayed for each item depending on the length of the serial numbers.

**Spindle Shafts:** The serial numbers of the spindle shafts

**Paddles:** The serial numbers of the paddles

**Basket Shafts:** The serial numbers of the basket shafts

**Baskets:** The serial numbers of the baskets

**Vessels:** The serial numbers of the vessels
Custom Sets [1-3]: For additional serialized accessories or apparatus which may be used on the unit. These can be changed through the Titles configuration screen. For example rotating cylinders (Apparatus 6)

Mag Temp Probes tab: Lists the serial numbers of each of the vessel temperature probes if they are installed on an AutoMag or SuperMag (Elite 8 only). These serial numbers are read directly from the probes and cannot be edited.

The Service Log screen is accessed by the Service button at the bottom of the screen. To update the service logs, touch the appropriate field for the item to be updated and the current date will be entered and, if applicable, the cycles reset to 0. When resetting any of the counters, a confirmation will be requested. The date refers to the date the action last occurred.

Last Calibrated: The date of the last calibration of the unit.

Last Preventive Maint: The date of the last preventive maintenance performed on the unit.

Number of Tests: The number of tests performed on the tester.

Belt Time (hrs): The number of hours on the belt and time since they were last replaced.

Motor Time (hrs): The number of hours on the motor and time since it was last replaced.

Heater Time (hrs): The number of hours on the heater element, and the time since it was last replaced.

Pump Time (hrs): The number of hours on the water pump, and the hours since it was last replaced.

Magazine (cycles): The number of times the magazine has moved up and down and the date since the motor was last replaced.
5.3 Display

The Display button allows the user to access the Touch Screen Settings screen.

**Brightness ( )**: This screen allows the user to adjust the brightness of the screen by using the slider under located next to the brightness symbol.

**Volume ( )**: The volume slider located next to the speaker symbol allows the user to increase or decrease the volume of the feedback sounds.

**Calibrate ( )**: This button begins the screen calibration procedure; it is recommended that a stylus be used for this to ensure the proper precision.

*NOTE: Do not use sharp objects for the calibration procedure, as the screen can be seriously damaged.*

**Default**: This button returns the touchscreen back to the factory default settings for brightness and volume.

5.4 Configuration

Touch the Config button on the menu to bring up the Device Setup screen.
The **Device Setup** screens allow the user to configure the Vision tester for communication and use with accessories. It can also be accessed by touching the **Setup** button at the bottom of the **Device Setup** screen.

**Instrument** tab: The **Instrument** tab allows for the configuration of the instrument ID and network communication settings. For more information on TCP/IP configuration, refer to Appendix B.

- **Instrument ID**: The instrument identification which will be displayed on printouts and applicable software packages. The system ID is limited to 25 characters.
- **I.P. Address**: The internet protocol address is a numerical label assigned to each instrument (sampler, tester, network printer) participating in a computer network that uses the Internet Protocol for communication.
- **Gateway Address**: The gateway address of the unit when connecting to a network.
- **Subnet Mask**: The subnet mask of the unit when connecting to a network.

**Printer** tab: The **Printer** tab allows the user to configure the printer the Vision tester will use.

- **Printer Type**: When touched, toggles the type of printer connected to the instrument.
  - **Network**: Used when the printer is connected via a TCP/IP network and supports PostScript.
  
  **NOTE**: *Network printers must support PostScript in their firmware. Printers that support PostScript through software drivers or do not support PostScript will not work.*
  
  - **RS-232**: Used when an RS-232 printer is connected.
  - **None**: Used when no printer is installed.

- **Page Format**: Toggles the paper size between **Letter** and **A4** when using a PostScript-capable network printer.
NOTE: Wrong paper size may omit lines from printout.

**IP Address**: For use when printing to PostScript-capable network printers. Allows the user to enter the IP address of the target printer.

**Printer Port**: For use when printing to PostScript-capable network printers. Allows the user to enter the appropriate port of the target printer (0-65535).

**Add Signature Line to Footer**: This adds a line for a signature and date to the bottom of printed reports (Yes or No).

**Use Duplex (if available)**: This allows for printing on both sides of a page if a network printer supports this option. Network printers which do not support duplex printing will print normally even if this is set to Yes (Yes or No).

**Use Color (if available)**: This allows for color printing if a network printer supports this option. Network printers which do not support color printing will print normally in black and white even if this is set to Yes (Yes or No).

**Accessories tab**: 

The **Accessories** tab allows the user to define the accessories installed on the Vision tester and accessories connected to the system.

**Sampler**: Configures the system for different autosamplers.

- **Vision**: Refers to the Vision AutoPlus.
- **Transfer Module**: Refers to a Waters Transfer Module as part of a Waters Alliance Dissolution System. For more information on configuring the tester for a Waters Alliance Dissolution System, refer to Appendix C.
- **None**: No autosampling system is used.

**Sampling Probe**: Toggles which type of sampling probe is connected to a system when touched. Options are **1L on a 1L Magazine**, **1L on a 2L Magazine**, or **2L on a 2L Magazine** (for use with the Vision Elite 8 AutoMag or SuperMag), or **Fixed** (when no magazine is installed).

**Digital Temperature Probes**: Toggles the Digital Temperature Probes (DTPs) installed between 0, 6, 7, and 8. This option is only visible if Magazine is selected as the sampling probe.

**Automatic Dosage Delivery**: Toggles whether or not Automatic Dosage Delivery (ADD) covers are used on the unit.
5. Operation

Titles

The Titles configuration is accessed by touching the Titles button at the bottom of the Device Setup screen. The titles configuration screen allows the user to set the desired titles for the test headers, protocols headers, and company information.

To edit any of the information, touch the field and enter the new title of the desired field. Titles are limited to 25 characters in length. For example, if instead of “Test Name” the user wanted the field titled “Lab Notebook” the user would touch the field for “Test Name” and enter the text “Lab Notebook,” which would change the field name to Lab Notebook.

Company tab

This tab allows editing of the company information. The labels for these fields cannot be changed.

Company: This is the name of the company that owns the Vision tester.

Department: The department that controls the Vision tester.

Logo: This field indicates that either the default HANSON RESEARCH logo or a CUSTOM LOGO will appear at the top of the report.

How to Load a Custom Logo

1. Prepare a jpeg image that meets the following requirements:
   a. No more than 100 pixels wide by 50 pixels high
b. 96 dpi  
c. Not more than 15 Kb in size  
d. Named logo.jpg  

2. Load the image into the root directory of a USB flash drive.  
3. Insert the USB flash drive into the USB port of the Vision AutoFilter.  
4. Touch the **Logo** field to load the logo into the Vision AutoFilter.  

**NOTE:** *The previous logo will be overwritten by the new logo. Only one logo can be present in the instrument at a time.*

**Headers** are information which applies to each individual test run, rather than a protocol. This tab allows for editing the header field names. Up to 8 header fields are available, each having a maximum length of 25 characters.

The default values for headers 1, 2, 3, and 8, respectively, are:

- **User Name**: Allows the user to enter their name or if security is enabled the name of the user logged in is automatically displayed. This label cannot be changed.
- **Test Name**: A test name if applicable.
- **Lot Number**: The lot number of the item being tested.
- **Comments**: Allows the user to add any comments which should be noted related to this test run.

The **Protocol** tab allows for editing the field of the protocol labels section. Up to 8 label fields are available, each having a maximum length of 25 characters.

The default values are:

- **Drug Name**: The name of the drug the protocol is designated to test (i.e. Aspirin).  
- **Dosage**: The dosage size of the drug to be tested (i.e. 300 mg).  
- **Protocol ID**: A secondary ID for the protocol; this does not need to be unique.
**Apparatus**: lists the apparatus used for the testing (i.e. Paddles, Baskets, Paddle over Disk).

**Media Type**: Lists the media type used for the dissolution test (i.e. Water, pH 7.4 Phosphate Buffer).

**Media Volume**: Lists the media volume used for the dissolution test (i.e. 900 mL).

The **Apparatus** tab allows for editing the field of the apparatus labels section. Up to 8 label fields are available, each having a maximum length of 25 characters.

The default values are:

- **Spindle Shafts**: The serial numbers of the spindle shafts.
- **Paddles**: The serial numbers of the paddles.
- **Basket Shafts**: The serial numbers of the basket shafts.
- **Baskets**: The serial numbers of the baskets.
- **Vessels**: The serial numbers of the vessels.
- **Custom Sets** [1-3]: For additional serialized accessories or apparatus which may be used on the unit. For example, rotating cylinders (Apparatus 6).

**Firmware Update**

The firmware update feature is accessed by touching the **Update** button at the bottom of the screen. The firmware update feature allows an operator to update the firmware of the Vision dissolution tester.

The firmware update feature uploads the file “timage.hru” from the root of the USB flash drive. The firmware update process is automated and takes up to 5 minutes to complete. Protocols, system settings, security settings, and users are not overwritten when a firmware update is performed.
5.5 Time

The time and alarm settings are accessed by touching the **Time** button on the menu. The **Edit Alarms** screen appears. This screen provides access to the alarms of the Vision tester and setting the system time and date.

The **Alarms** button at the bottom also brings up the Edit Alarms screen. There is a tab available for each alarm; the function of each alarm is listed below.

**Preheat Alarm:** This screen allows the user to enable a preheat wakeup alarm. The waterbath heats to the set point at the specified time and date. This allows the tester to be ready for the start of a workday while saving power overnight.

- **Bath Temperature:** This is the temperature that the tester will heat up to. Brings up numeric keypad. Range 25-55 °C; preset values are 32, 37, and 55 °C.
- **Alarm Time:** The time the alarm will begin the bath heating.
- **Alarm Date:** The date that the alarm will begin the tester heating (or Disabled).
- **Recurrence:** Toggles between the following values:
  - **Disabled:** The alarm will occur only once at the time and date set and will not reoccur.
  - **Enabled:** The alarm will occur at the time and date set and will recur.

The **Reset** button at the bottom of the screen will clear or turn off the selected alarm.
Every Day: The alarm occurs every day.

Every 0 days: This option brings up an Edit button, which allows the user to enter the number of days between when the alarm occurs. For example if the user entered 30 days, the alarm would occur every 30 days. The range is 2-1827 days.

Mon -> Fri: The alarm will occur every Monday through Friday.

Mon -> Sat: The alarm will occur every Monday through Saturday.

Sampling Alarm tab

This screen provides the user with the ability to enable a sampling alarm. The sampling alarm notifies the user when a sample point is eminent when running a protocol. A message is displayed on the screen with an alarm sound. The alarm will disappear after the sampling point has passed.

Sampling Alarm: Toggles the alarm between enabled or disabled.

Prenotification Time: The amount of time before a sample point the alarm begins to sound. For example if the user set the alarm to 0:01, the alarm would begin 1 minute before each sample point (0-9:59 in hh:mm).

User Alarms tab

User alarms are customizable alarms which the user can setup to display a specific message. The alarms can be used to notify users when to change the bath water, or any other routine task. The user alarms can be set for a specific time and date, and also can be set to recur.

The alarm displays a reminder message on the screen with an alarm sound. The alarm will stop when the user touches OK on the alarm notification pop-up.

Alarm Number: Toggles between the 3 user alarms available.

Alarm Time: The time the alarm will begin.
Alarm Date: The date the alarm will begin (or Disabled).

Recurrence: Toggles between the following values:

Disables: The alarm will occur only once at the time and date set and will not recur.

Every day: The alarm occurs every day.

Every 0 days: This option brings up an Edit button, which allows the user to enter the number of days between when the alarm occurs. For example if the user entered 30 days, the alarm would occur every 30 days. The range is 2-1827 days.

Mon -> Fri: The alarm will occur every Monday through Friday.

Mon -> Sat: The alarm will occur every Monday through Saturday.

Reminder: The text which is displayed when the alarm goes off. For example if the operator set this to “Change Tester Bath Water” the text “Change Tester Bath Water” would be displayed when the alarm went off. This message is not erased if the reset button is touched to reset the alarm.

The Calibration Alarm notifies the user that the calibration or preventive maintenance on the instrument is due.

Alarm Type: The type of alarm that is displayed. The options are:

Calibration: Displays a calibration due pop-up on the screen

Preventive Maintenance: Displays a Preventive Maintenance due pop-up on the screen.

Alarm Time: The time the alarm will begin.

Alarm Date: The date the alarm will begin (or Disabled).

Recurrence: Toggles between the following values:

Disables: The alarm will occur only once at the time and date set and will not recur.

Every day: The alarm occurs every day.

Every 0 days: This option brings up an Edit button, which allows the user to enter the number of days between when the alarm occurs. For example if the user entered 30 days, the alarm would occur every 30 days. The range is 2-1827 days.

Mon -> Fri: The alarm will occur every Monday through Friday.
**Mon -> Sat:** The alarm will occur every Monday through Saturday.

The **Edit Time/Date** screen is accessed by touching the **Time/Date** button located along the bottom of the Edit Alarms screen. It allows the user to set the time and date on the tester.

![Edit Alarms Screen](image)

The **System Date** format is displayed as DD-MMM-YYYY where DD is the day (01-31), MMM is the current month (Jan – Dec), and YYYY is the year in the long format (2009-2999). The entry of the format is numerical having the format DD-MM-YYYY.

The **System Time** format is 24 hour time (military time) as HH:MM where HH is the current hour (00-24) and MM is the current minute (00-59).

**NOTE:** The system clock is powered by a capacitor. If the system is left unplugged for 2 weeks, then the time and date will have to be reset. The system must be plugged in at least 5 minutes for the capacitor to reach sufficient charge to maintain the time and date when the system is powered off.

![Edit Time/Date Screen](image)
5.6 Tools

Touching the Tools button on the main menu displays the Tools screen.

This provides access to the Magazine Calibration screen first (only available when an AutoMag or SuperMag is installed and Auto-Probes are configured in the Config menu). This screen allows the user to calibrate the AutoMag or SuperMag and provides access to basic control for movement of the magazine.

The Magazine Calibration screen is also accessed by touching the Cal Mag button at the bottom of the screen.

Mag Sample Travel: This field is the depth at which the Magazine will travel to when the sample button is touched.

Up: Moves the Magazine up.

ADD: Moves the Magazine down to the height to trigger Auto Dosage Delivery covers.

Home: Homes the Magazine by raising it up against the drive head then moving it down a set amount.

Sample: Moves the Magazine to the sample position specified in the Mag Sample Travel field.

Calibrate: This button runs the magazine calibration procedure. The AutoMag is calibrated before it leaves the factory. However, if it needs to be recalibrated, use the following procedure from the Magazine Calibration screen:

1. Place the AutoMag calibration tool in the center of the vessel plate. (See Fig. 5.1 for placement.)

NOTE: Before touching the Calibrate button, ensure that the magazine calibration tool is in place on the vessel plate below the drive screw.
Fig. 5.1 AutoMag Calibration Tool in Place

2. Touch the **Calibrate** button. This will bring up a pop-up screen that asks if the calibration tool is in place. Select **OK** to confirm.

3. The AutoMag or SuperMag will lower, then stall on the calibration tool, then return to the home position. Once this cycle completes, the magazine is calibrated.

Touch the **Cal Temp** button at the bottom of the screen for the **Adjust Temp Probe Offset** screen. This screen allows the user to adjust the offsets to each of the temperature probes installed on the tester and within the Vision Heater.

There are two tabs, **Instrument Probes** and **Vessel Probes**. To adjust the offset of a probe, touch the field in which it is listed and a numeric keypad will appear. Enter the correct temperature as measured by an NIST traceable thermometer to make the correction.
**NOTE:** If “--.--” is displayed in any of the fields, that indicates there is an issue with that temperature probe. Contact Technical Support for assistance.

**Instrument Probes** tab:

*External:* The external temperature probe installed on the dissolution tester

*Heater:* The temperature probe located in the heater which controls the rate at which the heater is heating the bath water.

*Safety:* This is for reference and technical support only. The offset cannot be adjusted.

**Vessel Probes** tab: Each of the vessel probes are listed and can be adjusted independently.

**Log Instrument Temperatures** screen is accessed by touching the Log Temp button at the bottom of the screen.

This screen allows users with only an external temperature probe to log bath and vessel temperatures to the printer.

**NOTE:** If “Probe Error” is displayed there is an issue with the temperature probe. Contact Technical Support for assistance.
Up (↑) and Down (↓) Arrows: These buttons cycle through the vessels (1 through 8) and the bath.

Log: This button will print the temperature of the selected position. If a serial validation printer is installed, the temperatures will print each time the Log button is pressed. If a PostScript network printer is installed, the temperatures will print when the operator leaves the Log Instrument Temperatures screen.

If a test is running, the elapsed time will replace the buttons at the bottom of the screen. A Log button will appear on the pop-up when starting or ending a test. This allows the user to log temperatures before, during, and after a test and ensure those temperatures will appear in the test log.

Remote Command screen is accessed by touching the Control button at the bottom of the screen.

This screen provides access to the Vision tester service and support functions. The button for this screen does not appear to operators if security features are enabled.

NOTE: The Remote Command screen should only be used when instructed by Hanson Research Hanson Technical Support.
5.7 Protocols

Protocols can be accessed by touching the Protocols button on the main menu, or from the home screen by touching the [Select Protocol] or protocol name displayed in the upper left corner of the home screen.

Protocols are a list of parameters and events that are required to perform a dissolution test. These parameters can be modified to accommodate the user needs. Up to 100 different protocols can be stored.

The Recent tab displays the 20 protocols which were used most recently.

The Page # tabs display the protocols in alphabetical order based on protocol name.

The protocols are listed alphabetically by protocol name in groups of 5 over 5 pages within the interface. The options available for protocols are shown on the buttons on the right side of the screen when all protocols are displayed:
**Checksum**: This button generates a unique checksum for the protocols. This can be used to ensure a restored set of protocols is identical to the original set. When touched, the **Protocols check** pop-up is displayed, which first informs the user the value is being calculated, then displays the calculated value.

For example, an operator touches the **Checksum** button and obtains a value of 0EA4. The operator then changes a protocol label by 1 character. When the operator touches the **Checksum** button again, it will generate a different value.

This feature can be used to ensure that backups and restorations of protocols are identical to the originals. The feature can also be used by managers to ensure that protocols have not been changed without authorization.

**Archive**: Allows **Backup** and **Restore** functions.

**Backup**: This button saves all existing protocols on a USB flash drive. When this button is touched, the protocol backup pop-up is displayed. The pop-up prompts the user to insert a flash drive into the USB slot if it is not inserted. If the flash drive is already inserted, the protocols are written to the drive and the pop-up disappears. The protocols are saved in a single file named **dproto.bak**.

**Restore**: This button allows protocols to be restored from the flash drive inserted into the USB port. All protocols will be restored from the **dproto.bak** file.
NOTE: The restore function will produce an exact copy of the protocols on the flash drive. All existing protocols will be overwritten.

If the dproto.bak file does not exist, then a pop-up error message is displayed and the message is also written to the error log. The message asks the user to confirm protocol restoration. If the user touches No, then the protocols will not be restored. If the user touches Yes, all the protocols will be overwritten.

Import: This button allows the user to import all previously exported protocols from a flash drive inserted into the USB port. Protocols must have been previously exported to the flash drive in order to import them. Only protocols with differing protocol names will be added. Existing protocols may be overwritten if the user confirms an overwrite; otherwise, the existing protocol will remain.

<table>
<thead>
<tr>
<th>Term</th>
<th>2.14 file name</th>
<th>2.20 file name</th>
<th>Used for</th>
<th>Existing Protocols / Users</th>
<th>Data sent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Backup</td>
<td>proto.bak</td>
<td>dproto.bak</td>
<td>All protocols or users</td>
<td>Overwritten</td>
<td>Writes to USB drive</td>
</tr>
<tr>
<td>Restore</td>
<td>proto.bak</td>
<td>dproto.bak</td>
<td>All protocols or users</td>
<td>Overwritten</td>
<td>Copies from USB drive</td>
</tr>
<tr>
<td>Export</td>
<td>*.hpf</td>
<td>*.hpd</td>
<td>Single protocols</td>
<td>Kept</td>
<td>Writes to USB drive</td>
</tr>
<tr>
<td>Import</td>
<td>*.hpf</td>
<td>*.hpd</td>
<td>Single protocols</td>
<td>Kept</td>
<td>Copies from USB drive</td>
</tr>
</tbody>
</table>

Figure 5.2 Summary of USB Transfer Functions

Add: Allows the user to create a new protocol.

To select an existing protocol, first select the group it is in.

Select the individual protocol on the following screen. The revision date of each protocol is displayed and cannot be directly edited. If security features are enabled, the last user to edit the protocol is displayed.
The following options are available once a protocol is selected, beginning with the tabs along the bottom of the screen:

**Export**: Exports the open protocol to a USB flash drive. The exported protocols are saved with an `.hdp` extension.

**Copy**: Creates a copy of the open protocol for the user to work on. The copy is immediately opened for editing and the protocol name has **(Copy)** added to the end. If the protocol name is too long, part of it may be overwritten.

**Delete**: Deletes the open protocol.

**Print**: Prints the selected protocol.

Tabs available on the Protocol screen are as follows:

**Labels** tab:

The **Labels** tab provides the user a place to list the protocol name, as well as other information on the protocol:

**Protocol Name**: This is the name of the protocol and must be unique. The Protocol Name is how the protocols are organized on the protocol selection screens.

**NOTE: Do not use a comma (,) in the Protocol Name field. Doing so will cause communication issues with the dissolution tester.**
**Comments:** Allows the user to add any notes specific to the protocol.

The following field names can also be edited by the user though the configuration settings on the title screen.

**Drug Name:** The name of the drug the protocol is designated to test (e.g., prednisone).

**Dosage:** The dosage size of the drug to be tested (e.g., 300 mg).

**Apparatus:** Lists the apparatus used for the testing (i.e., Paddles, Baskets, Paddle over Disk, or apparatus number [e.g., 2]).

**Protocol ID:** A secondary identifier for the protocol. This does not need to be unique like the Protocol Name.

**Media Type:** Lists the media type used for the dissolution test (e.g., Water, pH 7.4 Phosphate Buffer).

**Media Volume:** Lists the media volume used for the dissolution test (e.g., 900 mL).

**Dissolution tab:**

The **Dissolution** tab provides information and settings for the dissolution test.

**Drive Speed:** The target drive speed for the dissolution test. Range is 0, 25-250 rpm.

**Speed Tolerance:** The tolerance for the motor speed for a dissolution test. The default value is ± 4% of the set point. Range is 0 (off), 1-10%.

**Tester Temperature:** The target tester temperature of the dissolution tester. Range is 0, 25.00 - 55.00°C.

**Temperature Tolerance:** The tolerance for the primary temperature probe on the dissolution tester. The default value is ± 0.5 °C. Range is 0 (off), 0.10 to 5.00 °C.

**Test Length:** the total time of the dissolution test. The range is 0-999:00 (hh:mm).

**Digital Temp Probes:** Allows vessel temperature probes mounted on the AutoMag or SuperMag of the Vision Elite 8 to be monitored during the test. The options are Enabled or Disabled.
Print Interval: The interval at which the tester status (speed, temperature, etc.) will be printed. The range is 0 to 999:00 (hh:mm). If the user does not wish the status to print the Print Interval should be set to 00:00.

NOTE: The tester status is printed by default at all sample points, even if the print interval is set to 00:00.

Vessel Goal Temperature: The desired temperature of the vessels. This is option is only applicable when Digital Temp Probes field is set to Enabled. The range is 0 (off), 25.00 to 55.00 °C.

Sampling tab:

If the Vision (G2) AutoPlus is being used, the protocol can be exported to it and these settings will be used for the automated sampling.

NOTE: A stand-alone tester will only run protocols with the sampling mode set to Manual.

Sampling Mode: determines the type of sampling procedure:

Collect Only: The AutoPlus collects a sample.

Manual: For manual sampling. When manual sampling is selected, the user has the option of defining how long the paddles remain spinning after a test has ended, to allow for collection of the last sample. This time is entered in the Stagger Extension field.

Collect and Detect: a sample is collected and the system pauses for the Read Delay for detection by UV/Vis spectrophotometric analysis.

Rack Type: The type of rack used for sample collection during the test. 16 x 100 (default), 12 x 32, and UPLC 12 x 32. If the wrong rack is installed, the test will not start.
Rinse Volume: The amount of volume pumped before detection or collection is done. The range is 0-99.9 mL. This volume should be large enough to ensure that old material in the lines is rinsed past the needles of the collector and/or UV cells to ensure the sample collected or detected is representative of what is in the vessels of the tester. The default value is 7 mL.

**NOTE:** If a Vision AutoFilter is installed, this volume is pumped without a filter in place.

Rinse Volume with filter: This field is only visible if a Vision AutoFilter is installed. This is the sample rinse volume pumped with a filter in place. The range is 0-99.9 mL. A minimum of 3 mL is recommended. This option is not visible if the AutoFilter option in the protocol is set to No. A filter icon is present to indicate this volume is pumped with a filter in place.

Collect Volume: The volume collected into test tubes or vials during a sampling cycle. The range is 0-99.9 mL. The maximum for 16 x 100 test tubes is recommended to be no more than 15 mL; for 12 x 32 vials, no more than 1.5 mL. This function only applies to Collect Only and Collect and Detect modes.

Media Replace: Volume from the media replace source (typically Source C if configured) to be transferred to the current source after sampling. The range is 0-99.9 mL.

If the AutoFilter is configured for pull-through, an option is available to select whether or not the AutoFilter will keep a filter in place for the Media Replace step. If enabled an icon of a filter will appear in the Media Replace field.

Generally the Media Replace volume should be set to be the same as the total of the Rinse Volume and the Collect Volume. For systems that use a Retrieval Reservoir, the media replace volume should be same as the Collect Volume.

Detect Volume: The volume pumped after detection by a UV spectrophotometer. Only applicable with Collect and Detect mode. The range is 0-99.9 mL. This volume must be less than the Collect Volume.

Read Delay: This is the time required to hold the flow cell full for detection, and should be programmed to the time required to analyze all the flow cells used. It is the length of the pause that occurs between the collection volume and detect volume. This option is only applicable with Collect and Detect mode. The range is 0 to 12,000 seconds.

Magazine Travel: This parameter defines magazine stroke from home to the sampling position. The range is 0 (disabled) to 100 mm (for 1 L vessels) or 140 mm (for 2 L vessels). The default value is 60 mm. Preset options for magazine travel are Baskets 500, Baskets 900, Paddles 500, Paddles 900, Small Vol, and Chinese Small Vol for selecting predetermined sampling height based on apparatus and commonly used media volume in the vessels.

For example, Baskets 500 would be a preset value for the proper magazine travel in a test involving 500 mL of media in each vessel.
The travel values are approximate and fine tuning may be necessary. The suggested travel values do not account for additional distance that may be needed due to tip filters.

**Auto Dosage Delivery Delay**: If Auto Dosage Delivery covers are installed on the Vision Elite 8, this value is the delay between when the ADD covers are triggered, and the time the test starts. The recommended value for this is 5 seconds. The range is 0 (disabled) to 99 seconds.

**Tester Offset Time**: This determines the offset between the testers when running multiple testers. The minimum recommended value is 0:05 minutes. The range is 0:00 – 1:30 (hh:mm).

The **Options** tab allows for testing options to be set outside of sampling and dissolution tester settings.

**Auto-Start Test**: This option allows the user to determine if the test will automatically start. For the types of auto-starts, see the testing section. The options available are:

- **Enabled**: The protocol will automatically start once the conditions are reached.
- **Disabled**: The protocol will not automatically start once the conditions are reached and it must be started manually.
- **Prompt**: When the protocol is set up to run, the user will be prompted if they want to automatically start the test or not.

**Pre-Start Rinse Time**: Allows the user to set the Vision G2 AutoPlus to start the pumping ahead of the scheduled sampling time to allow for fine tuning sample points. The range is 0-3600 seconds.
**Backflush Filter:** When enabled, the system will withdraw 1 mL of sample and return it to the source before the sampling cycle begins in order to clean material out of any installed filters. The options are **Yes** or **No**.

**NOTE:** The pumping for the Backflush Filter option begins on the second sample point.

**Auto Wash At End:** When enabled, the instrument will perform a wash routine at the end of the test. The wash routine is defined in the automatic syringe control screen.

**Infinity Test Length:** The length of the infinity test which follows the dissolution test. If no infinity test is desired set this value to 0:00. The range is 0:00 to 9:59 in h:mm format.

**NOTE:** The infinity test begins after the dissolution test is over. For example, if a dissolution test was 2 hours, with a 30 minute infinity test, the user would need to set a sample point at 2:30 (h:mm) to collect an infinity test sample.

**Infinity Test Speed:** Sets the speed of the infinity test that follows the normal test. The range is 0, 25 to 250 rpm.

**Retrieval Volume:** The volume that will be pumped out of the Retrieval Reservoir and back to a dissolution tester when the Retrieval Reservoir is used. An option is available to select whether or not the AutoFilter will keep a filter in place for the Retrieval Volume step. A filter icon will appear in the Retrieval Volume field if the option to use a filter is selected.

The range is 0 to 99.9 mL; the recommended retrieval volume is 1.5x the sample rinse volume. For example, if the rinse volume is 8 mL, the retrieval volume should be set to 12 mL.

**Use AutoFilter:** This setting toggles whether or not the AutoFilter will be used for this protocol. If **Yes**, the AutoFilter will change filters at the programmed times. If **No**, then the coupling assembly of the AutoFilter will remain in the through position.

The **Events** tab allows the user to add events or modify the **Event Table**.

The **Event Table** is a sequence of up to 50 events that will take place at user-programmed times. There are two types of events, sampling and remote commands. Sampling events must have a time assigned to it. Remote command
events may occur during the test, **pre-run** (before the test), or **post-run** (after the test).

**NOTE:** Pre-run and post-run events cannot be sampling events.

**Pre-Run:** Events programmed as a pre-run event will occur before the test begins.

*For example, an operator programs a pre-run event of Drive Speed for 25 rpm. Prior to the test starting the motor will spin at 25 rpm. When the test begins, the motor will go to the speed programmed on the **Dissolution** tab.*

**Post-Run:** Events programmed as post-run will occur after the test has completed.

*For example, an operator programs a post-run event of Bath Temp for 40 °C. Once the test completes, the bath temperature will be set to 40 °C.*

To edit or delete an event, touch the field in which it appears; this will open the **Edit Event** screen.

To add a new event, touch the **Add Event** button; the following screen is displayed:

The **Add Event** screen allows the user to add an event or events to the event table.

**Start Time:** This defines the start of the first event. The range is 0:00 to 999:00 (hh:mm). Preset buttons are **Pre-Run** and **Post-Run**.

**NOTE:** A warning will appear if sample points may overlap due to the protocol settings. This warning is based on the total volume pumped by the AutoPlus at each sample point, testers configured, tester offset time, and AutoFilter use. The warning will appear when the user attempts to save the protocol. The warning will not appear if the user views the protocol without making any changes.
**Event Type:** This defines the type of event that is to occur. By default, all events are sampling events. An **(S)** before the event indicates that it is performed by the **Sampler.** A **(T)** before the event indicates it is performed by the **Tester.** A **(B)** before the event indicates it is performed by either or **Both** the autosampler and dissolution tester. An **(F)** indicates the command is performed by the **Filter Changer.**

**(S) Sample:** Collects a sample. If an AutoFilter is installed options will appear to modify the sampling process. The syntax is **RF** or **CF, Tester.** If the AutoFilter is installed and the field is left blank, the AutoFilter will change filters at every sample event.

- **CF:** Instructs the AutoFilter to change the filter on the specified sample point.
- **RF:** Instructs the AutoFilter to reuse the filter for the specified sample point.
- **Tester:** A, B, or C as appropriate.

*For example:*

- **RF:** *The filter will be reused for all testers on this sample point.*
- **CF,B:** *The filter will be changed on tester B. Tester A will reuse the filter from the previous sample point.*

**(S) Backflush Filter:** The options are **Enabled** or **Disabled.** This draws 1 mL of media from the vessels on the dissolution tester, then pumps the media out back to the vessels, before a sampling cycle begins. This removes any particles that might clog the tip filter.

**(T) Bath Temp:** The parameter is a temperature value. It allows the user to set a new dissolution tester bath temperature.

**(F) Change Filter:** Instructs the Vision AutoFilter to change a filter. The parameters are the testers (A, B, or C) for which the filter is changed.

*For example, if B was entered, the AutoFilter would change a filter for the sample on tester B, but would not change the filter for tester A.*

**(S) Collect Volume:** This allows the user to set a new collection volume for the test.
(B) Delay: This allows the user to set a delay for the start of the test. The delay waits for the specified amount of time. Range 1 to 12,000 sec. It is valid for Pre-Run only.

**NOTE:** To stop paddle rotation temporarily during a dissolution test, use the Pause event.

(S) Detect Volume: The parameter is the detection volume. It allows the user to set a new Detect Volume for the test.

(S) Dilute: The options are (dilution) Volume, Rinse (volume), Source, StartRow, and RowCount. It allows the user to perform a dilution at the time of the event rather than after each sample (dilution event). The range is 0 to 99.9 mL.

**NOTE:** The Dilute event is only compatible with port B or port C set as a media source. It will not function with Home Port 2 set as a media source.

For example, if the user programmed a Dilute event at 2 hours with 5, 7, C, 3, 10, the AutoPlus would first rinse from C to D with 7 mL, then pump 5 mL from source C in to rows 3 through 13.

(S) Dilution: The options are Volume, Rinse, and Source. It allows the user to perform a dilution during the test. The range is 0 to 99.9 mL. Set volumes to 0.0 to turn off.

For example, for a dilution volume of 5 mL, a rinse of 7 mL, and a source C, the parameter would read: 5,7,C.

(F) Discard Filter: The AutoFilter discards the current filter. The parameters are the tester.

For example, if an operator entered A, the filter would be discarded for tester A sample points.

(S) Dispense Flow Rate: The parameter is speed of the syringes while dispensing. This changes the speed at which the Vision G2 AutoPlus syringes dispense material. The range is 0.6 to 23.8 mL/min. The default setting is 19.0 mL/min.

**NOTE:** 19.0 mL/min. should not be exceeded, or the Vision G2 AutoPlus could be damaged.

(T) Drive Speed: The parameter is the tester drive speed. It allows the user to set a new motor speed for the dissolution tester. The range is 0 for off, or 25 to 250 rpm.

(F) Filtered Media Replace: Toggles whether or not the media replace is done with a filter in place. The options are yes and no.

(F) Filtered Retrieval: Toggles whether or not the retrieval volume is pumped with a filter in place. The options are yes and no.
(S) Load Flow Rate: The parameter is speed of the syringes while loading. This changes the speed at which the Vision G2 AutoPlus syringes load material. The range is 0.6 to 23.8 mL/min. The default setting is 19.0 mL/min.

NOTE: 19.0 mL/min. should not be exceeded, or the Vision G2 AutoPlus could be damaged.

(T) Magazine Travel: This parameter defines magazine stroke from home to the sampling position. The range is 0 (disabled) to 100 mm (for 1 L vessels) or 140 mm (for 2 L vessels). The default value is 60 mm. Preset options for magazine travel are Baskets 500, Baskets 900, Paddles 500, Paddles 900, Small Vol, and Chinese Small Vol for selecting predetermined sampling height based on apparatus and commonly used media volume in the vessels.

For example, Baskets 500 would be a preset value for the proper magazine travel in a test involving 500 mL of media in each vessel.

(S) Media Replace: The parameter is volume, and the range is 0 to 99.9 mL. This changes the media replace volume pumped during the test.

(T) Pause: The parameter is time in minutes from 1 to 999. This stops the spindles on the testers from spinning for the specified amount of time. The tester will then count up for the duration of the pause, while the total elapsed time is held constant.

For example, if a pause was programmed for 2 minutes, the paddles would stop spinning for 2 minutes, then resume spinning after the 2 minutes had expired.

(T) Print Interval: The parameter is the interval between printing. This changes the print interval for printing the status of the dissolution testers.

(B) Print Statistics: This prints the current statistics for the test. There are no parameters for this command.

(T) ProbeDown: Moves the AutoMag down.

(T) ProbeUp: Moves the AutoMag up.

(B) Prompt: This creates a pop up message box with a message. The message may be up to 11 characters in length.

(S) Read Delay: This changes the read delay when working with collect and detect protocols. The parameter is time; the range is 0 to 12,000 sec.

(S) Retrieval Volume: This changes the volume pulled when operating the Retrieval Reservoir; the range is 0 to 99.9 mL.

(F) Reuse Filter: This instructs the AutoFilter to reuse a filter. If a filter is not coupled, but is in the hold position, the filter will be reused for the sample point. If a filter is already in the filter coupled position, then the filter will be kept in place. If there is not a filter in the filter coupled position or on
the shuttle assembly, then a new filter is loaded. The parameters are the testers that the filter will be reused for.

*For example, if a A,B were entered, the filter would be reused for tester A and B at the next sample point.*

(S) **Rinse Volume:** This allows the user to set a new sample rinse volume (0 to 99.9 mL) during the test.

(S) **Rinse Volume with Filter:** This allows the user to set a new sample rinse volume with a filter (0 to 99.9 mL) during the test.

(A) **Send to Serial:** The options are **PortNum** and **Text. Text** is the string that is sent to the port. **PortNum** refers to the port number of the Vision instrument.

1 – Host port
2 – Printer
3 – Collector (for AutoPlus) or Vision Heater (for tester). This port is not applicable to the AutoFilter.

(T) **Speed Tolerance:** This changes the dissolution tester motor speed tolerance for the protocol. The options are 0 (disabled), or 1 to 10%.

(T) **Status:** This allows the user to get an automatic status at the specified time. The speed and temperature is reported.

(T) **Temperature Tolerance:** This changes the dissolution tester temperature tolerance for the protocol. The options are 0 (disabled), or 0.1 to 5.00 °C.

(S) **Transfer:** The options are **Volume, Source, Destination.** It allows the user to transfer a specified volume of solution from a specified source to a specified destination.

*For example, if a transfer of 5 mL from source C to source A is desired, the parameter would read: 5,C,A.*

The following sources/targets are available when using a Transfer command in the event table of a protocol.

**U:** This source/target keeps the needles up. It is useful as a source to pull air into the syringes to dry out the lines. It can also be used to push any remaining media back to the vessel.

**W:** This source/target lowers the needles into Home Port 2 of the AutoFill.

**H:** This lowers the needles into the Home Port 1 (or waste port) of the AutoFill.

**1-25:** This can be used as a target only. This target will lower the needles into the corresponding row of the rack.
For example, if “10” was entered, the needles would lower in the 10th row of the installed rack.

D: Keep the collector in the current position when the transfer will occur. Using D will not lower the needles of the collector when performing transfers!

(F) Uncouple and Hold Filter: This instructs the AutoFilter to uncouple and move the filter to the load position. The parameters are the testers.

For example, if the user put in A,B, the filter would be uncoupled and put in the load position for testers A and B.

(S) Valve Delay: This changes the dispense valve delay when an AutoPlus is working in conjunction with an AutoFilter. The delay allows extra pressure caused by the filter to bleed off, allowing for more accurate transfer volumes. The delay is changed only when a filter is coupled in the AutoFilter. The parameter is the time in seconds. The default value for this is 7 seconds. A minimum of 5 seconds is recommended.

(B) Vessel Goal Temperature: The parameter is the temperature value. It allows the user to change the desired vessel temperature when used with Digital Temperature Probes (DTPs) on the Vision Elite 8 AutoMag. The options are 0 (for disabled), or 25 to 55 °C.

Number of Events: This allows the user to set the number of times this event will occur. By default, only one occurrence of the event is created. For multiple occurrences, the first event begins at the start time.

Interval Between Events: This allows the user to set the interval between the events occurring when multiple events are being added to the event table, in the format hh:mm, where hh is hours and mm is minutes. The range varies depending on the number of events and the sampling times.
5.8 How to Program a Protocol

Below are the instructions on how to program a basic protocol.

1. Touch the **Menu** button on the home screen to bring up the menu.

![Menu Button](image)

2. Touch the **Protocols** button on the menu to bring up the protocol screen.

![Protocols Button](image)

3. Touch the **Add** button to create a new protocol.

![Add Button](image)

4. The **Labels** tab of the protocol will appear. Begin by editing the protocol name. Protocol names must be unique and be set before the protocol can be saved. To change the protocol name, touch the **Protocol Name** field and enter an appropriate protocol name.

![Labels Tab](image)

5. Touch the other fields to enter the appropriate information for each of those fields. When finished, touch the **Dissolution** tab on the left side of the screen.

![Dissolution Tab](image)
6. Begin by entering the drive speed for the dissolution testers by touching the **Drive Speed** field.

7. Once the drive speed is entered, touch the other fields to enter the appropriate information. When finished, touch the **Sampling** tab.

8. Touch the **Sampling Mode** field to set the appropriate sampling mode.

9. With the correct sampling mode entered, proceed to enter the rest of the information by touching the appropriate fields. When finished entering the information, touch the **Options** tab on the left.
10. Configure the options as appropriate for the protocol by touching on the fields. When finished, touch the **Events** tab on the left.

11. Touch the **Add Event** button on the bottom to add a new event.

12. Select the **Start Time** of the first event, then the **Event Type** by touching the respective fields. If there is more than one of the event, as with sampling, touch the number of events field to set the total number of events (for example, sample points). Finally touch the Interval Between Events field to set the time that occurs between the events.

13. When the event is configured, touch the **Save** button on the bottom right to add the event to the events table.

14. If an event is not desired (for example, an extra sample point), touch the field the event appears in.

15. On the **Edit Event** screen touch the **Delete** button to remove the event.
16. If no changes are needed, touch the **Exit** button in the bottom right of the screen to save the protocol.
6. Test Menu

When starting a test on the Vision tester, a number of screens appear that are unique to the process. These options appear once **Start** is touched on the home screen.

The **Prev ( )** and **Next ( )** buttons are common to each screen. **Next ( )** advances the user to the next screen in the process of starting a test. The **Prev ( )** button allows the user to return to the previous screen.

The header information screen allows the user to enter information specific to that test run. The labels for the headers can be changed through the configuration screens. The fields are:

- **User Name:** Allows the user to enter a name, or if security is enabled, the name of the user logged in is automatically displayed.
- **Test Name:** Allows the user to enter a test name, if applicable.
- **Lot Number:** Allows the user to input the lot number of the item being tested.
- **Comments:** Allows the user to add any comments related to the test run.

Select the options as appropriate for the test. The following options are available on the **Test Options** screen.

- **Heater Off At End Of Test:** This option causes the Vision tester to turn off the heater at the end of the dissolution test in order to reduce power consumption.
Auto Start: Displays if the protocol will automatically start when conditions are met. If Auto Start is disabled in the protocol, this field is locked as “No.” If Auto Start within the protocol is set to Prompt or Yes, the field can be changed to the following Auto Start options:

**When Temp Ready:** Starts the test when the bath temperature is within specification.

**At Set Time:** Starts the test at a specific date and time regardless of temperature. This adds date and time fields which allow the user to set the time and date the test will start.

**Temp and Time:** Starts the test when both the temperature and time are met. If the tester temperature is not within specification at the programmed time, the test will start when the temperature is within specification. If the tester is at the correct temperature before the programmed time, the test will start at the programmed time.

**Start Date:** The date the test is scheduled to begin.

**Start Time:** The time the test is scheduled to begin.

### 6.2 How to Use the Quick Start

1. Begin at the home screen and ensure the temperature is correct for running the test.

2. Touch the RPM SETPOINT field (0.0 unless a test is running). Enter the speed of the test and touch the Quick Start button in the bottom right.

   *NOTE: Do not use the preset buttons, as this will start the spindles moving immediately.*

3. Touch the Elapsed Time field and set a test length, if desired. If no test length is set, the test will run until the user touches the Stop button in the lower right corner of the home screen.

   *NOTE: If Quick Start is not selected, the Elapsed Time field will not respond when touched.*
4. Touch the Start button in the bottom right corner.

5. A pop-up will appear, asking the user to Run, Abort, or Log.
   a. To start the test touch Run.
   b. To abort the test, touch Abort.
   c. To log temperatures prior to dropping a tablet, touch Log.

6. When Run is touched, the spindles will begin to turn at the set point. The test will continue until the user touches the Stop button located in the lower right corner of the home screen, or until the test length set in step 3 has elapsed.

6.3 How to Start a Test

1. To start a test, first begin at the home screen and touch protocol name or [Select Protocol] text in the upper left hand corner of the screen.

2. Review the loaded protocol and touch the Exit button if ok. Otherwise, select the correct protocol from the list, then touch Exit, then Exit again to return to the home screen.
3. Press the **Start** button located on the lower right corner of the home screen.

4. Enter the appropriate information in the Header screen. This is for information only and will appear on printed reports. When finished press the **Next** button at the bottom of the screen.

5. Select the options as appropriate for the test. The following options are available on the test option screen. Once the options are set press the **Run Test** button.

6. The Vision tester will return to the home screen. If Auto Start is not enabled, the tester will prompt the user to drop the dosage and press the **Run** button, starting the test (or **Abort** to cancel).
6.4 Manual Staggered Start with Vision G2 Tester(s)

1. Confirm the vessels, paddles, or baskets and basket shafts are clean and in good condition. Install them in their designated positions.

2. Confirm the heights of apparatus from the vessel bottom using a height gauge.

3. On the tester, touch the temperature to bring up the Temp Setpoint screen. Enter the desired temperature (+0.10 °C of the desired vessel temperature is recommended) and touch OK.

4. Raise the apparatus out of the vessels by pulling up on the spindle shafts, or in the case of a Vision Elite 8, raising the drive head.

5. Fill the vessels with media.

6. Prepare the apparatus:
   a. Baskets
      i. Raise the spindle shafts to their highest point.
      ii. If using a Vision Elite 8, lower the drive head to the testing position.
      iii. Cover the vessels
      iv. Allow the media to stabilize.
   b. Paddles
      i. Lower the paddles into the media to about 1 cm above the testing height. If using a Vision Elite 8 the drive head should be lowered.
      ii. Cover the vessels and allow the media to stabilize.
   c. Paddles with ADD Cover
      i. Close the chamber of the ADD cover by pressing the hinged portion on the bottom of the cover closed.
      ii. Lower the paddles into the media to the testing height. If using a Vision Elite 8, the drive head should be lowered.
      iii. Cover the vessels and allow the media to stabilize.

7. Once the media has stabilized, ensure the protocol is loaded by checking the upper left corner of the screen. If the correct protocol is loaded, do nothing. If it is not, touch the upper left corner of the screen, then touch Exit and select the protocol to be used for testing.

8. Touch the Start button in the lower right corner of the screen. Enter the header information as appropriate, then touch Next.

9. Prepare the apparatus:
   a. Baskets
      i. Place the dosage in each of the baskets and install the baskets on the basket shafts.
      ii. In the case of the Vision Elite 8, lower the drive head to the testing position with all 8 spindle shafts pulled up, taking care that the baskets do not come into contact with the vessel covers.
      iii. Remove the cover over position 1.
iv. Lower the basket on position 1 to the testing position and touch **Run** to start the test.

v. Replace the vessel cover over position 1.

vi. Repeat the previous steps for the remaining positions in turn, based on the desired stagger time.

b. **Paddles**

   i. Drop the dosage into vessel 1 by lifting up the side of the vessel cover and inserting the dosage through the opening into the vessel while grasping the spindle clamp so the paddle does not spin.

   ii. Push the paddle down into the testing position and touch **Run** to start the test.

   iii. Replace the vessel cover over position 1.

   iv. Repeat the previous steps for each of the remaining positions in turn, based on the desired stagger time.

c. **Paddles with ADD cover**

   i. Place the dosage in each of the dose tubes located on the ADD cover for all positions.

   ii. Place the dose caps on top of the dose tubes for all positions.

   iii. Drop the dosage into position 1 by depressing the push pin.

   iv. Touch **Run** to start the test.

   v. Replace the vessel cover over position 1.

   vi. Repeat the previous steps for each of the remaining positions in turn based on the desired stagger time.
6.5 Manual Simultaneous Start with Vision G2 Tester(s)

1. Confirm the vessels, paddles, or baskets and baskets shafts are clean and in good condition. Install them into their designated positions.

2. Confirm the heights of apparatus from the vessel bottom using a height gauge.

3. On the tester, touch the temperature to bring up the set temperature screen. Enter the desired temperature (+ 0.10 °C of the desired vessel temperature is recommended) and touch **OK**.

4. Raise the apparatus out of the vessels by pulling up on the spindle shafts to their highest point, or in the case of a Vision Elite 8, raising the drive head to its highest point.

5. Fill the vessels with media.

6. Prepare the apparatus:
   a. Baskets
      i. Cover the vessels.
      ii. Allow the media to stabilize.
   b. Paddles
      i. Lower the paddles into the testing position. If using a Vision Elite 8, lower the drive head.
      ii. Cover the vessels and allow the media to stabilize.
   c. Paddles with ADD Cover
      i. Lower the paddles into the testing position. If using a Vision Elite 8, lower the drive head.
      ii. Close the chamber of the ADD cover by pressing the hinged portion on the bottom of the cover closed.
      ii. Cover the vessels and allow the media to stabilize.

7. Once the media is stabilized, ensure the protocol is loaded by checking the upper left corner of the screen. If the correct protocol is loaded, do nothing. If it is not, touch the upper left corner of the screen, then touch **Exit** and select the protocol to be used for testing.

8. Touch the **Start** button in the lower right corner of the screen. Enter the header information as appropriate, then touch **Next**.

9. Prepare the apparatus:
   a. Baskets - Classic 6
      i. Place the dosage in each basket and install the baskets on the basket shafts.
      ii. Remove the vessel cover over each of the positions.
      iii. Lower the baskets on all positions rapidly.
      iv. Touch **Run** to start the test.
      v. Replace the vessel covers over each of the positions.
   b. Baskets - Elite 8
      i. Place the dosage in each basket and install the baskets on the basket shafts.
ii. Remove the vessel cover over each of the positions.
iii. Lower the drive head to the testing position.
iv. Touch Run to start the test.
v. Replace the vessel covers over each of the positions.

c. Paddles
i. Remove the vessel cover over each of the positions.
ii. Rapidly drop a dosage in each position.
iii. Touch Run to start the test.
iv. Replace the vessel covers over each position.

c. Paddles with ADD cover
i. Place the dosage in each of the dose tubes located on the ADD cover for all positions.
ii. Place the dose caps on top of the dose tubes for all positions.
iii. Drop the dosage into all positions by depressing the push pins on each cover.
iv. Touch Run to start the test.
6.6 Manual (or 3rd Party Autosampling) Using AutoMag with Digital Temperature Probes (DTPs)

1. Confirm the vessels, paddles, or baskets and basket shafts are clean and in good condition. Install them in their designated positions.
2. Confirm the heights of apparatus from the vessel bottom using a height gauge.
3. On the tester, touch the temperature to bring up the set temperature screen. Enter the desired temperature (+ 0.10 °C of the desired vessel temperature is recommended) and touch OK.
4. Raise the apparatus out of the vessels by raising the drive head.
5. Fill the vessels with media.
6. Prepare the apparatus:
   a. Baskets - Elite 8
      i. Lower the spindles so they are at their lowest point; do not move the drive head.
      ii. Cover the vessels
      iii. Allow the media to stabilize.
   b. Paddles
      i. Lower the drive head to the testing position.
      ii. Cover the vessels and allow the media to stabilize.
   c. Paddles with ADD Cover
      i. Lower the drive head to the testing position.
      ii. Close the chamber of the ADD cover by pressing the hinged portion on the bottom of the cover closed.
      iii. Cover the vessels and allow the media to stabilize.
7. Once the media has stabilized, ensure the protocol is loaded by checking the upper left corner of the screen. If the correct protocol is loaded, do nothing. If it is not, touch the upper left corner of the screen, then touch Exit and select the protocol to be used for testing.
8. Touch the Start button in the lower right corner of the screen. Enter the header information as appropriate, then touch Next ( ).
9. Prepare the apparatus as instructed below. Once the test is running, the AutoMag will lower and begin monitoring the vessel temperatures if configured to do so.
   a. Baskets - Elite 8
      i. Place the dosage in each basket and install the baskets on the basket shafts.
      ii. Remove the vessel cover over each of the positions.
      iii. Lower the drive head to the testing position.
      iv. Touch Run to start the test.
      v. Replace the vessel covers over each of the positions.
b. Paddles
   i. Remove the vessel cover over each of the positions.
   ii. Rapidly drop a dosage in each position.
   iii. Touch **Run** to start the test.
   iv. Replace the vessel covers over each position.

c. Paddles with ADD cover
   i. Place the dosage in each of the dose tubes located on the ADD cover for all positions.
   ii. Place the dose caps on top of the dose tubes for all positions.
   iii. Drop the dosage into all positions by depressing the push pins on each cover.
   iv. Touch **Run** to start the test.
6.7 Small Volume Vessels

1. Confirm the small volume vessels and mini paddles are clean and in good condition. Install them in their designated positions.

2. On the tester, touch the temperature to bring up the set temperature screen. Enter the desired temperature (+ 0.10 °C of the desired vessel temperature is recommended) and touch OK.

3. Fill vessels with media. Pull the spindles up to the highest level. Lower drive head if using an Elite 8.

4. Place covers on vessel.

5. Once the media has stabilized, ensure the protocol is loaded by checking the upper left corner of the screen. If the correct protocol is loaded, do nothing. If it is not, touch the upper left corner of the screen, then touch Exit and select the protocol to be used for testing.

6. Touch the Start button in the lower right corner of the screen. Enter the header information as appropriate, then touch Next.

7. Lift the cover and drop the dosage into the first position.

8. Touch Run.

9. Once the appropriate offset has passed, drop the next dosage into position 2, and so on. Recommended offset time between positions is 2 minutes.

6.8 Immersion Cell

1. Confirm the small volume vessels and mini paddles are clean and in good condition. Install them in their designated positions.

2. On the tester, touch the temperature to bring up the set temperature screen. Enter the desired temperature (+ 0.10 °C of the desired vessel temperature is recommended) and touch OK.

3. Fill vessels with media. Pull the spindles up to the highest level. Lower drive head if using an Elite 8.

4. Place covers on vessel.

5. Once the media has stabilized, ensure the protocol is loaded by checking the upper left corner of the screen. If the correct protocol is loaded, do nothing. If it is not, touch the upper left corner of the screen, then touch Exit and select the protocol to be used for testing.

6. Touch the Start button in the lower right corner of the screen. Enter the header information as appropriate, then touch Next.

7. Use the installation rod to place the first cell into position 1.

8. Touch Run.

9. Once the appropriate offset has passed, place the next cell into position 2, and so on. Recommended offset time between positions is 2 minutes.
7.1 Contacting Hanson Research Corporation for Technical Support

For technical support, please submit a TSR form located at http://www.hansonresearch.com/tsr.htm or e-mail techsupport@hansonresearch.com

If you require phone support, please call 800.821.8165 or 818.882.7266 and select the option for Technical Support. Please have the following information available:

1. Instrument Type
2. Serial Number
3. Firmware Version
4. What is the system configuration? How is the Vision tester connected to other equipment?
5. How long did the equipment work before the problem occurred?
6. How old is the equipment?
7. Were there any recent repairs or maintenance on the unit?
8. How is the system being used? What is the application?
9. Detailed information about the problem. What is working and what is not?
10. The troubleshooting steps that have already been taken.
## 7.2 Electrical Troubleshooting

<table>
<thead>
<tr>
<th>Problem</th>
<th>Possible Causes</th>
<th>Recommended Action</th>
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</thead>
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<td>Display is dark</td>
<td>Tester is not turned on.</td>
<td>Use power switch to turn tester on.</td>
</tr>
<tr>
<td></td>
<td>Tester is not plugged in.</td>
<td>Ensure tester is plugged into an outlet that is delivering power.</td>
</tr>
<tr>
<td>USB functions not working</td>
<td>USB Drive is not formatted.</td>
<td>The Hanson USB drive has already been formatted. If using another USB drive, format using a PC.</td>
</tr>
<tr>
<td></td>
<td>USB drive is damaged.</td>
<td>Use another USB drive.</td>
</tr>
<tr>
<td></td>
<td>Monument board is damaged.</td>
<td>Replace monument board.</td>
</tr>
<tr>
<td>System does not make noise</td>
<td>Speaker volume set to 0.</td>
<td>Use Display screen to raise speaker volume.</td>
</tr>
<tr>
<td></td>
<td>Display board is damaged.</td>
<td>Replace display board.</td>
</tr>
<tr>
<td>Screen is illuminated but system not responsive</td>
<td>System has frozen.</td>
<td>Note last action, reboot system. Report issue to Hanson Technical Support.</td>
</tr>
<tr>
<td></td>
<td>Touchscreen requires calibration.</td>
<td>If possible, recalibrate through display screen. If display screen cannot be reached, reboot system and touch the screen during the logo splash screen.</td>
</tr>
</tbody>
</table>
### 7.3 Mechanical Troubleshooting

<table>
<thead>
<tr>
<th>Problem</th>
<th>Possible Causes</th>
<th>Recommended Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Excessive vibration in system</td>
<td>Belts are too tight or too loose.</td>
<td>Replace or adjust belts according to maintenance procedure in this manual.</td>
</tr>
<tr>
<td></td>
<td>Tester is not level.</td>
<td>Ensure all feet of tester are secure on bench.</td>
</tr>
<tr>
<td></td>
<td>Alignment nut of high stand tester may be loose.</td>
<td>Tighten alignment nut.</td>
</tr>
<tr>
<td>Paddle/Basket heights not correct</td>
<td>Improper operation</td>
<td>Confirm that spindle clamp and spindle are properly engaged.</td>
</tr>
<tr>
<td></td>
<td>Clamp has loosened or spindle shaft replaced.</td>
<td>Confirm that paddle or basket shaft is properly tightened in spindle shaft.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Perform the spindle height adjustment procedure listed in Maintenance section.</td>
</tr>
</tbody>
</table>
### 7.4 Heater Troubleshooting

<table>
<thead>
<tr>
<th>Problem</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tester doesn't communicate with heater</td>
</tr>
<tr>
<td>Main Check Error when tester heats up beyond a certain temperature</td>
</tr>
<tr>
<td>Tester heats up to different temperature than set point</td>
</tr>
<tr>
<td>When measuring temperature, Probe Error or --.-- is displayed</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Possible Causes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heater not turned on.</td>
</tr>
<tr>
<td>Heater not connected.</td>
</tr>
<tr>
<td>Board Failure.</td>
</tr>
<tr>
<td>Component failure.</td>
</tr>
<tr>
<td>Set point has changed due to test starting.</td>
</tr>
<tr>
<td>Offset for heater probe is incorrect.</td>
</tr>
<tr>
<td>Heater probe has failed.</td>
</tr>
<tr>
<td>External temperature probe offset is incorrect.</td>
</tr>
<tr>
<td>External temperature probe has failed.</td>
</tr>
<tr>
<td>Probe is disconnected.</td>
</tr>
<tr>
<td>Probe is damaged.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Recommended Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Turn on heater.</td>
</tr>
<tr>
<td>Connect heater to tester using RS-232 cable to Temp Control ports.</td>
</tr>
<tr>
<td>Contact Hanson Technical Support.</td>
</tr>
<tr>
<td>Contact Hanson Technical Support.</td>
</tr>
<tr>
<td>Confirm set point on main screen.</td>
</tr>
<tr>
<td>Correct heater probe offset on probe calibration screen.</td>
</tr>
<tr>
<td>Replace heater probe.</td>
</tr>
<tr>
<td>Correct external probe offset on probe calibration screen.</td>
</tr>
<tr>
<td>Replace external temperature probe.</td>
</tr>
<tr>
<td>Reconnect temperature probe.</td>
</tr>
<tr>
<td>Contact Technical Support.</td>
</tr>
</tbody>
</table>
### 7.5 AutoMag/SuperMag Troubleshooting

<table>
<thead>
<tr>
<th>Problem</th>
<th>Possible Causes</th>
<th>Recommended Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Magazine is not moving the proper distance</td>
<td>Magazine may not be calibrated.</td>
<td>Perform magazine calibration.</td>
</tr>
<tr>
<td></td>
<td>Protocol not setup for proper sample distance.</td>
<td>Change Magazine Travel in protocol.</td>
</tr>
<tr>
<td>Magazine is not moving at all.</td>
<td>Magazine not configured.</td>
<td>Ensure protocol makes use of magazine.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Ensure magazine is setup in Device Setup.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Contact Hanson Research Technical Support.</td>
</tr>
<tr>
<td>Vessel temperature probes not working.</td>
<td>Vessel temperature probes not configured.</td>
<td>Ensure probes are configured for 6, 7 or 8 probes as appropriate in device setup.</td>
</tr>
<tr>
<td></td>
<td>Vessel temperature probes not connected.</td>
<td>Ensure that probes are connected to tester main board.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Contact Hanson Research Technical Support.</td>
</tr>
<tr>
<td>When measuring temperature, <strong>Probe Error</strong> or --.-- is displayed</td>
<td>Probe is disconnected.</td>
<td>Reconnect temperature probe.</td>
</tr>
<tr>
<td></td>
<td>Probe is damaged.</td>
<td>Contact Technical Support.</td>
</tr>
</tbody>
</table>
## 7. Troubleshooting

### 7.6 Serial (Validation) Printer Troubleshooting

<table>
<thead>
<tr>
<th>Problem</th>
<th>Possible Causes</th>
<th>Recommended Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Light always blinks</td>
<td>No paper.</td>
<td>Replace paper roll.</td>
</tr>
<tr>
<td></td>
<td>Paper incorrectly installed.</td>
<td>Check paper to see that it is installed correctly and that the paper indicator button is not stuck. Consult printer operation manual.</td>
</tr>
<tr>
<td>Prints a little and then light blinks</td>
<td>Paper incorrectly installed.</td>
<td>Check paper to see that it is installed correctly and that the paper indicator button is not stuck. Consult printer operation manual.</td>
</tr>
<tr>
<td>Will not print</td>
<td>No paper.</td>
<td>Replace paper roll.</td>
</tr>
<tr>
<td></td>
<td>Paper incorrectly installed.</td>
<td>Check paper to see that it is installed correctly and that the paper indicator button is not stuck. Consult printer operation manual.</td>
</tr>
<tr>
<td></td>
<td>Printer not connected.</td>
<td>Connect printer.</td>
</tr>
</tbody>
</table>

### 7.7 Serial (Validation) Printer Self Test

Turn power off, hold down the LF button, and turn power back on. When unit begins to print, release button.

### 7.8 Network Printer Troubleshooting

<table>
<thead>
<tr>
<th>Problem</th>
<th>Possible Causes</th>
<th>Recommended Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tester will not print</td>
<td>IP Address incorrect.</td>
<td>Set the IP address of tester to work with printer.</td>
</tr>
<tr>
<td></td>
<td>No PostScript support.</td>
<td>Switch to a printer with PostScript supported by the printer firmware.</td>
</tr>
<tr>
<td></td>
<td>Printer settings incorrect.</td>
<td>Ensure printer settings are correct for printer in system configuration.</td>
</tr>
</tbody>
</table>
8.1 Scheduled Maintenance Overview

After Each Test

Clean up any spills or dissolution media wherever it was spilled on the system. Wipe down the system with a clean damp cloth when finished.

Rinse baskets, basket shafts, paddles, and/or vessels with DI or better quality water. Avoid harsh detergents which may damage the materials.

Weekly

Inspect bath water for algae or other contaminants. Drain and replace if necessary.

Monthly

Replace bath water, regardless of condition, to prevent algae growth.

Every 6 Months

Check the temperature and motor speed calibration.

Inspect the spindles for smooth rotation.

Inspect the o-rings to ensure that the spindle shafts are held securely.

Annually

Inspect the drive belts and idler pulleys.

Every Two Years

Replace drive belts.

8.2 O-Ring Inspection and Replacement

1. To inspect o-rings, raise the spindle shaft up so that the end of the spindle shaft is flush with the bottom of the spindle. Release any grip on the clamps and observe the spindle shaft.

2. If the spindle shaft slips, the o-rings are in need of replacement. If the spindle shaft remains where it is, then the o-rings are fine.

3. To replace o-rings use the o-ring replacement tool (74-107-003).

4. The top o-ring can be removed using the hook end of the tool and sliding it to the o-ring through the slot in the spindle.

5. The bottom o-ring requires that the o-ring first be pushed out, using the small dowel pin. With the o-ring pushed out slightly toward the center of the spindle, it can be hooked using the tool.

6. When replacing the o-rings, use the tool to guide each o-ring into place; the spindle shaft can be used to help roll it into place.
8.3 Belt Replacement

1. Remove the spindle shafts from the tester.
2. Grasp the drive head cover on both sides and lift straight up to remove the cover.
3. Locate the tensioner(s) for the drive belts. The Classic 6 has one tensioner located near the center of the drive head. The Elite 8 has two tensioners, one near the drive motor at the rear center of the instrument, and one near the monument toward the front center of the instrument.
4. Use a 5/32 hex key to loosen the tensioner – do not remove the tensioner.
5. Loosen and remove the belt from the spindles.
6. Route the new belt around the spindles and tensioners in the same manner as the old belt.
7. Slide the tensioner to add tension to the drive belt. Proper tension will be when the belt can be gently deflected 6-10 mm between spindles 5 and 6 on the Elite 8, or spindles 2 and 3 on the Classic 6.
8. Replace the cover by aligning it over the spindles and monument and then pressing down until it pops back into place.
9. Reinstall the spindle shafts.

8.4 Heater and Temperature Probe Adjustment

1. Place an NIST traceable thermometer next to the temperature probe.
2. From the home screen, touch the Menu button followed by the Tools button.
3. Touch the Cal Temp button at the bottom of the screen.
4. Locate the probe on the Instrument or Vessel Probes tab and touch that field.
5. Use the numeric keypad to enter the temperature on the NIST traceable thermometer, then touch OK.

8.5 Spindle Shaft Height Adjustment

1. Install either the paddle or basket shaft with basket into the spindle shaft.
2. Place a height set gauge (from the Height Set and Check kit) in the bottom of the vessel of the affected position.
3. Gently lower the paddle or basket so it rests on top of the height gauge.
4. Using a hex key, loosen the bolt on the spindle shaft clamp.
5. Adjust the spindle clamp so that it is properly engaged to the spindle. Make sure that the paddle or basket is still resting on top of the height gauge.
6. Tighten the spindle clamp using the same hex key.
7. Confirm the height of any apparatus used in that spindle position. If not all apparatuses meet the necessary height requirements, contact Hanson Technical Support.
9. Moving and Storage

If the Vision tester will not be used for a short period of time (3 days or more), the instrument should be cleaned and the power should be turned off. If the tester will not be used for an extended period of time (30 days or more), the instrument should be cleaned, drained, covered, and unplugged from the power source.

The instrument is heavy and great care should be taken when moving it. If the instrument is moved to a new location, revalidation should be considered.

Two people are required to lift the Classic 6 and/or the Elite 8 dissolution tester. Lifting should be done with one person situated on each side of the instrument. Lift the equipment by the base frame.

*NOTE: Lifting without assistance may cause injury.*
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## A.1. Vision Errors

<table>
<thead>
<tr>
<th>Error Code</th>
<th>Title</th>
<th>Message</th>
<th>Fault</th>
<th>Check the Following</th>
</tr>
</thead>
<tbody>
<tr>
<td>0001</td>
<td>Backup Error</td>
<td>Corrupted data encountered during backup. Contact Tech Support.</td>
<td>Cannot open one of the protocols on the monument board when backing up the protocols.</td>
<td>1. Try a new USB drive. 2. Try a new copy of the backup file.</td>
</tr>
<tr>
<td>0002</td>
<td>USB Drive Backup Error</td>
<td>Error accessing the protocol backup file on the USB drive. Make sure the USB drive has enough space.</td>
<td>Cannot read or write the protocols backup file from the USB flash drive when restoring protocols from the USB drive.</td>
<td>1. Try a new USB drive. 2. Try a new copy of the backup file.</td>
</tr>
<tr>
<td>0003</td>
<td>Restore Error</td>
<td>Error restoring the protocols from a protocol backup file in the instrument memory.</td>
<td>When restoring protocols from a backup, the checksum of the backup file was checked one more time.</td>
<td>1. Try a new USB drive. 2. Try a new copy of the backup file.</td>
</tr>
<tr>
<td>0004</td>
<td>USB Drive Restore Error</td>
<td>Error accessing the protocol backup file on the USB drive. The protocol backup file on the USB drive is corrupt.</td>
<td>Corrupted protocols backup file or the backup file contains protocols of an unknown version.</td>
<td>1. Try a new USB drive. 2. Try a new copy of the backup file.</td>
</tr>
<tr>
<td>0005</td>
<td>USB Drive Write Error</td>
<td>Error occurred while writing data to the USB drive. Make sure the USB drive has enough space.</td>
<td>Information could not be sent to USB flash drive.</td>
<td>1. Unsupported USB flash drive 2. Mount board failure</td>
</tr>
<tr>
<td>0006</td>
<td>Could Not Import Logo</td>
<td>Make sure the logo.jpg file being imported has the correct format as described in the User</td>
<td>Logo.jpg does not meet system requirements.</td>
<td>Logo.jpg requirements in User Guide</td>
</tr>
<tr>
<td>0009</td>
<td>Instrument Memory Error</td>
<td>Error occurred while accessing instrument memory. Contact Tech Support.</td>
<td>Error Reading or Writing information to the instrument memory located on the monument board.</td>
<td>1. Normal after a firmware update - should not persist after first reboot</td>
</tr>
<tr>
<td>0010</td>
<td>Instrument Memory Error</td>
<td>Error occurred while calculating the protocols checksum. Contact Tech Support.</td>
<td>Error Reading data from the instrument memory or corrupted data in the instrument memory.</td>
<td>Contact Technical Support</td>
</tr>
<tr>
<td>0011</td>
<td>I2C Bus Error</td>
<td>I2C Bus Error detected. Restart the instrument. If the problem persists, contact Tech Support.</td>
<td>The system detected I2C bus error.</td>
<td>1. Monument board failure 2. Main board failure</td>
</tr>
<tr>
<td>0012</td>
<td>SPI Bus Error</td>
<td>SPI Bus Error detected. Restart the instrument. If the problem persists, contact Tech Support.</td>
<td>The system detected SPI bus error.</td>
<td>1. Monument board failure 2. Main board failure</td>
</tr>
<tr>
<td>0013</td>
<td>Checksum Error</td>
<td>Error occurred while calculating the protocols checksum. Contact Tech Support.</td>
<td>System is unable to calculate a checksum for the protocols.</td>
<td>1. Monument board failure 2. Main board failure or corrupted memory or corrupted firmware update</td>
</tr>
<tr>
<td>0014</td>
<td>Firmware Update Failed</td>
<td>Firmware update failed. Contact Tech Support.</td>
<td>Part of the firmware update process failed to work.</td>
<td>1. Firmware file may be corrupted 2. Monument board failure</td>
</tr>
<tr>
<td>0015</td>
<td>Display Image Version Mismatch</td>
<td>Display image version mismatch. Contact Tech Support.</td>
<td>Firmware image does not match display firmware, or unexpected display image version returned by the system.</td>
<td>1. Display firmware is compatible with system firmware</td>
</tr>
<tr>
<td>0016</td>
<td>Version Compatibility Error</td>
<td>The firmware versions of the instruments in the system are not compatible. Contact Tech Support.</td>
<td>Mistmatched firmware between different instruments.</td>
<td>Compatibility of firmware between instruments</td>
</tr>
<tr>
<td>0017</td>
<td>Test Log Full</td>
<td>Test log is full. Update the protocol so it generates less test log data.</td>
<td>The test has generated more data than is capable of fitting in the instruments memory.</td>
<td>Occurrence of print status messages</td>
</tr>
<tr>
<td>0018</td>
<td>Auto-Start Can’t Be in Past</td>
<td>Check current time and set Auto-Start time in the future.</td>
<td>User set Auto-Start in the past.</td>
<td>Auto-Start date set in the future</td>
</tr>
<tr>
<td>0019</td>
<td>Temp Tolerance Error X °C</td>
<td>The drive speed is outside of the tolerance. Contact Tech Support.</td>
<td>Temperature reached an out of tolerance value during a test.</td>
<td>1. Pump flow 2. Temperature probe accuracy</td>
</tr>
<tr>
<td>0020</td>
<td>Speed Tolerance Error X rpm</td>
<td>The drive speed is outside of the tolerance. Contact Tech Support.</td>
<td>Motor speed reached an out of tolerance value during the test.</td>
<td>Contact Technical Support</td>
</tr>
<tr>
<td>0021</td>
<td>Vessel X Tolerance Error: X</td>
<td>The printer is not communicating. Make sure the printer is online and connected.</td>
<td>Temperature reached an out of tolerance value during a test.</td>
<td>1. Pump flow 2. Temperature probe accuracy</td>
</tr>
<tr>
<td>0022</td>
<td>Printer Comm. Error</td>
<td>The printer is not communicating. Make sure the printer is online and connected.</td>
<td>The printer is off or not configured correctly.</td>
<td>1. Printer connection 2. Printer tab in system configuration</td>
</tr>
<tr>
<td>0023</td>
<td>Protocol Has No Name</td>
<td>Protocol has no name. Assign a name for the protocol or delete the protocol.</td>
<td>Protocol name field is blank.</td>
<td>Protocol name filed in protocol</td>
</tr>
</tbody>
</table>
## Vision G2 Testers User Guide

### Appendix A: Errors

<table>
<thead>
<tr>
<th>Error Code</th>
<th>Title</th>
<th>Message</th>
<th>Fault</th>
<th>Check the Following</th>
</tr>
</thead>
<tbody>
<tr>
<td>0024</td>
<td>Protocol Name Already in Use</td>
<td>Protocol name already in use. Choose a different name for the protocol.</td>
<td>Protocol name is in use by another protocol.</td>
<td>Protocol name filed in protocol</td>
</tr>
<tr>
<td>0025</td>
<td>Protocols at Maximum</td>
<td>Maximum number of protocols reached (100). Cannot continue.</td>
<td>Action would create more than 100 protocols.</td>
<td>Unused protocols should be removed.</td>
</tr>
<tr>
<td>0026</td>
<td>Events Beyond Max Number</td>
<td>This selection creates more than the allowed number of individual events.</td>
<td>The number of programmed events has exceeded 50.</td>
<td>1. Occurrence field of events 2. Total events number 50 or less</td>
</tr>
<tr>
<td>0027</td>
<td>Events Beyond Max Time</td>
<td>One or more event times are beyond the max test length. Check the User.</td>
<td>Events cannot occur past 999:00 (hh:mm).</td>
<td>1. Occurrence field of events 2. Time between events field</td>
</tr>
<tr>
<td>0028</td>
<td>AutoMag Configuration Mismatch</td>
<td>AutoMag configuration and the protocol do not match.</td>
<td>Magazine travel in protocol exceeds that of configured AutoMag.</td>
<td>1. Magazine travel field for protocol 2. System configuration of AutoMag</td>
</tr>
<tr>
<td>0029</td>
<td>Not Configured for AutoMag</td>
<td>Tester not configured for AutoMag required by the protocol.</td>
<td>A protocol has a magazine travel set to something besides 0 when no AutoMag is present in the protocol.</td>
<td>2. System configuration of AutoMag</td>
</tr>
<tr>
<td>0030</td>
<td>Need DTP for Vessel Goal Temp</td>
<td>DTPs need to be enabled for non-zero Vessel Goal Temperature.</td>
<td>Protocol parameter conflict; enable DTPs in protocol.</td>
<td>1. The vessel temperature field for protocol 2. System configuration of Digital Temperature</td>
</tr>
<tr>
<td>0031</td>
<td>AutoDosage Delay for AutoStart</td>
<td>Need AutoDosage delay value for using AutoStart. 5 seconds is recommended.</td>
<td>Protocol parameter conflict; specify AutoDosage delay.</td>
<td>1. Auto Dosage Delivery covers configuration 2. Auto Dosage Delivery delay setting</td>
</tr>
<tr>
<td>0032</td>
<td>ADD Configuration Mismatch</td>
<td>ADD configuration and the protocol do not match.</td>
<td>The protocol specifies use of Auto-Start, but Auto Dosage Delivery covers are not configured.</td>
<td>1. Auto Dosage Delivery covers configuration 2. Auto Dosage Delivery delay setting</td>
</tr>
<tr>
<td>0033</td>
<td>Delay Only for Pre- or Post-Run</td>
<td>Delay events are only valid for Pre-run or Post-run events.</td>
<td>User tried to set delay event during test.</td>
<td>Pause event in User Guide</td>
</tr>
<tr>
<td>0034</td>
<td>Illegal Parameter at Event X</td>
<td>Event X has illegal parameter value. Update the protocol and use a valid parameter.</td>
<td>One of the parameters of the specified event is incorrect.</td>
<td>Event and User Guide for proper syntax</td>
</tr>
<tr>
<td>0035</td>
<td>Illegal Parameter</td>
<td>The parameter value specified is invalid. Use a valid parameter.</td>
<td>One of the parameters of the specified event is incorrect.</td>
<td>Event and User Guide for proper syntax</td>
</tr>
<tr>
<td>0036</td>
<td>No Pre- or Post-Run samples</td>
<td>Pre-run or Post-run time sampling not supported. Set sample event during test.</td>
<td>User tried to sample in pre-run or post-run. Sampling events occur during testing.</td>
<td></td>
</tr>
<tr>
<td>0037</td>
<td>1 Pre/Post-Run Event at a Time</td>
<td>Pre- and Post-run events can only be made one at a time. Change Number of Events to 1.</td>
<td>The occurrence was greater than 1 when creating a pre- or post-run event.</td>
<td>The occurrence field when creating an event</td>
</tr>
<tr>
<td>0038</td>
<td>Real Time Clock Error</td>
<td>Set the date and time of the instrument. If the problem persists, contact Tech Support.</td>
<td>Time or date not set or corrupted, reported when the instrument is powered on.</td>
<td>1. Time and date set 2. Instrument powered on for 5 minutes</td>
</tr>
<tr>
<td>0039</td>
<td>Incorrect Alarm Date/Time</td>
<td>The alarm cannot be set in the past. Check current time.</td>
<td>User attempted to set alarm in the past.</td>
<td>Alarm set for the future</td>
</tr>
<tr>
<td>0040</td>
<td>System Date Not Set</td>
<td>System date needs to be set before setting alarm date.</td>
<td>System date has not been set.</td>
<td>System date</td>
</tr>
<tr>
<td>0041</td>
<td>System Date Not Set</td>
<td>System date needs to be set before setting alarm time.</td>
<td>System date has not been set.</td>
<td>System date</td>
</tr>
<tr>
<td>0042</td>
<td>System Date Not Set</td>
<td>System date needs to be set before setting start date.</td>
<td>System date has not been set or has been corrupted.</td>
<td>System date</td>
</tr>
<tr>
<td>0043</td>
<td>System Date Not Set</td>
<td>System date needs to be set before setting start time.</td>
<td>System date has not been set or has been corrupted.</td>
<td>System date</td>
</tr>
<tr>
<td>0044</td>
<td>Password Change Failed</td>
<td>Re-entered password didn't match the new password.</td>
<td>The re-entered password didn't match the first password entered.</td>
<td>Password and verification should match.</td>
</tr>
<tr>
<td>0045</td>
<td>Collect Must Be &gt; Detect Vol</td>
<td>The collect volume can't be lower than the detect volume. Increase Collect volume or lower Detect volume.</td>
<td>The detect volume is the same as or greater than the collect volume.</td>
<td>Collect volume is greater than the detect volume.</td>
</tr>
</tbody>
</table>
## Appendix A: Errors

### A.2. Vision Tester Errors

<table>
<thead>
<tr>
<th>Error Code</th>
<th>Error Title</th>
<th>Message</th>
<th>Fault</th>
<th>Check the Following</th>
</tr>
</thead>
</table>
| 1000       | AutoMag Error at Event X     | AutoMag misaligned or jammed. Check for obstructions.                   | The tester detected the AutoMag did not move, or did not move as expected at the event. | 1. AutoMag misaligned or jammed  
2. AutoMag motor connection  
3. AutoMag motor failure  
4. Main board failure |
| 1001       | AutoMag Error                | AutoMag not homed. Home the AutoMag.                                    | The AutoMag was not homed properly. Home the AutoMag before running the test. | 1. AutoMag misaligned or jammed  
2. AutoMag motor connection  
3. AutoMag motor failure  
4. Main board failure |
| 1002       | AutoMag Homing Error         | AutoMag is unable to home against drive plate. Contact Tech Support.    | AutoMag did not detect upper home position.                           | 1. AutoMag is able to home against drive plate  
2. The AutoMag motor failure |
| 1003       | AutoMag Comm Error           | Cannot communicate with AutoMag or wrong probe configuration. Check system configuration. |                                                                      |                                                                                      |
| 1004       | DTP X Missing                |                                                                           |                                                                      |                                                                                      |
| 1005       | DTP Configuration Error      |                                                                           |                                                                      |                                                                                      |
| 1006       | DTP Communication Error      |                                                                           |                                                                      |                                                                                      |
| 1007       | DTP Configuration Mismatch   | DTP configuration and protocol do not match.                            | The protocol is trying to use DTPs that are not configured. Enable DTPs in configuration. | 1. The vessel temperature field for protocol  
2. System configuration of Digital Temperature Probes |
| 1008       | Probe Offset Out of Range    | Desired offset is outside the range of -9.99 through 9.99. Check offset. If the problem persists, contact Tech Support. | User tried to apply an offset greater than 9.99 or less than -9.99. | 1. Probe offset is entered correctly  
2. Temperature probe failure |
| 1009       | External Probe Error         | Cannot communicate with the external temperature probe. Make sure the probe is connected. | The tester can't communicate with the external temperature probe. | 1. External temperature probe connection  
2. External temperature probe failure  
3. Main board failure |
| 1010       | External Probe Comm. Error   |                                                                           |                                                                      |                                                                                      |
| 1011       | External Probe Bad Temp Read |                                                                           |                                                                      |                                                                                      |
| 1012       | Auxiliary CPU Error          |                                                                           |                                                                      | Main board failure                                                                  |
| 1013       | Speed Tolerance Error        |                                                                           |                                                                      | 1. Check the motor  
2. Check the belt  
3. Check the main board |
| 1014       | Set Sampling to Manual       | Collect or Collect and Detect protocols must be run on the AutoPlus. Set Sampling to Manual. | User has tried to run a protocol with automation on a tester. | Sampling Mode field for protocol. |
### A.3. Vision Heater Errors

<table>
<thead>
<tr>
<th>Error Code</th>
<th>Error Message Title</th>
<th>Message</th>
<th>Fault</th>
</tr>
</thead>
<tbody>
<tr>
<td>1500</td>
<td>Heater Comm. Error</td>
<td>The Vision Heater is not communicating. Make sure the Vision Heater is online and connected.</td>
<td>The tester and heater are not communicating.</td>
</tr>
<tr>
<td>1501</td>
<td>Heater Control Test Error</td>
<td>The tester external temperature probe did not record a rise in temperature during a heating test.</td>
<td>1. External probe in bath water 2. Bath is full 3. Heater is heating</td>
</tr>
<tr>
<td>1503</td>
<td>Heater Power Error</td>
<td>Vision Heater coil is not receiving power. Turn off the heater for 10 min. If the problem persists, contact Tech Support.</td>
<td>Heater coil is not receiving power.</td>
</tr>
<tr>
<td>1505</td>
<td>Heater Comm. Shutdown</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1506</td>
<td>Heater Temp Rise Error</td>
<td>Vision Heater is heating up too quickly. Make sure the Vision Heater is primed. The safety probe has been triggered.</td>
<td>Heater is heating up too quickly.</td>
</tr>
<tr>
<td>1507</td>
<td>Heater Probe Bad Reading</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1508</td>
<td>Safety Probe Bad Reading</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1509</td>
<td>Heater High-Temp Error</td>
<td>Vision Heater High-Temp Error</td>
<td></td>
</tr>
<tr>
<td>1510</td>
<td>Heater High-Current Error</td>
<td>Vision Heater High-Current Error</td>
<td></td>
</tr>
</tbody>
</table>

Check the Following:

- Vision Heater power
- Vision Heater connection
- Inlet probe connection
- Inlet probe failure
- Heater board failure
- Safety probe connection
- Safety probe failure
- Priming of the pump
- Safety probe accuracy
- Heater board failure
B. Networking

B.1. Networks

A network is a series of devices that are connected together and able to communicate with each other. The Vision G2 dissolution testers and samplers communicate with each other as a network using TCP/IP protocols.

In order for the Vision G2 AutoPlus to communicate with the Vision dissolution testers, it must be connected through a network switch. The AutoPlus and testers each communicate through a TCP/IP protocol which requires a unique IP address, default gateway address, and subnet mask.

A network PostScript capable printer may be connected directly to the switch if the operator wants to use this printer while keeping the system isolated from the larger corporate network.

B.2. Isolated Networks

If the operator wishes to have an isolated system, then the switch does not need to be connected to anything else, other than the AutoPlus and testers.

![Diagram of network setup]

An isolated Hanson Vision G2 system should be setup as follows:

- **Vision G2 AutoPlus**
  - IP Address: 192.168.1.10
  - Default Gateway: 192.168.1.1
  - Subnet Mask: 255.255.255.0

- **Vision Dissolution Tester 1**
  - IP Address: 192.168.1.20
  - Default Gateway: 192.168.1.1
  - Subnet Mask: 255.255.255.0

- **Vision Dissolution Tester 2**
  - IP Address: 192.168.1.21
  - Default Gateway: 192.168.1.1
  - Subnet Mask: 255.255.255.0
B.3. Connecting to Agilent ChemStation systems

When connecting Vision G2 instruments to an Agilent ChemStation system it is required that the PC with the ChemStation software and the 8453 be configured with correct IP addresses. The following settings are recommended:

- **Agilent ChemStation Computer**
  - IP Address: 192.168.1.1
  - Default Gateway: 192.168.1.1
  - Subnet Mask: 255.255.255.0

- **8453 UV/Vis Spectrophotometer (configured through bootp)**
  - IP Address: 192.168.1.2
  - Default Gateway: 192.168.1.1
  - Subnet Mask: 255.255.255.0

*NOTE: Hanson Dissolution System Drivers version 5.0 are required for communication with Vision G2 instruments. Vision G2 instruments require firmware 2.1 or higher.*

B.4. Corporate Networks

It is also possible to connect the Vision G2 AutoPlus, and Vision dissolution testers to a corporate network. However, when doing so, the operator should contact the IT department to obtain unique IP address settings for the AutoPlus and each of the installed dissolution testers.

For connections to corporate networks, contact the IT department and request the information for each dissolution tester, sampler, or printer to be added. If the IT department requires more information regarding the Hanson equipment, contact Hanson Technical Support.
C. Working with a Waters Alliance Dissolution System

The Vision G2 dissolution testers are capable of interfacing with the Waters Alliance Dissolution System with Empower software for on-line HPLC testing. The Vision G2 dissolution testers function in a similar manner to the SR8-Plus dissolution testers when run in this configuration.

C.1. Firmware Requirements

Vision G2 dissolution testers require firmware version 2.11 or higher in order to be compatible with the Waters Alliance Dissolution System.

C.2. Installation and Configuration

1. Connect an RS-232 cable to Port #2 on the Waters Transfer Module.
2. Connect the other end of the RS-232 cable to the RS-232 port on the Vision G2 dissolution tester which will be “Bath A”.
3. If a second tester is present, connect Bath A and Bath B via a TCP/IP connection. This can be through a network switch or connected directly.
4. Configure Bath A and Bath B with sequential IP addresses.
   a. For example, if Bath A has an IP address 192.168.1.20, Bath B must be 192.168.1.21.
5. In the Device Setup screen of each tester, set the Sampler to Transfer Module.

C.3. Operating the System

The system can be operated from the Alliance 2690D/2695D interface or from Empower. For more information on operating either system in dissolution mode, refer to the appropriate Waters documentation.

To use Digital Temperature Probes (DTPs), adjust magazine travel, or set a vessel goal temperature, a protocol named WTM must be added to the dissolution tester. When starting a test, the transfer module will use the DTP settings, vessel goal temperature, and magazine travel from the WTM protocol.

**NOTE: Vessel temperatures will not be recorded by Empower.**

To have the tester use a specific magazine travel for tests using the Transfer Module, do the following:

1. Add a new protocol.
2. Set the protocol name to WTM. The WTM must be in all capital letters.
3. Touch the Sampling tab.
4. Touch the Magazine Travel field and set the value to what is desired for the test.
5. Exit the protocol to save it.
6. Start a test using the 2690D/2695D or Empower, and the tester will move the AutoMag (or SuperMag) appropriately when collecting a sample.

C.4. Limitations

The system has the following limitations when running a test using the 2690D/2695D and Transfer Module.
• The event table will be ignored in the WTM protocol.
• The sampling events, temperature, infinity test speed, and auto print interval range are all restricted by Empower.
• The maximum label length is 20 characters instead of 25.
• The speed tolerance is either off or USP ± 4% instead of programmable from 1 to 10%.
• The temperature tolerance is either off or USP ± 0.5 °C instead of programmable from 0.1 °C to 5.00 °C.
• The IP address of the second Vision G2 tester must be sequential with the first tester.
• If a Waters Transfer Module protocol is not present, the protocol ID “Protocol” will be used when a test is running.
• Waters Empower will not record the vessel temperatures. A separate printer for the tester is required.
Appendix D: Report

D. Report Explanation

- Company, department and name of the user who printed the report
- Customizable logo
- Document title, includes the name of the protocol that was run
- Test results, red in case of errors
- Sampler and testers selected for the run
- Test completed with 7 errors
- Bath temperatures recorded
- Tester offset
- Tester name
- Tester start time
- Drive speed data point, red if out of tolerance
- Bath temperature data point, red if out of tolerance
- Value out of tolerance
- Back in tolerance
- Late sample
- Sample
- No temperature and speed data points recorded, so no tolerance bands here
- Sampling duration
- Optional signature line
- Instrument ID
- Printed date/time

Sample:

<table>
<thead>
<tr>
<th>Tester A</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Min</strong></td>
</tr>
<tr>
<td>Speed</td>
</tr>
<tr>
<td>100.1 rpm</td>
</tr>
<tr>
<td>Vess1</td>
</tr>
<tr>
<td>37.27 °C</td>
</tr>
<tr>
<td>Vess4</td>
</tr>
<tr>
<td>35.43 °C</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Tester B</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Min</strong></td>
</tr>
<tr>
<td>Speed</td>
</tr>
<tr>
<td>100.1 rpm</td>
</tr>
<tr>
<td>Vess1</td>
</tr>
<tr>
<td>36.52 °C</td>
</tr>
<tr>
<td>Vess4</td>
</tr>
<tr>
<td>30.54 °C</td>
</tr>
</tbody>
</table>

Signed by:

Printed From: VAP JH LAB

Page 1 of 8

Printed: 05-Dec-2013 10:30
### Test Log

**Test:** X29 2 Hour Test  
**Comments:** N/A  
**Lot Number:** ST4HGVY  
**Test Number:** 12BF  
**User Name:** John Heaney  
**AutoStart:** When Temp Ready  
**Heater off at end:** No  
**Starting row:** 1  

#### VAP JH LAB

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>0:00:00</td>
<td>Test start</td>
<td>04-Dec-2013 13:30:05</td>
</tr>
</tbody>
</table>

#### Tester A

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>0:00:00</td>
<td>Test start</td>
<td>04-Dec-2013 13:30:07</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>0:00:36</td>
<td>Vessels (°C)</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>36.94</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>36.93</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>36.93</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>36.94</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>36.84</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>36.81</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>36.92</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>37.27</td>
<td></td>
</tr>
</tbody>
</table>

#### Tester B

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>0:00:00</td>
<td>Test start</td>
<td>04-Dec-2013 13:40:07</td>
</tr>
<tr>
<td>0:10:26</td>
<td>Error</td>
<td>Temp tolerance error 25.96 °C</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>0:00:36</td>
<td>Vessels (°C)</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>36.86</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>36.69</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>36.52</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>36.63</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>36.54</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>36.79</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>37.18</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>36.52</td>
<td></td>
</tr>
</tbody>
</table>

#### Tester A

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>0:11:02</td>
<td>Warning</td>
<td>Temp within tolerance 36.64 °C</td>
</tr>
</tbody>
</table>

#### Tester A

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>0:15:01</td>
<td>Action</td>
<td>Sample Rinse, 7.0 ml</td>
</tr>
</tbody>
</table>

#### Tester A

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>0:15:12</td>
<td>Vessels (°C)</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>36.96</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>36.95</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>36.97</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>36.96</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>36.90</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>36.84</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>36.93</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>37.29</td>
<td></td>
</tr>
</tbody>
</table>

#### Tester A

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>0:17:05</td>
<td>Action</td>
<td>AutoFilter Filter changed</td>
</tr>
</tbody>
</table>

---

**Signed by:**  
**Date:**
## Appendix D: Report

### Test Report: X29 2 Hour Test

**Tester A**

<table>
<thead>
<tr>
<th>Time</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>0:17:05</td>
<td>Sample Rinse with Filter, 3.0 ml</td>
</tr>
<tr>
<td>0:18:07</td>
<td>Collect with Filter, 5.0 ml</td>
</tr>
<tr>
<td>0:19:12</td>
<td>Media Replace, 5.0 ml</td>
</tr>
<tr>
<td>0:20:33</td>
<td>Rinse Retrieval, 15.0 ml</td>
</tr>
<tr>
<td>0:22:42</td>
<td>Sample Done</td>
</tr>
</tbody>
</table>

**Tester B**

<table>
<thead>
<tr>
<th>Time</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>0:15:01</td>
<td>Sample Rinse, 7.0 ml</td>
</tr>
</tbody>
</table>

### Sample Row 1

<table>
<thead>
<tr>
<th>Speed</th>
<th>Temperature</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>37.31 °C</td>
</tr>
</tbody>
</table>

### Vessels (°C)

<table>
<thead>
<tr>
<th>Vessels</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>36.89</td>
<td>36.72</td>
<td>36.96</td>
<td>36.95</td>
<td>36.59</td>
<td>36.83</td>
<td>37.21</td>
<td>36.56</td>
</tr>
</tbody>
</table>

### Sample Row 2

<table>
<thead>
<tr>
<th>Time</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>0:17:05</td>
<td>Sample Rinse with Filter, 3.0 ml</td>
</tr>
</tbody>
</table>

### Tester B

**Tester B**

<table>
<thead>
<tr>
<th>Time</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>0:17:05</td>
<td>AutoFilter Filter changed</td>
</tr>
</tbody>
</table>

### Error Icon

**Tester A**

<table>
<thead>
<tr>
<th>Time</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>0:34:52</td>
<td>Sample late 4 min 52 s</td>
</tr>
</tbody>
</table>

### Error Icon

**Tester A**

<table>
<thead>
<tr>
<th>Time</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>0:36:58</td>
<td>AutoFilter Filter reused</td>
</tr>
</tbody>
</table>

---

**Signed by:** [Signature]

**Date:** [Date]

---

**Printed From:** VAP JH LAB

**Page:** 3 of 8

**Printed:** 05-Dec-2013 10:30
## Tester A

- **0:36:58** Sample 2
  - Sample Rinse with Filter, 3.0 ml
- **0:38:00** Collect with Filter, 5.0 ml
- **0:39:05** Media Replace, 5.0 ml
- **0:40:27** Rinse Retrieval, 15.0 ml

### Test Report: X29 2 Hour Test

**Tester A**

<table>
<thead>
<tr>
<th>Speed 100.2 rpm</th>
<th>Temperature 37.32 °C</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vessels (°C)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>36.90</td>
<td>36.74</td>
<td>36.56</td>
</tr>
<tr>
<td>36.60</td>
<td>36.84</td>
<td>37.22</td>
</tr>
</tbody>
</table>

**Tester A**

- **0:43:41** Sample Done

**Tester B**

- **0:34:45** Sample late 4 min 45 s

**Tester B**

- **0:34:46** Sample Rinse, 7.0 ml

**Tester B**

<table>
<thead>
<tr>
<th>Speed 100.2 rpm</th>
<th>Temperature 37.32 °C</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vessels (°C)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>36.90</td>
<td>36.74</td>
<td>36.57</td>
</tr>
<tr>
<td>36.59</td>
<td>36.84</td>
<td>37.21</td>
</tr>
</tbody>
</table>

**Tester B**

- **0:36:50** AutoFilter Filter replaced

**Tester B**

- **0:36:50** Sample 2
  - Sample Rinse with Filter, 3.0 ml
  - Collect with Filter, 5.0 ml
  - Media Replace, 5.0 ml
  - Rinse Retrieval, 15.0 ml
  - Sample Done

**Tester B**

- **0:43:39** Temp tolerance error 24.30 °C

**Tester B**

- **0:46:44** Temp within tolerance 36.62 °C

**Tester A**

- **1:00:01** Sample Rinse, 7.0 ml
### Appendix D: Report

#### Test Report: X29 2 Hour Test

<table>
<thead>
<tr>
<th>Vessels (°C)</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test A</td>
<td>35.57</td>
<td>35.43</td>
<td>35.72</td>
<td>35.71</td>
<td>35.43</td>
</tr>
<tr>
<td>Status</td>
<td>36.91</td>
<td>36.85</td>
<td>36.94</td>
<td>37.28</td>
<td>36.94</td>
</tr>
</tbody>
</table>

#### Vessels tolerance error (°C)

<table>
<thead>
<tr>
<th>Vessels tolerance error (°C)</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test A</td>
<td>35.57</td>
<td>35.43</td>
<td>35.72</td>
<td>35.71</td>
<td>35.43</td>
</tr>
</tbody>
</table>

#### Sample Row 5

<table>
<thead>
<tr>
<th>Sample</th>
<th>1:02:05</th>
<th>1:03:07</th>
<th>1:04:13</th>
<th>1:05:34</th>
<th>1:07:43</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sample</td>
<td>Sample Rinse with Filter, 3.0 ml</td>
<td>Collect with Filter, 5.0 ml</td>
<td>Media Replace, 5.0 ml</td>
<td>Rinse Retrieval, 15.0 ml</td>
<td>Sample Done</td>
</tr>
<tr>
<td>Row 5</td>
<td>Sample Row 5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Sample Row 6

<table>
<thead>
<tr>
<th>Sample</th>
<th>1:02:05</th>
<th>1:03:07</th>
<th>1:04:14</th>
<th>1:05:35</th>
<th>1:08:49</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sample</td>
<td>Sample Rinse with Filter, 3.0 ml</td>
<td>Collect with Filter, 5.0 ml</td>
<td>Media Replace, 5.0 ml</td>
<td>Rinse Retrieval, 15.0 ml</td>
<td>Sample Done</td>
</tr>
<tr>
<td>Row 6</td>
<td>Sample Row 6</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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Signed by: 
Date: 

Printed From: VAP JH LAB 
Page 5 of 8 
Printed: 05-Dec-2013 10:30
### Test Report: X29 2 Hour Test

**Tester A**

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>1:30:12</td>
<td>Vessels within tolerance (°C)</td>
</tr>
<tr>
<td></td>
<td>1 36.96  2 36.92  3 36.96  4 36.94  5 36.90</td>
</tr>
</tbody>
</table>

**Tester A**

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>1:32:05</td>
<td>AutoFilter Filter reused</td>
</tr>
</tbody>
</table>

**Tester A**

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>1:32:05</td>
<td>Sample 4</td>
</tr>
</tbody>
</table>

**Sample 4**

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>1:32:05</td>
<td>Sample Rinse with Filter, 3.0 ml</td>
</tr>
<tr>
<td>1:33:08</td>
<td>Collect with Filter, 5.0 ml</td>
</tr>
<tr>
<td>1:34:14</td>
<td>Media Replace, 5.0 ml</td>
</tr>
<tr>
<td>1:35:35</td>
<td>Rinse Retrieval, 15.0 ml</td>
</tr>
<tr>
<td>1:38:49</td>
<td>Sample Done</td>
</tr>
</tbody>
</table>

**Tester B**

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>1:30:01</td>
<td>Sample Rinse, 7.0 ml</td>
</tr>
</tbody>
</table>

**Tester B**

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>1:30:22</td>
<td>Speed 100.2 rpm, Temperature 37.28 °C</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Vessels (°C)</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 36.86</td>
<td></td>
</tr>
<tr>
<td>2 36.71</td>
<td></td>
</tr>
<tr>
<td>3 36.56</td>
<td></td>
</tr>
<tr>
<td>4 36.64</td>
<td></td>
</tr>
<tr>
<td>5 36.57</td>
<td></td>
</tr>
<tr>
<td>6 36.81</td>
<td></td>
</tr>
<tr>
<td>7 37.18</td>
<td></td>
</tr>
<tr>
<td>8 36.54</td>
<td></td>
</tr>
</tbody>
</table>

**Tester B**

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>1:32:05</td>
<td>AutoFilter Filter reused</td>
</tr>
</tbody>
</table>

**Tester B**

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>1:32:05</td>
<td>Sample 4</td>
</tr>
</tbody>
</table>

**Sample 4**

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>1:32:05</td>
<td>Sample Rinse with Filter, 3.0 ml</td>
</tr>
<tr>
<td>1:33:08</td>
<td>Collect with Filter, 5.0 ml</td>
</tr>
<tr>
<td>1:34:14</td>
<td>Media Replace, 5.0 ml</td>
</tr>
<tr>
<td>1:35:35</td>
<td>Rinse Retrieval, 15.0 ml</td>
</tr>
<tr>
<td>1:37:44</td>
<td>Sample Done</td>
</tr>
</tbody>
</table>

**Tester A**

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>2:00:00</td>
<td>Rack mismatch - skipped sample</td>
</tr>
</tbody>
</table>

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**Signed by:**

**Date:**

Printed: 05-Dec-2013 10:30
### Test Report: X29 2 Hour Test

**Tester A**

<table>
<thead>
<tr>
<th>Speed</th>
<th>Min</th>
<th>Max</th>
<th>Avg</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>100.1 rpm</td>
<td>100.2 rpm</td>
<td>100.1 rpm</td>
</tr>
<tr>
<td>Temperature</td>
<td>24.07 °C</td>
<td>37.10 °C</td>
<td>36.97 °C</td>
</tr>
<tr>
<td>Vess1</td>
<td>35.57 °C</td>
<td>36.97 °C</td>
<td>36.72 °C</td>
</tr>
<tr>
<td>Vess2</td>
<td>35.43 °C</td>
<td>36.95 °C</td>
<td>36.68 °C</td>
</tr>
<tr>
<td>Vess3</td>
<td>35.72 °C</td>
<td>36.97 °C</td>
<td>36.75 °C</td>
</tr>
<tr>
<td>Vess4</td>
<td>35.71 °C</td>
<td>36.97 °C</td>
<td>36.74 °C</td>
</tr>
<tr>
<td>Vess5</td>
<td>35.43 °C</td>
<td>36.93 °C</td>
<td>36.62 °C</td>
</tr>
<tr>
<td>Vess6</td>
<td>36.81 °C</td>
<td>36.85 °C</td>
<td>36.83 °C</td>
</tr>
<tr>
<td>Vess7</td>
<td>36.92 °C</td>
<td>36.94 °C</td>
<td>36.93 °C</td>
</tr>
<tr>
<td>Vess8</td>
<td>37.27 °C</td>
<td>37.31 °C</td>
<td>37.29 °C</td>
</tr>
</tbody>
</table>

**Tester B**

<table>
<thead>
<tr>
<th>Speed</th>
<th>Min</th>
<th>Max</th>
<th>Avg</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>100.2 rpm</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Temperature</td>
<td></td>
<td>37.28 °C</td>
<td></td>
</tr>
<tr>
<td>Vessels (°C)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>36.86</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>36.71</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>36.54</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>36.64</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>36.56</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>36.79</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>37.19</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>36.54</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Statistics**

- **Min** values are below the minimum acceptable value.
- **Max** values are above the maximum acceptable value.
- **Avg** values are within acceptable range.

**Test Notes**

- **Tester A** finished on 04-Dec-2013 15:30:25.
- **Tester B** Sample Rinse, 7.0 ml

**AutoFilter**

- 02:05: AutoFilter filter set discarded
- 02:05: AutoFilter Filter changed

**Sample Row 10**

<table>
<thead>
<tr>
<th>Time</th>
<th>Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>02:05</td>
<td>Sample Rinse with Filter, 3.0 ml</td>
</tr>
<tr>
<td>02:08</td>
<td>Collect with Filter, 5.0 ml</td>
</tr>
<tr>
<td>04:15</td>
<td>Media Replace, 5.0 ml</td>
</tr>
<tr>
<td>05:35</td>
<td>Rinse Retrieval, 15.0 ml</td>
</tr>
<tr>
<td>07:45</td>
<td>Sample Done</td>
</tr>
</tbody>
</table>

---

**Signed by:**** Date:**

---

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## Appendix D: Report

**Tester B**

<table>
<thead>
<tr>
<th></th>
<th>Min</th>
<th>Max</th>
<th>Avg</th>
</tr>
</thead>
<tbody>
<tr>
<td>Speed</td>
<td>100.1 rpm</td>
<td>100.2 rpm</td>
<td>100.1 rpm</td>
</tr>
<tr>
<td>Temp</td>
<td>21.15 °C</td>
<td>37.34 °C</td>
<td>36.90 °C</td>
</tr>
<tr>
<td>Vess1</td>
<td>36.86 °C</td>
<td>36.90 °C</td>
<td>36.88 °C</td>
</tr>
<tr>
<td>Vess2</td>
<td>36.69 °C</td>
<td>36.74 °C</td>
<td>36.71 °C</td>
</tr>
<tr>
<td>Vess3</td>
<td>36.52 °C</td>
<td>36.58 °C</td>
<td>36.55 °C</td>
</tr>
<tr>
<td>Vess4</td>
<td>36.63 °C</td>
<td>36.68 °C</td>
<td>36.65 °C</td>
</tr>
<tr>
<td>Vess5</td>
<td>36.54 °C</td>
<td>36.60 °C</td>
<td>36.57 °C</td>
</tr>
<tr>
<td>Vess6</td>
<td>36.79 °C</td>
<td>36.84 °C</td>
<td>36.81 °C</td>
</tr>
<tr>
<td>Vess7</td>
<td>37.15 °C</td>
<td>37.22 °C</td>
<td>37.19 °C</td>
</tr>
<tr>
<td>Vess8</td>
<td>36.52 °C</td>
<td>36.58 °C</td>
<td>36.55 °C</td>
</tr>
</tbody>
</table>

**Tester B**

2:07:48  Test finish 04-Dec-2013 15:48:10

**VAP JH LAB**

2:17:55  Test finish 04-Dec-2013 15:46:16