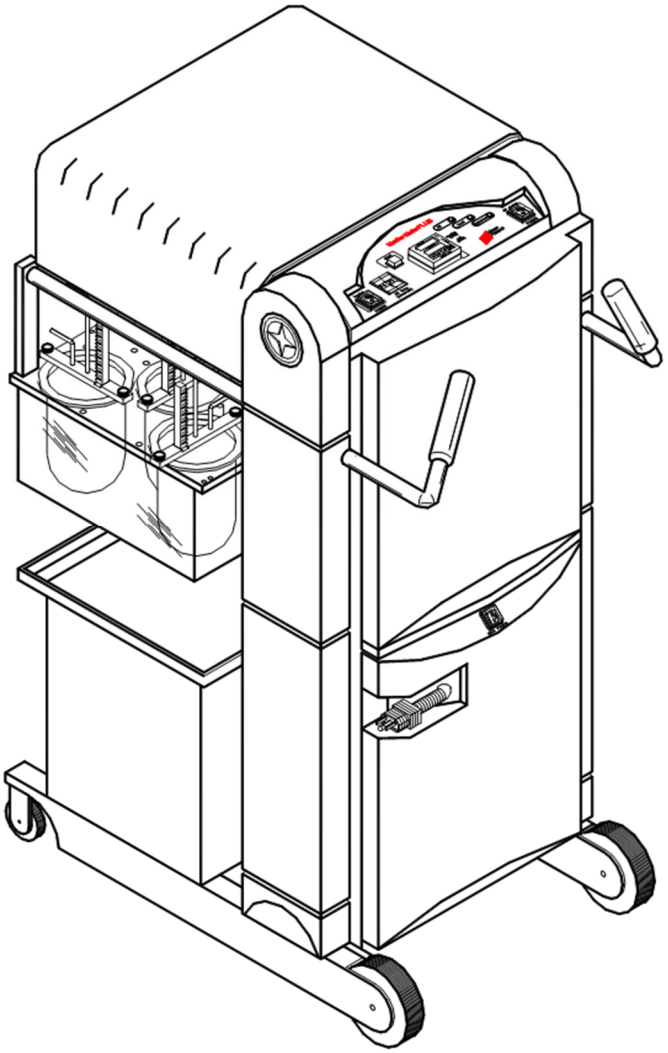
MEDIA-MATE PLUS™
OPERATION MANUAL



TELEDYNE HANSON

25-710-800-Rev. Q—18 June 2020

About Teledyne Hanson

Teledyne Hanson, a division of Teledyne Instruments, Inc., is a global technology company specializing in analytical test instruments for the pharmaceutical industry. Founded by the innovator of modern dissolution test technology, Teledyne Hanson helps ensure the world's pharmaceuticals are pure, safe, and effective by manufacturing equipment that sets the global standard for quality, innovation, and long-term value. Teledyne Hanson instruments are used by scientists in over 75 countries worldwide and are supported by the industry's top customer service team. For more information, visit teledynehanson.com.

Headquarters

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Sales and Support

Congratulations on your purchase of the Teledyne Hanson Media-Mate Plus™. While we are certain you will enjoy this new product, we also understand from time to time you may have a question or technical issue requiring our assistance. Please feel free to contact us at any time by any of the methods below.

Website: teledynehanson.com
Tech support request form: teledynehanson.com/tech-support-request
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Document Revision History

REVISION	DATE	DESCRIPTION
L		Section Three – Specifications: Changed "Media Tank Volume (unusable)" to 2 L to reflect low volume tank upgrade.
M		Section Six – Validation and Calibration: Updated Adjustment of Sensor Display Temperature steps. Updated new Watlow controller. Section Seven – Operating Instructions: Added newer dissolution tester models.
O	23 Apr 2015	Section Three – Specifications: Changed tank capacities to "about 18 liters". Section Seven – Operating Instructions: Changed temperature setting to "at least the 18-liters mark." Section Eight – Troubleshooting: Changed Temperature Control Problems to "Fill tank to at least the 18-liter mark."
P	18 June 2019	Updated to Teledyne format.
Q	18 June 2020	Clarified instructions in section 6 for Adjustment of Sensor Display Temperature, Volume Delivery Calibration, and Fine Adjustment of Delivery Volume. Added information about Distek systems and compatibility with Classic 6 and Elite 8 testers in section 7. Clarified instructions for Pressure or Vacuum Leak in section 8. Added parts to section 11. Changed Teledyne Hanson Research, to Teledyne Hanson.

To confirm that you have received the latest version of this user guide, contact Teledyne Hanson Technical Support.

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Figures and Diagrams

Section 1 – Safety Considerations

General

The instrument should be on its own circuit to prevent problems and circuit overload.

Never work on the electrical components in the system while there is power to the instrument. Disconnect power: Do not run instrument with the protective cover removed from the electrical control cabinet.

Do not fill the tank through the filter port on the tank; the instrument may not handle the backpressure.

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

Safety Markings

For your own safety, you must observe the following safety warning signs. The safety warning signs indicate a possible source of danger and provide preventative information.

Sign	Location	Safety Warning
	Control panel	**Caution:** Keep media and other liquids away from the control panel and away from all electrical components.
	Control panel	**Caution:** Do not press start switch until indicator lights are off.
	Control panel	**Caution:** Do not restart instrument with liquid in vessels without consulting troubleshooting section.
 	Interface panel Heater	**Caution:** No operator-accessible parts inside. Refer servicing to qualified personnel only. Risk of electrical shock. Do not open. **Achtung:** Es gibt keine vorn Benutzer zo wanenden Teile. Oberlassen Sie Reparaturen dem qualifizierten Service-fachmann. Hochspannung. Nicht öffnen. **Attention:** Aucune pièce remplaçable par l'utilisateur. Toute réparation doit être effectuée par un technicien qualifié. Risque d' electrocution. Ne pas ouvrir.
	Interface panel	**Caution:** Turn instrument off and remove power cord before replacing fuses. Fuses must be replaced with the same current rating and type described next to the fuse holder.
	Heater	**Caution:** Heater is hot; do not touch.
	Interface panel	**Note:** Line and neutral fused separately.
	Inside control	**Note:** Protective conductor terminal.
	Pump panel	**Caution:** Withdraw power cord to mark prior to plugging into grounded electrical outlet. Withdrawing the full length of the cord may jam the retracting mechanism.

Section 2 – Introduction

The Teledyne Hanson Media-Mate Plus is a portable, automatic dissolution prep system. The instrument will preheat, filter, measure, deaerate and deliver dissolution media to numerous dissolution test stations.

Design Features

Portable Cart**:** The cart is compact and easy to maneuver.

Control: The electronics are enclosed within the cart for protection and may be easily removed for service. The control panel is a user-friendly design with digital readout of actual media temperature and temperature set point.

Pressure/Vacuum Air Pump: The air pump is enclosed within the cart frame for quiet operation. It is easily removed for service.

Dispense Head: The dispense head connects to the dispense tubing with quick disconnects and is user-configurable for filling six or seven dissolution vessels in parallel. The dispense head is designed to interface with the Teledyne Hanson SR-6™, SR-8™, SR8-Plus™, Vision® Classic 6™, and Vision® Elite 8™ dissolution test stations as well as most test stations made by other manufacturers.

Heater Assembly: The heater is an integral design comprised of the heater element, temperature sensor, overload sensor, and level sensor. The heater is easily removed for cleaning or for placement in spare media tanks.

Volume Setting: The dispense volume is user-selectable from 250 to 1000 mL in 50 mL increments. The measure system has been factory-calibrated and is easily recalibrated by the user.

Media Tank: The tank is chemically inert and is equipped with a 5-micron filter and standard hose bib for quick and easy connection. The tank is easily removed for cleaning or for replacement with spare tanks. A chemically inert cover prevents evaporation and provides a docking location for the dispense head.

Retractable Cord Reel: The instrument is equipped with a 14-gauge, 3-conductor, 20 ft cord-reel.

Section 3 – Specifications

Weight

Without media: 67 kg (148 lbs.)

With 40 liters of media: 107 kg (236 lbs.)

Size

Length: 80.9 cm (31.9 in.)

Width: 53.4 cm (21.0 in.)

Height: 114.0 cm (44.8 in.)

Electrical

Voltage: 115 VAC or 230 VAC ± 10%

Frequency: 50/60 Hz

Current: 13 Amp (115 VAC) or 8 Amp (230 VAC)

Phase: single

4 Fuses (TT type)/ 115 VAC units:

One 1/2 Amp, 250 VAC,

One 3/4 Amp, 250 VAC,

One 8 Amp, 250 VAC,

One 15 Amp.

4 Fuses (TT type)/ 230 VAC units:

One 1/2 Amp, 250 VAC,

One 3/8 Amp, 250 VAC,

One 5 Amp, 250 VAC,

One 8 Amp, 250 VAC.

Environment

Maximum ambient temperature: 5 °C below temperature set point

Maximum humidity: < 85 %

Performance

Cycle time: less than 5 minutes

Pre-heat temperature range: 30 °C to 45 °C

Pre-heat temperature control accuracy: ± 0.5 °C

Pre-heat temperature readout accuracy: ± 0.2 °C

Pre-heat time (21 to 37 deg C): 60 minutes

Delivery volume range: 250 mL to 1000 mL

Delivery volume accuracy: ± 1.0 %

Deaeration: 95% saturation maximum

Filtration: 5 micron nominal

Note: Accuracy may be improved by fine adjustment (see Fine Adjustment of the Delivery Volume in section 6).

Tank capacities

Media tank volume (usable): 40 liters (10.5 gal)

Media tank volume (unusable): 2 liters (0.53 gal)

Media volume to top of filter: 8 liters (2.1 gal)

Media volume when low water level sensor turns heater off: about 18 liters (4.8 gal)

Materials wet

Tank: High density polyethylene

Heater: Teflon coated

Filter: Polyethylene

Vessel: SAN (styrene/acrylonitrile)

Fittings and fill hose: PVC

Tubing: Stainless steel and Tygon

Section 4 – How it Works

The THR Media-Mate Plus uses a self-tuning PID controller and a Teflon-coated heater to heat the media. Media is moved by low pressure or vacuum and directed by a two-position, multi-channel pinch valve. The media is deaerated by a thin film vacuum process. The media volume is accurately measured by a user-set incremental measuring system. A programmable timer controls the following sequence of events.

1. Fill (fill light “ON”)

   Vacuum draws heated media from the media tank into the measure vessels. The fill time thumbwheel has been set such that actual fill time is sufficient to fill measure vessels slightly above the required volume. The media is deaerated during the fill cycle by thin film vacuum technology.

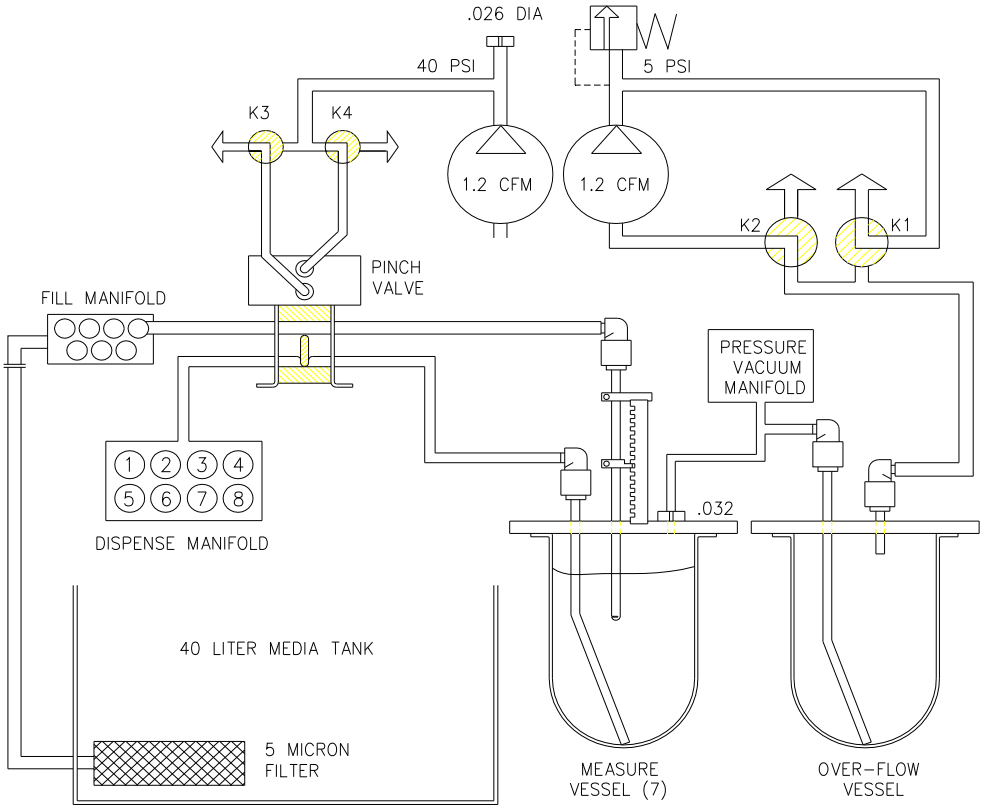


Figure 4-1

2. Level (level light “ON”)

   Pressure in the measure vessels returns excess media back to the media tank. The volume of media remaining in the vessels is the amount set by the adjustment of the incremental standards.

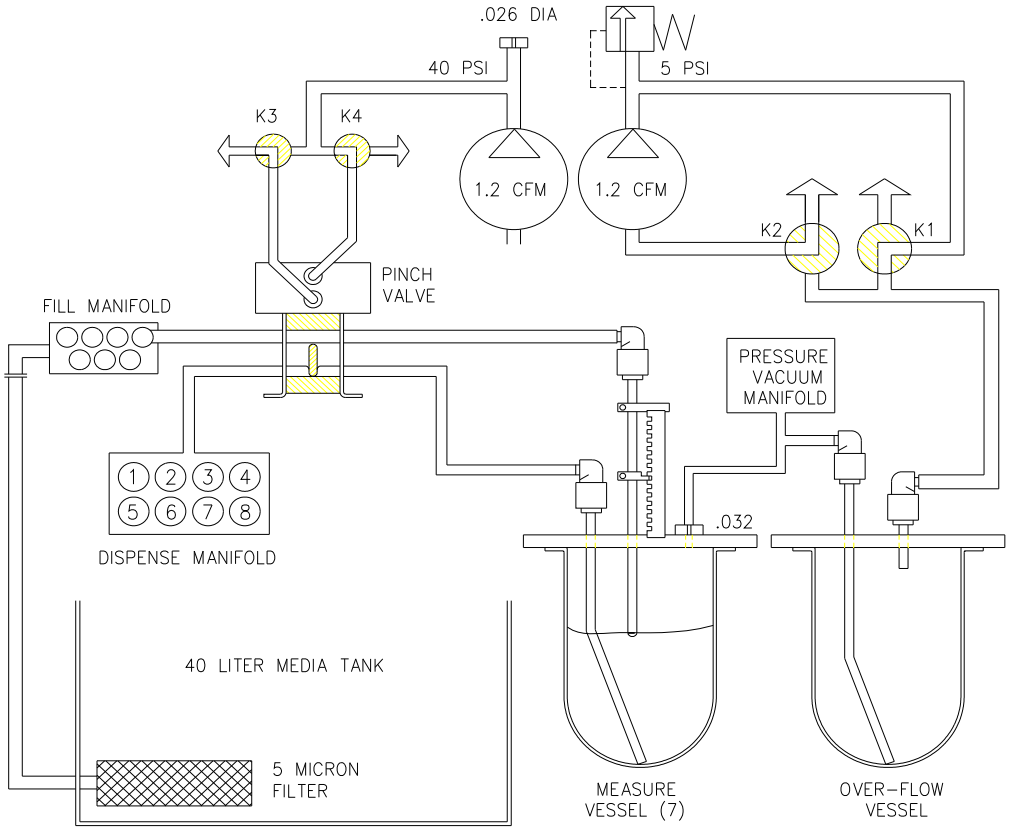


Figure 4-2

3. Dispense (dispense light “ON”)

   The pinch valve is shifted, opening the dispense lines and closing the fill lines. Pressure in the measure vessels delivers media out the dispense manifold.

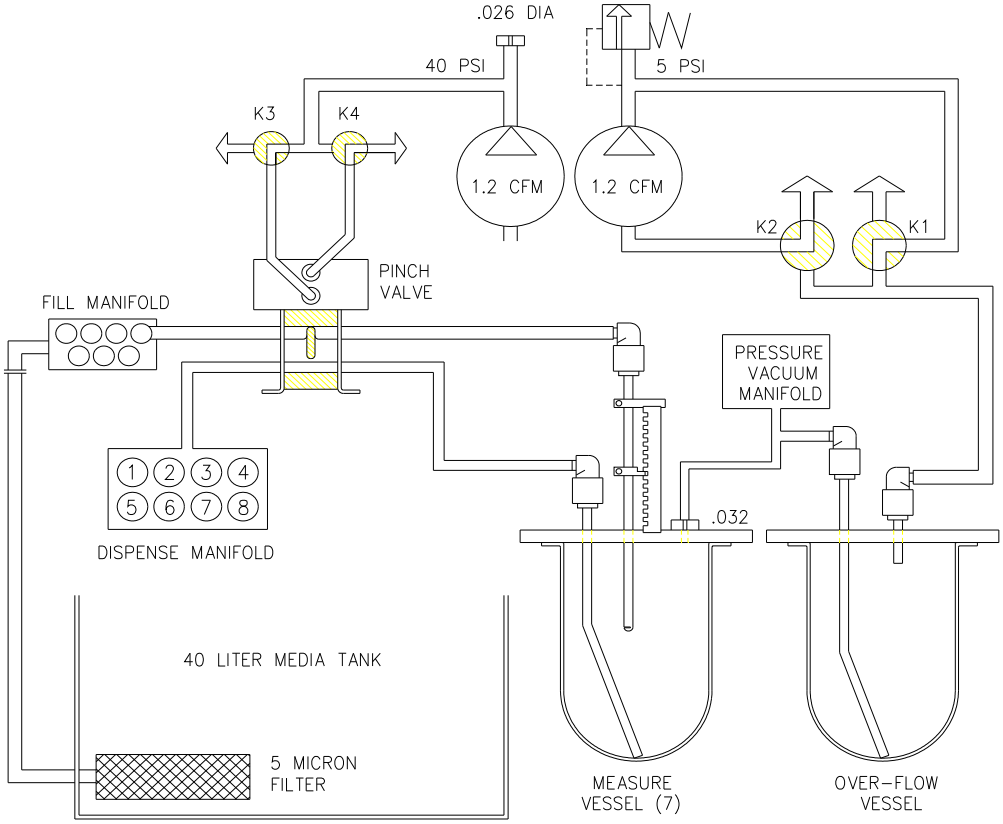


Figure 4-3

4. Standby (no lights on)

   The instrument is waiting for the operator command to start a cycle. Air flows through the measure vessels and out the fill lines into the media tank. This provides media circulation for optimum temperature control.

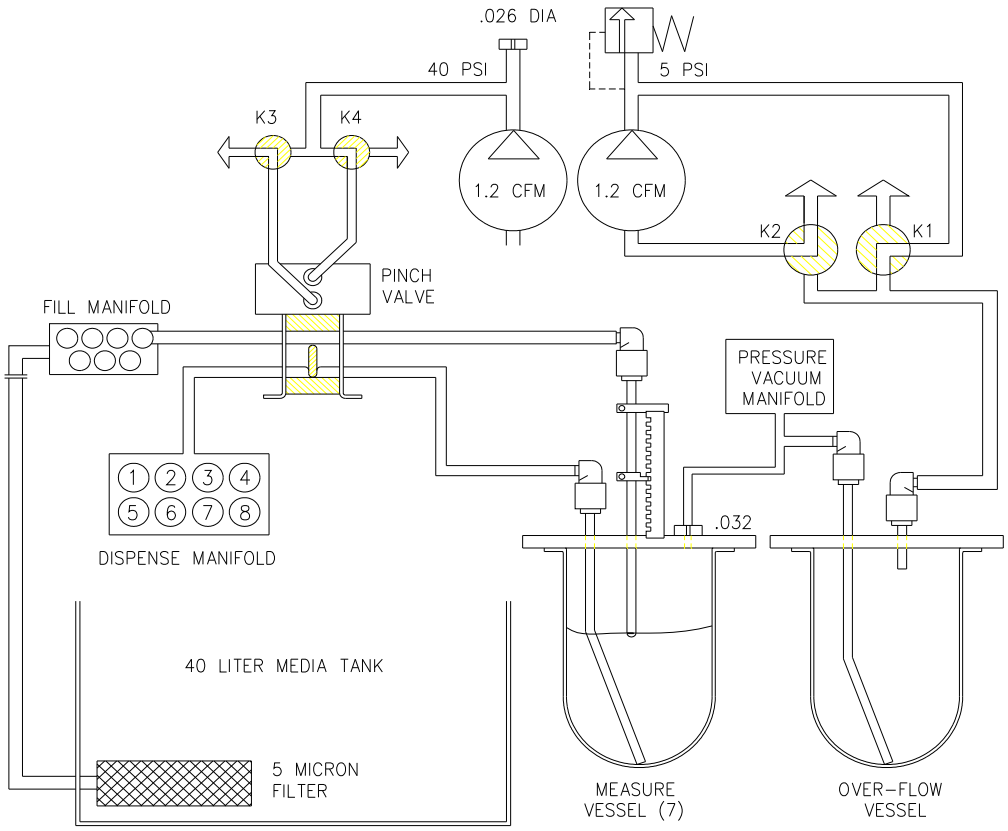


Figure 4-4

Section 5 – Installation

Location

Environment

The media tank temperature must exceed ambient room temperature by at least 5 °C for maximum performance of the temperature control system. Therefore, for best results, the ambient temperature should not be allowed to exceed 32 °C (90 °F) for 37 °C tests, or 27 °C (81 °F) for 32 °C tests.

Easy access to a water source and waste disposal for filling and emptying of the waterbath is convenient, although not necessary.

Space

The Media-Mate Plus system is designed to be mobile up to 6.25 m (20 ft). The laboratory floor should be level and flat to prevent the instrument from moving when left unattended.

Electrical

The Media-Mate Plus system requires a single, grounded electrical outlet, within 5.63 m (18 ft) of the location of the instrument.

The instrument is available in two configurations, 115 VAC and 230 VAC. The voltages are set at the factory and cannot be changed (see model number label on control interface panel next to fuses to determine voltage). The electrical requirements are summarized in section 3 of this operation manual.

Unpacking

The Media-Mate Plus is shipped fully assembled in one box. The shipping box is specifically designed to provide maximum shipping protection and to facilitate unpacking. The shipping box consists of a lower cardboard tray secured to a pallet with a large box placed over the instrument. The upper box is strapped to the lower tray and pallet.

Note: Shortages or damages must be reported immediately to the freight carrier and to Teledyne Hanson. Notify us by telephone (818) 882-7266.

To unpack

1. Move package close to final destination with pallet-moving equipment.
2. Cut and remove straps.
3. Remove upper box taking care not to damage box.
4. Remove instrument from box.
5. Reassemble empty box and store for possible future use.

Parts Identification

Throughout this operation manual, reference is made to various components by name. Figures 5-1 through 5-6 are provided to assist in the visual identification of these components.

System Check-out

1. After removing the instrument from the box, remove all other shipping materials.
2. Visually inspect the instrument for damage or missing parts
3. Remove the heater assembly from its shipping position within tank.
4. Remove dispense head (see figure 5-5) from shipping position within tank, remove from bubble pack, and place as shown.
5. Ensure filter housing has slots facing down.
6. Visually inspect all electrical and pneumatic connections at interface panel.
7. Review operating instructions. (see section 7)

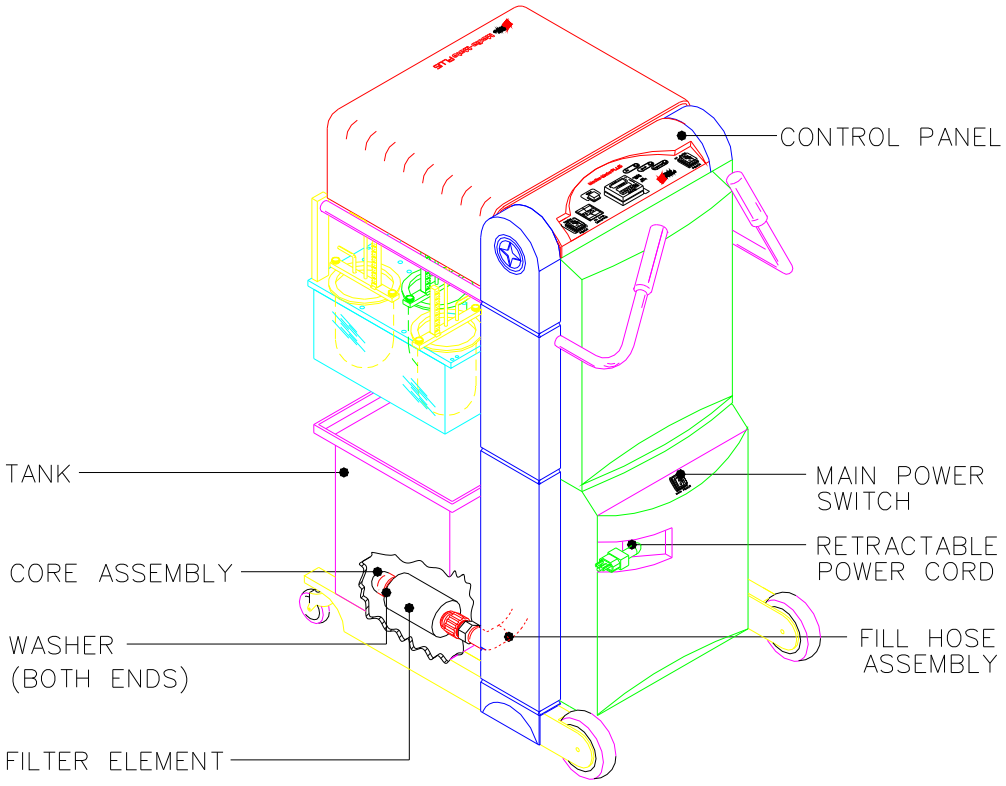

CONTROL PANEL
TANK
MAIN POWER SWITCH
RETRACTABLE POWER CORD
CORE ASSEMBLY
WASHER (BOTH ENDS)
FILL HOSE ASSEMBLY
FILTER ELEMENT

Figure 5-1

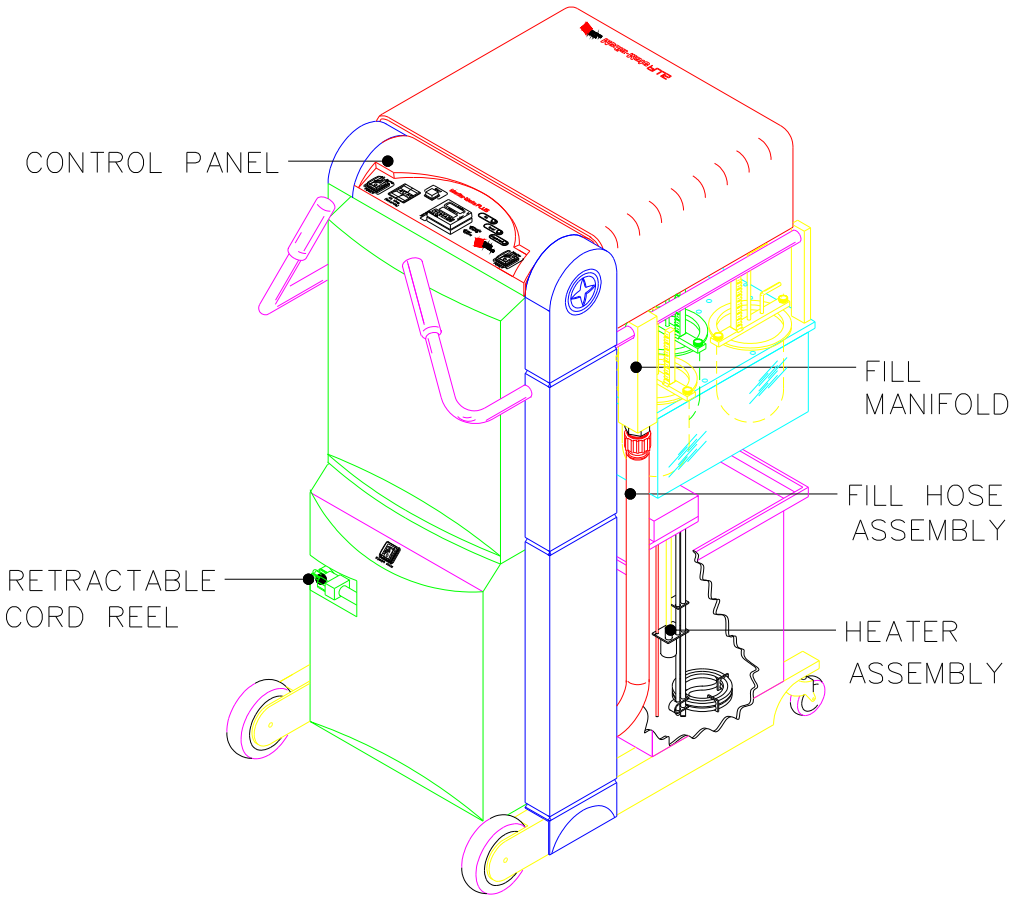

CONTROL PANEL
FILL MANIFOLD
FILL HOSE ASSEMBLY
RETRACTABLE CORD REEL
HEATER ASSEMBLY

Figure 5.2

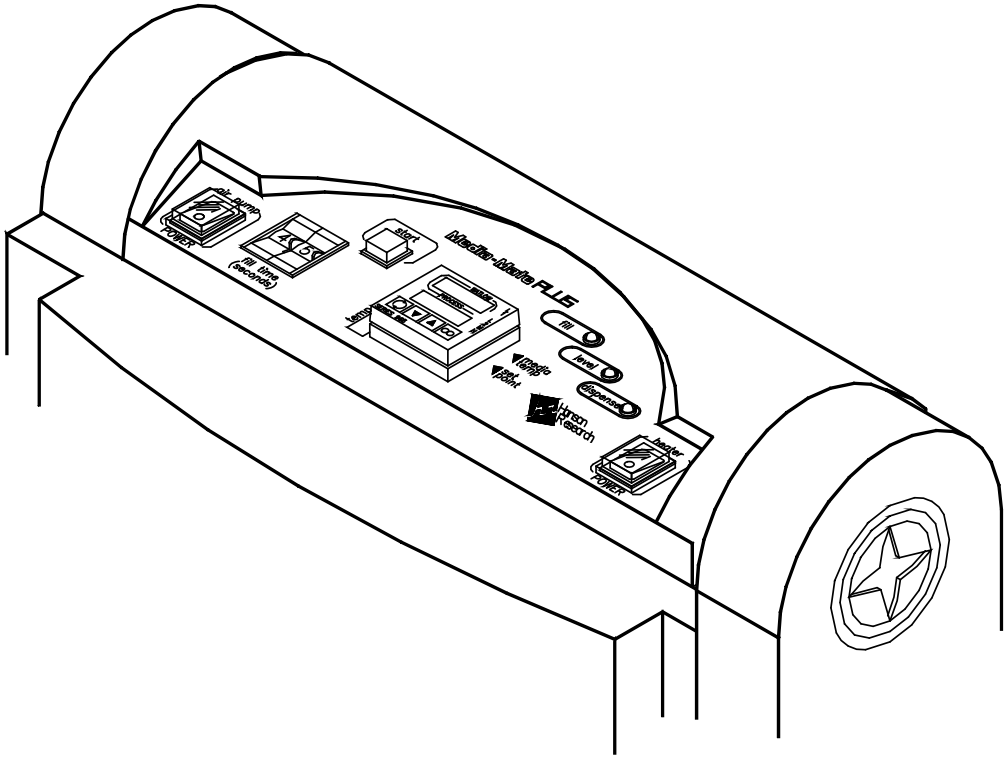


Figure 5-3 Control panel

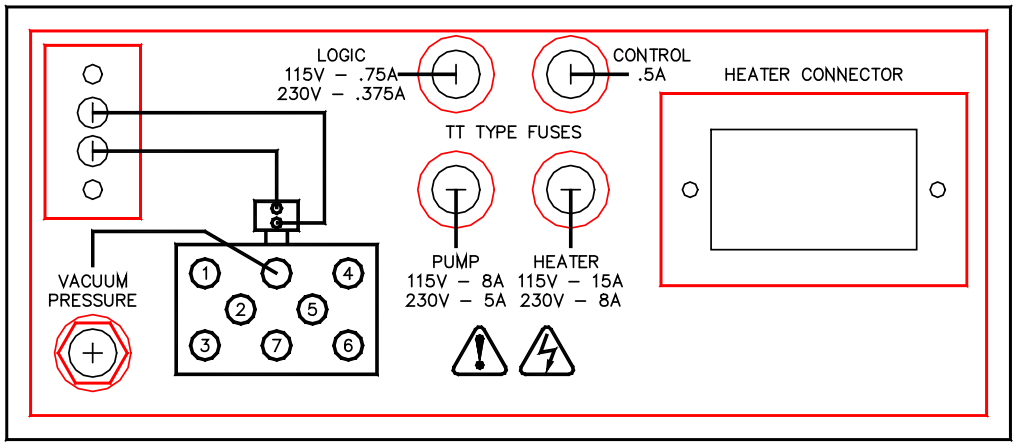


Figure 5-4 Interface panel

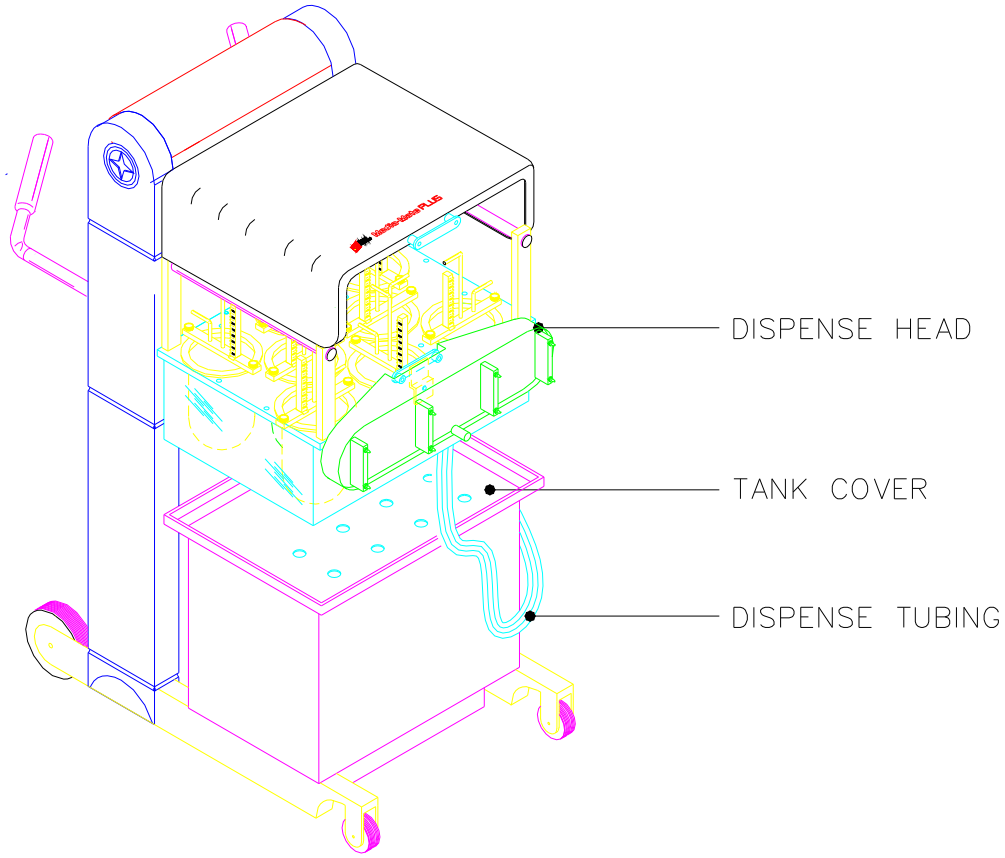


Figure 5-5

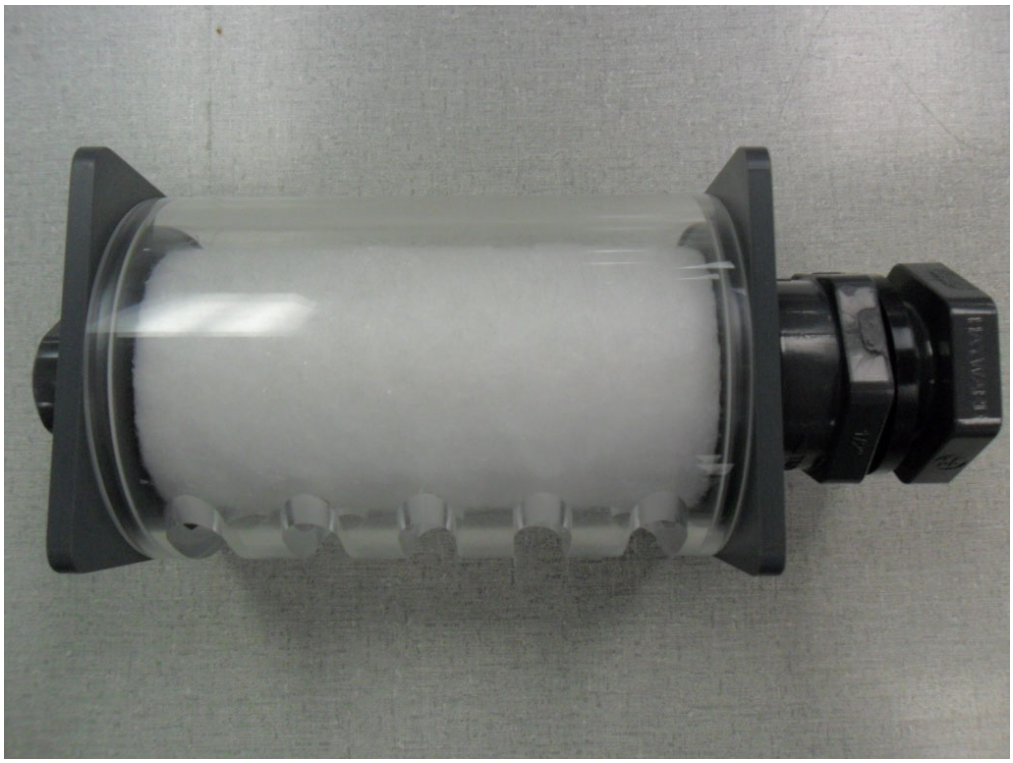


Figure 5-6 Filter housing assembly

Note: The filter housing assembly will function best if the slots are facing the bottom of the tank.

Removed from tank to provide clear view. Clear filter housing shown only to provide clarification on function.

Installation

Caution: The instrument should not be plugged in until installed as per the instructions below.

1. Clean the inside of the tank as necessary to remove any packing debris and fill with approximately 40 L of DI water (see Cleaning the Media Tank and Fluid Lines in section 9).
2. Install the heater assembly into the tank as shown (see figure 5-2). Place tank cover onto tank (see figure 5.5).

   Caution: The filled tank is heavy, and media may spill. This installation requires two people. The person holding and pushing the tank onto the cart legs should be capable of supporting the weight of the tank.
3. One person aligns the Media-Mate Plus cart legs with steps on tank from the back. Tip the tank just enough so that the cart legs can be pushed under the tank. Lift the opposite side of the tank and push as you slide the cart legs under.

   Hint: Keep the front wheels of the cart straight.
4. Remove the fill hose assembly from its holding position on the side of the tank and connect to the fill manifold (see figure 5-2).
5. Connect the heater connector into the interface panel (see figure 5-4).
6. Connect the dispense tubing to the dispense head and position over the holes in the tank cover (see figure 5-5).

   Note: Configure the dissolution test station vessel pattern (see Configuring the Dispense Head in section 7).

Startup

Caution: The voltage indicated on the Media-Mate Plus system must be the same as the power source. If the incorrect voltage is indicated, do not plug in the instrument and contact THR immediately.

Caution: Do not press the start switch until the indicator lights are off as this may cause overfilling of the system.

The instrument must be plugged into a grounded power outlet.

1. Pull the power cord out of the retractable cord reel and plug the other end of the power cord into a grounded three-prong power outlet.

   Note: The power cord plug may need to be replaced for some countries' power outlet configurations. Ensure that the replacement plug is approved and properly rated for voltage and amperage by following the power cord color code below:

USA Color Code	Wire Description	International Color Code
Black	Live	Brown
White	Neutral	Light blue
Green	Ground	Green with yellow stripe

2. Turn on the main power switch, located on the pump panel next to the power cord outlet.
3. Turn on the heater, located on the control panel. Allow the media to heat to set temperature.
4. Turn on the air pump, located on the control panel.
5. Run a test cycle (see Test Cycle in section 7) while observing instrument performance.
6. During the test cycle, verify the correct sequence of events by observing the sequence LEDs on the control panel and by visually observing fluid flow at the measure vessels.
7. During the test cycle, verify heater operation by observing the "1" LED on the temperature controller ("1" is energized when the heater is on).

8. Turn off the heater and air pump switches.
9. Turn off the main power switch and remove the power cord from the grounded three-prong power outlet and return into retractable cord reel.

Section 6 – Validation and Calibration

Pre-Heat Temperature Calibration

Calibration of the temperature control system is recommended every six months for 32 °C and 37 °C set points. A temperature calibration log is provided and may be copied for entry of temperature calibration data.

1. Place calibrated thermometer (p/n 65-233-402) in the 3/8 in. hole provided in the tank cover (hole located furthest from heater assembly).
2. Set temperature set point to 32 °C (see Temperature Setting in section 7) and allow it to stabilize.
3. Record set point temperature and sensor display temperature from the digital display on the control panel. Record actual temperature from calibrated thermometer.
4. Set temperature set point to 37 °C (see Temperature Setting in section 7) and allow it to stabilize.
5. Record set point temperature and sensor display temperature from the digital display on the control panel. Record actual temperature from calibrated thermometer.

Adjustment of Sensor Display Temperature

Caution: The sensor display temperature has been adjusted at the factory and should not require any additional adjustment. Adjustment may be made only when calibration indicates more than 0.2 °C difference between display temperature and actual temperature (see Pre-Heat Temperature Calibration in section 6).

1. Press both the Up (↑) and Down (↓) keys simultaneously and hold for 3 seconds until you see “LOC”. (If “2” is displayed, change number using Up key to “5” to enter operations menu).
2. Press the (∞) key, then press the ↻ key repeatedly until you see “i.CA”.

3. Add or subtract to the number in order to equal the standard temperature.
4. After calibrating, press the (∞) key, then press both the Up (↑) and Down (↓) keys simultaneously until you see “LOC”, which needs to be changed to “2”. Press the (∞) key to finish.
5. Recalibrate per Pre-Heat Temperature Calibration in section 6.

Volume Delivery Calibration

Calibration of volume delivery is recommended for all volume settings that will be used. Recalibration is recommended every six months for each setting used. Recalibration is also required whenever the delivery volume has been fine adjusted (see Fine Adjustment of the Delivery Volume in section 6). To facilitate volume calibration, THR recommends the volume calibration kit (p/n 25-710-705).

1. Set volume to desired increment (see Volume Selection in section 7).
2. Teledyne Hanson recommends performing volume calibration at room temperature. Set temperature control to the desired temperature and allow the media temperature to stabilize (see Temperature Setting in section 7).
3. Place the dispense head over pre-numbered, plastic vessels (ref. p/n 25-710-705).
4. Start the Media-Mate Plus cycle (see Section 7 – Operating Instructions).
5. Using a calibrated laboratory scale, tare with empty vessel, weigh filled vessels, and record the actual media weight of the delivered volume for each vessel.
6. Empty and dry the vessels and repeat steps 1 through 5 for a total of 5 cycles.
7. Calculate and record the media volume for each vessel. The density of the media at the calibration temperature is required for the calculation below.

   Media Volume = media weight divided by media density at calibration temperature.

8. Repeat all of the above steps for each incremental volume setting that will be used.

Fine Adjustment of the Delivery Volume

(one incremental setting only)

When dissolution rate calculations are corrected for actual mean delivery volumes recorded, it should not be necessary to fine-adjust the delivery volume. For applications that do require a more accurate delivery volume, adjust as follows:

1. Calibrate volume at desired incremental setting (see Volume Delivery Calibration in section 6).
2. Review calibration data and identify adjusters that require finer adjustment.
3. Fine adjustment is accomplished by accurately adjusting the pointer position on the fill tube (see figures 6-1 and 6-2). The pointer must be moved approximately 0.0048 in. per mL of volume delivery change.

   Example: To change delivery volume by 2.5 mL [2.5 X 0.0048 = 0.012], the pointer must be moved 0.012 in.

When delivery volume is too high, reduce by raising the pointer as follows:

1. Loosen the upper lock screw using a 1/4 in. wrench so that the fill tube may be moved.
2. Using the calibration gauge (p/n 91-902-045), select a size which corresponds with the required volume change [Volume Change X .0048] or refer to the conversion chart in figure 6-1.
3. Place the calibration gauge between the pointer and the upper side of the incremental standard notch (see figure 6-1).
4. Move the fill tube up until the pointer and calibration gauge are tight against the upper side of the incremental standard notch.
5. Tighten the upper lock screw and remove the calibration gauge.

6. Use a 1/4 in. wrench to loosen the pointer handle lock nut and slide the pointer up to the top of the incremental standard notch and retighten the pointer handle lock nut.
7. Loosen the upper lock screw and move the dispense tube down until the pointer is tight against the bottom side of the incremental standard notch and retighten the upper lock screw.
8. Repeat steps 1 through 7 as necessary for each vessel.
9. Calibrate per Volume Delivery Calibration in section 6.

CONVERSION TABLE	
0.001	0.21
0.0015	0.31
0.002	0.42
0.003	0.63
0.004	0.83
0.005	1.04
0.006	1.25
0.007	1.46
0.008	1.67
0.009	1.88
0.010	2.08
0.012	2.50
0.014	2.92
0.015	3.13
0.016	3.33
0.018	3.75
0.020	4.17
0.022	4.58
0.024	5.00
0.025	5.21
CONVERSION TABLE	
INCH = ML x .0048	

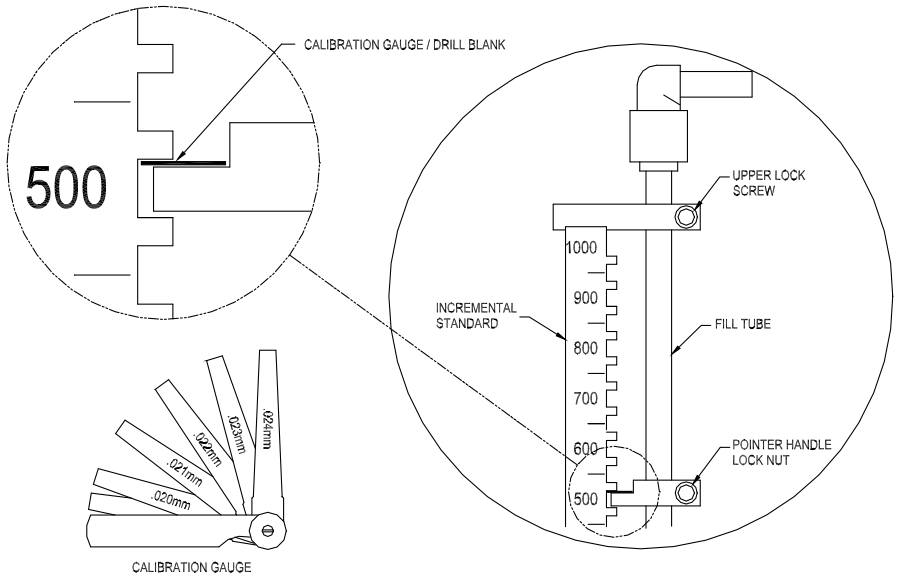


Figure 6-1

When delivery volume is too low increase by lowering the pointer as follows:

1. Loosen the upper lock screw using a 1/4 in. wrench so that the fill tube may be moved.
2. Using the calibration gauge (p/n 91-902-045), select a size which corresponds with the required volume change [Volume Change X .0048] or refer to the conversion chart in figure 6-2.
3. Raise the fill tube as necessary and place the calibration gauge between the pointer and the lower side of the incremental standard notch (see figure 6-2).
4. Lower the fill tube so that the pointer and calibration gauge are tight against the lower side of the incremental standard notch.
5. Tighten the upper lock screw and remove the calibration gauge.
6. Use 1/4 in. wrench to loosen the pointer handle lock nut and slide the pointer down tight against the bottom of the incremental standard notch and retighten the pointer handle lock nut.

CONVERSION TABLE	
0.001	0.21
0.0015	0.31
0.002	0.42
0.003	0.63
0.004	0.83
0.005	1.04
0.006	1.25
0.007	1.46
0.008	1.67
0.009	1.88
0.010	2.08
0.012	2.50
0.014	2.92
0.015	3.13
0.016	3.33
0.018	3.75
0.020	4.17
0.022	4.58
0.024	5.00
0.025	5.21
CONVERSION TABLE	
INCH = ML x .0048	

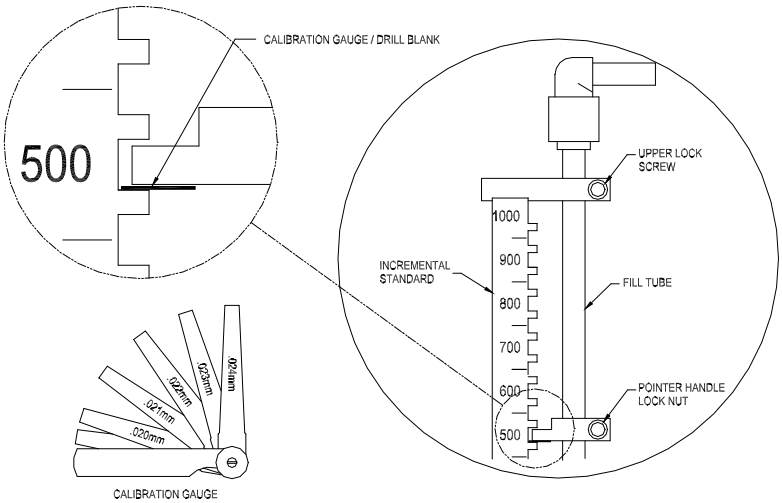


Figure 6-2

7. Repeat steps 1 through 6 as necessary for each vessel.
8. Calibrate per Volume Delivery Calibration in section 6.

Deaeration Validation

Deaeration is validated by running a standard instrument cycle and then measuring the dissolved oxygen content in each filled dissolution vessel. Dissolved oxygen meters are readily available from laboratory suppliers such as Cole Parmer, (800) 323-4340.

To avoid dissolution problems, the maximum dissolved oxygen content should not exceed 95% saturation at operating temperature (Handbook of Dissolution Testing, William Hanson, 3rd ed.).

The USP dissolution toolkit recommends a dissolved oxygen level of not more than 6 ppm. The Media-Mate Plus will meet this at 37 °C with 500 mL and higher volumes and/or temperatures.

Deaeration validation must be performed with all user-input adjustments set and recorded on the deaeration validation log. Validation is recommended for each set of user adjustments that will be used. Validation is recommended prior to the first use of the instrument and should be repeated every six months.

1. Set all user-input adjustments (see section 7).
2. Initiate an instrument cycle (see Test Cycle in section 7).
3. Using a calibrated dissolved oxygen meter, measure the dissolved oxygen content in each dissolution vessel.
4. Record all user-input adjustment settings and dissolved oxygen readings on the deaeration validation log.

Temperature Controller (PID) Setup

The temperature controller (see figure 6-3) has been programmed at the factory to obtain optimum temperature control and quick heat-up time. The program set points are locked and should not require changing or resetting. If the factory program has been altered for any reason, it may be restored in accordance with THR procedure number 25-710-807, “Programming Procedures for Temperature Controller.” This procedure is available on request from Teledyne Hanson Technical Support.

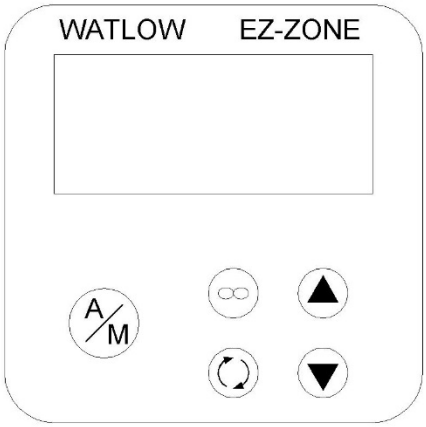


Figure 6-3 Temperature controller

Temperature Calibration Record

Instrument model number: _____

Instrument serial number: _____

Set point temperature (°C)	Display temperature (°C)	Actual temperature (°C)	Date	Tested by

Volume Calibration Record

Instrument model number: _____

Instrument serial number: _____

User Input Settings							
Setup number	Media	Volume (mL)	Temperature (°C)	Media density (g/mL)	Fill time (seconds)		
1							
2							
Delivered Volume (mL) Setup #1							
	Vessel identification						
Cycle number	1	2	3	4	5	6	7
1							
2							
3							
4							
5							
Delivered Volume (mL) Setup #2							
	Vessel identification						
Cycle number	1	2	3	4	5	6	7
1							
2							
3							
4							
5							

Tested by: _____ Date: _____

Deaeration Validation Record

Instrument model number: _____

Instrument serial number: _____

User Input Settings				
Setup number	Media	Volume setting (mL)	Temperature setting (°C)	Fill time setting (seconds)
1				
2				

Deaeration Reading (Percent Saturation)							
	Vessel identification						
Setup number	1	2	3	4	5	6	7
1							
2							

	Vessel identification						
Setup number	1	2	3	4	5	6	7
1							
2							

	Vessel identification						
Setup number	1	2	3	4	5	6	7
1							
2							

Tested by: _____ Date: _____

Section 7 – Operating Instructions

Volume Selection

See figures 6-1 and 6-2.

1. Loosen the upper lock screw so that the dispense tube may be moved.
2. Grasp the pointer handle and rotate 45° in either direction.
3. Raise or lower the dispense tube as necessary to align the pointer with the appropriate incremental standard notch.

   Note: The incremental standard has been marked with a volumetric scale so that the appropriate notch may be readily located.
4. Rotate the pointer handle until the pointer engages the incremental standard notch.
5. Move the pointer down tight against the lower side of the notch and tighten the upper lock screw.
6. Repeat steps 1 through 5 for each vessel position.

Temperature Setting

See figure 5-3.

The temperature controller is located in the approximate center of the control panel. The temperature controller has two digital displays that display in tenths of a degree. The upper display shows actual media temperature while the lower display shows set point temperature.

To set temperature

1. Verify that the media tank has been filled to at least the 18-liters mark.
2. Verify that the heater assembly is installed in the tank and is plugged into the interface panel.
3. Plug the retractable power cord into an appropriate AC power receptacle (see Electrical in section 5 for retracting requirements of cordage).

4. Turn on heater power and air pump power at the control panel.
5. Increase or decrease set point temperature using the “UP”/”DOWN” arrow keys located just below the set point display on the temperature controller. Allow adequate time for the temperature to stabilize.

Fill Time Setting

See figure 5-3.

The fill time setting determines the amount of time the system will allocate to the fill cycle and is dependent on the delivery volume setting. The amount of time allocated must be sufficient to fill the measure vessels 50 - 100 mL above the fill tube slot. The fill time is set by adjusting the fill time thumbwheel located on the control panel.

Low to moderate viscosity media

1. Start by setting the fill time to the value that corresponds to the volume setting in the table below.

Vol. setting (mL)	250	400	500	600	700	800	900	1000
Fill time (sec.)	45	50	55	60	65	70	75	80

2. Run a test cycle (see Test Cycle in section 7) while observing the measure vessels during the fill cycle to see where the fill level is with respect to the fill tube slot. The test media must have the same approximate viscosity as the dissolution media that will be used.
3. If the actual fill level is too high, reduce the fill time. If the actual fill level is too low, increase the fill time.
4. Repeat steps 2 and 3 until the desired characteristics are achieved.

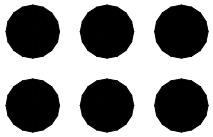
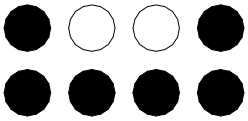
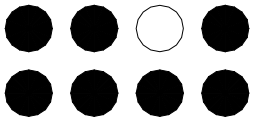
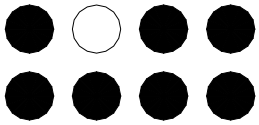
High viscosity media

For high viscosity media it may be necessary to set the volume adjustment to one half the desired delivery volume and run two cycles.

1. Set volume adjustment to one half the desired delivery volume.
2. Set the fill time to two times the value that corresponds to the volume setting in the table above.
3. Run a test cycle (see Test Cycle in section 7) while observing the measure vessels during the fill cycle to see where the fill level is with respect to the fill tube slot. The test media must have the same approximate viscosity as the dissolution media that will be used.
4. If the actual fill level is too high, reduce the fill time. If the actual fill level is too low, increase the fill time.
5. Repeat steps 3 and 4 until the desired characteristics are achieved.

Configuring the Dispense Head

The Media-Mate Plus dispense head has been designed to accommodate the THR SR6™, SR8™, SR8-Plus™, Vision® Classic 6™ and Vision® Elite 8™ dissolution test stations and most test stations manufactured by other manufacturers. The dispense head is connected to the dispense harness by quick disconnects which have been identified by the numbers 1 through 7. The dispense head will accommodate six or seven dissolution vessels by enabling or disabling #7 measure vessel (see figures 7.1 and 7.2). The configuration is achieved by connecting the quick disconnects so that the pattern formed matches the test station vessel pattern. Common vessel patterns are shown below:

Typical configurations	
3 + 3 configuration	
	THR: Classic 6™, SR6™, SR2™, SR72, QC-72™ VanKel: VK7000, VK700 Logan: D800, D600
4 + 2 configuration	
	THR: Elite 8™, SR8-Plus™, SR8™ VanKel: VK7000, VK700 Distek: 2100s, 2500, 5100 Logan: D800, D600
4 + 3 configuration	
	THR: Elite 8, SR8-Plus, SR8 VanKel: VK7000, VK700 Logan: D800, D600
4 + 3 configuration	
	THR: Elite 8, SR8-Plus, SR8 VanKel: VK7000, VK700 Logan: D800, D600

Media-Mate Plus Interface with all Distek 2100's, Distek 2500, and Distek 5100

Filling six vessels

1. Remove the two fittings labeled "not used" in figure 7-1 below.
2. Close the two shut-off valves to the seventh vessel at the Media-Mate Plus dispense assembly (see figure 7-2).

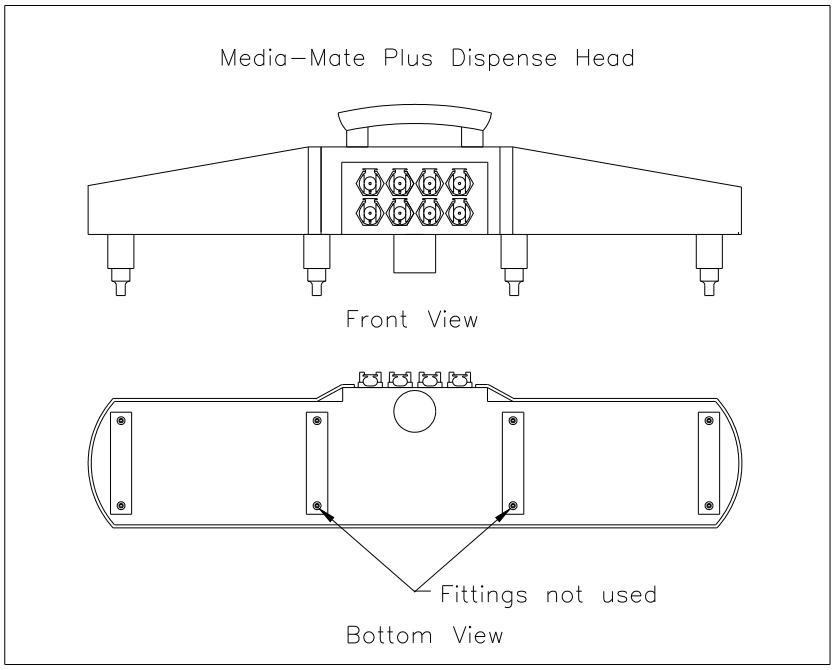


Figure 7-1

Filling seven vessels

1. Remove the two fittings labeled "not used" in figure 7-1 above.
2. Connect the single flask filling assembly (p/n 25-710-415) to the Media-Mate Plus dispense harness, #7 quick disconnect.
3. Open the two shut-off valves to the seventh vessel at the Media-Mate Plus dispense assembly (see figure 7-3).

To configure the dispense bar

1. For Six Vessels: Close the ball valve and pinch valve at vessel 7 (see figure 7-2):

   For Seven Vessels: Open the ball valve and pinch valve at vessel 7 (see figure 7-3):

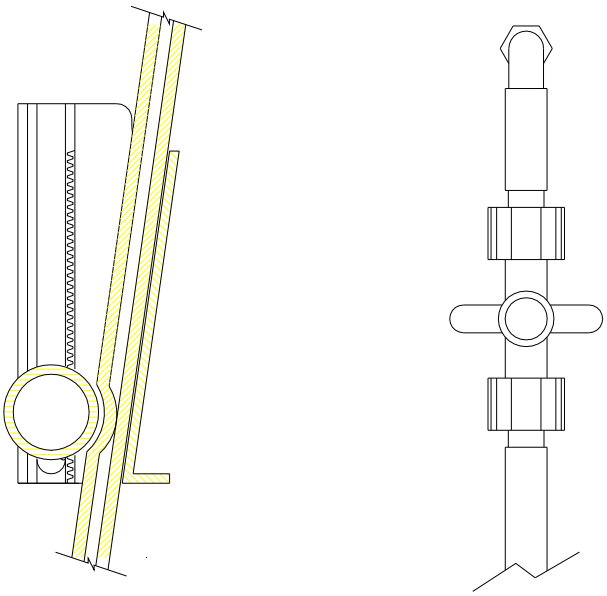


Figure 7-2

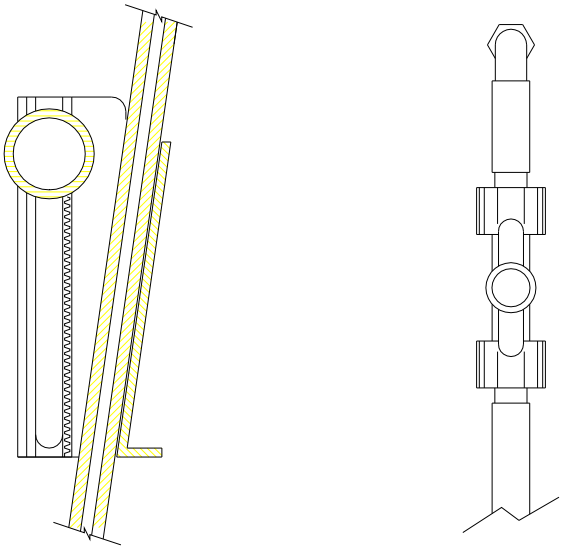


Figure 7-3

2. Observe the dissolution test station vessel pattern.
3. Arrange the quick disconnects at the dispense head to match the observed pattern.

   Note: For six dissolution vessels, the # 7 disconnect must be connected to an inactive location.

Test Cycle

Test cycles are accomplished with the dispense head positioned on the media tank cover docking position. This arrangement provides for media return back to the tank during an instrument cycle. Test cycles are useful for observation of instrument performance.

Running a test cycle

1. Set all user inputs (see Volume Selection, Temperature Setting, and Fill Time Setting in section 7).
2. Position the dispense head in the docking position on the media tank cover.
3. Fill the media tank with media.
4. Plug the retractable power cord into an appropriate AC power receptacle (see Electrical in section 5 for retracting requirements of cordage).
5. Turn on the main power switch located on the pump panel next to the power cord outlet.
6. Turn on air pump power at the control panel.
7. Press the start button on the control panel.

Filling dissolution vessels

1. Set all user inputs (see Volume Selection, Temperature Setting, and Fill Time Setting in section 7).
2. Fill the media tank with media.
3. Plug the retractable power cord into an appropriate AC power receptacle (see Electrical in section 5 for retracting requirements of cordage).
4. Turn on the main power switch, located on the pump panel next to the power cord outlet.

5. Turn on the air pump and heater power switches, located on the control panel.
6. Configure the dispense head (see Configuring the Dispense Head in section 7).
7. Place the dispense head over the dissolution vessels on the test station.
8. Verify that the active output ports on the dispense bar engage appropriate vessels on the dissolution test station.
9. Verify the media temperature at the control panel.
10. Press the start button at the control panel.
11. When the cycle is finished, remove the dispense head from the dissolution test station and return to the docking position on the media tank cover.

Section 8 – Troubleshooting

Volume Delivery Problems

1. Dispense volume is too high or too low.

Cause	Solution
Improper volume setting	Reset (see section 7)
Improper volume adjustment	Reset (see section 6)
Improper fill time setting	Reset (see section 7)
Pressure or vacuum leak	Check and correct (see section 8)
Clogged inlet filter	Replace element (see section 9)
Restricted passage	Visually check tubing for kinks.
High media viscosity	Run two cycles (see section 7)
Pinch valve leaks	Check and correct (see section 8)

2. Fails to completely dispense (media left in measure vessels).

Cause	Solution
High media viscosity	Run two cycles (see section 7)
Fill time too high	Reset (see section 7)

Temperature Control Problems

1. Does not heat media (media remains at ambient temperature).

Cause	Solution
Power source connection	Check and correct all electrical connections.
Low water level	Fill tank to at least the 18-liter mark.
Blown fuse	Replace fuse (see section 9). Contact Technical Support if fuse blows again.
Set point too low	Adjust set point higher.
Defective heater assembly	Check and replace if necessary.
Defective temperature controller	Check and replace if necessary.

2. Temperature fluctuates more than ± 0.5 °C with the tank filled to at least the 20-liter mark. Note that lower liquid levels may cause readings to fluctuate more than 0.5 °C.

Cause	Solution
Defective heater assembly	Check and replace if necessary.
Defective temperature controller	Check and replace if necessary.
Temperature control program changed	Check program and fix.

3. Temperature reading does not match calibrated thermometer.

Cause	Solution
Unit not calibrated	Perform calibration procedure (see section 6).

Deaeration Problems

Delivered media exceeds 95% saturation.

Cause	Solution
Improper fill time setting	Reset (see section 7).
Low media temperature	Increase to 2° C above test temperature.

Service Procedures

Pressure or vacuum leak

1. Disconnect fill hose at upper hose connection and connect hose to tank side port.
2. Plug manifold port with hose cap fitting.
3. Connect power cord to power source. Turn on the main power switch located on the pump panel next to the power cord outlet and turn on power to air pump at control panel.
4. Apply leak test compound (p/n 91-951-025) or equivalent to all accessible, sealed connections such as vessel covers and tube fittings.
5. Foaming compound indicates a leak.

6. Turn power off and disconnect instrument from power source.
7. Correct all points of leakage and retest per above steps 1 – 6 until the system has no leaks.
8. Remove hose fitting cap from fill manifold and reconnect fill hose.

Pinch valve leaks

1. Set up and run a test cycle (see Test Cycle in section 7).
2. Remove tank cover and observe inlet filter element during the dispense cycle.

   Note: Dispense LED on the control panel is energized during the dispense cycle.
3. Bubbles emitting from the filter indicate a leaking pinch valve assembly. Contact Teledyne Hanson Technical Support for service.

Liquid in Vessels

If the instrument is turned off in the middle of a cycle and/or media is left in the vessels, it is important not to start another cycle before emptying the vessels as overfilling can occur.

Emptying the vessels is done by setting the fill time to 1 second, placing the dispense head back on the tank, and starting a cycle. The material in the vessels will be dispensed back into the tank without overfilling the vessels. Remember to reset the fill time.

Section 9 – Maintenance

Media-Mate Plus has been designed to be a low maintenance instrument. In general, the instrument is maintained by proper cleaning after use, periodic replacement of the filter element and periodic lubrication of fill tubes.

The Media-Mate Plus has type 316 stainless steel in the liquid flow path. HCl can affect the 316 stainless steel, especially when the solution is left to dry.

When using HCl, rinse the Media-Mate Plus with D.I. water when finished. Do not allow the HCl to set in the unit for long periods of time (4 hours or more). Rinse off any external spillage immediately.

General Cleaning

See section 5 for identification of parts.

The exterior of the instrument should be periodically wiped down with a damp cloth. Particular attention should be given to the volume adjust components located on the dispense assembly. Frequency of cleaning depends on instrument usage and operating environment.

Cleaning the Media Tank and Fluid Lines

Note: Always unplug the heater assembly.

The media tank should always be cleaned prior to filling the tank with new media, or if it will not be used within 36 hours.

Cleaning method

1. Disconnect the fill tube assembly at the fill manifold and drain the tank out the fill tube. The side of the tank housing by the filter assembly may be shifted off of the support rail in order to facilitate more complete draining.
2. Remove the tank and pour out any remaining media and wipe dry.
3. Replace the tank and reconnect the fill tube assembly at the fill manifold.
4. Fill the tank with clean DI water and run a couple of test cycles (see Test Cycle in section 7).
5. Repeat steps 1 – 3.

6. With the tank empty, run two dry test cycles (see Test Cycle in section 7). This will help dry the fluid passages and leave the instrument ready for the next usage.
7. If the instrument is not going to be used within 15 days, it should be covered and moved to an appropriate storage location.

Lubrication

The fill tubes (see figure 6-1) should be lubricated every six-months to maintain easy movement and to facilitate easy adjustment of the volume setting.

To lubricate

1. Adjust the volume delivery setting to 1000 mL (see Volume Selection in section 7).
2. Apply a small amount of silicone grease (p/n 91-951-004) to the exterior of the fill tubes between the pointer and the vessel cover.
3. Loosen the upper lock screw and rotate the pointer in order to disengage the incremental standard.
4. Move the fill tube up and down several times between the upper and lower extreme positions.
5. Raise the fill tube to the upper position and remove excess grease.
6. Reset volume selection (see Volume Selection in section 7).

Replacing the Filter Element

A clogged filter element will restrict media flow and impair instrument performance. The filter element should be replaced every 90 days or whenever the fill level is reduced by 25 mL (this may be observed during the fill cycle). Also, since the filter element will retain a small volume of media, it must be replaced whenever the tank is to be filled with a media that is different than the media that was previously used.

Replacing the element for units without a filter housing

1. Unscrew the filter core assembly and remove it from the tank along with the element and washers (see figure 9-1).
2. Discard the element and replace with a new element (p/n 25-710-723).

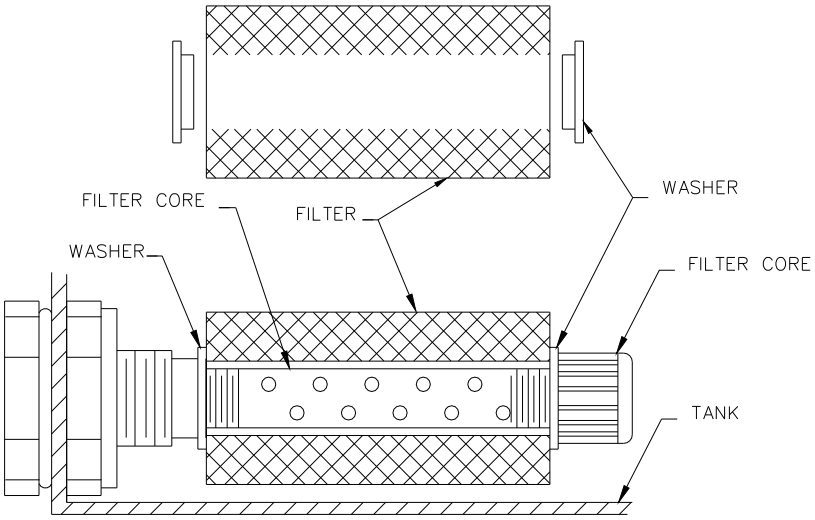


Figure 9-1

For systems with a filter housing used to reduce dead volume in the Media-Mate Plus tank, follow the procedure below.

Replacing the element for units with a filter housing

1. Unscrew the filter core assembly and remove it from the tank along with the filter, filter element, and filter housing end caps (see figure 9-2).
2. Remove the filter housing end caps and slide the filter off the filter core.

3. Discard the old element and replace with a new element (p/n 25-710-723).
4. Slide the new element into the housing and secure with the end caps.
5. Slide the filter core through the assembly.
6. Reinstall the assembly into the Media-Mate Plus tank with the slots of the filter housing facing down.

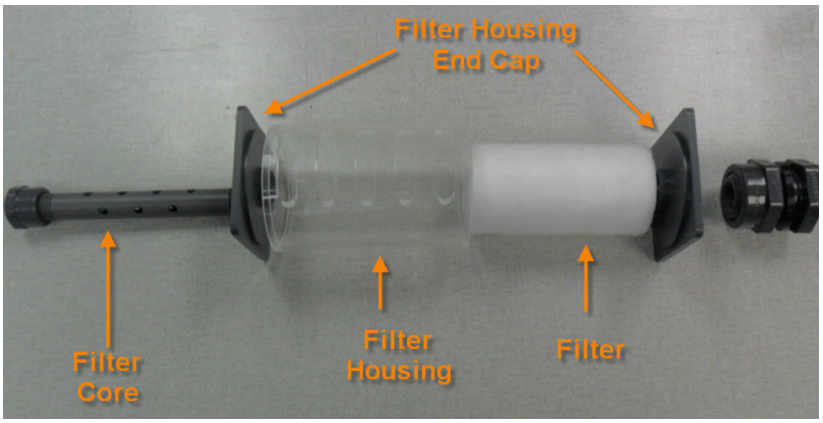


Figure 9-2

Note: Removed from tank to provide clear view. Clear filter housing shown only to provide clarification on function.

Fuse Replacement

The fuses are located on the interface panel of the control. Each system has four (4) fuses. The amperage is labeled next to the fuse. Notice that the amperage of three of the four fuses is dependent upon the voltage of the system.

Caution: For continued protection against risk of fire, replace the fuse(s) with the same type and current rating. Do not over-tighten the fuse holder.

To check the fuses and replace a defective fuse:

1. For fuse holders with slot knobs, insert the end of a standard (flat) screwdriver into the slot, push in and slightly turn counterclockwise to remove the holder.
2. For fuse holders with finger grip knobs, push in and slightly turn counterclockwise to remove the holder.
3. Visually inspect the fuse to see if it is defective. If you are not sure, use an Ohm meter to confirm.
4. If it is defective, remove the fuse from the holder by pulling it straight out. Replace with a fuse of the same type and rating.
5. Push the fuse back into the control. Secure the fuse holder by pressing in and slightly turning clockwise.

   Note: Use a standard (flat) screwdriver for fuse holders with slot knobs.

Section 10 – Moving and Storage

Storage

If the Media-Mate Plus will not be used for an extended period of time (15-days or more), the power should be turned off and disconnected from the power source. The instrument should be cleaned (see section 9), covered, and moved to an appropriate storage location.

Moving

The Media-Mate Plus is a portable system and therefore does not require special consideration when being moved within the same laboratory or building. For shipment to another location, the instrument should be repackaged in its original shipping container.

Section 11 – Parts, Supplies, & Accessories

Spare Parts and Kits

25-710-701	Two-year spare parts kit, 115/230 V
25-710-125	Stand-alone temperature control, 115 V
25-710-126	Stand-alone temperature control, 230 V
25-710-400	Extra 40-liter tank assembly with heater, 115 V
25-710-401	Extra 40-liter tank assembly with heater, 230 V
25-710-723	Filter element, 5-micron (pack of 5)
25-710-404	Fill hose assembly
25-710-706	Fuse kit, 115 V
25-710-707	Fuse kit, 230 V
91-601-219	Female quick disconnect fitting
91-601-220	Male quick disconnect fitting
25-710-507	Connector
25-710-569	Nipple fitting, dispense head, gray PVC
25-710-511	Incremental standard
25-710-514	Pointer
25-710-408	Standoff assembly, ¾” (1 per clamp; requires 7 per system)
25-710-409	Standoff assembly, 3/8” (1 per clamp; requires 7 per system)
25-710-515	Fill tube (0.025” gap)
25-710-577	Fill tube (0.007” gap)
25-710-564	Dispense tube SS
25-710-588	Dispense tube PEEK
25-710-556	Support
25-710-130	Heater replacement kit, 115 V
25-710-131	Heater replacement kit, 230 V
91-601-237	Fitting, ¼” male x ¼” female, stem elbow
91-425-004	O-ring, ¼”
91-217-021	Over-protection sensor
91-600-014	Tygon tubing, 1/8” x ¼” (sold per foot; 70 ft per unit)
91-600-020	Tygon tubing, 3/16” x 5/16” (sold per foot; 40 ft per unit)

91-601-230	Fitting, 1/8-MPT x 1/8-B, straight
91-601-231	Fitting, 1/8-MPT x 1/8-B, elbow
93-670-018	Nut, acorn, ¼-20, stainless steel
25-710-725	Tubing replacement kit, Media-Mate Plus

Tools and Accessories

25-710-449	Flask holding stand for 8 vessels
91-902-020	Electro-mechanical tool kit
91-951-004	Silicone grease (1 tube)
91-951-025	Leak test compound
91-030-003	Vessel, plastic
65-233-401	Certified calibrated thermometer
65-233-402	Certified calibrated digital thermometer
25-710-415	Single flask filling assembly
91-902-045	Calibration gauge set

Section 12 – General Warranty

Teledyne Hanson is a division of Teledyne Instruments, Inc. Teledyne Hanson products are warranted for one full year including parts and labor. Service contracts and preventive maintenance contracts are available for post-warranty support. International dealer warranties may vary. Teledyne Hanson makes no warranty, expressed or implied, for glassware, consumables, or products not manufactured by Teledyne Hanson, as evidenced by nameplate on the item or other designation. Teledyne Hanson will give reasonable assistance to buyer in obtaining from the respective manufacturer whatever adjustment is available under the manufacturer's own warranty. Teledyne Hanson shall be released from any and all obligations under any warranty, either expressed or implied, if the product covered is repaired or modified by other than its own personnel, or without written authorization from Teledyne Hanson. There are no other warranties, expressed or implied, and Teledyne Hanson shall not be liable under any circumstances for damages of any kind, direct, consequential, or otherwise.

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