AccuCoat® HD15 In-Line Heater

OWNER'S MANUAL

AutoJet® TECHNOLOGIES

Spraying Systems Co.®
Experts in Spray Technology

ML00HD15
spray.com

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SECTION 1

PREFACE

1.1 IMPORTANT

The AccuCoat® HD15 In-Line Heater and all components are produced, tested and checked at the factory. The system can be dangerous if used incorrectly. Read this manual carefully and read any safety instructions.

Operators must always follow the general safety instructions in the working area and aim to prevent accidents.

The manufacturer reserves the right to make changes in standard construction without prior notification.

Images and diagrams in this manual may not be exact representations of your system configuration.

1.2 HOW TO USE THIS MANUAL

This manual is intended to be a source of information for the operators and technicians who may be installing, interacting with, or servicing/maintaining Spraying Systems Co.® systems and components.

This manual contains important safety warnings, installation instructions, operating instructions, troubleshooting, and maintenance information.

ICONS

WARNING: The user can be seriously injured, damage their health, and/or damage the system.

CAUTION: Product, process, or environment can be damaged or be in danger if the instructions are not followed correctly.

ATTENTION: Supplementary information for the user draws attention to possible problems.

SECTION 2

SAFETY

2.1 GENERAL SAFETY INFORMATION

READ AND FOLLOW INSTRUCTIONS

All safety-related and operating instructions should be read before the system is operated. Follow all operating instructions.

SERVICING

Do not attempt to service this system unless you have been trained or authorized to conduct repairs. Only authorized and qualified service personnel should attempt to service this system. Service by unauthorized personnel may void any and all warranties.

WARNING: Before performing any maintenance, make sure electrical power is off and any air/liquid pressure is bled from the system.

UNINTENDED USE

Use of Spraying Systems Co.® equipment in ways other than those described in the documentation supplied with the equipment may result in injury to persons or damage to property. Examples of unintended use of equipment would be:

- Using incompatible materials/damaged parts
- Making unauthorized modifications/using unapproved auxiliary equipment
- Removing or bypassing safety guards or interlocks
- Operating equipment in excess of maximum ratings

REGULATIONS AND APPROVALS

Make sure all equipment is rated and approved for the environment in which it is used. Any approvals obtained for Spraying Systems Co.® equipment will be voided if instructions for installation, operation, and service are not followed. All phases of equipment installation must comply with federal, state, and local codes.

PERSONAL PROTECTIVE EQUIPMENT

Spraying Systems Co.® strongly recommends the use of appropriate safety equipment when working in potentially hazardous environments and chemicals. This safety equipment includes, but is not limited to, the following:

- Protective hat
- Safety glasses or face shield
- Chemical-resistant safety gloves and apron
- Long sleeve shirt and long pants

Users of this product should never place themselves in the path of the spray. Users should consult and follow the recommendations of the Safety Data Sheet (SDS) of any chemical or fluid sprayed using this system.

PRESSURIZED SYSTEMS

It is important to recognize proper safety precautions when using a pressurized spray system. When dealing with pressure applications, the system pressure should never exceed the lowest rated component. Always know the system, all component capabilities, maximum pressures and flow rates.

WARNING: Fluids under pressure can penetrate skin and cause severe injury.

ATTENTION: Always remember to carefully read the chemical manufacturer's labels, follow SDS and all directions.

WARNING OF SHOCK HAZARD

To reduce the risk of electric shock, do not open the cover on electrical control panel. For service contact Spraying Systems Co.® at 1-866-321-2250.

WARNING: Plug panels into a GFCI outlet.

WARNING: To prevent injury, avoid contact with potentially hot parts. Components can cause severe burns. Do not aim the spray at any person or part of the body. Do not place any part of your body into the spray pattern.

USE OF CHEMICAL COMPONENTS

Spraying Systems Co. does not manufacture or supply any of the chemical components used in this equipment and is not responsible for their effects. Because of the large number of chemicals that could be used and their different chemical reactions, the buyer and user of this equipment should determine compatibility of the materials used and any of the potential hazards involved.

2.2 UNPACKING THE SYSTEM

The system components come packaged to protect them from damage. Use caution when opening the crate. The crate will contain all parts needed to install the unit. Parts of the unit may be wrapped in bubble wrap. Remove all of the packaging material wrapping the system. Once unpacked and removed from the crate, the system is ready for installation and connection.

CAUTION: The packaging may contain exposed cables, hoses, or other components. Always exercise caution when opening boxes to avoid accidental damage or slicing of various components.

SECTION 3

ACCUCOAT® HD15 OVERVIEW

3.1 PRODUCT FEATURES

The AccuCoat® HD15 In-Line Heater is an add-on unit that can be paired with many of the Precision Spray Controllers offered by Spraying Systems Co.® such as AutoJet SCS (Spray Control Series) panels to provide heat to your spray application. The HD15 comes available in a threaded version with push-tube fittings or a sanitary version with clamp-style connections. All wetted parts are constructed of 316 stainless steel and VITON® seals.

The in-line construction allows heating to be achieved only on-demand for optimal response and energy efficiency. The heater is made with food contact materials to ensure food safety. It can be used with light oils, sugars, syrups or release agents to help achieve consistent, uniform coverage, minimize clogging problems, and ensure the proper volume of coating to the target. The system should not be used with fluids that solidify at room temperature.

WARNING: Do not enable heating without fluid in the system.

SYSTEM USAGE

The HD15 heater can be used to feed the nozzle directly or use a liquid recirculating system through nozzle or outlet bypass. The system is designed for optimum performance using the recirculation feature of the AutoJet SCS Series Pump System or Coating Supply Unit. This will ensure consistent temperatures and uniform spray.

Heating capabilities are a factor of the heater, flow rate, and the properties of the fluid (specific heat C_p, density, inlet temperature, etc.).

RESPONSE LIGHT

Light is illuminated when power is being provided to the heater. The temperature controller utilizes a PID control loop to control the heater. This means that during the course of operation the light (indicating power to the heater) will vary from fully on, blinking quickly, intermittent pulses, or off for a duration of time even when the system is heating.

3.2 SPECIFICATIONS

CONTROL PANEL SPECIFICATIONS

- Maximum temperature controller setting is 130°F (54°C).
- Washdown stainless steel proof (Non-Ex).
- Power OFF/ON/START illuminated switch - When started, switch will turn to ON and illuminate the control panel. (If power is interrupted, restart system again.)
- Power Cord: Domestic - 125 VAC Hz, 15 Amps, Standard US 3 blade plug, 9’10”/ European Version - 230VAC, 50 Hz, 8 Amps, for Europe—Belgium, Germany, France, Spain, 9’10”
- Ambient temperature for electric control panel:
  - 32°F Min (5°C)/103°F Max (40°C)
  - Liquid must not solidify at room temperature.

HEATING UNIT SPECIFICATIONS

- 1.5 kW heater with built in K-type thermocouple.
- Helical grooved thermowell.
- Two RTD temperature sensors for process control and high limit.
- Watlow temperature controller that displays the current/ setpoint temperature.

Threaded
Heater Control Panels in Kits:
- 04CHICP1K5301W0—120VAC/1Ph/60Hz, 15A
- 04CHICP1K5301W5—230VAC/1Ph/50Hz, 8A
Liquid Connections:
- Liquid inlet/outlet: 1/2” NPT, 1/2” BSPT
Sanitary
Heater Control Panels in Kits:
- 04CHIE115401W0—120VAC/Ph/60Hz, 15A
- 04CHIE11K5401W5—230VAC/1Ph/50Hz, 8A
Liquid Connections:
- Liquid inlet/outlet: 3/4” Tri-Clamp sanitary connection

STANDARD SPECIFICATIONS:

- To be installed indoors.
- Max. humidity: 90%
- Not explosion proof (Non-Ex)
- International Connection 1/2” BSPT
- Height above sea level: < 3,280 ft.
- Dimensions: 15” (381 mm) x 8” (203.2 mm) x 20” (508mm)
- Weight: < 40 lb. (18.1 kg)
- Pressure: 100 psi max(7 bar) capable.
- Flow Rate: 0.5 GPM max(1.9 lpm/min.) suggested.

Note: An area of 24” (609.6 mm) around the unit should be kept free for maintenance purposes.

Heating Example 1:

Heating vegetable oil without recirculation at a flow rate of 0.5 GPM (1.9 l/min).

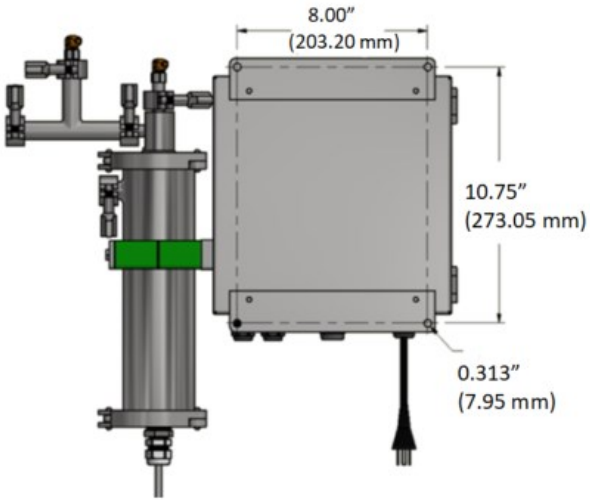
Temperature Increase: 50°F (27.8°C) (Heating from 70°F to 120°F (21°C to 49°C))

Heating Example 2:

Heating water without recirculation at a flow rate of 0.25 GPM (0.95 l/min).

Temperature Increase: 35°F (27.2°C) (Heating from 70°F to 105°F (21°C to 41°C))

Note: Even though the flowrate is lower, the specific heat is significantly higher so the temperature increase is lower than example 2.



3.3 SYSTEM MOUNTING

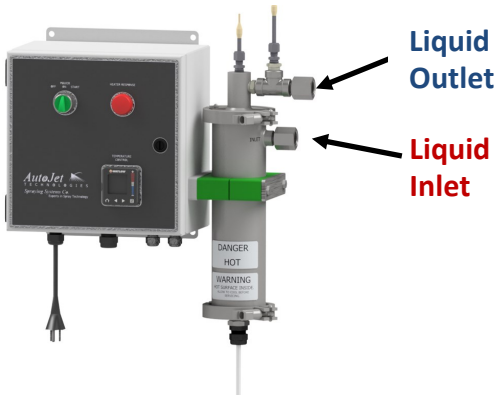
The HD15 In-Line Heater should be mounted in a convenient location near the spray application. A properly grounded power outlet must be easily accessible.

Install wall anchors that are designed to support at least 50 lbs. (22.68 kg) according to the anchor manufacturers’ specifications.

LIQUID CONNECTIONS

The liquid connections have stainless steel 1/2” NPT ports for both the inlet/outlet connections (or 3/4” inlet/outlet Tri-Clamp sanitary connection). Push connect fittings and tubing will be supplied separately with the system. The fluid supply connects to the HD15 inlet. The outlet connects to the spray nozzle (s) or liquid distribution manifold.

Note: International connection size - 1/2” BSPT



SECTION 4

SYSTEM START-UP AND OPERATION

For optimum performance, a recirculating system is required, such as that of the AutoJet® SCS Series Pump System or Coating Supply Unit. This will result in more consistent temperature and flow rate which will produce more consistent spray patterns.

While it is suggested to use a recirculating system, the AccuCoat® HD15 In-Line Heater can also be used to feed the nozzle directly. This works best for applications which have consistent, continuous spray with minimal interruptions.

4.1 SYSTEM OPERATION

OPERATION WITH A RECIRCULATING SYSTEM

Once fluid is recirculating and the system has reached the desired temperature, use the system as normal. Follow the spray controller manual for adjusting and controlling all aspects of the application aside from heating.

It is suggested that should the system need to be turned off for any duration of time, the heater should be powered off then the fluid should continue to be recirculated for several minutes. This will dissipate the heat that the mass of the heater assembly contains, preventing the temperature of the stationary fluid inside the heater assembly from climbing above the desired setpoint. This is especially important for fluids that may break down or become damaged at higher temperatures.

CAUTION: The heater should never be enabled when the system does not contain fluid.

OPERATION WHEN FEEDING THE NOZZLE DIRECTLY

Once the system has reached the desired temperature, use the AccuCoat HD15 In-Line Heater as normal. Follow the spray controller manual for adjusting and controlling all aspects of the spray application aside from heating.

During the course of any spray operation, it is common for there to be short periods when the system is not being used to spray. When feeding the nozzle directly without recirculation, it is normal that the temperature of the stationary fluid inside the heater assembly rise above the setpoint. However, once spray resumes the temperature will quickly return to normal.

It is suggested that should the system need to be turned off for any duration of time, the heater should be powered off, and then the fluid should continue to pass through the system for several minutes. This will dissipate the heat that the mass of the heater assembly contains, preventing the temperature of the stationary fluid inside the heater assembly from climbing above the desired setpoint. This is especially important for fluids that may break down or become damaged at higher temperatures.

4.2 SYSTEM START-UP

Before starting the system, make sure all fluid and electrical connections have been made and are secure.

START-UP WITH A RECIRCULATING SYSTEM

1) To begin using the system, power up the HD15 In-Line Heater by turning the green “POWER OFF/ON/START” switch to “START.”
2) The switch will turn “ON” and become illuminated.
3) Prime and begin recirculating fluid through the system per the instruction manual of the spray controller (AutoJet SCS Series Pump System or Coating Supply Unit).
4) Adjust the temperature setpoint to the desired value.
5) The system utilizes a ramping function to minimize severe over-shooting of the temperature setpoint. Every time the system is powered on or the temperature setpoint changes, a controlled ramp rate from the current temperature to the temperature setpoint takes place. This allows the system to achieve its temperature in a steady manner.

1) During the ramp cycle, the temperature controller will alternate the display between the normal state and the ramping notification. The ramping notification displays “Attn” in the lower display and “rP1” in the upper display (“Attention; Ramping”).

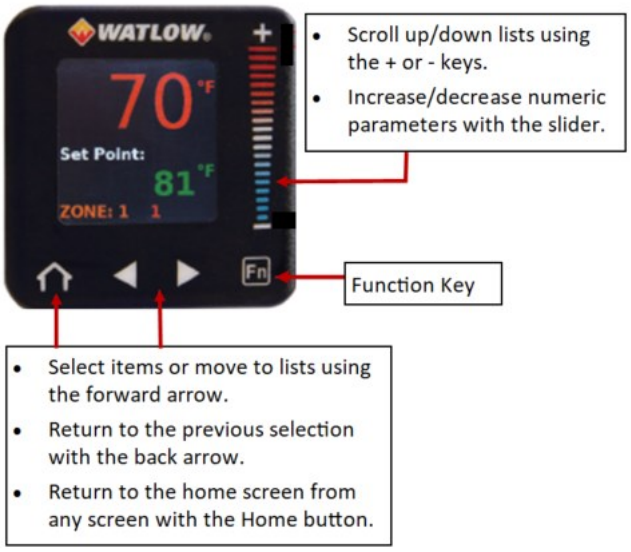
2) Indicator will become illuminated when power is being provided to the heater. The temperature controller utilizes a PID control loop to control the heater. This means that during the course of operation the light (indicating power to the heater) will vary from fully on, blinking quickly, intermittent pulses, or even off for a duration of time even when the system is heating.

3) Depending on the fluid being heated and the flow rate, it may take several minutes for the displayed current temperature to begin to rise.

4) Once the system has reached the desired temperature, the system is ready to spray.

4.3 USING THE WATLOW CONTROL PANEL

The HD15 Heater utilizes an EZ-Zone® series Watlow temperature controller. The figure below shows the key buttons and displays of the controller. For more detail, reference the complete manual for the Watlow Temperature Controller.



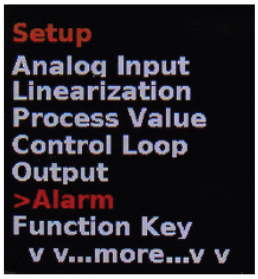
MOUNTING TO PANEL

1. Make the panel cutout using the measurements in figure 1.
2. Remove the green terminal connectors and the mounting collar assembly.
3. Insert the controller into the panel cutout from the front.
4. Orient the collar base so the flat side faces front and the screw openings are on the sides (see figure 2), then slide the base over the back of the controller.
5. Slide the mounting bracket over the controller with the screws aligned to the collar base. Push the bracket gently but firmly until the hooks snap into the slots in the case.
6. Tighten the two #6-19 x 1.5” screws with a Phillips screwdriver until the device is flush to the panel (3 to 4” lbs. torque).
7. Reinstall the terminal connectors to their original locations. (Or first connect field wiring as indicated in this guide and then reinstall the connectors).

Figure 1

Figure 2

SET UP ALARM TYPES/SIDES



Alarm Types

Alarm Types:

- process: alarm set points are set directly
- deviation: alarm set points are relative to the control loop's set point.
- Off: no alarm occurs

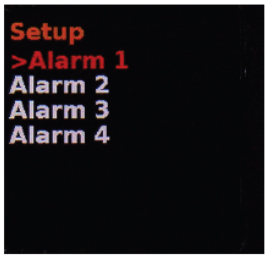
Alarm Sides:

Alarm sides allow you to set a high alarm, a low alarm, or both.

- high: alarm when process is above high alarm set point.
- low: alarm when process is below low alarm set point.
- both: high and low alarms are active.

SETTING UP ALARM TYPE

1. From Home, tap the forward arrow to go to Operations, then scroll to and select Setup.
2. Scroll to and select Alarm.
3. Scroll to and select Alarm 1, 2, 3, or 4.
4. Scroll to and select Alarm Type.
5. Scroll to and select the type: process, deviation, or off



Alarm Sides

SETTING UP ALARM SIDES

1. Use the *back arrow* to return to *Alarm 1, 2, 3, or 4*.
2. Scroll to and select *Alarm Sides*.
3. Scroll to and select the desired sides option: *high, low, or both*.
4. Use the *back arrow* to return to the Alarm list.
5. Scroll to the *Alarm High Set Point* or *Alarm Low Set Point*, as necessary for your sides selection.

-Repeat steps for remaining alarms

- During normal operation, the temperature controller will display the current temperature in the Upper Display and the current temperature setpoint in the lower display. Use the Up and Down Arrows to adjust the temperature setpoint.

RAMPING—The system utilizes a ramping function to minimize over-shooting the temperature setpoint. Every time the system is powered on or the temperature setpoint is changed, a controlled ramp rate from the current temperature to the temperature setpoint takes place. This allows the system to achieve its temperature in a steady manner.

- During the ramp cycle, the temperature controller will alternate the display between the normal state and the ramping notification. The ramping notification displays “Attn” in the lower display and “rP1”  in the upper display (“Attention; Ramping”).
- The temperature controller accomplishes the ramping cycle by setting an “internal setpoint” that takes precedence over the main setpoint when ramping. At the start of the ramp cycle, the “internal setpoint” is then set equal to the current temperature and increased by 1°F every 15 seconds (4°F per minute) until the “internal setpoint” is equal to the actual setpoint. Please note that though the ramping cycle has been completed, it still may take a few moments for the fluid to reach the setpoint.

- Press the “RIGHT ARROW” to display the Operations menu. Press the “LEFT ARROW” at any time to return to the main display.
- Use the numeric slide or the +/- keys to toggle between menu items
- Use RIGHT ARROW to select menu item
- Press HOME button at anytime to return to Home screen.
- Press the “FN Button” to effectively pause the heating operation. Press the “FN Button” again to resume normal operation.

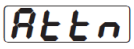
- This heater pause is achieved by changing the control mode to Manual and locking the heater output at 0%. This can be seen by cycling to the heater power display as described above.

AUTOTUNE—The temperature controller has been enabled with an Autotune function.

The Autotune function is an automatic sequence that optimizes the heating PID parameters to the specific system and fluid. During this sequence, the controller learns how the system reacts and adjusts the control loop to result in a better heater response.

- The system response is dependent on many things. Including:
  - ♦ Fluid type
  - ♦ Flow rate
  - ♦ Ambient temperature
  - ♦ Overall system configuration.
- Before enabling the Autotune sequence, make sure the system is operating as it normally would during the spray application.

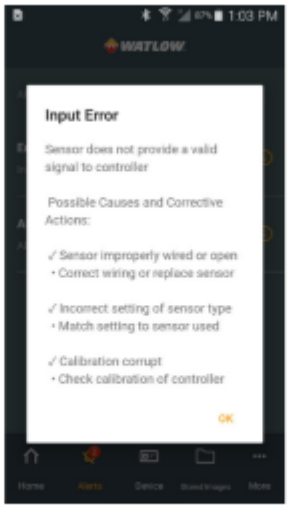
Note: If the fluid being heated is extremely temperature sensitive, before enabling the Autotune sequence it is suggested to lower the temperature setpoint below the maximum fluid temperature.

- During the Autotune sequence, the temperature controller will intentionally overshoot the temperature setpoint and then drop below the setpoint. This may happen several times.
- During the Autotune sequence, the display will flash  and  . Once the Autotune is completed, the display will return to its normal state.
- Allow the controller to complete the full Autotune sequence before adjusting the temperature or turning off the controller.

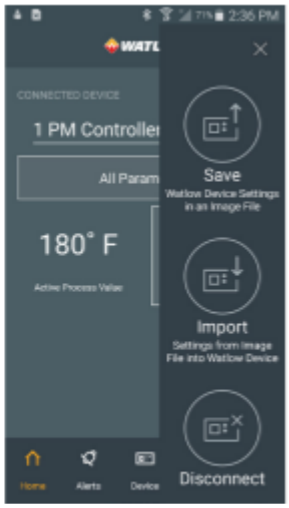
EZ-LINK™ Mobile APP

Watlow's EZ-LINK™ mobile app allows users to easily set up and monitor Watlow® PM PLUS™ and EZ-ZONE® PM controllers via Bluetooth® wireless technology. The app is available free-of-charge from the app stores for phones and tablets, and provides access to the controller's parameters with fully spelled out names in plain text with help topics that explain each parameter and option. The EZ-LINK mobile app provides many other benefits to the user including password protection, alarm and error indicators, connection to Watlow for feedback and support and accessing device information such as firmware version, part number and serial number.

Provides access to controller's home page parameters



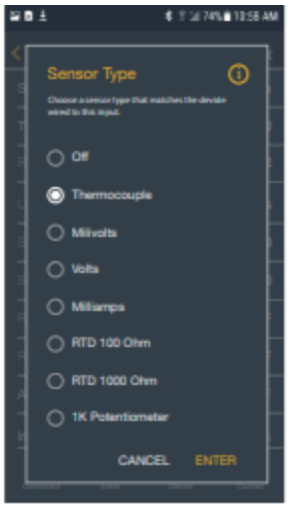
Decodes alarms, errors and messages



Save and import system image files via Bluetooth

Readable text for easy setup

Easy operation

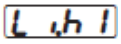
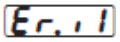
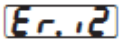


Help with each parameter

SECTION 5

TROUBLESHOOTING

If these troubleshooting steps are followed and the system still does not function please contact your local Sales Engineer by calling 1-800-95-SPRAY (1-800-957-7729) or call corporate support toll free 1-866-321-2250.

Watlow Controller		
	Problem	**Solution**
1	Watlow Controller will not power up – main power indictor switch does not illuminate.	a. Check to insure power cord is plugged into controller and power outlet and power switch has been turned to "START" and is in the "on" position. b. Check fuse on internal power rail. To do this follow these steps: • Unplug the system and check the panel for any loose wires. • Locate the 2 Amp MDA fuse holder on the top rail on the left hand side and lift up on the tab on the top of the fuse holder exposing the fuse. • Due to the type of fuse used, have a qualified electrical technician test the fuse and replace if necessary (see spare parts list). • Replace faceplate to its original position.
2	Controller powers up, yet heat does not turn on – Heater Response Indicator does NOT illuminate/flash.	a. Check to insure power cord is plugged into controller and power outlet. Turn power switch to "START" and the "ON" position, and is illuminated. b. Check temperature controller for error messages. The most common error codes are listed below, see temperature controller manual for details.  - High limit has been tripped. 1. Allow system to cool. 2. Ensure fluid is present in the system 3. Press blue reset key on temperature controller. 4. If system continues to trip the high limit, contact your local Sales Engineer.  - Error, Input 1. Process temperature RTD. 1. Unplug the system. 2. Check the panel for any loose wires (See electrical drawings for RTD connections).  - Error, Input 2. High Limit temperature thermocouple. 1. Unplug the system. 2. Check the panel for any loose wires (See electrical drawings for thermocouple connections).
3	Controller powers up, Heater Response indicator illuminates, yet system does not heat.	Check to insure power cord is plugged into controller and power outlet and power switch has been turned to "START", is in the "ON" position, and is illuminated. Check fuse on internal power rail. To do this follow these steps: 1. Unplug the system. 2. Check the panel for any loose wires. 3. Locate the 15 Amp Class CC fuse holder on the top rail on the left hand side and lift up on the tab on the top of the fuse holder exposing the fuse. 4. Test the fuse and replace if necessary (see spare parts list). 5. Replace faceplate to its original position.

SECTION 6

SUGGESTED SYSTEM MAINTENANCE

Note: Any long term shut-down requires that all liquid lines, liquid components, pumps, spray nozzles be flushed and cleaned thoroughly.

	Monthly Maintenance
Pneumatic	Check all pneumatic connections for leaks and tighten.
Liquid	Check all liquid connections for leaks and repair. Check all tubes and/or hoses for leaks and repair. Check liquid components for leaks and repair.
Electric	Check control panel for lose or corroded wires.

SECTION 7

REFERENCE MATERIALS

Please reference your Spray Controller Manual

IA00PM6C1CHALCJ	Temperature Controller Manual
AP116332	HD15 Data Sheet

SECTION 8

SPARE PARTS LIST

Please contact your local Spray Specialist to purchase replacement parts.

THREADED—04CHICP1K5301W0

Part Number	Description
FU0071385K517	Fuse, 2 Amp MDA Style
FU00LPCC15	Fuse, 15 Amp Class CC
IA00PM6C1CHALCJ	Temperature Controller
FRMM5044K17	3” Tri-Clamp Gasket
CL004322K155	3” Tri-Clamp Clamp
HT00EM75975	1.5 kW Heater
OR005577K144	O-Ring
TE00R1T185L483 + PL00SSLK14-14	4.125” RTD Temperature Sensor and Compression fitting
TE00R1T18500515 + PL00SSLK14-14	5” RTD Temperature Sensor and Compression fitting
International Spare Parts	
FU00LPCC7	Fuse, Low-Peak time delay, 7 Amp, rejection-type, Class CC
FU0071385K515	Fuse, 1A, MDA-style, ceramic high current.
HT00HD1500230	Heater, Immersion, 1500W, 230V

SANITARY—04CHIE11K5401W0

Part Number	Description
FU0071385K517	Fuse, 2 Amp MDA Style
FU00LPCC15	Fuse, 15 Amp Class CC
IA00PM6C1CHALCJ	Temperature Controller
FRMM5044K17	3” Tri-Clamp Gasket
CL004322K155	3” Tri-Clamp Clamp
HT00EM75975	1.5 kW Heater
OR005577K144	O-Ring
PL00RDPT75B024	Sanitary RTD Temperature Sensor – RTD #2 (High Limit)
PL00RDPTCUSTOM	Sanitary RTD Temperature Sensor – RTD #1 (Process)
WR00EVT004	Cable for RTD, orange right angle, M12, 5 meter length
CL004759K61	1/2" to 3/4" Tri-Clamp Clamp
FRMM5044K12	3/4" Tri-Clamp Gasket
International Spare Parts	
FU00LPCC7	Fuse, Low-Peak time delay, 7 Amp, rejection-type, Class CC
FU0071385K515	Fuse, 1A, MDA-style, ceramic high current.
HT00HD1500230	Heater, Immersion, 1500W, 230V

Warranty is one (1) year on non-wear parts from ship date. Wear items are covered for manufacturing defect only for a period of one (1) year. Wear items include, but may not be limited to, Liquid pump and Liquid regulator. Seller warrants that its products will conform to and perform in accordance with the products’ specifications.

Seller warrants that the products do not infringe upon any copyright, patent, or trademark.

THE FOREGOING WARRANTIES ARE IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THOSE CONCERNING MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

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