Rapid Purger
Product Bulletin 76-00

Type: V300

Purpose:
The V300 rapid purger from Parker is designed to safely and efficiently remove non-condensable gases from ammonia refrigeration systems. The V300 is an improvement over the successful V200 series and offers several new features and benefits.

The V300 is equipped with a RS-485 communication port for easy interface to controller data transmission. All of the parameters accessible via the HMI cable are now accessible via the serial channel. Further advancements include extended data logging time and password protection for factory calibration settings.

Like its predecessor the V200, the V300 can be used with 120 or 240 VAC and can handle from 4 to 20 purge points.

Contact Information:
Parker Hannifin Corporation
Refrigerating Specialties Division
2445 South 25th Avenue 
Broadview, IL 60155-3891

phone (708) 681-6300
fax (708) 681-6306

www.parker.com/refspec

Product Features:
• Compact design with equivalent capacity of our V200 model
• Made from 100% corrosion free components
• RS-485 communication capability
• Records purge cycles and purge time up to 12 weeks
• Password protection prevents tampering
• Multiple language display
• Factory calibrated for plug and play functionality
• Automatically adjusts vent pressures based on system conditions
• Energy saving sleep mode will activate with the lack of non-condensable gases
• Proprietary microprocessor control for all sensing
• Includes 1/2" Globe-T SW isolation valves for the liquid, foul gas and suction lines
• Includes a 30"-150 psig ammonia gauge and encapsulated leaded coils
**Technical Data**

Liquid Temperature Range ........... -20°C to 50°C (5°F to 120°F)
Ambient Temperature Range ........... 2°C to 54°C (35°F to 130°F)

Maximum Rated Pressure ............ 21.0 bar (305 psig)

**Introduction**

Non-condensable gasses such as air, hydrogen, nitrogen and hydrocarbons reduce the overall efficiency of refrigeration systems. The effects of non-condensable gasses, in a refrigeration system, increase the system operating pressures. These in turn negatively effect system performance. Increased compressor discharge temperature, higher energy costs, reduced system efficiency, leaks due to higher pressures, and increased wear on mechanical components are all negative consequences of non-condensable gasses in refrigeration systems.

The build-up of non-condensable gasses in the system can be attributed to several factors. These include inadequate system evacuation during service of system equipment, additions of refrigerant, leaks through external seals on equipment as well as refrigerant, and oil decomposition.

Common indicators of non-condensable gasses in the system are excessively high condensing pressure or temperature and deviations in the pressure and temperature relationship at saturation conditions. This can be determined by checking the temperature and pressure relationship at a known point in the system where the refrigerant is saturated, such as the condenser drain legs or high pressure receiver, as illustrated in Figure 1.

A higher temperature measured at this point, compared to the saturation pressure, indicates the presence of non-condensable gasses in the system.

Purging non-condensable gas from a refrigeration system can be accomplished manually, mechanically or automatically. Manual purging generally involves personnel removing air from specified purge “points” within the system through hand shut off valves routed to a water bucket. Mechanical purging is achieved by use of a device which will allow air to escape to a water reservoir when air is present. The latter method is automatic purging, which is generally achieved by the use of a self-contained system.
incorporating microprocessor controls. These are designed to sample the non-condensable gasses and refrigerant mixture and purge when non-condensable gasses are present.

Mechanical and automatic air purging units, commonly referred to as “purgers”, are manufactured by several companies. Each manufacturer’s purger operates in its own unique way. This article will focus specifically on the automatic purgers manufactured by Parker Hannifin Refrigerating Specialties Division.

The most common purge points in a refrigeration system are at the condenser drain, pilot receivers, thermosyphon receivers, high pressure receivers, liquid drain header, equalizing lines, and low velocity-high side areas.

Purge points should be located to ensure no liquid refrigerant is drawn into the purger. The Rapid Purger V300 has a liquid drainer at the foul gas inlet to prevent any liquid refrigerant from entering the shell side of the heat exchanger.

Purge Cycle

The purge cycle consists of three main processes: fill & pre-cool, separation of non condensable gases & refrigerant, and the safe release of the non-condensable gases.

1. Fill & Pre-Cool (See Figure 2 for a graphic representation of this cycle)

   This cycle begins with high pressure liquid ammonia feeding through the liquid solenoid, check valve and orifice (causing expansion) into the V300’s heat exchanger. The liquid solenoid stays energized until the level of ammonia in the heat exchanger is sensed by the level sensor. The level sensor is strategically located so that all of the tubes in the heat exchanger are filled with liquid ammonia. This guarantees the highest level of performance.

   The V300 Rapid Purger will stay in the “Pre-Cool” mode until the shell of the heat exchanger reaches a temperature of 4.4ºC (40ºF) or lower. This is determined by the temperature of the suction the purger is tied into. Once the purger reaches the required temperature, the purger will enter the active mode.

   To prevent a vacuum type situation, the A2B evaporator pressure regulator, located on the return suction line, is set at 0.24 barg (3.5 psig). This will prevent the heat exchanger from reaching temperature below -29ºC (-20ºF).

2. Separation of Non-Condensable Gases & Refrigerant (See Figure 3 for a graphic representation of this cycle)

   Once the fill and pre-cool cycle reaches the desired temperature and liquid level, it selects a purge point and commences a purge cycle by activating a solenoid located on the high side of the system, as illustrated in Figure 1.

   With an active purge point, the non-condensable gasses and refrigerant mix, also known as foul gas, enters the shell side of the heat exchanger through the liquid drainer, check valve and a flow control orifice. Any liquid that has condensed in the purge lines will collect in the liquid drainer and return directly to the suction. If the foul gas line does not contain condensed liquid and any remaining liquid in the liquid drainer evaporates to the suction, the liquid drainer flow control ball will prevent any foul gas from entering the suction line by blocking the orifice at the bottom of the liquid drainer tank, forcing the foul gas through the flow control orifice.

   After going through the control orifice the foul gas passes over the tubes in the heat exchanger and residual refrigerant is condensed. Liquid accumulation in the shell side of the heat exchanger continues until the level reaches the differential check valve, where the liquid is recycled back
to the liquid makeup side of the heat exchanger. This "Recycling" of ammonia reduces the need to call for more makeup refrigerant to maintain the liquid level on the tube side of the heat exchanger.

The Rapid Purger V300 can only purge one point at any given time. In the separation of non-condensable gases, purging is done automatically and effectively with built-in control features such as purge sampling and sleep mode.

In automatic mode, each purge point is sampled for a minimum of five minutes. If the purge conditions are not met within the sample time limit, the Rapid Purger continues to the next purge point. When a purge point meets the purge conditions within the sample time limit, the Rapid Purger starts the purge cycle. The purge cycle shuts off when non-purge conditions are met.

Sleep mode allows the system to bypass purge points after two cycles of not meeting the purge conditions within the minimum sample time of five minutes. After the Rapid Purger samples each purge point twice without a vent occurring, the system will shut off for two hours.

3. Release of Non-Condensable Gases (See Figure 4 for a graphic representation of this cycle)

Non-condensable gases will continue to accumulate in the "Vapor Vent Float" chamber as it is separated from the refrigerant. Once the volume of these gases in the float chamber rises past the target pressures, based on the sampled temperature, the vent and water solenoids are energized and the non-condensable gases are released into the water bubbler. For safe disposal, the non-condensable gases are diluted in the water.

Any oil that may collect in the V300 purger can be drained off from the two oil drains. Before draining the oil, shut-off the purger and close the liquid and foul gas valves. Allow the purger to pump out any remaining refrigerant and close the suction line valve. Use normal oil draining precautions to prevent injury or property damage.

**Figure 4: Purger Release of Non-Condensable Gases**

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**Installation**

All purgers are packed for a maximum protection. Unpack carefully. Check the carton to make sure all items are unpacked. Save the enclosed instructions for the installer and eventual user. Do not remove the protective coverings until the purger is ready to be installed.

The V300 Rapid Purger includes three ½" socket weld (SW) shut-off isolation valves used for the suction, liquid, and foul gas line. A ¼" national pipe thread (NPT) 30-150 psig ammonia pressure gauge is also included for the monitoring suction line.

Once the purger is ready to be installed we recommend the following installation procedure. These instructions are for a new system installation. If the purger is being installed in an existing system or replacing an existing purger, the high pressure liquid, foul gas, and suction lines must be isolated and pumped out.

1. Mount the Rapid Purger to a wall or structure that can easily handle its weight and installation hardware. The approximate weight of the purger is 34.5 kg (76 lbs). Figure 5 provides dimensional information for the mounting holes, line locations and overall purger height, width and length.

If mounting the purger outside it is recommended the it be protected from the natural elements like the sun, rain, etc. The outside ambient temperature cannot exceed a range of 2°C to 54°C (35°F to 130°F).

Make sure to leave access for servicing the unit if required. The recommended clearance zone, as shown in Figure 5, is 254 mm.

**Figure 5: Purger Dimensional Information**
(10") for the top and sides. The bottom of the purger must be free of obstructions to allow for water drain and oil removal.

2. Properly locate, support and align the systems high pressure liquid, foul gas and suction lines with the purger.

   **Note:** To prevent oil from entering the heat exchanger and reducing performance of the purger, it is recommended to tie the liquid line in from the side or top of the desired liquid piping. We also recommended to connect the suction line from the purger to the low side system suction. This will allow setting of the A2 regulator for optimal performance down to a minimum of 0.24 barg (3.5 psig).

3. Weld in the three ½” SW shut-off isolation valves. Make sure the connections are free from debris and corrosion. For more installation instruction on hand shut-off valves, refer to the RSBHV safety bulletin located in the purger packet.

   Before welding the systems high pressure liquid, foul gas and suction lines to the hand shut-off valves need to be in the open position. Normally, it is not necessary to disassemble valves for welding. However, if welding is prolonged enough to overheat the body, a wet rag should be wrapped around the valve bonnet and upper body during welding. The codes applicable to the welding of socket weld valves require that the pipe be inserted into the socket until bottomed against the stop. The pipe is then to be backed out approximately ⅛ of an inch before welding.

4. Remove the purger flange connections, with the welded stubs, from the high pressure liquid, foul gas and suction line. The flanges are highlighted, in gray, in Figure 6.

   **WARNING**
   Do not trap the foul gas line prior to entering the purger. This will cause the foul gas to condense.

5. Wait several minutes before welding the purger flanges to the hand shut-off valves. Be certain the mating surface of the flange is parallel to the mating flange and perpendicular to the pipe axis. Again, the hand shut-off valves must be in the open position prior to welding. Check the connections to make sure they are free from debris.

6. After the shut-off valves and purger flanges have been installed wait several minutes to cool down from the welding process. The hand shut-off valves must be put in the closed position to prevent any ammonia from entering the heat exchanger prior to finishing the installation. If the valves are closed before the heat dissipates from the welds, the seat can be damaged.

7. Using the same flange nuts and bolts, reconnect the flanges to the purger and tighten them progressively. For more information on flange torque specification, please reference the IIAR 2-2008 Section 10 documentation.

8. Purge the water line to remove any contaminants prior to connecting it to the water feed solenoid, highlighted in gray in Figure 7. This will prevent the solenoid valve, flow switch and water lines from becoming plugged. Apply Teflon tape/paste to the ¼” NPT threaded nipple prior to threading it into the water solenoid.

9. Install a water drain line for the bubbler. The connection for the drain line is ¾”-14 FPT. Follow your local codes on how to properly dispose of the water after a purge.

10. Check and verify both oil drain valves, shown in Figure 6, are closed by removing the seal cap and turning the adjustment stem clockwise. If the adjustment stem does not move it means the valve is fully seated. Do not over tighten; it can damage the seat and be a potential leak point.

11. Open the purger control panel to start wiring the purge points and power supply, see Figure 8 for wiring diagram. All common lines should tie together at the DIN rail terminal blocks. Coil common, shown in Figure 8, on the purge point solenoids connections are common to the relay. Incoming line power (120/240 volts) should be supplied to these terminals. An incoming neutral should be supplied to one of each of the coil
leads. The other coil lead should be attached to the N.O. or coil neutral terminal for each independent purge point solenoid (S6N, S8F).

The terminal blocks supplied with the purger accept wire from 12-22 AWG wire. For wire sizes smaller than 12 AWG, wire pin terminals are supplied to make installation easier. It is recommended to use the pin terminals for the optimal electrical connection. The maximum allowable torque o the field wiring terminals is 0.4 Nm (3.5 in-lbs).

Input power to the controller should not exceed a maximum of 265 VAC. If voltage spikes in excess of this are expected, a surge suppressor must be installed.

On the bottom of the purger control enclosure are access ports to feed the power and purge point wire connections. Wire only one purge point solenoid to each controller contact relay.

12. The purger may be commissioned once the unit is properly connected to the associated piping within the ammonia system and all power connections are securely established.

13. Supply power to the purger and wait for the start up screen to display. Follow the instructions on the display screen and familiarize yourself with the control panel’s interface, see Figure 9.

On startup, the purger will enter a 15 second delay. This allows the bubbler to fill with water before starting any purge cycles.

If the water bubbler does not fill to the recommended water level press and hold the (INIT) button on the controller keypad to energize the water solenoid valve. When water begins to drain from the overflow tube, release the (INIT) button to de-energize the water solenoid valve.

14. When the initial startup is complete, the startup screen can be exited by pressing the MENU button on the control panel interface. This will bring you to the main display screen where the actual temperature and pressure, target vent, active purge point, number of vents, duration of vent and solenoid activity is displayed.

The main display screen, on startup, is always in English. To change the language follow the language setting instructions located in appendix A.

15. The number of purge points for the system needs to be defined with the required sample time for each point. To setup the purge points, follow the purger type and purge points setting instructions located further in the document. The purge mode can also be set to either automatic, time based or manual purging.

16. Now that the purger is properly installed and commissioned, the high pressure liquid, foul gas, and suction lines can be opened to the purger. Slowly open each line, no order required, and check for leaks. If there no leaks, continue opening the hand shut-off valves to full open.

The purger will automatically start establishing the conditions required for purging.

All other setup instructions, such as date setup, time setup, display settings, history, etc. can be found in appendix A.
Startup Instructions

<table>
<thead>
<tr>
<th>Steps</th>
<th>Setup Instructions</th>
<th>Display</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>To Initiate a startup, press the (MENU) button to go to the secondary menu screen.</td>
<td><img src="image" alt="STARTUP MENU" /></td>
<td>If the selection bar does not have ‘Start Up’ selected, use the (A) or (V) button to move the selection bar.</td>
</tr>
<tr>
<td>2</td>
<td>Use the (V) button to move the selection bar to the ‘Start Up’ option and then press (Enter).</td>
<td><img src="image" alt="STARTUP MENU" /></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Follow the instructions on the screen and then press (Enter).</td>
<td><img src="image" alt="STARTUP MENU" /></td>
<td>1. BEFORE SETTING PURGE CYCLE CHECK THAT WATER MAKE-UP TANK CONTAINS WATER.</td>
</tr>
<tr>
<td></td>
<td></td>
<td><img src="image" alt="STARTUP MENU" /></td>
<td>2. DEFINE AND SET EACH POINT REQUIRED IN THE SYSTEM.</td>
</tr>
<tr>
<td></td>
<td></td>
<td><img src="image" alt="STARTUP MENU" /></td>
<td>3. SETUP PURGE CYCLE TYPE (AUTO, MANUAL, OR TIME)</td>
</tr>
<tr>
<td></td>
<td></td>
<td><img src="image" alt="STARTUP MENU" /></td>
<td>PRESS (ENTER) TO CONTINUE</td>
</tr>
</tbody>
</table>

Nameplate Information

![Nameplate Image](image)

Table 1: V300 Rapid Purger Nameplate Identification

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Cartridge Model</td>
</tr>
<tr>
<td>2</td>
<td>Year of Manufacture, Complete V300 Purger</td>
</tr>
<tr>
<td>3</td>
<td>Serial Reference Number</td>
</tr>
<tr>
<td>4</td>
<td>Canadian Registration Number (CRN)</td>
</tr>
<tr>
<td>5</td>
<td>National Board Number (NB#)</td>
</tr>
<tr>
<td>6</td>
<td>Year of Manufacture, Heat Exchanger</td>
</tr>
</tbody>
</table>

Figure 10: V300 Rapid Purger Nameplates
## Password Setting Instructions

<table>
<thead>
<tr>
<th>Steps</th>
<th>Setup Instructions</th>
<th>Display</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>To set the Password for calibrating the Pressure Input or the RTD, press the (MENU) button to go to the secondary menu screen</td>
<td><img src="" alt="Main Menu" /></td>
<td>If the selection bar does not have the 'Setup' option selected, use the (A) or (V) button to move the selection bar.</td>
</tr>
<tr>
<td>2</td>
<td>Use the (V) button to move the selection bar to the 'Setup' option and then press (Enter)</td>
<td><img src="" alt="Main Menu" /></td>
<td>If the selection bar does not have the 'Set Password' option selected, use the (A) or (V) button to move the selection bar.</td>
</tr>
<tr>
<td>3</td>
<td>Use the (V) button to move the selection bar to 'Set Password' and then press (Enter)</td>
<td><img src="" alt="Setup Menu" /></td>
<td>The Password change screen will not be accessible without the correct password.</td>
</tr>
<tr>
<td>4</td>
<td>Use the (A) and (V) buttons followed by (Enter) for each of the four digits of the password</td>
<td><img src="" alt="Password Restricted Menu" /></td>
<td></td>
</tr>
</tbody>
</table>
# Purge Type and Points Setting Instructions

<table>
<thead>
<tr>
<th>Steps</th>
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<th>Display</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>To change the purge type, press the (MENU) button to go to the main menu screen.</td>
<td><img src="#" alt="Main Menu" /></td>
<td>If the selection bar does not have the ‘Setup’ option selected, use the (A) or (V) button to move the selection bar.</td>
</tr>
<tr>
<td>2</td>
<td>Use the (v) button to move the selection bar to the SETUP option.</td>
<td><img src="#" alt="Setup Menu" /></td>
<td>If the selection bar does not have ‘Purge Options’ selected, use the (A) or (V) button to move the selection bar.</td>
</tr>
<tr>
<td>3</td>
<td>Use the (v) button to move to ‘Purge Options’ and Press (Enter) again to enter the Purge Options selectable</td>
<td><img src="#" alt="Purge Options" /></td>
<td>If ‘Select Purge Type’ is selected, then jump to Step 5 If ‘Setup Points’ is selected, then jump to Step 13</td>
</tr>
<tr>
<td>4</td>
<td>In the Purge Options menu select ‘Select Purge Type’ or ‘Setup Points’ and press (Enter)</td>
<td><img src="#" alt="Select Purge Type" /></td>
<td>If ‘Select Purge Type’ is selected, then jump to Step 5 If ‘Setup Points’ is selected, then jump to Step 13</td>
</tr>
<tr>
<td>5</td>
<td>In the Select Purge Type menu, select either Auto, Manual, or Time-Based by using the (A) or (V) button to move the selection bar and press (Enter)</td>
<td><img src="#" alt="Select Purge Type" /></td>
<td>If ‘Auto’ is selected, then jump to Step 13 If ‘Manual’ is selected, then jump to Step 13 If ‘Time-Based’ is selected, then jump to Step 6</td>
</tr>
<tr>
<td>6</td>
<td>Use the (A) or (V) buttons to enter the start time hour for the purge cycle to begin every day</td>
<td><img src="#" alt="Set Purge Start Time" /></td>
<td>Time-Based purging establishes the same time block every day for the purger to be active. The Purger will be in sleep mode for all times outside of this daily time block.</td>
</tr>
<tr>
<td>7</td>
<td>Use the (A) or (V) buttons to enter the start time minute within the hour set in Step 6 for the purge cycle to begin every day</td>
<td><img src="#" alt="Set Purge Start Time" /></td>
<td>If the Purge time is set for Greenwich Mean Time (GMT), jump to Step 8 If the Purger time is set for Military Time, jump to Step 9</td>
</tr>
<tr>
<td>8</td>
<td>Use the (A) or (V) buttons to select the start meridiem, ‘AM’ or ‘PM’</td>
<td><img src="#" alt="Set Purge Start Time" /></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Use the (A) or (V) buttons to enter the end time hour for the purge cycle to begin every day</td>
<td><img src="#" alt="Set Purge End Time" /></td>
<td>To cancel the operation, press (Menu) to return to the beginning of the Start Time setting screens</td>
</tr>
</tbody>
</table>
Purge Type and Points Setting Instructions

<table>
<thead>
<tr>
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</tr>
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<tbody>
<tr>
<td>10</td>
<td>Use the ((\wedge)) or ((\vee)) buttons to enter the end time minute within the hour set in Step 9 for the purge cycle to begin every day</td>
<td>SET PURGER END TIME&lt;br&gt;ENTER THE MINUTE: 20&lt;br&gt;SELECT WITH (\wedge) (\vee) PRESS (ENTER)&lt;br&gt;PRESS (MENU) TO GO BACK&lt;br&gt;TO SETTING START TIME</td>
<td>If the Purge time is set for Greenwich Mean Time (GMT), jump to Step 11&lt;br&gt;If the Purger time is set for Military Time, jump to Step 12</td>
</tr>
<tr>
<td>11</td>
<td>Use the ((\wedge)) or ((\vee)) buttons to select the end meridiem, 'AM' or 'PM</td>
<td>SET AM / PM&lt;br&gt;SELECT WITH (\wedge) (\vee) PRESS (ENTER)&lt;br&gt;PRESS (MENU) TO GO BACK&lt;br&gt;TO SETTING START TIME</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>This screen gives the opportunity to check if all the values for Time-Based purging are correct. If everything entered is correct, press (Enter) to make the changes</td>
<td>START / END TIME REVIEW&lt;br&gt;PLEASE REVIEW SETTING:&lt;br&gt;START TIME: 9:05 AM&lt;br&gt;END TIME: 11:20 PM&lt;br&gt;SELECT WITH (\wedge) (\vee) PRESS (ENTER)&lt;br&gt;PRESS (MENU) TO GO BACK&lt;br&gt;TO SETTING STOP TIME</td>
<td>To cancel the operation, press (Menu) to return to the beginning of the Stop Time setting screens</td>
</tr>
<tr>
<td>13</td>
<td>Use the ((\wedge)) or ((\vee)) buttons to select the number of Purge Points in the system</td>
<td>SETUP POINTS&lt;br&gt;HOW MANY POINTS ARE NEEDED? 04&lt;br&gt;SELECT WITH (\wedge) (\vee) PRESS (ENTER)&lt;br&gt;PRESS (MENU) TO GO BACK</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>Use the ((\wedge)) or ((\vee)) buttons to select the specific purge point that needs its duration altered and press (Enter)</td>
<td>POINT DURATION&lt;br&gt;01 20 MIN&lt;br&gt;02 15 MIN&lt;br&gt;03 10 MIN&lt;br&gt;04 20 MIN&lt;br&gt;SELECT WITH (\wedge) (\vee) PRESS (ENTER)&lt;br&gt;PRESS (MENU) TO RETURN</td>
<td>The Duration options are 5 min, 10 min, 15 min, and 20 min</td>
</tr>
<tr>
<td>15</td>
<td>When the purge point is selected, press (Enter) to allow the respective duration to be selectable</td>
<td>POINT DURATION&lt;br&gt;01 20 MIN&lt;br&gt;02 15 MIN&lt;br&gt;03 10 MIN&lt;br&gt;04 20 MIN&lt;br&gt;SELECT WITH (\wedge) (\vee) PRESS (ENTER)&lt;br&gt;PRESS (MENU) TO RETURN</td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>Use the ((\wedge)) or ((\vee)) buttons to select the duration of a particular purge point and then press (Enter) to set the duration</td>
<td>POINT DURATION&lt;br&gt;01 20 MIN&lt;br&gt;02 15 MIN&lt;br&gt;03 10 MIN&lt;br&gt;04 20 MIN&lt;br&gt;SELECT WITH (\wedge) (\vee) PRESS (ENTER)&lt;br&gt;PRESS (MENU) TO RETURN</td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>Repeat steps 14-16 until all the purge points have the desired durations</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## Calibrate Pressure Input and RTD

<table>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>To calibrate the Pressure Input or the RTD, press the (MENU) button to go to the secondary menu screen.</td>
<td><img src="#" alt="Display" /></td>
<td>If the selection bar does not have the ‘Setup’ option selected, use the (A) or (V) button to move the selection bar.</td>
</tr>
<tr>
<td>2</td>
<td>Use the (V) button to move the selection bar to the ‘Setup’ option and then press (Enter).</td>
<td><img src="#" alt="Display" /></td>
<td>If ‘Calibrate Pressure Input’ is selected, jump to Step 4. If ‘Calibrate RTD (Temperature)’ is selected, jump to Step 8.</td>
</tr>
<tr>
<td>3</td>
<td>Use the (V) button to move the selection bar to either ‘Calibrate Pressure Input’ or ‘Calibrate RTD (Temperature)’ and then press (Enter).</td>
<td><img src="#" alt="Display" /></td>
<td>The default value is the factory calibrated value.</td>
</tr>
<tr>
<td>4</td>
<td>Use the (A) and (V) buttons followed by (Enter) for each of the four digits of the password.</td>
<td><img src="#" alt="Display" /></td>
<td>The default value is the factory calibrated value.</td>
</tr>
<tr>
<td>5</td>
<td>Use the (A) and (V) buttons to select the minimum pressure and press (Enter) to set the value.</td>
<td><img src="#" alt="Display" /></td>
<td>The default value is the factory calibrated value.</td>
</tr>
<tr>
<td>6</td>
<td>Use the (A) and (V) buttons to select the maximum pressure and press (Enter) to set the value.</td>
<td><img src="#" alt="Display" /></td>
<td>The default value is the factory calibrated value.</td>
</tr>
<tr>
<td>7</td>
<td>This screen gives the opportunity to check if all the values for calibrating the pressure input are correct. If everything entered is correct, press (Enter) to make the changes.</td>
<td><img src="#" alt="Display" /></td>
<td>Press (Enter) two more times to get back to the Main Menu.</td>
</tr>
<tr>
<td>8</td>
<td>Use the (A) and (V) buttons followed by (Enter) for each of the four digits of the password.</td>
<td><img src="#" alt="Display" /></td>
<td>The default value is the factory calibrated value.</td>
</tr>
<tr>
<td>9</td>
<td>Use the (A) and (V) buttons to set the ambient RTD temperature and press (Enter) to set the value.</td>
<td><img src="#" alt="Display" /></td>
<td>The default value is the factory calibrated value.</td>
</tr>
</tbody>
</table>
Remote Communications Setup/Assembly Instructions

The V300 Rapid Purger is equipped with a RS-485 communication port for easy interface to controller data transmission. To make the connection from the CAT5 Ethernet cable (RJ45 plug) to the computer, Refrigerating Specialties recommends using the Gearmo GM-482422 USB to RS-485/422 interface converter, see Figure 11 below.

![Figure 11: RS-485/422 Interface Converter](image)

To connect the CAT5 Ethernet cable to the GM-482422 converter follow below instructions.

1. Measure the length of the CAT5 cable from the V300 Rapid Purger to the computer.
2. Cut off one end of the CAT5 cable to expose the internal wires.
3. Strip the ends of the of the white/blue, solid blue and solid brown cables.
4. Fasten the white/blue CAT 5 wire to Pin 1, 485+, on the Gearmo adaptor.
5. Fasten the solid blue CAT 5 wire to Pin 2, 485-, on the Gearmo adaptor.
6. Fasten the white/blue CAT 5 wire to Pin 5, GRD, on the Gearmo adaptor.
7. The cable is now ready for use.

For remote communications setup follow the Parker GUI, option 1, or the customer customized GUI, option 2, located further in this bulletin.

<table>
<thead>
<tr>
<th>Connection Pole</th>
<th>Data Output</th>
<th>RS-422 Full Duplex</th>
<th>RS-485 Half Duplex</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>T/R+</td>
<td>Send (A+)</td>
<td>RS-485 (A+)</td>
</tr>
<tr>
<td>2</td>
<td>T/R-</td>
<td>Send (B-)</td>
<td>RS-485 (B-)</td>
</tr>
<tr>
<td>3</td>
<td>RXD+</td>
<td>Receive (A+)</td>
<td>N/C</td>
</tr>
<tr>
<td>4</td>
<td>RXD-</td>
<td>Receive (B-)</td>
<td>N/C</td>
</tr>
<tr>
<td>5</td>
<td>GND</td>
<td>Ground Wire</td>
<td>Ground Wire</td>
</tr>
</tbody>
</table>

*Table 2: RS-485, RS-422 Data Output, Connector, and Bay-Line Distribution*
### Gearmo USB to RS485 Adaptor Driver Installation Instructions

<table>
<thead>
<tr>
<th>Steps</th>
<th>Setup Instructions</th>
<th>Display</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Insert the Gearmo FTDI driver CD into the computer of choice's CD-drive.</td>
<td></td>
<td>The driver is also available for download at <a href="http://www.gearmo.com/shop/usb-to-rs485-rs422-converter-ftdi-chip-with-terminals/">http://www.gearmo.com/shop/usb-to-rs485-rs422-converter-ftdi-chip-with-terminals/</a> If you choose to download the driver, proceed to Step 5 These instructions will show how to install the driver on a computer running Windows 7. Windows XP, 2003, Vista, 7, 8 as well as Linux and Mac OS 10.X are supported</td>
</tr>
<tr>
<td>2</td>
<td>Open the folder labelled ‘Driver’ located in the drive containing the Gearmo CD (D: drive).</td>
<td><img src="" alt="Folder 'Driver'" /></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Now open the folder which corresponds to the operating system on your computer of choice, in this case it is ‘win xp server 2003 2008 Vista 7 8 32-64bit’</td>
<td><img src="" alt="Folder 'win xp server 2003 2008 Vista 7 8 32-64bit'" /></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Double click the executable file labelled ‘CDM20828_Setup’ and follow the on-screen instructions to install the driver.</td>
<td><img src="" alt="CDM20828_Setup" /></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Following the link from Step 1 will show the information page on the Gearmo adapter. Under the ‘Drivers &amp; Manuals’ tab on this page, select ‘Latest FTDI Driver’ to download the driver installation file.</td>
<td><img src="" alt="Drivers &amp; Manuals" /></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Open the ZIP folder labelled ‘FTDI-Latest’ when the download is complete. Double-click the executable file in this folder and follow the on-screen instructions to install the driver.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Remote Communications Setup Instructions - Option 1

<table>
<thead>
<tr>
<th>Steps</th>
<th>Setup Instructions</th>
<th>Display</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Install the program (RS485 V300 Purger Interface V1.1.exe) on the desired computer.</td>
<td><img src="V300_Purger_Interface.png" alt="Image" /></td>
<td>Download the remote com interface at <a href="http://www.ParkerRealSolutions.com">www.ParkerRealSolutions.com</a></td>
</tr>
<tr>
<td>2</td>
<td>Run the ‘RS485 V300 Purger Interface V1.3.exe’ Application.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Connect the USB side of the USB/RS485 cable to the computer.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Open the V300 Purger Controller enclosure by unlatching the two side latches.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Feed the other end of the cable (RS845 side) through an unused hole at the bottom of the V300 Purger Controller enclosure.</td>
<td><img src="V300_Purger_Controller_enclosure.png" alt="Image" /></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Plug in the RS845 (Cat5) connector to the RJ45 Jack on the Display Board affixed to the backside of the Enclosure lid.</td>
<td><img src="RS845_Cat5_connector.png" alt="Image" /></td>
<td>The adaptor’s driver should be installed on the laptop for the w port to be recognized.</td>
</tr>
<tr>
<td>7</td>
<td>If you are running the Remote Communications on a Windows Operating System, access ‘Device Manager’ through ‘Control Panel’. Under ‘Ports (COM &amp; LPT)’, double-click the COM port that aligns with the RS-485 converter.</td>
<td><img src="Device_Manager.png" alt="Image" /></td>
<td>In order for the Remote Communications Interface to run properly, the COM port settings on the computer of choice, V300 Purger Controller, and Purger Interface Application must match.</td>
</tr>
<tr>
<td>8</td>
<td>The following window will appear. Select ‘Port Settings’ and ensure that ‘Bits per second’ is 19200, and ‘Parity’ is Even. Then click ‘Advanced’</td>
<td><img src="Port_Settings.png" alt="Image" /></td>
<td></td>
</tr>
<tr>
<td>Steps</td>
<td>Setup Instructions</td>
<td>Display</td>
<td>Notes</td>
</tr>
<tr>
<td>-------</td>
<td>--------------------</td>
<td>---------</td>
<td>-------</td>
</tr>
<tr>
<td>9</td>
<td>The following window will appear. Ensure that ‘Receive’ and ‘Transmit’ are both set to 4096, and that ‘Latency Timer’ is set to 1.</td>
<td><img src="image1" alt="Window Display" /></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Click on the ‘COM Port Settings’ in the Remote Communications application to set up the COM Port.</td>
<td><img src="image2" alt="COM Port Settings" /></td>
<td>It is important to select the correct COM port that aligns with the RS-485 converter. This can be determined by starting the application on the PC with the RS485 converter unplugged from the V300 Purger Controller, then look at the COM ports that are available on the Bootloader. Then, plug in the RS485 converter and click ‘Find COM Ports’ in the application. The additional COM port that appears is the port that should be selected.</td>
</tr>
<tr>
<td>11</td>
<td>Select the COM port that is associated with the RS485 cable.</td>
<td><img src="image3" alt="COM Port Settings" /></td>
<td></td>
</tr>
</tbody>
</table>
| 12    | Set the Baud Rate to ‘19200’  
Set the Parity to ‘Even’  
Keep the Refresh Rate to ‘5’ Seconds | ![COM Port Settings](image4) | If connection is properly established, the real time display will appear in the remote communications application: |
| 13    | Press ‘Apply’ to set the parameters and return to the Main Screen. Then press ‘Connect’ on the Main Screen to establish a connection. | ![COM Port Settings](image5) | From here on, remote monitoring and setting is enabled via the application. |
### Remote Communications Setup Instructions - Option 1 Continued

<table>
<thead>
<tr>
<th>Steps</th>
<th>Setup Instructions</th>
<th>Display</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>14</td>
<td>Click ‘View History’ on the Main Page. To update any parameter, select ‘Purge setting’</td>
<td>![Image]</td>
<td>To set any parameter, press ‘Apply’</td>
</tr>
<tr>
<td>15</td>
<td>To Initiate a manual purge, select ‘INIT’ on the Main Screen</td>
<td>![Image]</td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>The following screen will appear. Select the purge point in question and press ‘Initiate Point’ to start.</td>
<td>![Image]</td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>To terminate a purge, select ‘TERM’ on the Main Screen</td>
<td>![Image]</td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>The following screen will appear. Select ‘Terminate Point’ to terminate the current purge point and cycle to the next. Select ‘Terminate Cycle’ to end purging completely.</td>
<td>![Image]</td>
<td></td>
</tr>
<tr>
<td>19</td>
<td>Click ‘View History’ on the Main Page to view the last 12 weeks of history.</td>
<td>![Image]</td>
<td>If current week is selected, point by point observations can be viewed</td>
</tr>
<tr>
<td>20</td>
<td>The following screen will appear. Here, select any date in time and press ‘read’ to get a history for the week in question.</td>
<td>![Image]</td>
<td></td>
</tr>
<tr>
<td>21</td>
<td>The screen will show the number of vents and total vent time at each purge point for a given week.</td>
<td>![Image]</td>
<td></td>
</tr>
</tbody>
</table>
## Remote Communications Setup Instructions - Option 2

<table>
<thead>
<tr>
<th>Steps</th>
<th>Setup Instructions</th>
<th>Display</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Use the Protocol list 'MSC_114-PURGE2_COMMUNICATIONS TABLE' to create a Customer Graphical User Interface.</td>
<td>Can set up to Integrate directly into Main control panel.</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Open the custom Application.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Connect the USB side of the USB/RS485 cable to the computer.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Open the V300 Purger Controller enclosure by unlatching the two side latches.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Feed the other end of the cable (RS845 side) through an unused hole at the bottom of the V300 Purger Controller enclosure.</td>
<td>Feed from the outside to the inside.</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Plug in the RS845 (Cat5) connector to the RJ45 Jack on the Display Board affixed to the backside of the Enclosure lid.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Establish communication with the V300 Purger through the custom application.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Navigate the application to monitor and set parameters as desired.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## Communication Protocol

<table>
<thead>
<tr>
<th>Variable (TX Data)</th>
<th>Start Header HEX</th>
<th>Variable HEX</th>
<th>Data Length ASCII</th>
<th>Data sent using ASCII (No Error ASCII)</th>
<th>Carriage Return HEX</th>
<th>Checksum Single Byte Checksum (HEX)</th>
</tr>
</thead>
<tbody>
<tr>
<td>timefomat</td>
<td>0x01</td>
<td>0x41</td>
<td>1</td>
<td>1 = AM/PM, 2 = 24HR</td>
<td>0x0D</td>
<td>0 = VALUE(1) * 1 + VALUE(2) * 2 + VALUE(n) * n</td>
</tr>
<tr>
<td>dateformat</td>
<td>0x01</td>
<td>0x42</td>
<td>1</td>
<td>1 = MON/DD/YY, 2 = DD/MON/YY, 3 = DD/MM/YY, 4 = MM/DD/YY</td>
<td>0x0D</td>
<td>0 = VALUE(1) * 1 + VALUE(2) * 2 + VALUE(n) * n</td>
</tr>
<tr>
<td>SetPurgePoints</td>
<td>0x01</td>
<td>0x43</td>
<td>2</td>
<td>Number of Points, 01 - 20</td>
<td>0x0D</td>
<td>0 = VALUE(1) * 1 + VALUE(2) * 2 + VALUE(n) * n</td>
</tr>
<tr>
<td>Password</td>
<td>0x01</td>
<td>0x44</td>
<td>4</td>
<td>4 digits 0-9 (###)</td>
<td>0x0D</td>
<td>0 = VALUE(1) * 1 + VALUE(2) * 2 + VALUE(n) * n</td>
</tr>
<tr>
<td>Baud</td>
<td>0x01</td>
<td>0x45</td>
<td>1</td>
<td>1 = 9600, 2 = 19200</td>
<td>0x0D</td>
<td>0 = VALUE(1) * 1 + VALUE(2) * 2 + VALUE(n) * n</td>
</tr>
<tr>
<td>Parity</td>
<td>0x01</td>
<td>0x46</td>
<td>1</td>
<td>1 = ODD, 2 = EVEN</td>
<td>0x0D</td>
<td>0 = VALUE(1) * 1 + VALUE(2) * 2 + VALUE(n) * n</td>
</tr>
<tr>
<td>Temp_Scale</td>
<td>0x01</td>
<td>0x47</td>
<td>1</td>
<td></td>
<td>0x0D</td>
<td>0 = VALUE(1) * 1 + VALUE(2) * 2 + VALUE(n) * n</td>
</tr>
<tr>
<td>Backlight_Pct</td>
<td>0x01</td>
<td>0x48</td>
<td>3</td>
<td>Backlight percentage, 000 - 100%</td>
<td>0x0D</td>
<td>0 = VALUE(1) * 1 + VALUE(2) * 2 + VALUE(n) * n</td>
</tr>
<tr>
<td>Contrast_Pct</td>
<td>0x01</td>
<td>0x49</td>
<td>3</td>
<td>Contrast percentage 000 - 100%</td>
<td>0x0D</td>
<td>0 = VALUE(1) * 1 + VALUE(2) * 2 + VALUE(n) * n</td>
</tr>
<tr>
<td>Temp1_Offset</td>
<td>0x01</td>
<td>0x4A</td>
<td>2 (3)</td>
<td>Temperature Offset -30 to 30</td>
<td>0x0D</td>
<td>0 = VALUE(1) * 1 + VALUE(2) * 2 + VALUE(n) * n</td>
</tr>
<tr>
<td>Pressure_Max</td>
<td>0x01</td>
<td>0x4B</td>
<td>3</td>
<td>Pressure max in PSI, 300 to 750</td>
<td>0x0D</td>
<td>0 = VALUE(1) * 1 + VALUE(2) * 2 + VALUE(n) * n</td>
</tr>
<tr>
<td>Pressure_Min</td>
<td>0x01</td>
<td>0x4C</td>
<td>2</td>
<td>Pressure min in PSI, 01 to 50</td>
<td>0x0D</td>
<td>0 = VALUE(1) * 1 + VALUE(2) * 2 + VALUE(n) * n</td>
</tr>
<tr>
<td>PurgeType</td>
<td>0x01</td>
<td>0x4D</td>
<td>1</td>
<td></td>
<td>0x0D</td>
<td>0 = VALUE(1) * 1 + VALUE(2) * 2 + VALUE(n) * n</td>
</tr>
<tr>
<td>TimeModeStartHour</td>
<td>0x01</td>
<td>0x4E</td>
<td>2</td>
<td>Start Hour, 00 to 23</td>
<td>0x0D</td>
<td>0 = VALUE(1) * 1 + VALUE(2) * 2 + VALUE(n) * n</td>
</tr>
<tr>
<td>TimeModeStartMin</td>
<td>0x01</td>
<td>0x4F</td>
<td>2</td>
<td>Start Minute, 00 to 59</td>
<td>0x0D</td>
<td>0 = VALUE(1) * 1 + VALUE(2) * 2 + VALUE(n) * n</td>
</tr>
<tr>
<td>TimeModeEndHour</td>
<td>0x01</td>
<td>0x50</td>
<td>2</td>
<td>Stop Hour, 00 to 23</td>
<td>0x0D</td>
<td>0 = VALUE(1) * 1 + VALUE(2) * 2 + VALUE(n) * n</td>
</tr>
<tr>
<td>TimeModeEndMin</td>
<td>0x01</td>
<td>0x51</td>
<td>2</td>
<td>Stop Minute, 00 to 59</td>
<td>0x0D</td>
<td>0 = VALUE(1) * 1 + VALUE(2) * 2 + VALUE(n) * n</td>
</tr>
<tr>
<td>Current Min</td>
<td>0x01</td>
<td>0x53</td>
<td>2</td>
<td>Current Time Minutes, 00 to 59</td>
<td>0x0D</td>
<td>0 = VALUE(1) * 1 + VALUE(2) * 2 + VALUE(n) * n</td>
</tr>
<tr>
<td>Current Hour</td>
<td>0x01</td>
<td>0x54</td>
<td>2</td>
<td>Current Time Hours, 00 to 23</td>
<td>0x0D</td>
<td>0 = VALUE(1) * 1 + VALUE(2) * 2 + VALUE(n) * n</td>
</tr>
<tr>
<td>Current DoW</td>
<td>0x01</td>
<td>0x55</td>
<td>1</td>
<td>Current Time Day of Week (0 is Sunday, 1 is Monday, 2 is Tuesday, 3 is Wednesday, 4 is Thursday, 5 is Friday, 6 is Saturday)</td>
<td>0x0D</td>
<td>0 = VALUE(1) * 1 + VALUE(2) * 2 + VALUE(n) * n</td>
</tr>
<tr>
<td>Current Date</td>
<td>0x01</td>
<td>0x56</td>
<td>2</td>
<td>Current Day of Month, 01 to 31 (set month and year first to ensure that the day of month is valid for the current month)</td>
<td>0x0D</td>
<td>0 = VALUE(1) * 1 + VALUE(2) * 2 + VALUE(n) * n</td>
</tr>
<tr>
<td>Current Month</td>
<td>0x01</td>
<td>0x57</td>
<td>2</td>
<td>Current Month, 01 to 12</td>
<td>0x0D</td>
<td>0 = VALUE(1) * 1 + VALUE(2) * 2 + VALUE(n) * n</td>
</tr>
<tr>
<td>Current Year</td>
<td>0x01</td>
<td>0x58</td>
<td>2</td>
<td>Current Year, 01 to 99</td>
<td>0x0D</td>
<td>0 = VALUE(1) * 1 + VALUE(2) * 2 + VALUE(n) * n</td>
</tr>
<tr>
<td>SleepMode</td>
<td>0x01</td>
<td>0x5A</td>
<td>0</td>
<td>No Data, Read Only</td>
<td>0x0D</td>
<td>0 = VALUE(1) * 1 + VALUE(2) * 2 + VALUE(n) * n</td>
</tr>
<tr>
<td>SleepTimeMins</td>
<td>0x01</td>
<td>0x5B</td>
<td>0</td>
<td>No Data, Read Only</td>
<td>0x0D</td>
<td>0 = VALUE(1) * 1 + VALUE(2) * 2 + VALUE(n) * n</td>
</tr>
<tr>
<td>SleepTimeHours</td>
<td>0x01</td>
<td>0x5C</td>
<td>0</td>
<td>No Data, Read Only</td>
<td>0x0D</td>
<td>0 = VALUE(1) * 1 + VALUE(2) * 2 + VALUE(n) * n</td>
</tr>
<tr>
<td>TargetVentPressure</td>
<td>0x01</td>
<td>0x5D</td>
<td>0</td>
<td>No Data, Read Only</td>
<td>0x0D</td>
<td>0 = VALUE(1) * 1 + VALUE(2) * 2 + VALUE(n) * n</td>
</tr>
<tr>
<td>TargetResetPressure</td>
<td>0x01</td>
<td>0x5E</td>
<td>0</td>
<td>No Data, Read Only</td>
<td>0x0D</td>
<td>0 = VALUE(1) * 1 + VALUE(2) * 2 + VALUE(n) * n</td>
</tr>
<tr>
<td>ActualPressure</td>
<td>0x01</td>
<td>0x5F</td>
<td>0</td>
<td>No Data, Read Only</td>
<td>0x0D</td>
<td>0 = VALUE(1) * 1 + VALUE(2) * 2 + VALUE(n) * n</td>
</tr>
<tr>
<td>LiquidState</td>
<td>0x01</td>
<td>0x60</td>
<td>0</td>
<td>No Data, Read Only</td>
<td>0x0D</td>
<td>0 = VALUE(1) * 1 + VALUE(2) * 2 + VALUE(n) * n</td>
</tr>
<tr>
<td>VentState</td>
<td>0x01</td>
<td>0x61</td>
<td>0</td>
<td>No Data, Read Only</td>
<td>0x0D</td>
<td>0 = VALUE(1) * 1 + VALUE(2) * 2 + VALUE(n) * n</td>
</tr>
<tr>
<td>ActivePoint</td>
<td>0x01</td>
<td>0x62</td>
<td>0</td>
<td>No Data, Read Only</td>
<td>0x0D</td>
<td>0 = VALUE(1) * 1 + VALUE(2) * 2 + VALUE(n) * n</td>
</tr>
<tr>
<td>ActivePointMinutes</td>
<td>0x01</td>
<td>0x63</td>
<td>0</td>
<td>No Data, Read Only</td>
<td>0x0D</td>
<td>0 = VALUE(1) * 1 + VALUE(2) * 2 + VALUE(n) * n</td>
</tr>
<tr>
<td>ActivePointSeconds</td>
<td>0x01</td>
<td>0x64</td>
<td>0</td>
<td>No Data, Read Only</td>
<td>0x0D</td>
<td>0 = VALUE(1) * 1 + VALUE(2) * 2 + VALUE(n) * n</td>
</tr>
<tr>
<td>ActualTemp</td>
<td>0x01</td>
<td>0x65</td>
<td>0</td>
<td>No Data, Read Only</td>
<td>0x0D</td>
<td>0 = VALUE(1) * 1 + VALUE(2) * 2 + VALUE(n) * n</td>
</tr>
<tr>
<td>PurgeTime</td>
<td>0x01</td>
<td>0x66-0x77</td>
<td>20 (points)</td>
<td>Purge times, valid data is 05, 10, 15, 20</td>
<td>0x0D</td>
<td>0 = VALUE(1) * 1 + VALUE(2) * 2 + VALUE(n) * n</td>
</tr>
<tr>
<td>CurrentPgPtVents</td>
<td>0x01</td>
<td>0x7A</td>
<td>0</td>
<td>No Data, Read Only</td>
<td>0x0D</td>
<td>0 = VALUE(1) * 1 + VALUE(2) * 2 + VALUE(n) * n</td>
</tr>
<tr>
<td>CurrentPgPHours</td>
<td>0x01</td>
<td>0x7B</td>
<td>0</td>
<td>No Data, Read Only</td>
<td>0x0D</td>
<td>0 = VALUE(1) * 1 + VALUE(2) * 2 + VALUE(n) * n</td>
</tr>
<tr>
<td>CurrentPgPMins</td>
<td>0x01</td>
<td>0x7C</td>
<td>0</td>
<td>No Data, Read Only</td>
<td>0x0D</td>
<td>0 = VALUE(1) * 1 + VALUE(2) * 2 + VALUE(n) * n</td>
</tr>
<tr>
<td>CurrentPgPtSecs</td>
<td>0x01</td>
<td>0x7D</td>
<td>0</td>
<td>No Data, Read Only</td>
<td>0x0D</td>
<td>0 = VALUE(1) * 1 + VALUE(2) * 2 + VALUE(n) * n</td>
</tr>
<tr>
<td>ReadHistory</td>
<td>0x01</td>
<td>0x7E</td>
<td>5</td>
<td>2 Bytes for Week (00 = current, 01 = one week ago thru 12 = twelve weeks ago), 2 Bytes for Purge Point to retrieve history for (01 to 20). One Byte for Day of Week (0 = SUN, 6 = SAT)</td>
<td>0x0D</td>
<td>0 = VALUE(1) * 1 + VALUE(2) * 2 + VALUE(n) * n</td>
</tr>
</tbody>
</table>
Bulletin 76-00

Maintenance Instructions

**Procedure** | **Instructions**
---|---
**Oil Draining** | Review your facilities procedures on how to properly pump down and drain oil from a vessel before attempting to drain oil from the purger heat exchanger. The following instructions are a recommendation and may not fall within the PM program of your facility.

1. Follow the facilities oil draining procedures on how to properly extract oil from a vessel. The RSBCV safety bulletin, located in the purger packet, provides additional safety and pump out instructions. Read these instructions prior to continuing to the next step.

2. The purger heat exchanger must be isolated and pumped out before removing the oil. Close the hand shut-off valves to the high pressure liquid and foul gas line. Keep the suction hand shut-off valve open to pump down the heat exchanger.

   **Note:** The purger controller can remain powered through the draining oil maintenance procedure.

3. Manually open the SV2 solenoid, #6 in the exploded view, on the high pressure liquid line by removing the seal cap and turning the manual opening stem clockwise until only the flats on the end of the stem protrude from the packing nut. This will prevent liquid ammonia from being trapped between the liquid hand shut-off valve and SV2 solenoid.

4. Use the HSBR level switch as an ammonia level indicator. When the LEDs turn off, the system will call for liquid, but the liquid hand shut-off valve is preventing any additional liquid from entering the purger, pumping out the heat exchanger.

5. Allow the purger to pump out a few more minutes before closing the suction line hand shut-off valve. The remaining ammonia in the system will pressurize the vessel and assist in draining the oil.

6. Purge one oil drain line at a time. Slowly crack open the shell side oil drain valve, see Figure 6, and discharge the oil into the proper container accepted by safety codes and standards.

   **WARNING:** Do not open the oil drain valves completely.

7. When the oil is done draining close the oil drain valve.

8. Repeat steps 6 thru 7 for the tube side oil drain valve.

9. After draining all the oil from the purger heat exchanger the system is ready to go back online. Return the SV2 solenoid valve back to automatic mode by turning the stem counter clockwise as far as it will go. Loosen the packing nut before tuning the stem and re-tighten after the stem out.

10. Slowly open each line, no order required, and check for leaks. If there no leaks continue opening the hand shut-off valves to full open. The purger will automatically start establishing the conditions required for purging.

---

**Communication Protocol Continued**

<table>
<thead>
<tr>
<th>Variable (TX Data)</th>
<th>Start Header HEX</th>
<th>Variable HEX</th>
<th>Data Length</th>
<th>Data sent using ASCII (No Error)</th>
<th>Carriage Return HEX</th>
<th>Checksum Single Byte Checksum (HEX)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0x01</td>
<td>0x7F</td>
<td>0x01</td>
<td>0x0D</td>
<td>No Data, Read Only</td>
<td>0x0D</td>
<td>VALUE(1) * 1 + VALUE(2) * 2 + VALUE(n) * n</td>
</tr>
<tr>
<td>Terminate Point</td>
<td>0x01</td>
<td>0x80</td>
<td>1</td>
<td>Terminate Current Point, 2 = Terminate Cycle</td>
<td>0x0D</td>
<td>VALUE(1) * 1 + VALUE(2) * 2 + VALUE(n) * n</td>
</tr>
<tr>
<td>Initiate Point</td>
<td>0x01</td>
<td>0x81</td>
<td>2</td>
<td>2 Bytes are for the purge point number 01-20.</td>
<td>0x0D</td>
<td>VALUE(1) * 1 + VALUE(2) * 2 + VALUE(n) * n</td>
</tr>
<tr>
<td>InitScreenControl</td>
<td>0x01</td>
<td>0x82</td>
<td>1</td>
<td>0 = Do nothing (not filling Bubbler) 1 = Exit Init Screen, 2 = Filling Bubbler</td>
<td>0x0D</td>
<td>VALUE(1) * 1 + VALUE(2) * 2 + VALUE(n) * n</td>
</tr>
</tbody>
</table>

---

**ASCII to Hex Conversion**

<table>
<thead>
<tr>
<th>ASCII Number</th>
<th>HEX Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0x30</td>
</tr>
<tr>
<td>1</td>
<td>0x31</td>
</tr>
<tr>
<td>2</td>
<td>0x32</td>
</tr>
<tr>
<td>3</td>
<td>0x33</td>
</tr>
<tr>
<td>4</td>
<td>0x34</td>
</tr>
<tr>
<td>5</td>
<td>0x35</td>
</tr>
<tr>
<td>6</td>
<td>0x36</td>
</tr>
<tr>
<td>7</td>
<td>0x37</td>
</tr>
<tr>
<td>8</td>
<td>0x38</td>
</tr>
<tr>
<td>9</td>
<td>0x39</td>
</tr>
</tbody>
</table>
Figure 12: V300 Auto Purger Exploded View
<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>Kit Description</th>
<th>Kit</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Controller, V300</td>
<td>120V Controller</td>
<td>098998</td>
</tr>
<tr>
<td>2</td>
<td>Connecting Bolts, Controller</td>
<td>4 Point</td>
<td>098999</td>
</tr>
<tr>
<td>9(3)</td>
<td>Coil, Solenoid Valve</td>
<td>12 Point</td>
<td>099000</td>
</tr>
<tr>
<td>10</td>
<td>Retaining Clip, Coil</td>
<td>16 Point</td>
<td>099001</td>
</tr>
<tr>
<td>12</td>
<td>Pressure Transducer</td>
<td>20 Point</td>
<td>099002</td>
</tr>
<tr>
<td>17</td>
<td>Flow Switch, Water Line</td>
<td>240V Controller</td>
<td>099024</td>
</tr>
<tr>
<td>18</td>
<td>Pipe, Threaded</td>
<td>4 Point</td>
<td>099025</td>
</tr>
<tr>
<td>19</td>
<td>Solenoid Valve, Water Line</td>
<td>8 Point</td>
<td>099026</td>
</tr>
<tr>
<td>21</td>
<td>Nylon Connector, Elbow</td>
<td>12 Point</td>
<td>099027</td>
</tr>
<tr>
<td>24</td>
<td>Level Switch, HBSR</td>
<td>16 Point</td>
<td>099028</td>
</tr>
<tr>
<td>33</td>
<td>Temperature Probe</td>
<td>20 Point</td>
<td>099028</td>
</tr>
<tr>
<td>4(12)</td>
<td>Gasket, Flange</td>
<td>Gasket Pkg, Flange</td>
<td>202078</td>
</tr>
<tr>
<td>4(2)</td>
<td>Gasket, Flange Disc Strainer</td>
<td>Strainer Assembly, Disc</td>
<td>200912</td>
</tr>
<tr>
<td>6</td>
<td>Gasket, Flange Solenoid Valve, SV2</td>
<td>Solenoid Valve Assembly, Liquid Line</td>
<td>209369</td>
</tr>
<tr>
<td>7</td>
<td>Check Valve, CK4A-2 (¼&quot; NPT)</td>
<td>Check Valve Assembly</td>
<td>CK413X00SN</td>
</tr>
<tr>
<td>8</td>
<td>Orifice, 0.040&quot; (¼&quot; NPT)</td>
<td>Plug Pkg, Orifice 0.040&quot;</td>
<td>208667</td>
</tr>
<tr>
<td>9</td>
<td>Coil, Solenoid Valve Retaining Clip, Coil</td>
<td>Coil Pkg</td>
<td>209073</td>
</tr>
<tr>
<td>11</td>
<td>Orifice, 0.026&quot; (¼&quot; NPT)</td>
<td>Plug Pkg, Orifice 0.026&quot;</td>
<td>208665</td>
</tr>
<tr>
<td>12</td>
<td>Pressure Transducer</td>
<td>Pressure Transducer</td>
<td>209292</td>
</tr>
<tr>
<td>13</td>
<td>Pressure Gauge, Ammonia</td>
<td>Pressure Gauge</td>
<td>760mm - 10.5 bar</td>
</tr>
<tr>
<td></td>
<td></td>
<td>30&quot; - 150psig</td>
<td>309401</td>
</tr>
<tr>
<td>14</td>
<td>Angle, Unibody (¼&quot; NPT)</td>
<td>Angle Unibody Assembly</td>
<td>106630</td>
</tr>
<tr>
<td>16</td>
<td>Pressure Regulator</td>
<td>Pressure Regulator, A2B RA</td>
<td>209290</td>
</tr>
<tr>
<td>17</td>
<td>Flow Switch, Water</td>
<td>Flow Switch Assembly</td>
<td>209324</td>
</tr>
<tr>
<td>18</td>
<td>Pipe, Threaded</td>
<td>Solenoid Valve Assembly, Water Line</td>
<td>208787</td>
</tr>
<tr>
<td>19</td>
<td>Solenoid Valve, Water Line</td>
<td>Nylon Connector, Elbow</td>
<td>208787</td>
</tr>
<tr>
<td>20(6)</td>
<td>Nylon Tubing</td>
<td>Nylon Tubing, Bubbler</td>
<td>208668</td>
</tr>
<tr>
<td>21(4)</td>
<td>Nylon Connector, Elbow</td>
<td></td>
<td></td>
</tr>
<tr>
<td>22</td>
<td>Water Bubbler</td>
<td>Water Bubbler Assembly</td>
<td>208789</td>
</tr>
<tr>
<td>24</td>
<td>Level Switch, HBSR</td>
<td>Level Switch Assembly</td>
<td>208790</td>
</tr>
<tr>
<td>25</td>
<td>Differential Check Valve, (50psig)</td>
<td>Differential Check Valve Assembly</td>
<td>309657</td>
</tr>
<tr>
<td>27</td>
<td>Unibody, Globe (¼&quot; NPT)</td>
<td>Globe Unibody Assembly</td>
<td>106621</td>
</tr>
<tr>
<td>28</td>
<td>Orifice, 0.032&quot; (¼&quot; NPT)</td>
<td>Plug Pkg, Orifice 0.032&quot;</td>
<td>208666</td>
</tr>
<tr>
<td>29</td>
<td>Gasket, Flange 13mm (½&quot;) Ring Adaptor</td>
<td>Ring Adaptor</td>
<td>200095</td>
</tr>
<tr>
<td>31</td>
<td>Liquid Drainer</td>
<td>Liquid Drainer</td>
<td>309625</td>
</tr>
<tr>
<td>33(1)</td>
<td>Temperature Probe</td>
<td>Temperature Probe, Sensor</td>
<td>209075</td>
</tr>
<tr>
<td>37</td>
<td>Orifice, 0.028&quot; (¼&quot; NPT)</td>
<td>Plug Pkg, Orifice 0.028&quot;</td>
<td>209365</td>
</tr>
<tr>
<td>38</td>
<td>Solenoid Valve, S6P</td>
<td>Solenoid Valve Assembly, Vent Line</td>
<td>208982</td>
</tr>
</tbody>
</table>

Table 3: V300 Rapid Purger Repair Kits

1 Should the RTD require replacement, the factory setting must be changed in order to calibrate the RTD. Close the hand valve for the foul gas inlet and liquid feed inlet. Remove the faulty RTD and connect the replacement RTD to the proper wiring. Place the RTD in a container with ice and water. Observe the temperature reading on the controller screen and wait for it to stabilize. Once the temperature has stabilized change the offset to cause the temperature reading to be 0°C (32°F). Double check the reading in the ice water bath and ensure that the RTD is reading 0°C (32°F). The RTD is now calibrated.
### Service Pointers

<table>
<thead>
<tr>
<th>Symptom</th>
<th>Possible Cause</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water bubbler cloudy</td>
<td>Water supply turned off.</td>
<td>Open water supply ball valve supplied with purger.</td>
</tr>
<tr>
<td></td>
<td>Hard water.</td>
<td>Check water solenoid coil for proper operation (Loose wire, burned out). Replace if necessary.</td>
</tr>
<tr>
<td></td>
<td>Venting ammonia.</td>
<td>Check vent solenoid coil for proper operation. If bubbles are seen in the water bubbler when idle, vent solenoid is leaking. Clean or replace solenoid if needed.</td>
</tr>
<tr>
<td></td>
<td>Cloudy bubbler</td>
<td>Clean the bubbler using a long handle bottle brush and a cleaning agent such as CLR®, Lime-A-Way® or vinegar can be used to remove the water scale.</td>
</tr>
<tr>
<td>Purger stays in “Pre-Cool” mode, will not purge.</td>
<td>Suction too high.</td>
<td>Verify Suction is below 4.4°C (40°F) - 4.0 bar (58.4 psig) for R-717. Adjust the A2 suction regulator to maintain 3 psig (if in or near a vacuum). If suction is above 3 psig, remove setting from A2 regulator by turning stem counter clock wise until it stops.</td>
</tr>
<tr>
<td></td>
<td>Liquid NH₃ supply off or obstructed.</td>
<td>Check liquid ammonia solenoid, S6P, for proper operation (Loose wire, burned out). Replace if necessary. Check controller display for “Liquid Solenoid” pilot light. Segment should be darkened if liquid is required. This is located on the upper left side of the front panel (#1). Check level sensor for proper operation (Loose wire, defective sensor). Replace if necessary. Check liquid supply orifice for obstructions. Clean or replace if necessary.</td>
</tr>
<tr>
<td></td>
<td>RTD not reading accurately or no display.</td>
<td>Note: RTD is factory calibrated and no field adjustment is required. If the main controller displays “_ _ _” rather than an actual temperature reading, check for loose wires. Check wire loom from main board to cover for loose or damaged wires/connections. Replace RTD if necessary.</td>
</tr>
<tr>
<td>No temperature reading on controller display.</td>
<td>Loose RTD connection.</td>
<td>Check for loose wires connecting the RTD to the main controller board.</td>
</tr>
<tr>
<td></td>
<td>Loose or damaged wire loom connecting front panel to main board.</td>
<td>Check wire loom from main board to cover for loose or damaged wires/connections.</td>
</tr>
<tr>
<td></td>
<td>Faulty RTD.</td>
<td>Check resistance range of the RTD (100 ohm +/- 0.1%) Replace RTD if necessary.</td>
</tr>
<tr>
<td>No pressure reading on controller display.</td>
<td>Loose wire connection.</td>
<td>Note: pressure transducer is factory calibrated and no field adjustment is required. Check for loose wires connecting the pressure transducer to the main controller board.</td>
</tr>
<tr>
<td></td>
<td>Faulty pressure transducer.</td>
<td>Replace pressure transducer if necessary.</td>
</tr>
<tr>
<td>Purger reaches target pressure, vent solenoid will not open.</td>
<td>Water is not available</td>
<td>Check water supply line to purger and ensure water is available</td>
</tr>
<tr>
<td></td>
<td>Water flow switch is faulty</td>
<td>Replace water flow switch</td>
</tr>
<tr>
<td></td>
<td>Purge solenoid coil faulty</td>
<td>Check solenoid coil for proper operation, replace if necessary</td>
</tr>
<tr>
<td>Water is supplied to water solenoid valve but no flow is present</td>
<td>Water is not available</td>
<td>Check water supply line to purger and ensure water is available</td>
</tr>
<tr>
<td></td>
<td>Water flow switch is faulty</td>
<td>Replace water flow switch</td>
</tr>
<tr>
<td></td>
<td>Purge solenoid coil faulty</td>
<td>Check solenoid coil for proper operation, replace if necessary</td>
</tr>
</tbody>
</table>

**ADVISORY** - The water supply should use softened or filtered water to prevent calcification or deposits which could block the water solenoid valve. If softened/filtered water is not available premature failure of the water solenoid valve may result.
## Service Pointers Continued

<table>
<thead>
<tr>
<th>Symptom</th>
<th>Possible Cause</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strong Ammonia smell coming from bubbler (#22).</td>
<td>Water make up closed or restricted.</td>
<td>Make sure the fresh water supply to the bubbler is not turned off or being restricted. Check the operation of the water makeup solenoid. Verify that the coil is energized when the vent cycle is active. The magnetic field can be verified with a small screwdriver touching the top of the solenoid tube. It should be drawn to the tube if the coil is powered and functioning properly. If the coil functions and water still does not flow to the bubbler, check the supply lines for obstructions. Use filtered/soft water. Replace the water solenoid, #19 in the exploded view, if necessary.</td>
</tr>
<tr>
<td>Leaking vent solenoid.</td>
<td>If bubbles are seen in the bubbler well after a vent has occurred, the vent solenoid may be leaking. Replace the solenoid if necessary.</td>
<td></td>
</tr>
<tr>
<td>Controller in &quot;sleep mode&quot;, will not purger</td>
<td>No foul gas present in system.</td>
<td>The purger controller will automatically go into “Sleep Mode” if it has sampled every programmed purge point twice without a vent occurring. It will stay in sleep mode for 2 hours then resume its programmed cycle. You can override the sleep mode cycle by simply pressing the “Enter” key on the controller. The sleep mode feature will not be disabled and will repeat again if no vent occurs.</td>
</tr>
<tr>
<td>Purger display goes black (full contrast)</td>
<td>Coil interference</td>
<td>ADVISORY - It is recommended that Refrigerating Specialties coils be used with the Refrigerating Specialties Rapid Purger for optimal performance. If the use of Refrigerating Specialties coils is not an option, coils with an inrush current rating of less than 1.22 amps MUST be used. If this symptom is presented it is recommended that an RC filter or MOV suppressor be added to the coil common line to prevent disruption of the display.</td>
</tr>
<tr>
<td>Power is supplied to controller but the purger does not turn on</td>
<td>Blown fuse</td>
<td>Replace fuse on common (L1) terminal block.</td>
</tr>
<tr>
<td></td>
<td>Poor connection on common/neutral the inputs</td>
<td>Check common/neutral connections into junction box.</td>
</tr>
<tr>
<td></td>
<td>Improper wiring</td>
<td>Ensure that common/neutral wiring matches the wiring diagram.</td>
</tr>
<tr>
<td></td>
<td>Faulty controller</td>
<td>Replace controller assembly.</td>
</tr>
<tr>
<td>High temperature</td>
<td>Oil built up in the heat exchanger</td>
<td>Drain oil from the heat exchanger. Follow maintenance procedures located in this bulletin.</td>
</tr>
<tr>
<td>Data communication failure</td>
<td></td>
<td>Make sure USB interface connection is correct. Make sure RS-485/RS-422 output interface connection is correct. Make sure power supply is OK. Make sure the wire terminal connection is OK. Make sure the pilot lamp flashes when receiving. Make sure the pilot lamp flashes when sending.</td>
</tr>
<tr>
<td>Data missing or incorrect</td>
<td></td>
<td>Check to see whether if the data rate and format at both ends of the communication equipment are consistent.</td>
</tr>
</tbody>
</table>
APPENDIX
Purge Point Initiation/ Termination Instructions

<table>
<thead>
<tr>
<th>Steps</th>
<th>Setup Instructions</th>
<th>Display</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>To initiate a purge when 'No Active Points' are present, press (Init)</td>
<td>![Display Image]</td>
<td>Purge type must be set to ‘Manual’ To initiate a purge in sleep mode, proceed to Step 11</td>
</tr>
<tr>
<td>2</td>
<td>Use the (A) or (V) buttons to choose the ‘Manual Purge Point’ to initiate, then press (Enter) to select.</td>
<td>![Display Image]</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>To terminate the purge point, press (Term)</td>
<td>![Display Image]</td>
<td>To terminate a purge point in Auto mode, proceed to Step 6</td>
</tr>
<tr>
<td>4</td>
<td>Use the (A) or (V) buttons to move the selection bar to 'Terminate Active Point 01' and press (Enter)</td>
<td>![Display Image]</td>
<td>Selecting 'Terminate Purge Cycle' while in auto mode will produce the same results</td>
</tr>
<tr>
<td>5</td>
<td>The screen now indicates that 'No Active Points' are present</td>
<td>![Display Image]</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>To terminate a purge point in Auto mode, press (term)</td>
<td>![Display Image]</td>
<td>To terminate the purge cycle, proceed to Step 9</td>
</tr>
<tr>
<td>7</td>
<td>Use the (A) or (V) buttons to move the selection bar to 'Terminate Active Point 01' and press (Enter)</td>
<td>![Display Image]</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>The screen now indicates that 'Active Point 02' has begun purging</td>
<td>![Display Image]</td>
<td>To cycle to the next purge point, repeat Steps 6-7 If Steps 6-7 are repeated until the purge cycle has looped twice, the system will enter 'Sleep' mode If there is only one purge point, the system will restart 'Purge Point 01'</td>
</tr>
<tr>
<td>8.5</td>
<td>To begin terminating the purge cycle, press the (Term) button.</td>
<td>![Display Image]</td>
<td></td>
</tr>
</tbody>
</table>
## Purge Point Initiation/Termination Instructions Continued

<table>
<thead>
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<tbody>
<tr>
<td>9</td>
<td>Use the (A) or (v) buttons to move the selection bar to 'Terminate Purge Cycle' and press (Enter)</td>
<td><img src="image1" alt="Display" /></td>
<td>Terminating the purge cycle will always change the mode to Manual</td>
</tr>
<tr>
<td>10</td>
<td>The screen now indicates that 'No Active Points' are present and the mode has changed to Manual</td>
<td><img src="image2" alt="Display" /></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>To initiate a purge in 'Sleep' mode, press (init)</td>
<td><img src="image3" alt="Display" /></td>
<td>Initiating in Auto mode will start the first purge point</td>
</tr>
<tr>
<td>12</td>
<td>The screen now indicates that 'Active Point 01' has begun purging</td>
<td><img src="image4" alt="Display" /></td>
<td></td>
</tr>
<tr>
<td>Steps</td>
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<tr>
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<td>---------</td>
<td>-------</td>
</tr>
<tr>
<td>1</td>
<td>To set the RS485 communications or change units from Metric to English, visa versa, press the (A) or (v) buttons at the same time, from the main screen, to get into the settings menu.</td>
<td><img src="image1.png" alt="Settings Menu" /></td>
<td>The baud rate and parity are for RS485 communication. Default: BAUD Rate: 19200 PARITY: EVEN</td>
</tr>
<tr>
<td>2</td>
<td>Use the (A) or (v) buttons to select between the baud rate, parity or temperature scale options.</td>
<td><img src="image2.png" alt="Settings Menu" /></td>
<td>To change units select the temperature scale option.</td>
</tr>
<tr>
<td>3</td>
<td>After moving the selection bar to the option you would like to change press the (ENTER) button.</td>
<td><img src="image3.png" alt="Settings Menu" /></td>
<td>In this example English units was changed to Metric.</td>
</tr>
<tr>
<td>4</td>
<td>Use the (A) or (v) buttons to make parameter changes within the selected option.</td>
<td><img src="image4.png" alt="Settings Menu" /></td>
<td>This will take you back to the settings menu and the (A) and (v) buttons can be used to make other option selections.</td>
</tr>
<tr>
<td>5</td>
<td>Press the (ENTER) button when done making changes.</td>
<td><img src="image5.png" alt="Settings Menu" /></td>
<td>Now the main screen is displayed in Metric units.</td>
</tr>
<tr>
<td>6</td>
<td>Press the (MENU) button to return to the main screen.</td>
<td><img src="image6.png" alt="Liquid/sol" /></td>
<td></td>
</tr>
</tbody>
</table>

**Setting Communications and Unit Instructions**

**Software Version:** 2.0  
**Baud Rate:** 19200  
**Parity:** EVEN  
**Temperature Scale:** ENGLISH

**Select with (A) (v) Press (Enter) Press (Menu) to Return**
### Display Setting Instructions

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<tr>
<td>1</td>
<td>To change the screen contrast or backlight brightness press the (ENTER) and (TERM) buttons at the same time to get into the display settings menu.</td>
<td><img src="image" alt="Display Settings Menu" /></td>
<td>To enter the display settings menu screen the controller must be in the main screen.</td>
</tr>
<tr>
<td>2</td>
<td>To change the contrast move the selection bar to CONTRAST ADJUST, if not already there, by using the (A) and (V) buttons and then press the (ENTER) button.</td>
<td><img src="image" alt="Display Settings Menu" /></td>
<td>If the selection bar does not have the contrast adjust option selected, use the (A) or (V) button to move the selection bar.</td>
</tr>
<tr>
<td>3</td>
<td>Use the (A) or (V) button to increase or decrease the contrast.</td>
<td><img src="image" alt="Contrast Adjust" /></td>
<td>The contrast bar indicates the level at which the contrast is currently at. Pressing (A) button increases the contrast and (V) button decreases the contrast.</td>
</tr>
<tr>
<td>4</td>
<td>Press the (ENTER) button to return to the display setting menu screen.</td>
<td><img src="image" alt="Contrast Adjust" /></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>To change the backlight move the selection bar to BACKLIGHT ADJUST by pushing (V) button and then press the (ENTER) button.</td>
<td><img src="image" alt="Display Settings Menu" /></td>
<td>The backlight brightness bar indicates the level at which the brightness of the backlight is current at. Pressing (A) button increases the brightness and (V) button decreases the brightness.</td>
</tr>
<tr>
<td>6</td>
<td>Use the (A) or (V) button to increase or decrease the backlight brightness.</td>
<td><img src="image" alt="Backlight Brightness Adjust" /></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Press the (ENTER) button to return to the display setting menu or (MENU) button to return to the main menu screen if changing the backlight brightness is not desired.</td>
<td><img src="image" alt="Display Settings Menu" /></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Press the (MENU) button to return to the main screen.</td>
<td><img src="image" alt="Liquid Sol. Vent / Water Sol." /></td>
<td></td>
</tr>
</tbody>
</table>
### Language Setting Instructions

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</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>To change the language for the text on the display, press the (MENU) button to go to the secondary menu screen.</td>
<td><img src="#" alt="Main Menu" /></td>
<td>To enter the main menu screen the controller must be in the main screen.</td>
</tr>
<tr>
<td>2</td>
<td>Use the (v) button to move the selection bar to the 'Language Menu' option and then press (Enter).</td>
<td><img src="#" alt="Language Menu" /></td>
<td>If the selection bar does not have 'Language Menu' selected, use the (κ) or (v) button to move the selection bar.</td>
</tr>
<tr>
<td>3</td>
<td>Use the (κ) or (v) button to move the selection bar to the desired language and then press (Enter).</td>
<td><img src="#" alt="Language Menu" /></td>
<td>Press (Menu) to return to the Main Menu screen.</td>
</tr>
</tbody>
</table>

### Date/Time Setting Instructions

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</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>To change the date press the (MENU) button to go to the main menu screen.</td>
<td><img src="#" alt="Main Menu" /></td>
<td>To enter the main menu screen the controller must be in the main screen.</td>
</tr>
<tr>
<td>2</td>
<td>Use the (v) button to move the selection bar to the SETUP option.</td>
<td><img src="#" alt="Main Menu" /></td>
<td>If the selection bar does not have the setup option selected, use the (κ) or (v) button to move the selection bar.</td>
</tr>
<tr>
<td>3</td>
<td>Press (ENTER) again to enter the SET DATE AND TIME option.</td>
<td><img src="#" alt="Setup Menu" /></td>
<td>If the selection bar does not have the set date and time option selected, use the (κ) or (v) button to move the selection bar.</td>
</tr>
<tr>
<td>4</td>
<td>In the set date and time menu select the SET DATE AND TIME option and press (ENTER).</td>
<td><img src="#" alt="Setup Menu" /></td>
<td>If the selection bar does not have the set date and time option selected, use the (κ) or (v) button to move the selection bar.</td>
</tr>
<tr>
<td>5</td>
<td>Select the current year by using the (κ) or (v) button to increase or decrease the year. When the year is selected, press (ENTER) to continue to next screen.</td>
<td><img src="#" alt="Setup Menu" /></td>
<td>To cancel the operation, press (MENU) to return to the set date and time menu. Follow step 13 of the date/time setting instructions to exit to the main menu screen.</td>
</tr>
</tbody>
</table>
## Date/Time Setting Instructions Continued

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<tbody>
<tr>
<td>6</td>
<td>Select the current month by using the (A) or (v) button. When the month is selected, press (ENTER) to continue to next screen.</td>
<td><img src="SET_CURRENT_DATE_TIME" alt="Display" /></td>
<td>To cancel the operation, press (MENU) to return to the set date and time menu. Follow step 13 of the date/time setting instructions to exit to the main menu screen.</td>
</tr>
<tr>
<td>7</td>
<td>Select the current date by using the (A) or (v) button. When the date is selected, press (ENTER) to continue to next screen.</td>
<td><img src="SET_CURRENT_DATE_TIME" alt="Display" /></td>
<td>To cancel the operation, press (MENU) to return to the set date and time menu. Follow step 13 of the date/time setting instructions to exit to the main menu screen.</td>
</tr>
<tr>
<td>8</td>
<td>Select the current day of the week by using the (A) or (v) button. When the day of the week is selected, press (ENTER) to continue to next screen.</td>
<td><img src="SET_CURRENT_DATE_TIME" alt="Display" /></td>
<td>To cancel the operation, press (MENU) to return to the set date and time menu. Follow step 13 of the date/time setting instructions to exit to the main menu screen.</td>
</tr>
<tr>
<td>9</td>
<td>Select the current hour by using the (A) or (v) button. When the hour is selected, press (ENTER) to continue to next screen.</td>
<td><img src="SET_CURRENT_DATE_TIME" alt="Display" /></td>
<td>To cancel the operation, press (MENU) to return to the set date and time menu. Follow step 13 of the date/time setting instructions to exit to the main menu screen.</td>
</tr>
<tr>
<td>10</td>
<td>Select the current minute by using the (A) or (v) button. When the minute is selected, press (ENTER) to continue to next screen.</td>
<td><img src="SET_CURRENT_DATE_TIME" alt="Display" /></td>
<td>To cancel the operation, press (MENU) to return to the set date and time menu. Follow step 13 of the date/time setting instructions to exit to the main menu screen.</td>
</tr>
<tr>
<td>11</td>
<td>Select the correct period of day by using the (A) or (v) button. When the period of day is selected, press (ENTER) to continue to next screen.</td>
<td><img src="SET_CURRENT_DATE_TIME" alt="Display" /></td>
<td>To cancel the operation, press (MENU) to return to the set date and time menu. Follow step 13 of the date/time setting instructions to exit to the main menu screen.</td>
</tr>
<tr>
<td>12</td>
<td>This screen gives the opportunity to check if all the values for date and time are correct. If everything entered is correct, press (ENTER) make the changes and return to the set date and time menu.</td>
<td><img src="SET_CURRENT_DATE_TIME" alt="Display" /></td>
<td>To cancel the operation, press (MENU) to return to the set date and time menu. Follow step 13 of the date/time setting instructions to exit to the main menu screen.</td>
</tr>
<tr>
<td>13</td>
<td>When complete setting up date and time press (MENU) three additional times to return to main screen.</td>
<td><img src="SET_CURRENT_DATE_TIME" alt="Display" /></td>
<td>To cancel the operation, press (MENU) to return to the set date and time menu. Follow step 13 of the date/time setting instructions to exit to the main menu screen.</td>
</tr>
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<td>Steps</td>
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<td>-------</td>
<td>--------------------</td>
<td>---------</td>
<td>-------</td>
</tr>
<tr>
<td>1</td>
<td>To change the date format press the (MENU) button to go to the main menu screen.</td>
<td><img src="#" alt="Main Menu Display" /></td>
<td>To enter the main menu screen the controller must be in the main screen.</td>
</tr>
<tr>
<td>2</td>
<td>Use the (v) button to move the selection bar to the SETUP option.</td>
<td><img src="#" alt="Setup Menu Display" /></td>
<td>If the selection bar does not have the setup option selected, use the (A) or (v) button to move the selection bar.</td>
</tr>
<tr>
<td>3</td>
<td>Press (ENTER) again to enter the SET DATE AND TIME option.</td>
<td><img src="#" alt="Set Date and Time Menu Display" /></td>
<td>If the selection bar does not have the set date and time option selected, use the (A) or (v) button to move the selection bar.</td>
</tr>
<tr>
<td>4</td>
<td>In the set date and time menu, select the SET DATE FORMAT option and press (ENTER).</td>
<td><img src="#" alt="Set Date Format Menu Display" /></td>
<td>If the selection bar does not have the set date format option selected, use the (A) or (v) button to move the selection bar.</td>
</tr>
<tr>
<td>5</td>
<td>In the set date format menu, select a month/date/year format by using the (A) or (v) button to move the selection bar and press (ENTER).</td>
<td><img src="#" alt="Set Date Format Display" /></td>
<td>Month (MON) - Example: AUG Month (MM) - Two digit number Date (DD) - Two digit number Year (YY) - Last two digits of the year When complete setting up date formatting and if there are no other changes, press (MENU) four times to return to main menu screen.</td>
</tr>
<tr>
<td>6</td>
<td>Press (MENU) once to return to the set date and time menu.</td>
<td><img src="#" alt="Set Time Format Menu Display" /></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>To change the set time format use the (v) button to move the selection bar to the SET TIME FORMAT option.</td>
<td><img src="#" alt="Set Time Format Display" /></td>
<td>If the selection bar does not have the set time format option selected, use the (A) or (v) button to move the selection bar.</td>
</tr>
<tr>
<td>8</td>
<td>In the set time format menu select a hour format by using the (A) or (v) button to move the selection bar and press (ENTER).</td>
<td><img src="#" alt="Set Time Format Display" /></td>
<td>Two options available: Greenwich Mean time (GMT) or Military time</td>
</tr>
<tr>
<td>9</td>
<td>When complete setting up date and time formatting press (MENU) four times to return to main screen.</td>
<td><img src="#" alt="Liquid Solvent Vents / Water Solvent Vents Display" /></td>
<td></td>
</tr>
</tbody>
</table>
## History Viewing Instructions

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<tbody>
<tr>
<td>1</td>
<td>To view the History, press the (MENU) button to go to the secondary menu screen</td>
<td><img src="#" alt="Main Menu" /></td>
<td>If the selection bar does not have 'History' selected, use the (A) or (V) button to move the selection bar.</td>
</tr>
<tr>
<td>2</td>
<td>Use the (V) button to move the selection bar to the 'History' option and then press (Enter)</td>
<td><img src="#" alt="History Menu" /></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Use the (A) or (V) button to move the selection bar to the 'Read Point History' option and then press (Enter)</td>
<td><img src="#" alt="Read Point History" /></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>To view the current week's history press (Enter) when the selection bar highlights 'This Week'</td>
<td><img src="#" alt="Select History Period" /></td>
<td>Vents represents the total vents on a given Day and Purge Point Time represents the total time of all vents on a given Day and Purge Point</td>
</tr>
<tr>
<td>5</td>
<td>On this screen, you can observe Purge Point number, Day, Vents, and total time of vents</td>
<td><img src="#" alt="History for Current Week" /></td>
<td>The purge point number will be displayed on the upper left hand corner. If you are done with viewing History, press (Menu) four times to return to the Main Menu</td>
</tr>
<tr>
<td>6</td>
<td>To toggle to a history for a different purge point, press the (A) or (V) button</td>
<td><img src="#" alt="History for 01 Weeks Ago" /></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Press (Menu) to return to the 'Select History Period' screen</td>
<td><img src="#" alt="Select History Period" /></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>To view history for a previous week, use the (A) or (V) button to toggle to the week of choice and then press (Enter)</td>
<td><img src="#" alt="Select History Period" /></td>
<td>Repeat Steps 7-8 to view a different week of purging history. Press (Menu) four times to return to the Main Menu</td>
</tr>
<tr>
<td>9</td>
<td>This screen shows all the purge points and their respective number of vents and total vent times</td>
<td><img src="#" alt="History for 01 Weeks Ago" /></td>
<td></td>
</tr>
</tbody>
</table>
# Clearing History Instructions

<table>
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<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>To clear the History, press the (MENU) button to go to the secondary menu screen.</td>
<td>![Main Menu]</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Use the (V) button to move the selection bar to the 'History' option and then press (Enter).</td>
<td>![Main Menu]</td>
<td>If the selection bar does not have 'History' selected, use the (A) or (V) button to move the selection bar.</td>
</tr>
<tr>
<td>3</td>
<td>Use the (A) or (V) button to move the selection bar to the 'Clear History' option and then press (Enter).</td>
<td>![History Menu]</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Press 'Init' to start the history clearing.</td>
<td>![Please Confirm History Clear]</td>
<td>If you wish not to clear history, press any other key besides (Init).</td>
</tr>
<tr>
<td>5</td>
<td>This screen indicates that history is being cleared.</td>
<td>![Clearing History]</td>
<td>The screen will automatically go to the Main Menu screen after the history is successfully cleared.</td>
</tr>
</tbody>
</table>
## Factory Test Mode Instructions

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</tr>
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<tbody>
<tr>
<td>1</td>
<td>To perform a factory test, press the (MENU) button to go to the secondary menu screen</td>
<td><img src="image1" alt="Display" /></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Use the (v) button to move the selection bar to the 'Factory Test Mode' option and then press (Enter)</td>
<td><img src="image2" alt="Display" /></td>
<td>If the selection bar does not have 'Factory Test Mode' selected, use the (A) or (v) button to move the selection bar.</td>
</tr>
<tr>
<td>3</td>
<td>Enter the new password by using the (A) and (v) buttons followed by (Enter) for each of the four digits of the password.</td>
<td><img src="image3" alt="Display" /></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Observe the Factory test sequence initiate.</td>
<td><img src="image4" alt="Display" /></td>
<td>If a failure occurs, the screen will display the failure mode.</td>
</tr>
</tbody>
</table>
Safe Operation (See Bulletin RSBCV)
People doing any work on a refrigeration system must be qualified and completely familiar with the system and the Refrigerating Specialties Division valves involved, or all other precautions will be meaningless. This includes reading and understanding pertinent Refrigerating Specialties Division Product Bulletins and Safety Bulletin RSBC prior to installation or servicing work.

Where cold refrigerant liquid lines are used, it is necessary that certain precautions be taken to avoid damage which could result from liquid expansion. Temperature increase in a piping section full of solid liquid will cause high pressure due to the expanding liquid which can possibly rupture a gasket, pipe or valve. All hand valves isolating such sections should be marked, warning against accidental closing, and must not be closed until the liquid is removed. Check valves must never be installed upstream of solenoid valves, or regulators with electric shut-off, nor should hand valves upstream of solenoid valves or downstream of check valves be closed until the liquid has been removed.

It is advisable to properly install relief devices in any section where liquid expansion could take place. Avoid all piping or control arrangements which might produce thermal or pressure shock.

For the protection of people and products, all refrigerant must be removed from the section to be worked on before a valve, strainer, or other device is opened or removed. Flanges with ODS connections are not suitable for ammonia service.

Warranty
All Refrigerating Specialties products are under warranty against defects in workmanship and materials for a period of one year from date of shipment from factory. This warranty is in force only when products are properly installed, field assembled, maintained, and operated in use and service as specifically stated in Refrigerating Specialties Catalogs or Bulletins for normal refrigeration applications, unless otherwise approved in writing by the Refrigerating Specialties Division. Defective products, or parts thereof returned to the factory with transportation charges prepaid and found to be defective by factory inspection, will be replaced or repaired at Refrigerating Specialties option, free of charge, F.O.B. factory. Warranty does not cover products which have been altered, or repaired in the field, damaged in transit, or have suffered accidents, misuse, or abuse. Products disabled by dirt or other foreign substances will not be considered defective.

The express warranty set forth above constitutes the only warranty applicable to Refrigerating Specialties products, and is in lieu of all other warranties, expressed or implied, written including any warranty of merchantability, or fitness for a particular purpose. In no event is Refrigerating Specialties responsible for any consequential damages of any nature whatsoever. No employee, agent, dealer or other person is authorized to give any warranties on behalf of Refrigerating Specialties, nor to assume, for Refrigerating Specialties, any other liability in connection with any of its products.