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</thead>
<tbody>
<tr>
<td>North America</td>
<td>+1-800-FOR-GUTS (1-800-367-4887)</td>
</tr>
<tr>
<td></td>
<td>+1-978-262-2900</td>
</tr>
<tr>
<td>Europe</td>
<td>+49-1804-CALL-GUTS (+49-1804-2255-4887)</td>
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<tr>
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<tr>
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<td>Korea</td>
<td>+82-31-288-2500</td>
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<tr>
<td>Singapore</td>
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1 Safety

Overview

This section describes safety conventions for the Brooks Automation Product. All personnel involved in the operation or maintenance of the product must be familiar with the safety precautions outlined in this section.

**NOTE:** These safety recommendations are basic guidelines. If the facility where the Product is installed has additional safety guidelines they should be followed as well, along with the applicable national and international safety codes.

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Introduction

Follow all safety precautions during installation, normal operation, and when servicing CTI-Cryogenics products.

This chapter explains the safety conventions used throughout this manual. CTI-Cryogenics uses a specific format for cautions and warnings, which includes standard signal words and safety shapes.

See also the Customer Support appendix or call your local Customer Support Center for assistance.
Signal Word Descriptions

All cautions and warnings contain signal words, which call attention to safety messages and designate the degree of hazard seriousness. The following table shows the signal words and their meanings that may be used in this document.

Table 1-1: Safety Signal Words

<table>
<thead>
<tr>
<th>Term</th>
<th>Example</th>
<th>Definition</th>
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<tbody>
<tr>
<td>CAUTION</td>
<td>![CAUTION]</td>
<td>A signal word that indicates a situation or unsafe practice, which if not avoided may result in equipment damage. A CAUTION is highlighted in yellow.</td>
</tr>
<tr>
<td>CAUTION</td>
<td>![CAUTION]</td>
<td>A signal word accompanied by a safety shape that indicates a potentially hazardous situation or unsafe practice. If not avoided, the action may result in minor or moderate personal injury or equipment damage. A CAUTION is highlighted in yellow.</td>
</tr>
<tr>
<td>WARNING</td>
<td>![WARNING]</td>
<td>A signal word accompanied by a safety shape that indicates a potentially hazardous situation. If not avoided, the action may result in serious injury or death. A WARNING is highlighted in orange.</td>
</tr>
</tbody>
</table>
Safety Shape Descriptions

All cautions and warnings contain safety shapes, which have specific safety meanings. The following table shows some of the safety shapes used in this document and their meanings.

Table 1-2: Safety Shapes

<table>
<thead>
<tr>
<th>Example</th>
<th>Term</th>
<th>Shape Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="example1.png" alt="Image" /></td>
<td>General Warning</td>
<td>Indicates a general hazard. Details about this hazard appear in the safety notice explanation.</td>
</tr>
<tr>
<td><img src="example2.png" alt="Image" /></td>
<td>High Voltage</td>
<td>Indicates a high voltage hazard.</td>
</tr>
<tr>
<td><img src="example3.png" alt="Image" /></td>
<td>Hot Surface</td>
<td>Indicates a surface is hot enough to cause discomfort or a burn.</td>
</tr>
</tbody>
</table>

References

For more information about safety standards, see the following documents:

- ISO 7010: 2003(E), Graphic symbols - Safety colours and safety signs - Safety signs used in workplaces and public areas
- ISO 3864-1: 2002(E), Graphic symbols - Safety colours and safety signs - Part 1: Design principles for safety signs in workplaces and public areas
2 Getting Started

Overview

This section provides the minimum amount of information you need to begin using the Single Stage Cryopump.

For safety information about this product and safety notice conventions in this manual, see Chapter 1: Safety.

For details about installation, system parameters, system configuration, and other related information, see 8040730, On-Board IS Single Stage Cryopump Quick Installation Guide.

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Identify Single Stage Cryopumps and Configurations

Although other custom configurations are available, the Low Profile Single Stage Cryopump, used with a turbopump, is addressed in this manual.

Figure 2-1: Low Profile Single Stage Cryopump
Verify Equipment Installation

Ensure that all On-Board IS Cryopump System components are installed and connected to the Intercomponent Network before operating the process tool.

- **On-Board IS Cryopumps**
  Use the appropriate *On-Board IS Cryopump Quick Installation Guide* included with each cryopump.

- **On-Board IS 1000 Compressors**
  Use the directions found in the *On-Board IS 1000 Compressor Quick Installation Guide* included with each compressor.

- **On-Board IS Controller**
  Use the directions found in either the *Rack Mount* or *Pump Mount On-Board IS Controller Quick Installation Guide* included with the Controller.

- **On-Board IS Remote**
  Use the directions found in the *On-Board IS Remote Quick Installation Guide*, included with the Remote keypad.

**NOTE:** Not all systems include a Remote. See 8040677, On-Board IS Cryopump System Command Set Reference to control the system through the RS-232 interface.
Set the Intercomponent Network Addresses

The Intercomponent Network contains three channels; A, B and C. After you properly install the system components (cryopumps, compressors, and other parts of the system), set the respective network address for each system component.

See Figure 2-2 for an example of a typical intercomponent system network.

To ensure the network communication does not fail, install a network terminator in the network cable connector on the last Single Stage Cryopump and Compressor on each network channel, if it is not already installed.

![Typical Intercomponent Network Diagram]

Figure 2-2: Typical Intercomponent Network
On-Board IS Cryopump Addresses

**NOTE:** If you set the first Channel B address to 0, it appears as 10 on the Remote keypad. If you set the first Channel C address to 0, it appears as 20 on the Remote keypad.

1. Set the address switch for each On-Board IS Cryopump on channel A to the appropriate network address as shown in Figure 2-2, with the address switch in Figure 2-3.

2. Set the address switch for each On-Board IS Cryopump on channel B to the appropriate network address as shown in Figure 2-2, with the address switch in Figure 2-3.

![Figure 2-3: Network Address Switch for Single Stage Cryopumps](image)

**NOTE:** Other types of cryopumps have two address switches. See the appropriate On-Board IS Cryopump Quick Installation Guide or Operation Guide for the cryopump.

3. Note the address of the Single Stage Cryopump for future use.

On-Board IS 1000 Compressor Addresses

**NOTE:** If you set the first Channel C address to 0, it appears as 20 on the Remote keypad.

Set the address switch for each Compressor on channel C to the appropriate network address as shown in Figure 2-2, with the address switch in Figure 2-4.

![Figure 2-4: Compressor Network Address Switch](image)
Apply Power to the System

After you set the network addresses, turn power ON by doing the following:

1. Close all process chamber Hi-Vac valves, if applicable to your system.
2. Set the Compressor System Circuit Breaker to the ON (UP) position.
3. Set the Compressor Control Circuit Breaker to the ON (UP) position.
4. Set the power switch on the front panel of the Compressors to the ON position.

The system now has power.
Verify Cryopump and Compressor Recognition

After you set the network addresses and apply power to the system, verify the network recognizes all system components (cryopumps, compressors, and other parts of the system) by performing the steps in this section with the On-Board IS Remote keypad (Remote).

For details about using the Remote, see Using the On-Board IS Remote Keypad on page 4-2.

If you do not use the Remote, see 8040677, On-Board IS Cryopump System Command Set Reference to control the system through the RS-232 interface.

To verify the system recognizes the cryopump and compressors:

1. Plug in the On-Board IS Remote keypad to the On-Board IS Controller (Controller) for the system.

   See the On-Board IS Remote Quick Installation Guide for rack and pump mount Controller details.

   The On-Board IS Controller main screen appears.

   ![Controller Main Screen]

   *Figure 2-5: Controller Main Screen*

2. From the On-Board IS Controller main screen, select Access Device.

   The Choose Device screen appears.
3. Note the number of cryopumps (Pumps) and compressors that are recognized by the Controller, and ensure this equals the number of components on the system.

If the number of components on the system does not equal the number in the Choose Device screen, check the system installation.

If the number of components on the system equals the number in the Choose Device screen, you can configure the Rough and Helium Maps.
Configure Accessories for the Cryopump

After you verify the network recognizes all system components, you must configure the cryopump to include the appropriate accessories, which may include a TC gauge, purge valve, rough valve, combinations of these, or no accessories. Use the Remote keypad to perform the steps in this section.

For assistance with your system accessories, see Appendix A: Customer Brooks Automation Technical Support Information on page 8-2.

For details about using the Remote keypad, see Using the On-Board IS Remote Keypad on page 4-2.

If you do not use the Remote keypad, see 8040677, On-Board IS Cryopump System Command Set to control the system through the RS-232 interface.

To configure the accessories for the cryopump:

1. Go to the main On-Board IS Cryopump screen on the Remote keypad.

![ON-BOARD IS CRYOPUMP

Monitor
Regeneration
▶ System Setup
Control
Pump Info](image)

*Figure 2-7: Cryopump Main Screen*

If the Remote is plugged into the Controller, see Open a Remote Session from the Controller on page 4-5 to get to this screen.
2. Choose System Setup and press Enter.

The System Setup screen appears.

```
SYSTEM SETUP
Regeneration
Security Config
Communication
Power Failure
► Pump Configuration
Display Setup
```

*Figure 2-8: System Setup Screen*

3. Choose Pump Configuration and press Enter.

```
SELECT CONFIGURATION
►■ No Accessories
□ TC Gauge
□ Purge Valve
□ Rough Valve + TC
□ Purge Valve + TC
□ Purge + Rough + TC
ENTER
```

*Figure 2-9: Pump Configuration Screen*

4. Use the arrow keys on the Remote keypad to move the cursor to the accessory or accessory combination you want to select, and then press Enter.

The box to the left of the accessory or combination becomes shaded.

```
SELECT CONFIGURATION
□ No Accessories
□ TC Gauge
□ Purge Valve
►■ Rough Valve + TC
□ Purge Valve + TC
□ Purge + Rough + TC
ENTER
```

*Figure 2-10: Select Accessories*
5. Use the arrow keys to move the cursor to *Enter*, and then press *Enter* on the Remote keypad.

The system is configured for the accessories you chose.

**Configure the Rough, Helium, and Regeneration Maps**

Choose the system components to add to each rough map and helium map in the *Configuring Maps* chapter, and regeneration map in the *Using the Single Stage Cryopump* chapter.
Set the Power Fail Recovery System

After you configure the Rough, Helium, and Regeneration Maps, you must set the Power Failure Recovery (PFR) system. Use the Remote keypad to perform the steps in this section.

For details about using the Remote keypad, see Using the On-Board IS Remote Keypad on page 4-2.

If you do not use the Remote keypad, see 8040677, On-Board IS Cryopump System Command Set to control the system through the RS-232 interface.

To set the PFR system for the cryopump:

1. Go to the main On-Board IS Cryopump screen on the Remote keypad.

   ![Cryopump Main Screen](image)

   Figure 2-11: Cryopump Main Screen

   If the Remote is plugged into the Controller, see Open a Remote Session from the Controller on page 4-5 to get to this screen.

2. Choose System Setup and press Enter.

   The System Setup screen appears.

   ![System Setup Screen](image)

   Figure 2-12: System Setup Screen
3. Choose *Power Failure* and press *Enter*.

The *Power Failure* screen appears.

![POWER FAILURE

Recovery ON
Temperature (K) 260](image)

*Figure 2-13: Power Failure Screen*

4. Use the arrows keys to change the *Recovery* (mode) and *Temperature* value, if you do not want to keep the defaults.

See *Power Failure Recovery Parameters on page 5-12* for more information about these settings.

The PFR system is now set.
Startup the Single Stage Cryopump

With the Remote, go to the Startup screen. See Startup the Single Stage Cryopump on page 4-11 for specific instructions.

For details about using the Remote, see Using the On-Board IS Remote Keypad on page 4-2.

If you do not use the Remote, see 8040677, On-Board IS Cryopump System Command Set to control the system through the RS-232 interface.
3 Configuring Maps

Overview

This chapter describes setting and maintaining rough and helium maps. For information about regeneration maps, see Perform a Group Full Regeneration on page 4-27.

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About Maps ................................................................. 3-2
About Rough Maps ...................................................... 3-3
   View Rough Maps .................................................... 3-4
   Configure Rough Maps ............................................. 3-6
About Helium Maps ..................................................... 3-9
   View Helium Maps .................................................. 3-10
   Configure Helium Maps .......................................... 3-12
About Maps

A map manages each cryopump or compressor on rough or helium manifolds, so that the system operates efficiently during regeneration.

If your system has more than one rough or helium manifold, then you can use more than one rough or helium map. You may use up to five maps on a multiple On-Board IS System.

You can configure maps by adding (assigning) cryopumps and compressors, as appropriate, to different maps or removing them from the maps. See the following sections for more formation about map types and how to configure them.

There are three basic map types:

- Rough maps for managing when cryopumps use rough manifolds. See About Rough Maps on page 3-3.
- Helium maps for managing when cryopumps use each compressor. See About Helium Maps on page 3-9.
- Regeneration maps for managing a Group Regeneration. See Perform a Group Full Regeneration on page 4-27.
About Rough Maps

Through a rough map, the On-Board IS Controller manages when each cryopump uses a shared rough manifold and rough pump. Each On-Board IS System may contain up to five rough maps. See the following figure for an example of cryopumps grouped together by their corresponding rough pumps.

**NOTE:**
*If the address is set to 0, it appears as 10 on Channel B.*
**If the address is set to 0, it appears as 20 on Channel C.*
View Rough Maps

Before you change the configuration of cryopumps for a rough map, you can see its rough map.

**NOTE:** If you are creating rough maps, follow the steps in Configure Rough Maps on page 3-6.

After you assign a cryopump to a rough map, rough coordination turns on automatically.

1. Ensure the Remote keypad is plugged into the Controller, to which the cryopumps are attached.
2. Go to the On-Board IS Controller screen.

3. Choose Monitor and press Enter.

The Monitor Network screen appears.

The Regeneration screen appears.

![Regeneration Setup](image)

**Figure 3-4: Regeneration Screen**

5. Choose Rough Map and press Enter.

The Rough Map 1 screen appears.

![Rough Map 1](image)

**Figure 3-5: Rough Map 1 Screen**

6. Choose Next Map and press Enter to see Rough Maps 2 through 5, in sequence.

You can use this information to decide which cryopumps to add or remove from each Rough Map as necessary.
Configure Rough Maps

You can configure rough maps by adding or removing cryopumps from them.

**NOTE:** After you assign a cryopump to a rough map, rough coordination turns on automatically.

To configure a rough map:

1. Ensure the Remote keypad is plugged into the Controller, to which the cryopumps are attached.
2. Note the addresses of the cryopumps that you want to add to a rough map.
3. Go to the *On-Board IS Controller* screen.


The *System Setup* screen appears.
5. Choose Regeneration and press Enter.

The Regeneration Setup screen appears.

![Regeneration Setup Screen](image)

**NOTE:** You may choose any Rough Map number (up to 5) for configuring cryopumps. Use the arrow buttons on the Remote keypad to enter the Rough Map number you want.

6. Choose Rough Map and press Enter.

The Rough Map 1 screen appears.

![Rough Map 1 Screen](image)

7. Use the Remote keypad arrow buttons to navigate to the address of the cryopumps you want to add or remove from the rough map. Use the Enter button to mark the boxes of the cryopump addresses.
8. After you mark the cryopump addresses you want to add or remove from the rough map, navigate to Accept Change, and press Enter.

The Verify Rough Map 1 screen appears.

![Verify Rough Map 1 Screen](image)

This screen shows you the cryopumps that belong to Rough Map 1.

9. If the correct cryopumps are in Rough Map 1, press Enter.

If the cryopumps are not correct for Rough Map 1, press Back, and then perform Step 7 and Step 9 again.

You have successfully configured a rough map.
About Helium Maps

Through a helium map, the On-Board IS Controller manages when each cryopump uses a shared helium manifold and compressor. See Figure 3-11 for cryopumps grouped together by their corresponding compressors.

Figure 3-11: Helium Map Configuration Example

NOTE: *If the address is set to 0, it appears as 10 on Channel B.
**If the address is set to 0, it appears as 20 on Channel C.
View Helium Maps

Before you change the configuration of cryopumps or compressors for a helium map, you can see its helium map.

**NOTE:** If you are configuring helium maps, follow the steps in Configure Helium Maps on page 3-12.

1. Ensure the Remote keypad is plugged into the Controller, to which the cryopumps are attached.

2. Go to the On-Board IS Controller screen.

![Figure 3-12: On-Board IS Controller Screen](image)

3. Choose Monitor and press Enter.

   The Monitor Network screen appears.

![Figure 3-13: Monitor Network Screen](image)

The Helium Management screen appears.

```
HELIUM MANAGEMENT

► Show Helium Maps
```

*Figure 3-14: Helium Management Screen*

5. Choose Show Helium Maps and press Enter.

The Helium Map 1 screen appears.

```
HELIUM MAP 1

00 02 04 05
14 15 16 20
20

► Next Map
```

*Figure 3-15: Helium Map 1 Screen*

6. Choose Next Map and press Enter to see Helium Maps 2 through 5, in sequence.

You can use this information to decide which cryopumps and compressors to add or remove from each Helium Map as necessary.
Configure Helium Maps

You can configure helium maps by adding or removing cryopumps and compressors from them.

To configure a helium map:

1. Note the addresses of the cryopumps and compressors that you want to add or remove from a helium map.
2. Ensure the Remote keypad is plugged into the Controller, to which the cryopumps are connected.
3. Go to the On-Board IS Controller screen.

   ![On-Board IS Controller Screen](image1)

   Figure 3-16: On-Board IS Controller Screen


   The System Setup screen appears.

   ![System Setup Screen](image2)

   Figure 3-17: System Setup Screen
5. Choose Helium and press Enter.

The Helium screen appears.

![Helium Screen](image)

**Figure 3-18: Helium Screen**

**NOTE:** Use the arrow buttons on the Remote keypad to choose any Helium Map number recognized by the system.

6. Choose Helium Map and press Enter.

The Choose Map Pumps screen appears.

![Choose Map Pumps Screen](image)

**Figure 3-19: Choose Map Pumps Screen**

7. Use the Remote keypad arrow buttons to navigate to the address of the cryopumps you want to add or remove from the helium map. Use the Enter button to mark the boxes of the cryopump addresses.
8. After you mark all the cryopump addresses you want to add or remove from the helium map, navigate to Accept Change, and press Enter.

The Choose Compressors screen appears.

![Choose Compressors Screen](image)

Figure 3-20: Choose Compressors Screen

9. Use the Remote keypad arrow buttons to navigate to the address of the compressors you want to add or remove from the helium map. Use the Enter button to mark the boxes of the compressor addresses.

10. After you mark all the compressor addresses you want to add or remove from the helium map, navigate to Accept Change, and press Enter.

The Verify Helium Map 1 screen appears.

![Verify Helium Map 1 Screen](image)

Figure 3-21: Verify Helium Map 1 Screen

This screen shows you the cryopumps and compressors that belong to Helium Map 1.

11. If the correct cryopumps are in Helium Map 1, press Enter.

If the cryopumps and/or the compressors are not correct in Helium Map 1, press Back, and then perform Step 7 through Step 11 again.

You have successfully configured a helium map.
4 Using the Single Stage Cryopump

Overview

This chapter explains how to operate the cryopump through the Remote keypad, and when and why you should perform different types of regeneration.

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Using the On-Board IS Remote Keypad

You can use the On-Board IS Remote keypad (Remote) to control the cryopump and other system components individually through the component itself, or system-wide through the On-Board IS Controller (Controller).

Plug in the Remote to the component you want to use. See the *On-Board IS Remote Quick Installation Guide* for rack and pump mount Controller details.

The Remote screen changes as you choose different menu items with the buttons.

Select Items on the Remote Screen

Select screens and change values the same way for every screen that appears on the Remote (see Figure 4-1).

1. Use the arrow buttons to move the cursor to an item on the screen.
2. Press the ENTER button to select the item.

The selected screen appears or the action is completed, as appropriate.

**NOTE:** After the Remote is idle for 15 minutes, a screen saver appears, and dims the display to its lowest level of brightness. Press any button on the remote display to turn off the screen saver and return the screen to its normal level of brightness.
Change Parameters on the Remote

1. Use the arrow buttons to move the cursor (an arrow) to a menu item on the screen.

   ![System Setup Menu]

   Figure 4-2: Select a Menu Item for a Different Remote Screen

2. Press the **ENTER** button to select the menu item.

   The selected screen appears or the action is completed, as appropriate.

   ![Communication Menu]

   Figure 4-3: Menu Item Screen

3. Use the arrow buttons to move the cursor to the menu item for the value you want to change.

4. Press the **ENTER** button. The value is underlined.

   ![Communication Menu with Underlined Value]

   Figure 4-4: Select a Value
5. Use the arrow buttons to change the value.

In this example, each time you press the up or down arrow buttons, the value changes to 2400, 9600, 19200, or 38400.

![Figure 4-5: Change the Value](image)

6. Press the **ENTER** button. The value remains at the new value, and the cursor appears to the left of the menu item.

![Figure 4-6: New Value is Set](image)

The new value is now set.

**NOTE:** After the Remote is idle for 15 minutes, a screen saver appears, and dims the display to its lowest level of brightness. Press any button on the remote display to turn off the screen saver and return the screen to its normal level of brightness.
Open a Remote Session from the Controller

You can access an individual cryopump through the Controller by opening a Remote Session with the cryopump.

To open a Remote Session from the Controller:

1. Note the network address of the Single Stage Cryopump for which you want to open a Remote Session.

2. Go to the On-Board IS Controller screen on the Remote keypad.


The Choose Device screen appears.

The Network Pumps screen appears.

![Network Pumps Screen](image)

Figure 4-9: Network Pumps Screen

5. Use the Remote keypad arrows to navigate to the Single Stage Cryopump network address (as noted in Step 1), and press Enter.

The On-Board IS Cryopump screen appears.

![On-Board IS Cryopump Screen](image)

Figure 4-10: On-Board IS Cryopump Screen

The Remote Session is now open. You can navigate to all Single Stage Cryopump Remote screens from this one.
Close a Remote Session from the Controller

To close the Remote Session:

1. Press the Back button on the Remote keypad until you see the following Close Remote Session screen.

![CLOSE REMOTE SESSION]

Are you sure?

No

► Yes

Figure 4-11: Close Remote Session Screen

2. Choose Yes, and press Enter.

The Single Stage Cryopump Remote session closes, and you can use the Controller screens for the system again.

### About Regeneration and the On-Board *IS* Single Stage Cryopump

The Single Stage Cryopump is a capture pump; it cryogenically condenses gases (creating frost), then warms and eliminates them from the vacuum system during regeneration. Typically, you should plan regeneration to coincide with the routine maintenance of a cryopump system, but you can start regeneration any time.

Regeneration incorporates several parameters that are preset at the factory, such as extended purge (min.) and sublime temperature (K). To change these parameters before regeneration, see Change Regeneration Parameters on page 4-31. For a list of the default regeneration parameters, see Appendix B: Default Parameters (Values) on page 8-3.

#### Sublime Regeneration:

The cryopump stops cooling, stays below atmospheric pressure, warms enough to eliminate the frost that was trapped since the last regeneration, and then cools to the operating temperature.

**NOTE:** The cryopump must have a TC gauge to perform a Sublime Regeneration.

Use a Sublime Regeneration when the Single Stage Cryopump is connected to a turbopump, so that no liquid drips into the turbopump as the cryopump warms.

#### Timed Sublime:

A type of Sublime Regeneration in which you set the time duration of the regeneration. This is also called a Partial Regeneration.

Use a Timed Sublime Regeneration when you have a short, fixed time during cryopump and system maintenance in the chamber.

---

**WARNING**

Toxic Materials

Internal surfaces of the cryopump may contain process-specific toxic or corrosive materials, even after regeneration is complete. Adhere to all safety protocols as appropriate, and avoid touching internal surfaces.
NOTE: Not all of the frost may be eliminated during this time.

Pressure Sublime:
A type of Sublime Regeneration in which all the frost is removed.

Use a Pressure Sublime Regeneration for most regenerations when the cryopump is connected to a turbopump. See Perform a Regeneration on One Single Stage Cryopump for instructions.

Warmup Regeneration:
The cryopump stops cooling, may go above atmospheric pressure, and warms enough to eliminate the frost that was trapped since the last regeneration. See the Warmup Without and With Cooldown definitions for details about when to use this type. See Perform a Regeneration on One Single Stage Cryopump for instructions, and Change Warmup Regeneration Parameters to set either Warmup Regeneration.

Warmup Without Cooldown:
A type of Warmup Regeneration in which the cryopump remains warm, and does not resume operation.

Use a Warmup Without Cooldown Regeneration when you perform maintenance for an extended time, and the cryopump is not connected to a turbopump. You can also wipe moisture off of the cryopump during this time, if necessary.

Warmup With Cooldown:
A type of Warmup Regeneration in which the cryopump cools down and resumes pumping, after reaching a specific temperature.

Use a Warmup With Cooldown for most regenerations when the cryopump is not connected to a turbopump, and you want to warm it for a specific time period. See the following definition for Startup.

Startup:
The cryopump starts a Warmup With Cooldown Regeneration. Use Startup to start the Single Stage Cryopump for the first time or to re-start it after a Shutdown. See Startup the Single Stage Cryopump for instructions.

Shutdown:
The cryopump starts a Pressure Sublime Regeneration. Use Shutdown to stop the cooling and pumping, but hold the cryopump below atmospheric pressure as it warms so that no liquid drips onto other system components, such as a turbopump. After a set time, the cryopump warms to ambient temperature and the motor shuts off. See Shutdown the Single Stage Cryopump for instructions.
Group Full Regeneration:
The system starts a Warmup With Cooldown or a Pressure Sublume, depending upon the last regeneration performed on the cryopump. Use a Group Full Regeneration to coordinate rough manifold sharing (if applicable) for all cryopumps on the system that regenerate at the same time. See Perform a Group Full Regeneration for instructions.

Group Fast Regeneration:

NOTE: Single Stage Cryopumps are not included in a Group Fast Regeneration.

The system starts a Partial Warmup with Cooldown and coordinates rough pump and purge valve sharing (if applicable) for all cryopumps on the system that regenerate at the same time.
Startup the Single Stage Cryopump

Use the Startup function to start the Single Stage Cryopump for the first time or to re-start it after a Shutdown. The cryopump starts a Warmup With Cooldown Regeneration.

To Startup the cryopump:

1. Go to the On-Board IS Cryopump screen on the Remote keypad.

   ![Figure 4-12: Cryopump Main Screen](image)

   If the Remote is plugged into the Controller, see Open a Remote Session from the Controller on page 4-5 to get to this screen.

2. Choose Control and press Enter.

   The Control screen appears.

   ![Figure 4-13: Control Screen](image)
3. Choose *Pump* and press *Enter*.

The *Pump Control* screen appears.

![Pump Control Screen]

4. Choose *Startup* and press *Enter*.

The *Start a Warmup Regeneration* screen appears.

![Start a Warmup Regeneration Screen]

5. Choose *Yes* and press *Enter*.

The *Regeneration Status* screen appears.

![Regeneration Status Screen]
NOTE: If the system has a purge valve, the system performs an extended purge before the motor is on and begins cooling.

The Actual temperature will rise until it meets the Target temperature, and then the motor begins cooling the cryopump.

The Regeneration Status screen shows when Regeneration is finished.

![Regeneration Status Screen](image)

Figure 4-17: Regeneration Status Screen
Shutdown the Single Stage Cryopump

Use Shutdown to stop the cooling and pumping, but hold the cryopump below atmospheric pressure (in a Pressure Sublime Regeneration) so that no liquid drips onto other system components, such as a turbopump.

**CAUTION**

Equipment Damage

To avoid permanently damaging a turbopump connected to the Single Stage Cryopump, ensure that no liquid enters the turbopump.

Consult your turbopump instructions about specific safety measures.

**NOTE:** *The cryopump must have a TC gauge to perform a Shutdown (Sublime Regeneration).*

To Shutdown the cryopump:

1. Go to the *On-Board IS Cryopump* screen on the Remote keypad.

   ![ON-BOARD IS CRYOPUMP](Diagram)

   **Figure 4-18: Cryopump Main Screen**

   If the Remote is plugged into the Controller, see *Open a Remote Session from the Controller on page 4-5* to get to this screen.
2. Choose *Control* and press *Enter*.

The *Control* screen appears.

![CONTROL][2]

*Figure 4-19: Control Screen*

3. Choose *Pump* and press *Enter*.

The *Pump Control* screen appears.

![PUMP CONTROL][3]

*Figure 4-20: Pump Control Screen*

4. Choose *Safe Shutdown* and press *Enter*.

The *Shutdown* screen appears.

![SHUTDOWN][4]

*Figure 4-21: Shutdown Screen*
5. Choose *Sublime* and press *Enter*.

The *Start a Sublime* screen appears.

![Sublime Screen](image1)

*Figure 4-22: Start a Sublime (Shutdown) Screen*

6. Choose *Yes* and press *Enter*.

The *Regeneration Status* screen appears.

![Regeneration Status Screen](image2)

*Figure 4-23: Regeneration Status Screen*

The *Actual* temperature will rise until it meets the *Target* temperature, and the temperature remains steady until the pressure drops, indicating all the frost sublimated.

The *Regeneration Status* screen shows when Regeneration is finished.

![Regeneration Status Screen](image3)

*Figure 4-24: Regeneration Status Screen*
Perform a Regeneration on One Single Stage Cryopump

You can use a Pressure Sublime Regeneration for most regenerations when the cryopump is connected to a turbopump. See the following section for instructions.

For other situations, you may also use a Warmup Regeneration. See Perform a Warmup Regeneration on page 4-20.

Perform a Pressure Sublime Regeneration

**NOTE:** The cryopump must have a TC gauge to perform a Sublime Regeneration.

To start a Pressure Sublime Regeneration:

1. Go to the On-Board IS Cryopump screen on the Remote keypad.

   ![Figure 4-25: Cryopump Main Screen](image)

   If the Remote is plugged into the Controller, see Open a Remote Session from the Controller on page 4-5 to get to this screen.

2. Choose Regeneration and press Enter.

   The Regeneration screen appears.

   ![Figure 4-26: Regeneration Screen](image)
3. Choose *Pressure Sublime* and press *Enter*.

The *Start Sublime Regen* screen appears.

![START SUBLIME REGEN](image)

*Figure 4-27: Start Sublime Regen Screen*

4. Choose *Yes* and press *Enter*.

The system performs a Pressure Sublime Regeneration, and a *Regeneration Status* screen appears for each regeneration cycle.

**NOTE:** *Some regeneration cycles may last for two hours or more, depending on your application.*

![REGENERATION STATUS](image)

*Figure 4-28: Regeneration Status Screen, Warmup Cycle*
Actual and Target values in the previous figure indicate pressure measured in microns.
Perform a Warmup Regeneration

To set a Warmup With or Without Cooldown, see Change Regeneration Parameters on page 4-31.

To start a Warmup Regeneration:

1. Go to the On-Board IS Cryopump screen on the Remote keypad.

![ON-BOARD IS CRYOPUMP](image)

Figure 4-32: Cryopump Main Screen

If the Remote is plugged into the Controller, see Open a Remote Session from the Controller on page 4-5 to get to this screen.

2. Choose Regeneration and press Enter.

The Regeneration screen appears.

![REGENERATION](image)

Figure 4-33: Regeneration Screen
3. Choose *Warmup* and press *Enter*.

The *Start Warmup Regen* screen appears.

![START WARMUP REGEN](image)

*Figure 4-34: Start Warmup Regen Screen*

4. Choose *Yes* and press *Enter*.

The system performs a Warmup Regeneration, and the *Regeneration Status* screen appears.

![REGENERATION STATUS](image)

*Figure 4-35: Regeneration Status Screen, Warmup Cycle*

![REGENERATION STATUS](image)

*Figure 4-36: Regeneration Status Screen, Cooldown Cycle*
The *Regeneration Status* screen shows when Regeneration is finished.

![Regeneration Status Screen](image)

*Figure 4-37: Regeneration Status Screen*
Set and Start a Timed Sublime Regeneration

Use a Timed Sublime Regeneration when you have a short, fixed time during cryopump and system maintenance in the chamber because you can limit the time for this regeneration by setting the roughing time.

**NOTE:** Not all of the frost may sublimate during this time.

**NOTE:** This is also called a Partial Regeneration.

First, set the sublime time for the Timed Sublime Regeneration (in minutes), and then start the Time Sublime Regeneration.

Set the Sublime Time for the Timed Sublime Regeneration

To set the sublime time:

1. Go to the *On-Board IS Cryopump* screen on the Remote keypad.

   ![On-Board IS Cryopump Screen](image)

   *Figure 4-38: Cryopump Main Screen*

   If the Remote is plugged into the Controller, see Open a Remote Session from the Controller on page 4-5 to get to this screen.
2. Choose *System Setup* and press *Enter*.

The *System Setup* screen appears.

```
SYSTEM SETUP
  ► Regeneration
  Security Config
  Communication
  Power Failure
  Pump Configuration
  Display Setup
```

*Figure 4-39: System Setup Screen*

3. Choose *Regeneration* and press *Enter*.

The *Regeneration* screen appears.

```
REGENERATION SETUP
  Warmup
  ► Sublime
  Roughing
  Delay
```

*Figure 4-40: Regeneration Screen*

4. Choose *Sublime* and press *Enter*.

The *Sublime Setup* screen appears.

```
SUBLIME SETUP
  Temperature (K)  XXX
  ► Time (min)     YYY
```

*Figure 4-41: Sublime Setup Screen*
5. Choose *Time*.

6. Use the arrows on the Remote keypad to set the time (YYY) and press *Enter*.

When you start a Time Sublime Regeneration, it sublimes for the time you set.

**Start the Timed Sublime Regeneration**

To start a Timed Sublime Regeneration:

1. Go to the *On-Board IS Cryopump* screen on the Remote keypad.

   ![Cryopump Main Screen](image)

   *Figure 4-42: Cryopump Main Screen*

   If the Remote is plugged into the Controller, see *Open a Remote Session from the Controller on page 4-5* to get to this screen.

2. Choose *Regeneration* and press *Enter*.

   The *Regeneration* screen appears.

   ![Regeneration Screen](image)

   *Figure 4-43: Regeneration Screen*

The Start Sublime Regen screen appears.

![START SUBLIME REGEN](image)

*Figure 4-44: Start Sublime Regen Screen*

4. Choose Yes and press Enter.

The system performs a Timed Sublime Regeneration.

**NOTE:** Not all of the frost may sublimate during this time.

The Regeneration Status screen shows when Regeneration is finished.

![REGENERATION STATUS](image)

*Figure 4-45: Regeneration Status Screen*
Perform a Group Full Regeneration

Use a Group Full Regeneration to coordinate rough valve and rough manifold sharing (if applicable) for all cryopumps on the system that regenerate at the same time. The cryopump begins a Warmup With Cooldown or a Pressure Sublime, depending upon the last regeneration it performed.

An On-Board IS Cryopump System can have up to five Regeneration Groups or Maps. When the Regeneration starts, the Controller coordinates the rough manifold for each Regeneration Group and rough map. For more information, see Configure Rough Maps on page 3-6 to create rough maps.

NOTE: If you restart regeneration for any one cryopump while others are in a group regeneration, the restarted pump finishes last.

To start a Group Full Regeneration:

1. Plug the Remote into the Controller.

2. Go to the On-Board IS Controller screen on the Remote keypad.

![Figure 4-46: Controller Main Screen](image-url)
3. Choose Regeneration and press Enter.

The Regeneration screen appears.

![Figure 4-47: Regeneration Screen](image)

4. Ensure Group Regen is ON.

5. Choose Start and press Enter.

The Choose Regen Pumps screen appears.

![Figure 4-48: Choose Regen Pumps Screen](image)

**NOTE:** Your pump address may be different from the ones in the previous figure.
6. Choose the addresses of the pumps you want to regenerate, use the arrow buttons to choose Enter on the screen, and then press Enter on the Remote keypad.

The List to Regen screen appears. This shows all the cryopump addresses you chose in the previous screen.

```
<table>
<thead>
<tr>
<th>LIST TO REGEN</th>
</tr>
</thead>
<tbody>
<tr>
<td>02 03 04 05 06 07 08</td>
</tr>
<tr>
<td>Start Fast Regen</td>
</tr>
<tr>
<td>▶ Start Full Regen</td>
</tr>
</tbody>
</table>
```

*Figure 4-49: List to Regen Screen*

7. Choose Start Full Regen and press Enter.

**NOTE:** If you start a Fast Regeneration, the Single Stage Cryopump does not regenerate with the other designated cryopumps. For more information about Fast Regeneration, see the definition in About Regeneration and the On-Board IS Single Stage Cryopump on page 4-8 and the On-Board IS Cryopump Operations Manual.

The Start Full Regen screen appears.

```
<table>
<thead>
<tr>
<th>START FULL REGEN</th>
</tr>
</thead>
<tbody>
<tr>
<td>Are you sure?</td>
</tr>
<tr>
<td>▶ NO</td>
</tr>
<tr>
<td>▶ YES</td>
</tr>
</tbody>
</table>
```

*Figure 4-50: Start Full Regen Screen*
8. Choose Yes and press Enter.

The Full Regen Started screen appears.

Figure 4-51: Full Regen Response Screen

Regeneration starts for all designated cryopumps.
Change Regeneration Parameters

Change the parameters for Warmup and Sublime Regeneration to optimize regeneration for your system.

See Regeneration Parameters on page 5-10 for information about parameter options.

See Appendix B: Default Parameters (Values) on page 8-3 for information about default settings.

Change Warmup Regeneration Parameters

You can change these Warmup Regeneration parameters:

- **Extended purge** (time, in minutes): Control the length of time the purge gas flows into the cryopump after it warms up.
- **Cooldown Mode** (on/off): Control the end of Warmup Regeneration by setting it to cooldown or stay warm.

To change the Warmup Regeneration parameters:

1. Go to the On-Board IS Cryopump screen on the Remote keypad.

![ON-BOARD IS CRYOPUMP](image)

Figure 4-52: Cryopump Main Screen

If the Remote is plugged into the Controller, see Open a Remote Session from the Controller on page 4-5 to get to this screen.
2. Choose System Setup and press Enter.
   
The System Setup screen appears.

   ![SYSTEM SETUP](image)

   Figure 4-53: System Setup Screen

3. Choose Regeneration and press Enter.
   
The Regeneration screen appears.

   ![REGENERATION SETUP](image)

   Figure 4-54: Regeneration Screen

   
The Warmup Setup screen appears.

   ![WARMUP SETUP](image)

   Figure 4-55: Warmup Setup Screen
5. Choose Ext Purge orCooldown Mode and press Enter.

The cursor moves to the value (parameter) you want to change, and appears as a blinking line underneath the value.

6. Use the arrow keys on the Remote keypad to change the value, and press Enter.

The new parameter is set.

Change Sublime Regeneration Parameters

You can change these Sublime Regeneration parameters:

- **Temperature** (Kelvin): Control the maximum temperature during a Sublime Regeneration.
- **Time** (minutes): Control the maximum sublime time during a Time Sublime Regeneration.

To change the Sublime Regeneration parameters:

1. Go to the On-Board IS Cryopump screen on the Remote keypad.

   ![ON-BOARD IS CRYOPUMP](image)

   *Figure 4-56: Cryopump Main Screen*

If the Remote is plugged into the Controller, see [Open a Remote Session from the Controller on page 4-5](#) to get to this screen.
2. Choose System Setup and press Enter.

The System Setup screen appears.

```
SYSTEM SETUP
  ◄ Regeneration
  Security Config
  Communication
  Power Failure
  Pump Configuration
  Display Setup
```

*Figure 4-57: System Setup Screen*

3. Choose Regeneration and press Enter.

The Regeneration screen appears.

```
REGENERATION SETUP
  Warmup
  ◄ Sublime
  Roughing
  Delay
```

*Figure 4-58: Regeneration Screen*


The Sublime Setup screen appears.

```
SUBLIME SETUP
  Temperature (K)  230
  Time (min)       20
```

*Figure 4-59: Sublime Setup Screen*
5. Choose *Temperature* or *Time* and press *Enter*.

The cursor moves to the value (parameter) you want to change, and appears as a blinking line underneath the value.

6. Use the arrow keys on the Remote keypad to change the value, and press *Enter*.

7. Turn on Rough Coordination. See *Configure Rough Maps on page 3-6*.

The new parameter is set.
5 About Single Stage Cryopump Remote Screens

Overview

This chapter shows all the Remote screens you can see through the Single Stage Cryopump or the Controller, using the On-Board IS Remote keypad (the Remote).

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About Local Cryopump Remote Screens

Local Remote screens are specific to one cryopump, as opposed to using system Remote screens for multiple system components.

You can access local Remote screens when you plug the Remote keypad into the Controller (see Open a Remote Session from the Controller on page 4-5), or an individual Single Stage Cryopump.

See the following sections for descriptions of all Single Stage Cryopump local Remote screens.

About the Cryopump Main Screen and Functions

The following figure shows the cryopump main screen (home screen) after you plug the Remote directly into an On-Board IS Single Stage Cryopump.

![Figure 5-1: Cryopump Main Screen](image)

Each function on the main screen leads to other screens, from which you can see the status and re-configure cryopump processes. These are the basic purposes of each cryopump function:

**Monitor**

Use the Monitor function to view the cryopump data and configurations status of the Single Stage Cryopump. Refer to the Monitor Screens on page 5-4 within this section for more information.

**Regeneration**

Use the Regeneration function to establish regeneration cycle information. Refer to Regeneration Screens on page 5-7 within this section for more information.
System Setup

Use the System Setup function to change and display the configuration of the cryopump. Refer to System Setup Screens on page 5-9 within this section for more information.

Control

Use the Control function to see the settings for the cryopump, valves, and temperature. You can also clear an HFI trip and initiate a Startup or Shutdown. Refer to Control Screens on page 5-15 within this section for more information.

Pump Info

Use the Pump Info function to see the serial number, address and other information about the cryopump. Refer to Cryopump Information Screen on page 5-18 within this section for more information.
Monitor Screens

To view activity for this cryopump, choose any Monitor screen item.

**NOTE:** You cannot change any settings when you view Monitor screens. They show the current status of the cryopump.

The following table briefly describes each part of the Monitor screens, including parameters set by the cryopump (system) or parameters set by you (user). The letter preceding the screen name corresponds to the letter above each screen in Figure 5-2.

---

**Figure 5-2: Cryopump Monitor Screens**
### Table 5-1: Monitor Definitions, by Screen

<table>
<thead>
<tr>
<th>Screen Name</th>
<th>Screen Component</th>
<th>Set by System or Set by User</th>
<th>Parameter and (Explanation)</th>
</tr>
</thead>
<tbody>
<tr>
<td>(A) Pump State</td>
<td>Temperature (in Kelvin, K)</td>
<td>System</td>
<td><em>OPN</em> (temperature sensor is open) 5K to 350K, actual temperature range *&lt;br&gt;<em>SHO</em> (temperature sensor is shorted)</td>
</tr>
<tr>
<td></td>
<td>Vacuum (pressure in microns, µ)</td>
<td>System</td>
<td>0µ to 999µ (N/A if system does not have a TC gauge.)</td>
</tr>
<tr>
<td></td>
<td>Pump</td>
<td>System</td>
<td><em>On</em> (motor is running and pump is operating)&lt;br&gt;<em>Off</em></td>
</tr>
<tr>
<td></td>
<td>Regen Status</td>
<td>System</td>
<td><em>Warmup in progress,</em>&lt;br&gt;Sublime in progress,<em>&lt;br&gt;Shutdown in progress,</em>&lt;br&gt;Idle&lt;br&gt;(See About Regeneration and the On-Board IS Single Stage Cryopump on page 4-8.)</td>
</tr>
<tr>
<td>(B) Regeneration Info</td>
<td>Rough Valve Coord</td>
<td>System</td>
<td><em>On,</em>&lt;br&gt;<em>Off</em></td>
</tr>
<tr>
<td></td>
<td>Time Since Last Full (in hours, h)</td>
<td>System</td>
<td>[XXX] (Time since last Warmup, Pressure Sublime, or Sublime Shutdown.)</td>
</tr>
<tr>
<td></td>
<td>Time Since Last Partial (in hours, h)</td>
<td>System</td>
<td>[XXX] (Time since last Time Sublime, Warmup, Pressure Sublime, or Sublime Shutdown.)</td>
</tr>
<tr>
<td>(C) Valve Status</td>
<td>Rough</td>
<td>System</td>
<td>Open, Closed, N/A</td>
</tr>
<tr>
<td></td>
<td>Purge</td>
<td>System</td>
<td>Open, Closed, N/A</td>
</tr>
</tbody>
</table>
### Table 5-1: Monitor Definitions, by Screen

<table>
<thead>
<tr>
<th>Screen Name</th>
<th>Screen Component</th>
<th>Set by System or Set by User</th>
<th>Parameter and (Explanation)</th>
</tr>
</thead>
<tbody>
<tr>
<td>(D) Temperature Control</td>
<td>Status</td>
<td>System</td>
<td>On, Off</td>
</tr>
<tr>
<td></td>
<td>Setpoint</td>
<td>System</td>
<td>(Uses setpoint during Temperature Control. See Valve Control and Temperature Control Screens on page 5-17.)</td>
</tr>
</tbody>
</table>
Regeneration Screens

To view and set the Regeneration activities (functions) for this cryopump, use the Regeneration screens.

**NOTE:** The screen is password protected if the security is set. See Security Parameters on page 5-11 to set a password.

If Regeneration is **idle**, then this screen appears:

![Diagram A](image1)

If Regeneration is **running**, then this screen appears:

![Diagram C](image2)

---

*Figure 5-3: Regeneration Screens*
The following table briefly describes each part of the Regeneration screens, including the action that occurs after you choose an item on the screen. The letter preceding the screen name in the table corresponds to the letter above each screen in Figure 5-3.

### Table 5-2: Regeneration Definitions, by Screen

<table>
<thead>
<tr>
<th>Screen Name</th>
<th>Screen Component Choice</th>
<th>Action and (Explanation)</th>
</tr>
</thead>
<tbody>
<tr>
<td>(A) Regeneration</td>
<td>Warmup</td>
<td>A Warmup Regeneration is ready to start. (See About Regeneration and the On-Board IS Single Stage Cryopump on page 4-8 and Change Warmup Regeneration Parameters on page 4-31).</td>
</tr>
<tr>
<td></td>
<td>Pressure Sublime</td>
<td>A Pressure Sublime is ready to start. (See About Regeneration and the On-Board IS Single Stage Cryopump on page 4-8 and Regeneration Parameters on page 5-10).</td>
</tr>
<tr>
<td></td>
<td>Time Sublime</td>
<td>A Time Sublime is ready to start. (See About Regeneration and the On-Board IS Single Stage Cryopump on page 4-8 and Regeneration Parameters on page 5-10).</td>
</tr>
<tr>
<td></td>
<td>Sublime Shutdown</td>
<td>A Sublime Shutdown is ready to start. (See About Regeneration and the On-Board IS Single Stage Cryopump on page 4-8 and Regeneration Parameters on page 5-10).</td>
</tr>
<tr>
<td>(B) Start XXXX Regen</td>
<td>Yes</td>
<td>Starts the Regeneration you chose.</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>Returns to (A) Regeneration screen.</td>
</tr>
<tr>
<td>(C) Regeneration Status</td>
<td>XXXX in Progress</td>
<td>Continues the Regeneration you chose.</td>
</tr>
<tr>
<td></td>
<td>Abort</td>
<td>Gives you the option of stopping the Regeneration.</td>
</tr>
<tr>
<td>(D) Abort Regeneration</td>
<td>Yes</td>
<td>Stops the Regeneration.</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>Does not stop the Regeneration.</td>
</tr>
</tbody>
</table>
System Setup Screens

Through the System Setup, you can manage regeneration, security, communication rates, power failure, and Remote display.

Figure 5-4: Cryopump System Setup Function Screens
The following sections briefly describe each part of the System Setup screens, including the action that occurs after you choose an item on the screen or parameters, if applicable.

### Regeneration Parameters

On the Regeneration Setup screen, each function you choose brings you to a different screen.

The following table briefly describes each of the Regeneration Setup screens, including the action that occurs after you choose an item on the screen or parameters. The letter preceding the screen name in the table corresponds to the letter above each screen in Figure 5-4 on page 5-9.

<table>
<thead>
<tr>
<th>Screen Name</th>
<th>Screen Component Choice</th>
<th>Set by System or Set by User</th>
<th>Parameter, Action, and (Explanation)</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Re-A) Warmup Setup</td>
<td>Ext Purge (in minutes, min)</td>
<td>User</td>
<td>0 to 999 minutes Set the extended purge time.</td>
</tr>
<tr>
<td></td>
<td>Cooldown Mode</td>
<td>User</td>
<td>On: cools down to a setpoint. Off: maintains Warmup setpoint. (See Appendix B: Default Parameters (Values) on page 8-3)</td>
</tr>
<tr>
<td>(Re-B) Sublime Setup</td>
<td>Temperature (in Kelvin, K)</td>
<td>User</td>
<td>110 to 250K Setpoint for all sublime regenerations.</td>
</tr>
<tr>
<td></td>
<td>Time (in minutes, min)</td>
<td>User</td>
<td>0 to 600 minutes Setpoint for Time Sublime.</td>
</tr>
<tr>
<td>(Re-C) Roughing Setup</td>
<td>Rough Coord</td>
<td>User</td>
<td>On: Rough coordination is on. Off: Rough coordination is off.</td>
</tr>
<tr>
<td>(Re-D) Delay Setup</td>
<td>Start Delay (in hours, h)</td>
<td>User</td>
<td>0 to 99.9 hours Set a time delay before Regeneration starts.</td>
</tr>
</tbody>
</table>
Security Parameters

The following table briefly describes the Security Setup screen, including the action that occurs after you choose an item on the screen or parameters. The letter preceding the screen name in the table corresponds to the letter above each screen in Figure 5-4 on page 5-9.

**Table 5-4: System Setup: Security Setup Definitions, by Screen**

<table>
<thead>
<tr>
<th>Screen Name</th>
<th>Screen Component Choice</th>
<th>Set by System or Set by User</th>
<th>Parameter, Action, and (Explanation)</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Se-A) Security Setup</td>
<td>Password</td>
<td>User</td>
<td><strong>On:</strong> All screens except Monitor and Pump Info require a password. <strong>Off:</strong> No password is required to view any screens.</td>
</tr>
<tr>
<td></td>
<td>Regen Params</td>
<td>User</td>
<td><strong>Lock:</strong> Regeneration screens are password protected. <strong>Unlock:</strong> Regeneration screens are not password protected.</td>
</tr>
<tr>
<td></td>
<td>Change Password</td>
<td>N/A</td>
<td>Opens the Enter Password screen so that you can change the password.</td>
</tr>
<tr>
<td>(Se-B) Enter Pass-</td>
<td>_ _ _ _ _</td>
<td>User</td>
<td>1 to 32767 (Arrow keys on the Remote keypad change the password numbers.)</td>
</tr>
<tr>
<td>word</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Se-C) Confirm Pass-</td>
<td>_ _ _ _ _</td>
<td>User</td>
<td>1 to 32767, same as you chose in the Enter Password screen. (Arrow keys on the Remote keypad change the password numbers.)</td>
</tr>
<tr>
<td>word</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Se-D) Password</td>
<td>N/A</td>
<td>System</td>
<td>(Press Back to return to the Enter Password screen.)</td>
</tr>
<tr>
<td>Entry</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Communication Parameters for the RS-232 Ports

The following table briefly describes the Communication Setup screens, including the action that occurs after you choose an item on the screen or parameters. See Figure 5-4 on page 5-9 for the actual Communication Setup screen.

<table>
<thead>
<tr>
<th>Screen Component Choice</th>
<th>Set by System or Set by User</th>
<th>Parameter, Action, and (Explanation)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Host</td>
<td>User</td>
<td>2400</td>
</tr>
<tr>
<td></td>
<td></td>
<td>9600</td>
</tr>
<tr>
<td></td>
<td></td>
<td>19200</td>
</tr>
<tr>
<td></td>
<td></td>
<td>38400</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Sets the baud rate for the host port.</td>
</tr>
<tr>
<td>Service</td>
<td>User</td>
<td>2400</td>
</tr>
<tr>
<td></td>
<td></td>
<td>9600</td>
</tr>
<tr>
<td></td>
<td></td>
<td>19200</td>
</tr>
<tr>
<td></td>
<td></td>
<td>38400</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Sets the baud rate for the service port.</td>
</tr>
</tbody>
</table>

Power Failure Recovery Parameters

The following table briefly describes the Power Failure screen (see Figure 5-4 on page 5-9), including the action that occurs after you choose an item on the screen or parameters.

<table>
<thead>
<tr>
<th>Screen Component Choice</th>
<th>Set by System or Set by User</th>
<th>Parameter and Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Recovery</td>
<td>User</td>
<td>On: A regeneration may start after the power is restored, depending on the cryopump status. Off: The cryopump performs no action after a power failure. Cool: The cryopump starts cooling if it is below the power failure setpoint.</td>
</tr>
</tbody>
</table>
### Configuration of Cryopump Hardware

The following table briefly describes the Select Configuration screen (see Figure 5-4 on page 5-9), including the action that occurs after you choose an item on the screen or parameters.

See Configure Accessories for the Cryopump on page 2-9 to set the appropriate accessory configuration.

#### Table 5-7: System Setup: Configuration Definitions, by Screen

<table>
<thead>
<tr>
<th>Screen Component Choice</th>
<th>Set by System or Set by User</th>
<th>Parameter, Action, and (Explanation)</th>
</tr>
</thead>
<tbody>
<tr>
<td>No Accessories</td>
<td>User</td>
<td>(Choose if the cryopump has no hardware associated with it.)</td>
</tr>
<tr>
<td>TC Gauge</td>
<td>User</td>
<td>(Choose if the cryopump has a TC gauge only.)</td>
</tr>
<tr>
<td>Purge Valve</td>
<td>User</td>
<td>(Choose if the cryopump has a purge valve only.)</td>
</tr>
<tr>
<td>Rough Valve + TC</td>
<td>User</td>
<td>(Choose if the cryopump has a rough valve and a TC gauge.)</td>
</tr>
<tr>
<td>Purge Valve + TC</td>
<td>User</td>
<td>(Choose if the cryopump has a purge valve and a TC gauge.)</td>
</tr>
<tr>
<td>Purge + Rough + TC</td>
<td>User</td>
<td>(Choose if the cryopump has a purge valve, a rough valve, and a TC gauge.)</td>
</tr>
<tr>
<td>Enter</td>
<td>N/A</td>
<td>Sets the hardware you chose.</td>
</tr>
</tbody>
</table>

#### Table 5-6: System Setup: Power Failure Definitions, by Screen

<table>
<thead>
<tr>
<th>Screen Component Choice</th>
<th>Set by System or Set by User</th>
<th>Parameter, Action, and (Explanation)</th>
</tr>
</thead>
</table>
| Temperature (in Kelvin, K) | User | 110 to 260K  
After a power failure, the cryopump uses this setpoint to evaluate its status, and determine which action to perform. |
Remote Parameters, Including the Display

The following table briefly describes the Display Setup screen (see Figure 5-4 on page 5-9), including the action that occurs after you choose an item on the screen or parameters.

Table 5-8: System Setup: Display Setup Definitions, by Screen

<table>
<thead>
<tr>
<th>Screen Component Choice</th>
<th>Set by System or Set by User</th>
<th>Parameter and Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brightness</td>
<td>User</td>
<td>0 to 15: The Remote display window increases (to 0) or decreases in brightness (to 15).</td>
</tr>
<tr>
<td>Volume</td>
<td>User</td>
<td>0 to 16: The volume of the confirmation beep increases (to 16) or decreases (to 0, silence).</td>
</tr>
<tr>
<td>Screen Timeout</td>
<td>User</td>
<td>0 to 60 minutes: The time of keypad inactivity until the screen saver mode starts.</td>
</tr>
<tr>
<td>Set Default</td>
<td>User</td>
<td>Resets cryopump parameters back to the default settings.</td>
</tr>
</tbody>
</table>
Control Screens

**Figure 5-5: Cryopump Control Function Screens**
Pump Control Screens

The following table briefly describes each of the Pump Control screens, including the action that occurs after you choose an item on the screen or parameters. The letter preceding the screen name in the table corresponds to the letter above each screen in Figure 5-5.

<table>
<thead>
<tr>
<th>Screen Name</th>
<th>Screen Component Choice</th>
<th>Set by System or Set by User</th>
<th>Parameter, Action, and (Explanation)</th>
</tr>
</thead>
<tbody>
<tr>
<td>(A) Pump Control</td>
<td>Motor</td>
<td>System</td>
<td>On: Cryopump motor is on and cooling. Off: Cryopump motor is off, and the cryopump is warm or warming. Idle: Cryopump motor is idling and cryopump is cool.</td>
</tr>
<tr>
<td>HFI Status</td>
<td>User</td>
<td></td>
<td>OK: Opens a screen to notify you that the HFI is already set. (Circuit is complete and does not need to be reset.) Trip: Opens the Clear HFI Trip Status screen. (Circuit must be cleared.)</td>
</tr>
<tr>
<td>Startup</td>
<td>N/A</td>
<td></td>
<td>Opens the Start a Warmup Regeneration screen.</td>
</tr>
<tr>
<td>Shutdown</td>
<td>N/A</td>
<td></td>
<td>Opens the Shutdown screen.</td>
</tr>
<tr>
<td>(B) Clear HFI Trip Status</td>
<td>No</td>
<td>N/A</td>
<td>Opens the Pump Control screen.</td>
</tr>
<tr>
<td></td>
<td>Yes</td>
<td>N/A</td>
<td>Resets HFI status to Ok.</td>
</tr>
<tr>
<td>(C) Start a Warmup Regeneration</td>
<td>No</td>
<td>N/A</td>
<td>Opens the Pump Control screen.</td>
</tr>
<tr>
<td></td>
<td>Yes</td>
<td>N/A</td>
<td>Starts a Warmup Regeneration and uses the Cooldown Mode. Opens the Regeneration Status screen.</td>
</tr>
<tr>
<td>(D) Shutdown</td>
<td>Sublime</td>
<td>N/A</td>
<td>Opens the Start a Sublime screen.</td>
</tr>
</tbody>
</table>
Valve Control and Temperature Control Screens

The following table briefly describes the Valve Control screen and the Temperature control screen (see Figure 5-5), including the action that occurs after you choose an item on the screen or parameters.

Table 5-10: Control: Valve and Temperature Control Definitions, by Screen

<table>
<thead>
<tr>
<th>Screen Name</th>
<th>Screen Component Choice</th>
<th>Set by System or Set by User</th>
<th>Parameter and Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Valve Control</td>
<td>Rough</td>
<td>User</td>
<td><em>Open:</em> Rough valve is open. <em>Closed:</em> Rough valve is closed. <em>N/A:</em> There is no rough valve on the cryopump.</td>
</tr>
<tr>
<td></td>
<td>Purge</td>
<td>User</td>
<td><em>Open:</em> Purge valve is open. <em>Closed:</em> Purge valve is closed. <em>N/A:</em> There is no purge valve on the cryopump.</td>
</tr>
<tr>
<td>Temperature Control</td>
<td>Status</td>
<td>User</td>
<td><em>On:</em> Temperature control is on. System maintains temperature at control setpoint. <em>Off:</em> Temperature control is off.</td>
</tr>
<tr>
<td></td>
<td>Setpoint</td>
<td>User</td>
<td>0 to 320 K Default = 107K Sets the temperature to which the cryopump cools.</td>
</tr>
</tbody>
</table>
Cryopump Information Screen

Figure 5-6: Cryopump Information Screen

The following table briefly describes the Pump Info screen.

Table 5-11: Pump Info Definitions, by Screen

<table>
<thead>
<tr>
<th>Screen Component Choice</th>
<th>Set by System or Set by User</th>
<th>Parameter and Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>S/N (Serial Number)</td>
<td>System</td>
<td>The serial number of the cryopump.</td>
</tr>
<tr>
<td>Address</td>
<td>System</td>
<td>The network address of the cryopump.</td>
</tr>
<tr>
<td>Oper. Time (Operating Time)</td>
<td>System</td>
<td>The total time (in hours) the cryopump motor has been on.</td>
</tr>
<tr>
<td>Soft. Rev (Software Revision)</td>
<td>System</td>
<td>The current version number of the software for the cryopump.</td>
</tr>
</tbody>
</table>
6 About Controller Remote Screens

Overview

This chapter shows all the Remote screens you can see through the On-Board IS Controller (Controller), using the On-Board IS Remote keypad (the Remote).

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About Cryopump System (Controller) Screens

You can use the On-Board IS Remote keypad to control the cryopump and other system components individually through the component itself, or system-wide through the On-Board IS Controller (Controller).

Plug the Remote keypad into the Controller for the system. See the On-Board IS Remote Quick Installation Guide for rack and pump mount Controller details.

For more information about how to use the Remote, see Using the On-Board IS Remote Keypad on page 4-2.

You can also access local cryopump screens through the Controller (see Open a Remote Session from the Controller on page 4-5). For more information about these screens, see About Local Cryopump Remote Screens on page 5-2.

This chapter also shows the Controller screens that are applicable to the Single Stage Cryopump in these sections:

• Monitor Screens on page 6-5
• Regeneration Screens on page 6-7
• Access Device Screens on page 6-9
• System Setup Screens on page 6-11
About the Main Controller Screen and Functions

After you plug the Remote into the Controller, the On-Board IS Controller Screen appears:

![ON-BOARD
IS CONTROLLER](image)

Figure 6-1: On-Board IS Controller Screen

**Monitor**

Use this menu item to access the Monitor Network screen, through which you can:

- View the network status; cryopump temperatures and compressor pressures
- View the network addresses of system components (network devices)
- View the regeneration rough pump and power fail coordination options
- View the cryopumps on each helium map

**Regeneration**

Use this menu item to access the Regeneration screen, through which you can:

- Start and control Group Full Regeneration
- Configure the Group Full Regeneration map

**Access Device**

Use this menu item to access the Choose Device screen, through which you can:

- Check the status of compressors and cryopumps
- Open a Remote Session with individual cryopumps; see Open a Remote Session from the Controller on page 4-5.
System Setup

Use this menu item to access the System Setup screen, through which you can:

• Set the regeneration rough pump coordination and power fail coordination
• Set the cryopumps and compressors on each helium map
• Set or change a password for the Remote
• Set the Controller communication values

Controller Info

Use this menu item to access the Controller Info screen, through which you can view the serial number and software revision number.
Monitor Screens

To view network activity for the system, choose any Monitor screen item.

**NOTE:** You cannot change any settings when you view Monitor screens. They show the current status of the cryopump.

Figure 6-2: Controller Monitor Network Screens
The following table briefly describes each part of the Monitor screens, including parameters automatically set by the system or parameters set by you (user). The letter preceding the screen name corresponds to the letter above each screen in Figure 6-2.

**Table 6-1: Monitor Definitions, by Screen**

<table>
<thead>
<tr>
<th>Screen Name</th>
<th>Screen Component</th>
<th>Set by System or User</th>
<th>Parameter and (Explanation)</th>
</tr>
</thead>
<tbody>
<tr>
<td>(A) Network Status</td>
<td>Pump Temp ID T1/T2 (K)</td>
<td>System</td>
<td>Cryopump address Stage 1 temperature / Stage 2 temperature</td>
</tr>
<tr>
<td></td>
<td>IS Compressors</td>
<td>System</td>
<td>Compressor address Helium supply pressure / Difference in pressure</td>
</tr>
<tr>
<td>(B) Network Devices</td>
<td>Network Pumps</td>
<td>System</td>
<td>Cryopump addresses.</td>
</tr>
<tr>
<td></td>
<td>Network Compressors</td>
<td>System</td>
<td>Compressor addresses.</td>
</tr>
<tr>
<td>(C) Regeneration</td>
<td>Coordination: Full</td>
<td>System</td>
<td>On, Off (Full Group Roughing capabilities are on or off.)</td>
</tr>
<tr>
<td></td>
<td>Coordination: Pwr Fail</td>
<td>System</td>
<td>On, Off (Power Fail recovery capabilities are on or off.)</td>
</tr>
<tr>
<td></td>
<td>Rough Map</td>
<td>System</td>
<td>1, 2, 3, 4, 5 (Choose the Rough Map number to see which cryopumps belong to a specific rough map.)</td>
</tr>
<tr>
<td>Rough Map 1</td>
<td>N/A</td>
<td>System</td>
<td>Cryopump addresses for cryopumps assigned to this rough map.</td>
</tr>
<tr>
<td>(D) Helium Management</td>
<td>Status</td>
<td>System</td>
<td>On, Off</td>
</tr>
<tr>
<td></td>
<td>Setpoint</td>
<td>System</td>
<td>110K to 250K (Current temperature of cryopump.)</td>
</tr>
</tbody>
</table>
Regeneration Screens

To configure and control Group Full Regeneration, use the Regeneration screens.

**NOTE:** Single Stage Cryopumps are not capable of performing a Fast Regeneration. See About Regeneration and the On-Board IS Single Stage Cryopump on page 4-8.

![Flowchart of Regeneration Screens]

*Figure 6-3: Controller Regeneration Screens*
The following table briefly describes each part of the Regeneration screens, including the action that occurs after you choose an item on the screen. The letter preceding the screen name in the table corresponds to the letter above each screen in Figure 6-3. For more information, see About Regeneration and the On-Board IS Single Stage Cryopump on page 4-8, and especially the definitions of Group Full Regeneration and Group Fast Regeneration.

<table>
<thead>
<tr>
<th>Screen Name</th>
<th>Screen Component Choice</th>
<th>Parameter, Action, and (Explanation)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regeneration</td>
<td>Start</td>
<td>Opens the next screen in the sequence to start a regeneration.</td>
</tr>
<tr>
<td></td>
<td>Abort</td>
<td>Opens the next screen in the sequence to stop a regeneration.</td>
</tr>
<tr>
<td></td>
<td>Group Regen</td>
<td>On, Off (Group Regeneration capabilities are on or off.)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(A)</td>
</tr>
<tr>
<td>(A) Choose Regen</td>
<td>(Cryopump Addresses)</td>
<td>Choose the cryopumps, by address, that you want included in a Group Full Regeneration.</td>
</tr>
<tr>
<td>Pumps</td>
<td></td>
<td></td>
</tr>
<tr>
<td>List to Regen</td>
<td>Start Fast Regen</td>
<td>N/A (A Single Stage Cryopump cannot perform a Fast Regen, and is excluded if you choose it.)</td>
</tr>
<tr>
<td></td>
<td>Start Full Regen</td>
<td>All cryopumps you choose start a Group Full Regeneration.</td>
</tr>
<tr>
<td>Start Full Regen</td>
<td>Yes</td>
<td>Starts the Regeneration.</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>Does not start the Regeneration.</td>
</tr>
<tr>
<td>Regeneration Status</td>
<td>N/A</td>
<td>Updates the state of regeneration, based on the regeneration type.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(B)</td>
</tr>
<tr>
<td>(B) Abort Regen</td>
<td>Yes</td>
<td>Stops the Regeneration.</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>Does not stop the Regeneration.</td>
</tr>
<tr>
<td>Abort Regen</td>
<td>N/A</td>
<td>Regeneration stops.</td>
</tr>
</tbody>
</table>
Access Device Screens

To view complete information about individual system components, or open a Remote session, use the Access Device screens.

**Figure 6-4: Controller Choose Device (Access Device) Screens**
The following table briefly describes each part of the Access Device screens, including the action that occurs after you choose an item on the screen. The letter preceding the screen name in the table corresponds to the letter above each screen in Figure 6-4.

**Table 6-3: Access Device Definitions, by Screen**

<table>
<thead>
<tr>
<th>Screen Name</th>
<th>Screen Component Choice</th>
<th>Action and Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Choose Device</td>
<td>Pumps</td>
<td>Shows total number of cryopumps connected to the Controller. Choose <em>Pumps</em> to see a list of cryopump addresses.</td>
</tr>
<tr>
<td></td>
<td>Compressors</td>
<td>Shows total number of compressors connected to the Controller. Choose <em>Compressors</em> to see a list of compressor addresses.</td>
</tr>
<tr>
<td>(A) Network Pumps</td>
<td>(Cryopump Addresses)</td>
<td>Choose a cryopump, by address, for which you want to open a remote session.</td>
</tr>
<tr>
<td>(Remote Session Opens)</td>
<td>(Main screen for component)</td>
<td>See About the Cryopump Main Screen and Functions on page 5-2.</td>
</tr>
<tr>
<td>Close Remote Session</td>
<td>Yes</td>
<td>Remote session closes, and confirmation screen appears.</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>Remote session continues, main screen for component appears.</td>
</tr>
<tr>
<td>(B) Network Compressors</td>
<td>(Compressor Addresses)</td>
<td>Choose a compressor, by address, for which you want to see the current statistics.</td>
</tr>
<tr>
<td>Compressor XX</td>
<td>N/A</td>
<td>Shows the statistics for a compressor</td>
</tr>
</tbody>
</table>
System Setup Screens

Through the System Setup, you can manage regeneration maps, security, communication with the RS-232 port, helium maps, and the keypad display options.

Figure 6-5: Controller System Setup Screens
The following sections briefly describe each part of the System Setup screens, including the action that occurs after you choose an item on the screen or parameters, if applicable.

System Setup, Regeneration

On the Regeneration Setup screen, each function you choose brings you to a different screen.

The following table briefly describes each of the Regeneration Setup screens, including the action that occurs after you choose an item on the screen or parameters. The letter preceding the screen name in the table corresponds to the letter above each screen in Figure 6-5 on page 6-11.

<table>
<thead>
<tr>
<th>Screen Name</th>
<th>Screen Component Choice</th>
<th>Set by System or User</th>
<th>Parameter, Action, and (Explanation)</th>
</tr>
</thead>
<tbody>
<tr>
<td>(A) Regeneration Setup</td>
<td>Coordination: Full</td>
<td>User</td>
<td>On, Off (Group roughing capabilities are on or off.)</td>
</tr>
<tr>
<td></td>
<td>Coordination: Pwr Fail</td>
<td>User</td>
<td>On, Off (Power Fail recovery capabilities are on or off.)</td>
</tr>
<tr>
<td>Rough Map 1</td>
<td>User</td>
<td></td>
<td>1, 2, 3, 4, 5 Choose the Rough Map number to assign the cryopumps to a specific rough map.</td>
</tr>
<tr>
<td>Rough Map 1 (Cryopump Addresses)</td>
<td>User</td>
<td></td>
<td>Cryopumps that you want to include in a Rough Map.</td>
</tr>
<tr>
<td>Verify Rough Map 1</td>
<td>(Cryopump Addresses)</td>
<td>System (information from previous screen)</td>
<td>Choose Accept Change or press the Back button.</td>
</tr>
</tbody>
</table>
System Setup, Password

The following table briefly describes the Security Setup screen, including the action that occurs after you choose an item on the screen or parameters. The letter preceding the screen name in the table corresponds to the letter above each screen in Figure 6-5 on page 6-11.

<table>
<thead>
<tr>
<th>Screen Name</th>
<th>Screen Component Choice</th>
<th>Set by System or User</th>
<th>Parameter, Action, and (Explanation)</th>
</tr>
</thead>
<tbody>
<tr>
<td>(B) Security Setup</td>
<td>Password</td>
<td>User</td>
<td>On: All screens except Monitor and Pump Info require a password. Off: No password is required to view any screens.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Change Password</td>
</tr>
<tr>
<td>Enter Password</td>
<td>_ _ _ _ _</td>
<td>User</td>
<td>1 to 32767 (Arrow keys on the Remote keypad change the password numbers.)</td>
</tr>
<tr>
<td>Confirm Password</td>
<td>_ _ _ _ _</td>
<td>User</td>
<td>1 to 3277, same as you chose in the Enter Password screen. (Arrow keys on the Remote keypad change the password numbers.)</td>
</tr>
</tbody>
</table>
System Setup, Communication for the RS-232 Ports

The following table briefly describes the Communication Setup screens, including the action that occurs after you choose an item on the screen or parameters. See Figure 6-5 on page 6-11 for the actual Communication Setup screen.

Table 6-6: System Setup: Communication Definitions, by Screen

<table>
<thead>
<tr>
<th>Screen Component Choice</th>
<th>Set by System or User</th>
<th>Parameter, Action, and (Explanation)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Host</td>
<td>User</td>
<td>2400</td>
</tr>
<tr>
<td></td>
<td></td>
<td>9600</td>
</tr>
<tr>
<td></td>
<td></td>
<td>19200</td>
</tr>
<tr>
<td></td>
<td></td>
<td>38400</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Sets the baud rate for the host port.</td>
</tr>
<tr>
<td>Service</td>
<td>User</td>
<td>2400</td>
</tr>
<tr>
<td></td>
<td></td>
<td>9600</td>
</tr>
<tr>
<td></td>
<td></td>
<td>19200</td>
</tr>
<tr>
<td></td>
<td></td>
<td>38400</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Sets the baud rate for the service port.</td>
</tr>
<tr>
<td>Aux</td>
<td>User</td>
<td>2400</td>
</tr>
<tr>
<td></td>
<td></td>
<td>9600</td>
</tr>
<tr>
<td></td>
<td></td>
<td>19200</td>
</tr>
<tr>
<td></td>
<td></td>
<td>38400</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Sets the baud rate for the auxiliary port.</td>
</tr>
</tbody>
</table>
System Setup, Helium Maps

The following table briefly describes the Helium screens, including the action that occurs after you choose an item on the screen or parameters. See Figure 6-5 on page 6-11 for the actual Helium screen.

Table 6-7: System Setup: Helium Definitions, by Screen

<table>
<thead>
<tr>
<th>Screen Name</th>
<th>Screen Component Choice</th>
<th>Set by System or User</th>
<th>Parameter, Action, and (Explanation)</th>
</tr>
</thead>
<tbody>
<tr>
<td>(C) Helium</td>
<td>Helium Map 1</td>
<td>User</td>
<td>1, 2, 3, 4, 5</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Choose the Helium Map number to assign the cryopumps and compressors to a specific helium map.</td>
</tr>
<tr>
<td>Choose Map Pumps</td>
<td>(Cryopump Addresses)</td>
<td>User</td>
<td>Cryopumps that you want to include in a helium map</td>
</tr>
<tr>
<td>Choose Compressors</td>
<td>(Compressor Addresses)</td>
<td>User</td>
<td>Compressors that you want to include in a helium map</td>
</tr>
<tr>
<td>Verify Helium Map 1</td>
<td>(Cryopump and Compressor Addresses)</td>
<td>System (information from previous two screens)</td>
<td>Choose Accept Change or press the Back button.</td>
</tr>
</tbody>
</table>
System Setup, Remote Display

The following table briefly describes the Display Setup screen (see Figure 6-5 on page 6-11), including the action that occurs after you choose an item on the screen or parameters.

Table 6-8: System Setup: Display Setup Definitions, by Screen

<table>
<thead>
<tr>
<th>Screen Component Choice</th>
<th>Set by System or User</th>
<th>Parameter and Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brightness</td>
<td>User</td>
<td>0 to 15: The Remote display window increases (to 0) or decreases in brightness (to 15).</td>
</tr>
<tr>
<td>Volume</td>
<td>User</td>
<td>0 to 16: The volume of the confirmation beep increases (to 16) or decreases (to 0, silence).</td>
</tr>
<tr>
<td>Screen Timeout</td>
<td>User</td>
<td>0 to 60 minutes: The time of keypad inactivity until the screen saver mode starts.</td>
</tr>
<tr>
<td>Set Default</td>
<td>User</td>
<td>Resets cryopump parameters back to the default settings.</td>
</tr>
</tbody>
</table>
Controller Info Screen

On the Controller Info screen, you can view the serial number and software revision number of the Controller.

![Figure 6-6: Controller Info Screen](image)

The following table briefly describes each part of the Controller Info screen.

<table>
<thead>
<tr>
<th>Screen Component Choice</th>
<th>Set by System or User</th>
<th>Parameter and Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>S/N (Serial Number)</td>
<td>System</td>
<td>The serial number of the Controller.</td>
</tr>
<tr>
<td>Soft. Rev (Software Revision)</td>
<td>System</td>
<td>The current version number of the software for the Controller.</td>
</tr>
</tbody>
</table>
7 Troubleshooting

Overview

This chapter provides information about troubleshooting the Single Stage Cryopump.

NOTE: See Appendix A: Customer Brooks Automation Technical Support Information on page 8-2 for customer support and contact information if necessary.

Chapter Contents

Intercomponent Network Potential Problems.................................7-2
Cryopump Operation Potential Problems........................................7-4
## Intercomponent Network Potential Problems

Refer to the following table if you are experiencing Intercomponent Network communication problems.

<table>
<thead>
<tr>
<th>Problem</th>
<th>Possible Cause</th>
<th>Corrective Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Cryopumps are not visible on Controller screens.</td>
<td>1a. A network terminator is not installed in the last cryopump on channel A or B.</td>
<td>1a. Refer to the <em>On-Board IS Cryopump Quick Installation Guide</em> and install a network terminator in the last cryopump on channels A or B.</td>
</tr>
<tr>
<td></td>
<td>1b. The cryopump is connected to channel C.</td>
<td>1b. Disconnect the cryopump from channel C and connect it to channels A or B.</td>
</tr>
<tr>
<td></td>
<td>1c. Defective network cable.</td>
<td>1c. Replace network cable.</td>
</tr>
<tr>
<td></td>
<td>1d. Remote keypad cable is not connected.</td>
<td>1d. Plug in Remote keypad cable.</td>
</tr>
<tr>
<td>2. Compressors are not visible on Controller screens.</td>
<td>2a. A network terminator is not installed in the last compressor on channel C.</td>
<td>2a. Refer to the <em>On-Board IS 1000 Compressor Quick Installation Guide</em> and install a network terminator in the last compressor on channel C.</td>
</tr>
<tr>
<td></td>
<td>2b. The compressor is connected to channels A or B.</td>
<td>2b. Disconnect the compressor from channels A or B and connect it to channel C.</td>
</tr>
<tr>
<td></td>
<td>2c. Defective network cable.</td>
<td>2c. Replace network cable.</td>
</tr>
<tr>
<td></td>
<td>2d. Remote keypad cable is not connected.</td>
<td>2d. Plug in Remote keypad cable.</td>
</tr>
</tbody>
</table>
Table 7-1: Intercomponent Network Potential Problems

<table>
<thead>
<tr>
<th>Problem</th>
<th>Possible Cause</th>
<th>Corrective Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>3. Status LED III on the Controller is <em>not</em> blinking.</td>
<td>3a. Channel A, B or C network cable is disconnected from controller.</td>
<td>3a. Connect the network cable(s) to the controller.</td>
</tr>
<tr>
<td></td>
<td>3b. Defective network cable.</td>
<td>3b. Replace network cable.</td>
</tr>
</tbody>
</table>
Cryopump Operation Potential Problems

Refer to the following table if you are experiencing problems operating the cryopump.

*Table 7-2: Cryopump Operation Potential Problems*

<table>
<thead>
<tr>
<th>Problem</th>
<th>Possible Cause</th>
<th>Corrective Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Received this message on the Remote:</td>
<td>Tried to start a Fast Regeneration with a Single Stage Cryopump in a Group.</td>
<td>Remove the Single Stage Cryopump from the Regeneration Map. See Perform a Group Full Regeneration on page 4-27.</td>
</tr>
<tr>
<td><strong>FAST REGEN RESPONSE</strong>&lt;br/&gt;Regen Did Not Start Reason:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Problem Pump List</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cryopumps do not warm to target regeneration temperature due to heaters not starting.</td>
<td>The HFI is tripped.</td>
<td>See Pump Control Screens on page 5-16 to clear the HFI trip status.</td>
</tr>
</tbody>
</table>
Appendices

Overview

The following appendices are included to provide the user with a single location for specific information related to the Brooks Automation Product.

Contents

Appendix A: Customer Brooks Automation Technical Support Information . . .8-2
Appendix B: Default Parameters (Values) . . . . . . . . . . . . . . . . . . . . . .8-3
Appendix A: Customer Brooks Automation Technical Support Information

When contacting Brooks Automation for Technical Support, please have the following information available.

1. Record the part number and serial number from the equipment.
2. Provide the installed location of the equipment.
3. Provide name, e-mail address, and telephone number of the person to contact.
4. List any error codes received during the failure.
5. Prepare a detailed description of the events relating to the error.
   - Time that the equipment has been in operation
   - Work that was done on the equipment prior to the error
   - Functions that the equipment was performing when the error occurred
   - Actions taken after the error and the results of those actions
   - Other information that may assist the Specialist
6. Contact Brooks Automation Technical Support at these numbers:

<table>
<thead>
<tr>
<th>Brooks Location</th>
<th>GUTS® Contact Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>North America</td>
<td>1-800-FOR-GUTS (1-800-367-4887) US/Canada +1-978-262-2900</td>
</tr>
<tr>
<td>Europe</td>
<td>+49 1804 CALL GUTS (+49 1804 2255 4887)</td>
</tr>
<tr>
<td>Japan</td>
<td>+81-45-477-5980</td>
</tr>
<tr>
<td>China</td>
<td>+86-21-5131-7066</td>
</tr>
<tr>
<td>Taiwan</td>
<td>+886-3-552-5225</td>
</tr>
<tr>
<td>Korea</td>
<td>+82-31-288-2500</td>
</tr>
<tr>
<td>Singapore</td>
<td>+65-6464-1481</td>
</tr>
</tbody>
</table>

For additional contact information, please go to the Brooks Automation web site at www.brooks.com or send an E-mail to techsupport@brooks.com.
Appendix B: Default Parameters (Values)

The following table shows the default values for regeneration and purges. To change applicable values, see Change Regeneration Parameters on page 4-31 or Regeneration Parameters on page 5-10.

Table 8-1: Default Process Values and Parameters

<table>
<thead>
<tr>
<th>Part of Process</th>
<th>Default Value</th>
<th>Parameter</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extended Warmup purge time</td>
<td>10 minute</td>
<td>0 - 999 minutes</td>
</tr>
<tr>
<td>Power fail recovery</td>
<td>OFF</td>
<td>ON/OFF/*COOL</td>
</tr>
<tr>
<td>Power fail recovery temperature</td>
<td>260K</td>
<td>110 - 260K</td>
</tr>
<tr>
<td>Rough coordination</td>
<td>OFF</td>
<td>ON/OFF</td>
</tr>
<tr>
<td>Start delay time</td>
<td>0</td>
<td>0 - 99.9 hours</td>
</tr>
<tr>
<td>Sublime maximum temperature</td>
<td>230K</td>
<td>110 - 250K</td>
</tr>
<tr>
<td>Timed Sublime maximum rough time</td>
<td>30 minutes</td>
<td>0 - 600 minutes</td>
</tr>
</tbody>
</table>

*Not a parameter set by a user.
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