



Troubleshooting

Look in *Table 1* to find the error message that is displayed on the 8600 Compressor elapsed time meter/error message display. Press the RESET switch to cancel the failure signal, and the status display will show the elapsed time. If the failure message is not cancelled when the RESET switch is pressed, wait fifteen minutes and press the RESET switch again. If the thermal switch operates, it takes about 15 minutes to reset. For more detailed information, see the *Cryo-Torr® 8600 Compressor Installation, Operation and Maintenance Manual* (8040707).



**WARNING**

High Voltage
Disconnect the 8600 Compressor from its power source before performing any troubleshooting procedures. The 8600 Compressor pump is hot after operating. Wait for the pump to cool down before working on the inside of the compressor. Do not change or modify any 8600 Compressor internal wiring circuits, this may cause failure of the compressor and cold head due to improper phasing.

Table 1: 8600 Compressor Troubleshooting Procedures

| No. | Message | Possible Cause | Corrective Action |
|-----|-----------------------|---------------------------------------|---|
| 1. | Cooling Water | Thermal switch (TS3) operates. | Check the cooling water requirements. |
| 2. | Low Pressure | Low pressure switch (LPS) operates. | Add helium gas. |
| 3. | Overload | Overcurrent relay (TS) operates. | 1. Check the power source requirements. 2. Check the cooling water and ambient temperature. 3. Check the static helium pressure. |
| 4. | Others | Thermal switch (TS1 or TS2) operates. | Contact Customer Support. |
| 5. | Reverse Phase | Reverse 3 phase at input power. | Change phase at input power connector. |
| 6. | Cir Protector-2 | Circuit Protector (CP2) operates. | Turn on the Cir P2. Contact the customer support center. |
| 7. | Power Failure | Power failure of more than 2 seconds. | 1.) When the NORMAL/C20 switch is in the NORMAL position, the 8600 Compressor runs automatically when power fails within seconds. 2.) When the NORMAL/C20 switch is in the C20 position, the following occurs: The POWER FAILURE message is not displayed if the operation signal is OFF within 50 msec after the power is cut. Pushing the RESET button is unnecessary. When the operation signal is OFF after 50 msec, the 8600 Compressor runs automatically when power fails within seconds. 3.) Regeneration: If the temperature of the 20HP Cryopump second stage is 20K or more (or at a pressure of 1X10 ⁻² Pa or more) due to the power failure, regenerate the cryopump. |
| 8. | Ref. Fuse (C30V Only) | The fuse blows. | Replace the fuse and contact Customer Support. |

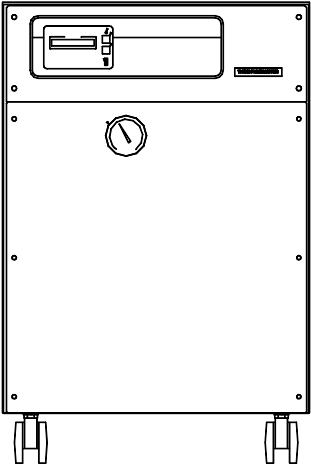


**CAUTION**

High Voltage
When an irregular stop occurs due to a failure not listed in *Table 1* , shut off the power supply and then turn on the power supply.

8600 Compressor
Quick Installation Guide

Part Number 8040705, Revision A, 01/11/2013
ECO Number 63723



8600 Compressor Specifications


| Cooling Water | General | Electrical |
|--|---|---|
| Maximum Inlet Temperature: < 101 psig (0.7MPa (gage)) Minimum Inlet Temperature: 40° F (5° C) Flow Rate: 1.0~3.3 gpm (5~15L/min) Pressure Drop (Inlet-to-outlet): 2.9 - 24.6 psi (0.02~0.17MPa). Refer to Water Flow Rate chart in product manual, 8040707. Maximum Inlet Pressure: < 101 psig (< 0.7 MPa (gage)) | Part Number: 8175001g001 Input Power Cable: Supplied Static Helium Pressure: 200 psig ± 6 psi (1.4 ± 0.04MPa) Interface: Cryopump power receptacle mates with Brooks' cryopump power cable for single pump use. Gas Supply And Return Connectors: 1/2-inch Aeroquip® Self-sealing Couplings Remote Control Receptacle: Supplied Adsorber Service Schedule: 24,000 Hours Inclination Angle: < 5° Ambient Operating Temperature: 50 - 100° F (10 ~ 38° C) Must be installed in a dust-free and moisture-free area. | Power Source: 190 - 220 VAC 50Hz and 200 - 230 VAC 60Hz Phase: 3 Power (Normal Operation): 5.2kW @ 50 Hz and 6.8kW@60 Hz Minimum Electrical Service: 30 AMPS |

Before You Start

- 1. Ensure the Cryo-Torr Cryopumps are installed according to the appropriate *Cryo-Torr Cryopump Quick Installation Guide*.
- 2. Read and follow all safety notices in this guide and in the appropriate compressor guides.

Compressor Safety

Ensure the compressor operates safely and dependably by adhering to all safety notices when you use or service the compressor.



⚠ WARNING

High Voltage

To avoid severe injury or loss of life from high voltage electric shock, turn off all electrical power before proceeding and adhere to all local electrical codes.

The 8600 Compressor may start automatically when you use the remote start feature. Lockout and tagout the 8600 Compressor to prevent a remote start from occurring before attempting to service the Compressor.

Perform all electrical work in accordance with all local electrical codes.

Follow all local high voltage safety precautions to reduce the possibility of electrical shock. Ensure all electrical power is OFF before continuing with this procedure.

Disconnected is when the power entry module is set to OFF, or the power cord is detached from the power entry module.

8600 Compressor Installation

- 1 Look for any shipping damage and verify shipping pressure between 200 psig ± 6 psi (1.4 ± 0.04mpA).
- 2 Connect the Helium return line (see Figure 3).
- 3 Connect the Helium supply line (see Figure 3).
- 4 Verify helium pressure (gauge on front of compressor). Refer to “Static Helium System Pressure Verification.”
- 5 Connect the cooling water in line (3/8 FPT, see Figure 2).
- 6 Connect the cooling water out line (3/8 FPT). Flowrate = 1.0 - 3.3 gpm (5 - 15 L/min).
- 7 Connect the compressor remote cable.
- 8 Connect the power cable (see Figure 4).
- 9 Turn on the compressor. See “Troubleshooting” section on back page.
- 10 Refer to the Cryo-Torr® 20HP Quick Installation Guide for cryopump connections.
- 11 Perform the startup procedure.

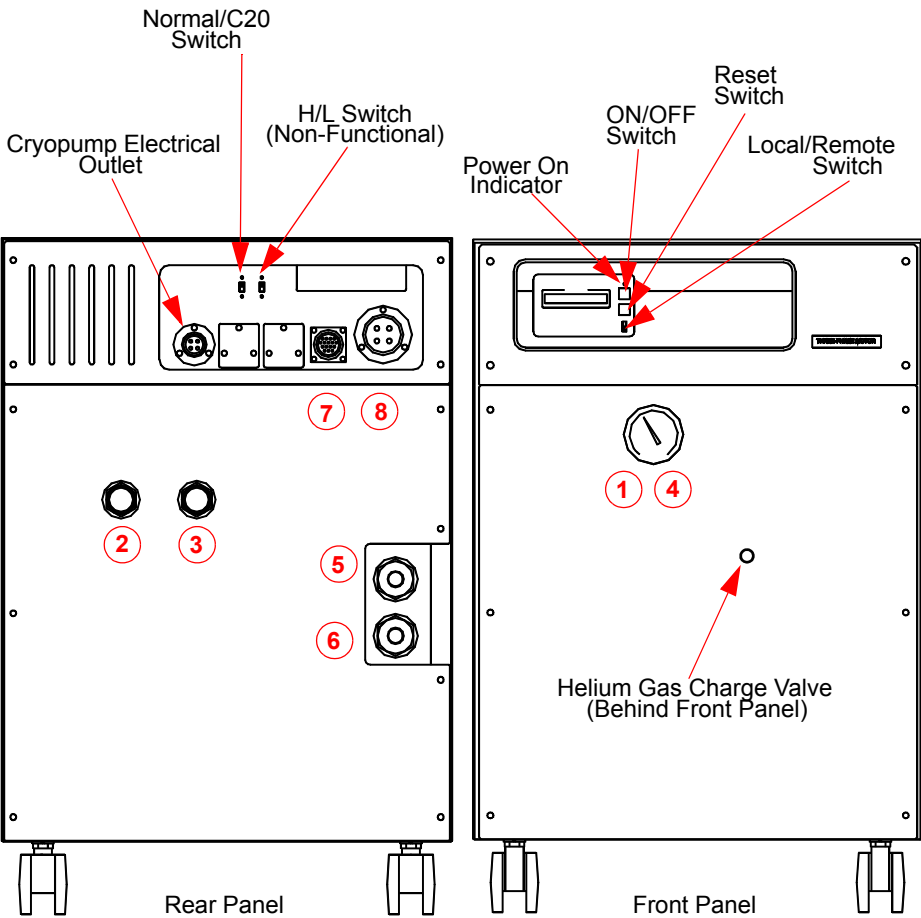


Figure 1: On-Board /S 1000 Compressor Installation Points

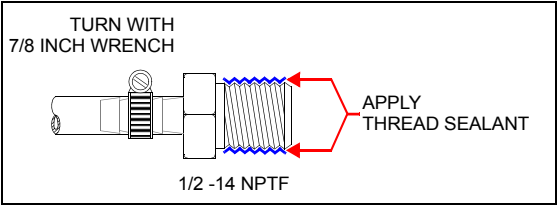


Figure 2: Water Line Connection

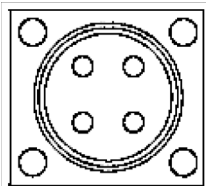


Figure 4: Power Cable Connector

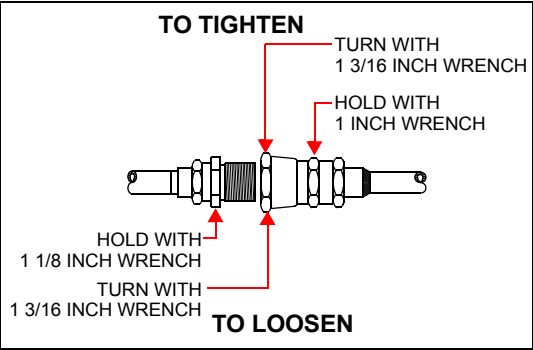


Figure 3: Helium Flex Line Connections

Static Helium System Pressure Verification

The proper static helium system pressure is necessary so that the cryopumps operate at maximum performance.

- 1. Make sure the 8600 Compressor and Cryo-Torr 20 HP Cryopumps are OFF.
- 2. Make sure all system helium connections have been made.
- 3. Allow all system components to acclimate to a temperature between 68° F and 71.6° F (20° C - 22° C).
- 4. Read the Compressor helium pressure gauge located on the Compressor rear panel (see Figure 1). Compare the gauge reading to the appropriate 50/60 Hz line frequency value (depending upon your system installation).

Startup

See 8040613, *Cryo-Torr High-Vacuum Pump Installation, Operation and Maintenance Instructions*, for details.

Product Information and Technical Support

Please visit the Brooks Automation website at www.brooks.com or e-mail to tscallcenter@brooks.com.