



ThermaClear[®] Chiller

Treatment Instructions



Safe Handling, Storage, and Disposal of ThermaClear[®]

- **Moisture-sensitive (hygroscopic):** Keep sealed and minimize exposure to air.
- **Storage:** Use nitrogen gas (N₂) to displace any air from the Treatment container after opening. Store in a cool, dry location, away from heat or open flames.
- **Aquatic Hazard:** Treatment is toxic to marine life. Handle according to applicable environmental regulations and prevent release into sinks, drains, sewers, or waterways.
- **Disposal:** Do not dispose of unwanted treatment or any removed oil in municipal or landfill waste streams. Refer to SDS and follow applicable regulations for correct disposal.
- **Safety:** Keep out of reach of children. Use Personal Protective Equipment when handling or installing treatment.
- **CAS Registry Numbers:** 67762-38-3 and 64742-88-7



Required Supplies

- **Personal Protective Equipment (PPE):** Hand, ear, and eye protection.
- **Treatment:** Sealed gallon-size (128 oz.) containers of ThermaClear® Chiller.
- **Approved Pump System:** ThermaClear® Pump (64 oz. reservoir) with charging hose and valve.
- **Oil draining:** Separate, six-foot (6') hose with shut-off valve and Schraeder fitting to drain oil.
- **Oil recovery:** Wide-mouth, sealable container to safely collect and dispose of removed chiller oil.
- **Tools:** Service wrenches, shop towels, and ECM Technologies treatment stickers.
 - **NOTE:** specialty valve adaptors may be required based on system type(s).

Step 1 - Preparation:

Inspect chiller for basic issues prior to ThermaClear® treatment while the compressor is running.

Only treat chillers confirmed to be in proper working condition.

- A general observation of the equipment condition and maintenance status.
- Review latest oil analysis to confirm that oil quality is acceptable prior to installation.
- **DO NOT** treat chillers that have acid or water contamination as evidenced by oil analysis.
- Verify refrigerant type and whether system is a high-pressure or low-pressure system.
- Confirm that the chiller is operating with the proper oil level and oil pressure at normal run conditions.
- Calculate ThermaClear® treatment volume as 10% of the total oil sump volume:
 - Use 1 gallon of ThermaClear® Chiller per 10 gallons of chiller oil sump capacity.

Step 2 - Fill and Bleed the ThermaClear® Pump:

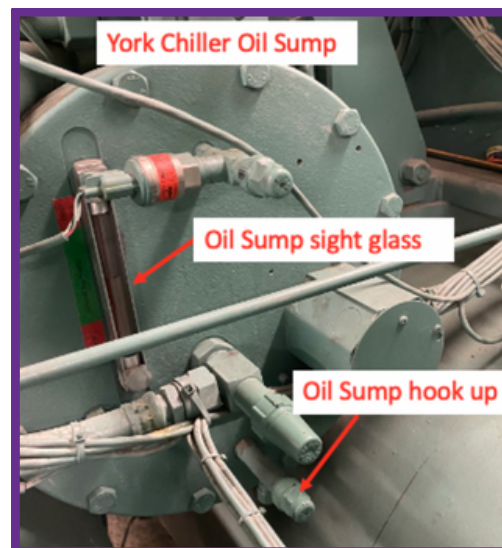
- Close the valve on the charging hose, remove the pump reservoir cap and carefully pour the desired amount of ThermaClear® Chiller into the pump reservoir. The pump holds a maximum of 64 oz.
- Immediately reattach the pump reservoir cap and close the cap on the Treatment container.
- Connect the hose (valve side) to the fitting on the pump reservoir cap and open the valve.
- Ensure that the bleeder valve on the pump reservoir cap is open to let air escape while bleeding.
- Pump Treatment back into the reservoir until the stream is bubble-free.
- Close the valve on the charging hose once the pump is bled and the handle is fully depressed.
- Disconnect the charging hose from the fitting on the pump reservoir cap.
- **BEFORE** treatment, note the liquid level in the pump reservoir using the markings on the cylinder.
 - Use the 5 oz. and 1 oz. marks on the reservoir cylinder to confirm the exact starting volume.



Step 3 – Remove 10% of Chiller Oil Capacity:

- Temporarily disable the refrigerant monitoring system during installation. If the system is not disabled, notify the responsible personnel that the monitoring system may alarm during the treatment process.
- Adhere to the equipment manufacturer's instructions for properly removing/adding refrigerant oil.

- Ensure that the chiller system is running throughout the process:
 - If a high-pressure system, (i.e., R-134A) reduce operating pressure to a low level before removing any oil from the sump, to avoid foaming or release of refrigerant during the removal process.
 - If a low-pressure system, (i.e., R-123) run at normal load and standard operating pressure.
- Connect the 6' refrigerant hose (with the shut-off valve closed) to the oil drain port of the system. Place the other end of the refrigerant hose in a wide-mouth, sealable container for oil recovery.
- Open the oil sump drain port and remove the exact amount of oil to be replaced by ThermaClear® Chiller, not to exceed 10% of the total oil sump volume.
 - **Note:** Oil removal must be performed according to OEM guidelines and EPA regulations.
- Close the shut-off valve on the hose and then close the chiller oil sump drain port. Disconnect hose.



Step 4 – Install 70% of the Treatment into the Oil Sump Drain Port

- Connect the charging hose of the ThermaClear® Pump to the oil sump drain port of the Chiller.
- Open the oil sump drain port and the shut-off valve on the charging hose.
- Ensure that the bleeder valve on the pump reservoir cap remains open during installation.
- Pump 70% of the ThermaClear® treatment into the oil sump drain port. (Ex: 70% of 1 gallon = 90 oz.).
 - Each pull draws a fixed volume from the reservoir, and each push injects the same volume.

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- Do not run the pump dry during installation. Once the liquid level in the reservoir reaches 5 oz., open the pump reservoir cap and add more ThermaClear® Chiller to avoid re-bleeding the pump.
- **WARNING:** The pump handle should depress with medium-firm pressure. If the handle will not depress under force, stop and verify all connections/valve position to avoid pump damage.
- Close the shut-off valve on the charging hose immediately. Close the chiller oil sump drain port.
- Disconnect the charging hose and use a shop towel to clean up any drips during disconnection.

Step 5 – Install 30% of Treatment into Low-Pressure Side of Evaporator

- Connect the charging hose of the ThermaClear® Pump to the low-pressure port on the evaporator.
 - **WARNING:** Never connect the charging hose to the high-pressure port of any chiller system. The pump reservoir and/or reservoir cap can explode and may cause serious injury.
- Open the Schraeder valve on the low-pressure port and open the shut-off valve on the charging hose.
- Ensure that the bleeder valve on the pump reservoir cap remains open during installation.
- Pump the last 30% of the ThermaClear® treatment into the evaporator (Ex: 30% of 1 gallon = 38 oz.).
- Do not run the pump dry during installation. Once the liquid level in the reservoir reaches 5 oz., open the pump reservoir cap and add more ThermaClear® Chiller to avoid re-bleeding the pump.
- Close the shut-off valve on the charging hose immediately. Close the evaporator low-pressure port.
- Disconnect the charging hose and use a shop towel to clean up any drips during disconnection.



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Step 6 - Recover Unused Treatment:

- Place the charging hose inside the original ThermaClear® Chiller Treatment container.
- Open the valve and pump out all remaining Treatment.
- Close the valve and use a shop towel to remove drips from the end of the hose.
- Use nitrogen gas (N₂) to displace air from the treatment container before resealing.
- Confirm that the pump reservoir cap, charging hose valve, and Treatment Container are all closed.



Step 7 - Post-Treatment Checklist:

- For high-pressure systems (R-134A), restore the system to normal operating pressure and run the system at normal conditions. For low-pressure systems (R-123), keep running at normal conditions.
- Check and verify that the system is out of test mode and returned to normal operating mode.
- If the refrigerant monitoring system was disabled, verify with the plant operator that it was reenabled.
- Monitor the chiller oil level and operating pressures for 30 minutes after ThermaClear® treatment.
- Document the date and time of install, who was present, and how much ThermaClear® was used.
- Affix a ThermaClear® treatment sticker by the name plate of each treated unit.
- Notify the appropriate parties that treatment has been completed successfully.
- Confirm with Plant Operator if they want to keep/dispose of the removed oil themselves. If not, ensure that any recovered oil is disposed of or recycled in accordance with applicable local regulations.

Step 8 – Plant Operator to Monitor Chiller Operation for Two (2) Weeks:

- Advise the Plant Operator to monitor oil levels as some oil entrained in the system will be returned to the sump. The oil level should be adjusted to keep total oil volume within specification. If the Plant Operator is not able to perform this task, it is the responsibility of the installer to plan to follow up and perform any final adjustments to the oil level in the chiller(s) as necessary to stay within specifications.
- It is possible that the filter dryer system can become saturated with oil due to high rates of oil-fouling remedied by ThermaClear® treatment. If the filters become clogged, they should be replaced.

Spill Cleanup and Safety Procedures:

- Ask Contain spills immediately with absorbent materials.
- Place ThermaClear-soaked absorbent into a heavy-duty plastic bag or oil-resistant container.
- Clean remaining residue with an appropriate degreaser or cleaning solution.
- Refer to the ThermaClear® SDS and follow local regulations for disposal of saturated materials.
- Never dispose of ThermaClear® down any drains, sinks, sewers, or into local waterways.
- For skin contact, wash immediately with soap and water.
- For eye contact, flush with water and seek medical attention.

