MRI Chiller Installation Guidelines

*These Items are the responsibility of the installing contractor to complete prior to the startup of the MRI Chiller.*

**Please refer to DTS chiller manual for further info. Contact DTS at 800-968-5665 for questions or concerns with these items**

Setting and Rigging:

**Chiller Weights:**
REFER TO CHILLER CUTSHEETS OR DRAWINGS THAT ARE INCLUDED IN THIS PACKET FOR THESE SPECS. ENSURE YOU MATCH YOUR CHILLER MODEL TO THE DRAWING YOU ARE LOOKING AT BEFORE SIZING CRANES, PADS, CURBS, ETC.

**Arrangements:**
Unit and accessories will arrive on a flat-bed truck. The freight carrier does not provide unloading service. Include any necessary rigging fees in your installation bid.

**Ground Level Setting:**
- Place unit on a concrete pad. **Standard dimensions:** 5’W x 12’L x min 4” depth. *Ensure you size your pad based on the chiller you are receiving*
- Pad must be poured with less than ½” slope per 10’ or be shimmed to level.
- Ensure placement is minimum 5 feet (6 feet recommended) from walls and minimum 8 feet overhead clearance.
- Secure unit to pad with 1/2” bolts at all 8 feet.

**Roof Level Setting:**
- **Always follow all local ordinances and codes for roof installations.**
- If OSHPD certification is required in your area, please ensure you are installing an OSHPD certified chiller.
- Chillers are capable of pumping 65 feet vertical distance to MRI SEP cabinet. Please reach out to DTS prior to installation if your site planning exceeds this limit.
- For rooftop installs where the unit is above patient rooms or staff areas, DTS recommends the use of Isolation springs that are placed between the chiller and roof curb to eliminate vibration.
- DTS does not provide roof curbs, installation contractor must include these if needed.
Plumbing:

- **Provide fluid piping – Please refer to document MED-WI-010 for further instruction**
  - Copper is recommended with flex connectors and isolation ball valves at the chiller inlet and outlet connections.
  - Chiller inlet and outlet ports are referenced on the cutsheet of the applicable chiller you are installing. Refer to these documents as needed.
  - 45, 60, 63, 70, and 106kW chillers can support a maximum total of 500 equivalent feet of piping. (supply pipe ft. + return pipe ft. + total fittings ft.) If your run exceeds this, please reach out to DTS for information and recommendations. If your chiller is not one of the mentioned, please reach out to DTS.
  - Each chiller is supplied with a filter flow meter kit to be installed indoors on the supply line from the chiller to the SEP. Refer to the Filter Flow Meter Kit manual for information.

Process Fluid:

- **Fill chiller and pipes with glycol mixture – Please refer to document MED-WI-011 for further instruction**
  - Glycol can be purchased from DTS, or sourced by the group installing the chiller. DTS recommends a 50% mix of inhibited propylene glycol to water.
  - Installation contractor must provide distilled or DI water to mix with glycol (if not using pre-mixed glycol). 45-65+ gallons will be needed.
  - **TAP WATER IS NOT APPROVED TO MIX WITH GLYCOL.** The naturally occurring minerals and sediments in tap water will cause the fluid to fall outside the water purity specification required by MRI equipment.
  - Dilute the glycol to a 50/50 glycol-water mixture with the water provided.
  - Fill the system with the mixture
    - Fill the chiller reservoir first. The capacity of the reservoir by model can be found in the cutsheet for the chiller you are installing. This can be filled through the sight glass or the fill cap on top of the chiller reservoir.
    - 1 gallon per 6’ of 2” piping will be required to fill the plumbing lines.
    - You cannot fill the chiller through the pipes. There are anti-backflow solenoids that prevent that. It must be filled direct into the chiller.

Electrical:

- **Provide electrical supply to chiller – Please refer to document MED-WI-012 for further instruction**
  - Refer to the data tag on the chiller for electrical information. Refer to the above referenced document for further power requirements
  - Connect power drop, turn chiller disconnect to “ON” and check for proper phasing. Correct phasing if needed. Leave on until chiller startup.
  - A Carel remote display panel with 150’ connector cord is included with each shipment. These pieces are located within the electrical enclosure of the chiller.
  - If the distance of the chiller from where the remote display panel will be installed exceeds 150’, you must purchase the Long Distance Remote Kit. This will increase the acceptable distance from 150’ up to 400’.
NOTE: If you are utilizing the 10-40GPM city water bypass panel, it will take the place of the DTS Filter kit, as you do not need both.
**Purpose:** Define process of W Series chiller plumbing connections and installations

**Scope:** Applicable to all field personnel participating in installation of defined equipment.

**Related Documents:** F-M001, MED-WI-011

### Affected Equipment:

- WVO3000
- WO5000 (12kW)
- WO7500 (17kW/21kW)
- WO2-7500 (37kW)
- WO2-2-5000 (60/63kW)
- WO2-2-7500 (70kW)
- WO2-10000 (45kW)
- WO2-2-10000 (75kW)
- WO3-2-10000 (106kW)

### Process:

1. Verify chiller model via datatag located on chiller E-Box and that the model aligns as a piece of Affected Equipment within this document.
2. Utilize this document and chiller manual provided to determine that site pipe run is acceptable by DTS requirements. If the provided document does not provide adequate verification, call Dimplex Thermal Solutions’ Medical Service team at 800-968-5665 x710.
3. Refer to recommended piping layout on page 5 of this document.
4. Follow plumbing related guidelines listed in Chiller Installation Responsibility Checklist (F-M001).
5. Complete plumbing connections
6. Leak check piping installation. Ensure chiller is isolated from site piping before putting plumbing under any pressure.
7. Flush piping to remove any installation debris
8. Back fill chiller lines with glycol mixture (process for this defined in MED-WI-011) if applicable.
9. Wait for chiller startup to be completed to verify no plumbing issues exist
Plumbing Recommendations:

1. Copper piping is recommended for fluid lines in and out of chiller. Do not utilize carbon steel, black pipe, or PVC. If you need clarification on type of piping you are using, contact DTS at 800-968-5665.

2. These recommendations are for “open to atmosphere” fluid systems. These chillers are NOT pressurized. Do NOT install bladder tanks, expansion tanks, shot feeders, pressure sensors, booster pumps, automatic water makeup systems, or any other supplemental equipment on the plumbing of these chiller without express instruction from Dimplex Thermal Solutions.

3. IF YOUR PLUMBING INSTALLATION DEVIATES FROM ANY OF THESE PARAMETERS, CONTACT DTS AT 800-968-5665 X710 FOR RECOMMENDATIONS.

4. FOR CHILLERS WITH 1.25” LINE SIZE:
   a. Models: WO5000
   b. 

<table>
<thead>
<tr>
<th>Fitting</th>
<th>Equivalent feet per fitting</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.25” 90º Standard Elbow</td>
<td>3.3ft</td>
</tr>
<tr>
<td>1.25” 90º Street Elbow</td>
<td>5.6ft</td>
</tr>
<tr>
<td>1.25” 45º Standard Elbow</td>
<td>1.7ft</td>
</tr>
<tr>
<td>1.25” 45º Street Elbow</td>
<td>3.0ft</td>
</tr>
<tr>
<td>1.25” Globe Valve</td>
<td>38ft</td>
</tr>
<tr>
<td>1.25” Gate Valve</td>
<td>1.5ft</td>
</tr>
<tr>
<td>1.25” Angle Valve</td>
<td>15ft</td>
</tr>
</tbody>
</table>
5. FOR CHILLERS WITH 1.5” LINE SIZE:
   a. Standard Fitting Losses in Equivalent Feet of Pipe:

<table>
<thead>
<tr>
<th>Fitting</th>
<th>Equivalent feet per fitting</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.5” 90º Standard Elbow</td>
<td>4.0ft</td>
</tr>
<tr>
<td>1.5” 90º Street Elbow</td>
<td>6.3ft</td>
</tr>
<tr>
<td>1.5” 45º Standard Elbow</td>
<td>2.1ft.</td>
</tr>
<tr>
<td>1.5” 45º Street Elbow</td>
<td>3.4ft.</td>
</tr>
<tr>
<td>1.5” Globe Valve</td>
<td>43.0ft.</td>
</tr>
<tr>
<td>1.5” Gate Valve</td>
<td>1.8ft.</td>
</tr>
<tr>
<td>1.5” Angle Valve</td>
<td>18.0ft.</td>
</tr>
</tbody>
</table>

6. FOR CHILLERS WITH 2” LINE SIZE:
   a. The Heat Exchanger can pump fluid vertically up to 75 feet (usually 6 stories).
   b. Standard Fitting Losses in Equivalent Feet of Pipe:

<table>
<thead>
<tr>
<th>Fitting</th>
<th>Equivalent feet per fitting</th>
</tr>
</thead>
<tbody>
<tr>
<td>2” 90º Standard Elbow</td>
<td>5.0ft</td>
</tr>
<tr>
<td>2” 90º Street Elbow</td>
<td>8.2ft</td>
</tr>
<tr>
<td>2” 45º Standard Elbow</td>
<td>2.6ft.</td>
</tr>
<tr>
<td>2” 45º Street Elbow</td>
<td>4.5ft.</td>
</tr>
<tr>
<td>2” Globe Valve</td>
<td>55.0ft.</td>
</tr>
<tr>
<td>2” Gate Valve</td>
<td>2.3ft.</td>
</tr>
<tr>
<td>2” Angle Valve</td>
<td>24.0ft.</td>
</tr>
</tbody>
</table>

7. For chillers located more than 75’ above the chiller, a booster pump is recommended. Consult factory for details.
8. FOR CHILLERS WITH ANY LINE SIZE NOT DEFINED IN THIS DOCUMENT
   a. If you have a chiller with a different line size then defined in this document, please call DTS at 800-968-5665 x710 for clarification
   b. Please note that the chillers listed in this document are for builds that are open to the atmosphere. These guidelines do NOT apply to pressurized chiller
Revision History

DEPT. MANAGER: K. HASTINGS  INITIAL ISSUE DATE: 7/1/2016
<table>
<thead>
<tr>
<th>Version</th>
<th>Revision Date</th>
<th>Description of Change</th>
<th>Changes Made By (Name &amp; Title):</th>
</tr>
</thead>
<tbody>
<tr>
<td>001</td>
<td>7/1/2016</td>
<td>Creation of document</td>
<td>Kyle Hastings, Medical Service Manager</td>
</tr>
<tr>
<td>002</td>
<td>1/9/2017</td>
<td>Edit Process step 6, general grammar updates</td>
<td>Kyle Hastings, Medical Service Manager</td>
</tr>
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</table>
Purpose: Define process of W Series chiller process fluid installation and fill.

Scope: Applicable to all field personnel participating in installation of defined equipment.

Related Documents: F-M001, MED-WI-010

Affected Equipment:
- WVO3000
- WO5000 (12kW)
- WO7500 (17kW/21kW)
- WO2-7500 (37kW)
- WO2-2-5000 (60/63kW)
- WO2-2-7500 (70kW)
- WO2-10000 (45kW)
- WO2-2-10000 (75kW)
- WO3-2-10000 (106kW)

Process:
1. Complete rigging and setting of chiller at end user location.
2. Ensure site plumbing has been flushed clean and has no residual installation debris. **DO NOT FLUSH PLUMBING THROUGH CHILLER OR PROCESS EQUIPMENT AS DAMAGE MAY RESULT.**
3. Utilize this document and chiller manual to determine volume of fluid mixture needed for system.
4. If needed, source glycol and water for mixture.
5. Add correct fluid mixture to chiller reservoir.
   i. Remove air filters from chiller.
   ii. Remove vent cap or stainless steel plate that is on top of the reservoir.
   iii. Pump directly into the tank until the appropriate mixture is reached and the fluid level sight glass on the chiller is at the MAX level.
   iv. Reinstall reservoir cap once system is full and free of air.
   v. Reinstall chiller air filters.
6. If plumbing system has fill ports or other ways to backfill the piping, add the same concentration of fluid mixture used in the reservoir to fill the pipe lines.
7. Wait for startup of chiller to verify correct concentration and fluid level is achieved with system fully operational.
8. Make any corrections necessary.

**Process Fluid Recommendations:**

1. Reservoir Capacity by model:

<table>
<thead>
<tr>
<th>Chiller Model</th>
<th>Reservoir Capacity (US Gallons)</th>
</tr>
</thead>
<tbody>
<tr>
<td>WVO3000</td>
<td>10</td>
</tr>
<tr>
<td>WO5000</td>
<td>50</td>
</tr>
<tr>
<td>WO7500</td>
<td>50</td>
</tr>
<tr>
<td>WO2-7500</td>
<td>70</td>
</tr>
<tr>
<td>WO2-10000</td>
<td>100</td>
</tr>
<tr>
<td>WO2-2-5000</td>
<td>100</td>
</tr>
<tr>
<td>WO2-2-7500</td>
<td>100</td>
</tr>
<tr>
<td>WO2-2-10000</td>
<td>100</td>
</tr>
<tr>
<td>WO3-2-10000</td>
<td>100</td>
</tr>
</tbody>
</table>

2. The above table references volume needed for the chiller reservoir only. Plumbing volume will need to be calculated separately and added to the chiller reservoir volume to determine total fluid needed. See below table.

<table>
<thead>
<tr>
<th>Line Size</th>
<th>US Gallons per foot</th>
<th>US Gallons per ten feet</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.25”</td>
<td>0.078</td>
<td>0.7</td>
</tr>
<tr>
<td>1.5”</td>
<td>0.11</td>
<td>1.1</td>
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<tr>
<td>2”</td>
<td>0.17</td>
<td>1.7</td>
</tr>
<tr>
<td>2.5”</td>
<td>0.25</td>
<td>2.5</td>
</tr>
</tbody>
</table>
3. When installing a chiller outdoors, the water to glycol mix must be 50% (freeze point of -35F°). If the chiller is indoors, the water to glycol mix must be 30% glycol to 70% water (freeze point of 8F°).

4. When utilizing 100% glycol concentration, the fluid must be diluted to the correct concentration mixture. This must be accomplished with a demineralized water. i.e. distilled water, Deionized water, reverse osmosis water, etc. TAP WATER MAY NOT BE USED TO MIX WITH THE GLYCOL.

5. The water and glycol defined in Item 3 can be premixed prior to filling the system, or can be added separately to the reservoir and self-mix when the fluid circulates through the system.

6. After the system has been filled, test the mixture with a refractometer or hydrometer to ensure correct concentration level.

7. DTS recommends that the chillers be filled with an industrial inhibited propylene glycol. If this cannot be sourced in your local area, reach out to DTS’ Parts Department for information on sourcing.

8. You cannot backfill the chiller reservoir through the piping. The system utilizes check valves or anti-backflow solenoids to prevent this. The pipes and chiller reservoir need to be filled separately.

9. Note what brand, type, concentration of glycol was used to fill the system, and date of system filling on the inside of the electrical panel door with permanent marker. This will ensure that the correct type of glycol is used going forward when the system requires refilling.
Revision History

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</tbody>
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Purpose: Define process of W Series chiller power and wiring installation/connections.

Scope: Applicable to all field personnel participating in installation of defined equipment.

Related Documents: F-M001

Affected Equipment:
- WVO3000
- WO5000 (12kW)
- WO7500 (17kW/21kW)
- WO2-7500 (37kW)
- WO2-2-5000 (60/63kW)
- WO2-2-7500 (70kW)
- WO2-10000 (45kW)
- WO2-2-10000 (75kW)
- WO3-2-10000 (106kW)

Process:
1. Always exercise safety measures when working with high voltage systems. Wear appropriate PPE and follow all safety steps when working with the chiller system.
2. Review all state and local electrical codes prior to making any electrical installations. These codes will supersede direction in this document. If any standards or codes in your geographical area conflict with directions from this document, reach out to Dimplex Thermal Solutions for support.
3. Review electrical schematics in this document and the manual that comes with the chiller unit.
4. Size breaker or disconnect appropriately. See chiller name plate for additional info.
5. Land main power on chiller.
6. Verify phasing is correct. This can be checked at the phase monitor that is mounted in the chiller electrical panel
7. Run ¾” conduit with pull string from chiller down to MRI Suite or MR mechanical room for the remote display cable
8. Pull remote display cable through conduit. Standard cable is a 150’ phone-like cable.
9. Connect and mount Carel remote display on wall per manufacturer instructions
10. Once chiller installation is complete, turn chiller disconnect “ON” to allow crankcase heaters to run for a minimum of 8 hours prior to startup. See form F-M001 for additional details.

**Electrical Recommendations:**

<table>
<thead>
<tr>
<th>Model</th>
<th>Max Chiller Disconnect Fuse</th>
<th>MAX FLA</th>
<th>Max Overcurrent Protection</th>
<th>Minimum Circuit Ampacity</th>
</tr>
</thead>
<tbody>
<tr>
<td>WVO3000</td>
<td>20A</td>
<td>16A</td>
<td>25A</td>
<td>20A</td>
</tr>
<tr>
<td>WO5000</td>
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<td>22A</td>
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<td>WO7500</td>
<td>30A</td>
<td>26A</td>
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<td>WO2-7500</td>
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<td>48A</td>
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<td>WO2-2-5000</td>
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<td>61A</td>
<td>80A</td>
<td>70A</td>
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<td>85A</td>
<td>110A</td>
<td>100A</td>
</tr>
<tr>
<td>WO2-2-10000</td>
<td>125A</td>
<td>100A</td>
<td>125A</td>
<td>110A</td>
</tr>
<tr>
<td>WO3-2-10000</td>
<td>175A</td>
<td>148A</td>
<td>225A</td>
<td>163A</td>
</tr>
</tbody>
</table>

- For 230v chillers, double all amperage data for applicable model. For 208v, consult factory.
- If you need a chiller to run in anything other than above mentioned voltages, phasing, or Hz, consult factory.
- If distance from chiller to where the remote display will be mounted is greater than 150’, a Long Distance Remote Kit is required. Call DTS for information.
- **DO NOT SPLICE THE REMOTE DISPLAY CABLE TO INCREASE LENGTH.** This will not work and can cause a cable short that will affect the operation of the chiller.
- The system is disabled in the control parameters. When turning the electrical disconnect on, the system will not begin circulating. It will provide power to the system heaters only until a startup technician enables the system operation.
**TAGGING INSTRUCTIONS**

- **A)** Manuals must ship with machine or machine does not ship.

- **B)** Place additional tags inside the machine.

- **C)** Place additional tags inside the electrical enclosure mounted on tag rails which are riveted to the panel. Add note to electrical prints.

- **D)** Tags outside and outside the electrical enclosure need to be riveted.

- **E)** Tags inside the machine need to be riveted.

- **F)** Sequence of operation tag required.

- **G)** Inlet and outlet tags only to be riveted.

- **H)** Special language tags are required.
  - [ ] French
  - [ ] German
  - [ ] Spanish
  - [ ] Other (see special instructions)

**SPECIAL INSTRUCTIONS:**

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NOTE:

TAR TAPE IS ONLY TO BE USED ON THE SUCTION LINE VIBRATION ELIMINATOR.

1. BEFORE STARTING! SEE PLUMBING BOM FOR ANY PRE-CUT INSULATION

2. 1/2" INSULATION ON ALL TANK SURFACES EXCLUDING THE TOP OF RECTANGLE TANKS

3. 1/2" INSULATION ON ALL PLUMBING HEAT EXCHANGERS EXCLUDING SUBMERSED COIL

4. SINGLE LAYER TAR TAPE STARTING 2" BELOW SUCTION LINE VIBRATION ELIMINATOR ENDING 2" ABOVE VIBRATION ELIMINATOR

5. 1/2" INSULATION ON REFRIGERATION SUCTION LINE AND COMPONENTS STARTING AT THE BOTTOM

6. 1/2" INSULATION ON ALL PLUMBING COMPONENTS EXCLUDING CLEAR PORTION OF SIGHT GLASS

7. 1/2" INSULATION ON HEATER SHEATHS

8. SHELL AND TUBE WATER COOLED CONDENSER AND WATER COOLED CONDENSER PIPING NOT TO BE INSULATED.