



Rear Door Heat Exchanger

Installation and Maintenance Guide

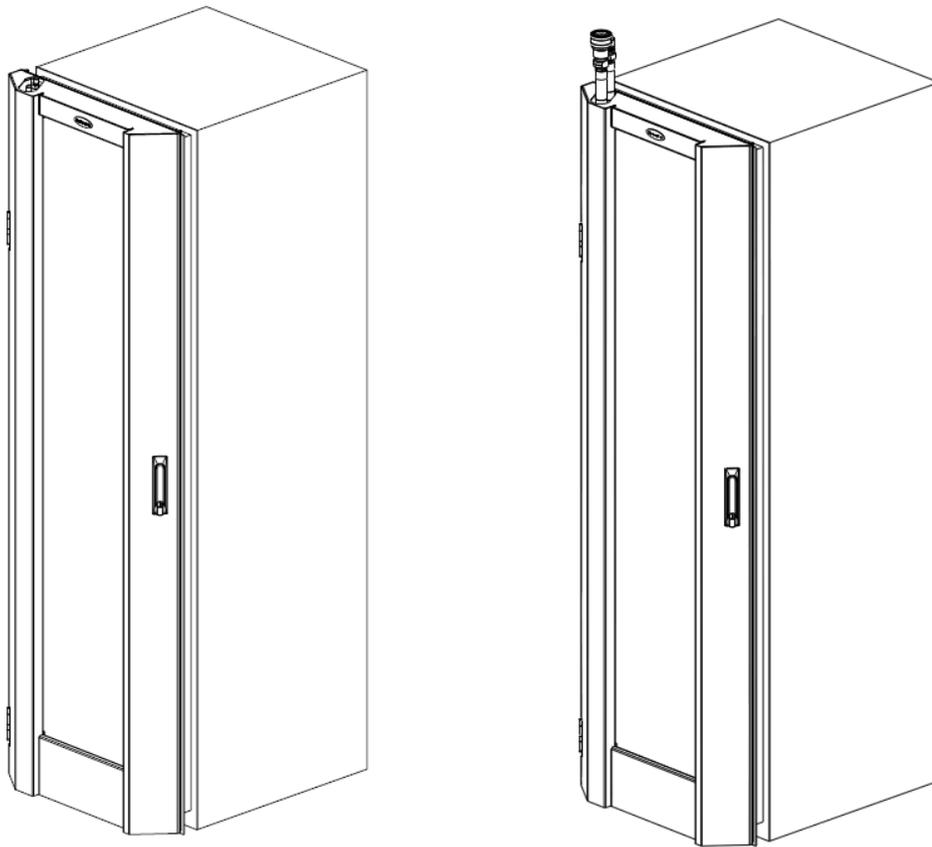


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Chapter 1 – Introduction

This *Installation and Maintenance Guide* contains instructions for installing and setting up the Coolcentric® Rear Door Heat Exchanger (RDHx).

The RDHx is a water-cooled door that is mounted on the rear of an IT enclosure to cool the air that is heated and exhausted by devices mounted inside the IT enclosure. Supply and return water hoses (sold separately) deliver conditioned water to the RDHx and remove the heated water from it. The RDHx can be used on IT enclosures that are deployed on either a raised floor or a non-raised floor.

This document might be updated occasionally to include information about new features. Technical updates to this documentation are available from the Coolcentric web site:

<http://www.coolcentric.com>.

Related Documentation

This *Rear Door Heat Exchanger Installation and Maintenance Guide* provides general information about the RDHx, including information about features and how to get help. In addition to this Guide, more information on site preparation and secondary loop ancillary items can be found in the *Rear Door Heat Exchanger Planning Guide*.

Notices and Statements in this Document

The following notices and statements are used in this document:

- **Note:** These notices provide important tips, guidance, or advice.
- **Important:** These notices provide information or advice that might help you avoid inconveniences or problem situations.
- **Attention:** These notices indicate potential damage to programs, devices, or data. An attention notice is placed just before the instruction or situation in which damage could occur.



Caution: These statements indicate situations that can be potentially hazardous to you. A caution statement is placed just before the description of a potentially hazardous procedure step or situation.

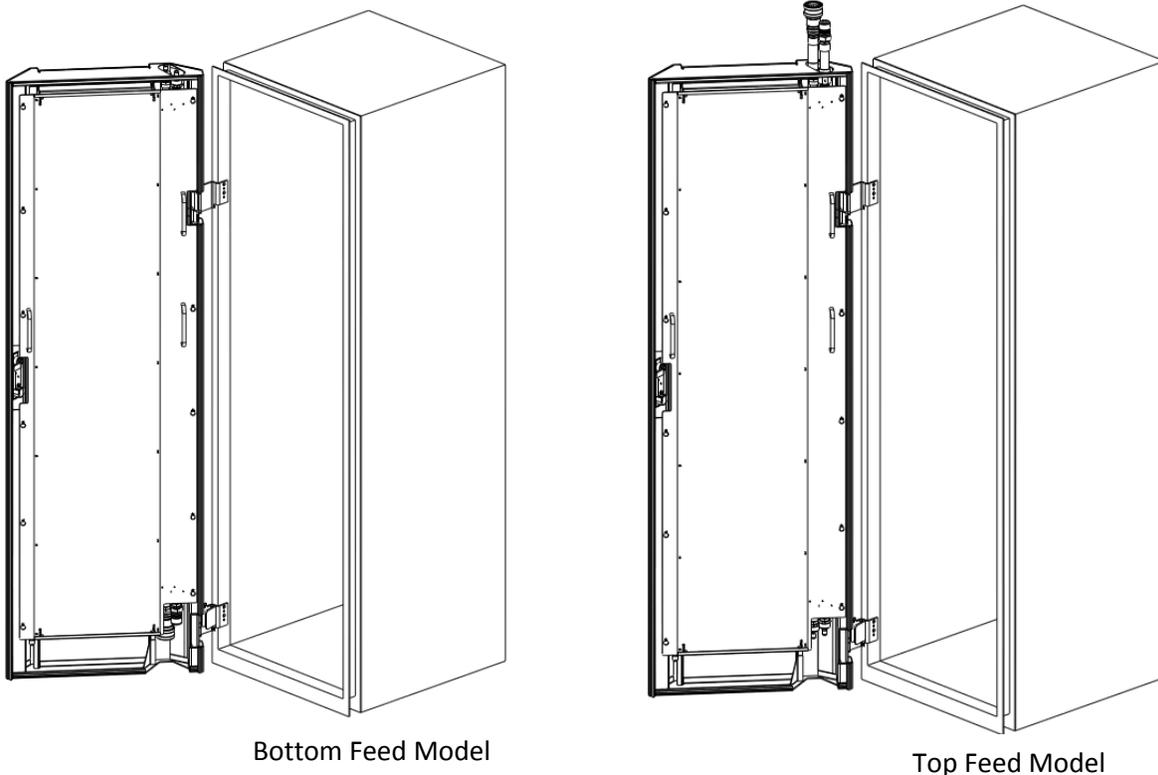


Danger: These statements indicate situations that can be potentially lethal or extremely hazardous to you. A danger statement is placed just before the description of a potentially lethal or extremely hazardous procedure step or situation.

Chapter 2 – Installing the Rear Door Heat Exchanger

Before you can install the RDHx, you must have prepared the facility according to the *Rear Door Heat Exchanger Planning Guide* for water-cooled data centers. The Planning Guide is available on the Coolcentric website (<http://www.coolcentric.com>) in the “Information” section under “Documentation”. The *Planning Guide* includes the water-quality and water-supply specifications.

You can install the RDHx while devices in the IT enclosure are operational; however the optimum time for installation is during a scheduled maintenance period.



Main Tasks

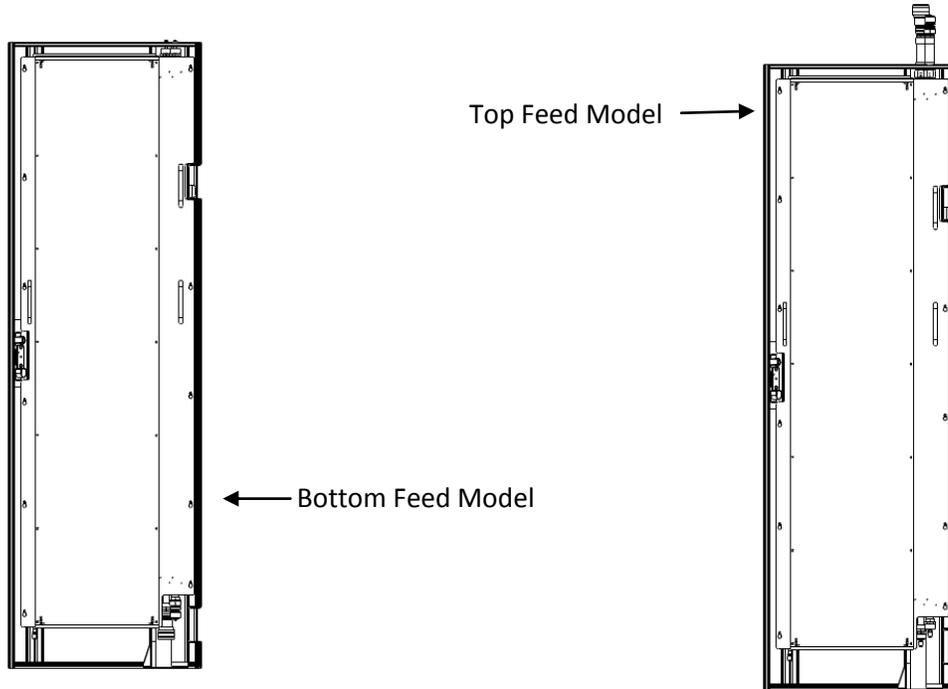
Installing the RDHx consists of the following main tasks:

1. Remove the existing IT enclosure’s rear door, hinges and door latch (if installed).
2. Attach the Transition Frame (if required) as described in the *Transition Frame Installation Guide* supplied with each Transition Frame.
3. Attach the RDHx hinges directly to the IT enclosure rear frame or to the Transition Frame (if required).
4. Place the RDHx door assembly on both hinges.
5. Connect the supply and return hoses from the chilled water source, the Coolant Distribution Unit (CDU) or External Manifold to the couplings on the RDHx.
6. Fill the RDHx with treated water and purge remaining air from the coil.
7. Secure the hoses and the RDHx door assembly.

Note: Connecting the hoses from a CDU unit to the RDHx creates the required secondary loop in the water-circulation system. See the *Rear Door Heat Exchanger Planning Guide* for information about primary and secondary loops in the water-circulation system.

Required Components and Tools

1. RDHx Door assembly
2. RDHx hinge kit (ships with the RDHx)
3. RDHx Documentation package (ships with the RDHx)
4. Transition Frame Kit (if required, ships with the RDHx)
5. Air purging tool (sold separately). One air purging tool can be used to commission multiple RDHx doors.
6. Hose Kits (sold separately)
7. Water Treatment (sold separately)
8. Raised Floor Grommet (if a raised floor is used, sold separately)



The following tools (supplied by customer) are required to complete an installation:

1. Tool necessary to remove the existing IT enclosure rear door hinges and latch (see the Enclosure Installation Manual provided by the enclosure vendor for details).
2. Tool necessary to attach the Transition Frame (if required) to the IT enclosure rear frame (see the *Transition Frame Installation Guide* for details).
3. 4mm hex key to attach the RDHx hinge to the IT enclosure rear frame or Transition Frame (if required).
4. A bucket (approximately 2 quarts / 2 liters) to capture water that escapes as you purge air from the system while filling the RDHx with treated water.
5. Tool to cut a hose cut-out hole in the raised floor tile (if a raised floor is used).

Note: Although the likelihood of water exposure is extremely small, you might prefer to place some water-absorbent material beneath the RDHx as a general practice when performing procedures on the RDHx.

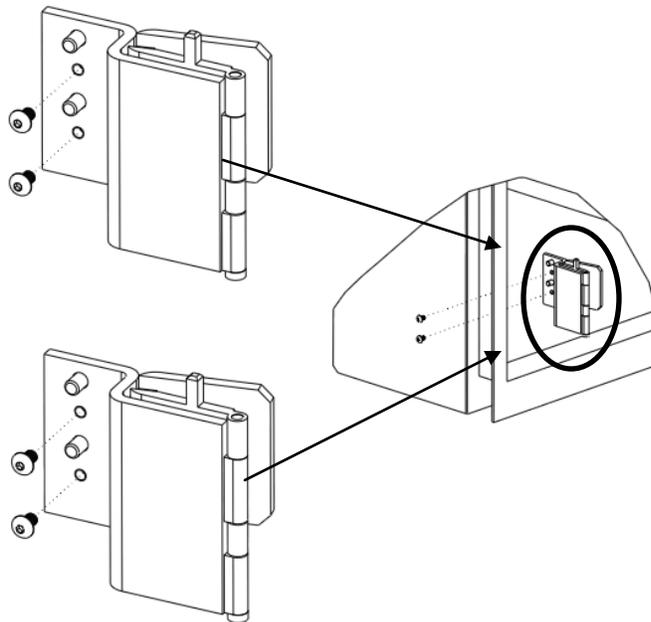
Installation Procedures

Complete the procedures in this section to install the RDHx door assembly.

Attaching the RDHx Door Assembly to the Enclosure or Transition Frame (if required)

To install the RDHx, complete the following steps:

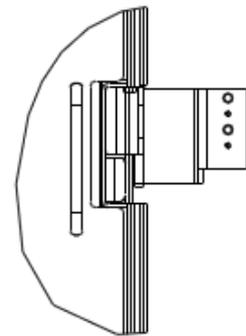
1. Remove the RDHx door assembly and all components from the packaging.
2. Unlock and open the existing rear door (if one is installed) on the IT enclosure.
3. Remove the existing rear door, hinges and door latch per the instructions in the Enclosure Installation Manual provided by the IT enclosure vendor. Store existing rear door, hinges and door latch for possible future use.
4. Attach the Transition Frame (if required) as described in the *Transition Frame Installation Guide*.
5. If a Transition Frame is not required, install the RDHx hinges on the IT enclosure rear frame using the 4mm hex key as shown below.



6. Using the lift handles, place the RDHx so that the hinge pins are aligned with the hinge mounting holes in the door assembly. Slowly lower the RDHx door assembly onto both hinge pins until the pins are fully engaged in the RDHx door assembly.

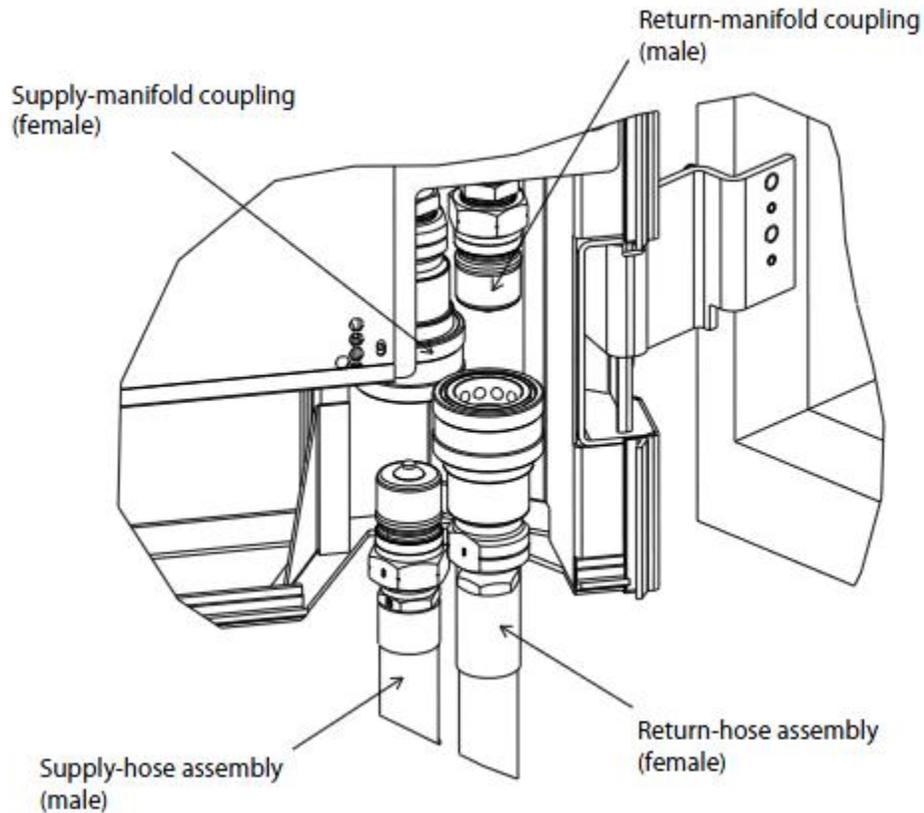


Caution: It is recommended that two people perform the attachment of the RDHx to the hinges to prevent the RDHx from falling down.



Connecting the Water Supply

To connect the chilled water supply to the RDHx, complete the following steps:



1. Open the RDHx to 90°.
2. If the IT enclosure is on a raised floor, remove the raised floor tile that the supply and return water hoses will pass through and pull the hoses up to provide slack.

Note: It is recommended that hose cut-out in the raised floor tile should be on the tile edge so that the tile can be removed without having to disconnect the hoses. If this is not possible, then a hose cut-out must be made in the interior of the raised floor tile. The raised floor tile will remain in place and the supply and return hoses must be routed through the hose cut-out in the interior of the raised floor tile before attaching to the RDHx.



Caution: When using the External Right Angle Hose Kits to pass the hose under the enclosure frame the clearance between the bottom of the RDHx and the floor must be at least 2.125" (54mm).

3. Attach the male supply hose coupling to the female supply coupling on the RDHx. To attach the supply hose, complete the following steps:

- a. Align the male supply hose coupling with the female supply coupling on the RDHx.

Note: If you misalign the couplings, it will be difficult to connect the hose.

- b. Move the collar on the female coupling on the RDHx upward.
- c. Insert the male supply hose coupling. Exert upward pressure until the female collar moves downward and locks in place with an audible click.

Note: After the couplings are engaged but before the collar has locked into place, you can let go of the collar and use both hands to push the hose upward to lock the couplings.

4. Attach the female return hose coupling to the male coupling on the RDHx. To attach the return hose, complete the following steps:

- a. Align the female return hose coupling with the male return coupling on the RDHx.

Note: If you misalign the couplings, it will be difficult to connect the hose.

- b. Move the collar on the female return hose coupling downward and raise the female coupling to the male coupling on the RDHx.
- c. Exert upward pressure until the female collar moves upward and locks in place with an audible click.

Note: After the couplings are engaged but before the collar has locked into place, you can let go of the collar and use both hands to push the return hose upward to lock the couplings.

Filling the RDHx with Water

To fill the RDHx with water for the first time, complete the following steps.

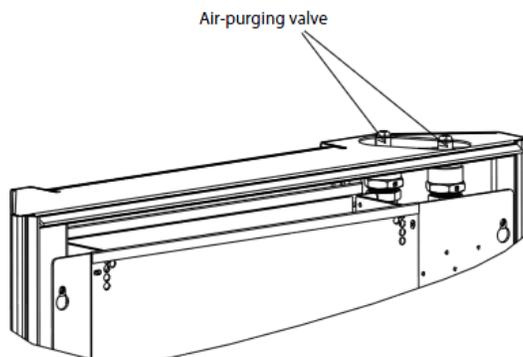


Caution: Wear safety goggles or other eye protection whenever filling, draining, or purging air from the RDHx.

1. Unscrew and retain the caps from both air-purging valves (on bottom feed models only).

Note: The valves are similar to the valves on bicycle tires. The following photo on the right shows the air-purging tool (sold separately) consisting of a long hose (72"/1840mm) and a short extension hose (6"/160mm).

2. Place one end of the long hose of the air-purging tool into a bucket to catch the water that escapes during the filling procedure.



3. Attach the other end of the long hose to the leftmost (supply) air-purging valve. As the air-purging tool is screwed onto the valve, air will begin to escape.

Note: The 6"/160mm extension hose is used for draining the RDHx; it is not required for this procedure.

4. Turn on the flow of water to the RDHx. Water that is mixed with air will begin to spit into the bucket when the RDHx coil is almost full.
5. When there is a steady stream of water from the air-purging tool into the bucket, unscrew the air-purging tool from the valve.

Attention: If water drips from the air-purging valve after you remove the air-purging tool, reattach the tool and disconnect it again to exercise and seat the seal.

6. With one end of the air-purging tool inside the bucket, attach the other end of the air-purging tool to the rightmost (return) air-purging valve. As the air-purging tool is screwed on to the valve, air will begin to escape. When there is a steady stream of water from the air-purging tool into the bucket, unscrew the air-purging tool from the valve.

Note: Water will spray or spit into the bucket during this procedure. If air remains in the coil it will cause a splashing or gurgling sound. Repeat the air-purging procedure on both valves if this sound is present.

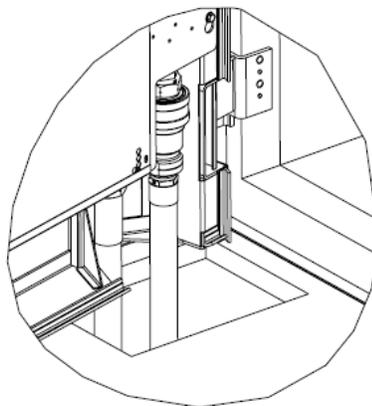
7. Feel the tops and bottoms of the RDHx manifold (the vertical copper supply and return pipes on the RDHx). If they are cool to the touch, the chilled water is flowing correctly through the RDHx.
8. Screw the valve caps onto the air-purging valves and hand-tighten them to provide a secondary seal.

Completing the Installation

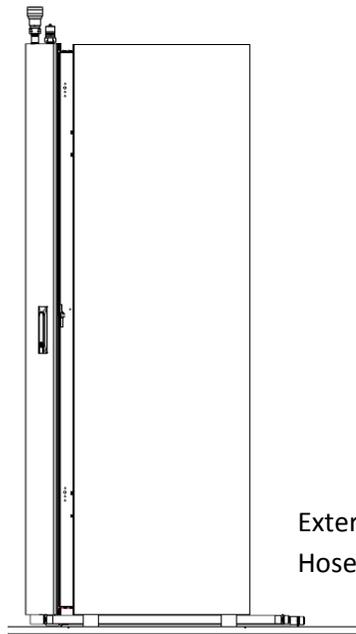
Complete the following steps:

1. Install the raised floor tile (on a raised floor) that was removed or route the hoses away from the IT enclosure (on a non-raised floor).
2. Close and latch the RDHx door.

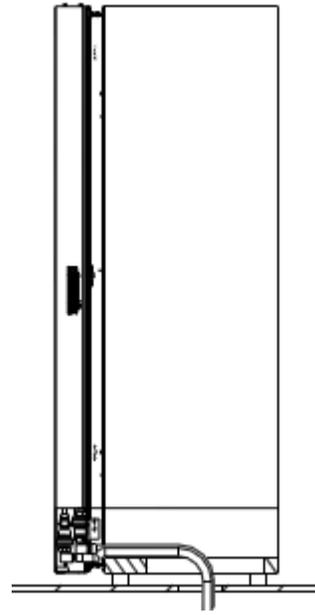
Note: If the IT Enclosure is on a non-raised floor, you might have to manually keep the hoses parallel and move them back into position as you close the door



Straight Angle Hose Kit



External Right Angle
Hose Kit



Internal Right Angle
Hose Kit



Caution: When using the External Right Angle Hose Kits to pass the hose under the enclosure frame the clearance between the bottom of the RDHx/IT enclosure and the floor must be at least 2.125" (54mm).

3. Check the RDHx after several hours of operation. If there is a splashing or gurgling sound, repeat the air-purging procedure on both air purging valves (trapped air from the hoses might have migrated to the RDHx).
4. Check the RDHx for air in the coil again after one month of operation, to ensure that the RDHx is filled correctly.

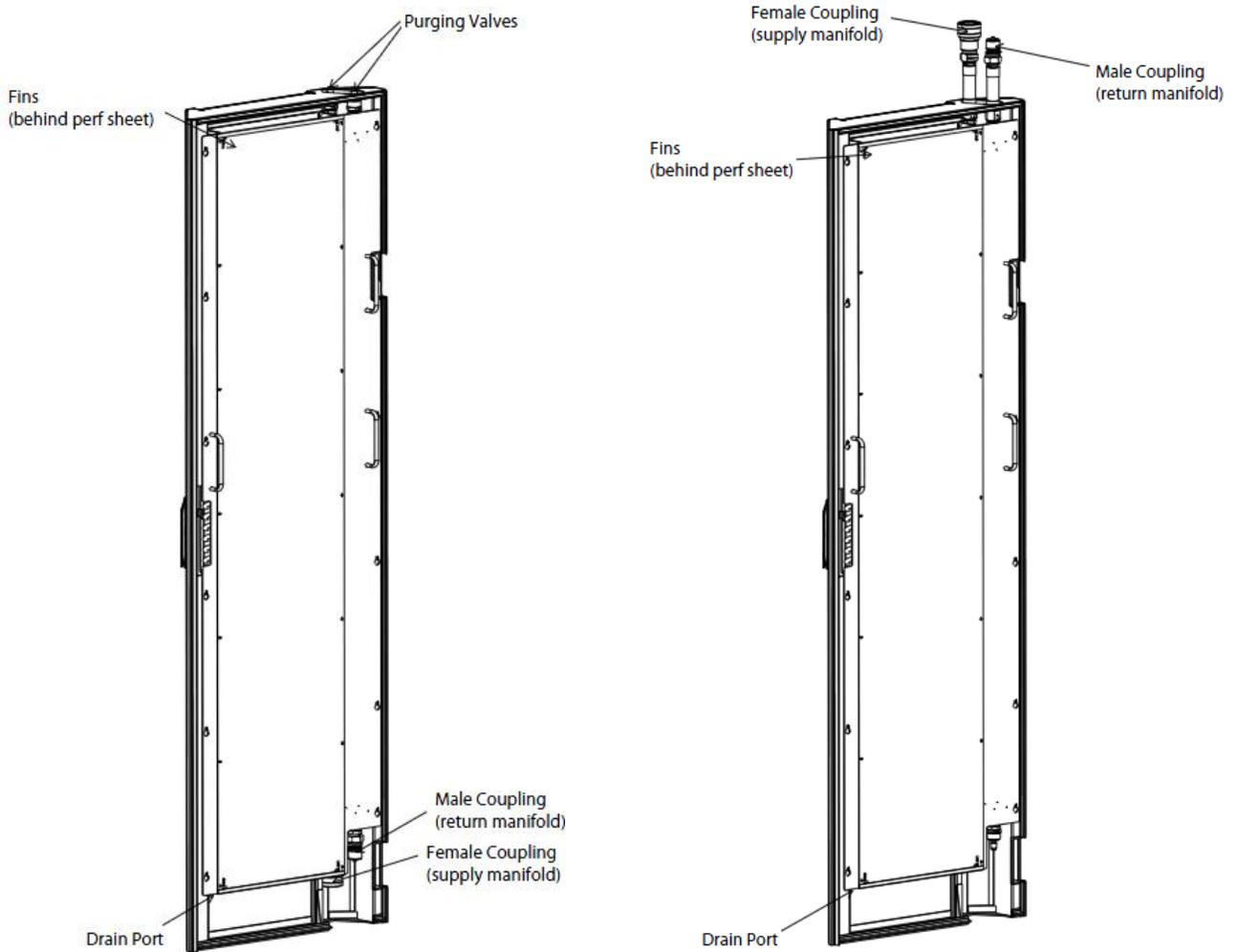
Airflow Management

IT enclosures should be configured to maximize the airflow through the RDHx. Exact configurations will vary based on selection of IT equipment, enclosure models and site specific conditions. Consult your enclosure supplier for further guidance on available accessories and best practices for enclosure-level airflow management. Optimal cooling performance can be achieved when industry accepted best practices are used such as the following:

1. Any open U spaces on the front mounting rails should be covered using horizontal blanking panels and any open spaces along the side of the front mounting rails (particularly in enclosures over 600mm/24" wide) should be covered using vertical blanking panels.
2. Side Panels or Divider Panels should be used on both sides of each enclosure to contain the exhaust air within each enclosure.
3. Solid Roof Panels and Bases should be used to contain the exhaust air within each enclosure. Any cable/cord penetrations should be blocked as much as possible using devices such as brush strips.
4. Any penetrations through raised floor tiles should use raised floor brush strip grommets to block as much of the opening as possible.

Chapter 3 – Maintenance Procedures

The following illustration shows the locations of components on the RDHx.



Note: Although the likelihood of water exposure is extremely small, you might prefer to place some water-absorbent material beneath the RDHx as a general practice when performing procedures on the RDHx.

Purging Air from the RDHx

Perform this procedure as part of regular maintenance and when you hear a splashing or gurgling sound from the manifolds.



Caution: Wear safety goggles or other eye protection whenever filling, draining, or purging air from the RDHx.

1. Unscrew and retain the caps from both air-purging valves (on bottom feed models only).

Note: The valves are similar to the valves on bicycle tires.

2. Place one end of the long hose of the air-purging tool into the bucket to catch the water that escapes during the purging procedure.
3. Attach the other end of the long hose to the leftmost (supply) air-purging valve. As the air-purging tool is screwed on to the valve, water that is mixed with air will begin to spit into the bucket.

Note: The 6"/160mm extension hose is used for draining the RDHx; it is not required for this procedure.

4. When there is a steady stream of water from the air-purging tool into the bucket, unscrew the air-purging tool from the valve.

Attention: If water drips from the air-purging valve after you remove the air-purging tool, reattach the tool and disconnect it again to exercise and seat the seal.

5. With one end of the air-purging tool inside the bucket, attach the other end of the air-purging tool to the rightmost (return) air-purging valve. As the air-purging tool is screwed on to the valve, water that is mixed with air will begin to spit into the bucket. When there is a steady stream of water from the air-purging tool into the bucket, unscrew the air-purging tool from the valve.

Note: Air in a coil causes a splashing or gurgling sound. Repeat the air-purging procedure on both valves if this sound is present.

6. Screw the valve caps onto the air-purging valves and hand-tighten them to provide a secondary seal.

Draining the RDHX

Perform this procedure before having the RDHx removed from the IT enclosure or when directed to do so by Coolcentric Professional Services. The drain port is at the bottom of the RDHx, near the supply and return couplings (see illustration above).



Caution: Wear safety goggles or other eye protection whenever filling, draining, or purging air from the RDHx.

Note: Although the likelihood of water exposure is extremely small, you might prefer to place some water-absorbent material beneath the RDHx as a general practice when draining the RDHx.

To drain water from the RDHx, complete the following steps.

1. Shut off the flow of water to the RDHx at the source.

Note: Depending on your facility, this might mean turning off the CDU unit, closing a valve at the CDU unit, or a similar action.

2. Open the RDHx door assembly to 90°.
3. Disconnect the return hose and the supply hose from the RDHx and move them out of the way.
4. Remove the valve caps from the air-purging valves (on bottom feed models only) and from the drain port.
5. Place one end of the long hose of the air-purging tool into a bucket (minimum 1.5 gallons / 5.7 liters capacity) to catch the water that escapes during the draining procedure.
6. Attach the other end of the long hose to the drain port. As the air-purging tool is screwed on to the port, water that is mixed with air will begin to spit into the bucket.
7. Attach the 6"/160mm extension hose to one of the air-purging valves at the top of the RDHx (on bottom feed models only) to allow air to enter the manifolds.

Note: Instead of using the 6"/160mm extension hose, if filtered and oil-free compressed air is available, you can attach the compressed-air hose to the air-purging valve to force water out of the RDHx. Keep the air pressure at 50 psi (3.4 Bar) or less to avoid excessive spray at the drain port.

8. When the water flow at the drain port stops, move the 6"/160mm extension hose or compressed-air hose to the other air-purging valve (on bottom feed models only) and repeat the process.
9. When the water has drained completely from the coil, complete the following steps:
 - a. Remove the 6"/160mm extension hose or compressed-air hose from the air-purging valve.
 - b. Remove the long hose from the drain port.
 - c. Screw the valve caps onto the air-purging valves (on bottom feed models only) and drain port valve and hand-tighten them to provide a secondary seal.

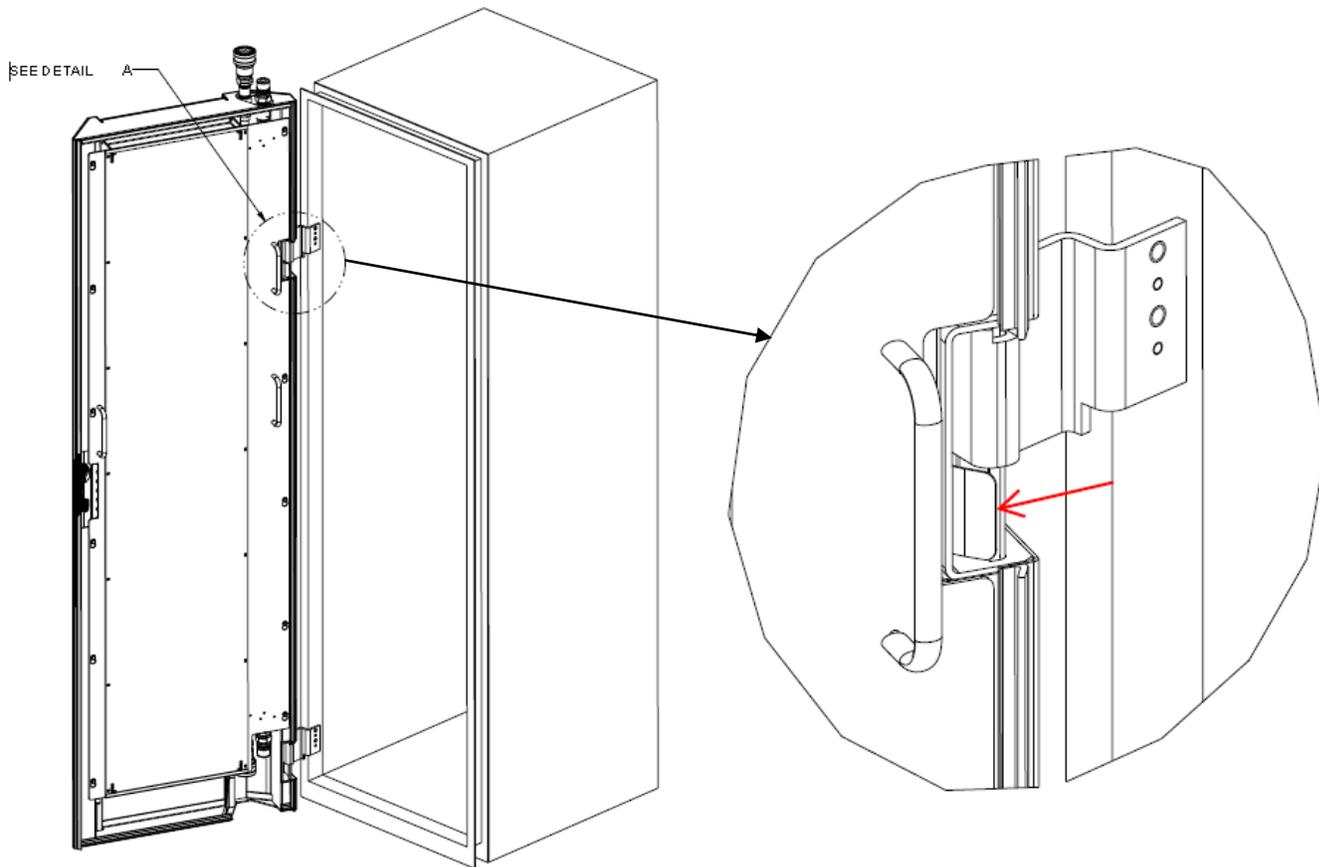
Removing the RDHX

Perform this procedure before having the RDHx removed from the IT enclosure or when directed to do so by Coolcentric Professional Services.



Caution: It is recommended that two people perform the attachment of the RDHx to the hinges to prevent the RDHx from falling down.

1. While the RDHx can be removed from the IT enclosure when filled with water, it is recommended to drain water from the RDHx as described in the section above before removing the RDHx.
2. Open the RDHx door assembly to 90°.
3. Disconnect the return hose and the supply hose from the RDHx and move them out of the way.
4. The hinge retention spring in the top hinge pocket on the RDHx door assembly must be depressed toward the lifting handle to allow the RDHx door assembly to be lifted off the hinges. While grasping two lifting handles use one your finger to pull the spring toward the lifting handle.
5. Gently lift the RDHx door assembly up making sure the hinge retention spring clears the upper hinge. Continue to lift the RDHx door assembly up until the door assembly has cleared the hinge pins and the door assembly can be physically removed.
6. It is recommended to store the RDHx on its back for stability.



Maintenance Schedule

Perform the following maintenance tasks at the indicated intervals.

Task	Frequency
Inspect the RDHx coil fins for blockage (from dust, dirt, debris, etc.)	Annually
Check the coil for temperature (make sure that the top of the coil is cool) and sounds of air in the system, to ensure that the RDHx is filled correctly.	One month after installation and then annually
Inspect the entire length of the supply hose and return hose for damage, age cracks, and kinks. Be sure to inspect the door and outside of the IT enclosure for any signs of damage.	Annually

Technical Support and Service

To obtain technical support or service please contact Coolcentric Corp directly at:

Toll-free (US/Canada): +1 877.248.3883

DDI: +1 508.203.4690

Email: support@coolcentric.com

Coolcentric Limited Product and Service Warranty

To obtain a copy of Coolcentric's Limited Product and Service Warranty:

Call Toll-free (US/Canada): +1 877.248.3883

Call DDI: +1 508.203.4690

Visit: www.coolcentric.com/information/documentation/warranty