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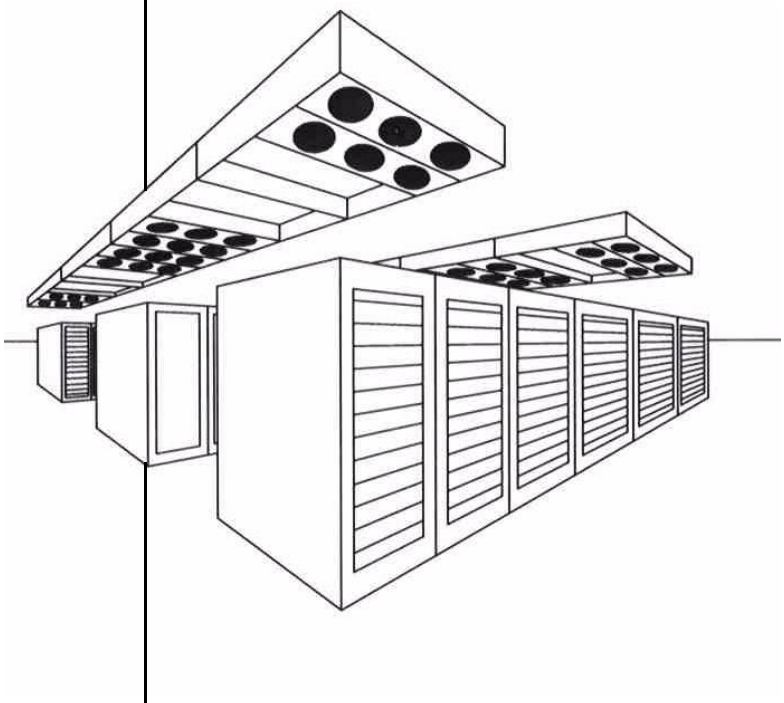
ENVIRONMENTAL PROTECTION

DataCool

INSTALLATION, OPERATION & MAINTENANCE



20 kW Nominal Capacity

EMERSON

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1.0 INSTALLATION

1.1 References

This document shall be used together with site specific documentation and documentation for other parts of the system.

1.2 General Safety Guidelines

NOTE
Follow all local codes.

CAUTION
Before installing DataCool fan coils, determine if any building alterations are required to run piping and wiring and verify that the roof structure can support the weight of DataCool units and supporting hardware.

CAUTION
System contains hazardous electrical voltage. Disconnect all power before working within.

NOTE
Carefully follow all unit dimensional drawings and refer to the submittal engineering drawings of individual units for proper clearances.

1.3 Pre-Installation Checks

Before proceeding with installation of the DataCool, read the instructions and verify that all parts are included.

Parts included with DataCool:

- Installation manual (this document)
- DataCool module
- Fan Trays [2 total]
- Parts bag including:
- Mounting kit

1. 2. Verify that the DataCool unit voltage matches the available utility power. The nameplate with this information is located on the bottom of the cooling module.
2. Check the received materials to be sure all required assemblies and parts have been received. If you discover any external damages, report them to the shipping company and your local Liebert representative.
3. When unpacking and handling the DataCool module, extra care should be taken to prevent damage to the coil.

1.4 Installation considerations

The DataCool module is to be securely mounted to the roof structure. It is typically located two (2) to three (3) feet above the heat-dissipating equipment. A suspended ceiling, if one exists, should be located at the same level as the DataCool unit.

Table 1 Application limits

Input Voltage		Range of Return Air Conditions to Unit	
Min	Max	Dry Bulb Temp.	Relative Humidity
-5%	+10%	65° to 85°F (18° to 29°C)	20% to 80%

1.4.1 Room Preparation

The room should be well insulated and must have a sealed vapor barrier. The vapor barrier in the ceiling and walls can be a polyethylene film. Paint on concrete walls and floors should contain either rubber or plastic.

NOTE
The single most important requirement for maintaining environmental control in the conditioned room is the vapor barrier.

Outside or fresh air should be kept to a minimum when tight temperature and humidity control is required. Outside air adds to the cooling, heating, dehumidifying and humidifying loads of the site. Doors should be properly sealed to minimize leaks and should not contain ventilation grilles.

2.0 GENERAL PRODUCT INFORMATION

2.1 Product/System Description

The Liebert DataCool is an overhead cooling system designed to be installed above heat dissipating equipment. Two (2) fan trays draw hot air exhausted from the equipment through a cooling coil and discharge cool air back down to the equipment, see **Figure 1** below. The system consists of DataCool fan coils, Coolant Distribution Units, power and signal cabling and interconnecting piping, see **Figure 1** below. The DataCool fan coil can be equipped with an optional air filter.

A coolant distribution unit (CDU) controls the fluid temperature for up to five (5) DataCool units, preventing the water temperature from causing coil condensation. Each CDU is rated for 100 kw (341,300 BTUHs) of cooling, and each DataCool unit is rated for 20 kw (68,260 BTUHs).

The control in the CDU monitors room conditions and controls the leaving water temperature to always be above the room dew point, to prevent coil condensation. If a leak is detected, an internal purge system instantly pumps fluid to a drain.

Figure 1 Generic air flow schematic

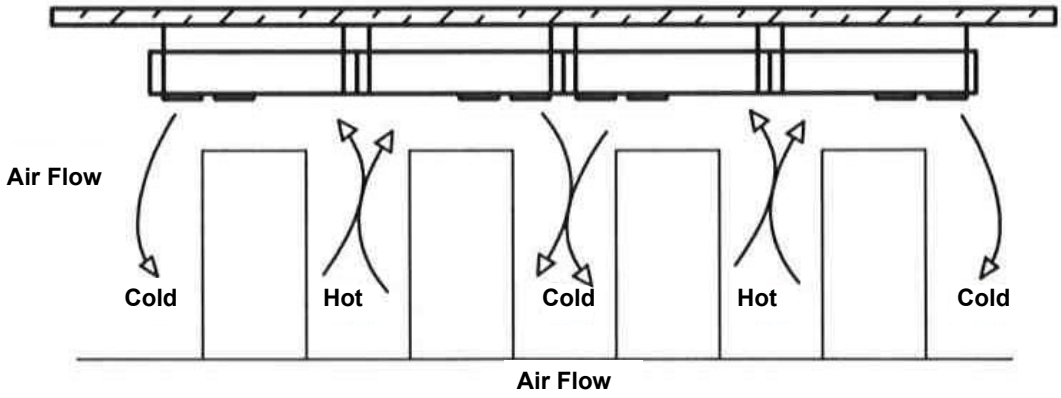


Figure 2 Generic piping schematic

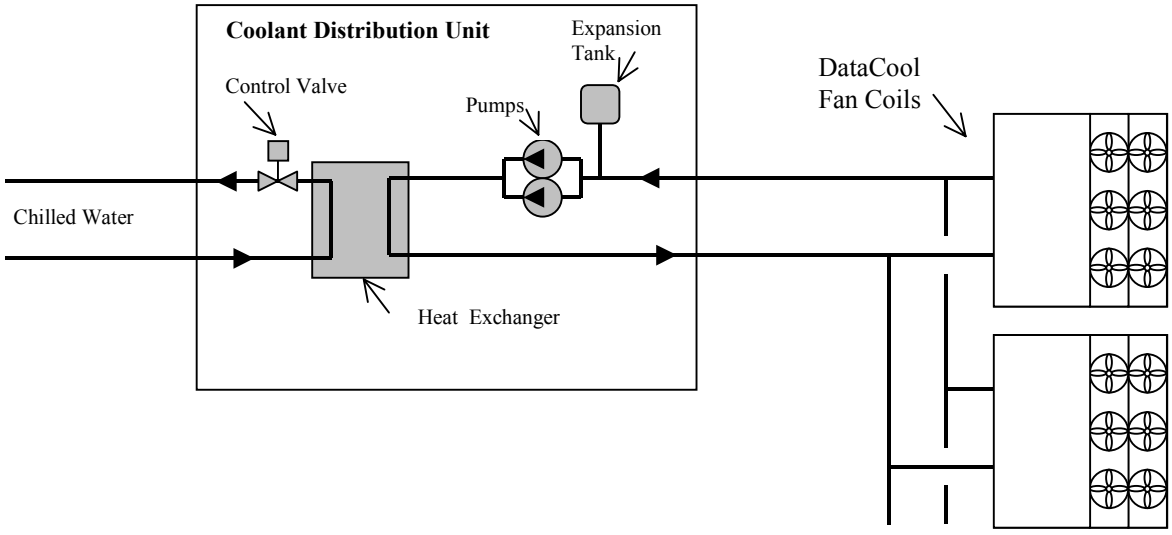
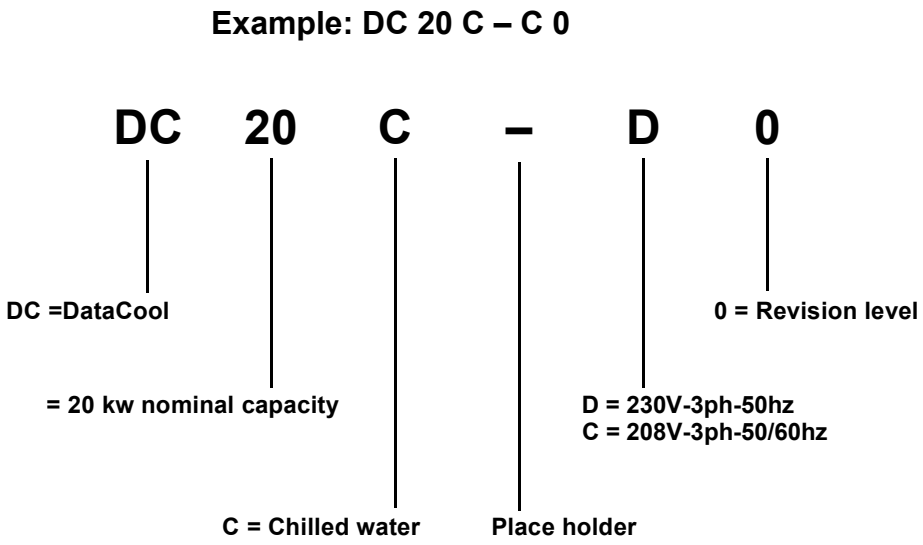


Figure 3 DataCool model number nomenclature



2.2 Checking and Unpacking

Check the received materials to be sure all required assemblies and parts have been received. If you discover any external damages, report them to the shipping company. If you later find any concealed damages, report it to the shipping company and your local Liebert representative.

When unpacking and handling the DataCool fan coil, extra care shall be taken so the fins on the coil are not damaged.

3.0 MECHANICAL CONSIDERATIONS

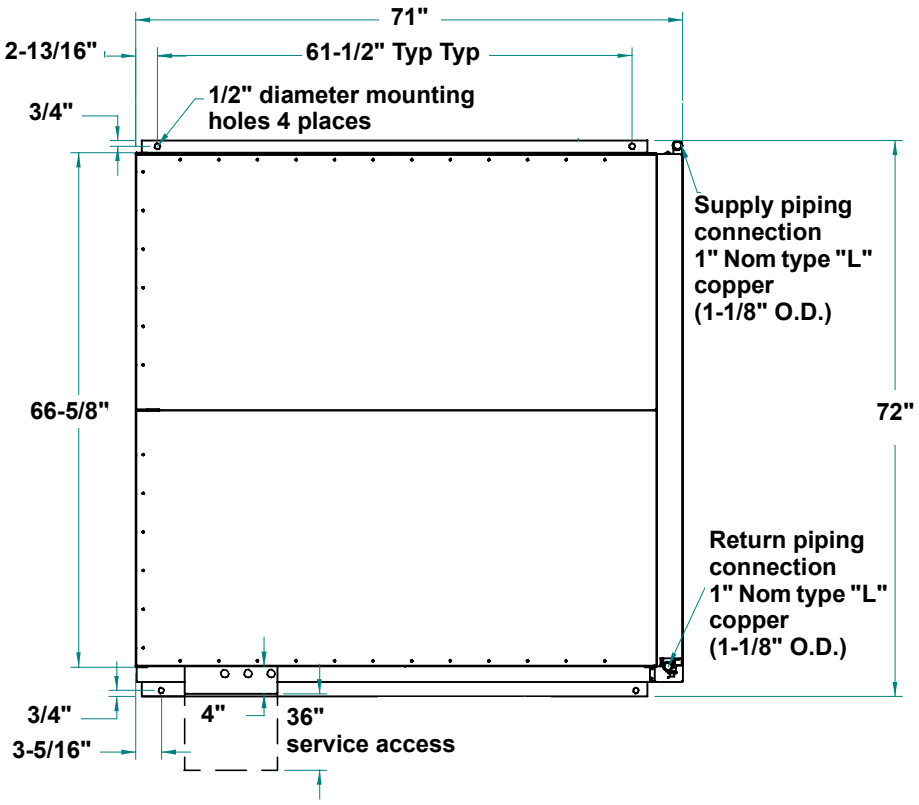
WARNING
BE SURE TO SECURELY ANCHOR THE TOP ENDS OF THE SUSPENSION RODS. MAKE SURE ALL NUTS ARE TIGHT.

3.1 Ceiling Preparation

The DataCool module must be securely mounted to the roof structure. The ceiling and ceiling supports of existing buildings may require reinforcements. Be sure to follow all applicable codes. Use field-supplied threaded suspension rods and 3/8"-16 factory hardware kit.

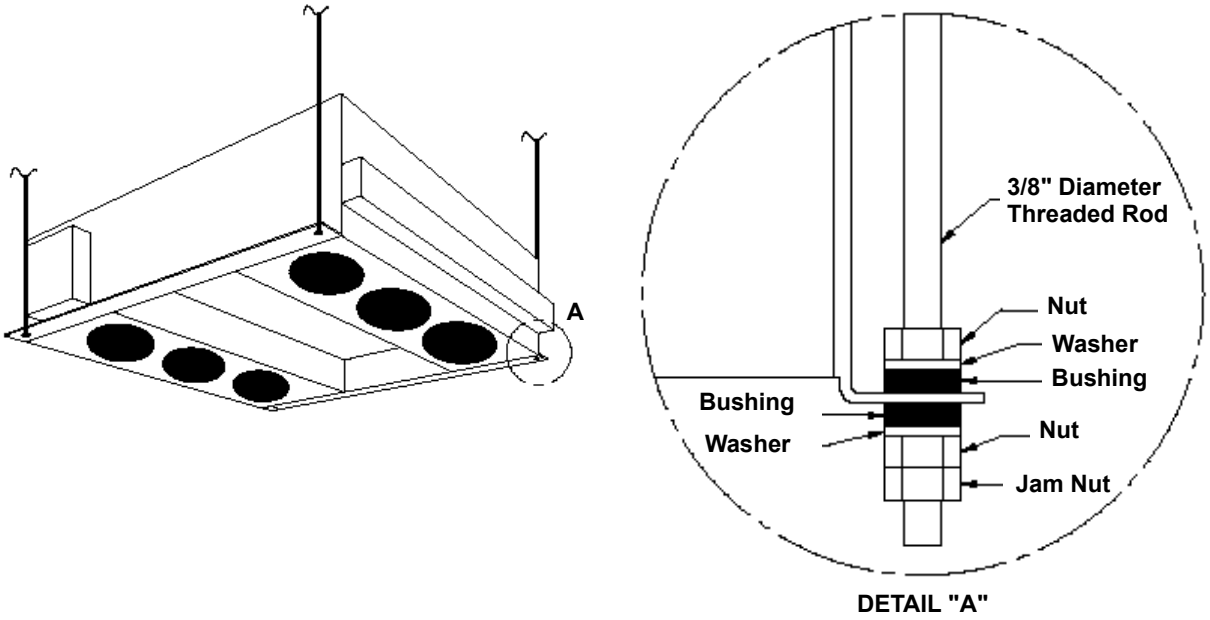
1. Install the four (4) field-supplied rods by suspending them from suitable building structural members. Locate the rods so that they will align with the four mounting holes in the flanges that are part of the unit base. See **Figure 4** below.

Figure 4 Mounting Hole Location Diagram



2. Using a suitable lifting device, raise the unit up and pass the threaded rods through the four(4) mounting holes in the flanges that are part of the unit base.
3. Attach the threaded rods to the unit flanges using the supplied nuts and grommets. See **Figure 5** below. The rubber grommets provide vibration isolation.

Figure 5 Threaded rod and hardware kit installation

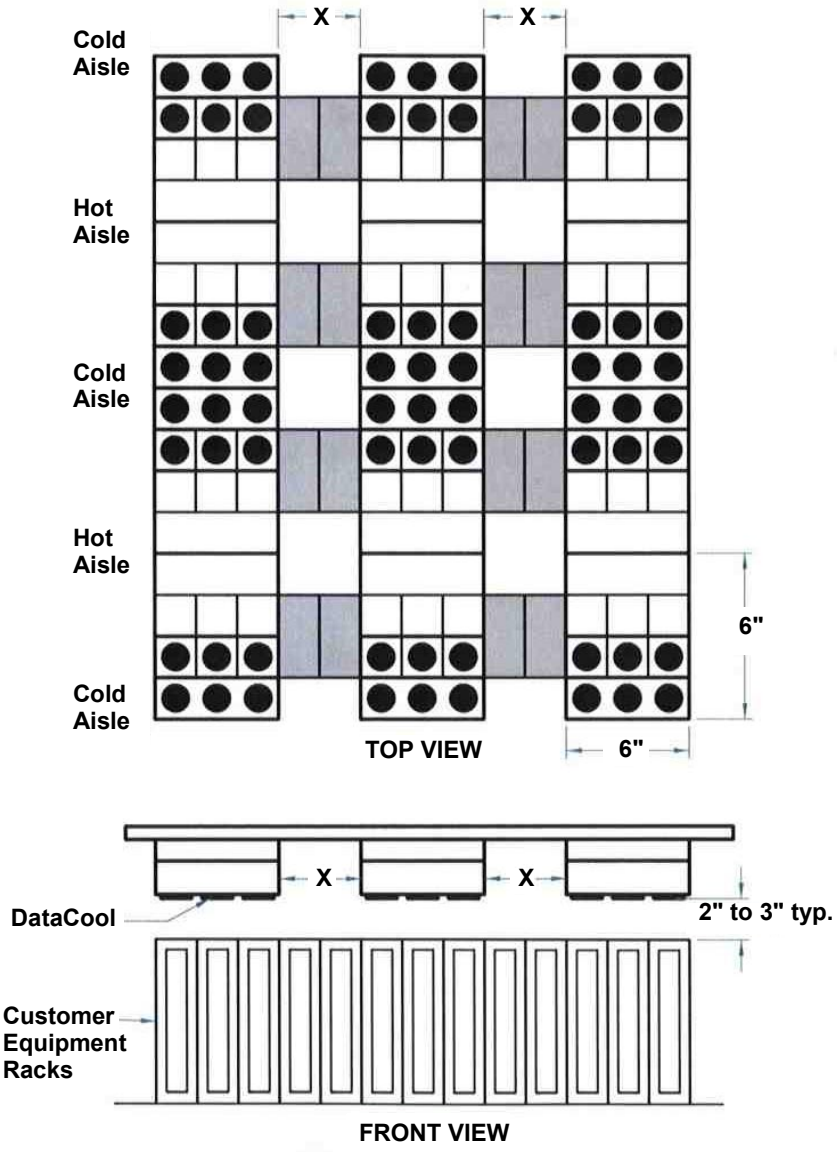


4. Use the plain nuts to hold the unit in place. Adjust these nuts so that the weight of the unit is supported evenly by the four (4) rods and unit is level.
5. Use the Nylock nuts to "jam" the plain nuts.

3.2 Locating in Ceiling, Spacing

The distances between the DataCool fan coils are determined by the heat density to be cooled. Refer to site-specfic drawings for actual spacing.

Figure 6 Typical spacing of DataCool units



3.3 Fan Tray Installation

WARNING
EACH DATACOOL FAN TRAY WEIGHS 45 LBS. BECAUSE OF THE WEIGHT AND THE DIMENSIONS OF EACH FAN TRAY, THE MANUFACTURER RECOMMENDS THAT TWO(2) OR MORE PEOPLE INSTALL THE FAN TRAY.

1. Remove fan tray installation panel on underside of DataCool unit.
2. Insert fan tray into opposite channel from the installation door on DataCool unit.
3. Rotate fan tray up and into the installation opening.
4. Carefully slide fan tray to the opposite end of the DataCool unit. Use caution when moving the fan tray on the channel, as it can easily become "wedged" in the channel.
5. Repeat steps 2 through 4, for the second fan tray.
6. Re-install the fan tray installation panel on underside of DataCool Unit.
7. After moving the fan trays to the desired location in the DataCool Unit, connect all power and control connections.

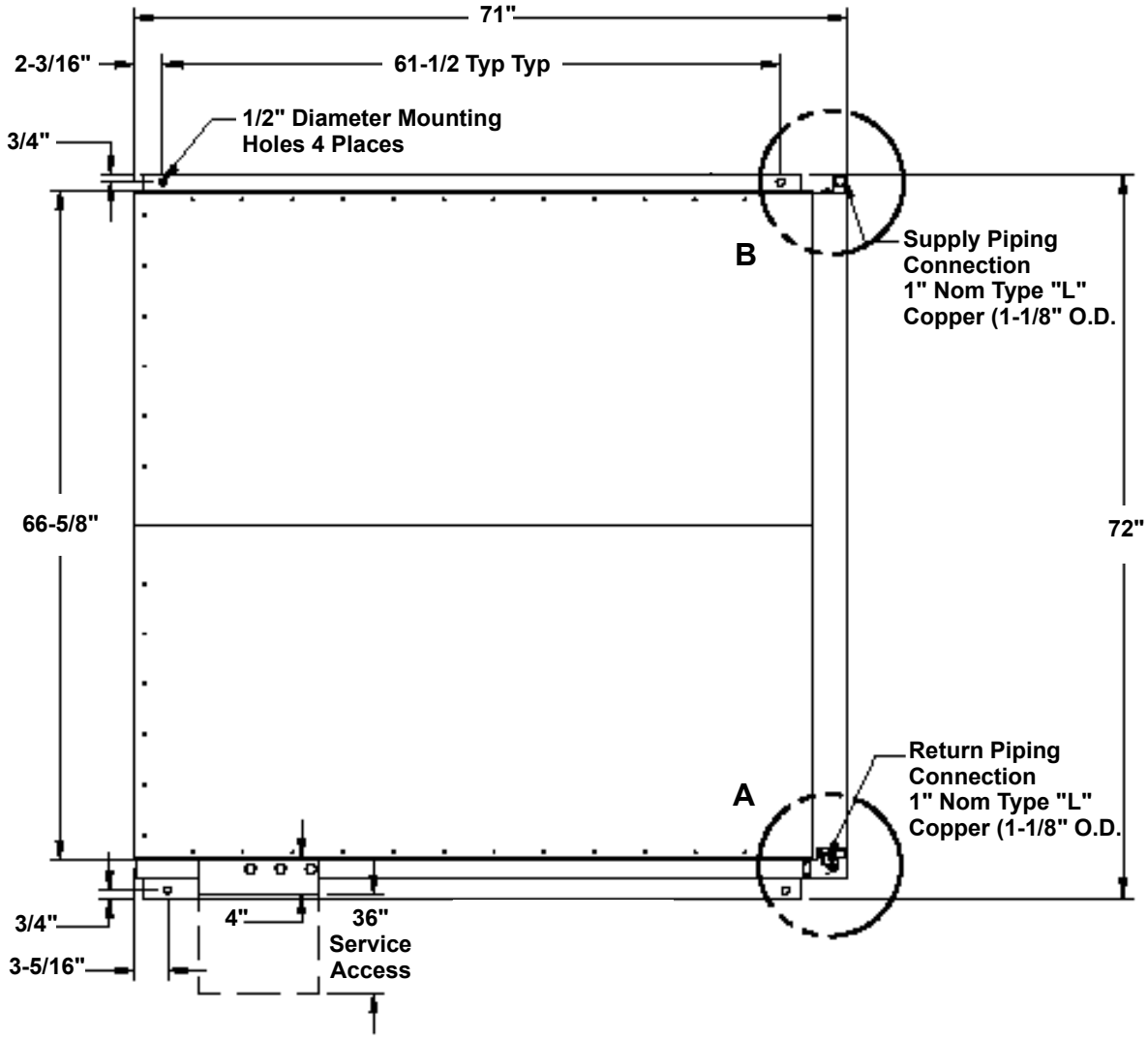
3.4 Weight and Dimensions

The DataCool fan coil's dimensions are 72" x 71" x 21-3/4" (1.83m x 1.8m x 0.55 m) and its weight is 30 lbs. (150 kg) dry and 350 lbs. (160 kg) filled. Refer to **Figure 7** for specific dimensions.

3.4.1 Weight Distribution

The weight is evenly distributed within the DataCool unit. However, the manifolds in the front of the unit and the actual position of the fan trays have an impact on the weight distribution.

Figure 7 DataCool dimensions, hole locations and connections



3.5 Leveling

To optimize the fluid management function, the DataCool fan coils must be mounted so the tray in the front of the unit below the header is 1/4" lower at the end where the level sensor is located.

3.6 Electrical

All power and control wiring and power connections must be in accordance with the National Electrical Code (NEC) and local codes. Refer to unit serial tag for electrical requirements.

CAUTION
USE COPPER WIRING ONLY. MAKE SURE THAT ALL CONNECTIONS ARE TIGHT.

Voltage supplied must agree with the voltage specified on the unit serial tag. If a field supplied disconnect is required, it may be bolted the DataCool module, but not to any of the removable panels. This would interfere with access to the unit. Make sure that the coil or any other water lines are not punctured when mounting the disconnect switch.

Route the electrical service conduit through the hole provided in the electrical box on the DataCool unit. Make connections at the factory terminal block or disconnect switch, L1, L2, L3. Connect earth ground to lug provided.

Table 2 Electrical data

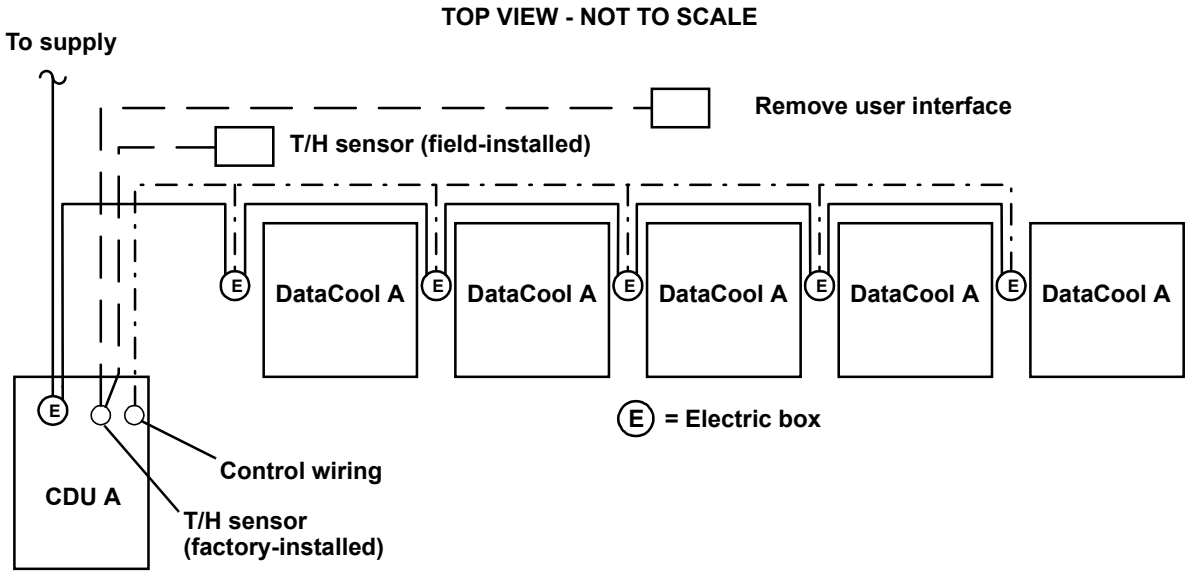
Model	Volts	Phase	Hz	FLA	WSA	OPD
DC20C-C0	208[1]	3	60	10.8	11.3	15
DC20C-D0	230[2]	3	60	9.4	9.9	15

Notes
1. 208V supply is “wye” connected, 4-wire plus ground
2. 230V supply is “delta” connected, 3-wire plus ground

3.6.1 High Voltage Connections

The DataCool fan coils can be powered with AC voltage from the CDU in the system (see **Figure 8** below) or from separate distribution panels.

Figure 8 DataCool Electrical Schematic



3.6.2 Low Voltage Connections

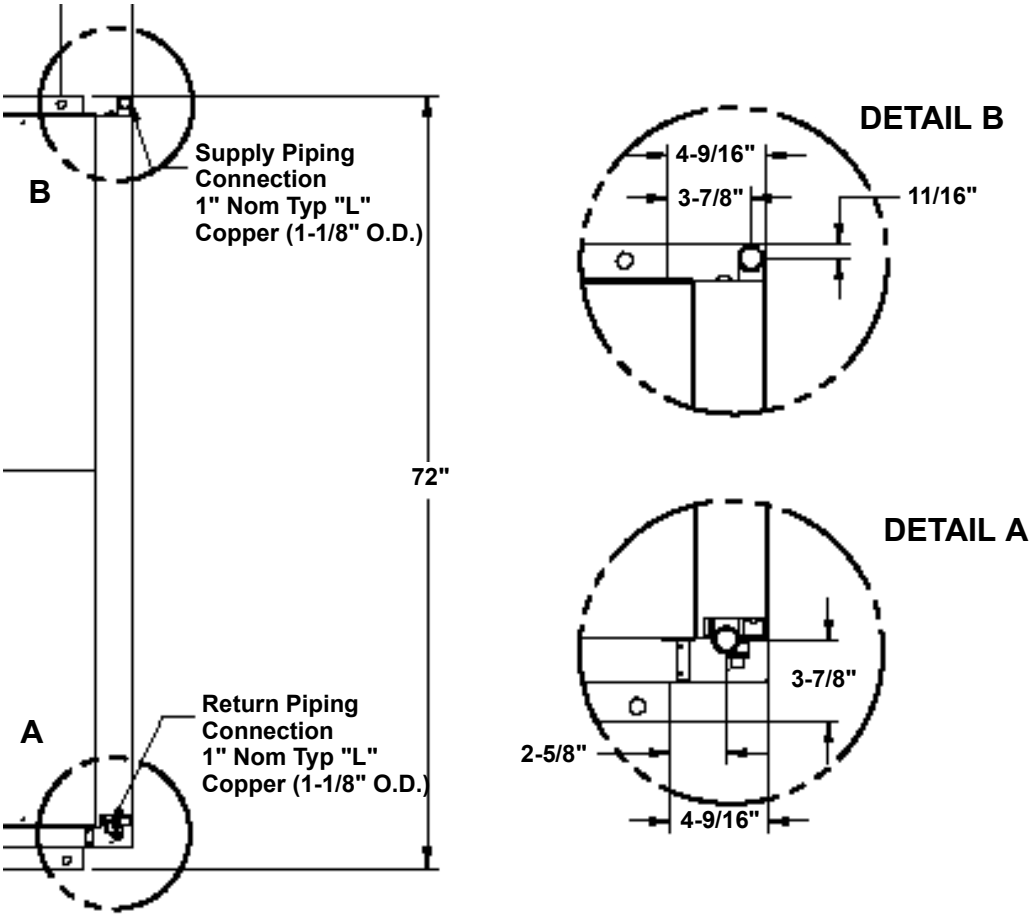
Connect cables for Low Voltage between the Electric box on the DataCool fan coil and the CDU. See **Figure 8** above.

3.7 Piping

3.7.1 Connection Sizes

Supply and return piping connections on the DataCool fan coil are 1" nom type “L” Copper (1-1/8" O.D.)

Figure 9 Piping connection sizes



3.7.2 Recommended Piping Size

Connect the main pipes between the DataCool branch piping and the CDU according to **Table 3**, below. Elbows and restrictions shall be minimized to get good fluid flow.

Branch piping between the main piping and the DataCool fan coil shall be 1-1/4" OD copper with the equivalent length not to exceed 20’ (6m).

Table 3 Supply and return requirements for DataCool loop

Nominal Pipe Size In (mm)	Maximum Total Equivalent Length Ft (m)	Piping Material
2.5 (64)	150 (23)	Type L Copper
3 (76)	300 (46)	Copper or Sch 40 Steel
3.5 (89)	600 (91)	Copper or Sch 40 Steel

3.8 Insulation

To avoid the risk of condensation, all piping between DataCool and the CDU that are not in a conditioned space shall be insulated.

3.9 System Schematic

If possible, the DataCool fan coils shall be connected to the CDU's in an interlaced configuration. However, in a system with just one CDU, the DataCool fan coils shall be connected to the CDU in a non-interlaced configuration. See **Figure 10** and **Figure 11** below.

Figure 10 Typical DataCool piping schematic—interlaced connection

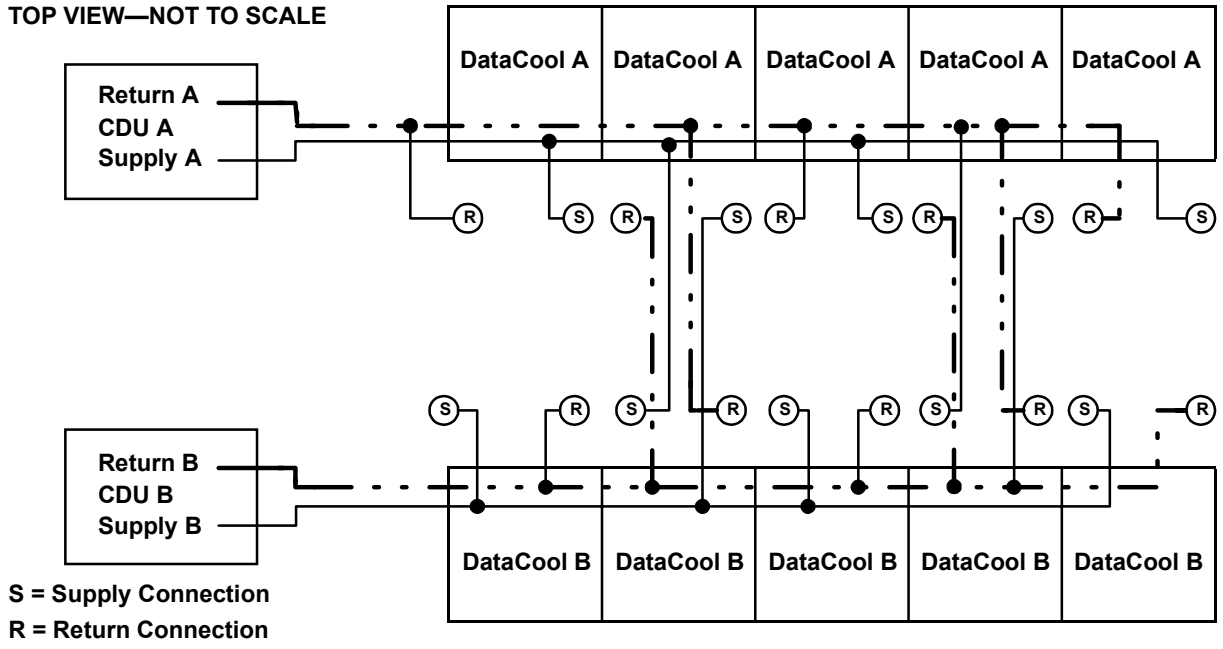
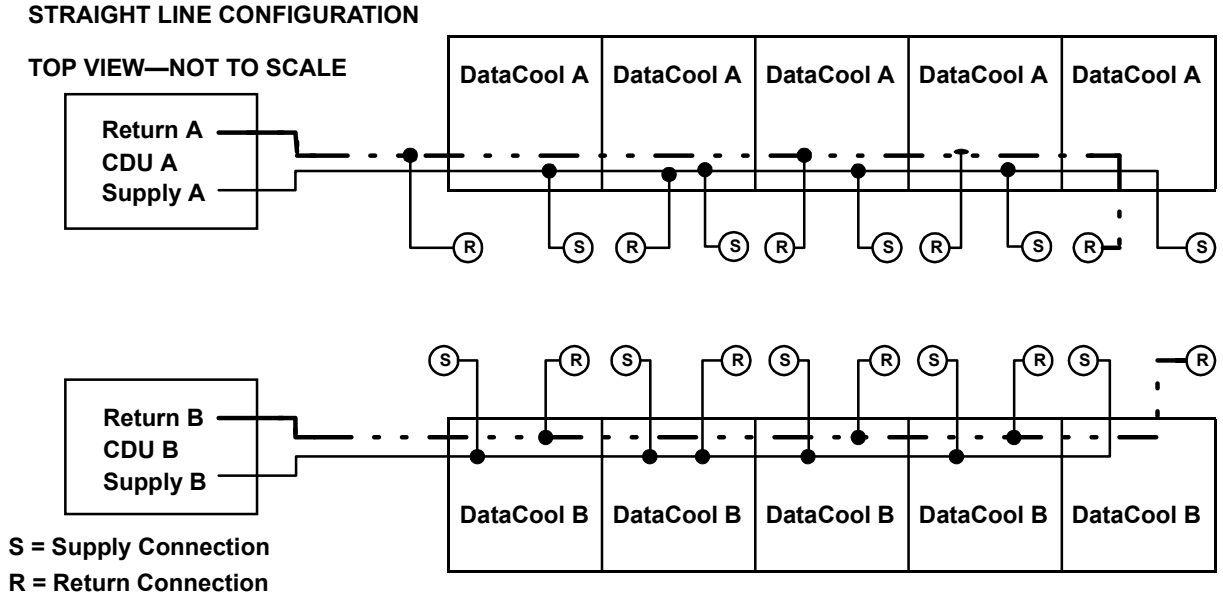


Figure 11 Typical DataCool piping schematic—non-interlaced connection

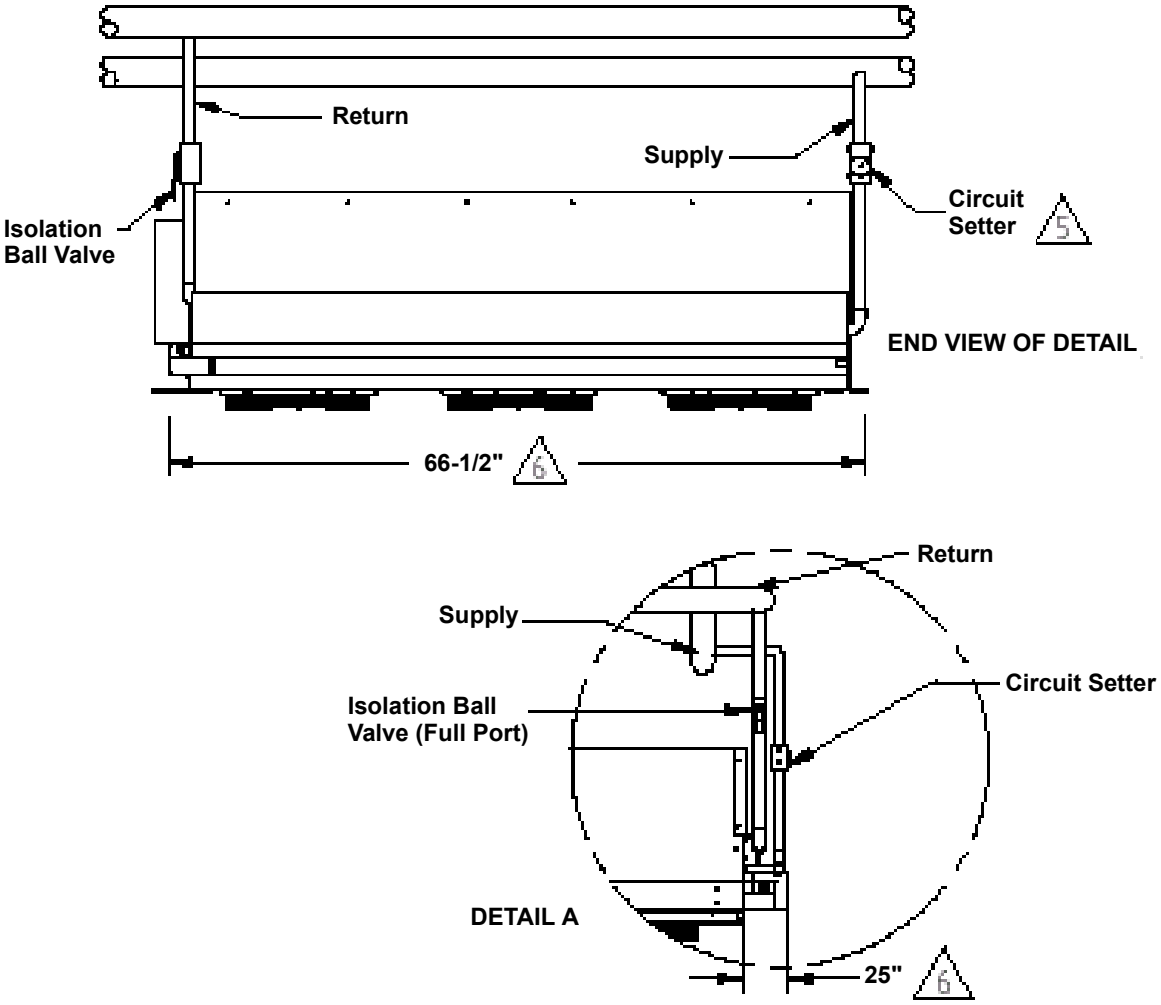


3.10 Piping Details - Shut-Off/Isolation Valves

To allow for flow adjustment and fluid isolation of each DataCool module, install a 1-1/4" circuit setter and a 1" full port isolation valve on each branch circuit, see **Figure 12** below.

Install one (1) 1-1/4" circuit setter per branch supply line. Use Bell & Gossett (or equivalent) type CB. Provide straight 1-1/4" pipe for 4" upstream and 2" downstream of each circuit.

Figure 12 Piping details



3.11 Filling the System

- Use water hose to tap in to system in the CDU.
- Valve off system and fill in sections.
- Bleed air in the high points of the piping system.
- If inhibitors are not required to meet the water quality requirements, dye can be added to make it easier to check for leaks.

3.12 Pressure Test (AIR)

Disconnect the expansion tank and other sensitive components from the hydraulic circuit prior to pressure testing. If possible, valve off the system into sections and pressure test a section at a time.

Pressure test the piping system with 25 psi (1.7 bar) air for 30 minutes or according to local codes.

3.13 Pressure Test (Fluid)

Make sure that the expansion tank and other sensitive components are disconnected from the hydraulic circuit prior to pressure testing. If possible, valve off the system into sections and pressure test a section at a time.

Pressure test the piping system with water at 70 psi (4.7 bar) for 6 hours or according to local codes.

3.14 Checklist for Proper Installation

___ 1. Threaded rods installed in ceiling.

___ 2. DataCool module sectured on threaded rod using grommets, washers and nuts.

___ 3. DataCool module level, with header-end 1/4" lower.

___ 4. High voltage wiring to DataCool module.

___ 5. Low voltage wiring to DataCool.

___ 6. Piping from CDU to DataCool, with isolation valves and circuit setter piped to each DataCool.

___ 7. Piping insulated.

___ 8. System filled with water and air purged from system.

___ 9. Pressure test system

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ENVIRONMENTAL PROTECTION

DataCool

INSTALLATION, OPERATION & MAINTENANCE MANUAL

The Company Behind the Products

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SL-16710 (9/01)

Technical Support

United States
1050 Dearborn Drive
P.O. Box 29186
Columbus, OH 43229
1-800-222-5877

Outside the United States
+614-888-0246

24 hours a day, 7 days a week
1-800-222-5877

3-Phase UPS
1-800-543-2778

Environmental Control
1-800-543-2778

Italy
Via Leonardo Da Vinci 8
Zona Industriale Tognana
35028 Piove Di Sacco (PD)
+39 049 9719 111
FAX: +39 049 5841 257

Asia
23F, Allied Kajima Bldg.
138 Gloucester Road
Wanchai
Hong Kong
+852 2 572 2201
FAX: +852 2 831 0114

Web Site
www.liebert.com

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