DIRECT COIL INC.

INNOVATIVE HEAT TRANSFER PRODUCTS

REFRIGERANT COILS

INSTALLATION AND OPERATING MANUAL

A SINGLE SOURCE FOR ALL YOUR COIL NEEDS AND CUSTOM ENGINEERED HEAT TRANSFER PRODUCTS

Contents

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www.directcoil.com

Introduction

Custom designed for specific use; Direct Coil takes pride in enabling customization from design to manufacture. Variations are offered in design, connections, casing, fins, circuitry and materials.

Extensively tested and sized using proprietary software, Direct Coil refrigerant coils are designed for comfort conditioning, heating and industrial applications.

Types

Direct Coil manufactures two varieties of refrigerant coils: expansion coils which expand liquid refrigerant and cool the airflow, and condensation coils, which work by condensing refrigerant and warming the airflow.

Most condenser coils resemble water coils, however expansion coils come with a single connection and a distributor valve with copper pipes that feed the coil.

Features

A refrigerant coil has five main features:

- Connections
- Casing
- Fins
- Headers
- Distributor(s) (only direct expansion coils)

Nomenclature

Any coil is designated a standard Direct Coil model number.

Ex., 5DC-02-30.0-08-45.0-20

5 ➔ Tube OD

This parameter is codified by the following table

Figure 1 - Handing and Header Location

Number	Tube OD	Tube Pattern
2	5/16	1.00 X 0.625
1	**3/8**	1.00 X **0.750**
3	3/8	1.00 X 0.866
6	**3/8**	1.25 X **1.083**
4	1/2	1.25 X 1.083
7	**1/2**	1.50 X **1.299**
5	5/8	1.50 X 1.299

DC → Coil type (DC for condenser coil/DX for expansion coil)

02 → Rows

30.0 → Fin height (FH)

08 → Fins per inch (FPI)

45.0 → Fin length (FL)

20 → Number of Feeds

Drawings

Figure 1 - Right Handed Coil

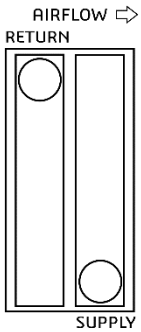
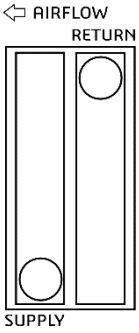
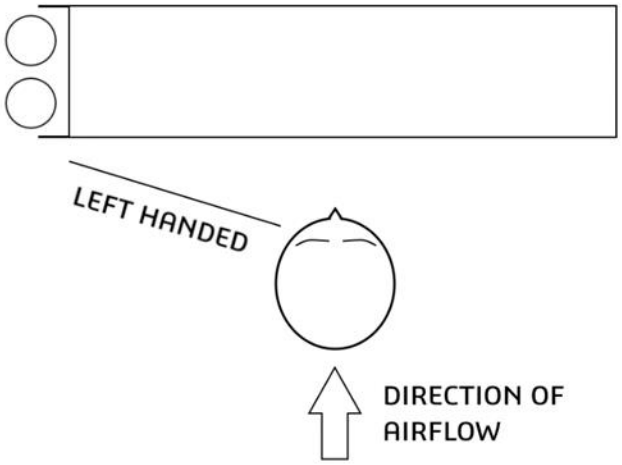


Figure 2 - Left Handed Coil



The arrow on the top of the view indicates both the direction of airflow, and the handing of the coil.

Another way of determining the coil handing is to consider where the headers would be if one was looking at the coil with the airflow hitting the back of his or her head.



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Installation

Receiving

1. The coils should be carefully inspected for shipping damage upon receipt
2. The freight BOL should also be checked against items received for complete delivery
3. Any shortage or damage should be noted on the delivery receipt; doing this lets the courier know that you intend to file a claim

If any shortage or damage is discovered after unpacking the unit, call the courier for a concealed damage or shortage inspection. For additional assistance, contact your Direct Coil representative.

Installation

1. Remove the coil from the shipping container and avoid damaging the fins. Any bends can be straightened using the appropriate equipment
2. It is recommended to clean the coil using an industrial coil cleaner before installation
3. The DX coil(s) should be mounted level, with tubes in a horizontal orientation. Airflow can be horizontal or vertical
4. The distributor should be inspected to verify that the nozzle is in place
5. Proper functioning of the thermostatic expansion valve function is critical for DX coil performance. It is recommended to carefully follow the TXV manufacturer's instructions when installing the valve
6. The suction line should be connected to the suction connection, and liquid to the expansion valve. Connecting in any other configuration will impact performance
7. Ensure that clearance is given between the coil and any surrounding structures
8. The coil should be completely leak free prior to commissioning. Pressure test the coil, expansion valve assembly and suction connection to 100 psi with dry nitrogen
9. The coil should be left pressurized for a minimum of 30 minutes with no loss of pressure. Thoroughly leak test the coil and system including all brazed joints
10. It is important follow proper methods for evacuating and charging systems with refrigerant. Use the compressor manufacturer's recommendations for charging the system with refrigerant and starting the compressor. After the system is started, adjust TXV superheat following TXV manufacturer's directions

All pipe brazing must be done using high quality materials and must be tested for leaks. Pipe sizes for the system must be selected based on the head (pressure) available from the circulation pump. Ensure that the drainpipe is sized adequately.

Recommendations

1. Refrigerant piping must be done in accordance with all applicable national and local codes, and with accepted industry standards

Lifting Instructions

When lifting a coil, one should ensure that proper precautions are taken, including:

- Wearing safety equipment, such as hard-toe shoes
- Safety gloves

One should also lift while maintaining proper posture, as refrigerant coils are heavy and improper procedure could cause harm.

NEVER LIFT A COIL BY THE HEADER, CIRCUITS, OR CONNECTIONS.

1. Any coil that is 45 pounds or heavier will have two removeable lifting brackets. Use only these when lifting the coil
2. When lifting a coil, lifting should be done by the legs and the coil kept close to the center of gravity
3. If the coil is too heavy, find help and perform an assisted lift

Piping

This section is a guide for the correct installation of the refrigerant fluid piping system; however, Direct Coil is not responsible for the installation of the piping.

1. After both lines are connected, the entire system must be leak tested (see 'First Use'). Care should be given to those parts which will be inaccessible in future dates.
2. The header, pipes, and brazed joints should not be used to support any loads or weight
3. Ensure that all field piping is self-supporting and can accommodate thermal expansion and contraction (of the coil)

All piping must be installed only by a licensed plumbing contractor, and in compliance with local codes. It is the responsibility of the engineer and/or the piping contractor to ensure that the piping is correctly sized in relation to the installation.

Operation and Maintenance

First Use

Air Distribution

1. Uniform air flow is crucial to coil performance and should not vary significantly across the coil face
2. Air velocities should be maintained between 200 and 550 feet per minute without a mist eliminator and between 200 and 700 feet per minute with a mist eliminator
3. The drain pan should be designed and installed such that there is no standing water
4. The maximum operating temperature is 350°F for any Direct Coil coils

Filters

Filters upstream of the coil should be checked regularly for dirt and clogging. If the filters are dirty, they should be cleaned or replaced. It is important that the coils be clean to maintain maximum heat transfer capability.

Cleaning

1. Coils must be cleaned periodically to obtain maximum performance. Soiled fins reduce the capacity of the coil, and demand more energy from the fan
2. Periodic inspection of the coil for signs of damage, leaks or corrosion is also recommended. Any repair or replacement of parts should be performed by a qualified professional.
3. Any fluid passing through the coil should be free of any sort of contaminants. Periodic testing and correction will enable the coil to last longer.
4. Fins can be cleaned using spray washers or using commercial cleaners. Care must be taken not to damage the coils and to not allow water to touch any electrical equipment. However, caution should be exercised when working with the fins as the sharp edges can cause serious personal injury.
5. When the coil surface itself needs cleaning, ensure an appropriate solution and equipment are selected to avoid damage to the coil and/or enabling any health hazards. Cleaning should be done inwards from the airflow exit so any contaminant will later be pushed out of the coil. Follow the manufacturer's instructions with any cleaning solution or equipment

Warranty

Direct Coil Inc. warrants to its direct purchasers that Products, including Service Parts, manufactured by the **Direct Coil Inc.** shall be free of defects in material or workmanship, under normal use and service for a period of one (1) year from date of original installation , or eighteen (18) months from date of shipment by Direct Coil, whichever first occurs. This warranty is not applicable if the purchaser has not fulfilled their payment obligations as per terms and conditions of sale.

Any Products covered by this warranty found to Direct Coil's satisfaction to be defective upon examination at Direct Coil's factory will at Direct Coil's option, be repaired or replaced and returned to Buyer via lowest common carrier, or Direct Coil may at its option grant Buyer a credit for the purchase price of the defective Product. Buyer must pay all costs for transportation of Products to Direct Coil's factory. The repair or replacement of such defects shall constitute full performance by Direct Coil of its obligations under this warranty. Product loss of any type is not covered. Refrigerant loss is not covered.

Direct Coil Inc. shall have no liability for expenses incurred for repairs made by Buyer except by prior, written authorization. Any claim under this warranty shall be made to Direct Coil in writing within the warranty period specified above otherwise such claim shall be deemed waived. In the event that parts of equipment have to be returned to the factory for repairs, return goods authorization number must be obtained by contacting sales department. No return goods shipment will be accepted without an authorization number.

Direct Coil Inc. shall have no warranty obligation whatsoever if its products have been subjected to alteration, misuse, negligence, free chemicals in system, corrosive atmosphere, accident, or if operation is contrary to Direct Coil's or manufacturer's recommendations, or if the serial number has been altered, defaced, or moved.

Direct Coil Inc. makes no warranty, express or implied, of fitness for any particular purpose, or of any other nature, with respect to products manufactured or sold by Direct Coil, except as specifically set forth above. No one is authorized to change this warranty or to create for on behalf of the Company any other obligation or liability in connection with the Products.

It is expressly understood and agreed that **Direct Coil Inc.** shall not be liable to buyer, or any customer of buyer, for direct or indirect, special, incidental, consequential or penal damages, or for any expenses incurred by reason of the use or misuse by buyer or third parties of the products.

All written correspondence is to be made to:

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