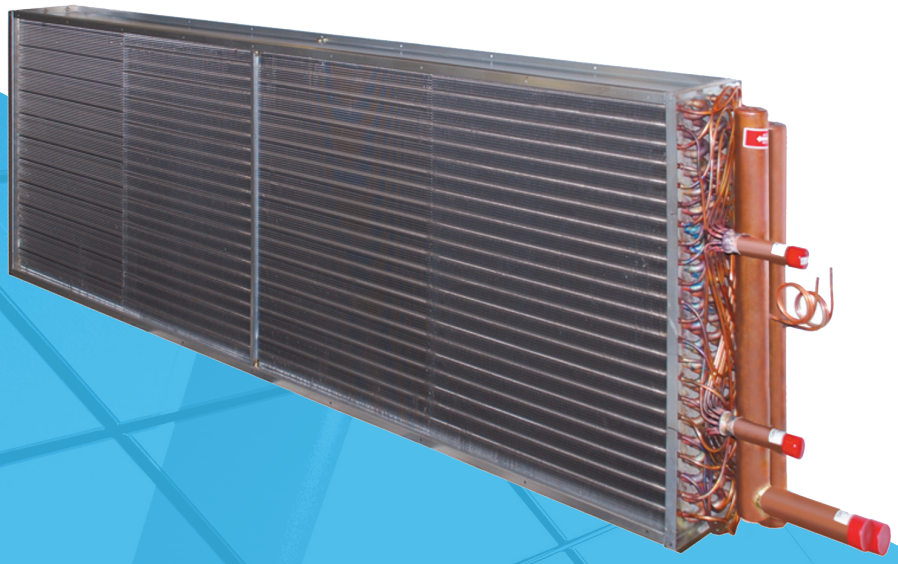
INSTALLATION, OPERATION & MAINTENANCE

IM 902-1

OCTOBER 2023

DIRECT EXPANSION (DX) COOLING COILS



- TYPES: EN, EF, ER, EJ, EK

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Introduction

General Information

Guidelines for the installation, operation and maintenance of Daikin Applied direct expansion (DX) cooling coils have been provided to help insure proper performance of the coils and their longevity. These are general guidelines that may have to be tailored to meet the specific requirements of any one job. As always, an experienced installation company or fully trained individual should perform the installation and maintenance of any coil. Protective equipment such as safety glasses, steel toe boots and gloves are recommended during the installation and routine maintenance of the coil.

Hazard Identification Information

⚠ DANGER

Dangers indicate a hazardous situation which will result in death or serious injury if not avoided.

⚠ WARNING

Warnings indicate potentially hazardous situations, which can result in property damage, severe personal injury, or death if not avoided.

⚠ CAUTION

Cautions indicate potentially hazardous situations, which can result in personal injury or equipment damage if not avoided.

Receiving Instructions

1. All Daikin Applied coils are factory tested at 315 psig minimum air pressure while submersed in water, inspected, and carefully packaged.
2. Damage to the coils can occur after they have left the factory. Therefore, the coils should be inspected for shipping damage upon receipt. The freight bill should also be checked against items received for complete delivery.
3. Damaged and/or missing items should be noted on the carrier's freight bill and signed by the driver.
4. For additional assistance, contact your local Daikin Applied sales representative.

Storage Instructions

1. Carefully remove all shipping wrap material and open the shipping crate. Inspect the coil for shipping damage and report it immediately if damage is found.
2. Cap the coil to protect coil openings from damage and infestation.
3. Re-crate the coil. Do not re-apply shipping wrap material.
4. Store the coil indoors in a clean, dry environment on a level surface. Ensure adequate support is used to prevent the coil from sagging, if raised.
5. Do not stack coils or store anything on top of the coil.
6. Isolate coil from shocks and vibrations, if necessary.
7. Do not clean galvanized steel surfaces with oil dissolving chemicals. This may remove the protective coating and accelerate corrosion.
8. Any damage to the coil resulting from improper storage will not be covered by Daikin Applied's warranty terms.

Coil Types

Model EN

This evaporator coil is used for applications where capacity control is not required. Single or multiple distributors are available depending on the number of circuits required. Model EN (see Figure 1 on page 4) evaporators utilize dual suction connections when multiple distributors are used.

Model EF

Face control (see Figure 1 on page 4) is another evaporator coil option offered. Face control is the simplest form of capacity control. These coils are normally furnished with two distributors and two suction connections offering 50% capacity reduction capabilities.

Model ER

Daikin Applied offers a row control option (see Figure 1 on page 4) for six row evaporator coils. These coils are split into two rows and four rows that offer approximately a 50% capacity reduction.

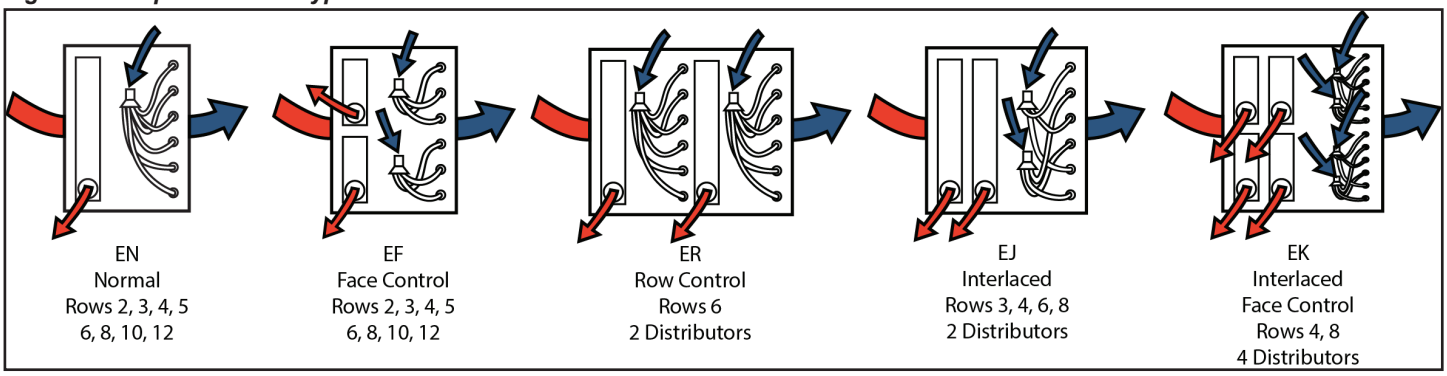
Model EJ

These evaporator coils (see Figure 1 on page 4) come with interlaced circuiting. This form of capacity control utilizes two distributors with each feeding every other tube in the first row of the coil. Each distributor has a separate suction connection.

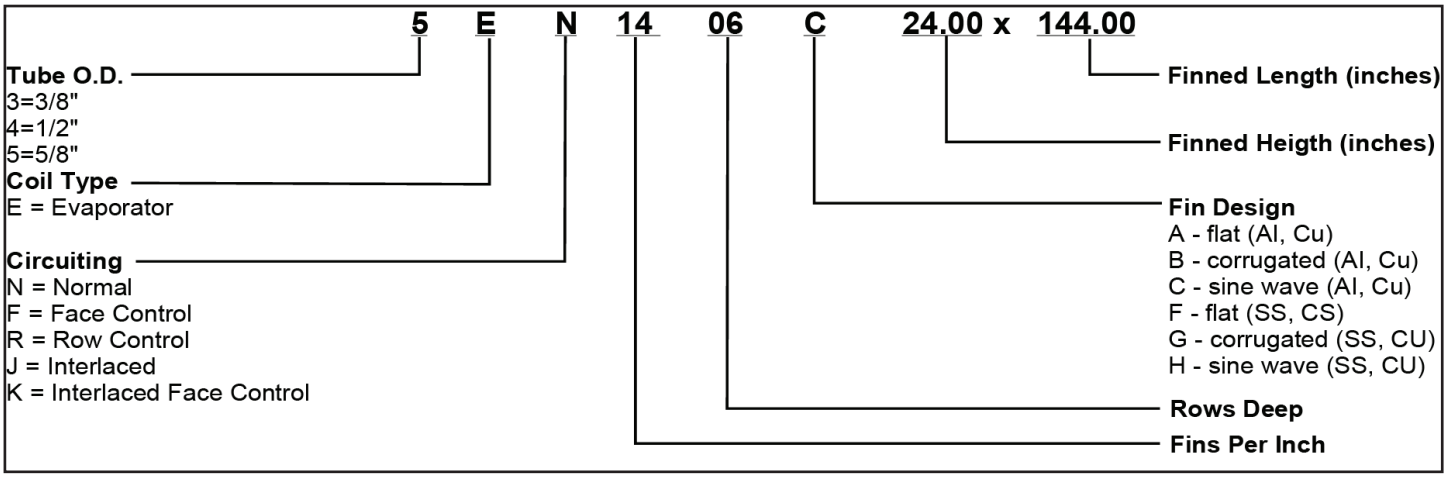
Model EK

For applications that require face control and interlaced circuits, we offer evaporator model EK (see Figure 1 on page 4). Interlaced face control utilizes four distributors and four suction connections.

Figure 1: Evaporator Coil Types



Nomenclature



Installation

Mounting

Position the coil such that the suction header is at the entering airside of the coil and the distributor tubes are at the leaving airside of the coil. This orientation provides counter flow heat exchange that is required for proper coil performance.

The suction connection is located at the bottom of the coil when properly installed (see Figure 1 on page 4).

Installation Procedure

⚠ CAUTION

Sharp edges on sheet metal and fasteners can cause personal injury. This equipment must be installed, operated, and serviced only by an experienced installation company and fully trained personnel. Protective equipment such as safety glasses, steel toe boots and gloves are recommended during the installation and routine maintenance of the coil.

⚠ CAUTION

Failure to properly install the coil can result in irreparable damage to the coil as well as other components in the system.

If you are unsure about any portion of the installation, contact your local steam specialist for assistance.

1. Carefully remove the coil from the shipping package to avoid damage to the finned area. Damaged fins can be straightened using an appropriate fin comb.
2. Proper clearance should be maintained between the coil and other structures such as the fan, filter racks, transition areas, etc.
3. Inspect the refrigerant distributor and verify that the nozzle is in place. The nozzle is generally held in place by a retaining ring or it is an integral part of the distributor itself (see Figure 2 on page 6). If a hot gas bypass kit was ordered with the coil, the nozzle that is in the distributor will need to be relocated into the hot gas bypass assembly (Figure 3 on page 6).
4. All field brazing and welding should be performed using high quality materials and an inert gas purge (such as nitrogen) to reduce oxidation of the internal surface of the coil.
5. If a hot gas bypass kit was ordered with the coil, install it now (refer to Figure 4 on page 6 for a general installation diagram). Complete installation instructions are in the box that contains the hot gas bypass kit. Align the side port with the hot gas line prior to brazing into place (see Figure 4 on page 6).
6. Connect the suction line and suction connection (see Figure 4 on page 6).
7. Install the expansion valve (see Figure 4 on page 6). Follow the expansion valve manufacturer's recommendations for installation to avoid damaging the valve. If the valve is externally equalized, use a tubing cutter to cut off the plugged end of the factory-installed equalizer line. Next, use a de-burring tool to remove any loose metal from the equalizer line (see Figure 4 on page 6) and attach it to the expansion valve. If the valve is internally equalized, the factory-installed equalizer line can be left as is or it can be cut back and sealed.
8. The expansion valve's remote sensing bulb (see Figure 4 on page 6) should be securely strapped to the horizontal run of the suction line at the 3 or 9 o'clock position and insulated.
9. Connect the liquid line (see Figure 4 on page 6) to the expansion valve. Pressurize the coil, expansion valve assembly, and suction connection to 100 psig with dry nitrogen or other suitable gas. The coil should be left pressurized for a minimum of 10 minutes.
10. If the coil holds pressure, the hook-up can be considered leak free. If the pressure drops by 5 psi or less, re-pressurize the coil and wait another 10 minutes. If the pressure drops again, there are more than likely one or more small leaks, which should be located and repaired. Pressure losses greater than 5 psi would indicate a larger leak, which should be isolated and repaired. Be sure to check valves and fittings as potential sites for leakage or bleed. If the coil is found to be leaking, contact your local Daikin Applied coil representative.

NOTE: Unauthorized repair of the coil may void the coil's warranty.

11. Use a vacuum pump to evacuate the coil and any interconnecting piping that has been open to atmosphere. Measure the vacuum in the piping using a micron gauge located as far from the pump as possible (the vacuum at the pump will be greater than the rest of the system). Evacuate the coil to 500 microns or less then close the valve between the pump and the system. If the vacuum holds to 500 microns or less for one minute, the system is ready to be charged or refrigerant pumped down in another portion of the system can be opened to the coil. A steady rise in microns would indicate that moisture is still present and that the coil should be further vacuumed until the moisture has been removed.
12. Failure to obtain a high vacuum is indicative of a great deal of moisture or a small leak. Break the vacuum with a charge of dry nitrogen or other suitable gas and recheck for leaks (soapy water works well). If no leaks are found, continue vacuuming the coil until the desired vacuum is reached.
13. All field piping must be self-supporting.

Figure 2: Distributor

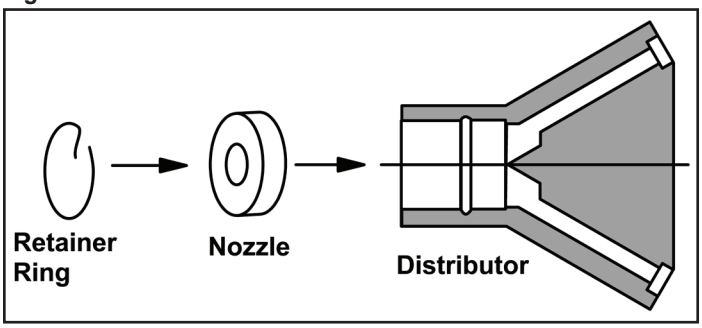


Figure 3: Hot Gas Bypass Kit

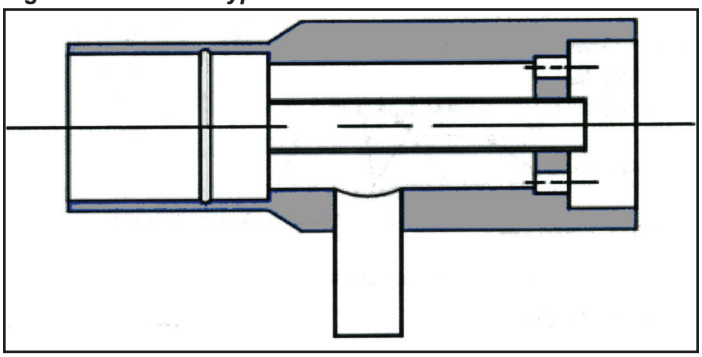
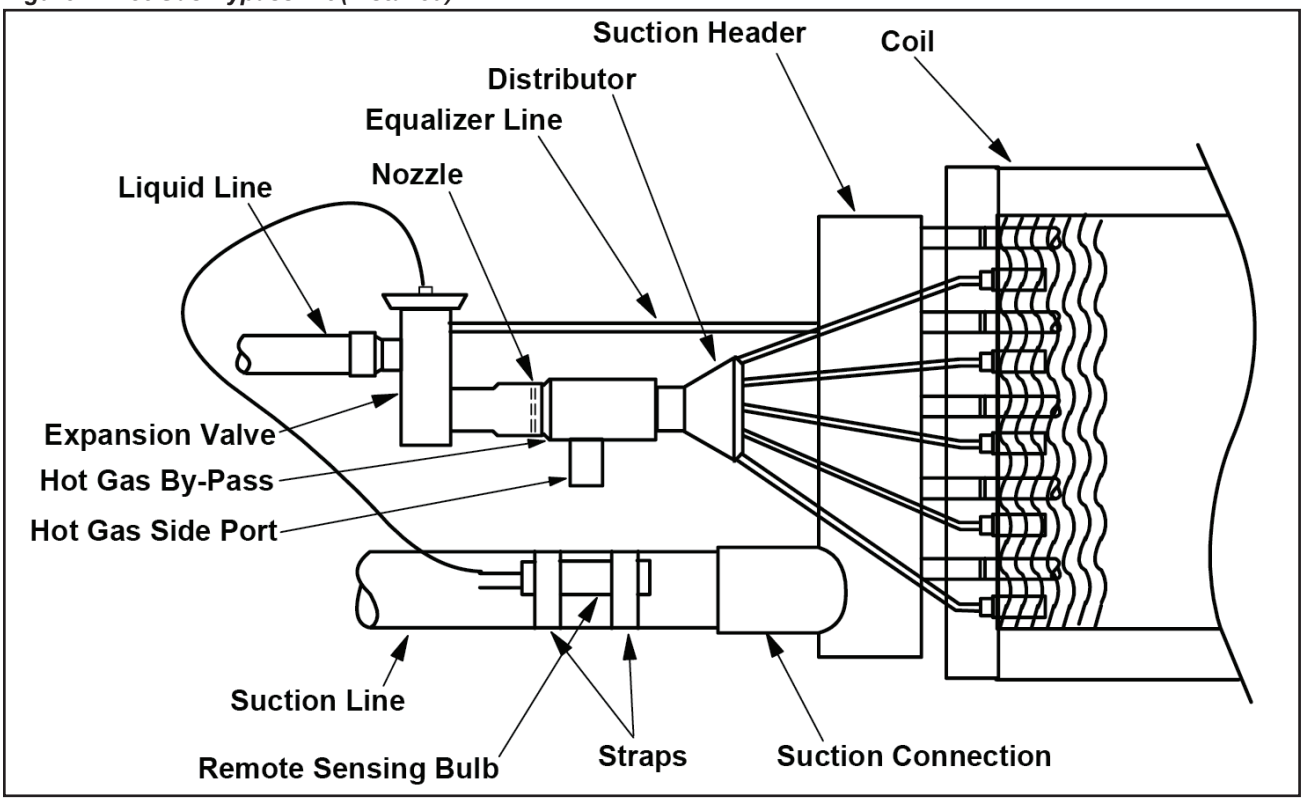


Figure 4: Hot Gas Bypass Kit (Installed)



Operation and Maintenance

Operation

1. Proper air distribution is vital to coil performance. Airflow anywhere on the coil face should not vary by more than 20%.
2. The drain pan and associated piping (drain line and trap) should be installed so that there is no standing water in the drain pan and that no blow-through occurs.
3. Air velocities should be maintained between 200-550 feet per minute.

Maintenance

⚠ DANGER

Follow the manufacturer's guidelines for lockout/tagout and disconnect all power to the unit before performing maintenance. Contact with high voltage power will cause electrical shock, resulting in severe personal injury or death.

⚠ WARNING

Moving parts, high pressure, and/or high temperature fluids can cause serious personal injury.

1. Filters should be inspected on a regular basis and changed as needed. Maintaining clean filters is a cost effective way to help maintain maximum coil performance and service life.
2. Periodic inspection of the coil for signs of corrosion and/or leaks is recommended. Repair and replacement of the coil and the connecting piping, valves, etc., should be performed as needed by a qualified individual(s).
3. Should the coil surface need cleaning, caution should be exercised in selecting the cleaning solution as well as the cleaning equipment. Improper selection can result in damage to the coil and/or health hazards.
4. Suggested cleaning instructions:
    a. When handling strong chemicals, be sure to wear chemical impervious gloves, apron, and splash goggles.
    b. Acti-Brite (AB-1) is the recommended cleaning solution. Contact your local Daikin Applied Parts Distributor.
    c. Determine required dilution for the specific application. It is recommended to start with a dilution ratio of 10:1 and increase concentration until the desired results are achieved.
    d. As with mixing all acids, place the desired amount of water into the tank and then add the chemicals.
    e. Turn off fans and allow hot coils to cool before applying.
    f. Using plain water, wet both the coil as well as the area surrounding the equipment. Wetting the coil with water aids in product penetration and performance.
    g. Apply properly diluted product to coil surface. Whenever possible, apply solution from the outlet side of the coil. Allow solution to remain on surface, normally 5-10 minutes. Do not allow solution to dry on the coil.

⚠ CAUTION

Carefully read and follow the manufacturer's recommendations before using any cleaning fluid.

NOTE: In extreme cases, application may have to be repeated to achieve desired results.

    h. If foaming does not occur, check for extreme grease buildup which will slow cleaning process. Foaming may not occur if coil is coated or painted.
    i. Rinse coils, tools, and surrounding area thoroughly after the coil cleaning.
5. Clean the coil from the leaving airside so that foreign material will be washed out of the coil rather than pushed further in.
6. Periodic inspection of the coil for signs of corrosion and for leaks is recommended. Small leaks can be detected using a Halide torch. Repair and replacement of the coil and the connecting piping, valves, etc., should be performed as needed by a qualified individual.
7. The use of filter-dryers in the system piping is recommended along with a sight glass that has a moisture indicator. Replace the filter dryer(s) as needed.

NOTE: Refrigerant conversions are beyond the scope of this manual and should only be performed by qualified parties.

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