# *SUMMIT MANUFACTURING, INC.*
# INSTALLATION INSTRUCTIONS
# AIR CONDITIONING & HEAT PUMP INDOOR COILS

### *INTRODUCTION*

Summit Indoor Coils are designed specifically for use with various models of residential gas or electric furnaces or air handlers in downflow, upflow or horizontal applications.

These instructions are primarily intended to assist qualified individuals trained and experienced in the proper installation of this type of equipment. Some state codes require installation and service personnel to be licensed. Refer to authorities having jurisdiction for additional guidance. Remember that the Clean Air Act of 1990 requires technician certification for handling refrigerant.

**NOTE: EFFICIENCY AND CAPACITY RATINGS ARE LISTED IN CURRENT ARI DIRECTORY FOR SUMMIT COILS MIX-MATCHED WITH MANY BRANDS OF OUTDOOR CONDENSING OR HEAT PUMP UNITS. AIR CONDITIONING COIL MIX-MATCHES ARE LISTED IN INDOOR COIL MANUFACTURER AIR CONDITIONING SECTION. HEAT PUMP COIL MIX-MATCHES ARE LISTED IN INDOOR COIL MANUFACTURER HEAT PUMP SECTION.**

### *GENERAL COIL INSTALLATION NOTES*

**CAUTION! ALL SUMMIT COILS ARE SHIPPED FROM OUR FACTORY PRESSURIZED WITH NITROGEN. THEY DO NOT CONTAIN ANY HCFC22.**

1. Most Summit Coils are equipped with a schrader valve port to allow field installation of thermal expansion valve without having to sweat it in. This schrader valve can also serve the useful purpose of checking for leaks prior to installation. Unscrew the schrader valve cap and press the depressor. **IF THERE IS NO NITROGEN PRESSURE PRESENT, THE COIL MAY HAVE DEVELOPED A LEAK DURING SHIPMENT AND SHOULD BE RETURNED TO THE POINT OF PURCHASE FOR EXCHANGE.** If pressure is present, then go ahead and relieve the pressure in the coil by continuing to depress the schrader valve. When there is no pressure then cut off the ends of the copper tubes.

In a Summit non-schrader version coil, relieve pressure by punching a hole with a pointed instrument in the end of the suction line (large copper) tube BEFORE cutting the ends off. **IF THERE IS NO NITROGEN PRESSURE PRESENT, THE COIL MAY HAVE DEVELOPED A LEAK DURING SHIPMENT AND SHOULD BE RETURNED TO THE POINT OF PURCHASE FOR EXCHANGE.**

2. The blower and duct system must be properly sized in order to provide adequate cooling and heating performance. Select the correct motor speed tap on the furnace blower to give the required CFM needed for rated cooling capacity. Return air filters of generous size must be provided, in order to avoid contaminating the coil, blower and ductwork, or restricting necessary air flow.

3. It is essential that the indoor coil and outdoor unit be properly matched and that the flowrator in the coil be equipped with the proper orifice. A flowrator piston with an orifice size that is too small will cause starving and one that is too large will cause flooding of the coil with refrigerant.

Improper sizing of orifice or incorrect charge will result in inefficient operation. See more details in installations for coils with flowrators.

4. Where ratings require addition of an expansion valve, kits are available that can normally be added to Summit coils in the field without cutting or brazing. See instructions for coil with expansion valve. **BE SURE THAT THE FLOWRATOR PISTON HAS BEEN REMOVED FROM FLOWRATORS DISTRIBUTOR BODY PRIOR TO INSTALLATION OF EXPANSION VALVE.**

5. For optimum performance and efficiency of air conditioning or heat pump coils, adjust system charge and/or superheat as recommended by outdoor unit manufacturers. Procedures will differ between manufacturers.

6. It is recommended that coil be sprayed with liquid detergent thoroughly and rinsed thoroughly before installation to assure proper drainage of condensate from the coil fins to eliminate water blowoff and to assure maximum coil performance. If not sprayed, approximately 50 hours of break in time is required to achieve the same results.

7. Always be sure coil is installed level or sloped slightly toward primary and secondary (the higher of the two) drain fittings. Connect both drain lines to open drain, but never to a closed sewer. Pitch drain lines away from drain pan. Always, test drain lines with water before operating. Reduction in size of the drain lines is not recommended.

8. **A WATER TRAP** is recommended on all coil applications, but **IS REQUIRED ON PULL THROUGH INSTALLATIONS ON ELECTRIC FURNACES. FAILURE TO PROVIDE CAN RESULT IN IMPROPER DRAINAGE OR POTENTIAL SHOCK HAZARD.**



9. **CAUTION: IT IS MANDATORY TO USE AN EMERGENCY AUXILIARY DRAIN PAN WITH ANY COIL OR AIR HANDLER INSTALLED IN AN ATTIC OR ABOVE A FINISHED CEILING. IT MUST HAVE**

**ITS OWN DRAIN LINE (A WATER TRAP IS NOT NECESSARY) WITH ITS OUTPUT INTO AN OPEN DRAIN (NOT A CLOSED SEWER). IT SHOULD ALLOW EASY VISUAL INSPECTION SO THAT IF CONDENSATE FLOW IS SEEN THE HOMEOWNER KNOWS THAT THE COIL DRAIN PAN LINES ARE PLUGGED AND NEED MAINTENANCE.**

10. Refrigerant piping is critical on any coil installation when the outdoor unit is to be located below the level of the coil. For proper piping design considerations, refer to the guidelines furnished by the manufacturer of the outdoor unit.

11. Check all field installed refrigerant connections with electronic leak detector, halide torch, or soap bubbles.

12. Refer to installation instructions provided with the outdoor unit, furnace or air handler and line sets for completion of system installation.

### *SPECIAL INSTRUCTIONS FOR COILS WITH FLOWRATORS.*

The sizing of the flowrator orifice piston should be based strictly on the rated capacity of the outdoor unit and coil match.

Summit provides capacity performance ratings that match both same size and upsized Coils with a specific manufacturers outdoor units. At the Summit distributors request, the flowrator orifice piston is selected and installed in each coil for the specific range of cooling capacities likely to be encountered. The factory installed orifice piston size is marked on the flowrator body and on the front of the coil carton.

When using this coil with an outdoor unit of another capacity, select an orifice piston from the table below if the capacity range for the coil and outdoor unit to be used differs.

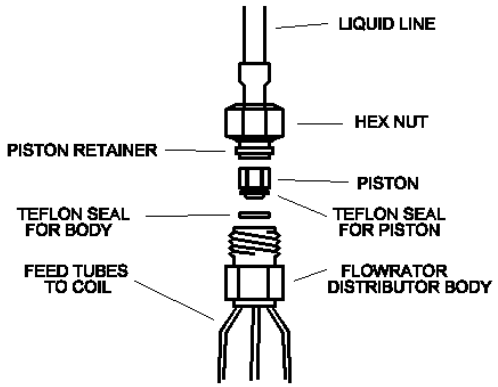
Failure to install the proper orifice piston can lead to poor system performance and possible compressor damage. A variation of one piston size is not normally critical. Summit reserves the right to substitute a factory installed piston one size smaller or greater if the piston size ordered is out of stock.

A selection of replacement orifice pistons is available from your Summit supplier.

| **Condensing Unit Cooling Capacity (BTUH)** | **Proper Coil Orifice Piston ID Size (1/1000")** | **Rating** |
|---|---|---|
| 18,000 | 49 | |
| 24,000 | 59 | |
| 30,000 | 63 | |
| 36,000 | 71 | |
| 42,000 | 76 | |
| 48,000 | 82 | |
| 60,000 | 90 | |

For indoor coils with flowrators, the flowrator distributor assembly consists of flowrator distributor body with attached copper tubes feeding the coil, a piston with an internal orifice of a specific ID size, and a hex nut to attach the piston retainer and liquid line. See Diagram below.

**DIAGRAM 1**
**FLOWRATOR DISTRIBUTOR**




**IF A COMBINATION IS USED THAT REQUIRES A PISTON SIZE CHANGE, CHANGE THE PISTON IN THE DISTRIBUTOR ON THE INDOOR COIL BEFORE INSTALLING THE COIL OR CONNECTING THE REFRIGERANT LINESET OR CHARGING THE SYSTEM.**

Use the following procedure:

Using a back-up wrench on the flowrator distributor body, unscrew the hex nut thus detaching the liquid line from the flowrator distributor body.

Use a fine wire with hook on one end to insert into the hole in the piston that is in the flowrator body. Carefully remove the piston and replace with a proper sized one, installing piston with teflon seal end of the piston in distributor first. Do not force piston into flowrator distributor.

**NOTE:** With piston in flowrator distributor, **THE TEFLON SEAL END OF THE PISTON SHOULD BE DOWN AND SHOULD NOT BE SEEN BY LOOKING IN THE END OF THE FLOWRATOR DISTRIBUTOR.** The piston must be free to rotate and move up and down. Make sure piston is free to move in flowrator distributor body. Make sure that the teflon ring seal on the flowrator distributor body is still in place.

Replace the hex nut and liquid line on the flowrator distributor body and torque from 10 to 30 inch lbs. **DO NOT OVER TIGHTEN.** Be sure to use a back-up wrench on flowrator distributor body.

Re-mark piston size on outside of flowrator distributor body with a permanent marking pen. **Check fittings for leaks after installation.**



### *SPECIAL INSTRUCTIONS FOR COILS WITH THERMAL EXPANSION VALVES.*

For indoor coils requiring expansion valves, both bleed and non-bleed types are available in several sizes. The expansion valve used is externally equalized and the superheat is non-adjustable. All Summit expansion valves have a built-in check

making them heat pump capable. While thermal expansion valves can be factory installed, they are normally available in kit form for field installation. For the kit version, follow the installation instructions provided with the kit. Normally these can be field installed before system is charged without requiring cutting and brazing. **BE SURE THAT THE FLOWRATOR PISTON HAS BEEN REMOVED FROM FLOWRATOR DISTRIBUTOR BODY PRIOR TO INSTALLATION OF EXPANSION VALVE.**

Be sure that the expansion valve provided is the proper size and type required to achieve rating. If a non-bleed type valve is to be used, the outdoor unit must be equipped with a hard start kit allowing the outdoor unit to start under load. Check with our factory if necessary.

When a non-bleed expansion valve (TXV2) is specified in a Summit AC or HP Rating, the following assumptions are made:

a.) The TXV2 is a field installed accessory to be field installed in accordance with recommended TXV practice.
b.) The combination of this non-bleed valve and the compressor in the outdoor unit results in a system that operates with a loaded condition on startup.
c.) The outdoor unit is capable of starting against this loaded condition or a hard start kit is to be field installed.

If any of the assumptions don't fit the application and the system starts unloaded, the ARI SEER Rating must be decreased by .4 SEER.

In most cases a reciprocating compressor with a TXV2 will start loaded whereas a scroll compressor will start unloaded.

## *SPECIAL CONSIDERATIONS FOR SELECTING HEAT PUMP COILS.*

The selection of indoor heat pump coils is much more critical than selection of indoor coils for air conditioning units. The differences are as follows:

1. Only indoor coils with flowrators or expansion/check valve flow control devices may be used with outdoor heat pump units. These devices permit reversing refrigerant flow in the coils when changing from cooling to heating. **CAP TUBE COILS MUST NOT BE USED WITH HEAT PUMP.**

2. Mix-matching of indoor coils for heat pumps demands that the heat rejection capacity, internal volume, and equivalent orifice of the mix-match coil be at least equal to that of the smallest internal volume matched coil recommended by outdoor unit manufacturer for that outdoor unit.

3. It is important that selection be based on Summit's recommendation for a specific coil with a specific orifice to be used with an outdoor heat pump unit of a specific make, series, and model number.

4. Failure to conform to proper selection requirements will affect efficiency, charging, and reliability and may result in damage to the system.

5. The mix-matching of specific indoor heat pump coils with specific outdoor heat pump units as certified in the Summit heat pump section of the current ARI Directory will assure proper and efficient operation of heat pump systems.

## *SPECIAL INSTRUCTIONS FOR CHARGING HEAT PUMP COILS.*

Specific detailed instructions for refrigerant charging of a heat pump system as recommended by the outdoor unit manufacturer should be followed. These instructions will differ between manufacturers, but in general are as follows:

**WITH FLOWRATOR IN INDOOR COIL, USE SUPERHEAT METHOD IN COOLING MODE.** Measure following values from system: outside ambient temperature, suction pressure at gauge, suction line temperature at compressor. **Adjust charge to achieve recommended superheat.**

**WITH EXPANSION/CHECK VALVE IN INDOOR COIL, USE LIQUID LINE PRESSURE METHOD IN COOLING MODE.** Measure following values from system: outside ambient temperature, indoor wet bulb temperature, liquid line head pressure at gauge. **Adjust charge to achieve recommended liquid line head pressure.**

If the installer encounters a problem using the outdoor manufacturers suggested charging method he should contact the factory for assistance.

## *SPECIAL INSTRUCTIONS FOR HORIZONTAL AND 4 WAY CLOSE COUPLED COILS.*

**CAUTION: IT IS MANDATORY TO USE AN EMERGENCY AUXILIARY DRAIN PAN WITH ANY COIL OR AIR HANDLER INSTALLED IN AN ATTIC OR ABOVE A FINISHED CEILING.**

1. The "M" (4-Way Multi-Position) Series coils are designed to eliminate the need for a transition between the coil and furnace in most new applications. In blow through applications, the furnace and coil must be sufficiently attached to allow uniform air distribution across the coil surface. If this cannot be achieved with a direct connection, then a minimum of 18" length transition must be field supplied between the furnace and coil housing.



2. "M" (4-Way Multi-Position) Series coils that fit flush with Multi-Position furnaces sometimes have marginal air openings. In applications where the highest air flow for a given furnace width as listed in furnace manufacturer's specification are desired, we recommend use of a wider coil cabinet or reducing motor speed tap so as not to exceed 400 CFM per 12,000 BTUH of rated cooling capacity. Reducing the airflow to cooling capacity ratio will also lower the sensible to total ratio with better humidity control without reducing efficiency.

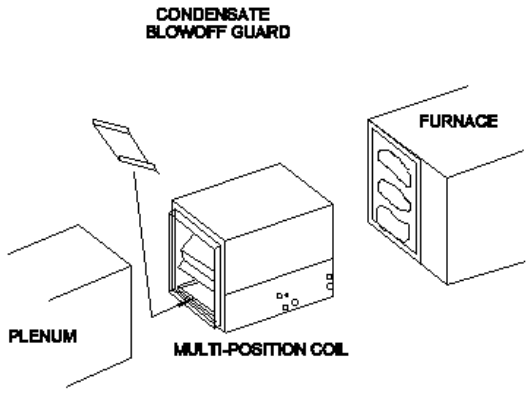
3. Care should be taken to insure no internal damage is done to the coil or furnace when fastening together or suspending the coil and furnace assembly (always support both coil and furnace SEPARATELY). Never use screws longer than 1/2" in length and always determine what is on the opposite side of the penetration prior to inserting the screw.

4. "M" (4-Way Multi-Position) Series coils are factory supplied for all positions: right to left, left to right, upflow, and downflow. When fastening the coil to the furnace, care should be taken to insure no internal damage to coil or furnace (see paragraph 3 above).

5. On some "M" Series coils where the air enters the open end of the "A" and the apex of the coil is downstream from the air inlet, a condensate blowoff guard is provided to be attached to the horizontal drain pan to catch any condensate blowoff.

**BE SURE TO CAP THE UNUSED DRAIN FITTINGS.**

**DIAGRAM 2**
**USE OF CONDENSATE BLOWOFF GUARD**




6. "M" (4-Way Multi-Position) Series coils are provided flat on both ends with separate flange that can be located on either end as desired to change air direction through coil. Air may blow into apex or open end of coil.

7. On those coils used for downflow or reverse flow applications the top cap shipped must be removed and repositioned as shown (Diagram 3). On reverse flow the two piece pan must be caulked to seal between the pans and prevent air from blowing water out of horizontal pan. The air pressure drop is much higher so air can blow water out between the pans in the corners of the "A" end plate. Seal seam between horizontal pan and "A" coil pan by caulking mating surface on horizontal pan and setting "A" pan in it. Center "A" pan in horizontal pan and add screws at corners (Diagram 4) to hold in place while reassembling pan. All air leaks must be stopped, it is recommended that opposite hand coil be ordered to allow air to enter bottom of "A" on coil.

**DIAGRAM 3**
**(TOP CAP)**

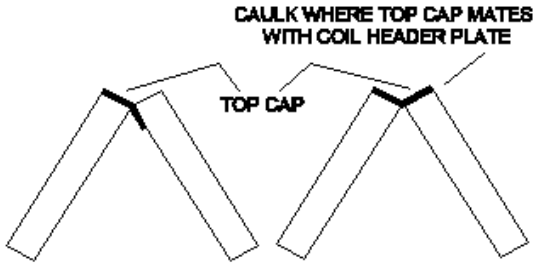
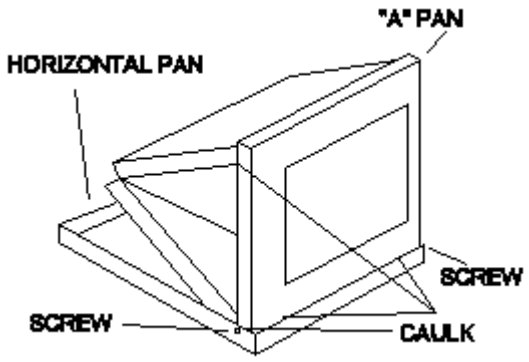



**DIAGRAM 4**
**(REVERSE FLOW)**




***CONTACT US FOR HELP OR FOR ANY COMMENTS ON OUR PRODUCTS.***

As we strive to better serve our customers like you, we are always ready to help you. We also welcome any comments from our customers concerning quality and improvements that could be made to our products. Please call or write us.

Thank you for the purchase of our product.

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