

**TEMPEC INC.**  
**VERTICAL FAN COIL UNIT**  
**MODELS TFA, TFE, TFS, TCA, TCE, TCS**



“TF”



“TC”

**INSTALLATION AND MAINTENANCE  
MANUAL**

## **INSTALLATION PRECAUTIONS**

### **Inspection**

- The entire shipment should be inspected for damage, either readily visible or concealed. Any damage should be noted on the freight bill by the carrier's agent and Temspec notified as soon as possible.
- Remove the inlet service panel and check the fan wheel for free rotation by spinning it manually. Slight misalignment can be corrected by repositioning the motor or by loosening the fan hub set screw and repositioning the fan on the motor shaft.
- Check riser projections at each end of the cabinet for damage that would prevent making an acceptable piping connection.
- Check internal piping, coil and valve packages for possible transit damage. Tighten all mechanical fittings.
- Thermostats, speed switches and other accessories which have been shipped separately should be inspected for quantity and transit damage.

### **Handling**

The fan coil units must be handled with the due care required for an HVAC unit. Avoid dropping or jarring the unit during offloading and moving the unit into position. Do not lift the unit using the riser pipes.

If the cabinet has a painted finish, do not remove the protective packaging material until after the unit is set in position.

### **Installation**

Unless otherwise requested by the customer at the time of shop drawing approval, the cabinet insulation is left intact, covering the supply air openings and, if applicable, the secondary return air opening. The reasons for this are:

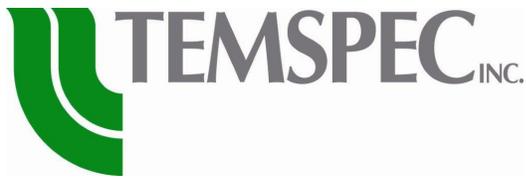
- To provide a measure of protection from wind driven rain or snow entering the unit before the windows are installed.
- To prevent construction dust entering the unit.

Use solder to connect the risers. Do not use Silfos (brazing) as this will cause the pipe to overheat and the insulation to be damaged. Ensure that the horizontal run-out from each riser is centered in the slot in the cabinet and that the run-out from the riser is at 90° as it enters the cabinet, prior to soldering the risers. Anchoring the risers to the floor slabs is the responsibility of the contractor. Shim the unit plumb. It is not necessary to use a pad under the unit. Fire stopping the floor opening and making good the riser insulation at the floor opening is the responsibility of the contractor. Check that the drain hose is not kinked before soldering the condensate riser. If the risers incorporate expansion compensation loops, remove the support brackets after anchoring the risers.

The fan coil unit has compression fittings or unions at the shut off valves. These fittings must be tightened prior to pressure testing the system by the contractor as part of the installation procedure. Mechanical fittings can loosen during transportation and handling.

The coil is pressure tested hydrostatically at the factory using a propylene glycol solution. Trace amounts of this solution are allowed to remain in the coil to ensure that the coil does not freeze during transportation. After testing on site with water the fan coil unit must not be exposed to a risk of freezing.

The interior of the unit must be vacuumed clean before the unit is started up. This includes fan motor windings.



### **Two-way Control Valves**

When two way valves are used, pump and chiller bypass or pump speed control must be included in the system. This is necessary to ensure that the close-off pressure rating of the valve is not exceeded. The maximum close-off pressure rating is given in the submittals.

### **Electrical Connection**

It is assumed that the fan coil unit will be in a dedicated electrical circuit. If the unit is to be in a circuit which includes electrical outlets or other electrical devices, Temspec must be informed prior to releasing the units for production.

## **INSTALLATION METHOD**

### **Identification**

The fan coil unit has a label pasted on a panel inside the unit

The label shows either the floor and riser number or the room number.

The unit must be placed in the correct location in the building in accordance with the label.

### **Handling**

1. If the unit has risers attached, do not lift the unit using the riser pipes.
2. Protect the fan coil from rain and snow. Be aware that there have been instances of units being stood upright, unsecured on the edge of a building and being blown off the building during a windstorm.

### **Installation of Units with Risers Attached**

1. A rectangular opening is made in the floor slab, usually sleeved before pouring the floor. Refer to the catalog or submittals for sizes.
2. Rotate the unit from the horizontal position to vertical so that the bottom end of the risers insert into the expanded end of the risers on the unit below. 2" is allowed in the riser length for the depth of the insertion. Shim the unit plumb
3. Before making the joint, ensure that the run outs from the supply and return risers are centered in the slots in the cabinet. If this is not done there is considerable risk of distorting the run out when the hot water riser expands causing the run out to bottom out on the edge of the slot in the sheet metal. Also ensure that the condensate riser stub out is at 90° to the cabinet so that the drain hose is not kinked.
4. Riser anchoring is required for two purposes. The risers are anchored to the floor slab at one or more points in the height of the building so that they do not slip down under gravity. The second reason is to spread the expansion in opposite directions from the anchor point. Typically, risers will be anchored at the mid-point of the height of the building. If there are riser expansion loops included in the risers inside the unit, the anchor point will be at the mid-point between two sets of loops. For example in a 16 story building there will be a loop on the hot water riser on floor 8 and anchors at floors 4 and 12. After anchoring, the risers are in effect attached to the building structure so it does not matter if the plastic straps holding the risers to the unit break off after installation.
5. Connect the risers by soldering (not brazing) using 95/5 solder. An additional cap of 50/50 solder can be added for extra strength.
6. If the unit has a riser loop inside, remove the support strap.
7. Make good the riser insulation between floors.
8. Fire stop the floor opening in accordance with code.



### **Flushing and Testing**

1. The fan coil is normally equipped with ball type shut off valves. The unit is shipped with the ball valves open to the coil.
2. After checking mechanical fittings inside the unit for tightness, it is recommended that the units on each riser stack are pressure tested using compressed air. Check for audible air leaks.
3. Close the ball valves and flush the riser system.
4. Open the supply side ball valve and bleed air from the coils. The coil has a manual air vent for this purpose. The top of each riser should also have an air vent (not provided by the factory).
5. Test the units and risers hydrostatically. Open the return side ball valve after testing.
6. Check that the strainer mesh is not choked, if there are strainers included with the unit.

### **Ducted Units**

Remove the supply air opening knock-out in the top panel of the fan coil. Cut out the cabinet insulation from the opening and butter the cut edge if it is glassfiber insulation. Attach the supply air duct.

Note that supply air duct flanges are not provided by the factory.

### **Electrical Connection**

The unit has a single point connection at the junction box inside the unit. It might also have a disconnect switch and/or a fuse. All electrical wiring must be in accordance with the current version of the national and local codes. A qualified electrician must carry out the work. The junction box is located behind the access panel. Electrical power to the unit should be disconnected by opening the remote disconnect device prior to removing the fan/motor shield. Do not use the motor speed switch as a disconnect method.

### **Thermostat Installation**

1. **Unit mounted thermostat** – Connect the wires from the thermostat to the wire harness inside the electrical box using the plug provided or wire nuts. Fit the thermostat onto the electrical box using the machine screws provided. The recessed electrical box is located on the front of the unit, above the return air panel.
2. **Remote mounted thermostat** – Run low voltage wires from the 24V thermostat on the wall back to the terminal strip inside the unit.

### **Top Extension**

If a top extension has been provided to trim the unit up to the ceiling, the extension overlaps the top of the unit by 1 ½". Use sheet metal screws to attach the extension directly to the top of the unit.

### **Riser Pipe Cover**

If a riser cover has been provided it is installed after the floor opening has been fire-stopped. An offset bracket is included which is screwed to the front of the side face of the unit. An angle wall bracket is also provided. The cover snaps into the offset bracket and is screwed to the wall bracket. Refer to the catalog for illustrations of the bracket arrangements.

## Changing the Motor Speeds

Occasionally the speeds at which the motor runs at will need to be changed on site. This process depends on the type of motor. If there are any questions after reading, please contact Temspc.

### PSC motors

For 4 or 5 speed PSC motors, the wiring needs to be changed at the quick connect connecting the high voltage wire harness to the motor wires. The high voltage wire harness wires need to be removed from the quick connect and reattached to the new desired settings. For example, if Low=MED-LO, Med=MED, High=MED-HI and the speeds want to be increased, the new setup should be Low=MED, Med=MED-HI, High=HI. To change the pins, a technician needs to use a pin extractor (see the following document as an example on how to use pin extractor: <https://www.te.com/commerce/DocumentDelivery/DDEController?Action=srchtrv&DocNm=408-10376&DocType=SS&DocLang=EN>) . Wire colours vary depending on the motor, to make sure the motor is wired correctly, consult both the electrical drawing and the wiring diagram on the motor.

### Discrete Speed ECM Motors

Temspc's discrete speed ECM motors come with five programmed speed taps, of which only three are used at once corresponding to the thermostat fan speeds. All five taps are wired with a single plug that attaches to the motor, see Figure 1 as an example. The desired speed taps are then wired into the terminal block in connection to the thermostat fan speed outputs, and the unused motor wires are capped off, see Figure 2 as an example. To change the taps, a technician needs to cut the cap off the new wire to be used and the motor wires need to be wired into the terminal strip into the corresponding thermostat fan speed terminals in the new desired setup. The new unused wire must be capped off. Always consult the unit drawing before attempting work as the wire colours and the taps used can vary between projects and unit sizes.

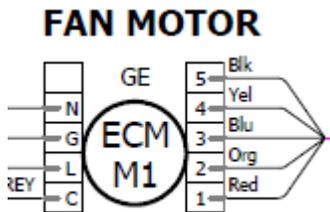


Figure 1: Speed tap wiring on right side of motor

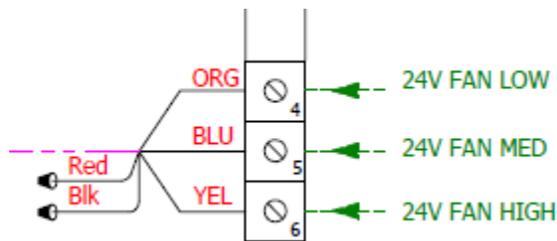


Figure 2: Terminal strip connection with capped wires

### Variable Speed ECM Motors

There are two different controls that could come with the motor. An EBM board to convert 0-10VDC to PWM or a cable to do the same function. If there is an EBM board, rotate the single dial to either increase or decrease the maximum airflow for the unit. If there is just a cable, the motor will need to be reprogrammed. To do this contact Temspc.

## MAINTENANCE INSTRUCTIONS

### Safety

1. Always isolate the unit electrically before removing the front access panel. Do this by opening the circuit breaker (or other switching device) the distribution panel in the suite. Do not use the three speed fan switch as the means of isolation. There is a high risk of electrocution if the unit is improperly isolated. If in doubt have a qualified electrician perform the service work.
2. Ensure that the fan has stopped rotating before proceeding to work within the unit.
3. If the unit is equipped with a fuse or circuit breaker, do not change out either of these devices with ones of a higher Amp rating. The purpose of a fuse or circuit breaker is to protect the power wiring to the unit.
4. Take care when working inside the unit. Sheet metal components may have sharp edges.
5. If the black acrylic coating on the glassfiber cabinet liner is damaged, it must be patched to prevent glassfiber particles entering the air stream.

### Every 3 Months

Replace the filter. The filter can be one of two types: a 1" thick cardboard framed type or a wire frame with filter media attached. The filter is accessed by removal of the front panel.

### Annually (before the start of the cooling season)

Remove the return air/access panel from the unit.

1. Vacuum the drain pan and check that the drain outlet is not blocked. Pour water into the pan and check that it drains quickly. If it appears to be partly blocked, remove and clean the drain hose beneath the pan.
2. If the coil surface is dirty, vacuum the surface which faces the room. Take care not to damage the aluminum fins on the coil. If the fins are flattened, the performance of the unit will be reduced.
3. Inspect the surface of the cabinet liner for evidence of dampness. The liner should be completely dry in all areas. Vacuum excessive dust from the liner, taking care not to damage the black acrylic coating on the liner. Do not run the unit if the liner is damp as this can promote mold growth. Determine the cause of the dampness. If there is evidence of mold growth it might be necessary to replace part or all of the liner. If in doubt consult a remediation specialist.
4. Replace the thermostat battery if it is a seven-day programmable type.

The following components do not require routine maintenance:

Fan, fan motor, control valve, electric heater (fan coil models TFE, TCE), thermostat.

Note that fan motors have sealed bearings and do not require additional lubrication. Older units may have oiler tubes into which are added a few drops of SAE-20 non-detergent oil every 6 months.