

# Temspec Leaf < Vertical Stack Fan Coil Unit Models TL, TF, & TR



# INSTALLATION, OPERATION AND MAINTENANCE MANUAL



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## WARNING

Only qualified personnel should install and service the equipment. The installation, starting up, and servicing of heating, ventilating, and air-conditioning equipment can be hazardous and requires specific knowledge and training. Improperly installed, adjusted, or altered equipment by an unqualified person could result in death or serious injury. When working on the equipment, observe all precautions on the labels that are attached to the equipment

# WARNING

## **Proper Field Wiring and Ground Required!**

Failure to follow code could result in death or serious injury. All field wiring MUST be performed by qualified personnel. Improperly installed and grounded field wiring poses FIRE and ELECTROCUTION hazards. To avoid these hazards, you MUST follow requirements for field wiring installation and grounding as described on the local electrical codes

# WARNING

RISK OF ELECTRIC SHOCK. CAN CAUSE INJURY OR DEATH: DISCONNECT ALL REMOTE ELECTRIC POWER SUPPLIES BEFORE SERVICING

## NOTICE:

## **Use Copper Conductors Only!**

Failure to use copper conductors could result in equipment damage as unit terminals are not designed to accept other types of conductors



## 1 Design and Take-off Precautions

Always refer to the job submittal for job specific information.

Attention should be paid to the height of drywall which encapsulates ductwork in a bulkhead. Note the height of the side supply air opening shown in the submittal and ensure that the drywall does not interfere with the side wall grille. Make allowance for the 1" flange around the grille.

The TL vertical stacked fan coil unit is designed to have drywall applied directly to the face of the unit. Floor sleeves and extension sleeves through shear walls are not included.

It is important to accurately locate the floor sleeve relative to the fan coil and the drywall. Also note that the return air panel of the type which attaches with a quarter-turn fasteners cannot be used with a sleeve and 1/2" drywall must be directly attached to the front of the unit.

## 2 Receiving Inspection

The entire shipment should be inspected for damage, either readily visible or concealed. Any damage must be noted on the freight bill by the carrier's agent and Temspec notified within 24 hours.

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. If contractor / installer deems it necessary to tighten mechanical fittings Temspec does not assume any responsibility for this procedure. It is stressed that the component manufacturer's recommended procedures be strictly followed.

Check to make sure the drain pan's overflow switch did not come loose or shift out of place during shipping

Thermostats and other accessories which have been shipped separately should be inspected for transit damage.

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

### 2.1 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.

#### 2.2 Handling

Avoid dropping or jarring the fan coil unit during offloading and moving the unit into position. Do not lift the unit using the riser pipes or H/ERV module.

Unless otherwise requested by the customer at the time of shop drawing approval, the cabinet insulation is left intact, covering the supply air grille openings and, if applicable, the secondary return air opening to prevent dust, snow, or rain from entering the unit. The installer is responsible for cutting out the insulation and buttering the cut edge prior to installing the grilles.

#### 2.3 Accessories

Do not install grilles or thermostats until after the walls have been painted. Caution the painter against spraying over the labels on the front cover of the unit.

## 3 Installation

#### 3.1 Identification

The fan coil unit has a label pasted on the motor cover panel for furred in units, or on a panel inside for painted units.

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.

### 3.2 Handling

If the unit has risers attached, do not lift the unit using the riser pipes.

If the unit has a H/ERV module, do not lift using the module.

The fan coils and risers must be kept dry, so protect them from rain and snow.

#### 3.3 Installation of Units with Risers Attached

A rectangular opening is made in the floor slab, usually sleeved before pouring the floor. Refer to the catalog or submittals for sizes.

Rotate the unit from the horizontal position to vertical so that the bottom end of the risers inserts 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 to avoid standing water. It is not necessary to use a pad under the unit.

Before making the solder joint, ensure that the stub 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 contact the edge of the slot in the sheet metal potentially causing failures or leaks. Also ensure that the condensate riser stub out is at 90° to the cabinet so that the drain hose is not kinked.

Connect the risers by soldering (not brazing) using 95/5 solder. An additional cap of 50/50 solder can be added for extra strength. Do not use brazing as this will cause the pipe to overheat and the insulation to be damaged.

Caution must be taken not to strain the coil connection. Excessive pressure in any direction can cause the coil



casing to cut into the coil connection stub or cause it to bend and lead to leaks.

Ensure that the horizontal stub-out from each riser is centered in the slot in the cabinet and that the stubout 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.

If the risers are shipped loose, the insulation in the riser inset holes will need to be cut. To do this simply cut an "X" in the hole to allow the stub-out to enter the unit with minimal insulation damage. Check that the drain hose is not kinked before soldering the condensate riser.

Fire stopping the floor opening and making good the riser insulation at the floor opening is the responsibility of the contractor.

The fan coil unit has unions at the shut off valves. These fittings must be checked prior to pressure testing the system by the contractor as part of the installation procedure. Mechanical fittings can loosen during transportation and handling. If contractor /installer deem it necessary to tighten mechanical fittings Temspec does not assume any responsibility for this procedure. It is stressed that the component manufacturer's recommended procedures be strictly followed.

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 freezing temperatures.

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 midpoint of the height of the building. If there are riser expansion loops, the anchor point will be at the midpoint 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. Temspec does not advise on the location or method of anchoring as this is the responsibility of the engineering company retained to design the riser system.

#### 3.4 Flushing and Testing

The fan coil is normally equipped with ball type shut off valves. The unit is shipped with the ball valves open to the coil unless requested prior to units released to production. 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 or nitrogen before filling with water. Do not exceed 300PSI, or max pressure noted on the submittal. Sustained excess pressures may cause damage to components, including leaks.

Close the ball valves and flush the riser system.

Check to see if the control valve is in an open position. If it cannot be locked in an open position the unit will need to powered on so the valve can be driven to an open position to avoid being subjected to a load greater than its close off pressure. Units with 6 way valves the process will have to be repeated for both the hot and cold water systems.

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).

Test the units and risers hydrostatically. Open the return side ball valve after testing.

Check that the strainer mesh is not choked, if there are strainers included with the unit.

City water is very corrosive to brass components. Provide water treatment as soon as the system is charged to avoid premature leaks and/or avoid failure of internal components.

#### 3.5 Drywall Installation

The fan coil model series "TL" or "TR" has a cabinet which is designed to be furred-in. Drywall can be directly attached to the cabinet, or the unit can be framed.

Direct Application – The hinged air panel must be used. It is designed to fit the  $\frac{1}{2}$ " drywall flange around the return air / access opening on the unit. Use drywall screws no longer than 1  $\frac{1}{4}$ " and follow the instructions in Section 13 which shows where the screws can be located to avoid damaging internal components. Do not attach screws to the H/ERV module. When using the hinged panel, drywall **MUST** be attached to the front. The sides and back can be framed.

Framing – Frame the unit using metal studs. It is preferable that the stud does not touch the fan coil cabinet so that any slight vibration which may exist is not transferred to the stud.

Before installing the thermostat and grilles, the walls must be painted. Instruct the painter not to spray over the labels on the unit. After installation, dust must be vacuumed from the coil surfaces, the drain pan, the motor windings, and the cabinet insulation.



## 3.6 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 glass fiber insulation. Attach the supply air duct.

Note: Supply air duct flanges are not provided by the factory.

## 3.7 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 fan/motor shield. Electrical power to the unit should be disconnected by opening the remote disconnect device prior to removing the fan/motor shield. All wiring must enter the unit through designated openings and not through the riser stub out openings. Only copper wiring shall be used for connections with the unit.

### 3.8 Supply Air Grille Installation

The grille is a snap-in fit into the collar on the unit. If the unit has a ducted supply, side supply air grilles are provided with a balancing damper. If the unit has two unit mounted grilles and is not ducted, one of the grilles is provided with a damper. This grille is to be fitted to the opening which requires the lesser of the two air flows (for example the bedroom).

### 3.9 H/ERV Ducting

Attach 5in round ducting to the duct collars provided. Seal the duct join with tape. See the job specific submittal for the duct connection layout.

# 3.10 Return Air/Access Panel Installation 3.10.1 Panel with hinged access door

Remove the hinged door by raising to the horizontal position and gently pull out past the hinge pins.

Remove the top pair of screws from the motor cover panel.

Align the bottom and hook on over the bottom collar of the fan coil unit. Tilt the panel up so that it is flush against the unit/drywall.

Secure the panel by reinstalling the machine screws through the slotted tabs on the panel frame.

Re-install the hinged filter access door using the same technique used to remove it.

#### 3.10.2 Perimeter Panel

Insert the panel into the collar on the fan coil unit so that the panel frame is against the drywall.

Open the hinged access panel and secure the frame by fitting sheet metal screws through the holes on the edge of the frame (six for TL units and eight for TR units). Do not overtighten the screws.

## 3.11 Top Extension for Painted Units

If a top extension has been provided to trim the unit up to the ceiling, the extension overlaps the top of the unit by 1-1/2". Use sheet metal screws to attach the extension directly to the unit.

## 3.12 Riser Pipe Cover for Painted Units

If a riser cover has been provided, it is installed after the floor opening has been fire-stopped. A cover support bracket and a wall bracket are provided the cover install. The support bracket screws into the side face of the unit close to the front. The wall bracket screws into the wall where the cover will align with the wall. The cover snaps into the support bracket and screws to the wall bracket. Refer to the submittal for illustrations of the bracket arrangements.

#### 3.13 Thermostat Installation

#### 3.13.1 Unit mounted thermostat

For thermostats provided by Temspec, connect the wires from the thermostat to the wire harness usually inside the electrical compartment using the plug provided. Mount the thermostat on the electrical box provided (concealed units) or directly to the unit (painted units).

For thermostats provided by others, connect the provided wires to the thermostat (see wiring diagram for wire identification). Mount the thermostat on the electrical box provided (concealed units) or directly to the unit (painted units).

#### 3.13.2 Remote mounted thermostat

Run low voltage wires from the 24V thermostat on the wall back to the terminal strip inside the unit.

A motor speed board in the unit will allow adjustment of the fan speeds if the factory settings are not suitable.

Caution: Adjusting fan RPM to a higher speed may result in excessive air flow noise.



## **Outdoor Air Connection**

Temspec Leaf units may have an outdoor air connection located at the bottom of the unit below the drain pan.

#### 4.1 Manual Damper

One option with an outdoor option is to have a manual damper in the unit. This allows for manual balancing of the amount of outdoor air coming into the unit.



The standard opening is 4"x6". All unit sizes have the opening located 1-1/4" from the side of the unit. and 1-3/8" up from the bottom of the unit. An example for the left side is to the right. The options for locations are, left, right, back-right, and back-left.

#### 4.2 Automatic Damper

Another option is to have the damper be automatically controlled to shut off the outdoor air when it is not desired. Normally when the room is unoccupied or when the outdoor air temperature is too low.

The opening for the automatic damper is 4"x6". The opening is 1-1/4" located from bottom of the unit. For openings on the left or right the opening is located 1-13/16" back from the front of the unit. For units with back openings, the opening is located 4-1/2" from the side with the risers.



1.25

1.375



BACK SIDE DETAIL VIEW- BOTTO DETAIL SHOWN FOR BACK OA OPE AND LEFT RISER SLOTS

#### 5 **Operating Instructions**

Turn on the disconnect switch located behind the fan enclosure cover to the "On" position.

#### **Standard Digital Programmable** 5.1 Thermostat (Spartan)

Select the mode, RUN, HALT, or STOP, by pressing the "Mode" button

Adjust the setpoint to desired temperature setting using the up/down arrow buttons.

Toggle the "Fan" button between auto and continuous. The fan speed will vary based on the difference between room temperature and room setpoint. In Auto mode, the fan will shut off when there is no heating/ cooling demand, this is the most economical operating mode. In continuous the fan will run at a low speed.

The "On/Off" button turns the unit on or off.

The thermostat allows for 7 day scheduling. The battery back-up lasts for 5 years.

See thermostat operating instructions for further information. Refer to thermostat operating instructions for other thermostats used.

Note: the thermostat must have 0-10VDC fan signal to control fan speed. A motor speed board model SPDM will allow the contractor to adjust the maximum fan speed if the factory set point is not suitable. If a thermostat with a 3-speed fan switch is used, a digital to analogue interface board model EVO/10Y-4Spd must be used to convert the fan signal to a 0-10VDC.

## 5.2 Adjusting the maximum airflow

The maximum airflow is factory set to the closest nominal design airflow, or to the safest the low speed to work with electric heat but can be field adjusted if needed.

With a 0-10VDC thermostat fan signal, the max CFM can be adjusted by adjusting the blue knob on the EBM fan board in the electrical box. See the picture and reference chart to the left. To increase the maximum airflow, turn the adjustment clockwise to increase maximum airflow and counterclockwise to reduce it. The chart below indicates the % flow, airflow, relative to cabinet size and external static pressure.

If a 3 speed fan control thermostat is used, the airflow for each speed is factory set to be 50% on low speed, 75% on medium speed, and 100% on high speed, or 70%, 85%, and 100% for units with electric heat. Each motor speed airflow may be adjusted by turning the adjustment dials on the EVO board. Call 1=low speed, call 2=medium speed and call 3=high speed.



Rotate dial clockwise to increase max airflow or counterclockwise to decrease. (Used with 0-10VDC fan speed signal)

Figure 1: Max CFM Adjustment Board



Table 1: EBM Fan Speed Controller Setting Reference (230V motors)

Cabinet Size	CFM/ L/S	Dial Position @ free discharge	Dial Position @ 0.2"/ 50pa ESP	Dial Position @ 0.4"/ 100pa ESP
03 -04	200/94	60%	-	-
03 -04	300/145	70%	85%	-
03 -04	400/190	90%	100%	-
06 -08	500/235	60%	70%	80%
06 -08	600/285	70%	75%	85%
06 -08	700/330	80%	85%	95%
06 -08	800/380	90%	95%	-
10-12	900/425	55%	65%	70%
10-12	1000/470	65%	70%	75%
10-12	1100/520	75%	75%	80%
10-12	1200/565	80%	85%	90%

Warning: if the maximum CFM is adjusted to a value above the design airflow, excessive air noise could occur



Rotate dial(s) clockwise to increase max airflow or counterclockwise to decrease. Call 1, 2 & 3 are used with 3 speed fan thermostats. (Call 4 not used) No call must be at zero flow.

Figure 2: EVO 4-Spd CFM Adjustment Board

## 5.3 H/ERV Fan Adjustment

To adjust the normal operating speed of the fan, use the potentiometers located on the control board. Clockwise increase the speed and counterclockwise decrease the speed.



Figure 3: H/ERV module fan adjustment dials

## 5.4 H/ERV Defrost Timer Adjustment

The defrost timer is adjustable with the timer dip switch selection (SW2). The below chart shows the switch locations and the associated settings.

Table 2: Defrost Timer Adjustment

SW2 Setup	Defrost Timer
(1,2,3,4)	
OFF, OFF, OFF, OFF (DEFAULT)	Defrost on 5mins, off 5mins
ON, OFF, OFF, OFF	Defrost on 1mins, off 9mins
OFF, ON, OFF, OFF	Defrost on 2mins, off 8mins
ON, ON, OFF, OFF	Defrost on 3mins, off 7mins
OFF, OFF, ON, OFF	Defrost on 4mins, off 6mins
ON, OFF, ON, OFF	Defrost on 5mins, off 5mins
OFF, ON, ON, OFF	Defrost on 6mins, off 4mins
ON, ON, ON, OFF	Defrost on 7mins, off 3mins
OFF, OFF, OFF, ON	Defrost on 8mins, off 2mins
ON, OFF, OFF, ON	Defrost on 9mins, off 1mins



Figure 4: H/ERV module dip switches



## 5.5 H/ERV Fan Purge mode adjustment

By default, the purge mode speeds both fans up to full speed. To adjust the fan speed, power off the unit, set SW2 to ON, ON, ON, ON and power up the unit. This will enter the control board into the "Purge Mode Set" function. Adjust the potentiometers to the proper fan speed for the site application. Power the unit back off and reset SW1 to the original settings and power the unit back on to have it run like normal. This will cause the "Normal Mode" fan speeds to have to be readjusted.

## 5.6 H/ERV Defrost Threshold Adjustment

The defrost threshold temperature is adjustable with the threshold dip switch selection (SW1). The below chart shows the switch location and the associated settings.

Table 3: Defrost Threshold Adjustment

SW1 Setup	Defrost Threshold
(1,2,3,4)	
OFF, OFF, OFF, OFF (DEFAULT)	-5C (23F)
ON, OFF, OFF, OFF	0C (32F)
OFF, ON, OFF, OFF	-2C (28.4F)
ON, ON, OFF, OFF	-4C (24.8F)
OFF, OFF, ON, OFF	-6C (21.2F)
ON, OFF, ON, OFF	-8C (17.6F)
OFF, ON, ON, OFF	-10C (14F)
ON, ON, ON, OFF	-12C (10.4F)
OFF, OFF, OFF, ON	-14C (6.8F)
ON, OFF, OFF, ON	-16C (3.2F)
OFF, ON, OFF, ON	-18C (-0.4F)
ON, ON, OFF, ON	-20C (-4F)

## 6 Sequence of Operation

Note: always refer to wiring diagram on the motor cover panel to the determine the model and type of fan coil. This can be viewed by lifting the hinged filter access panel door.

## 6.1 2-Pipe Heating/Cooling Units

The control valve is activated by the cool and heat outputs from the thermostat which are connected to an aquastat.

On a call for cooling from the thermostat and the water

temperature is less than 65F, the aquastat energizes the control valve. If the water temperature rises above 85F, the aquastat de-energizes the control valve.

On a call for heating from the thermostat and the water temperature is greater than 85F, the aquastat energizes the control valve. If the water temperature drops below 65F, the aquastat de-energizes the control valve.

The aquastat has black, yellow, and orange wire leads. The switch closes for heating at 85F +/- 5F through BL and ORA and cooling at 65F +/- 5F through BL and YEL.

#### 6.2 2-Pipe Heating/Cooling Auxiliary Electric Heat Unit

The control valve and electric heat relay are activated by the cool and heat outputs of the thermostat which are connected to two aquastats labeled A1 and A2 on the wiring diagram.

On a call for cooling from the thermostat and the water temperature is less than 65F, the A1 aquastat energizes the control valve. If the water temperature rises above 85F, the aquastat deenergizes the control valve.

On a call for heating from the thermostat and the water temperature is more than 85F, the A1 aquastat energizes the control valve. If the water drops below 65F, the aquastat de-energizes the control valve and the A2 aquastat energizes the electric heat relay.

#### 6.3 2-Pipe Heating/Cooling Total Electric Heat Unit

The control valve and electric heat relay are activated by the cool and heat outputs of the thermostat. No aquastats are used.

On a call for cooling from the thermostat, the thermostat energizes the child water control valve.

On a call for heating from the thermostat, the thermostat heat output energizes the electric heat relay. The control valve remains closed.

### 6.4 4-Pipe Heating/Cooling Unit

The hot water control valve and chilled water control valve are activated by the cool and heat outputs of the thermostat. No aquastats are used.

On a call for cooling from the thermostat, the thermostat cool output energizes the chilled water control valve.

On a call for heating from the thermostat, the thermostat heat output energizes the hot water control valve

Note: See submittal for more information specific to the unit and refer to the wiring diagram on the motor cover.

## 6.5 H/ERV Normal Running Mode

When the H/ERV control is turned on, both module fans will start and run at the selected speed (adjustable on site) and the internal damper will open.



### 6.6 H/ERV Purge Mode

When the PURGE mode is selected, the fans will run at high speed. An optional accessory is the remote mount purge timer. This is a 20/40/60min push button timer. Push the button one for 20mins, twice for 40mins, three times for 60mins, and four times to stop activation.

## 6.7 H/ERV Defrost Mode

The defrost mode activates to prevent frost buildup on the core due to cold outdoor air. When the temperature on the outdoor side of the core reaches below the threshold (-5C (23F) is default), the unit will enter defrost mode. During this mode, the internal damper will close, and recirculation will occur for a split of a 10 minute interval (5 mins is default), during this mode both fans will run at low speed. When it is not recirculating, the unit will run in Normal Mode.

#### 6.8 H/ERV Freeze Protection

When the temperature sensor located on the coil reads below 2.8C (37F) the unit will go into a freeze protection mode to try and prevent the coil from freezing. In this mode, the H/ERV and Fan Coil fans will stop, the H/ERV damper will close, and the hot water valve (or only valve for 2-pipe systems) will open. The unit will stay in this mode until a temperature of 12.8C (55F) is reached.

## 7 Maintenance

Always isolate the unit electrically before removing the front access panel. Do this by opening the circuit breaker (or other switching device) in the distribution panel in the suite. Do not use the 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.

Ensure that the fan has stopped rotating before proceeding to work within the unit.

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 wiring to the unit.

Take care when working inside the unit. Sheet metal components may have sharp edges.

### 7.1 Every 3 Months

#### 7.1.1 Check/replace the Return Air filter

The filter can be one of two types: a 1" thick cardboard framed type or a metal frame with filter media attached.

To access the filter, grasp the bottom of the hinged door and pull sharply forwards. Lift the door to the horizontal position. The filter is now accessible and is removed by sliding upwards out of the channels attached to the inside of the grille.

Table 4. Leaf Offic Standard filler Sizes	Table 4: I	Leaf Unit	standard	filter	sizes
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Part	03/04	06/08	10/12
TL Unit	14"x25"x1"	14"x25"x1"	16"x25"x1"
	(355x635x25)	(355x635x25)	(405x635x25)
TF Unit	14"x25"x1"	16"x25"x1"	16"x25"x1"
	(355x635x25)	(405x635x25)	(405x635x25)
TR Unit	14x"25x1"	14"x25"x1"	18"x25"x1"
	(355x635x25)	(355x635x25)	(455x635x25)

#### 7.1.2 Check/ clean the H/ERV filters

The H/ERV filter are an electrostatic washable filter to protect the core from any debris. To wash the filters, soak with water and a mild soap. Lightly shake and dry the excess water off of the filter before re-installing.

To access these filters, remove both access panels on the front of the unit by undoing the screws and pulling the panels towards you. Next remove the H/ERV module access panel by removing the rods and pulling the panel away from the module. The filters can be slid out of the guides.

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

Remove the return air/access panel from the wall.

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.

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.

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.

Fan, fan motor, control valve(s), electric heater, drain pan over-flow switch, and thermostat do not require routine maintenance.

Note: fan motor has sealed bearings and does not require additional lubrication.



## 8 Start-up Check List

## 8.1 Receiving & Inspection

- Unit received undamaged
- Unit received as ordered

## 8.2 Handling & Installation

- Unit installed level & square
- Proper access is provided
- Proper over-current protection is provided
- Unit protected from dirt & foreign matter

### 8.3 Cooling/heating Connections

- Protect valve package components from excessive heat
- Pressure-test all piping for leaks
- Install drain lines and traps as required
- Insulate all piping as required
- Connect risers from master to secondary units if required
- Connect risers to piping package if shipped separately or supplied by others

## 8.4 Electrical Connections

- Refer to unit wiring diagram
- Connect incoming power service
- Install and connect "shipped lose" components like thermostat

### 8.5 Unit Start-up

- Check for free and proper fan rotation
- Record electrical supply voltage and amperage
- Check all wiring for secure connections
- Close all unit isolation valves
- · Flush water systems
- Check the strainer (if applicable) after one week of flushing the system for debris
- Open all isolation valves after system flush
- Check that Erie control valve is not in the "locked" open position.
- Vent water systems as required
- All duct work and grills are in place
- Filters are in place
- Start blowers, pumps, chillers etc.
- · Check all units for electrical over-load
- Check all duct work and units for air leaks

- · Balance water systems as required
- The Erie control valve can be "locked" open by manually positioning the lever on the back of the valve actuator. Ensure this released so after flushing to allow the valve to be controlled by the thermostat
- Balance air system as required
- Record all final settings for future reference
- · Check piping and walls for severe vibration
- Check all dampers for proper operation (if any)
- Verify heating and cooling operation
- Ensure all access panels and grilles are securely in place
- Verify condensate is flowing
- Ensure the condensate switch did not shift during shipping or installation

## 9 Fan Removal Procedure

## 9.1 03/04 Units

- Remove the Return Air Grille and the motor cover
- Disconnect power by switching off the disconnect with the main unit disconnect
- Open the electrical enclosure and disconnect all motor wires and feed back into the motor chamber
- Remove the screws connecting the motor base to the fan bulkhead
- Slide the assembly out through the front opening making sure the motor wires are not caught on anything
- To install a new fan, follow the above steps in reverse

#### 9.2 06/08 Units

- Remove the Return Air Grille and the motor cover
- Disconnect power by switching off the disconnect with the main unit disconnect
- Open the electrical enclosure and disconnect all motor wires and feed back into the motor chamber
- Unscrew the nuts for the frame support legs (found underneath the fan bulkhead)
- Once all four nuts are removed the fan and frame can lifted and removed out of the front opening
- To install a new fan, remove the base from the new assembly then follow the above steps in reverse order while making sure to align the motor wires properly



## 9.3 10/12 Units without H/ERV module

- Remove the Return Air Grille and the motor cover
- Disconnect power by switching off the disconnect with the main unit disconnect
- Open the electrical enclosure and disconnect all motor wires and feed back into the motor chamber
- Remove the screws connecting the motor base to the fan bulkhead
- Slide the assembly out through the front opening making sure the motor wires are not caught on anything
- To install a new fan, follow the above steps in reverse

#### 9.4 10/12 Units with an H/ERV module

- · Remove the Return Air Grille and the motor cover
- Disconnect power by switching off the disconnect with the main unit disconnect
- Open the electrical enclosure and disconnect all motor wires and feed back into the motor chamber
- Unscrew the nuts for the frame support legs (found underneath the fan bulkhead)
- If the unit has electric heat, the heater needs to be disconnected and removed.
- Once all four nuts are removed, lift the fan up over the electrical box and out of the opening
- To install a new fan, remove the base from the new assembly then follow the above steps in reverse order while making sure to align the motor wires properly

Contact Temspec if more information is needed.

## **10 Limited Warranty**

TEMSPEC INCORPORATED warrants the equipment from factory defects in material or workmanship for a period of eighteen months from the date of shipping.

For this warranty to be valid, the unit(s) must be installed and maintained in accordance with the manufacturer's printed instructions. It does not cover parts damaged by vandalism, improper installation, maintenance, or abuse.

Should any replacement parts be required within the warranty period, they will be supplied at no charge, freight prepaid to the jobsite. The cost of labor or incidental expenses incurred in the repair or replacement of parts does not form part of this warranty.

The warranty period commences from the date of shipment, except when otherwise agreed at the point of sale (see specific warranty terms and conditions for details).

## **11 Part Sales**

Table 5: Standard Leaf Unit replacement parts

Part	03/04	06/08	10/12
TL Fan Coil Filter	FPY 14125	FPY 14125	FPY 16125
TF Fan Coil Filter	FPY 14125	FPY 16125	FPY 16125
TR Fan Coil Filter	FPY 14125	FPY 14125	FPY 18125
Fan Coil Fan Assembly (120V)	BFE 0251017	BFE 0281017	BFE 0311035
Fan Coil Fan Assembly (200-277V)	BFE 0252008	BFE 0282017	BFE 0313050
Fan Coil Valve 2 Pos Actuator (Normally Open)	RVM 00231	RVM 00231	RVM 00231
Fan Coil Valve 2 Pos Actuator (Normally Closed)	RVM 00131	RVM 00131	RVM 00131
E/HRV Fan	BFE 0131006	BFE 0131006	BFE 0131006
E/HRV Filter	FRE 06006	FRE 06006	FRE 06006
E/HRV Damper Actuator	EAD 28110S	EAD 28110S	EAD 28110S

Unit layout can be seen below

For other job specific parts please contact Temspec Technical Support by phone:1-800-TEMSPEC or (905)-670-3595 or by email at service@temspec.com.

For replacement parts, please contact Temspec and ask for "parts sales". We can be reached by phone:1-800-TEMSPEC or (905)-670-3595 or by email at sales@temspec.com.

Be sure to include the unit serial number located on the unit nameplate.



# 12 Troubleshooting

Table 6: Standard Troubleshooting

Fault	Common Causes	Troubleshooting	Solution
	Motor not receiving	Ensure the unit is supplied with correct line voltage	Power on main power supply and unit power switch
	power	Ensure all wiring connections are correct and secure	Fix any loose connections
Supply Fan fails to start	pply Fan fails	Ensure controller is powered	Verify 24VAC from transformer to controller. Replace controller if power is present but it is not powering up
	receiving control signal	Ensure controller is sending a proper signal	Verify the controller programming/ setup
		Ensure H/ERV Control board is powered and not in Freeze Protection mode	Check wiring connections and ensure the coil temperature sensor is above 12.8C (55F)
	Failed Motor	Ensure motor is receiving power and control signal	Replace motor
	Motor not receiving	Ensure the unit is supplied with correct line voltage	Power on main power supply and unit power switch
	power	Ensure all wiring connections are correct and secure	Fix any loose connections
		Ensure the H/ERV control board is powered	Verify 24VAC from transformer to the control board
H/ERV Fan Fail to Start	Motor is not receiving control	Ensure the control signal is not turned down too low	Adjust the potentiometers on the board.
	signal	Ensure H/ERV Control board is powered and not in Freeze Protection mode	Check wiring connections and ensure the coil temperature sensor is above 12.8C (55F)
	Failed Motor	Ensure motor is receiving power and control signal	Replace motor



Table 7: Standard Troubleshooting continued

Fault	Common Causes	Troubleshooting	Solution
		Ensure controller is sending a	Verify the controller
		proper signal	programming/ setup
Control Valve	Actuator is not receiving proper signal	Aquastat is blocking signal to valve (2-pipe units only)	Verify the water temperature in the coil is above 85F for heating or below 65F for cooling. Replace Aquastat if it has failed
rails to Open		Ensuro H/ERV/ Control board is	Chock wiring
		powered and not in Freeze Protection mode (will force open HW actuator in 4-pipe or the only valve in 2-pipe)	connections and ensure the coil temperature sensor is above 12.8C (55F)
	Failed Actuator	Ensure the actuator is receiving proper signal	Replace Actuator
	Ensure the unit is su correct line voltage Ensure controller is s proper signal	Ensure the unit is supplied with correct line voltage	Power on main power supply and unit power switch
		Ensure controller is sending a proper signal	Verify the controller programming/ setup
	Heater is not	Aquastat is blocking signal to valve (2-pipe changeover units only)	Verify the water temperature in the coil is below. Replace Aquastat if it has failed
Electric Heat Coils Fails to Operate	receiving power	Ensure the air differential pressure switch in not blocking the signal	Ensure the fan is running and the intake tubing for the switch is in place and not blocked. Replace the switch if failed
		Ensure the manual temperature limit switch is not tripped	Press switch to reset. <b>Caution:</b> could be very hot, switch trips at 175F
	Failed heat coil	Ensure the actuator is receiving proper voltage	Replace heat coil



## **13 Leaf Drywall Screw Locations**



SCREW LOCATIONS FOR DRYWALL LEAF UINTS

> DO NOT PENETRATE CABINET WITH DRYWALL SCREWS IN SHADED AREAS SHOWN ON SKETCH BELOW.



FRONT VIEW

SIDE AND BACK VIEW

	X1	Х	Y	¥1
300/400	1 1/4"	12 5/16"	52 1/16"	5 15/16"
600/800	2 7/8"	14 5/16"	52 1/16"	5 15/16"
1000/1200	2 9/16"	18 13/16"	54 1/16"	5 15/16"

# NOTE: THE LENGTH OF SCREW FOR INSTALLATION OF DRYWALL SHOULD NOT BE LONGER THAN 1 1/4"

DATE: 2019-10-17

INTENTED AS A GUIDELINE ONLY. CARE MUST BE TAKEN ON SITE.

REVISION : 00



## 14 Standard Leaf Unit Layout

#### TEMSPEC Vertical Stack Fan Coil Unit - Dimensions TRS 1000/1200 - 4 Pipe Unit with ERV/HRV Module Configuration shown is Back (BK) coil, Left (LT) module, and Top Ducted SA Coil conn. can be: LT, RT, BK, or reverse order: RL, RR, RB Module can be: LT, RT, BK, with option to swap EA In/EA Out position OA In is always in the centre SA can be out the front, remaining free side, ducted, or cobination there of OA EA EA Out In In TOP VIEW 13 14 15 16 17 -18 -11 12 -8 19 5 1/4" 3 3/4" HWR HWR CWR CWS -10 -20 47 36 22 O Cond. 23 2 5/8 FRONT VIEW BACK VIEW SIDE VIEW SIDE SECTION w/LT Module w/BK Coil Conn. w/LT Module

- 1. Top duct connection knock-out 16" x 16" for nominal 1000/1200 cfm
- 2. Module/SA plenum access panel
- Motor cover allows access to motor, coil, piping package, and electrical compartment. Location of, identification, safety, and certification labels
- 4. RA section with flange mounted filter chanel
- Coil connections/riser stub-outs. Centered in 2.5" x 5" openings on LT, RT, or BK of cabinet (BK shown). Reversed order option available
- 6. Condensate/drain connection from drain pan to condensate riser
- 7. ERV/HRV module shown on LT (RT and BK mounting also available)
- 8. Power cable entry (RT side) and control cable entry (LT side)
- 9. 20" ga steel cabinet, insulated with 1" acrylic coated glassfiber 1/2 closed cell cabinet insulation optional upgrade
- 3" x 5" duct for ERV/HRV treated fresh air to return side of coil Always located below EA out
- 11. Mounting flange for perimeter type RA panel. Shipped secured to unit

- 12. Perimeter type hinged RA access panel allows access to change filter, and removable access panels for unit maintenance
- 13. Outside air/exhaust air motorized damper
- 14. Exhaust air out fan
- 15. Outside air in fan
- 16. ERV or HRV core
- 17. Condensate drain drains to unit drain pan
- 18. Electrical compartment
- 19. Backward inclined impeller fan with proportional ECM
- 20. 2 pipe CW cooling / HW heating coil with 6-way control value
- Drain pan, pitched in two directions. Acrivic coated galvanized steel Stainless steel optional upgrade. c/w overflow float switch
- 22. 5" x 4" opening below drain pan for ERV/HRV intake
- 23. Reinforced vinyl flex hose, forms a p-trap as it exits the unit