

## Safety Considerations

The equipment covered by this manual is designed for safe and reliable operation within its design specification limits. To avoid personal injury or damage to equipment or property while installing or operating this equipment, it is essential that qualified, experienced personnel perform these functions using good judgment and safe practices. See the following cautionary statements.

### Danger

**ELECTRICAL SHOCK HAZARDS.** All power must be disconnected prior to installation and servicing this equipment. There may be more than one power source present. Insure that all power sources have been disconnected to avoid electrocution or shock injuries.

**MOVING PARTS HAZARD.** Motor and blower must be disconnected prior to opening access panels. Motors can start automatically; disconnect all power and control circuits prior to servicing to avoid serious crushing or dismemberment injuries.

**BURN HAZARD.** Electrical resistance heating elements must be disconnected prior to servicing. Electric heaters may start automatically; disconnect all power and control circuits prior to servicing to avoid burns.

### Caution

The equipment covered by this manual is available with a variety of options and accessories. Consult the approved unit submittal, order acknowledgment and other manuals for details on the options and accessories provided with the equipment on each project. Safe practices regarding mechanical equipment must be followed at all times when handling, installing or servicing any unit. All power must be disconnected before any installation or service should be attempted. More than one power source may be supplied to the unit. Power to remote mounted control devices may not be supplied through the unit. Never wear bulky or loose fitting clothing when working with mechanical equipment. Gloves should only be worn when required for proper protection from heat or other possible injury. Safety glasses or goggles should always be worn when drilling, cutting or working with chemicals such as lubricants. Never pressurize any equipment beyond specified test pressures. The manufacturer assumes no responsibility for personal injury or property damage resulting from improper or unsafe practices during handling service or operation of any equipment.

### Preface

Nailor Industries fan coils represent an investment, which can, when installed and operated properly, give long and trouble free service. Your equipment is initially protected under the manufacturer's standard warranty. However, this warranty is provided under the condition that the steps outlined in this manual for initial inspection, proper installation, periodic maintenance and everyday operation of the equipment be followed in detail. This manual should be fully reviewed in advance of any actual work being done on the equipment. Should any questions arise, please contact your local Sales Representative or the factory before proceeding.

## Unpacking and Inspection

All units have been carefully inspected, tested and packaged at Nailor's manufacturing facility. It is the responsibility of the receiving party to inspect the equipment upon arrival. Any obvious damage to the packaging and/or its contents should be recorded on the bill of lading and a claim should be filed with the freight carrier. After determining the condition of the unit's exterior, including all piping, each unit should be carefully removed from the package and inspected for hidden damage. Any hidden damage should be recorded and immediately reported to the carrier and a claim filed. Should a claim for shipping damage be filed, the unit, the shipping package and all packing must be retained for inspection by the freight carrier. All equipment should be stored in the factory shipping package until installation. At the time of receipt, the equipment type and arrangement should be verified against the order documents. Should any discrepancy be found the local sales rep should be notified immediately so that the proper action may be instituted? The factory must be notified about any questions concerning warranty repairs BEFORE any corrective action is taken. Should equipment require factory operations a Return Authorization Number will be issued. Any returns not marked with an authorization number will be refused. The manufacturer will not accept claims for expenses not authorized.

## Ship Loose Items

Items may often be shipped loose for field installation. These items are shipped loose to offer protection against shipping and job site damage or by customer request. Refer to packing slip. These items require the same inspection as the unit.

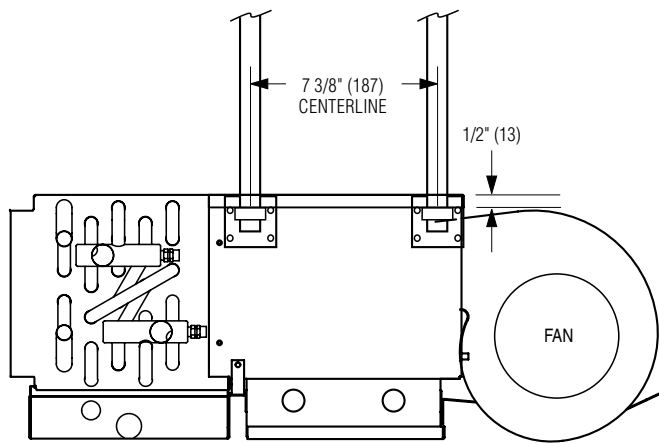
## Handling & Installation

Even though the Nailor fan coil unit is a sturdily constructed unit, great care should be taken when handling it. Care should be taken to protect the blower assembly, coil, piping, and drain stub outs during handling. The piping and blower assemblies should not be used as handles for lifting or moving the unit. Units may also have delicate internal components that could be damaged by improper handling. Care should be taken to prevent impact forces on the unit that may cause internal damage. The units covered in this manual are not suitable for outdoor installation and should never be used for that purpose. The units should never be stored or installed where they may be subjected to a harsh environment such as rain, snow, or extreme temperatures. Care should be taken to prevent any materials such as paint, plaster, drywall dust, and other construction materials from being deposited in the drain pan, heater, coils, or on the motor or blower wheels. Failure to do so may have negative effects on unit operation and may result in premature failure.

To prevent contamination, the units should have some form of temporary covering placed over them during construction.

Anchoring the equipment in place is achieved by using the mounting points provided and positioning the unit to maintain the unit on a level plane. All units are supplied with hanger brackets for use with 3/8" all thread hanger rod. Adequate clearance must be provided for service and removal of the equipment and its accessory components.

Dimensions are in inches (mm).



**Fan Coil Unit Support Using Hanger Brackets and Rods  
(For Model Series 40F).**

After unit is mounted, the service connections such as water, drain and electrical can be made. At this time it should be confirmed that the proper types of services have been provided to the unit. The water connections should be checked for line size, temperature, and location. Electrical service to the unit should be compared to the unit nameplate to verify compatibility. The routing, and sizing of all piping, the type and sizing of all wiring and other electrical components such as circuit breakers, disconnects switches, etc. should be determined by the individual job requirements and should not be based on the size or type connections provided with the equipment. All installations should be made in compliance with all governing codes and ordinances. This compliance to all codes is the responsibility of the installing contractor.

## Coils & Valve Package

All valve components should be installed as required, and all service valves should be checked for correct operation. If coil and valve package connections are to be made by braze or solder, care should be taken to assure that no components in the valve package are subjected to a high temperature which may damage seals or other materials. Valve bodies should be wrapped with a wet rag to help dispel heat during brazing or soldering operations. Protect adjacent flammable materials when brazing. Use flame and heat protection barriers where needed. The chilled water valve package should be installed such that all pipes and fittings that extend beyond the drain pan are contained in the auxiliary drain pan or other device or insulated to prohibit sweating. All piping leading to the unit must be sufficiently supported to avoid excessive stress on the unit's piping. However, adequate free movement is required for thermal expansion/contraction. If union connections are used, backup wrenches must be used during any tightening process to keep the copper tube or fitting from being damaged. Nailor will not accept any responsibility for improper tightening procedures that damage the connections.

**Factory installed threaded connections have been tightened and tested at the factory before shipping. These connections must be checked for tightness in the field before unit is put into service to ensure fittings did not loosen due to shipping vibration. Any connection found to be loose must be tightened. Nailor will not be held responsible or accept any charges for tightening loose fittings.**

After the connections are completed, the system should then be tested for leaks.

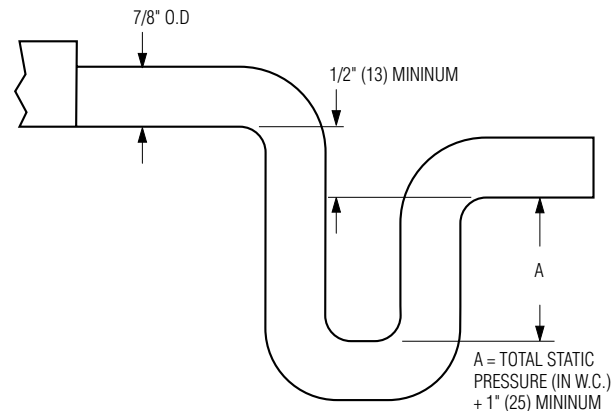
**All water coils must be protected from freezing after initial water fill. Even if the system is drained unit coils may still retain enough water to cause damage if exposed to temperatures below freezing.**

## Drain Pan

The drain pan is easily removable for cleaning or reversing connections. The auxiliary drip pan (if supplied) must be sloped toward the drain pan to catch condensed moisture from valves and piping. The drain pan is internally sloped toward the drain connection. The drain should be checked before initial startup, and periodically thereafter to assure that the drain is clear. If the drain is clogged, steps should be taken to clear the debris so that condensate will flow easily.

## Condensate Trap

Install drain line and trap in accordance with all applicable codes. A slope of 1/8 in. per 1 ft. of condensate drain line run is necessary for adequate condensate drainage. Insulate the drain line to prevent sweating. Supports are required for the drain line to prevent excessive stress on the drain pan. A drain trap may be required by local codes and is recommended for odor control. Each drain pan should be individually trapped. The differential height of the trap inlet to outlet must be at least 1" greater than total static pressure of the unit. See Figure below for details.



## Ductwork Connections

All ductwork must be complete and connected; all grilles, filters, access doors and panels must be properly installed to establish system operating conditions BEFORE beginning air balancing operations. Balance specialists who are familiar with all procedures required to establish air distribution and fan system operating conditions should do the air balancing. After proper system operation has been established the actual air delivery and motor amp draw should be recorded for future reference. The manufacturer assumes no responsibility for undesirable system operation due to improper design, equipment or component selection, and/or installation of ductwork, grilles, and other field supplied components.

Dimensions are in inches (mm).

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## Electrical Connections

The unit nameplate lists the unit electrical characteristics such as the required voltage, fan and heater amperage, and required circuit ampacity. The unit-wiring diagram shows all unit and field wiring. Because each project can be different and each unit on a project may be different the installer must be familiar with the wiring diagram and nameplate on the unit before beginning any wiring. An adequately sized fuse, circuit breaker, or disconnect that meets local and national electric codes must be supplied. All electrical connections should be checked for tightness before startup. All field-installed components should be located and checked for proper function and compatibility. All internal components should be checked for shipping damage and any loose connections should be tightened to prevent any problems during startup. Any devices furnished by the factory for field installation must be wired in strict accordance with the applicable wiring diagrams. Failure to do so could result in personnel injury or damage to the equipment and will void all manufacturers' warranties.

## Start Up

### General

Before beginning any startup operation all start up personnel should familiarize themselves with the unit options, accessories, and control sequence to understand the proper system operation. All personnel should have a good working knowledge of the general start up procedures along with the appropriate start-up guides and balancing guides available. The building must be completely finished with all doors, windows, interior walls and insulation in place. The entire building should be as complete as possible before beginning any system balance. Before any startup operations occur a final visual inspection should be made of the system. Once it has been established that the installation is correct, complete, and no foreign articles have been left in the units or other areas the startup procedure can begin.

### Cooling/Heating System

Before the water system is started and balanced the chill/hot water systems should be flushed to remove any contaminant that might collect in the system during construction. All unit service valves must be in the closed position during this operation to keep foreign matter from entering the unit and clogging the valves. Strainers should be installed in the piping mains to prevent this material from entering the units while they are operating. During the filling of the system the vent valve on top of the coil should be turned counter clockwise one and one-half turns so any trapped air in the coil can escape. CAUTION: The coil air vents are not to be used to bleed the entire system. The main piping must have air vents installed in it where potential air traps could be located. Some systems may require repeated venting over a period of time to properly eliminate air from the system. CAUTION: Do not exceed 350 PSIG operating pressure.

### Electric Resistance Heater Assembly

Electric resistance heaters typically require no normal periodic maintenance when unit air filters are changed properly. The two most important operating conditions for an electric heater are, proper air flow, and proper supply voltage. High supply voltage or

insufficient airflow will cause the heater strips to cycle on the high side. The strip heaters are equipped with automatic reset switches to prevent overheating of the unit. Once the switches are tripped the heater will remain off until it cools past the lower set point for the trip switches to reset. If the trip switches actuate, the system should be checked and any condition causing the high limit cutout must be corrected immediately.

## Normal Operation and Periodic Maintenance

**ALL POWER MUST BE SWITCHED OFF BEFORE SERVICING**

### General

Each unit on a job will have its own unique operating environment and conditions that will dictate the maintenance schedule for that unit. A formal schedule and maintenance log and an individual unit log should be established and maintained to establish max performance and service life. Information regarding safety precautions contained in the preface at the beginning of this manual should be followed during any service and maintenance operations.

### Motor Blower Assembly

Nailor uses permanently lubricated, PSC type motors that do not require field lubrication to ensure a long trouble free blower life. However, should it become necessary, the blower assemblies in these units are easily removable. Disconnect wiring from the control panel. Remove the nuts located in the top left and right corners of the unit allows the blower bulkhead assembly to be removed from the unit. To reinstall the blower assembly repeat the removal sequence in reverse order, making sure to reconnect all wiring harnesses. Dirt and dust should not be allowed to accumulate on the blower wheel or housing. This can result in an unbalanced blower wheel and damage the wheel or motor. The wheel can be cleaned periodically with a vacuum cleaner and brush.

### Coil Assembly

To access coils for servicing, remove blower and motor assemblies. Coils may be cleaned by brushing the coil face with a soft brush. The brush strokes should be in the direction of the fin never across the fin. Cleaning with a vacuum cleaner should follow this. If compressed air is available the coil may be cleaned by blowing air through the coil from the leaving airside. Vacuuming should follow this procedure also. Even coils that have the filter changed on a regular basis still require cleaning periodically.

### Filters

Return air filters should be replaced on a regular basis. The time interval between each replacement should be established based on inspection of the filter. If the replacement filters are not purchased from the factory, the filters used should be the same type and size as those furnished from, or recommended by the factory. Filters with excessively high air pressure drops are not compatible with the type of fan coil unit covered in this manual.

Dimensions are in inches (mm).

# Electronic Thermostat Control • Quick Reference

For 3-Speed PSC and 3-Speed ECM Motor Units (not applicable to EPIC ECM motors)

## ENGINEERED COMFORT / VENSTAR DIGITAL DISPLAY NON-PROGRAMMABLE THERMOSTATS

System Type	Thermostat Code	Control Type	Type	Change-over Type	System Switch	Fan Switch	Aquastat/ Changeover Sensor	Voltage
2-pipe	TV1 (T1070)	Cool Only	Z	N/A	Yes	3 sp./Auto	No	24
	TV2 (T1070)	Heat Only	W	N/A	Yes	3 sp./Auto	No	24
	TV3 (T1070)	Heat/Cool	Z	Auto	Yes	3 sp./Auto	Yes	24
	TV4 (T1070)	Heat/Cool w/aux. elec. heat	ZE	Auto	Yes	3 sp./Auto	Yes	24
	TV5 (T1070)	Cool w/elec. heat	ZE	Auto	Yes	3 sp./Auto	No	24
4-pipe	TV6 (T1070)	Heat/Cool	ZW	Auto	Yes	3 sp./Auto	No	24

## ENGINEERED COMFORT / VENSTAR DIGITAL DISPLAY PROGRAMMABLE ( 7 DAY ) THERMOSTATS

System Type	Thermostat Code	Control Type	Type	Change-over Type	System Switch	Fan Switch	Aquastat/ Changeover Sensor	Voltage
2-pipe	TVP1 (T1075)	Cool Only	Z	N/A	Yes	3 sp./Auto	No	24
	TVP2 (T1075)	Heat Only	W	N/A	Yes	3 sp./Auto	No	24
	TVP3 (T1075)	Heat/Cool	Z	Auto	Yes	3 sp./Auto	Yes	24
	TVP4 (T1075)	Heat/Cool w/aux. elec. heat	ZE	Auto	Yes	3 sp./Auto	Yes	24
	TVP5 (T1075)	Cool w/elec. heat	ZE	Auto	Yes	3 sp./Auto	No	24
4-pipe	TVP6 (T1075)	Heat/Cool	ZW	Auto	Yes	3 sp./Auto	No	24
	TVP7 (T1075N)	Heat/Cool	ZW	Auto	Yes	3 sp./Auto	No	24

## HONEYWELL DIGITAL DISPLAY (LCD) NON-PROGRAMMABLE THERMOSTATS

System Type	Thermostat Code	Control Type	Type	Change-over Type	System Switch	Fan Switch	Aquastat/ Changeover Sensor	Voltage
2-pipe	TT1 (TB8575A)	Heat/Cool SuitePRO	Z	Auto/Man.	Yes	3 sp./Auto	Yes	24
	TT2 (TB8575A)	Heat/Cool w/aux. elec. heat SuitePRO	ZE	Auto/Man.	Yes	3 sp./Auto	Yes	24
	TT3 (TB8575A)	Cool w/elec. heat SuitePRO	ZE	Auto/Man.	Yes	3 sp./Auto	No	24
4-pipe	TT4 (TB8575A)	Heat/Cool SuitePRO	ZW	Auto/Man.	Yes	3 sp./Auto	No	24

## HONEYWELL PROGRAMMABLE ( 7 DAY ) THERMOSTATS

System Type	Thermostat Code	Control Type	Type	Change-over Type	System Switch	Fan Switch	Aquastat/ Changeover Sensor	Voltage
2-pipe	TP1 (TB7100A100)	Heat/Cool MultiPRO	Z	Auto/Man.	Yes	3 sp./Auto	Yes	24
	TP2 (TB7100A100)	Heat/Cool w/aux. elec. heat MultiPRO	ZE	Auto/Man.	Yes	3 sp./Auto	Yes	24
	TP3 (TB7100A100)	Cool w/elec heat MultiPRO	ZE	Manual	Yes	3 sp./Auto	No	24
4-pipe	TP4 (TB7100A100)	Heat/Cool MultiPro	ZW	Auto	Yes	3 sp./Auto	No	24



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Dimensions are in inches (mm).