WATER COOLED AIR CONDITIONERS

HORIZONTAL & VERTICAL MODELS
R410A

INSTALLATION, OPERATION AND MAINTENANCE

SERIES "KACE" KACE-009A KACE-012A KACE-015A KACE-018A
KACE-024A KACE-030A KACE-036A KACE-042A
KACE-048A KACE-060A KACE-072A KACE-096A
KACE-120A KACE-144A

Warning
Mechanical Thermostat may affect Electronic Control card in unit. Connect an electronic Thermostat to unit.

Each air conditioner has been operated and checked out prior to shipment. Failure to operate after installation indicates damage in transit or improper installation.

INSPECTION
Check packaging during unloading. Note transit damage on all copies of bill of lading. Inspect air conditioners for hidden shipping damage after packaging is removed. Transit damage claims must be filed promptly with Freight Company by purchaser.

HANDLING
Always handle **Vertical units upright and Horizontal units flat on their base**. Moving a vertical unit on its side, placing a horizontal unit on end, or dropping it may damage internal parts and displace oil from the compressor's crankcase.

STORAGE
If job site storage is necessary, place the unit in a clean, warm dry area. Follow instructions under Handling.

LOCATION
Note that units with different capacities may have identical dimensions. Labels on unit packaging must be carefully scrutinized and matched to job location. These units are not approved for outdoor installation and therefore must be installed inside the space being conditioned.

PLACEMENT
Install air conditioners in a level plane and locate unit around the service panel to ensure that proper access is available including that for filter removal.
¨ For Vertical Units: Install the air conditioner with a piece of sound insulating material between unit and floor to avoid possible transmission of noise into the building structure. (rubber backed carpeting will suffice for vertical models). For units installed in closets adjacent to conditioned space, provide insulated return air ducting with at least one 90° elbow or provide a sound baffle between the return air grille and unit filter.
¨ Horizontal units are provided with isolation hanger support. See Fig. 2 for proper installation when the unit is suspended.

LOCATION OF SUPPLY & RETURN CONNECTIONS
(SEE FIG. 1 & 2)

WIRING
All wiring should conform to the CEC and/or local code requirements. Power disconnect shall be field provided (by others). The wiring diagram is located on electrical box cover on vertical models and on the back of the service panel on horizontal models. Make certain the line voltage and the 24 volt control circuit are properly identified and wired in accordance with the unit wiring diagram.
¨ Water cooled air conditioners are classified as direct (permanently) connected devices by the CEC. Air conditioners must be properly grounded as per instructions on the unit wiring diagram.

CONDENSATE DRAINAGE
Vertical Units: Ensure that the plastic drain tube is connected to the bottom of the coil drain pan at one end and the other end of the condensate drain tube should extend through the left post on the front side of the unit, see Fig. 1. Connect the drain through a trap to the condensate drain system in conformance to local plumbing codes. Slope the drain line for proper gravity flow of condensate away from unit. The top of the trap and further connections must be below the unit drain connection level.
Horizontal Units: The condensate drain tube should be connected to the side of the unit, see Fig. 2. Follow the above instructions (given for the vertical units) for proper condensate draining.

WATER SUPPLY (UNIT CONNECTED ON OPEN WATER CIRCUIT)
The source of water for air conditioner operation is the responsibility of the owner and/or the installing contractor. The air conditioner **must not function without water**, and predetermined rates of flow (l/s or USGPM) must be maintained for the unit to opera-te at rated capacity. Since the water function is to absorb heat from the refrigerant, the flow rate for each model varies with the entering water temperature (EWT). A pressure-operated water valve is installed for this reason inside the unit and SAE-13 calibra-

ted at the factory for a condensing pressure of 1400 kPa "gauge" (205 PSIG.). Piping size to and from unit **must match or exceed** the inlet and outlet water connection sizes on the air conditioner.

¨ **Never use** a hose of a smaller inside diameter than that of the water connection sizes on the unit.
¨ The hoses must be rated to match or exceed temperatures and pressures which occur during normal operation of system (temperature between 4° C (40° F) and 43° C (110° F); and pressures up to 1380 kPa (200 PSI).
¨ When hoses are connected they must not be subjected to any stress in tension or by twisting or kinking.
¨ Hoses available as an accessory to the unit are provided with hexagonal surfaces on the fittings as are the water fittings on units. Use a properly sized wrench on the hexagonal surface to tighten connections. **Never use** a wrench on the hose or sleeve that crimps the fitting into the hose.
¨ **Do not over-tighten connections**. Turn in the mating threads by hand or with a wrench until snug, then tighten with a wrench beyond the point just enough to seal the joint (for tapered pipe threads this would be an additional 1/2 to one full turn; for union or flare connections no more than 1/4 of a turn).
¨ Before pressurizing the system, closely inspect the hose and fittings to be sure there are no cuts, abrasions, twists or kinks. Hoses must not be in contact with any sharp edge while in use.
¨ Hose supplier will not take responsibility for hose leakage, failure or damage resulting from water leaks.

SUPPLY DUCTING

Flanges around the blower opening are intended for a flexible supply air duct connection to unit. **Be certain blower wheel turns freely** before making the duct connection. Supply air ductwork must be insulated with 25 or 38 mm thick (1" or 1 1/2") fibreglass, sealed at all joints and must have an exterior vapour barrier. The air conditioner's life expectancy and efficient performance are dependent on adequate air flow. Under no circumstance should the unit be installed where the total external static pressure exceed those shown in the Table 1.

TABLE 1

MODEL	EXTERNAL STATIC PRESSURE	
	Pa	**inch wg**
009	75	0.30
012	75	0.30
015	75	0.30
018	75	0.30
024	188	0.75
030	188	0.75
036	188	0.75
042	188	0.75
048	188	0.75
060	188	0.75
072	25 to 275	0.10 to 1.1
096	25 to 275	0.10 to 1.1
120	25 to 275	0.10 to 1.1
144	25 to 275	0.10 to 1.1

WIRING - LINE VOLTAGE

WATER CONNECTIONS

If flexible hoses are used to make the water in-out connections to the unit, certain precautions must be taken to ensure proper unit operation and avoid hose damage. Check mainpower voltage. Refer to unit wiring diagram and make changes (if required) to permit the unit to operate on the available supply voltage. Connect power as per the unit wiring diagram, conforming to the local and national electrical code requirements.

CONNECTION AND LOCATION OF THERMOSTAT

Wiring the thermostat to the unit should be done as per the wiring diagram (inside the panel of the electrical box on the vertical units and on the inside of the service panel for horizontal units). Thermostat must be absolutely level when installed and located to best sense the actual room temperature. Avoid false sensing heat or cold from sunlight, open doors or window drafts, supply air outlets, fireplaces, ovens, etc.

HIGH PRESSURE PROTECTION

Your unit is protected against excessive high pres-sure by a pressure limiting control. If the pressure rises above 560 psi (2,758 kPa), the pressure switch will shut down the unit.

RESET UNIT

To restart, **the unit must** be turned "OFF" at the thermostat or at the main power switch. Then switch to "ON" position; the unit will start functioning. If not, call a technician to solve the problem. Repeated resetting on unit without getting the fault corrected will cause compressor failure.

START UP INSTRUCTIONS

After installation of unit and the ductwork, water and condensate connections, the wiring in accordance with preceding instructions, the unit is ready for start-up. Check all wire connections to the unit and to external control devices for tightness.
¨ Set temperature on the thermostat below room temperature and start the unit. After operating for five(5) minutes, air supply should have a minimum temperature drop of 10-12° C (18-22° F). Use a surface temperature device or any other device to check the temperature of supply water and return water. The **minimum temperature** rise should be 6° C (10° F).
¨ If the above conditions are not met, one or more of the following problems exist: low air flow, low water flow, or unit is possibly defective.

MAINTENANCE AND SERVICE

¨ Do not operate the air conditioner without the air filter in place. Filters should be serviced regularly, **at least every three months**.
Dirty filters will result in inefficient performance.
¨ Check the air coil and fan wheel yearly for cleanliness and clean if necessary.

FIGURE 1

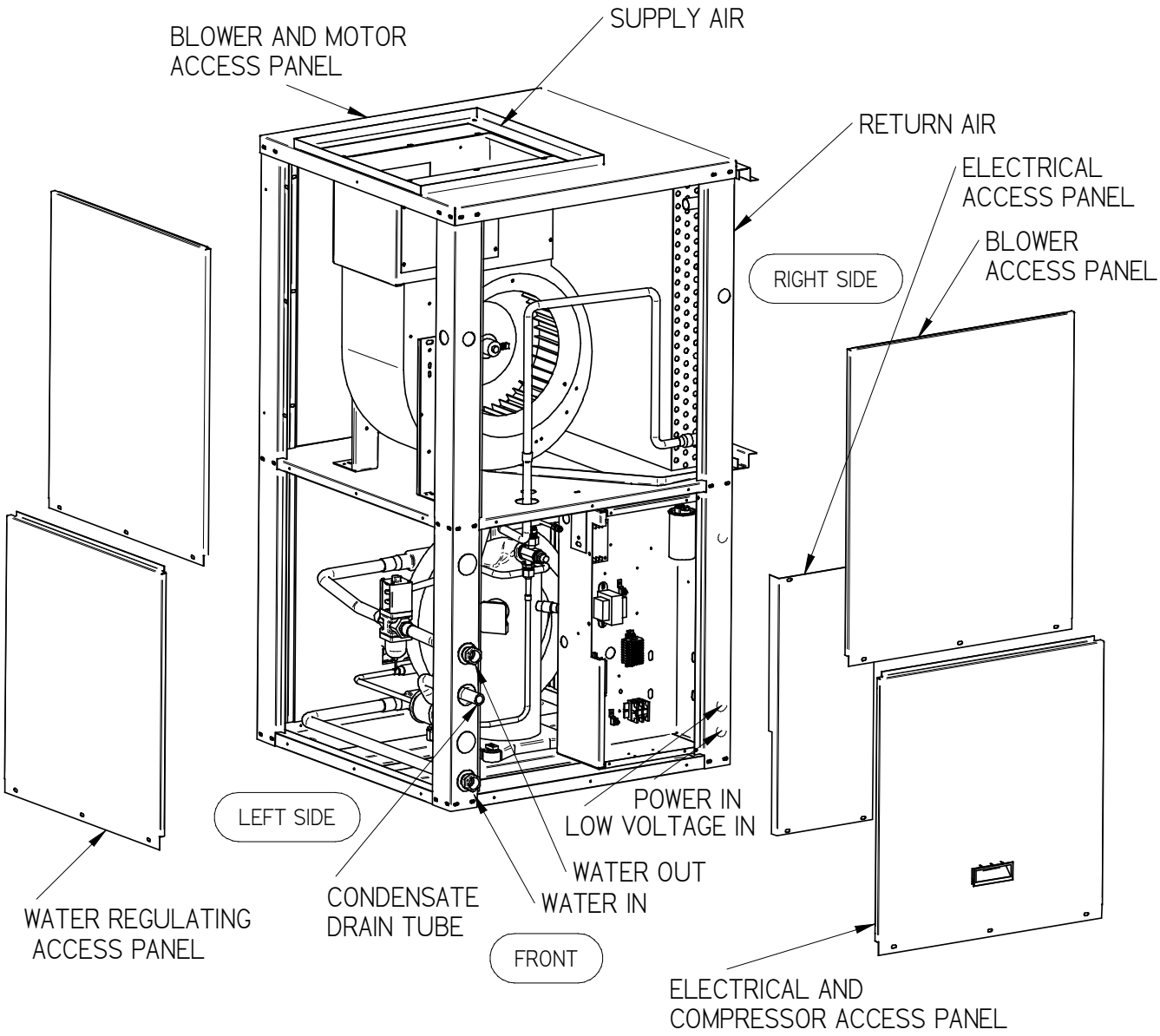
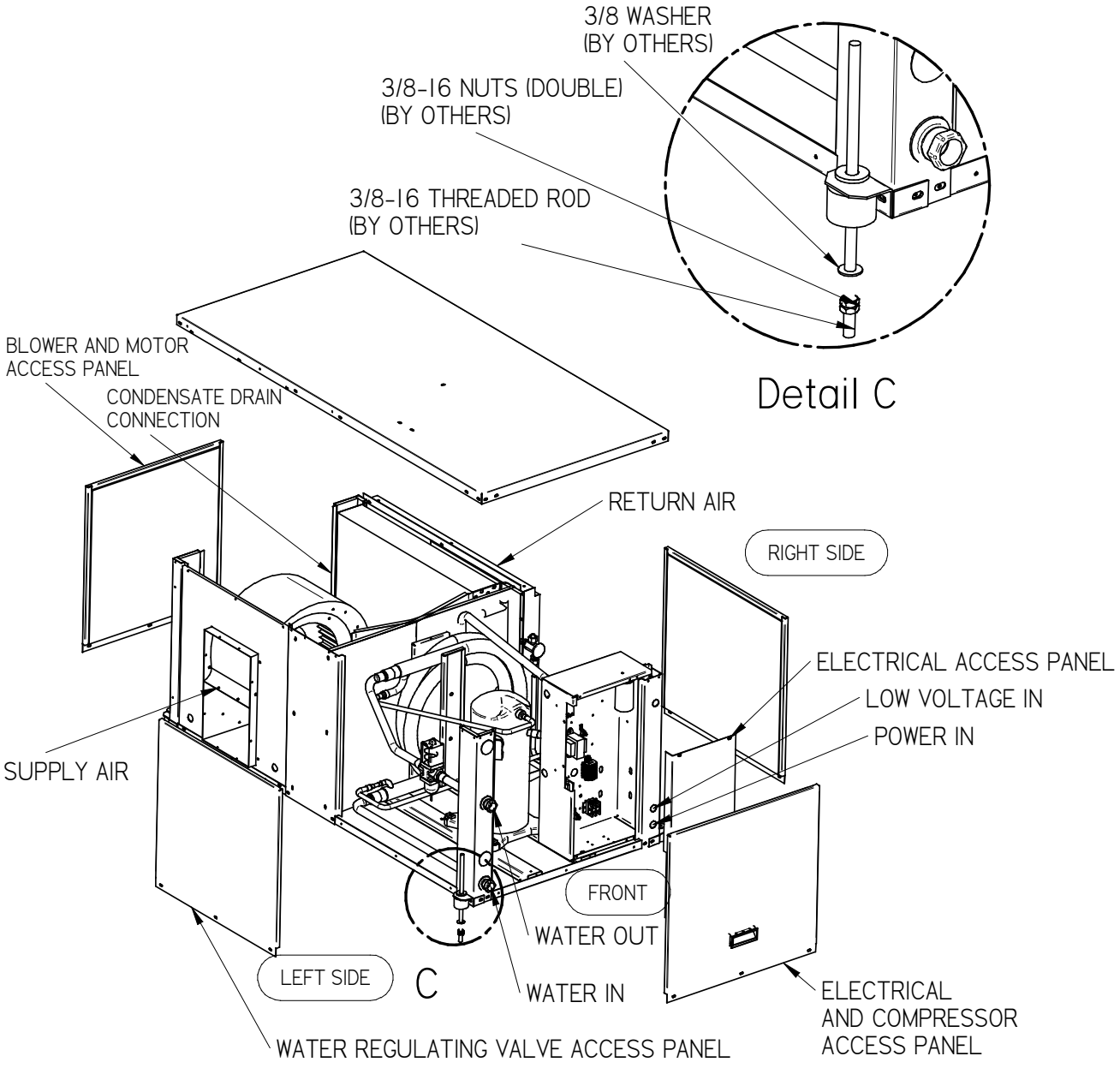
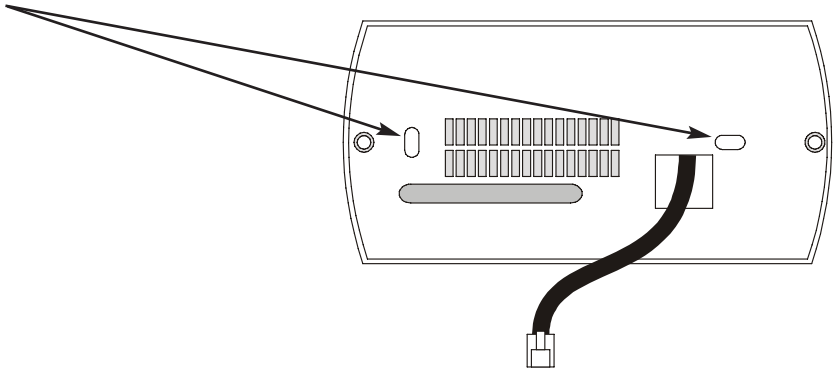

BLOWER AND MOTOR
ACCESS PANEL
SUPPLY AIR
RETURN AIR
ELECTRICAL
ACCESS PANEL
BLOWER
ACCESS PANEL
RIGHT SIDE
LEFT SIDE
POWER IN
LOW VOLTAGE IN
WATER OUT
WATER IN
CONDENSATE
DRAIN TUBE
WATER REGULATING
ACCESS PANEL
FRONT
ELECTRICAL AND
COMPRESSOR ACCESS PANEL

FIGURE 2

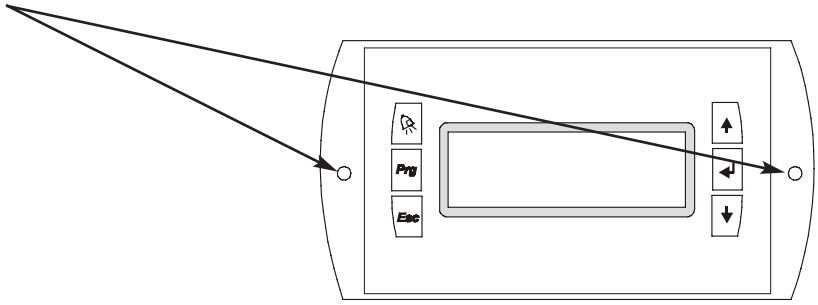

3/8 WASHER
(BY OTHERS)
3/8-16 NUTS (DOUBLE)
(BY OTHERS)
3/8-16 THREADED ROD
(BY OTHERS)
Detail C
BLOWER AND MOTOR
ACCESS PANEL
CONDENSATE DRAIN
CONNECTION
RETURN AIR
RIGHT SIDE
ELECTRICAL ACCESS PANEL
LOW VOLTAGE IN
POWER IN
SUPPLY AIR
FRONT
WATER OUT
LEFT SIDE
C
WATER IN
ELECTRICAL
AND COMPRESSOR
ACCESS PANEL
WATER REGULATING VALVE ACCESS PANEL

Remove the display from its box. Refer to the instructions included. Separate the display into its three pieces.

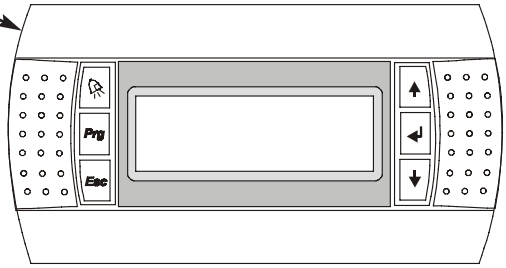
Thread the end of the cable thorugh the hole in the sub-base as shown. Using care to maintain level, screw the sub-base to the wall box here.



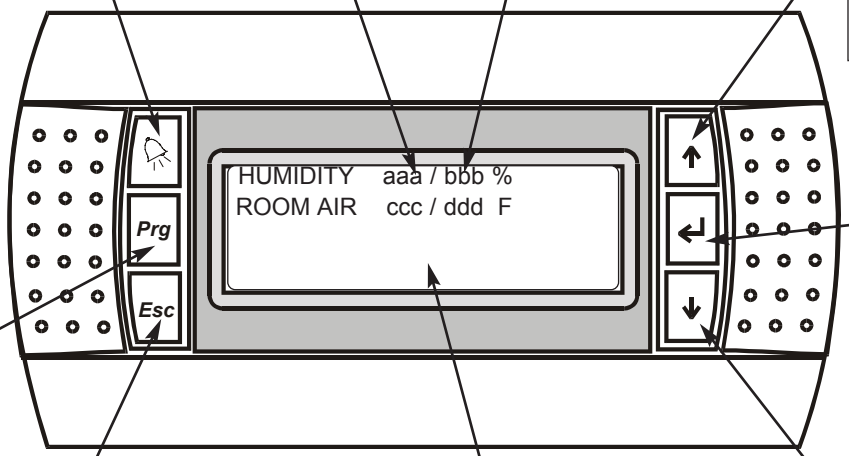
Connect the cable to the modular telephone jack on the back of the display. Screw the display to its sub-base here.



Snap the front cover over the display.



Startup Supervisaire® Controller Interface



is used to access the list of alarm conditions, if any exist.

Default screen
present value set point

is used to scroll upward through screens and to increase settings.
Do not press and at the same time.

While in the default screen, press the **Prg** button to display the program version.

is used to navigate around the screen and to accept inputs.

Esc is used to return to previous interface levels

The backlit LCD screen displays any needed information on the operation of the system.

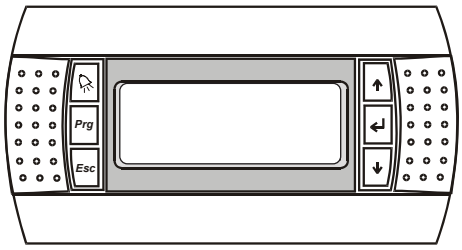
is used to scroll downward through screens and to decrease settings.
Do not press and at the same time.

STARTUP

Set Display Address

To set the display address, follow these instructions.

1. If safe to do so, turn on the electric power to the unit.
   If the display shows "Humidity" and other information, no further action is needed. If not, proceed to step 2.



2. Simultaneously press and hold the ↑, ↓, and ↵ buttons for at least five seconds. The screen at right will appear, where **aa** and **bb** are numbers.

blinking cursor

```
Display address
setting . . . . . : aa

I/O Board address : bb
```

3. Press ↵. The cursor will move to **aa**, as shown.

```
Display address
setting . . . . . : aa

I/O Board address : bb
```

4. Press ↓ until **aa** equals 0.

```
Display address
setting . . . . . : 0
```

5. Press ↵. Note that "I/O Board address : bb" disappears. The screen at right appears briefly, followed by the unit default screen.

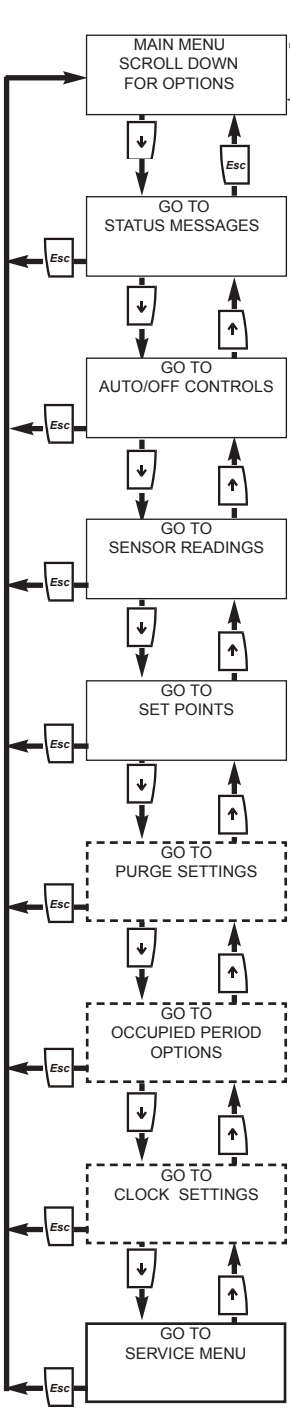
```
Display address
changed
```

Default Screen

```
HUMIDITY    aaa / bbb %
ROOM AIR    ccc / ddd  F
xxxxxxxxxxxxxxxxxxxxxx
xxxxxxxxxxxxxxxxxxx
```

Startup Supervisaire® Controller Interface

For a controller interface map, see **Operation**.



This displays the version of the operating program.

There are many possible status messages. This screen is the gateway to other screens that display these status messages. See **Operation - Controller Messages**.

The unit ships with the major components disabled in software. This screen is the gateway to other screens used to enable or disable the major components of the unit. See **Startup - Enable Operation**.

There are several sensors throughout the unit. This screen is the gateway to other screens used to display the readings of these sensors. See **Startup - Read Sensors** or **Operation - Read Sensors**.

This screen is the gateway to other screens used for setting the operating set points of the unit. The set points are protected by a user password. See **Startup - Adjust Set points** or **Operation - Adjust Set points**.

This screen appears only on units with the optional Purge feature. This screen is the gateway to other screens used to adjust or trigger Purge mode. See **Startup - Pre-Startup Adjustments**.

This screen appears only on units with the optional occupation feature. This screen is the gateway to other screens used to adjust or define occupied periods. See **Startup - Pre-Startup Adjustments**.

This screen appears only on units with the optional occupation feature. This screen is the gateway to other screens used to set the internal clock (where used). See **Startup - Pre-Startup Adjustments**.

This screen is the gateway to other screens used for service monitoring or modification.

Important!

Never run the blower without the filters in place. Regardless of filters, never run the blower when construction dust is present. The resulting heat exchanger damage is not covered by the warranty.

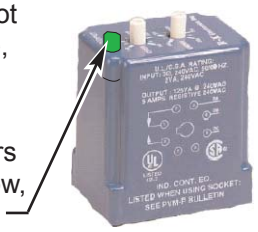
Important!

Airflow must be set and confirmed before the refrigeration system is adjusted.

Adjust airflow

Before the unit is operated, the supply duct air flow must be measured and set by a qualified air-balancing technician. Air flow must be measured with all air side access doors closed.

Air flow is adjusted by changing the variable sheave on the blower motor shaft. Do not use other sheaves or change the airflow outside the range given on the unit nameplate, without the express approval of ThermoPlus.

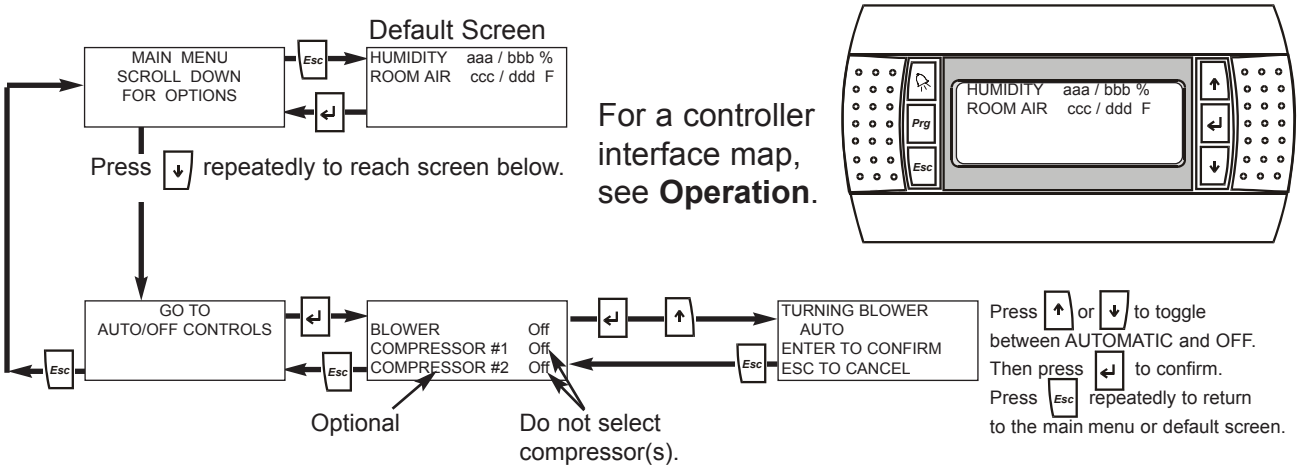


To run the blower only:

1. Turn on the branch-circuit disconnect switch. Some units may have voltage monitors that prevent operation in the event the branch circuit has voltage that is too high, too low, has lost a phase, or has reversed phase rotation. If the green LED is not lit, confirm that the applied voltage is within ±10% of the nameplate voltage (NEMA MG-1), that all three phases are present, and that the phase rotation is correct.

2. In the unit electrical enclosure, press START on the blower motor overload (if any).

3. Follow the steps below to start the blower. If prompted for a password on units made after 4/2005, enter 1793. For units made after 4/2005, enter 17 or 1793.



For a controller interface map, see **Operation**.

If the blower does not turn the proper direction, a qualified person should disconnect electric power and interchange any two of the branch circuit wires at the unit input lugs. Torque the connectors as discussed earlier. **Do <u>not</u> move any factory installed wires.**

4. When air-flow adjustment is complete, the blower can be stopped by repeating the steps above. If prompted for a password on units made before 4/2005, enter 1793. For units made after 4/2005, enter 17 or 1793.

If possible and safe, leave the electrical power connected to the unit and leave the blower overload (if any) ON. This will allow the compressor crankcase heater(s) to function. The crankcase heaters must be on continuously for at least 10 hours before the compressors are started.