Installation

Foundation

⚠WARNING

Heavy Objects!

Failure to follow instructions below or properly lift unit could result in unit dropping and possibly crushing operator/technician which could result in death or serious injury, and equipment or property-only damage. Ensure that all the lifting equipment used is properly rated for the weight of the unit being lifted. Each of the cables (chains or slings), hooks, and shackles used to lift the unit must be capable of supporting the entire weight of the unit. Lifting cables (chains or slings) may not be of the same length. Adjust as necessary for even unit lift.

Horizontal Units

If the unit is installed at ground level, elevate it above the snow line. Provide concrete footings at each support location with a "full perimeter" support structure or a slab foundation for support. Refer to the weights information in the Dimensions and Weights chapter for the unit's operating and point loading weights when constructing a footing foundation.

If anchoring is required, anchor the unit to the slab using hold down bolts or isolators. Isolators should be installed to minimize the transmission of vibrations into the building.

⚠WARNING

Risk of Roof Collapsing!

Failure to ensure proper structural roof support could cause the roof to collapse, which could result in death or serious injury and property damage. Confirm with a structural engineer that the roof structure is strong enough to support the combined weight of the roofcurb and the unit. Refer to the weights section for typical unit and curb weights.

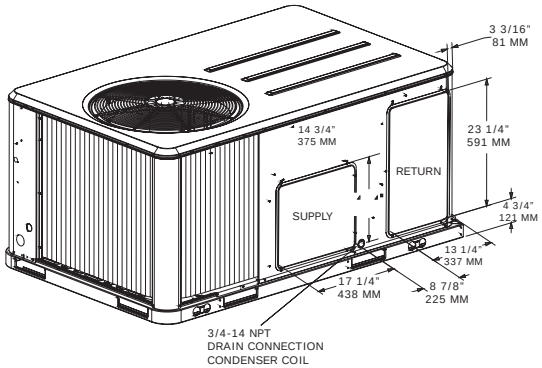
For rooftop applications, ensure the roof is strong enough to support the combined unit and support structural weight. Refer to maximum unit and corner weights (center of gravity) dimensions in the Dimensions and Weights section for the unit operating weights. If anchoring is required, anchor the unit to the roof with hold-down bolts or isolators.

Check with a roofing contractor for proper waterproofing procedures.

Ductwork

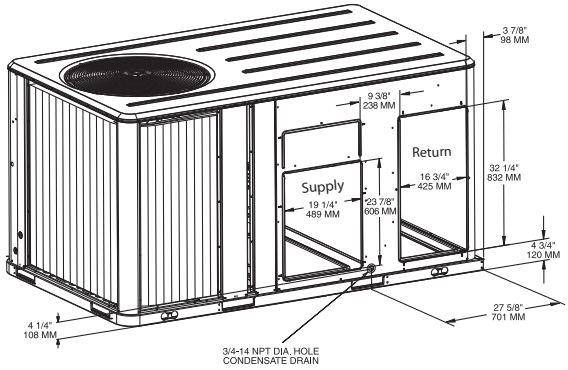
Supply and return air openings as viewed from the rear of the unit are shown in the following drawings.

Figure 32. Cooling and gas/electric — 3 to 5 tons standard efficiency, 3 tons high efficiency— horizontal airflow supply/return[(a)]



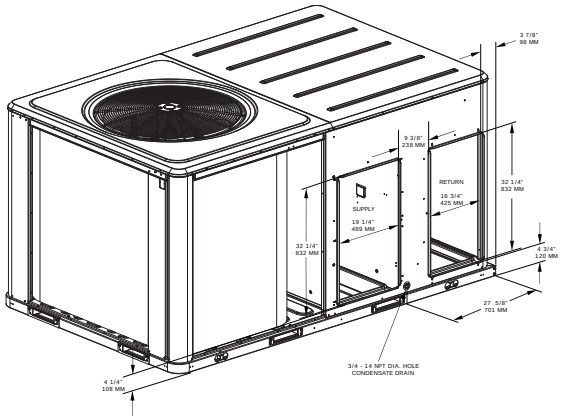
(a) All dimensions are in inches/millimeters.

Figure 33. Cooling and gas/electric — 6-10 ton standard efficiency units, 4 to 6 ton high efficiency units, 6(074)-8.5 (Microchannel) high efficiency unit—horizontal airflow supply/return[(a)]



(a) All dimensions are in inches/millimeters.

Figure 34. Cooling and gas/electric —10 tons high efficiency— horizontal airflow, supply and return[(a)]



(a) All dimensions are in inches/millimeters.

Supply and return air openings as viewed from a downflow configuration are shown in the following drawings.

Elbows with turning vanes or splitters are recommended to minimize air noise due to turbulence and to reduce static pressure.

When attaching the ductwork to the unit, provide a water tight flexible connector at the unit to prevent operating sounds from transmitting through the ductwork.

All outdoor ductwork between the unit and the structure should be weather proofed after installation is completed.

Figure 35. 3 to 5 ton standard efficiency units and 3 ton high efficiency units - downflow supply and return air openings w/ through-the-base utilities

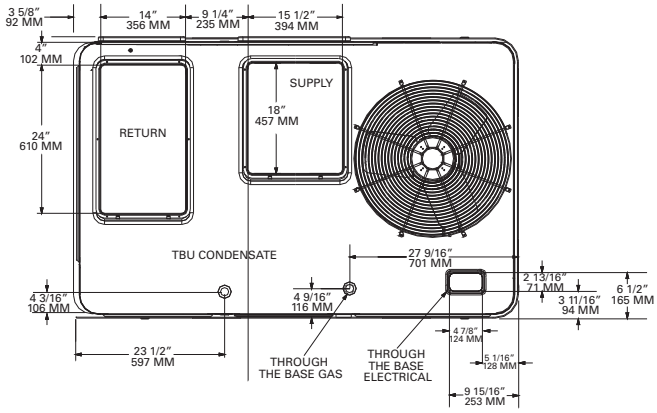


Figure 36. 4 to 6 ton high efficiency units, 6(074)-8.5 (Microchannel) high efficiency units and 6 to 10 ton standard efficiency units - down flow supply and return air openings w/ through-the- base utilities

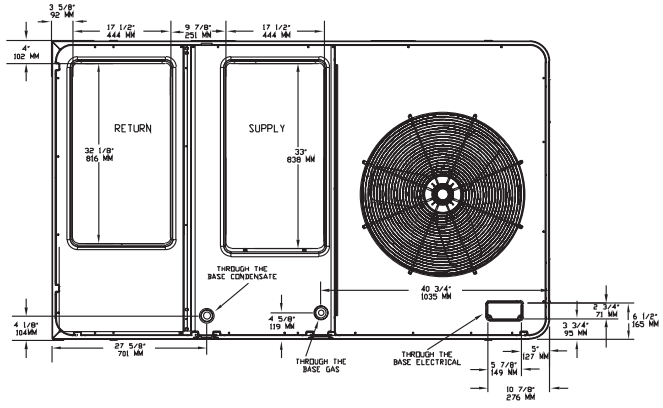
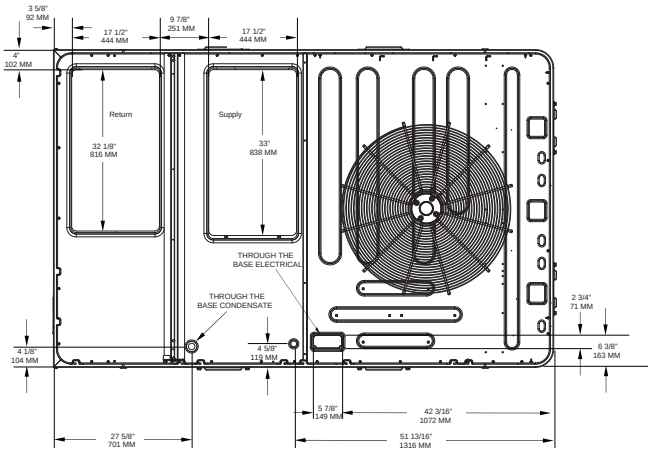


Figure 37. 10 ton high efficiency unit - downflow supply and return air openings w/ through-the-base utilities



Roof Curb

Downflow

The roof curbs for these units consists of a "full perimeter" enclosure to support the unit just inside of the unit base rail. The 10 ton high efficiency units contain a support base alignment rail and will extend past the end of the roof curb as shown in figures below.

Before installing any roof curb, verify;

- It is the correct curb for the unit,
- It includes the necessary gaskets and hardware,
- The installation location provides the required clearance for proper operation,
- The curb is level and square. The top surface of the curb must be true to assure an adequate curb-to-unit seal.

⚠WARNING

Combustible Materials!

Failure to maintain proper clearance between the unit heat exchanger, vent surfaces and combustible materials could cause a fire which could result in death or serious injury or property damage. Refer to unit nameplate and installation instructions for proper clearances.

Verify that appropriate materials were used in the construction of roof and ductwork. Combustible materials should not be used in the construction of ductwork or roof curb that is in close proximity to heater elements or any hot surface. Any combustible material on the inside of the unit base should be removed and replaced with appropriate material.

Step-by-step curb assembly and installation instructions ship with each accessory roof curb kit. Follow the

instructions carefully to assure proper fit-up when the unit is set into place.

Note: *To assure proper condensate flow during operation, as well as proper operation of the condensate overflow switch (if equipped), the unit and curb must be level.*

If the unit is elevated, a field constructed catwalk around the unit is strongly recommended to provide easy access for unit maintenance and service.

Recommendations for installing the Supply Air and Return Air ductwork joining the roof curb are included in the curb instruction booklet. Curb ductwork must be fabricated and installed by the installing contractor before the unit is set into place.

Note: *For sound consideration, cut only the holes in the roof deck for the ductwork penetrations. Do not cut out the entire roof deck within the curb perimeter.*

Figure 38. View for base to roof curb alignment YHC120F on 50" x 84" roof curb

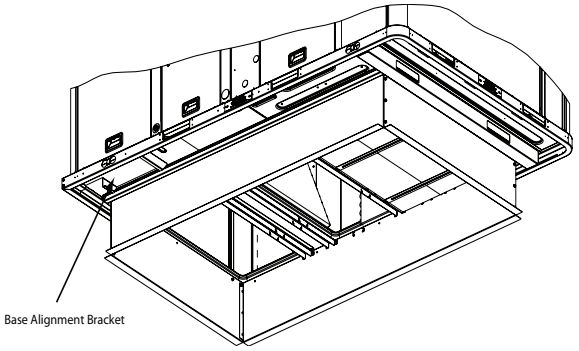
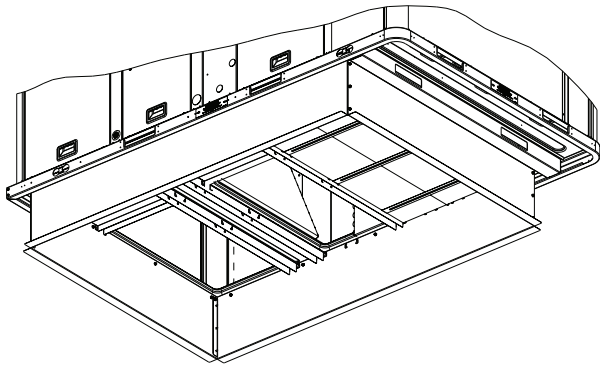


Figure 39. View for base to roof curb alignment YHC120F on 60" x 84" roof curb



If a Curb Accessory Kit is not used:

- The ductwork can be attached directly to the factory-provided flanges around the unit's supply and return air openings. Be sure to use flexible duct connections at the unit.
- For "built-up" curbs supplied by others, gaskets must be installed around the curb perimeter flange and the supply and return air opening flanges.

Rigging

⚠WARNING

Heavy Objects!

Failure to follow instructions below or properly lift unit could result in unit dropping and possibly crushing operator/technician which could result in death or serious injury, and equipment or property-only damage. Ensure that all the lifting equipment used is properly rated for the weight of the unit being lifted. Each of the cables (chains or slings), hooks, and shackles used to lift the unit must be capable of supporting the entire weight of the unit. Lifting cables (chains or slings) may not be of the same length. Adjust as necessary for even unit lift.

A rigging illustration and center-of-gravity dimensional data table is shown in the weights section. Refer to the typical unit operating weights table before proceeding.

1. Remove all drill screws fastening wood protection to metal base rail. Remove all screws securing wooden protection to wooden top crate.
2. Remove Wooden Top Crate.

⚠WARNING

Improper Unit Lift!

Failure to properly lift unit could result in unit dropping and possibly crushing operator/technician which could result in death or serious injury, and equipment or property-only damage. Test lift unit approximately 24 inches to verify proper center of gravity lift point. To avoid dropping of unit, reposition lifting point if unit is not level.

3. Rig the unit as shown in the weights section. Attach adequate strength lifting slings to all four lifting brackets in the unit base rail. Do not use cables, chains, or slings except as shown.
4. Install a lifting bar, as shown in the weights section to protect the unit and to facilitate a uniform lift. The minimum distance between the lifting hook and the top of the unit should be 7 feet.
5. Test-lift the unit to ensure it is properly rigged and balanced, make any necessary rigging adjustments.

Figure 40. Fork pockets - all units except 10 ton high efficiency units

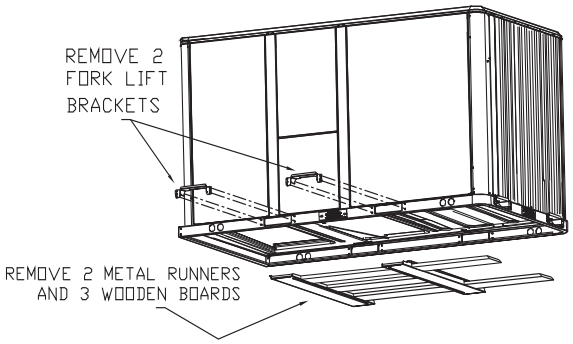
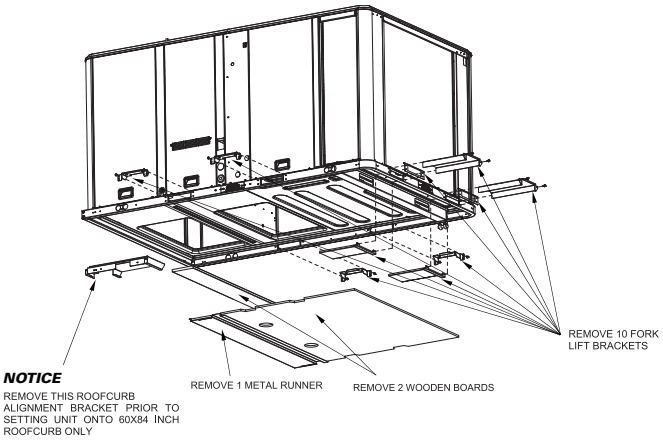


Figure 41. Fork pockets - 10 ton high efficiency unit



6. Lift the unit enough to allow the removal of base fork pocket protection components as shown in the following figures.
7. When 10 ton high efficiency units are installed on smaller existing roof curb (50"x 84") for replacement applications, do not remove alignment bracket. This bracket helps assure proper alignment of duct openings.
8. Downflow units; align the base rail of the unit with the curb rail while lowering the unit onto the curb. Make sure that the gasket on the curb is not damaged while positioning the unit.

General Unit Requirements

The checklist listed below is a summary of the steps required to successfully install a commercial unit. This checklist is intended to acquaint the installing personnel with what is required in the installation process. It does not replace the detailed instructions called out in the applicable sections of this manual.

- Check the unit for shipping damage and material shortage; file a freight claim and notify appropriate sales representative.
- Verify correct model, options and voltage from unit nameplate.
- Verify that the installation location of the unit will provide the required clearance for proper operation.
- Assemble and install the roof curb (if applicable). Refer to the latest edition of the curb installers guide that ships with each curb kit.
- Fabricate and install ductwork; secure ductwork to curb.
- Install pitch pocket for power supply through building roof. (If applicable)
- Rigging the unit.
- Set the unit onto the curb; check for levelness.
- Ensure unit-to-curb seal is tight and without buckles or cracks.
- Install and connect a condensate drain line to the evaporator drain connection.

Note: *Condensate Overflow Switch (if equipped) will not work if unit is not leveled properly.*

Factory Installed Economizer

- Ensure the economizer has been pulled out into the operating position. Refer to the economizer installation guide for proper position and setup.
- Install all access panels.

Temperature Limit Switch Usage for Gas Heat Units

Units are factory shipped in the downflow discharge configuration but can be field converted to a horizontal discharge configuration. Some, but not all units require a different TCO1 limit switch, which is attached to the combustion blower motor if horizontal discharge configuration is used.

If any of the units are installed in the downflow discharge configuration and have the alternate TCO1 limit switch provided, remove the additional TCO1 limit switch from the combustion blower motor and discard.

Table 5. TC01 tripping values

Unit Model - 6 to 10 Ton Standard Efficiency	TCO1 Tripping Values - Downflow/ Horizontal
YSC072H**(M,Y)	155F/170F
YSC072H**(L,X)	170F
YSC072H**(H,Z)	145F/155F
YSC090H**(L,X)	180F/200F
YSC090H**(M,Y)	155F
YSC090H**(H,Z)	155F
YSC092H**(L,X)[a]	200F/220F
YSC092H**(L,X)[b]	225F
YSC092H**(M,Y)[a]	230F
YSC092H**(M,Y)[b]	190F/225F

Table 5. TC01 tripping values (continued)

Unit Model - 6 to 10 Ton Standard Efficiency	TCO1 Tripping Values - Downflow/ Horizontal
YSC092H**(H,Z)[a]	220F/260F
YSC092H**(H,Z)[b]	220F/260F
YSC102H**(L,X)[a]	200F/220F
YSC102H**(L,X)[b]	225F
YSC102H**(M,Y)[a]	230F
YSC102H**(M,Y)[b]	190F/225F
YSC102H**(H,Z)[a]	220F/260F
YSC102H**(H,Z)[b]	220F/260F
YSC120H**(L,X)	190F/225F
YSC120H**(M,Y)	200F
YSC120H**(H,Z)	150F/210F

(a) Digit 15 = 0,1
(b) Digit 15 = 6,7

Table 6. TC01 tripping values[a],[b]

Unit Model - High Efficiency 15 SEER	TCO1 Tripping Values - Downflow/ Horizontal
YHC036E**(L,X)-DD	180F
YHC036E**(L,X)-BD	170F
YHC036E1*(M,Y)-DD YHC036E(3,4,W)*(M,Y)-DD	190F 170F/190F
YHC036E**(M,Y)-BD	180F/190F
YHC036E1*(H,Z)-DD YHC036E(3,4,W)*(H,Z)-DD	190F/220F 170F/190F
YHC036E**(H,Z)-BD	155F/190F
YHC048F1*(L,X)-DD YHC048E/F(3,4,W)*(L,X)-DD	170F/155F 145F/155F
YHC048E/F**(L,X)-BD	155F
YHC048F1*(M,Y)-DD YHC048E/F(3,4,W)*(M,Y)-DD	140F 150F/170F
YHC048E/F**(M,Y)-BD	170F/180F
YHC048F1*(H,Z)-DD YHC048E/F(3,4,W)*(H,Z)-DD	180F/200F 220F
YHC048E/F**(H,Z)-BD	220F/260F
YHC060F1*(L,X)-DD YHC060E/F(3,4,W)*(L,X)-DD	155F 140F
YHC060E/F**(L,X)-BD	155F/145F
YHC060F1*(M,Y)-DD YHC060E/F(3,4,W)*(M,Y)-DD	140F/150F 145F/170F
YHC060E/F**(M,Y)-BD	170F
YHC060F1*(H,Z)-DD YHC060E/F(3,4,W)*(H,Z)-DD	180F 190F/220F
YHC060E/F**(H,Z)-BD	220F/230F
YHC072E/F**(L,X)	200F
YHC072E/F**(M,Y)	220F
YHC072E/F**(H,Z)	210F
YHC074F**(L,X)	170F
YHC074F**(M,Y)	180F/190F
YHC074F**(H,Z)	180F/230F
YHC092F**(L,X)	200F/220F
YHC092F**(M,Y)	190F/225F
YHC092F**(H,Z)	200F

Table 6. TC01 tripping values[a],[b] (continued)

Unit Model - High Efficiency 15 SEER	TCO1 Tripping Values - Downflow/ Horizontal
YHC102F**(L,X)	200F/220F
YHC102F**(M,Y)	190F/225F
YHC102F**(H,Z)	200F
YHC120F**(L,X)	170F/200F
YHC120F**(M,Y)	170F/190F
YHC120F**(H,Z)	135F/155F

(a) BD= Belt drive ID motor
(b) DD= Direct drive ID motor

Table 7. TC01 tripping values

Unit Model - High Efficiency 17 Plus	TCO1 Tripping Values - Downflow/ Horizontal
YHC037**(L,X)	190F
YHC037**(M,Y)	170F/220F
YHC037**(H,Z)	220F
YHC047**(L,X)	145F/155F
YHC047**(M,Y)	170F
YHC047**(H,Z)	220F
YHC067**(L,X)	140F
YHC067**(M,Y)	170F
YHC067**(H,Z)	170F

Table 8. TC01 tripping values

Unit Model - 3 to 5 Ton Standard Efficiency - MCHE	Standard Motor TCO1 Tripping Values Downflow/ Horizontal	Oversized Motor TCO1 Tripping Values Downflow/ Horizontal
YSC036G**(L,X)B	170F	170F
YSC036G**(M,Y)B	170F	170F/155F
YSC036G**(H,Z)B	150F	150F
YSC048G**(L,X)B	170F	155F
YSC048G**(M,Y)B	170F	170F/155F
YSC048G**(H,Z)B	150F	150F
YSC060**(L,X)B	170F	155F
YSC060**(M,Y)B	155F	155F
YSC060**(H,Z)B	150F	150F

Horizontal Discharge Conversion (3 to 5 Ton Units)

Note: *3 to 5 ton units supply cover to supply opening and return cover to return opening.*

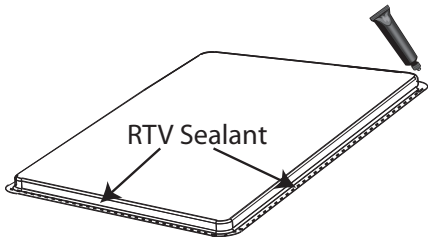
Supplies needed by installer for conversion: 3 oz. tube of high temperature RTV sealant. (500°F / 260°C: similar to Dow Corning 736)

Important: *Failure to use recommended sealant could result in unit performance loss.*

If a unit is to be converted to a horizontal discharge, the following conversion must be performed:

1. Remove RETURN and SUPPLY duct covers.
2. Locate supply cover. Apply ¼ in. (6mm.) continuous bead of 500°F RTV sealant to the flange as shown.

Figure 42. Duct cover

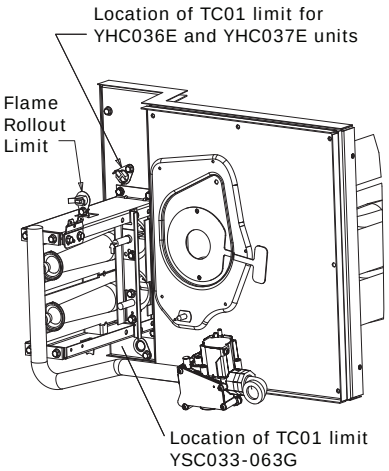


3. Position duct cover as shown, rotate 90 degrees to allow entrance into supply opening.
4. Slide duct covers into duct openings until inward edge of duct cover engages with the 2 retaining clips on the duct flanges. Secure the outward edge of each duct cover with 2 screws.
5. Slide RETURN DUCT COVER (insulation side up) into supply opening until inward edge of duct cover engages with the 2 retaining clips on the duct flange. Secure outward edge of the duct cover with two screws.
6. After completing installation of the duct covers for horizontal discharge, proceed to TCO1 instructions.

TCO1 Instructions

If the unit being installed has a different TCO1 value (refer to previous tables), the limit control TCO1 must be replaced with the extra limit control shipped in the heater compartment. Replace TCO1 following the instructions in steps 1 through 3 below. If the unit being installed does not correspond to any in the following list, skip steps 1 through 3 and go on to next step in the installation process.

Figure 43. TCO1 location (YHC036E, YHC037E)



⚠WARNING

Hazardous Voltage!

Failure to disconnect power before servicing could result in death or serious injury. Disconnect all electric power, including remote disconnects before servicing. Follow proper lockout/tagout procedures to ensure the power can not be inadvertently energized.

1. Remove the heat section access panel.
2. Remove TCO1 from shipping location, attached to the combustion blower.
3. Replace and discard the existing TCO1 originally installed at the factory for down flow operation with the TCO1 shipped attached to the combustion blower for horizontal operation.
4. Replace heat section access panel.

Horizontal Discharge Conversion (6 to 10 Ton Units)

Note: *6 to 10 ton units the supply cover to return opening and return cover to supply opening.*

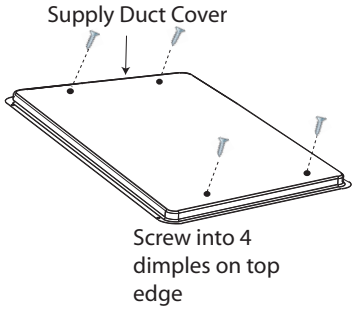
Supplies Needed by Installer for Conversion: 3 oz. tube of high Temperature RTV sealant (500°F / 260°C: Similar to Dow Corning 736).

Important: *Failure to use recommended sealant could result in unit performance loss.*

If a unit is to be converted to a Horizontal discharge, the following conversion must be performed:

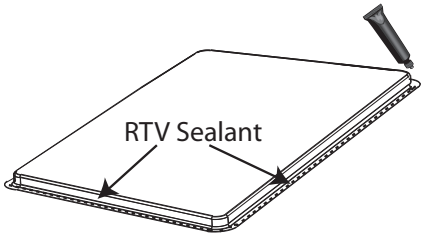
1. Remove RETURN and SUPPLY duct covers.
2. Place SUPPLY DUCT COVER over down-flow return opening. (insulation side down)
3. Using self-drilling screws, (or screws removed from duct cover), screw through dimples to attach DUCT COVER to base.

Figure 44. Duct cover



4. On original RETURN DUCT COVER, apply ¼"(6mm.) continuous bead of 500°F RTV sealant around flange (opposite insulation side), as shown.

Figure 45. Duct cover

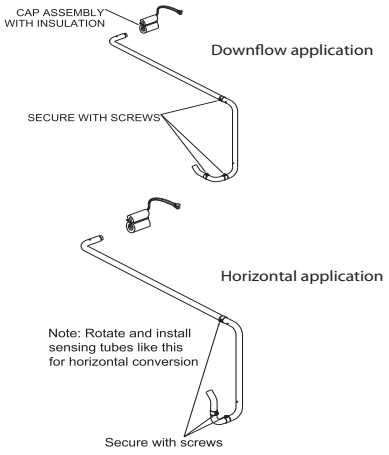


5. Slide RETURN DUCT COVER (insulation side up) into supply opening until inward edge of duct cover engages with the 2 retaining clips on the duct flange. Secure outward edge of the duct cover with two screws.

Note: *If unit is equipped with Return Air Smoke Detector, refer to field conversion instructions for horizontal discharge before installing return air duct.*

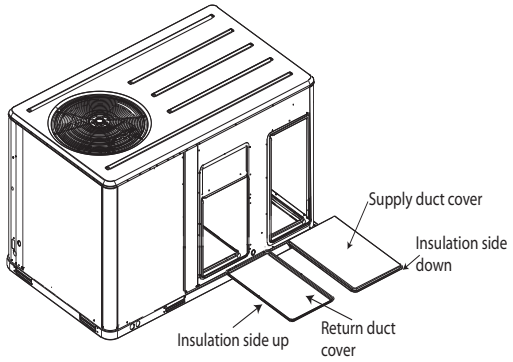
Note: *If unit is equipped with Discharge Air Sensing option refer to the following figure for proper tube positioning based on unit tonnage.*

Figure 46. For YSC120H*R and YHC074F, 092F, 102F models



6. After completing installation of the duct covers for horizontal discharge, proceed to TCO1 instructions.

Figure 47. Supply and return covers



TCO1 Instructions

If the unit being installed is listed in the following list, the limit control TCO1 must be replaced with the extra limit control shipped in the heater compartment. Replace TCO1 following the instructions in steps 1 through 3 below. If the unit being installed does not correspond to any in the following list, skip steps1 through 3 and go on to next step in the installation process.

Unit Model Number

YSC072H**(H,Z),YSC092H**(M,Y), YSC092H**(H,Z), YSC102H**(M,Y), YSC102H**(H,Z), YSC120H**(L,X), YSC120H**(H,Z), YSC090H**(L,X), YHC074F**(M,Y), YHC074F**(H,Z), YHC092F**(M,Y), YHC102F**(M,Y), YHC120F**(L,X), YHC120F**(H,Z).

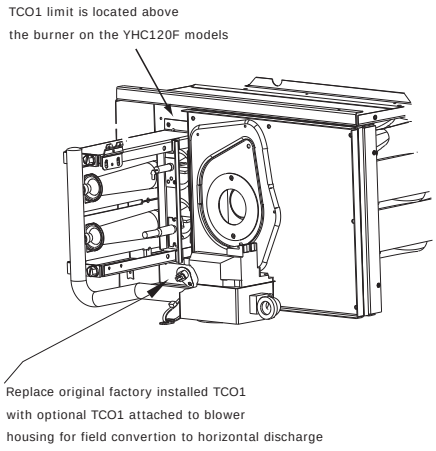
⚠WARNING

Hazardous Voltage!

Failure to disconnect power before servicing could result in death or serious injury. Disconnect all electric power, including remote disconnects before servicing. Follow proper lockout/tagout procedures to ensure the power can not be inadvertently energized.

1. Remove the heat section access panel.
2. Remove TCO1 from shipping location, attached to the combustion blower.
3. Replace and discard the existing TCO1 originally installed at the factory for down flow operation with the TCO1 shipped attached to the combustion blower for horizontal operation.
4. Replace heat section access panel.

Figure 48. TCO1 location (YHC120F)



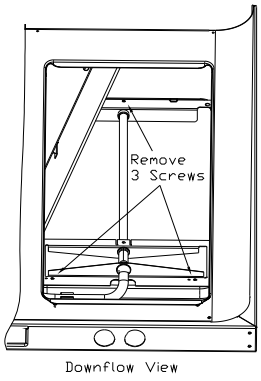
Return Air Smoke Detector

The factory installed Return Air Smoke Detector is installed in the downflow discharge position. No additional field setup is required.

If a unit is to be converted to horizontal discharge, the following conversion must be performed:

1. If the unit has an economizer, it must be pulled out in the operating position.
2. Remove the 3 screws from the mounting brackets. Refer to downflow view for screws locations.

Figure 49. Downflow view



3. Lift the tube and bracket from the downflow duct opening. Rotate the tube and bracket assembly 180 degrees ensuring that the holes on the copper sensing tube face away from the unit and face the return air ductwork. For screw location, reference the following two figures.

Figure 50. Horizontal view 1

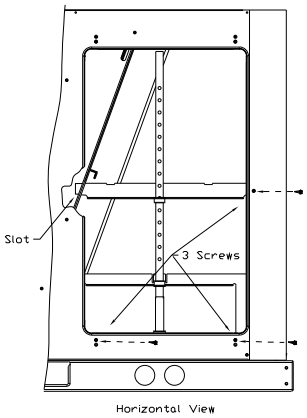
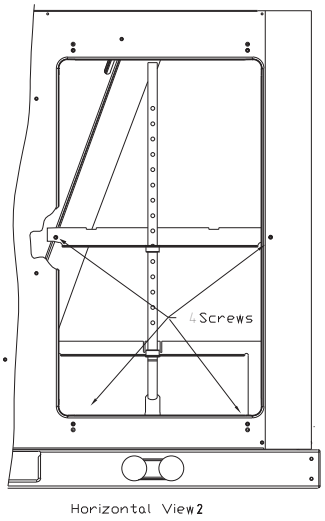


Figure 51. Horizontal view 2



Note: *Check to insure that the flexible tubing lies flat on the base pan surface.*

4. Slide the top bracket down the copper sensing tube. For YSC036G-060, and YHC036-037E units insert the tab on the left side into the slot on the indoor coil block off and secure the right side of the bracket with one of the 3 screws removed in step 2. Refer to Figure 50, p. 34. For YHC047E-067E, YHC048E/F-060E/F, YSC072H-120H and YHC(072E/F, 074F-120F) units secure the tab on left side to the indoor coil block off with one of the screws removed in step 2 and secure the right side of the bracket with one of the screws removed from the access panel. Refer to Figure 51, p. 34.
5. Using the remaining 2 screws removed in step 2, secure the bottom bracket. Refer to Figure 50, p. 34.

Note: *Larger diameter holes on bottom bracket line up with the dimples on the rear panel. The smaller diameter holes line up with the screw holes in the rear panel.*

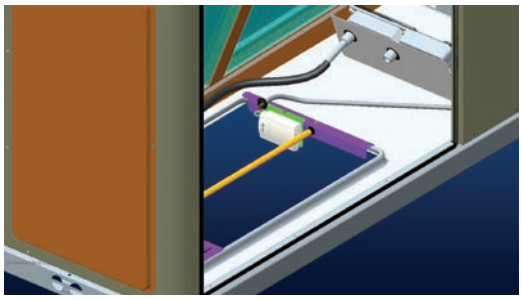
Air-Fi® Wireless Communication Interface

The factory installed wireless communications interface is installed in the downflow discharge position.

If a unit is to be converted to horizontal discharge, the following conversion must be performed:

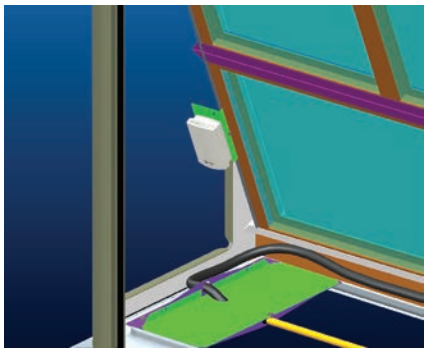
1. If the unit has an economizer, it must be pulled out in the operating position.
2. Remove the screw from the mounting bracket. Refer to downflow view for screw and bracket location.

Figure 52. Wireless communication interface - downflow



3. Mount the bracket in the horizontal discharge location. Refer to horizontal view for screw and bracket location.

Figure 53. Wireless communication interface - horizontal



Note: *Cable ties must be removed to allow the cable to extend to the horizontal mounting location.*

Main Electrical Power Requirements

⚠WARNING

Hazardous Voltage w/Capacitors!

Failure to disconnect power and discharge capacitors before servicing could result in death or serious injury. Disconnect all electric power, including remote disconnects and discharge all motor start/run capacitors before servicing. Follow proper lockout/ tagout procedures to ensure the power cannot be inadvertently energized. Verify with an appropriate voltmeter that all capacitors have discharged.

For additional information regarding the safe discharge of capacitors, see PROD-SVB06A-EN

⚠WARNING

Proper Field Wiring and Grounding 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 in NEC and your local/state electrical codes.

Verify that the power supply complies with the unit nameplate specifications.

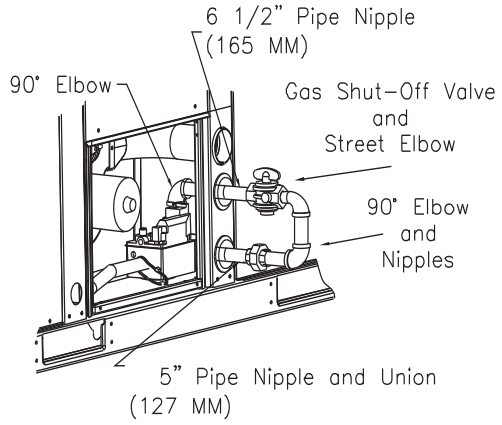
- Inspect all control panel components; tighten any loose connections.
- Connect properly sized and protected power supply wiring to a field-supplied/installed disconnect switch and to the main power terminal block (HTB1) in the unit control panel.
- Install proper grounding wires to an earth ground.

Through-the-Base Gas Installation

The gas supply line must extend 4⅝" above the base pan. The "Through-the-Base Gas" kit is located in the heat vestibule compartment. To gain access to the kit, remove the Heat Compartment access panel.

1. Remove the pipe assembly strapped to the manifold. Unscrew 90° elbow from 6½" nipple and slide rubber grommet off of nipple.
2. Remove the plastic plug from the hole in the center post and insert the grommet removed from 6½" pipe nipple.
3. Using pipe sealant, attach the 90° elbow to the gas supply line.
4. Disconnect the 5" pipe nipple and union from the "Through-the-Base Gas" kit assembly.
5. Using pipe sealant, attach the 6½" nipple and gas shutoff assembly to the 90° elbow on the gas supply line.
6. Using pipe sealant, attach the 5" pipe nipple and union to the street el attached to the gas valve.
7. Connect 5" pipe nipple and union to 6½" nipple and gas shutoff assembly.

Figure 54. Typical through-the-base gas installation



Requirements for Gas Heat

Note: *The unit gas train and optional through-the-base gas shut-off valve are rated at 1/2 PSIG maximum. A pressure reducing regulator is recommended to prevent this maximum from being exceeded. These components must be isolated during field gas piping test that exceed 1/2 PSIG. It is recommended that the field piping be capped prior to the unit gas train or optional through-the-base gas shut-off valve if present.*

- Gas supply line properly sized and connected to the unit gas train.
- All gas piping joints properly sealed.
- Gas piping leak checked with a soap solution. If piping connections to the unit are complete, do not pressurize piping in excess of 0.50 psig or 14" W.C. to prevent component failure.
- Drip leg Installed in the gas piping near the unit.
- Minimum gas supply pressure should be 4.5" W.C.
- Maximum gas supply pressure must not exceed 14.0" W.C.
- Manifold pressure for single stage heaters should be set to 3.3" W.C.
- Manifold pressure for two stage heaters should be set to 3.5" W.C. on HIGH FIRE and 1.8" W.C. on LOW FIRE.
- Flue Exhaust clear of any obstruction.

Condensate Drain Configuration

⚠WARNING

Hazardous Voltage!

Failure to disconnect power before servicing could result in death or serious injury. Disconnect all electric power, including remote disconnects before servicing. Follow proper lockout/tagout procedures to ensure the power can not be inadvertently energized.

An evaporator condensate drain connection is provided on each unit. Refer to the ductwork section in the Installation chapter for the appropriate drain location.

The condensate drain pan is factory installed to drain condensate to the back side of the unit. Refer to the ductwork section in the Installation chapter for the drawings. It can be converted to drain condensate out the front side of the unit or through-the-base.

To convert drain condensate out the front of unit:

1. Remove evaporator access panel and supply air access panels.
2. Remove the support panel that the condensate drain pan exits through.
3. Slide the condensate drain pan out of the unit and rotate 180°.
4. Slide the condensate drain pan back into the unit, align the drain with the grommeted opening in the rear support panel and push until the coupling is seated in the grommet.
5. Replace the front support panel by aligning the panel with tabs in the raceway. Align the condensate drain pan support in the grommeted hole as the panel is put in place.
6. Replace evaporator access panel and supply air access panels.

To convert drain condensate through-the base of unit:

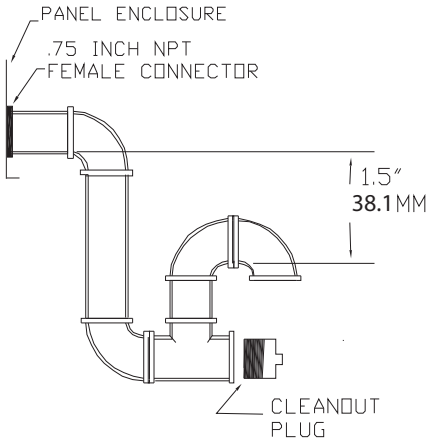
1. Remove evaporator access panel and supply air access panels.
2. Remove the support panel that the condensate drain pan exits through.
3. Slide the condensate drain pan out of the unit.
4. Place on a level surface in the position it was removed from the unit.
5. Remove the plug knockout in the bottom of the drain pan to convert it to through-the-base drainage.
6. Plug the original condensate drain opening with a field supplied 3/4″ NPT plug.

7. Slide the condensate drain pan back into the unit, align the drain support with the grommeted opening in the rear support panel and push until the support is seated in the grommet.
8. Replace the front support panel by aligning the panel with tabs in the raceway. Align the plugged condensate drain pan coupling in the grommeted hole as the panel is put in place.
9. Replace evaporator access panel and supply air access panels.

A condensate trap must be installed at the unit due to the drain connection being on the "negative pressure" side of the fan. Install the P-Trap using the guidelines in Figure 55, p. 37.

A condensate drain line must be connected to the p-trap. Pitch the drain lines at least 1/2 inch for every 10 feet of horizontal run to assure proper condensate flow. Do not allow the horizontal run to sag causing a possible double-trap condition which could result in condensate backup due to "air lock".

Figure 55. Condensate trap installation



Drain Pan Removal (Units with Condensate Overflow Switch Option)

Before drain pan removal, the switch wire must be disconnected from wire tie on panel and/or any tape before drain pan can be removed.

Care must be taken so the wire does not catch on the bottom of indoor coil or any protrusion.

Note: *When reversing the drain pan, on some units, the condensate overflow switch will need to be moved to the second hole in its bracket to avoid contact with headers or indoor coil.*

Filter Installation

The quantity of filters is determined by unit size. Access to the filters is obtained by removing the filter access panel. Refer to the unit Service Facts (shipped with each unit) for filter requirements.

Note: *Do not operate the unit without filters.*

Field Installed Power Wiring

⚠WARNING

Proper Field Wiring and Grounding 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 in NEC and your local/state electrical codes.

An overall dimensional layout for the field installed wiring entrance into the unit is illustrated in the Dimensions and Weights chapter. To insure that the unit's supply power wiring is properly sized and installed, follow the following guidelines.

Verify that the power supply available is compatible with the unit's nameplate ratings. The available supply power must be within 10% of the rated voltage stamped on the nameplate. Use only copper conductors to connect the power supply to the unit.

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.

Important: *If the unit is not equipped with an optional factory installed non-fused disconnect switch or circuit breaker, a field supplied disconnect switch must be installed at or near the unit in accordance with the National Electrical Code (NEC latest edition).*

Main Unit Power

⚠WARNING

Proper Field Wiring and Grounding 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 in NEC and your local/state electrical codes.

⚠WARNING

Hazardous Voltage!

Failure to disconnect power before servicing could result in death or serious injury. Disconnect all electric power, including remote disconnects before servicing. Follow proper lockout/tagout procedures to ensure the power can not be inadvertently energized.

Standard Wiring

1. Location of the applicable electrical service entrance is illustrated in the Dimensions and Weights chapter. Complete the unit's power wiring connections at Compressor Contactor # 1 (CC1) inside the unit control panel. Refer to the customer connection diagram that is shipped with the unit for specific termination points
2. Provide proper grounding for the unit in accordance with local and national codes.

Optional TBUE Wiring (Through-the-Base Electrical Option)

1. Location of the applicable electrical service is illustrated below. Refer to the customer connection diagram that is shipped with the unit for specific termination points. The termination points, depending on the customer option selected would be a factory mounted non-fused disconnect switch (UDC) or circuit breaker (UCB). If neither a factory mounted non-fused disconnect switch (UDC) or circuit breaker (UCB) was factory mounted, field wiring connections should be terminated in the control box at Compressor Contactor # 1 (CC1).
2. Provide proper grounding for the unit in accordance with local and national codes.

Note: *Black Gasket is shipped from the factory and is located in the literature ship-with bag in the control box. Apply Black Gasket around conduit plate on all 4 sides after installation to prevent air leakage from the building entering the electrical enclosures.*

Note: *Seal between wiring and conduit with Black Gasket or weather proof sealer to prevent air leakage from the building entering the electrical enclosures. Also seal around conduit and wiring at all roof and curb penetrations.*

Figure 56. All units except 10 ton high efficiency units

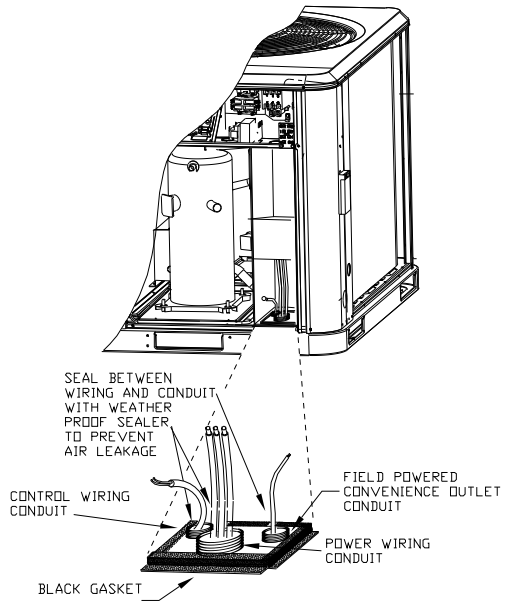
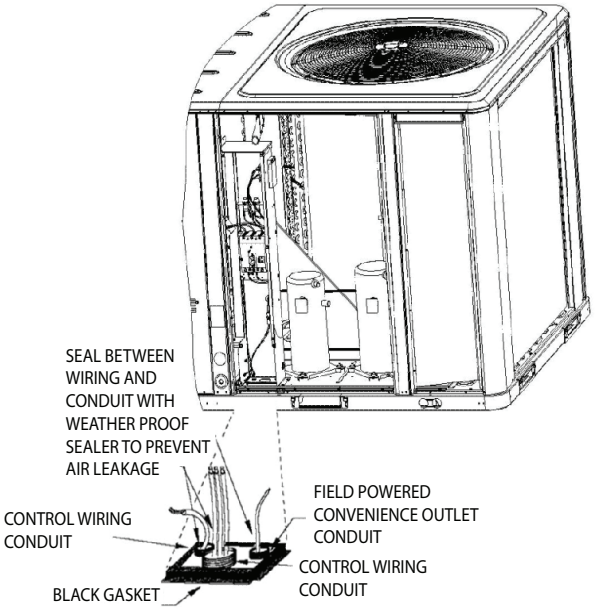


Figure 57. 10 ton high efficiency units



Field-Installed Control Wiring

⚠WARNING

Hazardous Voltage!

Failure to disconnect power before servicing could result in death or serious injury. Disconnect all electric power, including remote disconnects before servicing. Follow proper lockout/tagout procedures to ensure the power can not be inadvertently energized.

⚠WARNING

Proper Field Wiring and Grounding 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 in NEC and your local/state electrical codes.

An overall layout of the various control options available with the required number of conductors for each control device is illustrated in Figure 58, p. 40 and Figure 59, p. 40.

Note: *All field wiring must conform to NEC guidelines as well as state and local codes.*

Control Power Transformer

The 24 volt control power transformers are to be used only with the accessories called out in this manual. Transformers rated greater than 50 VA are equipped with internal circuit breakers. If a circuit breaker trips, turn "Off" all power to the unit before attempting to reset it.

⚠WARNING

Hazardous Voltage!

Failure to disconnect power before servicing could result in death or serious injury. Disconnect all electric power, including remote disconnects before servicing. Follow proper lockout/tagout procedures to ensure the power can not be inadvertently energized.

The transformer is located in the control panel. The circuit breaker is located on the left side of the transformer and can be reset by pressing in on the black reset button.

Controls Using 24 Vac

Before installing any connecting wiring, refer to the Dimensions and Weights chapter for the electrical access locations provided on the unit and Table 9, p. 39 or Table 10, p. 39 for AC conductor sizing guidelines, and;

1. Use copper conductors unless otherwise specified.
2. Ensure that the AC control wiring between the controls and the unit's termination point does not exceed three (3) ohms/conductor for the length of the run.

NOTICE:

Controls Using 24 VAC!

Resistance in excess of 3 ohms per conductor could cause component failure due to insufficient AC voltage supply.

Note: *Be sure to check all loads and conductors for grounds, shorts, and mis-wiring.*

3. Do not run the AC low voltage wiring in the same conduit with the high voltage power wiring.
4. Route low voltage wiring per illustrations on page 41.

Table 9. Electromechanical thermostat 24V AC conductors with ReliaTel™

Distance from Unit to Control	Recommended Wire Size
000 - 460 feet	18 gauge
000 - 140 m	0.75 mm^2
461 - 732 feet	16 gauge
141 - 223 m	1.3 mm^2
733 - 1000 feet	14 gauge
224 - 305 m	2.0 mm^2

Table 10. Electromechanical thermostat 24V AC conductors with electromechanical unit

Distance from Unit to Control	Recommended Wire Size
0 - 30 feet	22 gauge
0 - 9.1 m	0.33 m^2
31 - 50 feet	20 gauge
9.5 - 15.2 m	0.50m^2
51 - 75 feet	18 gauge
15.5 - 22.9 m	0.75 m^2
76 - 125 feet	16 gauge
23.1 - 38.1 m	1.3 m^2
126 - 200 feet	14 gauge
38.4 - 60.9 m	2.0 m^2

Controls using DC Analog Input/Outputs (Standard Low Voltage Multi conductor Wire)

Before installing any connecting wiring between the unit and components utilizing a DC analog input\output signal, refer to the Dimensions and Weights chapter for the electrical access locations provided on the unit.

- Table 11, p. 40 lists the conductor sizing guidelines that must be followed when interconnecting the DC binary output devices and the system components utilizing a DC analog input/output signal to the unit.

Note: *Resistance in excess of 2.5 ohms per conductor can cause deviations in the accuracy of the controls.*

Note: *Ensure that the wiring between controls and the unit's termination point does not exceed two and a half (2.5) ohms/conductor for the length of the run.*

- Do not run the electrical wires transporting DC signals in or around conduit housing high voltage wires.
- Route low voltage wiring per illustrations on page 41.

DC Conductors

Table 11. Zone sensor module wiring

Distance from Unit to Control	Recommended Wire Size
0 - 150 feet	22 gauge
0 - 45.7 m	0.33 mm^2
151 - 240 feet	20 gauge
46 - 73.1 m	0.50 mm^2
241 -385 feet	18 gauge
73.5 - 117.3 m	0.75 mm^2
386 - 610 feet	16 gauge
117.7 - 185.9 m	1.3 mm^2
611 - 970 feet	14 gauge
186.2 - 295.7 m	2.0 mm^2

Figure 58. Typical field wiring diagrams for electromechanical

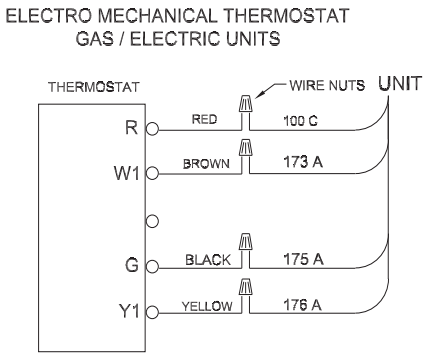
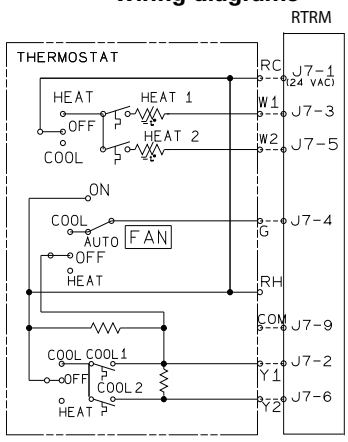


Figure 59. ReliaTel™ conventional thermostat field wiring diagrams(a)



(a) Not compatible with VAV units.

Figure 60. ReliaTel™ options module (RTOM board)

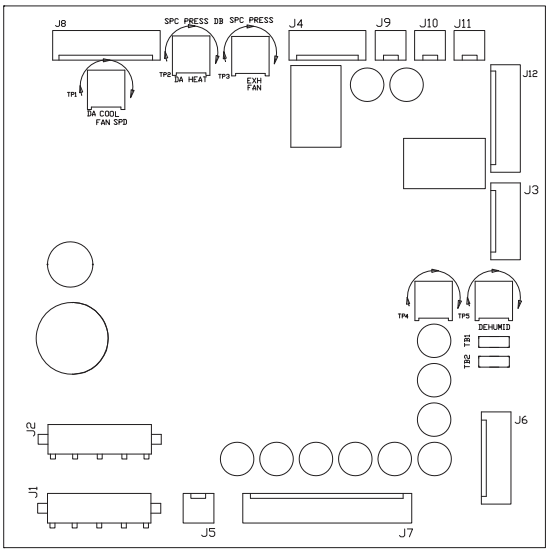


Figure 61. ReliaTel™ relative humidity sensor (dehumidification option)

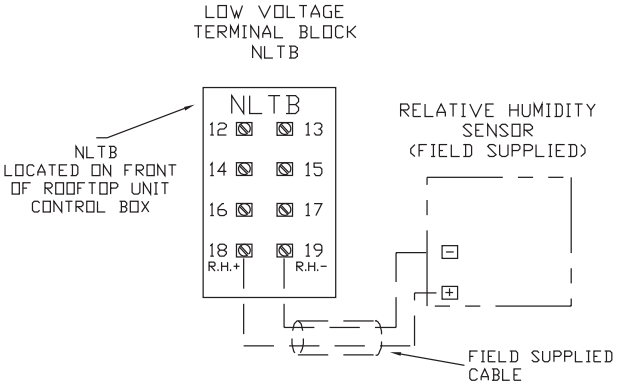


Figure 62. ReliaTel™ humidistat (dehumidification option)

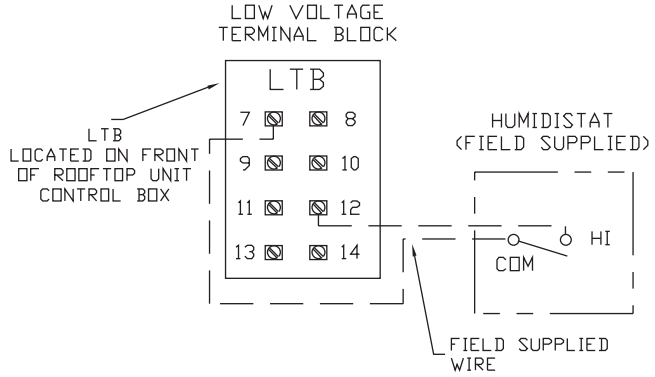


Figure 63. Electromechanical control customer low voltage routing (all units except 10 ton high efficiency)

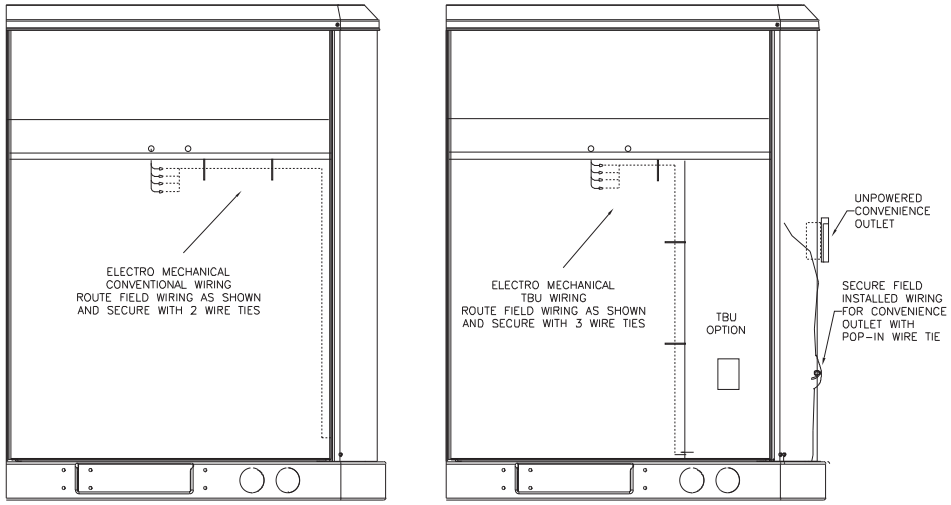


Figure 64. ReliaTel™ control customer low voltage routing (all units except 10 ton high efficiency)

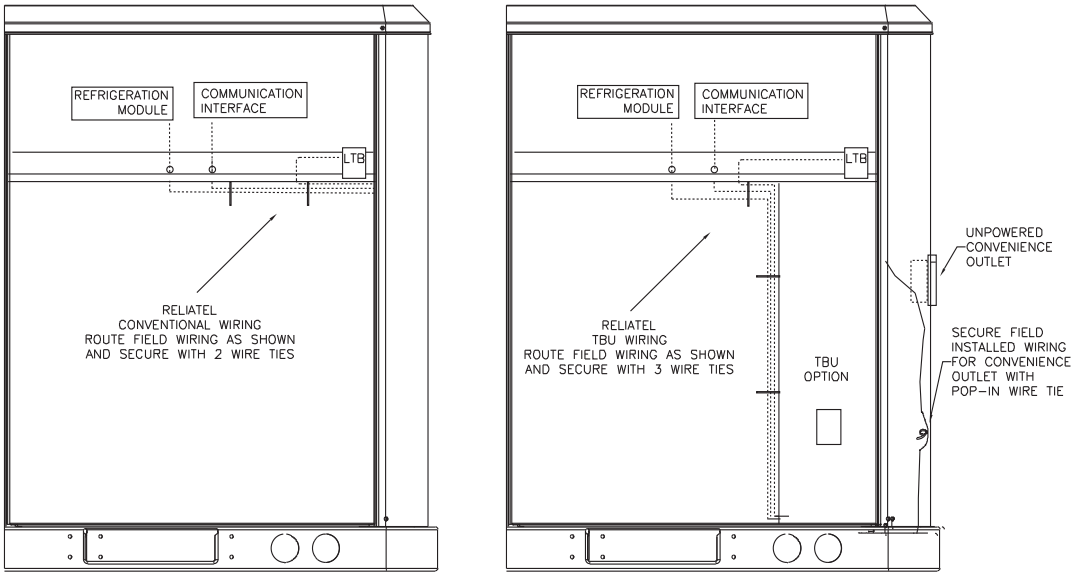


Figure 65. ReliaTel™ (without TBUE) control customer wire routing (10 ton high efficiency)

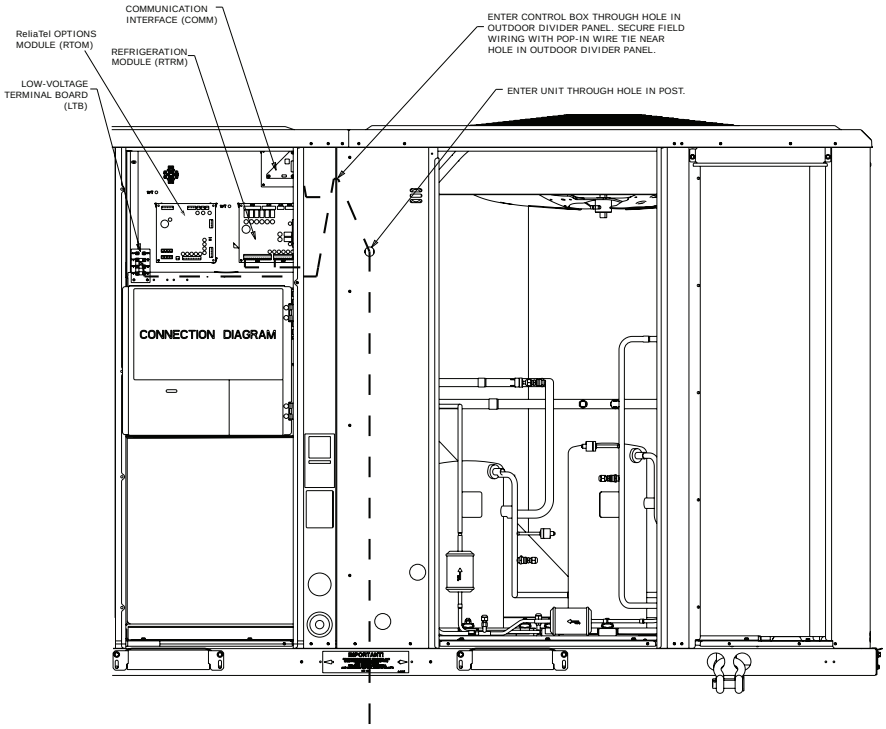


Figure 66. ReliaTel™ (with TBUE) control customer wire routing (10 ton high efficiency)

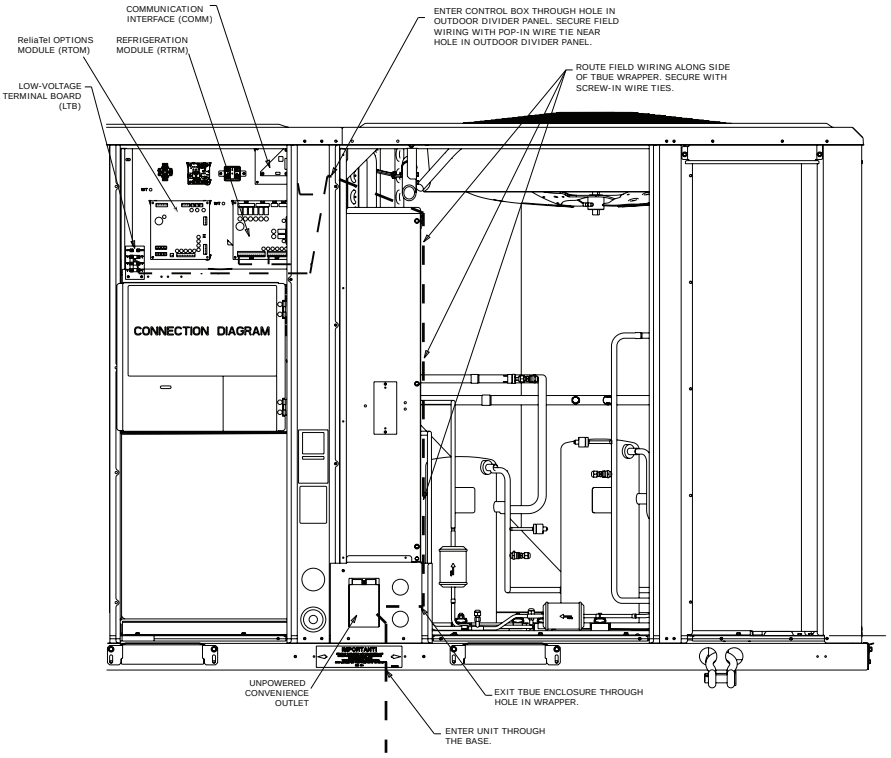


Figure 67. Electromechanical (without TBUE) control customer wire routing (10 ton high efficiency)

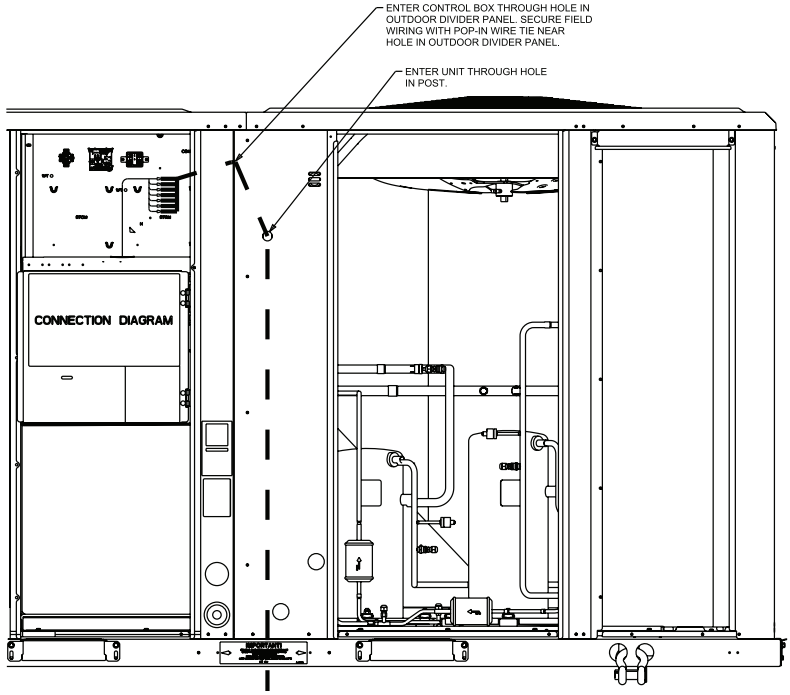
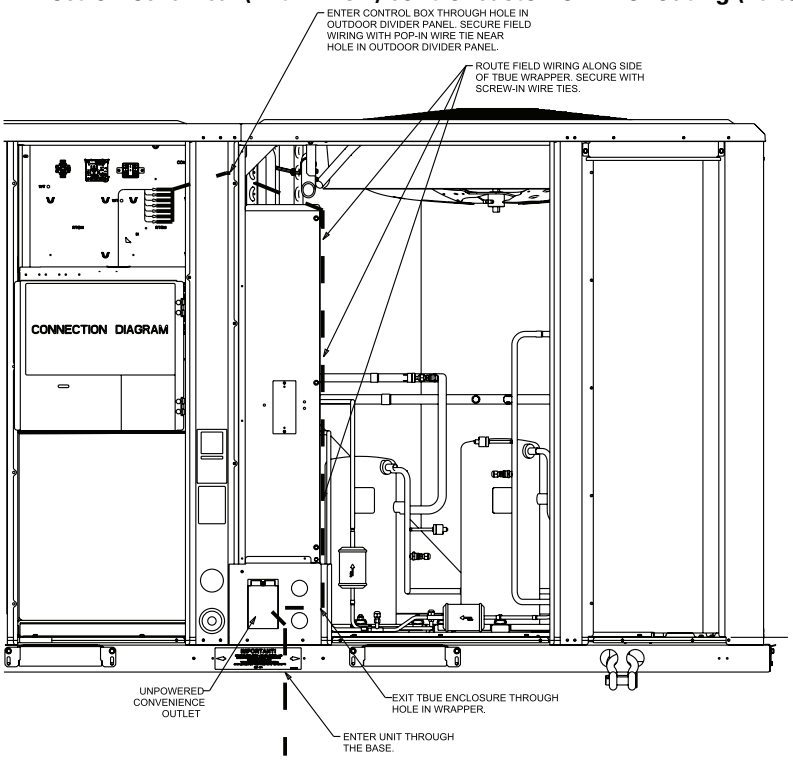


Figure 68. Electromechanical (with TBUE) control customer wire routing (10 ton high efficiency)



Space Temperature Averaging (ReliaTel™ Only)

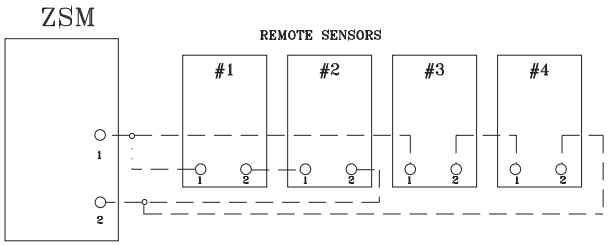
Space temperature averaging is accomplished by wiring a number of remote sensors in a series/parallel circuit.

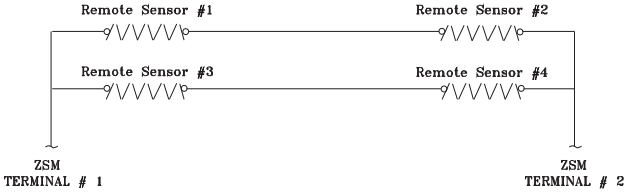
Using the BAYSENS016* or BAYSENS077*, at least four sensors are required to accomplish space temperature averaging. See diagram below.

- Example #1 illustrates two series circuits with two sensors in each circuit wired in parallel. The square of any number of remote sensors is required.
- Example #2 illustrates three sensors squared in a series/parallel circuit. Using BAYSENS077*, two sensors are required to accomplish space temperature averaging.
- Example #3 illustrates the circuit required for this sensor. Table 12, p. 46 lists the temperature versus resistance coefficient for all sensors.

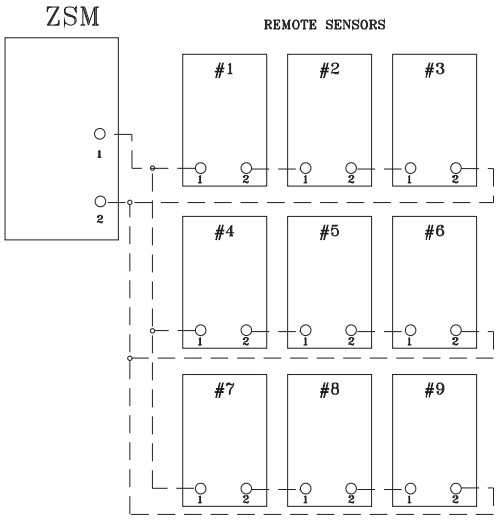
Figure 69. Examples

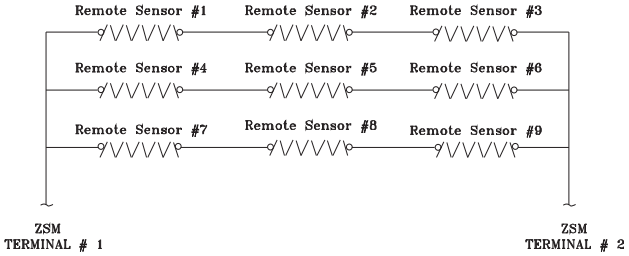
EXAMPLE #1



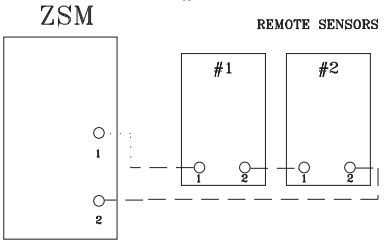


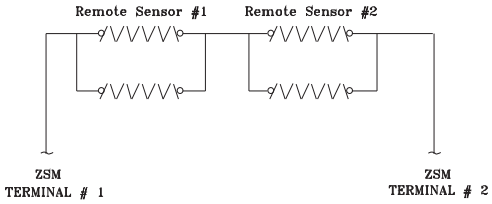
EXAMPLE #2





EXAMPLE #3





Note: *Wiring pin numbers are for reference only. There are multiple smoke detector systems that could have differently numbered pins. For correct wiring details, please refer to the specific smoke detector literature that accompanied this unit.*

Figure 70. Typical field wiring diagrams for optional controls (ReliaTel™ only)

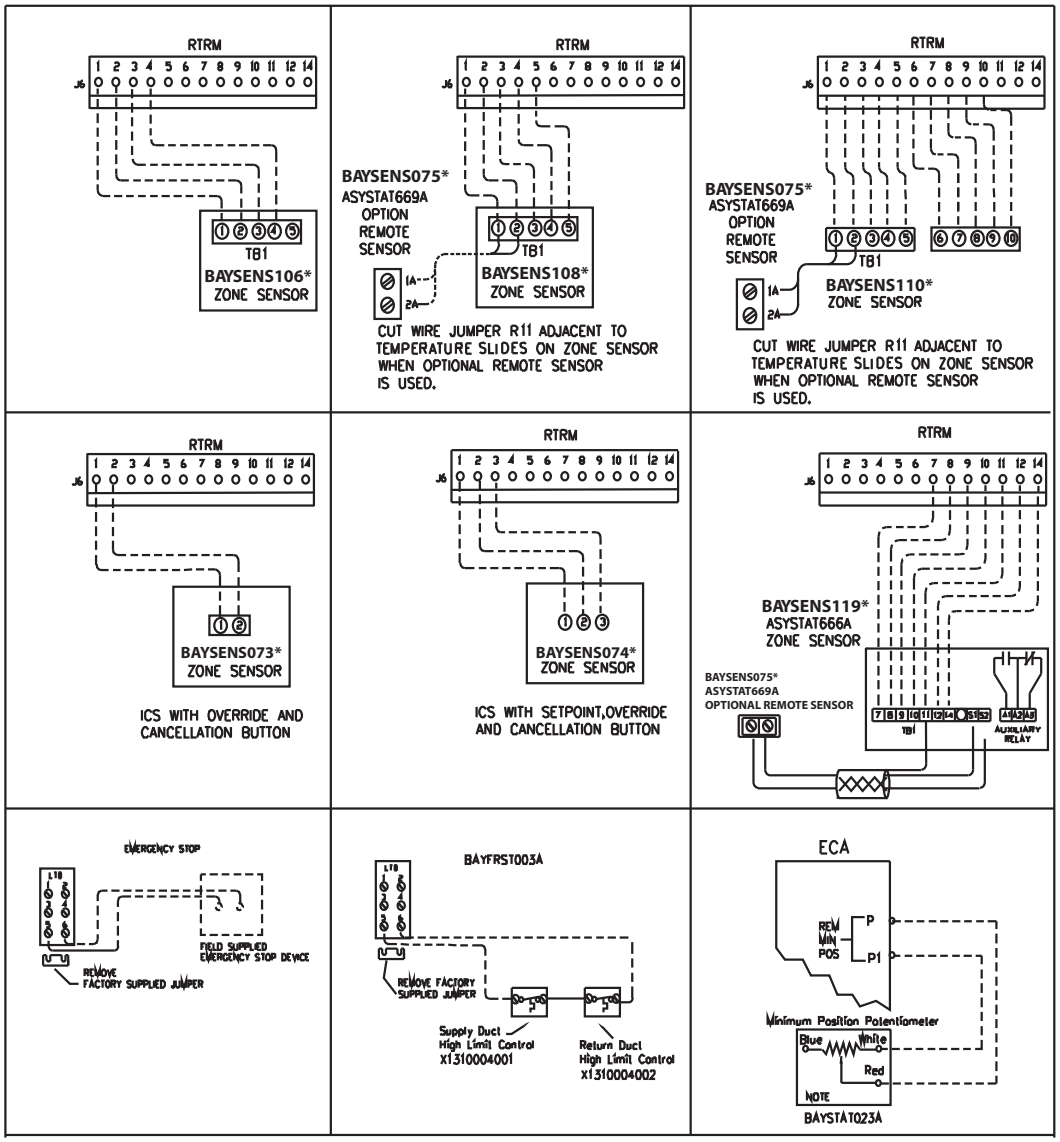


Table 12. Temperature vs. resistance

Temperature		
Degrees °F	**Degrees °C**	**Nominal Resistance**
-20°	-28.9°	170.1 K - Ohms
-15°	-26.1°	143.5 K - Ohms
-10°	-23.3°	121.4 K - Ohms
-5°	-20.6°	103.0 K - Ohms
0°	-17.8°	87.56 K - Ohms
5°	-15.0°	74.65 K - Ohms
10°	-12.2°	63.80 K - Ohms
15°	-9.4°	54.66 K - Ohms
20°	-6.7°	46.94 K - Ohms
25°	-3.8°	40.40 K - Ohms
30°	-1.1°	34.85 K - Ohms
35°	1.7°	30.18 K - Ohms
40°	4.4°	26.22 K - Ohms
45°	7.2°	22.85 K - Ohms
50°	10.0°	19.96 K - Ohms
55°	12.8°	17.47 K - Ohms
60°	15.6°	15.33 K - Ohms
65°	18.3°	13.49 K - Ohms
70°	21.1°	11.89 K - Ohms
75°	23.9°	10.50 K - Ohms
80°	26.7°	9.297 K - Ohms
85°	29.4°	8.247 K - Ohms
90°	32.2°	7.330 K - Ohms
95°	35.0°	6.528 K - Ohms

Table 13. Sizing natural gas pipe mains and branches

	Iron Pipe Size (IPS) Inches				
Length of Pipe (Ft.)	**½" Pipe**	**¾" Pipe**	**1" Pipe**	**1¼" Pipe**	**1½" Pipe**
15	76	176	345	750	1220
30	52	120	241	535	850
45	43	99	199	435	700
60	38	86	173	380	610
75		77	155	345	545

Note: Capacity of Pipe of Different Diameters and Lengths in Cu. Ft. Per Hr. with Pressure Drop of 0.3" and Specific Gravity of 0.60

Table 14. Iron pipe size (SI) millimeters

	Iron Pipe Size (SI) Millimeters				
Length of Pipe (Meters)	**15 mm Pipe**	**20 mm Pipe**	**25 mm Pipe**	**32 mm Pipe**	**40 mm Pipe**
4.6	2.15	4.98	9.76	21.23	34.54
9.1	1.47	3.39	6.82	15.14	24.06
13.7	1.21	2.80	5.63	12.31	19.82
18.3	1.07	2.43	4.89	10.76	17.27
22.9	—	2.18	4.38	9.76	15.40

Note: Capacity of Pipe of Different Diameters and Lengths in Cu. Meter Per Hr. with Pressure Drop of 74.6 Pa and Specific Gravity of 0.60.

Figure 71. Schematic diagram for field gas piping to unit