

L4064A-F,J,N,R,T,W,Y FAN AND LIMIT CONTROLLERS

INSTALLATION INSTRUCTIONS

APPLICATION

These combination warm air fan and limit controllers are suitable for all types of forced air heating systems. The controllers have 2 switches; one which opens the limit circuit if the plenum temperature exceeds the preset safety limit; it resets automatically. The other switch turns the fan on and off. On the L4064A-F,J,N and R, fan is turned on and off according to plenum temperature. The L4064T,W, and Y however, have a bimetal heater in the fan switch that turns the fan on approximately 20 to 90 seconds* after a call for heat begins. Fan off is approximately 2-4 minutes after the call for heat ends. The L4064B,D,N,R, and W have a manual fan switch to override the fan on and off settings and allow continuous fan operation. The L4064A-F,N,T,W,Y may be used with all forced warm air systems. The L4064J and R have a special high temperature range suitable for gravity heating systems. All models may be used as limit controllers by wiring only the limit side. Limit contacts are suitable for line voltage, low voltage

**The fan-on timing can vary depending on applied voltage and switch ambient.*

INSTALLATION

WHEN INSTALLING THIS PRODUCT...

1. Read these instructions carefully. Failure to follow them could damage the product or cause a hazardous condition.
2. Check the ratings given in the instructions and on the product to make sure the product is suitable for your application.
3. Installer must be a trained, experienced service technician.
4. For 230VAC application, use of double insulated cable is required.
5. After installation is complete, check out product operation as provided in these instructions.

WARNING

Failure to remove brass jumper, if limit switch is in low voltage circuit, can cause electrical shock hazard or damage low voltage controls.

CAUTION

1. Disconnect power supply before connecting wiring to prevent electrical shock or equipment damage.
2. When connecting cable or conduit to control, avoid straining the control case.

Follow furnace or burner manufacturer's instructions, if available. Maximum element temperature is:
L4064A-F,N,T,W,Y—350 F (177 C).
L4064J,R—250 F (121 C) above limit setting.
Maximum switch temperature is:
L4064A-F,J,N,R—190 F (88 C).
L4064T,W,Y—115 F (46 C).



Do not exceed these temperatures or the following electrical ratings (amperes):

Table 1. Electrical Ranges

	120 Vac		240 Vac	
	FAN	LIMIT	FAN	LIMIT
Full Load	14	8	7	4
Locked Rotor	84	48	42	24

Pilot Duty: 2 A at 24 Vac; 0.25 A at 0.25 to 12 Vdc.
 Maximum Combined Connected Load: 2000 VA. 75 C (167 F) (min.) field wiring required. Wiring must conform to NEC Class 1 requirements.

Approval

- IP20 compliance
- CE pin number 0085BM0320, valid for B and N type.
- DIN Certco registration:
 - L4064B IS Classified as TR/TW;
 - L4064N IS Classified as STB
- CSA certified file #LR1622
- UL listed file #LR1322-336

LOCATION

If this is a replacement installation, locate the L4064 in the same location as the control being replaced. Sensing tube length should be same as old control. If this is a new installation, the element should be installed only by a trained, experienced service technician according to the furnace manufacturer's instructions. The element must not touch any internal part of the furnace.

NOTE: The electrical rating is at maximum switch temperature of 190 F (88 C). If plenum surface temperature exceeds 190 F (88 C), heat insulating material or mounting bracket must be used.

MOUNTING

- The devices may be mounted as follows:
- L4064A,B,E,F,N,T,W,Y— Surface or bracket (rigid or swivel)
 - L4064C,D— Surface only.
 - L4064J,R— Bracket (swivel or rigid) mounting only.

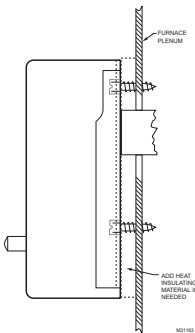


Fig. 1. Surface mounting for L4064. The L4064C and D require a 1-1/2 in. (38.1 mm) diameter hole for element insertion; all other models require a 13/16 in. (20.6 mm) hole.

Surface Mounting (Fig. 1)

L4064A,B,E,F,T,W,Y—Hole in plenum should be just large enough to accommodate the 3/4 in. (19.1 mm) diameter element tube. A 13/16 in. (20.6 mm) diameter hole is recommended. L4064C,D—Hole in plenum should be 1-9/16 in. (39.7 mm) diameter to accommodate the 1-1/2 in. (38.1 mm) diameter element.

1. Remove cover by squeezing sides and pulling off. Insert element in plenum and mark location of mounting holes. Make sure the case is snug against the plenum before marking the mounting holes.
2. Punch or drill holes for mounting screws.
3. Place insulation between plenum and case if necessary.
4. Fasten controller securely with mounting screws.

Swivel Mounting (Fig. 2)

L4064A,B,E,F,J,R,T,W,Y may be swivel-mounted. The swivel bracket requires a 1-9/16 in. (39.7 mm) hole in the plenum.

1. Use bracket as a template to make the location of mounting holes in plenum. Drill or punch holes for mounting screws.
2. Fasten the bracket in place with furnished screws. Start the screws but do not tighten.
3. Insert element tube through bracket, straighten controller, and fasten. Tighten the mounting screws securely. It may be necessary to rotate the bracket to tighten all screws securely.

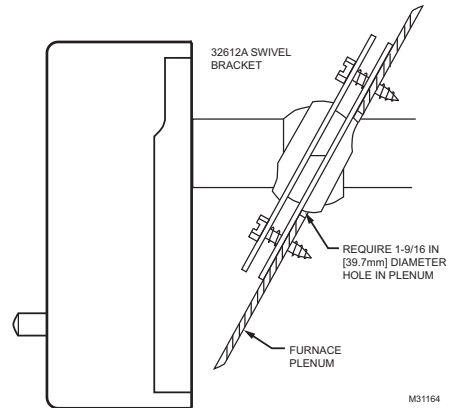


Fig. 2. Swivel mounting requires a 1-9/16 in. (40 mm) diameter mounting hole for element insertion.

⚠ WARNING

When mounting control on bracket, setscrew must strike tube frame, NOT sensing element. If setscrew strikes sensing element, the safety limit function can fail and cause a fire hazard.

L4064A,B,E,F,J,R,T,W,Y may be mounted using a rigid bracket. The rigid bracket requires a hole 13/16 in. (20.6 mm) diameter for mounting.

1. Use bracket as a template to mark the location of mounting holes in plenum. Drill or punch holes for mounting screws.
2. Fasten bracket in place with furnished screws. Tighten the screws securely.
3. Insert element tube through bracket, straighten controller and fasten by tightening setscrew. Be sure screw strikes tube frame and does not strike sensing element.

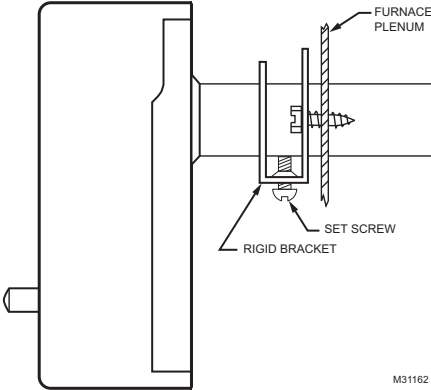


Fig. 3. Rigid bracket mounting requires a hole 13/16 in.

WIRING

Disconnect power supply before beginning installation to prevent electrical shock or equipment damage. All wiring must comply with local electrical codes and ordinances or in the absence of local codes with the National Electrical Code ANSI CI-1981-NFPA 70. Follow burner or furnace manufacturer's instructions if available; otherwise, see Fig. 4-6 and proceed as follows.

IMPORTANT

The brass jumper is the breakaway type. It must be removed when the limit is used in the low voltage circuit. To remove jumper, break with a needlenose pliers and remove completely. Once removed, it is not replaceable. See Fig. 4 for location.

1. If cable is used, we recommend using a strain-relief bushing in the knockout. Bushing is available from your local electrical supply.
2. Refer to the following section for type of wiring connections (standard wire push-in terminals or female receptacle).
3. If strain relief bushing is used, close the movable gate when all wires have been connected to the terminals

Wiring Connections

When connecting cable or conduit to this controller, use care to avoid strain on the control case. Connections can be made to standard wire push-in terminals or female receptacles for 1/4 in. (6.4 mm) male flag connectors on both the fan and limit switches (Fig. 4). L4064T,W,Y have 1/4 in. male push-in terminals for low voltage heater.

For Standard wire Push-in terminals

Connect wires to the terminals as follows:

1. Use Nos. 14, 16, or 18 solid wire or Nos. 14 or 16 stranded wire, depending on electrical requirement.
2. Strip insulation from wires the distance shown by the strip gauge on the controller. If wire insulation is 4/64 in. (2 mm) thick, strip additional 1/4 in. (6 mm) to ensure wire seats securely in push-in connectors.
3. Solid wire may be inserted directly into the terminal holes. If stranded wire is used, insert a small screwdriver into the slot next to the terminal. Push screwdriver in and hold while inserting wire into terminal (Fig. 8). Remove screwdriver. If stranded wire is solder-dipped, it can be pushed directly into terminal holes.

For Female Receptacles

It is recommended that the female receptacles be used for wiring accessory equipment; i.e., electronic air cleaner, humidifier, etc. Connect wires to the receptacles as follows:

1. Use Nos. 14 to 18 size wire, depending on electrical requirement.
2. Attach 1/4 in. (6.4 mm) male flag connector to each wire.
3. Push male flag connector directly into the female receptacle. Make sure that the flag is forced to the bottom of cavity and wire is in the channel (Fig. 4).

IMPORTANT

Make certain all wires are clear of rotating scaleplate.

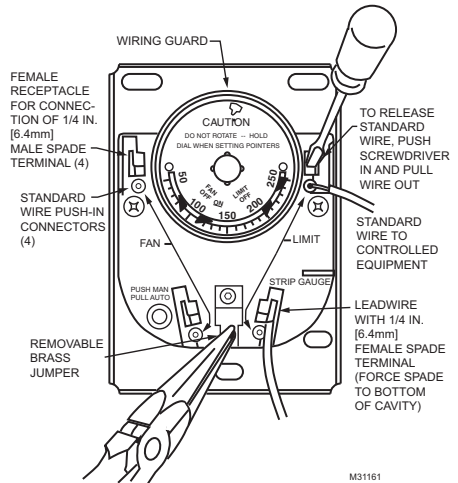
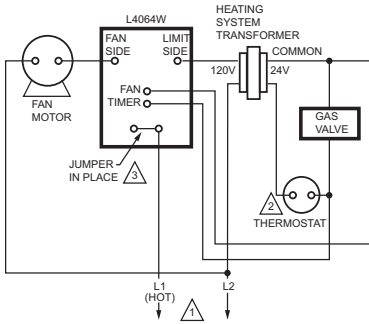


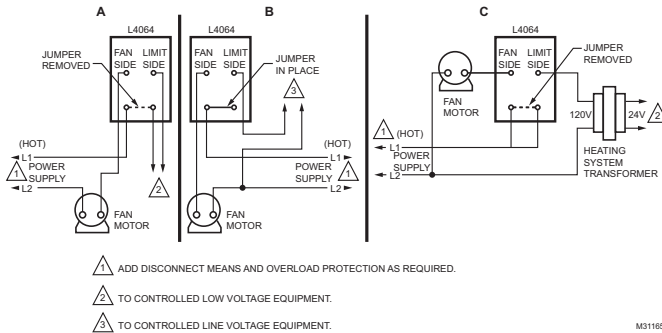
Fig. 4. Location of Wiring Connections



- ⚠ POWER SUPPLY-PROVIDE DISCONNECT MEANS AND OVERLOAD PROTECTION AS REQUIRED.
- ⚠ ADD .1 TO ANTICIPATOR SETTING ON THE THERMOSTAT WHEN FAN TIMER IS CONNECTED.
- ⚠ TO USE AS LOW VOLTAGE LIMIT CONTROLLER, REMOVE JUMPER AND CONNECT TERMINALS IN LOW VOLTAGE CIRCUIT.

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Fig. 5. L4064T,W,Y 3-wire line voltage hookup



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Fig. 6. A: Limit in low voltage circuit
 B: Limit in line voltage circuit
 C: Limit in line voltage circuit without jumper.

SETTINGS AND ADJUSTMENTS

⚠ CAUTION

When adjusting the fan and limit set point levers (Fig. 7), hold the scaleplate dial to keep it from turning and straining the sensing element.

IMPORTANT

The L4064T,W,Y, use a bimetal heater, in the fan switch, to turn on the fan approximately 20 to 90 seconds* after a call for heat. When the call for heat ends, the fan will continue to run until the fan-off temperature is reached and the bimetal heater switch cools down (approximately 2 to 4 minutes). If the L4064T, W or Y is used to replace an L4064A or B, the blower fan may circulate cool air until the plenum heats up. No adjustment of the fan-on time is possible.

Move each indicator lever to the control point recommended by the burner or furnace manufacturer. Use gentle finger pressure.

Fan Setting Adjustment



1. Move the FAN OFF lever to the temperature at which the fan is to stop to prevent circulation of cool air.
2. Move the FAN ON lever as follows: L4064A-F,N—FAN ON range is from 15 F (8.3 C) above the FAN OFF setting to 35 F (19.0 C) below the LIMIT OFF setting. L4064J,R—FAN ON range is from 20 F (11.1 C) above the FAN OFF setting to 45 F (24.9 C) below the LIMIT OFF setting. L4064T,W,Y—Move the FAN ON lever as needed for setting the FAN OFF indicator and LIMIT indicator. The FAN ON indicator is nonfunctional on the L4064T,W,Y; a special bimetal heater acts to turn on the fan approximately 20 to 90 seconds* after a call for heat from the thermostat. On-time will vary, depending on the voltage applied to the bimetal heater and on the temperature surrounding the fan switch. Operation of L4064T,W,Y is the same as L4064A devices if the heater terminals are not connected to low voltage.

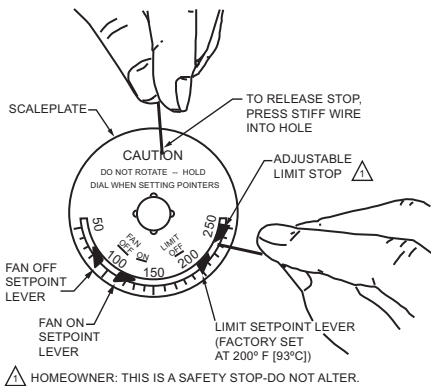
MANUAL FAN SWITCH L4064B,D,N,R,W

For constant fan operation (overriding fan setting levers), push the FAN switch button in. For fan to cycle automatically, pull button out.

LIMIT STOP ADJUSTMENT

These controllers have a limit stop which prevents the limit set point lever from being adjusted beyond the equipment manufacturer's specifications.

1. Push a stiff wire through hole in scaleplate to depress the stop disc not more than 1/16 in. (1.6 mm) to release stop lock (Fig. 7). Stop disc is on back of scaleplate.
2. While depressing the stop disc, insert another stiff wire into hole in limit stop (Fig. 7) and use this wire to move stop to desired setting. If the L4064 is replacement control, high limit stop setting should be the same as that of the control being replaced (Move stop clockwise  to lower the setting, counter-clockwise  to raise it.) Then remove both wires.



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Fig. 7. Changing the High Limit Stop

3. Set the LIMIT OFF lever to the temperature at which the high limit switch is to open to stop the burner. If the high limit stop has been properly set, the LIMIT OFF lever should be as high as the stop permits.

*The fan-on timing can vary depending on applied voltage and switch ambient

OPERATION

L4064A-F,J,N,R—As the plenum temperature rises, the coiled bimetal sensing element of the control warps and mechanically makes the fan contacts (at the FAN ON temperature setting). During normal operation, the call for heat ends before the LIMIT setting is reached and the fan contacts break as the plenum temperature falls and the FAN OFF setting is reached. If the call for heat continues until the temperature in the plenum rises to the LIMIT setting, the bimetal element will mechanically break the limit contacts and de-energize the heating control circuit. L4064T,W,Y—The operation of the L4064T,W,Y is the same except that this controller uses a bimetal heater in the fan switch to make the switch contacts independent of the bimetal sensing element. This heater acts to anticipate the rise in plenum temperature and turns on the fan approximately 20 to 90 seconds* after the thermostat calls for heat. Actual on-time will vary, depending on the voltage applied to the bimetal heater and on the temperature surrounding the fan switch.

*The fan-on timing can vary depending on applied voltage and switch ambient.

CHECKOUT

When installation is complete, disconnect the fan motor circuit at the L4064. Turn on power and set thermostat to call for heat. Burner should come on and limit controller should shut burner off when plenum temperature reaches the limit set point. Turn off power, reconnect the fan switch, turn on power and again set thermostat to call for heat. On L4064A-F,J,N,R fan should start when plenum temperature has reached fan-on setting. On L4064T,W,Y, fan should start approximately 20 to 90 seconds* after call for heat. Fan should shut off on all L4064 models (except L4064T,W,Y) when call for heat ends and plenum has cooled to fan-off setting. The L4064T,W,Y shut off the fan when the sensing element and the bimetal heater switch have cooled to the fan-off setting. This is usually 2 to 4 minutes after the call for heat ends.

*The fan-on timing can vary depending on applied voltage and switch ambient. of the limit in this checkout, push reset switch button.

NOTE: L4064N are manual reset models. Also providing the function of the limit in this checkout, push reset switch button.

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