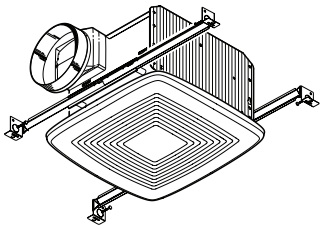
QTXE SERIES
ULTRA SILENT™ FANS



READ AND SAVE THESE INSTRUCTIONS

WARNING

TO REDUCE THE RISK OF FIRE, ELECTRIC SHOCK, OR INJURY TO PERSONS, OBSERVE THE FOLLOWING:

1. Use this unit only in the manner intended by the manufacturer. If you have questions, contact the manufacturer at the address or telephone number listed in the warranty.
2. Before servicing or cleaning unit, switch power off at service panel and lock the service disconnecting means to prevent power from being switched on accidentally. When the service disconnecting means cannot be locked, securely fasten a prominent warning device, such as a tag, to the service panel.
3. Installation work and electrical wiring must be done by a qualified person(s) in accordance with all applicable codes and standards, including fire-rated construction codes and standards.
4. Sufficient air is needed for proper combustion and exhausting of gases through the flue (chimney) of fuel burning equipment to prevent backdrafting. Follow the heating equipment manufacturer's guideline and safety standards such as those published by the National Fire Protection Association (NFPA), and the American Society for Heating, Refrigeration and Air Conditioning Engineers (ASHRAE), and the local code authorities.
5. When cutting or drilling into wall or ceiling, do not damage electrical wiring and other hidden utilities.
6. Ducted fans must always be vented to the outdoors.
7. Acceptable for use over a tub or shower when connected to a GFCI (Ground Fault Circuit Interrupter) - protected branch circuit (ceiling installation only).
8. This unit must be grounded.

CAUTION

1. For general ventilating use only. Do not use to exhaust hazardous or explosive materials and vapors.
2. This product is designed for installation in ceilings up to a 12/12 pitch (45 degree angle). Duct connector must point up. DO NOT MOUNT THIS PRODUCT IN A WALL.
3. To avoid motor bearing damage and noisy and/or unbalanced impellers, keep drywall spray, construction dust, etc. off power unit.
4. Please read specification label on product for further information and requirements.

CLEANING & MAINTENANCE

For quiet and efficient operation, long life, and attractive appearance - lower or remove grille and vacuum interior of unit with the dusting brush attachment.

The motor is permanently lubricated and never needs oiling. If the motor bearings are making excessive or unusual noises, replace the blower assembly (includes motor and impeller).

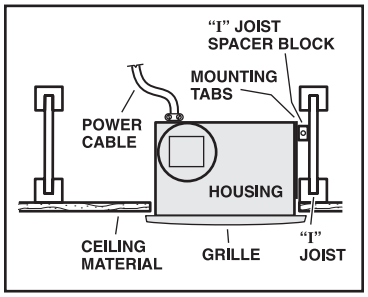
OPERATION

Use an on/off switch or speed control to operate this ventilator. See "Connect Wiring" for details. Use of speed controls other than the Broan Models 78V and 78W may cause a motor humming noise.

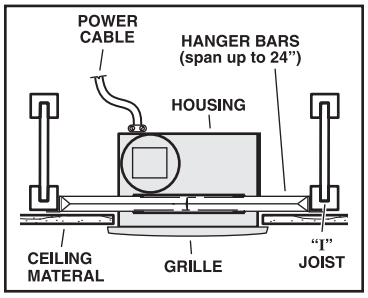
Installer: Leave this manual with the homeowner.

TYPICAL INSTALLATIONS

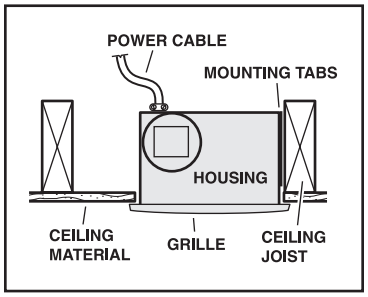
Housing mounted to I-joists.



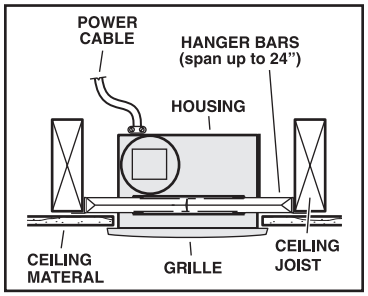
Housing mounted anywhere between I-joists using hanger bars.



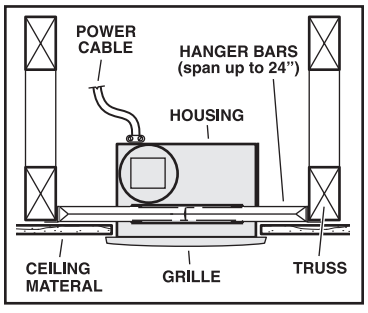
Housing mounted to joists.



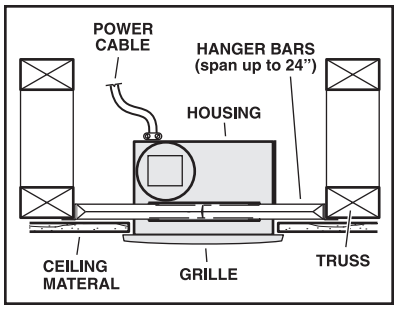
Housing mounted anywhere between joists using hanger bars.



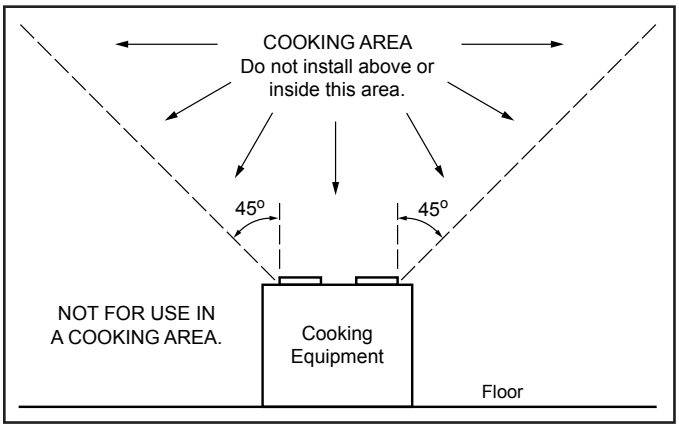
Housing mounted anywhere between trusses using hanger bars.

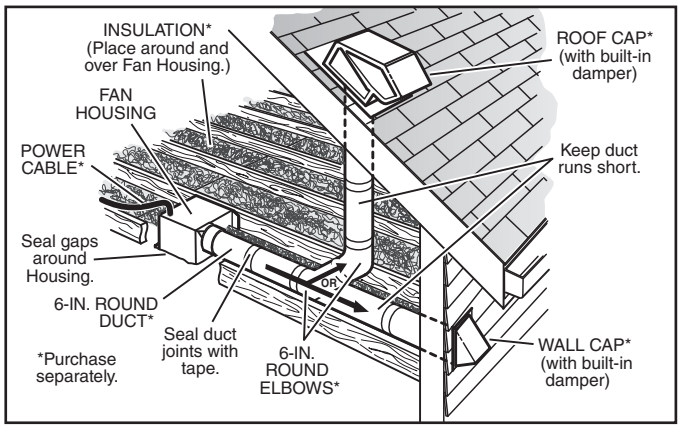


Housing mounted anywhere between trusses using hanger bars.



PLAN THE INSTALLATION





The ducting from this fan to the outside of the building has a strong effect on the air flow, noise and energy use of the fan. Use the shortest, straightest duct routing possible for best performance, and avoid installing the fan with smaller ducts than recommended. Insulation around the ducts can reduce energy loss and inhibit mold growth. Fans installed with existing ducts may not achieve their rated airflow.

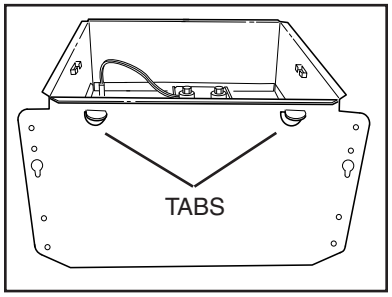
Use a roof cap or wall cap that has a built-in damper to reduce backdrafts.

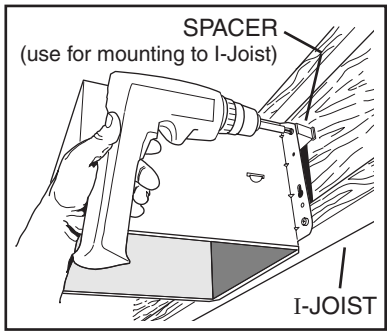
Plan to supply the unit with proper line voltage and appropriate power cable.

INSTALL HOUSING & DUCT

1a. Mount housing to joist or I-joist.

Use a pliers to bend housing **TABS** out to 90⁰. Hold housing in place so that the housing tabs contact the bottom of the joist. The housing mounts with four (4) screws or nails. Screw or nail housing to joist through lowest holes in each mounting flange, then through highest holes. NOTE: Mounting to **I-JOIST** (shown) requires use of **SPACERS** (included) between the highest hole of each mounting flange and the I-joist.

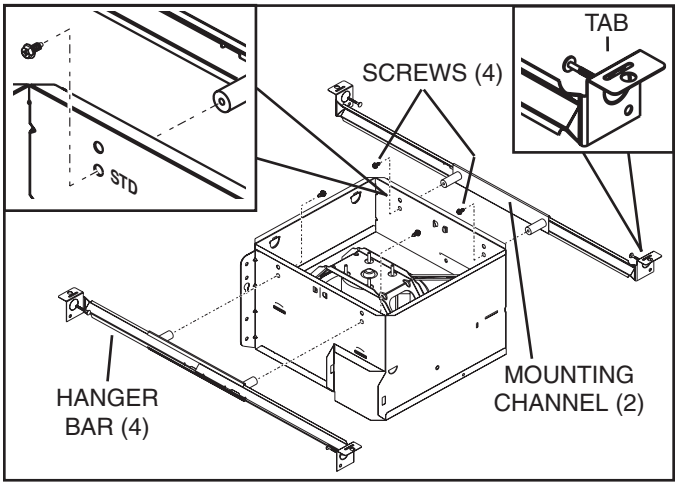




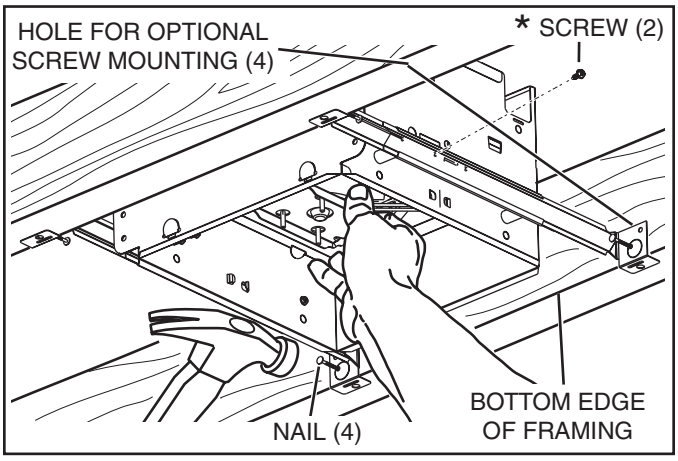
OR

1b. Mount housing anywhere between trusses, joists, or I-joists using hanger bars.

Sliding hanger bars are provided to allow for accurate positioning of housing anywhere between framing. They can be used on all types of framing (I-joist, standard joist, and truss construction) and span up to 24".



Attach the MOUNTING CHANNELS to the housing using the SCREWS supplied. Make sure TABS face "up" as shown. Use the set of channel mounting holes (marked "STD") to mount the housing flush with the bottom of the drywall. Use the other set of holes (not marked) to mount the housing flush with the top of the drywall.



Extend HANGER BARS to the width of the framing.

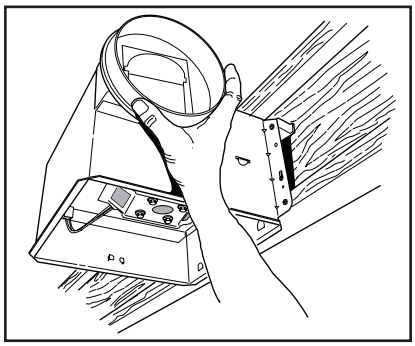
Hold ventilator in place with the hanger bar tabs wrapping around the BOTTOM EDGE OF THE FRAMING.

NAIL ventilator to framing or fasten with screws (not provided) through HOLES near nails.

* To ensure a noise-free mount: Secure hanger bars together with SCREWS or use a pliers to crimp mounting channels tightly around hanger bars.

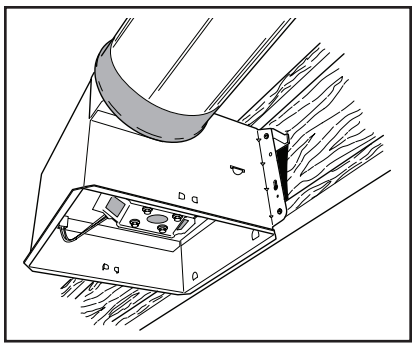
2. Attach damper/duct connector.

Snap damper / duct connector onto housing. Make sure connector is flush with top of housing and damper flap falls closed.

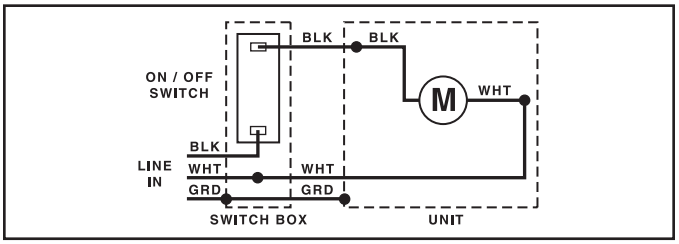


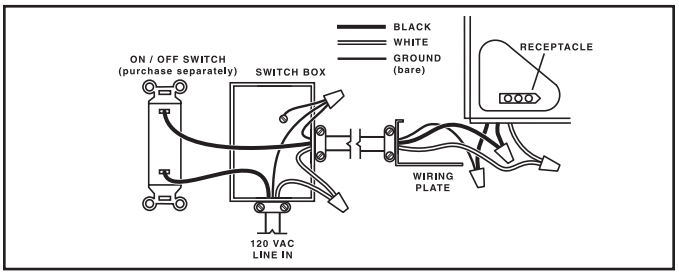
3. Install 6-inch round duct-work.

Connect 6-inch round ductwork to damper / duct connector. Run ductwork to a roof cap or wall cap. Tape all ductwork connections to make them secure and air tight.



CONNECT WIRING



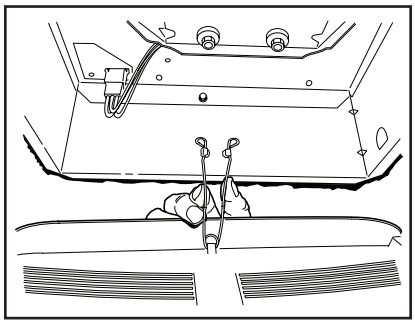


4. Connect electrical wiring.
Run 120 VAC house wiring to installation location. Use proper UL approved connector to secure house wiring to wiring plate. Connect wires as shown in wiring diagrams.

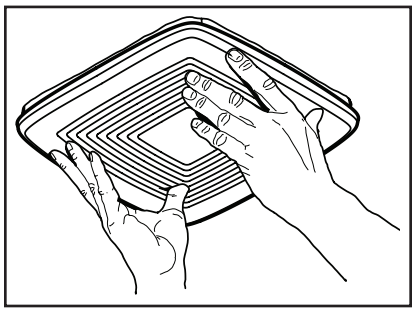
INSTALL GRILLE

5. Finish ceiling.
Install ceiling material. Cut out around housing.

6. Attach grille to housing.
Squeeze grille springs and insert them into slots on each side of housing.



7. Push grille against ceiling.



Broan SmartSense® Intelligent Ventilation Controllers

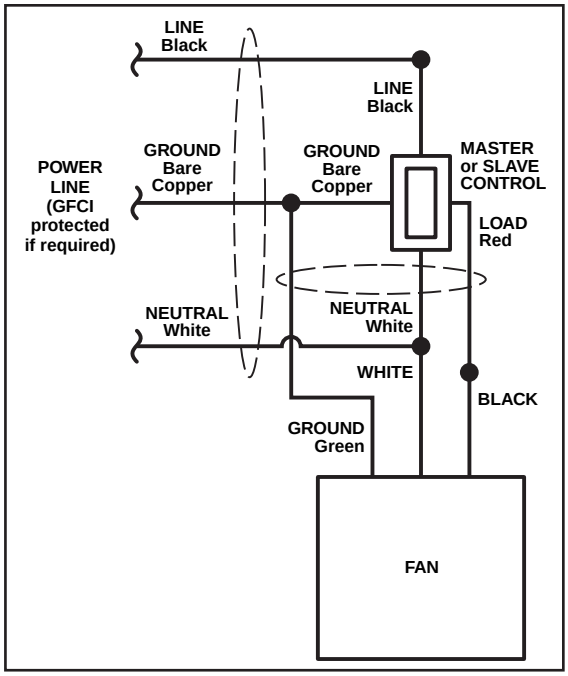
READ AND SAVE THESE INSTRUCTIONS

WARNING

TO REDUCE THE RISK OF FIRE, ELECTRIC SHOCK, OR INJURY TO PERSONS, OBSERVE THE FOLLOWING:

1. Use this unit only in the manner intended by the manufacturer. If you have questions, contact the manufacturer at the address or telephone number listed in the warranty.
2. Before servicing or cleaning unit, switch power off at service panel and lock the service disconnecting means to prevent power from being switched on accidentally. When the service disconnecting means cannot be locked, securely fasten a prominent warning device, such as a tag, to the service panel.
3. Installation work and electrical wiring must be done by a qualified person(s) in accordance with all applicable codes and standards, including fire-rated construction codes and standards.
4. Sufficient air is needed for proper combustion and exhausting of gases through the flue (chimney) of fuel burning equipment to prevent backdrafting. Follow the heating equipment manufacturer's guideline and safety standards such as those published by the National Fire Protection Association (NFPA), and the American Society for Heating, Refrigeration and Air Conditioning Engineers (ASHRAE), and the local code authorities.
5. When cutting or drilling into wall or ceiling, do not damage electrical wiring and other hidden utilities.
6. This unit must be grounded.
7. Do not connect this product as a load on a fan speed control or light dimmer.
8. Read and understand entire instructions before proceeding with installation.

INSTALLATION



Install controls and wire them as shown. Use following guidelines:

- **IMPORTANT:**
  QTXE080 Ultra Silent™ fan must be wired to SMSC080 SmartSense® control.
  QTXE110 Ultra Silent™ fan must be wired to SMSC110 SmartSense® control.
- Use minimum 75 °C rated electrical wiring.
- Except for required neutral wire, these controls install like normal switches. Make sure electrician knows each control location must have a neutral wire. Neutral wire at switch locations may be code requirement or regular practice in installation municipality; but unless explicitly specified, electrician might not install it.
- Specify deep device electrical boxes where controls will be installed. These controls fit in most North American electrical boxes; however, deep boxes provide extra working space which eases installation. Labor cost savings can offset higher box costs, which is usually less than a dollar over standard depth boxes. Use boxes that have 18 cu. in. minimum volume and are at least 1-1/2 in. deep.
- All controls must be grounded using attached ground wire.

CONTROL OPERATION

HOW SYSTEM WORKS

Broan SmartSense® system is design to provide recommended ventilation for desirable indoor air quality. Related ventilation requirements of *ANSI/ASHRAE Standard 62, "Ventilation for Acceptable Indoor Air Quality" are fulfilled when this system is installed accordingly. Ventilation level, which is based on home square footage and number of bedrooms, is easily set during installation. Power outages do not affect settings, since they are stored in power independent (nonvolatile) memory. Energy usage is optimized by monitoring fan on-time and adjusting automatic ventilation as needed. Indoor air quality is provided 24-hours a day, 7-days a week.

A single Broan SmartSense® system is powerful enough to fulfill ventilation rates for larger homes; however, it is recommended to use multiple installations for homes with multiple bathrooms. Multiple installations provide distributed ventilation throughout the home. Multiple installations are linked and communicate through home's normal power circuits to form an indoor air quality network. In typical multiple installations, Master control is located in master bathroom. Broan and Best by Broan LinkLogic™ enabled range hoods and LinkLogic™ enabled electric dampers can be linked with SmartSense® so their indoor air quality ventilation contribution is included.

Additional features, which are turned off at factory, include Vacation, Disabled, Automatic-Off, and Delayed-Off modes. Vacation mode temporarily disables system until Master fan is manually turned on. Disabled mode removes fan from automatic ventilation usage. Disabled mode does not affect manual operation and its ventilation is credited toward system level requirement, but Broan SmartSense® will not turn it on for automatic ventilation.

If fan is manually left on, Automatic-Off turns it off after 60-minutes. Delayed-Off turns fan off after 20-minutes from when Off paddle is pressed. Fan can be immediately turned off by pressing Off paddle twice.

* American National Standards Institute / American Society of Heating, Refrigerating and Air-Conditioning Engineers

HOW LED WORKS

LED works differently in Run and Program/Feature Selection modes.

Run Mode: LED is off when fan is off. LED is on when fan is on manual ventilation; turned on by pressing On paddle. LED turns on briefly every second (fast-blink) when fan is on automatic ventilation; turned on by Broan SmartSense®.

Program/Feature Selection Mode: LED turns on and off every second (slow-blink) when system is in Program or Feature Selection mode. LED is off when Feature associated with pressed paddle is off. LED is on when Feature associated with pressed paddle is on.

INDOOR AIR QUALITY NETWORK

A single Broan SmartSense® system is powerful enough to fulfill ventilation rates for larger homes; however, it is recommended to use multiple installations for homes with multiple bathrooms. Multiple installations provide distributed ventilation throughout the home.

Multiple installations communicate through a home's electrical power circuits to form an indoor air quality network. Communication pathways are called links. For optimum link performance, wire multiple installations to the same electrical circuit. If installation on the same electrical circuit is not possible then try to keep multiple installations on the same electrical phase. If multiple installations are connected to different electrical phases, have an electrician install an SMSCPLR Broan SmartSense® Phase Coupler near circuit breaker panel.

Multiple installations can operate independently; although, it is recommended to link them together as an indoor air quality network. If single system is installed or independent system operation is desired, proceed with "How To Set System Level" section.

One Broan SmartSense® control is selected as system Master during set up. Any control can be selected as system Master, but typically master bathroom control is chosen. All controls are factory set as system Masters; therefore, installations will operate as independent systems at factory set system level after installation if following set up is not done.

One Master control can link up to 10 Broan SmartSense® and LinkLogic™ devices. SmartSense® controls that are linked to Master control are called Slaves.

HOW TO LINK SMARTSENSE® SYSTEM

1. Unless another control is designated and clearly marked on frame, under decorative plate, or documented on this instruction sheet as Master control, go to master bathroom control.
2. Put Master control in Program mode; press and hold SET button for 3-seconds (a beep should be heard) then release it.

   Note: In order to help with single person installation, Master control will wait 6-minutes in Program mode for Slave link.
3. LED should be turning on and off every second (slow-blink); if it isn't then repeat step 2.
4. Go to first control to link as a Slave.
5. Press and hold SET button for 3-seconds (a beep should be heard) then release it.
6. Fan and LED should turn on after Slave's SET button is released. Note: At same time Slave turns on, Master fan turns on.
7. Press and release Slave's Off paddle to manually turn fan off.
8. If there are more Slave installations then go to next control and repeat steps 5 through 8; otherwise continue with next step.

   Note: In order to help with single person installation, Master control will remain in Program mode for 6-minutes after last Slave is linked.
9. When all Slaves are linked, exit Master Program mode; go to Master control, press and release SET button.
10. Master LED will fast-blink to indicate system level (see HOW TO SET SYSTEM LEVEL, steps 9-12) and then remain on steady, since fan is on. This action confirms Program mode exit.
11. Press and release Master's Off paddle to turn off LED and fan.

BROAN®

HOW TO SET SYSTEM LEVEL

Installer, homeowner, or building science expert may adjust Broan SmartSense® ventilation system level.

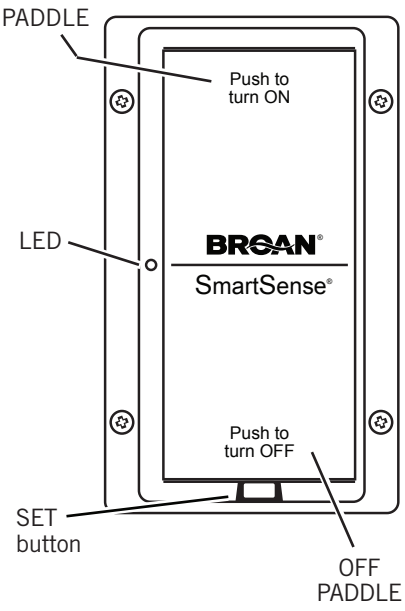
1. System Level is only set in Master control. If home has more than one installation then locate Master control; it is usually in master bathroom or it should be clearly marked or documented.
2. Circle, mark or highlight System Level in Table A using home's square footage and number of bedrooms.
   Note: Building science experts may calculate different rate based on air infiltration measurements.
3. Circle, mark or highlight same System Level in Table B.
4. If home's System Level is 30 then next steps are not necessary, since System Level is set at factory to 30.
5. Put Master control in Program mode; press and hold SET button for 3-seconds and then release it.
6. LED should be turning on and off every second (slow-blink); if it is not then repeat step 5.
7. Press and release (tap) On paddle number of times from Table B. If you tap On paddle too many times, tap Off paddle and System Level will be reduced once for each Off paddle tap.
   In order to reset System Level to 30, immediately after entering Program mode (Steps 5-6), tap On paddle only once and then tap Off paddle only once.
   If you lose On paddle counts, tap Off paddle 9 times or more then tap On paddle twice; System Level will be at 30; proceed with On paddle taps from Table B.
8. Exit Program mode; press and release SET button.
9. After exiting Program mode, LED will fast-blink a number of times.
   LED will fast-blink the same number of times in three sets with a slight pause in between each set.
10. Count number of times LED fast-blinks in a set.
11. Compare number of times LED fast-blinks in a set to number for System Level in Table B.
12. If they are the same then System Level is set accordingly; otherwise, re-adjust System Level starting with step 5.

TABLE A

Floor Area (ft^2)	Bedrooms				
	0 - 1	2 - 3	4 - 5	6 - 7	> 7
≤ 1500	30	45	60	75	90
1501 - 3000	45	60	75	90	105
3001 - 4500	60	75	90	105	120
4501 - 6000	75	90	105	120	135
6001 - 7500	90	105	120	135	150
> 7500	105	120	135	150	165

TABLE B

System Level	ON Taps	Fast Blinks
165	9	11
150	8	10
135	7	9
120	6	8
105	5	7
90	4	6
75	3	5
60	2	4
45	1	3
30	ON & OFF or OFF 9x & ON 2x	2



FEATURES

Vacation Mode

Used only with Master control. Temporarily disables Broan SmartSense® system. Master control will not automatically turn on its fan or any other system fan. After Feature Selection mode exit, Vacation mode is cancelled when Master control On paddle is pressed.

To activate Vacation Mode:

1. Make sure fan and LED are off: Press and release OFF PADDLE.
2. Put control in Feature Selection mode: Press and hold ON PADDLE (approximately 10 seconds, a beep should be heard) until LED turns on and off every second (slow blink).
3. Release ON PADDLE.
4. Press and hold ON PADDLE:
   a. If LED is off when ON PADDLE is held on then Vacation mode is off.
   b. If LED is on when ON PADDLE is held on then Vacation mode is on.
5. Release ON PADDLE.
6. Press and release ON PADDLE to toggle Vacation mode status:
   a. If Vacation mode was off then it will be turned on.
   b. If Vacation mode was on then it will be turned off.
7. Repeat steps 4 through 6 to review and set desired Vacation mode status.
8. Press and release SET button to exit Feature Selection mode.
9. Fan and LED will turn on for 1 to 2 seconds and then turn off, which indicates Vacation mode has been set.

Note: Vacation mode is turned off when master control is manually turned on and off; therefore, make sure no one touches master control after Vacation mode is turned on.

Disabled Mode

Excludes fan from automatic ventilation usage. Does not affect manual operation and its ventilation is credited toward system level accumulation. Master control will not turn it on for automatic ventilation requirement fulfillment. If Master control is put in Disabled mode, it will not turn on any fans for automatic ventilation and recommended indoor air quality ventilation level is not assured.

To activate Disabled Mode:

1. Make sure fan and LED are off: Press and release OFF PADDLE.
2. Put control in Feature Selection mode: Press and hold ON PADDLE (approximately 10 seconds, a beep should be heard) until LED turns on and off every second (slow blink).
3. Release ON PADDLE.
4. Press and hold OFF PADDLE:
   a. If LED is off when OFF PADDLE is held on then Disabled mode is off.
   b. If LED is on when OFF PADDLE is held on then Disabled mode is on.

5. Release OFF PADDLE.
6. Press and release OFF PADDLE to toggle Disabled mode status:
   a. If Disabled mode was off then it will be turned on.
   b. If Disabled mode was on then it will be turned off.
7. Repeat steps 4 through 6 to review and set desired Disabled mode status.
8. Press and release SET button to exit Feature Selection mode.
9. Fan and LED will turn on for 1 to 2 seconds and then turn off, which indicates Disabled mode has been set.

Automatic-Off Mode

Automatically turns fan off 60-minutes after it was manually turned on.

To activate Automatic-Off mode:

1. Make sure fan and LED are off: Press and release OFF PADDLE.
2. Put control in Feature Selection mode: Press and hold OFF PADDLE (approximately 10 seconds, a beep should be heard) until LED turns on and off every second (slow blink).
3. Release OFF PADDLE.
4. Press and hold ON PADDLE:
   a. If LED is off when ON PADDLE is held on then Automatic-Off mode is off.
   b. If LED is on when ON PADDLE is held on then Automatic-Off mode is on.
5. Release ON PADDLE.
6. Press and release ON PADDLE to toggle Automatic-Off mode status.
   a. If Automatic-Off mode was off then it will be turned on.
   b. If Automatic-Off mode was on then it will be turned off.
7. Repeat steps 4 through 6 to review and set desired Automatic-Off mode status.
8. Press and release SET button to exit Feature Selection mode.
9. Fan and LED will turn on for 1 to 2 seconds and then turn off, which indicates Disabled mode has been set.

Delayed-Off Mode

Turns fan off 20-minutes after Off paddle was pressed once. In order to turn fan off immediately, press Off paddle twice.

To activate Delayed-Off mode:

1. Make sure fan and LED are off: Press and release OFF PADDLE.
2. Put control in Feature Selection mode: Press and hold OFF PADDLE (approximately 10 seconds, a beep should be heard) until LED turns on and off every second (slow blink).
3. Release OFF PADDLE.
4. Press and hold OFF PADDLE:
   a. If LED is off when OFF PADDLE is held on then Delayed-Off mode is off.
   b. If LED is on when OFF PADDLE is held on then Delayed-Off mode is on.
5. Release OFF PADDLE.
6. Press and release OFF PADDLE to toggle Delayed-Off mode status.
   a. If Delayed-Off mode was off then it will be turned on.
   b. If Delayed-Off mode was on then it will be turned off.
7. Repeat steps 4 through 6 to review and set desired Delayed-Off mode status.
8. Press and release SET button to exit Feature Selection mode.
9. Fan and LED will turn on for 1 to 2 seconds and then turn off, which indicates Disabled mode has been set.

SYSTEM LEVEL VENTILATION RATE ADJUSTMENT

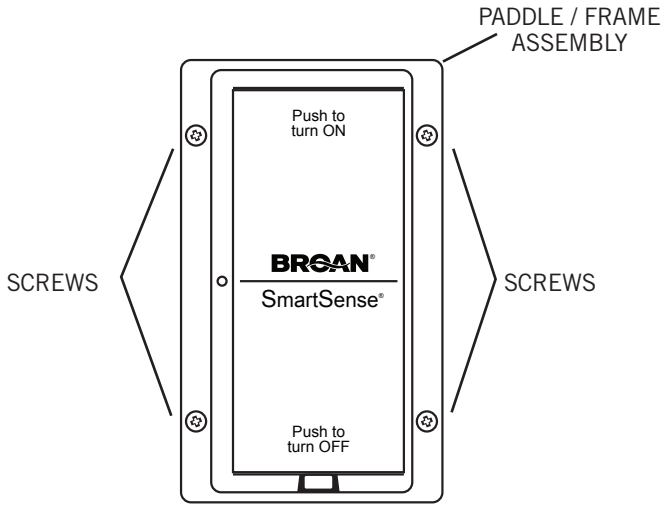
Used for California Title 24 and ASHRAE 62.2. compliance based on actual, field-measured air flow rates.

1. Calculate ventilation rate using ASHRAE 62.2 formula 4.1a for single-family buildings or formula 4.2a for multifamily buildings:
   $Q = (0.01 \times A) + [7.5 \times (N + 1)]$ (4.1a);
   $Q = (0.03 \times A) + [7.5 \times (N + 1)]$ (4.2a);
   Where:
   Q is ventilation rate in cfm;
   A is floor area of residence in square-feet;
   N is number of bedrooms, but not less than 1.
2. Measure actual air flow (cfm) of each installed fan.
3. Calculated adjustment factor using the following formula:
   $K = (88 \times N_{TOTAL}) \div [(1.1 \times N_{80} \times CFM_{80}) + (0.8 \times N_{110} \times CFM_{110})]$;
   Where:
   K is adjustment factor (unit less);
   CFM_{80} is the lowest air flow of 80 cfm fans measured in step 2;
   CFM_{110} is the lowest air flow of 110 cfm fans measured in step 2;
   N_{80} is number of 80 cfm fans in system;
   N_{110} is number of 110 cfm fans in system;
   N_{TOTAL} is total number of fans in system ($N_{TOTAL} = N_{80} + N_{110}$).
4. Calculate adjusted ventilation rate: $Q' = Q \times K$.
5. Set SmartSense master's system level equal to or greater than Q'.

HOW TO CHANGE CONTROL COLOR

An almond paddle/frame assembly is included.

1. Use magnetic #1 Philips screwdriver and remove (4) screws from white paddle/frame.
2. Remove white paddle/frame from control.
   Caution: Do not touch or put anything inside control housing; control damage may result.
3. Place almond paddle/frame on control.
4. Replace (4) screws and lightly tighten them.
   Caution: Do not over tighten screws; frame may crack.



RESTORING POWER TO CONTROL

Control stores all settings in nonvolatile memory; so they are not lost when power is removed. After power loss, control will automatically return fan to its state (on or off) before power was interrupted.

HOW TO RESTORE CONTROL FACTORY SETTINGS

This "Restore" procedure clears control's nonvolatile memory. It returns control to how it was shipped from factory. All Feature selections are turned off and all links are removed. "Restore" procedure should be used cautiously; usually it is used only when first setting up a system or for single unit installations.

Links are unique for each device pair. If one end of the link is removed, it is important to remove the other end. "Restore" only removes links within its control. Other link-end needs to be removed in other device.

CAUTION: Before continuing, choose one of following options: (a) remove links to target "Restore" control using procedure described in "How To Remove Specific Individual Links" or (b) "Restore" all controls in system and "Restore" all other LinkLogic™ and INSTEON™ devices; then links need to be reestablished using "How To Link SmartSense® System" procedure.

1. Remove power from control's microcontroller; either: (a) turn circuit breaker off or (b) pull SET button until it is fully extended.
2. Wait 15-seconds.
3. Press and hold SET button.
4. For option (1a), turn circuit breaker on while SET button is pressed. For option (1b), push in and press SET button in one motion.
5. Continue holding SET button for 3-seconds after power is applied then release it.
   Within 2-seconds, fan and LED turn on; stay on for 1 to 2-seconds and then turn off.
6. If control does not respond as described, start process over with step 1.