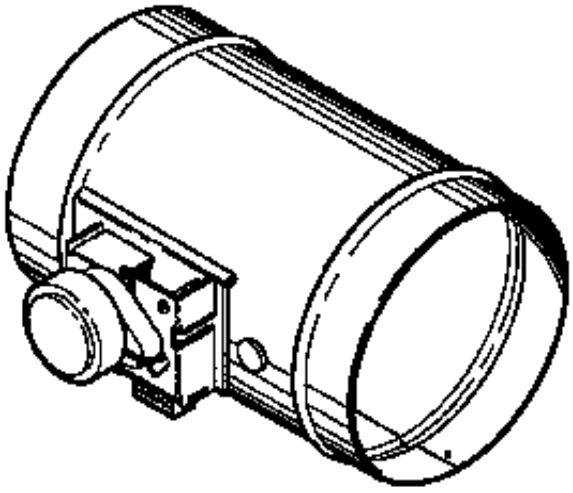
Broan Automatic Make-Up Air Damper

Application Guide



Residential Use Only

Read and Save this Information

INSTALLER: Leave this guide with the consumer.

Broan–NuTone LLC Hartford, Wisconsin www.broan.com 800-558-1711

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About the Application Guide

Congratulations on your purchase of the Broan Automatic Make-Up Air Damper! This product, called the "Damper" throughout this guide, is designed to keep your home well ventilated and comfortable for years to come. The Damper works automatically once it's properly installed with a compatible Broan or BEST exhaust device, so you won't have to give your home's exhaust systems a moments thought.

Please read this Guide thoroughly, noting the specific applications for which the Automatic Make-Up Air Damper is intended, as well as the different installation approaches.

Installers – note that a separate set of Installation Instructions for the Damper is available from Broan. The Application Guide does not contain specific installation instructions.

Important Information about the Application Guide

Please take note that this guide uses the following symbols to emphasize particular information:

⚠ WARNING

Identifies an instruction which, if not followed, might cause serious personal injuries including possibility of death.

CAUTION

Denotes an instruction which, if not followed, may severely damage the unit and/or its components.

NOTE: Indicates supplementary information needed to fully complete an instruction.

We welcome any suggestions you may have concerning this manual and/or the product, or ways to better serve you. Please forward all correspondence at the address below:

Broan-NuTone LLC
Indoor Air Quality Marketing
926 W. State St.
Hartford, WI 53027
1-800-558-1711

About the Broan Automatic Make-Up Air Damper Unit

⚠ WARNING

TO REDUCE THE RISK OF FIRE, ELECTRIC SHOCK, OR INJURY TO PERSON(S) OBSERVE THE FOLLOWING:

1. This unit is intended for residential installation only.
2. 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.
3. This unit is not designed to provide combustion air for fuel-burning appliances.
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. Do not connect the unit directly to a combustion appliance of any type.
6. 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.
7. When performing installation, servicing or cleaning the unit, it is recommended to wear safety glasses and gloves.
8. Do not use the unit in conjunction with any exhaust device other than compatible Broan exhaust fans or compatible BEST or Broan range hoods.
9. During extreme weather events including snow storms, ensure that the intake area for the outside air duct is not blocked and able to provide a clear pathway for outside air to enter the system.
10. When cutting or drilling into wall or ceiling, do not damage electrical wiring or other hidden utilities.
11. When notching or drilling into framing including floor supports, rim joists, and wall studs, comply with code and manufacturer limitations on allowable modifications to these structural members.
12. This unit is intended to be installed within the home in a location protected from moisture.
13. This unit must be in an accessible location which allows for inspection of the unit.
14. 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 this document.
15. When federal, provincial or state legislation comprises more restrictive installation and/or certification requirements, the aforementioned requirements prevail on those of this document and the installer agrees to conform to these at his own expense.

CAUTION

1. Unit is for general household ventilation only. Do not use for ventilation near hazardous materials or explosives.
2. Unit shall not be installed to introduce air from crawlspaces, garages, attics, adjacent dwelling units, or other locations within the building shell. Unit shall be installed to introduce air directly from outdoors.
3. Do not run the outside air duct directly above or closer than 2 ft to any furnace or its supply plenum, boiler, or other heat producing appliance.
4. Any ductwork used in conjunction with the Damper must be installed in compliance with all local and national codes that are applicable.
5. Do not operate the Damper for fresh air introduction until all system filters, including the central duct system filter, have been installed per the system design.
6. Please read the unit specification label on the product for further information and requirements.
7. The Damper’s outdoor air intake, ducting, and any filters should be inspected and maintained on a regular basis.

Table of Contents

1. Broan Automatic Make-Up Air Damper – Product Function

The Broan Automatic Make-Up Air Damper (the "Damper") provides a pathway for fresh air to enter a home from outdoors when a compatible exhaust device is operating. The Damper opens when a compatible BEST or Broan range hood or Broan exhaust fan is operating, thereby creating a known, controlled point for fresh air to enter the home while air is being exhausted from the building by the exhaust fan(s) and/or range hood.

By operating in this manner, the Damper provides two key benefits for the home:

- It facilitates air exchange between indoors and outdoors, by helping to allow fresh air into the home to replace air which is exhausted out of the home.
- By allowing fresh air into the building when a compatible exhaust device is on, the Damper helps to avoid negative pressure conditions within the home which may interfere with the proper operation of combustion equipment within the home.

Overall, the Damper let's your Broan or BEST exhaust devices do their job more effectively and without interfering with the proper operation of other home systems.

2. Different Models of the Broan Automatic Make-Up Air Damper

The Damper comes in two different models – the **LinkLogic™** model (SMD Model) and the **Direct-Wired** model (MD Model). Both models are available in 6" and 8" sizes. The main difference between these two models is the way in which the Damper communicates with the exhaust device.

The LinkLogic™ model (SMD) establishes communication and control between the exhaust device and the Damper through a powerline communications protocol. In other words, the exhaust device(s) and the Damper talk to each other by sending signals across your home's normal electrical wiring. The LinkLogic™ model of the Damper works with compatible Broan exhaust fans (such as the SmartSense® system) as well as a selection of compatible BEST range hoods. Note that Broan range hoods are not compatible with the LinkLogic™ model of the Damper at this time.

The Direct-Wired model (MD) communicates with the exhaust device through an independent, hard-wired connection between the exhaust device and the Damper. The Direct-Wired model of the Damper works with compatible Broan and BEST range hoods. Visit www.broan.com and search damper model numbers for a complete list of compatible range hoods.

For the purpose of this Application Guide, the term "Damper" refers to both models of the Broan Automatic Make-Up Air Damper, except where noted otherwise.

3. Definitions & Key Terms

Within the scope of this document, several important terms are used. To give product installers and users a clear understanding, several key terms are defined below.

Atmospherically vented combustion appliances: a category of combustion appliances, including some water heaters, wood burning stoves, and fireplaces, which relies upon the buoyancy of the hot combustion exhaust gas to force it upward through a flue pipe and out of the house. Such appliances do not use a fan to help exhaust combustion gasses to outdoors.

Depressurization: a condition in which one area of a house has an air pressure which is lower than another space. For example, a kitchen with a very large range hood (~ 1000 cfm) may be depressurized with respect to outdoors when the range hood is on. This is due to the fact that the range hood is pulling air out of the kitchen space at a rate greater than the rate at which fresh air replaces the exhaust air. Pressure levels in homes are typically measured in units called Pascals (1 Pa = 0.004" water column), and are measured "with respect to" another zone such as outdoors or a different part of the home.

Exhaust system: one or more fans that remove air from the building, causing outdoor air to enter by openings in the building shell. These openings can be specifically designed passive inlets or make-up air dampers, or random cracks and gaps in the building envelope such as those typically found around windows, doors, and other features.

Make-up air: outside air which is intentionally supplied to the building to replace air which is being exhausted from indoors due to the operation of combustion appliance, fireplace, or some type of exhaust fan. Make-up air may enter the home through an outside air duct with a damper, which is open when make-up air is needed and closed at other times. Make-up air may also enter the home through air inlets built into the home's envelope.

Make-up air damper: a general category of damper which opens to provide make-up air to a building's indoor environment. Such dampers may open and close based on the ambient air pressure with respect to outdoors or in response to an electrical signal from a controller or another piece of HVAC equipment. Other make-up air dampers may be permanently kept open, so there is always an open pathway between indoors and outside. In the case of Broan's Automatic Make-Up Air Damper, this device opens in response to an electrical signal from a compatible Broan exhaust device.

Natural infiltration: uncontrolled exchange of indoor and outdoor air through cracks and openings in the envelope of a building. Many older homes are not well air-sealed, and rely on entirely on natural infiltration to remove or dilute indoor air pollutants.

Passive opening: an intentionally installed opening in the building shell for the purpose of allowing a pathway for fresh air to enter the building. Passive openings do not utilize fans to introduce the fresh air, but merely provide an opening for air transfer.

4. When to Use the Broan Automatic Make-Up Air Damper

- *When Required by Code*. If your local code requires make-up air to be supplied in conjunction with a kitchen range hood, use the Broan Automatic Make-Up Air Damper along with a compatible BEST range hood or Broan range hood.

- *Tight Homes with Exhaust-based Whole-House Ventilation.* In homes which are air-sealed to limit natural infiltration, whole-house ventilation systems (such as Broan SmartSense®) which use exhaust fans to ventilate may need help to introduce outdoor air into the home. The Damper provides this help by providing a pathway for fresh air to enter the home when the exhaust system is operating. Providing this make-up air is especially important in homes with atmospherically vented combustions appliances.

- *Homes with larger range hoods.* In homes where the kitchen range hood exhausts a lot of the home's air to outdoors, the Damper helps to replace this air by creating an opening for fresh air to enter the home when the range hood is operating. Range hoods with flow rates over 300 cfm are often considered as large range hoods. Providing this make-up air is especially important in homes with atmospherically vented combustions appliances.

⚠ WARNING

Please note: there are other applications in which an unrestricted passive opening or a passive opening with a different type of damper, such as a barometric damper which opens under negative pressure, may be called for. The Broan Automatic Make-Up Air Damper is not intended to be used for supplying combustion air or wired directly to combustion appliances of any type. Consult your mechanical contractor and local code requirements for applications not described above. For applications requiring a barometric damper, Broan offers 4" and 6" models (Broan products BD4 and BD6, respectively).

5. Common Applications

The Broan Automatic Make-Up Air Damper can be used in a variety of applications. Common applications are listed below, organized by each model of the Damper: **LinkLogic™ Model** (SMD Model) and **Direct-Wired Model** (MD Model).

5.1 Applications with the LinkLogic™ Model (SMD Model)

- LinkLogic™-enabled BEST Range Hood with Damper [graphic]
    - The Damper works in sync with a LinkLogic™-enabled BEST range hood. When the range hood is turned on to exhaust kitchen air, the Damper fully opens to allow fresh air into the home to replace the exhausted kitchen air. Conversely, when the range hood stops operating, the Damper goes to a closed position. Communications between the two devices occur over the home's power lines, so no additional control wiring is necessary.

- SmartSense® Whole-House Ventilation System with Damper [graphic]
    - The Damper works in sync with Broan's SmartSense® whole-house ventilation system. When any one or more of the SmartSense® exhaust fans turns on, the Damper fully opens to allow fresh air into the home. When no SmartSense®

fans are operating, the Damper goes to a closed position. SmartSense® utilizes LinkLogic™, so communications between the fans and the Damper occurs over the home's power lines, and no additional control wiring between the Damper and fans is necessary.

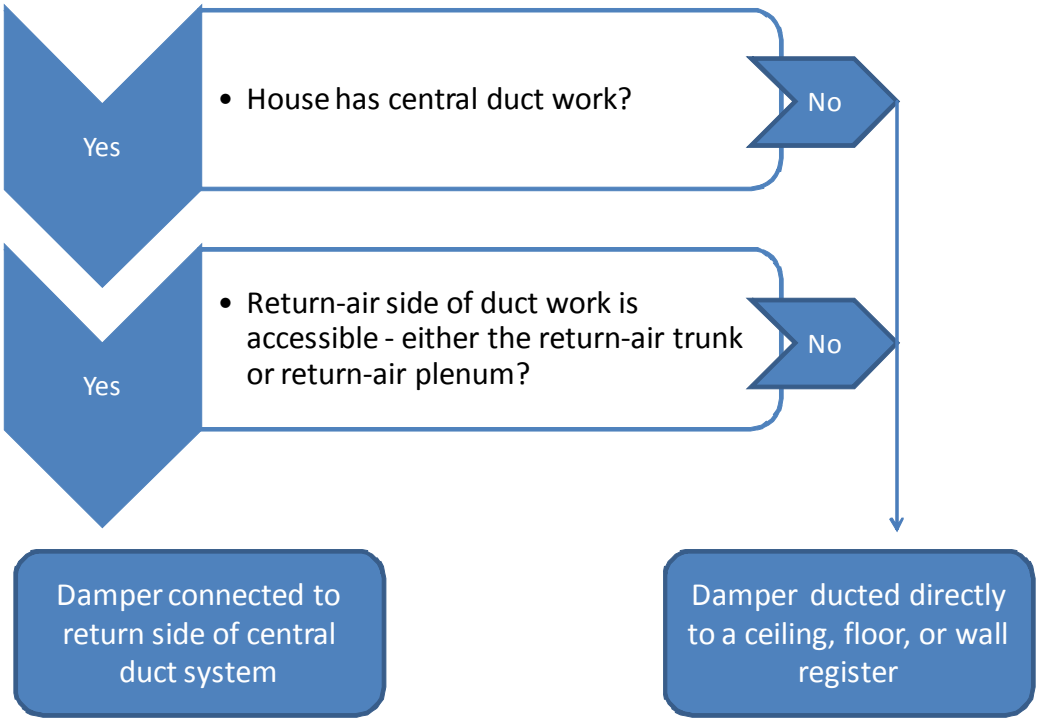
- LinkLogic™-enabled BEST Range Hood and SmartSense® Ventilation with Damper [graphic]
    - The Damper opens in sync with the range hood operation as well as the SmartSense® ventilation fans in the home. Because both the range hood and SmartSense® fans are LinkLogic™ enabled, they can both communicate with the Damper in an integrated manner to ensure that the Damper is open for fresh air when any of these exhaust devices is running.

5.2 Applications with the Direct-Wired Model (MD Model)

- Compatible BEST or Broan Range Hood with Damper [graphic]
    - The Damper fully opens or closes based on a direct signal from a compatible BEST or Broan range hood which is "MD-capable." This signal is triggered by the operation of the range hood, which is sent through a hard wired connection between the two devices using a Broan-supplied transformer. Only those BEST or Broan range hoods which are MD-capable may be used for this application.

6. Planning the Installation

Planning the installation first requires selecting the most appropriate installation approach. The chart below offers suggestions for the most effective installation approach by considering a few important factors. Further details on the two main types of installations are provided below.



6.1 Sizing the Damper & the Duct

The required amount of makeup air will vary for each home and the amount of exhaust ventilation provided within the home. As a general rule of thumb, Broan recommends sizing the make up air damper as follows:

- Use one 6" damper for exhaust ventilation rated up to 500 CFM
- Use one 8" damper for exhaust ventilation rated up to 1000 CFM
- Use two 8" damper for exhaust ventilation rated up to 1500 CFM

However, Broan highly recommends that a qualified professional HVAC contractor be consulted after installation to ensure there is no negative pressure in the home when ventilators are operational. If negative pressure exists, then additional make up air should added. Refer to the following section for details.

Side note to sizing guidelines:

To ensure that an adequately sized Damper(s) is installed, the most effective approach is to measure the pressure levels in a home which result from the operation of compatible exhaust fan(s) and/or range hoods. When these exhaust devices operate, the Damper should open and no significant depressurization levels with respect to outdoors should occur in the house as a result of the exhaust device's operation. Combustion equipment manufacturer literature and local codes/standards should be consulted to determine what level of depressurization is acceptable around certain types of combustion equipment. Note that other systems and features of the home can also create negative pressures in the home relative to outdoors, and that the Damper is not intended to address these.

6.2 Outside Air Intake Location

Proper design and location of the outside air intake location is critical in ensuring that the Damper can safely and reliably provide an opening for fresh air to enter the home. The following requirements for the location of the outside air intake must be met:

- Outside air intake is located a minimum of 10' from combustion appliance vents, chimneys, plumbing stacks, and bathroom or kitchen exhaust vents. If local codes have more stringent separation requirements, they shall apply.
- Outside air intake is placed high enough above grade to prevent blockage from snow or other debris such as leaves, and at a minimum of 1' above grade.
- Make-up air damper should not draw air from crawlspaces, garages, attics, adjacent dwelling units, or any enclosed part of the building. The Damper should be installed to draw air directly from outdoors.

6.3 Outside Air Intake Opening Protection

Because the Damper, together with the end cap and outside air duct which are installed with it, will allow outdoor air into the indoor environment, it is important to meet the following requirements:

- Install the protective screen provided with your Damper as shown below to protect the opening to the outside air duct

- If a protective screen other than the screen provided with your Damper is used, it must cover the entire opening of the outside air duct. This screen must also have openings of at least ¼" but no larger than ½"
- The outdoor air intake opening should meet local code provisions for the protection of openings in exterior walls, including steps to prevent moisture intrusion around the opening.

Note that the screen over the outside air opening is not a filter. It is intended to prevent the intake of leaves, animals, or debris into the outside air duct. A downstream filter is necessary to remove pollen, dust, and other airborne particles. Potential filter locations are shown below in the Typical Installations section.

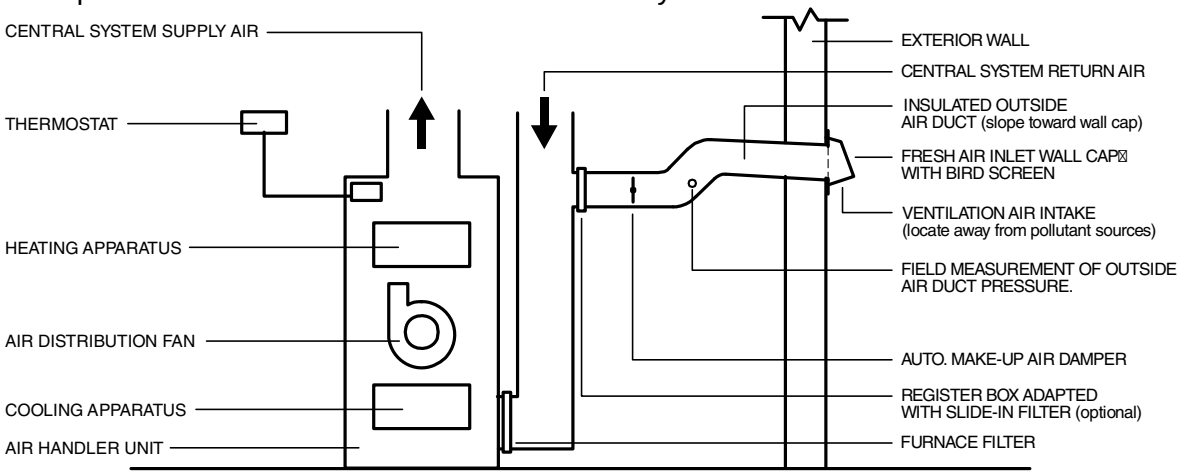
6.4 Minimum Return Air Temperature Requirements

HVAC equipment manufacturers may have minimum requirements for the air temperature in the return air plenum. Introducing outdoor air to the return side of the central duct system may impact this temperature. The installer should adjust both the size of the OA duct and the location of its connection to the return side of the central duct system in a manner so that minimum air temperature requirements are satisfied under design conditions.

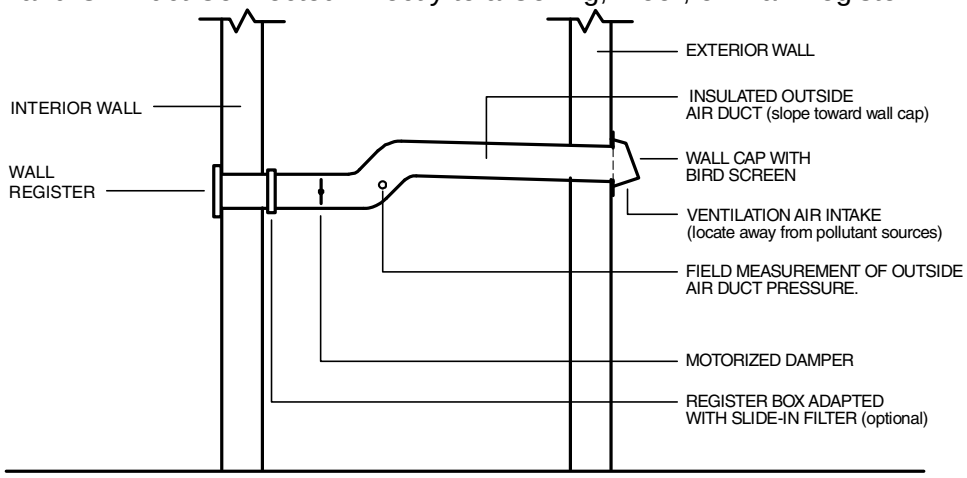
7. Typical Installations

Installations will vary according to the location in the home where the unit is installed and which model Damper is used. Use the following illustrations and notes as guidance for your own installation. Always comply with local code requirements and in any instance where a detail shown below conflicts with local code, the local code provision shall apply.

7.1 Damper connected to return side of central duct system



7.2 Damper and OA Duct Connected Directly to a Ceiling, Floor, or Wall Register



8 Installation

A separate set of Installation Instructions for the Damper is available from Broan and must be consulted for installations. The Application Guide does not contain specific installation instructions. To access the appropriate Installation Instructions, visit www.broan.com and enter the Damper's model number in the Search box.

For installation guidance on BEST or Broan range hoods, or Broan exhaust fans, reference the installation instructions for these products, which can also be found on www.broan.com.

9 System Operation

Once the Damper and the associated Broan or BEST exhaust devices are installed, the installer should confirm that the Damper opens and closes in conjunction with signals from the exhaust devices(s) as intended.

The appropriate contractor should also ensure the proper operation and venting of all combustion equipment in the home.

10 Maintenance

Regular maintenance is necessary to ensure the proper operation of the Damper system. Failure to conduct such routine maintenance can jeopardize the ability of the Damper to introduce fresh air into the home. Regular maintenance should include the following activities:

- Clean the outside insect screen to ensure it is free from debris and open to allow fresh air to enter.
- Clean or replace the interior filter(s) which serve to filter fresh air before it enters the home.
- Maintain a clear opening at the outdoor end cap, which means preventing the buildup of snow, leaves, or vegetation at the end cap.
- During regular HVAC maintenance, have the mechanical contractor inspect the Damper system for proper operation.

Frequently Asked Questions (FAQs) on the Broan Automatic Make-Up Air Damper

1. What does the Broan Automatic Make-Up Air Damper do?

The Broan Automatic Make-Up Air Damper (the "Damper") provides a pathway for fresh air to enter a home from outdoors when a compatible exhaust device is operating. The Damper opens when a compatible BEST or Broan range hood or Broan exhaust fan is operating, thereby creating a known, controlled point for fresh air to enter the home while air is being exhausted from the building by the exhaust fan(s) and/or range hood.

By operating in this manner, the Damper provides two key benefits for the home:

- It facilitates air exchange between indoors and outdoors, by helping to allow fresh air into the home to replace air which is exhausted out of the home.
- By allowing fresh air into the building when a compatible exhaust device is on, the Damper helps to avoid negative pressure conditions within the home which may interfere with the proper operation of combustion equipment within the home.

Overall, the Damper let's your Broan or BEST exhaust devices do their job more effectively and without interfering with the proper operation of other home systems.

2. Does the "Damper" provide combustion air for combustion appliances like a water heater or a furnace?

No. The Damper helps to replace air which is exhausted by a compatible range hood or exhaust fan. But it does **NOT** help to replace air which is drawn from the indoors by a combustion appliance like a natural gas water heater, and it should not be relied upon to perform this function. One main reason for this restriction is that the Damper is only open when the exhaust fan or range hood that it's connected to is operating. So there is no assurance that the Damper would be open when other appliances, like a water heater, are operating. Other means must be provided to ensure adequate combustion air for these appliances.

3. How do I know if I need make-up air for my range hood?

In some cases the local building code may tell you that make-up air is necessary. For example, some codes specify that range hoods with exhaust flows of 300 cubic feet per minute (CFM) or higher need a mechanical system to introduce make-up air.

In other cases, make-up air for a range hood is desirable regardless of whether code requires it. This is especially true for:

- larger range hoods (those over 300 cfm)
- homes which are well air-sealed - so outside air may not be able to easily find its way into the home through cracks, to replace air which is exhausted out
- homes with atmospherically vented combustion appliances (i.e. a water heater or natural draft fireplace), which are more susceptible to improper venting if depressurization occurs in the home.

In homes with any one of these factors make-up air is advised. And in homes with more than one of these conditions make-up air for the range hood is strongly advised.

4. **What are the benefits of providing make-up air to replace air which is exhausted out of the home by a range hood or bathroom exhaust fans?**

   Exhaust fans in a home are designed to pull out pollutants like cooking odors or moisture from a shower at the source, so they don't linger in the home. Because these fans pull air out of the house, this air needs to be replaced with "new" air from outdoors. Normally this make-up air enters the home through cracks and holes in the "shell" of the building. But modern homes are air-sealed much more thoroughly so there are not as many cracks and openings. Plus some exhaust fans like range hoods exhaust a lot more air than can be replaced through normal cracks in the building shell.

   By providing an intentionally designed opening for fresh air to replace air which is exhausted out by the range hood or bath exhaust fans, several important benefits result:

   - The make-up air entering the home comes in at a known point, where it is also filtered
   - Negative pressure conditions, which could arise if air is exhausted from a home without being replaced by new fresh air, are prevented
   - Pollutants are more effectively exhausted from the home while fresh replacement air is drawn into the home, improving ventilation

5. **Does ASHRAE 62.2-2007 – "Ventilation and Acceptable Indoor Air Quality in Low-Rise Residential Buildings" – require the use of a make-up air damper?**

   ASHRAE 62.2-2007 does not specifically require make-up air dampers. In a few limited circumstances, this standard does require that net exhaust flows from a house be limited. For example, Section 6.4 of the standard limits the net exhaust flow from a home's two largest exhaust appliances if the home has atmospherically vented or solid-fuel burning appliances located within the pressure boundary of the house. This standard is available at www.ashrae.org.

6. **Can I use the Broan Automatic Make-Up Air Damper with other equipment in my home?**

   No. The Broan Automatic Make-Up Air Damper may only be used with compatible BEST or Broan range hoods, or compatible Broan exhaust fans. More information on exact models of the Damper and compatible exhaust devices can be found in the Broan Automatic Make-Up Air Damper Application Guide.

7. **What are the different ways that the Damper can be installed in my home?**

   The most common way to install the Damper is to connect it to a home's central duct system. In this application, outside fresh air enters the home through the Damper and is then routed and distributed through the home's ducts. More information on this installation approach can be found in the Broan Automatic Make-Up Air Damper Application Guide.

8. What if my home doesn't have ducts?

Homes without ducts can still utilize the Damper to help replace air which is exhausted from the home by the range hood or other exhaust fans. An installation illustration for this situation is included in the Damper's Application Guide. .

9. What happens after a power outage?

The Damper system and the associated exhaust devices will not lose their settings following a power outage. So the system will resume its normal operation following a power outage, based on the settings it used prior to the outage.