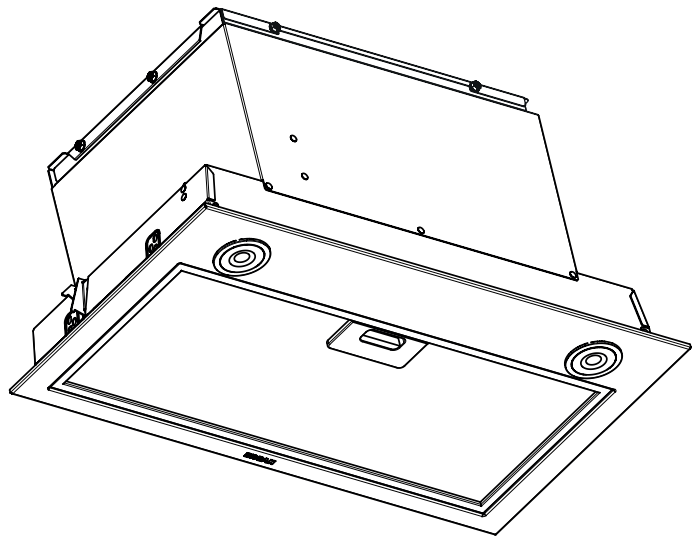




# Powerpack Insert

Model number: PMA400SS

## INSTALLATION, USE & CARE INSTRUCTIONS



Serial number:

1106307E

**Safety . . . . . 3-4**

**Installation . . . . . 5-16**

    Recommended Tools and Accessories. . . . . 5

    Contents. . . . . 5

    Install Ductwork (Ducted Installations Only) . . . . . 6

    Install the Wall Switches. . . . . 6

    Optional Liners . . . . . 7

    Remove the Adapter/Damper. . . . . 7

    Remove the Cabinet Brackets . . . . . 7

    Prepare the Cabinet . . . . . 8-10

    Prepare the Unit . . . . . 11-12

    Install the Unit. . . . . 13-15

    Connect Ductwork. . . . . 15

    Wiring. . . . . 16

    Install the Filter . . . . . 16

**Operation . . . . . 17**

**Maintenance and Cleaning . . . . . 18**

    Grease Filter

    Non-Ducted Recirculation Filter

    Stainless Steel Cleaning

**Wiring Diagram . . . . . 19**

**Service Parts . . . . . 20**

**Warranty . . . . . 21**

To register your product, please visit our website:

In the United States - [broan-nutone.com](http://broan-nutone.com)

In Canada - [broan-nutone.ca](http://broan-nutone.ca)

For Technical Support, call:

In the United States - 800-637-1453

In Canada - 800-567-3855

**Installer: Leave this manual with the homeowner.**

## **READ AND SAVE THESE INSTRUCTIONS**

**⚠ Intended for domestic cooking only ⚠**

### **⚠ WARNING**



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



- 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.
- 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.
- 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.
- 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.
- When cutting or drilling into wall or ceiling, do not damage electrical wiring and other hidden utilities.
- Ducted fans must always be vented to the outdoors.
- Do not use this unit with any separate solid-state speed control device.
- To reduce the risk of fire, use only metal ductwork.
- This unit must be grounded.
- When installing, servicing or cleaning the unit, it is recommended to wear safety glasses and gloves.
- When applicable local regulations comprise 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.

### ⚠ WARNING



#### TO REDUCE THE RISK OF A RANGE TOP GREASE FIRE:

- A. Never leave surface units unattended at high settings. Boilovers cause smoking and greasy spillovers that may ignite. Heat oils slowly on low or medium settings.
- B. Always turn hood ON when cooking at high heat or when flambeing food (i.e. Crepes Suzette, Cherries Jubilee, Peppercorn Beef Flambe).
- C. Clean ventilating fans frequently. Grease should not be allowed to accumulate on fan or filter.
- D. Use proper pan size. Always use cookware appropriate for the size of the surface element.

#### TO REDUCE THE RISK OF INJURY TO PERSONS IN THE EVENT OF A RANGE TOP GREASE FIRE, OBSERVE THE FOLLOWING:\*

1. SMOTHER FLAMES with a close-fitting lid, cookie sheet, or metal tray, then turn off the burner. BE CAREFUL TO PREVENT BURNS. If the flames do not go out immediately, EVACUATE AND CALL THE FIRE DEPARTMENT.
2. NEVER PICK UP A FLAMING PAN - You may be burned.
3. DO NOT USE WATER, including wet dishcloths or towels - violent steam explosion will result.
4. Use an extinguisher ONLY if:
  - A. You know you have a Class ABC extinguisher and you already know how to operate it.
  - B. The fire is small and contained in the area where it started.
  - C. The fire department is being called.
  - D. You can fight the fire with your back to an exit.

\* Based on "Kitchen Fire Safety Tips" published by NFPA.

### ⚠ CAUTION



- For indoor residential use only.
- To reduce risk of fire and to properly exhaust air, be sure to duct air outside. Do not vent exhaust air into spaces within walls or ceilings or into attics, crawl spaces, or garages.
- Take care when using cleaning agents or detergents.
- Avoid using food products that produce flames under the Range Hood.
- For general ventilating use only. Do not use to exhaust hazardous or explosive materials and vapors.
- To avoid motor bearing damage and noisy and/or unbalanced impellers, keep drywall spray, construction dust, etc. off power unit.
- Your hood motor has a thermal overload which will automatically shut off the motor if it becomes overheated. The motor will restart when it cools down. If the motor continues to shut off and restart, have the hood serviced.
- The bottom of the hood MUST NOT BE LESS than 24" and recommended at a maximum of 30" above the cooktop for best capture of cooking impurities.
- Use only with range hood cord connection kits that have been investigated and found acceptable for use with this model range hood.
- Please read specification label on product for further information and requirements.

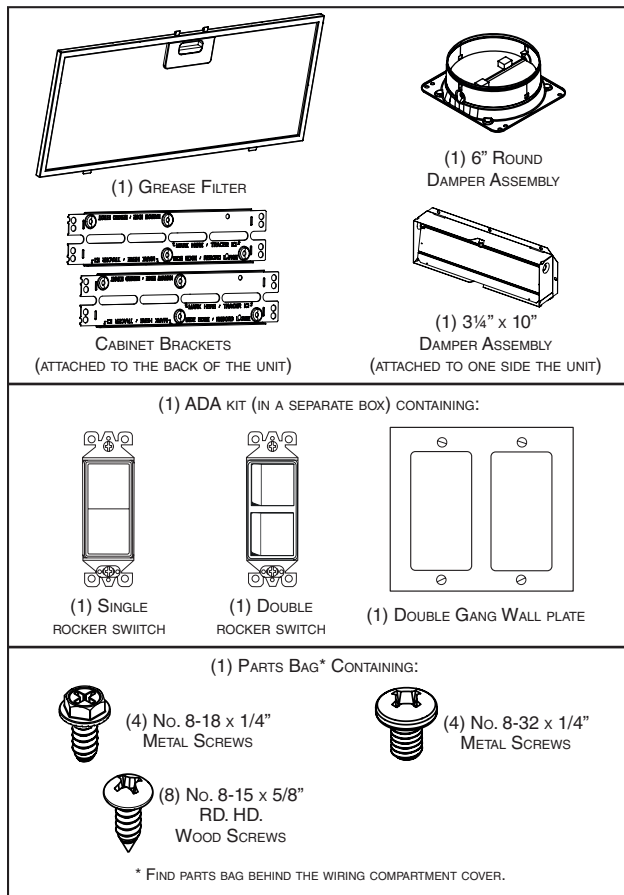
## RECOMMENDED TOOLS AND ACCESSORIES

- Measuring tape
- Phillips screwdriver no. 2
- Nut driver or socket 3/8"
- Flat blade screwdriver (to open knockout holes)
- Saw (to cut holes in cabinet)
- Sheet metal shears
- Pliers
- Metal foil duct tape
- Scissors (to cut metal foil duct tape)
- Pencil
- Wire stripper
- 2 Strain reliefs, 7/8" diameter
- 8 Appropriate wire nuts
- 14/3 Cable (suitable for at least 90° C (194° F))
- 14/2 Cable (suitable for at least 90° C (194° F))
- Liner (optional)

## CONTENTS

Before proceeding to the installation, check the contents of the box. If items are missing or damaged, contact the manufacturer.

Make sure that the following items are included:



## INSTALL THE DUCTWORK (DUCTED INSTALLATION ONLY)

NOTE: To reduce the risk of fire, use only metal ductwork.

1. Decide where the ductwork will run between the powerpack insert and the outside. (FIG. 1)
2. 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. Refer to the table below to help you plan the most efficient installation.
3. Install wall cap or roof cap (sold separately). Connect metal ductwork to cap and work back towards the powerpack insert location. Use 2" metal foil duct tape to seal the joints between ductwork sections.

### MAXIMUM DUCT LENGTH RECOMMENDED TO ACHIEVE 80% EXHAUST EFFICIENCY

| 3¼" x 10"<br>HORIZONTAL<br>MAXIMUM<br>DUCT LENGTH | 3¼" x 10"<br>VERTICAL<br>MAXIMUM<br>DUCT LENGTH | 6" ROUND<br>MAXIMUM<br>DUCT<br>LENGTH | ROOF OR<br>WALL CAP<br>WITH DAMPER | ELBOW(S)*<br>(90° AND<br>/OR 45°) |
|---|---|---------------------------------------|------------------------------------|-----------------------------------|
| 52 ft.  | 83 ft.  | 64 ft.                                | 1                                  | 0                                 |
| 43 ft.  | 74 ft.  | 55 ft.                                | 1                                  | 1                                 |
| 35 ft.  | 66 ft.  | 46 ft.                                | 1                                  | 2                                 |

\*Standard elbows with 1" internal radius.

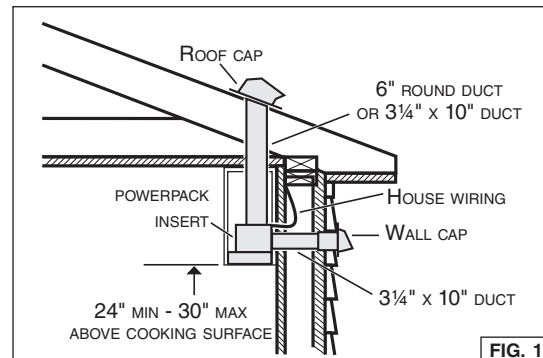


FIG. 1

## INSTALL THE WALL SWITCHES

### CAUTION

Only use included switches. Only use wires suitable for at least 90°C (194°F).

1. Unpack the wall switches from the box. Using pliers, remove the small tab on the double rocker switch (circled in FIG. 2).
2. Install both rocker switches at a convenient place for the user. Use one 14/3 cable and one 14/2 cable to wire the switch box to the powerpack insert (FIG. 3).

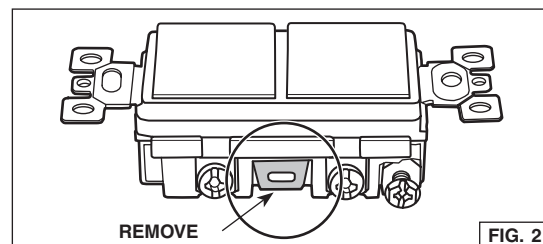


FIG. 2

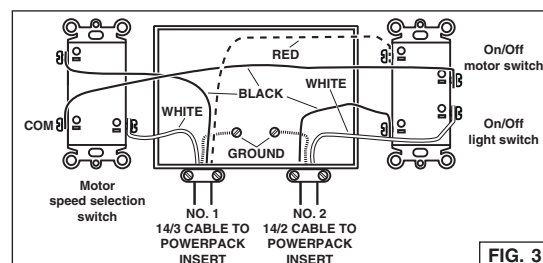
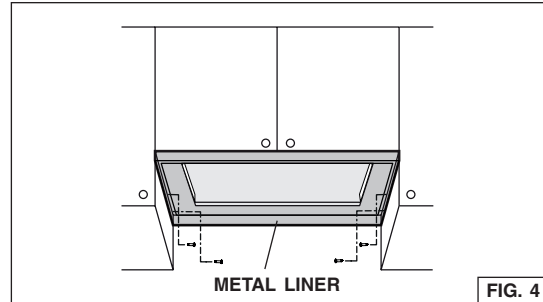


FIG. 3

## OPTIONAL LINERS

For installations where the PMA400SS unit is less than 30" above cooktop, this powerpack insert should be mounted into a metal liner (FIG. 4) to protect cabinetry combustible material from heat, in order to meet building code requirements. This will allow easier cleaning and provide protection to the cabinetry. Refer to table at right to find the liner model corresponding to the cabinet style and width.

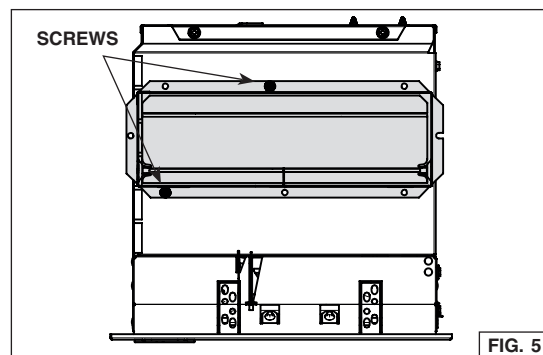
Visit [www.broan-nutone.com](http://www.broan-nutone.com) or [www.broan-nutone.ca](http://www.broan-nutone.ca) to view specific model information.



| LINER MODEL | CABINET NOMINAL WIDTH |
|-------------|-----------------------|
| LB30SS      | 30"                   |
| LB36SS      | 36"                   |

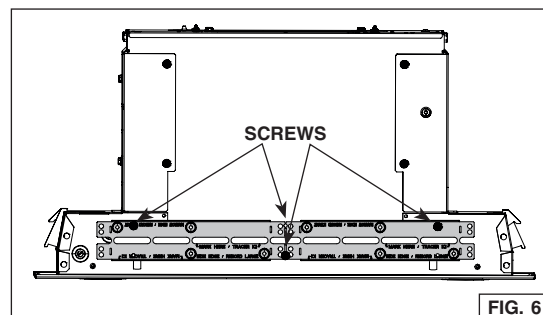
## REMOVE THE ADAPTER/DAMPER

Detach and set aside the 3¼" x 10" adapter/damper (grey part in FIG. 5) from the side of the powerpack insert by removing its 2 retaining screws. Discard the screws.

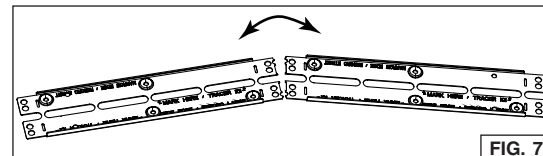


## REMOVE THE CABINET BRACKETS

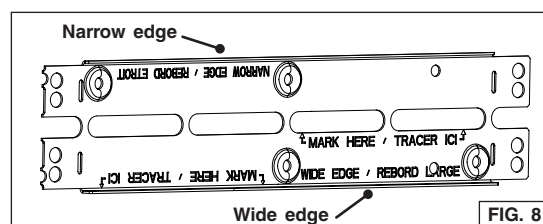
Detach the cabinet brackets (grey part in FIG. 6) from the back of the powerpack insert by removing its 4 retaining screws. Discard the screws.



Fold up and down the bracket until it is split in two separate parts (FIG. 7). Keep the brackets for possible further use.



**NOTE:** Both cabinet brackets have one wide edge and one narrow edge (FIG. 8), to cover all installation configurations depending on cabinet widths.



## PREPARE THE CABINET

### ⚠ WARNING

The cabinet must be secured to wall studs or other wooden framework behind the drywall to support the weight of this unit. Failure to do so may cause personal injury or damage to countertop or cooktop.

NOTES: A. The unit has to be installed inside the cabinet. If installing with one of the optional liners, use it as a template to cut the hole in the bottom of the cabinet.

B. The unit should be mounted centered laterally over the cooktop burners.

C. For back to front position, the unit must be mounted according to local building codes.

1. Cut a hole in the bottom of the cabinet, using the dimensions shown (FIG. 9), or use the optional liner as a template.
2. Where needed, install the metal liner.
3. Measure the remaining material of the cabinet bottom sides (C) (FIG. 10), if it is 1/4" or more, there is no need to use the cabinet brackets. Go to step 8 on page 10.
4. When there is less than 1/4" remaining material (C), carefully remove those strips. Measure the cabinet inner width (D) (FIG. 10). Refer to the table below to see which cabinet bracket edge configuration must be used.

| NARROW EDGE            | WIDE EDGE           |
|------------------------|---------------------|
| D                      | D                   |
| From 19-9/16" to < 20" | From 20" to 20-1/2" |

5. Pay attention to the Ease of Install hooks location on the unit (distance given from unit front flange, FIG. 11). Measure and mark the position of the Ease of Install hooks (shown as E in FIG. 12 on next page) on both cabinet side walls.

CUT A HOLE IN THE BOTTOM OF THE CABINET

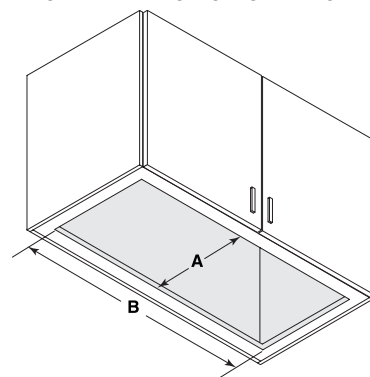


FIG. 9

A = 10 1/4"  
B = 19 9/16"

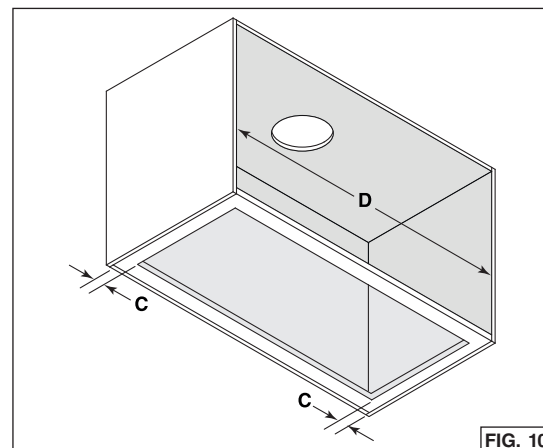


FIG. 10

UNIT TOP VIEW

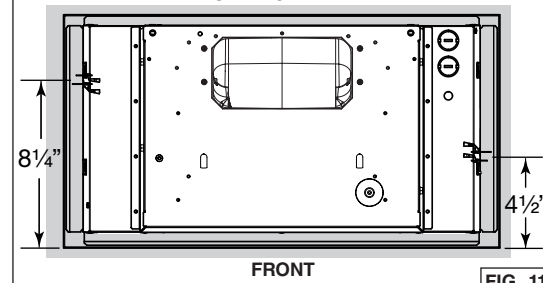


FIG. 11



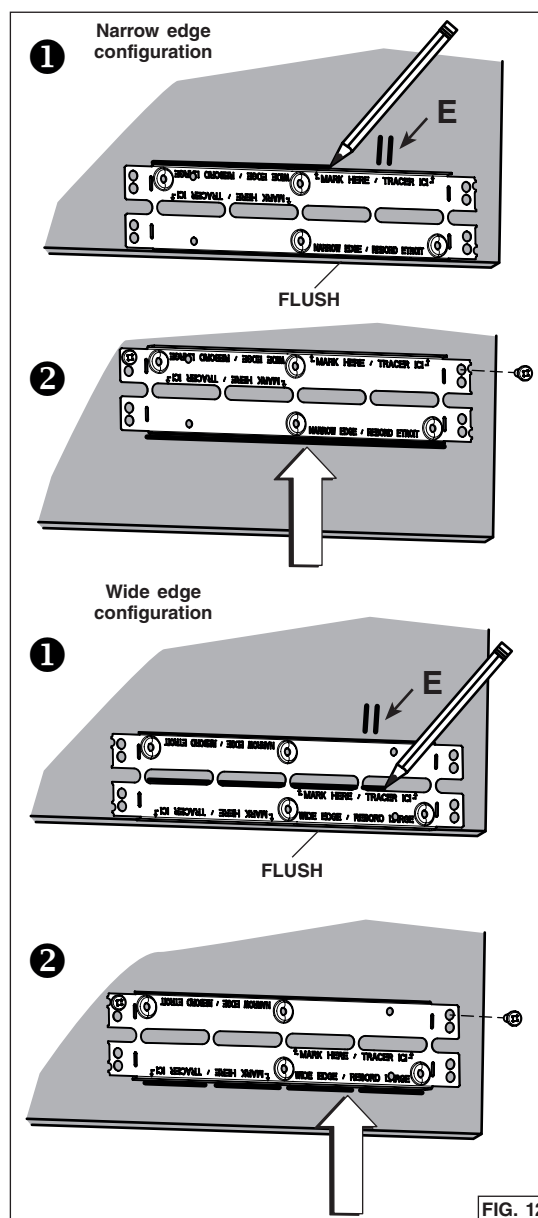
## PREPARE THE CABINET (CONT'D)

6. Install the cabinet brackets as follow (FIG. 12):

- ❶ Align the bracket flush with the bottom of the right cabinet side panel, with the hooks marked position (E) between the bottom embossed holes. For the narrow edge configuration, trace a line on the top of the bracket. For wide edge configuration, trace a line at the bottom of the central slots.
- ❷ Lift the bracket flush with the marked lined. Assemble the bracket to the cabinet side panel using 2 no. 8 x 5/8" wood screws (included in parts bag) through the upper holes.

NOTE: Do not use the embossed holes to attach the bracket to the cabinet.

- ❸ Repeat steps ❶ to ❷ for the left cabinet side panel.

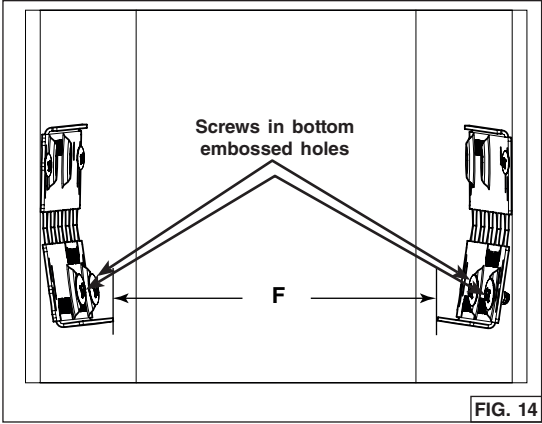
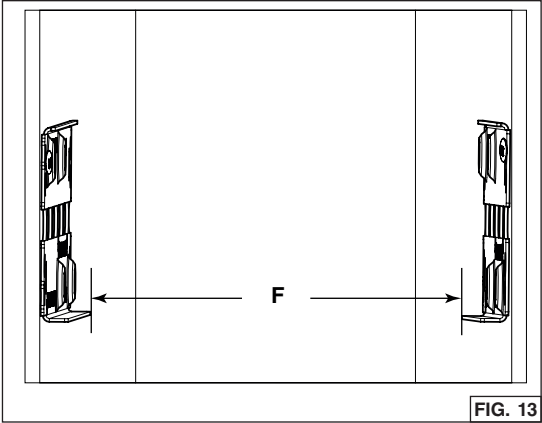


**PREPARE THE CABINET (CONT'D)**

7. Measure the distance between both bottom bracket edges (**F**) (FIG. 13). The table below shows the appropriate distance needed.

| NARROW EDGE                               | WIDE EDGE                                 |
|---|---|
| <b>F</b><br>From 19-3/8"<br>to < 19-9/16" | <b>F</b><br>From 19-9/16"<br>to 19-13/16" |

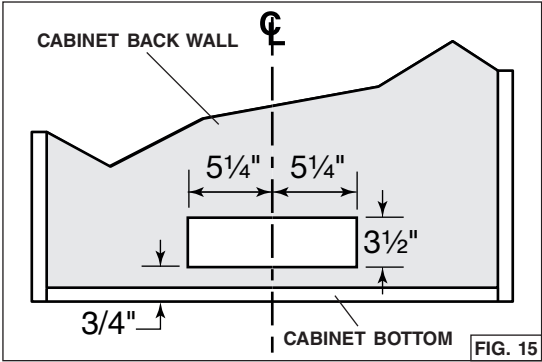
If the measured distance needs to be shortened, screw two no. 8-32 x 1/4" machine screws, in each bottom embossed cabinet brackets hole; this will slightly bend the bottom part of the brackets (FIG. 14). Screw both brackets until the appropriate distance is obtained.



**HORIZONTAL EXHAUST INSTALLATION ONLY**

This powerpack insert is factory shipped to exhaust vertically; however, it is possible to make it exhaust horizontally (3 1/4" x 10" ducting only).

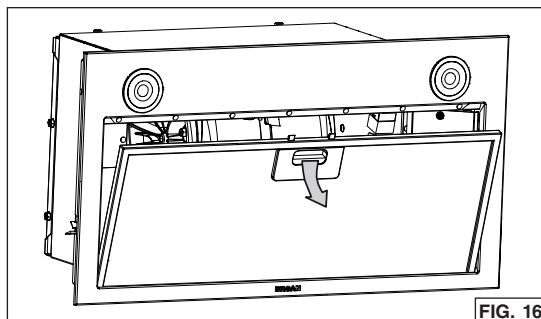
8. Cut the hole for the horizontal exhaust through the back wall of the cabinet using the dimensions shown. (FIG. 15).



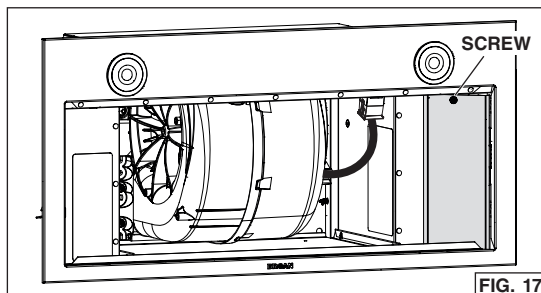
## PREPARE THE UNIT

### ALL INSTALLATIONS

1. If present, remove all protective polyfilm from the unit and/or parts.
2. Remove the grease filter by pushing down on latch tab and tilting the filter downward (FIG. 16). Set aside the filter.

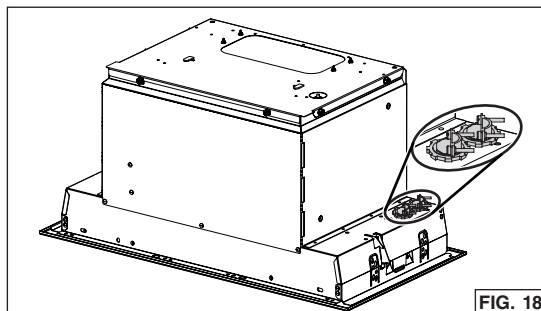


3. Disassemble the electrical compartment cover (grey part in FIG. 17) from inside the unit by removing its retaining screw. Remove the parts bag behind the cover. Set aside the parts bag and the cover along with its screw.



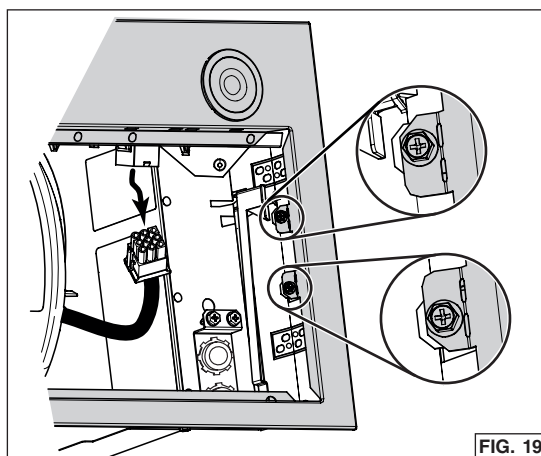
4. Punch out **both** knock-out holes. Install an appropriate 7/8" diameter strain relief (not included, grey parts in FIG. 18) in each hole.

NOTE: The HCK44 cord connection kit (optional) can be used instead of the house power cable. Refer to the instruction packed with the HCK44 cord connection kit.

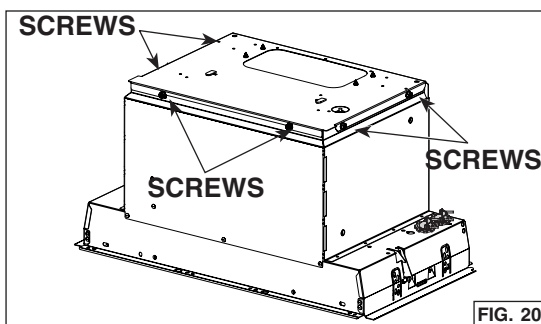


### HORIZONTAL EXHAUST INSTALLATION ONLY

5. Unplug the blower cable from its connector on faceplate. Disassemble the faceplate from the unit by removing its 4 retaining screws (two per side, circled in FIG. 19). Set aside the faceplate along with its screws.



6. Remove the 6 screws (2 per side and 2 in front) retaining the blower support plate to the top of the unit (FIG. 20). Carefully lift out and set aside the blower with its support plate. The blower will be reinstalled later in the unit.



## PREPARE THE UNIT (CONT'D)

### HORIZONTAL EXHAUST INSTALLATION ONLY (CONT'D)

7. From inside the unit, detach the back plate (grey part in FIG. 21) by removing its both retaining nuts using 3/8" diameter socket. Set aside the nuts and plate.

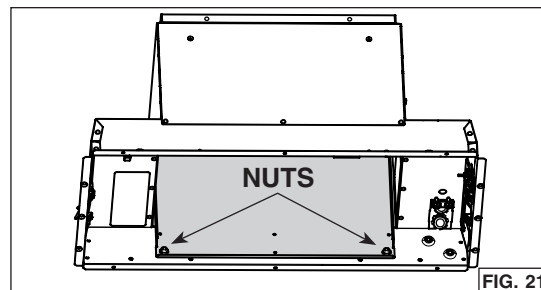


FIG. 21

8. Install the back plate on top of the unit, where the blower support plate was. Orient the holes nearby the corners towards the back of the unit. Assemble to the top of the unit using 6 screws previously removed in step 6 (FIG. 22).

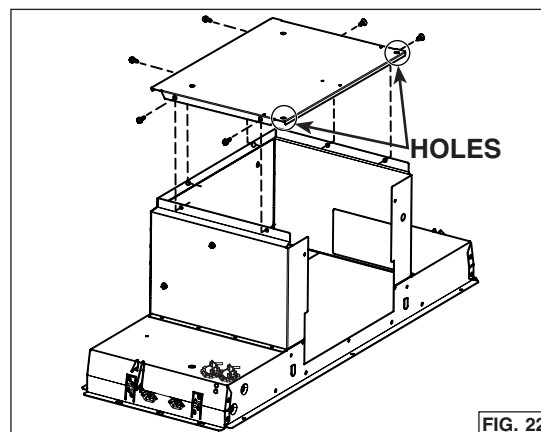


FIG. 22

### VERTICAL EXHAUST INSTALLATION ONLY

9. For rectangular ducting, use 2 included no. 8-18 x 1/4" metal screws to attach the included 3 1/4" x 10" adapter damper on top of the unit, over the blower exhaust opening (FIG. 23).

NOTE: The damper hinge must be towards the front of the unit.

For round ducting, use 4 included no. 8-18 x 1/4" metal screws to attach the included 6-in. round adapter damper on top of the unit, over the blower exhaust opening (FIG. 23).

NOTE: The damper hinge must be parallel to the sides of the unit.

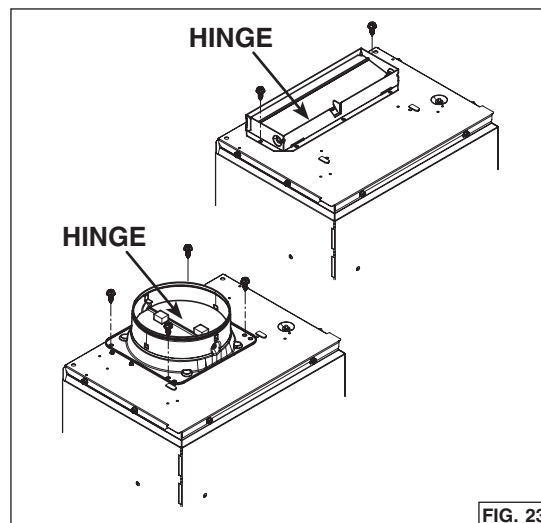


FIG. 23

## INSTALL THE UNIT

1. Run house power cable between service panel and unit location. Stub out a 2-foot length of power cable inside the cabinet. Insert the power cable in the unit through one of the 7/8" diameter strain relief previously installed.

NOTE: Not necessary if the optional HCK44 cord connection kit is used.

2. Stub out a 2-foot length of both 14/2 cable and 14/3 cable coming from switches. Insert the 14/2 cable and the 14/3 cable in the unit through the other 7/8" diameter strain relief previously installed.

3. Insert the unit in the cabinet, until you feel a 'click' from both sides of the unit, confirming that the Ease of Install Hooks rest on the top of the cabinet bottom sides **1**, or cabinet brackets **2** or **3** (FIG. 24). Move the unit from left to right, from rear to front and up to ensure the Ease of Install Hooks are retaining the unit inside the cabinet.

NOTE: The unit will be protruding below the cabinetry until tightened.

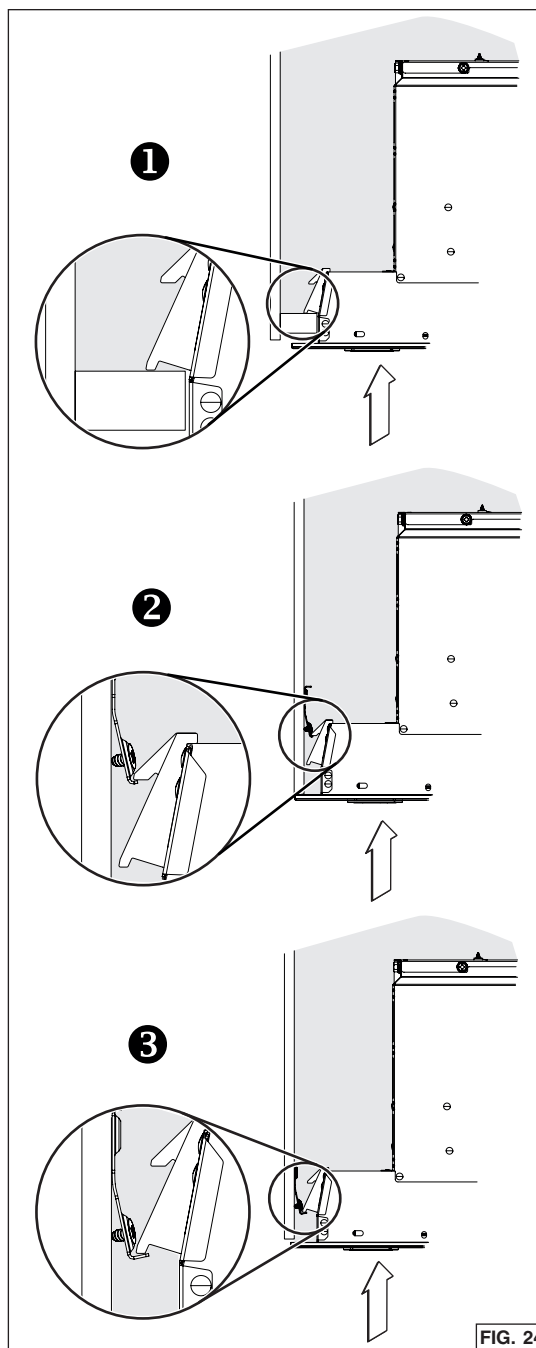


FIG. 24

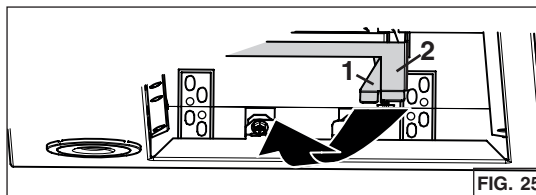


FIG. 25

NOTE: If, for any reason, the unit has to be removed from the cabinet, it is possible to disengage the Ease of Install Hooks. To do so, while holding and pushing on one side of the unit, lift simultaneously Ease of Install Hooks levers (**1** and **2**, grey parts in FIG. 25) in the other side of the unit until the hooks are retracted.

### INSTALL THE UNIT (CONT'D)

- Lift the unit until contact is made between the unit flange and cabinet. Secure the unit to the cabinet using 4 no. 8 x 5/8" wood screws included in parts bag (2 screws per side). Use upper or lower holes (1, 2, 3, 4, 5 or 6) (FIG. 26).

#### ⚠ WARNING

The Ease of Install Hooks **TEMPORARILY** hold the unit in place. The unit **MUST BE** secured to the cabinet using the included 4 screws.

#### ⚠ WARNING

Never use this unit as a shelf.

### HORIZONTAL EXHAUST INSTALLATION ONLY

- From inside the unit, slide the 3¼" x 10" adapter/damper in the horizontal duct, then attach it to the unit using aluminum duct tape all around the joint (FIG. 27). Ensure the damper opens as shown in damper side view.

- Insert the blower with its support plate inside the unit, where the back plate was initially (A). Attach to the unit using 2 nuts previously removed in step 7 on page 12 (B) (FIG. 28).

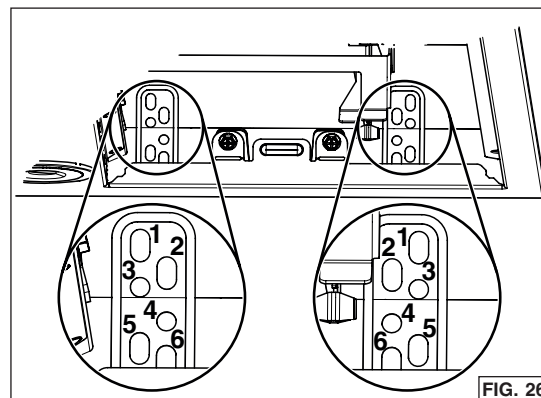


FIG. 26

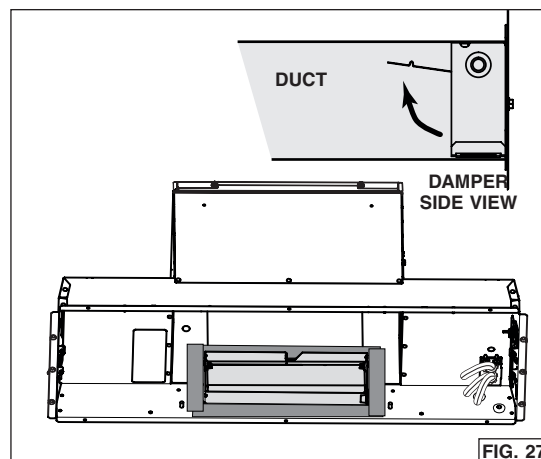


FIG. 27

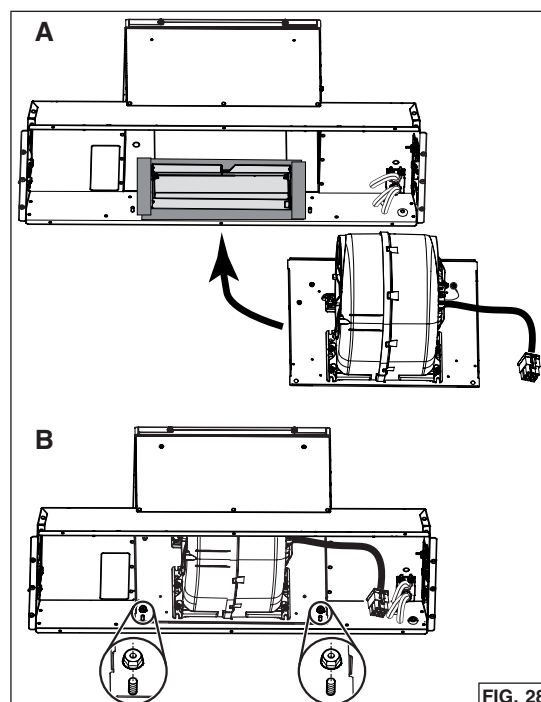


FIG. 28

## INSTALL THE UNIT (CONT'D)

### HORIZONTAL EXHAUST INSTALLATION ONLY (CONT'D)

7. Reinstall and secure the faceplate to the unit using its 4 retaining screws (two per side). Plug the blower cable to its connector on faceplate (FIG. 29).

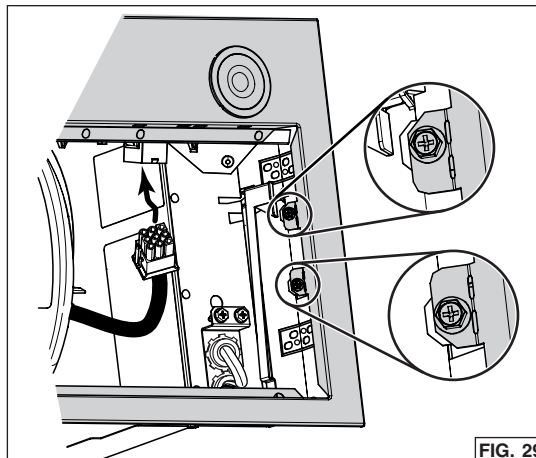


FIG. 29

## CONNECT DUCTWORK

### VERTICAL EXHAUST INSTALLATION ONLY

#### Ducted Installation

Use 6-in. round or 3¼" x 10" metal duct to connect the adapter damper on the top of the unit to the ductwork above (FIG. 30). Seal the joint using aluminum duct tape.

#### Non-Ducted Installation

A non-duct kit is required for this type of installation (purchase separately, model number: HARKPM21). To install, follow the instructions packed with the kit.

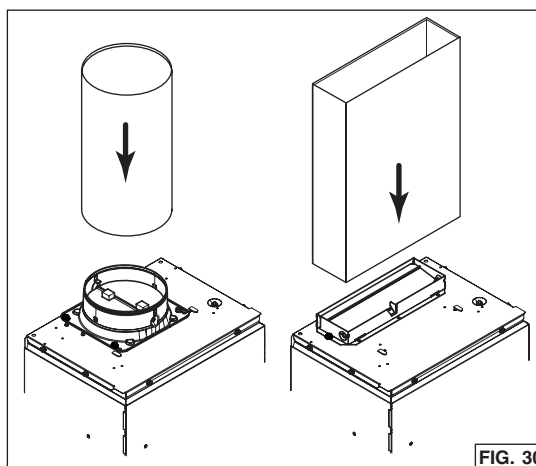


FIG. 30

## WIRING

### ⚠ WARNING

**Risk of electric shock. Electrical wiring must be done by qualified personnel in accordance with all applicable codes and standards. Before connecting wires, switch power off at service panel and lock service disconnecting means to prevent power from being switched on accidentally.**

NOTES: 1. Use appropriate wire nuts (not included) for wire connections.

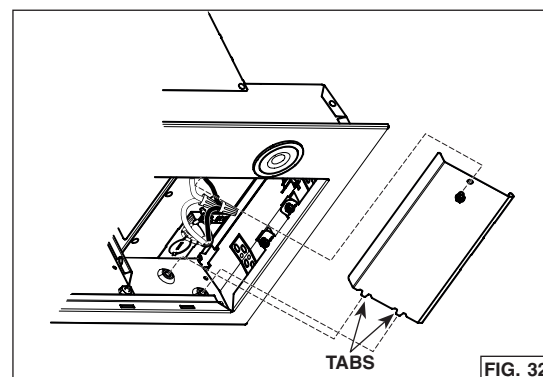
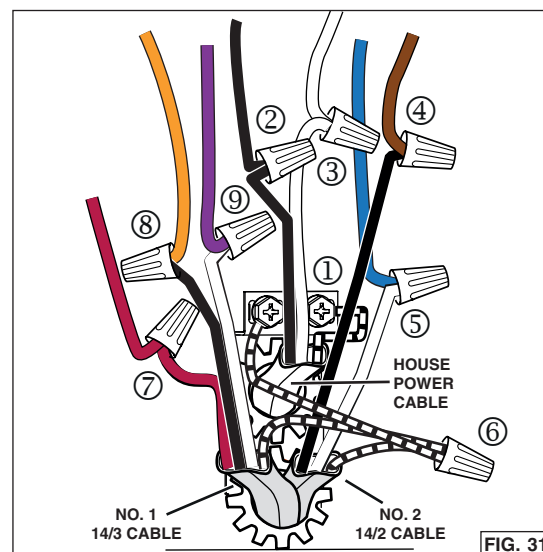
2. Refer to FIG. 31 for wire connections.

1. Connect GREEN or bare wire from house power cable to one of the unit GREEN ground screw (①).
2. Connect **house power cable** to unit wiring: BLACK to BLACK (②) and WHITE to WHITE (③).
3. Connect **No. 2 14/2 cable** to unit wiring: BLACK to BROWN (④) and WHITE to BLUE (⑤).
4. Using a short ground wire (not provided), connect GREEN or bare wires from no. 1 and no. 2 cables to the other unit GREEN ground screw (⑥).
5. Connect **No. 1 14/3 cable** to unit wiring: RED to RED (⑦), BLACK to ORANGE (⑧) and WHITE to PURPLE (⑨).
6. Reinstall the electrical cover in the unit; ensuring the bottom tabs are inserted in their embossed location. Secure in place using its retaining screw (FIG. 32).

NOTE: Not all wires shown.

### CAUTION

**Take care not to pinch wires while reinstalling wiring cover.**



## INSTALL THE FILTER

### Ducted Installation

Reinstall the grease filter.

### Non-Ducted Installation

Attach the non-ducted filter (included with the HARKPM21 non-duct kit) to the back of the grease filter using clips (provided with non-ducted filter). To order a new non-ducted filter, use service part number S99010464.