

# MAKE-UP AIR SYSTEM

Model: MAS-1 and MAS-2



The Field Controls Make-Up Air System consists of a make-up air damper, mounted on the return air duct of an HVAC system, and an intake air hood, installed through an exterior wall, to allow outdoor air into the home, with the two being typically connected by installer-supplied standard 6" galvanized sheet-metal pipe (recommended). This device provides fresh air inflow on demand to minimize house depressurization due to moderately-powered exhausting devices (bath fans, dryers, range hoods, etc.), and for the recommended fresh-air changes per hour (ACH) for good indoor air quality.

## ITEMS INCLUDED:

- 1- Make-Up air damper with air flow adjustment slide
- 1- Mounting template
- 1- 6" intake hood (not included with MAS-2)

## READ THESE INSTRUCTIONS CAREFULLY AND COMPLETELY BEFORE PROCEEDING WITH THE INSTALLATION.

This device **MUST** be installed by a qualified agency in accordance with the manufacturer's installation instructions. The definition of a qualified agency is: any individual, firm, corporation or company which either in person or through a representative is engaged in, and is responsible for, the installation and operation of HVAC appliances, who is experienced in such work, familiar with all the precautions required, and has complied with all the requirements of the authority having jurisdiction.

Please retain these instructions after installation.

Installed By: \_\_\_\_\_ Phone: \_\_\_\_\_ Installation Date: \_\_\_\_\_



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## INSTALLATION OF MAKE-UP AIR DAMPER:

1. Switch the HVAC system to "off".
2. Apply mounting template onto the side of the return air plenum of the furnace by wetting the back side and applying to any vertical surface of the return air plenum.

**CAUTION:** Unit must be mounted on a vertical surface. Level the template horizontally by marking a line onto the plenum using a level. Then apply the edge of the template on this line. (See Figure 2)

3. After allowing template to dry, drill (4)  $\frac{1}{8}$ " diameter holes at the location indicated on the template. Also, drill 4 or 5 holes along the cutting line of the  $6\frac{1}{8}$ " diameter hole indicated on the template to allow for a starting hole for cutting. Then cut hole with metal shears.

**WARNING:** Use care to avoid dropping duct material into the return air duct when cutting hole.

**CAUTION:** Sharp metal edges may cause serious injury; use caution and wear appropriate protective equipment to protect hands, arms, and other bodily areas from injury when cutting sheet metal.

4. Make sure the adjustment slide is in place on the damper flange (see Figures 2 & 3) and all the way down onto the flange with the slide sandwiched between the damper flange and mounting surface. Attach the make-up air damper using supplied sheet metal screws or other suitable fasteners, making sure the adjustment slide is between the upper two screws. Leave the screws slightly loose to allow for adjustment.
5. The HVAC system may now be returned to normal operation.

## INSTALLATION OF INTAKE HOOD (not included with MAS-2)

1. Locate intake hood at least 10' away from any device that exhausts flue gases, and at least 12" above grade.
2. Cut a  $6\frac{1}{8}$ " diameter hole through the wall. Then mount the intake hood to the wall using suitable installer-supplied fasteners. Then caulk along the edges of the hood mounting plate with silicone or equivalent sealant.
3. Connect 6" sheet metal duct piping (recommended) or 6" flex duct from the intake hood to the make-up air damper (see Figure 1). The use of flex duct will reduce the maximum available air flow of the system; if used, stretch the flex duct fully and avoid sharp bends, such as hanging from narrow supports. Fasten and support air duct so the ductwork does not put a strain on the make-up air damper.

**NOTE:** Some areas require insulation wrapped around the duct. This will be required if sweating occurs on the outside of the duct. Seal all duct joints and seams with foil tape or equivalent.

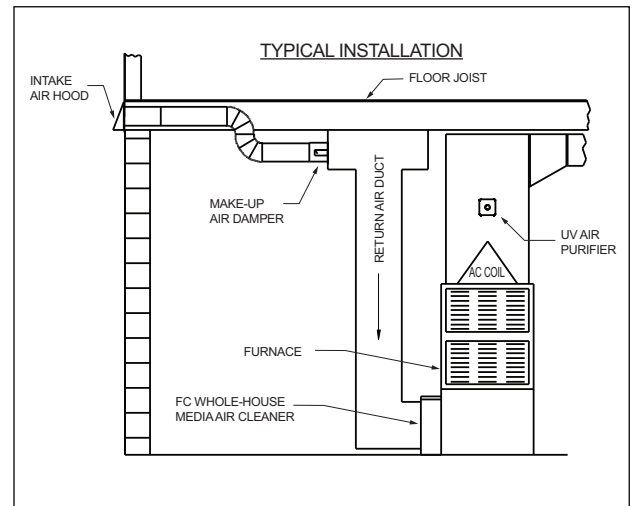


Figure 1

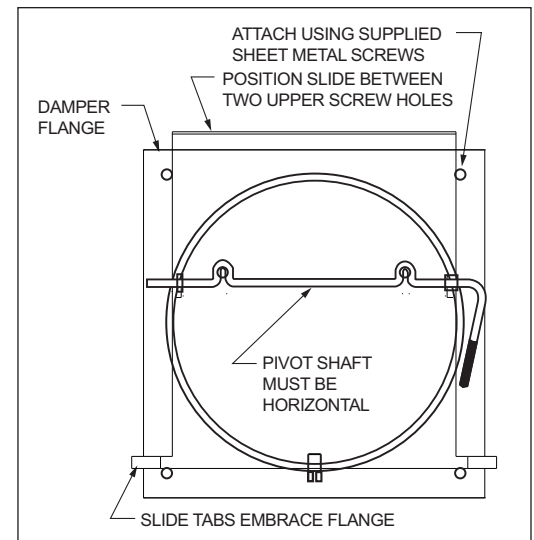


Figure 2

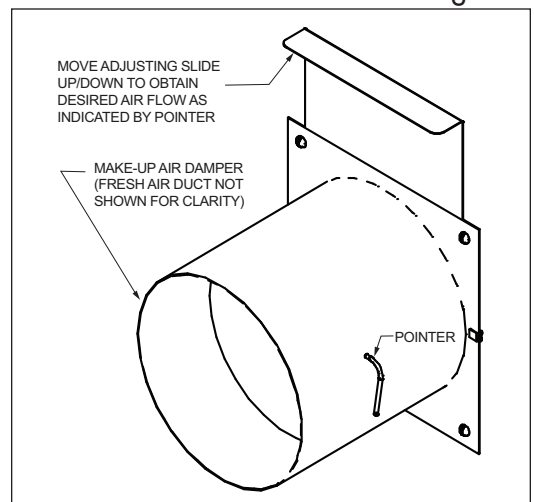


Figure 3

### DETERMINING THE DESIRED FRESH-AIR FLOW RATE:

1. Determine building square footage. Then refer to the table below for air flow in cubic feet per minute (cfm), based on the normal occupancy level.
2. Divide the cfm from the table by the fraction of time that the HVAC circulation fan runs. For instance, if the fan runs about half the time, then the desired fresh air rate is twice the cfm from the table. If the fan runs one-third of the time, then the desired fresh air rate is three times the cfm from the table. If the fan is set to run constantly, then the desired fresh air rate equals the cfm from the table (setting the fan to run constantly also provides maximum filtration and UV treatment of the indoor air).
3. If your average ceiling height differs from 8', then multiply the cfm from the step above by the height in feet, and divide by 8. For example, a 1500 sq. ft. house with 3 occupants, fan on  $\frac{2}{3}$  of the time, and a 9' ceiling would require  $38 \div \frac{2}{3} \times 9 \div 8 = 64$  cfm desired from the MAS.

BUILDING AREA (SQ.FT.)	NUMBER OF OCCUPANTS IN THE HOME				
	0-2	3	4	5	6
1000	25	33	40	48	55
1250	28	35	43	50	58
1500	30	38	45	53	60
1750	33	40	48	55	63
2000	35	43	50	58	65
2250	38	45	53	60	68
2500	40	48	55	63	70
2750	43	50	58	65	73
3000	45	53	60	68	75
3500	50	58	65	73	80
4000	55	63	70	78	85

The air flow rates from the table are as recommended by ASHRAE (the American Society of Heating, Refrigeration, and Air-Conditioning Engineers), the recognized authority on air freshness. When combined with the natural “breathing” of an average house (natural infiltration), the desired cfm as calculated above will provide approximately 0.3 to 0.5 air changes per hour (ACH) in the home, depending on the size of the house and its occupancy level. The table has been constructed such that smaller homes require a slightly higher ventilation rate than larger homes, due to the smaller area available for the house to breathe naturally. Also, if your house is of unusually tight construction, or is not sealed very tightly, the desired cfm may be increased or decreased respectively; refer to your contractor for the relative tightness of your house and guidance on increasing or decreasing the desired ACH from the damper.

### ADJUSTING THE MAKE-UP DAMPER FOR DESIRED FRESH-AIR FLOW RATE:

1. Switch the fan control to on, or turn on the heat if season permits.
2. If the MAS is intended to function chiefly as a make-up air device, adjust the slide to the max flow position (all the way up).
3. If the MAS is to be used primarily as a fresh-air device for indoor air quality purposes, adjust the damper slide up for more air flow, and down for less, until the pointer indicates the desired air flow rate on the indicating scale. **NOTE:** Changes in the brand or location of the system air filter may cause the air flow rate to change, as well as any other changes to the system that may affect the plenum pressure at the mounting location. Also, if your system has a multi- or variable-speed circulation fan, the air flow rate will vary somewhat with the fan speed.
4. Tighten the mounting screws and apply foil duct tape around the edges of the damper.

**This manual may be downloaded and printed from the Field Controls website ([www.fieldcontrols.com](http://www.fieldcontrols.com))**

**WARRANTY**

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