Make Up Air Unit MAU Series

Model Code:

MAU	48	20	1
A	B	C	D

A: Series
B: 48 - 480V
C: Kilowatts
D: 1 or 3-phase

c UL us LISTED

- Make up air solution with integrated logic controller
- Incremental cycle timer per hour
- Automatic damper control
- Remote exhaust fan control
- Remote override switch
- Remote lockout switch
- 760 to 2120 CFM
- Fully modulating electric heat
- Horizontal or vertical installation
- Compact footprint
- Replaceable filter
- Available in 480V - single & three phase
- 5 Year limited warranty

MADE IN USA

The MAU Series Make Up Air Unit

Today's airtight homes and offices beg for fresh air. When we trap the heat, excess humidity and indoor pollutants such as cleaning products, smoking and pets, will negatively affect the quality of the air we breathe, making our environment both uncomfortable and unhealthy. Stale and humid air must be replaced by fresh air. During winter, the incoming fresh air is at too low a temperature to be comfortable and requires preheating. It is more economical to preheat the incoming air at a specific, controlled source than requiring the central system to continually compensate for heat loss.The King MAU is designed to complement your heating system by preheating this fresh air at the lowest cost, thus continuously proving comfortable ventilation throughout the house. The King make up air unit (MAU) combines a fan driven fully modulating electric heating unit with a fresh air ventilation logic controller providing an extremely versatile all-in-one packaged unit. It is designed to work with HVAC equipment to provide indoor air quality into a return air plenum or provide make up air directly into a home or commercial building. When the fresh air required is 760 CFM or more the new King MAU air make-up offers the optimum solution at the lowest total cost.

Fresh air with HVAC System:

The King MAU improves indoor air quality by using a fan to deliver fresh air through an outside damper and heating the incoming air to a preset temperature. This is done by an integrated logic controller which opens the damper, activates the fan and modulates the electric heat to a preset discharge temperature delivering the tempered are directly into a return air plenum or a separate fresh air ductwork system. The logic controller provided these additional features:

1. **Fresh Air Cycle timer** – This is a 1 hour cycle timer that activates the Fan/heat modulation/damper circuit. It is based on minutes per hour of fresh air required and is broken into ½ hour segments. The MUA is programed to work with the primary HVAC unit by supplying the fresh air demand when the HVAC is operating providing heat. If the HVAC unit does not call for heat during the 1 hour cycle then the MAU will turn on automatically and fulfill the setting of the timer. The MAU may cycle on and off several times during the 1 hour cycle in conjunction with the HVAC unit in order to meet time requirement. The entire fresh air cycle time will always be met each hour by prioritizing to run when there is a call for heat and then run independently to add the balance of time required. This design feature improves the overall HVAC system efficiency.
2. **Exhaust Fan** – the logic controller will activate an optional exhaust fan (or any auxiliary equipment) when the 'EF' terminals are wired in series with 24V relay and the Damper switch is in 'AUTO'. The 'EF' contacts will not operate when the Damper switch is 'CLOSED'. The 'EF' contacts will close when the override switch is closed. The 'EF' contacts require a 24V power source.
3. **Primary Override Switch** – A dry contact closure across the 'O' terminals will activate the Fan/Heat Modulation/Damper circuit and turn on the HVAC fan system. This switch overrides ventilation timing and all other inputs are ignored.
4. **Lockout Switch** – The controller can be wired to an optional outdoor thermostat and/or a humidistat by using the 'L' terminals to prevent the MUA form turning on. Remove the factory set jumper to activate this feature. This feature can also be used to monitor indoor activity such as an occupancy sensor and CO2 sensor.

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Ordering Information

MODEL	PHASE	KILO WATTS	BTU (000)	VOLTS	*AMPS	CIRCUIT PROTECTION L1 L2	CIRCUIT PROTECTION L3 L4	CIRCUIT PROTECTION L5 L6	CIRCUIT PROTECTION L7 L8	75°C WIRE SIZING L1 L2	75°C WIRE SIZING L3 L4	75°C WIRE SIZING L5 L6	75°C WIRE SIZING L7 L8	# OF ELEMENTS	MOTOR VOLTS	MOTOR HP	TEMPERATURE RISE LOW	TEMPERATURE RISE MED.	TEMPERATURE RISE HIGH	HEIGHT	WT. (lbs)
MAU4805-1	1	5	17.1	480	12.1	15				#14				1	480	1/5	20°	18°	16°	30½"	57
MAU4810-1	1	10	34.1	480	22.5	30				#10				2	480	1/5	41°	37°	32°	30½"	65
MAU4812-1	1	11.5	39.2	480	25.7	40				#8				2	480	1/5	47°	42°	36°	30½"	65
MAU4815-1	1	15	51.2	480	32.9	50				#6				3	480	1/5	61°	55°	47°	30½"	74
MAU4818-1	1	17.25	58.8	480	37.6	50				#6				3	480	1/5	70°	63°	55°	30½"	74
MAU4820A-1	1	20	68.3	480	43.4	60				#6				4	480	1/5	81°	73°	63°	37½"	76
MAU4820-1	1	20	68.3	480	43.4	60				#6				4	480	1/3	57°	51°	41°	37½"	76
MAU4822-1	1	22.5	76.8	480	48.6	60				#6				4	480	1/3	57°	51°	41°	37½"	76
MAU4825-1	1	25	85.3	480	53.8	20	60			#12	#6			5	480	1/3	72°	63°	51°	37½"	81
MAU4830-1	1	30	102.4	480	65.7	30	60			#10	#6			6	480	1/3	86°	76°	62°	37½"	85
MAU4835-1	1	34.5	117.7	480	73.6	40	60			#8	#6			6	480	1/3	99°	87°	71°	37½"	85

MODEL	PHASE	KILO WATTS	BTU (000)	VOLTS	*AMPS	CIRCUIT PROTECTION L1 / L2 / L3	75°C WIRE SIZING L1 / L2 / L3	# OF ELEMENTS	MOTOR VOLTS	MOTOR HP	TEMPERATURE RISE LOW	TEMPERATURE RISE MED.	TEMPERATURE RISE HIGH	HEIGHT	WT. (lbs)
MAU4805-3	3	5	17.1	480	7.7	10	#14	1	480	1/5	20°	18°	16°	30½"	57
MAU4810-3	3	10	34.1	480	13.7	20	#12	2	480	1/5	41°	37°	32°	30½"	74
MAU4812-3	3	12	40.9	480	16.1	20	#12	3	480	1/5	47°	55°	36°	30½"	74
MAU4815-3	3	15	51.2	480	21.4	30	#10	3	480	1/5	61°	63°	47°	30½"	74
MAU4818-3	3	17.25	58.8	480	22.4	40	#8	3	480	1/5	70°	51°	55°	30½"	74
MAU4820-3	3	20	68.3	480	25.7	30	#12	4	480	1/3	57°	56°	41°	37½"	74
MAU4824-3	3	24	81.6	480	30.5	50	#6	6	480	1/3	69°	63°	49°	37½"	85
MAU4825-3	3	25	85.3	480	32	50	#6	5	480	1/3	72°	76°	51°	37½"	85
MAU4830-3	3	30	102.4	480	37.3	50	#6	6	480	1/3	86°	76°	62°	37½"	85
MAU4835-3	3	34.5	117.7	480	43	60	#6	6	480	1/3	99°	87°	71°	37½"	85

* Includes motor load

Accessories

MODEL	UPC	DESCRIPTION	WEIGHT(lbs.)
KFS-4PJB	20185	* 4-Pole Jumper Bar - 15kW to 20kW	.05
KFS-6PJB	20184	* 6-Pole Jumper Bar - 25kW to 30kW	.05
KFSSB	20182	1" discharge sub base	5
KFS-DT	20186	Transition from 14" x 14" Outlet to 12" round	25

* For single strike connection

DIMENSIONAL CLEARANCE	
Cabinet Sides	1 in.
Cabinet Front	0 in.
Exhaust duct within 3 feet of furnace	1 in.
Return Air Plenum	0 in.

Options

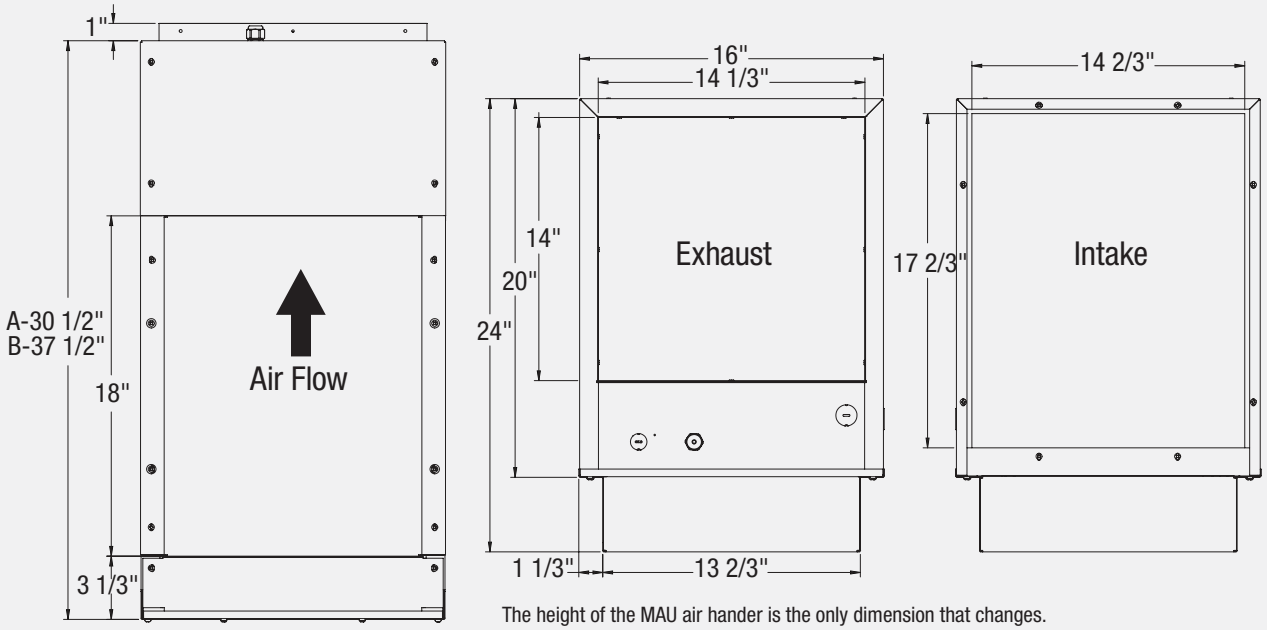
ADD SUFFIX:	DESCRIPTION
-JB	15 kW to 30 kW, 1-Phase
-1/3HP	1/3 HP Motor & Blower - 3 kW to 18 kW

Factory Installed Options

ADD SUFFIX:	DESCRIPTION
-DS40	40 Amp, 3-Pole Disconnect Switch w/ Padlock Provision
-DS60	60 Amp, 3-Pole Disconnect Switch w/ Padlock Provision
-DS80	80 Amp, 3-Pole Disconnect Switch w/ Padlock Provision

Make Up Air Unit MAU Series

Dimensional Data



The height of the MAU air hander is the only dimension that changes.
Please refer to selection chart to determine the size of the unit.

Air Flow Chart

CASE SIZE	HP	SPEED	CFM (STATIC) 0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8
Small Case 30.5" tall (3-18 kW)	1/5	LOW	1090	980	940	890	840	920	800	760
		MED	1260	1090	1040	980	930	890	810	780
		HIGH	1370	1260	1220	1170	1120	1090	1080	990
	1/3	LOW	1700	1680	1670	1660	1650	1640	1630	1620
		MED	1810	1800	1790	1750	1740	1730	1720	1710
		HIGH	1960	1940	1930	1910	1870	1860	1850	1830
Large Case 37.5" tall (20-35 kW)	1/5	LOW	1160	1120	1090	1050	1020	990	960	850
		MED	1310	1230	1200	1150	1120	1050	990	910
		HIGH	1480	1410	1390	1270	1240	1180	1120	1040
	1/3	LOW	1860	1850	1840	1830	1820	1810	1790	1740
		MED	2000	1980	1960	1940	1930	1920	1910	1900
		HIGH	2120	2100	2070	2050	2030	2020	2010	2000

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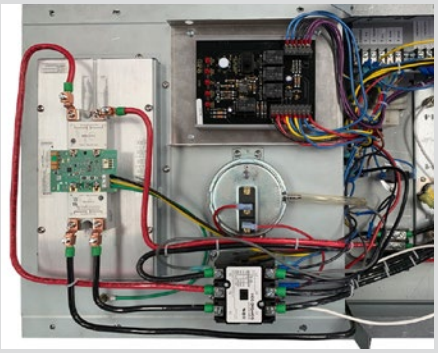

SCR Fully Modulating Fan Coil Unit

SCR Power Control

Logic Control Unit

- SCR Power Control provides precise modulation of the electric resistance heating load. Available for 208V, 240V, 480V 1-phase and 3-Phase. Amp rating: 45A and 75A or 90A (2x45A units). Accepts 4 – 20 mA or 0-10 VDC input signal Includes LED indication light.

- Selectable 3-Speed Fan is set up at installation to provide the required CFM.

Connection set up for King MAU interconnected to HVAC unit:

- HVAC Heating signal -W
- HVAC Fan input from thermostat -G1
- Fan Output to HVAC System -G2
- HVAC System Hot -R
- HVAC System Common -C
- MAU C to 24V (factory prewired)
- MAU R to 24V (factory prewired)
- MAU W1 to D (factory prewired)
- D-D to Damper Motor
- O-O (Manual Override) will turn on MUAH, plus HVAC Fan, ignores
- No connection -W
- No connection -G1
- No Connection -G2
- MAU C to -C
- MUAH R to -R
- MAU C to -24V (factory prewired)
- MAU R to -24V (factory prewired)
- MAU W1 to -D (factory prewired)
- D-D to Damper Motor
- O-O (Manual Override) will turn on MAU, open dDamper, plus HVAC Fan, ignores Lockout feature.

Lockout feature.

- EF-EF dry contact to operate remote relay for equipment such as an exhaust fan. Requires 24V power source.
- L-L, Lockout contacts – inactive if jumper is installed, when Jumper is removed external control contacts need must be closed for Fan/Heat Modulation and damper to open.

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Optional Components for Modulating Fan Coil Unit

Modulating Thermostat

Duct Temperature Sensor

- Built-In Modulating Thermostat with 0 to 10VDC modulating output controls the output temperature by modulating directly to the SCR power controller. (Can be removed and mounted remotely).
- Duct Temperature Sensor is used with the modulating thermostat and is mounted on the discharge side unit to precisely control the air temperature. Controls discharge air temperature regardless of the incoming air temperature typical of make up air applications.
- Air Flow Switch Provision Terminals (Air Flow Switch Purchased Seperately) to be interlocked with the unit so that the heating coils do not energize without airflow detected.

Engineering Specifications

Contractor shall supply and install MAU Series electric Make Up Air Unit manufactured by King Electrical Mfg. Company. Furnaces shall be of the wattage and voltage as indicated on the plans.

Transformer: Each furnace is equipped with a heavy-duty low voltage (24 Volt) transformer for the thermostat control circuit.

Contactor or Time Delay Sequencer: Actuates heating element banks at random intervals to minimize electrical surges in compliance with E.E.I. and N.E.M.A. standards.

Heating Elements: Quick heating, long life Ni-Chrome elements are sized to provide proper watt density for maximum heat dissipation by fan-forced air convection currents.

Terminal Block: For field wiring (optional special order) KFSTB

Air Filter: Convenient access for replacement of standard 16" x 20" x 1" filter.

Motor: Long life, 48 frame capacitor run, thermally protected, permanently lubricated, direct drive motor (no belts to adjust or slip). This low noise, up to 3-speed motor is designed for maintenance-free operation.

Overcurrent Protection: 480 volt MAU models have terminal blocks. Internal 60 amp fusing is provided for MAU models over 48 amps.

Limit Control: Integral automatic high temperature limit control in each heating element bank prevents the delivery of air at unsafe temperatures. 20-35 kW use a manual reset limit control to completely shut the furnace off should an over temperature occur.

Fan Relay: Heavy-duty dual speed fan relay is standard with furnaces for air conditioning or summer fan operation.

Low Voltage Terminal Block: 24 Volt control screw terminals

Approvals: UL (E48864)