

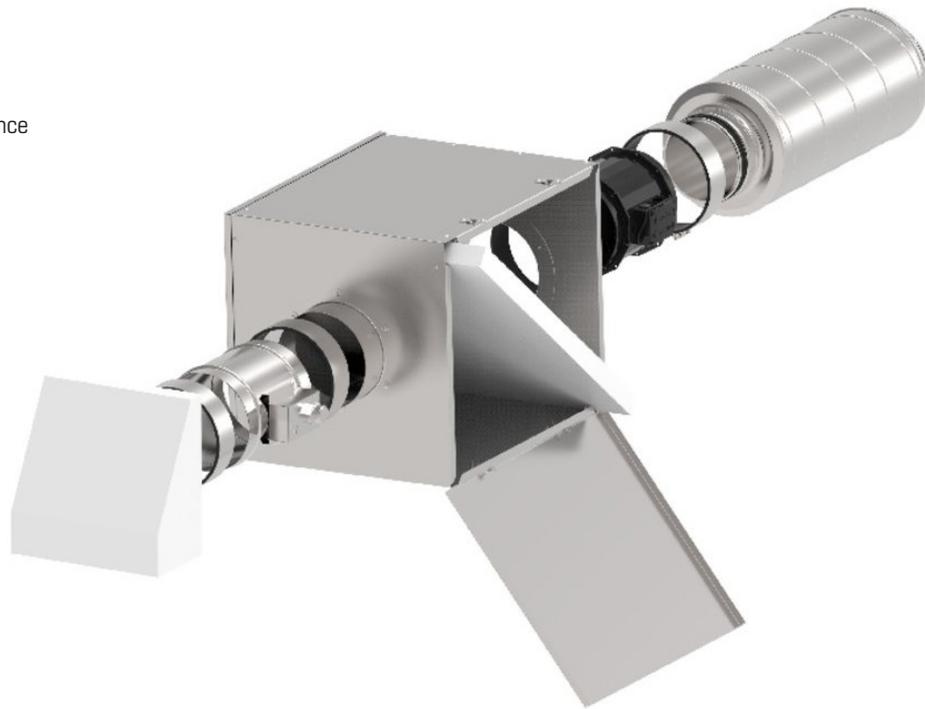
Installation, Operations, and Maintenance Manual

MUAS Series

Makeup Air System & Controller

PARTS IN THE BOX

Inline Fan, 1 pc
Metal Intake Wall Hood, 1 pc
Motorized Shut-off Damper, 1 pc
Filter Cabinet, 1 pc
Duct Silencer, 1 pc
Mounting Clamps, 3 pairs
Controller, 1 pc
Installation, Operations, and Maintenance
Manual, 1 pc



Technical / Customer Support:

United States Tel.: 800.747.1762

Canada Tel.: 800.565.3548



fantech[®]
a systemair company

				
Note	Warning / Important note	Information	Technical information	Practical tip

Warnings

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

1. Installation work and electrical wiring must be done by a qualified person(s) in accordance with national electric codes, local electric codes, ordinances and regulations, including fire-rated construction codes and standards.
2. This system is not designed to provide combustion air for fuel-burning appliances.
3. Do not connect the system directly to a combustion appliance of any type.
4. Before servicing or cleaning any system component, 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.
5. When performing installation, servicing or cleaning of the system, it is recommended to wear safety glasses and gloves.
6. Locate the outside air inlet hood above any anticipated snow drift level and away from any architectural and landscape features to ensure that the intake area for the outside air duct is not blocked and provides a clear pathway for outside air to enter the system.
7. When cutting or drilling into wall or ceiling, do not damage electrical wiring or other hidden utilities.
8. 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.
9. This system can only be used for its intended design. Any internal wiring changes, modifications or bypass of any controls, or installation practices not according to the details of the instruction manual will void the product warranty. Follow all installation, wiring and setup instructions indicated in the manufacturer's manual.

Caution

1. Do not locate outside air inlet near hazardous materials or explosives.
2. System shall not be installed to introduce air from crawlspaces, garages, attics, adjacent dwelling units, or other locations within the building shell. System shall be installed to introduce air directly from outdoors.
3. Do not install the makeup air system and supply ductwork directly above or closer than a distance of two feet to any furnace or its supply plenum, boiler, or other heat producing appliance.
4. Any ductwork used in conjunction with the system must be installed in compliance with all local and national codes that are applicable.
5. Do not operate the system until all system filters have been installed per the system design.
6. Please read the specification label on each system component for further information and requirements.
7. Each system component, including filters, should be inspected and maintained on a regular basis.
8. This system is intended for installation in a dry location protected from moisture.
9. This system must be installed in an accessible location which allows for system inspection and maintenance.
10. This system will automatically provide outdoor air into a building. Coordinate with the HVAC designer/contractor the effects that the supply of outdoor air will have on the building's comfort and mechanical systems. The HVAC designer should take into consideration the makeup air system's frequency and duration of use as well as the outdoor air flow quantity.
11. Use this system only in the manner intended by the manufacturer. If you have questions, contact the manufacturer at the address or telephone number provided in this document.
12. When federal, provincial or state legislation comprises more restrictive installation and/or certification requirements, the aforementioned requirements prevail over those of this document and the installer agrees to conform to these at his own expense.
13. Do not supply outdoor air to a space or duct system where water pipes or water coils might be susceptible to freezing due to the supply of outdoor air.

Application

The Fantech MUAS is a low voltage controlled assembly of components which provides the automatic supply of outdoor air into a building. When controlled by the current sensing Fantech Makeup Air Controller “FMAC”, the system is suitable as compensation for single speed, multi-speed, and variable speed exhaust fans.

The FMAC initiates the MUAS upon sensing the exhaust fan motor current, and controls the supply of outside air into the building in proportion to that being exhausted.

This system may be used to replace air being removed by a kitchen hood exhaust fan or other continuously or intermittently operating powered exhaust system. Mechanical replacement of exhaust air allows an exhaust system to function more effectively, helps to maintain pressure equilibrium between the building interior and the exterior, and allows for management (quantity, cleaning, tempering and location) of the introduction of outside air to the building’s interior space. An electric heater (optional) may be included as a system component. The heater is not intended to provide heating to the interior space, but rather to temper the supply of cold outdoor air before it is delivered to the building.

Due to its component-based, field-assembled nature, the Fantech MUAS offers flexibility as to where and how it can be installed into a building. The installation location should be suitable for periodic inspection and maintenance. It is not required that the individual system components be installed in a linear (straight line) arrangement. System components may be connected by duct work (by others) to permit lengths and elbows for accommodating the physical space available for installation. It is important to adhere to all instructions included with each system component for proper installation, however, keeping service clearances and straight duct lengths upstream and downstream of components as required.

The air discharged from the Fantech MUAS will almost always be contained in duct work (by others), so that the supply of makeup air may be routed to a suitable location for delivery to the interior space.

The Fantech MUAS components and the system’s duct work must be insulated to prevent the formation of condensation.

Fantech recommends that makeup air be ducted to the space from where the compensated exhaust is being removed. For example, makeup air used to compensate a kitchen exhaust hood should be delivered directly to the kitchen space. For this same example, it is advisable that the air be delivered to the kitchen in such a way as to not disturb the exhaust air pattern at the hood. In general, this can be accomplished by locating the makeup air supply grille at least a few feet away from the footprint of the kitchen hood, and ensuring that no streams of makeup air supply are directed toward the area between the range top and the hood. Depending on the makeup air flow rate, grilles might be suitably located above kitchen cabinets, behind refrigerators, or simply at a convenient location on a wall or the ceiling.

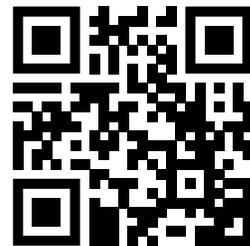
Depending upon the version of the building code that governs the

installation, there are potentially many code-compliant methods of introducing the makeup air into the building.

Realizing this, **Fantech deems it unacceptable to use central HVAC system equipment and duct work for treatment and conveyance of makeup air.**

Reasons for this include:

- Furnace manufacturers often limit the temperature of air entering the heat exchanger to no less than 50-55°F. The equipment warranty could be voided if the limit is broken.
- Residential HVAC heating and cooling systems typically cycle on/off with one or two stages of capacity on a signal from the space thermostat. To put it another way, the central HVAC system is intended to maintain a condition in the living space, and it only operates when the living space condition becomes uncomfortable. Since makeup air comes directly from outdoors, it is often quite uncomfortable. The uncomfortable makeup air would be conditioned only when the space thermostat is calling for action.
- The temperature difference between the indoor condition and the outdoor condition can at times be significant. Cold makeup air could cause the formation of condensation on the exterior of poorly insulated duct work and equipment. Very humid makeup air could result in condensation on the interior of poorly insulated duct work and equipment.



Make a scan of the QR code above to access Fantech’s warranty in English, French, or Spanish. Includes a 5y warranty.

If additional support is needed to retrieve the warranty, visit fantech.net; call (800) 747-1762 (US), (800) 565-3548 (Canada), or +52 55 1328-7328 (Latin America); email support@fantech.net; or mail us at 10048 Industrial Blvd, Lenexa, KS 66215 United States or at 50 Kanalläkt Way, Bouctouche, NB E4S 3M5 Canada.

Makeup Air System Components

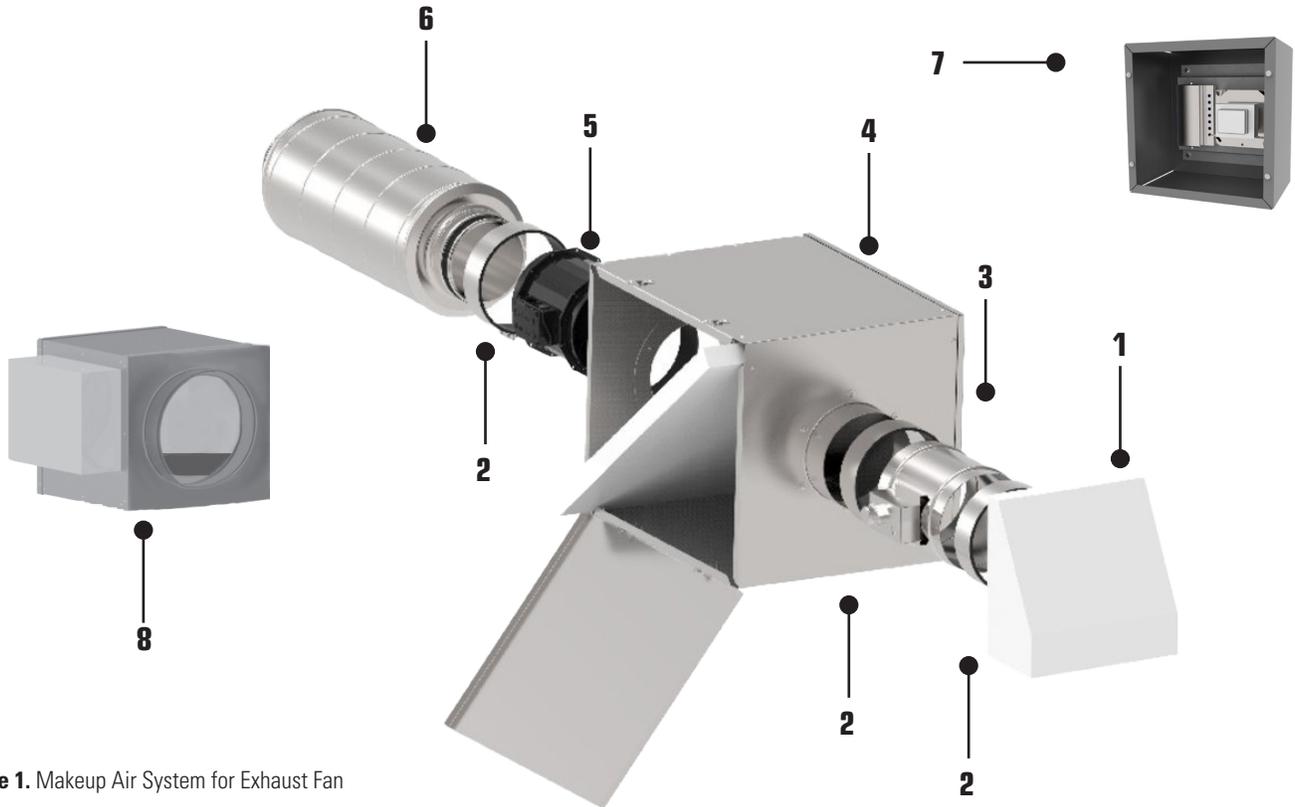


Figure 1. Makeup Air System for Exhaust Fan

1	Wall Intake Hood, FML	5	Makeup Air Fan
2	Fast Clamp, FC	6	Silencer, LD
3	Shut-off Damper, ADC	7	Controller, FMAC*
4	Filter cassette, FGR HV	8	Makeup Air Heater (Optional)



*The FMAC Controller includes a transducer, system control board, 24V transformer, NEMA enclosure, enclosure back plate for mounting transformer and controller, 4" x 4" electrical box for supporting the transformer.

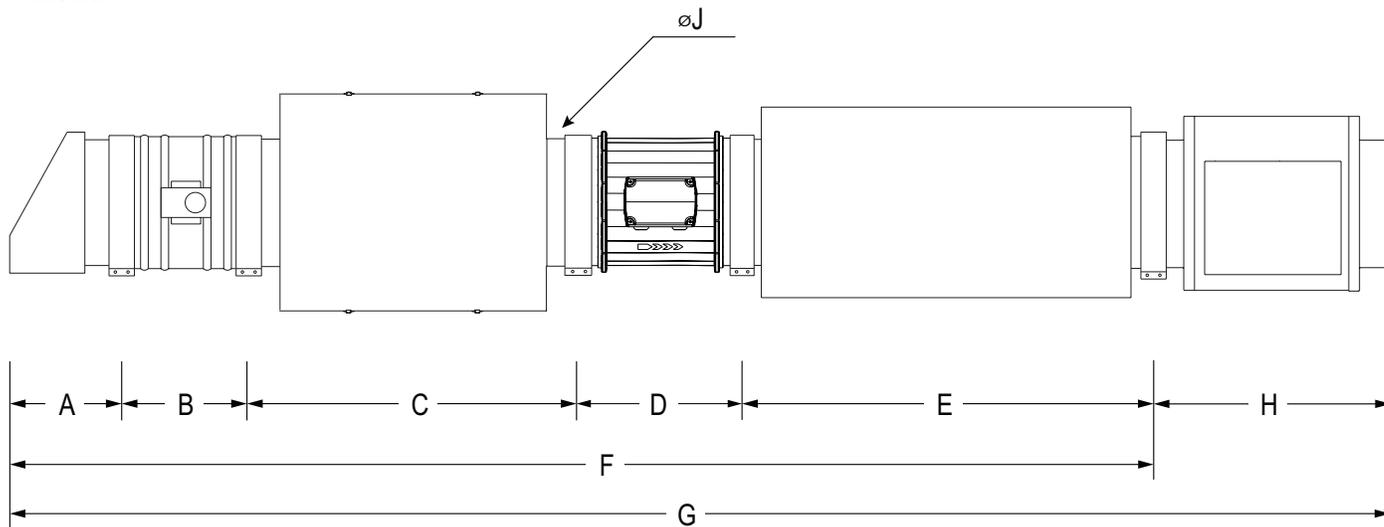


Items Which Must Be Furnished By Others:

- a. Insulation
- b. Wiring
- c. Electrical Wiring Boxes
- d. Equipment Supports/Hangers
- e. Duct work
- f. Electrical Disconnect Means
- g. Miscellaneous Hardware and Any Other Items not described in this document

Dimensions

MUAS



Model	A	B	C	D	E	F	H (optional)	G	J
MUAS 750	10	10	30 1/2	7 7/8	26 5/8	85	14	99	8
MUAS 1200	10	10	30 1/2	9 13/16	38 1/2	98 13/16	14	112 13/16	10

Dimensions are in inches.

Makeup Air System Installation

Read all instructions before starting installation.

Low voltage wiring should be routed the shortest distance possible to avoid unnecessary voltage drop.

The current transducer wire shall be a minimum 20 AWG twisted pair. The current transducer and all control wires shall be kept away from high voltage wiring to avoid signal interference.

Recommended ambient operating temperature range for the MUAS is -20°F (28.8°C) to 140°F (60°C). We recommend that the installer insulate the entire length of the MUAS and all duct work connected to the system to prevent condensation from forming.

The installer is responsible to ensure that air entering gas/oil heat exchangers is 55°F (12.8°C) or greater and that air contacting water pipes or water coils will not cause freezing.

The 240V electric heater component (optional) must be installed on a properly sized, dedicated electrical circuit. The supply fan and FMAC transformer may be powered via a shared electrical circuit.

Installation Steps:

Each system component must be individually secured to the building structure.

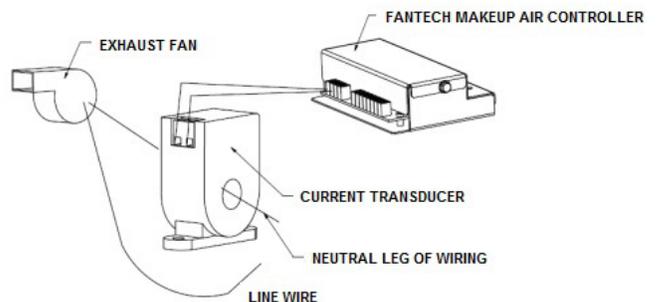
DO NOT ENERGIZE THE POWER TO ANY SYSTEM COMPONENT UNTIL THE ENTIRE SYSTEM HAS BEEN INSTALLED AND IS READY FOR SETUP AND STARTUP.

1. Install intake hood component per its instructions. Take care to locate the intake appropriately on an exterior wall. Mind the warning and caution statements in this document.
2. Install the motorized damper component per its instructions, and connect it to the intake hood with a fast clamp. The damper is furnished with a 24V AC motor; the damper control method is power open and spring closed.
3. Install the filter module component per its instructions. Connect the filter module to the motorized damper with a fast clamp. Make sure the filter is accessible for cleaning and replacement.
4. Install the supply fan component per its instructions. Connect the supply fan to the filter module with a fast clamp and a duct transition (if necessary). The supply fan should be installed and mechanically supported to reduce the transmission of fan/motor vibration to the building structure.
5. Install the duct silencer component connecting to the supply fan with a fast clamp.
6. Install the optional electric heater component (if included) per its instructions. Instructions which are located in the optional heater box carton.
7. 8 / 6 kW heater is Stelpro model SDHR8-6K-240VIP-CIR017-OTDD-OEMK-1
10 / 10 kW heater is Stelpro model SDHR10-10K-240VIP-CIR017-OTDD-OEMK-1
12 / 10 kW heater is Stelpro model SDHR12-10K-240VIP-CIR017-OTDD-OEMK-1
12 / 20 kW heater is Stelpro model SDHR12-20K-240VIP-CIR017-LOTDD-OEMK-1
Default operating mode Setting is W1.
Default temperature setting is 60°F.
8. Install additional supply ductwork (if necessary). Other suitable supply

duct systems exist. It is recommended that the supply makeup air not be provided directly to an occupied living space where thermal discomfort and objectionable noise could result. Be mindful of the effect that the newly installed quantity of outdoor air will have on the central HVAC system. Coordinate efforts with the HVAC contractor to ensure compatibility.

9. Insulate all MUAS components located where condensation could form on cold surfaces, including all duct work connected to the system.
10. Install the FMAC's 24V transformer onto the included 4"x 4" electrical box. Install the FMAC's controller and transformer w/ 4 x 4 box onto the included back plate. Install the back plate into the included NEMA enclosure. Secure the NEMA enclosure to the building structure in a convenient, moisture-free, interior location near the MUAS.
11. Install the FMAC's current transducer onto the neutral leg of the wiring for the compensated exhaust fan (by others). The current transducer must be installed close to the exhaust fan if not a dedicated circuit. Install low voltage wire between the current transducer and the FMAC's makeup air controller. Reference the wiring diagram in Figure 5 for wiring termination locations.

Figure 2. Current Transducer Wiring & Installation



12. Install low voltage wire between the transformer and FMAC's makeup air controller. Reference the wiring diagram in Figure 5 for wiring termination locations. Provide 120/1/60 electrical power to the transformer.
13. Provide 240/1/60 electrical power to the heater (optional, if included) on a dedicated circuit. Reference the wiring diagram in Figure 5 for wiring termination locations. The 10 kW heater uses 41.7 Amps and the 20 kW heater uses 83.3 Amps.
14. Provide 120/1/60 electrical power to the supply fan. Install wiring per all applicable codes. Refer to the wiring diagram in Figure 5 for wiring termination locations.
15. Remove the 3-pronged potentiometer from the wiring terminal block of the makeup air fan. The 3-pronged potentiometer will not be used for the MUAS. Install low voltage wiring between the FMAC's makeup air controller and the makeup air fan. Refer to the wiring diagram in Figure 5 for wiring termination locations.
16. Install low voltage wiring between the FMAC's makeup air controller and the ADC shut-off damper. Refer to the wiring diagram in Figure 5 for wiring termination locations.

Controller Operation and System Wiring

When the FMAC's controller receives a signal from the current transducer that the compensated exhaust fan is operating, the FMAC controller's outputs will be activated.

The controller will provide a 24VAC signal to power the motorized damper to the open position.

The controller will provide a 0-10VDC signal to the makeup air supply fan to operate the fan at a speed proportional to the compensated exhaust fan's speed.

The controller will provide a 24VAC signal to enable the optional duct heater (if included). Note that the duct heater includes its own operational sequence, and will only operate if first enabled by the FMAC controller, and then only if the supply air temperature requires that heat be added.

Heater (Optional) Default Settings

Fantech recommends that the default mode be set on W1 and the default temperature be set at 60°F.

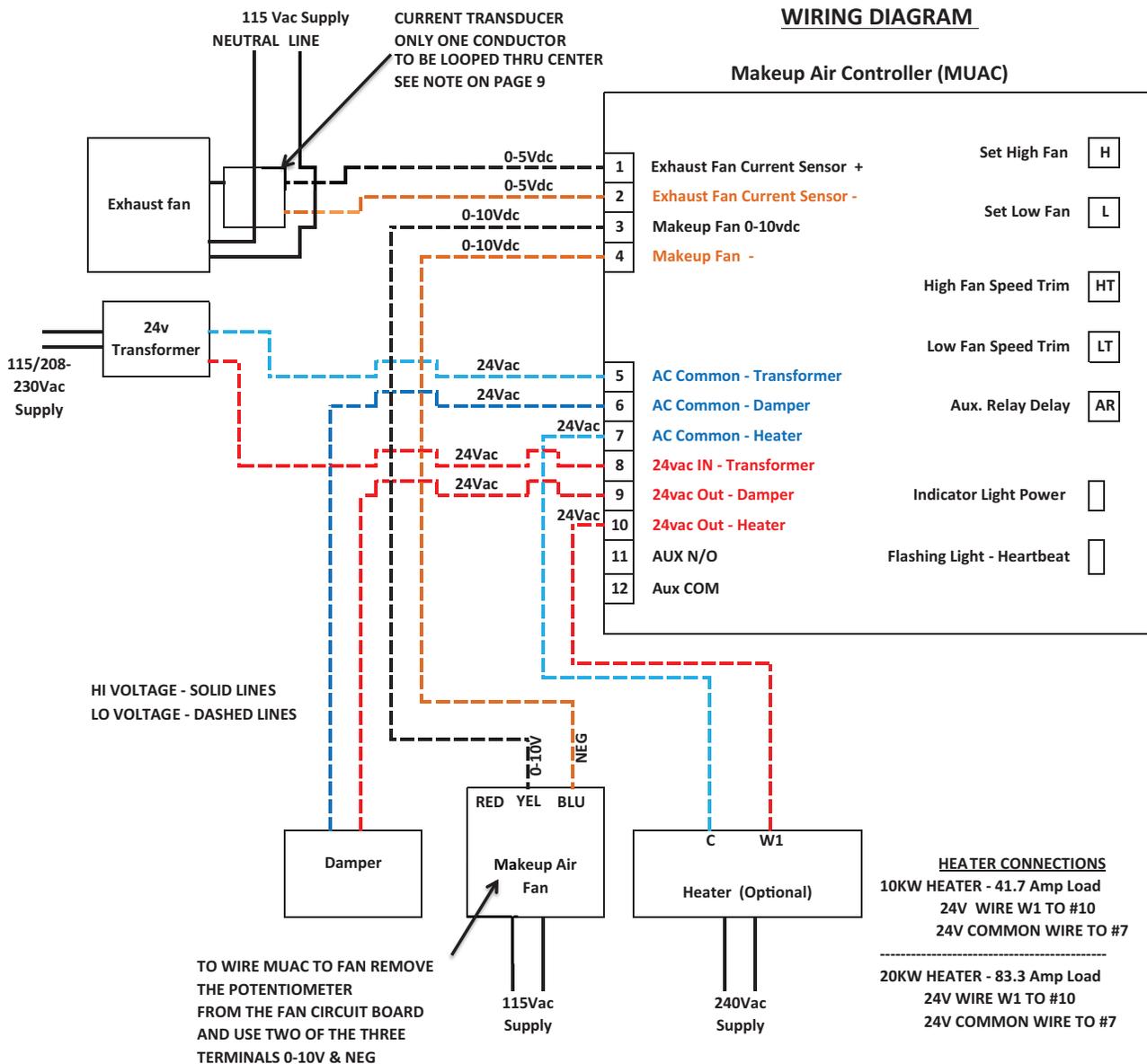
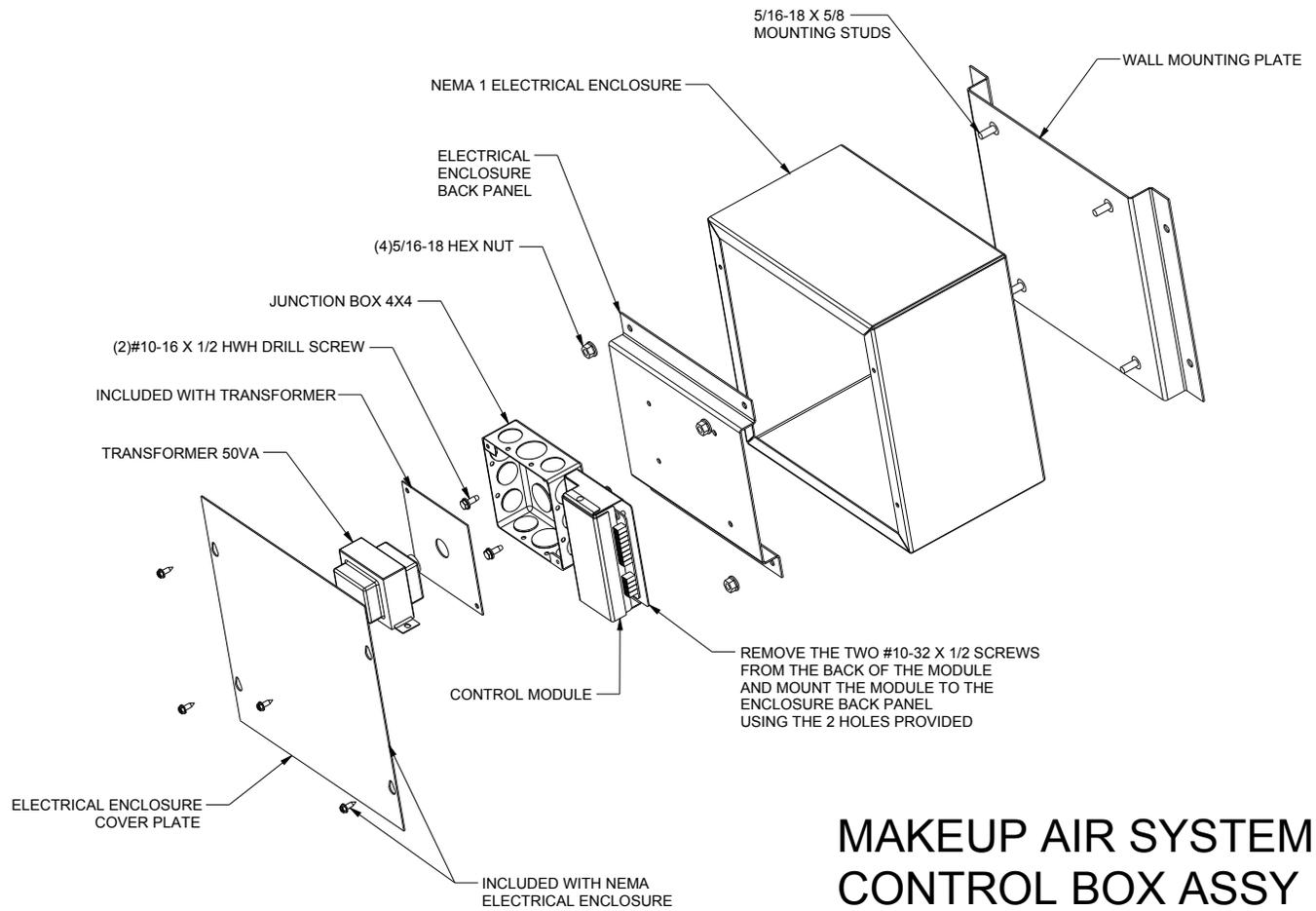


Figure 5. System Wiring Diagram

MUAS Control Enclosure



Notes

All wiring is by others. Wiring terminations for each component are contained in their respective installation instructions.

Placement of components is up to the discretion of the installing contractor.

For applications with small current loads (such as less than 2 Amps), wrap the monitored conductor through the sensor aperture several times to increase the current measured by the sensor.

Example: Exhaust fan amperage rating of 2 amps.

One pass through the CS650-10 aperture V output is approx. 1Vdc
 Five passes through the CS650-10 aperture V output is approx. 5 V DC
 Keeping the amperage reading close to 10 Amps, will increase your systems accuracy.



Always monitor the neutral wire of the exhaust fan motor. This will allow proper amperage readings of variable as well as multi-speed exhaust fans.

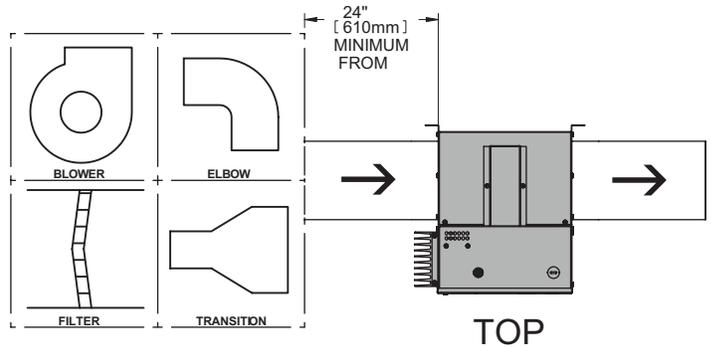
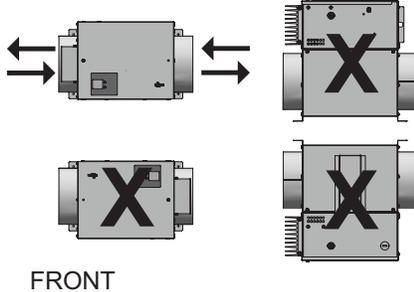
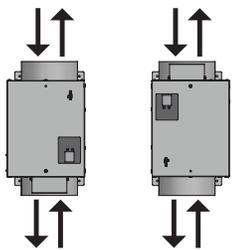
Optional Heater

Installation Configuration & Clearances

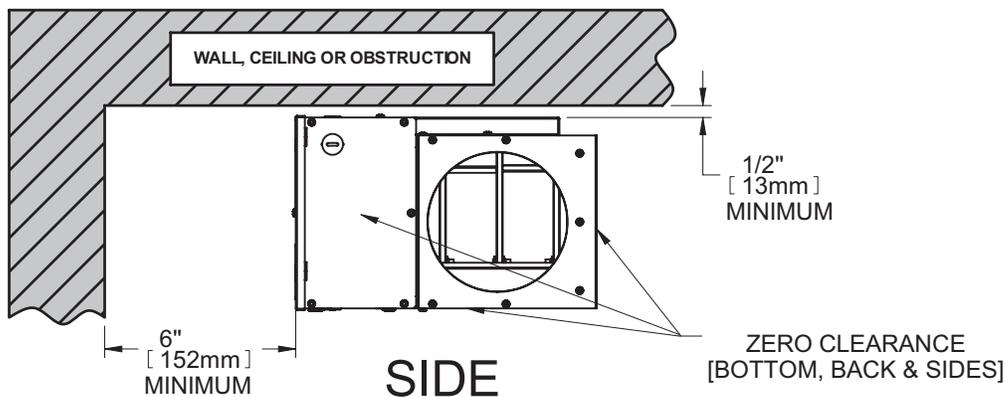
Vertical Flow

Horizontal Flow

Minimum distance to avoid overheating of the elements

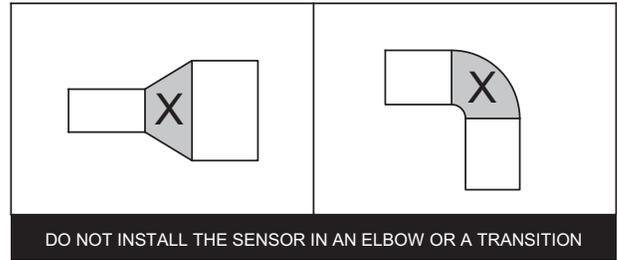
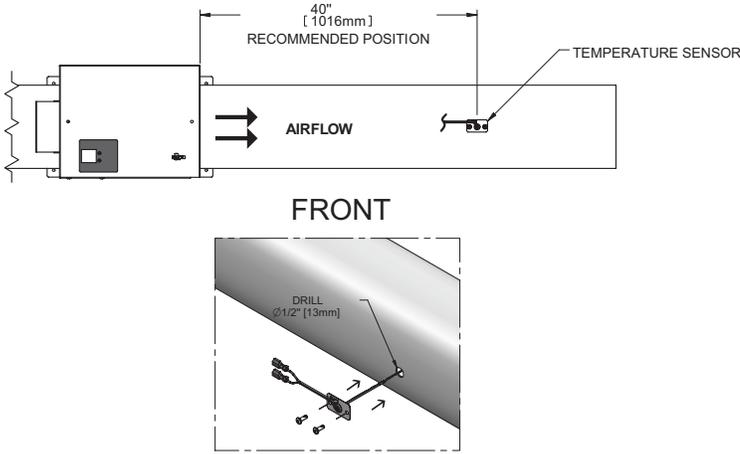


Clearance



Do not install an access panel in the duct any closer than 24" before or after the heater element. Follow local codes for installing this heater.

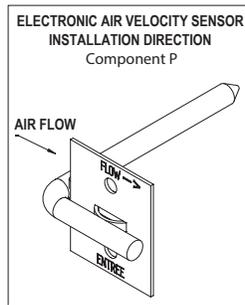
Sensor - Temperature Sensor Installation



ELECTRONIC AIR VELOCITY SENSOR Component P

This sensor must be positioned upstream of the coil according to the air flow direction in the ventilation duct, as shown.

This sensor measures air velocity in the duct. If it is less than 100 ppm, the coil stops heating.

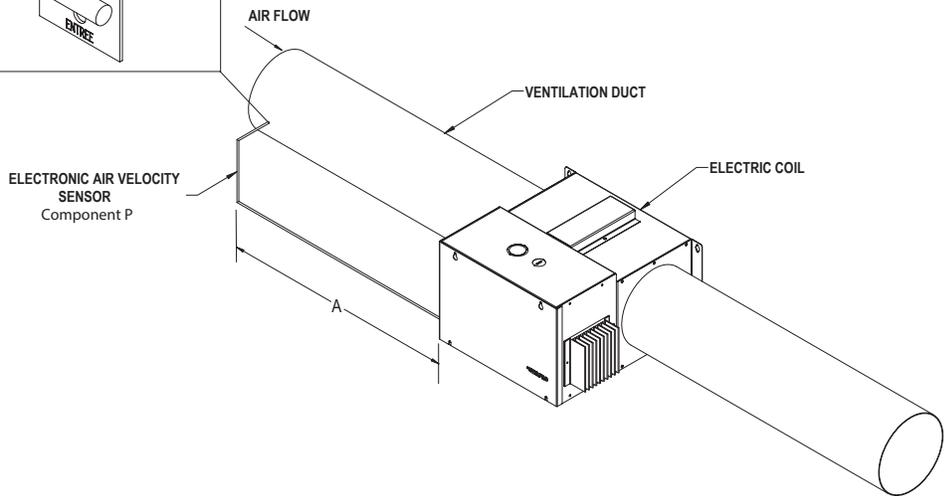


SENSOR #	LENGTH
SEN-005"	60" (5 ft)
SEN-012"	180" (15 ft)

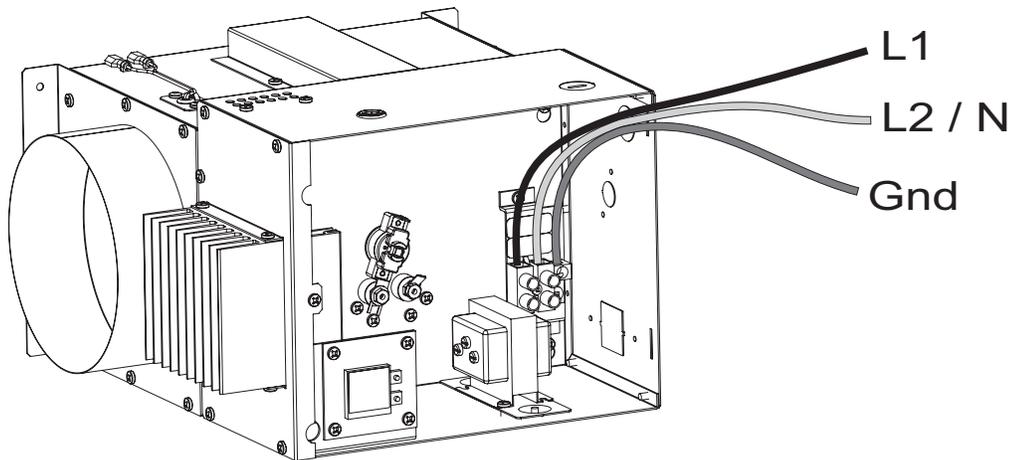
*COMPATIBLE WITH CIR-047, CIR-048, CIR-017 AND CIR-011

MINIMUM INSTALLATION DISTANCE BEFORE THE COIL

Power	A
12 KW or less	10 in.
more than 12 KW	40 in.



Electrical Connection



 The heater does not come with a disconnect switch, the power should be turned off from the main electrical panel (circuit breaker) before servicing the unit.

Fantech reserves the right to make technical changes.
For updated documentation please refer to www.fantech.net

Fantech®