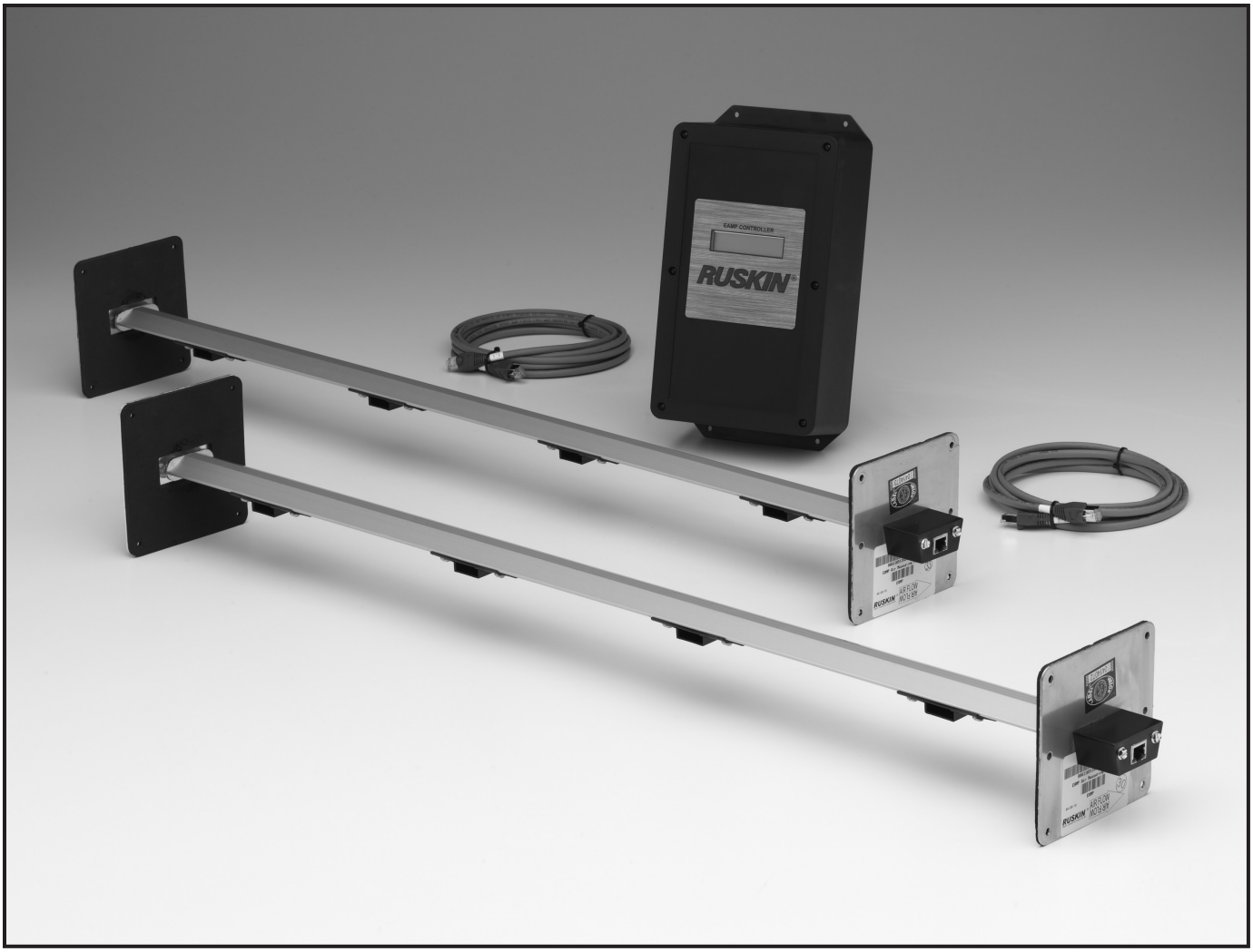
RUSKIN®

Air Quality Solutions

Installation & Maintenance Manual



Model: EAMP

Electronic Air Measuring Probe with EAMP020 Electronic Controller

II-EAMP-815/Replaces II-EAMP-615

EAMP Thermal Dispersion Probe Airflow Measuring System
Installation Instructions

APPLICATIONS

The Ruskin EAMP Thermal Dispersion Probe and EAMP020 Electronic Controller is an air measurement system that uses thermal dispersion technology to measure the airflow velocity and temperature in duct and plenum applications. Insertion probes are typically installed in retrofit applications but may also be specified on new construction projects.

The product may be used in rectangular, oval or round applications when installed in accordance with this installation manual. Use behind a rain hood, in front of an outside air damper, return air duct, downstream of a fan discharge or in the exhaust duct.

NORTH AMERICAN EMISSIONS COMPLIANCE

United States

This equipment has been tested and found to comply with the limits for a Class A digital device pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when this equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his/her own expense.

Canada

This Class (A) digital apparatus meets all the requirements of the Canadian Interference-Causing Equipment Regulations.

Cet appareil numérique de la Classe (A) respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.

INSTALLATION

WARNING: Risk of Electric Shock

Disconnect power supply before making electrical connections. Contact with components carrying hazardous voltage can cause electrical shock and may result in severe personal injury or death.

IMPORTANT: Only a qualified service technician should install this system. To avoid unsatisfactory operation or damage to the product, strictly follow the instructions provided and do not substitute parts. Damage to the product resulting from not following the instructions or using unauthorized parts may be excluded from the manufacturer's warranty coverage.

MOUNTING

The sensor density is based on extensive lab testing to optimize the accuracy of the Electronic Controller. When installing the thermal dispersion probe(s), use the *Square Duct Mounting, Round Duct Mounting and Oval Duct Mounting* sections to determine the proper spacing between each probe within the opening. Contact your local Ruskin representative if you have questions regarding a particular application.

Location Considerations

IMPORTANT: The thermal dispersion probe(s) may be installed in the vertical or horizontal plane of the duct. Use vertical installation for fan discharge applications. In vertical mount applications where moisture is possible, mount the multiplexer on the top. In horizontal mount applications, mount the probes so that the plastic sensor shrouds are on the bottom of the probe.

The minimum spacing between louvers and probes is 6" in the direction of airflow. The minimum spacing between probes and dampers or filter banks is 6" in the direction of airflow. Probes must be upstream of dampers or filters.

IMPORTANT: The Electronic Controller enclosure cover is secured with six Phillips screws. Take care when mounting the Electronic Controller to ensure there is adequate clearance to remove the cover and make electrical connections in the top of the box.

Mount the Electronic Controller inside of an air handling unit or place the Electronic Controller with similar control panels within the structure.

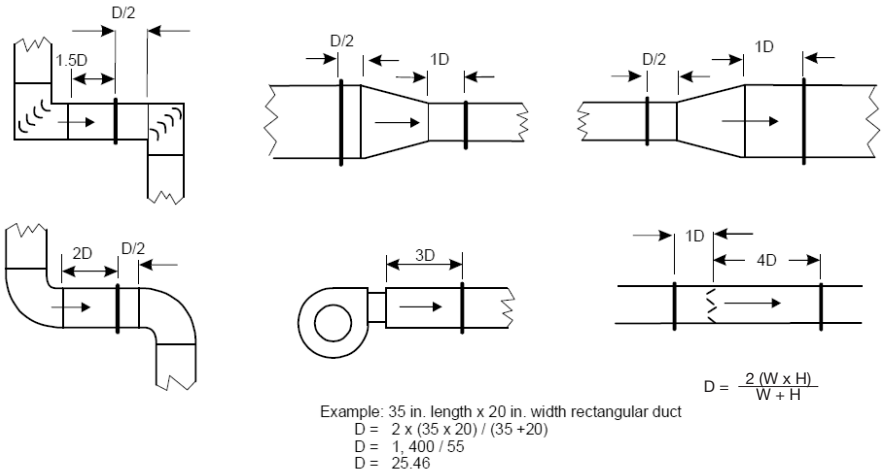
Do not install or store the Electronic Controller outdoors.

Mount the Electronic Controller within 100 feet total cable length of the thermal dispersion probe(s) to prevent voltage drop or distortion between the Electronic Controller and the probe(s). See INSTALLATION.

Mount the EAMP020 Electronic Controller on a flat surface.

MINIMUM MOUNTING DISTANCES

Detail A represents applications for which the EAMP Thermal Dispersion Probe with Electronic Controller is most suitable. If your particular application is not shown, or if you do not have the space to observe the minimum distance, please contact your local Ruskin representative for the best solution. The locations shown on these details represent the minimum clearance from most obstructions that create an airflow disturbance.



Detail A: Minimum Mounting Distances

Note: Ruskin Models AML3 and AML6 outside air measurement louvers are recommended when the air measurement station must be located within 10 ft of the outside air intake.

Wind gusts or sustained wind effects may conflict with attempted air flow measurement of less than 200 FPM (2.3 MPH) especially when the EAMP probes are installed in less than ideal locations (behind existing louvers or in rain hoods). Consider resizing the opening to increase velocity above 200 FPM, adding a separate damper to measure and control the minimum outside air intake, or moving the air measurement station into a more protected location or within ductwork.

INSERTION MOUNTING
(Duct & Plenum Applications)

INTERNAL MOUNTING
(Plenum Applications)

STAND-OFF MOUNTING
(Damper Face Applications)

Probe Mounting

Ruskin's EAMP series probes may be installed in square, round or oval ducts and plenums. The insertion style mounting bracket is standard but the probes also come with an internal mounting and stand-off mounting options for applications that require probes mounted inside of a plenum, or on the air entering face of a Ruskin model CD50 or CD60 damper (damper sold separately).

SQUARE DUCT MOUNTING

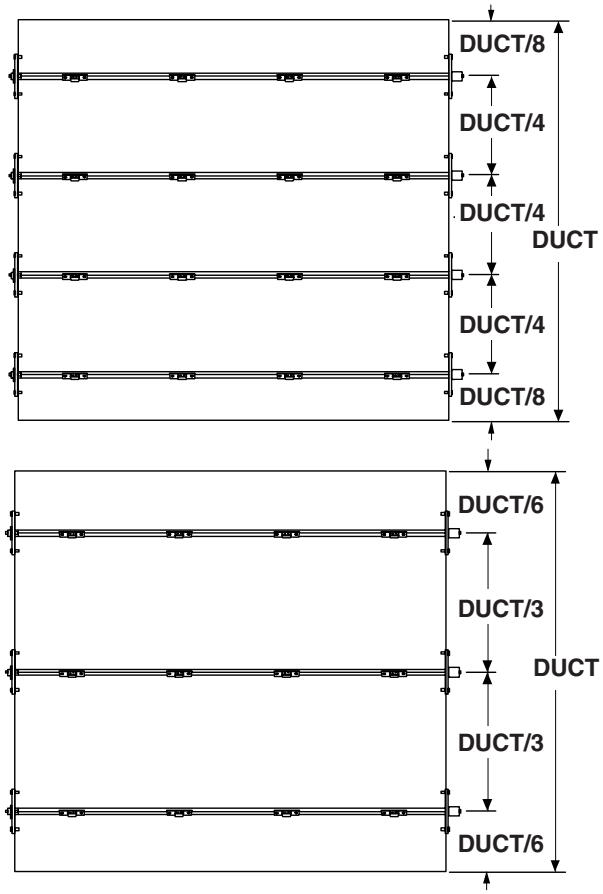


Figure 1: Rectangular Duct Mounting - Three and Four Probe Configurations

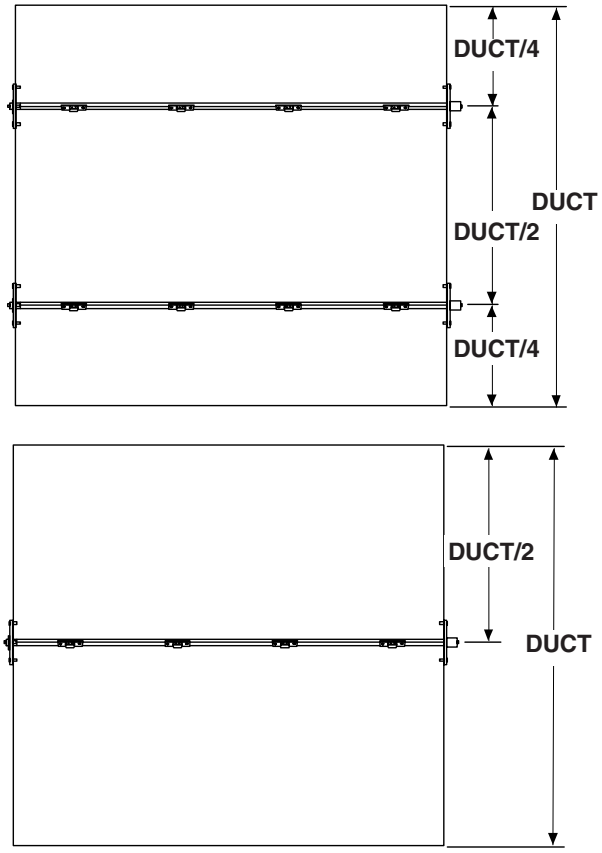


Figure 2: Rectangular Duct Mounting - One and Two Probe Configurations

Table 1: Number of Probes/Sensors per Probe for Rectangular Duct Applications

DUCT HEIGHT "B"	DUCT WIDTH "A"														
	12" (305)	18" (457)	24" (610)	30" (762)	36" (914)	42" (1067)	48" (1219)	54" (1372)	60" (1524)	66" (1676)	72" (1829)	84" (2134)	96" (2438)	108" (2743)	120" (3048)
12" (305)	2/2	2/2	1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/4
18" (457)	2/2	2/2	2/2	2/2	2/3	2/3	2/3	2/3	2/3	2/4	2/4	2/4	2/4	2/4	2/4
24" (610)	2/2	2/2	2/3	2/3	2/3	2/3	2/4	2/4	2/4	2/4	2/4	2/4	2/4	2/4	2/4
30" (762)	2/2	3/2	3/2	2/3	2/3	2/4	2/4	2/4	2/4	2/4	2/4	2/4	2/4	2/4	2/4
36" (914)	2/2	3/2	3/2	3/2	2/4	2/4	2/4	2/4	2/4	2/4	2/4	2/4	2/4	2/4	2/4
42" (1067)	3/2	3/2	3/2	3/3	4/2	3/4	3/4	3/4	4/4	4/4	4/4	4/4	4/4	4/4	4/4
48" (1219)	3/2	3/2	4/2	4/2	4/3	4/3	4/4	4/4	4/4	4/4	4/4	4/4	4/4	4/4	4/4
54" (1372)	3/2	3/2	4/2	4/2	4/3	4/3	4/4	4/4	4/4	4/4	4/4	4/4	4/4	4/4	4/4
60" (1524)	3/2	3/2	4/3	4/3	4/3	4/4	4/4	4/4	4/4	4/4	4/4	4/4	4/4	4/4	4/4
66" (1676)	3/2	4/2	4/3	4/3	4/4	4/4	4/4	4/4	4/4	4/4	4/4	4/4	4/4	4/4	4/4
72" (1829)	3/2	4/2	4/4	4/4	4/4	4/4	4/4	4/4	4/4	4/4	4/4	4/4	4/4	4/4	4/4
84" (2134)	4/2	4/2	4/4	4/4	4/4	4/4	4/4	4/4	4/4	4/4	4/4	4/4	4/4	4/4	4/4
96" (2438)	4/2	4/3	4/4	4/4	4/4	4/4	4/4	4/4	4/4	4/4	4/4	4/4	4/4	4/4	4/4
108" (2743)	4/2	4/3	4/4	4/4	4/4	4/4	4/4	4/4	4/4	4/4	4/4	4/4	4/4	4/4	4/4
120" (3048)	4/2	4/3	4/4	4/4	4/4	4/4	4/4	4/4	4/4	4/4	4/4	4/4	4/4	4/4	4/4

NOTE: Probes are made in the WIDTH dimension. Higher sensor density can be accomplished by ordering probes from Table 1 for a taller (than actual) opening to obtain the desired sensor density.

ROUND DUCT MOUNTING

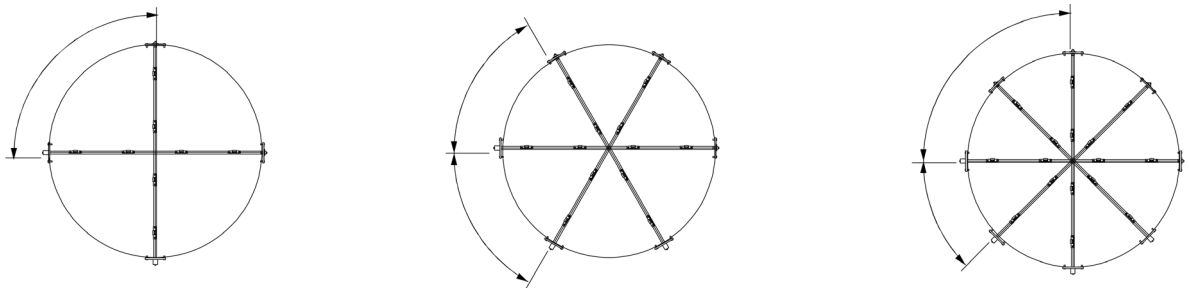


Figure 3: Round Duct Mounting - Two, Three and Four Probe Configurations

Duct Diameter, In. (mm)	No. of Probes/No. of Sensors Per Probe
12" (305)	2/2
18" (457)	2/2
24" (610)	2/2
36" (914)	2/4
42" (1067)	2/4
48" (1219)	3/4
60" (1524)	4/4
72" (1829)	4/4
96" (2438)	4/4
120" (3048)	4/4

Table 2: Number of Probes/Sensors per Probe for Round Duct Applications

OVAL DUCT MOUNTING

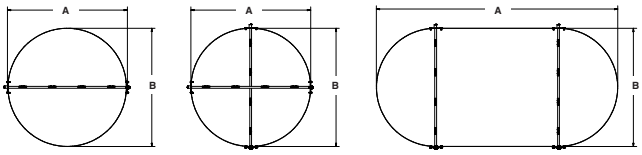


Figure 4: Oval Duct Mounting - One and Two Probe Configurations

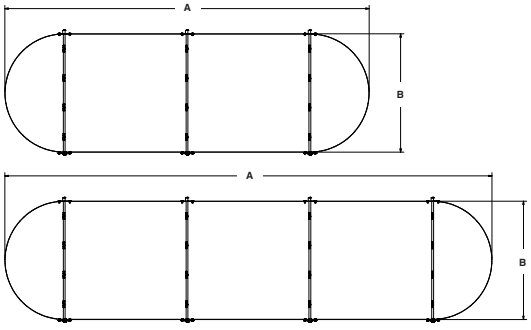


Figure 5: Oval Duct Mounting - Three and Four Probe Configurations

Duct Height, in. (mm)	Duct Width, in. (mm)									
	12" (305)	**18"** (457)	**24"** (610)	**36"** (914)	**42"** (1067)	**48"** (1219)	**60"** (1524)	**72"** (1829)	**96"** (2438)	**120"** (3048)
12" (305)	2/2	2/2	1/3	1/3	3/2	3/2	4/2	4/2	4/2	4/2
18" (457)		2/2	1/3	1/3	3/2	3/2	4/2	4/2	4/2	4/2
24" (610)			2/2	2/3	3/2	3/2	4/2	4/2	4/2	4/2
36" (914)				2/4	3/3	3/3	4/3	4/3	4/3	4/3
42" (1067)					2/4	3/3	4/3	4/3	4/3	4/3
48" (1219)						3/4	4/4	4/4	4/4	4/4
60" (1524)							4/4	4/4	4/4	4/4
72" (1829)								4/4	4/4	4/4
96" (2438)									4/4	4/4
120" (3048)										4/4

*Probes run vertically in “B” dimension (height of opening).

SQUARE DUCT MOUNTING FOR LOW SENSOR DENSITY PROBES

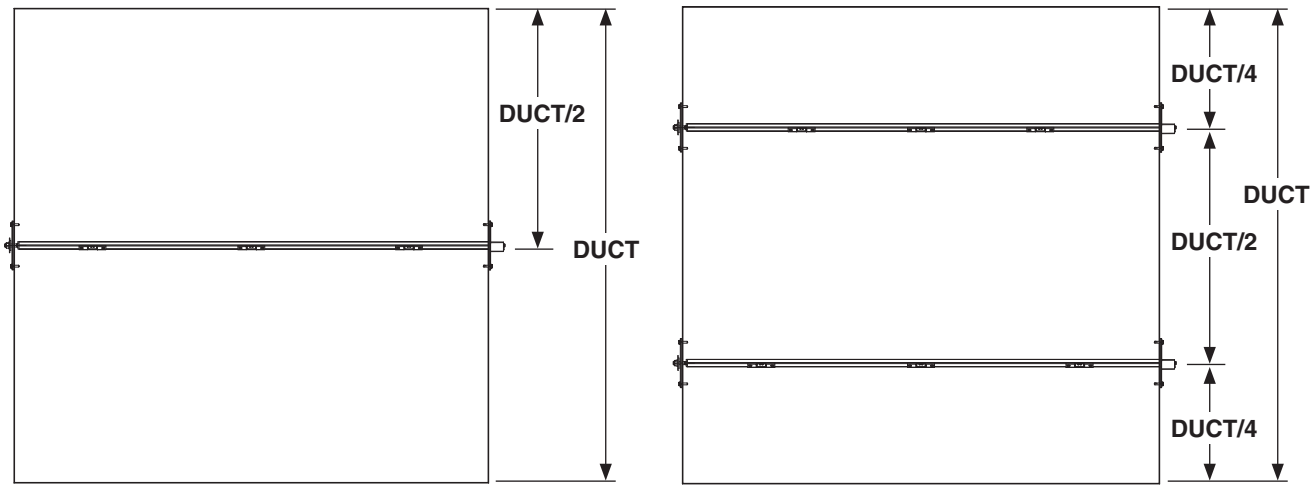


Figure 6: Rectangular Duct Mounting - One and Two Probe Configurations

Detail A page 3 represents minimum required upstream and downstream spacing. In rectangular duct, when space available is greater than shown on Detail A, you may use Table 4, Low Sensor Density.

Table 4: Number of Probes/Sensors per Probe for Rectangular Duct Applications

DUCT HEIGHT, in. (mm)	DUCT WIDTH, in. (mm)												
	12" (305)	**18"** (457)	**24"** (610)	**30"** (762)	**36"** (914)	**42"** (1067)	**48"** (1219)	**54"** (1372)	**60"** (1524)	**66"** (1676)	**72"** (1829)	**84"** (2134)	**96"** (2438)
12" (305)	1/3	1/3	1/3	1/3	1/3	1/3	1/3	1/3	1/3	1/3	1/3	1/3	1/3
18" (457)	1/3	1/3	1/3	1/3	1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/4
24" (610)	1/3	1/3	2/2	2/2	2/2	2/2	2/3	2/3	2/3	2/3	2/3	2/3	2/3
30" (762)	2/2	2/2	2/2	2/2	2/2								
36" (914)	2/2	2/2	2/3	2/3									
42" (1067)	2/2	2/2	2/3										
48" (1219)	2/2	2/2											
54" (1372)	2/2	2/2											
60" (1524)	2/2	2/2											
66" (1676)	2/2												
72" (1829)	2/2												
84" (2134)	2/2												

INSTALLATION

IMPORTANT: In addition to these instructions, the installation contractor shall comply with all local and International codes and standards to ensure proper and safe installation.

The thermal dispersion probes and Electronic Controller ship as one air measurement station. Remove the thermal dispersion probe(s) and the Electronic Controller from the shipping containers and inspect the devices for damage before installation. Transmitter and supplied probes are calibrated as a matched set and all probes supplied must be installed.

Installing the Thermal Dispersion Probes (Insertion Mounting)

1. Inspect the duct work and/or opening to ensure no obstructions or irregularities interfere with installation of the probes. See *Mounting* for probe mounting locations. Ensure that adequate clearance exists at the installation site to permit installation and removal of the probe(s).
2. Based on information from Mounting, determine where to mount the probes and mark the hole locations on the outside of the duct or the plenum.
   a. Mark a 3 inch hole (round or square) where each probe will be inserted.
   b. Mark a 2 inch hole on the opposite side of the duct or plenum from the insertion hole.

   Double-check the hole locations before proceeding to next step.
3. Cut 3 inch and 2 inch diameter holes (one set of holes for each probe). For rectangular ducts, if the duct requires three probes, then make three 3 inch holes on one side and three 2 inch holes on the opposite side of the duct/plenum.
4. Remove the mounting plate(s) on the mounting stud end of the probe. Keep the nut(s) and washer(s) for next step.
5. Holding the multiplexer end of the probe (the end with the black box on it), insert the mounting stud end of each probe into the 3 inch holes until the probe mounting stud extends through the 2 inch holes in the opposite side of the duct.

   Note: For horizontal installations, ensure that the sensors are on the bottom of the probe and installed level or sloped slightly away from the multiplexer (connector end) of the probe.
6. With the probe(s) in place, go to the other side of the duct/plenum, and install the mounting plate(s) onto the stud(s). With the stud centered in the 2 inch hole, place the mounting bracket over the stud, followed by the nut and washer. Tighten the nut and washer against the mounting plate. Do not over tighten.

   Note: Do not place screws in the four corner holes of the mounting plate(s) in this step.
7. Measuring from the top of the duct, locate the center of each probe stud to the dimension indicated in Mounting. Once the stud is centered on the proper location, secure the mounting plate with four self-drilling screws. Repeat this step for each probe in the duct/plenum.
8. Moving back to the multiplexer side of the duct, measure from the top as in the previous step to center the multiplexer on the height dimension. The multiplexer end should be the same distance from the top of the duct/plenum as the center of the mounting stud on the opposite side (within +0/-½ inch). Once the multiplexer end has been positioned, secure the mounting plate with four self-drilling screws.
9. When using stand off mounting brackets, mount probes onto the face of a damper on the air entering side, upstream from the damper.

IMPORTANT: Install the probes with the mounting plates square and without twisting or bending.

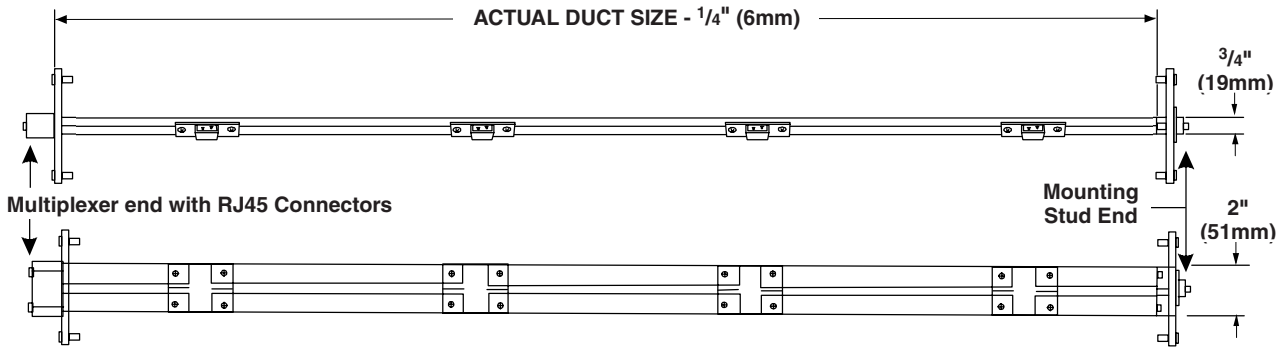
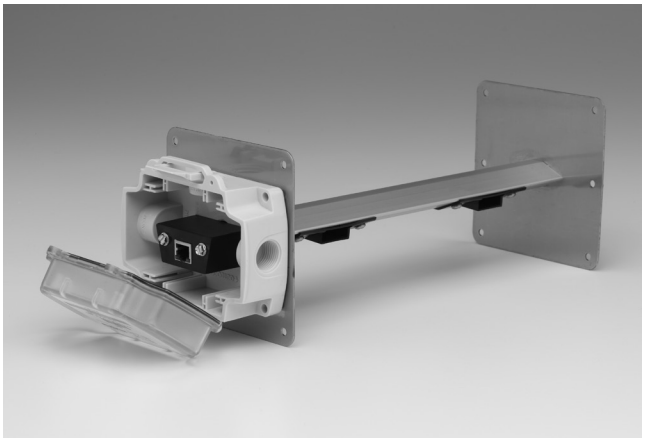


Figure 7: Thermal Dispersion Probe

IMPORTANT: When probe multiplexers are exposed to the outdoor environment, the National Electrical Manufacturers' Association (NEMA) Type 4 weathershield option is required.



Installing the Ruskin EAMP020 Electronic Controller

1. Securely mount the Electronic Controller on a wall near the probe(s). Use four field-supplied fasteners to mount the enclosure in an appropriate location. Use fasteners suitable for the wall material.
2. Remove the cover plate.
3. Remove the appropriate conduit plugs on the top of the Electronic Controller for connection of the field wires to the circuit board terminal blocks (see Figure 9).
4. Wire the supply power and outputs. See *Wiring*.

IMPORTANT: Tests show that fluctuating, erratic and inaccurate signal levels are possible when AC power wiring is present in the same conduit as the signal lines. Mount the Electronic Controller and run wiring away from variable frequency drives (VFD's) and broadcast antennas. Avoid running this device's wiring in the same conduit as AC power wiring or with wiring used to supply highly inductive loads such as motors, contactors and relays.

IMPORTANT: Shorter cable lengths are better. Mount the Electronic Controller within 50 feet of a 2 probe air measurement station, within 33 feet of a 3 probe air measurement station and less than 25 feet of an air measurement station when 4 probes are being used. Avoid cable loops or coils.

IMPORTANT: Always connect CAT5e cables from the thermal dispersion probes directly to the Electronic Controller. To avoid equipment damage, do NOT connect a router between the probes and the controller.

If replacement cables are needed, they must meet the following spec:

CAT5e cable specs, with simple pairing:

CAT5e solid plenum cable
4-pair shielded, twisted pair cable
24 AWG solid bare copper conductor
Meets or exceeds CAT5e spec
Teflon insulated, plenum jacket
CMP rated for use in any area used for air return, drop ceiling, airducts, and in public buildings
Compliant with EIA/TIA standards by ETL
CSA listed

PIN #	WIRE COLOR
1	WHITE & GREEN
2	GREEN
3	WHITE & ORANGE
4	ORANGE
5	WHITE & BLUE
6	BLUE
7	WHITE & BROWN
8	BROWN

Note: Standard Ethernet cables and crossover cables should not be used because they do not have the correct simple pairing wire terminations.

Controller	Sensor Assignment Number
Left Input	1 through 4
Left Center Input	5 through 8
Right Center Input	9 through 12
Right Input	13 through 16
See PROBE CONNECTION Fig. 9	

WIRING

See Figure 9 for supply power and output connections.

Follow these steps to make wiring connections:

1. Connect dedicated 24 VAC power to Electronic Controller. 75 VA recommended.
   a. Connect 24 VAC hot to 24H + terminal.
   b. Connect 24 VAC common to 24C - terminal.
   c. Negative (-) terminal to be connected to earth ground.
2. Connect 4 to 20 mA velocity and temperature outputs from the Electronic Controller to a Building Automation System (BAS) controller.

Wiring from the 4-20 mA outputs to the Building Automation System (BAS) should be shielded twisted pair of at least 22 AWG. Larger gage wire may be required for long runs. All wiring must comply with applicable codes.

Note: The Electronic Controller provides two 4-20 mA signals to the building automation system. DO NOT APPLY LOOP POWER TO THIS CONTROLLER.

Finishing the Installation

1. Connect a shielded CAT5e cable between the RJ45 connector on each probe (see Figure 7) to an RJ45 connector on the Electronic Controller (see Figure 8), with the metal shielded cable end connected to the controller.

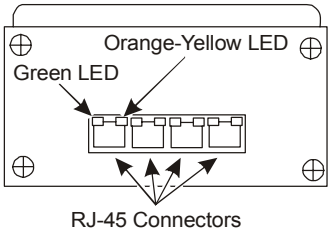


Figure 8: EAMP020 Electronic Controller, Bottom View

2. Move the Electronic Controller's power switch (see Figure 9) to the ON position.
3. Use the LCD Contrast Adjustment screw (see Figure 9) to adjust the LCD contrast as desired:
   - Turn the screw clockwise to increase contrast.
   - Turn the screw counterclockwise to decrease contrast.
4. Use the Initialization Menu to configure the Electronic Controller for your application. See *Setup and Adjustments* for specific instructions.
5. After configuring the Electronic Controller, replace the cover and fasteners.

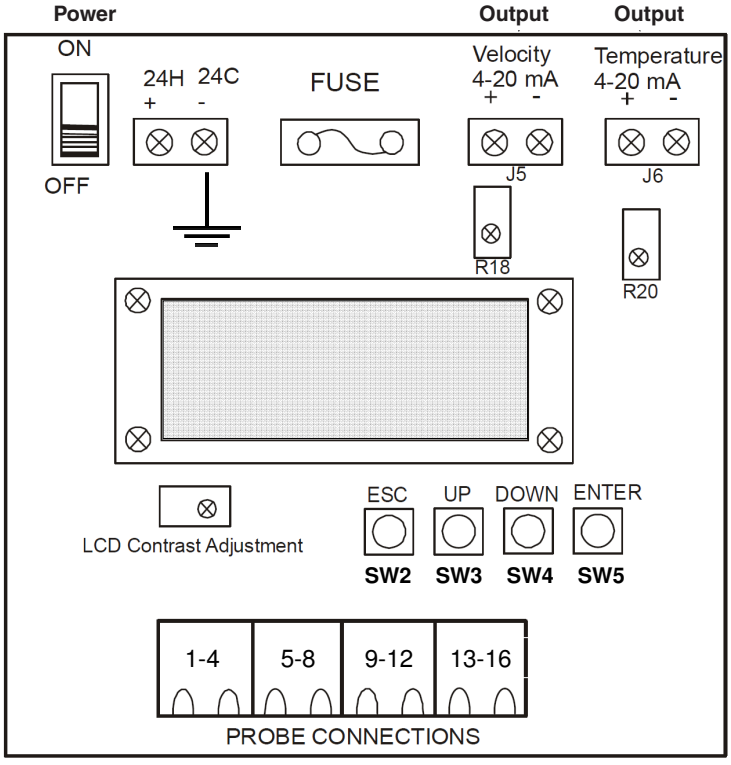
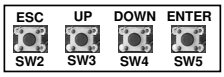


Figure 9: EAMP020 Electronic Controller, Front View

SETUP AND ADJUSTMENTS

Use UP and DOWN (see Figure 9) to scroll through each sensor's velocity and temperature reading. Press ESC on the Electronic Controller to display the average velocity and temperature values.

To access the initialization menu, press and hold both ENTER and ESC on the Electronic Controller until the LCD screen clears.



We recommend setting up the controller using FPM.

Initialization Menu

The initialization menu allows the user to reset factory settings, temporarily deactivate the LCD screen, enable error indication, change units, adjust gain and offset, and set the zero cutoff of the Electronic Controller. See Figure 10.

To scroll through each of the menu options, press UP and DOWN on the Electronic Controller (see Figure 9):

- TEMPERATURE DISPLAY ON/OFF
- RESET SETTINGS
- LCD ON/OFF
- ERROR INDICATION
- TEST SIGNAL
- UNITS
- GAIN
- OFFSET
- ZERO CUTOFF
- DISPLAY VELOCITY OUTPUT FORMULA
- SCALE VELOCITY mA OUTPUT SIGNAL
- ADJUST mA OUTPUT FILTER VALUE

Note: Pressing ESC while in one of the option menus exits the option menu without saving changes and returns to the Initialization menu. To save changes, press ENTER then press ESC.

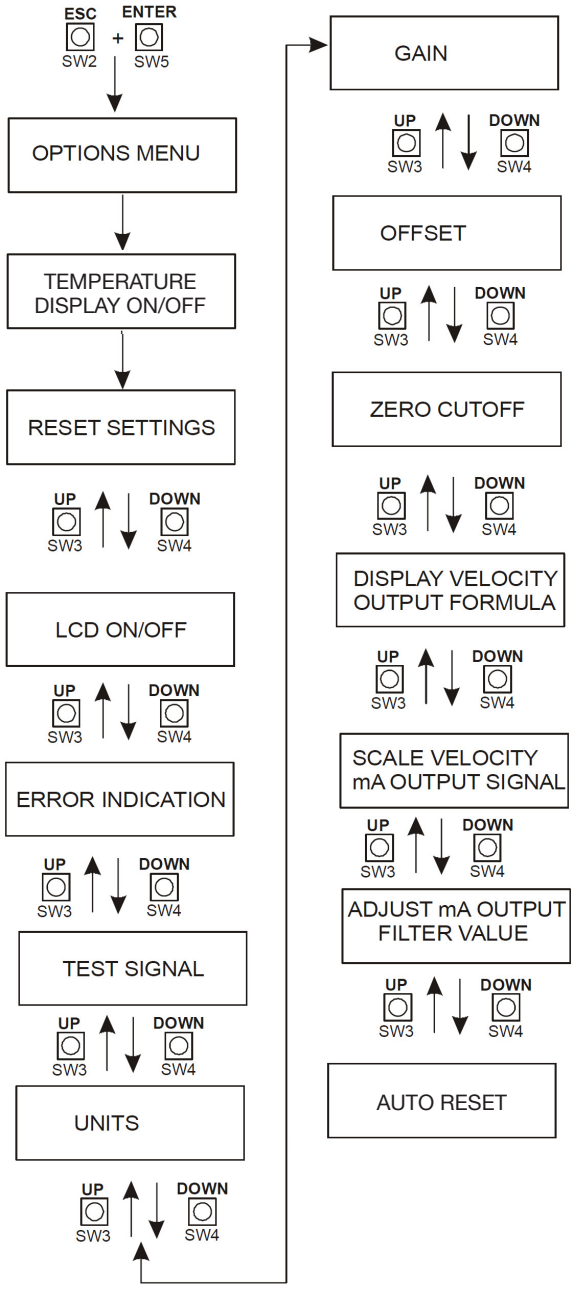


Figure 10: Installation Menu

RESET SETTINGS

This option restores the Electronic Controller to the default factory settings.

Note: If the Electronic Controller has settings other than the default settings, you may want to make note of them before you reset the Electronic Controller. The default values are denoted in Figures 11 through 21 with an asterisk *.

Figure 11	ARE YOU SURE
Figure 12	DISPLAY
Figure 13	ERROR INDICATION
Figure 14	SET TEST SIGNAL
Figure 15	UNIT SYSTEM, VELOCITY UNIT
Figure 16	GAIN VALUE
Figure 17	OFFSET VALUE
Figure 18	CUTOFF VALUE
Figure 19	DISPLAY VELOCITY OUTPUT FORMULA
Figure 20	SCALE VELOCITY mA OUTPUT SIGNAL
Figure 21	FILTER VALUE

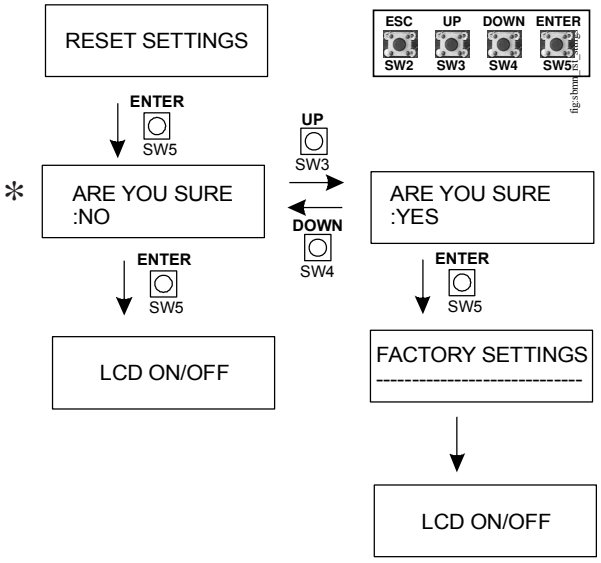


Figure 11: Reset Settings Submenu

TEMPERATURE DISPLAY ON/OFF

This option turns the Temperature Display on the Electronic Controller ON or OFF.

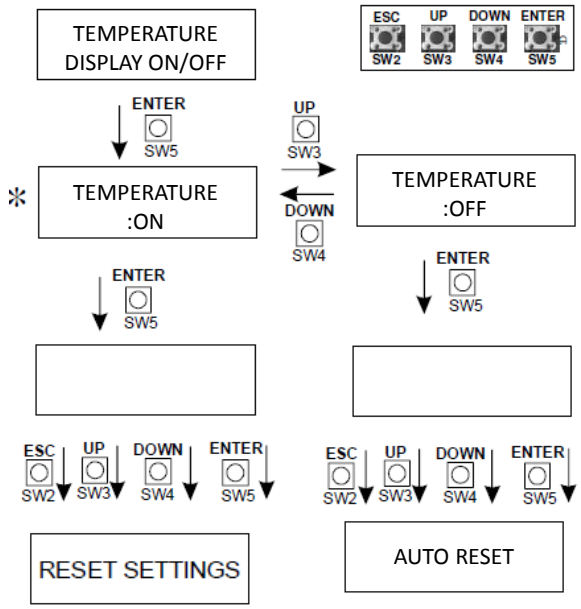


Figure 12: Temp Display ON/OFF Submenu

LCD ON/OFF

This option turns the LCD screen on the Electronic Controller ON or OFF.

Note: Pressing ESC, UP, DOWN, or ENTER reactivates the LCD screen.

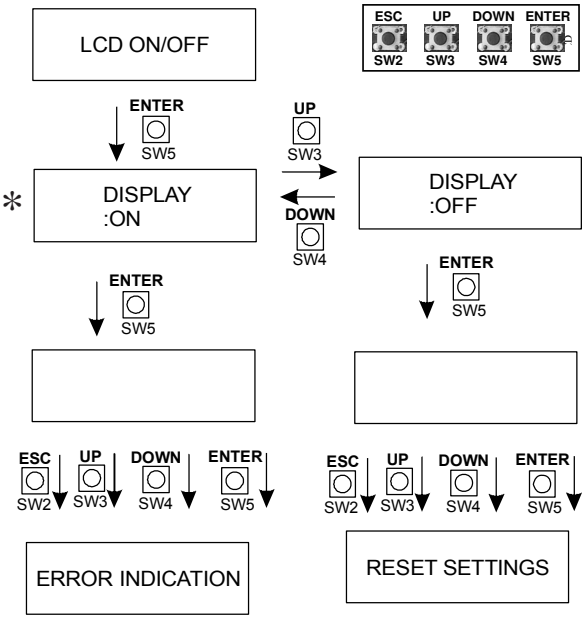


Figure 13: LCD ON/OFF Submenu

ERROR INDICATION

This option activates the error indication on the LCD screen. When an error occurs, the temperature appears as a lowercase letter f (degrees Fahrenheit).

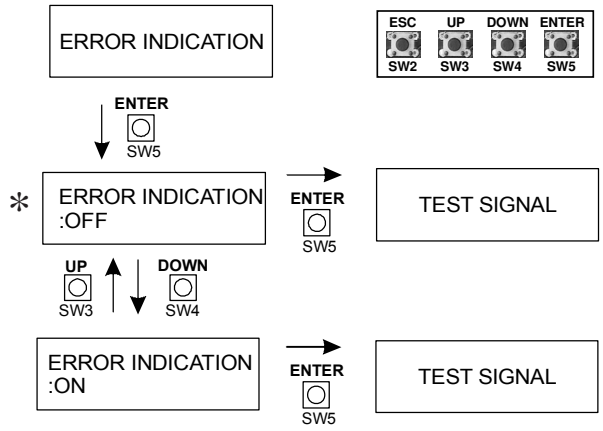


Figure 14: Error Indication Submenu

TEST SIGNAL

This option outputs a fixed 4, 10 or 20 mA value to each 4 to 20 mA output. This test checks the output signal from the Electronic Controller for velocity and temperature. Make sure a user is present at the BAS computer to verify that the appropriate test signal from the Electronic Controller is reaching the BAS.

To turn a test signal ON, press ENTER from the initialization menu to access the TEST SIGNAL options. Use UP and DOWN to select the SET TEST SIGNAL: YES option. Use UP and DOWN to scroll through each of the available fixed output signals (4, 10, or 20 mA). Press ENTER to accept the test output signal and turn the test signal ON. Allow time for signal to stabilize.

To turn the test signal OFF, press ENTER or ESC.

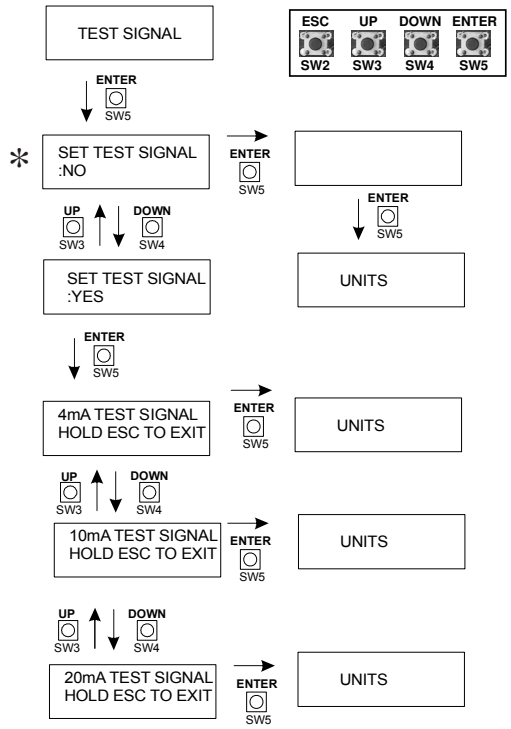


Figure 15: Test Signal Submenu

Note: Connect BAS wiring and verify test signal at BAS and correct automation scaling has been configured. If test signal at BAS does not produce expected results, disconnect BAS wiring and verify the test signal at Electronic Controller with a meter. If test signal at Electronic Controller is not correct, contact factory for additional calibration procedure instructions.

UNITS

This option sets the displayed velocity and temperature unit. To access this menu, press ENTER. The LCD screen states UNIT SYSTEM. Use UP and DOWN to select SI or IU unit systems.

- Select SI for FPM or CFM with temperature in degrees Fahrenheit.
- Select UI for MPS or LPS with temperature in degrees Celsius.

Use UP and DOWN to scroll through the available units. Press ENTER to select the desired unit.

If CFM or LPS is selected, the area is requested on the LCD screen. Use UP and DOWN to adjust the area calculation. Press ENTER to accept the area value.

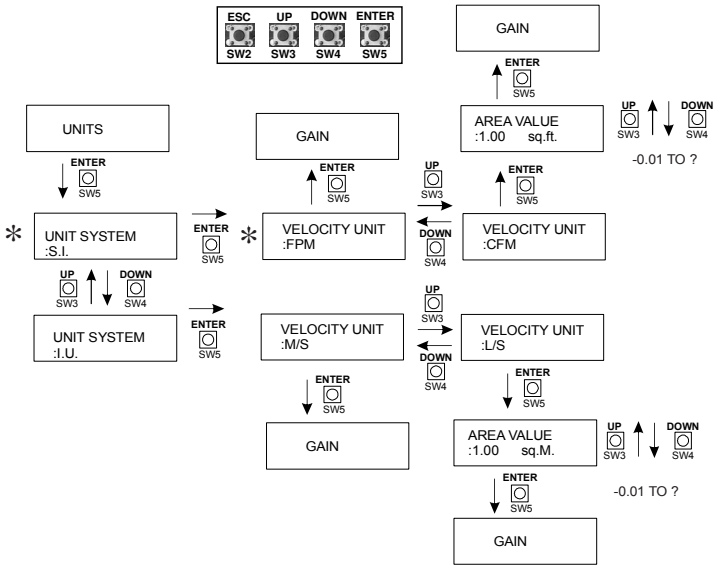


Figure 16: Units Submenu

GAIN

This option adjusts the gain for the average velocity calculation. Press ENTER from the initialization menu to access the GAIN adjustment. Use UP and DOWN to adjust the desired gain value (Range = 0.01 to 99). Press ENTER to accept the value.

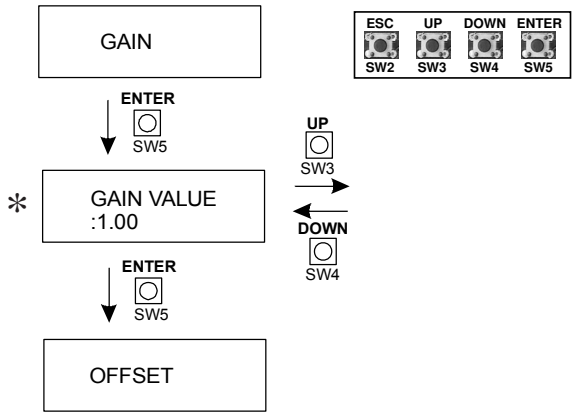


Figure 17: Gain Submenu

OFFSET

This option adjusts the offset for the average velocity calculation. Press ENTER from the initialization menu to access the OFFSET adjustment. Use UP and DOWN to adjust the offset value (Range = -1000 to 1000). Press ENTER to accept the value.

Note: Offset value is always in FPM.

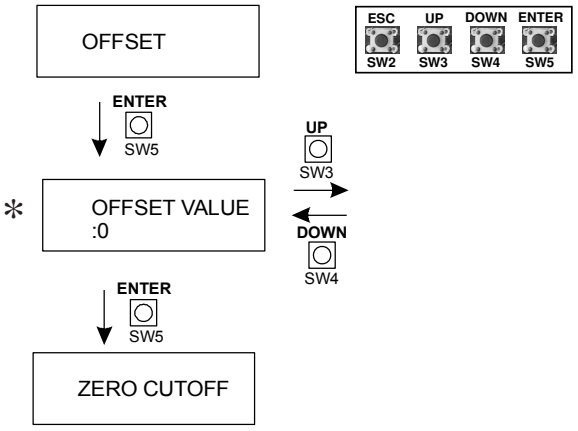


Figure 18: Offset Submenu

USING THE GAIN AND OFFSET SUBMENUS

The average velocity is the average of each of the individual sensor readings on each probe. To compensate for system effect, use the GAIN for a correction multiplier and the OFFSET as a correction (addition/subtraction) to the average velocity calculation.

The GAIN or OFFSET is used to adjust the EAMP system to match a balancer's report. When a difference occurs between the output of the Electronic Controller and the test and balance report, adjust the gain. We recommend setting the gain to 1 and taking multiple readings to determine the difference. To calculate the gain, divide the test and balance report by the output/reading of the Electronic Controller.

Adjusting the Gain

This feature applies a ***multiplier*** across the entire scale.

If a balance report states a flow of 800 FPM, and the EAMP system reports 1,000 FPM, adjust the gain to 0.80 (800 / 1,000 = 0.80).

If a balance report states a flow of 1,000 FPM and the EAMP system reports 900 FPM, adjust the gain to 1.11 (1,000 / 900 = 1.11).

Adjusting the Offset

This feature applies a ***value*** to the entire scale.

If a balance report states a flow of 1,000 FPM, and the EAMP system reports 800 FPM, adjust the offset to 200 (1000 - 800 = 200).

If the balance report states a flow of 900 FPM and the EAMP system reports 1,000 FPM, adjust the offset to -100. (900 - 1,000 = -100).

ZERO CUTOFF

This option sets the zero velocity reference point. Ensure that there is no airflow flowing through the system, then access this menu to set the zero velocity reference point. The LCD screen displays CUTOFF VALUE. Use UP and DOWN to scroll to values 40 FPM and above. Press ENTER to accept the value.

The calculated velocity indicates zero when it reaches the zero cutoff value.

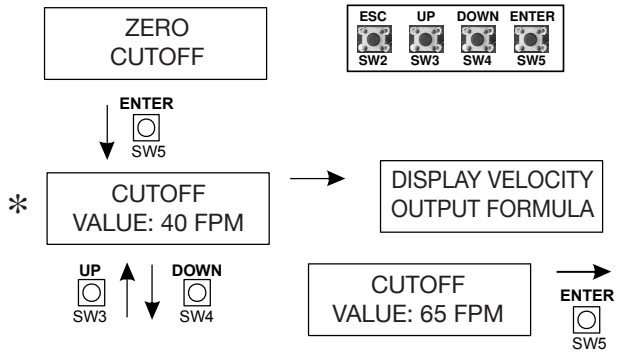


Figure 19: Zero Cutoff Submenu

DISPLAY VELOCITY OUTPUT FORMULA

This option displays the velocity output formula. Depending on units selected and gain & offset values used, the velocity output formula will display the scaling values that must be used to convert the mA output into the correct flow in the automation interface.

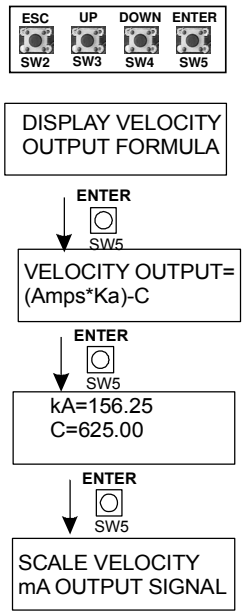


Figure 20: Display Velocity Output Formula Submenu

SCALE VELOCITY mA OUTPUT SIGNAL

This option allows the user to improve the resolution of the output signals by changing the start and end points. For example; the factory setting is 0 to 4,000 FPM. If the maximum system flow is 2,000 FPM, the output can be set so that 20 mA equals 2,000 FPM instead of 4,000 FPM.

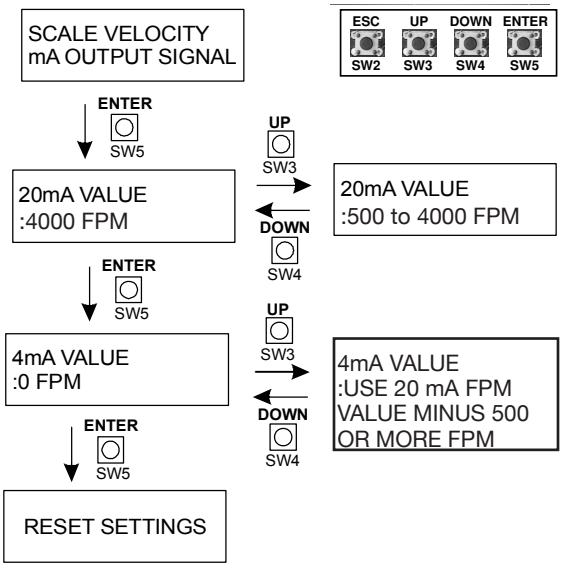
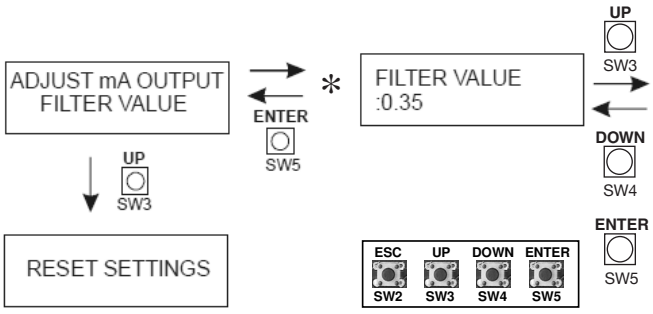


Figure 21: Scale Velocity mA Output Signal Submenu with Velocity Unit: FPM Selected

ADJUST mA OUTPUT FILTER VALUE

This option submenu allows the user to adjust the mA filter value used to speed up or slow down the mA output rate of change. Use the default value of 0.35 for the majority of applications. Use an mA filter value of 0.5 to 1.0 when an instantaneous output signal is required for applications such as fan tracking. Use smaller values such as 0.25 for a more stable output. As the value decreases, filtering increases. The mA output filter responds to the air flow calculation and is applied to the 4 to 20 mA output signal only.



Note: Range is 0.0 to 1.0. Factory mA output default= .35

Figure 22:
Adjust mA Output Filter Value Submenu

TROUBLESHOOTING

During Normal Operation two LEDs illuminate at the RJ45 connector on the EAMP020 Electronic Controller. The left (green) LED indicates that the Electronic Controller has properly identified the probe. The right (orange-yellow) LED illuminates each time the Electronic Controller communicates with the connected thermal dispersion probe. See Figure 8.

If the right (orange-yellow) LED does not blink, reset the Electronic Controller by cycling the power switch OFF and then ON. See Figure 9.

Use UP and DOWN (see Figure 9) to scroll through each sensor's velocity and temperature reading. Press ESC on the Electronic Controller to display the average velocity and temperature values.

If an error occurs with one of the sensors, an error indication displays on the LCD screen. The error is indicated on the LCD screen by the velocity unit in lowercase letters.

REPAIR INFORMATION

If the EAMP Thermal Dispersion Probe Airflow Measuring System fails to operate within its specifications, replace the unit. For a replacement EAMP System, contact the nearest Ruskin representative.

MAINTENANCE

Twice a year, scroll through the velocity and temperature values using UP and DOWN (see Figure 9). Remove the thermal dispersion probes and clean the sensor nodes if readings vary from normal readings.
To remove the electronic probes:

1. Remove cover from Electronic Controller and turn power switch off. Please make sure the probe is allowed to cool before cleaning.
2. Unplug the shielded Cat5e cable from the RJ45 connector on the end of the thermal dispersion probe.
3. Remove the mounting screws from the mounting plates on both sides of the thermal dispersion probe.
4. Remove lock nut and washer from mounting stud.
5. Slide the thermal dispersion probe out of the duct from the side with the RJ45 connector.
6. Wipe down the thermal dispersion probe with a damp cloth. Ensure that the sensor is on bottom side of the probe during cleaning so any moisture encountered in the cleaning process will drain out of the probe and sensor.
7. Remove lint, dust, and other matter from the opening of the sensor shroud by blowing through the hole or using a soft bristle brush. (Do not use high pressure air.) Care must be taken not to bend the thermistors while cleaning. The leads of the thermistors are fragile and can break if bent.
8. Replace the thermal dispersion probe assembly in duct by reversing Step 3 through Step 7.

Annually inspect the thermal dispersion probe in unfiltered outside air, return air, or exhaust air applications to ensure that the thermal dispersion probe is free of excessive buildup of lint, dust, or other airborne particulate. Gently clean the thermal dispersion probe with a small, soft bristle brush when necessary.

SuperClean Defluxer by MicroCare (MCC-SPR) (or equal) can be used to spray clean the thermistors. MicroCare MC-SPR is designed for cleaning electronics, rosins and plastics. MicroCare MC-SPR is static safe and nonflammable. You can find the product located here http://www.all-spec.com/products/MCSPR.html

TECHNICAL SPECIFICATIONS

EAMP Thermal Dispersion Probe Airflow Measuring System

Velocity Requirements	Minimum 0 FPM (0 MPM) Maximum 4,000 FPM (1219 MPM)
Pressure Drop	Four 48 in. (122 cm) long probes in 48 x 48 in. (122 x 122 cm) duct: 0.1 in. w.g. (24.9 Pa)
Power	24 VAC
Power Consumption	Dedicated 75 VA transformer recommended 4 probes with 4 sensors: 65 VA; 3 probes with 4 sensors: 50 VA 2 probes with 4 sensors: 35 VA; 1 probes with 4 sensors: 20 VA
Temperature Rating	Sensor: -25 to 140°F (-32 to 60°C); 0-99% RH, non-condensing Controller: -20° F to 120° F (-29° C to 49° C); 0-99% RH, non-condensing
Approximate Weight	Controller: 2.9 lb (1.32 kg) Sensor: 1 lb (0.45 kg)

Measuring stations are tested at an AMCA Certified Laboratory using instrumentation and procedures in accordance with AMCA Standard No. 610-93, Airflow Station Performance.

The performance specifications are nominal and conform to acceptable industry standards. For application at conditions beyond these specifications, consult the local Ruskin office. Ruskin shall not be liable for damages resulting from misapplication or misuse of its products.

RECOMMENDED SPARE PARTS LIST
EAMP

Description	Part Number
Fuse (2.5 AMP)	031202.5HXP
Locknut	93298A120
Shielded CAT5e Cable	88-020024-00B
120/24 VAC 100 VA Transformer	IAQ080
Mounting Plate Washer	9109A119
EAMP Mounting Plate	85-021557-01 B

Contact Ruskin Air & Sound Control, Air Measuring Product Sales
3900 Dr. Greaves Road Grandview, MO 64030.
Telephone: 816-761-7476
www.ruskin.com

The information provided in this manual is believed to be complete and accurate. Ruskin Manufacturing is a manufacturer and supplier of equipment and, as such, is not responsible for the manner in which its equipment is used nor for infringement of rights of third parties resulting from such use. System design is the prerogative and responsibility of the system designer.

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