

DRAMM



AME Horizontal Air Flow System Manual

DRAMM

Thank you for your purchase of this AME HAF System.

Your Dramm AME Horizontal Air Flow System is designed to provide even, gentle air flow to homogenize temperature, humidity, CO₂, and the general environment throughout the greenhouse and to gently remove the microclimate around the plant created by transpiration.

This system consists of both fans and speed regulation. Unlike other HAF systems that focus on speed, The AME System concentrates on even momentum. Lower, but consistent, air speeds provide more stable momentum, providing more even air flow with less turbulence and uneven crop drying.

Please direct any questions or service requests you might have to the contacts below.

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Limited Warranty

This is a limited warranty as defined in the consumer product warranty and federal trade commission improvement act. This warranty gives you specific legal rights, which may vary from state to state.

Dramm Corporation warrants to the extent of the purchase price, that the AME Fans will be free from defects in materials and workmanship to the original purchaser for a period of three years. Parts subject to wear are not covered under this limited warranty. Defects or damages due to the misuse, non-observance of safety standards are not covered under this limited warranty. Please read and follow the instructions and heed warnings stated in the operating manual.

Dramm Corporation makes no other further warranty, expressed or implied, and all other or further warranties, including any warranties of merchantability or fitness for a particular purpose are expressly excluded.

In no event shall Dramm Corporation be liable for loss of product, profit or any other special, incidental or consequential damages including, but not limited to, plant damage, property or persons.

This warranty begins on the date of original purchase. If warranty service is required, the equipment must be sent prepaid to:

**AME Fan Service
Dramm Corporation
2000 North 18th Street
Manitowoc, WI 54220**

The Damm AME System

The Damm AME Horizontal Air Flow System is designed to run at lower speeds for best result. In most greenhouses, your fan speed should be approximately 50 - 60% of the maximum capacity of the fan. This will not only reduce turbulence and prevent uneven drying of your crop, but it will also reduce your electrical usage when compared to full speed operation. The chart below shows the two different AME fans at lower voltages and slower rpm. In each instance, the Watts are reduced as voltage to the fan is reduced. Lower operating costs result.

AME350

Static Pressure (in.H2O)	Airflow (cfm)	rpm	Volts	Amps	Watts	cfm/Watt
0.00	1850	1430	230.0	0.75	171	10.8
0.00	1770	1359	220.0	0.77	164	10.8
0.00	1660	1276	210.0	0.77	156	10.6
0.00	1530	1189	200.0	0.77	145	10.6
0.00	1410	1083	190.0	0.75	134	10.5
0.00	1260	976	180.0	0.73	121	10.4
0.00	1140	887	170.0	0.66	109	10.5
0.00	990	776	160.0	0.67	97	10.2
0.00	870	687	150.0	0.63	85	10.2
0.00	750	589	140.0	0.60	73	10.3
0.00	630	494	130.0	0.55	61	10.3

AME400

Static Pressure (in.H2O)	Airflow (cfm)	rpm	Volts	Amps	Watts	cfm/Watt
0.00	2860	1648	230.0	1.13	250	11.4
0.00	2820	1628	220.0	1.18	248	11.4
0.00	2780	1605	210.0	1.24	243	11.4
0.00	2740	1571	200.0	1.31	241	11.4
0.00	2640	1527	190.0	1.37	240	11.0
0.00	2530	1463	180.0	1.43	236	10.7
0.00	2350	1371	170.0	1.50	230	10.2
0.00	2110	1233	160.0	1.55	219	9.7
0.00	1800	1050	150.0	1.55	202	8.9
0.00	1490	868	140.0	1.50	176	8.4
0.00	1220	718	130.0	1.41	152	8.0
0.00	1000	599	120.0	1.30	127	7.9
0.00	820	495	110.0	1.18	102	8.0
0.00	630	382	100.0	1.05	80	7.9

Finally, low volume chemical applications can be improved with lower speed fans. High speed, basket fans can collect pesticide on the blades and can cause over-deposition beneath the fans. Slower moving, AME fans will not cause this potential damage.

While your fans should run at medium speed most of the time, there are some times where increased air speed is beneficial. Any time that the crop needs to be dried more quickly, higher air speeds can help. Your variable speed system allows you to have control on these occasions.

It is possible to have your climate control computer vary the speed through an analog connection (4-20 mAmp, 2-10 VDC) to our speed controller. Instructions on connecting this are detailed later in the manual.

Hanging:

Due to differences in greenhouse construction, Dramm AME Fans do not come with specific mounting brackets. The fans have four mounting holes on the corners of the fan housing. These are suitable for bolting through to greenhouse trusses or other mounting hardware created on site.

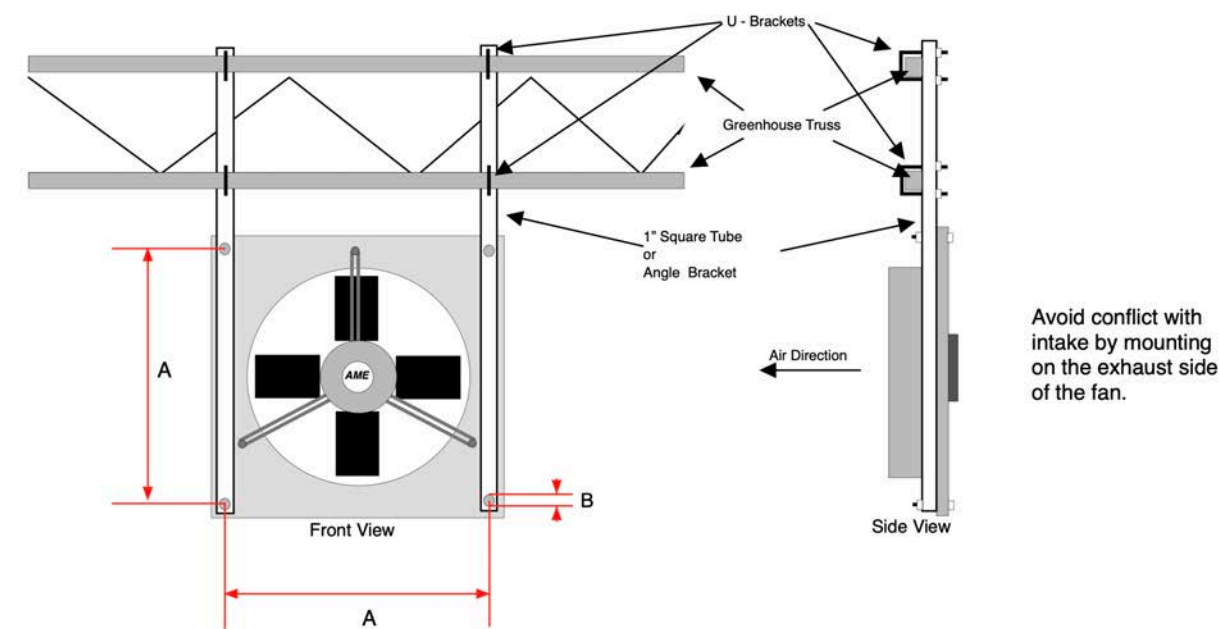
AME fans should be mounted level with the ground and rigid. Chains should not be used to hang AME fans.

Make sure that any mounting hardware that might obstruct air flow is mounted to the outlet (rough) side of the housing. Keep the intake free of all obstructions. Any obstruction may reduce the amount of air flowing through the fan.

AME fans do not include guards. When hung above 8 feet above the ground, guards are not required. If hanging fans below 8 feet, guards must be purchased and installed separately. Installation of guards is covered later in this manual.

A common method for hanging the AME fans is with 1" square tubing, angle bracket or Unistrut. A drawing of this is included below. Ensure that either is mounted on the OUTLET side of the fan to prevent a reduction of airflow.

Height is dependent on crop and growing situation. Contact DRAMM with questions.



ALL AME Fans are 208v-240v, 1Ø Standard.

Fan	A	B
AME350	15.75"	.38"
AME400	17.48"	.38"

Fans do not include brackets or guards.
Guards are available for fans placed lower than 8' above ground level.

Wiring:

Connection Instructions

For best results, the AME fans can use a three-wire connection to regulate the motor speed. This increases electrical efficiency and reduces wear on the motor. In a three-wire installation of the AME systems, full voltage is connected to the start winding of the motors and the speed control current is connected to the run winding. This allows for a lower starting load and less running load and less heat build up. The result is greater electrical efficiency and a longer motor life. **NOTE: Three Wire Installation is best for larger installations.**

General Guidelines

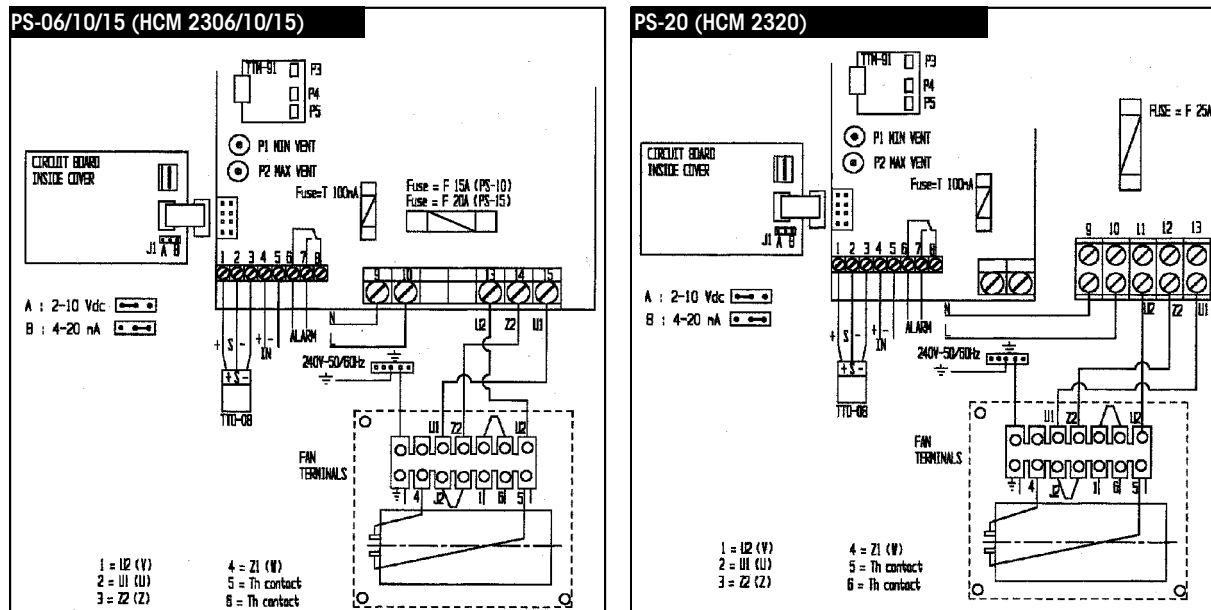
Two Wire Installation:

- Connect U1 in the controller to U1 in the fan.
- Connect U2 in the controller to TK in the fan.
 - TK is the thermal contact. This is jumpered to U2 in the fan.

Three Wire Installation:

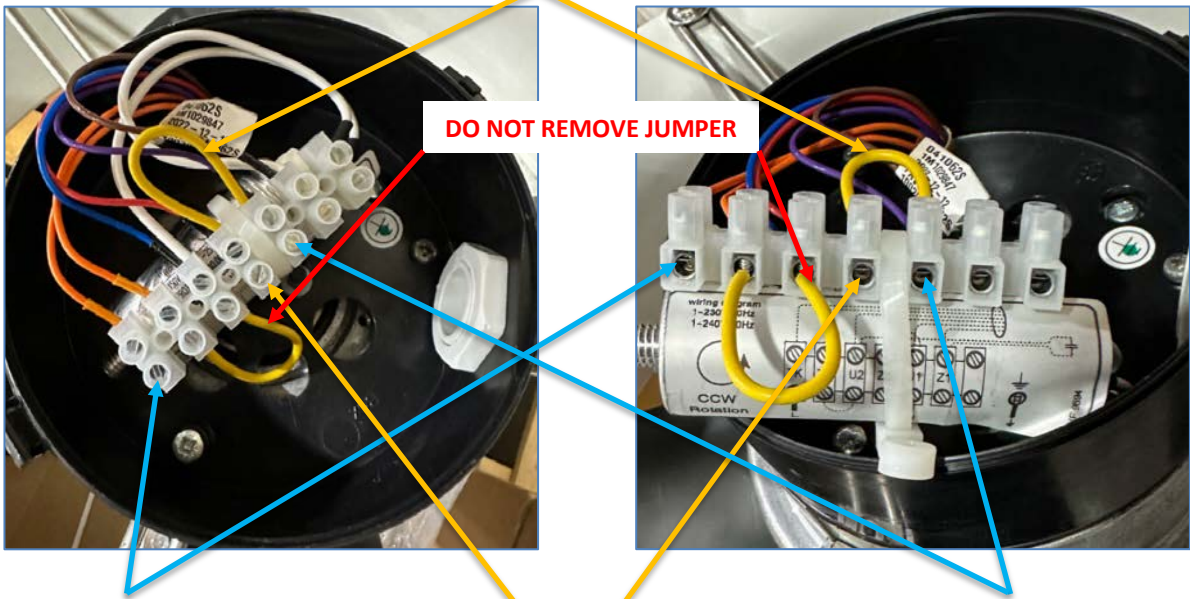
- Connect U1 in the controller to U1 in the fan.
- Connect U2 in the controller to TK in the fan.
 - TK is the thermal contact. This is jumpered to U2 in the fan.
- Connect Z2 in the controller to Z2 in the fan.
- **REMOVE JUMPER** between U1 and Z2 in the fan.
 - **DO NOT REMOVE THE JUMPER** between TK and U2.

GROUND ALL Circuits using the ground block in the controller and the ground screw in the fans.



Fan Connection

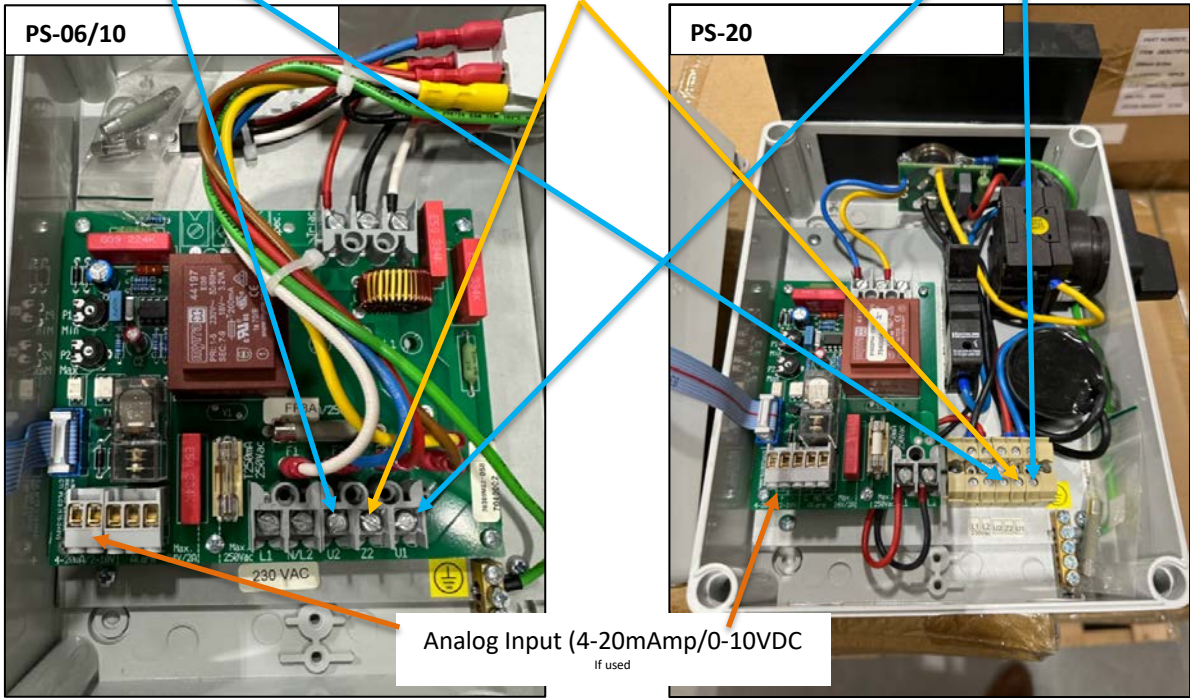
Remove jumper between U2 and Z2.
THREE WIRE CONNECTION ONLY



Connect TK (thermal contact) to U2 in controller. Thermal contact jumpered to U2 in fan.

Connect U1 to U1 in controller.

Connect Z2 to Z2 in controller.
THREE WIRE CONNECTION ONLY



IMPORTANT: Wiring must remain consistent throughout the installation for speed control to work.
DO NOT CROSS WIRES

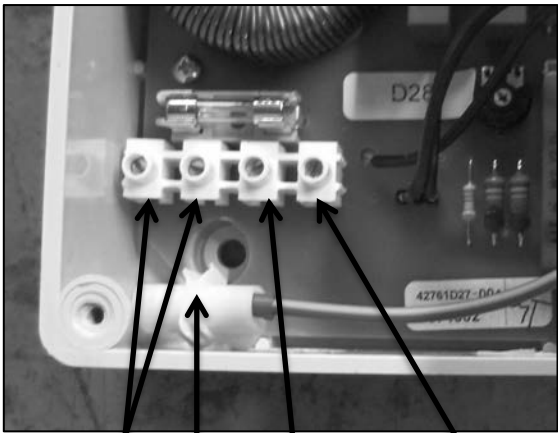
ERW 2303/ERW 2305

If using the **PS-05** (ERW 2305), the following instructions should be used.

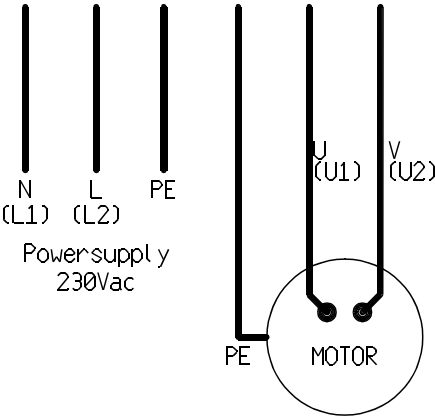
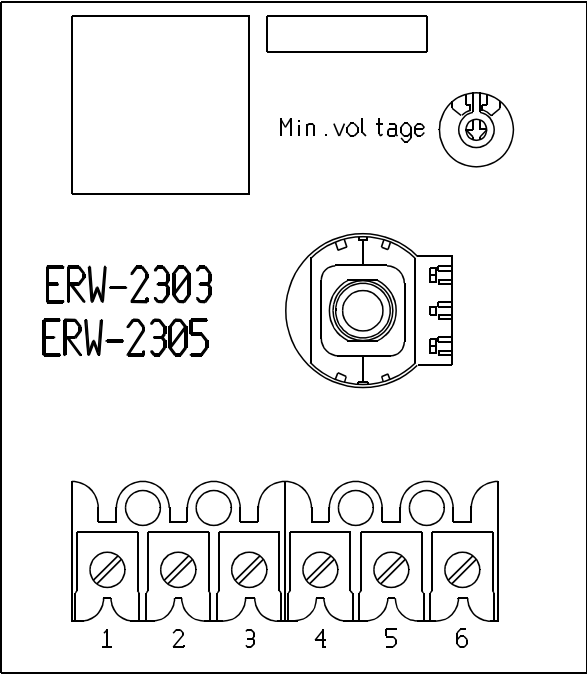
Connect line voltage to positions 1 and 2 and ground to position 3 on the controller.

Connect position 4 to ground on the fan.

Connect position 5 to U1 on the fan and connect position 6 to U2 on the fan.



Line In
Ground
To U1 in fan
To U2 in fan



Max. load	ERW-2303 : Max. 3Amp.
	ERW-2305 : Max. 5Amp.
Min. load	100 Watt

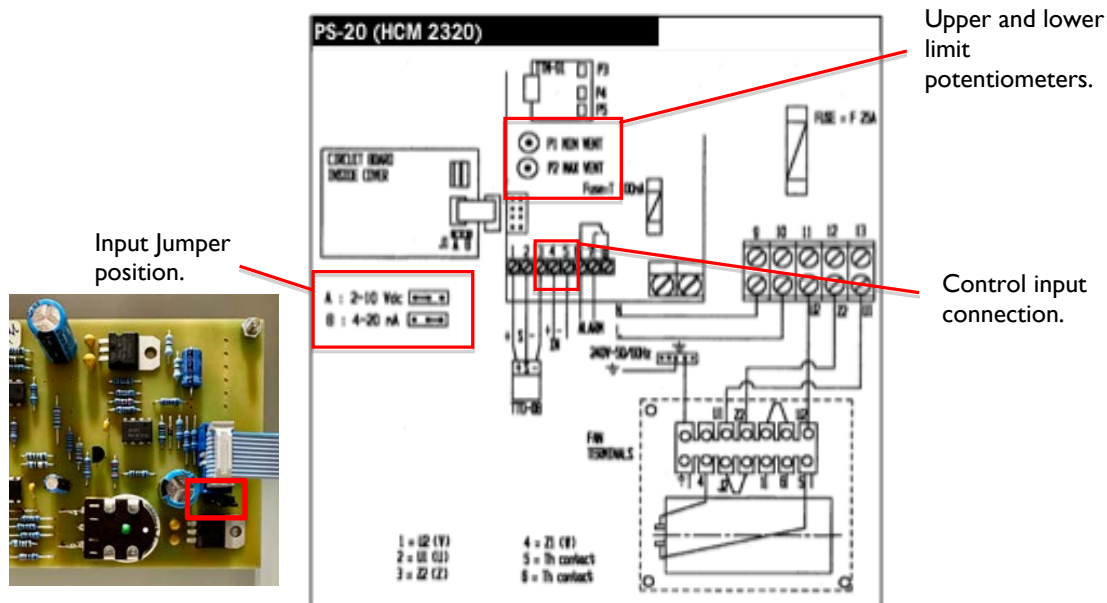
AME Fan Speed Regulation from an External Controller

Operation of DRAMM AME Fans from an External Computer

The speed of the Dramm AME Fans can be controlled by an external computer by using a proportional output signal connected to a Dramm Speed Controller.

Each of the following Speed Controllers have an input that will accept either a 20-Vdc or 4-20 mA signal. The signal type is selected by the position of jumper J1 as seen in the diagram below.

Upper and lower limits on the speed of the fan are set using the minimum and maximum ventilation potentiometers inside the controller. These are also highlighted on the diagram below. **This may need to be adjusted depending on voltage and load. Use a meter to measure voltage for best results.**



As these signals are proportional analog signals, the controller will accept the low signal as the minimum ventilation rate and the high signal as the maximum ventilation rate. As the signal increases from low to high, the controller will adjust proportionally.

NOTE: Any signal from an external source will override the knob on the front of the speed controller. If there is no signal, the knob on the front of the speed controller will adjust the speed of the fans.

As a result, this feature can be used to turn off the fans when desired. If the knob is in the OFF position (turned fully to the left, a click will indicate this) and there is no signal, the fans will be turned off.

Voltage Regulation Limit Potentiometers

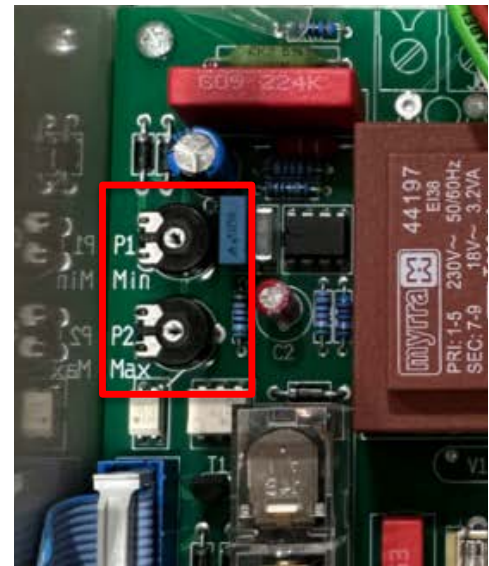
The Dramm AME System uses voltage regulation to adjust the speed of the fans. The HCM Speed Controllers have two limit potentiometers on the main board to reduce the range of voltage regulation. These potentiometers may need adjustment after installation to realize the full range of speed regulation on the complete circuit.

To adjust, begin with the Max Potentiometer. Turn the knob on the front of the controller to full speed. Measure the output voltage to the fans. As the controller uses several volts to power the controls, you should only be able to reach a maximum output voltage of the input voltage minus 4-5v volts.

If the output voltage is significantly lower than the input voltage, use a small screwdriver and adjust the Max Potentiometer to increase voltage.

This potentiometer can also be used as an upper limit to reduce access to full speed by setting it at a lower voltage.

To adjust the Minimum Potentiometer, turn the knob to the lowest speed, but do not turn this knob to the OFF position. Avoid the physical click that denotes OFF. Normally, the voltage required to turn the fans will be around 110v. This may vary with line drop and resistance. If the fans do not turn, adjust the Min Potentiometer so that all of the fans begin to turn. You may wish to increase this limit slightly for more evenness from fan to fan.



P1 (Min) and P2 (Max) Potentiometers

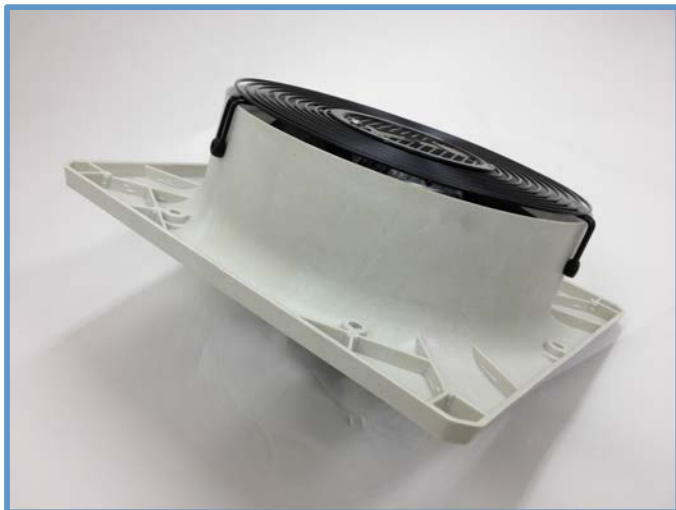
Basic Operation

The PS-06,10 and 20 all have a main switch on the side of the controller marked HAND, 0 and AUTO.

- Hand is full power and bypasses the controls.
- 0 is off
- Auto switches control to the knob on the front of the controller.
 - NOTE: any analog input signal will OVERRIDE the knob.
 - The knob will take over in the absence of a signal.
- The knob will control the speed, increasing as you turn to the right.
- The knob also has an off position when turned all the way to the left past a click.



Optional Guard Installation



The front guard is pressure fit. The rubber grommets will hold the guard in place with friction alone. Just press into place over the front housing of the fan.



Grommets hold the guard securely.



The rear guard is held in place by the 3 motor mounting brackets.

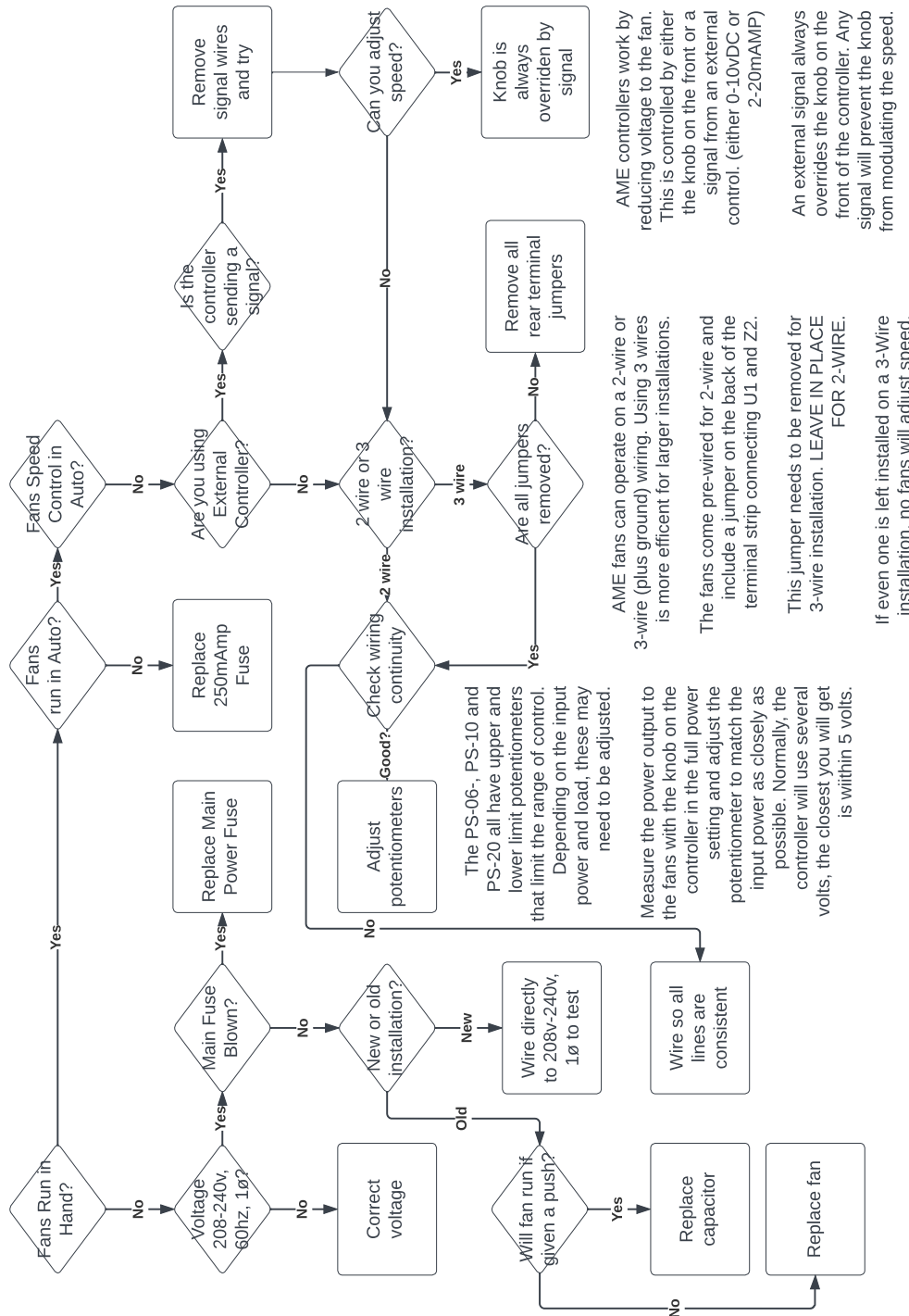
Place the fan exhaust side down on a flat surface.

Remove the bolts holding the mounting brackets in place.

Slide the brackets through the space between the first and second wire guard rings and reconnect the brackets to the fan housing.

Troubleshooting:

DRAMM AME Troubleshooting



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