



**AUTOMATIC DUST COLLECTION
FOR SMALL SHOPS**

**MODEL GG500A
MOTOR CONTACTOR
INSTRUCTIONS**

Thank you for choosing our Automatic Dust Collection System. We at Grngate have developed what we hope will be a valuable addition to your shop. Numerous articles have been written about the health risks associated with sawdust. Our goal is to provide you, the woodworker, with both a cleaner and safer shop. Making the entire dust collection system operation totally automatic and independent of the actual machine operation allows the user to maximize his/her enjoyment of their shop time.

Our staff includes professional design engineers and manufacturing personnel who are also dedicated woodworking enthusiasts. We have tried to address many of the issues with both installation and operation we have encountered over many years of experience. We wish you many years of chip making enjoyment!

BEFORE WE START ON THE INSTALLATION AND SETUP, LET'S TAKE A MOMENT TO TALK ABOUT SAFETY.

If you are installing an accessory Motor Contactor you already have purchased our Automatic Dust Collection system. During installation, you will have addressed various mechanical and electrical issues. As part of wiring the System Controller, you will also be connecting the Contactor to AC power and your collector.

Although we have tried to make the installation as easy and simple as possible there is always some risk associated with any AC power wiring tasks. We will guide you through some of the wiring procedures with accurate descriptions and pictures, but as this accessory requires high current wiring with the correct sized wire and techniques, we strongly suggest you

CONSULT THE SERVICES OF A LICENSED ELECTRICIAN AND FOLLOW ALL LOCAL BUILDING CODE REQUIREMENTS.

WHY AN AUTOMATIC SYSTEM?

All dust collection systems share a common goal: to collect the sawdust and wood chips generated by various woodworking machines. Many small shops will use a simple shop-vac connected to a particular machine. When it's time to use another machine, the shop-vac is disconnected and re-attached to the new tool. Although this technique certainly works, there are several issues that can cause time and annoyance. The ducting must be moved from tool to tool, the shop-vac must be controlled independently of the tool and many shop-vacs will quickly experience a clogged filter. Although there are after-market remote controls to help, the other issues remain.

The next step up is to connect several tools to a central collector via duct work. To allow for efficient operation, only the tool in use is 'connected' to the ducting. This is done with the use of blast gates which are nothing more than some sort of valve in the duct line at each tool. Many woodworking supply sources sell various types with the sliding gate being very common. Although this removes the need to mechanically move the duct connection from tool to tool, the other issues still remain. To use any particular machine tool the user must:

- Open the associated blast gate (assuming all the other blast gates on unused tools are closed)
- Turn on the collector
- And finally, do whatever task is required with the particular tool.

After to operation is completed these steps are reversed. The tool is turned off, the collector is turned off and the blast gate closed.

Now let's see what the Grngate system can do for you.

SYSTEM DESCRIPTION

Our system completely eliminates all of the steps above other than just turning on the tool and going to work. All the other required operations are handled automatically by the system without any action from the woodworker.

When a tool is turned on, a sensor on the tools' power cord senses the tool motor current. This in turn will command a motorized blast gate to open while simultaneously turning on the central collector. When the tool is turned off, the procedure is reversed with various delays built into the system to allow any debris buildup in the duct work to be flushed out.

Most blast gates will be operated by a tool sensor but there are times when manual control is desired such as for a floor sweep. We offer a kit that replaces the sensor with a manual switch for these chores.

Although most small shops will have only one tool in use at a time, the system allows several tools to be used simultaneously assuming the duct work design and collector have been sized accordingly.

Numerous safety features have been incorporated addressing such issues as a gate jam, overloading or shorting of the system wiring and mechanical shielding to keep little fingers away from the moving parts of the gates.

To keep the sensor installation safe, easy and simple, the machine sensors just clip onto the various power cords of the tool. There is no need to have access to the tools' AC junction boxes.

The blast gates are placed in the duct line at each tool. The duct collars on the gates have a stepped diameter to allow a wide variety of ducts to be used such as metal, flexible and plastic pipe.

All the system components- sensors, gates and system controller- are connected with computer-type cabling that is supplied. All the cables use well-proven RJ-type connectors such as are on telephones and computer networks.

The actual connectivity of all the parts is very flexible to allow for essentially any ductwork layout. But more on that later.

WHAT'S IN THE BOX

The Motor Contactor accessory kit contains:

- 1- MOTOR CONTACTOR
- 1- INSTRUCTION MANUAL

The Contactor has a pre-wired power cable for connection to the System Controller. What's not in the box is the AC wiring required to connect the Motor Contactor to the AC power and dust collector. Since each installation will be unique with various power plug choices and wiring length, we feel strongly it is safer for the user to work with a licensed electrician to determine what the installation requires.

INSTALLATION

OK, it's time to add the Contactor to your system.

MOTOR CONTACTOR- MOUNTING

The unit has a three foot power cable that will be connected to the System Controller. Mount the Contactor close enough to the System Controller to allow for this connection.

There are several mounting holes on the flanges of the unit. Two are on the upper and lower flanges. You can drill out the holes to a larger size if you need to accommodate a larger screw diameter.

Try to mount the unit such that at least one screw will be into a stud. If you must mount it onto drywall, use some sort of toggle bolt, plastic wall anchor or other drywall attachment means. Most hardware centers will have various product offerings.

WIRING

SYSTEM CONTROLLER VOLTAGE SELECTION

Whatever power you will be using for your dust collector, the System Controller ***MUST*** be connected to 115 VAC, **not** 220 VAC. Although the System Controller is capable of being powered with either 115 VAC or 230 VAC, ***you must select 115 VAC.***

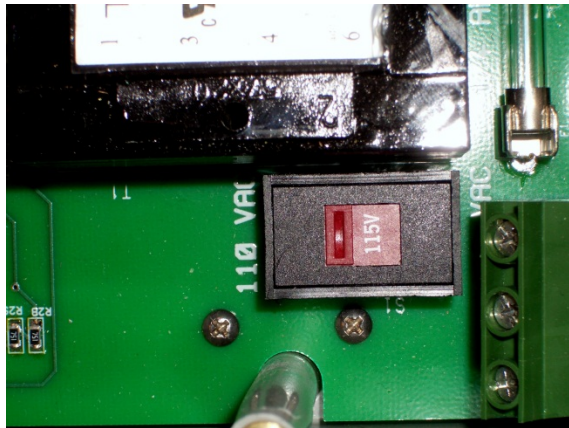
NOTE: Powering the System Controller from 220 VAC will permanently damage the Motor Contactor.

We suggest you select this voltage option right now so it won't be forgotten later.

The System Controller has a voltage selection switch inside.

The top cover is removed by removing the six screws around the perimeter. The cover can now be removed. CAUTION- there is a cable connecting electronic assemblies in the top and bottom halves of the case. Please don't put undue strain on this cable.

Use a small flat blade screwdriver and slide the switch actuator so the 115V voltage shows on the switch.



FAILURE TO SELECT THE CORRECT AC VOLTAGE RANGE WILL RESULT IN DAMAGE TO THE MOTOR CONTACTOR

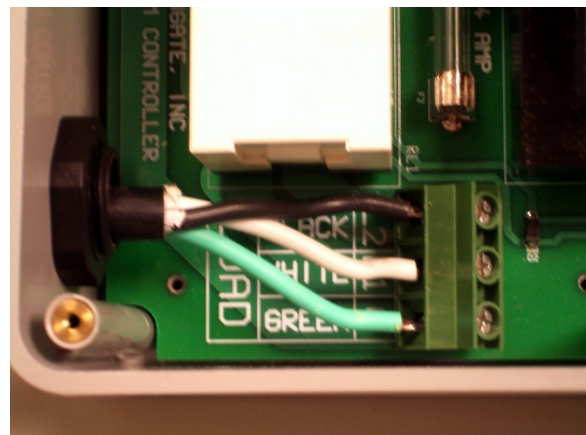
MOTOR CONTACTOR-TO-CONTROLLER WIRING

The top cover of the Motor Contactor is removed by removing the six screws around the perimeter. The Motor Contactor has a three foot cable pre-wired inside the unit. We stuff this power cable into the unit for ease of shipping. Pull this cable out of the cable gland.

The free end of this cable is already prepared for connection to the System Controller. Insert the cable through the right hand cable gland on the System Controller. If the cable won't slide through, try opening up the clamp on the gland by turning it counter clockwise. It may be somewhat hard the turn and will have a clicking sound as it turns.

Pull the cable through so that there is sufficient length to be able to insert the wire ends into the terminal block.

Now insert the wire ends into the terminal block labeled LOAD with the wire color matching the label on the board. If the wire doesn't insert, make sure the terminal block opening is fully open.



Turn the screw on the top of the terminal block counter-clockwise to open up the connection recess. After the wire end is fully inserted into the block there should be no exposed bare wire. Hold the wire firm and turn the screw clockwise until it is snug. Give it just a little more without over tightening to ensure a good contact

After all three wires are securely tightened, allow a little slack in the cable and twist the gland nut clockwise until it firmly grips the cable.

Any excess cable between the boxes can be bundled up and fastened with a tie wrap or tape.

SYSTEM CONTROLLER AC WIRING

As part of the installation of the System Controller, the instruction manual for the Starter System covered the wiring of this component. However, rather than wiring the Controller to your dust collector, it will be wired to the Motor Contactor.

MOTOR CONTACTOR-TO-COLLECTOR AC WIRING

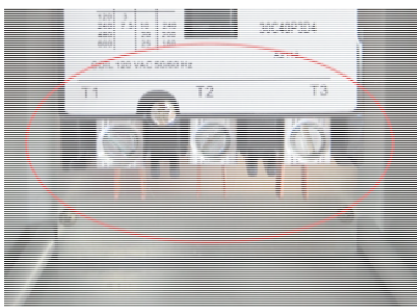
You purchased the Motor Contactor because you have a larger dust collector motor that requires the Contactor's higher current capability. Your collector motor may be either single or three phase. The contactor has three poles (contacts) that allow for either type. You will use two poles for a single phase motor and all three poles for a three phase motor.

The size and type of collector motor will determine the required size of the wiring. There are too many variables for us to list specific wire sizes and circuit breaker recommendations.

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Depending on your installation, you may be using power plugs and sockets, direct wiring into junction boxes or a combination of both. The cable that goes from the Motor Contactor to the collector's motor is connected to the contactor's terminals.

The wires in three conductor cable for a single phase motor are usually white, black with the safety wire being either green or bare. The fourth wire in four conductor cable for three phase motors is usually red.



Insert the prepared cable through the right hand cable gland. Pull the cable through so that there is sufficient length to be able to insert into the terminals of the Contactor. The wires will be connected to the terminals on the Contactor that are at the top of the box. These are farthest from the glands and are labeled T1, T2 and T3.

Leave the safety wire free for now.

A single phase installation will use two of the contacts, T1 and T2. A three phase installation will use all three of the contacts, T1, T2 and T3.

Insert the wire ends into the contacts. If the wire doesn't insert, make sure the contact screw is fully open. Turn the screw counter-clockwise to open up the connection recess but be careful not to back in all the way out. After the wire end is fully inserted into the terminal there should be little or no exposed bare wire. Hold the wire firm and turn the screw clockwise until it is snug. Give it just a little more without over tightening to ensure a good contact. If you are using stranded wire and did not tin the wire ends make sure that there are no strands of exposed wire. If there are, remove the wire, re-twist the bare wire end and re-insert and tighten.

After all the wires are securely tightened, allow a little slack in the wiring and twist the gland nut clockwise until it firmly grips the cable.

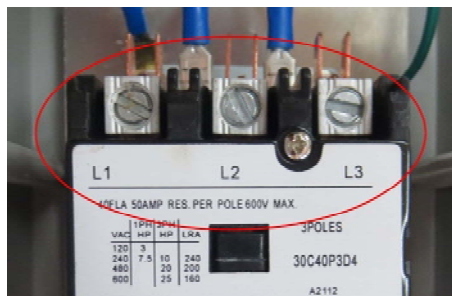
The other end of this cable is then connected to your collector. This will depend on your choice of the various options of appropriate plug and socket or direct wire into the collector motor's electrical junction box. Follow the manufacturer's instructions regarding this connection.

AC POWER-TO-CONTACTOR WIRING

MAKE SURE THAT THE POWER CABLE IS COMPLETELY DISCONNECTED/UNPLUGGED FROM THE POWER SOURCE!

FAILURE TO DO SO COULD RESULT IN INJURY OR DEATH

Now repeat this process with the power cable supplying AC voltage



The power cable is connected to the contactor's L1 and L2 terminals for a single phase motor. A three phase motor is connected to L1, L2 and L3. Use the same technique you did for the earlier connections.

You will want to match the wire color on the L(x) and T(x) connections. Example: If the white wire going to the collector motor is connected to T1 then the white wire coming from the AC power source should be connected to L1. This ensures that the motor is
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correctly connected for proper operation. This particularly important on three phase motors as they can run in the wrong rotation if incorrectly wired.

Now you need to connect all three safety wires. At this point you should have three dangling green wires- one each from the AC power cable, the collector cable and the contactor plate. Using the supplied wire nut, arrange all three safety wires so their ends line up. Again, if you are using stranded wire and the wire strands have not been tinned individually, twist the strands so they won't fray. Insert them into the wire nut and twist the nut while holding onto the wires to prevent them from turning.

If any of the safety wires are bare (without insulation) take particular care to make sure they are not near any of the terminals on the contactor.

The safety wires are at earth ground and should they accidentally touch any of the 'hot' terminals, sparks would fly and you would have a tripped circuit breaker!

The final wiring task is to connect the power cable to your AC source.

THE POWER MUST BE OFF BEFORE YOU START THIS CONNECTION

FAILURE TO DO SO COULD RESULT IN INJURY OR DEATH

There are several ways to connect to the voltage supply. You may wire directly into a junction box, a breaker box or use a plug.

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Congratulations! You have completed all the wiring.

SYSTEM SETUP

There are no setup chores to be done. Once the wiring is done and power is turned on, you should be able to press the MANUAL button on the System Controller and have the collector turn on. If you have installed all the gates and sensors your system should be completely automatic.

CONGRATULATIONS!

YOU HAVE TOTALLY COMPLETED THE INSTALLATION OF YOUR NEW SYSTEM!

OPERATION

When power is turned on to the system for the first time, the SYSTEM CONTROLLER has an initial delay of 30 seconds to allow any open or partially open gates to close.

Gate closure is automatic and the gates will cycle to a closed position with a slow motor start. The collector will not be turned on.

After the 30 second initial delay has finished the FAN LED on the SYSTEM CONTROLLER will blink 3 times indicating the system is ready.

Now when any machine tool is started, such as your table saw, the saw's gate will open followed by the dust collector powering up.

The FAN LED on the SYSTEM CONTROLLER will turn on indicating the Motor Contactor has been energized. You will hear a definite 'thump' when the Contactor is energized.

After the tool is turned off, the OFF DELAY will be enabled after which the collector will turn off followed about 2 seconds later by the gate closure.

The collector may be manually turned on at any time by pressing the MANUAL push button switch on the SYSTEM CONTROLLER.

If a tool is now turned on with the collector having been manually activated, its gate will open. However, the collector is already on. When the tool is turned off, the gate will close and the collector will turn off with the timing as described above. The tool being turned off will override the previous manual action.

Should you want to turn the collector off with a tool already turned on and the collector operating, just press the MANUAL switch on the SYSTEM CONTROLLER. This will override the gate signal and power down the collector. The collector will stay off even though the tool is still on and its gate open. When the tool is turned off its gate will close and the collector will continue to stay off. The system is now back to normal operation and the next tool turned on will open its gate and start the collector as usual.

TROUBLE SHOOTING

There are various safety features designed into the system. These include:

- An AC power fuse inside the SYSTEM CONTROLLER. This protects against a problem with the controller power supply. The fuse is a ¼ Amp SloBlo 3AG type. Please contact Grngate If you experience continued fuse problems.
- If an overload or short should occur in the gate network cabling, the FAN LED on the SYSTEM CONTROLLER will blink. If the collector was on, it will turn off. You can find where the issue is by unplugging the gate cables starting at the CONTROLLER and working your way down the 'daisy chain(s)'. When the LED stops blinking, the problem is further down that particular chain. This may be

caused by a faulty gate or damaged cable. The system will automatically return to normal operation once the fault has been fixed.

- Gate jamming. This can be caused by a piece of material that lodged in the gate and subsequently stalled the gate motor when it tried to open or close. The gate will try to automatically clear the jam by cycling three times. If the jam persists, the gate will stop and freeze. After the jam has been cleared, the gate must be reset by removing the power. This is done by unplugging the gate cable that leads back to the SYSTEM CONTROLLER. After the cable is re-inserted, the gate will automatically close. This may be accompanied by briefly turning on the collector. The system should now be back to normal.
- All power and signal lines are protected against electrostatic discharge. Plastic ductwork can sometimes produce rather startling 'sparks'.

Please contact Grngate at any time if you have questions or concerns regarding your system.

www.grngate.com

info@grngate.com

Again, thanks for selecting our system and we wish you many rewarding and enjoyable woodworking experiences!