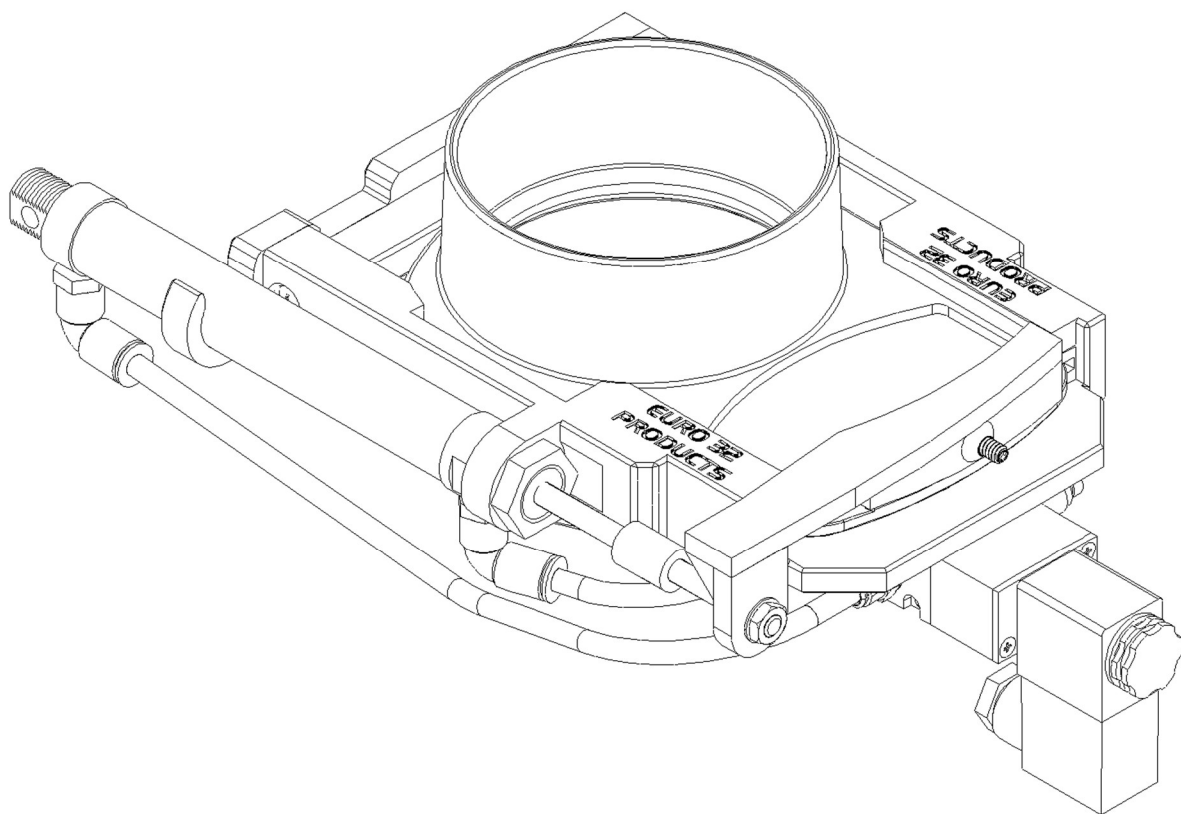




PNEUMATIC BLAST GATE USER GUIDE



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OK, now that you've added an air cylinder and pneumatic switch to your blast gate, how do you control it? This guide will show you the general circuits that can be used to control the opening and closing of your blast gate. This guide will offer some general insights and best practices when using your dust collector, that could add years of life to your dust collection system. Let's get started....

Extending the life of your dust collector

Did you know that turning your dust collector on and off several times in a short period of time can shorten the life of the electric motor's start capacitor?

The answer is YES! Frequently turning a capacitor start motor on and off can significantly shorten the life of the start capacitor, as each start cycle generates a high current surge that stresses the capacitor, leading to faster wear and potential failure over time; this is especially true if the motor is not allowed to cool down adequately between starts.

Key points to remember:

- **High inrush current:**

When a motor starts, it draws a high current which puts significant stress on the start capacitor.

- **Heat generation:**

This high current causes the capacitor to heat up, and repeated heating cycles can accelerate its degradation.

- **Design for short bursts:**

Start capacitors are designed to handle high current for a short period during motor startup, not continuous operation.

Factors that can worsen the issue:

- **Frequent starts:**

Frequent on/off cycles with minimal time between starts will put more stress on the capacitor.

- **Overheating conditions:**

If the motor is already hot or operating in a high-temperature environment, the capacitor will be further stressed.

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What to do:

- **Minimize unnecessary starts:** If possible, design your system to minimize the number of motor starts.
- **Allow cooling time:** Ensure the motor has enough time to cool down between starts.
- **Proper maintenance:** Regularly check the capacitor for signs of damage or wear and replace it if necessary.
- **Don't choak your dust collector:** Starting your dust collector with all the blast gates closed, places additional stress on the motors start capacitor as the dust collector tries to suck in air. Best practice is to have one blast gate open when you turn on your dust collector.

You're probably asking yourself, why start off a guide on blast gates talking about the capacitor that starts the motor of your dust collector? The reason is to help you understand what can happen to your dust collectors' motors start capacitor when it's started often and how to avoid its premature failure. Selecting the way, you control your dust collector and blast gates can prolong your dust collector's life. In the next section we'll cover the most common ways of controlling your dust collector and blast gates of your system.

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Blast gate control options:

In this section we'll cover the various options to control your dust collector and the blast gates.

Fully automated:

- The dust collector turns on and the blast gate opens when the power tool is turned on – dust collector stops, and gate closes when the power tool is turned off.
 - This is the most expensive and the most complex option.
 - Frequent starting/stopping of the dust collector when going from tool-to-tool leaves insufficient cool down time of the dust collector's motor.
 - *If set up incorrectly, you could choke your dust collector at start-up, putting stress on the motors start capacitor.*

This guide will not cover this type of system due to its complexity and cost. If you are keen on using this approach, search YouTube, you'll find videos that show fully automated system controls being built by several content creators.

Semi-automated:

- Turn dust collector on manually, blast gates open/close automatically when the power tool is turned on/off.
 - Requires additional components, making it slightly more expensive, but less expensive than a fully automated system.
 - The dust collector can be left on as you move from one tool to another, eliminating the chance of overheating the motors capacitor.
 - *If set up incorrectly, you could choke your dust collector at start-up, putting stress on the motors start capacitor.*

The following circuit diagrams show the general components required to build an automated switch for opening and closing a blast gate.

The following items are needed:

1 – Current Sensing Switch/Relay, Normally Open Current Sensing Switch Adjustable AC 0.2-30A (available on Amazon) [Current Sensing Switch, Normally Open Current Sensing Switch Adjustable AC 0.2-30A SZC23-NO-AL-CH: Amazon.com: Industrial & Scientific](#)



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Items continued...

1 – One blast gate fitted with a pneumatic air cylinder

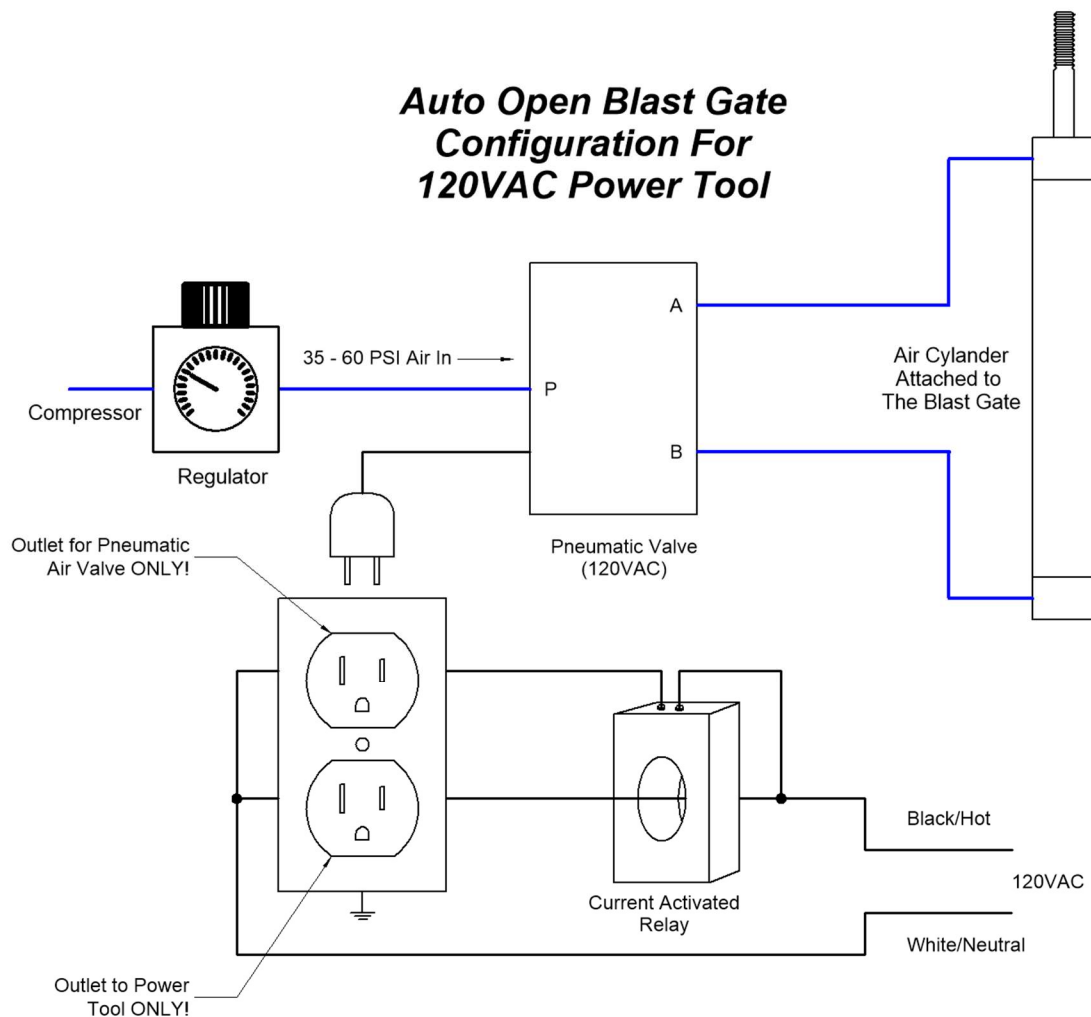
1 – Pneumatic Valve (110/120VAC version)

- AC110V 4V210-08/Junction Box NPT 110VAC (Available on Amazon® or Tailonz.com)

1 – 110/120VAC outlet (select for current draw (15 or 20A) of the equipment it will be used on)

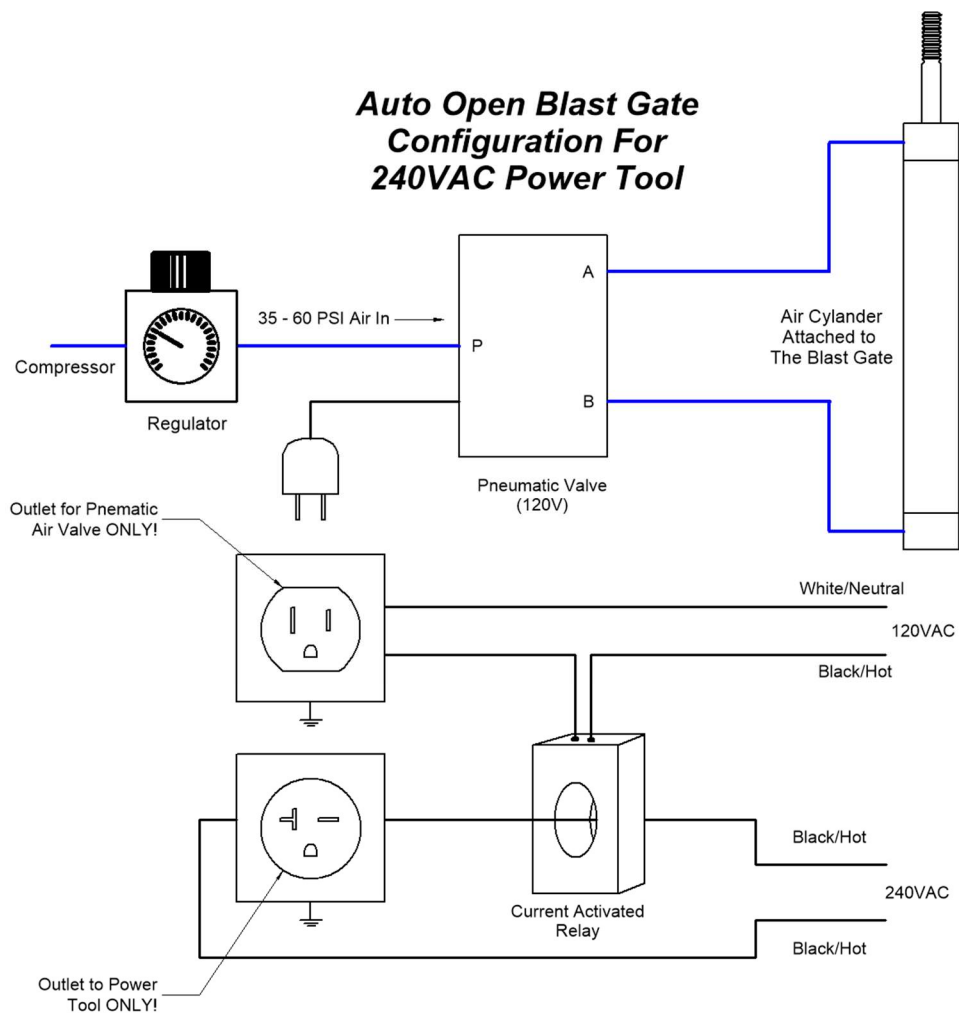
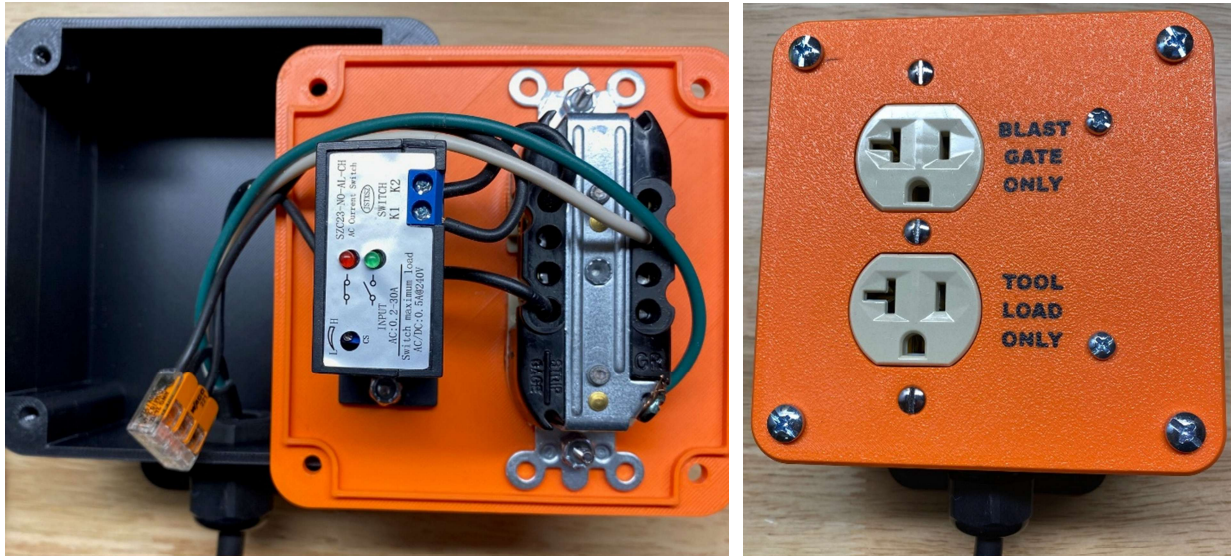
Stranded Wire - select proper wire gauge based on the current draw of the equipment it will be used on.
(Note: the pneumatic valve draws less than 0.5A therefore, you can use a smaller wire gauge size to connect to the relay)

Note: For 240 VAC equipment, you'll need a 240VAC rated outlet in addition to the above items



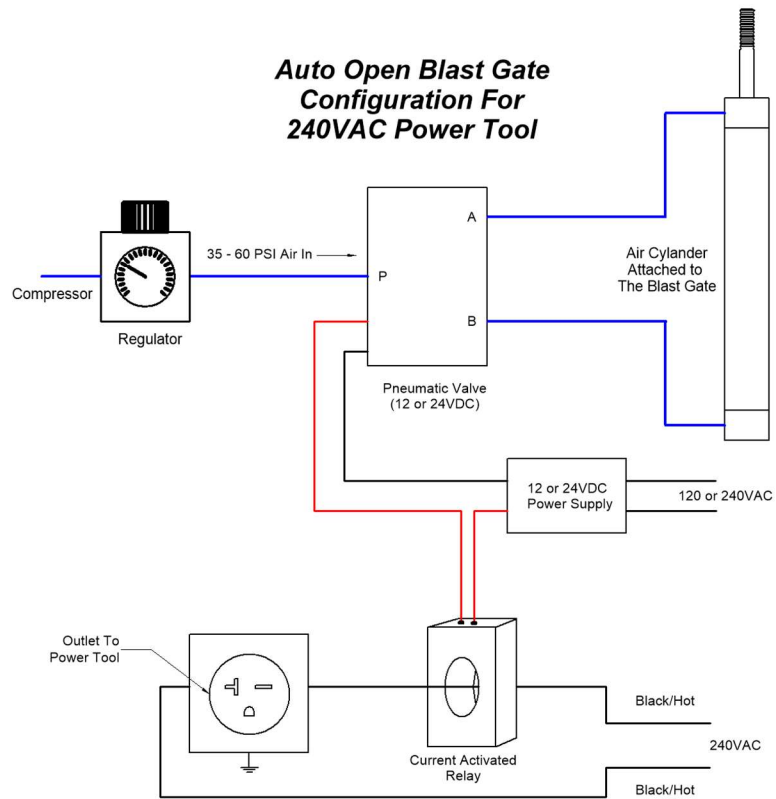
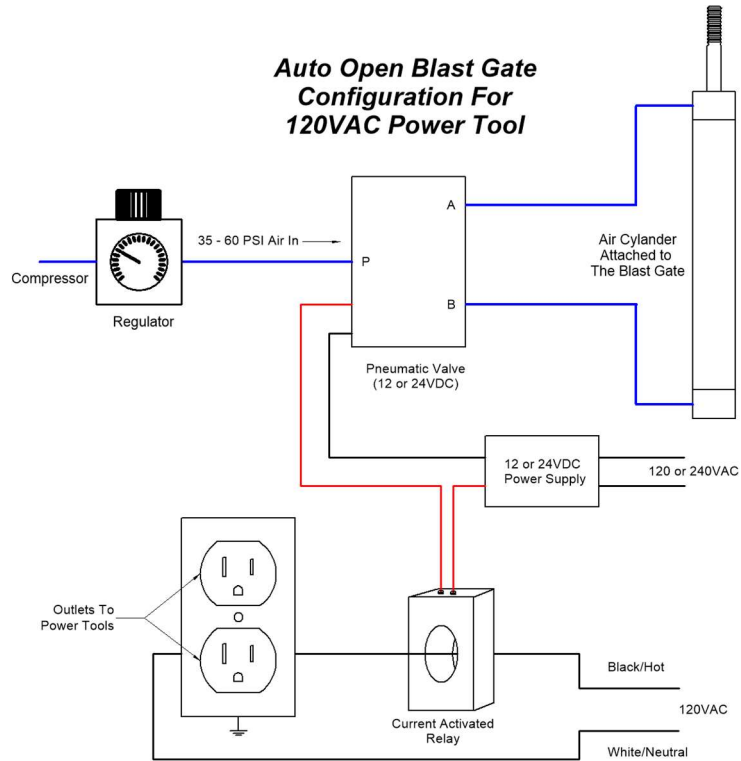
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Example of a completed automated blast gate switch:



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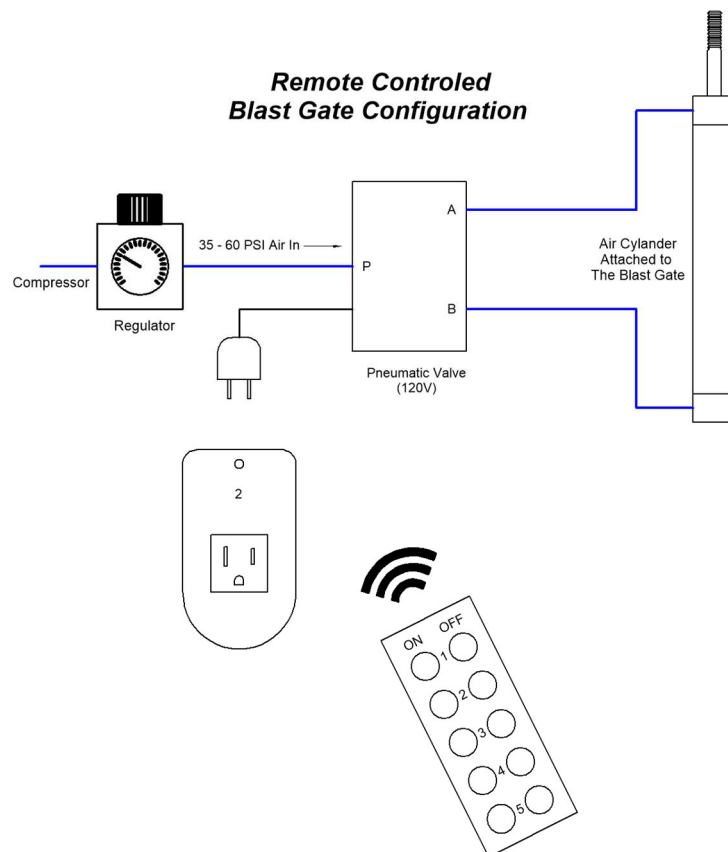
Additional Semi-automated circuits using 12 VDC or 24 VDC pneumatic valves:



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Wireless Remote Controlled:

- Turn your dust collector on and off manually or use a wireless remote. Open and close blast gates manually using a wireless remote control.
 - Most cost-effective solution.
 - Requires a wireless remote control for 120 VAC electrical outlets, which are available at a reasonable prices (under \$30) for example, this one found on Amazon [BN-LINK Wireless Remote Control Electrical Outlet Switch for Lights, Fans, Christmas Lights, Small Appliance, Long Range White \(Learning Code, 5Rx-2Tx\) 1200W/10A - Amazon.com](#) This unit allows you to control up to five blast gates, or you can use one outlet to control the dust collector (may need to add a relay to handle the collectors current) & four blast gates.
 - The dust collector can be left on as you move from one tool to another, eliminating the chance of overheating the motors capacitor.
 - Allows you to set up a blast gate that is “normally open”, eliminating the chance of choking your dust collector when turned on. (It’s recommended setting up the “normally open” gate on your table saw, as this is usually the most often used tool. When moving to another tool, open its blast gate and then close the “normally open” blast gate.) **To make a blast gate “normally open”, reverse the “A” & “B” hose connections on the pneumatic valve.**



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Using a wireless remote control to turn your dust collector on/off:

Most dust collectors draw significant current, which is beyond the current capabilities of most wireless remote-controlled outlets, therefore, it is necessary to use a relay/contactor to handle the high current draw of the dust collector. The following are basic relay/contactor circuits for 120 or 240VAC dust collectors. The relay's electromagnetic coil is powered through the wireless remote outlet, which allows the relay's contacts to open and close.

The relay you choose to use depends on the voltage and current requirements of your dust collector. (I found a contactor that can handle 40 Amps of current on Amazon at [Amazon.com: SunLee 2 Pole 40 Amp contactor 120v Coil UL 2 Pole Lighting Load 50 AMP Contactor Equivalent to 42CF15AF for Condenser Compressor HVAC Contactor : Industrial & Scientific](https://www.amazon.com/SunLee-2-Pole-40-Amp-Contactor-120v-Coil-UL-2-Pole-Lighting-Load-50-AMP-Contactor-Equivalent-to-42CF15AF-for-Condenser-Compressor-HVAC-Contactor-Industrial-Scientific/dp/B078888888) that should work for most dust collectors.) However, a licensed electrician will be able to help you choose the correct relay/contactor.

