



Enabling Your Ideas

Technical Document

File name: TD10162_AC_Powered_External_Contactor_Accessory_Kit

Rev: 0213A

Product Identification: External Power Contactor Kit (PN 33044)

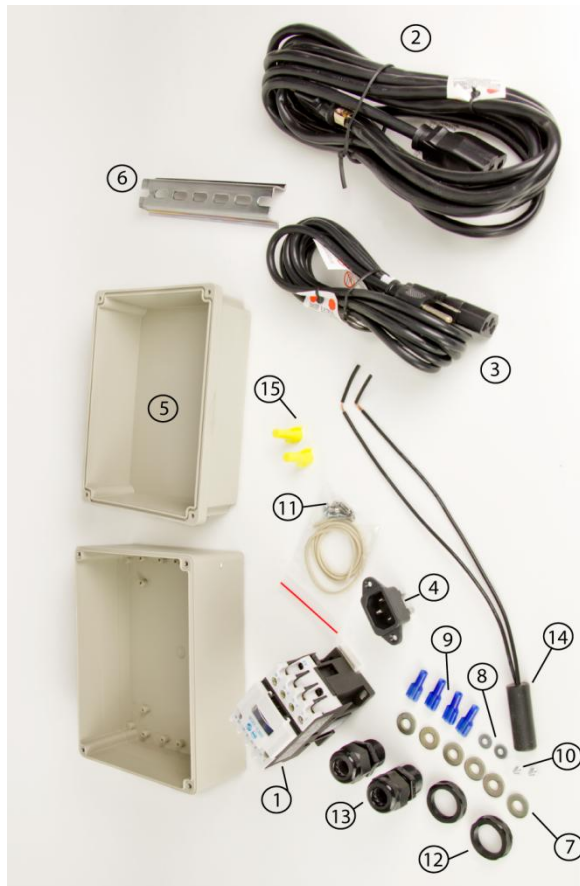
Overview

This document describes the assembly process for building an AC powered external contactor accessory. This is useful when there is a need to control significant power, such as a large coolant pump or a shop vacuum, but the controlled power source is limited in its capacity to control electrical power. In the context of Tormach milling machines, this issue occurs when there is a need to use the switched convenience outlet for larger pumps, vacuums, or other accessories.

CAUTION: The construction of electrical equipment is potentially dangerous. Tormach recommends having a fundamental understanding of how to safely and correctly work with electrical components. If you do not feel confident in assembly of this category of equipment, have a licensed electrician complete this procedure.

The standard Tormach mill configuration provides an AC switched outlet at the bottom of the control cabinet which can be operated either under manual control from the console or via automatic control using the M codes (M7, M8, M9). With this kit the switched outlet controls a power relay which, in turn, can switch much larger currents.

Item	Description	Quantity
1	Relay Contactor	1
2	10' Extension Cord (Power)	1
3	7' IEC Cord (Control)	1
4	IEC Power Inlet connector	1
5	Enclosure	1
6	DIN Rail	1
7	1/4" Flat Washer	6
8	#6 Flat Washer	2
9	Spade Terminal Connector	4
10	Sheet Metal Screw	2
11	Round Headed Screws	4 (2 extra)
12	Black Nylon Plastic Lock Nut	2
13	Cord Grip	2
14	Electrical Noise Suppressor	1
15	Wire Nut	2





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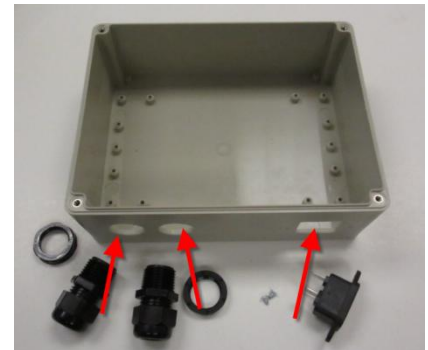
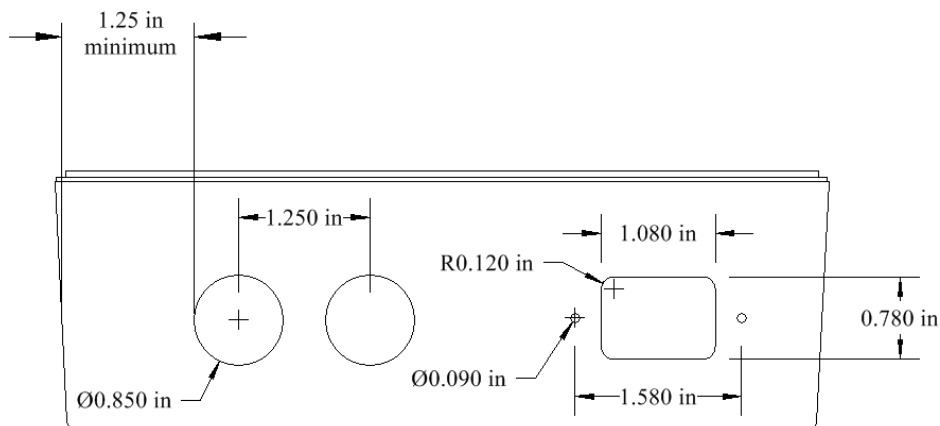
Tools Necessary for Assembly:

- Milling machine and small end mill
- Phillips screwdriver
- Wire stripper
- Wire Terminal Crimping Tool

Procedure

The first step is to mill the necessary holes in the plastic enclosure.

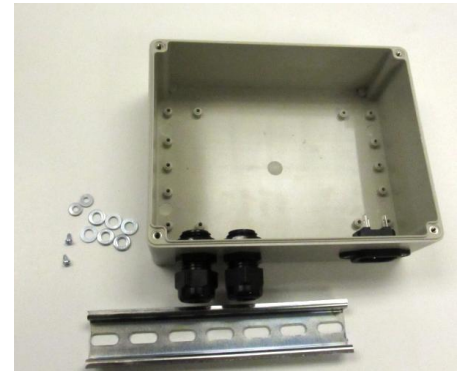
After the holes are cut you can install the cord grips in the enclosure box.



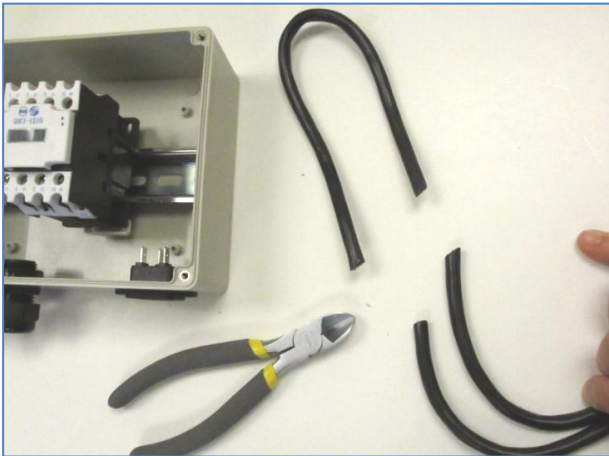
With the cut outs completed, install the cord grips with the locknuts and the IEC power connector with the two flat head sheet metal screws.



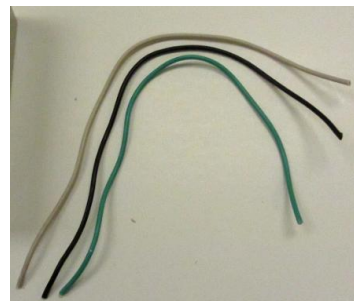
After the cord grips are installed, install the DIN rail along the centerline of the box using the washers and two of the round headed screws included with the outlet box. The mounting posts extend above the DIN rail so the 1/4" larger washers are used as spacers as shown in the photo on the right (three washers are used on each side).



With the DIN rail installed, you can snap the relay contactor onto the DIN rail.



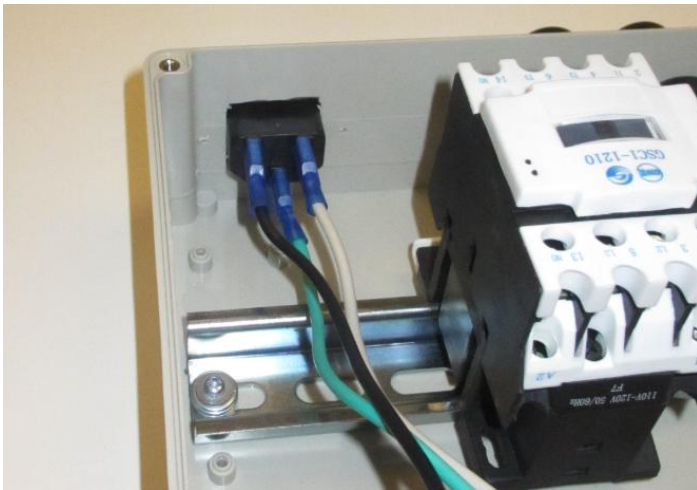
Next cut the 10' extension cord approximately in half. Also cut off a short section of about 12" as we'll need a bit of wire for the internal wiring. Pull each of the individual wires out of the short bit of cord.



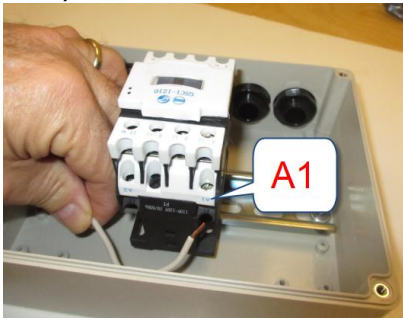
Now strip and crimp a spade terminal connector on one end of each of the three wires.



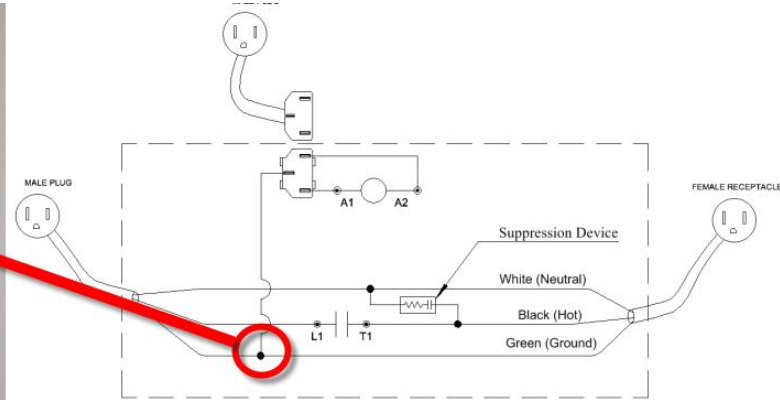
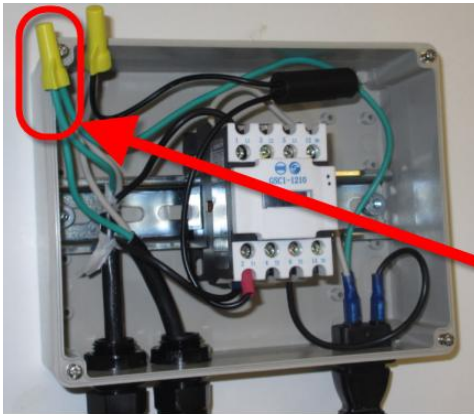
These wires are then pushed onto the IEC power receptacle. Be sure to put them onto the proper positions as shown in the photograph. If you look closely at the back of the IEC power receptacle you should see that it is marked L for the black wire (LINE), N for the white wire (NEUTRAL) and a ground symbol for the green wire.



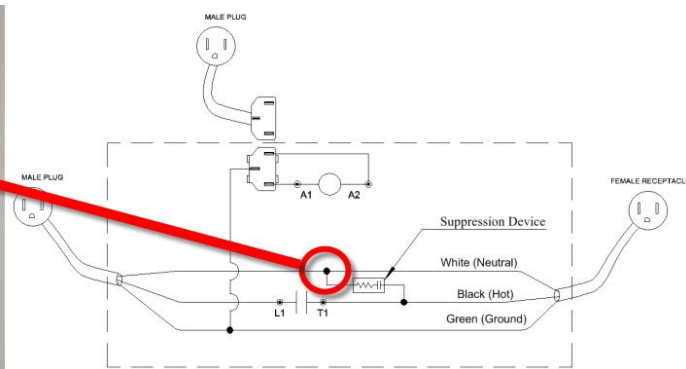
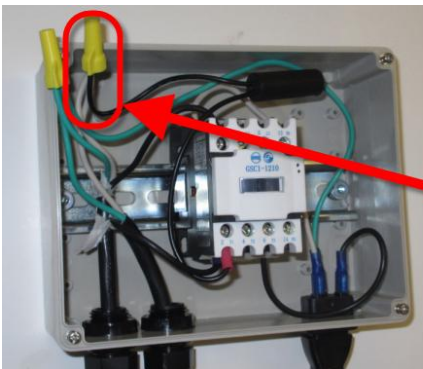
Next you need to install the coil wires. The white wire will go to A1 and the black wire goes to A2.



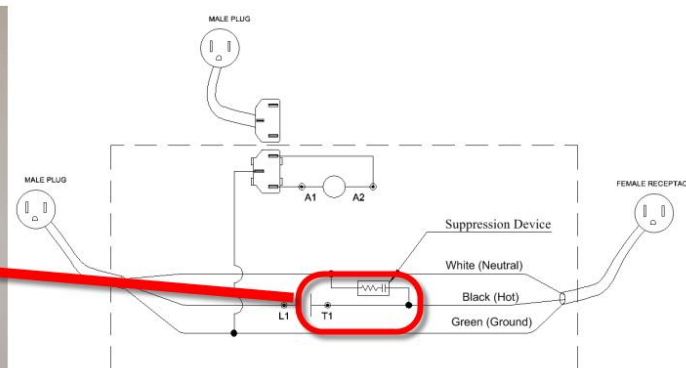
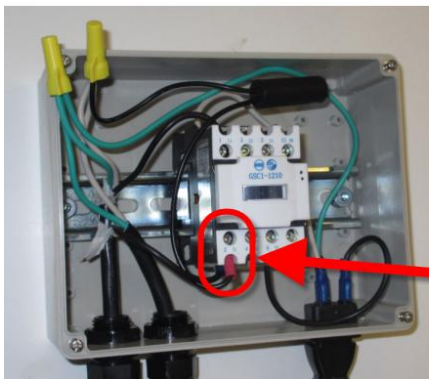
The cut ends of the extension cord are then run through the cord grips and stripped. The black wires of each should be stripped about 3/8" and the green and white wires are stripped about 3/4". The black wires will go to the contactor on terminals L1 and T1. All this is summarized on the next page in both photo and schematic.



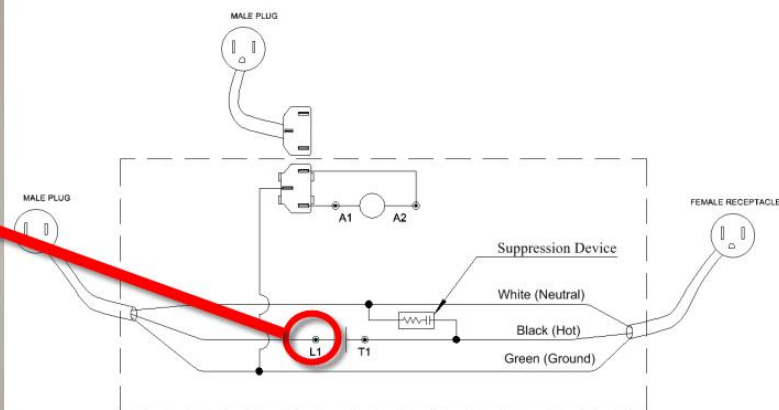
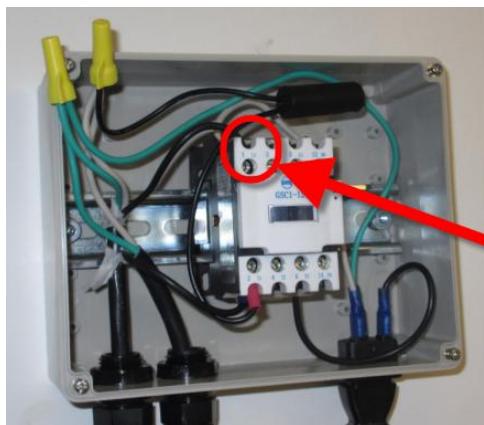
Grounds are all connected to each other with a wire nut.
The grounds are the green wires.



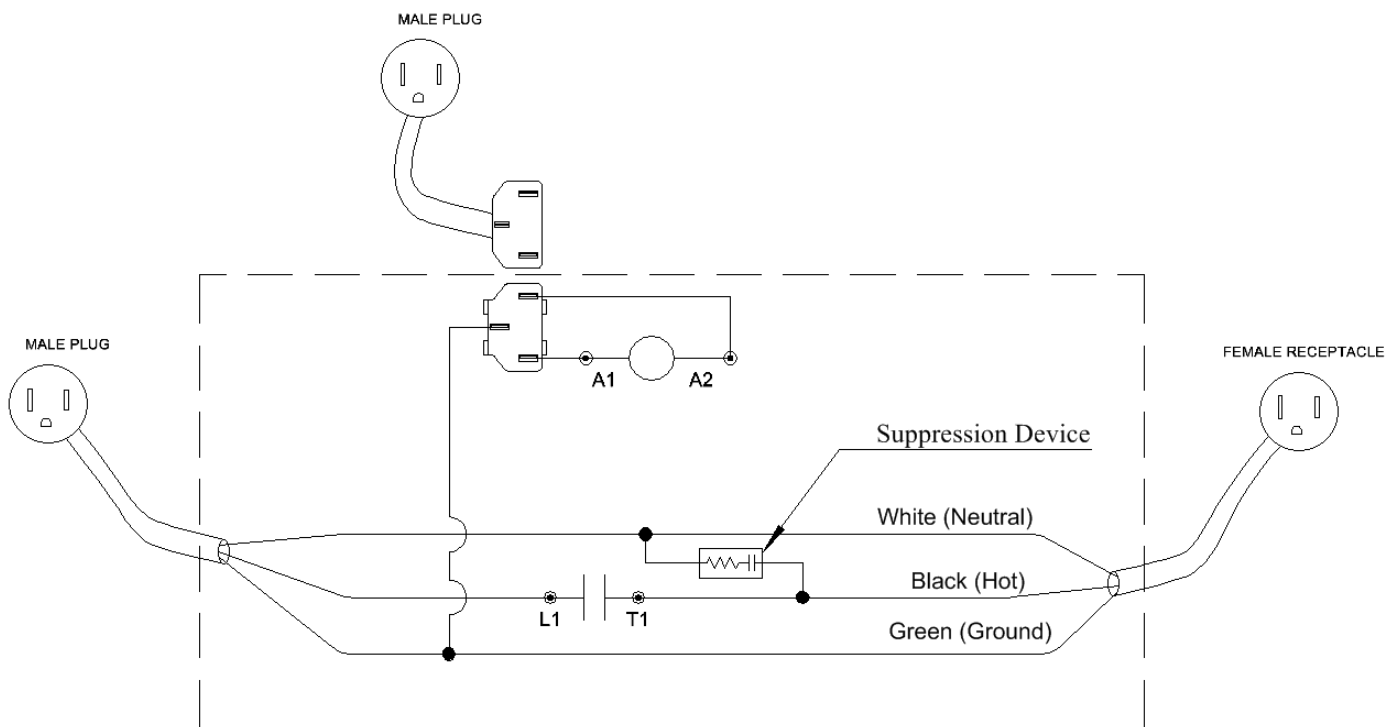
Neutrals from both Load and Line are connected to suppression device with a wire nut. The neutral wires are the white wires.



Load (female receptacle) and suppression device wire into T1 terminal



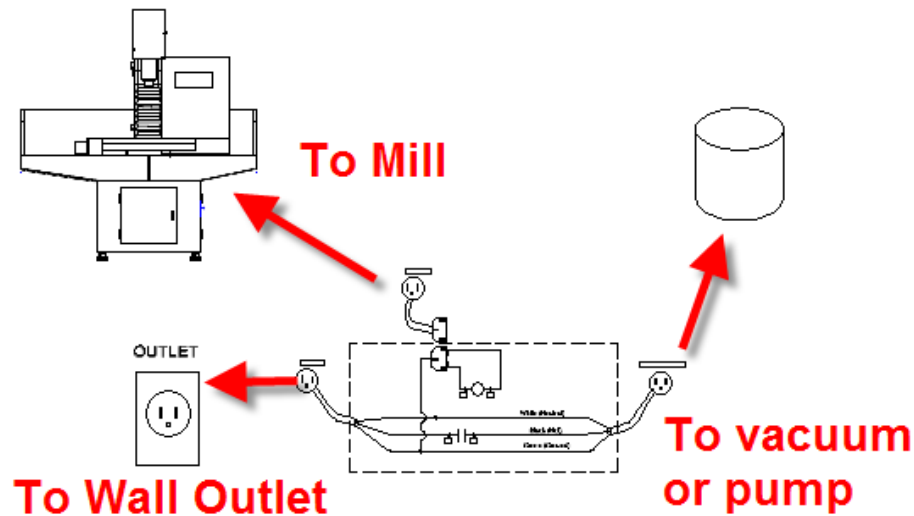
Line (male power plug) are connected into the L1 terminal



This is the completed wiring diagram.

Control power comes in on top, line power comes in from the left, and the power for your device (load) is on the right.

With these connections made, all that is necessary is to close the box with the cover and 4 screws included. The IEC power cord will be plugged into the control AC power. If you're using this with a Tormach PCNC mill that would mean the AC outlet normally intended for the coolant pump. Then the other male plug is plugged into a different power source, one which is rated for whatever device you want to control. The device is then plugged into the female AC receptacle. The power cord is rated to 13 amps.



Variations:

The contactor included in the kit can also be used for 230 VAC control or even 3 phase control. To modify the circuit to support 230 VAC control you need to run both the white wires and the black wires from the power cords through the contactor. Run the white wires to terminals L2 and T2, next to the L1 and T1 terminals. You can use the power cable, but you must cut off the molded AC plug and socket and get the appropriate 230 volt versions from your local hardware store or electrical supplier. The wire of the power cord is OK to use but the white wire should be marked with black electrical tape or black heat shrink tubing in order to designate the fact that it is a hot wire, not a neutral wire. The schematic for a 230 VAC wired external contactor box is below. Remember that the suppression device should always go on the load side, not the line side.

