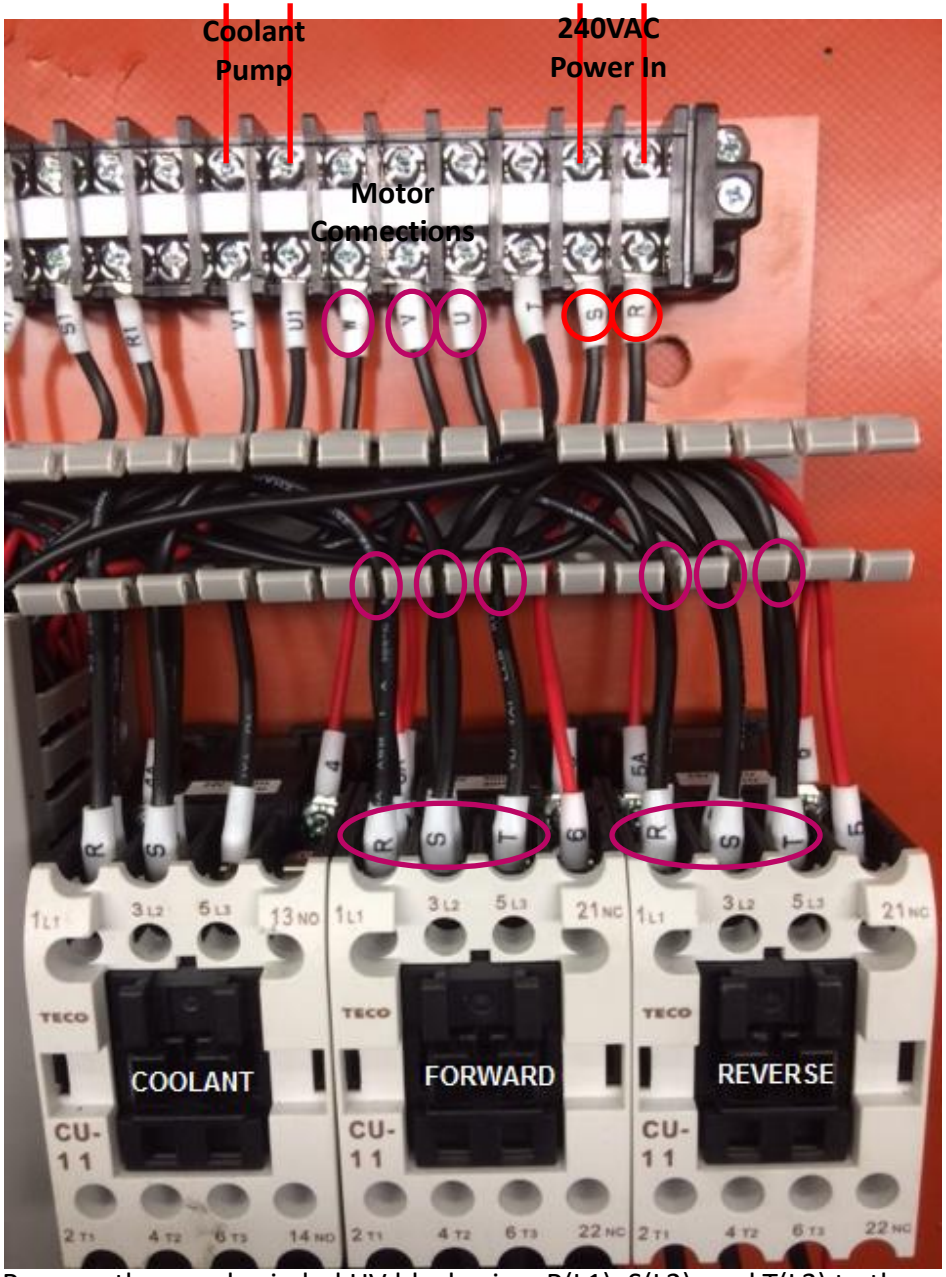
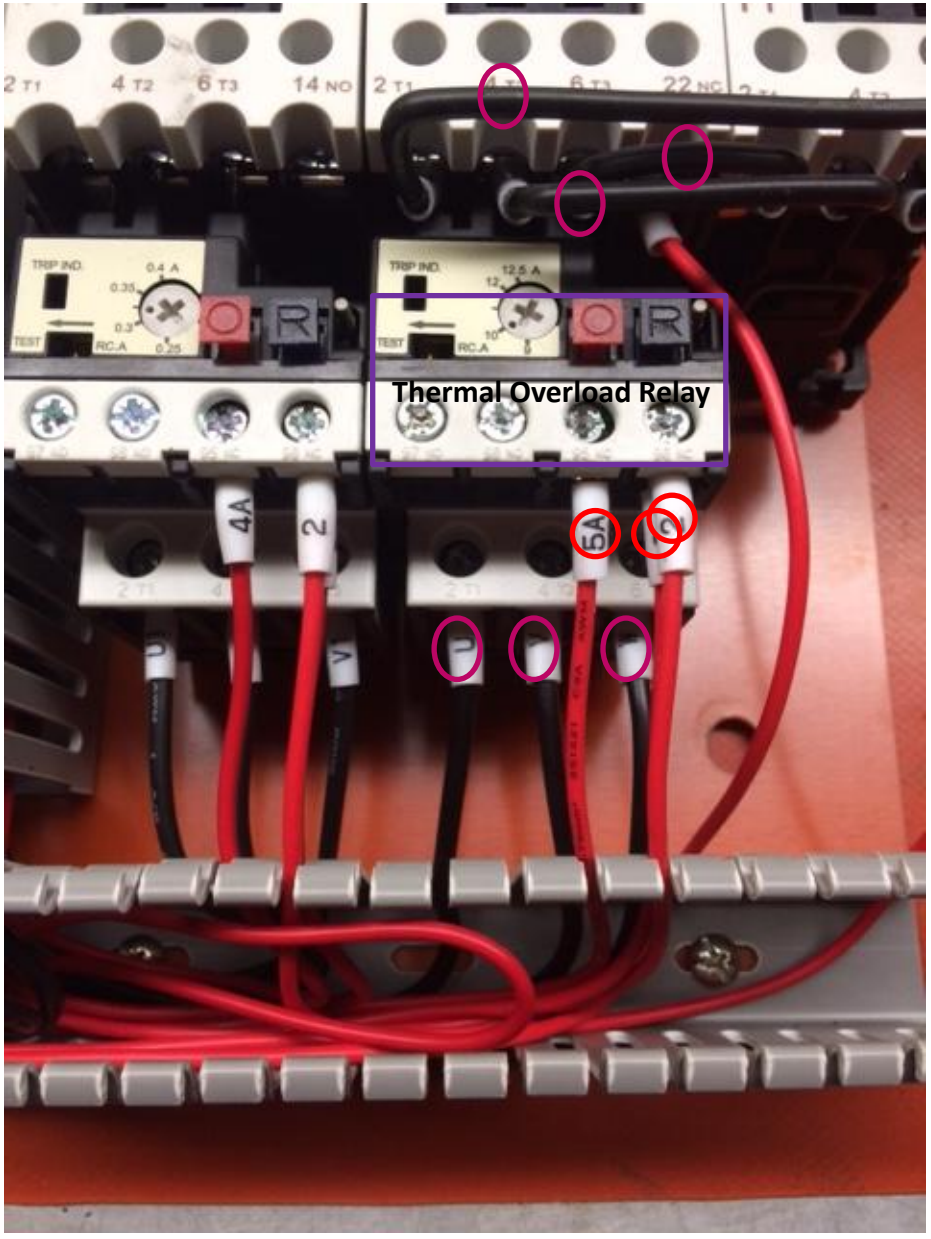
PM 1440GT Three Phase Lathe possible VFD connections/schematics to use the factory new lathe contactors to switch the VFD direction inputs. This is a possible way to reconfigure a lathe for VFD use, but it is not recommended vs. a dedicated VFD control system with low voltage relays and interlocks.

This requires removing the high voltage wiring to the forward and reverse contactors. This is only for new machines as used contactors will most likely not work because of increased contact resistance from previous contact arching. Contactors are specifically designed for switching electrical power (120-480V) and not low voltage & low current signal level inputs, as such they may not work or be intermittent with switching low voltage/signal level inputs of a VFD.

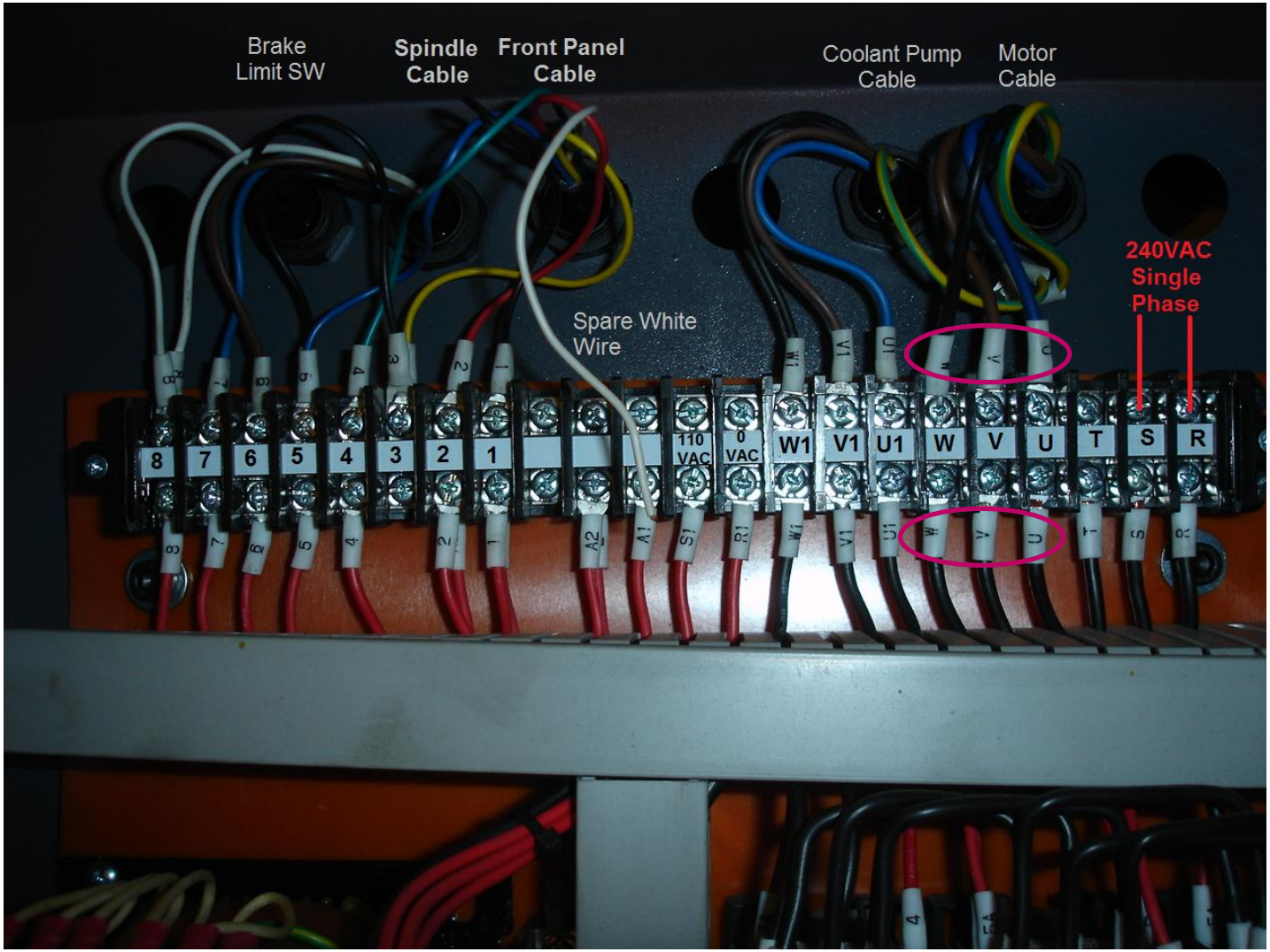
There are several different variants on the wiring of the PM1440GT. The suggested modifications/changes have not been tested, may differ by machine and are provided as is as a concept. You assume all responsibility for the use of any of these modifications or changes to the stock machine, compliance with all electrical codes and consequence of any/all use of the lathe. Consult Quality Machine Tools first as to any modifications to the lathe.



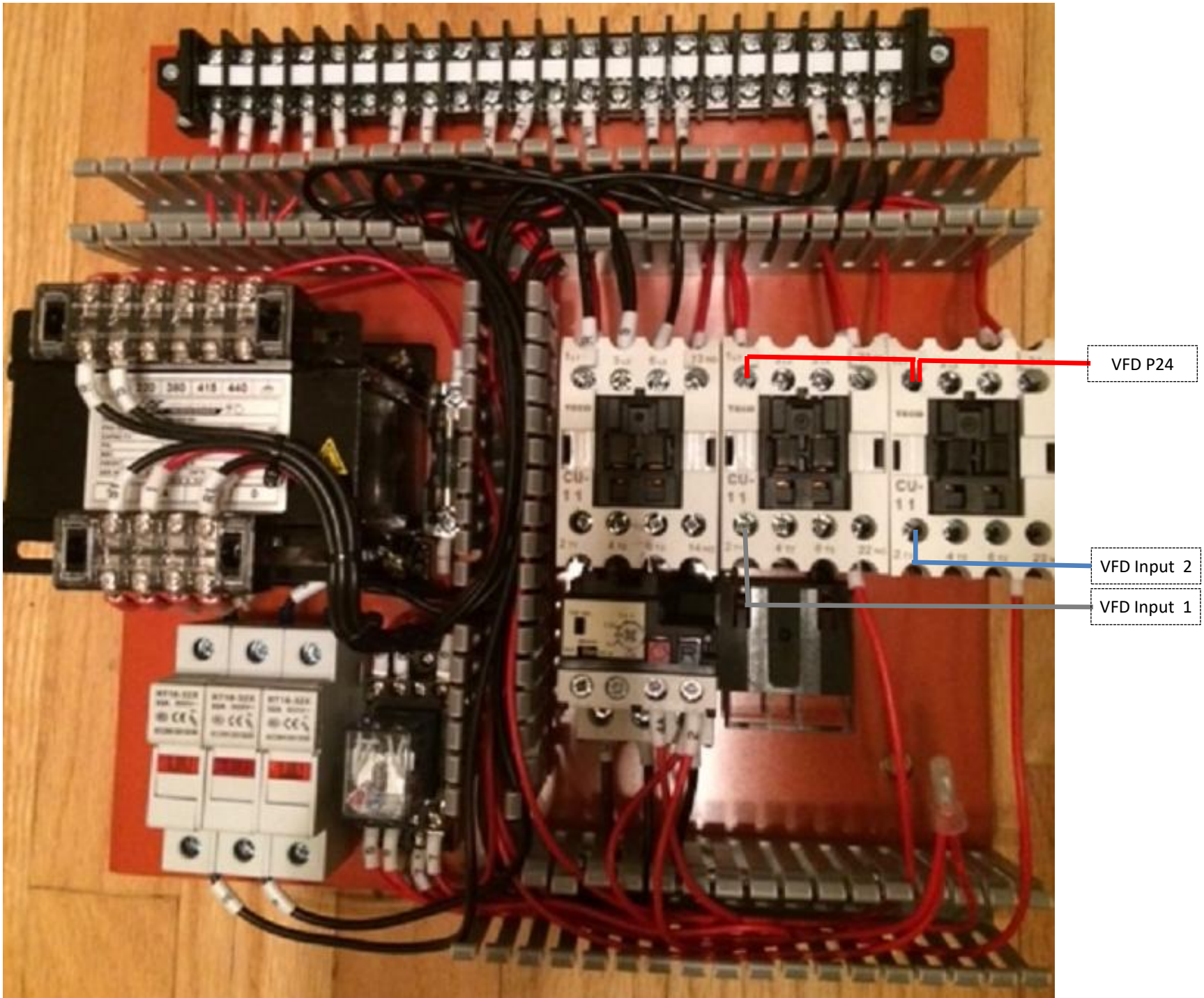
Remove the purple circled HV black wires R(L1), S(L2), and T(L3) to the forward and reverse contactors. Disconnect and **remove each wire at both ends**. Remove the R and S black wires that goes from the Forward contactor to the Coolant contactor. This may vary by lathe.



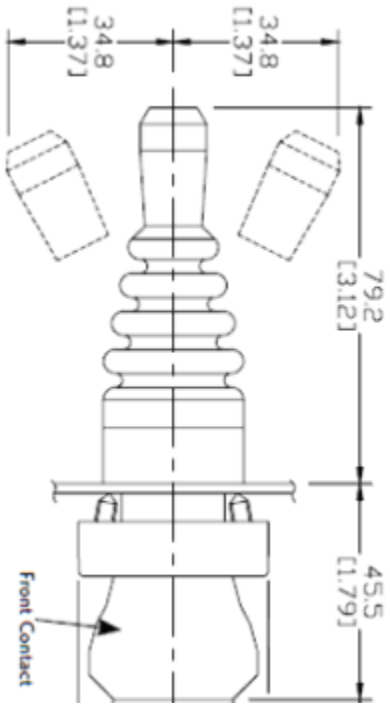
Remove the purple circled HV black wires U (T1), V(T2), and W(T3) to the forward and reverse contactors. Disconnect and remove each wire at both ends. Remove the Forward contactor thermal overload, connect the three red (red circles) wires 2, 2, and 5A and insulate the connection.

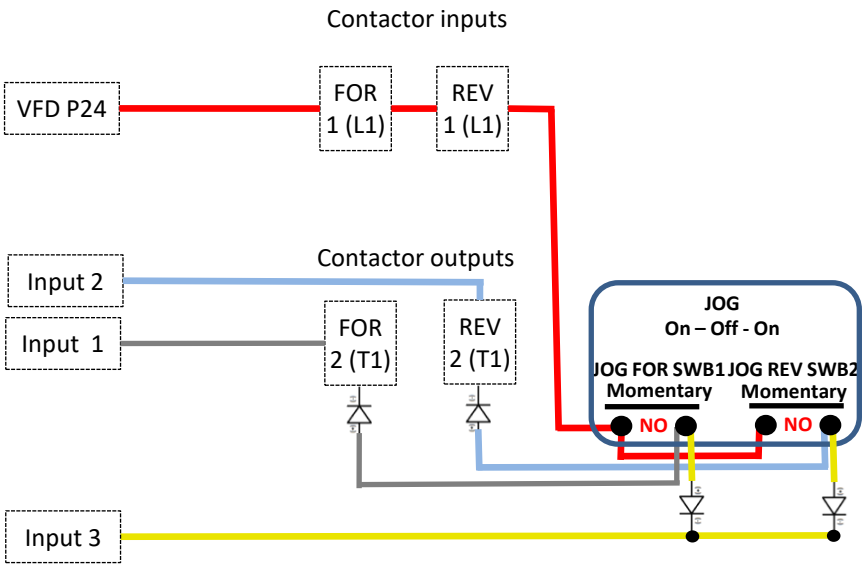


Remove the motor U, V, W wires to the contactor and from the terminal strip to the motor. The motor must be directly connected to the VFD motor terminals per the manuals.


VFD P24
VFD Input 2
VFD Input 1

Two way Joystick Jog using For/Rev VFD inputs for Hitachi WJ200
ECX Series 22mm Plastic Joystick EXC3510

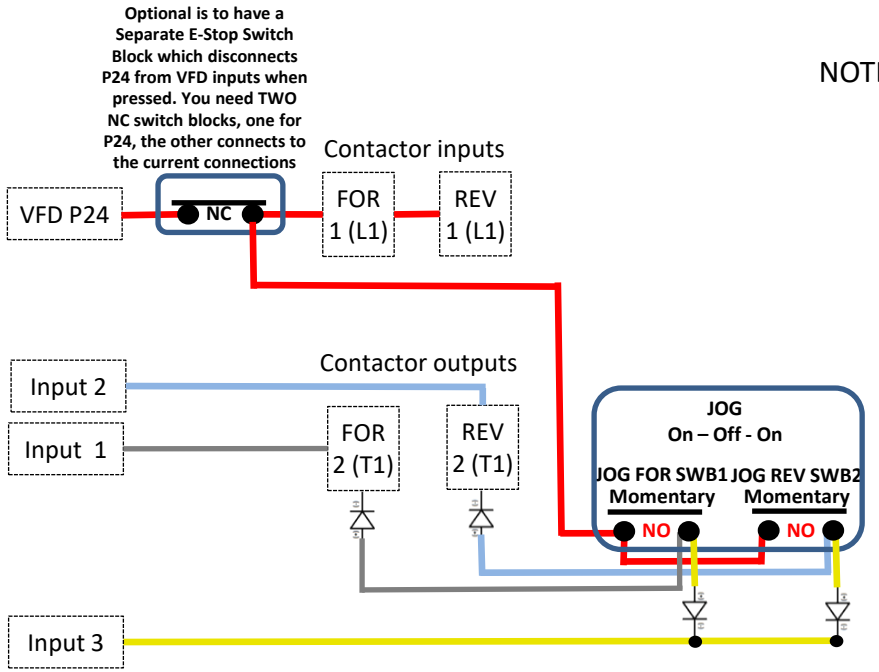




Note: The VFD inputs much be set to **SOURCE logic** to use the diodes as shown.

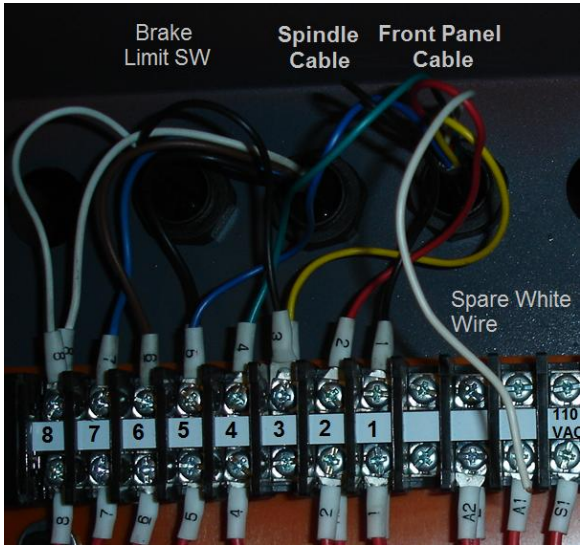
Diode 1N400X type: 1N4004-7

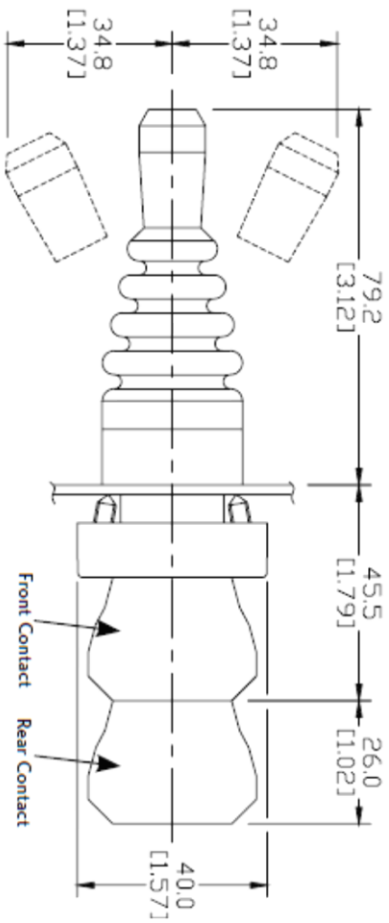
NOTE: Input 3 must be programmed for Jog

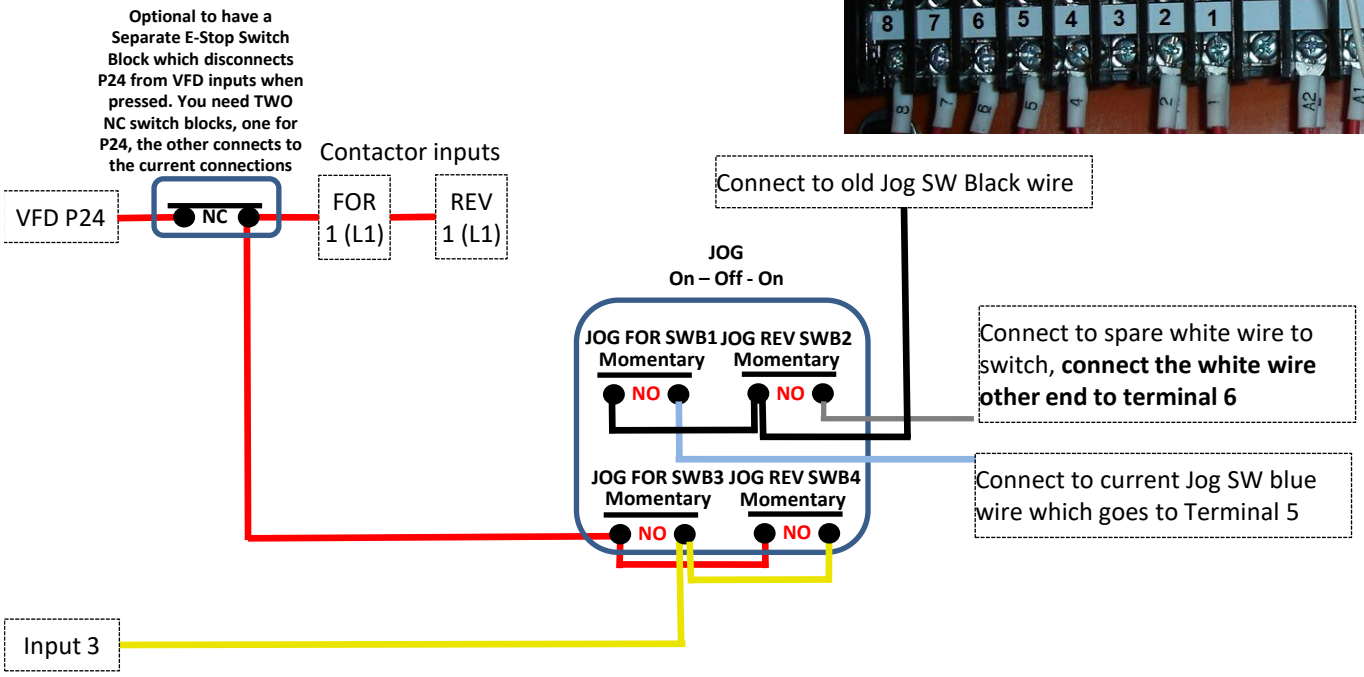


Diode 1N400X type: 1N4004-7

Two way Joystick Jog using For/Rev contactors for Hitachi WJ200
ECX Series 22mm Plastic Joystick EXC3510
and *ECX1040-2 (two additional NO switch blocks)*
Total of 4 NO switch blocks

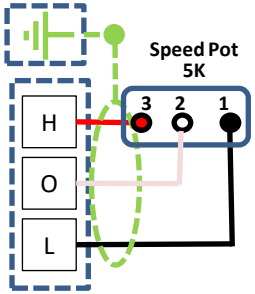






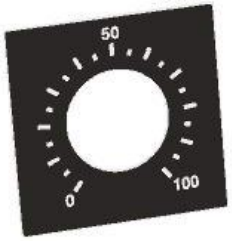
NOTE: Input 3 must be programmed for Jog

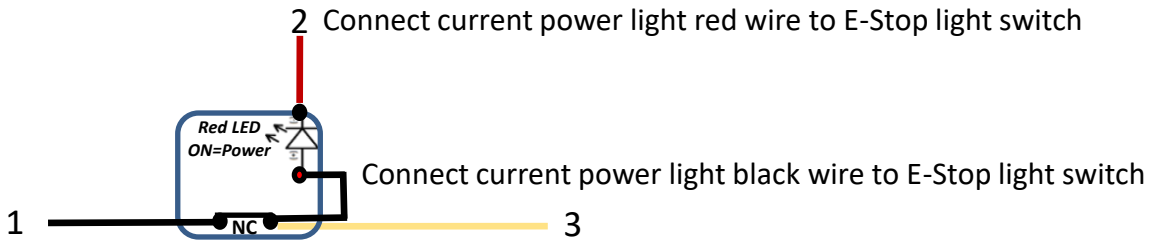
Use (24V) Lighted E-Stop Switch as Power Indicator
Replace factory power light with speed pot.



Speed Control
Use 4 conductor shielded cable (green wire is not used). ground cable shield at VFD end only

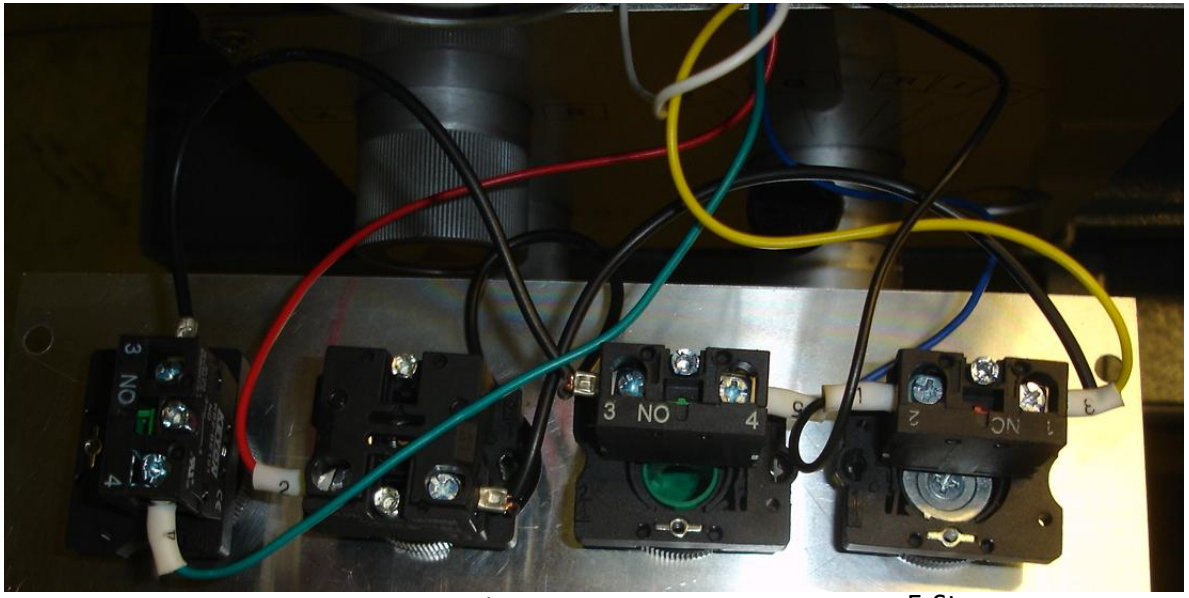
ECX2300-5K 22mm potentiometer 5K
ECX2640 22mm legend plate 0-100



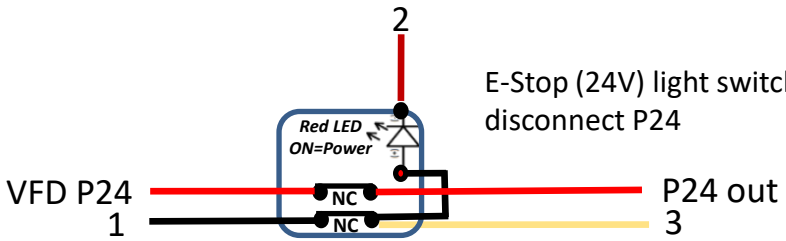


2 Connect current power light red wire to E-Stop light switch

Connect current power light black wire to E-Stop light switch



Coolant Power Light Jog E-Stop



E-Stop (24V) light switch with second NC switch block to disconnect P24

24V Lighted E-Stop, connect the current indicator lamp wires to the E-Stop light connections.

GCX1226-24
https://www.automationdirect.com/adc/Shopping/Catalog/Pushbuttons_-z-_Switches_-z-_Indicators/22mm_Metal/Emergency_Stop_Pushbuttons_Illuminated_-a-_Non-Illuminated/GCX1226-24

https://www.automationdirect.com/adc/Shopping/Catalog/Pushbuttons_-z-_Switches_-z-_Indicators/22mm_Metal/22mm_Pushbutton_Accessories/Contact_Blocks/ECX1030-2

Fuji Electric AR22V0L-01E3R
https://www.automationdirect.com/adc/Shopping/Catalog/Pushbuttons_-z-_Switches_-z-_Indicators/Fuji_Electric_22mm_(AR22_Series)/Emergency_Stop_Pushbuttons_Illuminated_-a-_Non-Illuminated/AR22V0L-01E3R

https://www.automationdirect.com/adc/Shopping/Catalog/Pushbuttons_-z-_Switches_-z-_Indicators/Fuji_Electric_22mm_(AR22_Series)/22mm_Pushbutton_Accessories/Contact_Blocks/AR9B291

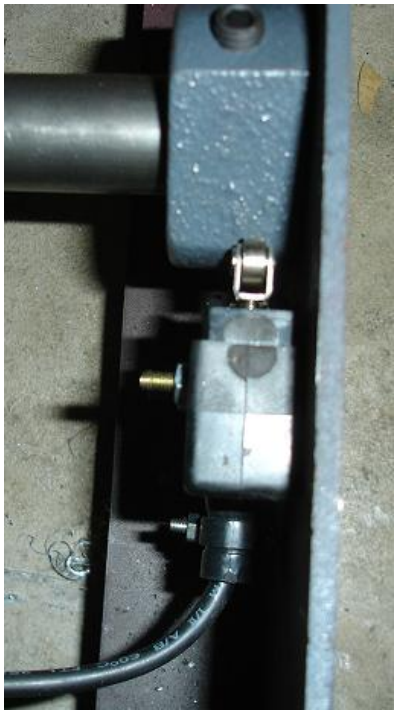
Idec AVLW49902-R-24V
http://www.lectrocomponents.com/products/idec-avlw49902-r-24v-switch.html

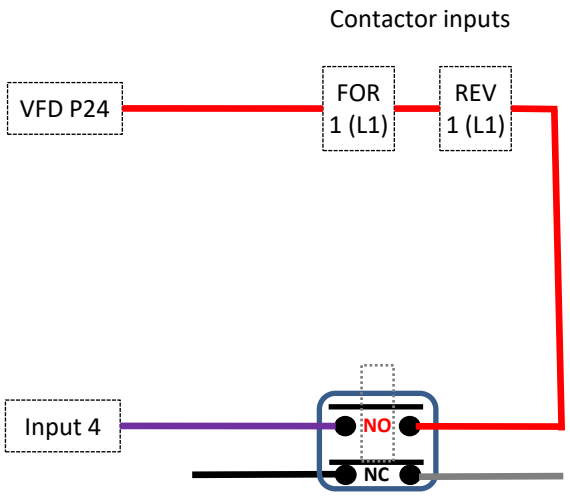
https://www.onlinecomponents.com/idec-avlw49902r24v.html

Note: A second NC switch block is required if P24 is disconnected by the second switch block, the Idec model listed is configured with two NC contact blocks

Mechanical Foot Brake for Hitachi WJ200
Use of DPDT Limit Switch to Activate the VFD Free Run Command

Stock single pole limit brake SW





Current brake limit switch connections, black and white

Replace the current brake switch with a DPDT Limit Brake SW (snap action). Example is a Honeywell GLEA24C or similar limit switch

VFD P24 (logic source voltage for VFD inputs) is connected to NO switch block

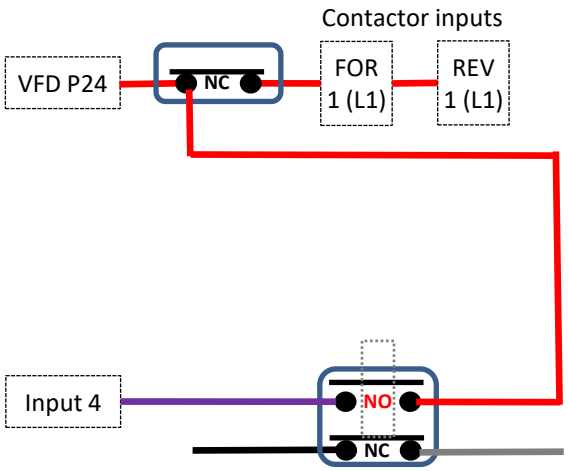
Existing switch wires connected to separate NC switch block

https://www.zoro.com/honeywell-micro-switch-global-limit-switch-glea24c/i/G4175893

GLEA24C

Global Limit Switches Series GLS: Top Roller Plunger, 2NC 2NO DPDT Snap Action, 0.5 in - 14NPT conduit

Optional is to have a Separate E-Stop Switch Block which disconnects P24 from VFD inputs when pressed. You need TWO NC switch blocks, one for P24, the other connects to the current connections

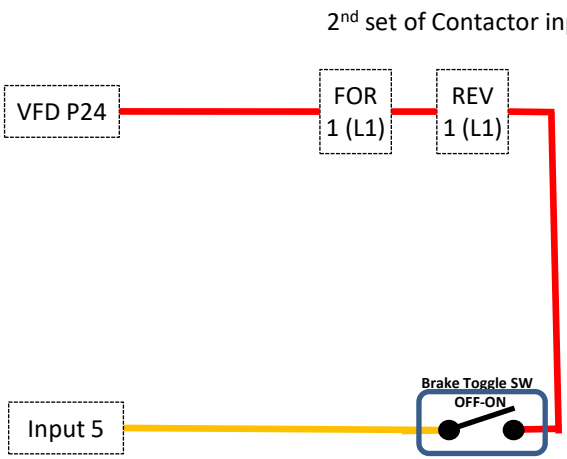


Current brake limit switch connections, black and white

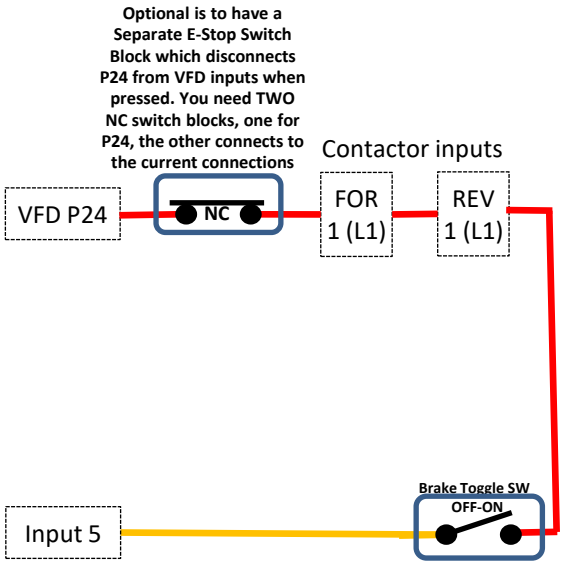
Note: The logic voltage for the free wheel command must always be active, so the voltage source for this input must not be interrupted by the E-Stop switch block.

NOTE: Input 4 must be programmed for Free Run Stop 11:(FRS: Free-Run Stop)

Two Stage Braking Switch for Hitachi WJ200
ON = longer braking time



Use small mini/micro toggle switch at front panel to switch between single stage and two stage braking.



NOTE: Input 5 default is set for two stag braking when the input is active