

Leadscrew Tapping Cycle - A7/A8 Block Electric AFTE

Leadscrew tapping uses a fixed mechanical drive and hence the forward feed and retract feed are fixed by the pitch of the leadscrew. It is important that the leadscrew being used is the correct one for the thread that is being tapped.

Leadscrew tappers reverse the motor to withdraw the tap from the hole. On electric AFTE's their depth and datum signals are given by electric proximity switches on the A7/A8 Block which are to reverse the motor at depth and to stop it at the datum position.

The control for this is **SEPARATE** and is commonly carried out by machine builders own control circuitry.

The electric leadscrew tappers from Desoutter come equipped with three proximity switches for home/datum, depth and no-hole sensing.

In any Control Circuitry the following are recommended:

Cycle Button	When pressed the tool will cycle.
Emergency Stop	When pressed the tool will stop.
Inch Reverse	Enables inch reversal of the tool when setting up (also used to return tool to datum after emergency stop is pressed or no hole sensed.
Inch Forward	Enables the tool to be inched forward when setting up.

Proximity Switch Types Connections and Use

Block Type	Proximity Switch Type	Operating Voltage	Voltage Drop	Rated Operating Current	Operating Temperature
A7	M8 PNP NO	10-30V	<=2.5V	250mA	-25 to 70 C
A8	M8 NPN NO	10-30V	<=2.5V	250mA	-25 to 70 C

The output is short circuit protected (pulsed). After elimination of the short circuit the switch is ready again for operating.

Datum should be used to sense home position and hence to stop the motor at the end of a cycle.

Datum - 24V (Brown) to 24V
 0V (Blue) to 0V
 Output (Black) to STOP the motor

Depth should be used to sense end of stroke position and hence to actuate the reverse of the motor.

Depth - 24V (Brown) to 24V
 0V (Blue) to 0V
 Output (Black) to REVERSE the motor

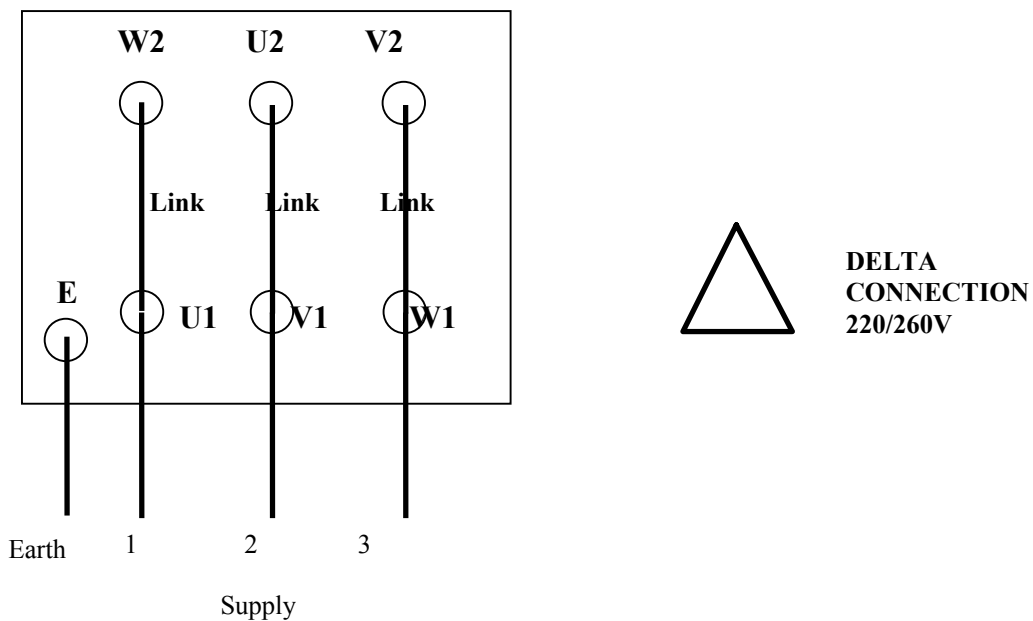
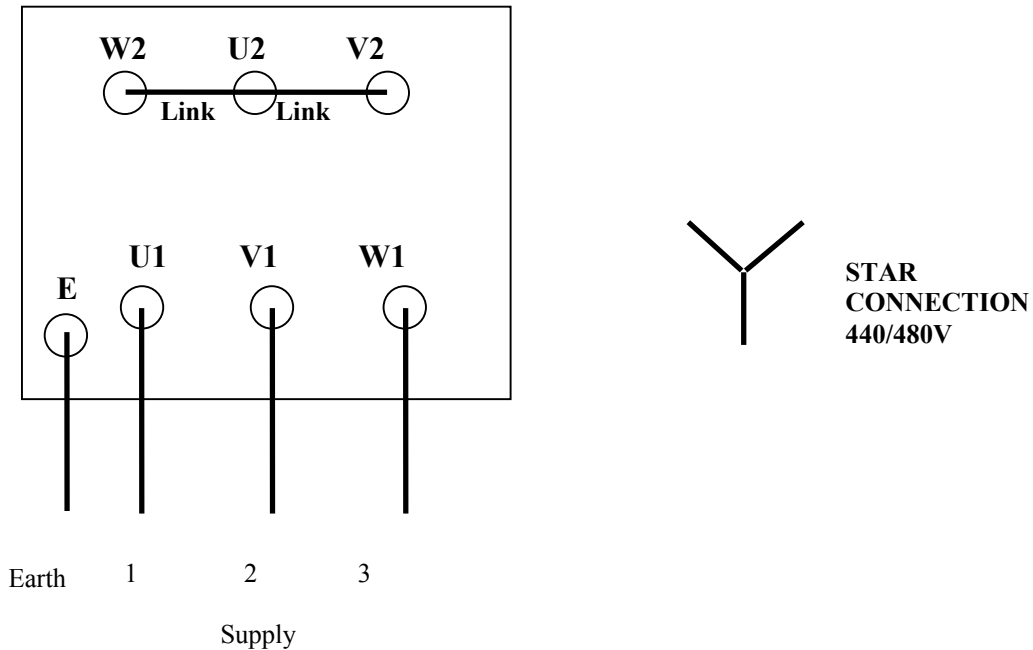
No -Hole should be used to sense a component with no hole - the output should be used to stop the motor.

No Hole - 24V (Brown) to 24V
 0V (Blue) to 0V
 Output (Black) to STOP the motor

Proximity Switch Type	Proximity Switch Part Number	Cable Part Number
M8 PNP NO	381223	381233
M8 NPN NO	396183	397043

Electric Motor Connection

The electric motor used on the AFTE's are 3 phase mechanical brake motors and can be connected to into both 440-480 volts or 220-240 volts at 60Hz by changing the connections to the motor as shown below.

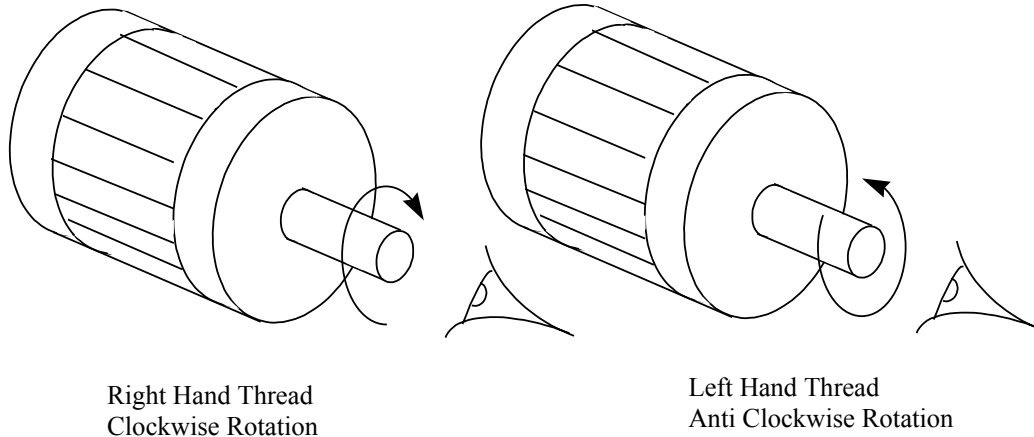


The motors must be connected to a 3 phase supply in accordance to the Voltage Charts in the relevant service sheet and provided with a starter fitted with an overload protection.

Recommended overload settings and the connection type.

Tool Series (Motor Part No.)	Speeds (50Hz)	Voltage /V	Frequency /Hz	Motor Connection	Power /hp	Full Load Current /A	Recommended Overload Setting /A
AFTE270 (381253)	1100-2950	220/260	60	Delta	0.28	1.0	1.0-1.2
	4 pole	440/480	60	Star		0.6	0.6-0.8
AFTE470 (310373)	180-1450	220/260	60	Delta	0.6	2.0	2.0-2.2
	4 pole	440/480	60	Star		1.1	1.1-1.3
AFTE480 (380433)	180-1450	220/260	60	Delta	1.2	3.8	3.8-4.0
	4 pole	440/480	60	Star		2.2	2.2-2.4

When connecting the motor ensure that the motor rotation is correct. Remove the belt from the pulley's and view the motor from the shaft end of the motor. For right hand threads the rotation should be clockwise and anti clockwise for left hand threads.



To reverse the motor interchange U1 and V1 connections.

NOTE: Before cycling a leadscrew tapper check the following:-

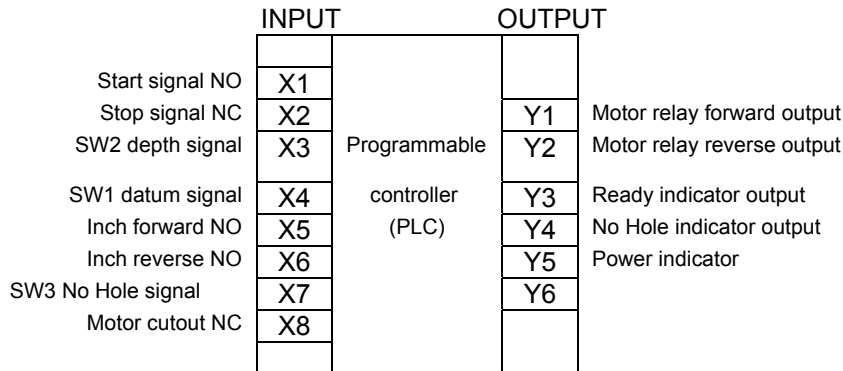
- 1. Electric Motor is running in the correct direction.**
- 2. Proximity switches are fitted correctly i.e. are sensing datum and depth and that the logic of the control circuitry is functioning correctly:-**
 - i.e. Depth reverses the direction of the electric motor.**
 - Datum stops the electric motor.**

Operation of AFTE Tapper using a Programmable Controller

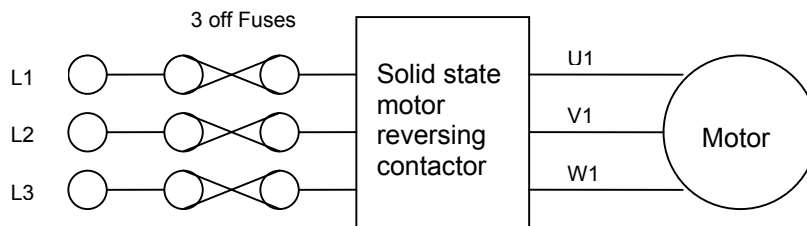
Electrical connections to AFTE270/470/480:

Consult tool service sheet for correct wiring of motor and proximity switches.

Control circuit:



Motor Switching Circuit:



Note*: Ultra-fast fuses must be used. The fuses must have an I²T rating lower than the contactor.
Fuse size Ø10 x 38mm.

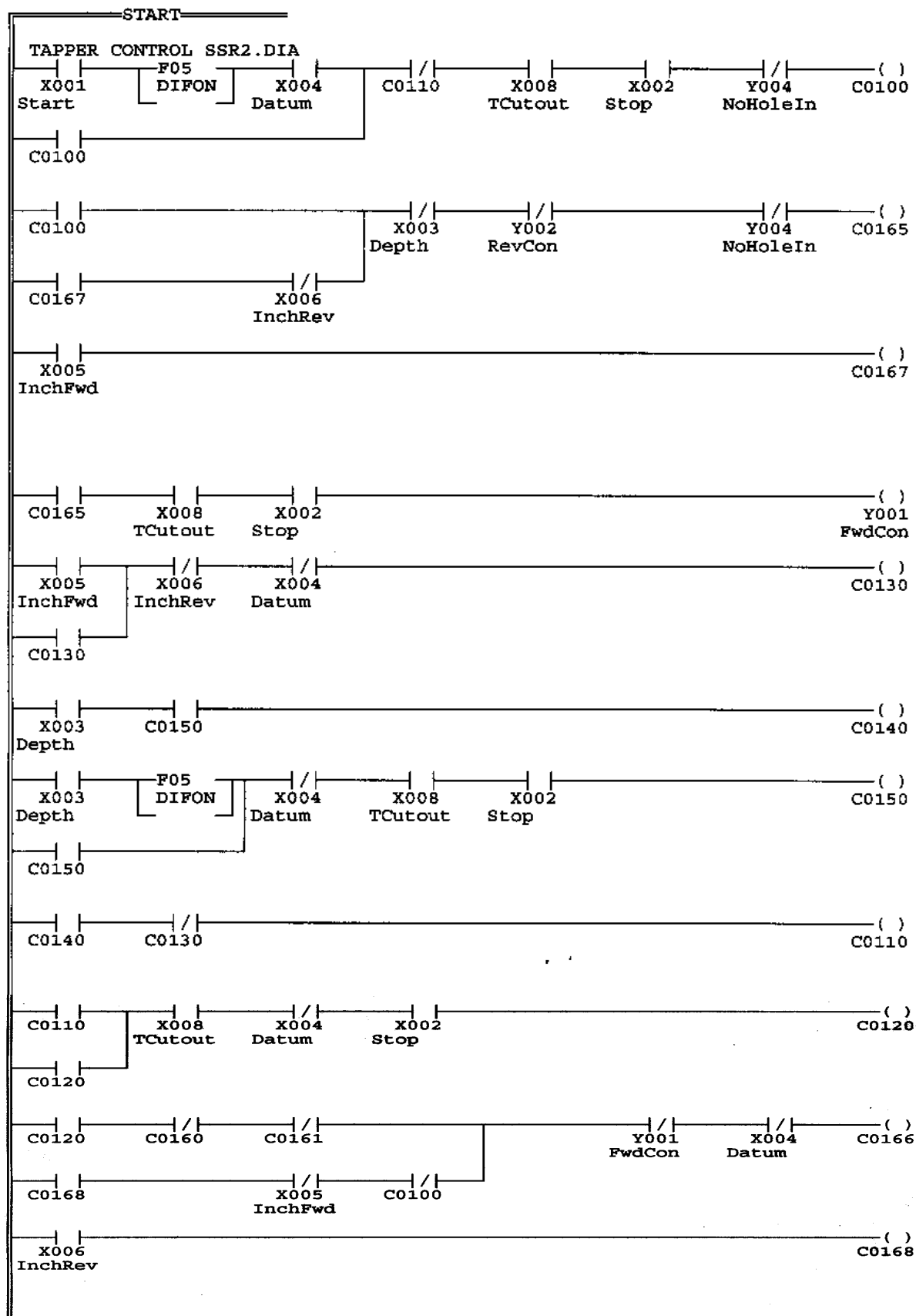
Motor rotation test must be carried out as described in AFTE service sheet before operating the tool.

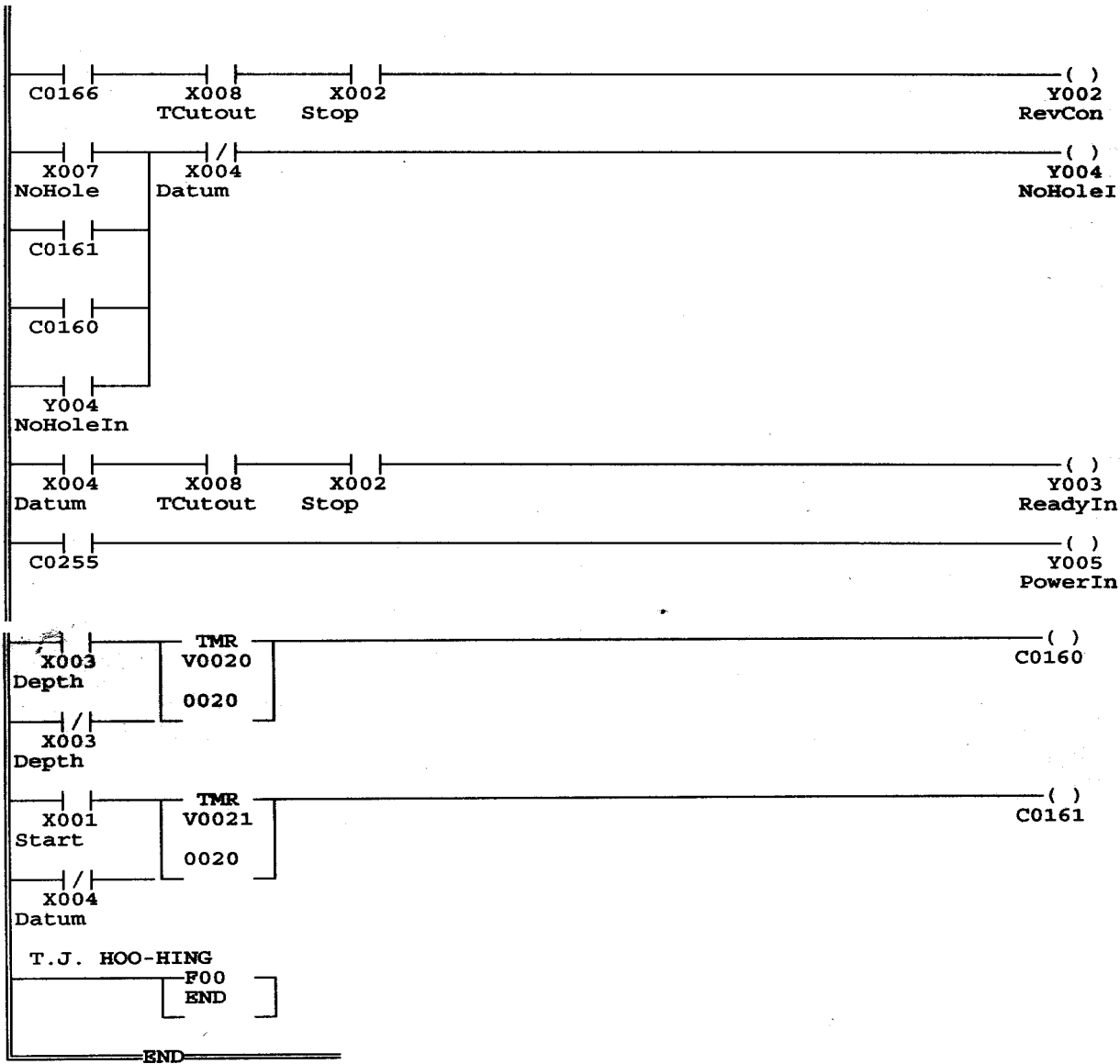
Desoutter recommends that the SRC3D Solid State Relay from Intercable Danmark is used in the circuit.

Warning :

Customer is responsible for ensuring the safe installation and operation of the control equipment.

Ladder Diagram:





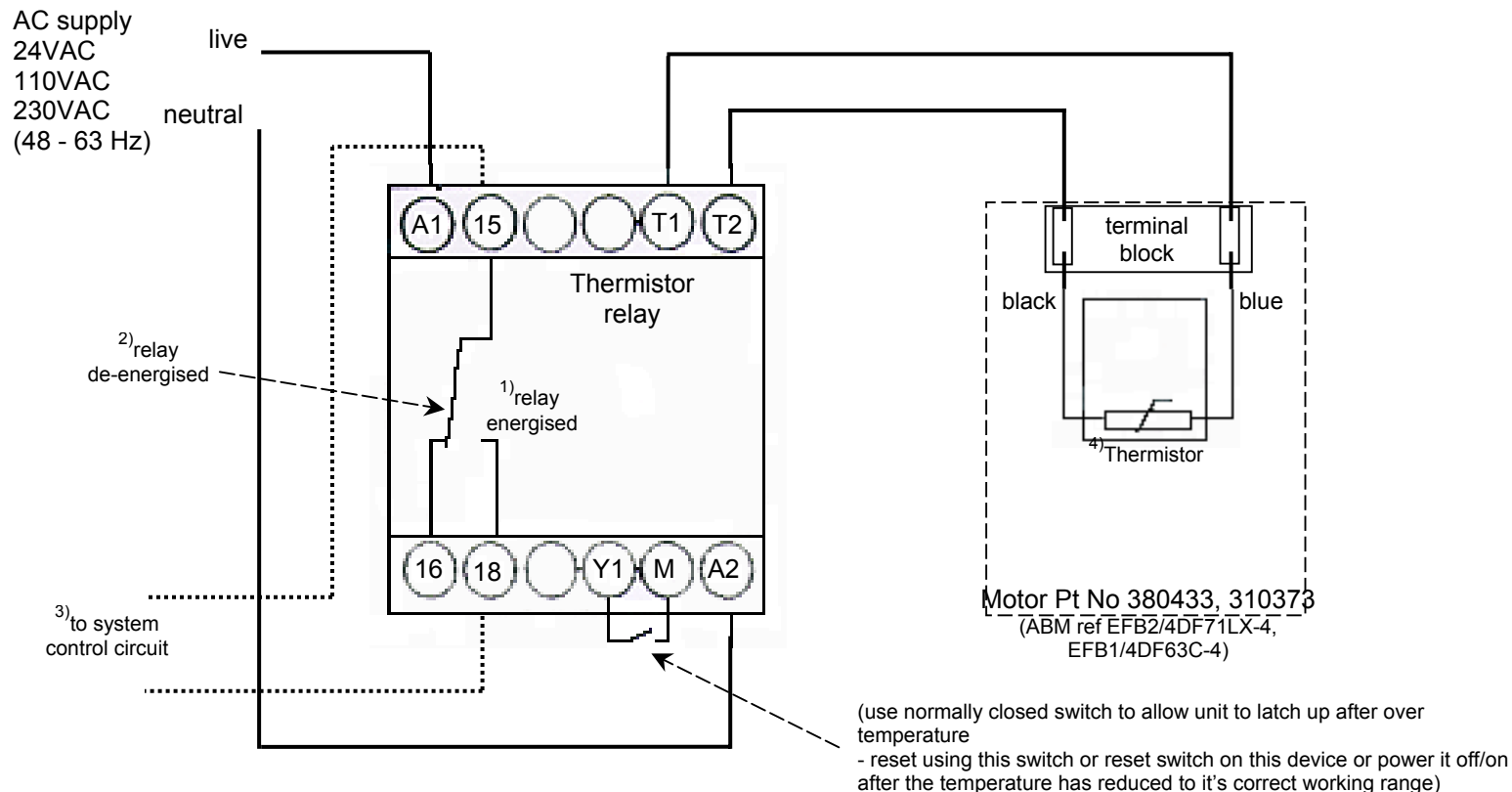
For motor connection instructions refer to 'operating instructions' supplied with the AFTE480 in conjunction with this document. The following supersedes the instruction concerning the 'thermal cut-out' connections.

The brake motors used on the AFTE480 and AFTE470 now contain a built in Thermistor Detector PTC (in place of the thermal cut-out) that is used for motor overload protection.

To enable the thermistor to be utilised an external thermistor relay is required.

Suitable thermistor relays are available from electrical/electronic suppliers.

Below shows a typical connection diagram using a thermistor relay:

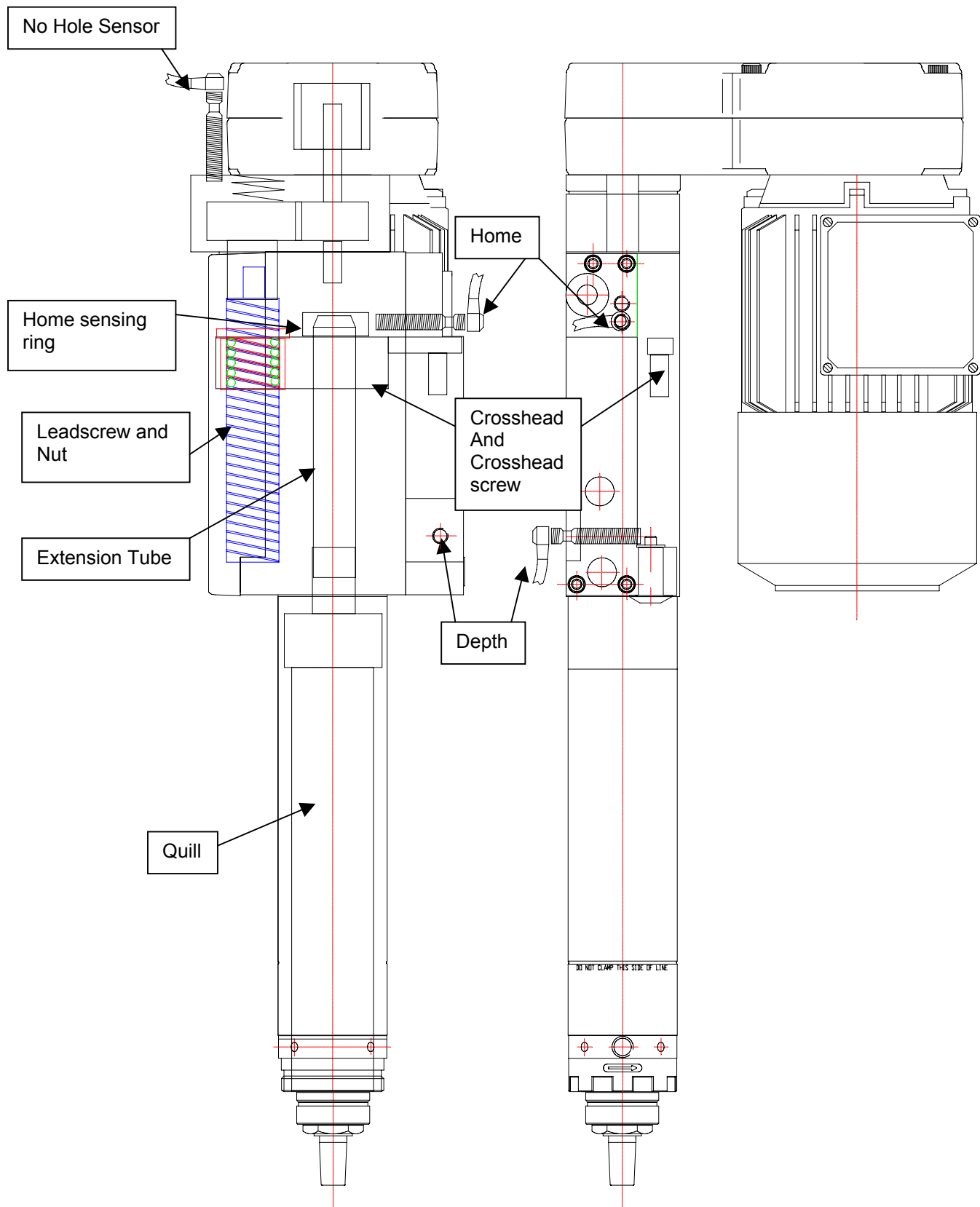


1) relay energised when temperature OK.

2) relay de-energised when over temperature or short circuit in thermistor circuit.

3) connect in series with holding coil in the supply contactor or to TC1 & TC2 of the Desouter control box.

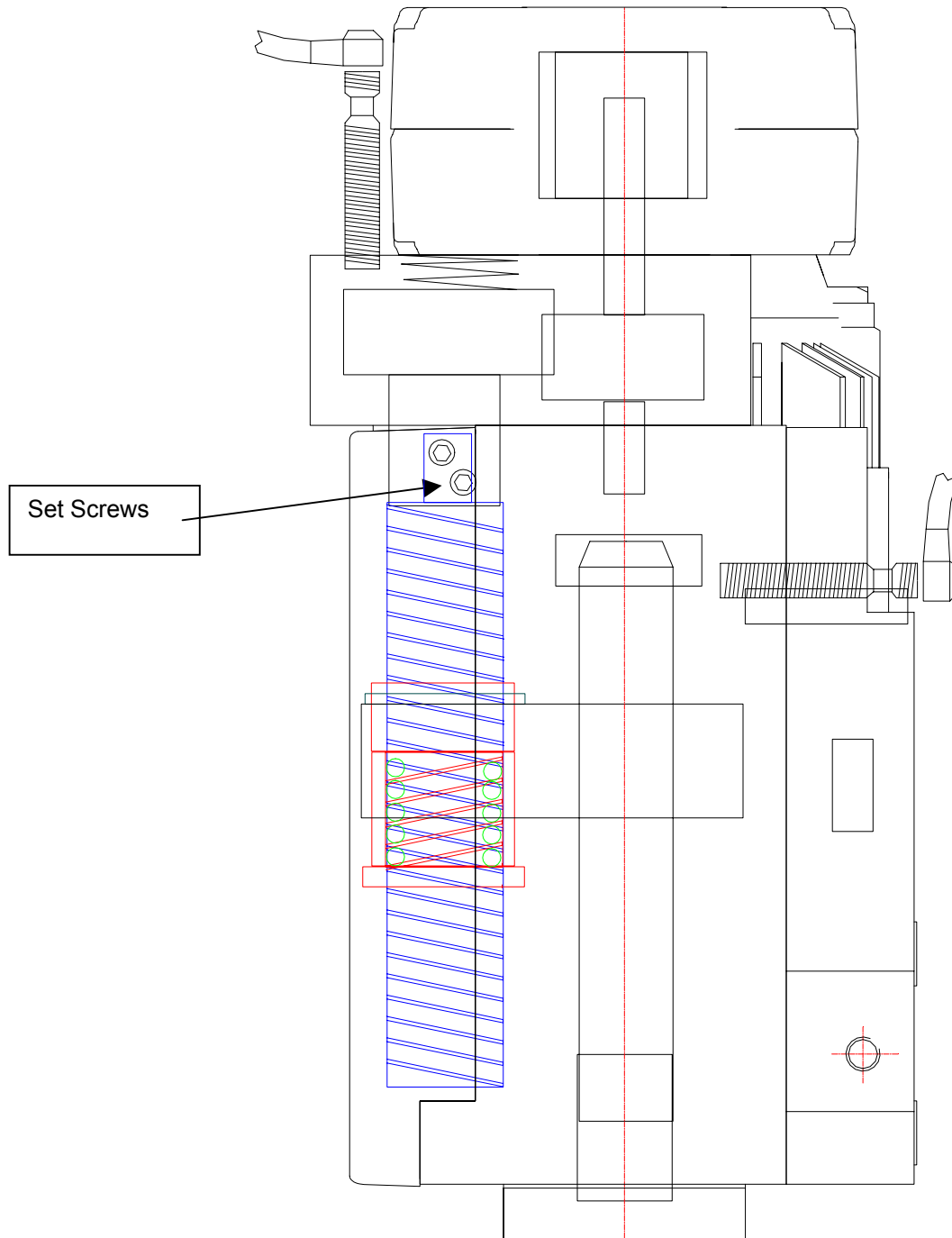
4) "Release" (Over temperature) resistance is $\geq 3990\Omega$, "Reset" (Temperature within acceptable range) resistance is $\leq 1650\Omega$.



AFTE Terminology

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Fitting/Changing The Leadscrew

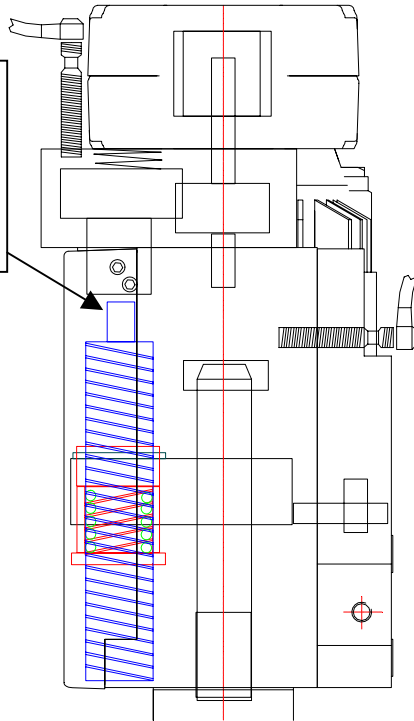


The leadscrew is held in place by two set screws, the drive is supplied by a key.
To get access to the leadscrew and set screws remove the plastic cover and either jog
the drive electrically or remove the pulley housing cover and belt and manually turn the
drive.

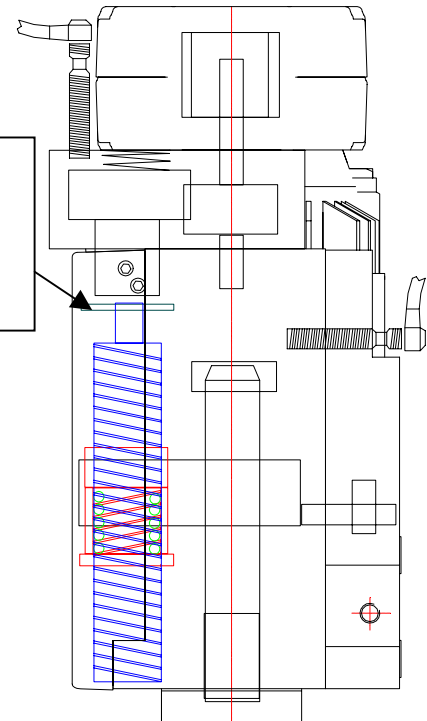
NOTE: Position the leadscrew nut approximately half way down the leadscrew – this will
aid removal.

Removal of leadscrew

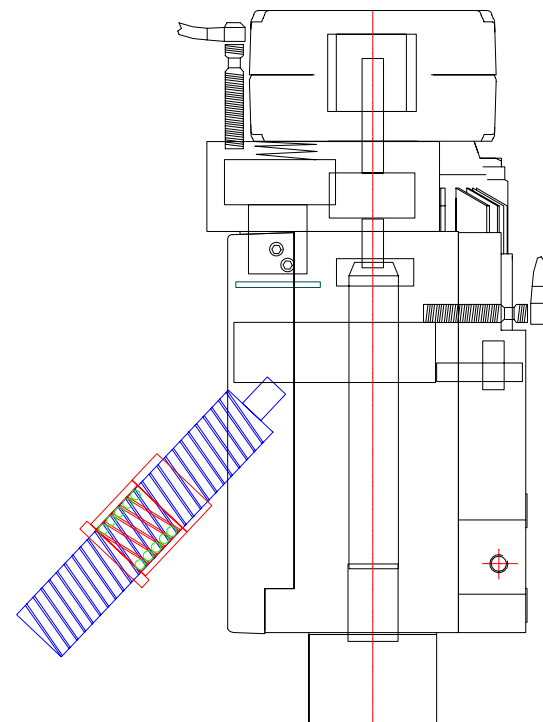
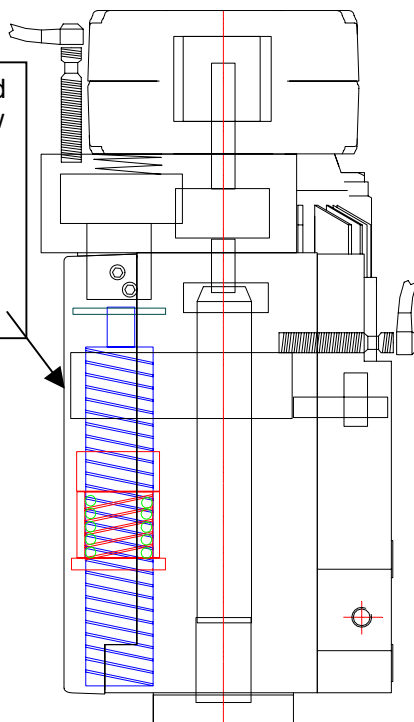
1. Loosen the set screws and pull down of the quill – this should dis-engage the leadscrew



2. With pliers remove the external snap ring on the leadscrew nut

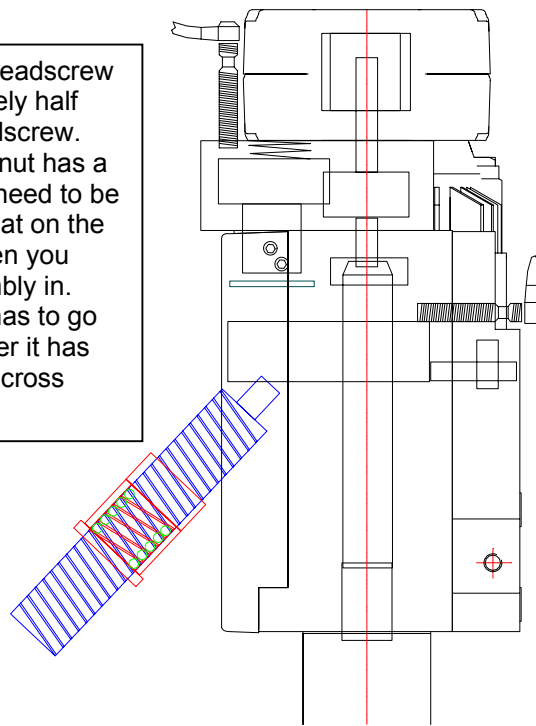


3. Loosen crosshead on both the leadscrew nut and the extension tube slide the crosshead back to allow the leadscrew to be removed

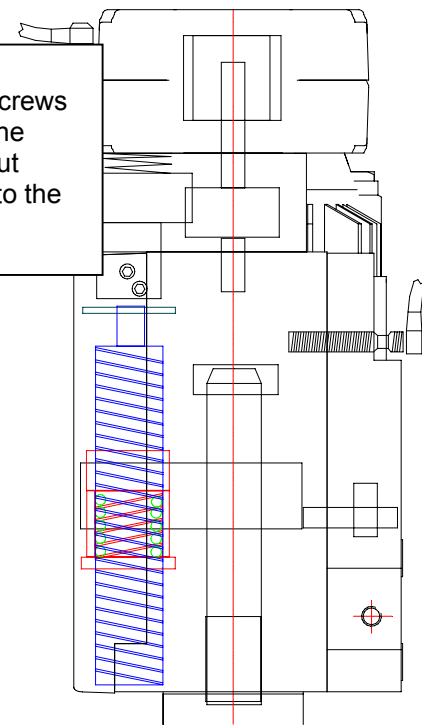


Fitting The Leadscrew

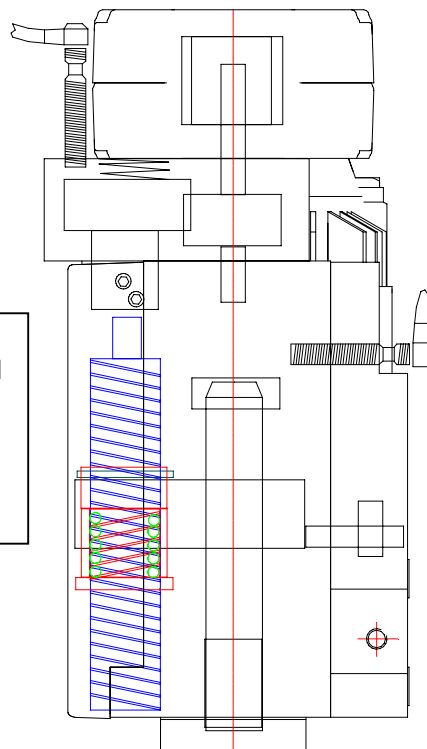
1. Position the leadscrew nut approximately half way on the leadscrew. The leadscrew nut has a flat on it which need to be located with a flat on the cross head when you slide the assembly in. The snap ring has to go over the nut after it has been put in the cross head



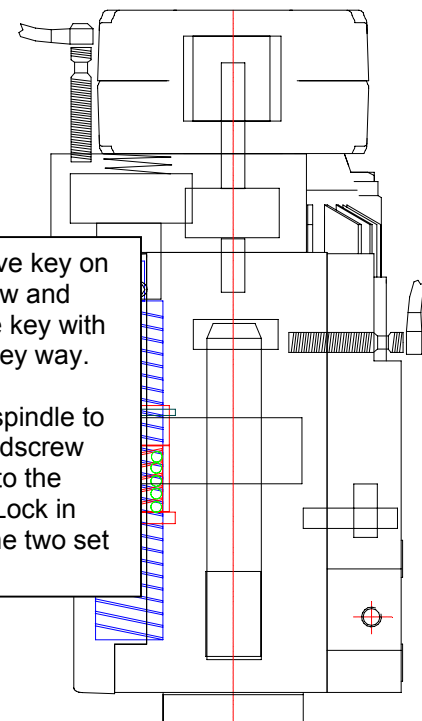
2. With both crosshead screws loose slide the leadscrew nut assembly into the crosshead.



3. Fit the snap ring on the leadscrew nut and slide the crosshead such that it butts up against the snap ring. Tighten both crosshead screws



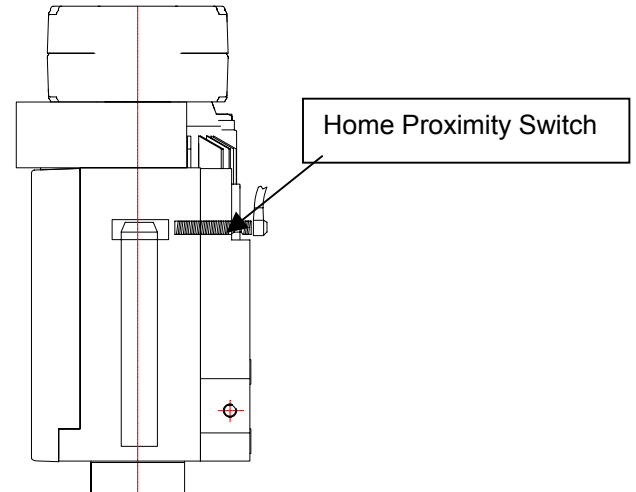
4. Fit the drive key on the leadscrew and orientate the key with the mating key way. Push on the quill/output spindle to push the leadscrew assembly into the drive shaft. Lock in place with the two set screws



For stroke setting refer to leadscrew taper set up document.

1. Setting the HOME position proximity switch

With the “cross head” loosened on the “extension tube”, slide the “quill” back until the “home sensing ring” back until it is in front of the “home proximity switch”. Screw the “home proximity switch” in until it touches the “home sensing ring”. Back the “home

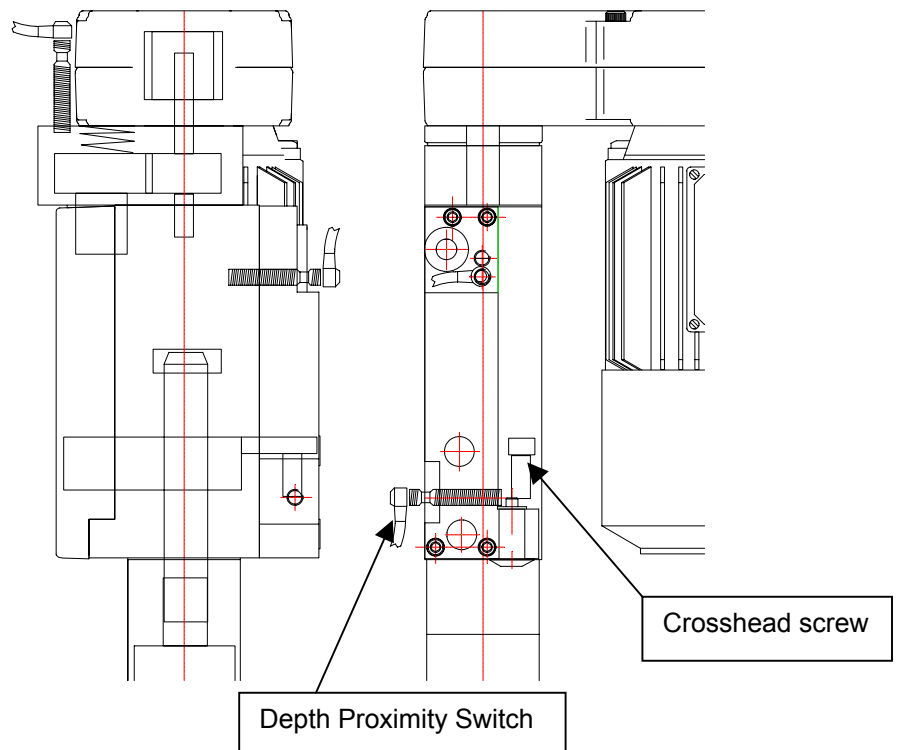


proximity switch” approximately one turn – make sure it is still sensing.

2. Setting the DEPTH position proximity switch

With the leadscrew NOT fitted

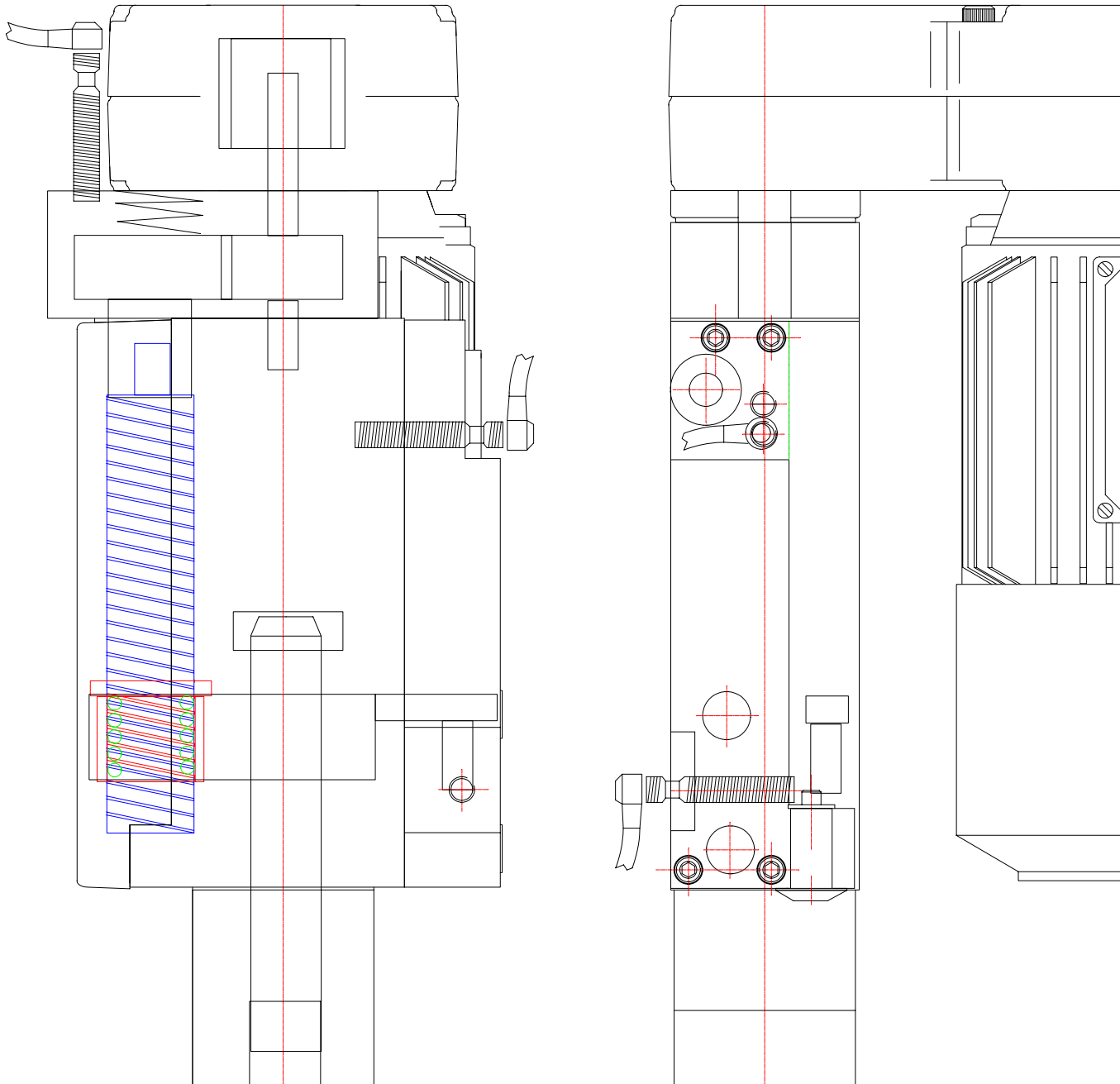
With the “cross head” tightened on the “extension tube”, slide the “quill” forward until the “crosshead screw” is in front of the “depth proximity switch”. Screw the “depth proximity switch” in until it touches the “crosshead screw”. Back the “depth proximity switch” approximately one turn – make sure it is still sensing.



3. Setting the DEPTH position proximity switch

With the leadscrew fitted

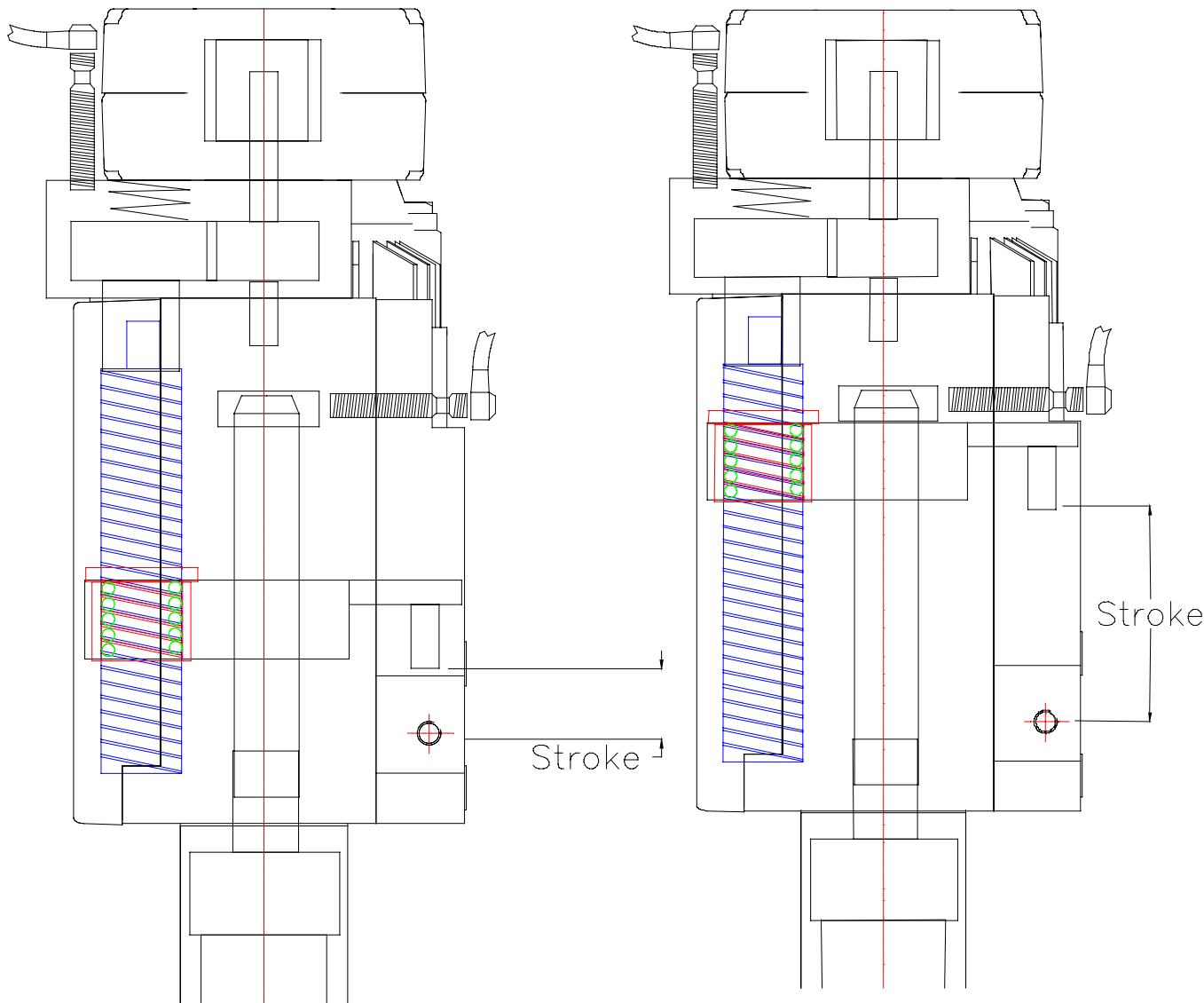
Ensure the “cross head” is tightened on the “extension tube”. Rotate the leadscrew manually or through a jog function in the controls until the “crosshead screw” is in front of the “depth proximity switch”. Screw the “depth proximity switch” in until it touches the “crosshead screw”. Back the “depth proximity switch” approximately one turn – make sure it is still sensing.



4. Setting the Stroke

This can only be done with the leadscrew fitted. Go to step 1 and make sure the home proximity switch is sensing.

With the "crosshead" loosened on the "extension tube" rotate the leadscrew manually or through a jog function in the controls until the "crosshead screw" to "depth proximity switch" distance is the stroke required.



Example Strokes

5. The No Hole Sensor

This will give a signal if there is no hole to be tapped or if excess torque is required to tap the hole.

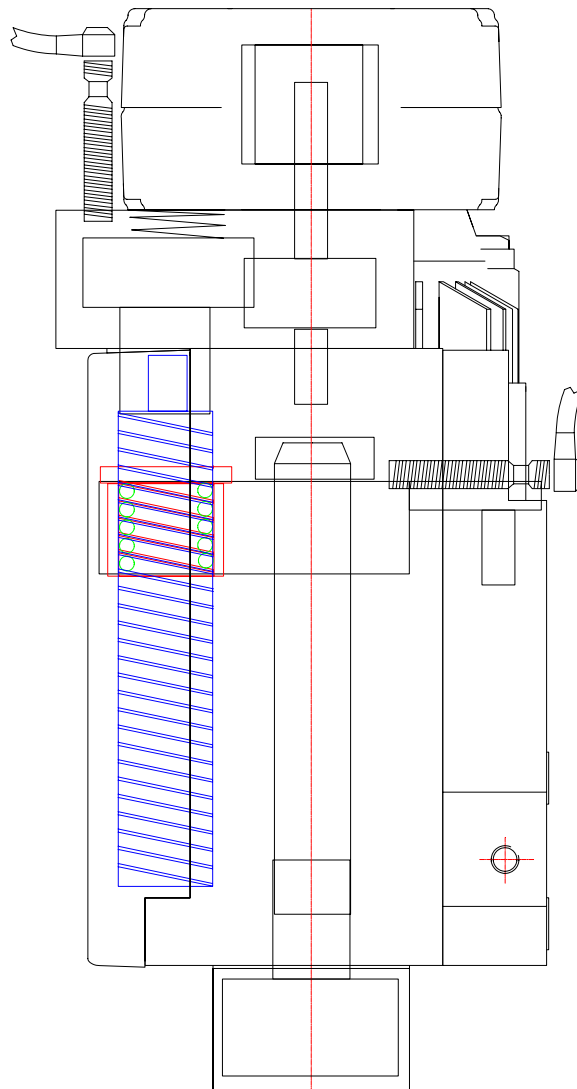
The leadscrew is spring loaded through "belleville" washers such that if it can not drive forward the leadscrew will be driven backwards.

To set the no hole sensor screw the proximity switch in until it bottoms out. Unscrew the proximity switch until it no longer senses – this will guarantee a signal in a no hole condition and give the finest setting for an "over torque" condition. "Over torque" will occur when the tap wears and will indicate that the tap should be changed.

The greater the distance the "no hole proximity switch" is backed out the more "over torque" it will cope with.

The two drawings below show the standard condition and with the leadscrew pushed back to give the "no hole" signal.

No Hole Signal



Standard Condition

