

OPERATION & MAINTENANCE MANUAL



WARNING

This machine **must only** be used by personnel who have been properly instructed in all aspects of the machine's safe operation.

Operators **must** also wear the recommended personal protective equipment and have thoroughly read and understood this manual.

Serial Plates

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Below is a copy of the serial plate displayed on the back of the machine



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2 Overview

The CSS Vector Saw is designed to provide an automated and accurate method of measuring and cutting material components.

The CSS Vector Saw must be used per the standard operating procedures set out in this manual. Any actions carried out which are not contained in this manual are not endorsed by Spida Machinery, and cannot be warranted.

All operators should read and then sign the register of this manual before operating the CSS Vector Saw to ensure they are thoroughly familiar with the machine capabilities, limitations and to ensure correct operating procedures are adhered too.

Only those operators that have received training on the correct operation of the CSS Vector Saw are deemed competent and qualifies to operate the machine.

The CSS Vector Saw test procedures must be performed at installation and after any maintenance, adjustment, repair or modification of the machine. The test procedure is available on request.

The competent operator must also regularly perform the recommended maintenance procedures and checks detailed in this manual.

All electrical wires must be set as to not allow their movement through any areas of adjacent machinery that could cause them to be damaged or severed.

This manual offers many safety tips, but its purpose is not to provide instruction in all the skills and techniques required to manufacture timber frames safely and efficiently.

Due to improvements in design and performance during production, in some cases there may be minor discrepancies between the actual machine and the illustrations and text in this manual.

3 Specifications

Table 1, CSS Vector Saw Specifications

Specifications	NZ/AUS (mm)	US (Inches)
Overall Width	1580 mm	62.2"
Overall Height	1915 mm	75.4"
Overall Length	10710 mm	421.7"
Working Height	870 mm	34.3"
Weight	~800 kg	~800 kg
Operational Noise	92.8 dB (free running) 98.1 dB (Working)	92.8 dB (free running) 98.1 dB (Working)
Material Feed ¹	Left or Right	Left or Right
Fence Height	115 mm	4.5"
Length of Cut	600 mm	23.6"
Depth of Cut	150 mm	5.9"
Radial Angles	9° - 171°	9° - 171°
Saw Blade	450 mm Dia	17.72" Dia
Saw Arbor	35 mm Dia	1.38" Dia
Arbor Motor	4 kW (5.5hp)	

Voltage	Current	RPM 50Hz	RPM 60Hz	PF
230/400	15.2/8.8	2890	3468	0.8
240/415	15.2/8.8	2890	3468	0.76
260/460	15.9/9.9	3116	3740	0.8

Power Requirement	25 Amp 230-460V 3 Phase
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Specifications may change without notice

Notes:

1. Saw can be assembled in left or right configurations

4 Installation

4.1 Handling & Transport

- Box all additional parts and secure with the machine
- Using a single fork truck, lift the machine package underneath using the forklift spaces provided
- Once on the truck, tightly strap the machine.
- Do **not** place any loads on top of the machine
- The machine should be kept free from road grime and rain, and should be covered at all times while being transported

The CSS Vector Saw will be delivered in large component form and will require assembly on site by trained personnel. Due care and attention should be given whilst unpacking the components from their packaging materials. Any damage caused whilst in transit should be noted immediately and Spida Machinery informed. Refer to section 3 specifications for weights of individual components when selecting Manual Handling Equipment required, prior to positioning them on the selected site.

4.2 Installation

- It is advisable to forklift the machine package as close to the final assembly point as possible to reduce manual lifting
- The final operating position of the machine must be free from any rubbish or impediments
- There must be good lighting in the installation area to allow proper positioning of the machine
- The ground on which the machine rests must not vary by more than 30mm over a 12m x 2m area
- The CSS Vector Saw should be leveled using adjustable feet. Once level, machine should be bolted to the floor through holes provided.
- Electrical commissioning to be to local standards and be performed by a qualified electrician

The site selected for the CSS Vector Saw will depend on the ground. The ground chosen should be clean and free of water or possible flooding. The area on which the framework sits must be as even and horizontal as possible. This can be achieved by adjusting the height of the feet. There should be no twist to the framework once the feet have been adjusted to take the ground into account.

The final operating position of the machine should be free of all rubbish or impediments, with general access to all areas of the CSS Vector Saw for the ease of loading and unloading material of varying sizes.

Check that all safety equipment is functioning properly.

5 Safety

This section is provided as a guide only, it is the responsibility of the employer to ensure compliance with the relevant Health and Safety Regulations applicable to them at the time.

5.1 Young Persons

No person under the age of 15 should be allowed to operate or assist with the operation of machinery.

5.2 Long Hair and Loose clothing

Any long hair or loose clothing must be fully contained to eliminate the risk of entanglement with machinery.

PROTECTIVE SAFETY CLOTHING AND EQUIPMENT MUST BE WORN; INCLUDING:

Eyewear

Hearing protection

Respirator or Dust mask

Protective Clothing

Safety footwear



5.3 Cleaning and Maintenance of Machinery

For safe and reliable use, machinery should be regularly cleaned and maintained. During cleaning and maintenance, the CSS Vector Saw must be isolated from all sources of energy and locked out to prevent unexpected operation.

5.4 Training and Supervision of CSS Vector Saw Operators

No person should be expected or allowed to operate the CSS Vector Saw until they have been fully trained and authorised to do so. They must be familiar with:

- Actual and potential hazards and appropriate controls.
- Correct use and adjustment of guards.
- Emergency procedures.
- How the CSS Vector Saw works.
- Checks to perform prior to starting.
- How to recognise potential faults.
- Location of controls and how to Stop and Start the CSS Vector Saw.

5.5 Responsibilities of CSS Vector Saw Operators

Operators should:

- Check the CSS Vector Saw prior to use and during operation to ensure it is in sound operating order.
- Report immediately any defects noted to their supervisor.
- Use any, and all safety equipment provided.
- Not operate any machinery if under the influence of drugs or alcohol, consult a physician or pharmacist if unsure of any medication.

5.6 Operating Speeds and Vibration

Machinery should be operated within its designed limitations and for its designed use only, any unfamiliar noise, vibration or failure should be investigated and remedied promptly.

5.7 Machinery Stability and Location

The CSS Vector Saw should be securely fastened to the structure of the building to prevent movement or toppling over. Location should provide access all around for maintenance and cleaning. Lighting must be adequate to allow operator to clearly see controls and work pieces but not glaring or blinding.

Consideration should be given to the operators work area for product flow and to minimise repetitive actions and unnecessary movement.

An exclusion zone around the CSS Vector Saw should be maintained to prevent persons not directly involved with the operation of the machine from reaching any part of the machine.

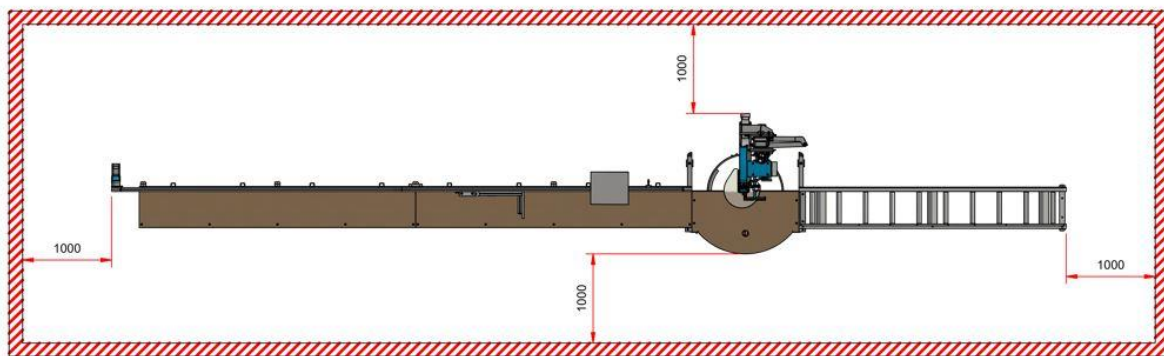


Figure 1, Recommended exclusion zone around the CSS Vector Saw.

5.8 Electrical Safety

Electrical wiring must be installed and maintained by a suitably qualified person in accordance with relevant regulations.

5.9 Isolation, hold cards and lock out devices

There should be procedures for isolating and locking out the CSS Vector Saw, for purposes of maintenance and to prevent unintended use should a fault have been identified.

5.10 Noise control

The normal operation noise of some machines will be more than permitted noise exposure levels. Employers must ensure adequate hearing protection is available and is used by all persons in the affected area.

5.11 Manual Handling

Manual handling should be avoided where possible, use of mechanical lifting and assisting equipment is recommended. Consider using forklifts, hoists, and trolleys to eliminate lifting and carrying components.

5.12 Recommended Service Interval

It is recommended that for optimal performance, the CSS Vector Saw should be serviced every 6 months.

It is also recommended that a service log be kept, as a reminder of when the next service should be due. Spida Machinery performs service runs on a regular basis throughout NZ; however, should the need arise for an early service, or should a service need to be booked in advance, please advise Spida Machinery accordingly.



WARNING! Do not operate the CSS Vector Saw without having received the proper instruction in operation and safety from this manual.

WARNING! It is recommended that the employers maintain training records demonstrating the competencies of each employee

6 Safe Operation

NOTE: The CSS Vector Saw is to be operated in accordance with this manual. Deviation from this specified operation may result in incorrect cutting, measuring or injury.

6.1 User Warnings

- All moveable parts of the machinery must be set so as not to allow its movement through the cutting/pressing area of adjacent machinery.
- All machine and components should be inspected upon delivery and at weekly intervals for looseness, fracture, bends, sharp edges or surfaces and any other condition that may contribute to a human mishap or further deterioration of the machine. We suggest a log be kept for this purpose.
- When broken, damaged, or loose parts (or any condition that may represent a hazard) are observed, corrective action should be taken immediately. Inadequate attention to maintain the machine can cause the premature failure of these parts. We suggest this information also be logged.
- The electrical boxes should be locked at all times to avoid casual entry by unauthorized persons, as touching live surfaces is hazardous.
- Never go behind the Fence when the Saw is running
- Split, broken, warped, twisted or material with excessive wane should be avoided or used with caution because of the greater possibility of the material not being held securely during manufacturing processes.
- The machine is not to be used for any other purpose than the cutting and measuring of material.
- Keep hands out of moving parts on the machine. Operators should be instructed not to extend fingers or limbs into or beyond the vicinity of the warning labels. The danger here is obvious – fingers in these areas will risk mutilation.
- Be sure the machine is completely free of foreign objects, and that all guards are in place before connection to electrical supply.
- Any guards removed for maintenance or adjustments **must** be replaced before the machine is put back into service.
- Exceeding the capabilities of the machine will void the warranty and could lead to a serious injury.
- All Operators should read and then sign the register of this manual before operating the CSS Vector Saw to ensure they are thoroughly familiar with the machine capabilities and limitations and to ensure correct operating procedures are adhered to.
- Failure to perform the daily and weekly service checks as per the schedule may result in serious machine damage or a severe accident.



WARNING! This machine must only be operated by personnel who have been properly instructed in all aspects of the machine's safe operation. They must also be wearing the recommended protective clothing and have thoroughly read and understood this operation and service manual.

6.2 Manual Handling

The following is not a comprehensive list. Manual lifting has the potential to be hazardous; so, for a full description of material handling please refer to lifting standards, techniques, and your own company policies.

- Ensure material supply is via forklift or other support mechanism
- Ensure correct lifting techniques are adopted to transfer material to infeed of cutting line
- Suggest use of trolleys or bench at required height and location to minimize handling and twisting
- Ensure required PPE is worn
- Ensure correct and appropriate lifting techniques are used
- Suggest the setup of a material supply via gravity roller transfer system
- Avoid twisting torso when moving pre-cut members from transfer system to pressing surface of table
- Only lift components of weight which you assess to be within your limit
- Use machinery (forklift) for material decreed to be too heavy or ask for assistance from another worker

6.3 General

Table 2, General Hazards

POTENTIAL HAZARDS	SAFE WORK PROCEDURE
Safety	Ask questions if you have any doubts about doing the work safely. Check and adjust all safety devices daily.
Poor Guarding	Ensure all guards are fitted correctly and are adequately guarding the saw blade and moving parts. Make sure guards are in position and in good working order. Do not operate machine without guards.
Poor Housekeeping	Inspect Saw and surrounding areas for obstructions, hazards, and defects. Remove built-up debris from around machine, electrical leads, and power points.
Electrical Faults	Inspect electrical leads for damage.
Inoperable Safety Switches	Check that start/stop and emergency stop buttons operate effectively.
Incorrect Accessories	Use only the accessories designed for each specific application
Foreign Objects	Check that foreign objects and maintenance tools etc. are removed from the machine before using the machine.
Defective/Damaged parts	Any identified defects must be reported and actioned prior to use of the CSS Vector Saw.



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6.4 Operation

Table 3, Operational Hazards

POTENTIAL HAZARDS	SAFE WORK PROCEDURE
Slip, Trip & Falls	Avoid awkward operations and hand positions where a sudden slip could cause your hand or part of your body to move into the sawing line. Electric power cords should be above head level or in the floor in such a way that they are not trip hazards. Floor areas should be level and non-slip. Clean up any spills immediately.
Workplace	Use good lighting so that the work piece and machine controls can be seen clearly. Position or shade light sources so they do not shine in the operators' eyes or cause glare and reflections. Ensure that the floor space around the equipment is sufficient to allow the operator to process his work without bumping into other staff or equipment. Keep the work area free of clutter, clean, well swept and well lit.
Housekeeping	Clean built up debris from around the machine, electrical leads, and power points
Defects	Report all defects to the supervisor
Personal Protection	Wear safety glasses or a face shield. Wear hearing protection that is suitable for the level and frequency of the noise you are exposed to in the work area. Wear dust masks when required. Do not wear gloves when operating this machine. Do not wear loose clothing, work gloves, neckties, rings, bracelets or other jewellery that can become entangled with moving parts
Machine Guarding	Make sure all guards are fastened in position. The machine MUST NOT be operated with any of the guards removed. The machine is fitted with steel guards.
Improper Use	Only use the machine for what it has been designed for.
Material Defects	Inspect stock for nails or other foreign materials before sawing. Use only material that the machine has been designed to accommodate.
Operator Technique	Do not impede the movement of the Saw while in use. Ensure any body parts, clothing, or work tools do not get in the way of moving parts. Only place material once the Saw is in the home position and has come to a complete halt. Do not attempt to move the Saw before material has been removed.
Hit by projectiles	The CSS Vector Saw must be electrically isolated before attempting to clear blockages or material jams. Any small off cut should be removed using a push stick which has been properly constructed. Do not use fingers to remove items which have become entangled in movable parts.



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6.5 Maintenance

Table 4, Maintenance Hazards

POTENTIAL HAZARDS	SAFE WORK PROCEDURE
Cleaning and maintenance preparation	Isolate power to the machine before inspecting, changing, cleaning, adjusting or repairing a machine. Do not use compressed air to remove sawdust etc. from machines or clothing.
Operational Buttons	Make sure that Operational buttons are in good working condition and within easy convenient reach of an operator. Buttons should be protected so that accidental contact will not upset the machine.
Emergency Stop Buttons	Make sure that Emergency Stop buttons are in good working condition and within easy convenient reach of an operator.
Incorrect electrical isolation of machine	Machine must be switched off at the Main Power switch, before maintenance or cleaning
Incorrect tools	Use Correct tools for the job to minimise personal injury and damage to the machine
Stalled Blade	Isolate power before attempting to free a stalled blade
Guarding	Ensure Guards are fitted correctly, adjusted and in good working order.



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6.6 Recommendations

That the operator is trained, on induction of the dangers of accessing the machine operating area.

The electrical system is to be serviced, by a qualified electrician only.

That all operators are walked through the operators' manual and all potential hazards are identified.

That good housekeeping is maintained at all times to avoid the risk of slips, trips or falls.

That approved eye and hearing protection is used at all times when operating the machine.

That approved dust masks and safety footwear are worn at all times when operating the machine.

That if the machine is not operating as efficiently as specified, the operator notify their supervisor who in turn takes appropriate action and eliminate the problem if possible.

All guards and safety devices are not to be removed.

It is recommended that a visual exclusion zone be marked on the floor on a one metre (1000mm) perimeter surrounding the working area of the machine. To identify the work space to pedestrians.



WARNING! This machine must only be operated by personnel who have been properly instructed in all aspects of the machine's safe operation. They must also be wearing the recommended protective clothing and have thoroughly read and understood this operation and service manual.

7 Operating Controls

Before attempting to operate the CSS Vector Saw, familiarise yourself with the location and function of each control.

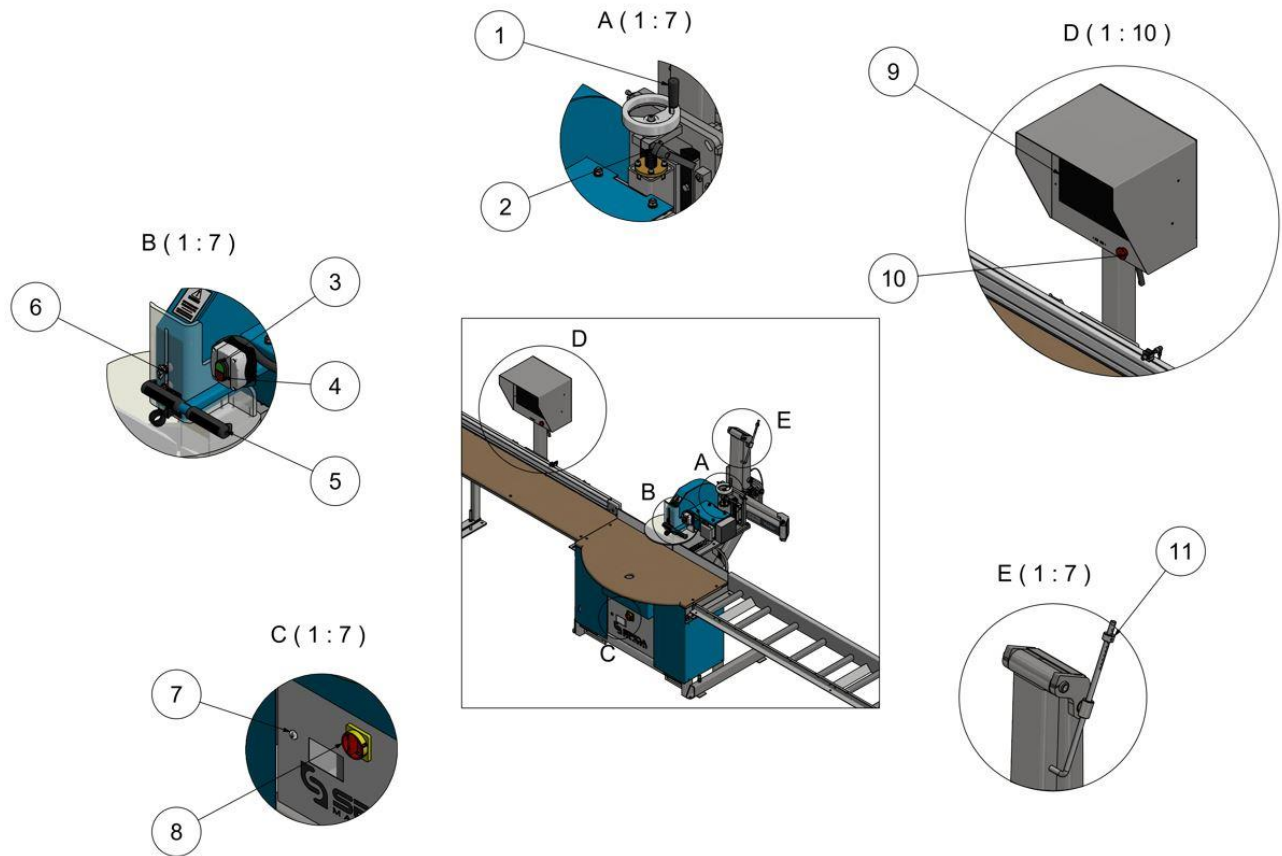


Figure 2, CSS Vector Saw controls

Table 5, Control functions (see Figure 2)

Control	Function	Description
1	Blade Guard assembly height adjustment	Moves the blade, motor, and guard assembly to the correct height
2	Blade Guard assembly height lock	Stops further height adjustment once assembly is in place
3	Saw Blade start button	Activates the Saw blade
4	Saw Blade stop button	Deactivates the Saw blade
5	CSS Vector Saw Handle	Allows the user to move the Saw blade to perform a cut
6	Barrier Guard adjustment	Moves the barrier guard to the correct height
7	Cabinet door latch	Allows the electrical cabinet to be locked/unlocked as required
8	Power Control for Vector - On/Off switch	Turns the power to the machine on/off as required
9	Operating HMI (Human Machine Interface)	A touch screen to allow the user to input commands as required
10	Emergency Stop	Cuts all power to the machine in case of emergency
11	Stroke Limiter	Prevents Saw blade from exceeding maximum cut length



WARNING! Do not operate CSS Vector Saw without the correct knowledge and function of each of the controls.

8 Operation

NOTE: The CSS Vector Saw is to be operated in accordance with this manual. Deviation from this specified operation may result in incorrect cutting or injury.

8.1 Machine Set-up

Before operations commence, the operator must ensure that the CSS Vector Saw has been set-up correctly.

To set-up the machine:

- Ensure that the safety guards are secured and correctly positioned.
- Complete a visual inspection of potential hazards near the proximity of the machine.
- Check that there are no obstructions either to any moving parts; between the CSS Vector Saw and any adjacent machining area; or further down the framing line.
- Complete all safety checks required
- Ensure that the stroke limiter is set so that the saw will not exceed the maximum cut length.
Note: The leading edge of the blade must be at least ~50mm back from the edge of the bench at the maximum cut length.

Once the Saw and the surrounding area are satisfactorily clear, the CSS Vector Saw can be switched on.

8.2 Operation

1. Select and load cutting file
2. Select and load member in cutting file.
3. Start Saw blade
4. Load timber to be cut onto in-feed bench
5. Make the cut/s on the leading end of the timber
6. Move the timber along to the Stop
7. Make the required cut/s on the trailing end
8. Remove and stack finished member
9. Continue cutting required cut list

Never go behind the fence line when the Saw is running.

Always keep hands clear of Saw Blade, and Saw Blade path

8.3 Machine Shut-down

Once operations are complete, ensure that the CSS Vector Saw is switched off and any foreign tools/equipment are removed. The correct shut-down procedure is as follows:

- Exit Spida Machinery Software, then shut down computer from Windows start-menu
- When screen turns off, switch off main power to CSS Vector Saw
- Lock main isolator if someone is conducting maintenance



WARNING! Do not stack finished members on the out-feed bench

9 Parts Identification

9.1 Top Level Assembly

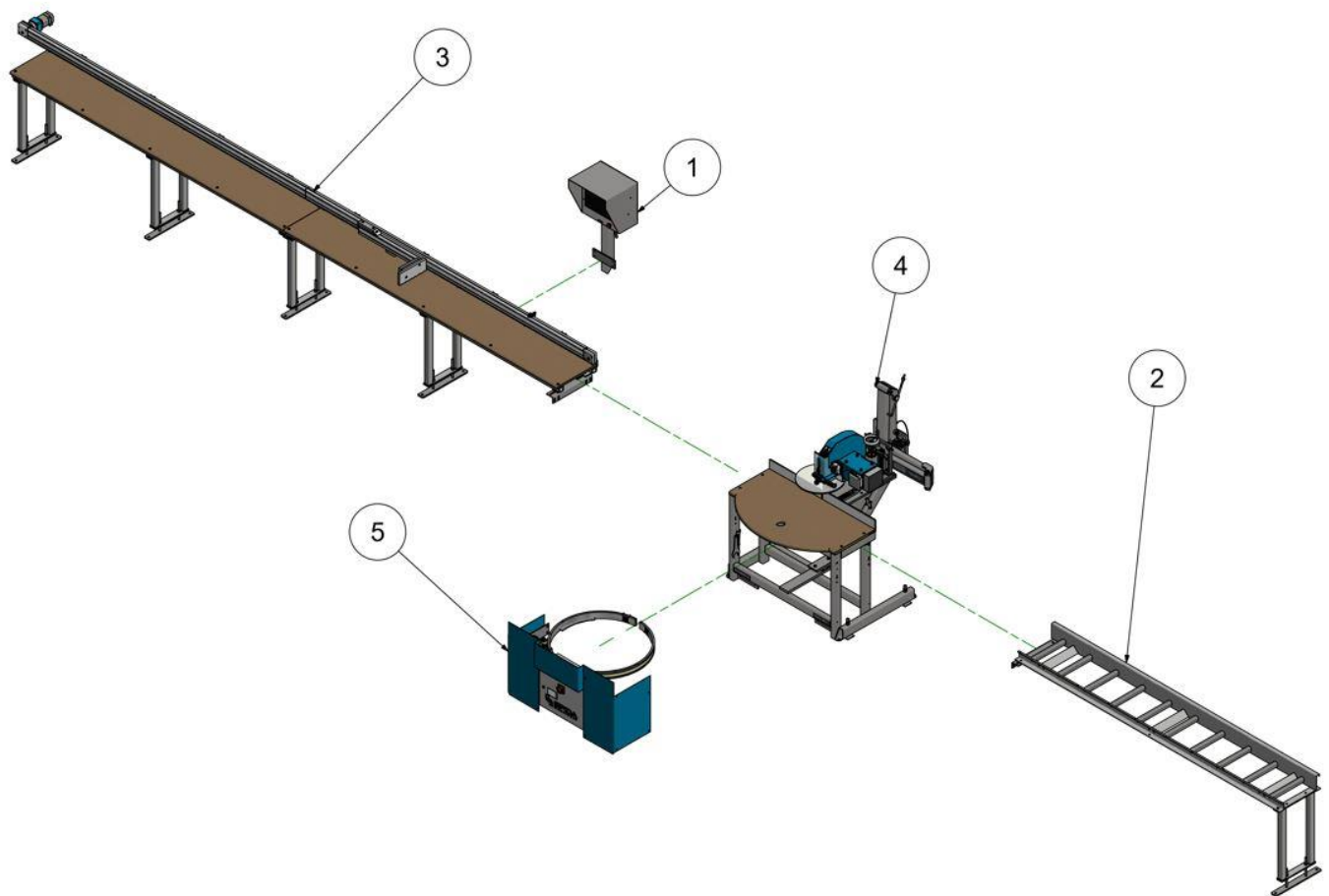


Figure 3, CSS Vector Saw.

Table 6, Parts List – CSS Vector Saw

ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	0605000	Multi Monitor Assembly
2	1	1110000 - 3000 LHS	Roller Table - 3m
3	1	1202000 LHS	Rapid Stop Table (6m)
4	1	SM2K - C - TYPE2015	CSS & CXM Assy Kit 2015
5	1	SM2K - CSSPARTS	Parts for Ctype - CSS saw

9.2 CSS & CXM Assy Kit 2015 (SM2K – C – TYPE2015)

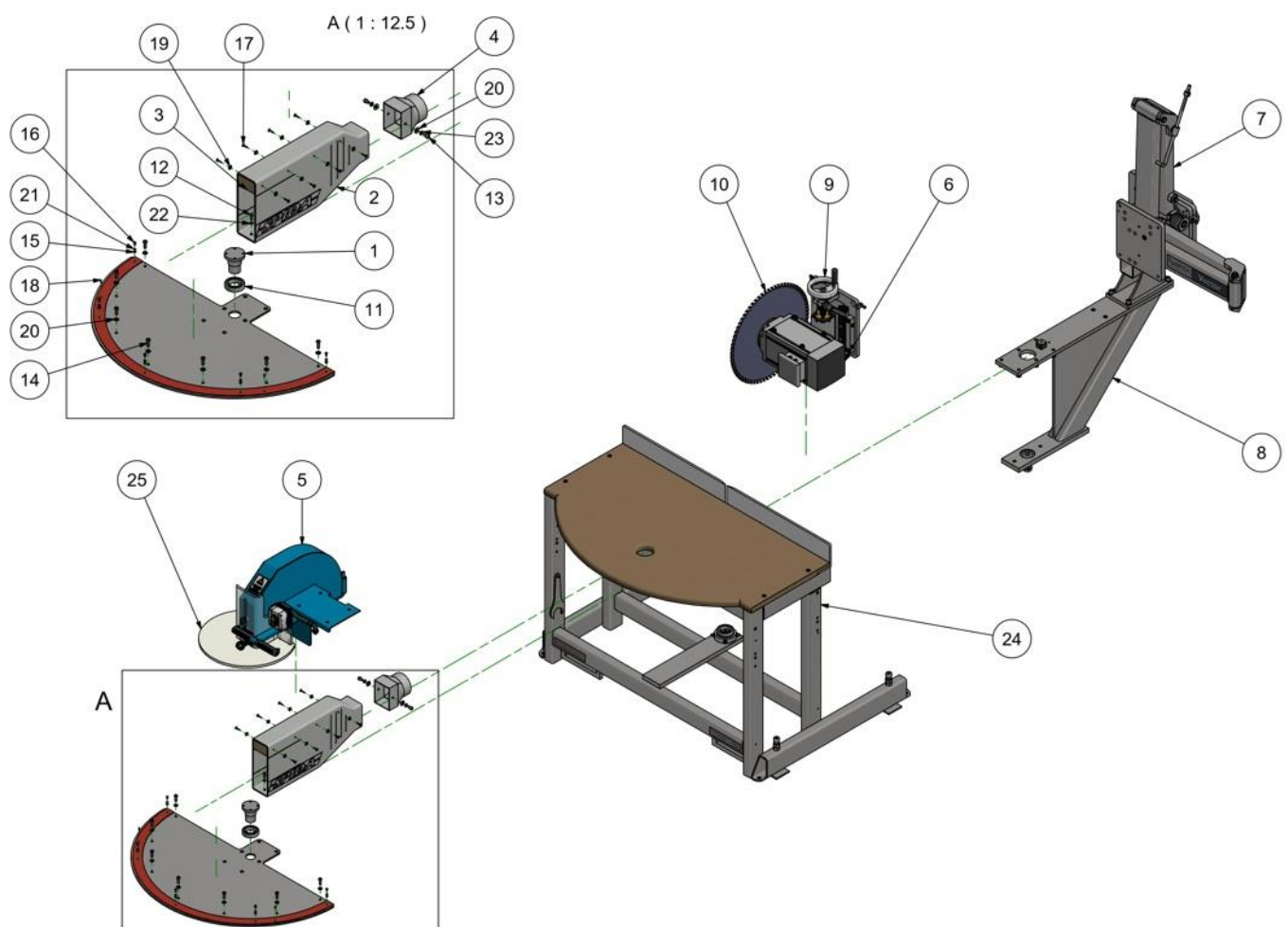


Figure 4, CSS & CXM Assy Kit 2015 (SM2K – C – TYPE2015)

Table 7, CSS & CXM Assy Kit 2015 (SM2K – C – TYPE2015) parts list

ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	8530115	Top Bearing Pin. 70mm Dia. BCQ
2	1	8530350-01	Dust Chute - CSS - Grey RAL7035
3	1	8530350-02	Chute Top Infill
4	1	8530352	Chute Adaptor
5	1	8530400 - K2	Blade Guard Assy - 450
6	1	8530400 - K4	CXM Motor Kit
7	1	8531300	Arm Assembly - CXM 2015
8	1	8830123	Column Support Assembly - Apollo
9	1	8830400-K1	Height Adjust Assembly - Apollo
10	1	BL4503566	Blade - 450mm x 35mm Bore x 72tt (CSS)
11	2	BRG6008	Bearing - 6008-2RS
12	1	HWCSM616	Hex Socket Head Cap Screw M6x16
13	2	HWCSM812	Hex Socket Head Cap Screw M8x12
14	7	HWCSM825BH	Cap Screw M8x25 Button (Dome) Head
15	5	HWFWM4	Flat Washer M4
16	5	HWMSM410PP	Mach Screw - M4x10 Pan Head
17	8	HWSTS1020CSP	Twin Fast Screw 10gx20 Csk Poz
18	2	HWTM310	Tension Pin - M3x10mm
19	8	HWWC#8	Washer - Cup No 8 Nickel Plated
20	9	HWWF8	Flat Washer M8
21	5	HWWSM4 - Curved	Washer - Spring - Curved - M4 ZP
22	1	HWWSM6 - Curved	Washer - Spring - Curved - M6 ZP
23	2	HWWSM8 - Curved	Washer - Spring - Curved - M8 ZP
24	1	SMPBF401	C Type Base Frame v3
25	1	SMPGD01	Barrier Guard

9.2.1 Arm Assembly (8531300) and Column Support (8830123)

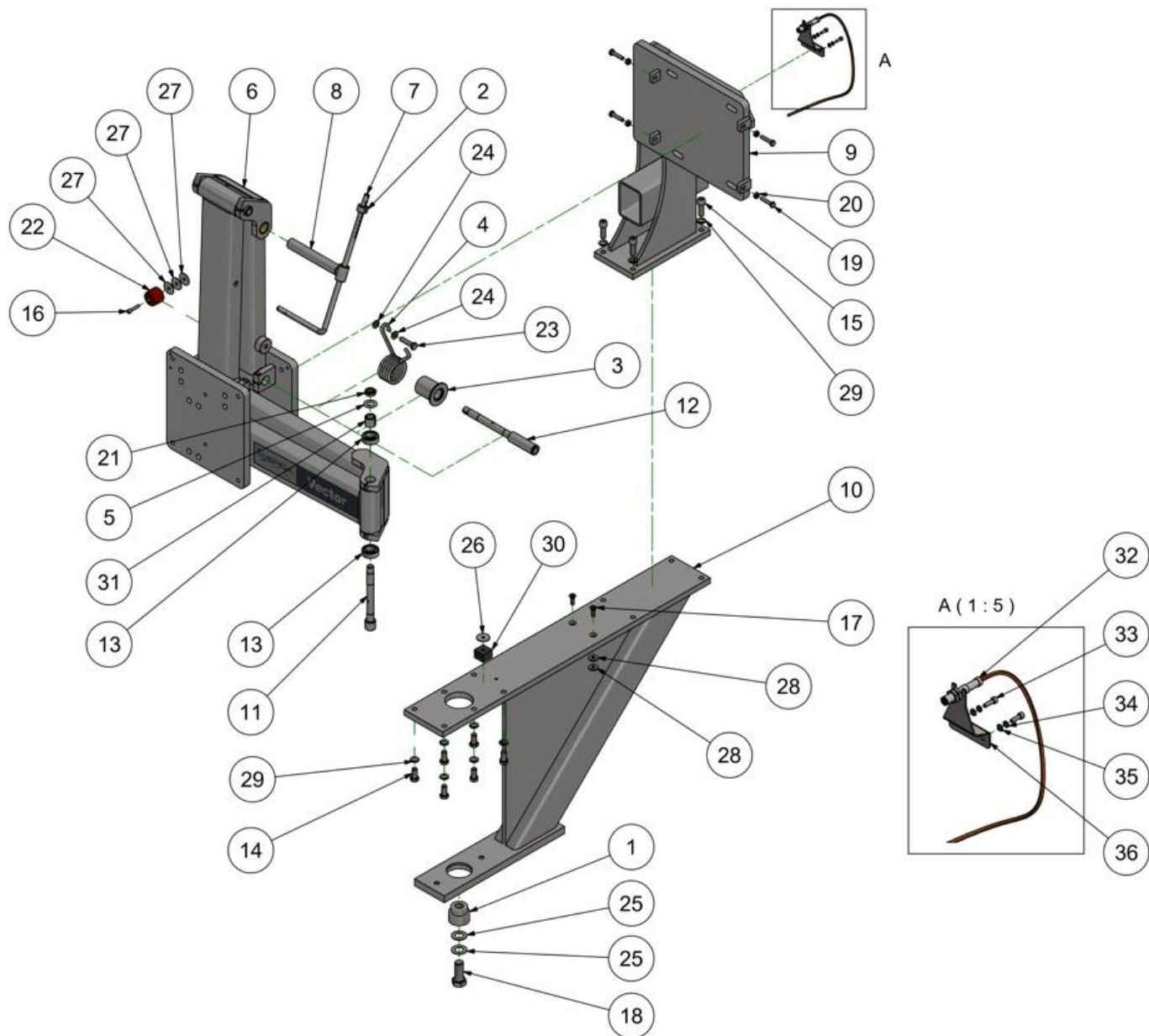


Figure 5, Arm Assembly and Column Support

Table 8, Arm Assembly and Column Support parts list

ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	8530116	Bottom Pin
2	1	8530307	Stroke Limiter Collar 12mm Zinc
3	1	8530310	Spring Boss
4	1	8530311	Return Spring - CXM "C" Type
5	6	8530314	Lock Washer - 5/8
6	1	8531300S	Arm and Plate Set - 2015 revision
7	1	8531305	Stroke Limiter Arm - 2015
8	1	8531306	Stroke Lim Sleeve -2015
9	1	8531340	Column Post - CXM
10	1	8830123	Column Support Assembly - Apollo
11	5	8830315	Metric Arm Pin
12	1	8830316	Arm set Long pin
13	12	BRG30203	Arm Assy Bearing 30203
14	6	HWBHM1225	Hex bolt M12x25
15	4	HWCSM1235	Cap Screw - M12x35ZP
16	1	HWCSM630	Hex Socket Head Cap Screw M6x30
17	2	HWCSM825CS	Hex Socket CSK Cap Screw M8x25
18	1	HWHBM2050	Hex Bolt - M20x50 HTZP
19	4	HWHBM835	Hex Bolt - M8x35 HTZP
20	4	HWNHM8	Hex nut M8
21	6	HWNPM16F	Half Nut - Pressed - M16 x 1.5 Fine. Steel lock nut. Metric fine
22	1	HWRS3830M6	Rubber stop
23	1	HWSSM1040H	St Scr - M10x40 HT 16mm Hex ZP
24	2	HWWFM10	Washer Flat M10
25	2	HWWFM20	Plain Washer M20
26	1	HWWFM6	Washer - Flat - M6ZP
27	3	HWWFM632	Washer M6x32
28	4	HWWHM8	Washer - Heavy - M8ZP
29	10	HWWSM12 - Curved	Washer - Spring - Curved - M12 ZP
30	1	SMPMB8530	Mounting block for Dust Chute
31	6	SMPSBM251724	24mm Split Bush
32	1	RA872CD3NP12D4	Prox Sensor - GEN 3 CSS
33	2	HWCSM516	Hex Socket Head Cap Screw M5x16
34	2	HWWSM5	Washer - Spring - M5 ZP
35	2	HWWFM5	Flat Washer M5
36	1	SMPBKT01	Sensor Bracket

9.2.2 Height Adjust Assembly (8830400-K1) and Base Frame (SMPBF401)

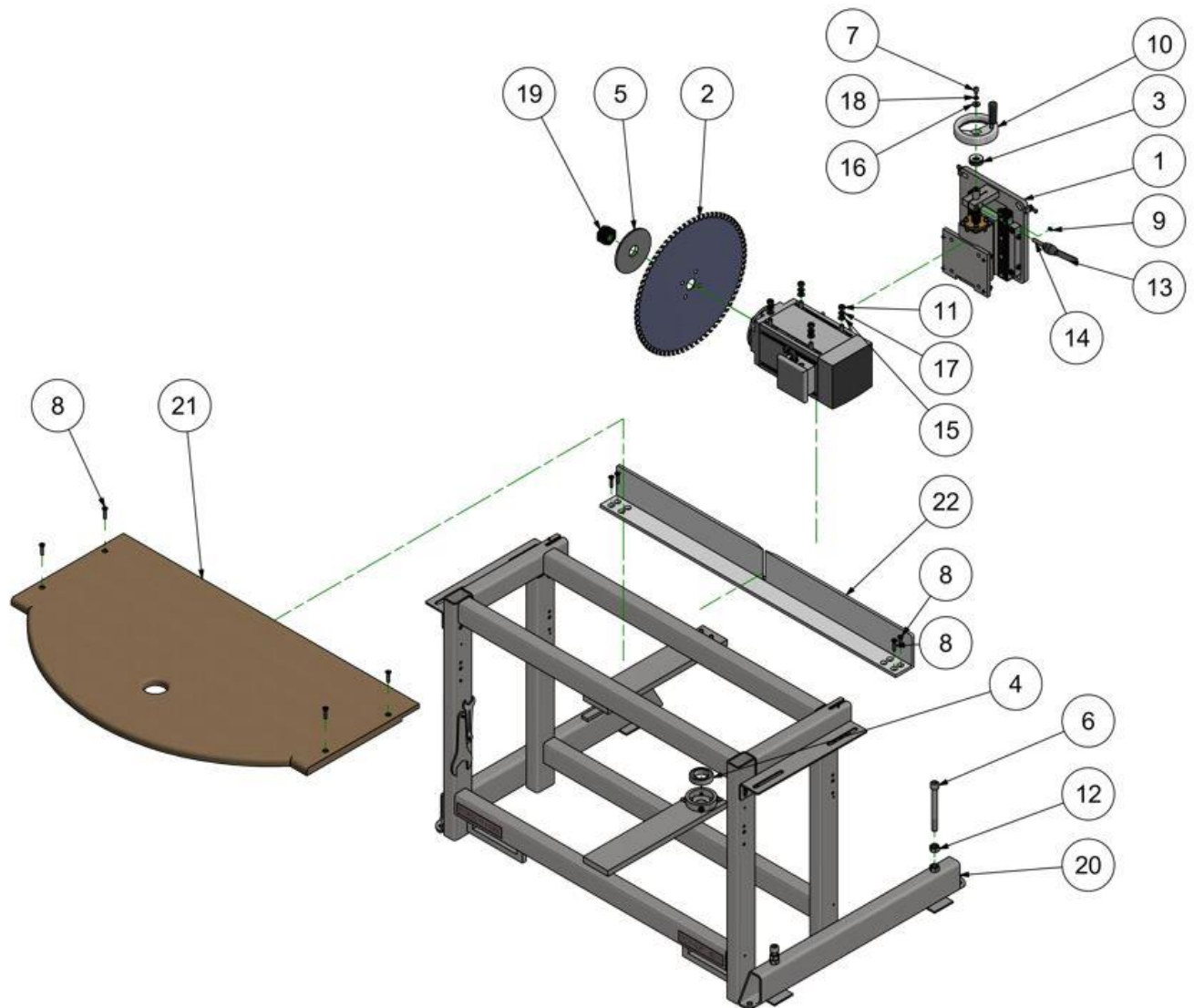


Figure 6, Height Adjust Assembly and Base Frame

Table 9, Height Adjust Assembly and Base Frame parts list

ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	8830400S	Height Adjust Assembly Set - Apollo
2	1	BL4503566	Blade - 450mm x 35mm Bore x 72tt (CSS)
3	1	BRG51204	Thrust Brg - 20mm H/A Shaft
4	1	BRG6008	Bearing - 6008-2RS
5	1	Flange	Motor Outer Flange
6	4	HWCSM16150	Cap Screw - M16x150 ZP
7	1	HWCSM812	Hex Socket Head Cap Screw M8x12
8	8	HWCSM835CS	Hex Socket CSK Cap Screw M8x35
9	1	HWGNM6	Grease Nipple - 6mm straight
10	1	HWHWM125-20 Handwheel	Handwheel - Dia 125mm bore 20mm Part # D-3120-125-B12
11	8	HWNHM10	Hex nut M10
12	4	HWNHM16	Hex nut M16
13	1	HWQCM10	Quick Clamp - M10 Kipp Lever Fe Part # 2556
14	60.000 mm	HWTRM10	Threaded Rod - M10 ZP
15	19	HWWFM10	Washer Flat M10
16	1	HWWHM8	Washer - Heavy - M8ZP
17	4	HWWSM10 - Curved	Washer - Spring - Curved - M10 ZP
18	1	HWWSM8	Washer - Spring - M8 ZP
19	1	Nut	Lock Nut
20	1	SMPBF401	C Type Base Frame v3
21	1	SMPBT1200	Bench Top 25mm MDF 1200mm long
22	1	SMPFE01	Fence - CXM/CSSIII 115mm High

9.2.3 Blade Guard Assembly (8530400-K2)

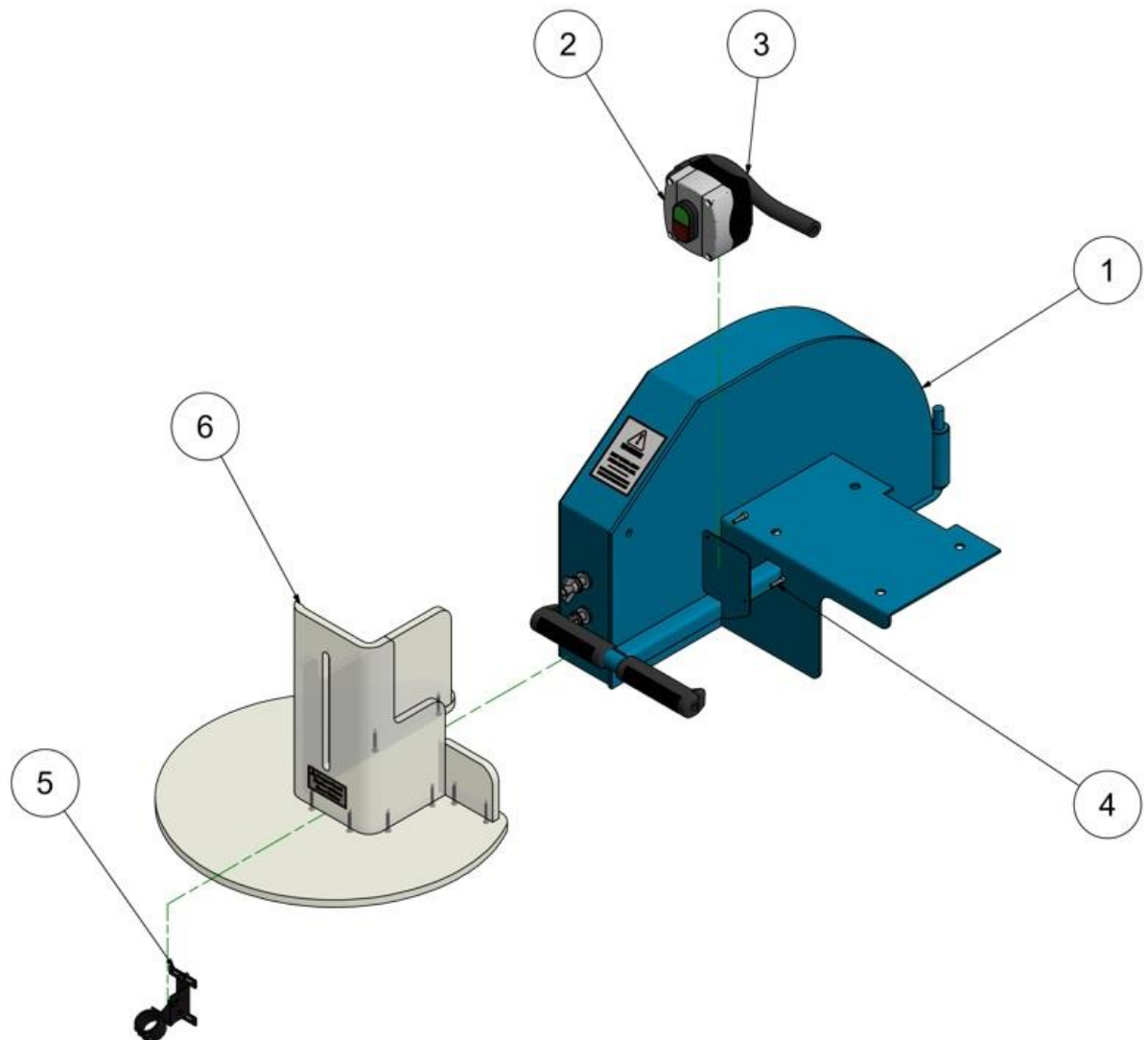


Figure 7, Blade Guard Assembly

Table 10, Blade Guard Assembly parts list

ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	8530400 - K2	Blade Guard Assy - 450
2	1	ESS	Stop/Start Switch - CW operator
3	1	ETFM16short	Technoflex Conduit 16mm (Elec)
4	2	HWCSM416	Cap Screw - M4x16 ZP
5	1	LaserBKT	Laser Bracket - Part of EK Laser
6	1	SMPGD01	Barrier Guard

9.3 Parts for Ctype - CSS saw (SM2K-CSSPARTS)

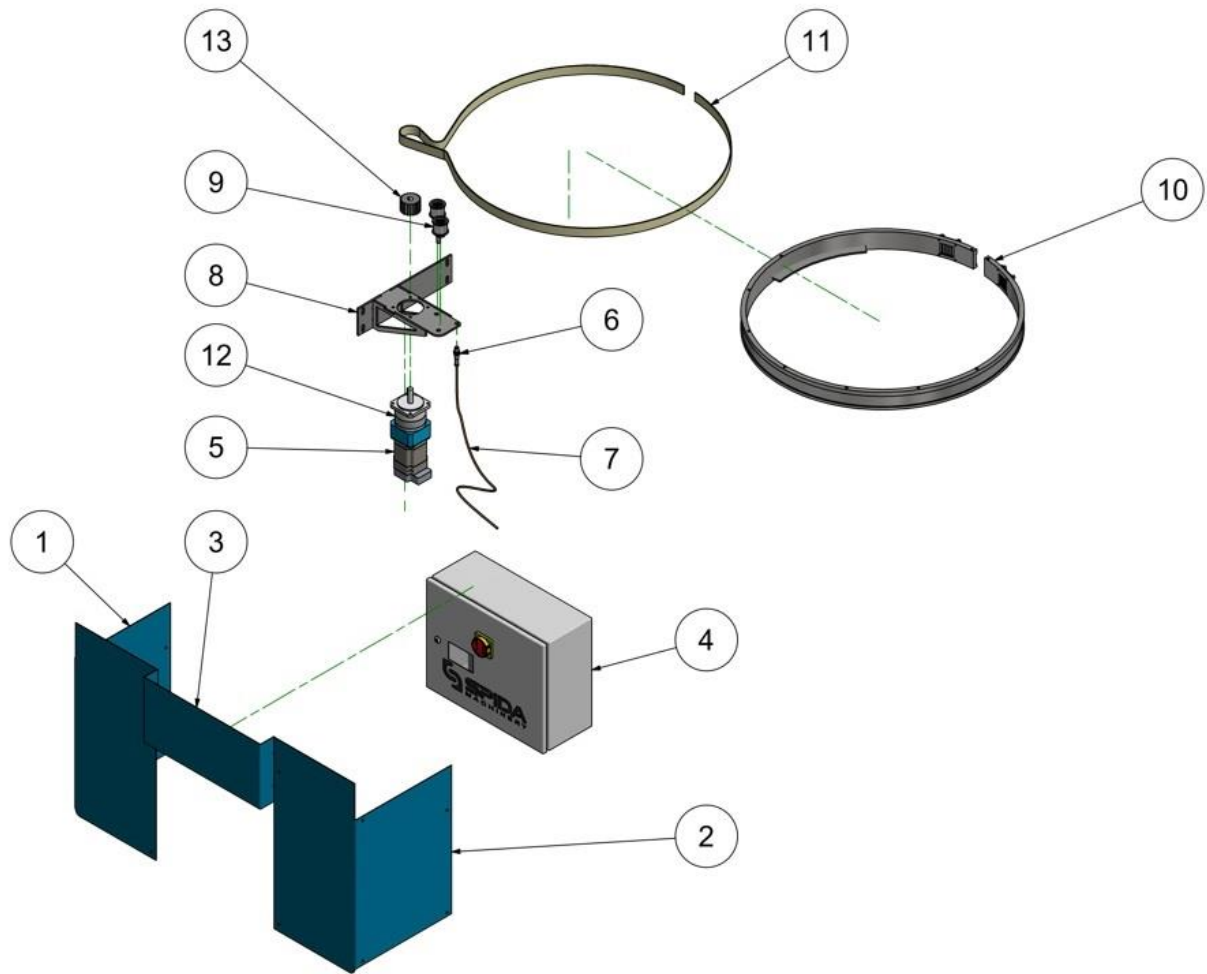


Figure 8, Ctype – CSS saw Assembly

Table 11, Ctype – CSS saw Assembly parts list

ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	9103616	Front Guard Left - CSS (MS 2mm)
2	1	9103617	Front Guard Right - CSS (MS 2mm)
3	1	9103618	Front Guard Middle - CSS (MS 2mm)
4	1	EEMAS0405021M	Electrical kit
5	1	EMBLY343160V5K	BLY3473D Brushless 5000RPM 160VDC 440W Motor Complete
6	1	RA872CD3NP12D4	Prox Sensor - GEN 3 CSS
7	1	RA889DF4-AC5	Cordset - 5m - Straight
8	1	SMPBKT10	CSS Rotation Gearbox Bracket v2
9	2	SMPRB04	Belt Tension Roller Mark II
10	1	SMPRB05	Rotation Ring 65mm deep - Assembly
11	1	SMPRB06	Rotation Belt - Metric Gen 5 & 7 (2.9 mtrs)
12	1	TRGB0901-NS-010-12-16	Gearbox - 34 Motor - 12mm input 16mm output
13	1	TRTIP20AT1032F-16	Timing Pulley 20 Tooth 16 Bore

9.4 Multi Monitor Assembly (0605000)

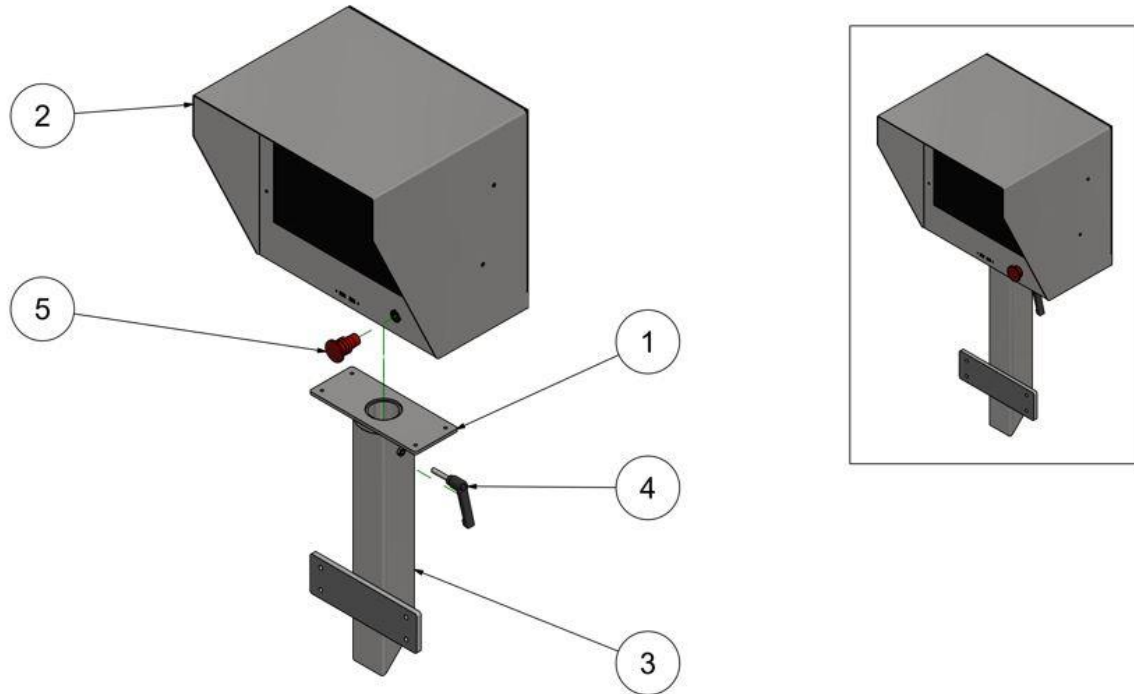


Figure 9, Multi Monitor Assembly

Table 12, Multi Monitor Assembly parts list

ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	0605102	Monitor locator
2	1	0605106	Monitor Cover Assembly
3	1	0605211	Monitor mount bracket
4	1	HWQCM8	Quick Clamp Handle - M8
5	1	SW3dPS-E-Stop_Button	Emergency stop button

9.4.1 Multi Monitor Stand Final Assembly bits (0605000FA)

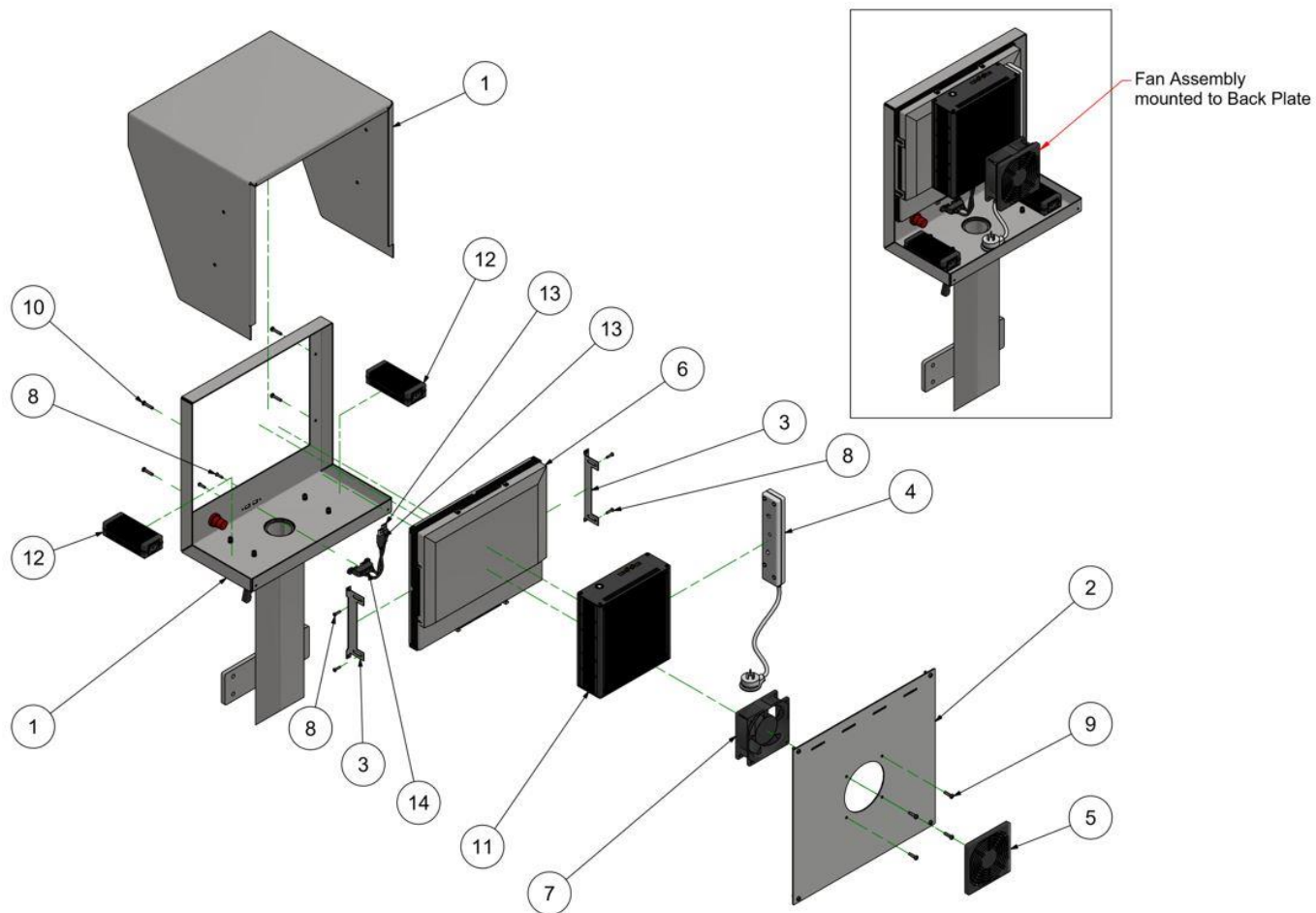


Figure 10, Multi Monitor Stand Final Assembly

Note: The illustration above shows minimal wires for clarity. The actual Monitor Box will contain more wires, and there may be differences in some components location.

Table 13, Multi Monitor Stand Final Assembly parts list

ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	0605106	Monitor Cover Assembly
2	1	0605112	Backplate with Vent Holes
3	2	0605602 - 01	ELO ET1739L Mount Bracket
4	1	4 Outlet Powerboard	4 Outlet Powerboard
5	1	Dust cover	Fan dust cover
6	1	ET1739L - E012584	ELO Touch Screen
7	1	Fan - DS12038ABHT	Computer cooling fan - DS12038ABHT
8	6	HWCSM416BH	Button Head Cap Screw M4x16
9	8	HWCSM520BH	Button Head Cap Screw M5x20
10	4	HWCSM525BH	Button Head Cap Screw M5x25
11	1	MultiMonitor Computer	Cyberlogix Gen V Computer
12	2	Power Adapter	Power Adapter - LR120050
13	2	USB Connector - M	USB Connector - M
14	1	USB Dual Head - F	USB Dual Head - F

9.5 Roller Table Assembly (1110000 – 3000)

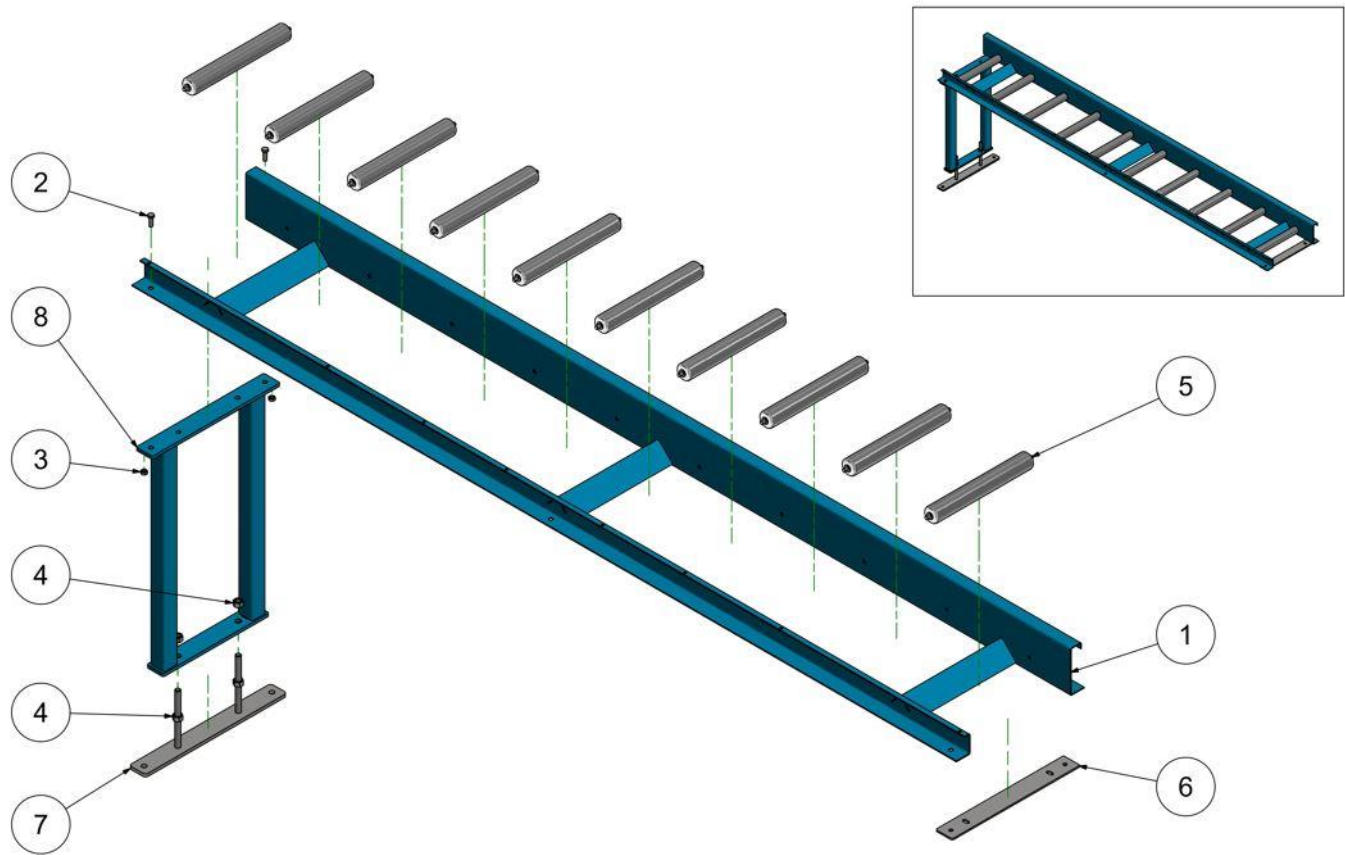


Figure 11, Roller Table Assembly

Table 14, Roller Table Assembly parts list

ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	1110001	Roller Table Frame - Fence Type V2
2	2	HWBHM1030	Hex bolt M10x30
3	2	HWNHM10	Hex nut M10
4	4	HWNHM16	Hex nut M16
5	10	HWRSD50355	Roller - Steel 50x355
6	1	SMPPLT18	Roller Table Attachment Plate
7	1	SMPTBF01	SMP - Foot v.1
8	1	SMPTBL02	SMP - Leg v.2

9.6 Rapid Stop Table Assembly (1202000)

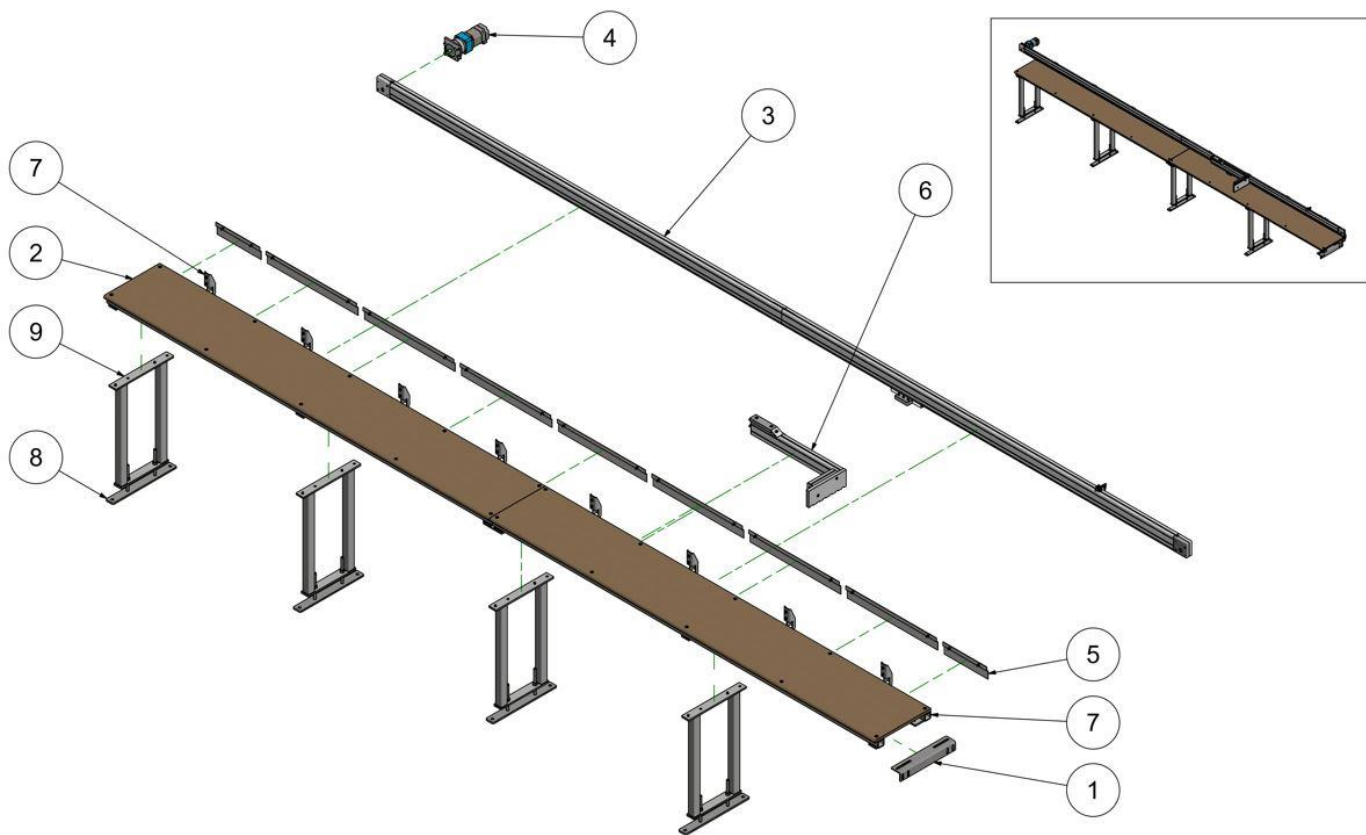


Figure 12, Rapid Stop Table Assembly

Table 15, Rapid Stop Table Assembly parts list

ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	SMPBKT11	Saw Connector Brkt
2	2	SMPBT3100-450-18	Bench top 3100x295x18
3	1	SMPGPFA6300	Fence assembly
4	1	SMPGPGK1	Gearbox & Motor Assembly
5	5782.000 mm	SMPGPSG	Fence Trolley Guard - Aluminium Extrusion
6	1	SMPGPTK1	Trolley/Stop
7	2	SMPTB02	Outfeed Table Frame
8	4	SMPTBF01	SMP - Foot v.1
9	4	SMPTBL02	SMP - Leg v.2

9.6.1 Fence Assy (SMPGPFA6300)

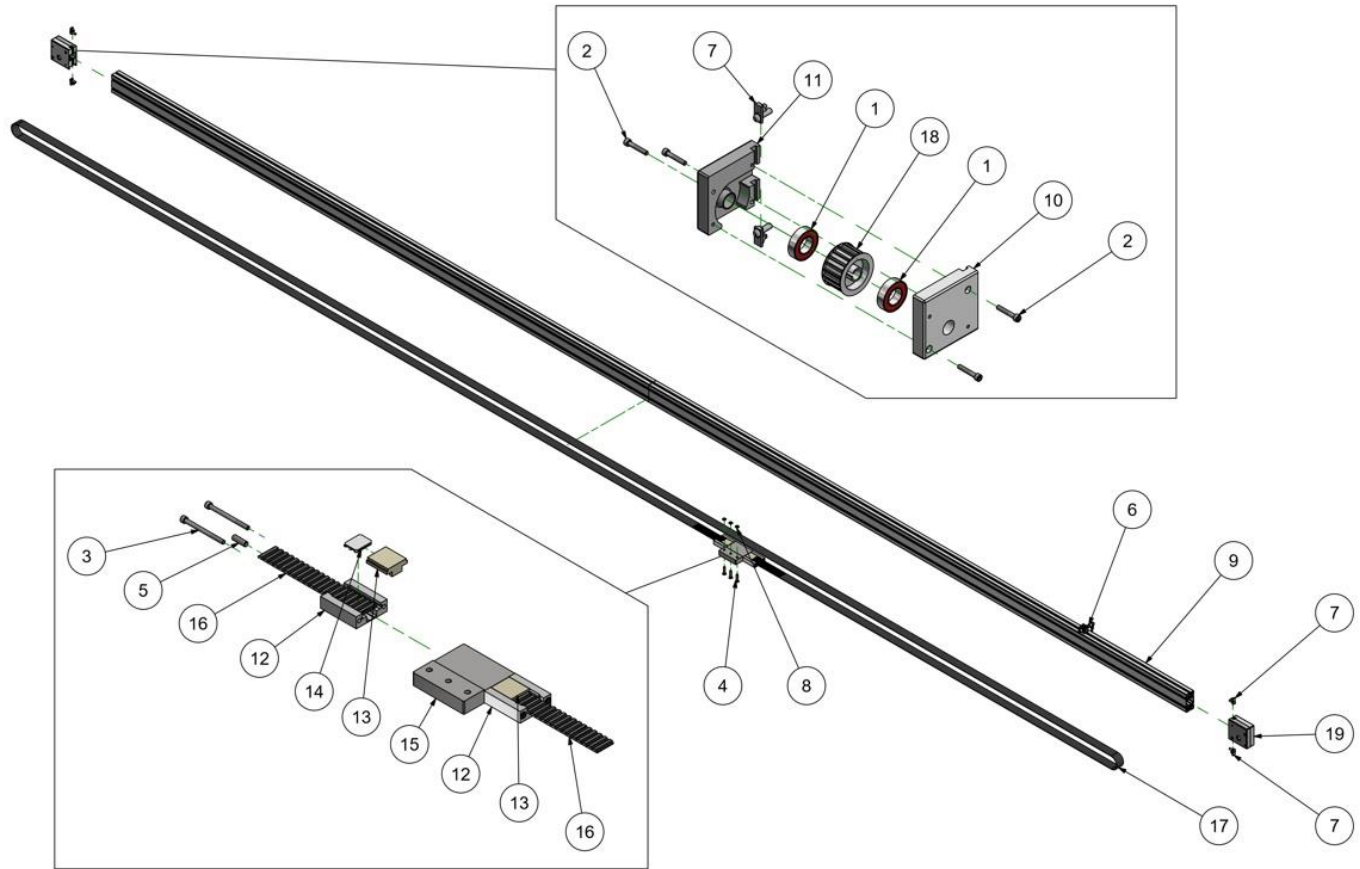


Figure 13, Fence Assembly

Table 16, Fence Assembly parts list

ITEM	QTY	PART NUMBER	DESCRIPTION	
1	4	BRG6005DD	Bearing 47x25x12	
2	8	HWCSM635	Hex Socket Head Cap Screw M6x35	
3	4	HWCSM675	Hex Socket Head Cap Screw M6x75	
4	3	HWCSM835CS	Hex Socket CSK Cap Screw M8x35	
5	2	HWSSM825	Hex socket set screw M8x25	
6	1	IME12-04BPSZCOS	SICK, Proximity Sensor	
7	4	MT21-1018	Power Lock Fasteners	
8	3	MT21-1351	M8 Sq Nut - Posn Fixing	
9	6300 mm	SMPGP9045	Guide Profile	
10	2	SMPGPPBa	Pulley Block part 1	
11	2	SMPGPPBb	Pulley Block part 2	
12	2	SMPGPTB - 01	Belt tensioner body	Part of Assembly SMPGPTB
13	2	SMPGPTB - 03	Tension block slider	
14	2	SMPGPTB-02	Tension block insert	
15	1	SMPGPTC	Tensioner connector	
16	2	TRTIB-AT10-32	Timing Belt AT 10/32	
17	1	TRTIB-AT10/32	Timing Belt AT10/32	
18	2	TRTIP19AT1032F-BF A	19 Tth Pulley AT10 x 32mm belt 16mm Bore bearings inset	
19	2	SMPGPPB45	Pulley Block assembled	

9.6.2 Guide Profile Gearbox Kit (SMPGPGK1)

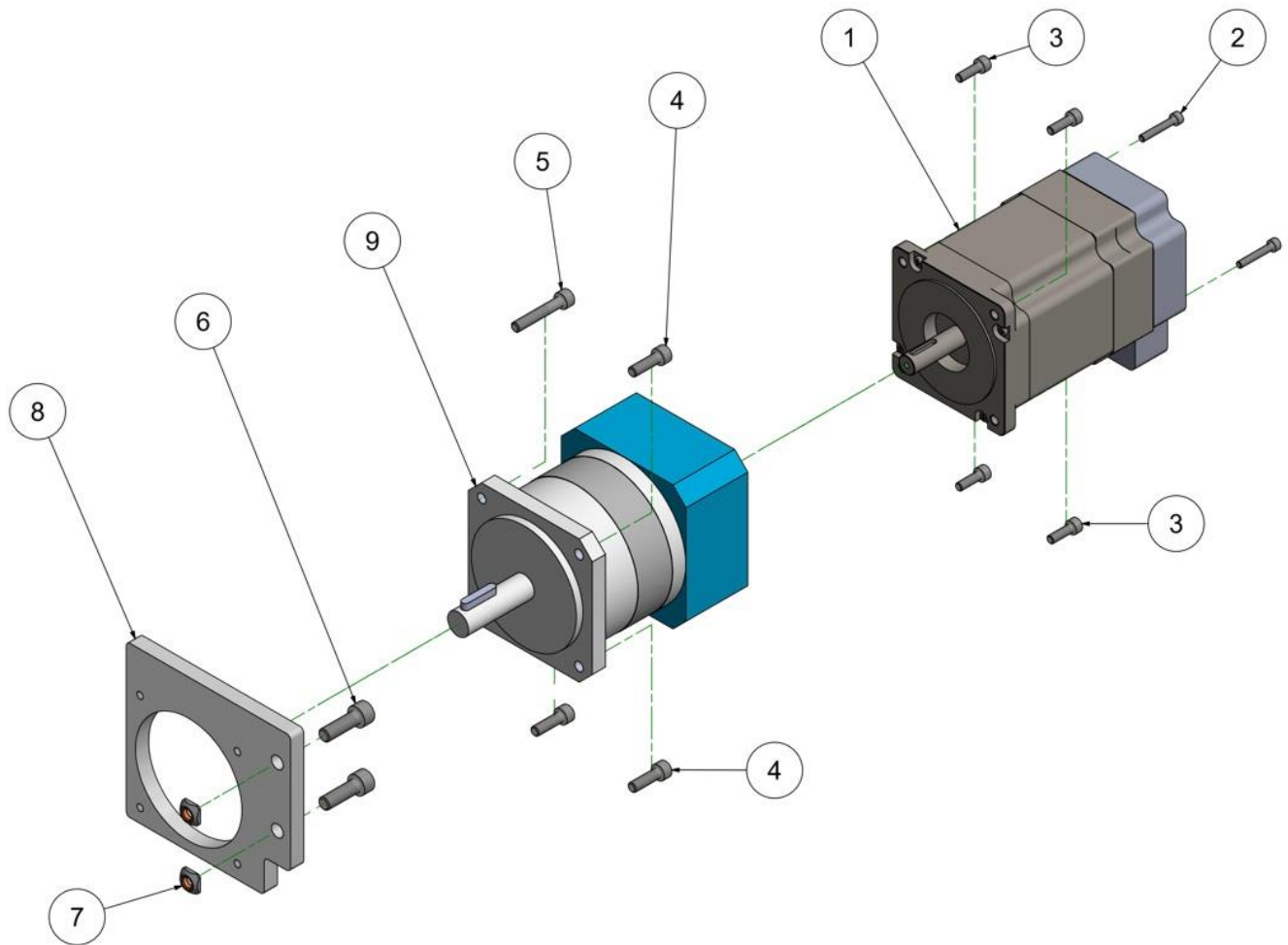


Figure 14, Gearbox Motor Assembly

Table 17, Gearbox Motor Assembly parts list

ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	EMBLY343160V5K	BLY3473D Brushless 5000RPM 160VDC 440W Motor Complete
2	2	HWCSM425	Hex Socket Head Cap Screw M4x25
3	4	HWCSM516	Hex Socket Head Cap Screw M5x16
4	3	HWCSM620	Hex Socket Head Cap Screw M6x20
5	1	HWCSM635	Hex Socket Head Cap Screw M6x35
6	2	HWCSM825	Hex Socket Head Cap Screw M8x25
7	2	MT21-1351	M8 Sq Nut - Posn Fixing
8	1	SMPPLT20	Mount Plate GB to Guide Profile
9	1	TRGB0901-NS-010-12-16	Gearbox - 34 Motor - 12mm input 16mm output

9.6.3 Guide Profile Trolley Kit (SMPGPTK1)

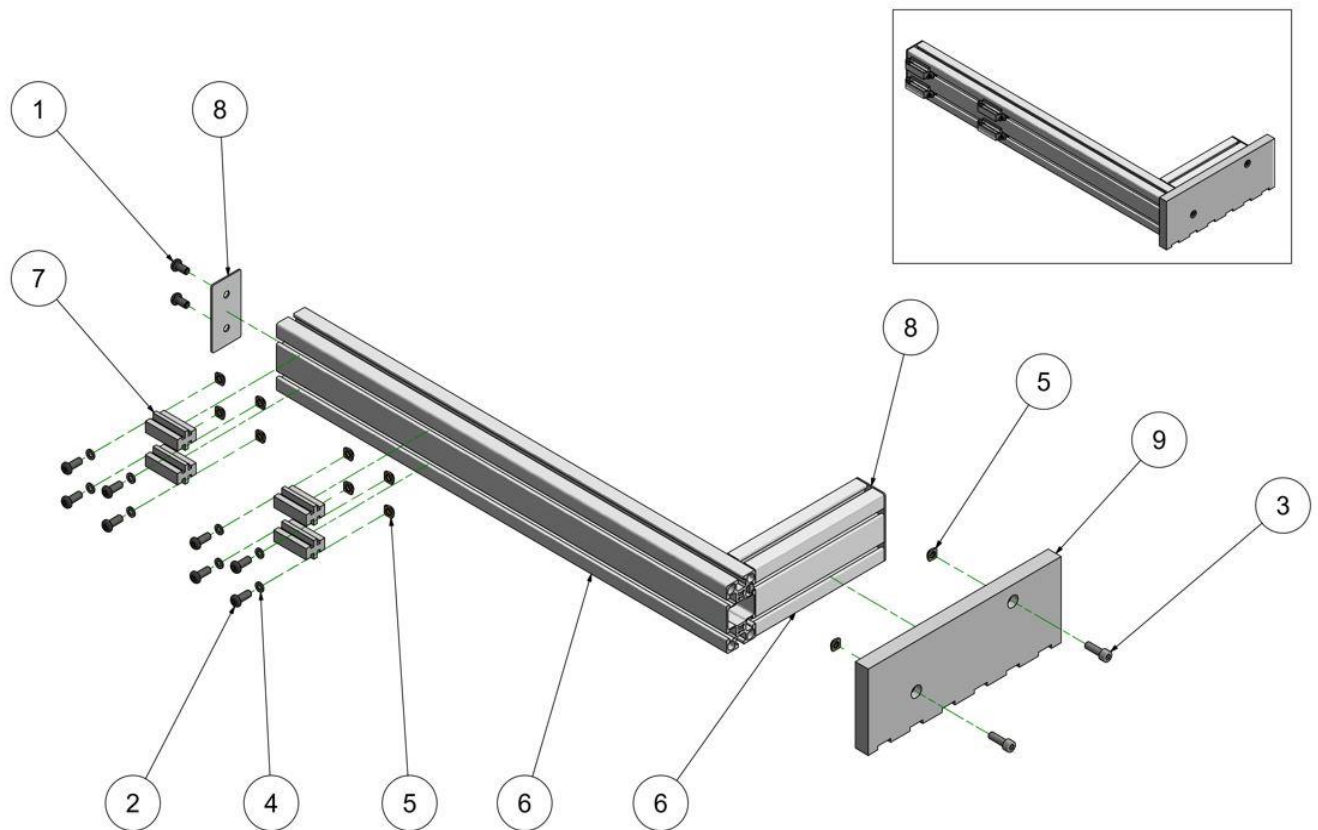


Figure 15, Guide Profile Trolley Assembly

Table 18, Guide Profile Trolley Assembly parts list

ITEM	QTY	PART NUMBER	DESCRIPTION
1	2	HWCSM816BH	Button Head Cap Screw M8x16
2	8	HWCSM820BH	Button Head Screw M8x20
3	2	HWCSM825	Hex Socket Head Cap Screw M8x25
4	8	HWWFM6	Flat Washer M6
5	10	MT21-1351	M8 Sq Nut - Posn Fixing
6	900.000 mm	SMPGP9045	Guide Profile
7	200.000 mm	SMPGPDS	Slider for GP
8	2	SMPGPEP	Guide profile end cap
9	1	SMPGPPP1	Pusher Block

10 Maintenance

If a part is damaged substantially, or if anything covered in this maintenance section cannot be fixed by general maintenance; then do not use the CSS Vector Saw and contact a supervisor, maintenance engineer, or Spida Machinery.

Table 19, Maintenance intervals

Check	Day	Week	Month	½ Year
Guards in place	x			
Work area is clear	x			
Motor Brake operation	x			
Dust Chute Clear	x			
Clean Saw of any build up	x			
Noises or Vibrations	x			
Emergency stop working	x			
Height adjust and Blade Guard assemblies in good condition			x	
Rotation assemblies in good condition			x	
Motors running smoothly			x	
For loose or damaged bolts			x	
Check Sensors are tight			x	
Blow out Brake/Back cover			x	
Floor bolts for tightness				x
Inspect Rotation Belt				x
Grease Arm Joints				x
Trolley Slides				x
Fence Gap				x
Bench Top				x
Maintain CSS Vector Saw				x



Failure to perform these checks as per schedule indicated in Table 19 may result in severe damage or a serious accident.



WARNING! Electrical power supply must be isolated from machinery and appropriate danger tagging in place whenever any maintenance is being performed on machinery. Any defects, which are found on inspection should be rectified immediately and reported to the supervisor for appropriate action.

10.1 Maintenance Items

10.1.1 Guards

Check Guards are in place, and they are tight, with no loose bolts. Guards should always be operational.

10.1.2 Keep work area clear

Ensure that the area surrounding the CSS Vector Saw is free of trip hazards, unnecessary tools, or other debris. There should be no reason for passers-by to approach or pass near the CSS Vector Saw while it is in use.

10.1.3 Motor Brake operation

The Motor brake should stop the saw blade within 6-8 seconds when the Saw has been switched off or the emergency stop has been applied. Do not use the saw if the time for the blade to stop is too long. This test should be performed before using the machine, at least once a day.

The magnetic friction brake can be adjusted by setting the correct clearance between the friction plate and the coil using the cap screw located in the centre of the brake shaft.

NOTE for the brake to function efficiently, the gap between the brake pad and plate should be set between 8 – 10 thou, approximately 5/8th of a turn.

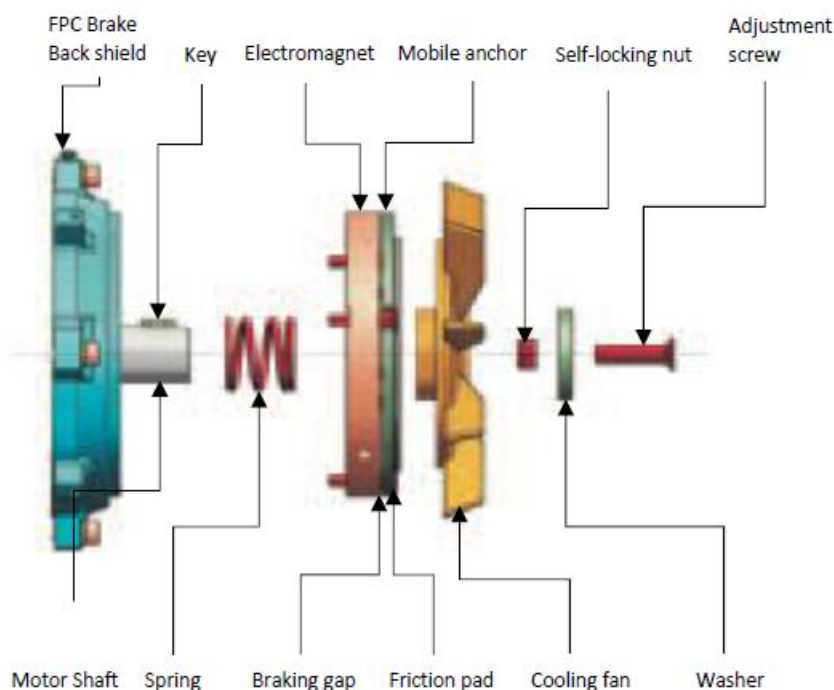


Figure 16, Motor brake assembly

10.1.4 Dust Chute Clear

Once a day the dust chute should be checked for any obstructions or build-up of saw dust. If any large obstruction is found, isolate the power to the Saw and remove the blade cover before attempting to remove said obstruction.

10.1.5 Clean Saw of any build up

Keep the Saw free of any build-up of debris. Moving parts should not be obstructed, and the Saw should be usable without any hindrance. Remove and replace components as required to clean out any built-up debris or dust; ensure that any components removed are then replaced correctly.

Ensure there are no offcuts or any sawdust blocking the saw. If there are any obstructions that prevent the saw blade from moving freely, then only attempt to free the blade once the saw has been electrically isolated.

10.1.6 Noises or vibrations

Take note of any unusual noises or vibrations. Do not operate the Saw if the cause of any vibrations or unusual noises cannot be found.

10.1.7 Emergency Stop Buttons

Check the emergency stop is working and that it stops the machine when activated. This test should be performed before using the machine, at least once a day. Whenever the Emergency Stops are used, ensure that the Servo motors are reset and homed. This will ensure that the motors will continue working as required, and that accurate measurements are retained.

Check operational controls are working, and that they function as designed. Inspect these other controls at regular intervals.

10.1.8 Arm Assembly

The arm assembly should allow the user to smoothly pull the saw blade through the placed material to perform a cut; and should then allow the user to easily return the blade back into position behind the guard, and hold it there until the next cut is required.

The arm assembly should be maintained every month to:

- Check on the condition of the bearings and other moving parts.

All assembly components should also be checked to ensure there is no damage or wear that will affect the performance of the assembly. Ensure that there are no loose, damaged, or missing bolts, and replace or tighten as necessary.

Do not use the Saw if any of the moving parts do not have fluid motion; if the saw blade is moving without any external force being applied; or if the blade is stuck in a certain position; and if any of the above cannot be fixed by general maintenance.

10.1.9 Height adjust and Blade Guard Assemblies

The height adjust assembly should move the saw blade up and down easily as required, and the blade guard assembly should allow the saw blade to spin and cut easily while protecting the user from the saw blade.

Both assemblies should be maintained every month to:

- Check on the condition of the saw blade
- Ensure all moving parts are moving correctly, and are free to move.

All assembly components should also be checked to ensure there is no damage or wear that will affect the performance of the assemblies. Ensure that there are no loose, damaged, or missing bolts, and replace or tighten as necessary.

Do not use the Saw if the saw blade is not up to full speed; or if any moving parts do not have fluid motion or are sticking; and if any of the above cannot be fixed by general maintenance.

If the blade is replaced, then be sure to check the height of the new blade. Also, be sure to confirm the new blade thickness matches the settings in the computer software.

10.1.10 Rotation assemblies

The rotation assemblies should allow the rotation ring and radial plate to easily move around the CSS Base, and set-up at the angles required by the cutting program.

These assemblies should be maintained every month to:

- Check the calibration of the assembly to ensure that the rotation ring is being moved to the correct angles
- Check that the rotation ring is still sitting square on the CSS Base
- Ensure that all moving parts are moving correctly, and are free to move
- Ensure that the motor is still working correctly.

All assembly components should also be checked to ensure there is no damage or wear that will affect the performance of the assemblies. Ensure that there are no loose, damaged, or missing bolts, and replace or tighten as necessary.

Do not use the Saw if the rotation ring is not easily moving around the CSS base or is stuck; if the motor is sputtering or stalling; or if any moving parts do not have fluid motion or are sticking; and if any of the above cannot be fixed by general maintenance.

10.1.11 Motors

The motors should stop and start with no issues, and should easily either turn the saw blade (Arbor motor); move the rotation ring around the CSS base (Servo motor); or move the Trolley stop (Servo motor). Clean the motors regularly by blowing out dust and other debris with dry compressed air.

Arbor Motor:

- Check blade condition
- Check the brakes
- Check condition of the motor

Servo motor:

- Check the point where the motor joins the gearbox (Screws, mount connection, etc)
- Check the shaft locks (this shaft should not be loose)
- Check condition of the motor

Do not use the Saw if there are any substantial or unfixable issues with either of the motors.

10.1.12 Loose Fasteners and Fixings

Check for loose, missing, or damaged bolts especially on guards, cover and floor fixing. Tighten or replace where necessary.

10.1.13 Check sensors are tight

Check the three proximity sensors (on the Rapid Stop, Rotation ring, and on the back of the arms), are fitted snugly. If any of the sensors are loose, check the positioning of the sensors are still correct and that there is a 1.5 – 2.5mm gap between the sensor and sensor bar; then tighten any screws/parts as required. If the position is incorrect, then set proximity position as per Section 10.3 as required.

10.1.14 Rotation Belt

The belt used to rotate the rotation ring around the CSS Base, and the Belt Rollers and Pulley, should be checked every 6 months for any heat damage or excessive wear and replaced if required.

10.1.15 Trolley Slides

The sliders on the Rapid Stop Trolley should allow the trolley to move up and down the Fence smoothly and easily. Check the slides for excessive play and/or wear, and tighten/replace if necessary. Use the guide in section 10.4 to replace the sliders, or alternatively contact Spida Machinery.

10.1.16 Fence Gap

The gap in the fence should allow the blade to pass through without interference. If interference is occurring, check the fence for any deformities and/or check that the height assembly is adjusted to the correct height. Repair, replace, or adjust parts as required. This should be checked every six months, or when a new saw blade is installed.

10.1.17 Bench Top

Check the bench top for excessive wear or damage, and replace if necessary. If the blade is interfering with the bench top, check that the height assembly is adjusted to the correct height. This should be checked every six months, or when a new saw blade is installed.

10.1.18 Maintain CSS Vector Saw

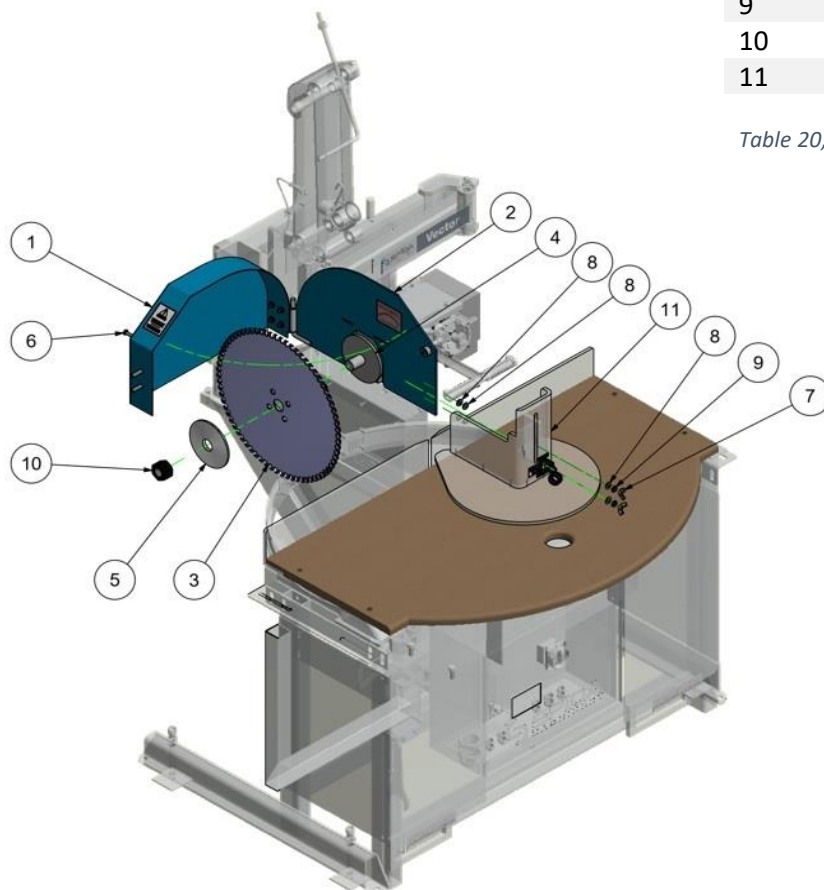
Check all major operating components for wear, fatigue, and alignment. Adjust, tighten, or replace components as required.

Do not use the Saw if it is damaged significantly or if it is not working correctly, and all other mentioned maintenance is not applicable.

10.2 Replace Saw blade

Tools required:

- 13mm spanner
- 46mm spanner (supplied)



Item	Description
1	Blade Guard Outer Door
2	Blade Guard Back plate
3	Blade
4	Inner flange
5	Outer flange
6	M8x90 Cap Screw
7	M10 Wing nut
8	M10 Washer
9	M8 Washer
10	Lock Nut
11	Perspex Barrier Guard

Table 20, Blade Replacement parts

Figure 17, Blade Replacement

Replacement blades, 450mm Dia. 35mm bore 72 teeth Spida Machinery part number BL4503566. Contact Spida Machinery for replacement blades.

Before starting make sure machine is isolated electrically.

To replace the blade in saw:

- Remove the M10 wing nuts and washers holding the Perspex barrier guard, and then remove the guard itself.
- Undo the M8 bolt holding the two sides of the Blade Guard together, using the 13mm spanner, and swing the Blade Guard open on its hinge.
- Remove the lock nut on the motor shaft using the 46mm spanner supplied. The lock nut will be left-hand thread.
- Once the lock nut has been removed, the outer flange will slide off the motor shaft, enabling the blade to be removed.

When installing a new blade make sure blade is seated flat against inner and outer flanges and flanges are seated straight on motor shaft before tightening lock nut. Be sure to check the height of the new blade; to ensure that the correct measurements are retained.

10.3 Set Proximity position

The Proximity Sensor position will need to be reset whenever a sensor, lead or bracket is replaced.

Tools Required (for all 3 configurations): 2x 17mm Spanners (to tighten sensors)

10.3.1 Rapid Stop Proximity Sensor Configuration

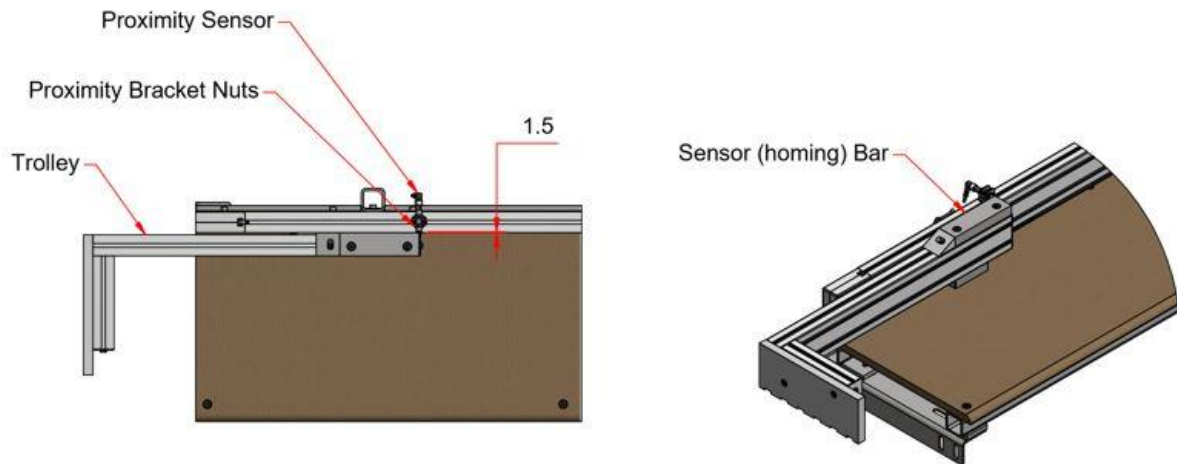


Figure 18, Rapid Stop proximity sensor configuration

- Power off Saw and Rapid Stop.
- Push the Trolley to the minimum position (closest to Saw).
- Loosen proximity bracket nuts.
- Position the proximity sensor to the rear of the sensor bar as shown in Figure 18.
- Tighten proximity bracket nuts.
- Ensure there is a 1.5 – 2.5mm gap between face of sensor and sensor bar.
- Check home position is correct, if not alter in set up screen.
- Reset enable home trolley.
- Send out to 6 metres, and check.
- If incorrect recalibrate trolley as normal.

10.3.2 Arm Assembly Proximity Sensor Configuration

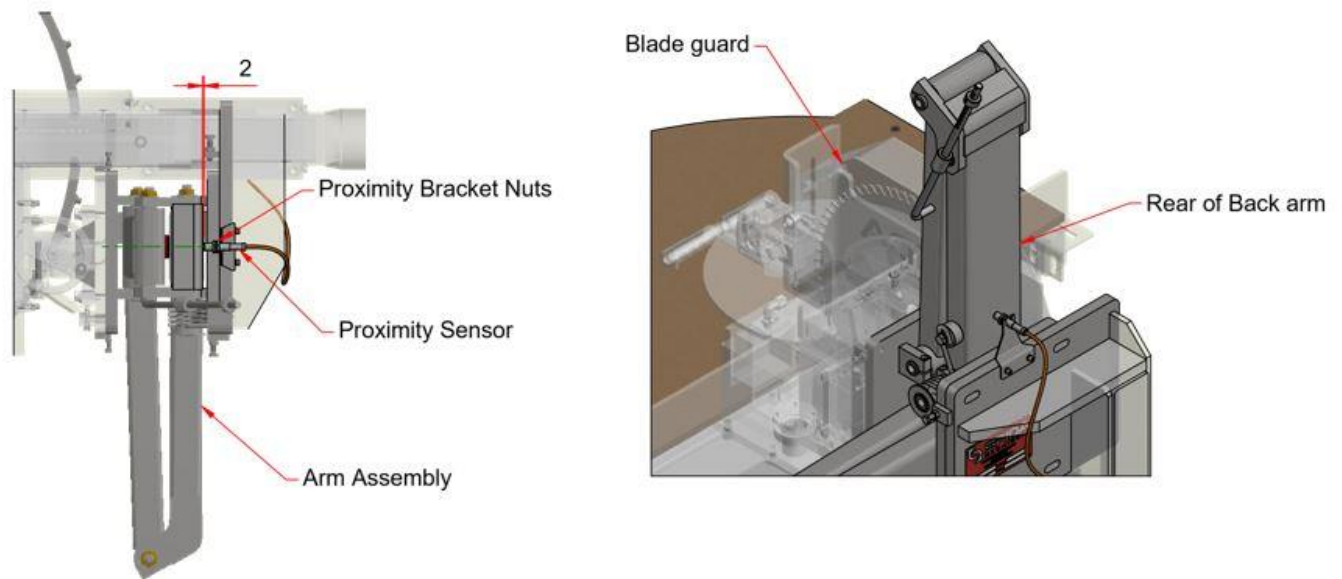


Figure 19, Arm Assembly proximity sensor configuration

- Power off Saw and Rapid Stop.
- Push the Blade guard back until the arm assembly is as close together as possible.
- Ensure that the proximity sensor is located in the middle of the back arm as shown in Figure 19.
- Loosen proximity bracket nuts.
- Position the proximity sensor so there is a 1.5 – 2.5mm gap between face of sensor and the rear of the back arm.
- Tighten proximity bracket nuts.

10.3.3 Rotation Ring Proximity Sensor Configuration

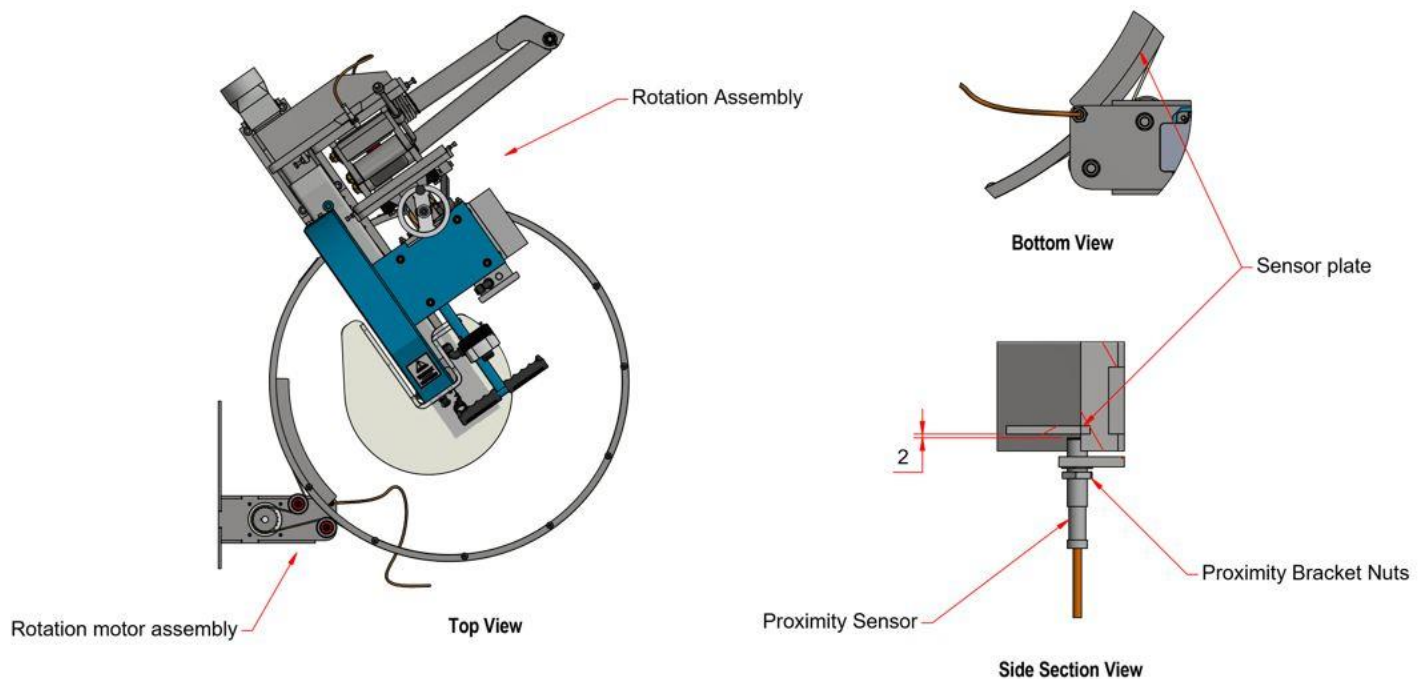


Figure 20, Rotation Ring proximity sensor configuration

- Power off Saw and Rapid Stop.
- Push the Rotation assembly over until the sensor plate is above the proximity sensor on the rotation motor assembly. See Figure 20.
- Ensure that the edge of the sensor plate is directly above the proximity sensor, as shown in Figure 20; this should be within the home position. The home position for Left-hand saws is any angle above 100°, and the home position for Right-hand saws is any angle less than 80°.
- Loosen proximity bracket nuts.
- Position the proximity sensor so there is a 1.5 – 2.5mm gap between face of sensor and bottom of sensor plate.
- Tighten proximity bracket nuts.

10.4 Replacing Trolley Slides

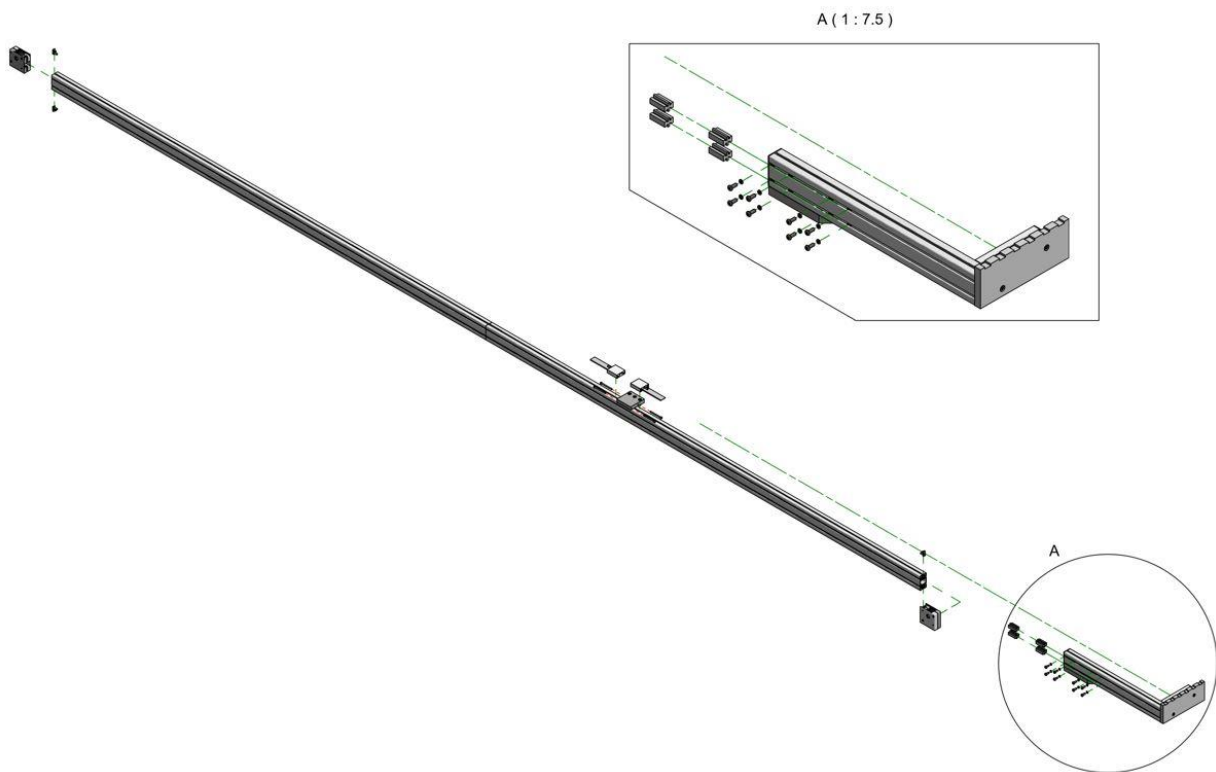


Figure 21, Trolley slide replacement

Tools required: Set of Allan keys

- Disconnect power.
- Disconnect lead and remove home sensor.
- Disconnect leads from and remove motor.
- Undo 16 cap screws holding fence assy.
- Turn upside down, and release belt tension. (Grub screw in centre of tensioner)
- Remove tensioners, (outside screws.)
- Undo pulley blocks from each end, grub screw top and bottom.
- Slide trolley out at one end.
- Undo grub screws either side of slides, remove, replace.
- Blow out the aluminium extrusion, and pulley blocks.
- Reassemble, tension belt (put most tension at the front, leaving adjustment at rear if more tension is needed later.
- Bolt fence back up.
- Fit motor and leads.
- Fit home sensor and lead.
- Start up, enable home trolley.
- Check home position is correct, if not alter in set up screen.
- Reset enable home trolley.
- Send out to 6 mtrs, and check.
- If incorrect recalibrate trolley as normal.

10.4.1 Reference Distances for Trolley sliders

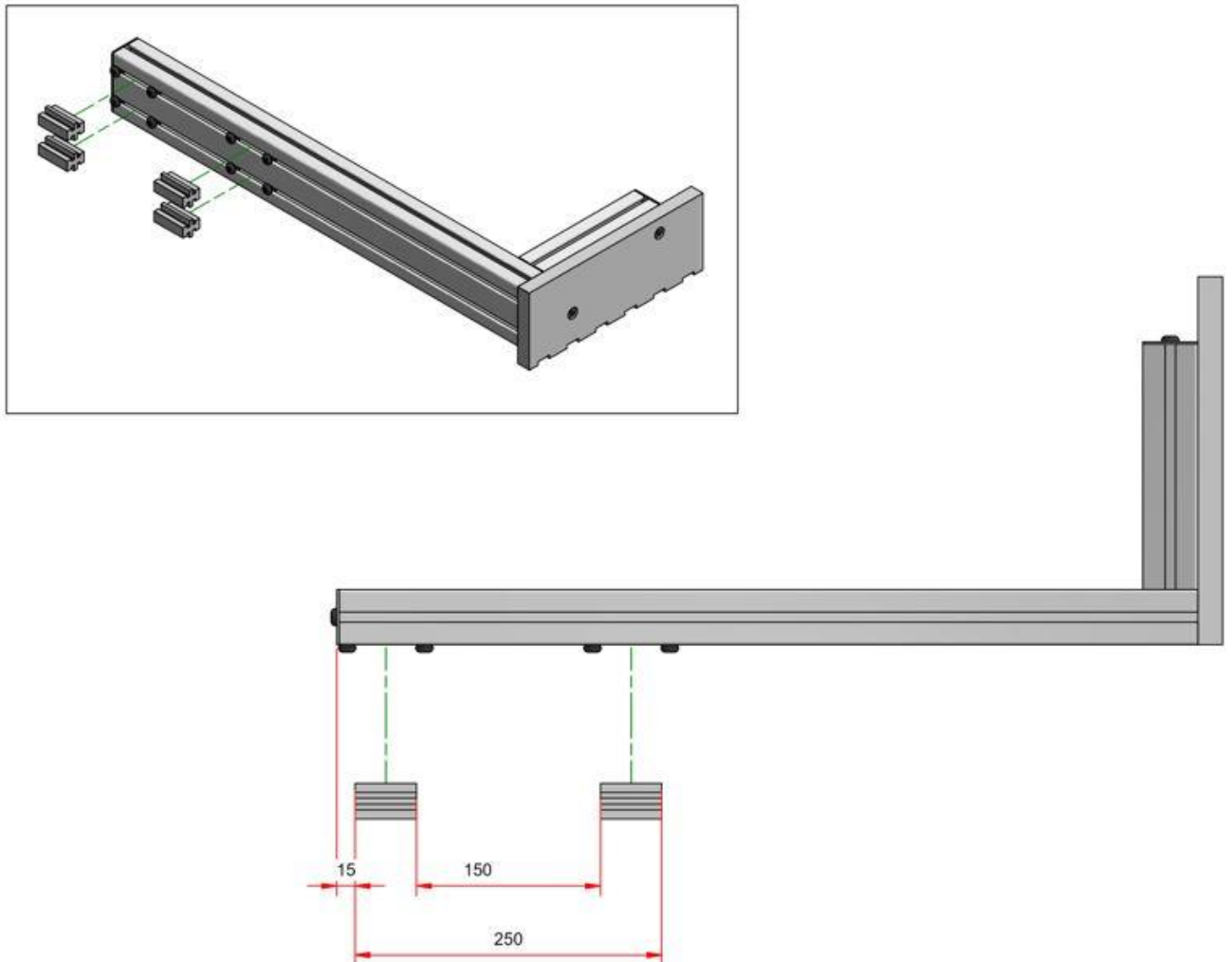


Figure 22, Stop Slider distances

The above figure shows the required distances in mm between the sliders, and between the slider and the end of the Stop. Use these distances when the sliders need to be removed for maintenance.

10.5 Replace Rotation Belt

Tools required:

- Set of Allan keys
- 1" Spanner (supplied)
- 19mm Spanner

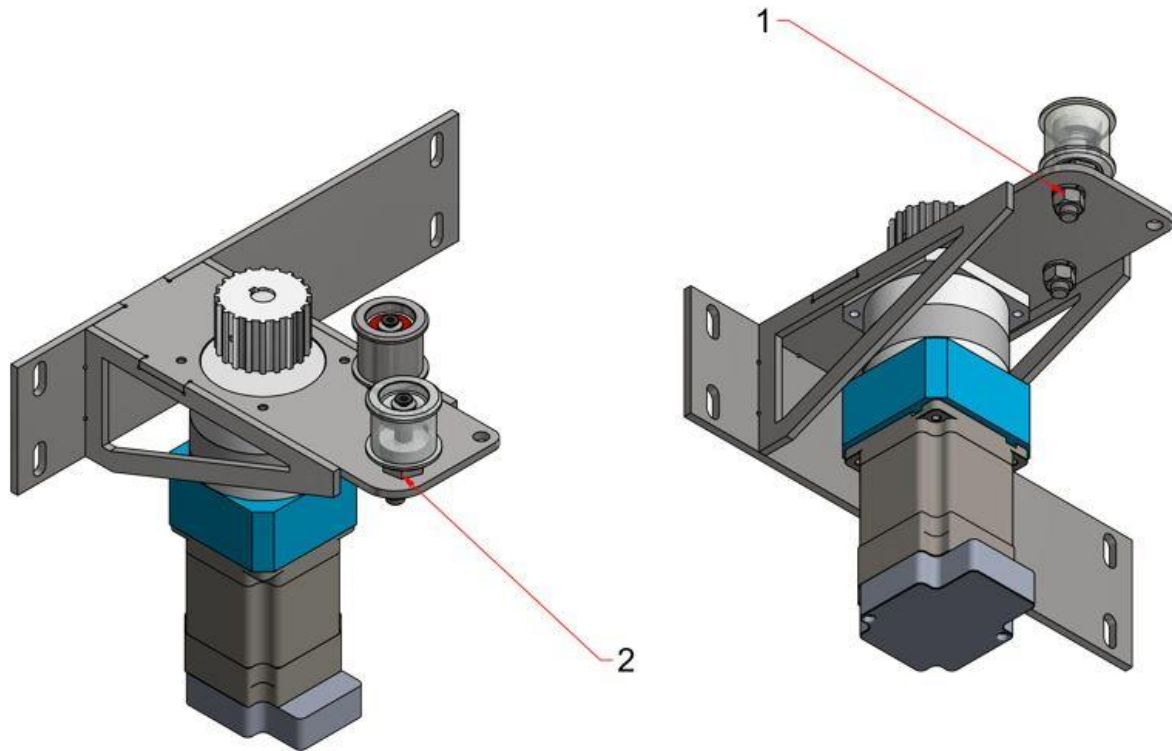


Figure 23, Rotation Motor Assembly

- Remove saw table top and blue guard plate in front of gearbox.
- Rotate saw to the left until the gearbox and belt adjusting rollers are accessible from the top.
- Loosen off the securing nut (1) using spanner provided, on both rollers. Turn eccentric nut (2) on both rollers until minimum tension is achieved and belt is loose.
- There are two plates securing ends of rotation belt. Remove each of these plates by taking out the four bolts holding them on.
- Remove the old belt.
- Starting with the end of the new belt, secure it to the left-hand side (one nearest the rotation gearbox) using one of the plates from the 4th step.
- Weave the new belt around the pulleys and secure the other end in place (remove as much "slack" as you can by hand).
- Loosen securing nut on the pulley nearest the front of the saw and turn the eccentric nut until the maximum adjustment is achieved. Tighten the securing nut. (Amount of adjustment by this pulley is minimal).
- Final tensioning of belt is achieved by adjusting the second tensioning roller.
- Check the tension of the belt between the rollers on top of the gearbox. When tensioned correctly, the belt should be tight to the touch (i.e. very little movement).

10.6 Replace Motor Brake

When replacing the Motor brake on the Arbor motor, be sure to follow the instructions provided below depending on the type of brake being used:

10.6.1 FPC Brake

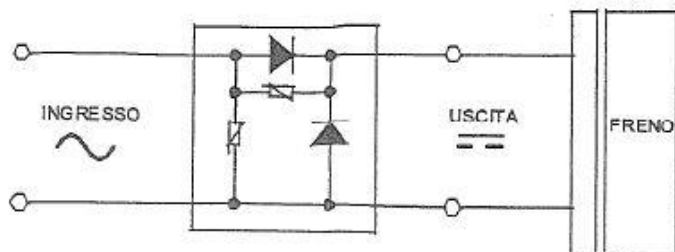


Figure 24, Connection Diagram for FPC Brake

Brake adjustment (or braking gap adjustment – r)

Adjust the screw until you achieve braking gap value listed on the table below.

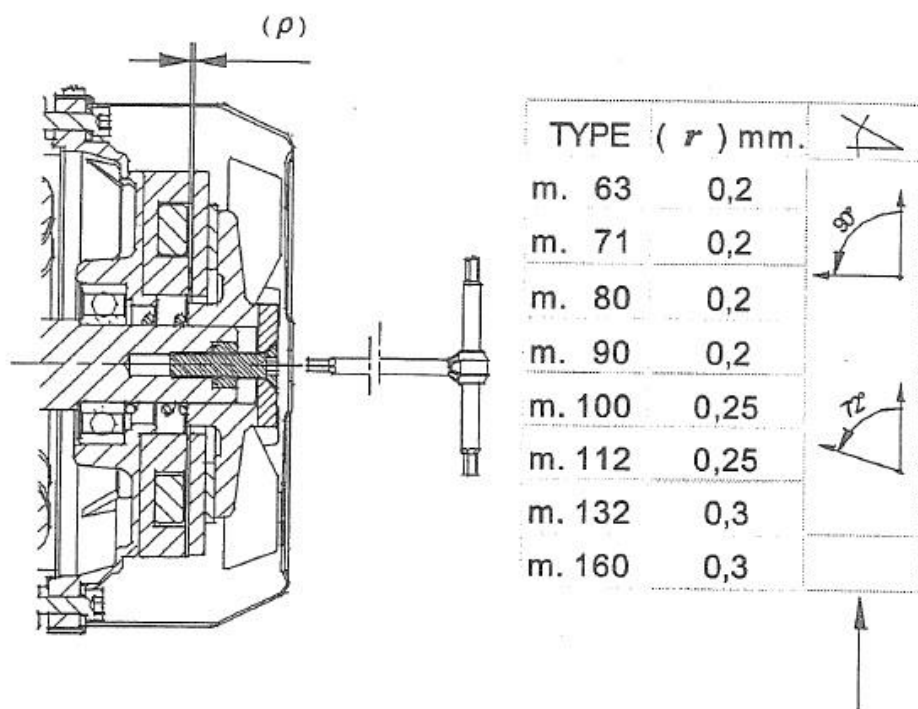


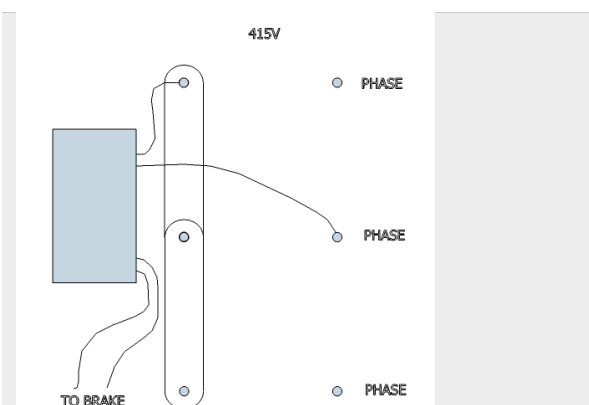
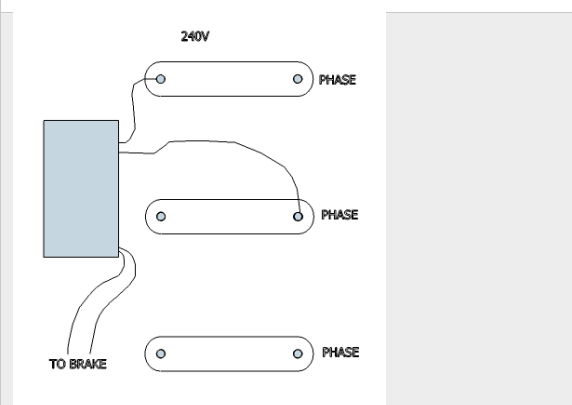
Figure 25, Brake Adjustment

Note: For a quicker but more approximate adjustment, first tighten the adjustment screw clockwise until it reaches the bottom; then loosen it, turning it anti-clockwise (see values listed on the table above).

10.6.2 100V Brakes

Connecting 100V Brakes on CEG Motors

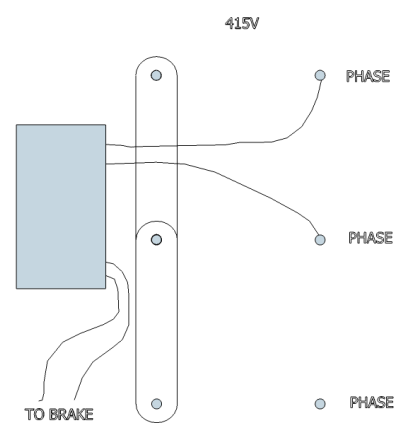
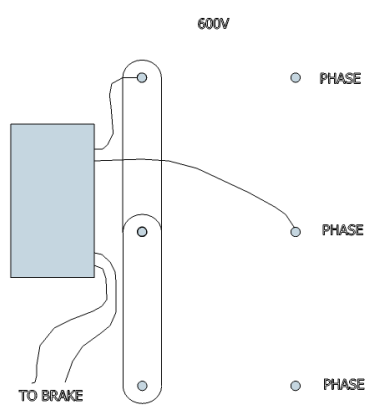
- It is vitally important to ensure you have the correct connection of the motor brake to prevent damage to the brake.
- The Rectifier supplied is suitable for any mains Voltage supplied, it approximately halves the supply Alternating Voltage to DC (240V AC becomes ~100VDC and 415V AC becomes ~190VDC)
- Identify the Voltage of the brake fitted to the motor, usually it is 100V, however some units have 190V brakes. Check!
- To set correct gap on brake, fully tighten centre bolt and then undo $\frac{3}{4}$ of a turn. When energised it should “click”. During running there should be no smell of burning or heat and the blade should stop in ~ 8 seconds after powering off.

100V Brakes 415V Power supply	100V Brakes 240V Power supply
<p>The Motor must be connected in STAR as per diagram</p> 	<p>The Motor must be connected in DELTA as per diagram</p> 

10.6.3 190V Brakes

Connecting 190V Brakes on CEG Motors

- It is vitally important to ensure you have the correct connection of the motor brake to prevent damage to the brake.
- The Rectifier supplied is suitable for any mains Voltage supplied, it approximately halves the supply Alternating Voltage to DC (240V AC becomes ~100VDC and 415V AC becomes ~190VDC)
- Identify the Voltage of the brake fitted to the motor, usually it is 100V, however some units have 190V brakes. Check!
- To set correct gap on brake, fully tighten centre bolt and then undo $\frac{3}{4}$ of a turn. When energised it should “click”. During running there should be no smell of burning or heat and the blade should stop in ~ 8 seconds after powering off.

190V Brakes 415V Power supply	190V Brakes 600V Power supply
	<p>The Motor must be connected in DELTA as per diagram</p> 

10.7 Test Cuts (If required)

If a test cut is required by Spida Machinery, the following steps must be carried out. If there are any other issues with the CSS Vector Saw, then contact Spida Machinery accordingly.

Testing the Cut Accuracy

To obtain the optimum cutting accuracy, it is necessary to check that both the blade line of travel and the front face of the fence are directly over the centre of rotation.

To check this, perform the following:

1. Check that the blade is square to the fence and in a vertical plane (90°).
2. Place an off cut of timber on the table, ensuring it is against the fence (**Must be clamped**).
3. With the radial degree setting at 90°, cut the timber part way through.
4. Without moving the timber reset the angle to 45° to the left, and make a second cut part way through.
5. Reset the angle to 45° to the right, and make a third cut part way through.
6. Check the alignment of the outfeed side of the cuts. The points of intersection should all be at the same point at the rear face of the timber, as shown in Figure 26.

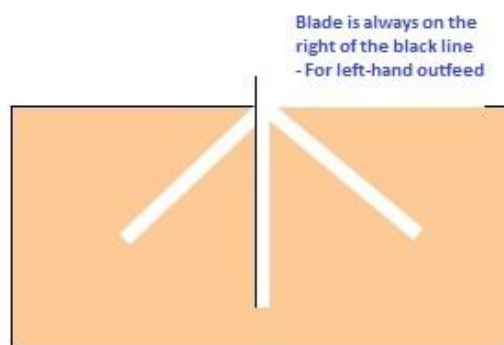


Figure 26, Example of a correct Left-hand Outfeed test cut

NOTE:

Saws with **right hand outfeed**, the **right** side of the saw cuts should intersect.
Saws with **left hand outfeed**, the **left** side of the saw cuts should intersect.

7. If the point of intersection is too far back or forward, adjustment can be made at the fence. To adjust the fence, loosen the 8mm Countersunk Cap screws holding the fence to the base frame, on either side of the fence.

NOTE:

If the intersection point is too far **forward** (Figure 27), move the fence **forward**.
If the intersection point is too far **back** (Figure 28), move the fence **back**.

8. Only make minor adjustments at a time, and make sure the grub screws are tightened before rechecking.

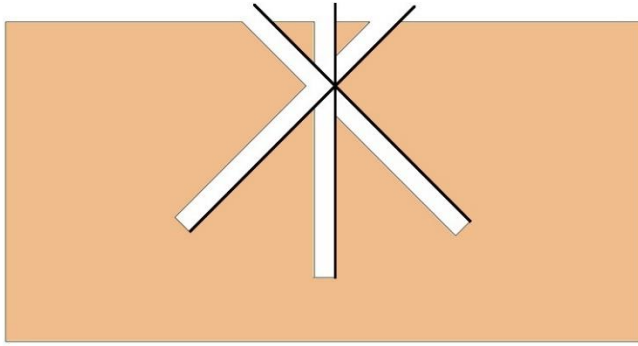


Figure 27, Fence too far back, Right-hand Outfeed

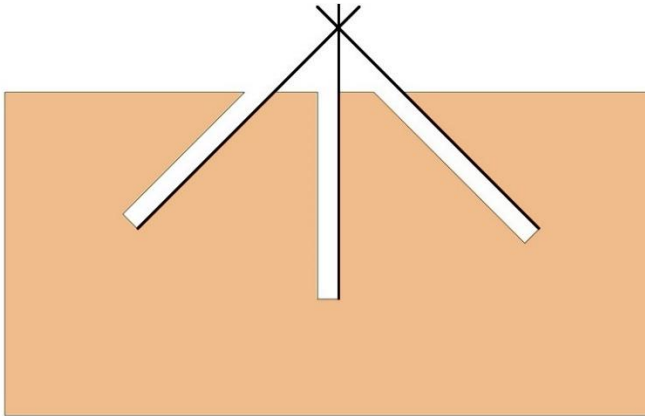


Figure 28, Fence too far forward, Right-hand Outfeed

11 Foreseeable Misuse

Through experience, Spida Machinery's technical staff have listed (in order of occurrence) the most common misuses of the machinery by operators, the symptoms that result and the rectification required to address the misuse and return the machine to optimal working order.

Table 21, Common misuse issues

MISUSE	SYMPTOM	RECTIFICATION REQUIRED
Lack of cleaning	Saw blade not returning to position	<ul style="list-style-type: none"> - Clean Saw, especially cutting surfaces, dust chute, around saw blade, and dusting around return spring. - Remove any large pieces of debris, and clean out any dirt. - Clean and check motors, and service saw blade. - Check the angles and calibration of the blade and re-align if required. - Check sharpness of blade and replace if required.
	Saw blade cutting incorrectly	
	Machine overheating	
	Saw blade failing to cut	
	Motor tripping out or overloaded	
Lack of care	Rotation ring not moving correctly	<ul style="list-style-type: none"> - Repair or replace any damaged, loose, or missing parts. - Re-tension belt and check angles, as they may have changed slightly - Remove any loose or unnecessary objects. - Re-calibrate parts as required. - Note, if possible, how each part was mistreated, and train operators to prevent additional misuse of these and other parts. - Contact Spida Machinery in the event of a major crash
	Rotation Belt loose	
	Objects in Rotation Assembly	
	Misaligned rotation ring, arm assembly or guards	
	Misaligned or incorrect cutting angles	
	Bent or stuck saw blade	
	Saw cutting incorrectly	
	Parts not working as designed	
	No operation or loss of control data	

Any other misuse and resultant damage of the machine is deemed non-foreseeable as its occurrence is not consistent.

12 Trouble Shooting

Table 22, Trouble shooting

Trouble	Probable Causes	Correction
Starting Saw blade failed	Factory power abnormal	Check power supply
	Start switch damaged	Replaced damaged switch
	Power wire damaged	Replace damaged wires
	Overload tripped	Check overload setting. Reset overload
Poor cutting quality	Saw blade dulled	Sharpen blade
	Inaccurate fence alignment	Refer to Spida Machinery
Workpiece burnt	Saw blade dulled	Sharpen blade
	Blade damaged	Replace blade
Saw blade slows down during cutting	Saw blade dulled	Sharpen blade
	Motor tripping out/stalled	Clean motor and test voltage. Repair/replace as necessary
	Blade damaged	Replace blade
Saw blade cutting at an incorrect angle	Rotation not correctly calibrated	Re-calibrate as required
Saw blade assembly not moving easily/getting stuck	Arm assembly joints damaged/worn/caught	Check return spring. Free any moving parts that have become stuck. Repair/replace parts as required
Saw blade assembly not adjusting height correctly/easily, or not staying at the correct height	Height adjust shaft misaligned/damaged	Re-align/repair/or replace as required
	Adjusting wheel misaligned/damaged	Re-align/repair/or replace as required
	Other moving parts damaged/worn	Check all moving parts and repair/replace as required
	Quick clamp handle stuck/not tightening correctly	Ensure handle is correctly attached and lubricated. Otherwise repair/replace as required
Arbor/Servo motor/s do not run at full speed	Power voltage too low	Test voltage
Arbor/Servo motor/s overheating	Motor vents blocked	Clean motor
	Motor is damaged	Repair/replace motor
Rotation ring not moving/not moving smoothly	Rotation ring misaligned	Ensure rotation ring is sitting square with CSS Vector Saw base
	Rotation Belt misaligned/damaged	Ensure belt is sitting square on rotation ring and around rollers/pulley, and replace if damaged or excessively worn
	Rotation rollers or pulleys misaligned/damaged	Ensure rollers and pulleys are sitting square on rotation gearbox bracket; replace if damaged or excessively worn

	Servo motor/s tripping out/stalled	Check fault number on motion controller (look through Perspex on control box). Clean motor and test voltage. Repair/replace as necessary
Rotation ring not stopping correctly during homing	Sensor or sensor cable damaged	Repair/replace sensor or sensor cables as required
	Electrical supply compromised	Find and replace damaged lines/parts as required

If any of the above corrections do not solve the issue, then do not use the Saw and contact a supervisor, maintenance engineer, or Spida Machinery.

13 Distributor & Repairer Contacts

13.1 Agent/Distributor

Company Name: _____

Address: _____

Contact Person: _____

Ph.: _____ Fax: _____

Mobile: _____ Email: _____

13.2 Automation Repairs

Company Name: _____

Address: _____

Contact Person: _____

Ph.: _____ Fax: _____

Mobile: _____ Email: _____

13.3 Mechanical Repairs

Company Name: _____

Address: _____

Contact Person: _____

Ph.: _____ Fax: _____

Mobile: _____ Email: _____

14 Warranty

SM2012 Ltd, SPIDA Machinery, Tauranga, New Zealand, warrants the equipment listed below to the initial purchaser of the equipment only against defective workmanship and materials only, for a period of twelve (12) months from the date of shipment from SPIDA's factory, subject to the following conditions:

1. SPIDA extends the original manufacturer's warranty to SPIDA on buy-in items such as motors, saw blades and air cylinders or other such buy-in items but does not add its warranty herein described to such items.
2. This warranty only applies if:
 - a. The attached copy of this warranty is signed by the initial purchaser and returned to SPIDA's address shown above within 14 days of shipment of the goods from SPIDA's factory.
 - b. The equipment is installed by SPIDA or its licensed installer.
 - c. Regular routine maintenance has been carried out on equipment in accordance with instructions in manual provided by SPIDA and proper housing and shelter provided for the equipment.
 - d. The equipment is operated by competent personnel in accordance with the operating instructions set out in the manual provided by SPIDA and not otherwise.
 - e. The equipment has not been subjected to alterations or repairs or dismantling without prior written approval of SPIDA. Any parts returned to SPIDA either for repair or consideration of a warranty claim consequent to an authorisation to dismantle must be shipped prepaid.
 - f. SPIDA may, at its option, either repair or replace the defective part upon inspection at the site of the equipment where originally installed. The warranty does not cover the cost of freight, Labour or traveling for the removal or replacement of the defective parts,
 - g. This warranty does not apply to any deterioration due to average wear and tear or normal use or exposure.
 - h. In all warranty matters, including any question of whether this warranty applies to any claim, the decision of SPIDA is final,

This warranty is the only warranty made by SPIDA as the manufacturer and is expressly in lieu of and excludes all other warranties, conditions, representations and terms expressed or implied, statutory or otherwise, except any implied by law and which by law cannot be excluded. Neither SPIDA or its agents or servants will be liable in any way for any consequential loss, damage or injury including any loss of use, profits or contracts.

The law applicable to this warranty shall be the law of New Zealand and the parties hereto submit to the exclusive jurisdiction of the Courts of New Zealand.



Machinery/Equipment

The item bearing the following serial plate:

Date of Shipment: _____

Signed by: _____

Name: _____

Position: _____

Acceptance of Warranty

I acknowledge and accept the contents of this warranty.

Signed by: _____

Name: _____

Company: _____

Position: _____

Date: _____

15 Electrical Drawings – NZ/AU

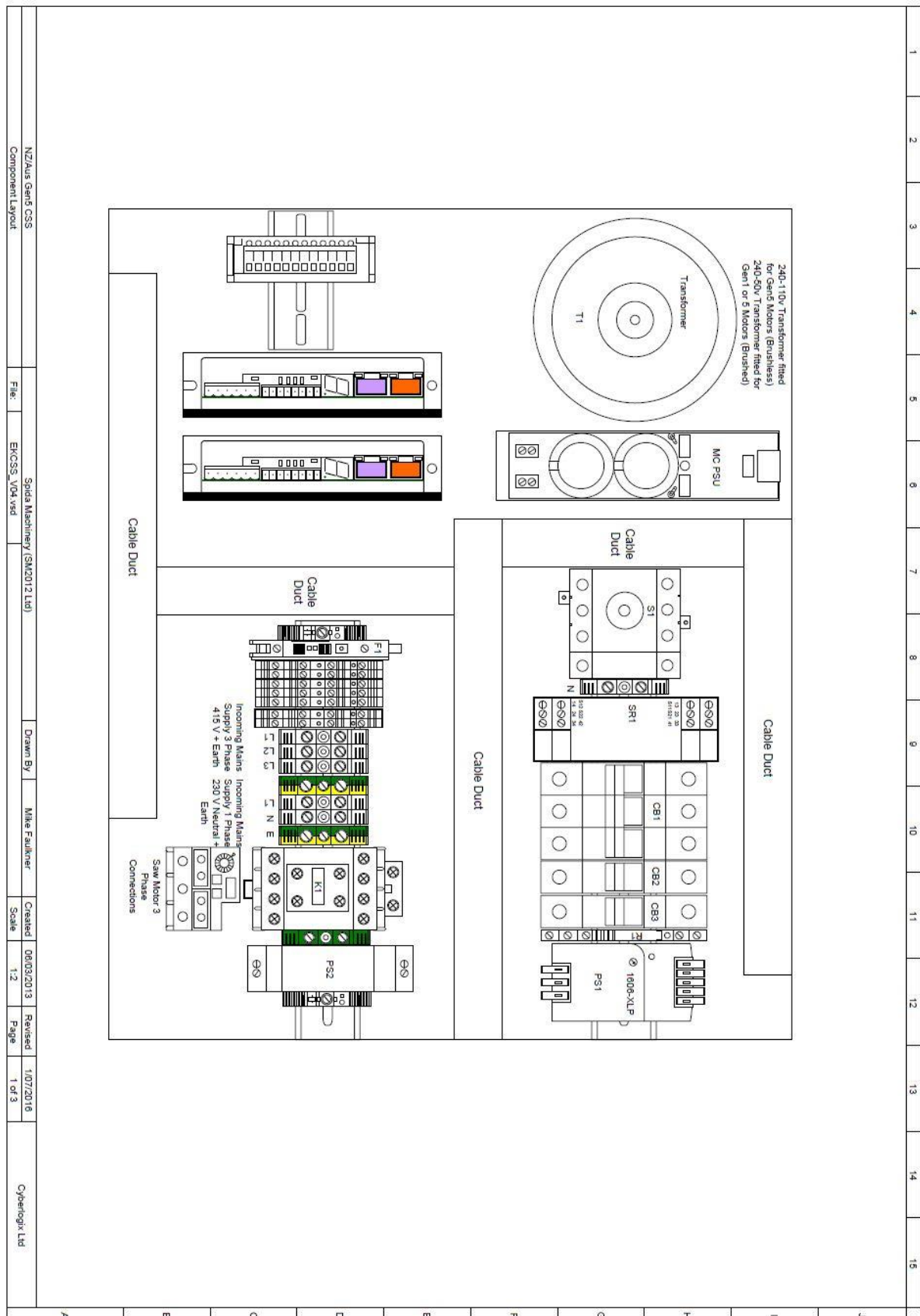


Figure 29, CSS Vector Saw Electrical Drawings NZ/AU part 1

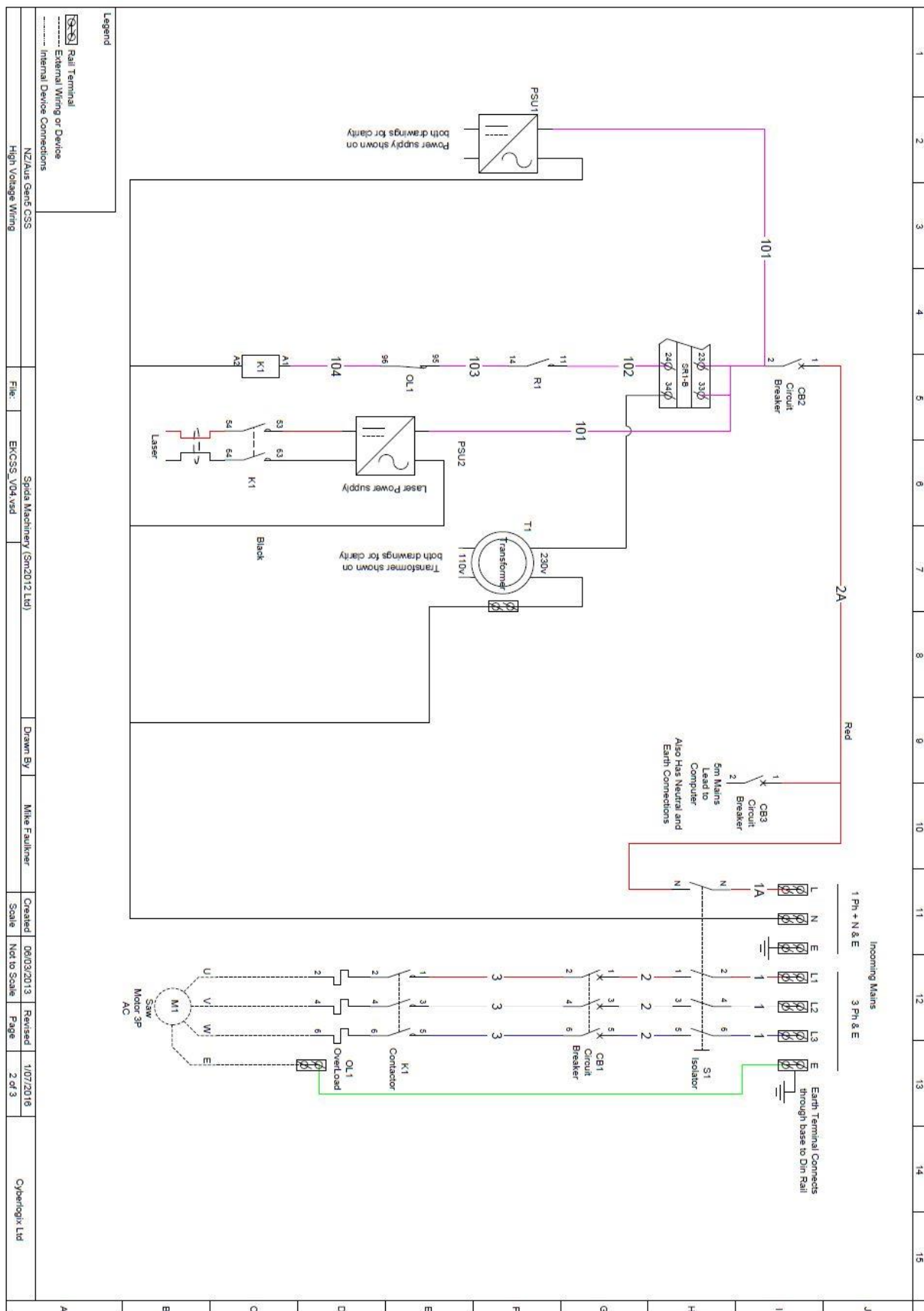


Figure 30, CSS Vector Saw Electrical Drawings NZ/AU part 2

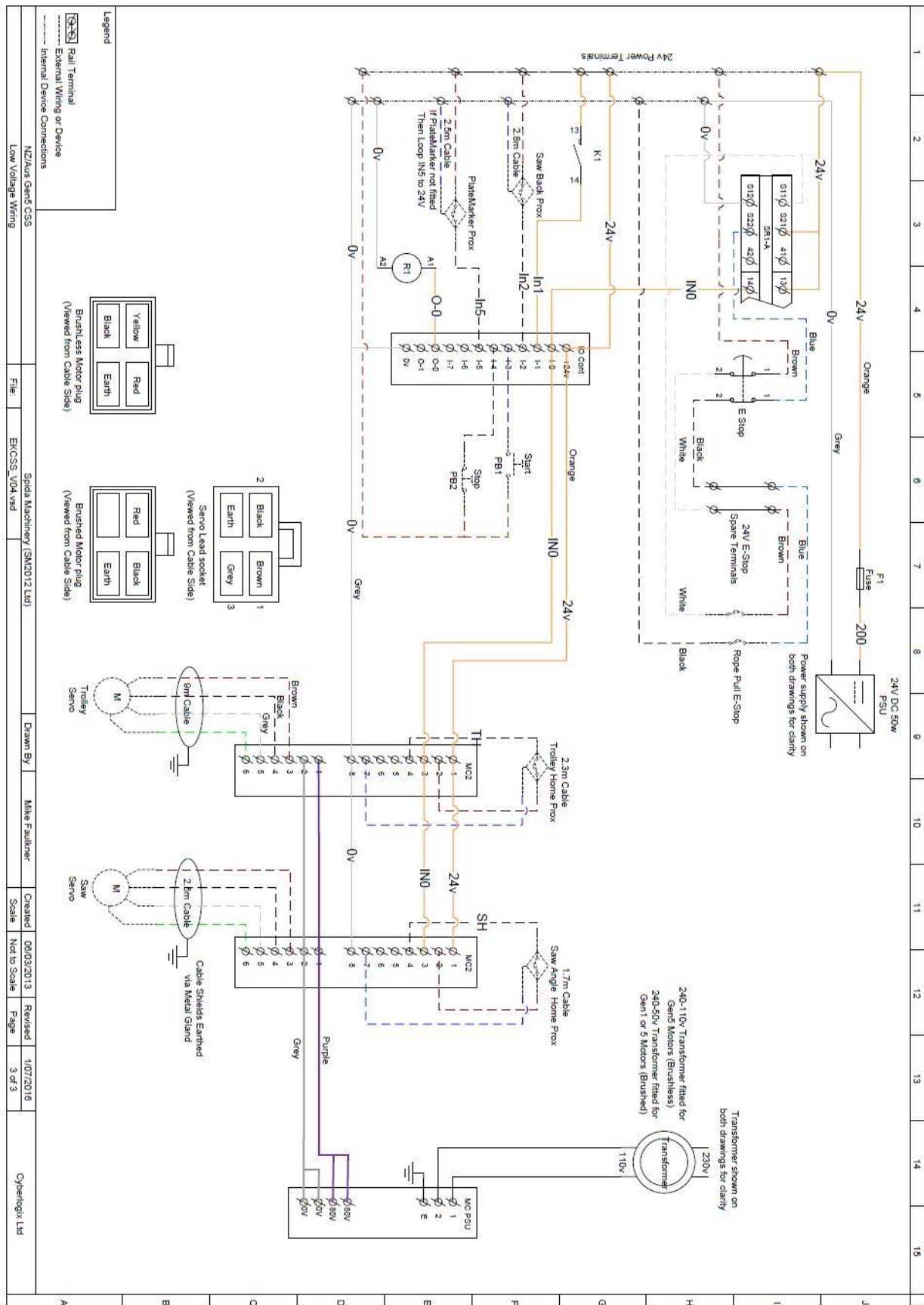


Figure 31, CSS Vector Saw Electrical Drawings NZ/AU part 3

16 Electrical Drawings – US

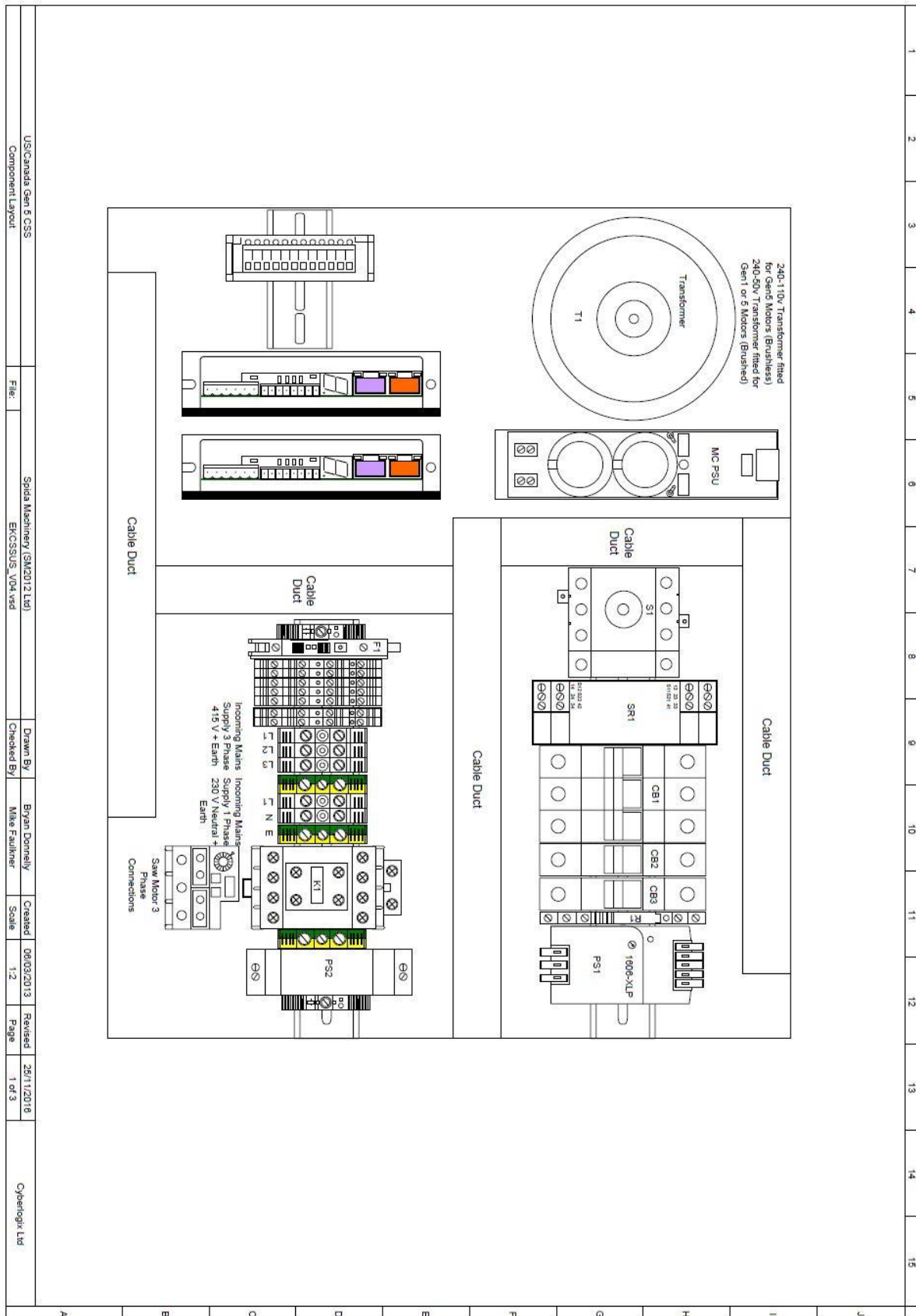


Figure 32, CSS Vector Saw Electrical Drawings US part 1

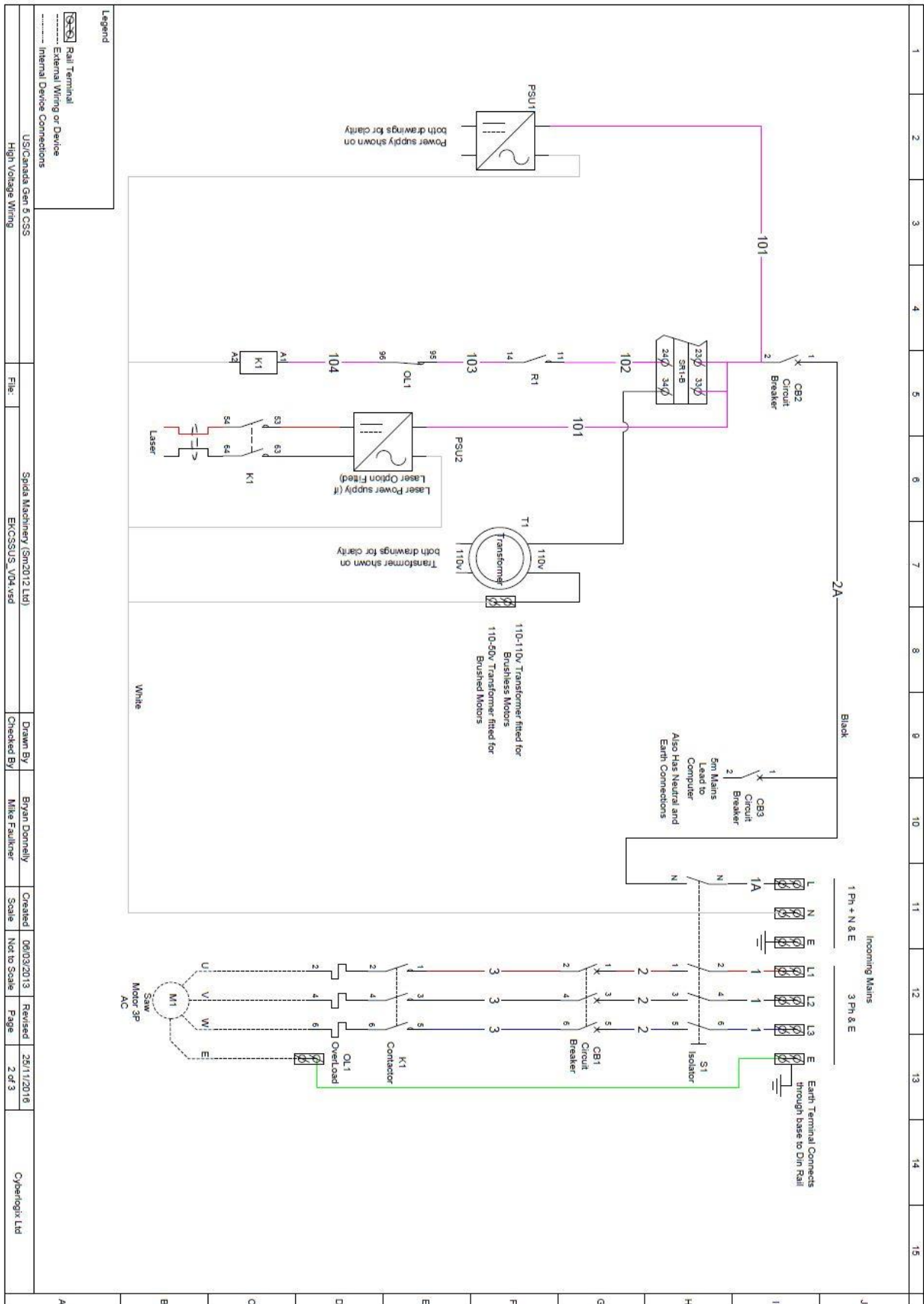


Figure 33, CSS Vector Saw Electrical Drawings US part 2

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17 Training Certificate

Instructor: _____

Company: _____

I declare that:

- I have trained the person names below (“the trainee”) in the safe operation of the machinery/equipment detailed in the training manual.
- The trainee has demonstrated an understanding of the safe operation of the machinery/equipment.
- The trainee has indicated the he/she has read and understood this training manual.

Signed: _____

Date: _____

Trainee: _____

Company: _____

Position: _____

I declare that:

- I have received instruction from the person named above (“the instructor”) for the safe operation of the machinery/equipment detailed in this training manual.
- All information in this training manual was demonstrated and explained by the instructor.
- I have thoroughly read and understood this training manual.

Signed: _____

Date: _____

Witnessed by:

Name: _____

Company: _____

Signed: _____

Date: _____