SPIDA MACHINERY
A MULTINAIL COMPANY

Mitre Pin Box

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

All enquiries should be directed to:
SM2012 Ltd - Known as Spida Machinery

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

1 Contents

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2 Overview

The Spida Mitre Pin Box is designed to manipulate components prior to cutting to achieve required mitre angles.

The Spida Mitre Pin Box 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 Spida Mitre Pin Box 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 Spida Mitre Pin Box are deemed competent and qualifies to operate the machine.

The Spida Mitre Pin Box 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 safety 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, Spida Mitre Pin Box Specifications

Overall Width	204 mm
Overall Height	144 mm
Overall Length	244 mm
Pin adjustment (Total extension from Fence line)	40.8 mm
Weight	15 kg
Servo Motor	Single Phase
Air Supply	6-8 Bar (600-800 kPa)
Power Requirement	10 Amp, 115V, Single Phase

4 Installation

4.1 Handling & Transport

- Box with other additional parts and secure with the assigned 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 always be covered while being transported

The Spida Mitre Pin Box and assigned machine 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 assigned machine and Spida Mitre Pin Box must be free from any rubbish or impediments
- There must be good lighting in the installation area to allow proper positioning of the assigned machine and Spida Mitre Pin Box
- The ground on which the assigned machine rests must not vary by more than 30mm over the total footprint area of the machine
- The assigned machine should be leveled using adjustable feet. Once level, the machine should be bolted to the floor through the holes provided.
- Electrical commissioning to be to local standards and be performed by a qualified electrician

The site selected for the assigned machine 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 assigned machine should be free of all rubbish or impediments, with general access to all areas of the machine for the ease of loading and unloading material of varying sizes.

With the Spida Mitre Pin Box in position, a qualified engineer should be used to connect the pneumatic components to the machine and adjust the air pressure to the required setting (refer to 3 Specifications for pressure settings).

Check all pneumatic hoses and connectors to ensure that the fittings haven't worked loose during transportation of the machine. Re-tighten all fittings that appear to be leaking. If leaking persists undo the fittings and apply a sealing compound to the joints in question. Re-tighten the fitting. (Any serious leaking problems during the warranty period should be reported to Spida Machinery). Check the air pressure in the system is sufficient to operate the machine (refer to 3 Specifications for pressure settings).

To check the air pressure, turn the compressor on and allow the pressure to build up. When the controls are activated, normal pressure should read 6-8 bar or 600- 800 kPa. All maximum pressures are factory set and should not be changed.

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 Spida Mitre Pin Box must be isolated from all sources of energy and locked out to prevent unexpected operation.

5.4 Training and Supervision of Spida Mitre Pin Box Operators

No person should be expected or allowed to operate the Spida Mitre Pin Box 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 Spida Mitre Pin Box works.
- Checks to perform prior to starting.
- How to recognise potential faults.
- Location of controls and how to Stop and Start the Spida Mitre Pin Box.

5.5 Responsibilities of Spida Mitre Pin Box Operators

Operators should:

- Check the Spida Mitre Pin Box 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 Spida Mitre Pin Box should be securely fastened to the structure of the assigned machine to prevent movement or toppling over. Location of the assigned machine 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.

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 Spida Mitre Pin Box, 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 Spida Mitre Pin Box 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 Spida Mitre Pin Box 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 Spida Mitre Pin Box 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 hazardous areas of adjacent machinery.
- The machine and all 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 always be locked to avoid casual entry by unauthorized persons, as touching live surfaces is hazardous.
- Never put hands in-between components and the Spida Mitre Pin Box when the Mitre Box is in use.
- 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 to manipulate components to the correct mitre angle.
- 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 Spida Mitre Pin Box 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
- 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 components from one area to another
- 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

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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 moving parts. Make sure guards are in position and in good working order. Do not operate machine without guards.
Poor Housekeeping	Inspect Mitre Box and surrounding areas for obstructions, hazards, and defects. Remove built-up debris from around machine, electrical leads, pneumatic lines, and power points.
Electrical / Air Supply Faults	Inspect electrical leads and/or pneumatic lines 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 Spida Mitre Pin Box.

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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 and pneumatic lines 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, pneumatic lines, 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 using. Use only material that the machine has been designed to accommodate.
Operator Technique	Do not impede the movement of the Mitre Box 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 Mitre Box is in the home position and has come to a complete halt. Do not attempt to activate the Mitre Box before material has been removed.
Hit by projectiles	The Spida Mitre Pin Box must be electrically and pneumatically isolated before attempting to clear blockages or material jams. 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	Lock out (pneumatically isolate), and 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 and pneumatic isolation of machine	Machine power must be switched off at the Main Power Switch, and the air locked out at the main isolator, before maintenance or cleaning.
Incorrect tools	Use Correct tools for the job to minimise personal injury and damage to the machine
Stalled Pin	Isolate power and air before attempting to free a stalled pin
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 always maintained to avoid the risk of slips, trips or falls.

That approved eye and hearing protection is always used when operating the machine.

That approved dust masks and safety footwear are always worn 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 eliminates 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 assigned machine. To identify the work space to pedestrians.

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7 Operating Controls

There are no direct electrical controls on the Spida Mitre Pin Box.

The Mitre Pin Box is controlled by the software that runs the assigned machine, and all necessary functions of the Mitre Pin Box have been pre-set.

The Spida Mitre Pin Box does have a small pneumatic filter/regulator on the back, to help control the Mitre Pin Box pneumatics.

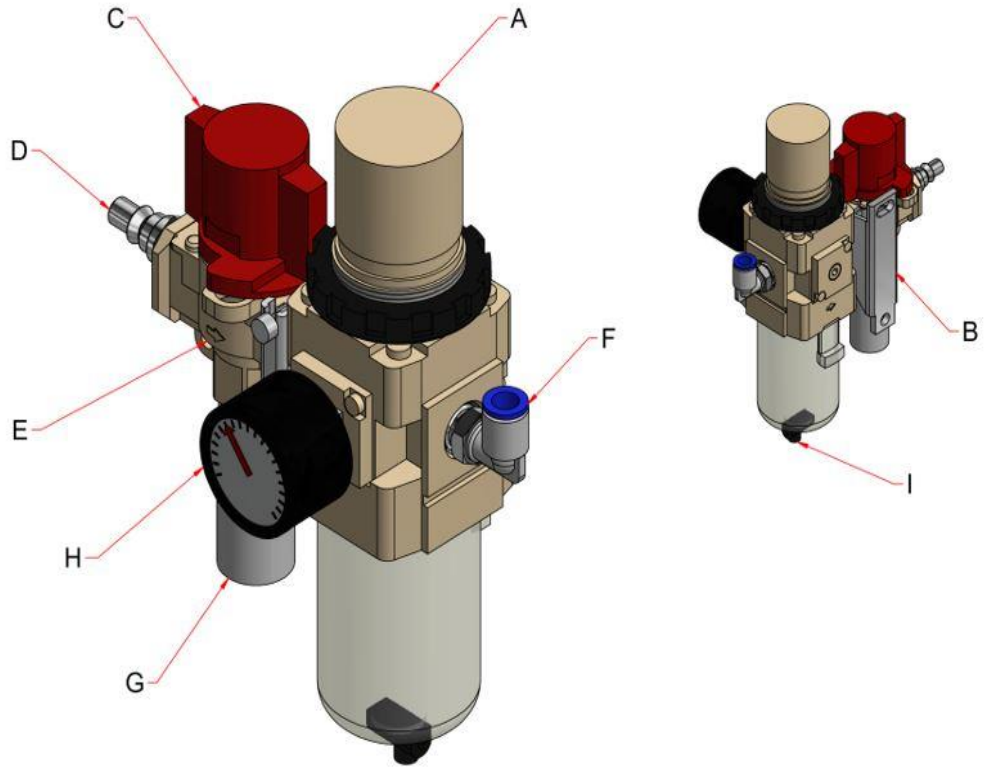

Figure 1, Filter/Regulator assembly

Table 5, Filter/Regulator Parts

Control	Function
A	Regulator adjustment
B	Mounting bracket
C	Valve on/off
D	Air in
E	Pressure relief valve
F	Air to Mitre Box
G	Silencer
H	Pressure gauge
I	Moisture release

WARNING! Do not operate Spida Mitre Pin Box without the correct knowledge and function of each of the controls.

8 Operation

NOTE: The Spida Mitre Pin Box is to be operated in accordance with this manual. Deviation from this specified operation may result in incorrect manipulation, cutting, or injury.

8.1 Machine Set-up

Before operations commence, the operator must ensure that the Spida Mitre Pin Box 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 Spida Mitre Pin Box and any adjacent machining area; or further down the framing line.
- Complete all safety checks required

Once the Mitre Box and the surrounding area are satisfactorily clear, the Spida Mitre Pin Box and assigned machine can be switched on.

8.2 General Operation of Mitre Box

From pre-programmed data, the software determines the required angle and direction of the component to be cut.

Once the component is in place:

- The motor activates and turns the Ball screw shaft, moving the Ball screw prox plate to a pre-calculated position to achieve the required angle.
- Pneumatics activate, pushing out required pin, depending on what direction the component is required to be cut.
- The back stop on the pin is stopped by the Ball screw prox plate, holding the pin out at exactly the right distance to get the angle required.

Once the required cut has been made:

- The activated pin is retracted.
- The component is moved to the next required position.

8.3 Standard Operation

1. Select and load cutting file, on assigned machine.
2. Select and load member in cutting file, on assigned machine.
3. Start Saw blade.
4. Load timber to be cut onto in-feed bench.
5. Move the timber along to the Stop.
6. Activate the cutting file, keeping clear of the Mitre Box.
7. The Stop will move the timber to the correct cutting position, and the Mitre Box will tilt the timber to the required angle.
8. Make the cut/s on the leading end of the timber.
9. The Stop and Mitre Box will automatically manipulate the timber and move it into the next required position.
10. Make the required cut/s on the trailing end.
11. Remove and stack finished member.
12. Continue cutting required cut list.

Never go behind the fence line when the Mitre Box is running.

Always keep hands clear of Mitre Pins, and Mitre Pin path

8.4 Machine Shut-down

Once operations are complete, ensure that the Spida Mitre Pin Box and assigned machine 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 Spida Mitre Pin Box and assigned machine
- Lock main isolator if someone is conducting maintenance

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

9 Parts Identification

9.1 Spida Mitre Pin Box setup – Example (9802-RSCOM-0501-1110)

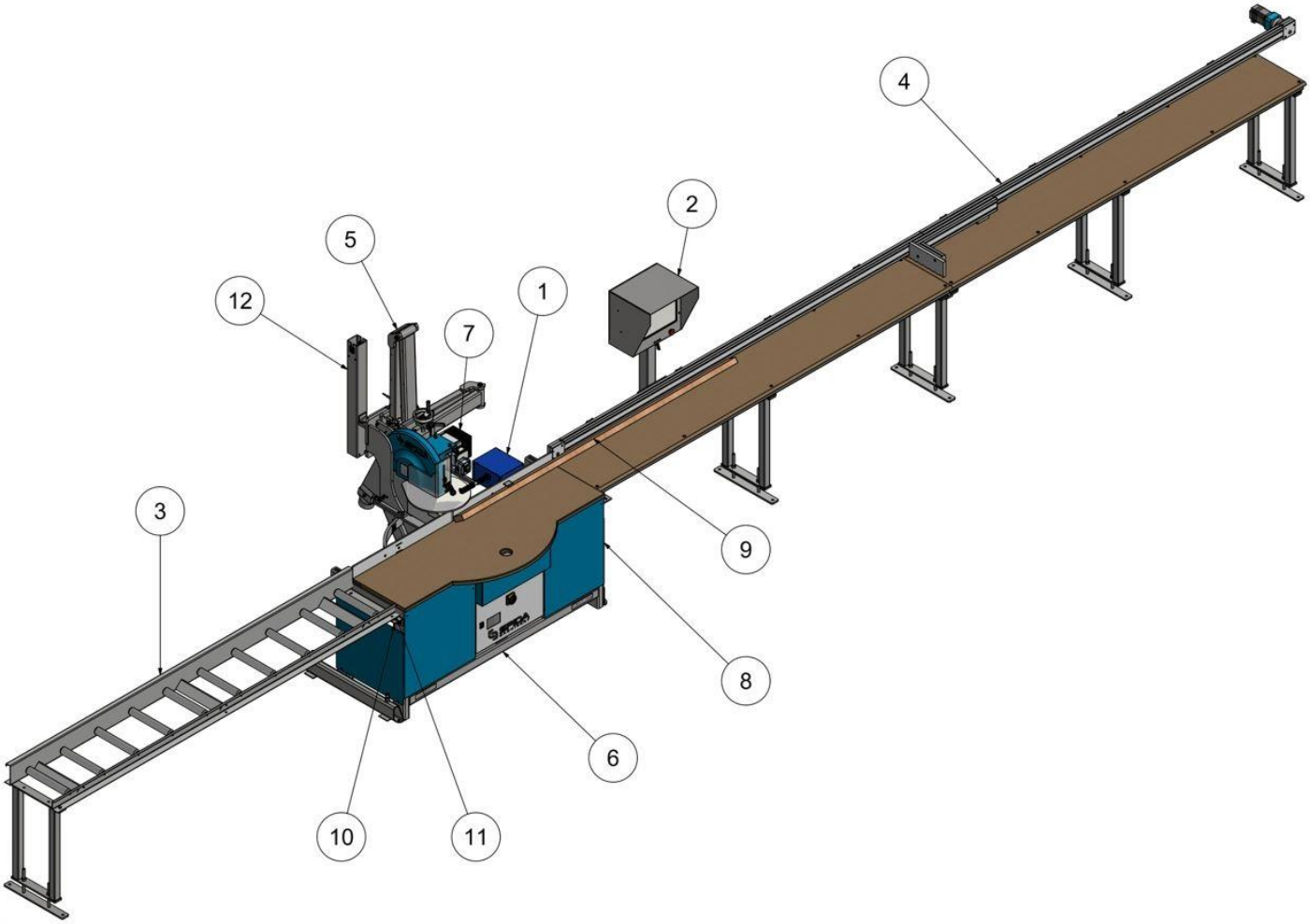

Figure 2, Spida Mitre Pin Box setup example.

Table 6, Parts List – Spida Mitre Pin Box setup example

ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	0501000	Mitre Pin Box
2	1	0605000	Multi Monitor Assembly
3	1	1110000 - 3000	Roller Table - 3m
4	1	1202000	Rapid Stop Table (6m)
5	1	8830300	Arm Assembly - Apollo
6	1	8831100 for Mitre Box	Apollo saw base to column post Assembly
7	1	8831400	Apollo Saw Motor Group
8	1	9802200	Automation parts for C-Type - CSS XL saw
9	2400.000 mm	RMT88.9-38.1	Timber 88.9x38.1
10	1	SMPBKT11	Saw Connector Brkt
11	1	SMPPLT18	Roller Table Attachment Plate
12	1	SMPSL01 v3	Automatic Stroke Limiter assembly

9.2 Spida Mitre Pin Box (0501000)

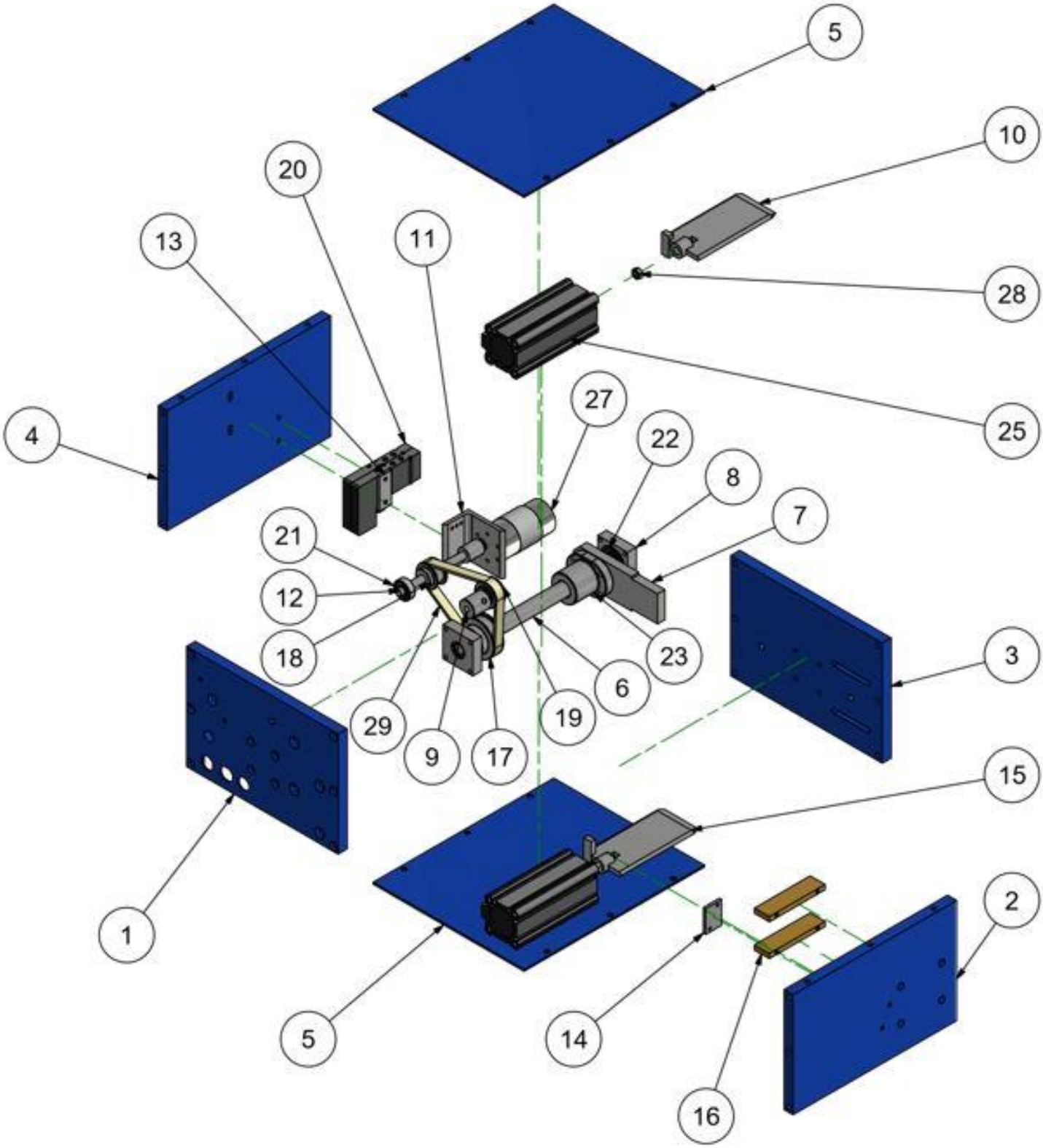

Figure 3, Spida Mitre Pin Box (0501000)

Table 7, Spida Mitre Pin Box (0501000) parts list

ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	0501101	Mitre box side - Back
2	1	0501102	Mitre box side - Right
3	1	0501103	Mitre box side - Front
4	1	0501104	Mitre box side - Left
5	2	0501105	Mitre box Top/Bottom
6	1	0501201	Ball screw shaft mach.
7	1	0501202	Ball screw prox plate
8	2	0501203	Bearing Housing
9	1	0501204	Pulley Tensioner
10	1	0501205	Knife Assembly Right
11	1	0501206	Motor mount bracket
12	1	0501207	Drive motor shaft
13	1	0501208	Valve mount plate
14	1	0501209	Micro switch spacer
15	1	0501210	Knife Assembly Left
16	2	0501211	Brass 20x6 L=75
17	1	0501213	Ball screw pulley
18	1	0501214	Motor shaft pulley
19	1	0501215	Idler pulley
20	2	AVSY3120-5LOU-M5	Solenoid Valve
21	1	BRG608	Bearing 608 VV
22	2	BRG6201	Bearing 6201
23	1	BRGBSHR1605T3FS	HIWIN Ball Screw Nut
24	1	BRGHK0810	Bearing Needle roller HK0810
25	2	CDQ2A32-75(0_0) _BODY	CQ2_BODY-Compact Cylinder/Standard: Double Acting Single Rod
26	2	CDQ2A32-75-(0_0) _CYROD (thin)	CQ2_CYROD-
27	1	EMB3724V319	Mitre box servo motor
28	2	HWNHM6	Hex nut M6
29	1	TIB120XL037	Timing Belt 120 XL 037

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 Spida Mitre Pin Box and contact a supervisor, maintenance engineer, or Spida Machinery.

Table 8, Maintenance intervals

Check	Day	Week	Month	½ Year
Guards in place	x			
Work area is clear	x			
Pin Slots Clear	x			
Cylinder Operation				
Clean Mitre Box of any build up	x			
Noises or Vibrations	x			
Emergency stop working	x			
Drain moisture from air reservoir		x		
Air supply pressure		x		
Pneumatic Filter		x		
Pin assemblies in good condition			x	
Rotation assembly in good condition			x	
Motor is running smoothly			x	
For loose or damaged bolts			x	
Attachment bolts for tightness				x
Inspect Timing Belt				x
Pins				x
Ball screw prox plate				x
Pin Slot Gap				x
Mitre Box outer plates				x
Maintain Spida Mitre Pin Box				x

Failure to perform these checks as per schedule indicated in Table 8 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 Spida Mitre Pin Box and the assigned machine is free of trip hazards, unnecessary tools, or other debris. There should be no reason for passers-by to approach or pass near the Spida Mitre Pin Box or the assigned machine while they are in use.

10.1.3 Pin Slots Clear

Once a day the Pin Slots should be checked for any obstructions or build-up of saw dust. If any large obstruction is found, isolate the power and air to the assigned machine before attempting to remove said obstruction.

10.1.4 Inspect Cylinders

All pneumatic cylinders should slide freely, push and pull evenly, and there should be no excessive wear visible on shafts. Check for loose fastenings or damage to the air cylinder.

Test both cylinders before work commences each day. Both cylinders should activate/deactivate when required, and the cylinders should not allow the pins to move when active and/or inactive. The cylinders should hold the required pin securely at the required distance out from the Fence line when active, and behind the Fence line when inactive.

Do not use the Mitre Box if, during any of these tests; the pins are loose; the pins do not go behind the Fence line when inactive; the pins do not come out at the correct distance from the Fence line when active; if either of the pins are moving when they should be in place; or if any of the cylinders are not activating properly.

10.1.5 Clean Mitre Box of any build up

Keep the Mitre Box free of any build-up of debris. Moving parts should not be obstructed, and the Mitre Box 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 Mitre Box. If there are any obstructions that prevent the pins from moving freely, then only attempt to free the pins once the Mitre Box has been electrically and pneumatically isolated.

10.1.6 Noises or vibrations

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

10.1.7 Emergency Stop Buttons

Check the emergency stop on the assigned machine is working and that it stops the machine and all components 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 (as applicable). This will ensure that the motors will continue working as required, and that accurate measurements are retained.

Also check operational controls on the assigned machine are working, and that they function as designed. Inspect these other controls at regular intervals.

10.1.8 Dry Air Supply

For best results, clean dry air is essential. A drain valve is provided on the air reservoir and this should be opened weekly to drain any condensation; or when moisture is seen in the reservoir prior to commencing work.

10.1.9 Air Supply

Air pressure should be maintained at 600-800 kPa; this can be checked at the filter regulator located on the back of the Mitre Box. Take measures to ensure air quality; such as by installing an aftercooler, air dryer, or water separator. Do not use compressed air that contains chemicals; synthetic oils, including organic solvents; or salt or corrosive gases, etc., as it can cause either damage or a malfunction. If synthetic oil is used for the compressor oil, depending on the type of synthetic oil used, or on the conditions of use, there may be adverse effects on the resin of the pneumatic equipment or on the seals if the oil is flowed out to the outlet side; so, the mounting of a main line filter is recommended.

10.1.10 Check Filter/Regulator

Periodically check the filter and regulator for any cracks or damage. If condensation in the drain bowl is not emptied on a regular basis, the bowl will overflow and allow the condensation to enter the compressed air lines. Water can cause malfunction of pneumatic equipment. The filter and regulator are located on the back of the Mitre Box.

Also, be sure to check the pneumatic lines at the same time for possible kinks, air leaks, or other damage.

10.1.11 Pin Assemblies

The Pin assembly should move the pins in and out of the pin slots easily and should hold the pins out at the correct distance when required.

Both assemblies should be maintained every month to:

- Check on the condition of the pins
- Check on the condition of the cylinders
- Ensure all parts are aligned correctly
- Ensure the pins are moving through the pin slots correctly
- Ensure the pins do not or cannot be moved once in place
- 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 Mitre Box if the either of the pins and/or cylinders are missing/damaged/excessively worn; if any of the parts are misaligned; if the pins are getting stuck on or cannot move easily through the pin slots; if either of the pins are allowing movement once in place or are not being held out at the correct distance; or if any moving parts do not have fluid motion and/or are sticking; and if any of the above cannot be fixed by general maintenance.

10.1.12 Rotation assembly

The rotation assembly should allow the motor to easily rotate the Ball screw shaft, to move the Ball screw prox plate to the required position.

This assembly should be maintained every month to:

- Ensure that the Ball screw prox plate is being moved to the correct position when required
- Check that the belt is still sitting square on the pulleys
- 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 Mitre Box if the timing belt is not moving easily around the pulleys or is stuck; if the Ball screw prox plate is not moving to the correct location when required, or is moving once in position; 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.

10.1.13 Motor

The motor should stop and start with no issues and should easily turn the Ball screw shaft and move the Ball screw prox plate up and down. Regularly clean out any dust and other debris around 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 Mitre Box if there are any substantial or unfixable issues with the motors.

10.1.14 Loose Fasteners and Fixings

Check for loose, missing, or damaged bolts especially on guards, covers, and machine attachments. Tighten or replace where necessary.

10.1.15 Timing Belt

The belt used to connect the motor and the Ball screw shaft should be checked every 6 months for any heat damage or excessive wear and replaced if required.

10.1.16 Pins

The Pins (or knife assemblies) in the Mitre Box should move in and out on the cylinder shafts, and in and out of the pin slots, smoothly and easily. Check the pins for excessive play and/or wear and tighten/replace if necessary. If the pins are damaged, and/or require replacement, contact Spida Machinery.

10.1.17 Ball screw prox plate

The Ball screw prox plate should easily move up and down the mitre box on the Ball screw shaft. It should easily stop at the pre-programmed locations, and should not move once in place.

Do not use the Mitre Box if the Ball screw prox plate is stopping in the wrong place; or is moving once in place (Either problem can be determined through incorrect mitre angles; the pins not extending correctly; or similar); and if any of the above cannot be fixed by general maintenance.

10.1.18 Pin Slot Gap

The gaps in both the Mitre Box and the Fence should allow the pins to pass through without interference. If interference is occurring, check the slots and/or pins for any deformities and/or excessive wear. Repair, replace, or adjust parts as required. This should be checked every six months.

10.1.19 Mitre Box Outer Plates

Check all outer plates for excessive wear or damage and replace if necessary. If the pins or any parts from adjacent machinery are interfering with the outer plates, check that the Mitre Box is still being held in the correct location and/or that the pin slots are allowing free pin movement. This should be checked every six months.

10.1.20 Maintain Spida Mitre Pin Box

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

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

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 9, Common misuse issues

MISUSE	SYMPTOM	RECTIFICATION REQUIRED
Lack of cleaning	Pins blocked/moving incorrectly/failing	- Clean Mitre Box, especially outer plate and fence surfaces, pin slots, and around pins. - Remove any large pieces of debris and clean out any dirt. - Clean and check motor - Clean air lines, and service filter/regulator - Check all pneumatic cylinders, clean and service as required.
	Pins holding components at incorrect mitre angle	
	Machine overheating	
	Unusual amount of noise while parts are moving	
	Motor tripping out or overloaded	
Lack of care	Pins not moving correctly	- Repair or replace any damaged, loose, or missing parts. - Check for bent, broken, or leaking air lines, and replace as required. - Re-tension belt and ensure it is sitting square on pulleys - 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 issue
	Excessive wear of moving parts	
	Timing Belt loose	
	Foreign objects in Main assembly/obstructing moving parts	
	Broken, damaged, or misaligned parts	
	Bent or stuck pneumatic cylinders	
	Bent/stuck/misaligned pins	
	Pins not activating at the correct times	
	Parts not working as designed	
	Unusual amount of noise while parts are moving	

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

12 Trouble Shooting

Table 10, Trouble shooting

Trouble	Probable Causes	Correction
Starting machine failed	Factory power abnormal	Check power supply.
	Start switch on assigned machine damaged	Replaced damaged switch.
	Power wire damaged	Replace damaged wires.
	Emergency stop/s activated	Ensure all emergency stops have been deactivated.
	Overload tripped	Check overload setting. Reset overload.
Incorrect mitre angle	Motor malfunction	See possible corrections below. Otherwise contact Spida Machinery.
	Cylinder malfunction	See possible corrections below. Otherwise contact Spida Machinery.
	Computer hardware is damaged/malfunctioning	Replace/repair parts if possible. Turn machine off and on again, otherwise contact supplier for further information.
	Computer software is damaged/malfunctioning	Turn machine off and on again, otherwise contact supplier for further information.
	Bent or misaligned pins/ball screw prox plate	Repair or replace parts as required.
	Missing or damaged parts/parts moving incorrectly	Repair or replace parts as required.
	Inaccurate fence and/or pin slot alignment	Repair/replace parts and/or remove obstructions as required. Contact Spida Machinery in the event of a major issue.
Pins activating incorrectly	Cylinders are supplied by incorrect air pressures	Clean air lines and ensure regulated pressure to each cylinder is the same.
	Damaged air lines	Check for bent, broken, or leaking air lines, and replace as required.
	Damaged cylinders/attached components	Repair/replace parts as required.
	Parts misaligned	Re-align parts as necessary. Ensure other assembly items are not interfering with pin movement.
	Parts obstructed	Remove obstructions as required. Ensure pin slots are clear and aligned correctly with pins.
Pins not activating	Pins jammed/broken	Check for obstructions. Repair/replace parts/remove obstructions as required.
	Cylinders jammed	Check for obstructions. Repair/replace parts/remove obstructions as required.
	Air supply	Replace any broken air lines.

Ball screw prox plate not adjusting height correctly/easily, or not staying at the correct height	Control switches on assigned machine not activating/jammed/damaged	Check controls for damage. Repair/remove obstructions as required. Contact Spida Machinery in the event of a major issue.
	Computer hardware is damaged/malfunctioning	Replace/repair parts if possible. Turn machine off and on again, otherwise contact supplier for further information.
	Computer software is damaged/malfunctioning	Turn machine off and on again, otherwise contact supplier for further information.
	No power to motor	Check electrical supply to motor.
	Motor is damaged/not receiving power correctly	Repair/replace motor as required. Check electrical supply to motor. Test voltage.
	Parts misaligned	Re-align parts within the rotation assembly as necessary. Ensure rotation assembly parts are not interfering with pin assemblies.
	Parts loose/damaged/missing and/or obstructed	Check for obstructions. Repair/replace parts and/or remove obstructions as required.
Ball screw prox plate not moving	Control switches on assigned machine not activating/jammed/damaged	Check controls for damage. Repair/remove obstructions as required. Contact Spida Machinery in the event of a major issue.
	Computer hardware is damaged/malfunctioning	Replace/repair parts if possible. Turn machine off and on again, otherwise contact supplier for further information.
	Computer software is damaged/malfunctioning	Turn machine off and on again, otherwise contact supplier for further information.
	No power to motor	Check electrical supply to motor.
	Ball screw shaft/prox plate jammed	Check plate and shaft for damage/obstructions and repair/ remove obstructions as required.
Motor does not run at full speed	Power voltage too low	Test voltage.
Motor not running smoothly	Excessive noise or vibration	Clean motor.
	Motor not switching on	Check electrical leads for faults.
	Drive shaft not turning	Remove any debris that may be blocking movement. Ensure pulleys, bearings, and shaft are correctly located.
	Drive shaft not turning uniformly	Tighten any loose bolts, ensure the shaft, bearings, and pulleys are located correctly.

	Overheating	Remove any debris, make sure there is nothing to obstruct the free circulation of air or dissipation of heat around the motor.
	Motor is tripping	Turn machine off and on again.
	Motor is damaged	Repair/replace motor.
Pneumatic cylinders ineffective/inadequately performing	Blocked air lines	Check for blockages. Flush system if required.
	Damaged air lines	Check for bent, broken, or leaking air lines, and replace as required.
	Loose, damaged, or missing parts	Inspect cylinder parts. Repair or replace items as required.
Components not moving onward once cut has been made	Pins activating incorrectly	See possible corrections above. Otherwise contact Spida Machinery.
	Computer hardware is damaged/malfunctioning	Replace/repair parts if possible. Turn machine off and on again, otherwise contact supplier for further information.
	Computer software is damaged/malfunctioning	Turn machine off and on again, otherwise contact supplier for further information.

If any of the above corrections do not solve the issue, then do not use the Mitre Box 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 Drawing

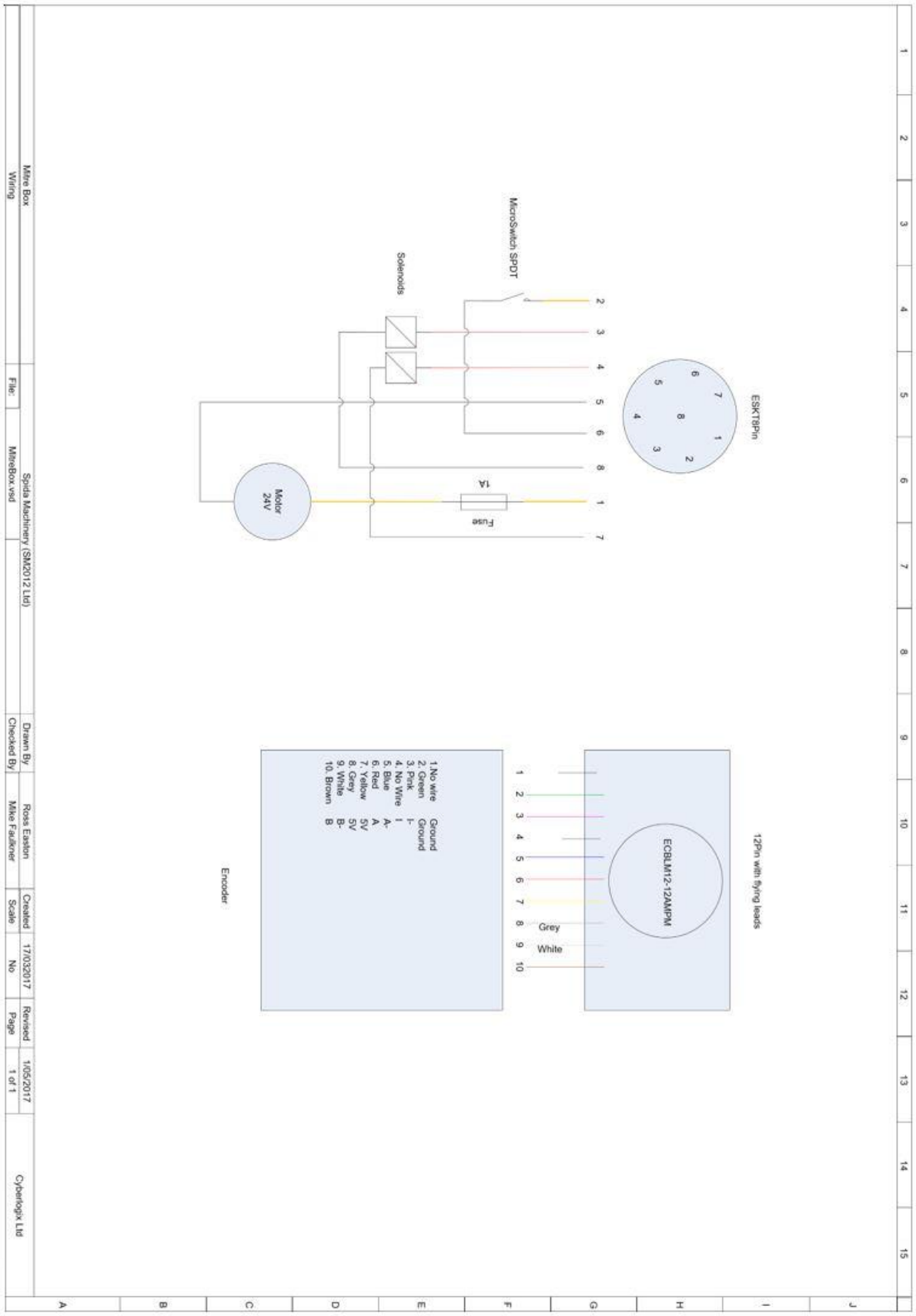

Figure 4, Spida Mitre Pin Box Electrical Drawing

16 Training Certificate – Spida Mitre Pin Box

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: _____