



Equipment Type:	300 mm (~12-inch) Manual Abrasive Cut-off Machine
Model:	MEGA-T300S
Electrical Requirements:	208Y / 380 Volts (3-phase)
Frequency:	50/60 Hz
Motor Horsepower:	5.5 hp (4 KW) (3-phase)
Manual Revision Date:	October 10, 2021
	This instruction manual is provided with each piece of delivered equipment.

Please read this instruction manual carefully and follow all installation, operating and safety guidelines.

PACE TECHNOLOGIES WARRANTY

Terms and Conditions applying to PACE Technologies Metallographic Products

1. LIMITED WARRANTY AND DISCLAIMER:

PACE Technologies metallographic equipment are warranted for two years from the purchase date to be free from defects in material and workmanship under correct use, normal operating conditions, and proper application. PACE Technologies consumable products are warranted for one year, unless otherwise specified. PACE Technologies obligation under this warranty shall be limited to the repair or exchange, at PACE Technologies option, of any PACE Technologies Product or part which proves to be defective as provided herein. PACE Technologies reserves the right to either inspect the product at Buyer's location or require it to be returned to the factory for inspection. Buyer is responsible for freight to and from factory on all warranty claims. The above warranty does not extend to goods damaged or subjected to accident, abuse or misuse after release from PACE Technologies warehouse, nor goods altered or repaired by anyone other than specifically authorized PACE Technologies representatives. PACE Technologies shall not in any way be responsible for the consequences of any alteration, modification or misuse unless previously approved in writing by an officer of PACE Technologies.

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3. DELIVERY:

Customer assumes and shall bear the risk of all loss or damage to the Products from every cause whatsoever, whether or not insured, and title to such Products shall pass to Customer upon PACE Technologies delivery of the Products to the common carrier of Pace Technologies choice, or the carrier specified in writing by Customer, for shipment to Customer. Any claims for breakage, loss, delay, or damage shall be made to the carrier by the Customer and Pace Technologies will render customer reasonable assistance in prosecuting such claims.

4. ACCEPTANCE:

Customer shall inspect the Products promptly upon receipt of delivery. Unless customer objects in writing

within thirty (30) business days thereafter, customer shall be deemed to have accepted the Products. All claims for damages, errors, or shortage in Products delivered shall be made by Customer in writing within such five (5) business day period. Failure to make any claim timely shall constitute acceptance of the Products.

5. RESOCKING FEE:

All returns are subject to a restocking charge equal to 15% (fifteen per cent) of the Invoice, unless the Goods are proved to be non-conformed.

6. PAYMENT:

Customer agrees to provide timely payment for the Products in accordance with the terms of payment set forth on the reverse side hereof or in any proposal submitted herewith. If any payment is not paid on or before its due date, Customer shall pay interest on such late payment from the due date until paid at the lesser of 12% per annum or the maximum rate allowed by law.

7. DEFAULT:

If Buyer is in default (including, but not limited to, the failure by Buyer to pay all amounts due and payable to Seller) under the work or purchase order or any other agreement between Buyer and Seller, Buyer's rights under the warranty shall be suspended during any period of such default and the original warranty period will not be extended beyond its original expiration date despite such suspension of warranty rights.

8. MISCELLANEOUS PROVISIONS:

This agreement has been made in and shall be governed by the laws of the State of Arizona. These terms and conditions and the description of the Products on the reverse side hereof or in any proposal submitted herewith constitute the entire agreement and understanding of the parties with respect to this sale and supersede all prior and contemporaneous agreements or understandings, inducements or representations, expressed or implied, written or oral, between the parties with respect hereto. Any term or provision of this Agreement may be amended, and any observance of any term of this Agreement may be waived, only by a writing signed by the party to be bounds. The waiver by a party of any breach shall not be deemed to constitute a waiver of any other breach. Should suit be brought on this Agreement, the prevailing party shall be entitled to recover its reasonable attorneys' fees and other costs of suit including costs and attorneys' fees incurred on appeal or in collection of any judgment.

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1.0 Product Description

The **MEGA-T300S** is a manual wheel feed or table feed abrasive cut-off machine for cutting materials ranging from soft aluminum metals to hardened tool steels. It is ideal for the metallographic laboratory, as well as for small industrial or production applications.

The **MEGA-T300S** is very robust and durable with its cast aluminum alloy and stainless steel construction. Featuring a corrosion-free T-slot table, the **MEGA-T300S** is a very versatile wheel / table feed bench top model metallographic cutter.

Powerful motor

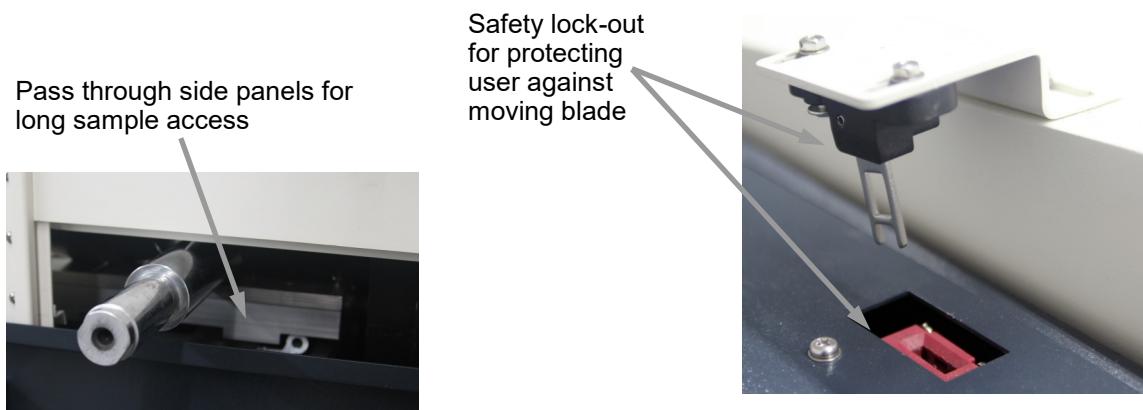
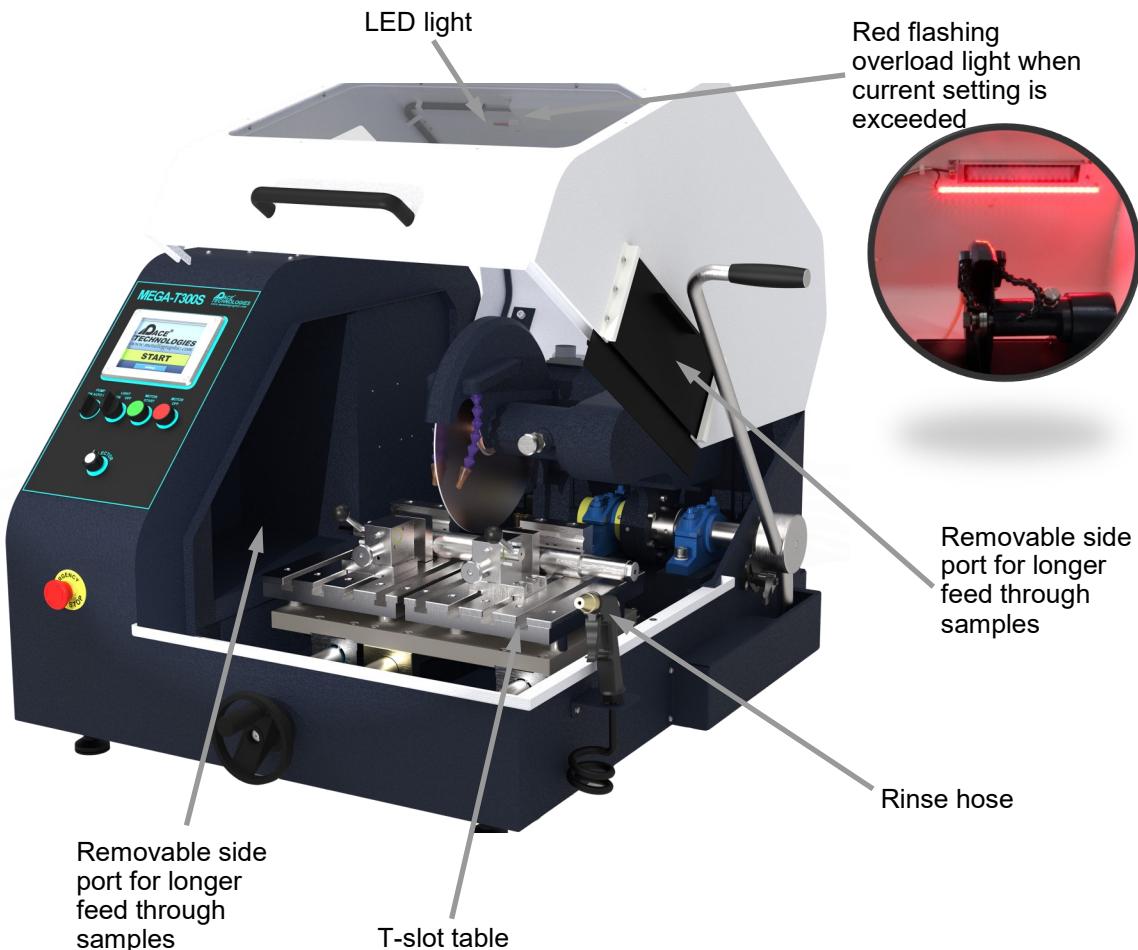
The **MEGA-T300S** is equipped with a powerful belt driven servo motor. In addition, the motor has an inductive brake for faster stopping of the blade (approx. 2 seconds).

Manual feed and table feed cutting

The **MEGA-T300S** is an easy-to-use manual cutter with simple controls. Cutting can be accomplished with either a wheel feed or table feed.

The **MEGA-T300S** also has a removable side port panel for sectioning longer samples.





Coolant applied directly to the blade

Flexible coolant hose for application to cutting area



Easy to use vises



1.2 Technical Specifications

Electrical specifications:	208Y (3-phase or 120/120/120 to ground) or 380V 3-phase
Motor power:	Constant torque variable speed Servo Motor - 5.5 hp (4 KW/13 Nm)
Speed (rpm):	Variable 1500-3500 rpm
Adjustable cutting load:	2-15 amps
Electronic motor brake	Stops in ~2 seconds
Cut-off wheels:	12-inch mm (~300 mm) diameter
Wheel arbor:	32 mm (~1.25 inch) diameter
Maximum sample diameter:	5-inch (125 mm) diameter 3 x 10-inches (75 x 250 mm) (HxD)
Wheel feed	Manual
Table feed	Manual
Vertical movement	5.25-inch (135 mm)
Table feed movement (y-axis)	7.6-inch (190 mm)
Weight:	Approx. 500 lbs (230 kg)
Dimensions (WxDxH):	Hood Closed: 33.5 x 37.5 x 30-inch (850 cm x 950 cm x 766 cm) Hood Open: 33.5 x 37.5 x 35.5-inch (850 cm x 950 cm x 900 cm)
Table dimensions (WxD):	11 x 18.25-inch t-slot (280 x 470 mm)
Cutting chamber:	Cast aluminum block construction
Hood and body	Fabricated steel with shock resistant plastic window
Working temperature:	32° - 100°F (0 - 40°C)
Shipping temperature:	32° - 100°F (0 - 40°C)
Storage temperature:	32° - 100°F (0 - 40°C)
Recirculation system (included):	14 gallons (53 liters)



EU Directives:

 Machinery directive 2006/42/EC
 RoHS Directive 2011/65/EU

1.3 Mechanical Schematic

Note: Installation of the **MEGA-T300S** should be on a flat sturdy surface, with easy access to electrical connections.

2.0 Unpacking, Shipping and Installation

2.1 Unpacking

Unit is delivered in a crate. Unpack and check for completeness of parts.

Measures WxHxD: Approx. 36 x 40 x 35-inch

Weight: Approximately 550 lbs.

2.2 Shipping

When moving crate, lift from bottom. To move MEGA-T300S use support bars provided with the machine.

The **MEGA-T300S** is constructed of sensitive electronic and mechanical components. **Do not drop.**

! **Caution:** Heavy equipment. Take care to avoid bodily injury.



(Installation continued on next page)

Please read this instruction manual carefully and follow all installation, operating and safety guidelines.

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2.3 Installation

! Install unit carefully! Improper installation voids warranty.

The **MEGA-T300S** should be placed on a flat stable surface.

! Connect coolant tank supply, drain and electrical connections.



! Electrical connections—The standard saw is designed to operate at 208-220V 3-phase (120V-120V-120V-ground) (optional 380V)

Verify voltage on nameplate



! Verify the direction of rotation of the cut-off wheel. The wheel should turn from top to bottom as viewed from the front of the machine. If not reverse any two of the 3-phase power wires.

(Installation continued on next page)

Recirculating tank connections



- External coolant supply:** Attach 3/4-inch tube between pump and cutter.
- Drain:** 1.5-inch (38 mm) tube.
- Electrical connections:** Connect electrical power cable to source.
Note: Inspect the operating voltage on the name plate.
- Electrical connection for external coolant supply:** Power for recirculation system comes from the **MEGA-MT300S**.
- Recommended Coolant:** To minimize corrosion a coolant with a anti-corrosion additive or an oil emulsion coolant is recommended. Note: It is recommended that the coolant be changed every 50 cuts or every week, whichever occurs first.

(Installation continued on next page)

3.0 Safety Guidelines

3.1 Warning Sign

! This sign points to special safety features on the machine.

3.2 Safety Precautions

Careful attention to this instruction manual and the recommended safety guidelines is essential for the safe operation of the **MEGA-T300S**.

Proper operator training is required for the safe operation of the **MEGA-T300S**. Any unauthorized mechanical and electrical change, as well as improper operation, voids all warranty claims. All service issues need to be reported to the manufacturer / supplier.

- ! Before operating, cutting chamber hood must be closed. After cutting, the safety latch will not open for approximately 2-3 seconds after pressing the stop (red) button.
- ! Use only certified cut-off wheels from a professional supplier. Improper blades selection voids warranty. (For appropriate blade selection, refer to the Abrasive Blade Selection Guidelines Chart in Section 4.4)
- ! Disconnect power before opening the main unit.
- ! Replacement parts should be installed only by qualified personnel.
- ! Securely clamp the part / sample to the working table. During cutting, consider that the part may pinch and cause jamming of the cut-off wheel. Use the appropriate clamping devices to avoid this occurrence.
- ! Never start a cut under load.
- ! Make sure that the cut-off blade is rotating down and into the sample.

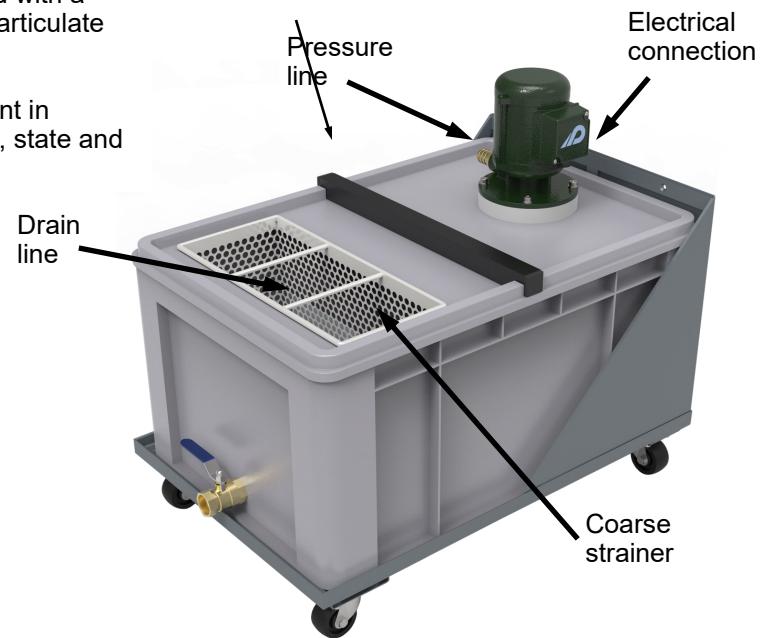
3.3 Emergency Statement

The MEGA-T300S abrasive cutter has been designed for cutting metallographic specimens. DO NOT CUT oversize samples. Always follow proper operational guidelines and avoid contact with moving parts, lubricants and abrasives. Seek appropriate medical care for cutting injuries.

Recirculation tank

The **MEGA-T300S** is equipped with a coarse filter to remove large particulate and broken blades

Note: Dispose of the old coolant in accordance with federal, state and local regulations.



Rinse line

After cutting, it is recommended that the cutting chamber be rinsed to prevent debris and corrosion build-up.



3.4 Safety Tests



Emergency stop switch

! Examine and verify that the **MEGA-T300S** safety devices and operating performance are in good working condition prior to use. The following safety checks are considered important:

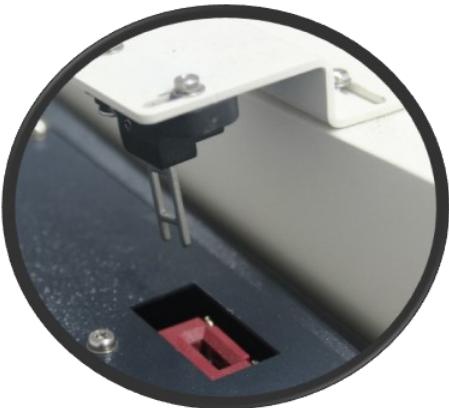
Emergency stop switch

Test: Activate main switch and close hood; depress emergency stop switch.

Proper Response: Machine powers down and motor stops in 2-3 seconds

Malfunction: Machine does not lose power.

Corrective measure: If system does not power down, disconnect power supply cord and call service technician.



Magnetic Safety switch

Magnetic safety lock out switch

Test: Activate main switch and close hood; turn cut-off wheel ON then OFF; Try to open the hood.

Proper Response: Hood does not open for approximately 3 -5 seconds.

Malfunction: Hood opens immediately.

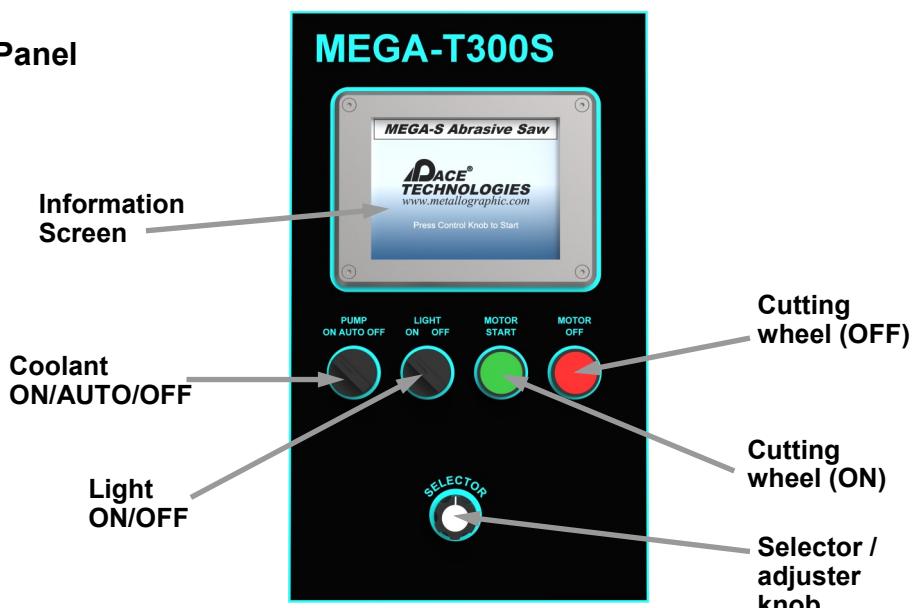
Corrective measure: If cut-off wheel does not power down, disconnect power supply cord and call service technician.

4.0 Start-up and Operation

4.1 General

The **MEGA-T300S** is a manual wheel and manual table feed cutter.

4.2 Control Panel



Cutting wheel ON/: Starts the cutting wheel.

Cutting wheel OFF/: Stops the cutting wheel (inductive brake engages to slow wheel). Hood cannot be opened until safety lock releases in approximately ~2 seconds after pressing the stop button.

Coolant ON/AUTO/OFF: Operates the coolant pump in Auto or Manual mode.

Light ON/OFF: Turns inside chamber light On or Off.

Selector / adjuster knob Rotate to select feature, push to accept

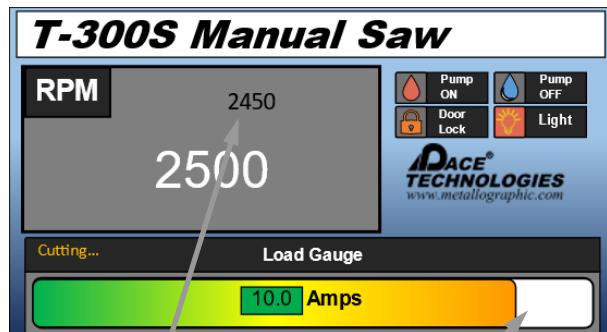
START UP SCREEN



Start up screen - Press control panel knob to progress to information screen

Set Speed
Cutting force (amps) Setting

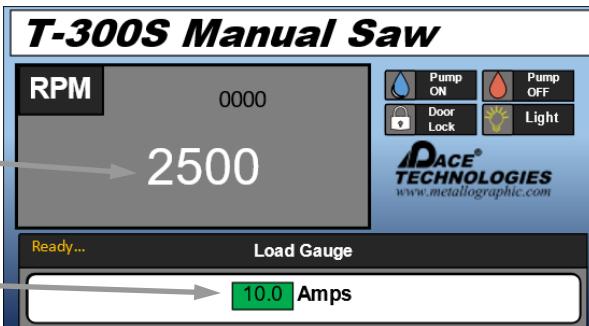
OPERATING SCREEN



Actual Operating Speed

Percentage or fraction of amps to set amount

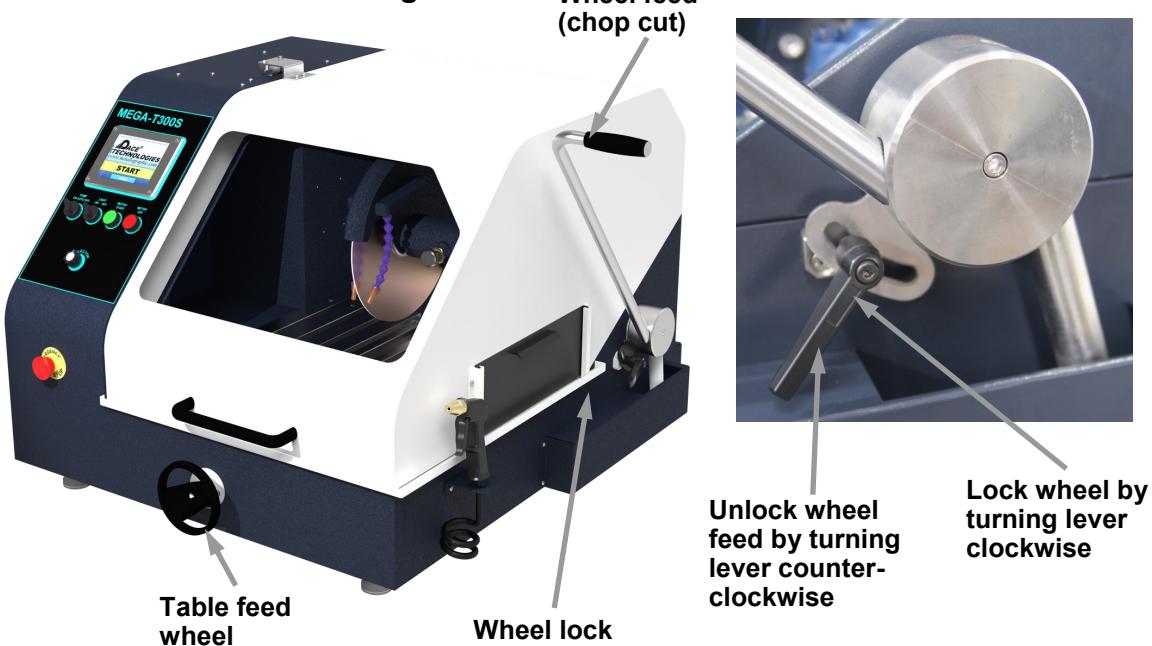
INFORMATION READY SCREEN



Information screen - set speed and force (amps) by rotating selector knob to highlight parameter in green, press knob, rotate to adjust parameter, press knob to set. Repeat for other parameter.

4.3 Wheel and Table Feed

4.3.1 Wheel feed cutting



4.3.2 Table feed cutting



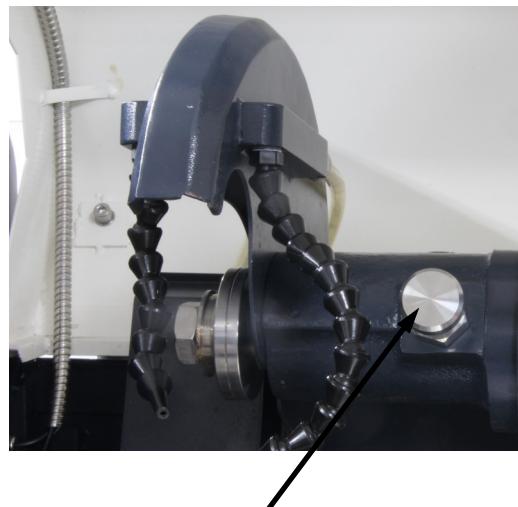
4.4 Changing abrasive cut-off wheels

1. Remove blade locking bolt (reverse threaded).
2. Position new 300 mm abrasive cut-off wheel into position.
- !** Use only certified abrasive cut-off wheels.
3. Gently tighten blade locking bolt (Note: locking bolt is reverse threaded).

Changing Blade

Remove: Loosen by turning clockwise

Tighten: Turn counter-clockwise



To prevent
shaft from
turning, push
in locking rod
to hold in place

ABRASIVE Cutting CONSUMABLES SELECTION GUIDELINES CHART

Abrasive Cutting Fluids

Pace Product Name	Catalog Number	Packaging
MAXCUT™ Abrasive Cutting Fluid (32 oz)	MAXCUT 1000-32	32 oz
MAXCUT™ Abrasive Cutting Fluid (128 oz)	MAXCUT 1000-128	1 gallon
MAXCUT™ 2 Cutting Fluid with Anticorrosion Additive (32 oz)	MAXCUT2 1000-32	32 oz
MAXCUT™ 2 Cutting Fluid with Anticorrosion Additive (128 oz)	MAXCUT2 1000-128	1 gallon

300 mm (~12") MAXCUT™ Abrasive Blades 32mm (~1¼") Arbor

Pace Product Name	Catalog Number	Packaging
Soft Non-ferrous Materials (Aluminum, Brass, Zinc, Etc.)	MAX-E300	10
Hard Non-ferrous Materials	MAX-C300	10
Soft Steels	MAX-E300	10
Case Hardened Steels	MAX-VHS300	10
Steels and Ferrous Metals	MAX-D300	10
Universal Thin Resin/rubber Alumina Blade	MAX-A300	10
General Purpose Industrial Blade	MAX-I300	10



MAXCUT-A Blade



MAXCUT-C Blade



MAXCUT-D Blade



MAXCUT-D-RT Blade



MAXCUT-E Blade



MAXCUT-I Blade

4.5 Manual cutting (step-by-step procedure)

1. Connect electrical power and turn on master power switch on the side panel before opening the hood.
2. Position fixtures and sample near to cut-off wheel.
3. Close hood.
4. Turn on coolant and cutter motor.
5. Hand feed the cutting wheel or table feed into the sample.
6. Turn off cutter and allow blade to completely stop before opening cover.
Note magnetic safety switch has an approximately 3-5 second delay. Cutter hood cannot be opened until safety switch is deactivated.

4.6 Fixturing sample

For proper clamping, use the appropriate clamping vises to securely hold the sample in place. It is recommended that both sides of the part be clamped to avoid pinching of the blade (possibly breaking the blade) and to minimize burning of the workpiece during cutting.

! For proper fixturing, take into account the initial stress on the samples.

Fixture examples

Fast clamping



Left lever (Cat. No. QCL-1100)
Right lever (Cat. No. QCR-1100)

Note: vises have a slot in them so that the face does not rotate



UNIVERSAL Clamping vise

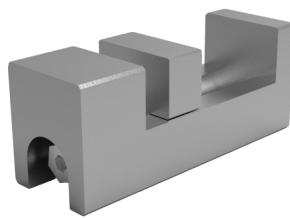


UNIVERSAL (Cat. No. MG15-01)
Clamping height 0 - 3.5 in (0 - 90 mm)



MEGA Saddle Clamping vise

MEGA S
Fastener
Vise



5.0 Maintenance

5.1 Introduction

The recommended maintenance for the **MEGA-T300S** includes the following:

1. Use an anti-corrosion cutting fluid such as the MAXCUT 2 cutting fluid. It is recommended that the cutting fluid be changed every 50 cuts or weekly for maximum effectiveness.
2. Rinse and dry the table and vises after use.
3. When the cutter is not in use, OPEN the HOOD to prevent humidity and corrosion build-up inside the cutting chamber.
4. If cutter will not be used for an extended period of time, coat the table and vises with a water displacement oil such as WD-40.
5. Use only recommended abrasive blades to minimize overheating the bearings and motor. Do not exceed the recommend amp rating of the motor.
6. Grease the appropriate fittings periodically (minimally after every 200 cuts or every other month, whichever occurs first).
7. Immediately replace any broken or damaged parts.

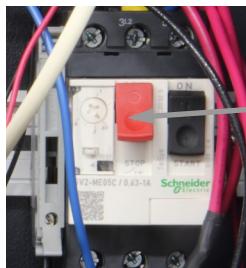
Note: corrosion is considered a maintenance issue and not a warranty issue

5.2 Cleaning outside cabinet

The cabinet and front shield should be cleaned occasionally with a moistened cloth. Do not use any chemicals or cleaning abrasives. We recommend an anti-condensation gel be used on the front panel.

6.0 Trouble Shooting

Problem	Cause	Solution
No power or function	a. Unit is disconnected from main electrical power supply. b. Main power switch is off. c. Emergency stop button engaged.	a. Verify electrical source and connection. b. Turn on main power switch. c. Release by turning clockwise.
Main motor does not operate	a. Hood not closed. b. Overload relays activated	b. Close hood c. Restart after resetting relay.
Pump motor does not operate	a. Plug is disconnected b. Overload relay activated	a. Check plug. b. Restart after resetting Q2 relay.
Excessive vibration during cutting	a. Not cutting with enough force b. Specimen locked too far back on cutting table c. Incorrect blade selection	a. Increase cutting force. b. Move specimen forward. c. Use correct blade.
Corrosion of table of vises	a. Improper cleaning and drying b. Incorrect or old cutting fluid. c. Cutting chamber has become a humidity / corrosion chamber d. Long term storage oxidation	a. Rinse and dry table and vises. b. Use an anti-corrosion cutting fluid such as the MAXCUT 2 or an oil-emulsion cutting fluid such as the MAXCUT OL-1000. It is recommended that the cutting fluid be changed every 50 cuts or weekly for maximum effectiveness. c. Open hood when not being used d. If cutter will not be used for an extended period of time, coat the table and vises with a water displacement oil such as WD-40.



If motor or pump does not turn on check relay

7.0 Metallographic Cutting Basics

Philosophy:

1. Cutting is the most important metallographic sample preparation step
2. Minimize damage during sectioning
3. Less sectioning damage = reduced number of grinding and polishing steps

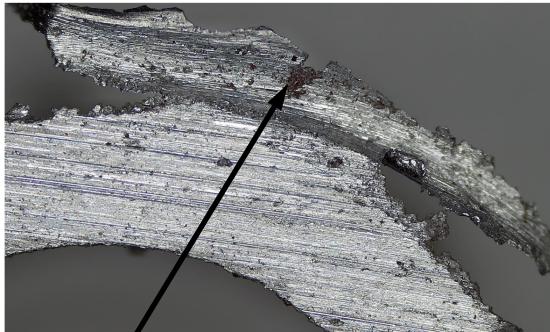
Note: In some cases cutting damage cannot be removed by subsequent polishing operations (especially for brittle samples)

Time Well Spent:

1. Spend more time on sectioning in order to decrease overall sample preparation time
2. Protect integrity of the specimen with proper sectioning

Wheel feed

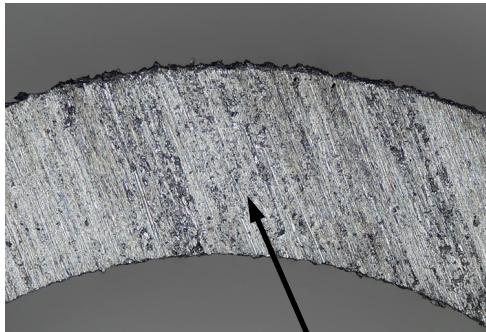
- High speed (3500 rpm)
- High load (10 amps)



Coarse finish with
large cutting burr

Table feed

- Low speed (1500 rpm)
- Low load (2 amps)

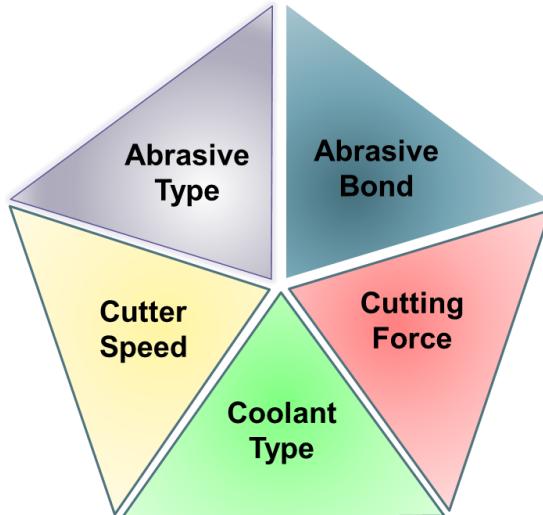


Finer finish with
minimal cutting burr

7.0 Metallographic Cutting Pentagon

Five variables for successful sectioning:

- Abrasive Type
 - Silicon Carbide
 - Alumina
- Abrasive Bond
 - Resin
 - Rubber
- Cutting Force
 - Control by motor current
 - Cutter Speed
Low (1500-2000 rpm)
 - Medium (2000-2500 rpm)
 - High (2500-3500 rpm)
- Coolant
 - Water-based
 - Oil Emulsion-based



Metallographic Abrasive Blades:

- Resin Bonded Blades
 - Breakdown easily
 - Less smell and burning
 - More versatile
 - Alumina abrasives
- Rubber Bonded Blades
 - Longer life
 - Produces a burnt rubber smell
 - More likely to burn the sample
 - More difficult to match the blade to the material being cut
 - SiC and Alumina abrasives



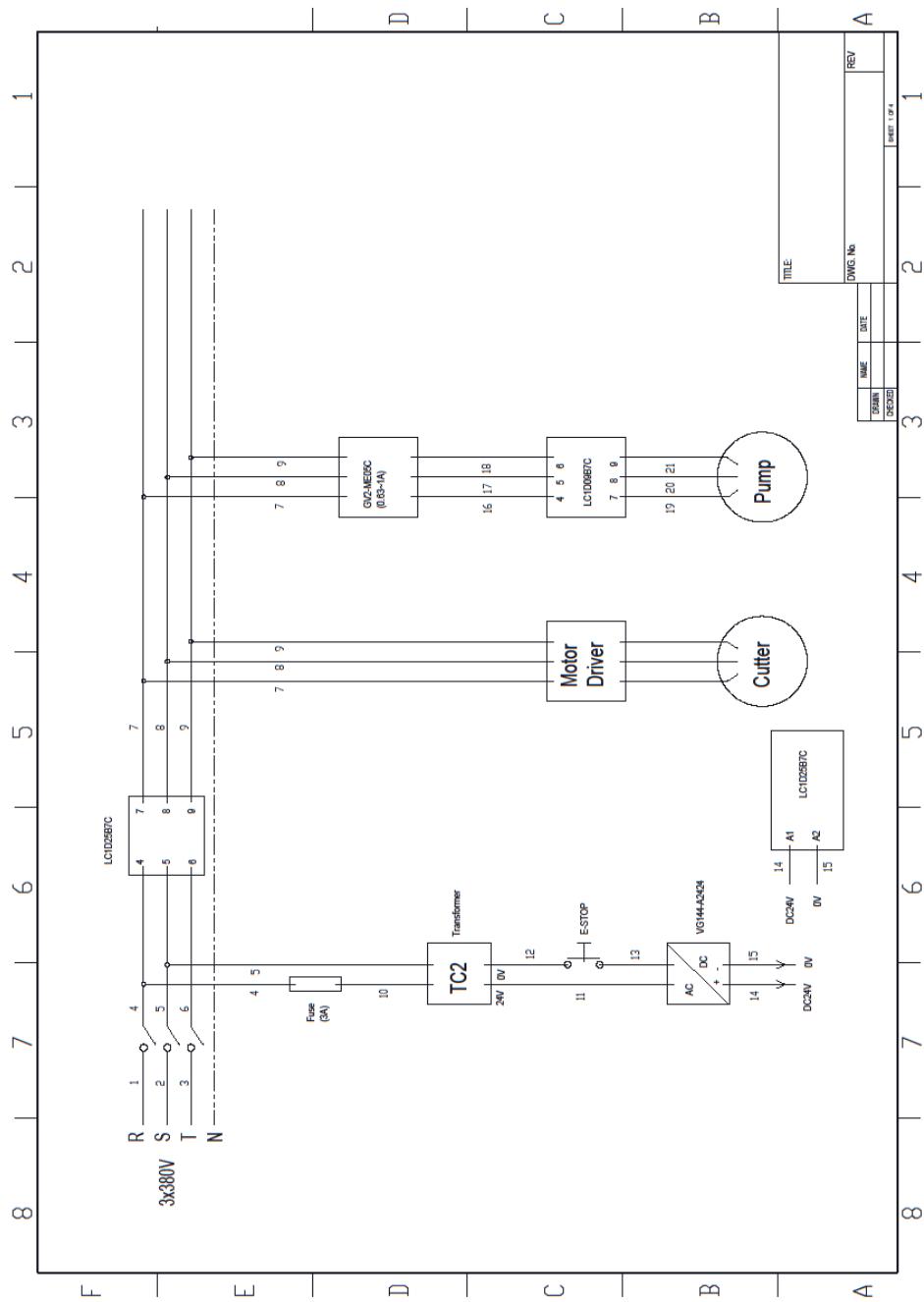
Machine Parameters:

- Wheel Speed
 - Slower speed for softer metals (1500-2000 rpm)
 - Medium speed for most metals (2500-3000 rpm)
 - Higher speed for harder samples (3500 rpm)
- Cutting Force
 - Controlled by limiting current to the motor
 - 2-15 amps
 - Softer metals lower load (2-5 amps)
 - Most metals medium load (6-10 amps)
 - Harder samples higher loads (11-15 amps)

Recommended Cutting Procedures:

Material	Abrasive / Bond	Blade	Cutting Speed	Cutting Force
Soft non-ferrous metals (aluminum, brass, zinc, etc.)	Alumina / resin	MAX-E	1500 rpm	2-5 amps
Hard non-ferrous metals (titanium, zirconium, etc.)	SiC / rubber	MAX-C	2500 rpm	5-10 amps
Soft steels	Alumina / resin	MAX-E	1500 rpm	5-10 amps
Hard and case hardened steels	Alumina / resin	MAX-VHS	2500 rpm	10-15 amps
General purpose steel and ferrous metals	Alumina / resin	MAX-D	2500 rpm	10-15 amps
Universal thin blade	Alumina / rubber	MAX-A	2500 rpm	10-15 amps
Industrial longer life blades	Alumina / resin	MAX-I	3500 rpm	10-15 amps
Ceramics and glass	Diamond / metal	DMAX	3500 rpm	5-10 amps

8.0 Drawing



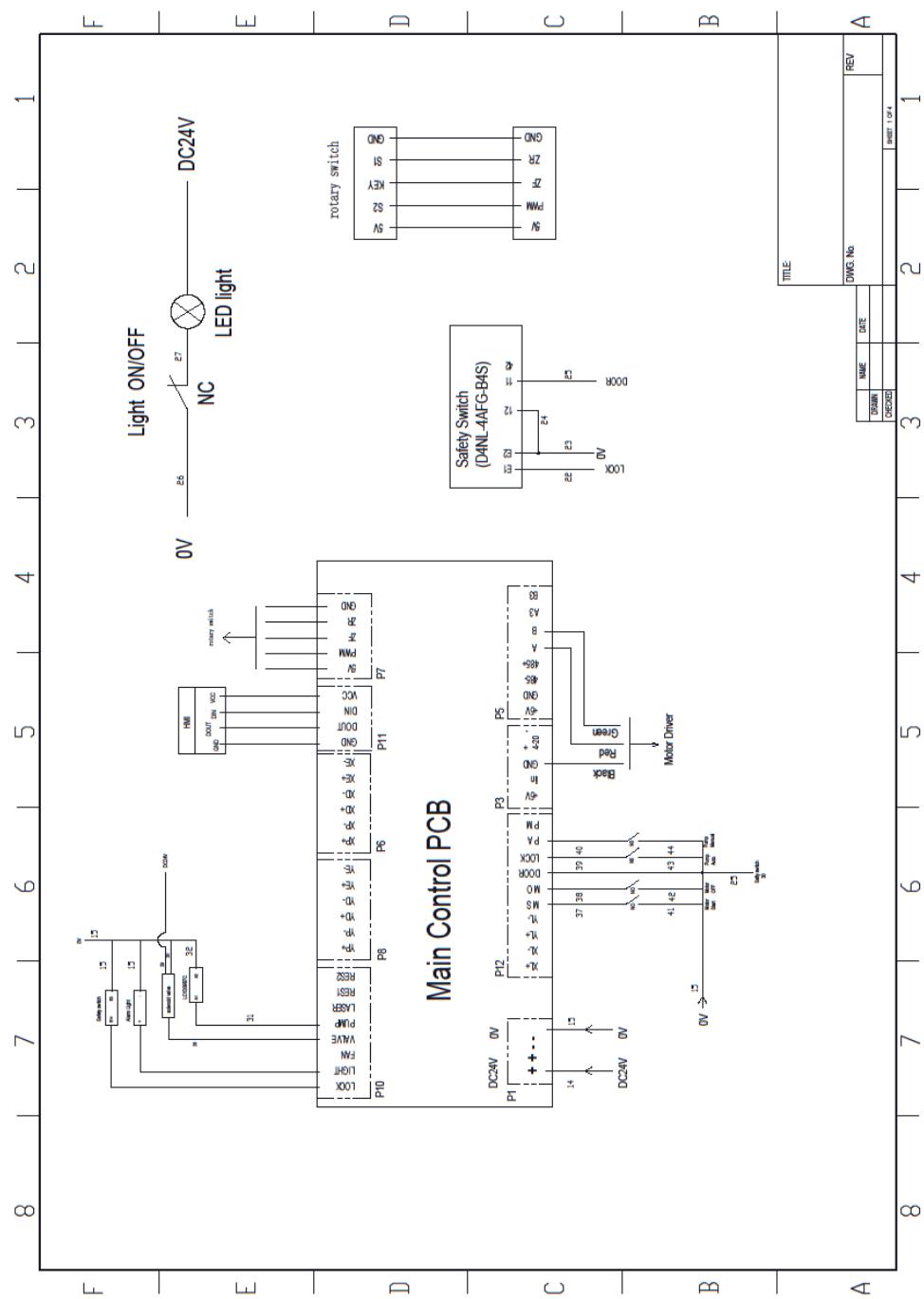


MEGA-T300S

Abrasive Cutter

INSTRUCTION MANUAL

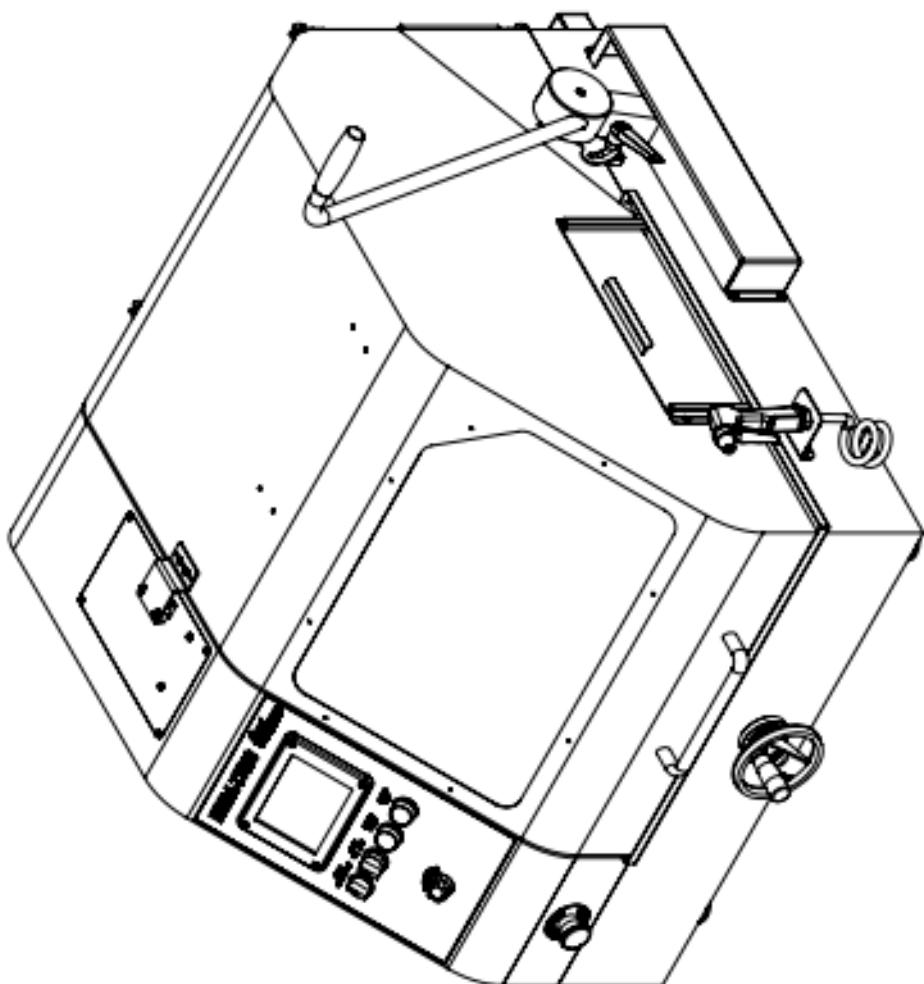
3601 E. 34th St. Tucson, AZ 85713 USA Tel. +1 520-882-6598 Fax +1 520-882-6599 email: pace@metallographic.com Web: <http://www.metallographic.com>

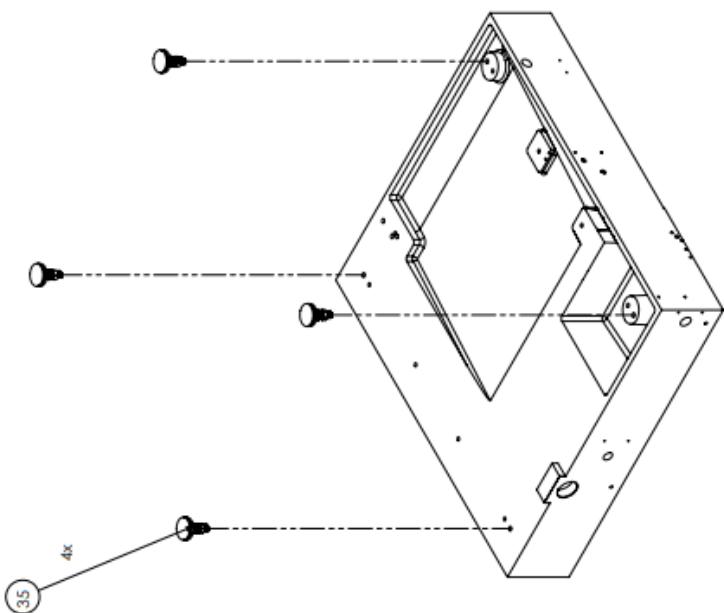
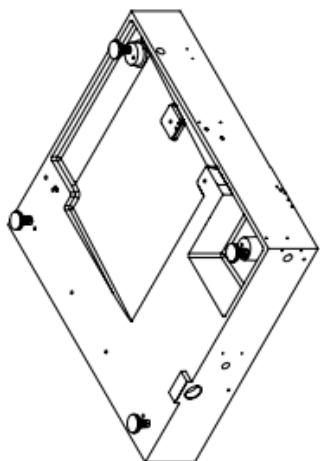


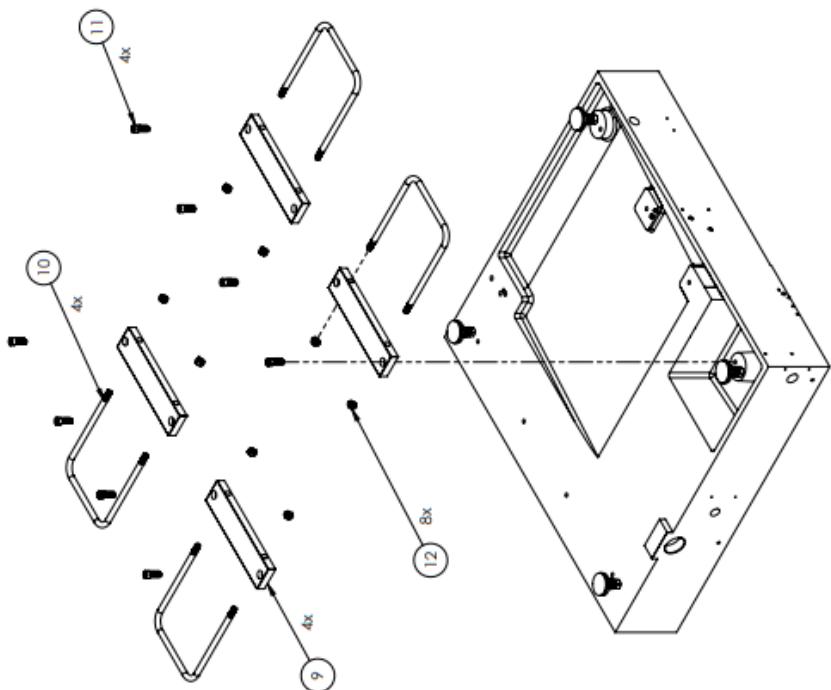
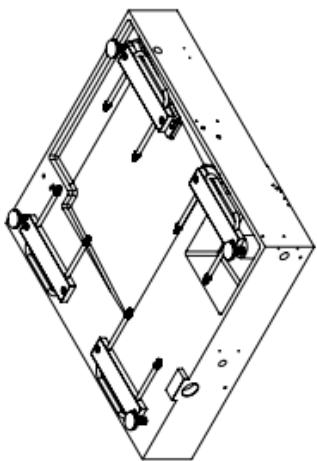
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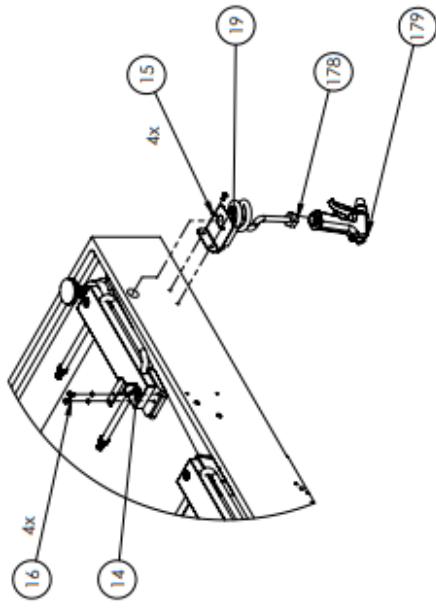
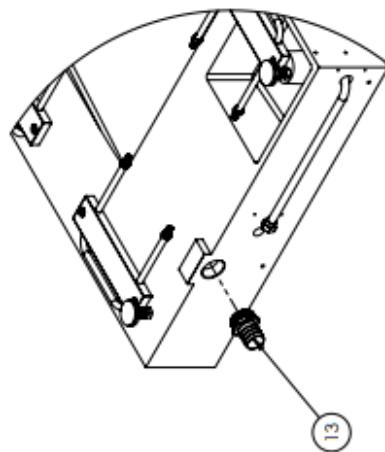
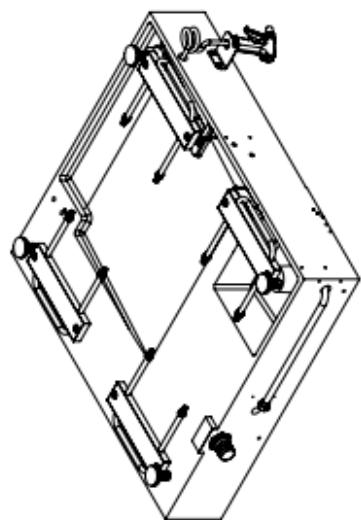
9.0 Exploded Drawings

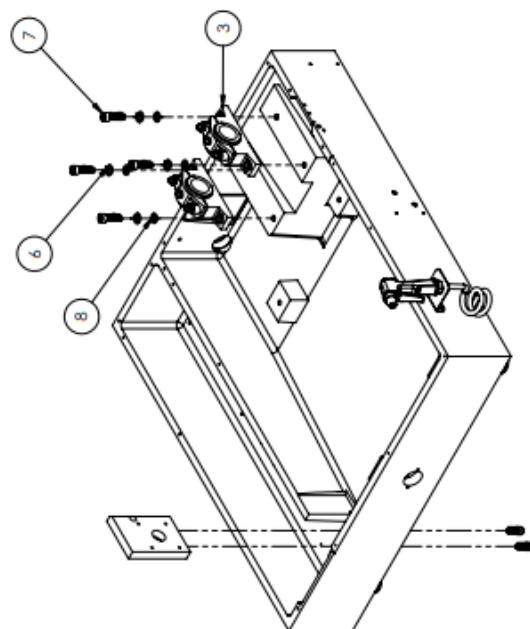
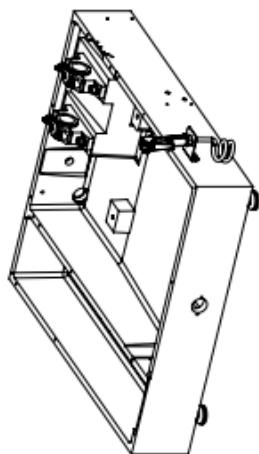
MEGA T300S ASSEMBLY DOCUMENTATION

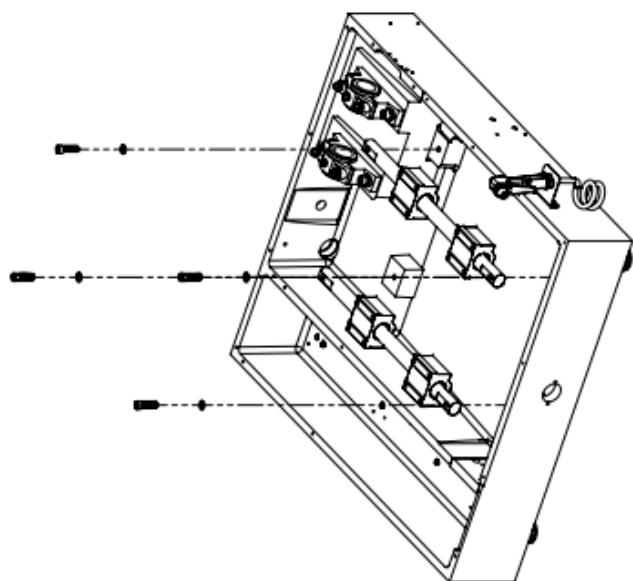
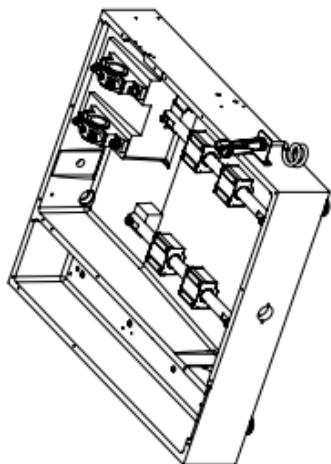


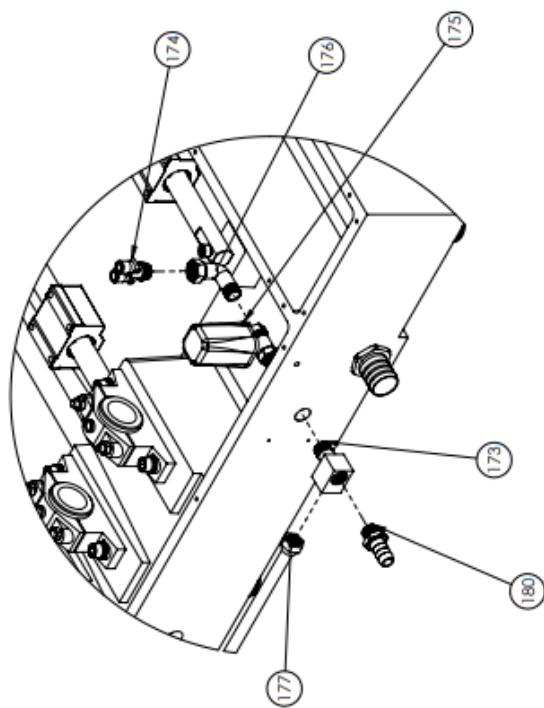
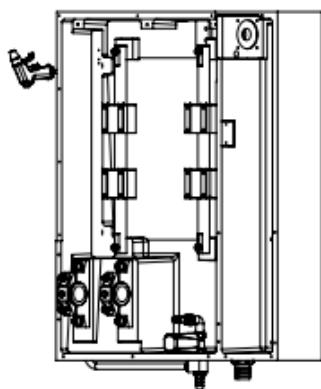


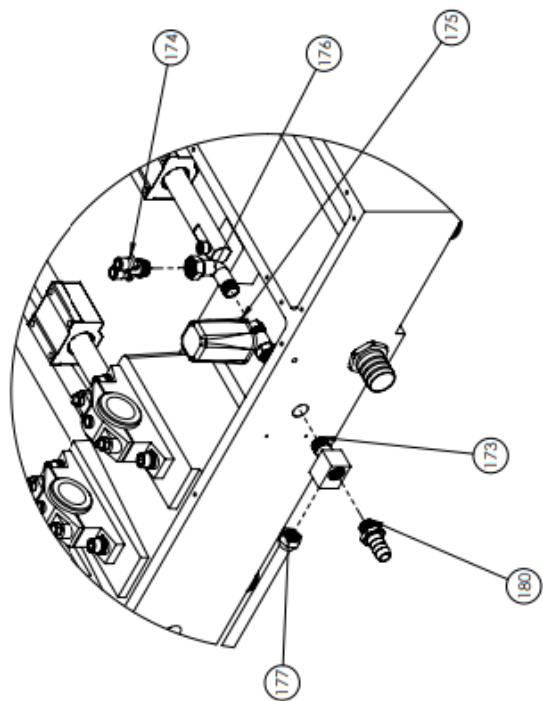
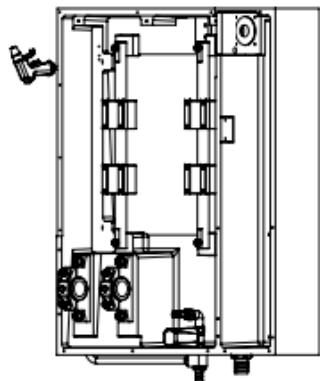


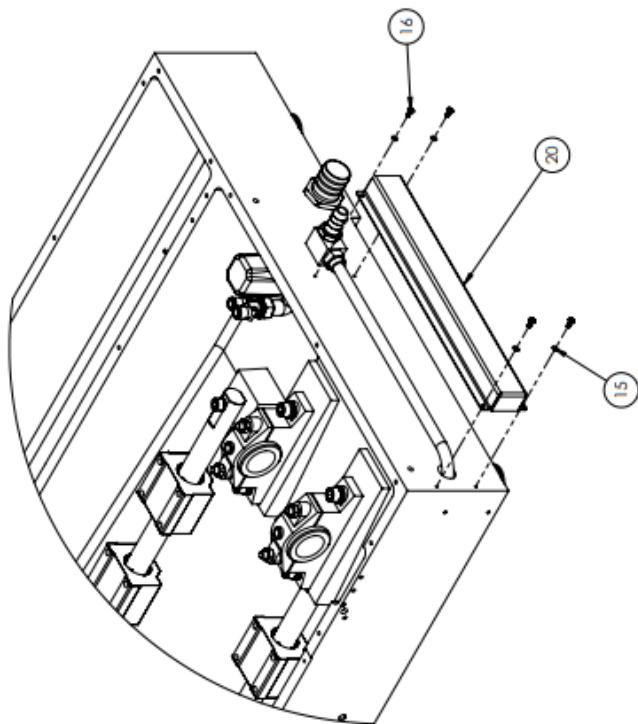
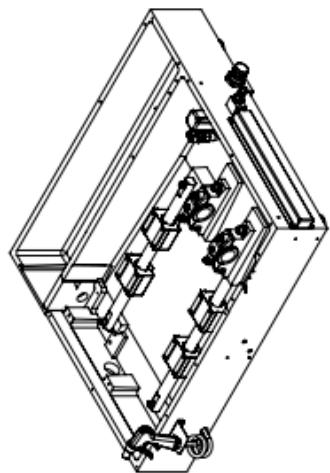


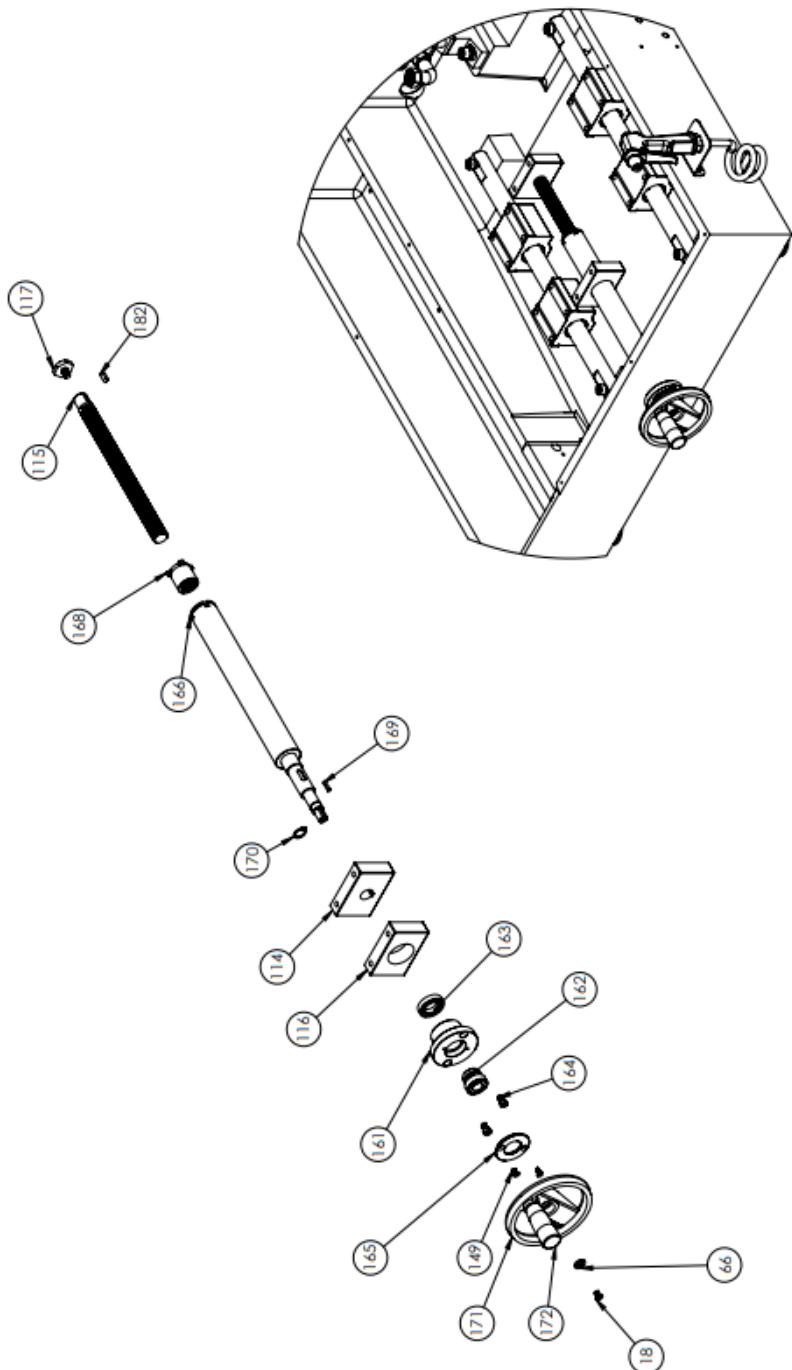


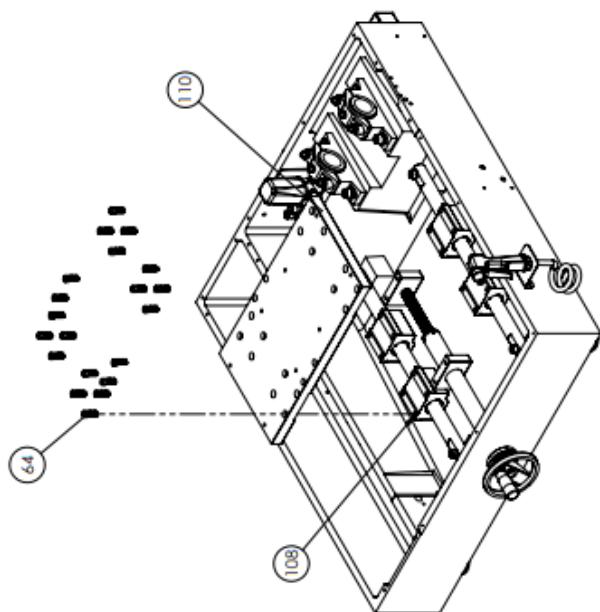
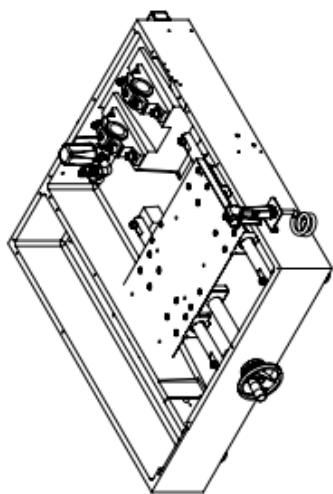


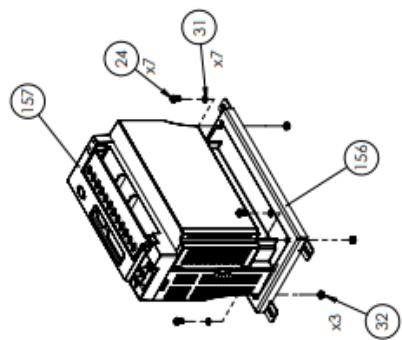
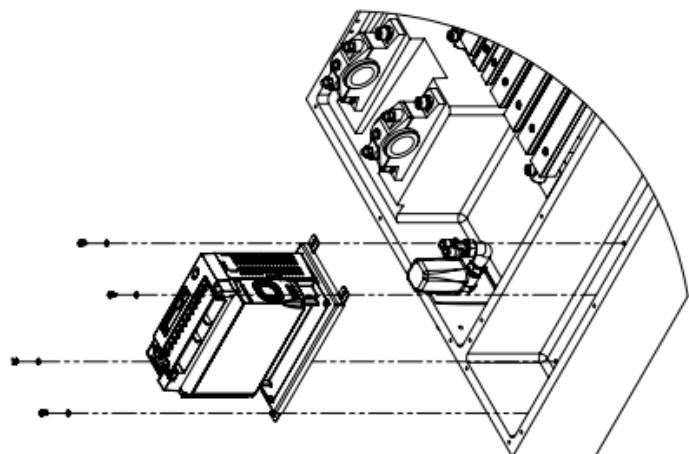
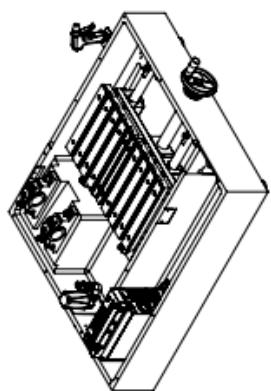


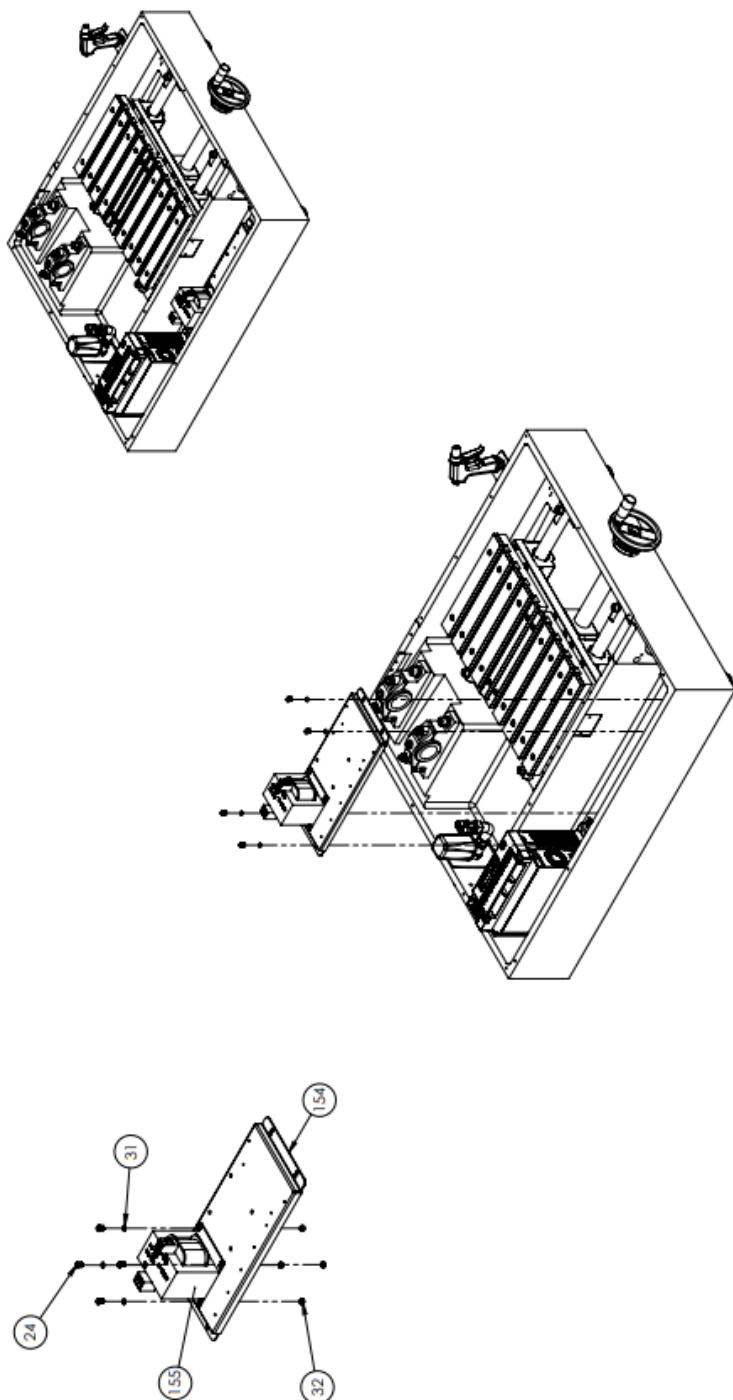


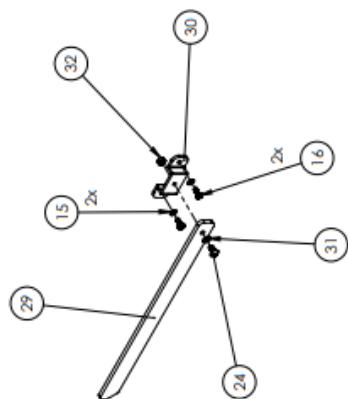
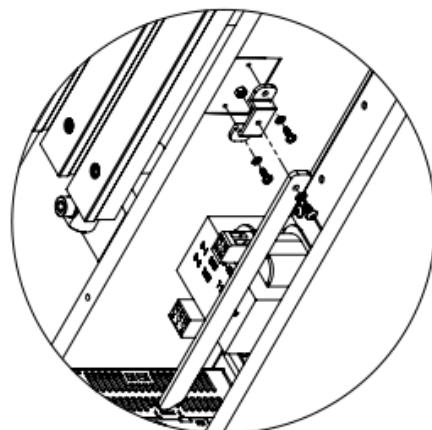
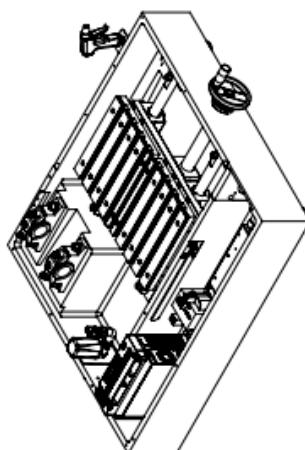


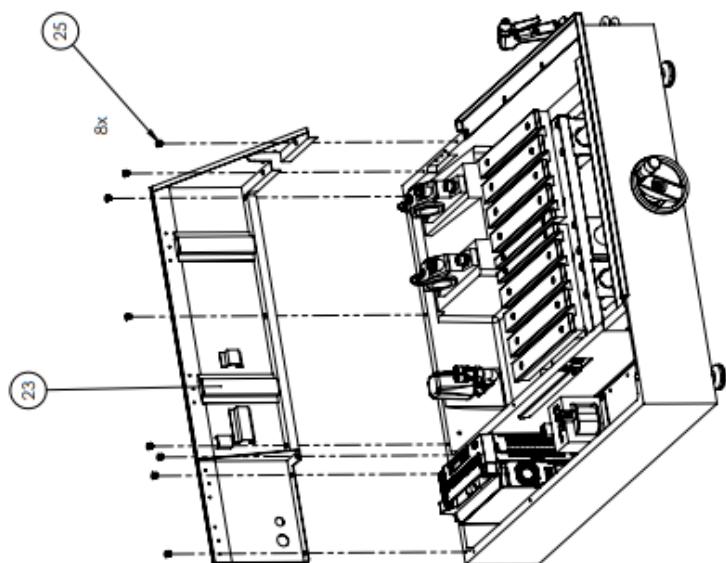
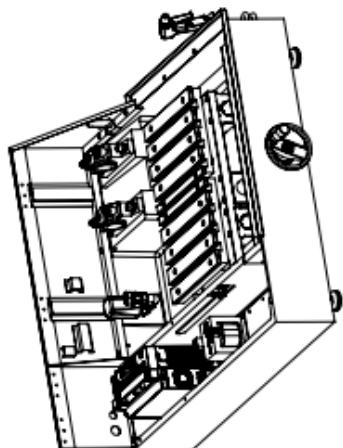


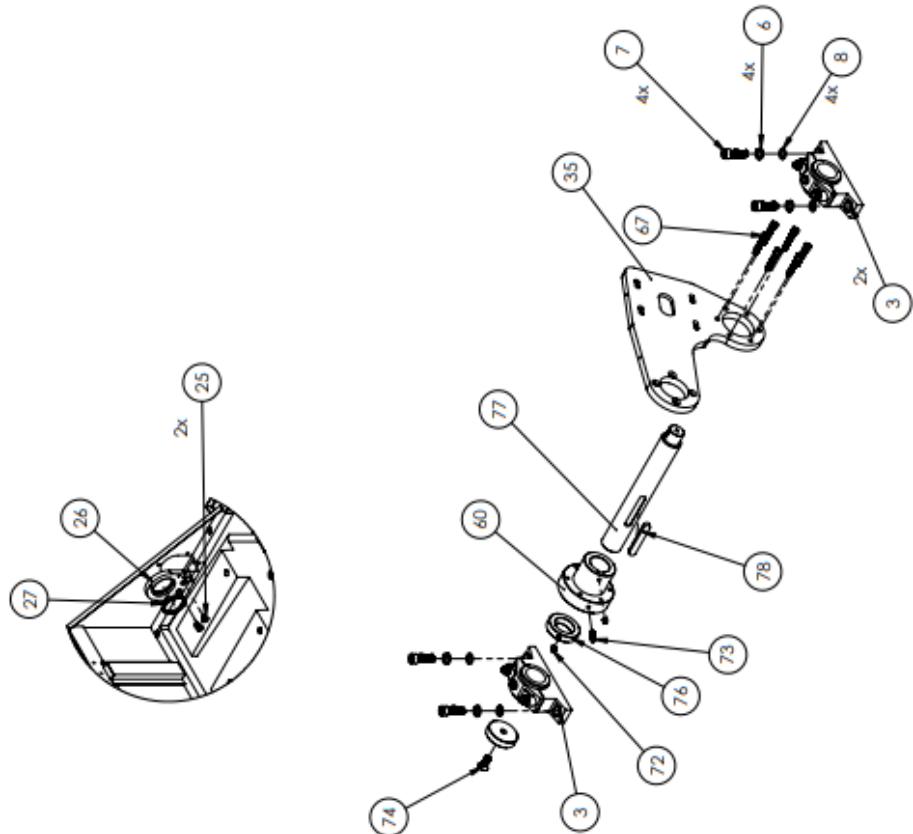
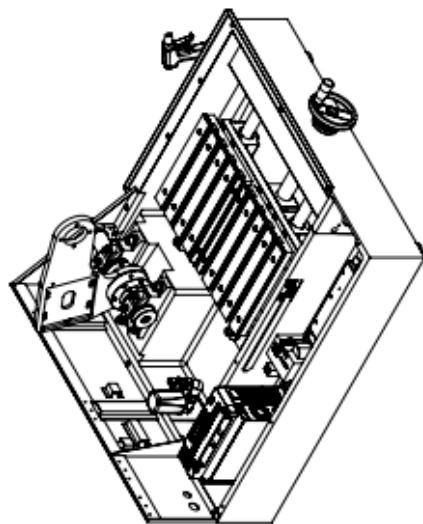


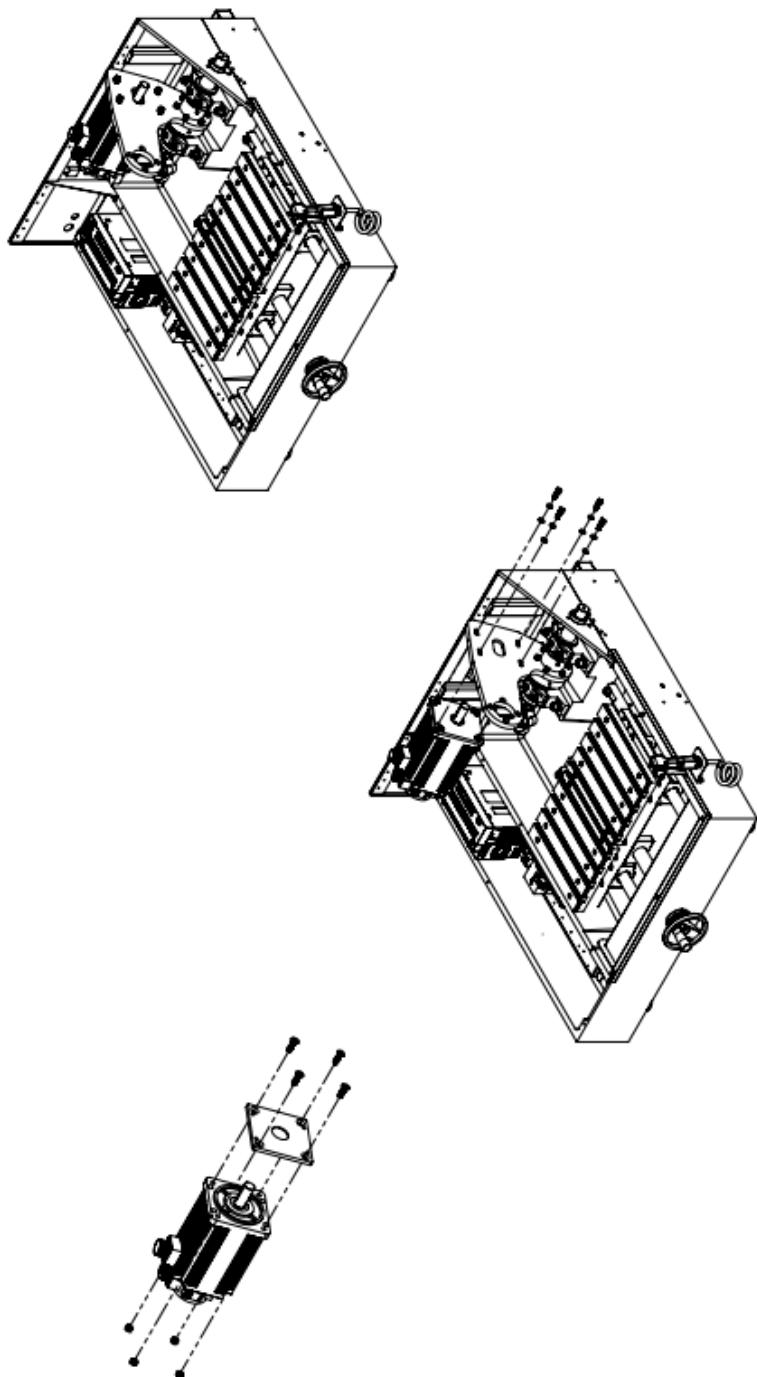


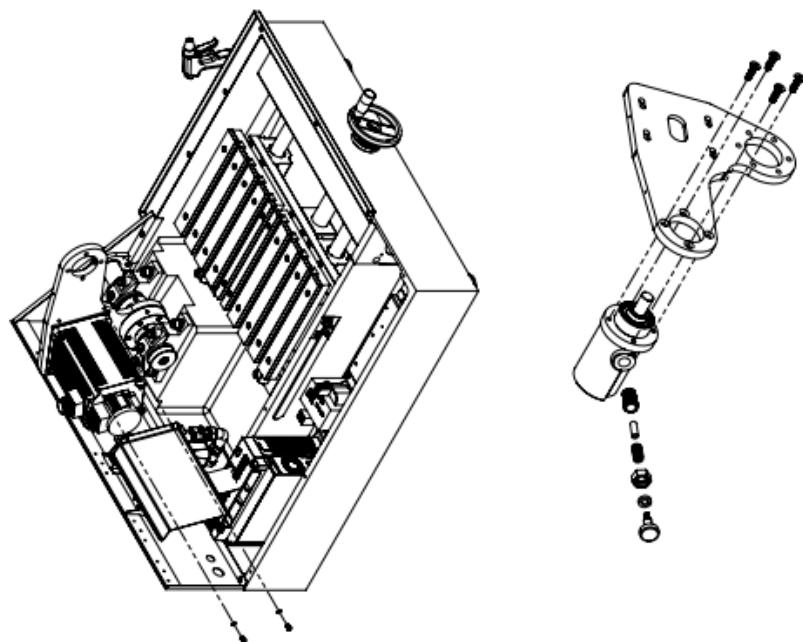
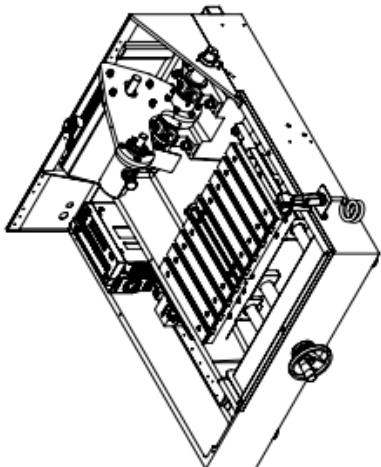


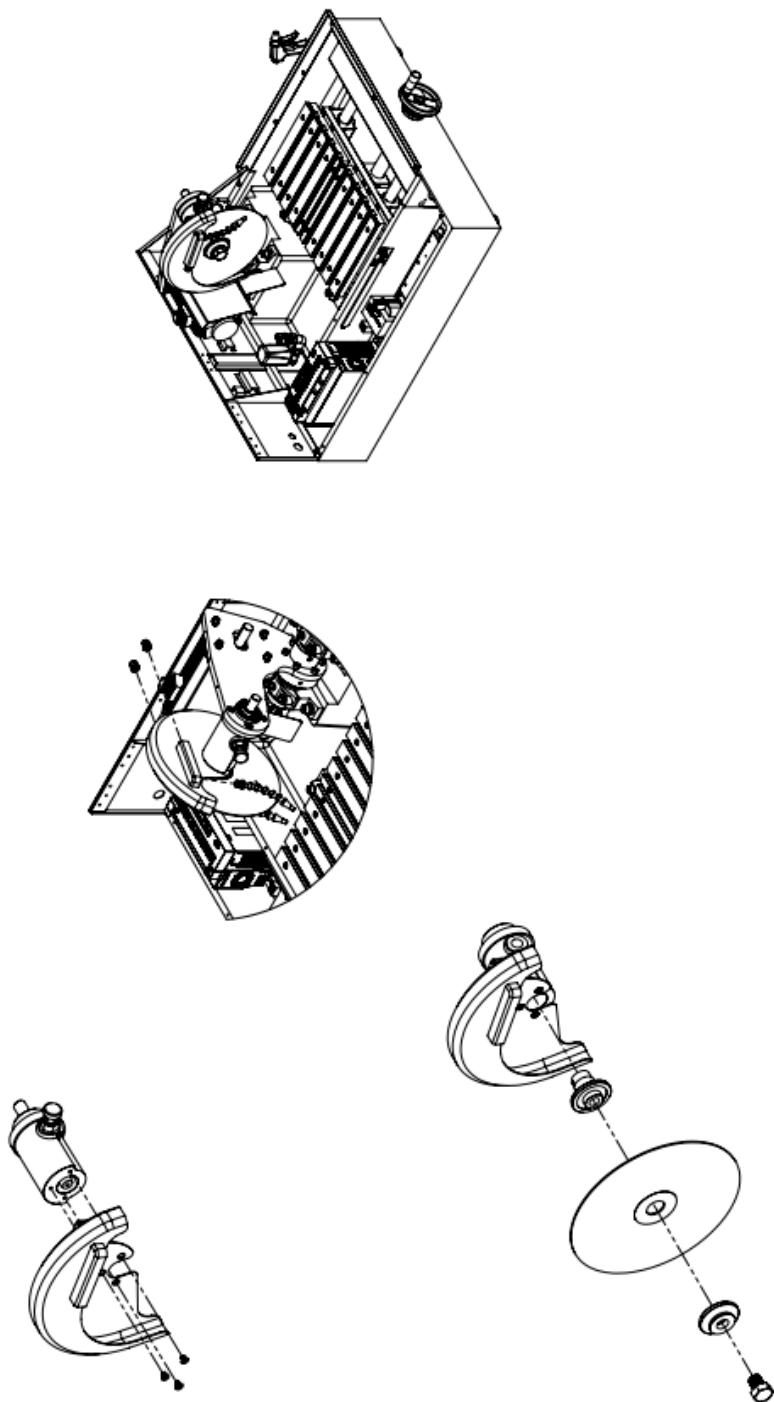


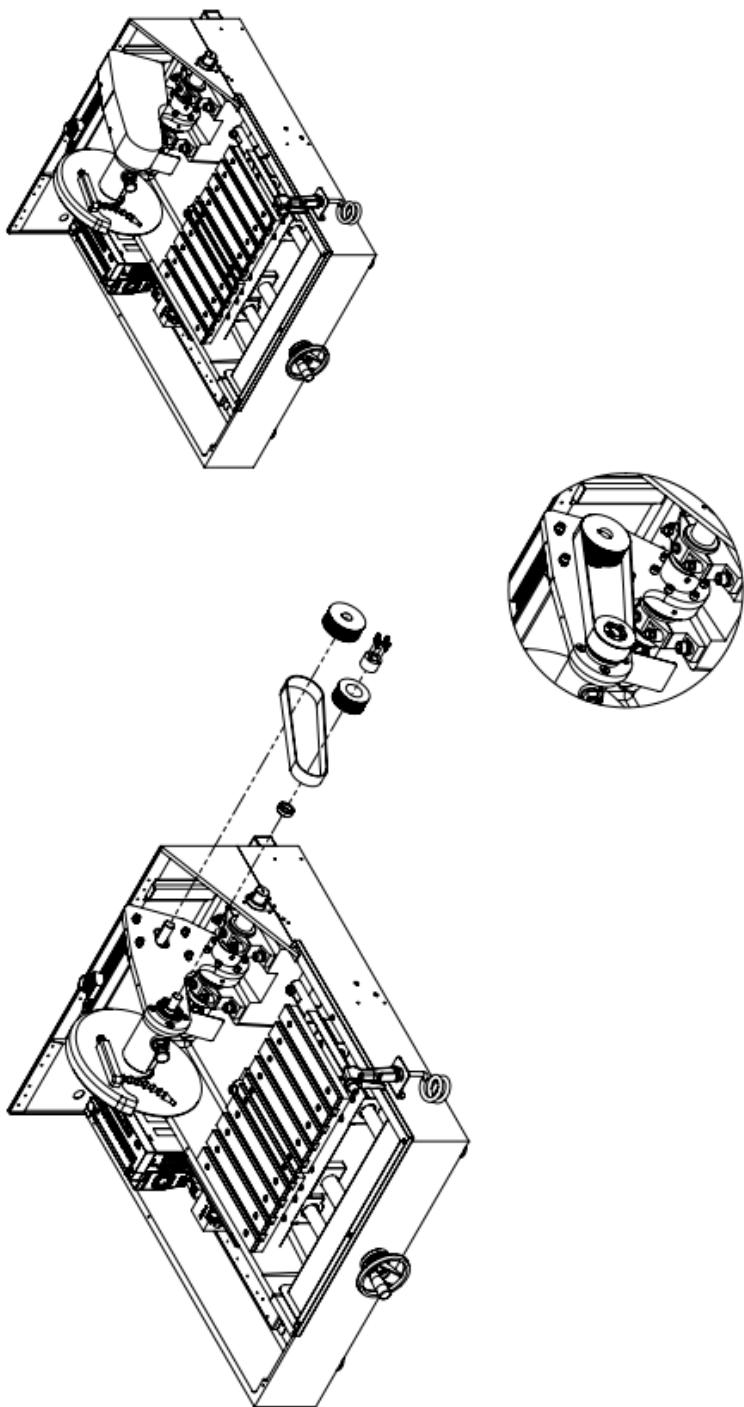


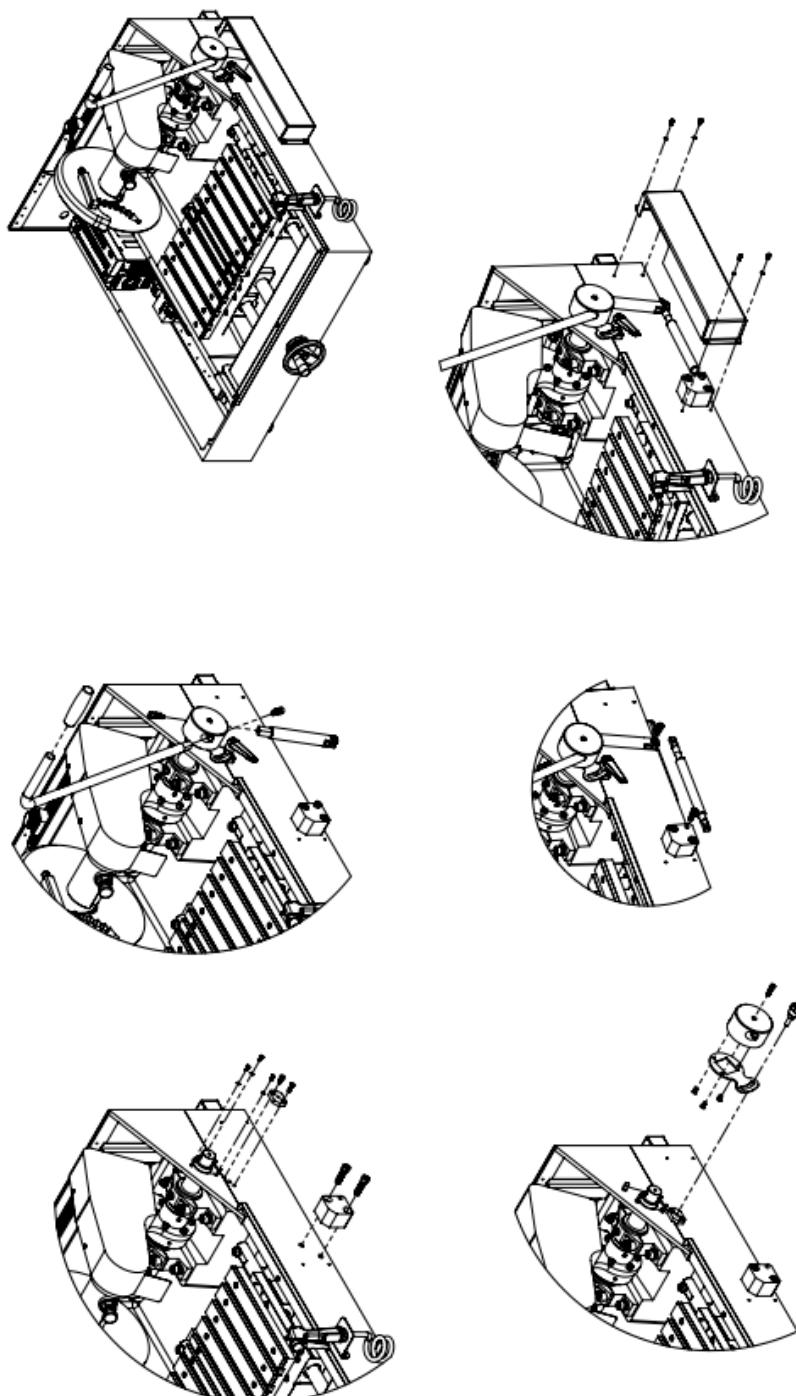






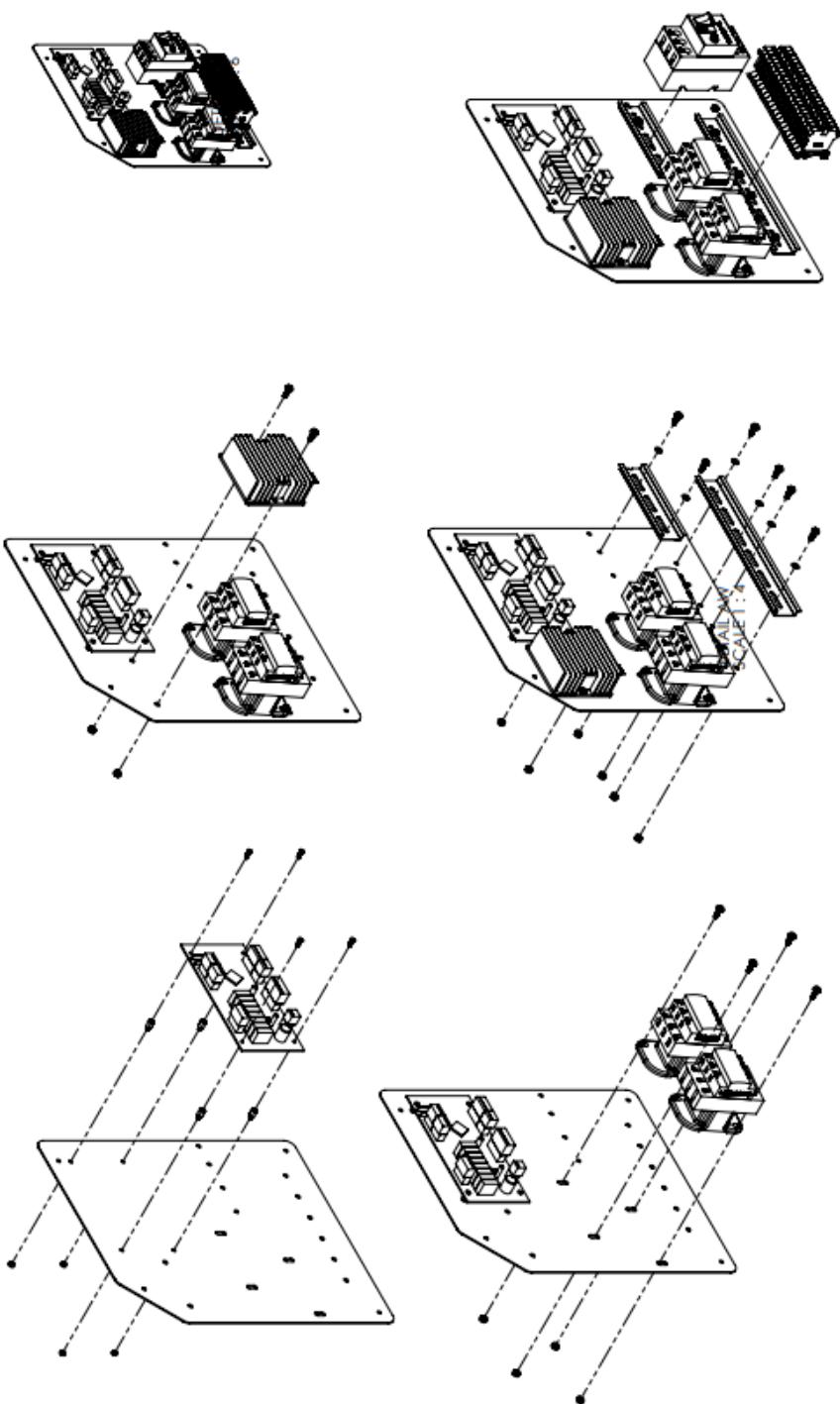






▲ INSTRUCTION MANUAL

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Please read this instruction manual carefully and follow all installation, operating and safety guidelines.

