ROTA-SPRAY PROCESSOR MODEL 1210 (ROTARY-JET) INSTRUCTIONS

MEGA PART NO: 500-702 & 500-713

PLEASE READ IMPORTANT UNPACKING INSTRUCTIONS

1**.** Carefully consider where the unit will be located. It should be close to any necessary services.

2. Remove unit and ancillary items from the packaging:

Board holder	x 1	40mm bend	x 1
Washing machine hose	x 1	Mains Lead	x 1
Drain Hose Assembly	x 1	Chamber lid	x 1
Sump Guard	x 1		

3. We consider the ideal height of the top of the processing chamber to be 110cm. Place on a bench to give this height or use stand on the **500-707** Rota-Spray base unit to give the 110cm overall height.

4. Fit perforated Sump Guard to process chamber. It slots into a groove just beneath the process shelf. (See figure 1)

5. Connect spray wash water inlet to water supply using the washing machine hose Waste water outlet to waste is connected using the 40mm bend.

Ensure all water services are connected in accordance with local water bylaws.
For effective washing of panels, we recommend a head pressure of 2 bar minimum

6. Before connection to mains power read the Electrical Safety notice on the rear of this sheet. Before filling the chamber, ensure the drain valve is closed, and threaded plug is in position. Ensure the tank is filled with liquid to the level of the processing shelf. To add liquid, remove lid and pour directly into the processing chamber. The unit needs 5 litres for optimum performance; otherwise the pump will stall, causing a pulsing effect.

7. The mains electrical supply must be via a 'Residual Current Device' (RCD) Available from Mega (part 161053) if required.

NOTE: The Rota-Spray is designed to use:-

1) Our Ferric Chloride to etch Copper, Brass and Stainless Steel (For etching Copper & Brass please dilute with 1.5 Ltr water & 3.5 Ltr Ferric Chloride to make 5 Ltr for Stainless Steel use as supplied.
2) Ferric Nitrate to Etch Silver
3) Water Based Photoresist Developer to develop Photoresist coatings.

If you wish to use any other Chemistry to process different materials, please contact your Supplier for advice before proceeding.

Failure to do this may cause serious Damage and will invalidate the warranty

Selecting Chemistry

The Rota-Spray is designed specifically for use with the Mega range of PCB chemistry. The carefully selected range of compatible chemistry has many safety features. The developer does not, unlike others, contain Sodium Hydroxide (Caustic Soda). Liquid Ferric is recommended for best results. If Ferric Pellets are used, they must be mixed outside the unit. Any solid material in the process solution will damage the impellors in the pump tube.

Fine Etch Crystals cannot be used in the Rota-Spray, as they are not effective in this type of process.

The following chemistry, available from Mega is recommended:

Developer For pre-coated boards	600-007	500g = 12 litres of working solution
Developer For pre-coated boards	600-010	1 litre concentrate = 20 litres working solution
Etchant	600-015	Liquid Etchant (5 litres) for Copper / Brass / Steel
Etchant	600-016	Liquid Etchant (25 litres) for Copper / Brass / Steel
Etchant	600-050	Ferric Nitrate 500g for 1 Litre (5 needed) for Silver Etching
Developer For dry film resist	500-164	Dry Film 1 litre conc. = 25 litres
Developer For dry film resist	500-162	Dry Film 5 litres concentrate

Instructions of Use

PLEASE READ THIS VERY IMPORTANT NOTICE

PLEASE DO NOT LEAVE THIS UNIT UNATTENDED WHEN IN USE

The Rota-Spray is constructed in PVC Plastic with welded seams and joints. This practice has been widely used throughout the Chemical Processing Industry for many years. It is physically very strong and extremely resistant

Set the temperature as required, 45ºC for etching. For standard 1 oz (35 micron) copper – Time set to 90 seconds is recommended

Temperature control

The temperature controller is a microprocessor-based digital electronic regulator used to control temperature with ON/OFF control of the heater. The liquid temperature is displayed on a 2 digit red LED display while the heater state is indicated by a LED (OUT/SET).
When the unit is powered up ° C is displayed for ten seconds, then the temperature of the liquid will be displayed. The heater will be activated if the liquid temperature is below the set point. The factory pre-set is 45 °C.

Please note – If the unit reaches set point and is then turned off and on again the heater will not operate until the temperature is 3 °C below the set point.

If there is insufficient liquid in the tank the temperature display will not operate, and the LED will display 'E' OR 'E1'

IMPORTANT

The maximum temperature that can be set is 50°C.

NO ATTEMPT SHOULD BE MADE TO INCRESE THE TEMPERATURE BEYOND 50°C, AS THIS WOULD CAUSE SERIOUS DAMAGE TO THE UNIT AND INVALIDATE ANY WARRANTY

Setting temperature mode

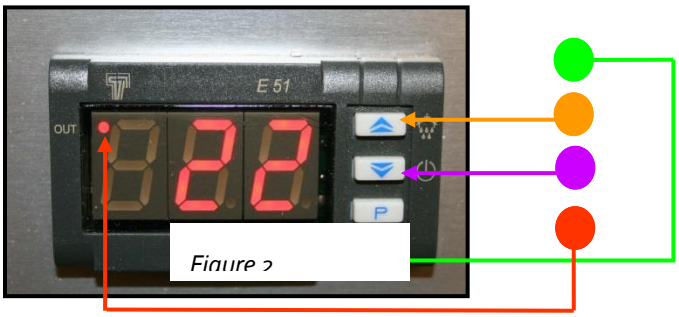


Figure 2

Setting the temperature is achieved by programming the set point.

1. Push the **P** key and keep it pushed for one second
2. **SP** will be displayed and the out/set led will blink rapidly
3. Release the key and the set point will be displayed
4. Press up key to increase temperature
5. Press down key to decrease temperature
6. Not pressing any key for five seconds will automatically leave set temperature mode
7. The liquid temperature will now be displayed.

1 – *KEY -P*: Program the temperature set point.

2 – *KEY -RISE*: Increase temperature.

3 – *KEY -FALL*: Decrease Temperature.

4 – *LED*: It indicates when the Heater is being energised and goes out when temperature has been reached.

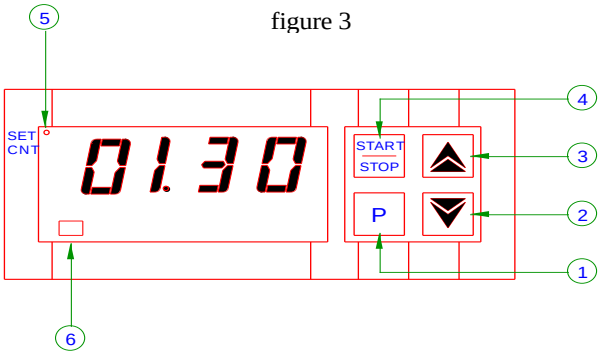
Timer operation

The timer is used to operate the motor for set time periods. Once the timer is set and the START key pressed, the motor operates and the timer counts down to Zero.
The motor will not operate unless the lid is in place.

Setting the timer

5. **LED SET / CNT**: Signals set point mode (flashing fast), Count on mode (flashing each second), the count stopped (on) or reset mode (off).

figure 3



4. **KEY START / STOP** is used to Start, Stop or Reset the counter.

3. **KEY UP**: Is used to increase the programming

2. **KEY DOWN**: Is used to decrease the programming values

1. **KEY P**: Is used to program the set point

6. **LED OUT 1** : Indicates when the output is ON or OFF

PROCEDURE
1. Push the **P** key.
2. The LED OUT will blink.
3. Press the **UP** key to increase the time.
4. Press the **DOWN** key to decrease the time.
5. Not pressing any key for 5 seconds will automatically leave set time mode.

Board Holder

The board holder enables the operator to move the PCB laminate into a separate integral spray wash tank for cleaning without coming into contact with the chemistry.

It maybe loaded with a 10" x 12" panel or several smaller panels using the additional board holder rails. To add extra rails, undo the nuts and remove the bottom of the board holder, slide in extra rails and re-assemble. All panels on one rail should be identical in at least one dimension so they are parallel to the rails. This way, they will remain secure. The panel(s) are best loaded with the board holder in a vertical position. Standard 1.6mm thick P.C.B's and Metal Panels are best retained, using the 'V' grooves. The top and bottom rails can be reversed to hold up to 3mm thick panels in 'Square' grooves.
**** NOTE**: Use the board holder key provided to tighten and undo the nuts. Apply enough torque to secure the rails in place. Avoid over-tightening as this may damage some components.

Processing

When the time is Set and the Pre-set temperature reached, the unit is ready to process. Insert the loaded board holder in the unit and secure the lid. Turn ON the timer to operate the motor. After processing, you can examine the panel(s) whilst they are still in the unit. If necessary, the unit can be re-activated for additional spray processing. The Start / Stop can be used to achieve this without re-setting the timer. After processing has finished it is best to lift the loaded board holder. Slowly and carefully upwards and let any liquid drain into the processing chamber before putting it into the wash chamber.

Spray Wash

Switch ON the spray wash switch on the Control Panel, which will open a solenoid valve and allow water to pass through the spray wash bars. Then gently lower the board holder into the Spray Wash Chamber. Ensure the board holder and panel(s) are completely clean before switching off, and removing the panels.

It takes no more than 30 seconds to clean a panel so after cleaning switch 'OFF' to conserve water. The duty cycle of the spray wash unit is 3 minutes 'ON' followed by 1 minute 'OFF'.

Emptying Process Chamber
The process chamber drain outlet is fitted with a threaded plug to avoid accidental spillage, should the drain valve be tampered with.
The drain valve handle must be in a vertical position to close the valve.
To drain the unit, first ensure the valve is in the closed position, using a suitable wrench. Unscrew the threaded plug and fit the drain hose assembly. Empty the contents of the unit into a suitable container by turning the valve through 90º into the 'Open' position.

Before refilling the chamber, close the drain valve, remove drain hose assembly and refit threaded plug ***DO NOT OVER TIGHTEN THE THREADED PLUG AS THIS COULD CAUSE DAMAGE TO THE VALVE ASSEMBLY.***

For extra security against tampering – the handle of the drain valve can be removed by gently pulling it away from the valve shaft.

Cleaning
Always remove any drips or splashes of processing chemistry when they occur with a damp cloth or sponge. Never let them dry.

The outside of the plastic case should be kept clean with non abrasive cleaner. Any Ferric Chloride staining can be removed with Mega's Ferric Chloride Stain Remover (600-039).
When spent chemistry is removed, always wash the unit through thoroughly with water before adding new chemistry. If Ferric chloride has been used, the inside of the machine can be cleaned with a 5 litre solution of Ferric Chloride Stain Remover (600-039). Ensure this is mixed outside the machine, 500grams to make 5 litres is ideal. Running the Rota-Spray with this solution will clean all the spray chamber and etching column. Avoid wiping inside the chambers with anything that will leave any debris i.e. paper towels, etc., as this will eventually get into the spray tube and block the spray holes.
Never use any solvents to clean the unit.

Electrical Safety Notice

CONNECTIONS TO MAINS ELECTRICAL SUPPLY

This equipment is designed to safety class 1
Before connecting this equipment to the mains electricity supply, examine the information on the apparatus rating label. Ensure that the mains supply is single phase alternating current (a.c.) of the stated frequency (Hz), with neutral nominally at earth potential.
Check the supply voltage is within the stated range.
The equipment rating label states the value of the fuse fitted to the
apparatus itself. Ensure that the plug or supply circuit is fitted with an appropriate fuse of higher value.

WARNING THIS APPARATUS MUST BE EARTHED.

The wires in the mains lead are coloured in accordance with the following code:

Green/Yellow - Earth (E)
Blue - Neutral (N)
Brown - Live (L)

If a moulded fused plug is not fitted connect the wires to a non-reversible 3 pin plug as follows:-

Green/Yellow wire to terminal marked:
E (earth) or G (ground) or coloured Green or coloured Green/Yellow.

Blue wire to terminal marked:
N (neutral) or Common or coloured blue.

Brown wire to terminal marked:
L (live) or Phase or coloured Brown.

1 AMP POWER SOCKET: Please note: There is an IEC chassis socket fitted under the control panel. This is only utilised when an external pump is fitted for the spray wash chamber. The spray wash switch controls power to the socket. The socket is rated at 1 AMP maximum.

NO SERVICING OR MAINTENANCE SHOULD BE CARRIED OUT UNTIL THE UNIT HAS BEEN SWITCHED OFF AND ISOLATED FROM THE MAINS ELECTRICITY SUPPLY.

Any spare parts which may be required are supplied on the understanding that the replacement of these requiring the exposure of live electrical connections will be undertaken by an electrically qualified person.