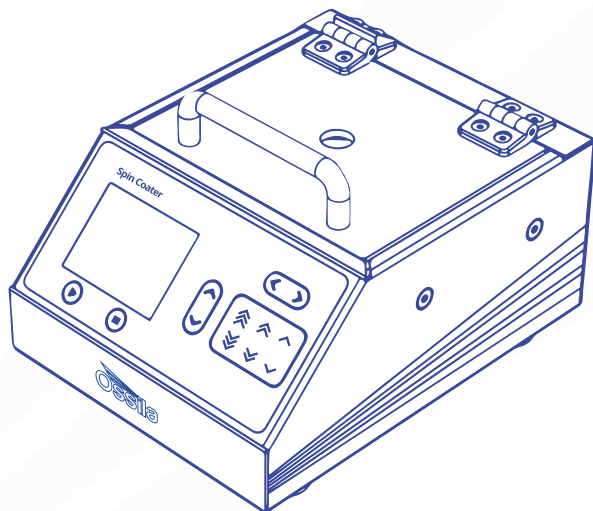


# SPIN COATER USER MANUAL

**Manual Version:** 3.0.H  
**Product Code:** L2001A3  
**Product Version:** 3.0  
**Software Version:** 3.0



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# 1. Overview

The vacuum-free Ossila Spin Coater is part of the Institute of Physics award-winning Solar Cell Prototyping Platform\*. Unlike most other models in the market, it does not need a vacuum pump or nitrogen line – therefore requiring less servicing and enabling you to produce high-quality coatings without the problems of substrate warping. Compact & portable, the Spin Coater will help you optimise space in the glovebox or on the workbench without compromising on functionality – making it the ideal solution for busy labs with limited space.

Substrates are held firmly on the chuck without the need for a vacuum. This produces a better uniform thin-film coating across the substrate. The Ossila Spin Coater is operated via a built-in interactive user interface. During a cycle, the product recipe number, spinning speed, and remaining time are displayed on the full-colour display screen – so you do not need an external PC connection.

\*The Ossila Solar Cell Prototyping Platform is a complementary collection of substrates, materials, & equipment as part of a high-performance standard photovoltaic reference architecture. This platform enables researchers to produce high-quality, fully-functional solar cells which can be used as a reliable baseline.

For more information: [ossila.com/pages/solar-cell-prototyping-platform](https://ossila.com/pages/solar-cell-prototyping-platform)



# 2. EU Declaration of Conformity (DoC)

**We**

**Company Name:** Ossila Limited

**Postal Address:** Solpro Business Park, Windsor Street.

**Postcode:** S4 7WB

**City:** Sheffield

**Telephone number:** +44 (0)114 2999 180

**Email Address:** info@ossila.com

**declare that the DoC is issued under our sole responsibility and belongs to the following product:**

**Product:** Spin Coater (L2001A3)

**Serial number:** L2001A3-xxxx

**Object of declaration:**

Spin Coater (L2001A3)

**The object of declaration described above is in conformity with the relevant Union harmonisation legislation:**

Machinery Directive 2006/42/EC

EMC Directive 2014/30/EU

RoHS Directive 2011/65/EU

**The following harmonised standards and technical specifications have been applied:**

BS EN ISO 12100:2010 Safety of machinery - General principles for design - Risk assessment and risk reduction.

**Signed:**



**Name:** Dr James Kingsley

**Place:** Sheffield

**Date:** 17/10/2018

**[Декларация]                    за съответствие на ЕС**

Производител: Ossila Ltd., Solpro Business Park, Windsor Street, S4 7WD, Великобритания

Декларира с цялата си отговорност, че посоченото оборудване съответства на приложимото законодателство на ЕС за хармонизиране, посочено на предходната(-ите) страница(-и) на настоящия документ.

**[Čeština]                        Prohlášení o shodě EU**

Výrobce: Ossila Ltd., Solpro Business Park, Windsor Street, S4 7WD, Spojené Království

Prohlašujeme na vlastní odpovědnost, že uvedené zařízení je v souladu s příslušnými harmonizačními předpisy EU uvedenými na předchozích stranách tohoto dokumentu.

**[Dansk]                         EU-overensstemme I seserklæring**

Producent: Ossila Ltd., Solpro Business Park, Windsor Street, S4 7WD, UK

Erklærer herved, at vi alene er ansvarlige for, at det nævnte udstyr er i overensstemmelse med den relevante EU-harmoniseringslovgivning, der er anført på den/de foregående side(r) i dette dokument.

**[Deutsch]                        EU-Konformitätserklärung**

Hersteller: Ossila Ltd., Solpro Business Park, Windsor Street, S4 7WD, Vereinigtes Königreich

Wir erklären in alleiniger Verantwortung, dass das aufgeführte Gerät konform mit der relevanten EU-Harmonisierungsgesetzgebung auf den vorangegangenen Seiten dieses Dokuments ist.

**[Eesti keel]                     Eli vastavusavaldus**

Tootja: Ossila Ltd., Solpro Business Park, Windsor Street, S4 7WD, UK

Kinnitame oma ainuvastutuse, et loetletud seadmed on kooskõlas antud dokumendi eelmisel lehelkujil / eelmistel lehekülgedel ära toodud asjaomaste ELi ühtlustamise õigusaktidega.

**[Ελληνικά]                     Δήλωση πιστότητας ΕΕ**

Κατασκευαστής: Ossila Ltd., Solpro Business Park, Windsor Street, S4 7WD, Ηνωμένο Βασίλειο

Δηλώνουμε υπεύθυνα ότι ο αναφερόμενος εξοπλισμός συμμορφώνεται με τη σχετική νομοθεσία εναρμόνισης της ΕΕ που υπάρχει στις προηγούμενες σελίδες του παρόντος εγγράφου.

**[Español]                        Declaración de conformidad UE**

Fabricante: Ossila Ltd., Solpro Business Park, Windsor Street, S4 7WD, Reino Unido

Declaramos bajo nuestra única responsabilidad que el siguiente producto se ajusta a la pertinente legislación de armonización de la UE enumerada en las páginas anteriores de este documento.

**[Français]                     Déclaration de conformité UE**

Fabricant: Ossila Ltd., Solpro Business Park, Windsor Street, S4 7WD, Royaume-Uni

Déclarons sous notre seule responsabilité que le matériel mentionné est conforme à la législation en vigueur de l'UE présentée sur la/ les page(s) précédente(s) de ce document.

**[Hrvatski]                        E.U izjava o sukladnosti**

Proizvođač: Ossila Ltd., Solpro Business Park, Windsor Street, S4 7WD, Velika Britanija

Izjavljujemo na vlastitu odgovornost da je navedena oprema sukladna s mjerodavnim zakonodavstvom EU-a o usklađivanju koje je navedeno na prethodnoj(nim) stranici(ama) ovoga dokumenta.

**[Italiano]                        Dichiarazione di conformità UE**

Produttore: Ossila Ltd., Solpro Business Park, Windsor Street, S4 7WD, UK

Si dichiara sotto la propria personale responsabilità che l'apparecchiatura in elenco è conforme alla normativa di armonizzazione UE rilevante indicata nelle pagine precedenti del presente documento.

**[Latviešu]                        ES atbilstības deklarācija**

Ražotājs: Ossila Ltd., Solpro Business Park, Windsor Street, S4 7WD, UK

Ar pilnu atbildību paziņojam, ka uzskaitītais aprīkojums atbilst attiecīgajiem ES saskaņošanas tiesību aktiem, kas minēti iepriekšējās šī dokumenta lapās.

**[Lietuvių k.]****ES atitikties deklaracija**

Gamintojas: Ossila Ltd., Solpro Business Park, Windsor Street, S4 7WD, UK

atsakingai pareiškia, kad išvardinta įranga atitinka aktualius ES harmonizavimo teisės aktus, nurodytus ankstesniuose šio dokumento

**[Magyar]****EU-s megfeleléségi nyilatkozat**

Gyártó: Ossila Ltd., Solpro Business Park, Windsor Street, S4 7WD, UK

Kizárólagos felelősségünk mellett kijelentjük, hogy a felsorolt eszköz megfelel az ezen dokumentum előző oldalán/oldalain található EU-s összehangolt jogszabályokra vonatkozó rendelkezéseinek.

**[Nederlands]****EU-Conformiteitsverklaring**

Fabrikant: Ossila Ltd., Solpro Business Park, Windsor Street, S4 7WD, UK

Verklaart onder onze uitsluitende verantwoordelijkheid dat de vermelde apparatuur in overeenstemming is met de relevante harmonisatiewetgeving van de EU op de vorige pagina(s) van dit document.

**[Norsk]****EU-samsvarserklæring**

Produsent: Ossila Ltd., Solpro Business Park, Windsor Street, S4 7WD, UK

Erklærer under vårt eneansvar at utstyret oppført er i overholdelse med relevant EU-harmoniseringslovverk som står på de(n) forrige siden(e) i dette dokumentet.

**[Polski]****Deklaracja zgodności Unii Europejskiej**

Producent: Ossila Ltd., Solpro Business Park, Windsor Street, S4 7WD, UK

Oświadczamy na własną odpowiedzialność, że podane urządzenie jest zgodne ze stosownymi przepisami harmonizacyjnymi Unii Europejskiej, które przedstawiono na poprzednich stronach niniejszego dokumentu.

**[Por tuguês]****Declaração de Conformidade UE**

Fabricante: Ossila Ltd., Solpro Business Park, Windsor Street, S4 7WD, Reino Unido

Declara sob sua exclusiva responsabilidade que o equipamento indicado está em conformidade com a legislação de harmonização relevante da UE mencionada na(s) página(s) anterior(es) deste documento.

**[Română]****Declarație de conformitate UE**

Producător: Ossila Ltd., Solpro Business Park, Windsor Street, S4 7WD, Regatul Unit

Declară pe proprie răspundere că echipamentul prezentat este în conformitate cu prevederile legislației UE de armonizare aplicabile prezentate la pagina/paginile anterioare a/ale acestui document.

**[Slovensky]****Vyhlasenie o zhode pre EÚ**

Výrobca: Ossila Ltd., Solpro Business Park, Windsor Street, S4 7WD, Spojené kráľovstvo

Na vlastnú zodpovednosť prehlasuje, že uvedené zariadenie je v súlade s príslušnými právnymi predpismi EÚ o harmonizácii uvedenými na predchádzajúcich stranách tohto dokumentu.

**[Slovenščina]****Izjava EU o skladnosti**

Proizvajalec: Ossila Ltd., Solpro Business Park, Windsor Street, S4 7WD, UK

s polno odgovornostjo izjavlja, da je navedena oprema skladna z veljavno uskladitveno zakonodajo EU, navedeno na prejšnji strani/ prejšnjih straneh tega dokumenta.

**[Suomi]****EU-vaatimusten mukaisuusvakuutus**

Valmistaja: Ossila Ltd., Solpro Business Park, Windsor Street, S4 7WD, UK

Vakuutamme täten olemamme yksin vastuussa siitä, että tässä asiakirjassa luetellut laitteet ovat tämän asiakirjan sivuilla edellisillä sivuilla kuvattujen olennaisten yhdenmukaistamista koskevien EU-säädösten vaatimusten mukaisia.

**[Svenska]****EU-försäkran om överensstämmelse**

Tillverkare: Ossila Ltd., Solpro Business Park, Windsor Street, S4 7WD, Storbritannien

Vi intygar härmed att den utrustning som förtecknas överensstämmer med relevanta förordningar gällande EU-harmonisering som finns på föregående sidor i detta dokument.

# 3. Safety

## 3.1 Warning

- Devices with applied bias or current should NOT be left unattended, as a power failure may result in board damage or device damage (and potentially hazardous situations).
- Only use the unit with the supplied 24 VDC power adapter.
- Opening the lid will cause the rotating chuck to stop. However, due to inertia, it can take a few seconds for the chuck to come to a complete stop.
- Ensure the substrate is placed in an adequately-sized chuck recess, as it holds it in place and stops it flying out.
- The unit should be operated under a working exhaust hood when used with flammable or toxic substances.

## 3.2 Use of Equipment

This Spin Coater is designed to be used as instructed, and in the following environmental conditions:





- Indoors in a laboratory environment (pollution degree 2)
- Altitudes up to 2000 m
- Temperatures of 5°C to 40°C; maximum relative humidity of 80% up to 31°C.

The Spin Coater is supplied with a power adapter and a power cord for the country of purchase (in accordance with European Commission regulations and British Standards). Use of any other electrical power cables or adaptors is not recommended.

## 3.3 Hazard Icons

Please note the following symbols that can be found at points throughout the rest of the manual.

**Table 1.1.** Hazard warning labels used in this manual.

Symbol	Associated Hazard
	General warning or caution, which accompanying text will explain
	Electrical shock
	Explosion
	Inhalation

## 3.4 General Hazards

Before installing or operating the Spin Coater, there are several health and safety precautions which must be followed and executed to ensure safe installation and operation.

**WARNING: Improper handling when operating or servicing this equipment can result in serious injury. Read this manual before operating or servicing this equipment.**



I. DANGER: DO NOT use the Spin Coater in the presence of an explosive atmosphere.



II. WARNING: Emergency Power Disconnect options: Use the power cord as a disconnect method. Ensure that the power outlet for this cord is easily accessible by the user.



III. CAUTION: Opening the lid will cause the rotating chuck to stop. However, due to inertia it will take a few seconds for the rotating chuck to come to a complete stop at the highest speeds.



IV. CAUTION: Ensure the substrate is placed into a chuck with an adequate-sized recess as it holds it in place and stops it flying around the bowl or even out of the bowl if the lid was opened at the highest speed (see caution III).



V. CAUTION: Use under an exhaust hood when used with flammable or harmful solvents.

## 3.5 Servicing

If servicing is required, please return the unit to Ossila Ltd. The warranty will be invalidated if:

- Modification or service has taken place by anyone other than an Ossila engineer.
- The Unit has been subjected to chemical damage through improper use.
- The Unit has been operated outside the usage parameters stated in the user documentation associated with the Unit.
- The Unit has been rendered inoperable through accident, misuse, contamination, improper maintenance, modification or other external causes.



## 3.6 Health and Safety – Installation



- I. Place the machine on a solid, level surface, free from vibration and temperature extremes. For optimum performance, make sure that the chuck is also level.
- II. Refer to the specifications section or to the label on the power adapter for electrical requirements.
- III. The machine is not to be used in a hazardous atmosphere.

## 3.7 Health and Safety – Operation



- I. CAUTION: The unit should be operated under an exhaust hood when flammable or harmful solvents are being used.



- II. CAUTION: Opening the lid will cause the rotating chuck to stop. However, due to inertia, it will take a few seconds for the rotating chuck to come to a complete stop at the highest speeds. There is a risk of substances flying out of the bowl.

## 3.8 Health and Safety – Servicing



Servicing should only be performed by an Ossila engineer. Any modification or alteration may damage the equipment, cause injury, or death. It will also void your equipment's warranty.

# 4. Unpacking

## 4.1 Packing List

The standard items included with the Spin Coater are:

- The Spin Coater unit
- Power adapter with a power cord (specific for country of operation)
- Chuck (as specified by the customer)
- User manual

## 4.2 Damage Inspection

Examine the components for evidence of shipping damage. If damage has occurred, please contact Ossila directly for further action.

## 5. Specifications

The Spin Coater specifications are shown in **Table 5.1**.

**Table 5.1.** Spin Coater specifications.

Spin Coater	Specifications
Programs	10 programs with up to 50 steps each
Speed stability	< 2%
Speed	120 RPM to 6000 RPM
Spin time	1 sec- 1000 sec
Power supply	24 VDC / 2A
Interlock	Software/hardware interlock
Case dimensions	Width: 170 mm Height: 140 mm Depth: 225 mm
Materials	Central polypropylene unit, steel frame, sides and base, PET display and keypad, and tempered glass lid
Fuses	1 A slow blow
Weight	3 kg

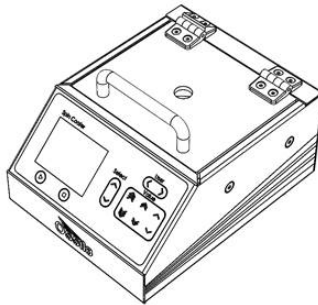
# 6. System Components

The Spin Coater L2001A comprises three items: the Ossila spin coater (**Figure 6.1**), power adapter (**Figure 6.2**) and the Ossila spin coater chuck (**Figure 6.3**).

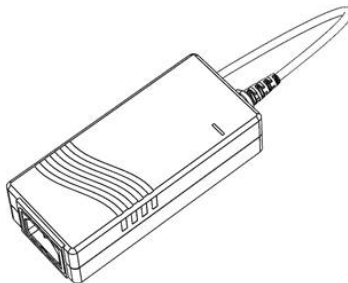
The Spin Coater is powered from a 24VDC mains power adapter. The power supply adapter is supplied with a power plug that is suitable for the country of purchase.

The Spin Coater chuck recess size is specified by the customer. The chucks are designed with close tolerances and provide a flat, rigid surface for mounting substrates of different sizes, weights and shapes. Proper chuck selection should be based on substrate size. The chuck has a push-fit connection to the motor coupling in the bowl of the Spin Coater, and is easily removable for cleaning or interchanging with other chucks. The chuck is made from a high-density copolymer of polypropylene, which has a high degree of chemical resistance. For cleaning, see **Section 9.1**.

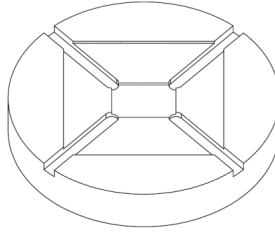
**Figure 6.1.** The Ossila Spin Coater.



**Figure 6.2.** The 24 VDC power adapter.



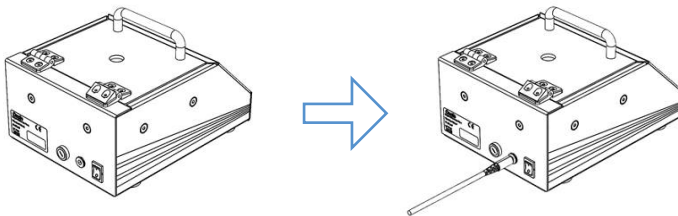
**Figure 6.3.** The Ossila Spin Coater chuck.



## 7. Installation

1. Place the unit on a solid, level surface. Ensure the area is free from vibrations, temperature extremes and highly flammable or explosive materials. Make sure the chuck is also level.
2. Before plugging in the spin coater, ensure the power switch on the unit is switched to the '0' position (off).
3. Connect the power adapter to the power jack on the back panel of the Spin Coater unit (see **Figure 7.1**).
4. Refer to the label on the power adapter for electrical requirements.
5. Switch the Spin Coater power switch to the 'I' position to turn the unit on.

**Figure 7.1.** Connecting the power adapter to the power jack on the back panel of the unit.

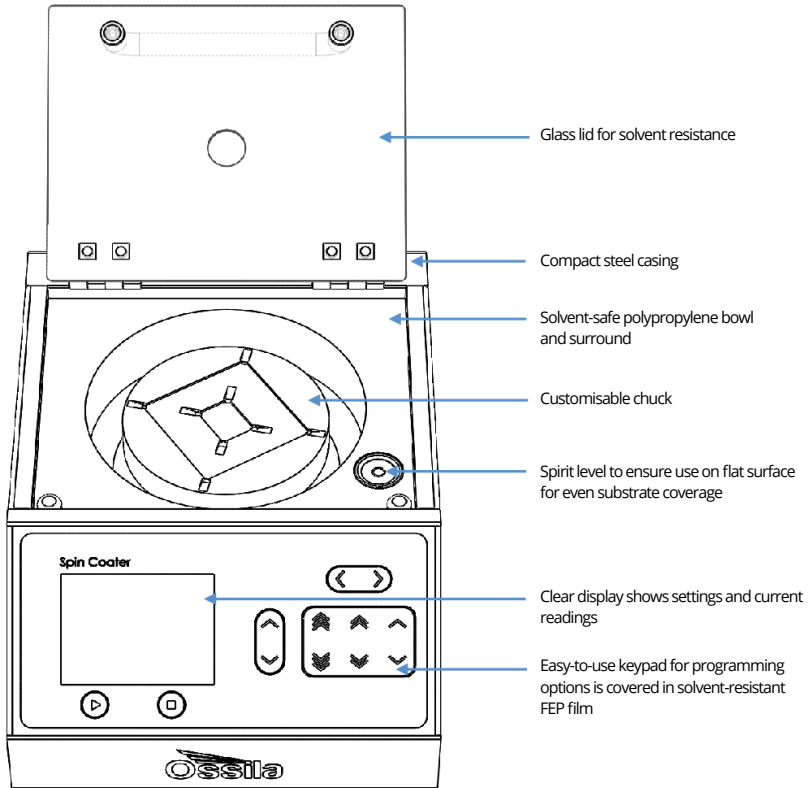


# 8. Operation

## 8.1 Overview

A top-down view of the Spin Coater is shown in **Figure 8.1**, with all the relevant components highlighted.

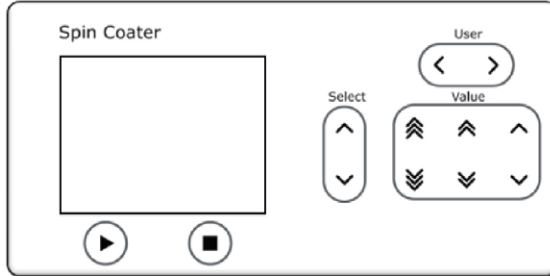
Figure 8.1 Spin Coater top-down image.



## 8.2 User Interface

Figure 8.2 shows the front panel of the spin coater, with a description of the functionality of each button.

Figure 8.2 Spin Coater screen and keypad.



**Start** The ▶ button is used to initiate a programmed sequence. While a program is running, the display will show the message “RUNNING” with the current speed and elapsed time. The “RUNNING” message will disappear once the program is finished.

**Stop** The ■ button is used to terminate the running program. It will reset to the first step of a given program when pressed.

**User** These < > buttons are used to navigate between different user profiles.

**Select** These ⤴ ⤵ buttons are used to navigate between the changeable parameters within a program. While navigating, the cursor icon will indicate which parameter is selected. These buttons are used to navigate between the changeable parameters within a program. While navigating, the cursor icon will indicate which parameter is selected.

**Value** These buttons are used to change the values where the cursor is located. The buttons are divided into three columns; small increase/decrease (by 1 or 10) ⤴ ⤵, medium increase/decrease (by 10 or 100) ⤶ ⤷, and large increase/decrease (by 100 or 1000) ⤴ ⤵ shows the increase and decrease values for each button, with respect to the profile.

# 8.3 Programming and Usage

The Ossila Spin Coater has two pre-set experimental programs to get you started.

Table 8.1. Pre-set programs



User no.	Program No.	Step No.	RPM	TIME (sec)
User 01	Program 01	1	2000	30
	Program 02	1	2000	30
		2	5000	5

## (I) Selecting a User Profile (“User”)

1. To select the user profile of your choice, press either the left or right “User” buttons. The maximum number of user profiles is **10**.

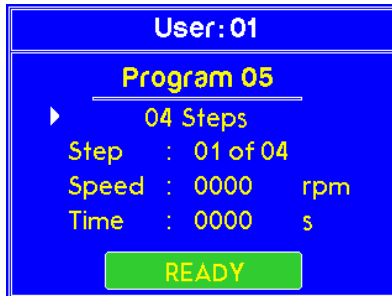


## (II) Selecting a Program

- Each user profile can store up to 10 programs. To choose between program numbers, navigate to the "Program" line and press the up  or down  buttons.

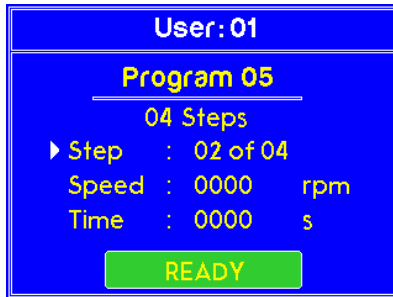


- To edit the program, you can alter the number of steps in a program by using the following buttons  . The maximum number of steps is **50 steps**.





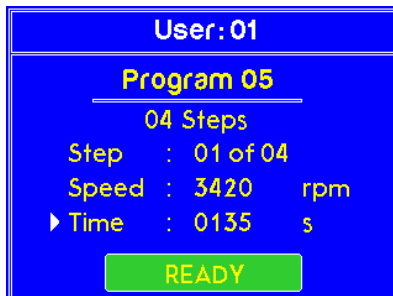
4. Navigate to the **“Step”** line by using the **“Select”** keys to choose which step number is to be edited. The step number can be selected by using the following keys: **▲** or **▼**.



5. Navigate to the **“Speed”** line to change the speed of the current step. Use the **“Value”** buttons to increase or decrease the value. The maximum value is 6000 rpm.



6. Navigate to the **“Time”** line to specify the time duration for the current step. Use the **“Value”** buttons to increase or decrease the value. The maximum time duration is 1000 seconds.

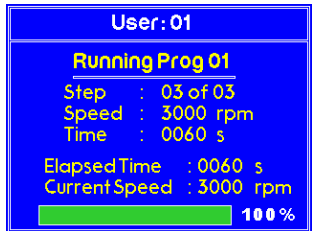
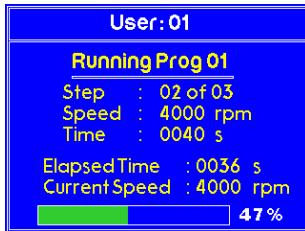
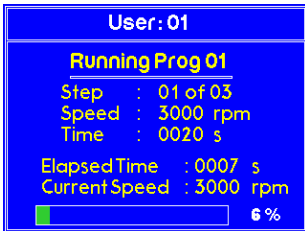


- 7. Navigate back to the "Step" line using the cursor. Then, increase the number of steps to set the Speed and Time.

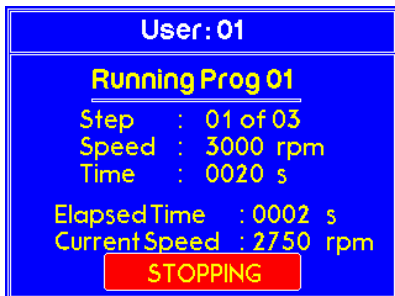


(III) Start Program

- 8. Once everything is set and ready, press "Start" to run the program. At the bottom of the display, the current elapsed time and current speed will be shown.



- 9. To abort the operation, press the "STOP" button.



10. Once the operation is completed, a “STOPPING” warning message will appear to notify the user. When this warning is displayed, the motor cannot re-run until it has completely stopped.



11. If the lid is opened, a warning appears on the screen to notify the user. If the lid is opened while the motor is running, the system will force the motor to stop.



## 9. Maintenance

### 9.1 Cleaning

- To clean the lid, bowl, and chuck, use a solvent that is appropriate to dissolve the materials that have been spin coated.
- Use a soft cloth or towel in order to avoid damage to the polypropylene.
- Take care when cleaning around the keypad and display area, because organic solvents may damage/remove the label.

### 9.2 Repair and Service

The only user-serviceable part in this unit is the fuse (accessible externally). If the unit is faulty, please return it to Ossila. We will promptly quote to repair any faults that occur outside the 2-year warranty period. Parts subject to normal wear and tear (Spin Coater chucks) are not covered by the warranty.

## 9.3 Storage Conditions

The Spin Coater should be kept in dry conditions; away from direct sources of heat or sunlight, and in such a manner as to preserve the working life of the instrument.


# 10. Troubleshooting

**Table 10.1.** Troubleshooting guidelines for the Ossila Spin Coater

Problem	Possible cause	Action
Spin Coater will not power up	The power supply may not be connected properly, or the switch is in the OFF position	Check the connection and make sure the power is turned ON
Cycle will not start	No recipe programmed	Select/program a recipe
	Lid open/close not detected, or lid still open	Open and close the lid properly
Cycle starts, but immediately stops	Recipe problem	Review, edit and re-enter recipe as needed
Display time or RPM appears incorrect	Issue with the program	Turn OFF the Spin Coater for 5 seconds, and then restart
Coating issues	a. If the chuck is removed (for cleaning etc), it may not have been re-inserted properly causing an imbalance	a. Ensure the chuck is pushed in thoroughly so that the two metallic headers are inserted all the way and flush with the top of the chuck
	b. The Spin Coater is not level	b. Place the Spin Coater on a flat and sturdy surface and use the in-built spirit level
	c. If the above does not solve the issue	c. Contact Ossila

# 11. Related products


## 11.1 Compatible Substrates



**ITO Substrates**

Our range of 15 x 20 mm ITO substrates for OPV, OLED and sensing applications.

Product codes: S111 / S101 / S211 / S281 / S171



**Pre-patterned ITO OFET Substrates**

Designed to enable fabrication and characterisation without the need for vacuum evaporations or probe stations.

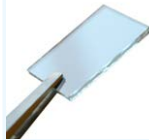
Product codes: S161 / S162



**Silicon Oxide OFET Substrates**

Silicon substrates with thermal oxide layer pre-cut to fit the Ossila OFET fabrication systems.

Product code: S146



**Synthetic Quartz Coated Substrates**

Flat glass substrates coated with 20 nm of SiO<sub>2</sub> to help with surface wetting and prevent ion migration.

Product code: S151

## 11.2 Related Equipment



**UV Ozone Cleaner**

For removing contamination on the surface of samples, providing you with ultraclean surfaces within minutes.

Product code: L2002A2



**Syringe Pump**

High-precision, programmable single and dual syringe pumps for the automatic dispensing of solutions.


Product codes: L2003S1 / L2003D1



**Four-Point Probe Test System**

Quick, easy, and accurate characterisation and sheet resistance measurements for various materials.

Product code: T2001A3



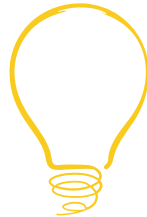
**Source Measure Unit**

Source voltage, measure current, get data. Simplify and accelerate your data collection!

Product code: P2005A2



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