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**SC300M**

# SUNCONTROL

REGULATE YOUR SOLAR ENERGY



USER GUIDE



**NDS ENERGY S.R.L.**

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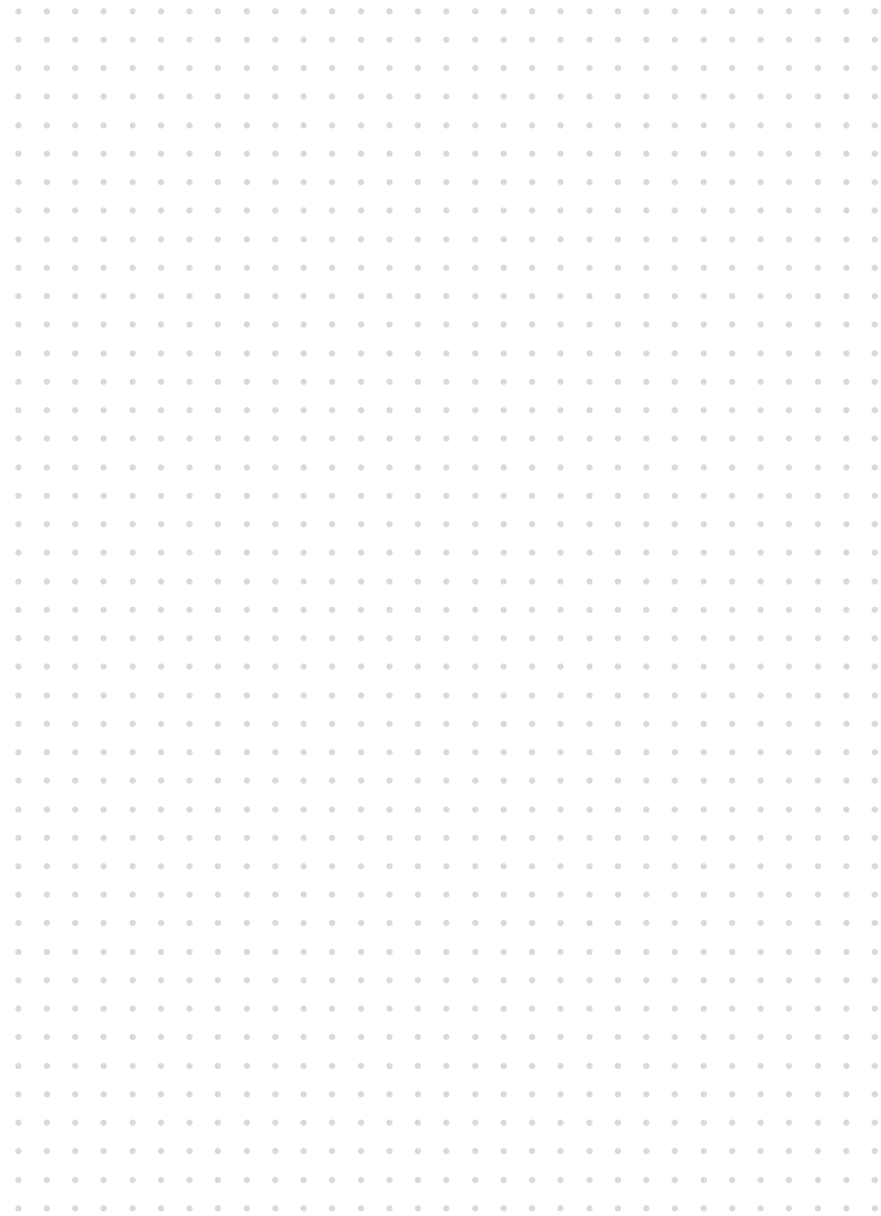
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# NOTES

A large grid of small dots arranged in approximately 25 rows and 40 columns, intended for taking notes.

# NOTES



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## INTRODUCTION

**SUNCONTROL** IS THE CHARGE DEVICE THAT CAN **MAXIMIZE** PERFORMANCES OF YOUR PHOTOVOLTAIC MODULES.

DESIGNED AND BUILT BY NDS, **SUNCONTROL** (BASED ON MODEL) CAN HANDLE UP TO 300W IN INPUT, WITH A MAXIMUM CHARGE OF 20A. THE MICROPROCESSOR CAN DO UP TO FOUR CHARGE PHASES, INCLUDING THE IMPORTANT DESULPHATION PHASE WHICH GUARANTEES A LONGER BATTERY LIFE.

### WARNINGS

- KEEP THE DEVICE OUT OF REACH FOR CHILDREN.
- CAREFULLY CHECK THE INTEGRITY OF THE DEVICE, CONNECTION CABLES, AND CONNECTORS.
- TO AVOID OVERHEATING AND FIRE RISK, DON'T INSTALL THE DEVICE IN A SEALED ENVIRONMENT, ALWAYS PREFER VENTILATED AREAS. DO NOT PLACE THE DEVICE ON EASILY INFLAMMABLE SURFACES OR ENVIRONMENTS (EG: PAPER, CLOTH, ETC.).
- PROTECT THE DEVICE FROM SUNLIGHT OR DIRECT HEAT SOURCES.
- TO AVOID MALFUNCTIONS DON'T INSTALL AND USE THE DEVICE IN VERY HUMID ENVIRONMENTS, IN DIRECT CONTACT WITH SPLASHES OF WATER, LIQUIDS OR RAIN.
- TO AVOID THE RISK OF ELECTRIC SHOCK AND / OR FIRE, MAKE SURE THE VEHICLE POWER SUPPLY IS IN GOOD CONDITION.
- IN CASE OF DAMAGED OR INADEQUATE CONNECTION CABLES, MAKE THE REPLACEMENT IMMEDIATELY, USING QUALIFIED TECHNICIANS, DO NOT USE THE DEVICE WITH DAMAGED CABLES AND / OR INADEQUATE SECTION.
- IN CASE OF PRODUCT ANOMALIES DO NOT USE IT! IT IS STRICTLY FORBIDDEN TO OPEN THE DEVICE. REPAIRS CAN ONLY BE CARRIED OUT BY QUALIFIED TECHNICAL PERSONNEL USING ORIGINAL SPARE PARTS.
- INFORMATION IN THIS MANUAL CAN BE CHANGED WITHOUT NOTICE. NDS ENERGY S.R.L. RESERVES THE RIGHT TO CHANGES AND IMPROVE PRODUCTS AT ANY TIME WITHOUT PRIOR NOTICE AND WITHOUT ANY OBLIGATION TO APPLY THESE CHANGES TO THE DEVICES PREVIOUSLY DISTRIBUTED.

## WARRANTY



### WARRANTY COUPON

MODEL\_\_\_\_\_

SERIAL\_\_\_\_\_

SELLING DATE\_\_\_\_\_

STAMP AND SIGNATURE

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## F.A.Q.

- **IS IT POSSIBLE TO MOUNT A SINGLE 200W PANEL ON A SINGLE INPUT (PF1 OR PF2)?**

YOU CAN CONNECT A 200W PANEL SUCH AS PF1, PROVIDED THE OTHER CHANNEL (PF2) IS SHORTED OR JOINED WITH PF1.

- **WHAT IS THE MAXIMUM VOLTAGE OF THE PANEL ACCEPTED?**  
MAXIMUM VOLTAGE IS 27V.
- **A FAR ABOVE 15V BATTERY VOLTAGE (WITH THE SUN REGULATOR ACTIVE) IS NORMAL?**

YES, IT IS NORMAL WHEN THE DEVICE IS IN DESULPHATION (THE LED BLINKS 3 TIMES). YOU CAN STILL DISABLE THIS FUNCTION BY SELECTING THE JUMPER SW3 AS DESCRIBED IN THE "CHARGING CURVE SELECTION" SECTION.

- PRODUCT IMAGES ARE PURELY INDICATIVE AND MAY NOT BE PERFECTLY REPRESENTATIVE OF PRODUCT FEATURES, DIFFERING IN COLOR, SIZE, OR ACCESSORIES.
- KEEP THE INSTRUCTION MANUAL NEAR THE DEVICE FOR EASY ACCESS TO ESSENTIAL SAFETY, USAGE, AND MAINTENANCE INFORMATION.

## FEATURES

**SUNCONTROL** IS AN AUTOMATIC VOLTAGE REGULATOR DEVICE THAT, IN THE STANDARD VERSION, OPTIMIZE RECHARGE FOR 12V SERVICE BATTERIES. **SUNCONTROL** SUPPORTS THE FOLLOWING TYPES OF TECHNOLOGIES: LEAD ACID, GEL, AGM OR LITHIUM AND PHOTOVOLTAIC PANELS WITH 12V RATED VOLTAGE.

THE **SUNCONTROL** MODEL SC300M ALLOWS THE RECHARGE OF THE SERVICES BATTERIES USING PHOTOVOLTAIC PANELS WITH RATED VOLTAGE OF 12V.

IT HAS TWO SEPARATE INPUTS FOR TWO PHOTOVOLTAIC PANELS UP TO 150WP MAXIMUM POWER EACH, WITH 12V RATED VOLTAGE.

THE SYSTEM HAS TWO OUTPUTS: ONE FOR THE SERVICE BATTERIES AND THE OTHER ONE FOR THE START BATTERY, THUS ALLOWING THE BATTERY TO BE CHARGED AND MAINTAINED.

TWO INDICATION LEDS (GREEN AND YELLOW) ONE FOR CHARGING THE SERVICE BATTERY, THE OTHER FOR CHARGING THE START BATTERY. THE LEDS NUMBER OF FLASHES ALSO INDICATE THE EXACT DEVICE CHARGING PHASE.

THE CHARGING CURVE IS SELECTABLE BY THREE JUMPERS.

TOUCH SCREEN DISPLAY CONNECTION READY, USEFUL TO SHOW CHARGING DATA AND AUTOMATIC CHARGING CURVE SETTING.

## INSTALLATION

TO MAKE THE ELECTRICAL CONNECTIONS COMFORTABLE AND SET THE RIGHT CHARGING CURVE, OPEN THE DEVICE COVER BY PRESSING MODERATELY AND CAREFULLY THE TABS PLACED SIDE BY SIDE ON THE DEVICE, USING A SMALL SCREWDRIVER.



ONCE THE COVER IS REMOVED YOU HAVE DIRECT ACCESS TO THE PCB, THEN TO THE FASTON FOR CONNECTING THE DEVICE TO PHOTOVOLTAIC PANELS AND BATTERIES; IT IS ALSO POSSIBLE TO SELECT THE CHARGING CURVE AND THE REPLACEMENT OF THE FUSES (IF NECESSARY) AS SHOWN IN THE FOLLOWING FIGURE.

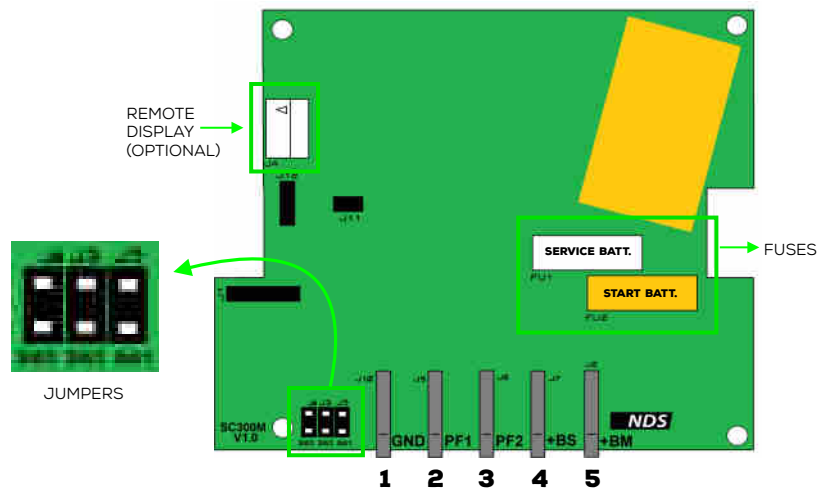


FIG.2

## FUSES REPLACEMENT

IN CASE OF DAMAGE OF THE PROTECTION FUSES ON THE PCB, IT'S POSSIBLE TO REPLACE THEM WITH THE ORIGINAL SPARE FUSES PROVIDED. TO REACH THE FUSES, REMOVE THE COVER OF THE DEVICE, AND FOLLOW THE INSTRUCTIONS IN THE INSTALLATION SECTION.

## TECHNICAL FEATURES

DESCRIPTION	TECHNICAL FEATURES
SINGLE INPUT VOLTAGE PHOTOVOLTAIC PANEL VOLTAGE (VOS)	16V - 27V
PHOTOVOLTAIC PANEL	2
MAXIMUM PEAK POWER FOR EACH INPUT	150 WP
ACTIVATION VOLTAGE CHARGE STAR BATTERY	< 12,5V
NOMINAL VOLTAGE	12V
STAND-BY CONSUMPTION	5mA
SIZE	L123 X W108 X H50 MM
WEIGHT	0,40KG (CABLES NOT INCLUDED)

IF YOU DO NOT USE THE VEHICLE FOR A LONG TIME, IT'S RECOMMENDED TO DISCONNECT ALL THE LOADS TO COMPLETELY INTERRUPT ANY RESIDUAL CONSUMPTION THAT MAY DISCHARGE THE SERVICE BATTERY.

## OPERATION

TWO LEDS (GREEN AND YELLOW) INDICATE THE ACTIVE CHARGE STATUS ON ONE OR BOTH OF THE BATTERIES (SERVICE AND STARTUP); THE FLASHING SERIES EMITTED BY THE LED INDICATES THE CHARGING PHASE IN WHICH THE BATTERY IS LOCATED: 1 BLINK WILL MATCH THE FIRST PHASE, 2 BLINKS AT THE SECOND AND SO ON...

- THE **FLASHING GREEN LED** INDICATES "SERVICE BATTERY CHARGING". THE SYSTEM DELIVERS CHARGES TO THE SERVICE BATTERIES IF:
  1. PHOTOVOLTAIC PANELS ARE IRRADIATED BY SUN
  2. THE VOLTAGE SUPPLIED BY THE PANEL IS HIGHER THAN THAT OF THE BATTERY ITSELF.
  
- THE **FLASHING YELLOW LED** INDICATES "START BATTERY CHARGING". THE SYSTEM DELIVERS CHARGES TO THE START BATTERY IF:
  1. PHOTOVOLTAIC PANELS ARE IRRADIATED BY SUN
  2. THE SERVICE BATTERY IS CHARGED BETWEEN 80% AND 100%
  3. THE START BATTERY VOLTAGE IS UNDER 12,5V

CHARGING PHASE	N° FLASHES	CHARGING PHASE	N° FLASHES
1	●	1	●
2	●●	2	●●
3	●●●	3	●●●
4	●●●●	4	●●●●

- A FAST BLINK OF BOTH LEDS (WITH AN ACTIVE SOLAR PANEL) SIGNALS AN ABNORMALITY DUE TO SERVICE BATTERY FUSE FAILURE OR THAT THE SERVICE BATTERY VOLTAGE IS BELOW 6V.

**N.B: WHEN THE PHOTOVOLTAIC PANELS INTERRUPTS POWER SUPPLY DUE TO INSUFFICIENT SOLAR POWER, THE SYSTEM TERMINATES CHARGING BY ENTERING STANDBY MODE, AT THIS STAGE THE LEDS WILL NOT BLINK AND THE OVERALL CONSUMPTION WILL BE MINIMIZED.**

## CHARGING CURVE SELECTION

THE JUMPERS ON THE CARD ALLOWS TO SELECT THE APPROPRIATE CHARGING CURVE FOR THE INSTALLED SERVICE BATTERY. THE JUMPER **SW3**, IF CONNECTED, EXCLUDES THE DESULPHATION PHASE FROM THE CHARGING CURVE, WHICH IS USEFUL IF THERE ARE ON-BOARD CONTROL UNITS AND HOUSEHOLD APPLIANCES SENSITIVE TO VOLTAGES GREATER THAN 15V.

**NOTE: THE DEFAULT SETTING IS SPECIFIC FOR AGM BATTERY.**

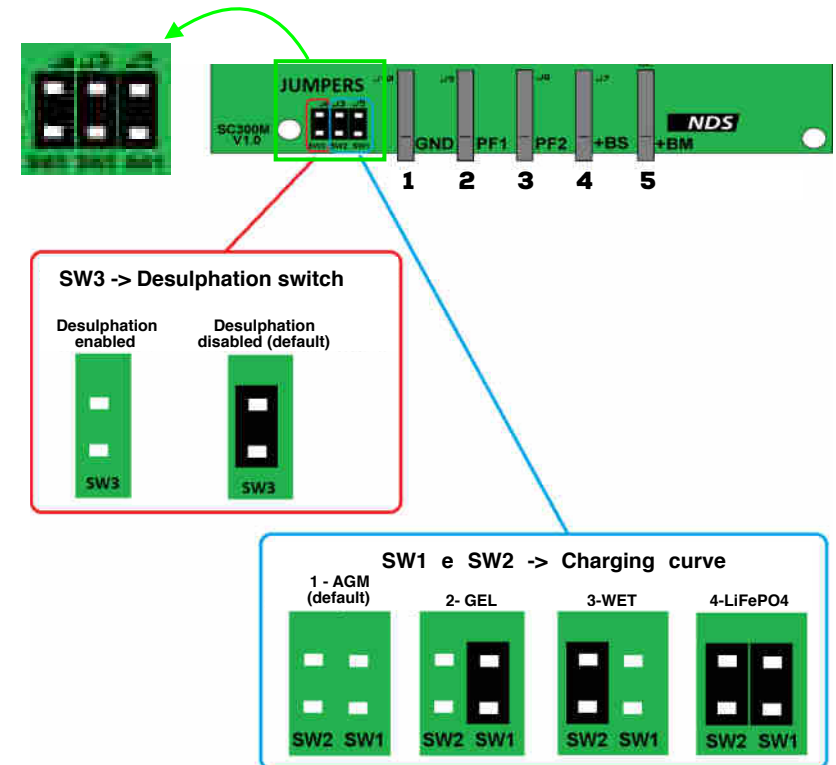
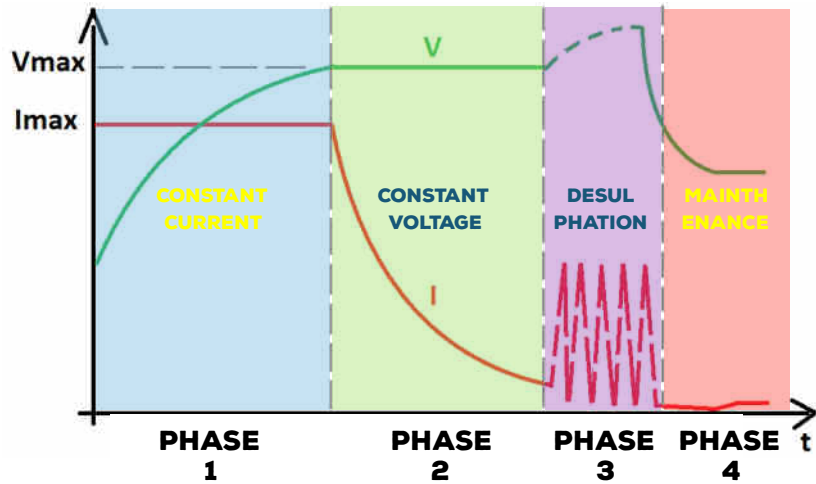


FIG.3

**NOTE: THE SERVICE BATTERY TYPE SELECTION AND THE DESULPHATION PHASE EXCLUSION CAN BE SET BY THE DISPLAY ONLY IF ALL THE SELECTION JUMPERS HAVE BEEN REMOVED ON THE SC300M BOARD, OTHERWISE THE SETTINGS SELECTED ON THE SUNCONTROL WILL BE USED INSTEAD.**

## CHARGING CURVES

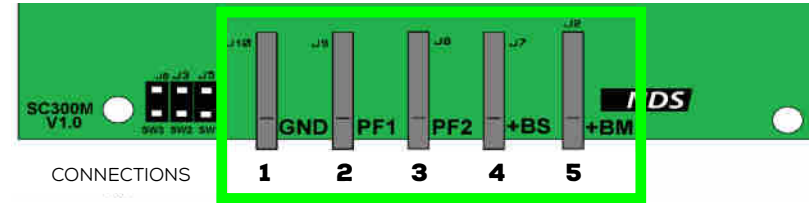


**SUMMARY TABLE**

PHASE	DESCRIPTION
PHASE 1	CONSTANT CURRENT
PHASE 2	CONSTANT VOLTAGE
PHASE 3	DESULPHATION
PHASE 4	MAINTENANCE

CHARGING CURVES	PHASE 2 CONSTANT V	PHASE 3 DESULPHATION	PHASE 4 MAINTENANCE
AGM	14,8V	15,8V	13,7V
GEL	14,2V	15,8V	13,4V
WET (LEAD ACID)	14,4V	15,8V	13,4V
LiFePO <sub>4</sub>	14,6V	/	13,7V

## CONNECTION DIAGRAM



### PIN

1. SERVICE BATTERY (AND PHOTOVOLTAIC PANELS) GROUND.
2. POSITIVE PHOTOVOLTAIC PANEL NO. 1 (PF1).
3. POSITIVE PHOTOVOLTAIC PANEL NO. 2 (PF2).
4. POSITIVE SERVICE BATTERY (OR POSITIVE COMMON SYSTEM IF THERE IS A POWER SWITCH OR IMANAGER).
5. START BATTERY POSITIVE.

**IT IS RECOMMENDED TO USE CABLES OF AT LEAST 4-6 MM<sup>2</sup>.**