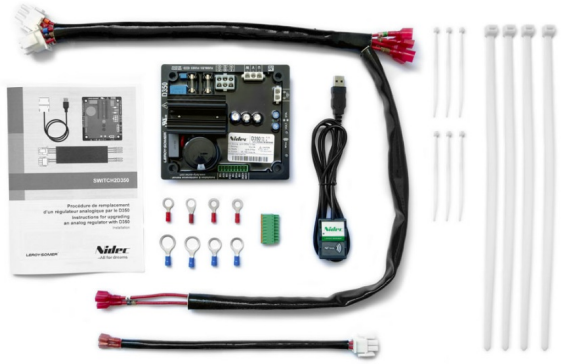
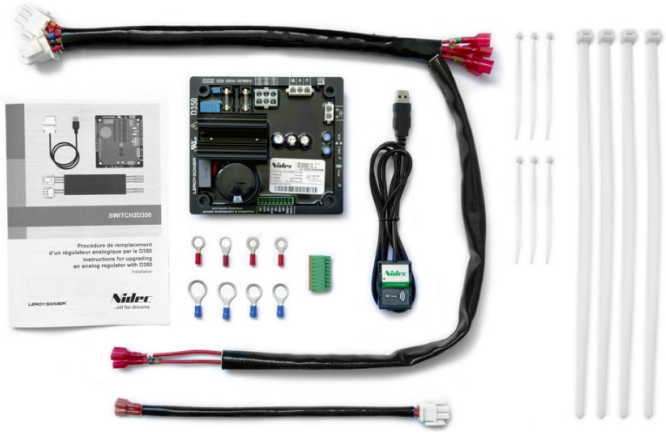


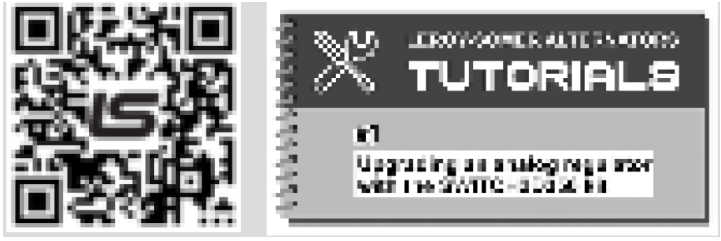
Nidec SWITCH2D350 Leroy Somer Upgrading An Analog Regulator Installation Guide

Contents

Nidec SWITCH2D350 Leroy Somer Upgrading An Analog Regulator



To watch our installation tutorial, scan the QR code or or go to: **http://lrsm.co/switch2d350**



SAFETY INSTRUCTIONS

Tightening torque for user terminal is:

- Connectors 3.5 mm pitch: 0.22 Nm min. to 0.25 Nm max.
  Crimping power connectors (provided into the kit) must be done with a specific tool:
- Tyco Electronics ref. 91500, 91510, 91508, 91506 or equivalent

For UL certified generators:

- Copper conductors, with adapted gauge and temperature rating at least 75°C must be used.
- Instrument transformers shall comply with basic insulation requirements defined in the Instrument Transformers standards (IEEE C57.13 series) or the equivalent.
- Protection for the power supply circuit by Listed Class CC Fuse (10A max.) or Listed inverse time circuit breaker (10A max.).

It is essential to comply with the power connection diagrams recommended in this manual.
The D350 includes devices which, in the event of problems, can de-energize or over excite the generator.
The generator itself can also become jammed for mechanical reasons.
Finally, voltage fluctuations or power cuts may also cause the unit to stop.
In an installation, the D350 is a device designed to be integrated into an electric cabinet or enclosed into the electrical machine, and can under no circumstances be considered to be a safety device. It is therefore the responsibility of the machine manufacturer, the designer of the installation or the user to take all necessary precautions to ensure that the system complies with current standards, and to provide any devices required to ensure the safety of equipment and personnel (especially direct contact with connectors when the AVR is running).
LEROY-SOMER declines all responsibility in the event of the above recommendations not being observed.
Please refer to D350 instruction manual, available in LEROY-SOMER Internet site, to ensure installation and wiring.
You must imperatively understand and comply with the safety instructions described in it.

CONTENTS OF THE KIT

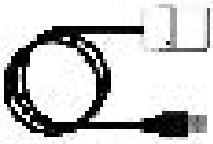
The SWITCH2D350 is a universal kit that allows replacement of R438, R448 and R450 analog regulators with a D350 digital regulator, regardless of the type of alternator installed.

It consists of:

- 1 D350 regulator

- 1 set of cables converting FASTON to MATE-N-LOK

- 1 plastic bag of lugs of various sizes to connect cables 9 and 10:
  - 2 lugs of diameter 6
  - 2 lugs of diameter 8
  - 2 lugs of diameter 10
  - 2 lugs of diameter 12
  - 1 9-pin connector
- 1 secondary cable set for connection of the current transformer (optional: to be connected if available in the alternator)
- 1 NFlink™ programming module (not applicable for the LITE version)



UPGRADING ANALOG REGULATOR

GENERAL CASE

- Remove the panels from the terminal box to access the analog regulator.
- Disconnect the FASTON connectors from the analog regulator.
- Unscrew and remove the analog regulator.
- Insert and screw in the D350 (M5 CBLX: 4 Nm ±1).
- Take the main cable set:
  - Connect the two 3- and 6- pin MATE-N-LOK foolproof connectors to the D350.
  - Connect all male FASTON tabs in the cable set to the corresponding female FASTON receptacles from the alternator.
- Optional: if necessary, connect the current transformer with the “2-pin MATE-N-LOK” cable set provided in the kit.

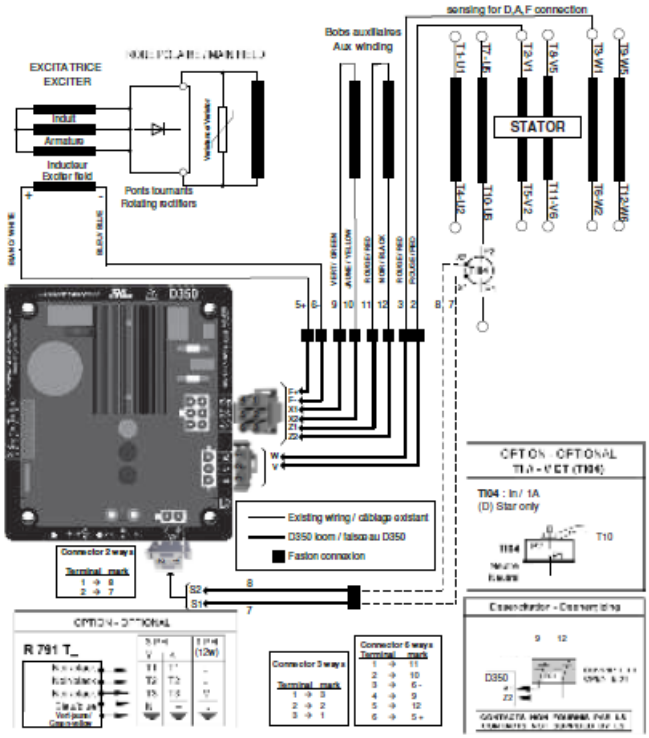
- Replace and tighten the lid of the terminal box.

Examples of tightening torques depending on the alternator used:

Alternator type	Tool	Tightening torque
LSA 40/42.2/42.3	M6 CBLX	3.6 Nm ±0.4
LSA 44.2/44.3	M5 H	5 Nm ±1
From LSA 46	M6 H	8 Nm ±1

Regulator wiring diagram

GENERAL CASE



UPGRADING ANALOG REGULATOR

SPECIAL CASE

For discontinued generators, the AREP voltage may be too weak to ensure the AVR voltage build up.
In this case, it is recommended to supply wires 9 and 10 directly from the generator's terminal box.

- For safety reasons, it is MANDATORY to insulate the yellow and green wires, marked 9 and 10, from the alternator.
- Select lugs corresponding to the sizes of the terminals on the alternator panel.

Examples of lug diameters depending on the alternator used:

Alternator type	Lug
LSA 40	M6
LSA 42.2/42.3	M8
LSA 44.2/44.3	M10
From LSA 46	M10

- Measure and then cut cables 9 and 10 according to the desired length before crimping the lugs.
  These cables are long enough to be attached attached to the other cables present in the terminal box.
- Crimp the two cables 9 and 10 with the lugs selected above.
- Connect wires 9 and 10 to the corresponding terminals on the alternator panel according to the following diagram, which includes the main connection diagrams.

For any other connection diagram, refer to the manual of the corresponding alternator or contact our technical support (**service.epg@leroy-somer.com**).

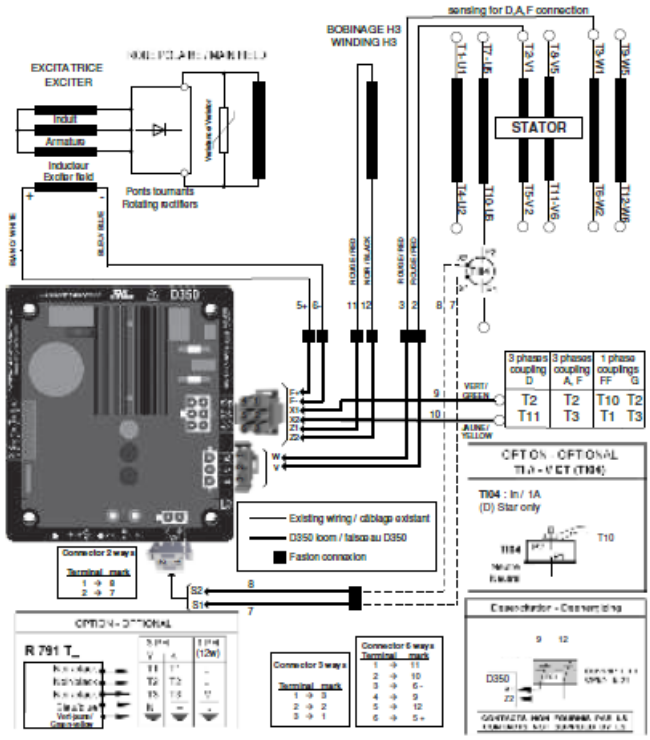
The voltage across 9 and 10 shall not exceed 277V.

- Tighten the nuts:

Nut	Tightening torque
M6	4 Nm ±1
M8	10 Nm ±1
M10	20 Nm ±3
M12	35 Nm ±5

Regulator wiring diagram

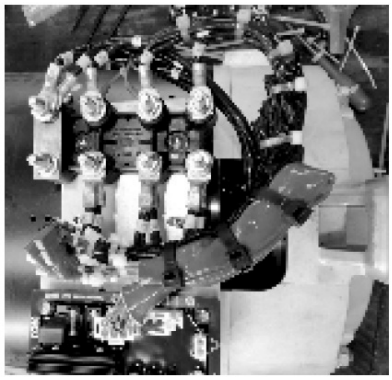
SPECIAL CASE

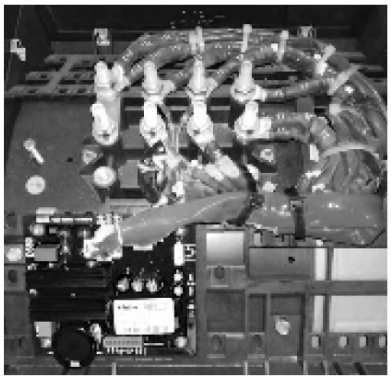


WIRING PRECAUTIONS

- Particular care should be taken in maintaining the cables in the terminal box in order to avoid any damage due to frictions or vibrations.
- To adjust the length according to the alternator frame and the layout of the terminal box, it is recommended to form a curve with the cable set.
- Avoid direct contact between the cable set and any exposed electrical part (terminal block studs, stator cable lugs) or any part that could physically damage the sleeve or wires.
- The cable sets must be properly maintained to avoid damage due to vibrations.

Examples of cable set arrangement on LSA 42.3 and LSA 44.3



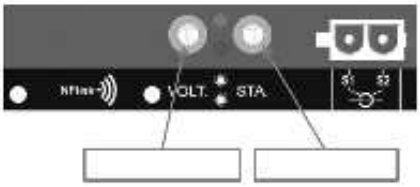


CONFIGURATION OF THE D350 DIGITAL REGULATOR

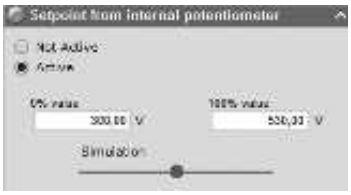
Operations as analogue

AVR
The D350 can be used as a simple analogue AVR.
Hereafter are the available features that can be used or adjusted without any computer.

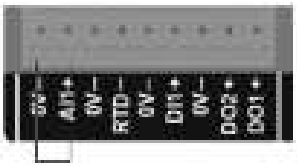
Voltage setting
For recall, 2 potentiometers are available on the D350.



VOLT Potentiometer is dedicated to voltage adjustment. Default factory setting allows to set the voltage from 300V to 530V as shown below.

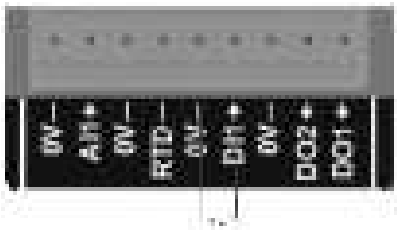


If lower voltage setpoint is needed (for example 230V), then a jumper must be used between AI1 and 0V terminals as below.



Stability setting
STA Potentiometer is dedicated to the stability setting.
With factory settings, counter-clockwise corresponds to low dynamics performance and full-clockwise will lead to high dynamics performances.
In general, potentiometer in middle position suits most of the cases.

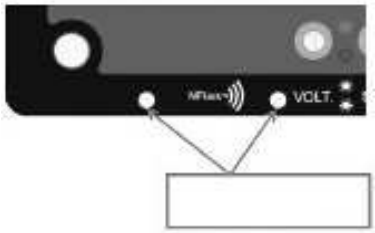
Switching 50/60Hz
This functionality allows to easily go from 50Hz to 60Hz.
In the D350, this can be done via the digital input named DI1 as shown below.



By default, this switching will only affect the AVR knee point and it is the user's responsibility to manually adjust the voltage setpoint to meet his requirements.

Configuration with "Easier advanced" PC software

Communicate with the D350
The communication with the D350 via the PC software is done using the NFLink™ module.
The configuration module hereafter called
NFLink™ is placed on the plastic enclosure thanks to two dedicated positioning holes as shown below.



Software installation
Step 1: Choose the installation language

Step 2: Choose the installation type

- Quick installation: the files are copied automatically and the software directory is created.
- Custom installation:
    - Choose the installation directory

- After selecting the directory, click “Next”
- Confirm by clicking “Install” if the path is as expected

Step3: Once installation is complete, you can choose to start the software (box ticked by default) and to manage the shortcuts.

- Click on “Done” to quit the installation page.

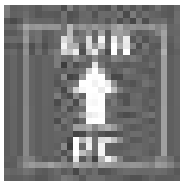
- A shortcut is created on your desktop:

- In order to have access to all the settings of the D350, use the “Expert” mode.

Import a predefined configuration

- Click on “Open a file”.

- Select the desired file.
- If there is no modification to be made, export the configuration to the AVR.



Create a new quick configuration

- Click on “New quick configuration”.

Step 1: Selection of the alternator

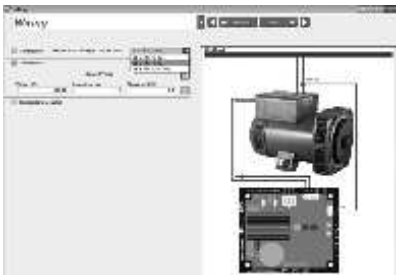
- Select the alternator type among those included in the database.

- Double click on the picture to continue the configuration process.

Step 2: Definition of the alternator features

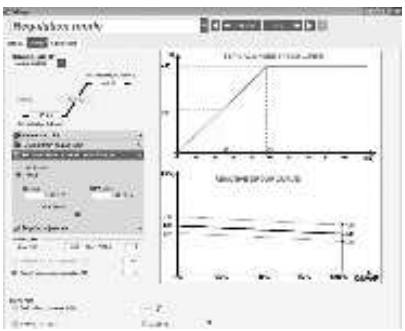
- Select the alternator core length.
- Define the excitation type (AREP, SHUNT or PMG).
- Select the frequency and the connection diagram.
  The right side picture is updated according to the user's selection.
- Selection the rated voltage and the thermal class.
- Then click on "Next".

Step 3: Wiring definition



- When a PT is used: tick the "Alternator PT" box and fill the primary and the secondary of the voltage transformer.
- When a CT is used: tick the "Alternator CT" box and fill the primary and the secondary of the current transformer.

Step 4: Regulation mode selection



- Voltage regulation: the box is ticked by default. Adjust the voltage setpoint if necessary.
- Reactive droop compensation: when a CT is connected this function can be activated and its value adjusted.
- Soft Start duration: this function can be used to ensure a smooth voltage build up.

Step 5: Configuration upload

- Click on “Upload your new configuration” to upload the configuration into the regulator. In that case, the not filled parameters will be completed thanks to the Easyreg Advanced database.
- When clicking on “Continue the configuration in custom mode”, the user will access to a configuration mode which contains all the parameters menus initialized with the values that were defined on quick configuration mode.

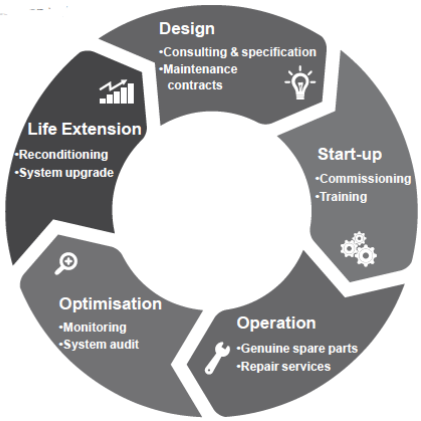
Scan the QR code or go to **http://lrsm.co/d350** to access to the product page where you will find:

- D350 regulator maintenance manual (ref. 5611en)
- “Easy Reg Advanced” software

Service & Support

Our worldwide service network of over 80 facilities is at your service.
This local presence is our guarantee for fast and efficient repair, support and maintenance services.
Trust your alternator maintenance and support to electric power generation experts.
Our field personnel are 100% qualified and fully trained to operate in all environments and on all machine types.
We have a deep understanding of alternator operation, providing the best value service to optimize your cost of ownership.

Where we can help:



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- China: +86 591 88373036
- India: +91 806 726 4867
- service.epg@leroy-somer.com

Scan the code or go to:

www.lrsm.co/support

Documents / Resources

	Nidec SWITCH2D350 Leroy Somer Upgrading An Analog Regulator [pdf] Installation Guide SWITCH2D350, Leroy Somer Upgrading An Analog Regulator, SWITCH2D350 Leroy Somer U pgrading An Analog Regulator, Upgrading An Analog Regulator, Analog Regulator, Regulator

References

- Leroy-Somer
- Leroy-Somer D350 AVR - digital automatic voltage regulator - Generators
- AVR Leroy-Somer D350 - régulateur de tension automatique numérique - Alternateurs Leroy-Somer
- Leroy-Somer SWITCH2D350 kit - Generators
- Leroy-Somer kit SWITCH2D350 - Alternateurs Leroy-Somer
- Somer Dental Labs | Quality, Experience, Consistency

- Automation Solutions | Emerson US
- Leroy-Somer Alternators - Generators
- Leroy-Somer Service & Support - Generators