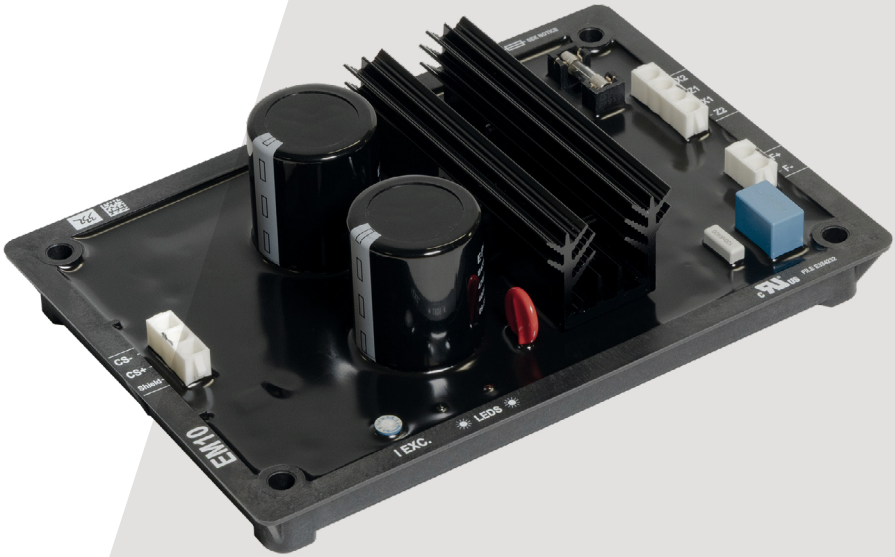
Nidec Power



EM10

Excitation Module

Installation and maintenance

LEROY-SOMER™

EM10
Excitation Module

This manual concerns the EM10 which you have just purchased.
We wish to draw your attention to the contents of this maintenance manual.

SAFETY MEASURES

Before using your EM10 for the first time, it is important to read the whole of this installation and maintenance manual.
All necessary operations and interventions on this machine must be performed by a qualified technician.
For field applications relative to for instance nonlinear loads, transformers magnetizations or huge load impacts and load shedding, it is highly recommended to contact our technical support service in order to fine tune the factory settings of the voltage regulator. Our technical support service will be pleased to provide any additional information you may require.
The various operations described in this manual are accompanied by recommendations or symbols to alert the user to potential risks of accidents. It is vital that you understand and take notice of the following warning symbols.

WARNING

Warning symbol for an operation capable of damaging or destroying the machine or surrounding equipment.

Warning symbol for general danger to personnel.

Warning symbol for electrical danger to personnel.

All such operations performed on the EM10 should be undertaken by personnel trained in the commissioning, servicing and maintenance of electrical and mechanical components.

WARNING

The EM10 can be incorporated in a EC-marked machine.

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Excitation Module

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1 - GENERAL DESCRIPTION

The EM10 Excitation Module is a power electronics component designed to provide excitation current to the generator that is controlled by an External Voltage Regulator (EVR).

Nidec Power is leading the power generation marketplace with power solutions engineered to deliver unmatched flexibility, expandability, reliability and cost-effectiveness.

1.1 - Features

- Over-excitation protection – limit can be adjusted via a potentiometer (IEXC)
- Green status LED indicating unit is powered on
- Red status LED indicating excitation current limiting (flashing) or shutdown (solid)

The External Voltage Regulator system offers:

- Automatic Voltage Regulation (AVR)
- Programmable stability settings
- Soft start control with an adjustable time setting in AVR control mode
- Dual Slope Under Frequency (Volts / Hz) regulation
- Three-phase or single-phase generator voltage (RMS) sensing/regulation in AVR mode

The EVR can also offer:

- Power Factor Regulation (PF)
- Generator paralleling with reactive droop compensation
- Line drop compensation

1.2 - Complete system integration

The EM10 is designed and factory tested to work seamlessly with Leroy-Somer™ alternators using Shunt Excitation (SE), AREP Excitation (AREP) or Permanent Magnet (PMG) excitation systems.

2 - SPECIFICATIONS

2.1 - Electrical

Generator excitation types	Shunt excitation / AREP excitation / Permanent Magnet (PMG)
Max. continuous field current output	6 Amps
Max. forcing field current output	10 Amps
Max. AC voltage input (X1:X2, Z1:Z2)	180 Vrms
Internal fuses	cULus recognized fuses Shunt: 5x20 10A 250V Fast acting Ir >1.6kA AREP, PMG : 5x20 10A 250V Fast acting Ir >100A

2.2 - Environmental

Operating temperature range	-40 °C (−40 °F) to +70 °C (+158 °F)
Storage temperature range	-40 °C (−40 °F) to +85 °C (+185 °F)
Relative humidity tolerance	95% non-condensing humidity
Salt spray	5% salt (NaCl) solution for 120 hrs
Vibration	4.5 G-rms, 24-2000 Hz in 3 orthogonal planes
Electromagnetic compatibility	RF Immunity (radiated & conducted) RF Emissions (radiated & conducted) Electrical transients
Weight	800 g ± 30 g
Power consumption (at max.continuous rating)	<450 VA

2.3 - Conformity

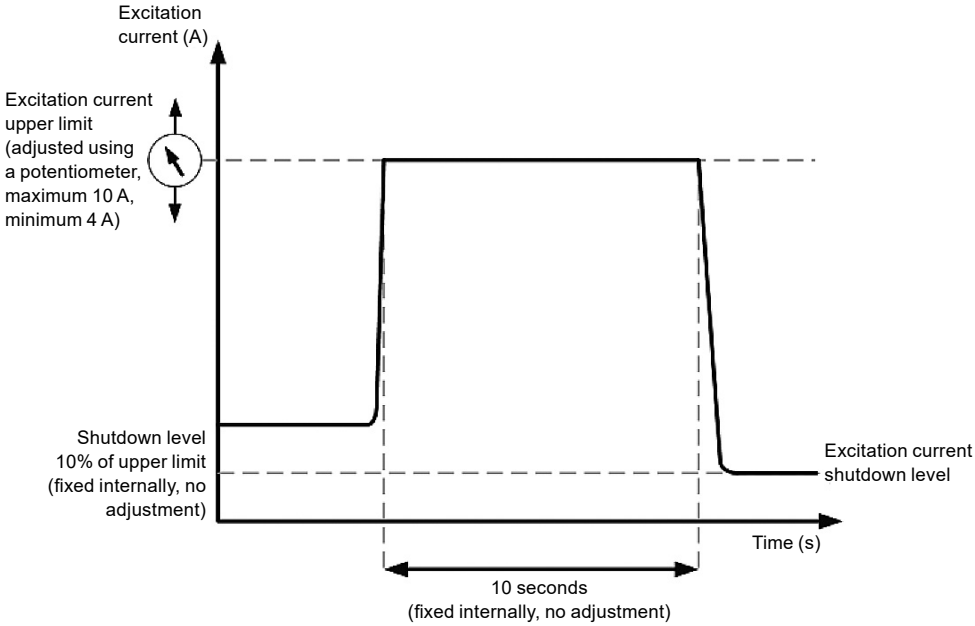
UL	UL Recognized (U.S. and Canada) File No. E334232
CE integration certificate	In conformity with the applicable requirements of the following standards: EN 50178 EN 60204-1 EN 61000-6-2 EN 61000-6-4

3 - OVER-EXCITATION PROTECTION

If a short-circuit fault occurs at the generator terminals, the EM10 will allow the excitation current to rise to the upper limit value set by the adjustment potentiometer (max. 10 A).

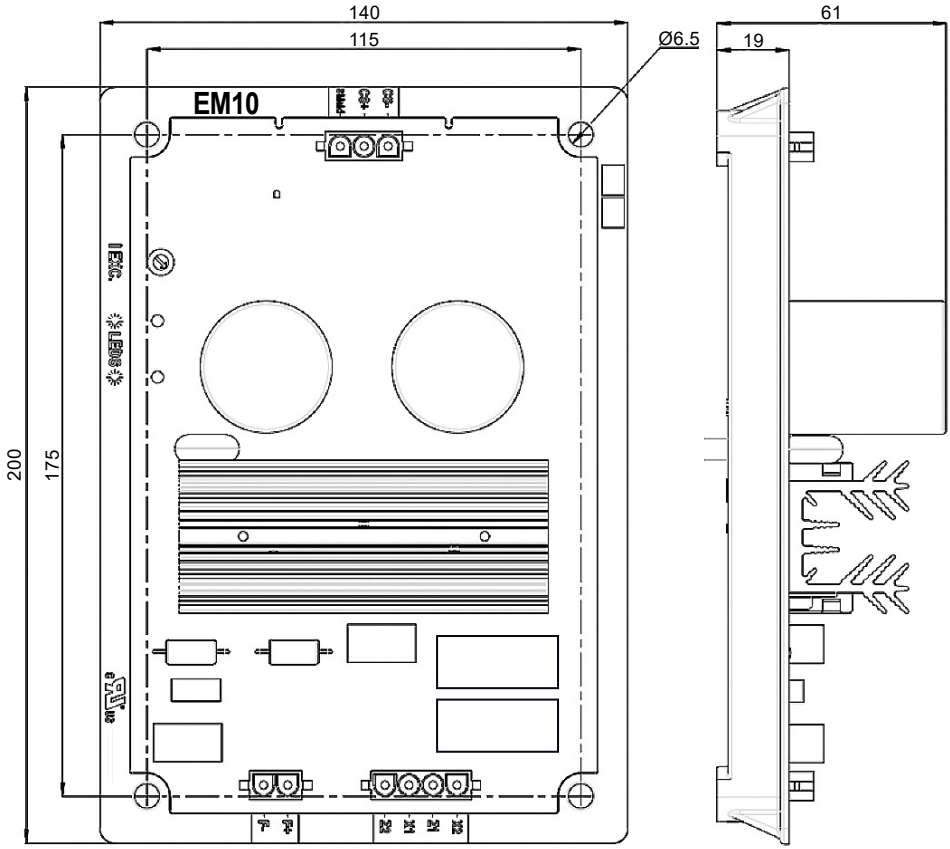
The excitation current will be clamped at the upper limit value for 10 seconds (fixed internally).

After 10 seconds, the excitation current is reduced to a value of 10% of the maximum potentiometer setting.



4 - DIMENSIONS

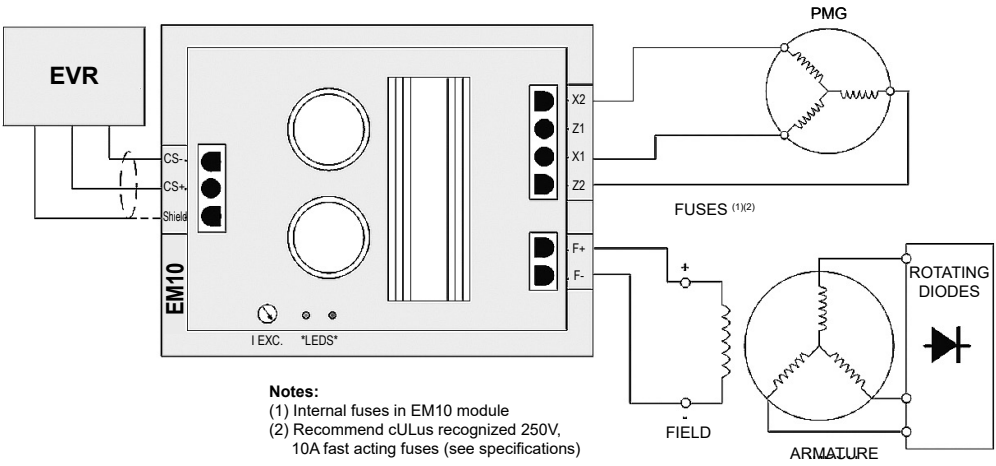
(in mm)



EM10
Excitation Module

5 - EXAMPLE CONNECTION DIAGRAM

(Permanent Magnet Excitation)



Notes:
(1) Internal fuses in EM10 module
(2) Recommend cULus recognized 250V, 10A fast acting fuses (see specifications)

2-way Connector Functions:

Label	Function
F+	Exciter Field Positive Output
F-	Exciter Field Negative Output

3-way Connector Functions:

Label	Function
Shield	Excitation Command Shield
CS+	Excitation Command Positive Input
CS-	Excitation Command Negative Input

4-way Connector Functions (PMG Excitation):

Label	Function
X2	Excitation Power Supply Input (PMG Phase B)
Z1	Not Connected
X1	Excitation Power Supply Input (PMG Phase A)
Z2	Excitation Power Supply Input (PMG Phase C)

4-way Connector Functions (Shunt Excitation):

Label	Function
X2	Excitation Power Supply Input (Single-phase)
Z1	Not Connected
X1	Excitation Power Supply Input (Single-phase)
Z2	Not Connected

4-way Connector Functions (AREP Excitation):

Label	Function
X2	Excitation Power Supply Input (Aux Winding 1 - H1)
Z1	Excitation Power Supply Input (Aux Winding 2 - H3)
X1	Excitation Power Supply Input (Aux Winding 1 - H1)
Z2	Excitation Power Supply Input (Aux Winding 2 - H3)

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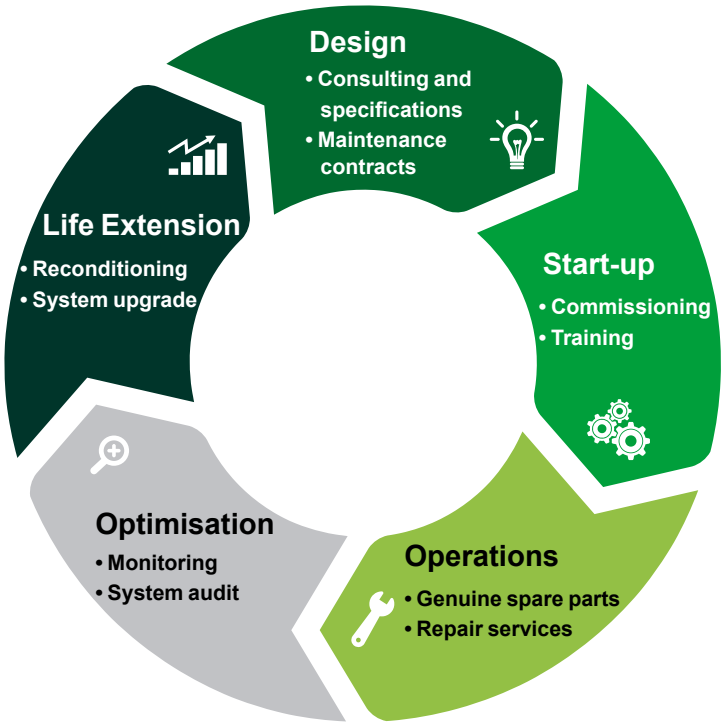
Service & Support

Our worldwide service network of over 80 facilities is at your service. Our local presence is your 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 alternators operations, providing the best value service to optimize your cost of ownership.

How can we help:



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Scan the code or go to:
www.lrsm.co/support

Nidec

All for dreams

www.nidecpower.com

Connect with us at:

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