
EXCITATION MODULE



EM15

The EM15 Excitation Module is a power electronics component designed to provide excitation current to the generator that is controlled by the Integrated Voltage Regulator (IVR) feature in the EMCP 4 controls.

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

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)

When used with EMCP 4.3/4.4 and IVR-compatible EMCP 4.1/4.2 controllers, the Integrated 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

EMCP 4.3/4.4 and IVR-compatible EMCP 4.2 controllers also offer:

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

WORLDWIDE PRODUCT SUPPORT

- Worldwide parts availability through the Cat® dealer network
- Over 1,800 dealer branch stores operating in 200 countries
- The best product support record in the industry

COMPLETE SYSTEM INTEGRATION

Fully designed and factory tested to work seamlessly with Cat generators using Self Excitation (SE), Internal Excitation (IE) or Permanent Magnet (PMG) excitation systems and EMCP controls.

EXCITATION MODULE – EM15



SPECIFICATIONS

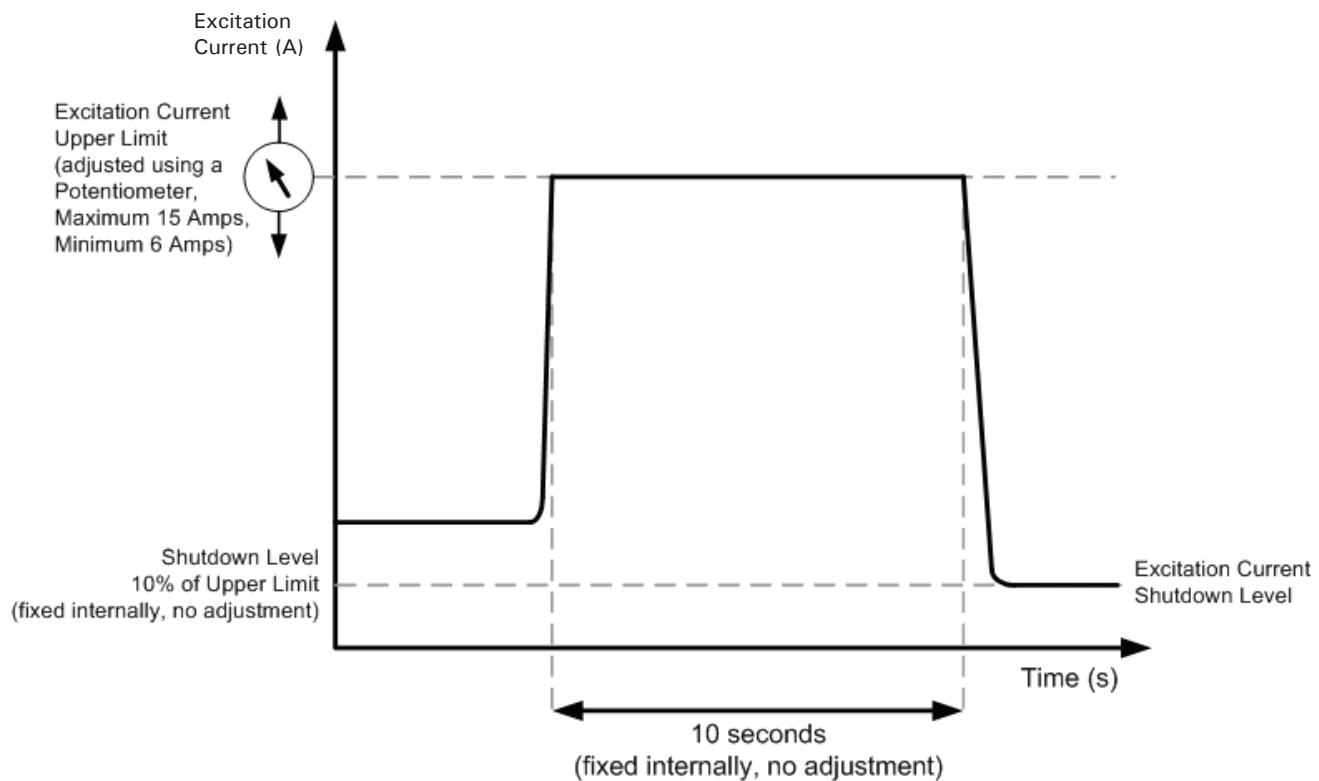
ELECTRICAL	
Generator ExcitationTypes	Self Excitation / Internal Excitation / Permanent Magnet (PMG)
Max. Continuous Field Current Output	7 Amps
Max. Forcing Field Current Output	15 Amps
Max. AC Voltage Input (X1:X2, Z1:Z2)	240Vrms
ENVIRONMENTAL	
Operating Temperature Range	-40 °C (-40 °F) to +70 °C (+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)	<600VA
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

EXCITATION MODULE – EM15



OVER-EXCITATION PROTECTION

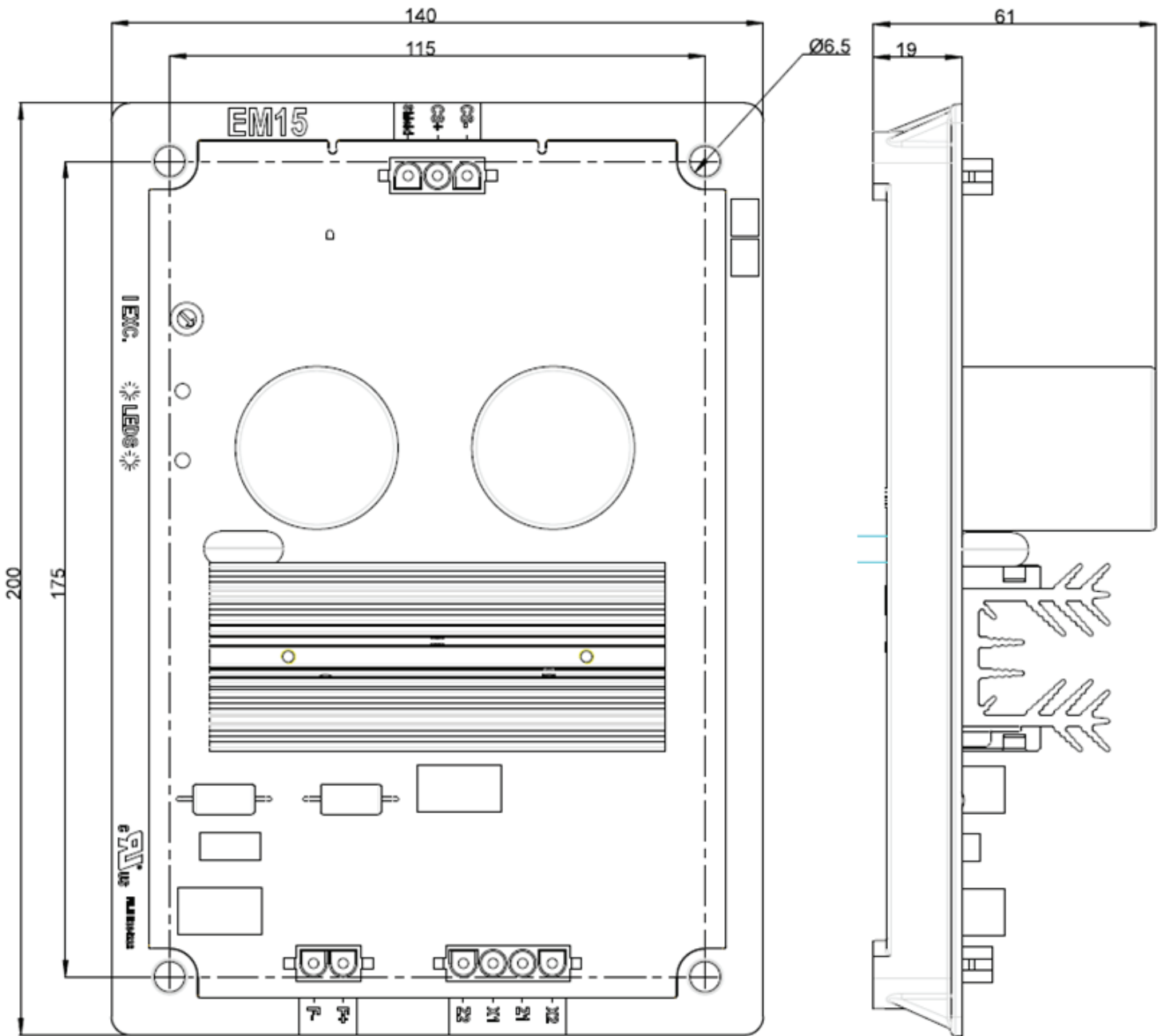
- If a short-circuit fault occurs at the generator terminals, the EM15 will allow the excitation current to rise to the upper limit value set by the adjustment potentiometer (max. 15 Amps).
- The excitation current will be clamped at the upper limit value for 10 seconds (fixed internally).
- After 10 seconds, the excitation current is reduced to a value of 10% of the potentiometer setting.



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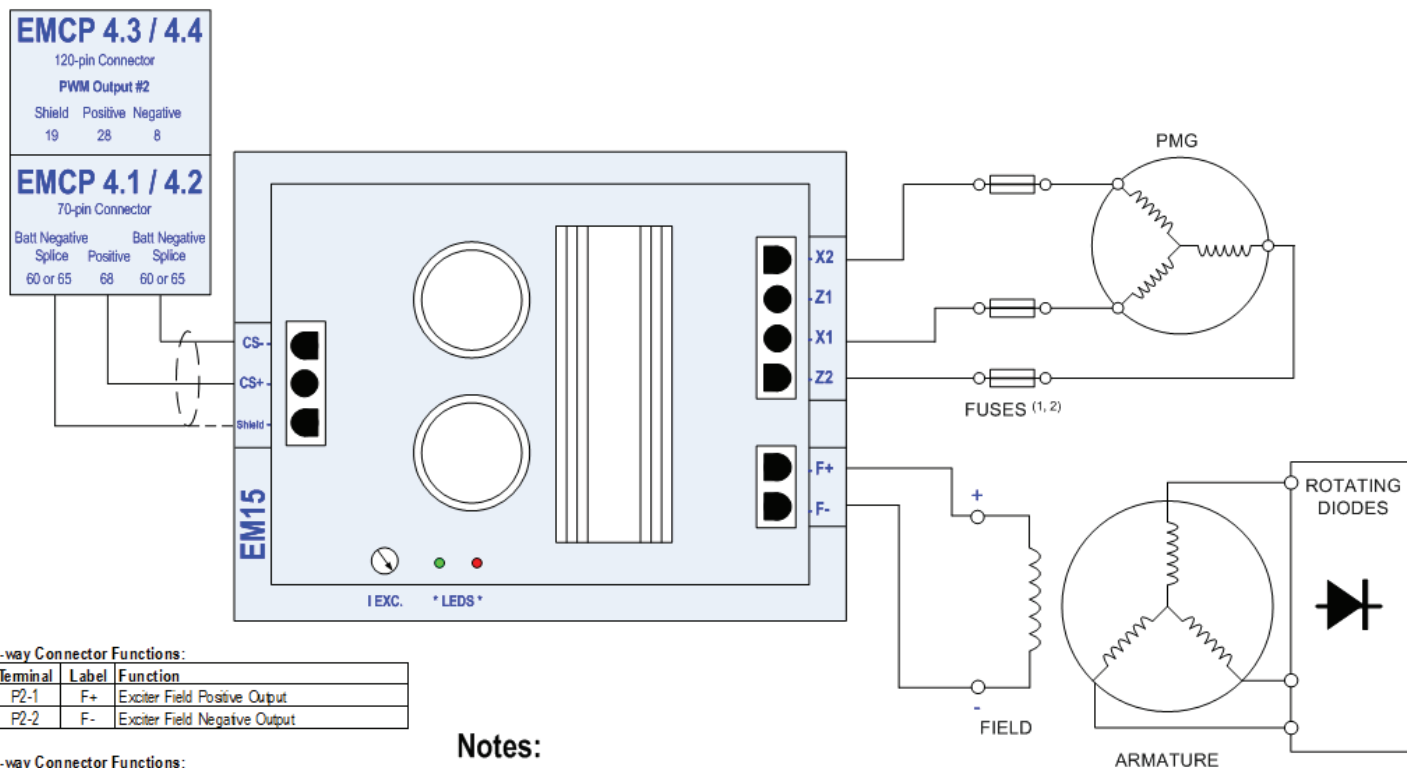
OUTLINE DRAWING (Dimensions in mm)



EXCITATION MODULE – EM15



EXAMPLE CONNECTION DIAGRAM (Permanent Magnet Excitation)



2-way Connector Functions:

Terminal	Label	Function
P2-1	F+	Exciter Field Positive Output
P2-2	F-	Exciter Field Negative Output

3-way Connector Functions:

Terminal	Label	Function
P3-1	Shield	Excitation Command Shield
P3-2	CS+	Excitation Command Positive Input
P3-3	CS-	Excitation Command Negative Input

4-way Connector Functions (PMG Excitation):

Terminal	Label	Function
P4-1	X2	Excitation Power Supply Input (PMG Phase B)
P4-2	Z1	Not Connected
P4-3	X1	Excitation Power Supply Input (PMG Phase A)
P4-4	Z2	Excitation Power Supply Input (PMG Phase C)

Notes:

- (1) External fuses required with EM15 module
- (2) Recommend 250V, 10A fast acting fuses

4-way Connector Functions (Self-Excitation):

Terminal	Label	Function
P4-1	X2	Excitation Power Supply Input (single-phase)
P4-2	Z1	Not Connected
P4-3	X1	Excitation Power Supply Input (single-phase)
P4-4	Z2	Not Connected

4-way Connector Functions (Internal Excitation):

Terminal	Label	Function
P4-1	X2	Excitation Power Supply Input (Aux Winding 1 - Positive)
P4-2	Z1	Excitation Power Supply Input (Aux Winding 2 - Positive)
P4-3	X1	Excitation Power Supply Input (Aux Winding 1 - Negative)
P4-4	Z2	Excitation Power Supply Input (Aux Winding 2 - Negative)

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