THE POWER OF SYNERGY

ZSM

Ignition module for synchronous PTO/PTI machines

Instruction Manual V1.3

Product version V1.0.1.0

WARNINGS AND COMMISSIONING INFORMATION

HAZARDOUS VOLTAGES.
DO NOT OPERATE WHEN NOT FAMILIAR WITH GENERATORS.

- ***Check the isolation of the generator windings before installation.***
  Poor isolation will cause damage to the AVR and dangerous situations for persons.
- The system should not be installed, operated, serviced or modified except by qualified personnel who understand the danger of electric shock hazards and have read and understood the user instructions.
- Never work on a LIVE generator. Unless there is another person present who can switch off the power supply or stop the engine.
- Dangerous voltages are present at the voltage regulator board. Accidental contact with live conductors could result in serious electrical shock or electrocution.
- Disconnect / lock the power source before making repairs, connecting test instruments, or removing or making connections to the voltage regulator or generator.
- Defects in the generator, windings, resistor, SCR, rotating rectifier or AVR may cause consequential defects. Precautions must be taken to prevent this from occurring.
- Prevent the generator from starting automatically or manually prior to working on the rotating part of the generator.
- Inspect the other, related above listed parts on healthy state or proper functioning prior operating the generator.
- The unit should be installed securely. Tighten all wires securely. Do not stand aside of an opened generator after initial installation of the ZSM during commissioning or test.
- The unit should be installed with respect to the environmental specifications.

REVISION HISTORY

Version			Change
Product	Hardware	Manual	
V1.0.0.0	1.0	1.1	*First release*
V1.0.1.0	1.0.1	1.2	*New manual layout, Improved temp range.*
V1.0.1.0	1.0.1	1.3	*Installation guidelines added*

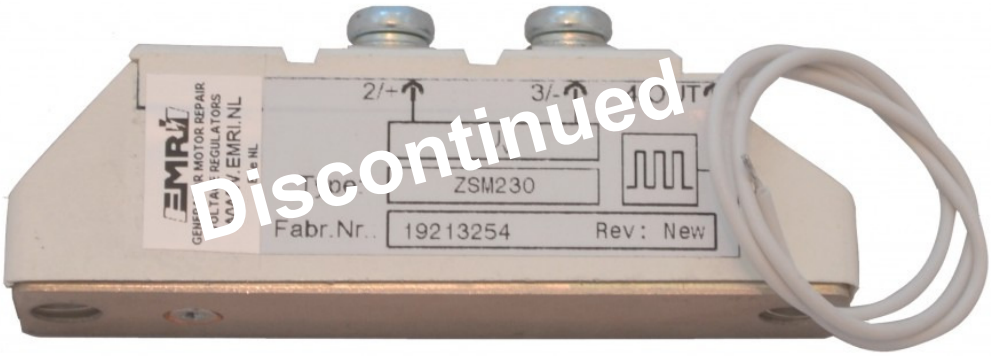
The table provides a historical summary of the changes made to the ZSM.
Revisions are listed in chronological order.

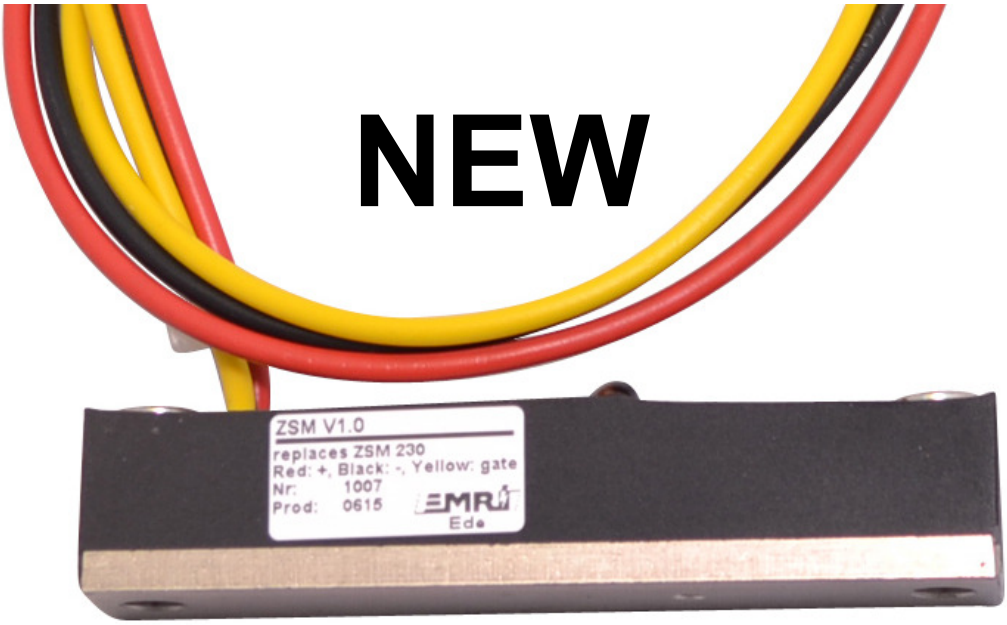
The manual does not cover all technical details of the product. Specifications may be modified by the manufacturer without notice. For further information, the manufacturer should be contacted.

TABLE OF CONTENTS

GENERAL DESCRIPTION

The ZSM ignition module is used in synchronous machines to release excitation for the main rotor poles, enabling synchronous motor operation in PTI mode, or power generation in PTO mode. The module replaces the previously manufactured AVK/SEG/WOODWARD ZSM230 modules.





ABSOLUTE MAXIMUM RATING

Symbol	Parameter	Condition	Min.	Max.	Unit
Voltage	Supply +.-	DC	0	250	V_{DC}
		< 10s.	0	375	V_{DC}
VA	Power	> 30 Volt.	7	-	VA
Operation	Duty cyle	S1 (continuously)	-	S1	%
Gate	Voltage	Peak value	-	13	V
	Current	Peak value	-	1.5	A
Insulation	All circuits to mounting	1000 Volt	-	>20	MΩ
Mounting	Moment		-	5 +/-15%	Nm
	Angle	Not critical	-	-	
Weight	Kg		-	0.1	Kg
T_{AMB}	Operating temperature	95% RHD non condensing Mounting plate temperature ≤ 120°C	-40	+70	°C
T_{STG}	Storage temperature	95% RHD non condensing	-45	+85	°C

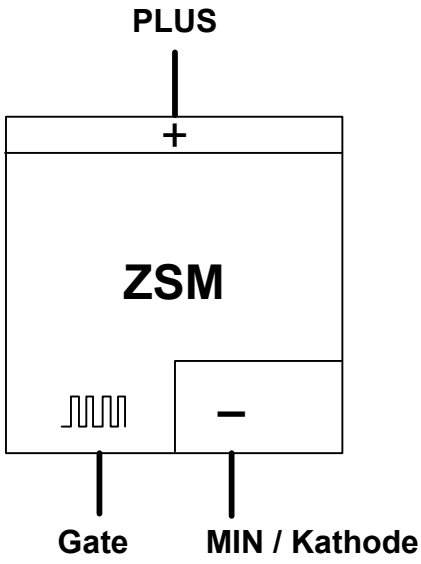
Stresses above “Absolute Maximum Ratings” may cause permanent damage to the device. This is a stress rating only and functional operation of the device at those or any other conditions above those indicated in the operation listing of this specification is not implied. Exposure to maximum rating conditions for extended periods may affect device reliability and lifetime.

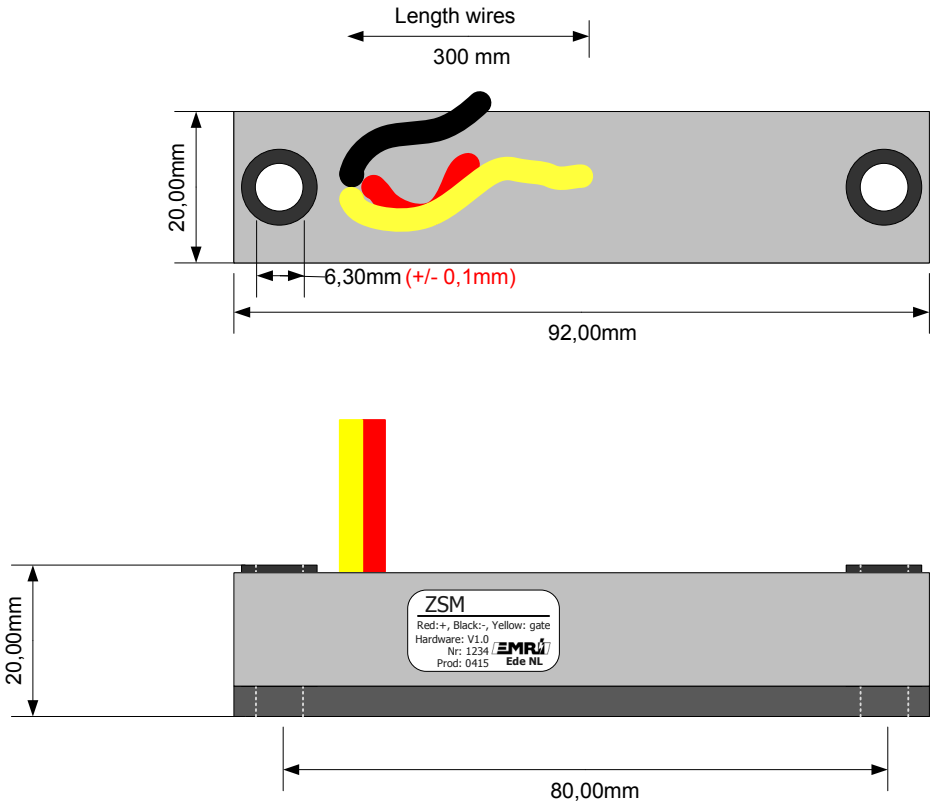
QUICK REFERENCE

The EMRI ZSM module dimensions complies with the previously supplied versions in Semipack 1 housing. The way of connection is improved and matches all previous configurations.
30 cm long leads must be connected to the corresponding signals on the main rotor with cable lugs and AMP Faston connector. Pay attention to adapt the lengths of the cables and fasten the cables very good on the rotating part of the generator.
The ZSM has two sensing connections and one output connection.

The input and output wires are coloured to match with its function.

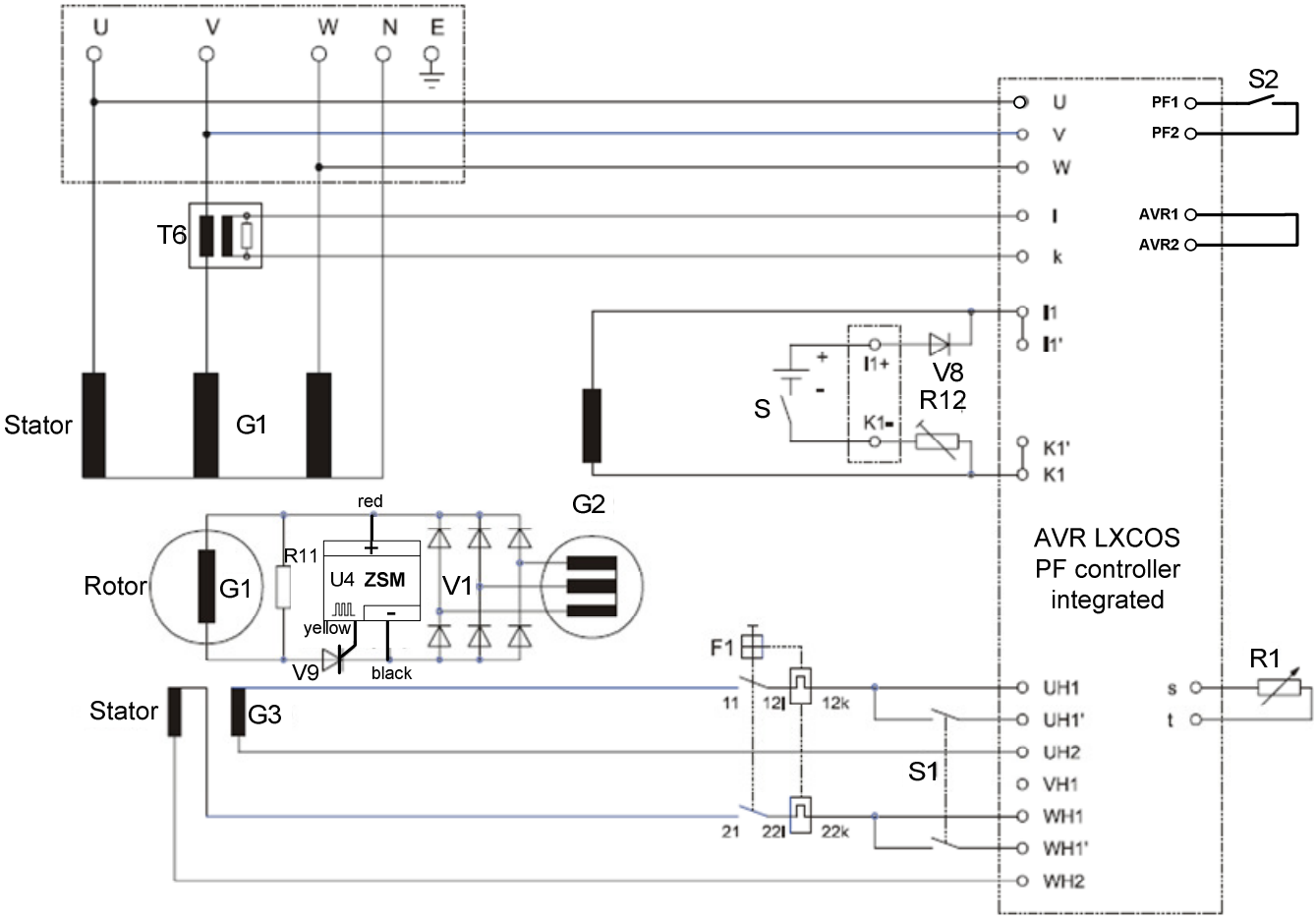
- Red is positive (2/+)
- Black is minus (3/-)
- Yellow is gate signal (4/OUT ⎍⎍⎍)





WIRING DIAGRAM

ZSM with LXCOS

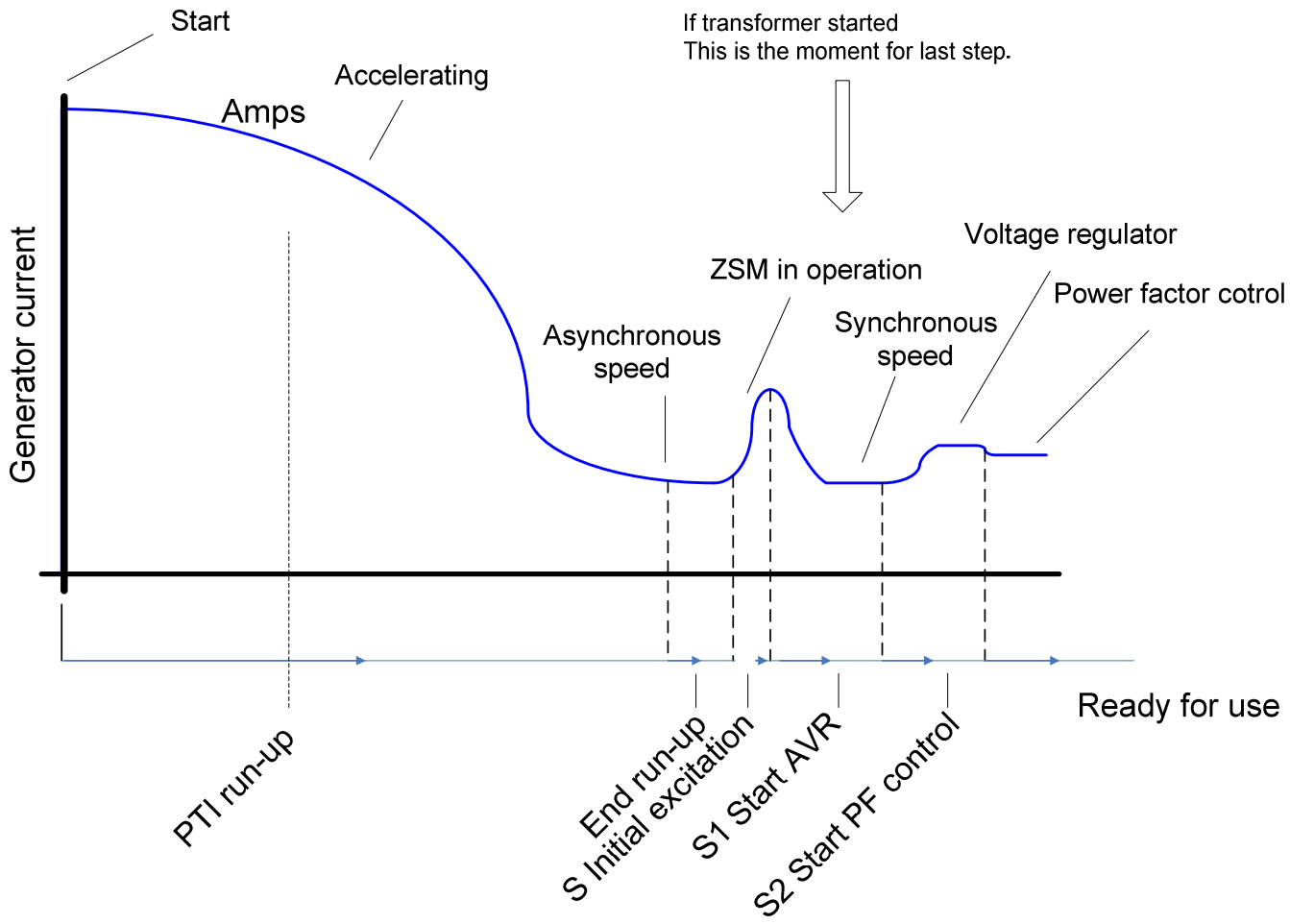


Explanations:

G1	Main generator
G2	Exciter generator
G3	Auxiliary windings
V1	Rotating rectifier
V9	SCR/Thyristor
T6	Droop transformer
R1	External setpoint adjuster
R11	Protective resistor
R12	Pre-excitation resistor (Optional)
U4	Iginition Module
F1	Protective switch
S	Start initial excitation after run-up
S1	Start automatic excitation after initial exc.
S2	Closed during PTI operation

SEQUENCE OF OPERATION

ZSM with LXCOS

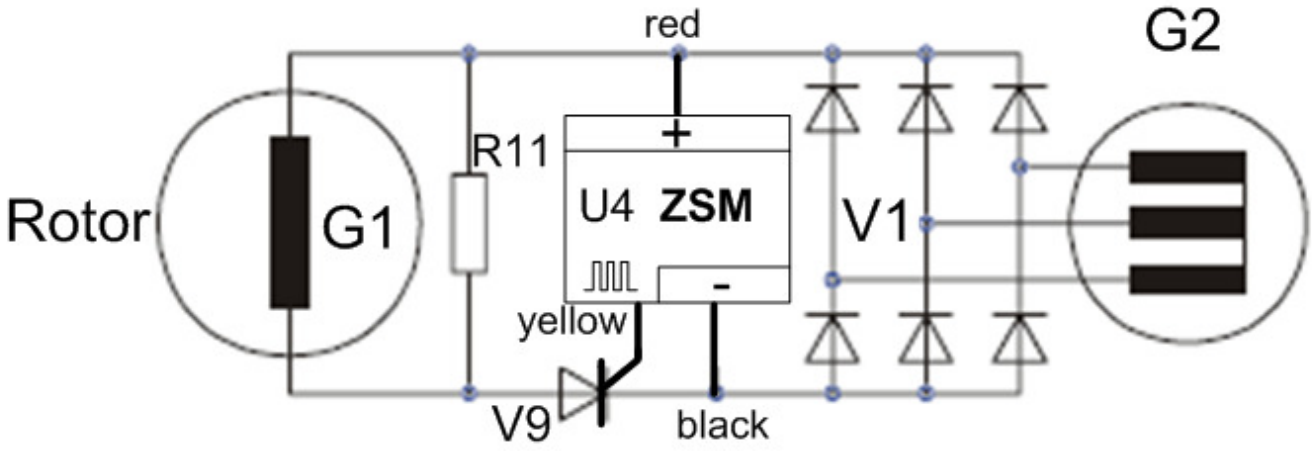


INSTALLATION I

The new ZSM uses three leads with different colours.

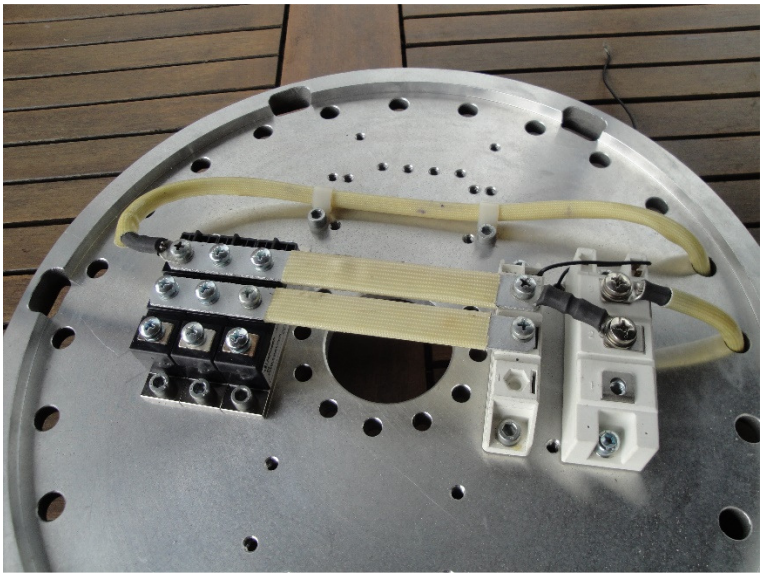
Colour codes:

YELLOW	Gate ignition for soldering at V9 the thyristor gate (4)
RED	Positive V1 for connection to + of rotating rectifier. Cable lug (AMP)
BLACK	Negative V1 for connection to - of rotating rectifier. Cable lug (AMP)



DSU86 and larger

As a result of the new physical shape the ZSM module another setup on the rotating resistor rectifier carrier may be required.



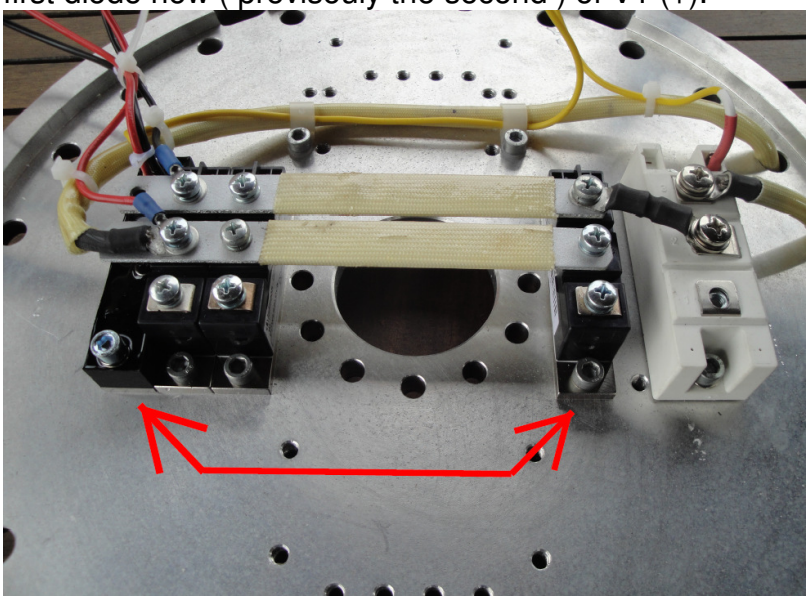
DSU86 and larger setup

The diode module installed opposite side from the Thyristor module si fitted should replaced to the old ZSM module position. The free position due to the replaced diode will be used for the new ZSM.
The RED and Black leads are to be cut on length and connected to the positive and negative rectifier poles.

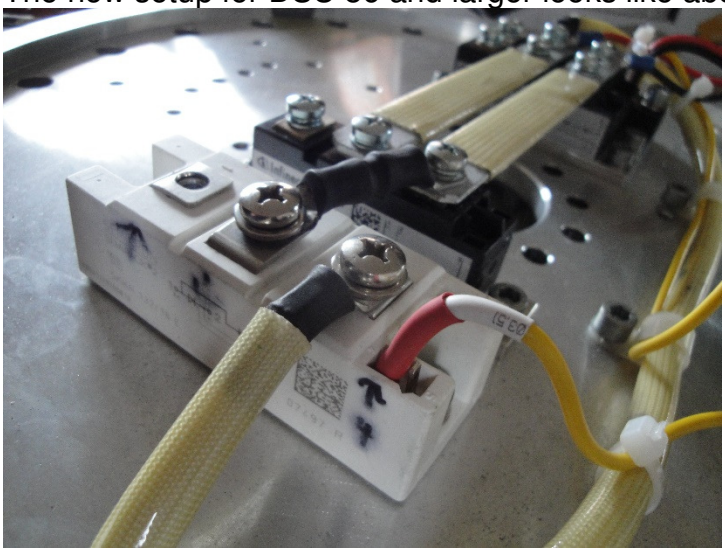
INSTALLATION II

The YELLOW lead is to be guided along the rotating resistor wiring to the Thyristor gate connection, to be cut on length and to be soldered to the gate (4) and fixed with shrink tube and cable ties to prevent mechanical stress.

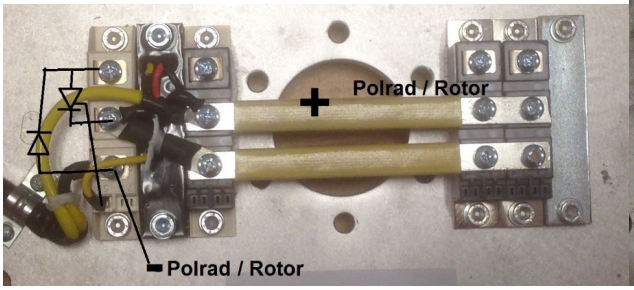
The cable from rotating resistor prior connected to the replaced diode is to be connected to the first diode now (previsouly the second) of V1 (+).



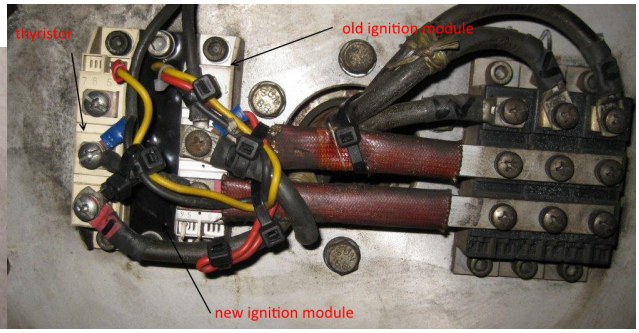
The new setup for DSU 86 and larger looks like above. One diode module and ZSM are swapped.



Yellow lead, cut on length and to be soldered to the gate (4) and fixed with shrink tube and cable ties to prevent mechanical stress.



This is how it will look like

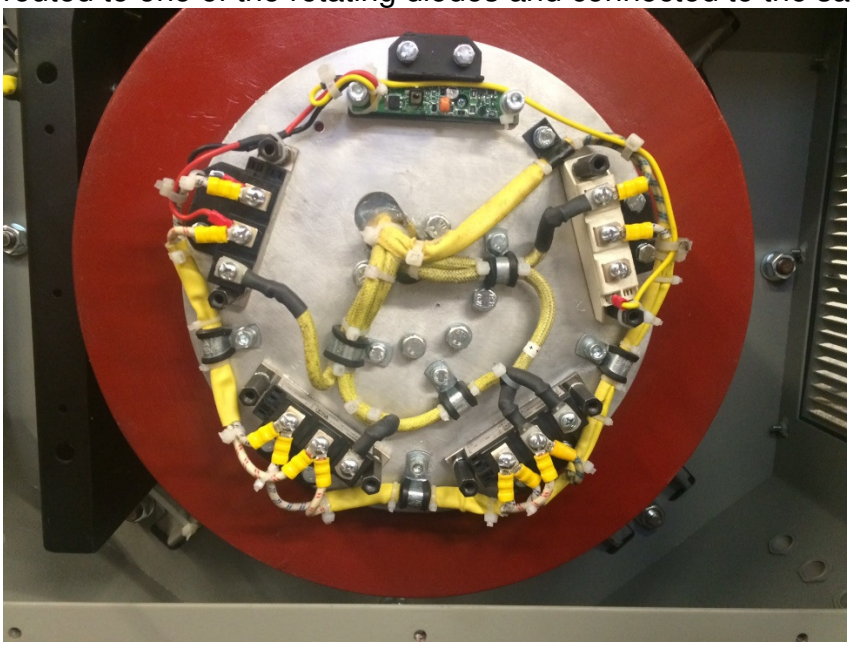


another option for mounting

INSTALLATION III

DSU62 and DSU74

On the resistor and rectifier carrier of DSU62 and DSU74 there will be modification in the wiring. The rotorpole cables to "2"(+) and "3"(-) shall be redirected to the next rotating diode module beside. + and -.
In case a rotor lead or a lead from rotating resistor was connected to the ZSM, it has to be re-routed to one of the rotating diodes and connected to the same polarity(+,-) as before.



Wiring DSU74 diode carrier.

If doubts on correct installation:
Contact the supplier with a photograph of the existing situation which include the marking of the cables :

AC1, AC2, AC3 (exciter rotor winding)
+, - (Positive and negative of the main rotor poles)
R, R (Resistor connection)
Type of diodemodule

Empty page

CONTACT

EMRI Electronics B.V.
Morsestraat 10
6716 AH, Ede, Netherlands
Tel: +31 (0)318 620 427
Website: www.emri.nl
E-mail: info@emri.nl

Manufacturer

THE POWER OF SYNERGY

CANARY ISLANDS, Las Palmas
Zamakona Yards
Tel: +34 928467521
Fax: +34 928461233
Website: www.zamakonayards.com/
E-mail: jbetancor@zamakonayards.com

CHILE, Santiago
Lucio Vicencio y CIA.LTDA
Tel: +1-281-334-2904
Fax:: +1-832-221-5642
Website: www.luciovicencio.cl
E-mail: luciovincencioltda@gmail.com

GREECE, Piraeus
Stavros Kassidiaris S.A.
Tel: +30 210 4636000
Fax: +30 210 4624471
Website:www.kassidiaris.gr
E-mail: info@kassidiaris.gr

ICELAND, Hafnarfjordur
Rafeining ehf
Tel: +354 565 3049
Fax: +354 565 3048
Website: www.rafeining.is
E-mail: rafeining@rafeining.is

INDIA, Faridabad
Power Solutions
Tel: +91 9868907903
Fax:: +91 129 2431216
Website: www.psolindia.com
E-mail: ramesh.powersolutions@gmail.com

NORWAY, Bergen
Frydenbø Electric A/S
Tel: +47 55 34 91 00
Fax: +47 55 34 91 10
Website: www.frydenbo.no
E-mail: firma.fel@frydenboe.no

POLAND, Gdynia
An-Elec Sp. z o.o.
Tel: +48 58 668 44 00
Fax: +48 58 668 44 66
Website: http://an-elec.pl
E-mail: info@an-elec.pl

POLAND, Szczecin
MARCONTREL
Tel: +48 91 4 888 474
Fax: +48 91 4 888 475
Website: www.marcontrel.com
E-mail: emri@marcontrel.com

POLAND, Szczecin-Mierzyn
Marel Serwis
Tel: +48 91 48 58 388
Fax: +48 91 48 79 948
Website: www.marel.szczecin.pl
E-mail: handel@marel.szczecin.pl

REPUBLIC OF PANAMA, Panama
PASRAS S.A.
Tel: +507 3140095
Fax: +507 3140094
Website: www.pasras.com
E-mail: info@pasras.com

ROMANIA, Constanta
SAMTEC SRL
Tel: +40 241 517 047
Fax: +40 241 517 047
Website: www.samtec.ro
E-mail: samtec_srl@yahoo.com

SINGAPORE, Singapore
Cyclect Electrical Engineering
Tel: +65 6868 6013
Fax: +65 6863 6260
Website: www.cyclect.com.sg
E-mail: heng.p@cyclect.com.sg

SOUTH AFRICA, Roodepoort
Yneldo Electronics
Tel: +27(0)117637053
Fax: +27(0)117634212
Website: www.yneldo.com
E-mail: yneldo@yneldo.com

SWEDEN, Kungälv
Elektrisk Drivteknik EDT AB
Tel: +46-705-28 20 60
Tel: +46-709-50 47 90
Website: www.edtab.se
E-mail: info@edtab.se

THAILAND, Bang Lamung
Semtec Maritime/Genetech Co.Ltd
Tel: +66 38301262
Fax: +1-832-221-5642
Website: semtecmaritime.com/
Email: ron@northstarusa.co

TURKEY, Izmir
INTEGRAL
Tel: +90 (555) 211 55 75
Email: ozgur@integralguc.com

UNITED ARAB EMIRATES, Sharjah
KDU Technical Services
Tel: +971-6-5575480
Fax: +971-6-5575490
Website: www.kdutech.ae
E-mail: kdutech@kdutech.ae

UNITED KINGDOM, Stockton on Tees
MJR Controls
Tel: +44 1642 762 151
Fax: +44 1642 762 502
Website: www.mjrcontrols.com
Email: chris.milner@mjrcontrols.com

UNITED KINGDOM, Cheadle Hulme
TGS Total Generator Solutions Ltd
Tel: +44161 8188720
Fax: +447754677963
Website: http://totalgeneratorsolutions.com
Email: sales@totalgeneratorsolutions.com

UNITED STATES, Kemah - Texas
Ramtec Marine Systems LLC
Tel: +1-281-334-2904
Fax: +1-832-221-5642
Website: www.ramtec-marine.com
Email: waling@ramtec-marine.com