



LEGA ENERGY ELECTRONIC

200-3000 KVA THREE-PHASE SERVO REGULATOR



**INSTRUCTIONS FOR USE
SERVO THREE-PHASE VOLTAGE REGULATOR**



Important Notice!

Thank you for preferring us. Your product has been designed to protect your sensitive devices for years.

This manual contains very important information both as to specifications, installation and operation of regulator and as to safety of regulator and related loads. It is essential to thoroughly read and understand the manual and follow instructions for proper and safe operation and maximum performance of product.



Read completely and thoroughly the manual prior to installation!



Keep the manual for future reference!

Symbols Used



Indicates special attention in manual.



Indicates life-critical instructions.



Indicates damage to device and/or injury to user.

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Safety



Information relating to safety of Lega Servo Regulator and devices connected thereto as well as the safety of user has been detailed as follows. However, installation shall not start before reading the entire manual.



- ▶ Please read this booklet in order to use the regulator for a longer life.
- ▶ The warranty document is given with this booklet. It has three copy. When the device is been commissioning, the warranty document is confirmed by relevant institution and then third copy is sent to manufacturer.
- ▶ Please put the manual user in a place where can been reached in the future keep.
- ▶ When device is switched from cold to hot, air humidity may concentrate inside. In such a case wait for at least two hours because operation will be highly dangerous.
- ▶ Device must be operated in an environment equipped with all specifications mentioned in “installation” section of manual.
- ▶ Make sure the spaces left around the device for ventilation are not blocked.
- ▶ Be careful not to allow any foreign substances (liquid or solid) penetrate into device.
- ▶ Device must be connected by authorized service technician.
- ▶ Earthing connections must be made.
- ▶ Connections against fire danger must be made with proper section of cables. All cables must be insulated and laid in a manner to prevent stumbling.
- ▶ No loads must be connected to output of device that exceed its power.
- ▶ Device may only be repaired by authorized service technician.
- ▶ In case of emergency, (damage to cabin, front panel or connections, penetration of foreign substances into device etc.) device must be shut down immediately and input voltage must be disconnected and authorized service must be informed.
- ▶ Please don't use your device before grounding.
- ▶ The cover of the regulator must not be opened. In the device isn't any part that the user can interfere.
- ▶ Please shouldn't be used your device above its power.
- ▶ The temperature and humidity at the place where the regulator is used must be the proper value.
- ▶ Please pay attention to provide ventilation and be distance over 20 cm between the device and the closest object in order to work cooling system of device properly.
- ▶ Device must be properly packaged for transport.
- ▶ Please, do not lift heavy loads without help.



<18 kg (<40 lb)



18–32 kg (40–70 lb)



32–55 kg (70–120 lb)



>55 kg (>120 lb)

1 Purpose, Scope and Responsibility

1.1 PURPOSE

This guide introduces the introduction, use, maintenance and compliance of the device which is selling from our company.

1.2 SCOPE

This guide contains between 200 kVA – 3000 kVA Servo Regulators.

1.3 RESPONSINILITY

The user or responsible can use the regulators which are produces by LEGA, safely.

Please, comply with instructions for validity of warranty conditions and your safety.

Misuse/misusage, damages in transit, short circuit, natural disasters and failures that can occur in cases where this instruction is not followed are in non-warranty.

The installation and maintenance is made only by our authorized service.

2 Effects for Human and Environmental Health

When the regulators fail, They may cause a fire such as all electrical devices.

The location of the device should be isolated from human habitat.

Lids of the device should not be opened by unauthorized persons because it has an electric.

When the lids open, there is a risk of electric shock and life threatening.

Electric must be cut off before the lids of device open.

3 Transportation and Shipping

Our all of product have package. The devices that weighing more than 20 kg, should not carry with human; shoul use forklifts. When the device is carried, It shouldn't be reduced and lashed.

4 Definition of System

Preventing any surges and drops and all irregularities in mains voltage and regulating the voltage LEGA Servo Automatic Voltage Regulator electro-mechanically cuts off output voltage in any surges and drops outside setting zone thanks to electronically provided protection and prevents any related possible damages (cut-off option).

Regulator is used safely for computer system, fax, photocopy and laboratory devices, domestic and business illumination, complete flat and office feeds, manufacturing houses and workshops.

LEGA Servo Regulators, precisely, rapidly and safely regulate Output Voltage through serial booster transformers connected to the mains and precise variac and Microprocessor Controlled Digital Controlling Unit. In order to hold Output Voltage at desired level with the least error, Servo System provides DC motor by triggering with thyristors at suitable level.

Regulators also offer the user accurate and precise Input/output Voltage, Frequency and Current Values (option) with Digital Display feature.

Phase protection is produced upon demand (cut-off option) and output voltage is cut-off with contactor whenever no low input voltage, high input voltage and any phase is available. In order to prevent from any influence by spikes 2 seconds of delay is available between pulling and releasing times of contactor. Moreover, regulator is equipped with manual by-pass switch and on/off features.

Input Voltage, Output Voltage, Output Frequency and as an option Output Current values are displayed digitally on display. Front panel allows remote display on if any voltage occurs at output with available signal lamps and if output voltage is either high or low within limits and at the same time dry contact information. Proper fuses have been used to protect both load and Digital EPM against Short Circuit and Over Currents. Device is internally cooled by fan. Single-phase models are naturally cooled thanks to special internal structure.

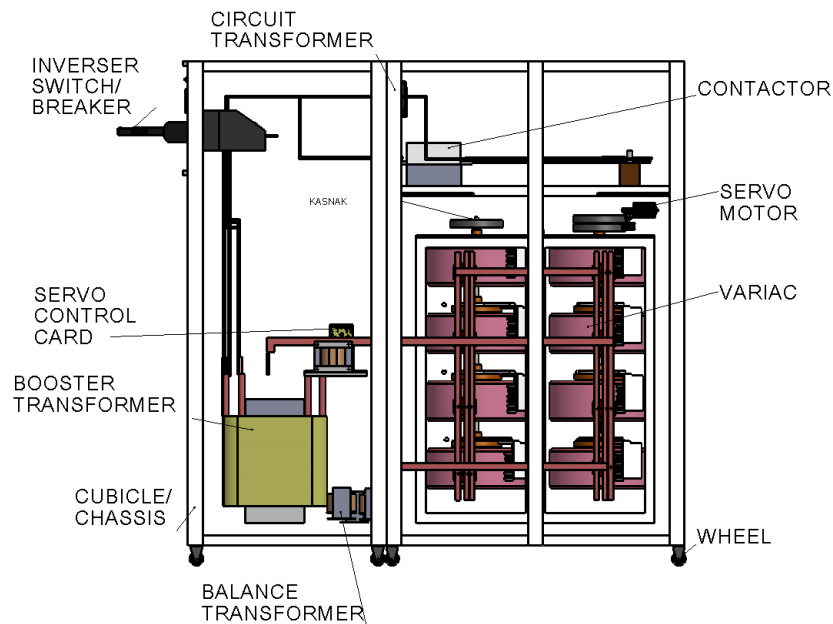
5. Working Principle Of Servo Regulators

LEGA Servo-Controlled voltage regulators consist of regulating toroid transformer (variac), auxiliary transformer and servo-motor commanding variable transformer and electronic circuits commanding such motor according to output voltage.

Thanks to its fast-responding time controlling system, DC motor sequence with high-startup torque rapidly regulates even small voltage changes on input. When input voltage is outside operating limits, output voltage is automatically adjusted to desired value by limit-control system and servo motor is

deactivated by controlling circuit. Upon completion of regulation, motor is disconnected from energy through electronic braking circuit to enable silent operation.

SINGLE-PHASE CONNECTION UP TO 200 KVA – 3000 KVA



Picture	
200KVA – 3000 KVA	
NO	SEMI MANUFACTURED
1	Invertor switch/breaker
2	Contactor
3	Variac
4	Balance transformer
5	Servo motor
6	Circuit transformer
7	Pulley
8	Cubucle/Chassis
9	Wheel

6 Installation



Examine the device once you receive. Although device is properly packed, it may get damaged during transportation. If there is any damage on packaging, contact transporter.



Check if customizations you demanded upon ordering have been made before starting up the device.

6.1. Handling



Device must be properly packaged for handling. Therefore, it is highly recommended to keep the original packaging.

6.2. Storing

Device must be stored in a dry environment away from any heaters and direct sunlight at temperature between $-25\text{ }^{\circ}\text{C}$ and $+55\text{ }^{\circ}\text{C}$.

Relative humidity in the environment must be between 20% and 95% (non-condensable).

6.3. Placement

Device must be placed in;

- ▶ With no direct sunlight;
- ▶ Dry; and
- ▶ Away from heating elements and well-ventilated place.

Moreover:

- ▶ Environment must not contain extreme dust and
- ▶ Surfaces of device containing vents must be at a distance of at least 20 cm.

Regulator may operate in environment temperatures between $0\text{ }^{\circ}\text{C}$ and $+40\text{ }^{\circ}\text{C}$.

6.4. Connections



Connections may only be made by authorized service technicians. Any attempts by user to make connections may threaten life.



When device is switched from cold to hot, air humidity may concentrate inside. In such a case wait for at least two hours before making connections because it will be highly dangerous.

Connection terminals of device are either on front or back face. Cover on terminals must be disassembled to make connections.

Connections are described below. Please follow the order below while making the connections.

6.4.1. Earth Connection



Servo Regulator must be earth connected.

Servo regulator's input earth terminal must be connected to a high-quality (low resistance) earth line.

Loads must be earth connected via output earthing terminal.

6.4.2. Input Connection

A bipolar automatic fuse connected on phase and neutral lines must be added to main switchboard to connect Servo Regulator and a residual current relay must be installed.

To install an automatic fuse at equivalent values with input fuse of device on switchboard will be appropriate.

Protection threshold value of residual current relay in the input of Servo Regulator must be the total of 30 mA and residual currents of loads connected to Servo Regulator output.

Current values recommended as above are given only considering Servo Regulator on the automatic fuse in question. Otherwise, both values must be recalculated considering all devices on the same fuse.



Any modifications on switchboard must be performed by an authorized service technician on electrical installations.

After necessary modifications, switch automatic fuse on switchboard to "0" position and connect phase to INPUT terminal through fuse on switchboard and neutral to NEUTRAL terminal.



Make sure to switch automatic fuse on switchboard to "0" before starting to connect input cables.



Minimum section of cables between switchboard and Servo Regulator must be selected according to the power of device. In case of selecting small sections, there may be a risk of fire.

6.4.3. Output Connection



In case Servo Regulators are to supply more than a few independent loads, it is recommended to use different fuses and residual current relays for each load. When each load is connected to Servo Regulator through each and every fuse according to its respective current, in case of a short circuit on any of the loads, short circuited fuse blows and other loads do not get affected by this case thanks to short circuit protection property of device.



Make sure input, output automations and automatic fuses on switchboards are in “0” position before starting to make output connections.

Loads are connected to OUTPUT, NEUTRAL and output earthing terminals on switchboard of Servo Regulator.



Sections of cables between Servo Regulator and loads must be selected according to its respective current.



Sections of cables between Servo Regulator and loads must be selected according to its respective current.



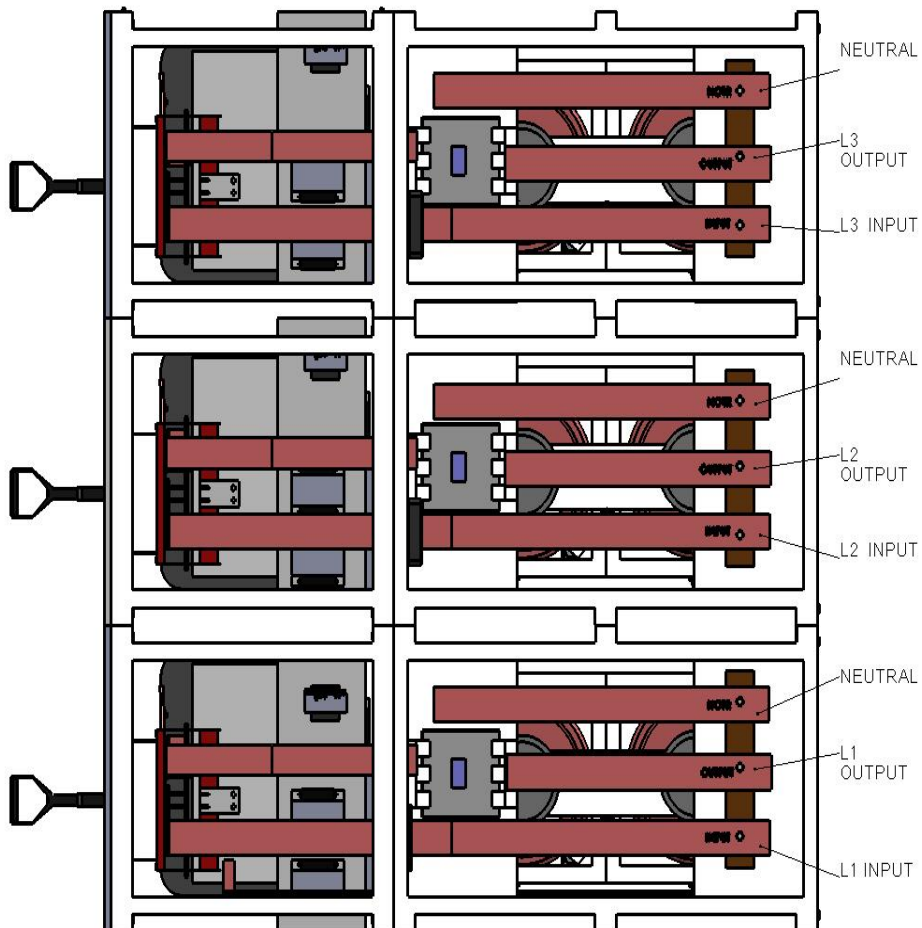
Maximum power contracted by loads connected to Servo Regulator must not exceed nominal power of Servo Regulator.

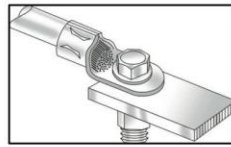
6 PCS THREE-PHASE SERVO REGULATORS

Input / Output Electrical Connections SCHEMA

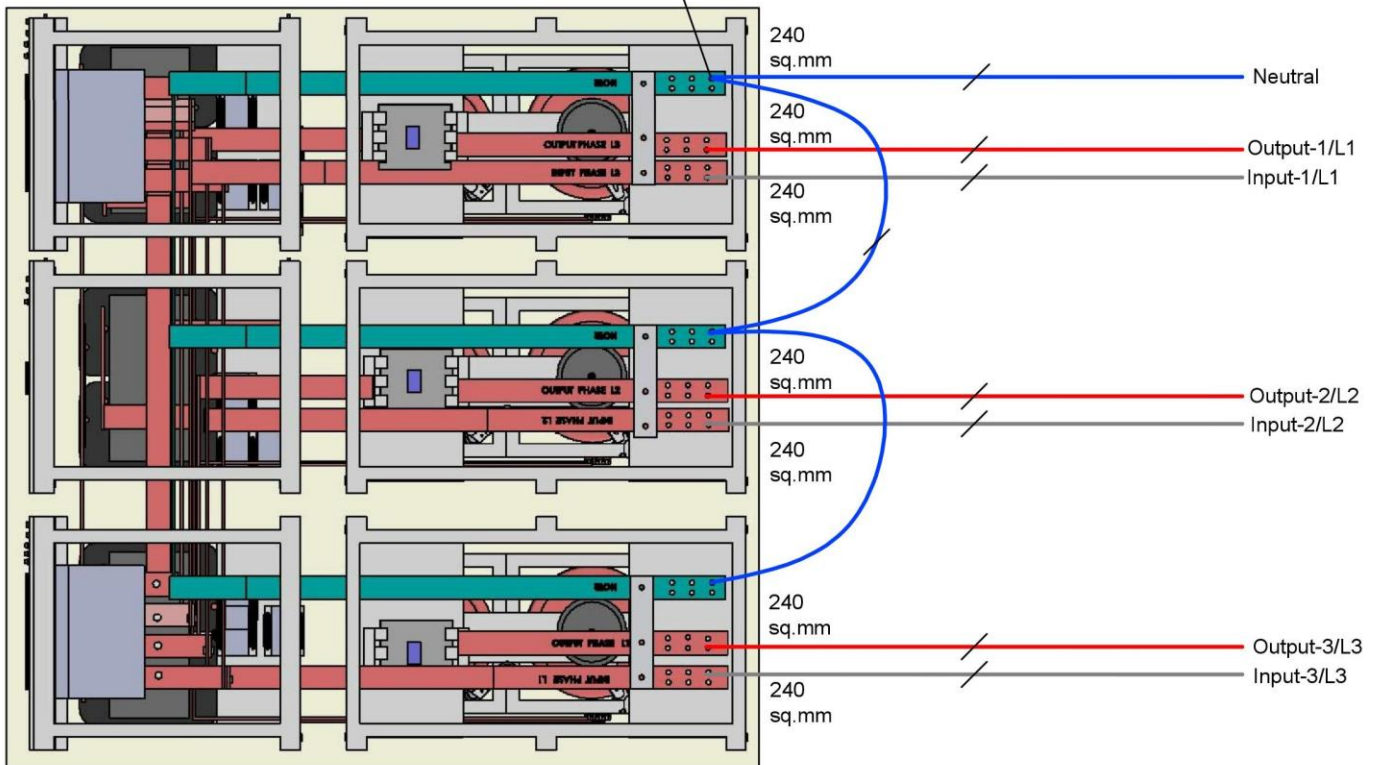
Apply Phase of inputs and outputs according to the image.

When you put in use every single phase interconnected with his own neutral phase.





Cable
Lug
Bus



7. Starting Up and Switching Off

7.1. Starting Up

After making the connections as described above, all you have to do to start up the device is to switch all fuses and automations on switchboard to “ON” position and then device will automatically start if mains voltage is above a certain value.

7.2. Switching Off

Turn the Switch and Fuses to “0” position to switch off the device.

If maintenance and etc. operations will be performed on Servo regulator without cutting the power of loads connected to the device, turn switch to Mains position.

8. Operation

8.1. Operating the Device

8.1.1. Operating from Regulator

Operating from regulator is possible only if mains voltage is between certain limits. While Servo Regulator is operating in this mode, it processes mains voltage and supplies the loads with a voltage equal to mains nominal value. Detailed information about mains voltage range the device may operate within is given in section “Input Voltage Tolerance”.

8.1.2. Operating from Mains (BYPASS)

Transferring voltage on input to output through a mechanical switch on Servo Regulators is called “by-pass”.

Bypass feature is generally used to separate Servo Regulator from input and output without deactivating the loads during maintenance.

8.2. Operation under Abnormal Situations

8.2.1 Overloading

Connecting loads exceeding nominal power of device output is called “overloading”.

Device keeps powering the loads exceeding nominal power in regulator mode until fuses blow.



Be careful not to overload the device for safe operation.

8.2.2 Short Circuit on Output

Device forces the fuse on device to blow acting as a source of current upon any short circuits on output. Short circuit disappears upon blowing of fuse and other loads are protected against getting affected by this situation.



Each and every load must be connected to circuit through different fuses selected according to nominal current to enable device properly perform short circuit protection function.

8.3 Indicators

8.3.1 Display (EPM Display)

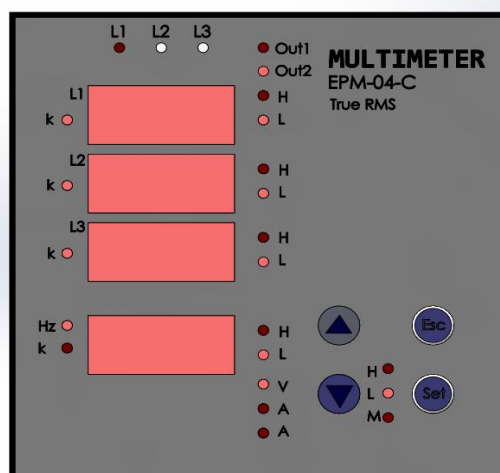
Output Voltage, Input Voltage values are displayed on display.

8.3.2. Lamps

There are 2 lamps on panel. If single lamp is on, it means by-pass mode and if both lamps are on, it means regulator mode.

9. EPM-04-C Introduction and Use

Device is manufactured as phase and current protected as optional which feature prevents the supplied devices from getting damaged by shutting down the system in case where device is subjected to overcurrent loading or one or two voltage is not available. Such current and phase values are factory set according to the power of device and are not needed to be changed.



Nevertheless if it is required to change, press and hold set button and a pin code will appear in 3 seconds. Enter (1234) and press upper arrow and enter (curh1) section. Enter max. current for device and press and hold Esc key until yes appears on screen. Then press set key and save the selection. Voltage values are factory set as low voltage 180volts and high voltage 245 volts. If you want to change such settings, press up and down keys (spuolh1) and enter desired voltage values. Press Esc key until yes appears on screen and then save with set key.

10. Device Features and Rudiments

10.1 Wide power range: Single-phase production from 1 kVA up to 25 kVA,
Three-phase production from 200 kVA up to 3000 KVA

10.2 Voltage field:

Standard; 160/250/220 V single-phase
 275/450/380 V three-phase

Special regulators: 140/240/220 V single-phase
 242/415/380 V three-phase
 120/240/220 V single-phase
 208/415/380 V three-phase

10.3. Regulation speed rate: 90 V/sec.

10.4. Output deviation: Unless regulator is used over its own power, no deviations occur on output.

10.5. Efficiency: Efficiency is better than 98% since LEGA regulators and transformers consist of high-quality silicon sheet and B-ef class conductive materials.

10.6. Working temperature: Unless regulators are used in acidic and humid environments, working temperature may be up to 50°C. Additional cooling system is applied for temperatures over such degree.

10.7. Over voltage and phase protection unit (optional): Cut off the output at sudden low and high input voltage(when the regulator is out of setting field). Continuously, monitors the mains voltage and automatically opens the output when it enters the regulator setting field. It prevents low or high voltage in case of any fault that may occur in the regulator. It completely closes the output so that the used devices are not damaged. It prevents the regulator from operating for a long time (cut off the output voltage) in a faulty manner and allows the user to be warned. It will prevent other malfunctions in the regulator. It keeps the regulator constantly checking the output voltages so that it provides to be in compliance with the standards.

10.8. By-Pass system: Regulators provide by-pass through high-quality switches. In case of any failure, regulator may be transferred to the mains through switch without any operation on installation with 2x and 6x pole reversion switches.

10.9. Superior Performance:

High quality and long lasting materials.

Safe and tried system

Silent operation. High efficiency.

Undistorted output.

Stable and uninterrupted supply.

Wide regulation range. High precision.

10.10. Areas of Usage:

- CNC Machine
- Heating, Cooling and Air Condition Equipment
- Radio, Television and Transmitting Stations
- Electric and Electronic Medical Devices
- Rectifiers
- Electric Motors
- Wire and Wireless Communications Tools
- Automatic Welding Machines
- Magnetic Devices
- Lighting Devices

- Printing Press and Sensitive Electronic Typesetting Machines
- Sensitive Photograph Studio Tools
- Inductions Heating Tools
- Electroplating System
- All Kinds Of Electronic Weaving, Embroidery and Knitwear Machines
- Laboratories where electrical and electronical equipment
- Test and Research Laboratories
- Factory, Hospital, Hotel and Apartment General Entrances
- And Other Places and Tools that require stable voltage.

11. Technical Specifications and Data

Technical Specifications													
MODEL	330200	330250	330300	330400	330500	330600	330800	331000	331250	331600	332000	332500	333000
Power kVA	200	250	300	400	500	600	800	1000	1250	1600	2000	2500	3000
REGULATOR INPUT													
In.Vol.Correct.Interval	275 - 450 VAC (Standard) 210 - 415 VAC (Opsiyonel)												
In.Vol.Working Interval	155 - 490 VAC												
Operation Frequency	47...65 Hz												
Line Input Protection	Overcurrent, Low and High voltage protection												
REGULATOR OUTPUT													
Output Voltage	380 VAC RMS \pm % 1												
Overloading	10 Sec. % 200 Load												
Correction Speed	~ 90 Volt / Sec.												
Upturn Period	~ 90 Volt / Sec. (160 VAC - 250 VAC)												
Output Protection	Protects load by opening the circuit when overburden, short circuit occurs.												
WORKING PRINCIPLE													
	Servo Motor, Microprocessor Controlled, Full Automatic												
GENERAL													
Cooling	Smart Fan System												
Measured Value Monitor.	TRUE RMS Panel Voltmeter (74x74 mm) output voltage and line voltage monitorization												
Total Harmonic Distortion	-												
Total Efficiency	> % 97												
Mechanical By-Pass	"Manually Controlled Line - PAKO SWITCH Selects Voltage Regulator" Switch Turn On / Off												
Protection Level	IP 20 // IP 25 (Standard)												
ENVIRONMENTAL													
Working Temperature	-10 °C / 50 °C												
Storage Temperature	- 25 °C / +60 °C												
Relative Humidity	< % 90, DIN (40040)												
Working Altitude	< 2000 m.												
Acoustic Level	< 50 dB (1 metersquare)												
Documents	CE // TÜV Austria Hellas (ISO 9001)												
DIMENSIONS (cm)													
HxWxD (cm)	172 x 60 x 70 (3 Pieces)			170 x 60 x 117 (3 Pieces)			185 x 70 x 80 (6 Pieces)			195 x 80 x 100 (6 Pieces)		175x140x100	205x140x100
Weight (kg)	1050	1150	1250	1500	2000	2500	2750	3500	3750	4500	5500	7000	8500

12. Important Points in Regulator Use

Automatic Servo Voltage Regulators are used to prevent precise devices from failing under bad electrical network conditions. Users with such bad network conditions use Regulator to transfer to devices a regular electrical network.

An electrical network professionally installed within a building is installed by selecting proper quality and thickness of conductive and in accordance with necessary earthing and distribution principles. Any users willing to create regular electrical network with the use of a regulator must pay attention to certain points in making the connections between devices to be supplied by the Regulator. Otherwise, user's health and device's integrity may not be guaranteed.

- ▶ Regulator must be connected to electrical network by an authorized service technician using proper sections of cables and as described in installation section.
- ▶ Regulator must be connected to an “earthed” switchboard providing the current capacity written on the label on back panel.
- ▶ Any device supplied by a socket/switchboard, which is not or poorly earthed, pose a danger of electrical shock to user and the risk of failure of electronic circuits is high.
- ▶ Some building electrical installations may show earthed sockets but may contain two-lined (phase and neutral) sockets. Either earth terminals of such sockets may not have been connected to protection earth or connected to neutral terminal instead. In case where no current flows through neutral line, protection may be on earth level. Since neutral voltage will be more different than protection earth level as such sockets or any parallel sockets are loaded, human health and safety of supplied equipment are in danger.

13. Maintenance and Usage Rules

If you would like to clean the device, please follow the instructions below:

- ▶ Switch off the loads
- ▶ Turn all fuses and switch on device to “0” position.
- ▶ Wipe the device with a damp-dry cloth.
- ▶ Do not keep any inflammable and heat affected materials around the device (under, above, in front, back or on sides of device).
- ▶ Device's environment must be at normal room temperature values and if possible device should not be exposed to direct sunlight and left or used in humid or damp environments.
- ▶ Operating environment must be free of any rodents and insects.
- ▶ Doors of device must not be opened other than in Authorized Service station.
- ▶ Device must not be exposed to any impacts or high temperature causing deformation on external box.

- ▶ Any later modifications on electrical installation of device must be suitable to device power.
- ▶ External appearance of device must be checked once a month.
- ▶ Painting of device must be checked once a year.
- ▶ Switches and cables of device must be checked once a month.



Make sure no liquid or solid foreign substances penetrate into device.



Do not use cleaning powder or any other substances that may damage plastic parts.

14. Possible Problems on While on Using

- The ground line should be checked in any electrical leakage.
- If the device is overloaded with usage capacity; overheating and smell are shown. Please check whether the incoming load and usage capacity is suitable.
- When smell and overheating are seen, the device must be switched off and must be contacted with authorized service.
- If water and other liquid entering the device, the device input power must be disconnected for safety reasons.
- If the device connection cables are damaged by rodents and other factors, the device should not be used and the cables be replaced by authorized persons.
- If the device is not energized by constant signaling, please contact with the service for capacity.

15. Possible Problems and Solutions

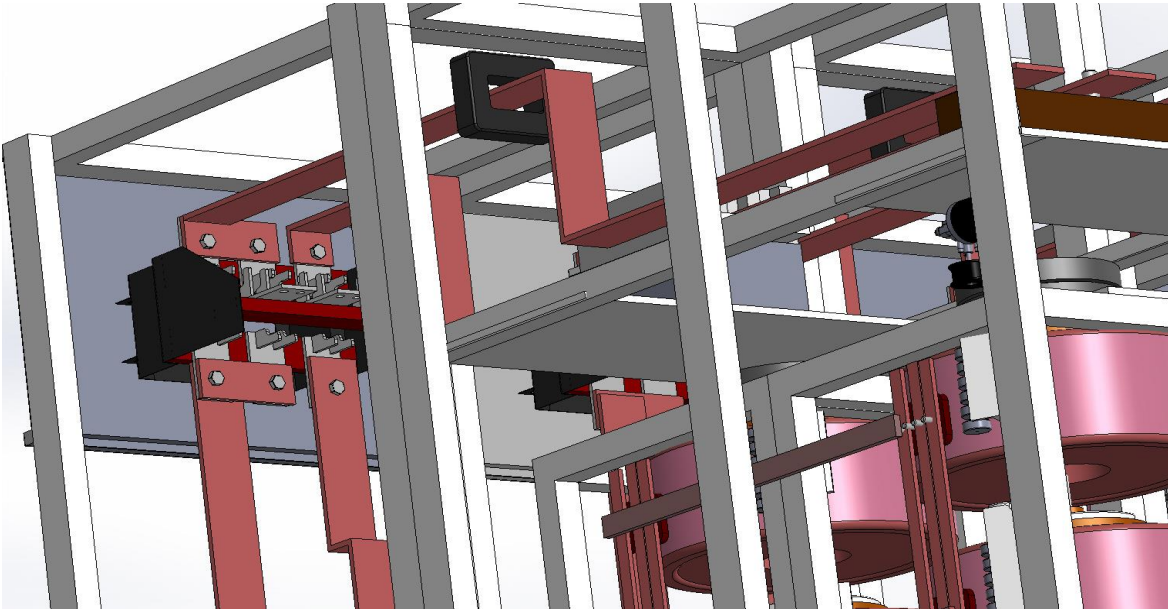
Problem	Possible Cause	Solution
Voltmeter does not show right	Voltmeter defective is	If voltmeter is digital, check socket; if it is analog, replace.
	Electronic card defective is	Check neutral connection, if problem persists please inform Technical Service
Smell emanates from device	Overloading available is	Check loads on phase, switch device to Mains position and inform Technical Service.
Device does not indicate voltage	If device is protected is	Check fuse switch. Phase may be cut off, may not be neutral or voltage is not within operating range.
	If device is not protected is not	Fuse switch may be burned off or defective, voltmeter may be defective. Report technical service
Device turns on and off sometimes	If device is protected is	Make sure neutral and phases are correct.
	If device is not protected is not	It must be drawing excessive ampere. Voltage may be outside current limits.
Sounds coming from device	Overloading available, motor connection may be loose is	Turn device to mains positions, please contact your dealer or Service Center. Provide Service Center with following information: -Device Serial Nr. and KVA, -Date of occurrence of problem.
IMPORTANT NOTICE: Any interventions to device must only be made by qualified individuals.		

16. Out of Warranty Situations

- Defects and breaking and scratching of external surfaces of devices that may occur due to transportation, dropping and impact after delivery of the device to the user,
- Defects that may occur due to transportation, drop and impact after delivery of the device to the user
- Improper use and improper voltage application,
- Interventions made by unauthorized persons.

WARRANTY TERMS

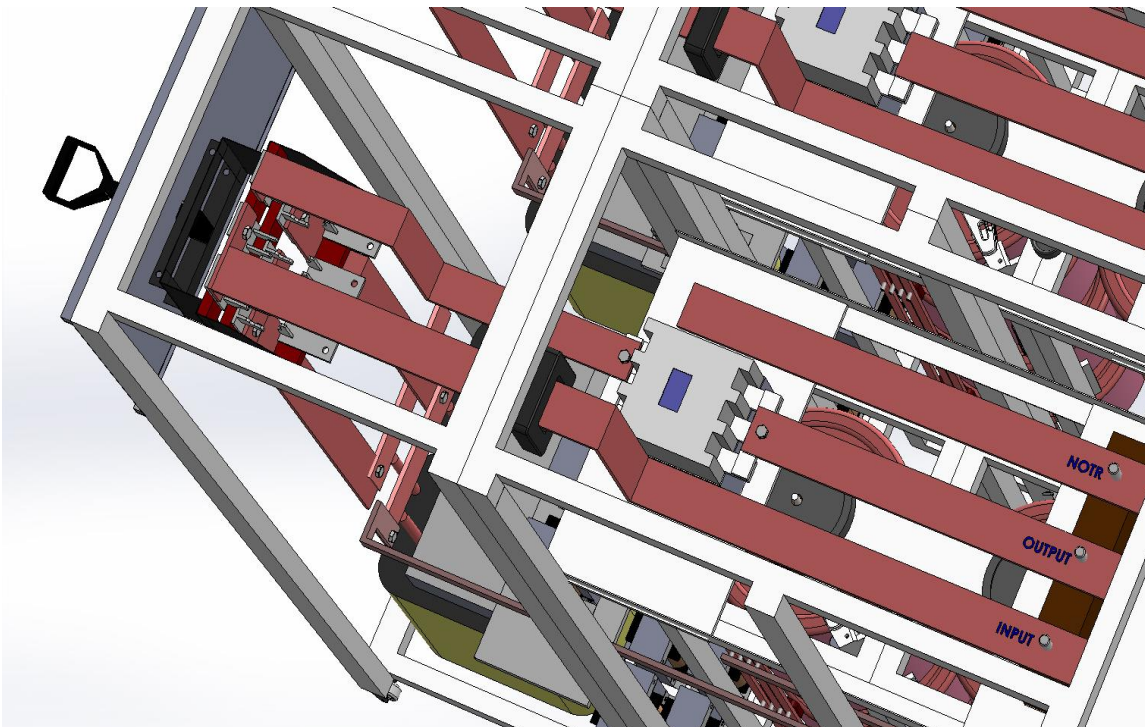
1. Warranty period begins from the date of delivery and least 2(two) years.
2. The device is under the warranty of our company, including all parts of the device.
3. The period during repair is excluded from the warranty period if the device is damaged during the warranty dates. The repair period is 21(Twenty one) working days at maximum. This period starts with delivering the device to the service station; or to the seller, agent, representative, importer or manufacturer if there is no available service station. Unless the damage is not repaired within 15(fifteen) working days, manufacturer or producer is obliged to provide the consumer another similar device until the repair process is over.
4. All repairs will be conducted free of charge for any workmanship cost or changing spare parts in the warranty period if the device is damaged because of materials and workmanship, or during mounting the device.
5. Although the consumer accepts the repair terms, free replacement, refund or discount in the rate of damage cost may be demanded if;
 - Starting from the date of delivery, the same damage repeats twice within that year during the warranty period or different damages occur more than four times or there are more than six damages during this period, besides these different damages make the non-use of device permanent,
 - The minimum repair period is exceeded,
 - It is determined in a report by a service station, or that repair is not possible or the seller, agent, representative, importer or manufacturer if there is no available service station, the company will replace the device free of charge, make a refund or demand a discount in the damage rate.
6. Any damage resulting from the contradictory use of the device as stated in the user's manual would be out of warranty.
7. You may apply to the Ministry of Industry and Trade, General Directorate of Protection of Consumers and Competition if you have any problems in terms of this Certificate of Warranty.



Picture-A



Connecting bars with inverter switch

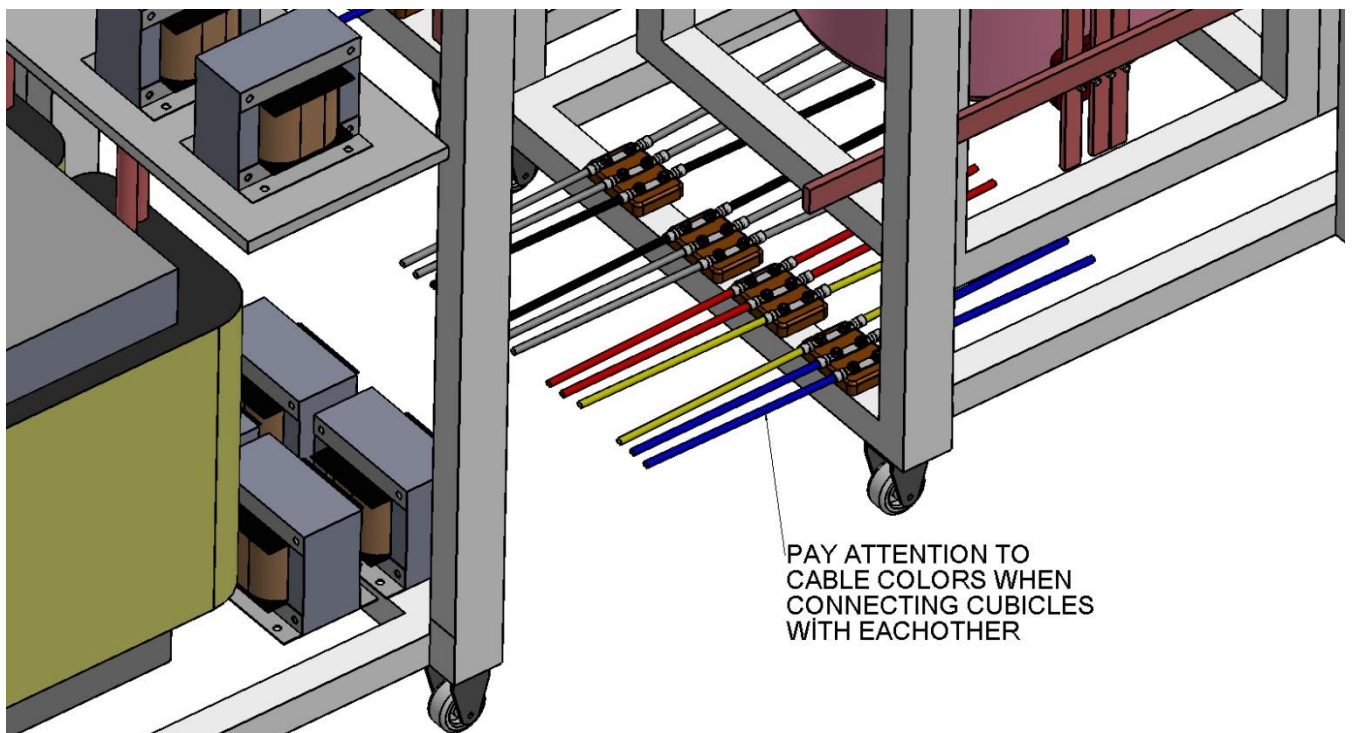


Control schema

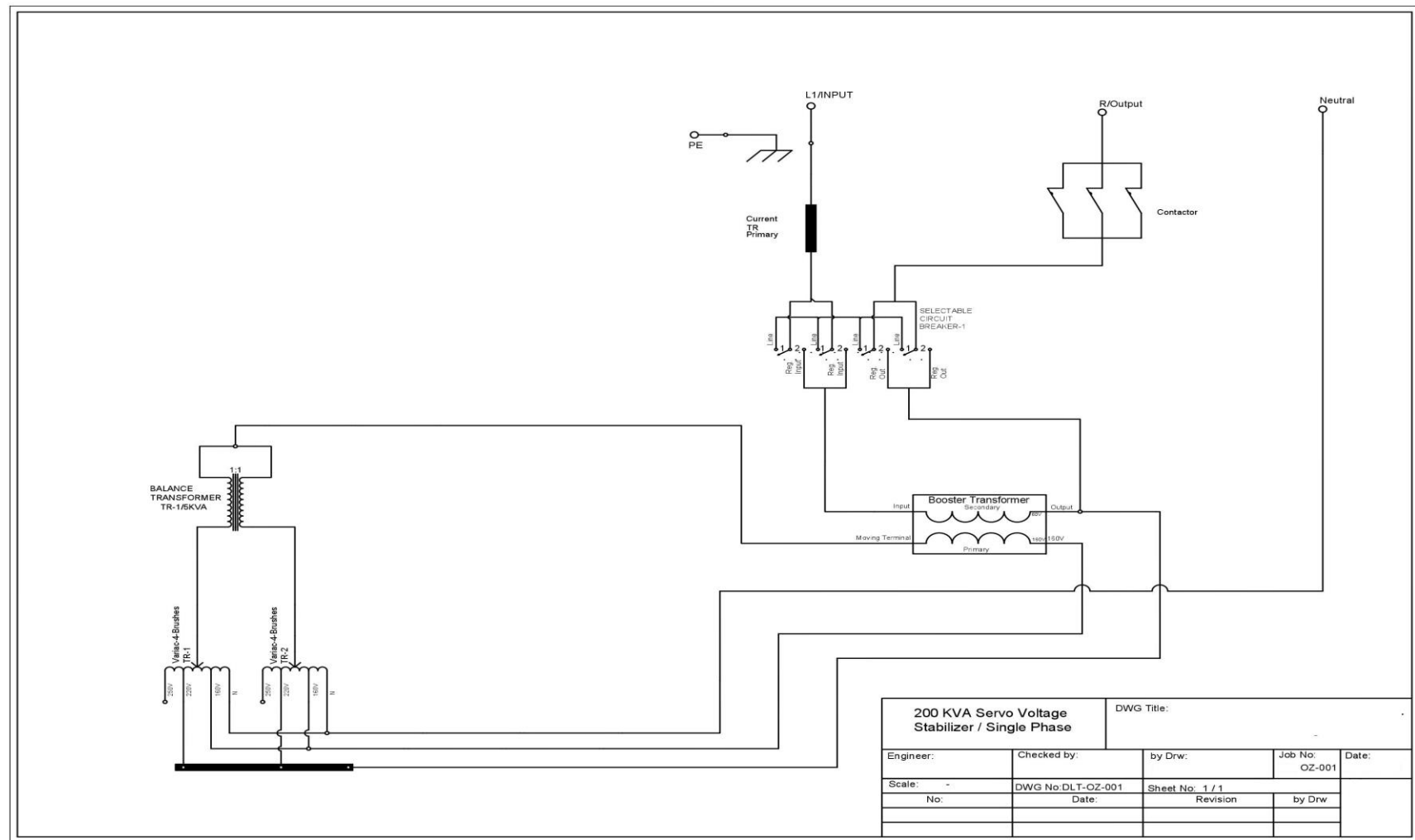
Diagram illustrating the connection of cables to the transformer assembly. The assembly consists of three main units, each with two large green transformer coils and a red vertical support structure. The units are mounted on a metal frame with wheels.

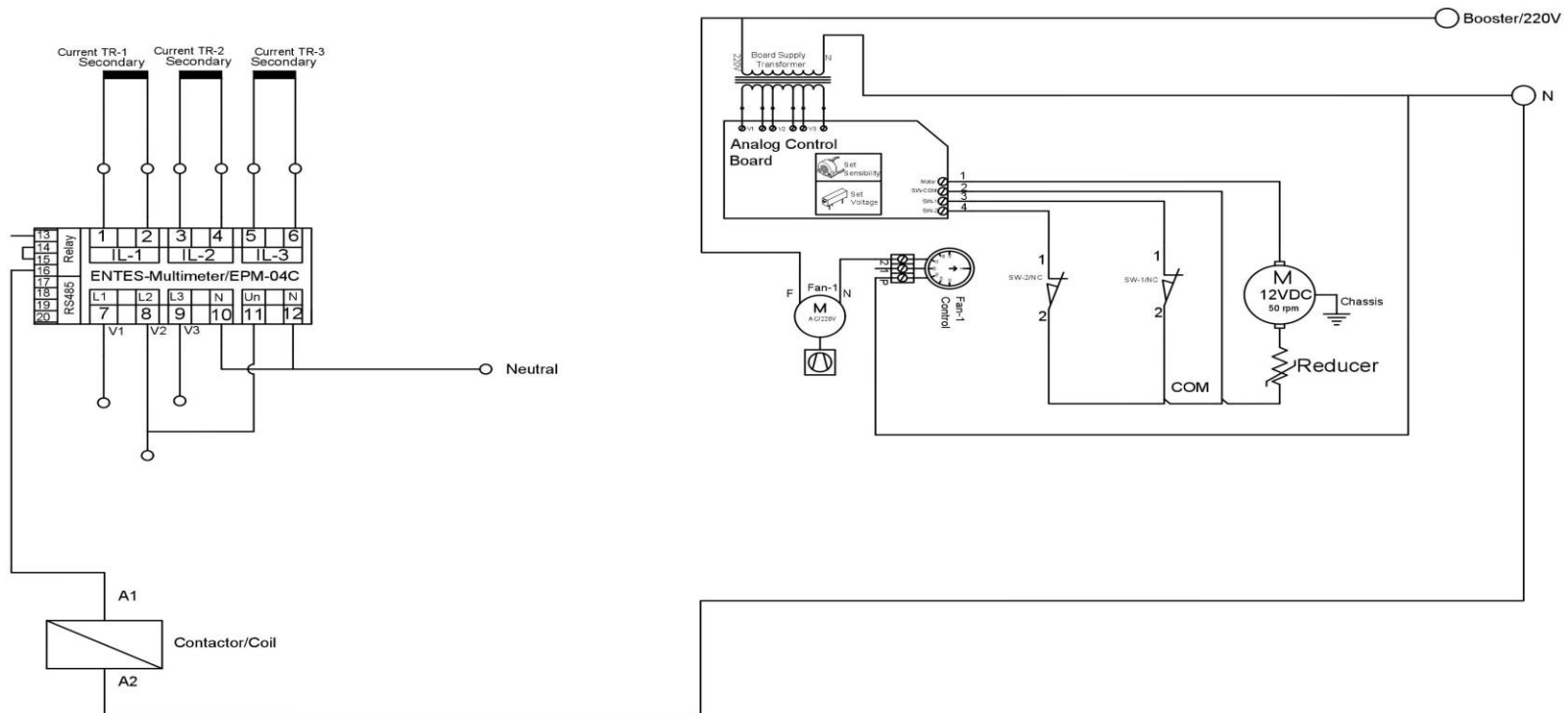
PLEASE CONNECT THE CABLES TO CONNECTORS ACCORDING TO CABLE COLOURS

PLEASE CONNECT THE CABLES TO CONNECTORS ACCORDING TO CABLE COLORS

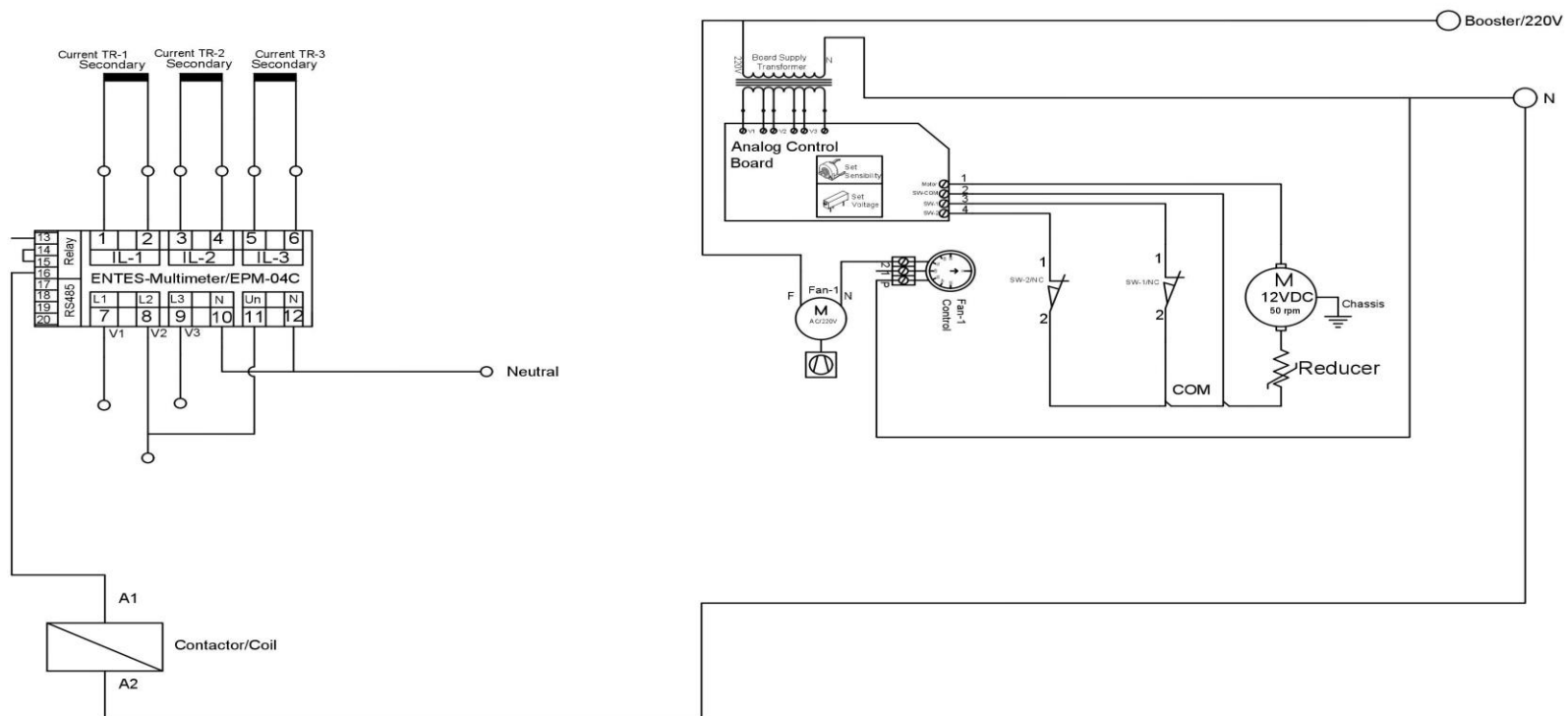


Picture-C

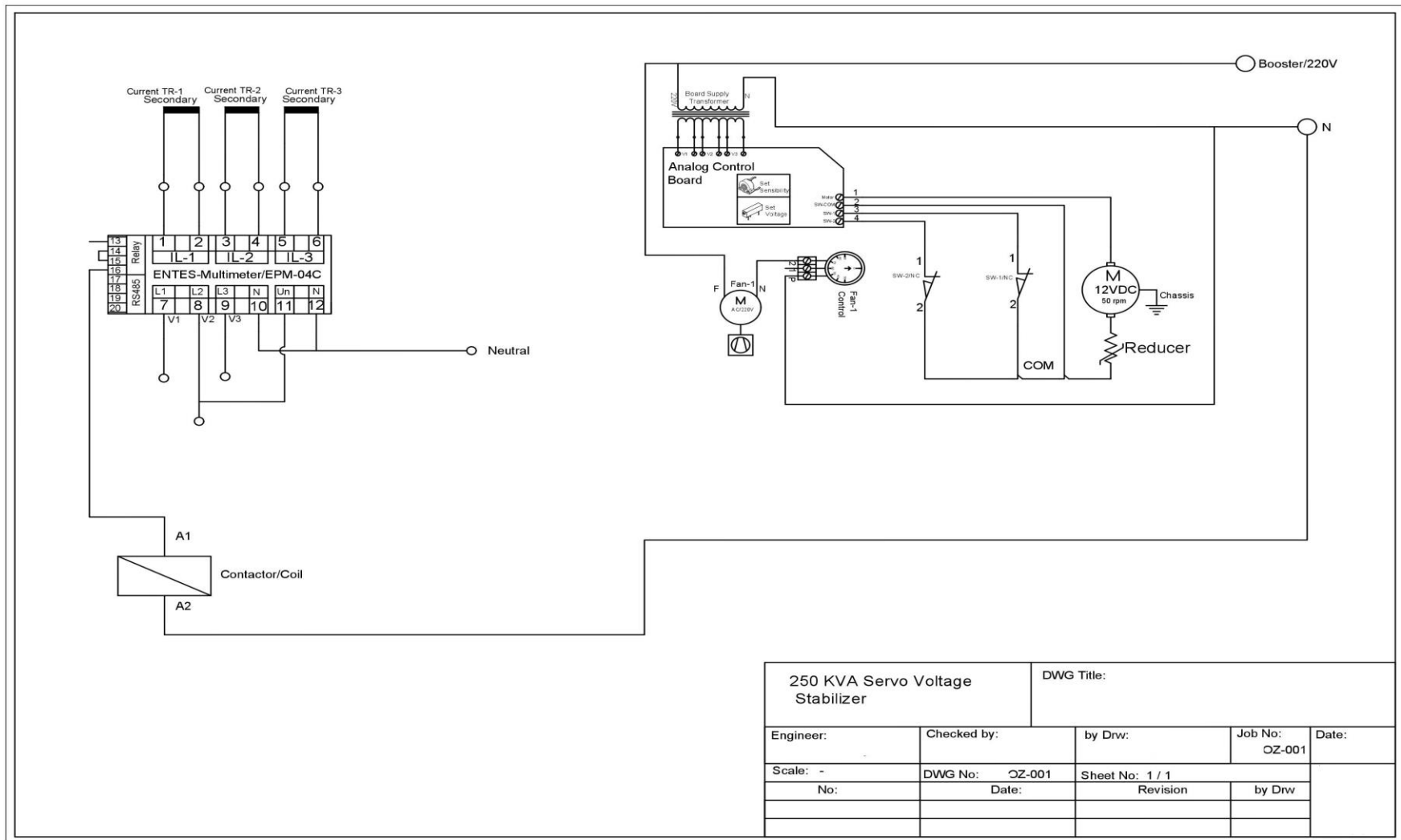


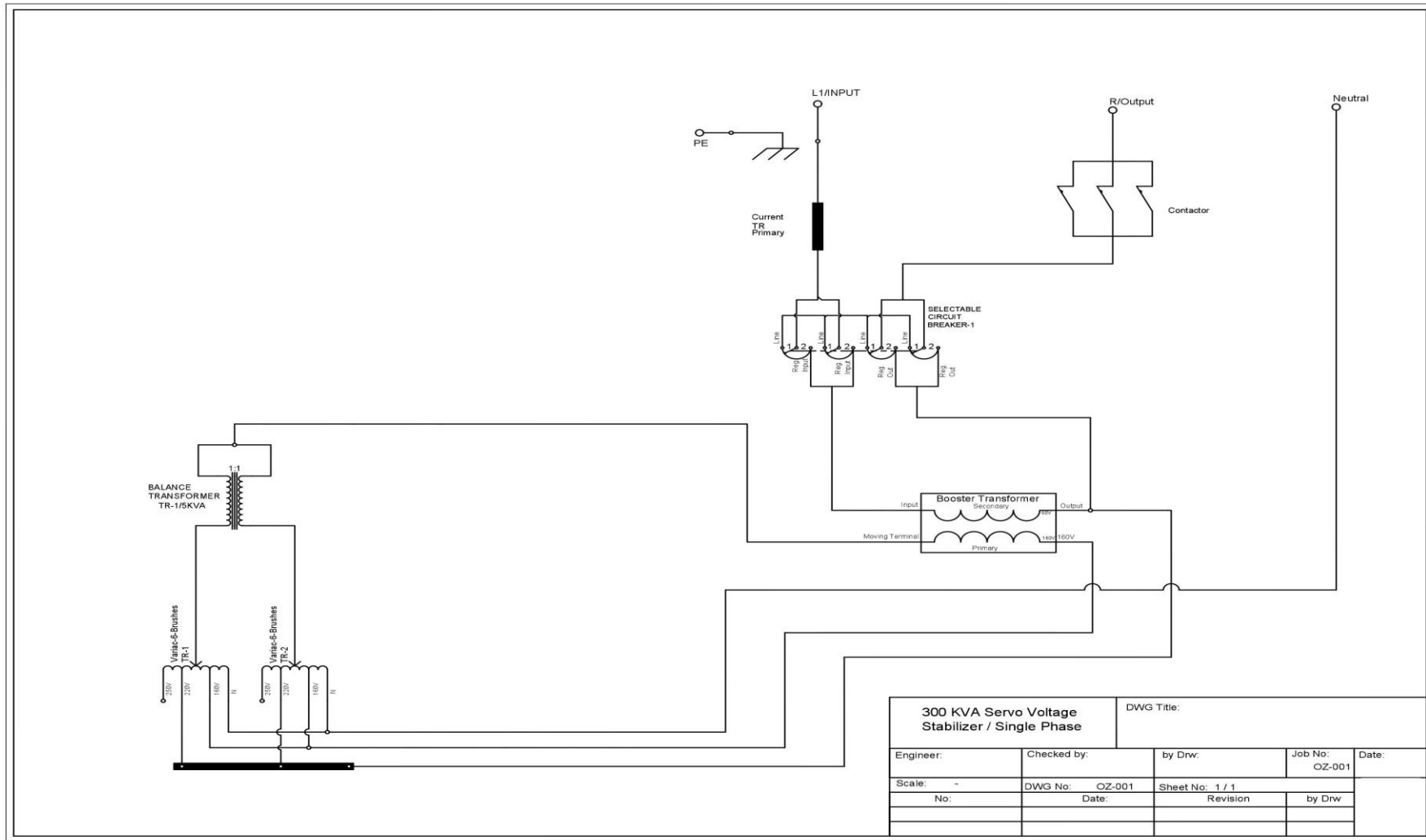


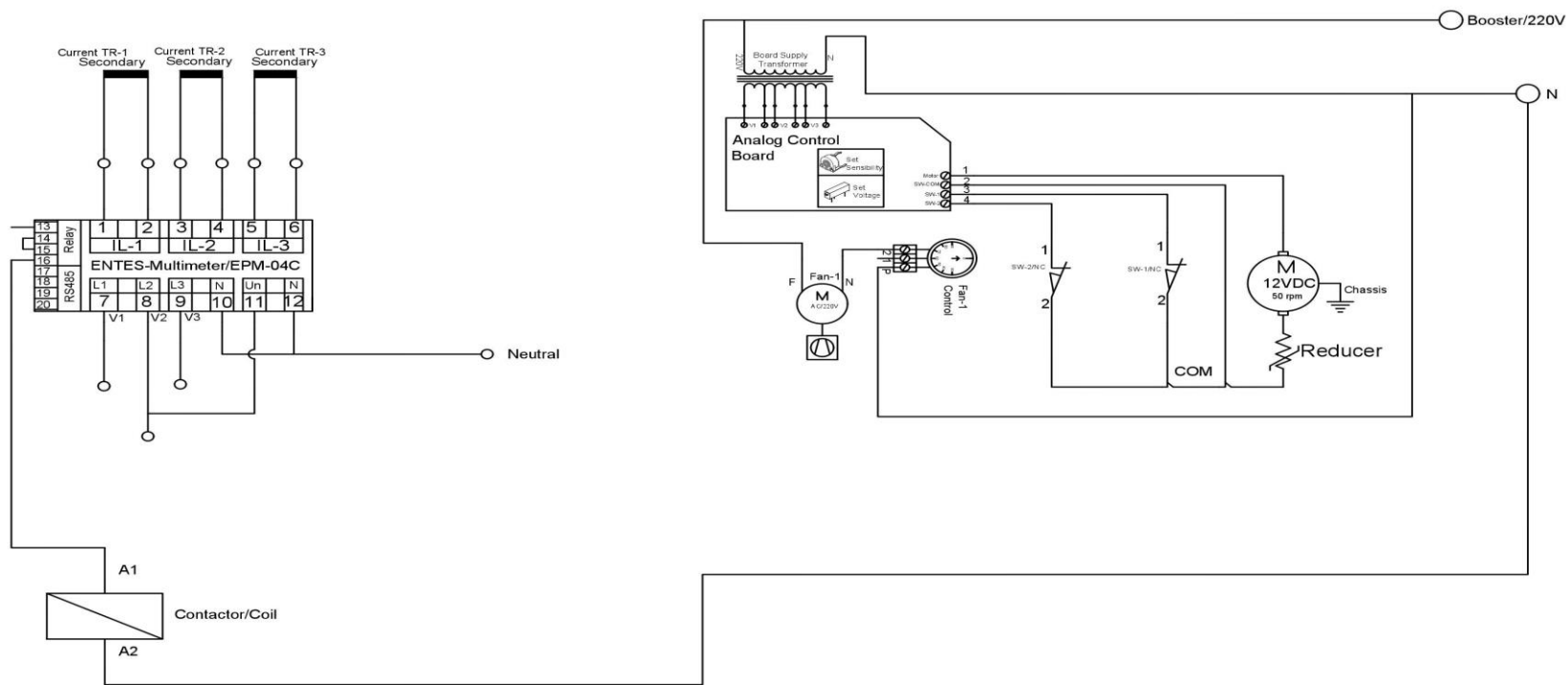
200 KVA Servo Voltage Stabilizer		DWG Title:		
Engineer:	Checked by:	by Drw:	Job No: OZ-001	Date:
Scale: -	DWG No: OZ-001	Sheet No: 1 / 1		
No:	Date:	Revision		
			by Drw	



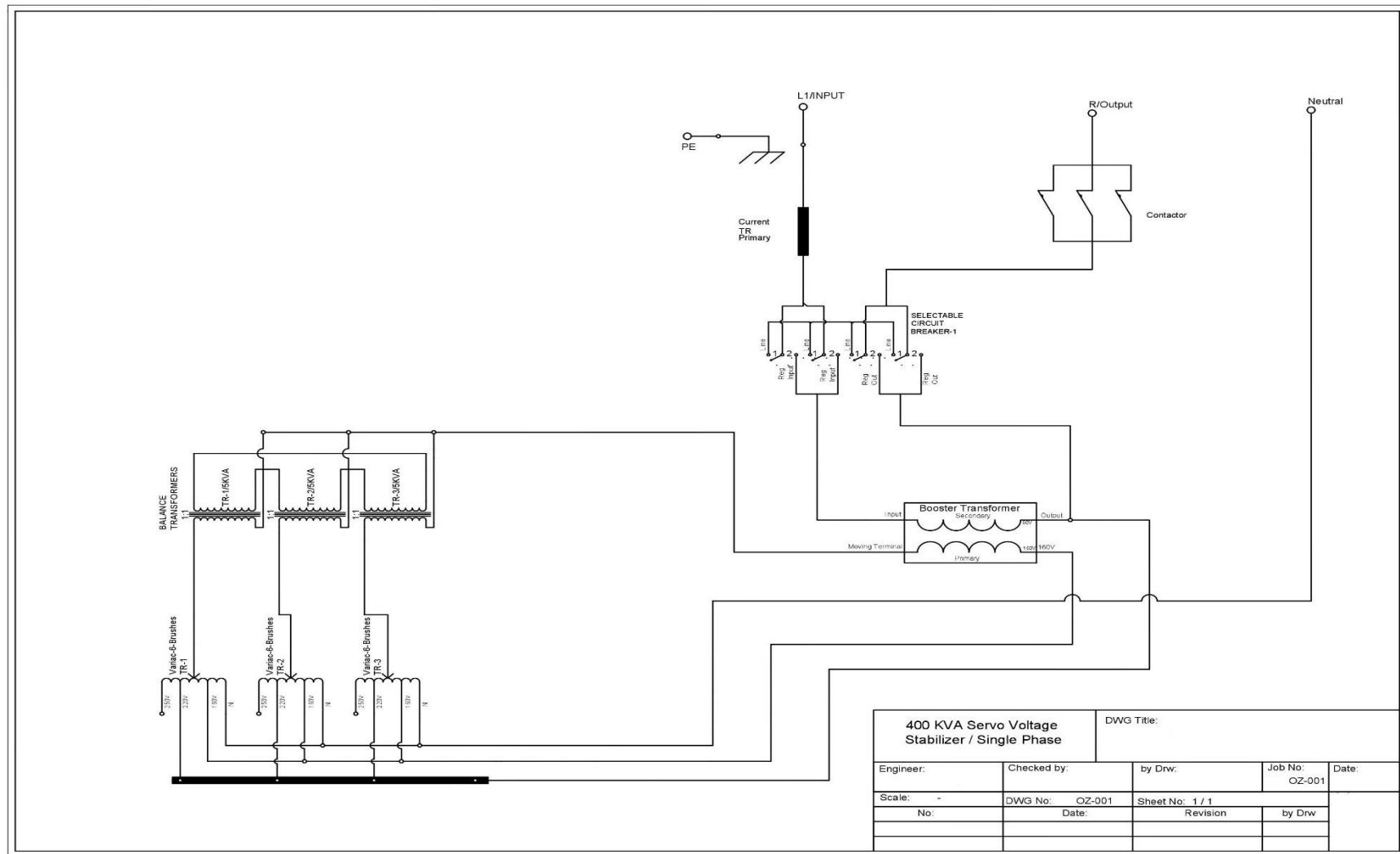
250 KVA Servo Voltage Stabilizer		DWG Title:		
Engineer:	Checked by:	by Drw:	Job No: OZ-001	Date:
Scale: -	DWG No: OZ-001	Sheet No: 1 / 1		
No:	Date:	Revision	by Drw	

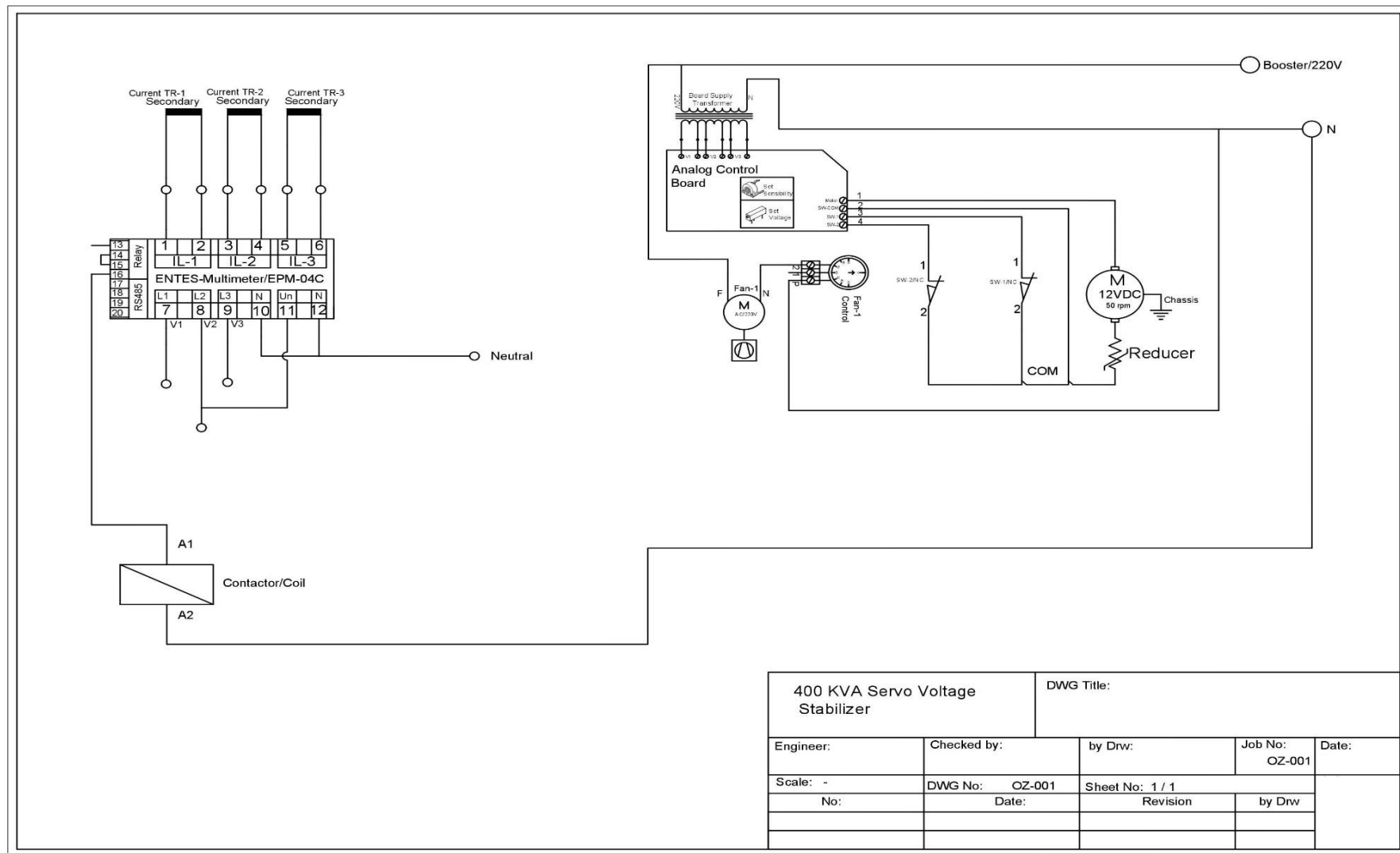


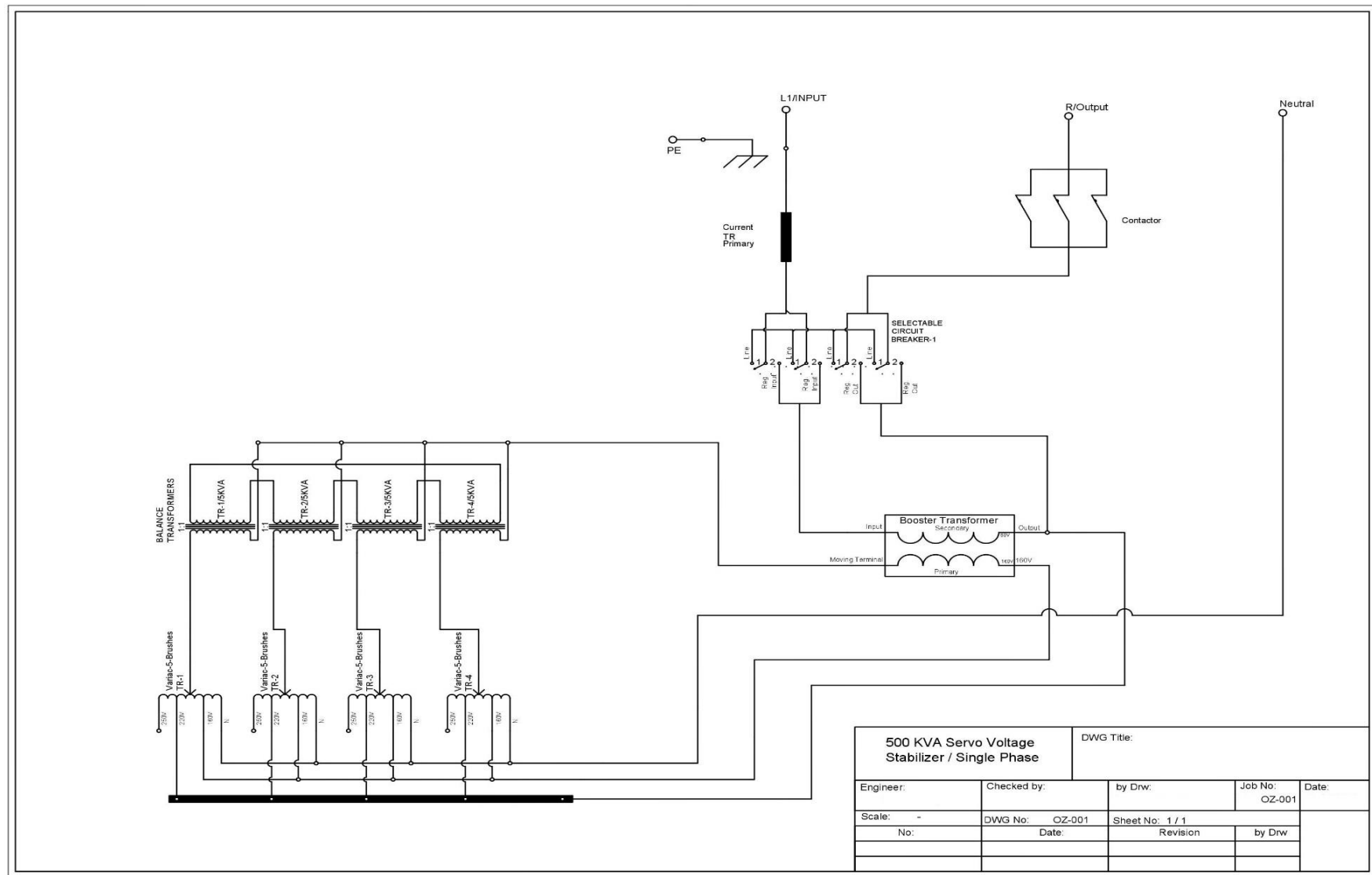


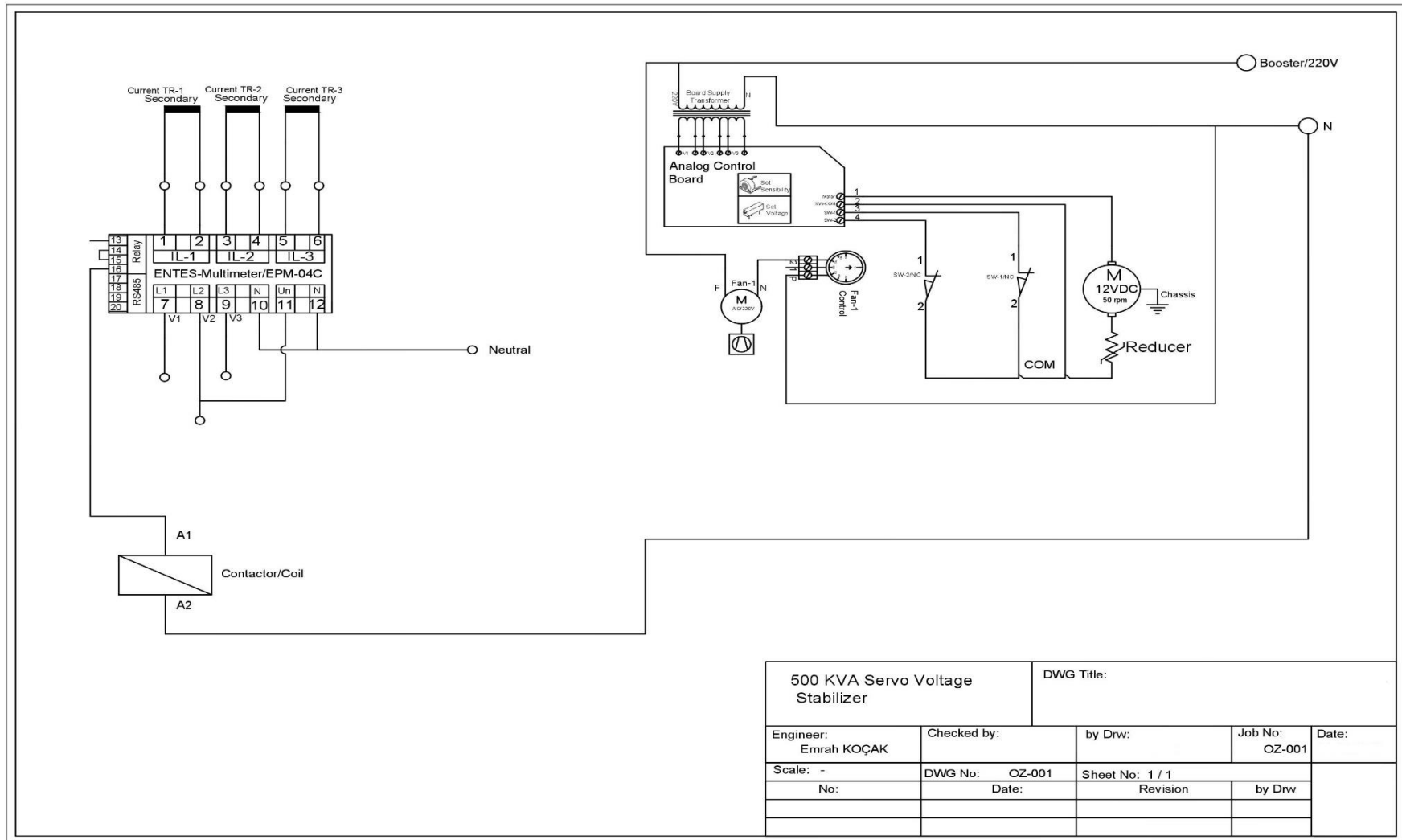


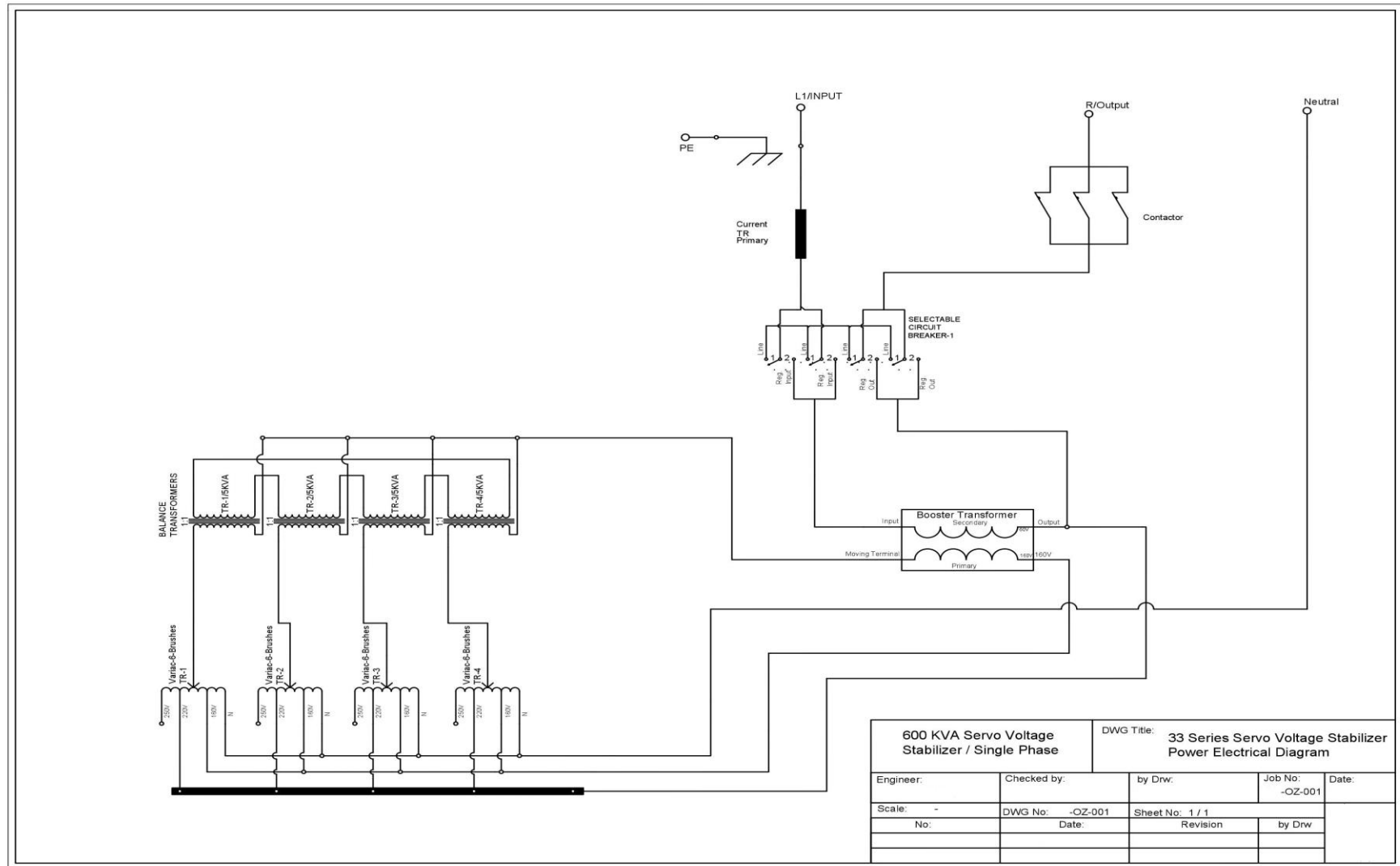
300 KVA Servo Voltage Stabilizer		DWG Title:		
Engineer:	Checked by:	by Drw:	Job No:	Date:
			OZ-001	
Scale: -	DWG No.: OZ-001	Sheet No: 1 / 1		
No:	Date:	Revision		



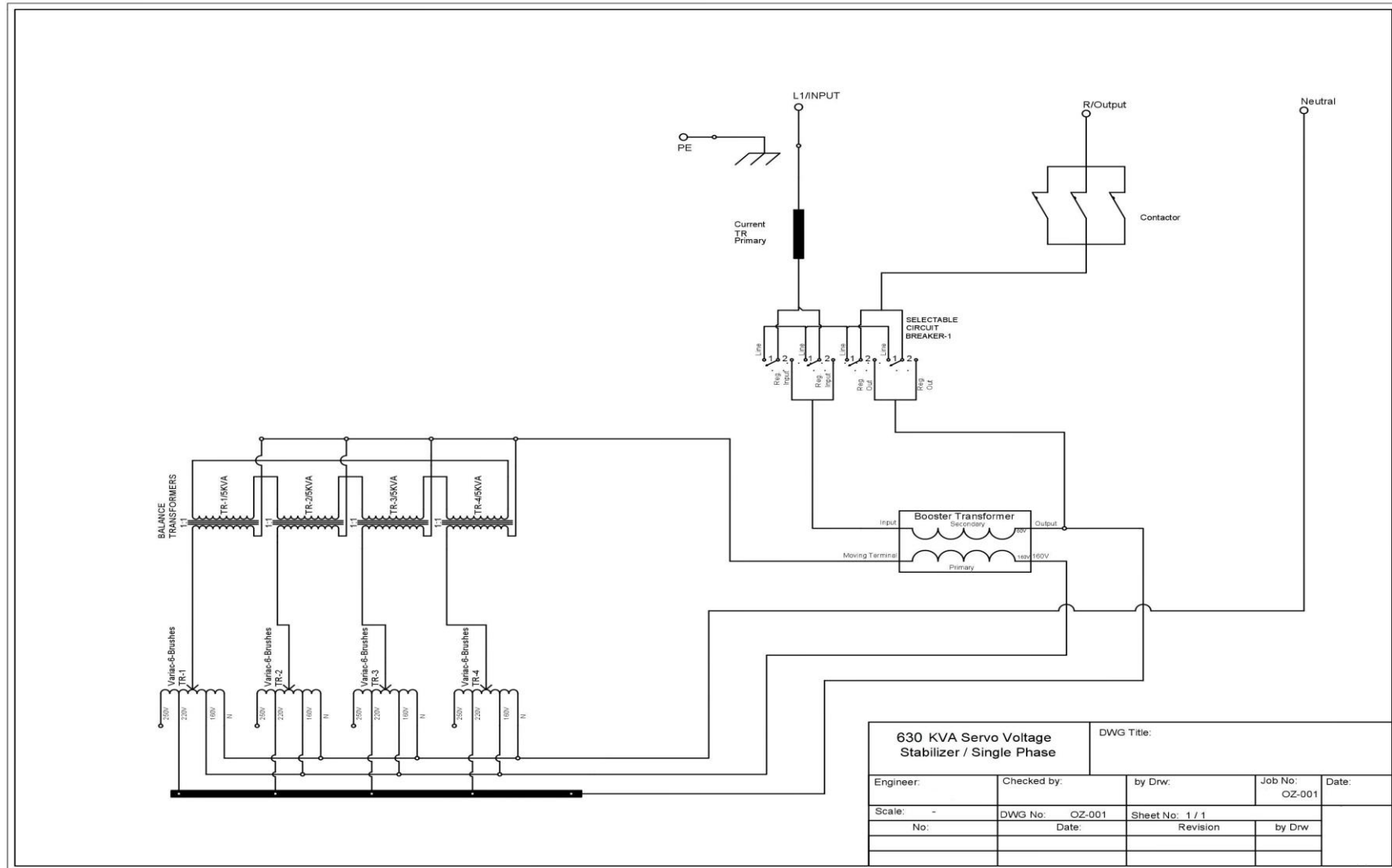


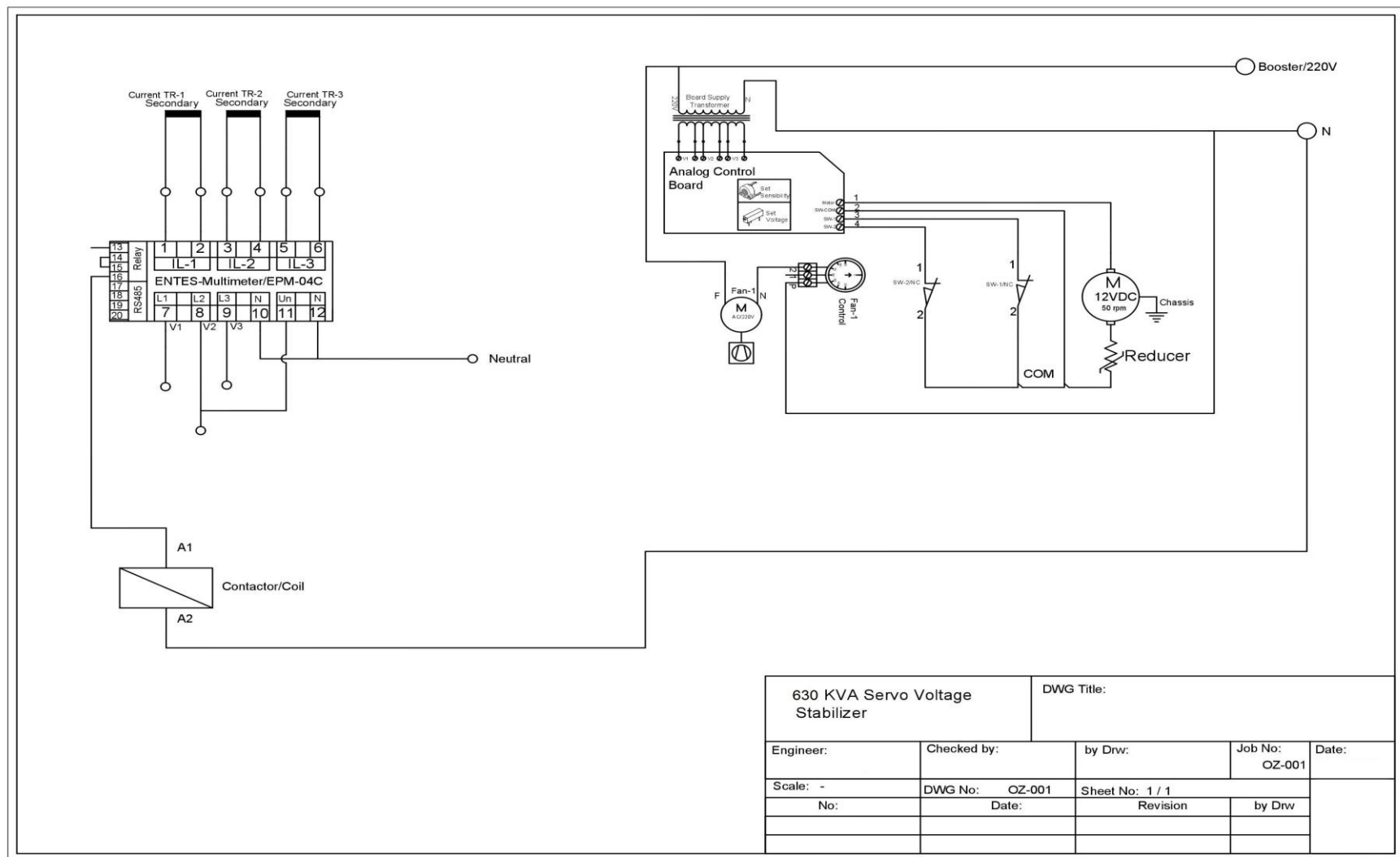


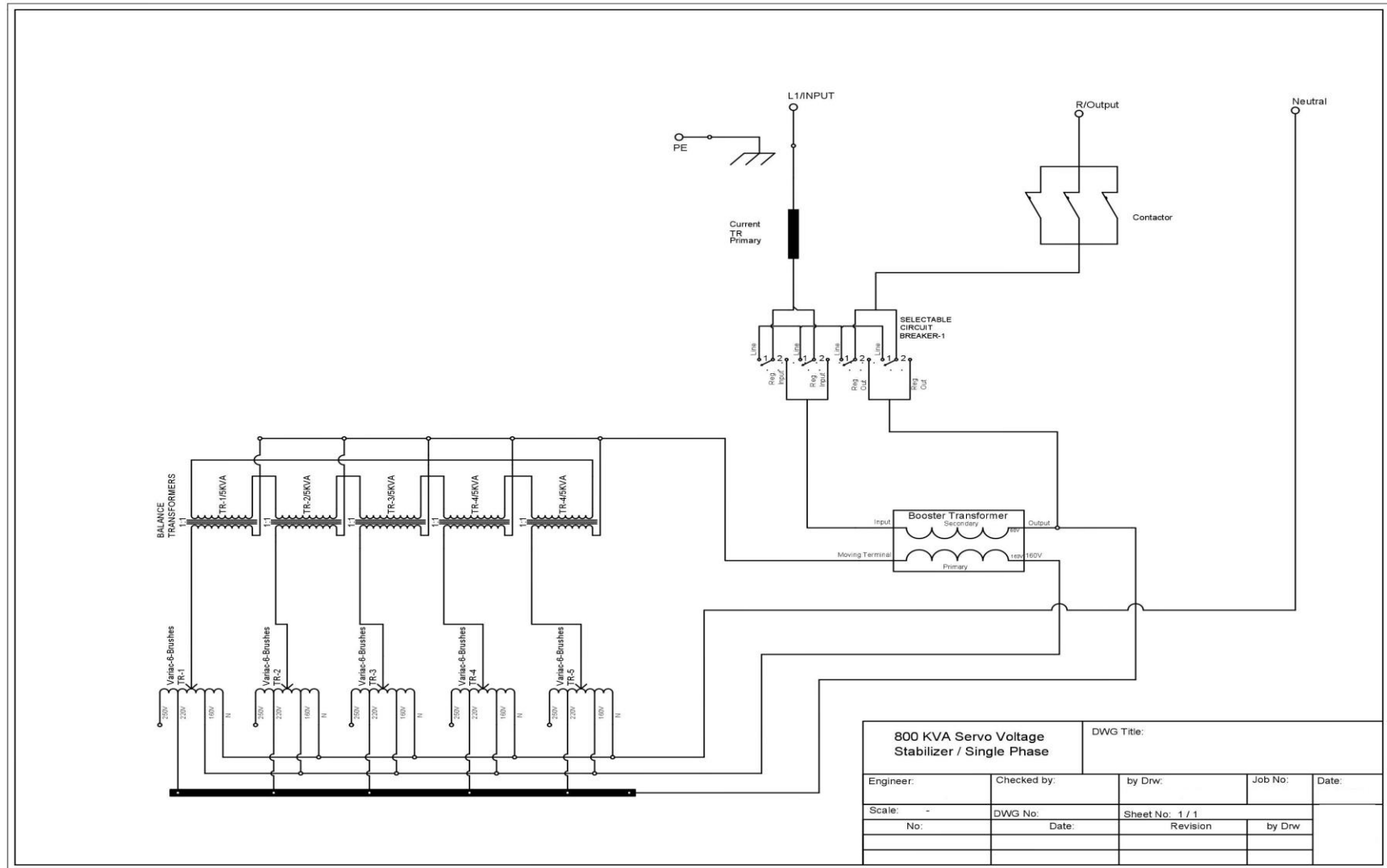


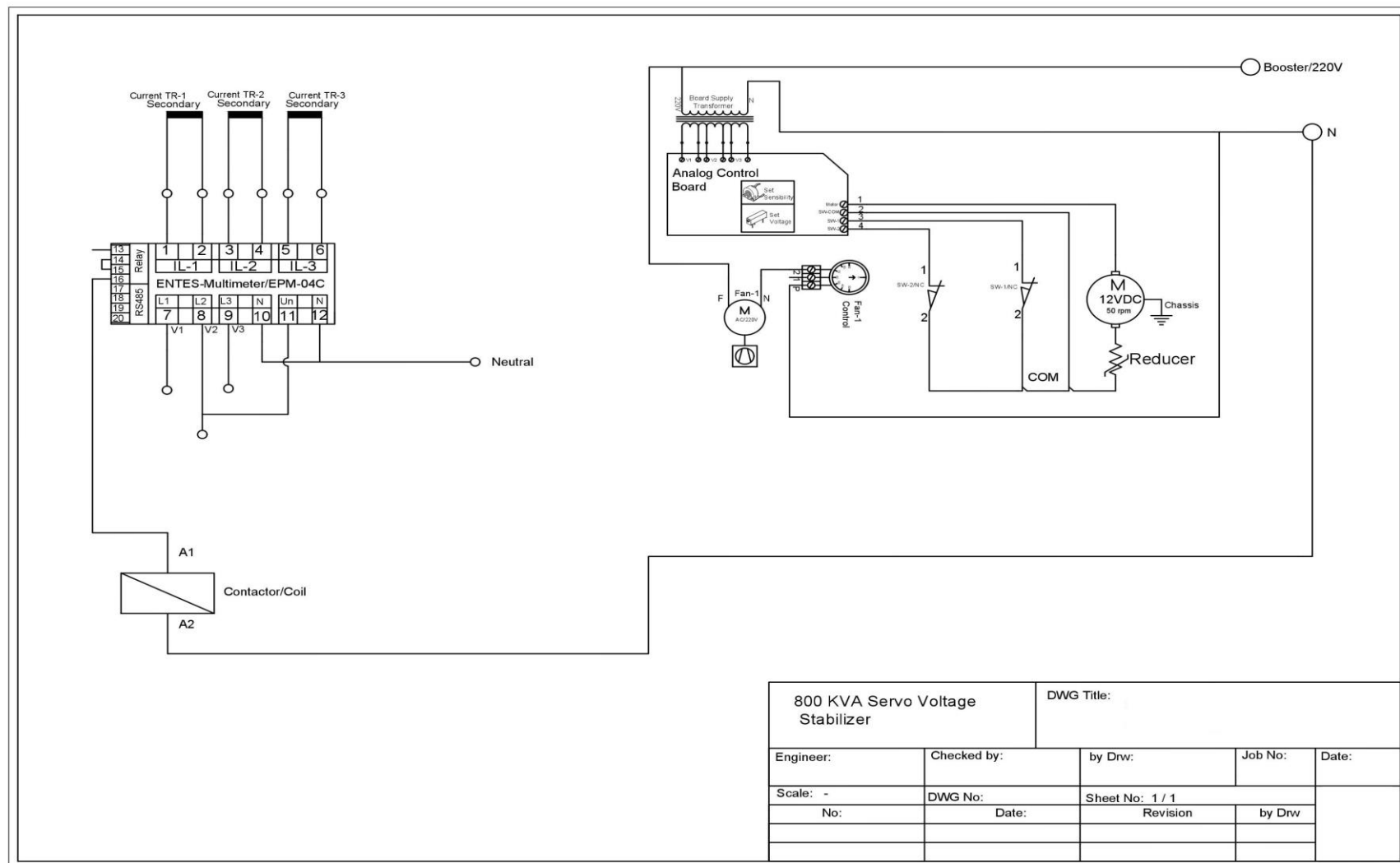


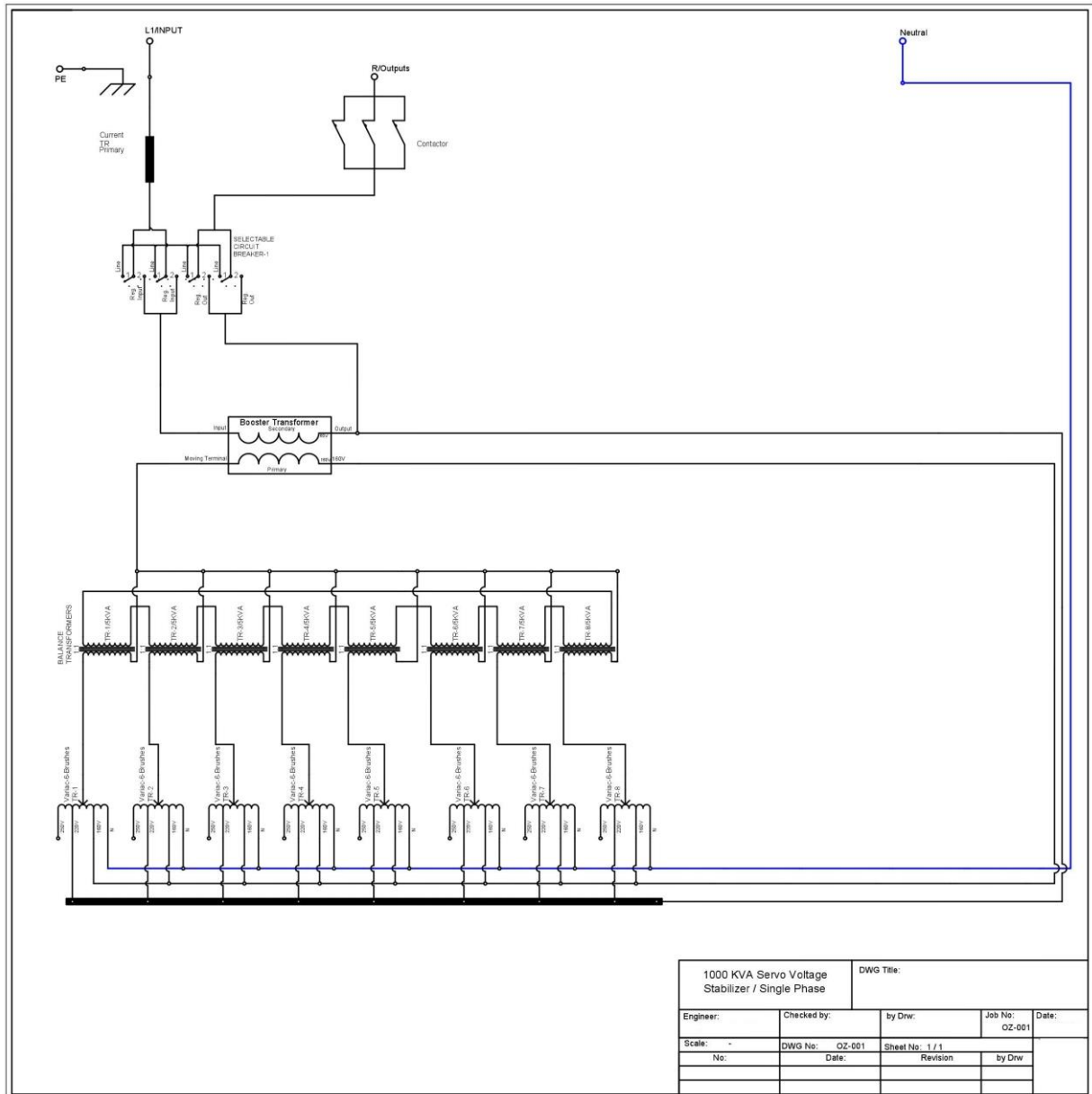


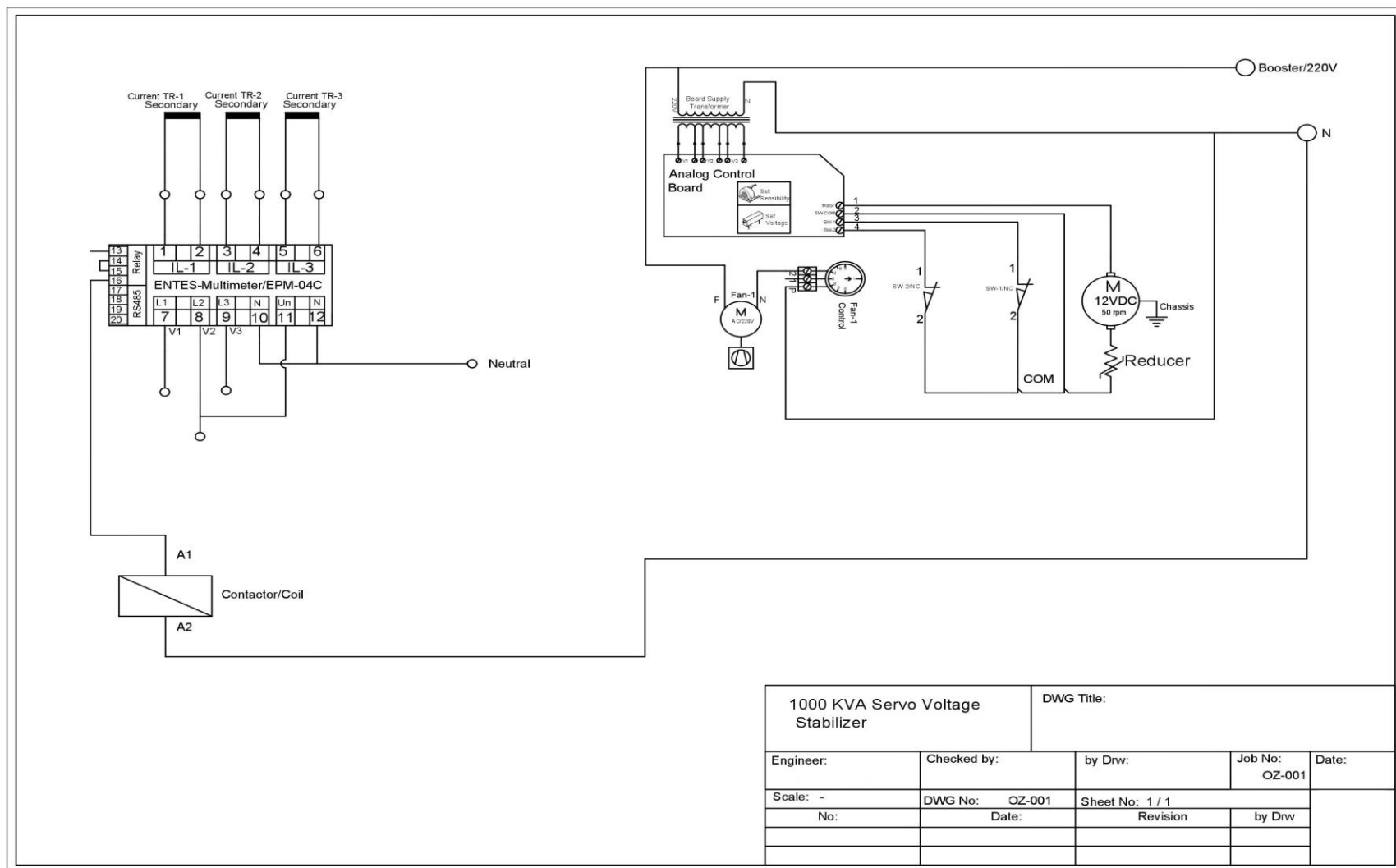


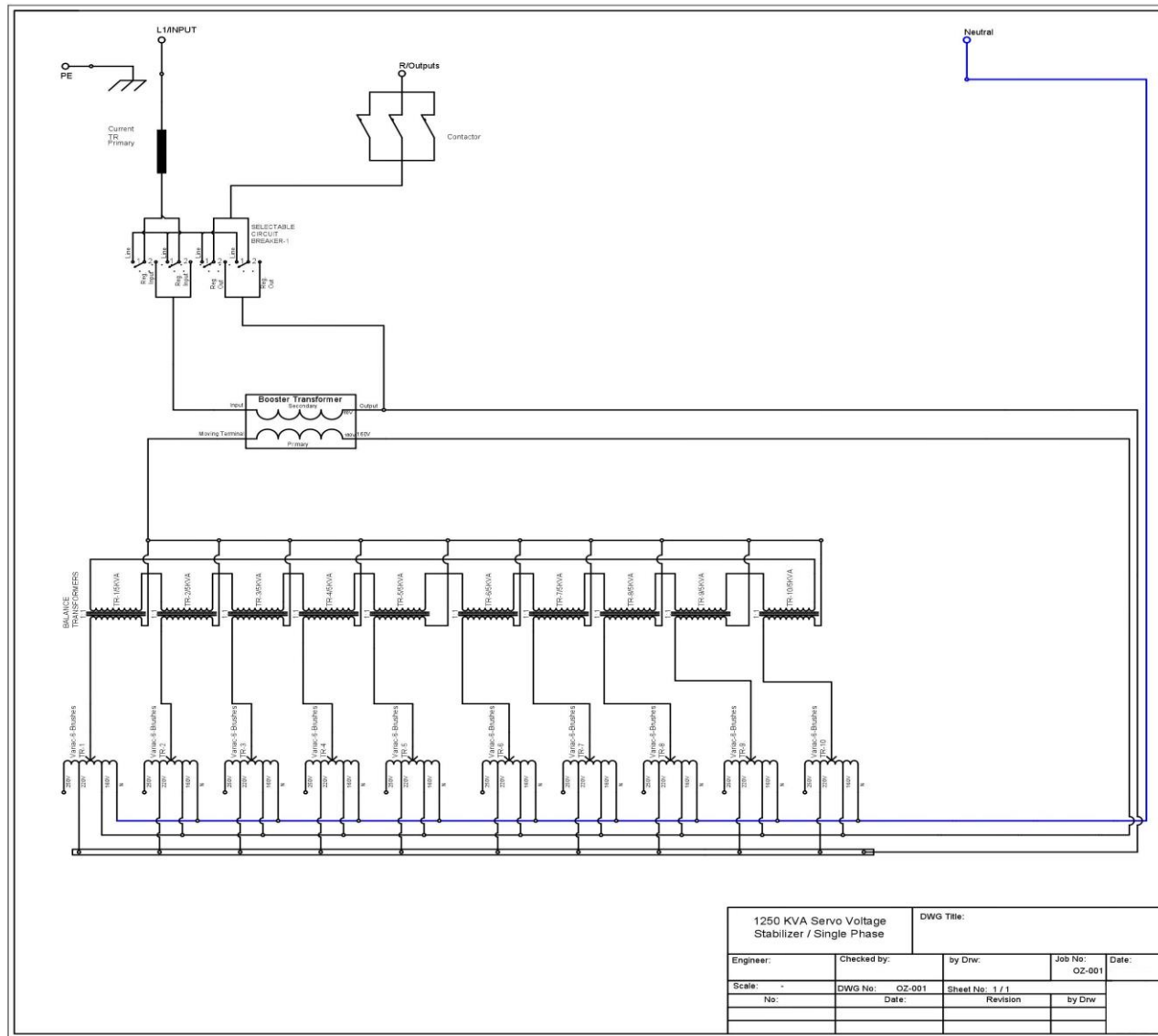


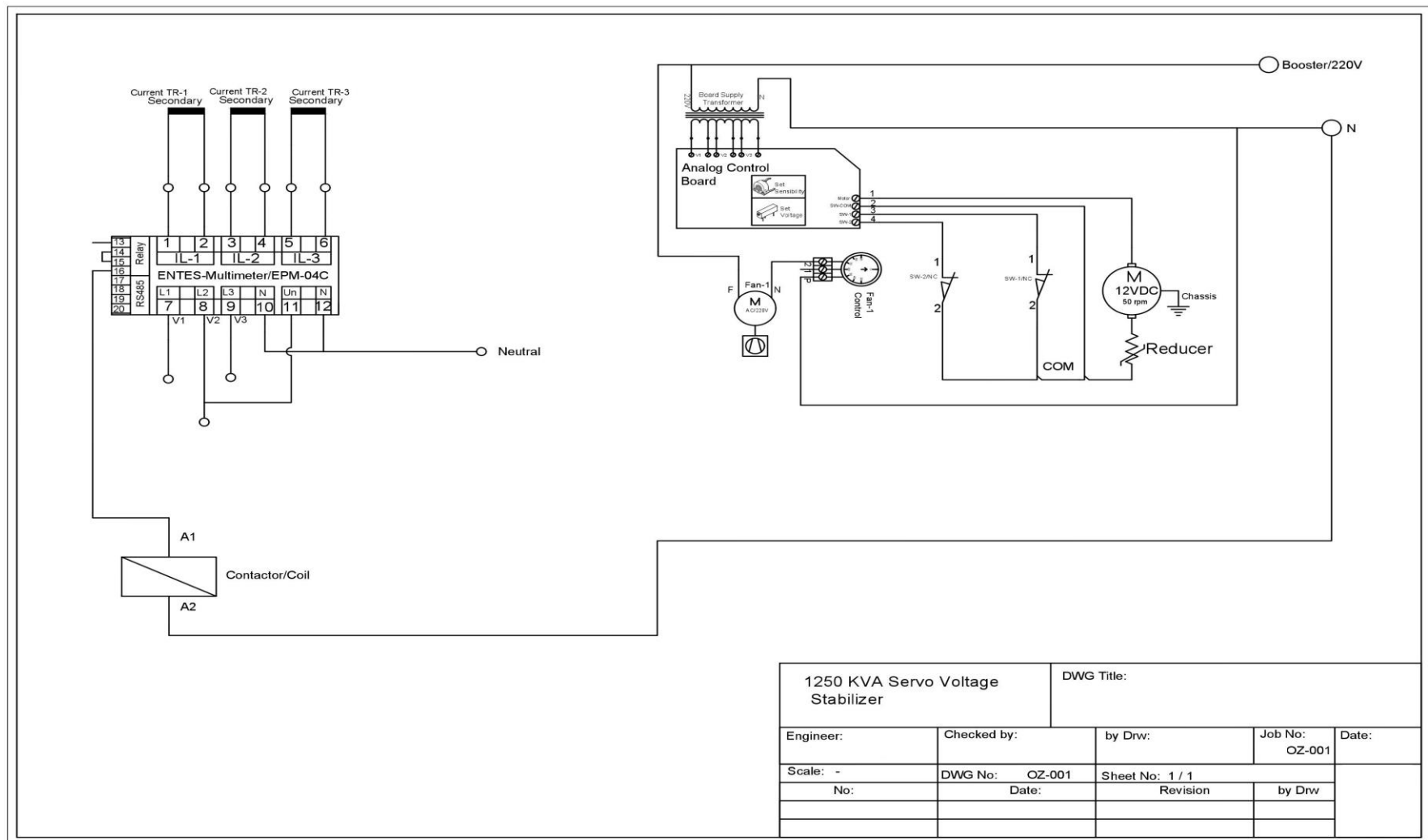


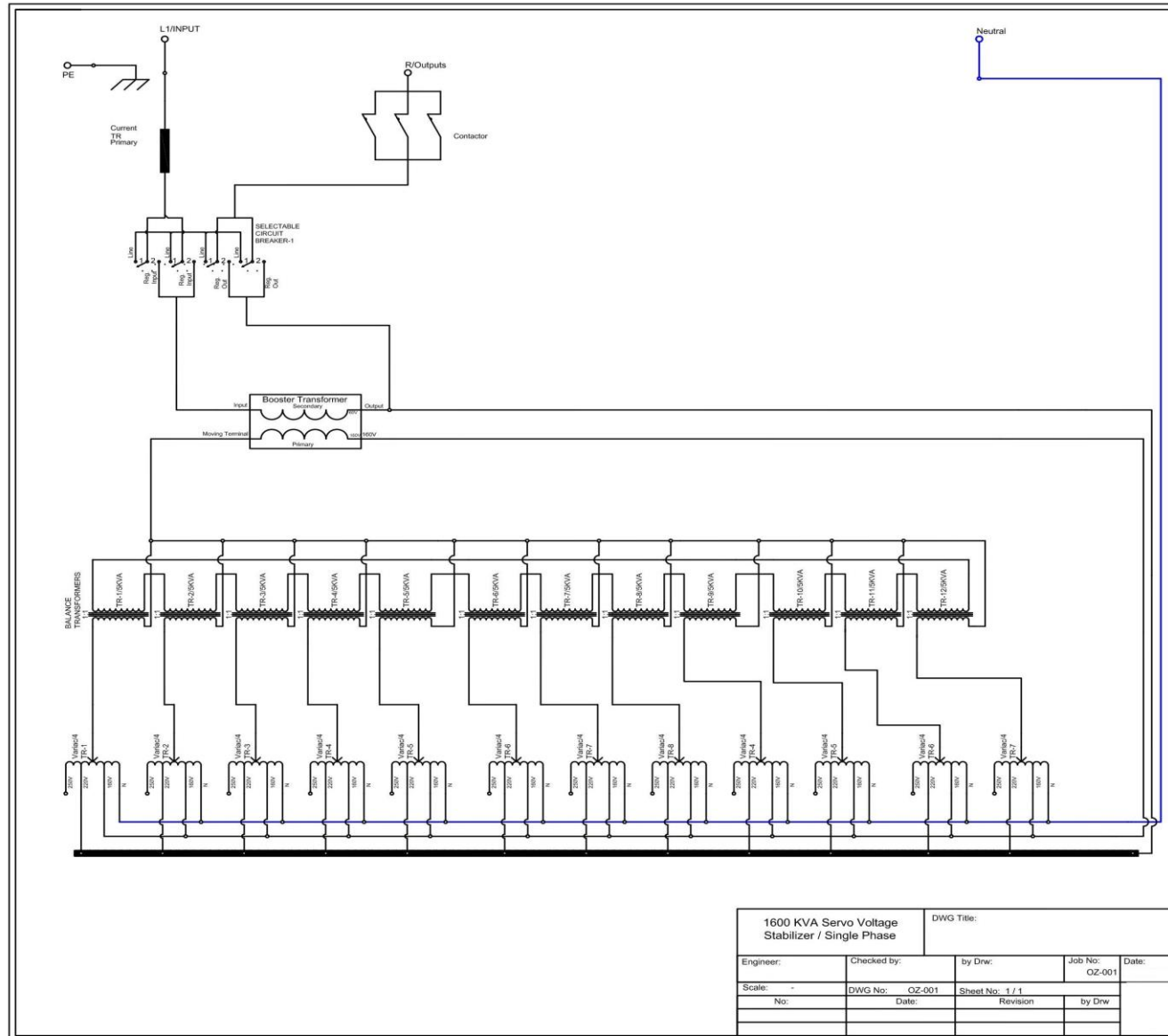


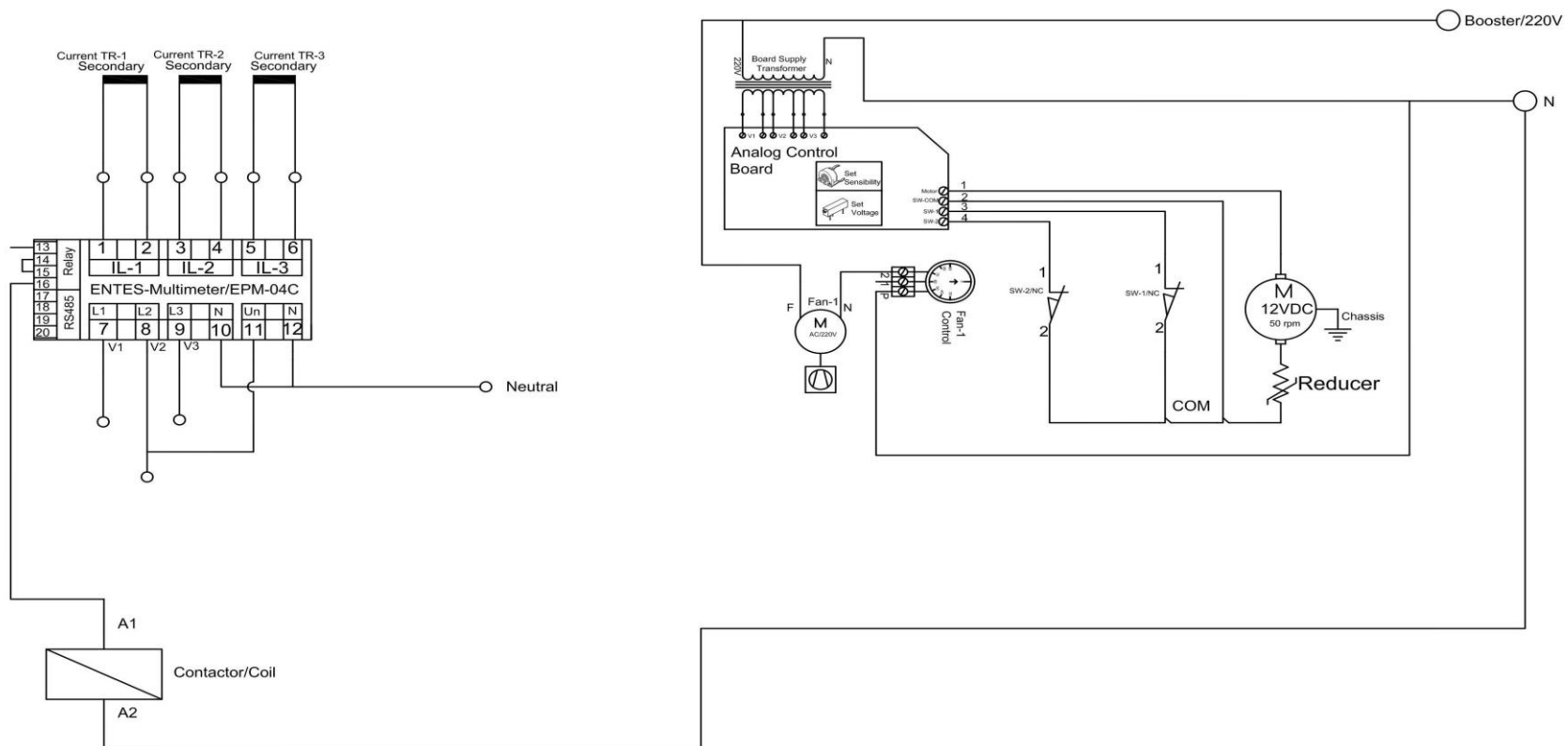












1600 KVA Servo Voltage Stabilizer			DWG Title:	
Engineer:	Checked by:	by Drw:	Job No: OZ-001	Date:
Scale: -	DWG No: OZ-001	Sheet No: 1 / 1		
No:	Date:	Revision	by Drw	

