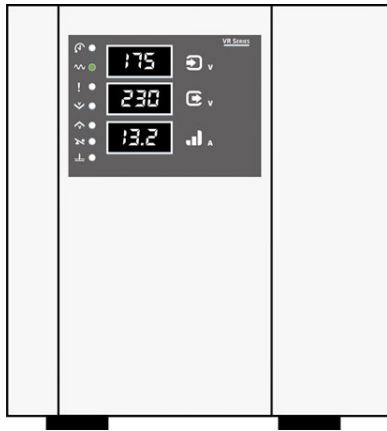


VR-G SERIES **USER / OPERATOR** **PRODUCT MANUAL**



AC VOLTAGE STABILISERS **/ POWER LINE CONDITIONERS**

500 to 5000VA
SINGLE PHASE

WITH SECTIONS ON
INSTALLATION, MAINTENANCE & FRONT-LINE FAULT FINDING

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IMPORTANT **PLEASE READ**

This User / Operator Manual contains information concerning the safe and proper installation and operating procedures applicable to the VR-G range of Single Phase Static Electronic AC Voltage Stabilisers / Power Line Conditioners. The Manual should be read in full before attempting to use, or operate the equipment.

If any problems are encountered with the procedures contained within this Manual then seek assistance from Sinalda UK or the distributor from whom you purchased the equipment.

Whilst every precaution has been taken to ensure the accuracy and completeness of this User Manual, Sinalda UK assumes no responsibility and disclaims all liabilities for damages resulting from misuse of this information or any error or omission.

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Low Cost Protection For Today's Modern Power Needs



1. Introduction

1.1 Overview

VR-G Series microprocessor controlled Single Phase Voltage Stabilisers / Line Conditioners automatically correct brownouts (by boosting low voltage) and over-voltages (by stepping down high voltage). They are, designed to ensure the delivery of a stable and clean output voltage that is at an acceptable level for the connected load equipment.

Being designed for many years of reliable and maintenance-free service, Sinalda's VR-G models provide protection from incoming line voltage sags, spikes and surges / swells. In addition they take voltage protection to the next level by ensuring defence against mains born electrical noise – delivering what is commonly referred to us a “CLEAN” supply.

1.2 Applications

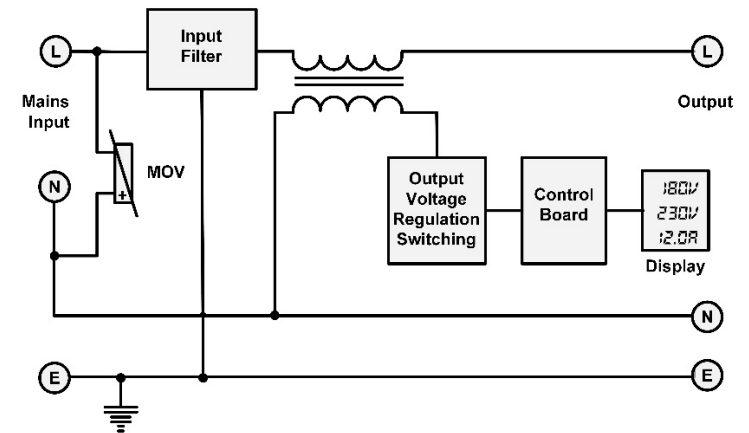


Capable of supporting all electrical and electronic modern office and general household appliances (including air conditioners, computers, fridges, TV, satellite and any other electrical loads), VR-G models are designed to deliver a

regulated and clean output voltage for power environments where the incoming utility mains supply can be as low as 140V or as high as 270V.

1.3 Basic Principle of Operation

VR Series AC Voltage Stabilisers / Line Conditioners are intended as low cost solutions, being designed around an auto transformer with a single input and multiple outputs. The outputs are arranged in steps / taps delivering a higher or lower voltage.



Under normally running conditions the stabiliser will continuously monitor the rise and fall of the incoming utility mains supply. On detection of change in the supply it will energize the most appropriate electro-magnetic switch for selecting the most suitable output winding tap to correct and stabilise the voltage. As a result, the load equipment connected to the stabiliser will receive a safe, tolerable voltage and be able to operate reliably - irrespective of the fluctuating and irregularities of the incoming voltage supply.



1.4 Features



Suitable for all electrical and electronic equipment, VR Series Voltage Stabilisers / Conditioners continuously monitor the incoming supply. Should the incoming voltage rise or drop, the Stabilisers will automatically control the output to ensure the voltage reaching the load equipment remains within the load equipments intended requisite input voltage window.



Protection against all too common everyday high energy spikes and transient voltages typically introduced into the utility mains supply by nearby disturbances resulting from peak power demands or stop / start operation of electrical machines.



Filtering designed to attenuate disruptive and damaging electrical noise on the incoming supply. Ensures protection against Common Mode electrical noise that occurs between the neutral and earth, and also Normal (AKA. Transverse / Differential) Mode electrical noise that occurs between the line and neutral.



Basic protection of the load equipment from the potentially damaging effects of high transient over-voltages introduced indirectly into the utility mains supply following a lightning strike.



A 10 second time delay on system restart designed to prevent nuisance tripping. Ensures that load appliances are not switched on-off repeatedly during fluctuations, nor are they subjected to massive surges normally experienced when power returns after power outages. For air conditioning applications this feature should ensure compressors have sufficient time to neutralise before re-starting.



An extremely fast speed of response to voltage changes ensures VR Series Voltage Stabilisers are ideal for virtually all types of critical load applications.



Being based on the highly reliable microprocessor controlled digital electronic design topology, VR Series models are solid state with no moving parts making them perfect for applications where an 'Install and Forget' solution is required.



With no user required replacable components, VR Series Voltage Stabilisers / Conditioners offer a long design life and are basically 'Maintenance Free' solutions.

Please Note: VR Series Voltage Stabilisers / Power Conditioners are **NOT FOR USE** with life sustaining equipment, or any device where the power requirements exceed the "Maximum Output Rating" listed in the Specification table.



2: General Specification

2.1 Input

Model No	VR-500G	VR-1000G	VR-2000G	VR-3000G	VR-5000G
Nominal Input Voltages	220V – 230V – 240V AC Single Phase, 2 Wire (L, N & G/E)				
Input Voltage Range	800V to 270V AC Single Phase, 2 Wire (L, N & G/E)				
Max Input Current - Amps	6.3	12.5	25	37.5	62.5
Input Power Socket – with IEC Power Cable	IEC 320 C13	IEC 320 C13	Hardwire - Screw Terminals		
Operating Frequency	50 / 60 Hz (35 to 63 Hz)				
Surge Suppression	TVSS - Protects loads against high-energy Spikes and Transient Voltages				
Surge Rating	300 Joules				
Noise Filtering	LC Filters delivering Common Mode 60dB@100kHz & Normal Mode 40dB@100kHz				

2.2 Output

Model No	VR-500G	VR-1000G	VR-2000G	VR-3000G	VR-5000G	
Max Output Rating	<i>VA/Watts</i>	500	1000	2000	3000	5000
	<i>Amps</i>	2.1	4.3	8.6	13	21.7
Output Voltage	220V – 230V – 240V AC Single Phase, 2 Wire (L, N & G/E)					
Output Voltage Accuracy	230V ±10%					
Output Power Socket / Terminals	IEC 320 C13	IEC 320 C13	Hardwire - Screw Terminals			
Response Time	200 milliseconds					

Power Factor	No effect on performance providing the Stabiliser / Conditioner is being used within its rated capacity
Overload Ratings	10 x Max. Current for 100 milliseconds 2.5 x Max. Current for 10 seconds 1.5 x Max. Current for 1 minute
Operating Frequency	50 / 60 Hz (47 to 63 Hz)

2.3 Additional Features

Model No	VR-500G	VR-1000G	VR-2000G	VR-3000G	VR-5000G
Input Breaker	Over Current & Short Circuit Protection				
Manual Bypass	Manual Bypass Switch – with interlocking				
Loss of Supply	Automatic Restart on Return of the Utility Mains Supply				
Restart Time Delay	10 Seconds restart time delay to prevent nuisance tripping and protect sensitive equipment against damage				
Audible Alarms	Low Voltage, High Voltage, Overload & Over Temperature				
LED Display Indicators	Time Delay, Normal, Irregularities, Low Voltage, High Voltage, Overload & Over Temperature				
Digital Display Metering	Input Volts, Output Volts & Load Current (Amps)				

2.4 Environmental

Model No	VR-500G	VR-1000G	VR-2000G	VR-3000G	VR-5000G
Efficiency	>98%				
Harmonic Distortion	THD – Less than 1%				
Operating Temperature	0 to 45°C. Derate by 2% for each additional °C up to max. of 60°C				
Maximum Altitude	4000 meters. Derate by 2.5% for each additional 500 metres				
Relative Humidity	Suitable for indoor tropical use up to 90% RH (non-condensing)				



2.5 Physical

Model No	VR-500G	VR-1000G	VR-2000G	VR-3000G	VR-5000G
Construction	Freestanding Enclosures to IP20 (NEMA 1 Style) - BS/EN 60529				
Colour	RAL 1013 (Oyster White - Epoxy Powder Coat)				
Physical Size W x H x D mm	205 x 215 x 280		235 x 275 x 350	280 x 295 x 380	
Weight	7 Kg	10 Kg	15 Kg	19 Kg	27 Kg
Packed Size W x H x D cm	40 x 30 x 30		50 x 42 x 40		
Packed Weight	9.3 Kg	12.7 Kg	18 Kg	22.5 Kg	30.5 Kg

2.6 Certification & Compliance

Model No	VR-500G	VR-1000G	VR-2000G	VR-3000G	VR-5000G
EMC Compliance	Complies with BS/EN 55022 & the relevant parts of BS/EN 61000 standards				
CE Certification	CE Marked - being fully compliant with European Union Directives 2014/30/EU (The EMC Directive) and 2014/35/EU (The Low Voltage Directive)				

2.7 Warranty

Model No	VR-500G	VR-1000G	VR-2000G	VR-3000G	VR-5000G
Standard Warranty	24 Months / 2 Years				

3: Safety Instructions



Read and follow all Safety Instructions

Please save these instructions for future reference

3.1 Introduction

These instructions are addressed to the Installer and End User / Operator of the VR Series of Single Phase AC Voltage Stabiliser / Conditioners. We strongly suggest you keep this manual next to the equipment for future reference.

3.2 General Installation & Usage

Do not use the Stabiliser / Conditioner for other than the intended use.

Do not install Stabiliser / Conditioner in back feed circuits, such as solar panel and wind turbine applications, where the energy is supplied back to the grid, nor should the input voltage supply be connected to the output of stabiliser.

If on delivery there is evidence of visible damage, do not attempt to install or start the Stabiliser / Conditioner. Advise the transport delivery company and inform Sinalda UK, or the resale partner from whom you purchased the equipment.

The Stabiliser / Conditioner can contain potentially dangerous voltages – up to 300V AC. As there are no user replaceable components, once installed there should be no reason to remove the protective covers. If the covers are removed, use extreme caution and do not leave the unit unattended with the covers off.

Hazardous voltages can be present at the unit's output any time AC input power is applied. To avoid possible personal injury, or equipment damage, and to make certain there is no output voltage, turn the unit off and disconnect the AC Input.



To reduce the risk of fire, or electrical shock, install the unit in an indoor area free from conductive contaminants.

Do not use outdoors.

Do not place the unit near water or liquids, gas and combustible materials or in an excessively humid environment where condensation is very likely to occur.

To reduce the risk of overheating, do not block the unit's ventilation panels and try to avoid positioning the unit in direct strong sunlight or close to other heat sources.

Do not allow liquids or foreign objects to enter the unit.

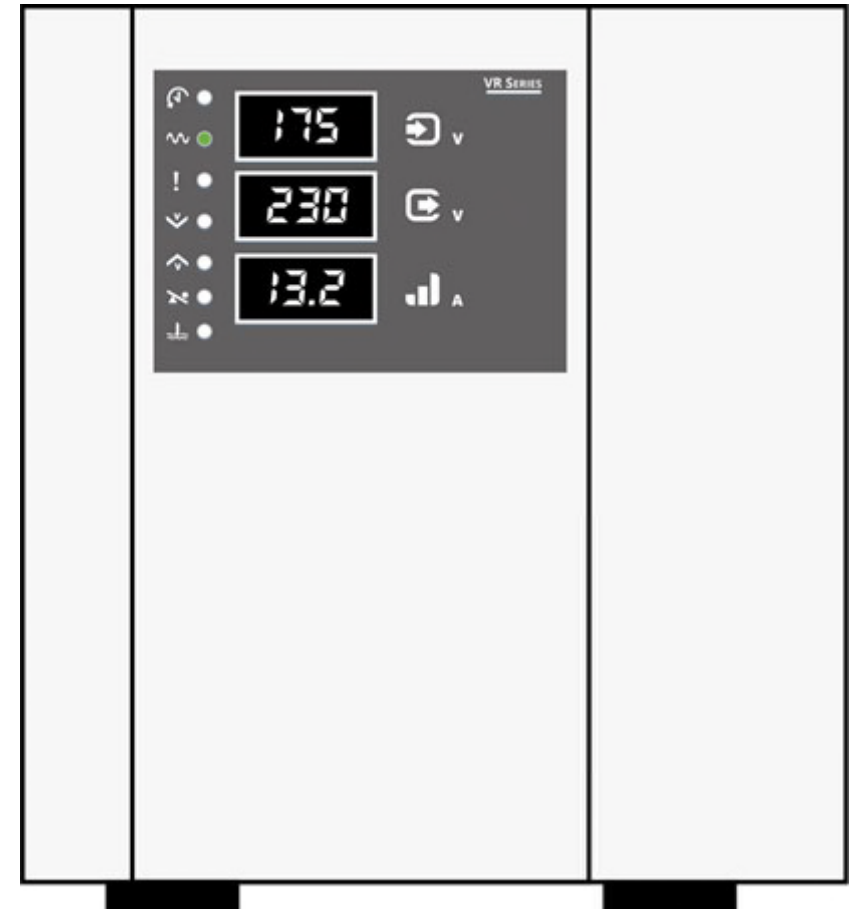
The installation and use of this product must comply with all relevant current electrical installations that are in force in the territory of installation.

Where the system is required to be hardwired into the input utility mains supply we would strongly suggest that a qualified electrician should install the equipment. The electrician should install the AC input according to the instructions contained in this manual. Standard safety practices should be followed at all times.

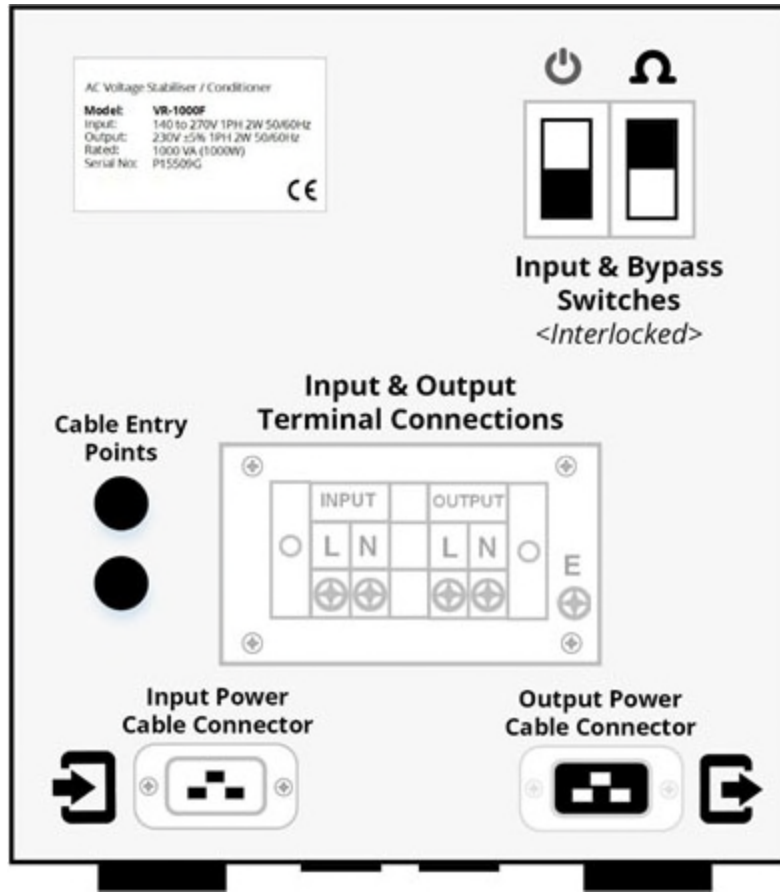
The unit must be grounded or earthed at all times when in use.

4: Visual External Appearance

4.1 Front View

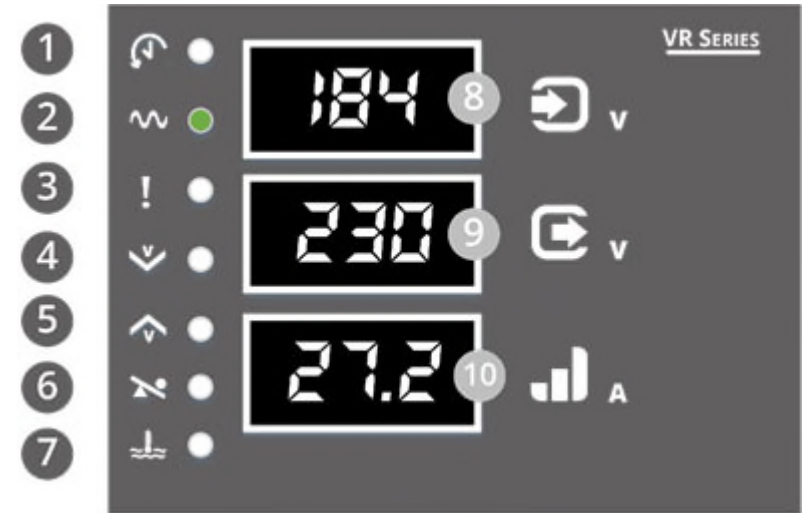


4.2 Rear View



NB: Provision of Input and Output Power Cable Connectors is dependent on the model purchased. Where Input Connectors are fitted the Stabiliser / Conditioner is supplied with a suitably rated IEC power cable.

4.3 Display Panel



LED Indication & Alarms

- | | | |
|---|----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1 | Time Delay | 10 second delay in the supply of power to the output on start-up and on the re-engagement of the output after an irregular event. |
| 2 | Normal | All is Working Fine |
| 3 | Irregularities | Fault Condition Present |
| 4 | Low Voltage | Input Voltage 10V+ lower than permissible input Voltage Window. Output will be automatically disconnected. Audible Alarm will activate. On fault clearance Output will be automatically re-engaged. |



5 High Voltage	Input Voltage 10V+ greater than permissible input Voltage Window. Output will be automatically disconnected. Audible Alarm will activate. On fault clearance Output will be automatically re-engaged.
6 Overload	Actual load current exceeds the model's stated maximum rating. Audible Alarm for 60 seconds and then the Output will be automatically disconnected. On fault clearance system will require manual restart.
7 Over Temperature	Internal temperature exceeds 120°C. Output will be automatically disconnected. Audible Alarm will activate. On fault clearance system will require manual restart.

Digital Metering

8 Input Volt Meter	Voltage level of the incoming utility mains supply.
9 Output Volt Meter	Output Voltage delivered by the system.
10 Load Ammeter	Power (Amps) drawn by the connected load.

5: Installation & Operation Instructions

5.1 Unpacking & Inspection

If on delivery there is evidence of visible damage, do not attempt to install or start the Stabiliser / Conditioner. Advise the transport delivery company and inform Sinalda UK, or the resale partner from whom you purchased the equipment.

After unpacking and removing the polystyrene protective packaging from the VR Series unit, inspect the ventilation slots to ensure that they are free from all obstruction. Use a vacuum cleaner to dislodge any obstructions.

We would suggest you retain the packing carton and packaging material to return the VR Series Stabiliser / Conditioner in the unlikely event of its operational failure.

5.2 Positioning

Although the Stabiliser / Conditioner does not produce excessive heat, you should ensure that it is positioned so that a free flow of air allows the unit to cool. To reduce the risk of overheating, do not block the unit's ventilation panels and try to avoid positioning the unit in direct strong sunlight or close to other heat sources

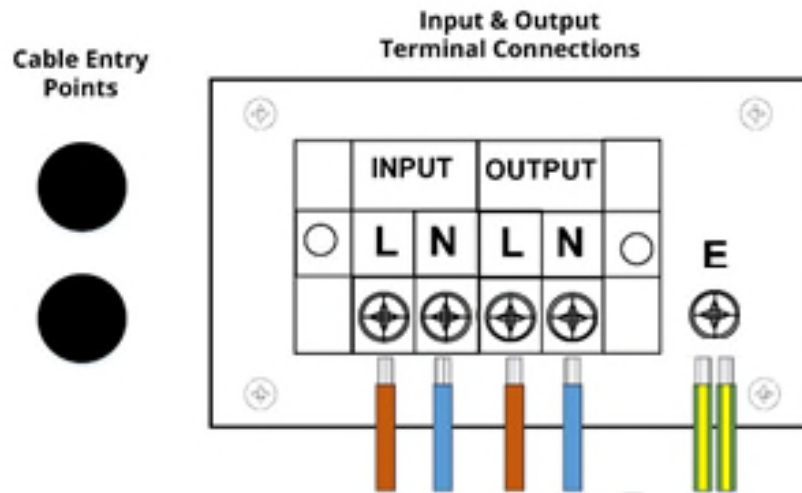
The Stabiliser is intended for indoor use only. Do not install inside a closed cupboard and do not allow papers, or other materials, to be piled on top of the enclosure.

Do not place the unit near water or liquids, gas and combustible materials or in an excessively humid environment where condensation is very likely to occur.



5.3 Hardwire Installation & Operation

For use with a Two-Phase Supply (*No Neutral*) Phase 2 (L2) should be connected to the Neutral Connections on the Stabiliser instead.



- Remove Terminals Connection Cover Plate.
- Ensure supply is isolated before making connections.
- Connect the Input Cable to the terminal block (as indicated) and take to mains supply via cable entry access hole in the enclosure.
- Connect Output Cable to the terminal block (as indicated) and take to the load via the relevant cable entry access hole in the enclosure.
- Check all wires are properly secured (using glanding - as appropriate), connections are tight and cables are correctly wired before switching on.

- Refit Terminals Connection Cover Plate.
 - Energise / Switch-On the mains utility supply. Connect the load equipment and Switch-On the Input Breaker to turn the Stabiliser / Conditioner on.
 - There will be a 10 second delay before the output engages. The delay will ensure that the utility mains supply is good before connecting the load and protects the load equipment from rapid switching on and off.
 - The LED Indicators and Digital Metering on the Front Display Panel will display the operational status of the Voltage Stabiliser / Power Conditioner – see Section 4.3
- Any variation to the input power supply, up or down, will be monitored and adjusted by the VR Series Stabiliser / Conditioner.

Please Note:

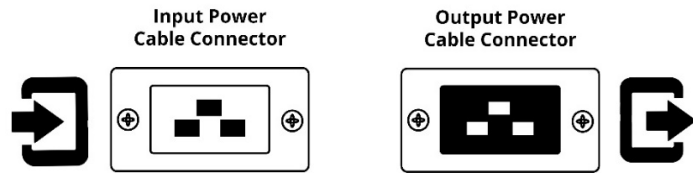
If you are unfamiliar with installing electrical equipment, prior to installing the Stabiliser / Conditioner, please consult with a qualified electrician.

Also with the cable connections -

- The wire coloured **BROWN** must be connected to the terminal marked 'L' for Live
- The wire coloured **BLUE** must be connected to the terminal marked 'N' for Neutral.
- The wire coloured **YELLOW and GREEN** must be connected to the terminal marked 'E' for Earth/Ground.



5.4 Plug N Play Installation Option & Operation



- Where the selected model's maximum input and maximum output current ratings permit the Voltage Stabiliser / Conditioner is fitted with alternative standard IEC input and output sockets (10/16 Amps).
- Where an Input Power Cable Connector is available the Stabiliser / Conditioner comes bundled with an appropriately rated IEC input power cable.
- Having connected the input and output power cables, energise the mains utility supply. Connect the load equipment and Switch-On the Input Breaker to turn the Stabiliser / Conditioner on.
- Upon Start-Up there will be a 10 second delay before the output engages. The delay will ensure that the utility mains supply is good before connecting the load and protects the load equipment from rapid switching on and off.
- The LED Indicators and Digital Metering on the Front Display Panel will display the operational status of the Voltage Stabiliser / Power Conditioner – see Section 4.3.
- Any variation to the input power supply, up or down, will be monitored and adjusted by the VR Series Stabiliser / Conditioner.

5.5 Manual Bypass Operation

- In the unlikely event of a problem with VR Series model the Stabiliser / Conditioner can be bypassed – with the input supply being fed directly to the load equipment.
- In order to manually activate this bypass, disconnect the load and Switch-Off the Input Switch. Then Switch-On the Bypass Switch and reconnect the load equipment.

Please Note:

The Input Switch and Bypass Switch are interlocked to prevent the activation of both switches at the same time. **Do not attempt** to force the activation of both switches at the same time as this will damage both the Stabiliser / Conditioner and connected load equipment.



6: Troubleshooting

Symptom	Possible Cause	Remedy
The unit does not Switch On. None of the LEDs are illuminated.	<p>1) The external input mains utility supply fuse has blown or the external input breaker has tripped.</p> <p>2) The unit's input breaker has tripped.</p> <p>3) No power is available from the mains supply.</p>	<p>Change the input supply fuse or reset the breaker.</p> <p>Ensure that the load current does not exceed the capacity of the unit. If, after changing the fuse / resetting the breaker, the unit is still not functioning return the unit for repair.</p> <p>Ensure that you are using the correct voltage (i.e.230V or 120V).</p>
The unit appears to be functioning correctly but there is no power being supplied to the load.	<p>Load is not plugged in / connected.</p> <p>Load is not switched on.</p> <p>A fuse on the load has blown.</p> <p>Time delay is in progress.</p>	<p>Check the load is plugged in / connected.</p> <p>Check / replace the fuse on the output load.</p> <p>Check that the input voltage is within the acceptable range of the unit.</p> <p>Check that the load is switched on.</p> <p>Wait for the time delay to end.</p>
The unit appears to be functioning correctly, but the output voltage is persistently low.	<p>The mains input is too low.</p> <p>Due to a continuous severe brown-out.</p>	

	The unit is rated at 230V and the incoming supply is 120V.	
LED Front Panel Red Alarm Condition shows		
Irregularities	Fault Condition Present	<i>See below</i>
- Low Voltage	Input Voltage 10V+ lower than permissible input Voltage Window.	Output will be automatically disconnected. Audible Alarm will activate. On fault clearance Output will be automatically re-engaged.
- High Voltage	Input Voltage 10V+ greater than permissible input	Voltage Window. Output will be automatically disconnected. Audible Alarm will activate. On fault clearance, the Output will be automatically re-engaged.
- Overload	Actual load current exceeds the model's stated maximum rating.	Audible Alarm for 60 seconds and then the Output will be automatically disconnected. Reduce the loading on the unit. On fault clearance system will require manual restart.
- Over Temp	Internal core temperature of the primary transformer exceeds 120°C.	Output will be automatically disconnected. Audible Alarm will activate. Allow unit to cool and ensure airflow not restricted. On fault clearance system will require manual restart.



7: Warranty & Returns

7.1 Warranty

Sinalda UK warrants its products to be free from defects in materials and workmanship for a period of one (1) year from the date of purchase, or two (2) years providing the original purchaser has within 30 days of purchase officially registered the product warranty direct with Sinalda UK.

The obligation under this warranty is limited to repairing or replacing, at Sinalda's sole discretion, any such defective products.

The warranty does not apply if the product has been damaged by accident, negligence, or misapplication or has been altered or modified in any way.

Except as provided herein, Sinalda UK makes no warranties, expressed or implied, including warranties of merchantability and fitness for a particular purpose.

Some countries do not permit limitation or exclusion of implied warranties; therefore, the aforesaid limitation(s) or exclusion(s) may not apply to the purchaser.

Except as provided above, in no event shall Sinalda be liable for direct, indirect, special, incidental, or consequential damages arising out of the use of this product, even if advised of the possibility of such damage. Specifically, Sinalda is not liable for any costs, such as lost profits or revenue, loss of equipment, loss of use of equipment, loss of software, loss of data, costs of substitutes, claims by third parties, or otherwise. This warranty gives you specific legal rights and you may also have other rights which may vary from location to location.

This warranty does not affect your statutory or Common Law rights.

7.2 Returns Procedure

Should your VR Series Stabiliser / Power Conditioner need repair, the quickest and simplest way is to return it to the resale partner / dealer you purchased it from or direct to your nearest Sinalda office.

Important:

Before returning a product to Sinalda, please contact the After Sales Support Department to obtain a Returns Number and to be advised of the nearest and most appropriate Service Centre to which you should send the goods.

Sinalda UK - After Sales Support

Email Support: support@sinalda.com
Tel: +44(0)345 504 6442
Web: <https://www.sinalda.com>

At the time of your request please note you will be asked to provide the following information:-

- Your Name, Company Name, Address, Telephone No, Email Address
- Date of Purchase, Where and From Whom it was Purchased
- Serial No, Model No
- Local Voltage and Type of Load Connected
- A Description of the Fault

Once you have the Returns Number and Shipping Address you should ensure that the unit is securely packed (*ideally in the packing carton the Stabiliser / Conditioner was originally supplied*). It is imperative that you ensure that the Returns Number is clearly shown on the packing carton and also a note is added in the box to advise where and to whom should be returned the item on its repair or replacement.

Kindly ensure that all products returned to Sinalda are done on a transportation prepaid basis.

Complying with the above will ensure that you're Stabiliser / Conditioner will be treated promptly and efficiently. Without a Returns Number it will not be possible to trace a unit or check progress on the repair of the item.



Notes:

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Products available

Voltage Stabilisers 1 to 3125 kVA

- Servo Electronic Design 1 to 600 kVA
- Static Digital Electronic Design 6 to 3125 kVA
- Industrial Magnetic Induction Design 250 to 5000 kVA

Power Line Conditioners 0.5 to 2000 kVA

- Ferro-Resonant Design 0.5 to 5 kVA
- Static Digital Electronic Design 6 to 2000 kVA

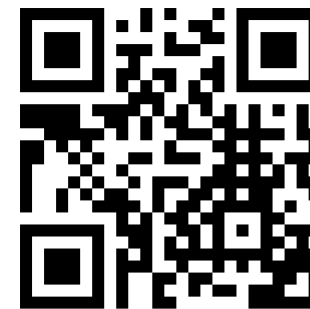
Constant Voltage Compensators 3 to 1500 kVA

Automatic Voltage Optimisers 10 to 1000 kVA

Variable Transformers 3 to 800 Amps

Variable Voltage & Frequency Converters 2 to 400 kVA

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