Qoltec®

User Manual

Three-phase AVR voltage stabiliser

10kVA | 15kVA | 20kVA | 30kVA | 40kVA

Model: 51906, 51907, 51908, 51909, 51910

Introduction

Thank you for choosing our automatic voltage regulator (AVR). This unit provides effective protection for connected loads against fluctuations in the supply voltage.

The stabiliser utilises Servo Motor Control technology with independent regulation of each phase, ensuring high precision voltage stabilisation and reliable operation in industrial installations and professional power supply systems.

This manual contains information on the installation, use and safe operation of the AVR stabiliser. Should you encounter any problems with the unit, please refer to this manual before contacting technical support.

Important safety instructions

1. To avoid damage to the unit, it is recommended that the stabiliser is transported only in its original packaging.
2. In the event of a sudden change in temperature – for example, when moving the unit from a cool room to a workplace with a higher temperature – condensation may form inside the stabiliser. The unit must be completely dry before it is put into operation. It is recommended that you wait at least 2 hours before switching on the unit.
3. Before connecting the stabiliser to the mains, ensure that the ambient conditions comply with the parameters specified in the technical specifications. Use suitable cables with sufficient current-carrying capacity to connect the stabiliser. Recommended cable cross-section: $\leq 0.5 A/mm^2$.
4. All cables must be laid safely to prevent anyone from stepping on or tripping over them.
5. The stabiliser is fitted with an internal earth terminal. The external earth lead must be connected correctly. The earth connection must not be removed or disconnected.
6. If the output voltage varies by more than 10V, adjust the fine-tuning potentiometer located on the control board:
    - turning clockwise increases the output voltage,
    - turning anti-clockwise reduces the output voltage. Note: Each phase must be adjusted separately and recalibrated to 220V per phase.

7. Do not insert any metal or foreign objects, such as paper clips, nails, etc., into the unit.
8. The interior of the stabiliser must be kept clean. Accumulated dust may jam the gear mechanism and affect the accuracy of voltage regulation. The device must be cleaned regularly.
9. In emergency situations, such as:

- damage to the casing,
- damage to the front panel,
- damage to the power cables,
- spillage of liquid onto the device,
- foreign objects entering the device,

Switch off the stabiliser immediately, disconnect it from the mains supply and contact an authorised service centre.

10. If the stabiliser loses its automatic regulation:
    - disconnect the power supply,
    - check the microswitch, the control board and the gear mechanism,
    - once the fault has been rectified, restart the unit.

During testing, rotate the electric brush carefully to avoid damaging the servo mechanism and the reduction gearbox.

Note: Avoid overloading

Do not operate the stabiliser above its maximum rated power.

For equipment fitted with compressors or electric motors, the starting power may be up to twice the rated power of the unit.

Ensure that the total starting power of all connected devices does not exceed the stabiliser's maximum output power.

Before connecting devices, you should also check that the stabiliser's output voltage and frequency are compatible with the requirements of the connected loads.

11. Ensure that the input phases A, B and C are evenly loaded. In the event of an imbalance in the input phases, the output voltage will still be maintained within the range of 220V ±3%.

Recommendations regarding the installation location

The stabiliser must only be used in an environment that meets the following conditions:

- adequate ventilation is provided,
- the unit is not exposed to direct sunlight or heat sources,
- the device is kept out of the reach of children,
- the device is protected from water, moisture, oil and grease,
- the device is kept away from flammable materials.

The type of input plug and output socket may vary depending on the country or region. Please refer to the product for further details.

Instructions for use

1. Before switching on the device, ensure that the phase wires A, B and C, as well as the neutral wire, are correctly connected. Then switch on the stabiliser. Upon start-up, the delay function is activated (factory setting: 5 seconds).
2. In the event of changes in mains voltage, the carbon brush automatically moves to the appropriate adjustment position. During operation, you may hear the sound of the brush moving — this is normal.
3. When switching off the unit at the end of operation, first switch off the power to the connected loads, then switch off the voltage stabiliser. Do not switch the stabiliser's power switch on or off whilst the unit is operating normally.
4. As the input voltage drops, the stabiliser's load capacity also decreases. In this case, the power of the connected devices should be reduced accordingly, in line with the device's load characteristics.
5. The unit is equipped with a bypass function. Once the bypass switch is activated, it is not possible to start the voltage stabiliser using the regulator's main power switch.

Meaning of the indicators

Indicator	**Description**
DELAY	A flashing 'DELAY' indicator means that the stabiliser is operating in delay mode.
LOW VOLTAGE	A flashing 'LOW VOLTAGE' indicator means that the under-voltage protection has been activated.
HIGH VOLTAGE	A flashing 'HIGH VOLTAGE' indicator means that the over-voltage protection has been activated.

A PHASE VOLTAGE	Displays the input/output voltage of phase A or the voltage between phases A and B.
B PHASE VOLTAGE	Displays the input/output voltage value for phase B or the voltage between phases B and C.
C PHASE VOLTAGE	Displays the input/output voltage value for phase C or the voltage between phases C and A.
A PHASE CURRENT	Displays the input current value for phase A.
B PHASE CURRENT	Displays the input current value for phase B.
C PHASE CURRENT	Displays the input current value for phase C.
OVER LOAD	If the ‘OVER LOAD’ indicator flashes, this indicates that the overload protection has been activated.
OVER HEAT	A flashing ‘OVER HEAT’ indicator means that the thermal protection has been activated.
PHASE FAILURE	A flashing “PHASE FAILURE” indicator means that the phase failure protection has been activated.

Button functions

1. Password-protected operations

Please note that the following operations are password-protected.

To gain access, or for service or maintenance support, please contact your local authorised distributor.

Button	Function description
SET	Press the ‘SET’ button to display function numbers ‘1’ to ‘15’ and select the appropriate configuration settings.
▲	Press to increase the selected value.
▼	Press to decrease the selected value.
V/I	Press to switch the display between input voltage and output voltage.
PHASE	Press to switch the display between phase-to-phase voltage and three-phase voltage.
ENTER	Press to enter the selected function or confirm a setting.

Description of settings functions

No.	Function description
1	Selecting the device’s power setting
2	Setting the upper voltage adjustment range
3	Setting the lower voltage adjustment range
4	Setting the overvoltage protection (245V–255V)
5	Setting the undervoltage protection (140V–195V)
6	Overload protection setting (80%–150%) • 80%–120%: 20-second delay • 130%–150%: immediate disconnection without delay
7	Temperature protection setting (80°C ±5°C to 125°C ±10°C)
8	Fan start-up temperature setting (30°C–60°C)
9	Delay time setting (3 s–250 s)
10	Selection of phase sequence protection • ‘1’ = protection enabled • ‘0’ = protection disabled
11	Audible signal control • “1” = buzzer enabled • “0” = buzzer off
12	Setting the output voltage for phase A (205V–235V, step IV)
13	Setting the output voltage for phase B (205V–235V, step IV)
14	Setting the output voltage for phase C (205V–235V, step IV)
15	Setting the output voltage accuracy • Minimum: 2V = 1% accuracy • Maximum: 11V = 10% accuracy

Error codes and troubleshooting

Error code	**Description of the problem**	**Cause / device operation**	**Recommended solution**
E-1	Overvoltage protection	The stabiliser has detected an excessively high input voltage and activated the overvoltage protection. An audible alarm is triggered.	Please wait until the input voltage returns to the correct operating range. The device will restart automatically.
E-2	Undervoltage protection	The stabiliser has detected an excessively low input voltage	Please wait until the input voltage rises to

Error code	Description of the problem	Cause / device operation	Recommended solution
		and activated the undervoltage protection. An audible alarm is triggered.	the correct level. The unit will restart automatically.
E-3	Overload protection	The power of the connected devices exceeds the stabiliser's permissible load. An audible alarm and the overload protection are activated.	Disconnect some of the loads to reduce the load. Once the load has stabilised, the unit will restart automatically.
E-4	Thermal protection	The internal temperature of the unit has exceeded the permissible operating level. An audible alarm is triggered.	Please wait until the unit's temperature has dropped. Once it has cooled down , the stabiliser will restart automatically.
E-5	Frequency protection	The input voltage frequency is outside the unit's permissible operating range. An audible alarm is triggered.	Please wait until the frequency returns to the range of 46Hz–75Hz. The stabiliser will restart automatically.

Protection functions

The stabiliser is equipped with the following protection systems:

- protection against phase and neutral wire reversal,
- phase loss protection,
- protection against incorrect phase sequence,
- neutral wire loss protection.

Once the cause of the fault has been rectified, press the blue button again to restart the stabiliser.

Warning

You must immediately stop using the AVR stabiliser if the MCB and the Shunt Release module are tripped (the blue button is extended).

In this case, check:

- that the phase and neutral wires are correctly connected,
- that all phases are present,
- the correct phase sequence,
- that the neutral wire is correctly connected.

Principle of operation

The device consists of a contact voltage regulator, a measuring circuit, a voltage control system, a servomechanism and a movable control arm.

In the event of a change in the input or output voltage, the measuring circuit continuously monitors and compares the voltage values. Based on the measurement results, the control system activates the servo mechanism, which moves the regulator arm to automatically regulate the voltage and maintain a stable output voltage.

This process ensures continuous voltage stabilisation and the reliable and safe operation of connected devices.

Technical specifications

Rated output power (at 380V input voltage)

Model	**Rated power**	**Output power***
10kVA	10,000 VA	8 kW
15 kVA	15,000 VA	12 kW
20 kVA	20,000 VA	16 kW
30 kVA	30,000 VA	24 kW
40 kVA	40,000 VA	32 kW

*Calculated at a power factor (PF) of 0.8 and an input voltage of 380V.

Model	**51906**	**51907**	**51908**	**51909**	**51910**
Power	10 kVA	15 kVA	20 kVA	30 kVA	40 kVA

Transformer configurations	3	6			
Number of phases	Three-phase				
Input voltage range (three-phase)	280V–430V AC				
Output voltage (three-phase)	380 V ± 3%				
Frequency	50–60 Hz				
Power factor	PF 80%; AC to AC: >97%				
Phase protection (overvoltage)	YES				
Regulation time	≤0.5 sec				
Operating temperature	-10℃–40℃				
Relative humidity	<90%				
Distortion	1.0–3.0%				
Efficiency	>90%				
Dielectric strength	Compliant with the applicable standard				
Delay time	5s/240s				

Troubleshooting

Problem	**Possible causes**
No output voltage	a) The stabiliser is in delay mode — please wait a few seconds. b) The input voltage exceeds the device's permissible operating range. The overvoltage or undervoltage protection has been activated to protect the connected devices.

Problem	Possible causes
The output voltage is slightly too high or too low	a) The input voltage is outside the stabilisation range — this is normal. b) Adjust the fine-tuning potentiometer to restore the output voltage to the required accuracy range.
Output voltage fluctuations	a) There are significant voltage fluctuations in the mains supply. b) The voltage stabilisation accuracy is set too high and the unit requires recalibration.
Large differences between phase voltages	If the voltages of the individual phases differ from one another, the input voltage may be unbalanced. Despite this, the output voltage is maintained within the range of 380V ±3%.

Maintenance

1. To ensure the correct and safe operation of the unit, its technical condition should be checked regularly and the unit kept clean.
2. Disconnect the unit from the mains before carrying out any maintenance work.
3. Dust and dirt should be removed regularly from the housing and ventilation openings.
4. Do not use aggressive chemicals or solvents.
5. Check the condition of the power cables and electrical connections periodically.
6. All servicing and repair work must be carried out exclusively by qualified personnel.

Disposal

Do not dispose of the end-of-life appliance with household waste. The product is subject to the separate collection of electrical and electronic equipment in accordance with applicable environmental regulations. To ensure proper disposal, the appliance must be taken to an appropriate collection point for end-of-life electrical and electronic equipment.

Service and warranty

The device has been designed for use in professional electrical installations and should be operated in accordance with the instructions in the user manual.

All servicing, maintenance and repair work must be carried out exclusively by qualified personnel or an authorised service centre.

In the event of any malfunction, you should:

- disconnect the stabiliser from the mains supply,
- stop using the unit,
- contact an authorised service centre.

Unauthorised modifications, DIY repairs or incorrect installation may result in damage to the device and the loss of warranty rights.

Warranty terms and detailed service information are available from the retailer.