Voltage Regulation & Power Quality

Voltage Stabilizers & Voltage Controllers

Tap-changing stabilizers and adjustable voltage controllers up to 500 kVA.

Rating band: Up to 500 kVA

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This class covers two non-servo products. Automatic voltage stabilizers switch between transformer taps with relays or thyristors to keep the output within a stated band, and suit dedicated loads and smaller supplies. Voltage controllers use a manual or motorised variable transformer to set an adjustable output voltage for heaters, test benches and process equipment, up to 500 kVA.

Class summary

Typical values for the class

Rating range
Up to 500 kVA

Supply
Single or three phase, 50 Hz

Technology
Tap-changing or variable transformer

Control
Automatic, manual or motorised

Typical specification

Parameter	Value or range	Conditions and basis
Rating range	Up to 500 kVA	Tap-changing stabilizers typically 1–100 kVA; voltage controllers up to 500 kVA
Input voltage window	170–270 V AC single phase; 340–480 V AC three phase	Stabilizers; voltage controllers take a nominal 230 or 415 V AC input
Output voltage	230 or 415 V AC fixed (stabilizers); adjustable, typically 0–270 V or 0–470 V AC (controllers)	Single phase and three phase respectively
Output accuracy	Typically ±2–5% of set voltage	Tap-changing stabilizers; depends on the number of taps
Correction time	Typically under 1 s per tap step	Tap-changing stabilizers
Frequency	50 Hz	Operation typically within 47–53 Hz
Cooling	Air cooled; oil cooled for higher ratings	Selected against rating and ambient conditions
Efficiency	Typically 95–98%	At rated load and nominal input
Control	Automatic (stabilizers); manual handwheel or motorised (controllers)	Remote raise and lower for motorised controllers by assessment
Protection	Under-voltage and over-voltage cut-off; overload trip; time-delayed restart	Thresholds and delays stated for each unit
Ambient temperature	0–45 °C	Derating above 45 °C

Figures are typical values for the class and rating band; the quotation states the values for a specific unit.

Parameter	Value or range	Conditions and basis
Enclosure and mounting	Powder-coated sheet steel, wall mounted or floor standing; IP20 or IP21 indoor	Mounting depends on rating
Metering and indication	Digital or analogue voltmeter; status lamps	Output ammeter by assessment

Selection and application

Features

Feature	What it means in use
Tap-changing correction	Relay or thyristor switching moves the output between transformer taps, which keeps compact units simple to install and maintain.
Adjustable output	Voltage controllers set the output anywhere across their range, for heaters, test benches and process loads that need a chosen voltage.
Time-delayed restart	After a supply interruption the output returns only after a set delay, which protects compressors and motors from rapid restarts.
Manual or motorised adjustment	Controllers are offered with a handwheel or a motor drive; the motorised version can take raise and lower commands from a panel.
Formats by rating	Smaller units are wall mounted; larger units are floor standing with air or oil cooling selected for the site.

Selection questions

Question	Answer
Should I choose a tap-changing stabilizer or a servo stabilizer?	A tap-changing stabilizer corrects in steps and suits dedicated loads that tolerate a few per cent of variation. A servo stabilizer corrects continuously and holds a tighter output, which suits larger and more sensitive loads.
What is a voltage controller used for?	A voltage controller sets an adjustable output voltage rather than holding a fixed one. Typical duties are heater and furnace control, motor and lamp testing, and process equipment that needs a chosen voltage.
Can a voltage controller run continuously at full current?	Continuous current at low output settings depends on the variable transformer and brush rating. State the duty at each operating setting so the rating can be checked.
What information is needed for selection?	The connected load, the input voltage range or required output range, the duty pattern and the installation location. Recorded supply measurements help where they are available.

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Typical applications

Application context
Dedicated machines and equipment circuits
Air-conditioning and refrigeration equipment
Heater, oven and furnace power adjustment
Test benches and laboratories needing adjustable AC
Small commercial premises and residences
Process equipment with a set voltage requirement

Where the class fits

	Duty or project context
01	Commercial and project electrical systems
02	Industrial equipment and controlled-voltage duties
03	Application-specific voltage-control requirements

Documents for an agreed scope

	Document
01	Technical proposal for the agreed scope
02	Configuration, connection and interface details
03	Operating instructions
04	Inspection and handover records when included in scope

Information needed for selection

	Input
01	Input supply range and required output voltage or adjustment range
02	Load type, duty pattern and operating environment
03	Control, protection, indication and interface expectations
04	Installation, maintenance and access constraints

How a requirement is handled

	Activity
01	Confirm the voltage-control objective and load
02	Review operating, duty and interface conditions
03	Propose the rating, technology and control arrangement
04	Document the agreed configuration and inspection scope

Document control

Field	Entry	Field	Entry
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