

Vishay ESTA Power Capacitors Solutions



VISHAY ESTA

Vishay ESTA is one of the few manufacturers to offer a complete range of power capacitors. These cost-effective devices for harmonic control, energy savings, and voltage stabilization are highly reliable and environmentally safe, and can be used under the most rugged conditions. Vishay ESTA power capacitors address a wide range of energy-generation applications. Their “green” applications include energy generation in on- and off-shore wind turbines and solar power plants.

Vishay ESTA power capacitors are used in energy transmission and distribution in high, medium, and low voltage networks to improve network quality. Their efficient operation helps promote CO₂ reduction as well as reducing losses in long distance HVDC transmissions. The power capacitors are also used for RFI filters and voltage and frequency converters in traction and industrial drives.

Vishay ESTA capacitors are manufactured with the highest quality standards and come complete and ready to use for all applications.

PRODUCTS

Induction Heating Capacitors
Power Electronic Capacitors
Low Voltage Capacitors
Power Factor Controllers
High Voltage Capacitors

RESOURCES

- For technical questions contact esta@vishay.com
- Sales Contacts: www.vishay.com/doc?99915



Furnace Capacitors

Applications

- Static power capacitors for inductive heating plant compensation

Standards

- EN 60110/1 and 2
- IEC 60110/1

Ranges

- Mains frequency: 230 V to 3000 V, 50 Hz / 60 Hz, up to 800 kvar per unit
- Medium frequency: 250 V to 4000 V, 150 Hz to 100 000 Hz, up to 10 000 kvar per unit

Benefits

- Compact construction
- Each product designed to customer specifications
- Can operate in extreme environmental conditions
- Easy to integrate into overall system concepts
- Low inductivity

Types of Cooling

- Natural cooling
- Forced cooling
- Water cooling



Power Electronic Capacitors

Applications

- DC Link capacitors for HVDC and STATCOM
- Static converters for:
 - Heavy-haul locomotives
 - Light local trains
 - Trolley busses
 - Trams / streetcars
 - Industrial converters
- DC supply equipment
- High voltage testing systems
- Impulse discharge energy

Standards

- IEC 61071
- IEC 61881
- Customer specifications

Ranges

- AC up to 24 kV per unit
- DC up to 125 kV and 15 kJ per unit
- Rectangular and tubular designs for casings

Benefits

- All appropriate capacitor technologies available to ensure optimum suitability to specific applications
- Highest flexibility in mechanical designs, including designs for low quantities



Low Voltage Power Capacitors

Applications

- Individual and group fixed compensation
- Controlled central compensation
- Filter circuits for mains systems with harmonics

Standards

- EN 60831/1 and 2
- IEC 60831/1 and 2

Ranges

- 230 V to 1000 V, 50 Hz / 60 Hz
- 2.5 kvar to 56.2 kvar in cylindrical / triangular aluminum casing; up to 500 kvar in welded rectangular steel casing

Benefits

- Low loss, self-healing MKP technology
- Compact design
- Excellent heat dissipation
- Biodegradable, vegetable-based, non-PCB, non-toxic filling agent, or dry version available
- Burst-proof as confirmed by independent international inspection centers such as UL/ULC
- Highest overcurrent and inrush current capabilities
- Life expectancy of > 150 000 operating hours with highly consistent capacitance values
- Custom designs available



WORLD'S FIRST LEVER-OPERATED TERMINAL BLOCK WITH SPRING CONNECTION



ESTAspring

Power Factor Controllers

Applications

- Manual and automatic control of central power factor correction equipment in low voltage plants and special types for medium voltage applications

Standards

- IEC 60664-1
- IEC/EN 61010-1
- IEC/EN 61326
- CE certification

Ranges

- 6- or 12-step versions
- Operating voltage: 230 V or 120 V; 50 Hz or 60 Hz
- Maximum measuring voltage range: 90 V to 690 V, stepless

Benefits

- High contrast backlit display for good reading even in poor lighting conditions
- Over-temperature switch-off (model ESTAmat PFC-N)
- Easy mounting with small flat springs
- Automatic self-setting (model ESTAmat PFC-N)
- 4-quadrant operation means trouble-free service in generator mode
- Optimized switching performance
- Constant display of actual power factor and energized steps
- Display of $\cos \phi$, active, reactive, and apparent power
- Additional step data (model ESTAmat PFC-N)
- Alarm functions



High Voltage Power Capacitors

Applications

- Shunt capacitors
- Harmonic filters
- Series capacitors
- Capacitors for SVC (static var compensator)
- AC capacitors for HVDC transmission
- DC capacitors for HVDC transmission
- Surge suppressors and RC circuits

Standards

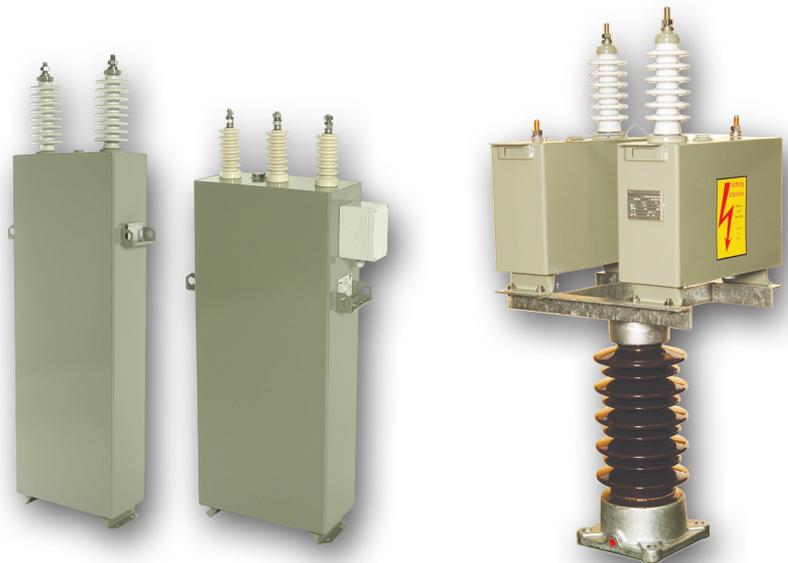
- EN 60871
- IEC 60871
- IEC 60143
- Other standards upon request

Ranges

- Individual capacitors from 660 V to 24 kV, up to 900 kvar
- Capacitor banks up to 800 kV, any output

Benefits

- Voltage and output rating can be matched precisely to customer specifications
- Element fuses or fuseless technologies for high operating reliability
- Flexible plant design with specially designed racks
- Vishay ESTA unbalance protection



Unbalance Protection Relays

Applications

The microprocessor-based ESTAsym MD and CPR capacitor protection relays use a versatile integrated current measuring multifunction relay design to enable the protection of medium and high voltage capacitor banks. Using FFT techniques, the ESTAsym MD calculates the fundamental and harmonic currents from measured line and unbalance currents, and uses these values to implement individual protection functions.

Standards

- EN 50178, Class II
- EN 61010-1
- EN 50081-1
- EN 50082-2
- CE certification

Ranges

- 100 VAC to 240 VAC, 50 Hz / 60 Hz or 100 VDC to 375 VDC
- 1 A to 5 A

Benefits

The ESTAsym capacitor protection relays are particularly appropriate for capacitor banks connected in double star and bridge circuit configurations.

The following protective functions are provided:

- Capacitor unbalance protection
- In addition for ESTAsym MD:
 - Line current unbalance protection
 - Overvoltage protection
 - Overheating protection
 - Ground fault protection
 - Overcurrent protection
 - Undercurrent protection
 - Capacitor bank discharge timer

The ESTAsym MD stores all data, including date and time information, in a report file. The included PC software provides you with convenient access to this data.



**SEMICONDUCTORS*****MOSFETs Segment***

MOSFETs

- Low-Voltage TrenchFET® Power MOSFETs
- Medium-Voltage Power MOSFETs
- High-Voltage Planar MOSFETs
- High-Voltage Superjunction MOSFETs
- Automotive-Grade MOSFETs

ICs

- VRPower® DrMOS Integrated Power Stages
- Power Management and Power Control ICs
- Smart Load Switches
- Analog Switches and Multiplexers

Diodes Segment

Rectifiers

- Schottky Rectifiers
- Ultra-Fast Recovery Rectifiers
- Standard and Fast Recovery Rectifiers
- High-Power Rectifiers/Diodes
- Bridge Rectifiers

Small-Signal Diodes

- Schottky and Switching Diodes
- Zener Diodes
- RF PIN Diodes

Protection Diodes

- TVS Diodes or TRANSZORB® (unidirectional, bidirectional)
- ESD Protection Diodes (including arrays)

Thyristors/SCRs

- Phase-Control Thyristors
- Fast Thyristors

IGBTs

- Field Stop Trench
- Punch-Through Trench

Power Modules

- Input Modules (diodes and thyristors)
- Output and Switching Modules (contain MOSFETs, IGBTs, and diodes)
- Custom Modules

Optoelectronic Components Segment

Infrared Emitters and Detectors

Optical Sensors

- Proximity
- Ambient light
- Light Index (RGBW, UV, IR)
- Humidity
- Quadrant Sensors
- Transmissive
- Reflective

Infrared Remote Control Receivers

Optocouplers

- Phototransistor, Photodarlington
- Linear
- Phototriac
- High-Speed
- IGBT and MOSFET Driver

Solid-State Relays

LEDs and 7-Segment Displays

Infrared Data Transceiver Modules

Custom Products

PASSIVE COMPONENTS***Resistors and Inductors Segment***

Film Resistors

- Metal Film Resistors
- Thin Film Resistors
- Thick Film Resistors
- Power Thick Film Resistors
- Metal Oxide Film Resistors
- Carbon Film Resistors

Wirewound Resistors

- Vitreous, Cemented, and Housed Resistors
- Braking and Neutral Grounding Resistors
- Custom Load Banks

Power Metal Strip® Resistors

- Battery Management Shunts
- Crowbar and Steel Blade Resistors

Thermo Fuses

Chip Fuses

Pyrotechnic Initiators / Igniters

Variable Resistors

- Cermet Variable Resistors
- Wirewound Variable Resistors
- Conductive Plastic Variable Resistors
- Contactless Potentiometers
- Hall Effect Position Sensors
- Precision Magnetic Encoders

Networks/Arrays

Non-Linear Resistors

- NTC Thermistors
- PTC Thermistors
- Thin Film RTDs
- Varistors

Magnetics

- Inductors
- Wireless Charging Coils
- Planar Devices
- Transformers
- Custom Magnetics

Connectors

Capacitors Segment

Tantalum Capacitors

- Molded Chip Tantalum Capacitors
- Molded Chip Polymer Tantalum Capacitors
- Coated Chip Tantalum Capacitors
- Solid Through-Hole Tantalum Capacitors
- Wet Tantalum Capacitors

Ceramic Capacitors

- Multilayer Chip Capacitors
- Disc Capacitors
- Multilayer Chip RF Capacitors
- Chip Antennas
- Thin Film Capacitors

Film Capacitors

Power Capacitors

Heavy-Current Capacitors

Aluminum Electrolytic Capacitors

ENYCAP™ Energy Storage Capacitors