ABBACUS
Metal Enclosed Capacitor Bank

Power and Productivity for a Better World
ABBACUS

**METAL ENCLOSED CAPACITOR BANK**

ABB is the world’s leading capacitor manufacturer. This competence has led to a fully integrated ABB solution known as ABBACUS, for reactive compensation in medium voltage networks.

The ABBACUS is a packaged reactive compensation system which combines primary components, and secondary control and protection, within a compact modular enclosure. The system can be either configured as a fixed or switched capacitor bank. The switched bank consists of single or multiple steps, automatically controlled to improve power factor.

The design of the ABBACUS provides compensation for both electrical distribution utilities and large industrial power users including mining, pulp and paper, chemical, petrochemical, wind farms, plastics and heavy industry.

The ABBACUS is available in a range of MECB (Metal Enclosed Capacitor Bank) models and is suitable for voltage ranges between 1kV and 24kV. For higher voltages contact ABB.

The ABBACUS is assembled and factory tested in an ISO 9001 and ISO 14001 environment.

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**Design Configuration**

The ABBACUS design will consist of an incoming module and/or connecting power modules housing the primary equipment with optional secondary and ancillary equipment kits. The ABBACUS design is modular allowing future expandability.

**Single Line Configuration**

The incomer module facilitates connection to the customer network. It comprises of a high voltage compartment and a control cubicle allowing for a single point termination of power cables and control wiring.

**CONTROL CUBICLE**

The Control Cubicle for the ABBACUS depending on the MECB series can accommodate the following options:

- Power factor controller
- Modbus communication
- Safety interlock keys
- Over current/earth fault protection relay
- Unbalance protection relay
- Unbalance/overload protection relay
- Under/overvoltage protection relay
- Local/remote and manual/automatic switching
- Alarm indication: power factor not reached/over temperature/over pressure/fuse failure
The ABBACUS is a smart solution with the following features and benefits:

<table>
<thead>
<tr>
<th>Feature</th>
<th>Benefit</th>
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<tbody>
<tr>
<td>ABB’s experience and knowledge</td>
<td>Reliability and Performance</td>
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<tr>
<td>ABB’s premium range of components</td>
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<tr>
<td>Factory tested</td>
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<td>Integrated design of primary and secondary equipment</td>
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<td>Durable aluminium enclosure suitable for a variety of applications</td>
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<tr>
<td>Reduces operating costs</td>
<td>Commercial</td>
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<td>Proven ABB design reducing life cycle costs</td>
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<tr>
<td>Fully enclosed design protecting live parts</td>
<td>Safety</td>
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<td>Safety levels ranging from pad lockable doors through to interlocking with upstream devices</td>
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<tr>
<td>Explosion venting in each module</td>
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<tr>
<td>Modular in design</td>
<td>Flexibility</td>
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<td>Expandable design to meet the needs of increased plant load</td>
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<td>Relocatable asset, can be moved as plant demands change</td>
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<tr>
<td>Maximise factory assembly</td>
<td>Easy to use</td>
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<td>minimise plant down time</td>
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<tr>
<td>simple installation</td>
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<tr>
<td>Ease of handling</td>
<td>Real estate saving</td>
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<tr>
<td>Compact design</td>
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### HIGH VOLTAGE SECTION

The High Voltage Section for the ABBACUS range can according to the options selected accommodate the following:
- Incoming cable termination busbars
- Isolator/earth switch
- Surge arrestors
- Circuit breakers
- Protection voltage transformers
- Line current transformers
- Control voltage transformers
- Live line indication

### Power Module

The Power Modules in the ABBACUS when energised generate the reactive power. These modules are designed to be interconnected to each other and the incomer module. An appropriate power module can be chosen depending on the required application.

The Power Modules for the ABBACUS range can accommodate the following:
- Capacitors
- Inrush reactors or detuning reactors
- HRC fuses
- Contactors
- Unbalance current transformers
- Rapid discharge voltage transformers
- Pressure switches
- Earthing stick
- Safety interlocks
- Lights
- Anti condensation heaters
- Connecting busbars
- Cable entry box
- Cooling fans
- Thermosats

ABBACUS is the smart solution
# Technical Specifications

The specification detailed below is for the standard ABBACUS. Contact ABB for solutions outside this specification.

### General
- **Voltage**: 1 – 24kV
- **Control Voltage**: 230 – 240V Standard
- **Maximum Output**: Up to 13.2MVar
- **Frequency**: 50 or 60 Hz
- **Location**: Indoor or Outdoor
- **Ambient Temperature**: –10/+45°C (1)
- **Altitude**: <1000m above sea level
- **Humidity**: Maximum 90% RH non condensing
- **Insulation Level**:
  - ≤12kV: 28/75kV BIL
  - >12kV–17.5kV: 38/95kV BIL
  - >17.5kV–24kV: 50/125kV BIL
- **Short Circuit Current**: 25kA for 1 second
- **Bank Configuration**: Fixed, switched single or multistep
- **Standards**: IEC or equivalent

### Capacitors
- **Type**: Single, three or split-phase
- **Fusing**: Internal or unfused
- **Discharge Resistor**: Built-in
- **Losses**: <0.15W/kvar including resistors
- **Dielectric**: Polypropylene film
- **Impregnant**: Faradol 810 non PCB
- **Container**: Stainless steel
- **Bushings**: Grey porcelain one, two or three

### Inrush Reactors
- **Type**: Single phase, air core
- **Continuous current**: 1.43 x capacitor current
- **Temperature class**: Max T55/B

### Detuning (Filter) Reactors
- **Type**: Single or three phase, iron core
- **Limit of linearity (95%)**: ≥ 1.7 x Nominal Current
- **Temperature class**: Max T55/F

### Contactors and Switches
- **ABB Model**: VSC Electrically Latched
  - **Voltage**: 7.2kV
  - **Type**: Vacuum
- **ABB Model**: V-contact Electrically Latched
  - **Voltage**: 7.2, 12kV
  - **Type**: Vacuum
- **ABB Model**: PS15, PS25 Electrically Latched
  - **Voltage**: 15, 25kV
  - **Type**: Vacuum
- **Circuit Breaker**: VD4
  - **Type**: Vacuum
- **Isolator**: NAL
  - **Type**: Air insulated
- **Earth Switch**: E, EB
  - **Type**: Air insulated

### Enclosure
- **Material**: ‘AA’ Grade Corrosion Resistant Aluminium or Zinc-coated steel
- **Base frame**: Hot dipped galvanized steel
- **Protection**: IP31 indoor, IP44/IP54 outdoor
- **Paint system**: Powdercoat RAL 7035

### Power Factor Controller
- **ABB Model**: RVC, RVT
- **Measuring System**: Microprocessor-based system for single or three phase system
- **Control Voltage**: 110 Vac to 440 Vac

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*Please refer to individual product brochures for detailed information on each component or contact ABB.*

* Applies only to MECB 12 F 00, MECB 12 F 01 and MECB 12 S 00.

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