Voltage Compensator

**Type VB-C**

The VB-C series is an active voltage conditioner designed to solve voltage problems by SHIZUKI Smart Backup System. It responds instantly to power quality problems such as sags and swells, providing continuous regulation of voltage.

**Key benefits**
- Continuous protection from common utility voltage problems
- Worry-free operation
- Maintenance-free
- Faster return on investment thanks to high efficiency (98%)

**Key features**
- 3-level inverter technology with sophisticated control software
- Scalable design
- Colorful graphical touch screen interface
- Eco-friendly: Non-use of Lead Acid Battery
- Redundant internal bypass providing fail-safe operation

**Typical applications**
- Electronics industry
- Sensitive machinery, Clean room control
- Food and beverage
- High speed bottling, Packaging lines
- Continuous process
- Fiber production lines, Extrusion process
- Automotive
- Welding process, Coating process
- Pharmaceutical
- Batch process, Climate control

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### Technical Specifications

<table>
<thead>
<tr>
<th>Capacity</th>
<th>60kVA</th>
<th>120kVA</th>
<th>180kVA</th>
<th>240kVA</th>
<th>300kVA</th>
<th>360kVA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phase</td>
<td>3 phase + N (4-wire)</td>
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<tr>
<td>Voltage</td>
<td>380V, 400V, 415V</td>
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</tr>
<tr>
<td>Frequency</td>
<td>50/60 Hz</td>
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</table>

**Input**

- **Voltage (Operation Mode):**
  - ECO Mode: 380V system: 342V~418V
  - 400V system: 360V~440V
  - 415V system: 373.5V~456.5V
- Dual Backup Mode: 380V system: 200V~342V & 418V~480V
  - 400V system: 200V~360V & 440V~480V
  - 415V system: 200V~373.5V & 456.5V~480V
- Backup Mode: 200V~0V

**Output**

- **Correction Time (at full load):**
  - 15 minutes: 110% of system voltage – 480V input voltage
  - 14 minutes: 90% remaining input voltage
  - 10 minutes: 70% remaining input voltage
  - 0.2 seconds: 200V – 0V input voltage

- **Response time:** ≤ 0.2ms
- **Applicable load power factor:** 0 ~ 1.0
- **Applicable load crest factor:** No limit (ECO Mode) / 3 : 1 (Dual / Backup Mode)
- **Overload current capability:** 110% for 60 minutes, 125% for 10 minutes, 150% for 1 minute

**Storage device**

- Aluminum Electrolytic capacitors (No battery)
- ECO Mode: > 98%
- Dual / Backup Mode: > 94%

**Main Unit**

- **Dimensions (mm) (W×D×H):**
  - W×D×H: 602×1539
- **Weight:**
  - 230 kg
- **Outline Drawing:**
  - Fig.3, Fig.5

**Distribution Board Unit (External Bypass)**

- Parallels of Main Unit: Up to 6 units
- Dimensions (mm) (W×D×H): 400×827×1539
- **Outline Drawing:**
  - Fig.4

**Environment**

- **Operation Temp.:** 0 ~ 40°C
- **Operation Humidity:** 0 ~ 95% (Without condensation)
- **Noise (at 1 meter):** < 60dBA (ECO Mode)
- **Tested to Standards:** LVD: EN62040-1, EMC requirements: EN62040-2

**Others**

- **Compliance:** SEMI F47, IEC61000-4-11
- **Protection Grade:** IP20
- **Display and MMI:** 4.3" colorful LCD touch screen
- **Built-in Comm. Port:** USB, EPO, Dry-contact
- **Optional Comm.:** 2 Communication slots for SNMP card, RS-485 card, Dry contact card

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**Options**

- Remote monitoring by SNMP protocol
- Correction time can be expanded by additional capacitor unit
**SSBS: SHIZUKI Smart Backup System**  
- Conventional system has only one way to backup or compensate voltage sags. This model can compensate voltage fluctuations including shallow sags and swells WITHOUT using energy storage device as Dual Backup Mode by 3 level inverter technology.
- Thanks to this technology, lifetime of energy storage will be expanded and output voltage can be stabilized.

**System diagram and Correction**

- **System diagram**
  
  ![System diagram](image)

- **Correction**
  
  ![Correction](image)

**Voltage compensation**

Fig. 1 shows output voltage when 200V input voltage sag has happened and operated as "Dual Backup Mode". Fig. 2 shows operation of "Backup Mode" with 100% drop.

- **Fig. 1 Dual mode**
  
  ![Fig. 1](image)

- **Fig. 2 Backup mode**
  
  ![Fig. 2](image)

**Output voltage stabilizing (for Dual Backup Mode)**

At Dual Backup Mode, output voltage is stabilized by AC/AC converter. It shall improve voltage stability and quality where the utility power is unstable or unreliable.

**Dimensions**

- Scalable up to 360kVA (6 in parallel), with one Bypass unit panel when 2 to 6 in parallel.