dervasil
MEDIUM VOLTAGE NETWORKS
LIGHTNING ARRESTERS & INSULATORS
OUR EXPERIENCE
With 25 years of experience in the field of overvoltage protection for medium voltage lines, DERVASIL designs and manufactures zinc oxide varistor arresters and composite insulators.

OUR PRODUCTS
DERVASIL presents:
- A comprehensive range of latest generation arresters:
  - 5 kA or 10 kA arresters with fault indicators or disconnector.
  - Arresters for cutting off power follow currents.
  - Arresters for D.C voltage.
- These arresters do not have any internal spark gaps.
  They have very stable characteristics, practically constant and very short response times (30 to 50 nanoseconds).
- The directly moulded silicone housing provides both absolute sealing, exceptional resistance to pollution and a non-dangerous character in case of short-circuits.
  They are tested according to the latest version of the publication IEC 60099-4.
- A new range of composite insulators, suspension insulators, anchoring insulators and support insulators.
- Fault indicators and surge counters for maintaining and monitoring arresters.

OUR R & D RESOURCES
DERVASIL has computing resources and test equipment for designing medium voltage arresters and insulators.
Our experience is available to customers for specific applications.

QUALITY SYSTEM
DERVASIL is a certified company ISO 9001 and ISO 14001. Our production unit is approved by EDF and integrates all the equipment required for the routine tests required by the publications IEC 60099-4, IEC 61109 and IEC 61952.
OVERVOLTAGES ON DIRECT CURRENT RAILWAY NETWORKS

On these networks, the switching overvoltages are generally very energetic and the temporary overvoltages are frequent and long. The direct current power supply also imposes an additional stress.

The AZE range was specially designed for this use and the leakage distance is highly increased to withstand the high pollution generated by the friction of pantograph on the catenary. The varistors are designed to withstand the continuous DC voltage.

The model can be selected using the table below:

<table>
<thead>
<tr>
<th>Nominal Voltage (V)</th>
<th>Highest continuous voltage Umax 1 (V)</th>
<th>Highest overvoltage of duration 300 s Umax 2 (V)</th>
<th>Highest overvoltage of duration 20ms Umax 3 (V)</th>
<th>Recommended AZE arrester</th>
</tr>
</thead>
<tbody>
<tr>
<td>500</td>
<td>700</td>
<td>650</td>
<td>850</td>
<td>AZE 010T</td>
</tr>
<tr>
<td>600</td>
<td>720</td>
<td>800</td>
<td>1010</td>
<td>AZE 010T</td>
</tr>
<tr>
<td>750</td>
<td>900</td>
<td>1000</td>
<td>1270</td>
<td>AZE 010T</td>
</tr>
<tr>
<td>800</td>
<td>960</td>
<td>1050</td>
<td>1350</td>
<td>AZE 012T</td>
</tr>
<tr>
<td>1000</td>
<td>1200</td>
<td>1300</td>
<td>1700</td>
<td>AZE 012T</td>
</tr>
<tr>
<td>1200</td>
<td>1450</td>
<td>1600</td>
<td>2030</td>
<td>AZE 015T</td>
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<tr>
<td>1500</td>
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<td>1950</td>
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<td>2400</td>
<td>2900</td>
<td>3200</td>
<td>4050</td>
<td>AZE 030T</td>
</tr>
<tr>
<td>3000</td>
<td>3600</td>
<td>3900</td>
<td>5080</td>
<td>AZE 040T</td>
</tr>
<tr>
<td>3500</td>
<td>4200</td>
<td>4650</td>
<td>5900</td>
<td>AZE 050T</td>
</tr>
</tbody>
</table>
AZE---T SERIES
ARRESTER 10 kA

40 GENERAL CHARACTERISTICS
AZE---T
AZE---T  GENERAL CHARACTERISTICS

ACCORDING TO IEC 60099-4.

- Zinc oxide varistors.
- Silicone rubber housing.
- Outdoor and indoor use.
- High resistance to vibrations.
- High resistance to vandalism.

Can be connected to line with aluminium or copper cables from 25 to 148 mm² (with or without terminal).

Single-arrester packed in a cardboard box.

Ordering example: 1 AZE 040T

<table>
<thead>
<tr>
<th>Arrester type</th>
<th>Leakage (mm)</th>
<th>Height H (mm)</th>
<th>Unit weight (kg)</th>
<th>Insulation withstand of housing</th>
<th>Mounting clearances</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1.2/50 µs (kVc)</td>
<td>50 Hz voltage wet (kVrms)</td>
</tr>
<tr>
<td>AZE 010T</td>
<td>400</td>
<td>174</td>
<td>1,2</td>
<td>29</td>
<td>160</td>
</tr>
<tr>
<td>AZE 012T</td>
<td>400</td>
<td>174</td>
<td>1,2</td>
<td>29</td>
<td>160</td>
</tr>
<tr>
<td>AZE 015T</td>
<td>400</td>
<td>174</td>
<td>1,3</td>
<td>38</td>
<td>180</td>
</tr>
<tr>
<td>AZE 020T</td>
<td>400</td>
<td>174</td>
<td>1,4</td>
<td>38</td>
<td>180</td>
</tr>
<tr>
<td>AZE 030T</td>
<td>400</td>
<td>176</td>
<td>1,4</td>
<td>38</td>
<td>190</td>
</tr>
<tr>
<td>AZE 040T</td>
<td>400</td>
<td>176</td>
<td>1,4</td>
<td>43</td>
<td>210</td>
</tr>
<tr>
<td>AZE 050T</td>
<td>400</td>
<td>176</td>
<td>1,5</td>
<td>46</td>
<td>230</td>
</tr>
</tbody>
</table>
ELECTRICAL AND MECHANICAL CHARACTERISTICS

- Nominal discharge current: 10 kA 8/20 µs impulse
- Line discharge class: 2
- High current withstand: 2 x 100 kA 4/10 µs impulses
- Long duration current withstand: 20 x 600 A 2000 µs impulses
- Energy absorption capacity: 5.5 kJoule/kV of Uc for one 2000 µs impulse
- Service temperature: -40°C to +50°C (+60°C short duration)
- Permanent cantilever strength: 100 N.m
- Max cantilever strength for one minute: 250 N.m
- Max torsion strength: 30 N.m
- Pollution area IEC 60815: 3
- Short circuit rating after overvoltage failure: 20000 A for 0.2 s / 600 A for 1 s
- Partial discharge level at 1.05 Uc: < 3pc

PROTECTIVE CHARACTERISTICS

<table>
<thead>
<tr>
<th>Arrester type</th>
<th>Nominal Voltage (V)</th>
<th>Highest Continuous Voltage (Ummax(V))</th>
<th>Highest overvoltage at duration 20 ms (Ummax2(V))</th>
<th>Max. Residual voltage (kVc) LIGHTNING IMPULSE</th>
<th>Max. Residual voltage (kVc) SWITCH IMPULSE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AZE 010T</td>
<td>750</td>
<td>900</td>
<td>1000</td>
<td>1270</td>
<td>2.4</td>
</tr>
<tr>
<td></td>
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<tr>
<td>AZE 012T</td>
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<td>1200</td>
<td>1300</td>
<td>1700</td>
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</tr>
<tr>
<td>AZE 015T</td>
<td>1200</td>
<td>1450</td>
<td>1600</td>
<td>2030</td>
<td>2.8</td>
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<tr>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>AZE 020T</td>
<td>1500</td>
<td>1800</td>
<td>1950</td>
<td>2540</td>
<td>3.0</td>
</tr>
<tr>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AZE 030T</td>
<td>2400</td>
<td>2900</td>
<td>3200</td>
<td>4050</td>
<td>5.7</td>
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<td></td>
</tr>
<tr>
<td>AZE 040T</td>
<td>3000</td>
<td>3600</td>
<td>3900</td>
<td>5080</td>
<td>8.9</td>
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<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AZE 050T</td>
<td>3500</td>
<td>4200</td>
<td>4450</td>
<td>5900</td>
<td>11.9</td>
</tr>
</tbody>
</table>

K = TOV / Uc

AZE---T line arresters do not have spark gaps in series. The zinc oxide ceramics are designed to withstand the continuous phase to ground voltage of the network. They are capable of bearing increased operational voltages for a limited period. The temporary overvoltage characteristics give the duration T and corresponding TOV with respect to continuous voltage Uc.

The curve E = 0 is valid for arresters without any energy preloading. The other curve is valid for arresters that have already absorbed impulses corresponding to their maximum energy absorption capacity.
ACCESSORIES

43 ARRESTER MOUNTING BRACKETS
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44 • INSULATING.

45 ARRESTER LINE CONNECTIONS

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46 WITH LEAKAGE CURRENT METER

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47 • MODELS TO MOUNT ON THE GROUND CABLE OF ARRESTERS.

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48 • FOR SUSPENSION AND TENSION INSULATORS.
ARRESTER MOUNTING BRACKETS

STANDARD

<table>
<thead>
<tr>
<th>Strip</th>
<th>L (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>EZX 1</td>
<td>100</td>
</tr>
<tr>
<td>EZX 2</td>
<td>150</td>
</tr>
<tr>
<td>EZX 3</td>
<td>210</td>
</tr>
</tbody>
</table>

TYPE DIN

AZ 1

AZ 2
ACCESSORIES

NEMA

AZNEMA

INSULATING

SUP M10

SUP M12
AUTOMATIC DISCONNECTION DEVICE

Device for **disconnecting an arrester** in the event of arrester failure to prevent a permanent fault and provides a visible signal of the faulty arrester. The operator can energize the line again and re-establish the service. However, the overvoltage protection is removed. Periodic maintenance inspections must be scheduled to replace disconnected arresters. The device must be connected to ground by a flexible cable to enable an effective operation and provide a visual indication of the disconnection.

To order this accessory, use the references with the figure 2:
Examples: EZBD 122 - AZBD 122 - AZC 122 - AZE 0122 T.

SURGE COUNTER WITH LEAKAGE CURRENT METER

The **ZC B1-M surge counter** is supplied for monitoring arresters with the purpose of preventive maintenance. It is used to measure the leakage current circulating in the arresters and record the number of discharges that it absorbs.

The counter must be connected between the arrester and the ground, ideally by an insulated cable of the shortest possible length.

The arrester will be replaced when the leakage current will exceed three times the initial value when arrester was installed. The current must be read under normal, dry atmospheric conditions. Indeed, wet or rainy conditions can increase the value of the current due to additive surface currents circulating on the arrester housing.

BIRD PROTECTIVE INSULATING CAP

The **Dervasil insulating cap (Polyamid moulded)** is specially designed for fitting on the arrester top.
FAULT INDICATORS

Designed to indicate the failure of an arrester without disconnecting the arrester from the network. The line can be energised again after replacing the failed arrester.

Three indicator types are available.

MODELS TO MOUNT ON THE ARRESTER

**MX 481**

Device operating from 15 A for compensated or high impedance grounded neutral networks.

To order this accessory, use the references with the letter P:

Examples : EZP 12 - AZP 12 - AZCP 12 - AZE P 012 T.

**INDIC 150 A**

Device operating from 150 A for low impedance or solidly grounded neutral networks.

To order this accessory, use the references with the figure 1:

Examples : EZBD 12 - AZBD 12 - AZC 12 - AZE 012 T.

MODEL TO MOUNT ON THE GROUND CABLE OF ARRESTER

**MX 480**

Adding an indicator on the ground cable of the arrester allows you to locate the damaged arrester rapidly and re-establish the service.

Three indicator types are available.

**Visual indication**

Indicator in normal condition

Indicator after arrester failure

**Before installation, test with the device MX-480/test**

**RESET**

After removal of faulty arrester, reset with the device MX-480/test

**Ground cable**

Metal strip

Mounting on the ground connection cable
ACCESSORIES

ARCING HORNS

For isolated cable overhead lines, large installation of overvoltage protection is absolutely necessary. We provide an economical solution by combining arcing horns with the arrester. This device is installed in parallel to line post, suspension or tension insulators.

FOR LINE POST INSULATORS

FOR SUSPENSION AND TENSION INSULATORS
### INSULATORS FOR RAILS NETWORKS

**RC 60-3A1**

**TENSION INSULATOR 3 kV CC**

**INFRABEL (BELGIUM)**

**COMPLIANT WITH IEC 61952 STANDARD AND INFRABEL SPECIFICATION I405 460003**

<table>
<thead>
<tr>
<th>Insulator Reference</th>
<th>Typical line voltage (kV)</th>
<th>CTS specified tensile load (kN)</th>
<th>Leakage distance (mm)</th>
<th>Arcing distance (mm)</th>
<th>Number of sheds</th>
<th>Shed diameter (mm)</th>
<th>Weight (Kg)</th>
<th>Dry power frequency withstand (kV)</th>
<th>Wet power frequency withstand (kV)</th>
<th>Lightning impulse withstand 1.2/50 µs (kV)</th>
</tr>
</thead>
<tbody>
<tr>
<td>RC 60-3 Type A1</td>
<td>3</td>
<td>60</td>
<td>374</td>
<td>164</td>
<td>3/2</td>
<td>100/64</td>
<td>1.2</td>
<td>75</td>
<td>38</td>
<td>95</td>
</tr>
</tbody>
</table>

**RC 60-3B2**

**TENSION INSULATOR 3 kV CC**

**INFRABEL (BELGIQUE)**

**COMPLIANT WITH IEC 61952 STANDARD AND INFRABEL SPECIFICATION I405 460003**

<table>
<thead>
<tr>
<th>Reference Insulator</th>
<th>Nominal voltage (kV)</th>
<th>CTS specified tensile load (kN)</th>
<th>Leakage distance (mm)</th>
<th>Arcing distance (mm)</th>
<th>Number of sheds</th>
<th>Shed diameter (mm)</th>
<th>Weight (Kg)</th>
<th>Dry power frequency withstand (kV)</th>
<th>Wet power frequency withstand (kV)</th>
<th>Lightning impulse withstand 1.2/50 µs (kV)</th>
</tr>
</thead>
<tbody>
<tr>
<td>RC 60-3 Type B2</td>
<td>3</td>
<td>60</td>
<td>374</td>
<td>164</td>
<td>3/2</td>
<td>100/64</td>
<td>1.4</td>
<td>75</td>
<td>38</td>
<td>95</td>
</tr>
</tbody>
</table>
### RC 70-4  
**TENSION INSULATOR 3 kV CC**  
**RFI TYPE (ITALY)**  
**COMPLIANT WITH IEC 61109 STANDARD AND RFI SPECIFICATION TE 128**

<table>
<thead>
<tr>
<th>Reference Insulator</th>
<th>Nominal voltage (kVcc)</th>
<th>CTS specified tensile load (kN)</th>
<th>Leakage distance (mm)</th>
<th>Arcing distance (mm)</th>
<th>Number of sheds</th>
<th>Shed diameter (mm)</th>
<th>Weight (Kg)</th>
<th>Dry power frequency voltage withstand (kV)</th>
<th>Wet power frequency voltage withstand (kV)</th>
<th>Lightning impulse withstand 1.2/50 µs (kV)</th>
</tr>
</thead>
<tbody>
<tr>
<td>RC 70-4</td>
<td>3</td>
<td>70</td>
<td>330</td>
<td>216</td>
<td>2</td>
<td>80</td>
<td>1.6</td>
<td>90</td>
<td>55</td>
<td>125</td>
</tr>
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</table>

### RC 9-4  
**SUSPENSION INSULATOR 3 kV CC**  
**COMPLIANT WITH IEC 61952 STANDARD AND RFI SPECIFICATION TE SP IFS 009 A**

<table>
<thead>
<tr>
<th>Reference Insulator</th>
<th>Nominal voltage (kVcc)</th>
<th>CTS specified tensile load (kN)</th>
<th>Leakage distance (mm)</th>
<th>Arcing distance (mm)</th>
<th>Number of sheds</th>
<th>Shed diameter (mm)</th>
<th>Weight (Kg)</th>
<th>Dry power frequency voltage withstand (kV)</th>
<th>Wet power frequency voltage withstand (kV)</th>
<th>Lightning impulse withstand 1.2/50 µs (kV)</th>
</tr>
</thead>
<tbody>
<tr>
<td>RC 9-4</td>
<td>3</td>
<td>40</td>
<td>350</td>
<td>150</td>
<td>3</td>
<td>120</td>
<td>2,2</td>
<td>55</td>
<td>50</td>
<td>125</td>
</tr>
</tbody>
</table>
**RC 6-1**  
**SUPPORT INSULATOR 3 kV CC**

**COMPLIANT WITH IEC 61952 STANDARD AND INFRABEL SPECIFICATION I405-464.002**

<table>
<thead>
<tr>
<th>Reference Insulator</th>
<th>Nominal voltage (kVcc)</th>
<th>CTS specified tensile load (kN)</th>
<th>Leakage distance (mm)</th>
<th>Arcing distance (mm)</th>
<th>Number of sheds</th>
<th>Shed diameter (mm)</th>
<th>Weight (Kg)</th>
<th>Dry power frequency withstand (kV)</th>
<th>Wet power frequency withstand (kV)</th>
<th>Lightning impulse withstand 1.2/50 µs (kV)</th>
</tr>
</thead>
<tbody>
<tr>
<td>RC 6-1</td>
<td>3</td>
<td>25</td>
<td>385</td>
<td>165</td>
<td>5</td>
<td>110</td>
<td>3,2</td>
<td>68</td>
<td>38</td>
<td>130 143</td>
</tr>
</tbody>
</table>

**IC 50-3**  
**SUPPORT INSULATOR 25 kV AC**

**COMPLIANT WITH IEC 61952 STANDARD**

<table>
<thead>
<tr>
<th>Reference Insulator</th>
<th>Nominal voltage (kV)</th>
<th>CTS specified tensile load (kN)</th>
<th>Leakage distance (mm)</th>
<th>Arcing distance (mm)</th>
<th>Number of sheds</th>
<th>Shed diameter (mm)</th>
<th>Weight (Kg)</th>
<th>Dry power frequency withstand (kV)</th>
<th>Wet power frequency withstand (kV)</th>
<th>Lightning impulse withstand 1.2/50 µs (kV)</th>
</tr>
</thead>
<tbody>
<tr>
<td>IC 50-3</td>
<td>25</td>
<td>50</td>
<td>860</td>
<td>310</td>
<td>7/6</td>
<td>120/80</td>
<td>2,2</td>
<td>125</td>
<td>100</td>
<td>200 255</td>
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</tbody>
</table>