

# GAS INSULATED SURGE ARRESTERS

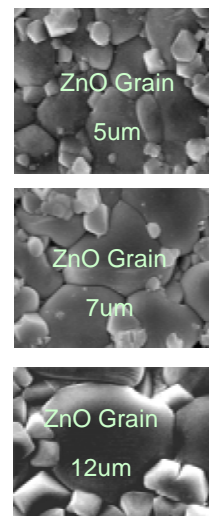
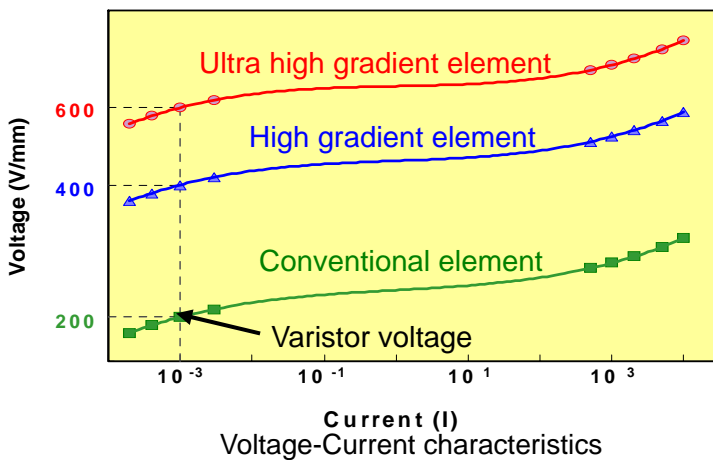
Since the beginning of Surge Arresters manufacturing more than 80 years ago, TOSHIBA has continuously endeavored to improve surge arrester technology and quality control system, and has achieved positive results in manufacturing and employing the world's beating techniques. With these technologies and experiences, TOSHIBA started the manufacturing of GIS type Arresters in the middle of 1960 as a pioneer in the world. Since then, "Compact Design", "Layout Flexibility" and "High Reliability" have been always required to GIS type arresters to suit for the GIS set-up in a limited space. To meet the requirement, TOSHIBA has pursued the performance of GIS arrester by refining the technology of electric field analysis and voltage grading of ZnO element. As a consequence, TOSHIBA has achieved the best solution to develop up to Ultra High Gradient Type Surge Arresters.

## - Features -

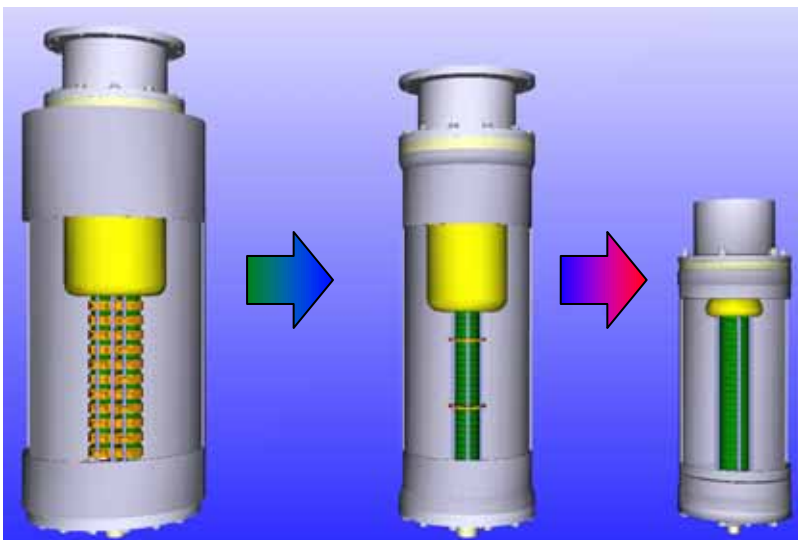
- **Compact Design**
- Excellent Protective Characteristics
- **Optimized Simple Structure**
- High Quality and Reliability
- Compliance with International Standards
- Manufacturing by Advanced Facilities under **ISO-9001** certification



## Structure of SA



Micro structure of ZnO element



Conventional type

High gradient type

Ultra high gradient type

### Compactness

Small quantity of parts

### Simple structure

Small amount of parts

Current path: single element array

### Voltage equalizing shield

Optimized shape: 3-D Electric field analysis with sufficient accuracy which TOSHIBA developed

## Standard Ratings (High gradient type)

| IEC Line Discharge Class        |            | Class 3    | Class 4    | Class 5   |
|---------------------------------|------------|------------|------------|-----------|
| Type                            |            | RVLRB      | RVLRF      | RVLRA     |
| Maximum System Voltage          | (kVrms)    | 72.5 - 245 | 72.5 - 420 | 420 - 550 |
| Rated Voltage (Ur)              | (kVrms)    | 60 - 216   | 60 - 390   | 336 - 444 |
| Nominal Discharge Current       | (kAcrest)  | 10         | 20         |           |
| High Current Impulse Capability | (kAcrest)  | 100        |            |           |
| Discharge Voltage Ratio         | (V10kA/Ur) | 2.45       | 2.30       | 2.20      |
| Energy Absorption Capability *  | (kJ/kV-Ur) | 7          | 12         | 17        |

\*) Energy absorption capability means the dissipated total energy per two shots of switching surge that surge arrester can withstand thermally.

## Accessories

Surge counters (SDC-N4 = Non ammeter type/ SDC-N4A = Ammeter attached type) can be supplied upon the customer's request.

| Type                                      | SDC-N4                                    | SDC-N4A                    |
|---|---|----------------------------|
| Indication of Counter                     | 6 digit cyclometer at least 5 counts/sec. |                            |
| Minimum Operating Current                 | 30 A (8/20 $\mu$ s)                       |                            |
| Maximum High Current Withstand Capability | 100 kA (4/10 $\mu$ s)                     |                            |
| Residual Voltage at 100kA(4/10 $\mu$ s)   | 5kV peak and below                        |                            |
| Switching Impulse Current Withstand       | 4000A X 2ms                               |                            |
| Ammeter Scale                             | --  | 0 - 5 mArms (linear scale) |



SDC-N4

SDC-N4A

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