

## TOPx-y

**TOPx-y** (Telecommunication Overvoltage Protection) are basic overvoltage protection (**x** - number of protected lines, **y** - disconnection module type). Comparing to protection devices with two-pole Gas Discharge Tubes (GDT), **TOPx-y** are realized with three-pole GDT with fail-safe clip. Advantage of three-pole GDT is protection of the both wire a and b with the same tube. That way different tolerances of the two tubes are avoided, as well as the possibility if the tubes do not spark over at the same time, to have few thousand volts overvoltage between a and b wire. Fail-safe clip is mounted on three-pole GDT, providing additional thermal protection. In the case of cross-contact between telecommunication and power cable, when GDT absorbs a lot of energy and its temperature increases, its heat activates fail-safe clip and connects a and b line direct to the grounded pole. This way, all destructive energy is drained in the ground, preventing damage of protected equipment (exchange etc.).

**TOPx-y** main characteristics are:

1. Response time up to 500 ns.
2. Maximum impulse spark-over voltage 450-600 V.

**TOPx-y** are inserted at disconnection modules of Reichle - De Massari and Krone distribution frames. At Reichle - De Massari types (VS83 Modular, VS92 Standard and VS Compact) protection is inserted at the rear side of the module. At Krone types (LSA Plus and LSA Profile) protection is inserted at the front side of the module.

Types of **TOPx-y** protection devices for Reichle - De Massari modules:

- VS83 Modular 10x2 **TOP10-VS83**
- VS83 Modular 12x2 **TOP12-VS83**
- VS92 Standard 10x2 **TOP10-VS92**
- VS Compact 10x2 **TOP10-VSC**
- VS Compact 16x2 **TOP16-VSC**
- VS Compact 20x2 **TOP20-VSC**

Types of **TOPx-y** protection devices for Krone modules:

- LSA Plus and LSA Profile **TOP10-KLP**

This configuration is recommended for overvoltage protection of telecommunication equipment connected with underground cable networks (with no risk of cross-contact between telecommunication and power cable).

This protection configuration complies with ITU-T K.11, K.20 and K.21. Recommendations.

### TOPx-y TECHNICAL SPECIFICATIONS

Protection type		Group overvoltage
DC spark-over voltage		230 V
Impulse discharge current (8/20 $\mu$ s)	Nominal	10 kA
	Maximal	20 kA
Surge response voltage (10/700 $\mu$ s, $U_p=4$ kV)		450÷600 V peak
Insulation resistance		$> 10^{10} \Omega$
Contact resistance		$< 15 \text{ m}\Omega$
Response time		$< 500 \text{ ns}$
Signal attenuation in speech frequency range (0,3-3,4 kHz)		$< 0,01 \text{ dB}$
Number of protected lines		10, 12, 16, 20
International recommendations		ITU-T (K.11, K.20, K.21)
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