

# ZVC High Altitude and Enhanced Insulation Designed To Order, Arc-proof, Air-insulated, Modular, Insulation Coordinated, Motor Control Centre up to 5000m a.s.l

- ✓ Savings on electrical switchroom construction cost with compact footprint. Only 0.365m<sup>2</sup>.
- ✓ Fault current limiting. Reduced let through energy allows lower MVA distribution switchgear.
- ✓ Savings on cable installation cost, up to 25% reduction.

With ease of operation, increased reliability and compact footprint, ZVC will provide your Power Process System installations with significantly lower Total Cost of Ownership.

## High Altitude, Overvoltages and Insulation

Specification of dielectric withstand rating of equipment is based on the expected dielectric stresses. This is a combination of the stress caused by the power-frequency continuous voltage and the stress caused by the mostly short-term overvoltages.

The insulation coordination is defined in IEC60071-1 as the selection of the dielectric withstand required for equipment that is to be used at a specific site in a network. This process requires basic knowledge of the operational conditions in the network and the planned overvoltage protection devices, and the probability of an insulation fault on equipment which can be accepted under economic and operational aspects.

The power frequency voltages and the overvoltages acting on an insulation or an overvoltage protection device can be classified by causes and processes into the following categories:


- Power frequency continuous voltages resulting from normal system operation.
- Temporary overvoltages (power frequency) resulting from earth faults, switching operations (e.g. load shedding, resonances, ferroresonance or similar).
- Slow-front overvoltages resulting from switching operations or direct lightning strikes at great distance, with rise times between 20µs and 5000µs and times to half-value up to 20ms.
- Fast-front overvoltages resulting from switching operations or lightning strikes with rise times between 0.1µs and 20µs and times to half-value up to 300µs.
- Combined overvoltages, primarily between conductors and at open switching device gaps.



The following standardized voltage shapes are defined as representative voltage characteristics for the above categories:

- Standard short-duration power-frequency voltage with a frequency between 48Hz and 62Hz and a duration of 60s.
- Standard switching impulse voltage; a voltage pulse with a rise time of 250µs and a time to half-value of 2500µs.
- Standard lightning impulse voltage; a voltage pulse with a rise time of 1.2µs and a time to half-value of 50µs.
- Combined standard switching impulse voltage; two simultaneous voltage impulses of opposite polarity.

## Technical data

Switchgear ZVC	Fused Contactor	Circuit Breaker
Type of construction	Metal clad with withdrawable Contactor or FCL Breaker	
Compartmented to IEC 62271-200	Partition class PM	
Loss of service continuity	Category LSC2A	
Internal arc classification	AFL (or AFLR with Gas Duct)	
Service voltage	Up to 6.9kV	
Insulation levels to IEC	38kV (Power frequency withstand)	
	95kV peak (Impulse withstand)	
Rated main busbar current (40°C)	Up to 4000A	
Rated normal current	Up to 630A	
Rated short time current	Up to 50kA	6kA (Non-fault current limiting)
	Up to 50kA (Fault current limiting c/w HV fuse)	
Arc fault withstand current	Up to 50kA	
Tested according to	IEC Standards	
Overall dimensions		H [mm]
		W [mm]
		D [mm]
<b>Application</b>		
Motor starter	Up to 6000kW	
Transformer feeder	Up to 6000kVA	
Capacitor bank feeder	Up to 2000kVAR	

The above data are not limiting values.

## Design Features

- 1304mm overall panel depth features (Front cable access)
- Simple direct connection to UniGear ZS1.
- Aluzinc construction.
- Improved access for rear cabling options.
- Safety benefits and operations behind closed doors.
- Integral interlocked fault make earth switch.
- Full range of type test to IEC standards.
- LSC2A, PM, AFLR Rating to IEC62271-200

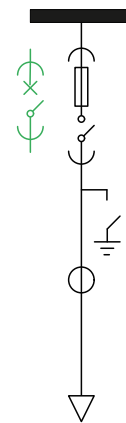
## Insulation Coordination

The procedure in accordance with IEC60071-1 requires basic knowledge of the physical processes, the operating conditions and the dielectric response of the equipment with its application.

The starting point of the coordination procedure is the system analysis, which should determine what voltage stresses can be expected under operational conditions. This should also include overvoltage protection devices.

The results of the system analysis will include peak values and rate of occurrence of voltage stress in the following categories: short-duration power-frequency voltage, switching impulse voltage, lightning impulse voltage etc.

## Typical Single Line Diagram



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The data and illustrations are not binding. We reserve the right to make changes in the course of technical development of the product.

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