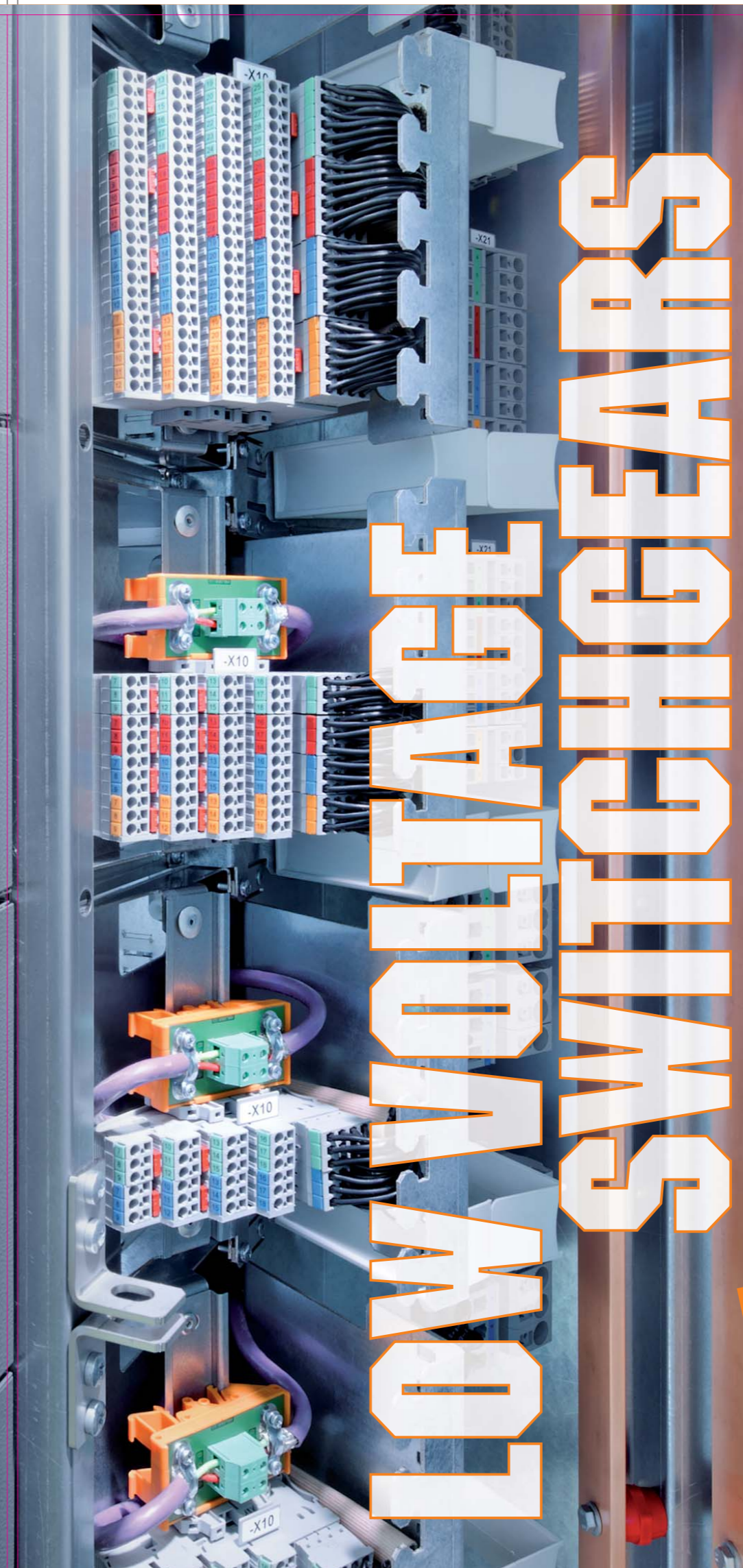


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# LOW VOLTAGE SWITCHGEARS

**RITTER**  
Starkstromtechnik

Type-tested low voltage switchgear panels with the following panel designs:

Motor Control Center MCC, Circuit breaker, Switch-disconnector-fuses, Power factor correction.

Metal-clad and compartmentalized up to 1 kV rated current up to 4000 A Rated short-time withstand current up to 100 kA  
DIN EN 60439-1  
DIN EN 60439-1, supplement 2

**NEW**

DIN EN 61439-2  
DIN VDE 0660-600-2  
IEC/TR 61641

## LSF 3001

Circuit breaker panels

LS-panels in withdrawable and fixed assembly for 3-poles circuit breaker with rated current up to 4000 A. Rated peak current can be up to 100 kA.

## KFF 3001

Coupler panels

LS-panels in withdrawable and fixed assembly for 3-poles circuit breaker with rated current up to 4000A. Rated peak current can be up to 100 kA.

## MCC 3001

Motor control centre

This is the panel with 11 tiers and max 44 modules. Modules can be hardwired or bus interface design.

## SAS 3001

Switch-disconnector with fuses

This panel have horizontal integrated switch-disconnector with fuses.

## SLF 3001

Switch-disconnector block with fuses

This is panel have vertical integrated switch-disconnector with fuses.

## KPF 3001

Compensations panel

This is panel can be suitable for compensation up to 400 kVar.

## KOF 3001

Compensations panel

This panel is open for different configurations, for example for control, frequency converter.

## Description

Ritter Low Voltage Switchgear NS 3001 is supplied in factory-assembled, type-tested design.

The switchgear is assembled with galvanised sheet-steel, bolted and rivetted. The doors and covers are painted in the RAL7035. The colour can be changed.

Ritter low voltage switchgear assemblies of type NS 3001 have passed the test for resistance to internal accidental arcing.

The main bus bar is arranged on the back side, in the middle of the switchgear.

The bus bars are linked from panel to panel; this makes it possible for the system to be extended or to replace one panel in the system in a simple manner.

All system variants can be located back-to-back, free standing or against a wall. Installation and dismantling work can be carried out from the front of the system.

## Normen

NEW: DIN EN 61439-2 Layout  
DIN VDE 0660-600-2 Layout  
NEU: IEC/TR 61641

DIN EN 60439-1  
DIN EN 60439-1 Supplement 2

## Types of Protection

The encapsulation of the NS 3001 switchgear assemblies is in accordance with IP31, but can also be executed in accordance with IP41. Higher protection types normally resulted with reductions in the rated value.

The insides compartmentalisation and low-voltage niche are produced in with protections type IP2X.

## Equipment

In the type-tested versions of the low voltage switchgear NS 3001 are following devices assembled:

- Circuit-breaker, Siemens, ABB
- Switch disconnector, Siemens, ABB
- NH-fuses, Wöhner
- Moulded-case circuit-breaker, Siemens, ABB
- Overload-protection-combination, Siemens, ABB
- Miniature circuit breaker MCB's, ABB
- Indications instruments, Socomec, Tyco
- Control devices, Schlegel
- Transformer, Phoenix
- Undervoltage relays, Dold / Bender
- Isolations control, ABB
- Auxiliary relays, Siemens / Finder
- Coupler relays, Siemens
- Clamps, Phoenix

The alternative producers of these devices are also possible.

## General technical description

	Industry / EVU	Building services eng.
Provided norms	DIN EN 61439-2 (Layout) IEC/TR 61641 (Layout) DIN EN 60439-1 DIN EN 60439-1; supp.sh. 2	DIN EN 61439-2 (Layout) DIN EN 60439-1
Rated voltage $U_n$	400 V, 500 V, 690 V	400 V, 500 V, 690 V
Rated current $I_n$	4000 A	4000 A
Rated short time duration	0,3 s	No tested
Frequency $f$	50/60 Hz	50/60 Hz
Rated short time current $I_{sw}$	100 kA	100 kA
Rated peak withstand current $I_{pk}$	220 kA	220 kA
Rated isolation voltage $U_i$	1000 V	1000 V

## Erection

The low voltage switchgear panels are designed for use indoors in closed electro rooms in accordance with DIN EN 50110-1. They are erected against a wall or they are freestanding.

The equipment should operate in the ambient temperature range from -5°C until 40°C and is designed for pollution degree 3, for operation in the industry.

After consultation with the producer, it is possible in case of specific operating conditions to take measures to avoid problems with condensation, pollution and high ambient temperatures (for example heater, acclimatisation, removal of mildew and insects, improvement of heat dissipation and filtering of supply air). This apply specially for equipment in the clammy tropically area.

The setting up classification for low voltages equipment is given in the VDE 0100 part 729.

The aisle width is specified to be more then or equal 700 mm, so when the modules are in the park position more or equal 600 mm is required.

All doors can be open up to approximately 180°.

For transport and delivery it is possible to pack up just one single or couple panel together.

The panels can be screwed with special fastener in U-profile in the existing ground or in the concrete ground.

Ambient temperature	min. -5°C max. +40°C 50% r. H.
Highest value over 24 h	+35°C
Max altitude above sea level	2000 m
Relativt humidity	5% - 95% no condensation

## Internal accidental arcing

The low-voltage circuit breaker combination is tested according to the DIN EN 60439-1, supplementary sheet 2, proceeding the test under internal arcing conditions respectively IEC / TR 61641 / 2008-01 second edition "Enclosed low-voltage switchgear and controlgear-guide for testing under conditions of arcing due to internal fault."

The technical report present information about tests set-up, applying of the inflammable, repeating of test, criteria to pass of test.

During the tests indicators have be placed up to 2 m height, at all panel's sides available to the operating personal.

In the test report should be accredited that what's concerning operating personal:

- The doors remained close, covering aren't open.
- No dangerous parts fall a part.
- The force of internal, accidental arcing shouldn't be able to brand holes in the free available sides.
- Vertical installed indicators should not brand.
- The earthing circuit for touchable parts of the outsides coating which are still functioning.

Concerning construction and equipments protection additionally:

- The influence of the arcing on the area of ignition is limited, no expansion occur on that area or other areas.

And additionally:

- After setting of arcing or isolation or demounting of parts which are from arcing affected should be possible for remaining low-voltages equipment to run emergency operations.

## Sizes and dimensions

Sizes and dimensions are coordinate and can be matched to particular circumstances. The height of the panel types NS 3001 with protections degree IP31 is 2300 mm, with protections degree IP41 it is 2400 mm.

The standardisation of the modules and operating devices provides a high degree of variability in respect of the opportunities for combination so that solutions for operating and handing can usually be found in the project-design phase or following the issuing of en order even where the spatial situation is very special.