

E3K

**DRIESCHER -
Air-insulated
medium-voltage switchgear**

- Withdrawable type WEL
- Withdrawable type with 2- or 3-compartment design E2K, E3K
- Rated voltage 12 kV and 24 kV
- Rated current up to 2500 A



WEL

**ELEKTROTECHNISCHE WERKE
FRITZ DRIESCHER & SÖHNE GMBH**

D-85366 MOOSBURG • TEL. +49 87 61 6 81-0 • FAX +49 87 61 68 12 30
<http://www.driescher.com> infoservice@driescher.de



DRIESCHER - Air-insulated medium-voltage switchgear of withdrawable design

In compliance with EN 62271-200

Content

- 2 General information, operating conditions
- 3 Design features and equipment
- 4 Switchpanels in withdrawable design – circuit-breaker (WEL)
- 6 Switchpanels in withdrawable design – circuit-breaker and compartment design (E2K/E3K)
- 8 The withdrawable unit with circuit-breaker or switch-fuse combination, advantages

General information

These air-insulated medium-voltage switchpanels in withdrawable design have been designed to deliver a very reliable yet cost-efficient power supply and operating safety.

The withdrawable design enables a visible isolating distance of the circuit-breaker or switch-fuse combination and consequently a disconnecter free design of the switchpanel.

Design forms:

Withdrawable design circuit-breaker Type (WEL):

- Switch panel with circuit-breaker
- With inserting insulating plate
- Optionally with earthing switch and motor-operated mechanism, as well as with current and voltage transformers

Withdrawable design circuit-breaker / switch-fuse combination with 2- or 3-compartment design Type (E2K, E3K):

- Switchpanel with circuit-breaker or switch-disconnector with automatic 2 or 3-chamber partitions.

(in this case the insulating plate is omitted)
- optionally with earthing switch and motor-operated mechanism as well as with current and voltage transformers

The panel types can be provided as individual panels or as switchgear where the equipment (earthing switch, current and voltage transformers), order of panels etc. can be determined by the customer.

The metal encapsulated medium-voltage switch panels are designed to meet the demand in networks of municipal utility corporations and supply corporations in industry and public buildings.

The type-tested switchpanels are in compliance with the requirements of DIN EN 62271-200, protection class IP 3X/4X.

The resistance to accidental arcs has been rated at 16 kA, 25 kA and 31,5 kA; 1s by a neutral testing institute. The installed switches are designed in compliance with the corresponding switchgear standards.

Technical data of the installed switches are to be found

- in brochure 727 for switch-fuse combination H 27
- in brochure 731 for earthing switches
- in brochure 747 for circuit-breakers

Operating conditions

The switch panels in withdrawable design are installed in closed electrical operating areas which are only to be entered by special staff and appropriately instructed personnel.

Installation can be carried out at levels of up to 1000 meters above sea level.

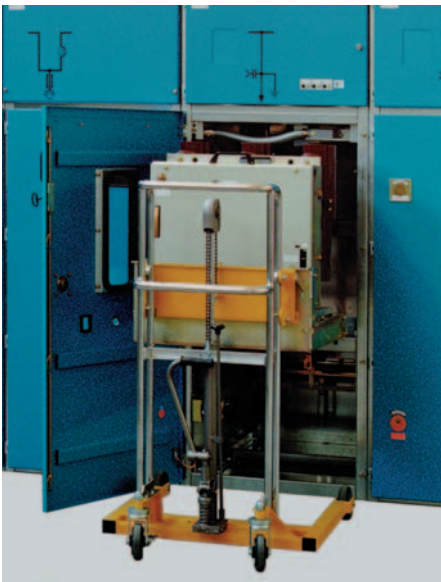
At levels above 1000 meters the rated insulating level of the switchgear must be corrected accordingly.

The switch panels are designed for use under normal operating conditions in compliance with EN 62271-1.

Design features and equipment



*Fig. 1:
Open circuit-breaker panel in withdrawable design with earthing switch*



*Fig. 2:
Withdrawal of the vacuum circuit-breaker using service truck*

Design features:

- Metal-encapsulated, air-insulated switchpanel
- The switchpanel frame is of a screwed, hot-galvanized composite design
- Busbar partitioning from panel to panel with FRP-insulating plates and three leadthroughs (optional)
- Single-wing, reinforced solid sheet doors (16 kA-31.5 kA) with laminated safety glass and cylinder lock
- Integrated secondary device module with separate door in front of busbars
- Covers at the top of galvanized steel sheet for pressure relief; closed at the back and open at the bottom (optional full covering at the bottom). Pressure relief can be in upward or downward direction
- Connecting cables are conducted into the switch panels from below on two-dimensional adjustable crossbars
- All installed switches can be manually operated or with motor-operated mechanism with closed panel door

Equipment:

- In switch panels without chamber partitions there is a insulating protective barrier provided. This can be inserted with switchgears in isolated position and with closed doors
- In switch panels with 2 or 3-compartments the compartments are automatically covered by a self-closing metal shutter in isolated position. (here the inserting insulating plate is omitted)
- Current and voltage transformer
- For earthing and short-circuiting there are make-proof earthing switches with motor-operated mechanism available. If required it is possible to install appropriate surge voltage protectors in the panel.
- Incorrect operation is ruled out through power-free interlocking of the devices towards each other.
- Mimic diagram with integrated mechanical position indicator on the front (electrical position display optional)
- available in all RAL colours

Switchpanels in withdrawable design Type (WEL)

- **Disconnecter free**, withdrawable design Type (WEL)
- **Metal-encapsulated and air-insulated**
- **High degree of operating safety based on sturdy, patented 2-spindle design of withdrawable cassette**
- For partitioning with circuit-breaker in isolated position there is an Insulating protective barrier available for inserting
- All switching operations including the moving of the circuit-breaker into isolated position are carried out behind closed panel doors in order to guarantee maximum personal protection
- Variable locking options for the complete switch panel in order to ensure maximum operating safety
- **Protection up to IP3X**
- Weight when fully equipped approx. 1000 kg



Fig. 3:
12 kV Circuit-breaker panel (WEL)

Technical data of switchpanel

Rated voltage	U_r	12 kV	24 kV
Lightning impulse withstand voltage	U_p	75 kV	125 kV
Rated short-duration power-frequency withstand voltage	U_d	28 kV	50 kV
Rated current	I_r	630 A and 1250 A ²⁾	630 A and 1250 A ²⁾
Rated short-time current	I_k	31.5 kA	31.5 kA
Rated short-circuit duration	t_k	3 s ¹⁾	3 s ¹⁾
Rated peak short-circuit current	I_p	80 kA	80 kA
Rated frequency	f_r	50 Hz	50 Hz

Technical data of switches

Vacuum circuit-breaker

Rated voltage	U_r	12 kV	24 kV
Rated current	I_r	up to 1250 A ²⁾	up to 1250 A ²⁾
Rated short-time current	I_k	up to 31.5 kA	up to 31.5 kA
Rated peak short-circuit current	I_p	up to 80 kA	up to 80 kA

1) Rated short-circuit duration under arcing influence 1 s.

2) higher currents upon request

Withdrawable switchpanels (WEL)

Panel dimensions:

12 kV

Width: 800 mm • 900 mm

Depth: 1100 mm

Height: 2100 mm with simple secondary relay module ²⁾
 2280 mm with updated secondary relay module
 2460 mm with high secondary relay module

24 kV

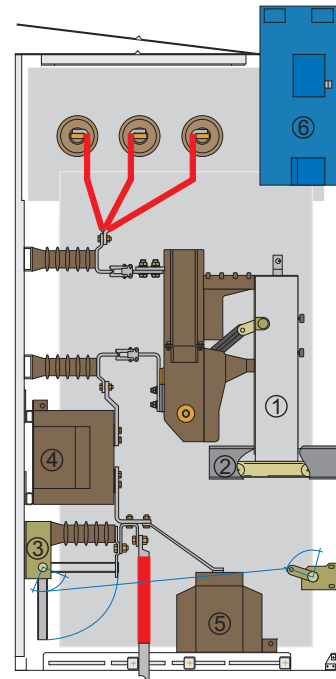
Width: 800 mm ¹⁾ • 900 mm ¹⁾ • 1000 mm

Depth: 1100 mm

Height: 2100 mm with simple secondary relay module
 2280 mm with updated secondary relay module
 2460 mm with high secondary relay module

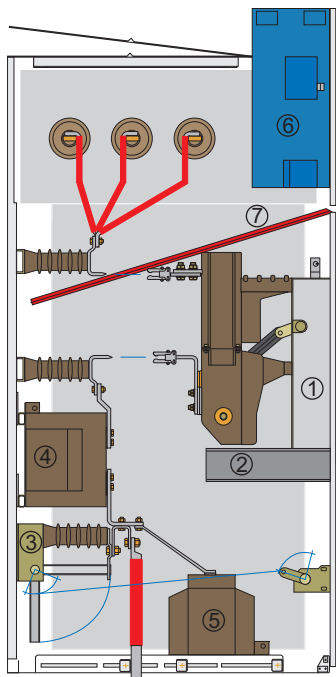
1) These panel widths are equipped with FRP plates for additional insulation

2) Height of relay modules depending on equipment



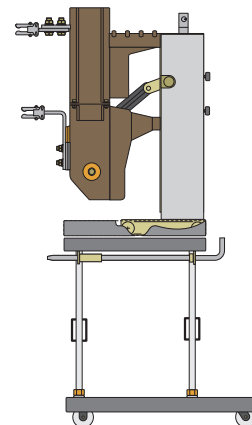
Circuit-breaker in
ON-Position

- ① Circuit-Breaker
- ② Withdrawable cassette
- ③ Earthing switch
- ④ Current transformer
- ⑤ Voltage transformer
- ⑥ Secondary relay
- ⑦ Insulating protective barrier*



Circuit-breaker in
OFF-Position

* The Insulating protective barrier can be inserted when the circuit-breaker is in isolated position (also possible in lockable design)



Circuit-breaker with
auxiliary truck

Withdrawable switchpanels in 2- or 3-compartment design (E2K or E3K)

- **Disconnecter free**, withdrawable design with compartment design
Type E2K or E3K
- **Metal-encapsulated and air-insulated**
- **High operating safety** based on sturdy, patented 2-spindle design of withdrawable cassette
- **Maximum supply reliability** through steel sheet partition with high short-circuit strength between the chambers
- **Maximum operating safety** through automatically closing or opening metal shutter in front of the contacts
- All switching operations including the moving of the circuit-breaker withdrawable unit into isolated position are carried out behind closed panel doors in order **to guarantee maximum personal protection.**
- Doors with patented closing mechanism
- Separate pressure relief flaps for each chamber at the top
- **Protection up to IP4X**
- Weight when fully equipped approx. 1200 kg (acc. to design)



Fig. 4: Circuit-breaker panel with 3-compartment design type E3K

Technical data of switchpanel

Rated voltage	U_r	12 kV	24 kV
Lightning impulse withstand voltage	U_p	75 kV	125 kV
Rated short-duration power-frequency withstand voltage	U_d	28 kV	50 kV
Rated current	I_r	630 A / 1250 A / 2500 A	630 A / 1250 A / 2500 A
Rated short-time current	I_k	up to 31.5 kA	up to 31.5 kA
Rated short-circuit duration	t_k	3 s*	3 s*
Rated peak short-circuit current	I_p	up to 80 kA	up to 80 kA
Rated frequency	f_r	50 Hz	50 Hz

Technical data of switches

Vacuum Circuit-Breaker

Rated voltage	U_r	12 kV	24 kV
Rated current	I_r	up to 2500 A	up to 2500 A
Rated short-time current	I_k	up to 31.5 kA ¹⁾	up to 31.5 kA ¹⁾
Rated peak short-circuit current	I_p	up to 80 kA	up to 80 kA

Switch-disconnector H27

Rated voltage	U_r	12 kV	24 kV
Rated current	I_r	630 A	630 A
Rated short-time current	I_k	20 kA	20 kA
Rated peak short-circuit current	I_p	50 kA	50 kA

Switch-fuse combination H27

Rated voltage	U_r	12 kV	24 kV
Rated current	I_r	125 A ²⁾	125 A ²⁾
Rated short-time current	I_k	25 kA ³⁾	25 kA ³⁾
Rated peak short-circuit current	I_p	63 kA	63 kA

* = Rated short-circuit duration under arcing influence 1 s.

1) higher currents upon request

2) max. rated current of the HV-HBC fuse

3) in accordance with the attached HV-HBC fuses

Withdrawable switchpanels in 2- or 3-compartment design (E2K or E3K)

Panel dimensions:

12 kV with 2- or 3-compartment design

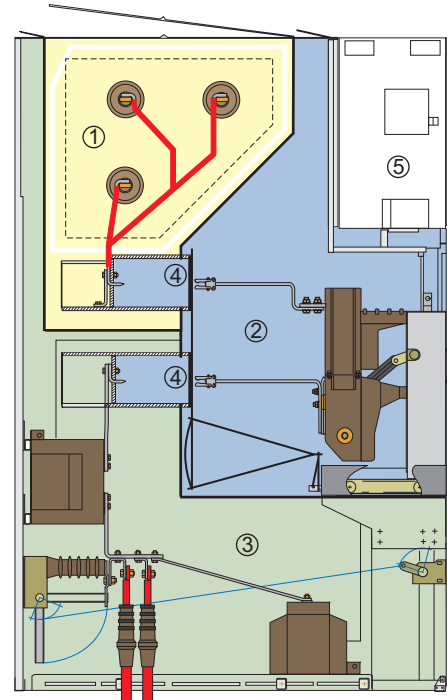
Width: 800 mm • 1000 mm ³⁾
 Depth: 1400 mm • 1600 mm
 Height: 2400 mm

24 kV with 2- or 3-compartment design

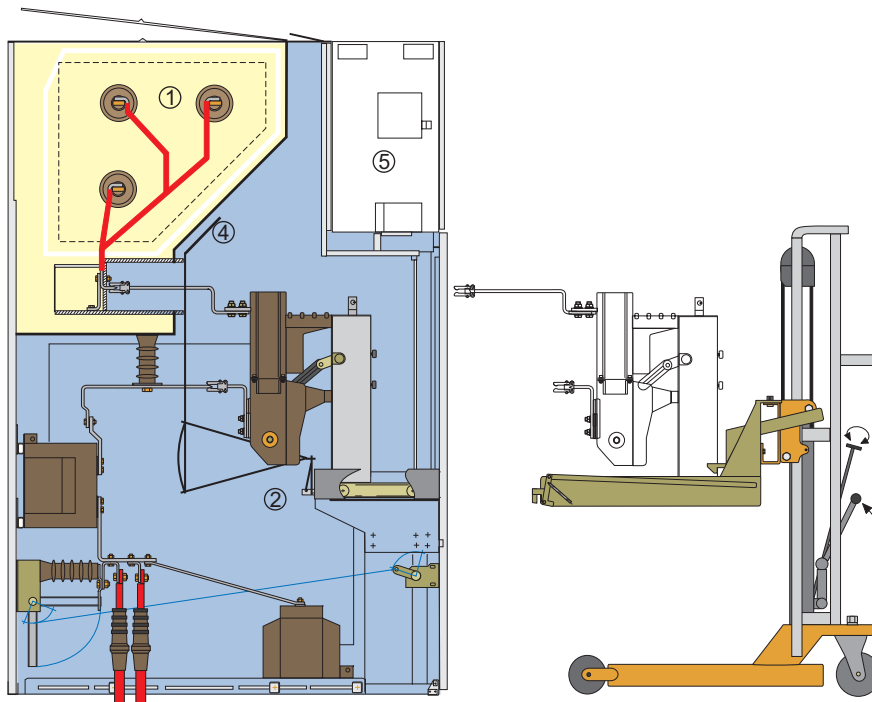
Width: 800 mm ¹⁾ • 1000 mm ³⁾
 Depth: 1600 mm
 Height: 2400 mm with simple secondary module ²⁾
 2600 mm with updated secondary module

- 1) These panel widths are fitted with FRP plates for additional insulation
 2) Height of the relay boxes depends on equipment
 3) Width necessary for I_r 2500 A

- ① Busbar chamber
- ② Circuit-breaker chamber
- ③ Partition chamber of cable feeder
- ④ Automatically opening and closing metal shutter
- ⑤ Low-voltage compartment or secondary device module



Type E3K: 3-compartment - design 630 A
 with circuit-breaker in OFF position



Type E2K: 2-compartment with service truck
 circuit-breaker in operating position

The withdrawable unit

Voltage supply:

Switch and operating mechanism $U_v = 24 \text{ V DC}, 48 \text{ V DC}, 60 \text{ V DC}, 110 \text{ V DC}, 220 \text{ V DC}, 110 \text{ V AC}, 230 \text{ V AC}$

Power consumption (vacuum circuit-breaker):

Motor for spring mechanism of switch $P_s = 256.5 \text{ W}$
Charging time (with 230 V AC) $t_s = \text{ca. } 4 \text{ s}$

Power consumption (withdrawable unit):

Operating mechanism of withdrawable cassette $P_F = 342 \text{ W}$
Travel time (with 230 V AC) $t_F = \text{ca. } 4.5 \text{ s}$



Fig. 5: Withdrawable cassette with motor-operated mechanism and vacuum circuit-breaker

Advantages

- **Separator-free design**
- All switching operations including the moving of the circuit-breaker into isolated position are carried out behind the closed door on the front to ensure **maximum personal protection**
- **Very safe and reliable moving of the withdrawable cassette** based on the high quality ball-bearing rollers and patented 2-spindle method
- **Simple operation and optimal access of the device components**
- Safe and reliable earthing of withdrawable cassette through the metal rollers
- The used DRIESCHER switches are characterized by an exceptionally **high service life and minimum maintenance**
- **Very flexible** based on compact dimensions and many different equipment possibilities



Fig. 6: Service truck with switch-fuse combination H27 SEA

- Cost-efficient, service friendly and variable design through easily removable circuit-breaker by means of:
 - auxiliary truck equipped with docking unit, also non-tilt, vertically adjustable design with operator friendly features (Page 5)
 - service truck additionally fitted with a hydraulic unit for lifting and lowering the circuit-breaker (Page 7)

Dimensions, weights, diagrams and descriptions in this brochure are non-binding. Subject to change without notice.

STROM • SICHER • SCHALTEN

Printed on chlorine free bleached paper. For nature's sake.

**ELEKTROTECHNISCHE WERKE
FRITZ DRIESCHER & SÖHNE GMBH**

D-85366 Moosburg • Phone: +49 8761 681-0 • Fax: +49 8761 681-137
www.driescher.com info@service@driescher.de

