

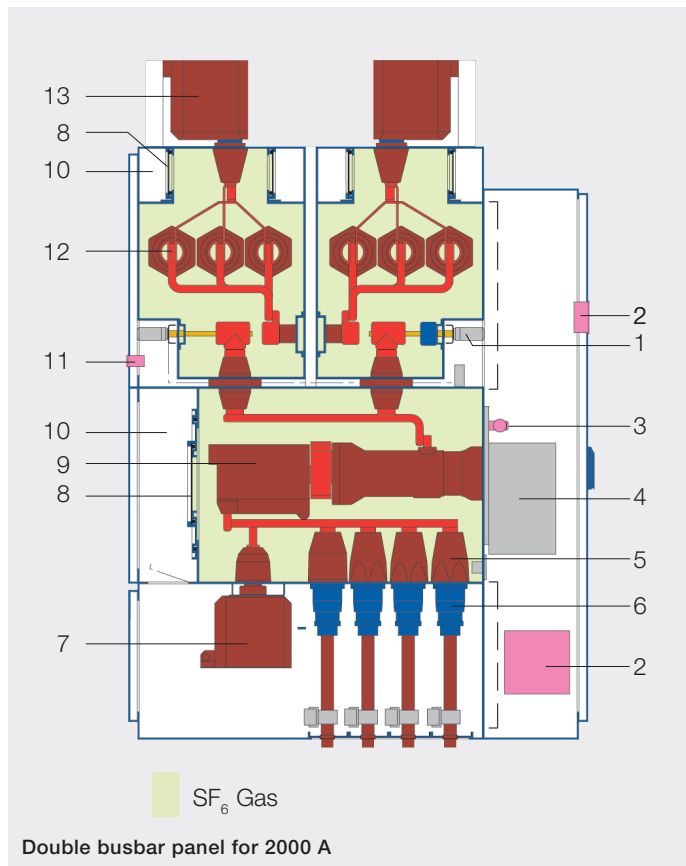


# ZX2

## Gas-insulated medium voltage switchgear

# ZX2

## Double busbar



- 1 Three position disconnect
- 2 Multifunctional protection and control unit
- 3 Gas density sensor and filling valve
- 4 Vacuum circuit-breaker
- 5 Cable socket
- 6 Inner cone cable connector
- 7 Plug-in voltage transformer – feeder
- 8 Pressure relief disk
- 9 Current transformer or combined current and voltage sensor
- 10 Pressure relief duct
- 11 Measuring sockets for capacitive voltage indicator system
- 12 Busbars
- 13 Plug-in voltage transformer – busbar

### Versatile

Partitioned single or double busbar system for all applications – even with the most demanding parameters – up to 40 kV, up to 40 kA, for incoming feeders and sectionalizers up to 2500 A and for single busbars up to 4000 A.

All the switching devices can be remote controlled, and as an option mechanically interlocked. Both combined protection and control units and pure protection devices are used. The plug-in busbar technology without bolted joints permits simple and therefore safe installation.

The level of operator safety, already impressively confirmed by the IAC classification AFLR 40 kA 1s.

### Configuration opportunities

Together with incoming and outgoing feeder panels with circuit-breakers for various rated currents and thus various panel widths (23.6 and 31.5 inches), panel variants for bus sectionalizers and couplers, pure disconnect and metering panels round off the range. Busbar voltage measurement can also be implemented as an integrated function.

### Accessibility

Operator control is effected either remotely or at the front of the system. The power cables are accessible at the rear. The switchgear is installed free-standing in the room with rear access.

### SF<sub>6</sub> insulation

All high voltage parts are effectively isolated from fluctuating ambient influences in sealed enclosures filled with SF<sub>6</sub> insulating gas. Dust, humidity, harmful gases or vermin therefore have no effect. Temperature-compensated pressure sensors reliably and continuously monitor their own function and the quality of the gas insulation.

SF<sub>6</sub> is a non-toxic, inert gas. The dielectric strength is 2.3 times that of air. It is therefore excellently suitable for use as an insulating gas in electrical equipment. After end of service life of the switchgear, SF<sub>6</sub> can be reused directly by the operator or can be recycled by the manufacturer.

| Technical data                            |                   | ANSI / IEEE Ratings |                   |                   | Special Ratings   |
|---|-------------------|---------------------|-------------------|-------------------|-------------------|
| Rated voltage                             | kV                | 15                  | 27                | 38                |                   |
| Maximum operating voltage                 | kV                | 15                  | 27                | 38                | 42                |
| Rated power frequency withstand voltage   | kV                | 36                  | 60/125            | 80/200            | 85/200            |
| Rated lightning impulse withstand voltage | kV                | 75                  | 125               | 200               | 200               |
| Rated frequency                           | Hz                | 60                  | 60                | 60                | 60                |
| Rated busbar current <sup>2)</sup>        | A                 | ... 1200 ... 2500   | ... 1250 ... 2500 | ... 1250 ... 2500 | ... 1250 ... 2500 |
| Rated current of feeder                   | A                 | ... 1200 ... 2500   | ... 1250 ... 2500 | ... 1250 ... 2500 | ... 1250 ... 2500 |
| Rated peak withstand current              | kA                | ... 104             | ... 104           | ... 104           | ... 104           |
| Rated short-time current 3 s              | kA                | ... 40              | ... 40            | ... 40            | ... 40            |
| Internal Arc Classification <sup>1)</sup> | IAC AFLR 40 kA 1s |                     |                   |                   |                   |

<sup>1)</sup> according to IEC 61271-200

Pressure relief via duct in the switchroom or to the outside via plenum

<sup>2)</sup> Single busbar systems up to 4000 A on request

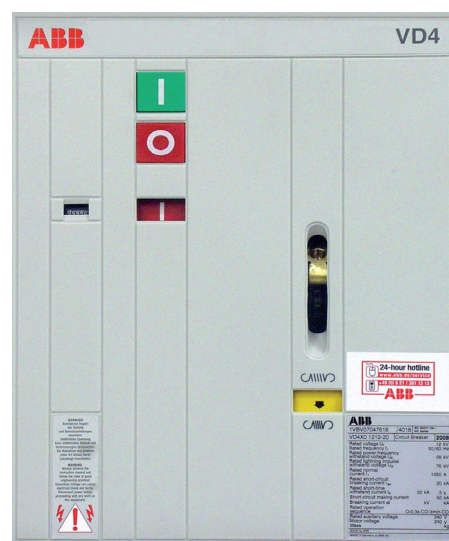
# ZX2 components

## Durable and reliable

### High quality components

The permanently installed vacuum circuit-breakers are three-phase switching devices and fundamentally consist of the mechanical stored-energy spring mechanism and three poles with the vacuum interrupters. The three position disconnects constitute combined disconnect and grounding switches. The three switch positions – connecting, disconnecting and grounding – are clearly defined by the mechanical structure of the switch, reliably excluding simultaneous connecting and grounding positions. For grounding, the three position disconnect – under no current – prepares the connection to ground.

Grounding proper is then performed by the circuit-breaker. A circuit-breaker in the function of an grounding switch is of higher quality than any other grounding switch. The gear is standard with stainless steel encapsulation, manufactured from laser cut sheet material to ensure highest quality. The combination of these high-quality switching devices with the sealed for life, SF<sub>6</sub>-filled enclosures guarantees maintenance-free switchgear.



### Always the right connection

In the cable termination compartment, the power cables are connected with inner cone cable connectors, or with outer cone cable connectors depending on the current. Up to four parallel cables can be installed. Depending on the connection system, a surge arrester can either be added or fitted as an alternative to one cable.

A non-return valve on the SF<sub>6</sub>-filled stainless steel enclosure facilitates systematic extraction of the insulating gas at the end of a panel's service life.

### Current transformers

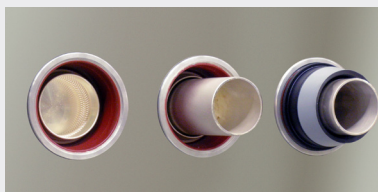
Generously dimensioned block-type or bushing-type current transformers with several cores supply the signals required for protection and measurement.

### Voltage transformers

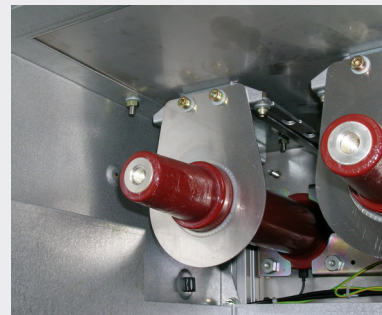
Shockproof voltage transformers are plugged into inner cone sockets. These are removable or isolatable for test purposes, especially for cable testing.



Cable termination compartment with inner cone connectors



Plug-in busbar connection



Cable termination compartment with outer cone bushings

# ZX2

## Maximum operator safety

### Maximum operator safety for the total live time

All live components are enclosed to prevent accidental contact. Probability of internal arc is greatly reduced thanks to ZX Family's stainless steel sealed (for life) pressure systems - medium voltage components isolated from external influences for 40 years.

### Segregated gas compartments

Segregated stainless steel gas compartments greatly reduce the probability that damage from internal arcing may propagate inside the switchgear.

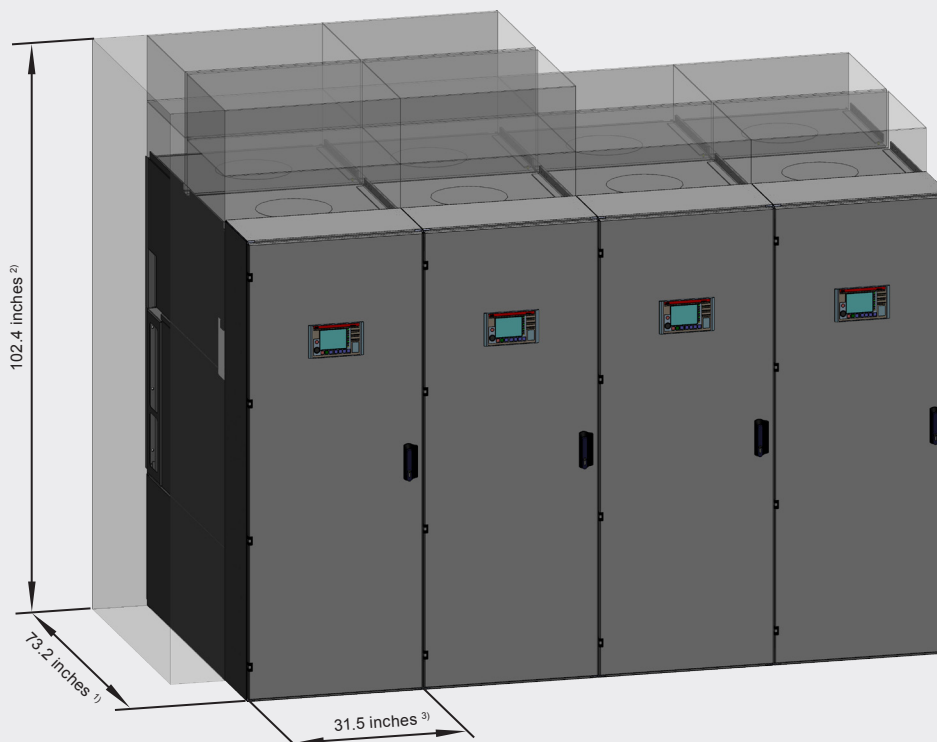
### Plenums

Integral plenums to redirecting any plasma and hot toxic gases, generated in the extremely unlikely event of internal arcing, away from personnel.

### Three phase design

The ZX2's three phase design does not allow for propagation of internal arcs to adjacent panels. In the unlikely case of an arc flash event, only the compartment where the arc occurred is affected, leaving the rest of the switchgear line-up unscathed. The operator's safety is maintained since the arc is contained to one compartment of one frame. There is less downtime associated with the outage, as only 1 frame would require maintenance.

Plenums in transparent view



Exemplary illustration: Plenum discharges into the switchroom

<sup>1)</sup> Low voltage compartment depth: 19.7 inches / Panel for  $I_b > 2000$  A: plus 13 inches for a heat sink at the circuit-breaker compartment  
<sup>2)</sup> Without taking account of heat sinks, fans or voltage transformers on busbar compartments  
<sup>3)</sup> Also 23.6 inches possible, depending on electrical data

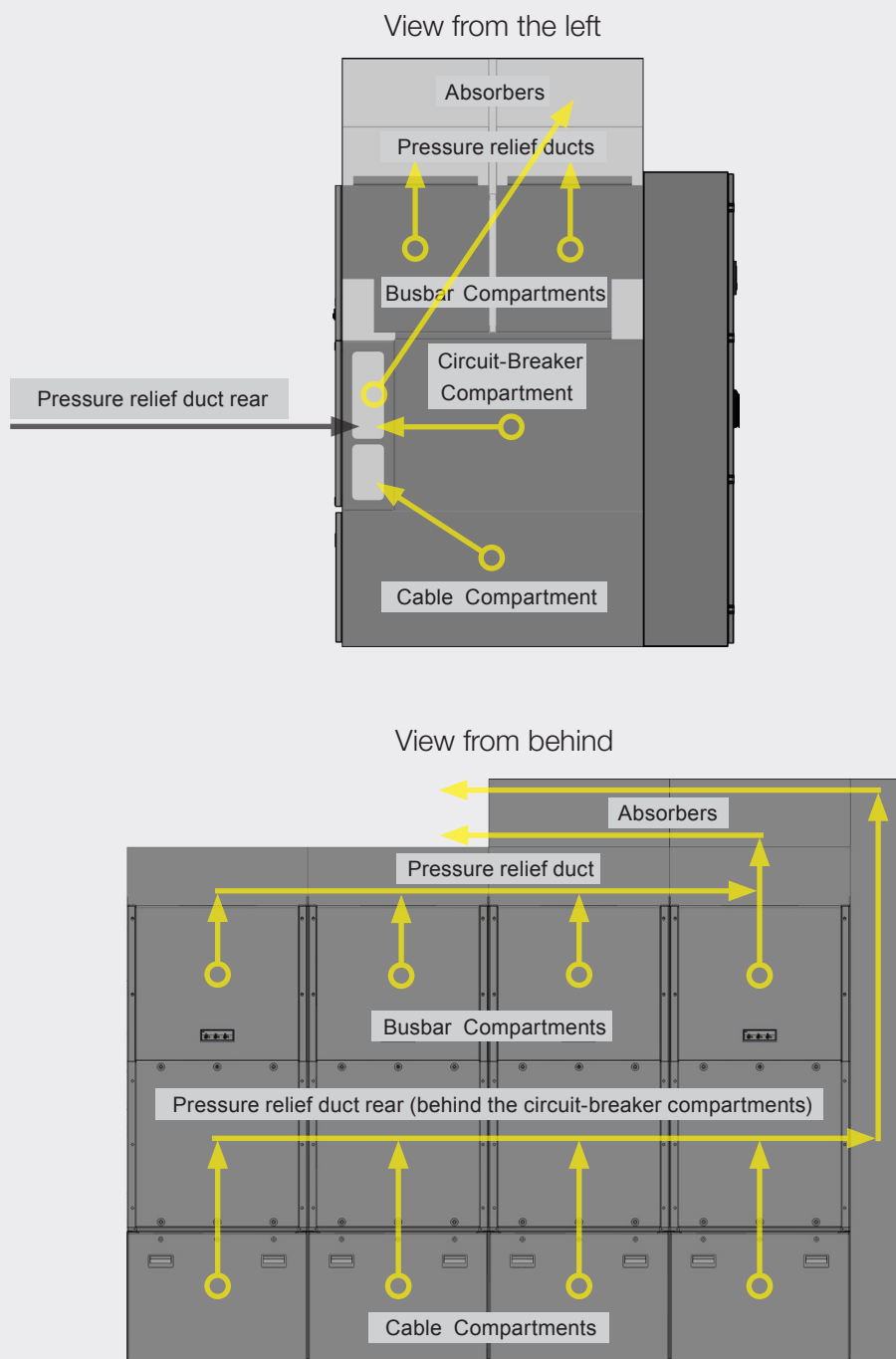
# ZX2

## Improved safety

### Improved safety for personal

Figures show the redirecting of hot gases, generated in the extremely unlikely event of internal arcing from the location of constitution through the plenums to the outside on the top of the switchgear.

Discharge of pressure from the circuit-breaker compartments and cable termination compartments is effected via the rear pressure relief duct, and then through a pressure relief duct designed as a broad end cover at the side of the switchgear block into the front absorber. Discharge of pressure from the busbar compartments is directed into the upper pressure relief ducts. The pressure surge is cooled in the (plasma) absorber located above the upper duct and released into the switchgear room.



Exemplary illustration: Plenum discharges into the switchroom

# Contact



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