ABB – ELDS, 2019

MV Primary Gas-insulated Switchgear

Type ZX2

Speaker, position

ZX2

MV Primary Gas-insulated Switchgear – ZX2

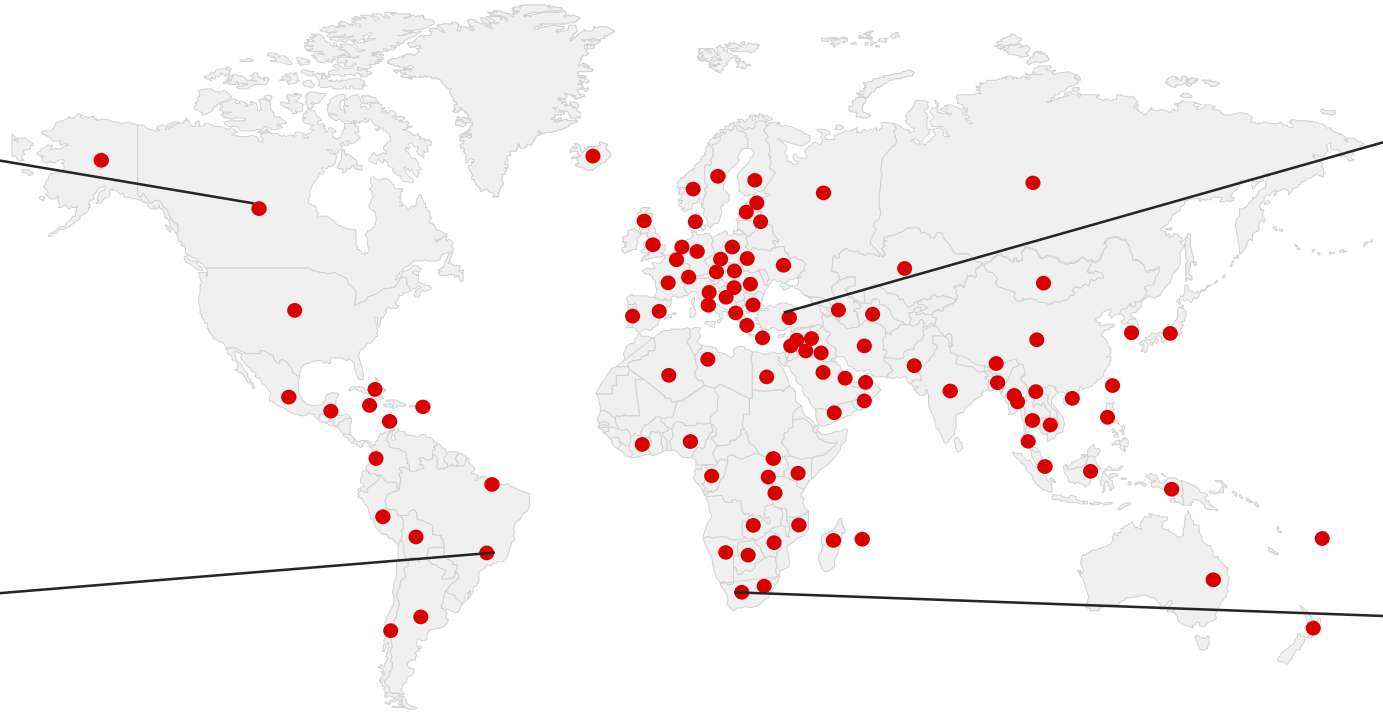
References

Canada

Crosslinx Transit Solution Constructors
122 x ZX2 Panels for Toronto Metro

Brazil

Arena Fonte Nova
18 x ZX0.2 Panels for the stadium



Turkey

Istanbul Metropolitan Municipality
198 x ZX0.2 panels for the Istanbul Metro

South Africa

City of Cape town
More than 100 x ZX0.2 Panels for the Cape Town

Over 75.000 panels installed in more than 100 countries!

MV Primary Gas-insulated Switchgear – ZX2

Reliable, safe, cost-effective and operator-friendly

Our solution

Reliable

- Performance and aging behavior independent of site conditions
- **Proven**, durable circuit breaker design with extended lifetime
- Increased avaiulability

Safe

- Reduced fault rate
- Increased operator safety due to **arc-resistant** design
- No access to MV parts

Cost-effective

- **Compact** switchgear design and optimized substation layout
- **Maintenance-free** MV parts
- Reduced demand for spare parts

Operator-friendly

- **Safe, fast and easy installation** without gas works and the need for special tools
- Intuitive panel control
- **Flexible, customized design**

Portfolio

Portfolio overview ZX2

Why choose ABB?

Contacts

MV Primary Gas-insulated Switchgear – ZX2

ABB's MV GIS offering

IEC primary switchgear

Gas-insulated switchgear (GIS Primary):

– Global: ZX0, **ZX0.2, ZX1.2, ZX2**, ZX1.5R (for rail applications)

Recent innovations: **Digital switchgear, eco-efficient GIS**

For ANSI markets

Gas-insulated switchgear (GIS Primary): **ZX2, ZX2.2, ZX0.2**

IEC secondary switchgear

Gas-insulated switchgear (GIS RMU): **SafeRing, SafePlus, SafeLink** families

Recent innovations: **Eco-efficient GIS, smart grid enabled switchgear**

MV Primary Gas-insulated Switchgear – ZX2

Where is MV GIS technology used?

Applications

Utilities (ZX0.2, ZX2)

- **Electricity Distribution**
- **Substations**
- Power Generation
  - Conventional
  - **Renewables**

Industry (ZX2, ZX1.2)

- Oil and Gas
- **Mining and Minerals**
- **Pulp and Paper**
- Petrochemicals
- Steel

Transportation (ZX0.2, ZX2, ZX1.5R)

- **Rail**
- Airports
- Marine
  - Offshore Applications
  - Vessels

Building (ZX0.2, ZX2)

- **Data Center**
- Hospitals
- Infrastructure

MV Primary Gas-insulated Switchgear – ZX2

Well-positioned in attractive markets

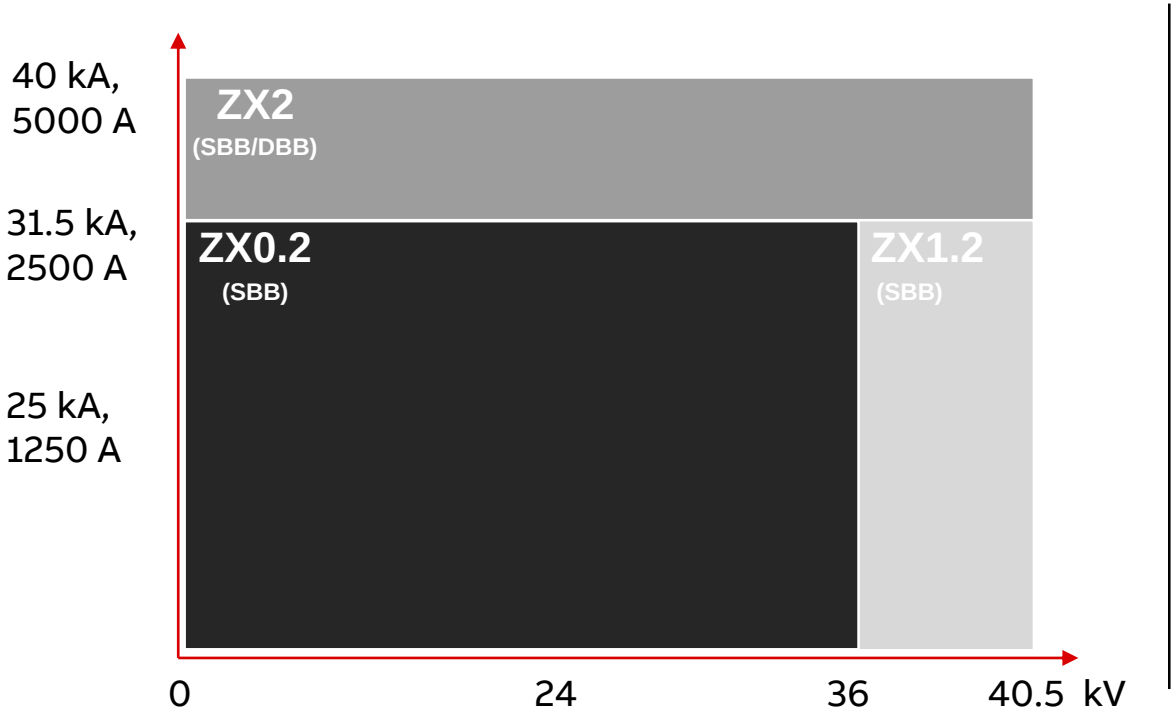
Well-positioned ZX portfolio

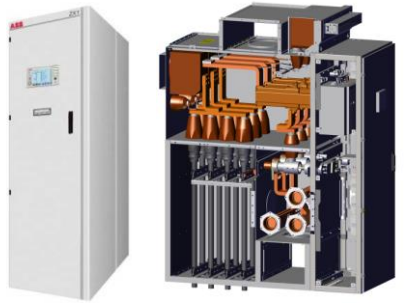
- Most **complete switchgear** portfolio
- Global coverage of requirements – **locally supplied and supported**
- **Flexible** design, **reliable and** and **cost-efficient**
- Global presence with **local service and support**

Most complete portfolio, global coverage

MV Primary Gas-insulated Switchgear – ZX2

ZX Family





ZX1.2

ZX0.2

ZX2

MV Primary Gas-insulated Switchgear – ZX2

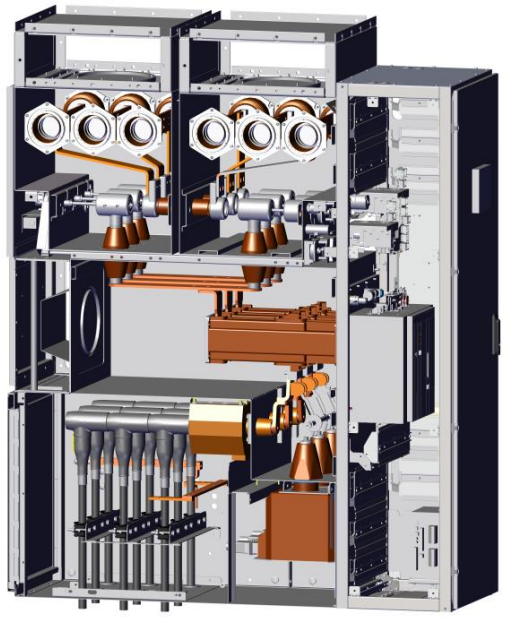
Flexible, high-quality design to meet all customer requirements

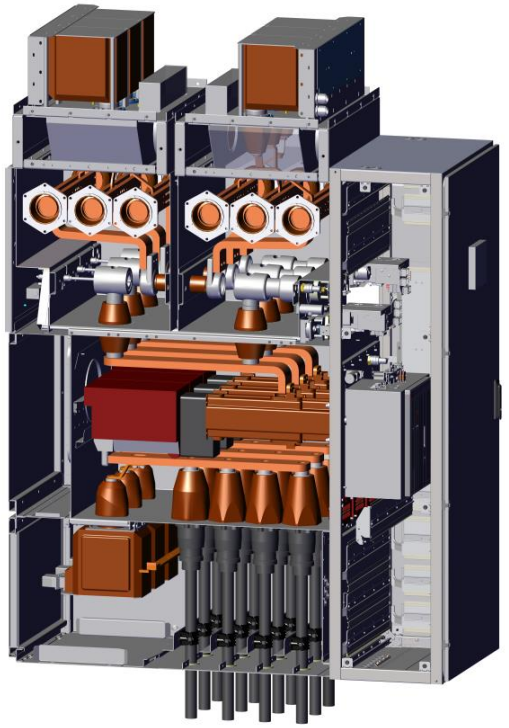
MV Primary Gas-insulated Switchgear – ZX2

Are you looking for a safe, reliable and compact switchgear design?

Flexible, high-quality design to meet all customer requirements

- Up to **40.5kV and 200kV BIL**
- Up to **5000A (SBB) or 3150A (DBB)**
- Up to **40kA, 3 sec**
- **3-phase encapsulated, modular arc-resistant design**
- All gas compartments are fully segregated, no gas connection between adjacent panels
- Factory-assembled, -filled and –tested panels
- IEC 62271-200
- Several local certifications available on request





MV Primary Gas-insulated Switchgear – ZX2

Are you concerned about gas handling?

Gas compartments

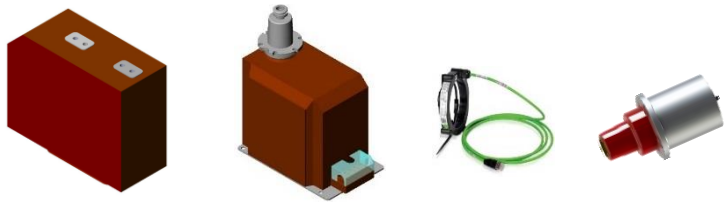
- Each **feeder consists of 2 (SBB) or 3 (DBB) gas** compartments made from laser-cut **stainless steel**
- Each gas compartment is equipped with a on-return filling valve (with protective cap) and **repair openings**
- Operation at slight overpressure - rated **operating pressure 130kPa** (alarm level 120kPa) for rated voltage > 36kV
- **Low amount of SF6** used per panel: 5 - 10 kg
- **Gas leakage < 0,1% per year**
- **No checks on the insulating gas are necessary and maintenance-free**

No gas handling during 40-year lifetime of the switchgear required

MV Primary Gas-insulated Switchgear – ZX2

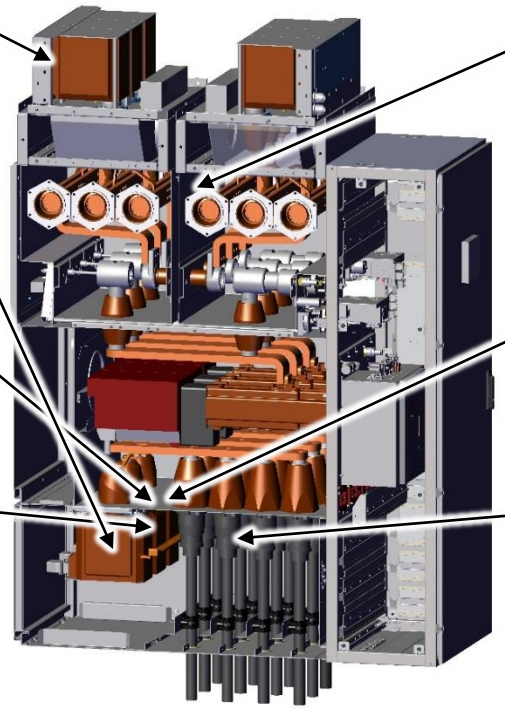
Technology: safe, fast and easy installation

Voltage transformer – current transformer / Sensor



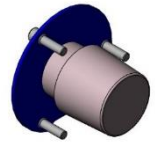
Surge arrestor

Test plug

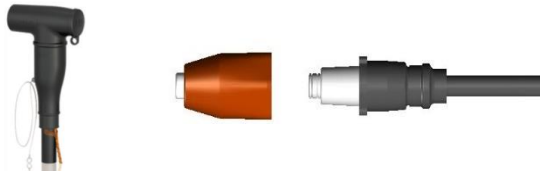


Busbar (plug-in)

Dummy plug



Cable plug

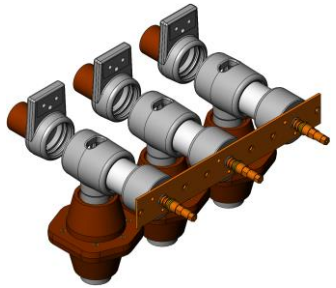


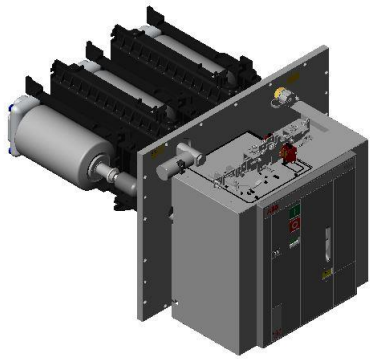
MV Primary Gas-insulated Switchgear – ZX2

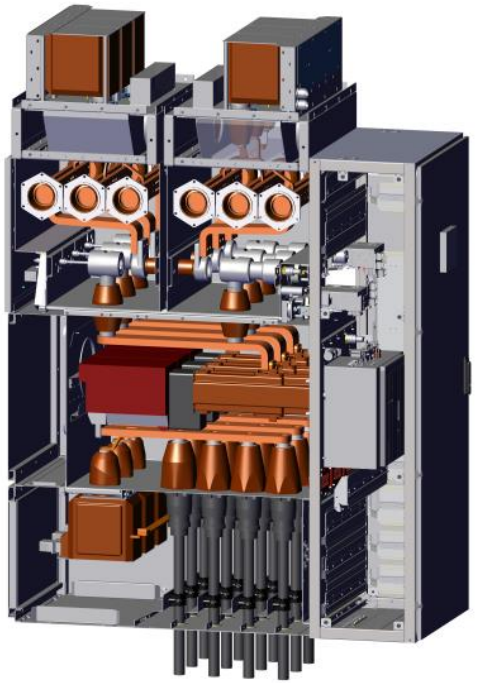
Key components

Operation

- Motorized operating mechanisms for switching devices located easily accesible inside LVC
- Manual emergency operation possible
- Advantages of **earthing via circuit breaker and three position switch** in series:
  - Circuit breaker is of higher quality than any earthing switch
  - Higher number of make-proof earthing operations
  - No contamination of SF6 through switching operations
- Optional view ports for visual verification
- High performance CB



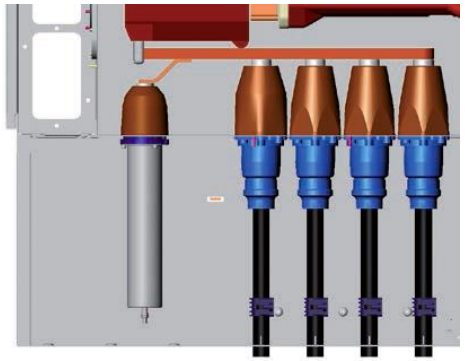




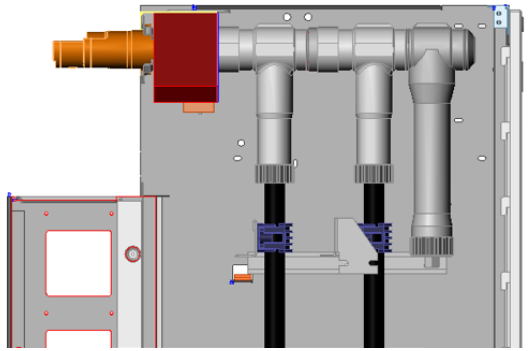
MV Primary Gas-insulated Switchgear – ZX2

How would you like to make your cable connection?

Inner cone termination

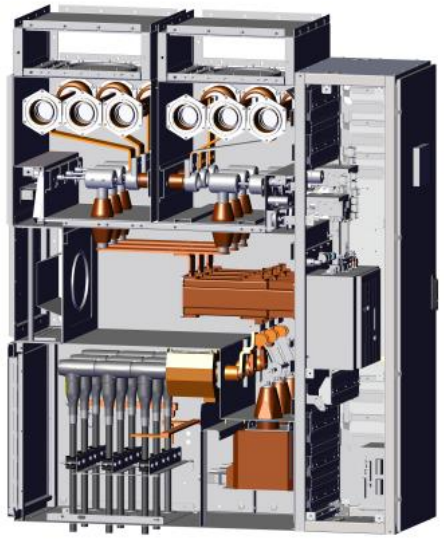


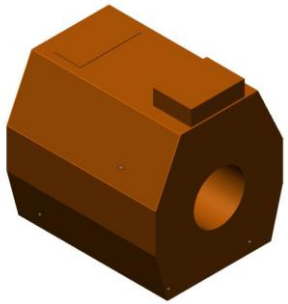
Outer cone termination



MV Primary Gas-insulated Switchgear – ZX2

Current transformer / Ring type

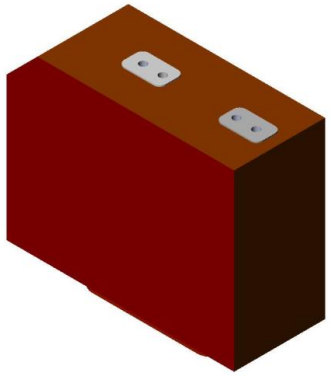


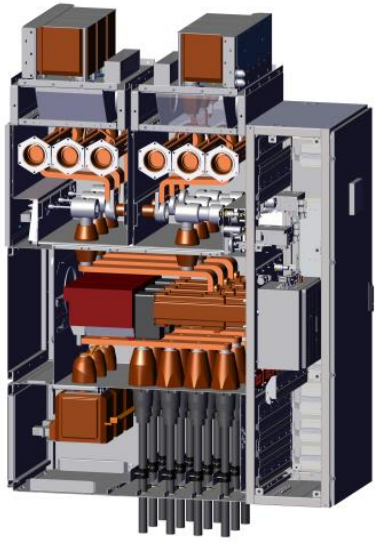


Technical data of the ring core current transformers (primary data)					
Type og current transformer				1	2
Rated voltage		U_r	kV	0.72	
Rated short duration power-frequenzy withstand voltage		U_d	kV	3	
Rated frequenzy		f_f	Hz	50/60	
Rated thermal short-time current		I_{therm}	kA	25	40
Rated impulse current		I_p	kA	62.5	100
Core data					
Panel width			mm	2 x 400	600
Rated primary current		I_r	A	…630	…1250
Rated secondary current				1 or 5	
Max. number of cores				2	3
Measuring cores	Capacity Class		VA	2.5 to 15 0.2 / 0.5 / 1	…20 0.2 / 0.5 / 1
Protection cores	Capacity Class Overcurrent factor		VA	2.5 to 15 5P to 10P 10 to 20	…20 5P 20

MV Primary Gas-insulated Switchgear – ZX2

Current transformer / Block type

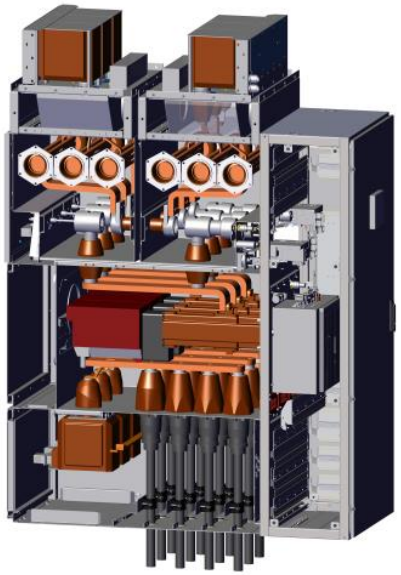


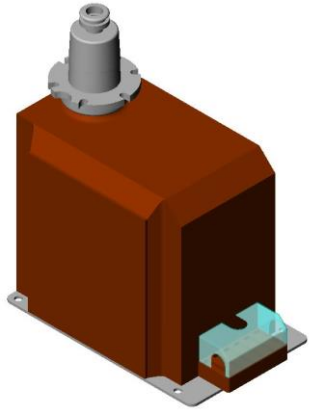


Technical data of the current transformers (primary data), device B and C					
Rated voltage		U_r	kV	…24	…36
Max. operating voltage			kV	24	40.5
Rated short duration power-frequency withstand voltage		U_d	kV	50	70 (85)
Rated lightning impulse withstand voltage		U_p	kV	125	170 (185)
Rated frequenzy		f_r	Hz	50/60	50/60
Rated thermal short-time current		I_{therm}		100 /250 x I, max. 40kA – 3 s	100 /250 x I, max. 40kA – 3 s
Core data					
Panel width			mm	600	800, 840
Rated primary current		I_r	A	…1250	…2500
Rated secondary current			A	1 to 5	1 to 5
Max. number of cores				3	5
Measuring cores	Capacity Class		VA	2.5 to 15 0.2 / 0.5 / 1	
Protection cores	Capacity Class Overcurrent factor		VA	2.5 to 30 5P to 10P 10 to 20	

MV Primary Gas-insulated Switchgear – ZX2

Voltage transformer





Rated power frequenzy withstand voltage of voltage transformers

Rated voltage [kV]	Rated power frequenzy withstand voltage (1 min) [kV]
> 12 to 24	50
> 24 to 36	70
> 36 to 40.5	85

Technical data of voltage transformers

	Max. capacity [VA]	Class	Rated secondary voltafe of the metering winding [V]	Rated secondary voltage of the earth fault winding [V]	Rated thermal current limit of the metering winding with rated voltage factor 1.2 / continuous [A]	Rated thermal long duration current of the earth fault winding with rated voltage factor 1.9 / 8 h[A]
Voltage transformers for 1250 A panel, 3 x cable sockets per phase	15 45 100	0.2 0.5 1	100 / √3 110 / √3	100 / 3 110 / 3	4	4
All other voltage transformers	30 75 150	0.2 0.5 1	100 / √3 110 / √3	100 / 3 110 / 3	6	6

MV Primary Gas-insulated Switchgear – ZX2

What is your control and protection philosophy?

Protection, metering and control

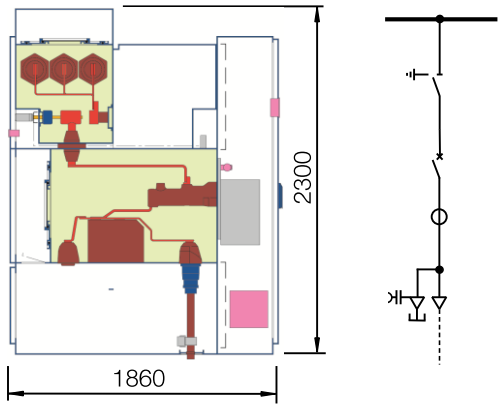
PCU

REX 640

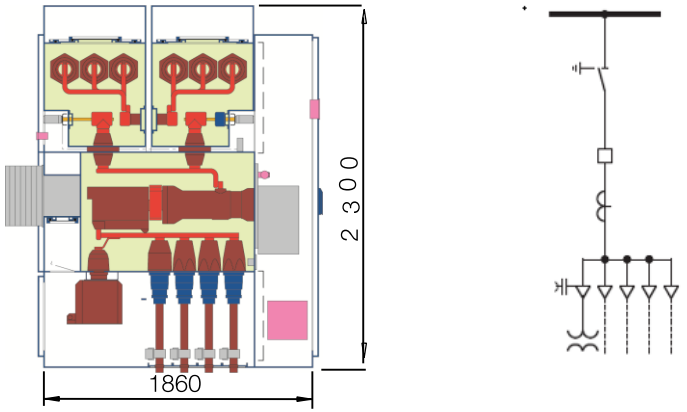
MV Primary Gas-insulated Switchgear – ZX2

Section views

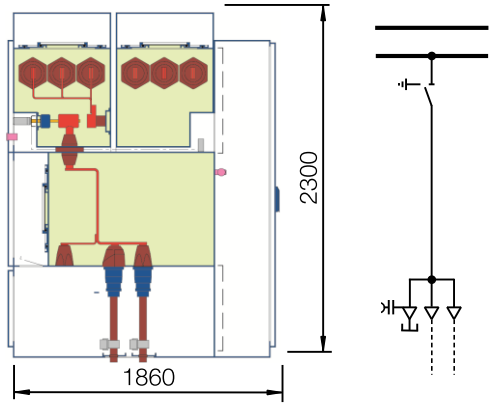
Typical panel variants ZX2



Outgoing feeder panel



Incoming feeder panel

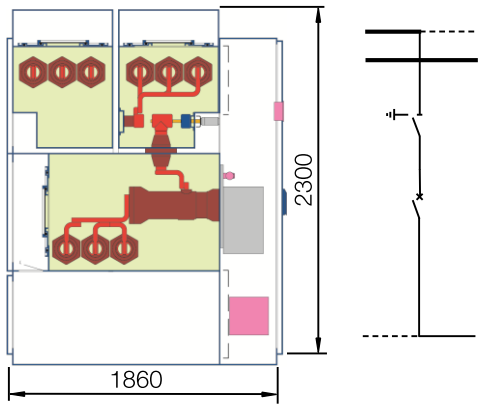


Cable termination panel

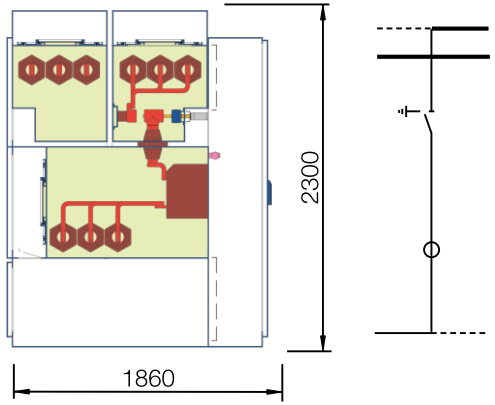
MV Primary Gas-insulated Switchgear – ZX2

Section views

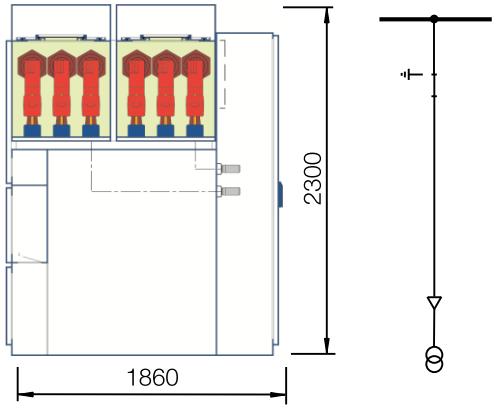
Typical panel variants ZX2



Sectionalizer panel



Riser panel



Metering panel

MV Primary Gas-insulated Switchgear – ZX2

How easy can a switchgear installation be?

Busbar connection

Safe, fast and easy installation, no gas works at site, no special tolls required !





MV Primary Gas-insulated Switchgear – ZX2

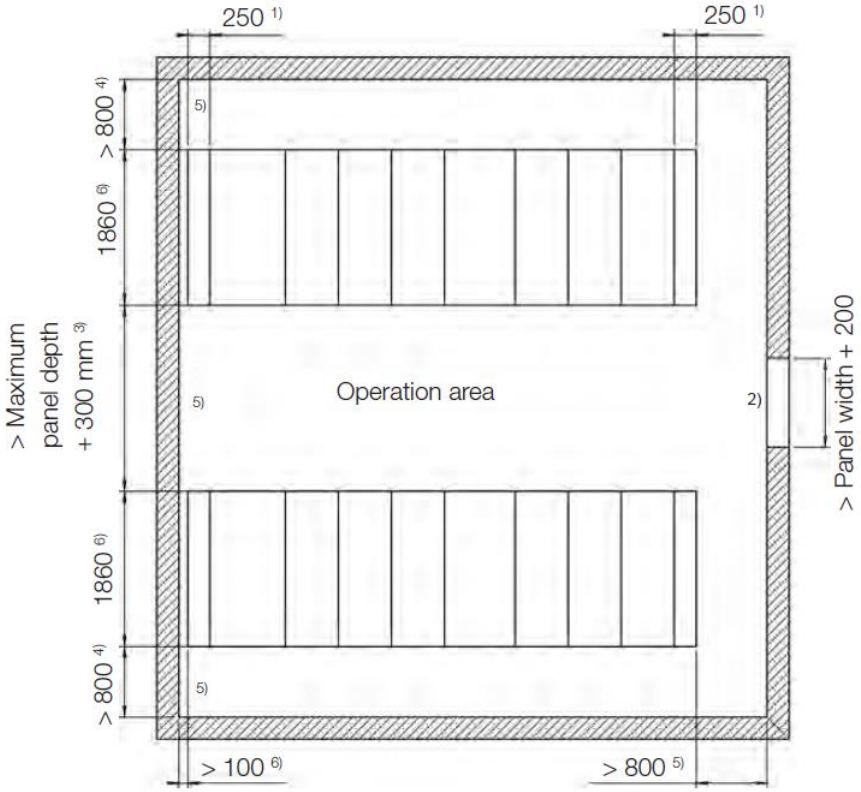
Saving space helps to reduce cost

Installation

- Delivery of **factory filled and tested panels**
- Installation without gas works at site
- Transverse installation is possible
- Installation on standard floor frames embedded in concrete floor, on intermediate frame or on raised false floor
- Installation and commissioning shall be done by **trained and certified service personnel**

Panel weights

Panel type	Panel width [mm]	Weight, max. [kg]
Single busbar	2x400 600 800	1500 1400 2000
Double busbar	2 x 400 600 800	1800 1600 2400
Side pressure relief duct (increase in weight of the relevant end panel)		250



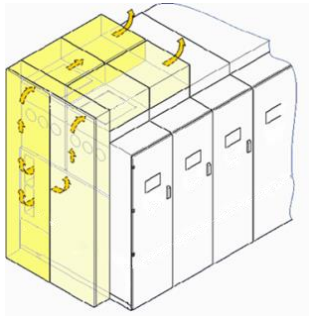
MV Primary Gas-insulated Switchgear – ZX2

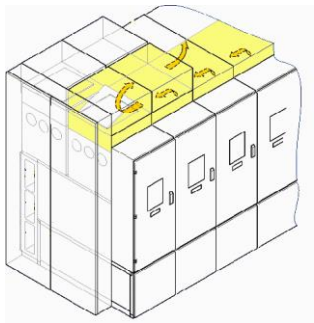
How does your switchgear room look like?

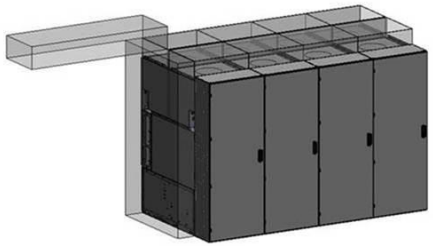
Installation – Minimum room heights

Minimum room heigths

Pressure relief into the switchgear room (absorber) [mm]	Pressure relief into the switchgear room with a fan on the absorber [mm]	Pressure relief to the outside [mm]	Integrated metering on at least one panel [mm]	Integrated metering with plug-in, isolatable voltage transformers on at least one panel [mm]	Heat sink on at least one panel [mm]
> 2800	> 3000			> 3500	> 3200







Sales Product Presentation – ZX2

Why choose ABB?

Highlights

- ABB is the pioneer in MV GIS
- Continuous improvement
- Products tailored to meet your local requirements and standards
- Highly reliable, smart, compact and economic solution
- Full engineering and technical support
- Worldwide footprint and service network

Sales Product Presentation – ZX2

Links

http://abb.com/

http://abb.com/medium-voltage

https://new.abb.com/medium-voltage/switchgear/gas-insulated-switchgear

Let’s write the future of safe, smart, and sustainable electrification


ABB