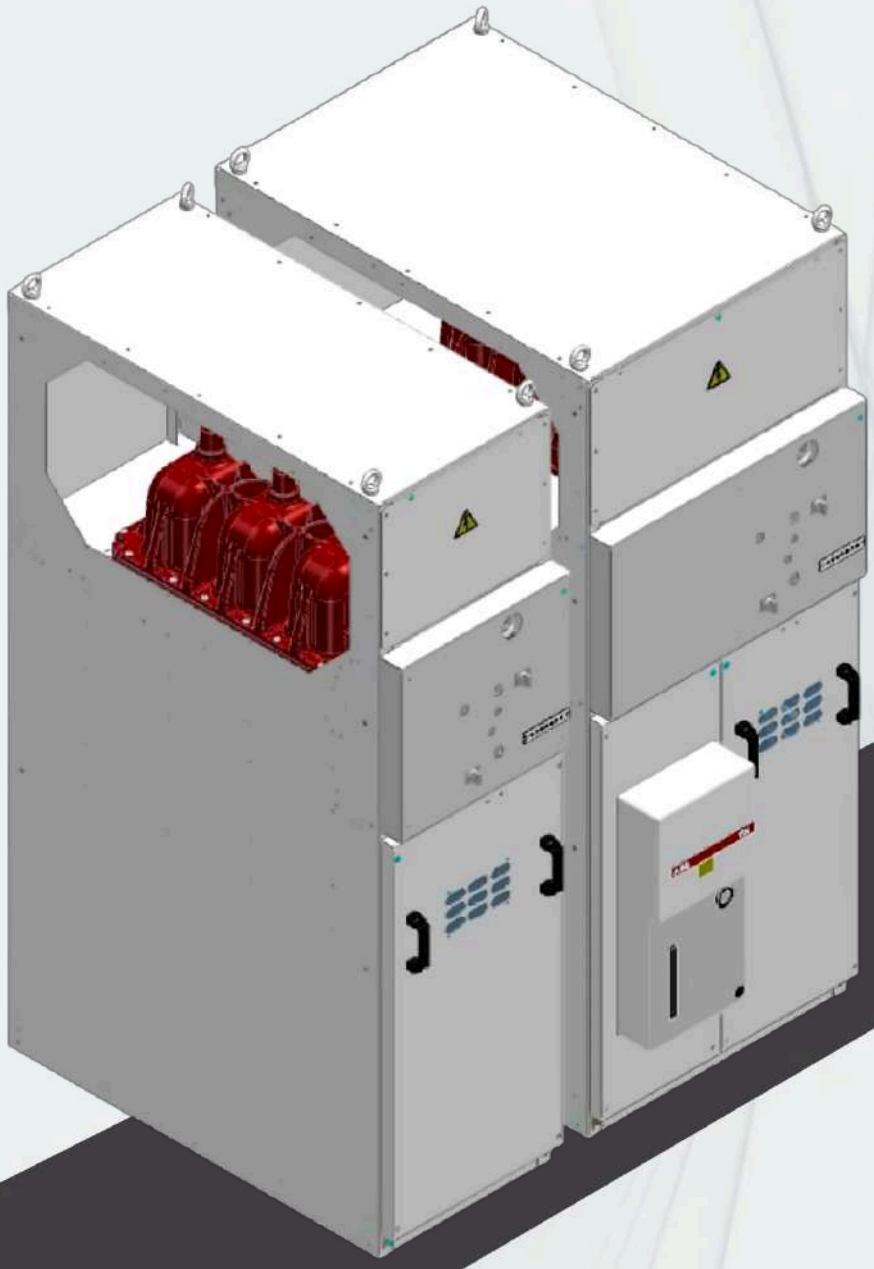
AIR-SEC

VOLTAGE	CURRENT	SHORT-TIME
12 · 17,5 · 24 kV	630 A	16 – 20 kA

MEDIUM VOLTAGE SWITCHGEAR WITH AIR-ON SF6-FREE LOAD BREAK SWITCH METAL ENCLOSED (LSC2A)



according to

IEC 62271-200

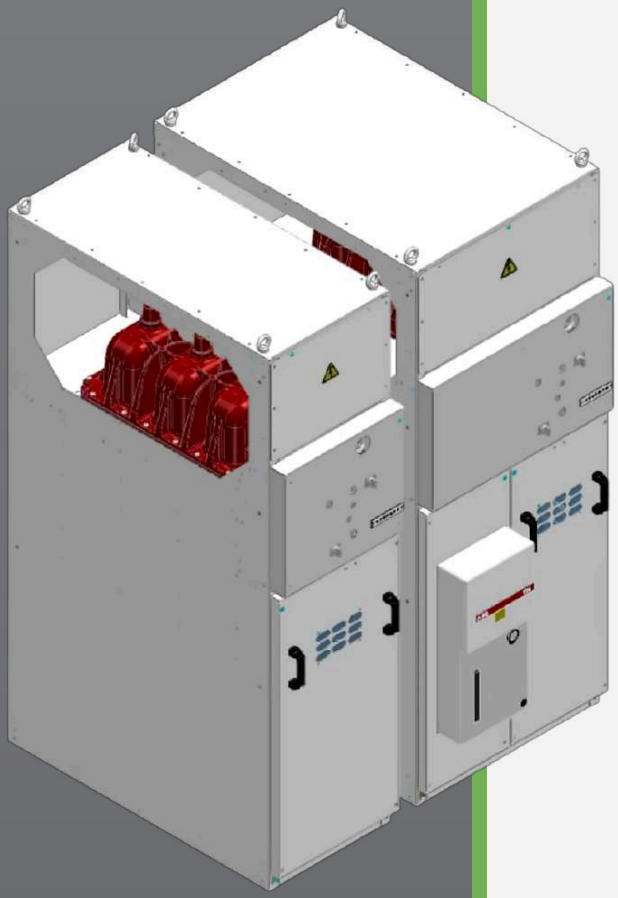


About us

3B Energy can propose a huge number of products related to the energy sector. We are active in the whole world of Power Transmission and Distribution: Medium Voltage switchgears, Medium Voltage switches, Low Voltage PCs, Low Voltage MCCs with fixed and withdrawable units, Transformers, Cabinets. 3B Energy can propose a wide range of products for fulfilling any request and need.

3B Energy is very active and smart in assisting customers in finding solutions related to the energy sector. We can support the customer during the engineering phase of the plant, during the purchasing steps, for the supply and for after-sales services. 3B Energy is a real "turnkey" solution provider: Package Substations, Transformer Substations, Mobile Cabinets; we can propose a complete solution set, letting the customer have one player only for the whole plant.

3B Energy can propose a complete and detailed list of services covering each step of the engineering phase. Our technical staff is highly expert and professional and can support the customer starting from the base design of a single component up to a complete apparatus for electrical applications. We can design and engineer every component the customer may need — from a single contact to a complete switching device — and develop the technology for any product or application in the energy sector.



Contents

01 **Description** — General features, applications, safety and standards — 4

02 **Unit Types** — The modular AIR-SEC family at a glance — 6

03 **Technical Data** — Electrical ratings of the series — 7

04 **Typical Units** — K1 · K2 · BR · ME · M · L · T · CB — 8

05 **AIR-ON Load Break Switch** — SF6-free dry-air switching technology — 16

AIR-SEC

VOLTAGE 12 · 17,5 · 24 kV | CURRENT 630 A | SHORT-TIME 16 – 20 kA

GENERAL

- AIR-SEC series metal-enclosed units have been designed and tested to be used for all energy distribution systems up to 24 kV
- Modular metal-enclosed units are the optimal solution thanks to their easy operation, modular structure and side-by-side module arrangement
- AIR-SEC series metal-enclosed units are manufactured according to IEC Standards
- Optimal dimensions
- Long-term technical solutions for various applications
- High level of personal safety

APPLICATIONS

- Manufacturing industry
- Secondary electricity distribution networks
- Shopping malls
- MV / LV distribution transformer substations
- Small size power plants
- Wind power plants
- Airports, hospitals, holiday villages

Enclosure of cubicle is 2 mm galvanized steel sheet. If desired, al-zinc is also possible.
No welding during the assembling of the structure.

SAFETY

- There is a surveillance window on the front cover of every cubicle to check inside the cubicle without opening the door / cover
- The door / cover of the accessible compartments is mechanically interlocked with the earthing switches
- High voltage indication system in each cubicle

STANDARDS

- Compliance with standards IEC 62271-200
- Classification (according to IEC 62271-200)
- Classification of service continuity: LSC 2A
- Classification of the partitions: (Partition: insulated or metallic)
- Classification of arc proofing: IAC A (FL), IAC A (FLR) - Optional

AIR-SEC

VOLTAGE 12 · 17,5 · 24 kV | CURRENT 630 A | SHORT-TIME 16 – 20 kA

1 Busbar compartment

Busbar compartment is located on the top of the cubicle. It contains the main busbar which interconnects the cubicles. And also:

- Tool-based accessible compartment with regard to accessibility (it is not possible to open the covers without using tools)
- Withstand to internal arc
- IP 3X protection degree

2 Cable compartment

Cable compartment is located at the bottom of the cubicle. It contains switching devices, measuring transformers, HV fuses, earthing devices, support insulators according to the functional type of the cubicle. Incoming / outgoing MV cable connection of the cubicle is made in this compartment. The door has an inspection window. And also:

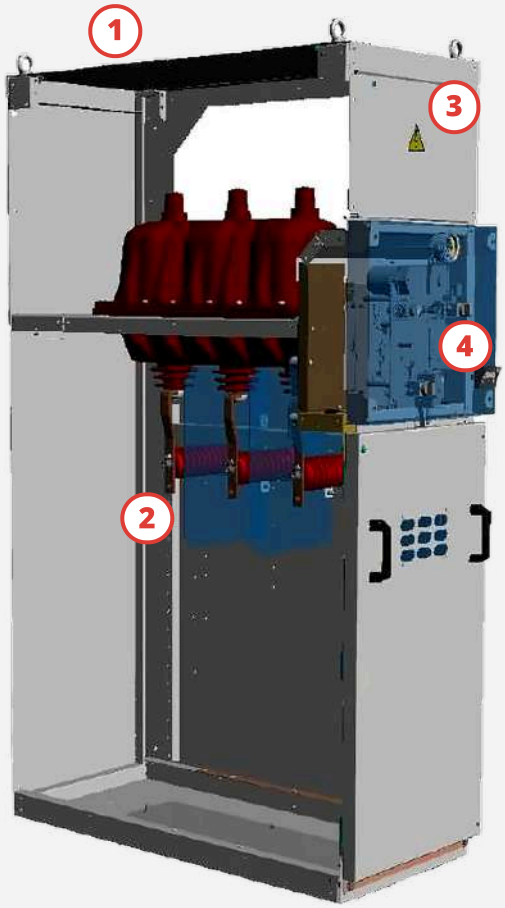
- Procedure-based accessible compartment with regard to accessibility (it is possible to open the covers without using tools)
- Withstand to internal arc
- IP 3X protection degree

3 Low voltage compartment

Low voltage compartment is located on the front-top of the cubicle, with IP3X protection degree. According to the functional type of the cubicle, it contains protection relays, LV fuses, measuring instruments, auxiliary relays, miniature circuit breakers, terminal blocks, AC/DC supply, etc.

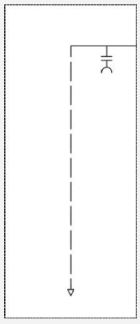
4 Operating mechanism compartment

Operating mechanism compartment is located on the front of the cubicle. According to the functional type of the cubicle it contains load-break switch mechanism, earthing switch mechanism and the interlocking metal parts. Circuit breakers have their own separate mechanism. All metal parts of the operating mechanism are protected against corrosion.

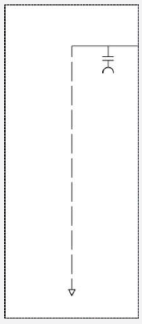


Unit types

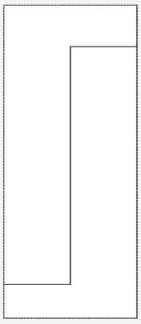
Type AIR-SEC K1
Incoming Cable Unit



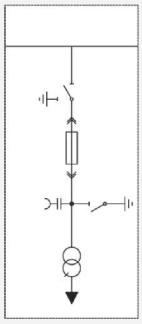
Type AIR-SEC K2
Incoming Cable Unit



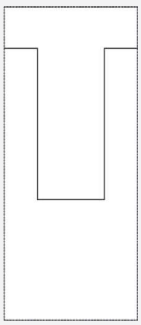
Type AIR-SEC BR
Bus Riser Unit



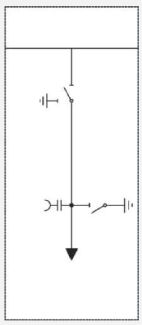
Type AIR-SEC ME
Metering Unit



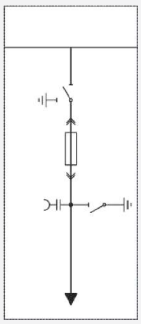
Type AIR-SEC M
Bus Riser with Metering Unit



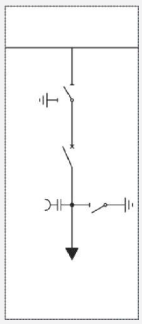
Type AIR-SEC L
Line Switch Unit



Type AIR-SEC T
Transformer Protection Unit

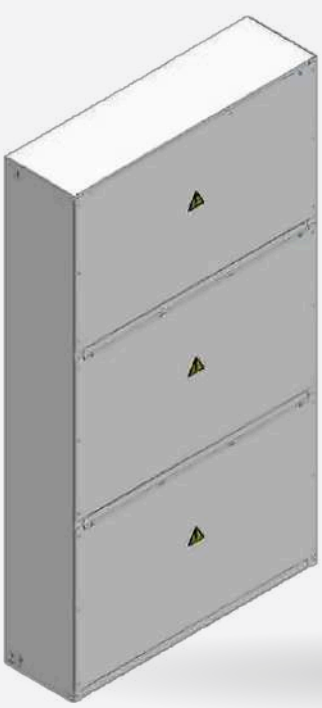


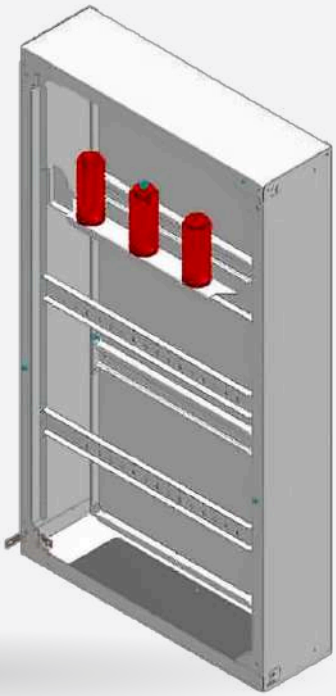
Type AIR-SEC CB
Circuit-Breaker Unit

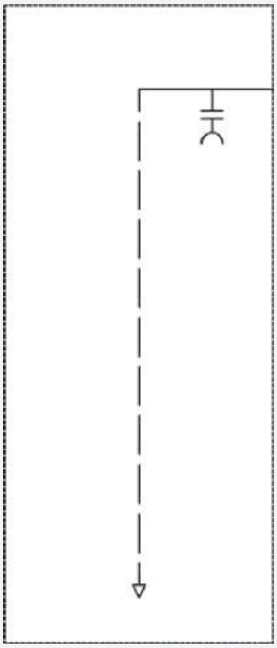


Rated voltage	kV	12	17.5	24
Lightning impulse withstand voltage	kV peak			
- Across phases and phase to neutral		75	95	125
- Across the isolating distance		85	110	145
Rated power frequency withstand voltage	kV eff			
- Across phases and phase to neutral		28	38	50
- Across the isolating distance		32	45	60
Rated frequency	Hz	50 / 60	50 / 60	50 / 60
Rated current				
- Busbar	A	630	630	630
- Feeder / branch	A	630	630	630
Rated short time withstand current	kA eff			
- Main circuit		20	20	20
- Earthing circuit		20	20	20
Rated peak withstand current	kA peak	50	50	50
Rated duration of short circuit	s	1	1	1
Arc fault current, 1 s	kA	16	16	16
Internal arc class (optional)		A(FLR)/A(FL)	A(FLR)/A(FL)	A(FLR)/A(FL)
Partitions class		PI	PI	PI
Loss of the service continuity		LSC2A	LSC2A	LSC2A
Degree of protection, enclosure		IP3X	IP3X	IP3X
Degree of protection, partitions		IP3X	IP3X	IP3X
Ambient temperature	°C			
- Maximum value		+40	+40	+40
- Maximum value of 24 h mean		+35	+35	+35
- Minimum value		-5	-5	-5
Altitude above sea level	m	≤1000	≤1000	≤1000

Type AIR-SEC K1







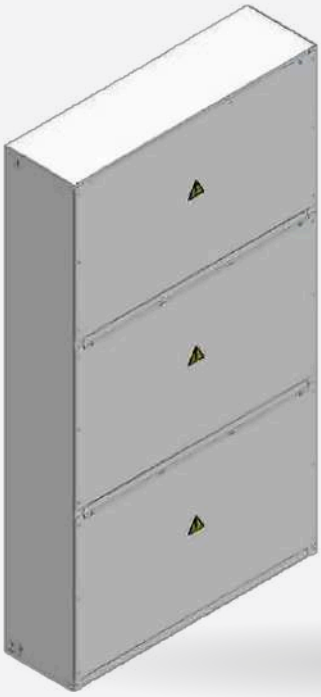
Standard equipment

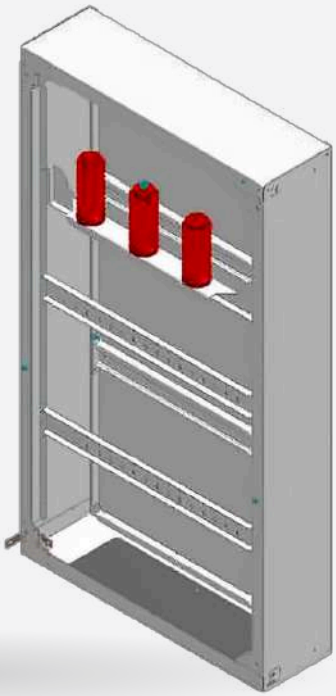
1. Voltage indicator device
2. Earthing bar

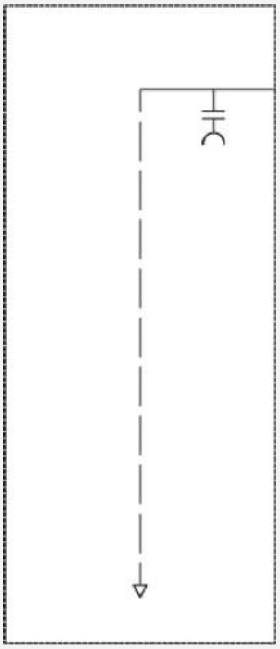
Technical data

Rated voltage	[kV]	12	17,5	24
Rated current	[A]	630	630	630
Rated short-time withstand current	[kA]	20	20	20
Maximum rated duration of short circuit	[s]	1	1	1
Net Weight	kg	100	100	100
Gross Weight	kg	130	130	130
Width	mm	300	300	300
Depth	mm	1080	1080	1080
Height	mm	1900	1900	1900

Type AIR-SEC K2





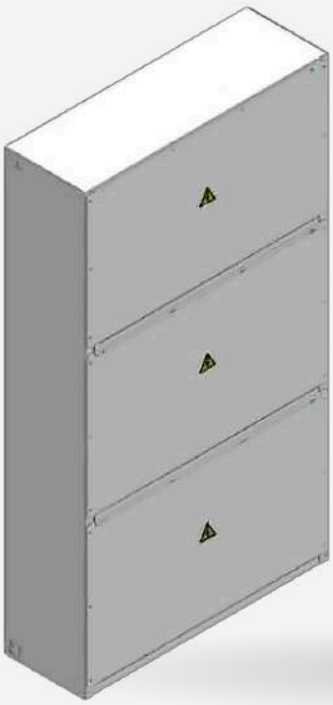


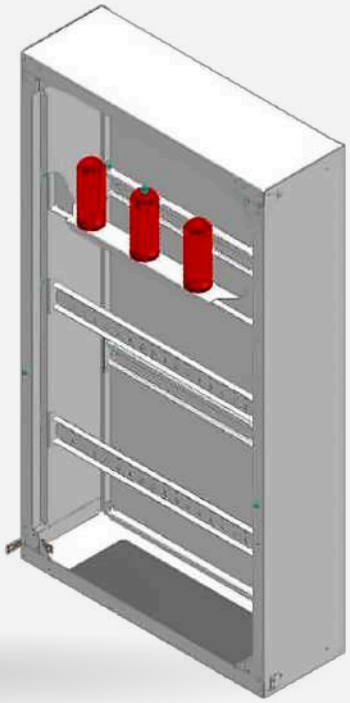
Standard equipment

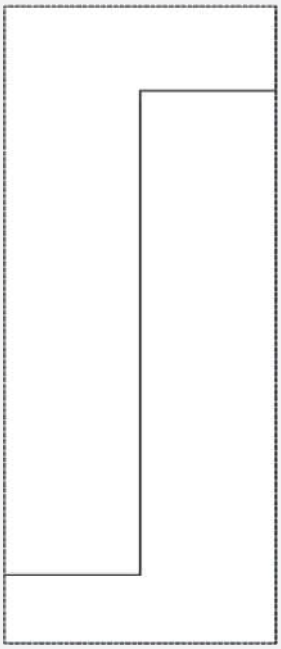
1. Voltage indicator device
2. Earthing bar

Technical data

Rated voltage	[kV]	12	17,5	24
Rated current	[A]	630	630	630
Rated short-time withstand current	[kA]	20	20	20
Maximum rated duration of short circuit	[s]	1	1	1
Net Weight	kg	105	105	105
Gross Weight	kg	135	135	135
Width	mm	350	350	350
Depth	mm	1080	1080	1080
Height	mm	1900	1900	1900





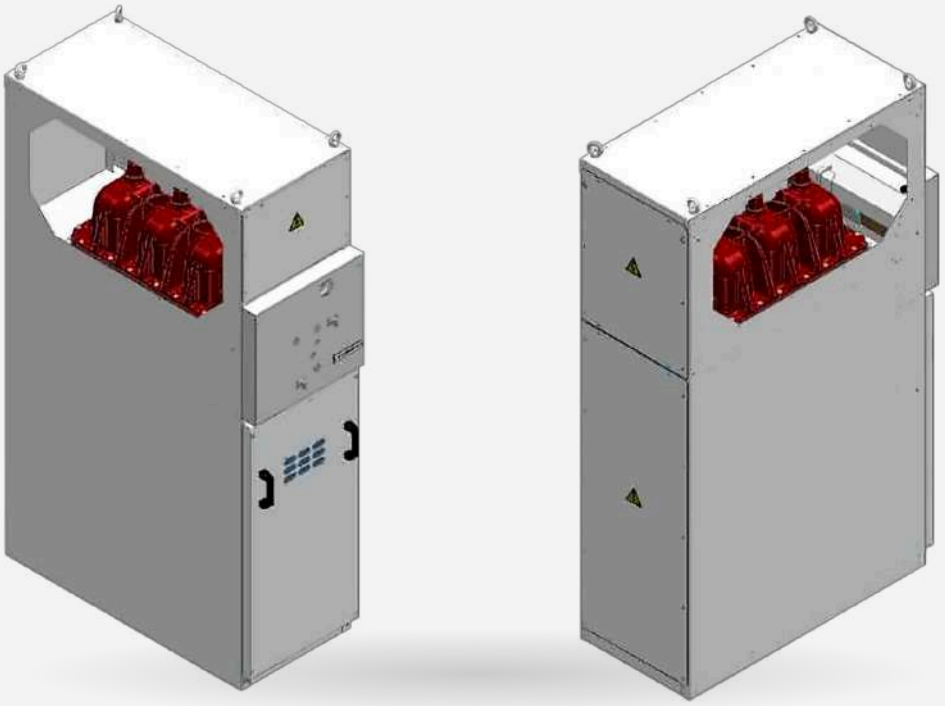


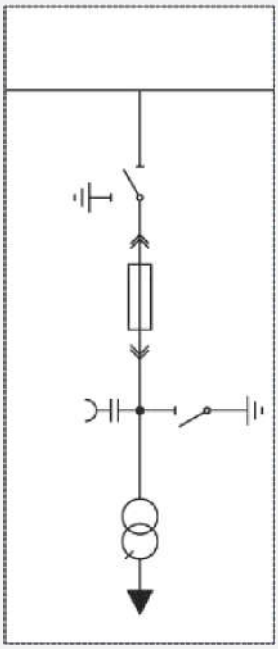
Standard equipment

1. Voltage indicator device
2. Busbars
3. Earthing bar

Technical data

Rated voltage	[kV]	12	17,5	24
Rated current	[A]	630	630	630
Rated short-time withstand current	[kA]	20	20	20
Maximum rated duration of short circuit	[s]	1	1	1
Net Weight	kg	190	190	190
Gross Weight	kg	220	220	220
Width	mm	350	350	350
Depth	mm	1080	1080	1080
Height	mm	1900	1900	1900





Standard equipment

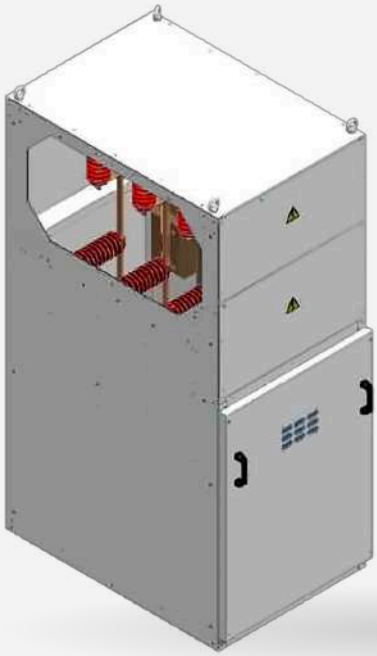
1. 3-position SF6-free load break switch (open – closed – earthed)
2. Operating mechanism with mechanical position indication
3. Voltage transformers
4. Fuses
5. Voltage indicator device
6. Heater
7. Earthing bar
8. Busbars
9. Interlocking unit
10. Auxiliary contacts for open/close (3NO+3NC) and earth (4NO+4NC) position

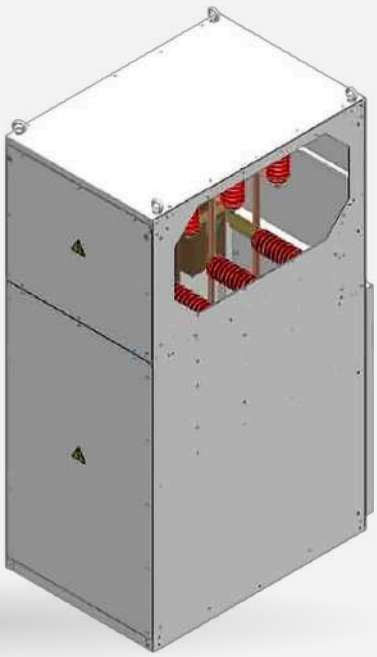
Optional equipments

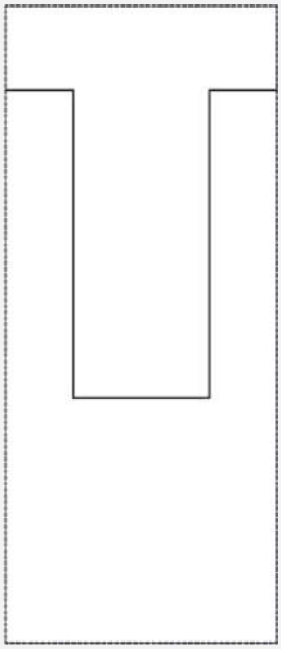
1. Earthing switch
2. Current transformers
3. Air density indication
4. Cable fault indication device
5. Metering

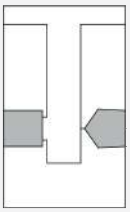
Technical data

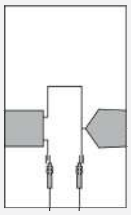
Rated voltage	[kV]	12	17,5	24
Rated current	[A]	630	630	630
Rated short-time withstand current	[kA]	20	20	20
Maximum rated duration of short circuit	[s]	1	1	1
Net Weight	kg	320	320	320
Gross Weight	kg	350	350	350
Width	mm	500	500	500
Depth	mm	1080	1080	1080
Height	mm	1900	1900	1900

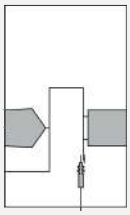


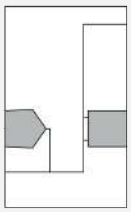












Standard equipment

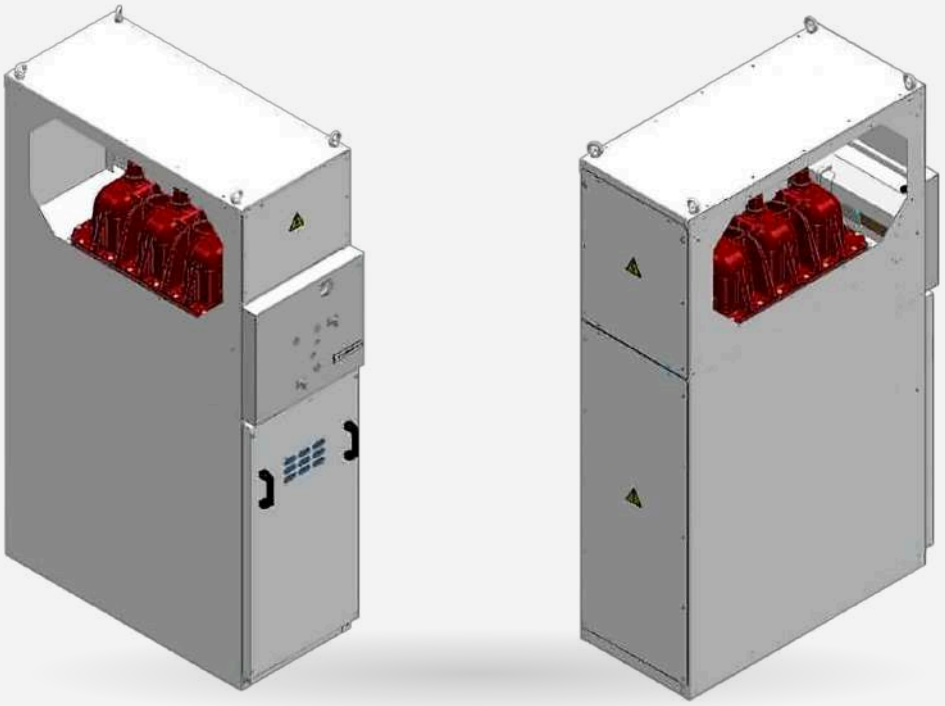
1. Bushings
2. Current transformers (toroidal or standard)
3. Voltage transformers
4. Busbars
5. Earthing bar
6. Ammeter, voltmeter
7. Heater
8. Interlocking unit
9. Voltage indicator device

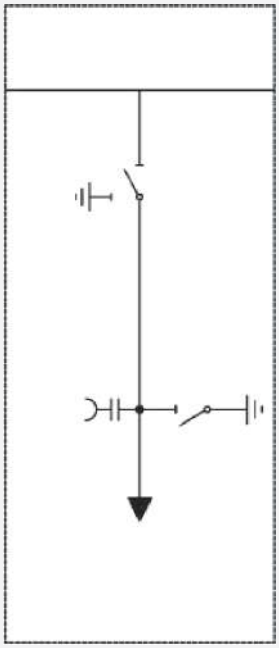
Optional equipments

1. Energy meter
2. MV fuses
3. Surge arresters

Technical data

Rated voltage	[kV]	12	17,5	24
Rated current	[A]	630	630	630
Rated short-time withstand current	[kA]	20	20	20
Maximum rated duration of short circuit	[s]	1	1	1
Net Weight	kg	325	325	325
Gross Weight	kg	355	355	355
Width	mm	750	750	750
Depth	mm	1080	1080	1080
Height	mm	1900	1900	1900





Standard equipment

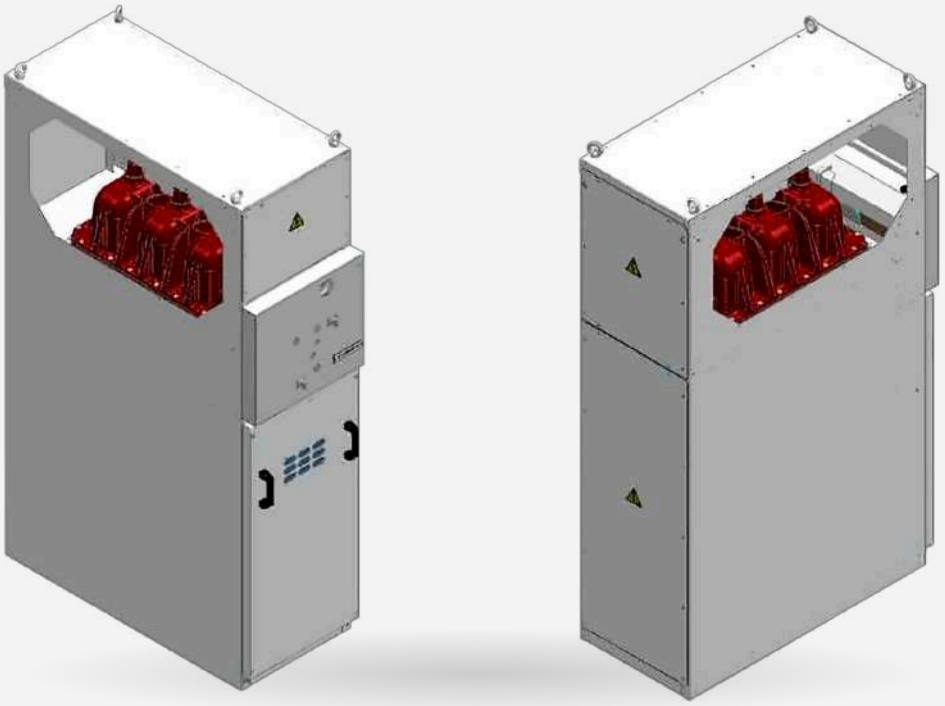
1. 3-position SF6-free load break switch (open – closed – earthed)
2. Operating mechanism with mechanical position indication
3. Voltage indicator device
4. Heater
5. Earthing bar
6. Busbars
7. Interlocking unit
8. Auxiliary contacts for open/close (3NO+3NC) and earth (4NO+4NC) position
9. Cable entry with cable support

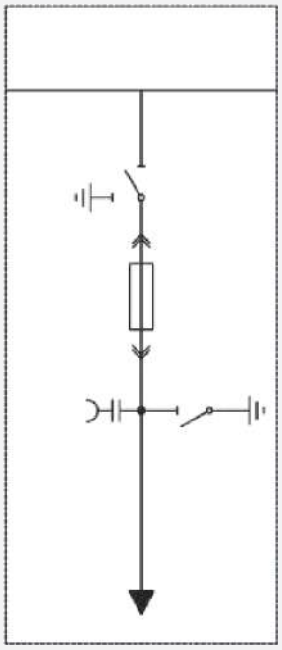
Optional equipments

1. Air density indication
2. Motor operation device
3. Cable fault indication device
4. Surge arresters
5. Current transformers

Technical data

Rated voltage	[kV]	12	17,5	24
Rated current	[A]	630	630	630
Rated short-time withstand current	[kA]	20	20	20
Maximum rated duration of short circuit	[s]	1	1	1
Net Weight	kg	240	240	240
Gross Weight	kg	270	270	270
Width	mm	500	500	500
Depth	mm	1080	1080	1080
Height	mm	1900	1900	1900





Standard equipment

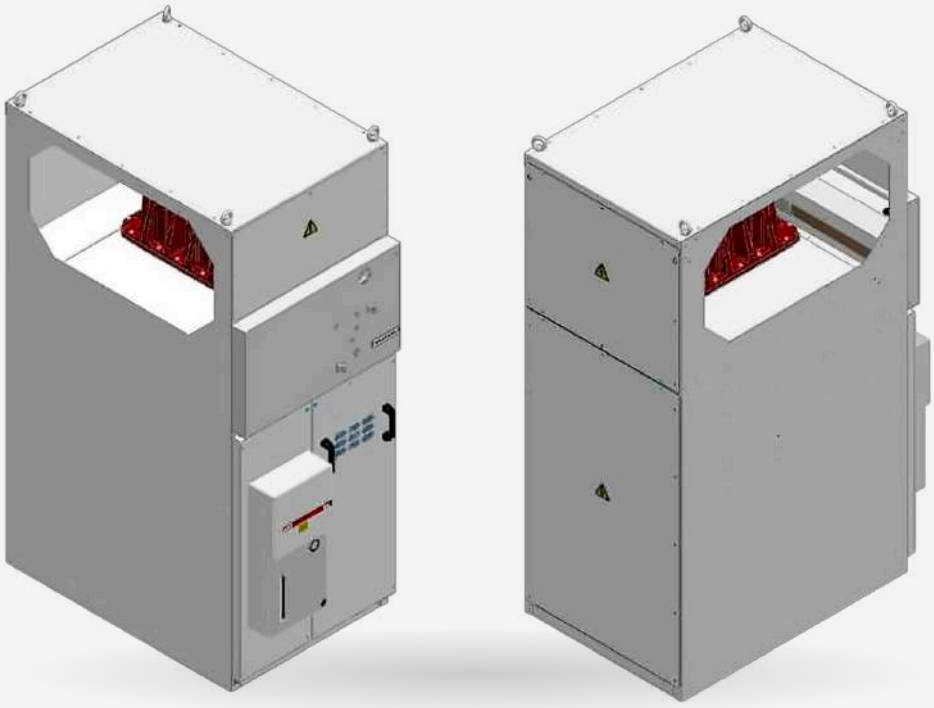
1. 3-position SF6-free load break switch (open – closed – earthed)
2. Operating mechanism with mechanical position indication
3. Earthing switch 2 kA
4. Set of fuses
5. Voltage indicator device
6. Heater
7. Earthing bar
8. Busbars
9. Interlocking unit
10. Auxiliary contacts for open/close (3NO+3NC) and earth (4NO+4NC) position
11. Cable entry with cable support

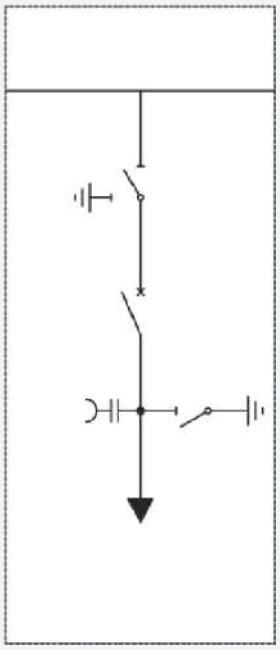
Optional equipments

1. Air density indication
2. Motor operation device
3. Cable fault indication device
4. Surge arresters
5. Current transformers

Technical data

Rated voltage	[kV]	12	17,5	24
Rated current	[A]	630	630	630
Rated short-time withstand current	[kA]	20	20	20
Maximum rated duration of short circuit	[s]	1	1	1
Net Weight	kg	275	275	275
Gross Weight	kg	305	305	305
Width	mm	500	500	500
Depth	mm	1080	1080	1080
Height	mm	1900	1900	1900





Standard equipment

1. 3-position SF6-free load break switch (open – closed – earthed)
2. Operating mechanism with mechanical position indication
3. Circuit breaker, vacuum type
4. Current transformers (toroidal or standard type)
5. Over current protection relay
6. Voltage indicator device
7. Heater
8. Earthing bar
9. Busbars
10. Interlocking unit
11. Auxiliary contacts for open/close (3NO+3NC) and earth (4NO+4NC) position
12. Cable entry with cable support

Optional equipments

1. Air density indication
2. Motor operation device
3. Cable fault indication device
4. Surge arresters
5. Voltage transformers

Technical data

Rated voltage	[kV]	12	17,5	24
Rated current	[A]	630	630	630
Rated short-time withstand current	[kA]	20	20	20
Maximum rated duration of short circuit	[s]	1	1	1
Net Weight	kg	430	430	430
Gross Weight	kg	460	460	460
Width	mm	750	750	750
Depth	mm	1080	1080	1080
Height	mm	1900	1900	1900

Functioning concept

The AIR-ON three-position disconnector in dry air is a new device used in medium voltage networks to ensure safe disconnection of electrical lines.

The integration of a vacuum bottle allows for controlled interruption of active loads, improving safety and reliability.

Thanks to the use of dry air as an insulating medium, the new AIR-ON disconnector has a GWP index of 0 and complies with the new European standard EU 2024/573.

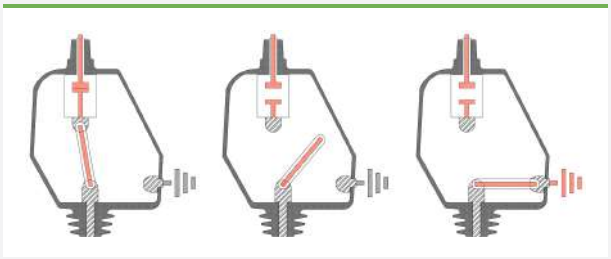
GWP 0 DRY AIR INSULATION



Better Technical Performance

Higher interrupting capacity:
- The interrupting module with a vacuum bottle allows for more efficient management of switching currents, improving performance compared to traditional disconnectors.
- Reduction of the electric arc effect, increasing the lifespan of components.

Optimal operation in challenging conditions:
- Dry air ensures excellent dielectric strength, even in environments with high humidity or extreme temperatures.
- Less chemical degradation compared to solutions with SF6 gas.



Technical data	Switch-disconnector AIR-ON	Internal earthing switch line side · ST1	External earthing switch transformer protection · ST2
Rated voltage U_r	24 kV	24 kV	24 kV
Lightning impulse withstand voltage U_p (to earth / isol. dist.)	125 / 145 kV	–	–
Power-frequency withstand voltage U_d, 1 min (to earth / isol. dist.)	50 / 60 kV	–	–
Rated frequency f_r	50 Hz	50 Hz	50 Hz
Rated continuous current I_r	630 A	–	–
Short-time withstand current I_k – t_k	20 kA – 1 s	20 kA – 1 s	1 kA – 1 s
Peak withstand current I_p	52 kA	52 kA	2.6 kA
Short-circuit making capacity	16 kA	16 / 20 kA	2.6 kA
Mainly active load / closed-loop breaking current	630 / 630 A	–	–
No-load cable / line breaking current	16 / 1.5 A	–	–
Mechanical operation class	M1 (1000 CO)	M0 (1000 CO)	M0 (1000 CO)
Electrical operation class	E3	E2 (16 kA) · E1 (20 kA)	E2
Degree of protection	IP30	–	–
Applied standard	IEC 62271-103	IEC 62271-102	IEC 62271-102

Note

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