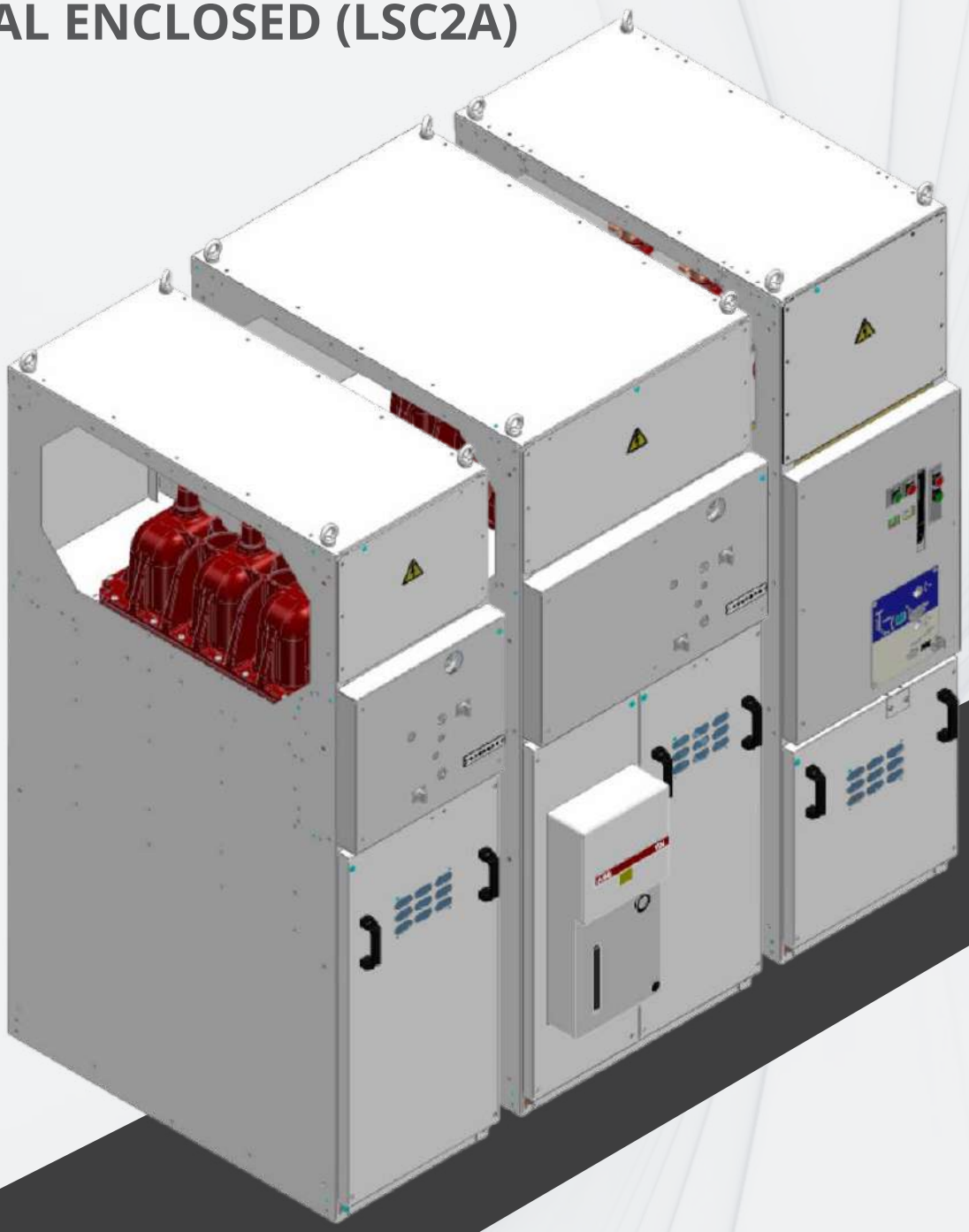
AIR-SEC

12 - 17,5 - 24 kV
630 A
16 - 20 kA

MEDIUM VOLTAGE SWITCHGEAR WITH AIR-ON SF6-FREE LBS AND ENERGY BREAKER METAL ENCLOSED (LSC2A)



according to IEC

About us

3B Energy can propose a huge number of Products related to Energy sector. We are active in the whole world of Power Transmission and Distribution. Medium Voltage switchgears, Medium Voltage switches, Low Voltage PC, Low Voltage MCCs with fix 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 for finding Solutions related to Energy sector. We can support the customer during engineering phase of the plant, during purchasing steps, for the supply and after-sales services. 3B Energy is a real "turnkey" Solution provider; Package Substations, Transfomer Substations, Mobile Cabinets; we can propose a complete solution set for letting the customer have one player only for his whole plant.

3B Energy can propose a complete and detailed list of Services which can cover each step of Engineering phase. Our technical staff is highly expert and professional and can support the customer starting from the base design of a single component till a complete apparatus for electrical application. We can design and project every component the customer may need: a single contact or a complete switching device, we can develop and engineer the technology for any product or application of Energy sector

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GENERAL

- AIR-SEC series Metal Enclosed units which are produced by our company,have been designed and tested to be used for all energy distribution systems till 24 kV
- Modular Metal Enclosed units appear as the optimal solution with their easiness of taking operation by means of their modular structure and with their module apposition characteristic for companies
- AIR-SEC series Metal enclosed unit are manufactured according to IEC Standards
- Optimal dimensions
- Long term technical solutions for various applications
- High level personal safety

APPLICATIONS

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

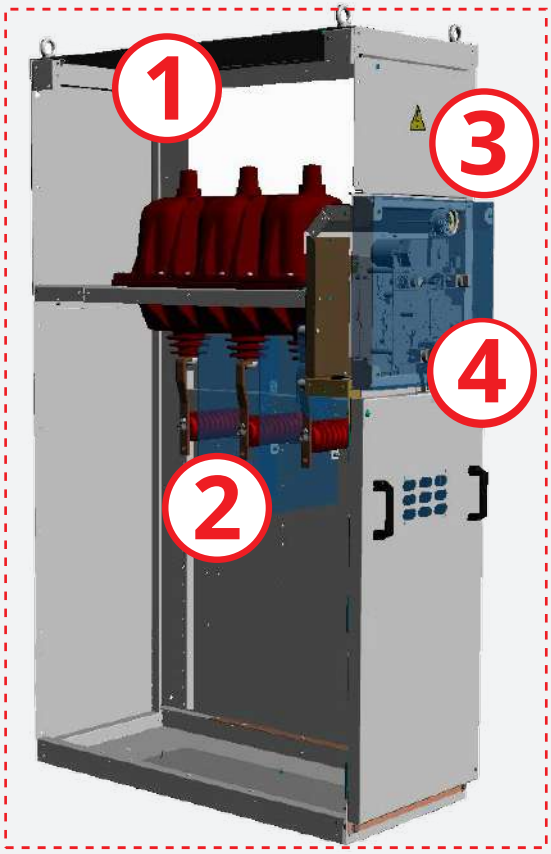
Enclosure of cubicle is 2 mm galvanized steel sheet. If desired al-zinc is also possible.
No welding during the assembling of the structure.

SAFETY

- There is a survelliance window on the front cover of the every cubicle to check inside the cubicle without open 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 contunity: LSC 2A
- Classification of the partitions: (Partition: Insulated or Metallic)
- Classification of arc proofing: IAC A (FL), IAC A (FLR) - Optional



1 Busbar compartment

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

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

2 Cable comparment

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 means that it is possible to open the covers without using any tools)
- Withstand to internal arc
- IP 3X protection degree

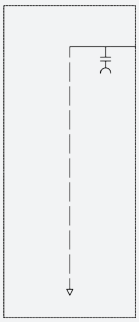
3 Low voltage compartment

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

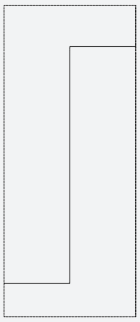
4 Operating mechanism compartment

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 same interlocking metal parts.
Circuit breakers has own mechanism, separately.
All metal parts of the operating mechanism are protected agains to corrosion

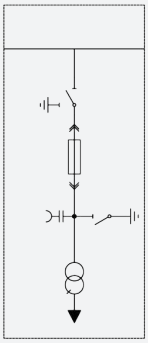
Type AIR-SEC K1- K2
Incoming Cable Unit



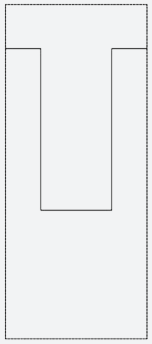
Type AIR-SEC BR
Bus Riser Unit



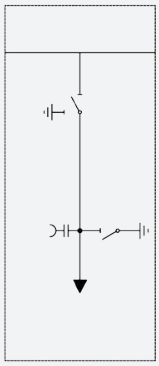
Type AIR-SEC ME
Metering Unit



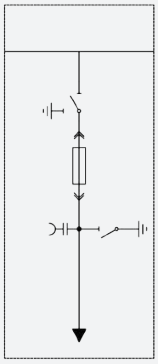
Type AIR-SEC M
Bus Riser with Metering Unit



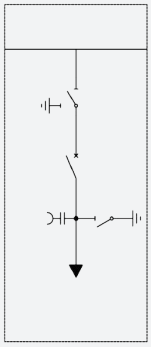
Type AIR-SEC L
Line Switch Unit



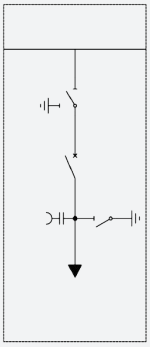
Type AIR-SEC T
Transformer Protection Unit



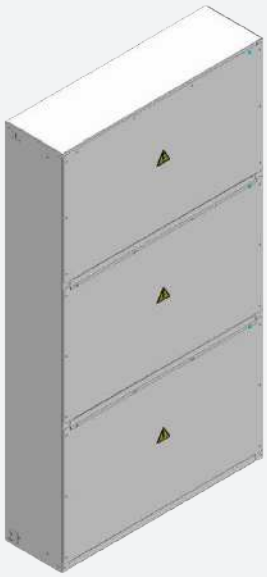
Type AIR-SEC CB
Circuit-Breaker Unit

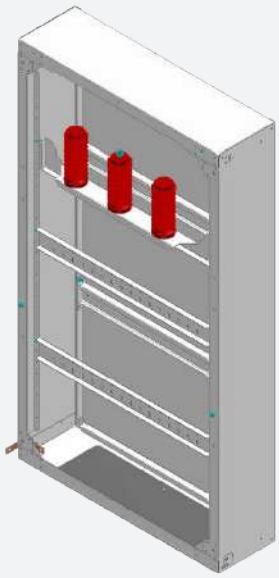


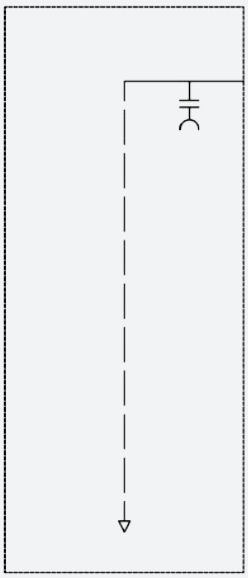
Type AIR-SEC EB
Energy Breaker Unit



Rated voltage	kV	12	17.5	24
Rated lighting 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		630	630	630
- Feeder / branch		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 temparature	° 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





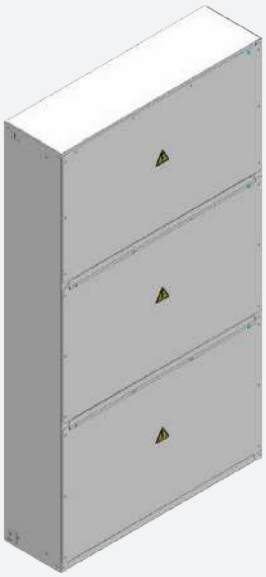


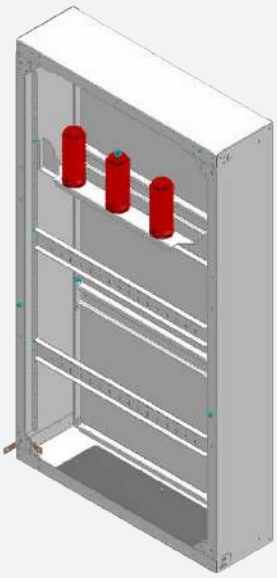
Standard equipment

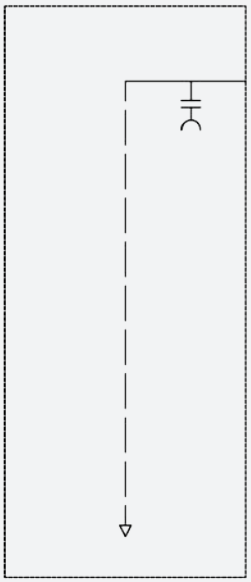
1. Voltage indicator device
2. Earthing bar

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





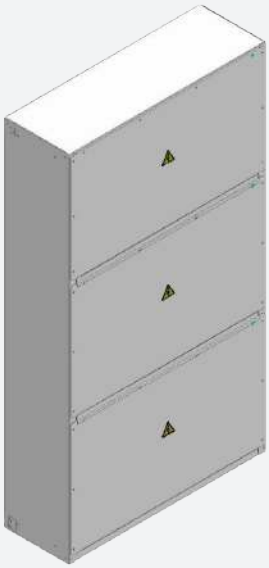


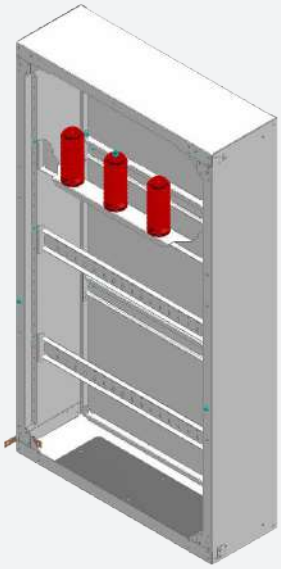
Standard equipment

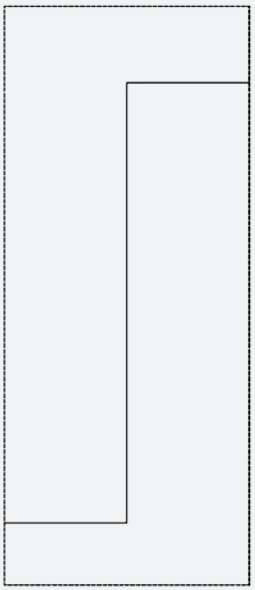
1. Voltage indicator device
2. Earthing bar

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





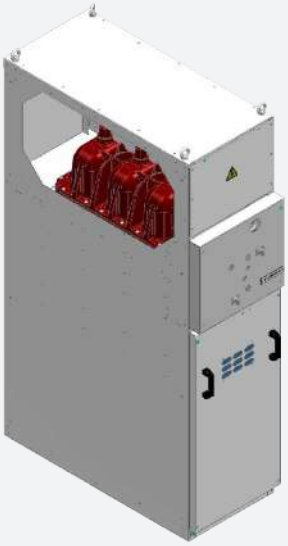


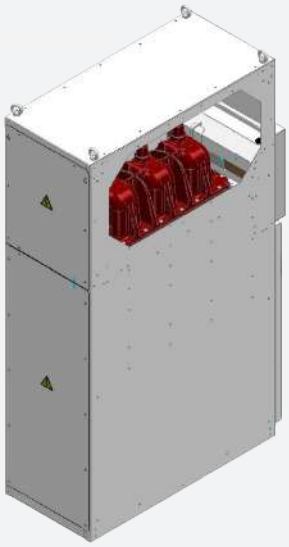
Standard equipment

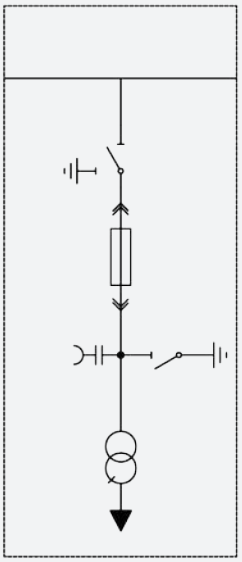
1. Voltage indicator device
2. Busbars
3. Earthing bar

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

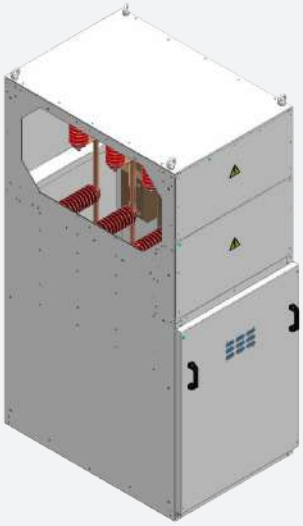
1. 3-Position SF6-free load break switch (open - closed - earthed)
2. Operating mechanism with mechanical position indication
3. Voltage transformers
4. Fuses
5. Voltage indicator device
6. Heater
7. Earthing bar
8. Busbars
9. Interlocking unit
10. Auxiliary contacts for open/close (3NO+3NC) and earth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

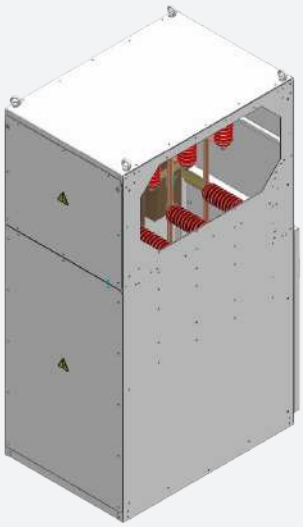
Optional equipments

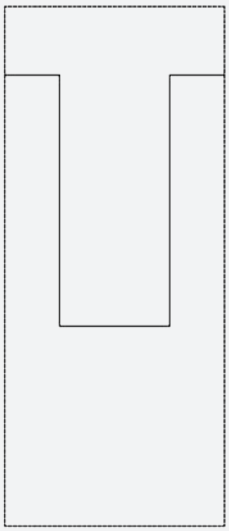
1. Earthing switch
2. Current transformers
3. Air density indication
4. Cable fault indication device
5. Metering

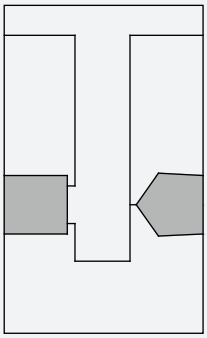
Technical data

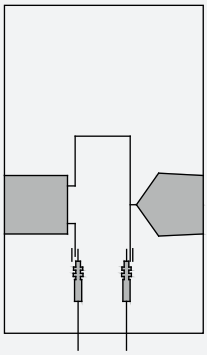
Rated voltage	[kV]	12	17,5	24
Rated current	[A]	630	630	630
Rated short-time withstand current	[kA]	20	20	20
Maximum rated duration of short circuit	[s]	1	1	1
Net Weight	kg	320	320	320
Gross Weight	kg	350	350	350
Width	mm	500	500	500
Depth	mm	1080	1080	1080
Height	mm	1900	1900	1900

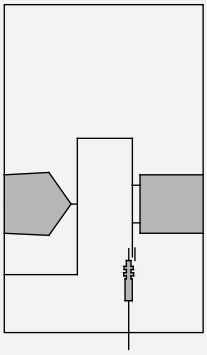


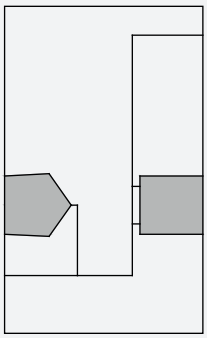












Standard equipment

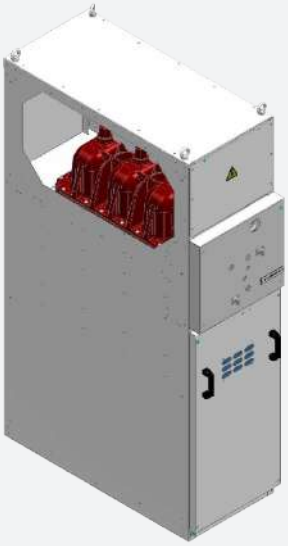
1. Bushings
2. Current Transformers (toroidal or standard)
3. Voltage transformers
4. Busbars
5. Earthing bar
6. Ammeter ,Voltmeter
7. Heater
8. Interlocking unit
9. Voltage indicator device

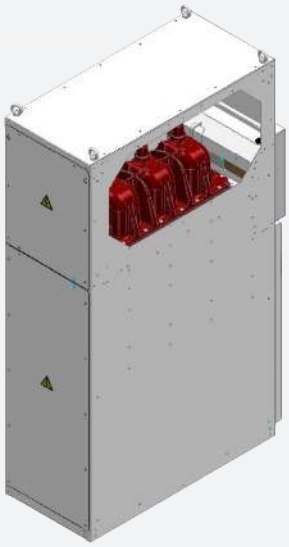
Optional equipments

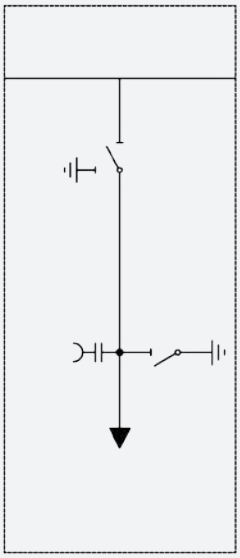
1. Energy meter
2. MV fuses
3. Surge arresters

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

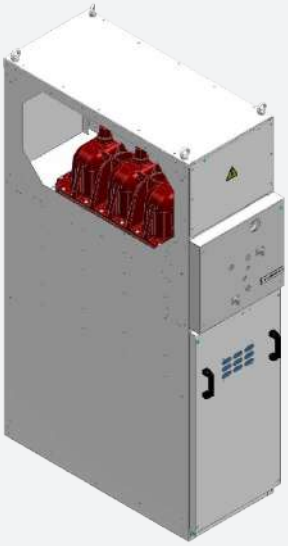
1. 3-Position SF6-free load break switch (open - closed - earthed)
2. Operating mechanism with mechanical position indication
3. Voltage indicator device
4. Heater
5. Earthing bar
6. Busbars
7. Interlocking unit
8. Auxiliary contacts for open/close (3NO+3NC) and earth (4NO+4NC) position
9. Cable entry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

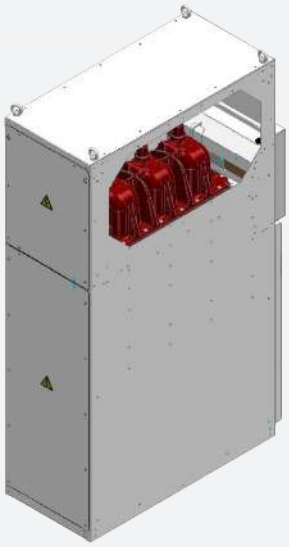
Optional equipments

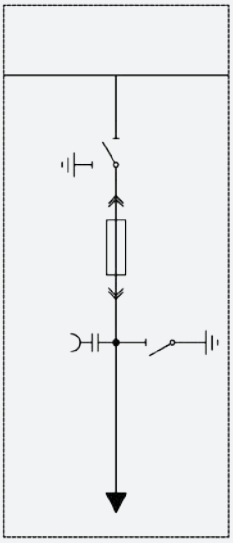
1. Air density indication
2. Motor operation device
3. Cable fault indication device
4. Surge arresters
5. Current transformers

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

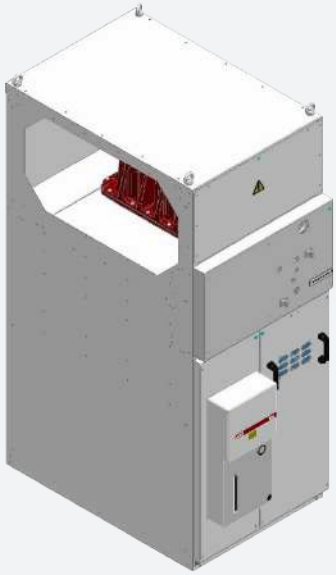
1. 3-Position SF6-free load break switch (open - closed - earthed)
2. Operating mechanism with mechanical position indication
3. Earthing Switch 2kA
4. Set of Fuses
5. Voltage indicator device
6. Heater
7. Earthing bar
8. Busbars
9. Interlocking unit
10. Auxiliary contacts for open/close (3NO+3NC) and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

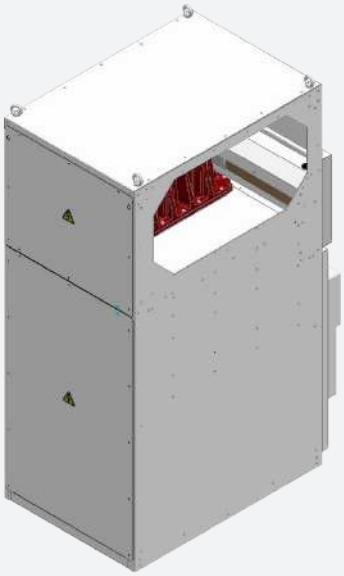
Optional equipments

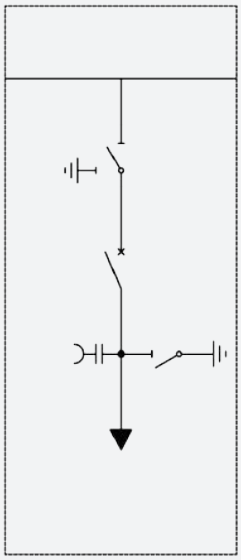
1. Air density indication
2. Motor operation device
3. Cable fault indication device
4. Surge arresters
5. Current transformers

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

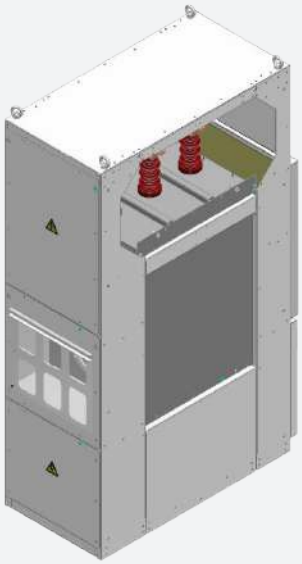
1. 3-Position SF6-free load break switch (open - closed - earthed)
2. Operating mechanism with mechanical position indication
3. Circuit breaker, vacuum type
4. Current transformers (toroidal or standard type)
5. Over current protection relay
6. Voltage indicator device
7. Heater
8. Earthing bar
9. Busbars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

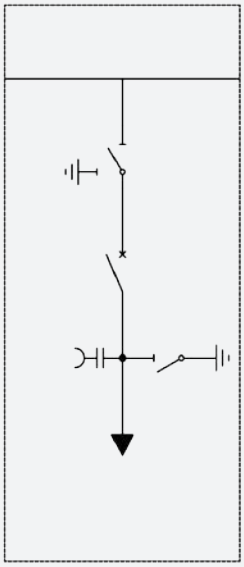
Optional equipments

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





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	340	340	340
Gross Weight	kg	370	370	370
Width	mm	550	550	550
Depth	mm	1080	1080	1080
Height	mm	1900	1900	1900

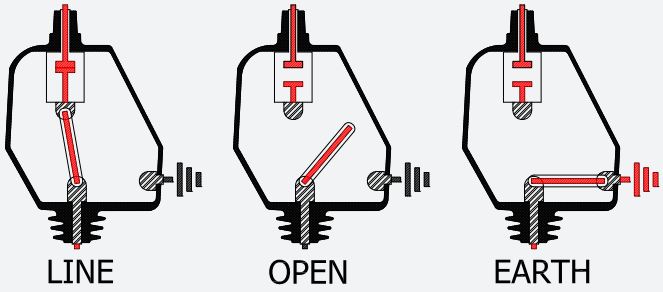
Functioning concept

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.

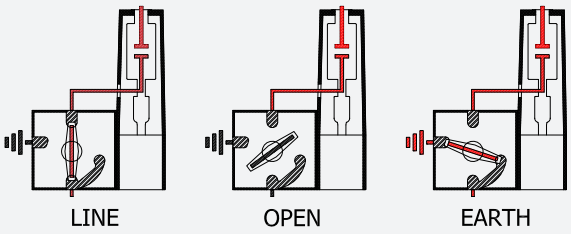
Better Technical Performance

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	Load Break Switch AIR-ON	Earthing Switch
Rated voltage	24 kV	24 kV
Rated current	630 A	
Rated short circuit withstand current	20 kA - 1 sec	20 kA - 1 sec
Electrical endurance	E3	E1, E2
Mechanical endurance	M1	M0
Applied standard	IEC 62271-103 1000 Operations	IEC 62271 - 102 1000 Operations



Medium voltage multifunction breaker up to 24kV

A solution that redefines efficiency, safety, and reliability standards for electrical distribution networks.
The Medium Voltage Multifunction Breaker represents a significant advancement in network management by combining innovation, safety, and efficiency into a single compact solution.

Technological innovation

Our new device integrates three essential functions for electrical network management into a single unit:

- Vacuum circuit breaker: ensures efficient circuit interruption using advanced technology.
- Disconnect switch: provides safe isolation in compliance with regulations.
- Earth switch: ensures reliable and secure groundin.
- Integrated interlocking system: allows safe and secure operation.

This configuration reduces the footprint, simplifies maintenance operations, and enhances overall system safety.

Key Advantages

- Space optimization: fewer installed components and a reduced overall switchgear volume.
- Enhanced reliability: fewer electrical and mechanical connections, minimizing failure risks.
- Ease of installation and maintenance: simplified operational management by integrating three functions in a single device.
- Increased safety: fewer critical points and improved control over disconnection and grounding operations.

Technical Data	Load Break Switch + VCB ENERGY BREAKER	Earthing Switch
Rated voltage	24 kV	24 kV
Rated current	630 A	
Rated short circuit withstand current	20 kA - 1 sec	20 kA - 1 sec
Electrical endurance	E2, C2, S2	E2
Mechanical endurance	10000 - M2	M2
Applied standard	IEC 62271-103 10000 Operations	IEC 62271 - 102 1000 Operations

Note

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