ELTECHNIKA
MEDIUM VOLTAGE EQUIPMENT

VOLGA

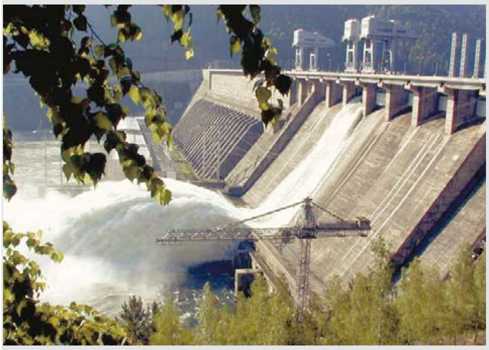
Medium-voltage air-insulated Switchgear, up to 24 kV

Catalogue 2019

CONTENTS

GENERAL INFORMATION

STANDARTS COMPLIENCE



The switchgear and main apparatus contained in it comply with the following Standards:

- IEC 62271-1 for general purposes
- IEC 62271-200 for the switchgear
- IEC 62271-102 for the earthing switch
- IEC 62271-100 for the circuit-breakers
- IEC 60529 for degree of protections

PROTECTION

RELIABILITY, SAFETY

For active protection against an internal arc, devices consisting of various types of sensors can be installed in the various compartments, which detect the immediate outburst of the fault and carry out selective tripping of the circuit-breakers.

The fault limiting systems are based on sensors which use the pressure or light generated by the arc fault as trigger for fault disconnection.

ARC PROTECTION

Switchgear can optionally befitted with a fast and selective arc flash protection. It offers a three-channel arcfault protection system for arc flash supervision of the circuit breaker, cable and busbar compartment of switchgear panels

Flaps protection micro-switches positioned on the top of the switchgear near the gas exhaust flaps of the three power compartments (busbars, circuit-breaker and cables).

The shock wave makes the flaps open and operate the micro-switches connected to the shunt opening release of the circuit-breaker.

INTERLOCKS

The safety mechanical interlocks are standard ones, please see the dedicated table on 19 page.

They are set out by the IEC standards and are therefore necessary to guarantee the correct operation sequence.

LOCKING MAGNETS

The locking magnets enable automatic interlocking logics without human intervention. This magnet can also be applied to the earthing switch of busbar applications.

The magnets operate with active logics and therefore the lack of auxiliary voltage leaves the interlocking system active in safety condition.

The switchgear can be fitted with instrument transformers or sensors for current and voltage measurement and protection and any type of protection and control unit.

TECHNICAL DATA

ELECTRICAL CHARACTERISTICS. MODIFICATIONS

ELECTRICAL CHARACTERISTICS

Electrical characteristics	Value	
Rated voltage [kV]	12	24
Rated power frequency withstand voltage [kV 1min]	42	65
Circuit-breaker rated current [A]	630; 800; 1000; 1250; 1600; 2000; 2500; 3150, 4000*	630; 1000; 1250; 1600; 2000; 2500; 3150
Rated short time withstand current [kA 3s]	20; 25; 31,5	
Rated supply voltage of auxiliary control circuits [V]:		
– DC	110; 220	
– AC	100; 220	
– light circuit	24	
Duration, years	30	
Degree of protection	IP3X; IP4X	

* with forced vetilation

MODIFICATIONS

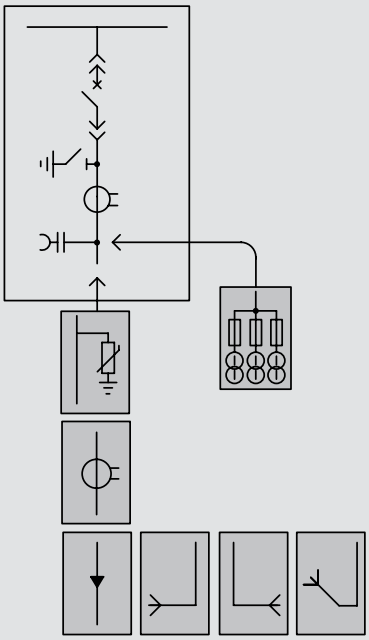
Function	Incoming/ Outgoing Feeder	Bus-tie	Riser with disconnector	Measuruents	Auxiliary transformer	Busbar Bridge	Riser
Designation	**IF 1, 2, 3**	**BT 1, 2, 3**	**RD 1, 2, 3**	**M**	**AT**	**BB 1, 2, 3**	**R 1, 2, 3**
Withdrawable part	Vacuum circuit-breaker	Vacuum circuit-breaker	Disconnector link	Voltage transformer	Fuse	–	–

	Width 650 mm; 750 mm		Width 800 mm		Width1000 mm	
	12 kV, 630–1250 A		12 kV, 1600–2000 A 24 kV, 630–1600 A		10 kV, 2500–4000 A 20 kV, 2000–3150 A	

TECHNICAL DATA

PRODUCT RANGE

INCOMING/OUTGOING FEEDER



Designation		IF 1			IF 2			IF 3			IF 2			IF 3		
Rated voltage, kV		12									24					
Rated current, kA		20	25	31,5	20	25	31,5	20	25	31,5	20	25	31,5	20	25	31,5
Circuit-breaker	I_r, A															
VF12	630	•	•	•												
	800	•	•	•												
	1250	•	•	•												
	1600				•	•	•									
	2000				•	•	•									
	2500							•	•	•						
	3150							•	•	•						
	4000							•	•	•						
VF24	630										•	•	•			
	1000										•	•	•			
	1250										•	•	•			
	1600										•	•	•			
	2000													•	•	•
	2500													•	•	•
	3150													•	•	•
SION	800	•	•	•												
	1250	•	•	•												
	2000					•	•									
	2500								•	•						
EVOLIS	630		•	•												
	1250		•	•												
	1600					•	•									
	2500								•	•						

Options


Surge arrester


Zero sequence core phase transformer


Cable connection


Input from the left side


Input from the right side


Input from the rear

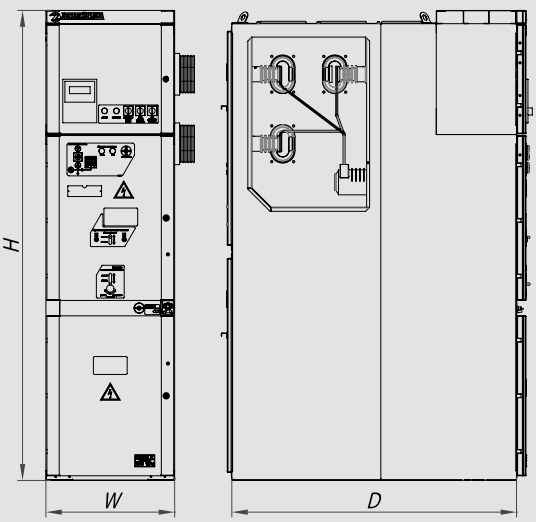

Voltage transformer

Dimensions, mm

	IF 1	IF 2		IF 3	
U_r	12	12	24	12	24
H	2370	2370		2370	
W	650, 750	800		1000	
D	1430	1430	1700	1430	1700

Weight, kg

650	800	1000	900	1200

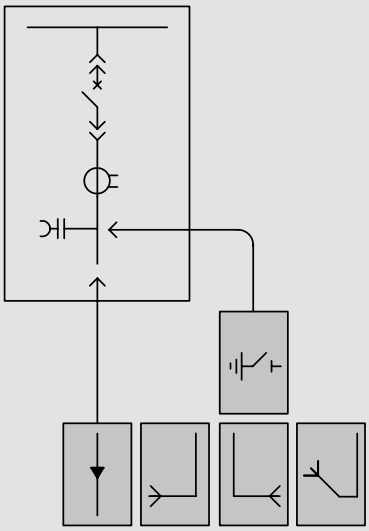


TECHNICAL DATA

PRODUCT RANGE

BUS-TIE (BT)

Designation		BC 1			BC 2			BC 3			BC 2			BC 3		
Rated voltage, kV		12									24					
Rated current, kA		20	25	31,5	20	25	31,5	20	25	31,5	20	25	31,5	20	25	31,5
Circuit-breaker	I_r, A															
VF12	630	•	•	•												
	800	•	•	•												
	1250	•	•	•												
	1600				•	•	•									
	2000				•	•	•									
	2500							•	•	•						
	3150							•	•	•						
	4000							•	•	•						
VF24	630										•	•	•			
	1000										•	•	•			
	1250										•	•	•			
	1600										•	•	•			
	2000													•	•	•
	2500													•	•	•
	3150													•	•	•
SION	800	•	•	•												
	1250	•	•	•												
	2000					•	•									
	2500								•	•						
EVOLIS	630		•	•												
	1250		•	•												
	1600					•	•									
	2500								•	•						



Options

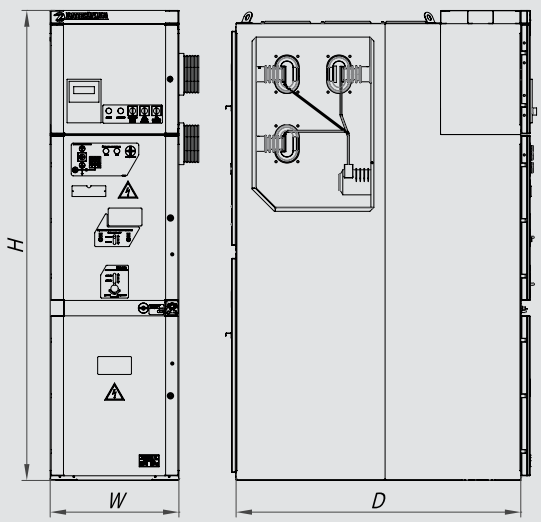

Earthing switch


Cable connection


Input from the left side


Input from the right side


Input from the rear



Dimensions, mm

	BC 1	BC 2		BC 3	
U_r	12	12	24	12	24
H	2370	2370		2370	
W	650, 750	800		1000	
D	1430	1430	1700	1430	1700

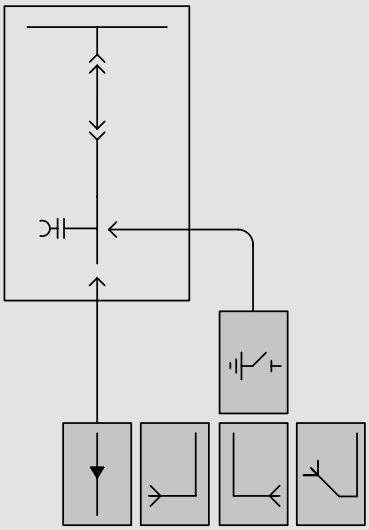
Weight, kg

650	800	1000	900	1200

TECHNICAL DATA

PRODUCT

RISER WITH DISCONNECTOR (RD)



Designation	RD 1	RD 2	RD 3	RD 2	RD 3
Rated voltage, kV		12		24	
Rated short-time withstand current (3 sec), kA			31,5		
Rated busbar current, A:					
1250	•			•	
1600		•		•	
2000		•			•
2500			•		•
3150			•		•
4000			•		

Options

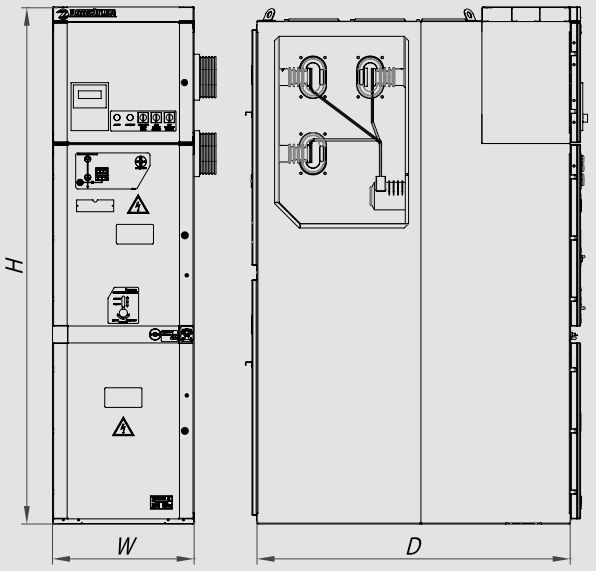

Earthing switch


Cable connection


Input from the left side


Input from the right side


Input from the rear



Dimensions, mm

	RD 1	RD 2		RD 3	
U_r	12	12	24	12	24
H	2370	2370		2370	
W	650, 750	800		1000	
D	1430	1430	1700	1430	1700

Weight, kg

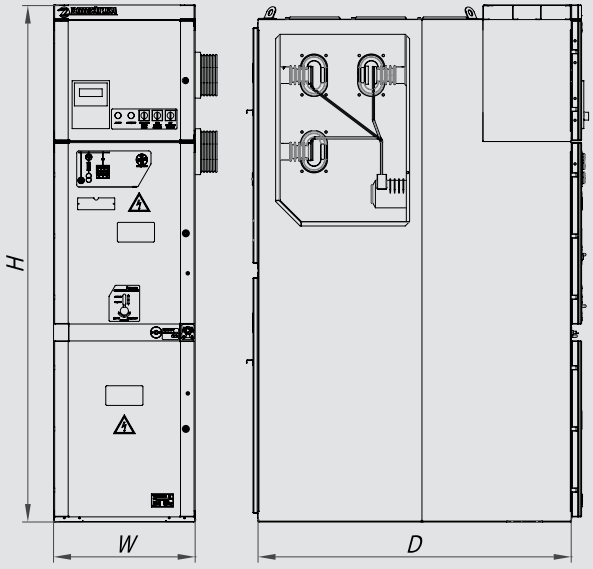
550	700	900	850	1100

TECHNICAL DATA

PRODUCT

MEASUREMENTS

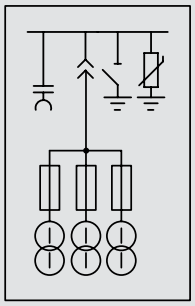
Designation		M	M
Rated voltage, kV		12	24
Rated short-time withstand current (3 sec), kA		31,5	
Rated busbar current, A:			
	1600	•	•
	2500	•	•
	3150	•	•
	4000	•	



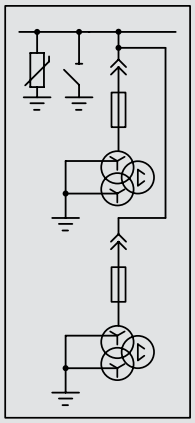
Dimensions, mm

	M	
U_r	12	24
H	2370	2370
W	650, 750	800
D	1430	1700
Weight, kg		
	650	900

12 kV



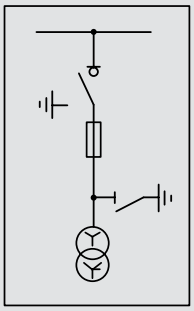
Combined solution for 12 and 24 kV



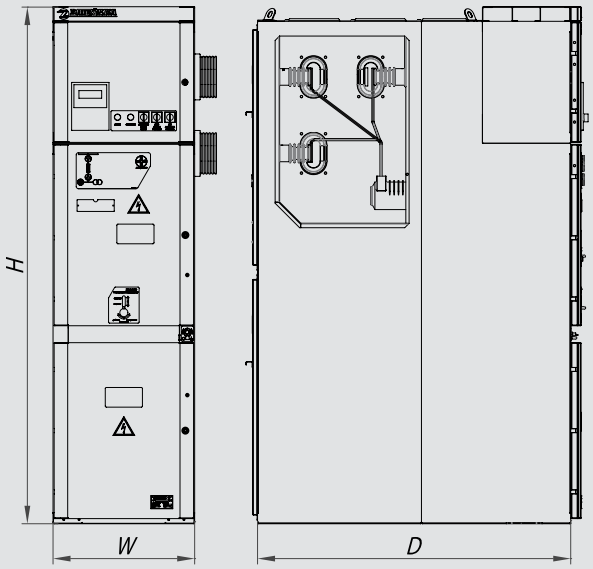
TECHNICAL DATA

PRODUCT

AUXILIARY TRANSFORMER



Designation		AT	AT
Rated voltage, kV		12	24
Rated short-time withstand current (3 sec), kA		31,5	
Rated busbar current, A:			
	1600	•	•
	2500	•	•
	3150	•	•
	4000	•	
Transformer power, kVA		25; 40	40



Dimensions, mm

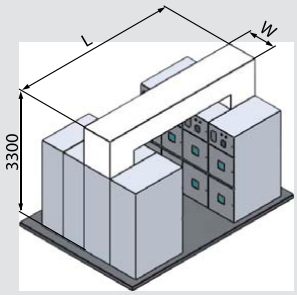
	AT	
U_r	12	24
H	2370	2370
W	650, 750, 800, 1000	1000
D	1430	1700
Weight, kg		
	800	1200

TECHNICAL DATA

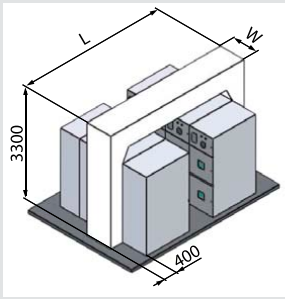
PRODUCT

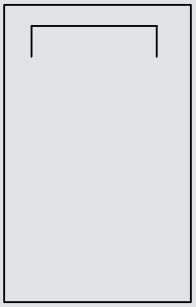
BUSBAR BRIDGE

Single section busbar bridge



Double section busbar bridge

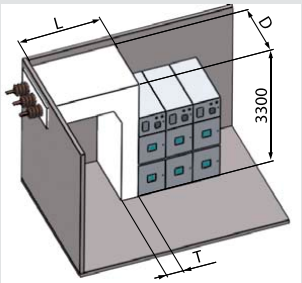




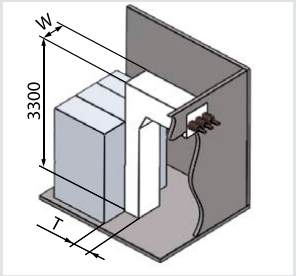
Designation	BB 1	BB 2	BB 3	BB 2	BB 3
Rated voltage, kV		12		24	
Rated busbar current, A:					
1250	•			•	
1600		•		•	
2000		•			•
2500			•		•
3150			•		•
4000			•		
Dimensions, mm:					
W		800	1000	800	1000
L (determined by the project)	≥ 5200 (by 100)				

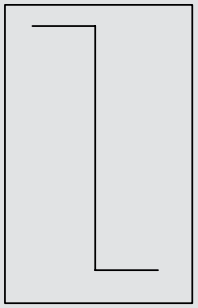
RISER (R)

Riser (busbar input from the lateral side)



Riser (busbar input from the rear side)





Designation	R 1	R 2	R 3	R 2	R 3
Rated voltage, kV		12		24	
Rated busbar current, A:					
1250	•			•	
1600		•		•	
2000		•			•
2500			•		•
3150			•		•
4000			•		
Dimensions, mm					
W		800	1000	800	1000
D		1430	1430	1730	1730
T		400	400	500	500
L (determined by the project)	by 50				

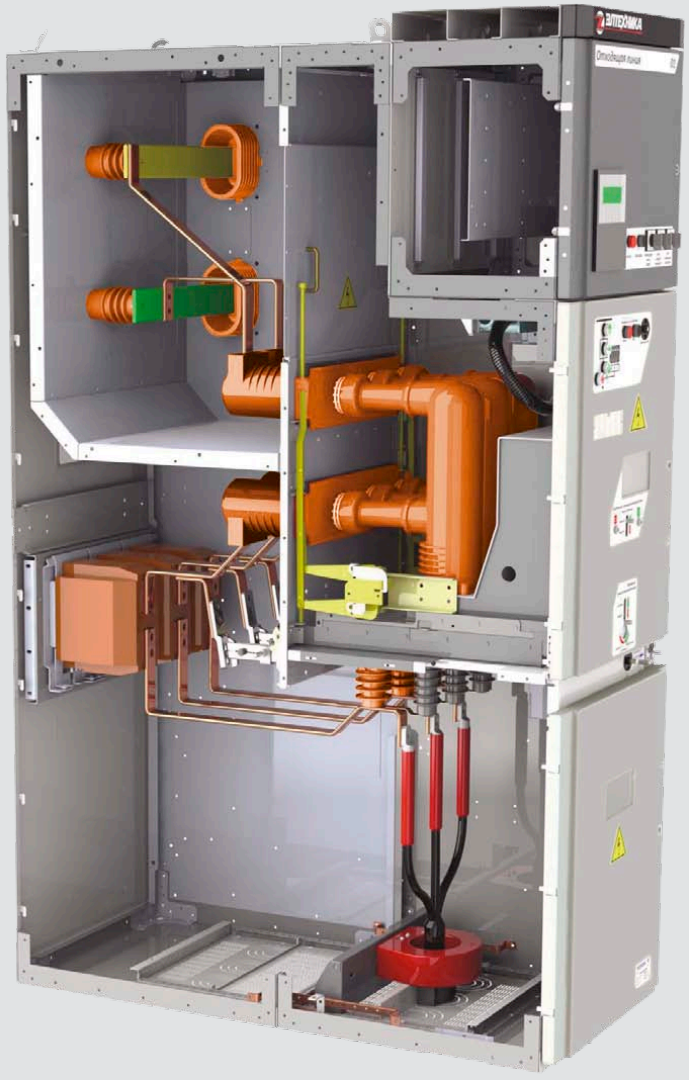
DESIGN FEATURES

COMPARTMENTS

Each switchgear unit consists of three power compartments: circuit-breaker, busbars and cables; please refer to figure on next page. Each unit is fitted with a low voltage compartment, where all the auxiliary instruments are housed.

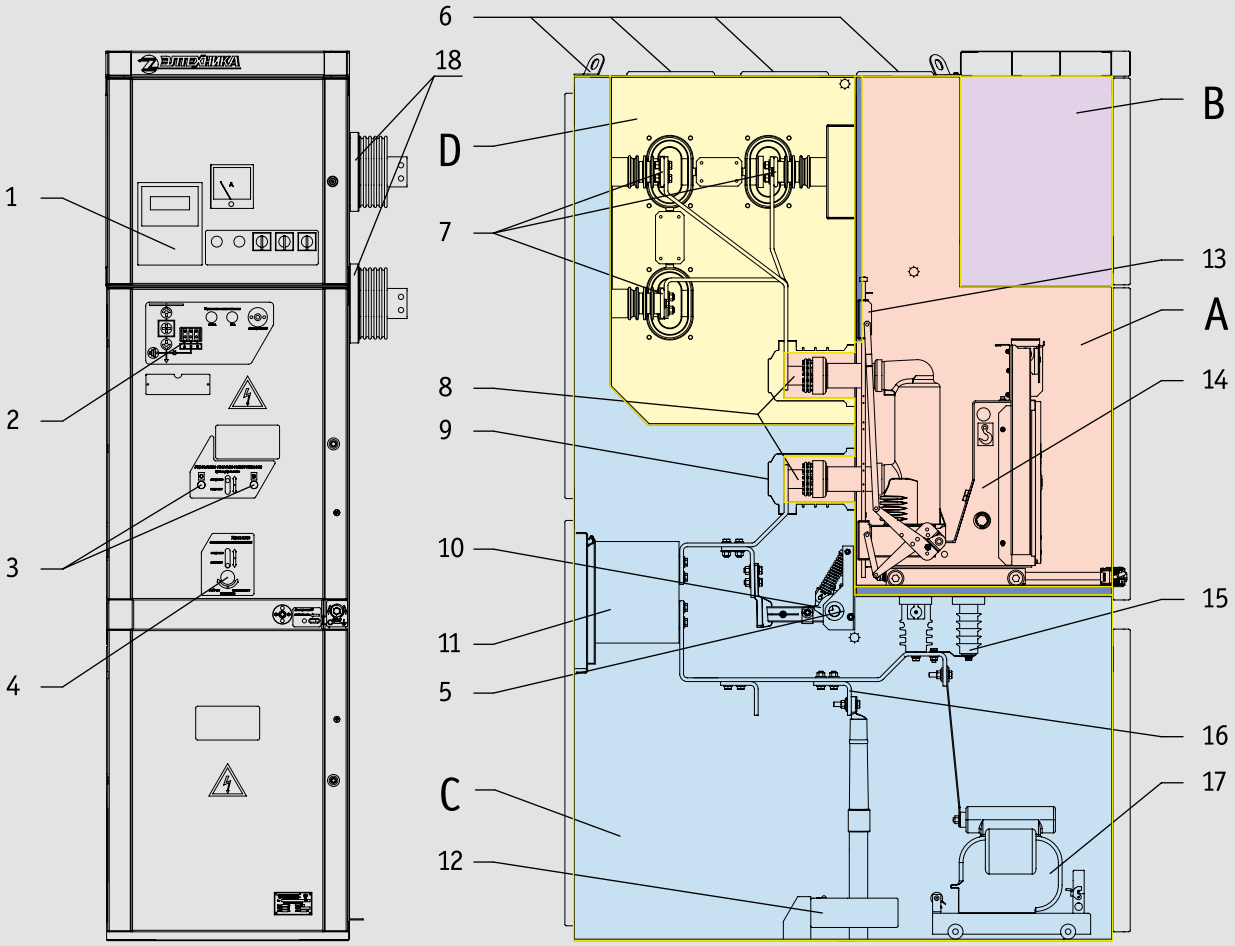
Arc-proof switchgear is normally provided with a duct for evacuation of the gases produced by an arc; different types of gas ducts are available.

All the compartments are accessible from the front and maintenance operations can correctly carried out with the switchgear installed up against a wall. The compartments are segregated from each other by metallic partitions.



DESIGN FEATURES

COMPARTMENTS



A	Apparatus compartment	C	Cable compartment
B	Low-voltage compartment	D	Busbar compartment

1 – protection relay
2 – voltage presence indicator
3 – actuating opening for closing/opening the circuit-breaker
4 – actuating opening for racking the withdrawable part
5 – mechanical position indicator for earthing switch
6 – flaps
7 – busbar
8 – contact system
9 – bushing-type insulator
10 – earthing switch
11 – current transformer
12 – zero sequence phase current transformer
13 – shutter mechanism
14 – vacuum circuit-breaker
15 – surge arrester
16 – cable connection
17 – voltage transformer
18 – bushing insulator

DESIGN

APPARATUS COMPARTMENT

VOLGA switchgear can be fitted with the widest range of apparatus available on the market today, and of these the vacuum circuit-breaker now occupies a position of prime importance in all sectors of primary distribution.

The insulating bushings in the circuit-breaker compartment contain the contacts for connection of the circuit-breaker with the busbar compartment and cable compartment respectively.

The insulating bushings are of single-pole type and are made of epoxy resin.

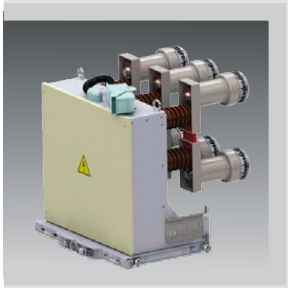
The shutters are metallic (up to 1600 A) or polymeric material (up to 4000 A) and are activated automatically during movement of the circuit-breaker from the racked-out position to the operation position and vice versa.

The device locks the shutters in the closed position when the apparatus is removed from the compartment. The operator cannot open the shutters manually. The shutters can only be operated by the apparatus truck or the service truck. The door is equipped with a multi-point lock.

Structural elements that obstruct the view are not shown

DESIGN

WITHDRAWABLE PARTS



APPARATUS

The range of apparatus available for VOLGA switchgear is the most complete on the market, including:

- Withdrawable vacuum circuit-breakers with mechanical or magnetic actuator
- Withdrawable voltage transformer
- Withdrawable fuses
- Withdrawable disconnector link
- Fixed version of switch-disconnectors

This makes it possible to offer a single switchgear-user interface, with the same operational and maintenance procedures.

DESIGN

LOW VOLTAGE COMPARTMENT

The low voltage compartment is designed based on convenience and efficiency requirements.

Switchgear can be fitted with any type of protection and control unit.

Structural elements that obstruct the view are not shown

DESIGN

CABLE COMPARTMENT

Structural elements that obstruct the view are not shown

CABLE CONNECTIONS

The cable compartment contains the branch system for connection of the power cables to the lower contacts of the circuit-breaker. The feeder connections are made of electrolytic copper and they are flat busbars for the whole range of currents.

CABLES

Single and three-core cables up to a maximum of twelve per phase can be used depending on the rated voltage, the unit dimensions and the cable cross section. The switchgear can be back to wall installed as the cables are easily accessible from the front.

DESIGN

BUSBAR COMPARTMENT

MAIN BUSBARS

The busbar compartment contains the main busbar system connected to the upper isolating contacts of the circuit-breaker by means of branch connections. The main busbars are made of electrolytic copper.

Every busbar compartment is divided out of other in connected swetchgears by metal partition with bushings.

Structural elements that obstruct the view are not shown

DESIGN

INTERLOCKS

LIST OF INTERLOCKS AND THEIR DESCRIPTION

	Standard safety interlocks (mandatory)	
	Description	**Condition to be met**
1	Apparatus racking-in/out	Apparatus in open position
2	Apparatus closing	Defined truck position
3	Earthing switch closing	Truck in test position
4	Apparatus racking-in	Earthing switch in open position
5	Apparatus compartment door opening	Truck in test position
6	Apparatus racking-in	Apparatus compartment door closed
7	Feeder compartment door opening	Earthing switch in ON position
8	Earthing switch opening	Cable compartment door closed

	Locking magnets (on request)	
	Description	**Condition to be met**
1	Apparatus racking-in/out	Magnet energized
2	Earthing switch ON/OFF	Magnet energized

COMPONENTS

VACUUM CIRCUIT-BREAKER

APPARATUS RANGE

VOLGA switchgear can be fitted with the widest range of apparatus available on the market today, and of these the vacuum circuitbreaker now occupies a position of prime importance in all sectors of primary distribution.

Vacuum circuit-breakers cover the whole range of switchgear parameters and therefore the whole range of applications.

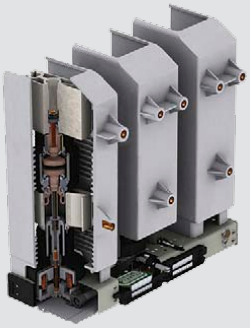
Many years of experience gained in developing and using vacuum interrupters is today reflected in the range of Eltechnika circuit-breakers, which stand out for their exceptional electrical and mechanical characteristics, extremely long life, low maintenance, compactness and the use of highly innovative construction techniques.

VF12

VF24

EVOLIS

SION



ISM15_SHELL

ISM15_LD

COMPONENTS

VACUUM CIRCUIT-BREAKER

TECHNICAL DATA

Vacuum circuit-breakers cover the whole range of switchgear parameters and therefore the whole range of applications.

Many years of experience gained in developing and using vacuum interrupters is today reflected in the range of VF-series circuit-breakers, which stand out for their exceptional electrical and mechanical characteristics, extremely long life, low maintenance, compactness and the use of highly innovative construction techniques.

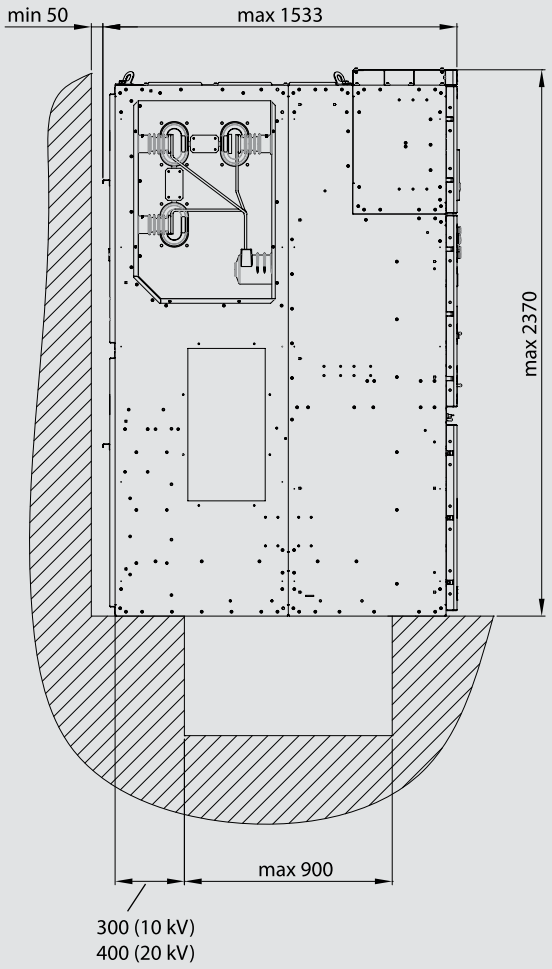
Parameter		Value	
Rated voltage, kV		12	24
Rated normal current, A		630; 800; 1000; 1250; 1600; 2000; 2500; 3150; 4000*	630; 1000; 1250; 1600; 2000; 2500; 3150
Rated short-time withstand current, kA (3 s)		20; 25; 31,5	20; 25; 31,5
– Making capacity, kA		51; 63; 81	51; 63; 81
– rated short-circuit breaking current symmetrical, kA		20; 25; 31,5	20; 25; 31,5
Rated power frequency withstand voltage [kV 1min]		42	65
Impuse withstand voltage 1,2/50 msec		75	125
Rated supply voltage of auxiliary control circuits, V (AC/DC)		220; 110	220; 110
Mechanical endurance	– up to 1600 A	30000	10000
	– up to 3150\4000* A	10000	10000

* With forced ventilation

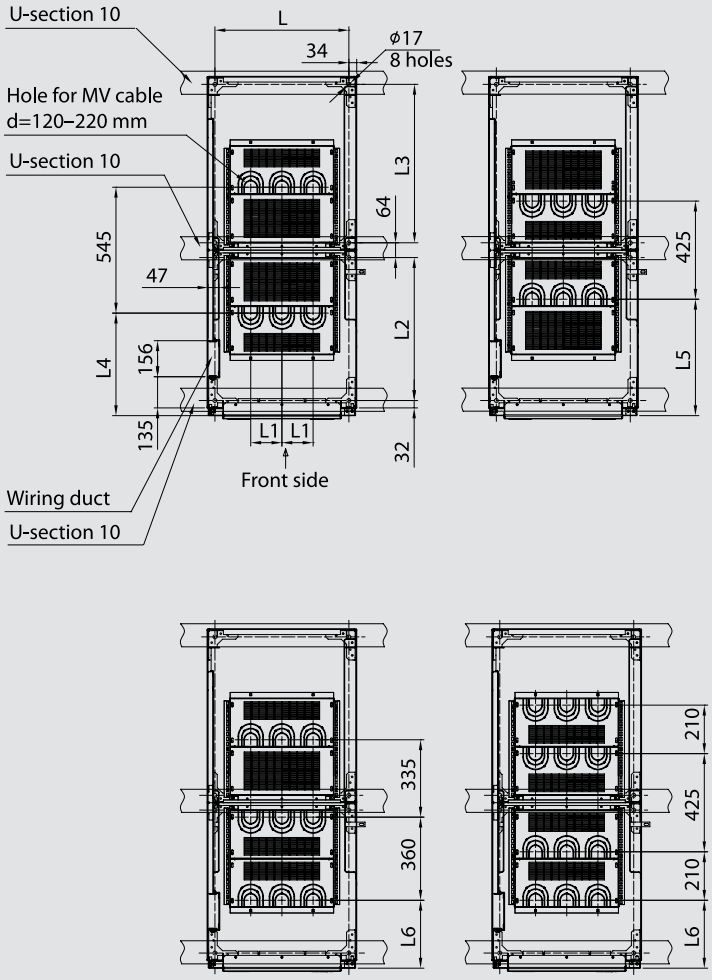
INSTALLATION

OVERAL DIMENSIONS

SIDE VIEW



BOTTOM OF INCOMING/OUTGOING FEADER



Rated voltage, kV	Rated current, A	Dimensions, mm							
		B	L	L1	L2	L3	L4	L5	L6
12	≤ 1250	650, 750	580, 680	135	619	686	444	504	294
	1600; 2000	800	730	210					
	2500; 3150	1000	930	240					
24	≤ 1600	800	730	210	782	790	574	634	423
	2000; 2500; 3150	1000	930	240					

Catalogue 2019

VOLGA Medium-voltage air-insulated Switchgear, up to 24 kV

ELTECHNIKA, JSC

19 Gruzovoy proyezd,
Saint Petersburg, Russia
Tel.: +7 812 329-97-97
Fax: +7 812 329-97-92
E-mail: info@elteh.ru

www.elteh.ru

Sales department:

Tel.: (812) 329-33-97
E-mail: sales@elteh.ru