

SFA-AIS

AIR INSULATED
METAL ENCLOSED
SWITCHGEARS

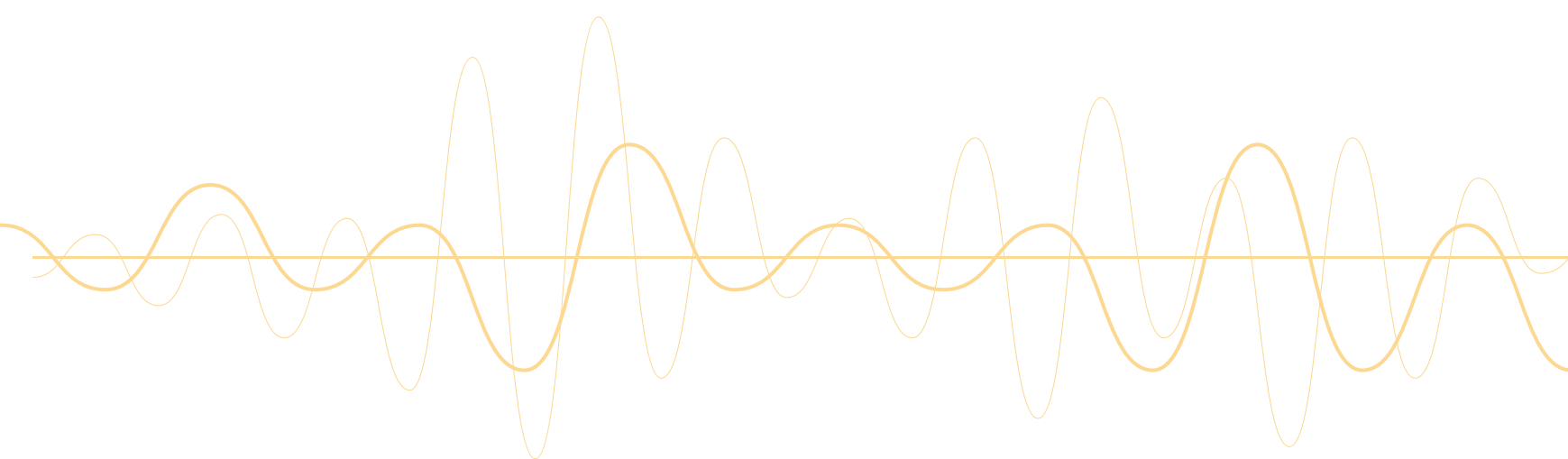
36kV

SFA ELECTRIC

ELECTRIC

SFA





Welcome

CORPORATE

About Us

SFA Electromechanical Electricity Industry and Trade Inc. (shortly **SFA ELECTRIC**) was established in 2015 to operate in the electromechanical sector. The company's founding partners have more than 40 years of experience in the sector and the company carries out its production activities in the factory located in Ankara Sincan Organized Industrial Zone on an area of 17.500m².

SFA ELECTRIC develops its products in R & D department according to the relevant national / international standards and technical specifications. The developed products are taken to the mass production stage after successfully completing the relevant type tests in accredited laboratories. ISO Quality Standards are followed in production.

SFA ELECTRIC; as an international firm, has a rapid growth trend and thanks to strong ex activities SFA ELECTRIC has succeeded to take part in the "2016 & 2018 top exporters" in the sector. Achieving higher levels in this ranking with new products and new markets is among the targets of the Company.

Mission

As **SFA ELECTRIC**, our mission is to provide medium-voltage switchgear to users in a cost-effective way by producing the highest quality.

Vision

It is to be a dynamic, innovative and differentiating brand in the global market for the development and production of medium voltage switchgear used in electricity transmission and distribution.

Environmental Policy

As a company that is responsible for its values, we promise to protect the environment and to comply with ISO 14001 standards.

In this context, we have constructed our business in a way that is more efficient and more useful to humanity and our world in the examination of the energy of societies.

We support environmentally friendly products and the reduction of carbon dioxide emissions. In this sense, we follow the rules and support activities that reduce global warming. In this context, we donate to **TEMA** and **WWF** institutions for every order we receive in accordance with our understanding of giving back to nature and our corporate strategy.



SFA ELECTRIC PRODUCTS

01 > SF6 Gas Insulated Switchgears and Controlgears (Cubicles) (≤ 36 kV)

02 > Switching Devices (≤ 36 kV)

- Vacuum Circuit Breakers,
- Circuit Breakers with SF6,
- Switch-Disconnectors with SF6,
- Switch+Fuse Combinations with SF6,
- Earthing switches

03 > Air Insulated Metal Enclosed Switchgears
And Controlgears (Cubicles) (≤ 36 kV)

04 > Seperable Cable Connectors

05 > Transformer Substations (≤ 1600 kVA)

- Concrete Enclosure
- Metal Sheet Steel Enclosure,

06 > Special Products

- Mobile Substations
- Invertor Kiosks (Concrete Enclosure)
- Invertor Kiosks (Container type)

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01

36kV
SFA-AIS
AIR INSULATED
METAL ENCLOSED SWITCHGEARS
GENERAL



Key Features;

- Compact design and type tested,
- High level operator safety, high level operation reliability,
- Modular design allows unlimited installation possibilities,
- The lower maintenance cost
- Suitable for remote control and monitoring,
- Comply with relevant IEC and EN standards

Safety;

- Withstand to internal arc due to durable design against thermal and dynamic effects,
- Possibility to check visually the position of Earthing Switch (CLOSE or OPEN) through the surveillance window on the front panel.
- Consecutive interlocking systems prevent incorrect operation. Access to the cable compartment and fuse compartment is only possible if the related earthing switch/switches is on the earthed position.

Fields of Major Application;

- Secondary Electricity Distribution networks
- MV/LV Distribution Transformer Substation,
- Wind & Solar Power Plants,
- Commercial Applications: Ports, train stations, airports, hospitals, schools, hotels, shopping malls, commercial centers, holiday complexes,
- Industrial Applications: Water, iron and steel, automotive, oil & gas.

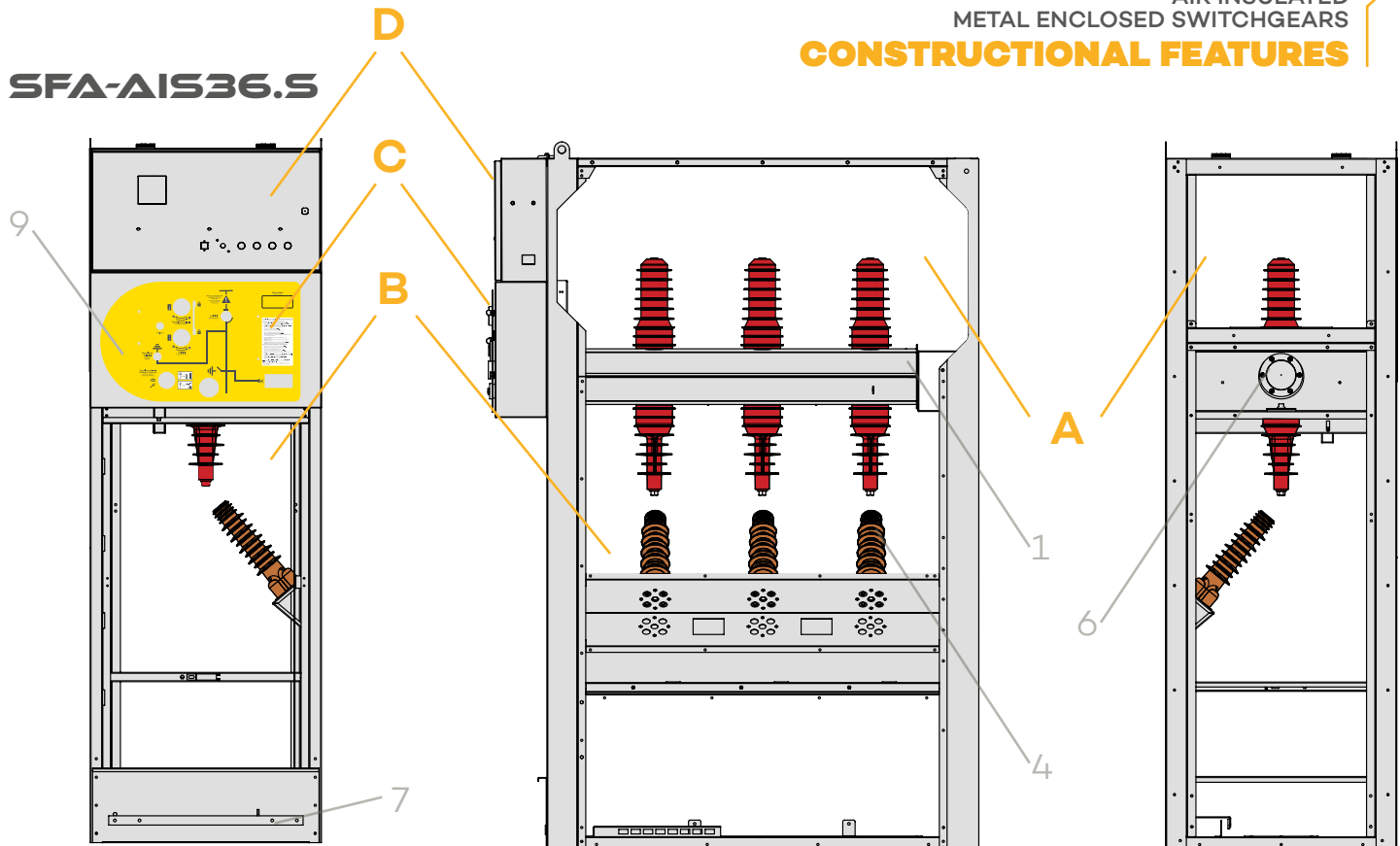


Applied standard	: IEC 62271-200
Loss of the Service Continuity	: LSC2
Partition	: PM
Internal arc	: IAC A (FL) IAC A (FLR)*

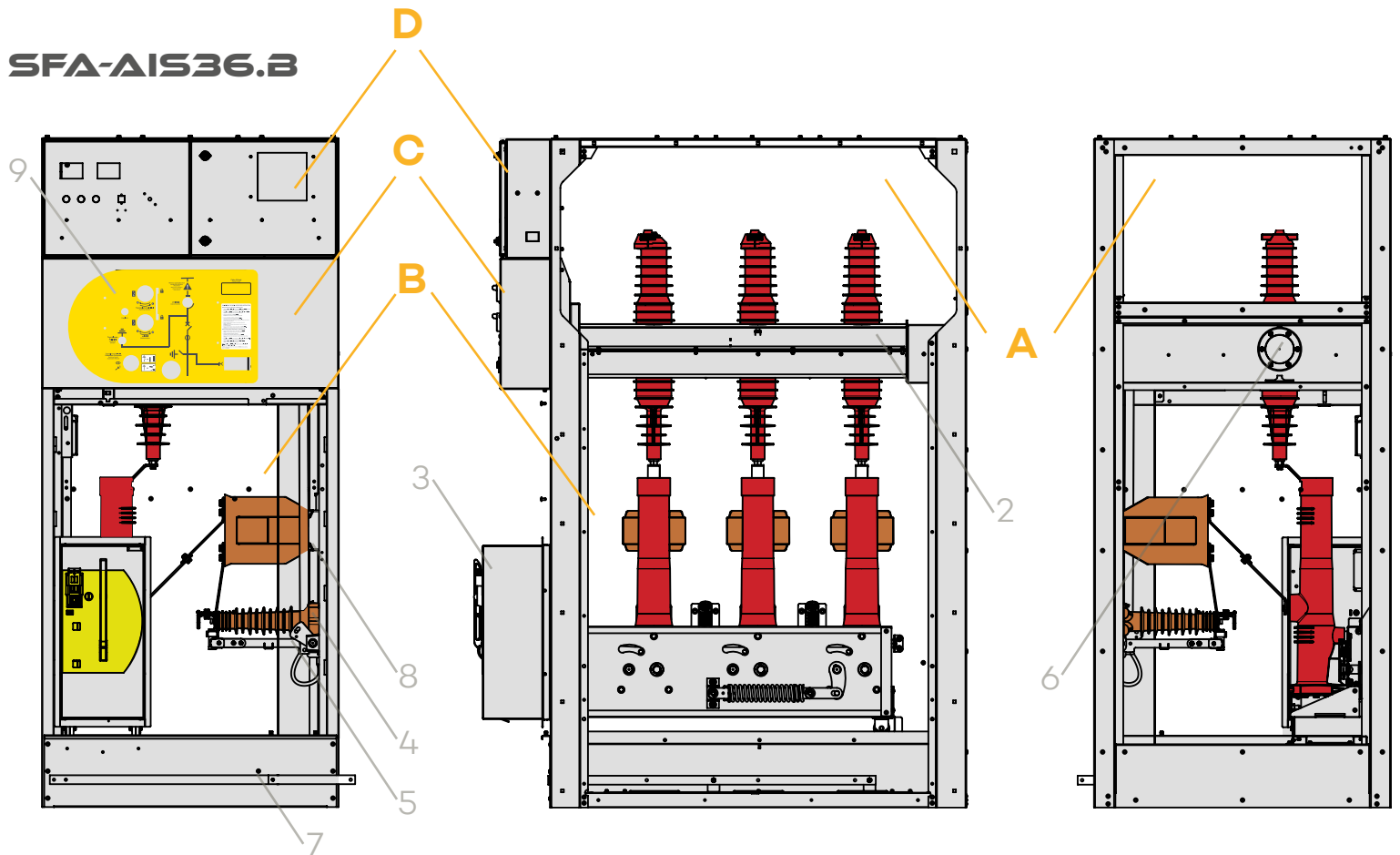
**available upon request*

CONSTRUCTIONAL FEATURES

SFA-AIS36.S



SFA-AIS36.B



- 1- Load Break Switch
- 2- Disconnector
- 3- Circuit Breaker
- 4- Isolator
- 5- Earthing Switch
- 6- Pressure Relief Valve
- 7- Earthing Bar
- 8- Current Transformer
- 9- Mimic Diagram

SFA-AIS36 Cubicles consist of four compartments;

- A-** Main Busbar Compartment,
- B-** HV Cable Connection Compartment,
- C-** Operating Mechanism Compartment
- D-** LV Panel Compartment

02

36kV SFA-AIS AIR INSULATED METAL ENCLOSED SWITCHGEARS CONSTRUCTIONAL FEATURES

As SFA Electric, we are caring all the operators on site. As a reflection of our high level of Operational Health and Safety understanding, we have designed our products so that the operator can visually check the position of Earthing Switch through the Surveillance Windows provided.





Standard Equipments

- Switch-disconnector (for AIS36.S/F/C/M)
- Disconnecter (for AIS36.B/V/D/OTP/OTP-F)
- Circuit Breaker (for AIS36.B/BC/OTP/OTP-F)
- Integrated capacitive voltage presence indicator system (VPIS) without contact
- Operating mechanisms
- SF6 Gas Pressure Manometer without contact
- Main busbar, earthing bar and e-field equalizers
- Operating handles
- Pad-locking facility
- LV Panel
- CT/VT/Relay according to the project **

Optional Equipments

- SF6 Gas Pressure Manometer (hermetic and double contact)
- Double Spring Operating Mechanism (for AIS36.S/C/V/D/B)
- Remote OPENING and CLOSING operation with cable (ROCO)
- SCADA compliance
- Surveillance window (for observing earthing switch position of LBS and DS*)
- Motor + Gear Box
- AC/DC Battery Rectifier Set
- VPIS with contact

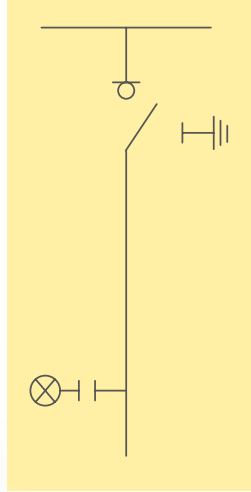
*LBS: Load Break Switch DS: Disconnecter Switch

** The scope of the switchgears may change according to customer requirements. Please check the scope part of Technical Offers.

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TYPES

SFA-AIS36.S

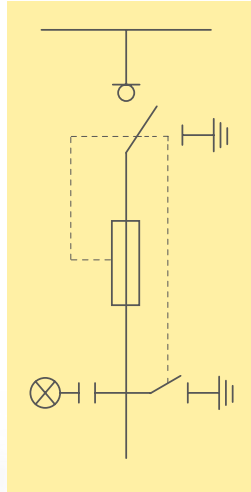
INCOMING - OUTGOING FUNCTIONAL UNIT WITH LOAD BREAK SWITCH



DIMENSIONS (mm)			
	Width	Depth	Height
36kV	750	1400	2250

SFA-AIS36.F

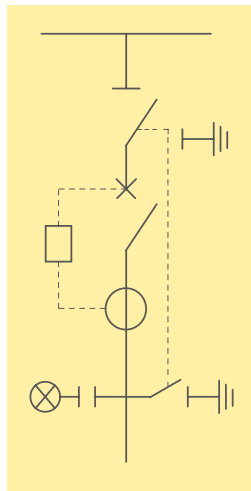
TRANSFORMER PROTECTION FUNCTIONAL UNIT WITH SWITH-FUSE COMBINATION



DIMENSIONS (mm)			
	Width	Depth	Height
36kV	750	1400	2250

SFA-AIS36.B

INCOMING-OUTGOING OR TRANSFORMER PROTECTION FUNCTIONAL UNIT WITH CIRCUIT BREAKER*



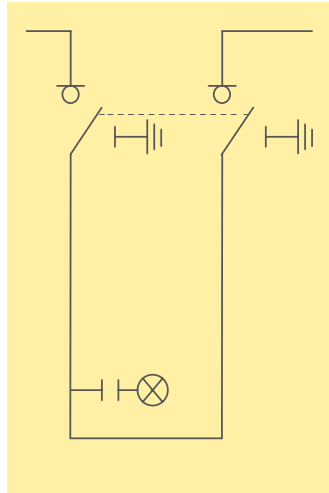
DIMENSIONS (mm)			
	Width	Depth	Height
36kV	1000	1400	2250



This Functional Unit type tested with both Vacuum Circuit Breaker and SF6 Circuit Breaker. Both options are available upon request.

SFA-AIS36.C

COUPLING FUNCTIONAL UNIT WITH TWO LOAD BREAK SWITCHES

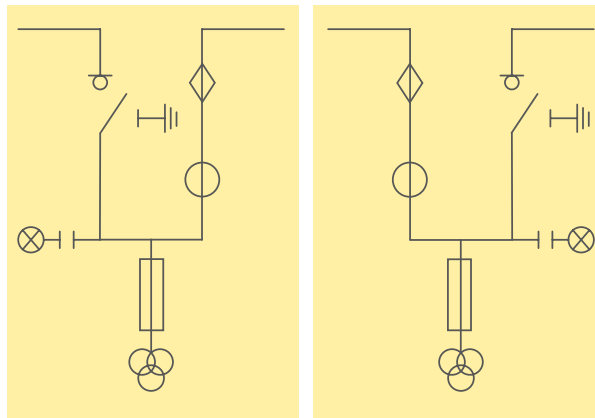


DIMENSIONS (mm)

	Width	Depth	Height
36kV	1000	1400	2250

SFA-AIS36.M

CURRENT - VOLTAGE METERING FUNCTIONAL UNIT WITH LOAD BREAK SWITCH

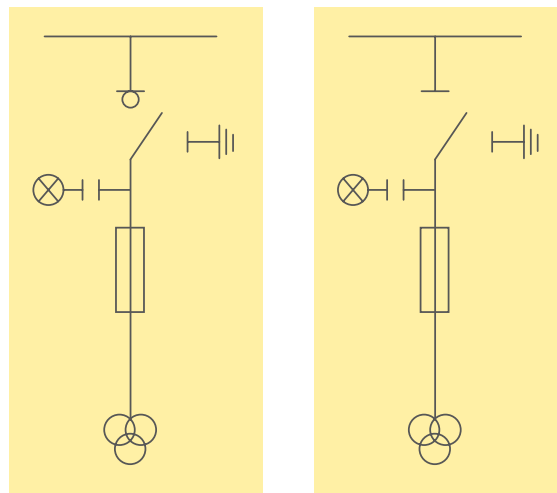


DIMENSIONS (mm)

	Width	Depth	Height
36kV	1000	1400	2250

SFA-AIS36.V

VOLTAGE METERING FUNCTIONAL UNIT WITH LOAD BREAK / DISCONNECTOR SWITCH



DIMENSIONS (mm)

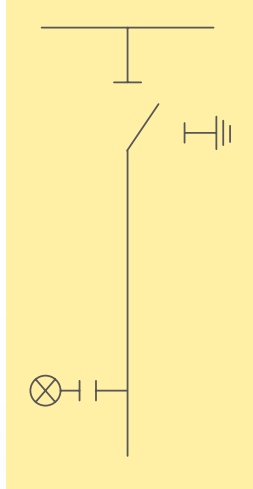
	Width	Depth	Height
36kV	750	1400	2250

03

36kV
SFA-AIS
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TYPES

SFA-AIS36.D

INCOMING - OUTGOING FUNCTIONAL UNIT WITH DISCONNECTOR SWITCH

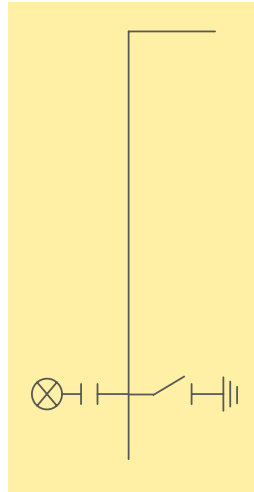
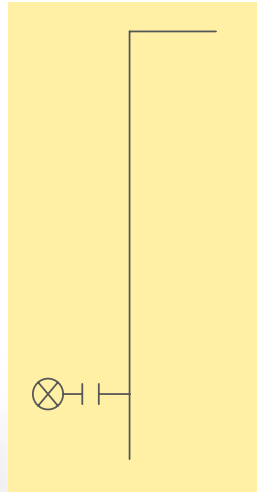


DIMENSIONS (mm)

	Width	Depth	Height
36kV	750	1400	2250

SFA-AIS36.BR

BUS RISING FUNCTIONAL UNIT

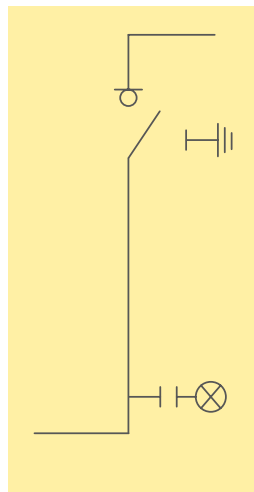
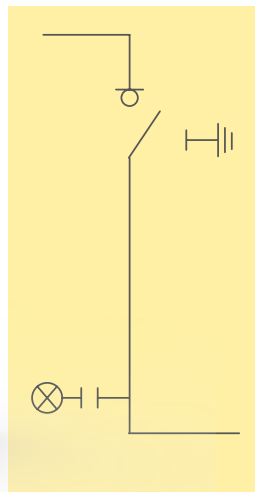


DIMENSIONS (mm)

	Width	Depth	Height
36kV	750	1400	2250

SFA-AIS36.SB

BUS SECTION FUNCTIONAL UNIT WITH LOAD BREAK SWITCH (LATERAL OUTGOING)



DIMENSIONS (mm)

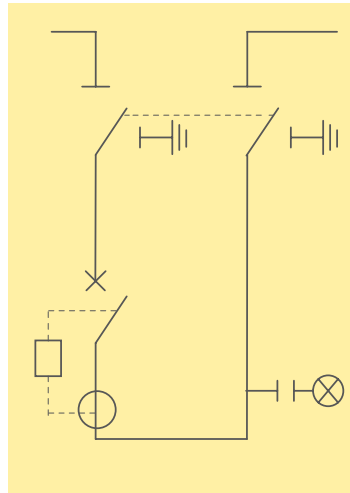
	Width	Depth	Height
36kV	750	1400	2250



Lateral outgoing is possible for both directions : Left & Right.

SFA-AIS36-BC

COUPLING FUNCTIONAL UNIT WITH CIRCUIT BREAKER



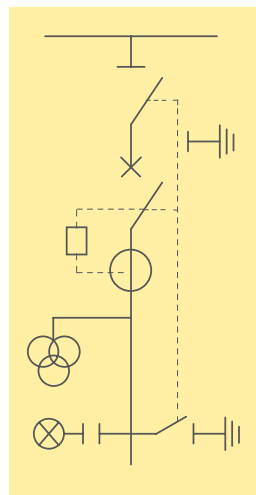
DIMENSIONS (mm)

	Width	Depth	Height
36kV	1000	1400	2250

* This Functional Unit type tested with both Vacuum Circuit Breaker and SF6 Circuit Breaker. Both options are available upon request.

SFA-AIS36-OTP

INCOMING-OUTGOING FUNCTIONAL UNIT WITH CIRCUIT BREAKER* & VOLTAGE TRANSFORMER W/OUT FUSE



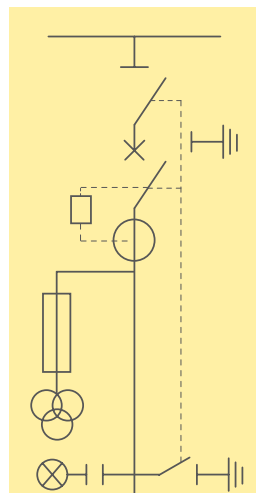
DIMENSIONS (mm)

	Width	Depth	Height
36kV	1000	1400	2250

* This Functional Unit type tested with both Vacuum Circuit Breaker and SF6 Circuit Breaker. Both options are available upon request.

SFA-AIS36-OTP-F

INCOMING-OUTGOING FUNCTIONAL UNIT WITH CIRCUIT BREAKER* & VOLTAGE TRANSFORMER WITH FUSE

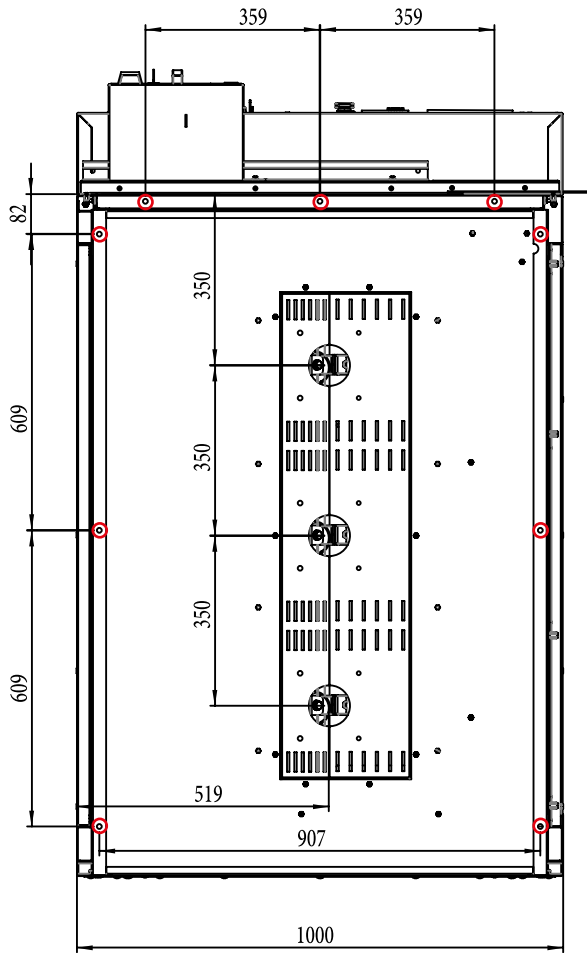


DIMENSIONS (mm)

	Width	Depth	Height
36kV	1400	1400	2250

* This Functional Unit type tested with both Vacuum Circuit Breaker and SF6 Circuit Breaker. Both options are available upon request.

36kV SFA-AIS AIR INSULATED METAL ENCLOSED SWITCHGEARS TYPES



The bottom view on the right is valid for below models:

- SFA-AIS36.S
- SFA-AIS36.F
- SFA-AIS36.V
- SFA-AIS36.D

- Fixing points
- ▲ Front
- ▼ Rear

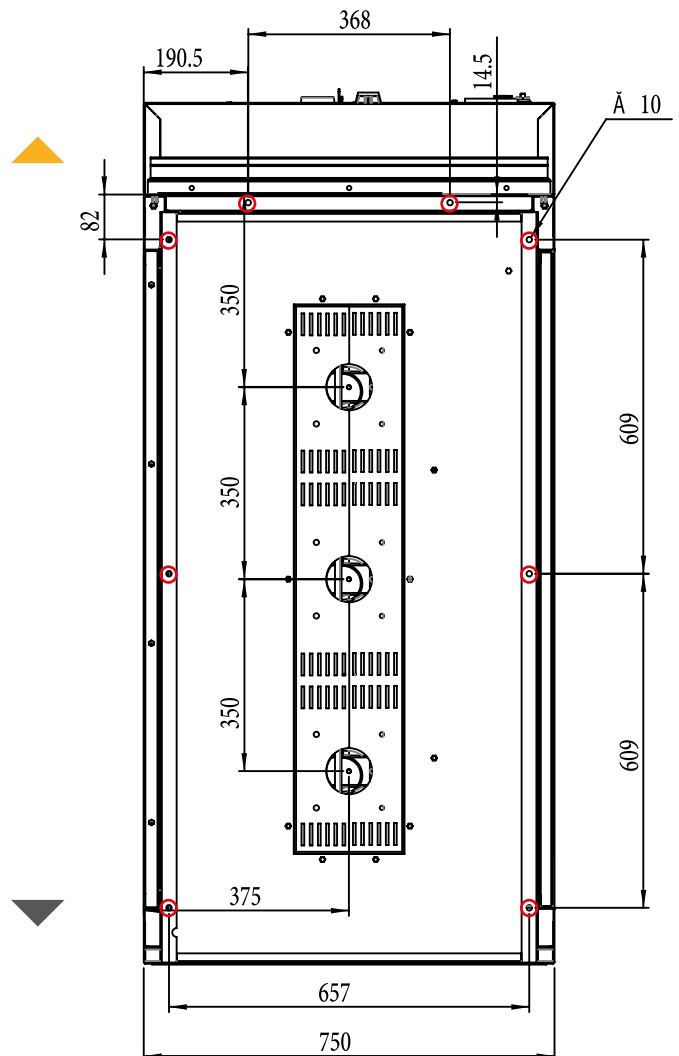
* Switchgears should be fixed to the ground with M10 x 30 steel bolts.

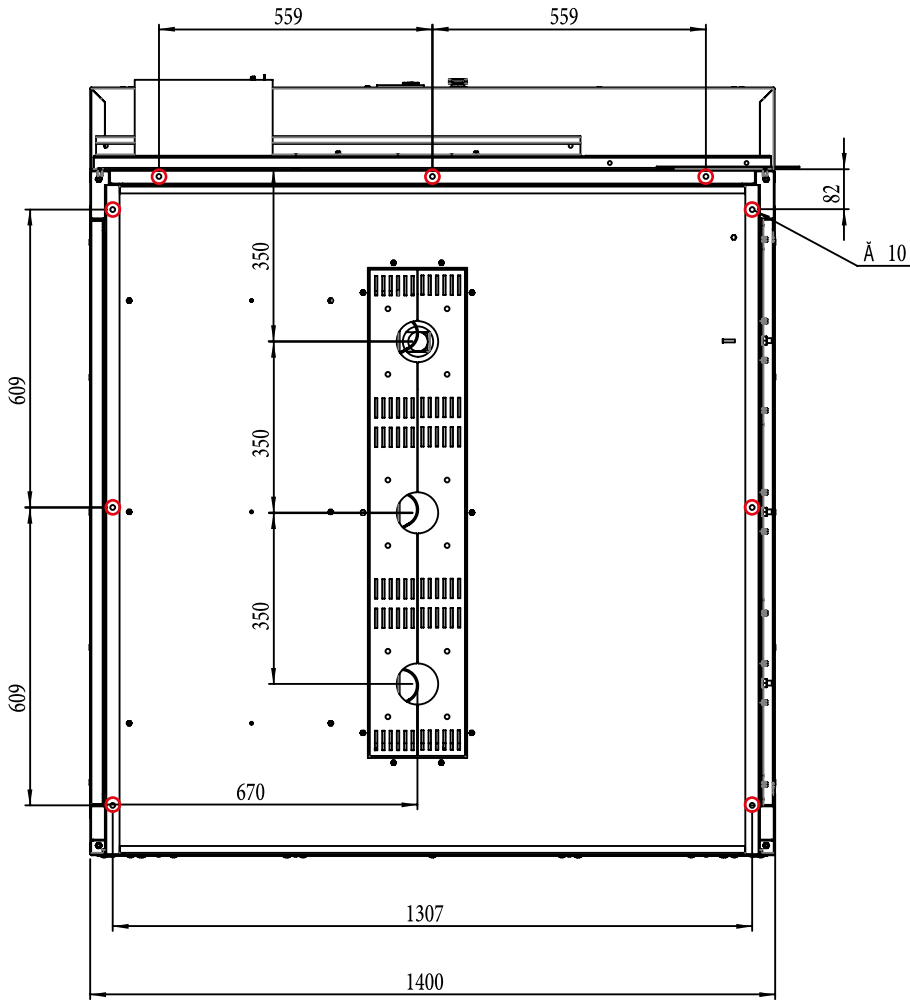
The bottom view on the left is valid for below models:

- SFA-AIS36.B
- SFA-AIS36.C
- SFA-AIS36.M
- SFA-AIS36.BC
- SFA-AIS36.OTP

- Fixing points
- ▲ Front
- ▼ Rear

* Switchgears should be fixed to the ground with M10 x 30 steel bolts.





The bottom view on the left is valid for below model:

SFA-AIS36.OTP-F

○ Fixing points

▲ Front

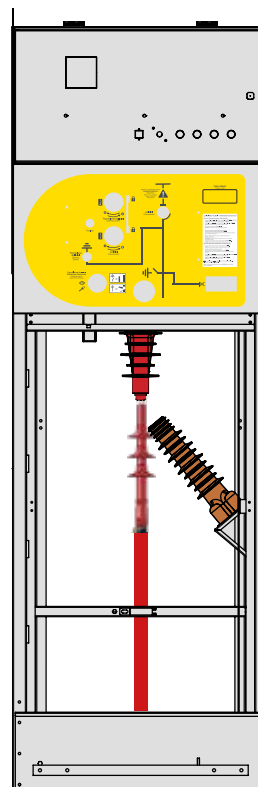
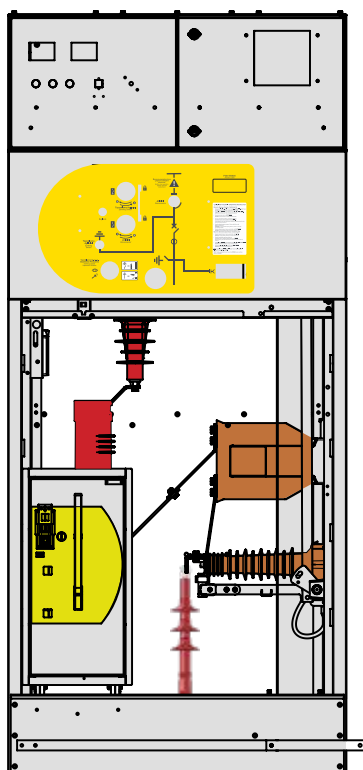
▼ Rear



- Switchgears should be fixed to the ground with M10 x 30 steel bolts.

HV CABLE CONNECTION

Cable Connection of the SFA-AIS.36 is done in the Cable Connection Compartment which is located at the front of the cubicle by using Separable Cable Connectors.





SFA-LBS



SFA-SFC

M018 Type Mechanism

- Opening and Closing operation takes place at one stage. The position of the switch (*closing, opening and earthing operation*) is performed manually by the Operating Handle. For motorized types, mentioned operation is performed via geared motor.

M019 Type Mechanism

- Energy storage is performed by the operator using by Operating Handle or via geared motor (*for motorized mechanism*)

Relasing of the energy is performed;

- By operator with using push button (*mechanically*)
- By shunt coils (*electrically*)
- By striker pin on the switch-fuse combination (*mechanically*)

Load Break Switch, Switch-fuse Combination & Switch Disconnecter

Type		SFA-LBS	SFA-SFC	SFA-DS
Rated voltage (kV)	kV	36	36	36
Rated current (A)	A	630	630	630
Rated short circuit withstand current	kA/sec	16-1	16/1 (upstream) & 1/1 (downstream)	16-1
Electrical endurance		E3	E3/-	-
Mechanical endurance		M1	M1	M1
Insulating medium		SF6 Gas	SF6 Gas	SF6 Gas
Gas tightness type		Sealed Pressure	Sealed Pressure	Sealed Pressure
Standards applied		IEC 62271-102	IEC 62271-103	IEC 62271-103

EARTHING SWITCH

Type	SFA-ES36	SFA-ES36	SFA-ES36
Electrical Endurance	E2	E0	E0
Standards applied	IEC 62271-102	IEC 62271-103	IEC 62271-103



SFA-SCB



SFA-VCB



ABB HD4/VD4

SCB-M & KKM-V Type Mechanism

- SCB-M is mechanism of SFA-SCB SF6 Insulated CB
- KKM-V is mechanism of SFA-VCB Vacuum Circuit Breaker
- Energy storage is performed by the operator using by Operating Handle or via geared motor (for motorized mechanism)

Relasing of the energy is performed;

- By operator with using push button (mechanically)
- By shunt coils (electrically)

SF6 Circuit Breaker & Vacuum Circuit Breaker

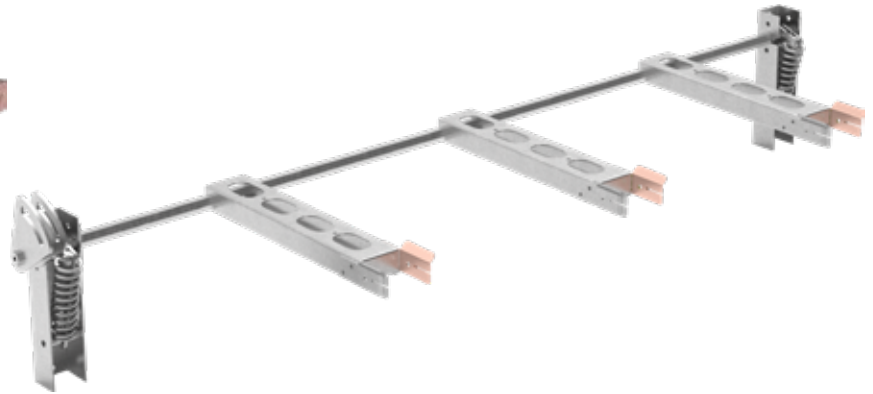
Type		SFA-SCB	SFA-VCB	ABB HD4/VD4
Rated voltage (kV)	kV	36	36	36
Rated current (A)	A	630	630/1250	630...3150
Rated short circuit withstand current	kA/sec	16-3	20-3	16...40-3
Rated breaking current	kA	16	16	16...40
Capacitive Charging Class		C2	C2	C2
Rated Operating Sequence		O-0.3S-CO-3min.-CO	O-0.3S-CO-3min.-CO	O-0.3S-CO-3min.-CO
Switching medium		SF6 Gas	Vacuum	Vacuum
Gas tightness type		Sealed Pressure	N/A	Sealed Pressure - N/A
Standards applied		IEC 62271-100	IEC 62271-100	IEC 62271-100



SFA-AIS36 switchgears are also type tested with ABB Circuit Breakers. For more information, please contact us.



SFA-ES16



SFA-ES1

Earthing Switches

- SFA-ES16 is used at metal-enclosed switchgear models of SFA-AIS series with Circuit Breaker.
- SFA-ES1 is used at metal-enclosed switchgear models of SFA-AIS36.F.

SFA-ES16 & ES1 Earthing Switches

Type		SFA-ES16	SFA-ES1
Rated voltage (kV)	kV	36	36
Rated short circuit making current	kA/PEAK	40	2.5
Rated breaking current	kA	16	1
Electrical Endurance		E2	E2
Standards applied		IEC 62271-103	IEC 62271-103

36kV
SFA-AIS
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 METAL ENCLOSED SWITCHGEARS
HV FUSE SELECTION



HV Fuses to be used in SFA-AIS36 should be integrated cut-out type and with striker (medium).



VOLTAGE	DIMENSIONS (mm)	
	A	D
17.5kV	33	367
24kV	33	442
36kV	33	537

Rated Voltage (kV)	36 kV						
Rated Power (kVA)	250	400	630	800	1000	1250	1600
% Uk	4,5			6			
İnterteknik (Tip: ACT)	10A	16A	20A	20A	25A	31,5A	40A
Güral	10A	16A	20-25A	20-25A	25A	30A	40A



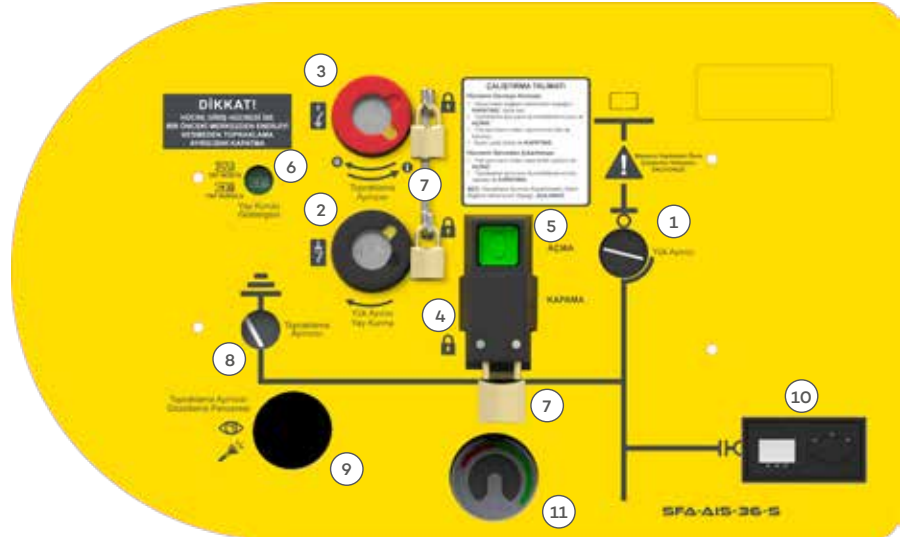
In case of using except 36 kV voltage level, please contact with SFA ELECTRIC to determine correct HV Fuse.

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CONTROL PANEL

FOR CUBICLE WITH SWITCH-DISCONNECTOR

(for M019 typed mechanism)

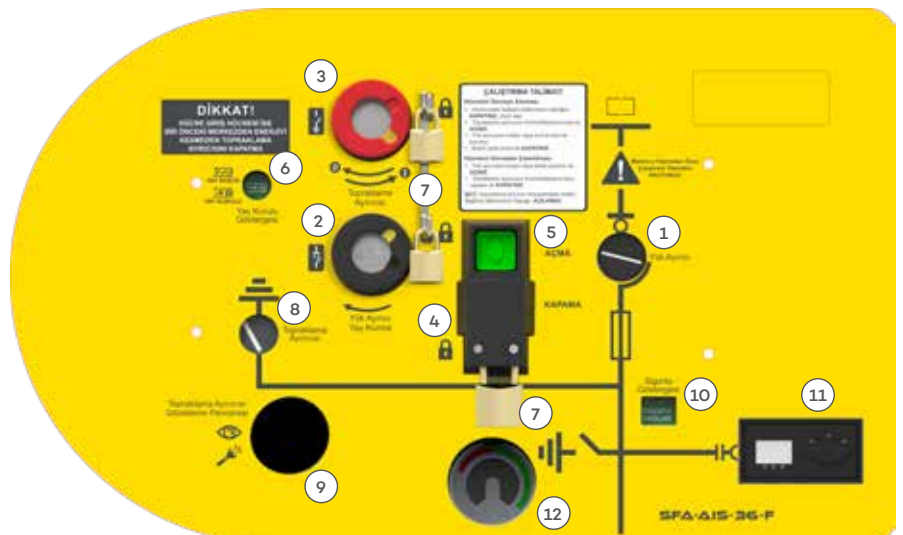
1. Position indicator for switch-disconnector
2. Operating Handle Slot for switch-disconnector
3. Operating Handle Slot for earthing switch
4. Push Button for closing operation of switch-disconnector (mechanically)
5. Push Button for opening operation of switch-disconnector (mechanically)
6. "Spring Charged" or "Spring Discharged" indicator for switch-disconnector
7. Pad-locking
8. Position indicator for earthing switch
9. Surveillance window (for earthing switch contact position)



FOR CUBICLE WITH SWITCH FUSE COMBINATION

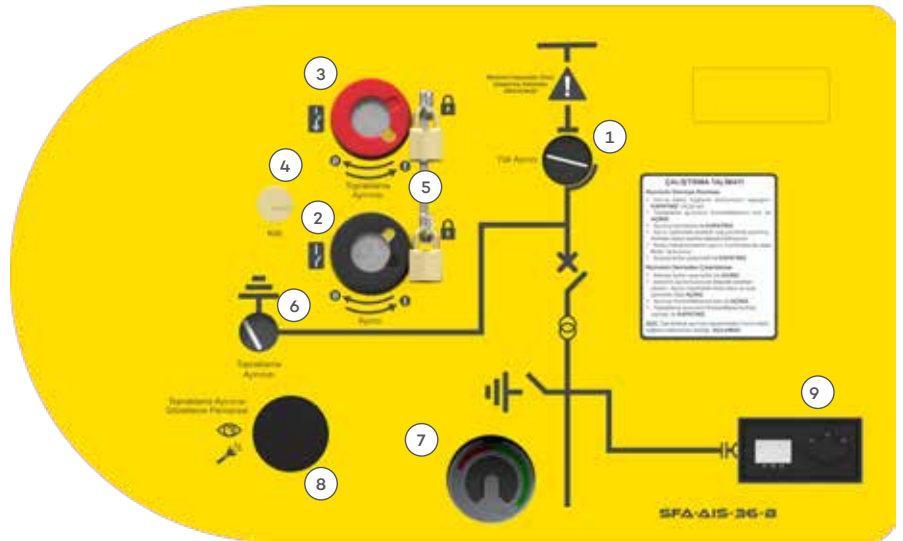
(for M019 typed mechanism)

1. Position indicator for switch-disconnector
2. Operating Handle Slot for switch-disconnector
3. Operating Handle Slot for earthing switch
4. Push Button for closing operation of switch-disconnector (mechanically)
5. Push Button for opening operation of switch-disconnector (mechanically)
6. "Spring Charged" or "Spring Discharged" indicator for switch-disconnector
7. Padlocking
8. Position indicator for earthing switch
9. Surveillance window (for earthing switch contact position)
10. HV Fuse indicator



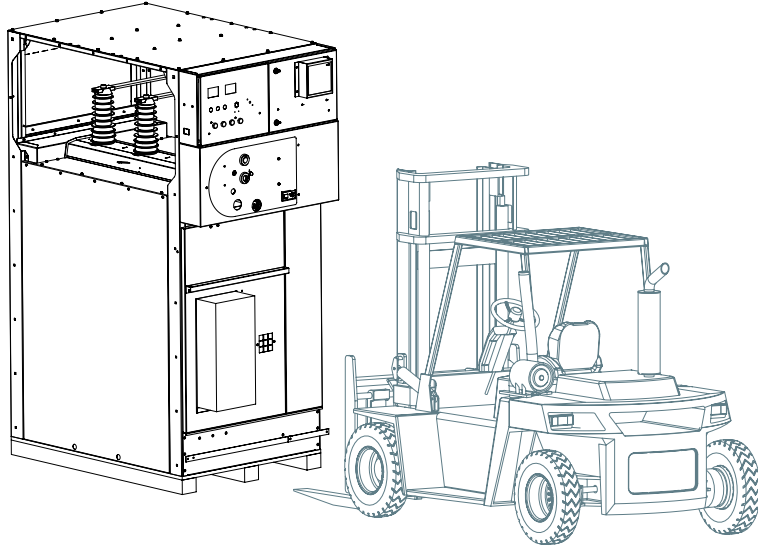
FOR CUBICLE WITH VACUUM CIRCUIT BREAKER

1. Position indicator for disconnector
2. Operating Handle Shaft for disconnector
3. Operating Handle Shaft for earthing switch
4. Key
5. Pad locking
6. Position indicator for earthing switch
7. SF6 Gas Manometer
8. Surveillance window (for earthing switch contact position)
9. Voltage Presence Indicator
10. Position indicator for disconnector



	STANDARDS	CLASSIFICATION	
		Partition	PM
SFA-AIS 36	IEC 62271-200	Loss of Service Continuity	LSC 2
		Internal arc (for compact type)	A (FL) 16 kA-1 s
		Internal arc (for modular type)	A (FLR) 16 kA-1 s
SWITCH-DISCONNECTOR	IEC 62271-103	General purpose, M1, E3	
SWITCH-FUSE COMBINATION	IEC 62271-105		
CIRCUIT BREAKER	IEC 62271-100	M1, E2 (for cable network)	
DISCONNECTOR	IEC 62271-102	M1, E0	
EARTHING SWITCH	IEC 62271-102	M1, E2	
VOLTAGE DETECTION SYSTEM	IEC 61243-5	Voltage Presence Indicating System (VPIS)	
PLUG-IN BUSHINGS	IEC 50181	Outer cone plug-in bushing	

	IP CLASS	ACCESSIBILITY	INTERLOCKINGS
SWITCHING COMPARTMENT	IP 67	NON-ACCESSIBLE	-
HV CABLE CONNECTION COMPARTMENT	IP2X	ACCESSIBLE	Unless the earthing switch is earthed, the cover of the compartment can not be opened.
HV FUSE COMPARTMENT	IP3X	ACCESSIBLE	Unless the up and down-stream earthing switches are earthed, the cover of the compartment can not be opened.
OPERATING MECHANISM COMPARTMENT	IP2X	ACCESSIBLE	Accessible with tool.
LV PANEL COMPARTMENT	IP3X	ACCESSIBLE	-

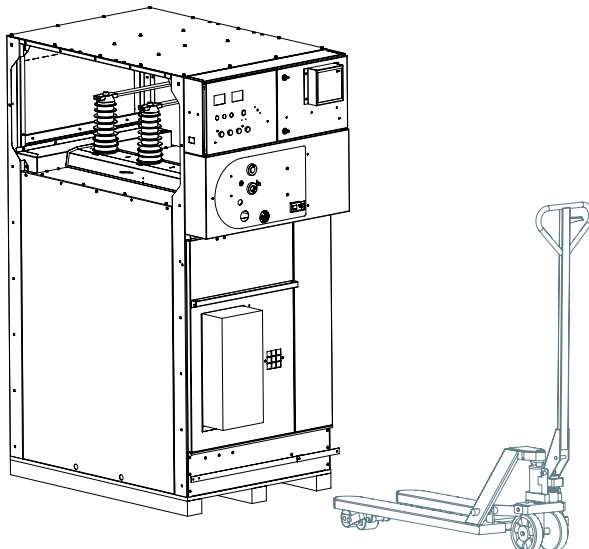
PACKING AND TRANSPORT**PACKING:**

Unless otherwise is stated;

- **For railway and highway transportation;** cubicle is fixed on the wooden pallets and covered with plastic.
- **For air and sea transportation;** cubicles are packed by using shrink-wrap in wooden crate and put desiccant bags against humidity.

HANDLING:

- Package can be transported with lifted truck or forklift truck (for only with pallet)

**WARNING!**

- Never tip the crates over.
- Avoid slipping and tilting

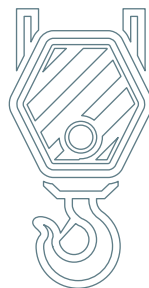
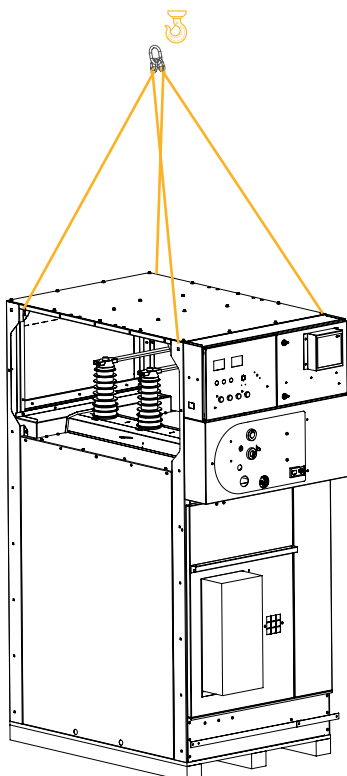
STORAGE:

The followings should be recommended for a smooth storage;

- Keep the equipment in its original package during the storage,
- The storage area should be protected against rain, water, water vapor, saline atmosphere and pollution.
- Storage area temperature is advised not below than -25 C
- altında olmamalıdır.

Crane transport with lifting eyes:

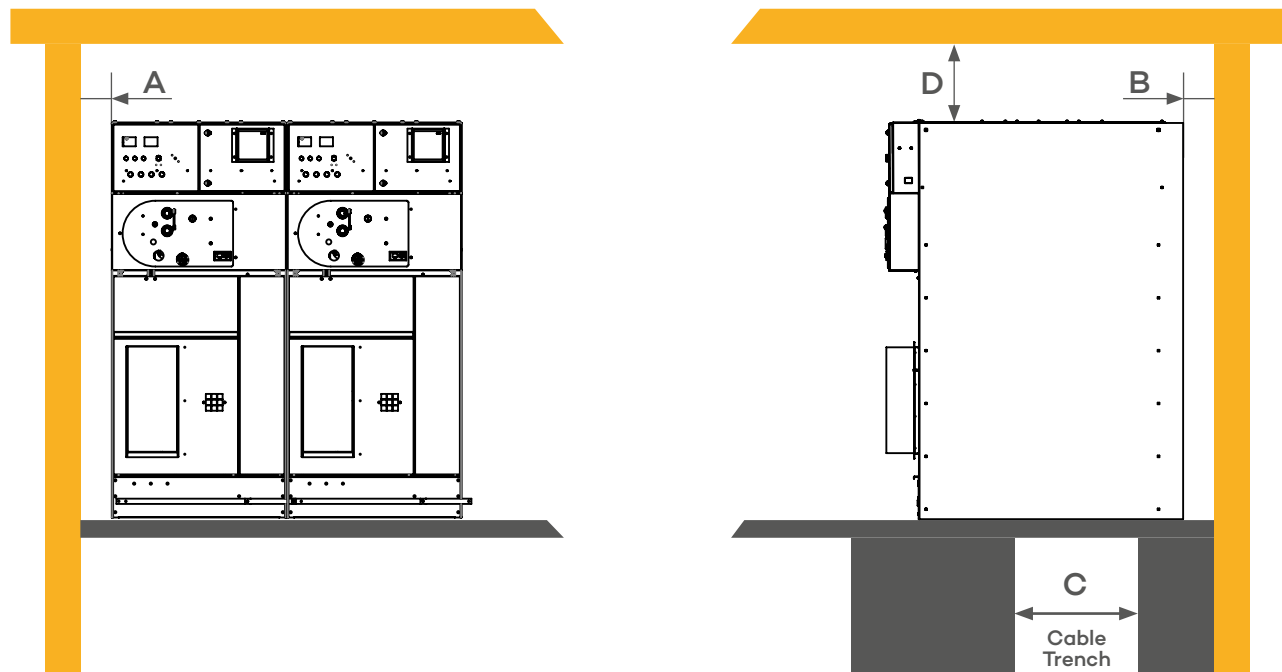
Cubicles can be lifted and transported by four lifting eyes at the top. Be sure that lifting capacity of the rope is proper for the weight of the cubicle.



Before installation on site;

- Be sure that there is no damage on the equipment during the transportation,
- Be sure that the indicator of the SF₆ Gas Manometer is on the GREEN area.
- Be sure that there is no any missing parts of the cubicle. (Operating handle, extension kits, etc.)

SFA-AIS36 cubicles should be installed indoor.



A	B	C	D
Minimum 50 mm	100 mm	640 mm (± 25)	400 mm

**WARNING!**

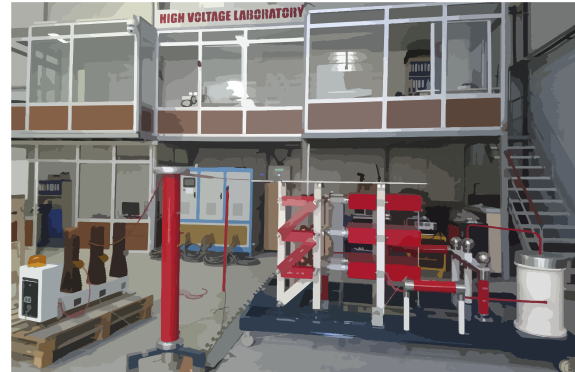
- The floor to be fixed on should be well-levelled. Other wise cover of the compartment does not work properly and some failures may occur on the extension bar.
- The distances to rear and side walls should be taken into consideration.

QUALITY CONTROL:

Type tests of SFA-AIS36 were carried out in the accredited Labs.

Following routine tests are applied to each units.

- Power frequency withstand test,
- Measurement of the resistance of the main circuit,
- Gas leakage test,
- Mechanical operating test,
- Visual controls,
- Electrically functional tests



QUALITY MANAGEMENT SYSTEM:

All products in SFA ELECTRIC have been manufactured under well-defined Quality Systems and procedures applied to all departments.

Conformity of the production with Quality Management Systems is certified by Bureau Veritas.

<p>ISO 9001 BUREAU VERITAS Certification</p> 	<p>ISO 14001 BUREAU VERITAS Certification</p> 	<p>ISO 45001 BUREAU VERITAS Certification</p> 
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ISO 9001:2015
 Quality Management System

ISO 14001:2004
 Environmental Management System

ISO 45001
 Occupational Health And Safety
 Management System

36kV
SFA-AIS
 AIR INSULATED
 METAL ENCLOSED SWITCHGEARS
TECHNICAL FEATURES

SFA-AIS36 (General)

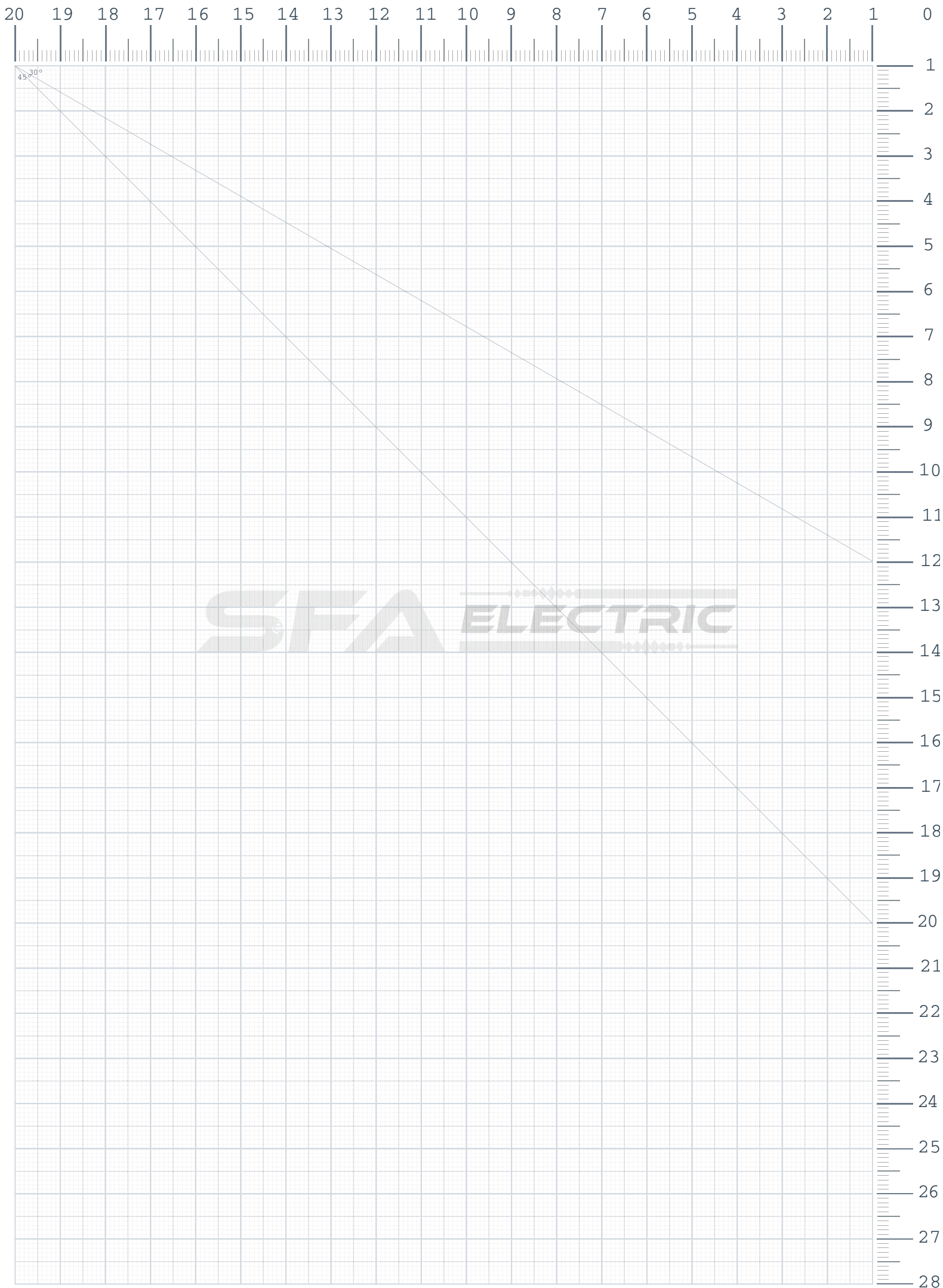
Rated Voltage	kV	36
Rated normal current (main busbar)	A	630
Rated power frequency withstand voltage		
§ Phase to earth, between the phases	kV-etken	70
§ Across the isolating distance	kV-etken	80
Rated lightning impulse withstand voltage		
§ Phase to earth, between the phases	kV-tepe	170
§ Across the isolating distance	kV-tepe	195
Rated frequency	Hz	50
Rated short-circuit withstand current	kA	16
Duration of short-circuit	s	1
Rated transfer current (valid for Switch-fuse combination)	A	470
Rated filling level for insulation	bar	1,4 (abs)
Minimum functional level for insulation	bar	1,3 (abs)
Internal arc classification (IAC)		A (FL) 16 kA-1s
Loss of the Service Continuity		LSC 2A-PM
Mechanical Impact Class (IK)	Joule	IK10 (20J)
Standards Applied		IEC 62271-1, IEC 62271-200

NORMAL SERVICE CONDITIONS

Ambient temperature		
* Maximum	°C	40
* Average	°C	35
* Minimum	°C	-25
Indoor/Outdoor Installation		Indoor/outdoor*
Altitude		up to 2000 m
Relative humidity		maximum % 96

* Get in contact with SFA ELECTRIC for OUTDOOR solution

* Rated currents are defined for max. 40 °C.



SFA ELECTRIC

1. Organize Sanayi Bölgesi 5. Kısım Oğuz Caddesi No:52
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