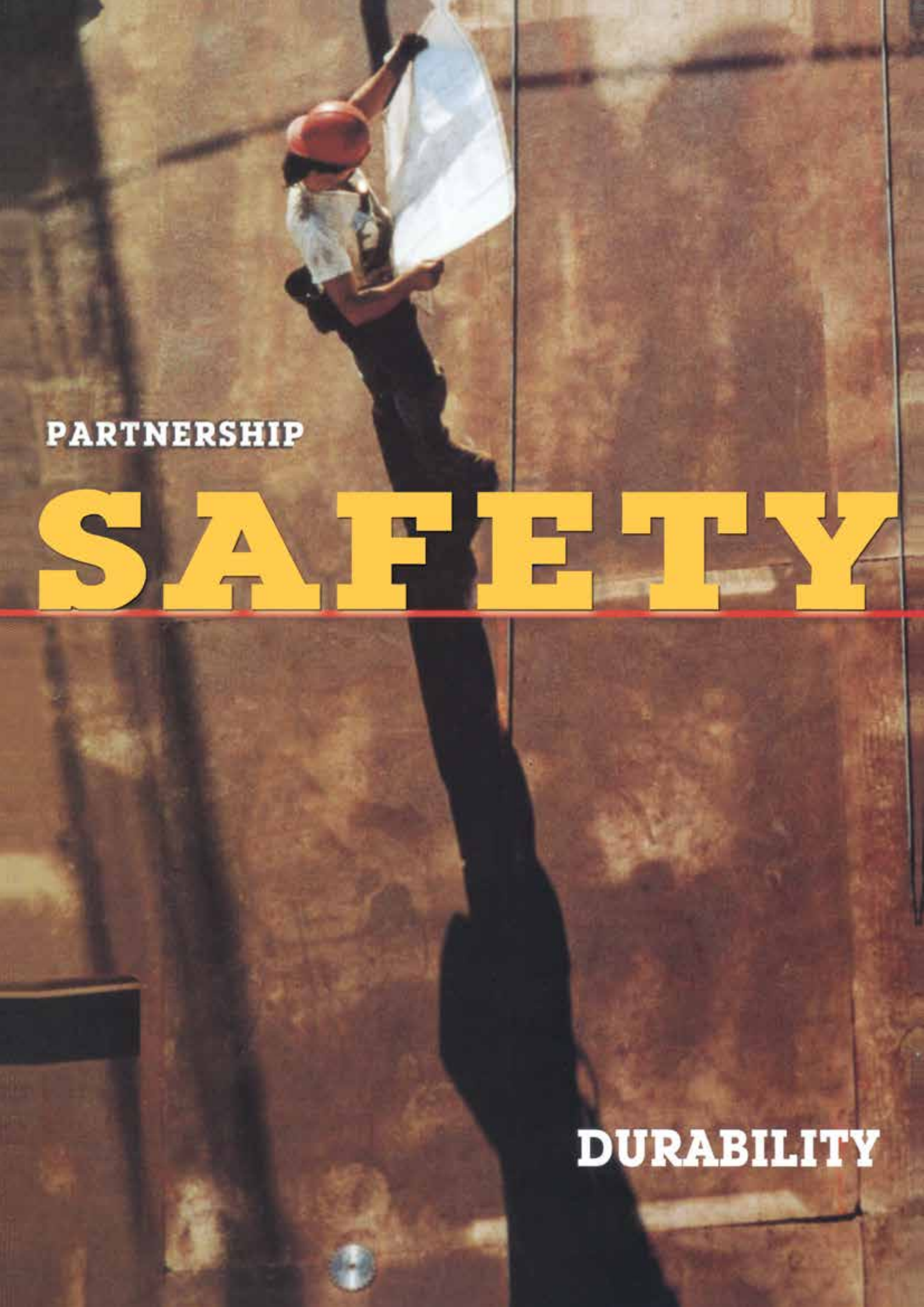


MEDIUM VOLTAGE AIR INSULATED METAL ENCLOSED SWITCHGEAR

ME6 up to 17.5 kV



النفار
alfanar



PARTNERSHIP

SAFETY

DURABILITY

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1 - Introduction to ME6

A - ME6 Solutions

ME6 have been designed to provide a wide variety of functions and service as required by modern power distribution system.

ME6 offers high personal and operating safety, optimal availability, secure engineering, easy operation and high efficiency with low lifecycle costs.

ME6 units are Modular Extensible Air insulated metal enclosed switchgear, designed for supplying sustainable energy, protecting electrical equipment in secondary distribution networks.

ME6 is realized with standardized typical units. During the design stage of the units we took into consideration the functionality, the simplicity of operation and locking devices and a long period of service without any maintenance



B - Quality Management

ME6 units are produced with an integrated quality system carefully defined for all departments. During each stage of the manufacturing process we ensure that ME6 units are built perfectly; and comply with the highest adherence standards. The ME6 quality system is ISO 9001:2015 Certified.



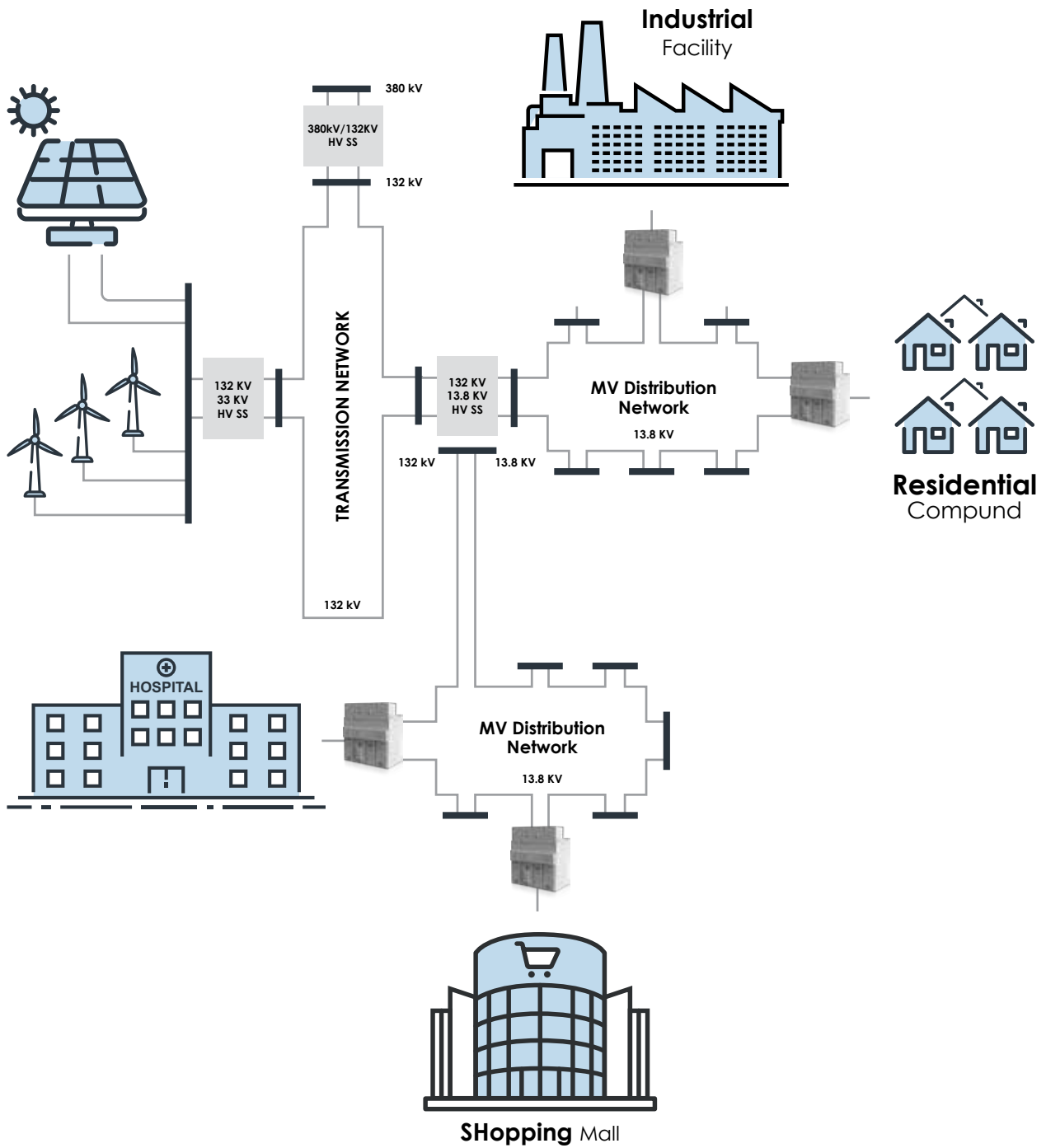
C - Quality Checks and Tests

Every ME6 unit undergoes routine quality tests and intensive related IEC Standards checks to ensure the highest quality product. These tests are:

- Design and visual check
- Mechanical Operating and interlock Tests
- Insulation Resistance Test
- Dielectric Test on the Main Circuit
- Dielectric Test on Control and Auxiliary Circuits
- Functional Tests
- Measurement of the Resistance of the Main Circuit
- Test of Measuring and Protection Circuits

The Quality Control Department prepares a test quality certificate for each unit and records the results for future accessibility and quality assurance.

2 - ME6 in Power Grids



3 - Applications



A - Infrastructure and buildings: ports, railway stations, airports, hospitals, schools, hotels, malls, commercial centers, holiday resorts etc.



B - Industries: water, iron and steel, automotive, oil and gas etc.



C- Power Grid: Metered Ring main unit in the Secondary Distribution network

4 – Standards and Operating Conditions

ME6 fully complies with the following IEC standards used under general operation conditions for indoor switch-gears:

- a. Switchgear Standards:
 - IEC-62271-1
 - IEC-62271-200
- b. Switch-Disconnecter Standards:
 - IEC-62271-103/102
- c. Circuit Breaker Standards
 - IEC-62271-100
- d. CT Standard:
 - IEC 61869-2
- e. VT Standard:
 - IEC 61869-3
- f. Relay Standard:
 - IEC 60255
- g. Capacitive Voltage Indicator:
 - IEC 61243-5



Operating Conditions:

- Ambient temperature ranges from -25 °C to 55 °C
- Altitude range of (0-1000 m) *
- Maximum relative humidity of 100%



*: For 1000+ m please contact [alfanar](#)

5 – ME6 Functional units

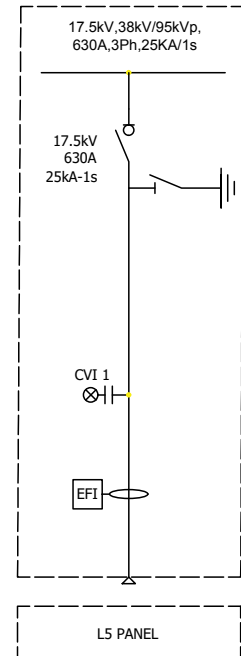
A. L5 INCOMING/OUTGOING UNIT

BASE UNIT COMPONENTS

- Main busbars
- Earthing bar
- Inspection window
- Safety interlocks
- Switch Disconnecter
- Earthing switch
- Cable clamps
- Synoptic diagram
- Reference plate for operation steps

OPTIONAL COMPONENTS

- Key interlocks for SD6
- Capacitor dividers and lamps
- Auxiliary contacts
- Space heater
- Internal lighting for unit
- Earth fault indicator



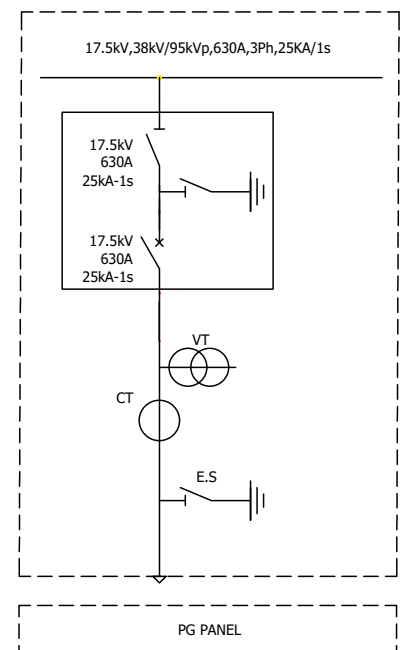
B. PG INCOMING/OUTGOING UNIT WITH VACUUM CIRCUIT BREAKER

BASE UNIT COMPONENTS

- Main busbars
- Earthing bar
- Inspection window
- Safety interlocks
- Disconnecter with key interlock
- Vacuum circuit breaker and accessories
- Earthing switch
- Cable clamps
- Synoptic diagram
- Reference plate for operation steps

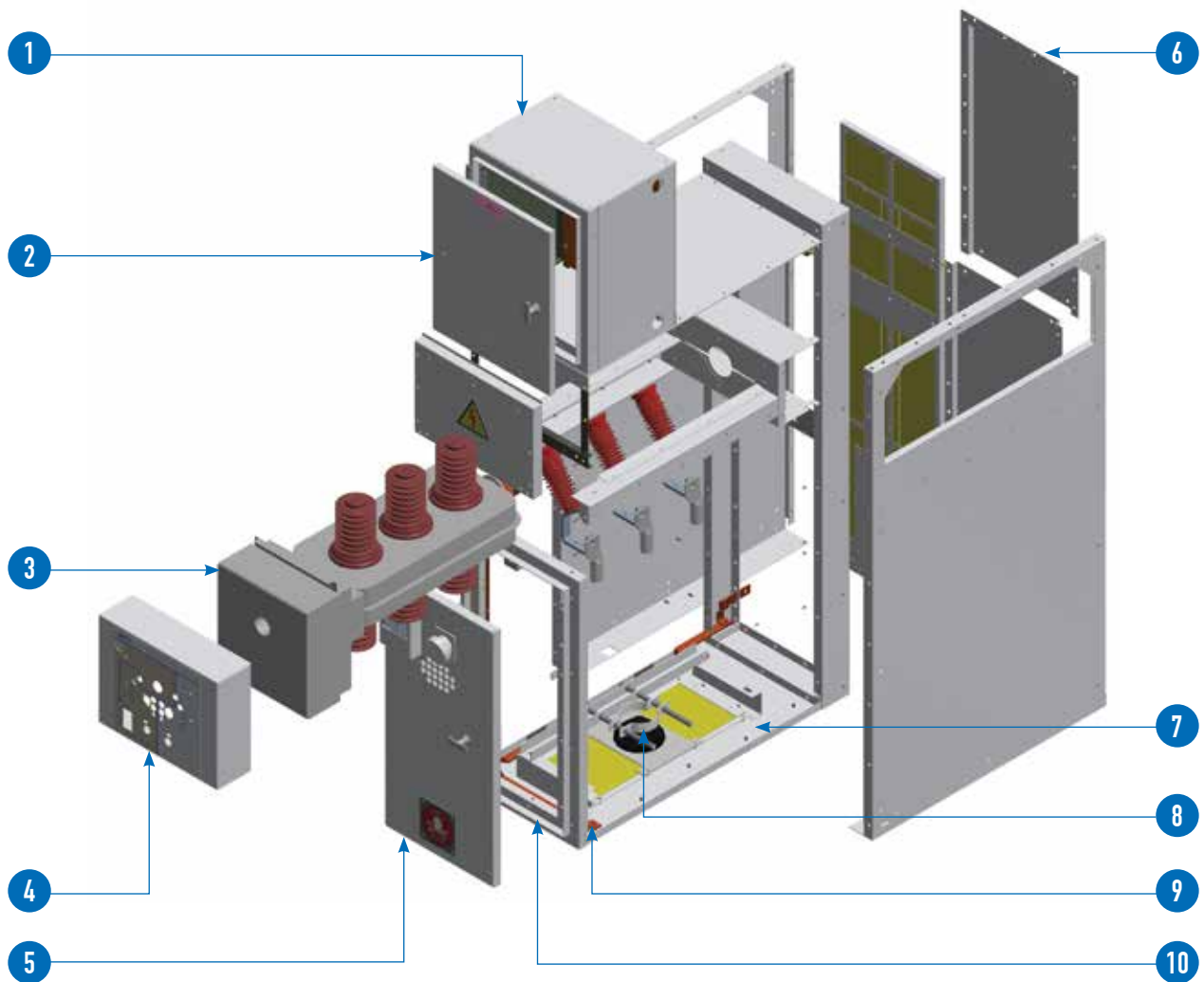
OPTIONAL COMPONENTS

- Key interlocks for D6
- Capacitor dividers and lamps
- Auxiliary contacts
- Space heater
- Internal lighting for unit
- Current/voltage transformers



6 - Product Breakdown

L5 breakdown

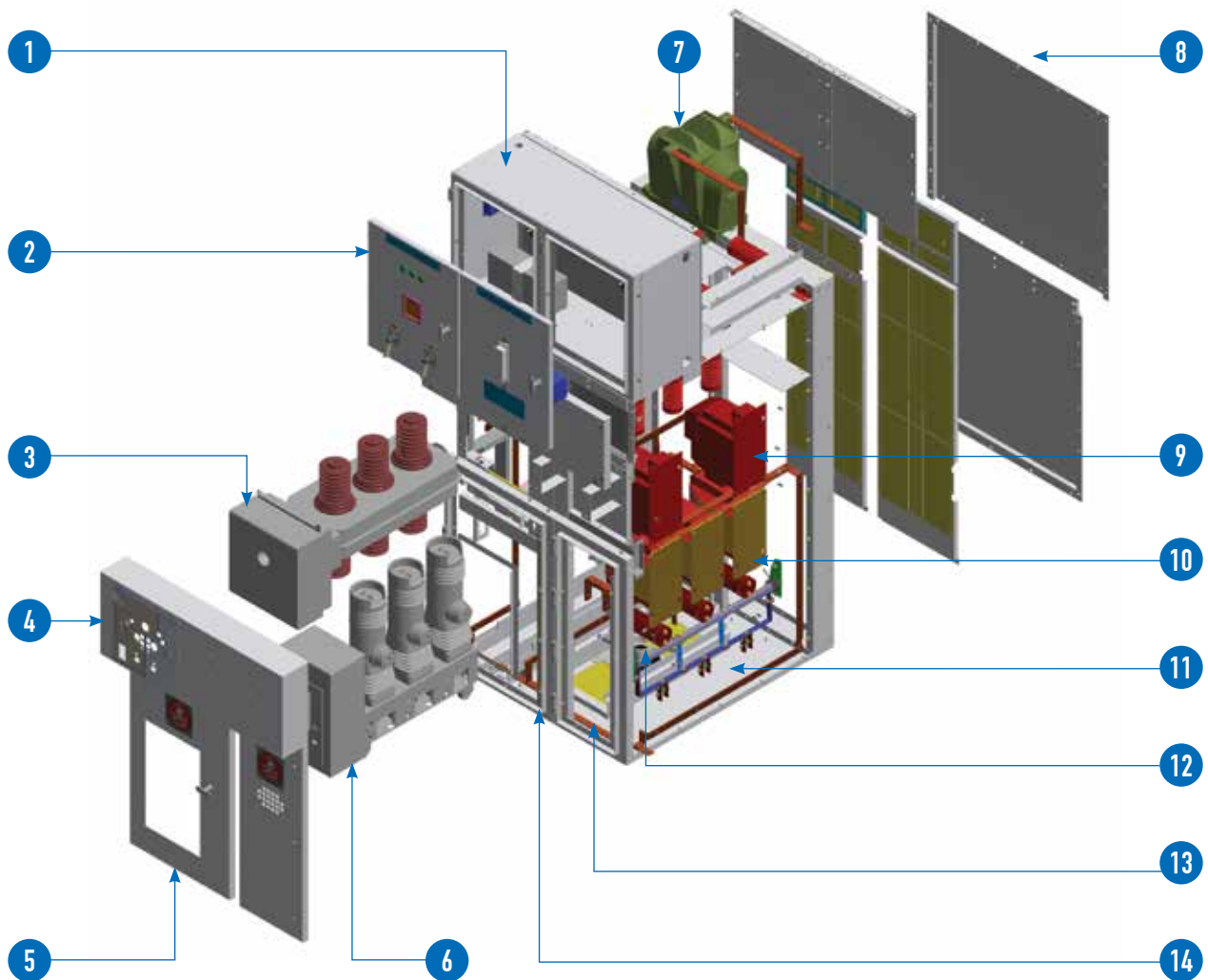


- 1 - LV box
- 2 - LV compartment door
- 3 - Load break switch
- 4 - Mechanism cover
- 5 - Cable compartment door

- 6 - Rear cover
- 7 - Gland plate
- 8 - Cable clamps
- 9 - Earth bar
- 10 - Frame

6 - Product Breakdown

PG Breakdown



- 1 - LV box
- 2 - LV compartment door
- 3 - Load break switch
- 4 - Mechanism cover
- 5 - Cable compartment door
- 6 - VCB
- 7 - CPT

- 8 - Rear cover
- 9 - VT
- 10 - CT
- 11 - Gland plate
- 12 - VT
- 13 - Earth bar
- 14 - Frame

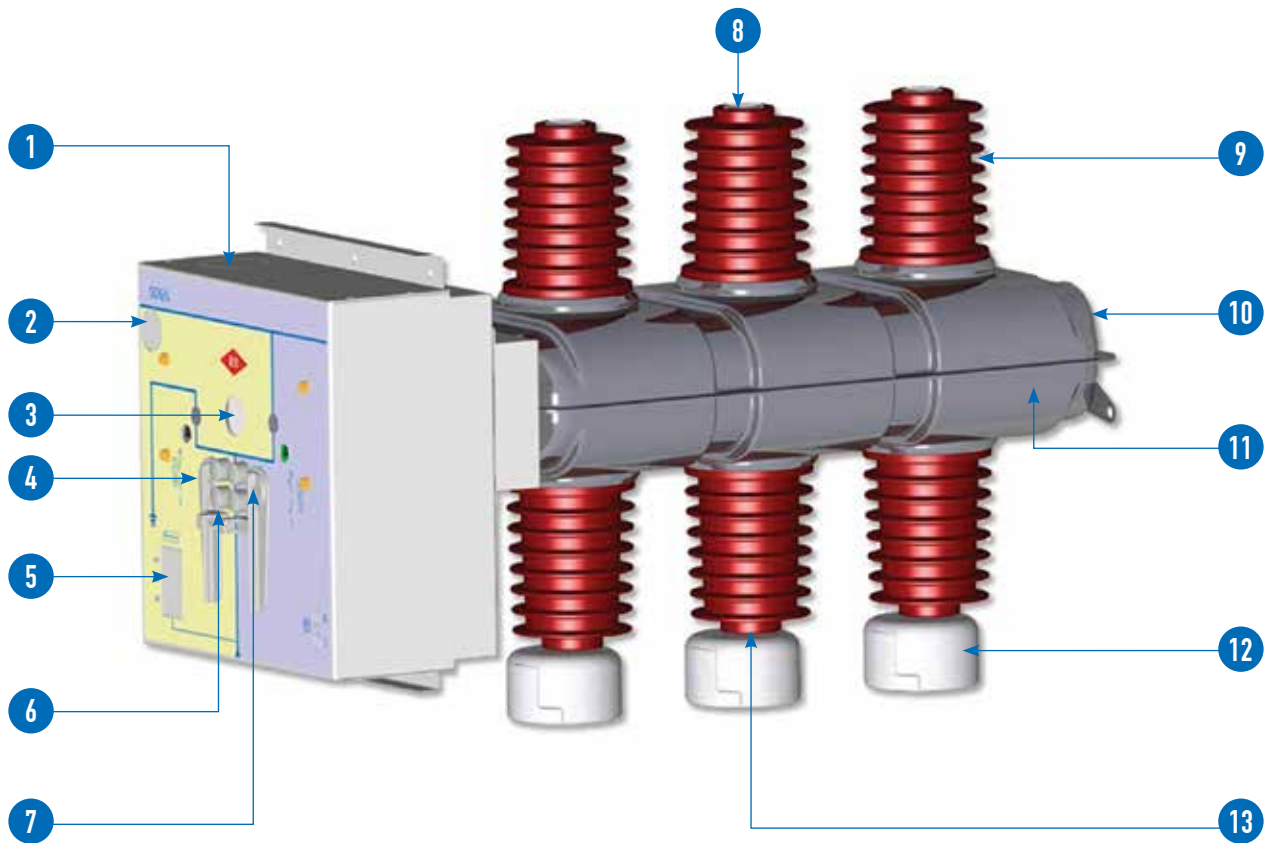
7 - Technical Data Sheet

Electrical Characteristics	
Voltage	17.5 kV
Lighting impulse withstand voltage	95 kV
Power frequency withstand voltage	38kV
Frequency	60 Hz
Normal current	630 A
Short time withstand current	25 kA
Peak withstand current	65 kA
Short circuit duration	3 s
Degree of protection	IP 41
Partition class	PM
Loss of service continuity category (LSC)	LCS2A
IAC classified sides	A FLR
Arc fault current (IA)	25 kA
Arc fault duration (tA)	1 s

8 - ME6 Components

A. SD6 SWITCH-DISCONNECTOR

SF6 disconnecting unit is equipped with switch-disconnector and earthing switch fitted with separated and interlocked operating mechanism

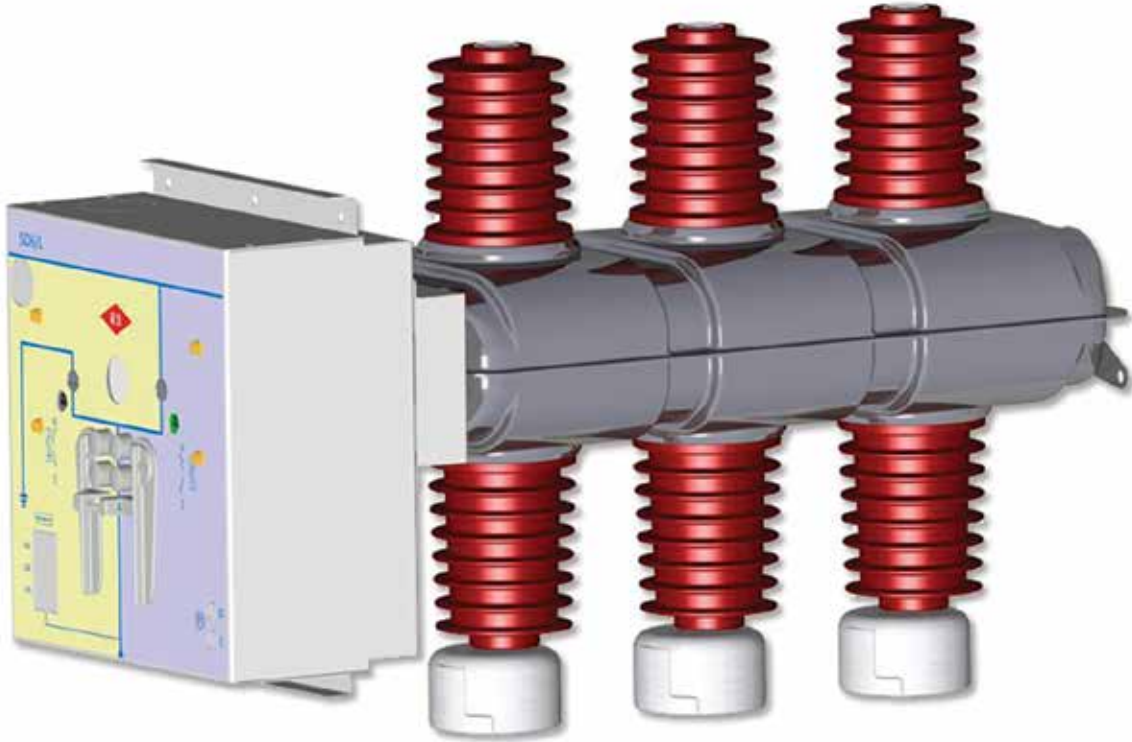


- 1 - Operating mechanisms box
- 2 - Manometer
- 3 - Inspection window
- 4 - Earthing-switch operating seat
- 5 - Voltage signalling lamps
- 6 - Key interlock
- 7 - Switch-disconnector operating seat

- 8 - Upper terminal
- 9 - Insulator
- 10 - Safety valve
- 11 - Stainless steel body
- 12 - Electrical field adapter
- 13 - Lower terminal

8 - ME6 Components

B. D6 DISCONNECTOR



CHARACTERISTICS OF COMPONENTS

Structurally, the disconnecter type D6 is similar to the SD6/L switch-disconnector with the changes as below listed.

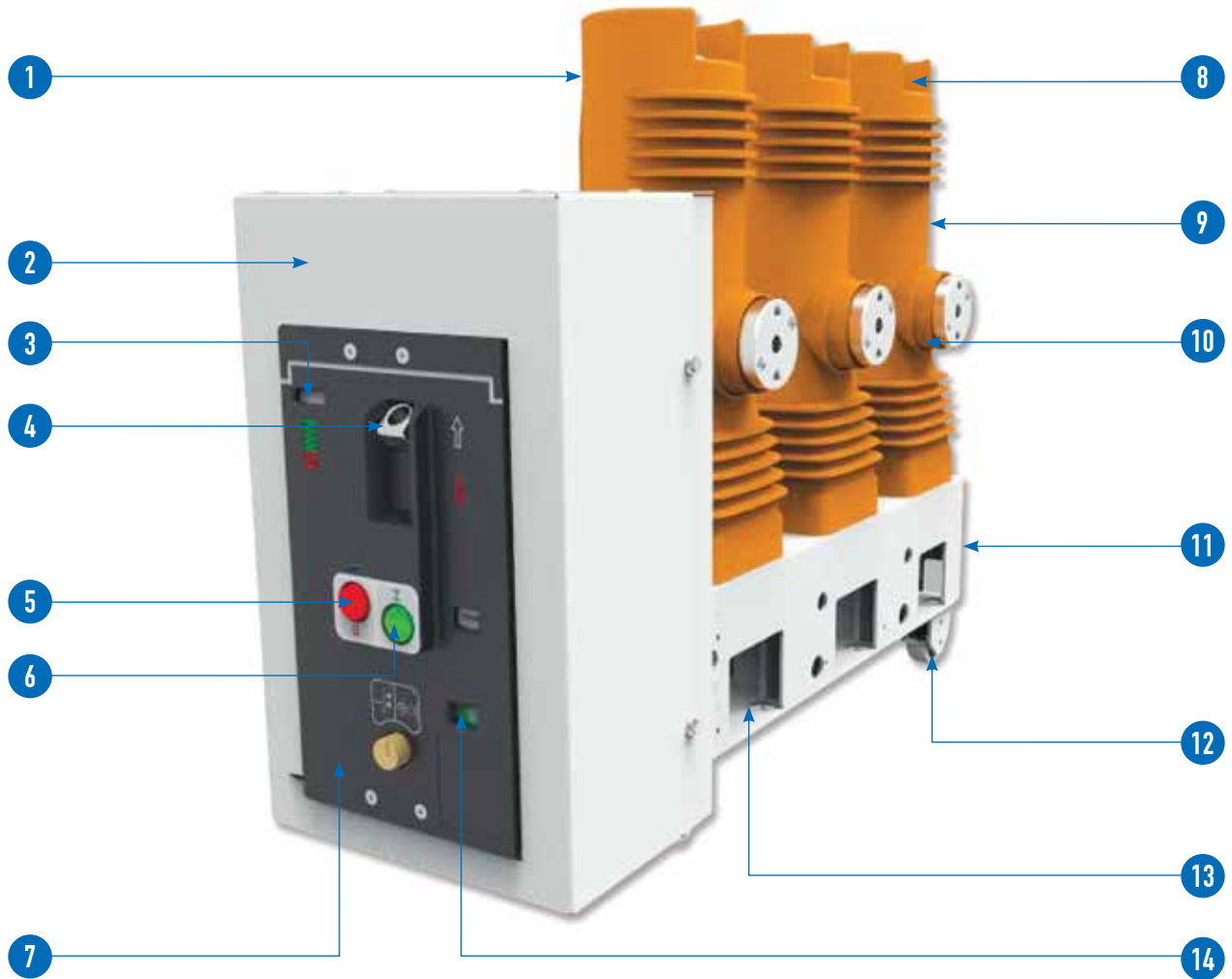
Elimination of the arc-breaking contacts.

Elimination of the blowing device.

The disconnecter is equipped, both for closing and opening operations, with a manual operating mechanism. Operation can be fitted with a keylock, padlock facility and auxiliary contacts. The disconnecter can be coupled with an earthing switch type "ST" (when it is used with a circuit breaker).

8 - ME6 Components

C .Vacuum Circuit Breaker



- 1 - Epoxy housing
- 2 - Mechanism cover
- 3 - Spring charge indicator
- 4 - Spring charging socket
- 5 - Closing button
- 6 - Tripping button
- 7 - Front sheet

- 8 - Upper terminal
- 9 - Vacuum interrupter
- 10 - Lower terminal
- 11 - Support bracket
- 12 - Wheels
- 13 - Crank shaft
- 14 - On / Off indicator

8 - ME6 Components

SFA-EVK Type Circuit Breakers



Designed for use with air insulated metal enclosed switchgear and Controlgear and indoor application. EVK CB's are suitable to rapid auto-reclosing.



About Vacuum Technology

According to paschin curves, high values of dielectric strength of medium can be obtained at very low or very high-pressure levels, the characteristics of insulation at very low pressure values provide very low distance between contacts. This distance varies from 10 mm to 20 mm considering the voltage level.

Current interruption

Vacuum circuit breakers do not require an interrupting or insulation medium. In fact, the interrupters do not ionizable material.

During the separation of current carrying contacts, contact pressure reduces, real contact surface reduces, and the temperature of contacts increases to melting temperature. This produces metal vapours which initiates and supports the vacuum arc.

Maintaining until the next current zero. Due to the special geometry of the spiral contacts, the arc column is kept rotating by the radial magnetic field produced in order to involve a wider surface than that of a fixed contracted arc. Thus, overheating and erosion of the contacts are prevented, so the lifespan of circuit breaker is increased.



8 - ME6 Components

SFA-EVK VCB Accessories

Auxiliary Contact group:

This contact takes initial force from the drive shaft of breaker, so changes its position with open/close operations of breaker. If not specified, the default components are 6 normal open (NO) and normal close (NC) contacts. These are used in the open/close control of breaker.



Anti-Pumping Device:

The anti-pumping device prevents close operation if electrical commands of open and close appear at the same time. By doing so, possibility of breaker failure is reduced. The control circuit have anti-pumping release



Open/Close Releases:

All mechanisms based on stored energy principle must have opening and closing releases. The opening/closing releases used in opening/closing circuits, respectively. The operating voltages of releases must be specified at order by client.



Spring Charging Motor:

Used to charge closing spring automatically.



8 - ME6 Components

Technical data sheet

Manufacturer	Alfanar/SFA electric
Type	EVK 17.5
Class	E2 C1 M2 S1
Voltage	17.5 kV
Lighting impulse withstand voltage	95 kV
Power frequency withstand voltage	38kV
Frequency	60 Hz
Normal current	630 A
Short circuit making current	65 kA
Short circuit breaking current	25 kA
Operating sequence	O – 0.3sec – CO - 3min - CO
Short circuit duration	1 s
Operating mechanism Type	SFA electric
Closing device voltage	48 VDC (1)
Opening device voltage	48 VDC (2)
Motor voltage	220 VAC (3)
Temperature class	-10 C to 55 C
Operating altitude	1000m*
Applied standard	62271-100

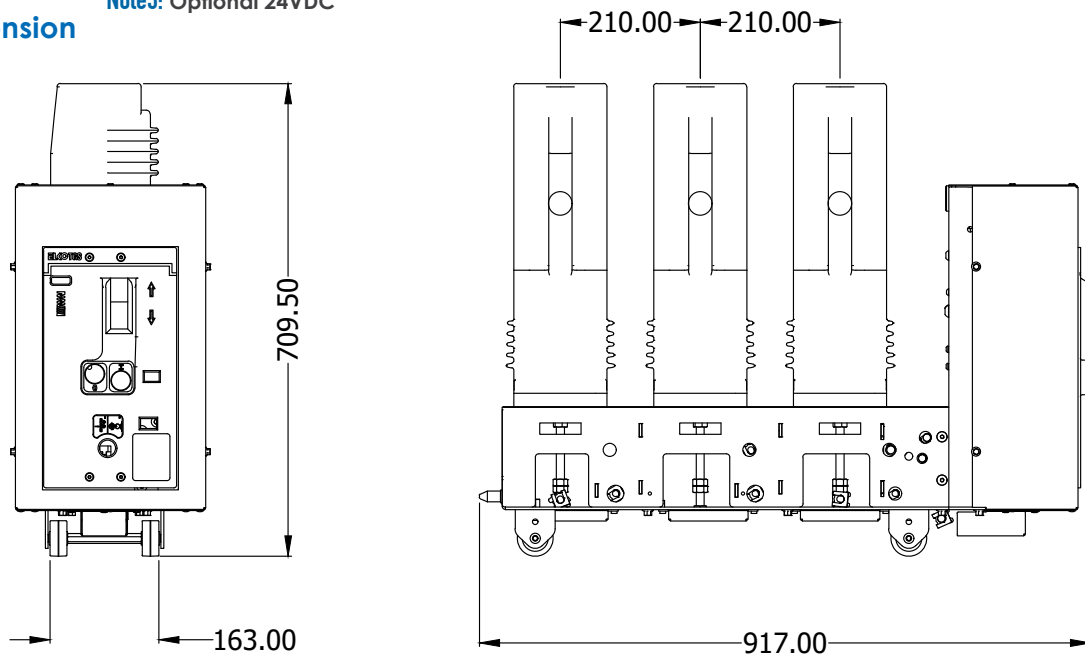
* for more than 1000m please contact [alfanar](#)

Note1: Optional 125VDC,110VDC,220VAC

Note2: Optional 125VDC,110VDC,220VAC

Note3: Optional 24VDC

Dimension



8 – ME6 Components

D. Current transformers



As per IEC-60044-1 and SEC specification 50-SDMS-01

A current transformer is designed to convert the primary rated current which flows through the primary winding. The secondary winding must generally be short circuited at any time, otherwise dangerous high voltages can occur at the secondary terminals. The secondary connected devices are connected in series.

Current Transformers can be equipped with one or more independent magnetic cores with equal or different characteristics for measuring, metering and/or protective purposes.

Current Transformer Types

- Indoor support-type current transformer in block-type design
- Indoor support-type current transformer in single-turn design
- Indoor bushing-type current transformer in single-turn design
- Indoor bar-primary bushing-type current transformer

Important note:

Accuracy class for measuring CT is the limit of the percentage current error at rated current I_N . Generally, current transformers are used for a measuring range of 5 % to 120 % of the rated primary current.

As per IEC-60044-2 and SEC specification

Voltage transformers have only one iron core with attached secondary winding (s).

If an open delta circuit (da-dn) is necessary, an additional winding can be provided for single pole insulated transformers. It is extremely dangerous to short circuit a voltage transformer. For single pole insulated transformers the end of the primary winding is grounded as "N" inside of the secondary terminal box, and must not be removed during operation.

- Earthed (single-phase) or unearthed (double-phase) indoor transformers in various sizes
- Two phase to phase voltage transformers
- Fixed at feeder side of the circuit breaker for metering purpose.
- Dry type, epoxy encapsulated

F. Voltage Transformers



G. Control Power Transformers

As per IEC-60044-2 and SEC specification

ME6 not require any external auxiliary AC/DC power supply

- One phase to phase voltage transformers
- Connected to the bus-bar side
- Dry type, epoxy encapsulated

H. Earth Fault indicator



SEC approved type with automatic resetting on 220-230V

- Split core type sensor supplied.
- EFI protected inside separate sunshield cover with a mesh front.
- EFI installed on the left-hand side line-feeder.
- Two auxiliaries contacts provided
- Three-pin plug for testing provided.

8 – ME6 Components

I. Protection Relay

Major Features and Benefits

- Phase, ground, and negative-Thermal protection
- ANSI and IEC time-overcurrent curves
- Trip circuit supervision / Trip lockout function
- Disturbance / Events /Fault recorder
- Circuit-breaker failure
- Hardware options for mounting, terminals, output contacts, and communications
- Current / thermal / unbalance metering
- Supports IEC 61850, IEC 60870-5-103, Modbus, Profibus and DNP3 communication protocols.

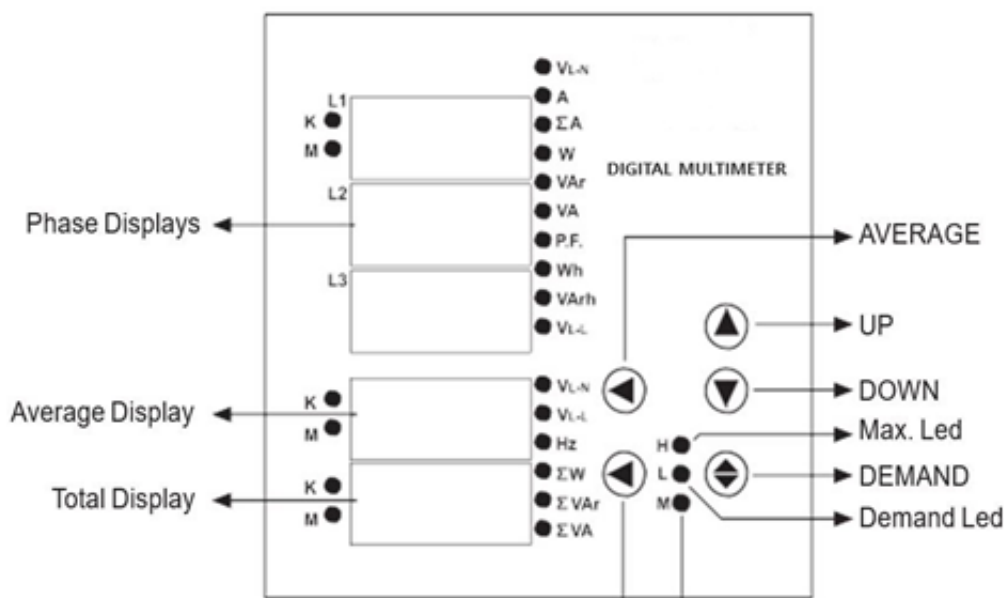
J. Load Management System

The LMS Control and monitor the consumer's load during normal conditions and peak time.

- In normal conditions, if the consumer exceeds the contracted load, the LMS give alarm then trips the breaker after a pre-set time delay.
- During peak time, if the consumer exceeds the load previously determined by SEC, the LMS give alarm and tripping / closing the breaker in a sequence and time delay provided by SEC.
- The LMS restore the power automatically after the peak period is over without the intervention of any operator.

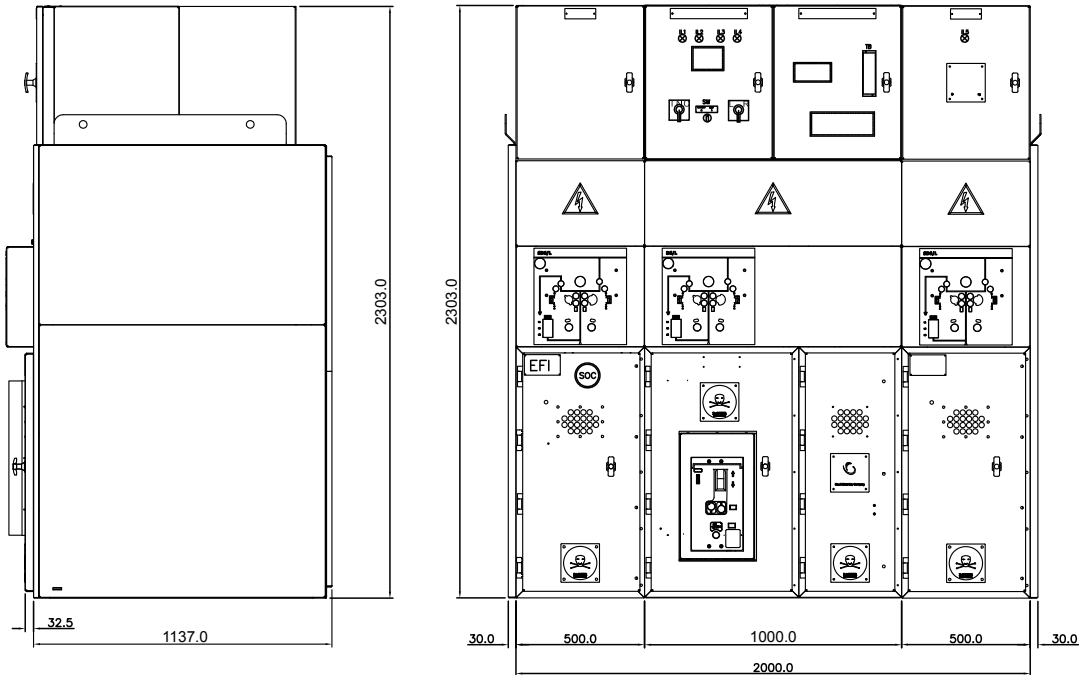
K. Digital Multimeter

Developed for measuring all the electrical parameters on network. Measured parameters are shown in 5 separate displays array. This allows to monitor more than 40 parameters at the same time. Current and Voltage transformers ratios can be adjusted. Min. and Max. values for phase voltage, phase current and total current demand values for phase current, total current and total active, reactive and apparent power are recorded. DMM has MODBUS serial interface option



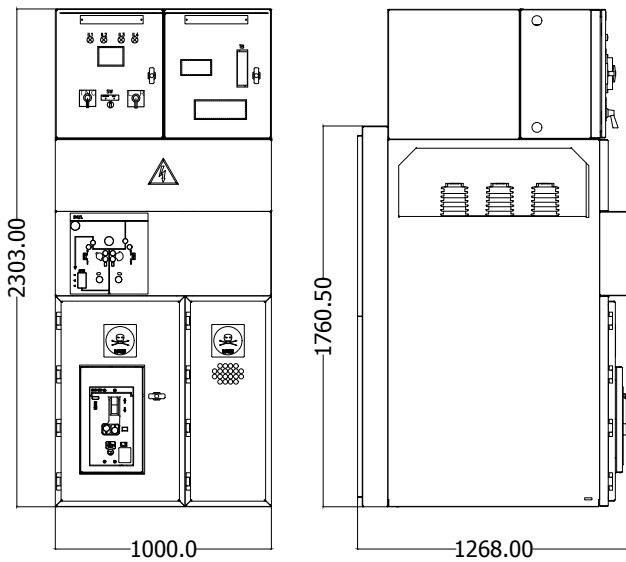
9 - Dimensions layout

ME6 dimension as MRMU

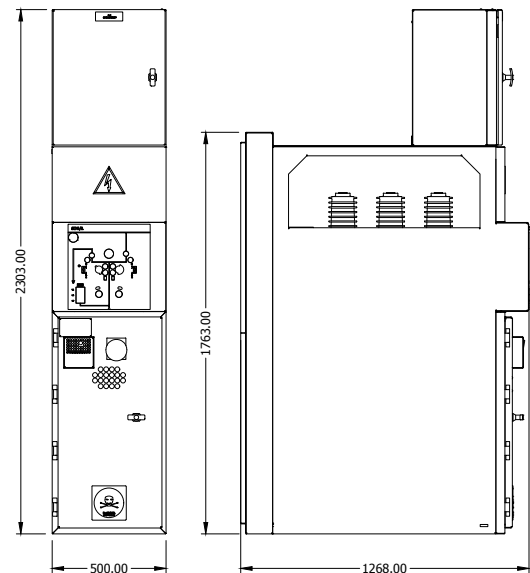


Height	Depth	Width	Weight
2303 mm	1137 mm	2060mm	1400 Kg

PG Dimension



L5 Dimension

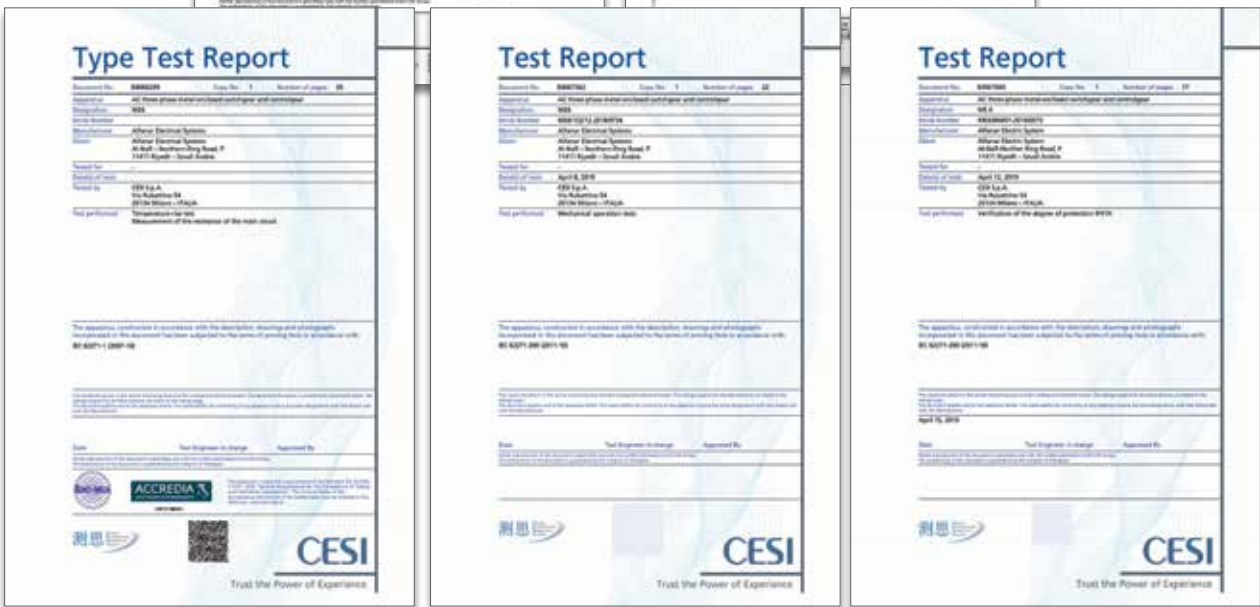
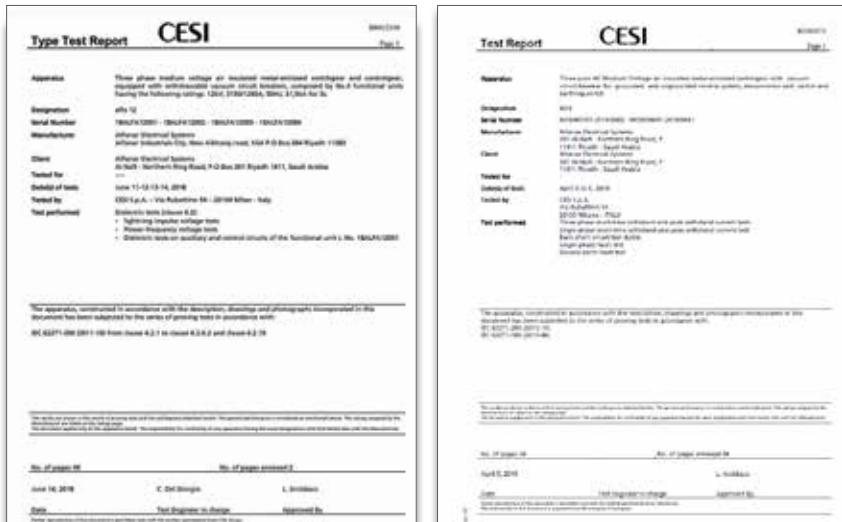


10 - Type test

ME6 has undergone all the tests required by the international (IEC) Standards. In addition, tests were carried out on ME6 units considered most sensitive to the effects of the tests and therefore the results were extended across the whole range.

1. Impulse withstand-voltage tests
2. Power frequency withstand-voltage tests.
3. Temperature-rise tests.
4. Short time current tests
5. Verification of making and breaking capacity.
6. Mechanical endurance/operation tests.
7. Verification of degrees of protection for persons against contact with live and moving parts.
8. Internal arc tests.
9. Protection degree test to IEC 60529.

Each switchgear unit is subjected to routine tests in the factory before delivery.



Notes

A series of horizontal dotted lines for writing notes.



For catalogue soft copy scan QR code

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