

HIGH VOLTAGE AND LOW VOLTAGE SWITCHGEAR

High Voltage & Low Voltage Switchgear

AL-AHLEIA SWITCHGEAR CO.
K.S.C.C.

Kuwait



Driven by a vision to pioneer, ASC has risen from its humble beginning more than 25 years ago of a sole factory for LV boards, to an organisation boasting of 11 factories managing LV & HV Switchgear, Transformers and Package Sub-stations, establishing itself as the largest power equipment manufacturer in the region.

ASC takes pride for being the leading local manufacturer of HV products, transformers and package S/S. Over time, ASC products have attained a reputation for quality, reliability as well as sustainability which gained recognition in the industrial sector in the Middle East.

All products have been developed inside the walls of the factory and will continue to improve, because progress stops once the spirit of pioneering is lost.



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II- LOW VOLTAGE SWITCHGEAR

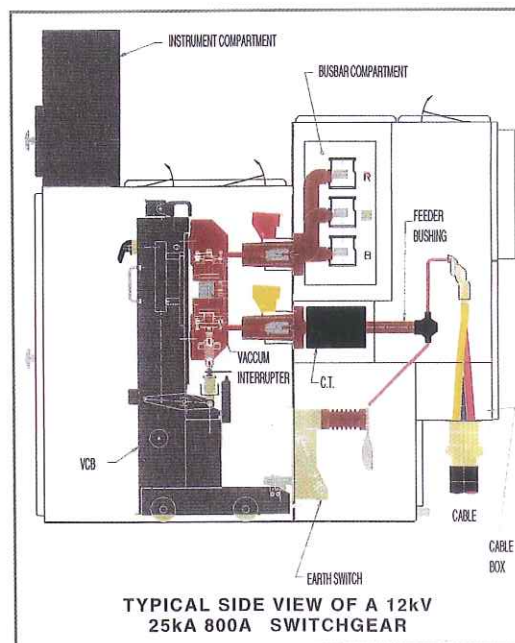
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I- HIGH VOLTAGE SWITCHGEAR

1. 15KV SINGLE BUSBAR AIR INSULATED SWITCHGEAR TYPE AH12

Fully Type tested air insulated, extensible switchgear comprises of Horizontal Isolation and Horizontal Drawout Vacuum Circuit Breaker, CTs/PTs (as applicable), earth switch and cable box.

TECHNICAL DATA



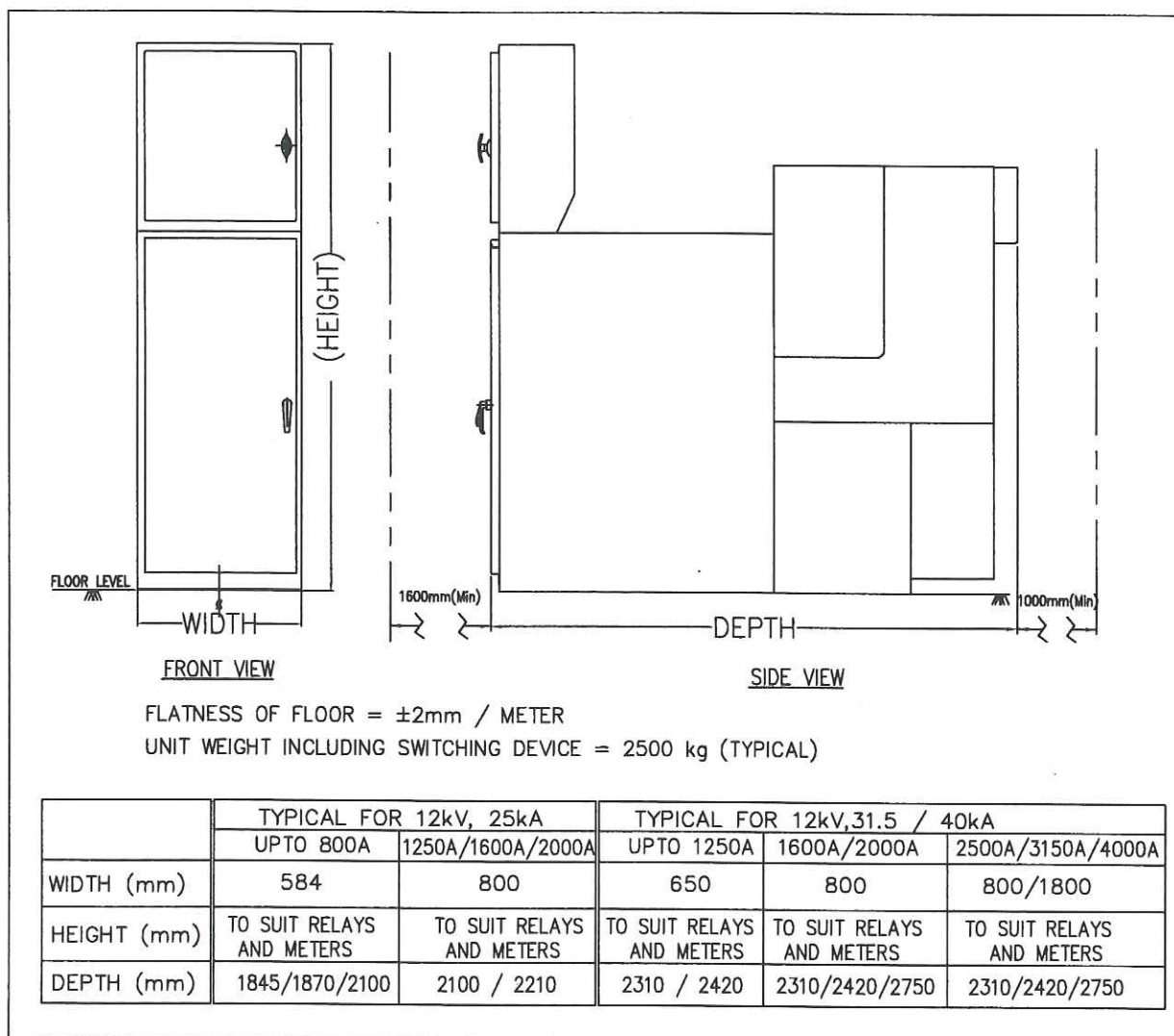
Internal Arc Fault Tested

Type	: AH12
Voltage rating	: Up to 15kV
Frequency	: 50 Hz / 60 Hz
Normal circuit current	: Up to 3150A / 4000A with forced cooling
Normal busbar current	: Up to 4000A
Short circuit breaking current	: Up to 40kA
Short time rating-Main circuit	: Up to 40kA-3sec, 110kA peak
Earth Circuit	: Up to 40kA-3sec, 110kA peak
P.F. Withstand voltage	: Up to 38kV
Impulse withstand voltage	: Up to 95kV peak
Internal Arc Fault test	: Up to 40kA, Criteria 1 to 5 as per Annexure A of IEC 62271-200
Degree of Protection	: As required.
Applicable Standards	: IEC 62271-200 / IEC 62271-100 / IEC 62271-102

SALIENT FEATURES

- Loss of service continuity category : LSC2B (as per IEC 62271-200).
- Partition Class : PM (Metallic) (as per IEC 62271-200).
- Accessibility of compartment:
 - Busbar compartment : Tool based.
 - Cable compartment : Tool based.
 - Switching compartment : Interlock based.
- Fully interlocked VCB trolley & Earth switch.
- Pressure relief flap for individual HV compartment.
- Fully insulated / shrouded busbars & bus connections.
- Cable box suitable for heat shrinkable PILC/XLPE cable termination.

OVERALL DIMENSIONS

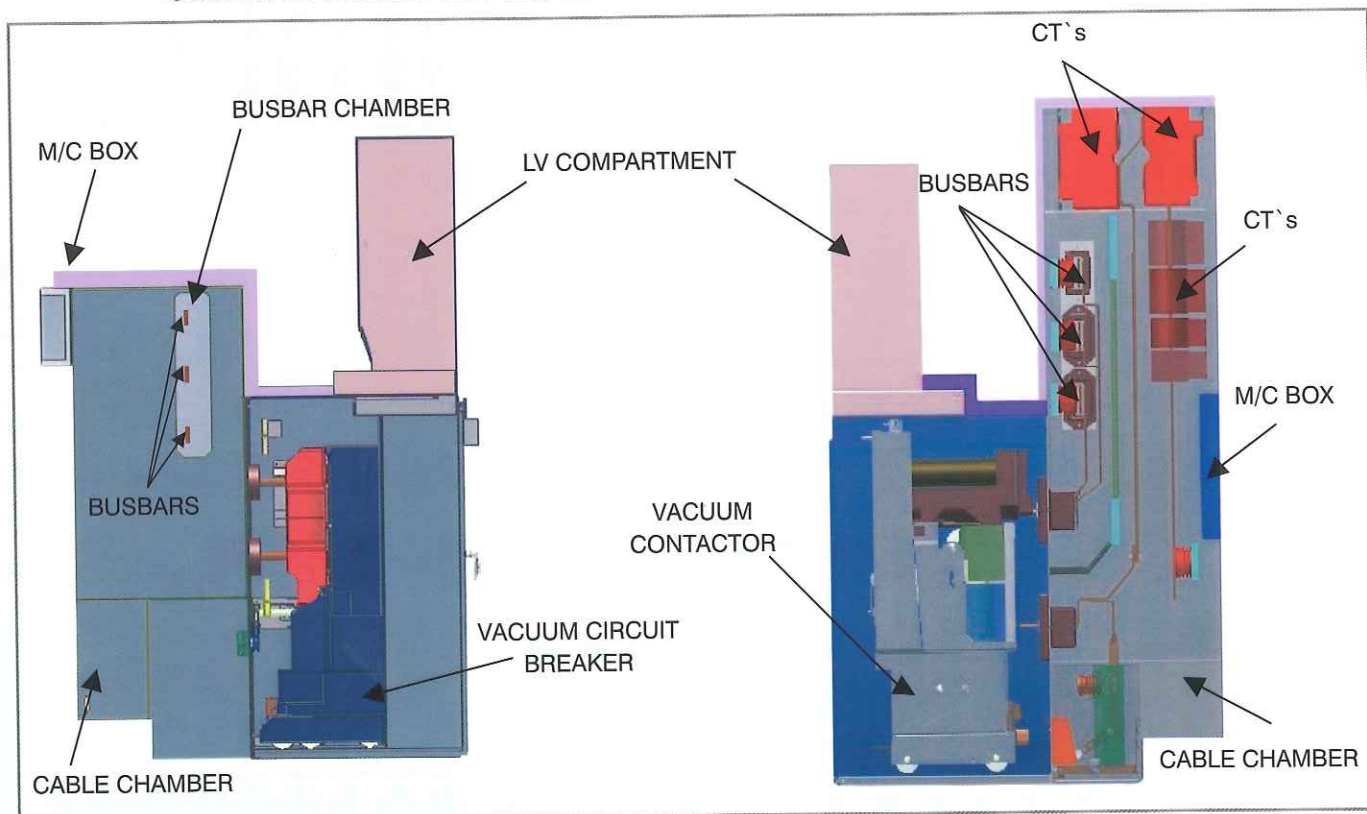


2. 7.2KV SINGLE BUSBAR AIR INSULATED SWITCHGEAR TYPE AH12

AH12 SWITCHGEAR is fully type tested air insulated extensible switchgear consisting of horizontal isolation and horizontal draw out Vacuum Circuit Breaker / Vacuum contactor, CTs / PTs (as applicable), Earthing Switch and Cable box.

SALIENT FEATURES

- Loss of service continuity category : LSC2B (AS PER IEC 62271-200)
- Partition class : PM (METALLIC) (AS PER IEC 62271-200)
- Accessibility of compartment :
 - Busbar compartment : Tool based.
 - Cable compartment : Tool based.
 - Switching compartment : Interlock based.
- Robust metal enclosed with cubicle construction
- All operations of the switchgear can be carried out from the front of the cubicle with cubicle door closed.
- Fully interlocked VCB trolley and Earthing Switch.
- Pressure relief flap for all HV compartments.
- Fully insulated / shrouded busbars & bus connections.
- Cable box suitable for heat shrinkable XLPE cable termination.



TYPICAL SIDE VIEWS OF AH12 SWITCHGEAR

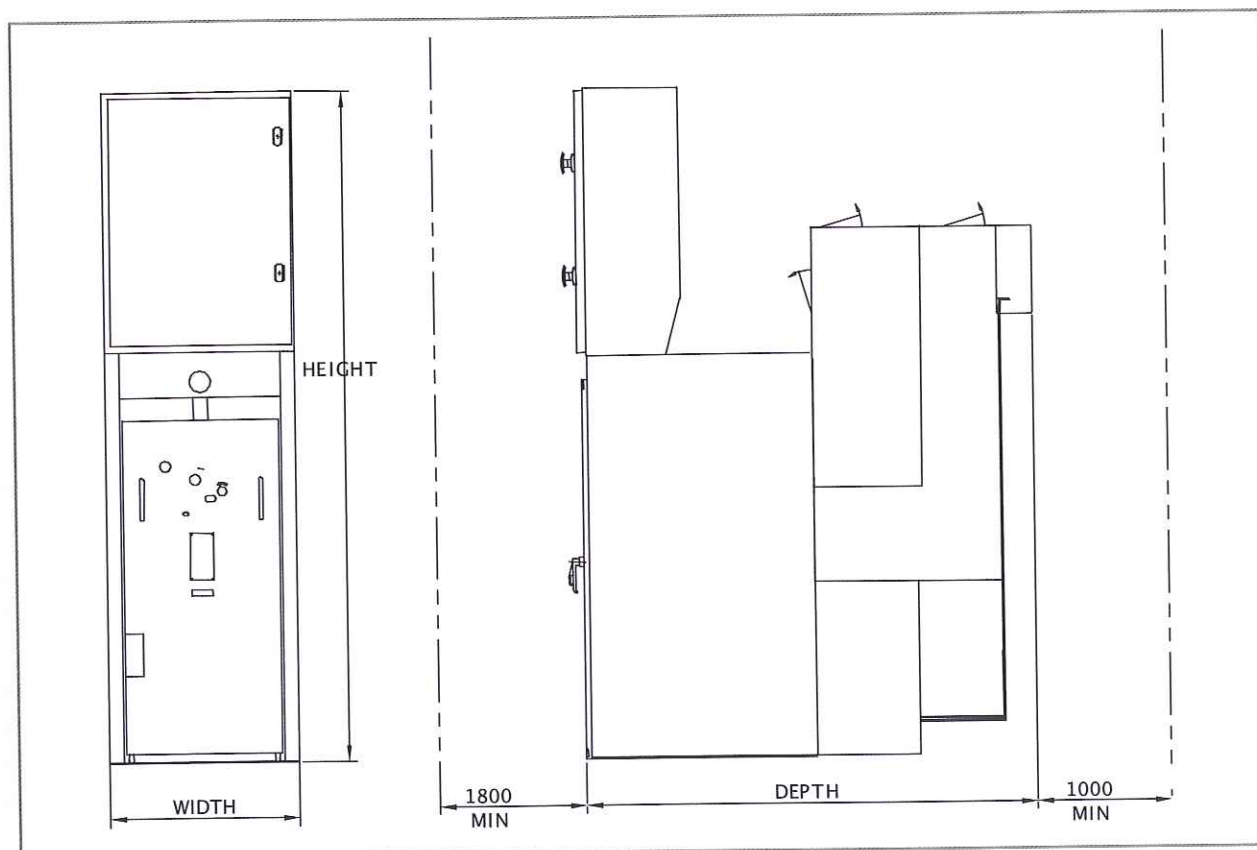
TECHNICAL DATA

			VCB PANEL	CONTACTOR	STARTER	COMBINATION
1	Rated voltage	Ur [KV]	7.2	7.2	7.2	7.2
2	Power frequency withstand voltage	Ur [KV]	20	20	20	20
3	Impulse withstand voltage	Up [KV]	60	60	60	60
4	Rated frequency	fr [Hz]	50/60	50/60	50/60	50/60
5	Rated operational current	Ie [A]	2000	400	400	400
6	Rated short- time withstand current	Ik [KA]	Up to 40kA	6	6	Up to 40 KA
7	Rated peak withstand current	Ip [KA]	Up to 40kA	15	15	Up to 100 KA
8	Rated duration of short circuit current	Tk [sec]	-	1	1	1
9	Rated short circuit breaking capacity	Isc [KA]	Up to 40kA	6	6	Up to 40 KA
10	Rated short circuit making capacity	Ima [KA]	Up to 100kA	15	15	Up to 100 KA
11	Utilization category	-	-	AC4	AC4	AC4
12	Rated supply of auxiliary And control circuit	Ua [Vac/Vdc]	110V DC	230AC	230AC	230AC
13	Degree of protection	-		AS REQUIRED		
14	Opening time	[msec]	-	100-120	100-120	100-120
15	Closing time [msec]	[msec]	-	150-240	150-240	150-240
16	Highest rating for motor starter	[KW]	[see note-1]			
17	Electrical life	[No. of operation]	-	1000000	1000000	1000000
18	Mechanical life	[No. of operation]	-	1000000	1000000	1000000

Note-1 : Consult ASC for motor starter rating. It depends upon number of starts per hour and run up time.

Typical value : for 1100 KW motor starter for 12 starts per hour and 6 sec run up time.

OVERALL DIMENSIONS AND WEIGHT



FLATNESS OF FLOOR = $\pm 2\text{mm/METRE}$

UNIT WEIGHT INCLUDING SWITCHING DEVICE = 2000 KG

	TYPICAL FOR 7.2 KV,25 KA, VCB PANEL		TYPICAL FOR 7.2 KV,40 KA, VCB PANEL		VACUUM CONTACTOR PANEL
BUSBAR / FEEDER RATINGS	2000A / UPTO 800 A	2000A / 1250A / 1600A UPTO 2000A	2000A / UPTO 1250A	2000A / 1600A UPTO 2000A	2000A / 400A
WIDTH (mm)	584	800	TO SUIT RELAYS AND METERS	800	435
HEIGHT(mm)	TO SUIT RELAYS AND METERS	TO SUIT RELAYS AND METERS	1540	TO SUIT RELAYS AND METERS	TO SUIT RELAYS AND METERS
DEPTH (mm)	1540	1540	1540	1540	1540

3. HORIZONTAL ISOLATION VACUUM CIRCUIT BREAKER TYPE AH12

The AH12 Horizontal Drawout and Horizontal Isolation Vacuum Circuit Breakers are suitable for use up to 15kV rated voltage.

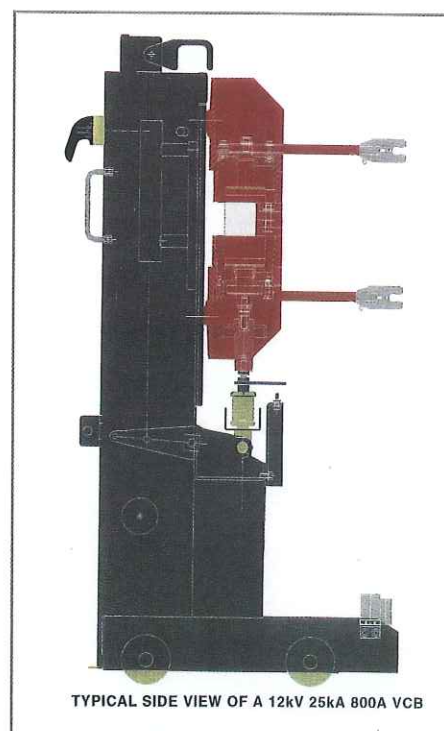
TECHNICAL DATA

Type	: AH12
Voltage/Frequency	: 12kV/15kV / 50/60Hz
Normal Current	: Up to 3150A / 4000A with forced cooling
Short-time Current	: Up to 40kA for 3secs.
P.F. Withstand	: Up to 38kV
Impulse Withstand	: Up to 95kVp
Applicable Standard	: IEC 62271-100
S.C. Breaking Current	: Up to 40kA
Making Capacity	: Up to 110kAp
Operating Sequence	: O-3min-CO-3min-CO O-0.3sec-CO-1min-CO
Operating Mechanism	: Manual / Motorized
Rated Voltage of Closing and	: 24/30/50/110/220V DC

Rated Voltage of Charging Motor : 30/50/110/220/240V AC/DC

SALIENT FEATURES

- Excellent breaking performance.
- Reduction of maintenance cost.
- Non-inflammability.
- High reliability and long life.
- No hot gas discharged outside.
- Totally self contained.
- Very short contact travel.
- Small inertia. Permits very frequent switching.
- Fully interlocked.



4. AIR INSULATED DOUBLE BUSBAR SWITCHGEAR

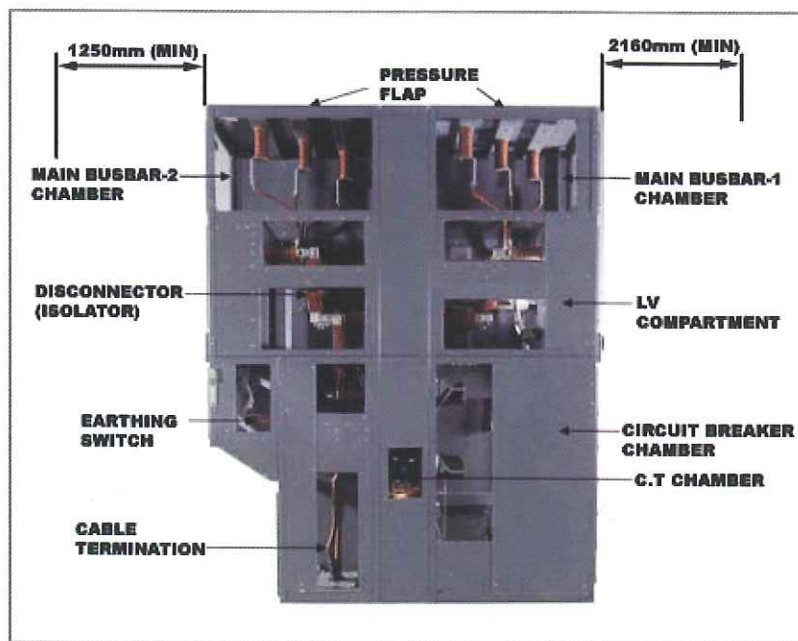
Fully Type tested air insulated, extensible double busbar switchgear comprises of Horizontal Isolation and Horizontal Drawout Vacuum Circuit Breaker, Disconnectors, CTs/PTs (as applicable), earthing switch and cable box.

TECHNICAL DATA

Type	: AH12
Voltage rating	: Up to 15kV
Frequency	: 50 Hz / 60 Hz
Normal circuit current	: Up to 3150A
Normal busbar current	: Up to 4000A
Short circuit breaking current	: Up to 40kA
Short time rating-Main circuit	: Up to 40kA-3sec, 100kA peak
Earth Circuit	: Up to 40kA-3sec, 100kA peak
P.F. Withstand voltage	: Up to 38kV
Impulse withstand voltage	: Up to 95kV peak
Degree of Protection	: As required.
Applicable Standards	: IEC 62271-200 / IEC 62271-100 / IEC 62271-102

SALIENT FEATURES

- Loss of service continuity category : LSC2B (as per IEC 62271-200).
- Partition Class : PM (Metallic) (as per IEC 62271-200).
- Accessibility of compartment:
 - Busbar compartment : Tool based.
 - Cable compartment : Tool based.
 - Switching compartment : Interlock based.
- Fully interlocked VCB, Earthing switch & Disconnecter.
- Pressure relief flap for individual HV compartment. Pressure switches can be given on request.
- Fully insulated / shrouded busbars & bus connections.
- Cable box suitable for heat shrinkable PILC/XLPE cables.
- Motorized disconnecter operation (optional).
- Provision for mounting fire fighting equipment.



Typical cross sectional view Outgoing Panel

OVERALL DIMENSIONS (in mm)

Busbar ratings up to 4000A

Typical for	12kV, 25kA up to 800A	12kV, 25kA up to 2000A	12kV, 40kA up to 1250A	12kV, 40kA up to 2500A
Width (W)	584	800	650	800
Depth (D)	2200	2200	2200	2200
Height (H)	2800	2800	2800	2800

5. 36KV GAS INSULATED SWITCHGEAR

Fully type tested gas insulated extensible switchgear offers single / double busbar metal enclosed construction. It consists of fixed VCB, 3 position disconnecter, CT/VT (as applicable) and air insulated cable box. A vacuum circuit breaker is used for switching of short circuit / operating currents and SF6 gas is used to insulate all HV parts.



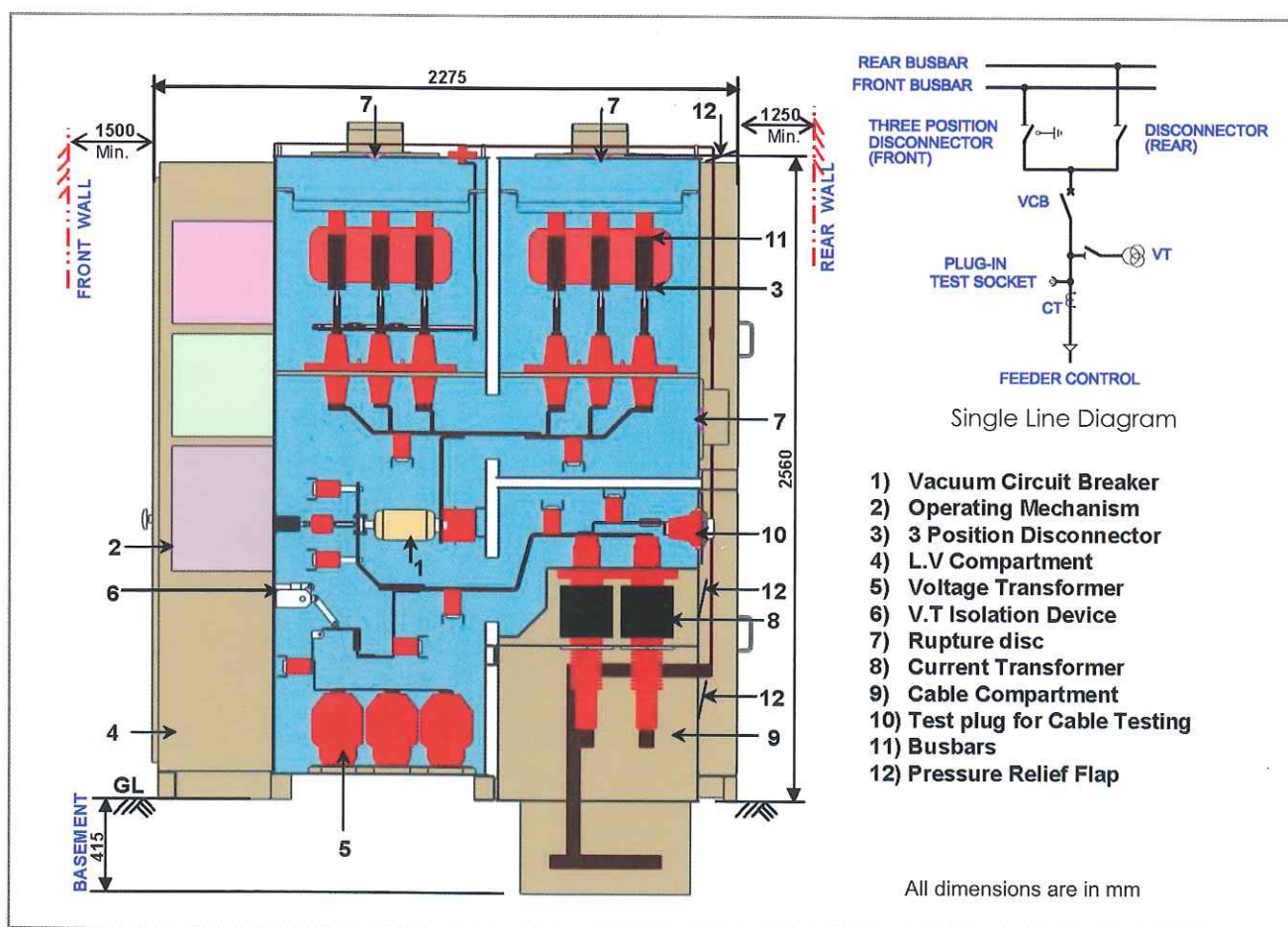
INTERNAL ARC FAULT TESTED

TECHNICAL DATA

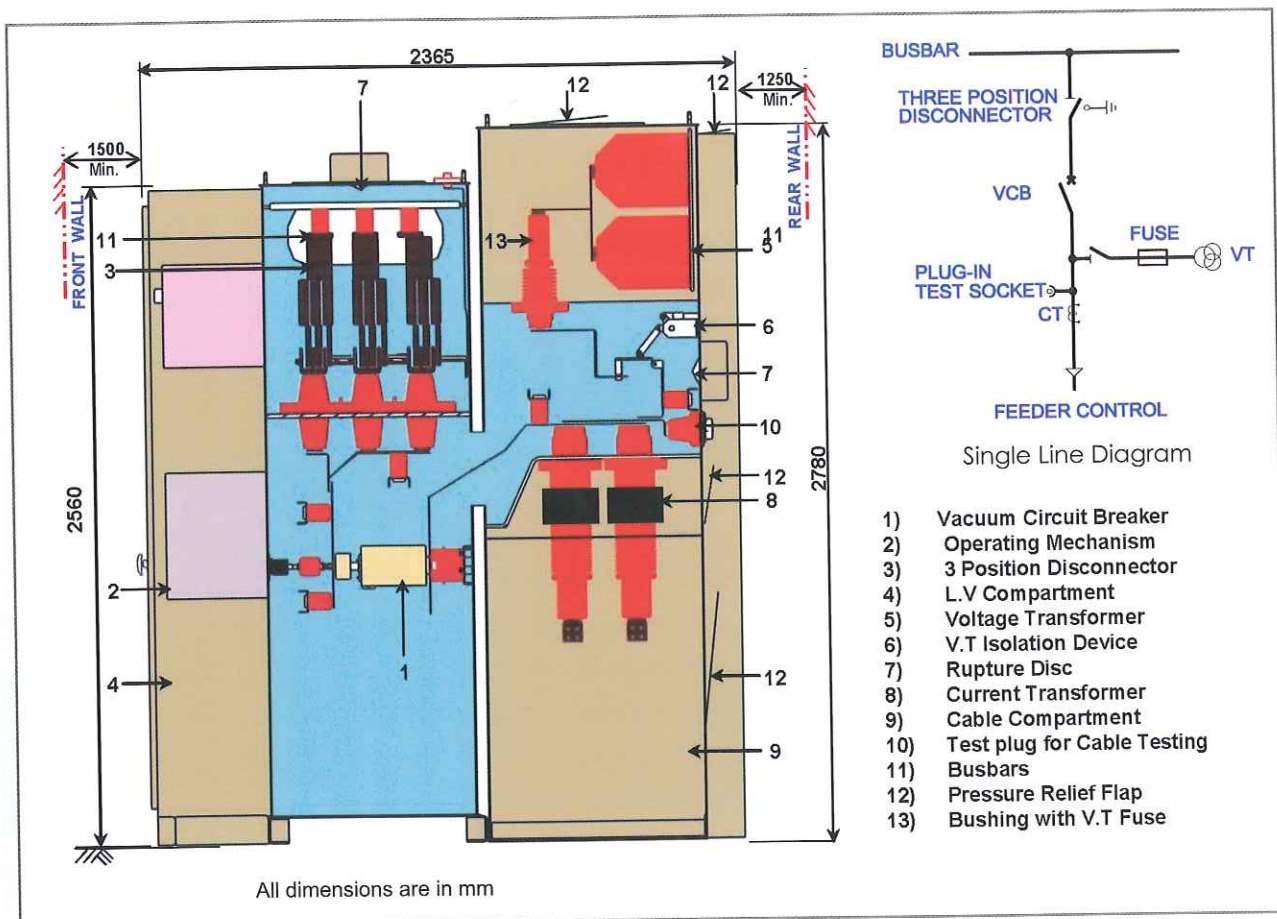
Type	: AF36
Voltage rating	: Up to 36kV
Frequency	: 50 Hz / 60 Hz
Normal circuit current	: Up to 2500A
Normal busbar current	: Up to 2500A
Short circuit breaking current	: Up to 40kA
Short time rating-Main circuit	: 25kA-3sec (62.5kA peak) : Up to 40kA-1sec (104kA peak)
Earth Circuit	: 26.3kA-3sec (66kA peak) : Up to 40kA-1sec (104kA peak)
P.F. Withstand voltage	: 70kV r.m.s
Impulse withstand voltage	: 170kV peak
Internal Arc Fault Test	: Up to 40kA-1sec, Criteria 1 to 5 as per Annexure A of IEC 62271-200
Degree of Protection	: As required.
Applicable Standards	: IEC 62271-200 / IEC 62271-100 / IEC 62271-102

SALIENT FEATURES

- All HV parts assembled inside hermetically sealed corrosion proof steel tanks and filled with SF6 gas, hence no effect of external environment.
- Sealed for life as per IEC 62271-200 & IEC 60694.
- Safety interlocking between 3P disconnecter and VCB.
- Current transformers mounted outside gas compartment for incomer / outgoing bays and mounted inside for Bussection bays.
- VT is provided with disconnecter to facilitate cable testing.
- Cable box suitable for XLPE/PILC/Plug in cable termination.
- Provision of power cable earthing and busbar earthing through 3 position disconnecter switches and VCB.
- Provision for power cable testing.
- Internal fault protection through rupturing discs, gas paths and relief flaps.
- Gas pressure monitoring for each compartment.
- Motorized operating mechanism for 3P disconnecter (Optional).
- Motorized / Manual spring closing mechanism for VCB.
- Separate control relay panel (as required).



Typical side view of 36kV, 31.5kA, 2000A, Double Busbar Switchgear



Typical side view of 36kV, 40kA, 2500A Switchgear

Gas Pressure:

- Filling Pressure: 0.04 MPa
- Minimum Functional Pressure: 0.02 MPa

OVERALL DIMENSIONS (in mm)

	Typical for 36kV, 25kA/31.5kA	Typical for 36kV, 40kA
Width (W)	666	766
Depth (D)	2275	2365
Height (H)	2560	2780
Weight (kg)	3000	3500

6. CONTROL AND RELAY PANELS

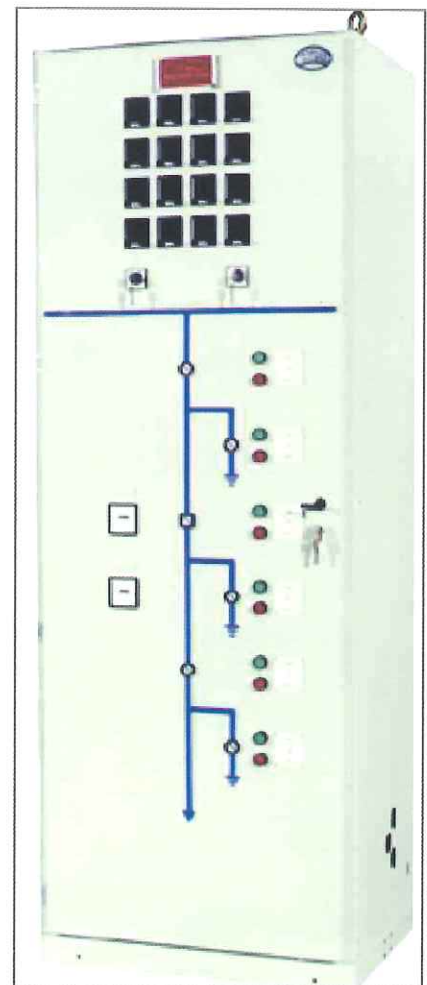
Al-Ahleia Control and Relay Panels for Switchgears upto 300 kV are designed, manufactured and supplied to suit requirements of each specification.



11 kV Remote Control and Protection Board In 'L' formation

RANGE OF CONTROL PANELS SUPPLIED

- Local Control Panels for 132 kV Switchgear
- Remote Control Panels for 132 kV and 300 kV Switchgear
- Relay Panels for 132 kV Switchgear
- Remote Control and Relay Panels for 11 kV and 33 kV Switchgear
- Tap Changer Control Panels for 132 / 11 kV and 300 / 132 kV Transformers
- Pilot Marshalling Cabinets
- Telemetry Terminal Transfer Cabinets
- Annunciator Panels
- Synchronising Panels



Local Control Panel for 132kV GIS

DESIGN AND CONSTRUCTION

A group of specialised Engineers and Draughtsmen having in-depth knowledge do the design of the electrical schemes for control and protection for all types of applications. Al-Ahleia is well equipped with latest CAD/CAM facility to undertake execution of orders for custom-built panels. High quality neatly wired Panel Boards of various sizes with coloured mimic can be provided for various requirements. Construction types include.

- Standard 600/800mm wide panels
- Relay panels with glass doors
- Duplex Control Panels with walkway
- Panels in 'L' and 'U' formation.

TECHNICAL SPECIFICATION

Reference Standard	: IEC 60439-1
Rated Insulation Voltage	: 690 V, 50 Hz / 60 Hz
Degree of Protection	: IP 51 (higher values on request)
Paint Colour Shade	: Light Grey Shade RAL 7032 (Other colours on request)
Cable Entry	: Bottom
Access	: Front / Rear

QUALITY ASSURANCE

Al-Ahleia is fully equipped to conduct all tests at works before supply of equipment to site. Testing facility includes primary and secondary injection test equipments for all types of relay testing.

INSTALLATION, TESTING AND COMMISSIONING

A team of professionals is available to undertake complete installation, testing and commissioning of all types of Control and Relay panels at site. Latest equipments are available to undertake complete testing and commissioning of all types of requirements.



7. BATTERY CHARGERS

INTRODUCTION

Al-Ahleia battery charger panels are designed and manufactured to suit the load requirements of each specification. Battery charges of rated D.C. voltage 24V, 30V, 50V, 110V, and 220V can be supplied.

FEATURES

- a. Nickel Cadmium or lead acid batteries as required.
- b. Permanent connection of battery to charger.
- c. Automatic high rate / low rate declining current charging or constant voltage charging.
- d. Natural cooling of components.
- e. Ideally suited for switchgear auxiliary supply.
- f. Complete input / output isolation.
- g. DC load normally fed from mains supply.
- h. Wall mounted or floor mounted design.
- i. Test facility for battery charge level (optional).
- j. Replaceable miniature fuses for A.C. and D.C. are provided on front panels for ease of maintenance (optional).



50VDC, 45A
BATTERY CHARGER

CONSTRUCTION

The enclosures are made out of zinc coated sheet steel and powder coated. Sheet steel fabrication work is done on automated CNC machines ensuring high quality.

QUALITY STANDARDS

AL-AHLEIA is equipped with testing facilities for all routine tests as per IEC/BS standards and customer specifications.



**SELF CONTAINED BATTERY AND
CHARGER FOR 50V DC.**