BEGEL ENERGY

Mobile Substation

5-31.5MVA

Easy Move, Quick Set and Solid Supply !!

Mobile Substation

Easy Move, Quick Set and Solid Supply !!

132/11.5kV Compact 10 MVA Mobile Substation (All in one trailer type)

Features — Mobile substation is :

1. set on the site in the shortest possible time, and Operation can be started immediately.
2. available as a permanent substation, or as an emergency installation for substation failures etc.
3. utilized as a tentative substation facility for Civil Engineering and Construction works etc.
4. compactly reduced its width to the transport-body during transportation.
5. easily transportable to peak-load area.
6. least maintained by usage of all Vacuum Circuit Breakers, suitable for a long unmanned operation.

Standards

IEC, EN (BS), JEC, etc.,

Ratings

High voltage side	
Phase	3
Frequency (Hz)	50, 60
Rated voltage (KV)	33, 66, 77, 110, 132, 138
Breaking Capacity (kA)	25, 31.5
Bank Capacity (MVA)	5, 7.5, 10, 15, 20, 25, 31.5
Connection	Over-head line or Busbar
Earthing system	Solidly Earthed

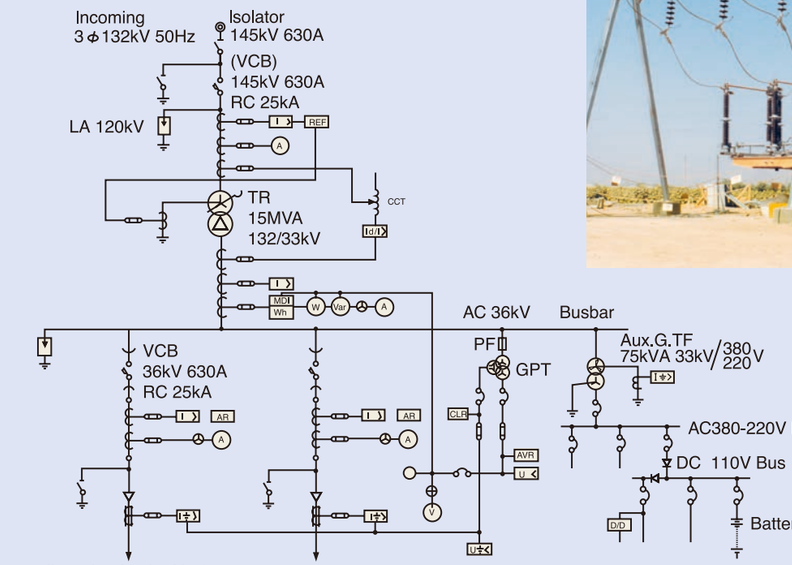
Medium Voltage side	
Rated voltage (KV)	6.6, 11, 13.8, 22, 33
Number of Feeder	1 to 6 (*)
Connection	Power cables
(*) depending on Rated voltage and Bank capacity.	

Auxiliary power supply	
AC Station service (V)	AC 380/220, 430/250
DC Station service (V)	DC110

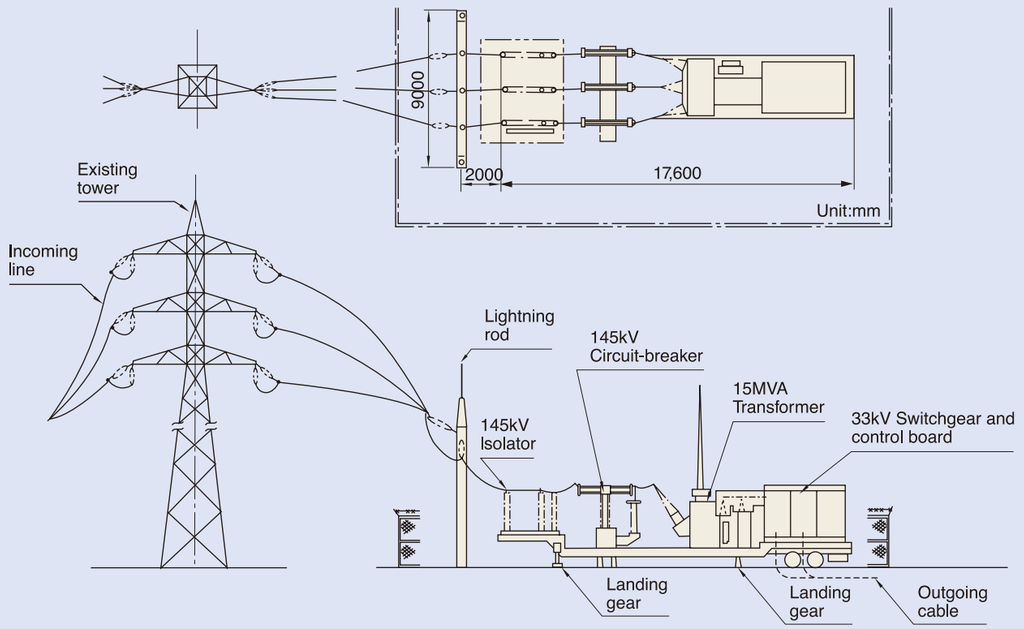
All in one trailer type

132kV/33kV Mobile Substation (All in one trailer type) under Installation

Single Line Diagram for the Compact Mobile Substation



132kV/33kV Compact 15MVA Mobile Substation (All in one trailer type)



Two trailer type

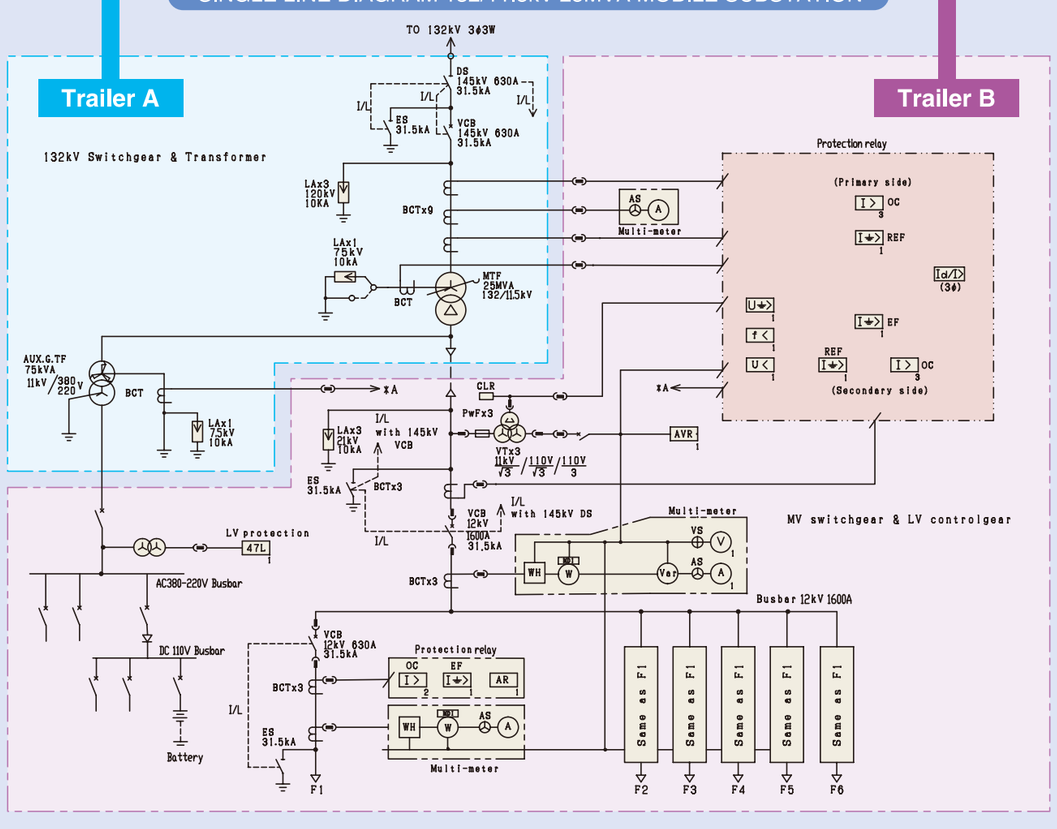
With multiple feeders for high Electricity demand

132/11.5kV Mobile Substation (two trailer type) under Installation

Trailer A

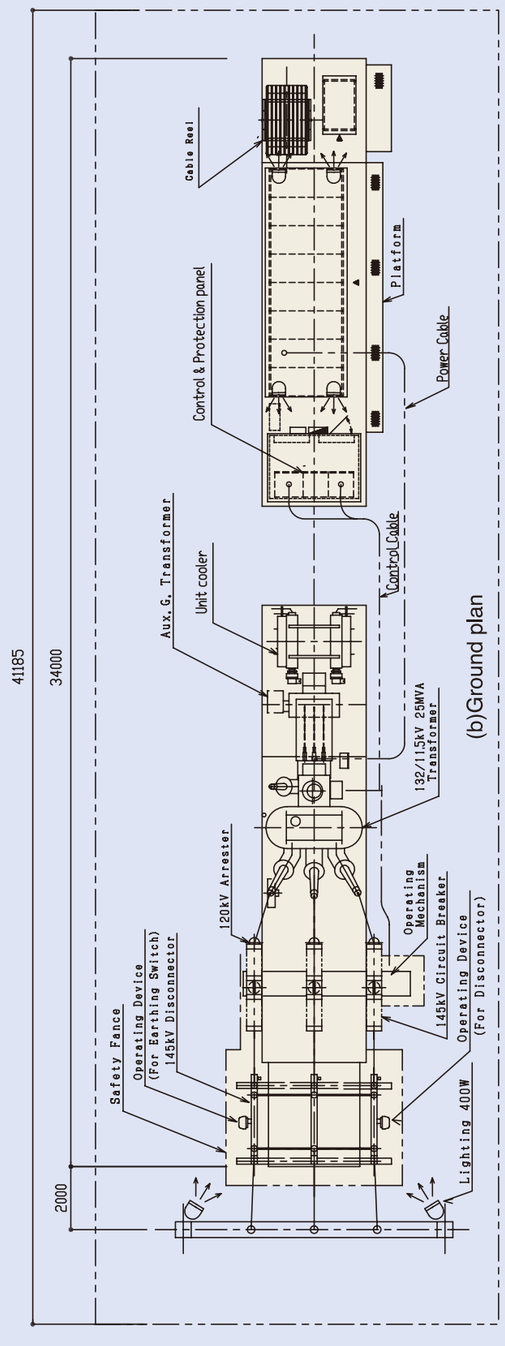
Trailer B

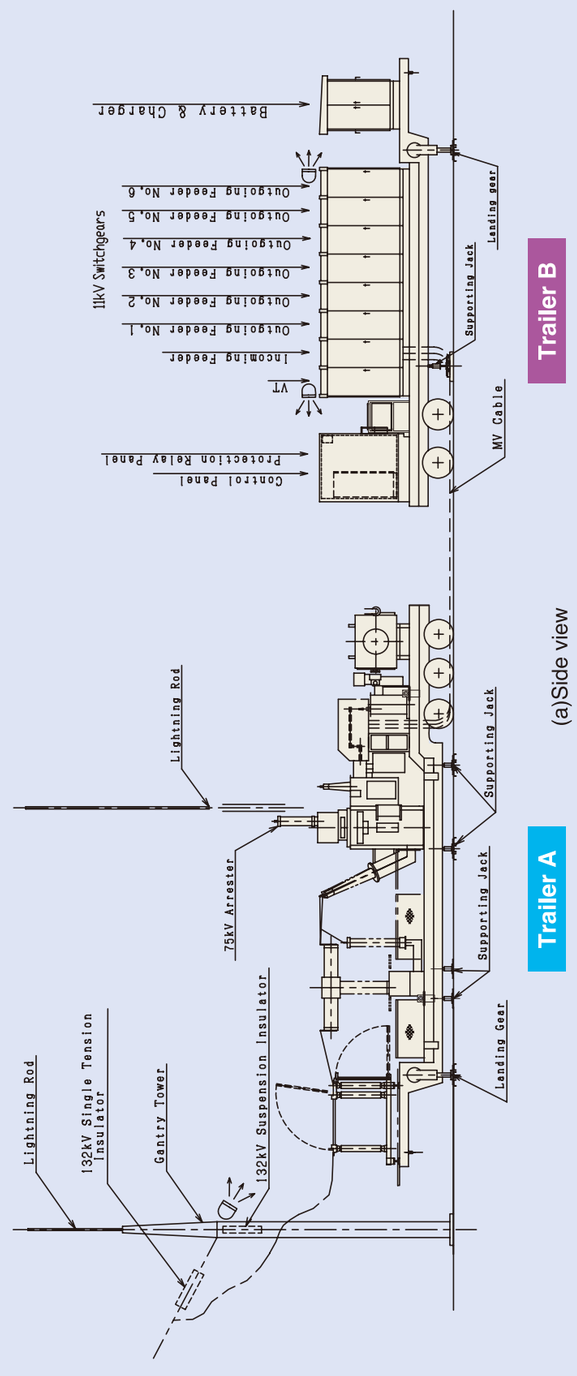
SINGLE LINE DIAGRAM 132/11.5kV 25MVA MOBILE SUBSTATION



Outline 132/11.5kV 25MVA Mobile Substation

With multiple feeders for high Electricity demand





Shipment and Transportation

132/33kV 25MVA Mobile Substation(two trailer type)

With Multiple feeders for more Electricity demand

Transportation

After complete assembly and test at the factory, each component is inspected carefully to make sure whether the Mobile substation is perfectly ready for road and sea transportation. Strength against vibration has been studied and all projected parts such as insulators are reinforced with transport-protectors based on the studies. Thus the completed Mobile substations are transported to the site safely in the state as shown in these photos here.

● **Rolling into Cargo-yard**

Left : Trailer A, HV Switchgear

Right : Trailer B, MV Switchgear & LV Control-gear

1.Transportation Dimension

In the same manner as ordinary trailers, the Mobile substations can be also transported on roads. It must be noted , however, that there may be a certain transport-limitations according to road regulations in each country.

The followings is the possible maximum dimension for manufacturing per trailer.

Length : Max. 20 m
Width : Max. 3.3m
Height : Max. 4.5m

Above : Loading onto a ship by crane

Above : Road transportation

2.Traveling speed

Max. cruising speed on paved road : 35km/h

Max. speed on unpaved road : 10km/h

Trailer A : Arrival at Site

Trailer B : Arrival at Site

Site Installation

After arrival at site, the mobile substation is prepared for energization through just putting equipment to the service position, attaching /fixing power conductors and cables, then site testing. It takes about two weeks to energize one complete Mobile substation including a land preparation. This saves a great deal of time to get a needing resource for countering a lost electricity or an acute high demand of electricity .

Preparation

Approx. 1 week

Installation work

First day
Jack setting & Arrangement of each Component

2nd day
Connections of HV power Conductors

3rd day
Connection of Secondary Cables etc.

4th day
Connection of Earthing system

5th day
Site testing

Completion

6th day
Connection to Existing O/H line

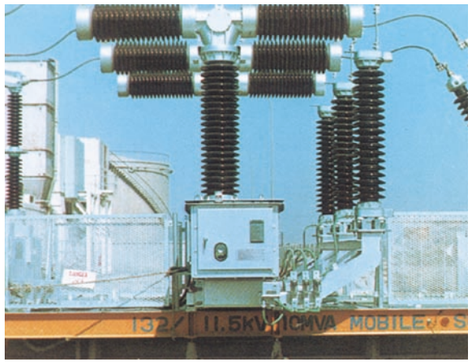
7th day
Energization of Mobile Substation

Installed Equipment

145kV Vacuum Circuit-Breaker

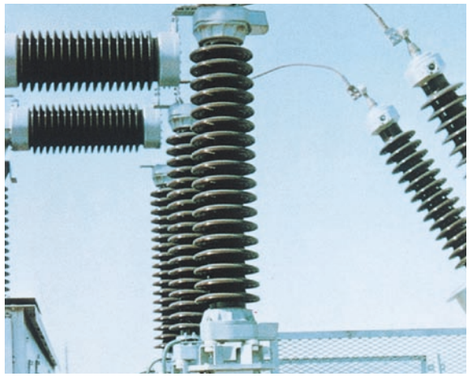
145kV Vacuum Circuit-Breaker (VCB) has been tested and passed a series of strict type tests in accordance with the IEC Standard, verifying the excellent performance characteristics of the VCB under rigorous testing conditions.

This is a 3-phase, gang-operated, 2-break circuit-breaker operated by a motor-charged spring. Operation is simple and reliability is high. Due to the superb characteristics of the vacuum interrupters used in the breaking section, the insulation recovery characteristic shortly after the execution of current interruption is particularly outstanding. In addition, the arcing time is short. Therefore the amount of contact erosion is kept minimal and the operational life is very long. The breaking section is absolutely maintenance-free.



120kV Surge Arrester

These are gapless surge arresters which employ high non-linear resistance elements composed mainly of zinc oxide. This type of surge arrester has excellent V-t characteristics and discharge capacity, and in addition no series gap is required. It offers good anticontamination characteristics and can be assembled into a smaller housing than conventional units. Thus this type is most suitable for application to mobile substations.



MV switchgear and LV Controlgear

Medium Voltage Switchgears are outdoor air-insulated Metal-Clad Type employed Vacuum Circuit Breakers (VCBs) with Insulated Busbars so that they achieve high reliability with least maintenace. VCBs are draw-out type with mechanical interlocked with Earthing Switch. Switchgears are equipped with Voltage Transformers and if required, Surge arresters are also mounted. Indoor type Control and Protection panels are housed in an outdoor type Kiosk (optionally with air-cooling equipment upon request for high ambient temperature), and all Protection Relays are of a numeric type which is highly reliable as well as extremely user-friendly in parameter setting and postmortem analysis etc. All trailer-on-board panels of switchgears and Control & protection panels including Battery & Charger are throughly verified against vibration resistant for safe travelling from site to site.

Power Transformer

Transformers for Mobile substations are manufactured upto 31.5MVA with On -load tap changer at high voltage side.
For Compact all-in one trailer type, transformers of 5 to 15MVA with various voltage ratio are offered.
For high capacity two trailer type, transformers of 20 to 31.5 MVA are supplied depending on a requirement of the secondary side Medium Voltage multi-feeder sections.
To reduce dimension, these transformers are generally designed of forced-oil & forced-air cooled type and employ heat-resistant insulation paper for windings.
High voltage bushings are air -insulated porcelain type and Low voltage bushings and terminals are housed in a metal-enclosed cablebox. All structures, including these parts are vibration-free.

Useful features for Quick Setting and Service

1. Turning bed for 145kV Vacuum Circuit Breaker(VCB)

VCB is easily set into Service position (right photo) from the Transport position (left photo) thanks to the turning bed embedded beneath it.

2. Trailer-On-Board Cable Reel

The power cables for Transformer Secondary connections to MV Switchgear are wound over the on-board Cable Reel and transported together to any site.

3. Traversing carriage

A traverse-moving carriage is provided on the service platform in front of MV switchear multi-feeder line-up for withdrawing, inserting or replacemment of draw-out type VCBs or VTs.

4. Quick plug-in connector

Control and auxiliary cables from main equiment to Supervisory Control and Protection panel are provided with robust weather-proof plug-in connector for a fail-proof re-engagement.