

ABOUT US

Our company, which started its activities in 1976, serves in electrical and electro-mechanical sector. In the time course from its first day founded to today, with periodically manufacturing facility and machine investments, while keeping up with nowadays manufacturing technology and speed, with our products of which we ever made no compromise in quality, we live the legitimate pride of reaching to our customers. By this time, in addition to our countless references, we had in manufacturing sector, we successfully completed plenty of nationwide turnkey projects such as energy transfer lines, residential power plants, highway lightening systems with control center set up, pole or building type transformer center with tunnel electrification and central control units set up, industrial and social facilities' complete electrical projects productions and applications.

With over 30 years of sector experience, TSE-EN 60439-1, TEDAS specifications, ISO 9001:2008 quality management system, OHSAS 18001 occupational health and safety management system, ISO 14001 environmental management system, with product reliability was approved at international accredited laboratories, production and management quality of our company which are well accepted at nationwide and internationally, products of which all manufacturing that are done at its own facilities are:

- Medium Voltage Switchgears
- Concrete and Sheet metal transformer kiosks
- Indoor and outdoor enclosures
- Control enclosures
- Automatic capacitor banks
- Sheet metal enclosures
- Primary and secondary distribution switchgears
- MCC panels
- Lighting panels
- 19" Rack Cabin Systems
- Cable Trays

Our firm, which added Metal Enclosed Modular Switchgears to its productions too in recent years, serves you with having wide range of Modular Switchgears, which are designed to use at energy distribution systems up to 36 kV, approved by testing at internationally accredited test laboratories, too.

Our company, which has a principle of being pioneer to its sector, aims to keep customer satisfaction on the rise with its product and service quality while keeping its leader and pioneer position by combining its endless energy with R&D department.



PNL-36 SERIES

Metal Enclosed Modular Switchgears

PNL-36 SERIES

■ METAL ENCLOSED MODULAR SWITCHGEARS

Meets all medium voltage switching requirements with several types and options from transformer protection to voltage and current metering.

■ ADVANTAGES OF THE SYSTEM

- Ease of installation
- Maintenance free
- Modular construction. System changes, additional modules can be easily applied.
- Space saving due to smaller construction
- Suitable for SCADA systems
- Maximum operator safety with several mechanical and electrical interlocks and safety precautions

■ STANDARDS AND SPECIFICATIONS

- EC 60529
- IEC 60694
- IEC 60265-1
- IEC 62271-1
- IEC 62271-100
- IEC 62271-102



SPECIFICATIONS

PNL 36 SERIES, 36 kV AIR INSULATED METAL ENCLOSED MODULAR SWITCHGEARS

Consists of 5 compartments separated from each other with metal plates



- Switching Compartment
- Bus Bar Compartment
- Cable Connection Compartment
- Switching Mechanism and Mimic Diagram Compartment
- Control and Metering Compartment

SWITCHING COMPARTMENT

SF6 Gas Insulated; load break switch, circuit breaker and switch are used for main switching. Upon customer requirement, different types of circuit breakers are applied

BUS BAR COMPARTMENT

Each module (switchgear) is connected to the other module with 3 bus bars (1 per phase). Bus bar compartment is made unreachable by placing the side plates (metal) of the first and the last module on the group. Bus bar compartment access is supplied from top plates.

CABLE CONNECTION COMPARTMENT

MV XLPE cables are fixed with cable glands located at the floor of the switchgear

SWITCHING MECHANISM & MIMIC DIAGRAM

This is the compartment where switching equipments such as switches, load break switches and circuit breakers are controlled and operated. The positions of the switching equipment can be seen on the mimic diagram.

CONTROL AND METERING COMPARTMENT

This is the auxiliary low voltage switchboard of the MV switchgear. Terminal blocs, LV fuses and circuit breakers, thermostats and metering equipment are in this compartment. This compartment can also be accessed while the switchgear is energized.

SPECIFICATIONS

■ **Rated Voltage**

36 kV

■ **Rated Network Frequency Withstand Voltage (1 min)**

Phase – Phase and Phase – Earth 70 kV

At Isolating Distance (open contacts) 80 kV

■ **Rated Lightning Impulse Voltage (1.2/50 μ s)**

Phase – Phase and Phase – Earth **170 kV**

At Isolating Distance (open contacts) **195 kV**

■ **Rated Frequency**

50/60 Hz

■ **Rated Nominal Current**

630 A

■ **Rated Peak Short Circuit Current**

40 kA

■ **Rated Short Circuit Current (1s)**

16 kA

■ **Load Break Switch**

Rated Closed Circuit Breaking Current **630 A**

Rated No Load Cable Breaking Current **630 A**

Rated Idle Cable Breaking Current **50 A**

Rated No Load Line Breaking Current **2 A**

Rated Earth Fault Current **150 A**

Line and Cable Breaking Current in Case of a Earth Fault **87 A**

Rated Transfer Current **630 A**

Rated Short Circuit Closing Current **40 kA – Peak**

Mechanical Class **M1-E3**

■ **MV Fuses**

36 kV

■ **Earthing Switch (Type 1)**

Rated Short Circuit Withstand Current (1s) **16 kA**

Rated Short Circuit Closing Current **40 kA – Peak**

■ **Earthing Switch (Type 2)**

Rated Short Circuit Withstand Current (1s) **1 kA**

Rated Short Circuit Closing Current **2,5 kA - Peak**

■ PNL-36 SERIES EQUIPMENT PROPERTIES USED INSIDE PNL 36 SERIES METAL ENCLOSED MODULAR ENCLOSURES

SF6 GAS (SULPHUR HEXAFLORIDE)

SF6 is a; nonflammable, colorless, odorless, poisonless, 5 times heavier than air and chemically stable gas. 20% oxygen and 80% SF6 mixture can be harmlessly inhaled. Since it is 5 times heavier than air, it settles to ground when exposed to atmosphere.

WHY? WHERE? WHEN?

SF6 Gas is used for more than 40 years in electrical switching equipments because of:

- High dielectric resistance
- High chemical stability
- Heat transfer ability
- Perfect arc extinguishing performance

Due to the advantages of SF6 gas, the switching equipments can be manufactured in smaller dimension with low cost and high efficiency.

Today the SF6 gas is used up to 800 kV voltage level for switching and insulation functions.



SPECIFICATIONS

■ SF6 ISOLATED SWITCH

SF6 isolated switches used in PNL 36 Series Switchgears are manufactured and type tested at internationally accredited laboratories according to IEC Standards. They are used for switching (opening and closing the circuit) while there is no load on the system.

■ RATED VOLTAGE	36 kV
■ RATED CURRENT	630 A
■ RATED SHORT CIRCUIT CURRENT	16 kA
■ RATED NETWORK FREQUENCY WITHSTAND VOLTAGE	70 kV
■ RATED LIGHTNING IMPULSE WITHSTAND VOLTAGE (1.2/50 µs)	170 kV

■ SF6 ISOLATED LOAD BREAK SWITCH

SF6 isolated load break switches used in PNL 36 Series Switchgears are manufactured and type tested at internationally accredited laboratories according to IEC Standards. They are used for switching (opening and closing the circuit) while there is load on the system.

■ RATED VOLTAGE	36 kV
■ RATED CURRENT	630 A
■ RATED SHORT CIRCUIT CURRENT	16 kA
■ RATED NETWORK FREQUENCY WITHSTAND VOLTAGE	70 kV
■ RATED LIGHTNING IMPULSE WITHSTAND VOLTAGE (1.2/50 µs)	170 kV
■ ELECTRICAL CLASS	E3
■ MECHANICAL CLASS	M1
■ FUSE COMBINATION	OPTIONAL
■ MOTORISED SPRING WIND UP	OPTIONAL

■ SF6 ISOLATED CIRCUIT BREAKER

SF6 isolated circuit breakers used in PNL 36 Series Switchgears are manufactured and type tested at internationally accredited laboratories according to IEC Standards. They are used for switching (opening and closing the circuit) while there is load, over current or short circuit on the system. They are equipped with spring winding motor and controlled by programmable or non-programmable control relays.

Every pole (phase) is a closed environment, a separate tube filled with SF6 gas.

■ RATED VOLTAGE	36 kV
■ RATED CURRENT	630 A
■ RATED SHORT CIRCUIT BREAKING CURRENT	16 - 25kA
■ RATED SHORT CIRCUIT CLOSING CURRENT	40-63A
■ RATED SHORT CIRCUIT CURRENT (1s)	16-25kA
■ RATED IDLE CABLE BREAKING CURRENT	50 A
■ RATED NETWORK FREQUENCY WITHSTAND VOLTAGE	70 kV
■ RATED LIGHTNING IMPULSE WITHSTAND VOLTAGE (1.2/50 μ s)	170 kV

■ EARTHING SWITCH TYPE 1&2

The earthing switches used in PNL 36 Series Modular Switchgears are used to earth the disconnected phases. They are E2 type switches can be closed on the short circuit 5 times and tested at internationally accredited laboratories according to IEC Standards

■ RATED VOLTAGE	36 kV
■ RATED SHORT CIRCUIT CURRENT	16 kA – 1 kA
■ RATED NETWORK FREQUENCY WITHSTAND VOLTAGE	70 kV
■ RATED LIGHTNING IMPULSE WITHSTAND VOLTAGE (1.2/50 μ s)	170 kV
■ CLASS	

SPECIFICATIONS

■ CURRENT AND VOLTAGE TRANSFORMERS

Current and voltage transformers used in PNL 36 Series Switchgears are manufactured and type tested at internationally accredited laboratories according to IEC Standards. They are used to measure the current flowing on the system and voltage. By the means of this information several maneuvers can be done. Also this information is used to calculate the energy consumption and quality.

■ OVERCURRENT RELAYS

Overcurrent relays used in PNL 36 Series Switchgears are manufactured and type tested at internationally accredited laboratories according to IEC Standards. They are used detect overcurrent, short circuit, earth fault and etc to open the circuit by controlling the circuit breaker.



PNL 36 Series Air Insulated Metal Enclosed switchgears are manufactured and type tested at internationally accredited laboratories according to IEC Standards and TEDAŞ Specifications. They are certified by TSE.

- PNL 36-01 INCOMING / OUTGOING SWITCHGEAR WITH LOAD BREAK SWITCH
- PNL 36-02 LOAD BREAK SWITCH + FUSE COMBINATION TRANSFORMER PROTECTION SWITCHGEAR
- PNL 36-03 VOLTAGE TRANSFORMER SWITCHGEAR
- PNL 36-04 INCOMING / OUTGOING SWITCHGEAR WITH CIRCUIT BREAKER
- PNL 36-05 BUS COUPLER SWITCHGEAR
- PNL 36-06 INCOMING / OUTGOING SWITCHGEAR WITH SWITCH
- PNL 36-07 CABLE CONNECTION SWITCHGEAR
- PNL 36-08 CURRENT AND VOLTAGE METERING SWITCHGEAR WITH LOAD BREAK SWITCH
- PNL 36-09 BUS RISER SWITCHGEAR
- PNL 36-10 CURRENT METERING AND BUS RISER SWITCHGEAR
- PNL 36-11 CURRENT METERING SWITCHGEAR
- PNL 36-12 BUS DIVIDER SWITCHGEAR WITH CIRCUIT BREAKER (EXIT FROM SIDE)
- PNL 36-13 BUS DIVIDER SWITCHGEAR WITH LOAD BREAK SWITCH (EXIT FROM SIDE)
- PNL 36-14 INCOMING / OUTGOING SWITCHGEAR WITH CIRCUIT BREAKER AND VOLTAGE TRANSFORMER – AUTO PRODUCER SWITCHGEAR
- PNL 36-15 CURRENT AND VOLTAGE METERING SWITCHGEAR WITH SWITCH
- PNL 36-16 COUPLING SWITCHGEAR WITH LOAD BREAK SWITCH
- PNL 36-17 SURGE ARRESTER SWITCHGEAR
- PNL 36-18 WALL PASSING SWITCHGEAR
- PNL 36-19 CURRENT AND VOLTAGE METERING SWITCHGEAR WITH LOAD BREAK SWITCH-R (INCOMING FROM RIGHT)
- PNL 36-20 CURRENT AND VOLTAGE METERING SWITCHGEAR WITH LOAD BREAK SWITCH-C (CABLE OUT)
- PNL 36-21 COUPLING SWITCHGEAR WITH LOAD BREAK SWITCH (INCOMING FROM RIGHT)
- PNL 36-22 CURRENT AND VOLTAGE METERING SWITCHGEAR

*We supply products from our catalogs and supply new designs according to our customer needs.

PNL 36-01

INCOMING / OUTGOING SWITCHGEAR WITH LOAD BREAK SWITCH

Used for input to or output from system with opening or closing system under load.

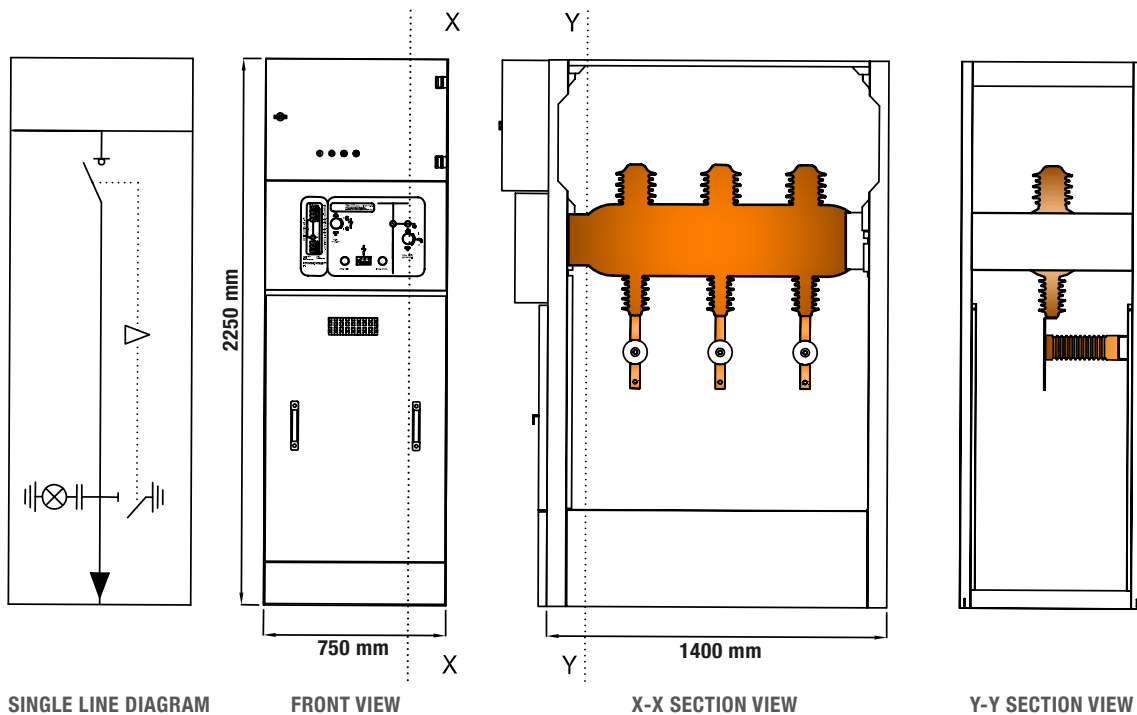


STANDARD HARDWARE

- SF6 Isolated Load Break Switch
- Earthing Switch (Type 2)
- Capacitive Voltage Indicator
- Load Break Switch Mechanism
- Opening / Closing Coils
- Auxiliary Contacts
- Main Bus Bars
- Heater with Thermostatic Control
- Enclosure Earthing Bus Bars
- Cable Connection Setup

OPTIONAL HARDWARE

- Earth Fault & Short Circuit Indicator
- Remote Control
- Load Break Switch Spring Winding Motor



LOAD BREAK SWITCH + FUSE COMBINATION TRANSFORMER PROTECTION SWITCHGEAR

Used to protect transformer in distribution systems.

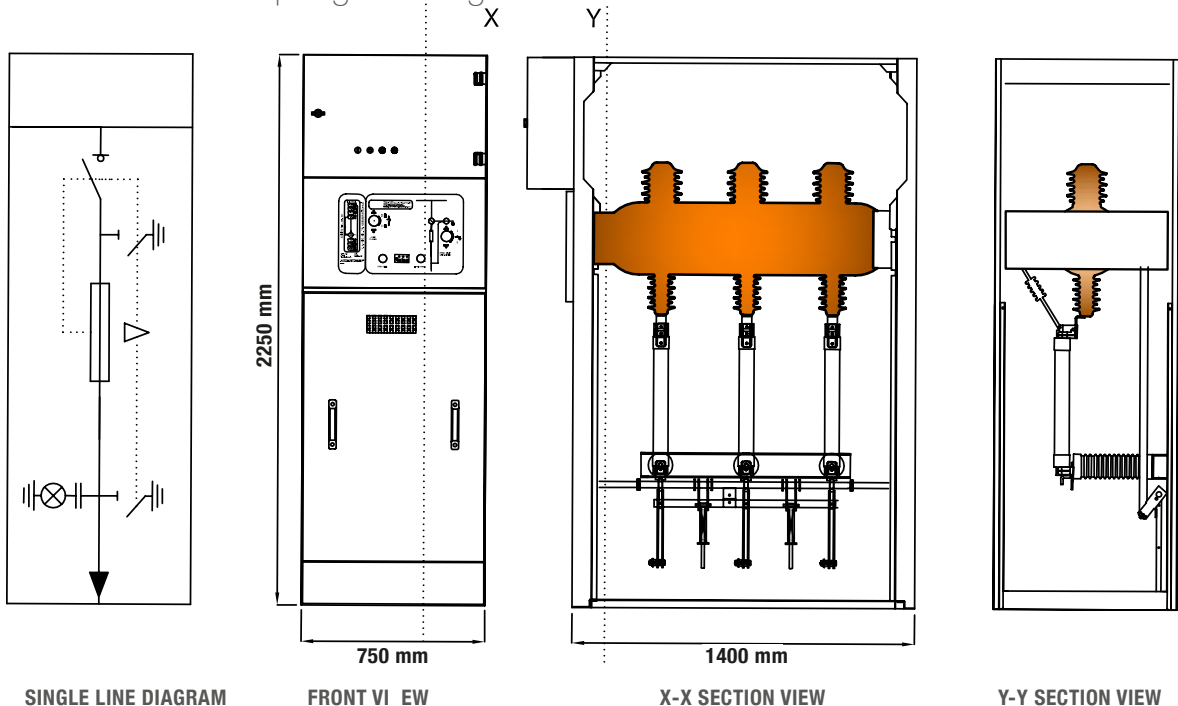
PNL 36-02

STANDARD HARDWARE

- SF6 Isolated Load Break Switch and Fuse Combination
- Earthling Switch (Type 2)
- Capacitive Voltage Indicator
- Load Break Switch Mechanism
- Opening / Closing Coils
- Auxiliary Contacts
- Main Bus Bars
- Heater with Thermostatic Control
- Enclosure Earthing Bus Bars
- Cable Connection Setup
- Medium Voltage Fuses
- Signal Lamp Box

OPTIONAL HARDWARE

- Battery Charger + Maintenance Free Battery Groups
- Remote Control
- Load Break Switch Spring Winding Motor



PNL 36-03

VOLTAGE TRANSFORMER SWITCHGEAR

Used to measure voltage and supply 220 V AC to auxiliary equipment.

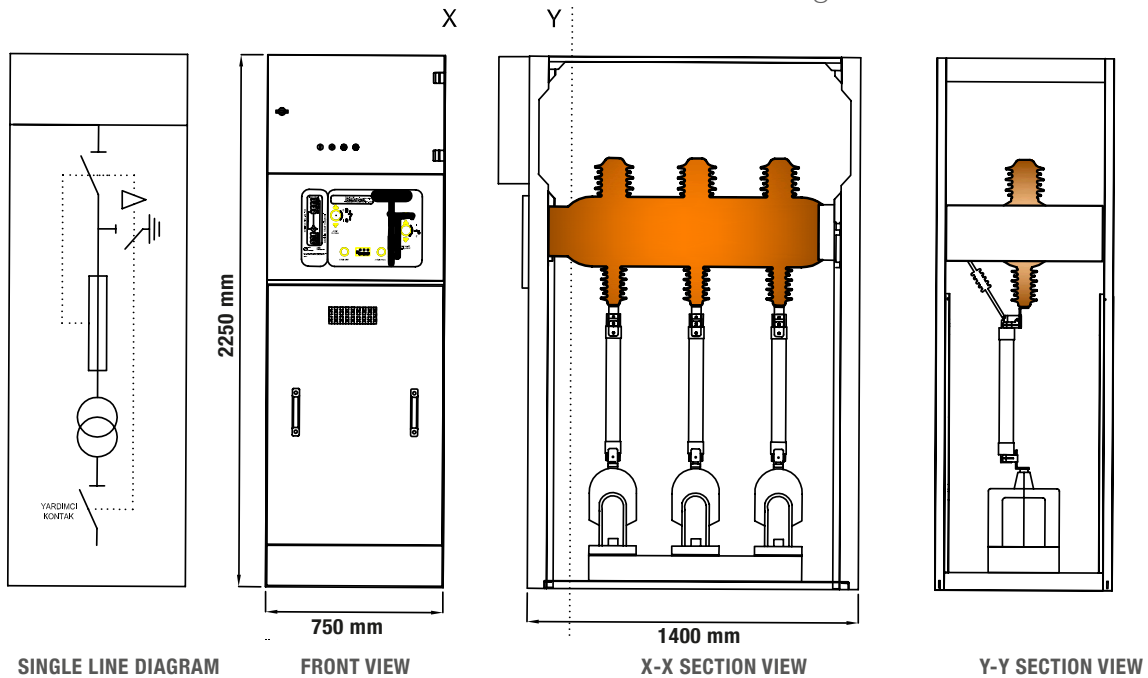


STANDARD HARDWARE

- SF6 Switch
- Earthing Switch (Type 2)
- Switch Mechanism
- Auxiliary Contacts
- Main Bus Bars
- Heater with Thermostatic Control
- Inside Earthing Enclosure Earthing Bus Bars
- Medium Voltage Fuses
- Low Voltage Fuses
- Voltage Transformer
- Voltmeter
- Voltmeter Selection Switch

OPTIONAL HARDWARE

- Active – Reactive Electricity Meter
- Other Metering Hardware



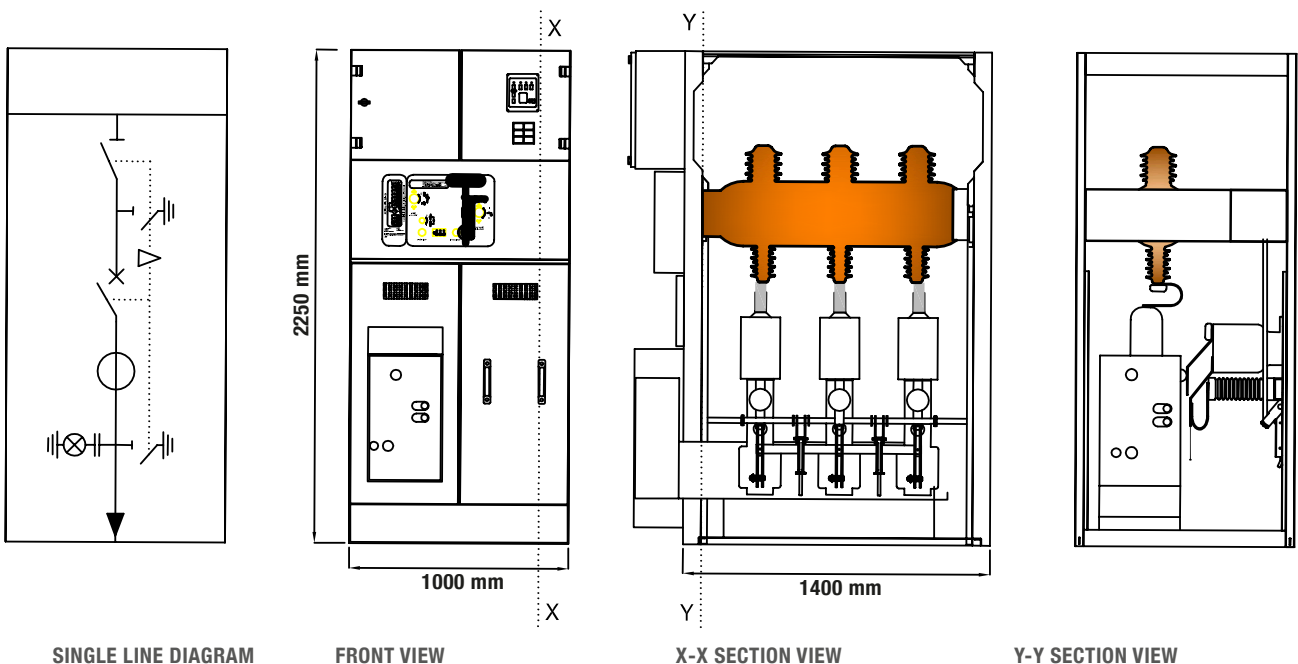
INCOMING / OUTGOING SWITCHGEAR WITH CIRCUIT BREAKER

PNL 36-04

Used to protect transformer or line from short circuit, overload and other electrical faults by breaking the circuit

STANDARD HARDWARE OPTIONAL HARDWARE

SF6 Isolated Switch	Protection Relay
SF6 Isolated Circuit Breaker	Digital Programmable Relay
MV Current Transformer	Battery Charger
Support Type	+ Maintenance Free
LPCT Type	Battery Groups
Earthing Switch (Type 1)	Remote Control
Overcurrent Relay	Active – Reactive
Magnetic Field Organizer	Electricity Meter
Capacitive Voltage Indicator	Ammeter
Switch Mechanism	Alarm Relay Combination (Transformer Protection)
Circuit Breaker Mechanism	Other Metering Hardware
Opening / Closing Coils	
Auxiliary Contacts	
Main Bus Bars	
Heater with Thermostatic Control	
Enclosure Earthing Bus Bars	
Cable Connection Setup	



SINGLE LINE DIAGRAM

FRONT VIEW

X-X SECTION VIEW

Y-Y SECTION VIEW

PNL 36-05

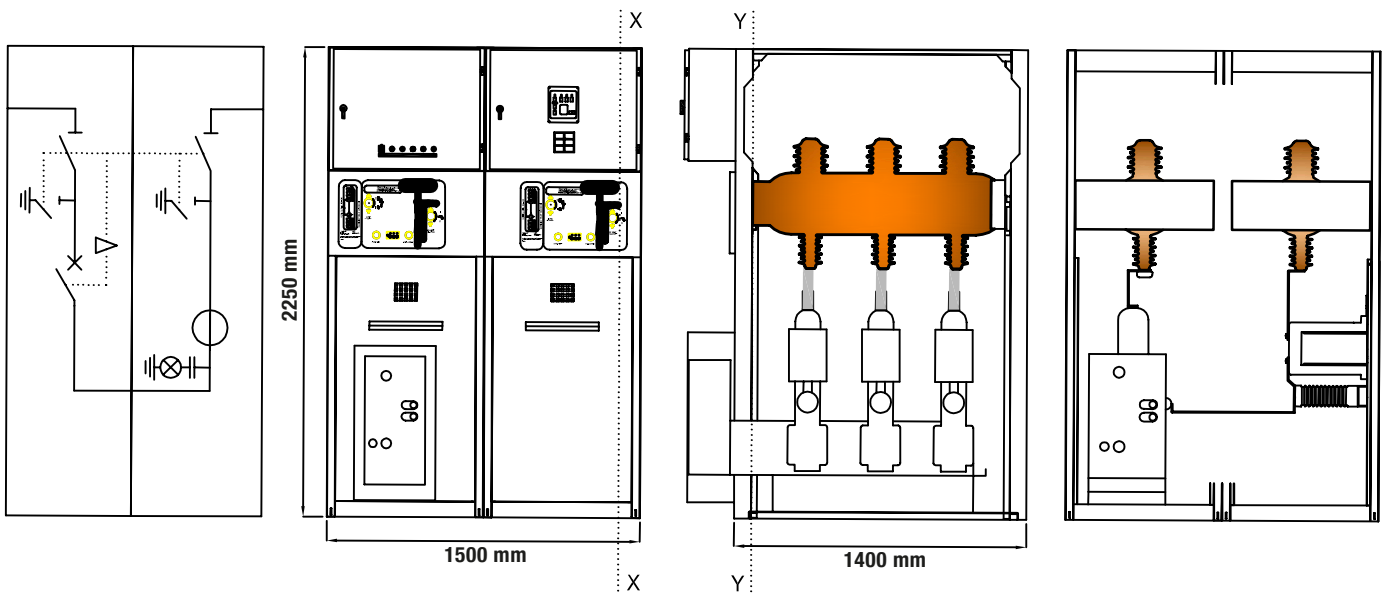
BUS COUPLER SWITCHGEAR

Used to couple (connect or disconnect) two main circuits.

STANDARD HARDWARE / OPTIONAL HARDWARE



SF6 Isolated Switch	Protection Relay
SF6 Isolated Circuit Breaker	Digital Programmable Relay
MV Current Transformer	Battery Charger
Support Type	+ Maintenance Free
LPCT Type	Battery Groups
Earthing Switch (Type 1)	Remote Control
Overcurrent Relay	Active – Reactive
Magnetic Field Organizer	Electricity Meter
Capacitive Voltage Indicator	Ammeter
Switch Mechanism	Other Metering Hardware
Circuit Breaker Mechanism	
Opening / Closing Coils	
Auxiliary Contacts	
Main Bus Bars	
Heater with Thermostatic Control	
Enclosure Earthing Bus Bars	



SINGLE LINE DIAGRAM

FRONT VIEW

X-X SECTION VIEW

Y-Y SECTION VIEW

INCOMING / OUTGOING SWITCHGEAR WITH SWITCH

Used for input to or output from system with opening or closing system while there is NO load.

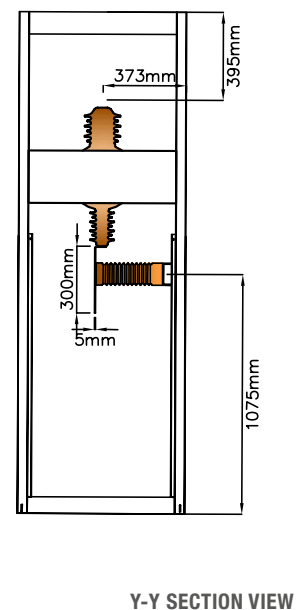
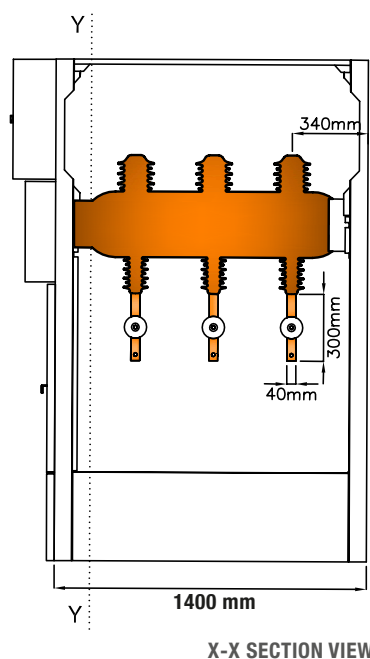
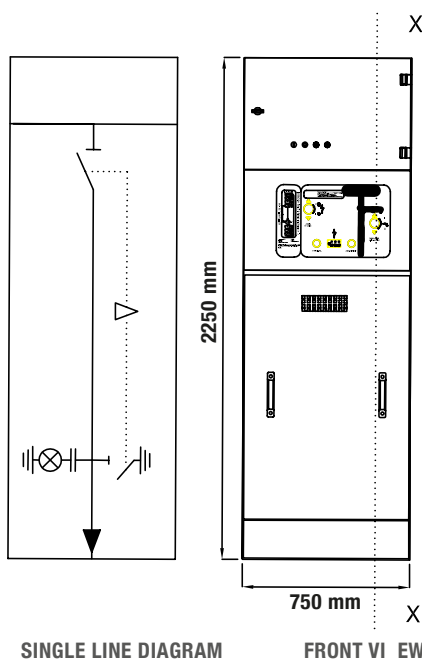
STANDARD HARDWARE

- SF6 Isolated Switch
- Earthing Switch (Type 2)
- Capacitive Voltage Indicator
- Switch Mechanism
- Auxiliary Contacts
- Main Bus Bars
- Heater with Thermostatic Control
- Enclosure Earthing Bus Bars
- Cable Connection Setup

OPTIONAL HARDWARE

- Earth Fault & Short Circuit Indicator

PNL 36-06



PNL 36-07

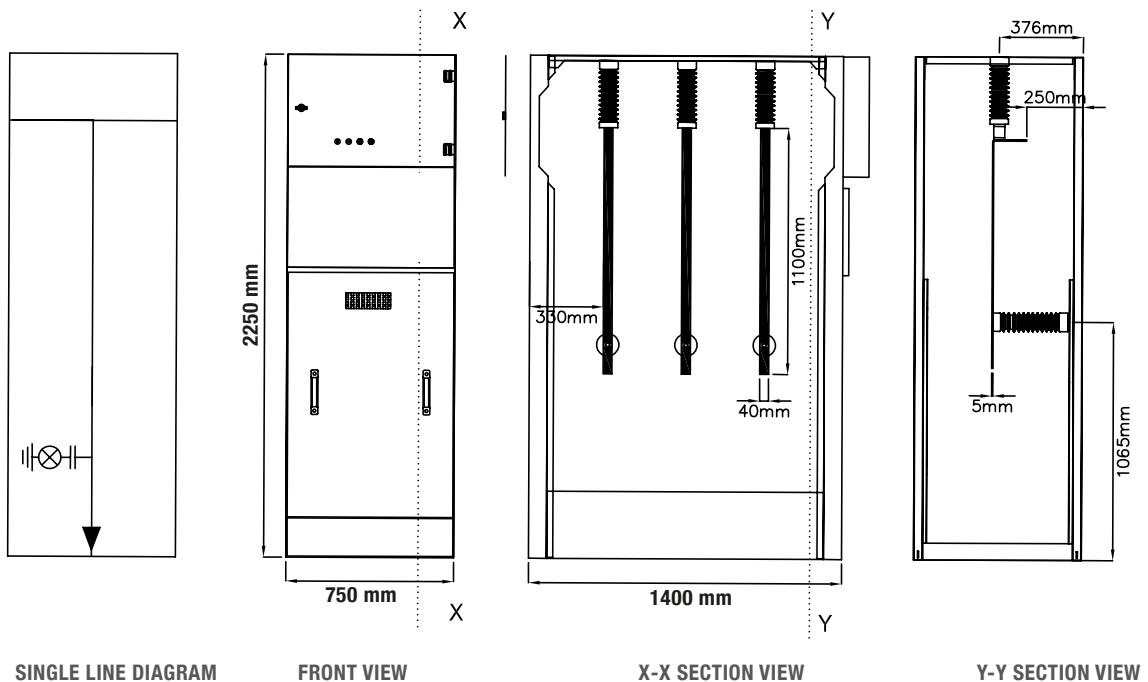
CABLE CONNECTION SWITCHGEAR

Used for connecting the MV XLPE cables safely to the main circuit.



STANDARD HARDWARE

- Capacitive Voltage Indicator
- Main Bus Bars
- Heater with Thermostatic Control
- Enclosure Earthing Bus Bars
- Cable Connection Setup



CURRENT AND VOLTAGE METERING SWITCHGEAR WITH LOAD BREAK SWITCH

Used to meter the current and voltage parameter from the system.

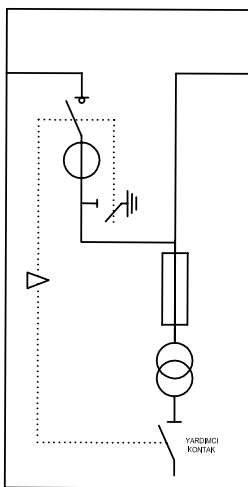
PNL 36-08

STANDARD HARDWARE

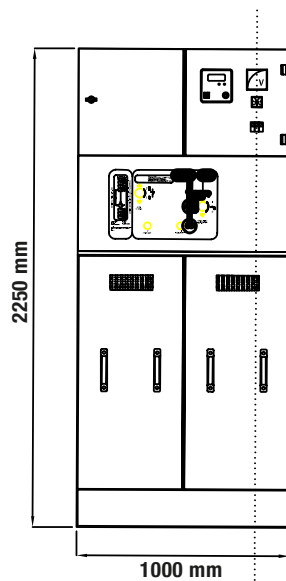
- SF6 Isolated Load Break Switch
- MV Current Transformer
- MV Voltage Transformer
- MV Fuses
- LV Fuses
- Voltmeter – Ammeter
- Voltmeter Selection Switch
- Through Passage Isolator
- Magnetic Field Organizer
- Capacitive Voltage Indicator
- Load Break Switch Mechanism
- Opening / Closing Coils
- Auxiliary Contacts
- Main Bus Bars
- Heater with Thermostatic Control
- Enclosure Earthing Bus Bars

OPTIONAL HARDWARE

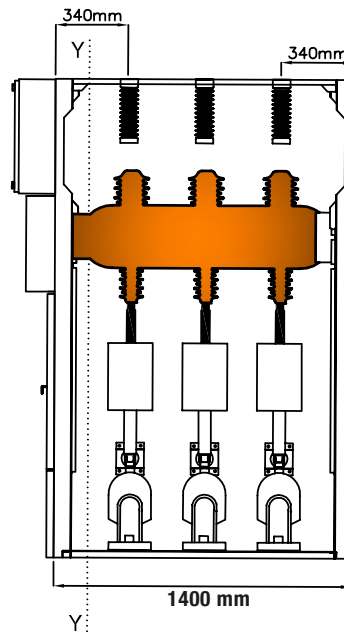
- Remote Control
- Active – Reactive
- Electricity Meter
- Load Break Switch
- Spring Winding
- Motor



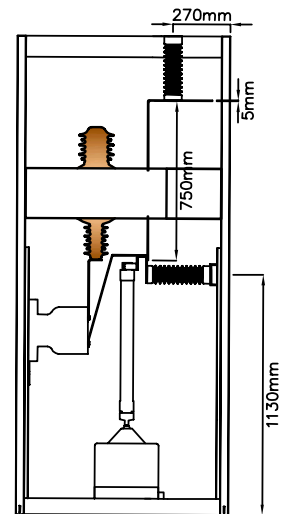
SINGLE LINE DIAGRAM



FRONT VIEW



X-X SECTION VIEW



Y-Y SECTION VIEW

PNL 36-09

BUS RISER SWITCHGEAR

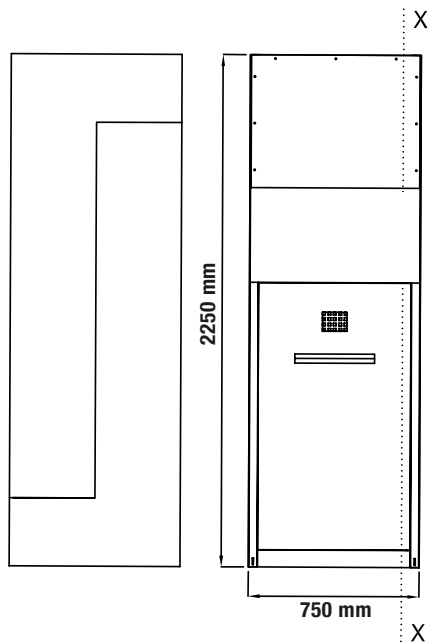
Used to rise the main circuit from bottom to top.



STANDARD HARDWARE

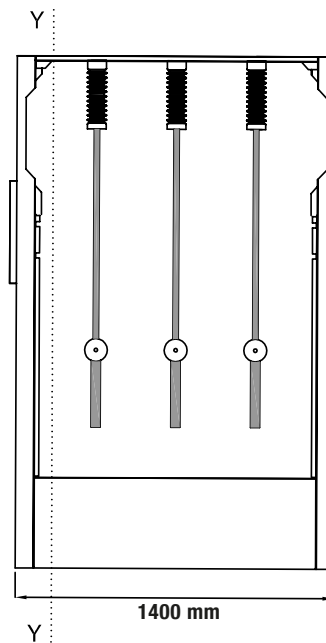
Main Bus Bars

Support Type Isolators

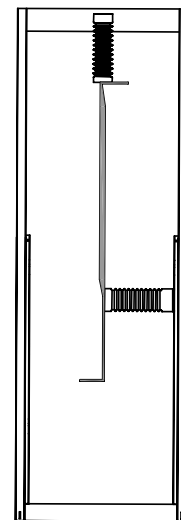


SINGLE LINE DIAGRAM

FRONT VIEW



X-X SECTION VIEW



Y-Y SECTION VIEW

CURRENT METERING AND BUS RISER SWITCHGEAR

Used to meter the current parameter from the system and rise the main circuit.

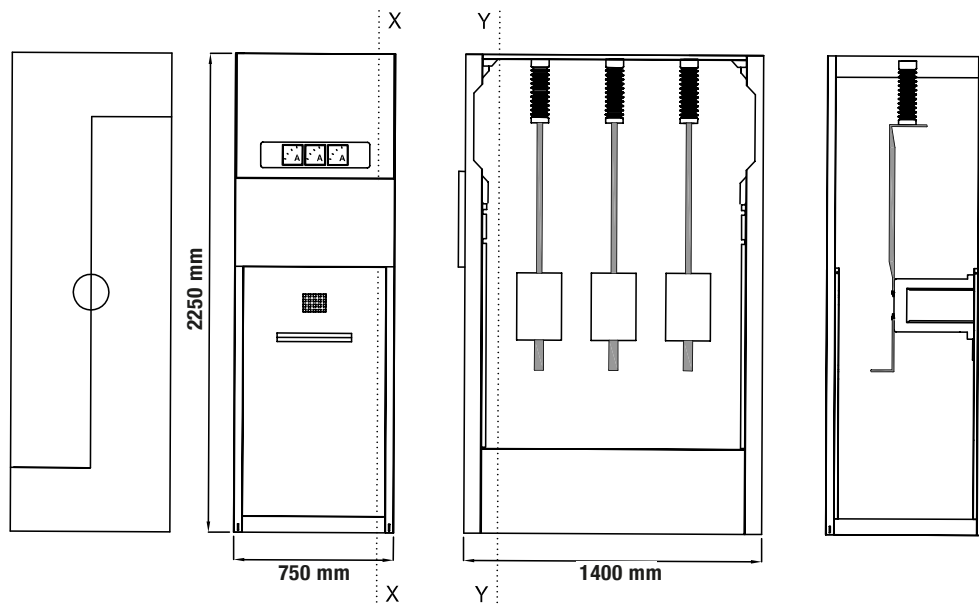
PNL 36-10

STANDARD HARDWARE

- MV Current Transformer
- Ammeter
- Main Bus Bars
- Heater with Thermostatic Control
- Enclosure Earthing Bus Bars

OPTIONAL HARDWARE

- Active – Reactive Electricity Meter
- Other Metering Hardware



SINGLE LINE DIAGRAM

FRONT VIEW

X-X SECTION VIEW

Y-Y SECTION VIEW

PNL 36-11

CURRENT METERING SWITCHGEAR

Used to meter the current parameter from the system.

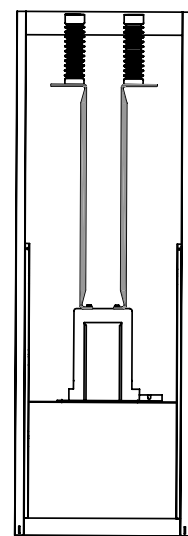
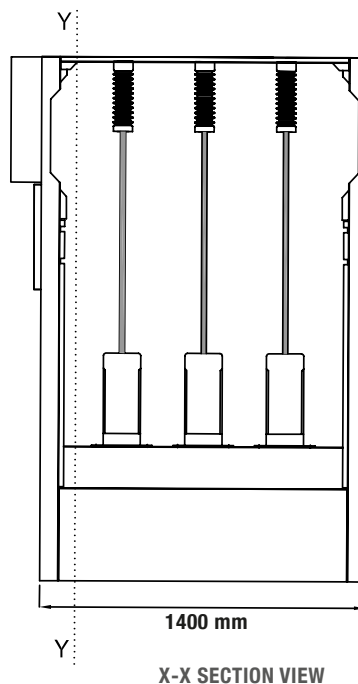
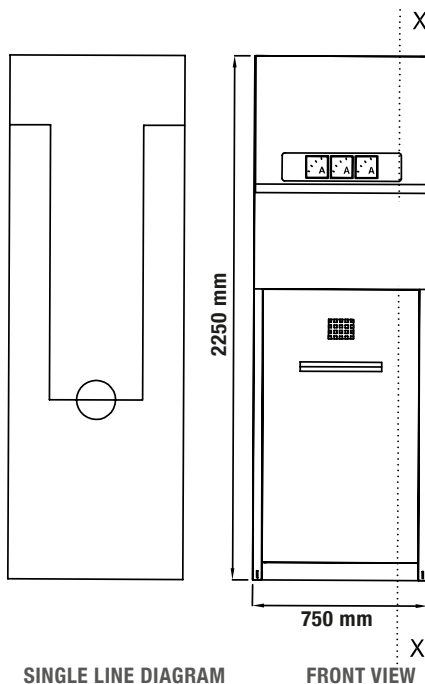


STANDARD HARDWARE

- MV Current Transformer
- Ammeter
- Main Bus Bars
- Heater with Thermostatic Control
- Enclosure Earthing Bus Bars

OPTIONAL HARDWARE

- Active – Reactive Electricity Meter
- Other Metering Hardware



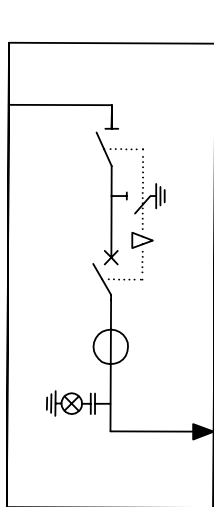
BUS DIVIDER SWITCHGEAR WITH CIRCUIT BREAKER (EXIT FROM SIDE)

Used to disconnect and divide main circuit.

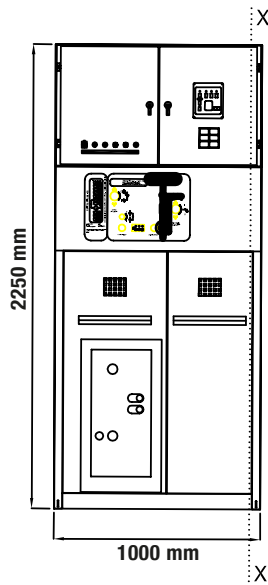
PNL 36-12

■ STANDARD HARDWARE ■ OPTIONAL HARDWARE

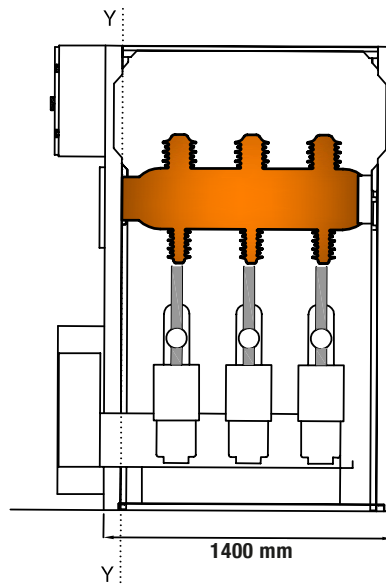
SF6 Isolated Switch	Protection Relay
SF6 Isolated Circuit Breaker	Remote Control
MV Current Transformer	Active – Reactive
Earthing Switch (Type 1)	Electricity Meter
Magnetic Field Organizer	Ammeter
Capacitive Voltage Indicator	Other Metering Hardware
Switch Mechanism	
Circuit Breaker Mechanism	
Opening / Closing Coils	
Auxiliary Contacts	
Main Bus Bars	
Heater with Thermostatic Control	
Enclosure Earthing Bus Bars	



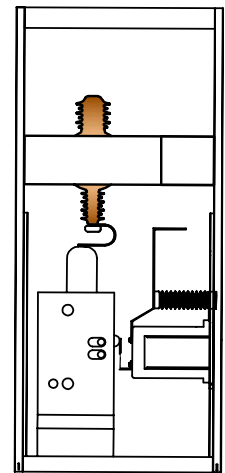
SINGLE LINE DIAGRAM



FRONT VIEW



X-X SECTION VIEW



Y-Y SECTION VIEW

PNL 36-13

BUS DIVIDER SWITCHGEAR WITH LOAD BREAK SWITCH (EXIT FROM SIDE)

Used to disconnect and divide main circuit.

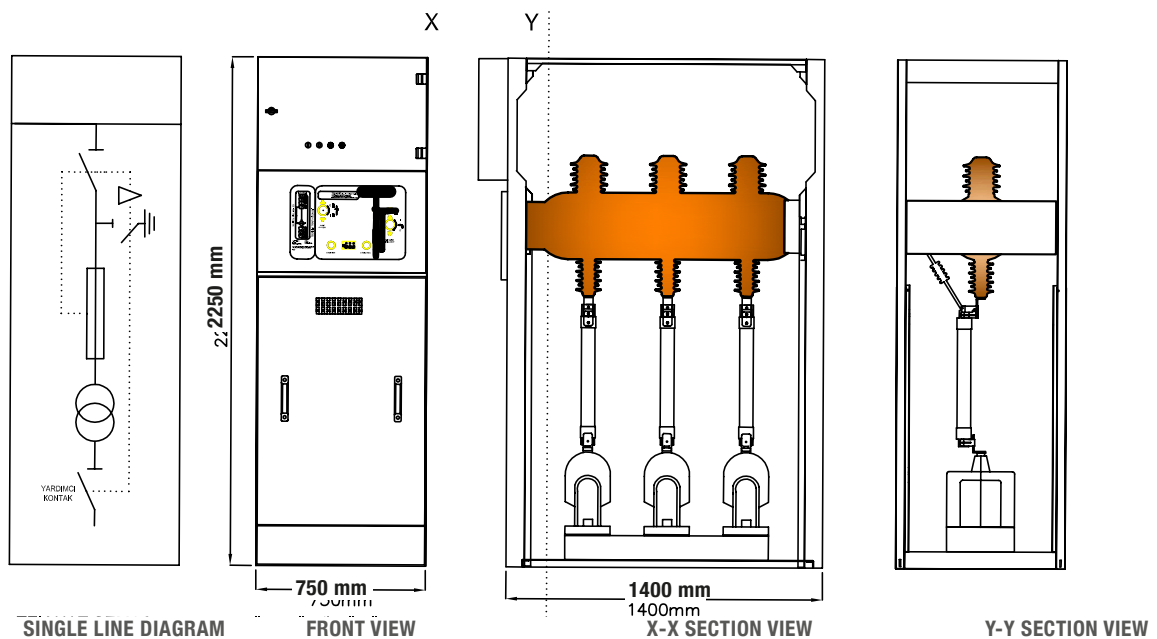


STANDARD HARDWARE

- SF6 Isolated Load Break Switch
- Earthing Switch (Type 1)
- Capacitive Voltage Indicator
- Switch Mechanism
- Through Passage Isolator
- Opening / Closing Coils
- Auxiliary Contacts
- Main Bus Bars
- Heater with Thermostatic Control
- Enclosure Earthing Bus Bars

OPTIONAL HARDWARE

- Load Break Switch Spring Winding Motor



INCOMING / OUTGOING SWITCHGEAR WITH CIRCUIT BREAKER AND VOLTAGE TRANSFORMER – AUTO PRODUCER SWITCHGEAR

PNL 36-14

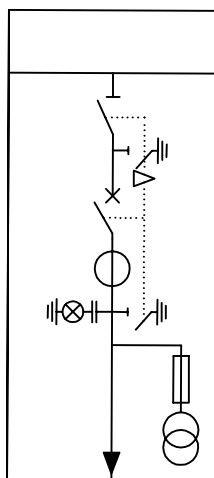
Used to connect self produced electricity to main network.

STANDARD HARDWARE

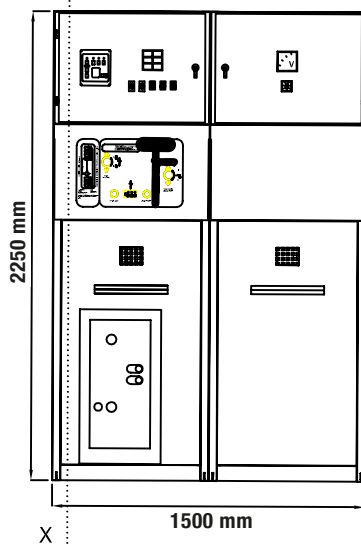
- SF6 Isolated Switch
- SF6 Isolated Circuit Breaker
- MV Current Transformer
- MV Voltage Transformer
- MV Fuses
- Earthing Switch (Type 1)
- Overcurrent Relay
- Magnetic Field Organizer
- Capacitive Voltage Indicator
- Switch Mechanism
- Circuit Breaker Mechanism
- Opening / Closing Coils
- Auxiliary Contacts
- Main Bus Bars
- Heater with Thermostatic Control
- Enclosure Earthing Bus Bars
- Cable Connection Setup

OPTIONAL HARDWARE

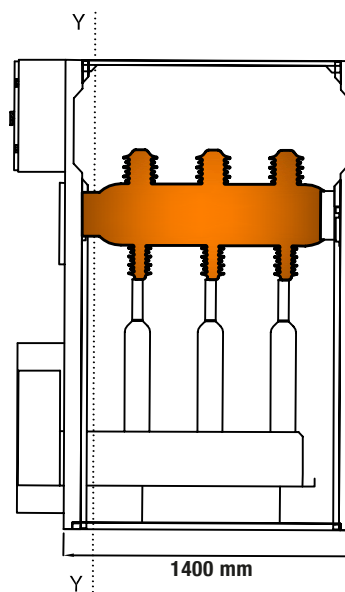
- Protection Relay
- Digital Programmable Relay
- Battery Charger + Maintenance Free Battery Groups
- Remote Control
- Active – Reactive Electricity Meter
- Ammeter
- Alarm Relay Combination (Transformer Protection)
- Other Metering Hardware



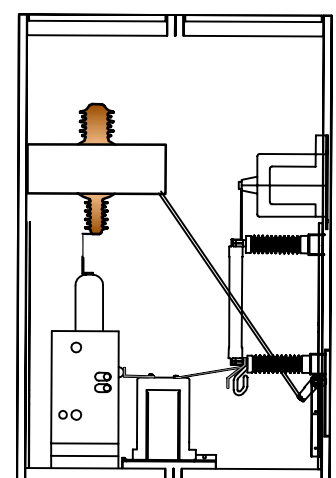
SINGLE LINE DIAGRAM



FRONT VIEW



X-X SECTION VIEW



Y-Y SECTION VIEW

PNL 36-15

CURRENT AND VOLTAGE METERING SWITCHGEAR WITH SWITCH

Used to meter the current and voltage parameter from the system.

Opening and closing can be done under no load condition.



STANDARD HARDWARE / OPTIONAL HARDWARE

SF6 Isolated Switch

MV Current Transformer

MV Voltage Transformer

MV Fuses

LV Fuses

Voltmeter – Ammeter

Voltmeter Selection Switch

Through Passage Isolator

Magnetic Field Organizer

Capacitive Voltage Indicator

Switch Mechanism

Auxiliary Contacts

Main Bus Bars

Heater with Thermostatic Control

Enclosure Earthing Bus Bars

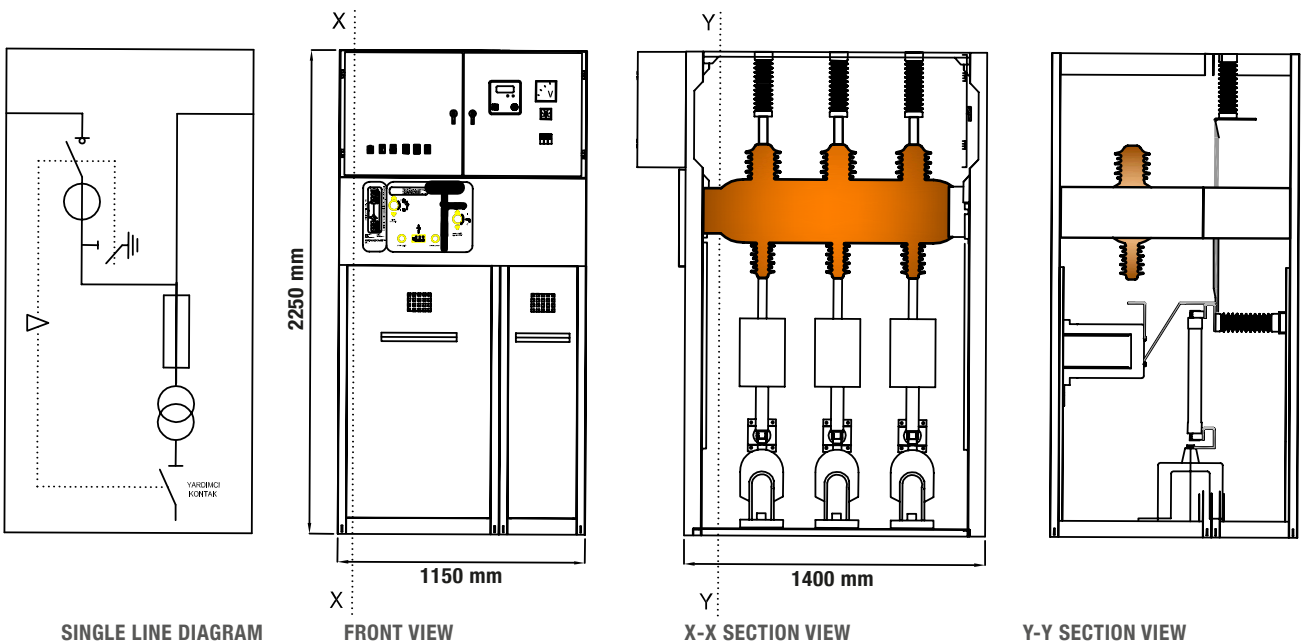
Remote Control

Active – Reactive

Electricity Meter

Switch Spring

Winding Motor



COUPLING SWITCHGEAR WITH LOAD BREAK SWITCH

Used to safely connect to or
disconnect from main network.

■ STANDARD HARDWARE

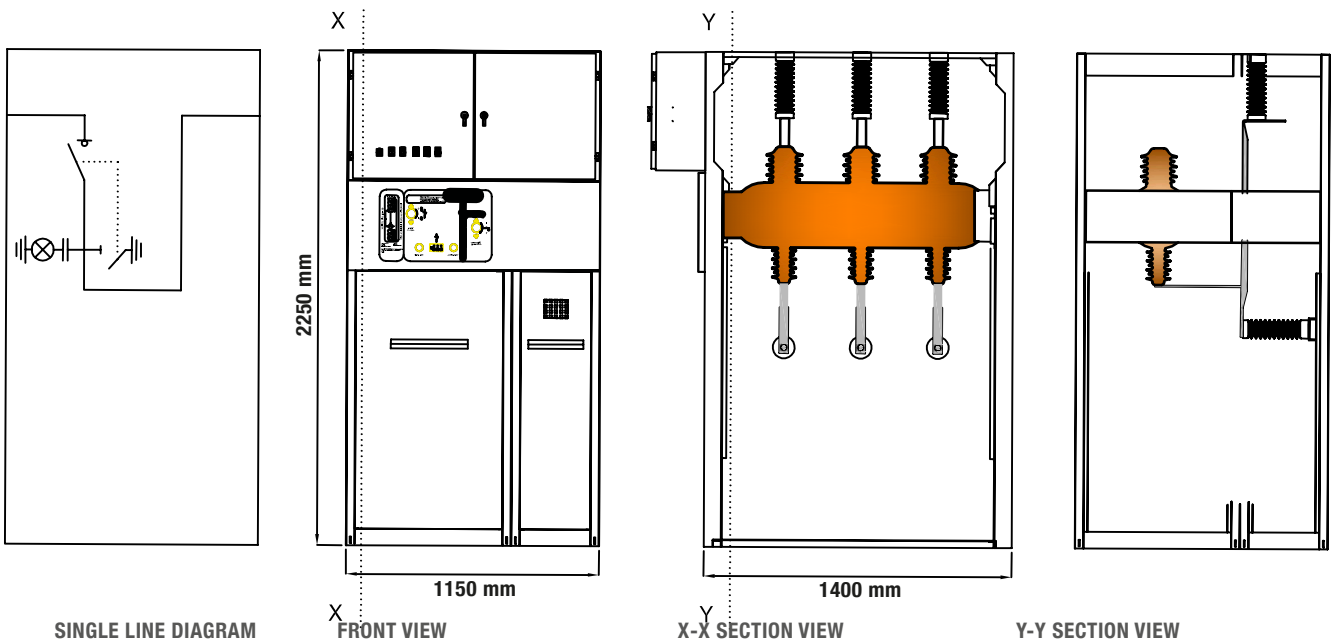
SF6 Isolated Load Break Switch

Load Break Switch Mechanism

Main Bus Bars

Heater with Thermostatic Control

PNL 36-16



PNL 36-17

SURGE ARRESTER SWITCHGEAR

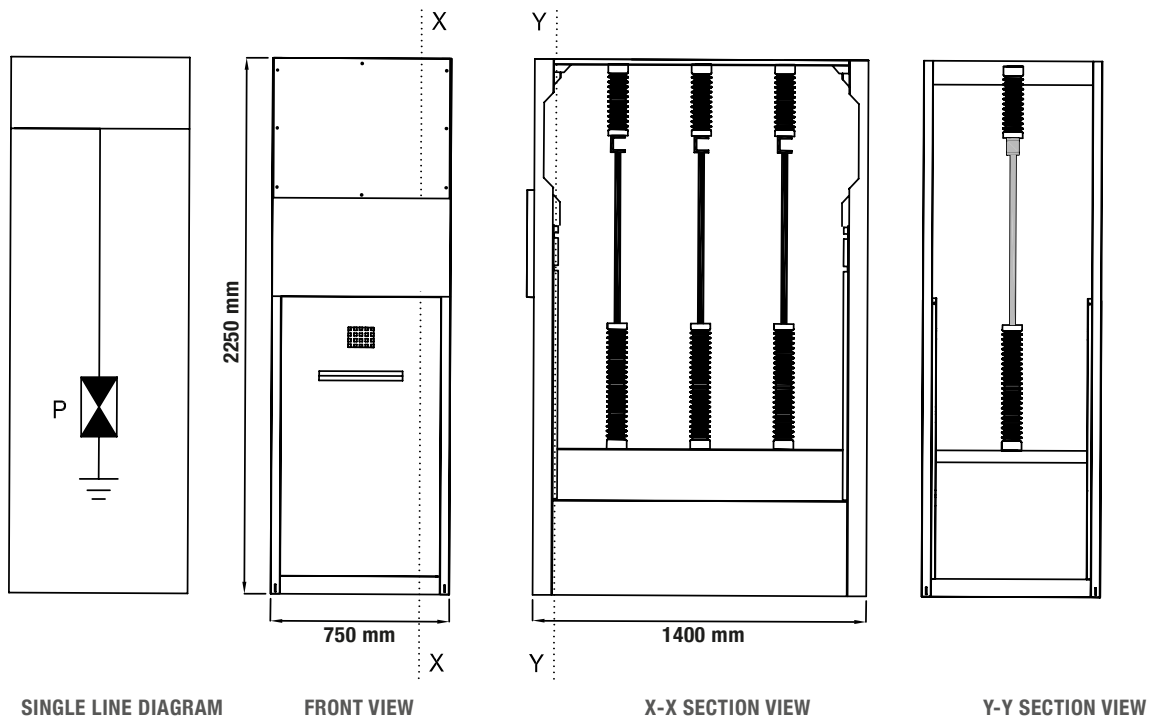
Used to protect system from high voltage



STANDARD HARDWARE

MV Surge Arrester

Main Bus Bars



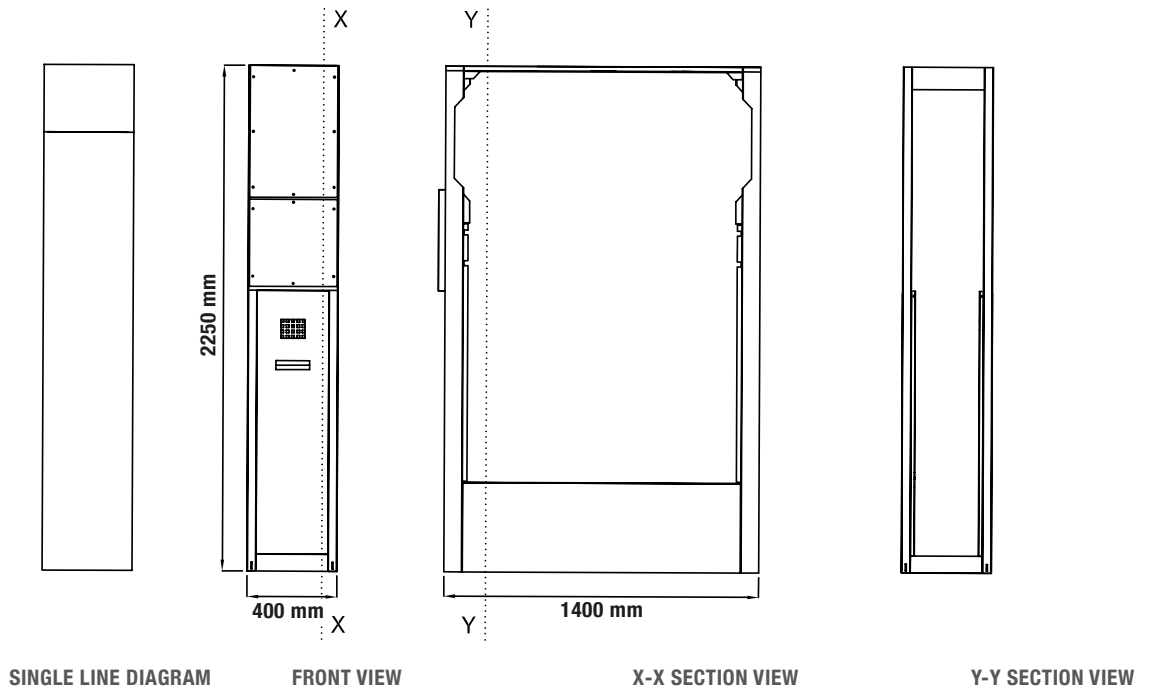
WALL PASSING SWITCHGEAR

Used to pass through the walls.

PNL 36-18

STANDARD HARDWARE

Main Bus Bars



PNL 36-19

CURRENT AND VOLTAGE METERING SWITCHGEAR WITH LOAD BREAK SWITCH-R (INCOMING FROM RIGHT)

Used to meter the current and voltage parameter from the system. Input is reversed (From right) compared to PNL 36-08

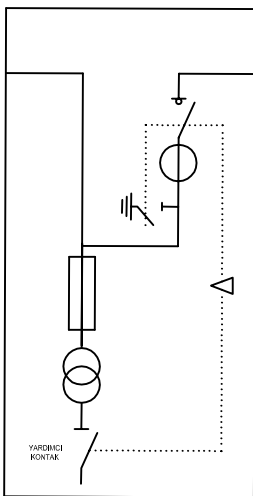


STANDARD HARDWARE

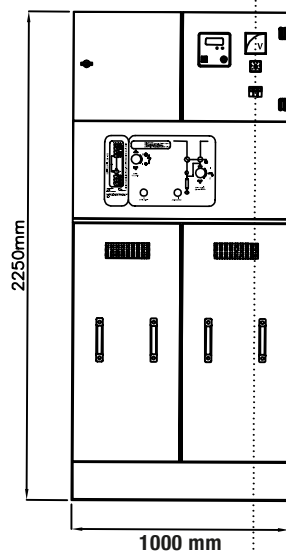
- SF6 Isolated Load Break Switch
- MV Current Transformer
- MV Voltage Transformer
- MV Fuses
- LV Fuses
- Voltmeter – Ammeter
- Voltmeter Selection Switch
- Through Passage Isolator
- Magnetic Field Organizer
- Capacitive Voltage Indicator
- Load Break Switch Mechanism
- Opening / Closing Coils
- Auxiliary Contacts
- Main Bus Bars
- Heater with Thermostatic Control
- Enclosure Earthing Bus Bars

OPTIONAL HARDWARE

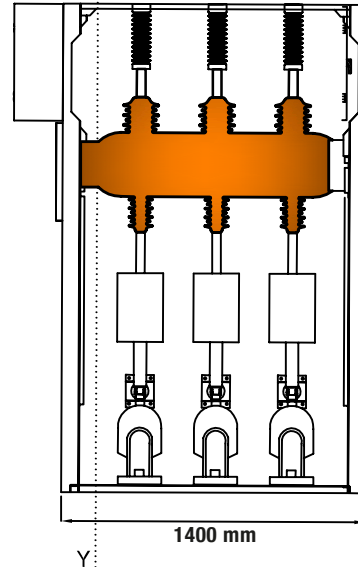
- Remote Control
- Active – Reactive
- Electricity Meter
- Load Break Switch
- Spring Winding
- Motor



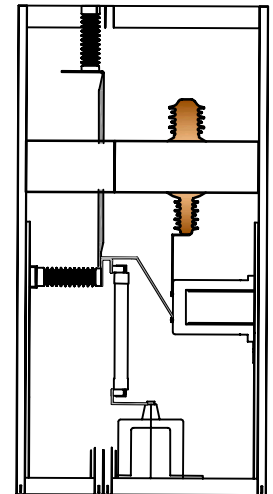
SINGLE LINE DIAGRAM



FRONT VIEW



X-X SECTION VIEW



Y-Y SECTION VIEW

CURRENT AND VOLTAGE METERING SWITCHGEAR WITH LOAD BREAK SWITCH-C (CABLE OUT)

PNL 36-20

Used to meter the current and voltage parameter from the system.

Output is with cable.

STANDARD HARDWARE

SF6 Isolated Load Break Switch

MV Current Transformer

MV Voltage Transformer

MV Fuses

LV Fuses

Voltmeter – Ammeter

Voltmeter Selection Switch

Through Passage Isolator

Magnetic Field Organizer

Capacitive Voltage Indicator

Load Break Switch Mechanism

Opening / Closing Coils

Auxiliary Contacts

Main Bus Bars

Heater with Thermostatic Control

Enclosure Earthing Bus Bars

Cable Connection Setup

OPTIONAL HARDWARE

Remote Control

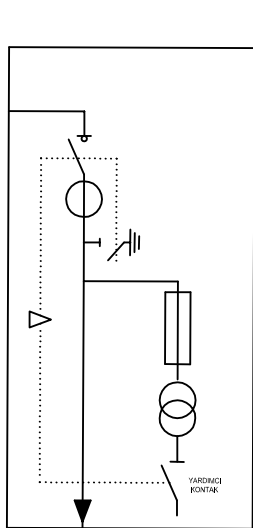
Active – Reactive

Electricity Meter

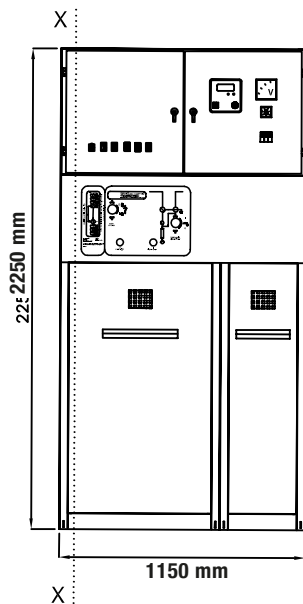
Load Break Switch

Spring Winding

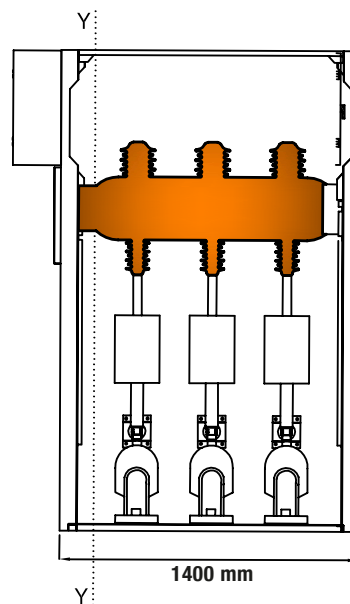
Motor



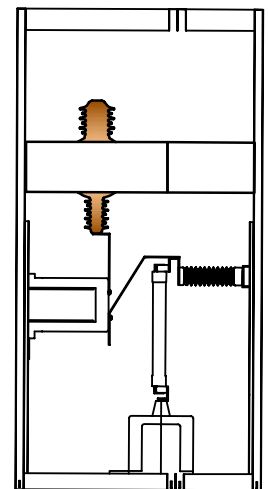
SINGLE LINE DIAGRAM



FRONT VIEW



X-X SECTION VIEW



Y-Y SECTION VIEW

PNL 36-21

COUPLING SWITCHGEAR WITH LOAD BREAK SWITCH (INCOMING FROM RIGHT)

Used to safely connect to or disconnect from main network.



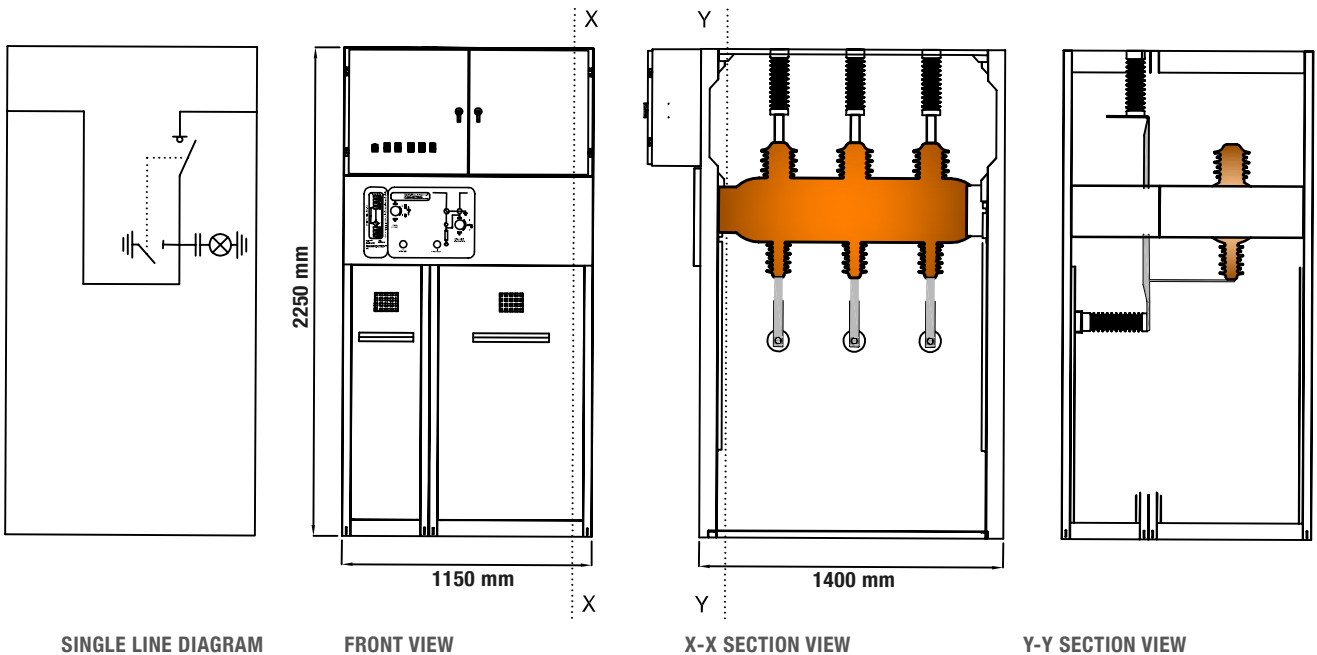
■ STANDARD HARDWARE

SF6 Isolated Load Break Switch

Load Break Switch Mechanism

Main Bus Bars

Heater with Thermostatic Control



CURRENT AND VOLTAGE METERING SWITCHGEAR

Used to meter the current and voltage parameter from the system.

STANDARD HARDWARE

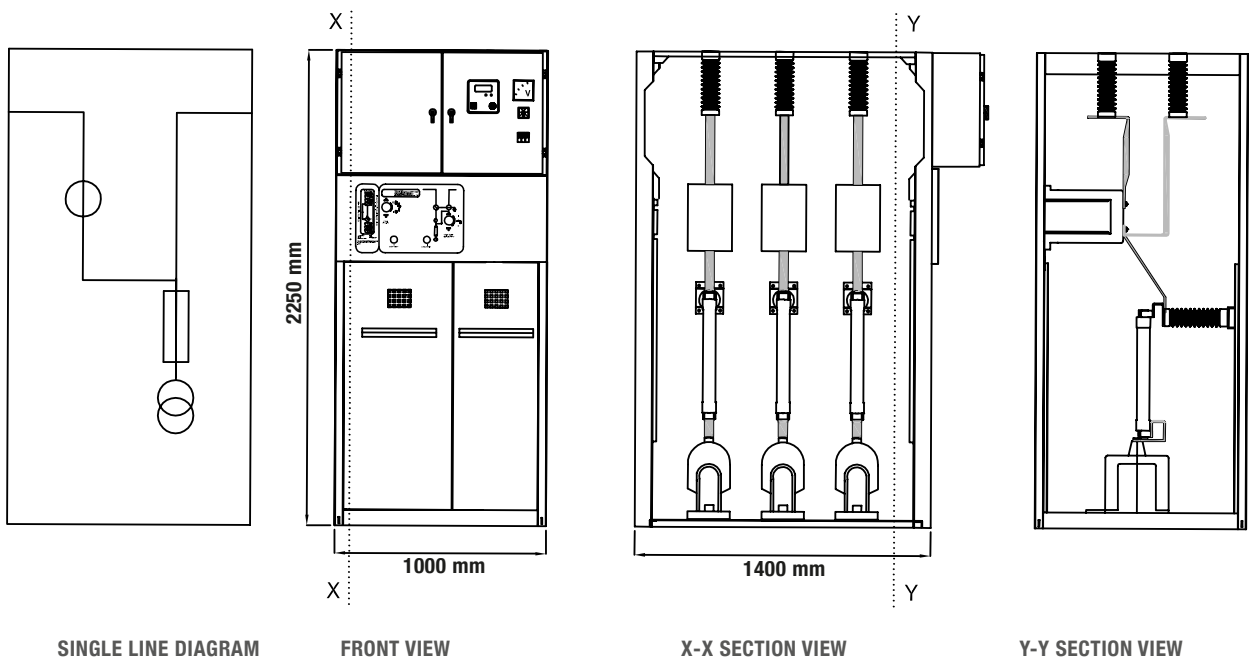
- MV Current Transformer
- MV Voltage Transformer
- MV Fuses
- LV Fuses
- Voltmeter – Ammeter
- Voltmeter Selection Switch
- Through Passage Isolator
- Magnetic Field Organizer
- Main Bus Bars
- Heater with Thermostatic Control
- Enclosure Earthing Bus Bars

PNL 36-22



OPTIONAL HARDWARE

- Active – Reactive Electricity Meter





NLB SERIES

Prefabricated, Monoblock, Concrete
Transformer Substations (Transformer Kiosks)

GENERAL

NLB Series concrete transformer kiosks are designed to be used in outdoor secondary distribution systems with different type of medium voltage switching equipments, transformers, low voltage switching equipments up to 36 kV. They are manufactured according to IEC 62271-202 standard and TEDAŞ – MYD/2000-36.C specifications.

NLB series are:

- Economical
- Aesthetic
- Reliable
- Maintenance Free
- Compact
- Fast installation and commissioning



■ Kiosks are generally:

Consist of 3 compartments ; MV switching compartment, transformer compartment and LV distribution panel compartment. Each compartment is divided with concrete wall from each other and has their own doors and ventilation louvers.

■ Advantages :

No need for complex basements.

Tank/basement is suitable for the minimum bending radius of 36kV 240 mm² cable.

- Maximum operator safety during internal arc
- Compact and Aesthetic
- Ease of shipping
- Configurable almost to infinity
- High quality with the tests run at shop floor

The concrete class used in NLB Series Transformer Stations is C-35/45 according to TS 500 standards. Outer faces are painted with RAL 5008, silicone based grained exterior paint. Different colors can be applied depending on customer request.

There are several weakened cable entry points which can easily be opened by user at the cable gallery at the bottom of the kiosks



STRUCTURAL SPECTS

■ Design and production of the kiosk are made considering the toughest conditions. Seismic calculations, pressure strength etc. are considered.

The dimensions of the compartments are determined with the recommendations of the manufacturers of the transformers, MV and LV switching equipments.

220 V lighting installation is standard installation at compartments.

The kiosk is rainproof. The ventilation lovers are IP 23.

There are four lifting pins (two per side) to safely lift the substations.

The part which will be buried underground is coated with insulation material in black color. The kiosks are installed on the basement prepared according to given basement details.

Ventilation louvers are located on the steel doors of the substation and filtered for bugs and etc. with aluminum expanded sheet.

Special door sizes are manufactured upon customer request.

All electrical and conductive materials equipment are connected to earth potential balancing bus bar. The connection between this earthing bus bar to outside earthing system is made at site by the user.

Cable gallery of the substations are suitable for the minimum bending radius of 36 kV 1x240 mm² XLPE cable.

■ **Operation Type:** Both outside and inside operated type.

■ **Tests:** Every substation is tested according to the IEC standards.

Substations are type tested at internationally accredited laboratories for internal arcing, short circuit, temperature rise etc. according to IEC standards.

■ **Protection Class:** Substations are IP 23 D according IEC 529.



DIMENSIONS

Type	Length (mm)	Width (mm)	Height (mm)	Base Area (m ²)	Weight (kg)
NLB B250	2.500	2.500	3.500	6.250	~10.000
NLB B310	3.100	2.500	3.500	7.750	~13.000
NLB B430	4.300	2.500	3.500	10.750	~16.000
NLB B525	5.250	2.500	3.500	13.125	~18.000
NLB B645	6.450	2.500	3.500	16.125	~19.000
NLB B730	7.300	2.500	3.500	18.250	~22.000



■ Rated Voltage	12-36kV
■ Type	NLB
■ Maximum Rated Power (kVA)	1600
■ Class (IEC 62271 – 202'a Göre)	10 K
■ Internal Arc (A and B access)	16kA – 1 sn
■ Standard	IEC 62271 – 202
■ Protection Class	IP 23 D



LIFTING AND HANDLING INSTRUCTIONS

- Crane selection should be done according to substation weight. The crane capacity must be at least two times the weight of the substation if telescopic cranes are used.
- Keep in mind that lifting capacity of telescopic cranes drops when the distance to the center increases
- Use four pins that are placed in the substation to lift the substation. There are four pin holes (2 per side) around the substation. Insert pins completely to the holes and use crane chains or rope for lifting.
- Place the substation on the basements carefully
- The roofs of the substations can be removed. Use eyebolts on the top of the roofs to lift the roof.
- Follow the instructions given with the substation.

BASEMENT DIMENSIONS

TYPE	Floor Dimensions(mm) LxW	Digging Dims.(mm) LxWxh	Conc. Foundation Dims(mm) LxWxh
NLB B250	2500x2500	3500x3500	3000x3000
NLB B310	2500x3100	3500x4100	3000x3600
NLB B430	2500x4300	3500x5300	3000x4800
NLB B525	2500x5250	3500x6250	3000x5750
NLB B645	2500x6450	3500x7450	3000x6950
NLB B730	2500x7300	3500x8300	3000x7900

GENERAL EXPLANATION

NLB Series transformer substations are indoor operated transformer substations for medium voltage networks. They have a monoblock construction which can house several different electromechanical configurations up to 2 ea 36 kV 800 kVA transformers and switchgears.

The substations are manufactured according to TEDAY MYD-2006-053 specifications. The kiosks are casted with BS-C35/45 quality concrete. The substations are weather proof and the roof is sealed for water leakage.

They are designed suitable to install parks, gardens, squares, road refuges and etc.



GENEL ÖZELLİKLER

- Independend doors for compartments. 1 Transformer up to 36 kV 1600 kVA, 2 transformers up to 36 kV 800 kVA.
- LV Switchboard
- MV and LC direct cable connections
- Earthing circuit
- Lighting and auxiliary services
- Excellent environmental compatibility
- Monoblock design
- Waterproof
- Smooth operation in all kinds of environmental conditions
- Resistance to high humidity
- Low operating costs
- Low or no maintenance
- Standard material
- Quick project creation
- Short delivery time
- Endless alternatives
- Turnkey solutions

■ CONFIGURATION TYPE: NLB – TYPE 1

- 1 transformer up to 1600 kVA
- MV Switchgears: 1 incoming – 1 Outgoing – 1 Transfromer Protection
- 1 LV Panel

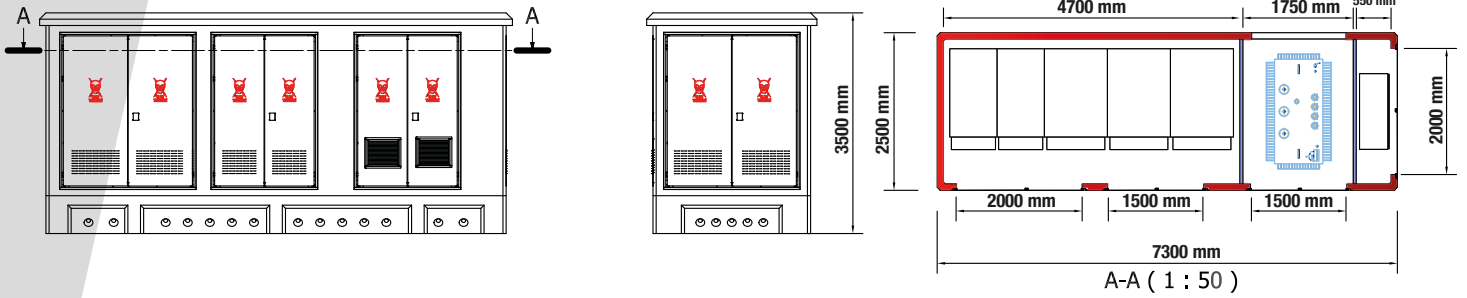
■ CONFIGURATION TYPE: NLB – TYPE 2

- 2 transformers up to 800 kVA
- MV Switchgears: 1 incoming – 1 Outgoing – 2 Transfromer Protection
- 2 LV Panel

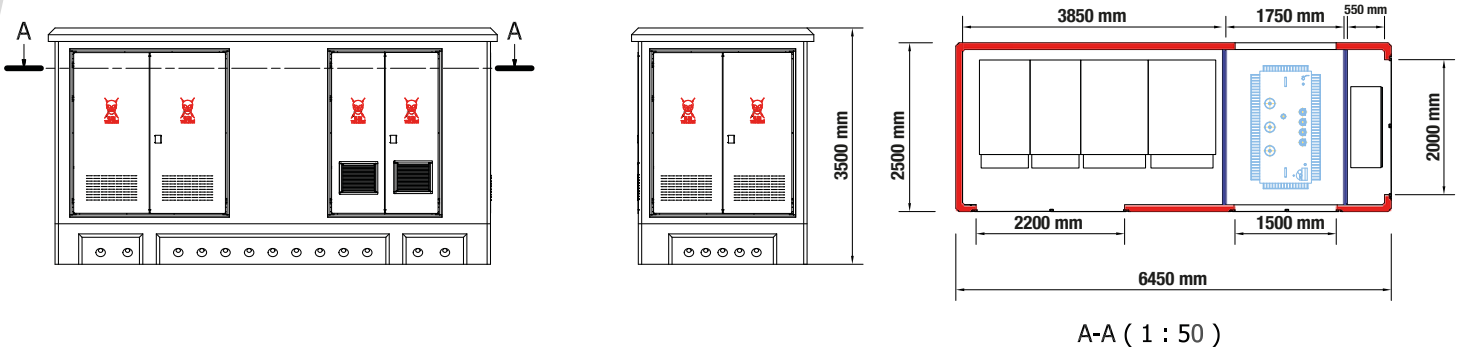


SUBSTATION TYPES

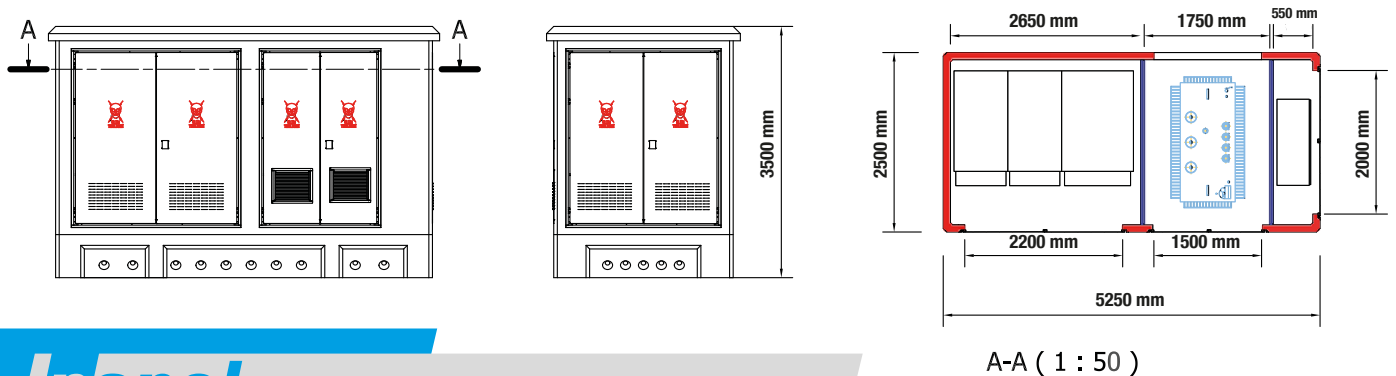
NLB B730



NLB B645

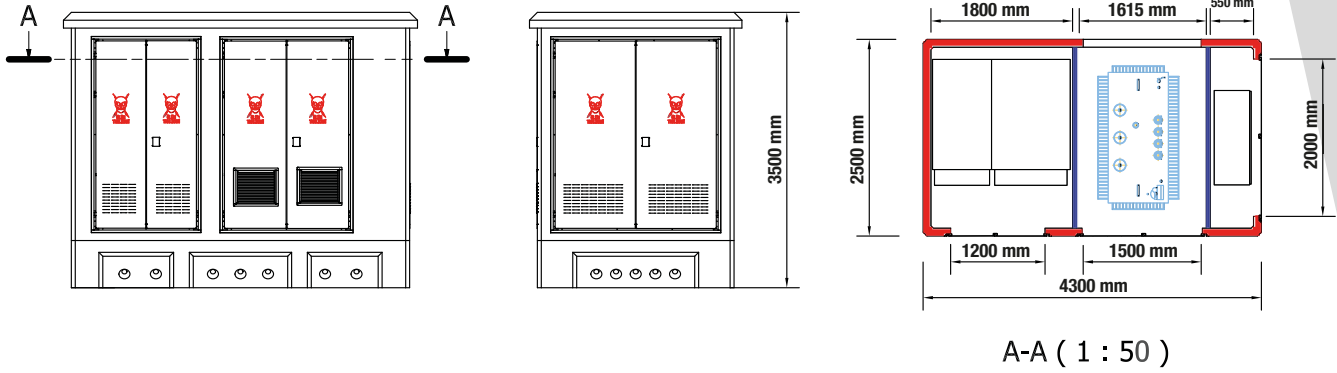


NLB B525

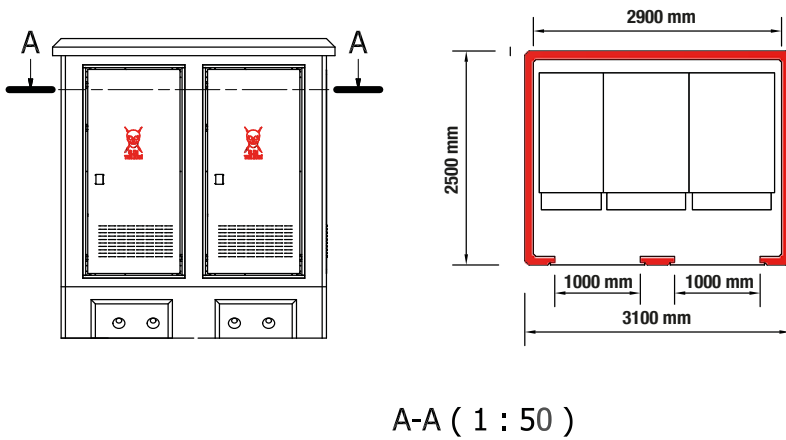


SUBSTATION TYPES

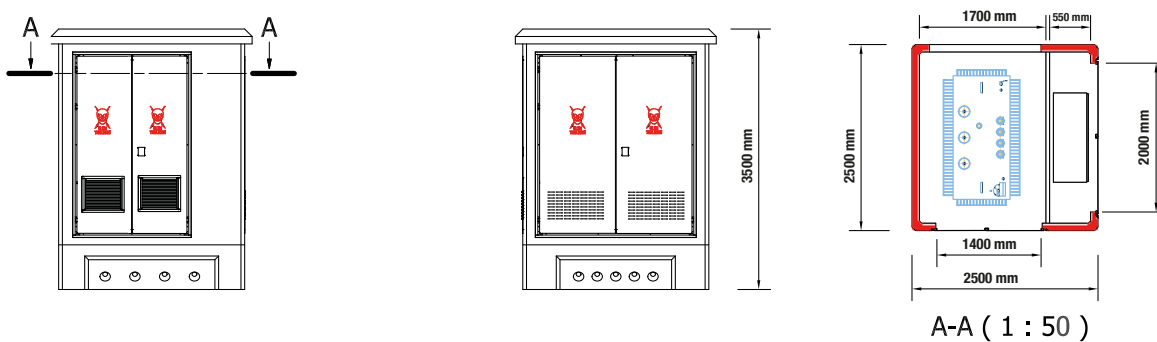
NLB B430



NLB B310



NLB B250





METAL KIOSK

METAL SUBSTATIONS

METAL KIOSKS

Sheet Metal Substations manufactured by our company are serving all around the world.

Sheet Metal Substations has compact design, smaller dimensions, are light-weight, and easily transferable. 4 Substaions up to 1000 kVA can be shipped by 1 truck.

These substations generally has 3 compartments.

1. MV Compartment: Generally Gas Isolated RMU's are used in this compartment.
2. TR Compartment: Transformer up to 1000 kVA can be installed.
3. LV panel according to the requirements of the customer.

Transformer substations are shipped fully equipped. All cabling between equipments and tests are done in shop.



METAL KIOSKS

A thin concrete basement is enough for the installation of the Sheet Metal Substations. After placing the substation on the concrete base; MV cable coming from the MV network is connected to the RMU and cable for load is connected to the LV cable. That is it.

Please do not hesitate to contact us substation installation, commissioning and operation.



DIMENSIONS

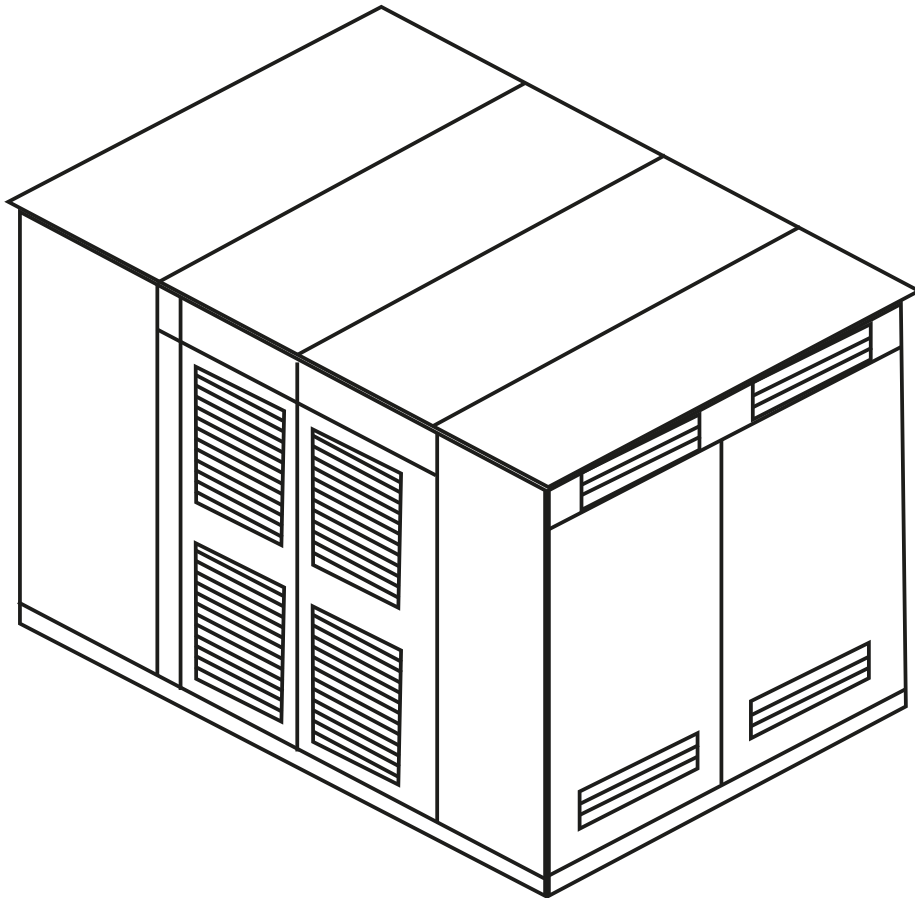
■ Height:
2400 mm

■ Length
3200 mm

■ Width:
2200 mm



- **Rated Voltage:** Up to 24 Kv'
- **Frequency:** 50 - 60 Hz
- **Maximum Transformer Power:** 1000 kVA



NOTES

NOTES

Handwriting practice lines consisting of 20 horizontal grey lines, each preceded by a blue slanted dash mark.

CERTIFICATES



- COMPLIANCE TO TURKISH STANDARTDS CERTIFICATE - TSE 14221
- COMPLIANCE TO TURKISH STANDARTDS CERTIFICATE- TSE 14326
- QUALITY MANAGEMENT CERTIFICATE - ISO 9001
- ENVIRONMENTAL MANAGEMENT SYSTEM CERTIFICATE- ISO 14001
- HEALTH AND SAFETY MANAGEMENT SYSTEM CERTIFICATE - OHSAS 18001
- TURKAK ACREDITATON INSTITUTE TEST REPORT