Prefabricated Transformer Substations IEC 62271-202

Compact Prefabricated Transformer Substations
miniBLOK and miniSUB
Up to 36 kV
<table>
<thead>
<tr>
<th>Contents</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prefabricated transformer substations</td>
<td>3</td>
</tr>
<tr>
<td><strong>MB</strong> compact equipment assembly for transformer substations</td>
<td>9</td>
</tr>
<tr>
<td>Compact prefabricated transformer substations</td>
<td>11</td>
</tr>
<tr>
<td><strong>miniBLOK</strong> kiosk-type compact prefabricated transformer substations</td>
<td>11</td>
</tr>
<tr>
<td><strong>miniSUB</strong> underground compact prefabricated transformer substations</td>
<td>16</td>
</tr>
</tbody>
</table>
The quality of the products designed, manufactured and installed by Ormazabal is backed by the implementation and certification of a quality management system, based on the international standard ISO 9001:2000.

Our commitment to the environment is reaffirmed with the implementation and certification of an environmental management system as laid down in international standard ISO 14001.

In view of the constant evolution in standards and design, the characteristics of the elements contained in this catalogue are subject to change without prior notification.

These characteristics, as well as the availability of components, are subject to confirmation by Ormazabal's Technical-Commercial Department.
The correct design and operating characteristics of Ormazabal’s Transformer Substations are verified with the standard tests described in standard IEC 62271-202. This standard gives an IAC classification to Transformer Substations that pass the internal arc tests, certifying their effectiveness to provide protection in case of an internal fault.

Therefore, Prefabricated Transformer Substations are products, standard-built, tested and supplied as a unit.

The Transformer Substations are installed in locations accessible to the public and must ensure the protection of persons and property according to the specified service conditions, paying special attention to the personal safety of the operators and the general public, even under fault conditions.

A Prefabricated Transformer Substation comprises the following main components:

A. Distribution transformers.
B. MV and LV electrical equipment.
C. MV and LV interconnections.
D. Auxiliary equipment and circuits.
E. Enclosure.

(*) Standard EN 50532: Compact Equipment Assembly (CEADS) has also been taken into account; under development at the time of publication of this catalogue.
Ormazabal’s Prefabricated Transformer Substations are comprised of compact electrical equipment or components:

- According to standard EN 50532*: “Compact Equipment Assembly for Distribution Substations”, compact electrical equipment is classified into type G, type A and type I Compact Equipment Assemblies. They differ in the type of connection, arrangement, proximity and/or insulating medium.

- Prefabricated Transformer Substations constituted by components are those that are configured with switchgear that, complying individually with the current international regulations, are built, tested and supplied as a unit.

Also, Ormazabal has a wide range of products for configuring Transformer Substations, both in industrialised enclosures (monoblock or modular) and buildings for other uses, which allows to configure any Medium Voltage network up to 36 kV.

(*) Under development at the time of publication of this catalogue.
Ormazabal is committed to **sustainable development** for improving its solutions.

Sustainable development, as the best compromise between the satisfaction of social demands, the care for the environment and the economy.

**Sustainable Development**

**Ecological**
- Supportable
- Viable

**Social**
- Supportable
- Viable

**Economical**
- Supportable
- Viable

**Social Demands**

Ormazabal designs its products and offers its services in favour of:

- **Continuity of service** through:
  - High electrical and mechanical characteristics.
  - Cubicles with regenerable insulation (gas) after Medium Voltage operations.
  - Admissible overloads in the transformer without compromising the safety of third parties, by access to live parts.
  - Remote-controlled switch-disconnectors.

- **Safety** through:
  - Low thermal load of the dielectrics: lower volume than other solutions in the market.
  - Fireproof insulation.
  - Equipment protection that limits the risk of fire of the liquid dielectrics.
  - Designs verified with internal arc tests.
  - Optimal interface with operators.
  - Internal interlocks.
  - Protection to avoid access to live parts.
The most important aspects are:

- **Personal protection**, both of operators and third parties, even in case of fault.
  - Verification with internal arc tests.
  - Installation of the earthing circuit.

- **Physical protection** in transformer accesses with an enclosure (live parts not accessible, even in overload conditions).

- Transformer Substations with reduced dimensions and, therefore, minimum quantity of dielectric liquid in the transformers: **low thermal load**.

- **Protection** of the switchgear against external impacts, pollution, adverse weather, solar radiation, vandalism, etc., as it is **inside** a concrete enclosure.
Ormazabal develops its products with a commitment for the environment. The **environmental impact** is **minimised** by:

- Reduction of the volume of dielectric liquid.
- Minimum dimensions.
- Cubicle tanks sealed for life. Insignificant leakage rate.
- Reduced losses in the transformer.
- Low risk of insulator spillage on the public roads, with no harm to the environment.
- Recyclability.
- Use of improvement tools:
  - Ecodesign: design methodology where the environment is taken into account in the development process of industrial products.
  - Analysis of the complete lifecycle: manufacture, use and end-of-life.

The most important aspects are:

- **Permanent protection** against possible leakage of dielectric liquid thanks to the arrangement of the oil collection pits, with resistant and sealed lining.

- **Adaptation to the surroundings:**
  - Minimum dimensions.
  - Various exterior surface finishes (colours, textures and reliefs).
  - Therefore:
    - High capacity for aesthetic integration and imitation.
    - Reduced visual impact.
**ECONOMY**

Ormazabal’s products help reduce the economic impact by:

- Optimal use of raw material.
- Minimal occupation of surface.
- Longer life, endurance and robustness of the equipment.
- Equipment adaptable to the evolution of the network (remote-controllable).
- Minimal civil work (integrated oil collection pit).
- High mechanical and electrical endurance.
- Reduction of energy loss.
- Equipment durability.

Therefore:

- Reduced lifecycle cost of equipment

**SUSTAINABLE DEVELOPMENT**

Sustainable development has evolved in the last decades according to social demands, the care for the environment, and the economy:
**PRESENTATION**

**Ormazabal's MB** is an associated type (A) compact equipment assembly, designed to be installed both in Prefabricated Transformer Substations and in buildings made for Transformer Substations, in public or private distribution networks up to 36 kV.

The main advantage of these assemblies is their high safety and protection for both persons and property against internal faults, their **IAC classification**, as well as their robustness and reliability.

Thanks to its manufacture, assembly, equipment and testing done entirely at the factory, **MB** offers uniform quality and a significant reduction of costs and installation time, making it possible to have an operational Transformer Substation available in a short time.

Compact Equipment Assembly Type A (Associated) according to standard EN 50532:
- Assembly whose functional units, located contiguously, are modified to obtain non-conventional direct interconnections between them, or to reduce the size of the assembly. Its units can be independent or share part of the enclosure or frame.

The deviations from the standard design maintain its safety, functional and operational characteristics unaltered.

This catalogue shows the type A (associated) MB due to the fact that, while maintaining its functional properties, it represents the evolution of the type G (grouped) MB, as it has direct connections that offer a higher reliability than the conventional ones in the grouped one.

**APPLICABLE STANDARDS**

- EN 50532*: Compact Equipment Assembly (CEADS)
- IEC / EN 62271-1: Common specifications for high voltage switchgear and controlgear standards.
- On request:
  - Specific regulations of the Utility.

(*) Under development at the time of publication of this catalogue
The MB has the following maximum configuration:

- Fully gas insulated Medium Voltage Switchgear: **CGMCOSMOS-2LP** up to 24 kV or **CGM.3-2LP** up to 36 kV. Electrical diagram (RMU) with 2 feeder functional units, input and output, and a protection functional unit with a switch-fuse combination.
- **Ormazabal** protection, control and metering units (remote control, telemetering, integrated control, telemanagement, etc.).
- Medium Voltage Distribution Transformer, 250, 400 or 630 kVA.
- LV Switchgear: Low Voltage Board with 4 outputs, with control and protection unit, as well as an auxiliary safety supply.
- Direct MV and LV interconnections.
- Self-supporting frame with lifting device and possibility of installing castor wheels.
- Earthing circuit connection.
- Lighting and auxiliary services.

Note: For other configurations and/or values, please consult Ormazabal’s Technical-Commercial Department.

### TECHNICAL CHARACTERISTICS

<table>
<thead>
<tr>
<th></th>
<th>MB 24</th>
<th>MB 36</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rated voltage [kV]</td>
<td>24</td>
<td>36</td>
</tr>
<tr>
<td>Frequency [Hz]</td>
<td>50</td>
<td>50</td>
</tr>
<tr>
<td>Internal Arc (IAC class)*</td>
<td>16 kA / 0.5 s</td>
<td>16 kA / 0.5 s</td>
</tr>
<tr>
<td>Transformer</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Power [kVA]</td>
<td>250/400/630</td>
<td>250/400/630</td>
</tr>
<tr>
<td>MV Switchgear</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rated current [A]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>In Busbars</td>
<td>400/630</td>
<td>400/630</td>
</tr>
<tr>
<td>Outgoing Line</td>
<td>400/630 (L) 200 (P)</td>
<td>400/630 (L) 200 (P)</td>
</tr>
<tr>
<td>Short-time current [kA]</td>
<td>16 / 20</td>
<td>16 / 20</td>
</tr>
<tr>
<td>Insulation level</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Industrial Frequency [kV]</td>
<td>50 / 60</td>
<td>70 / 80</td>
</tr>
<tr>
<td>Lightning impulse [kV] PEAK</td>
<td>125 / 145</td>
<td>170 / 195</td>
</tr>
<tr>
<td>Low Voltage Board</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rated voltage [V]</td>
<td>440</td>
<td>440</td>
</tr>
<tr>
<td>Rated current [A]</td>
<td>1000</td>
<td>1000</td>
</tr>
<tr>
<td>Rated current [A]/ no. outputs</td>
<td>400 / 4</td>
<td>400 / 4</td>
</tr>
</tbody>
</table>

(*) Please consult Ormazabal’s Technical-Commercial Department for the different configurations according to standard project.

Optionally: Anti-vibration devices and insulating platform.

### PHYSICAL CHARACTERISTICS

<table>
<thead>
<tr>
<th></th>
<th>MB 24</th>
<th>MB 36</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power [kVA]</td>
<td>250</td>
<td>400</td>
</tr>
<tr>
<td>Width [mm]</td>
<td>1890</td>
<td>1890</td>
</tr>
<tr>
<td>Depth [mm]</td>
<td>1673</td>
<td>1673</td>
</tr>
<tr>
<td>Height* [mm]</td>
<td>1532</td>
<td>1532</td>
</tr>
<tr>
<td>Weight [kg]</td>
<td>1600</td>
<td>1950</td>
</tr>
</tbody>
</table>

(*) With castor wheels

Note: For other configurations and/or values, please consult Ormazabal’s Technical-Commercial Department.
PRESENTATION

Ormazabal’s miniBLOK is a kiosk-type Compact Prefabricated Transformer Substation, installed on the surface and externally operated, with reduced dimensions, standard-built, tested and supplied from the factory as a unit.

It is characterised by incorporating an Ormazabal MB Medium Voltage associated type (A) compact equipment assembly, for use in both public and private distribution networks up to 36 kV.

Its careful exterior design and reduced dimensions minimise its visual impact, making it suitable when the available space is limited, in both industrial and residential areas.

The main advantage of these Transformer Substations is their high safety and protection for both persons and property against internal faults, their IAC classification, as well as their robustness and reliability.

Thanks to its manufacture, assembly, equipment and testing done entirely at the factory, miniBLOK offers uniform quality and a significant reduction of costs and installation time, making it possible to have an operational Transformer Substation available in a short time.

APPLICABLE STANDARDS

- EN 50532*: Compact Equipment Assembly (CEADS)
- On request:
  - Specific regulations of the Utility.
  - Applicable local regulations.

(*) Under development at the time of publication of this catalogue
The **miniBLOK Compact Prefabricated Transformer Substations** have the following maximum configuration:

- **MB associated compact equipment assembly:**
  - Fully gas insulated Medium Voltage Switchgear: **CGMCOSMOS-2LP** up to 24 kV or **CGM.3-2LP** up to 36 kV. Electrical diagram (RMU) with 2 feeder functional units, input and output, and a protection functional unit with a switch-fuse combination.
  - Ormazabal protection, control and metering units (remote control, telemetering, integrated control, telemanagement, etc.).
  - Medium Voltage Distribution Transformer, 250, 400 or 630 kVA.
  - LV Switchgear: Low Voltage board with control and protection unit, as well as an auxiliary safety supply.
  - Direct MV and LV interconnections.
  - Self-supporting frame.
  - Earthing circuit connection.
  - Lighting and auxiliary services.
  - Reinforced concrete monoblock enclosure with removable cover.
  - Optional: Operating insulated platform.

Note: For other configurations and/or values, please consult Ormazabal's Technical-Commercial Department.

The **miniBLOK** is characterised for having:

- **MB Associated compact equipment assembly:**
  - 24 and 36 kV models.
  - Fully factory-assembled.
  - Test performed on the MB as an individual unit and as an assembly in the miniBLOK.
  - Reduced size and versatility.
  - Ideal for use in public distribution networks up to 36 kV.
  - Fast and simple replacement of the equipment.
- Prefabricated concrete enclosure:
  - Reduced dimensions: ideal for limited spaces.
  - Low height: little visual impact.
  - Monoblock enclosure with removable cover.
  - Interior dielectric liquid collection pit, with resistant and sealed lining, for protection against soil contamination.
  - Fire barrier protection elements: layer of pebbles over the dielectric collection pit.
- Ventilation:
  - By natural air circulation, class 10, through two intake grilles installed in the enclosure walls and one outlet around the upper part of the enclosure.
- Improvement tools used:
  - Tests and modelling of natural ventilation with **Ormazabal** transformers, for the optimisation of their service life.
  - On request: customised studies according to the data provided by the customer.
- Personnel access:
  - Double door with fixing in place at 90° and 180° for performing operations and maintenance.
- MV and LV cable inlet/outlet:
  - Through pre-punched orifices in the base of the enclosure.
  - Auxiliary Low Voltage feeder inlet, located on the side of the enclosure. Allows the entry of cables coming from a generator set, to supply clients in the event of an incident, via the low voltage board.
TECHNICAL CHARACTERISTICS

<table>
<thead>
<tr>
<th></th>
<th>miniBLOK 24</th>
<th>miniBLOK 36</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rated voltage [kV]</td>
<td>24</td>
<td>36</td>
</tr>
<tr>
<td>Frequency [Hz]</td>
<td>50</td>
<td>50</td>
</tr>
<tr>
<td>Internal Arc (IAC class)</td>
<td>16 kA / 0.5 s</td>
<td>16 kA / 0.5 s</td>
</tr>
<tr>
<td><strong>Transformer</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Power [kVA]</td>
<td>250 / 400 / 630</td>
<td>250 / 400 / 630</td>
</tr>
<tr>
<td><strong>MV Switchgear</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rated current [A]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>In Busbars</td>
<td>400/630</td>
<td>400/630</td>
</tr>
<tr>
<td>Outgoing Line</td>
<td>400/630(L) 200(P)</td>
<td>400/630(L) 200(P)</td>
</tr>
<tr>
<td>Short-time current [kA]</td>
<td>16 / 20</td>
<td>16 / 20</td>
</tr>
<tr>
<td>Insulation level</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Industrial Frequency</td>
<td>50 / 60</td>
<td>70 / 80</td>
</tr>
<tr>
<td>Lightning impulse [kV]</td>
<td>125 / 145</td>
<td>170 / 195</td>
</tr>
<tr>
<td><strong>Low Voltage Board</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rated voltage [V]</td>
<td>440</td>
<td>440</td>
</tr>
<tr>
<td>Rated current [A]</td>
<td>1000</td>
<td>1000</td>
</tr>
<tr>
<td>Rated current [A]/ no. outputs</td>
<td>400 / 4</td>
<td>400 / 4</td>
</tr>
</tbody>
</table>

PHYSICAL CHARACTERISTICS

<table>
<thead>
<tr>
<th></th>
<th>miniBLOK 24</th>
<th>miniBLOK 36</th>
</tr>
</thead>
<tbody>
<tr>
<td>Width [mm]</td>
<td>2100</td>
<td>2100</td>
</tr>
<tr>
<td>Depth [mm]</td>
<td>2100</td>
<td>2100</td>
</tr>
<tr>
<td>Height [mm]</td>
<td>2240</td>
<td>2240</td>
</tr>
<tr>
<td>Visible height [mm]</td>
<td>1600</td>
<td>1600</td>
</tr>
<tr>
<td>Maximum weight* [kg]</td>
<td>7400</td>
<td>7550</td>
</tr>
</tbody>
</table>

(*) with 630 kVA transformer and no remote control.
Note: For other configurations and/or values, please consult Ormazabal’s Technical-Commercial Department.

INSTALLATION

The **miniBLOK** is supplied fully factory-assembled, so the installation process only involves placing the enclosure in the excavation and connecting the MV and LV cables.

Its simple installation, reduced dimensions and weight, as well as its recoverable nature, make it easy to use both in permanent applications and temporary uses.

Note: For making the excavation please request the technical documentation from our Technical-Commercial Department.

The installer must include the study of the earthing system in the project.
INTEGRATION IN THE SURROUNDINGS

The miniBLOK offers a wide range of exterior surface finishes (colours, textures and reliefs), giving it a great capacity for aesthetic harmony with the surroundings, integration and imitation.

This allows a greater adaptation to the requirements of the installation, while reducing its visual impact.

**COLOUR**
- Enclosure.
- Ventilation doors and grilles.
- Cover.

**TEXTURES**
On the enclosure:
- Rough finish: Arid relief.
- Teardrop finish: Scraped single-layer.
- Exposed stone.

**CORNERS IN RELIEF**
Imitation in:
- Rustic brick.
- Sandstone.
- Slate-coloured stone.
- Wood.

Note: More information in the corresponding catalogue.

![Colour swatches](image1)

![Texture examples](image2)

![Corner relief examples](image3)
ADVANTAGES

- Fully factory-assembled and equipped (enclosure, switchgear, transformer and internal earthing circuit).
- Product tested as a unit.

**High personnel safety**
- Against internal arcs, accidental direct contact, touch and step voltage.
- Equipotential work surface.
- No access to live parts. Integrated in the surroundings.
- Reduced environmental, visual and acoustic impact.

- Excellent resistance to pollution and other environmental factors.
- Easy to transport due to its reduced dimensions and weight.
- Simple installation, limited to the introduction of the enclosure in the excavation and the connection of the MV and LV cables.
- Fast changes of electrical equipment.

APPLICATIONS

The miniBLOK Transformer Substations are

- Safe
- Environmentally-friendly
- Sustainable
- Ergonomic

The miniBLOK is used for the following applications:

**Generation:**
- Photovoltaic facilities

**Distribution:**
- Public and private distribution
- Urban environments.
- Industrial environments.
- Areas with restricted or reduced space.
- Installations with integrated remote control, telemetering and/or telemanagement.
- etc.
Ormazabal’s miniSUB is a Compact Prefabricated Transformer Substation installed underground, with reduced dimensions, standard-built, tested and supplied from the factory as a unit.

It is characterised by incorporating an Ormazabal MB Medium Voltage associated type (A) compact equipment assembly, for use in both public and private distribution networks up to 36 kV.

The careful exterior design and reduced dimensions minimise its visual impact, making it suitable when the available space is limited, in both industrial and residential areas.

The main advantage of these Transformer Substations is their high safety and protection for both persons and property against internal faults, their IAC classification, as well as their robustness and reliability.

Thanks to its manufacture, assembly, equipment and testing done entirely at the factory, miniSUB offers uniform quality and a significant reduction of costs and installation time, making it possible to have an operational Transformer Substation available in a short time.
COMPOSITION

The miniSUB Compact Prefabricated Transformer Substations have the following maximum configuration:

- **MB associated compact equipment assembly:**
  - Fully gas insulated Medium Voltage Switchgear: CGMCOSMOS-2LP up to 24 kV or CGM.3-2LP up to 36 kV. Electrical diagram (RMU) with 2 feeder functional units, input and output, and a protection functional unit with a switch-fuse combination.
  - Ormazabal protection, control and metering units (remote control, telemetering, integrated control, telemanagement, etc.).
  - Medium Voltage Distribution Transformer, 250, 400 or 630 kVA.
  - LV Switchgear: Low Voltage board with control and protection unit, as well as an auxiliary safety supply.
  - Direct MV and LV interconnections.
  - Self-supporting frame.
  - Earthing circuit connection.
  - Lighting and auxiliary services.
- Reinforced concrete monoblock enclosure with removable cover.

Note: For other configurations and/or values, please consult Ormazabal’s Technical-Commercial Department.

APPLICABLE STANDARDS

- EN 50532*: Compact Equipment Assembly (CEADS)
- On request:
  - Specific regulations of the Utility.
  - Applicable local regulations.

(*) Under development at the time of publication of this catalogue.
CHARACTERISTICS

The miniSUB is characterised for having:

- **MB** Associated compact equipment assembly:
  - 24 and 36 kV models.
  - Fully factory-assembled.
  - Test performed on the MB as an individual unit and as an assembly in the miniSUB.
  - Reduced size and versatility.
  - Ideal for use in public distribution networks up to 36 V.
  - Fast and simple replacement of the equipment.

- Prefabricated concrete enclosure:
  - Reduced dimensions: ideal for limited spaces.
  - Underground installation: minimum visual impact.
  - Monoblock enclosure with removable cover.
  - Interior dielectric liquid collection pit, with resistant and sealed lining, for protection against soil contamination.
  - Fire barrier protection elements: layer of pebbles over the dielectric collection pit.

- Ventilation
  - By natural air circulation, class 10: horizontal (miniSUB-H) made up of grilles located on the horizontal plane (level 0) or vertically (miniSUB-V) with turrets located on the vertical plane.

- Improvement tools:
  - Tests and modelling of natural ventilation with Ormaezabal transformers, for the optimisation of their service life.
  - On request: customised studies according to the data provided by the customer.

- Personnel access:
  - Through non-slip trapdoor located on the cover. Easily opened, it deploys a perimeter safety barrier.

- MV and LV cable inlet/outlet:
  - Through 12 pre-punched orifices in the sides of the enclosure.
  - The orifices are protected with sealed feedthroughs, patented by Ormaezabal.
TECHNICAL CHARACTERISTICS

<table>
<thead>
<tr>
<th>miniSUB 24</th>
<th>miniSUB 36</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rated voltage [kV]</td>
<td>24</td>
</tr>
<tr>
<td>Frequency [Hz]</td>
<td>50</td>
</tr>
<tr>
<td>Internal Arc ([IAC class]</td>
<td>16 kA / 0.5 s</td>
</tr>
<tr>
<td>Transformer Power [kVA]</td>
<td>250 / 400 / 630</td>
</tr>
<tr>
<td>MV Switchgear Rated current [A]</td>
<td></td>
</tr>
<tr>
<td>In Busbars</td>
<td>400/630</td>
</tr>
<tr>
<td>Outgoing Line</td>
<td>400/630(L) 200(P)</td>
</tr>
<tr>
<td>Short-time current [kA]</td>
<td>16 / 20</td>
</tr>
<tr>
<td>Insulation level</td>
<td></td>
</tr>
<tr>
<td>Industrial Frequency [kV]</td>
<td>50 / 60</td>
</tr>
<tr>
<td>Lightning impulse [kV] PEAK</td>
<td>125 / 145</td>
</tr>
</tbody>
</table>

| Low Voltage Board | |
| Rated voltage [V] | 440 | 440 |
| Rated current [A] | 1000 | 1000 |
| Rated current [A]/ no. outputs | 400 / 4 | 400 / 4 |

PHYSICAL CHARACTERISTICS

<table>
<thead>
<tr>
<th>miniSUB 24</th>
<th>miniSUB 36</th>
<th>miniSUB 24</th>
<th>miniSUB 36</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ventilation</td>
<td>H</td>
<td>V</td>
<td></td>
</tr>
<tr>
<td>Width [mm]</td>
<td>4550</td>
<td>3460</td>
<td></td>
</tr>
<tr>
<td>Depth [mm]</td>
<td>2460</td>
<td>2460</td>
<td></td>
</tr>
<tr>
<td>Height [mm]</td>
<td>Body - 2350</td>
<td>-2350</td>
<td></td>
</tr>
<tr>
<td>Ventilation</td>
<td>0</td>
<td>+485</td>
<td></td>
</tr>
<tr>
<td>Maximum weight* [kg]</td>
<td>16700</td>
<td>16850</td>
<td>15200</td>
</tr>
</tbody>
</table>

(*) with 630 kVA transformer and no remote control.

Note: For other configurations and/or values, please consult Ormazabal’s Technical-Commercial Department.

INSTALLATION

The miniSUB is supplied fully factory-assembled, so the installation process only involves placing the enclosure in the excavation and connecting the MV and LV cables.

Its simple installation, reduced dimensions and weight, as well as its recoverable nature, make it easy to use both in permanent applications and temporary uses.

Note: For making the excavation please request the technical documentation from our Technical-Commercial Department. The installer must include the study of the earthing system in the project.
ADVANTAGES

• Fully factory-assembled and equipped (enclosure, switchgear, transformer and internal earthing circuit).

• Product tested as a unit.

**High personnel safety**
- Against internal arcs, accidental direct contact, touch and step voltage.
- Equipotential work surface.
- No access to live parts.

• Reduced environmental, visual and acoustic impact.
  - Containment of possible dielectric leakage.
  - Fire protection.

• Excellent resistance to pollution and other environmental factors.

• Waterproof and sealed.

• Easy to transport due to its reduced dimensions and weight.

• Simple installation, limited to the introduction of the enclosure in the excavation and the connection of the MV and LV cables.

• Fast changes of electrical equipment.

APPLICATIONS

The **miniSUB** Transformer Substations are

• Safe
• Environmentally-friendly
• Sustainable
• Ergonomic

and their main application are in:

**Distribution:**
- Public and private distribution
- Urban and residential environments.
- Historical environments.
- Large infrastructures: airports, ports, etc.
- Areas with reduced or restricted spaces (garage accesses, etc.).
- Installations with integrated remote control, telemetering and/or telemanagement.
- etc.
Transformer Substations up to 36 kV

**Prefabricated Transformer Substations**
- Medium Voltage Applications for Renewable Energy

Medium Voltage Secondary Distribution Switchgear
- CGMCOSMOS System
- CGM.3 System

Medium Voltage Primary Distribution Switchgear
- CPG System
- CPA System

Automation, Protection, Telemanagement and Communication

Distribution Transformers

Low Voltage Switchgear