Prefabricated transformer substations
Up to 36 – 40.5 kV IEC 62271-202
Reliable innovation. Personal solutions.
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Transformer Substations
I. Introduction

Preface

Prefabricated transformer substations

The prefabricated transformer substations are products which are IEC / EN 62271-202 compliant. They are built as standard, tested and are supplied as a unit.

- World biggest prefabricated transformer substation manufacturer
- More than 90,000 transformer substations installed worldwide
- More than 10,000 underground substations
- Manufactured 100% in Europe
- Application: DNS (Distribution Network Solutions for secondary distribution)

Your business and DNS applications

Segments

- Smart Grid
- Transmission & Distribution
- Generation

- Infrastructures
- Industrial
- Tertiary

- Wind
- Solar
- Dispatchable RES

DNS

A. Distribution transformer
B. MV and LV electrical equipment
C. MV and LV interconnection
D. Auxiliary equipment and circuits
E. Enclosure
II. Main features

Safety
- People and third parties protection: Internal arc tested (IAC class)
- Physical protection in transformer accesses (live parts not accessible, even in overload conditions)
- Dielectric liquid collector: Protection against insulator leakage

Reliability
- Factory-assembled and – equipped as a unit.
- Low thermal load: Minimum quantity of dielectric liquid in the transformers
- High mechanical and electrical endurance

Efficiency
- Protection against pollution, other environmental factors, impacts, vandalism…
- Longer life, endurance and robustness than non-prefabricated solutions
- Minimal civil works and easy transportation

Sustainability
- Minimal environmental, visual and acoustic impact.
- Reduced size and versatility
- Equipment adaptable to the evolution of the network

Continuous innovation
- Aesthetic integration into the environment
- Auxiliary low voltage feeder inlet to enter cables from a generator set
- Smart-grid ready substations
III. Product range
Prefabricated transformer substations (1/2)

Concrete

Compact kiosk: *miniblok*

Compact underground: *minisub*

Kiosk: *ormaset*  
*ormaset.p*

Rural kiosk:  
*cforce*  
*ctc*

CEADS (Compact equipment assembly):  
*mb*

Other specific tested configurations:

Walk-in:  
*pfu.4 iec*

Underground:  
*pfs.48 iec*  
*ormadis.s*
III. **Product range**

Prefabricated transformer substations (2/2)

Concrete

- **Walk-in (PAMI & PUIE):** cto
- **Rural kiosk (PRCS):** ctc.r
- **Rural kiosk (PSS):** ctc.ra & rb

Metallic

- **Kiosk:** ormaset.m
- **Outdoor compact:** mb.m
### III. Product range

**Compact kiosk: miniblok**

**Concrete**

*Kiosk-type compact* Prefabricated Transformer Substation used in Medium Voltage (MV) electrical distribution networks up to 36 kV

- Ground level installation
- Outdoor operation
- Tested and supplied from factory as a unit
- Internal arc tested
- Minimal visual impact
- Oil collecting pit
- Auxiliary LV feeder access for cables coming from a generator set
- Experience: Over 4,000 units installed

Consists of:

- MV associated (A) type compact equipment assembly (CEADS)
- Monoblock concrete enclosure with removable roof

**Range**

[miniblok.24](#)   [miniblok.36](#)

**Design**

1. Concrete enclosure
2. Optional: Operating isolating platform
3. **mb: Associated compact equipment assembly**
   - MV switchgear (RMU)
     - cgmcosmos-2lp (up to 24 kV)
     - cgm.3-2lp (up to 36 kV)
   - 1 Transformer up to 630 kVA
4. LV board
5. Ormazabal protection, control and metering units
## III. Product range

### Compact kiosk: miniblok

Technical details

<table>
<thead>
<tr>
<th>miniblok</th>
<th>mini blok 24</th>
<th>miniblok 36</th>
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<tbody>
<tr>
<td>Rated Voltage</td>
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<td>36</td>
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<tr>
<td>Rated frequency</td>
<td>50 [Hz]</td>
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<tr>
<td>Internal arc classification</td>
<td>16 kA / 0.5 s</td>
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<tr>
<td>Transformer</td>
<td>250 / 400 / 630 [kVA]</td>
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<tr>
<td>MV Switchgear</td>
<td>400 / 630 [A]</td>
<td>400/630 (l) 200 (p)</td>
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<tr>
<td>Short-time current</td>
<td>16 / 20</td>
<td></td>
</tr>
<tr>
<td>Low voltage board</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rated voltage</td>
<td>440 [V]</td>
<td></td>
</tr>
<tr>
<td>Rated current</td>
<td>1000 [A]</td>
<td></td>
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<tr>
<td>Outputs</td>
<td>4 x 400 [A]</td>
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<td>Weight (with a 630 kVA transformer)</td>
<td>7400</td>
<td>7550</td>
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<table>
<thead>
<tr>
<th>Standards</th>
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<tbody>
<tr>
<td>EN 50532</td>
</tr>
<tr>
<td>Compact equipment assembly (CEADS)</td>
</tr>
<tr>
<td>IEC / EN 62271-202</td>
</tr>
<tr>
<td>HV switchgear: Prefabricated transformer substations</td>
</tr>
</tbody>
</table>

- Transformer Substations
III. Product range

Compact kiosk: miniblok

Main countries with miniblok installed:

- Spain
- Argentina
- Chile
- Brazil
- Colombia
- Dominican Republic
- Switzerland
- Paraguay

References
III. Product range

Compact underground: **minisub**

Concrete

Underground-type compact Prefabricated Transformer Substation used in Medium Voltage (MV) electrical distribution networks up to 36 kV

- Tested and supplied from factory as a unit
- Natural ventilation (class 10)
- Internal arc tested
- Integration into the environment
- Oil collecting pit
- Experience: Over 2,000 units installed worldwide

Consists of:

- **MV** associated (A) type compact equipment assembly (CEADS)
- **Monoblock** concrete enclosure with removable cover

**Range**

**minisub-h**: Horizontal ventilation  
**minisub-v**: Vertical ventilation

**Design**

1. Concrete enclosure
2. Staff access
3. Ventilation (h or v)
4. **mb**: Associated compact equipment assembly
5. MV switchgear (RMU)
   - cgmcosmos-2lp (up to 24 kV)
   - cgm.3-2lp (up to 36 kV)
6. 1 Transformer up to 630 kVA
7. LV board
8. **Orma**zabal protection, control and metering units

Transformer Substations
### III. Product range

#### Compact underground: **minisub**

**Technical details**

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<th><strong>minisub: 24</strong></th>
<th><strong>minisub: 36</strong></th>
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<td>Rated frequency</td>
<td>$f_r$ [Hz]</td>
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<td>Internal arc classification</td>
<td>IAC</td>
<td>16 kA / 0.5 s</td>
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<tr>
<td>Transformer</td>
<td>Power [kVA]</td>
<td>250 / 400 / 630</td>
</tr>
<tr>
<td>MV Switchgear</td>
<td>Rated current</td>
<td>400 / 630</td>
</tr>
<tr>
<td></td>
<td>Busbars</td>
<td>$I_r$ [A]</td>
</tr>
<tr>
<td></td>
<td>Output</td>
<td>$I_r$ [A]</td>
</tr>
<tr>
<td></td>
<td>Short-time current</td>
<td>$I_k$ [kA]</td>
</tr>
<tr>
<td>Low voltage board</td>
<td>Rated voltage</td>
<td>440</td>
</tr>
<tr>
<td></td>
<td>Busbar</td>
<td>$I_r$ [A]</td>
</tr>
<tr>
<td></td>
<td>Outputs</td>
<td>$I_r$ [A]</td>
</tr>
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<td>Ventilation</td>
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<td>+485</td>
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<td>Width [mm]</td>
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<td>Depth [mm]</td>
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<tr>
<td></td>
<td>Height [mm]</td>
<td>-2240</td>
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<td></td>
<td>Ventilation height [mm]</td>
<td>0</td>
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<td></td>
<td>Weight (with a 630 kVA transformer) [kg]</td>
<td>16700 – 24 kV / 16850 – 36 kV</td>
</tr>
</tbody>
</table>

**Standards**

- **EN 50532**
  - Compact equipment assembly (CEADS)
- **IEC / EN 62271-202**
  - HV switchgear: Prefabricated transformer substations

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**Transformer Substations**
III. **Product range**

**Compact underground: minisub**

Main countries with **minisub** installed:

- Spain
- Argentina
- Portugal
- Turkey
III. Product range

CEADS – Compact equipment assembly: mb

Compact equipment assembly designed to be installed both in prefabricated transformer substations and in buildings made for that purpose, used in MV electrical distribution networks up to 36 kV (EN 50532)

- CEADS type A (associated)
- Fully factory assembled
- Tested and supplied from factory as a unit
- Internal arc tested
- To be integrated in miniblok and minisub compact TS
- Experience: Over 8,500 units installed worldwide

Range

mb.24
mb.36

Design

1. MV switchgear (RMU)
   - cgmcosmos-2lp (up to 24 kV)
   - cgm.3-2lp (up to 36 kV)

2. 1 Transformer up to 630 kVA

3. LV board

4. Ormazabal protection, control and metering units

5. Self-supporting frame

6. Direct MV and LV interconnections
### III. Product range

#### CEADS – Compact equipment assembly: mb

**Technical details**

<table>
<thead>
<tr>
<th>mb</th>
<th>mb.24</th>
<th>mb.36</th>
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<tbody>
<tr>
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<td>Ur [kV]</td>
<td>24</td>
</tr>
<tr>
<td><strong>Rated frequency</strong></td>
<td>fr [Hz]</td>
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</tr>
<tr>
<td><strong>Internal arc classification</strong></td>
<td>IAC</td>
<td></td>
</tr>
<tr>
<td><strong>Transformer</strong></td>
<td>Power [kVA]</td>
<td>250 / 400 / 630</td>
</tr>
<tr>
<td><strong>MV Switchgear</strong></td>
<td>Rated current</td>
<td>Busbars Ir [A]</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Output Ir [A]</td>
</tr>
<tr>
<td></td>
<td>Short-time current</td>
<td>Ik [kA]</td>
</tr>
<tr>
<td><strong>Low voltage board</strong></td>
<td>Rated voltage</td>
<td>Ur [V]</td>
</tr>
<tr>
<td></td>
<td>Rated current</td>
<td>Busbar Ir [A]</td>
</tr>
<tr>
<td></td>
<td>Outputs Ir [A]</td>
<td>4 x 400</td>
</tr>
<tr>
<td><strong>Width</strong></td>
<td>[mm]</td>
<td>1890</td>
</tr>
<tr>
<td><strong>Depth</strong></td>
<td>[mm]</td>
<td>1673</td>
</tr>
<tr>
<td><strong>Height</strong></td>
<td>[mm]</td>
<td>1532</td>
</tr>
<tr>
<td><strong>Weight</strong></td>
<td>[kg]</td>
<td>1600 (250 kVA) 1950 (400 kVA) 2400 (630 kVA)</td>
</tr>
</tbody>
</table>

#### Standards

<table>
<thead>
<tr>
<th>EN 50532</th>
<th>Compact equipment assembly (CEADS)</th>
</tr>
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<tbody>
<tr>
<td>IEC / EN 62271-1</td>
<td>HV switchgear: Common specifications for HV switchgear and control gear</td>
</tr>
</tbody>
</table>
III. Product range

CEADS – Compact equipment assembly: mb

References
III. Product range

Kiosk: ormaset

Concrete

Kiosk-type Prefabricated Transformer Substation used in Medium Voltage (MV) electrical distribution networks up to 36 kV

- Ground level installation (half-buried)
- Outdoor operation
- Independent accesses: MV switchgear and transformer + LV board
- Tested and supplied from factory as a unit
- Minimal visual impact
- Oil collecting pit
- Auxiliary LV feeder access for cables coming from a generator set
- Experience: Over 550 units installed worldwide

Range

- [Diagram of Range]

ormaset.24

ormaset.36
### III. Product range

**Kiosk: ormaset**

#### Technical details

<table>
<thead>
<tr>
<th></th>
<th>ormaset</th>
<th>ormaset 24</th>
<th>ormaset 36</th>
</tr>
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<tbody>
<tr>
<td><strong>Rated Voltage</strong></td>
<td>Ur [kV]</td>
<td>24</td>
<td>36</td>
</tr>
<tr>
<td><strong>Rated frequency</strong></td>
<td>fr [Hz]</td>
<td>50</td>
<td></td>
</tr>
<tr>
<td><strong>Transformer</strong></td>
<td>Power (max) [kVA]</td>
<td>1000</td>
<td></td>
</tr>
<tr>
<td><strong>MV Switchgear</strong></td>
<td>Rated current [A]</td>
<td>400 / 630</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Busbars</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Output</strong></td>
<td>Ir [A]</td>
<td>400 / 630 (l) 200 (p)</td>
<td></td>
</tr>
<tr>
<td>Short-time current</td>
<td>lk [kA]</td>
<td>16 / 20</td>
<td></td>
</tr>
<tr>
<td><strong>Low voltage board</strong></td>
<td>Rated voltage [V]</td>
<td>420</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Busbar (max) [A]</td>
<td>1600</td>
<td></td>
</tr>
<tr>
<td><strong>Width</strong></td>
<td>[mm]</td>
<td>3475</td>
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<tr>
<td><strong>Depth</strong></td>
<td>[mm]</td>
<td>2070</td>
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<tr>
<td><strong>Height</strong></td>
<td>[mm]</td>
<td>2350</td>
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<tr>
<td><strong>Visible height</strong></td>
<td>[mm]</td>
<td>4500</td>
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<tr>
<td><strong>Weight (without transformer)</strong></td>
<td>[kg]</td>
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</table>

**Standards**

<table>
<thead>
<tr>
<th>IEC / EN 62271-202</th>
<th>HV switchgear: Prefabricated transformer substations</th>
</tr>
</thead>
</table>
III. Product range

Kiosk: ormaset

Main countries with ormaset installed:

- Spain
- Portugal
- Poland
- Turkey

References
III. Product range

**Kiosk: ormaset.p**

**Concrete**

*Kiosk-type* Prefabricated Transformer Substation used in Medium Voltage (MV) electrical distribution networks up to 24 kV

- Ground level installation (half-buried)
- Outdoor operation
- Independent accesses: MV switchgear and transformer + LV board
- Supplied from factory as a unit
- Minimal visual impact
- Oil collecting pit

**Range**

<table>
<thead>
<tr>
<th>ormaset.p-173</th>
<th>ormaset.p-210</th>
</tr>
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<tbody>
<tr>
<td>1730 mm width series</td>
<td>2100 mm width series</td>
</tr>
</tbody>
</table>

1. Monoblok concrete enclosure
2. MV switchgear
   - cgmcosmos / ga-gae (up to 24 kV)
3. 1 Transformer up to 630 kVA
4. LV board
5. Ormazabal protection, control and metering units
### III. Product range

**Kiosk: ormaset.p**

**Technical details**

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<td>fr [Hz]</td>
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</tr>
<tr>
<td>Transformer</td>
<td>Power (max) [kVA]</td>
<td>630</td>
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</tr>
<tr>
<td>MV Switchgear</td>
<td>Rated current</td>
<td>Busbars, Ir [A]</td>
<td>400 / 630</td>
</tr>
<tr>
<td></td>
<td>Output</td>
<td>Ir [A]</td>
<td>400 / 630 (l) 200 (p)</td>
</tr>
<tr>
<td></td>
<td>Short-time current</td>
<td>Ik [kA]</td>
<td>16 / 20</td>
</tr>
<tr>
<td>Low voltage board</td>
<td>Rated voltage</td>
<td>Ur [V]</td>
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<tr>
<td></td>
<td>Rated current</td>
<td>Busbar (max), Ir [A]</td>
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<table>
<thead>
<tr>
<th></th>
<th>173/283</th>
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<th>210/290</th>
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<td>Depth</td>
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<td>2400</td>
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<tr>
<td>Height</td>
<td>[mm]</td>
<td>2415</td>
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<td>Visible height</td>
<td>[mm]</td>
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<td>Weight</td>
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</table>

**Standards:**
- IEC / EN 62271-202
- HV switchgear: Prefabricated transformer substations
III. Product range

Kiosk: ormaset.p

References

Utility

End Users

Main countries with ormaset.p installed:

- Poland
- Germany
- Switzerland
III. Product range

Rural kiosk: **ctr**

**Concrete**

*Kiosk-type compact* Prefabricated Transformer Substation used in Medium Voltage (MV) rural distribution networks up to 36 kV

- Ground level installation
- Outdoor operation
- Tested and supplied *from factory as a unit*
- Minimal visual impact
- Oil collecting pit
- Auxiliary LV feeder *access* for cables coming from a generator set
- Experience: Over 5,000 rural kiosks installed

Consists of:

- MV associated (A) type *compact equipment assembly* (CEADS)
- Monoblock concrete *enclosure* with removable roof

**Range**

![ctr.2](image1)

![ctr.3](image2)

**Concrete enclosure**

**2**  **Associated compact equipment assembly**

**2.1** MV switchgear

- cgm.cosmos (up to 24 kV)
- cgm.3 (up to 36 kV)

**2.2** 1 Transformer up to 630 kVA

**2.3** LV board

**Ormazabal protection and control unit: ekor.rpt-k**
## III. Product range

### Rural kiosk: **ctr**

**Technical details**

<table>
<thead>
<tr>
<th></th>
<th><strong>Ur</strong> [kV]</th>
<th><strong>fr</strong> [Hz]</th>
<th><strong>Power</strong> [kVA]</th>
<th><strong>Ir</strong> [A]</th>
<th><strong>Ik</strong> [kA]</th>
<th><strong>Ur</strong> [V]</th>
<th><strong>Ir</strong> [A]</th>
<th><strong>Outputs</strong> [A]</th>
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<td></td>
</tr>
<tr>
<td><strong>Transformer</strong></td>
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<tr>
<td><strong>MV Switchgear</strong></td>
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<td></td>
<td></td>
<td></td>
<td>1975 / 2010</td>
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<td><strong>Visible height</strong></td>
<td></td>
<td></td>
<td></td>
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<td>1500</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>4150 / 4350</td>
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**Standards**

- **EN 50532**: Compact equipment assembly (CEADS)
- **IEC / EN 62271-202**: HV switchgear: Prefabricated transformer substations
III. Product range

Rural kiosk: **ctr**

Main countries with **ctr** installed:
- Spain
- Argentina
- Turkey

References

Transformer Substations

Utility
III. Product range

Rural kiosk: ctc

Concrete

Kiosk-type under pole Prefabricated Transformer Substation used in Medium Voltage (MV) rural distribution networks up to 36 kV

- Ground level installation
- Outdoor operation
- Tested and supplied from factory as a unit
- Minimal visual impact
- Oil collecting pit
- Breaking and protection remain on the pole
- Experience: Over 5,000 rural kiosks installed

Consists of:

- Electrical equipment: MV/LV distribution transformer and LV board
- Monoblock concrete enclosure with removable roof

Range

ctc: 12 - 24 - 36 kV

Design

1. Concrete enclosure
2. Distribution transformer up to 250 kVA
3. LV board
4. Accesses

Transformer Substations
### III. Product range

**Rural kiosk: ctc**

#### Technical details

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Unit</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rated Voltage</td>
<td>Ur</td>
<td>12 / 24 / 36*</td>
</tr>
<tr>
<td>Rated frequency</td>
<td>fr</td>
<td>50</td>
</tr>
<tr>
<td>Transformer</td>
<td>Power</td>
<td>≤250</td>
</tr>
<tr>
<td>Low voltage board</td>
<td>Rated voltage</td>
<td>Ur</td>
</tr>
<tr>
<td>Low voltage board</td>
<td>Rated current</td>
<td>Ir</td>
</tr>
<tr>
<td>Width</td>
<td>[mm]</td>
<td>1330</td>
</tr>
<tr>
<td>Depth</td>
<td>[mm]</td>
<td>2170</td>
</tr>
<tr>
<td>Height</td>
<td>[mm]</td>
<td>2080</td>
</tr>
<tr>
<td>Visible height</td>
<td>[mm]</td>
<td>1600</td>
</tr>
<tr>
<td>Weight</td>
<td>[kg]</td>
<td>4600</td>
</tr>
</tbody>
</table>

(*) Requires personalized project

#### Standards

| IEC / EN 62271-202 | HV switchgear: Prefabricated transformer substations |

Transformer Substations
III. Product range

Rural kiosk: ctc

Main countries with ctc installed:

- Spain
- Argentina
III. Product range

Walk-in PAMI (Poste à aire de manœuvre intérieure): \textbf{cto}

Concrete

Walk-in type Prefabricated Transformer Substation with reduced dimensions used in Medium Voltage (MV) electrical distribution networks up to 24 kV. Generally in France for public distribution networks non exploited by EDF.

- Ground level installation
- Indoor operation
- Tested and supplied from factory as a unit
- \textbf{Minimal} visual impact
- Reduced occupied space
- Easy installation
- \textbf{Ergonomic design}: easy indoor access and operation
- Experience: about 700 \textbf{cto} installed
### III. Product range

**Walk-in PAMI** (Poste à aire de manœuvre intérieure): cto

#### Technical details

<table>
<thead>
<tr>
<th>cto</th>
<th>Rated Voltage</th>
<th>Ur [kV]</th>
<th>24</th>
</tr>
</thead>
<tbody>
<tr>
<td>cto</td>
<td>Rated frequency</td>
<td>fr [Hz]</td>
<td>50</td>
</tr>
<tr>
<td>cto</td>
<td>Transformer Power</td>
<td>kVA</td>
<td>50-630</td>
</tr>
<tr>
<td>cto</td>
<td>MV Switchgear Rated current</td>
<td>I [A]</td>
<td>400</td>
</tr>
<tr>
<td>cto</td>
<td>MV Switchgear Busbars</td>
<td>I [A]</td>
<td></td>
</tr>
<tr>
<td>cto</td>
<td>MV Switchgear Output</td>
<td>I [A]</td>
<td>400 (l) 200 (p)</td>
</tr>
<tr>
<td>cto</td>
<td>Low voltage board Rated voltage</td>
<td>Ur [V]</td>
<td>410</td>
</tr>
<tr>
<td>cto</td>
<td>Low voltage board Rated current</td>
<td>I [A]</td>
<td>1200</td>
</tr>
<tr>
<td>cto</td>
<td>Low voltage board Busbar (max)</td>
<td>I [A]</td>
<td></td>
</tr>
<tr>
<td>cto</td>
<td>Width</td>
<td>[mm]</td>
<td>2530</td>
</tr>
<tr>
<td>cto</td>
<td>Depth</td>
<td>[mm]</td>
<td>2200</td>
</tr>
<tr>
<td>cto</td>
<td>Height</td>
<td>[mm]</td>
<td>2300</td>
</tr>
<tr>
<td>cto</td>
<td>Visible height</td>
<td>[mm]</td>
<td>1700</td>
</tr>
<tr>
<td>cto</td>
<td>Weight (with a 630 kVA transformer)</td>
<td>[kg]</td>
<td>7300</td>
</tr>
</tbody>
</table>

#### Standards

| IEC / EN 62271-202 | HV switchgear: Prefabricated transformer substations |
### III. Product range

**Walk-in PAMI** *(Poste à aire de manœuvre intérieure): cto*

**Main countries with cto installed:**

- France
- Gabon

**Transformer Substations**
III. Product range

Walk-in PUIE (Poste Urbain Intégré à son Environnement): cto

Concrete

Walk-in type Prefabricated Transformer Substation with reduced dimensions used in public distribution networks up to 24 kV in France.

- According to standard: HN 64-S-56 et amendement 1 de janvier 2009

Consists of:

- Electrical equipment:
  - cgmosmos.c-2i+spt: 24 kV / 400 A / 12,5 kA 1 s
  - Transformer: transforma.tpc 400 - 630 kVA
  - LV board: TIPI type
  - ITI board for remote control
- Monoblock concrete enclosure with removable roof
III. Product range

Rural kiosk (PRCS type: Poste rural compact simplifié): ctc.r

Concrete

Kiosk-type compact Prefabricated Transformer Substation used in Medium Voltage (MV) rural distribution networks up to 24 kV in France

- According to specification ERDF HN 64-S-57 version B and NF C 11-201
- Ground level installation
- Outdoor operation
- Tested and supplied from factory as a unit
- Minimal visual impact
- Experience: Over 3,500 ctc.r installed

Consists of:

- MV/BT transforma.tpc (50, 100 or 160 kVA) according to HN64-S-57.
- LV board (TIPI or fused board)
- Base and side walls of concrete with metallic covers and grids

Range

Design

1 Concrete enclosure
1.1 Removable front cover
1.2 Foldable upper cover
2 TPC transformer up to 160 kVA
3 LV board

Transformer Substations
### III. Product range

**Rural kiosk (PRCS type: Poste rural compact simplifié):** ctc.r

#### Technical details

<table>
<thead>
<tr>
<th></th>
<th>Unit</th>
<th>50 kVA</th>
<th>100 kVA</th>
<th>160 kVA</th>
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</thead>
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<tr>
<td><strong>Rated Voltage</strong></td>
<td>[kV]</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ur</td>
<td></td>
<td>17.5</td>
<td>24</td>
<td></td>
</tr>
<tr>
<td><strong>Rated frequency</strong></td>
<td>[Hz]</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>fr</td>
<td></td>
<td>50</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Transformer</strong></td>
<td>[kVA]</td>
<td>50</td>
<td>100</td>
<td>160</td>
</tr>
<tr>
<td><strong>Low voltage board</strong></td>
<td>[V]</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ur</td>
<td></td>
<td>410</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Rated current</strong></td>
<td>[A]</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>lr</td>
<td></td>
<td>250 A</td>
<td>(160 kVA)</td>
<td></td>
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</table>

<table>
<thead>
<tr>
<th></th>
<th>Unit</th>
<th>50 kVA</th>
<th>100 kVA</th>
<th>160 kVA</th>
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</thead>
<tbody>
<tr>
<td><strong>Width</strong></td>
<td>[mm]</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>1480</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Depth</strong></td>
<td>[mm]</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>1680</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Height</strong></td>
<td>[mm]</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>1715</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Visible height</strong></td>
<td>[mm]</td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td>1455</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Weight</strong></td>
<td>[kg]</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>&lt;1600</td>
<td>&lt;1800</td>
<td>&lt;2000</td>
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</table>

#### Standards

- HN 64-S-57 Version B
- NF C 11-201
- IEC / EN 62271-202: HV switchgear: Prefabricated transformer substations
III. Product range

Rural kiosk (PRCS type: Poste rural compact simplifié): ctc.r

Main country with ctc.r installed:
- France

References
III. Product range

Rural kiosk (PSS-A or -B type: Poste au sol simplifié): ctc.ra & rb

Concrete

Kiosk-type compact Prefabricated Transformer Substation used in Medium Voltage (MV) rural distribution networks up to 24 kV in France

• According to specification ERDF HN 64-S-36 version D and NF C 11-201
• Ground level installation
• Outdoor operation
• Tested and supplied from factory as a unit
• Minimal visual impact
• Experience: About 900 ctc.ra & rb installed

Consists of:

• MV/BT transforma.tpc (100, 160 or 250 kVA) according to HN64-S-24.
• LV board (TIPI type)
• In ctc.rb: cgmcosmos switchgear up to 24 kV
• Base and side walls of concrete with metallic covers and grids

Range

![Concrete enclosure](1.1)
- Removable front cover
- Foldable upper cover

TPC transformer up to 250 kVA

MV switchgear
- cgmcosmos (up to 24 kV)

LV board

![Transformer Substations](100, 160 or 250 kVA) according to
# III. Product range

**Rural kiosk (PSS-A or -B type: Poste au sol simplifié):** ctc.ra & rb

## Technical details

<table>
<thead>
<tr>
<th>Object</th>
<th>Unit</th>
<th>ctc.ra</th>
<th>ctc.rb</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Rated Voltage</strong></td>
<td>kV</td>
<td>17.5</td>
<td>24</td>
</tr>
<tr>
<td><strong>Rated frequency</strong></td>
<td>Hz</td>
<td>50</td>
<td></td>
</tr>
<tr>
<td><strong>Transformer</strong></td>
<td>kVA</td>
<td>100</td>
<td>160</td>
</tr>
<tr>
<td><strong>Low voltage board</strong></td>
<td>V</td>
<td>410</td>
<td></td>
</tr>
<tr>
<td><strong>MV Switchgear</strong></td>
<td>kA</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td><strong>Width</strong></td>
<td>mm</td>
<td>1420</td>
<td>2300</td>
</tr>
<tr>
<td><strong>Depth</strong></td>
<td>mm</td>
<td>1620</td>
<td>1620</td>
</tr>
<tr>
<td><strong>Height</strong></td>
<td>mm</td>
<td>2100</td>
<td>2100</td>
</tr>
<tr>
<td><strong>Visible height</strong></td>
<td>mm</td>
<td>1500</td>
<td>1500</td>
</tr>
<tr>
<td><strong>Weight</strong></td>
<td>kg</td>
<td>&lt;3280</td>
<td>&lt;4980</td>
</tr>
</tbody>
</table>

## Standards

- HN 64-S-36 Version D
- HN 52-S-24
- NF C 11-201
- IEC / EN 62271-202
- HV switchgear: Prefabricated transformer substations
III. Product range
Rural kiosk (PSS-A or -B type: Poste au sol simplifié): ctc.ra & rb

References

Main country with ctc.ra & rb installed:
- France
III. Product range

Kiosk: **ormaset.m**

**Metallic**

**Kiosk-type** Prefabricated Transformer Substation used in Medium Voltage (MV) electrical distribution networks up to 36 kV

- Ground level installation
- Outdoor operation
- Independent accesses: MV switchgear and transformer + LV board
- Tested and supplied from factory as a unit
- Mobility and temporary uses
- Optional base with sleigh for easier relocation: **ormaset.m-s type**

---

**Design**

1. Metallic enclosure
2. MV switchgear
   - cgmosmos (up to 24 kV)
   - cgm.3 (up to 36 kV)
3. 1 Transformer up to 1000 kVA
4. LV board

---

**Range**

- **ormaset.m-24**
- **ormaset.m-36**
### III. Product range

**Kiosk: ORMASET.m**

#### Technical details

<table>
<thead>
<tr>
<th>ORMASET.m</th>
<th>ORMASET.m-24</th>
<th>ORMASET.m-36</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Rated Voltage</strong></td>
<td>Ur [kV]</td>
<td>24</td>
</tr>
<tr>
<td><strong>Rated frequency</strong></td>
<td>fr [Hz]</td>
<td>50</td>
</tr>
<tr>
<td><strong>Transformer</strong></td>
<td>Power (max) [kVA]</td>
<td>1000</td>
</tr>
<tr>
<td><strong>MV Switchgear</strong></td>
<td>Rated current</td>
<td>Busbars Ir [A]</td>
</tr>
<tr>
<td></td>
<td>Output</td>
<td>Ir [A]</td>
</tr>
<tr>
<td></td>
<td>Short-time current</td>
<td>Ik [kA]</td>
</tr>
<tr>
<td><strong>Low voltage board</strong></td>
<td>Rated voltage</td>
<td>Ur [V]</td>
</tr>
<tr>
<td></td>
<td>Rated current</td>
<td>Busbar (max) Ir [A]</td>
</tr>
<tr>
<td><strong>Width</strong></td>
<td>[mm]</td>
<td>3600</td>
</tr>
<tr>
<td><strong>Depth</strong></td>
<td>[mm]</td>
<td>2336</td>
</tr>
<tr>
<td><strong>Height</strong></td>
<td>[mm]</td>
<td>2300</td>
</tr>
<tr>
<td><strong>Weight</strong></td>
<td>[kg]</td>
<td>&lt;4800 (630 kVA) &lt;5500 (1000 kVA)</td>
</tr>
</tbody>
</table>

**Standards**

- IEC / EN 62271-202
- HV switchgear: Prefabricated transformer substations
III. Product range

Kiosk: **ormaset.m**

References

Utility  

End Users

Main country with **ormaset.m** installed:

- France
III. Product range

Outdoor compact: mb.m

Metallic

Outdoor compact prefabricated transformer substation used in Medium Voltage (MV) electrical distribution networks up to 40.5 kV.

- Ground level installation
- Outdoor operation
- Tested and supplied from factory as a unit
- Internal arc tested IAC AB 20 kA 1s
- Corrosivity C4 H (ISO 12944-A)
- Transportable in sea container HC 40’ (up to 3 units)

Range

mb.m – 24
mb.m – 36
mb.m – 40,5

PV applications s: mb.m-pv

Transformer Substations

1 Medium-voltage outdoor switchgear
   - cgmcosmos / ga (up to 24 kV)
   - cgm.3 (up to 40,5kV)

2 1 transformer up to 2,5 MVA
   Optional:
   - IP1X perimeter protection fence
   - Oil collection tank
   - MV and/or LV terminal cover box

3 Metal frame assembly
### III. Product range

**Outdoor compact: mb.m**

#### Technical details

<table>
<thead>
<tr>
<th>mb.m</th>
<th>mb.m 24</th>
<th>mb.m 36</th>
<th>mb.m 36 – 40.5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rated Voltage</td>
<td>Ur [kV]</td>
<td>24</td>
<td>36 / 40.5</td>
</tr>
<tr>
<td>Rated frequency</td>
<td>fr [Hz]</td>
<td>50</td>
<td></td>
</tr>
<tr>
<td>Transformer</td>
<td>Power [kVA]</td>
<td>⩽ 2500</td>
<td></td>
</tr>
<tr>
<td>MV Switchgear</td>
<td>Rated current</td>
<td>cgmcosmos Ir [A]</td>
<td>400 / 630</td>
</tr>
<tr>
<td></td>
<td>ga Ir [A]</td>
<td>630</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>cgm.3 Ir [A]</td>
<td>-</td>
<td>400 / 630</td>
</tr>
<tr>
<td>Short-time current</td>
<td>Ik [kA / 1s]</td>
<td>16 / 20 / 25* (* cgmcosmos &amp; cgm.3)</td>
<td></td>
</tr>
<tr>
<td>Internal arc</td>
<td>Class IAC AB [kA / 1s]</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>Width</td>
<td>[mm]</td>
<td>2997</td>
<td></td>
</tr>
<tr>
<td>Depth</td>
<td>[mm]</td>
<td>2296</td>
<td></td>
</tr>
<tr>
<td>Height</td>
<td>[mm]</td>
<td>2504</td>
<td></td>
</tr>
<tr>
<td>Weight (without transformer)</td>
<td>[kg]</td>
<td>1400-2100</td>
<td></td>
</tr>
</tbody>
</table>

#### Configurations

- cgmcosmos-3l, cgmcosmos-2lp, cgmcosmos-2lv.
- cgm.3-3l, cgm.3-2lp, cgm.3-2lv.
- ga-3k, ga-2k1ts, ga-2k1lsf

#### Optional:

- cgmcosmos-212p, cgmcosmos-4l, cgmcosmos-212v.
- cgm.3-212p, cgm.3-4l, cgm.3-212v.
- ga-4k, ga-2k2ts, ga-2k2lsf

---

Transformer Substations
III. Product range

Outdoor compact: mb.m

References

RES

Countries with mb.m:

- Jordan
Thank you!
more information:
www.ormazabal.com
and
social networks

Transformer Substation downloads:

- Brochures: CA-443 / 444 / 442 / 448 / 328 / 336 / 431 / 432 / 455
- Manuals: IG-135 / 131 / 130 / 181 & others

We are launching a new website
Designed for you, letting you know everything about OrmaZabal

more information:
www.ormazabal.com
and
social networks