MV/LV Substations
for Distribution Network Solutions

pf.p
Walk-in type concrete enclosure
for transformer substations

Up to 40.5 kV, 1600 kVA
IEC standards

Reliable innovation. Personal solutions.
www.ormazabal.com
Preface

Ormazabal pf.p transformer substation is a walk-in type outdoor substation for use in public medium voltage distribution networks up to 40.5 kV, and may contain up to two 1000 kVA transformers with natural ventilation. The dimensions of the substation as well as the electrical equipment can vary depending on customer’s needs.

pf.p is used into several Distribution Network Solutions (DNS) for utilities (conventional generation, public distribution, Smart Grids...), end users (infrastructures, industry, tertiary) and renewable energy (windfarms, and -PV- photovoltaic solar plants).

Benefits

Safety

» High personnel safety:
  • Optional arc proof: IAC Class-AB 21 kA 1 s
  • Tested according to IEC standards and requirements of IPH German institute
» Same equipotential earthing throughout the whole structure
» Transformer separation wall
» Dielectric liquid collection pit
» Non screwed roof to allow gas pressure relief in case of internal arc
» Fire resistance: 90 minutes according to Polish REI 90 standard

Reliability

» Configuration flexibility and partition adaptability
» Industrialized uniform quality
» Simple and quick installation, optimizing times and costs
» Protection against strong external impacts and weather conditions
» Painted with double coating layers on external / internal walls and cable cellar

Efficiency

» Ventilation: natural air circulation through grilles on walls and doors and self-ventilating roof
» MV and LV sealed cable entry systems
» Transportability to difficult access areas

Sustainability

» Long operational life
» Reduction in manufacturing energy consumption and emissions
» Doors and grilles made of galvanized steel or aluminium and powder varnished in colour
» Research on mechanical properties and durability of the concrete

Continuous innovation

» Capacity for aesthetic integration to the environment
» Suitability for any MV diagram
» Customized solutions according to individual needs

Design

pf.p is made up of two main components:
1. Prefabricated reinforced concrete enclosure
   1a. Concrete cellar
   • Sealed cable entries
   • Oil collection pit
1b. Main body
   • Doors
   • Ventilation grilles
1c. Removable roof
   • 2 slope roof
   • Bath type roof

2. Ormazabal electrical equipment:
   2a. Gas insulated MV switchgear
      • cgmcosmos / ga-gaes630 (up to 24-27 kV)
      • cgm.3 (up to 40,5 kV)
   2b. Distribution transformers
      Up to 2 x 1000 kVA
   2c. Low voltage board
   2d. Others
      • Cable connections
      • Earthing circuit
      • Lighting and auxiliary services circuit

pf.p can be divided in two or more compartments:
» MV switchgear & LV board
» Transformer
  • Each compartment usually has an individual door

Complexes

pf.p substations can be combined to enable construction of complex housings up to 1600 kVA. These kind of combinations provide a larger space for greater electrical requirements.

For substations with higher power please contact Ormazabal.
Standards
pf.p is designed in accordance with EN 62271-202 and applicable regulations.

Finishes
High capability of aesthetic harmonisation with the surroundings with our roof portfolio and surface adaptations.

Roof materials and different slope styles (bath or flat, gable or 2 slope, hip...) are available to meet any customer’s needs.

- Bath or flat roof; gradient: 0,5°
- Hip roof; gradient: 23°
- High hip roof; gradient: 35°
- Gable or 2 slope roof; gradient: 35°

Colours

<table>
<thead>
<tr>
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<th>RAL 8014</th>
<th>RAL 9003</th>
<th>RAL 7032</th>
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<tbody>
<tr>
<td>Exterior</td>
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<tr>
<td>Doors &amp; grilles and roof</td>
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<td>RAL 8014</td>
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<td>RAL 6016</td>
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- Water downpipe: Grey or brown.
  Note: Other colors under request.

Transportation and installation
For transportation, excavation and installation, please ask Ormazabal for the necessary technical documentation.

Technical details

### Family

- **pf.p-250: 2500 mm width series**
- **pf.p-300: 3000 mm width series**

#### Technical data

**Dimensions and weights**

<table>
<thead>
<tr>
<th>pf.p</th>
<th>250-350</th>
<th>250-420</th>
<th>250-500</th>
<th>250-600</th>
<th>250-650</th>
<th>250-700</th>
<th>300-450</th>
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<table>
<thead>
<tr>
<th>Weight*</th>
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<tbody>
<tr>
<td>Total</td>
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<tr>
<td>Roof weight</td>
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<tr>
<td>Cable cellar</td>
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</tbody>
</table>

* Empty enclosure
** Depending on foundation depth
Any other dimension / model on request

### Electrical configurations

pf.p is designed to house Ormazabal equipment.

The following are some of the most usual 24 kV configurations, for other examples please request the pf.p drawing collection.

Where:
- f = Feeder function cubicle
- p = Fuse protection function cubicle
- v = Circuit-breaker protection function cubicle
- t = Transformer
- lvb = Low voltage board

<table>
<thead>
<tr>
<th>pf.p-250-350</th>
<th>2lp / 2lv + 1t + lvb</th>
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</thead>
<tbody>
<tr>
<td>pf.p-250-420</td>
<td>3lp / 3lv + 1t + lvb</td>
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<tr>
<td>pf.p-250-350</td>
<td>2lp / 2lv + 1t + lvb</td>
</tr>
<tr>
<td>pf.p-250-500</td>
<td>2lm + 1t + lvb</td>
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<tr>
<td>pf.p-250-600</td>
<td>2lp + 2t + 2lvb</td>
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<tr>
<td>pf.p-250-650</td>
<td>2lm2p + 2t + 2lvb</td>
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<tr>
<td>pf.p-250-700</td>
<td>2lm2p + 2t + 2lvb</td>
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