



ORMAZABAL

Focus on Medium Voltage



Transformer Substations



PFU and PF

Walk-in-type, Ground Level Buildings for Transformer Substations

Up to 36 kV

PFU WALK-IN-TYPE, MONOBLOCK GROUND LEVEL BUILDINGS FOR TRANSFORMER SUBSTATIONS



PRESENTATION

The **PFU** building consists of an industrialised monoblock concrete enclosure for **Ormazabal's** walk-in type, ground level **Transformer Substations** up to 36 kV.



COMPOSITION

Ormazabal's Transformer Substations in **PFU** buildings consist of:

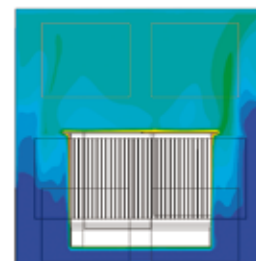
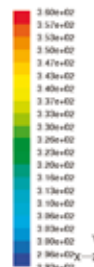
- Fully gas-insulated MV switchgear: CGMCOSMOS system (up to 24 kV) and CGM.3 system (36 kV).
- Ormazabal's protection, metering and control units (remote control, remote metering, integrated control, remote management, etc).
- Up to 2 MV/LV distribution transformers filled with dielectric liquid up to 36 kV and 1000 kVA⁽¹⁾ per transformer.
- LV switchgear: Low Voltage Board(s) with up to 8 outputs per board.
- Direct interconnections by means of MV and LV cable.
- Earthing circuit.
- Lighting and auxiliary services circuit.
- **PFU** monoblock concrete enclosure.

(1) For other values, please consult Ormazabal's Technical - Commercial Department.



CHARACTERISTICS

- Industrialised building for Transformer Substation:
 - Different MV distribution diagrams can be incorporated.
 - Comprising a monoblock enclosure (base and walls) plus removable roof.
 - Variety of external surface finishes.
- Up to 2 Transformers:
 - Building tested for transformers up to 36 kV and 1000 kVA.
 - Individual front door for each transformer.
 - Transformer fenced off with protection mesh.
 - Dielectric liquid collection pits, with resistant impermeable covering, designed and sized to suit the quantity of dielectric liquid they may need to hold.
 - Additional fire barrier protection elements: layer of pebbles on the dielectric collection pit.
- Ventilation:
 - By natural air circulation (class 10), achieved by the use of grilles installed in the enclosure walls and in the transformer door.
 - Natural ventilation tests and modelling with Ormazabal transformers, to optimise their service life.
 - Studies customised according to the data provided by the customer.
- Staff access:
 - Front door(s) for performing operations and maintenance tasks.
 - Physical separation can be added between the Utility and private cubicles.
- MV and LV cable input/output
 - Through the semi-perforated holes in the enclosure base (front/side).
 - Low Voltage auxiliary feeder, located on the enclosure front wall.



Ventilation simulation and modelling

PFU MODELS



PFU- 3



PFU- 4



PFU- 5

EXTERNAL DIMENSIONS AND WEIGHTS

PFU Up to 24/36 kV

	PFU-3	PFU-4	PFU-5
Length [mm]	3280	4460	6080
Depth [mm]	2380	2380	2380
Height [mm]	3045	3045	3045
Visible height [mm]	2585	2585	2585
Weight* [kg]	10545	13465	17460

Notes:

Optional: Raised cover for 36 kV (Standard height + 195 mm)

Dimensions of staff access door: 900 (24 kV) /1100 (36 kV) x 2100 mm

Dimensions of transformer door: 1260 x 2100 mm

(*) Weight of empty building with standard roof and ventilation for 1000 kVA



ELECTRICAL CONFIGURATIONS

TYPICAL ELECTRICAL CONFIGURATIONS

PFU-3	2L + 1P + 1 Transformer + 1LVB
PFU-4	3L + 1V + 1 Transformer + 1LVB
PFU-5	2L+ 1S + 1P + 1M + 1 Transf. + 1LVB
	2L + 2P + 2 Transformers + 2LVB
	3L + 2P + 2 Transformers + 2LVB
	3L + 1R+ 1P+ 1M + 1 Transformer + 1LVB
	1L + 1V + 1M + 2P + 2 Transf. + 2LVB

Note: For other configurations, please consult Ormazabal's Technical - Commercial Department

Where: L = Feeder Cubicle/Function

P = Fuse Protection Cubicle/Function

V = Prot. Function/Cubicle with Vacuum Circuit-Breaker

S = Busbar Switch Function/Cubicle

M = Metering Function/Cubicle

LVB = Low Voltage Board

APPLICABLE STANDARDS

- Applicable regulations on Power Plants, Substations and Transformer Substations.
- Specific legislation for Utilities



APPLICATIONS

Ormazabal Transformer Substations

- Safe
- Environmentally-friendly
- Sustainable
- Ergonomic

for **Generation:**

- Wind farms
- Photovoltaic facilities
- Co-generations
- etc.

for **Distribution:**

- Public and private distribution.
- Industrial environments.
- Large infrastructures: airports, railways, motorways, ports, tunnels, etc.
- Water purification plants
- Installations with integrated remote control.
- Remote metering installations.
- Transformer Substations can be proof against internal arc (IAC class) by agreement between manufacturer and customer.
- Prefabricated solutions in accordance with standard EN 62271-202, assembled in accordance with controlled procedures and factory-tested.
- Compatible with a wide range of **Ormazabal** substations for urban projects and technical solutions: Prefabricated Transformer Substations, Switching and Breaking Substations, etc.



INSTALLATION

The **PFU** building is supplied fully factory-assembled, making the installation process very simple.

As all the electrical switchgear can be installed in the factory, a great deal of time can be saved without affecting the quality.

Note: For excavation and installation, please ask Ormazabal's Technical - Commercial Department for the necessary technical documentation. It is the installer's responsibility to calculate and create the external earthing network.



ADAPTATION TO THE ENVIRONMENT

Ormazabal offers different types of external surface finish (colours, textures and reliefs) for **PFUs**, allowing them to blend easily into their environment, both by integration and camouflage.

This makes it much easier to adapt the assembly to the needs of the installation, while minimising the visual impact.



PF WALK-IN-TYPE, MODULAR GROUND LEVEL BUILDING FOR TRANSFORMER SUBSTATIONS



PRESENTATION

The **PF** building consists of a modular concrete enclosure for **Ormazabal's** walk-in type, ground level **Transformer Substations** up to 36 kV, made up of factory-supplied independent components installed together.



COMPOSITION

Ormazabal's Transformer Substations in **PF** buildings consist of:

- Fully gas-insulated MV switchgear: CGMCOSMOS system (up to 24 kV) and CGM.3 system (36 kV).
- Ormazabal's protection, metering and control units (remote control, remote metering, integrated control, remote management, etc).
- MV/LV distribution transformers filled with dielectric liquid up to 1000 kVA⁽¹⁾ per transformer.
- LV switchgear: Low Voltage Board(s) with up to 8 outputs per board.
- Direct interconnections by means of MV and LV cable.
- Earthing circuit.
- Lighting and auxiliary services circuit.
- PF modular concrete building.

(1) For other values, please consult Ormazabal's Technical - Commercial Department.



APPLICABLE STANDARDS

- Applicable regulations on Power Plants, Substations and Transformer Substations.
- Specific legislation for Utilities



APPLICATIONS

for **Generation:** Wind farms, photovoltaic facilities, etc.

for **Distribution:**

- Switching Substations
- Ormazabal Transformer Substations:
 - Public and private distribution.
 - Industrial environments.
 - Large infrastructures.
 - Permanent/temporary installations.
 - Remote metering installations.
 - Urban projects and technical solutions compatible with Prefabricated TS, Switching and Breaking Substations, etc.

PF MODELS



PF-203/303



PF-2030/3030



PF-202/302



PF-2015/3015

EXTERNAL DIMENSIONS AND WEIGHTS

PF Up to 24 kV	Panels:	PF-201/301 series					PF-2015/3015 series	
		PF-201	PF-202	PF-203	PF-204	PF-205	PF-2015	PF-2030
Length [mm]		2620	4880	7240	9600	11960	3700	7240
Width [mm]		2520	2620	2620	2620	2620	2620	2620
Height [mm]		3200	3200	3200	3200	3200	3200	3200
Visible height [mm]		2650	2650	2650	2650	2650	2650	2650
Weight* [kg]		9000	26100	22500	29200	35900	13500	23550

PF Up to 36 kV	Panels:	PF-201/301 series					PF-2015/3015 series		
		PF-301	PF-302	PF-303	PF-304	PF-305	PF-3015	PF-3030	PF-3035
Length [mm]		2620	4880	7240	9600	11960	3700	7240	8420
Width [mm]		2520	2620	2620	2620	2620	2620	2620	2620
Height [mm]		3600	3600	3600	3600	3600	3600	3600	3600
Visible height [mm]		3050	3050	3050	3050	3050	3050	3050	3050
Weight* [kg]		10000	17400	24100	31200	38300	15000	25650	28050

Notes:
 Staff access door dimensions: 900 (24 kV) / 1100 (36 kV) x 2100 mm.
 Dimensions of transformer door: 1260 x 2100 mm.
 (*)Weight not including doors, grilles or switchgear



ORMAZABAL

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Transformer Substations up to 36 kV

- Medium Voltage Applications for Renewable Energy



Medium Voltage Secondary Distribution Switchgear

- CGM.3 System
- CGMCOSMOS System



Medium Voltage Primary Distribution Switchgear

- CPG System
- CPA System



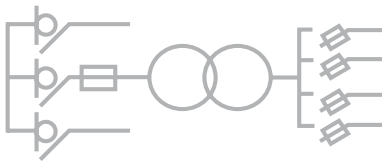
Protection, Control, Automation and Remote Control



Distribution Transformers



Low Voltage Switchgear



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.