



MV/LV Transformer Substations
for Distribution Network Solutions

ctr

Compact prefabricated rural
transformer substation

Up to 24 kV, 250 kVA

Standard IEC 62271-202

Reliable innovation. Personal solutions.

www.ormazabal.com

Foreword

After decades producing different types of industrialised enclosures and prefabricated transformer substations, in 2006 **Ormazabal** developed the **ctr** as a solution for rural distribution networks up to 24 kV.

ctr is a kiosk-type prefabricated transformer substation installed at ground level and operated externally, small in size, standard-built, tested and supplied from the factory as a single unit. One of its characteristics is that it includes a compact medium voltage associated **Ormazabal** unit in accordance with Standard IEC 62271-212.

ctr prefabricated transformer substations are used in a multitude of Distribution Network Solutions (DNS) for utilities (public distribution) and end-users of electrical energy (infrastructure, industry and tertiary). Its application is mainly aimed at rural environments, natural spaces, water catchment areas, high fire-risk forest areas and areas with restricted or reduced space.

It is the alternative to supporting and under-pole transformer installations. It can also be used in applications as an end-of-line substation. Up to now close to 5000 rural transformer substations have been installed all over the world.



Benefits

Safety

- » Heightened safety for persons against accidental direct contact, step voltage and contact voltage
- » Possibility of installation away from the overground-underground pole
- » Reduction of medium voltage trips due to atmospheric type overvoltages
- » Fire barrier protection components: layer of pebbles on the pit

Reliability

- » Fully factory-assembled (transformer, and internal earthing circuit in the enclosure)
- » Elimination of problems associated with birds nests
- » Decreased alteration of characteristics due to solar radiation, pollution or atmospheric agents, compared to on-pole solutions
- » Selectivity between MV and LV guards, and coordination with HV guards

Efficiency

- » Ventilation by natural circulation of air
- » Quick and simple replacement
- » Input/output of MV and LV cables through pre-punched orifices at the base of the building

Sustainability

- » MV switching and breaking with ground-level accessibility
- » Protection of birds
- » Reduced dimensions
- » Low risk for discharges of the insulators to the public highway: dielectric liquid collection pit that is watertight and has resistant coating

Continuous innovation

- » Low-voltage auxiliary supply from cables from a generator set, located on the side of the enclosure
- » Great ability for aesthetic integration into its environment
- » Prefabricated solutions available in accordance with EN 62271-202

Standard

IEC / UNE-EN 62271-202

High voltage/low voltage prefabricated transformer substations

IEC / UNE-EN 62271-212

Compact Equipment Assembly (CEADS)

On request:

Specific regulations of the Utility Company.
Applicable local regulations.

Technical details

Construction characteristics

- » Concrete monoblock enclosure (base and walls) with a removable cover

Compact electrical assembly:

- » Fully gas-insulated medium-voltage switchgear up to 24 kV: Electrical diagram of a feeder functional unit, containing three MV limiter fuse cartridges inside the tank. Includes voltage presence detector, **ekor.vpis**, and an earthing prevention alarm, **ekor.sas**
- » MV/LV distribution transformer, fully filled in dielectric liquid up to 24 kV in 100, 160 or 250 kVA
- » LV Switchgear: Low-voltage board, either two bases of 400 A or four bases of 160 A
- » Rural remote control cabinet, including wiring up to the low voltage board
- » MV direct interconnections through the **ormalink** connecting set and by LV cable
- » Earthing circuit connection
- » Lighting and auxiliary services

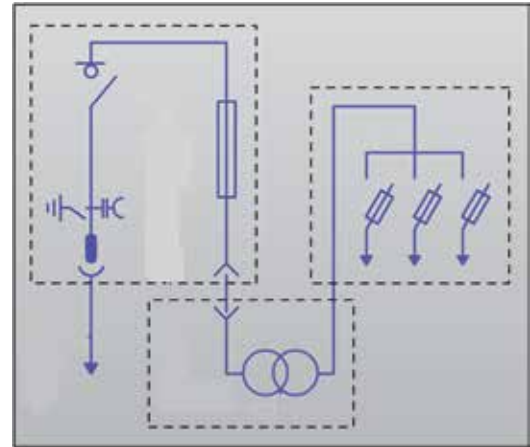
Technical characteristics

ctr.2		
Rated voltage	[kV]	24
Frequency	[Hz]	50
Transformer		
Power	[kVA]	100 / 160 / 250
MV Switchgear		
Rated current	[A]	200
Short-time current	[kA]	16
Insulation level		
Power Frequency	[kV]	50 / 60
Lightning impulse	[kV] _{PEAK}	125 / 145
Low-Voltage Board		
Rated voltage	[V]	420
Rated current	[A]	630
Rated current / N° outputs	[A]	400 / 2
Rated current / N° outputs		160 / 4

Design

ctr.2

Single wire diagram



- 1 Concrete enclosure
- 2 Compact electrical assembly:
 - 2.1 MV Switchgear
 - 2.2 Transformer
 - 2.3 LV Board

External dimensions and weight

		ctr.2	
Length	[mm]		150
Width	[mm]		1400
Height	[mm]		1280
Visible height	[mm]		1560
Total weight*	[kg]		660

*With 250 kVA transformer

➔ For other powers, please check with **Ormazabal**.





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