1ry Distribution Switchgear

IEC Standards
IEEE Standards

Reliable innovation.
Personal solutions.
Contents

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I. Introduction

Preface

cpg Single and double busbar panel type GIS system

**cpg.0** single busbar
- Up to 24 kV - 2500 A & 36 kV - 1250 A / 25 kA 1-3 s / 50 - 60 Hz. IEC
- Up to 27 kV - 2250 A & 38 kV - 1250 A / 25 kA 1-3 s / 50 - 60 Hz. IEEE-ANSI

**cpg.1** single and double busbar
- Up to 24 & 36 kV - 2000 A / 25-31.5 kA 1-3 s / 50 - 60 Hz. IEC
- Up to 27 & 38 kV - 2000 A / 25-31.5 kA 1-3 s / 50 - 60 Hz. IEEE-ANSI

- **cpg** system was launched in 2005
- High duty, flexible and extensible panels
- +5,000 units in service in +25 countries
- Application: **SSS** (Substation Solutions for primary distribution)

Your business and SSS applications

Segments

- **UTILITY**
  - Smart Grid
  - Transmission & Distribution
  - Generation

- **END USERS**
  - Infrastructures
  - Industrial
  - Tertiary

- **RES**
  - Wind
  - Solar
  - Dispatchable RES

**SSS**
II. Main features

Safety
• **Internal arc** tested AFL[R]
• **Gas insulated** and screened system
• Mechanical and electrical **interlocks** to prevent unsafe operations

Reliability
• **Gas insulated** and **sealed** for life
• **100 % routine tested** at factory
• **Seismic** tested

Efficiency
• **Modular design** extensible to both sides without gas handling
• **Easy frontal access** to install and to test MV cables and fuses
• **Optimised dimensions**

Sustainability
• **No SF₆** use during installation
• **En-of-life** management and **recycling**
• **Investment** in alternative **materials** and **own technology**

Continuous innovation
• Updated ratings: Up to **2500 A**
• **Voltage an current sensors** for metering and protection
• Optional **monitoring system** to see the switch position inside the gas tank
III. Technical details

**cpg system**

### cpg.0
**Single busbar**
- **v**: Circuit Breaker
- **f**: Fuse protection
- **s**: Disconnector
- **rb**: Busbar rise
- **c**: Busbar coupling

### cpg.1
**Single busbar**
- **v1**: Circuit Breaker
- **f1**: Fuse protection
- **s1**: Disconnector
- **c**: Longitudinal busbar coupling

**Double busbar**
- **v2**: Circuit Breaker
- **f2**: Fuse protection
- **s2**: Disconnector
- **cl**: Longitudinal busbar coupling
- **ct**: Transversal busbar coupling
### III. Technical details

#### General ratings

<table>
<thead>
<tr>
<th></th>
<th>IEC</th>
<th>ANSI / IEEE</th>
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<tbody>
<tr>
<td></td>
<td>cpg.0</td>
<td>cpg.1</td>
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<tr>
<td><strong>Rated Voltage</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ur [kV]</td>
<td>24</td>
<td>36</td>
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<tr>
<td><strong>Rated frequency</strong></td>
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<td></td>
</tr>
<tr>
<td>fr [Hz]</td>
<td>50 / 60</td>
<td>50 / 60</td>
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<td><strong>Rated normal current</strong></td>
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<td>Busbars (max) [A]</td>
<td>2500</td>
<td>1250</td>
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<td>Outgoing line [A]</td>
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<td>1250</td>
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<td><strong>Rated short-time withstand current</strong></td>
<td></td>
<td></td>
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<tr>
<td>with tk = 1 - 3 s [kA]</td>
<td>25</td>
<td>25 / 31.5</td>
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<tr>
<td>Peak value (max) [kA]</td>
<td>65</td>
<td>65 / 80</td>
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<tr>
<td><strong>Rated insulation level</strong></td>
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<tr>
<td>Rated power-frequency withstand voltage [1 min] [kV]</td>
<td>50/60</td>
<td>70/80</td>
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<td>Rated lightning impulse withstand voltage [kV]</td>
<td>125/145</td>
<td>170/195</td>
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<tr>
<td>Internal arc classification according to IEC 62271-200 (IEE Std C37.20,7)</td>
<td>AFL[R] 25 kA 1s</td>
<td>AFL 31.5 kA 1s</td>
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<td>Degree of protection IP</td>
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<td>Loss of service continuity category LSC</td>
<td>LSC2</td>
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<tr>
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IV. Design characteristics

Constructive structure: cpg.0

General view

Gas tank
Busbar compartment
Driving mechanism and operator interface
Cable compartment
Control box / LV compartment

Detailed view

1. Gas tank
   1.1 Vacuum CB
   1.2 Three-position switch - disconnector
   1.3 Pressure relief duct

2. Main busbars
3. Interface
   1. Driving mechanisms
   2. Voltage presence indicator
   3. Mimic diagram

4. Cable compartment
   4.1 Bushings
   4.2 CT
   4.3 VT
   4.4 Phase segregation
   4.5 Terminals

5. LV compartment
   5.1 Protection & control devices

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<td>Height [mm]</td>
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<tr>
<td>Weight [kg]</td>
<td>&lt;750</td>
<td>&lt;1100</td>
<td>&lt;1200</td>
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IV. Design characteristics
Constructive structure: cpg.1

General view

1. Gas tanks
2. Busbar compartment
3. Driving mechanism and operator interface
4. Cable compartment
5. Control box / LV compartment

<table>
<thead>
<tr>
<th>cpg.1-v1</th>
<th>cpg.1-v2</th>
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<tbody>
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<td>Width [mm]</td>
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<td>Depth [mm]</td>
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<tr>
<td>Height [mm]</td>
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<tr>
<td>Weight [kg]</td>
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</table>

Detailed view

1. Gas tank/s
   1.1 Vacuum CB
   1.2 Disconnectors
   1.3 Earthing switch
   1.4 Pressure relief duct
2. Main busbars
   v1: single
   v2: double
3. Interface
   3.1 Driving mechanisms
   3.2 Voltage presence / absence indicator
   3.3 Mimic diagram
4. Cable compartment
   4.1 Bushings
   4.2 CT
   4.3 VT
   4.4 Phase segregation
   4.5 Terminals
5. LV compartment
   5.1 Protection & control devices
V. References

Project References

<table>
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<tr>
<th>Utility</th>
<th>Periodical tenders of big worldwide utilities</th>
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<tbody>
<tr>
<td>Spain</td>
<td>Endesa substations in Barcelona</td>
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<tr>
<td>Switzerland</td>
<td>Egolzwil and Dierikon substations for CKW</td>
</tr>
<tr>
<td>USA</td>
<td>Iberdrola substations in NY and Maine</td>
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<td>Turkey</td>
<td>Substations of Baskent Elektrik AS in Ankara</td>
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<table>
<thead>
<tr>
<th>End Users</th>
<th>Spain: Port of Barcelona</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Austria: ski station</td>
</tr>
<tr>
<td></td>
<td>Mexico: UNAM university</td>
</tr>
<tr>
<td></td>
<td>Malaysia: Port of Tanjung Pelepas in Johor</td>
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<tr>
<td></td>
<td>Angola: Power plant and pumping station</td>
</tr>
<tr>
<td></td>
<td>Cuba: Puerto Escondido gas plant</td>
</tr>
</tbody>
</table>

| RES | Brazil: Rio do Fogo windfarm |
|     | Poland: Martifier windfarm   |
|     | Germany: Bukowsko windfarm   |
|     | Netherland: Owez off-shore windfarm |
|     | Spain: Los Collados windfarm |
|     | UK: Wymeswold PV plant       |

Countries with cpg panels installed:
- Spain
- Germany
- UK
- Austria
- Turkey
- Oman
- Malaysia
- South Africa
- Angola
- USA
- Brazil
- Argentina
- Mexico
- ....
V. References

Solution Notes

Utility

End Users

RES

Utility

Sonzier substation (Romande Energie)

Puerto Mazarrón substation (Iberdrola)

La Palma airport

Luanda substation

Crailsheim biomass power plant

Aura PV plant

Switzerland

Spain

Spain

Angola

Germany

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

We are launching a new website
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Flyer: CA-436
Manual: IG-123 / 137 / 196 / 197