ORMAZABAL
velatia

ga-gae630

2ry Distribution Switchgear

Up to 24 kV IEC standards

Location:

Date:

Speaker:

Reliable innovation.
Personal solutions.

Contents

30’

I. Introduction

Preface

ga-gae630

Fully gas insulated modular (**gae**) and compact RMU (**ga**) switchgear

- Up to 24 kV / 630 A / 20 kA 1-3 s / 50 - 60 Hz. IEC standards

- First **ga** RMU was launched in 1985, **gae** in 2001
- Completely designed in Germany
- +385,000 **ga** in service in +60 countries and +350,000 **gae** in service in +40 countries
- Application: **DNS** (Distribution Network Solutions for secondary distribution)

Your business and DNS applications

Segments

UTILITY

Smart Grid
Transmission & Distribution
Generation

END USERS

Infrastructures
Industrial
Tertiary

RES

Wind
Solar
Dispatchable RES

II. Main features

Safety

- **Internal arc** tested AFL
- All live components inside a **hermetically sealed gas tank**
- Mechanical and electrical **interlocks** to **prevent unsafe operations**

Reliability

- **Fully insulated** and **sealed** for life
- **100 % routine tested** at factory
- **Screened** cable **connectors**

Efficiency

- **ga compact design** up to four functions per gas tank
- **gae modular design** suitable to any electrical single line diagram
- **Easy frontal access** to install and to test MV cables and HRC fuses
- **Small size** and **light weight**

Sustainability

- **No SF_6** use during **installation**
- **En-of-life** management
- Use of highly **recyclable material**

Continuous innovation

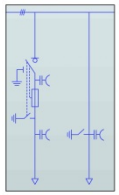
- **Smart-grid** ready system
- Ambient temperature in -**5 / -25ºC**

III. Technical details

ga-gae630 range

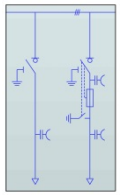
ga compact cubicles

1ts1a1

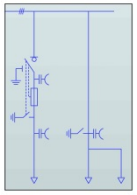


One transformer feeder and one connection

1ts1s-b

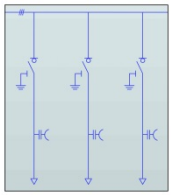


1ts1a2



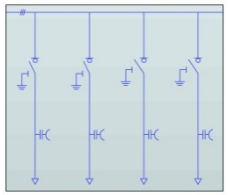
One transformer feeder and one cable connection with two set of bushings

3k



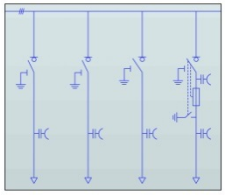
Three feeders

4k



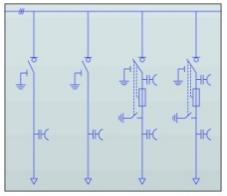
Four feeders

3k1ts



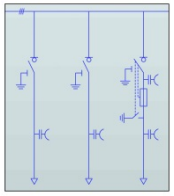
Three feeders and one transformer feeder

2k2ts



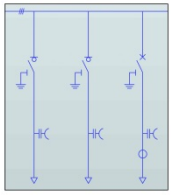
Two feeders and two transformer feeders

2k1ts



Two feeders and one transformer feeder

2k1lsf



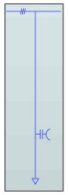
Two feeders and one SF_6 CB

gae modular cubicles

1k *1

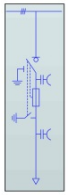
Load-break switch (LBS)

1a



Cable connection

1ts



Fused LBS

1lsf *2

SF_6 Circuit Breaker

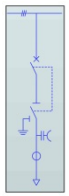
1h *3

Busbar riser

1e

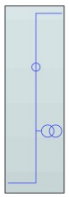
Busbar earthing

1lsv *4



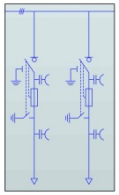
Vacuum CB

1m *5



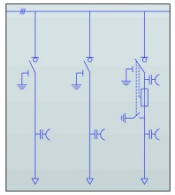
Metering

2ts



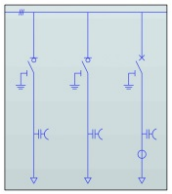
Two transformer feeders

2k1ts



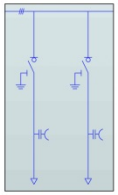
Two feeders and one transformer feeder

2k1lsf



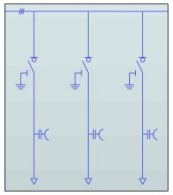
Two feeders and one SF_6 CB

2k



Two feeders

3k



Three feeders

(*) Available versions:
(1) 1k, 1kb and 1kg
(2) 1lsf and 1lsfg
(3) 1h1 and 1h2
(4) 1lsv and 1lsvg
(5) 1m1, 1m2, 1m4, 1m5, 1m5ü, 1m6

III. Technical details

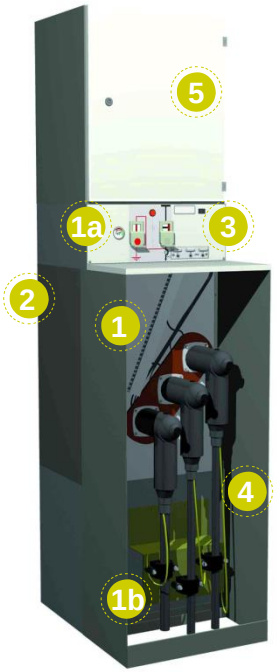
General ratings

ga-gae630				IEC			
Rated Voltage		**Ur**	**[kV]**	**7.2**	**12**	**17.5**	**24**
Rated frequency		**fr**	**[Hz]**	**50 / 60**			
Rated normal current		**Ir**					
	Busbars and cubicle interconnection		**[A]**	**630**			
	Feeder Output to transformer		**[A]** **[A]**	**630** **200**			
Rated short-time withstand current							
	with tk = 1 s – 3 s	**Ik**	**[kA]**	**20**			
	Peak value	**Ip**	**[kA]**	**50**			
Rated insulation level							
	Rated power-frequency withstand voltage [1 min]	**Ud**	**[kV]**	**20**	**28**	**38**	**50**
	Rated lightning impulse withstand voltage	**Up**	**[kV]**	**60**	**75**	**95**	**125**
Internal arc classification according to IEC 62271-200		**IAC**	**AFL**	**AFL 20 kA 1 s**			
Degree of protection		**IP**		**IP65 (Gas tank)** **IP3XD / IP44 (enclosure)**			
Colour of equipment		**RAL**		**Grey 7035**			
Loss of service continuity category		**LSC**		**LSC2**			
Partition class				**PM**			

IV. Design characteristics

Constructive structure: Modular cubicles

General view



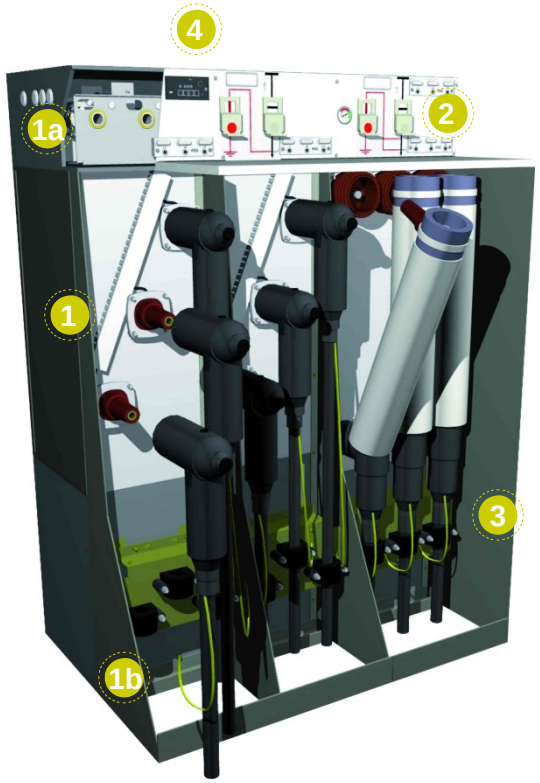
1. **Gas tank**
   - 1a Switching and breaking devices
   - 1b Pressure relief duct
2. **Busbar**
3. **Driving mechanism**
4. **Cable compartment**
5. **Control box**

		1k	1ts	1lsf	1lsv
Width	[mm]	350	400	600	500
Depth	[mm]	665	665	665	665
Height	[mm]	1400	1400	2000 / 2300	2000 / 2300
Weight	[kg]	127	150	225	330

IV. Design characteristics

Constructive structure: Compact cubicles

General view



1 **Gas tank**

1a Switching and breaking devices

1b Pressure relief duct

2 **Driving mechanism**

3 **Cable compartment**

4 **Control box**

		2k1ts	2k1lsf
Width	[mm]	980	980
Depth	[mm]	665	665
Height	[mm]	1400	1400
Weight	[kg]	298	355

V. References

Project References

Utility

- **Germany**: E.on, EnBW, RWE, RheinEnergie, Vattenfall….
- **China** : Southern Grid, State Grid…
- **Australia**: Energy Australia
- **Bulgaria** : B. Power
- **Dominican Republic**: EDESUR, CEPM
- **Malaysia**: Tenaga TNB

End Users

- **Germany:**
  - Dresden football stadium
  - DB (German railways) MV network
  - IOF Fraunhofer Institute
  - Zugspitze mountain cable car station
  - Leitz Industrial Park in Wetzlar
- **Malaysia:** Exxon Mobil platform
- **China**: 2008 Olympic games facilities

RES

- **Germany**: Wertheim PV plant
- **Italy**: Udine PV plant
- **South Africa**: Kalkbukt PV plant
- **Germany**: Schopfloch wind farm
- **Sweden**: Österlen wind farm
- **China**: Ningxia Hanas Master wind farm

Main countries with ga-gae630 installed:

Germany	Sweden
China	Denmark
South Africa	Ukraine
Dominican Rep.	Turkey
Czech Rep.	Egypt
Slovakia	Thailand
Poland	Indonesia
Romania	Malaysia
Switzerland	Australia
Hungary	Japan
Bulgaria	Vietnam

V. References

Solution Notes

End Users END USERS

Dresden
football stadium

Germany

RheinEnergie
headquarters
in Stuttgart

Germany

Thank you!

more information:

www.ormazabal.com

and

social networks

ga-gae630 downloads:

Brochure:	**CA-500**
Flyer:	**CA-438 / 439**
Manuals:	**OI_yyyy_GA-x / OI_yyy_GAE-x**