Eya Bantu Professional Services



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Represented by: Nico Potgieter

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Company Background

- Eya Bantu was established in 1999, is a South African based premium consulting, contracting and manufacturing company.
- > We offer a comprehensive range of consultancy services including
 - Project Management,
 - > Electrical Engineering and Design,
 - > Construction Supervision and Advisory Services like Energy Policies, Audits and Due Diligence.
- > Turnkey design solutions for PV and Wind renewable projects.
- > Turnkey control plant solutions for MV, HV and EHV Substations.
- > Turnkey MV Switchgear solutions.
- Eya Bantu is established on the core values of professionalism, commitment, integrity and excellence,
- > Eya Bantu has over 250 permanent people employed.



Company Switchgear Background

- **Eya Bantu Switchgear** a subsidiary of Eya Bantu Holdings was established in 2018
- Value added control plant contributions to Schneider Switchgear using the ready to customize (RTC) model.
 - Model was a success
 - First SG plant was built and completed by late 2018
 - +/-200 PIX Easy Switchgear installed base in Southern Africa.
- Eya Bantu was offered the License Partner agreement in 2020.
 - Prototypes were constructed to pass the strict quality and technical acceptance of Schneider Electrical globally.
 - In 2021 Eya Bantu passed the manufacturing audit
 - Awarded its official partner license to build the Pix Easy Medium Voltage Switchgear.
- This huge achievement led to our 2nd plant being constructed and completed in early 2022

Technical Capability: Design & Eng

Sub-transmission Lines (400kV, 132kV, 88kV, 66kV)

Technologist: Mike Brown Pr Tech Bob Branfield Nat Dip (Survey) Sub-transmission Substations (400kV, 132kV, 66kV) Philip Konig Pr Eng Engineer: Naas Burger Pr Eng Charl Fourie Cand Eng Technician: Andrew Hugo Distribution Lines (33KV, 22kV, 11kV) Technologist: Mike Brown Pr Tech Technician: Terry Lee Electrification (22kV, 11kV, 400V, 230V) Technologist: Neville Randall Pr Tech Mike Brown Pr Tech Bulumko Vena Pr Tech Technicians: Sive Mbangata, Andrew Hugo, Nico Potgieter

Control Plant (<1000V)

Technologist: Jadri Hurter Pr Tech Shane Tessendorf Pr Tech Garth Crews Pr Tech Garth Meyer Pr Techni **Buildings** Engineer: Naas Burger Pr Eng Technologist: Neville Randall Pr Tech Technician: Terry Lee

Grid Compliance

Engineer: Andrew McLaren

Protection grading studies

Engineer: Andrew McLaren

Technologist: Michael Bhowa, Odwa Luma, Luphelo Fatman, Bulumko Vena your partner in po

Switchgear Solutions and Design

Engineer: Andrew McLaren Technologist: Michael Bhowa, Jadri Hurter, Bulumko Vena

Technical Capability: Construction

MV Switchgear

Herbert Roth, Nico Potgieter, Koot Piek, Piere Loubser, Paul Loubser, Jeff Richter, Seliyanda Joseph

EHV_HV_MV Protection, Metering, Scada & AC/DC Aux

Mbuso Gcadu, Craig Powel, Garth Meyer, Armand Gerber, Herman Piek, Hugh Nel, Zulu Mzwakhe

LV Cabling, Lug and Loom

Ncedo Alfred Jack & Team

Primary Plant Testing

Danie Strydom, Phumelela Clinton Mathe

Oil Purification

Mbuso Gcadu



PIX Easy in 1 slide



Schneider GElectric



- Medium voltage air insulated switchgear with the brand new **EasyPact EXE** vacuum circuit breaker
 - Highest level of operator safety : LSC-2B 31.5kA 1s A-FLR Internal Arc Classification

Fully type tested



Life Is On

The **integrated floor rolling trolley** makes it easy to handle the circuit breaker





Applications & Electrical network

47

Electric

utilities

Oil & gas





' LJ



Industry





Hotels Airports



Water &

waste

water

My NY Power

Solar Plant



Mining, Automotive minerals & metals



Key benefits or Values



Safety tested for highest levels of operator safety with an Internal
Arc Classification of 31.5kA 1s A-FLR



Simplicity a solution with a circuit breaker on an integrated floor rolling trolley making it simple to maneuver Access to Safe repository through QR codes

Reliability designed for maximum service continuity with the LSC-2B PM classification

Efficiency Compact design and optimized architecture



Technical characteristics of the cubicle

Rated Voltage	12 kV	17,5 kV
Rated power frequency withstand voltage	28 kV	38 kV
Rated lightning impulse withstand voltage	75 kV	95 kV
Rated frequency	50/60 Hz	50/60 Hz*
Rated normal current	2 500 A	2 500 A
Rated short time withstand current (3 s)	Up to 31.5 kA	Up to 31.5 kA
Internal Arc Fault (1s), A-FLR	31.5 kA	31.5 kA
Degree of Protection	IP 4X IP 2X ^{between compartments}	IP 4X IP 2X between compartments
Partition Class	РМ	PM
Loss of service continuity	LSC2B	LSC2B
Mechanical endurance 'ES & Rack-in/out"	1000	1000
Ambient Temperature (deg C)	40°C	40°C
	Up to 1000m	Up to 1000m

Designed & tested according to IEC 62271-200



Technical characteristics of the breaker

EasyPact EXE

Characteristics		Rating
Rated frequency	Hz	50/60
Rated current	А	Up to 2500A
Rated short time current (3s)	kA rms	25 / 31.5
Making current	kAp	65
Breaking current	lsc	25 / 31.5
Mechanical endurance		10 000
Classification		E2 , M2
Operating sequence		0 – 0.3s – CO – 15s - CO
Capacitive switching class	kA	C2 for 25 C1 for 31.5

Designed & tested according to IEC 62271-100



Circuit breaker

5 Basic functional units





Architecture & Technical characteristics



(Available for 12kV ONLY)

Type tests Overview

Major type tests conducted in International labs such as KEMA, PEHLA, CESI, VOLTA, ASEFA & ASTA

- Internal Arc
- Making and breaking tests
- Short-time withstand current tests
- Dielectric tests
- Temperature rise tests
- IP tests



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List of Applicable Standards

Standards

IEC 62271-1	High-voltage switchgear and controlgear: common specifications
IEC 62271-200	High-voltage switchgear and controlgear – part 200: AC metal-enclosed switchgear and controlgear for rated voltages above 1kV and up to and including 52kV.
IEC 62271-100	High-voltage alternating-current circuit breakers.
IEC 62271-102	High-voltage switchgear and controlgear – part 102: Alternating current disconnectors and earthing switches.
IEC 60529	Degree of protection provided by enclosures
IEC 61869-2	Current transformers
IEC 61869-3	Voltage transformer.
IEC 61243-5	Live Working-Voltage Detection Systems
IEC 60720	Partial discharge measurements

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Protection, control and monitoring

VAMP Series of Relays with arc fault protection

Sepam Series of Relays

MICOM Series of Relays

Easergy P3 relays

Easergy P5 relays



VAMP



Sepam







Added Value

- Client Customization
 - Selection Criteria
- Full turnkey deliverable package,
 - Network analysis and studies to determine design parameters/ratings/quantities of the switchgear to be installed

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- > Custom Design Secondary Plant to customer requirements
- Procurement
- Assembly, testing and commissioning
- > Preference is to use schneider supplied equipment
- > Multi-vendor support is possible depending on client specifications
- Protection Settings Engineers
 - Settings calculations
 - Network studies

Solution w.r.t SLD – Phase 1



- Phase 1 (Primary Plant)
 - 12kV / 25kA 3s / 1250A BB

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- ► 1 x 1250A Incomer
- ► 4 x 800A/1250A Feeders
- 1 x 1250A Bus section
- ► 1 x 1250A Bus riser
- CTs & VTs to be specified accordingly
- Control Cubicle to specified accordingly
 - Relays, Meters, Quality of Supply, SCADA

Solution w.r.t SLD – Phase 2 Future



- Phase 2 (Primary Plant)
 - ▶ 12kV / 25kA 3s / 1250A BB

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- ► 1 x 1250A Incomer
- ► 4 x 800A/1250A Feeders
- CTs & VTs to be specified accordingly
- Control Cubicle to specified accordingly

EBSW Assembly Process

LV Cubicle Assy





Rear & Front Units

Earth Switch Assy



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Rear Door Assy

EBSW Assembly Process



Circuit Breaker & Trolley Assy



CB Arms Assy



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CT & VT Assy

EBSW Assembly Process







Testing in Progress - De Hoop 11kV Sub Swartland Munic

Copper Busbars Assy

Past Projects

- RTC and Value added Program
 - ► 16 complete switchgear units
 - e.g. Lesotho, NMBM, Atlantis, Mercedec Benz, Parys, Drakenstein
- On new SE and EBSG partnership
 - 1 completed projects (16 Panels) De Hoop 11kV Sub
 - 1 in progress projects (43 panels) Dalweiding 11.5kV Substatio



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Past Projects

Parys Substation



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Past Projects

F.A.T in-progress



Continuous development

- Factory processes optimization
 - > Projecting yearly projects
 - Pre-assemble common assemblies
 - > Raw material pre-order
 - Production of common panels
- Delivery time was 26-32 weeks
- Lead time Target is 18-22 weeks
- Target lead-time for in-stock panels is 2 weeks
- Local availability of components
 - Sheetmetal
 - > Copper
 - Insulation
 - Fasteners & other



Key Points

- > EBSG is the first Switchgear manufacturer in the coastal region and the first in Gqeberha
 - Local Support (SA)
 - > Schneider approved installers
 - Local office in CPT
 - > Local FAT in PE Factory (routine test reports, quality checks e.t.c.)
 - Extended warranty option
- Local content was in the region of 25-30% before (RTC & Value-Added Program)
- Current local content is between 50% 60% (Partnership)
- Aiming for 70% local content and looking to better it with time
- Corrosion protection (rusting)
 - > Aluzinc
 - > Other options supplier specific e.g. stainless steel
- Panel Heaters
 - > Cable & breaker compartments
 - Thermostat controlled





THANK YOU