

## MV COMPACT SUBSTATION

For Large Scale Solar Project

### Sole Distributor:



**RANKON POWER ENGINEERING & SERVICES SDN BHD ( 949843-T )**

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Enhance  
Edition

2019

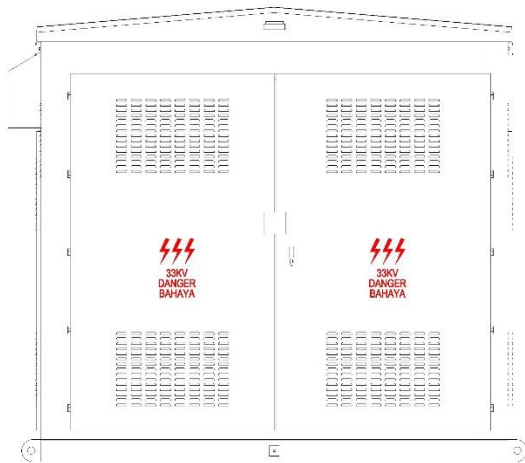
- Fully assembled in Malaysia
- Built in accordance with Malaysian / IEC Standards
- Able to custom-made to suit any requirement / conditions.
- Compatible with 800V Inverter system from HUAWEI & SUNGROW



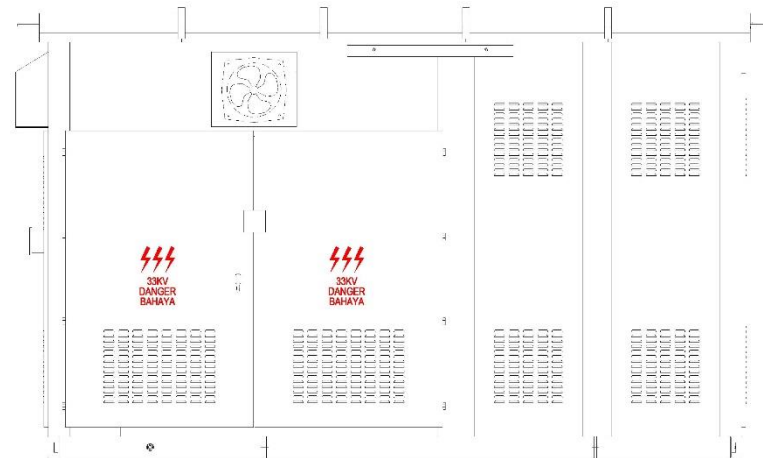
## CSS33-3000-LT

IP41 Outdoor Compact Substation consists of 33kV Motorized Breaker Ring Main Unit, 3MVA, 0.800/33kV mineral oil hermetically sealed Transformer & 2500A, 800V Main Switchboard

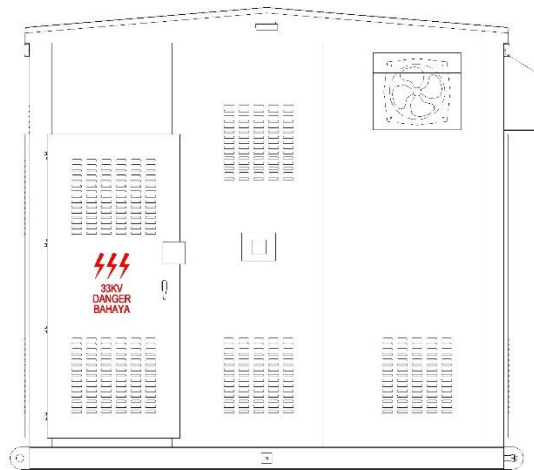
Material Used	: Hot Rolled Steel Sheet 2.5mm Body & 3.0mm Structure 2.0mm Roofing
Finishing	: Powder Coating
Flooring	: 3.0mm Aluminium Chequered Plate
Base Frame	: Mild Steel C-Channel with lifting lugs
Finishing	: Painted black with antirust coating layer
Dimension	: Approx. 5400mm x 3500mm x 3100mm (L x W x H)
Weight	: Approx. 16 tons
Accessories	: 32A single phase distribution board 30Vdc 20AH, 6A, 240Vac, 1Ø nickel cadmium battery unit Florescent lights & 13A switch socket outlets Exhaust fans with timer control Rubber mat
Optional	: Isolation transformer & MCCB for auxiliary power Fibre optic patch panel for data control system Outdoor remote-control panel with mimic diagram SCADA terminal box Power line control MCCB Raise up I-beam (1.5m) with platform c/w ladder & safety handrail <b>(Upon request)</b>



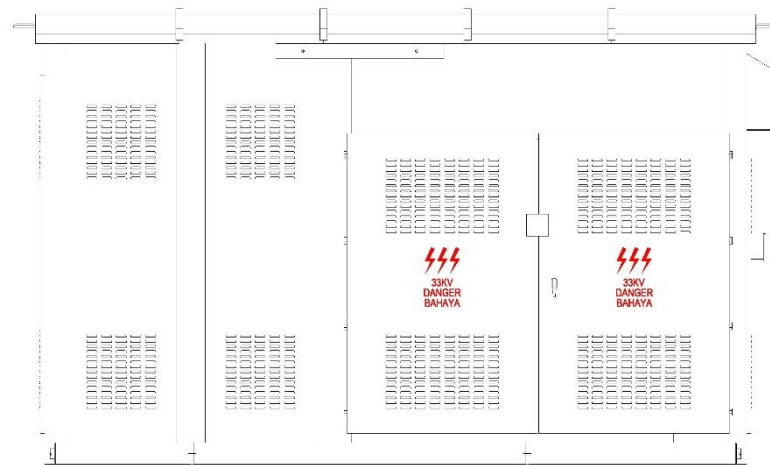
FRONT VIEW



LEFT HAND VIEW



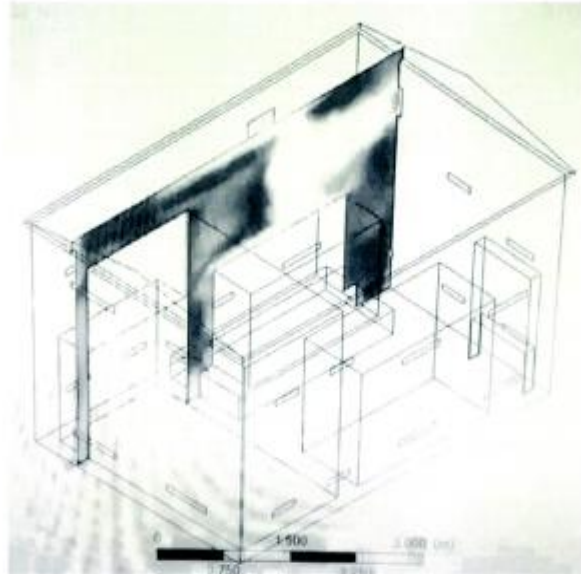
REAR VIEW



RIGHT HAND VIEW

## GENERAL OUTLINE DRAWING

COMPACT SUBSTATION CERTIFICATION



**Thermal Analysis**

33KV 1600KVA TRANSFORMER STATION

T01-T10, T12-20, T22

Dr. Lum YL | 31.08.18 | Client : M ELECTRICAL & ENGINEERING SDN. BHD.



**globalgroup**  
United Kingdom

*Certificate of Registration*

*This is to certify that the*  
**QUALITY MANAGEMENT SYSTEM**  
*of*  
**M ELECTRICAL & ENGINEERING SDN. BHD.**  
No. 6, Jalan TPP 3, Taman Perindustrian Putra, Puchong, Selangor Darul Ehsan, 47130, MALAYSIA  
*for*  
**Manufacture of Electrical Switchboard & Metalclad Cubicle, Mechanical & Electrical Assembly**  
*has been assessed and registered against the provisions of*  
**ISO 9001:2015**  
*International Standard*

*with*

Registration Number:	54Q19799	Issue Date:	12 November 2018
Project:	2-19799-1-Q	Cycle Start Date:	12 November 2018
		Recertification Due Date:	8 October 2021
Certification Approved By:	<i>G. Jones</i>	Expiry Date:	12 November 2021
Gary Jones			
Chief Executive Officer			

Registration is subject to the management system being continually maintained to the above standard under regular surveillance. Should surveillance not take place when required, registration shall be removed.

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**UKAS**  
MANAGEMENT SYSTEMS  
0954

80004974

- Details Certificate upon request

## 33kV Motorized Circuit Breaker Ring Main Unit – Transformer Incoming Panel

### Technical Specification

Type	: TM8-36-2 / HMM36-04
Voltage	: 36kV
Normal Current	: 630A
Frequency	: 50Hz
Lightning Impulse withstand voltage	: 170kV
Power Frequency withstand voltage	: 70kV
Short-circuit making current	: 50kA
Short-circuit making current	: 20kA
Short-circuit duration	: 3 sec
Operating voltage	: 30Vdc
Protection device	: Overcurrent Earth Fault Relay
Control System	: SF6 Gas tank pressure gauge with contacts

Made : Malaysia / Turkey

Warranty : 24 Months from commissioning date or  
30 months from date of delivery from  
manufacturer

## 33kV Load Break Switch Ring Main Unit – Outgoing Panel

### Technical Specification

Type	: TM8-36-1 / HMM36-01
Voltage	: 36kV
Normal Current	: 630A
Frequency	: 50Hz
Lightning Impulse withstand voltage	: 170kV
Power Frequency withstand voltage	: 70kV
Short-circuit making current	: 50kA
Short-circuit making current	: 20kA
Short-circuit duration	: 1 sec

## 33kV Step Up Mineral Oil Hermetically Sealed Transformer

### Technical Specification

Type	: Indoor / Outdoor type	Efficiency at unity pf @ 100% load	: 99.00%
Rated Power	: 3000kVA	Efficiency at unity pf @ 75% load	: 99.19%
Rate Voltage	: 0.800 / 33kV	Efficiency at unity pf @ 50% load	: 99.35%
Tapping Changer	: +/- 2 x 2.5% (5 Taps on 33kV)	Efficiency at unity pf @ 25% load	: 99.38%
Phase	: 3 Phase	Efficiency at 0.8 pf @ 100% load	: 98.76%
Frequency	: 50Hz	Efficiency at 0.8 pf @ 75% load	: 98.99%
Vector Group	: Dyn11	Efficiency at 0.8 pf @ 50% load	: 99.19%
Insulation Class	: Class A	Efficiency at 0.8 pf @ 25% load	: 99.23%
Ambient Temp	: 50°C		
Temp. Rise	: 55°C Winding, 50°C Oil	Protection device	: Thermometer with 2 contacts Pressure Gauge with 2 contacts Pressure relief valve Oil Level Indicator
No Load Loss	: 2950W with 10% Tolerance		
Load Loss @ 75°C	: 27300W with 10% Tolerance	Warranty	: 24 Months from commissioning date or 30 months from date of delivery from manufacturer
Impedance	: 6.00% with 10% Tolerance		
Cooling Method	: ONAN with corrugated fin walls		
Oil Type	: Mineral Oil as per IEC 60296		
HV/LV Winding	: Electrolytic Copper		
Core Type	: Core – Cold Rolled Grain Oriented		
Paint	: RAL 7033 without galvanizing		
Dimension	: Approx. 1370mm x 2150mm x 2220mm (W x L x H)		
Weight	: Approx. 6300kg		
Made	: Turkey		

## AIR CIRCUIT BREAKER (ACB)

### Technical Specification

Type	: UW2-25
Frame	: 2
Rated Uninterrupted Current (In) (A) at 50°C	: 2500A
Version	: N
Rated Operational Voltage at 50Hz, Ue	: 800Vac
Rated Insulation Voltage at 50Hz, Ui	: 1250Vac
Rated Impulse withstand Voltage, Uimp	: 12kV (Main Circuit) & 4kV (Auxiliary Circuit)
Suitability for Isolation	: Yes
Degree of Protection on Breaker Front	: IP53 Standard
Degree of Impact Protection on Breaker Front	: IK08 Standard
Pollution Degree Suitability	: 4
Utilization Category	: B
Compliance	: IS/IEC 60947 (Part-2), EN 60974-2, IEC 60974-2
Operational Temperature Range	: -5°C to 55°C
Storage Temperature Range	: -25°C to 85°C
Rated Ultimate S.C Breaking Capacity, Icu (kA)	: 800Vac @ 50kA
Rated Service S.C Breaking Capacity, Ics (kA)	: 800Vac @ 100% Icu
Rated Short-time withstand Capacity, Icw (kA)	: 0.5Sec @ 50kA 1.0Sec @ 50kA 3.0Sec @ 50kA
Rated S.C Making Capacity, Icm (kA)	: 800Vac @ 105kA
Breaking Time (ms)	: 25ms
Closing Time (ms)	: 60ms
Mechanical Life	: 15000
Dimension	: 581mm x 324mm 430mm (W x D x H)
Made	: India
Warranty	: 24 Months from commissioning date or 30 months from date of delivery from manufacturer



U-POWER  
**OMEGA**  
 Air Circuit Breakers

## MOLDED CASE CIRCUIT BREAKER (MCCB)

### Technical Specification

Type	: DZ6-160Y
Current Range, In (A)	: 160A
Release	: Electronic
Poles	: 3P + N
Impulse withstand Voltage, Uimp (kV)	: 8kV
Rated Operational Voltage, Ue (kV) (MAX) @ 50Hz	: 800Vac
Rated Insulation Voltage, Ui (V)	: 1000V
Utilization Category	: A
Standard	: IS 60974-2, IEC 60974-2, EN60974-2
Rated Short-circuit Breaking Capacity, Icu (kA) @ 800V	: 36kA
Rated Short-circuit Breaking Capacity, Ics (kA) @ 800V	: 30kA
Life	: Mechanical @ 20000 Electrical 415Vac @ 8000 Electrical 800Vac @ 4000
Making Capacity, kA	: 75.6kA
Operating Frequency, Hz	: 50Hz
Fingerproof Terminals	: Yes
Suitable for Isolation	: Yes
IP Class	: IP 20 / IP40 from front
Pollution Degree	: Class III
Load-line Bias	: No
Ambient Temperature	: -5°C to 55°C
Storage Temperature	: -15°C to 70°C
Mounting positions in vertical plane	: Vertical & 90° both directions
Dimension	: 120mm x 205mm x 105mm (W x H x D)
Made	: India
Warranty	: 24 Months from commissioning date or 30 months from date of delivery from manufacturer



## MAIN SWITCHBOARD

### Technical Specification

Type	: TERA K5000 PCC Type TS
Rated Service Voltage	: 800V
Rated frequency	: 50Hz
Rated Insulation Voltage	: 1000V
Rated Impulse withstand Voltage	: 12kV
Busbar System	: TPN-E
Rating of Horizontal Busbar	: 2500A
Fault Level Withstand	: 50kA for 1 sec
Degree of Protection	: IP 4X
Form of Separation	: Form III
Made	: Malaysia
Warranty	: 24 Months from commissioning date or 30 months from date of delivery from manufacturer



## MAIN SWITCHBOARD TYPE TEST CERTIFICATE

Intertek

Certificate No. 19960

## ASTA CERTIFICATE of Verification Tests

Laboratory Ref. No: LSWGWO0102629/01

**APPARATUS:** 4000A, 415V/690V/8kV( $U_p/U/U_{mp}$ ), 50/60Hz Extendable Power Switchgear and Controlgear Assembly incorporating a three-phase and neutral vertical & horizontal busbar system with, 1 incoming ACB unit, 1 outgoing ACB unit, 2 outgoing Switch Disconnector fuse units with contactors (DOL starters) and 2 outgoing Switch Disconnector fuse units and a protective circuit.

**DESIGNATION:** TYPE TS+TX

**VENDOR:** PT. TAMCO Indonesia (Larsen & Toubro Group Company)  
F-36, Jalan Jababeka Raya, Jababeka Industrial Estate,  
Cikarang Utara, Bekasi, 17530, Indonesia

**TESTED BY:** Electrical Research & Development Association  
ERDA Road, Makarpura Industrial Estate, Vadodara-390 010, Gujarat, INDIA.

**DATES OF TESTS:** 19<sup>th</sup> June to 27<sup>th</sup> July 2012

The apparatus, constructed in accordance with the description, drawings and photographs incorporated in this certificate has been subjected to the series of proving tests in accordance with

### IEC 61439-1 & 2: Edition 2.0 2011-08 & BSEN 61439-1 & 2: 2011

Verifications with reference to the tests listed in Annex D:

- |                                      |                                      |
|--------------------------------------|--------------------------------------|
| 1: Strength of materials and parts   | 9: Dielectric properties             |
| 2: Degree of protection              | 10: Temperature-rise                 |
| 3: Clearances                        | 11: short-circuit withstand strength |
| 4: Creepage distances                | 12: EMC compatibility                |
| 5: Protection against electric shock | 13: mechanical operation             |

6/7/8: no verification by testing required

Refer to pages A, B and C for ratings

The results are shown in the record of Proving Tests attached hereto. The values obtained and the general performance is considered to comply with the above Standard(s) and to justify the ratings assigned by the manufacturer as stated on the ratings page(s).

This certificate applies only to the apparatus tested. Responsibility for conformity of any apparatus having the same or other designations rests with the Manufacturer.

This certificate comprises this front sheet, 3 rating pages plus 114 other pages as detailed on page 1 & 2

Only integral reproductions of this whole certificate or reproductions of this page accompanied by any ratings pages are permitted.  
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*C P Stephens*  
C P Stephens  
ASTA Observer

*R. Hayward*  
Certification  
Manager

21<sup>st</sup> November 2014 ..... Date

OVERALL SINGLE LINE DIAGRAM

