

Project: Shakti Training and research center, Savar, Dhaka.

Scope: Supply, Installation, testing and commissioning of 1000 KVA Sub-Station with the flowing technical specification.

1. **11 KV HT SWITCHGEAR (VCB):** 1 set

Sheet steel metal clad, vermin and dust proof, free standing floor mounting indoor type HT switchgear panel with 630A, 11KV, 50 Hz three phase hard drawn electrolytic copper bus bars equipped with:

Incoming Feeder (Panel-1)

1 No. Incoming Feeder, consisting of the following:

1 No. 630 A, 50Hz 11KV, 350 MVA (3 sec.) triple pole, completely maintenance free (neither grassing nor adjustment will be required) Siemens/ABB Vacuum Circuit Breaker circuit breaker with manual spring charge operating mechanism, maximum service voltage 12 KV short circuit making current 50 KA (Peak), short circuit breaking current 20 KA, having 4NO+4NC auxiliary contacts, capacitor compensated shunt tripping coil, closing solenoid, ON/OFF/TRIP indicator.

1 No. 11KV Earthing Switch interlocked with the

3 Nos. cast resin Current Transformers, ratio 60/5 with adequate accuracy and burden.

Core 1: 15 VA, Class 0.5 M5 for metering
Core 2: 15 VA, Class 10 P10 for protection.

2 Nos. cast resin Potential Transformer, ratio 11KV/0.11KV with V-V (open Delta)
Burden 100VA, class: 0.5 for metering & protection.

1 No. Moving Iron Ammeter, 0-100 A with selector switch.

1 No. Moving Iron Voltmeter, 0-15KV with selector switch.

1 No. TP solid state IDMT (Adjustable) Relay for over current, earth fault and short circuit protection.

3 Nos. indicating light ON/OFF/TRIP

1 No. Panel Heater with thermostat switch

1 No. Cable end termination.

Origin: 1) VCB are Schneider/ABB of Italy.
2) IDEMT Relay ABB/L&T of India.
3) Siemens of China.

Bill of quantity schedule for 1000 KVA Sub-Station work.

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2. **DISTIBUTION TRANSFORMER (1000 KVA)** 1 No.

3-Phase, oil immersed, naturally air-cooled Transformer according to VDE/IEC/DIN standard with 3 HT Bushing and 4 LT Bushings arranged on tank top, conservator, oil level indicator, drain and filling valves, lifting lugs, bi-directional rollers with first filling of oil in

Transformer.

Technical data	:	
Rated Capacity	:	1000 KVA
Rated Frequency	:	50 Hz
Rated Voltage	:	
Primary	:	11000 V
Secondary	:	415 V
	:	
BIL	:	75 KV
Type of Cooling	:	ONAN
Vector Group	:	DYN 11
Type of loading	:	Distribution
Off load tap changer	:	$\pm 2 \times 2.5\%$, $\pm 5\%$, -7.5% ,
Ambient Temperature	:	40°C
Mean Temperature rise	:	
- in oil	:	60°C (max)
- in coil	:	65°C (mean)
Star point brought out & loadable upto	:	100%
Max. Service altitude	:	1000 Meters
Installation	:	Indoor
No-load loss	:	1730 Watt (max.)
Load loss	:	9770 Watt (max.)
Impedance Volt	:	_6_%

Accessories

- 1) Silicagel breather
- 2) Dial type thermometer

Origin:

- i) Core- Nippon/Kawasaki of Japan / EU.
- ii) Super wire- The super wire BRB/RR Kable.
- iii) Transformer Oil- Savita.

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3. L.T. SWITCHGEAR 1 set.

Sheet steel clad, dust and vermin proof, free standing floor mounting indoor type Low Tension Switchgear conforming to IEC/ VDE standard & suitable for 415V, 3 phase, 4 wire 50Hz with all wiring accessories, hard drawn electrolytic copper busbars of adequate rating, TPN&E equipped with:

Incoming (From 1000 KVA Transformer):

1 No. 1600 A, 65 KA, triple pole, Metal clad ACB with adjustable both Magnetic and thermally delayed overload & short-circuit protection.

3 Nos. Current Transformer, ratio 1600/5 A with adequate accuracy and burden

3 Nos. Ammeter, 0-1600 A

1 No. Voltmeter, 0-600 V with selector switch (six position).

3 Nos. indicating Lamps R-Y-B colour.

Outgoing:

2 No. 1000A, 50KA, TP MCCB with adjustable both Magnetic and thermally delayed overload and short-circuit protection.

1 Nos. 320A, 36KA, TP MCCB with adjustable both Magnetic and thermally delayed overload and short-circuit protection.

1 No. 100A, 25KA, TP MCCB with adjustable both Magnetic and thermally delayed overload and short-circuit protection.

Origin: ACB & MCCBs are Schneider/ABB of Italy.

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4. Auto changeover switch

1 set.

Sheet steel clad, dust and vermin proof, free standing floor mounting indoor type Low Tension Switchgear conforming to IEC/ VDE standard & suitable for 415V, 3 phase, 4 wire 50Hz with all wiring accessories, hard drawn electrolytic copper busbars of adequate rating, TPN&E equipped with:

Incoming (From 1000 KVA Transformer & Generator Synchronizing Panel):

2 No. 1600 A, 65 KA, triple pole, Metal clad ACB with adjustable both Magnetic and thermally delayed overload & short-circuit protection.

6 Nos. Current Transformer, ratio 1600/5 A with adequate accuracy and burden

2 Nos. Ammeter, 0-1600 A with selector switch

1 No. Voltmeter, 0-600 V with selector switch (six position).

7 Nos. indicating Lamps R-Y-B colour.

4 Nos. Push button switch.

2 Nos. Auto/Manual selector switch.

1 Lot of accessories such as Relay, Timer, Magnetic contractor & etc.

Origin: ACB are Schneider/ABB of Italy.

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5. **AUTOMATIC PFI PLANT (600 KVAR)** 1 Set

Sheet steel clad, dust and vermin proof, free standing floor mounting indoor type, 600 KVAR, 415 V, 50Hz indoor type centrally controlled PFI Plant with hard drawn copper busbars equipped with the following (The PFI Plant shall be interconnected by busbar with L.T. Panel).

1 No. 25 KVAR Bank of dry type TP power capacitor (Fixed).

2 Nos. 12.5 KVAR Bank of dry type TP power capacitors.

2 Nos. 25 KVAR Bank of dry type TP power capacitors.

6 Nos. 50 KVAR Bank of dry type TP power capacitors.

2 Nos. 100 KVAR Bank of dry type TP power capacitors.

1 No. Current Transformer, ratio 1600/5A with adequate accuracy and burden

1 No. 12-Stage Automatic microprocessor controlled Power Factor Correction Relay with inbuilt digital Power factor measuring meter

39 Nos. HRC Fuses with base of adequate rating.

12 Nos. Indicating lamps.

1 Nos. of Control Fuse.

Origin:

Capacitor-	Epcos of India.
Magnetic Contactor-	ABB / Schneider
PFC digital Relay-	Mikro of Malaysia / Epcos of India.

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6. **Earthing:**

a) Supply and installation of solid copper wire earthing lead 4 SWG in 1.5" dia /G.I. Pipe and termination of connections at both ends with as per drawing and specification. 8 sets

b) Supply and installation of 1.5" dia 20'-0" long G.I. Pipe earth electrode sunk up to a depth of 80'-0" below ground level to be used as earth electrode as per drawing and specifications. 8 Sets

c) Supply and installation including termination of copper wire earthing lead in. G.I. Pipe of adequate size from the earth electrode up to the earthing block in the sub-station and earth continuity conductor of 4 SWG as per specification and direction of E/C. 8 sets

d) Supply, installation, laying terminating of 4 SWG copper wire as per earthing lead from transformer neutral to the earth electrode including supply of cable lugs and compete with all accessories. 1 set

7. a) **Drop Out Fuse:** Supply of drop out fuse cut out for out door use rated maximum design voltage 12.5 kV, nominal voltage 11.0 KV, frequency 50Hz rated continuous current 100 Amps. Interrupting current 8.0 KA. Symmetrical r.m.s at 11.0 KV basic insulation level 95.0KV suitable for 3 phase connection of 3 nos. individual fuse barrier , single pole , single throw , single supporting insulator, cross arm mounted, open dropout fuse cut out complete with fuse holder and accessories, suitable for installation at ambient temperature 55°C (Maximum) and mounting altitude 1000 meters. 1 set.

b) **Lightning Arrestor:** Supply of lightning arrestor of rated voltage 11 kv, 50 Hz, maximum permissible voltage 12.7 KV normal discharge current 5KA minimum protective symmetrical fault current 20KA suitable for use at ambient temperature 50°C at 1000 meter above sea level of typed BD 12.7 TVI of GEM CO Ltd. or equivalent of USA/ UK /Pakistan/France Origin.

Bill of quantity schedule for 1000 KVA Sub-Station work.

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| | | 1 set |
| | c) Heat Shrink: Supply, installation of 11 KV Heat Shrink equivalents of USA/ UK / Pakistan / France Origin. | 4 set |
| 8) | <u>Cables Work:</u> | |
| | a) Supply of 3X95 mm HT XLEP cables | meter |
| | b) Supply of 1C-300 mm NYY LT cables | meter |
| | c) Supply of 1c-36 mm BYA cables for body earthing | coil |

9. **INSTALLATION:**

Installation testing & commissioning of HT Switch Gear, L.T. Panel, Transformers, PFI Plants etc. including carrying the equipment making the all necessary fittings.

L.S.

10. **Documentation:**

i. The contractor will produce & supply all drawings/ layout plan of the substation and all documents to us for submission to Electrical Licensing Board & PDB for load sanction purpose.

ii. After complete installation, testing, commissioning and balancing the contractor has to submit 2 copies of as built drawing and all documents to us. Working drawing shall have to be prepared by the contractor.

11. **REB and others Expenses**

- i. Application Fees for load
- ii. Security Bank deposit (Refundable) for load
- iii. Service charge with consultancy fees (Bank deposit)
- iv. Meter installation with wiring certificate by REB enlisted contractor
- v. Inspection by REB
- vi. Load clearance from REB
- vii. REB formalities
- viii. Expenses for HT connection
- ix. 12-core 4 RM Cable for metering.