

Subhead - 2.2
Generator & Related Works

Item No.	Description of Items	Unit	Unit Rate in Dhaka & Mymensingh Zone (Tk)	Unit Rate in Chattogram & Sylhet Zone (Tk)	Unit Rate in Khulna, Barishal & Gopalganj (Tk)	Unit Rate in Rajshahi & Rangpur (Tk)
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2.2.1 THREE PHASE GENERATOR MANUALLY OPERATED

Supply of 400V-415V, 3-phase 4-wire 50 Hz. air / water cooled, floor mounted, indoor type following continuous capacity (prime power) electric generating set suitable for tropicalized country complete with four stroke, 1500 rpm, diesel engine with all standard accessories viz. 12/24 volt DC battery & auto battery charger with ammeter, radiator assembly, oil & fuel pump, auto speed governor, air cleaner, fuel & oil tank, level & oil pressure gauge, RPM & hour meter, start & stop switch, exhaust silencer (to keep standard emission level), mounting spring and vibration isolator (to keep very minimum vibration in the room), mounting steel base frame etc. including safety & protection device viz. auto shut off with indicators for overload, over & under voltage, high temperature, low oil pressure, over speed, low fuel level etc. coupled with brush less, self excited alternator having control panel with auto voltage regulator, voltmeter & ammeter with selector switch, frequency meter compatible with standard building management system.

TPMCCB of required rating for overload & instantaneous short circuit release, manual change over switch, indicator for ON-OFF-TRIP etc. including maintenance tools, 3 sets of detailed technical catalogues & maintenance manual and manufactured, assembled and tested in accordance with NEMA / IEC / VDE / JIS standards along with relevant BDS IEC standard along with relevant BDS IEC standard (subject to satisfy standard test and approved by PWD)

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Item No.	Description of Items	Unit	Unit Rate in Dhaka & Mymensingh Zone (Tk)	Unit Rate in Chattogram & Sylhet Zone (Tk)	Unit Rate in Khulna, Barishal & Gopalganj (Tk)	Unit Rate in Rajshahi & Rangpur (Tk)
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2.2.1.1 (USA / UK / JAPAN / EU COUNTRIES)

The generating set shall be assembled & tested in USA / UK / JAPAN / EU countries. The diesel engine of the generating set shall be of Perkins (UK) / Deutz (Germany) / Cummins (UK) / Mitsubishi (Japan) / Volvo (Sweden) / Kohler (France) / Yanmar (Japan) / Caterpillar (USA) brand and alternator shall be of Stamford (UK) / Mecc Alte Spa (Italy) / Leroy Somer (Italy) / Kohler (France) / Caterpillar (USA) brand. The engine, alternator shall also be manufactured and tested as per relevant standards in USA / UK / JAPAN / EU countries & accepted / approved by the Engineer-in-charge.

2.2.1.1.1	10 KVA	Each	987,651.00	987,651.00	987,651.00	987,651.00
2.2.1.1.2	20 KVA	Each	1,185,687.00	1,185,687.00	1,185,687.00	1,185,687.00
2.2.1.1.3	30 KVA	Each	1,449,843.00	1,449,843.00	1,449,843.00	1,449,843.00
2.2.1.1.4	40 KVA	Each	1,609,029.00	1,609,029.00	1,609,029.00	1,609,029.00
2.2.1.1.5	60 KVA	Each	1,787,018.00	1,787,018.00	1,787,018.00	1,787,018.00
2.2.1.1.6	80 KVA	Each	1,902,588.00	1,902,588.00	1,902,588.00	1,902,588.00
2.2.1.1.7	100 KVA	Each	2,201,325.00	2,201,325.00	2,201,325.00	2,201,325.00
2.2.1.1.8	150 KVA	Each	2,738,379.00	2,738,379.00	2,738,379.00	2,738,379.00
2.2.1.1.9	200 KVA	Each	3,501,338.00	3,501,338.00	3,501,338.00	3,501,338.00
2.2.1.1.10	250KVA	Each	3,780,841.00	3,780,841.00	3,780,841.00	3,780,841.00
2.2.1.1.11	300 KVA	Each	4,354,605.00	4,354,605.00	4,354,605.00	4,354,605.00
2.2.1.1.12	400 KVA	Each	5,275,334.00	5,275,334.00	5,275,334.00	5,275,334.00
2.2.1.1.13	500 KVA	Each	6,508,267.00	6,508,267.00	6,508,267.00	6,508,267.00

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Item No.	Description of Items	Unit	Unit Rate in Dhaka & Mymensingh Zone (Tk)	Unit Rate in Chattogram & Sylhet Zone (Tk)	Unit Rate in Khulna, Barishal & Gopalganj (Tk)	Unit Rate in Rajshahi & Rangpur (Tk)
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2.2.1.2 (CHINA / INDIA / BANGLADESH / SOUTH ASIAN COUNTRIES)

The generating set shall be manufactured / assembled & tested as per relevant standards in CHINA / INDIA / BANGLADESH / South Asian countries and accepted / approved by the Engineer-in-charge. The major components like engine shall be of Perkins / Deutz / Cummins / Mitsubishi / Volvo / Kohler / Yanmar brand and alternator shall be of Stamford / Mecc Alte Spa / Leroy Somer / Kohler brand.

2.2.1.2.1	10 KVA	Each	829,730.00	829,730.00	829,730.00	829,730.00
2.2.1.2.2	20 KVA	Each	927,526.00	927,526.00	927,526.00	927,526.00
2.2.1.2.3	30 KVA	Each	1,112,786.00	1,112,786.00	1,112,786.00	1,112,786.00
2.2.1.2.4	40 KVA	Each	1,220,300.00	1,220,300.00	1,220,300.00	1,220,300.00
2.2.1.2.5	60 KVA	Each	1,415,278.00	1,415,278.00	1,415,278.00	1,415,278.00
2.2.1.2.6	80 KVA	Each	1,573,260.00	1,573,260.00	1,573,260.00	1,573,260.00
2.2.1.2.7	100 KVA	Each	1,836,892.00	1,836,892.00	1,836,892.00	1,836,892.00
2.2.1.2.8	150 KVA	Each	2,445,504.00	2,445,504.00	2,445,504.00	2,445,504.00
2.2.1.2.9	200 KVA	Each	3,092,674.00	3,092,674.00	3,092,674.00	3,092,674.00
2.2.1.2.10	250 KVA	Each	3,407,491.00	3,407,491.00	3,407,491.00	3,407,491.00
2.2.1.2.11	300 KVA	Each	4,015,372.00	4,015,372.00	4,015,372.00	4,015,372.00
2.2.1.2.12	400 KVA	Each	4,735,900.00	4,735,900.00	4,735,900.00	4,735,900.00
2.2.1.2.13	500 KVA	Each	5,799,572.00	5,799,572.00	5,799,572.00	5,799,572.00

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Item No.	Description of Items	Unit	Unit Rate in Dhaka & Mymensingh Zone (Tk)	Unit Rate in Chattogram & Sylhet Zone (Tk)	Unit Rate in Khulna, Barishal & Gopalganj (Tk)	Unit Rate in Rajshahi & Rangpur (Tk)
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2.2.2

THREE PHASE GENERATOR WITH ATS
(WITHOUT CANOPY)

Supply of 400V-415V, 3-phase, 4-wire, 50 Hz. air / water cooled, floor mounted, indoor type following continuous capacity (prime power) electric generating set with ATS without canopy suitable for tropicalized country complete with four stroke, 1500 rpm, diesel engine with all standard accessories viz. 12/24 volt DC battery & auto battery charger with ammeter, radiator assembly, oil & fuel pump, auto speed governor, air cleaner, fuel & oil tank, level & oil pressure gauge, RPM & hour meter, start & stop switch, exhaust silencer (to keep standard emission level), mounting spring and vibration isolator (to keep very minimum vibration in the room), mounting steel base frame etc. including safety & protection device viz. auto shut off with

indicators for overload, over & under voltage, high temperature, low oil pressure, over speed, low fuel level etc. coupled with brush less, self excited alternator having control panel with auto voltage regulator, voltmeter & ammeter with selector switch, frequency meter, compatible with standard building management system.

TPMCCB of required rating for overload & instantaneous short circuit release, auto start and auto charge over to load within 10 sec during normal power failure and stop & auto change over to normal supply within 5 minutes after resolution of normal power supply, indicator for 3 phase indicator for ON-OFF-TRIP etc. including maintenance tools, 3 sets of detailed technical catalogues & maintenance manual. Manufactured, assembled and tested in accordance with NEMA / IEC / VDE / JIS standards along with relevant BDS IEC standard (subject to satisfy standard test and approved by PWD)

2.2.2.1

(USA / UK / JAPAN / EU COUNTRIES)

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Item No.	Description of Items	Unit	Unit Rate in Dhaka & Mymensingh Zone (Tk)	Unit Rate in Chattogram & Sylhet Zone (Tk)	Unit Rate in Khulna, Barishal & Gopalganj (Tk)	Unit Rate in Rajshahi & Rangpur (Tk)
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The generating set shall be assembled & tested in USA / UK / JAPAN / EU countries. The major components like engine shall be of Perkins / Deutz / Cummins / Mitsubishi / Volvo / Kohler / Yanmar brand and alternator shall be of Stamford / Mecc Alte Spa / Leroy Somer / Kohler brand. The engine, alternator, ATS shall also be manufactured and tested as per relevant standards in USA / UK / JAPAN / EU countries & accepted / approved by the Engineer-in-charge.

2.2.2.1.1	10 KVA	Each	1,036,850.00	1,036,850.00	1,036,850.00	1,036,850.00
2.2.2.1.2	20 KVA	Each	1,294,895.00	1,294,895.00	1,294,895.00	1,294,895.00
2.2.2.1.3	30 KVA	Each	1,571,198.00	1,571,198.00	1,571,198.00	1,571,198.00
2.2.2.1.4	40 KVA	Each	1,689,204.00	1,689,204.00	1,689,204.00	1,689,204.00
2.2.2.1.5	60 KVA	Each	1,881,145.00	1,881,145.00	1,881,145.00	1,881,145.00
2.2.2.1.6	80 KVA	Each	2,116,873.00	2,116,873.00	2,116,873.00	2,116,873.00
2.2.2.1.7	100 KVA	Each	2,310,655.00	2,310,655.00	2,310,655.00	2,310,655.00
2.2.2.1.8	150 KVA	Each	2,932,646.00	2,932,646.00	2,932,646.00	2,932,646.00
2.2.2.1.9	200 KVA	Each	3,738,603.00	3,738,603.00	3,738,603.00	3,738,603.00
2.2.2.1.10	250KVA	Each	4,048,231.00	4,048,231.00	4,048,231.00	4,048,231.00
2.2.2.1.11	300 KVA	Each	4,720,162.00	4,720,162.00	4,720,162.00	4,720,162.00
2.2.2.1.12	400 KVA	Each	5,701,508.00	5,701,508.00	5,701,508.00	5,701,508.00
2.2.2.1.13	500 KVA	Each	6,996,820.00	6,996,820.00	6,996,820.00	6,996,820.00

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2.2.2.2 (CHINA / INDIA / BANGLADESH / SOUTH ASIAN COUNTRIES)

The generating set shall be manufactured / assembled & tested as per relevant standards in CHINA / INDIA / BANGLADESH / South Asian countries and accepted / approved by the Engineer-in-charge. The major components like engine shall be of Perkins / Deutz / Cummins / Mitsubishi / Volvo / Kohler / Yanmar brand and alternator shall be of Stamford / Mecc Alte Spa / Leroy Somer / Kohler brand.

2.2.2.2.1	10 KVA	Each	884,395.00	884,395.00	884,395.00	884,395.00
2.2.2.2.2	20 KVA	Each	982,191.00	982,191.00	982,191.00	982,191.00
2.2.2.2.3	30 KVA	Each	1,171,095.00	1,171,095.00	1,171,095.00	1,171,095.00
2.2.2.2.4	40 KVA	Each	1,285,898.00	1,285,898.00	1,285,898.00	1,285,898.00
2.2.2.2.5	60 KVA	Each	1,494,238.00	1,494,238.00	1,494,238.00	1,494,238.00
2.2.2.2.6	80 KVA	Each	1,677,731.00	1,677,731.00	1,677,731.00	1,677,731.00
2.2.2.2.7	100 KVA	Each	1,958,369.00	1,958,369.00	1,958,369.00	1,958,369.00
2.2.2.2.8	150 KVA	Each	2,623,101.00	2,623,101.00	2,623,101.00	2,623,101.00
2.2.2.2.9	200 KVA	Each	3,311,359.00	3,311,359.00	3,311,359.00	3,311,359.00
2.2.2.2.10	250KVA	Each	3,662,497.00	3,662,497.00	3,662,497.00	3,662,497.00
2.2.2.2.11	300 KVA	Each	4,380,170.00	4,380,170.00	4,380,170.00	4,380,170.00
2.2.2.2.12	400 KVA	Each	5,223,390.00	5,223,390.00	5,223,390.00	5,223,390.00
2.2.2.2.13	500 KVA	Each	6,346,137.00	6,346,137.00	6,346,137.00	6,346,137.00

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2.2.3 **THREE PHASE GENERATOR WITH ATS AND SOUND ATTENUATED ACOUSTICALLY TREATED CANOPY**
(Maximum sound level : 75 dBA at 7m distance in the generator room).

Supply of 400V-415V, 3-phase, 4-wire, 50 Hz. air / water cooled, floor mounted, indoor type following continuous capacity (prime power) electric generating set with ATS and sound attenuated acoustically treated canopy (Maximum sound level : 75 dBA at 7m distance in the generator room) suitable for tropicalized country complete with four stroke, 1500 rpm, diesel engine with all standard accessories viz. 12/24 volt DC battery & auto battery charger with ammeter, radiator assembly, oil & fuel pump, auto speed governor, air cleaner, fuel & oil tank, level & oil pressure gauge, RPM & hour meter, start & stop switch, exhaust silencer (to keep standard emission level), mounting spring and vibration isolator (to keep very minimum

vibration in the room), mounting steel base frame etc. including safety & protection device viz. auto shut off with indicators for overload, over & under voltage, high temperature, low oil pressure, over speed, low fuel level etc. coupled with brush less, self excited alternator having control panel with auto voltage regulator, voltmeter & ammeter with selector switch, frequency meter, compatible with standard building management system.

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Item No.	Description of Items	Unit	Unit Rate in Dhaka & Mymensingh Zone (Tk)	Unit Rate in Chattogram & Sylhet Zone (Tk)	Unit Rate in Khulna, Barishal & Gopalganj (Tk)	Unit Rate in Rajshahi & Rangpur (Tk)
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TPMCCB of required rating for overload & instantaneous short circuit release, auto start and auto charge over to load within 10 sec during normal power failure and stop & auto change over to normal supply within 5 minutes after resolution of normal power supply, indicator for 3 phase indicator for ON-OFF-TRIP etc. including maintenance tools, 3 sets of detailed technical catalogues & maintenance manual. Manufactured, assembled and tested in accordance with NEMA / IEC / VDE / JIS standards along with relevant BDS IEC standard (subject to satisfy standard test and approved by PWD)

2.2.3.1 (USA / UK / JAPAN / EU COUNTRIES)

The generating set shall be assembled & tested in USA / UK / JAPAN / EU countries. The major components like engine shall be of Perkins / Deutz / Cummins / Mitsubishi / Volvo / Kohler / Yanmar brand and alternator shall be of Stamford / Mecc Alte Spa / Leroy Somer / Kohler brand. The engine, alternator, ATS, canopy shall also be manufactured and tested as per relevant standards in USA / UK / JAPAN / EU countries & accepted / approved by the Engineer-in-charge.

2.2.3.1.1	10 KVA	Each	1,086,048.00	1,086,048.00	1,086,048.00	1,086,048.00
2.2.3.1.2	20 KVA	Each	1,367,276.00	1,367,276.00	1,367,276.00	1,367,276.00
2.2.3.1.3	30 KVA	Each	1,648,503.00	1,648,503.00	1,648,503.00	1,648,503.00
2.2.3.1.4	40 KVA	Each	1,769,379.00	1,769,379.00	1,769,379.00	1,769,379.00
2.2.3.1.5	60 KVA	Each	1,970,431.00	1,970,431.00	1,970,431.00	1,970,431.00
2.2.3.1.6	80 KVA	Each	2,217,093.00	2,217,093.00	2,217,093.00	2,217,093.00
2.2.3.1.7	100 KVA	Each	2,419,985.00	2,419,985.00	2,419,985.00	2,419,985.00
2.2.3.1.8	150 KVA	Each	3,344,456.00	3,344,456.00	3,344,456.00	3,344,456.00
2.2.3.1.9	200 KVA	Each	4,108,576.00	4,108,576.00	4,108,576.00	4,108,576.00

Item No.	Description of Items	Unit	Unit Rate in Dhaka & Mymensingh Zone (Tk)	Unit Rate in Chattogram & Sylhet Zone (Tk)	Unit Rate in Khulna, Barishal & Gopalganj (Tk)	Unit Rate in Rajshahi & Rangpur (Tk)
2.2.3.1.10	250KVA	Each	4,830,154.00	4,830,154.00	4,830,154.00	4,830,154.00
2.2.3.1.11	300 KVA	Each	5,794,712.00	5,794,712.00	5,794,712.00	5,794,712.00
2.2.3.1.12	400 KVA	Each	7,164,478.00	7,164,478.00	7,164,478.00	7,164,478.00
2.2.3.1.13	500 KVA	Each	8,044,530.00	8,044,530.00	8,044,530.00	8,044,530.00

2.2.3.2 (CHINA / INDIA / BANGLADESH / SOUTH ASIAN COUNTRIES)

The generating set shall be manufactured / assembled & tested as per relevant standards in CHINA / INDIA / BANGLADESH / SOUTH ASIAN Countries and accepted / approved by the Engineer-in-charge. The major components like engine shall be of Perkins / Deutz / Cummins / Mitsubishi / Volvo / Kohler / Yanmar brand and alternator shall be of Stamford / Mecc Alte Spa / Leroy Somer / Kohler brand.

2.2.3.2.1	10 KVA	Each	977,812.00	977,812.00	977,812.00	977,812.00
2.2.3.2.2	20 KVA	Each	1,121,890.00	1,121,890.00	1,121,890.00	1,121,890.00
2.2.3.2.3	30 KVA	Each	1,310,795.00	1,310,795.00	1,310,795.00	1,310,795.00
2.2.3.2.4	40 KVA	Each	1,421,953.00	1,421,953.00	1,421,953.00	1,421,953.00
2.2.3.2.5	60 KVA	Each	1,672,811.00	1,672,811.00	1,672,811.00	1,672,811.00
2.2.3.2.6	80 KVA	Each	1,897,606.00	1,897,606.00	1,897,606.00	1,897,606.00
2.2.3.2.7	100 KVA	Each	2,177,029.00	2,177,029.00	2,177,029.00	2,177,029.00
2.2.3.2.8	150 KVA	Each	3,011,728.00	3,011,728.00	3,011,728.00	3,011,728.00
2.2.3.2.9	200 KVA	Each	3,699,681.00	3,699,681.00	3,699,681.00	3,699,681.00
2.2.3.2.10	250KVA	Each	4,349,102.00	4,349,102.00	4,349,102.00	4,349,102.00
2.2.3.2.11	300 KVA	Each	5,217,449.00	5,217,449.00	5,217,449.00	5,217,449.00
2.2.3.2.12	400 KVA	Each	6,495,609.00	6,495,609.00	6,495,609.00	6,495,609.00

Item No.	Description of Items	Unit	Unit Rate in Dhaka & Mymensingh Zone (Tk)	Unit Rate in Chattogram & Sylhet Zone (Tk)	Unit Rate in Khulna, Barishal & Gopalganj (Tk)	Unit Rate in Rajshahi & Rangpur (Tk)
2.2.3.2.13	500 KVA	Each	7,242,776.00	7,242,776.00	7,242,776.00	7,242,776.00

2.2.4

MOBILE TYPE GENERATOR

The generating set shall be assembled & tested in USA / UK / JAPAN / EU countries. The major components like engine shall be of Perkins / Deutz / Cummins / Mitsubishi / Volvo / Kohler / Yanmar brand and alternator shall be of Stamford / Mecc Alte Spa / Leroy Somer / Kohler brand. The engine, alternator, ATS, canopy shall also be manufactured and tested as per relevant standards in USA / UK / JAPAN / EU countries & accepted / approved by the Engineer-in-charge.

With sound attenuated acoustically treated canopy, standard chassis including necessary wheels, brakes etc. as required as outdoor-type mobile unit. (Maximum sound level : 75 dBA at 7m distance (outdoor)).

2.2.4.1	20 KVA	Each	1,703,757.00	1,703,757.00	1,703,757.00	1,703,757.00
2.2.4.2	30 KVA	Each	1,824,105.00	1,824,105.00	1,824,105.00	1,824,105.00
2.2.4.3	60 KVA	Each	2,086,679.00	2,086,679.00	2,086,679.00	2,086,679.00
2.2.4.4	80 KVA	Each	2,465,350.00	2,465,350.00	2,465,350.00	2,465,350.00
2.2.4.5	100 KVA	Each	2,636,257.00	2,636,257.00	2,636,257.00	2,636,257.00
2.2.4.6	150 KVA	Each	3,286,036.00	3,286,036.00	3,286,036.00	3,286,036.00
2.2.4.7	200 KVA	Each	3,894,038.00	3,894,038.00	3,894,038.00	3,894,038.00










Item No.	Description of Items	Unit	Unit Rate in Dhaka & Mymensingh Zone (Tk)	Unit Rate in Chattogram & Sylhet Zone (Tk)	Unit Rate in Khulna, Barishal & Gopalganj (Tk)	Unit Rate in Rajshahi & Rangpur (Tk)
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2.2.5 INSTALLATION

Installation, testing & commissioning of following electric generator on prepared CC pad with the help of necessary T & P, skilled labour, technician, Engineer-in-charge including 2 hrs. / 5 day trial run operation by skilled operator with supply of necessary fuel & lubricant as per manufacturers instruction manual and in accordance with relevant IEC / NEMA / VDE / JIS standards so that vibration transfer rate to foundation shall be almost zero.

2.2.5.1 10KVA –20 KVA recoil start/auto battery start electric generating set.

Each	16,467.00	16,170.00	15,051.00	15,051.00
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2.2.5.2 30KVA – 80 KVA manual/auto/auto with soundproof acoustically treated canopy generating set.

Each	31,314.00	30,751.00	28,621.00	28,621.00
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2.2.5.3 100KVA – 150 KVA manual/auto/auto with soundproof acoustically treated canopy/mobile generating set with soundproof acoustically treated canopy.

Each	42,652.00	41,884.00	38,985.00	38,985.00
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2.2.5.4 200 KVA – 300 KVA manual/auto/auto with sound-proof acoustically treated canopy generating set.

Each	46,297.00	45,463.00	42,315.00	42,315.00
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2.2.5.5 400 KVA – 500 KVA manual/auto/auto with soundproof acoustically treated canopy generating set.

Each	97,992.00	96,229.00	89,565.00	89,565.00
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2.2.6 OPERATION & MAINTANANCE

Monthly Operation & maintenance of Generator set by skilled Mechanic/Electrician, Generator Operator & Helper round the clock including servicing, greasing, Changing of oil & air filter, operating changeover switch by manually / auto changeover switch, checking of contact points, minor repairing etc. as required and as per direction of the Engineer-in-charge.

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suitable for charging at constant voltage/current having necessary protective device against reverse battery terminal, short circuit complete with indicators, volt & amp meters, charging selector switch, ventilation fan etc. as required of following capacity accepted /approved by the Engineer-in-charge.

Item No.	Description of Items	Unit	Unit Rate in Dhaka & Mymensingh Zone (Tk)	Unit Rate in Chattogram & Sylhet Zone (Tk)	Unit Rate in Khulna, Barishal & Gopalganj (Tk)	Unit Rate in Rajshahi & Rangpur (Tk)
2.2.8.1	12 V DC, 20 amp	Each	61,598.00	61,598.00	61,598.00	61,598.00
2.2.8.2	12 V DC, 30 amp	Each	73,868.00	73,868.00	73,868.00	73,868.00
2.2.8.3	24 V DC 15 amp.	Each	61,598.00	61,598.00	61,598.00	61,598.00
2.2.8.4	24 V DC 20 amp.	Each	73,868.00	73,868.00	73,868.00	73,868.00
2.2.8.5	48 V DC 15 amp.	Each	122,950.00	122,950.00	122,950.00	122,950.00
2.2.8.6	48 V DC 20 amp.	Each	153,626.00	153,626.00	153,626.00	153,626.00
2.2.9	<u>GENERATOR SPARE PARTS</u>					
	Supply and installation of following generator servicing spare parts / items as required of following capacity accepted /approved by the Engineer-in-charge)					
2.2.9.1	Rating: 10 KVA - 100 KVA					
2.2.9.1.1	Fuel Filter	Nos	1,728.00	1,728.00	1,728.00	1,728.00
2.2.9.1.2	Fuel Filter Separator	Nos	1,795.00	1,795.00	1,795.00	1,795.00
2.2.9.1.3	Oil Filter	Nos	1,931.00	1,931.00	1,931.00	1,931.00
2.2.9.1.4	Air Filter	Nos	4,534.00	4,534.00	4,534.00	4,534.00
2.2.9.1.5	Lube Oil	Ltr	785.00	785.00	785.00	785.00
2.2.9.1.6	Coolant	Ltr	859.00	859.00	859.00	859.00
2.2.9.2	Rating: 150 KVA - 200 KVA					
2.2.9.2.1	Primary Fuel Filter	Nos	1,798.00	1,798.00	1,798.00	1,798.00
2.2.9.2.2	Secondary Fuel Filter	Nos	2,053.00	2,053.00	2,053.00	2,053.00
2.2.9.2.3	Oil Filter	Nos	1,931.00	1,931.00	1,931.00	1,931.00
2.2.9.2.4	Air Filter	Nos	10,512.00	10,512.00	10,512.00	10,512.00
2.2.9.2.5	Lube Oil	Ltr	785.00	785.00	785.00	785.00
2.2.9.2.6	Coolant	Ltr	859.00	859.00	859.00	859.00
2.2.9.3	Rating: 250 KVA - 500 KVA					
2.2.9.3.1	Primary Fuel Filter	Nos	5,493.00	5,493.00	5,493.00	5,493.00
2.2.9.3.2	Secondary Fuel Filter	Nos	4,411.00	4,411.00	4,411.00	4,411.00

Item No.	Description of Items	Unit	Unit Rate in Dhaka & Mymensingh Zone (Tk)	Unit Rate in Chattogram & Sylhet Zone (Tk)	Unit Rate in Khulna, Barishal & Gopalganj (Tk)	Unit Rate in Rajshahi & Rangpur (Tk)
2.2.9.3.3	Oil Filter	Nos	5,417.00	5,417.00	5,417.00	5,417.00
2.2.9.3.4	Air Filter	Nos	14,970.00	14,970.00	14,970.00	14,970.00
2.2.9.3.5	Lube Oil	Ltr	785.00	785.00	785.00	785.00
2.2.9.3.6	Coolant	Ltr	859.00	859.00	859.00	859.00

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Subhead-2.2
Generator and Related Works
ANNEXURE : 2.2

It shall be part & parcel of general and particular specification of STD .

DETAILED SPECIFICATION:

Diesel engine driven generating set having a continuous rated output at 0.8 Power factor at 415/230 Volts, 3-phase, 4-wire, 50Hz at 1500 RPM under conditions of normal temperatures and pressures with 10% overload for one hour at conditions specified under B.S. 5514, DIN6271, ISO 3046 / 1.

ENGINE:

Diesel engine driven generating set having a continuous rated output at 0.8 Power factor at 415/230 Volts, 3-phase, 4-wire, 50Hz at 1500 RPM under conditions of normal temperatures and pressures with 10% overload for one hour at conditions specified under B.S. 5514, DIN6271, ISO 3046/1.

The engine shall be complete with close control governing to BS 5514, 1979 Class A1 Fuel Injection equipment with

- a) Fuel oil filters
- b) Lubricating oil filters
- c) Air cleaners/filters
- d) Fuel solenoid energized to run,
- e) Lubricating oil pressure pump,
- f) Water circulating pump,
- g) Battery charging generator,
- h) Precision mechanical governor,
- i) Starter motor,
- j) Fuel solenoid
- k) Thermostatically controlled by pass system

ENGINE STARTING :

The engine shall be fitted with manual automatic electric starting by means of a starter motor arranged to engage with the fly wheel.

ENGINE COOLING :

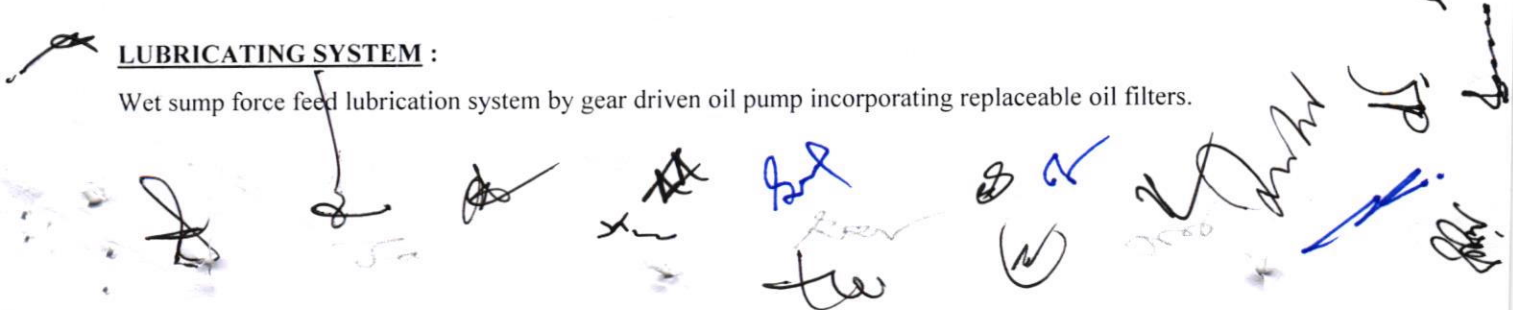
The diesel engine shall be cooled via a tropical air blast heavy duty radiator with engine driven pusher type fan, complete with water circulating pump , radiator guard, thermostat and by pass system .

BATTERIES :

The unit shall be supplied with a set of suitably rated heavy duty 12/24 volt industrial type lead acid batteries (dry charged). A mains operated battery charger should be mounted in control cubicle. A set of starter cables and connections would be supplied loose.

LUBRICATING SYSTEM :

Wet sump force feed lubrication system by gear driven oil pump incorporating replaceable oil filters.



EXHAUST SYSTEM :

The engine shall be supplied with :-

Acoustic type silencers, flexible bellows sections and rigid exhaust pipe of suitable length, suitable for use with Vee form engine, supplied loose for site erection. The complete exhaust system shall be designed to prevent any de-rate of the engine due to excessive back pressure. All exhaust components are to be finished with heat resistant paint.

ALTERNATOR :

Brushless Salient pole rotating field, self-exciting, self-regulating, single bearing construction with integral automatic voltage regulator providing voltage control to within $\pm 2\%$ of nominal range, no load to full load and at all power factors between unity and 0.8 lagging and with a maximum 5% prime mover speed variation.

Class H insulating on both rotor and stator windings and with enclosures to IP21 of BS 4999 Part 20, IEC & DIN standards. The alternator meets the requirement of BS 5000 and radio suppression to BS 800 & VDE class G&N.

ANTI-VIBRATION MOUNTINGS :

A set of anti-vibration mounts and spring isolator would be supplied loose for positioning beneath bed frame when the side is delivered to site. These have their own in - built leveling device and friction pad, therefore fixing to the floor is not necessary.

FUEL SYSTEM :

The unit shall be supplied with a base mounted fuel tank in corporate in the base frame of the unit providing sufficient fuel for 8 hours continuous full load operation, the base shall be pressure tested prior to assembly and will incorporate dial type content/gauge, filler cap, vent pipe, drain cock and all necessary fuel connections. All pipe terminations shall be completed during works assembly. The system shall include arrangement for low and high level alarm system of fuel. An additional daily fuel tank (self standing)1500 liter capacity with automatic supply type including level switch & pump .

FUEL TRANSFER :

A set of rotary type hand pump would be supplied with 3 meters of flexible pipe, suitable for manual fuel transfer to the daily service fuel tank.

COUPLING :

The alternator casing would be flange mounted to the engine flywheel housing and the rotor shaft, coupled to the engine flywheel through a flexible element to minimize torsional vibration throughout the operating range.

BASE FRAME :

The engine and alternator would be mounted on a fabricated steel type base frame of welded construction adequately designed to resist bending and torsional forces. The base frame shall accurately align and support the assembly and shall provide Sub-Station & Diesel Generator Set setting points and location points for securing to the foundation.

ENGINE INSTRUMENTATION :

Incorporated in the control panel or mounted on a separate engine mounted panel, our option, shall be the following engine instrumentation:-

1-Oil Pressure gauge.

1-Water Temperature gauge.

1-Hours run recorder.

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BONNET & SOUND PROOF CANOPY :

Should be fabricated by heavy duty steel structure covering with steel sheet. The inner side of the steel enclosure should be lined with sound absorbing materials which should be covered by perforated steel sheet. The sound reducing level should be 82 dBA @ 1 meter from the canopy.

GENERATING SET PROTECTION :

The unit shall be arranged to automatically shutdown and indicate the same in the event of:

- Fail to start
- Low oil pressure
- High engine temperature
- Engine over speed
- Overload
- Over/under voltage protection

FINISH:

The generating set would be finished in Hammer blue/Yellow and the control panel in grey/Yellow.

HAND BOOKS :

The equipment would be supplied with:

- i. Operation & maintenance manual.
- ii. Engine & alternator parts catalogue.

TOOLS :

One set of standard routine maintenance tools would be supplied in a tool box.

AUTO CHANGE OVER SWITCH :

At the event of mains failure, an energy stop switch should be attached with the Alternator body, the generator shall start or if supply voltage goes below specific level or single phasing automatically and change over to the load. With restoration of main supply the generator shall shut down automatically as well as the load shall be transferred to the normal supply. The bidder must mention the change over time in seconds.

The supply and installation of generators with automatic change over switch shall be on "turnkey basis" and shall include the cost of:

- a) Taking necessary permission from the relevant of authority.
- b) All pipe works.
- c) all inter connecting power and control cable works.
- d) Daily and reserve fuel tank including the transfer pump.

CHANGEOVER SWITCH OF A GENERATOR

A standby generator, if needed, is to be connected at the supply input point after the energy meter and after the main incoming switch or the main incoming circuit breaker, but through a changeover switch of appropriate rating. The rating of such a switch shall be at least 1.25 times the rating of the main incoming circuit breaker. The changeover switch shall be of such a type so that when moved to the mains position, there is no chance that the generator will be connected and vice versa.

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TABLE 2.2.1 :- GENERATOR ROOM AREA**Area Required for Generator Room for Different capacities**

Capacity (KW)	Area (m ²)
1 x 25	20
1 x 48	24
1 x 100	30
1 x 150	36
1 x 300	48
1 x 500	56

Note :

1)Generator shall not be installed in basement floor of any building .

TABLE 2.2.2 :- GENERATOR PHYSICAL DIMENSION**Dimension Required for Generator of Different capacities**

Capacity (KW)	Approximate Dimension Length (mm)* Width (mm)* Height (mm)
1 x 10	1750*775*1230
1 x 20	2100*938*1285
1 x 30	2100*938*1285
1 x 40	2100*938*1285
1 x 60	2572*1126*1571
1 x 80	2572*1126*1571
1 x 100	2572*1126*1571
1 x 150	3508*1200*1830
1 x 200	3508*1200*1830
1 x 250	4004*1380*2145
1 x 300	4475*1410*2430
1 x 400	5031*1560*2435
1 x 500	5031*1560*2435

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