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DEALERS & IMPORTERS OF POWER PLANTS & ALLIED MACHINERY

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140 MW (13 x 12.1 MW) Diesel fired Power Plant :

3.1. DIESEL ENGINE GENERATOR SETS

Diesel Engine;

Weight : ~152 tone,

Size : 3.55m x 9.45m x 5.15m

Generator;

Weight : ~ 57 tones

The above illustration shows Wärtsilä V38 engine and generator arrangement with the engine flexibly mounted on the fixing rails or common base frame.

NOTE: Please see appendices 11.7 for operation hours of engines

3.1.1. ENGINE

13 Engines Wärtsilä 18V38

The engine is four strokes; direct injected, turbocharged and intercooler design.

Configuration Vee form

Number of cylinders 18

Cylinder bore 380 mm

Diesel Engine Generator

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Stroke 475 mm

Speed 600 rpm

Mean piston speed: 9.5 m/s

Compression ratio : 13:1

Brake mean effective pressure: 25, 1 bar

Swept volume per cylinder: 53.9dm³

Number of valves: 2 inlet valves, 2 outlet valves

Direction of rotation faced towards flywheel: Clockwise

Engine shaft output: "12150"kWm

Engine shaft output corresponds to 100 % load of the engine at ISO 3046/I-1995(E) conditions.

The engine is designed for continuous heavy fuel duty and can be started and stopped on heavy fuel oil (HFO) provided that the fuel is heated to operating temperature. The system is designed for a fuel viscosity of 730 cSt/50 oC.

The Heavy Fuel Oil System (Fuel Oil No: 6) is the main fuel system. The engines can be started and stopped at heavy fuel, provided that operation temperature is maintained.

However, it is necessary to use Light Fuel Oil for cold starts.

Fuel Oil System

The Wärtsilä V38B engine is designed for continuous and correct operation on heavy fuel oil (HFO) as well as light fuel oil (LFO). A preheated engine can be started directly on HFO provided that the external fuel system has the correct temperature and pressure. The engine can also be stopped on HFO although the external system has to stay in operation i.e. fuel must be circulated through the stopped engine continuously for heating purposes.

The internal fuel system mainly comprises but not limited to the following equipment:

- Low pressure pipes made of steel
- High pressure pipes, double wall with common leak alarm
- Injection pumps, individual for each cylinder
- Fuel injector in each cylinder
- Fuel oil pressure regulating valve

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For one Engine Generator Set:

Required F.oil # 6 for 1 kwhr : 205,1 gr

output is subject to new location)

$205,1 \times 11.075 \times 24\text{hr} / (1000 \times 1000) = \mathbf{54.5 \text{ ton /day}}$

Note: These figures are given for information purpose only and can not be used as guaranteed values.

Technical Data for Operation Medias

The engines are designed and developed for continues operation on operation media as described in appendices 11.11. Please, notice that those are extreme limits for Wärtsilä engines.

3.1.2. GENERATOR

13 Self-cooled 3-phase brushless, salient pole type, synchronous generator(s)

Nominal output 13843 kVA

Power factor 0.8

Voltage 15000 V, adjustment range $\pm 5\%$

Frequency 50Hz

Speed 600rpm

Runaway speed 720rpm

Efficiency at rated output

Voltage and p.f. 0.8: $>97\%$

Continuous short circuit

Current about $3 \times I_n$

Insulation

Class / temperature rise F/F

Enclosure IP21

Standard IEC34

F.oil# 6 amount for one day per engine at Power Plant:

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3.2. FUEL OIL SYSTEM

3.2.1. LFO (DIESEL) SYSTEM

Unloading pump unit(s) 23 m³/hour

LFO Storage tank of 1.000 m³

Set of piping material for light fuel oil system

Flow meter for LFO system etc.

3.2.2. HEAVY FUEL OIL (HFO) SYSTEM

Unloading pump unit(s) 51.9 m³ /hour

HFO Storage tank(s) of 7.500 m³

HFO Transfer pump unit(s)

HFO Buffer tank of 200 m³

Separator units 3 pcs

HFO Daily fuel tank(s) of 200 m³

HFO Booster unit(s) AMB 2 pcs

HFO Sludge Tank

3.3. PLANT LUBRICATING OIL SYSTEM

Storage tank(s) for fresh oil of 40 m³

Transfer pump unit(s) (stationary, for clean oil)

Storage tank for intermediate storage of oil during maintenance, 16 m³

Storage tank for used oil of 20 m³

3.4. COMPRESSED AIR SYSTEM

Starting air system 140 m³/h

Control and instrumentation air system 125 m³/h

3.5. COOLING SYSTEM

3.5.1. ENGINE COOLING SYSTEM

Open type expansion vessel(s) for HT cooling water circuit

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Open type expansion vessel(s) for LT cooling water circuit

Radiator cooler package(s)

3.5.2. PLANT COOLING SYSTEM

Maintenance water tank with an electrical motor driven discharge pump

Storage tank for Glycol 40 m³

3.6. FIRE FIGHTING SYSTEM

2 fire pumps and hydrants with fire cabinets (one electric and one diesel engine driven)

3.7. FIRE FIGHTING & RAW WATER STORAGE TANK

Combined Capacity: 1.000m³

3.8. EMERGENCY / BLACK START DIESEL GENERATOR

Capacity of one 500 kVA

3.9. MEDIUM VOLTAGE SWITCHGEAR

3.9.1. MEDIUM VOLTAGE PANELS

Busbar measuring cubicle
Station auxiliary transformer
Station low voltage switchgears
110 V Power Plant Control 150 Ahr
24 V DC System 75 Ahr

3.10. SWITCHYARD

It is excluded from the scope of supply except 3 nos step up transformers.

3.11. BOILERS

3.11.1 HEAT RECOVERY STEAM GENERATORS

4 nos of HRSG's will be provided. It is strictly recommended to make proper modifications and overhaul for better efficiency to the existing HRSG's.

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3.11.2. PLANT AUXILIARY BOILER

For start-up period an Auxiliary Boiler (Oil Fired) will be supplied. Main characteristics of the boiler as follows;

- Steam flow: Max 5t/h, Min:3 t/h,
- 173C Saturated steam

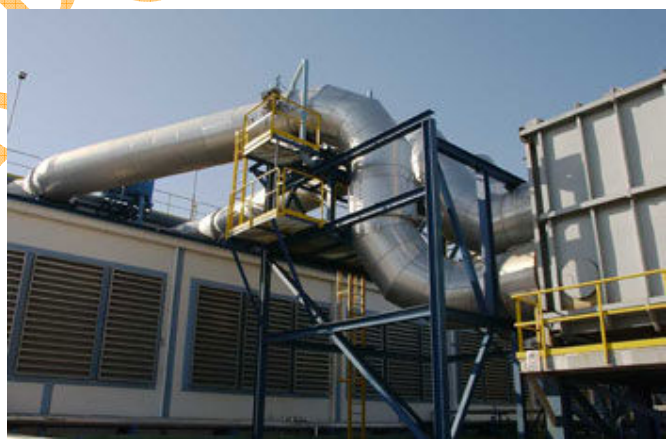
11.7 Engine Operating Hours

Engine operating hours are as follows as of 20 June, 2007;

- DG#1-11.441hr
- DG#2-10.986hr
- DG#3-11.262hr
- DG#4-10.825hr
- DG#5-10.864hr
- DG#6-10.875hr
- DG#7-16.447hr
- DG#8-13.996hr
- DG#9-14.284hr

- x. DG#10-9.976hr
- xi. DG#11-13.796hr
- xii. DG#12-11.796hr
- xiii. DG#13-10.075hr

PRODUCT IMAGES :





ML



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