

## FRAGANLYS

### TRENT 60 DUAL FUEL WLE GENSET SCOPE OF SUPPLY

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The base scope of supply for each Trent 60 Dual Fuel WLE Power Generation Package comprise the following:

#### Gas Turbine

- Rolls-Royce Industrial Trent 60 Dual Fuel WLE Gas Turbine with water injection system for emission control.
- Engine mounted lube oil pump and hydraulic starter.
- Complete Gas Turbine ignition system
- Engine mounted fuel injection manifolds
- Engine mounted water injection manifold

#### AC Generator

Two pole, open air cooled AC generator, 11.5kV, 3 phase, 50Hz, 0.85 power factor in accordance with IEC 34-3, equipped with class "F" insulation and designed for class "B" temperature rises, fitted with brushless exciter.

AC generator cooling air system comprising air filter media, ducting and silencer and generator shaft mounted cooling fan.

Structural steel baseplate complete with provision for lifting attachments.

Overall acoustic enclosure with access doors.

Internal lighting (main and emergency)

AC Generator lube oil system.

#### Gas Turbine Driver Package comprising

- Structural steel baseplate complete with provision for lifting attachments
- Overall acoustic enclosure with access doors
- Engine mounting system
- Inlet, exhaust, fuel, lube and start systems
- Radial intake with gas turbine water wash rings
- Internal lighting (main and emergency)
- Fire protection system CO<sub>2</sub>
- Gas detection system
- Dry diaphragm flexible coupling
- Gas turbine removal mechanical handling skid

#### Combustion Air System

- Self cleaning (pulse) air filter with first stage coalescer
- Pulse control system
- Air inlet silencer and ducting
- Supports, access door, ladder, internal lighting

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### Gas Turbine Exhaust System

- Turbine exhaust diffuser
- Exhaust Silencer
- Exhaust stack with integral CEMS system connection ports

### Turbine Enclosure Vent System

- Vent inlet filter system (integral with combustion inlet)
- Air inlet ducting, silencer and shut off dampers
- Vent exhaust system with 3 x 50% electric motor driven fans
- Vent exhaust ducting with shut-off dampers, silencer and weather hood

### Gas Turbine Bleed Air System

- Bleed air exhaust ducting and silencer

### Gas Turbine water wash system

- One mobile compressor cleaning system for unfired washing of the gas turbine compressor.

### Liquid Fuel Forwarding Skid

- High pressure liquid fuel forwarding skid.

### Water Injection Skid

- High pressure water forwarding skid.

### Control System

- Operator Interface (HMI) for location in remote control room. Based on "Intellution technology"

#### Gas Turbine Control System mounted on GT Package Skid

- Incorporating:
  - Package Control System (PCS)
  - Engine Control System (ECS)
  - Fire and Gas Protection System
  - Vibration Monitoring
  - Temperature Monitoring

#### AC Generator Control and Protection Panel (GCPP) Free standing.

- Incorporating:
  - Automatic Voltage Regulator
  - AC Generator metering and Protection
  - Automatic and manual synchronising

### Operation and Maintenance manuals

### Operator Training

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## TERMINATION POINTS (Interfaces between Centrax and Customer Scope)

| Interface                             | Terminal point  |
|---------------------------------------|---|
| Combustion Air                        | Inlet to intake filter house  |
| Compressed/Instrument air             | 1. Compressed air connection at air intake filter.<br>2. Connection at GT skid edge   |
| Exhaust Gas                           | Exhaust Stack Exit  |
| Ventilation                           | GT Enclosure and Generator Vent inlet and exhaust   |
| Foundations                           | Skid base and support steelwork   |
| Fuel Gas                              | Inlet flange on GT skid base and vent flange on GT enclosure roof   |
| Liquid Fuel                           | Inlet and Outlet flanges on Liquid fuel forwarding skid and GT skid edge  |
| Water Injection                       | Inlet and outlet connections on water injection skid and GT skid edge.  |
| Lubricants                            | Filling points at oil reservoirs (GT and Generator skids)<br>Grease nipples on equipment bearing housings (where applicable)  |
| Drains                                | Drain systems connections on applicable modules   |
| Grounding                             | Grounding (Earthing) terminals on modules and skids   |
| Control and Instrumentation           | Control Room HMI<br>GCPP Terminal strips in GCPP control panel and associated on skid terminal boxes  |
| MV Electric Power                     | Lineside Terminals of AC Generator<br>Neutral Terminals of AC Generator   |
| Coolant                               | Inlet and Outlet Connections on GT and AC Generator Module Skids  |
| Compressor Cleaning                   | Filling Point of Portable Wash Tank   |
| LV (400v 3 phase AC) Electric Power   | Motor terminals within the GT and AC Generator Packages.<br>Motors include: AC Gen. lube oil pumps, GT lube oil pumps, control oil pumps, start motor, water injection pumps, liquid fuel pumps, enclosure vent fans, oil tank breather fans. |
| LV (220v Single phase) Electric Power | LV Power terminals on GT package, AC Generator Package, CO <sub>2</sub> extinguishant skids, water injection skid, Intake filter housing.   |
| DC Power (Battery/UPS System)         | GT Skid DC Termination points, GCPP Terminal strip,   |