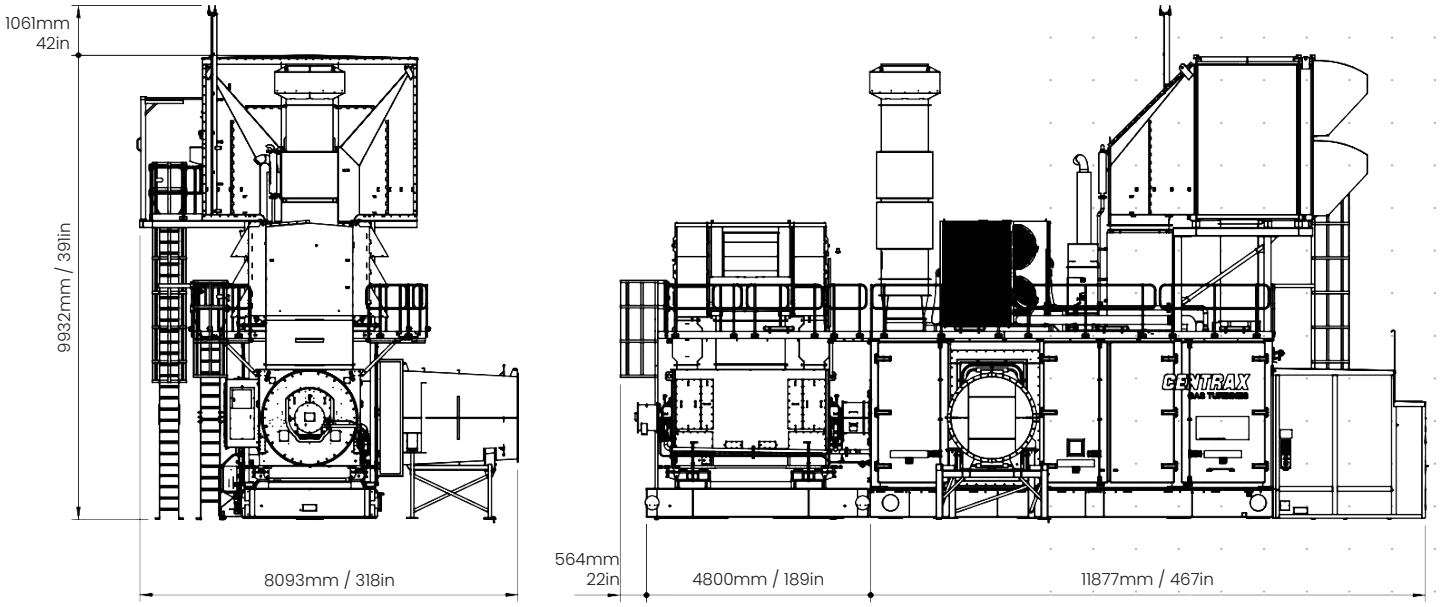
CX400 14.4MW

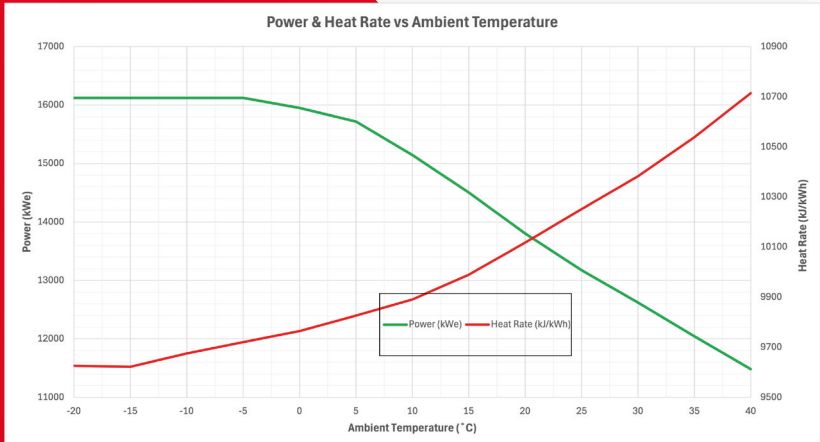
Gas Turbine Generator Set

CENTRAX
GAS TURBINES



Approx total weight = 117000 KG / 257941 lbs

Power Output	14501 kWe
Heat Rate	9989 kJ/kWh 9468 BTU/kWh
Exhaust Flow	44.5 kg/s 98.1 lb/s
Exhaust Temperature	529°c 984.2°F
Exhaust Thermal Energy	40236 kWth
Electrical efficiency at generator terminals	36%



ISO rating is based on the following characteristics:

Ambient Temperature **15°C (59°F),** Altitude (Sea level) **0m (0ft),** Ambient Pressure **1013 mbar (29.91 inHg),** Relative Humidity **60%,** Natural Gas fuel (LHV) **47889 kJ/kg (20589 BTU/lb)**

* Inlet losses, exhaust losses & package auxiliary losses are excluded

Capable of a high number of starts per year, easily accepts instantaneous increases/decreases in power output, fast start capabilities, cold and hot start.

Centrax Gas Turbines Ltd
Shaldon Road, Newton Abbot, Devon, TQ12 4SQ, England

+44 (0)1626 358000
uksupport@centraxgt.com

centraxgt.com

LRQA CERTIFIED
ISO 9001 · ISO 14001
ISO 45001

General specifications - Siemens SGT-400 14.4MWe

Gas Turbine

- Industrial twin shaft design
- 11 Stage axial compressor with variable guide vanes on stages 1 to 5
- Pressure ratio 16.7:1, blow-off valves to prevent compressor surge
- Combustion module
  - 6 reverse flow combustion chambers (cans)
  - Standard ignition system, high-energy ignition unit and 6 ignitors
  - Gas and Liquid fuel Dry Low Emissions (DLE) *
- 2 stage compressor turbine, 2 stage power turbine
- Power take-off through exhaust end (hot end drive)
- Tilting pad journal & thrust bearings

Gearbox

- Epicyclic speed reduction gearbox
- Reduce power turbine speed down to 1500rpm (50Hz) or 1800rpm (60Hz)

Generator

- 4 poles, 3 phase synchronous
- Wide range of voltages available for both 50Hz and 60Hz machines
- Open ventilation (IEC 60034-6:1991 classification IC0A1)
- CACA (Closed Air, Cooling Air) *
- CACW (Closed Air, Cooling Water)*
- Inlet and outlet air temperature monitoring
- Bearing temperature and vibration monitoring
- Stator winding temperature monitoring

Baseplate

- Two baseplates for driver (turbine & gearbox) and driven (generator) equipment
- Carbon steel structural sections and plate to BS EN 10025 S275
- Designed to support the machinery drive train, acoustic enclosure, and all auxiliary systems
- Designed to give low vibration level and turning moment, reduced foundation loads and cost
- Transmits all package loads to the foundation via anchor bolts
- 5500ltr integral oil tank is incorporated within the turbine baseplate
- Each baseplate designed for single point lift

Acoustic enclosure

- Indoor/Outdoor acoustic enclosure covering turbine and gearbox
- Integral engine and auxiliary maintenance beams
- Interior lighting
- Gas detection system, fire protection and CO2 suppression system in accordance with EN54 and EN12094

Integrated lube oil system

- Gearbox driven main lube oil pump
- AC driven auxiliary pump
- DC driven emergency pump
- Integrated DC battery system to provide emergency oil supply on loss of AC power
- Oil module regulates pressure and temperature
- Duplex oil filter
- External oil to air heat exchanger with safe area axial fans
- Water to oil cooler heat exchanger*
- Lube oil tank heaters
- Oil tank ventilation system with oil mist coalescer to reduce emissions
- Stainless steel piping
- First fill of oil included

Fuel system

- Natural gas
- Liquid fuel *
- Dual fuel (Natural gas / liquid) *
- Low BTU gas *
- Natural gas / Hydrogen mix *

Start system

- Electro-hydraulic start system, 110kW 3 phase AC motor

Turbine wash system

- Motoring (cold) wash, mobile wash tank

Turbine intake system

- Heated Vane Separator (HVS) anti-icing system
- 2 stage filtration system, 1st Stage M5. (ISO 16890 ePM10 60%), 2nd Stage E11 (ISO 29461-1 T12)
- 3 stage filtration system *
- Inlet chiller coils *
- Intake attenuation
- Support steelwork to EN1090-1&2 *

Acoustic enclosure ventilation system

- Heated vane separator (HVS) anti-icing system, single stage filtration system M5 (ISO 16890 ePM10 60%)
- Air outlet extractor fan
- Air inlet and outlet shut-off damper for CO2 retention
- Intake and outlet attenuation
- Support steelwork to EN1090-1&2 *

Turbine exhaust system

- Radial exhaust exit (Left/Right/Vertical)
- Thermal expansion compensator
- Thermal / Acoustic shroud
- Primary exhaust attenuator *

Package control

- On-skid control suite
- Control panel shelter *

Turbine control

- Rockwell Allen Bradley "Guardlogix" PLC, Rockwell Point I/O, Safety Point I/O and Flex I/O modules
- Dual Redundant ethernet ring (DLR) communication
- Hardwired interlocks to balance of plant (HRSG, gas compressor etc)
- Safety systems: Rockwell Allen Bradley "GuardLogix" Safety Integrity Level (SIL) PLC, hardwired emergency stop safety chain to SIL 2. Independent SIL overspeed protection module
- 19" touch screen human machine interface, system graphics, alarm display and historical logging
- Data communication link available for remote control & monitoring
- Vibration monitoring using Rockwell Dynamix 1444 series

Generator control and protection

- Electronic Automatic Voltage Regulator (AVR) with protection functions,
  - ANSI 58 - Rotating diode failure,
  - ANSI 60 - Voltage imbalance
- Digital integrated protection relay comprising: ANSI 21 - Under impedance,
  - ANSI 24 - Over excitation
  - ANSI 27 - Three-phase undervoltage,
  - ANSI 32R - Reverse power,
  - ANSI 40 - Loss of excitation,
  - ANSI 46 - Negative phase sequence,
  - ANSI 50/51 - Overcurrent,
  - ANSI 50BF - Breaker failure, *
  - ANSI 51N - Stator earth (ground) fault,
  - ANSI 59 - Three-phase overvoltage,
  - ANSI 59N - Neutral voltage displacement
  - ANSI 67N - Directional earth (ground) fault, *
  - ANSI 78 - Pole Slip
  - ANSI 81O - Over frequency,
  - ANSI 81U - Underfrequency,
  - ANSI 87G/T - Differential fault
- Additional generator protection by PLC, ANSI 38 - Generator bearing thermal protection, ANSI 49S - Stator thermal protection

Synchronising equipment

- ANSI 15 - automatic synchroniser
- ANSI 25 - check synchroniser
- Automatic or manual forward and back synchronising, MV circuit breaker control

Motor control centre

- Skid mounted 400V, 50Hz or 480/575V, 60Hz, 3ph MCC, allowing a single point of connection for the customer

Documentation

- Drawings
- Quality manual
- Test reports

Testing

- Factory testing of turbine
- Full fired package test

* Optional equipment

Centrax Gas Turbines Ltd
Shaldon Road, Newton Abbot, Devon, TQ12 4SQ, England

+44 (0)1626 358000
uksupport@centraxgt.com

centraxgt.com