

# **XQ5200 Data Sheet**

## **Standard Combustion, Dual Fuel**

### **50 Hz.**

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**Table 1. XQ5200 Designation**

<b>Manufacturer</b>	Solar Turbines Inc.
<b>Turbine Model</b>	Taurus 60, T7300S
<b>Package Model Designation</b>	XQ5200
<b>Combustion System</b>	Standard
<b>Fuel</b>	Natural Gas & Diesel #2

**Table 2. Dual Fuel Performance Data ISO\*, XQ5200 Mobile Power Unit**

	<i>Natural Gas</i>		<i>Diesel #2</i>	
	<i>English</i>	<i>Metric</i>	<i>English</i>	<i>Metric</i>
<b>Power Output</b>	5,200 kWe	5,200 kWe	5,089 kWe	5,089 kWe
<b>Heat Rate(LHV)</b>	11,263 Btu/kWe-hr	11,900 kJ/kWe-hr	11,376 Btu/kWe-hr	12,002 kJ/kWe-hr
<b>Fuel Flow (LHV)</b>	58.6 mmBTU/hr	61.8 mmkJ/hr	57.9 mmBTU/hr	61.0 mmkJ/hr
<b>Emissions NOX</b>	143 PPMvd	143 PPMvd	232 PPMvd	232 PPMvd
	33.3 LBM/HR	15.0 kg/hr	54.16 LBM/HR	24.6 kg/hr
<b>CO</b>	50 PPMvd	50 PPMvd	50 PPMvd	50 PPMvd
	7.1 LBM/HR	3.22 kg/hr	7.1 LBM/HR	3.22 kg/hr
<b>Gen. Voltage @ 50 hz.</b>	11 KV	11 KV	11 KV	11 KV
<b>Voltage Steady State</b>	0.5%	0.5%	0.5%	0.5%
<b>Short Circuit</b>	300% for 10 sec.	300% for 10 sec.	300% for 10 sec.	300% for 10 sec.

\* ISO = Sea Level, 60% Relative Humidity, No inlet or exhaust losses.

**Table 3. Natural Gas Site Performance data, METRIC**

**TAURUS 60-T7300S**

Heat Rate Data Given is Lower Heating Value

**GSC STANDARD**

**Std. Natural Gas Fuel**

Rel Humid, %	60					
SITE ELEVATION:	0	metre				
BAROMETRIC PRESSURE:	760.0	mmHg				
INLET DUCT LOSS:	76.2	mmH2O				
EXHAUST DUCT LOSS:	76.2	mmH2O				

**Nominal Data Single Unit**

AMBIENT AIR TEMPERATURE (T1):	-7	4	15	27	38	48	°C
PART POWER ( kWe), % LOAD, or 0 for MAX:	83%	89%	96%	100%	100%	100%	kWe
Nominal OUTPUT POWER: (@terminals)	4,900	4,900	4,900	4,650	4,205	3,819	kWe
FUEL FLOW (LHV):	58,413	58,996	59,353	57,593	54,187	51,430	MJ/hr
Nominal HEAT RATE: (@terminals)	11,921	12,040	12,113	12,386	12,887	13,466	kJ/kWe-hr
EXHAUST GAS TEMPERATURE (T7):	475	472	475	495	504	516	°C
EXHAUST GAS FLOW:	74,915	77,329	78,657	74,822	70,634	66,771	kg/hr
Nominal THERMAL EFFICIENCY: (@terminals)	30.21	29.91	29.73	29.07	27.94	26.74	%
Nominal HEAT RATE: (@terminals)	11,921	12,040	12,113	12,386	12,887	13,466	kJ/kWe-hr
PCD PRESSURE:	1,042	1,074	1,102	1,059	1,001	945	kPaG
EXHAUST HEAT (from T7 to T9):	27,694.17	28,380.96	29,127.91	29,353.99	28,385.37	27,698.07	MJ/hr

**Table 4. Natural Gas Site Performance data, ENGLISH**

**TAURUS 60-T7300S**

Heat Rate Data Given is Lower Heating Value

**GSC STANDARD**

**Std. Natural Gas Fuel**

Rel Humid, %	60					
SITE ELEVATION:	0	feet				
BAROMETRIC PRESSURE:	29.9	"Hg				
INLET DUCT LOSS:	3	"H2O				
EXHAUST DUCT LOSS:	3	"H2O				

**Nominal Data Single Unit**

AMBIENT AIR TEMPERATURE (T1):	19	39	59	81	100	118	°F
PART POWER ( kWe), % LOAD, or 0 for MAX:	83%	89%	96%	100%	100%	100%	kWe
Nominal OUTPUT POWER: (@terminals)	4,900	4,900	4,900	4,650	4,205	3,819	kWe
FUEL FLOW (LHV):	55	56	56	55	51	49	mmBTU/hr
Nominal HEAT RATE: (@terminals)	11,299	11,411	11,481	11,740	12,214	12,763	BTU/kWe-hr
EXHAUST GAS TEMPERATURE (T7):	886	882	887	924	940	961	°F
EXHAUST GAS FLOW:	165,158	170,482	173,409	164,954	155,721	147,204	lb/hr
Nominal THERMAL EFFICIENCY: (@terminals)	30.21	29.91	29.73	29.07	27.94	26.74	%
Nominal HEAT RATE: (@terminals)	11,299	11,411	11,481	11,740	12,214	12,763	BTU/kWe-hr
PCD PRESSURE:	151	156	160	154	145	137	PsiG
EXHAUST HEAT (from T7 to T9):	26.25	26.90	27.61	27.82	26.90	26.25	mmBTU/hr

*Please request site and application specific data for formal proposals.*

**Table 5. Diesel #2 Site Performance data, METRIC**

**TAURUS 60-T7300**

**GSC STANDARD**

**Diesel 2-D Fuel**

<b>RELATIVE HUMIDITY</b>	60	%
<b>SITE ELEVATION:</b>	0	metre
<b>BAROMETRIC PRESSURE:</b>	760.0	mmHg
<b>INLET DUCT LOSS:</b>	76.20	mmH2O
<b>EXHAUST DUCT LOSS:</b>	76.20	mmH2O

**Distillate Fuel Formulas, (Diesel #2)**

<b>Heat Value KJ/kg</b>	41,925.00
<b>kg/litre</b>	0.8543
<b>Fuel Temp.</b>	29 C

AMBIENT AIR TEMPERATURE (T1):	-7.0	4.0	15.0	27.0	38.0	48.0	°C
PART POWER ( kWe), % LOAD, or 0 for MAX:	85%	91%	98%	100%	100%	100%	kWe
Nominal OUTPUT POWER: (@terminals)	4,900	4,900	4,900	4,553	4,109	3,729	kWe
Nominal HEAT RATE: (@terminals)	12,023	12,091	12,187	12,519	13,041	13,648	kJ/kWe-hr
EXHAUST GAS TEMPERATURE (T7):	426	452	482	497	505	518	°C
EXHAUST GAS FLOW:	84,074	81,916	78,982	74,942	70,761	66,900	kg/hr
Nominal THERMAL EFFICIENCY: (@terminals)	29.95	29.78	29.55	28.76	27.61	26.38	%
PCD PRESSURE:	1,151	1,131	1,106	1,056	998	944	kPaG
EXHAUST HEAT (from T7 to T9):	24,126	25,797	27,454	27,254	26,389	25,857	MJ/hr
Liters per Hour	1,645	1,654	1,667	1,592	1,496	1,421	Nominal

**Table 6. Diesel #2 Site Performance data, ENGLISH**

**TAURUS 60-T7300**

**GSC STANDARD**

**Diesel 2-D Fuel**

<b>RELATIVE HUMIDITY</b>	60	%
<b>SITE ELEVATION:</b>	0	feet
<b>BAROMETRIC PRESSURE:</b>	29.9	"Hg
<b>INLET DUCT LOSS:</b>	3.00	"H2O
<b>EXHAUST DUCT LOSS:</b>	3.00	"H2O

**Distillate Fuel Formulas, (Diesel #2)**

<b>Heat Value, BTU/LB in LHV</b>	18,390
<b>Lbs./Gal.</b>	7.001
<b>Fuel Temp.</b>	85 deg. F

**Nominal Data**

AMBIENT AIR TEMPERATURE (T1):	19	39	59	81	100	118	°F
PART POWER ( kWe), % LOAD, or 0 for MAX:	85%	91%	98%	100%	100%	100%	kWe
Nominal OUTPUT POWER: (@terminals)	4,900	4,900	4,900	4,553	4,109	3,729	kWe
Nominal HEAT RATE: (@terminals)	11,395	11,460	11,551	11,866	12,360	12,936	BTU/kWe-hr
EXHAUST GAS TEMPERATURE (T7):	800	846	900	926	942	964	°F
EXHAUST GAS FLOW:	185,352	180,594	174,125	165,220	156,001	147,489	lb/hr
Nominal THERMAL EFFICIENCY: (@terminals)	29.95	29.78	29.55	28.76	27.61	26.38	%
PCD PRESSURE:	167	164	160	153	145	137	PsiG
EXHAUST HEAT (from T7 to T9):	23	24	26	26	25	25	mmBTU/hr
Gallons per Hour	433.7	436	440	420	395	375	Nominal
Gallons per kW-HR	0.089	0.089	0.090	0.092	0.096	0.100	Nominal
Gallons per MW-HR	88.5	89.0	89.7	92.2	96.0	100.5	Nominal

*Please request site and application specific data for formal proposals.*

**Table 7. Dimensional Data & Weights, Installed XQ5200 Mobile Power Unit**

	<i>English</i>	<i>Metric</i>
<i>Length</i>	48 ft.	14.6 meters
<i>Width</i>	21 ft.	6.4 meters
<i>Height</i>	26.6 ft.	8.1 meters
<i>Installed Weights</i>		
<i>Turbine Section</i>	118,000 lbs	54 M tons
<i>PCR Trailer</i>	55,000 lbs.	25 M tons

**Table 7A. Dimensional Data and Weights, Ocean Shipping.**

<i>Item #.</i>	<i>Lbs.</i> <i>(Metric tons)</i>	<i>Dimensions L X W X H</i> <i>English (Meters)</i>	<i>Description</i>
1	118,000 (53.6)	48'3" X 9' X 14'2" (14.7 x 2.75 x 4.32)	Turbine Enclosure w/ Integral Trailer. Air ride, 3 Axle, Mfg. by Solar Turbines Inc..
1A	6,900 (3.2)	14'1" X 8'6" X 3'6" (4.3 x 2.6 x 1.1)	Two Axle Air Ride Booster. Connects to Item 1 for highway transport but is removed for ocean transit and when assembled for operation.
2	55,000 (25)	46' X 8' 6" X 13'9.5" (14 X 2.6 X 4.2)	Power Control Room w/ Integral Trailer. Air ride, 2 Axle. Manufactured by Solar Turbines Inc.
3	35,000 (15.9)	40' X 8' X 8' 6" (12.2 x 2.5 x 2.6)	40 ft. shipping container packed with turbine auxiliary components.
3A	8,500 (3.9)	41' x 8' x 4' (12.5 x 2.5 x 1.2)	Chassis for Item 3. Optional 40 ft. fixed chassis for container.
4	35,000 (15.9)	40' X 8' X 8' 6" (12.2 x 2.5 x 2.6)	40 ft. shipping container packed with special tooling and spare parts
4A	8,500 (3.9)	41' x 8' x 4' (12.5 x 2.5 x 1.2)	Chassis for Item 4. Optional 40 ft. fixed chassis for container.

**Table 7B. Dimensional Data and Weights, Highway Shipping.**

<i>Item #.</i>	<i>Lbs.</i> <i>(Metric tons)</i>	<i>Dimensions L X W X H</i> <i>English (Meters)</i>	<i>Description</i>
1 & 1A	124,900 (56.7)	62'1" x 9' X 14'2" (19 x 2.75 x 4.32)	Turbine Enclosure w/ Integral Trailer & Booster. Item 1 & 1A configured for highway transport by Truck. 5 axles.
2	55,000 (25)	46' X 8' 6" X 13'9.5" (14 X 2.6 X 4.2)	Power Control Room w/ Integral Trailer. Air ride, 2 Axle. Manufactured by Solar Turbines Inc.
3 & 3A	43,500 (15.9)	41' X 8' X 12' 6" (12.5 x 2.5 x 3.8)	40 ft. container w/ Chassis packed with turbine auxiliary components.
4 & 4A	43,500 (15.9)	41' X 8' X 12' 6" (12.5 x 2.5 x 3.8)	40 ft. container w/ Chassis packed with special tooling & spares.

*Please request site and application specific data for formal proposals.*

**Table 8. Installation Requirements**

XQ5200 Mobile Power Unit

	<i>English</i>	<i>Metric</i>
<u><b>Natural Gas</b></u>		
<i>Gas Pres.</i>	250 PSIG	1,723 KPAG
<i>Max. Gas Demand</i>	1,400 SCFM	39.6 M <sup>3</sup> /MIN.
<u><b>Diesel #2</b></u>		
<i>Fuel Pres.</i>	25 – 50 PSIG	172 – 345 KPAG
<i>Fuel Flow</i>	8 GPM	30.3 L/Min
<u><b>Foundation</b></u>		
<i>Gravel Compacted to</i>	2,500 lbs./ft.2	120 kPA
<u><b>Fuel Quality</b></u>		
Clean dry fuel Per Solar Spec. ES 9-98.		

**Table 9. Infrastructure Requirements, XQ5200 Mobile Power Unit**

<u><b>Connections</b></u>
11 kV Load Connection, 50 hz.
Black Start, if needed (400V 50 hz., 200kW)
Telephone Line, ether net, broadband connection for Remote Communication & Control
<u><b>Set Up &amp; Commissioning</b></u>
Three – Five days
Small crane to lift components on roof, & fork Lift.

**Table 10. Solar Turbotronic Controller, XQ5200 Mobile Power Unit**

<u><b>Allen Bradley, PLC-5</b></u>
Provides sequencing to the package’s operating systems during starting, running & shutdown, and provides package monitoring and protection during all phases of operation. Key features include...
*Local operator interface and monitoring.
*Interface and monitoring in power control trailer
*Remote interface and monitoring.
*Operational summary displays of alarms, shutdowns, temperatures, pressures, vibration, engine performance, generator kW, voltage, p.f., hz., amps, current.
*Relay backup in event of PLC failure
*Flexibility to change logic or add features

*Please request site and application specific data for formal proposals.*

**Table 11. Switchgear, XQ5200 Mobile Power Unit**

***Operating Features, (One Line Available upon request)***

Parallel operation with the utility.  
 Island operation single or multiple units.  
 Protective Relays, (See Table 8)  
 Vacuum Circuit Breakers, 1,200A, 500MVA @ 15 KV  
     Breaker #1 customer load connection  
     Breaker #2 feeds Aux. Transformer & MCC to power turbine Accessories.  
 C.T.'s, Draw Out P.T.'s.  
 Lightning Arrestors, & Surge Capacitor

**Table 12. Grounding, XQ5200 Mobile Power Unit**

Option 1	Low Resistance grounding
Option 2	Ungrounded generator

**Table 13. Protective Relays, XQ5200 Mobile Power Unit**

<b><i>Beckwith M-3425</i></b>	<b><i>Designation</i></b>
Impedance	21
Undervoltage	27
RPR	32
Loss of Field Protection	40
Negative Phase Sequence	46
PT Blown Fuse	60FL
Phase overcurrent	51V
Inadvertent energization	50/27
Ground Overcurrent	50N, 51N
Overvoltage	59
Bus Ground Fault Detection	59N
Over/Under Frequency	81
Phase Differential	87
overcurrent	
Ground differential	87GD
Settings Programmable for resistance grounding or ungrounded operation.	
Basler BE-1, Overcurrent	50/51B

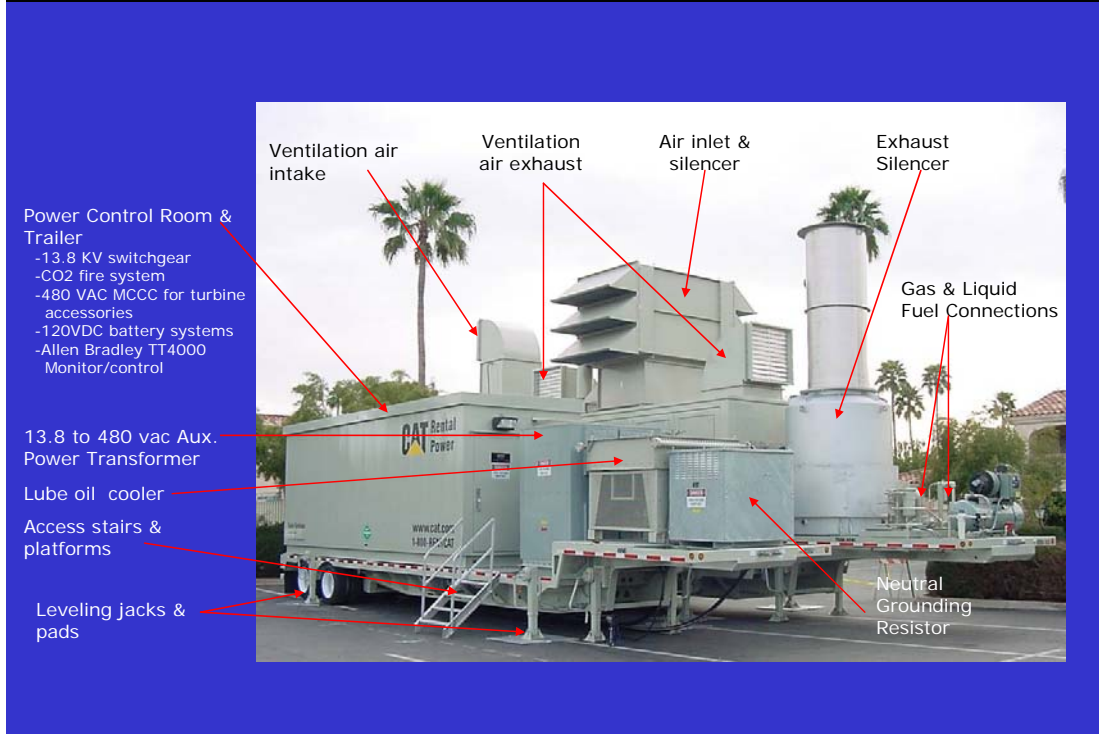
*Please request site and application specific data for formal proposals.*

**Table 14. XQ5200 Rental Power Benefits**

<i>Flexible Rental Solution</i>	<i>Easy to Install &amp; Relocate</i>
Short & Long Term Rental Options Rental/Purchase Options 50 or 60 hz. Units available	Highway transportable 3 to 5 day setup No concrete foundation required
<i>Environmentally Friendly</i>	<i>Complete Systems Solution</i>
Low Emissions, 25 ppmv Nox Quiet Operation, 87 dba @ 3 ft. (1M) No Visible Emissions Low Profile Design Easy to Permit	Set-up & Commissioning Maintenance Included Operators available Site Preparation (if needed) Transformers (if needed)
<i>Worldwide Support</i>	<i>Operational Features</i>
Caterpillar's Worldwide Rental Network Solar Turbines Worldwide Service Network	On line in six minutes Range of Control System Options KVAR Control & KW Control

**Table 15. XQ5200 Photo Overview**

**5.2 MW Solar Mobile Power Unit (XQ5200)**



*Please request site and application specific data for formal proposals.*