



XQ5200 Data Sheet

SoLoNox, Dual Fuel

60 Hz.

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Table 1. XQ5200 Designation

Manufacturer	Solar Turbines Inc.
Turbine Model	Taurus 60, T7300S
Package Model Designation	XQ5200
Combustion System	So Lo Nox™
Fuel	Natural Gas & Diesel #2

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

	<i>Natural Gas</i>	<i>Natural Gas</i>	<i>Diesel #2</i>	<i>Diesel #2</i>
	<i>English</i>	<i>Metric</i>	<i>English</i>	<i>Metric</i>
Power Output	5,200 kWe	5,200 kWe	5,089 kWe	5,089 kWe
Heat Rate(LHV)	11,263 Btu/kWe-hr	11,900 kJ/kWe-hr	11,376 Btu/kWe-hr	12,002 kJ/kWe-hr
Fuel Flow (LHV)	58.6 mmBTU/hr	61.8 mmkJ/hr	57.9 mmBTU/hr	61.0 mmkJ/hr
Emissions** NOX	48 PPMvd	48 PPMvd	96 PPMvd	96 PPMvd
	11.16 LBM/HR	5.06 kg/hr	22.41 LBM/HR	10.16 kg/hr
CO	50 PPMvd	50 PPMvd	50 PPMvd	50 PPMvd
	7.1 LBM/HR	3.22 kg/hr	7.1 LBM/HR	3.22 kg/hr
Gen. Voltage @ 60 hz.	12.47 to 13.8 KV	12.47 to 13.8 KV	12.47 to 13.8 KV	12.47 to 13.8 KV
Voltage Steady State	0.5%	0.5%	0.5%	0.5%
Short Circuit	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.

** Emissions valid if Load factor is > 50% on natural gas and > 80% on diesel fuel.

Table 3. Natural Gas Site Performance data, METRIC

TAURUS 60-T7300S	<u>Heat Rate Data Given is Lower Heating Value</u>					
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				
<u>Nominal Data Single Unit</u>						
AMBIENT AIR TEMPERATURE (T1):	-7	4	15	27	38	48 °C
PART POWER (kWe), % LOAD, or 0 for MAX:	100%	100%	100%	100%	100%	100% kWe
Nominal OUTPUT POWER: (@terminals)	5,869	5,488	5,095	4,661	4,214	3,827 kWe
FUEL FLOW (LHV):	67,563	64,765	61,323	57,681	54,254	51,485 MJ/hr
Nominal HEAT RATE: (@terminals)	11,511	11,802	12,037	12,375	12,875	13,452 kJ/kWe-hr
EXHAUST GAS TEMPERATURE (T7):	484	485	488	495	504	516 °C
EXHAUST GAS FLOW:	83,982	81,689	78,819	74,939	70,718	66,866 kg/hr
Nominal THERMAL EFFICIENCY: (@terminals)	31.28	30.51	29.92	29.10	27.97	26.77 %
PCD PRESSURE:	1,202	1,159	1,110	1,061	1,002	946 kPaG
EXHAUST HEAT (from T7 to T9):	31,886	31,167	30,277	29,369	28,405	27,712 MJ/hr

Table 4. Natural Gas Site Performance data, ENGLISH

TAURUS 60-T7300S	<u>Heat Rate Data Given is Lower Heating Value</u>					
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				
<u>Nominal Data Single Unit</u>						
AMBIENT AIR TEMPERATURE (T1):	20	40	59	80	100	118 °F
PART POWER (kWe), % LOAD, or 0 for MAX:	100%	100%	100%	100%	100%	100% kWe
Nominal OUTPUT POWER: (@terminals)	5,869	5,488	5,095	4,661	4,214	3,827 kWe
FUEL FLOW (LHV):	64	61	58	55	51	49 mmBTU/hr
Nominal HEAT RATE: (@terminals)	10,911	11,186	11,409	11,729	12,203	12,750 BTU/kWe-hr
EXHAUST GAS TEMPERATURE (T7):	903	906	910	923	939	960 °F
EXHAUST GAS FLOW:	185,149	180,094	173,767	165,212	155,908	147,414 lb/hr
Nominal THERMAL EFFICIENCY: (@terminals)	31.28	30.51	29.92	29.10	27.97	26.77 %
PCD PRESSURE:	174	168	161	154	145	137 PsiG
EXHAUST HEAT (from T7 to T9):	30	30	29	28	27	26 mmBTU/hr

Please request site and application specific data for formal proposals.

Table 5. Diesel #2 Site Performance data, METRIC

Diesel 2-D Fuel							
RELATIVE HUMIDITY	76						%
SITE ELEVATION:	0						metre
BAROMETRIC PRESSURE:	760.0						mmHg
INLET DUCT LOSS:	76.20						mmH2O
EXHAUST DUCT LOSS:	76.20						mmH2O
Distillate Fuel Formulas, (Diesel #2)							
Heat Value KJ/kg	41,925.00						
kg/litre	0.8543						
Fuel Temp.	29 C						
AMBIENT AIR TEMPERATURE (T1):	-6.7	4.4	15.0	26.7	37.8	47.8	°C
PART POWER (kWe), % LOAD, or 0 for MAX:	100%	100%	100%	100%	100%	100%	kWe
Nominal OUTPUT POWER: (@terminals)	5,750	5,377	4,990	4,565	4,118	3,738	kWe
Nominal HEAT RATE: (@terminals)	11,625	11,907	12,152	12,507	13,029	13,634	kJ/kWe-hr
EXHAUST GAS TEMPERATURE (T7):	484	487	489	496	505	518	°C
EXHAUST GAS FLOW:	84,182	81,858	78,985	75,067	70,838	66,999	kg/hr
Nominal THERMAL EFFICIENCY: (@terminals)	30.98	30.24	29.63	28.79	27.64	26.41	%
PCD PRESSURE:	1,197	1,152	1,109	1,057	999	945	kPaG
EXHAUST HEAT (from T7 to T9):	29,429	28,894	28,013	27,264	26,404	25,874	MJ/hr
Liters per Hour	1,866	1,788	1,693	1,594	1,498	1,423	Nominal
Liters per kW-HR	0.325	0.332	0.339	0.349	0.364	0.381	Nominal
Liters per MW-HR	325	332	339	349	364	381	Nominal

Table 6. Diesel #2 Site Performance data, ENGLISH

Diesel 2-D Fuel							
RELATIVE HUMIDITY	60						%
SITE ELEVATION:	0						feet
BAROMETRIC PRESSURE:	29.9						"Hg
INLET DUCT LOSS:	3.00						"H2O
EXHAUST DUCT LOSS:	3.00						"H2O
Distillate Fuel Formulas, (Diesel #2)							
Heat Value, BTU/LB in LHV	18,390						
Lbs./Gal.	7.001						
Fuel Temp.	85 deg.						F
AMBIENT AIR TEMPERATURE (T1):	20	40	59	80	100	118	°F
PART POWER (kWe), % LOAD, or 0 for MAX:	100%	100%	100%	100%	100%	100%	kWe
Nominal OUTPUT POWER: (@terminals)	5,750	5,377	4,990	4,565	4,118	3,738	kWe
Nominal HEAT RATE: (@terminals)	11,018	11,286	11,518	11,854	12,350	12,923	BTU/kWe-hr
EXHAUST GAS TEMPERATURE (T7):	903	909	911	926	941	964	°F
EXHAUST GAS FLOW:	185,589	180,465	174,132	165,494	156,170	147,708	lb/hr
Nominal THERMAL EFFICIENCY: (@terminals)	30.98	30.24	29.63	28.79	27.64	26.41	%
PCD PRESSURE:	174	167	161	153	145	137	PsiG
EXHAUST HEAT (from T7 to T9):	28	27	27	26	25	25	mmBTU/hr
Gallons per Hour	492.1	471	446	420	395	375	Nominal
Gallons per kW-HR	0.086	0.088	0.089	0.092	0.096	0.100	Nominal
Gallons per MW-HR	85.6	87.7	89.5	92.1	95.9	100.4	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>Natural Gas</u>		
<i>Gas Pres.</i>	250 PSIG	1,723 KPAG
<i>Max. Gas Demand</i>	1,400 SCFM	39.6 M ³ /MIN.
<u>Diesel #2</u>		
<i>Fuel Pres.</i>	25 – 50 PSIG	172 – 345 KPAG
<i>Fuel Flow</i>	8 GPM	30.3 L/Min
<u>Foundation</u>		
<i>Gravel Compacted to</i>	2,500 lbs./ft.2	120 kPA
<u>Fuel Quality</u>		
Clean dry fuel Per Solar Spec. ES 9-98.		

Table 9. Infrastructure Requirements, XQ5200 Mobile Power Unit

Connections

Black Start, if needed (480V 60 hz., 200kW)

Telephone Line, ether net, broadband connection for Remote Communication & Control

Set Up & Commissioning

Three – Five days

Small crane to lift components on roof, & fork Lift.

Table 10. Solar Turbotronic Controller, XQ5200 Mobile Power Unit

Allen Bradley, PLC-5

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

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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

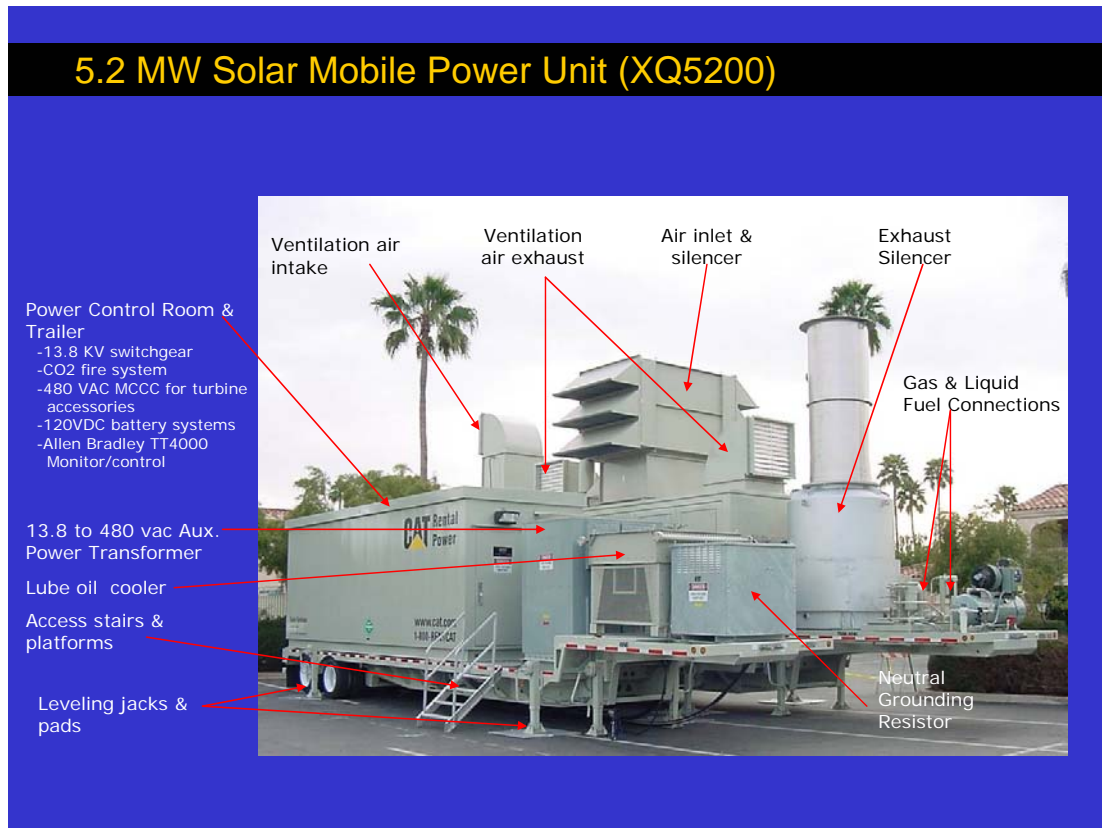
<i>Beckwith M-3425</i>	<i>Designation</i>
Impedance	21
Undervoltage	27
RPR	32
Loss of Field Protection	40
Negative Phase Sequence	46
PT Blown Fuse	60FL
Phase overcurrent	51V
Inadvertent energization	50/27
Ground Overcurrent	50N, 51N
Overvoltage	59
Bus Ground Fault Detection	59N
Over/Under Frequency	81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

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Table 14. XQ5200 Rental Power Benefits

<i>Flexible Rental Solution</i>	<i>Easy to Install & 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



Please request site and application specific data for formal proposals.