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SGE-S series gas engines and gen-sets biogas

1,200/1,500/1,800 rpm

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SGE-18SL & SGE-24SL

Engine Parameters	English Units	Metric Units	SGE-18SL						SGE-24SL					
Speed	rpm		1,200		1,500		1,800		1,200		1,500		1,800	
Engine power	bhp	kWb	338	(252)	422	(315)	469	(350)	449	(335)	562	(419)	607	(453)
Cylinder arrangement	In Line 6						In Line 8							
Mean effective pressure	psi	bar	203	(14.0)	203	(14.0)	188	(13.0)	203	(14.0)	203	(14.0)	183	(12.6)
Bore	inch	mm	5.98	(152)	5.98	(152)	5.98	(152)	5.98	(152)	5.98	(152)	5.98	(152)
Stroke	inch	mm	6.50	(165)	6.50	(165)	6.50	(165)	6.50	(165)	6.50	(165)	6.50	(165)
Displacement	cu.in	Litres	1,095	(18.0)	1,095	(18.0)	1,095	(18.0)	1,460	(24.0)	1,460	(24.0)	1,460	(24.0)
Mean piston speed	in/s	m/s	260	(6.6)	325	(8.3)	390	(9.9)	260	(6.6)	325	(8.3)	390	(9.9)
Compression ratio	11.6:1						11.6:1							
Combustion air mass flow	lbs/hr	kg/h	2,800	(1,270)	3,351	(1,580)	3,858	(1,750)	3,549	(1,610)	4,409	(2,000)	4,960	(2,250)
Packaged ventilation air flow ²⁾	scfm	m ³ /h	10,383	(17,640)	12,978	(22,050)	14,420	(24,500)	13,802	(23,450)	17,263	(29,330)	18,664	(31,710)
Engine coolant capacity (main/aux.) ³⁾	gal.	Litres	19/7	(70/25)	19/7	(70/25)	19/7	(70/25)	24/7	(90/25)	24/7	(90/25)	24/7	(90/25)
Lube oil capacity ³⁾	gal.	Litres	23	(86)	23	(86)	23	(86)	31	(116)	31	(116)	31	(116)
Lube oil consumption ⁴⁾	lbs/bhp.hr	g/kWh	0.00058	(0.35)	0.00058	(0.35)	0.00058	(0.35)	0.00058	(0.35)	0.00058	(0.35)	0.00058	(0.35)
Energy Balance														
Generator efficiency ^{5) 6)}	%	%	95.5		96.5		96.1		95.9		96.6		96.1	
Electrical power ^{5) 6)}	kWe	kW	241		304		336		321		405		435	
Jacket (HT) water heat (Oil cooler incl.)	Btu x 1,000/hr	kW	607.8	(178)	754.6	(221)	816.0	(239)	959.5	(281)	1,038.0	(304)	1,188.2	(348)
Intercooler (LT) water heat	Btu x 1,000/hr	kW	150.2	(44)	143.4	(42)	239.0	(70)	174.1	(51)	211.7	(62)	269.7	(79)
Exhaust heat - cooled to 120°C	Btu x 1,000/hr	kW	341.4	(100)	460.9	(135)	583.9	(171)	525.8	(154)	614.6	(180)	805.8	(236)
Engine radiation heat	Btu x 1,000/hr	kW	37.6	(11)	58.0	(17)	54.6	(16)	58.0	(17)	78.5	(23)	68.3	(20)
Generator radiation heat	Btu x 1,000/hr	kW	38.7	(11)	37.6	(11)	46.6	(14)	46.9	(14)	48.6	(14)	60.3	(18)
Fuel consumption ⁷⁾	Btu x 1,000/hr	kW	2,140.8	(627)	2,663.2	(780)	3,086.6	(904)	3,045.7	(892)	3,602.2	(1,055)	4,134.9	(1,211)
Mechanical efficiency	%		40.2		40.4		38.7		37.6		39.7		37.4	
Electrical efficiency	%		38.4		39.0		37.2		36.0		38.4		35.9	
Thermal efficiency	%		51.4		51.0		53.1		54.5		51.8		54.7	
Total efficiency	%		89.7		90.0		90.3		90.5		90.1		90.7	
System Parameters														
Jacket (HT) water temperature max.	°F	°C	194	(90)	194	(90)	194	(90)	194	(90)	194	(90)	194	(90)
Jacket (HT) water flow rate min./max.	gpm	m ³ /hr	110/264	(25/60)	136/264	(31/60)	145/264	(33/60)	172/264	(39/60)	185/264	(42/60)	211/264	(48/60)
Intercooler stages	Single						Single							
Intercooler (LT) coolant temperature max.	°F	°C	131	(55)	131	(55)	131	(55)	131	(55)	131	(55)	131	(55)
Intercooler (LT) coolant flow rate min./max	gpm	m ³ /hr	66/132	15/30	88/132	20/30	110/132	25/30	66/132	15/30	88/132	20/30	110/132	25/30
Exhaust manifold type	Wet						Wet							
Exhaust temperature	°F	°C	655	(346)	705	(374)	750	(399)	738	(392)	711	(377)	784	(418)
Exhaust mass flow wet	lbs/hr	kg/h	3,064	(1,390)	3,660	(1,660)	4,233	(1,920)	3,902	(1,770)	4,828	(2,190)	5,467	(2,480)
Exhaust back-pressure max.	psi	mbar	0.65	(45)	0.65	(45)	0.65	(45)	0.65	(45)	0.65	(45)	0.65	(45)
Maximum pressure loss in front of air cleaner	psi	mbar	0.073	(5)	0.073	(5)	0.073	(5)	0.073	(5)	0.073	(5)	0.073	(5)
Fuel pressure range	psi	mbar	0.73 - 3.48 (50 - 240)						0.73 - 3.48 (50 - 240)					
Starter battery 2x12 V, capacity required	Ampere-hour		280						280					
Emissions ⁸⁾														
NOx	g/bhp.hr		< 1		< 1.1		< 1		< 1		< 1.1		< 1	
CO	g/bhp.hr		< 1.8		< 1.8		< 1.8		< 1.8		< 1.8		< 1.8	
THC (in C1 base)	g/bhp.hr		< 3.5		< 3.5		< 3.5		< 3.5		< 3.5		< 3.5	
NMHC (in C1 base)	g/bhp.hr		< 0.7		< 0.7		< 0.7		< 0.7		< 0.7		< 0.7	

1) Reference gas (CH₄: 62.5%, CO₂: 36% N₂: 1.5%). For other biogas qualities consult

2) Assumes intake air flow at delta T = 5°C including combustion air

3) Not including pipes and heat exchangers

4) Mean lube oil consumption between maintenance steps

5) At 50 Hz, U = 0.4 kV, power factor = 1

6) At 60 Hz, U = 0.48 kV, power factor = 1

7) With a tolerance of + 5 %

8) Lower emission engines are available; consult a sales representative for performance data

- Engine performance data acc. to ISO 3046/1

- Fuel blending system available on request

- The values given in this data sheet are for information purposes only and not binding

SGE-36SL & SGE-48SL

Engine Parameters	English Units	Metric Units	SGE-36SL						SGE-48SL					
			1,200		1,500		1,800		1,200		1,500		1,800	
Speed	rpm		1,200		1,500		1,800		1,200		1,500		1,800	
Engine power	bhp	kWb	675	(503)	845	(630)	939	(700)	898	(670)	1,124	(838)	1,215	(906)
Cylinder arrangement			V12						V16					
Mean effective pressure	psi	bar	203	(14.0)	203	(14.0)	188	(13.0)	203	(14.0)	203	(14.0)	183	(12.6)
Bore	inch	mm	5.98	(152)	5.98	(152)	5.98	(152)	5.98	(152)	5.98	(152)	5.98	(152)
Stroke	inch	mm	6.50	(165)	6.50	(165)	6.50	(165)	6.50	(165)	6.50	(165)	6.50	(165)
Displacement	cu.in	Litres	2,191	(35.9)	2,191	(35.9)	2,191	(35.9)	2,921	(47.9)	2,921	(47.9)	2,921	(47.9)
Mean piston speed	in/s	m/s	260	(6.6)	325	(8.3)	390	(9.9)	260	(6.6)	325	(8.3)	390	(9.9)
Compression ratio			11.6:1						11.6:1					
Combustion air mass flow	lbs/hr	kg/h	5,401	(2,450)	6,745	(3,060)	7,584	(3,440)	7,319	(3,320)	8,841	(4,010)	9,480	(4,300)
Packaged ventilation air flow ²⁾	scfm	m ³ /h	20,724	(35,210)	25,956	(44,100)	28,840	(49,000)	27,604	(46,900)	34,526	(58,660)	37,328	(63,420)
Engine coolant capacity (main circuit) ³⁾	gal.	Litres	48/11	(180/40)	48/11	(180/40)	48/11	(180/40)	53/13	(200/50)	53/13	(200/50)	53/13	(200/50)
Lube oil capacity ³⁾	gal.	Litres	46	(174)	46	(174)	46	(174)	62	(233)	52	(195)	62	(233)
Lube oil consumption ⁴⁾	lbs/bhp.hr	g/kWh	0.00058	(0.35)	0.00058	(0.35)	0.00058	(0.35)	0.00058	(0.35)	0.00058	(0.35)	0.00058	(0.35)
Energy Balance														
Generator efficiency ^{5) 6)}	%	%	96.3		96.2		96.7		96.6		97		96.3	
Electrical power ^{5) 6)}	kWe	kW	485		610		677		647		813		873	
Jacket (HT) water heat (Oil cooler incl.)	Btu x 1,000/hr	kW	1,498.9	(439)	1,741.4	(510)	1,956.5	(573)	2,161.3	(633)	2,332.0	(683)	2,765.7	(810)
Intercooler (LT) water heat	Btu x 1,000/hr	kW	99	(29)	102.4	(30)	143.4	(42)	119.5	(35)	170.7	(50)	187.8	(55)
Exhaust heat - cooled to 120°C	Btu x 1,000/hr	kW	665.8	(195)	921.9	(270)	1,160.9	(340)	1,072.1	(314)	1,242.8	(364)	1,638.9	(480)
Engine radiation heat	Btu x 1,000/hr	kW	61.5	(18)	102.4	(30)	102.4	(30)	75.1	(22)	112.7	(33)	112.7	(33)
Generator radiation heat	Btu x 1,000/hr	kW	62.3	(18)	66.7	(21)	102.4	(30)	77.8	(23)	85.8	(25)	112.9	(33)
Fuel consumption ⁷⁾	Btu x 1,000/hr	kW	4,299.5	(1,256)	5,353.8	(1,568)	6,132.3	(1,796)	6,074.3	(1,779)	7,153.2	(2,095)	8,262.9	(2,420)
Mechanical efficiency	%		40		40.2		39		37.7		40		37.3	
Electrical efficiency	%		38.6		38.9		37.7		36.4		38.8		36.0	
Thermal efficiency	%		52.2		51.7		53.1		55.1		52.2		55.4	
Total efficiency	%		90.8		90.6		90.8		91.5		91		91.3	
System Parameters														
Jacket (HT) water temperature max.	°F	°C	194	(90)	194	(90)	194	(90)	194	(90)	194	(90)	194	(90)
Jacket (HT) water flow rate min/max	gpm	m ³ /hr	132/308	(30/70)	159/308	(36/70)	181/308	(41/70)	194/308	(44/70)	211/308	(48/70)	251/308	(57/70)
Intercooler stages			Double						Double					
Intercooler (LT) coolant temperature max.	°F	°C	131	(55)	131	(55)	131	(55)	131	(55)	131	(55)	131	(55)
Intercooler (LT) coolant flow rate min./max	gpm	m ³ /hr	66/132	15/30	88/132	20/30	110/132	25/30	66/132	15/30	88/132	20/30	110/132	25/30
Exhaust manifold type			Wet						Wet					
Exhaust temperature	°F	°C	658	(348)	702	(372)	756	(402)	732	(389)	714	(379)	817	(436)
Exhaust mass flow wet	lbs/hr	kg/h	5,908	(2,680)	7,363	(3,340)	8,311	(3,770)	8,047	(3,650)	9,700	(4,400)	10,472	(4,750)
Exhaust back-pressure max.	psi	mbar	0.65	(45)	0.65	(45)	0.65	(45)	0.65	(45)	0.65	(45)	0.65	(45)
Maximum pressure loss in front of air cleaner	psi	mbar	0.073	(5)	0.073	(5)	0.073	(5)	0.073	(5)	0.073	(5)	0.073	(5)
Fuel pressure range	psi	mbar	0.73 - 3.48 (50 - 240)						0.73 - 3.48 (50 - 240)					
Starter battery 2x12 V, capacity required	Ampere-hour		280						280					
Emissions ⁸⁾														
NOx	g/bhp.hr		< 1		< 1.1		< 1		< 1		< 1.1		< 1	
CO	g/bhp.hr		< 1.8		< 1.8		< 1.8		< 1.8		< 1.8		< 1.8	
THC (in C1base)	g/bhp.hr		< 3.5		< 3.5		< 3.5		< 3.5		< 3.5		< 3.5	
NMHC (in C1 base)	g/bhp.hr		< 0.7		< 0.7		< 0.7		< 0.7		< 0.7		< 0.7	

Speed	1,200/1,500/1,800 rpm
Generator frequency	50/60 Hz
Applicable gas types ¹⁾	Biogas. For natgas, landfill gas, sewage gas, flare gas, other special gases, please, ask.

SGE-56SL & SGE-56SM

Engine Parameters	English Units	Metric Units	SGE-56SL				SGE-56SM					
Speed	rpm		1,200		1,500		1,800		1,500		1,800	
Engine power	bhp	kWb	1,057	(788)	1,321	(985)	1,431	(1,067)	1,415	(1,055)	1,475	(1,100)
Cylinder arrangement			V16				V16					
Mean effective pressure	psi	bar	203	(14.0)	203	(14.0)	183	(12.6)	217	(15.0)	189	(13.0)
Bore	inch	mm	6.30	(160)	6.30	(160)	6.30	(160)	6.30	(160)	6.30	(160)
Stroke	inch	mm	6.89	(175)	6.89	(175)	6.89	(175)	6.89	(175)	6.89	(175)
Displacement	cu.in	Litres	3,436	(56.3)	3,436	(56.3)	3,436	(56.3)	3,436	(56.3)	3,436	(56.3)
Mean piston speed	in/s	m/s	276	(7.0)	344	(8.8)	413	(10.5)	344	(8.8)	413	(10.5)
Compression ratio			12.3 : 1				12.3 : 1					
Combustion air mass flow	lbs/hr	kg/h	8422	(3,820)	10251	(4,650)	11773	(5,340)	10869	(4,930)	11464	(5,200)
Packaged ventilation air flow ²⁾	scfm	m ³ /h	32466	(55,160)	40582	(68,950)	43961	(74,690)	43467	(73,850)	45321	(77,000)
Engine coolant capacity (main/aux.) ³⁾	gal.	Litres	53	(200)	53	(200)	53	(200)	53	(200)	53	(200)
Lube oil capacity ³⁾	gal.	Litres	72	(272)	72	(272)	72	(272)	72	(272)	72	(272)
Lube oil consumption ⁴⁾	lbs/bhp.hr	g/kWh	0.00033	(0.20)	0.00033	(0.20)	0.00033	(0.20)	0.00016	(0.10)	0.00016	(0.10)
Energy Balance												
Generator efficiency ^{5) 6)}	%	%	96.8		97.2		96.3		97.2		96.9	
Electrical power ^{5) 6)}	kWe	kW	763		957		1,028		1025		1066	
Jacket (HT) water heat (Oil cooler incl)	Btu x 1,000/hr	kW	2287.7	(670)	2,748.6	(805)	3062.7	(897)	2093.0	(613)	2284.2	(669)
Intercooler (LT) water heat	Btu x 1,000/hr	kW	143.4	(42)	181.0	(53)	187.8	(55)	225.4	(66)	266.3	(78)
Exhaust heat - cooled to 120°C	Btu x 1,000/hr	kW	1072.1	(314)	1,464.8	(429)	2007.7	(588)	2,222.8	(651)	2,550.6	(747)
Engine radiation heat	Btu x 1,000/hr	kW	112.7	(33)	126.3	(37)	129.7	(38)	177.5	(52)	187.8	(55)
Generator radiation heat	Btu x 1,000/hr	kW	86.1	(25)	94.2	(28)	134.8	(39)	100.9	(30)	116.4	(34)
Fuel consumption ⁷⁾	Btu x 1,000/hr	kW	6,740.1	(1,974)	8,413.1	(2,464)	9,638.9	(2,823)	8,880.9	(2,601)	9,635.5	(2,822)
Mechanical efficiency	%		39.9		40.0		37.8		40.6		39.0	
Electrical efficiency	%		38.6		38.9		36.4		39.4		37.8	
Thermal efficiency	%		52.0		52.2		54.6		51.1		52.9	
Total efficiency	%		90.6		91.1		91.1		90.6		90.7	
System Parameters												
Jacket (HT) water temperature max.	°F	°C	194	(90)	194	(90)	194	(90)	194	(90)	194	(90)
Jacket (HT) water flow rate min/max	gpm	m ³ /hr	207/308	(46/70)	247/308	(56/70)	273/308	(62/70)	189/308	(43/70)	203/308	(46/70)
Intercooler stages			Double				Double					
Intercooler (LT) coolant temperature max.	°F	°C	131	(55)	131	(55)	131	(55)	131	(55)	131	(55)
Intercooler (LT) coolant flow rate min/max.	gpm	m ³ /hr	66/132	15/30	88/132	25/30	110/132	25/30	88/132	25/30	110/132	25/30
Exhaust manifold type			Wet				Dry					
Exhaust temperature	°F	°C	671	(355)	721	(383)	813	(434)	927	(497)	984	(529)
Exhaust mass flow wet	lbs/hr	kg/h	9215	(4,180)	11,244	(5,100)	12,919	(5,860)	11,905	(5,400)	12,588	(5,710)
Exhaust backpressure max.	psi	mbar	0.65	(45)	0.65	(45)	0.65	(45)	0.65	(45)	0.65	(45)
Maximum pressure loss in front of air cleaner	psi	mbar	0.073	(5)	0.073	(5)	0.073	(5)	0.073	(5)	0.073	(5)
Fuel pressure range	psi	mbar	0.73 - 3.48 (50 - 240)				0.73 - 3.48 (50 - 240)					
Starter battery 2x12 V, capacity required	Ampere-hour		280				280					
Emissions ⁸⁾												
NOx	g/bhp.hr		< 1		< 1.1		< 1		< 1.1		< 1	
CO	g/bhp.hr		< 1.8		< 1.8		< 1.8		< 2.2		< 2.2	
THC (in C1 base)	g/bhp.hr		< 3.5		< 3.5		< 3.5		< 3.5		< 3.5	
NMHC (in C1 base)	g/bhp.hr		< 0.7		< 0.7		< 0.7		< 0.7		< 0.7	

Dimensions and other data

Engine Dimensions	English Units	Metric Units	SGE-18SL		SGE-24SL		SGE-36SL		SGE-48SL		SGE-56SL		SGE-56SM	
Width	in.	mm	59.3	(1,507)	57.4	(1,458)	65.5	(1,664)	65.5	(1,664)	65.7	(1,669)	65.7	(1,669)
Length	in.	mm	91.0	(2,312)	107.6	(2,734)	101.8	(2,588)	135.5	(3,443)	133.2	(3,385)	142.5	(3,621)
Height	in.	mm	74.2	(1,885)	75.3	(1,914)	88.8	(2,258)	89.4	(2,273)	89.3	(2,270)	89.1	(2,264)
Dry weight	lb	kg	5,952	(2,700)	7,716	(3,500)	9,259	(4,200)	12,015	(5,450)	12,787	(5,800)	12,787	(5,800)

Genset Dimensions	English Units	Metric Units	SGE-18SL		SGE-24SL		SGE-36SL		SGE-48SL		SGE-56SL		SGE-56SM	
Width	in.	mm	57.7	(1,467)	58.7	(1,492)	68.3	(1,736)	68.3	(1,736)	68.3	(1,736)	68.3	(1,736)
Length	in.	mm	109.4	(2,781)	128.8	(3,273)	140.9	(3,579)	167.9	(4,265)	170.5	(4,331)	174.3	(4,428)
Height	in.	mm	81.2	(2,064)	84.6	(2,151)	93.3	(2,372)	95.9	(2,437)	90.0	(2,287)	96.3	(2,447)
Dry weight	lb	kg	8,818	(4,000)	10,891	(4,940)	15,939	(7,230)	20,338	(9,225)	22,046	(10,000)	22,046	(10,000)

Noise emissions* 60 Hz																	
Engine Noise dB(A)	HZ (Frec. Band)	SGE-18SL			SGE-24SL			SGE-36SL			SGE-48SL			SGE-56SL		SGE-56SM	
		1,200	1,500	1,800	1,200	1,500	1,800	1,200	1,500	1,800	1,200	1,500	1,800	1,200	1,500	1,500	1,800
	125	--	--	--	59	72	70	--	70	--	66	73	70	71	76	76	73
	250	70	73	76	73	82	86	69	81	74	70	83	84	79	92	92	87
	500	82	83	88	79	87	84	76	86	90	76	88	84	81	89	89	85
	1,000	84	87	91	85	90	89	82	88	85	81	90	88	83	89	89	87
	2,000	81	84	87	83	89	87	83	86	87	80	89	89	84	89	89	91
	4,000	76	79	83	77	86	83	79	80	82	73	82	83	79	85	85	86
	LpA, Å dB(A)	88	90	94	88	95	94	87	92	93	85	95	93	89	97	97	95

Exhaust Noise dB(A)	HZ	SGE-18SL			SGE-24SL			SGE-36SL			SGE-48SL			SGE-56SL		SGE-56SM	
	63	94	97	99	96	99	101	96	100	102	94	98	99	98	102	102	103
	125	106	118	128	109	121	131	109	121	131	111	124	127	109	121	121	125
	250	106	124	128	113	127	131	113	126	131	112	125	114	112	125	125	135
	500	112	113	120	115	116	123	115	119	126	119	124	130	117	122	122	127
	1,000	108	112	115	111	115	118	112	117	119	116	121	123	113	118	118	120
	2,000	109	110	112	113	114	116	113	115	116	117	119	119	113	115	115	116
	4,000	109	106	105	112	109	108	114	110	110	116	111	112	114	109	109	112
	LpA, Å dB(A)	117	126	132	120	128	135	121	129	135	124	130	136	121	129	129	136

Notes: Data obtained according to ISO 9614-2 • Data obtained @ 1 m from engine according to UNE-EN ISO-11203:1996
 Maximum data standard deviations = ± 4 dB(A)

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