

SIEMENS

Ingenuity for life



SGE-H series gas engines and gen-sets biogas

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

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SGE-24HM & SGE-42HM

| Engine Parameters | English Units | Metric Units | SGE-24HM | | | | SGE-42HM | | | |
|--|----------------|-------------------|------------------------|----------|---------|----------|------------------------|----------|---------|----------|
| | | | 1,500 | | 1,800 | | 1,500 | | 1,800 | |
| Speed | rpm | | 1,500 | | 1,800 | | 1,500 | | 1,800 | |
| Engine power | bhp | kWb | 697 | (520) | 697 | (520) | 1,395 | (1,040) | 1,395 | (1,040) |
| Cylinder arrangement | | | In Line 8 | | | | V12 | | | |
| Mean effective pressure | psi | bar | 252 | (17.4) | 210 | (14.5) | 286 | (19.7) | 238 | (16.4) |
| Bore | inch | mm | 5.98 | (152) | 5.98 | (152) | 6.30 | (160) | 6.30 | (160) |
| Stroke | inch | mm | 6.50 | (165) | 6.50 | (165) | 6.89 | (175) | 6.89 | (175) |
| Displacement | cu.in | Litres | 1,460 | (24.0) | 1,460 | (24.0) | 1,718 | (42.2) | 1,718 | (42.2) |
| Mean piston speed | in/s | m/s | 325 | (8.3) | 390 | (9.9) | 344 | (8.8) | 413 | (10.5) |
| Compression ratio | | | 11.8 : 1 | | | | 11.9 : 1 | | | |
| Combustion air mass flow | lbs/hr | kg/h | 4,211 | (1,910) | 5,247 | (2,380) | 10,119 | (4,590) | 10,251 | (4,650) |
| Packaged ventilation air flow ²⁾ | scfm | m ³ /h | 21,424 | (36,400) | 21,424 | (36,400) | 42,849 | (72,800) | 42,849 | (72,800) |
| Engine coolant capacity (Main circuit) ³⁾ | gal. | Litres | 21 | (80) | 21 | (80) | 63 | (240) | 63 | (240) |
| Engine coolant capacity (Aux. circuit) ³⁾ | gal. | Litres | 5 | (20) | 5 | (20) | 20 | (75) | 20 | (75) |
| Lube oil capacity ³⁾ | gal. | Litres | 45 | (169) | 45 | (169) | 107 | (403) | 107 | (403) |
| Lube oil consumption ⁴⁾ | lbs/bhp.hr | g/kWh | 0.00058 | (0.35) | 0.00058 | (0.35) | 0.00025 | (0.15) | 0.00025 | (0.15) |
| Energy Balance | | | | | | | | | | |
| Generator efficiency ^{5) 6)} | % | % | 96.6 | | 96.2 | | 97.2 | | 96.9 | |
| Electrical power ^{5) 6)} | kWe | kW | 502 | | 500 | | 1,011 | | 1,008 | |
| Jacket (HT) water heat | Btu x 1,000/hr | kW | 788.7 | (231) | 679.5 | (199) | 1,864.3 | (546) | 1,959.9 | (574) |
| Intercooler (LT) water heat | Btu x 1,000/hr | kW | 273.2 | (80) | 327.8 | (199) | 198.0 | (58) | 194.6 | (57) |
| Exhaust heat - cooled to 120°C | Btu x 1,000/hr | kW | 874.1 | (256) | 1055.1 | (309) | 1,697.0 | (497) | 1,908.7 | (559) |
| Engine radiation heat | Btu x 1,000/hr | kW | 99.0 | (29) | 136.6 | (40) | 239.0 | (70) | 239.0 | (70) |
| Generator radiation heat | Btu x 1,000/hr | kW | 60.4 | (18) | 67.5 | (20) | 99.4 | (29) | 110.1 | (32) |
| Fuel consumption ⁷⁾ | Btu x 1,000/hr | kW | 4,029.0 | (1,180) | 4,244.1 | (1,243) | 8,071.7 | (2,364) | 8,382.4 | (2,455) |
| Mechanical efficiency | % | | 44.1 | | 41.8 | | 44.0 | | 42.4 | |
| Electrical efficiency | % | | 42.6 | | 40.2 | | 42.8 | | 41.0 | |
| Thermal efficiency | % | | 48.1 | | 48.6 | | 46.6 | | 48.5 | |
| Total efficiency | % | | 90.6 | | 88.8 | | 89.3 | | 89.5 | |
| System Parameters | | | | | | | | | | |
| Jacket (HT) water temperature max. | °F | °C | 194 | (90) | 194 | (90) | 194 | (90) | 194 | (90) |
| Jacket (HT) water flow rate min. | gpm | L/hr | 141 | (32) | 123 | (28) | 167 | (38) | 167 | (38) |
| Jacket (HT) water flow rate max. | gpm | L/hr | 264 | (60) | 264 | (60) | 308 | (70) | 308 | (70) |
| Intercooler stages | | | Single | | | | Double | | | |
| Intercooler (LT) coolant temperature | °F | °C | 131 | (55) | 131 | (55) | 131 | (55) | 131 | (55) |
| Intercooler (LT) coolant flow rate min./max. | gpm | L/hr | 88 | (20) | 110 | (25) | 88 | (20) | 110 | (25) |
| Intercooler (LT) coolant flow rate min./max. | gpm | L/hr | 132 | (30) | 132 | (30) | 132 | (30) | 132 | (30) |
| Exhaust manifold type | | | Dry | | | | Dry | | | |
| Exhaust temperature | °F | °C | 927 | (497) | 916 | (491) | 806 | (430) | 865 | (463) |
| Exhaust mass flow wet | lbs/hr | kg/h | 4,674 | (2,120) | 5,732 | (2,600) | 11,067 | (5,020) | 11,244 | (5,100) |
| Exhaust backpressure max. | psi | mbar | 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) |
| 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 | |
| CO | g/bhp.hr | | < 2.4 | | < 2.4 | | < 2.2 | | < 2.2 | |
| THC (in C1 base) | g/bhp.hr | | < 4.3 | | < 4.3 | | < 4.3 | | < 4.3 | |
| NMHC (in C1 base) | g/bhp.hr | | < 0.7 | | < 0.7 | | < 0.7 | | < 0.7 | |

1) Reference gas (CH₄: 67%, CO₂: 33%). 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

SGE-56HM

| Engine Parameters | English Units | Metric Units | SGE-56HM | | | | | |
|--|----------------|-------------------|------------------------|----------|---------|----------|----------|----------|
| | | | 1,200 | | 1,500 | | 1,800 | |
| Speed | rpm | | 1,200 | | 1,500 | | 1,800 | |
| Engine power | bhp | kWb | 1,395 | (1,040) | 1,663 | (1,240) | 1,810 | (1,350) |
| Cylinder arrangement | | | V16 | | | | | |
| Mean effective pressure | psi | bar | 268 | (18.5) | 256 | (17.6) | 232 | (16.0) |
| Bore | inch | mm | 6.30 | (160) | 6.30 | (160) | 6.30 | (160) |
| Stroke | inch | mm | 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) |
| Mean piston speed | in/s | m/s | 276 | (7.0) | 344 | (8.8) | 413 | (10.5) |
| Compression ratio | | | 11.9 : 1 | | | | | |
| Combustion air mass flow | lbs/hr | kg/h | 10,406 | (4,720) | 12,346 | (5,600) | 13,338 | (6,050) |
| Packaged ventilation air flow ²⁾ | scfm | m ³ /h | 42,849 | (72,800) | 51,089 | (86,800) | 51,621 | (94,500) |
| Engine coolant capacity (Main circuit) ³⁾ | gal. | Litres | 69 | (260) | 69 | (260) | 69 | (260) |
| Engine coolant capacity (Aux. circuit) ³⁾ | gal. | Litres | 20 | (75) | 20 | (75) | 20 | (75) |
| Lube oil capacity ³⁾ | gal. | Litres | 111 | (419) | 111 | (419) | 111 | (419) |
| Lube oil consumption ⁴⁾ | lbs/bhp.hr | g/kWh | 0.00025 | (0.15) | 0.00025 | (0.15) | 0.00025 | (0.15) |
| Energy Balance | | | | | | | | |
| Generator efficiency ^{5) 6)} | % | % | 96.8 | | 97.1 | | 96.9 | |
| Electrical power ^{5) 6)} | kWe | kW | 1,007 | | 1,204 | | 1,308 | |
| Jacket (HT) water heat | Btu x 1,000/hr | kW | 2,000.9 | (586) | 2,390.1 | (700) | 2,475.5 | (725) |
| Intercooler (LT) water heat | Btu x 1,000/hr | kW | 204.9 | (60) | 266.3 | (78) | 290.2 | (85) |
| Exhaust heat - cooled to 120°C | Btu x 1,000/hr | kW | 1,659.4 | (486) | 2,000.9 | (586) | 2,516.4 | (737) |
| Engine radiation heat | Btu x 1,000/hr | kW | 225.4 | (66) | 221.9 | (65) | 286.8 | (84) |
| Generator radiation heat | Btu x 1,000/hr | kW | 113.6 | (33) | 122.8 | (36) | 142.9 | (42) |
| Fuel consumption ⁷⁾ | Btu x 1,000/hr | kW | 8,174.1 | (2,394) | 9,748.2 | (2,855) | 10,868.1 | (3,183) |
| Mechanical efficiency | % | | 43.4 | | 43.4 | | 42.4 | |
| Electrical efficiency | % | | 42.1 | | 42.2 | | 41.1 | |
| Thermal efficiency | % | | 47.3 | | 47.8 | | 48.6 | |
| Total efficiency | % | | 89.3 | | 89.9 | | 89.7 | |
| System Parameters | | | | | | | | |
| Jacket (HT) water temperature max. | °F | °C | 194 | (90) | 194 | (90) | 194 | (90) |
| Jacket (HT) water flow rate min. | gpm | L/hr | 181 | (41) | 216 | (49) | 220 | (50) |
| Jacket (HT) water flow rate max. | gpm | L/hr | 308 | (70) | 308 | (70) | 308 | (70) |
| Intercooler stages | | | Double | | | | | |
| Intercooler (LT) coolant temperature | °F | °C | 131 | (55) | 131 | (55) | 131 | (55) |
| Intercooler (LT) coolant flow rate min. | gpm | L/hr | 66 | (15) | 88 | (20) | 110 | (25) |
| Intercooler (LT) coolant flow rate max. | gpm | L/hr | 132 | (30) | 132 | (30) | 132 | (30) |
| Exhaust manifold type | | | Dry | | | | | |
| Exhaust temperature | °F | °C | 779 | (415) | 788 | (420) | 874 | (468) |
| Exhaust mass flow wet | lbs/hr | kg/h | 11,354 | (5,150) | 13,470 | (6,110) | 14,595 | (6,620) |
| Exhaust backpressure max. | psi | mbar | 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) |
| Fuel pressure range | psi | mbar | 0.73 - 3.48 (50 - 240) | | | | | |
| Starter battery 2x12 V, capacity required | Ampere-hour | | 280 | | | | | |
| Emissions ⁸⁾ | | | | | | | | |
| NOx | g/bhp.hr | | < 1 | | < 1.1 | | < 1 | |
| CO | g/bhp.hr | | < 2.2 | | < 2.2 | | < 2.2 | |
| THC (in C1base) | g/bhp.hr | | < 4.3 | | < 4.3 | | < 4.3 | |
| NMHC (in C1 base) | g/bhp.hr | | < 0.7 | | < 0.7 | | < 0.7 | |

- 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

| | |
|------------------------------------|-----------------------|
| Speed | 1,200/1,500/1,800 rpm |
| Generator frequency | 50/60 Hz |
| Applicable gas types ¹⁾ | Biogas |

Dimensions and other data

| Engine Dimensions | English Units | Metric Units | SGE-24HM | | SGE-42HM | | SGE-56HM | |
|-------------------|---------------|--------------|----------|---------|----------|---------|----------|---------|
| Width | in. | mm | 81.8 | (2,079) | 84.8 | (2,155) | 84.2 | (2,141) |
| Length | in. | mm | 126.9 | (3,223) | 140.6 | (3,571) | 159.1 | (4,041) |
| Height | in. | mm | 62.6 | (1,590) | 85.8 | (2,181) | 87.3 | (2,217) |
| Dry weight | lb | kg | 9,259 | (4,200) | 13,779 | (6,250) | 16,535 | (7,500) |

| Genset Dimensions | English Units | Metric Units | SGE-24HM | | SGE-42HM | | SGE-56HM | |
|-------------------|---------------|--------------|----------|---------|----------|----------|----------|----------|
| Width | in. | mm | 81.8 | (2,079) | 84.8 | (2,155) | 84.2 | (2,141) |
| Length | in. | mm | 155.5 | (3,952) | 191.5 | (4,865) | 218.3 | (5,545) |
| Height | in. | mm | 68.4 | (1,738) | 93.4 | (2,373) | 91.3 | (2,319) |
| Dry weight | lb | kg | 13,735 | (6,230) | 23,667 | (10,735) | 26,896 | (12,200) |

| Noise emissions* | | | | | | | | |
|--------------------|-----------------|----------|-------|----------|-------|----------|-------|-------|
| Engine Noise dB(A) | HZ (Frec. Band) | SGE-24HM | | SGE-42HM | | SGE-56HM | | |
| | | 1,500 | 1,800 | 1,500 | 1,800 | 1,200 | 1,500 | 1,800 |
| | 125 | 73 | 67 | 71 | - | 71 | 73 | 70 |
| | 250 | 83 | 77 | 81 | 74 | 77 | 83 | 84 |
| | 500 | 85 | 80 | 84 | 88 | 79 | 85 | 82 |
| | 1,000 | 88 | 88 | 87 | 83 | 81 | 88 | 86 |
| | 2,000 | 92 | 91 | 90 | 90 | 88 | 92 | 92 |
| | 4,000 | 89 | 87 | 89 | 87 | 83 | 89 | 88 |
| | LpA, ã dB(A) | 96 | 94 | 94 | 94 | 90 | 96 | 95 |

| Exhaust Noise dB(A) | HZ | SGE-24HM | | SGE-42HM | | SGE-56HM | | |
|---------------------|--------------|----------|-----|----------|-----|----------|-----|-----|
| | 63 | 100 | 102 | 105 | 106 | 99 | 102 | 103 |
| | 125 | 121 | 131 | 119 | 129 | 109 | 122 | 125 |
| | 250 | 129 | 133 | 129 | 133 | 115 | 128 | 136 |
| | 500 | 116 | 122 | 116 | 123 | 116 | 122 | 127 |
| | 1,000 | 116 | 119 | 115 | 117 | 114 | 119 | 121 |
| | 2,000 | 115 | 117 | 113 | 114 | 114 | 117 | 117 |
| | 4,000 | 112 | 110 | 111 | 111 | 116 | 112 | 113 |
| | LpA, ã dB(A) | 130 | 136 | 130 | 135 | 122 | 130 | 137 |

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)

Published by
Siemens Energy, Inc. 2017

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Article-No. PGDR-B10018-00-4AUS

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