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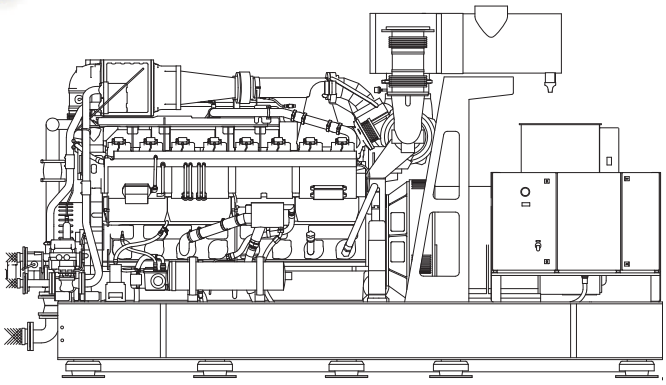

Fuel Consumption (ISO3046/1)	100% of Rated Load	90% of Rated Load	75% of Rated Load	50% of Rated Load
Fuel Consumption (LHV) ISO3046/1, kW (MMBTU/hr)	3516(12.01)	3191 (10.9)	2714(9.27)	1905(6.51)
Electrical Efficiency ISO3046/1, percent	45.2%	44.8%	43.9%	41.7%
Thermal Efficiency ISO3046/1, percent	43.8%	43.4%	42.6%	40.4%

ENGINE

Engine Manufacturer	Cummins
Engine Model	QSK60G
Configuration	V16
Displacement, L (cu.in)	60(3661)
Aspiration	Turbocharged (1)
Gross Engine Power Output, kWm (hp)	1588(2128)
BMEP, bar(psi)	21.2(307.4)
Bore, mm (in)	159(6.26)
Stroke, mm (in)	190(7.48)
Rated Speed, rpm	1500
Piston Speed, m/s (ft/min)	9.5(1870)
Compression Ratio	13.5:1
Lube Oil Capacity, L (qt)	380 (400)
Overspeed Limit, rpm	1875
Full Load Lubricating oil consumpti on, g/kWe-hr (g/hp-hr)	0.15(0.11)

FUEL SYSTEM

Gas supply pressure to FSOV inlet, bar (psi)	0.20 (2.9)
Minimum Methane Index	76

STARTING SYSTEM(S)

Electric starter voltage, volts	24
Minimum battery capacity @ 40°C (104°F), AH	720
Air Starter Pressure, barg (psig)	#N/A
Air Starter Flow Nm³/s (scfm)	#N/A

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aksa POWER GENERATION

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GENSET DIMENSIONS

Genset Length, m (ft)	5.21 (17.1)
Genset Width, m (ft)	1.99 (6.53)
Genset Height, m (ft)	2.98 (9.79)
Genset Weight (wet), kg (lbs)	15.887 (35.025)

ENERGY DATA

	100% of Rated Load	90% of Rated Load	75% of Rated Load	50% of Rated Load
Continuous Generator Electrical Output kWe @ 1.0 pf	1540	1386	1155	770
Total Heat Rejected in LT Circuit, kW(MMBTU/h)	110 (0.37)	96 (0.33)	75 (0.26)	52 (0.18)
Total Heat Rejected in HT Circuit, kW(MMBTU/h)	901 (3.07)	795 (2.71)	651 (2.22)	470 (1.61)
Unburnt, kW(MMBTU/h)	65 (0.22)	60 (0.21)	53 (0.18)	36 (0.12)
Heat Radiated to Ambient, kW(MMBTU/h)	230 (0.78)	209 (0.71)	177 (0.60)	123 (0.42)
Available Exhaust heat to 105°C, kW (MMBTU/h)	654 (2.23)	617 (2.11)	556 (1.90)	434 (1.48)

INTAKE AIR FLOW

	100% of Rated Load	90% of Rated Load	75% of Rated Load	50% of Rated Load
Intake Air Flow Mass, kg/s (lb/hr)	2.14 (16950)	1.91 (15130)	1.59 (12590)	1.09 (8630)
Intake Air Flow Volume, m^3/s @ 0°C (scfm)	1.65 (3690)	1.48 (3310)	1.23 (2750)	0.84 (1880)
Maximum Air Cleaner Restriction Below 35C, mmHG (in H_2O)	11 (5.9)	NA	NA	NA
Maximum Air Cleaner Restriction Above 35C, mmHG (in H_2O)	11 (5.9)	NA	NA	NA

EXHAUST AIR FLOW

	100% of Rated Load	90% of Rated Load	75% of Rated Load	50% of Rated Load
Exhaust Gas Flow Mass, kg/s (lb/hr)	2.22 (17580)	1.98 (15680)	1.65 (13070)	1.13 (8950)
Exhaust Gas Flow Volume, m^3/s (cfm)	4.06 (8600)	3.71 (7860)	3.20 (6780)	2.33 (4930)
Exhaust Temperature After Turbine, °C (°F)	373 (703)	389 (732)	412 (773)	455 (850)
Max Exhaust System Back Pressure, mmHG (in H_2O)	37.3 (20.0)	NA	NA	NA
Min Exhaust System Back Pressure, mmHG (in H_2O)	18.4 (10)	NA	NA	NA

EMISSIONS

	100% of Rated Load	90% of Rated Load	75% of Rated Load	50% of Rated Load
NO_x Emissions dry, ppm	167	170	169	173
NO_x Emissions, mg/Nm^3@5% 0_2(g/hp-h)	500 (0.80)	500 (0.80)	500 (0.80)	500 (0.90)
THC Emissions wet, ppm	1268	1327	1412	1446
THC Emissions, mg/Nm^3@5% 0_2(g/hp-h)	1429 (3.00)	1479 (3.00)	1553 (3.00)	1534 (3.00)
CH_4 Emissions wet, ppm	930	1096	1160	1183
CH_4 Emission, mg/Nm^3(g/hp-h)	1061 (2.0)	1245 (2.0)	1300 (3.0)	1280 (3.0)
NMHC Emissions wet, ppm	281	231	252	263
NMHC Exhaust Emissions, mg/Nm^3(g/hp-h)	320 (0.6)	260 (0.6)	280 (0.6)	280 (0.6)
VOC wet, ppm	253	266	284	295

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EMISSIONS

	100% of Rated Load	90% of Rated Load	75% of Rated Load	50% of Rated Load
VOC, mg/Nm³(g/hp-h)	280 (0.6)	300 (0.6)	310 (0.6)	310 (0.7)
Formaldehyde wet, ppm	80	81	82	84
Formaldehyde, mg/Nm³(g/hp-h)	170 (0.3)	170 (0.3)	170 (0.3)	170 (0.4)
CO Emissions (dry), ppm	454	463	465	470
CO Emissions, mg/Nm³@5% O_2(g/hp-h)	790 (1.50)	790 (1.50)	780 (1.50)	760 (1.60)
CO_2 Emissions (dry), percent	6.4	6.5	6.7	6.9
CO_2 Emissions, mg/Nm³@5% O_2(g/hp-h)	175970 (336)	176090 (339)	176460 (347)	176310 (373)
O_2 Emissions (dry), percent	9.5	9.3	9.1	8.7
Particulates PM10, g/hp-h	<0.03	<0.03	<0.03	<0.03

ALTERNATOR DATA

Manufacturer	Mecc Alte
Alternator Made and Model	ECO 46-1L/4 A
Frequency (Hz)	50
Power (kVA)	2100
VOLTAGE (V)	400
Phase 3	3
A.V.R.	DER1
Voltage Regulation	(+/-)0.5%
Insulation System	H
Protection	IP23
Rated Power Factor	0.8
WEIGHT COMP. GENERATOR (Kg)	3810
COOLING AIR (m³/min)	135

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GENSET DE-RATING

Altitude and Temperature Derate Multiplication Factor

Barometer		Altitude		Table A								
InHg	mbar	Feet	Meters	Derate Multiplier for all operation modes								
20.7	701	9843	3000	0.74	0.74	0.72	0.68	0.65	0.61	0.57	-	-
21.4	723	9022	2750	0.76	0.76	0.75	0.71	0.67	0.63	0.59	-	-
22.1	747	8202	2500	0.79	0.79	0.77	0.73	0.69	0.65	0.61	-	-
22.8	771	7382	2250	0.82	0.82	0.80	0.76	0.72	0.67	0.63	-	-
23.5	795	6562	2000	0.85	0.85	0.83	0.78	0.74	0.70	0.65	-	-
24.3	820	5741	1750	0.88	0.88	0.86	0.81	0.77	0.72	0.67	-	-
25.0	846	4921	1500	0.90	0.91	0.88	0.84	0.79	0.74	0.70	-	-
25.8	872	4101	1250	0.93	0.93	0.91	0.86	0.82	0.77	0.72	0.67	-
26.6	899	3281	1000	0.96	0.96	0.94	0.89	0.84	0.79	0.74	0.69	-
27.4	926	2461	750	0.99	1.00	0.97	0.92	0.87	0.82	0.77	0.72	-
28.3	954	1640	500	1.00	1.00	1.00	0.95	0.90	0.85	0.79	0.74	-
29.1	983	820	250	1.00	1.00	1.00	0.98	0.93	0.87	0.82	0.76	-
29.5	995	492	150	1.00	1.00	1.00	0.99	0.94	0.89	0.83	0.77	-
30.0	1012	0	0	1.00	1.00	1.00	1.00	0.96	0.90	0.85	0.79	-
Air Filter Inlet Temperature			°C	20	25	30	35	40	45	50	55	60
			°F	68	77	86	95	104	113	122	131	140

* Based on SEA standard ambient pressure vs. atitude. Assumes LT return temperature is 10 °C above air filter inlet.

Temperature & Altitude Derate

1. Determine derate multiplier vs. temperature and altitude in Table A depending upon your operating condition.
2. Assumes the LT return temperature is 10°C above the air filter inlet with a maximum LT temperature of 50°C.
3. If the LT temperature exceeds 50°C, consult factory for recommendations.
4. Altitude is based upon SAE standard ambient pressure vs. altitude. For low barometric conditions add 150m (500 ft) to site altitude.

Altitude and Ambient Heat Rejection Factor adjustment for HT and LT Circuits

Barometer		Altitude		Table A								
InHg	mbar	Feet	Meters	Derate Multiplier for all operation modes								
20.7	701	9843	3000	1.15	1.18	1.20	1.23	1.25	1.28	1.30	-	-
21.4	723	9022	2750	1.14	1.16	1.19	1.21	1.24	1.26	1.29	-	-
22.1	747	8202	2500	1.12	1.15	1.17	1.20	1.22	1.25	1.27	-	-
22.8	771	7382	2250	1.11	1.13	1.16	1.18	1.20	1.23	1.25	-	-
23.5	795	6562	2000	1.09	1.11	1.14	1.16	1.19	1.21	1.24	-	-
24.3	820	5741	1750	1.07	1.10	1.12	1.15	1.17	1.20	1.22	-	-
25.0	846	4921	1500	1.06	1.08	1.11	1.13	1.16	1.18	1.21	-	-
25.8	872	4101	1250	1.04	1.07	1.09	1.12	1.14	1.17	1.19	1.22	-
26.6	899	3281	1000	1.03	1.05	1.08	1.10	1.13	1.15	1.18	1.20	-
27.4	926	2461	750	1.01	1.04	1.06	1.09	1.11	1.14	1.16	1.19	-
28.3	954	1640	500	1.00	1.02	1.05	1.07	1.10	1.12	1.15	1.17	-
29.1	983	820	250	0.98	1.01	1.03	1.06	1.08	1.11	1.13	1.16	-
29.5	995	492	150	0.98	1.00	1.02	1.05	1.07	1.10	1.12	1.15	-
30.0	1012	0	0	0.97	0.99	1.02	1.04	1.07	1.09	1.11	1.14	-
Air Filter Inlet Temperature			°C	20	25	30	35	40	45	50	55	60
			°F	68	77	86	95	104	113	122	131	140

* Based on SEA standard ambient pressure vs. atitude. Assumes LT return temperature is 10 °C above air filter inlet.

LT & HT Circuit Heat Rejection Calculation

1. Determine derate multiplier vs. temperature derate per above.
2. Using the multiplier from #1 above as the percent load factor determine the Heat rejection from the previous page.
3. From Table B find the HT and LT circuit multiplier.
4. Multiply the result of step 2 by the result of step 3 to obtain the heat rejection at your altitude and temperature.

Methane Number Capability

	Load (Percent of Reted)		
100%	90%	75%	50%
76	70	70	70

Notes

1) Weights and set dimesions represent a generator set with its standard features only. See outline drawing for other configurations.
2) At ISO3046 reference conditions, altitude 1013 mbar (30in Hg), air inlet temperature 25°C (77°F)
3) According to ISO 3046/I with fuel consumption tolerance of +5%, -0%
4) Production variation/tolerance ±10%.
5) With air intake at 25°C (77°F). Tolerance ± 10°C.
6) Tested using pipeline natural gas with LHV of 33.44MJ/Nm^3 (905BTU/NCF)
7) Outlet temperature controlled by thermostat. Inlet temperature for reference only. Data taken with 50% Glycol.
8) Inlet temperature controlled by thermostat, outlet temperature for reference only.
9) Without engine driven coolant pumps
10) Standby (S), Prime (P), Continuous (C)
11) At electrical output of 1.0 Power Factor, 97% Alternator Efficiency
12) Tolerance+/-15%
13) Exhaust system back pressure is at rated load and will decrease at lower loads.
14) Tolerance ±10% for 500mg, ±14% for 350mg & ±20% for 250mg
15) NA = Not Applicable
16) Tolerance +/-5%

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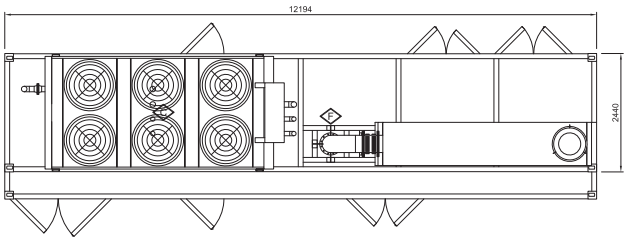
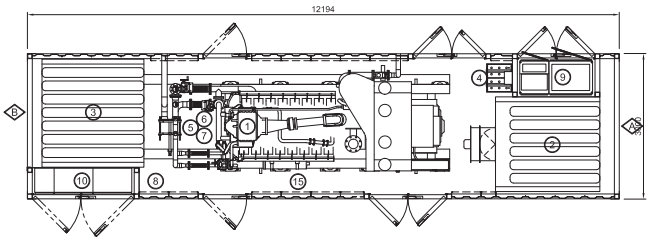
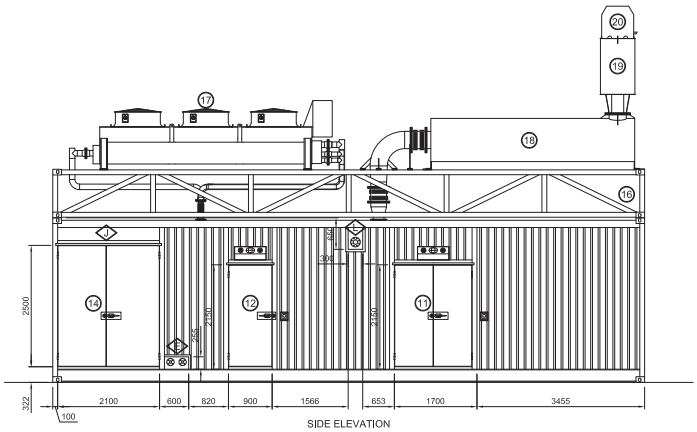
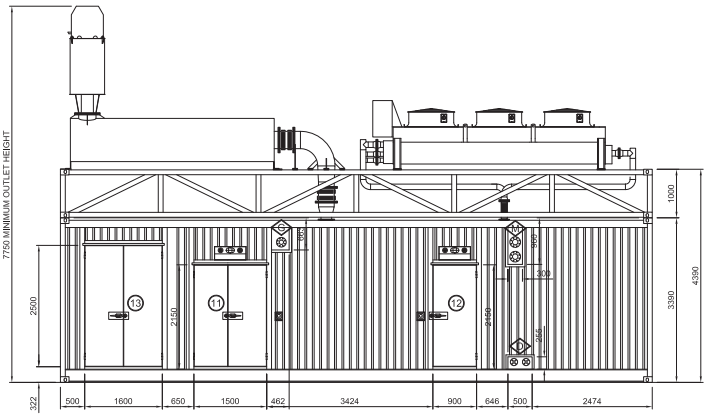






SIDE ELEVATION
SCALE 1:50 @ A1



SIDE ELEVATION
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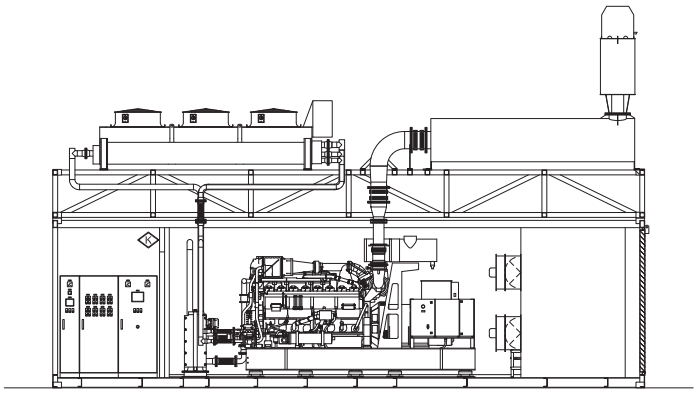
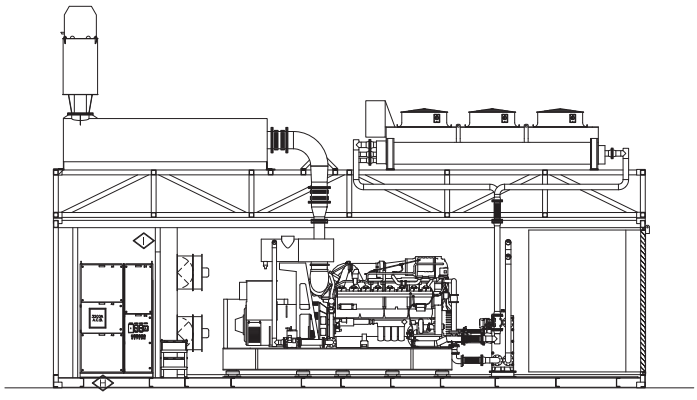


SECTION B - B
SCALE 1:50 @ A1



SECTION A - A
SCALE 1:50 @ A1

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