ELECTRIC POWER RATINGS GUIDE

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C32

DIESEL GENERATOR SETS

DIESEL

50 Hz, 6.8 – 250 kVA RATINGS

kVA		Generator Set	Engine	Configuration
Standby	Prime	Model		
Single Phase Output* 1500 rpm				
7.5	6.8	DE7.5E3S	C1.1	R96/EU Stage IIIA Equivalent
11	10	DE11E3S	C1.5	R96/EU Stage IIIA Equivalent
12	11	DE12E0S	C1.5	Low BSFC
14	13	DE14E3S	C2.2	R96/EU Stage IIIA Equivalent
16.5	15	DE16E3S	C2.2	R96/EU Stage IIIA Equivalent
26	24	DE26E0S	C3.3	Low BSFC
26	24	DE26E3S	C3.3	R96/EU Stage IIIA Equivalent
40	36	DE40E0S	C3.3	Low BSFC
40	36	DE40E2S	C3.3	R96/EU Stage II Equivalent
50	45	DE50E0S	C3.3	Low BSFC
55	50	DE55E3S	C4.4	EU Stage IIIA
90	82	DE90E2S	C4.4	R96/EU Stage II Equivalent
90	82	DE90E3S	C4.4	EU Stage IIIA
Three Phase Output 1500 rpm**				
9.5	8.5	DE9.5E3	C1.1	R96/EU Stage IIIA Equivalent
13.5	12.5	DE13.5E3	C1.5	R96/EU Stage IIIA Equivalent
16	14.5	DE16E0	C1.5	Low BSFC
18	16.5	DE18E3	C2.2	R96/EU Stage IIIA Equivalent
22	20	DE22E3	C2.2	R96/EU Stage IIIA Equivalent
33	30	DE33E0	C3.3	Low BSFC
33	30	DE33E3	C3.3	R96/EU Stage IIIA Equivalent
50	45	DE50E0	C3.3	Low BSFC
50	45	DE50E2	C3.3	R96/EU Stage II Equivalent
55	50	DE55E0	C3.3	Low BSFC
55	50	DE55E2	C4.4	R96/EU Stage II Equivalent
65	60	DE65E0	C3.3	Low BSFC
65	60	DE65E3	C4.4	EU Stage IIIA
88	80	DE88E0	C4.4	Low BSFC
88	80	DE88E3	C4.4	EU Stage IIIA
110	100	DE110E2	C4.4	R96/EUII Equivalent
110	100	DE110E3	C4.4	EU Stage IIIA
150	135	DE150E0	C7.1	Low BSFC
165	150	DE165E0	C7.1	Low BSFC
165	150	DE165E3	C7.1	R96/EU Stage IIIA Equivalent
175	160	DE175E3	C7.1	R96/EU Stage IIIA Equivalent
200	180	DE200E0	C7.1	Low BSFC
200	180	DE200E3	C7.1	R96/EU Stage IIIA Equivalent
250	230	DE250E0	C9	Low BSFC

*All ratings at 1.0 pf. **All ratings at 0.8 pf.

50 Hz, 250 – 850 kVA RATINGS

kVA		Generator Set	Engine	Configuration
Standby	Prime	Model		
1500 rpm				
275	250	DE275E0	C9	Low BSFC
275	250	DE275E3	C9	R96/EU Stage IIIA Equivalent
300	275	DE300E0	C9	Low BSFC
300	275	DE300E3	C9	R96/EU Stage IIIA Equivalent
330	300	DE330E0	C9	Low BSFC
—	350	DE350C3	C13	China Non-Road Stage III
—	400	DE400C3	C13	China Non-Road Stage III
400	350	DE400E0	C13	Low BSFC
450	400	DE450E0	C13	Low BSFC
450	400	DE450E3	C13	R96/EU Stage IIIA Equivalent
450	400	—	C15	Low BSFC
—	450	DE450C3	C15	China Non-Road Stage III
—	500	DE500C3	C15	China Non-Road Stage III
500	455	DE500E0	C15	Low BSFC
550	500	DE550E0	C15	Low BSFC
550	500	DE550E3	C15	R96/EU Stage IIIA Equivalent
605	550	DE605E0	C18	Low BSFC
—	600	DE600C3	C18	China Non-Road Stage III
660	600	DE660E0	C18	Low BSFC
700	635	—	C18	Low BSFC
715	650	DE715E0	C18	Low BSFC
780	706	DE780E0	C18	Low BSFC
850	770	DE850E0	C18	Low BSFC

50 Hz, 680 – 2500 kVA RATINGS

kVA				Generator Set Model	Configuration
Standby	Mission Critical	Prime	Continuous		
1500 rpm					
750	—	680	—	3412C	Low BSFC
800	—	725	—	3412C	Low BSFC
900	—	810	—	3412C	Low BSFC
1100	1100	1000	910	C32	Low BSFC, Low Emissions
1250	1250	1100	—	C32	Low BSFC
1250	1250	1150	1000	3512	Low BSFC
1400	1400	1275	—	C32	Low BSFC
1400	1400	1275	1206	3512	Low BSFC
1500	1500	1375	—	C32	Low BSFC
1500	1500	1360	—	3512B	Low BSFC, Low Emissions
1600	1600	1500	1320	3512B	Low BSFC, Low Emissions
1750	1750	1600	—	3512B	Low BSFC, Low Emissions
1875	1875	1700	1500	3512B	Low BSFC, Low Emissions
2000	2000	1825	1600	3516	Low BSFC
2250	2250	2000	—	3516C	< 2000 mg NOx, EPA Tier 2
2250	2250	2000	1750	3516B	Low BSFC, Low Emissions
—	—	2000	1750	3516B DGB	Low BSFC

DIESEL

50 Hz, 2500 – 4000 kVA RATINGS

kVA				Generator Set Model	Configuration
Standby	Mission Critical	Prime	Continuous		
1500 rpm					
—	—	2275	2000	3516B DGB	Low BSFC
2500	2500	2275	—	3516C	< 2000 mg NOx, EPA Tier 2
2500	2500	2275	2000	3516B	Low BSFC, Low Emissions
2750	2750	2500	—	3516C	< 2000 mg NOx, EPA Tier 2
2750	2750	2500	—	3516C	Low BSFC, EPA Tier 2
3000	3000	2750	—	3516C	EPA Tier 2
3000	3000	2750	—	3516E	< 2000 mg NOx
3000	3000	2750	—	3516E	Low BSFC
3000	3000	2725	2500	C175-16	Low BSFC, Low Emissions
3125	3125	2800	—	3516C	EPA Tier 2
3500	3500	3125	—	3516E	EPA Tier 2
3900	3900	3500	3150	C175-20	Low BSFC, Low Emissions
4000*	4000*	3600*	3250*	C175-20	Low BSFC, Low Emissions

*Rating does not include package mounted radiator.

50 Hz, 1963 – 7150 kVA RATINGS — POWER PLANT

kVA			Generator Set Model	Configuration
Standby	Prime	Continuous		
1000 rpm				
2688	2425	2200	3606	Low BSFC
3575	3250	2938	3608	Low BSFC
—	3250	2938	C280-08	IMO/U.S. EPA Tier 2
5375	4850	4400	3612	Low BSFC
—	4850	4400	C280-12	IMO/EPA Tier 2
7150	6500	5875	3616	Low BSFC
—	6500	5875	C280-16	IMO/EPA Tier 2
750 rpm				
—	1963	—	3606	Low BSFC
—	2600	—	3608	Low BSFC
—	3925	—	3612	Low BSFC
—	5200	—	3616	Low BSFC

50 Hz, 2000 – 5400 kVA RATINGS — HEAVY FUEL

Continuous		Generator Set Model*	Configuration
kVA	bkw		
1000 rpm			
2000	1680	3606	Low BSFC
2700	2240	3608	Low BSFC
4050	3360	3612	Low BSFC
5400	4480	3616	Low BSFC

*Special rating request required.

50 Hz, 1100 – 8700 kWe RATINGS — HEAVY FUEL

KWe*			Generator Set Model**	Configuration
Standby	Prime	Cont.		
1000 rpm				
1150	1100	1100	6CM20C	World Bank Certification (Stage I and II)
1500	1465	1465	8CM20C	World Bank Certification (Stage I and II)
1700	1650	1650	9CM20C	World Bank Certification (Stage I and II)
750 rpm				
1900	1735	1735	6CM25C	World Bank Certification (Stage I and II)
2000	1940	1940	6CM25E	World Bank Certification (Stage I and II)
2500	2315	2315	8CM25C	World Bank Certification (Stage I and II)
2700	2585	2585	8CM25E	World Bank Certification (Stage I and II)
2800	2600	2600	9CM25C	World Bank Certification (Stage I and II)
3000	2910	2910	9CM25E	World Bank Certification (Stage I and II)
3400	3085	3085	6CM32E	World Bank Certification (Stage I and II)
4500	4115	4115	8CM32E	World Bank Certification (Stage I and II)
5100	4630	4630	9CM32E	World Bank Certification (Stage I and II)
5880	5880	5880	12CM32C	World Bank Certification (Stage I and II)
6500	6170	6170	12CM32E	World Bank Certification (Stage I and II)
7840	7840	7840	16CM32C	World Bank Certification (Stage I and II)
8700	8230	8230	16CM32E	World Bank Certification (Stage I and II)
600 rpm				
2800	2780	2780	6CM32C	World Bank Certification (Stage I and II)
3800	3700	3700	8CM32C	World Bank Certification (Stage I and II)
4300	4170	4170	9CM32C	World Bank Certification (Stage I and II)

*Electric output depends on final generator specification.

**For CM medium speed engines a project application request is required.

DIESEL

50 Hz, 5579 – 16400 kWe RATINGS — HEAVY FUEL

KWe*			Generator Set Model**	Configuration
Standby	Prime	Cont.		
500 rpm				
6100	5579	5579	6CM43C	World Bank Certification (Stage I and II)
7100	6440	6440	7CM43C	World Bank Certification (Stage I and II)
8100	7438	7438	8CM43C	World Bank Certification (Stage I and II)
9200	8290	8290	9CM43C	World Bank Certification (Stage I and II)
12300	11170	11170	12CM43C	World Bank Certification (Stage I and II)
16400	14890	14890	16CM43C	World Bank Certification (Stage I and II)

*Electric output depends on final generator specification.
**For CM medium speed engines a project application request is required.

50 Hz, 5290 – 15100 kWe RATINGS — DUAL FUEL

KWe*			Generator Set Model**	Configuration
Standby	Prime	Contin.		
500 rpm				
5600	5290	5290	6CM46DF	World Bank Certification (Stage I and II)
6600	6170	6170	7CM46DF	World Bank Certification (Stage I and II)
7500	7050	7050	8CM46DF	World Bank Certification (Stage I and II)
8500	7930	7930	9CM46DF	World Bank Certification (Stage I and II)
11300	10580	10580	12CM46DF	World Bank Certification (Stage I and II)
15100	14110	14110	16CM46DF	World Bank Certification (Stage I and II)

*Electric output depends on final generator specification.
**For CM medium speed engines a project application request is required.

50 Hz, 30 – 2000 kVA RATINGS — RENTAL POWER

kVA			Generator Set Model	Configuration
Standby	Prime	Continuous		
1500 rpm				
33	30	—	XQP30	R96 / EU Stage IIIA Equivalent and Low BSFC
65	60	—	XQP60	EU Stage IIIA
110	100	—	XQP100	EU Stage IIIA and Low BSFC
165	150	—	XQP150	R96 / EU Stage IIIA Equivalent and Low BSFC
300	275	—	XQP275	R96 / EU Stage IIIA Equivalent
330	300	—	XQP300	Low BSFC
550	500	—	XQP500	R96 / EU Stage IIIA Equivalent and Low BSFC
1210	1100	—	XQP1100	Low BSFC
—	—	1438	XQC1200	Low BSFC / Low Emissions
—	—	1893	XQC1600	Low BSFC / Low Emissions
—	2000	1750	XQ2000 DGB™	Low BSFC

DIESEL

60 Hz, 8 – 750 ekW RATINGS

ekW		Generator Set		
Standby	Prime	Model	Engine	Configuration
Single Phase Output* 1800 rpm				
8.8	8	DE7.5E3S	C1.1	R96/EU Stage IIIA Equivalent
13	12	DE11E3S	C1.5	R96/EU Stage IIIA Equivalent
17	15.5	DE14E3S	C2.2	R96/EU Stage IIIA Equivalent
19.4	17.6	DE16E3S	C2.2	R96/EU Stage IIIA Equivalent
45	40	DE40E0S	C3.3	Low BSFC
60	55	DE50E0S	C3.3	Low BSFC
99.5	90	DE90E2S	C4.4	R96/EUII Equivalent
Three Phase Output 1800 rpm**				
8.8	8	DE9.5E3	C1.1	R96/EU Stage IIIA Equivalent
13.2	12	DE13.5E3	C1.5	R96/EU Stage IIIA Equivalent
17.6	16	DE18E3	C2.2	R96/EU Stage IIIA Equivalent
20	18	DE22E3	C2.2	R96/EU Stage IIIA Equivalent
30	27	DE33E0	C3.3	Low BSFC
45	40	DE50E0	C3.3	Low BSFC
50	45	DE55E0	C3.3	Low BSFC
60	55	DE65E0	C3.3	Low BSFC
80	72	DE88E0	C4.4	Low BSFC
100	90.4	DE110E2	C4.4	R96/EU Stage II Equivalent
132	120	DE150E0	C7.1	Low BSFC
150	135	DE165E0	C7.1	Low BSFC
175	160	DE200E0	C7.1	Low BSFC
200	180	DE200SE0	C9	Low BSFC
250	225	DE250SE0	C9	Low BSFC
275	250	DE275SE0	C9	Low BSFC
300	270	DE300SE0	C9	Low BSFC
300	275	DE300SE3	C9	R96/EU Stage IIIA Equivalent
350	320	DE350SE0	C13	Low BSFC
400	350	DE400SE0	C13	Low BSFC
450	410	DE450SE0	C15	Low BSFC
500	455	DE500SE0	C15	Low BSFC
550	500	DE550SE0	C18	Low BSFC
600	545	DE600SE0	C18	Low BSFC
716	650	DE715SE0	C18	Low BSFC
750	680	DE750SE0	C18	Low BSFC

*All ratings at 1.0 pf.
**All ratings at 0.8 pf.
ESE = “EPA Stationary Emergency”.

60 Hz, 8 – 200 ekW RATINGS

EPA Stationary Emergency – North America.

ekW		Generator Set Model	Engine	Configuration
Standby	Prime			
Single Phase Output* 1800 rpm				
8.8	8	DE7.5E3S	C1.1	ESE
13	12	DE11E3S	C1.5	ESE
17	15.5	DE14E3S	C2.2	ESE
19.4	17.6	DE16E3S	C2.2	ESE
40	36	D40S	C4.4	ESE
50	45	D50S	C4.4	ESE
60	55	D60S	C4.4	ESE
80	72	D80S	C4.4	ESE
100	90	D100S	C4.4	ESE
Three Phase Output** 1800 rpm				
8.8	8	DE9.5E3	C1.1	ESE
13.2	12	DE13.5E3	C1.5	ESE
17.6	16	DE18E3	C2.2	ESE
20	18	DE22E3	C2.2	ESE
40	36	D40	C4.4	ESE
50	45	D50	C4.4	ESE
60	55	D60	C4.4	ESE
80	72	D80	C4.4	ESE
100	90	D100	C4.4	ESE
125	114	D125	C7.1	ESE
150	136	D150	C7.1	ESE
175	158	D175	C7.1	ESE
200	—	D200	C7.1	ESE

*All ratings at 1.0 pf.
**All ratings at 0.8 pf.
ESE = “EPA Stationary Emergency”.

60 Hz, 180 – 4000 ekW RATINGS

ekW				Generator Set Model	Configuration
Standby	Mission Critical	Prime	Continuous		
Three Phase Output** 1800 rpm					
200	—	180	—	C9	ESE
250	—	225	—	C9	ESE
300	—	275	—	C9	ESE
350	—	320	—	C13	ESE
400	—	350	—	C13	ESE
450	—	410	—	C15	ESE
500	—	455	—	C15	ESE
500	—	455	—	C18	EPA Tier 4 Final
550	—	500	—	C18	ESE
600	—	545	—	C18	ESE
650	—	600	—	C18	ESE
700	—	635	—	C18	ESE
700	—	635	—	3412C	Low BSFC
750	—	680	—	C18	ESE
750	—	680	—	C27	ESE, Low BSFC
750	—	680	—	3412C	Low BSFC
800	800	725	—	C27	ESE, Low BSFC
800	—	725	—	3412C	Low BSFC
1000	1000	910	830	C32	ESE, Low BSFC
1100	1100	1000	890	3512	Low BSFC
1100	1100	1000	—	C32	ESE, Low BSFC
1250	1250	1135	—	C32	ESE, Low BSFC
1250	1250	1135	1010	3512	Low BSFC
1400	1400	1275	—	3512B	Low BSFC, Low Emissions
1500	1500	1360	1230	3512B	Low BSFC, Low Emissions
1500	1500	1360	1230	3512C	ESE
1750	1750	1600	—	3512C	ESE
1750	1750	1600	1450	3516	Low BSFC
2000	2000	1825	1640	3516B	Low BSFC, Low Emissions
—	—	1825	1640	3516B DGB	Low BSFC
2000	2000	1825	1650	3516C	EPA Tier 4 Final, ESE
2250	2250	2000	—	3516B	Low BSFC
2500	2500	2250	2050	3516C	EPA Tier 4 Final, ESE
2750	2750	2500	—	3516E	ESE
3000	3000	2725	2500	C175-16	EPA Tier 4 Final, ESE, Low BSFC
3900	3900	3500	3150	C175-20	ESE, Low BSFC
4000*	4000*	3600*	3250*	C175-20	ESE, Low BSFC

ESE = “EPA Stationary Emergency”. *Rating does not include package mounted radiator.
*All ratings at 0.8 pf.

60 Hz, 1525 – 5320 ekW RATINGS — POWER PLANT

ekW			Generator Set Model	Configuration
Standby	Prime	Continuous		
900 rpm				
2000	1820	1650	3606	Low BSFC
2660	2420	2200	3608	Low BSFC
—	2420	2200	C280-8*	EPA Tier 4 Final
4000	3640	3300	3612	Low BSFC
—	3640	3300	C280-12*	EPA Tier 4 Final
5320	4840	4400	3616	Low BSFC
—	4840	4400	C280-16*	EPA Tier 4 Final
720 rpm				
—	1525	—	3606	Low BSFC
—	2020	—	3608	Low BSFC
—	3050	—	3612	Low BSFC
—	4040	—	3616	Low BSFC

*Tier 4 Final is met using AVERAGE, BANKING, and TRADING PROGRAM.

60 Hz, 1500 – 4000 ekW RATINGS — HEAVY FUEL

Continuous		Generator Set Model*	Configuration
ekW	bkw		
900 rpm			
1500	1570	3606	Low BSFC
2000	2090	3608	Low BSFC
3000	3140	3612	Low BSFC
4000	4180	3616	Low BSFC

*Special rating request required.

DIESEL

60 Hz, 985 – 8700 kWe RATINGS — HEAVY FUEL

KWe*			Generator Set Model**	Configuration
Standby	Prime	Contin.		
900 rpm				
1000	985	985	6CM20C	World Bank Certification (Stage I and II)
1380	1310	1310	8CM20C	World Bank Certification (Stage I and II)
1500	1475	1475	9CM20C	World Bank Certification (Stage I and II)
720 rpm				
1900	1735	1735	6CM25C	World Bank Certification (Stage I and II)
2000	1940	1940	6CM25E	World Bank Certification (Stage I and II)
2500	2315	2315	8CM25C	World Bank Certification (Stage I and II)
2700	2585	2585	8CM25E	World Bank Certification (Stage I and II)
2800	2600	2600	9CM25C	World Bank Certification (Stage I and II)
3000	2910	2910	9CM25E	World Bank Certification (Stage I and II)
3400	3085	3085	6CM32E	World Bank Certification (Stage I and II)
4500	4115	4115	8CM32E	World Bank Certification (Stage I and II)
5100	4630	4630	9CM32E	World Bank Certification (Stage I and II)
5880	5880	5880	12CM32C	World Bank Certification (Stage I and II)
6500	6170	6170	12CM32E	World Bank Certification (Stage I and II)
7840	7840	7840	16CM32C	World Bank Certification (Stage I and II)
8700	8230	8230	16CM32E	World Bank Certification (Stage I and II)
600 rpm				
2800	2780	2780	6CM32C	World Bank Certification (Stage I and II)
3800	3700	3700	8CM32C	World Bank Certification (Stage I and II)
4300	4170	4170	9CM32C	World Bank Certification (Stage I and II)

*Electric output depends on final generator specification.
**For CM medium speed engines a project application request is required.

60 Hz, 5579 – 16400 kWe RATINGS — HEAVY FUEL

KWe*			Generator Set Model**	Configuration
Standby	Prime	Contin.		
514 rpm				
6100	5579	5579	6CM43C	World Bank Certification (Stage I and II)
7100	6440	6440	7CM43C	World Bank Certification (Stage I and II)
8100	7438	7438	8CM43C	World Bank Certification (Stage I and II)
9200	8290	8290	9CM43C	World Bank Certification (Stage I and II)
12300	11170	11170	12CM43C	World Bank Certification (Stage I and II)
16400	14890	14890	16CM43C	World Bank Certification (Stage I and II)

*Electric output depends on final generator specification.
**For CM medium speed engines a project application request is required.

60 Hz, 5290 – 15100 kWe RATINGS — DUAL FUEL

KWe*			Generator Set Model**	Configuration
Standby	Prime	Contin.		
514 rpm				
5600	5290	5290	6CM46DF	World Bank Certification (Stage I and II)
6600	6170	6170	7CM46DF	World Bank Certification (Stage I and II)
7500	7050	7050	8CM46DF	World Bank Certification (Stage I and II)
8500	7930	7930	9CM46DF	World Bank Certification (Stage I and II)
11300	10580	10580	12CM46DF	World Bank Certification (Stage I and II)
15100	14110	14110	16CM46DF	World Bank Certification (Stage I and II)

*Electric output depends on final generator specification.
**For CM medium speed engines a project application request is required.

DIESEL

60 Hz, 28 – 1705 ekW AND 34 – 625 kVA RATINGS — RENTAL POWER

ekW			Generator Set Model	Configuration
Standby	Prime	Continuous		
1800 rpm				
31	28	—	XQP30	Low BSFC
60	55	—	XQP60	Low BSFC
88	80	—	XQP100	Low BSFC
149	135	—	XQP150	Low BSFC
302	275	—	XQP300	Low BSFC
460	420	—	XQP500	Low BSFC
1067	970	—	XQP1100	Low BSFC
—	—	1260	XQC1200	Low BSFC, Low Emissions
—	—	1705	XQC1600	Low BSFC, Low Emissions
kVA			**Generator Set Model**	**Configuration**
Standby	**Prime**	**Continuous**		
1800 rpm				
38	34	—	XQ35	EPA Tier 4 Final
—	59	—	XQ60	EPA Tier 4 Final
138	125	—	XQ125	EPA Tier 4 Final
250	225	—	XQ230	EPA Tier 4 Final
469	425	—	XQ425	EPA Tier 4 Final
625	568	—	XQ570	EPA Tier 4 Final

DEFINITIONS

Standby Power

Output available with varying load for the duration of the interruption of the normal source power. Average power output is 70% of the standby power rating. Typical operation is 200 hours per year, with maximum expected usage of 500 hours per year.

Mission Critical

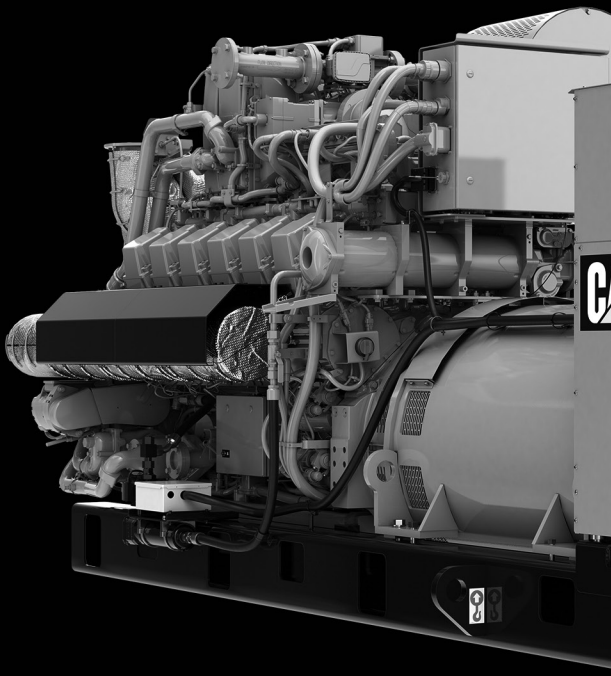
Output available with varying load for the duration of the interruption of the normal source power. Average power output is 85% of the mission critical power rating. Typical peak demand up to 100% of rated power for up to 5% of the operating time. Typical operation is 200 hours per year, with maximum expected usage of 500 hours per year.

Prime Power

Output available with varying load for an unlimited time. Average power output is 70% of the prime power rating. Typical peak demand of 100% of prime-rated ekW with 10% of overload capability for emergency use for a maximum of 1 hour in 12. Overload operation cannot exceed 25 hours per year.

Continuous Power

Output available without varying load for an unlimited time. Average power output is 70 – 100% of the continuous power rating. Typical peak demand is 100% of continuous rated ekW for 100% of operating hours.



G3512H 50 Hz

GAS GENERATOR SETS

50 Hz, 158 – 400 kVA RATINGS — NATURAL GAS

kVA		Generator Set Model	Engine
Standby	Prime		
Three Phase Output* 1500 rpm			
175	158	DG175-1 GC	14.2
200	180	DG200-1 GC	14.2
230	207	DG230-1 GC	14.2
250	225	DG250-1 GC	14.2
275	248	DG275-1 GC	14.2
300	270	DG300-1 GC	14.2
350	315	DG350-1 GC	21.9
400	360	DG400-1 GC	21.9

*All ratings at 0.8 pf.

50 Hz, 374 – 2300 ekW RATINGS — NATURAL GAS

eKW Continuous*	Generator Set Model**
1500 rpm	
374	G3412C
400	CG132B-8
600	CG132B-12
800	CG132B-16
983	G3516
1000	CG132B-16
1000	CG170-12
1016	G3512E
1088	G3516B
1125	CG170-12
1200	CG170-12
1211	G3512E
1500	G3512H
1500	CG170-16
1560	CG170-16
1603	G3516C
1976	G3520C
2000	CG170-20
2300	CG170B-20

*All ratings at 0.8 pf. *Electric output depends on final generator specification.
^ World Bank Certification (Stage I and II) & Dual Fuel Capable
**For CM medium speed engines a project application request is required.

50 Hz, 3333 – 14110 ekW RATINGS — NATURAL GAS

eKW Continuous*	Generator Set Model**
1000 rpm	
3333	CG260-12
4300	CG260-16
4500	CG260-16
750 rpm	
6580	G16CM34
10300	G20CM34
500 rpm	
5290	6CM46DF ^
6170	7CM46DF ^
7050	8CM46DF ^
7930	9CM46DF ^
10580	12CM46DF ^
14110	16CM46DF ^

*All ratings at 0.8 pf. *Electric output depends on final generator specification.
^ World Bank Certification (Stage I and II) & Dual Fuel Capable
**For CM medium speed engines a project application request is required.

50 Hz, 174 – 3510 ekW RATINGS — BIOGAS

ekW Continuous*	Generator Set Model
1500 rpm	
174	G3412
400	CG132B-8
600	CG132B-12
800	CG132B-16
1000	CG170-12
1041	G3516
1105	G3516+
1200	CG170-12
1560	CG170-16
2000	CG170-20
2300	CG170B-20
1000 rpm	
3510	CG260-16

*All ratings at 0.8 pf.

50 Hz, 5290 – 15100 kWe RATINGS — DUAL FUEL

KWe*			Generator Set Model**	Configuration
Standby	Prime	Contin.		
750 RPM				
6580	6580	6580	G16CM34	TA-Luft 2002
10300	10300	10300	G20CM34	TA-Luft 2002

*Electric output depends on final generator specification.
**For CM medium speed engines a project application request is required.

60 Hz, 50 – 150 ekW RATINGS — NATURAL GAS

ekW Standby	Generator Set Model	Engine	Configuration
Single Phase Output† 1800 rpm			
50	DG50-2S	5.7	ESE
50	DG50-4S	5.7	SCAQMD
60	DG60-2S	5.7	ESE
60	DG60-4S	5.7	SCAQMD
80	DG80-2S	5.7	ESE
100	DG100-2S	5.7	ESE
Three Phase Output* 1800 rpm			
50	DG50-2	5.7	ESE
50	DG50-4	5.7	SCAQMD
60	DG60-2	5.7	ESE
60	DG60-4	5.7	SCAQMD
80	DG80-2	5.7	ESE
100	DG100-2	5.7	ESE
125	DG125-2	8.8	ESE
150	DG150-2	8.8	ESE

† All ratings at 1.0 pf.
*All ratings at 0.8 pf.
ESE = “EPA Stationary Emergency”.
SCAQMD = “South Coast Air Quality Management District”.

60 Hz, 175 – 2500 ekW RATINGS — NATURAL GAS

ekW Standby	Generator Set Model	Engine	Configuration
Three Phase Output* 1800 rpm			
175	DG175-2 GC	14.2	ESE
175	DG175-1 GC	14.2	–
200	DG200-2 GC	14.2	ESE
200	DG200-1 GC	14.2	–
230	DG230-2 GC	14.2	ESE
230	DG230-1 GC	14.2	–
250	DG250-2 GC	14.2	ESE
250	DG250-1 GC	14.2	–
275	DG275-2 GC	14.2	ESE
275	DG275-1 GC	14.2	–
300	DG300-2 GC	14.2	ESE
300	DG300-1 GC	14.2	–
350	DG350-2 GC	21.9	ESE
350	DG350-1 GC	21.9	–
400	DG400-2 GC	21.9	ESE
400	DG400-1 GC	21.9	–
450	DG450-2 GC	21.9	ESE
450	DG450-1 GC	21.9	–
423	G3412C	G3412C	–
500	G3412C	G3412C	–
500	G3412	G3412	EPA
750	G3512	G3512	EPA
1000	G3512	G3512	EPA
2000	G3520	G3520	EPA
2500	G3520	G3520	EPA

*All ratings at 0.8 pf.
The following Certifications are applicable for US Sales:
ESE = “EPA Stationary Emergency”.
SCAQMD = “South Coast Air Quality Management District”.
EPA = “EPA Non-Emergency”

60 Hz, 253 – 14100 ekW RATINGS — NATURAL GAS

eKW Continuous*	Generator Set Model**
1800 rpm	
253	G3412
400	CG132B-8
423	G3412
453	G3412C
600	CG132B-12
800	CG132B-16
1300	G3516
1663	G3516C
2077	G3520C
1500 rpm	
1125	CG170-12
1200	CG170-12
1490	G3512H
1500	CG170-16
1560	CG170-16
2000	CG170-20
2008	G3516H
2026	G3520E
900 rpm	
3000	CG260-12
4000	CG260-16
4050	CG260-16
750 rpm	
6580	G16CM34
9800	G20CM34
514 rpm	
5290	6CM46DF ^
6170	7CM46DF ^
7050	8CM46DF ^
7930	9CM46DF ^
10580	12CM46DF ^
14110	16CM46DF ^

*All ratings at 0.8 pf. *Electric output depends on final generator specification.
^ World Bank Certification (Stage I and II) & Dual Fuel Capable
**For CM medium speed engines a project application request is required.

60 Hz, 194 – 3510 ekW RATINGS — BIOGAS

ekW Continuous	Generator Set Model
Three Phase Output* 1800 rpm	
194	G3412
400	CG132B-8
600	CG132B-12
800	CG132B-16
824	G3516
1000	G3516+
1626	G3520C
1500 rpm	
1200	CG170-12
1560	CG170-16
1936	G3520C
2000	CG170-20
900 rpm	
3510	CG260-16

*All ratings at 0.8 pf.

60 Hz, 50 – 140 ekW RATINGS — PROPANE GAS

ekW Standby	Generator Set Model	Engine	Configuration
Single Phase Output† 1800 rpm			
50	DG50-2S	5.7	ESE
50	DG50-4S	5.7	SCAQMD
57	DG60-2S	5.7	ESE
57	DG60-4S	5.7	SCAQMD
90	DG100-2S	5.7	ESE
Three Phase Output* 1800 rpm			
50	DG50-2	5.7	ESE
50	DG50-4	5.7	SCAQMD
57	DG60-2	5.7	ESE
57	DG60-4	5.7	SCAQMD
92	DG100-2	5.7	ESE
140	DG150-2	8.8	ESE

†All ratings at 1.0 pf.

*All ratings at 0.8 pf.

The following Certifications are applicable for US Sales:

ESE = “EPA Stationary Emergency”.

SCAQMD = “South Coast Air Quality Management District”.

GAS

60 Hz, 6580 – 9800 kWe RATINGS — DUAL FUEL

KWe*			Generator Set Model**	Configuration
Standby	Prime	Contin.		
750 RPM				
6580	6580	6580	G16CM34	TA-Luft 2002
9800	9800	9800	G20CM34	TA-Luft 2002

*Electric output depends on final generator specification.
**For CM medium speed engines a project application request is required.

50 – 60 Hz, 135 – 1900 ekW RATINGS — RENTAL POWER

ekW Continuous	Generator Set Model	Configuration
1800 rpm		
135	XG135	Factory certified US EPA Nonroad and Stationary SI Engine
400	XG400	Factory certified US EPA Nonroad SI Engine
1500 – 1800 rpm		
1475	XQ1475	US EPA NSPS SI Capable
1500 rpm		
1900	XGC1900	–

DEFINITIONS

Standby Power Rating

Output available with varying load for the duration of an emergency outage. Average power output is 70% of the standby power rating. Typical operation is 200 hours per year, with maximum expected usage of 500 hours per year.

Prime Power

Output available with varying load for an unlimited time. Average power output is 70% of the prime power rating. Typical peak demand of 100% of prime-rated ekW with 10% of overload capability for emergency use for a maximum of 1 hour in 12. Overload operation cannot exceed 25 hours per year.

Continuous Power Rating

Output available with non-varying load for an unlimited time. Average power output is 70-100% of the continuous power rating. Typical peak demand is 100% of continuous rated ekW for 100% of operating hours.

RENEWABLE HYBRID ENERGY SOLUTIONS

RENEWABLE HYBRID SOLUTIONS

Photovoltaic (PV) Module

Model	Power Output	Type
PVT117	117.5 watt per panel	Thin Film
PVC365 MP	365 watt per panel	Monocrystalline PERC
PVC395 MP	395 watt per panel	Monocrystalline PERC

Inverter Options – UL Listed

Output	Voltage	Frequency
50 kW	480V, 3 Phase	60 Hz
30 kW	480V, 3 Phase	60 Hz
24 kW	480V, 3 Phase	60 Hz
20 kW	480V, 3 Phase	60 Hz
15 kW	480V, 3 Phase	60 Hz
12 kW	480V, 3 Phase	60 Hz
7.7 kW	208V – 240V, 1 Phase	60 Hz
7 kW	208V – 240V, 1 Phase	60 Hz
6 kW	208V – 240V, 1 Phase	60 Hz
5 kW	208V – 240V, 1 Phase	60 Hz
3.8 kW	208V – 240V, 1 Phase	60 Hz
3 kW	208V – 240V, 1 Phase	60 Hz

Inverter Options – CE Mark

Output	Voltage	Frequency
50 kW	400V, 3 Phase	50 – 60 Hz
25 kW	380V – 415V, 3 Phase	50 – 60 Hz
20 kW	380V – 415V, 3 Phase	50 – 60 Hz
15 kW	380V – 415V, 3 Phase	50 – 60 Hz
12 kW	380V – 415V, 3 Phase	50 – 60 Hz
10 kW	380V – 415V, 3 Phase	50 – 60 Hz
9 kW	380V – 415V, 3 Phase	50 – 60 Hz
8 kW	380V – 415V, 3 Phase	50 – 60 Hz
7 kW	380V – 415V, 3 Phase	50 – 60 Hz
6 kW	380V – 415V, 3 Phase	50 – 60 Hz
5 kW	380V – 415V, 3 Phase	50 – 60 Hz
5 kW	220V – 240V, 1 Phase	50 – 60 Hz
4 kW	220V – 240V, 1 Phase	50 – 60 Hz
3.6 kW	220V – 240V, 1 Phase	50 – 60 Hz
3 kW	220V – 240V, 1 Phase	50 – 60 Hz

Inverter Options – Domestic China

Output	Voltage	Frequency
40 kW	380V – 415V, 3 Phase	50 Hz
33 kW	380V – 415V, 3 Phase	50 Hz
20 kW	380V – 415V, 3 Phase	50 Hz
17 kW	380V – 415V, 3 Phase	50 Hz
15 kW	380V – 415V, 3 Phase	50 Hz
10 kW	380V – 415V, 3 Phase	50 Hz
8 kW	380V – 415V, 3 Phase	50 Hz
6 kW	380V – 415V, 3 Phase	50 Hz
5 kW	380V – 415V, 3 Phase	50 Hz
4 kW	380V – 415V, 3 Phase	50 Hz
3 kW	380V – 415V, 3 Phase	50 Hz
5 kW	220V – 240V, 1 Phase	50 Hz
3 kW	220V – 240V, 1 Phase	50 Hz

RENEWABLE HYBRID SOLUTIONS

ENERGY STORAGE SYSTEMS

Grid Stability Modules

Grid Stability modules provide a pre-engineered solution to energy storage needs. The modules integrate with diesel or gas generator sets, photovoltaic (PV), or other renewable systems to provide short duration power. The module holds closely regulated system voltage and frequency during periods of rapid load addition or removal, or during periods of intermittent output from the renewables.

Model	1 Minute Output	30 Minute Output
PGS375	375 kW	250 kW
PGS750	750 kW	500 kW
PGS860	860 kW	500 kW
PGS1125	1125 kW	750 kW
PGS1290	1290 kW	750 kW
PGS1875	1875 kW	1250 kW

Energy Time Shift Module

Energy Time Shift modules provide a pre-engineered solution to energy storage needs. The scalable system integrates with photovoltaic (PV) or other renewable systems to store energy from renewables, generator sets, or the grid for use at a later time.

Model	Rated Power	Discharge Time
ES287H250	250 kW	1 hour
ES1.0H250 MW	250 kW	4 hour
ES1.8H250 MW	250 kW	7.2 hour
ES2.3H250 MW	250 kW	10 hour
ES1.2H1.0 MW	1000 kW	1 hour

MICROGRID MASTER CONTROLLERS (MMC)

MMC-S

The MMC-S is designed for residential and small business installations. It integrates the photovoltaic (PV) system, generator set, and energy storage system to provide renewable capacity penetration up to 60%.

MMC-M

The MMC-M is designed for industrial and small community installation. It integrates with the photovoltaic (PV) system, generator set, and energy storage system to provide renewable capacity penetration of greater than 60%. The MMC-M provides black start capability and performs load management functions.

MMC-L

The MMC-L is designed for large industrial, campus, and distributed resource installations. It integrates with the photovoltaic (PV) system, generator set, and energy storage system to provide renewable capacity penetration of greater than 60%. The MMC-L can control distributed assets and provides black start capability and load management functions.


RP6500
CAT

HOME AND OUTDOOR POWER PRODUCTS

GASOLINE

60 Hz 3600 rpm

USA and Canada

Model	Engine cc	Running Watts	Starting Watts	Output Volts
INV2000	80 OHV	1800	2250	120V
RP3600	212 OHV	3600	4500	120V
RP5500	300 OHV	5500	6875	120V – 240V
RP6500E	420 OHV	6500	8125	120V – 240V
RP7500E	420 OHV	7500	9375	120V – 240V
RP12000E	670 OHV Twin	12000	15000	120V – 240V

EPA, CARB and CSA compliant models are available.
All ratings are Single Phase at 1.0 pf.

Further information available at: cat.com/portablepower


CAT
RP7500

EMCP 4


CAT
ACK
RESET
EVENT LOG
RUN
AUTO
STOP
F1
F2
F3
F4
OK
CONTROL
AC
ENGINE
MAIN MENU
EMCP 4.4
AUTO
Hz
V
DANGER
WARNING
AUTO

EMCP 4

EMCP 4.1

The EMCP 4.1 provides basic engine controls – stop/run/auto push button controls, cycle crank, and cool down timer. The 3.8 inch graphical display supports multiple languages, including character languages such as Chinese, Arabic, Russian, and Japanese. The EMCP 4.1 provides monitoring of generator electrical output, including AC voltage, current, frequency, and mechanical information such as oil pressure, coolant temperature, engine speed, and battery voltage along with fuel level if a sensor is provided. It also provides a number of protective functions, such as warnings and shutdowns for over/under voltage, over/under frequency, low oil pressure, high coolant temperature, low coolant level, failure to start, and overspeed.

EMCP 4.2

The EMCP 4.2 builds on the features of the EMCP 4.1 controller, offering expanded engine monitoring based on information available from the engine ECM, along with expanded generator set protection and monitoring, such as generator kW, kVA, and kWh.

Flexibility is also increased with the addition of a modbus RTU communication port, remote annunciator modules, and expansion I/O modules to allow the EMCP 4 system to be configured to meet site specific design requirements.

With the additional monitoring and expansion modules available, the EMCP 4.2 is designed to provide control and protection for critical installations, such as NFPA-110 Level 1 applications.

EMCP 4.2B

The EMCP 4.2B adds advanced features to the EMCP 4.2 controller, offering expanded generator set protection and monitoring, such as additional overcurrent protection curve selection, real (kW) load histogram, trip kWh and trip kVArh. Display screens are configurable for customer desired parameters.

An integrated basic programmable logic control (PLC) function to read controller inputs and drive controller outputs is also provided with the EMCP 4.2B.

EMCP 4.3

The EMCP 4.3 further expands the EMCP 4 product line with the addition of 5.5 inch graphical display and additional context specific navigation keys.

With the addition of a Modbus TCP port, the EMCP 4.3 controller can be easily integrated into complex systems requiring complete generator set monitoring.

EMCP 4.4

The EMCP 4.4 builds on the EMCP 4.3 functionality with the addition of fully automatic multi generator set paralleling. The EMCP 4.4 provides all of the functions required to automatically parallel generator sets, including dead bus arbitration, automatic or manual modes of operation, and load sharing (real and reactive). Optional provisions allow for extended parallel operation of a single generator with Utility for Base Load/Import/Export capability.


CAT
NEMA TYPE 1
ENCLOSURE
INDOOR USE ONLY
SPACE
DANGER
TAP BOX


SYSTEMS
PRODUCTS

PRODUCT FEATURE COMPARISON

Description	EMCP 4.4	(1G1U)	EMCP 4.4 SCP	EMCP 4.4 Master (EGP)	(XLM)
Operating Modes					
Emergency Standby / Island Mode	●	●	●	●	●
Utility Paralleling	–	●	–	–	●
System Capacity					
Number of Units	8 – Hardwired 16 – MGDL	1	16	8 (Standard)	8 (Standard)
Voltages					
Voltage	●	●	●	●	●
	(208V - 15 kV)				
Generator Paralleling Functions					
Dead Bus Arbitration	●	●	(Note 2)	●	●
Synchronization	●	●		(Note 2)	(Note 2)
Load Sharing	●	–		●	●
Load Sense / Load Demand (LS / LD)	●	–		●	●
LS / LD – Engine Hours Balancing	●	–		●	●
Load Shed / Load Add Stages	Up to 4 (Note 1)	●	16	8	8
Utility Paralleling Functions					
Base Load Control	●	●	–	–	●
Load Management / Peak Shaving (Utility)	–	●	–	–	●
Utility Transfer / Control	–	●	–	–	●
Utility Protection Relaying (Industrial Grade)	–	●	–	–	●

Notes:

(1) Includes 1 fully featured load shed stage (feeder breaker control) plus 3 programmable generator set kW-based load shed stages.

(2) Function included as part of the system – performed by the EMCP 4.4 Generator Set Controller.

Other: Multi-Gen Data Link (MGDL).

KEY

● – Standard
– Not Available

	EXL	EPIC	Configurable Switchgear	Custom Switchgear
	Single Generator to Utility Paralleling with Optional Switchgear	Modular Control Panels Ideal for Adding Additional Generation Capacity	Configurable Controls and Switchgear with Standardized Sequence of Operations	Design to Order Switchgear with Customizable Sequence of Operations
	●	●	●	●
	●	●	●	●
	1	≤12	≤12	Unlimited
	●	●	●	●
	(208V – 38 kV)			
	●	●	●	●
	●	●	●	●
	–	●	●	●
	–	●	●	●
	–	–	–	–
	–	●	●	●
	–	–	–	–
	●	●	●	●
	●	●	●	●
	●	–	●	●

SYSTEMS PRODUCTS

ATS

Operating Modes:

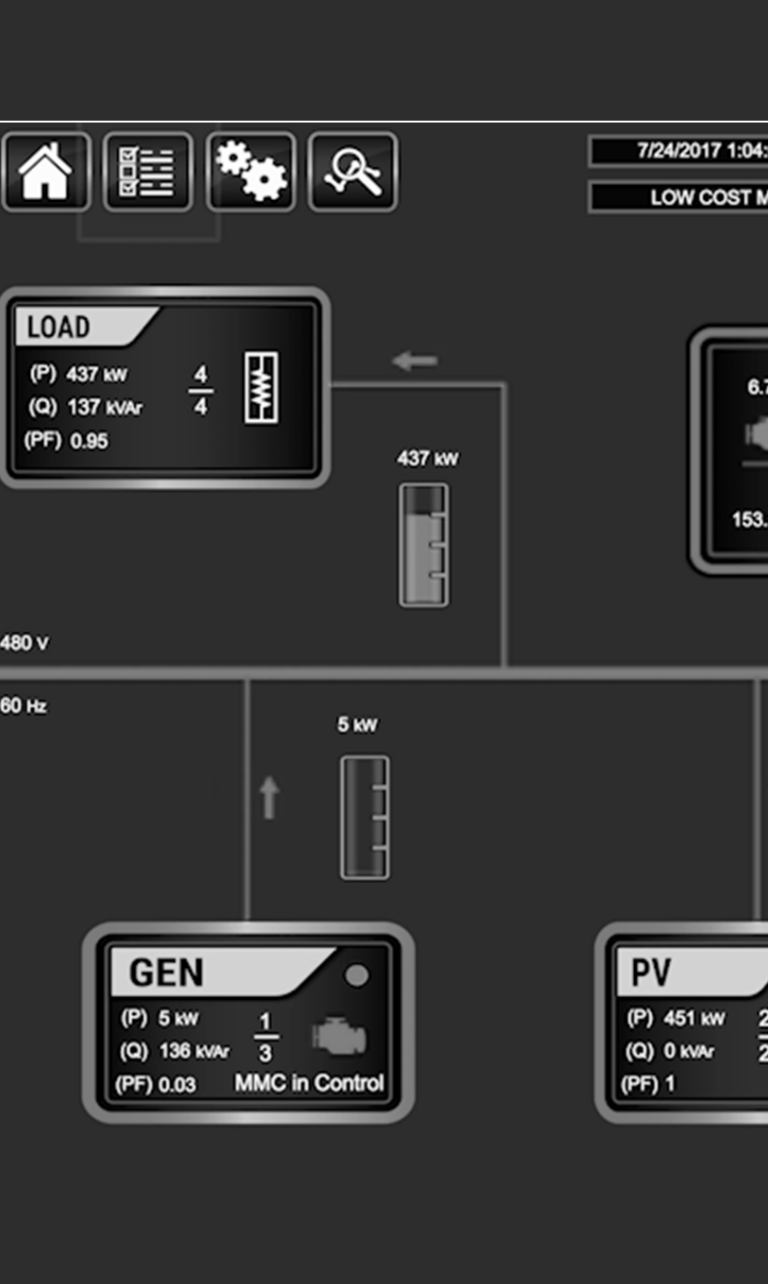
- Open Transition
- Closed Transition
- Delayed Transition
- Bypass Isolation

ATC Line

Amp Rating	Poles	Type
40 – 3000	2,3,4	Contactor
30 – 1000	2,3,4	MCCB
200 – 5000	2,3,4	Power Breaker

MX Line

Product	Amp Range	Enclosures	Controllers
CTX	40A – 400A	NEMA1, 3R	MX60
CTG	40A – 3000A	NEMA1, 3R, 4,4X 12	MX150
CTGD	40A – 3000A	NEMA1, 3R, 4,4X 12	MX150
CTGSE	40A – 3000A	NEMA1, 3R, 12	MX150
CTS	40A – 4000A	NEMA1, 3R, 4,4X 12	MX150
CTSD	40A – 4000A	NEMA1, 3R, 4,4X 12	MX250
CTSCT	100A – 4000A	NEMA1, 3R, 4,4X 12	MX250
CBTS/D	100A – 4000A	NEMA1, 3R, 4,4X 12	MX250
CBTSCT	100A – 4000A	NEMA1, 3R, 4,4X 12	MX250
CTE	40A – 4000A	NEMA1, 3R, 4,4X 12	MX250
CTED	40A – 4000A	NEMA1, 3R, 4,4X 12	MX250
CTECT	100A – 4000A	NEMA1, 3R, 4,4X 12	MX250
CBTE/D	100A – 4000A	NEMA1, 3R, 4,4X 12	MX250
CBTECT	100A – 4000A	NEMA1, 3R, 4,4X 12	MX250
CT30D/CT	1600A – 3000A	NEMA1, 3R	MX250, MX350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5 kW
GEN
(P) 5 kW
(Q) 136 kVAr
(PF) 0.03
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MMC in Control
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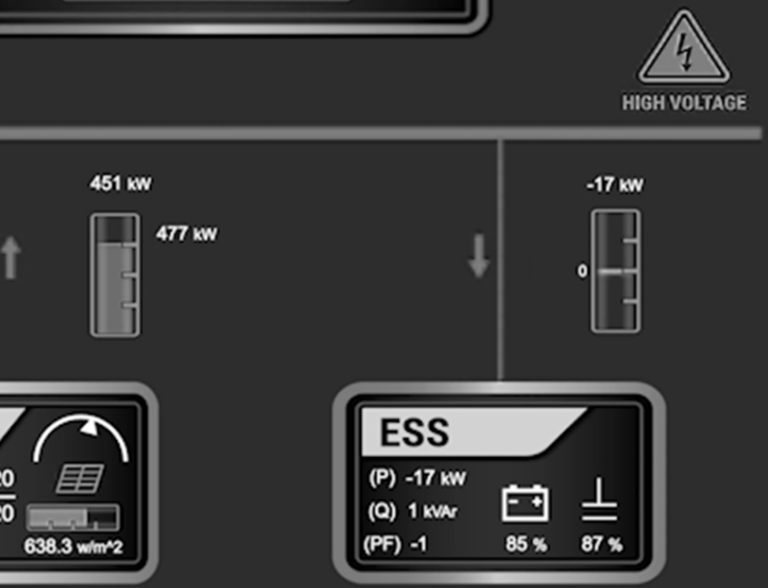
(PF) 1

CAT® CONNECT AND PRODUCT SUPPORT



CAT CONNECT

TECHNOLOGIES AND SERVICES

Remote Asset Monitoring with Cat® Connect turns data into insights and choices into profits.

- Remotely access information about a single unit or an entire fleet.
- Know more about asset health and performance with the easy-to-use web interface
- Make more informed decisions with accurate information available at your fingertips.
- Leverage Caterpillar's expertise to get higher performance and longer life at a lower total cost.

There are several Cat Connect offerings to meet your needs; standard features include:

- View generator set's ready to run status & location
- Status updates on engine & electrical parameters
- Visualization of asset's historical performance
- Events and Diagnostics to support remote troubleshooting
- Customize alerts by text or email to be sent in real time
- Geo-fencing
- Unlimited # of users.

Enhanced features add:

- Increased Data Channels and Frequency
- Customer defined Data Channels
- 3rd party device support
- Enhanced graphing- adjustable periods
- Advanced Data Discovery.

DATA PRIVACY OVERVIEW – YOUR DATA, OUR VALUES

Enroll now with confidence, knowing you're working with a partner who will:

- Be transparent about data collection
- Protect the data we collect
- Respect the data rights of others.

HIGH LEVEL SECURITY OVERVIEW

Designed with multi-layer security controls and safeguards, to protect against unauthorized access and disclosure.

- Cryptographic security controls to protect against unauthorized software changes
- Encrypted and authenticated remote connection
- Only outbound remote connection initiated by the device is allowed; does not participate in or respond to general Internet traffic
- Caterpillar IT infrastructure secured utilizing generally accepted information security principles and practices
- Secure web application connection with user login authentication and role-based access control

PRODUCT SUPPORT

PRODUCT SUPPORT DEFINITIONS

Extended Service Coverage (ESC)

Depending on the model and application, Silver, Gold, Platinum and Platinum Plus coverage levels are available from Caterpillar with terms to meet most applications, whether prime or standby.

Platinum and Platinum Plus provide additional allowances for overtime, emergency freight, rental, crane and rigging support. Please see the registration contract for details.

Equipment	Coverage Option
New Product	New ESC
Existing Product	Advantage ESC
Overhauls	OPC*

Electric Power ESC reimburses covered parts at customer list price, labor at selling rates and travel and mileage charges (less any deductibles) for covered repairs.

Available worldwide for all Cat Electric Power Products, ESC provides usual and customary parts and labor costs for covered system failures due to defects in materials and workmanship on components over the duration of the covered period.

This is a brief description of Extended Coverage. See your Cat dealer for more information. The Extended Coverage contract will govern.

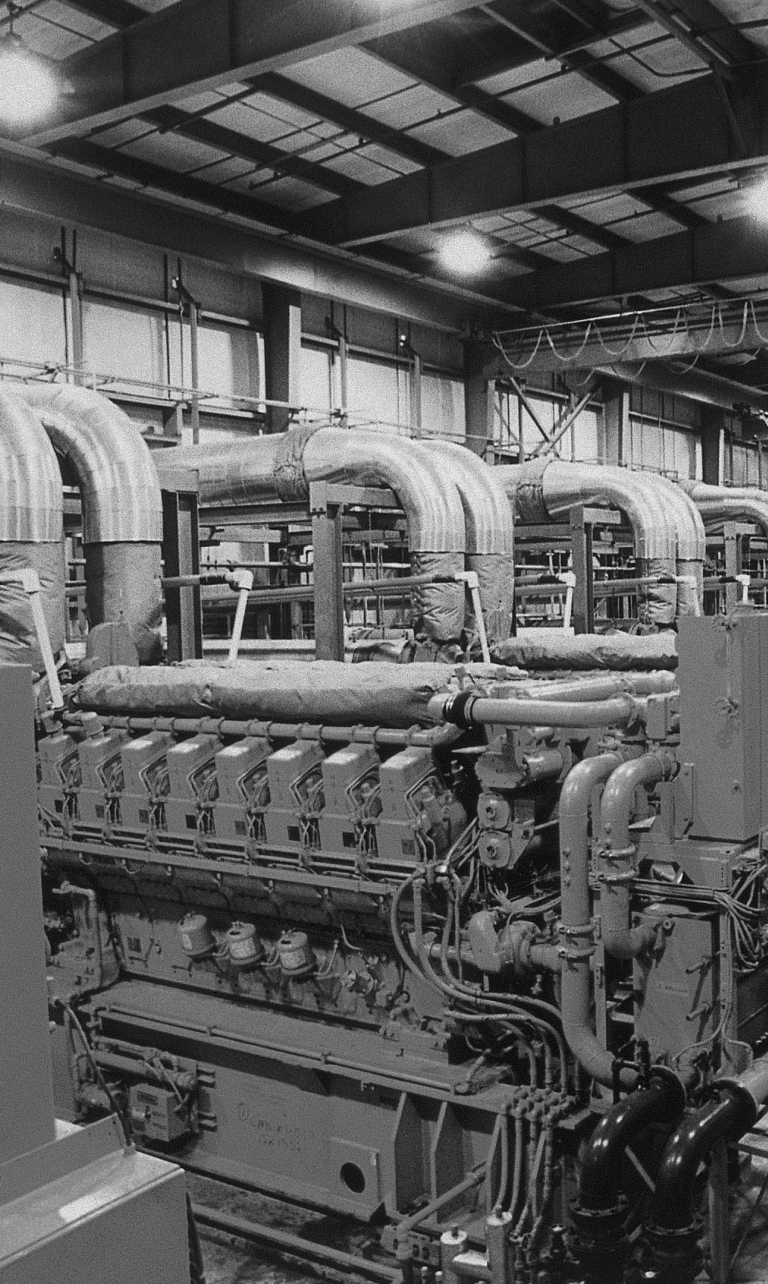
*Overhaul Protection Coverage.

CUSTOMER SUPPORT AGREEMENTS

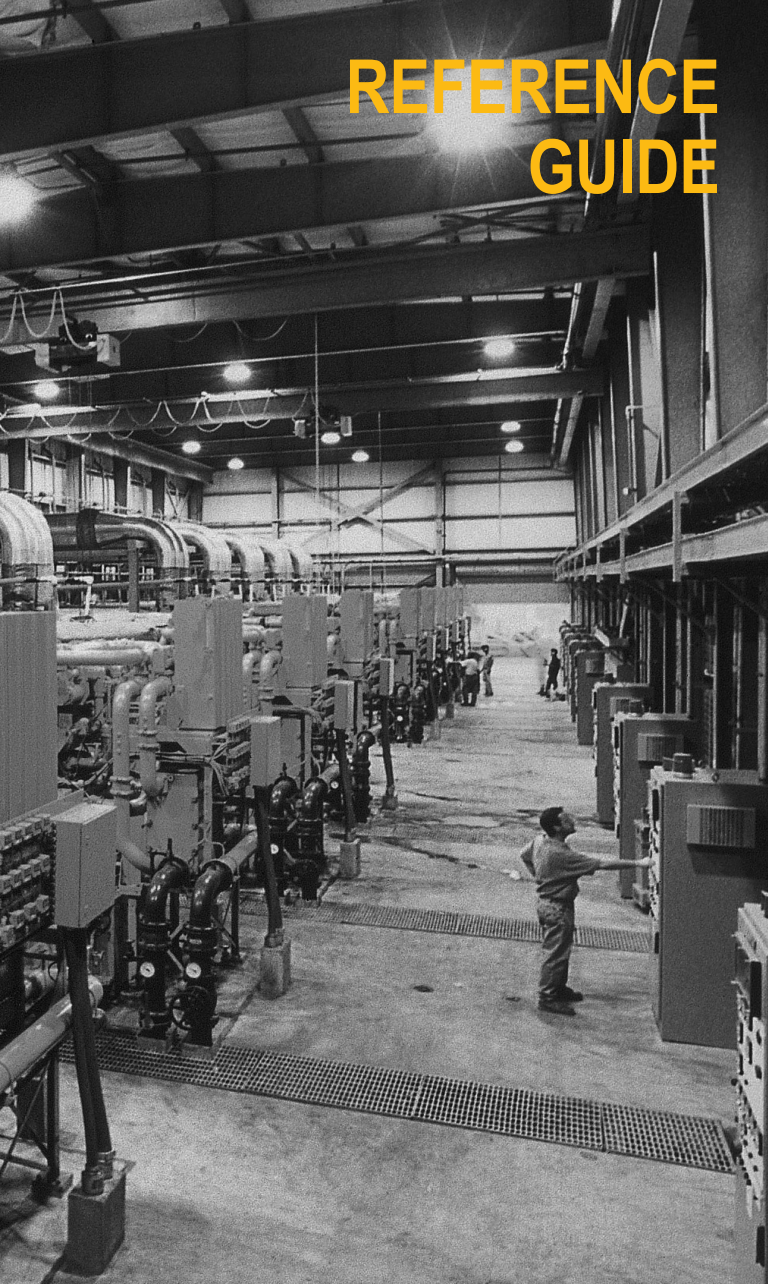
- A **Customer Support Agreement** (CSA) is an arrangement between the end user and the Cat dealer that helps lower the cost per unit of production.
- Agreements are tailored to fit your business needs and can range from simple Preventive Maintenance Kits to sophisticated Total Cost Performance Guarantees.
- Qualified Factory Trained dealer technicians assist you by maintaining your Cat Electric Power Products and driving down operating costs. Perhaps the most important feature of any CSA is flexibility.
- A **Preventive Maintenance** (PM) agreement covers specified maintenance at a fixed cost. You maintain reliability and efficiency because the maintenance is performed by highly skilled technicians at guaranteed costs, giving you the ability to budget more accurately.
- A **Total Maintenance and Repair** (TM&R) agreement covers all of the maintenance and repair costs. Instead of paying for maintenance or repairs as they are needed, you pay one flat rate to cover a broad range of parts and services.

	PM	TM&R
Detailed inspections by highly skilled technicians	✓	✓
Scheduled maintenance	✓	✓
Labor and travel costs	✓	✓
Use of genuine Cat parts, fluids and filters	✓	✓
S•O•S℠ Services and interpretation	✓	✓
Component repairs	–	✓
All unscheduled repairs, including wear out, with no exclusions, limitations or deductibles	–	✓

Check with your local Cat dealer for available options with each agreement.



REFERENCE GUIDE



REFERENCE

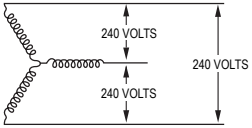
ELECTRICAL TABLES

To Obtain	Alternating Current		Direct Current
	Single-Phase	Three-Phase	
kW	$\frac{V \times I \times P.F.}{1000}$	$\frac{1.732 \times V \times I \times P.F.}{1000}$	$\frac{V \times I}{1000}$
kVA	$\frac{V \times I}{1000}$	$\frac{1.732 \times V \times I}{1000}$	–
Horsepower required when kW known (Generator)	$\frac{kW}{.746 \times EFF. (Gen)}$	$\frac{kW}{.746 \times EFF. (Gen)}$	$\frac{kW}{.746 \times EFF. (Gen)}$
kW input when HP known (Motor)	$\frac{HP \times .746}{EFF. (Mot.)}$	$\frac{HP \times .746}{EFF. (Mot.)}$	$\frac{HP \times .746}{EFF. (Mot.)}$
Amperes when HP known	$\frac{HP \times .746}{V \times P.F. \times EFF.}$	$\frac{HP \times .746}{1.732 \times V \times EFF. \times P.F.}$	$\frac{HP \times .746}{V \times EFF.}$
Amperes when kW known	$\frac{kW \times 1000}{V \times P.F.}$	$\frac{kW \times 1000}{1.732 \times V \times P.F.}$	$\frac{kW \times 1000}{V}$
Amperes when kVA known	$\frac{kVA \times 1000}{V}$	$\frac{kVA \times 1000}{1.732 \times V}$	–
Frequency Hz	$\frac{Poles \times RPM}{120}$	$\frac{Poles \times RPM}{120}$	–
Reactive kVA (kVAr)	$\frac{V \times I \times \sqrt{1-(P.F.)^2}}{1000}$	$\frac{1.732 \times V \times I \times \sqrt{1-(P.F.)^2}}{1000}$	–
% Voltage Regulation	$\frac{100 (V_{NL}-V_{FL})}{V_{FL}}$	$\frac{100 (V_{NL}-V_{FL})}{V_{FL}}$	$\frac{100 (V_{NL}-V_{FL})}{V_{FL}}$

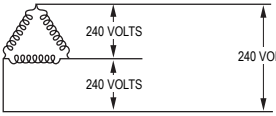
ELECTRICAL TABLE ABBREVIATIONS:

V – voltage in volts
I – current in amperes
kW – power in kilowatts (actual power)
kVA – kilovolt-amperes (apparent power)
HP – horsepower
RPM – revolutions per minute
kVAr – reactive kilovolt-amperes
EFF. – efficiency as a decimal factor
NL – no load
FL – full load
P.F. – power factor
Note: DC kW = DC kVA

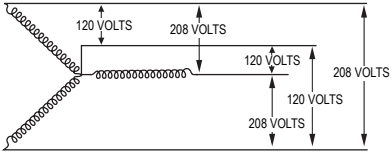
THREE-PHASE CONNECTION SYSTEMS



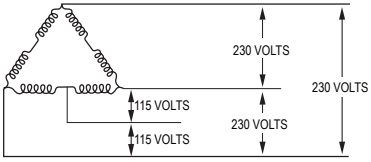
THREE-PHASE, THREE-WIRE (WYE)
A



THREE-PHASE, THREE-WIRE (DELTA)
B



THREE-PHASE, FOUR-WIRE (WYE)
C



THREE-PHASE, FOUR-WIRE (DELTA)
D

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