GENERATOR DATA

JANUARY 17, 2023

(AT400240)-ENGINE (BAA126422A)-CEM

For Help Desk Phone Numbers Click here

Selected Model

Engine: C15	**Generator Frame:** LC6124F	**Genset Rating (kW):** 440.0	**Line Voltage:** 400
Fuel: Diesel	**Generator Arrangement:** 2351212	**Genset Rating (kVA):** 550.0	**Phase Voltage:** 230
Frequency: 50	**Excitation Type:** AREP	**Pwr. Factor:** 0.8	**Rated Current:** 793.9
Duty: STANDBY	**Connection:** SERIES STAR	**Application:** EPG	**Status:** Current

Version: 40059 /40001 /40151 /2728

Spec Information

Generator Specification

Frame: LC6124F **Type:** LC	**No. of Bearings:** 1
Winding Type: RANDOM WOUND	**Flywheel:** 14.0
Connection: SERIES STAR	**Housing:** 1
Phases: 3	**No. of Leads:** 12
Poles: 4	**Wires per Lead:** 2
Sync Speed: 1500	**Generator Pitch:** 0.6667

Generator Efficiency

Per Unit Load	kW	Efficiency %
0.25	110.0	93.2
0.5	220.0	94.9
0.75	330.0	94.7
1.0	440.0	94.3

Reactances	Per Unit	Ohms
SUBTRANSIENT - DIRECT AXIS X''_d	0.1217	0.0354
SUBTRANSIENT - QUADRATURE AXIS X''_q	0.1619	0.0471
TRANSIENT - SATURATED X'_d	0.1746	0.0508
SYNCHRONOUS - DIRECT AXIS X_d	3.3753	0.9819
SYNCHRONOUS - QUADRATURE AXIS X_q	2.0247	0.5890
NEGATIVE SEQUENCE X_2	0.1413	0.0411
ZERO SEQUENCE X_0	0.0107	0.0031

Time Constants	Seconds
OPEN CIRCUIT TRANSIENT - DIRECT AXIS T'_{d0}	1.9300
SHORT CIRCUIT TRANSIENT - DIRECT AXIS T'_d	0.1000
OPEN CIRCUIT SUBSTRANSIENT - DIRECT AXIS T''_{d0}	0.0130
SHORT CIRCUIT SUBSTRANSIENT - DIRECT AXIS T''_d	0.0100
OPEN CIRCUIT SUBSTRANSIENT - QUADRATURE AXIS T''_{q0}	0.1250
SHORT CIRCUIT SUBSTRANSIENT - QUADRATURE AXIS T''_q	0.0100
EXCITER TIME CONSTANT T_e	0.0300
ARMATURE SHORT CIRCUIT T_a	0.0150

Short Circuit Ratio: 0.37	Stator Resistance = 0.0091 Ohms	Field Resistance = 0.9837 Ohms

Voltage Regulation

Voltage level adjustment: +/-	5.0%
Voltage regulation, steady state: +/-	0.5%
Voltage regulation with 3% speed change: +/-	0.5%
Waveform deviation line - line, no load: less than	2.0%
Telephone influence factor: less than	50

Generator Excitation

	No Load	Full Load, (rated) pf	
		Series	Parallel
Excitation voltage:	10.2 Volts	48.23 Volts	Volts
Excitation current	1.0 Amps	3.89 Amps	Amps

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Generator Mechanical Information

Center of Gravity

Dimension X	-505.0 mm	-19.9 IN.
Dimension Y	0.0 mm	0.0 IN.
Dimension Z	0.0 mm	0.0 IN.

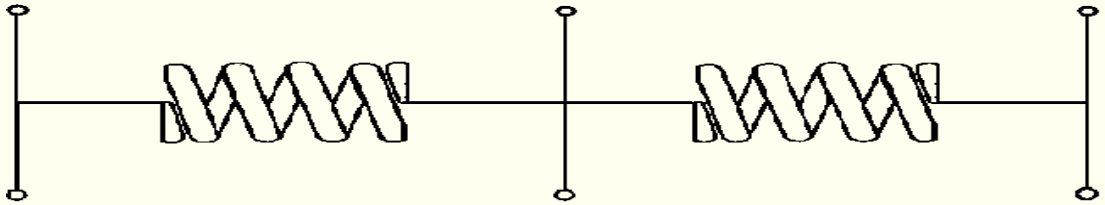
- "X" is measured from driven end of generator and parallel to rotor. Towards engine fan is positive. See General Information for details
- "Y" is measured vertically from rotor center line. Up is positive.
- "Z" is measured to left and right of rotor center line. To the right is positive.

Generator WT = 1260 kg * Rotor WT = 495 kg * Stator WT = 765 kg
2,778 LB 1,091 LB 1,687 LB

Rotor Balance = 0.0508 mm deflection PTP

Overspeed Capacity = 150% of synchronous speed

Generator Torsional Data



J1 = Coupling and Fan | **J2 = Rotor** | **J3 = Exciter End**

TOTAL J = J1 + J2 + J3

K1 = Shaft Stiffness between J1 + J2 (Diameter 1)

K2 = Shaft Stiffness between J2 + J3 (Diameter 2)

J1	K1	Min Shaft Dia 1	J2	K2	Min Shaft Dia 2	J3
17.1 LB IN. s^2	48.9 MLB IN./rad	4.5 IN.	49.6 LB IN. s^2	36.3 MLB IN./rad	4.3 IN.	1.5 LB IN. s^2
1.93 N m s^2	5.53 MN m/rad	115.0 mm	5.6 N m s^2	4.1 MN m/rad	110.0 mm	0.17 N m s^2

Total J

68.2 LB IN. s^2

7.7 N m s^2

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Generator Cooling Requirements - Temperature - Insulation Data

Cooling Requirements:		**Temperature Data: (Ambient 27 ^{0}C)**	
Heat Dissipated:	26.6 kW	**Stator Rise:**	163.0 ^{0}C
Air Flow:	54.0 m^3/min	**Rotor Rise:**	163.0 ^{0}C

Insulation Class: H

Insulation Reg. as shipped: 100.0 MΩ minimum at 40 ^{0}C

Thermal Limits of Generator

Frequency:	50 Hz
Line to Line Voltage:	400 Volts
B BR 80/40	408.0 kVA
F BR -105/40	464.0 kVA
H BR - 125/40	510.0 kVA
F PR - 130/40	510.0 kVA
H PR - 150/40	541.0 kVA
H PR27 - 163/27	561.0 kVA

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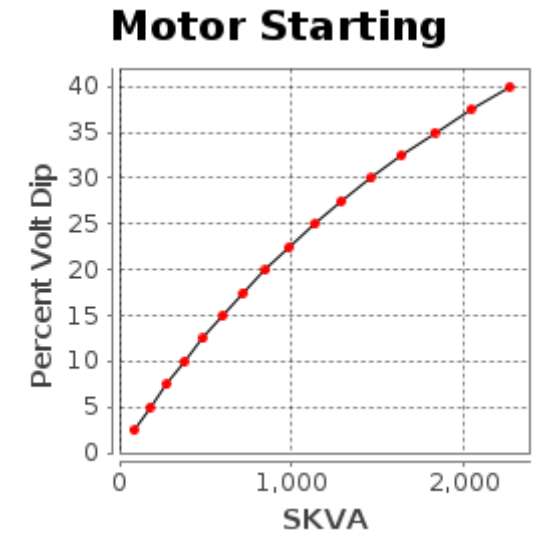
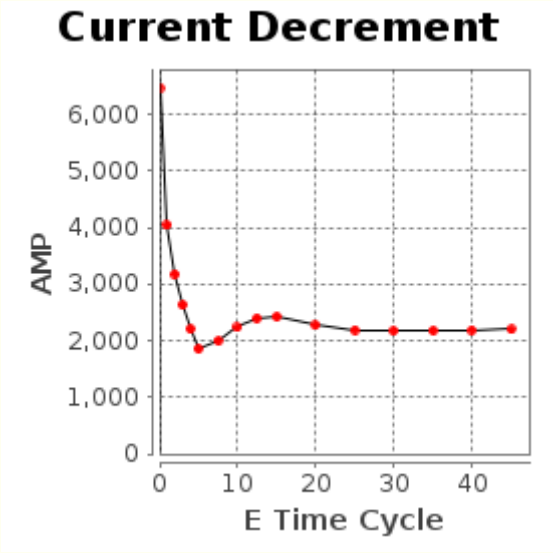
Starting Capability & Current Decrement
Motor Starting Capability (0.6 pf)

SKVA	Percent Volt Dip
87	2.5
179	5.0
275	7.5
377	10.0
485	12.5
599	15.0
720	17.5
849	20.0
986	22.5
1,132	25.0
1,288	27.5
1,455	30.0
1,635	32.5
1,828	35.0
2,037	37.5
2,264	40.0



Current Decrement Data

E Time Cycle	AMP
0.0	6,476
1.0	4,043
2.0	3,181
3.0	2,634
4.0	2,207
5.0	1,860
7.5	1,999
10.0	2,235
12.5	2,402
15.0	2,428
20.0	2,275
25.0	2,193
30.0	2,176
35.0	2,182
40.0	2,191
45.0	2,198



Instantaneous 3 Phase Fault Current: 6476 Amps **Instantaneous Line - Line Fault Current:** 5191 Amps

Instantaneous Line - Neutral Fault Current: 8640 Amps

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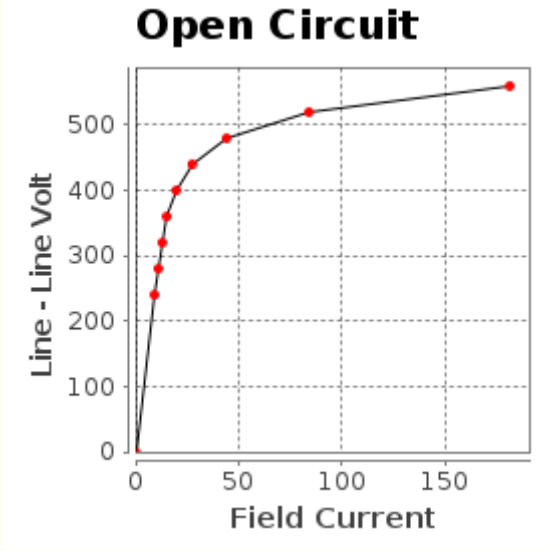
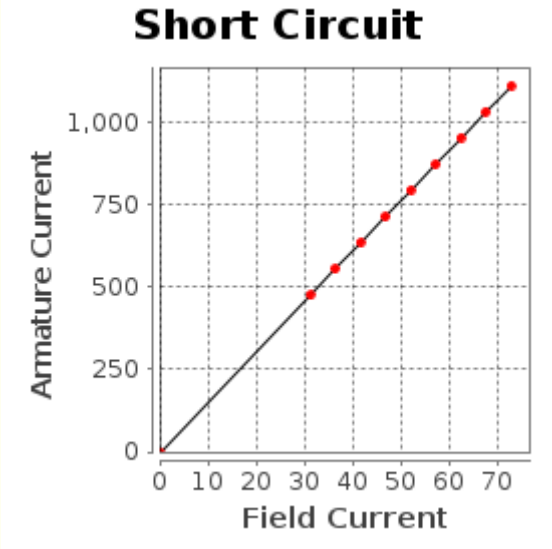
Generator Output Characteristic Curves
Open Circuit Curve

Field Current	Line - Line Volt
0.0	0
9.4	240
11.1	280
13.0	320
15.5	360
19.6	400
27.3	440
44.2	480
84.2	520
181.6	560



Short Circuit Curve

Field Current	Armature Current
0.0	0
31.2	476
36.4	556
41.6	635
46.8	714
52.0	794
57.2	873
62.4	953
67.6	1,032
72.8	1,111



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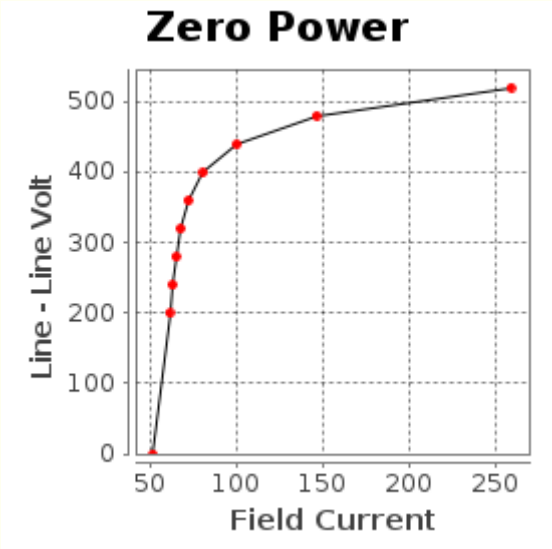
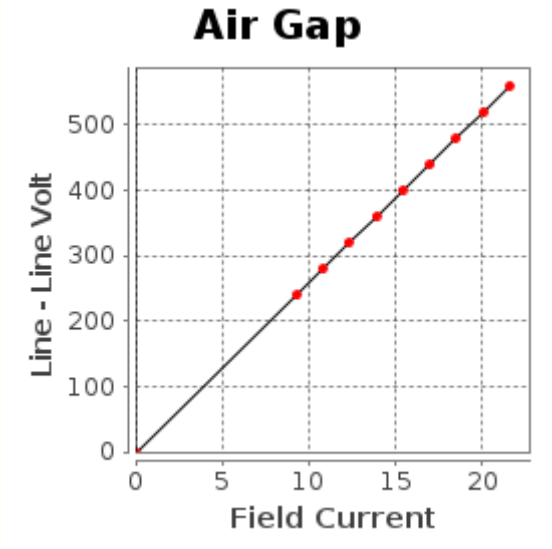
Generator Output Characteristic Curves
Zero Power Factor Curve

Field Current	Line - Line Volt
52.0	0
61.5	200
63.3	240
65.3	280
68.0	320
72.4	360
81.1	400
100.5	440
146.6	480
259.4	520



Air Gap Curve

Field Current	Line - Line Volt
0.0	0
9.3	240
10.8	280
12.3	320
13.9	360
15.4	400
17.0	440
18.5	480
20.1	520
21.6	560



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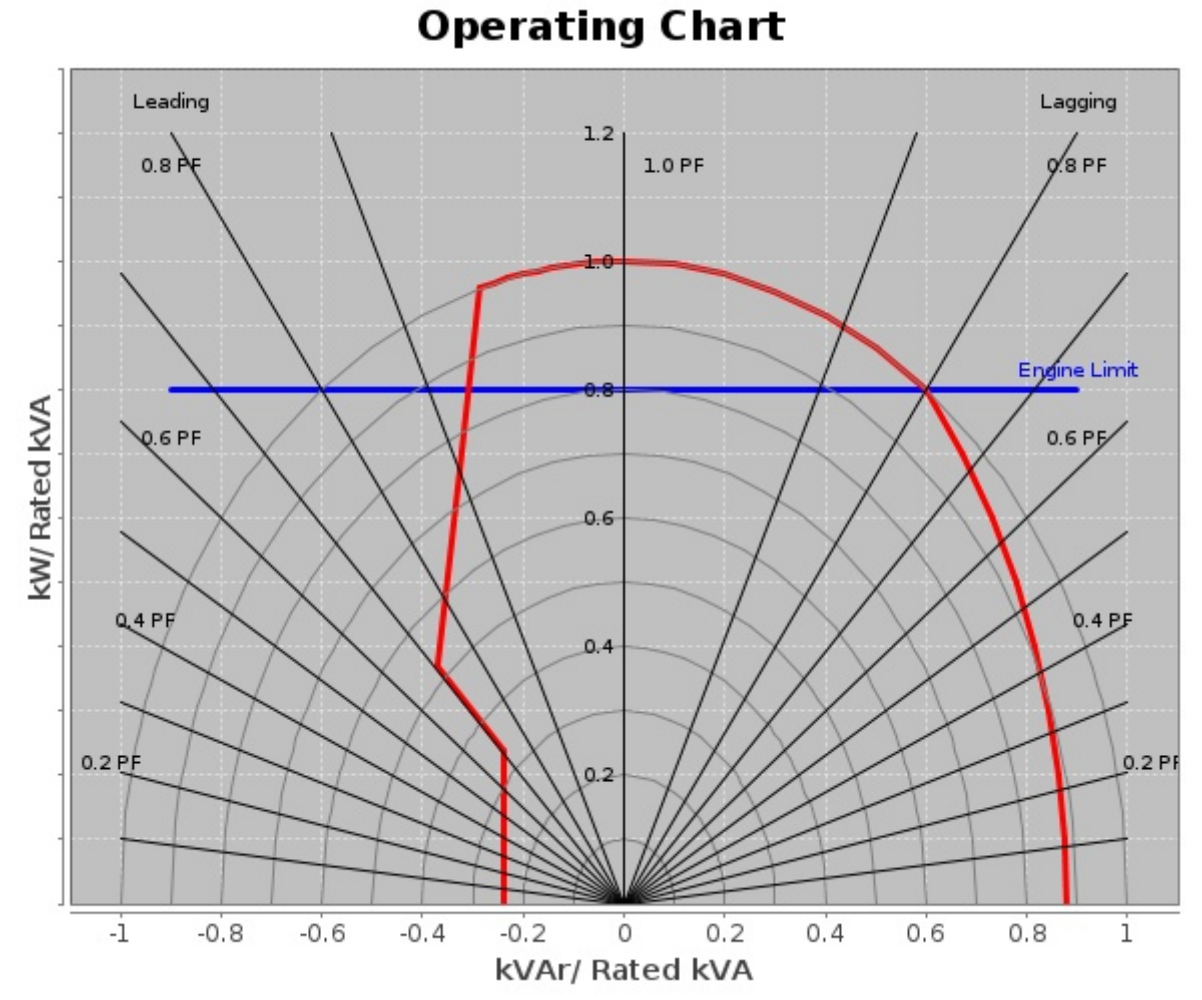
Reactive Capability Curve



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General Information

GENERATOR INFORMATION (DM7900)

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1. Motor Starting
Motor starting curves are obtained in accordance with IEC60034, and are displayed at 0.6 power factor.

2. Voltage Dip
Prediction of the generator synchronous voltage dip can be made by consulting the plot for the voltage dip value that corresponds to the desired motor starting kVA value.

3. Definitions
A) Generator Keys
Frame: abbreviation of generator frame size
Freq: frequency in hertz.
PP/SB: prime/standby duty respectively
Volts: line - line terminal voltage
kW: rating in electrical kilo watts
Model: engine sales model

B) Generator Temperature Rise
The indicated temperature rises are the IEC/NEMA limits for standby or prime power applications. The quoted rise figures are maximum limits only and are not necessarily indicative of the actual temperature rise of a given machine winding.

C) Centre of Gravity
The specified centre of gravity is for the generator only. For single bearing, and two bearing close coupled generators, the center of gravity is measured from the generator/engine flywheel-housing interface and from the centreline of the rotor Shaft.

For two bearing, standalone generators, the center of gravity is measured from the end of the rotor shaft and from the centerline of the rotor shaft.

D) Generator Current Decrement Curves
The generator current decrement curve indicates the generator armature current arising from a symmetrical three-phase fault at the generator terminals. Generators equipped with AREP or PMG excitation systems will sustain 300% of rated armature current for 10 seconds.

E) Generator Efficiency Curves
The efficiency curve is displayed for the generator only under the given conditions of rating, voltage, frequency and power factor. This is not the overall generating set efficiency curve.