

GENERATOR DATA

AUGUST 28, 2020

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Selected Model

Engine: C7.1 **Generator Frame:** LC5014F **Genset Rating (kW):** 160.0 **Line Voltage:** 415
Fuel: Diesel **Generator Arrangement:** 4594435 **Genset Rating (kVA):** 200.0 **Phase Voltage:** 240
Frequency: 50 **Excitation Type:** Self Excited **Pwr. Factor:** 0.8 **Rated Current:** 278.2
Duty: PRIME **Connection:** SERIES STAR **Application:** EPG **Status:** Current

Version: 41764 /41764 /42060 /13932

Spec Information

Generator Specification		Generator Efficiency			
Frame: LC5014F	Type: LC	No. of Bearings: 1	Per Unit Load	kW	Efficiency %
Winding Type: RANDOM WOUND		Flywheel: 11.5	0.25	40.0	90.4
Connection: SERIES STAR		Housing: 2	0.5	80.0	92.8
Phases: 3		No. of Leads: 12	0.75	120.0	92.9
Poles: 4		Wires per Lead: 1	1.0	160.0	92.3
Sync Speed: 1500		Generator Pitch: 0.6667	1.1	176.0	92.0

Reactances	Per Unit	Ohms
SUBTRANSIENT - DIRECT AXIS X'' _d	0.0823	0.0709
SUBTRANSIENT - QUADRATURE AXIS X'' _q	0.1017	0.0876
TRANSIENT - SATURATED X' _d	0.1370	0.1180
SYNCHRONOUS - DIRECT AXIS X _d	2.7940	2.4060
SYNCHRONOUS - QUADRATURE AXIS X _q	1.6757	1.4430
NEGATIVE SEQUENCE X ₂	0.0915	0.0788
ZERO SEQUENCE X ₀	0.0046	0.0040

Time Constants	Seconds
OPEN CIRCUIT TRANSIENT - DIRECT AXIS T' _{d0}	2.0420
SHORT CIRCUIT TRANSIENT - DIRECT AXIS T' _d	0.1000
OPEN CIRCUIT SUBTRANSIENT - DIRECT AXIS T'' _{d0}	0.0170
SHORT CIRCUIT SUBTRANSIENT - DIRECT AXIS T'' _d	0.0100
OPEN CIRCUIT SUBTRANSIENT - QUADRATURE AXIS T'' _{q0}	0.1650
SHORT CIRCUIT SUBTRANSIENT - QUADRATURE AXIS T'' _q	0.0100
EXCITER TIME CONSTANT T _e	0.0100
ARMATURE SHORT CIRCUIT T _a	0.0150

Short Circuit Ratio: 0.52	Stator Resistance = 0.0364 Ohms	Field Resistance = 0.242 Ohms
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Voltage Regulation		Generator Excitation		
Voltage level adjustment: +/-	5.0%	No Load	Full Load, (rated) pf	
Voltage regulation, steady state: +/-	0.5%		Series	Parallel
Voltage regulation with 3% speed change: +/-	0.5%	Excitation voltage: 10.47 Volts	41.4 Volts	Volts
Waveform deviation line - line, no load: less than	2.0%	Excitation current 1.19 Amps	3.87 Amps	Amps
Telephone influence factor: less than	50			

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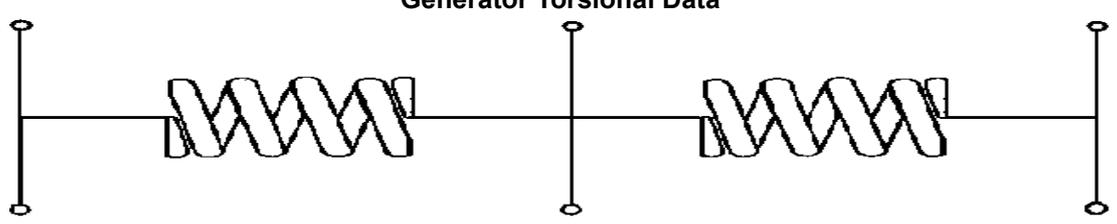
Generator Mechanical Information

Center of Gravity		
Dimension X	-470.0 mm	-18.5 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 = 625 kg	* Rotor WT = 245 kg	* Stator WT = 380 kg
1,378 LB	540 LB	838 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
3.3 LB IN. s ²	41.3 MLB IN./rad	4.5 IN.	12.7 LB IN. s ²	47.0 MLB IN./rad	4.3 IN.	1.2 LB IN. s ²
0.37 N m s ²	4.67 MN m/rad	115.0 mm	1.44 N m s ²	5.31 MN m/rad	110.0 mm	0.133 N m s ²
Total J						
17.2 LB IN. s ²						
1.943 N m s ²						

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Generator Cooling Requirements - Temperature - Insulation Data			
Cooling Requirements:		Temperature Data: (Ambient 40 °C)	
Heat Dissipated: 13.3 kW		Stator Rise:	125.0 °C
Air Flow: 25.8 m ³ /min		Rotor Rise:	125.0 °C
Insulation Class: H			
Insulation Reg. as shipped: 100.0 MΩ minimum at 40 °C			
Thermal Limits of Generator			
Frequency:	50 Hz		
Line to Line Voltage:	415 Volts		
B BR 80/40	160.0 kVA		
F BR -105/40	182.0 kVA		
H BR - 125/40	200.0 kVA		
F PR - 130/40	200.0 kVA		
H PR - 150/40	212.0 kVA		
H PR27 - 163/27	220.0 kVA		

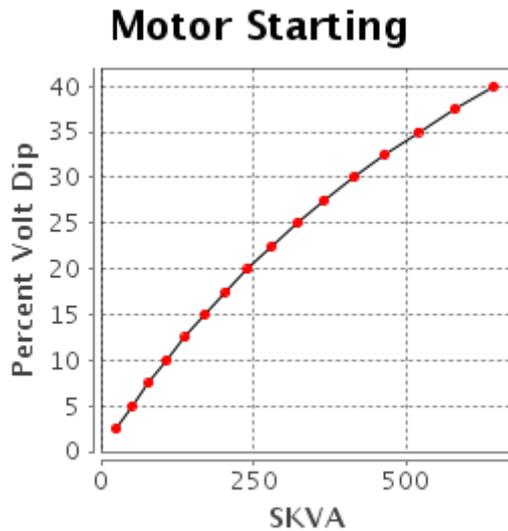
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**Starting Capability & Current Decrement
Motor Starting Capability (0.6 pf)**

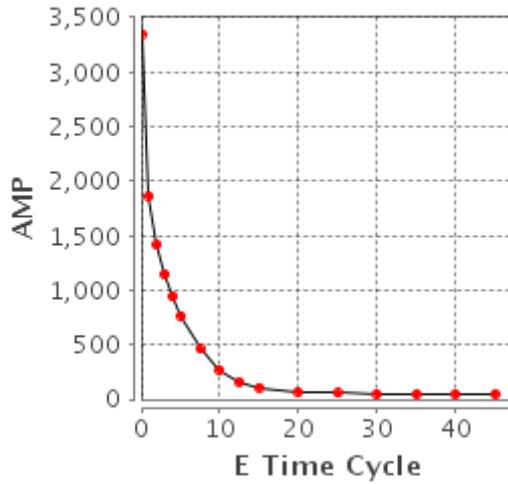
SKVA	Percent Volt Dip
25	2.5
51	5.0
78	7.5
107	10.0
138	12.5
170	15.0
205	17.5
241	20.0
280	22.5
322	25.0
366	27.5
414	30.0
465	32.5
520	35.0
580	37.5
644	40.0



Current Decrement Data

E Time Cycle	AMP
0.0	3,349
1.0	1,865
2.0	1,414
3.0	1,148
4.0	940
5.0	769
7.5	459
10.0	267
12.5	160
15.0	109
20.0	68
25.0	55
30.0	51
35.0	49
40.0	49
45.0	48

Current Decrement



Instantaneous 3 Phase Fault Current: 3349 Amps

Instantaneous Line - Line Fault Current: 2747 Amps

Instantaneous Line - Neutral Fault Current: 4635 Amps

Selected Model

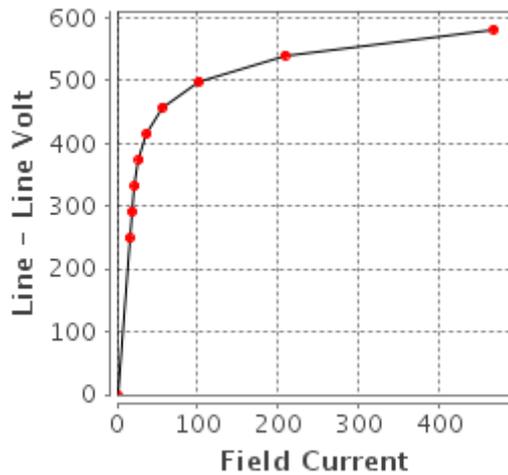
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**Generator Output Characteristic Curves
Open Circuit Curve**

Open Circuit

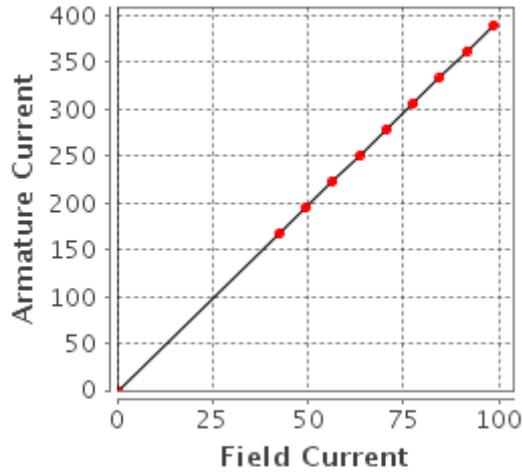
Field Current	Line - Line Volt
0.0	0
15.4	249
18.4	291
22.1	332
27.5	374
37.0	415
56.8	457
101.7	498
208.6	540
467.4	581



Short Circuit Curve

Short Circuit

Field Current	Armature Current
0.0	0
42.3	167
49.3	195
56.4	223
63.4	250
70.4	278
77.5	306
84.5	334
91.6	362
98.6	390



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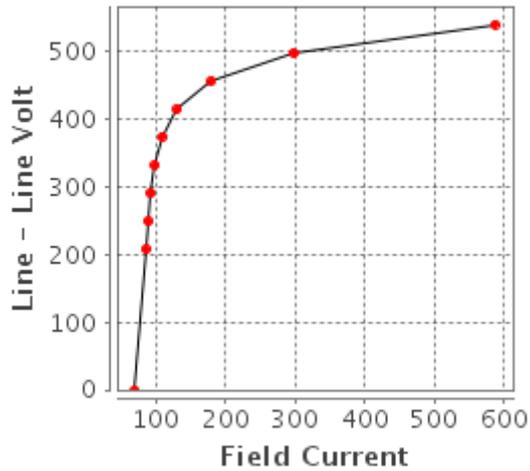
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Generator Output Characteristic Curves
Zero Power Factor Curve

Zero Power

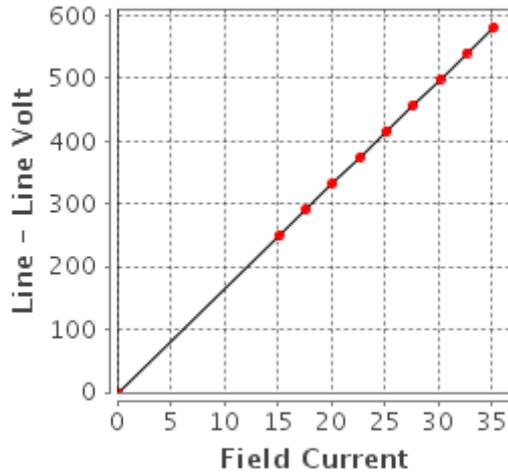
Field Current	Line - Line Volt
70.4	0
86.0	208
89.1	249
92.9	291
98.6	332
109.0	374
130.7	415
180.4	457
299.0	498
586.7	540



Air Gap Curve

Air Gap

Field Current	Line - Line Volt
0.0	0
15.1	249
17.6	291
20.1	332
22.7	374
25.2	415
27.7	457
30.2	498
32.7	540
35.2	581

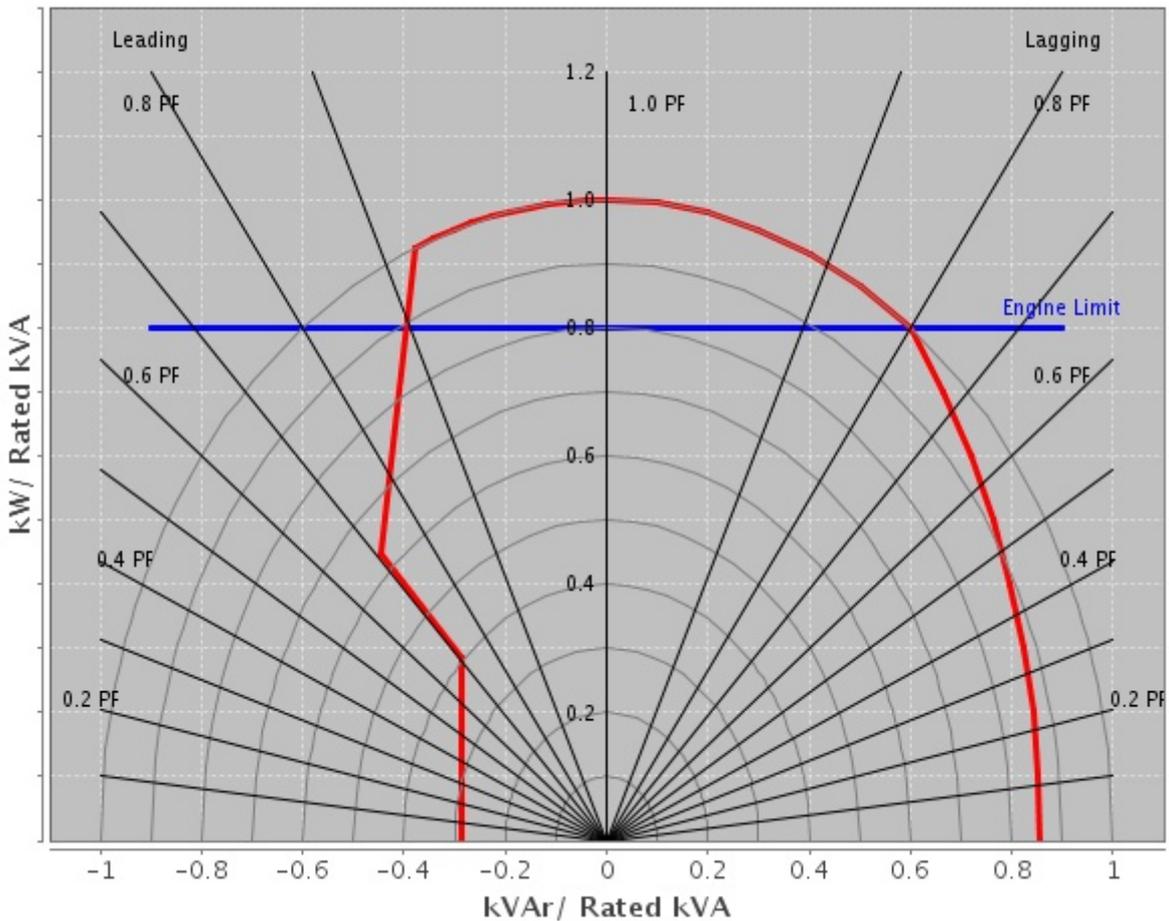


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**Reactive Capability Curve
Operating Chart**



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General Information

GENERATOR INFORMATION (DM7900)

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.

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