

Project: MXP11
Document N°: MXP11-ENE-DC-ZZ-DS-N-0102
Revision: P02
Revision Date: 12/05/2023
Stage: SW5
Status: S4
Document Title: Generator datasheett

Generator datasheet

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Revision History

Date	Revision	Status	Revised Sections	Description
27/04/2023	P01	S3 - Internal Review		
12/05/2023	P02	S4 - For review / approval		

GENERATOR DATA

APRIL 18, 2023

(AT400240)-ENGINE (BAA126422A)-CEM

For Help Desk Phone Numbers [Click here](#)

Selected Model

Engine: 3516 **Generator Frame:** 1868E **Genset Rating (kW):** 2600.0 **Line Voltage:** 400
Fuel: Diesel **Generator Arrangement:** 5851976 **Genset Rating (kVA):** 3250.0 **Phase Voltage:** 230
Frequency: 50 **Excitation Type:** Permanent Magnet **Pwr. Factor:** 0.8 **Rated Current:** 4691.0
Duty: STANDBY **Connection:** SERIES STAR **Application:** EPG **Status:** Current

Version: 20224 /20224 /20224 /675482

Spec Information

Generator Specification			Generator Efficiency		
Frame: 1868E	Type: SR5	No. of Bearings: 2	Per Unit Load	kW	Efficiency %
Winding Type: FORM WOUND Flywheel: 21.0			0.25	650.0	94.2
Connection: SERIES STAR Housing: 00			0.5	1300.0	96.1
Phases: 3 No. of Leads: 6			0.75	1950.0	96.3
Poles: 4 Wires per Lead: 8			1.0	2600.0	96.1
Sync Speed: 1500 Generator Pitch: 0.67					

Reactances	Per Unit	Ohms
SUBTRANSIENT - DIRECT AXIS X _d	0.1178	0.0058
SUBTRANSIENT - QUADRATURE AXIS X _q	0.1280	0.0063
TRANSIENT - SATURATED X _d	0.1523	0.0075
SYNCHRONOUS - DIRECT AXIS X _d	3.1159	0.1534
SYNCHRONOUS - QUADRATURE AXIS X _q	1.3244	0.0652
NEGATIVE SEQUENCE X ₂	0.1706	0.0084
ZERO SEQUENCE X ₀	0.0467	0.0023

Time Constants	Seconds
OPEN CIRCUIT TRANSIENT - DIRECT AXIS T _{d0}	5.5950
SHORT CIRCUIT TRANSIENT - DIRECT AXIS T _d	0.3618
OPEN CIRCUIT SUBTRANSIENT - DIRECT AXIS T _{d0}	0.0087
SHORT CIRCUIT SUBTRANSIENT - DIRECT AXIS T _d	0.0073
OPEN CIRCUIT SUBTRANSIENT - QUADRATURE AXIS T _{q0}	0.0080
SHORT CIRCUIT SUBTRANSIENT - QUADRATURE AXIS T _q	0.0068
EXCITER TIME CONSTANT T _e	0.2230
ARMATURE SHORT CIRCUIT T _a	0.0463

Short Circuit Ratio: 0.45	Stator Resistance = 8.0E-4 Ohms	Field Resistance = 1.106 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:	13.4 Volts	64.54 Volts Volts
Waveform deviation line - line, no load: less than	3.0%	Excitation current	1.23 Amps	4.88 Amps Amps
Telephone influence factor: less than	100			

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Generator Mechanical Information

Center of Gravity		
Dimension X	-1182.3 mm	-46.5 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 = 5864 kg	* Rotor WT = 2109 kg	* Stator WT = 3225 kg
12,928 LB	4,650 LB	7,110 LB

Rotor Balance = 0.0508 mm deflection PTP
Overspeed Capacity = 150% of synchronous speed

Generator Torsional Data

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
46.9 LB IN. s ²	58.6 MLB IN./rad	5.0 IN.	632.8 LB IN. s ²	44.3 MLB IN./rad	3.7 IN.	6.2 LB IN. s ²
5.3 N m s ²	6.62 MN m/rad	127.0 mm	71.5 N m s ²	5.01 MN m/rad	95.2 mm	0.7 N m s ²
Total J						
			685.9 LB IN. s ²			
			77.5 N m s ²			

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Generator Cooling Requirements - Temperature - Insulation Data			
Cooling Requirements:		Temperature Data: (Ambient 40 °C)	
Heat Dissipated: 105.5 kW		Stator Rise:	150.0 °C
Air Flow: 226.8 m ³ /min		Rotor Rise:	150.0 °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:	400 Volts		
B BR 80/40	2400.0 kVA		
F BR -105/40	2780.0 kVA		
H BR - 125/40	3000.0 kVA		
F PR - 130/40	3000.0 kVA		
H PR - 150/40	3250.0 kVA		

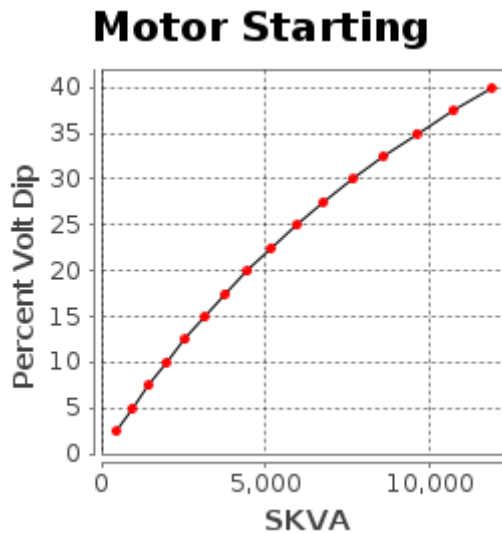
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**Starting Capability & Current Decrement
Motor Starting Capability (0.4 pf)**

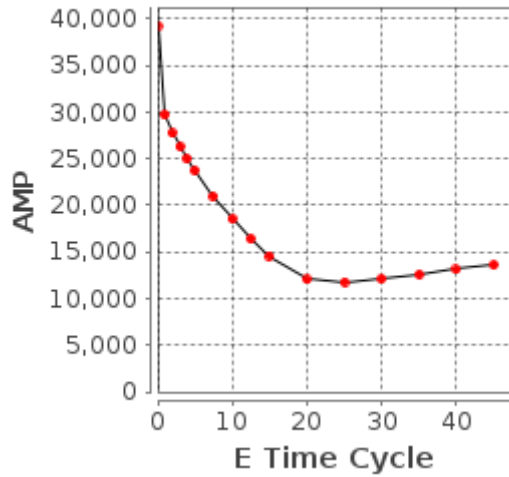
SKVA	Percent Volt Dip
457	2.5
939	5.0
1,446	7.5
1,982	10.0
2,548	12.5
3,148	15.0
3,784	17.5
4,459	20.0
5,179	22.5
5,946	25.0
6,766	27.5
7,645	30.0
8,588	32.5
9,605	35.0
10,702	37.5
11,892	40.0



Current Decrement Data

Current Decrement

E Time Cycle	AMP
0.0	39,307
1.0	29,725
2.0	27,736
3.0	26,326
4.0	25,022
5.0	23,790
7.5	20,994
10.0	18,558
12.5	16,437
15.0	14,589
20.0	12,041
25.0	11,804
30.0	12,146
35.0	12,624
40.0	13,126
45.0	13,645



Instantaneous 3 Phase Fault Current: 39307 Amps

Instantaneous Line - Line Fault Current: 27898 Amps

Instantaneous Line - Neutral Fault Current: 41550 Amps

Selected Model

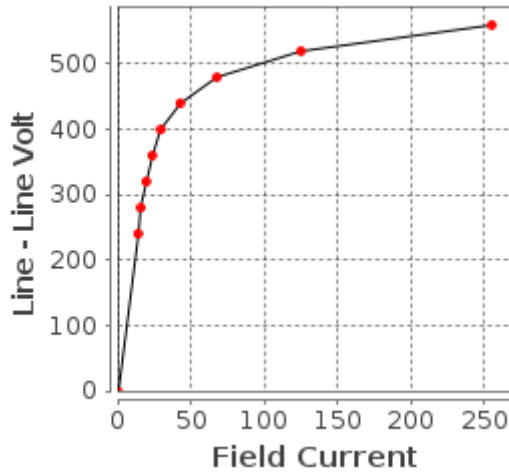
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**Generator Output Characteristic Curves
Open Circuit Curve**

Open Circuit

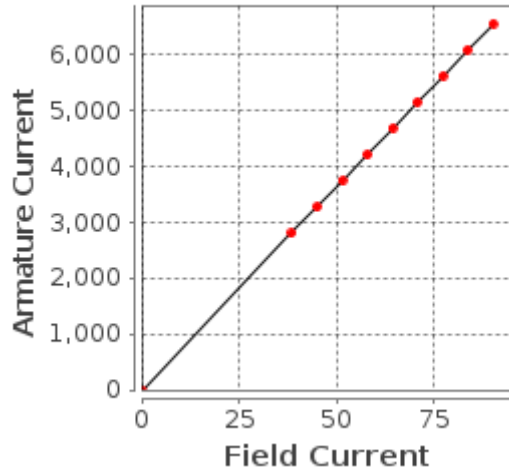
Field Current	Line - Line Volt
0.0	0
13.8	240
16.4	280
19.4	320
23.5	360
30.1	400
42.5	440
68.3	480
125.4	520
255.7	560



Short Circuit Curve

Short Circuit

Field Current	Armature Current
0.0	0
38.6	2,815
45.1	3,284
51.5	3,753
58.0	4,222
64.4	4,691
70.8	5,160
77.3	5,629
83.7	6,098
90.2	6,567



Selected Model

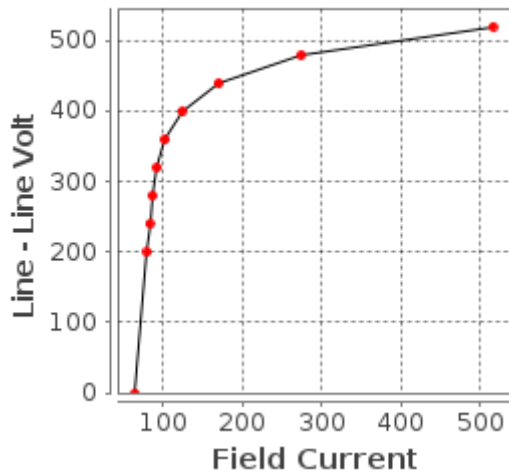
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Generator Output Characteristic Curves
Zero Power Factor Curve

Zero Power

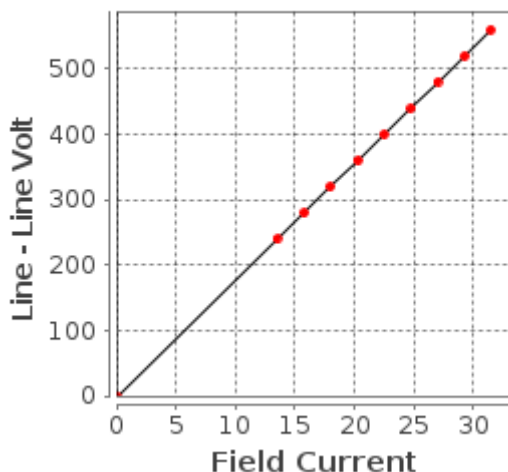
Field Current	Line - Line Volt
64.4	0
79.7	200
82.6	240
86.4	280
92.1	320
102.4	360
123.5	400
169.7	440
274.4	480
515.7	520



Air Gap Curve

Air Gap

Field Current	Line - Line Volt
0.0	0
13.5	240
15.8	280
18.0	320
20.3	360
22.5	400
24.8	440
27.0	480
29.3	520
31.5	560

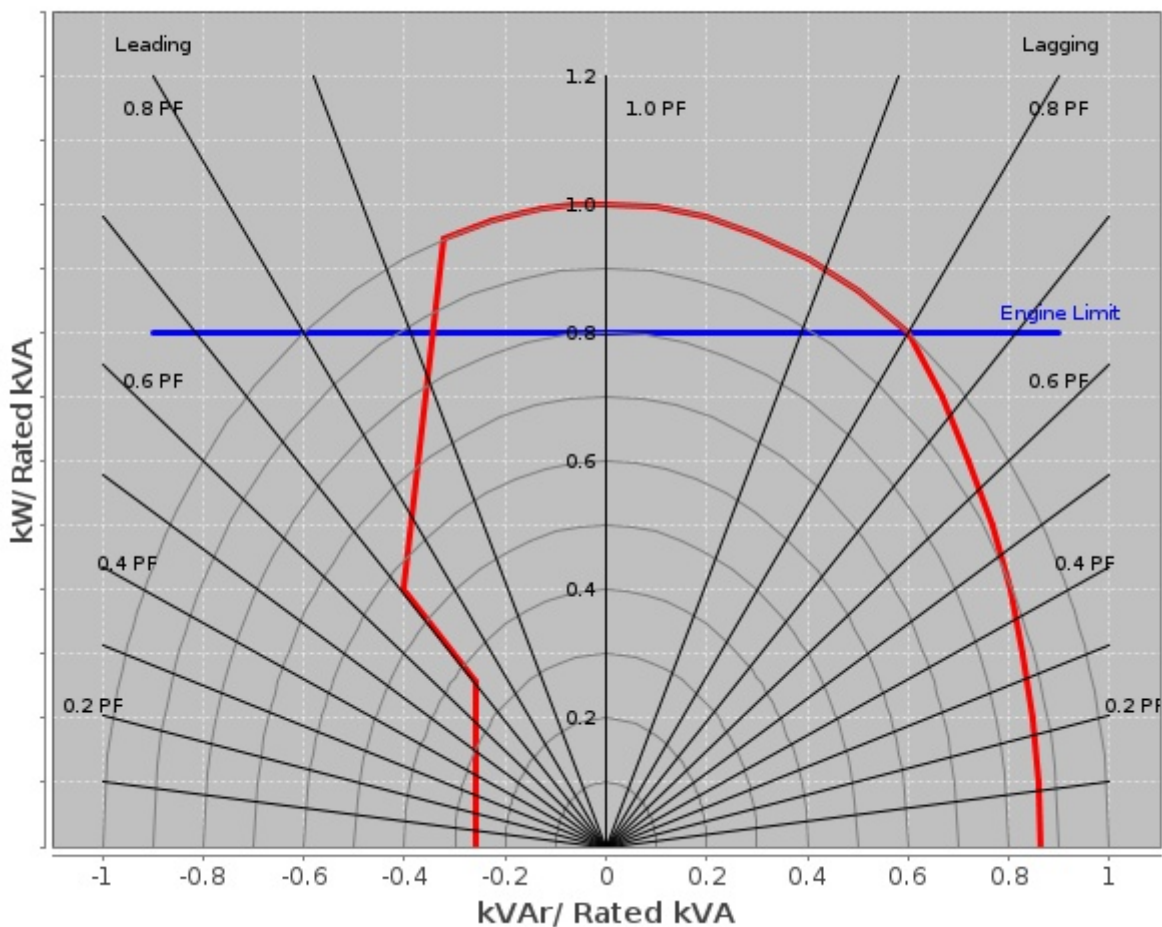


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**Reactive Capability Curve
Operating Chart**



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General Information

DM7825 Caterpillar SR5 Generators (50 Hz, 60 Hz)
 Data for 1400, 1600, 1700, 1800 and 1900 frames Caterpillar SR5
 generators built by Leroy Somer - USA and Leroy Somer France.

Refer to DM7821 for explanation of all generator data in Technical Marketing Information (TMI) except generator efficiency for which the explanation is given below.

GENERATOR EFFICIENCY

Generator efficiency is the percentage of engine flywheel (or other prime mover) power that is converted into electrical output. The generator efficiency shown is calculated by the summation of all losses method, and is determined in accordance with the IEC Standard 60034. The efficiency considers only the generator. There is no consideration of engine or parasitic losses here.

Refer to DM7829 for low and medium voltage protective setting values and limits.

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