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[Zero Power Factor Curve](#) [Reactive Capability Chart](#) [General Information](#)

|                                            |                                          |                                    |
|--------------------------------------------|------------------------------------------|------------------------------------|
| Selected Model                             |                                          |                                    |
| <b>Engine:</b> 3512                        | <b>Generator Frame:</b> 824              | <b>Genset Rating (kW):</b> 1360.0  |
| <b>Fuel:</b> Diesel                        | <b>Generator Arrangement:</b> 1638542    | <b>Genset Rating (kVA):</b> 1700.0 |
| <b>Frequency:</b> 60                       | <b>Excitation Type:</b> Permanent Magnet | <b>Pwr. Factor:</b> 0.8            |
| <b>Duty:</b> PRIME                         | <b>Connection:</b> SERIES STAR           | <b>Application:</b> MAR            |
|                                            |                                          | <b>Status:</b> Current             |
| <b>Version:</b> 41205 /40308 /41736 /11085 |                                          |                                    |

## Spec Information

| Generator Specification         |                   |                           | Generator Efficiency |           |                     |
|---------------------------------|-------------------|---------------------------|----------------------|-----------|---------------------|
| <b>Frame:</b> 824               | <b>Type:</b> SR4B | <b>No. of Bearings:</b> 2 | <b>Per Unit Load</b> | <b>kW</b> | <b>Efficiency %</b> |
| <b>Winding Type:</b> FORM WOUND |                   |                           |                      |           |                     |
| <b>Connection:</b> SERIESSTAR   |                   |                           | 0.25                 | 340       | 91.3                |
| <b>Phases:</b> 3                |                   |                           | 0.5                  | 680       | 94.3                |
| <b>Poles:</b> 4                 |                   |                           | 0.75                 | 1020      | 95.2                |
| <b>Sync Speed:</b> 1800         |                   |                           | 1                    | 1360      | 95.3                |
| <b>Generator Pitch:</b> 0.6667  |                   |                           | 1.1                  | 1496      | 95.3                |

| Reactances                             |  | Per Unit | Ohms   |
|----------------------------------------|--|----------|--------|
| SUBTRANSIENT - DIRECT AXIS $X''_d$     |  | 0.1645   | 0.0223 |
| SUBTRANSIENT - QUADRATURE AXIS $X''_q$ |  | 0.1505   | 0.0204 |
| TRANSIENT - SATURATED $X'_d$           |  | 0.2435   | 0.0330 |
| SYNCHRONOUS - DIRECT AXIS $X_d$        |  | 2.9912   | 0.4054 |
| SYNCHRONOUS - QUADRATURE AXIS $X_q$    |  | 1.4285   | 0.1936 |
| NEGATIVE SEQUENCE $X_2$                |  | 0.1579   | 0.0214 |
| ZERO SEQUENCE $X_0$                    |  | 0.0089   | 0.0012 |

| Time Constants                                         |  | Seconds |
|--------------------------------------------------------|--|---------|
| OPEN CIRCUIT TRANSIENT - DIRECT AXIS $T'_{d0}$         |  | 5.8770  |
| SHORT CIRCUIT TRANSIENT - DIRECT AXIS $T'_d$           |  | 0.4781  |
| OPEN CIRCUIT SUBTRANSIENT - DIRECT AXIS $T''_{d0}$     |  | 0.0090  |
| SHORT CIRCUIT SUBTRANSIENT - DIRECT AXIS $T''_d$       |  | 0.0079  |
| OPEN CIRCUIT SUBTRANSIENT - QUADRATURE AXIS $T''_{q0}$ |  | 0.0071  |
| SHORT CIRCUIT SUBTRANSIENT - QUADRATURE AXIS $T''_q$   |  | 0.0063  |
| EXCITER TIME CONSTANT $T_c$                            |  | 0.2225  |
| ARMATURE SHORT CIRCUIT $T_a$                           |  | 0.0601  |

|                           |                                 |                                |
|---------------------------|---------------------------------|--------------------------------|
| Short Circuit Ratio: 0.39 | Stator Resistance = 0.0019 Ohms | Field Resistance = 0.9324 Ohms |
|---------------------------|---------------------------------|--------------------------------|

| Voltage Regulation                                        |      | Generator Excitation       |                              |                 |
|-----------------------------------------------------------|------|----------------------------|------------------------------|-----------------|
| <b>Voltage level adjustment:</b> +/-                      | 5.0% | <b>No Load</b>             | <b>Full Load, (rated) pf</b> |                 |
| <b>Voltage regulation, steady state:</b> +/-              | 0.5% |                            | <b>Series</b>                | <b>Parallel</b> |
| <b>Voltage regulation with 3% speed change:</b> +/-       | 0.5% | <b>Excitation voltage:</b> | 6.7 Volts                    | 29.8 Volts      |
| <b>Waveform deviation line - line, no load:</b> less than | 3.0% | <b>Excitation current</b>  | 1.8 Amps                     | 6.4 Amps        |
| <b>Telephone influence factor:</b> less than              | 50   |                            |                              |                 |

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|                                            |                                          |                                    |
|--------------------------------------------|------------------------------------------|------------------------------------|
| Selected Model                             |                                          |                                    |
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| <b>Fuel:</b> Diesel                        | <b>Generator Arrangement:</b> 1638542    | <b>Genset Rating (kVA):</b> 1700.0 |
| <b>Frequency:</b> 60                       | <b>Excitation Type:</b> Permanent Magnet | <b>Pwr. Factor:</b> 0.8            |
| <b>Duty:</b> PRIME                         | <b>Connection:</b> SERIES STAR           | <b>Application:</b> MAR            |
|                                            |                                          | <b>Status:</b> Current             |
| <b>Version:</b> 41205 /40308 /41736 /11085 |                                          |                                    |

## Generator Mechanical Information

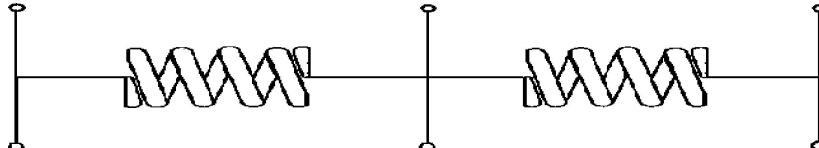
Center of Gravity

|             |            |           |
|-------------|------------|-----------|
| Dimension X | -1087.1 mm | -42.8 IN. |
| Dimension Y | 0 mm       | 0.0 IN.   |
| Dimension Z | 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 = 4340 kg | * Rotor WT = 1587 kg | * Stator WT = 2753 kg |
| 9,568 LB               | 3,499 LB             | 6,069 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 |                           |
| K1 = Shaft Stiffness between J1 + J2 (Diameter 1)                                  |                  |                 | TOTAL J = J1 + J2 + J3      |                  |                  |                           |
| K2 = Shaft Stiffness between J2 + J3 (Diameter 2)                                  |                  |                 |                             |                  |                  |                           |
| J1                                                                                 | K1               | Min Shaft Dia 1 | J2                          | K2               | Min Shaft Dia 2  | J3                        |
| 62.0 LB IN. s <sup>2</sup>                                                         | 56.6 MLB IN./rad | 5.0 IN.         | 559.4 LB IN. s <sup>2</sup> | 55.8 MLB IN./rad | 3.8 IN.          | 3.3 LB IN. s <sup>2</sup> |
| 7 N m s <sup>2</sup>                                                               | 6.4 MN m/rad     | 127 mm          | 63.207 N m s <sup>2</sup>   | 6.3 MN m/rad     | 96.5 mm          | 0.371 N m s <sup>2</sup>  |
| Total J                                                                            |                  |                 |                             |                  |                  |                           |
|                                                                                    |                  |                 | 624.7 LB IN. s <sup>2</sup> |                  |                  |                           |
|                                                                                    |                  |                 | 70.578 N m s <sup>2</sup>   |                  |                  |                           |

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|               |  |                                   |  |                                     |  |
|---------------|--|-----------------------------------|--|-------------------------------------|--|
| Engine: 3512  |  | Generator Frame: 824              |  | Selected Model                      |  |
| Fuel: Diesel  |  | Generator Arrangement: 1638542    |  | Genset Rating (kW): 1360.0          |  |
| Frequency: 60 |  | Excitation Type: Permanent Magnet |  | Genset Rating (kVA): 1700.0         |  |
| Duty: PRIME   |  | Connection: SERIES STAR           |  | Pwr. Factor: 0.8                    |  |
|               |  |                                   |  | Application: MAR                    |  |
|               |  |                                   |  | Line Voltage: 480                   |  |
|               |  |                                   |  | Phase Voltage: 277                  |  |
|               |  |                                   |  | Rated Current: 2044.8               |  |
|               |  |                                   |  | Status: Current                     |  |
|               |  |                                   |  | Version: 41205 /40308 /41736 /11085 |  |

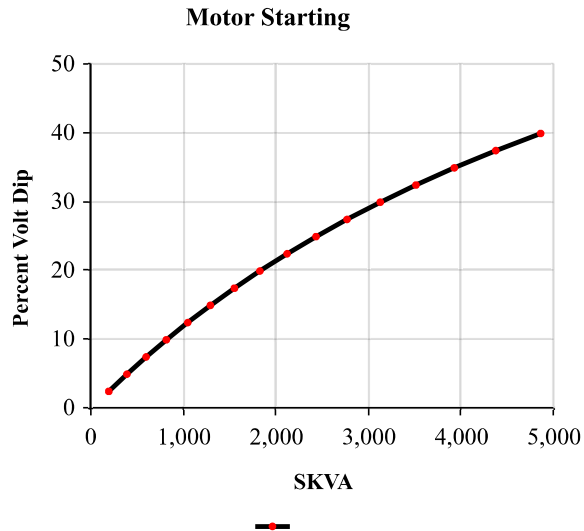
| Generator Cooling Requirements -<br>Temperature - Insulation Data |                                   |
|-------------------------------------------------------------------|-----------------------------------|
| Cooling Requirements:                                             | Temperature Data: (Ambient 50 °C) |
| Heat Dissipated: 67.1 kW                                          | Stator Rise: 90 °C                |
| Air Flow: 168 m <sup>3</sup> /min                                 | Rotor Rise: 90 °C                 |
| Insulation Class: H                                               |                                   |
| Insulation Reg. as shipped: 100MΩ minimum at 40 °C                |                                   |
| Thermal Limits of Generator                                       |                                   |
| Frequency: 60 Hz                                                  |                                   |
| Line to Line Voltage: 480 Volts                                   |                                   |
| Marine 90/50                                                      | 1780 kVA                          |

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|               |  |                                   |  |                                     |  |
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|               |  |                                   |  | Application: MAR                    |  |
|               |  |                                   |  | Line Voltage: 480                   |  |
|               |  |                                   |  | Phase Voltage: 277                  |  |
|               |  |                                   |  | Rated Current: 2044.8               |  |
|               |  |                                   |  | Status: Current                     |  |
|               |  |                                   |  | Version: 41205 /40308 /41736 /11085 |  |

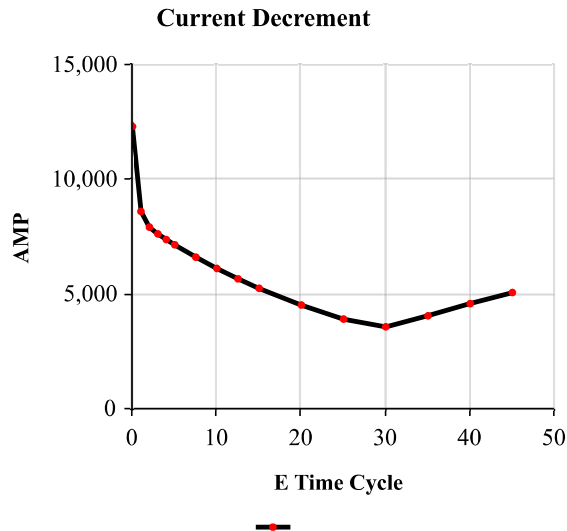
Starting Capability & Current Decrement  
Motor Starting Capability (0.4 pf)

| SKVA Percent Volt Dip |      |
|-----------------------|------|
| 187                   | 2.5  |
| 383                   | 5.0  |
| 590                   | 7.5  |
| 809                   | 10.0 |
| 1,040                 | 12.5 |
| 1,285                 | 15.0 |
| 1,545                 | 17.5 |
| 1,820                 | 20.0 |
| 2,114                 | 22.5 |
| 2,427                 | 25.0 |
| 2,762                 | 27.5 |
| 3,121                 | 30.0 |
| 3,506                 | 32.5 |
| 3,921                 | 35.0 |
| 4,369                 | 37.5 |
| 4,855                 | 40.0 |



Current Decrement Data

| E Time Cycle | AMP    |
|--------------|--------|
| 0.0          | 12,330 |
| 1.0          | 8,627  |
| 2.0          | 7,945  |
| 3.0          | 7,648  |
| 4.0          | 7,405  |
| 5.0          | 7,175  |
| 7.5          | 6,636  |
| 10.0         | 6,142  |
| 12.5         | 5,690  |
| 15.0         | 5,275  |
| 20.0         | 4,547  |
| 25.0         | 3,934  |
| 30.0         | 3,596  |
| 35.0         | 4,078  |
| 40.0         | 4,610  |
| 45.0         | 5,091  |



Instantaneous 3 Phase Fault Current: 12330 Amps

Instantaneous Line - Line Fault Current: 10913 Amps

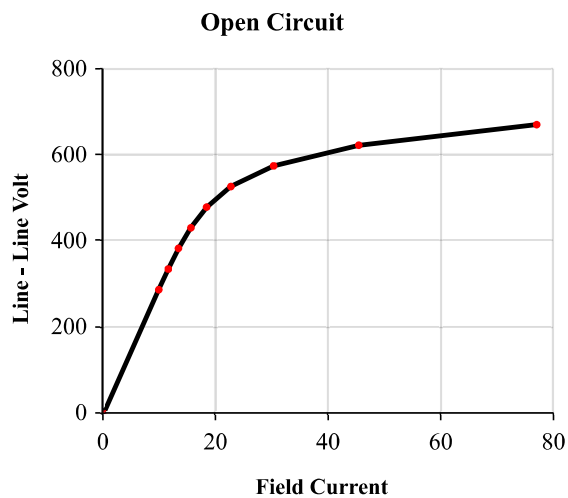
Instantaneous Line - Neutral Fault Current: 18381 Amps

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|               |                                   |                                     |                       |
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| Fuel: Diesel  | Generator Arrangement: 1638542    | Genset Rating (kVA): 1700.0         | Phase Voltage: 277    |
| Frequency: 60 | Excitation Type: Permanent Magnet | Pwr. Factor: 0.8                    | Rated Current: 2044.8 |
| Duty: PRIME   | Connection: SERIES STAR           | Application: MAR                    | Status: Current       |
|               |                                   | Version: 41205 /40308 /41736 /11085 |                       |

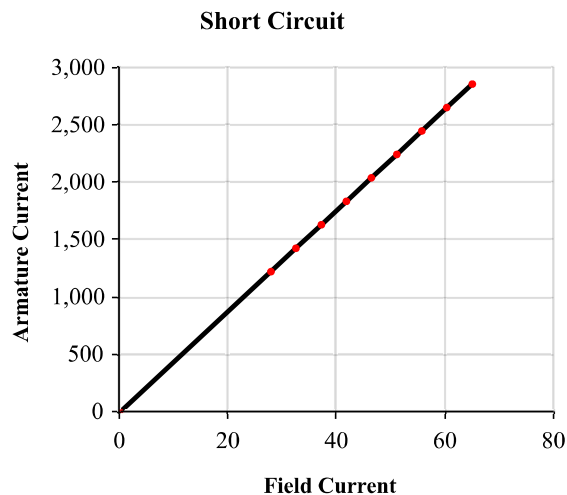
Generator Output Characteristic Curves  
Open Circuit Curve

| Field Current Line - Line Volt |     |
|--------------------------------|-----|
| 0.0                            | 0   |
| 9.8                            | 288 |
| 11.5                           | 336 |
| 13.3                           | 384 |
| 15.5                           | 432 |
| 18.3                           | 480 |
| 22.6                           | 528 |
| 30.2                           | 576 |
| 45.3                           | 624 |
| 76.9                           | 672 |



Short Circuit Curve

| Field Current Armature Current |       |
|--------------------------------|-------|
| 0.0                            | 0     |
| 27.8                           | 1,227 |
| 32.4                           | 1,431 |
| 37.1                           | 1,636 |
| 41.7                           | 1,840 |
| 46.3                           | 2,045 |
| 51.0                           | 2,249 |
| 55.6                           | 2,454 |
| 60.2                           | 2,658 |
| 64.9                           | 2,863 |

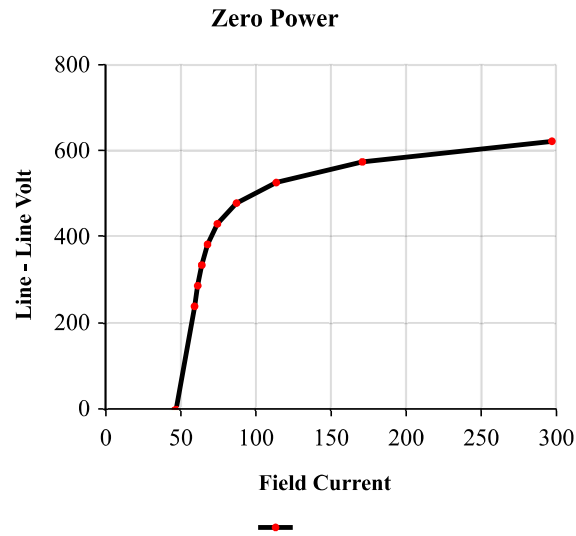


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|                      |                                          |                                            |
|----------------------|------------------------------------------|--------------------------------------------|
| Selected Model       |                                          |                                            |
| <b>Engine:</b> 3512  | <b>Generator Frame:</b> 824              | <b>Genset Rating (kW):</b> 1360.0          |
| <b>Fuel:</b> Diesel  | <b>Generator Arrangement:</b> 1638542    | <b>Genset Rating (kVA):</b> 1700.0         |
| <b>Frequency:</b> 60 | <b>Excitation Type:</b> Permanent Magnet | <b>Pwr. Factor:</b> 0.8                    |
| <b>Duty:</b> PRIME   | <b>Connection:</b> SERIES STAR           | <b>Application:</b> MAR                    |
|                      |                                          | <b>Line Voltage:</b> 480                   |
|                      |                                          | <b>Phase Voltage:</b> 277                  |
|                      |                                          | <b>Rated Current:</b> 2044.8               |
|                      |                                          | <b>Status:</b> Current                     |
|                      |                                          | <b>Version:</b> 41205 /40308 /41736 /11085 |

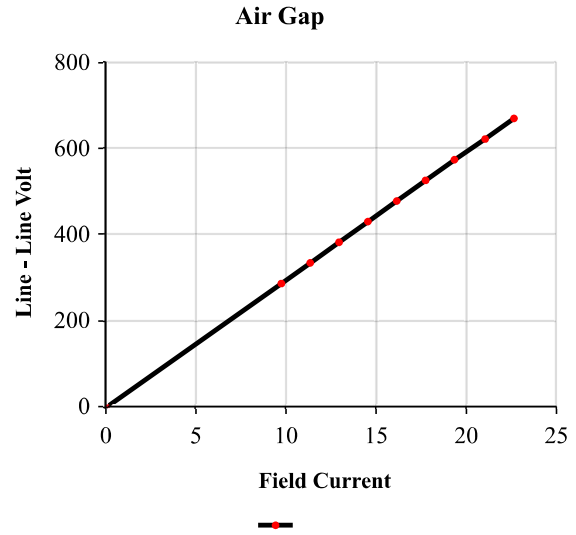
Generator Output Characteristic Curves  
Zero Power Factor Curve

| Field Current Line - Line Volt |     |
|--------------------------------|-----|
| 46.3                           | 0   |
| 58.6                           | 240 |
| 60.7                           | 288 |
| 63.4                           | 336 |
| 67.2                           | 384 |
| 73.8                           | 432 |
| 86.5                           | 480 |
| 113.0                          | 528 |
| 170.3                          | 576 |
| 296.5                          | 624 |



Air Gap Curve

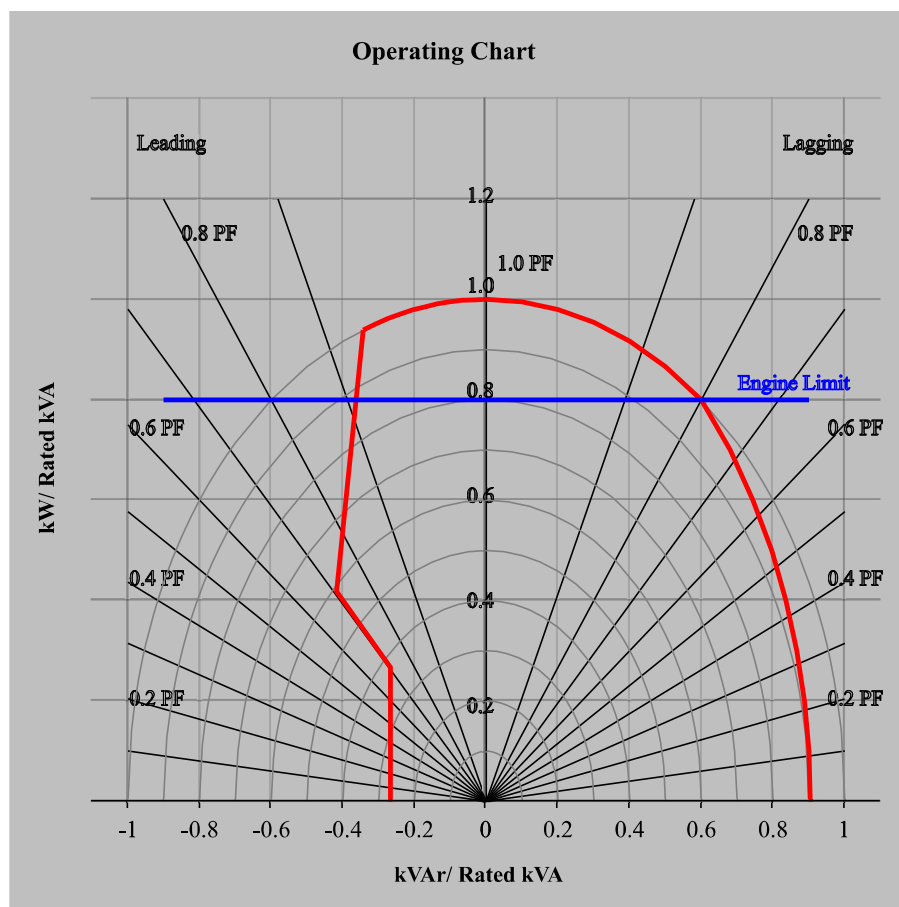
| Field Current Line - Line Volt |     |
|--------------------------------|-----|
| 0.0                            | 0   |
| 9.7                            | 288 |
| 11.3                           | 336 |
| 12.9                           | 384 |
| 14.5                           | 432 |
| 16.1                           | 480 |
| 17.7                           | 528 |
| 19.3                           | 576 |
| 21.0                           | 624 |
| 22.6                           | 672 |



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|                |                                   |                                     |
|----------------|-----------------------------------|-------------------------------------|
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| Fuel: Diesel   | Generator Arrangement: 1638542    | Genset Rating (kVA): 1700.0         |
| Frequency: 60  | Excitation Type: Permanent Magnet | Pwr. Factor: 0.8                    |
| Duty: PRIME    | Connection: SERIES STAR           | Application: MAR                    |
|                |                                   | Line Voltage: 480                   |
|                |                                   | Phase Voltage: 277                  |
|                |                                   | Rated Current: 2044.8               |
|                |                                   | Status: Current                     |
|                |                                   | Version: 41205 /40308 /41736 /11085 |

Reactive Capability Curve



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|                                            |                                          |                                    |
|--------------------------------------------|------------------------------------------|------------------------------------|
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| <b>Fuel:</b> Diesel                        | <b>Generator Arrangement:</b> 1638542    | <b>Genset Rating (kVA):</b> 1700.0 |
| <b>Frequency:</b> 60                       | <b>Excitation Type:</b> Permanent Magnet | <b>Pwr. Factor:</b> 0.8            |
| <b>Duty:</b> PRIME                         | <b>Connection:</b> SERIES STAR           | <b>Application:</b> MAR            |
|                                            |                                          | <b>Status:</b> Current             |
| <b>Version:</b> 41205 /40308 /41736 /11085 |                                          |                                    |

#### General Information

DM7824 Caterpillar SR4B Generators (50 Hz, 60 Hz)  
Data for 360s, 440s, 450s, 490, 590, 660, 690, 820 and 860 frames.  
Caterpillar SR4B generators built by Leroy Somer-USA(& predecessors).

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.

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