

TECHNICAL SPECIFICATION

Type designation: **AMG 0500BB04**
Application: Diesel/Gas engine Industrial Application Series
Site criteria: Land use

NOTES


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ENCLOSURES:

Item	Item NO.
Main dimension drawing	5860363
Rotor drawing	5860296

Prep. JE.ZH	29.8.2011	TECHNICAL SPECIFICATION			No. of sh.
Appr. TU.TU	29.8.2011				9
Resp. dept. R&D					
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1 PERFORMANCE DATA (Calculated values)

TYPE

Type designation: AMG 0500BB04

PERFORMANCE DATA

Main standard	IEC 60034							
Rated power factor	0.8							
Insulation class	H							
Temperature rise	H							
Ambient temperature	40 °C							
Altitude over sea level	≤ 1000 m							
Cooling/Protection	IC0A1/IP23							
Mounting arrangement	IMB20 / IMB25							
Weight	6278Kg							
Inertia	76.8 kgm ²							
Direction of rotation (Facing drive end)	CW							
Maximum overspeed	2250 rpm							
Winding pitch	14/18							
Stator winding resistance	0.0007 Ω per phase at 20°C series star connection							
Rotor winding resistance	0.8816 Ω at 20°C							
Ex. stator winding resistance	13.367 Ω at 20°C							
Ex. rotor winding resistance	0.0302 Ω at 20°C							
Total Harmonic Distortion	THD<5% at no load operation or rated Linear balanced load							
Voltage regulation	±1 %							
Speed	1500 rpm				1800 rpm			
Frequency	50 Hz				60 Hz			
Voltage series star 3ph.	380/220	400/231	415/240	440/254	415/240	440/254	460/266	480/277
Rated continuous output(kVA)	2420	2550	2500	2250	2645	2805	2930	3060
Rated efficiency	96.13%	96.19%	96.31%	96.48%	96.27%	96.38%	96.45%	96.49%
Xd(u)	3.613	3.436	3.129	2.505	3.973	3.748	3.582	3.436
Xd(s)	3.199	2.908	2.536	1.844	3.692	3.389	3.148	2.908
Xq(u)	1.516	1.442	1.313	1.052	1.667	1.573	1.503	1.442
X'd(u)	0.242	0.23	0.21	0.168	0.266	0.251	0.24	0.23
X'd(s)	0.22	0.209	0.191	0.153	0.242	0.228	0.218	0.209
X''d(u)	0.184	0.175	0.159	0.127	0.198	0.187	0.179	0.172
X''d(s)	0.167	0.159	0.145	0.116	0.18	0.17	0.163	0.156
X''q(u)	0.228	0.216	0.197	0.158	0.25	0.236	0.225	0.216
X''q(s)	0.207	0.197	0.179	0.144	0.227	0.214	0.205	0.196
X1(u)	0.115	0.11	0.1	0.08	0.127	0.12	0.114	0.11
X2(u)	0.206	0.196	0.178	0.143	0.224	0.212	0.202	0.194
X2(s)	0.187	0.178	0.162	0.13	0.204	0.192	0.184	0.176
X0(u)	0.072	0.068	0.062	0.05	0.077	0.073	0.07	0.067
Xp(s)	0.181	0.173	0.157	0.126	0.2	0.188	0.18	0.173
SCR (short circuit ratio), Ir0/Xd (u)	0.31	0.34	0.39	0.54	0.27	0.30	0.32	0.34
s=saturated value, u=unsaturated value, values are p.u. at rated voltage and power								
Td0'	6.069 s							
Td'	0.406 s							
Td''	0.00466 s							
Ta	0.0447 s							
CE-Marking	Generator fulfills the requirements of Low Voltage Directive (2006/95/EC) Generator supplied to EEA-area will be CE-marked							

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2 PERFORMANCE CURVES

THREE PHASE EFFICIENCY CURVES, 50 Hz/380–440 V

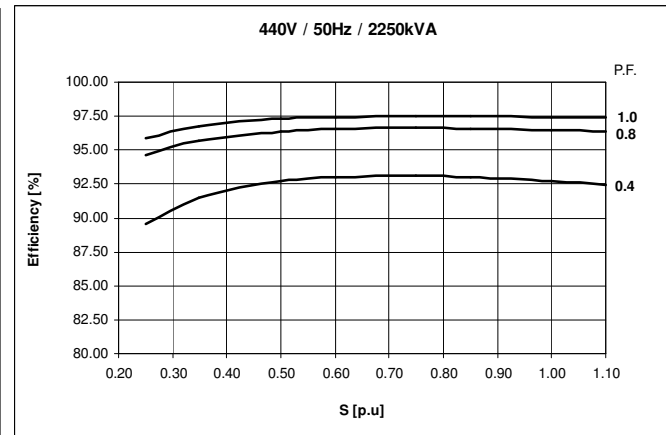
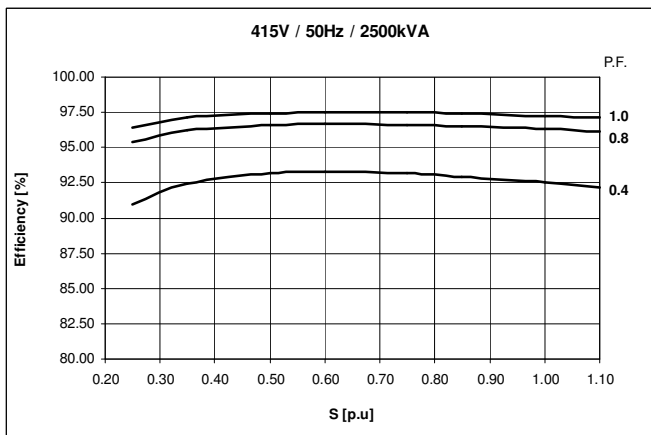
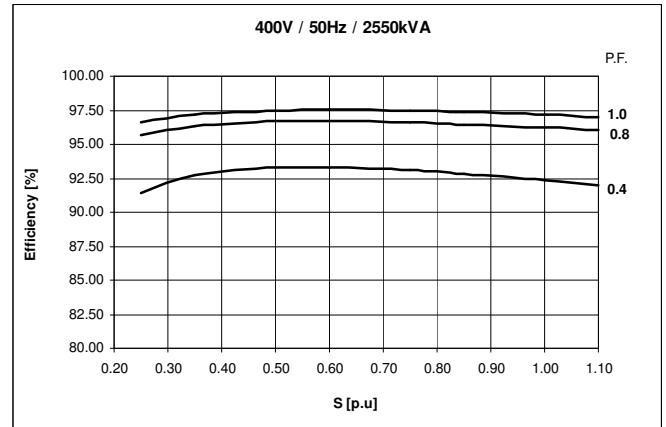
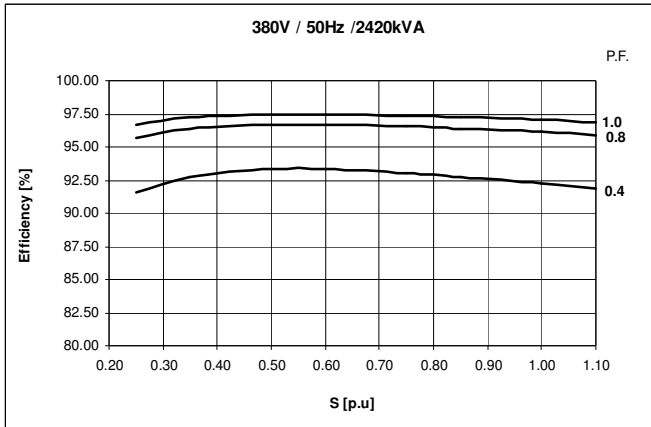


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THREE PHASE EFFICIENCY CURVES, 60 Hz/415–480 V

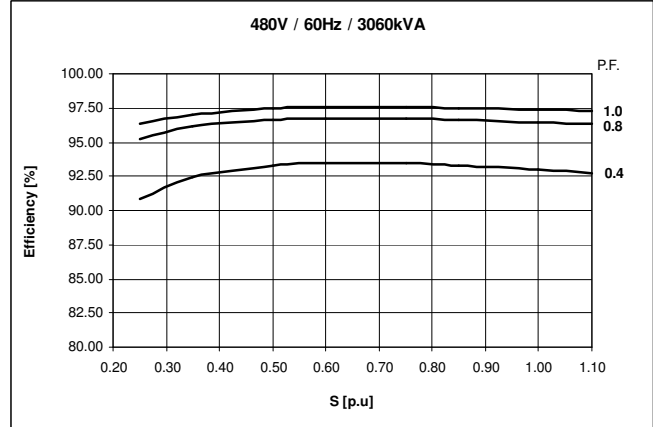
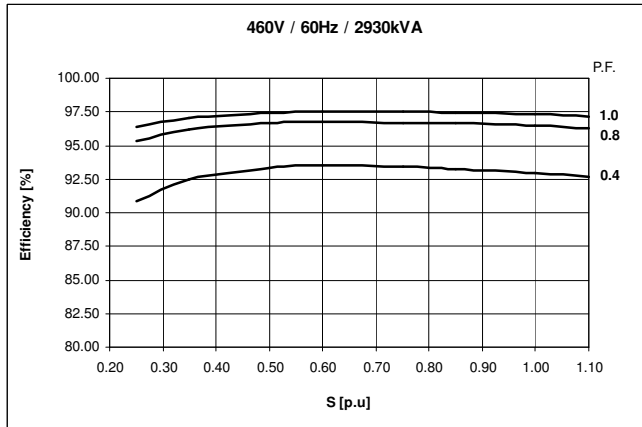
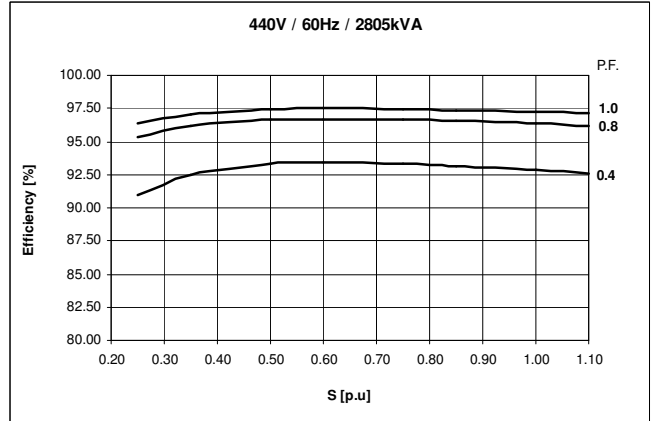
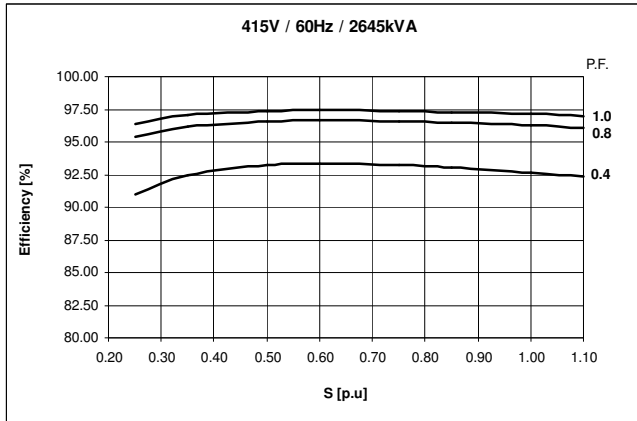


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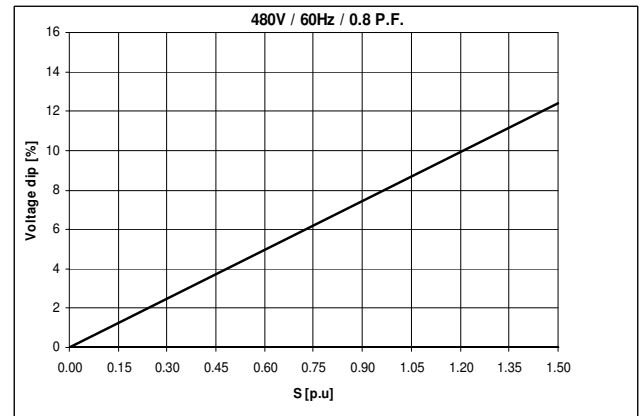
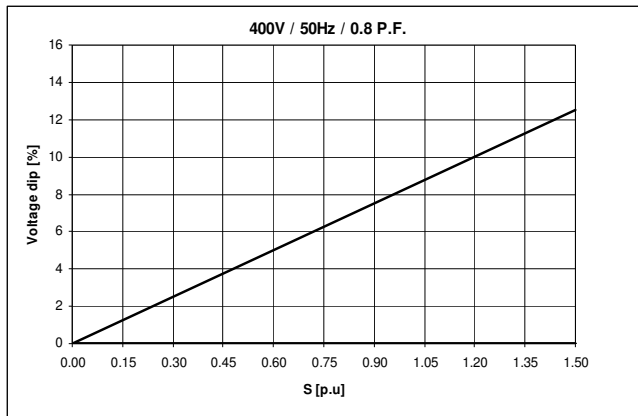
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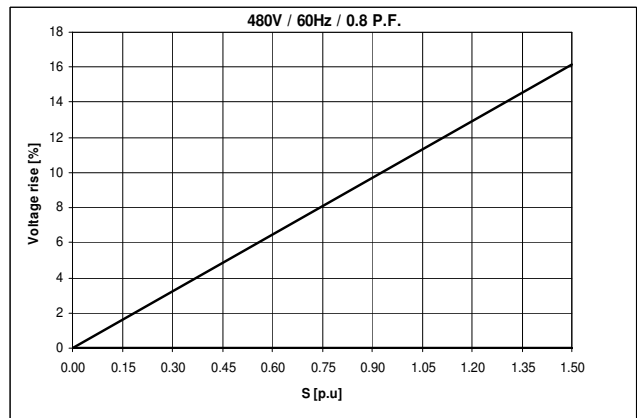
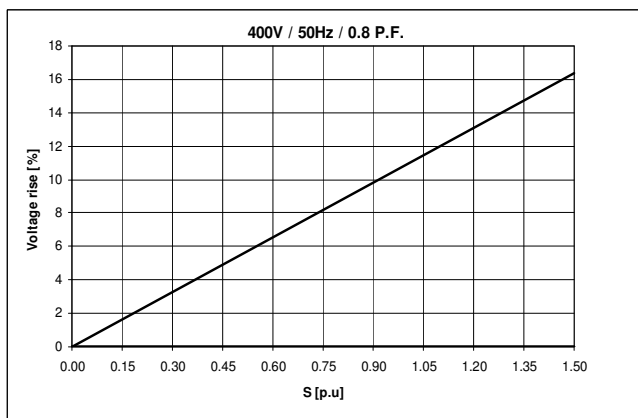
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TRANSIENT VOLTAGE REGULATION CURVES

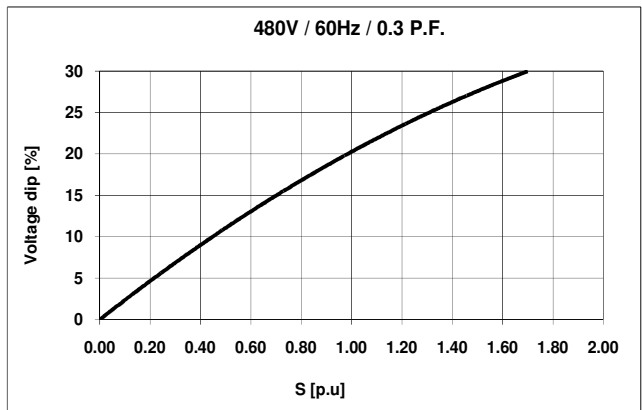
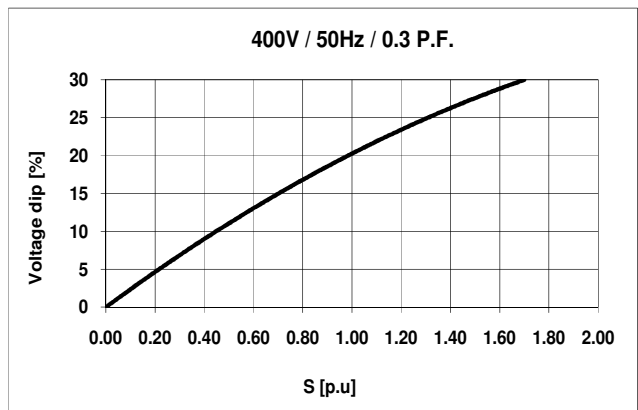
Load application (Auxiliary winding excitation)



Load rejection (Auxiliary winding excitation)



Locked Rotor Motor Starting Curve (Auxiliary winding excitation)



Note 1

S [P.U] = S/S(Rated), S means the actual operation capacity, S(Rated) means the generator rated output capacity.



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3 CONFIGURATION AND SCOPE OF SUPPLY

GENERAL

The generator is designed to operate together with a diesel or gas engine.

CONSTRUCTION

The stator frame is a rigid steel structure construction. The stator core is built of thin electric sheet steel laminations which are insulated on both sides with heat-resistant inorganic resin.

The rotor consists of a shaft and a star shape rotor core. The shaft is machined of rolled steel. Special heat treatment is used if shaft operates under heavy conditions. The poles are manufactured of 0.5 mm sheet steel. The pole laminations are pressed and welded together with steel bars. These bars are then welded to the end plates. Rotor balancing is done acc. to ISO 1940/1. The standard balancing quality grade is G2,5.

All windings are completely vacuum pressure impregnated with high quality resin. The windings are provided with very strong bracing which withstands all expected mechanical and electrical shocks and vibrations as well as chemicals.

The stator frame, core support and end-shields are welded together. The rolling bearing(s) are bolted between inner and outer bearing cover to the end-shields.

MAIN TERMINAL SPACE

Protection class IP44, Integrated into the top module of the generator.

Supply cable entries: Closed terminal box. Cable inlet to the main terminal box to be done by the customer.

Six (6) terminals: U1, V1, W1 and U2, V2, W2 brought to the main terminal box. Neutral point (N) made inside the terminal box by separate copper bar connecting U2, V2, W2 together. Main terminals U, V, W and neutral point N in the main terminal box for external connection.

Terminal marking acc. to IEC.

Max. internal air temperature 60 °C.

Designed for continuous current load.

FOUNDATION

The machine can be mounted using shimming, machined blocks, chock fast or on grouted sole plates or bed plate. Before using other mountings, contact us.

CONTROL SYSTEMS

General

Brushless excitation. The excitation power to the AVR is supplied by an auxiliary winding wound into the stator slots.

Automatic Voltage Regulator System


Standard voltage regulation system based on AEC63-7

Mounted inside the main terminal box.

Analog type AVR functions:

- a) 1-channel AVR.
- b) Excitation power from auxiliary winding.
- c) Voltage set-point adjustment (local) .
- d) U/f limiter.
- e) Paralleling operation.

Static voltage regulation accuracy +/- 1.0 %.

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Voltage recovery time after transient < 1.5 s, +/- 3.0 % (acc. to IEC 60034).

Nominal Um, range: < 63VDC and maximum 103VDC for 10s

Nominal Im, range: continuous 7ADC and maximum 12 ADC for 10 s.

BEARINGS

Non Drive-end: Rolling, w/grease, free.

Drive-end: Rolling, w/grease, locked.

Life time: $L_{10} \geq 30\,000$ h.

Not electrically insulated.

TESTING

Testing is according to IEC and ABB internal requirements. The test may be observed by the customer without extra charges. The test procedures are described in the following documents which are available on request:

-Routine tests: MDD 8006327 (for all machines)

-Type tests: MDD 8006328 (optional, to be agreed separately).

-Special tests: MDD 8006329 (optional, to be agreed separately).

PERFORMANCE CHARACTERISTICS AND OPERATIONAL LIMITS

Rating for continuous running duty:

Duty type S1.

Rating for short-time duty:

10 % overload at nominal power factor for one hour at twelve hour intervals.

50 % overload at nominal power factor for two minutes at twelve hour intervals.

Over current withstand capability:

3 times nominal current for 10s.

Generator shall be suitable for supplying circuits which, when supplied by a system of balanced and sinusoidal voltages:

Result in currents not exceeding a harmonic current factor of 0,05 and

Result in a system of currents where neither the negative-sequence component nor the zero-sequence component exceed 5% of the positive-sequence component.

Maximum voltage unbalance is 0,5 %.

Maximum I_2/I_N value for continuous operation is 8 %.

Maximum $(I_2/I_N)^2 \times t$ in seconds for operation under fault conditions is 20

Maximum continuous voltage variation with rated output is ± 5 %.

Maximum continuous frequency variation with rated output is ± 2 %.

Maximum combined voltage and frequency variation and maximum short-time limits are acc. to IEC 60034-1:2004, Section 7.3.

Radiated and conducted emissions comply with the requirements of CISPR 11, Class B, Group 1, Table B.1. (IEC 60034-1, Annex B).

TOLERANCES

Efficiency η

Machines up to and including 150 kW (or kVA)

-15 % of $(1-\eta)$.

Machines above 150 kW (or kVA)

-10 % of $(1-\eta)$

Total losses (applicable to machines with ratings >150 kW

+10 % of the total losses.



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or kVA)

Peak value of short-circuit current under specified conditions	±30 % of the value in the technical specification.
Steady short-circuit current at specified excitation	±15 % of the value in the technical specification.
Moment of inertia	±10 % of the value in the technical specification.

SURFACE TREATMENT

Grade: C2, Standard color

Surface treatment C2 according to the ISO 12944 standard, for standard industrial environment.

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4 ACCESSORIES

Standard accessories

No pc/pcs	Item
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6	PT100 for stator winding
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Optional accessories

No pc/pcs	Item
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1	Anticondensation heater
1	Current transformer for parallel operation
2	PT100 element for antifriction bearing



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