



No genset. 5 kW at idle.

A priced 10 kW, 48 V house system, against an APS alternator with Wakespeed, and Integrel.

The BMG bolts to the main engine on a J180 mount and puts up to 10 kW into the 48 V house bank, with 5 kW at engine idle. This note gives the parts and US\$ retail price, then the figures that decide whether the generator comes off the boat: power at idle, continuous output, and the engine hours to refill a day's energy.



THE PACKAGE

BMG charging at 48 V, 10 kW rear inverter

ITEM	QTY	RRP US\$
BMG on J180 billet mount, 10 kW inverter to 48 V	1	3,936
BMG controller, phone app, 2 CAN ports	1	312

BMG package, 48 V only **4,248**

One unit. The inverter is inside the BMG, so there is no separate rectifier or regulator to mount and wire. The BMG appears natively as an alternator in Victron GX displays, and BMG temperature also displays in Victron.

OPTION 1

Add a 12 V or 24 V house

Most boats keep 12 V or 24 V for instruments, pumps and lights. Scotty AI is a bidirectional DC-DC from the 48 V bank, and it takes over BMG control, so the US\$312 controller is not needed.

ITEM	QTY	RRP US\$
BMG on J180 mount, from above	1	3,936
Scotty AI 1500 W, 12 V	1	1,680
BMG with 12 V house		5,616
Or Scotty AI 3000 W, 12 or 24 V	1	2,878

BMG with 24 V house **6,814**

Scotty AI is E-Mark type approved under UNECE R10 and shows in Victron GX devices.

WHY 5 KW AT IDLE MATTERS

The generator's job, done by the main engine.

A cruising couple with an electric galley and hot water uses about 10 kWh a day. How long must the engine run to put that back?

- BMG at idle, 5 kW: about 2 hours in neutral at anchor; motoring at 7 kW, about 85 minutes
- APS 48 V 170 A at idle: 0.2 to 1.6 kW, so 6 hours or more, or a fast idle

- Integrel E-Power at idle: 2 to 3 kW, 3.5 to 5 hours; E-Drive about 2 kW
- A 5 kW diesel generator: 2 hours, plus its own fuel, service, space and noise

FOR REFERENCE

A similar job done two other ways

ITEM	US\$ APPROX
APS 48 V 170 A alternator	2,500
Wakespeed WS500 Pro, harness, shunt	750

Alternator and regulator, 48 V **3,250**

Integrel E-Power 9 kW package from 15,000

Integrel E-Drive, generator and drive quoted per vessel

The alternator route is cheaper to buy. However, it gives virtually no power at idle, so the boat still runs the engine hard or keeps a generator. It is only useful at cruising speed.

OPTION 2

Add a screen and remote monitoring

A 4 inch Quasar Glass display shows charge, engine load and temperature. Quasar ONE adds the digital twin, predictive health alerts and remote diagnostic support over its own modem and eSIM.

ITEM	QTY	RRP US\$
BMG package, from above		4,248
Quasar Glass 4 inch display	1	296
Quasar ONE, modem and eSIM	1	495

BMG, screen, twin and remote support **5,039**

The display needs Quasar ONE or a modem router. Add Scotty AI from Option 1 for a 12 V or 24 V house. After 12 months a subscription continues the eSIM and AI services.

What each machine gives, and when

An alternator makes its rated power only at high alternator speed. The BMG uses hybrid excitation and an integrated inverter, so it holds output at low engine speed and is limited by temperature, not rpm. Integrel winds for low speed too but rectifies rather than inverts.

48 V, HOT	SAFIERY BMG	APS 48 V 170 A + WS500	INTEGREL E-POWER 9	INTEGREL E-DRIVE
At engine idle	5 kW	0.2 to 1.6 kW at 2,250 to 2,500 alternator rpm	2 to 3 kW at 700 rpm, up to 4 kW on some engines	About 2 kW
Continuous	About 7.5 kW at high idle and above	3.6 kW at 3,000 alt rpm, 5.2 kW at 4,000	7 to 8 kW at cruise, well ventilated	About 11 kW at 1,900 to 2,200 rpm
Peak	10 kW for 20 s	170 A, about 9 kW, full speed	9 kW, 170 A, temperature limited	15 kW stated
Conversion efficiency	Generator 90%, integrated inverter 94%, 85% net	External regulator; 50 to 60% hot	External bridge rectifier; efficiency not published	Inverter drive; 4.1 to 4.7 kWh per litre on trials
Weight	7.3 kg, inverter included	Alternator plus regulator box	11.9 kg plus 5.4 kg controller	In the driveline
Fitment	J180 mount; Yanmar, Volvo Penta, Cummins	Stock position, plus regulator harness and shunt	Large frame on the engine front	Yanmar JH 40 to 110 hp, factory fit
Network	Published CAN to Scotty AI, Victron GX, Quasar	Published CAN, NMEA 2000, Victron	Proprietary Argo CAN	Proprietary Argo CAN

APS figures from its published UPI 100 C comparison sheet (May 2025), in alternator rpm; engine idle of 750 to 850 rpm is 2,250 to 2,550 alternator rpm on a 3:1 pulley. Integrel figures from the E-Power datasheet 1.8, the E-Power and E-Drive user guides and the Integrel FAQ. BMG peak is 20 s at 105 C above 5,000 BMG rpm; BMG rpm is not engine rpm.

5 kW

At engine idle, in neutral

2 h

Of idling to put back 10 kWh

85%

Net efficiency, generator plus inverter

7.3 kg

For 10 kW, inverter inside

PROTECTION AND CONTROL

What keeps the engine and the bank safe

	SAFIERY BMG	APS ALTERNATOR + WS500	INTEGREL E-POWER AND E-DRIVE
Engine load	Torque sensed; backs off on engine overload. Can operate with a 30 hp motor	No torque sensing; field limit set by installer	Load management in controller
Temperature	Motor and inverter sensed, output regulated	Alternator sensor to regulator	Air cooled; output falls when hot
Battery	CAN BMS integration, stop charge input	V, A and temperature targets; CAN to BMS	Proprietary CAN to own BMS
Load dump	Integrated, 100% protected	External protection needed	In the controller
Redundancy	Dual three phase windings, half power on a fault	Single winding	Single winding
Standards	Automotive platform, ISO 26262 ASIL B, IP6K9K	No functional safety rating	Marine rated

COMPETITIVE ASSESSMENT

Where it stands

Close to us, but not the same

- Charging from the main engine. All three take the generator's job onto the propulsion engine; the difference is what they give at the speed the boat actually runs.
- Smart regulation. The WS500 regulates on voltage, current and temperature and talks CAN to Victron and most BMSs. It cannot add power the alternator does not make at idle.
- 48 V house. All three agree. Only the BMG route includes the bidirectional DC-DC to 12 V or 24 V as a matched part.

Where the BMG is better

- Power at idle. 5 kW against 0.2 to 1.6 kW for the alternator and 2 to 3 kW for Integrel. This decides whether the generator comes off the boat.
- Efficiency. 85% net against 50 to 60% for a hot alternator. Less fuel and less engine room heat for the same kWh.
- One unit. Inverter inside, 7.3 kg, J180 mount. Integrel adds a 5.4 kg controller and its own network; the alternator adds a regulator, harness and shunt.
- Any battery. Charges any 48 V battery safely, whether on CAN or not. Open source interface.

Consideration

- The alternator route is about US\$1,000 cheaper to buy. It is not cheaper to run, and it does not remove the need for a generator.
- Integrel E-Drive is also an electric drive. Where silent harbour propulsion is the goal it answers a different question. For charging alone it is heavier, proprietary and quoted per vessel.
- APS sells its 48 V alternators through qualified upfitters only, so its pricing here is indicative.