



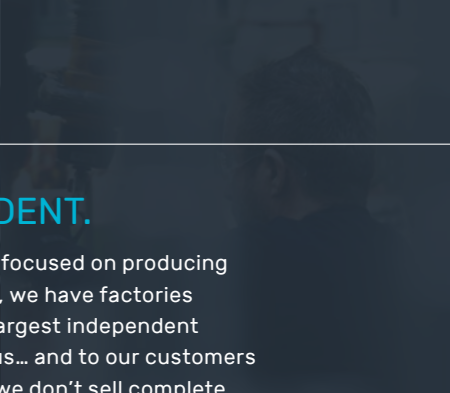
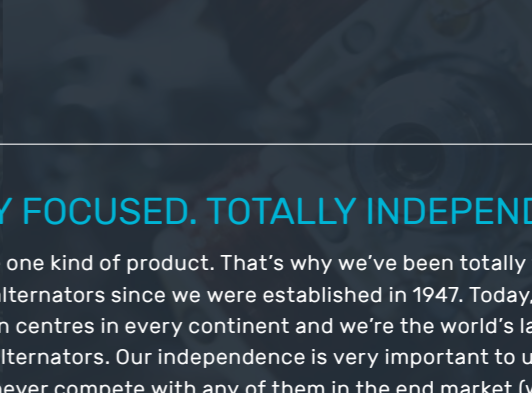
Totally Focused. Totally Independent.

TOTALLY FOCUSED ON

WELDERS AND
CUSTOMISED
POWER SOLUTIONS

Unique Company.
Unique People.





OUR UNIQUE COMPANY

TOTALLY FOCUSED. TOTALLY INDEPENDENT.

We only make one kind of product. That's why we've been totally focused on producing high quality alternators since we were established in 1947. Today, we have factories or distribution centres in every continent and we're the world's largest independent producer of alternators. Our independence is very important to us... and to our customers because we never compete with any of them in the end market (we don't sell complete generator sets). We believe that we're a totally unique company because of the special combination of qualities that set us apart from our competitors. We offer the highest levels of global support to our customers and we put them at the forefront of every single decision we make, which continually spurs us on in terms of our continuous development, product innovation and constantly evolving product ranges.

TOTALLY COMMITTED TO GLOBAL PRODUCTION

We manufacture the world's widest range of low voltage alternators 1 - 5,000kVA via our "made for manufacturing" product design in Italy, the UK, China and India. Our network of factories is supported by wholly-owned subsidiaries across the globe who specialise locally in the sales, distribution and aftersales for all Mecc Alte products. This global support ensures that our customers get the assistance they need... wherever they are.

TOTALLY COMMITTED TO QUALITY

We've reached the highest possible quality standards in every area of design, production and sales. At Mecc Alte, our constant pursuit of quality begins well before the actual production process with careful checks on semi-processed parts and sample testing of electrical components. We build over 1,400 alternators every day, over 450,000 a year. We have a complete range of products and our production process is totally integrated. This ensures that every production phase, from the design and selection of materials right through to manufacture and aftersales assistance, complies with the strictest international and organisational standards.

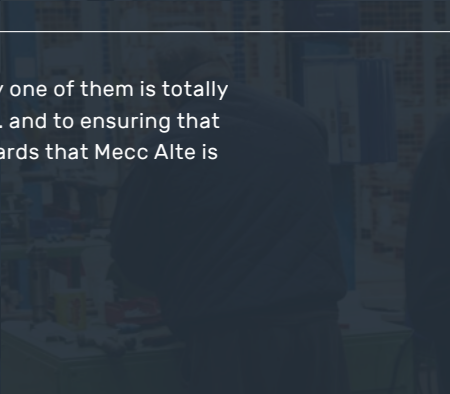
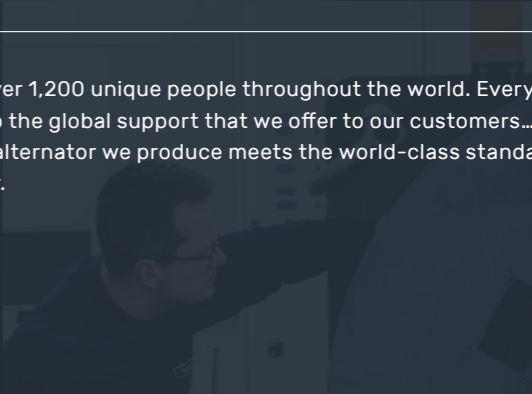
OUR UNIQUE PEOPLE

We employ over 1,200 unique people throughout the world. Every one of them is totally committed to the global support that we offer to our customers... and to ensuring that every single alternator we produce meets the world-class standards that Mecc Alte is renowned for.

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SETTING THE SCENE



Zanardi is a leading manufacturer of rotating electrical equipment, welders and customised power solutions. We are part of the Mecc Alte Group, which has specialised in only producing alternators since 1947.

We are a highly flexible company, ideally equipped to meet the ever-changing requirements of the power generation sector. We are flexible, innovative manufacturers of advanced quality alternators and components.

Zanardi has vast experience in many market sectors and supplies products worldwide – in a very diverse range of applications. The technical expertise and inherent quality that are hallmarks of our manufacturing capability has led to ever-increasing demand within all power generation sectors.

Our products are currently being utilised in the following applications:

Prime Power	Construction
Agriculture	Telecommunications
Fisheries	Homes
Marine	General Industry
Rental	Peak Shaving
Military	CHP



OUR ITALIAN HERITAGE, EXPERIENCE AND EXPERTISE



Mecc Alte was established in 1947 in Alte, Vicenza, Italy and has continuously evolved from its humble beginnings into a global brand in the 21st century.

Our strategic decision in the early 70s to specialise in only producing alternators has allowed us to attain a leading global position in the electromechanical field.

The Carraro family has retained sole ownership and, as an independently-owned private company, has focused on achieving the highest possible levels of specialisation, quality and service. We concentrate on servicing our customers and, what's more, we never compete with them in the end market.

Mecc Alte is in the business of transforming mechanically generated energy into electrical energy – so we only sell alternators. We are proud to be a flexible and fast-acting company and our 100% ownership of our supply and distribution channels gives us complete control in the market place.

We have extensive experience. We know what is needed from the industry we serve and we aim to provide it.



OUR MANUFACTURING PROCESS

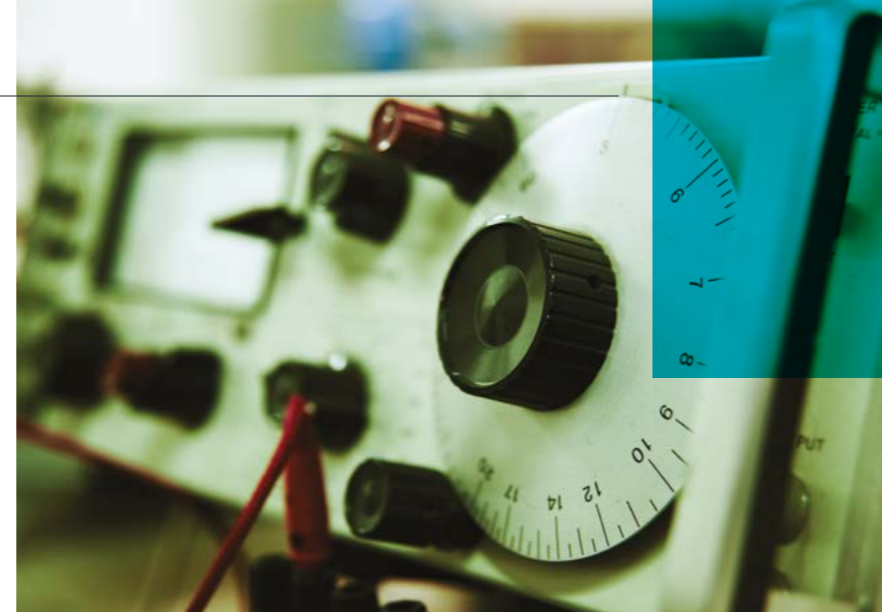
Our new, purpose-built factory puts us in a very strong position. We are able to support our customers and meet the increasing demand for our products even more effectively than before.



Able to manufacture machines to the highest possible standards, with full test facilities and research and development capabilities, we can quickly provide solutions to any power requirement. The entire productive cycle, from the phase of design to production, is supported by an efficient and dependable manufacturing and commercial centre which offers our customers a highly professional service.

Our facilities cover over 5,000m² and we can handle both short production runs of highly specialised product or large volumes runs to support the needs of our clients. As a very flexible and reactive company, we can react and maximise any market opportunities for our customers and ourselves.

Every one of our alternators is manufactured with carefully selected materials and components. Our production process consists of various stages of advanced manufacturing in order to ensure the best possible build quality.



OUR TECHNICAL DIVERSITY

As well as our own technical division, we also benefit from being part of the Mecc Alte Group. This is crucially important when it comes to designing the fundamental basics of a machine. In order to match any customer requirements, we have an independent, in-house technical office, with a purpose built testing facility for prototypes, and research and development within our factory. Consequently, any machine modification can be designed and tested inside our own facility. This important capability allows us to satisfy customer needs and ensures the reliability of our machines – even if they have been technically customised from the traditional design.

We design all our products through advanced computerised design and each and every part is carefully selected for its quality and performance which defines the characteristics of our products. This advanced technology allows rapid prototyping enabling us to offer a very fast technical solution and quick product feedback to our clients.

OUR PRODUCTS

Zanardi is a leading exponent of quality design and employs highly effective, dedicated software. Our alternators have a paralleled similarity to Mecc Alte products due to a maximisation of joint resources and skills. We are equipped to offer a standard selection of products and also have the ability to provide customised products too. All of our welders are fully designed and tested in-house.

OUR PRODUCT RANGE INCLUDES:

WELDING ALTERNATORS

Welders AC 2 poles (55-200A – 4kVA – 7kVA / 50Hz)
(55-220A – 7kVA – 8kVA / 60Hz)

Welders DC 2-4 poles (35-500A – 4kVA – 15kVA / 50Hz)
(35-530A – 4kVA – 18kVA / 60Hz)

2 POLE ALTERNATORS

Three phase brush – compound regulation
(6kVA – 55kVA / 50Hz) (7.2kVA – 65kVA / 60Hz)

Three phase brushless – electronic regulation
(22kVA – 82kVA / 50Hz) (26.5kVA – 98.5kVA / 60Hz)

DC ALTERNATORS

AL3A – low voltage DC alternators
(2 or 4 pole / 1ph or 3ph / 5 – 18kW)

AL28 – low voltage DC alternators
(2 or 4 pole / 1ph or 3ph / 12 – 24kW)

4 POLE ALTERNATORS

Single phase – brushless – electronic regulation
(11 – 20kVA / 50Hz)

Three phase brush – compound regulation
(10kVA – 37kVA / 50Hz) (12kVA – 44.4kVA / 60Hz)

Three phase brushless – electronic regulation
(11kVA – 70kVA / 50Hz) (13.2kVA – 84kVA / 60Hz)



SPECIALISED POWER SOLUTIONS

Customised power solutions

Wound components

PERMANENT MAGNET GENERATORS



PM3G (3 – 6kW)

PM5G (8 – 10kW)

PM7G (15 – 20kW)

PMG Fisso (DC fixed speed)

OUR ROTATING WELDER RANGE



WELDER AC 2 POLES

(55-200A – 4kVA-7kVA / 50Hz) (55-220A – 7kVA-8kVA / 60Hz)

The AC brushless generators-welders series denominated HM1 guarantees unlimited operation with minimum maintenance. In fact, its particular system enables the user to have full maximum power – either as a single phase generator or as a welder. With a distribution along the sides of the unit for output sockets, the product is really easy to use and delivers great accessibility and a comprehensive number of different panel options.

The AC welder is governed by a selector switch which controls the two functions (generator or welder) and by a commutator which regulates the welding current with seven positions on two scales (one scale for 130 amp version). All of this is packed inside a solid and rugged aluminium structure with a compact and light design and IP23 protection level.

All units have insulation systems to Class H requirements through advanced impregnation processes and material selection.

The HM1 series has been engineered to satisfy the most common end-user needs and the use of a single phase generator with good performances is complemented by an excellent AC welder. This permits the use of the most common diameters of rutile-type electrodes.

WELDER AC 2 POLES RANGE

Code	Poles	Power cl. H [50Hz]	Power cl. H [60Hz]	Welding Current [50Hz]	Welding Current [60Hz]
HM1130AC	2	4kVA	-	55÷130	-
HM1180AC	2	6kVA	7kVA	55÷180	55÷180
HM1200AC	2	7kVA	8kVA	55÷200	55÷220



WELDERS DC 2 POLES

(35-300A – 4-10kVA / 50Hz/ 60Hz)

The PW2 and PW3 generators-welders series are brush-type 2 pole alternators with compound or compound-electronic regulation. This feature guarantees output voltage precision and motor-starting capability. Created due to well-established and continuous experiences in the welding sector, this rotating DC welder series has models with 3 phase and derived 1 phase or pure 1 phase generator output. A unique characteristic of the series (models 200, 220) is that it automatically disconnects the generator output when it is being used in the welder function. This avoids having dangerous voltage and prevents overload. Instead, in the generator



function, there is a protection which, due to its specific system characteristics, prevents dangerous voltages in the generators – in case of accidental short circuit in the welding part. The selection of the required function, and of the output current regulation current, is governed by two commutators in the rear panel.

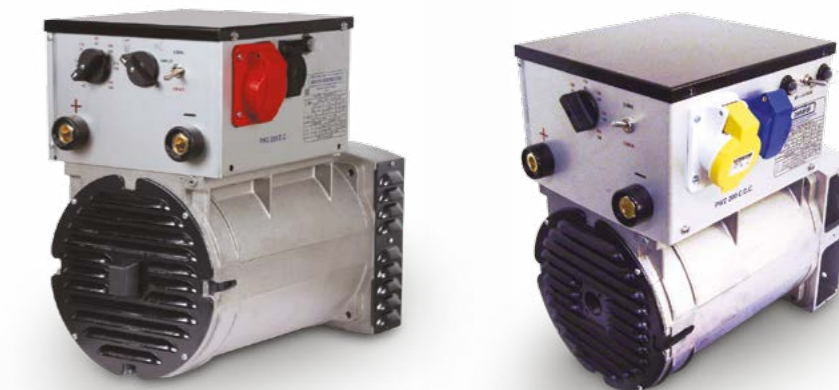
Again... a variety of socket boxes allows configuration of the socket on the side of the unit for maximum access.

The frame is made of Fe P12 steel, and all shafts are C45, to ensure the unit can withstand rugged environments and is resistant to vibration. All units have insulation system to Class H requirements through advanced impregnation processes and material selection.

The PW series has been engineered to satisfy the end-user that has specific medium power requirements and it allows the use of single or three phase utensils and of a DC welder which uses all types of electrodes (rutile, basics, cellulotics).

WELDERS DC 2 POLES (35÷300A / 50Hz) – AVAILABLE AS 50/60Hz

Code	Poles	Power cl. H [50Hz]	Power cl. H [60Hz]	Welding Current [50Hz]	Welding Current [60Hz]
PW2 170T DC	2	2/4kVA	-	40÷170	-
PW2 200T DC	2	3/5kVA	-	40÷200	-
PW2 220T DC	2	3/6kVA	-	40÷220	-
PW2 200M DC	2	4kVA	4kVA	40÷200	40÷200
PW2 220M DC	2	5kVA	5kVA	40÷220	40÷240
PW2 200EDLC	2	4.5kVA	4.5kVA	40÷200	40÷200
PW2 220EDLC	2	4.5kVA	5.5kVA	40÷220	40÷240
PW3 300T DC	2	4/10kVA	-	40÷300	-



**WELDERS DC 2-4 POLES WITH AC-DC CHOPPER CONVERTER
(35÷500A - 4kVA÷15kVA / 50Hz AND 60Hz)**

This series of welder generators has been designed to ensure high performance and maintenance-free operation. The EPW3; EPW4; EPW5 welder-generators are brushless excitation (with rotating diodes) and a total electronic regulation. The generator is regulated using the EVR01 regulator, and the welding current is regulated by "chopper" technology to obtain high welding quality (DC high frequency 40KHz). Due to a special design, this system also allows for simultaneous use of the alternator

and the welder. This special circuit also permits the forcing of the arc, anti-blockage, and is protected against short circuits on the exit from welding. The frame is made of Fe P12 steel, and all shafts are C45, to ensure that the unit can withstand rugged environments and is resistant to vibration. All units have insulation system to Class H requirements through advanced impregnation processes and material selection.

The EPW3-4-5 series has been sized to satisfy the most professional requirements of the welding sector, as it can be employed with high duty cycles in synergy with a 3 phase alternator which has optimum characteristics. All types of electrodes can be welded (rutile, basic cellulosic).

**WELDERS DC 2-4 POLES WITH AC-DC CHOPPER CONVERTER
(35÷500A - 4kVA÷15kVA / 50Hz) RANGE**

Code	Poles	Power cl. H [50Hz]	Power cl. H [60Hz]	Welding Current [50Hz]	Welding Current [60Hz]
EPW3 300T DC	2	4/10kVA	-	35÷300	-
EPW4 400T DC	2	10/15kVA	10/15kVA	35÷400	35÷400
EPW4 400T DC	4	4/10kVA	6/11kVA	35÷350	35÷370
EPW5 500T DC	4	10/15kVA	10/18kVA	35÷500	35÷530



SPECIALISED POWER SOLUTIONS

SPECIAL PRODUCTS

Our technical knowledge allows us to develop customised power solutions through many different types of alternator. The following list is a brief description of some of the special products that exist in our vast product library, all purpose built to meet a specific market need.

Induction generators for CHP applications

Alternators for marine and CHP applications

Modified shafts and frames for special applications

Synchronous generators with squirrel cage rotor with starting capability

DC machines (AC rectified) for battery charging and telecom applications

DC machines for many applications such as duties for ground support applications with high 'S3', or for powering magnetic cranes

Sales of generator components only (stator or rotors)

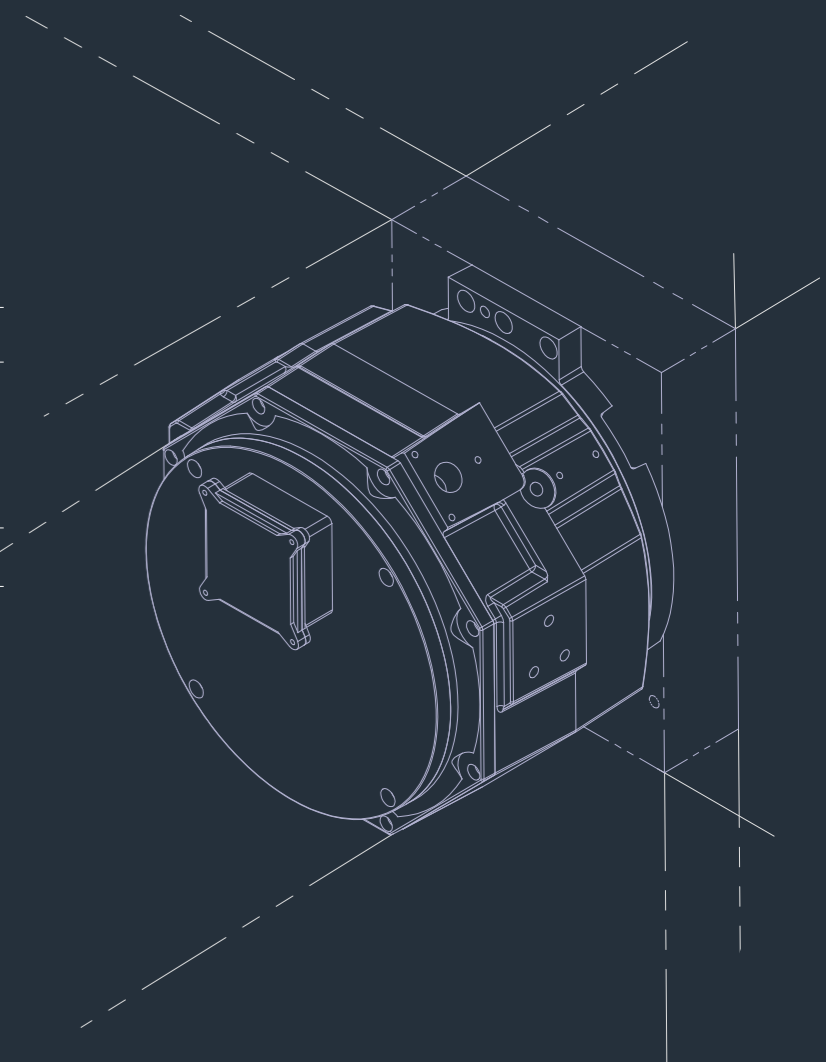
Low voltage generators for heavy duty marine applications

Special voltage generator, either AC or DC

Basics range of simplified asynchronous alternators available as:

- 2 pole, brushed or brushless
- 4 pole, brushed or brushless

Variable speed generators



OUR PERMANENT MAGNET GENERATOR (PMG) RANGE

PERMANENT MAGNET GENERATOR AND ELECTRONIC POWER INVERTOR

Unlike traditional AC alternator systems, a Permanent Magnet Generator allows considerable benefits. Physical benefits with reductions in weight and length, coupled with electronic benefits, ensure a superior technology devised to maximise efficiency of the complete power system.

Our Permanent Magnet Generator has an inbuilt EMC filter which works in a system with a single phase inverter. Harmonic Distortion is very low at <2% giving superior waveform, guaranteeing the safe operation of modern sensitive electronic equipment.

The power density is increased using inverter technology, where the traditional excitation winding systems are replaced and the stator is central with an external rotor. This maximises the potential of the magnets used.

The inverter produces a pure sine wave inverter for sensitive electronics and is supplied with an optional remote display panel. The inverter has several inbuilt protections such as, short-circuit protection, overload protection, over temperature protection and has a built-in service port and auxiliary connector with CAN support.

This PMG variable speed system can also be used in conjunction with the Mercurio Telecom and Hybrid DC Power Module and genset controller.

Model	Power (max rpm)	Power Range 50Hz	Power Range 60Hz
PM3G-3 Medio	3kW	2000-3000rpm	2400-3600rpm
PM3G-6 Medio	6kW	2000-3000rpm	2400-3600rpm
PM5G-8 Lento	8kW	1700-2400rpm	1900-2700rpm
PM5G-10 Medio	10kW	2000-3000rpm	2400-3600rpm
PM7G-15 Lento	15kW	1700-2400rpm	1900-2700rpm
PM5G-15 Lento	15kW	-	2400-3600rpm
PM7G-20 Lento	20kW	1700-2400rpm	1900-2700rpm
PM7G-20 Medio	20kW	2000-3000rpm	2400-3600rpm

SPEED CONTROL MODULE

An optional board made for the control of a diesel engine is able to handle the starting and stopping of the engine during normal operation. It can also control the engine speed by adjusting it according to operation intelligence (voltage outputs and current delivered) received from the inverter through a dedicated CAN communication line. The board handles the timing and sequence of the various outputs for the proper operation of the motor control. Through an interface with a dedicated user panel (by others), you can control the start of the driver motor (i.e. diesel engine) and, once you reach a stable rotation speed, enable the voltage generation of the inverter. It also controls the inverter and motor (engine) operation and, in case of problems or user requests, takes care to shut down the entire system and report any errors.

PERMANENT MAGNET GENERATOR - FIXED SPEED

The Fisso DC Permanent Magnet Generator is designed to supply specialist lamps on lighting towers, such as high efficiency LEDs and have an in-built rectifier bridge. The determinable fixed speed is selected depending on application and DC voltage levels can be adapted to suit operational requirements.



Permanent Magnet Generator

Speed Control Module



OUR LOW VOLTAGE RANGE

The AL series of low voltage generators use established synchronous alternator technology to develop lower than usual voltages for specific applications. Using 1ph, 3ph 6ph or even 9ph AC windings for varying degrees of precision, the low voltage AC output can be rectified to DC through a machine-mounted rectifier cooled by an integral fan. In DC, you have no limit of voltage although typical requirements of 28VDC (aircraft starting) and 48VDC (telecom) are most common. Voltages may be much higher such as 220VDC for use in magnetic cranes.

For the applications, designs exist in aircraft starting to provide 28VDC 750A continuous and 2500A transient power as the aircraft starts. For telecom a clean power supply down to 2% ripple is possible without the need for complex inverter technology.

In DC, the machine is regulated by our RT regulator, specific to the DC machines. This regulator can be used to regulate voltage only or to simultaneously regulate current and voltage required – as required in battery charging mode. DC Systems are not restricted to a synchronous speed, so you can have fixed, 2 speed or variable speed within certain limits. You can then use these machines at the most fuel-efficient speed for the engine such as 2200-2500rpm.

The same machines without rectifier can be used for other applications or where rectifiers are supplied by others – such as 35VAC to give 48VDC off the customer's rectifier. Here we act as a component supplier to a complete DC system.

Frame design is the same as for conventional AC machines so no changes are required to genset bedframe or enclosure, making a switch to DC very simple.

LOW VOLTAGE DC RANGE

Series	Model	RPM	Volts	Power	PH	System
AL3A	V24/4	1500rpm	24V DC	5-10kW	3ph	AVR
AL3A	V24/2	3000rpm	24V DC	5-18kW	3ph	AVR
AL2B	V28/4	500 or 1800rpm	28V DC	12-18kW	3ph	AVR
AL3A	V48/4	1500rpm	48V DC	5-10kW	3ph	AVR
AL3A	V48/2	3000rpm	48V DC	5-18kW	3ph	AVR
AL2B	V48/4	1500rpm	48V DC	12-24kW	3ph	AVR



LOW VOLTAGE AC RANGE

Series	Model	RPM	Volts	Power	PH	System
AL3A	V35/2	2200 or 3000rpm	35V AC	12-14kW	1ph	Capacitor
AL2B	V35/2	2800rpm	35V AC	16-22kW	1ph	Capacitor
AL2B	V35/4	2500rpm	35V AC	16-24kW	1ph	Capacitor



OPERATIONAL CONSIDERATIONS

We are proud that our alternators have many features built in as standard. This enables them to be used in a multitude of applications and environments.

We encourage our customers to understand where the alternator will be used and to consider the implications of its operating environments. This will enable us to recommend the correct alternator and to suggest any additional processes or requirements that may need to be considered to extend the alternator's performance and lifespan.

If an alternator is to be operated outside the normal temperature and altitude parameters of 40°C ambient (and 1000m above sea level), then the following de-rates must be applied.

In addition, other considerations should be made if a machine is to be operated in harsh environments. We can supply additional protection levels such as IP43, IP45 and even IP54 in some cases. If the environment is humid, we can supply anti-condensation heaters.

We can also upgrade the insulation protection system and offer alternative solutions such as GREY EG43 severe environment protection or TOTAL+ protection with a black severe environment protection. This is supplied on the winding for the harshest of environments. (See Insulation Systems Manual.)



Operating Altitude	Operating Ambient Temperature				
	25°C	40°C	45°C	50°C	55°C
< 1000m	1.07	1	0.96	0.93	0.91
1000m to 1500m	1.01	0.96	0.92	0.89	0.87
1500m to 2000m	0.96	0.91	0.87	0.84	0.83
2000m to 3000m	0.9	0.85	0.81	0.78	0.76

OUR QUALITY, SERVICE AND AFTERSALES

We have reached the highest possible quality standards in every area of design, production and sales. With us, the pursuit of quality begins long before actual production, with checks on semi-processed parts and sample tests on electronic components.

These tests are performed with rapid aging methods by means of alternating exposure to extreme temperatures. Our quality is enhanced during the production process with computerised equipment making checks on electronic and electrical circuits. The high quality of our finished products is due to a perfect combination – high performance and maximum reliability.

Every quality mark is a guarantee of the rigorous assessment of prototypes and a commitment to continuous audits by external inspectors to monitor product consistency – and product quality.

This quality assurance allows us to be proud of our products. Our products are now globally recognised. This high market acceptance has originated from a combination of effective marketing through our sales and distribution facilities, established training plans for our many customers, and consistently great aftersales service. We are a professional and responsible company and understand that a good reputation breeds success.

We recognise that our reputation depends on continually delivering high standards of support – whenever and wherever it is required. With an extensive global service and aftersales network, you can be assured that your product will be supported anywhere in the world.

Our quality is certified by international bodies and is supported by our ISO 9001 accreditation across the whole group. Ask factories for individual certifications achieved. This quality assurance allows us to be proud of our products and gives you peace of mind knowing our alternators are built with the highest possible quality standards.





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