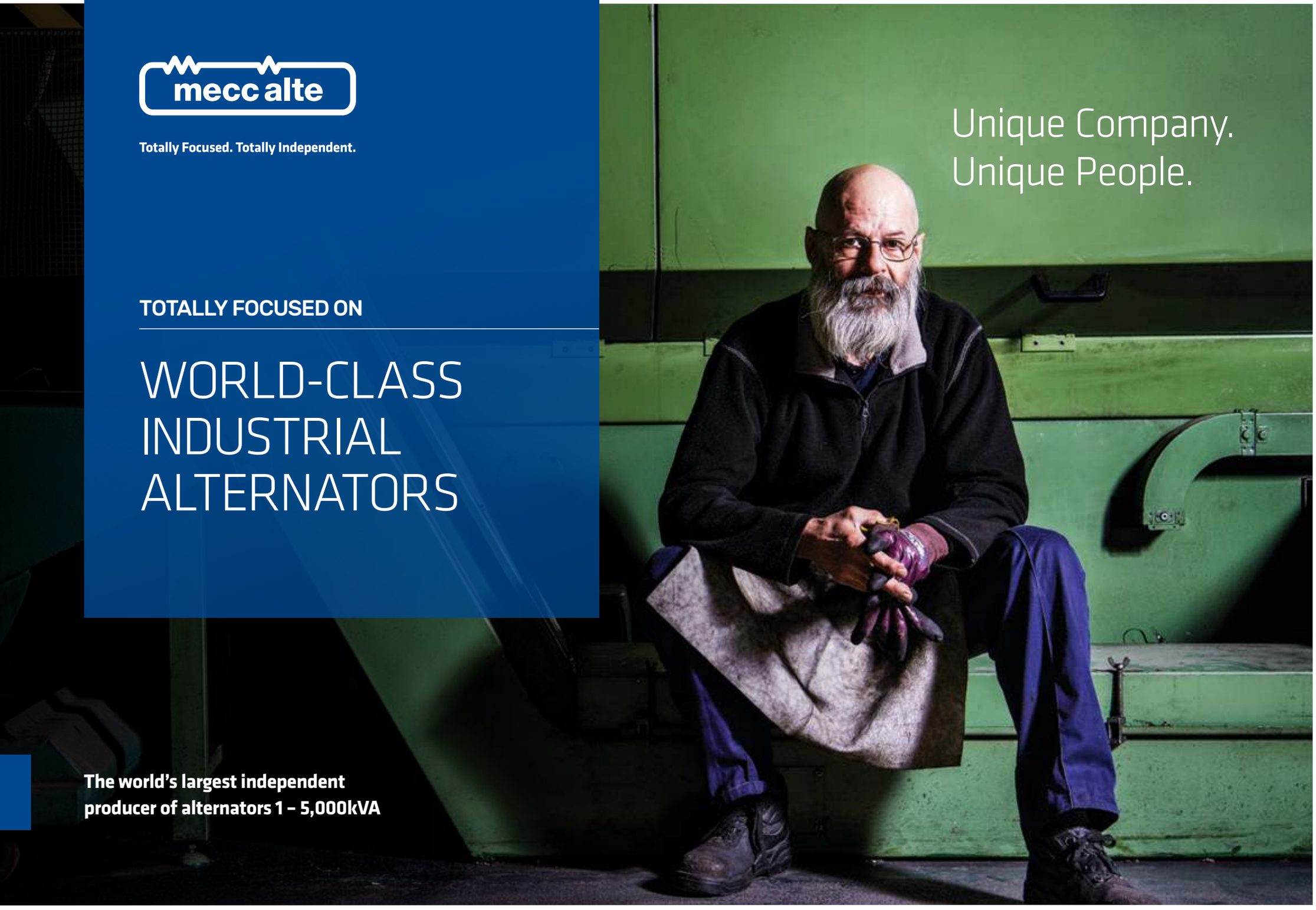
mecc alte

Totally Focused. Totally Independent.

TOTALLY FOCUSED ON

WORLD-CLASS INDUSTRIAL ALTERNATORS



The world's largest independent producer of alternators 1 – 5,000kVA

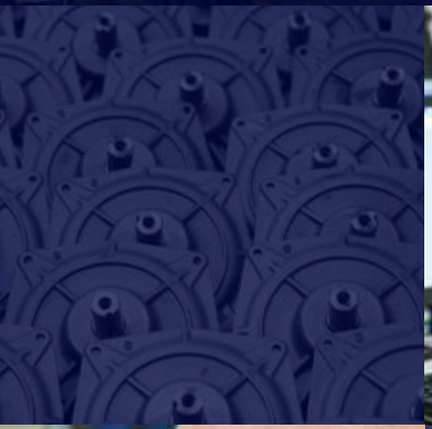






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OUR UNIQUE COMPANY

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.

OUR ITALIAN HERITAGE, EXPERIENCE AND EXPERTISE

70 YEARS 1947–2017



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 LEADING BRANDS

Industrial and Marine Products

Our main brand – a manufacturer and supplier of synchronous alternators 4 pole from 3.5kVA through to 5,000kVA and 2 pole alternators 5kVA to 2,000kVA.

- 3.5 – 5,000kVA
- 1 phase brushless – capacitor for light towers
- Slipring/Compound in 2 and 4 pole up to 24kVA
- Brushless compound in 2 and 4 pole to 98.5kVA with AVR option
- Brushless AVR in 2 and 4 pole to 5,000kVA
- 400Hz up to 200kVA
- 6 pole alternators
- Specialised technologies
- Variable speed
- Permanent magnet generators
- Generators for renewable applications (water and wind turbine)
- Mercurio DC system and hybrid systems for telecom applications 5kW to 15kW

Specialised Power Products

Focusing on MV and HV products for power generation and producing synchronous and asynchronous generators suitable for hydropower applications.

- Low, medium and high voltage alternators, designed for demanding applications
- 1 – 5MVA
- LV – voltage up to 690V / MV up to 7,200V / HV up to 13,800V
- > 4, 6, 8 pole
- Separate circuit cooling by air or water is available
- Hydropower alternators
- Synchronous alternators up to 10MVA, 380 – 15,000V, up to 32 pole, water or air-cooled, horizontal or vertical mounting
- Asynchronous alternators up to 700kW, low speed, water or air-cooled
- D2G – permanent magnet generators, steady speed without invertor up to 500kW

Portable 2 Pole Products 1 – 17kVA

A company that specialises in the volume manufacturing of small 2 pole portable units 1.2kVA to 17kVA.

- 1 phase brushless capacitor excited units with optional AVR or Brush + AVR
- 3 phase with slipring compound control or Brush + AVR

Welders and Specialised Products

A factory specialising in customised power solutions making tailor-made specialised alternators and welding generators.

- 2 and 4 pole welding alternators with auxiliary output
- AC 130-220A and 200-500A DC
- Special products tailored to meet customers' requirements
- Water-cooled, DC, lighting, totally enclosed, variable speed, short units
- Asynchronous alternators
- Wound component parts
- Permanent magnet generators

OUR APPLICATIONS

As a specialised manufacturer of synchronous alternators, welders and special rotating machines, within the electromechanical sector, we produce products that cover a highly diverse range of applications.

In addition to a very broad 'standard' product range, we can also meet specific customer requirements. We build a wide variety of specialised alternator products, which include 400Hz, water-cooled, DC, variable speed, totally enclosed, wind power and DC telecom systems.



Within general industry, our products are used in the following applications:

- Prime power
- Cogeneration
- UPS
- Commercial construction
- Rental
- Parallel operation
- Peak shaving
- Military
- Telecommunications
- Mining
- Irrigation
- Hospitals
- Homes
- and many other continuous or standby power applications.



EXPERIENCED DIVISIONS CATER FOR RAIL, IRRIGATION, MARINE, 400Hz, TELECOMS AND PTO MARKET SECTORS.

mecc alte rail

Our proven record in reliability and maintainability has established Mecc Alte as a leading player within the rail industry. We supply specialised products for vehicle-mounted power supply/traction and maintenance vehicles. With a specialist range of IP56 alternators specifically designed for rail applications.

Please see the Rail Mini Guide for further details.

mecc alte 400Hz

Our 400Hz alternator range is predominantly used in the aircraft ground support market. We are able to offer units for ground power supplies from small 5kVA 14 pole units through to large 200kVA 26 pole units.

Please see the 400Hz Mini Guide for further details.

mecc alte irrigation

The irrigation sector has its own unique everyday rigours demanded from an alternator. The Mecc Alte range is designed for high performance with TOTAL+ protection and resistive components to make it ideally suited to meet power demands in this sector.

Please see the Irrigation Mini Guide for further details.

mecc alte telecoms

Mecc Alte supports the telecoms industry globally with many products and power solutions systems. Covering AC and DC and hybrid options, we support fixed, twin and variable speed systems. With the Mercurio power system the simplest solution to more complex variable speed options.

Please see the Telecoms Mini Guide for further details.

mecc alte marine

Mecc Alte is a leading supplier to the marine genset market. Applications include: small water-cooled 4kW machines in the leisure boat industry, larger fully certified machines up to 3,000kVA used in power supply, emergency/auxiliary, main power on large vessels and bow thruster drives on others. We also have a range of CACW (Closed Air Circuit to Water) alternators incorporating heat exchangers.

Mecc Alte has DNV and BV marine type approvals.

Please see the Marine Mini Guide for further details.

mecc alte PTO

Mecc Alte manufactures a full range of PTO generators. With two product ranges we offer OEMs (original equipment manufacturers) either a base product consisting of a double bearing alternator and gearbox, or a complete product which includes an alternator with control panel, an over-gear with shaft guard, fitted onto a three-point linkage frame. These units are designed to be tractor-driven and to provide backing power in the event of a power failure in the agricultural community.

Please see the PTO Mini Guide for further details.

OUR PRODUCTS

We are a well established company that is ready and able to meet the demands of all the markets. We have a very wide product range developed as a result of our experience of operating in these markets for so many years.

4 Pole Alternator Range

Series	Control System	1 Phase 50Hz	3 Phase 50Hz	1 Phase 60Hz	3 Phase 60Hz	Unique Attributes	
LT3N/4	Brushless Capacitor Control	3.5-8kVA	-	4.5-10kVA	-	-	Suitable for Lighting Towers
BTP3/4	Brush / Slipring Transformer Control	5-11kVA	7-15kVA	6-13.2kVA	8.4-18kVA	450% Motor Start	-
ECP3/4	Brushless AVR Control with Digital Automatic Voltage Regulator and MAUX	4.6-11kVA	6.5-15kVA	4.8-13.5kVA	7.8-18kVA	MAUX 300% Motor Start	-
ECP28/4		5-22kVA	7.8-30kVA	5.5-25kVA	9.4-36kVA		-
NPE32/4		5-22.5kVA	7.5-27.5kVA	6-26.5kVA	9-34kVA		Space Saver
ECP32/4		23-47kVA	35-80kVA	24-57kVA	42-92kVA		-
ECP34/4		59-86kVA	85-160kVA	58-105kVA	102-192kVA		-
EC038/4		87-156kVA	180-350kVA	86-155kVA	220-420kVA		Optional PMAUX/DER
EC040/4		188-380kVA	400-750kVA	225-422kVA	480-900kVA		Optional PMAUX
EC043/4		-	800-1400kVA	-	960-1700kVA		Optional PMAUX
EC046/4		-	1500-2700kVA	-	1800-3300kVA		Optional PMAUX
EC049		-	2380-4670kVA	-	2856-5604kVA		Optional PMAUX
ECS028/4	Brushless Transformer Control	On Request	17-30kVA	On Request	20.4-36kVA	400% Motor Start	Optional AVIR
ECS032/4		On Request	35-75kVA	On Request	42-90kVA	400% Motor Start	Optional AVIR

All the ratings for guidance only: please refer to technical ratings book for confirmation.

2 Pole Alternator Range

Series	Control System	1 Phase 50Hz	3 Phase 50Hz	1 Phase 60Hz	3 Phase 60Hz	Unique Attributes	
LT3N/2	-	7-10kVA	-	8.4-12kVA	-	-	-
BTP3/2	Brush /Slipring Transformer Control	11-14kVA	16-20kVA	13.2-16.8kVA	19.2-24kVA	450% Motor Start	-
ECP3/2	Brushless AVR Control with Digital Automatic Voltage Regulator and MAUX	5.5-12.5kVA	8-20kVA	6.6-15kVA	9.6-24kVA	MAUX 300% Motor Start	-
ECP28/2		14.5-24kVA	22-40kVA	17.5-29kVA	26.5-48kVA	-	-
NPE32/2		5.3-25kVA	8-32kVA	6.6-30kVA	10-38.4kVA	-	Space Saver
ECP32/2		29-54kVA	44-82kVA	35-65kVA	53-98.5kVA	-	-
ECP34/2		53-76kVA	100-170kVA	70-101kVA	120-208kVA	-	-
EC037-EC043/2		On Request	158-950kVA	On Request	188-1140kVA	-	-

Specialised Alternator Range

Series	Control System	1 Phase 50Hz	3 Phase 50Hz	1 Phase 60Hz	3 Phase 60Hz	Unique Attributes	
Rail - TE34	Brushless AVR control with Digital Automatic Voltage Regulator and MAUX	On Request	50-80kVA	On Request	60-96kVA	MAUX 300% Motor Start	Totally Enclosed IP54
Marine		On Request	7.8-2750kVA	On Request	9.4-3300kVA	MAUX 300% Motor Start	Optional PMAUX on Large Units
400Hz - HC Series	HC Series Multipole Brushless with DSR and MAUX (400Hz)	-	5.5-200kVA (400Hz)	-	-	-	400Hz (14, 20 & 24 Pole)
EC046/6	Brushless AVR Control with DSR and MAUX	-	980-1700kVA	-	1200-2100kVA	MAUX 300% Motor Start	6 Pole
EC046 MV/HV EC049 MV/HV	Brushless AVR with DSR2 and MAUX	-	980-5000kVA	-	1200-5900kVA	MAUX 300% + PMG	Medium and High Voltage Range



MANUFACTURING PROCESS



We are a volume producer with complete control over our factories and have a truly international manufacturing base. All our factories incorporate the latest technologies and manufacturing processes, producing a truly global product that is consistent worldwide. This ensures physical characteristics, technical features, quality and performance are guaranteed wherever in the world it is manufactured.



Our facilities cover over 60.000m^2. We have over 1,2000 employees and over 30 CNC-controlled robots. We continue to invest in our future through increasing global capacity and this ensures that we are able to support the growth of our clients. We can react to any market demands and always ensure that we can instantly maximise any growth opportunities for our customers.

Every alternator we produce is made with highly selected materials and components – all tested in conformity to ISO 9001 quality specification and in conformity to ISO 18001 process qualification for health and safety.

Our production process consists of various stages of advanced manufacturing technologies. Each working phase is carried out using state-of-the-art equipment to ensure high performance, great reliability and precision. Robotic machining and winding operation processes enable the highest degree of precision which ensures maximum results in consistent quality. Operating to an effective environmental management system, we have ISO 14001 which ensures we minimise our impact on the environment.

Italy – Mecc Alte SpA
Producing alternators from 1 – 5,000kVA

Italy – Mecc Alte Power Products
Producing alternators from 100 – 5,000kVA

UK – Mecc Alte UK
From 5 – 3,000kVA 4 pole

China – Mecc Alte Haimen
Producing from 7kVA through to 3,000kVA

India – Mecc Alte India
Producing 5 – 420kVA 4 pole and 7.5 – 48kVA 2 pole

Italy – Mecc Alte Portable
Manufacturing portable alternators 1 – 17kVA 2 pole

Italy – Zanardi
Producing specialised products and welding alternators

With an integrated supply chain (we also own our own lamination factory) and 100% ownership of our sales and worldwide distribution, we are perfectly positioned to professionally serve all world markets... and further enhance our reputation as a global leader in alternator manufacturing.

ECO AND ECP RANGE

Our extensive experience in the power generation industry as well as our diligent studies and thorough research has led to the development of our ECO and ECP alternator range.

The versatility of our products and their robust design means that our ECO and ECP series are formed to meet the requirements of industry and the high technological specifications of applications such as telecommunications, cogeneration, military and other demanding market sectors.

Our ECO and ECP alternators are available with a 50 or 60Hz frequency, either with 2 poles ranging from 5.5 – 1,000kVA or with 4 poles ranging from 6.6 – 5,604kVA. They are available either as single bearing or as twin bearing with a double support. In order to couple them to a prime mover, it is possible to choose among a wide range of flanges and couplings.

All alternators consist of a fixed stator with skewed slots and a rotating inductor fitted. In addition, models above 15kVA are fitted with a damper cage as standard. All alternator windings have a 2/3rd pitch in order to reduce harmonic content.

The generators manufactured by Mecc Alte are in compliance with the CEI 2-3 file 11111 national standard. This Italian standard corresponds to the European standard EN 60034-1 and to the international standard IEC 60034-1; it is related also to the British standard BS 4999 Part 101; it is equivalent to the German standard VDE 0530 Part 1, and it is included in the French standard NF 51.111.

Mecc Alte generators meet also the requirements of international ISO 8528-3 standard (Reciprocating internal combustion engine driven alternating current generating sets – Part 3: Alternating current generators for generating sets) and the requirements of NEMA MG 1-2011 (Motors and Generators).

The generators are in conformity with the essential health and safety requirements imposed by the following directives:

2006/42 – Machinery Directive

2006/95 – Low Voltage Directive

2004/108 – Electromagnetic Compability Directive

The presumption of the conformity to the first directive is obtained by applying the following European standards EN 12100:2010 (Safety of Machinery – General principles for design – Risk assessment and risk reduction).

The presumption of the conformity to the second directive is obtained by applying the following European standard EN 60204-1 (Safety of machinery – Electrical equipment of machines Part 1: General requirements).

The presumption of the conformity to the third directive is obtained by applying the following European standards EN 61000-6-3 (Generic standards – Emission standard for residential, commercial and light-industrial environments) EN 61000-6-2 (Generic standards – Immunity for industrial environments).



The generators are designed and manufactured according to the following international standards:

Rating and performance – EN 60034-1

Methods for determining losses and efficiency – EN 60034-2

Classification of degree of protection (IP code) – EN 60034-5

Methods of cooling (IC code) – EN 60034-6

Types of construction and mounting arrangements – EN 60034-7

Terminal markings and direction of rotation – EN 60034-8

Noise limits – EN 60034-9

Starting performance of rotating electrical machines – EN 60034-12

Mechanical vibration – EN 60034-14

AC generators for reciprocating internal combustion engine driven generating sets – EN 60034-22

Normalised IEC voltages – EN 60038

Dimensions and outputs for electrical machines – EN 60072-1

Classification of insulating materials – EN 60085

Balance quality requirements for rotors in a constant (rigid) state – ISO 1940-1 (grade G 6.3 up to series 32, grade G 2.5 up to series 46)

Special versions are available, on request, to meet specific conditions or regulations.



WHY ARE OUR PRODUCTS SO POPULAR WITH SO MANY USERS?

Our 'made for manufacturing' design and advanced manufacturing technologies reduce the production processes and ensure consistent quality.

Our alternators are designed to ensure optimum efficiency which enables the customer to maximise outputs and fuel economies.

Efficient design ensures that our alternators have a high output to weight ratio. They are manufactured to ensure the shortest and lightest design to minimise space requirements.

Our products are reliable and robust and can be operated in many diverse applications without fear of failure. With hundreds of thousands of alternators now operating all over the world, our products' reliability is a given.

Our highly flexible accessories mean that customers can retrofit and minimise their stocks. (One product can fill a multitude of requirements.)

Our design systems are uncomplicated and our machines use common components – making serviceability easier.

We fit a MAUX auxiliary system into every product. This ensures 300% motor starting capacity for 20 seconds (or 300% short circuit capability). It is capable of handling both linear and non linear loads.

We also have an optional PMG on 180kVA and above which gives the same performance as the MAUX.

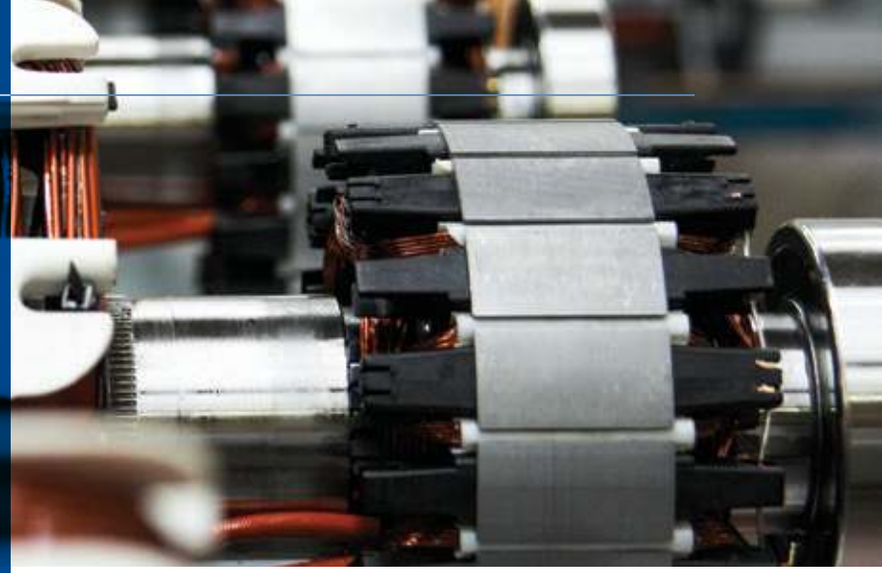
Digital regulators come as standard. They sense true RMS with voltage accuracy down to +/- 0.5% (DR1) and an abundance of additional features.

4 Pole Alternator Range				
Series	**1 Phase 50Hz**	**3 Phase 50Hz**	**1 Phase 60Hz**	**3 Phase 60Hz**
ECP3/4	4.6-11kVA	6.5-15kVA	4.8-13.5kVA	7.8-18kVA
ECP28/4	5-22kVA	7.8-30kVA	5.5-25kVA	9.4-36kVA
ECP32/4	23-47kVA	35-80kVA	24-57kVA	42-96kVA
ECP34/4	59-86kVA	85-160kVA	58-105kVA	102-192kVA
ECO38/4	87-156kVA	180-350kVA	86-155kVA	220-420kVA
ECO40/4	196-435kVA	400-750kVA	195-400kVA	480-900kVA
ECO43/4	-	800-1400kVA	-	960-1700kVA
ECO46/4	-	1500-2700kVA	-	1800-3300kVA
ECO49	-	2380-4670kVA	-	2856-5604kVA

2 Pole Alternator Range				
Series	**1 Phase 50Hz**	**3 Phase 50Hz**	**1 Phase 60Hz**	**3 Phase 60Hz**
ECP3/2	5.5-12.5kVA	8-20kVA	6.6-15kVA	9.6-24kVA
ECP28/2	14.5-24kVA	22-40kVA	17.5-29kVA	26.5-48kVA
ECP32/2	29-54kVA	44-82kVA	35-65kVA	53-98.5kVA
ECP34/2	67-113kVA	100-170kVA	80-139kVA	120-208kVA
ECO37/2	105-199kVA	158-300kVA	125-240kVA	163-360kVA
ECO40-ECO43/2	On Request	300-950kVA	On Request	360-1140kVA



GENERAL PRODUCT FEATURES



The ECO and ECP range has many product features designed into the alternator. Self-regulation is obtained through a digital electronic regulator that is fed by an auxiliary winding. We guarantee an almost constant supply from the generator – under any possible operating condition. A rotating inductor is fitted with a damper cage. The windings have a 2/3 pitch in order to reduce the harmonic content of voltage. The entire series is manufactured according to, and complies with, the most common specifications such as CEI 2-3, IEC 34-1, EN 60034-1, VDE 0530, BS 4999-5000, CAN/ CSA-C22.2 No14-95- No100-95. Special versions are available on request to meet exact specifications and regulations.

MECHANICAL STRUCTURE

The robust mechanical structure permits easy access to the connections and components during routine maintenance check-ups. The materials used in the mechanical structure are FEP12 steel for the frame, C45 steel for the shaft and cast iron for the end-brackets. The standard degree of alternator protection is IP23. Other higher degrees of protection, such as IP45 and IP54, are available on request.

INSULATION AND IMPREGNATION

Insulation is of Class H standard. Impregnation is made with premium tropicalised epoxy resins by dipping and dripping. High voltage parts are impregnated by vacuum, so the insulation level is always very good. In the high-power models, the stator windings undergo a second insulation process. GREY protection is standard on larger power machines where an additional layer of grey EG43 varnish is applied on the main and exciter stator to give enhanced protection. Other special treatments for particular environmental conditions are available on request; GREY+ protection and TOTAL+ protection which use a black severe environment protection to give the ultimate winding treatment. This protection system assures superior performances in harsh or demanding environments. (Please refer to Insulation Protection Systems Handbook for more information.)

VOLTAGE ACCURACY

The voltage accuracy is +/-0.5% (DER) in static condition, with any power factor and with speed variation between 5% and +30% with reference to the rated speed.



VOLTAGE REGULATION

The voltage can be regulated by the volt potentiometer on the electronic regulator or by an external control device, commonly used by the genset industry to govern the genset. With our digital AVRs, it is possible to control and adjust the range of voltage, electrically through our compatibility software. In addition, password protection can be set to avoid any possible trouble that can be made by less skilled personnel.

TRANSIENT VOLTAGE AND RESPONSE TIMES

At a full load, no load and at constant speed there is a transient voltage variation lower than 15% of the rated power. In such conditions, the 3% voltage resetting will occur in 0.2 seconds for powers up to 300kVA, while for higher powers it will occur in 0.3 seconds. (Refer to the User Manual for more detail.)

OVERLOAD

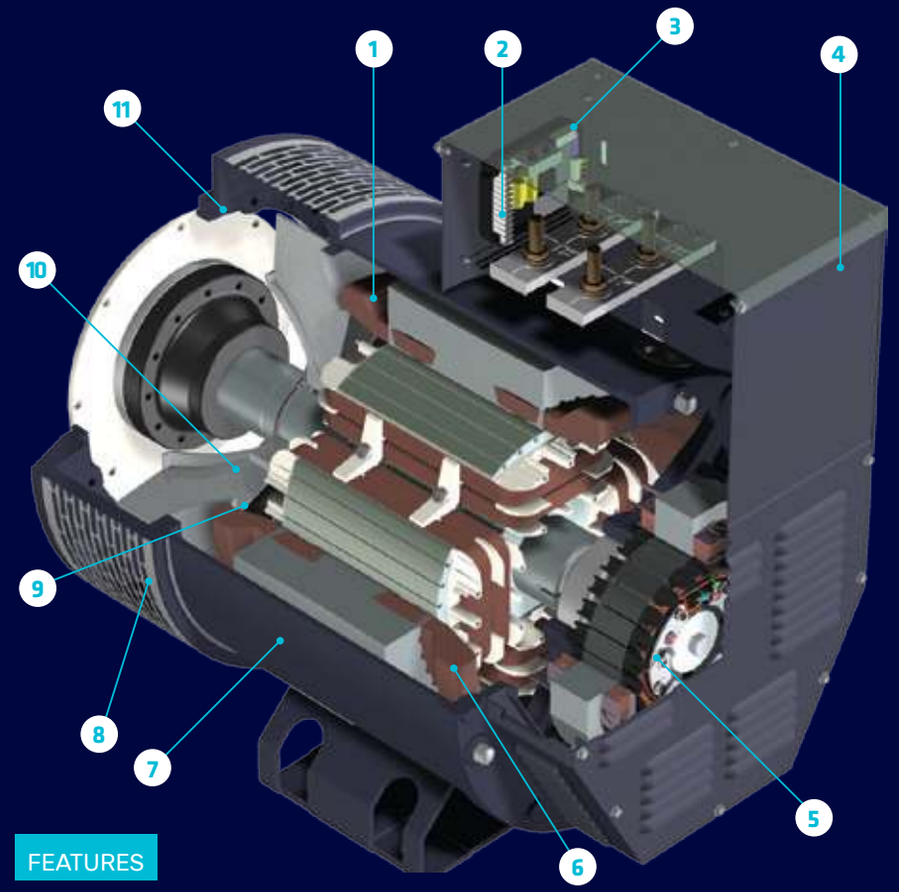
The permissible overloads are of 300% for 20 seconds, of 50% for 2 minutes and of 10% for 1 hour every 6 hours of operation.

PARALLEL OPERATION

ECO/ECP alternators with damper cage (>7.8kVA) can function in parallel among themselves, not withstanding the type of alternator and/or in parallel with the mains provided they are equipped with a droop transformer. This device is available upon request for the alternators up to type 38, while the alternators with a higher power are equipped with this as standard equipment. In case of parallel with the mains, we offer the P.F.R. 96/2 electronic device which controls the alternator's reactive current and/or power factor of the alternator.

RADIO INTERFERENCE SUPPRESSION

The standard generators comply with the specification VDE 0875, degree "K" and the basic safety requirements of the European regulation on electromagnetic compatibility. By applying the European standards EN 60034-1, we comply with the above mentioned regulation. Upon request, we are available to study and produce EMC filters according to more restrictive specifications.



FEATURES

01. Low reactance stator
02. DSR/DER – digital regulator with multiple settings and real-time memory, logging any faults in operation
03. Single regulator can be used throughout the range
04. Innovative design with low weight and compact size
05. Easy access to check diodes
06. MAUX system auxiliary winding as standard providing >300% short circuit current. PMG optional on 180kVA and above
07. Rugged design (withstands up to 7G)
08. FEM-assisted design of the magnetic circuit for optimum performance and maximum efficiency
09. MAUX system offers dedicated and isolated power supply to the regulator
10. 2/3rds pitch winding to eliminate harmonics
11. Flexible design accommodates many winding voltages and many coupling types



Please note, for the very latest ratings, you are advised to go to the Mecc Alte website **www.meccalte.com**.

Here you will find our dynamic technical data sheet builder, where you can create your own bespoke data sheet. Following a simple step-by-step process, you can get the information in a format that matches your application and requirement.

After selecting your chosen data, the data is automatically calculated and you are emailed
a customised data sheet showing performance
at your specified variants.

DDS
Dynamic Data Support

INNOVATIVE PRODUCT FEATURES

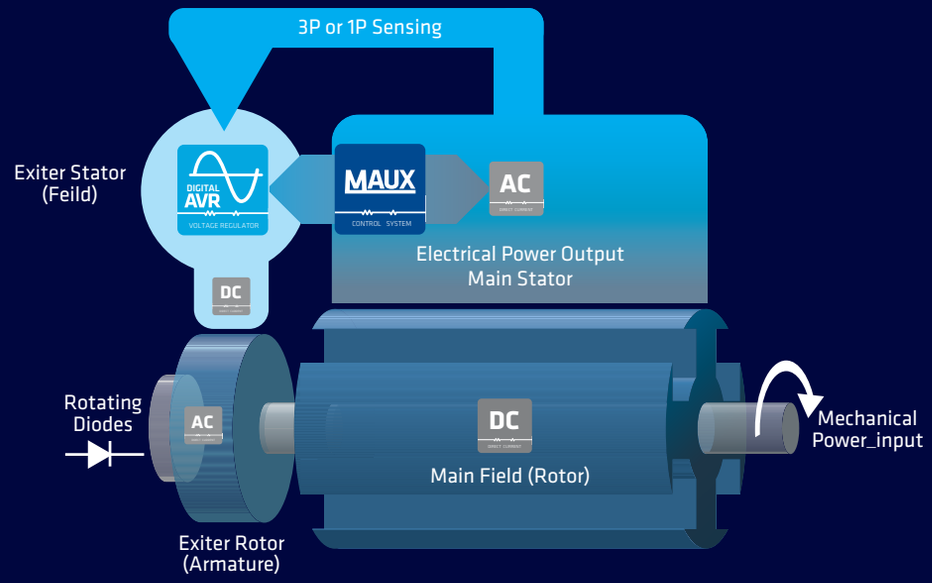
We are at the forefront of technological advancement and design and have built in many advanced features that make our generators stand out from the crowd.

AUXILIARY WINDING

MAUX (Mecc Alte Auxiliary)

The MAUX Mecc Alte Auxiliary Winding is a separate winding within the main stators that feeds the regulator. This winding enables every one of our alternators to take an overload of 300% forced current (short circuit maintenance) for 20 seconds. This is ideal for motor starting requirements.

Customers can be assured that they can maximise efficiencies and minimise alternator sizes when considering motor start applications. In addition, rather than adding length and extra weight by adding a PMG (an additional permanent magnet generator on the end of your alternator), customers can just fit a standard Mecc Alte alternator which matches the performance and is capable of supporting both linear and distorted loads. This delivers a more compact, efficient, lighter and intelligent solution to your motor starting requirement.

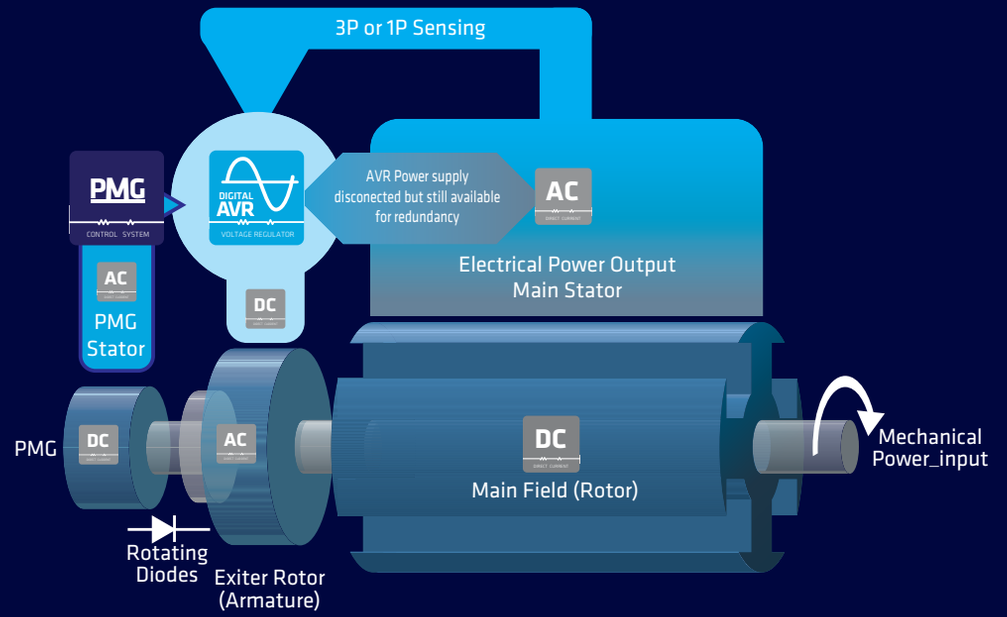


PMG (PERMANENT MAGNET GENERATOR)

PMG (Permanent Magnet Generator + Auxiliary)

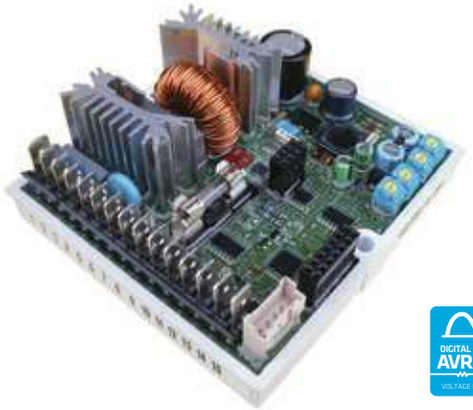
Mecc Alte pioneered the technological benefits of the MAUX, however, some traditional users still occasionally request a Permanent Magnet Generator option. (A PMG is an additional pilot excitation system derived from a permanent magnet generator driven from the main alternator shaft). Our philosophy is to use uncomplicated systems which means that, until the introduction of the digital regulator, we would require several different AVRs and consequently could see no benefit in offering a PMG option.

However, with the digital regulator we are now able to offer optional PMG on the standard higher power Mecc Alte products. The PMG System allows the fitting of a kit which adds a PMG onto the existing generator. This means that the MAUX auxiliary can act as a backup in times of trouble. There is no need to change the AVR, a kit can be kept in stock and retrofitted to our alternators above 400kVA. From 180kVA to 350kVA (50Hz), the PMG is factory fit only. The performances in terms of overload ability and transient responses are the same as with the MAUX and shown in the machine's data sheet.



DSR (DIGITAL REGULATOR)

The DSR is an advanced AVR replacing the traditional automatic voltage regulator. This voltage regulator is fully digital controlled and is fitted as standard across all our ECO and ECP models.



Connections on the DSR are through 15 fast on / fast off connectors which speed up the connection process. This is especially useful if reconnecting a 12 wire machine to any specific voltage. This regulator is cross-compatible with all ECO and ECP machines and can be used as standard with the MAUX system and the PMG ma systems, so there's never any need to change regulators. Its single phase sensing comes as standard.

Technically, it can work from –25°C up to 70°C and uses voltage sensing on true Root Mean Square (RMS) value, which is ideal for both linear and distorted loads. Voltage regulation accuracy is +/- 1%, from 15Hz to 72Hz. It is 50 or 60Hz compatible, as there is a hardware jumper for the 60Hz operation or within the digital software settings. We have endeavoured not to over complicate, enabling the DSR to also be operated mechanically. We not only have the digital setting points for Voltage, Amps, Stability and Hz but also have kept the potentiometers to enable mechanical adjustments for the more traditional users.

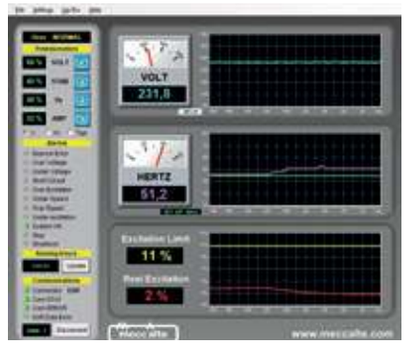
We've kept the under-speed protection but added an adjustable threshold and scope level. In addition, protection of excitation over-current is also included by means of an accurate thermal model of the generator rotor. Other clever features include an accurate management of short circuit. If the short circuit is not interrupted by an external protection device, the DSR stops the excitation and reboots the system preventing overload generator failure for an extended period when compared to standard analogue regulators. These settings, which allow the generator to cool down, can be set up to 25.5 seconds or even disabled should you already have your own protection in place. This regulator allows accurate management of a synchronous motor starting. The flexible digital platform easily enables soft start and load acceptance functions through simple preset software features.

By means of the external communication board (DXR or DL1), computer connection (RS232 or USB) or PLC connection (RS485 via MODBUS) is available. This allows changes to the AVR settings, to monitor in real-time performances (Voltage, Frequency or DSR status), or to download the alarm report (Communication software is available from Mecc Alte).

SO WHAT CAN WE MONITOR?

Self-operational start-up checks the DSR and checks it is working in the right state. If an alarm is triggered, the DSR will act on a multiple level. It will immediately protect the alternator if necessary, but differently from the conventional analogue AVR, it will also store the alarm and its duration in its internal memory, communicate with the external PLC or computer software if connected, signal an alarm code through a visual LED and trip and open collector transistor (called APO). The APO can be programmed on individual alarms on customer's wish, with a settable delay to add an invaluable protection to the power solution packaged to the final user.

Events are recorded in the internal memory capable of storing over 100 years of data. This will precisely record the alarm type, number of events recorded and the total duration of each alarm. Linked with an internal clock you can closely monitor loading and its effects and see what is happening to your alternator.



DER (DIGITAL ENHANCED REGULATOR)

The DER gives you the same performances as the DSR but with the addition of having the three phase sensing ability included as standard and 0.5% voltage precision.

DER2 (2ND GENERATION DIGITAL REGULATOR)

The DER2 has an embedded USB port and True RMS Sensing. Fully programmable with soft start facility. Voltage regulation is +/- 0.5%. Fully G3 ISO 8528 compliant.



AVR
DER2
VOLTAGE REGULATOR

2G DIGITAL
AVR
VOLTAGE REGULATOR

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 GREY+ with a black severe environment protection. This is supplied on the winding for the harshest of conditions.
(See Insulation Systems Manual.)



	Operating Ambient Temperature				
Operating Altitude	**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 OTHER INDUSTRIAL RANGES

We are a specialised manufacturer and have additional alternator ranges to meet specific market requirements. These are just some of our additional industrial product lines within our group.



BTP Range



ECSP Range



NPE Range



LT3N Range

BTP RANGE

The BTP range is characterised by a compound type regulation, with a brush/slipring and transformer control. They offer a high pick-up capacity of 450% offering unrivaled performance in motor start requirements.

ECSP RANGE

The ECSP range is a brushless transformer-controlled 4 pole industrial range that enables a motor start capability of > 400% forced current for 20 seconds. You can also fit an optional automatic voltage regulator, the AVIR, which improves the voltage regulation from +/-4% to +/- 1.5%, while still retaining the existing performance characteristics.

NPE RANGE

The NPE range uses all the same technologies of the ECO and ECP range. They are brushless and controlled with the standard DSR regulation and MAUX system but have been designed as compact as possible. This space-saving range is made as small as possible to allow minimal space impact.

LT3N RANGE

The LT3 alternator range is available as 1500rpm 50Hz or 1800rpm 60Hz, 1 phase. These machines are designed as brushless with capacitor control. Due to their operating system and low running speed, they are a product leader in the lighting tower market, as they are especially suited to run metal halide lights. In 2 pole 3000rpm, they are available from 7 – 12kVA.

4 Pole Alternator Range

Series	1 Phase 50Hz	3 Phase 50Hz	1 Phase 60Hz	3 Phase 60Hz
LT3N/4	3.5-8kVA	-	4.5-10kVA	-
BTP3/4	5-11kVA	7-15kVA	6-13.2kVA	8.4-18kVA
NPE32/4	5-22.5kVA	7.5-27.5kVA	6-26.5kVA	9-34kVA
ECSP28/4	On Request	17-30kVA	On Request	20.4-36kVA
ECSP32/4	On Request	35-80kVA	On Request	42-95kVA



2 Pole Alternator Range

Series	1 Phase 50Hz	3 Phase 50Hz	1 Phase 60Hz	3 Phase 60Hz
LT3N/2	7-10kVA	-	8.4-12kVA	-
BTP3/2	11-14kVA	16-20kVA	13.2-16.8kVA	19.2-24kVA
NPE32/2	5.3-25kVA	8-32kVA	6.6-30kVA	10-38.4kVA









OUR ACCESSORIES RANGE

Our customers can be confident that they can specify a product suitable for a given application. Therefore, if required, we can offer a large range of accessories that can be fitted to our alternators to further enhance performance.



OPTIONAL ACCESSORIES



PMG3 (PERMANENT MAGNET GENERATOR)

The Mecc Alte PMG is available for more traditional systems. Available on ECO38 as a factory-fitted option, or on ECO40, ECO43 and ECO46 as a factory-fitted or retro-fitted option.



PARALLEL OPERATION

On request, it is possible to install parallel operation equipment.

PFR96/2

The “power factor regulator” type PFR 96/2 designed and manufactured by Mecc Alte is a piece of electronic equipment that, when fitted to our generators type ECO and ECP, allows control of the reactive current and/or power factor of machines working in parallel with the grid, thus allowing the maximum utilisation of the plants. PFR96/2 is housed in a DIN standard aluminium box allowing easy fitting into the control panel.



PARALLEL DEVICE PD 500

The PD parallel device is a unified module allowing generators to operate in parallel among themselves with the typical voltage drop or with constant voltage.



PD 500 Universal Parallel Device now used on the whole range

It also allows operation in parallel with the grid with the addition of PFR96/2. Parallel devices (PDs) are fitted as standard on generator series 40 – 43 – 46; for the other series, it is available on request. (See Parallel Operation Manual or Grid Guidelines for further information.)

THERMAL PROTECTION

On request, it is possible to install one of the following devices as thermal protection.

PTC THERMISTORS

These components are assembled in the heads of the stator windings. They are usually set to trip at 150°C. When the pre-set temperature is reached, the thermistors emit a signal that can be used by a trigger device (not included) to protect the generator (Fig 1).

THERMAL RESISTORS

PT100

The resistance of this device varies proportionally to the temperature of the winding where it is assembled. If combined with a thermostat (not included) it allows to set the temperature to the desired value at which the whole protection system trips out.

BIMETALLIC OVERLOAD PROTECTIONS

These devices have a Normally Closed contact that trips immediately when a pre-set temperature is reached. If the temperature decreases, the contact resets automatically. (Please see our Thermal Probes and Heaters Manual for further information.)

ADDITIONAL EQUIPMENT

CT (CURRENT TRANSFORMERS)

Mecc Alte offers, on ECO 40, 43 and 46, a range of current transformers pre-installed on the generator. We can offer current transformers on customer's spec, for protection or measurement or even with a dual output.

The current transformers are also available with a retrofit kit that can be installed conveniently.





RBD-1

This is an electronic device which spots the presence of anomalies on the rotating diode bridge (opens diodes, short circuit etc); this accessory is available on request. Anomalies are indicated by a red LED as well as by the communication of a relay which, through an exchange contact of 2A 250V, allows the user to obtain signals, alarms or shutdowns. Through an external 12V battery, it is also possible to memorise any anomalies seen.



RADIO INTERFERENCE SUPPRESSORS (RIS)

Mecc Alte generators comply with the main standards of radio suppression. To comply with even more restrictive standards such as Mil STD 461 upon the customer's request, it is necessary to fit special filters in the generators, which Mecc Alte is able to design and manufacture.





DLI AND DXR-INTERFACE BOARD

The interface device permits connection of the DSR digital regulator to a home computer or a PLC-monitoring device. It can work with RS232, USB or RS485 protocols. If a computer is used, Mecc Alte offers this software solution to fully monitor and program its voltage regulators, which are the DSR terminal and the DSR reader.



ENVIRONMENTAL CONSIDERATIONS

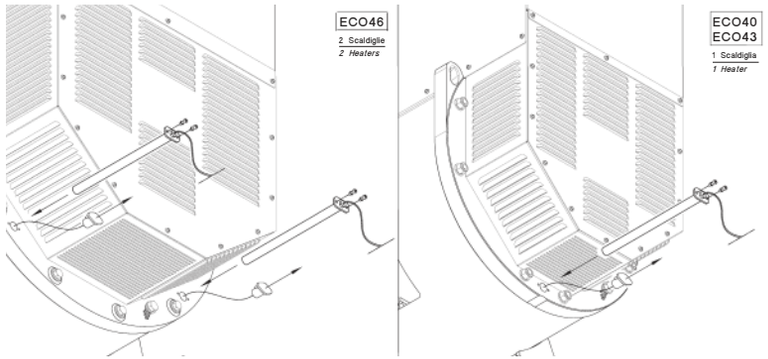
In considering the operational environment, the following accessories may be required.

ANTI-CONDENSATION HEATERS





Our whole range can be fitted with anti-condensation heaters of adequate power sized to alternator kVA. Voltage for heaters must be specified when ordering. New cylindrical cartridge style heaters are available on request. These new cylindrical heaters can be retro fitted. (Please see our Thermal Probes and Heaters Manual for further information.)



ADVANCED INSULATION SYSTEMS

We use Class H insulation protection as standard, but with an additional coating of grey EG43 varnish, which is a high temperature insulating enamel, we further protect the machine against moisture and chemical ingress. This GREY protection level is now standard for machines above 85kVA. If you find an even harsher and more demanding environment, it is possible to further enhance this level of insulation protection. The TOTAL+ protection level uses a black sever environment protection which is the ultimate winding treatment and offers superior protection in really harsh or demanding environments. This protection encapsulates the windings and seals them from moisture and chemical attack. In addition, it is also resistant to particle abrasion as it deflects any impacts. On some machines a de-rate is applied if this option is applied. (Please see the Insulation Protection Systems Handbook for further detail.)



EG43 grey varnish



Black severe environment protection





IP23 IP23+ IP45 IP55

INTAKE AIR FILTERS

Environmental conditions for our generators are extremely diversified. There are some very restrictive standards concerning the protection degree of machines that, in certain circumstances, must be applied. As standard, the Mecc Alte range is IP23, however upgrade systems are available to comply with IP23+, IP43 and IP45 of IEC standards.



TOTALLY ENCLOSED UNITS

Although not available as an accessory to retrofit, we can offer totally enclosed (TEFC) machines. These comply with IP54 and IP56 protection standards.



MARINE CERTIFICATION

Mecc Altes new UK based dedicated marine test facilty now can offer marine certification on a wide variety of Alternators from the range through the following agencies: Lloyds Register, Bureau Veritas, BKI, ABS, Korean Register, DNV-LG, ClassNK and RINA, with full type aproval from DNV-GL, ABS, BV and BKI



ABS DNV·GL ClassNK KR KOREAN REGISTER

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. That quality is certified by international bodies such as the Canadian Standards Association (CSA), the Underwriters Laboratories (UL) and Det Norske Veritas (DNV) and Bureau Veritas, further supported by our ISO 9001 accreditation from Registro Italiano Navale (RINA).

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. 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.





GLOBAL COMMUNICATION

We are proud of the relationship that we have with each and every one of our customers. Effective communications with them are an integral part of our operations.

We appreciate the importance of developments in electronic communication and recognise the World Wide Web as a continually-evolving global communication tool. Our website holds up-to-the-minute company and product information. Operating as an online database, customers have access to product and commercial documents and downloads for support 24 hours a day, 7 days a week, 365 days a year.

Visit www.meccalte.com

SUPPORT

Through our global companies, we offer worldwide support. In addition, our dedicated support website provides latest model information, spare parts listings, test report data and useful pre and post sales tools.

We have a dedicated and flexible download centre where drawings and technical information is readily available in a dedicated user-friendly area.

Visit www.meccalte.support.com for further info.

BROCHURES

MECC ALTE TECHNICAL GUIDES BILINGUAL ITALIAN/ENGLISH

- Parallel Operation
- Regulators
- Thermal Probes & Heaters
- Shaft Stiffness
- Standard Conditions of Sale
- Spare Parts Lists
- Ratings Book
- Motor Starting Capability
- Insulation Protection Systems
- Digital Regulator

MECC ALTE PRODUCT GUIDE

- Portable Range
- Power Products Range
- Zanardi Range

MECC ALTE MINI GUIDES

- 400Hz
- Rail
- Marine
- Irrigation
- Telecoms
- PTO

All available to download at: www.meccalte.com





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