mecc alte telecoms

Totally Focused. Totally Independent.

TOTALLY COMMITTED TO

SATISFYING YOUR TELECOM REQUIREMENTS

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





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.

INTRODUCTION



As the continual demand for wireless communication grows, off-grid telecommunication base station sites continue to be introduced around the globe. In rural or remote areas, where power from the grid is unavailable or unreliable, these cell sites require generator sets to provide power security... as prime power or backup standby power.

The power requirement for a base transceiver station can vary upon location and load being supplied. Typically, an AC cell station load consists of AC air-conditioning units, AC or DC lights, switch mode power supplies to convert AC to DC and battery banks.

The total cost of ownership (considering outlay, serviceability, fuel costs and efficiency of these power generation systems) is a major consideration for operators. The type of system chosen, and its efficiency, can have a major impact on these costs.

THE BIG QUESTION



WHICH POWER GENERATION SYSTEM?

Mecc Alte offers a full range of power solutions for telecom applications developed from our extensive experience, technical expertise and excellence in the power generation market. With hundreds of thousands of AC generators sold each year, our solutions vary from standard market-proven AC systems to state-of-the-art variable speed, PMG and DC solutions for more advanced installations.

AC ENERGY SYSTEMS

The standard range of Mecc Alte 4 pole AC alternators includes all the features needed to provide the highest performances requested by the telecom applications. Using high quality materials and advanced designs, they have market-leading efficiencies that optimise fuel savings. The high motor starting capability of every machine enables you to select the smallest generator to cope with any load application with the inbuilt MAUX system fitted as standard to ensure the most economical power solution.

DC ENERGY SYSTEMS

Mecc Alte also has great experience in producing Conventional Rotor Wound DC machines. Here, the conjunction of a conventional 3 or 6 phase machine, and a special AVR, allows control of the voltage and the maximum current resulting in a robust, compact and easy-to-use DC power solution.

PMG SYSTEMS

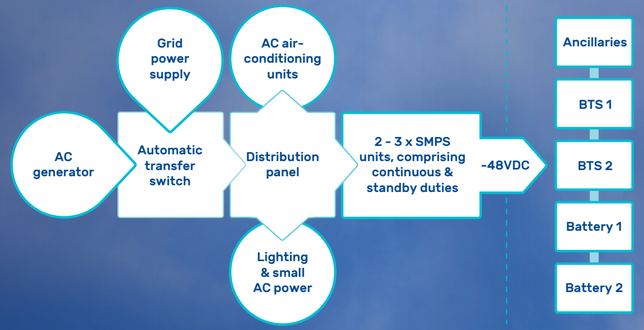
Where installations require as small a footprint as possible, Mecc Alte has alternative solutions with permanent magnet generators. Developing 3ph AC they will work with the Mercurio as an integral part of the 48VDC output to both transmitter and batteries, and to control both in hybrid operation. In addition to a smaller genset footprint, the permanent magnet machines easily accommodate variable speed operation. Speed range may be selected according to load data: max transmitter + deep cycle battery charging, engine power curve and accepted speed range. There are three sizes of permanent magnet machines: PM3G, PM5G & PM7G with full speed powers from 3kW to 15kW. The speed range can be adjusted to suit the engine characteristics but you can typically use 1700 to 2400rpm, 2000 to 3000rpm or 2400 to 3600rpm. Lower speeds are also possible depending on power required.

mercurio

HYBRID MERCURIO SYSTEMS

Understanding the market's needs, we have developed our flexible Mercurio system which is a simple, plug and play, competitive solution for the telecom sector. The foundation of the system is a dual focus power convertor. On one side, it embeds all the logic to control the genset when the DC battery set needs to be re-charged, as well as with the speed control. On the other, it accepts power inputs from any possible power supply, including conventional and existing Mecc Alte AC generators, Mecc Alte PMG generators, solar panels, small wind turbines and power supply from the grid as well.

AC ALTERNATOR SYSTEMS



TRADITIONAL AC ENERGY SYSTEMS

Traditionally, conventional AC diesel-driven generating sets are installed within the Base Transceiver Station to provide site load. Within each base transceiver, AC power is used to power air-conditioning units to cool the electronics and also the batteries. This AC power is converted by site base rectifiers to provide the DC power needed for the BTS load and battery charging.

AC ALTERNATOR SYSTEM

Mecc Alte AC alternators are a proven solution used in many applications globally. Their high efficiency and minimum maintenance make them an ideal telecom power selection. With an auxiliary winding system and low maintenance, the alternator is a compact and economical solution.

Air-conditioning motors absorb high current from the power supply upon starting so the selected AC generator must be able to deliver this peak start-up demand, therefore typically they are oversized in power. As these AC generating sets are predominantly sized based on these transient requirements of the air-conditioning units, a lower X"d value proportional to the SMPS loads being applied is preferred. Load creates a current distortion which then induces a resulting voltage distortion from the alternator. Again, this is generally minimised by machine selection and over-sizing to cover the transient load requirements.

The Mecc Alte brushless digitally regulated AC alternator range is ideally suited to the demands of this telecom application. With each alternator fitted as standard with the MAUX auxiliary winding system, it can provide superior motor starting capabilities allowing up to 300% overload for 20 seconds. With class leading low X"d (subtransient reactance), the alternator's performance with non-linear loads is enhanced. Thus, typically, no over-sizing is required, allowing the generating set provider the most cost-effective package.

ALTERNATOR PERFORMANCE INDICATORS

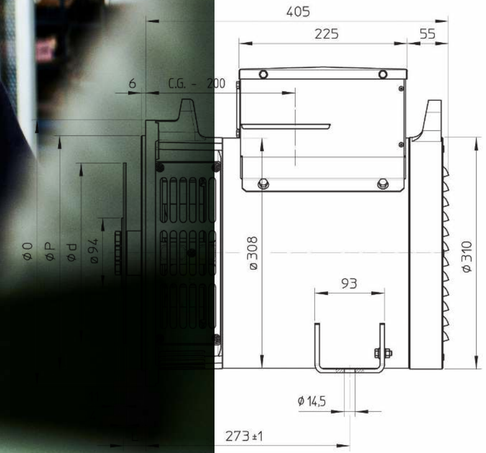
- High transient power for economic alternator selection
- Low reactance (X"d) values to enhance motor starting and performances with non-linear loads
- Volts/Hz characteristic – underspeed protection voltage reduces proportionally to rpm, to limit excitation current from a set threshold, to protect against over excitation should the engine fail to reach full speed
- Overload protection (operational after 20 seconds to avoid tripping on motor starting)
- A selection of advanced winding protection from 'GREY', 'GREY+' and 'TOTAL+' to suit even the harshest of environmental conditions
- Inlet filters and higher IP protection levels available on all sizes to suit all applications
- +/-1% digital voltage regulation as standard (Option for +/-0.5%)
- >300% overload from the MAUX auxiliary winding for 20 seconds

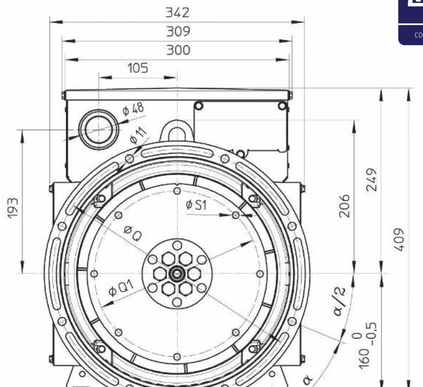












MAIN ROTOR AND STATOR

Impregnated using the latest roll/dip and VPI technology, the non-hygroscopic resin is added to the windings and then cured in the same process while rotating to ensure best coverage possible. The insulation materials used are Class H throughout. Copper used for the main windings is G2 with two layers of polyamide coating; the winding for the MAUX is G4 with four layers.

BEARINGS

Sealed-for-life, quality ball bearings are used throughout with oversize bearings at the driven end to accept the side loading in belt-driven applications. Rear bearing is outboard of the exciter for easier examination of the rectifier assembly.

MOTOR STARTING

MAUX CONTROL SYSTEM

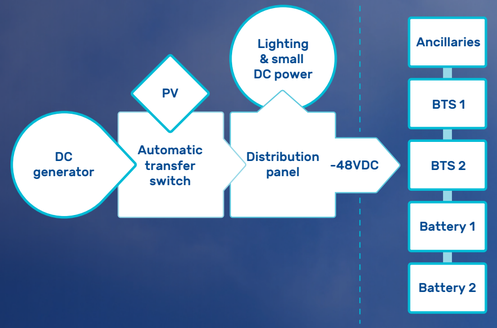
Key to the telecom application is the ability to accept large impact loads relative to the size of the alternator. The MAUX system used in over 150,000 machines each year is well proven. It provides over 300% power for 20 seconds which is easily enough for most aircon motors. The voltage dip will vary according to the level of the impact load but typical TVDs would be 15% with 100% load on, 25% with 200% load on and 35% with 300% load on.

EXCITATION SYSTEM

The brushless excitation system takes the DC voltage from the DSR regulator according to load changes. The DSR power is derived from the MAUX auxiliary winding within the main stator which uses the third harmonic to have high levels of power when starting motors.

DC ENERGY SYSTEMS

With the telecom market, the need for AC air-conditioning is reducing and, as such, the primary loads are DC. Other site loads such as lighting, heating, remote monitoring and air outlet damper motors can easily be designed for DC operation using DC-to-DC convertors. Therefore, a DC power generator system may be a more effective on-site solution.



This can be a traditional generator system with a DC alternator or a more complex hybrid system,

The Hybrid power theory is that it is more efficient to charge the batteries directly, which then supply the Base Transceiver Station, rather than power the station continually. These systems are operated at speeds and powers to suit the battery type, and cutting in and out at pre-set battery charge levels. This means that the generating set is not continually running, allowing considerable fuel savings. Base Transceiver Station systems are traditionally 48VDC, a legacy of the telecom market and typically being positive grounded this is considered better for use with common valve regulated lead acid (VRLA) batteries.

Other hybrid systems might also consider inputs from solar and wind sources.

MECC ALTE RANGE OF AL DC ALTERNATORS

Founded upon common principles and sharing components and features of the AC alternators supplied to the telecom market, simple construction ensures maximum reliability whilst minimising maintenance.

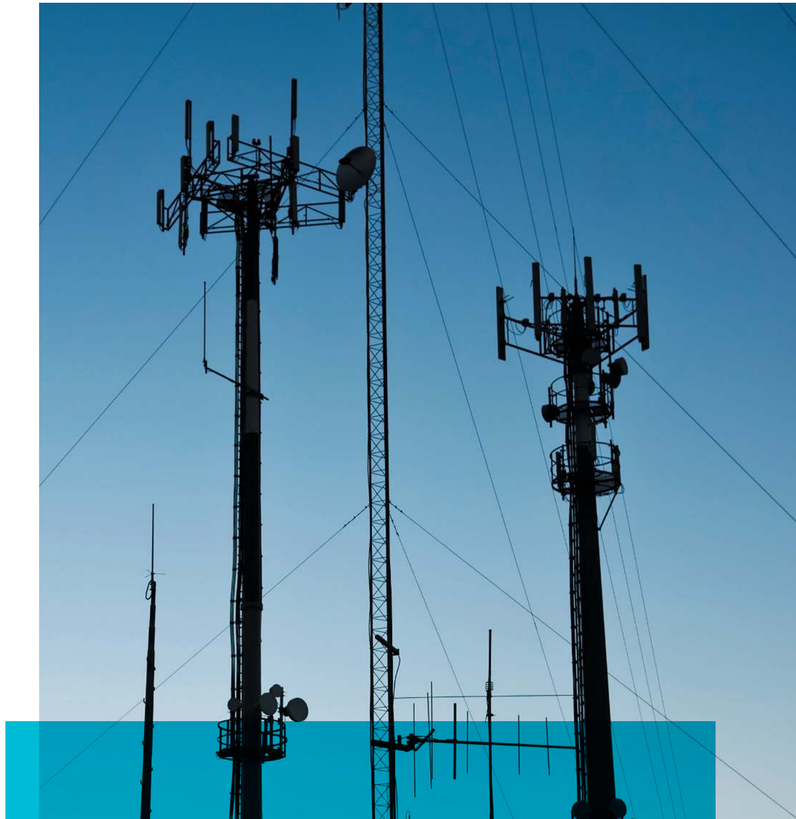
The Mecc Alte range of AL DC alternators are well proven, supplied as either 3, 6 or 9 phase AC rectified machines with voltage controlled as a function of the DC output (rather than AC output) from the rectifier sensing the DC side of the rectifier ensures correct excitation with DC load changes, guaranteeing a more stable output.

Voltage control is by the RT regulator. When supplied with a current-sensing transformer, the RT acts as a battery-charging regulator, limiting the maximum amps that can be drawn with adjustable potentiometers, and also the float or trickle charge, which is certainly a prerequisite for VRLA batteries. The voltage is controlled and rises as a function of the connected system. With voltage ripple down to less than 2%, the trade of cost versus battery life expectancy is acceptable with most battery suppliers anticipating 3.5 year life.

The AL machines may be supplied as fixed speed, dual speed or variable speed. The limitations of speed range are mainly due to the engine's speed/power curve and the BTS/ battery load.

External generating set controls are required to switch the set on and off according to battery charge status.

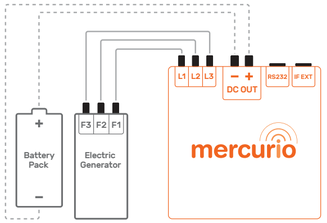




THE MERCURIO HYBRID SYSTEM



Mecc Alte has developed an innovative DC power convertor which, coupled with a Mecc Alte AC alternator, will deliver a quality DC power output customised to suit cell tower systems. The Mercurio system converts the AC output of a Mecc Alte generator to DC power whilst functioning as an alternator and genset supervisor. This enables it the ability to stop and start the genset system. It works with fixed, twin or variable speed control systems. It can also control AC or DC inputs from other devices such as the grid and renewable power sources like solar panels or micro wind turbines.



Providing electronically conditioned DC output the voltage ripple levels are down to <1%, this ensures a very long life for the batteries it charges. The Mercurio will constantly monitor the state of the connected batteries and start/stop the generator set according to pre-set criteria. Similarly, a -10 to +10VDC control voltage will control the engine speed to ensure power delivered exceeds the demand of the battery load profile. This profile may be adjusted for different types of batteries used.

Targeted for telecoms, modules with varying power outputs are available. The AC alternator input can be fixed, dual or variable speed operation. When considering total cost of ownership, a base station transceiver's power system efficiency and associated fuel economy are a major consideration versus the initial costs. The Mercurio supports all the Mecc Alte speed options.

Fixed speed where the standard AC alternator is operated at fixed speed, which is the most cost effective, simplest option using standard equipment throughout. Twin speed allows maximum power for when batteries are low charged and then power drop to trickle charge (float) before stopping but more sophisticated engine controls are required. If you use a variable speed system, you can further maximise fuel efficiency and charging profiles can be individually set to match battery type and optimise performance levels, although engine control is typically more expensive and complex subject to calibration.

Not only can the Mercurio be used with Mecc Alte's traditional AC alternator design, it also works with the Mecc Alte permanent magnet alternators. Although more expensive than traditional AC alternators, a PMG alternator can represent a smaller package compared to the standard construction machines. The stator wound component is central to the rotor, with three power leads to connect to the power convertor. Magnet type used depends on power required and the physical size targeted. Alternators are individually sized to suit the load profile and engine speed/power performance curves.

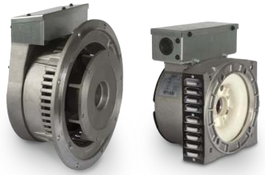
mercurio

mercurio 5

mercurio 10



ECP28 alternator



PMG variable speed alternators



Mercurio 5 module with optional display which can now be supplied loose for remote monitoring

SO WHAT ARE THE MERCURIO BENEFITS?

Simplicity
One plug-and-go system module for all applications.

Outlay costs are minimised
It can be used with our traditional AC alternator allowing the most cost-effective power supply.

Reliability
With proven reliability and technology and minimal maintenance.

OEM costs can be reduced
Use of common bedplates, canopies within existing designs and potentially the same engine systems already used.

It's an economical system
The alternators are sized to suit the load profile and engine speed/power performance curves. It can be used as a hybrid system monitoring battery top-up needs and stopping and starting as needed. It can also be used in twin speed or variable speed conditions ensuring maximum fuel economy.

High efficiency
Typical efficiency is 91.9% at 75% rated output for the power convertor.

Flexibility
It supports all the Mecc Alte speed systems, and charger profile can be easily changed.

Hybrid and grid tie compatible
It will accept additional AC (up to 400Hz) and DC (PV) inputs, as well as a traditional grid feed 50 or 60Hz.

Protected system
Load delay soft start function, 2x LED status (remote) protection for reverse polarity, short circuit, Vmax, Imax and over temperature. Option for remote LCD display with audible alarm and 8 'LED' warning lights.

MPPT built in
For PV input while the generator is in standby, the Mercurio has the MPPT built in as standard.

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.



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