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broadcast @xperience

FULL CATALOG
2008

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FAMILY ET3500

CATALOGUE AND TECHNICAL DETAILED LISTS FOR AMPLIFIERS: E2000-E3500-E7000-E10000-E15000-E31000

CATALOGUE AND TECHNICAL DETAILED LISTS FOR TRANSMITTERS: ET2000-ET3500-ET7000-ET10000-ET15000-ET31000

The family ET3500 is arrange in several configurations from 2KW to 31KW in systems 1+0 e N+1X.

broadcast experience

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CE

WARNING

The use of this device
is subject
to National Regulations

Elenos Srl

REVIEWS

31/05/2006	REVIEW 1:	Added outlines E2000 (pag. 22-23)
31/05/2007	REVIEW 2:	Modernized completely the handbook
02/10/2007	REVIEW 3:	Added designs of I block with quotas ET7000 Added designs of I block with quotas ET10000 Added designs of I block with quotas ET15000 Added designs of I block with quotas ET31000
19/10/2007	REVIEW 4:	Added heading to the entire manual
22/10/2007	REVIEW 5:	Added part scalability Updated graphics

Dear User,

Firstly, thank you for choosing an product.

products are solid state or thermionic tube transmitters that develop power from a minimum of 20W to a maximum of 30KW.

Great care has been taken during the design of the protection circuitry to ensure compatibility with products from other manufacturers. However the best performance is achieved when the equipment is used with other products manufactured by.

The unit has been designed to guarantee consistent performance over time, without the need for special maintenance. The need for this is minimised by regular functional checks of those components which are ventilated.

Operation of the unit is very easy and intuitive. Even so it is recommended that this manual and other relevant documentation is read carefully before any operation is attempted.

Customer Care

PRODUCTS

We design, realize, manufacture and market the following products :

Mos Fet transmitters up to 30KW
Tube Transmitters up to 30KW
Accessories: aerials, Stereo encoders, RDS, telemetry, Changeover units, audio processors, Sound treatment

Our equipment are 99/5EC European standard conform and respect the following Directives:

EN60215
EN301 489-11
EN 302 018-2

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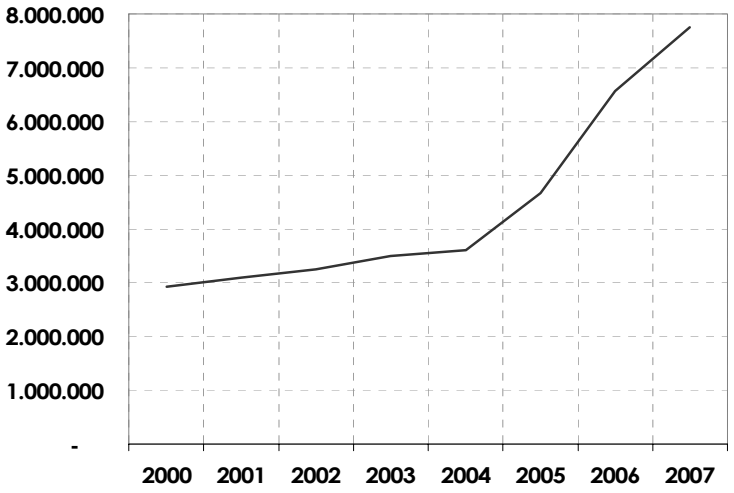
ANNUAL TURNOVER

Among our customers we have the big Italian networks and an international distributor: Radio Maria (our best customer) which owns:

more than 1.000 radio stations in Italy: 82% of them use our equipment
500 radio stations distributed in more than 40 countries, 90% of them use our products.

Mainly in:
USA, Bolivia, Colombia, Canada, Chile, Argentine, Brazil, Equator, Salvador, Guatemala, Mexico, Nicaragua, Panama, Peru, Philippines, Russia, Lithuania, Serbia, Croatia, Albania, Austria, Malta, Burkina Faso, Mali, Mozambique, Tanzania, Togo, Uganda, Zambia, France, Germany, Lebanon, Poland, Spain ,etc…



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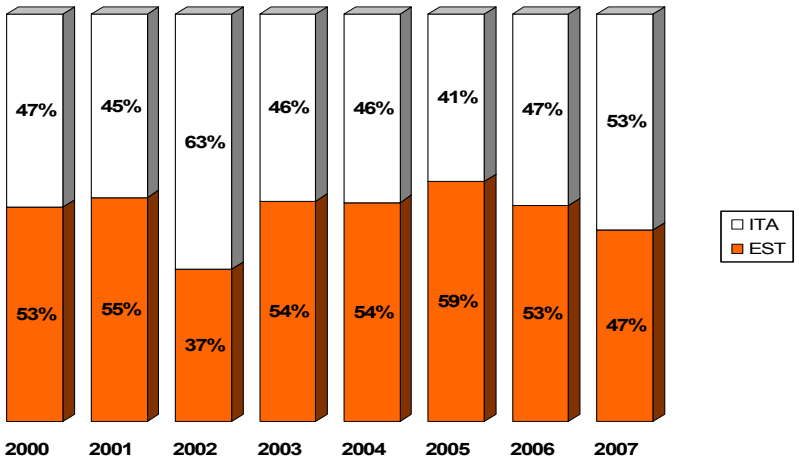
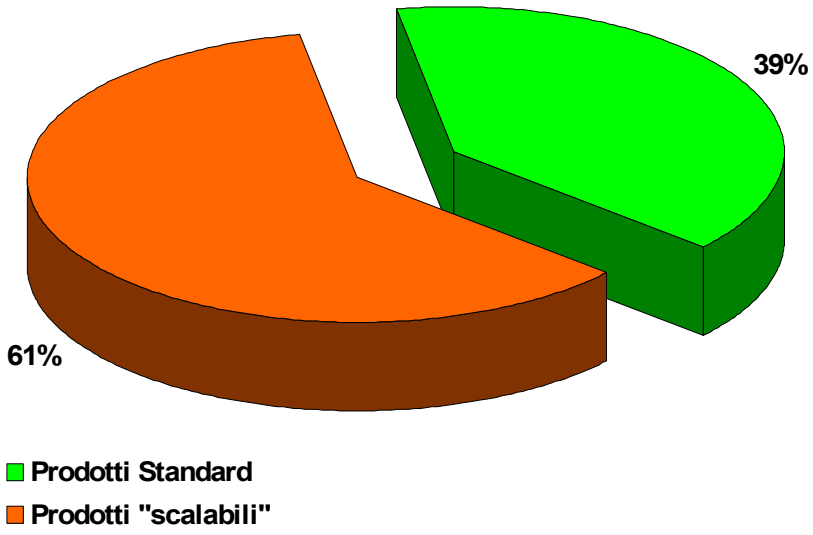
LOCAL SALES AND EXPORT

We sell our equipment all over the world thank to the avant-garde technology and excellent ratio quality/price.
Furthermore, our accurate selection on our dealers guarantees a good after-sales service.

Several patents cover our equipment, as:
Polynomial Coupler;
High-efficiency heat sink.

And many other that we use in cooperation with the University of Ferrara where our Research & development Manager teaches.





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BROADCAST TRADE FAIRS ATTENDED:

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- IBTS, Milan – Italy
- ABERT, Brasilia – Brazil
- CAPER, Buenos Aires – Argentina
- TRBE, Moscow – Russia
- Teleradio Broadcast, Kiew - Ukraine
- IFEMA, Madrid – Spain
- AFRICAST, Abuja – Nigeria
- MEDIATECH, Johannesburg – South Africa
- CONVENTION, Lisbon – Portugal
- Broadcast India, Mumbai – India

And many more exhibitions attended by our dealers…

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COUNTRIES WHERE OUR EQUIPMENT ARE HOMOLOGATED

- CE Europe
- FCC United States
- Argentina
- Brazil
- China
- Russia
- Bulgaria
- Hungary
- Romania
- Senegal
- Canada(homologation under process with Radio Canada)

ELENOS' GOALS

Our aim is to create reliable transmitters for a better efficiency at reduced consumption and maintenance costs.

Our strategies to obtain this result are:

- An accurate selection on quality of components
  - Papst and Sanyo Blowers
  - Lithium batteries, 10 years warranty
  - -25 +105 °C (60.000 at 60°C) Capacitors

- "Conservative Strategy" for ex. 20 transistors instead of 16 for a 5KW amplifier, 12 instead of 10 for a 3KW amplifier.
- Reduce the temperature of the equipment thanks to patented Heat Sinks
- Maximize the protections
- Redundancy without "Single Point Failures", power supply in parallel with "Current Sharing"
- Derating, temperature, VSWR, over-voltage
- Low Maintenance costs, dimensions, weight and consumption
- Excellent after sales service

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SCALABILITY

FAMIGLIA ET

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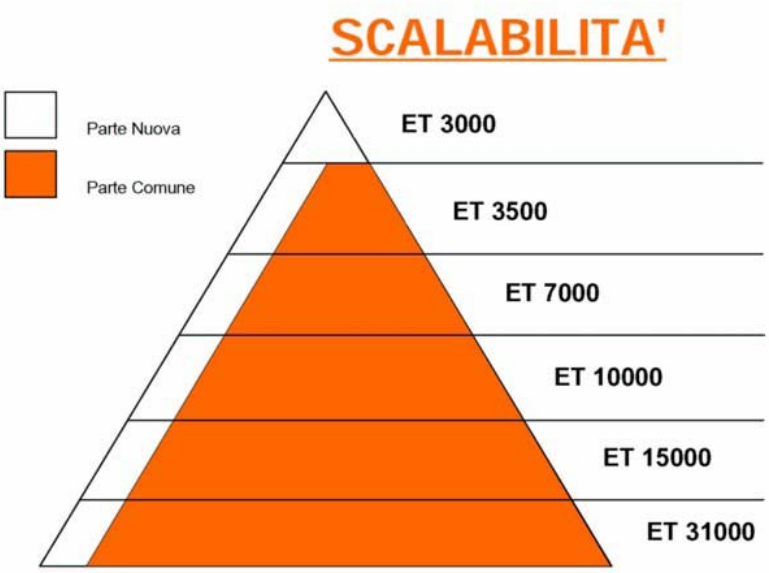
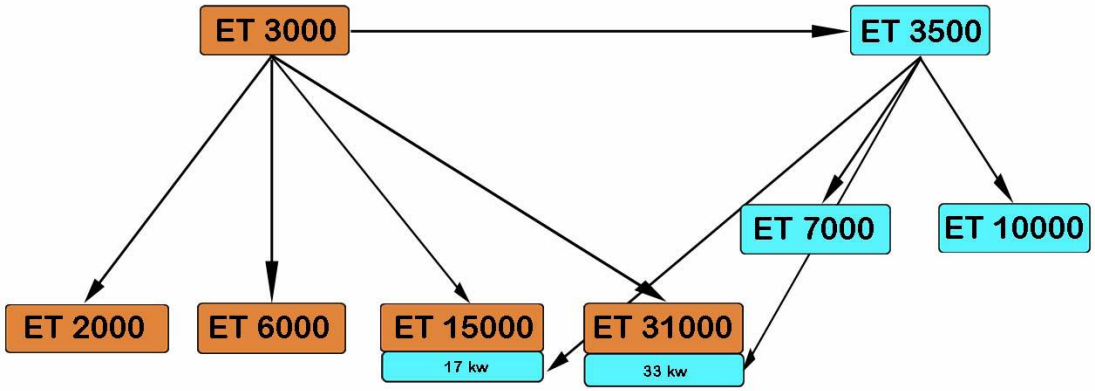
SCALABILITY

"Capacity oa a family of products immediatlely evolve its performance advantage of technical improvement of basic product"



SCALABILITY ADVANTAGES

- **Any technological improvement on the basic product is transferred directly on all apparatues of the family**
- **Spreading knowledge and automatic maintenance**
- **Interchangeability and independence of individual modules**



ET3500 FAMILY FM ICEFET TRANSMITTER FROM 2Kw TO 60Kw

INTRODUCTION

The ET3500 FM transmitters family is built up by combining the E3500 model in order to obtain higher power outputs: from 2Kw to 60Kw in 1+0 and N+1X configurations. All models are W.B. 87,5MHz – 108MHz and their frequency is changeable without adjustment.
The amplifiers are accessible from the front panel, the RF, control and power supply connections have been designed to ease the replacement of a module with no service interruption. Every base module is completely redundant itself.
The base module of this family is the E3500 amplifier with the ETG exciters, all the constituents of the family share the same characteristics concerning RF modules, power supplies, control logics, protection systems, derating, and so on. For this reason this document always refers to the characteristics of the E3500 amplifier and to the ETG exciter, same for all the other constituent of the family.

The main characteristics of the family:

- Tropicalization and completely stainless steel manufacture on all series
- Reduced dimensions and weight: it is the smallest and lightest transmitter of the world.
- Easy installation
- Convenient price
- Low cost for maintenance
- Reliability
- SMS alarms
- W.B.: ideal as a reserve (Dual Drive, Passive Reserve, Active Reserve, N+1)
- Working at full power with one RF module missing, and keeps in operation with even one RF Module functioning
- Working at full power with one power supply missing, and keeps in operation with even one power supply functioning.
- ICEFET technology
- Total redundancy on all models
- Remote diagnostic great ability
- Control and system logic through touch-screen graphic interface
- Connectivity
- Power supply
- Dual Exciter ETG100, ETG300, ETG500 and ETG1000
- Conservative use of mosfet
- No IPA (Intermediate Power Amplifier)
- IPF (Intelligent Proportional Foldback)
- IPC (Intelligent Power Control)
- Efficiency optimization on the whole band
- Fan speed proportional to temperature
- RF thermal derating
- Cooling system thermal derating
- PSU current derating

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RF amplifiers' fault derating
Alarm storage management
Continuous training: Elenos offers a continuous training to its distributors with the aim of qualifying their professionalism and allowing them to supply the better technical assistance on its products.
Sales service and technical assistance: ELENOS relies one of the greatest distribution channel of the world. Each distributor is selected mainly for his quality of the technical support he can provide to the customer.

The main characteristics of the equipment are described here below:

ICEFET TECHNOLOGY

This technology led to the lowest functioning temperature of MOSFETs. Together with the use of a high-efficiency heat sink (Elenos patent) a huge increase of reliability on MTBF is obtained.

TROPICALIZATION COMPLETELY STAINLESS STEEL MANUFACTURE

All mechanical parts are stainless steel, the electronic boards are treated with isolating varnish to protect against corrosion caused by salt deposit or humidity in general. Moreover, each electronic part that may be in contact with air flow has been protected with special protective screens.

TOTAL REDUNDANCY OF THE WHOLE SERIES

The ET3500 Family is conceived to be completely redundant.
The intrinsic redundancy of its equipment annuls each "SINGLE-POINT-FAILURES" thanks to a "SOFT FAILURE DESIGN" and to a sophisticated protection system allowing to stay «ON AIR» even in extreme working conditions.
If you analyze accurately the projects of many of the modern transmitters in the market, one realizes that they show "redundancy bottleneck" that is, parts of the transmitter that are not redundant, therefore more likely producing the interruption of the service if any of these parts goes faulty. Typical cases are fans, auxiliary power supplies, or medium stage amplifier or most frequently the control logic of the equipment.
In the ET3500 family each component s duplicated or multiplied to annul the redundancy bottleneck and prevent transmission interruption.
In the ELENOS ET3500 family the redundancy is on all series, there's no additional cost for the purchase of optional parts. This is an important detail when evaluating a purchase, in facts, on most transmitters in the market today redundancy is optional, to be paid separately. An example is the IPA or the power supply, usually declared redundant from the project but in the end an overprice is requested to be paid.

WIDE BAND

The transmitter maintains optimal performances of power and efficiency on the whole band, no need for tuning (important characteristic when we are dealing with a reserve transmitter in N+1 systems).

REDUCED WEIGHT AND DIMENSIONS

The complete transmitter is built in a 7U-rack dimensions (3.5KW) and 40U (15KW), with a base smallest than 0,31mq. (length 50cm x depth 63 cm).

REMOTE DIAGNOSTIC GREAT ABILITY

The Hostlink standard protocol used in the equipment grants a secure management of a high quantity of information for the remote diagnostic.
The telemetry based on Hyperterminal allows an easy remote access from any PC no necessity of dedicated software installation.

CONTROL AND SYSTEM LOGIC THROUGH TOUCH-SCREEN GRAPHIC INTERFACE

The SCU System Control Logic or the TCU Transmitter Control Logic analyse the operating parameters according t which it takes clever decisions for a better functioning of the transmitter. In this way it controls the output power stability, launch the VSWR derating, temperature and so on, to ease troubleshooting and store faulty conditions' memory.

CONNECTIVITY:

the transmitter can be controlled through:
The local control logic (Color Touch Screen Display);
Local PC with Hyperterminal through the RS232 or RS485 ports;
Remote PC with Hyperterminal through a PSTN or GSM Modem;
Remote or local PC with SNMP;
Parallel interface;
For local or remote PCs a specific software is not necessary, because of the use of ANSI standard terminal (Hyperterminal) or Web Browser as Internet Explorer.

POWER SUPPLY

The power supply is the heart of any electronic device, for this reason, the redundant ones are standard built in each ELENOS amplifier.
The power supply is over-dimensioned, reliable, with PFC and voltage share, are at extended range. Thanks to them the equipment works on supplies between 110VAC and 380VAC, both singlephase and three-phase.
The power supply room of the E3500 contains 3 power supplies of 2KW 50V 40° each.
The complete power supply case , therefore, produces a total of 6Kw 50V 120A exceeding for 20% the necessary total power to work at full scale. Thanks to power supplies redundancy, the transmitter delivers 2KW still with one damaged power supply, or at 1KW with two damaged power supplies.
The PFC reduces the harmonic emissions in the mains, improves the overall efficiency and the power factor of the equipment, that results 0,98.
The outputs 50 VDC of the three power supplies are connected in parallel and use the voltage share technology.
This technology guarantees that all power supplies deliver the same voltage in a way that none of them is overcharged and that temperature of all is the minimum possible, furthermore it improves the balance of the absorption on the three phases minimizing the voltage on the neutral to a value very near to 0.

ETG100, ETG300, ETG500 and ETG1000 EXCITERS

The ETG101, ETG300, ETG500 and ETG1000 are FM exciters solid state with output power constantly variable from 0 to the nominal power, in the band 87,5 – 108 MHz tuneable at steps of 1KHz from the

frontal panel through a LCD graphic interface, through which the user can analyse all operative parameters and program them through the ergonomic keyboard on the front panel.
The exciters of the ETG family are the state of art of FM broadcast, its warm and crystal sound - perceived from the first very listening – is confirmed by the measurements of the electric performances meaning the signal/noise ratio, distortion and the wide "Stereophonic Image"

DUAL EXCITER

In the ELENOS ET3500 family, all components and the softwares needed for the changeover between exciters are included in the combiner.

RF MODULE, CONSERVATIVE USE OF MOSFETs

The MOSFET used is the BLF278, it delivers alone 400W power. Our conservative choice to use it at 280W was aimed to give more reliability in case of overcurrent, excessive SWR or temperature.

NO IPA (Intermediate Power Amplifier)

The high power MOSFET transmitters in the market today use on average a "Medium Stage Driver" commonly defined IPA and go from 300-1000W. This amplifier represents the critical element of the chain because not redundant: in case of fault the user has the complete loss of service.
Elenos transmitters don't use the IPA, so they annul every bottleneck in redundancy; this has been possible thanks to the wide choice of powers available in the ETG family from 101W to 1000W.

IPF (INTELLIGENT PROPORTIONAL FOLDBACK)

IPF is an intelligent system that varies the transmitter's output power according to the mismatch condition of the load and permits to the transmitter to work also on loads highly mismatched.

IPC-INTELLIGENT POWER CONTROL

IPC maintains the output power within the 2% of the target power, independently from mains variations, from temperature or load.
The management of "IPC" power is based on the control of the VDS voltage supplied by the power supplies and the BIAS voltage supplied by two analogue outputs, -10/10V of the logic.
The amplifier, under correct functioning, maintains the set power with a tolerance of 30 W (+/-%).
The control algorithm, in normal functioning, leads to a 30V value the VDS voltage and increases the BIAS voltage to join the targeted power set or saturation (10V). If there isn't enough BIAS voltage to raise the amplifier to the requested power, the VDS voltage should be raised. This optimizes the efficiency of the RF part: under high currents and reduced voltages MOSFETS work always at the maximum saturation level.
To reduce start-up time, if the power output moves away from the target power for more than 100 W, the increases of VBIAS and VDS are not unitary, but for the VBIAS increases or decreases of 400 mV are made (the single step corresponds to 40 mV), and for the VDS of 500mV (with the correspondent step at 12,5 mV).
The management activates itself only if the forward power is higher than 25W, measured on the directional couplet, otherwise it maintains the VDS at the minimum value and the BIA at -4V.
The increase of VBIAS and VDS occurs only if the voltage delivered by the power supplies doesn't overpass 42A each. This avoids a condition of instability in case of a damaged power supply.

EFFICIENCY OPTIMIZATION ON THE WHOLE BAND

The most important results obtained from the IPC functioning and the increase of the efficiency on the whole band and for all power levels set.
To keep high efficiency, means low temperature, decrease operation costs and improvement of reliability.

DERATING

DERATING is a mechanism of reduction of output power proportional to the entity of the fault occurred.
There are four main derating:

1. Thermic derating for RF amplifier when out of ventilation;
2. Thermic derating of PSU or RF amplifier;
3. Current PSU derating;
4. Derating for one or more of RF amplifier;

FAN SPEED PROPORTIONAL TO THE TEMPERATURE

In each 3.5KW amplifier module are 6 very-high-durability blowers, 100.000 MTBF hours. Their overdimensioning is such that the amplifier can work at full scale for an undetermined time even with 2 still blowers. Furthermore the intelligent control system of speed, contributes to their durability.
The functioning of the intelligent control of fans is the following: under the 45°C the fans work at 60%. From 45°C to 65°C the fan speed is proportional to temperature and varies from 60% to 100%. From 65°C to 70% the fan speed varies proportionally from 100% to 120%.
On start-up or on the activation of the "on air" condition, fans run for 1 minute at their nominal value (100%) or more if the temperature needs it, after this minute they reduce their speed at a fixed slope of 1% per second joining the "set point" connected to the equipment internal temperature.

RF THERMAL DERATING

The reaction of the IPC control logic in case of temperature increase up to derating is the following:
Overpassing the temperature of 70°C on the RF heatsink and of 72°C for the power supplies activates the thermal derating mode;
With active derating on, first, the target power is reduced to the 52% of the set power (2% more than -3dB), this to avoid that the transmitter generates an alarm of 3dB.
The reduction of 1°C of the temperature from 70°C for RF or 72°C for PSU, while derating, increases the temperature of 1/10 of 48% of the target power. The output power is reduced to the target value if the temperature is lower or equal to 60°C for the RF or of 62°C for PSU. This avoids also the thermal derating condition, restoring the normal functioning of the equipment.
If temperature continues to rise despite derating, the output power is reduced again even below a -3dB level, generating also the -3dB alarm.
Id the derating is not able to stop the temperature raise, when the threshold of 80°C is overpassed for the RF or 77°C for PSU, turns off the power supplies, therefore the amplifier. The reset of the equipment occurs with a hysteresis of 5°C, so the functioning is reset respectively at 75°C for RF and 72°C for PSU.
The transmitter shut-down is managed with three block-outs, that means that after three times it tries to contain the temperature through the derating, the total block of the equipment is determined.
Notice: When the power supplies stop, stop of blowers is consequently caused, therefore the equipment will work without forced air-cooling.

COOLING SYSTEM THERMAL DERATING

The ALC logic reduces the output power to max.1600W in case of fast increase of temperature when fans get damaged.
Its functioning is the following:
If the output power red on the output directional coupler is higher than 1600W and the max absorbed current from the RF amplifier is higher than 5A, then the control is activated.
Derating starts therefore in the following cases:

- If the average temperature on frontal and rear blocks of the amplifiers is increasing
- If the average increase of module temperature is more than 2°C every 15 seconds
- If the difference of temperature between frontal and rear blocks is less than 3°C

At derating activation the equipment starts to work at 16000W
The reset of derating condition for damaged fans occurs if the temperature decreases every 15 seconds of 2°C and if the difference of temperature between frontal and rear blocks is more than 3°C.

PSU CURRENT DERATING

When the delivered currents from the single power supply increase, the ALC logic act as follows:
A maximum current of a single power supply over 40,5° determines the current derating condition.
The algorithm of ALC management under normal functioning conditions is replaced by another where the control of the VDS and VBIAS is determined by the set power and by the current delivered by the power supply – with major priority – that is maintained around 40A.
The current derating condition is annulled if the set power returns to the target value and the maximum current absorbed by the single power supply is equal or lower than 40A.
If the current delivered by one power supply is lower than 1/10 of the maximum current supplied by the other power supplies and if the total current delivered is higher than 10A, the power supplies generate a malfunctioning signal, in order to make a diagnosis of faulty power supply.

RF AMPLIFIERS FAULT DERATING

In case one or more broken RF amplifiers, this is what the ALC logic behaves:
the absorbed currents from the modules are detected by the SHUNT board. If the current value is lower than 1/10 of the maximum current delivered by the single RF amplifier, the power supplies have to give a VDS higher than 30V (minimum value), the total current is higher than 2,5*12> 30A (n. of RF modules) and the forward power is over 500W. Under these conditions the modules are considered faulty.
Controls on the total current, on the VDS state and on forward power mask the alarm in case of low current value, due to output powers too low and/or absence of driving.
A table shows the maximum power deliverable in a pre-defined and constant way according to the active modules.
If the maximum power deliverable is the set target power or higher, an alarm for RF modules malfunctioning is shown, but the equipment still works correctly.
If it is lower instead, the equipment will show an active derating and a malfunction of the amplifiers.
The reset of the derating condition of the modules occurs when the fault disappears, when the current of each module returns over 2,5 A and after a delay of 60 s.
To avoid the number of SMS sent in case of fault, the equipment does not send SMS during derating, in fact, the equipment sends SMS (if active) only for the -3dB signal, that means when the delivered power is lower than 50% of the set target power.

N° of active modules	Maximum deliverable power
0	< 500W
1	< 500W
2	< 500W
3	< 500W
4	< 500W
5	700W
6	1100W
7	1500W
8	1900W
9	2300W
10	2700W
11	3100W
12	3500W

PROTECTIONS

The E3500 has been built with a protection system that puts together hardware protections with the performances of software protections.

ALARM LIST MANAGEMENT

It lists the sequence of the last 19 alarms with date and time for each alarm.
Permanent stored data, with checksum,

HARDWARE PROTECTIONS

This system is composed by an ultra fast protection that turns off MOSFETS through the bias is the VSWR overpasses 10% of the maximum power. In fact, the equipment is able to bear shortcircuit events or open circuits on the RF output without damage.
Independent fuse protection on each 300W MOSFET amplifier module.
Electronic fast and fuse protection on power supply of the blowers.

SOFTWARE PROTECTIONS – ALARM MANAGEMENT

The protection system is made of the Alarm management module
Physic and logic digital inputs are used in order to verify the alarm condition. The state of each input is sampled, then the condition is elaborated in a logic way with a combinatory net so to determine which is active: the alarm or the message.
The minimum time is 100ms.
The turn-off modalities are mainly the following:

STOP3BLOCKOUT	Stops the equipment with Three Block Out
STOP	Stops the equipment without Three Block Out
STOPNOTFAULT	Stops the equipment without FAULT
RESETREQUIRED	Requests a reset
REDPOWER	Reduced power functioning
FAULT_LED	Still Red Led
FAULT_B_LED	Red Led Flashing at 1,5 Hz
ON_AIR_B_LED	Green led on air Flashing at 1,5 Hz
INHIBIT	Amplifier inhibition alarm
HALF_POWER	-3dB functioning alarm
INTLOCK	Amplifier block alarm
NO_MAINS	No mains presence alarm
T_DERATING	Power reduction for temperature alarm
I_DERATING	Power reduction for power supply currents alarm
U_DERATING	Reduced power alarm for fast over-temperature on forced air-cooling
RF_MOD_DERATING	Reduced power alarm for fault on RF modules

This module is repeatedly executed at equal priority of the ALC management in order to constantly verify if alarm causes occurs, so that to intervene in time.
The implementation is based on a table which describes the arrest nets, therefore the code is the same for all alarm and in case of new stops it doesn't need changes.

ALARM LIST

Alarm reset	Message, alarm reset under process, output flags decides the reset of all stored alarms and no more active.
Persistent data checksum error.	Message, the persistent data in eeprom have been lost and the equipment is configured with the default parameters.
Three block out.	Message, equipment blocked for consecutive faults, requests the reset from the user to allow restart.
Standby / on air.	Message, identifies that the amplifier is in stand-by mode ready to start without alarms.
-3dB.	Message, the amplifier delivers a power output lower than 3dB in respect to the target set. Further to the 5 seconds of mains delay there is also a delay of 55 seconds before start up.
Max reflected power.	It indicates a too high level of reflected power. It turns the equipment off in three block out.
Minimum -12V.	Voltage level too low on -12V which prevents functioning of its protections. It turns the equipment off in three block out.
RF Modules fault	Anomaly on RF module, maximum deliverable power is reduced.
RF Modules derating	Output power reduced due to a broken RF module. If the set target power is lower than the one deliverable by the system with the remaining modules, this message does not appear.
RF thermal derating.	Thermic anomaly on RF modules, reducing the maximum power output.
RF over temperature error.	Maximum operating temperature overpassed and equipment turn off in three block out.
PSUs fault error.	Malfunctioning of one or more power supplies. The fault is determined by a too low absorption (< 2A) of one or more power supplies comparing to the total current delivered (< 6A).
PSU current derating.	Overload of one or more power supplies and reduces the power output to reduce absorption. Fault is determined by a too-high absorption (> 40,5A) of one or more power supply.
PSUs max current error.	Indicates a prolonged overload of one or more power supplies. The fault is determined by a too high absorption (> 40,5A) of one or more power supplies for 60 seconds.
PSUs thermal derating.	Indicates a power supply over-temperature: it reduces power.
PSUs over temperature.	Indicates a power supply over-temperature: it turns off the amplifier.
UNB OVERTEMPERATURE MSG	
PSU / SHUNT communication error.	Malfunction of internal 485 BUS for communications between CPU and PSU/SHUNT.
EXT DRV ENABLE A MSG	
EXT COMM TIMEOUT MSG	

External Interlock	Input hardware and active interlock.
Cooling system fault derating.	Fast overheating of RF amplifier modules.
On air	On air and properly functioning.
Power up	Stores in the list that the equipment has re started-up

ETG3500

ICEFET SOLID STATE FM TRANSMITTERS

Totally STAINLESS STEEL, electronic boards are Protected from Humidity and Inclement of Tropical Weather.

All equipment undergo Rigorous Burn-In Process and quality controls.

Power sections were developed Over-Dimensioned with a conservative approach.

ICEFET Technology keeps temperature extremely low to increase the MTBF.

Fast hardware protections, further to Intelligent Proportional FoldBack of critical parameters like VSWR and temperature.

Ventilation, power supplies, MOSFET and exciter are fully redundant to avoid any “Single Point Failure” .

Our mission is to create the Most Reliable FM Transmitters Of The World

artbroadcast@elenos.com
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MAIN CARACTERISTICS

Buil-In Exciter with Warm Crystal Sound:
S/N 85dB, Stereo Crosstalk 75dB, Harmonic Distortion 0,02%.

BUILT-IN STEREO GENERATOR
Stereo Crosstalk higher than 75dB thanks to the digitally controlled Pilot Tone Phase

AES/EBU INPUT

LIMITER DISORTIONLESS
The output of the limiter is double stage filtered

IT CAN BE USE BOTH AS EXCITER OR AS FINAL STAGE AMPLIFIER SEPARATELY
The 150W exciter output is connected to the RF amplifier input through an external jumper, this allows to use, if needed, both separately.

RS232/RS485 CONECTIVITY

OPERATING AT REDUCED POWER WITH ONE OR MORE BROKEN RF MODULES

OPERATING AT REDUCED POWER WITH ONE OR MORE BROKEN POWER SUPPLIES

ICE-FET:
Means Mosfet and heat sink maximum efficiency to reduce temperature, in order to obtain a higher MTBF. The result is unmatched in size and weight by any other producer

ALWAYS ON AIR: (FULLY REDUNDANT):
ALWAYS ON AIR: (FULLY REDUNDANT): The redundancy of this equipment prevents SINGLE-POINT-FAILURES thanks to a SOFT FAILURE DESIGN and a protection system which keeps it « ON AIR» even in the most extreme working conditions.

IPC (Intelligent Power Control):
The IPC maintains constant the Output Power within 2% of the setting value, regardless of fluctuations in incoming AC line voltage, RF drive or load conditions.

IPF
The IPF allows the transmitter to stay on air into loads as poor as 3 to 1

BROAD BAND:
The transmitter keeps optimum performances of power and efficiency over the all Broad Band operation without needing of tuning what make it ideal for n+1 application

CONSTANT EFICIENCY:
The VPA and the Bias are both controlled to obtain maximum efficiency at any frequency and output power level. Keep the efficiency high means low heat, low operative cost, higher MTBF.

NO IPA:
In ELENOS transmitters, the IPA is always avoided. This choice eliminate one of the bottleneck in Redundancy frequently present on transmitters of this category.

EASY MAINTENACE:
all parts are easily accessible via the front panel(RF modules, electronic control boards) or via the rear panel (fans, combiners)

SMS ALARMS:
All alarms and event can be send by SMS

REDUCED SIZE AND WEIGHT:
Greatly reduced size and weight: the whole transmitter is contained in a 20-unit rack with a floor plan as less as 0,31 square meter!!! (50cm width x 86cm dept)

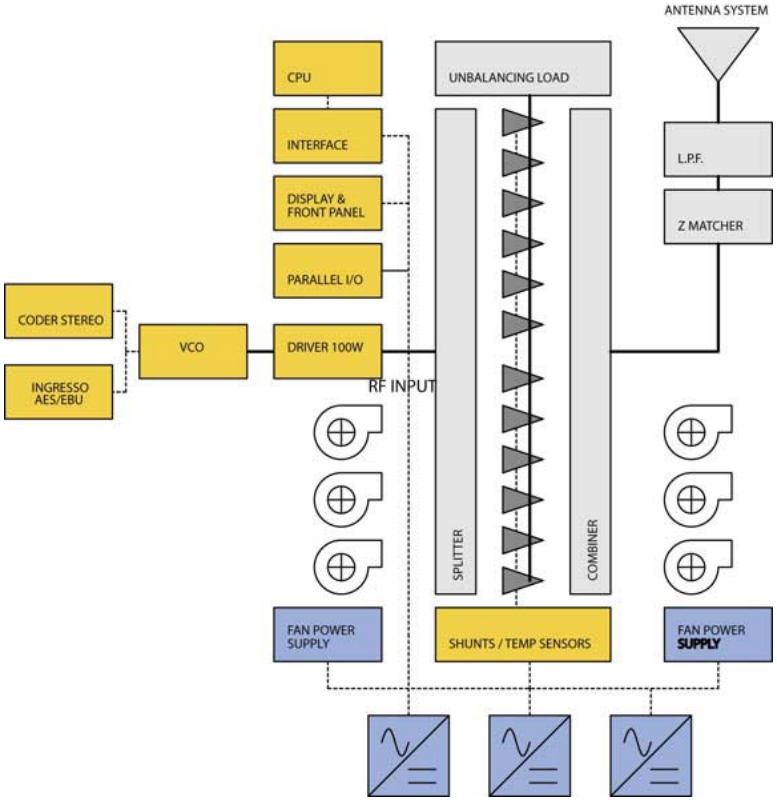
REMOTE DEEP DIAGNOSTIC CAPABILITY:

The industrial standard Hostlink Protocol allow to safety handle huge quantity of information to perform remote deep diagnosis.

WORLS WIDE SALES & SERVICE SUPPORT:

ELENOS is the FM manufacturer with one of the biggest distribution channel of the world. Each distributor is chose mainly by the technical support customer capability.

COMPOSITION & REDUNDANCY



0,1dB steps digital attenuator audio inputs and pilot tone
Stereo Generator
AES/EBU INPUT
Extremelly Linear Low Noise VCO
12 MOSFET Philips BLF278
3 Current Share combined 2.5KW PFC switching Power Supply
6 Microprocessor Speed Controlled Blowers
Microprocessor controlled
1 Output Harmonic Low Pass Filter

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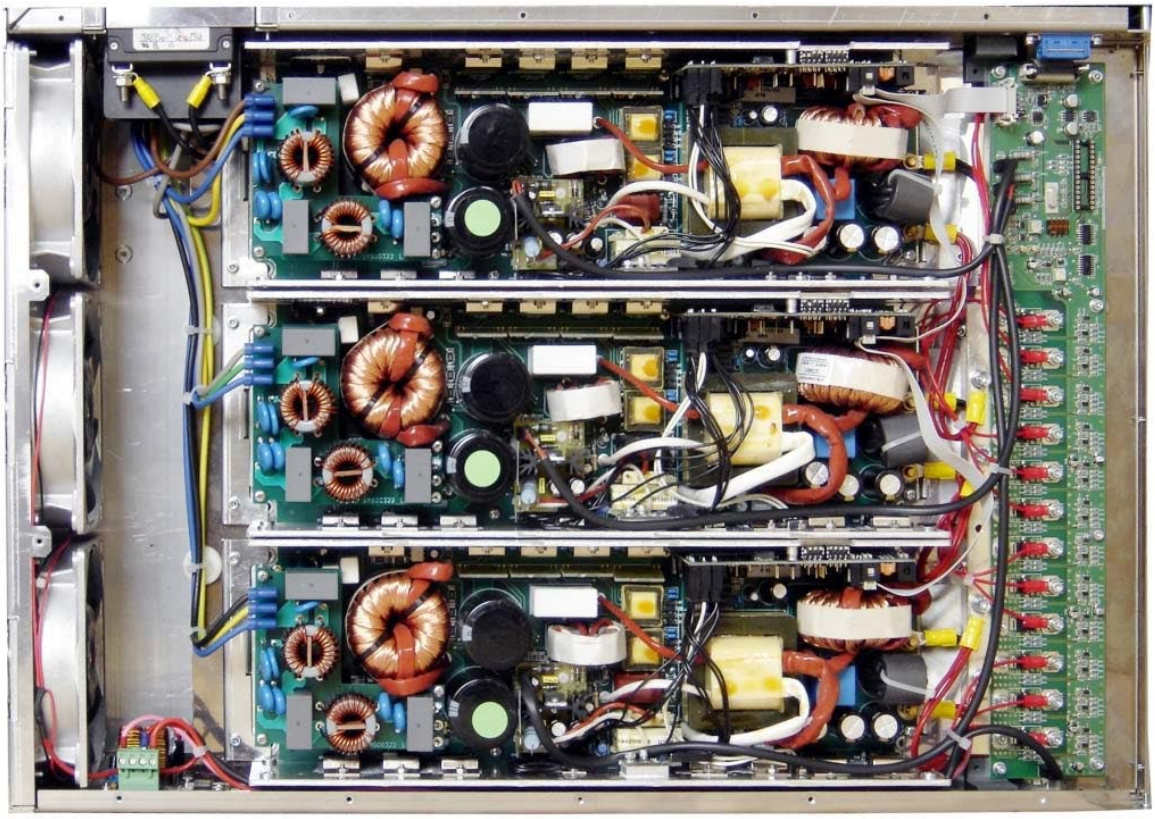
BACK VIEW

XX

TOP VIEW



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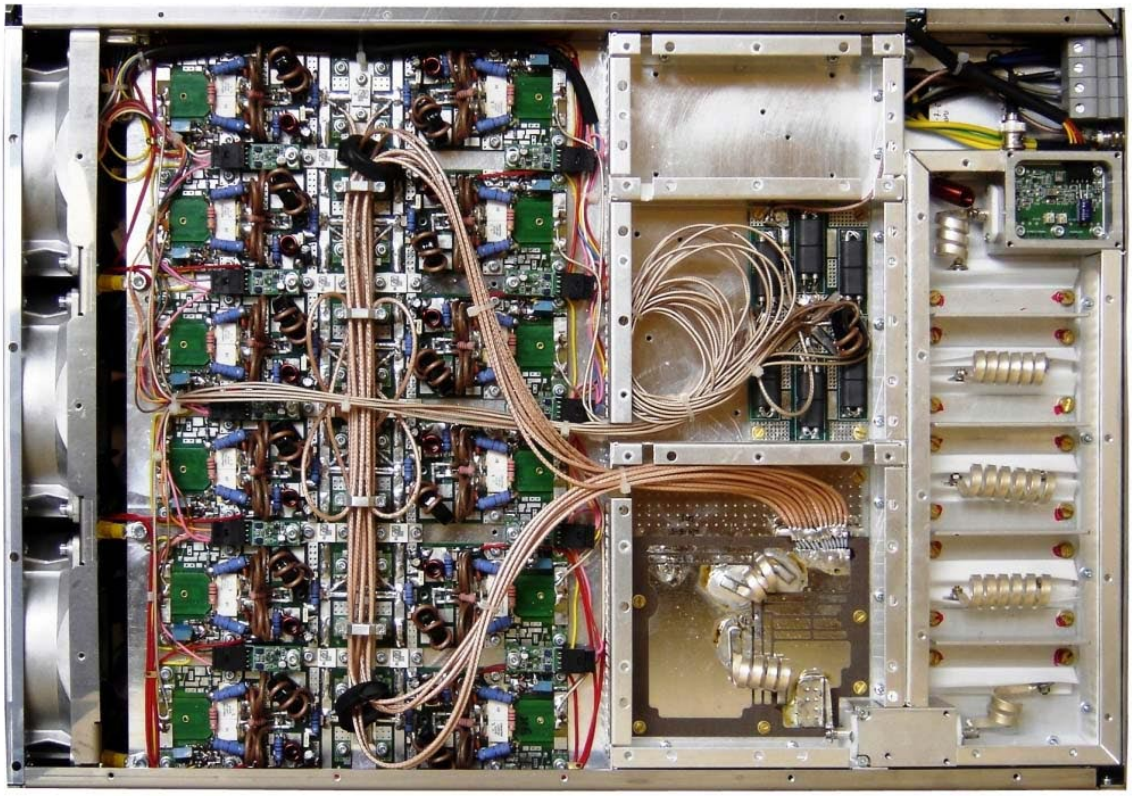
BOTTOM VIEW



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MAIN DISPLAY

FREQUENCY SETTING DISPLAY

POWER SETTING DISPLAY

TECHNICAL CARACTERISTICS

GENERAL DATA		
	Output Nominal Power	3500 W adjustable
	Operating band	87.5 - 108 MHz
	Output Low-pass Filter	W.B. 87.5 MHz - 108 MHz
	Corrosion	All mechanical parts are stainless steel
	Internal bus RS232/RS485	Yes
	Points of measure	RF Sample-MPX Monitor
	Displayed Parameters	More than 50 parameters displayed on a LCD
	Adjustments	From the frontal panel trough LCD /from PC
	Microprocessor controlled	Yes
	Power supply redundancy	Yes
	Blower redundancy	Yes
	Number of MOSFETs	12
	Final stage technology	ICEFET
	Transistor type	BLF278 Philips
	Number of power supplies	3
	Dimensions: Rack units	4 U
	Dimensions: Width	48,5 cm
	Dimensions: Height	17,6 cm
	Dimensions: Depth	70 cm
	Weight	43 Kg
	Power supply units maximum weight	6 Kg
CONNETTORS		
	RF Output connector	7/8"
	RF Output connector exciter	BNC
	RF Input connector	BNC
	Input connectors LEFT & RIGHT	XLR female
	MPX Input connector	BNC female
	SCA Connector	BNC female
	Remote control connector	DB25 female
	RS485/232 Connector	DB9 female
RF		
	Overall output power stability	+/-0,1 dB
	Output impedance	50 Ω
	Harmonic suppression	> 80 dB
	Spurious signal suppression	> 80 dB
	Driving power final stage	85 W
	Input impedance final stage	50 Ω
	Gain final stage	16 dB
	Software V.S.W.R. intervention threshold	350 W
	Fast V.S.W.R. intervention threshold	400 W
	Asynchronous residual AM (typical values)	0,1 %

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	Synchronous residual AM (typical values)	0,2 %
	RF Efficiency	65% typ.
	Output nominal power	3500 W Adjustable with continuity
	Maximum peak power	3800 W
AUDIO		
	L/R Audio input level	+12/-12 dBm to produce 75KHz standard deviation
	L/R level adjustment	Soft adjust 0,1dBm steps from front panel
	L/R Connector type	Balanced XLR
	L/R Input Impedance	Selectable 10K- 600Ω
	MPX audio input level	+12/-12 dBm to produce 75KHz standard deviation
	MPX level adjustment	Soft adjust 0,1dBm steps from front panel
	MPX Connetor type	Unbalanced BNC
	MPX Input impedance	5KΩ selectable
	PILOT level adjustment	Soft adjust 0,1dBm steps from front panel
	PILOT Phase adjustment	Soft adjust 0,1dBm steps from front panel
	SCA/RDS level adjustment	Soft adjust 0,1dBm steps from front panel
	SCA/RDS Connector type	Unbalanced BNC
	SCA/RDS Input Impedance	10KΩ
	19KHz Output	Yes
	STEREO/MPX easy changeover	Yes
	AES/EBU Input option	Optional (External adapter)
PERFORMANCE EXCITER		
	Time of adjustment - frequency	<0,1 minute
	Time of adjustment - power	<0,1 minute
	MTBF	10 Years
	Programmed Maintenance	5 Years
	Intermodulation distortion	<0.05% Measured with two of tones 1KHz & 1.3KHz, ratio 1:1 at 100% modulation
	Frequency deviaton	+/- 75 KHz 0.1dB steps adjustable
	Frequency steps	10 KHz
	THD+N	<0.03% @ 1KHz
	Pre-emphasis	50/75 microseconds +/-0,1dB
	FM S/N MPX FCC	82 dB 20Hz - 23KHz - 50uS - ref @ 53KHz - RMS
	FM S/N STEREO CCIR Weight	72 dB Weight-ref@53KHz-Qpk
	FM S/N STEREO CCIR Unweight	72 dB Unweight-ref@53KHz-QPk
	Mono frequency response	+/-0.15 dB 30Hz - 15KHz
	MPX frequency response	+/-0.1 dB 30Hz - 100KHz, -45dB at 19 KHz

	Stereo frequency response	+/-0.15 dB 30Hz - 15KHz
	SCA1,2,3 frequency response	+/-1 dB 20KHz - 100KHz, -45dB at 19KHz
	Type of modulation	F3 Direct FM modulation of the RF oscillator in fundamental frequency
	Stereo separation	> 60 dB @ 1KHz
	Pilot tone frequency	19 KHz
	Pilot tone deviation	7,5 KHz Adjustable
	Pilot tone frequency stability	+/-1 Hz
	Attenuation at 19KHz	> 45 dB
	Phase Response	0.1 degreeFrom linear phase; 53kHz to 100kHz
	Frequency stability	1 ppm from 0 to +40°C
	Time for starting up	30 sec. from OFF/ON
	Time for starting up	1 sec. from interlock close
	Modulation Capabilities	+/-200 KHz
POWER SUPPLY		
	Power supply	110, 220, 380 Threephase-singlephase 50-60Hz VAC
	Power consumption	5 KVA
	Magneto-thermic curve	D
	Current Consumption @220VAC/single phase	23 Amp.
	Magneto-thermic capacity @220VAC/single phase	32 Amp.
	Conductor Size @220VAC/single phase	10 sqrt.mm
	Conductor Size @220VAC/single phase	7 AWG
	Current Consumption @220VAC/three phase	13 Amp.
	Magneto-thermic capacity @220VAC/three phase	20 Amp.
	Conductor Size @220VAC/three phase	6 sqrt.mm
	Conductor Size @220VAC/three phase	9 AWG
	Current Consumption @380VAC/three phase	8 Amp.
	Magneto-thermic capacity @380VAC/three phase	13 Amp.
	Conductor Size @380VAC/three phase	4 sqrt.mm
	Conductor Size @380VAC/three phase	11 AWG
COOLING SYSTEM		
	Cooling flow (m3/h)	Variable from 300 to 600 m3/h

	Air temperature increase between output /input	17 °C
	Cooling system	Forced air-cooling through 6 axial fans
ENVIRONMENT		
	Temperature range (operating)	0 - +45 °C
	Temperature range (non operating)	-20 - +70 °C
	Humidity range (operating)	95% at 40 °C
	Humidity range (non operating)	90% at 65 °C
	Altitude range (operating)	>4600 meters
	Altitude range (non operating)	>15000 meters
TELECONTROL & TELEMETRY		
	Remote control	Yes
	Remote Control at clean contacts	Yes
	SNMP option	Under development
REGULATIONS CONFORMITY		
	High frequency radiations from the enclosure	Below limit imposed by technical regulations.
	Functionning type	h24 uninterrupted
	Electromagnetic fields immunity	Higher than specified by laws on electromagnetic fields compatibility
	CE Mark	Conform to 1999/5/CE European Directive
MANUFACTURING DATA		
	Year of the model	2007
	Spares availability guaranteed for	10 years from the date of purchase
PRE- & POST- MAINTENANCE		
	Recurrence	4/8 years
	Blower Replacement recurrence	4 years
	Air blowers quantity and prices	6
	Lithium batteris replacement recurrence	10 years
	Batteries	Yes, only for alarm list storage
	Time to realize the preventive maintenance every 4 years	1 Hour
	Time to realize the preventive maintenance very 8 years	2 Hours
	Level and number of technician for maintenance	1 technician
	Electrical safety	EN60215 (Standard CE)
	Average repair time (change of an RF module or power supply)	1 Hours
SET		
	Installation manual	Yes
	User manual	Yes
	Tests report	Yes
GUARANTY CONDITIONS		

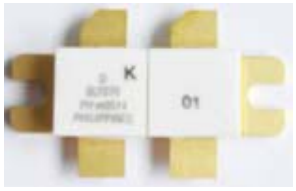
The equipment provided by Elenos srl covered under warranty of 24 months from the date of purchase of the product; That period is meant to be applied to the original that any subsequent buyers.

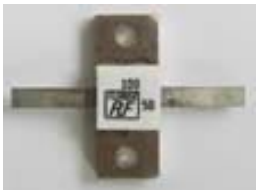
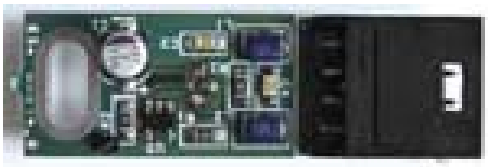
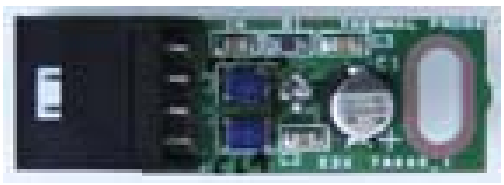
SPAREPARTS

SPARE PARTS MAINTENACE PREVENTIVE

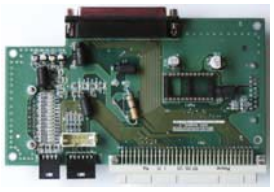
Euro: 652.7412	3	Power Supply #1 (COD: 2KWPFC-SER)	
		Fuse Kit	Fuse Kit E3000
Euro: 52.3052	6	RF Fan (COD: 1VENT026)	
		Battery	YES

SPARE PARTS CORRECTIVE MAINTENACE

Euro: 0	12	RF Amplifier Module (COD: ERK_20044_0)	
Euro: 256.51	12	Complete RF Amplifier board with Mosfets #1 (COD: E3K 2A044_0)	
Euro: 206	12	Mosfet #1 (COD: 2QRF0012 (BLF278))	
Euro: 77.2124	1	CPU (COD: E3K 8A044_0)	
			

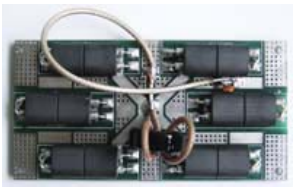
Euro: 30.175	1	Display (COD: 2DYL0001)	
Euro: 113.7716	1	Scheda shunt (COD: E3K 4A044_1)	
Euro: 15	16	Combiner Type #1 Absorber Resistors #1 (COD: 2RAF1007)	E3K 1A044 0 
Euro: 17.9218	10	front panel Output armonic filter L.P. FILTER Temperature sensor board #1 (COD: E3K 6A044_0)	9MOD2800_0 E3KPZ003 
Euro: 12.05	3	Temperature sensor board #2 (COD: E2K 7A000_1)	
Euro: 104.2	1	Fan Board (COD: E3K_3A044_0)	
			

Euro: 0 1 Scheda Interconnessioni (COD: E3K_9A044_0)



Euro: 0 1 Scheda Testina di Lettura (COD: E3K_5A044_0)

Euro: 0 1 Scheda Splitter #1 (COD: E3K_0A044_0)



Euro: 0 1 Scheda I/O Digitale (COD: CHG12A753_0)

Euro: 0 1 Scheda Pannello Pulsanti (COD: E3K_7A044_0)

Euro: 0 1 Sezionatore Magnetico Monofase (COD: 1SZ00037)

Euro: 0 1 Sezionatore Magnetico Trifase (COD: 1SZ00036)

Cables RG178 (50 Ohm) #2 CAB0150_0

Cables RG179 (75 Ohm) #2	CAB0149_10

ET2500

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OPERATING AT REDUCED POWER WITH ONE OR MORE BROKEN POWER SUPPLIES

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all parts are easily accessible via the front panel(RF modules, electronic control boards) or via the rear panel (fans, combiners)

BIG COLOUR TOUCH SCREEN GRAPHIC DISPLAY:
User friendly graphic interface allow access to control and diagnosis parameters

SMS ALARMS:
All alarms and event can be send by SMS

REDUCED SIZE AND WEIGHT:
Greatly reduced size and weight: the whole transmitter is contained in a 20-unit rack with a floor plan as less as 0,31 square meter!!! (50cm width x 86cm dept)

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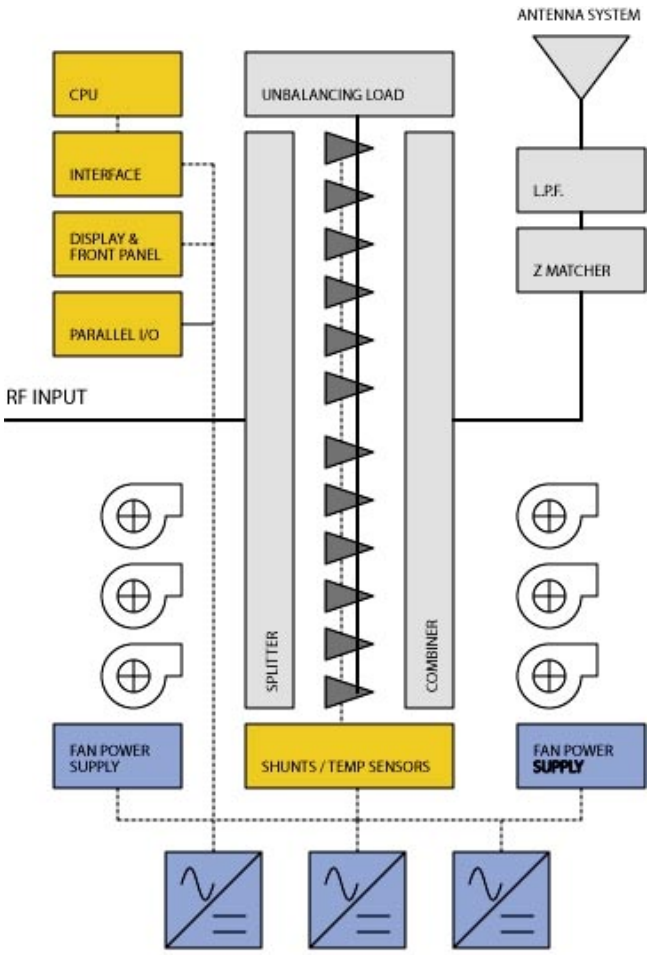
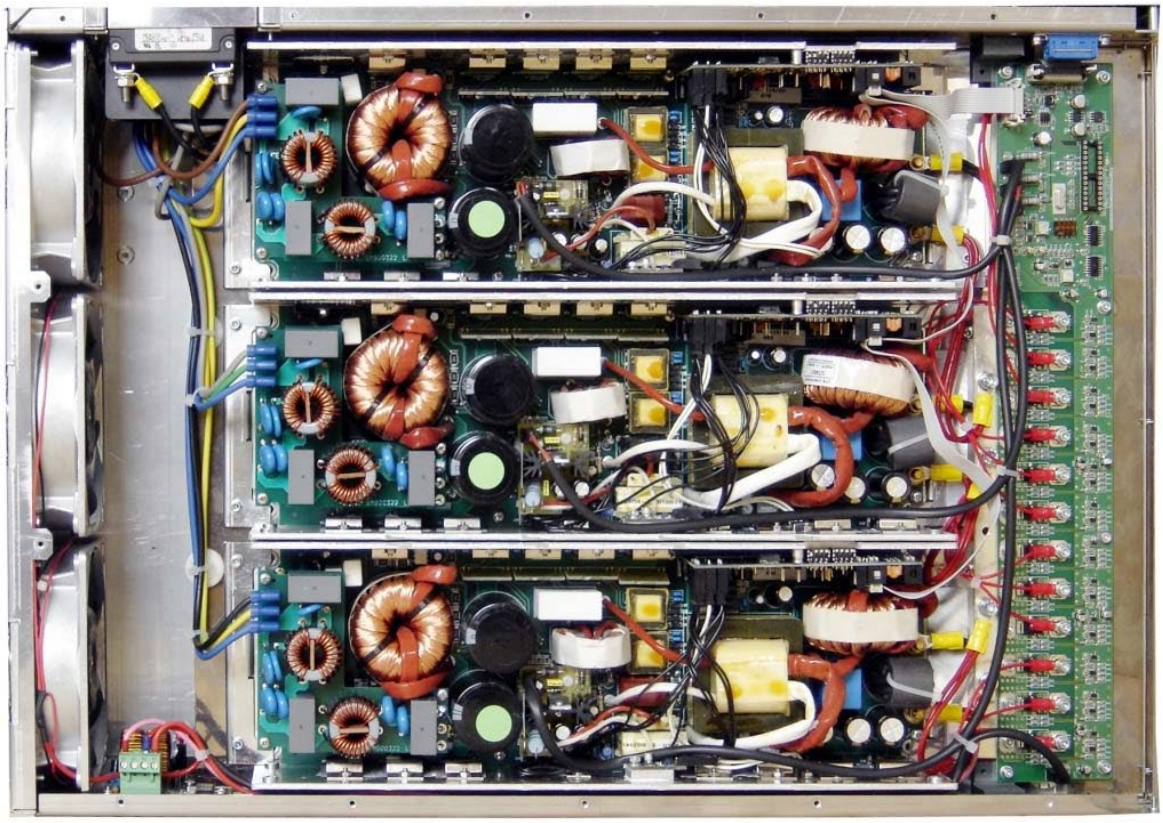


8 MOSFET Philips BLF278
2 Current Share combined 2.5KW PFC switching Power Supply
5 Microprocessor Speed Controlled Blowers
Microprocessor controlled
1 Output Harmonic Low Pass Filter
aaaa

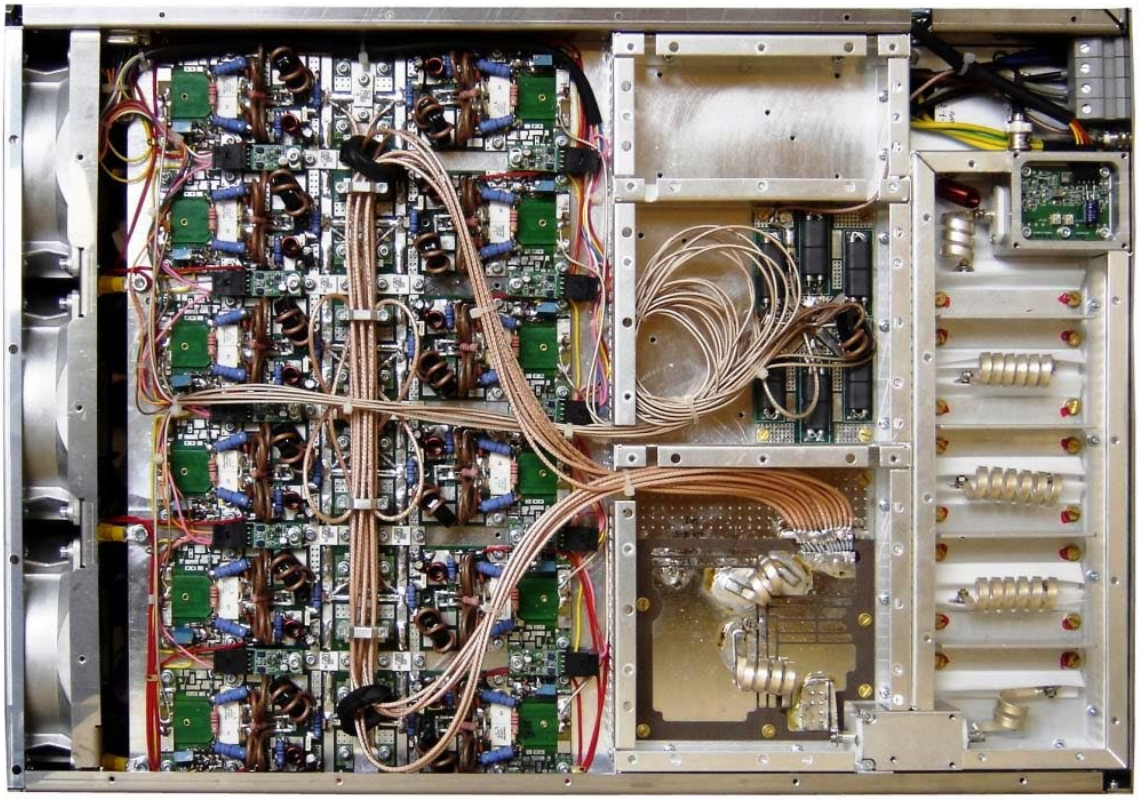
BACK VIEW

XX

TOP VIEW



BOTTOM VIEW



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MAIN CARACTERISTICS

COMPOSED		
	Exciter	ETG101
	Amplifiers	E2000
	Mounted in 19" standard rack	No
	Number of racks	Optional
GENERAL DATA		
	Output Nominal Power	2000 W adjustable
	Operating band	87.5 - 108 MHz
	Output Low-pass Filter	W.B. 87.5 MHz - 108 MHz
	Corrosion	All mechanical parts are stainless steel
	Internal bus RS232/RS485	Yes
	Points of measure	RF Sample-MPX Monitor
	Displayed Parameters	More than 50 parameters displayed on a LCD
	Adjustments	From the frontal panel trough LCD /from PC
	Microprocessor controlled	Yes
	Power supply redundancy	Yes
	Blower redundancy	Yes
	Number of MOSFETs	8
	Final stage technology	ICEFET
	Transistor type	BLF278 Philips
	Number of power supplies	2
	Dimensions: Rack units	4+3 U
	Dimensions: Width	48,5 cm
	Dimensions: Height	(17,6+13,5cm.) Tot. 31,1 cm
	Dimensions: Depth	70 cm
	Weight	(43+22Kg.) Tot.75 Kg
	RF Modules maximum weight	35 Kg
	Power supply units maximum weight	6 Kg
CONNETTORS		
	RF Output connector	7/8"
	RF Input connector	N
	Input connectors LEFT & RIGHT	XLR female
	MPX Input connector	BNC female
	SCA Connector	BNC female
	Remote control connector	DB25
	RS485/232 Connector	DB9
RF		
	Overall output power stability	+/-0,1 dB
	Output impedance	50 Ω
	Harmonic suppression	> 70 dB
	Spurious signal suppression	> 80 dB
	Driving power final stage	80 W
	Input impedance final stage	50 Ω
	Gain final stage	16 dB

	Software V.S.W.R. intervention threshold	200 W
	Fast V.S.W.R. intervention threshold	220 W
	Asynchronous residual AM (typical values)	0,1 %
	Synchronous residual AM (typical values)	0,2 %
	RF Efficiency	65% typ.
	Output nominal power	2500 W Adjustable with continuity
	Maximum peak power	2600 W
AUDIO		
	L/R Audio input level	+12/-12 dBm to produce 75KHz standard deviation
	L/R level adjustment	Soft adjust 0,1dBm steps from front panel
	L/R Connector type	Balanced XLR
	L/R Input Impedance	Selectable 10K- 600Ω
	MPX audio input level	+12/-12 dBm to produce 75KHz standard deviation
	MPX level adjustment	Soft adjust 0,1dBm steps from front panel
	MPX Connetor type	Unbalanced BNC
	MPX Input impedance	5KΩ selectable
	PILOT level adjustment	Adjustable Trimmer
	SCA/RDS Connector type	Unbalanced BNC
	SCA/RDS Input Impedance	10KΩ
	19KHz Output	Yes
	STEREO/MPX easy changeover	Yes
	AES/EBU Input option	Optional (External adapter)
PERFORMANCE EXCITER		
	Time of adjustment - frequency	< 1 minute
	Time of adjustment - power	< 1 minute
	MTBF	10 Years
	Programmed Maintenance	5 Years
	Intermodulation distortion	<0.05% Measured with two of tones 1KHz & 1.3KHz, ratio 1:1 at 100% modulation
	Frequency deviaton	+/- 75 KHz 0.1dB steps adjustable
	Frequency steps	10 KHz
	THD+N	<0.03% @ 1KHz
	Pre-emphasis	50/75 microseconds +/-0,1dB
	FM S/N MPX FCC	82 dB 20Hz - 23KHz - 50uS - ref @ 53KHz - RMS
	FM S/N STEREO CCIR Weight	72 dB Weight-ref@53KHz-Qpk
	FM S/N STEREO CCIR Unweight	72 dB Unweight-ref@53KHz-QPk
	Mono frequency response	+/-0.15 dB 30Hz - 15KHz
	MPX frequency response	+/-0.1 dB 30Hz - 100KHz, -45dB at 19 KHz

	Stereo frequency response	+/-0.15 dB 30Hz - 15KHz
	SCA1,2,3 frequency response	+/-1 dB 20KHz - 100KHz, -45dB at 19KHz
	Type of modulation	F3 Direct FM modulation of the RF oscillator in fundamental frequency
	Stereo separation	> 60 dB @ 1KHz
	Pilot tone frequency	19 KHz
	Pilot tone deviation	7,5 KHz Adjustable
	Pilot tone frequency stability	+/-1 Hz
	Attenuation at 19KHz	> 45 dB
	Phase Response	0.1 degreeFrom linear phase; 53kHz to 100kHz
	Frequency stability	1 ppm from 0 to +40°C
	Time for starting up	30 sec. from OFF/ON
	Time for starting up	1 sec. from interlock close
	Modulation Capabilities	+/-250 KHz
POWER SUPPLY		
	Power supply	110,220, 380 Threephase-singlephase 50-60Hz VAC
	Power consumption	5 KVA
	Magneto-thermic curve	D
	Current Consumption @220VAC/single phase	15 Amp.
	Magneto-thermic capacity @220VAC/single phase	25 Amp.
	Conductor Size @220VAC/single phase	6 sqrt.mm
	Conductor Size @220VAC/single phase	9 AWG
	Current Consumption @220VAC/three phase	9 Amp.
	Magneto-thermic capacity @220VAC/three phase	16 Amp.
	Conductor Size @220VAC/three phase	4 sqrt.mm
	Conductor Size @220VAC/three phase	11 AWG
	Current Consumption @380VAC/three phase	5 Amp.
	Magneto-thermic capacity @380VAC/three phase	10 Amp.
	Conductor Size @380VAC/three phase	2,5 sqrt.mm
	Conductor Size @380VAC/three phase	13 AWG
COOLING SYSTEM		
	Cooling flow (m3/h)	Variable from 400 to 800 m3/h

	Air temperature increase between output /input	17 °C
	Cooling system	Forced air-cooling
ENVIRONMENT		
	Temperature range (operating)	0 - +45 °C
	Temperature range (non operating)	-20 - +70 °C
	Humidity range (operating)	95% at 40 °C
	Humidity range (non operating)	90% at 65 °C
	Altitude range (operating)	>4600 meters
	Altitude range (non operating)	>15000 meters
TELECONTROL & TELEMETRY		
	Remote control	Yes
	Remote Control at clean contacts	Yes
	SNMP option	Under development
REGULATIONS CONFORMITY		
	High frequency radiations from the enclosure	Below limit imposed by technical regulations.
	Functionning type	h24 uninterrupted
	Electromagnetic fields immunity	Higher than specified by laws on electromagnetic fields compatibility
	CE Mark	Conform to 1999/5/CE European Directive
MANUFACTURING DATA		
	Year of the model	2005
	Spares availability guaranteed for	10 years from the date of purchase
PRE- & POST- MAINTENANCE		
	Recurrence	4/8 years
	Blower Replacement recurrence	4 years
	Air blowers quantity and prices	6
	Lithium batteris replacement recurrence	10 years
	Batteries	Yes, only for alarm list storage
	Time to realize the preventive maintenance every 4 years	1 Hour
	Time to realize the preventive maintenance very 8 years	2 Hours
	Level and number of technician for maintenance	1 technician
	Electrical safety	EN60215 (Standard CE)
	Average repair time (change of an RF module or power supply)	1 Hours
SET		
	Power supply cable	Yes
	Installation manual	Yes
	User manual	Yes
	Maintenance manual	Yes
	Tests report	Yes

The equipment provided by Elenos srl covered under warranty of 24 months from the date of purchase of the product; That period is meant to be applied to the original that any subsequent buyers.

MAIN CARACTERISTICS

SPARE PARTS MAINTENACE PREVENTIVE

Power Supply #1 (COD: 2KWPFC-SER)	
Fuse Kit	Fuse Kit E3000
RF Fan (COD: 1VENT026)	
Battery	YES

SPARE PARTS CORRECTIVE MAINTENACE

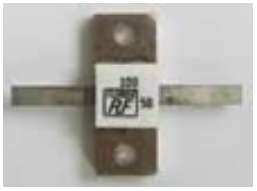
RF Amplifier Module (COD: ERK_20044_0)	
Complete RF Amplifier board with Mosfets #1	E3K 2A044_0
Mosfet #1 (COD: 2QRF0012 (BLF278))	
CPU (COD: E3K 8A044_0)	

Display (COD: 2DYL0001)

Scheda shunt (COD: E3K 4A044_1)

Combiner Type #1 E3K 1A044_0

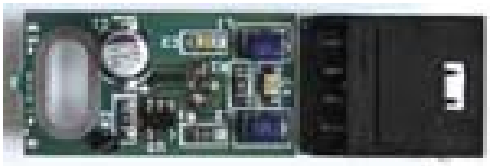
Absorber Resistors #1 (COD: 2RAF1007)



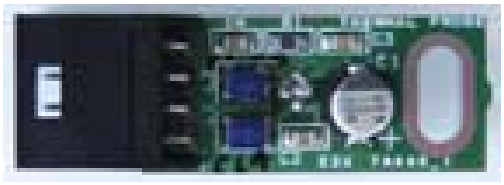
front panel 9MOD2800_0

Output armonic filter L.P. FILTER E3KPZ003

Temperature sensor board #1 (COD: E3K 6A044_0)



Temperature sensor board #2 (COD: E2K 7A000_1)

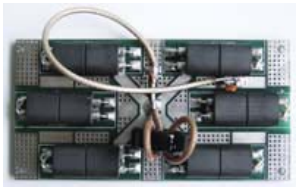


Fan Board (COD: E3K_3A044_0)

Scheda Interconnessioni (COD: E3K_9A044_0)

Scheda Testina di Lettura (COD: E3K_5A044_0)

Scheda Splitter #1 (COD: E3K_0A044_0)



Scheda I/O Digitale (COD: CHG12A753_0)

Scheda Pannello Pulsanti (COD: E3K_7A044_0)

Sezionatore Magnetico Monofase (COD: 1SZ00037)

Sezionatore Magnetico Trifase (COD: 1SZ00036)

Cables RG178 (50 Ohm) #2 CAB0150_0

Cables RG179 (75 Ohm) #2	CAB0149_10

ET3500

ICEFET SOLID STATE FM TRANSMITTERS

Totally STAINLESS STEEL, electronic boards are Protected from Humidity and Inclement of Tropical Weather.

All equipment undergo Rigorous Burn-In Process and quality controls.

Power sections were developed Over-Dimensioned with a conservative approach.

ICEFET Technology keeps temperature extremely low to increase the MTBF.

Fast hardware protections, further to Intelligent Proportional FoldBack of critical parameters like VSWR and temperature.

Ventilation, power supplies, MOSFET and exciter are fully redundant to avoid any “Single Point Failure” .

Our mission is to create the Most Reliable FM Transmitters Of The World

artbroadcast@elenos.com
Via G. Amendola 9- 44028 Poggio Renatico - Ferrara - Italy - Ph: +39 0532 829965 - www.elenos.com

MAIN CARACTERISTICS

OPERATING AT REDUCED POWER WITH ONE OR MORE BROKEN RF MODULES
OPERATING AT REDUCED POWER WITH ONE OR MORE BROKEN POWER SUPPLIES

ICE-FET:
Means Mosfet and heat sink maximum efficiency to reduce temperature, in order to obtain a higher MTBF. The result is unmatched in size and weight by any other producer

ALWAYS ON AIR: (FULLY REDUNDANT):
ALWAYS ON AIR: (FULLY REDUNDANT): The redundancy of this equipment prevents SINGLE-POINT-FAILURES thanks to a SOFT FAILURE DESIGN and a protection system which keeps it « ON AIR» even in the most extreme working conditions.

IPC (Intelligent Power Control):
The IPC maintains constant the Output Power within 2% of the setting value, regardless of fluctuations in incoming AC line voltage, RF drive or load conditions.

IPF
The IPF allows the transmitter to stay on air into loads as poor as 3 to 1

BROAD BAND:
The transmitter keeps optimum performances of power and efficiency over the all Broad Band operation without needing of tuning what make it ideal for n+1 application

CONSTANT EFICIENCY:
The VPA and the Bias are both controlled to obtain maximum efficiency at any frequency and output power level. Keep the efficiency high means low heat, low operative cost, higher MTBF.

NO IPA:
In ELENOS transmitters, the IPA is always avoided. This choice eliminate one of the bottleneck in Redundancy frequently present on transmitters of this category.

EASY MAINTENACE:
all parts are easily accessible via the front panel(RF modules, electronic control boards) or via the rear panel (fans, combiners)

BIG COLOUR TOUCH SCREEN GRAPHIC DISPLAY:
User friendly graphic interface allow access to control and diagnosis parameters

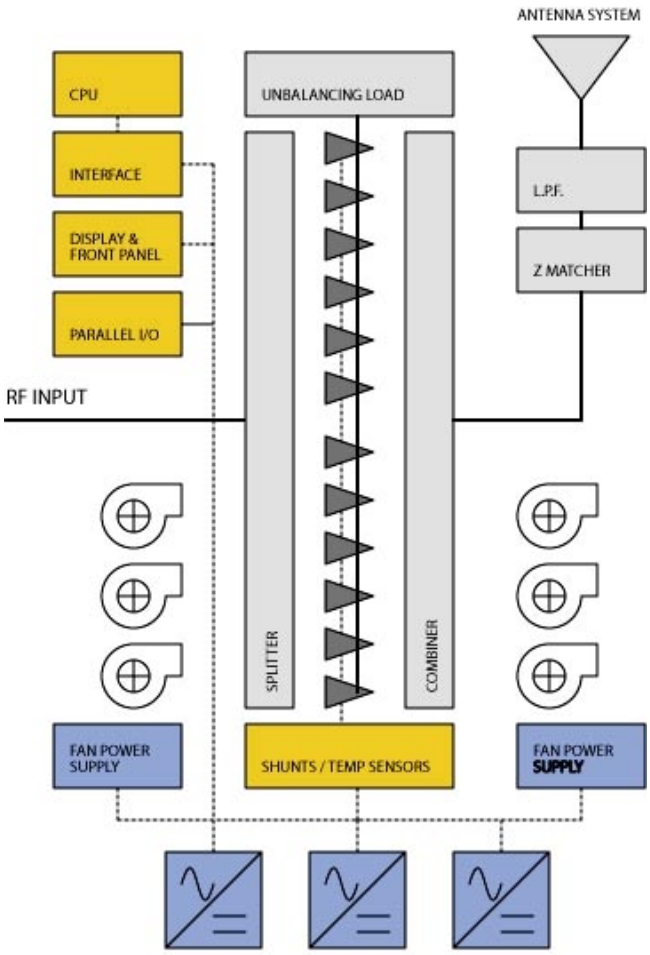
SMS ALARMS:
All alarms and event can be send by SMS

REDUCED SIZE AND WEIGHT:
Greatly reduced size and weight: the whole transmitter is contained in a 20-unit rack with a floor plan as less as 0,31 square meter!!! (50cm width x 86cm dept)

REMOTE DEEP DIAGNOSTIC CAPABILITY:
The industrial standard Hostlink Protocol allow to safety handle huge quantity of information to perform remote deep diagnosis.

WORLS WIDE SALES & SERVICE SUPPORT:
ELENOS is the FM manufacturer with one of the biggest distribution channel of the world. Each distributor is chose mainly by the technical support customer capability.

COMPOSITION & REDUNDANCY



12 MOSFET Philips BLF278
3 Current Share combined 2.5KW
PFC switching Power Supply
6 Microprocessor Speed Controlled Blowers
Microprocessor controlled
1 Output Harmonic Low Pass Filter
aaaa

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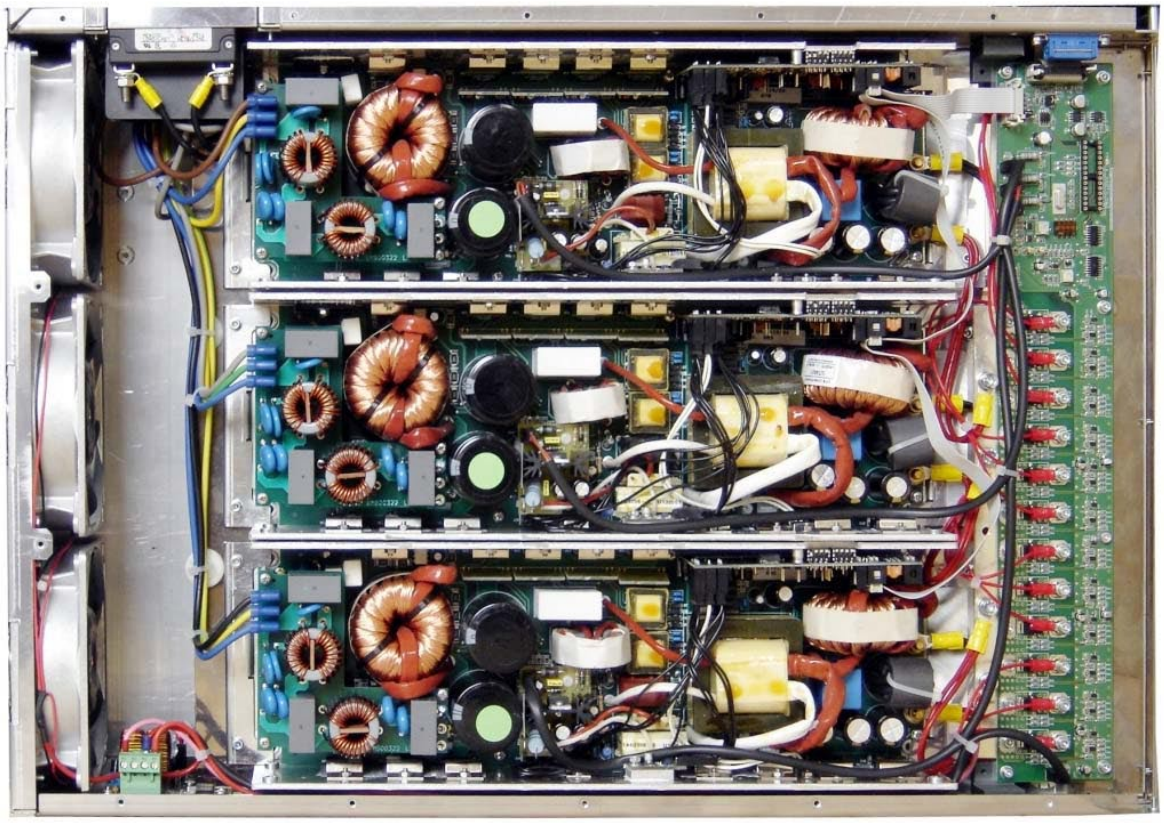
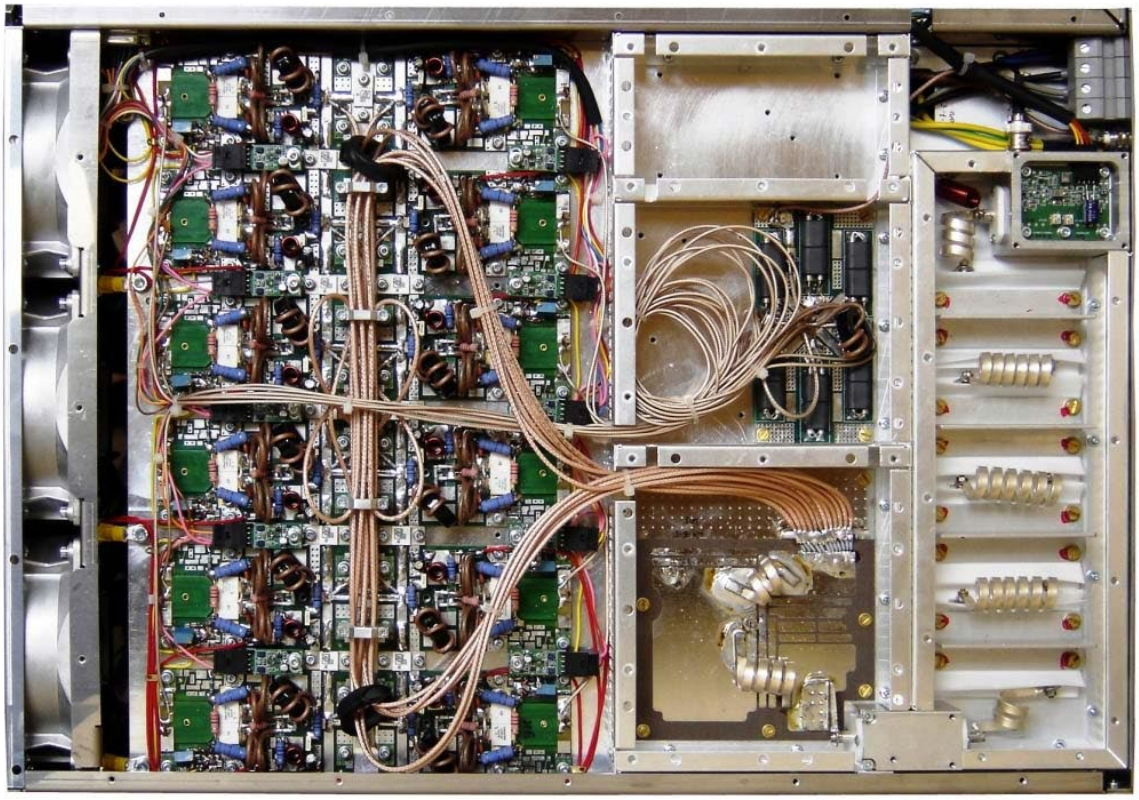
BACK VIEW

XX

TOP VIEW



BOTTOM VIEW



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MAIN CARACTERISTICS

COMPOSED		
	Exciter	ETG101
	Amplifiers	E3000
	Number of E3000 Amplifiers	1
	Mounted in 19" standard rack	No
	Number of racks	Optional
GENERAL DATA		
	Output Nominal Power	3000 W adjustable
	Operating band	87.5 - 108 MHz
	Output Low-pass Filter	W.B. 87.5 MHz - 108 MHz
	Corrosion	All mechanical parts are stainless steel
	Internal bus RS232/RS485	Yes
	Points of measure	RF Sample-MPX Monitor
	Displayed Parameters	More than 50 parameters displayed on a LCD
	Adjustments	From the frontal panel trough LCD /from PC
	Microprocessor controlled	Yes
	Power supply redundancy	Yes
	Blower redundancy	Yes
	Number of MOSFETs	12
	Final stage technology	ICEFET
	Transistor type	BLF278 Philips
	Number of power supplies	3
	Dimensions: Rack units	4+3 U
	Dimensions: Width	48,5 cm
	Dimensions: Height	(17,6+13,5cm.) Tot. 31,1 cm
	Dimensions: Depth	70 cm
	Weight	(43+22Kg.) Tot.75 Kg
	RF Modules maximum weight	35 Kg
	Power supply units maximum weight	6 Kg
CONNETTORS		
	RF Output connector	7/8"
	RF Input connector	N
	Input connectors LEFT & RIGHT	XLR female
	MPX Input connector	BNC female
	SCA Connector	BNC female
	Remote control connector	DB25
	RS485/232 Connector	DB9
RF		
	Overall output power stability	+/-0,1 dB
	Output impedance	50 Ω
	Harmonic suppression	> 70 dB
	Spurious signal suppression	> 80 dB
	Driving power final stage	80 W
	Input impedance final stage	50 Ω

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	Gain final stage	16 dB
	Software V.S.W.R. intervention threshold	300 W
	Fast V.S.W.R. intervention threshold	330 W
	Asynchronous residual AM (typical values)	0,1 %
	Synchronous residual AM (typical values)	0,2 %
	RF Efficiency	65% typ.
	Output nominal power	3500 W Adjustable with continuity
	Maximum peak power	3700 W
AUDIO		
	L/R Audio input level	+12/-12 dBm to produce 75KHz standard deviation
	L/R level adjustment	Soft adjust 0,1dBm steps from front panel
	L/R Connector type	Balanced XLR
	L/R Input Impedance	Selectable 10K- 600Ω
	MPX audio input level	+12/-12 dBm to produce 75KHz standard deviation
	MPX level adjustment	Soft adjust 0,1dBm steps from front panel
	MPX Connetor type	Unbalanced BNC
	MPX Input impedance	5KΩ selectable
	PILOT level adjustment	Adjustable Trimmer
	SCA/RDS Connector type	Unbalanced BNC
	SCA/RDS Input Impedance	10KΩ
	19KHz Output	Yes
	STEREO/MPX easy changeover	Yes
	AES/EBU Input option	Optional (External adapter)
PERFORMANCE EXCITER		
	Time of adjustment - frequency	< 1 minute
	Time of adjustment - power	< 1 minute
	MTBF	10 Years
	Programmed Maintenance	5 Years
	Intermodulation distortion	<0.05% Measured with two of tones 1KHz & 1.3KHz, ratio 1:1 at 100% modulation
	Frequency deviaton	+/- 75 KHz 0.1dB steps adjustable
	Frequency steps	10 KHz
	THD+N	<0.03% @ 1KHz
	Pre-emphasis	50/75 microseconds +/-0,1dB
	FM S/N MPX FCC	82 dB 20Hz - 23KHz - 50uS - ref @ 53KHz - RMS
	FM S/N STEREO CCIR Weight	72 dB Weight-ref@53KHz-Qpk
	FM S/N STEREO CCIR Unweight	72 dB Unweight-ref@53KHz-QPk
	Mono frequency response	+/-0.15 dB 30Hz - 15KHz

	MPX frequency response	+/-0.1 dB 30Hz - 100KHz, -45dB at 19 KHz
	Stereo frequency response	+/-0.15 dB 30Hz - 15KHz
	SCA1,2,3 frequency response	+/-1 dB 20KHz - 100KHz, -45dB at 19KHz
	Type of modulation	F3 Direct FM modulation of the RF oscillator in fundamental frequency
	Stereo separation	> 60 dB @ 1KHz
	Pilot tone frequency	19 KHz
	Pilot tone deviation	7,5 KHz Adjustable
	Pilot tone frequency stability	+/-1 Hz
	Attenuation at 19KHz	> 45 dB
	Phase Response	0.1 degreeFrom linear phase; 53kHz to 100kHz
	Frequency stability	1 ppm from 0 to +40°C
	Time for starting up	30 sec. from OFF/ON
	Time for starting up	1 sec. from interlock close
	Modulation Capabilities	+/-250 KHz
POWER SUPPLY		
	Power supply	110,220, 380 Threephase-singlephase 50-60Hz VAC
	Power consumption	5 KVA
	Magneto-thermic curve	D
	Current Consumption @220VAC/single phase	23 Amp.
	Magneto-thermic capacity @220VAC/single phase	32 Amp.
	Conductor Size @220VAC/single phase	10 sqrt.mm
	Conductor Size @220VAC/single phase	7 AWG
	Current Consumption @220VAC/three phase	13 Amp.
	Magneto-thermic capacity @220VAC/three phase	20 Amp.
	Conductor Size @220VAC/three phase	6 sqrt.mm
	Conductor Size @220VAC/three phase	9 AWG
	Current Consumption @380VAC/three phase	8 Amp.
	Magneto-thermic capacity @380VAC/three phase	13 Amp.
	Conductor Size @380VAC/three phase	4 sqrt.mm
	Conductor Size @380VAC/three phase	11 AWG
COOLING SYSTEM		

	Cooling flow (m3/h)	Variable from 400 to 800 m3/h
	Air temperature increase between output /input	17 °C
	Cooling system	Forced air-cooling through 6 axial fans
ENVIRONMENT		
	Temperature range (operating)	0 - +45 °C
	Temperature range (non operating)	-20 - +70 °C
	Humidity range (operating)	95% at 40 °C
	Humidity range (non operating)	90% at 65 °C
	Altitude range (operating)	>4600 meters
	Altitude range (non operating)	>15000 meters
TELECONTROL & TELEMETRY		
	Remote control	Yes
	Remote Control at clean contacts	Yes
	SNMP option	Under development
REGULATIONS CONFORMITY		
	High frequency radiations from the enclosure	Below limit imposed by technical regulations.
	Functionning type	h24 uninterrupted
	Electromagnetic fields immunity	Higher than specified by laws on electromagnetic fields compatibility
	CE Mark	Conform to 1999/5/CE European Directive
MANUFACTURING DATA		
	Year of the model	2005
	Spares availability guaranteed for	10 years from the date of purchase
PRE- & POST- MAINTENANCE		
	Recurrence	4/8 years
	Blower Replacement recurrence	4 years
	Air blowers quantity and prices	6
	Lithium batteris replacement recurrence	10 years
	Batteries	Yes, only for alarm list storage
	Time to realize the preventive maintenance every 4 years	1 Hour
	Time to realize the preventive maintenance very 8 years	2 Hours
	Level and number of technician for maintenance	1 technician
	Electrical safety	EN60215 (Standard CE)
	Average repair time (change of an RF module or power supply)	1 Hours
SET		
	Power supply cable	Yes
	Installation manual	Yes
	User manual	Yes
	Maintenance manual	Yes

Tests report	Yes
Troubleshooting manual	Yes

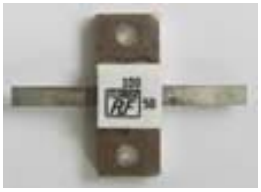
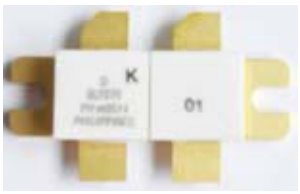
The equipment provided by Elenos srl covered under warranty of 24 months from the date of purchase of the product; That period is meant to be applied to the original that any subsequent buyers.

MAIN CARACTERISTICS

SPARE PARTS MAINTENACE PREVENTIVE

Power Supply #1 (COD: 2KWPFC-SER)	
Fuse Kit	Fuse Kit E3000
RF Fan (COD: 1VENT026)	
Battery	YES

SPARE PARTS CORRECTIVE MAINTENACE

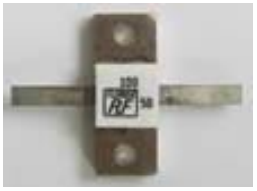
RF Amplifier Module (COD: ERK_20044_0)	
Complete RF Amplifier board with Mosfets #1 (COD: E3K 2A044_0)	
Mosfet #1 (COD: 2QRF0012 (BLF278))	
CPU (COD: E3K 8A044_0)	

Display (COD: 2DYL0001)

Scheda shunt (COD: E3K 4A044_1)

Combiner Type #1 E3K 1A044_0

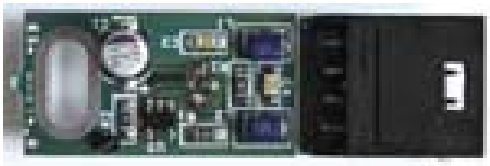
Absorber Resistors #1 (COD: 2RAF1007)



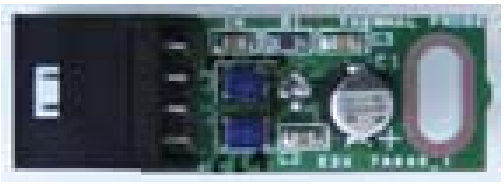
front panel 9MOD2800_0

Output armonic filter L.P. FILTER E3KPZ003

Temperature sensor board #1 (COD: E3K 6A044_0)

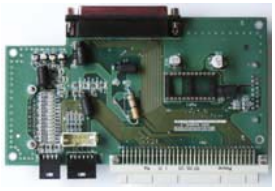


Temperature sensor board #2 (COD: E2K 7A000_1)



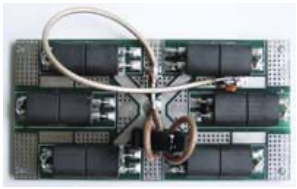
Fan Board (COD: E3K_3A044_0)

Scheda Interconnessioni (COD: E3K_9A044_0)



Scheda Testina di Lettura (COD: E3K_5A044_0)

Scheda Splitter #1 (COD: E3K_0A044_0)



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Scheda Pannello Pulsanti (COD: E3K_7A044_0)

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Cables RG179 (75 Ohm) #2	CAB0149_10

ET7000-3

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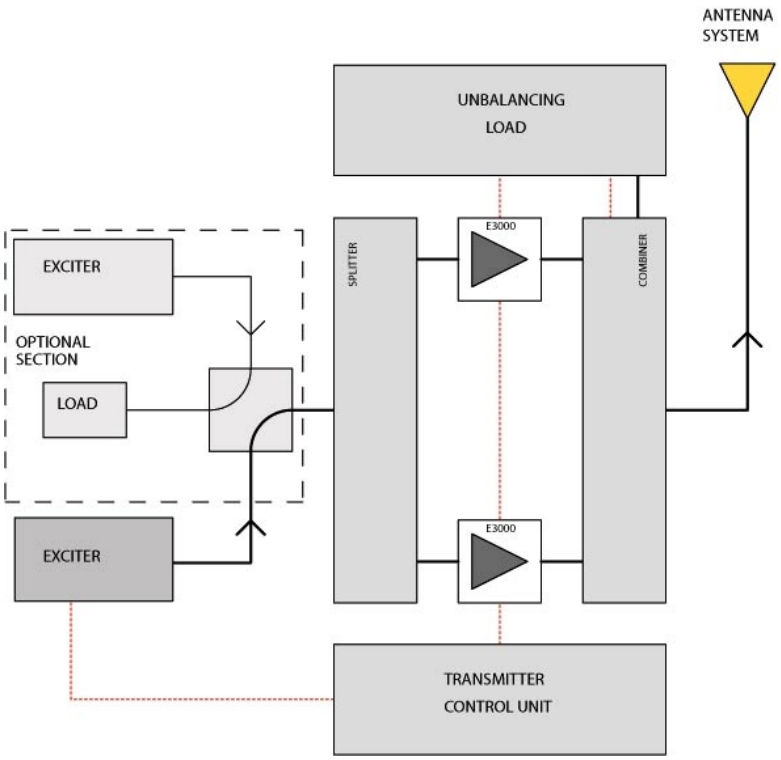

24 MOSFET Philips BLF278
6 Current Share combined 2.5KW PFC switching Power Supply
12 Microprocessor Speed Controlled Blowers
Microprocessor controlled
2 Output Harmonic Low Pass Filters
2 Exciters (in the DUAL DRIVE model)
2 x E3500 amplifiers
1 x 2 ways combiner 3600W input-7000W output
1 x Unbalanced load 2 x 3600W inputs able to handle the maximun unbalance power without derating of the output power.
1 x TCU-Transmitter Control Unit with LCD displau and redundant power supply.

CONFIGURATION

AAAA

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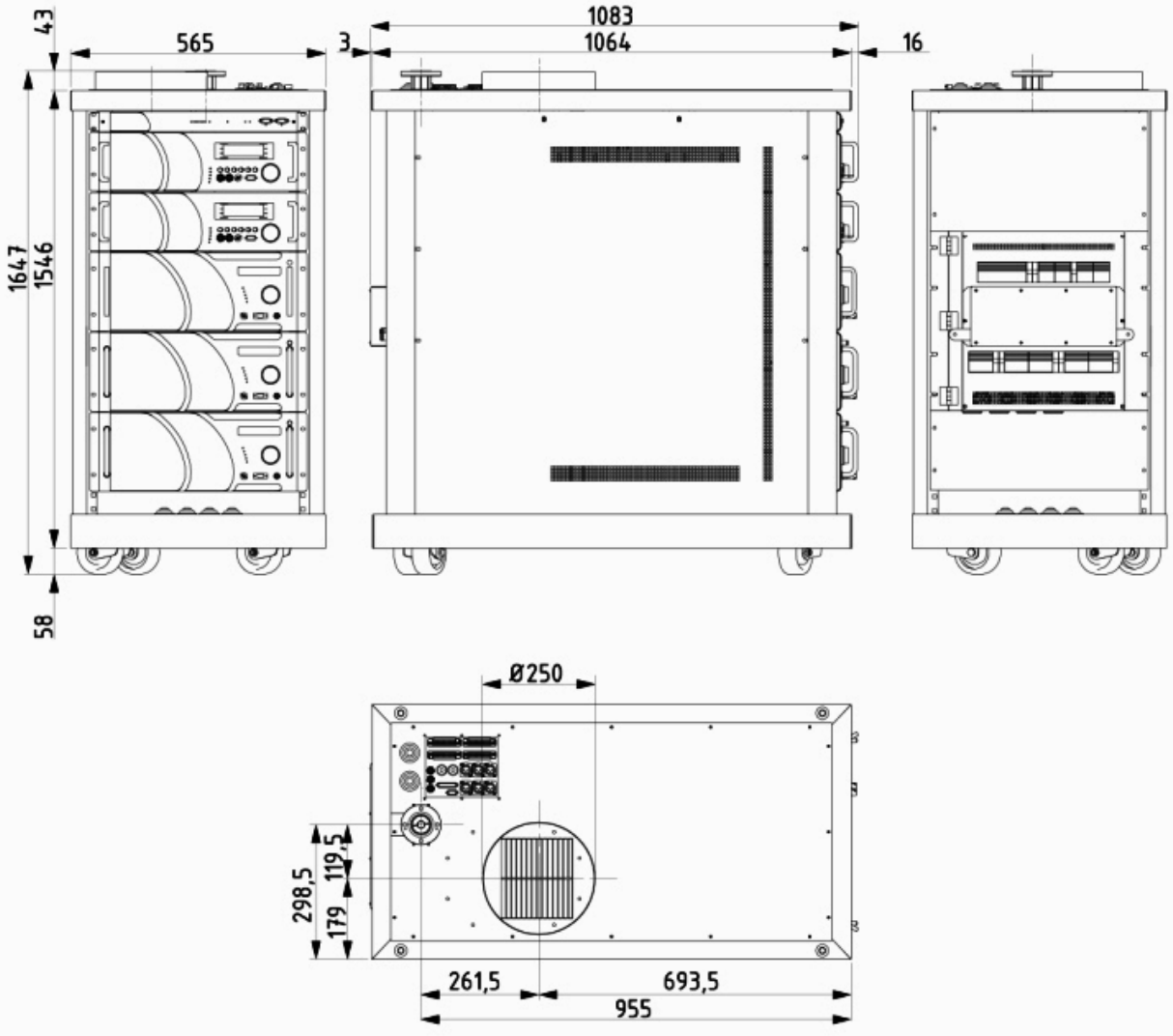
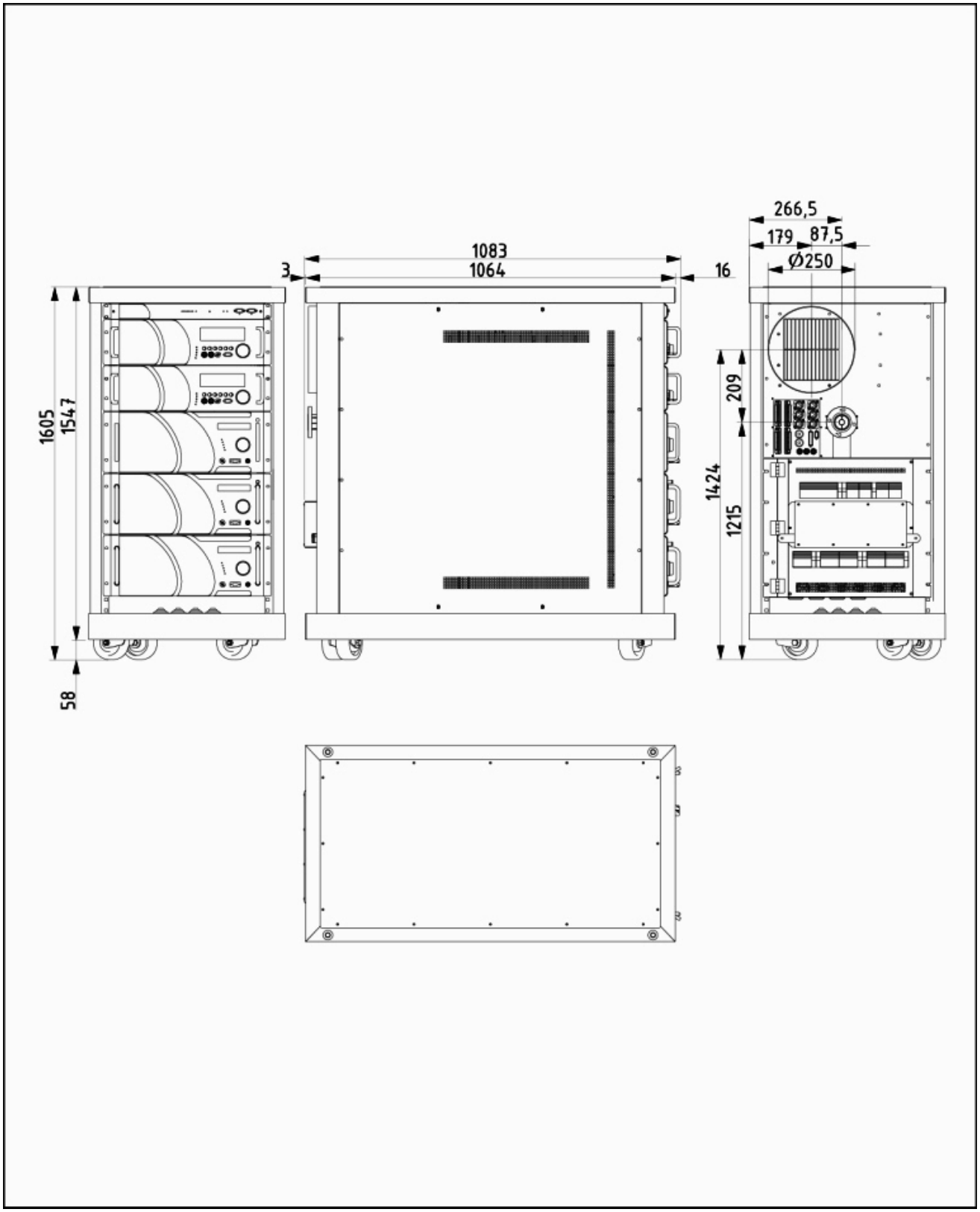
20U RACK, EXAUST AIR AND CONNECTORS ON THE TOP



AAAA

EXAUST AIR AND CONNECTORS ON THE BACK



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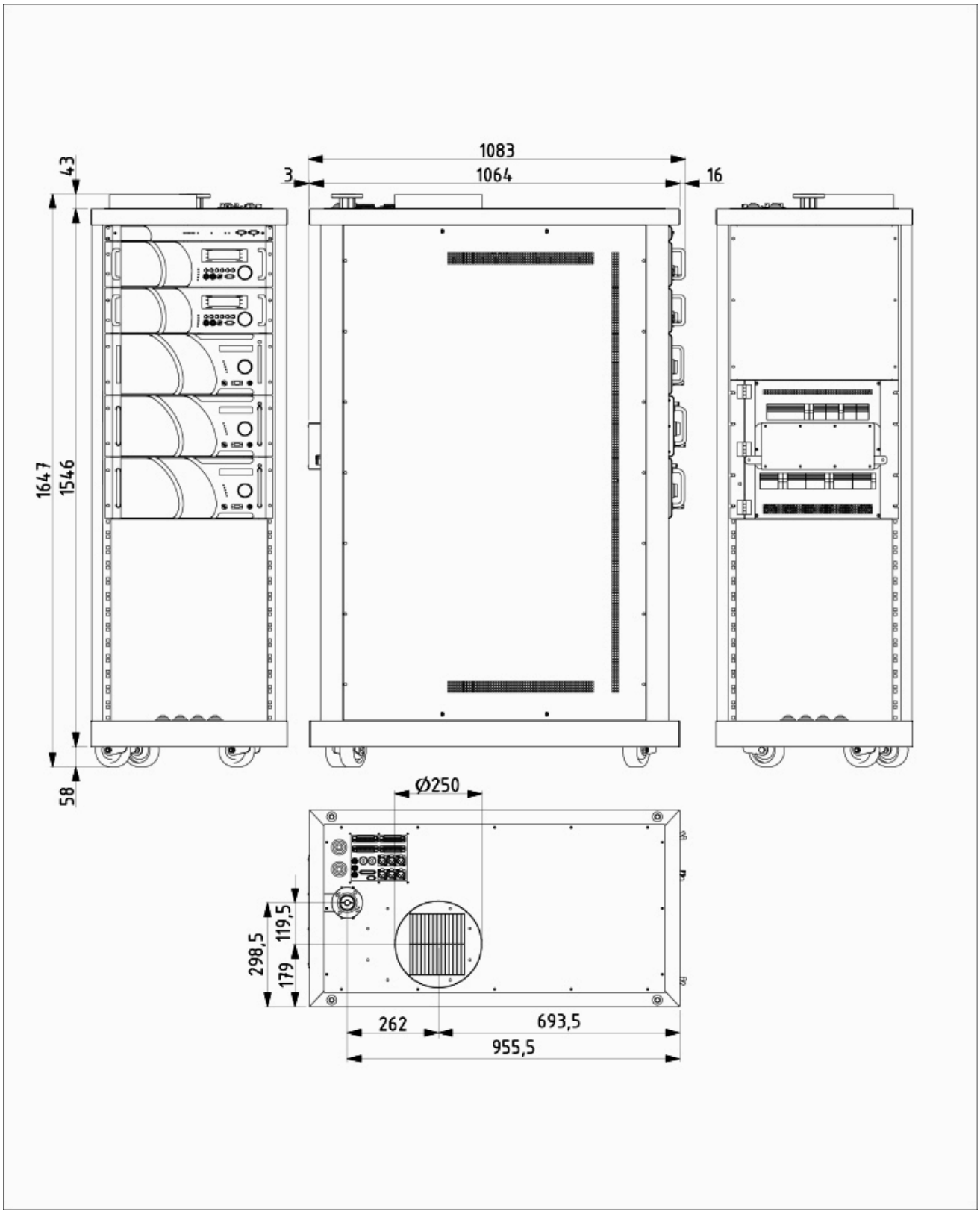
32U RACK, EXAUST AIR AND CONNECTORS ON THE TOP



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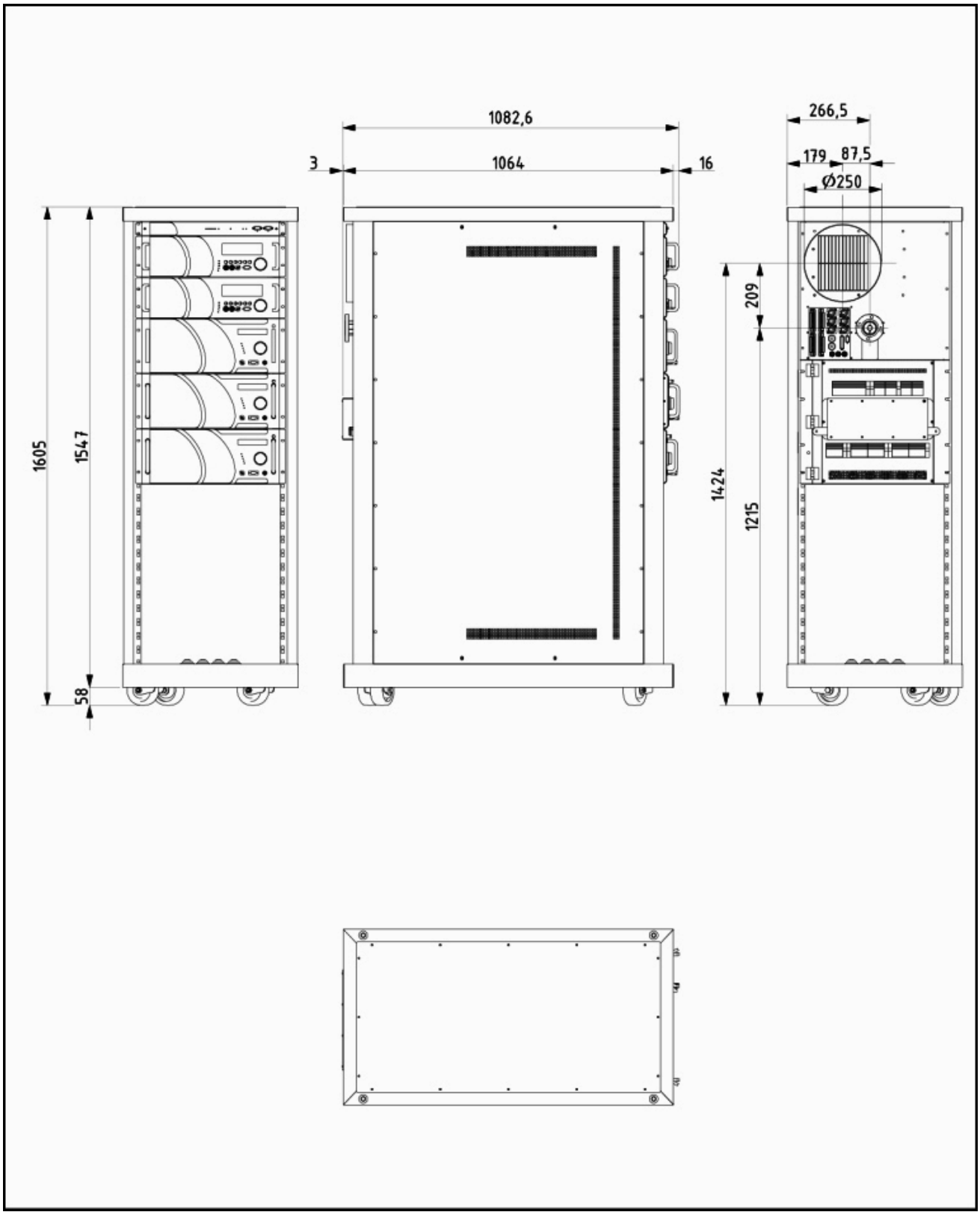
32U RACK, EXAUST AIR AND CONNECTORS ON THE BACK



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MAIN CARACTERISTICS

COMPOSED		
	Transmitter Control Unit	Integrated inside the Combiner
	Exciter	ETG300
	Dual Exciter	Yes
	Amplifiers	E3000
	Number of E3000 Amplifiers	2
	Combiner	COMB6/2: 2 ways 6KW combiner
	Dummy load	Integrated inside the Combiner
	Mounted in 19" standard rack	Yes
	Number of racks	1
	Equipped with rack: Units	20 U
	Equipped with rack: Width	55,8 cm
	Equipped with rack: Height	105,8 cm
	Equipped with rack: Depth	93,8 cm
GENERAL DATA		
	Output Nominal Power	6000 W adjustable
	Operating band	87.5 - 108 MHz
	Output Low-pass Filter	W.B. 87.5 MHz - 108 MHz
	Corrosion	All mechanical parts are stainless steel
	Internal bus RS232/RS485	Yes
	Points of measure	RF Sample-MPX Monitor
	Displayed Parameters	More than 100 parameters displayed on a LCD
	Adjustments	From the frontal panel trough LCD /from PC
	Microprocessor controlled	Yes
	Power supply redundancy	Yes
	Blower redundancy	Yes
	Number of MOSFETs	24
	Final stage technology	ICEFET
	Transistor type	BLF278 Philips
	Number of power supplies	6
	Weight	120 Kg
	RF Modules maximum weight	35 Kg
	Power supply units maximum weight	6 Kg
CONNETTORS		
	RF Output connector	1 5/8
	RF Input connector	N
	Input connectors LEFT & RIGHT	XLR female
	MPX Input connector	BNC female
	SCA Connector	BNC female
	Remote control connector	DB25
	RS485/232 Connector	DB9
RF		
	Overall output power stability	+/-0,1 dB
	Output impedance	50 Ω

	Harmonic suppression	> 70 dB
	Spurious signal suppression	> 80 dB
	Driving power final stage	80 W
	Input impedance final stage	50 Ω
	Gain final stage	16 dB
	Software V.S.W.R. intervention threshold	600 W
	Fast V.S.W.R. intervention threshold	660 W
	Asynchronous residual AM (typical values)	0,1 %
	Synchronous residual AM (typical values)	0,2 %
	RF Efficiency	65% typ.
	Output nominal power	7000 W Adjustable with continuity
	Maximum peak power	7500 W
AUDIO		
	L/R Audio input level	+12/-12 dBm to produce 75KHz standard deviation
	L/R level adjustment	Soft adjust 0,1dBm steps from front panel
	L/R Connector type	Balanced XLR
	L/R Input Impedance	Selectable 10K- 600Ω
	MPX audio input level	+12/-12 dBm to produce 75KHz standard deviation
	MPX level adjustment	Soft adjust 0,1dBm steps from front panel
	MPX Connetor type	Unbalanced BNC
	MPX Input impedance	5KΩ selectable
	PILOT level adjustment	Adjustable Trimmer
	SCA/RDS Connector type	Unbalanced BNC
	SCA/RDS Input Impedance	10KΩ
	19KHz Output	Yes
	STEREO/MPX easy changeover	Yes
	AES/EBU Input option	Optional (External adapter)
PERFORMANCE EXCITER		
	Time of adjustment - frequency	< 1 minute
	Time of adjustment - power	< 1 minute
	MTBF	10 Years
	Programmed Maintenance	5 Years
	Intermodulation distortion	<0.05% Measured with two of tones 1KHz & 1.3KHz, ratio 1:1 at 100% modulation
	Frequency deviaton	+/- 75 KHz 0.1dB steps adjustable
	Frequency steps	10 KHz
	THD+N	<0.03% @ 1KHz
	Pre-emphasis	50/75 microseconds +/-0,1dB
	FM S/N MPX FCC	82 dB 20Hz - 23KHz - 50uS - ref @ 53KHz - RMS

	FM S/N STEREO CCIR Weight	72 dB Weight-ref@53KHz-Qpk
	FM S/N STEREO CCIR Unweight	72 dB Unweight-ref@53KHz-QPk
	Mono frequency response	+/-0.15 dB 30Hz - 15KHz
	MPX frequency response	+/-0.1 dB 30Hz - 100KHz, -45dB at 19 KHz
	Stereo frequency response	+/-0.15 dB 30Hz - 15KHz
	SCA1,2,3 frequency response	+/-1 dB 20KHz - 100KHz, -45dB at 19KHz
	Type of modulation	F3 Direct FM modulation of the RF oscillator in fundamental frequency
	Stereo separation	> 60 dB @ 1KHz
	Pilot tone frequency	19 KHz
	Pilot tone deviation	7,5 KHz Adjustable
	Pilot tone frequency stability	+/-1 Hz
	Attenuation at 19KHz	> 45 dB
	Phase Response	0.1 degreeFrom linear phase; 53kHz to 100kHz
	Frequency stability	1 ppm from 0 to +40°C
	Time for starting up	30 sec. from OFF/ON
	Time for starting up	1 sec. from interlock close
	Modulation Capabilities	+/-250 KHz
POWER SUPPLY		
	Power supply	110,220, 380 trifase-monofase 50-60Hz VAC
	Power consumption	10 KVA
	Magneto-thermic curve	D
	Current Consumption @220VAC/single phase	46 Amp.
	Magneto-thermic capacity @220VAC/single phase	63 Amp.
	Conductor Size @220VAC/single phase	16 sqrt.mm
	Conductor Size @220VAC/single phase	5 AWG
	Current Consumption @220VAC/three phase	27 Amp.
	Magneto-thermic capacity @220VAC/three phase	40 Amp.
	Conductor Size @220VAC/three phase	10 sqrt.mm
	Conductor Size @220VAC/three phase	7 AWG
	Current Consumption @380VAC/three phase	16 Amp.
	Magneto-thermic capacity @380VAC/three phase	25 Amp.
	Conductor Size @380VAC/three phase	6 sqrt.mm

	Conductor Size @380VAC/three phase	9 AWG
COOLING SYSTEM		
	Cooling flow (m3/h)	Variable from 800 to 1600 m3/h
	Air temperature increase between output /input	20 °C
	Cooling system	Forced air-cooling
ENVIRONMENT		
	Temperature range (operating)	0 - +45 °C
	Temperature range (non operating)	-20 - +70 °C
	Humidity range (operating)	95% at 40 °C
	Humidity range (non operating)	90% at 65 °C
	Altitude range (operating)	>4600 meters
	Altitude range (non operating)	>15000 meters
TELECONTROL & TELEMETRY		
	Remote control	Yes
	Remote Control at clean contacts	Yes
	SNMP option	Under development
REGULATIONS CONFORMITY		
	High frequency radiations from the enclosure	Below limit imposed by technical regulations.
	Functionning type	h24 uninterrupted
	Electromagnetic fields immunity	Higher than specified by laws on electromagnetic fields compatibility
	CE Mark	Conform to 1999/5/CE European Directive
MANUFACTURING DATA		
	Year of the model	2006
	Spares availability guaranteed for	10 years from the date of purchase
PRE- & POST- MAINTENANCE		
	Recurrence	4/8 years
	Blower Replacement recurrence	4 years
	Air blowers quantity and prices	6
	Lithium batteris replacement recurrence	10 years
	Batteries	Yes, only for alarm list storage
	Time to realize the preventive maintenance every 4 years	1 Hour
	Time to realize the preventive maintenance very 8 years	2 Hours
	Level and number of technician for maintenance	1 technician
	Electrical safety	EN60215 (Standard CE)
	Average repair time (change of an RF module or power supply)	1 Hours
SET		
	Power supply cable	Yes
	Installation manual	Yes

User manual	Yes
Maintenance manual	Yes
Tests report	Yes

The equipment provided by Elenos srl covered under warranty of 24 months from the date of purchase of the product; That period is meant to be applied to the original that any subsequent buyers.

MAIN CARACTERISTICS

SPARE PARTS MAINTENACE PREVENTIVE

SPARE PARTS CORRECTIVE MAINTENACE	
0	

ET10000-3

ICEFET SOLID STATE FM TRANSMITTERS

Totally STAINLESS STEEL, electronic boards are Protected from Humidity and Inclement of Tropical Weather.

All equipment undergo Rigorous Burn-In Process and quality controls.

Power sections were developed Over-Dimensioned with a conservative approach.

ICEFET Technology keeps temperature extremely low to increase the MTBF.

Fast hardware protections, further to Intelligent Proportional FoldBack of critical parameters like VSWR and temperature.

Ventilation, power supplies, MOSFET and exciter are fully redundant to avoid any “Single Point Failure” .

Our mission is to create the Most Reliable FM Transmitters Of The World

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MAIN CARACTERISTICS

OPERATING AT REDUCED POWER WITH ONE OR MORE BROKEN RF MODULES
OPERATING AT REDUCED POWER WITH ONE OR MORE BROKEN POWER SUPPLIES

ICE-FET:
Means Mosfet and heat sink maximum efficiency to reduce temperature, in order to obtain a higher MTBF. The result is unmatched in size and weight by any other producer

ALWAYS ON AIR: (FULLY REDUNDANT):
ALWAYS ON AIR: (FULLY REDUNDANT): The redundancy of this equipment prevents SINGLE-POINT-FAILURES thanks to a SOFT FAILURE DESIGN and a protection system which keeps it « ON AIR» even in the most extreme working conditions.

IPC (Intelligent Power Control):
The IPC maintains constant the Output Power within 2% of the setting value, regardless of fluctuations in incoming AC line voltage, RF drive or load conditions.

IPF
The IPF allows the transmitter to stay on air into loads as poor as 3 to 1

BROAD BAND:
The transmitter keeps optimum performances of power and efficiency over the all Broad Band operation without needing of tuning what make it ideal for n+1 application

CONSTANT EFICIENCY:
The VPA and the Bias are both controlled to obtain maximum efficiency at any frequency and output power level. Keep the efficiency high means low heat, low operative cost, higher MTBF.

NO IPA:
In ELENOS transmitters, the IPA is always avoided. This choice eliminate one of the bottleneck in Redundancy frequently present on transmitters of this category.

EASY MAINTENACE:
all parts are easily accessible via the front panel(RF modules, electronic control boards) or via the rear panel (fans, combiners)

BIG COLOUR TOUCH SCREEN GRAPHIC DISPLAY:
User friendly graphic interface allow access to control and diagnosis parameters

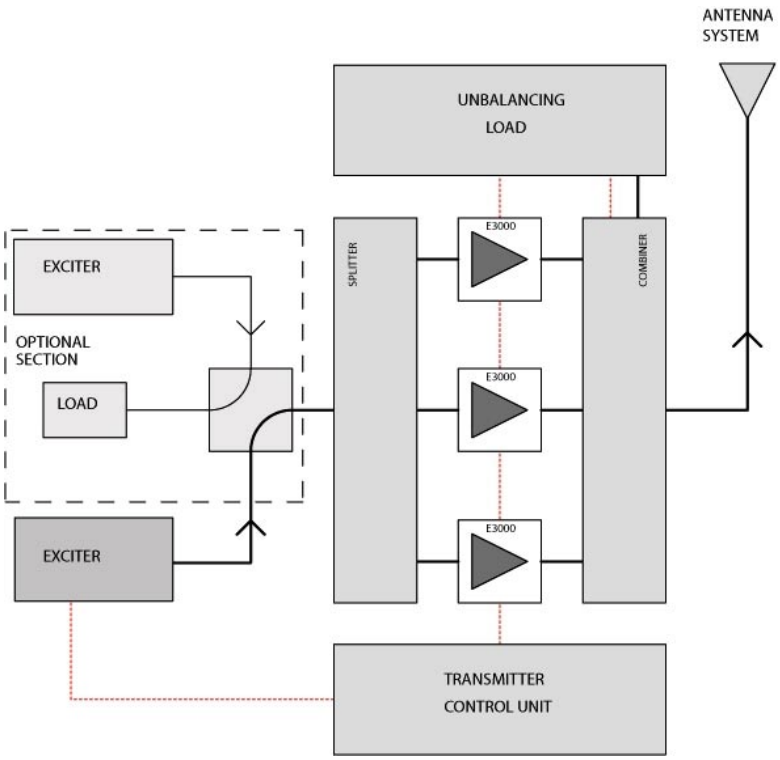
SMS ALARMS:
All alarms and event can be send by SMS

REDUCED SIZE AND WEIGHT:
Greatly reduced size and weight: the whole transmitter is contained in a 20-unit rack with a floor plan as less as 0,31 square meter!!! (50cm width x 86cm dept)

REMOTE DEEP DIAGNOSTIC CAPABILITY:
The industrial standard Hostlink Protocol allow to safety handle huge quantity of information to perform remote deep diagnosis.

WORLS WIDE SALES & SERVICE SUPPORT:
ELENOS is the FM manufacturer with one of the biggest distribution channel of the world. Each distributor is chose mainly by the technical support customer capability.

COMPOSITION & REDUNDANCY



36 MOSFET Philips BLF278
9 Current Share combined 2.5KW PFC switching Power Supply
18 Microprocessor Speed Controlled Blowers
Microprocessor controlled
3 Output Harmonic Low Pass Filters
2 Exciters (in the DUAL DRIVE model)
3 x E3500 amplifiers
1 x 3 wa36 MOSFET Philips BLF278
9 Current Share combined 2.5KW PFC switching Power Supply
18 Microprocessor Speed Controlled Blowers
Microprocessor controlled
3 Output Harmonic Low Pass Filters
2 Exciters (in the DUAL DRIVE model)
3 x E3500 amplifiers
1 x 3 ways combiner 3600W input-10000W output
1 x Unbalanced load 3 x 3600W inputs able to handle the maximun unbalance power without derating of

CONFIGURATION

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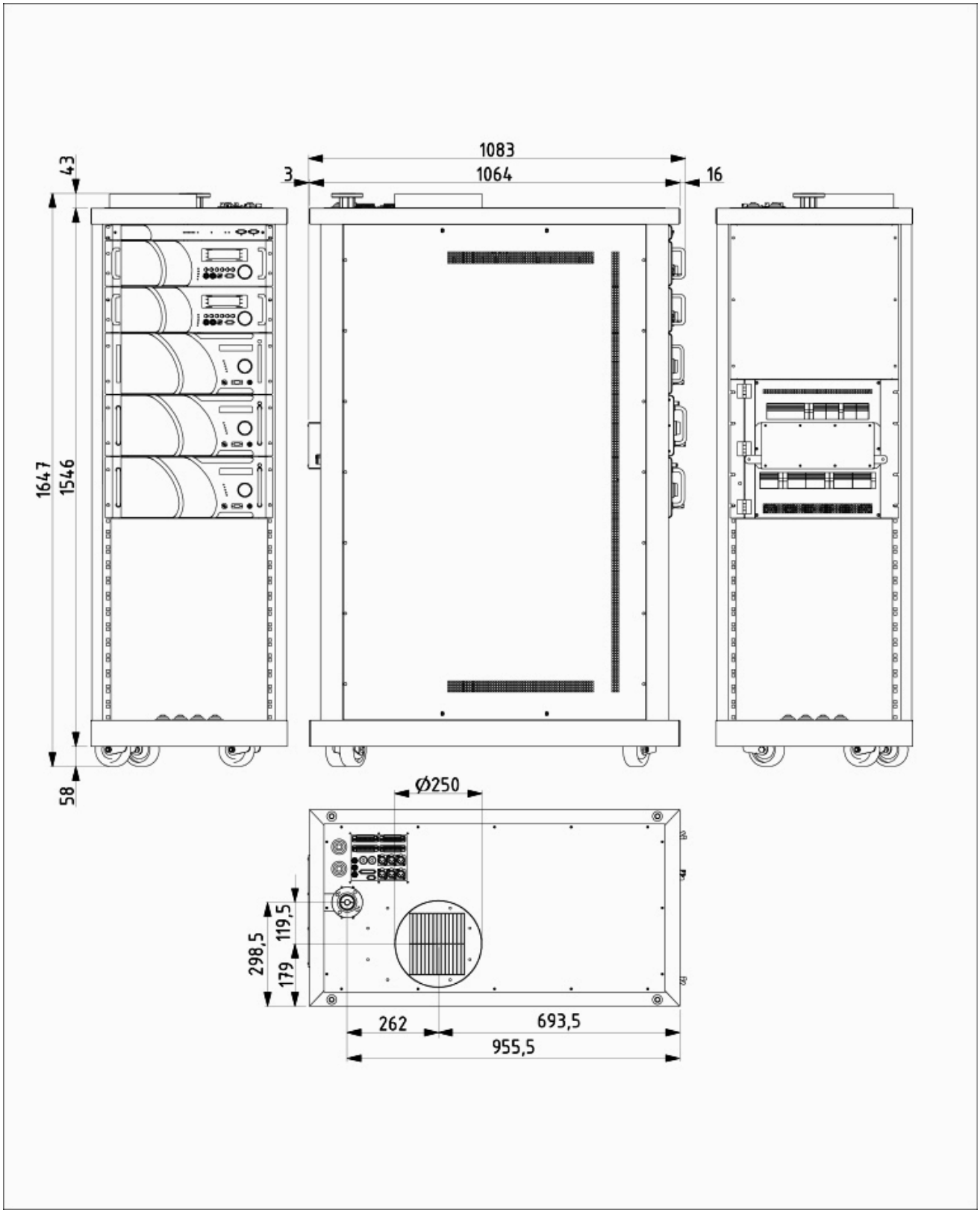
32U RACK, EXAUST AIR AND CONNECTORS ON THE TOP



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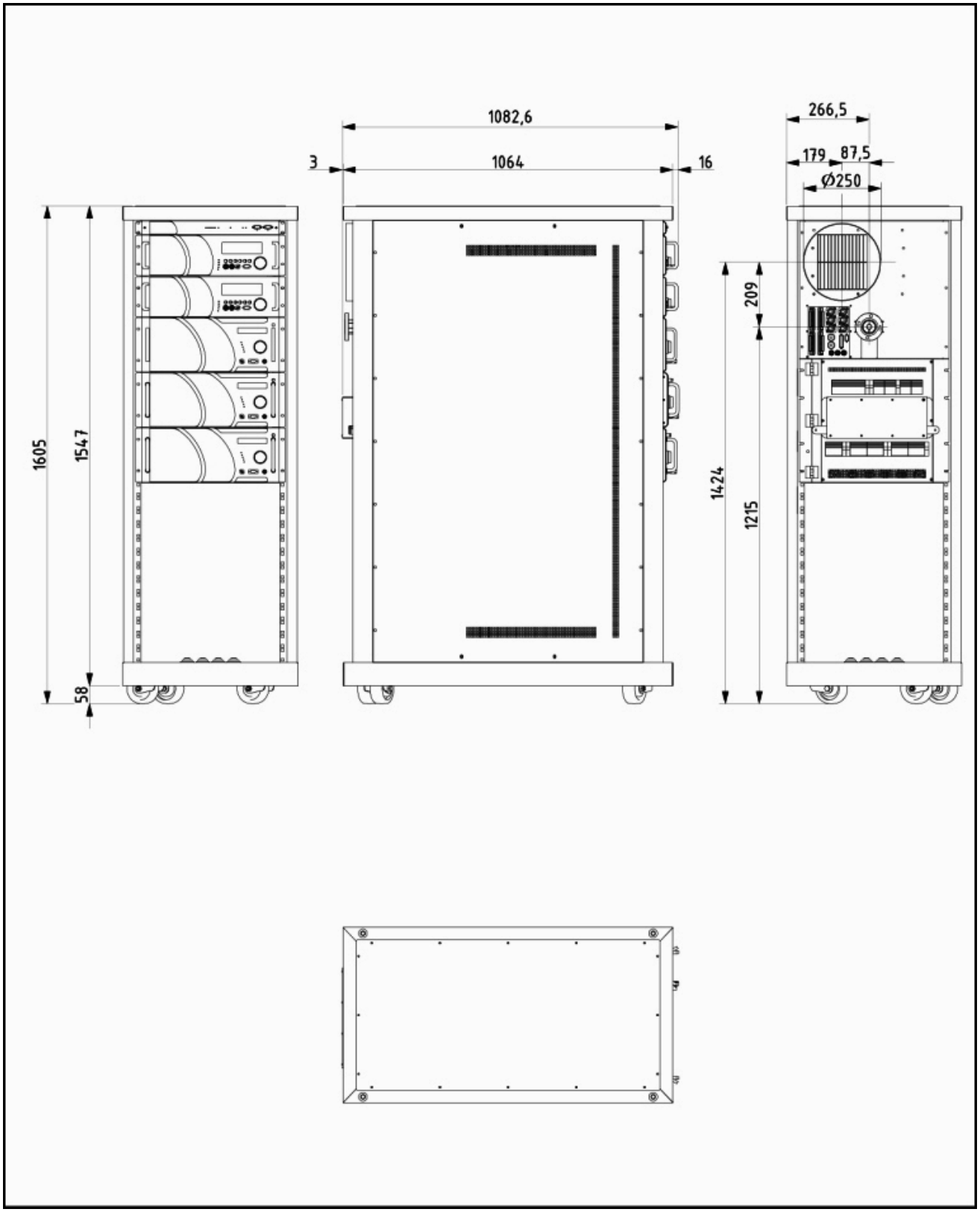
32U EXAUST AIR AND CONNECTORS ON THE BACK



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MAIN CARACTERISTICS

COMPOSED		
	Transmitter Control Unit	Integrated inside the Combiner
	Exciter	ETG300
	Dual Exciter	Yes
	Amplifiers	E3000
	Number of E3000 Amplifiers	3
	Combiner	COMB10/3: 3 ways combiner of 10KW
	Dummy load	Integrated inside the Combiner
	Mounted in 19" standard rack	Yes
	Number of racks	1
	Equipped with rack: Units	32 U
	Equipped with rack: Width	55,8 cm
	Equipped with rack: Height	159 cm
	Equipped with rack: Depth	93,8 cm
GENERAL DATA		
	Output Nominal Power	6000 W adjustable
	Operating band	87.5 - 108 MHz
	Output Low-pass Filter	W.B. 87.5 MHz - 108 MHz
	Corrosion	All mechanical parts are stainless steel
	Internal bus RS232/RS485	Yes
	Points of measure	RF Sample-MPX Monitor
	Displayed Parameters	More than 100 parameters displayed on a LCD
	Adjustments	From the frontal panel trough LCD /from PC
	Microprocessor controlled	Yes
	Power supply redundancy	Yes
	Blower redundancy	Yes
	Number of MOSFETs	36
	Final stage technology	ICEFET
	Transistor type	BLF278 Philips
	Number of power supplies	9
	Weight	215 Kg
CONNETTORS		
	RF Output connector	1 5/8
	RF Input connector	N
	Input connectors LEFT & RIGHT	XLR female
	MPX Input connector	BNC female
	SCA Connector	BNC female
	Remote control connector	DB25
	RS485/232 Connector	DB9
RF		
	Overall output power stability	+/-0,1 dB
	Output impedance	50 Ω
	Harmonic suppression	> 70 dB

	Spurious signal suppression	> 80 dB
	Driving power final stage	80 W
	Input impedance final stage	50 Ω
	Gain final stage	16 dB
	Software V.S.W.R. intervention threshold	600 W
	Fast V.S.W.R. intervention threshold	660 W
	Asynchronous residual AM (typical values)	0,1 %
	Synchronous residual AM (typical values)	0,2 %
	RF Efficiency	65% typ.
	Output nominal power	10000 W Adjustable with continuity
	Maximum peak power	10500 W
AUDIO		
	L/R Audio input level	+12/-12 dBm to produce 75KHz standard deviation
	L/R level adjustment	Soft adjust 0,1dBm steps from front panel
	L/R Connector type	Balanced XLR
	L/R Input Impedance	Selectable 10K- 600Ω
	MPX audio input level	+12/-12 dBm to produce 75KHz standard deviation
	MPX level adjustment	Soft adjust 0,1dBm steps from front panel
	MPX Connetor type	Unbalanced BNC
	MPX Input impedance	5KΩ selectable
	PILOT level adjustment	Adjustable Trimmer
	SCA/RDS Connector type	Unbalanced BNC
	SCA/RDS Input Impedance	10KΩ
	19KHz Output	Yes
	STEREO/MPX easy changeover	Yes
	AES/EBU Input option	Optional (External adapter)
PERFORMANCE EXCITER		
	Time of adjustment - frequency	< 1 minute
	Time of adjustment - power	< 1 minute
	MTBF	10 Years
	Programmed Maintenance	5 Years
	Intermodulation distortion	<0.05% Measured with two of tones 1KHz & 1.3KHz, ratio 1:1 at 100% modulation
	Frequency deviaton	+/- 75 KHz 0.1dB steps adjustable
	Frequency steps	10 KHz
	THD+N	<0.03% @ 1KHz
	Pre-emphasis	50/75 microseconds +/-0,1dB
	FM S/N MPX FCC	82 dB 20Hz - 23KHz - 50uS - ref @ 53KHz - RMS
	FM S/N STEREO CCIR Weight	72 dB Weight-ref@53KHz-Qpk

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	FM S/N STEREO CCIR Unweight	72 dB Unweight-ref@53KHz-QPk
	Mono frequency response	+/-0.15 dB 30Hz - 15KHz
	MPX frequency response	+/-0.1 dB 30Hz - 100KHz, -45dB at 19 KHz
	Stereo frequency response	+/-0.15 dB 30Hz - 15KHz
	SCA1,2,3 frequency response	+/-1 dB 20KHz - 100KHz, -45dB at 19KHz
	Type of modulation	F3 Direct FM modulation of the RF oscillator in fundamental frequency
	Stereo separation	> 60 dB @ 1KHz
	Pilot tone frequency	19 KHz
	Pilot tone deviation	7,5 KHz Adjustable
	Pilot tone frequency stability	+/-1 Hz
	Attenuation at 19KHz	> 45 dB
	Phase Response	0.1 degreeFrom linear phase; 53kHz to 100kHz
	Frequency stability	1 ppm from 0 to +40°C
	Time for starting up	30 sec. from OFF/ON
	Time for starting up	1 sec. from interlock close
	Modulation Capabilities	+/-250 KHz
POWER SUPPLY		
	Power supply	220/380 V. Threephase-singlephase 50-60Hz VAC
	Power consumption	16 KVA
	Magneto-thermic curve	D
	Current Consumption @220VAC/single phase	75 Amp.
	Magneto-thermic capacity @220VAC/single phase	100 Amp.
	Conductor Size @220VAC/single phase	25 sqrt.mm
	Conductor Size @220VAC/single phase	3 AWG
	Current Consumption @220VAC/three phase	43 Amp.
	Magneto-thermic capacity @220VAC/three phase	63 Amp.
	Conductor Size @220VAC/three phase	16 sqrt.mm
	Conductor Size @220VAC/three phase	5 AWG
	Current Consumption @380VAC/three phase	25 Amp.
	Magneto-thermic capacity @380VAC/three phase	40 Amp.
	Conductor Size @380VAC/three phase	10 sqrt.mm

	Conductor Size @380VAC/three phase	7 AWG
COOLING SYSTEM		
	Cooling flow (m3/h)	Variable from 1200 to 2400 m3/h
	Air temperature increase between output /input	20 °C
	Cooling system	Forced air-cooling
ENVIRONMENT		
	Temperature range (operating)	0 - +45 °C
	Temperature range (non operating)	-20 - +70 °C
	Humidity range (operating)	95% at 40 °C
	Humidity range (non operating)	90% at 65 °C
	Altitude range (operating)	>4600 meters
	Altitude range (non operating)	>15000 meters
TELECONTROL & TELEMETRY		
	Remote control	Yes
	Remote Control at clean contacts	Yes
	SNMP option	Under development
REGULATIONS CONFORMITY		
	High frequency radiations from the enclosure	Below limit imposed by technical regulations.
	Functionning type	h24 uninterrupted
	Electromagnetic fields immunity	Higher than specified by laws on electromagnetic fields compatibility
	CE Mark	Conform to 1999/5/CE European Directive
MANUFACTURING DATA		
	Year of the model	2006
	Spares availability guaranteed for	10 years from the date of purchase
PRE- & POST- MAINTENANCE		
	Recurrence	4/8 years
	Blower Replacement recurrence	4 years
	Air blowers quantity and prices	6
	Lithium batteris replacement recurrence	10 years
	Batteries	Yes, only for alarm list storage
	Time to realize the preventive maintenance every 4 years	1 Hour
	Time to realize the preventive maintenance very 8 years	2 Hours
	Level and number of technician for maintenance	1 technician
	Electrical safety	EN60215 (Standard CE)
	Average repair time (change of an RF module or power supply)	1 Hours
SET		
	Power supply cable	Yes
	Installation manual	Yes

User manual	Yes
Maintenance manual	Yes
Tests report	Yes

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SPARE PARTS CORRECTIVE MAINTENACE	
0	

ET15000-3

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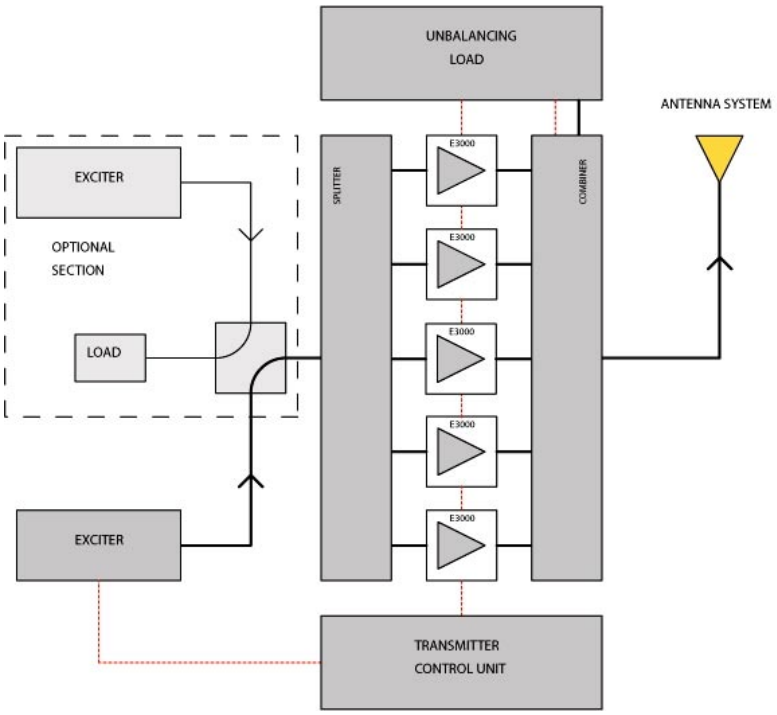
COMPOSITION & REDUNDANCY



60 MOSFET Philips BLF278
15 Current Share combined 2.5KW PFC switching Power Supply
30 Microprocessor Speed Controlled Blowers
Microprocessor controlled
5 Output Harmonic Low Pass Filters
2 Exciters (in the DUAL DRIVE model)
5 x E3500 amplifiers
1 x 5 ways combiner 3600W input-15000W output
1 x Unbalanced load 5 x 3600W inputs able to handle the maximun unbalance power without derating of the output power.
1 x TCU-Transmitter Control Unit with LCD displau and redundant power supply.

CONFIGURATION

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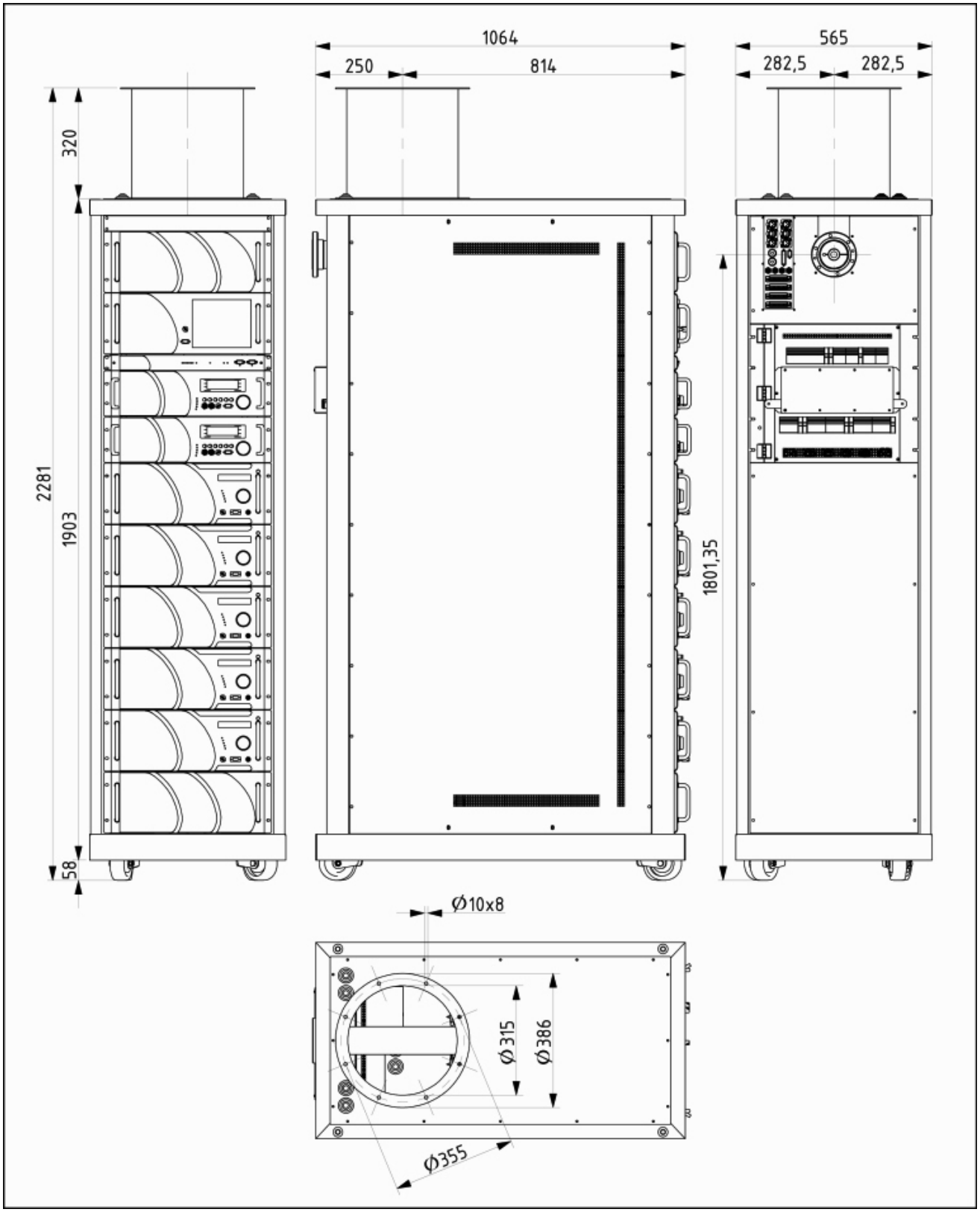
40U RACK, EXAUST AIR AND CONNECTORS ON THE TOP



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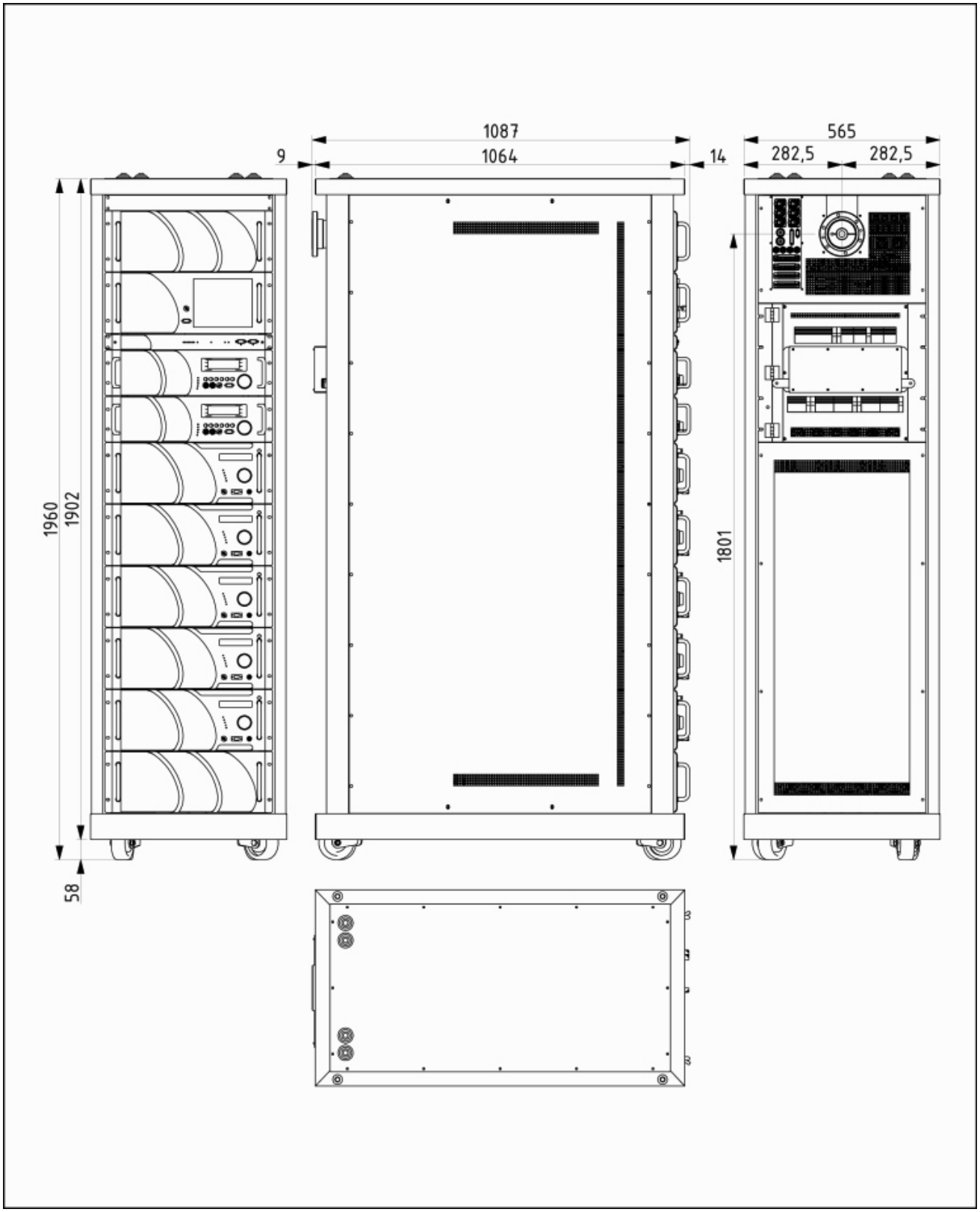
40U EXAUST AIR AND CONNECTORS ON THE BACK



MAIN CARACTERISTICS

COMPOSED		
	Transmitter Control Unit	TCU with Display LCD
	Exciter	ETG500
	Dual Exciter	Yes
	Amplifiers	E3000
	Number of E3000 Amplifiers	5
	Combiner	COMB15/5: 5 ways combiner of 15KW
	Dummy load	UNB.LOAD15/5: 15KW, 5 Ways
	Mounted in 19" standard rack	Yes
	Number of racks	1
	Equipped with rack: Units	40 U
	Equipped with rack: Width	55,8 cm
	Equipped with rack: Height	197,5 cm
	Equipped with rack: Depth	93,8 cm
GENERAL DATA		
	Output Nominal Power	15000 W adjustable
	Operating band	87.5 - 108 MHz
	Output Low-pass Filter	W.B. 87.5 MHz - 108 MHz
	Corrosion	All mechanical parts are stainless steel
	Internal bus RS232/RS485	Yes
	Points of measure	RF Sample-MPX Monitor
	Displayed Parameters	More than 250 parameters displayed on a LCD
	Adjustments	From the frontal panel trough LCD /from PC
	Microprocessor controlled	Yes
	Power supply redundancy	Yes
	Blower redundancy	Yes
	Number of MOSFETs	60
	Final stage technology	ICEFET
	Transistor type	BLF278 Philips
	Number of power supplies	15
	Weight	295 Kg
	RF Modules maximum weight	35 Kg
	Power supply units maximum weight	6 Kg
CONNETTORS		
	RF Output connector	3 1/8
	RF Input connector	N
	Input connectors LEFT & RIGHT	XLR female
	MPX Input connector	BNC female
	SCA Connector	BNC female
	Remote control connector	DB25
	RS485/232 Connector	DB9
RF		
	Overall output power stability	+/-0,1 dB

	Output impedance	50 Ω
	Harmonic suppression	> 70 dB
	Spurious signal suppression	> 80 dB
	Driving power final stage	80 W
	Input impedance final stage	50 Ω
	Gain final stage	16 dB
	Software V.S.W.R. intervention threshold	1500 W
	Fast V.S.W.R. intervention threshold	1650 W
	Asynchronous residual AM (typical values)	0,1 %
	Synchronous residual AM (typical values)	0,2 %
	RF Efficiency	65% typ.
	Output nominal power	15000 W Adjustable with continuity
	Maximum peak power	16000 W
AUDIO		
	L/R Audio input level	+12/-12 dBm to produce 75KHz standard deviation
	L/R level adjustment	Soft adjust 0,1dBm steps from front panel
	L/R Connector type	Balanced XLR
	L/R Input Impedance	Selectable 10K- 600Ω
	MPX audio input level	+12/-12 dBm to produce 75KHz standard deviation
	MPX level adjustment	Soft adjust 0,1dBm steps from front panel
	MPX Connetor type	Unbalanced BNC
	MPX Input impedance	5KΩ selectable
	PILOT level adjustment	Adjustable Trimmer
	SCA/RDS Connector type	Unbalanced BNC
	SCA/RDS Input Impedance	10KΩ
	19KHz Output	Yes
	STEREO/MPX easy changeover	Yes
	AES/EBU Input option	Optional (External adapter)
PERFORMANCE EXCITER		
	Time of adjustment - frequency	< 1 minute
	Time of adjustment - power	< 1 minute
	MTBF	10 Years
	Programmed Maintenance	5 Years
	Intermodulation distortion	<0.05% Measured with two of tones 1KHz & 1.3KHz, ratio 1:1 at 100% modulation
	Frequency deviaton	+/- 75 KHz 0.1dB steps adjustable
	Frequency steps	10 KHz
	THD+N	<0.03% @ 1KHz
	Pre-emphasis	50/75 microseconds +/-0,1dB

	FM S/N MPX FCC	82 dB 20Hz - 23KHz - 50uS - ref @ 53KHz - RMS
	FM S/N STEREO CCIR Weight	72 dB Weight-ref@53KHz-Qpk
	FM S/N STEREO CCIR Unweight	72 dB Unweight-ref@53KHz-QPk
	Mono frequency response	+/-0.15 dB 30Hz - 15KHz
	MPX frequency response	+/-0.1 dB 30Hz - 100KHz, -45dB at 19 KHz
	Stereo frequency response	+/-0.15 dB 30Hz - 15KHz
	SCA1,2,3 frequency response	+/-1 dB 20KHz - 100KHz, -45dB at 19KHz
	Type of modulation	F3 Direct FM modulation of the RF oscillator in fundamental frequency
	Stereo separation	> 60 dB @ 1KHz
	Pilot tone frequency	19 KHz
	Pilot tone deviation	7,5 KHz Adjustable
	Pilot tone frequency stability	+/-1 Hz
	Attenuation at 19KHz	> 45 dB
	Phase Response	0.1 degreeFrom linear phase; 53kHz to 100kHz
	Frequency stability	1 ppm from 0 to +40°C
	Time for starting up	30 sec. from OFF/ON
	Time for starting up	1 sec. from interlock close
	Modulation Capabilities	+/-250 KHz
POWER SUPPLY		
	Power supply	110,220, 380 trifase-monofase 50-60Hz VAC
	Power consumption	25 KVA
	Magneto-thermic curve	D
	Current Consumption @220VAC/three phase	68 Amp.
	Magneto-thermic capacity @220VAC/three phase	100 Amp.
	Conductor Size @220VAC/three phase	25 sqrt.mm
	Conductor Size @220VAC/three phase	3 AWG
	Current Consumption @380VAC/three phase	40 Amp.
	Magneto-thermic capacity @380VAC/three phase	63 Amp.
	Conductor Size @380VAC/three phase	16 sqrt.mm
	Conductor Size @380VAC/three phase	5 AWG
COOLING SYSTEM		
	Cooling flow (m3/h)	Variable from 2000 to 4000 m3/h
	Air temperature increase between output /input	20 °C

	Cooling system	Forced air-cooling
ENVIRONMENT		
	Temperature range (operating)	0 - +45 °C
	Temperature range (non operating)	-20 - +70 °C
	Humidity range (operating)	95% at 40 °C
	Humidity range (non operating)	90% at 65 °C
	Altitude range (operating)	>4600 meters
	Altitude range (non operating)	>15000 meters
TELECONTROL & TELEMETRY		
	Remote control	Yes
	Remote Control at clean contacts	Yes
	SNMP option	Under development
REGULATIONS CONFORMITY		
	High frequency radiations from the enclosure	Below limit imposed by technical regulations.
	Functionning type	h24 uninterrupted
	Electromagnetic fields immunity	Higher than specified by laws on electromagnetic fields compatibility
	CE Mark	Conform to 1999/5/CE European Directive
MANUFACTURING DATA		
	Year of the model	2005
	Spares availability guaranteed for	10 years from the date of purchase
PRE- & POST- MAINTENANCE		
	Recurrence	4/8 years
	Blower Replacement recurrence	4 years
	Air blowers quantity and prices	6
	Lithium batteris replacement recurrence	10 years
	Batteries	Yes, only for alarm list storage
	Time to realize the preventive maintenance every 4 years	1 Hour
	Time to realize the preventive maintenance very 8 years	2 Hours
	Level and number of technician for maintenance	1 technician
	Electrical safety	EN60215 (Standard CE)
	Average repair time (change of an RF module or power supply)	1 Hours
SET		
	Power supply cable	Yes
	Installation manual	Yes
	User manual	Yes
	Maintenance manual	Yes
	Tests report	Yes

The equipment provided by Elenos srl covered under warranty of 24 months from the date of purchase of the product; That period is meant to be applied to the original that any subsequent buyers.

MAIN CARACTERISTICS

SPARE PARTS MAINTENACE PREVENTIVE

SPARE PARTS CORRE CTIVE MAINTE NACE	SPARE PARTS CORRECTIVE MAINTENACE

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ET31000-3

ICEFET SOLID STATE FM TRANSMITTERS

Totally STAINLESS STEEL, electronic boards are Protected from Humidity and Inclement of Tropical Weather.

All equipment undergo Rigorous Burn-In Process and quality controls.

Power sections were developed Over-Dimensioned with a conservative approach.

ICEFET Technology keeps temperature extremely low to increase the MTBF.

Fast hardware protections, further to Intelligent Proportional FoldBack of critical parameters like VSWR and temperature.

Ventilation, power supplies, MOSFET and exciter are fully redundant to avoid any “Single Point Failure” .

Our mission is to create the Most Reliable FM Transmitters Of The World

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MAIN CARACTERISTICS

OPERATING AT REDUCED POWER WITH ONE OR MORE BROKEN RF MODULES
OPERATING AT REDUCED POWER WITH ONE OR MORE BROKEN POWER SUPPLIES

ICE-FET:
Means Mosfet and heat sink maximum efficiency to reduce temperature, in order to obtain a higher MTBF. The result is unmatched in size and weight by any other producer

ALWAYS ON AIR: (FULLY REDUNDANT):
ALWAYS ON AIR: (FULLY REDUNDANT): The redundancy of this equipment prevents SINGLE-POINT-FAILURES thanks to a SOFT FAILURE DESIGN and a protection system which keeps it « ON AIR» even in the most extreme working conditions.

IPC (Intelligent Power Control):
The IPC maintains constant the Output Power within 2% of the setting value, regardless of fluctuations in incoming AC line voltage, RF drive or load conditions.

IPF
The IPF allows the transmitter to stay on air into loads as poor as 3 to 1

BROAD BAND:
The transmitter keeps optimum performances of power and efficiency over the all Broad Band operation without needing of tuning what make it ideal for n+1 application

CONSTANT EFICIENCY:
The VPA and the Bias are both controlled to obtain maximum efficiency at any frequency and output power level. Keep the efficiency high means low heat, low operative cost, higher MTBF.

NO IPA:
In ELENOS transmitters, the IPA is always avoided. This choice eliminate one of the bottleneck in Redundancy frequently present on transmitters of this category.

EASY MAINTENACE:
all parts are easily accessible via the front panel(RF modules, electronic control boards) or via the rear panel (fans, combiners)

BIG COLOUR TOUCH SCREEN GRAPHIC DISPLAY:
User friendly graphic interface allow access to control and diagnosis parameters

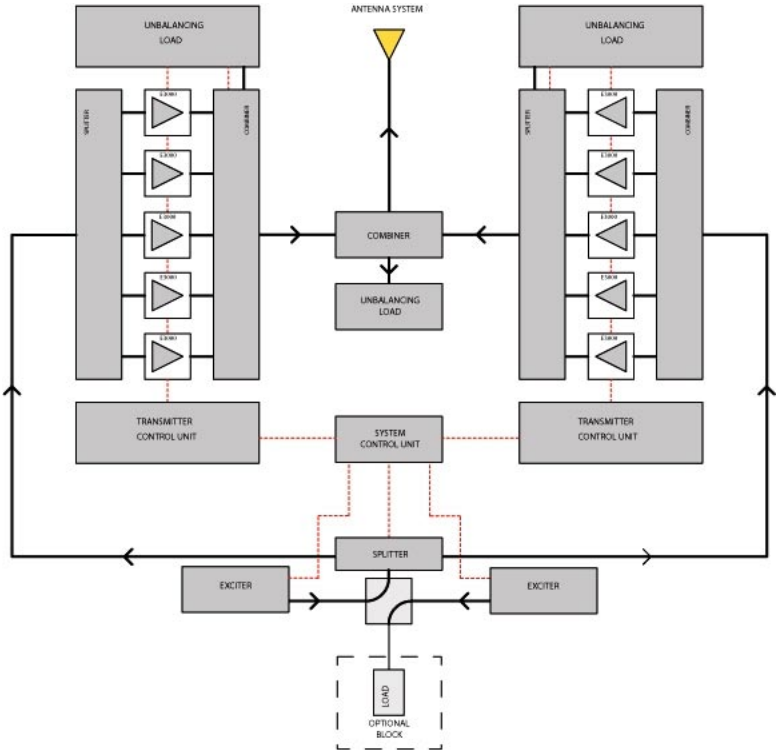
SMS ALARMS:
All alarms and event can be send by SMS

REDUCED SIZE AND WEIGHT:
Greatly reduced size and weight: the whole transmitter is contained in a 20-unit rack with a floor plan as less as 0,31 square meter!!! (50cm width x 86cm dept)

REMOTE DEEP DIAGNOSTIC CAPABILITY:
The industrial standard Hostlink Protocol allow to safety handle huge quantity of information to perform remote deep diagnosis.

WORLS WIDE SALES & SERVICE SUPPORT:
ELENOS is the FM manufacturer with one of the biggest distribution channel of the world. Each distributor is chose mainly by the technical support customer capability.

COMPOSITION & REDUNDANCY



120 MOSFET Philips BLF278
30 Current Share combined 2.5KW PFC switching Power Supply
60 Microprocessor Speed Controlled Blowers
Microprocessor controlled
10 Output Harmonic Low Pass Filters
2 Exciters (in the DUAL DRIVE model)
10 x E3500 amplifiers
2 x 5 ways combiner 3600W input-15000W output
2 x Unbalanced load 5 x 3600W inputs able to handle the maximun unbalance power without derating of the output power.
2 x TCU-Transmitter Control Unit with LCD displau and redundant power supply.
1 x SCU-System Control Unit with Color LCD with Touch Screen and redundant power supply.

CONFIGURATION

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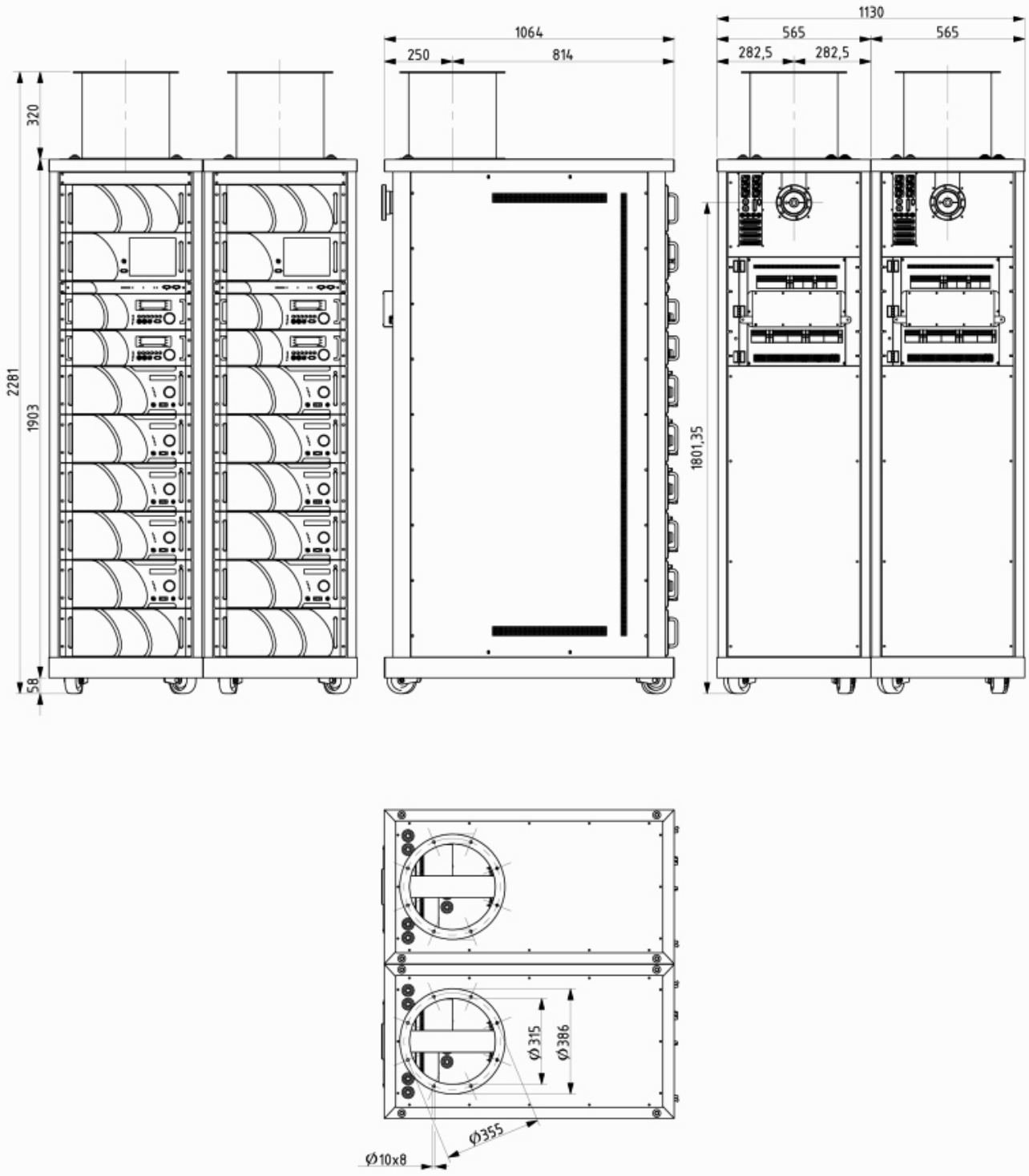
40U RACK, EXAUST AIR AND CONNECTORS ON THE TOP

AAAA



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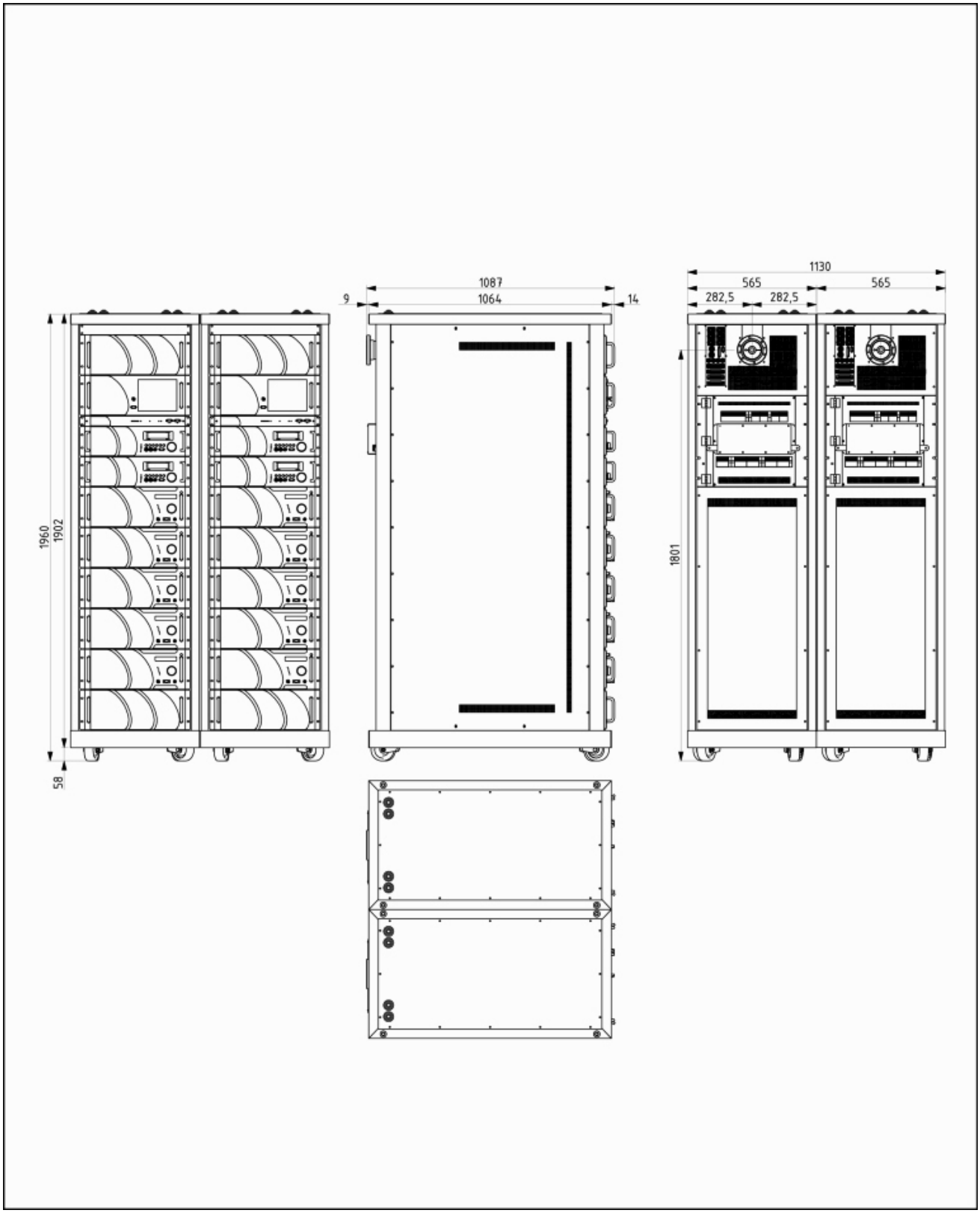
40U EXAUST AIR AND CONNECTORS ON THE BACK



MAIN CARACTERISTICS

COMPOSED		
	System Control units	SCU with Graphic Display and Touch-Screen
	Output Hybrid Combiner	31KW
	Hybrid Combiner Dummy Load	Bird 10KW
	Input Splitter	1 input 1KW 2 output 500W
	Transmitter Control Unit	TCU with Display LCD
	Exciter	ETG1000
	Dual Exciter	Yes
	Amplifiers	E3000
	Number of E3000 Amplifiers	10
	Combiner	COMB15/5: 5 ways combiner of 15KW
	Dummy load	UNB.LOAD15/5: 15KW, 5 Ways
	Mounted in 19" standard rack	Yes
	Number of racks	2
	Equipped with rack: Units	40+40 U
	Equipped with rack: Width	Tot. 120 cm
	Equipped with rack: Height	197,5 cm
	Equipped with rack: Depth	93,8 cm
GENERAL DATA		
	Output Nominal Power	31000 W adjustable
	Operating band	87.5 - 108 MHz
	Output Low-pass Filter	W.B. 87.5 MHz - 108 MHz
	Corrosion	All mechanical parts are stainless steel
	Internal bus RS232/RS485	Yes
	Points of measure	RF Sample-MPX Monitor
	Displayed Parameters	More than 250 parameters displayed on a LCD
	Adjustments	From the frontal panel trough LCD /from PC
	Microprocessor controlled	Yes
	Power supply redundancy	Yes
	Blower redundancy	Yes
	Number of MOSFETs	60
	Final stage technology	ICEFET
	Transistor type	BLF278 Philips
	Number of power supplies	30
	Weight	600 Kg
	RF Modules maximum weight	35 Kg
	Power supply units maximum weight	6 Kg
CONNETTORS		
	RF Output connector	3 1/8
	RF Input connector	N
	Input connectors LEFT & RIGHT	XLR female
	MPX Input connector	BNC female

	SCA Connector	BNC female
	Remote control connector	DB25
	RS485/232 Connector	DB9
RF		
	Overall output power stability	+/-0,1 dB
	Output impedance	50 Ω
	Harmonic suppression	> 70 dB
	Spurious signal suppression	> 80 dB
	Driving power final stage	80 W
	Input impedance final stage	50 Ω
	Gain final stage	16 dB
	Software V.S.W.R. intervention threshold	3000 W
	Fast V.S.W.R. intervention threshold	3300 W
	Asynchronous residual AM (typical values)	0,1 %
	Synchronous residual AM (typical values)	0,2 %
	RF Efficiency	65% typ.
	Output nominal power	31000 W Adjustable with continuity
	Maximum peak power	31000 W
AUDIO		
	L/R Audio input level	+12/-12 dBm to produce 75KHz standard deviation
	L/R level adjustment	Soft adjust 0,1dBm steps from front panel
	L/R Connector type	Balanced XLR
	L/R Input Impedance	Selectable 10K- 600Ω
	MPX audio input level	+12/-12 dBm to produce 75KHz standard deviation
	MPX level adjustment	Soft adjust 0,1dBm steps from front panel
	MPX Connetor type	Unbalanced BNC
	MPX Input impedance	5KΩ selectable
	PILOT level adjustment	Adjustable Trimmer
	SCA/RDS Connector type	Unbalanced BNC
	SCA/RDS Input Impedance	10KΩ
	19KHz Output	Yes
	STEREO/MPX easy changeover	Yes
	AES/EBU Input option	Optional (External adapter)
PERFORMANCE EXCITER		
	Time of adjustment - frequency	< 1 minute
	Time of adjustment - power	< 1 minute
	MTBF	10 Years
	Programmed Maintenance	5 Years
	Intermodulation distortion	<0.05% Measured with two of tones 1KHz & 1.3KHz, ratio 1:1 at 100% modulation

	Frequency deviaton	+/- 75 KHz 0.1dB steps adjustable
	Frequency steps	10 KHz
	THD+N	<0.03% @ 1KHz
	Pre-emphasis	50/75 microseconds +/-0,1dB
	FM S/N MPX FCC	82 dB 20Hz - 23KHz - 50uS - ref @ 53KHz - RMS
	FM S/N STEREO CCIR Weight	72 dB Weight-ref@53KHz-Qpk
	FM S/N STEREO CCIR Unweight	72 dB Unweight-ref@53KHz-QPk
	Mono frequency response	+/-0.15 dB 30Hz - 15KHz
	MPX frequency response	+/-0.1 dB 30Hz - 100KHz, -45dB at 19 KHz
	Stereo frequency response	+/-0.15 dB 30Hz - 15KHz
	SCA1,2,3 frequency response	+/-1 dB 20KHz - 100KHz, -45dB at 19KHz
	Type of modulation	F3 Direct FM modulation of the RF oscillator in fundamental frequency
	Stereo separation	> 60 dB @ 1KHz
	Pilot tone frequency	19 KHz
	Pilot tone deviation	7,5 KHz Adjustable
	Pilot tone frequency stability	+/-1 Hz
	Attenuation at 19KHz	> 45 dB
	Phase Response	0.1 degreeFrom linear phase; 53kHz to 100kHz
	Frequency stability	1 ppm from 0 to +40°C
	Time for starting up	30 sec. from OFF/ON
	Time for starting up	1 sec. from interlock close
	Modulation Capabilities	+/-250 KHz
POWER SUPPLY		
	Power supply	110,220, 380 trifase-monofase 50-60Hz VAC
	Power consumption	51 KVA
	Magneto-thermic curve	D
	Current Consumption @220VAC/three phase	2x68 Amp.
	Magneto-thermic capacity @220VAC/three phase	2x100 Amp.
	Conductor Size @220VAC/three phase	2x25 sqrt.mm
	Conductor Size @220VAC/three phase	2x3 AWG
	Current Consumption @380VAC/three phase	2x40 Amp.
	Magneto-thermic capacity @380VAC/three phase	2x63 Amp.
	Conductor Size @380VAC/three phase	2x16 sqrt.mm
	Conductor Size @380VAC/three phase	2x5 AWG

COOLING SYSTEM		
	Cooling flow (m3/h)	Variable from 4000 to 8000 m3/h
	Air temperature increase between output /input	20 °C
	Cooling system	Forced air-cooling
ENVIRONMENT		
	Temperature range (operating)	0 - +45 °C
	Temperature range (non operating)	-20 - +70 °C
	Humidity range (operating)	95% at 40 °C
	Humidity range (non operating)	90% at 65 °C
	Altitude range (operating)	>4600 meters
	Altitude range (non operating)	>15000 meters
TELECONTROL & TELEMETRY		
	Remote control	Yes
	Remote Control at clean contacts	Yes
	SNMP option	Under development
REGULATIONS CONFORMITY		
	High frequency radiations from the enclosure	Below limit imposed by technical regulations.
	Functionning type	h24 uninterrupted
	Electromagnetic fields immunity	Higher than specified by laws on electromagnetic fields compatibility
	CE Mark	Conform to 1999/5/CE European Directive
MANUFACTURING DATA		
	Year of the model	2005
	Spares availability guaranteed for	10 years from the date of purchase
PRE- & POST- MAINTENANCE		
	Recurrence	4/8 years
	Blower Replacement recurrence	4 years
	Air blowers quantity and prices	6
	Lithium batteris replacement recurrence	10 years
	Batteries	Yes, only for alarm list storage
	Time to realize the preventive maintenance every 4 years	1 Hour
	Time to realize the preventive maintenance very 8 years	2 Hours
	Level and number of technician for maintenance	1 technician
	Electrical safety	EN60215 (Standard CE)
	Average repair time (change of an RF module or power supply)	1 Hours
SET		
	Power supply cable	Yes
	Installation manual	Yes
	User manual	Yes
	Maintenance manual	Yes

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Tests report	Yes	

The equipment provided by Elenos srl covered under warranty of 24 months from the date of purchase of the product; That period is meant to be applied to the original that any subsequent buyers.

MAIN CARACTERISTICS

SPARE PARTS MAINTENACE PREVENTIVE

SPARE PARTS CORRECTIVE MAINTENACE	
0	

ETG101

100W FM Transmitter

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BACK VIEW

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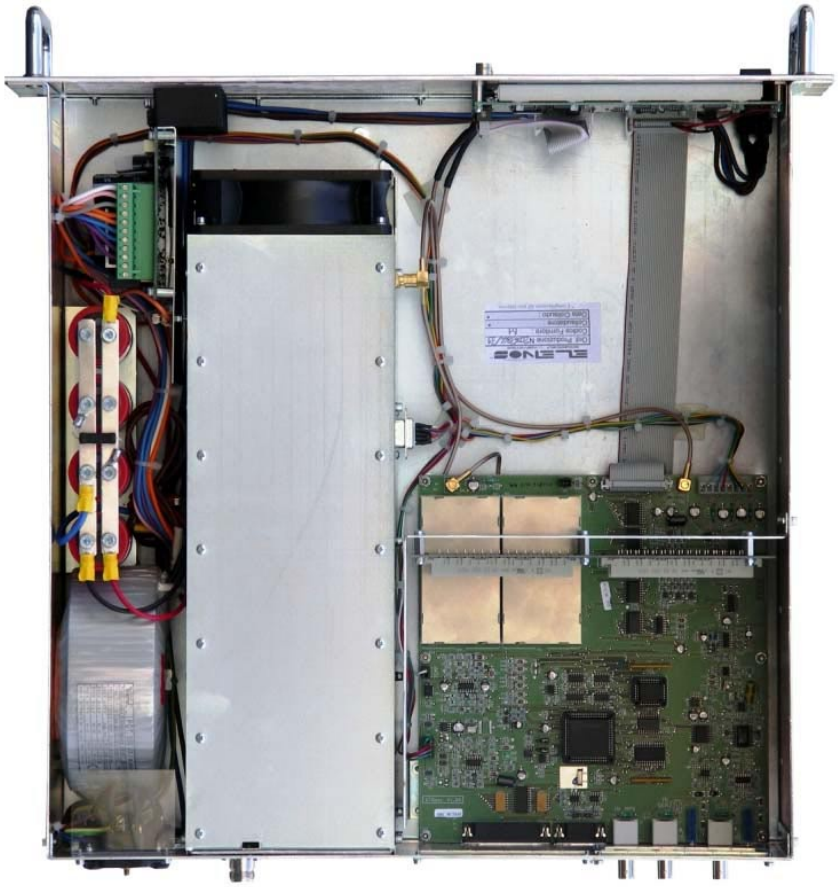
TOP VIEW



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MAIN DISPLAY

COMPOSED		
	Mounted in 19" standard rack	Yes
GENERAL DATA		
	Operating band	87.5 - 108 MHz
	Output Low-pass Filter	W.B. 87.5 MHz - 108 MHz
	Corrosion	All mechanical parts are stainless steel
	Internal bus RS232/RS485	Yes
	Points of measure	RF Sample-MPX Monitor
	Displayed Parameters	More than 50 parameters displayed on a LCD
	Adjustments	From the frontal panel trough LCD /from PC
	Microprocessor controlled	Yes
	Power supply redundancy	Yes
	Blower redundancy	Yes
	Final stage technology	MOSFET
	Transistor type	BLF177 Philips
	Compact	Yes
CONNETTORS		
	RF Output connector	N
	Input connectors LEFT & RIGHT	XLR female
	MPX Input connector	BNC female
	SCA Connector	BNC female
	Remote control connector	DB25
	RS485/232 Connector	DB9
RF		
	Automatic gain control	Stabilizes the output power value onthe set value
	Overall output power stability	+/-0,1 dB
	Harmonic suppression	> 70 dB
	Spurious signal suppression	> 80 dB
	Output nominal power	100 W Adjustable with continuity
	Maximum peak power	140 W
AUDIO		
	L/R Audio input level	+12/-12 dBm to produce 75KHz standard deviation
	L/R level adjustment	Soft adjust 0,1dBm steps from front panel
	L/R Connector type	Balanced XLR
	L/R Input Impedance	10K- 600 selectable
	MPX audio input level	+12/-12 dBm to produce 75KHz standard deviation
	MPX level adjustment	Soft adjust 0,1dBm steps from front panel
	MPX Connetor type	Unbalanced BNC
	MPX Input impedance	10 KΩ- 600 Ω selectable
	PILOT level adjustment	Trimmer adjustable
	SCA/RDS Connector type	BNC
	SCA/RDS Input Impedance	10 KΩΩ

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	19KHz Output	Yes
	STEREO/MPX easy changeover	Yes
	AES/EBU Input option	Optional (External adapter)
PERFORMANCE EXCITER		
	Intermodulation distortion	<0.05% Measured with two of tones 1KHz & 1.3KHz, ratio 1:1 at 100% modulation
	Frequency deviaton	+/- 75 KHz 0.1dB steps adjustable
	THD+N	<0.03% @ 1KHz
	Pre-emphasis	50/75 microseconds +/-0,1dB
	Mono frequency response	+/-0.15 dB 30Hz - 15KHz
	MPX frequency response	+/-0.1 dB 30Hz - 100KHz, -45dB at 19 KHz
	Stereo frequency response	+/-0.15 dB 30Hz - 15KHz
	SCA1,2,3 frequency response	+/-1 dB 20KHz - 100KHz, -45dB at 19KHz
	Type of modulation	F3 Direct FM modulation of the RF oscillator in fundamental frequency
	Pilot tone frequency stability	+/-1 Hz
POWER SUPPLY		
	Power supply	110-240 VAC
	Power consumption	180W typical to the maximum output power KVA
COOLING SYSTEM		
	Cooling system	Foced air-cooling
ENVIRONMENT		
	Temperature range (operating)	0 - +45 °C
	Temperature range (non operating)	-20 - +50 °C
	Humidity range (operating)	95% a 40 °C
	Humidity range (non operating)	90% a 65 °C
	Altitude range (operating)	>4600 meters
	Altitude range (non operating)	>15000 meters
TELECONTROL & TELEMETRY		
	Remote control	Sì
	Remote Control at clean contacts	Sì
	SNMP option	
	High frequency radiations from the enclosure	Below limit imposed by technical regulations.
	Functionning type	h24 uninterrupted
	Electromagnetic fields immunity	Higher than specified by laws on electromagnetic fields compatibility
	CE Mark	Conform to 1999/5/CE European Directive
MANUFACTURING DATA		
	Year of the model	2005
	Spares availability guaranteed for	10 years from the date of purchase
PRE- & POST- MAINTENANCE		
	Recurrence	4/8 years
	Blower Replacement recurrence	4 years

	Air blowers quantity and prices	2 x 36 + 2 x 24,6
	Lithium batteris replacement recurrence	10 years
	Batteries	Yes
	Time to realize the preventive maintenance every 4 years	1 ohur
	Time to realize the preventive maintenance very 8 years	2 ohur
	Level and number of technician for maintenance	1 technician
	Electrical safety	EN60215(Standard CE)
	Average repair time (change of an RF module or power supply)	1 Hour
SET		
	Power supply cable	Yes
	Installation manual	Yes
	User manual	Yes
	Maintenance manual	Yes
	Tests report	Yes
PRICES		
	Cost for 3 years warranty extention	2% price list

The equipment provided by Elenos srl covered under warranty of 24 months from the date of purchase of the product; That period is meant to be applied to the original that any subsequent buyers.

SPARE PARTS MAINTENACE PREVENTIVE

Power Supply #1 (COD: TG1 2A111_0)

Fuse Kit

Fuse Kit 101

RF Fan (COD: 1VENT005)

SPARE PARTS CORRECTIVE MAINTENACE

Mosfet #1 (COD: 2QRF00006 (BLF177))

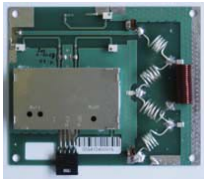
CPU

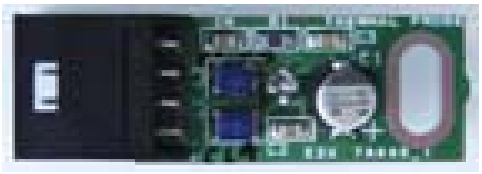
(vedere scheda eccitatore)

Display (COD: ETG100DS1)

front panel (COD: 9MOD2596_2)

Output armonic filter L.P. FILTER (COD: TG13A111_0 (con testina))



Temperature sensor board #1 (COD: E2K 7A000_1)	
Exiter board (monoscheda)	TG5 3A141_1
Driver Board (COD: TG1 0A111_1)	
Scheda Pannello Pulsanti	TG5 4A141_0
Scheda Finale	TG1 1A111_0
Trasformatore Alimentazione Servizi	2XRFT016

ETG300

300W FM Transmitter

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BACK VIEW

XX

TOP VIEW

aaaaaa

MAIN DISPLAY

COMPOSED		
	Mounted in 19" standard rack	Yes
GENERAL DATA		
	Operating band	87.5 - 108 MHz
	Output Low-pass Filter	W.B. 87.5 MHz - 108 MHz
	Corrosion	All mechanical parts are stainless steel
	Internal bus RS232/RS485	Yes
	Points of measure	RF Sample-MPX Monitor
	Displayed Parameters	More than 50 parameters displayed on a LCD
	Adjustments	From the frontal panel trough LCD /from PC
	Microprocessor controlled	Yes
	Final stage technology	MOSFET
	Transistor type	BLF278 Philips
	Compact	Yes
CONNETTORS		
	RF Output connector	N
	Input connectors LEFT & RIGHT	XLR female
	MPX Input connector	BNC female
	SCA Connector	BNC female
	Remote control connector	DB25
	RS485/232 Connector	DB9
RF		
	Automatic gain control	Stabilizes the output power value onthe set value
	Overall output power stability	+/-0,1 dB
	Harmonic suppression	> 70 dB
	Spurious signal suppression	> 80 dB
	RF Efficiency	43
AUDIO		
	L/R Audio input level	+12/-12 dBm to produce 75KHz standard deviation
	L/R level adjustment	Soft adjust 0,1dBm steps from front panel
	L/R Connector type	Balanced XLR
	L/R Input Impedance	10K- 600 selectable
	MPX audio input level	+12/-12 dBm to produce 75KHz standard deviation
	MPX level adjustment	Soft adjust 0,1dBm steps from front panel
	MPX Connetor type	Unbalanced BNC
	MPX Input impedance	10 KΩ- 600 Ω selectable
	PILOT level adjustment	Trimmer adjustable
	SCA/RDS Connector type	BNC
	SCA/RDS Input Impedance	10 KΩΩ
	19KHz Output	Yes

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	STEREO/MPX easy changeover	Yes
	AES/EBU Input option	Optional (External adapter)
PERFORMANCE EXCITER		
	Intermodulation distortion	<0.05% Measured with two of tones 1KHz & 1.3KHz, ratio 1:1 at 100% modulation
	Frequency deviaton	+/- 75 KHz 0.1dB steps adjustable
	THD+N	<0.03% @ 1KHz
	Pre-emphasis	50/75 microseconds +/-0,1dB
	Mono frequency response	+/-0.15 dB 30Hz - 15KHz
	MPX frequency response	+/-0.1 dB 30Hz - 100KHz, -45dB at 19 KHz
	Stereo frequency response	+/-0.15 dB 30Hz - 15KHz
	SCA1,2,3 frequency response	+/-1 dB 20KHz - 100KHz, -45dB at 19KHz
	Type of modulation	F3 Direct FM modulation of the RF oscillator in fundamental frequency
	Pilot tone frequency stability	+/-1 Hz
POWER SUPPLY		
	Power supply	110-240 VAC
	Power consumption	500 KVA
COOLING SYSTEM		
	Cooling system	Foced air-cooling
ENVIRONMENT		
	Temperature range (operating)	0 - +45 °C
	Temperature range (non operating)	-20 - +50 °C
	Humidity range (operating)	95% a 40 °C
	Humidity range (non operating)	90% a 65 °C
	Altitude range (operating)	>4600 meters
	Altitude range (non operating)	>15000 meters
	High frequency radiations from the enclosure	Below limit imposed by technical regulations.
	Functionning type	h24 uninterrupted
	Electromagnetic fields immunity	Higher than specified by laws on electromagnetic fields compatibility
	CE Mark	Conform to 1999/5/CE European Directive
	Year of the model	2005
	Spares availability guaranteed for	10 years from the date of purchase
	Recurrence	4/8 years
	Blower Replacement recurrence	4 years
	Air blowers quantity and prices	2 x 36 + 2 x 24,6
	Lithium batteris replacement recurrence	10 years
	Batteries	Yes
	Time to realize the preventive maintenance every 4 years	1 ohur

	Time to realize the preventive maintenance very 8 years	2 ohur
	Level and number of technician for maintenance	1 technician
	Electrical safety	EN60215(Standard CE)
	Average repair time (change of an RF module or power supply)	1 Hour
SET		
	Power supply cable	Yes
	Installation manual	Yes
	User manual	Yes
	Maintenance manual	Yes
	Tests report	Yes

The equipment provided by Elenos srl covered under warranty of 24 months from the date of purchase of the product; That period is meant to be applied to the original that any subsequent buyers.

SPARE PARTS MAINTENACE PREVENTIVE	
Fuse Kit	Fuse Kit 300
RF Fan	1VENT002
SPARE PARTS CORRECTIVE MAINTENACE	
CPU	(vedere scheda eccitatore)
Display	ETG100DS1
front panel	9MOD2596_2
Temperature sensor board #1	E2K 7A000_1
Exiter board (monoscheda)	TG5 3A141_1

ETG500

500W FM Transmitter

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BACK VIEW

XX

TOP VIEW

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MAIN DISPLAY

COMPOSED		
	Mounted in 19" standard rack	Yes
GENERAL DATA		
	Operating band	87.5 - 108 MHz
	Output Low-pass Filter	W.B. 87.5 MHz - 108 MHz
	Corrosion	All mechanical parts are stainless steel
	Internal bus RS232/RS485	Yes
	Points of measure	RF Sample-MPX Monitor
	Displayed Parameters	More than 50 parameters displayed on a LCD
	Adjustments	From the frontal panel trough LCD /from PC
	Microprocessor controlled	Yes
	Final stage technology	MOSFET
	Transistor type	BLF278 Philips
	RF Modules maximum weight	Kg
	Number of cooling fans or wind turbines on the amplifiers	2
	Compact	Yes
CONNETTORS		
	RF Output connector	N
	Input connectors LEFT & RIGHT	XLR female
	MPX Input connector	BNC female
	SCA Connector	BNC female
	Remote control connector	DB25
	RS485/232 Connector	DB9
RF		
	Automatic gain control	Stabilizes the output power value onthe set value
	Overall output power stability	+/-0,1 dB
	Harmonic suppression	> 70 dB
	Spurious signal suppression	> 80 dB
	Software V.S.W.R. intervention threshold	50 W
	Fast V.S.W.R. intervention threshold	50 W
	RF Efficiency	52
	Maximum peak power	600 W
AUDIO		
	L/R Audio input level	+12/-12 dBm to produce 75KHz standard deviation
	L/R level adjustment	Soft adjust 0,1dBm steps from front panel
	L/R Connector type	Balanced XLR
	L/R Input Impedance	10K- 600 selectable
	MPX audio input level	+12/-12 dBm to produce 75KHz standard deviation

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	MPX level adjustment	Soft adjust 0,1dBm steps from front panel
	MPX Connetor type	Unbalanced BNC
	MPX Input impedance	10 KΩ- 600 Ω selectable
	PILOT level adjustment	Trimmer adjustable
	SCA/RDS Connector type	BNC
	SCA/RDS Input Impedance	10 KΩΩ
	19KHz Output	Yes
	STEREO/MPX easy changeover	Yes
	AES/EBU Input option	Optional (External adapter)
PERFORMANCE EXCITER		
	Intermodulation distortion	<0.05% Measured with two of tones 1KHz & 1.3KHz, ratio 1:1 at 100% modulation
	Frequency deviaton	+/- 75 KHz 0.1dB steps adjustable
	THD+N	<0.03% @ 1KHz
	Pre-emphasis	50/75 microseconds +/-0,1dB
	Mono frequency response	+/-0.15 dB 30Hz - 15KHz
	MPX frequency response	+/-0.1 dB 30Hz - 100KHz, -45dB at 19 KHz
	Stereo frequency response	+/-0.15 dB 30Hz - 15KHz
	SCA1,2,3 frequency response	+/-1 dB 20KHz - 100KHz, -45dB at 19KHz
	Type of modulation	F3 Direct FM modulation of the RF oscillator in fundamental frequency
	Pilot tone frequency stability	+/-1 Hz
POWER SUPPLY		
	Power supply	110-240 VAC
	Power consumption	900 KVA
COOLING SYSTEM		
	Cooling system	Foced air-cooling
ENVIRONMENT		
	Temperature range (operating)	0 - +45 °C
	Temperature range (non operating)	-20 - +50 °C
	Humidity range (operating)	95% a 40 °C
	Humidity range (non operating)	90% a 65 °C
	Altitude range (operating)	>4600 meters
	Altitude range (non operating)	>15000 meters
	Remote control	Yes
	Remote Control at clean contacts	Yes
	SNMP option	Under develop
	High frequency radiations from the enclosure	Below limit imposed by technical regulations.
	Functionning type	h24 uninterrupted
	Electromagnetic fields immunity	Higher than specified by laws on electromagnetic fields compatibility
	CE Mark	Conform to 1999/5/CE European Directive

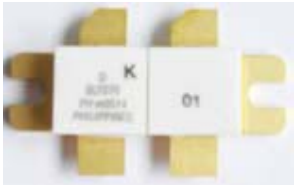
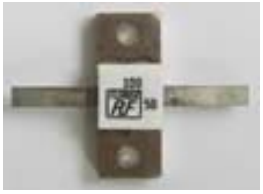
	Year of the model	2005
	Spares availability guaranteed for	10 years from the date of purchase
	Recurrence	4/8 years
	Blower Replacement recurrence	4 years
	Lithium batteris replacement recurrence	No
	Batteries	No
	Time to realize the preventive maintenance every 4 years	1 ohur
	Time to realize the preventive maintenance very 8 years	2 ohur
	Level and number of technician for maintenance	1 technician
	Electrical safety	EN60215(Standard CE)
	Average repair time (change of an RF module or power supply)	1 Hour
SET		
	Power supply cable	Yes
	Installation manual	Yes
	User manual	Yes
	Maintenance manual	Yes
	Tests report	Yes
PRICES		
	Cost for 3 years warranty extention	2% price list

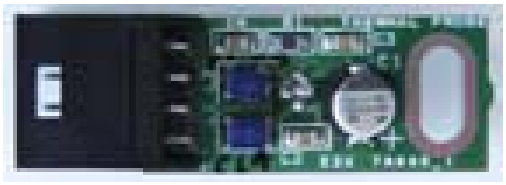
The equipment provided by Elenos srl covered under warranty of 24 months from the date of purchase of the product; That period is meant to be applied to the original that any subsequent buyers.

SPARE PARTS MAINTENACE PREVENTIVE

Power Supply #1 (COD: ETGALIMDR)	
Fuse Kit	Fuse Kit 500
RF Fan (COD: 1VENT002)	

SPARE PARTS CORRECTIVE MAINTENACE

RF Amplifier Module Sx.	TG501141_2
RF Amplifier Module Dx.	TG500141_2
Complete RF Amplifier board with Mosfets #1	TG5 0A141_2 (R)
Complete RF Amplifier board with Mosfets #2	TG5 0B141_2 (L)
Mosfet #1 (COD: 2QRF0012 (BLF278))	
CPU	(see exciter board)
Display (COD: ETG100DS1)	
Absorber Resistors #1 (COD: 2RAF1007)	

front panel (COD: 9MOD2596_2)	
Output armonic filter L.P. FILTER	ETG50A 101_1
Temperature sensor board #1 (COD: E2K 7A000_1)	
Exiter board (monoscheda)	TG5 3A141_1
Driver Board	TG5 2A141_1
Scheda Splitter #1	ETGSPL01
Scheda Pannello Pulsanti	TG5 4A141_0
Scheda Regolatore	TG1K1A151_1
Trasformatore Alimentazione Servizi	E1KDRAUX
Cables RG302 (75 Ohm) #1	CSF0027

ETG1000

Trasmettitore FM 1000W

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BACK VIEW

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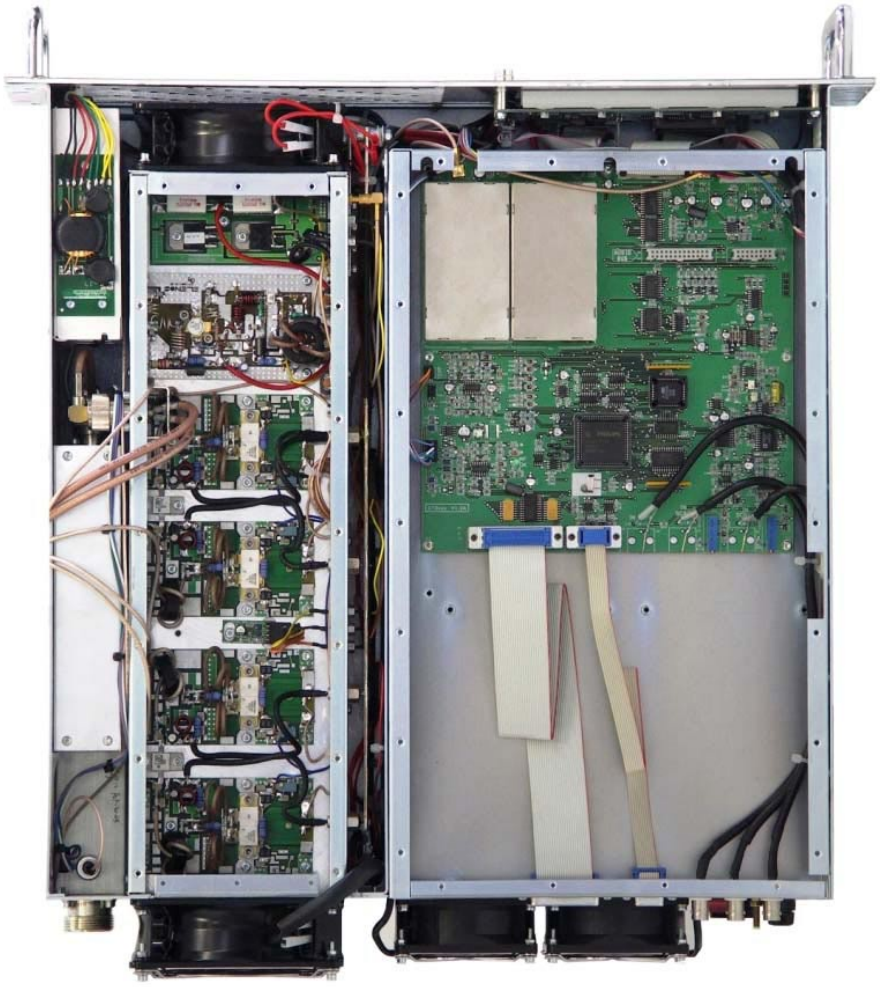
TOP VIEW



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MAIN DISPLAY

	Number of E3000 Amplifiers	4
	Mounted in 19" standard rack	Yes
GENERAL DATA		
	Output Nominal Power	1000 W adjustable
	Operating band	87.5 - 108 MHz
	Output Low-pass Filter	W.B. 87.5 MHz - 108 MHz
	Corrosion	All mechanical parts are stainless steel
	Internal bus RS232/RS485	Yes
	Points of measure	RF Sample-MPX Monitor
	Displayed Parameters	More than 50 parameters displayed on a LCD
	Adjustments	From the frontal panel trough LCD /from PC
	Microprocessor controlled	Yes
	Power supply redundancy	Yes
	Blower redundancy	Yes
	Final stage technology	MOSFET
	Transistor type	BLF278 Philips
	Dimensions: Width	46 cm
	Weight	22 Kg
	RF Modules maximum weight	Kg
	Number of cooling fans or wind turbines on the amplifiers	2
	Number of cooling fans or wind turbines on the exciter	2
	Compact	Yes
CONNETTORS		
	RF Output connector	7/16"
	Input connectors LEFT & RIGHT	XLR female
	MPX Input connector	BNC female
	SCA Connector	BNC female
	Remote control connector	DB25
	RS485/232 Connector	DB9
RF		
	Automatic gain control	Stabilizes the output power value onthe set value
	Overall output power stability	+/-0,1 dB
	Harmonic suppression	> 70 dB
	Spurious signal suppression	> 80 dB
AUDIO		
	L/R Audio input level	+12/-12 dBm to produce 75KHz standard deviation
	L/R level adjustment	Soft adjust 0,1dBm steps from front panel
	L/R Connector type	Balanced XLR
	L/R Input Impedance	10K- 600 selectable

	MPX audio input level	+12/-12 dBm to produce 75KHz standard deviation
	MPX level adjustment	Soft adjust 0,1dBm steps from front panel
	MPX Connetor type	Unbalanced BNC
	MPX Input impedance	10 KΩ- 600 Ω selectable
	PILOT level adjustment	Trimmer adjustable
	SCA/RDS Connector type	BNC
	SCA/RDS Input Impedance	10 KΩΩ
	19KHz Output	Yes
	STEREO/MPX easy changeover	Yes
	AES/EBU Input option	Optional (External adapter)
PERFORMANCE EXCITER		
	Intermodulation distortion	<0.05% Measured with two of tones 1KHz & 1.3KHz, ratio 1:1 at 100% modulation
	Frequency deviaton	+/- 75 KHz 0.1dB steps adjustable
	THD+N	<0.03% @ 1KHz
	Pre-emphasis	50/75 microseconds +/-0,1dB
	Mono frequency response	+/-0.15 dB 30Hz - 15KHz
	MPX frequency response	+/-0.1 dB 30Hz - 100KHz, -45dB at 19 KHz
	Stereo frequency response	+/-0.15 dB 30Hz - 15KHz
	SCA1,2,3 frequency response	+/-1 dB 20KHz - 100KHz, -45dB at 19KHz
	Type of modulation	F3 Direct FM modulation of the RF oscillator in fundamental frequency
	Pilot tone frequency stability	+/-1 Hz
POWER SUPPLY		
	Power supply	110-240 VAC
	Power consumption	1600W typical to the maximum output power KVA
COOLING SYSTEM		
	Cooling system	Foced air-cooling
ENVIRONMENT		
	Temperature range (operating)	0 - +45 °C
	Temperature range (non operating)	-20 - +50 °C
	Humidity range (operating)	95% a 40 °C
	Humidity range (non operating)	90% a 65 °C
	Altitude range (operating)	>4600 meters
	Altitude range (non operating)	>15000 meters
	Remote control	Yes
	Remote Control at clean contacts	Yes
	SNMP option	Under develop
	High frequency radiations from the enclosure	Below limit imposed by technical regulations.
	Functionning type	h24 uninterrupted

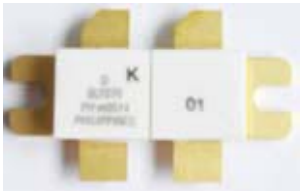
	Electromagnetic fields immunity	Higher than specified by laws on electromagnetic fields compatibility
	CE Mark	Conform to 1999/5/CE European Directive
	Year of the model	2005
	Spares availability guaranteed for	10 years from the date of purchase
	Recurrence	4/8 years
	Blower Replacement recurrence	4 years
	Air blowers quantity and prices	2 x 36 + 2 x 24,6
	Lithium batteris replacement recurrence	10 years
	Batteries	Yes
	Time to realize the preventive maintenance every 4 years	1 ohur
	Time to realize the preventive maintenance very 8 years	2 ohur
	Level and number of technician for maintenance	1 technician
	Electrical safety	EN60215(Standard CE)
	Average repair time (change of an RF module or power supply)	1 Hour
SET		
	Power supply cable	Yes
	Installation manual	Yes
	User manual	Yes
	Maintenance manual	Yes
	Tests report	Yes
PRICES		
	Cost for 3 years warranty extention	2% price list

The equipment provided by Elenos srl covered under warranty of 24 months from the date of purchase of the product; That period is meant to be applied to the original that any subsequent buyers.

SPARE PARTS MAINTENACE PREVENTIVE

Power Supply #1 (COD: ETGALIMPFC)	
Power Supply #2 (COD: ETGALIMDR)	
Fuse Kit	Fuse Kit 1000
RF Fan (COD: 1VENT002)	
Output Fan Power Supply Fan (COD: 1VENT020)	
Aux Fan	

SPARE PARTS CORRECTIVE MAINTENACE

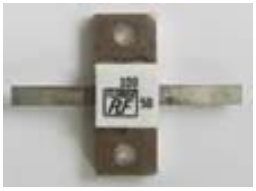
RF Amplifier Module Sx.	TG501141_2
RF Amplifier Module Dx.	TG500141_2
Complete RF Amplifier board with Mosfets #1	TG5 0A141_2 (R)
Complete RF Amplifier board with Mosfets #2	TG5 0B141_2 (L)
Mosfet #1 (COD: 2QRF0012 (BLF278))	

Mosfet #2 (COD: 2QRF0016 (BLF245))

CPU (see exciter board)

Display (COD: ETG100DS1)

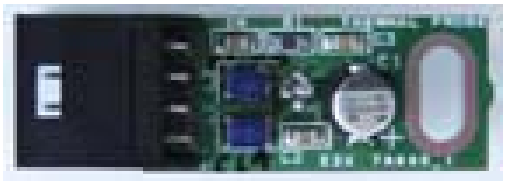
Absorber Resistors #1 (COD: 2RAF1007)



front panel (COD: 9MOD2596_2)

Output armonic filter L.P. FILTER TG1K4A151_0

Temperature sensor board #1 (COD: E2K 7A000_1)



Exiter board (monoscheda) (COD: TG1K AA151_1)

Driver Board TG030A 101_1

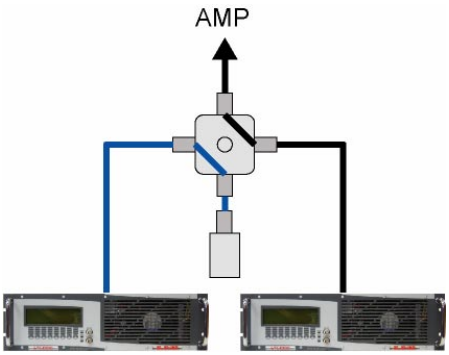
Scheda Testina di Lettura (COD: TG1K7151_1)

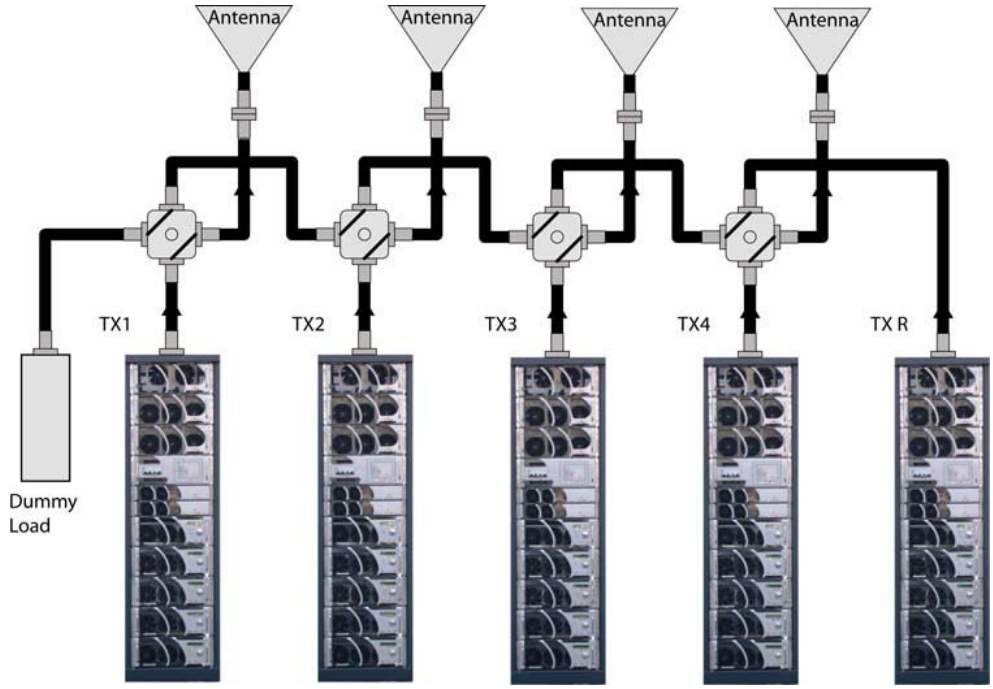
Scheda Splitter #1	TG1K3A151_0
Scheda Pannello Pulsanti	TG5 4A141_0
Scheda Regolatore	TG1K1A151_1
Trasformatore Alimentazione Servizi	E1KDRAUX

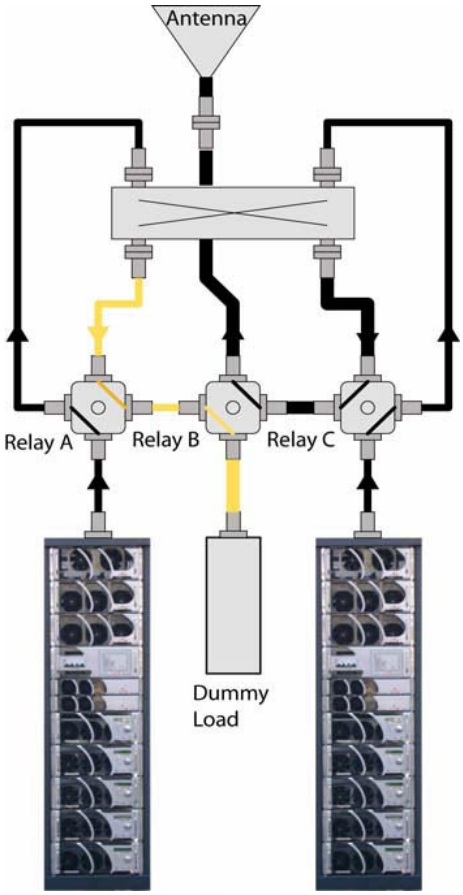
Cables RG302 (75 Ohm) #1 (COD: CSF0027)

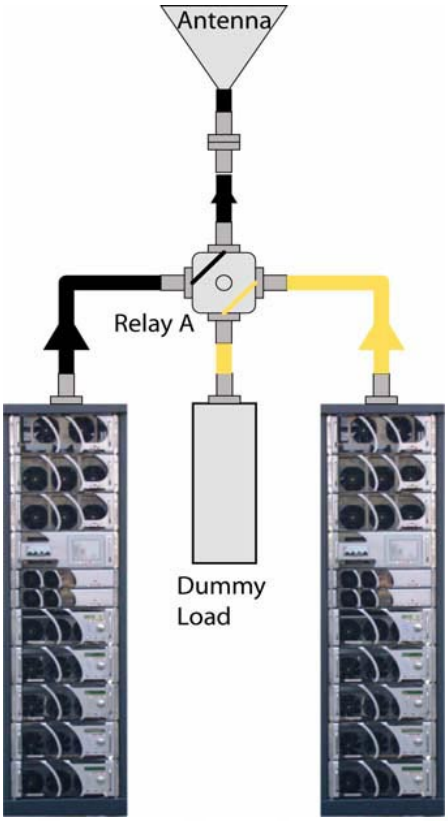
Cables RG178 (50 Ohm) #1	CSF0009
Cables RG179 (75 Ohm) #1	CSF0012

SYSTEMS 1+1 – N+1X









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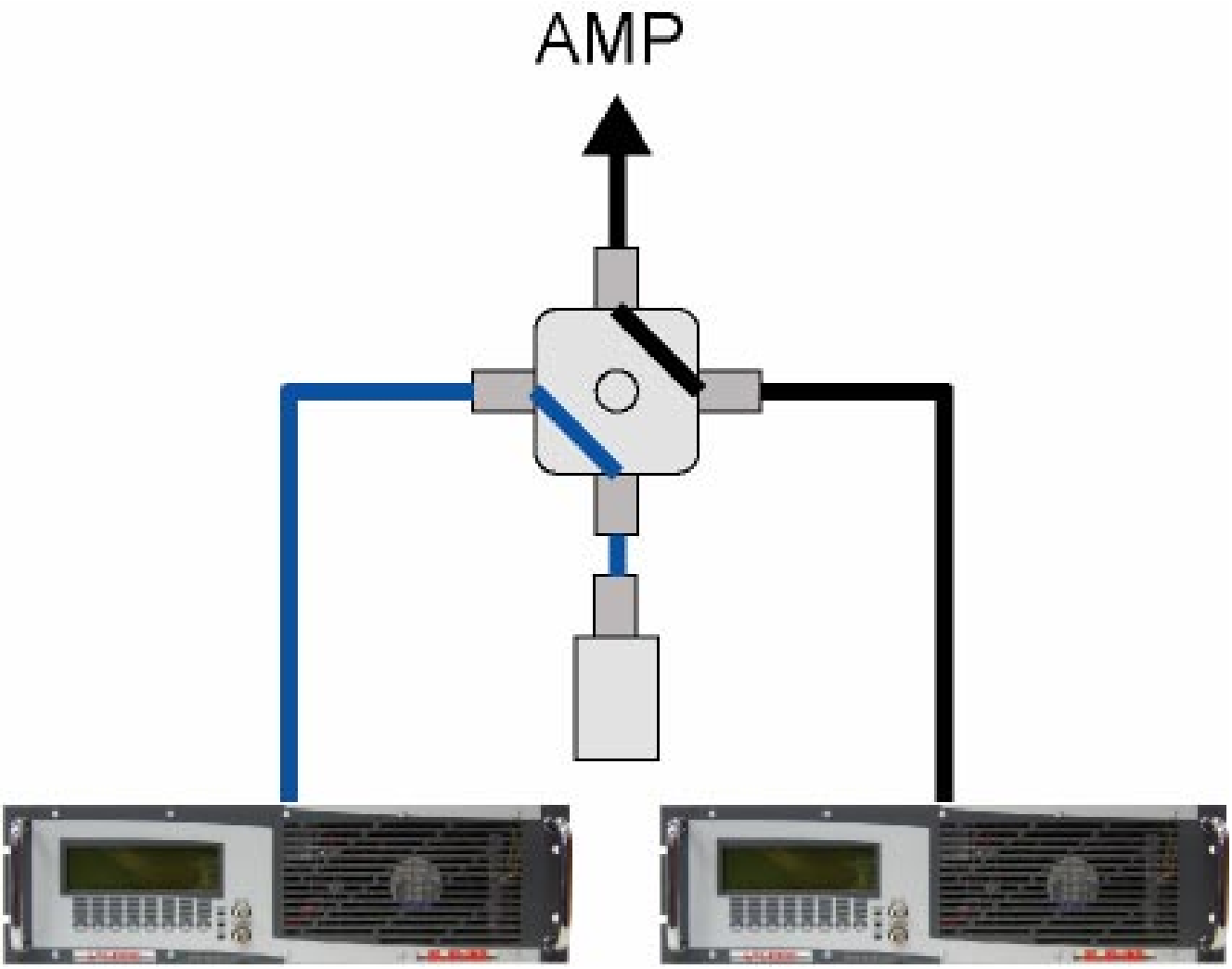
DOUBLE EXCITER SYSTEMS



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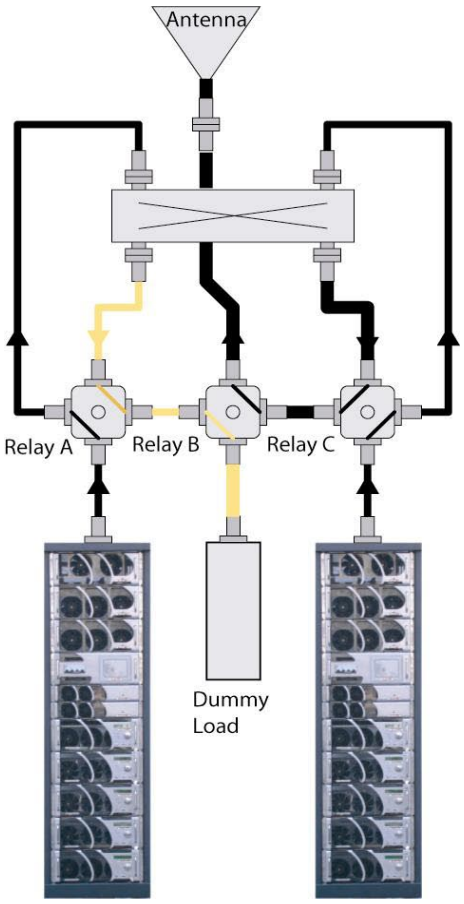
1+1 ACTIVE RESERVE SYSTEMS



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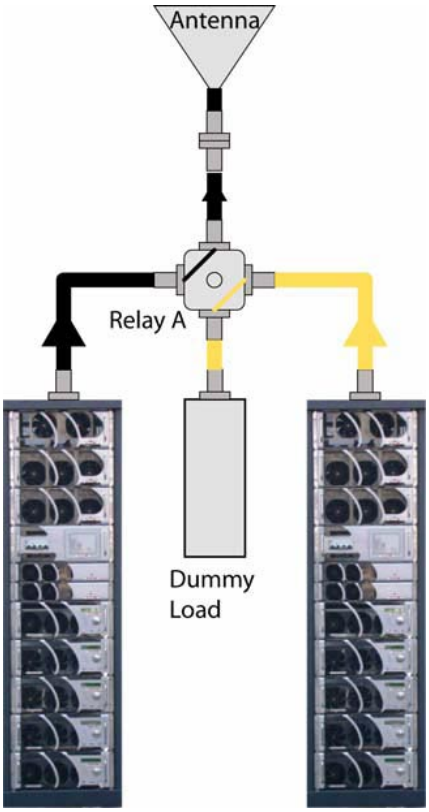
1+1 PASSIVE RESERVE SYSTEMS



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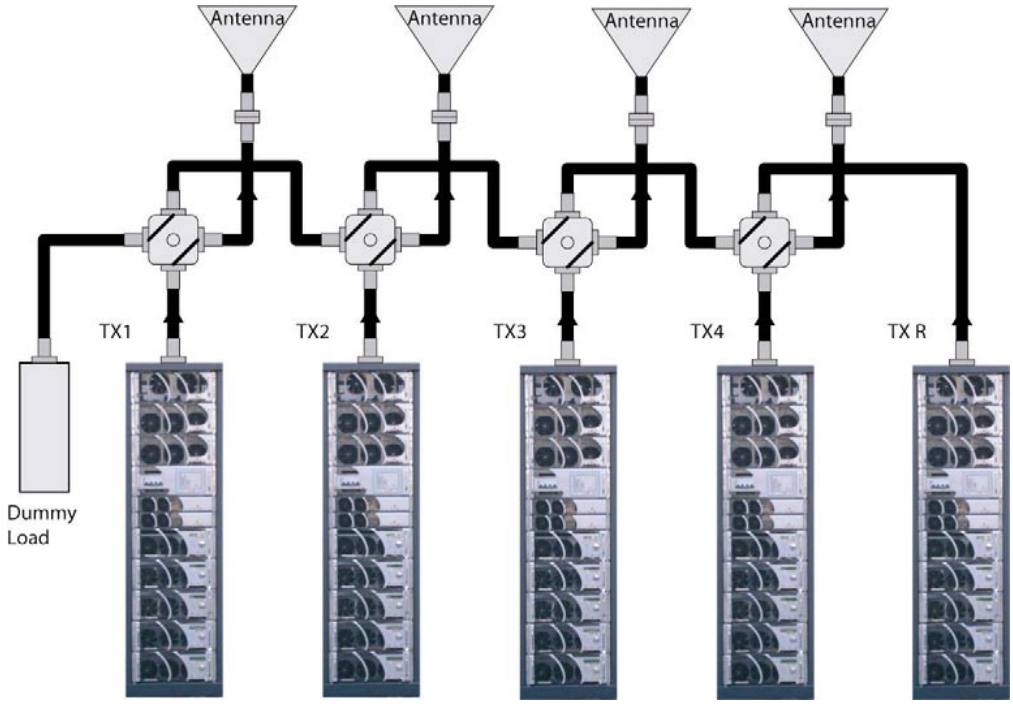
N+1X SYSTEMS



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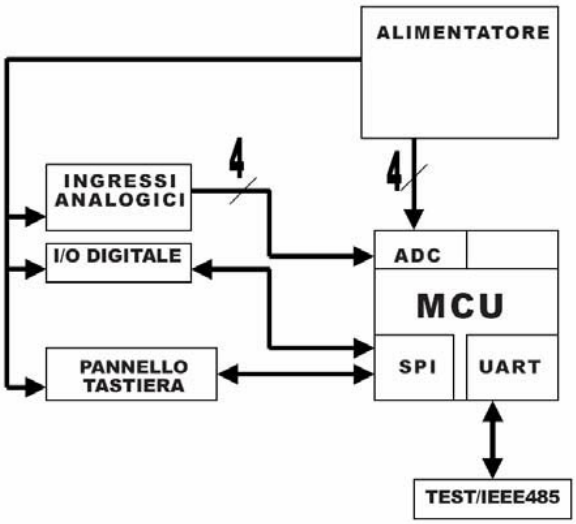
ECHOS CHANGEOVER CONTROLLER



POWER SUPPLY	
Supply voltage:	230V monofase 50-60Hz
Consumption:	36 VA
Weight:	5 kg
DIGITAL I/O	
8 optoisolated inputs + 8 relais outputs	
Maximum output current:	1 A
Maximum optoisolated input voltage:	24 VDC
ANALOG INPUT	
4 system galvanically isolated inputs	
Maximum non linearity in the range:	0,3%
Separately adjustable gain for:	10 V f.s. 5 V f.s. 2,5 V f.s. 2V f.s.
A/D CONVERTER	
Reading resolution:	10 bit ± 2 LSB
Maximum converter non linearity:	0,5 LSB

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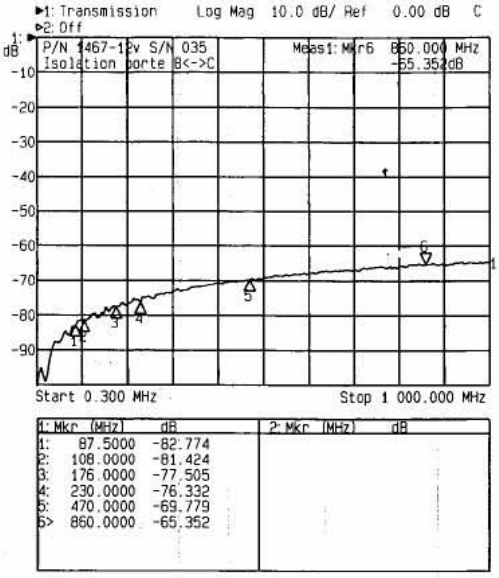
Technical data sheet

Part Number **1467**

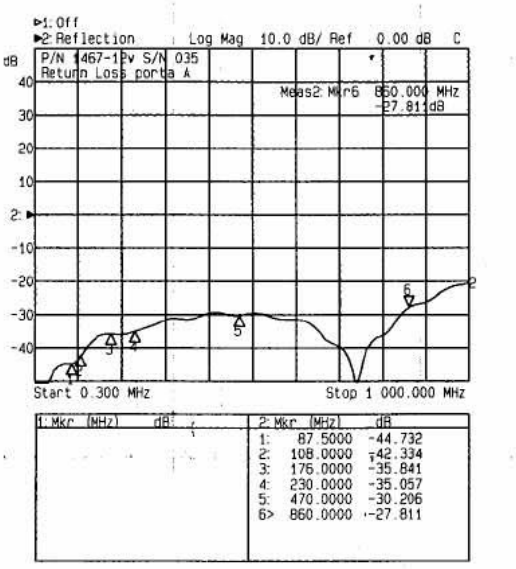
Commutating lir

DC ÷ 862 MHz Motorized Coaxial Switch 7/16



Mechanical Characteristics

Connections	DIN 7/16
Overall dimensions [WxDxH] [mm.]	117x117x146
Temperature range [C°]	-10 ÷ 50
Weight [kg.]	1.7



Electrical Characteristics

Frequency Range [MHz]	DC to 862 MHz
Insertion Loss [dB]	< 0.05
Input/Output Impedance [Ohm]	50
Operating Voltage [Vac]	220-240 / 50Hz
Control Voltage [Vdc]	5, 12 or 24
Switch-over Time [s]	< 3"

Frequency band	FM Radio	III	IV/V
Return loss [dB]	> 40	> 30	> 26
Insulation [dB]	> 80	> 75	> 65

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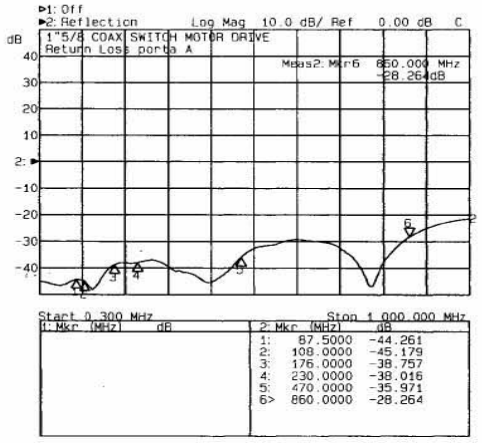
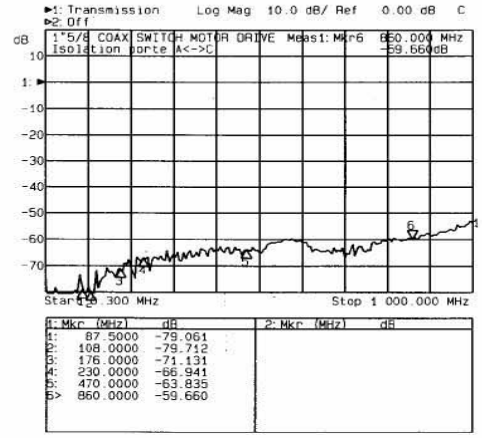
Technical data sheet

Part Number **1364**

Commutating line

DC ÷ 862 MHz **Motorized Coaxial Switch 1 5/8”**





Mechanical Characteristics

Connections	EIA 1 5/8”
Overall dimensions [WxDxH] [mm.]	205x205x295
Temperature range [C°]	-10 ÷ 50
Weight [kg.]	6.5

Electrical Characteristics

Frequency Range [MHz]	DC to 862 MHz
Insertion Loss [dB]	< 0.05
Input/Output Impedance [Ohm]	50
Operating Voltage [Vac]	220-240 / 50Hz
Control Voltage [Vdc]	5, 12 or 24
Switch-over Time [s]	< 3”

Frequency band	FM Radio	III	IV/V
Return loss [dB]	> 40	> 35	> 26
Insulation [dB]	> 80	> 65	> 60
Max. power [W]	10000	8000	4000

Data updating 21/02/2006

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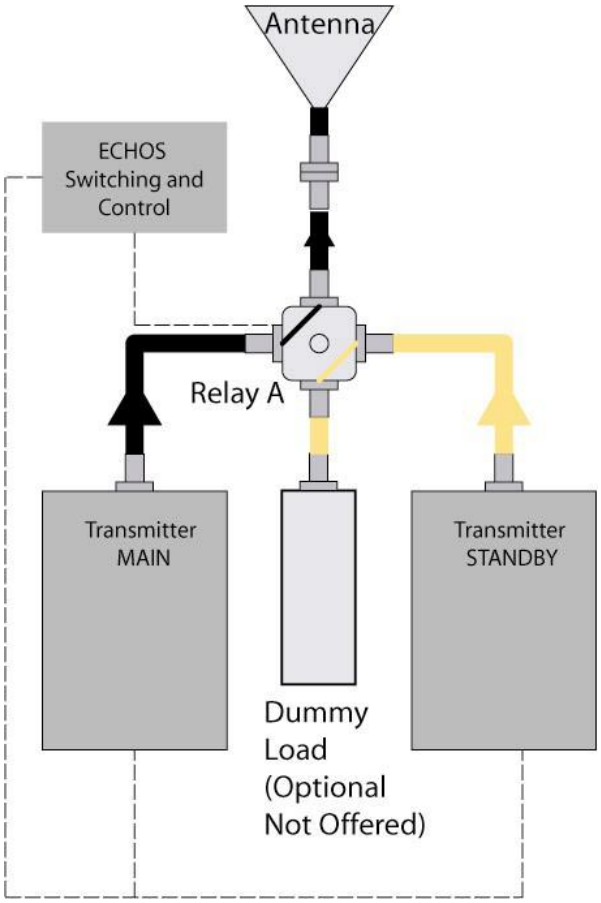
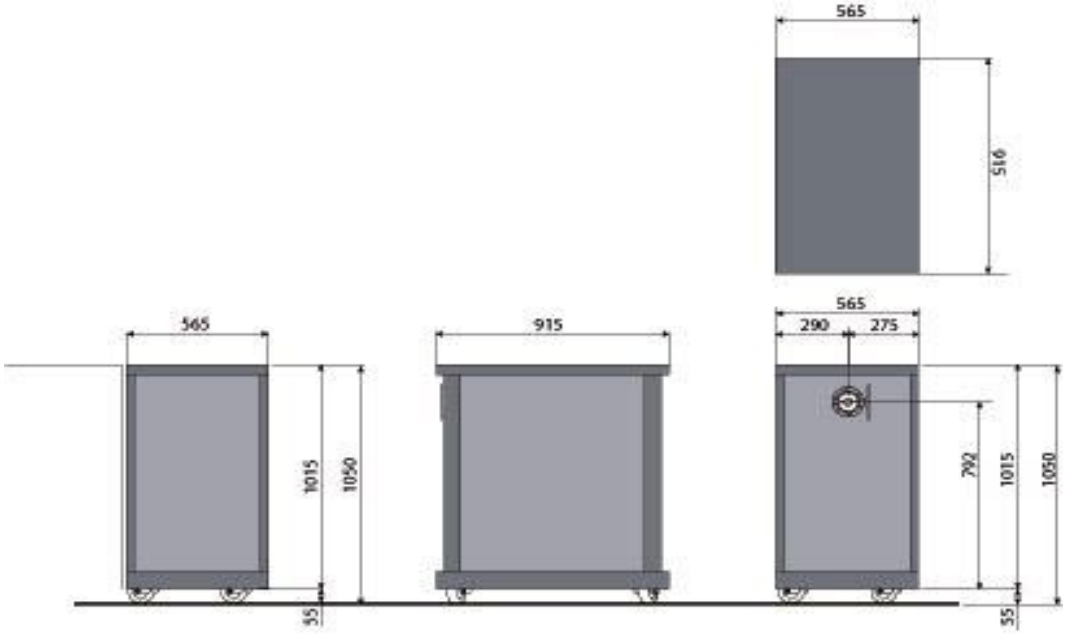
500W+500W

2XETG500 DR CHANGEOVER SYSTEM





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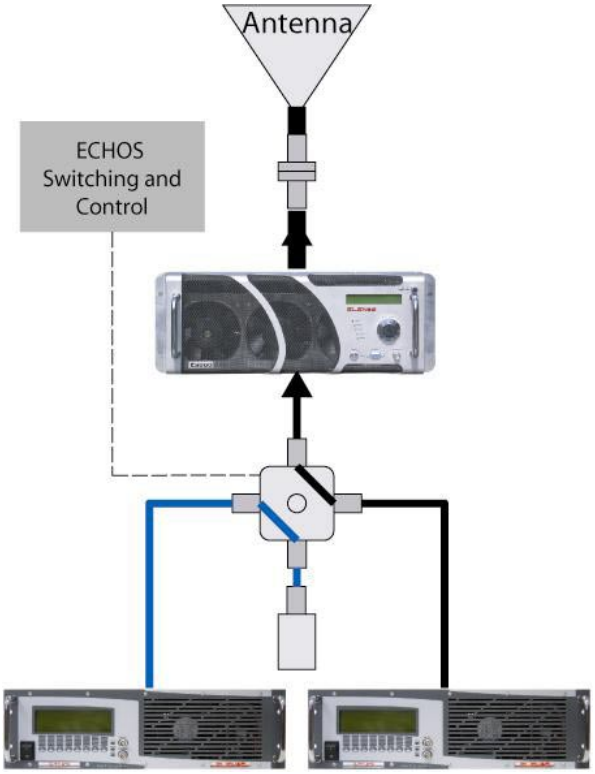
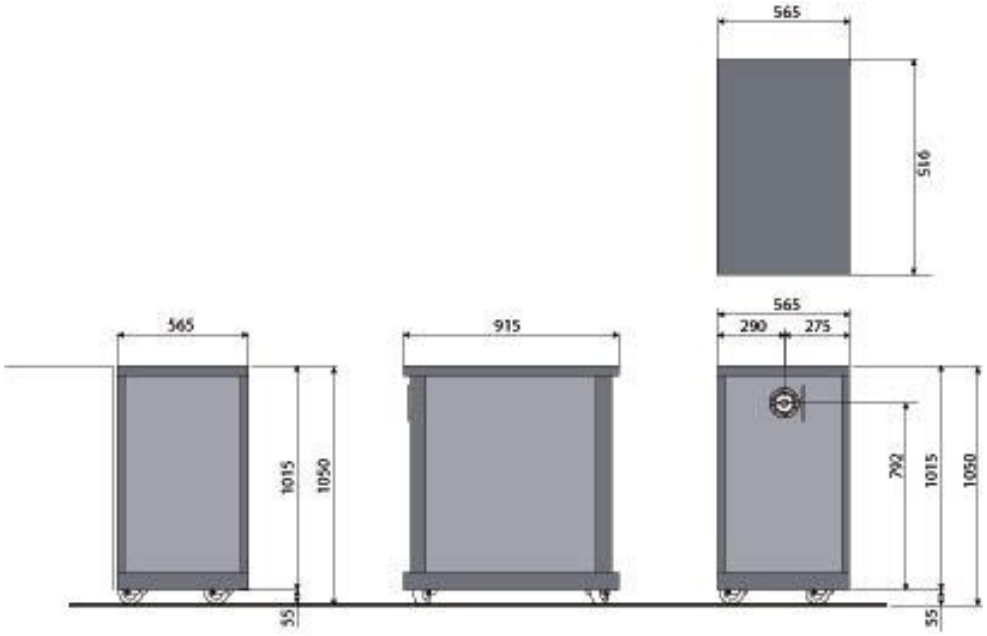
2000W DUAL EXCITER

ET2000 DUAL DRIVE TRANSMITTER





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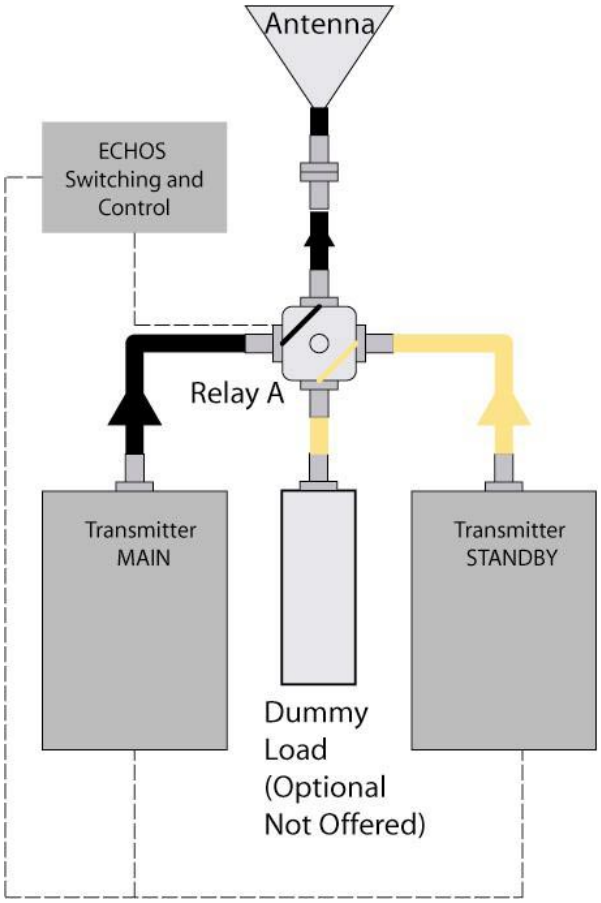
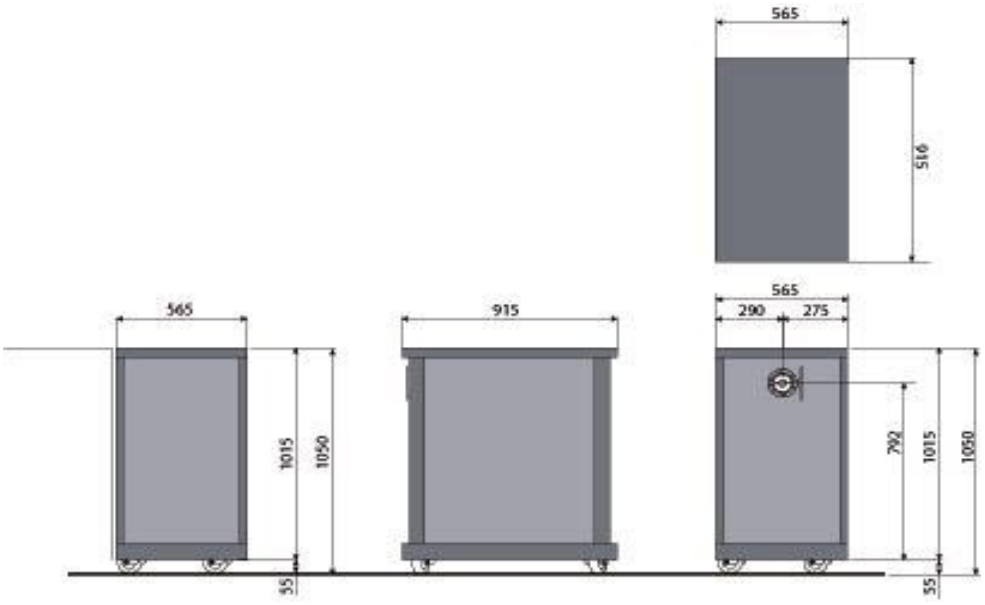
3500W+500W

ET3500 TRANSMITTER + ETG500 DR AS RESERVE





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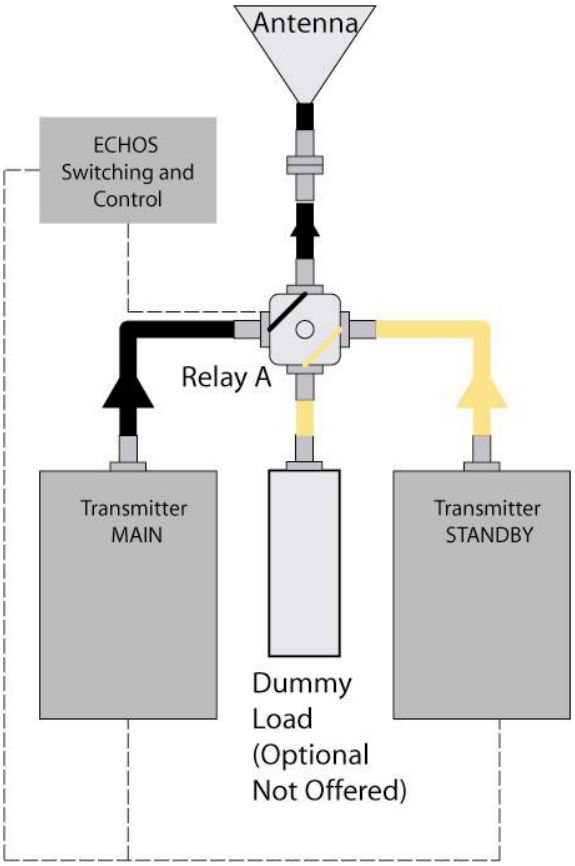
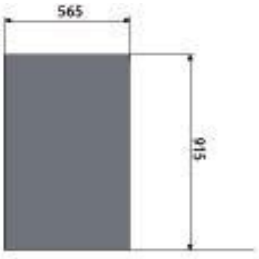
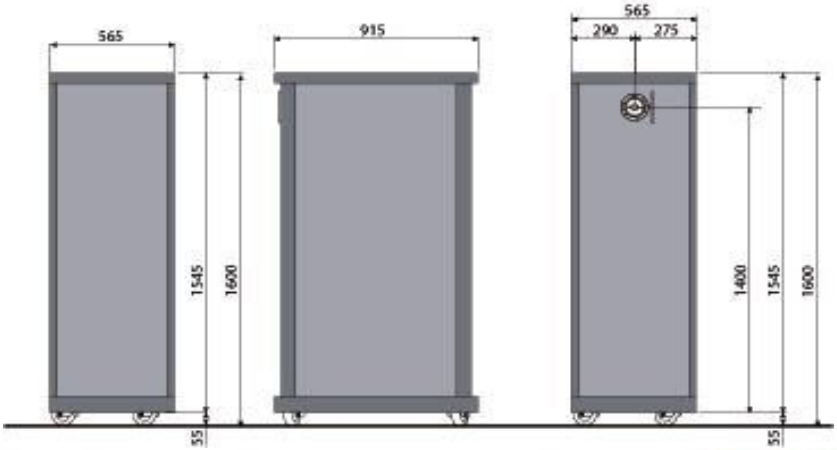
5000W+2000W

EK5000 TRANSMITTER + ET2000 DR AS RESERVE







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4+1 10KW SYSTEM

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TELEMETRY

The telemetry can be connected to equipment of any other broadcast producer through analogue or digital inputs/outputs, or to the brand new generation of Elenos equipment via its RS 485 port.
It is provided with 8 digital inputs, 8 analog inputs, 8 outputs dry contacts relay outputs, GSM modem, battery, Battery charger, led bar visualizing the GSM signal level, RS232 and RS485 ports.
The user can see parameters and give commands to the equipment via connection between Modem and PC and via SMS.
Name, scale and alarm threshold of parameters are programmable through linear or logarythmic conversion, therefore any tipe of parameter can be seen in perfect scale: Voltage, Amperage, Power, Temperature etc.
All inputs are programmable to generate and send SMS alarms. For example, the user can program the telemetry to send an alarm when the transmitter power goes under a set threshold, when the site door is open or it temperature on site is too high and so on.
The outputs can be programmed at dry contacts normally open or closed, or at negative or positive impulse.
The connection to PC is made using Windows standard Hyperterminal, therefore it is not only intuitive and easy-to-use, but also there is no need of a specific software installation. It uses a ASCII protocol and it's easily adaptable to other producers' software.
Thank to the internal battery, it sends an SMS in case of mains interruption.
A led bar on the front panel indicates the signal level of the GSM modem thanks to which it is easy to adjust the antenna for a better reception.

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SOLAR PANNEL

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MINIBOX

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RADIO LINK RECEIVER – ELR SERIES

MAIN FEATURES

- New functions and characteristics such as “Noise” and “Subcarrier” alarms.
- Microprocessor controlled.
- Large LCD graphics display show running parameters and settings.
- Direct, low noise, frequency Synthesizer with 10KHz steps.
- Frequency reference with high stability TCXO.
- Extremely simple frequency changing.
- Inputs, outputs and controls on front panel.
- Automatic switching between AC 110/220V and DC 12.5V supplies.
- High selectivity, double conversion.
- Very low noise, low distortion digital pulse demodulator (no calibration required).
- MPX processor with double low pass filter, amplitude and delay equalisation.
- 2 in-phase and 1 opposite-phase MPX outputs.
- 1 linear or or de-emphasised Mono output with 15KHz low pass filter.
- Remote telecontrol output alarms on front panel.
- IF 10.7MHz monitor on front panel.

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- Slides out for easy maintenance and repairs.

SOME OF THE AVAILABLE FUNCTIONS

Main window from which you can access to measures and setup menu. The equipment's operation can be observed from this window i.e. the reception frequency, PLL and squelch status, frequency deviation and reception signal. Your logo or trademark can be put in the square at the top left.

Frequency setting window. Scroll the "UP" and "DOWN" buttons with increasing speed until you reach the desired frequency and memorise with the "STORE" button. An analogical indicator shows the VCO's working position.
The deviation value can be read as a composite of the MPX signal or as deviation due only to the pilot tone at 19KHz. In both cases the analogical indicator shows the peak number. Every time 75KHz are exceeded, the word "OverModulation" appears in the "Composite deviation" window. One new function of this type of equipment is its subcarrier alarm that indicates loss of 19KHz pilot tone and thus that there is no modulation (In MPX signals).

In this window's SETUP menu you can set, the signal level at 0.1 dB steps directly for all the outputs in dBu (0dBu=0.775V) for a 75KHz deviation.

The reception signal is measured on a log scale with a dynamic of 60dB.
Another window with the same scale allows to fix the threshold of the squelch in a precise way.

RADIO LINK TRANSMITTER – ELT SERIES

MAIN FEATURES

- User interface with graphic display (240X64 pixels) and simple and intuitive menus.
- Direct low noise Frequency Synthesizer with 10KHz steps.
- Frequency reference with high stability TCXO
- 6 watts RF output power.
- Completely wide band (no calibration necessary over the whole range).
- Automatic power control (APC) for a constantly stable power.
- Wide choice of measurements: Direct and reflected power; internal air and RF amplifier temperatures; composite and MPX-Subcarrier frequency deviation; RDS and SCA frequency deviation
- Protection of reflected power with gradual reduction of output power (and reset) without stopping apparatus.
- RDS and SCA audio inputs on the front panel. RF output on front or back panel.
- Recognition and automatic (or manual) addressing of MPX and Mono signals.
- All operating parameters adjustable without opening the apparatus.
- AC 110/220V and DC 12.5V supply with automatic switch-over.
- Alarm outlet for remote controls on the front panel (optional).

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- Drawer type mechanism for taking out the frame and ease of maintenance and repairs.

SOME OF THE AVAILABLE FUNCTIONS

The main window from which you can access the measures and setup menu. This window also gives the operational state of the apparatus, the transmission frequency and the state of the PLL, information on Audio input and measurement of the deviation and output power. The panel in the top left corner can be used for insertion of your own logo or trademark.

Frequency setting window. With the "Up" and "Down" keys you can move, with increasing speed, in steps of 10KHz to the desired frequency which is then memorised with the "Store" button. An analogue indicator bar showing the VCO working position with lighting up of the writing "Out of Range" if the frequency setting is wrong.
Special care has been given to all the variable measurements thanks to the use of a vhighly accurate 12-bit ADC. In particular, measurement of the deviation parameter, very important in a transmitter, can be done for the total deviation, the MPX pilot frequency tone and any SCA or RDS sub-carriers present. For all measurements there is an analogue bar or numeric indicator.

"SETUP" menu window from which it is possible to adjust the output power. The value set remains stable over the entire frequency range thanks to the APC system (automatic power control). In the presence of stationery waves the system reduces proportionately the output power without stopping the apparatus and resetting the full power when the anomaly stops.
Window from which the input Audio signal parameters can be set. It is possible to set input impedance, pre-emphasis and signal type (Mono or MPX). Selecting the "Auto" mode the type of signal used in the "Audio In" input is recognised and addressed automatically.

Input Audio level adjustment window. Sliding the "UP" and "DOWN" keys fixes the signal input level ("IN Lvl" bar) and the deviation obtained can be seen simultaneously. The transmitter is calibrated for 75KHz deviation with an Audio signal of 0 dBu.