ENAG
l'énergie créative d'un constructeur

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June 26th 2017

DESCRIPTION : **Protection, control and power supply box for GMDSS system**

Vessels equipped with an AC or DC onboard network (external regulated filtered charger *)

TYPE : FCC - GMDSS 30 - RAE

REFERENCE : SEEL006413D

SERIAL NUMBER :

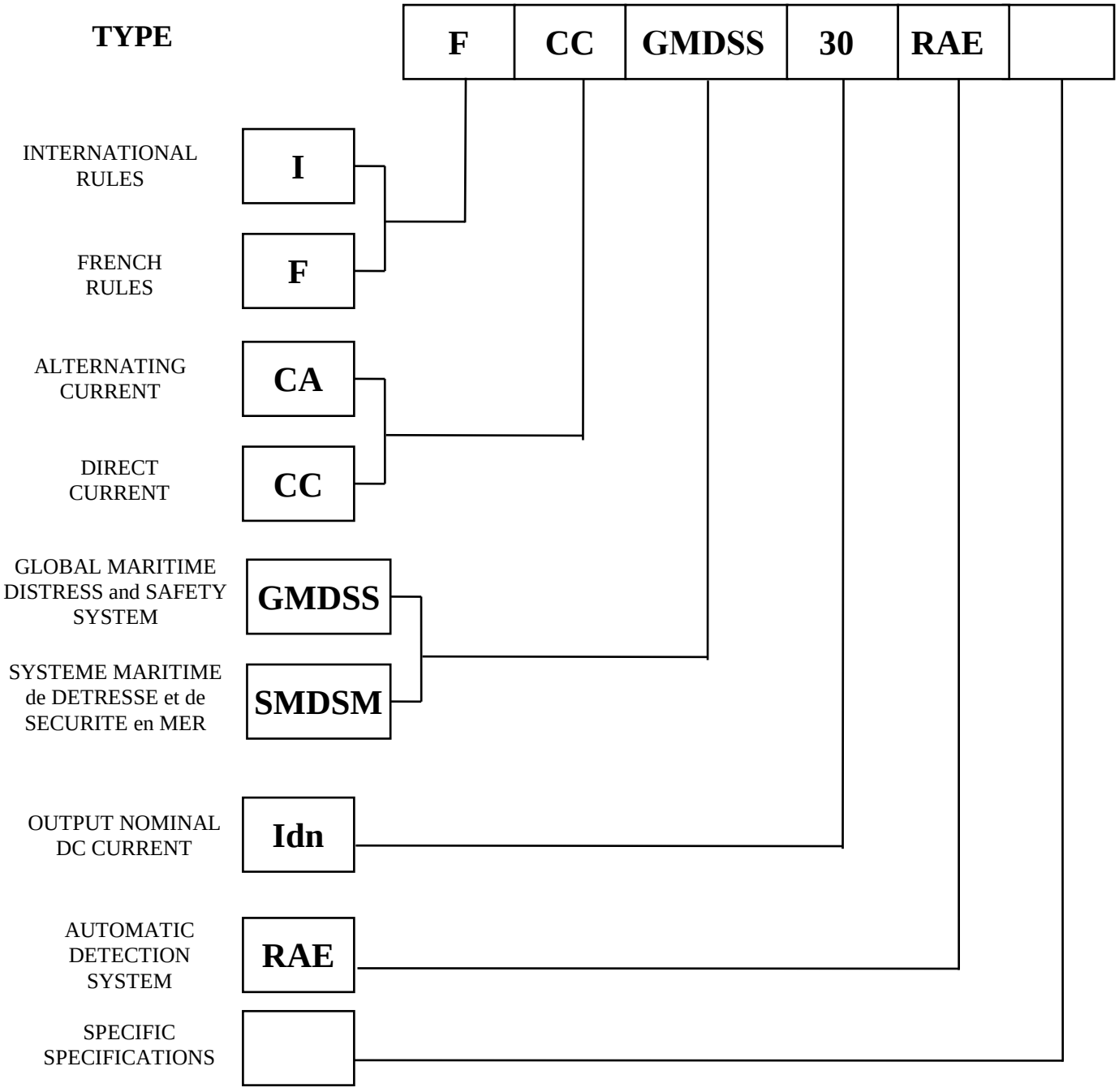
MANUFACTURER CODE : F 3645

CUSTOMER :

IDENTIFICATION

MATERIAL	FCC - GMDSS 30 - RAE

Material identification procedure



CONTENTS

1 - GENERALITIES

ENAG designs and manufactures power supplies for the marine environment for more than 30 years.

We also propose regulated and filtered power supplies and converters, monitoring systems which enable to compose the global supply of the GMDSS system and a full range of battery chargers.

This manual is intended for equipment users and installation and maintenance engineers. The manual must be read thoroughly before any operations are undertaken on the product and all the users must be informed.

Choice of Appliance

The choice of appliance will depend on applicable standards, battery type (technology used, number of cells, capacity), amount of current consumed by the load centres and installation and environment constraints.

2 - PRESENTATION

Compact box in conformity with div. 219 (project from 8/07/98).

It includes :

- 1 main source protected input (On-board generator or regulated and filtered battery charger *) — 219 - 13 - 1
- 1 separator diode - navigation post engine room — 219 - 13 - 5
- 1 stand-by source protected input (radio battery) — 219 - 13 - 1
- 1 emergency source protected input (service battery with associated generator if in operation) — 219 - 13 - 1
- 1 automatic reverser without cut-off — 219 - 13 - 3
- 1 supervision PCB with active protection,

  indicator lights, buzzer, voltmeter and ammeter

  - Main source over voltage default. Lights + Buzzer — 219 - 13 - 4 et 219 - 13 - 6
  - Emergency and stand-by battery under voltage defaults. Lights + Buzzer. Automatic battery test — 219 - 13 - 4
  - 1 Voltmeter and 1 ammeter — 219 - 13 - 3 et 219 - 25 - 4
- Protected outputs :
  - 1 HF transmitter
  - 1 Standard C
  - 1 Telex or 2nd standard C
  - 1 VHF with ASN
  - 1 VHF with ASN
  - 1 Navtex
  - 1 Emergency light or GPS

3 - OPERATING DESCRIPTION

The functioning principle of the GMDSS box is based on Automatic detection System (RAE system).
Taking into account the "GMDSS" supply logic, the aim is to supply the appropriate power with an optimal autonomy thanks to radio-communications systems.

Functioning modes :

1 – Main source present

The main generator, directly connected (DC) or through a battery charger (AC), supplies the loads and maintains the radio battery in good charge state. The whole system functions in "UPS" mode.

A stand-by battery test (radio battery) is carried out periodically (every 6 hours). It enables to :

- Check that the battery is present
- Check that the battery is in good charge state
- Lengthen its life duration by carrying out charge and discharge cycles.

The SW1 switch located on the control PCB enables to immediately launch a stand-by battery test (inspection control).

2 – Main source defective

The main generator does not supply the loads anymore. Two options are possible :

OPTION A : priority to the stand-by source. Use of the control PCB in U4 of the PAL ref GMDSS24A.

The loads are first supplied without cut-off by the stand-by source (within the limit of specified voltage), then by the emergency source. That way the emergency source is protected for an optimum autonomy.

OPTION B : priority to the emergency source. Use of the control PCB in U4 of the PAL ref GMDSS24B.

The loads are first supplied without cut-off by the emergency source (within the limit of specified voltage), then by the stand-by source. That way the stand-by source is protected for an optimum autonomy.

In case an over voltage of the main generator is detected, the generator is immediately disconnected and the loads are supplied by the stand-by or emergency source depending on the option chosen.

3 - Ship alongside the quay, motor stopped

The operator puts the switch on the « OFF » position. The radio is only supplied by the service battery as long as the battery main switch is not activated.

When the motor is started, the buzzer sound tells the user to put the switch on the "ON" position. The box is in operation.

4 - TECHNICAL CARACTERISTICS

4.1 ELECTRICAL CARACTERISTICS

- Main generator input : 24 VDC 30A
- Radio battery input : 24 VDC 30 A
- Service battery input : 24 VDC 30 A
- Protected loads outputs : 1 x 24VDC 30A
  6 x 24VDC 3A

4.2 MECHANICAL CHARACTERISTICS

- Housing in a metallic box with cable-glands.
- On the front panel, one voltmeter and one battery ammeter, alarm PCB and display PCB (Leds, buzzer). On/off switch and state light.
- IP 20 protection with natural ventilation

4.2.1 CLIMATIC SPECIFICATIONS

- Temperature : - 10°C at + 45°C
- Humidity : 95 % without condensation

4.2.2 APPILCABLE STANDARDS AND RULES

- Merchant Marine Rules Part 219
- SOLAS Rules
- Bureau Veritas approval
- CE Marking
- European directive.

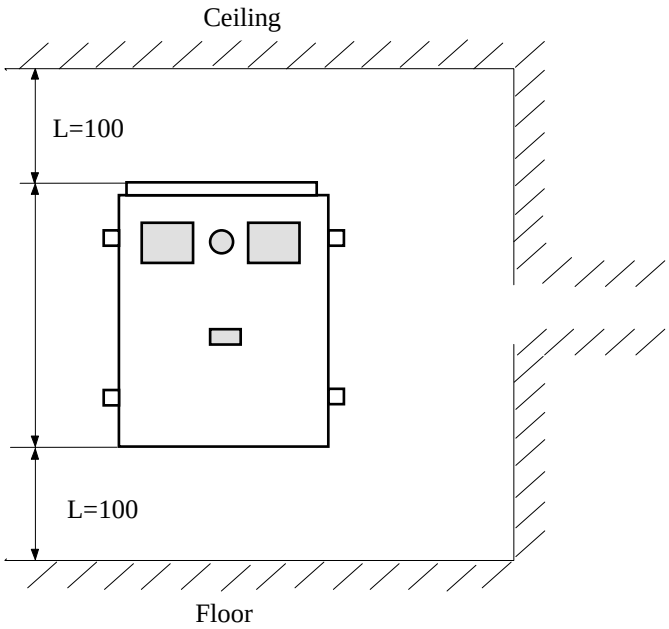
5 - INSTALLATION - CONNECTION - SETTINGS TROUBLESHOOTING

5.1 INSTALLATION

As the appliance is cooled by natural convection, a minimum allowance must be left for installation as shown.

Mounting centre distance and space requirement: see enclosed drawing.

The situation of the charger must be adapted to its protection rating.



5.2 CONNECTION

- The cable connection is done through metallic cable glands
- A shielded cable connection attenuates electromagnetic disturbance and reduces the susceptibility of the appliance. This type of cable is recommended in all installations.
- The ground terminal or lug of the appliance must be connected by a short, wide strap to the installation ground.
- The ground strap of the shielded cables must be linked to the appliance ground inside the case.
- Separate the supply, load and control cables.

5.3 SETTINGS

See enclosed drawing.

5.4 TROUBLESHOOTING

5.4.1 Switch at 0

- The led functioning on emergency battery remains switched off.

  ➲ **Check** the presence of voltage at the input terminals, the state of the F5 and F6 fuses.

- The voltmeter does not show the stand-by battery voltage.

  ➲ **Check** the presence of voltage at the input terminals, the state of the F3 and F4 fuses.

5.4.1 Switch on 1

- The led main source presence remains switched off.

  ➲ **Check** the presence of voltage at the input terminals, the state of the F1 and F2 fuses.

- The led main source presence is lit and the led functioning on main source remains switched off.

  IF OPTION A : priority to the stand-by source. Use of the control PCB in U4 on the PAL REF GMDSS24A

- The led functioning on stand-by source is lit.

  ➲ **Check** the voltage of the main source.

  ➲ **Check** the stand-by battery test is not running.

- The led functioning on emergency source is lit.

  ➲ **Check** the voltage of the main source and the stand-by source.

  IF OPTION B : priority to the emergency source. Use of the control PCB in U4 on the PAL REF GMDSS24B

- The led functioning on emergency source is lit.

  ➲ **Check** the voltage of the main source.

- The led functioning on stand-by source is lit.

  ➲ **Check** the stand-by battery test is not running.

  ➲ **Check** the voltage of the main source and the emergency source.

- The led stand-by battery default is lit.

  ➲ If the red led on the control PCB is lit, this means that a stand-by battery test has been carried out and that the result is negative. This led will remain lit until the next test.

  ➲ If the red led on the control PCB is not lit, this means that an over voltage on the stand-by battery has been detected.

  In both cases, check the stand-by battery.

Contact the ENAG Technical Department who will indicate any further tests to be carried out according to the measuring and testing means available to the operator.

☞In case of failure persistence, please contact the ENAG factory. The material must be dismounted and sent to the factory where the internal electronic circuits are checked on an appropriate test bench.

6 - MAINTENANCE

- Switch off the power.
- If the appliances are situated in a dusty atmosphere, clean them periodically with a vacuum cleaner as a build-up of dust prevents heat dissipation.
- An annual check on the main nuts and screws may prove necessary in highly disturbed environments (strong vibrations, wide temperature variations, etc.).
- The electrolytic capacitors must be replaced on average every ten years.
- A full technical inspection by a qualified inspector is recommended every year.

Guidelines on equipment installation

By virtue of European directive 89/336/EC, the equipment must conform to electromagnetic compatibility criteria ⇨ Date of application: January 1st, 1996.

The two main demands in terms of electromagnetic compatibility are:

- **Emission**: Protection of the environment against disturbance by conduction and radiation.
- **Immunity**: Absence of susceptibility in a disturbing atmosphere.

Installation

General Rules

The equipment must be installed according to the recommendations of the user manual. The main rules are as follows:

- Use shielded cables with a correct section in order to power the appliance and the load centres within acceptable tolerance limits.
  (Definition criteria: nature and length of the cables, ambient temperature, voltage drop, type of tracking, etc.).
- Make sure the equipment is correctly ventilated for good heat dissipation (installation space, ambient temperature, etc.).
- Choose the location in accordance with the protection rating of the appliance.

Emc-related installation guidelines

Cables:

- Use shielded cable for all connections (*). The shielding must be grounded on the transmitter side and the receiver side.
- Keep the cables and shielding connections as short as possible.
- Feed the cables as close as possible to the ground ("loose" cables or loops are to be avoided - fasten the cables down to the ground).
- Separate the supply and load cables.
- Separate the power and control cables (minimum 200 mm).
- The cables should only supply power to the appliance. A branch connection or bridge to supply another appliance are to be prohibited.

(*) This is a recommendation but is not compulsory. The installation electrician will consider the EMC environment and decide whether or not to use shielded cable.

Metal casing

- The cases or cabinets for the appliances or containing the equipment must be metallic or have a conductive coating.
- The ground bolt or lug of the casing should be connected to the main ground by the shortest strap possible. The bolt connected to the main ground must have a good electrical contact (scratch off the paint and weld the bolt).
- The ground being the reference point of the potential, the various current-bearing parts of the equipment environment must be made equipotential by linking them together (where possible, metal shielding and troughs are grounded with the shortest straps).

Additional attenuator systems

- The coils of contactors, relays, solenoid valves and electromagnets must be equipped with overvoltage arresters (RC circuits, varistor or diode on direct current, RC circuits or varistor on alternating current).

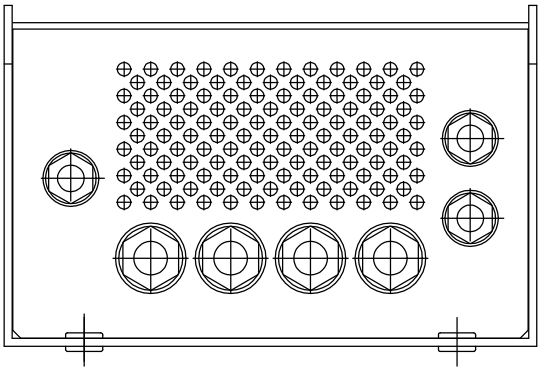
- Additional filters may be mounted according to applicable standards. Disturbance attenuation enables the specified levels to be attained. The filters must be mounted as near as possible to the appliance.

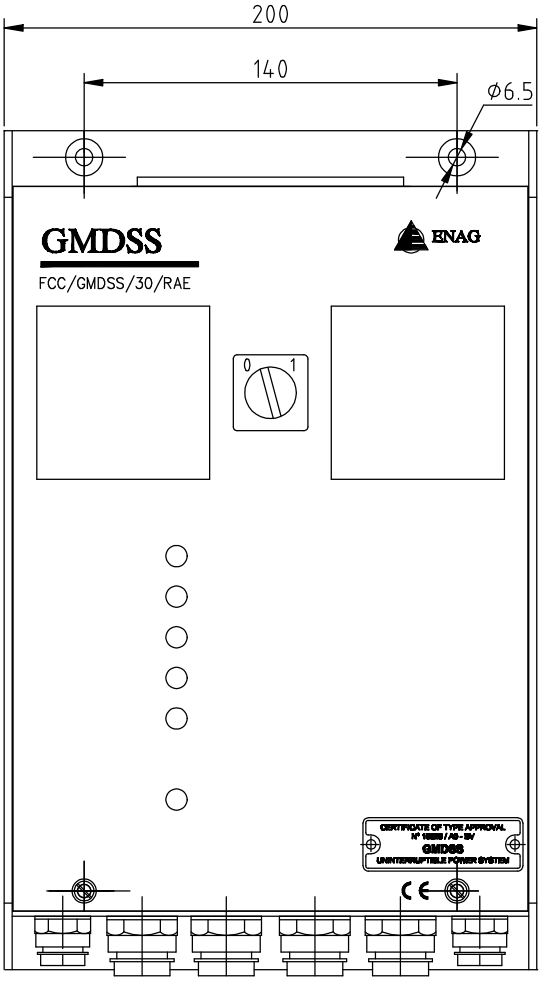
  Remember that filters increase the leakage current.

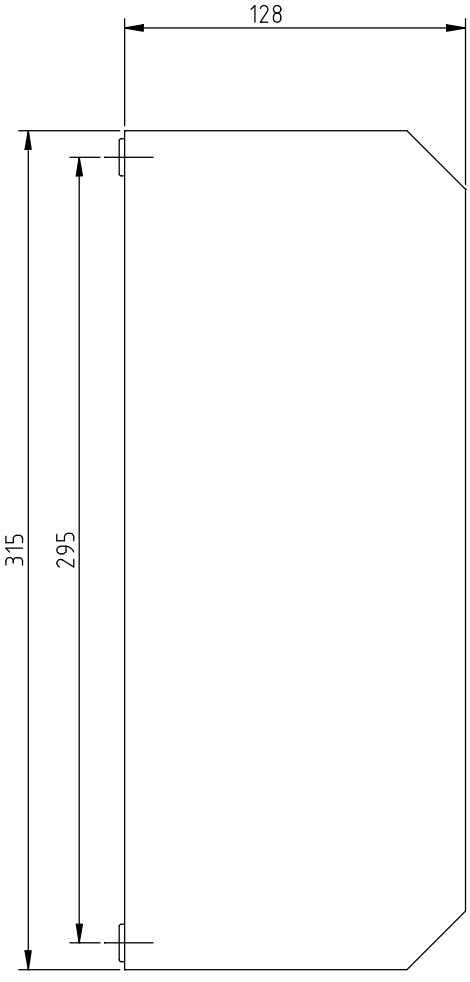
  As a general rule, we recommend consulting the manufacturer before installing a filter, particularly on the load and control cable side.

APPENDIX

Dimensions (power supply)	**N° 06413 01**
Electrical drawings	**N° 06413 02**
Connections	**N° 06413 03**
Dimensions (remote display)	**N° 16127 15**
Connections (remote display)	**N° 06413 10**
Spare parts list	**N° 06413 RA**
Settings (PCB)	**N° 04834 05**
Synoptic	**N° 04809 09**
Synoptic	**N° 04809 10**







MASSE : 3KG

				Quantité :
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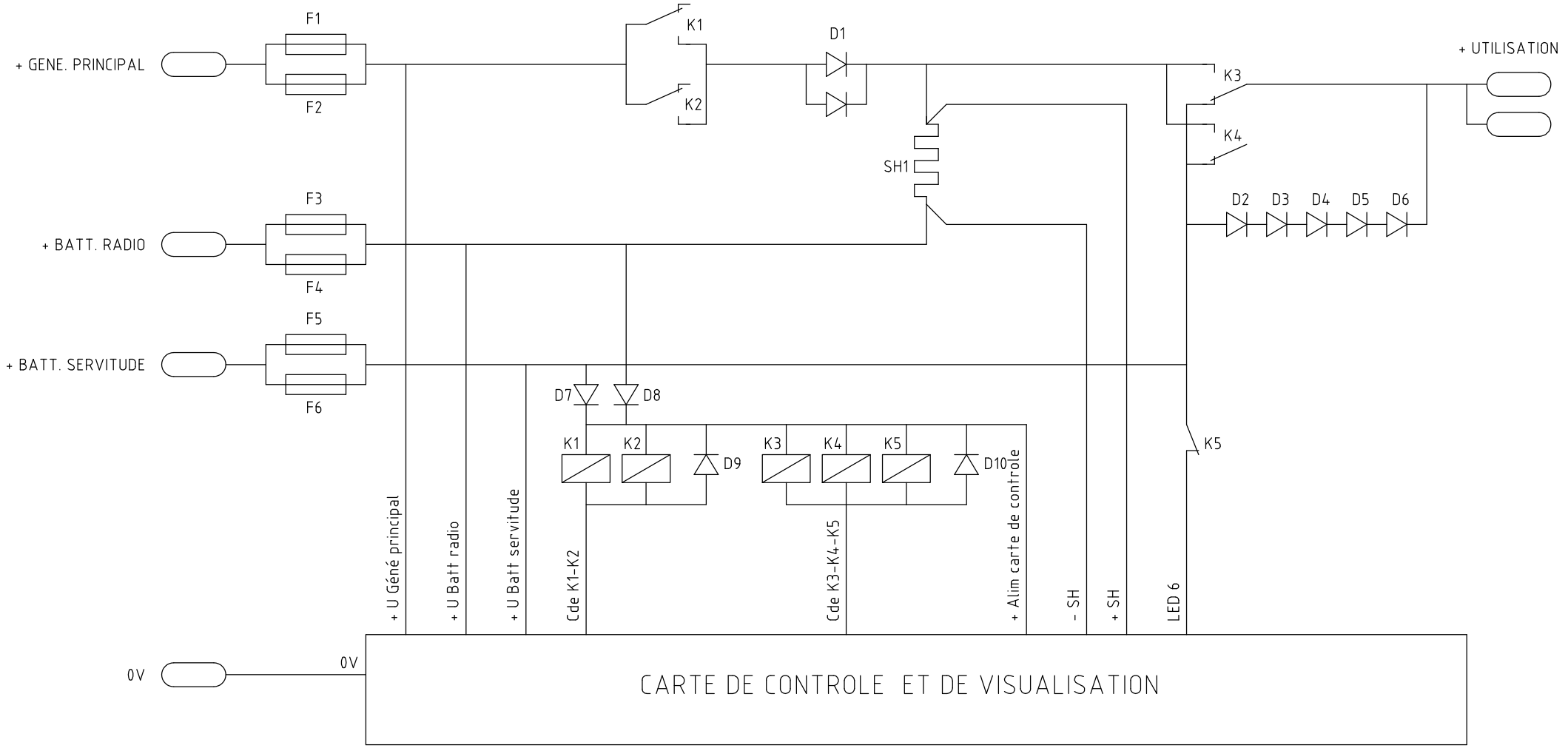
Date	Indice	Modification	Visa	
SMDSM 30 R.A.E. DIMENSION / ENCOMBREMENT			Ech : .5	Finition :
			Tol. générale :	Usiné :
47, Av. P. Mendès France 29000 QUIMPER Tél. 02 98 55 51 99 Fax 02 98 55 51 67		ENAG	Dessiné : GLM	Le : 27 09 01
			Vérifié :	F° : /
			N° 0641301 A	



Date	Indice	Modification	Visa	Quantité :
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SMDSM 30 R. A. E.
SCHEMA DE PRINCIPE

Tol. générale :	Usiné :
Dessiné : GLM	Le : 27 09 01
Vérifié :	F° : /
N° 0641302 A	

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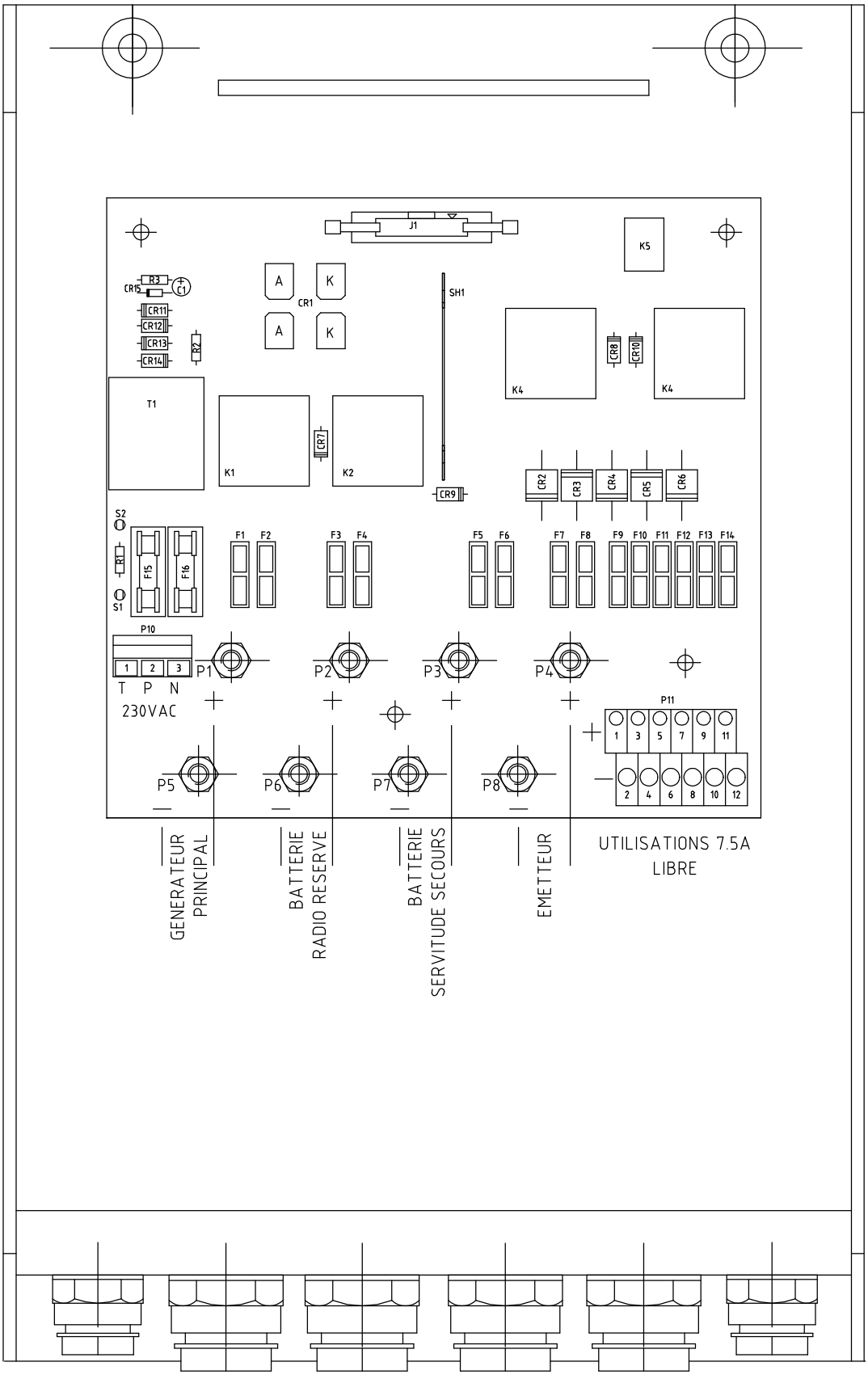

Date	Indice	Modification	Visa

SMDSM 24/30 SYSTEME R.A.E.
RACCORDEMENT

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Quantité :	
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Dessiné : GLM	Le : 27 09 01
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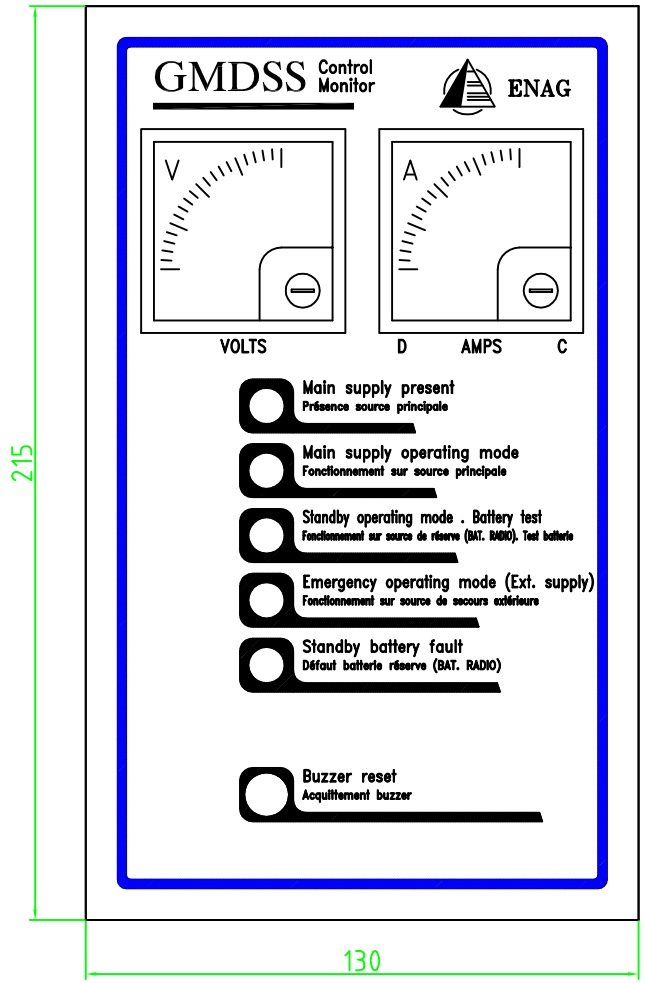
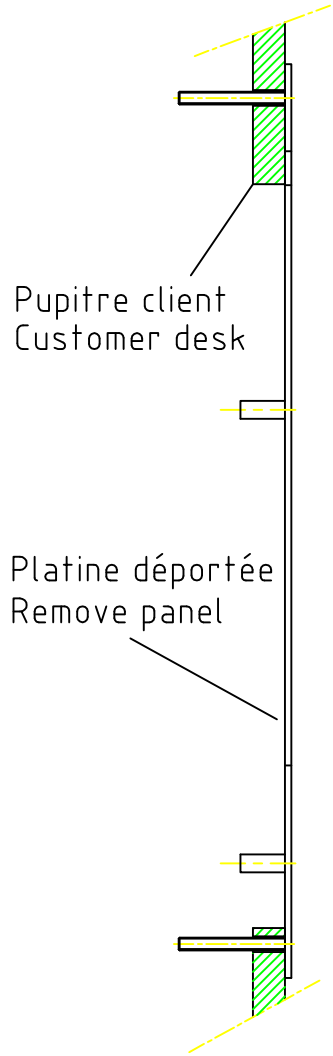
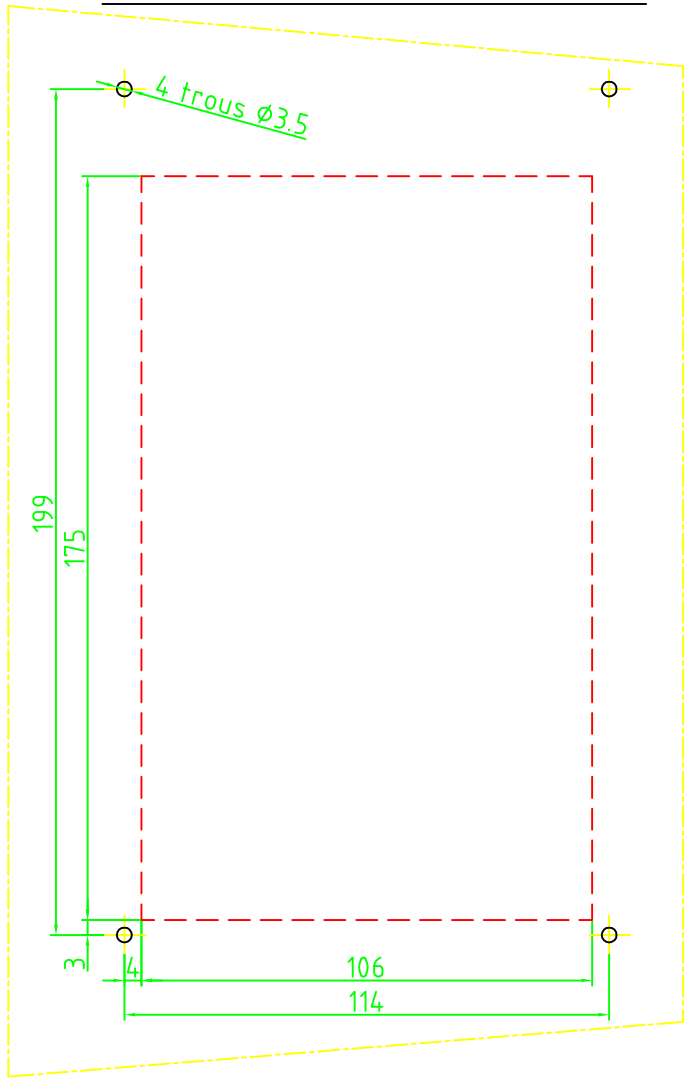
N° 0641303 A	

Platine déportée
remove panel





Découpe sur pupitre client
Cutout section on customer desk



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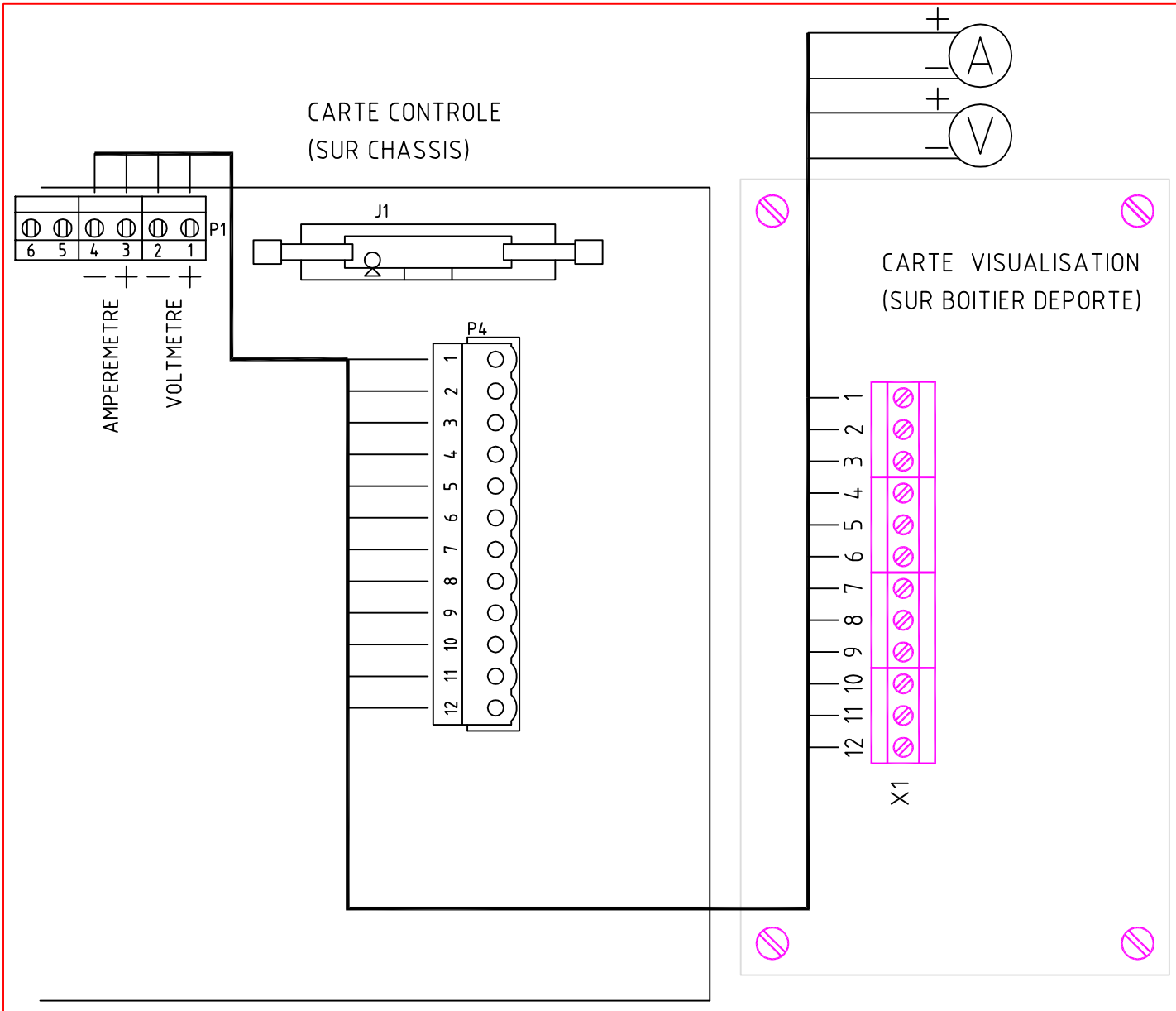
Date	Indice	Modification	Visa	Ech :	Finition :
PLATINE DEPORTEE VISUALISATION DECOUPE PUPITRE CLIENT CUSTOMER DESK CUTOUT SECTION				Tol. générale :	Usiné :
31, rue Marcel Paul 29000 QUIMPER Tél. 98 55 51 99 Fax 98 55 51 67		ENAG		Dessiné : C.Pr.	Le : 16-09-2015
				Vérifié : F.Pe.	F° : /
				N° 16127 15A	



RELIER LES CONNECTEURS NUMERO A NUMERO

BORNE 1 A BORNE 1 ; .....; BORNE 12 A BORNE 12.

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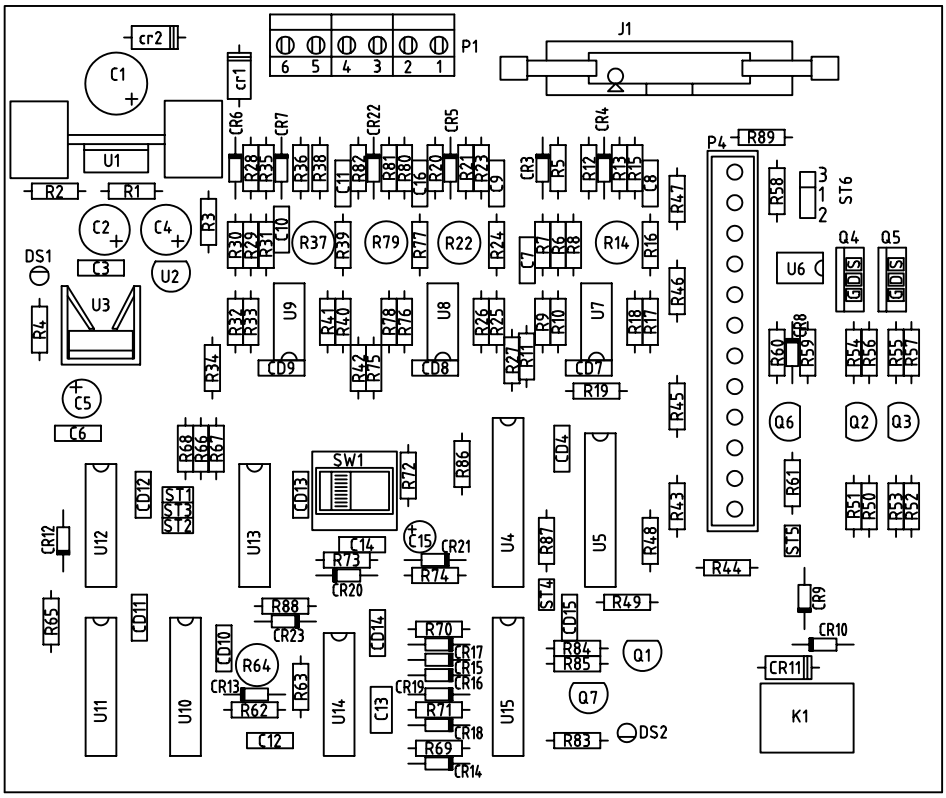
				Matière :
Date	Indice	Modification	Visa	
COFFRET DEPORTE RACCORDEMENT			Ech :	Finition :
			Tol. générale :	Usiné :
47, Av. P. Mendès France 29000 QUIMPER Tél. 02 98 55 51 99 Fax 02 98 55 51 67	ENAG		Dessiné : GLM	Le : 08 10 01
			Vérifié :	F° : /
			N° 0641310 A	

SEEL006413A N° 06413RAB

SPARE PARTS LIST

Rev :	Description			DATE :	NATO CODE :
B	SMDSM 24/30 SYSTEME RAE			17/01/2003	F3645
Qty	**Mark**	**Description**	**Reference**	**Manufacturer**	**Partnumber**
8	F1 à F8	Fuse ATO 15A-32V		ENAG	30011476
6	F9 - F14	Fuse ATO 7,5A-32V		ENAG	30013145
2	F15-F16	Fuse 5x20		ENAG	30005209
1	PL2	Control board		ENAG	SEEL004970A
1	PL1	Power board		ENAG	SEEL004835A
1	8	Anmeter		ENAG	30013611
1	6	Voltmeter		ENAG	30013587
1	PL4	Display board		ENAG	SEEL004932A



R14 : Niveau détection surtension génerateur principal

R14 : Overvoltage detection level main generator

R22 : Niveau de coupure tension basse batterie réserve

R22 : Low voltage cut-off level stand-by battery

R79 : Niveau de détection de défaut batterie en cours de test

R79 : Battery failure detection level during test

R37 : Niveau de coupure tension basse batterie de secours

R37 : Low voltage cut-off level emergency battery

R64 : Durée du test

R64 : Test duration

ST1 et ST3 : Durée / Duration 5,5mn

ST3 : Durée / Duration 11mn

ST2 : Durée / Duration 16mn

ST4 : En position : test batterie possible même en l'absence de batterie servitude

ST4 : In position : Battery test available even without any service battery

ST5 : En position : impossibilité d'inhiber le buzzer sur absence source principale

ST5 : In position : It is impossible to inhibit the buzzer in the absence of main source

ST6 (3, 1, 2) Source principale : source AC

Main source : AC source

ST6 (3, 1, 2) Source principale : source DC

Main source : DC source

DS1 : Présence tension.

DS1 : Voltage presence

DS2 : Le test s'est terminé en défaut.

DS2 : The test is finished in default

SW1 Fonctionnement normal : Test toutes les 6 heures.
1er test au bout de 3 heures après mise sous tension

Normal fonctioning : Test every 6 hours
First test 3 hours after power-up

Lancement immédiat du test batterie de réserve

Immediate starting up of the stand-by battery test

Date	Indice	Modification	Visa

Quantité :

Matière :

CARTE CONTROLE / CONTROL PCB

RACCORDEMENT - REGLAGES / CONNECTION SETTINGS

Ech :

Finition :

Tol. générale :

Usiné :

Dessiné : GLM

Le : 06 01 99

Vérifié :

F° : /

N° 04834 05B

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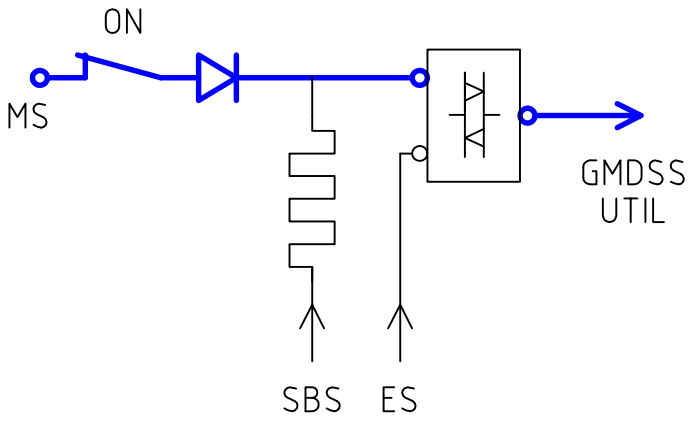
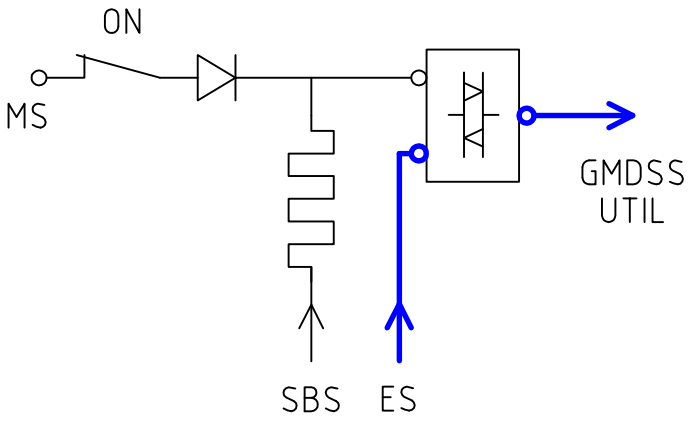
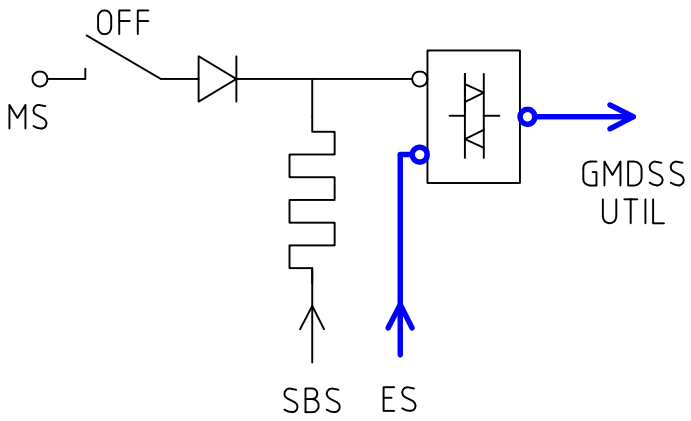
1 Main supply on



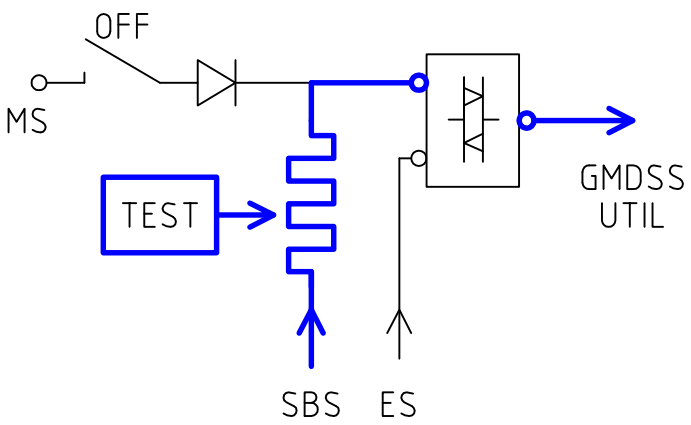
4 Main supply off and stand-by source out of order



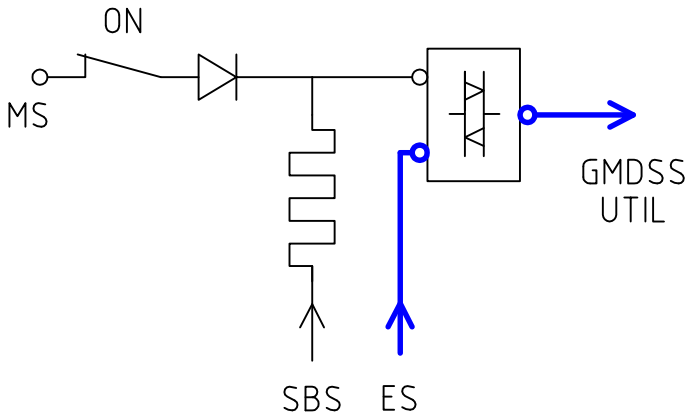
2 Overvoltage main supply



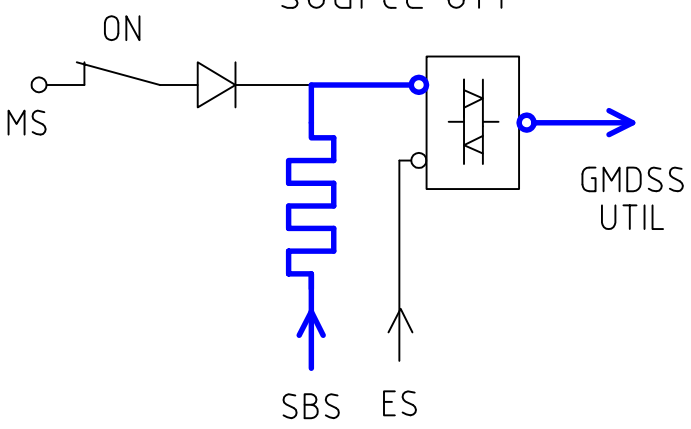
5 Battery test



3 Main supply off



6 Main supply and emergency source off



MS : Main Supply
SBS : Stand-By Source - external radio battery
ES : Emergency Source - External DC current source

GMDSS - RAE

Power automatic detection system with integrated battery test
Programmable selection of stand-by and emergency source

Type approval certificate : 10528/A1

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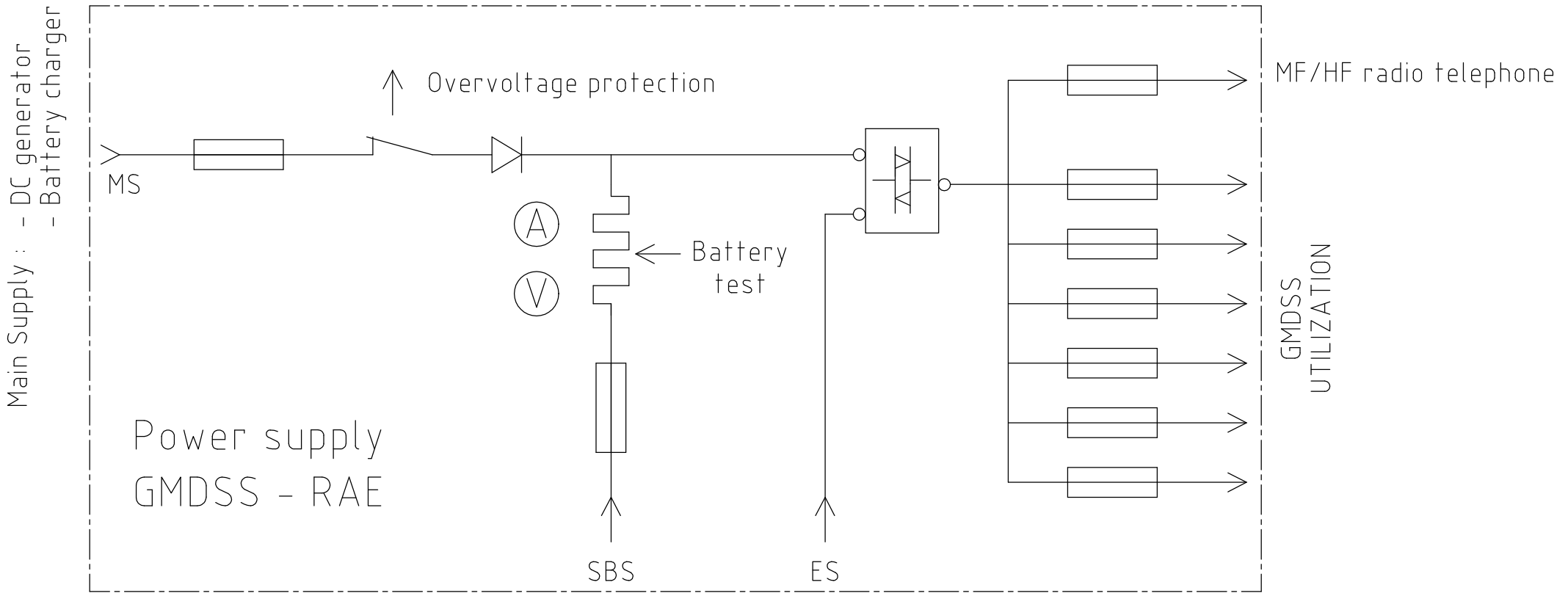
N° 0480909B	



- Automatic and uninterruptible switching of three sources
- Input overvoltage protection
- A constant fault monitoring of all power sources
- Automatic battery test
- Programmable selection of stand-by and emergency sources
- Integrated voltmeter and ammeter

GMDSS - RAE
Power automatic detection system with integrated battery test
Programmable selection of stand-by and emergency source

Type approval certificate : 10528/A1

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N° 04809 10B