ENAG
l'énergie créative d'un constructeur

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Documentation
24VDC
C.DM.V.Range

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CDMV High-Frequency
Switch-Mode Charger Range
Approved by the Bureau Véritas

CONTENTS

❶ Introduction

1.1 Installation and operating manual

The present document applies to chargers in the ENAG CDMV range of battery chargers listed below.

Supply voltage	Charger voltage	Charger current	ENAG Reference
85 - 265 Vca	24VCC	16A	SEEL002797
85 - 265 Vca	24VCC	20A	SEEL006963
85 - 265 Vca	24VCC	25A	SEEL006329
85 - 265 Vca	24VCC	30A	SEEL006489
85 - 265 Vca	24VCC	40A	SEEL006330
85 - 265 Vca	24VCC	50A	SEEL002674
170 - 265 Vca	24VCC	60A	SEEL003750
85 – 170 Vca	24VCC	80A	SEEL011904
170 - 265 Vca	24VCC	80A	SEEL006331
170 - 265 Vca	24VCC	100A	SEEL006332
170 - 265 Vca	24VCC	120A	SEEL006333

This manual is intended for users, installers and equipment maintenance personnel who must ensure they understand the present document before any intervention on the charger.

1.2 Validity of this document

This document is the property of ENAG; all the information contained in this document applies to the accompanying product. The company reserves the right to modify the specifications without prior notice.

1.3 Guarantee

Failure to comply with the rules for installation and operation cancels the manufacturer's guarantee and absolves ENAG of all responsibility.

The period of guarantee is 12 months. It applies to parts and labour for an **equipment returned to the factory**. Only parts acknowledged to have been defective from the outset will be replaced under the guarantee.

Equipment which has been misused or damaged by errors in connections, impacts, falls or which is defective from having been worked upon by persons other than those authorized by ENAG.

Equipment which has been installed or operated at variance with procedures outlined in the manual provided with each unit.

Under no circumstances, can any indemnity be granted by this warranty.

This warranty does not apply to the following terms :

❶Transportation and packaging charges to and from the factory or authorized service station.

❷Damage sustained in shipment, apparent or concealed.
Claims for such damage must be reported and filed with the carrier by the person receiving the equipment.

1.4 Brief presentation

ENAG has been specialized in the production of power supplies for the marine environment for over 30 years.

ENAG manufactures a complete range of automatic battery chargers.

We can also some regulated and filtered power supplies and converters which permitt to compose especially the global supply of the SMDSM system.

This manual presents the charger's range manufactured according to the BUREAU VERITAS standard, with the material approved by it.

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 users must be informed.

BUREAU VERITAS Approval number
of the CDMV and CDTV range : 06352/E0 BV.

Choice of Appliance

Battery chargers are designed to provide the battery's charging and floating current and, depending on requirements, the operating current. The ENAG models are filtered and, in the event of battery cut-out or damage, allow direct current to be supplied to the load centres.

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.

Appliances running on HF switch mode have the following advantages:

- Less space required
- Low weight
- Very low noise level
- Direct current for working power supply
- Low residual ripple.

1.5 Reference standards applied

The standards applied are:

- **NF EN 60950 + A1 + A2** (October 93): Safety of information processing equipment including electrical office equipment.
- **NF EN 50081-1** (June 92) EMC: Generic standard for emissions
- **NF EN 50082-1** (June 92) EMC: Generic standard for immunity
- **NF EN 55022** (December 1994): Limits and methods for measuring the characteristics of RF interference produced by information processing equipment.
- Bureau Véritas rules for this type of devices.

❷ Characteristics and operation

2.1 Technical characteristics

2.1.1 Mechanical characteristics

- Presentation : metal wall-mounted unit.
- IP 23 protection as standard.
- Standard paint: salt spray-resistant polyester coating.
- Dimensions: see space requirement and mounting plan in appendices.

2.1.2 Input characteristics

Model	Permissible input voltage (Vac)	Permissible input frequency (Hz)	Typical input current rating at 115 Vac
CDMV 24V-16A	85 - 265 Vca +/- 10% monophasé	47 à 65 Hz	5,2A
CDMV 24V-20A			6,4A
CDMV 24V-25A			7,5A
CDMV 24V-30A			9A
CDMV 24V-40A			12,5A
CDMV 24V-50A			12,5A
CDMV 24V-60A	170 - 265 Vca +/- 10% monophasé		9A @ 230Vca
CDMV 24V-80A	85 - 170 Vca +/- 10% monophasé		19A @ 115Vca
CDMV 24V-80A	170 - 265 Vca +/- 10% monophasé		11,5A @ 230Vca
CDMV 24V-100A	170 - 265 Vca +/- 10% monophasé		14,3 @ 230Vca
CDMV 24V-120A	170 - 265 Vca +/- 10% monophasé		16,8A @ 230Vca

2.1.3 Output characteristics

2.1.3.1 Voltage

- Regulated output voltage 27.2VDC: ± 1% (before fuse or separator).
- Max. ripple factor ≤1% (peak value to mean value).
- Electronic overload protection or limitation of the output current to the rated current level Idn.
- The user must check if the output voltage is compatible with the type batteries

2.1.4 Environmental specification

- Permanent operation in accordance with the provisions laid down in section 18-01 of Bureau Véritas.
- Ambient temperature: 0 - 45°C.
- Storage temperature: -20°C +70°C
- Average relative humidity of 70% (95% without condensation).
- Vibration - Section 19-2 Paragraph 19-25 of BV rules.

2.1.5 Protection and operating safety

2.1.5.1 Input protection

Models CDMV are fitted with two pole protection by 2 fuses F1 and F11 whose ratings are given in appendices.

2.1.5.2 Output protection

Output protection is provided by two fuses F2 and F22 whose ratings are given in appendices.

2.1.5.3 Additional safety devices

All models are fitted with the following safety devices:

- Protection against input voltage surges by a Varistor (275 Vac).
- Protection against abnormal heating of the power semiconductors.
- Protection against polarity reversal (output fuse blows)
- Protection against overloads on the output by limiting the power to the rated value for each model.

2.1.6 Options

The options do not form part of the basic battery charger supply. They are available from your reseller or from ENAG's Sales Department.

Be careful !!!

According to the choosen options, the dimensions and the weight of the box can change.

Options

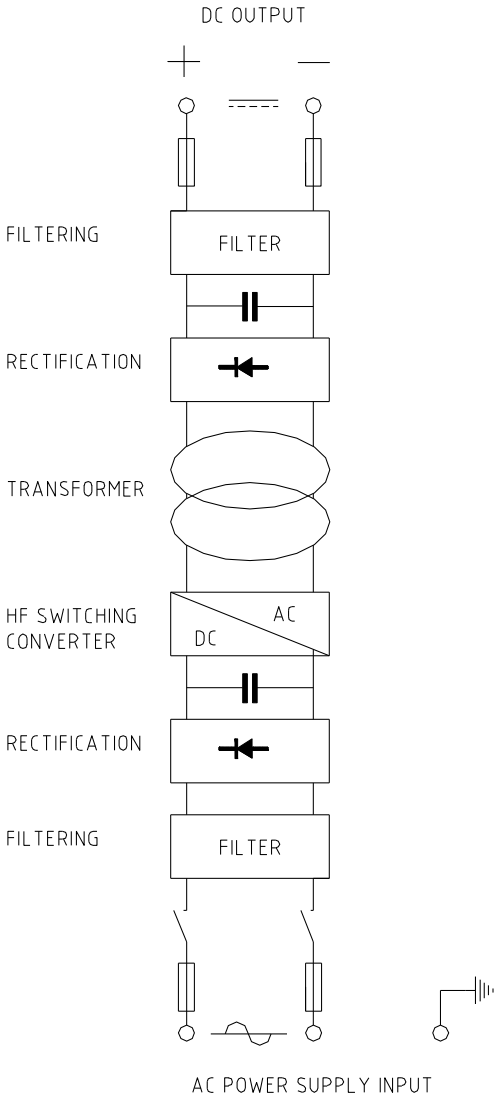
- Separation diode
- Manual clock 0-12 hours
- Charging fault relay
- Monotoring relay of charger ouput voltage
- Monotoring relay of insulations faults
- Remote control indicators
- Forced ventilation and varying degrees of protection for harsh environments.
- Special dispositions for ambient temperature.
- Special paints
- Special dimensions
- Navy approved charges (EG 13C / EG 13B).

2.2 Charger operation

2.2.1. Output voltage

The charger delivers a continous voltage functionning with hight frequency switch mode.

2.2.2. Block diagram



2.2.3.Fctionning of a charger board.

- EMC filter in common mode and differential mode on the power supply network.
- Rectification of the ac voltage by a diode bridge.
- Filtering of the dc voltage obtained by an electrolytic capacitor.
- Switching of the dc voltage at high frequency (20 to 100 kHz), by a converter.
- Transformation of the ac voltage by an HF transformer which also provides galvanic isolation.
- Rectification and filtering by an LC structure.
- EMC filtering.

2.2.4. Detailed operation

The functionning is completely automatical after switching on the charger. Check that the output voltage is compatible with type of batteries

The following controls are located in the front of the door of the device :

- 1 on/off switch.
- "On functionning" indicator light.
- 1 charger output voltage voltmeter (magneto-electric classe 1.5).
- 1 ammeter corresponding to the rated current of the charger (magneto-electric classe 1.5)

❸ Installation

3.1 Introduction

This section deals with matters relating to charger installation.

Installation and operating the charger for the first time must be undertaken by an electrician or professional installer in accordance with the standards in force (ex : in the case of pleasure boats, comply with the international standard ISO 13297).
The installer must take note of this operating manual and must inform users of the matters relating to installation and safety contained in section 5.

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.
- 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).

3.2 Items supplied

ENAG supply items include the following elements:

- 1 metal case containing the battery charger electronic functions,
- the present documentation (operating manual).

3.3 Special recommendations for installation

3.3.1. Case position

3.3.1.1. Preventing the charger overheating

The charger is designed to be mounted on a vertical.

An area of 150 mm from the sides, top and bottom of the case should be kept clear.

Cooling is provided by forced ventilation on certain models. The installer must make the necessary arrangements to ensure that the temperature of the air at entry is less than 40°C in extreme operating conditions.

Arrangements must also be made to ensure hot air can get away either side of the charger and in superior part.

3.3.1.2 Preventing running water or spray falling on the charger

The protection factor is IP23 and the charger position must be chosen so as to prevent any moisture or salt entering the charger.

If this were to occur, the equipment would be irreversibly damaged and there would be a potential risk to the user.

You are recommended to position the charger in a dry, well-ventilated location, away from any source of heat.

3.3.1.3 Arrangements for the batteries

Batteries connected to the charger are likely to give off explosive gases during the charging phase.

You are therefore recommended:

- ➲ to ban the use of any equipment generating sparks and flames near to the batteries.
- ➲ to position the batteries in a well-aired and ventilated location.
- ➲ to take note of the battery manufacturer's instructions when installing the batteries.

3.3.1.4 Accidental leakage currents to earth

① Accidental leakage current between line and earth

Comply with standard NFC 15-100 in respect of precautions over installation. Have the connection work done by an electrician or professional installer.

The charger must be connected to a system having a two-pole differential circuit breaker with 30 mA sensitivity.

② Accidental leakage current between charge circuit and earth

Detection of accidental leakage currents to earth must be provided by a safety device outside the charger (residual differential current device or insulation monitor device).

The installer must ensure that the rating and nature of the protection are appropriate for the risks.

Special precautions are recommended on any installation where there is a danger of electrolytic effects.

Regulations require the presence of a battery cut-out on the output + pole and on the output - pole.

3.3.1.5 Precautions regarding lightning strike

In geographic zones exposed to a high risk of lightning strikes, it may be worthwhile fitting a lightning conductor on the inlet side of the charger in order to prevent the latter being irreversibly damaged.

3.3.1.6 Electromagnetic interference generated by the charger

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.
- Use screened cable for all connections (*). The screening at both the emitter end and receiver end must be connected to earth..
- Make sure the length of the cables and screening connections are kept as short as possible.
- Route the cables as close to earthed objects as possible ("flying" cables or cable loops are to be avoided – fasten the cables against earthed objects).
- Separate the power supply cables from output cables.
- Separate power cables from monitor signal cables (minimum 200 mm).
- Cables must carry only the charger power supply. Branch or bridging connections in order to supply another equipment are to be banned.

(*) This is advice for installation and not an obligation. The electrician installer will decide whether to use screened cable or not, based on the EMC environment.

- 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.

3.4 Special recomandations for installation

This section lists the operations to be performed in order to commission the charger. It is advisable to comply strictly with these instructions before switching on for the first time.

3.4.1.Supply voltage

Check if the alimentation voltage is compatible with the tolerance of the product.

3.4.2. Selecting battery type

- You MUST check the compatibility of the supply voltage with battery type

Before connecting batteries to the charger, you MUST check battery polarity.

Check also the voltage of the batteries using a calibrated voltmeter. Too low a voltage on certain types of battery can indicate irreversible damage and an inability to take a recharge.

3.4.3. Connecting up the options

You MUST contact your reseller or ENAG's Sales Department.

❹ Maintenance and repair of the equipment

4.1 Introduction

This section deals with arrangements for maintenance and repair of the equipment. Correct operation and the life of the product are conditional on strictly complying with the recommendations below.

4.2 Equipment maintenance

- Disconnect the battery charger from the alternating mains supply for all maintenance operations.
- If the charger is placed in a dusty environment, vacuum it periodically to clean it since layers of dust might affect heat dissipation.
- Check the state of charge of the batteries every three months.
- An annual check that nuts and bolts are tight is necessary in order to guarantee correct functioning of the charger (especially in an environment subject to vibration, shock, large changes in temperature, etc.).
- A complete technical examination by a ENAG recommended serviceman is advisable every 5 years. This general technical examination can also be carried out in our factories.

4.3 Equipment repair

- Disconnect the battery charger from the ac mains supply and from the batteries before carrying out any repairs.
- If a fuse has blown, make sure the replacement complies with the rating and type of fuse recommended in this documentation.
- For any other repair action, contact a reseller or ENAG.

❺ Safety

5.1 Standards references

- Class I equipment in accordance with standard NF EN 60950.
- Installation requirements are contained in standard NFC 15-100 and the specific standard for "pleasure boats– electrical systems – Installation of ac distribution system", reference ISO 13297.

5.2 Precautions relating to personnel safety

- Installation must be undertaken by an electrician or professional installer.
- The alternating mains supply must be cut off before any intervention on the equipment.

5.3 Precautions relating to protection against fire and explosion

- Use the fuses defined in this documentation
- In the vicinity of the batteries:
- Ventilate the room,
- Do not smoke,
- Do not use a naked flame.

APPENDICES

- **Ground connexion CDMV** **02674 12**

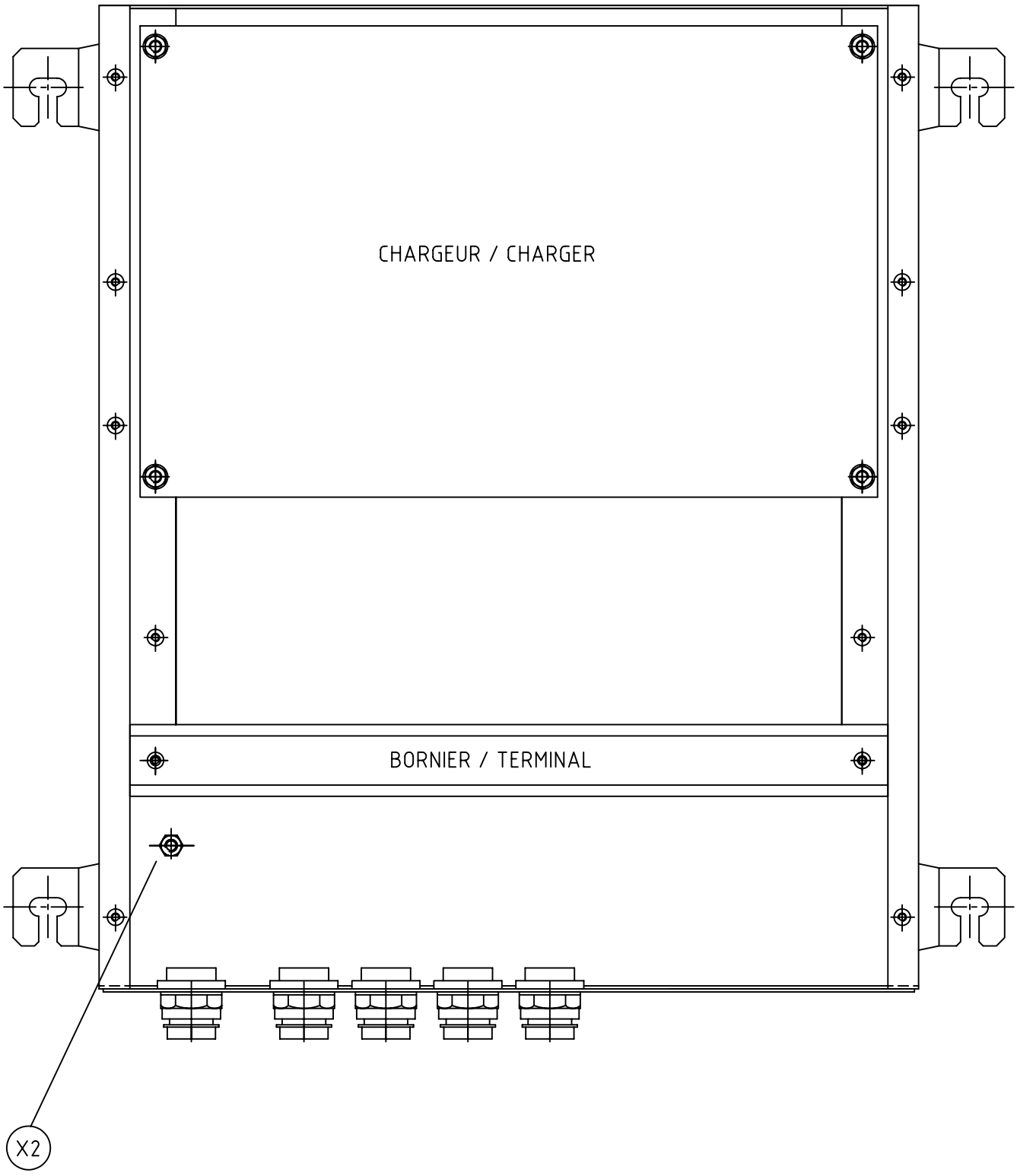
- **Dimensions CDMV** **02674 01**

- **Terminal CDMV 24/16** **02797 02**
- **Terminal CDMV 24/20** **06963 02**
- **Terminal CDMV 24/25** **06329 02**
- **Terminal CDMV 24/30** **06489 02**
- **Terminal CDMV 24/40** **06330 02**
- **Terminal CDMV 24/50** **02674 02**
- **Terminal CDMV 24/60** **03750 02**
- **Terminal CDMV 24/80 @ 115VAC** **11904 02**
- **Terminal CDMV 24/80 @ 230VAC** **06331 02**
- **Terminal CDMV 24/100** **06332 02**
- **Terminal CDMV 24/120** **06333 02**

- **Electrical drawing CDMV 24/16, 24/20 ,24/25, 24/30, 24/40, 24/50, 24/60** **02674 03**
- **Electrical drawing CDMV 24/80, 24/100, 24/120** **06331 03**

- **Setting procedure CDS3 chargers modules** **06331 06**

- **Spare parts list CDMV 24/16** **02797 RA**
- **Spare parts list CDMV 24/20** **06963 RA**
- **Spare parts list CDMV 24/25** **06329 RA**
- **Spare parts list CDMV 24/30** **06489 RA**
- **Spare parts list CDMV 24/40** **06330 RA**
- **Spare parts list CDMV 24/50** **02674 RA**
- **Spare parts list CDMV 24/60** **03750 RA**
- **Spare parts list CDMV 24/80 @ 115VAC** **11904 RA**
- **Spare parts list CDMV 24/80 @ 230VAC** **06331 RA**
- **Spare parts list CDMV 24/100** **06332 RA**
- **Spare parts list CDMV 24/120** **06333 RA**



BORNE DE MASSE
GROUND TERMINAL

				Quantité :
				Matière :
Date	Indice	Modification	Visa	
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			Tol. générale :	Usiné :
47, Av. P. Mendès France 29000 QUIMPER Tél. 02 98 55 51 99 Fax 02 98 55 51 67		ENAG	Dessiné : P.C.	Le : 06-09-2005
			Vérifié : F.Pe.	F° : /
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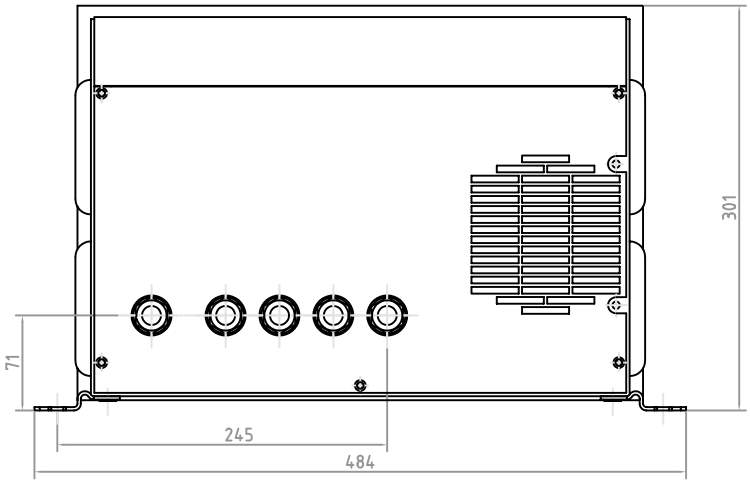

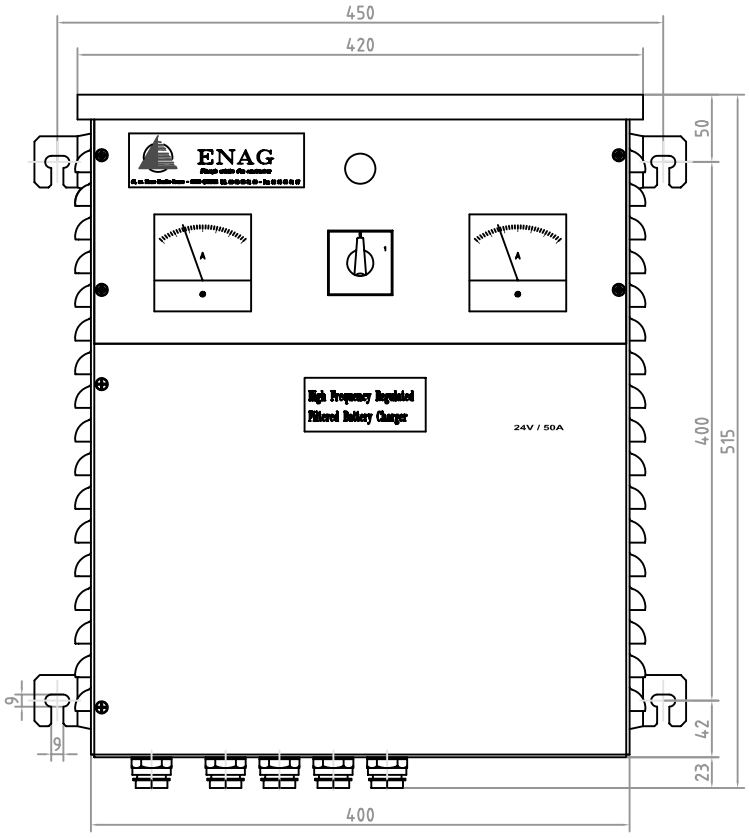

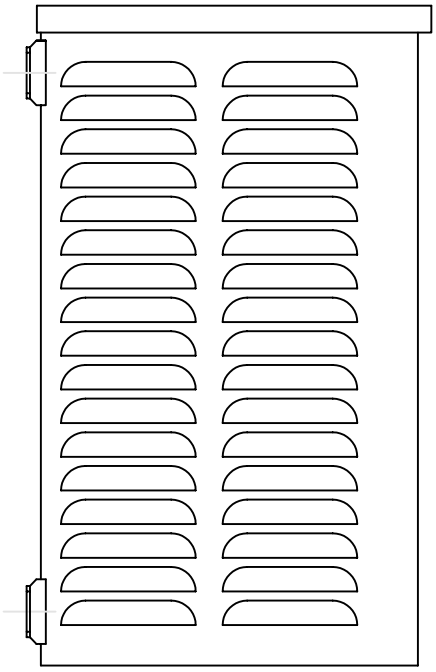

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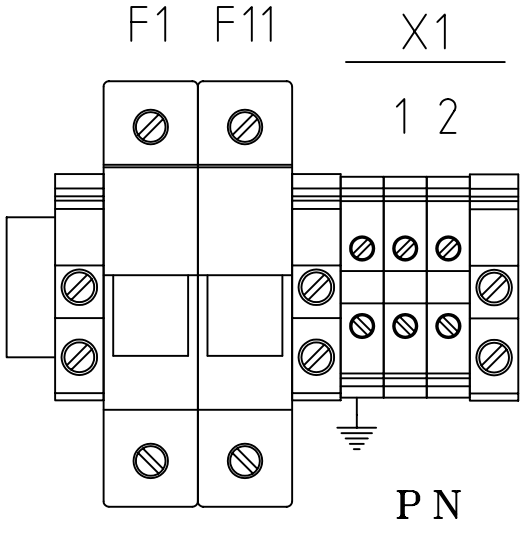

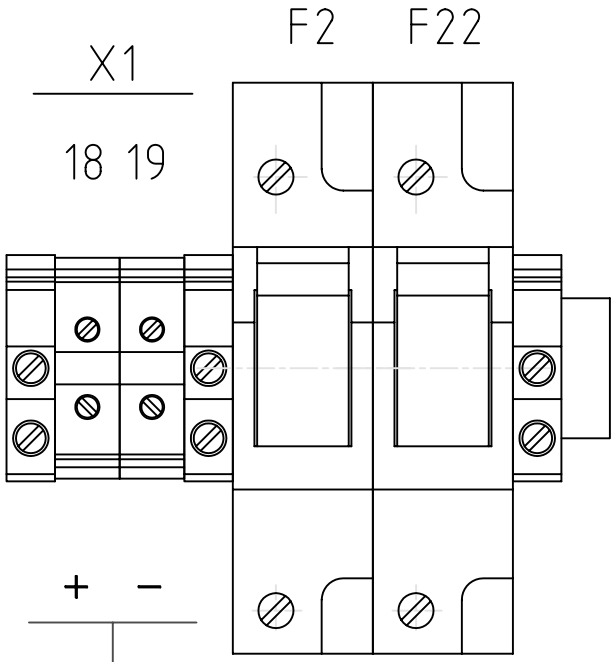

Input voltage Tension d'alimentation :	230VAC 47-63Hz	115VAC 47-63Hz
Input fuse Fusible d'entrée :	F1=F11=8AgG TYPE 10x38 - 500V	F1=F11=8AgG TYPE 10x38 - 500V
Input current Courant d'entrée :	2,5A	5,2A

Output voltage Tension de sortie :	27,2V
Output fuse Fusible de sortie :	F2=F22=16AgG TYPE 14x51 - 500V
Output current Courant de sortie :	16A

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CHARGEUR/CHARGER-CDMV 24V-16A BORNIER / TERMINAL			Ech : 1/1	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 : P.C.	Le : 29-01-2007
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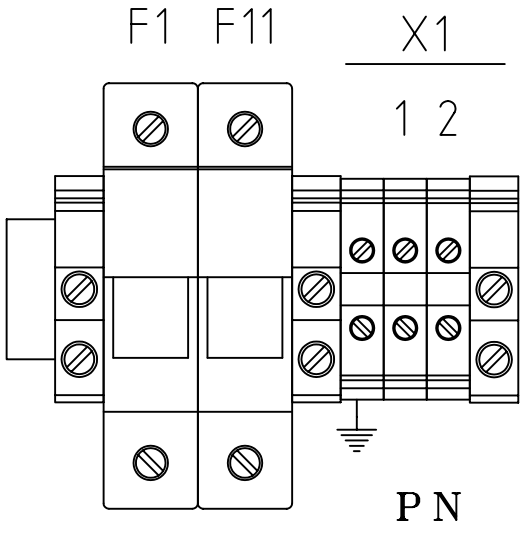

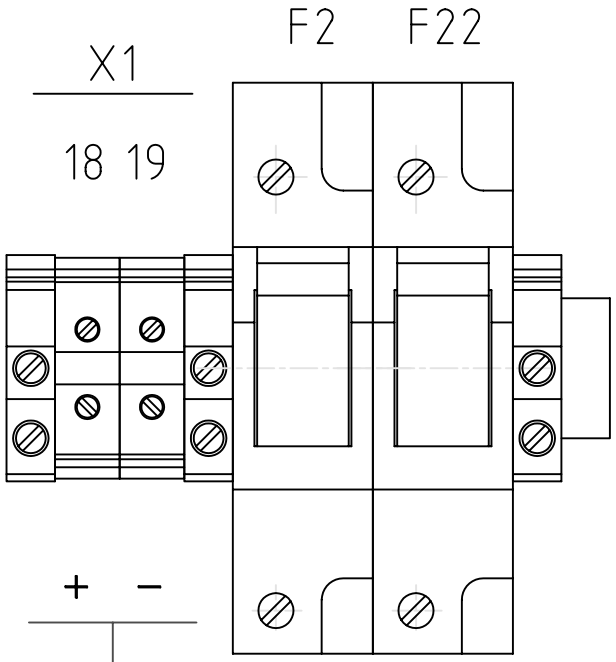

Input voltage Tension d'alimentation :	230VAC 47-63Hz	115VAC 47-63Hz
Input fuse Fusible d'entrée :	F1=F11=8AgG TYPE 10x38 - 500V	F1=F11=8AgG TYPE 10x38 - 500V
Input current Courant d'entrée :	3,1A	6,4A

Output voltage Tension de sortie :	27,2V
Output fuse Fusible de sortie :	F2=F22=20AgG TYPE 14x51 - 500V
Output current Courant de sortie :	20A

Date	Indice	Modification	Visa
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16-09-2004	B	CHGT CARTE CHARGEUR	C.Pr.

CHARGEUR/CHARGER-CDMV 24V-20A
BORNIER / TERMINAL

47, Av. P. Mendès France
29000 QUIMPER
Tél. 02 98 55 51 99
Fax 02 98 55 51 67

ENAG

Quantité :
Matière :
Ech : 1/1
Finition :
Tol. générale :
Usiné :
Dessiné : P.C.
Le : 16-09-2004
Vérifié : F.Pe.
F° : /
N° 06963 02
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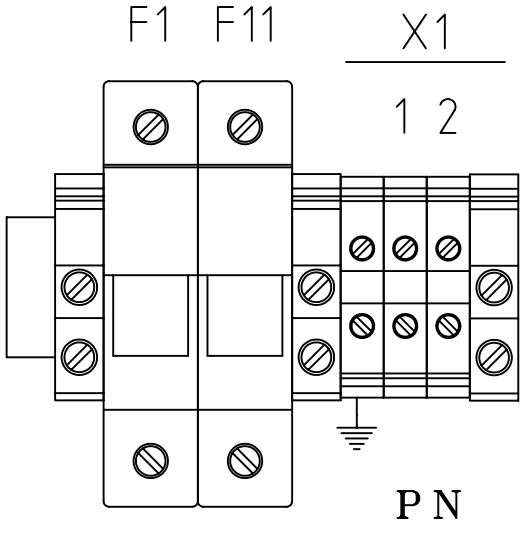

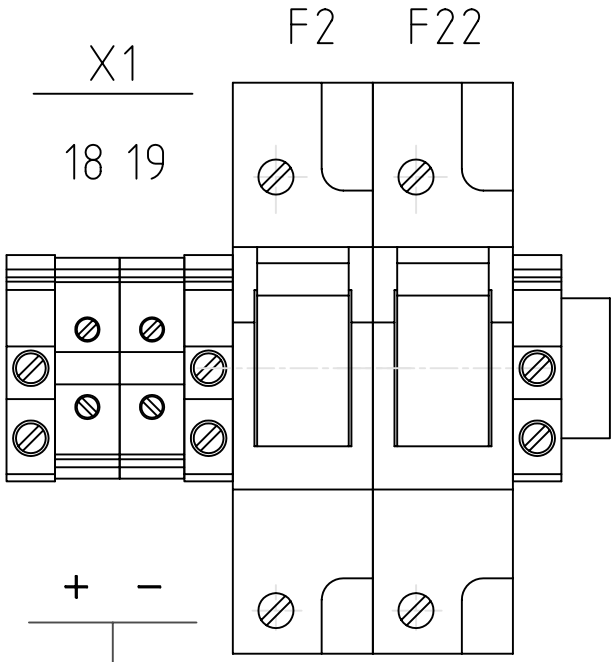

Input voltage Tension d'alimentation :	230VAC 47-63Hz	115VAC 47-63Hz
Input fuse Fusible d'entrée :	F1=F11=10AgG TYPE 10x38 - 500V	F1=F11=10AgG TYPE 10x38 - 500V
Input current Courant d'entrée :	3,7A	7,5A

Output voltage Tension de sortie :	27,2V
Output fuse Fusible de sortie :	F2=F22=25AgG TYPE 14x51 - 500V
Output current Courant de sortie :	25A

Date	Indice	Modification	Visa

CHARGEUR/CHARGER-CDMV 24V-25A
BORNIER / TERMINAL

47, Av. P. Mendès France
29000 QUIMPER
Tél. 02 98 55 51 99
Fax 02 98 55 51 67

ENAG

Quantité :
Matière :
Ech : 1/1
Finition :
Tol. générale :
Usiné :
Dessiné : P.C.
Le : 29-01-2007
Vérifié : F.Pe.
F° : /
N° 06329 02
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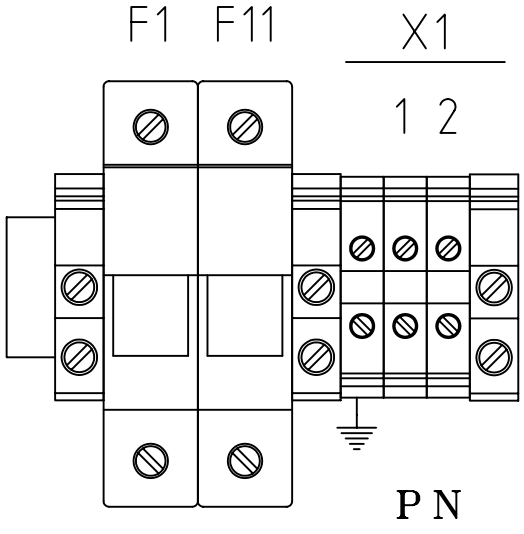
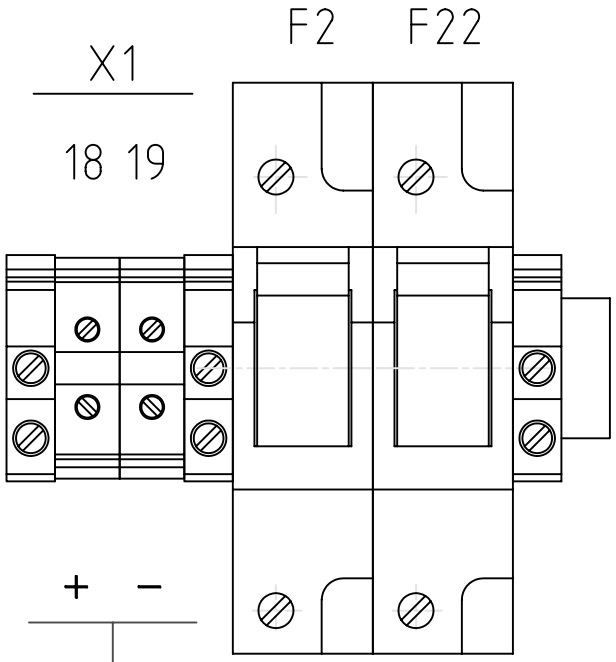




Input voltage Tension d'alimentation :	230VAC 47-63Hz	115VAC 47-63Hz
Input fuse Fusible d'entrée :	F1=F11=10AgG TYPE 10x38 - 500V	F1=F11=10AgG TYPE 10x38 - 500V
Input current Courant d'entrée :	4,4A	9A

Output voltage Tension de sortie :	27,2V
Output fuse Fusible de sortie :	F2=F22=32AgG TYPE 14x51 - 500V
Output current Courant de sortie :	30A

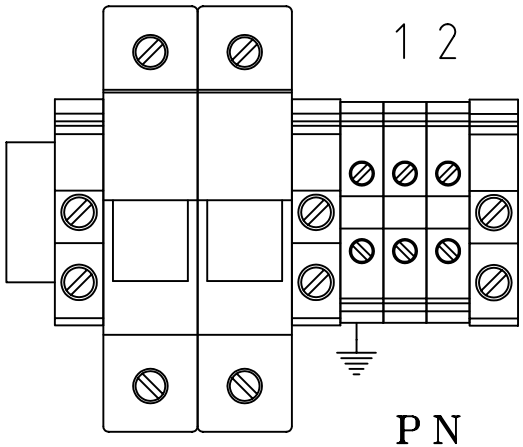
Date	Indice	Modification	Visa
29-01-2007	C	CHGT CARTE CHARGEUR	C.Pr.

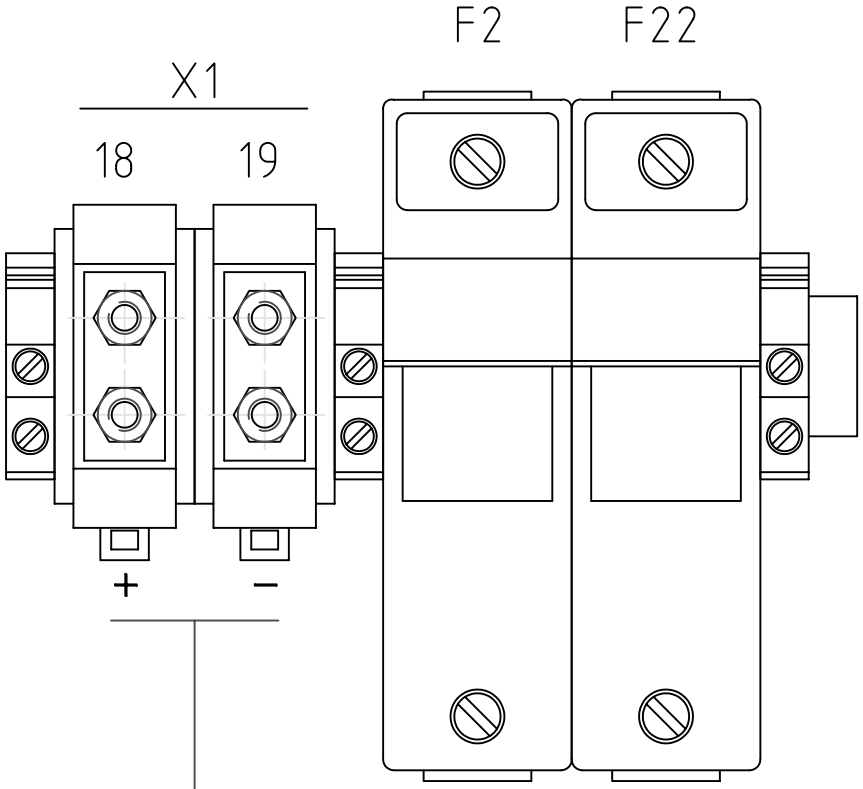
CHARGEUR/CHARGER-CDMV 24V-30A
BORNIER / TERMINAL

47, Av. P. Mendès France
29000 QUIMPER
Tél. 02 98 55 51 99
Fax 02 98 55 51 67

ENAG

Quantité :
Matière :
Ech : 1/1
Finition :
Tol. générale :
Usiné :
Dessiné : P.C.
Le : 14-08-2001
Vérifié : F.Pe.
F° : /
N° 06489 02
C





Input voltage Tension d'alimentation :	230VAC 47-63Hz	115VAC 47-63Hz
Input fuse Fusible d'entrée :	F1=F11=16AgG TYPE 10x38 - 500V	F1=F11=16AgG TYPE 10x38 - 500V
Input current Courant d'entrée :	6,5A	12,5A

Output voltage Tension de sortie :	27,2V
Output fuse Fusible de sortie :	F2=F22=40AgG TYPE 22x58 - 500V
Output current Courant de sortie :	40A

Date	Indice	Modification	Visa

Quantité :

Matière :

CHARGEUR/CHARGER-CDMV 24V-40A
BORNIER / TERMINAL

Ech : 1/1

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 : P.C.

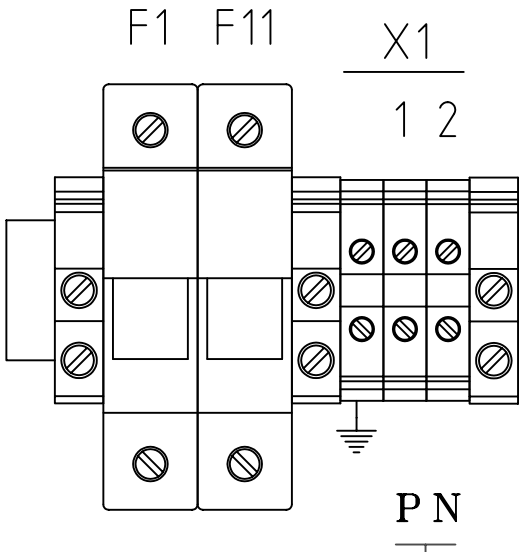
Le : 14-08-2001

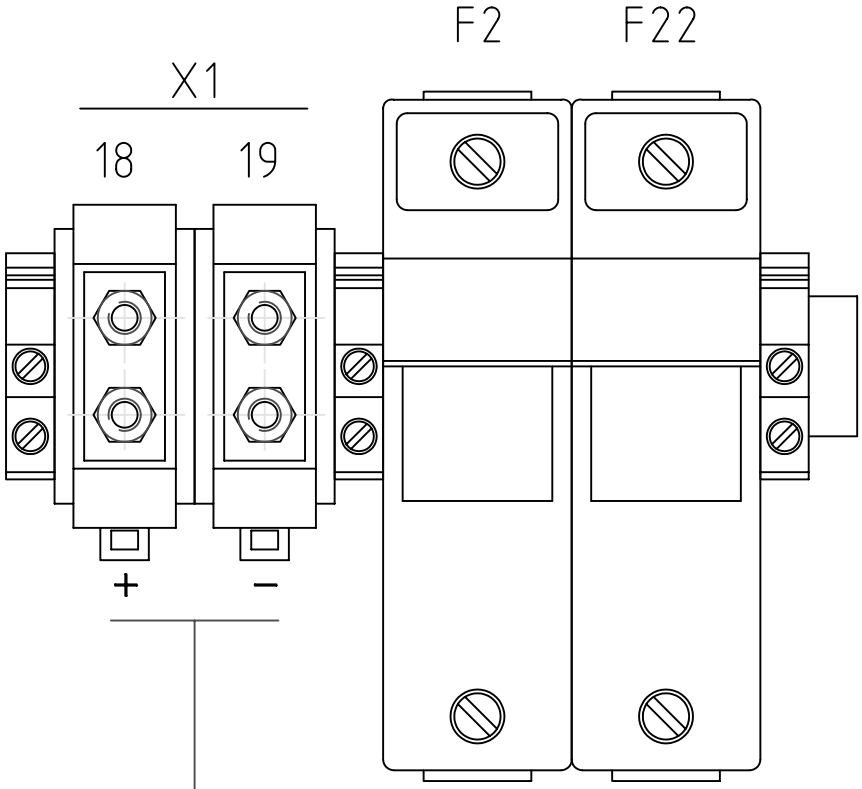
Vérifié :

F° : /

N° 06330 02

B

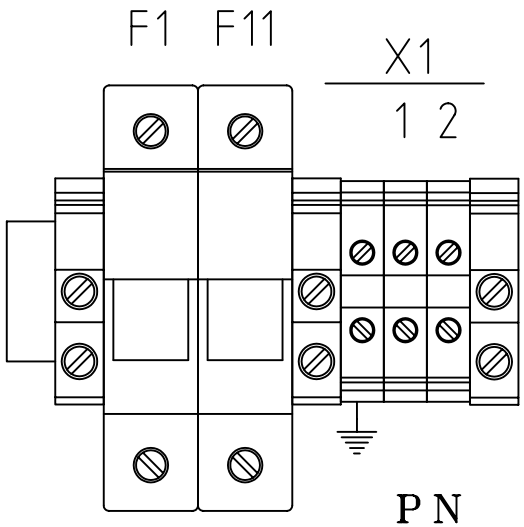


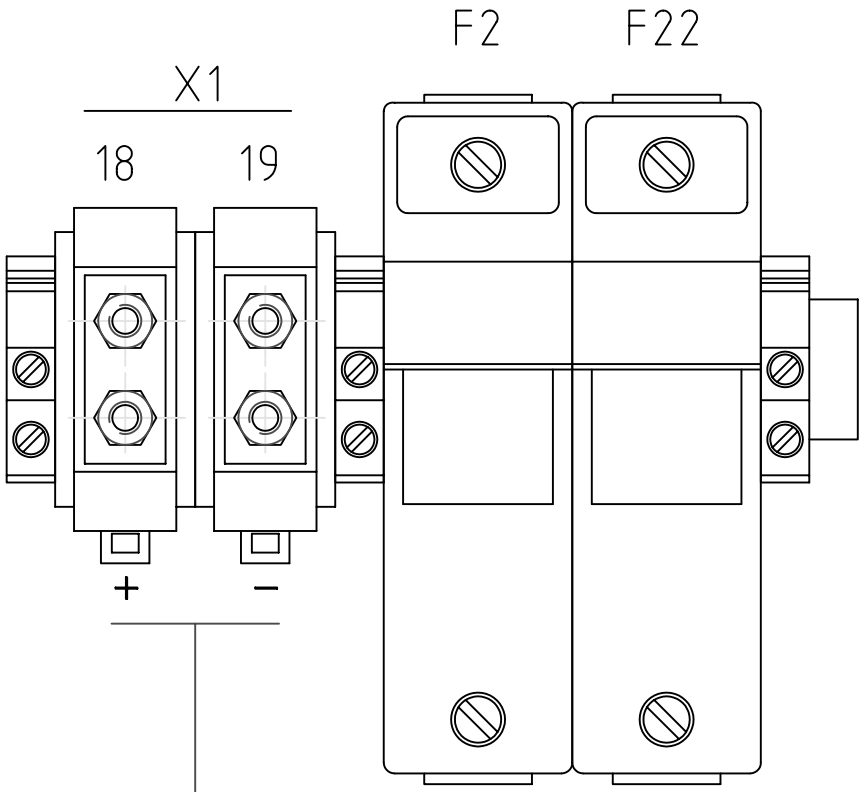


Input voltage Tension d'alimentation :	230VAC 47-63Hz	115VAC 47-63Hz
Input fuse Fusible d'entrée :	F1=F11=16AgG TYPE 10x38 - 500V	F1=F11=16AgG TYPE 10x38 - 500V
Input current Courant d'entrée :	7,5A	12,5A

Output voltage Tension de sortie :	27,2V
Output fuse Fusible de sortie :	F2=F22=50AgG TYPE 22x58 - 500V
Output current Courant de sortie :	50A

				Quantité :
29-01-2007	D	Chgt carte chargeur	C.Pr.	Matière :
Date	Indice	Modification	Visa	
CHARGEUR/CHARGER-CDMV 24V-50A BORNIER / TERMINAL			Ech : 1/1	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 : P.C.	Le : 14-08-2001
			Vérifié :	F° : /
			N° 02674 02	D





Input voltage Tension d'alimentation :	230VAC 47-65Hz
Input fuse Fusible d'entrée :	F1=F11=10AgG TYPE 10x38 - 500V
Input current Courant d'entrée :	9A

Output voltage Tension de sortie :	27,2V
Output fuse Fusible de sortie :	F2=F22=63AgG TYPE 22x58 - 500V
Output current Courant de sortie :	60A

Date	Indice	Modification	Visa
21-09-2009	D	CHGT CARTE CHARGEUR CDS3	C.Pr.
29-01-2007	C	CHGT CARTE CHARGEUR CDS2	C.Pr.

CHARGEUR / CHARGER CDMV 24V - 60A
BORNIER / TERMINAL

Quantité :
Matière :
Ech : 1/1
Finition :
Tol. générale :
Usiné :
Dessiné : P.C.
Le : 14-08-2001
Vérifié : F.Pe.
F° : /
N° 03750 02
D

47, Av. P. Mendès France
29000 QUIMPER
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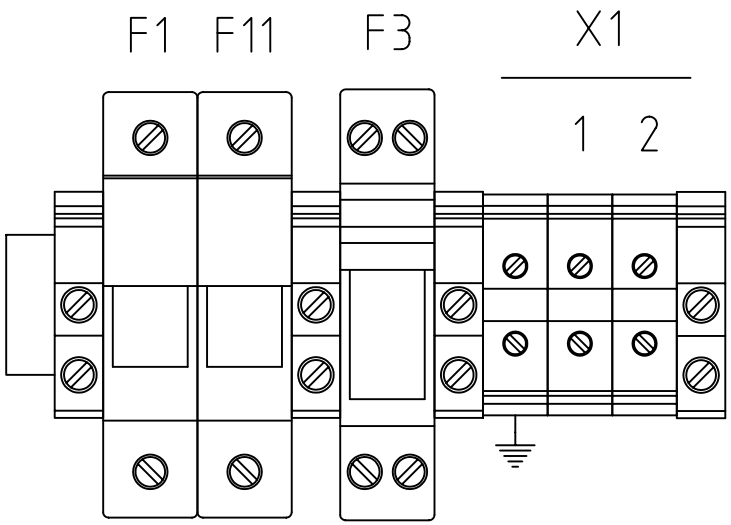
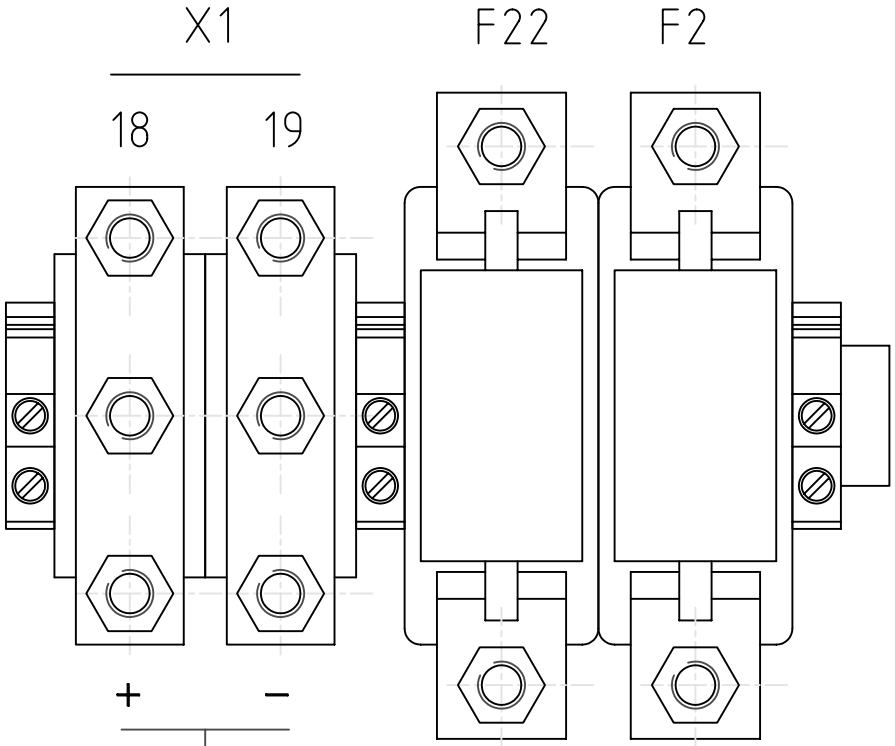
Fax 02 98 55 51 67

ENAG





P N

Input voltage Tension d'alimentation :	230VAC 47-63Hz
Input fuse Fusible d'entrée :	F1=F11=16AgG TYPE 10x38 - 500V
Input current Courant d'entrée :	11.5A

Output voltage Tension de sortie :	27,2V
Output fuse Fusible de sortie :	F2=F22=80AgG TYPE T00 - 500V
Output current Courant de sortie :	80A

Fan fuse Fusible ventilation :	F3=1AgG TYPE 10x38 - 500V

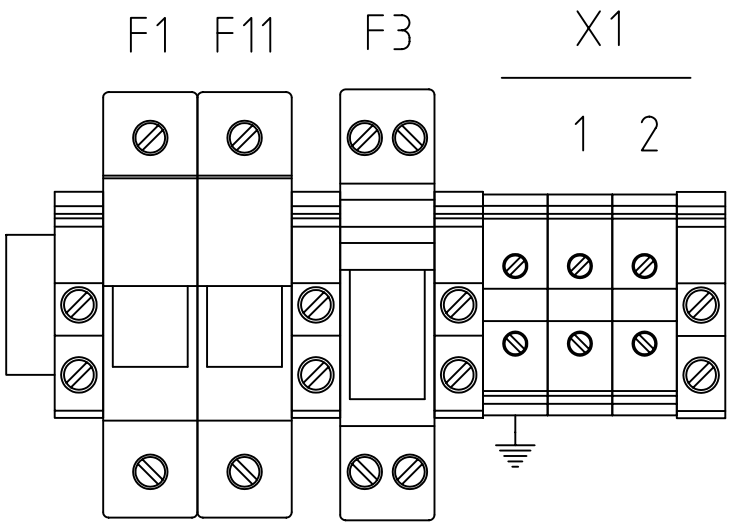
Date	Indice	Modification	Visa
15-07-2010	C	Chgt carte chargeur	C.Pr.
29-01-2007	B	Chgt carte chargeur	C.Pr.

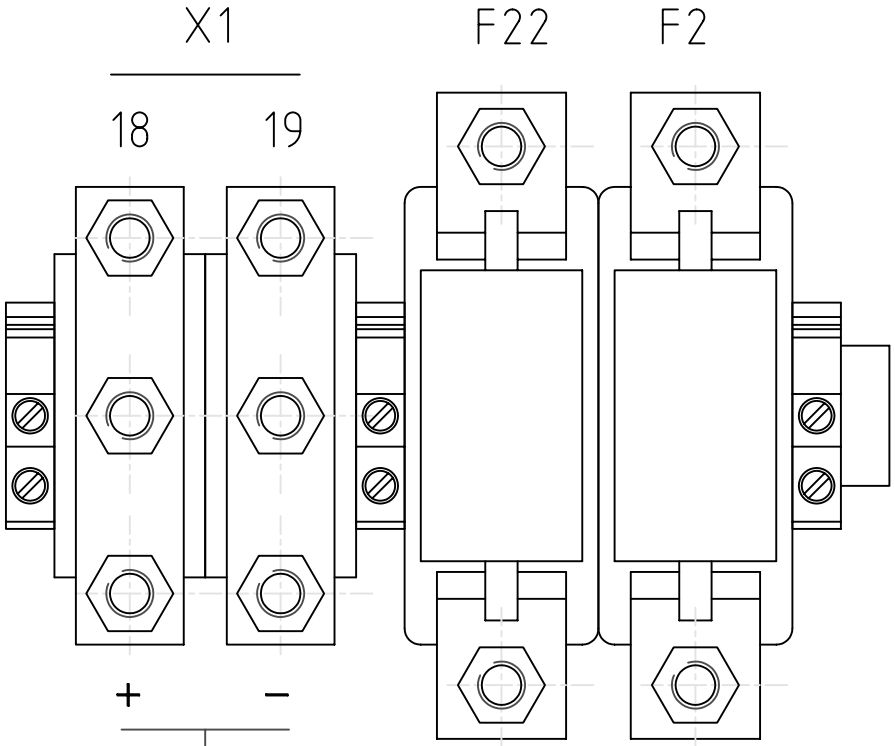
CHARGEUR / CHARGER CDMV 24V - 80A
BORNIER / TERMINAL

Quantité :
Matière :
Ech : 1/1
Finition :
Tol. générale :
Usiné :
Dessiné : C.Pr.
Le : 14-08-2001
Vérifié : F.Pe.
F° : /
N° 06331 02
C

47, Av. P. Mendès France
29000 QUIMPER
Tél. 02 98 55 51 99
Fax 02 98 55 51 67

ENAG





P N

Input voltage Tension d'alimentation :	230VAC 47-63Hz
Input fuse Fusible d'entrée :	F1=F11=16AgG TYPE 10x38 - 500V
Input current Courant d'entrée :	14.3A

Output voltage Tension de sortie :	27,2V
Output fuse Fusible de sortie :	F2=F22=100AgG TYPE T00 - 500V
Output current Courant de sortie :	100A

Fan fuse Fusible ventilation :	F3=1AgG TYPE 10x38 - 500V

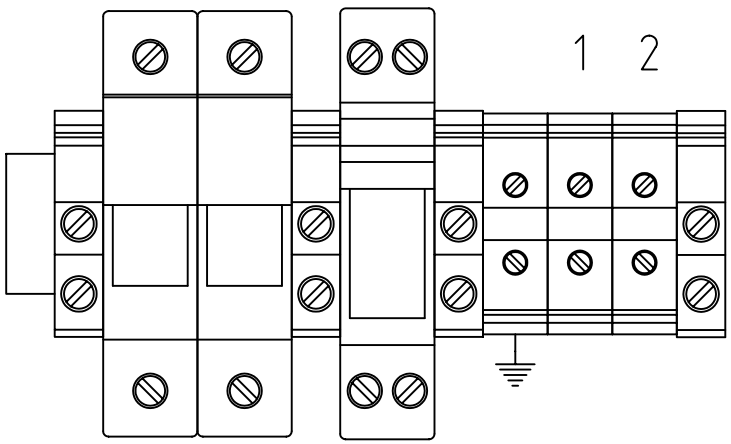
Date	Indice	Modification	Visa
15-07-2010	C	Chgt carte chargeur	C.Pr.
29-01-2007	B	Chgt carte chargeur	C.Pr.

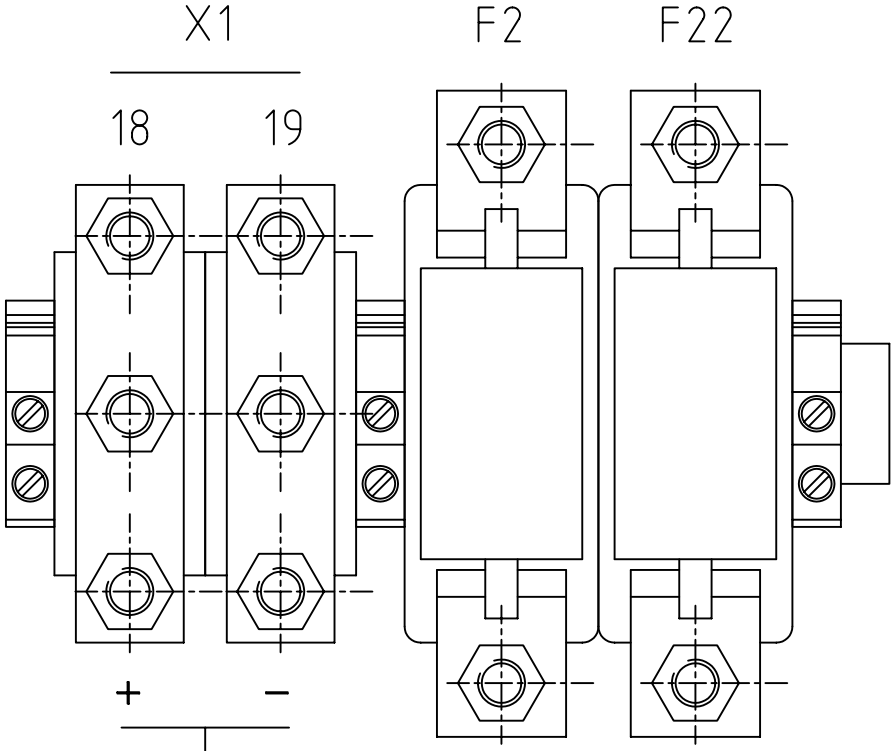
CHARGEUR / CHARGER CDMV 24V - 100A
BORNIER / TERMINAL

Quantité :
Matière :
Ech : 1/1
Finition :
Tol. générale :
Usiné :
Dessiné : C.Pr.
Le : 14-08-2001
Vérifié : F.Pe.
F° : /
N° 06332 02
C

47, Av. P. Mendès France
29000 QUIMPER
Tél. 02 98 55 51 99
Fax 02 98 55 51 67

ENAG





P N

Input voltage Tension d'alimentation :	230VAC 47-63Hz
Input fuse Fusible d'entrée :	F1=F11=20AgG TYPE 10x38 - 500V
Input current Courant d'entrée :	16.8A

Output voltage Tension de sortie :	27,2V
Output fuse Fusible de sortie :	F2=F22=125AgG TYPE T00 - 500V
Output current Courant de sortie :	120A (×)

(×) 120A @ 230VAC Entrée / Input
90A @ 115VAC Entrée / Input

				Quantité :
31-03-2010	C	Chgt carte chargeur	C.Pr.	
29-01-2007	B	Chgt carte chargeur	C.Pr.	Matière :
Date	Indice	Modification	Visa	

CHARGEUR / CHARGER CDMV 24V - 120A BORNIER / TERMINAL	Ech : 1/1	Finition :
	Tol. générale :	Usiné :
	Dessiné : C.Pr.	Le : 14-08-2001
	Vérifié : F.Pe.	F° : /
	N° 06333 02	C

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29000 QUIMPER
Tél. 02 98 55 51 99
Fax 02 98 55 51 67

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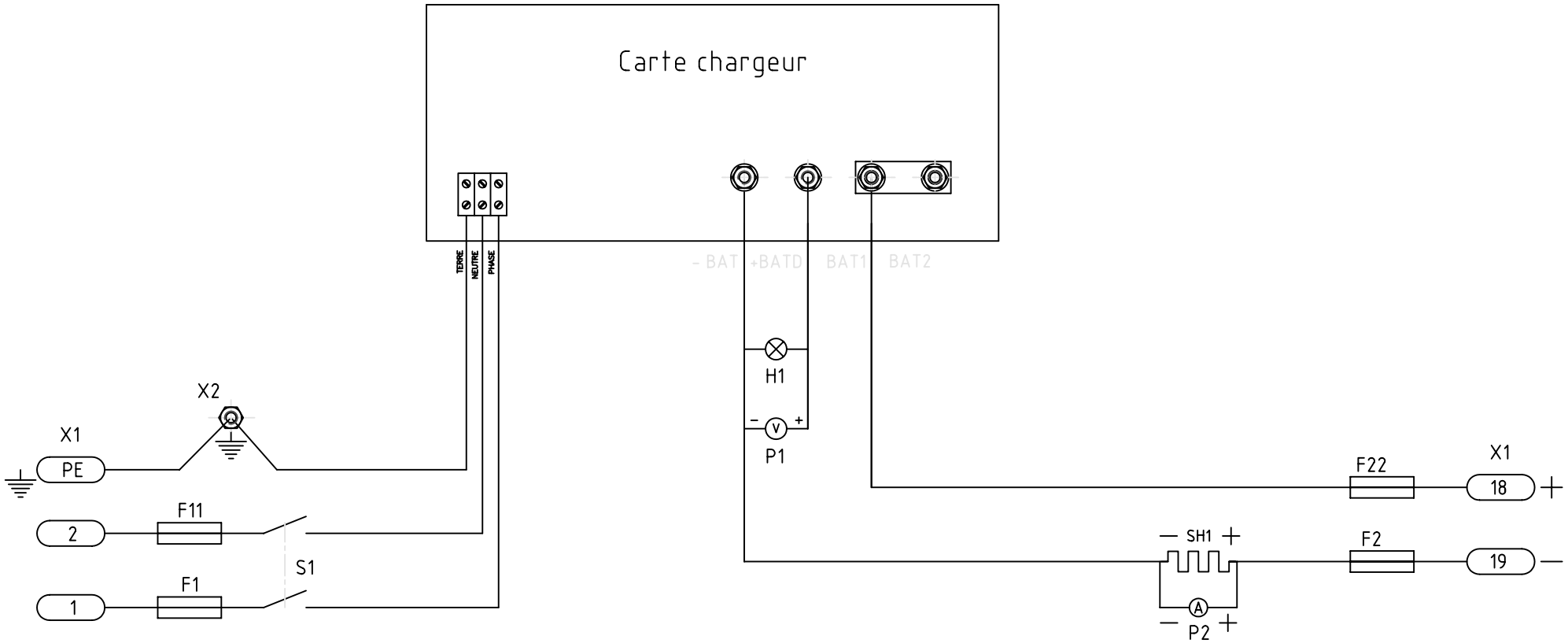
Fan fuse Fusible ventilation :	F3=1AgG TYPE 10x38 - 500V



Date	Indice	Modification	Visa
21/09/2009	E	CHGT CARTE CHARGEUR CDS3	C.Pr.
29/01/2007	D	CHGT CARTE CHARGEUR CDS2	C.Pr.

CDMV 24V - 20/30/40/50/60A

SCHEMA DE PRINCIPE / ELECTRICAL DRAWING

47, Av. P. Mendès France
29000 QUIMPER
Tél. 02 98 55 51 99
Fax 02 98 55 51 67

ENAG

Quantité :

Matière :

Ech :

Finition :

Tol. générale :

Usiné :

Dessiné : C.Pr.

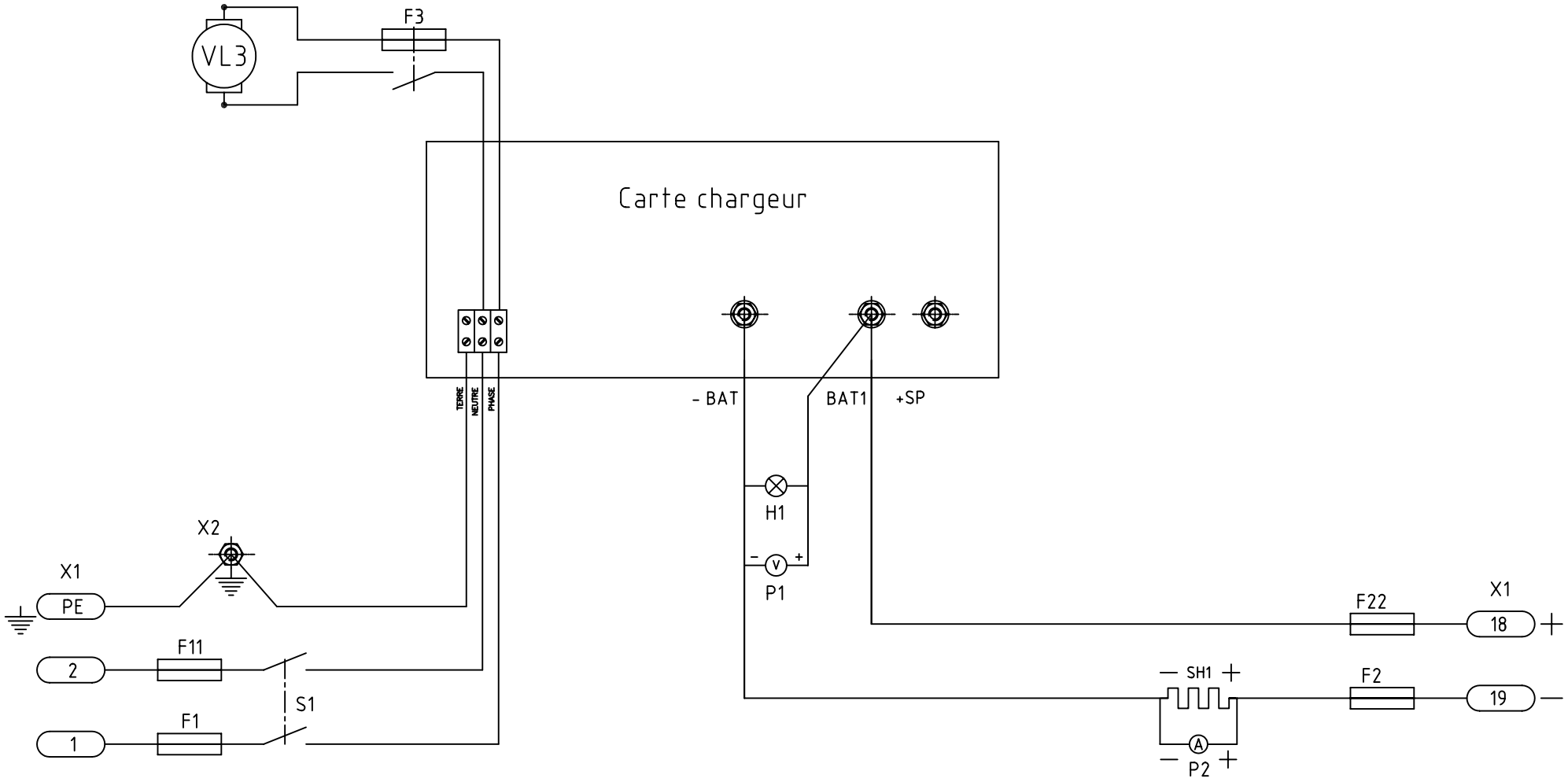
Le : 25/03/02

Vérifié : F.Pe.

F° : /

N° 02674 03

E



Date	Indice	Modification	Visa
12-10-2010	D	CHGT CARTE CHARGEUR CDS3	C.Pr.
15/02/07	C	CHGT CARTE CHARGEUR CDS2	FPe

CDMV 24V - 80/100/120A

SCHEMA DE PRINCIPE / ELECTRICAL DRAWING

47, Av. P. Mendès France
29000 QUIMPER
Tél. 02 98 55 51 99
Fax 02 98 55 51 67

ENAG

Quantité :

Matière :

Ech :

Finition :

Tol. générale :

Usiné :

Dessiné : C.Pr.

Le : 25/03/02

Vérifié : F.Pe.

F° : /

N° 06331 03

D

ENAG
l'énergie créative d'un constructeur

31 rue Marcel Paul
Z.I. Kerdroniou Est
29 000 Quimper • FRANCE
Tél. +33 (0)2 98 55 51 99
Fax : +33 (0)2 98 55 51 67
e-mail : contact@enag.fr
www.enag.fr

CDMV 24VCC 16 to 30A

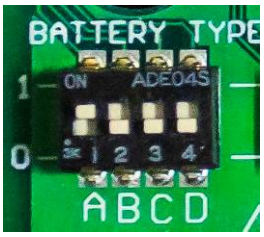
PROCEDURE DE REGLAGE DES MODULES CHARGEUR CDS4 EN FONCTION DU TYPE DE BATTERIES

SETTING PROCEDURE CDS4 CHARGERS MODULES ACCORDING TO THE BATTERIES TYPE

Les chargeurs CDS4 sont équipés de micro-interrupteurs permettant de configurer le chargeur en fonction du type de batteries et de l'application.
The CDS4 chargers are equipped with switches to configure the charger according the battery type and the application.

1 = ON

0 = OFF



Deux modes sont également disponibles :
2 charging modes are available :

- **La fonction BOOST permet une recharge plus rapide des batteries. Cette fonction est temporisée dans le temps (voir tableau ci-après) et est inhibée automatiquement si la batterie est chargée : arrêt du BOOST pour un courant batterie < 20% du courant nominal du chargeur. La fonction BOOST peut également être inhibée par un micro-interrupteur (E).**
- *The BOOST function enables a faster charge of the batteries. This function is time controlled (see table here after) and is automatically switched off when the battery is fully charged : BOOST stops when batteries current < 20% of charger rated current. The BOOST function can also be disabled by means of a switch **(E)**.*

- **La fonction REFRESH permet d'appliquer un échelon de tension de façon périodique afin d'entretenir la batterie, de favoriser son égalisation et ainsi prévenir d'une possible sulfatation. Cette fonction est activée à l'aide d'un micro-interrupteur (F).**
- *The REFRESH function enables to apply periodically a voltage step to maintain the battery, to promote its equalization and prevent from any sulphation. This function is activated by means of a switch (**F**).*

1 = ON

0 = OFF

Configuration des micro-interrupteurs				Désignation du type de batteries	Tension* avec BOOST OFF	Tension* avec BOOST ON	Durée maximale du BOOST à +/- 5% T_{BOOST}	Durée maximale de l'absorption à +/- 5% T_{ABS}
Switches setting				Description of the battery type	Voltage* with BOOST OFF	Voltage* with BOOST ON	Maximum duration of BOOST at +/- 5% T_{BOOST}	Maximum duration of ABSOPTION at +/- 5% T_{ABS}
A	B	C	D					
0	0	0	0	**Bat type ouverte électrolyte libre** *Opened type bat free electrolyte (wet)*	26,8V	28,2V	2H	4H
1	0	0	0	**Bat type fermée classique (plomb étanche)** *Classic sealed type bat (Sealed Lead)*	27,6V	28,8V	2H	4H
CONFIGURATION USINE / *FACTORY SETTING*								
0	1	0	0	**Bat type GEL** *GEL type bat*	27,6V	28,8V	2H	4H
1	1	0	0	**Bat type AGM **** *AGM type bat***	27,2V	28,8V	2H	4H
0	0	1	0	**Bat type spiralé** *Spiral type bat*	27,2V	28,8V	2H	4H
1	0	1	0	**Bat plomb calcium étain** *Tin calcium lead bat*	28,8V	30,2V	2H	4H
0	1	1	0	**Hivernage/standby Bat fermée** *Wintering or standby sealed bat*	26,8V	26,8V	0H	0H
1	1	1	0	**Alimentation stabilisée** *Stabilized DC power supply*	24,0V	24,0V	0H	0H
0	0	0	1	**Bat type ouverte SPE1** *SPE1 open type bat*	26,4V	29,6V	2H	4H
1	0	0	1	**Lithium Fer Phosphate (LiFePO 4) avec BMS (***)** *Lithium Iron Phosphate (LiFePO4) with BMS (***)*	27,6V	28,8V	6H	10H
0	1	1	1	**Réservé** / *Factory reserved*				
1	1	1	1	**Réservé** / *Factory reserved*				

(*) Tension sur + BAT 1, + BAT 2 et + BAT E avec 10% du courant nominal avec une tolérance de +/- 1%.

(**) Le REFRESH est déconseillé pour certains types de batteries AGM

(***) Système de supervision de la batterie

En cas de batteries spéciales, se référer à un installateur professionnel qui effectuera les réglages particuliers en accord avec les spécifications du constructeur d'accumulateurs et en tenant compte des particularités de l'installation.

In case of specific batteries, refer to an installer who will make the specific settings in accordance with the specifications of the batteries manufacturer and taking into account the specific aspects of the installation.

ENAG décline toute responsabilité en cas de détérioration des batteries ou de mauvaise recharge

ENAG accept no responsibility in case of batteries damage or incorrect reload.

CDMV 24VCC 40 to 120A

PROCEDURE DE REGLAGE
DES MODULES CHARGEUR CDS3
EN FONCTION DU TYPE DE BATTERIES

SETTING PROCEDURE
CDS3 CHARGERS MODULES
ACCORDING TO THE BATTERIES TYPE

Les chargeurs CDS3 sont équipés d'une roue codeuse (RC1) permettant de configurer le chargeur en fonction du type de batteries et de l'application. Configuration à l'aide d'un petit tournevis à tête plate (largeur 2,5mm) et tourner dans le sens horaire.
The CDS3 chargers are equipped with a selection wheel (RC1) allowing to set up the charger according the battery type and the application. Setting thanks to a small flat head screw driver (width 2,5mm) and turn in clockwise direction.

Les chargeurs CDS3 sont dotés de la fonction BOOST qui permet une recharge plus rapide des batteries. Cette fonction est temporisée dans le temps (voir tableau ci-après) et est inhibée automatiquement si la batterie est chargée : arrêt du BOOST pour I batteries < 15% de I chargeur nominal.
La fonction BOOST peut également être inhibée par basculement du Switch (SW1).
The CDS3 chargers are equipped with a Boost function for a faster charge of the batteries. This function is controlled by a timeout (see table here after) and is automatically inhibited when the battery is fully charged : stoppage of the boost for I batteries < 15% of I rated charger.
The Boost function can also be disabled by means of a switch (SW1).

RC1 : Sélection des courbes de charge
RC1: Selection of the load curves

SW1 : Sélection de la fonction BOOST
SW1 : Selection of the BOOST function

Configuration de RC1	Désignation du type de batterie ou configuration	Tension(*) avec BOOST OFF	Tension(*) avec BOOST ON	Durée maximum du BOOST à +/- 5% T_{BOOST}
RC1 setting	*Description of the battery type or setting*	*Voltage(*) BOOST OFF*	*Voltage(*) BOOST ON*	*Maximum duration of BOOST at +/- 5% T_{BOOST}*
0	**Bat type ouverte électrolyte libre** *Opened type bat free electrolyte*	26,8V	28,2V	2H
1	**Bat type fermée classique (plomb étanche)** *Classic sealed type bat (Lead sealed)*	27,6V	28,8V	6H
2	**Bat type GEL** *GEL type bat*	27,6V	28,8V	4H
3 **(configuration usine)** *(factory setting)*	**Bat type AGM** *AGM type bat*	27,2V	28,8V	4H
4	**Bat plomb calcium étain** *Tin calcium lead bat*	28,8V	30,2V	4H
5	**Bat type spiralé** *Spiral type bat*	27,2V	28,8V	6H
6	**Hivernage Bat ouverte** *Opened bat Wintering*	26,4V	26,4V	0H
7	**Hivernage ou standby Bat fermée** *Wintering or standby sealed bat*	26,8V	26,8V	0H
8	**Reg Spécifique 1 (GEL+)** *Specific setting 1 (GEL+)*	27,6V	28,8V	8H
9	**Reg Spécifique 2 (GEL SP)** *Specific setting 2 (GEL SP)*	27,6V	28,4V	4H
A	**Reg Spécifique 3 (AGM+)** *Specific setting 3 (AGM+)*	27,2V	28,8V	8H
B	**Reg Spécifique 4 (AGM SP)** *Specific setting 4 (AGM SP)*	27,2V	28,4V	4H
C	**Reg Spécifique 5** *Specific setting 5*	27,4V	28,6V	4H
D	**Reg Spécifique 6** *Specific setting 6*	26,6V	28,2V	10H
E	**Reg Spécifique 7** *Specific setting 7*	27,2V	29,6V	4H
F	**Alimentation à courant continu** *Direct current power supply*	24,5V	24,5V	0H

(*) **Tension sur BAT 1 / BAT 2 avec 10% du courant nominal avec une tolérance de +/- 1%**
(*) *Voltage on BAT 1 / BAT 2 with 10% of the rated current and a tolerance of +/- 1%.*

En cas de batteries spéciales, se référer à un installateur professionnel qui effectuera les réglages particuliers en accord avec les spécifications du constructeur d'accumulateurs et en tenant compte des particularités de l'installation.
In case of specific batteries, refer to an installer who will make the specific settings in accordance with the specifications of the batteries manufacturer and taking into account the specific aspects of the installation.

ENAG décline toute responsabilité en cas de détérioration des batteries ou de mauvaise recharge
ENAG accept no responsibility in case of batteries damage or incorrect reload.

SPARE PARTS LIST

Ind :	Description			DATE :	NATO CODE :
G	CDMV 115/230 - 50/60 - 24 - 16 - 1S			02/03/2016	F3645
Qty	**Rep**	**Description**	**Partnumber**	**Manufacturer**	**Item code**
1	A1	Charger 115/230-24-16-3S CDS4		ENAG	SEEL016305
2	F1-F11	Fuse 8AgG 10x38		ENAG	30001304
2	F2-F22	Fuse 16Agg 14x51		ENAG	30012443
1	H1	Lamp BA9S 30V		ENAG	30008158
1	P1	Voltmeter		ENAG	30016933
1	P2	Ammeter		ENAG	30012026
1	P2	Dial		ENAG	30012064

SEEL006963F N° 06963RAF

SPARE PARTS LIST

Ind :	Description			DATE :	NATO CODE :
F	CDMV 115/230-50-24-20-1S			02/03/2016	F3645
Qty	**Rep**	**Description**	**Partnumber**	**Manufacturer**	**Item code**
1	A1	Charger 115/230-24-20-3S CDS4		ENAG	SEEL013522
2	F1-F11	Fuse 8AgG 10x38		ENAG	30001304
2	F2-F22	Fuse 20Agg 14x51		ENAG	30007608
1	H1	Lamp BA9S 30V		ENAG	30008158
1	P1	Voltmeter		ENAG	30016933
1	P2	Ammeter		ENAG	30012026
1	P2	Dial		ENAG	30012211

SEEL006329D N° 06329RAD

SPARE PARTS LIST

Ind :	Description			DATE :	NATO CODE :
D	CHARGER CDMV 115/230 - 50/60 - 24 - 25 - 1S			02/03/2016	F3645
Qty	**Rep**	**Description**	**Partnumber**	**Manufacturer**	**Item code**
1	A1	Charger 115/230-50/60-24-25-3S CDS4		ENAG	SEEL016306
2	F1-F11	Fuse 10Agg 10x38		ENAG	30001307
2	F2-F22	Fuse 25Agg 14x51		ENAG	30001335
1	H1	Lamp BA9S 30V		ENAG	30008158
1	P1	Voltmeter		ENAG	30000477
1	P2	Ammeter 72x72		ENAG	30012026
1	P2	Dial		ENAG	30016938

SEEL006489F N° 06489RAE

SPARE PARTS LIST

Ind :	Description			DATE :	NATO CODE :
E	CHARGER CDMV 115/230-50-24-30-1S			02/03/2016	F3645
Qty	**Rep**	**Description**	**Partnumber**	**Manufacturer**	**Item code**
1	A1	Charger 115/230-50/60-24-30-3S CDS4		ENAG	SEEL013532
1	VL1	Fan 12VCC 70x70x20		ENAG	SEEL01343130
2	F1-F11	Fuse 10Agg 10x38		ENAG	30001307
2	F2-F22	Fuse 32Agg 14x51		ENAG	30001334
1	H1	Lamp BA9S 30V		ENAG	30008158
1	P1	Voltmeter		ENAG	30000477
1	P2	Ammeter 72x72		ENAG	30012026
1	P2	Dial		ENAG	30012057

SEEL006330D N° 06330RAD

SPARE PARTS LIST

Ind :	Description			DATE :	NATO CODE :
D	CHARGER CDMV 115/230 - 50/60 - 24 - 40 - 1S			21/09/2009	F3645
Qty	**Rep**	**Description**	**Partnumber**	**Manufacturer**	**Item code**
1	A1	Charger 115/230-50/60-24-40-3S CDS3		ENAG	SEEL011467
2	VL1-VL2	Fan 12VCC 80x80x25		ENAG	30012083
2	F1-F11	Fuse 16Agg 10x38		ENAG	30001101
2	F2-F22	Fuse 40Agg 22x58		ENAG	30018620
1	H1	Lamp BA9S 30V		ENAG	30008158
1	P1	Voltmeter		ENAG	30000477
1	P2	Ammeter		ENAG	30012026
1	P2	Dial		ENAG	30012222

SEEL002674G N° 02674RAE

SPARE PARTS LIST

Ind :	Description			DATE :	NATO CODE :
E	CHARGER CDMV 115/230-50-24-50-1S			21/09/2009	F3645
Qty	**Rep**	**Description**	**Partnumber**	**Manufacturer**	**Item code**
1	A1	Charger 115/230-24-50-3S CDS3		ENAG	SEEL011404
2	VL1-VL2	Fan 80x80x25 12VCC		ENAG	30012083
2	F1-F11	Fuse 16Agg 10x38		ENAG	30001101
2	F2-F22	Fuse 50Agg 22x58		ENAG	40009217
1	H1	Lamp BA9S 30V		ENAG	30008158
1	P1	Voltmeter		ENAG	30000477
1	P2	Ammeter		ENAG	30012026
1	P2	Dial		ENAG	30012065

SEEL003750F N° 03750RAD

SPARE PARTS LIST

Ind :	Description			DATE :	NATO CODE :
D	CHARGER CDMV 230 - 50 - 24 - 60 - 1S			21/09/2009	F3645
Qty	**Rep**	**Description**	**Partnumber**	**Manufacturer**	**Item code**
1	A1	Charger 115/230-24-60-3S CDS3		ENAG	SEEL010309
2	VL1	Fan 80x80x25 12VCC		ENAG	30012083
2	F1-F11	Fuse 16Agg 10x38		ENAG	30001101
2	F2-F22	Fuse 22x58 63 AgG		ENAG	30001346
1	H1	Lamp BA9S 30V		ENAG	30008158
1	P1	Voltmeter		ENAG	30000477
1	P2	Ammeter		ENAG	30012026
1	P2	Dial		ENAG	30012025

SEEL011904A N° 11904RAA

SPARE PARTS LIST

Ind :	Description			DATE :	NATO CODE :
A	CHARGER CDMV 115 - 60 - 24 - 80			10/09/2010	F3645
Qty	**Rep**	**Description**	**Partnumber**	**Manufacturer**	**Item code**
1	A1	Charger 230-50-24-120-3S CDS3		ENAG	SEEL010311
3	VL1-VL2-VL3	Fan 80x80x25 12VCC		ENAG	30012083
1	VL3	Fan 115Vac 120x120x25		ENAG	30017414
2	F1-F11	Fuse 32Agg 10x38		ENAG	30000124
2	F2-F22	Fuse 100Agg T00		ENAG	30001325
1	F3	Fuse 1Agg 10x38		ENAG	30001408
1	H1	Lamp BA9S 30V		ENAG	30008158
1	P1	Voltmeter		ENAG	30016933
1	P2	Ammeter 72x72		ENAG	30012026
1	P2	Dial		ENAG	30012025

SEEL006331D N° 06331RAD

SPARE PARTS LIST

Ind :	Description			DATE :	NATO CODE :
D	CHARGER CDMV 230 - 50 - 24 - 80			15/07/2010	F3645
Qty	**Rep**	**Description**	**Partnumber**	**Manufacturer**	**Item code**
1	A1	Charger 230-50-24-80-3S CDS3		ENAG	SEEL011405
3	VL1-VL2-VL3	Fan 80x80x25 12VCC		ENAG	30012083
1	VL3	Fan 230vac 120x120 15W		ENAG	30011481
2	F1-F11	Fuse 16Agg 10x38		ENAG	30001101
2	F2-F22	Fuse 80Agg T00		ENAG	30001104
1	F3	Fuse 1Agg 10x38		ENAG	30001408
1	H1	Lamp BA9S 30V		ENAG	30008158
1	P1	Voltmeter		ENAG	30016933
1	P2	Ammeter 72x72		ENAG	30012026
1	P2	Dial		ENAG	30012025

SEEL006332D N° 06332RAD

SPARE PARTS LIST

Ind :	Description			DATE :	NATO CODE :
D	CHARGER CDMV 230 - 50 - 24 - 100			15/07/2010	F3645
Qty	**Rep**	**Description**	**Partnumber**	**Manufacturer**	**Item code**
1	A1	Charger 230-50-24-100-3S CDS3		ENAG	SEEL011406
3	VL1-VL2-VL3	Fan 80x80x25 12VCC		ENAG	30012083
1	VL3	Fan 230vac 120x120 15W		ENAG	30011481
2	F1-F11	Fuse 16Agg 10x38		ENAG	30001101
2	F2-F22	Fuse 100Agg T00		ENAG	30001325
1	F3	Fuse 1Agg 10x38		ENAG	30001408
1	H1	Lamp BA9S 30V		ENAG	30008158
1	P1	Voltmeter		ENAG	30016933
1	P2	Ammeter 72x72		ENAG	30012026
1	P2	Dial		ENAG	30012504

SEEL006333D N° 06333RAD

SPARE PARTS LIST

Ind :	Description			DATE :	NATO CODE :
D	CHARGER CDMV 230 - 50 - 24 - 120			15/07/2010	F3645
Qty	**Rep**	**Description**	**Partnumber**	**Manufacturer**	**Item code**
1	A1	Charger 230-50-24-120-3S CDS3		ENAG	SEEL010311
3	VL1-VL2-VL3	Fan 80x80x25 12VCC		ENAG	30012083
1	VL3	Fan 230vac 120x120 15W		ENAG	30011481
2	F1-F11	Fuse 20Agg 10x38		ENAG	30001102
2	F2-F22	Fuse 125Agg T00		ENAG	30001105
1	F3	Fuse 1Agg 10x38		ENAG	30001408
1	H1	Lamp BA9S 30V		ENAG	30008158
1	P1	Voltmeter		ENAG	30016933
1	P2	Ammeter 72x72		ENAG	30012026
1	P2	Dial		ENAG	30012504