FPMD PORTABLE LANTERN (38201552)

INSTRUCTION MANUAL

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1 GENERAL POINTS – CHARACTERISTICS

1.1 GENERAL POINTS

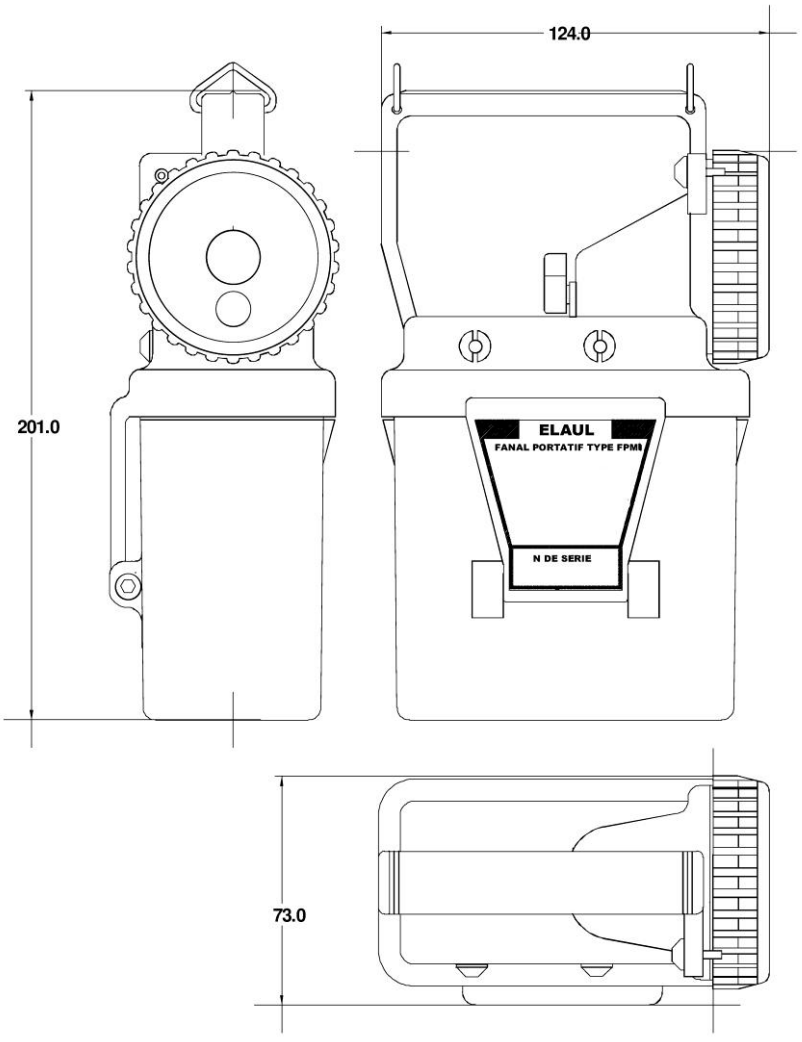
These portable lanterns are designed to ensure semi-fix safety lighting on ships and inside submarine fleet. They are mainly implemented:
- on wall-mounted charging bays located in corridors and in the main premises;
- on simple hanging stations.

They may be used as autonomous portable lights by the security staff in the whole of the premises.

1.2 CHARACTERISTICS

1.2.1 GENERAL CHARACTERISTICS

Manufacturer:	ELAUL
Type:	FPMD
Dimensions:	



Width	73 mm
Height	201 mm
Depth	124 mm
Weight	880 g

1.2.2 TECHNICAL CHARACTÉRISTICS

Accumulators:	
Type	NiCd
Number of parts	3
Main light source:	3W LED
Secondary/safety light source:	3 x 5mm LED device
Main light autonomy:	7H 30 à 20°C
Secondary light autonomy:	more than 48H at 20°C
Discharge current (nominal voltage):	
Main light source	650mA
Safety light source	100mA
Electronic circuits	1.3mA
Operating ambient temperature range:	from -25°C to +55°C

1.2.3 SAFETY MEASURES

Only the qualified personnel can carry out the tasks.
Respect the safety precautions regarding the hazards related to electrical operations carried out on electrical facilities.

1.2.3.1 Electrical hazards

Material equipped with a permanent internal battery.

1.2.3.2 Safety measures when putting into service operation

Use the suitable safety tools and equipment for individual protection.

Do not directly look at the light source during usage, as it may be harmful to the eyes.

2 DESCRIPTION - OPERATION

2.1 DESCRIPTION

The lantern features a casing with a built-in handle.

It is mainly composed of (see p22)
- An optical compartment (14) equipped with a main light source and with a safety light source. The front side of the projector is shut off by a glass (31) maintained by a threaded ring (36), which is itself locked with an Allen screw (21),
- An Ni-Cd waterproof accumulator battery (3),
- An operation switch (25) with stable position (neutral position) and two momentary positions (« start » or « switch off » enabling to switch the lantern on or off),
- A printed chip (23) gathering:
  - An automatic turn on function on the charging station in case of a power failure and an automatic switch off system when power is restored.
  - An automatic turn on function on removal and an automatic switch off system when the lantern is put back on its electrically powered charger.
  - An automatic turn on function of the safety light in case of failure of the main light source.

The accumulator battery (5), equipped with a fuse (7), is located in the carrier (1) constituting the casing while the projector forms the lid.
The latter contains the optical compartment, the operation switch and the handle.
The enclosure is secured with an Allen screw (2).

Charging is carried out by two devices (20) located on the lid.
Diodes ensure the protection against an accidental discharging of the battery throughout these devices.

2.2 OPERATION

2.2.1 BATTERY CHARGING OPERATION

Battery charging occurs when the lantern is set on the charger. As the charging contacts engage with the spring-loaded terminals of with the charger, the automatic switching circuit detects the charging current and switches the lantern to « stand by » mode.

2.2.2 OPERATION DURING AUTOMATIC SWITCHOVER

When the lantern is placed on the charger while switched on, it automatically transitions from “operation” or from « rest » mode to « stand by » mode.
The « stand by » mode corresponds to the mode during which the lantern’s battery is charging and its LEDs are off.
The « rest » mode is the mode during which the lantern is off and not charging. This mode can be obtained thanks to the operation switch

2.2.3 NORMAL OPERATION

This lantern is on normal operation when it is on and not charging.
This mode can be obtained from:

- « stand by » mode in case of a loss of mains,
- « rest » mode by operating the switch.

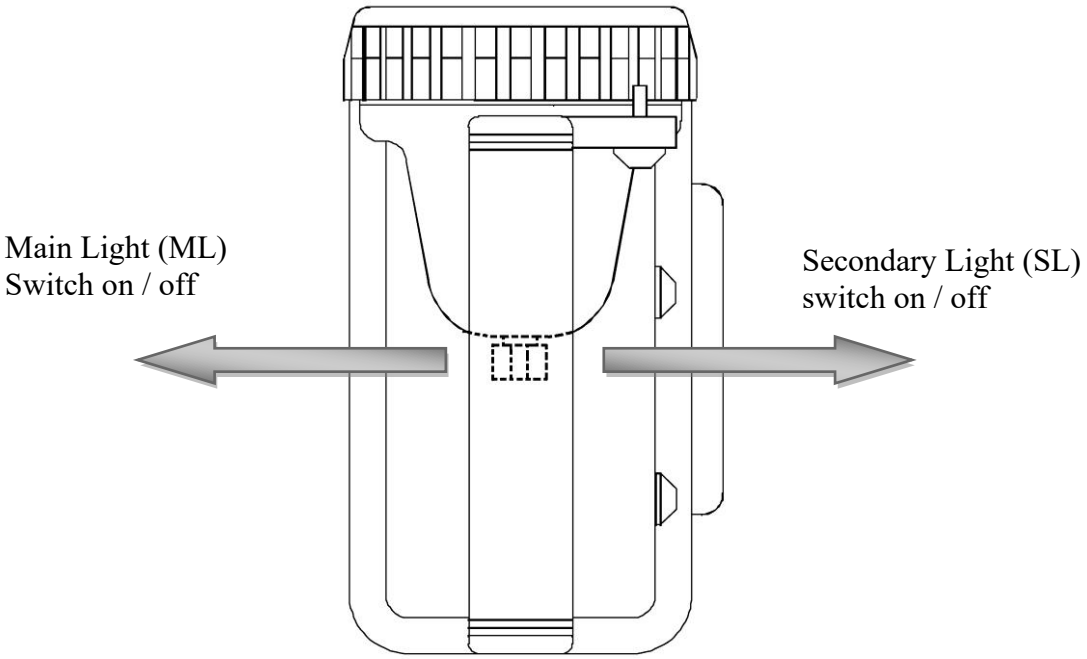
The lantern is switched off by operating the switch or when it is set on its charger.

2.2.4 SAFETY MODE

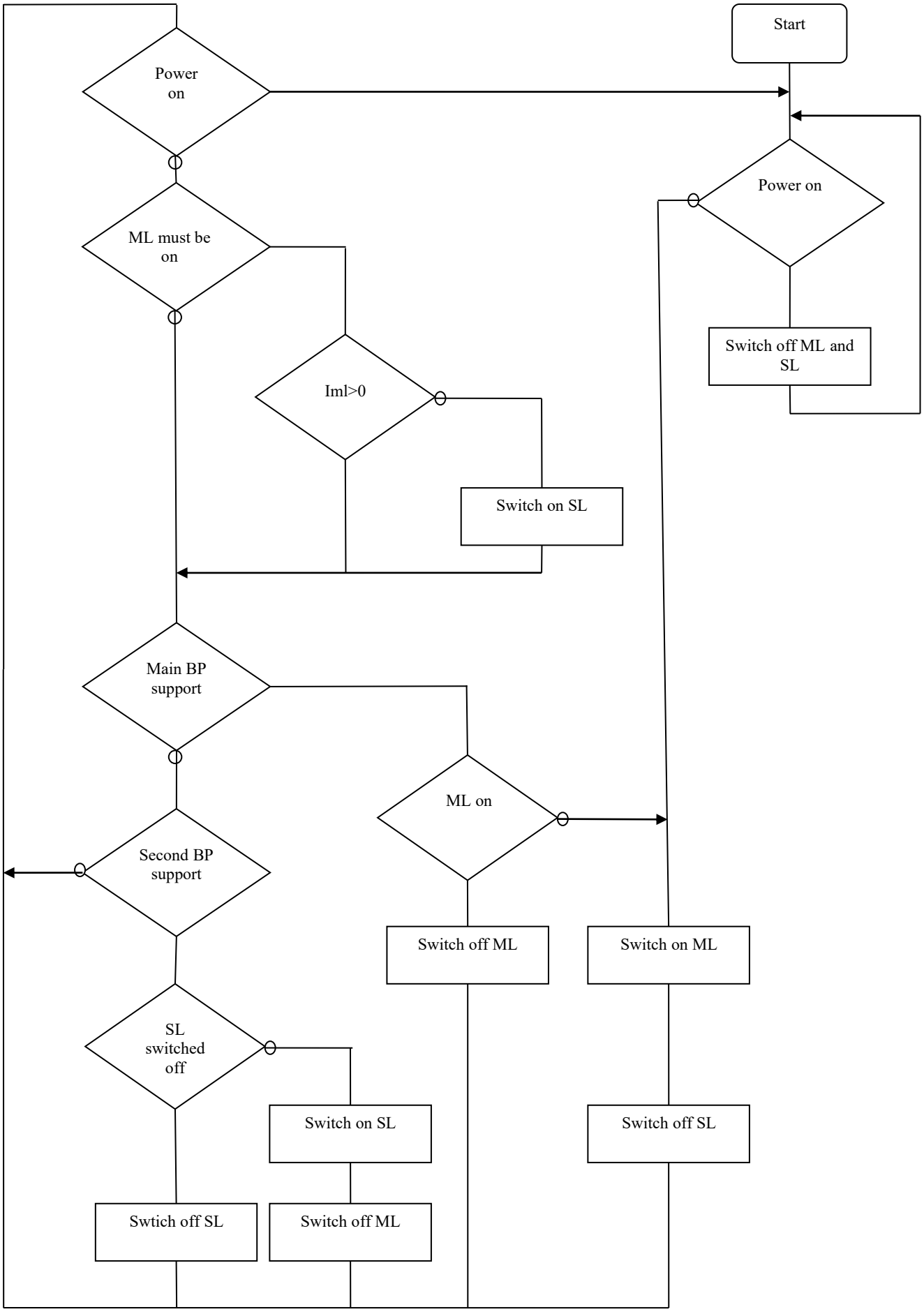
The lantern operates in safety mode when normal main lighting is unavailable due to a failure.
In case the main light breaks down, the lantern switches automatically to the secondary lighting.

2.2.5 COMMUTATOR OPERATION

The operation switch is located under the handle.
It is an automatic return switch with a central neutral position.
The light sources can be switched on and off by pushing the commutator and releasing it.



2.2.6 MICROPROCESSOR PROGRAMMING ALGORITHM



3 OPERATING INSTRUCTIONS

3.1 GUIDELINES FOR ONGOING USE

3.1.1 PUTTING INTO SERVICE

3.1.1.1 Lantern set on a charging station

No particular step is to be taken in that case. The operation is entirely automatic.
When mains voltage is present at the charging station, the lantern is in “stand-by” mode and the battery is charging.
- Upon loss of mains power, the switching circuit automatically switches to the “operating” mode and the main Led lamp (or if unavailable, the emergency LED lamp) turns on.
When the mains power is restored, the lantern automatically returns to “stand-by” mode.

3.1.1.2 Lantern set on a rest station or used as a portable lamp

- Activate the switch and then release it to turn on the lamp.
- Activate the switch and then release it to turn off the lamp.
- You can directly switch from one light source to another. To do so, activate the switch towards the light source wanted.

(See § 2.2.5)

3.1.2 ELEMENTARY MAINTENANCE GUIDE

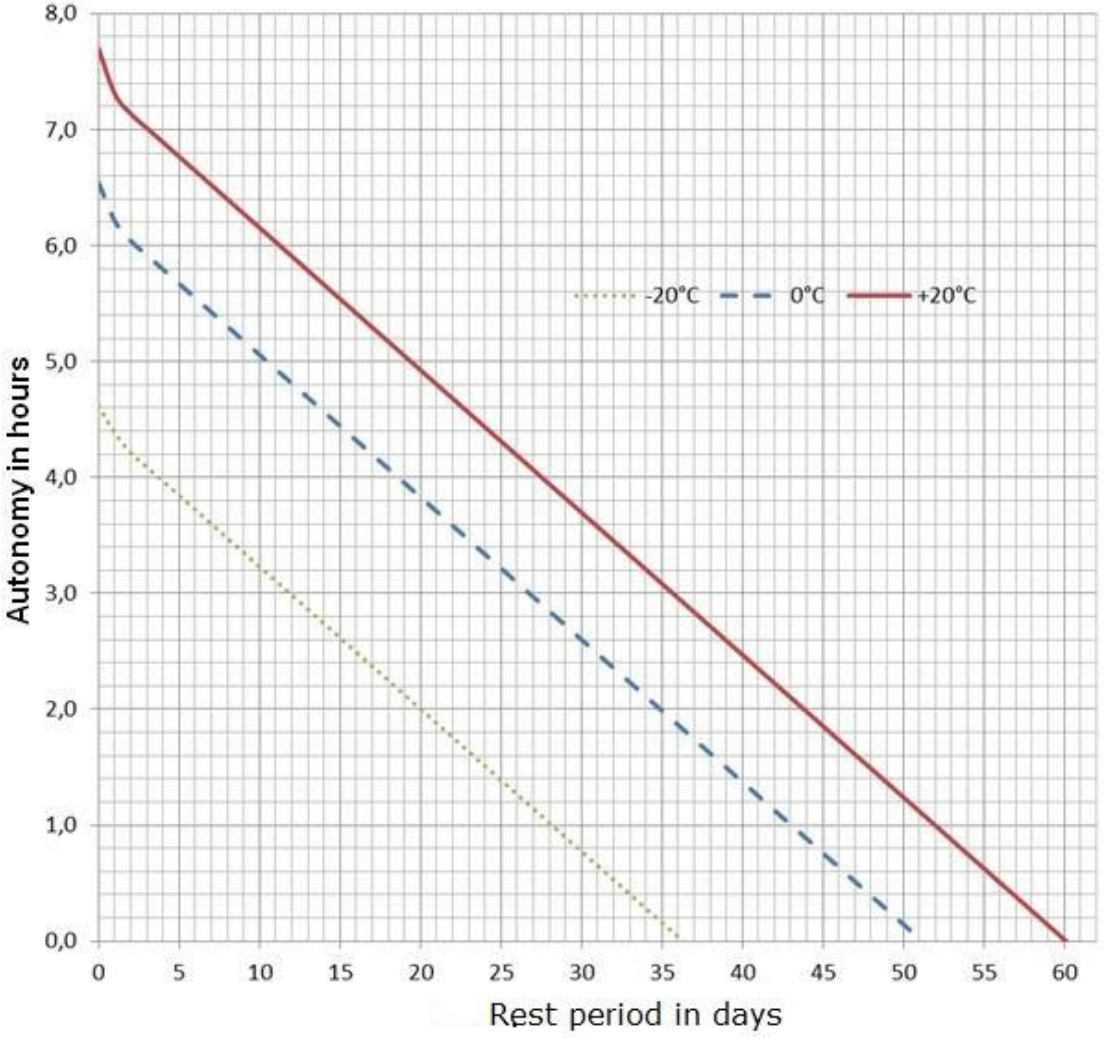
Occurrences during operation

Incident occurrence	Immediate reaction	Probable causes	Possible solution
The main and emergency LEDs do not switch on when mains voltage is lost.		Faulty charger	Set the lantern on a verified functional charger
		The LEDs are out of order.	Change the LED device
		Battery discharged.	Check the battery (See FT2 sheet)
		Damaged fuse.	Change the fuse (See FT1 sheet).
		Damaged printed card.	Change printed card or if not possible, the lantern.
The main LED does not turn on but the safety LEDs do whereas you are trying to turn on the main LED.		Main LED out of order	Change the LED device
		Damaged printed card.	Change printed card or if not possible, the lantern
Safety lighting does not turn on		Damaged LED.	Change the LED device.
		Battery discharged.	Check the charging level of the battery (See FT2 sheet).
		Damaged printed card.	Change printed card or if not possible, the lantern
Lack of operational autonomy		Damaged battery elements	Discharge the battery and then charge the lantern again for 24 hours. Check that the autonomy is normal; if not, change the battery.

TAB 3-1

3.1.3 AUTONOMY

Autonomy graph after a 24-hour charging at 20°C.



SETTINGS

Null

4 PREVENTIVE MAINTENANCE

4.1 MAINTENANCE SCHEDULE

Periodicity	Sheet	Task designation	*Maintenance level	Duration	Personnel	Complete unavailability of the material
	FT1	Operational check		0.1h	1	
	FT2	Control and maintenance of the charging		24h	1	
	FT3	Control of the aging of the battery		8h	1	
	FT4	Control of the fuse		0.3h	1	

*Maintenance level:
NTI1: task carried out by the crew
NTI2: task carried out by the base personnel
NTI3: task carried out by the shipyard personnel or by the manufacturer

4.2 PREVENTIVE MAINTENCE SHEETS

DEVICE CODE:	**WORK SHEET**		
DESIGNATION: FPMD LANTERN	**T**1 **FOLIO :** 1	**Periodicity:** S 00001	**Visit type**: VV01
SUBJECT: Functional control	**Duration:** 0,1 h		**Maintenance level:** 2
	Staff: 1		**Indisp.:**

MEANS OF EXECUTION:

- Charging plate PCM or PCP series type.

PROCEDURE:

- The FPMD lantern set on a PCM or PCP charging plate, ensure the main LED lamp turns on when off the charger.
- Put the lantern back on the charger and check that it turns off correctly.

DEVICE CODE:	**WORK SHEET**		
DESIGNATION: FPMD LANTERN	**T**2 **FOLIO:** 1	**Periodicity:** M 00003	**Visit type**: VM01
SUBJECT: Control and maintenance if the charge	**Duration:** 24 h		**Maintenance level:** 2
	Staff: 1		**Indisp.:**

MATERIAL AT STAKE

- Every lantern set on an hanging station without any system of charge

MEANS OF EXECUTION:

- Charging plate PCM or PCP series type.

PROCEDURE:

- Implement a 24-hour charge of the lanterns which are not set on a charging station; this charge will be carried out on a charging station available for this purpose.

NOTA

The periodicity depends on the temperature of the premises into which the lanterns are stored. The graph is available p 11.

DEVICE CODE:	WORK SHEET		
DESIGNATION: FPMD LANTERN	**T**3 **FOLIO:** 1	**Periodicity:** M 00015	**Visit type**: VM02
SUBJECT: Battery checking	**Duration:** 8h		**Maintenance level:** 2
	Staff: 1		**Indisp.:**

MEANS OF EXECUTION:

- Charging plate PCM or PCP series type.

PROCEDURE:

General points:

The sealed Ni-Cd parts do not necessitate any particular maintenance; however, an annual control of the battery status is advised. This control can be carried out by the user without any specific or specialized assistance.

Discharging of the lantern:

- Ensure that the lantern is fully charged (leave it on its charging plate for more than 24 hours) and discharge the lantern thanks to its main LED.

Verification of the autonomy:

NOTA

the autonomy of the lantern can be reduced up to 5 hours if stored in facilities where the temperature is different from 20°C,

The lantern is on « discharge » position:

- Check that the lantern is still on after 7h30 of use.

The battery is considered as working properly:

- Put the lantern back on its charging station or on its hanging station after you have charged it.

The lantern is off before the required 7 hours 30:

- Set the lantern on a charging station (the ambient temperature must be between 20 and 25°C); let it charge for 24 hours and proceed to another discharge on the main lamp.
- Make sure that the reduced running time that was noticed previously is not due to a malfunctioning or to an inappropriate setting of the charger. If the autonomy is not obtained, replace the battery (DM3).

DEVICE CODE:	WORK SHEET		
DESIGNATION: FPMD LANTERN	**T**4 **FOLIO:** 1	**Periodicity:** M 00036 ±00006	**Visit type**: VM03
SUBJECT: Battery fuse control	**Duration:** 0,3 h		**Maintenance level:** 2
	Staff: 1		**Indisp.: x**

PROCEDURE:

Pl. 1/fig. 1.

- Open the FPMD lantern.
- Check the F1 fuse (7).
- Close the FPMD lantern.

5 CORRECTIVE MAINTENANCE TASKS

5.1 LIST OF CORRECTIVE MAINTENANCE SHEETS

Sheet	List of breakdowns and corrective actions	NTI	Duration	Personnel	Complete unavailability of the device
D1	LED device change		0.15 h	1	YES
D2	Fuse change		0,5 h	1	YES
D3	Battery change		0.5 h x2	1	YES

5.2 CORRECTIVE MAINTENANCE SHEETS

DEVICE CODE:	DISMANTLING REASSEMBLING SHEET	
DESIGNATION: FPMD LANTERN	**D**1 **FOLIO:** 1	
SUBJECT: LED lamps and system change	**Duration:** 0,15 h	**Maintenance level:** 2
	Staff: 1	

1 MEANS OF EXECUTION

1.1 Equipment

– Appropriate wrench for locking screw (21)

– Flat screwdriver

1.2 Necessary drawings and schematics

– Exploded view, nomenclature list

1.3 Consumables

– Null

1.4 Control and test processes

– Null

2 SPARE PARTS

– Null

3 STEPS PRIOR TO ANY MAINTENANCE INTERVENTION

Equipment containing a permanently integrated battery.

4 EXECUTION PROCESS

- Remove the locking screw (21).
- Unscrew the ring (36).
- Remove the disk (31) and the hubcap/gasket (15, 32).
- Unscrew the screw maintaining the LED system (33)
- Replace the LED system (14), be careful not to short-circuit in order not to break the fuse (7).
- Reassemble in the reverse order.

5 TESTS AND CHECKS BEFORE RE-COMMISSIONING

Carry out a functional test of the light sources (main and secondary) by operating the switch

DEVICE CODE:	DISMANTLING REASSEMBLING SHEET	
DESIGNATION: FPMD LANTERN	**D**2 **FOLIO:** 1	

SUBJECT: Fuse change	Duration: 0,5 h	Maintenance level: 2
	Staff: 1	

1 EXECUTION PROCEDURE

1.1 Equipment

- 3-mm Allen wrench
- 7-mm wrench

1.2 Necessary drawings and schematics

- Exploded view, nomenclature list

1.3 Consumables

- Null

1.4 Test and control processes

- Null

2 SPARE PARTS

- Null

3 STEPS PRIOR TO ANY MAINTENANCE INTERVENTION

Equipment containing a permanently integrated battery.

4 EXECUTION PROCEDURE

Dismantling:

- Remove the CHC M4 screw (2).
- Separate the projector compartment from the container (1) by lifting the handle.
- Disconnect the wires between the battery and the projector.

Replacement of the fuse:

- The fuse (7) is maintained by a nut (11) and a screw (6) on the top shield (4).
- Replace the fuse (7) out of order by a new one and reassemble it without forgetting the wavy washers (10) and the nuts (11).
- Reassemble the projector in the reverse order.

5 TESTS AND CHECKS BEFORE RE-COMMISSIONING

Carry out a functional test of the light sources (main and secondary) by operating the switch.

DEVICE CODE:	DISMANTLING REASSEMBLING SHEET	
DESIGNATION: FPMD LANTERN	**D**3 **FOLIO:** 1	
SUBJECT: Battery change	**Duration:** 0,5 h x 2	**Maintenance level:** 2
	Staff: 1	

1 EXECUTION PROCEDURE

1.1 Equipment

- 3-mm Allen wrench
- 7-mm wrench

1.2 Necessary drawings and schematics

- Exploded vision, nomenclature

1.3 Consumables

- Null

1.4 Test and control processes

- Null

2 SPARE PARTS

- Null

3 STEPS PRIOR TO ANY MAINTENANCE INTERVENTION

Equipment containing a permanently integrated battery.

4 EXECUTION PROCEDURE

Dismantling:

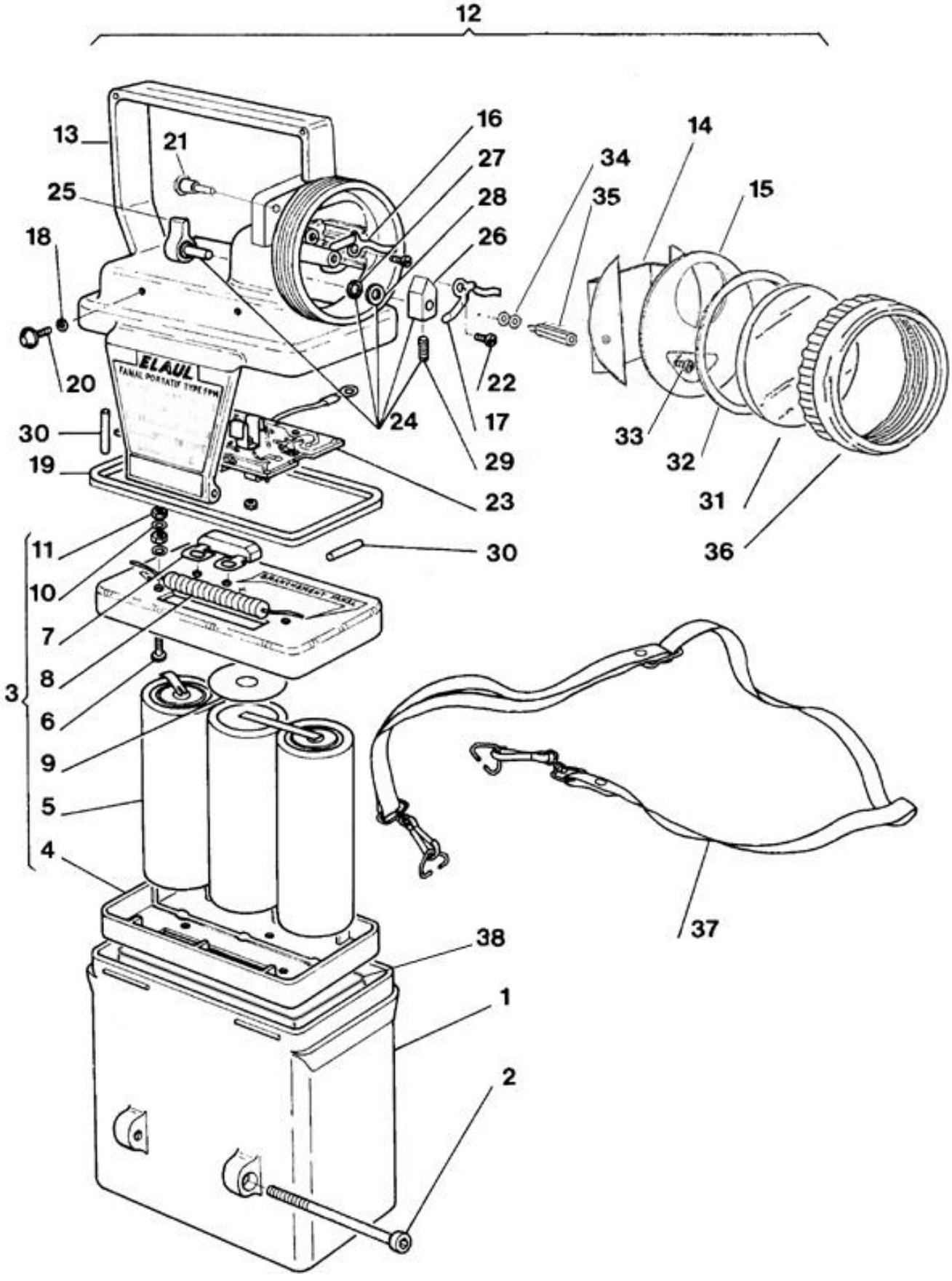
- Remove the CHC M4 screw (2).
- Separate the projector compartment from the container (1) by lifting it thanks to the handle.
- Disconnect the wires between the battery and the projector.
- Change the battery compartment
- Reassemble the projector in the reverse order.

5 TESTS AND CHECKS BEFORE RE-COMMISSIONING

Carry out a functional test of the light sources (main and secondary) by operating the switch (if the battery is completely discharged, proceed to a quick charging some minutes before).

Set the lantern on a charging station reserved for that purpose (the room temperature of the premises in which the test is carried out must be around 20°C-25°C) ; let it charge for 24 hours and proceed to a discharging of the main lamp. Check that the operation autonomy is correct and then proceed to a 24-hour charging.

6 ILLUSTRATED PARTS LIST



SPARE PARTS NOMENCLATURE

Code	DESIGNATION	ELAUL reference	NSN	Qty
1	Battery compartment with brace insert	50 708 407	6140-14-481-6219	1
2	Allen screw CHC M4*55	03 809 233	5305-14-405-6813	1
3	**Spare parts: Assembled Battery FPM/LTM**	62 100 837	6140-14-585-8620	1
4	Flask	01 708 403		2
5	NiCd 3 VRED 5500 Battery	02 100 836		1
6	Battery terminal	01 705 046		4
7	Encapsulated fuse	50 300 129	5920-14-402-2285	1
8	Resistor	09 114 239		1
9	Insulating washer	03 814 029		3
10	Wavy washer	03 813 009		8
11	HM4 ZBC nut	03 810 027		8
12	**Spare parts : Mounted projector body**	50 201 538		1
13	Bare projector body with brace inserts	50 708 404		1
14	LED devices in 3,6V	50 201 514	6210-14-585-8618	1
15	Hubcap support joint	01 703 529	6650-14-585-8613	1
18	D2,6 * 1 O ring	01 900 078	5331-14-284-9666	2
19	Flat gasket	01 900 104	5330-14-585-8616	1
20	Charging devices	01 705 012	59999143995716	2
21	Locking screw	03 705 294	53051143995715	1
22	TCBL M3*6 A2 screw	03 809 001		1
23	Cable printed card	50C301689	5898-14-585-8619	1
24	**Spare parts: Complete switch handle**	50 707 092	5930-14-402-2277	1
25	Handle with shaft	50 708 741		1
26	Cam	01 707 104		1
27	D3,75*1,6 O ring	01 900 080	5331-14-530-1737	1
28	M4 washer	03 809 202		1
29	M3*6 set screw	03 809 232		1
30	Wedge	01 900 081	5330-14-403-8476	3
31	Protection disc	01 200 825	6230-14-297-6822	1
32	Reflector gasket	01 900 057	5330-14-297-6823	1
33	Screw	03 804 004		1
34	Washer	03 809 247		2
35	Pillar	03 705 304		1
36	Closing ring	01 708 402	6230-14-402-2286	1
38	Battery wedge	01 900 093		1
37	**Option : Strap**	01 903 024	5340-14-399-5709	1