SBFL 160

Marker Light

Installation and service manual

V2.0 October 2026



SABIK

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Document Revision and Approval

VERSION NO.	DESCRIPTION	DATE	REVIEWED	APPROVED	AUTHOR
2.00	Rechargeable battery information and features added in to sections 1, 2, 4.2, 3.3. Branding and formatting updated. Section 9 contact information updated. Removed mentions of SBFH.	October 2026	H. Korpela	J. Lindberg	M. Stratikopoulos
1.01	Revised	30.Oct 2018			
1.00	First Release	22.Oct 2018			

Disclaimer: Every possible effort has been made to ensure the validity of this document. It represents the current view (as of the publishing date) on the functions and properties of the products mentioned in the document. SABIK OY is not responsible for possible typing errors. The pictures and drawings are for descriptive use only.

Glossary

ACRONYM	DEFINITION
iOS	**iPhone Operating System**
Ah	**Ampere-hour** A unit used to measure battery capacity. It indicates the amount of electrical charge a battery can supply over a specified period.
BMS	**Battery Management System** An electronic protection system that monitors and manages battery operation, protecting against overcharge, over-discharge, short circuits, and excessive current.
GPS	**Global Positioning System** A satellite-based navigation system used by the marker light for location tracking and synchronisation of flashing characteristics.
IALA	**International Association of Marine Aids to Navigation and Lighthouse Authorities** The international organisation responsible for standards and recommendations relating to marine aids to navigation.
IP Rating	**Ingress Protection Rating** A classification that defines the level of protection provided by an enclosure against the ingress of solids and liquids.
LED	**Light Emitting Diode** A highly efficient solid-state light source used within the marker light lantern.
$LiFePO_4$	**Lithium Iron Phosphate** A rechargeable lithium battery chemistry known for its long cycle life, thermal stability, and enhanced safety compared to other lithium battery technologies.
IP67	Protection against dust ingress and temporary immersion in water up to 1 metre for 30 minutes under specified conditions.
V	**Volt** The unit of electrical potential or voltage.

References

DOCUMENT NAME
Sabik easyProgrammer product manual

1. Introduction

The SBFL 160 Marker Light has been specifically developed for aquaculture farm marking applications. Designed to provide excellent daytime, nighttime, and radar visibility, the unit helps ensure safe identification of aquaculture infrastructure in a wide range of marine operating conditions. The marker light can be mounted directly onto aquaculture farm floats for simple installation and reliable long-term operation.

The marker light combines a high-visibility yellow buoy structure with an integrated battery system, LED lantern, light reflectors along with internal radar reflector. The battery system is available with either an integrated alkaline battery or a rechargeable $LiFePO_4$ battery The rugged, low-power LED lantern incorporates GPS synchronisation as standard, enabling precise flash synchronisation across multiple installations. Advanced Bluetooth® Control provides wireless monitoring and configuration up to 50 m using Android™ and iOS® mobile devices.

1.1 Standard Features

- Adjustable intensity and range
- Standard range 3 NM at Tc = 0.74
- IALA-compliant yellow light with internal radar reflector
- Energy sources: alkaline primary battery or rechargeable $LiFePO_4$ battery
- Vertical divergence 8° @ 50% (±1°) of peak intensity
- GPS synchronisation as standard
- Mounting mechanism can be customised for different floats
- Sabik easyProgrammer can be used for programming the lantern and for reading the status of the lantern and battery
- Advanced Bluetooth programming and control up to 50 m radius available as iPhone and Android app

1.2 Product Codes

SBFL 160-1.7YBS	Marker light with 220 Ah primary battery + sync
SBFL-160-1-7YLS	Marker light with a rechargeable 135 Ah, 16 V LiFePO4 battery + sync
950168	220 Ah primary battery
LFP16-135-QD	135 Ah 16 V Rechargeable battery with Legacy Quick-disconnect Terminals
LFP16-135-BD	135 Ah 16 V Rechargeable battery with Binder Connector
841011	Mechanics for buoy installation
VPL 110Y4	Lantern for SBFL marker light with synchronisation
980332	Sabik easyProgrammer
LFP-CHRG-2240-5-QD	$LiFePO_4$ 5S 4A Charger, Quick Disconnect Connectors
LFP-CHRG-2240-5-BD	$LiFePO_4$ 5S 4A Charger, Binder Connector

2. Technical Details

2.1 Main Technical Specifications

Max lantern intensity	60 cd
Vertical divergence	8° @ 50% (±1°) of peak intensity
Buoy material	UV resistant Polyethylene
Lantern material	UV resistant Polycarbonate
Weight without adapter plate	33 kg
Degree of protection, lantern	IP 67
Lantern programming	Wireless with Sabik easyProgrammer or with an advanced Bluetooth Android and iOS mobile app
Primary battery 220 Ah	Replacement interval: ~1,5 years
Rechargeable battery 135 Ah	Recharging interval: ~1 year
	Nominal Voltage: 16 V
	Maximum charging conditions: 18 V / 6.5 A at 0°C to +55°C
	Maximum discharging current: 6.5 A at −20°C to +60°C

2.2 Power Consumption

Please note: Power consumption is dependent on latitude and ambient temperature of product location. Use the relevant graph below as a guide when determining when to replace the battery with a fully charged battery.

2.2.1 Primary Battery

The graph below approximately describes the primary battery life.

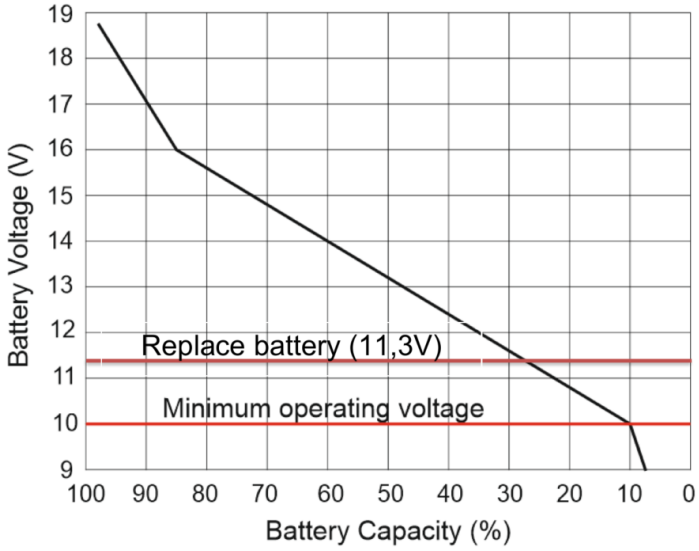


Figure 1 Primary battery life graph

2.2.2 Rechargeable Battery

The graph below provides an approximate indication of the rechargeable battery's state of charge based on its voltage.

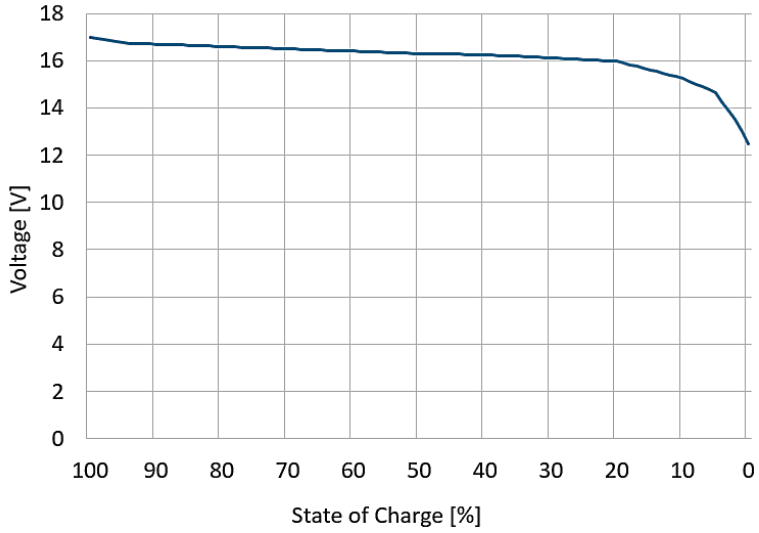


Figure 2 Rechargeable battery state-of-charge graph

2.3 Dimensions and Mechanical Properties

2.3.1 Dimensions

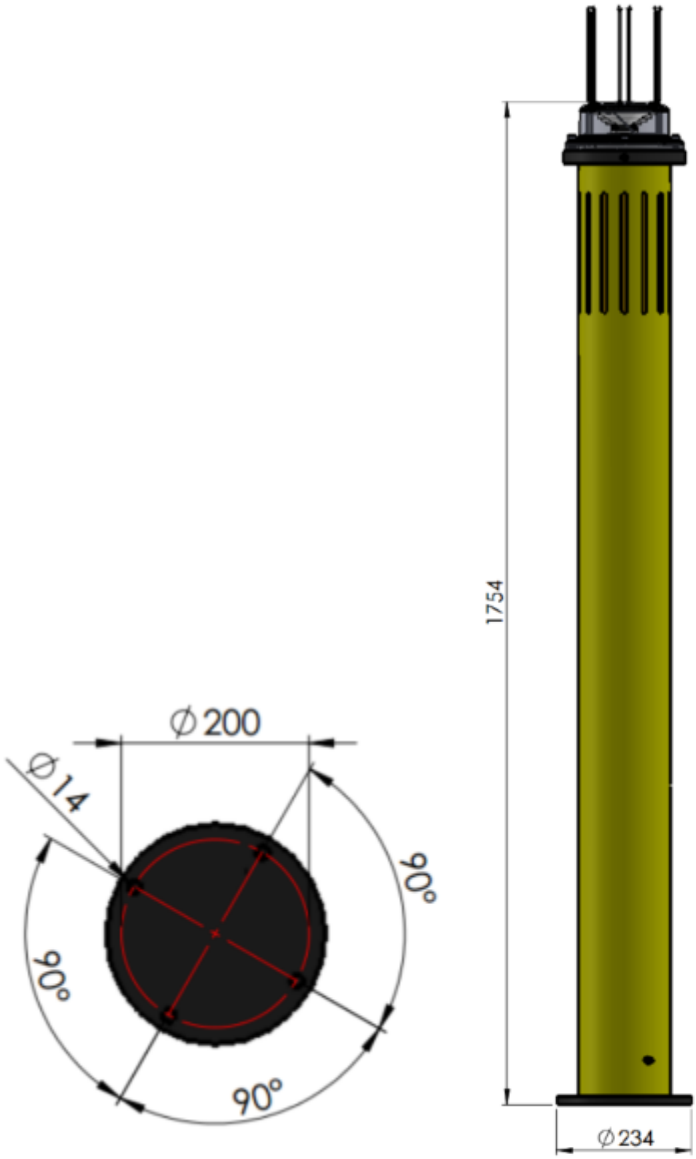


Figure 3 SBFL 160 side and base views, annotated

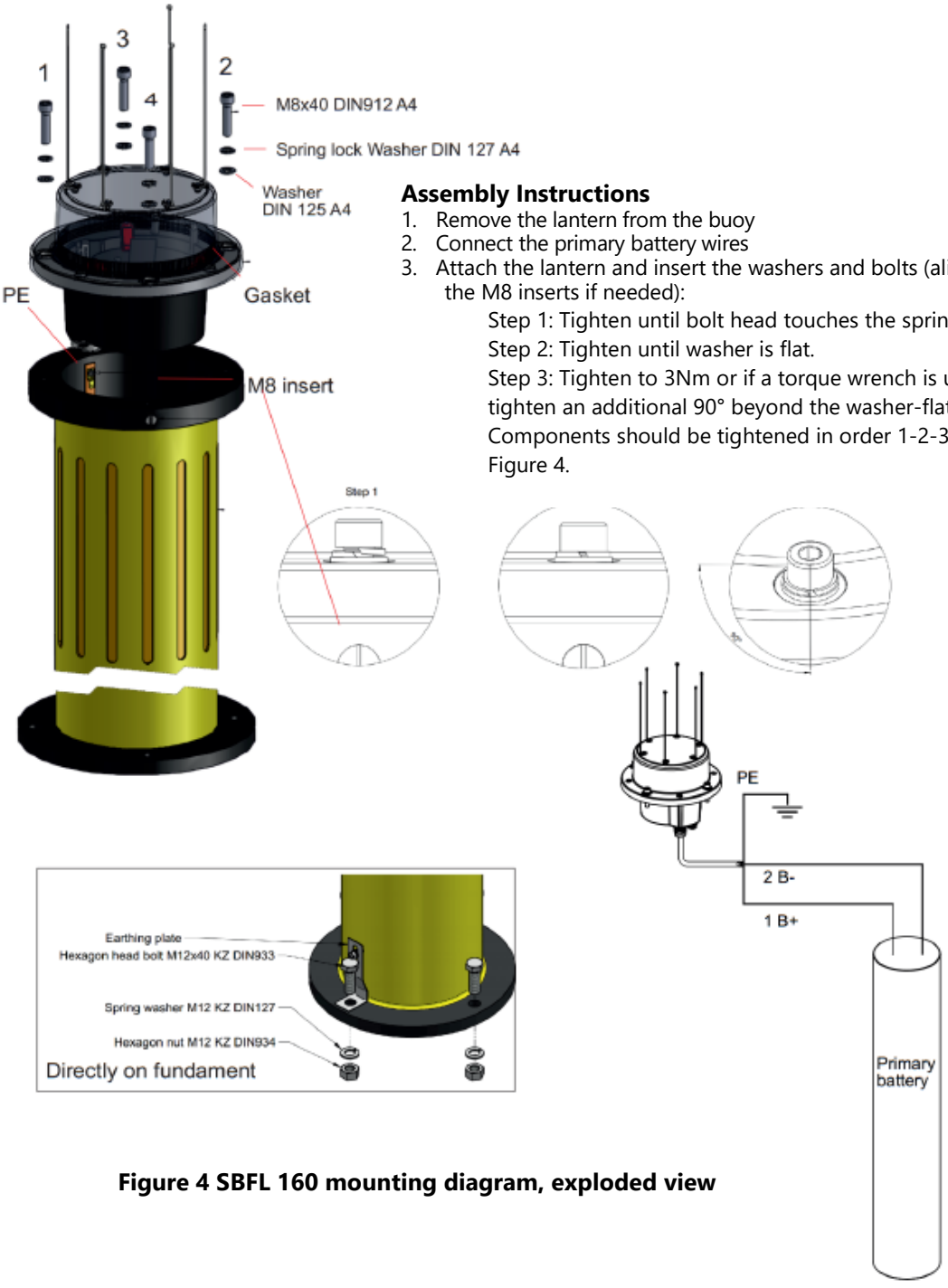
2.3.2 Mechanical Properties

The lantern buoy is made of UV resistant Polyethylene and the lantern of UV resistant Polycarbonate. For material details, refer to section 4, Environmental and Safety.

3. Commissioning

This chapter describes how to install, configure and test the lantern.

3.1 Mounting



Assembly Instructions

1. Remove the lantern from the buoy
2. Connect the primary battery wires
3. Attach the lantern and insert the washers and bolts (align the M8 inserts if needed):

   Step 1: Tighten until bolt head touches the spring washer.
   Step 2: Tighten until washer is flat.
   Step 3: Tighten to 3Nm or if a torque wrench is unavailable, tighten an additional 90° beyond the washer-flattened position.
   Components should be tightened in order 1-2-3-4 as labelled in Figure 4.

Figure 4 SBFL 160 mounting diagram, exploded view

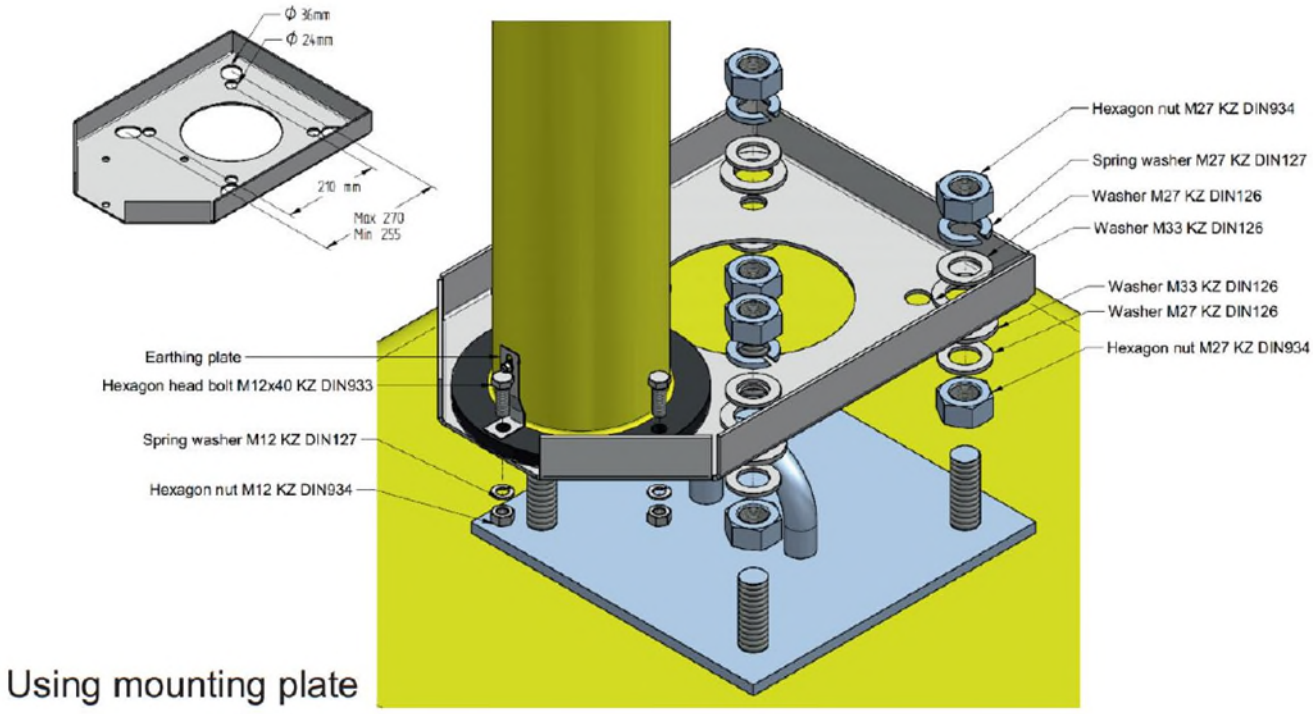


Figure 5 SBFL 160 mounting plate diagram, annotated

3.2 Battery Replacement

The buoy is fitted with either a Primary Battery (220 Ah) or a Rechargeable Battery (135 Ah). The Primary Battery is connected by PE, Plus (+) and Minus (-) connectors.

To replace the battery, you need an 8mm Hex (Allen) key and it is recommended to use Sabik easyProgrammer or Bluetooth app (for testing).

1. **Remove the lantern-head from the buoy using the 8mm Hex (Allen) key**
2. **Disconnect the wires**
3. **Remove the protecting foam**
4. **Remove the radar reflector**
5. **Remove the protecting foam**
6. **Carefully lift the battery from the buoy by lifting it from the handle on top**
7. **Insert replacement battery**
8. **Assemble in reverse order, remember to first connect the PE wire**
9. **Test using Bluetooth app or Sabik easyProgrammer**



Figure 6 SBFL 160 exploded view

3.3 Battery Recharging

Once the rechargeable battery has been removed from buoy as per the instructions in section 3.2, it can be recharged. It is available in two versions: either the legacy connectors or a Binder connector, refer to 1.2 for their product codes and section 2.1 for charging specifications. Adherence to instructions and safety precautions is essential, failure to do so may void the product warranty and has the potential to cause damage to equipment or personnel harm.

3.3.1 Safety Precautions

WARNING
Only use Sabik chargers approved for $LiFePO_4$ batteries.
WARNING
Verify the charger output voltage and current are compatible with the installed battery.
WARNING
Do not charge a damaged, swollen, leaking, or physically compromised battery.
WARNING
Do not short-circuit battery terminals or connectors.
WARNING
Charge the battery in a dry, well-ventilated location.
WARNING
Ensure all connectors and cables are free from corrosion, dirt, and moisture before charging.

3.3.2 Charging Procedure

1. **Inspect the Battery**

   Visually inspect the battery enclosure for:
   - Cracks
   - Impact damage
   - Swelling or deformation
   - Corrosion
   - Water ingress

Do not charge the battery if any damage is found.

2. **Connect the charger**

   Ensure the charging connector is clean and dry
   Verify power source

Place the battery on a stable surface away from direct heat sources.

3. **Charge the Battery**
   Allow the charging cycle to be completed uninterrupted.

4. **Verify Completion of Charge**
   Confirm the charger indicates a full charge.
   Disconnect AC power and disconnect the charger from the battery.

5. **Return to Service**
   Battery is ready to be reinstalled into the buoy.

3.4 Flasher

Pre-programmed on delivery. Programmable using Sabik easyProgrammer or Bluetooth. On the next pages you will find short descriptions.

3.5 Control & Monitoring

3.5.1 Sabik Bluetooth® Control Application

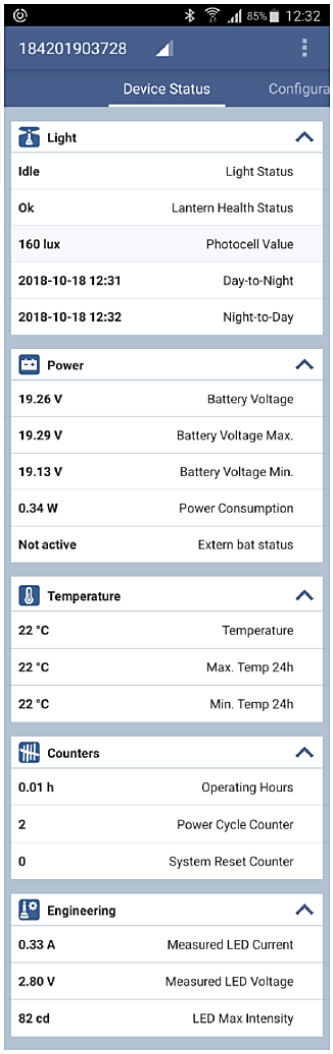
Download on the App Store

ANDROID APP ON Google play

The Sabik Bluetooth Control Application can be downloaded for free from Google Play or Apple AppStore.

Contact your local dealer to register.

Use the app to read the device status simply by selecting the lantern on first page.



Note: The pictures are for reference only. The interface may change with newer versions.

3.5.2 Sabik easyProgrammer

Sabik easyProgrammer is a stand-alone simple programmer for lanterns with an infrared-Interface.



1. Insert batteries (3 standard size AAA)
2. Start programmer: Press green ENTER for at least 2 seconds
3. Set/Check Date and time settings: Select ADVANCED -> DATE/TIME



Figure 7 Sabik easyProgrammer example front (Top), back – battery cover open (Bottom)

To check/change existing lantern settings

1. Select SETTINGS and press green ENTER.

2. Point at lantern's IR receiver to read lantern's settings. The programmer beeps twice, when reading is completed.

Please refer to the Sabik easyProgrammer product manual for more detailed information.

4. Environmental and Safety

4.1 Primary Battery

Battery Type
Alkaline primary battery 220 Ah, consists of cells.
Cell: LR20, LR14, LR6, LR03, or 6LR61

Ingredients

Ingredient Name	CAS Number	Weight component percentage
Manganese dioxide	1313-13-9	-25-45%
Zinc	7440-66-6	-10-20%
Potassium hydroxide	1310-58-3	-3-9%
Zinc oxide	1314-13-2	-0-1%
Graphite	7782-42-5	-1-4%
Steel	7439-89-6	-10-30%

Handling and storage
Do not disassemble, try to charge or throw in fire.
Do not short circuit or install with reverse polarity.
Store at dry places and at room temperature

Transport info
These are "Batteries dry" and are not considered to be a "hazardous material" per U.S. DOT (department of transportation regulations) or a " dangerous goods" per IATA (International Air Transport Association Regulations)

Disposal
Batteries should be disposed of in accordance to local regulations. In case of doubt, contact your local dealer for more information. Avoid heating/burning in order to avoid explosion and exposure to excessive temperatures.

Stability and reactivity
Stability: Stable
Incompatibility (materials to avoid): NA
Hazardous decomposition of by-products: Oxides or fumes of Mn, Zn
Hazardous polymerization: Will not occur

Toxicological information
Not applicable to batteries as such: for detailed info on ingredients check Ingredients section

Hazard identification
Critical hazards for human beings: If battery starts leaking, exposure to caustic ingredients is possible

Useful info: Keep out of reach of children
Critical hazards to environment: Not applicable

First aid measures
Avoid skin and eye contact to avoid irritation and/or caustic burns/injury
If leakage from battery contacts skin or eyes, flush immediately with copious quantity of water
Contact a physician for medical attention in case of eyes!
Ingestion is unlikely due to size of batteries, but in case it happens, a physician should be contacted immediately to avoid damage to intestines caused by the unnatural object.

Accidental release measures
Safety responsible should be notified in case of large spills. Caustic Kalium Hydroxide may come out from leaking batteries. Avoid contact to skin/and or eyes. Increase ventilation. Personnel cleaning up should wear appropriate protecting clothing and gloves.

Fire hazard

Flash point (Method used):	NA
Flammable limits:	LEL: NA UEL: NA
Extinguishing media:	Dry powder, carbon dioxide, foam, dry sand.
Special firefighting procedures:	Fire fighters should wear self-contained breathing apparatus when any fire.
Unusual fire and explosion hazards:	Cells exposed to excessive heat, may cause electrolyte leakage or explosion.

4.2 Rechargeable $LiFePO_4$ Battery

Battery Type
Rechargeable lithium iron phosphate battery pack.

Ingredients

Ingredient Name	CAS number	Maximum weight component percentage
Lithium iron phosphate	15365-14-7	≤ 40%
Graphite	7782-42-5	≤ 25%
Copper	7440-50-8	≤ 11%
Aluminium	7429-90-5	≤ 7%
Ethylene carbonate	96-49-1	≤ 5%
Dimethyl carbonate	616-38-6	≤ 5%
Lithium hexafluorophosphate	21324-40-3	≤ 3%
Polyvinylidene fluoride, PVDF	24937-79-9	≤ 2%
Silicon	7440-21-3	≤ 1%
Carboxymethyl cellulose	9004-32-4	≤ 1%

Handling and Storage
Do not disassemble, crush, puncture, or modify the battery.
Do not expose the battery to fire or temperatures above the specified operating limits.
Do not short-circuit the battery terminals.
Store in a cool, dry place away from direct sunlight and sources of heat.
For extended storage periods, maintain the battery at approximately 30-60% state of charge.

Transport Information
The battery is regulated as dangerous goods for transport:

- UN number: UN 3480, when transported as a standalone battery
- Proper shipping name: Lithium-ion batteries
- Hazard class: Class 9
- Energy rating: 2160 Wh
- UN 38.3 test report: KS2601S0670B01
- UN 38.3 test summary: available from the manufacturer or supplier

Before transport, switch off or electrically isolate the battery and protect its terminals against short circuit.
Do not transport a battery that is damaged, leaking, swollen, overheating, emitting an unusual odour, or smoking through the normal transport process. Obtain instructions from a qualified dangerous-goods specialist, carrier, or the manufacturer.

Disposal
Do not dispose of the battery as household or general waste.
Do not incinerate, burn, crush, puncture, or dismantle a waste battery.
Protect the terminals against short circuit before collection or transport.
Deliver the battery to an approved battery collection or recycling facility.
Damaged or defective batteries shall be handled by appropriately trained personnel and an authorised waste-management operator.
Dispose of or recycle the battery in accordance with applicable national and regional requirements.

Stability and Reactivity
Stability: Stable under normal temperature, pressure, operating, and storage conditions.
Incompatible materials: Oxidising agents.
Conditions to avoid: Heat, open flame, short circuit, electrical or mechanical abuse, and contact of exposed internal materials with water.
Hazardous polymerisation: Will not occur.
Hazardous decomposition products: Carbon monoxide, carbon dioxide, hydrocarbon gases, hydrogen, hydrogen fluoride, and other harmful fumes may be produced during fire or severe thermal decomposition.

Toxicological Information
An intact, sealed battery does not normally present a toxicological hazard during intended use. If the battery casing is damaged, leaked electrolyte, vapour, or smoke may irritate or damage the skin, eyes, and respiratory tract. Avoid all contact with released internal materials.

Hazard Identification
The battery is not classified by the supplier as hazardous under the referenced GHS physical, health, or environmental hazard classifications when intact and used as instructed.

Improper use or abuse, including overcharging, over-discharging, overheating, short-circuiting, crushing, puncturing, or exposure to fire, may result in:

- Electrolyte leakage
- Release of irritating or hazardous vapours
- Excessive heating
- Thermal runaway
- Fire
- Explosion

Keep the battery away from children and unauthorised persons.

First Aid Measures

- **Inhalation:** Move the affected person to fresh air. Obtain medical attention if breathing is difficult or symptoms occur. If breathing stops, begin appropriate resuscitation and contact emergency services.
- **Skin contact:** Remove contaminated clothing. Wash the affected area immediately with soap and plenty of water.
- **Eye contact:** Hold the eyelids open and rinse continuously with clean running water for at least 15 minutes. Obtain medical attention if irritation persists.
- **Ingestion:** Rinse the mouth with clean water and obtain medical attention promptly.

Fire Hazard

Suitable extinguishing media: Water spray, foam, dry chemical powder, carbon dioxide (CO_2), or sand.
In case of fire, firefighters should wear appropriate protective equipment and self-contained breathing apparatus.
Although $LiFePO_4$ batteries provide a high level of thermal stability, damaged batteries exposed to extreme temperatures or abuse may present a fire hazard.

4.3 Buoy

Polyethylene

1. Identification of the substance/mixture and of the company/undertaking

Trade name: BorSafe HE3490-LS (Trade name may differ)
Material use: raw material for plastics industry

2. Hazards identification

Health: The product is not classified as hazardous. Inhalation of dust may irritate the respiratory tract. Prolonged inhalation of high doses of decomposition products may give headache or irritation of the respiratory tract.
Fire: The product burns, but is not classified as flammable.
Environment: The product is not considered hazardous for the environment.

3. Composition/information on ingredients

The product is a polyethylene polymer.

Contains no substance classified as hazardous in concentrations, which should be taken into account according to EU regulations.

4. First aid measures
No specific instructions needed.
Skin contact: Cool melted product on skin with plenty of water. Do not remove solidified product.

5. Firefighting measures
Suitable extinguishing media: Water in spread jet, dry chemicals, foam or carbon dioxide.
Special exposure hazards: Principal toxicant in the smoke is carbon monoxide.

6. Accidental release measures
Vacuum or sweep up spill. All spill of material must be removed immediately to prevent slipping accidents.

7. Handling and storage
Handling: During processing and thermal treatment of the product, small amounts of volatile hydrocarbons may be released. Provide adequate ventilation. Local exhaust ventilation may be necessary. Avoid inhalation of dust and decomposition fumes. Dust from the product gives a potential risk for dust explosion. All equipment shall be grounded.
Storage: Safety aspects do not require any special precautions in terms of storage.

8. Exposure controls/personal protection
Provide adequate ventilation. Local exhaust ventilation may be necessary.

9. Physical and chemical properties
Appearance: solid, black
Odor: odourless
Melting point/range: 110 - 140 °C
Density: 0,9 - 1,0 g/cm3
Ignition temperature: > 320 °C
Water solubility: insoluble in water

10. Stability and reactivity
The product is a stable thermoplastic, with no chemical reactivity.

11.Toxicological information
The product is not classified as hazardous according to Regulation (EC) No 1272/2008.
Inhalation of dust may irritate the respiratory tract. Prolonged inhalation of high doses of decomposition products may give headache or irritation of the respiratory tract.

12.Ecological information
The product is not considered hazardous for the environment.

13. Disposal considerations
Reuse or recycle if not contaminated. The product may be safely used as fuel. Proper combustion does not require any special flue gas control. Check with local regulations.

14. Transport information
The product is not regulated by ADR/RID, IMDG or IATA.

15. Regulatory information
In accordance with Regulation (EC) No 1272/2008, the product does not need to be classified nor labelled.

16. Other information
Issued in accordance with Article 32 of Regulation (EC) No 1907/2006, and its amendments.

Disclaimer
To the best of our knowledge, the information contained herein for the battery and buoy raw materials is accurate and reliable as of the date of publication; however, we do not assume any liability whatsoever for the accuracy and completeness of such information.
Sabik makes no warranties which extend beyond the description contained herein. Nothing herein shall constitute any warranty of merchantability or fitness for a particular purpose.
It is the customer's responsibility to inspect and test our products in order to satisfy itself as to the suitability of the products for the customer's particular purpose. The customer is responsible for the appropriate, safe and legal use, processing and handling of our products.
No liability can be accepted in respect of the use of the products in conjunction with other materials. The information contained herein relates exclusively to our products when not used in conjunction with any third-party materials.

5. Disposal



NOTICE!
Incorrect handling or improper disposal can cause danger to the environment!

There can be serious damage to the environment if substances hazardous to the environment are handled incorrectly and if they are disposed of incorrectly.

- Separate waste and dispose of it separately.
- Observe the disposal instructions on containers/packaging and safety data sheets.
- Have dangerous waste disposed of by companies specialising in disposal.
- Immediately take appropriate action if substances hazardous to the environment are accidentally released into the environment. If in doubt, inform the responsible local authority of the damage.

5.1 Disposal Guidelines

- Have electronic scrap, electronic components, lubricants and other auxiliary materials disposed of by specialist disposal companies.
- If in doubt, obtain information on environmentally friendly disposal from the local authority or specific disposal specialists.

Below you will find some guidelines:

Electronic components
Electronic components and electronic scrap are classified as special waste and may only be disposed of by authorised specialist disposal companies.

Metals, plastics, paper
Unless there is a return or disposal contract, the dismantled components must be sent for recycling:

Scrap metals.
Send plastic elements and paper for recycling.
Dispose of the remaining components according to their material compositions.

Greases, oils and other floating chemicals
Greases and oils contain toxic substances. They may not enter the environment. They must be disposed of by a company specialising in disposal.

Batteries
Refer to sections 4.1 and 4.2 for battery disposal information.

5.2 Dismantling Process

Proceed as follows to dismantle a device:
Unless there is a return or disposal contract, the dismantled components must be sent for recycling:

- Scrap metals.
- Plastic elements.
- Sort the remaining components and dispose of them according to their material compositions.

5.3 EMC and Grounding

The lantern is tested for EMC.

6. Periodic Maintenance

The SBFL 160 is a robust lantern, which requires no maintenance, except for periodical lens cleaning and battery change. To maintain a good light output and achieve a long service life, it is advisable to visually inspect the lantern whenever visiting the site.

Mechanical inspection and maintenance:

- Check the lens and clean it with a damp cloth (Do NOT use any solvents!)
- Check the mounting bolts and the yellow buoy part especially the welding between the buoy and the bottom flange for damage and replace parts if necessary.
- Check and clean the roof and bird spike if necessary
- Check the lantern for leakage (condensation through the lens)

Functional inspection and maintenance:

- Check that the lantern turns on by covering the light top
- Check visually that the lens inside lantern is in place, LEDs are equal and uniform intensity when lit
- Read controller values with the Bluetooth app or with the Sabik easyProgrammer to check the status
- Check battery voltage with Bluetooth app or with the Sabik easyProgrammer. If battery voltage is below 11,3 V -replace the battery.

7. Troubleshooting

Q: I covered the photocell, but the lantern does not turn on.

- A1: Read controller values with the Bluetooth app or with the Sabik easyProgrammer and check status, you may also download the log file. The battery voltage is below the minimum programmed value. Replace the battery.
- A2: Read controller values with the programmer and check status. There is an LED failure error. Return the lantern for service.

Q: I covered the photocell, but the lantern does not turn on and I cannot read controller values with the programmer.

- A: Check the battery cables for damage or short-circuit. Replace the battery.

Q: I covered the photocell, but the lantern does not turn on and I cannot read controller values with the programmer even though I replaced the battery.

- A: Return the lantern for service.

Q: The lantern seems to work normally, but I cannot read it with the Sabik easyProgrammer.

- A1: Locate the IR eye on your programmer and on the lantern. Place them facing each other.
- A2: Try to shade out the sun and put the programmer close to the lens during read process.
- A3: Try different angles when reading, the light beam might block out the IR sensor of the PDA.

8. Appendices

No Appendices

9. Contact information

Please contact **sabik.support@spx.com** for technical support.

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