OPERATING MANUAL

BTD-1 Solar Kit

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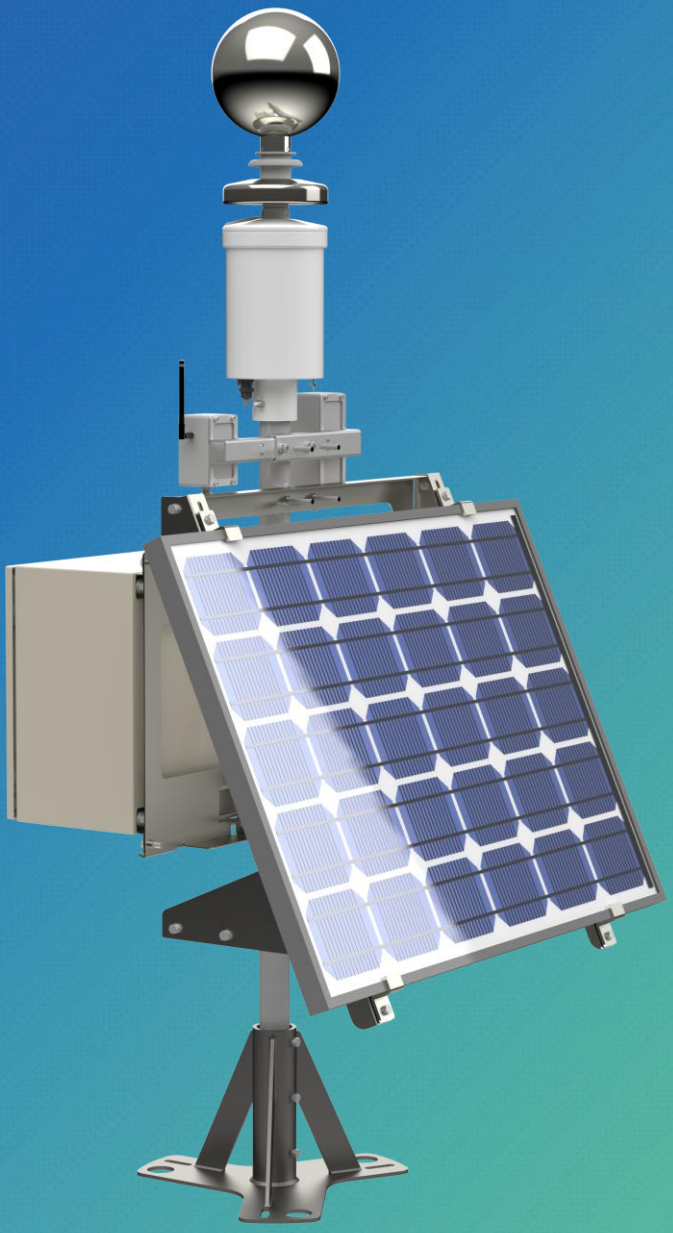

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Contents

General Information **4**
1 Technical specifications **5**
2 Installation **6**
3 Maintenance & Operation **9**
3.1 Servicing 10
3.2 Maintenance 10
3.3 Wiring Diagram 11
3.4 Dimensions 12

General Information

BTD-1 Solar Kit

The BTD-1 Lightning Warning System detects the presence of lightning flashes up to 83km away from the sensor and warns of the potential for overhead lightning even before the first lightning flash occurs. The optional solar kit allows for the user to remotely power the BTD-1 without the need to route cabling through obstructions. The solar kit is provided as a plug and play option, requiring minimal tooling and setup for operation. It is intended to be utilised outdoors.

The solar kit is recommended for use with a 12V 100Ah Lithium battery. Whilst the design has been optimised to provide power throughout the winter months, it may be that the BTD-1 does not remain continuously powered due to low levels of sustained solar energy from the sun.

Note, the solar kit is sold without a battery. A lead with M8 connectors is supplied with the solar kit for connection to an AGM or LFP battery.

Package Contents

The solar kit consists of:

- 1 x Solar Electronics Enclosure (excluding battery)
- 1 x Solar Electronics Enclosure Bracket (inc mounting clamps)
- 1 x Solar Panel
- 1 x Solar Panel Frame (inc mounting clamps)

Safety

DANGER: EXPLOSION HAZARD. USE IN WELL VENTILATED AREA. DO NOT BLOCK RELIEF VALVE.

WARNING: ENERGY STORAGE SYSTEM - ISOLATE DUAL POWER SUPPLY BEFORE SERVICING

ENSURE UNIT IS ADEQUATELY EARTHED

1 Technical specifications

Description	**BTD-1 Solar Kit**
Mounting Type	Pole Mount (44-56mm)
Battery Compatibility (not supplied)	LiFePO4, AGM
Battery Voltage	12VDC
Battery Max Dimensions	280 x 210 x 200 (mm)
Battery Max Weight	15kg
Rated Charge Current	10A
Nominal PV Power	145W
Max PV Open Circuit Voltage	75V
Max PV Short Circuit Current	13A
Automatic Load Disconnect	Yes
Low Voltage Disconnect	12.5V
Low Voltage Reconnect	13.1V
Charge Voltage Absorption	14.4V
Charge Voltage Float	13.4V
Charge Algorithm	Multi-stage Adaptive
Max Continuous Load Current	3A
Protection	Output Short Circuit
Load Connection	M12 Connector, 5-pin (Stainless Steel)
Weight	28kg approx. (without battery), 43kg max (with battery fitted)
Operating conditions	-20…+40 °C / 0…95 %RH / Max. altitude 2000m
Protection degree	IP 65
Enclosure Materials	Stainless Steel Aluminium
Related Standards	IEC 61010-1 IEC 62109-1

2 Installation

The solar kit has been designed to mount onto a pole with diameter of 44-56mm, with the preferred option being the Field Mount Kit (B1A.FMK) for the BTD-1, with the images in this manual demonstrating on the field mount kit. The unit should be grounded through the protective earth point located on the base of the enclosure after installation.

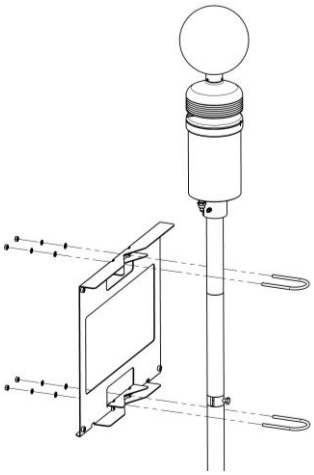
Tools required:

- 🛠 13mm Spanner
- 🛠 8mm Hex Key

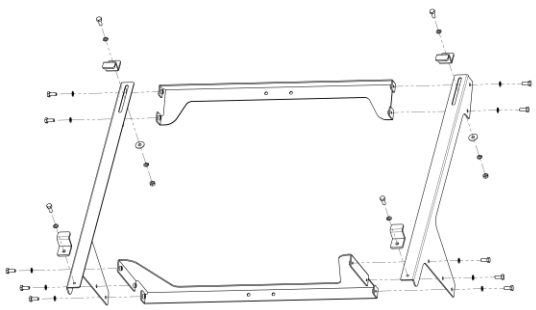
For users in the northern hemisphere, the solar panel should be located facing south, for users in the southern hemisphere, the solar panel should be located facing north.

Follow the steps below in order:

1) Install the Solar Electronics Enclosure Bracket approximately 300mm below the base of the BTD-1.
   🛠 13mm Spanner

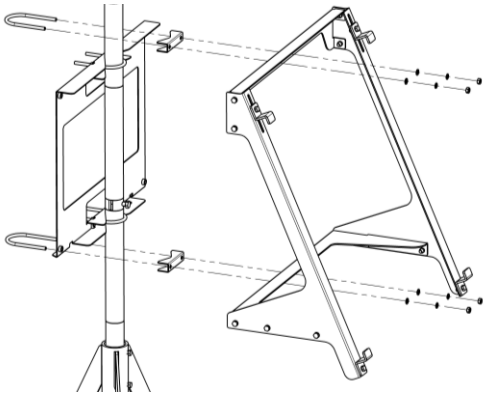


2) Assemble the Solar Panel Bracket before installation.
   🛠 13mm Spanner
   🛠 8mm Hex Key



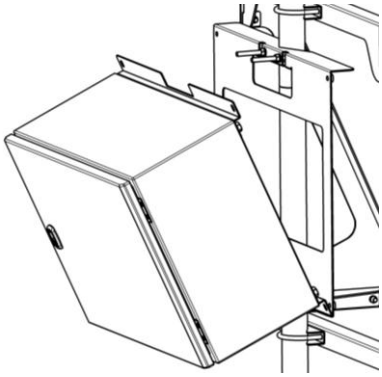
3) Install the Solar Panel Bracket on the supporting pole on the opposite side of the Electronics Enclosure bracket. For users in the northern hemisphere, the solar panel should be located facing south, for users in the southern hemisphere, the solar panel should be located facing north. Adjust the brackets as neccesary.

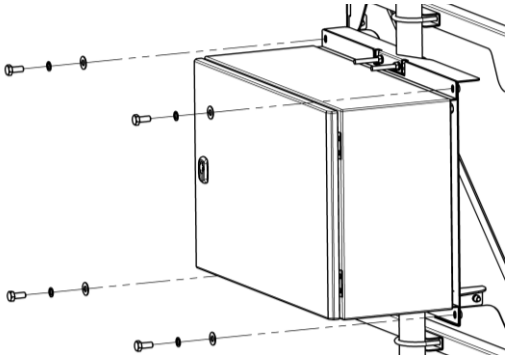
🛠 13mm Spanner



4) Place the Electronics Enclosure onto the corresponding bracket, using the lower lip to support the weight of the electronics enclosure during assembly. Secure the Electronics Enclosure to the bracket using the four M8 bolts.

🛠 8mm Hex Key

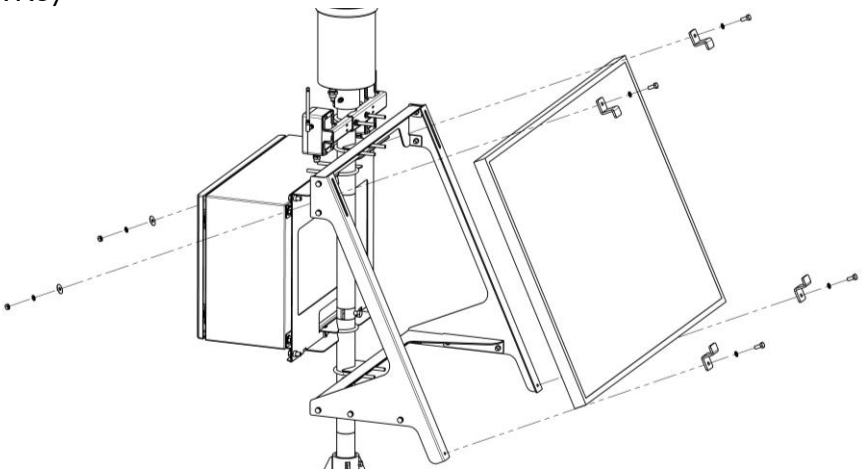




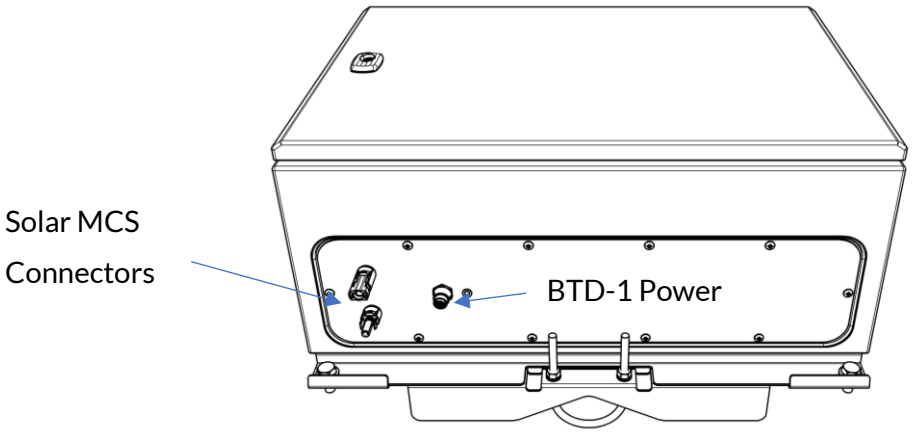
5) Loosely fit the lower and upper solar panel supporting clips. The upper clips require nuts on the rear of the bolt to allow for adjustment. Place the solar panel onto the frame, making the sure supporting clips fit over the solar panel. Tighten the supporting clips to secure the solar panel in place.

🛠 13mm Spanner

🛠 8mm Hex Key

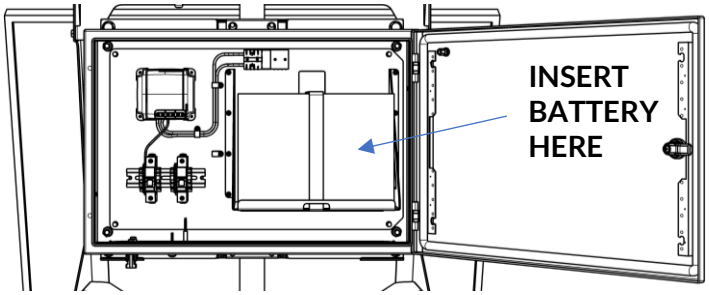


6) Connect the solar MCS lead to the base of the Electronics Enclosure. Connect a BTD-1 Power lead from the BTD-1 sensor to the base of the Electronics Enclosure.



7) Open the Electronics Enclosure. Install a suitable battery and connect via the supplied Anderson fused harness (M8 battery termals). Secure the battery using the supplied battery strap. Note, the system may become "live" during this stage depending on battery voltage.

Note: Record the type of battery used on the external of the enclosure (AGM/LFP)



8) Turn on the Solar 10A circuit breaker and the Load 3A circuit breaker.

9) Close the Electronics Enclosure. The solar kit installation is now complete.

3 Maintenance & Operation

The BTD-1 Solar Kit has been designed to keep the BTD-1 running through every season. However, while we've designed for maximum efficiency, continuous year-round power cannot be guaranteed during winter months in high-latitude regions due to significantly reduced solar exposure. Maintenance should be carried out by qualified personnel.

When under normal use, the load status can be checked by the status of the LED on the base of the electronics enclosure. The LED shall be illuminated if the battery is sufficiently charged to provide power to the load via the M12 connector.

If the LED is not illuminated, the battery may be flat. Opening of the cabinet door exposes the battery charger. There are three lights which indicate the current charging status of the battery:

Bulk

The battery is in the primary charging phase. Here the battery will be <80% state of charge.

Absorption

The battery is almost full charged.

Float

The battery is fully charged.

None

The battery has been depleted. Removal of battery and external recharge required.

The M12 connector pinout is as follows:

Power Pin	Description
1	V+
2	0V
3	V+
4	0V
5	NC

It is possible to utilise aftermarket solar panels provided their rating does not exceed 75VDC / 10A.

A minimum of 100mm is required from all sides of the solar kit to allow the pressure relief to function. A minimum of 500mm depth in front of the unit is required to allow for access for maintenance.

3.1 Servicing

If for any reason a service of the Solar Kit is required, you must first safely isolate the system. To do so, follow the steps below.

1) Open the enclosure door using the cabinet key provided.
2) Turn off the Load MCB (3A).
3) Turn off the Solar MCB (10).
4) Disconnect the battery via the Anderson connector.

Reconnection is the reversal of isolation.

CAUTION: Failure to follow isolation routine may result in equipment damage

3.2 Maintenance

WARNING: BATTERY MAINTENANCE.

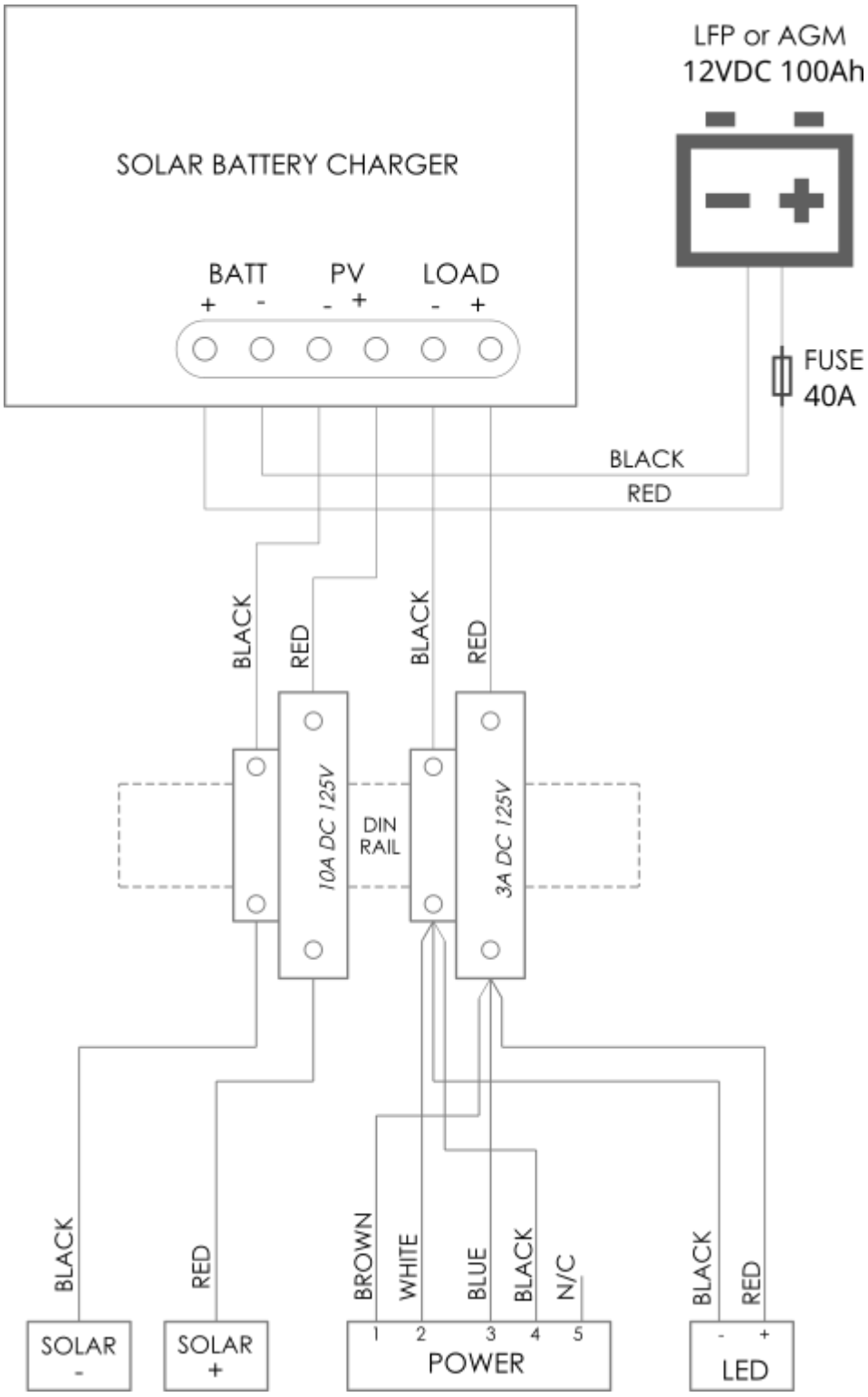
Inspect the internal battery at least every 6 months for signs of swelling, leakage, or terminal corrosion. Ensure the battery retention strap is securely tightened. Do not install a damaged battery. If the battery shows signs of thermal distress, isolate the system immediately and move the unit to a safe exterior location.

It is recommended that the unit is checked for any damage. Check for rusting/degrading metalwork, and that all fasteners are secure. Where a storm has occurred, additional checks are advised. Check any cabling for damage, particularly due to local wildlife.

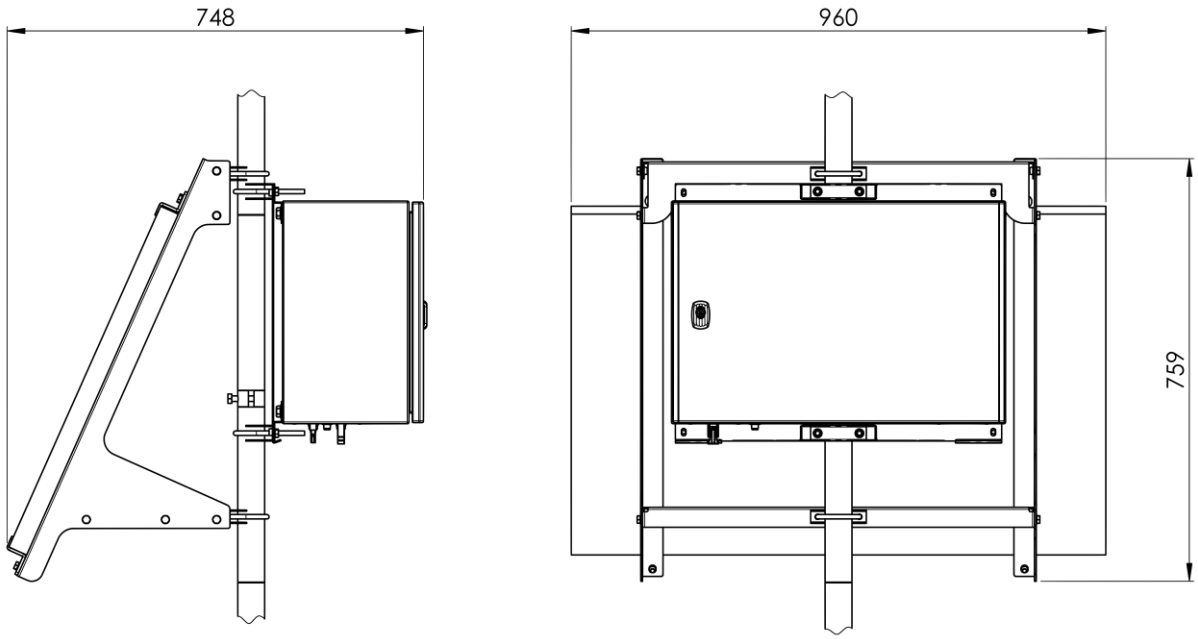
It is recommended the unit is cleaned on a yearly basis. The solar panel shall provide maximum output if it is kept clean.

If the battery fuse requires replacement a 40A blade fuse with 1kA interrupt capacity should be used. Never replace with a higher amperage rating.

3.3 Wiring Diagram



3.4 Dimensions



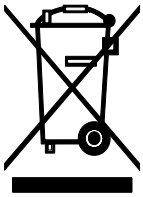
WARRANTY

The manufacturer is required to respond to the "factory warranty" only in those cases provided by the Consumer Rights Act 2015. Each instrument is sold after rigorous inspections; if any manufacturing defect is found, it is necessary to contact the distributor where the instrument was purchased from. During the warranty period (12 months from the date of invoice) any manufacturing defects found will be repaired free of charge. Misuse, wear, neglect, lack or inefficient maintenance as well as theft and damage during transport are excluded. Warranty does not apply if changes, tampering or unauthorized repairs are made on the product.
The manufacturer repairs the products that show defects of construction in accordance with the terms and conditions of warranty included in the manual of the product.

TECHNICAL INFORMATION

The quality level of our instruments is the result of the continuous product development. This may lead to differences between the information reported in the manual and the instrument you have purchased.
We reserve the right to change technical specifications and dimensions to fit the product requirements without prior notice.

DISPOSAL INFORMATION



Electrical and electronic equipment marked with specific symbol in compliance with 2012/19/EU Directive must be disposed of separately from household waste. European users can hand them over to the dealer or to the manufacturer when purchasing a new electrical and electronic equipment, or to a WEEE collection point designated by local authorities. Illegal disposal is punished by law.

Disposing of electrical and electronic equipment separately from normal waste helps to preserve natural resources and allows materials to be recycled in an environmentally friendly way without risks to human health.

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