RECHARGEABLE BATTERY

RIEGL RBLI 8S1P

Technical Data and User Instructions

RIEGL®
LASER MEASUREMENT SYSTEMS

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Rev. 2026-01-29 (Q01-01)

Revision History:
Rev. 2023-09-05 (Q01-01)
Rev. 2023-10-31 (Q01-01)
Rev. 2024-04-04 (Q01-01)
Rev. 2024-09-10 (Q01-01)
Rev. 2025-11-11 (Q01-01)

Contents

1 General

1.1 Warnings, Signs, and Symbols

DANGER	
	The “DANGER” information indicates an immediate danger. If the danger is not avoided it will result in death or serious injuries.

WARNING	
	The “WARNING” information indicates a hazardous situation. If the danger is not avoided it may result in serious injuries or serious physical damage.

CAUTION	
	The “CAUTION” information indicates a hazardous situation. If the danger is not avoided it may result in slight injuries or minor physical damage.

NOTE	
	The “NOTE” information alerts to a situation that may cause equipment damage but no personal injury.

	GENERAL WARNING		OPTICAL RADIATION
	ELECTRICITY		TEMPERATURE RELATED HAZARDS
	LASER RADIATION		EXPLOSION

This manual provides detailed technical data including safety directions, installation instructions, operational directions including maintenance, as well as information about the electromagnetic compatibility.

Improper use or use in contradiction to the instructions given may cause danger and/or injury. It is imperative to read through these operating instructions as well as the complete Scanner's Manual and the General Warnings & Instructions for *RIEGL* Laser Measurement Instruments carefully before using the device.

WARNING	
	Improper handling or usage of the **RBLI 8S1P** may lead to severe injury!

The **RBLI 8S1P** can be used with the following *RIEGL* VZ-i Series laser scanners:

RIEGL VZ-1200i
RIEGL VZ-600i

2 Description and Technical Specifications

Part-No. HW-VZXX-04-009-00	Battery-Pack Li-Ion RBLI 8S1P

2.2 Mechanical Specifications

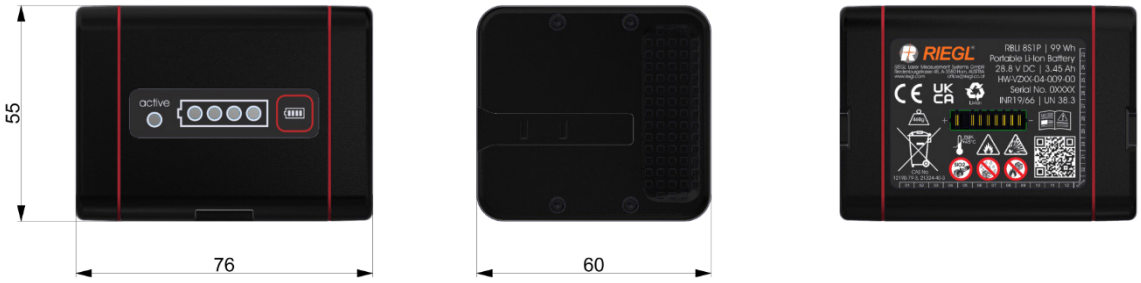


Fig. 1 Dimensional Drawing of the *RIEGL* RBLI 8S1P, all dimensions in mm

Dimensions (L x W x H)	76 x 55 x 60 mm
Weight	0.46 kg

2.3 Electrical Specifications

Technology	Li-Ion 28.8 V [1)]
Capacity	99 Wh, 3.45 Ah [2)]
Batter Pack Life	typ. 500 – 600 charging cycles
Self-Discharging per Month	approx. 8%
Voltage	28.8 V DC nominal
Max. Output Current	7 A DC
Charging Conditions (CCCV)	33.2 V / 1.5 A
Typical Charging Time	approx. 2 h 40 min
Operating Time with *RIEGL* VZ-600i with *RIEGL* VZ-1200i	 up to 90 minutes [3)] up to 80 minutes [3)]

1) The consideration of country-specific transport conditions (especially for air transport) lies fully within customer's responsibility.

2) The value given is the capacity of the battery according to the cell manufacturer's specifications. The capacity available in the application is lower.

3) The time given is a rough guideline value given as an example. In practice, it depends on several factors such as ambient temperature, use of additional equipment, etc.

2.3.1 Position of the Poles

Fig. 2 Position of the poles, plus and minus pole, two pins each

NOTE	
	The poles may only be cleaned by trained personnel! For more details, please contact support@riegl.com for further details.

2.4 Environmental Specifications

Temperature Range	
Operation (Discharging)	-5°C up to +45°C
Charging	0°C up to +40°C
Storage	-5°C up to +45°C **For detailed information please see chapter 3.3 “Storage”**

NOTE	
	The temperature limits of the RBLI 8S1P differ from the temperature limits of the VZ-i scanner!

2.5 Delivery Status

NOTE	
	After receiving the RBLI 8S1P, please fully charge the battery immediately!

Due to transport conditions and self-discharging, the battery may not be fully charged on receipt of delivery. E.g., for transport by air flight the battery may only be charged to 24%.

2.6 Description of the Front Side of the RBLI 8S1P

Fig. 3 Front side of the *RIEGL* RBLI 8S1P

1 Activity LED

2 Capacity LEDs

3 Capacity Test Button

2.6.1 Activity LED

The Activity LED (1) – positioned on the front side of the RBLI 8S1P indicates discharging of the battery.

LED status	Color	Meaning
LED, ON	blue	Discharging
LED, regularly blinking – discharging	blue	Discharging below a limit, which can be defined by the user via the scanner. [1)]
LED; blinking – charging (blinking 2 times every 2 sec.)	blue	Indicates a previous deep discharging once the battery charging process has been started.

[1)] Details given in the respective scanner manual.

2.6.2 Capacity LEDs

2.6.2.1 Capacity State

There are 4 LEDs (2) positioned on the front side of the RBLI 8S1P which indicate the charging state by pressing the capacity test button (3). (Each LED represents the state of approximately 25% of the full capacity).

LED status	Color	Meaning
4 LEDs on	green	Capacity ≥ 75%
3 LEDs on	green	Capacity ≥ 50% < 75%
2 LEDs on	green	Capacity ≥ 25% < 50%
1 LED on	green	Capacity ≥ 10% < 25%
1 LED, blinking	green	Capacity < 10%

2.6.2.2 Charging State

During the charging process the charging state is indicated in 4 steps. Each step is shown with one LED on (each LED signals 25% of the charging capability).
If the charging state exceeds on sequence, the LED of the finished sequence and all LEDs of the sequences below, are on.

Charging states between two sequences are indicated by a blinking LED of the current sequence.
All LEDs above the blinking LED are off.
If the charging process is successfully completed, all LEDs are off.

For example:
If the two lower LEDs are on and the third one is blinking, the charging state is between 50 and 75%.

3 Operating Notes and Requirements

3.1 Charging

There are two chargers for the RBLI 8S1P:

Dual Charger for
RIEGL RBLI 8S1P
(for up to two batteries)

Part-No.
HW-VZXX-04-010-00

Charging Station for
RIEGL RBLI 8S1P
(for up to six batteries)

Part-No.
HW-VZXX-04-011-00

CAUTION	
	**For charging the battery you must only use the original *RIEGL* Dual Charger or the original *RIEGL* Charging Station!** For detailed information please see the manuals of the "*RIEGL* Dual Charger for RBLI 8S1P" and the "*RIEGL* Charging Station for RBLI 8S1P" which are part of the manual package, or contact support@riegl.com. **Do not leave the battery unattended during the charging process**.

NOTE	
	Recharge the battery RBLI 8S1P immediately after discharging it. An empty RBLI 8S1P battery should not be stored for more than one month before recharging. If this is not observed, the battery may be damaged or become unusable!

NOTE	
	*RIEGL* does not recommend using other battery packs provided by the customer for charging the RBLI 8S1P. Such external, customer provided batteries are not protected against deep discharging by the RBLI 8S1P. The electronics inside the RBLI 8S1P are able to work down to voltages as low as 10V, which can damage your battery pack. Also, the power supply range of the RBLI 8S1P is independent of the scanner's power supply setting. The usage of an external battery for charging the lays only in the customer's responsibility.

3.2 Life Cycle

The life time of the RBLI 8S1P is up to 600 cycles (charging/discharging) and depends on ambient temperature, storage conditions, and the use of the battery itself.

3.3 Storage

The capacity level of a battery that is intended for storage should be more than 40 %. Batteries in long time storage (1 year plus) need refresh charging (see 3.4 “Refresh Charging Cycles”).

Temperature limitation during long time storage is between -10°C and +20°C.

WARNING	
	**Avoid storing the RBLI 8S1P at higher or lower temperatures than given in the specifications!** Failure to observe this may result in permanent damage to the RBLI 8S1P!

Due to the cell technology of Li-Ion cells, which have a self-discharging rate of between 5% and 10%, the battery’s operational life can be impaired when storing an empty RBLI 8S1P (charging level <5%) for a longer period.

NOTE	
	*RIEGL* recommends to remove the **RBLI 8S1P** out of the charger in case of longer storage periods to extend its lifetime!

3.4 Refresh Charging Cycles

This type of battery does not experience memory effect.

However, it is recommended to **fully recharge stored RBLI 8S1Ps once every 3 months**.

4 Safety Instructions

Highly flammable liquids are included!

In case of improper handling, explosions can occur!

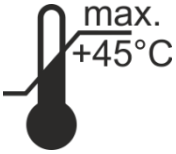
Protect from rain, water, moisture and other liquids!

Keep away from open fire and heat sources!

In case of fire, extinguish the RBLI 8S1P with SiO2 silicium dioxide

The requirements for electromagnetic compatibility are fulfilled. Please see chapter 4.2 “Electromagnetic Compatibility” for further details.

The requirement for UK Conformity Assessed are fulfilled. For details please see the certificate, which is part of the manual package.



The specified temperature must be observed, in particular the maximum temperature!
For further detail please see chapter 2.3 “Environmental Specifications”.

The included Li-Ion cells can be recycled!

Note the safety instructions in the user's manual, read through it carefully and keep it for future!

The total weight of one RBLI 8S1P are 460g.

Ensure proper disposal! Do not dispose in household waste!

4.1 General Safety

The RBLI 8S1P meets or exceeds the requirements of the following European Standard: **EN 61010-1:2010** Safety requirements for electrical equipment for measurement, control, and laboratory use Part 1: General Requirements
Note the following explanations and important instructions:

Temperature	The RBLI 8S1P is specified for a temperature range as to be seen in chapter 2.3 "Environmental Specifications".
Altitude	The RBLI 8S1P is specified for an altitude up to 2000m (operation or storage).
Relative Humidity	The RBLI 8S1P is specified for a maximum relative humidity of 80% at or below +30°C.
Enclosure	The battery must not be subjected to rain or dripping water or submerged under water or any other fluid. Moreover, it has to be protected against chemical influences.

NOTE	
	Never apply mechanical force of shock to the RBLI 8S1P! Furthermore, the RBLI 8S1P should be protected from being shocked or knocked.

DANGER	
	The battery itself **must never** be connected to 110, 230, or 400 V AC! Opening the battery is unacceptable due to the danger presented by the chemical substances, and must therefore be avoided at all costs.

WARNING	
	ANY USE OF THE RBLI 8S1P IN CONTRADICTION TO THE INSTRUCTIONS AS GIVEN IN THE MANUAL CAN BE DANGEROUS AND IS, THEREFORE, STRICTLY FORBIDDEN!

4.2 Electromagnetic Compatibility

The RBLI 8S1P meets or exceeds the requirements of the following European Standard:

EN 61326-1:2013

Electrical equipment for measurement, control and laboratory use - EMC requirements - Part 1: General requirements (IEC 61326-1:2012)

The RBLI 8S1P has passed the tests for class A equipment (industrial environment) as well as for class B equipment (residential and commercial environment).

Definition of the performance criteria and acceptable degradations:

Performance Criterion A: During testing, normal performance within the specified limits / nominal values.
Nominal values to be found in chapter 2.2 "Electrical Specifications".

Performance Criterion B: During testing, temporary degradation or loss of function or performance which is self-recovering

- loss or heavy degradation of functionalities during testing with self- recovery after finishing the test;

Performance Criterion C: During testing, temporary degradation, or loss of function or performance which requires operator intervention or system reset occurs

- loss or heavy degradation of functionalities during testing with self- recovery after finishing the test; a system reset may occur;
- loss or heavy degradation of functionalities, which require simple user intervention, e.g. replacement of a fuse, switching the device Off and On, restoration of settings;

For details, please refer to the corresponding CE declaration document of the RBLI 8S1P, which is included in the manual package on the USB-stick delivered with the ***RIEGL* VZ-600i / *RIEGL* VZ-1200i**.

4.3 Transportation

Shipping or transporting the RBLI 8S1P is subject to dangerous goods regulations, and must be carried out by your specially trained dangerous good officer.

WARNING	
	**It lies within the purchaser(s)/user(s) responsibility to get informed and to comply with the applicable national and international regulatory framework when importing, storing, using, handling and shipping or otherwise transporting the Li-Ion batteries.** **For detailed information, consult the responsible local authority!**

The RBLI 8S1P is UN 38.3 certified. Please refer to the corresponding certificate, which is part of the manual package.

NOTE	
	Any local and international transport regulations for the transport of Li-Ion batteries need to be considered.

To ensure the full performance of the VZ-600i / VZ-1200i laser scanner in operation, 2 pieces of Li-Ion batteries RBLI 8S1P are required. *RIEGL* recommends taking 2 more with you as a reserve. This enables continuous scanning operation even for larger projects and throughout the workday.

For details of the transport please refer to chapter 4.4 “Transportation together with the Scanner”.

4.4 Transportation together with the Scanner

4.4.1 Example for Packaging Labeling

When packaging the RBLI 8S1P together with the scanner, the following two labels have to be affixed:

- label with packaging instruction number (1)
- label with lithium-battery mark (2)

Fig. 4 Correct labeling of the packaging of the RBLI 8S1P and a *RIEGL* VZ-i series Scanner (current status of December 2022 – regulations may change)

4.4.2 Transportation Using the Scanner's Heavy-Duty Carrying Case

If the RBLI 8S1P stays inserted into the scanner for transportation, the scanner with inserted RBLI 8S1P has to be secured and transported in the scanner's original foam inserts.

Especially for air-transportation in the scanner carrying case, only one RBLI 8S1P may remain inserted in the scanner!

NOTE	
	**For detailed information, consult the responsible local authority!**

As *RIEGL* recommends to have 4 pieces of Li-Ion batteries RBLI 8S1P when working with the scanner, up to three additional pieces of Li-Ion batteries RBLI 8S1P have to be placed separately in the according foam-lined recesses in the scanner carrying case.

5 Additional Safety Hints and Requirements

5.1 Environment and Conditions

DANGER	
	Do not put the RBLI 8S1P into airtight containers or bags. The battery cells tend to generate flammable gas when overcharged which may cause an explosion if enclosed in an airtight container.

WARNING	
	Do not place the RBLI 8S1P near a device that may generate sparks (such as a switch or fuse) and do not place the RBLI 8S1P close to open fire. The RBLI 8S1P may generate a flammable gas when overcharged. The gas may ignite and burn or explode upon contact with a spark or flame.

CAUTION	
	• The RBLI 8S1P must not be subjected to rain or dripping water or submerged under water or any other fluid. • Avoid placing the RBLI 8S1P near a heat-generating device (such as a transformer) which may cause the RBLI 8S1P to generate excessive heat, leak or explode. • Do not allow the RBLI 8S1P to be exposed to rain or sea water. If the battery terminals should get wet, they may corrode. • Do not use or store the RBLI 8S1P in a car under the blazing sun or in direct sunlight. To do so may cause the RBLI 8S1P to leak, generate excessive heat, or explode. • Do not use or store the RBLI 8S1P in a dusty place as dust may cause a short circuit between the terminals. When using RBLI 8S1P in a dusty place, check the terminals periodically.

5.2 Handling and Operation

WARNING	
	Never disassemble, modify, puncture, mechanically shock, crash and/or short circuit the RBLI 8S1P, otherwise leakage, smoke emission, ignition, explosion, or fire, may occur which may result in personal injury and/or property damage.

CAUTION	
	Keep the RBLI 8S1P out of the reach of small children at all times!

NOTE	
	Fully recharge the RBLI 8S1P upon receipt. Recharge discharged RBLI 8S1P immediately. For more details, please see chapter 3.1 “Charging”.

5.3 Storage

NOTE	
	Before storing the RBLI 8S1P, charge the RBLI 8S1P to 40 %. Store the RBLI 8S1P in a dry place to prevent rust from forming on the terminals. Recharge the RBLI 8S1P every 3 months!

CAUTION	
	Keep the RBLI 8S1P away from rainwater that could cause corrosion on the terminals of the RBLI 8S1P. Store the RBLI 8S1P at room temperature or lower temperature. Do not store the RBLI 8S1P in direct sunlight, higher temperature or high humidity. To do so causes the RBLI 8S1P to shorten its life-span, performance deterioration or corrosion on terminals.

NOTE	
	Depending on the storage temperature, refresh the RBLI 8S1P in intervals as described in chapter 3.3“Storage”.

5.4 Warranty

Batteries that have been mishandled, abused, or damaged by the user are not covered under warranty. *RIEGL* LMS GmbH shall not be liable for any loss or damage, whether direct or indirect, special, incidental or consequential, arising from the use, misuse, or abuse of the Li-Ion batteries.

5.5 Disposal

When your *RIEGL* instrument finally reaches the end of its life-cycle, please take care for proper disposal according to Directive 2006/66/EC on batteries and accumulators and waste batteries and accumulators as well as Directive 2002/96/EC on Waste Electrical and Electronic Equipment (WEEE).

RIEGL is prepared to take back waste *RIEGL* instruments and their accessories free of charge in the production plant at Horn for proper treatment in compliance with the objectives of the above listed directives (please see 4.3 “Transportation”).
You may also dispose damaged Li-Ion batteries at your local Hazardous Waste Facility.

NOTE	
	**For detailed information, consult the responsible local authority!**