

An underwater scene featuring a torpedo moving through clear blue water. The torpedo is dark blue with a red and white checkered band near its conical nose. A large, dense trail of bubbles follows the torpedo's path, creating a dynamic sense of movement. The background is a deep, clear blue, and the overall composition is clean and professional.

SUNLIGHT
POWER IS KNOWLEDGE

**Advanced
Technology
Torpedo
Batteries —**

Torpedo Batteries

Our Company

We operate for 30 years in the global energy storage and power supply markets, offering a wide range of innovative high-quality products and services, covering the high-demanding energy needs of various sectors.

Silver-Zinc Torpedo Batteries

In the field of torpedo batteries we use the Silver-Zinc technology, which actually is the prevailing technology in this field.

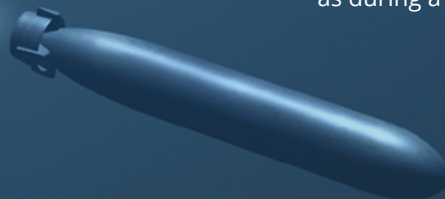
The active materials used in a Silver Oxide-Zinc battery are zinc (Zn) for the anode and silver oxide (AgO/ Ag₂O) for the cathode. Aqueous potassium hydroxide (KOH) is the electrolyte for this battery.

Primary Torpedo Batteries

Silver-Zinc batteries are available as primary battery for single use (combat battery application). Being totally maintenance-free, primary batteries provide the needed power within seconds after activation of the built-in self-contained electrolyte injection system, even after a long period of storage.

Secondary Torpedo Batteries

In addition, secondary torpedo batteries are rechargeable and therefore suitable for repeated use (exercise torpedo application). Identical to the combat battery in size and capacity, they allow the torpedo to run with the same power and duration as during a combat shot.

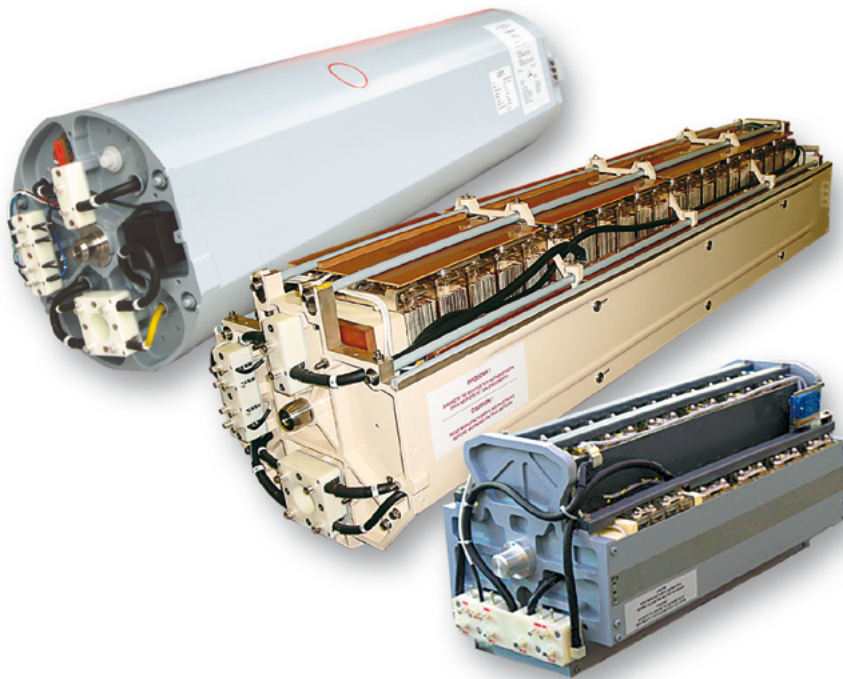


Range of Torpedo Batteries

Torpedo batteries range includes the following types:

Combat: **SLST-C3, SLST-C1**

Exercise: **SLST-E1, SLST-MK53**



Additional equipment and services

In addition to the batteries, we can provide the customers with a range of related products and services, such as customized packaging, a full range of measuring instruments, charging, discharging and monitoring equipment, etc.

SLST-C3 Battery

For Heavyweight Torpedo DM 2 A3

The **Silver-Oxide-Zinc-Alkaline primary battery**, type SLST-C3 is designed according to the German Military Standard MTV 6135-206 for use in heavyweight torpedoes DM2A3. As such it is officially approved by the torpedo manufacturer Atlas Elektronik, and certified by the German Federal Office of Bundeswehr Equipment, Information Technology and In-Service Support (BAAINBw).

Design and Function

The design of the battery SLST-C3 is based on the well-known battery SLST-C1. Some important features have been modified in order to meet the demands of the improved torpedo version DM2A3 such as:

Lower battery weight, more energy for the auxiliary battery section, modification of the centre of gravity, to be compatible with torpedo DM2A3, improved resistance against shock and vibration, analogue gas tank pressure sensor and compressed gas refilling capability, common test connector for leakage/activation sensor and compressed gas pressure sensors, replaceable pyrotechnical activation elements.

The battery SLST-C3 is designed for one-shot operation and long shelf life in non activated condition. It consists of two independent sub-batteries. The propulsion battery part includes 152 Ag-Zn cells and supplies power to the torpedo motor and control elements of the torpedo. The auxiliary battery section includes 21 Ag-Zn cells and provides power for the electronic systems inside the torpedo.

Safety and Reliability

The SLST-C3 Battery provides our customers with the most reliable and safe combat battery for torpedoes DM2A3. All components and sub-units, like cells, electrolyte tank and distribution system, gas tank, activation unit (1W/1A pyrotechnical igniters) and electronic safety device, are embedded in elastic potting material. This construction method makes it possible that all forces coming from outside will be absorbed by the resin, tie rods and endplates so that no environmental loads can affect the functional parts inside the housing. This combat battery is designed to withstand the specified environmental loads with regard to temperature, shock and vibration and to serve the torpedo with excellent electrical performance. The existence of only one moving part in the entire battery (pyrotechnic activation element) ensures very high reliability. In case of unintentional activation of the battery, a built-in resistor system will discharge the battery without external load and ensure a safe handling of the battery. During operation the battery's built-in electronic safety devices monitor all critical functions and parameters. The SLST-C3 Battery is maintenance free during the whole shelf lifetime.

Shelf Life

The minimum expected and specified shelf life is 10 years. With the company's lifetime extension program the shelf life of the battery SLST-C3 can be easily extended to 16 years.

Storage, Transport and Operational Conditions

| Designation | Values |
|-----------------------|---|
| Storage Temperature | -15°C to +35°C* |
| Transport Temperature | -15°C to +35°C* |
| Operating Temperature | +15°C to +47°C (Heating System "off") -4°C to +15°C (Heating System "on") Heating-up time from -2°C to +15°C: max. 5 hours |
| Relative Humidity | up to 95% |

* Up to one month per year the storage temperature is allowed to deviate by $\pm 10^\circ\text{C}$ from the specified temperature range

Features of Combat Battery SLST-C3

- Sintered silver electrodes.
- One moving part only needed for activation.
- No maintenance during total shelf life.
- Hermetically sealed design provides trouble free service under tropical conditions.
- All parts fixed by potting material.
- Two independent electrolyte absorbing systems.
- Built-in electrolyte heating system (activates at temperatures $< 15^\circ\text{C}$).
- Aluminium battery housing.
- Electronic safety logic system.
- Analogue gas tank pressure sensor and compressed gas refilling capability.
- Common test connector for leakage/activation sensor and compressed gas pressure sensors.
- Replaceable pyrotechnical activation elements.
- High capacity retention during shelf life.
- Electromagnetic compatibility (EMC) compliance.

SLST-C3 Battery

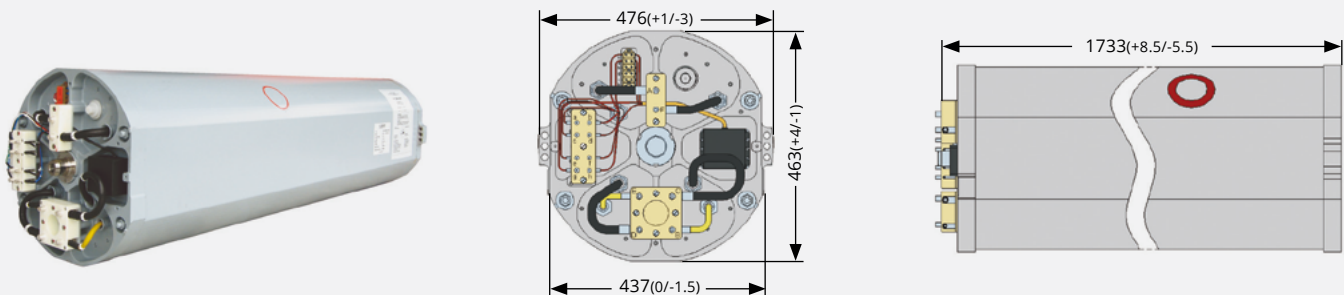
For Heavyweight Torpedo DM 2 A3

Electrical Characteristics

| Designation | Propulsion | | | Auxiliaries* |
|---------------------------------|--|---------------------|-----------|--------------|
| | Serial Connection | Parallel Connection | | |
| Battery Terminals | AC-DF | AC-DF | AB-EF | a-b |
| Torpedo Operation | High Speed | Medium Speed | Low Speed | |
| Terminal Voltage (V) | 210±8-6 | 114±6 | 85±5 | 28.5+3-1.5 |
| Discharge Current (A) | 480±5 | 300±5 | 250±5 | 40±0.5 |
| Final Discharge Voltage (V) | 189 | 102 | 80 | 26.5 |
| Discharge Time (min) | ≥13 | ≥45 | ≥53 | ≥60 |
| Capacity (Ah) | ≥104 | ≥225 | ≥221 | ≥40 |
| Number of Cells (pcs.) | 152 | 2x76 | 2x56 | 20 |
| Activation Time (sec) | ≤9 | ≤9 | ≤9 | ≤3 |
| Up to Threshold Voltage (V) | 180 | 100 | 74 | 25 |
| Under Load of (Ω) | 0.4 | 0.34 | 0.3 | 1.0 |
| Power (average) (kW) | ≥100.8 | ≥34.2 | ≥21.2 | ≥1.14 |
| Electrical Pulse for Activation | Voltage: 115V ±5V (AC) Frequency: 50, 60 or 400Hz Current: 1A ±0.3A Duration: ≥50ms | | | |
| Heating Power | 500W (maximum) Voltage: 115V ±5V (AC) Frequency: 50, 60 or 400Hz | | | |
| Leakage Sensor | included | | | |
| Pressure Sensor (switch) | included | | | |
| Pressure Sensor (analogue) | included | | | |

* Independent from the mode of operation there is a discharge current of 10A±3A available at the terminals D-h. The on-load voltage is ≥30V and the discharge time ≥22.5 min.

Battery Dimensions



Mechanical Characteristics

| Designation | Dimensions |
|-------------------|------------------|
| Overall Height | 463mm +4/-1 |
| Overall Width (1) | 437mm +0/-1.5 |
| Overall Width (2) | 476mm +1/-3 |
| Overall Length | 1733mm +8.5/-5.5 |
| Weight | 390kg ±5 |

References

| | |
|--|-------------------------|
| Standard Designation | DM 2 A3 Torpedo Battery |
| Item Name | Combat battery SLST-C3 |
| Part Number | 0246801 / 0288781 (NS) |
| Drawing Number | 16.400.0002 |
| Military Type Specification (BAAINBw, Germany) | MTV 6135-206 |
| NATO Stock No. (NSN) | 6135-12-323-3612 |

SLST-C1 Battery

For Heavyweight Torpedo DM 2 A1, SST4 and SUT

Company's primary battery type SLST-C1 is designed and approved according to the technical delivery specification no. 279.632.860.TL of ATLAS ELEKTRONIK for use in heavyweight torpedoes DM2A1, SST4 and SUT.

Design and Function

The battery is specifically designed for one-shot operation and long shelf life in non activated condition. It consists of two independent battery sections. The propulsion battery part includes 152 Ag-Zn cells and supplies power to the torpedo motor and control elements of the torpedo. The auxiliary battery section includes 21 Ag-Zn cells and provides power for the electronic systems inside the torpedo.

Safety and Reliability

The SLST-C1 battery provides our customers with the most reliable and safe combat battery for torpedoes DM2 A1/ SUT/SST4 available in the international market. All components and sub-units, like cells, battery blocks, electrolyte tank, gas tank, activation unit (1W/1A pyrotechnical igniters) and safety electronic device, are embedded in elastic potting material. This combat battery is designed to withstand the specified environmental loads like temperature, shock and vibration requirements and to serve the torpedo with excellent electrical performance. The existence of only one moving part in the entire battery (pyrotechnic activation element) ensures very high reliability.

In case of unintentional activation of the battery, a built-in resistor system will discharge the battery without external load and ensure a safe handling of the battery. During operation, the battery's built-in electronic safety devices monitor all critical function and parameters. The SLST-C1 battery is maintenance free during the whole shelf lifetime.

Shelf Life

The minimum expected and specified shelf life is 10 years. With company's lifetime extension program the shelf life of the battery SLST-C1 can be easily extended up to 16 years.

Storage, Transport and Operational Conditions

| Designation | Values |
|-----------------------|---|
| Storage Temperature | -15°C to +25°C* |
| Transport Temperature | -10°C to +25°C* |
| Operating Temperature | +15°C to +45°C (Heating System "off") -2°C to +15°C (Heating System "on") Heating-up time from -2°C to +15°C: max. 5 hours |
| Relative Humidity | up to 95% |

* Up to one month per year the storage temperature is allowed to deviate by $\pm 10^\circ\text{C}$ from the specified temperature range

Features of Combat Battery SLST-C1

- One moving part only needed for activation.
- No maintenance during total shelf life.
- Hermetically sealed design provides trouble free service under tropical conditions.
- All parts fixed by potting material.
- Two independent electrolyte absorbing systems.
- Heating of battery electrolyte only necessary at temperatures below 15°C.
- Aluminium battery housing.
- Sintered silver electrodes.
- High capacity retention during shelf life.
- Electronic safety logic system.
- Electromagnetic compatibility (EMC) compliance.

SLST-C1 BATTERY

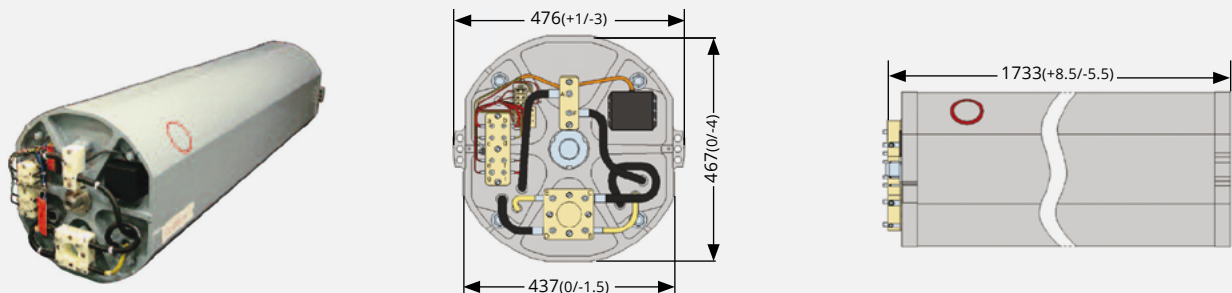
For Heavyweight Torpedo DM 2 A1, SST4 and SUT

Electrical Characteristics

| Designation | Propulsion | | | Auxiliaries* |
|---------------------------------|--|---------------------|-----------|--------------|
| | Serial Connection | Parallel Connection | | |
| Battery Terminals | AC-DF | AC-DF | AB-EF | a-b |
| Torpedo Operation | High Speed | Medium Speed | Low Speed | |
| Terminal Voltage (V) | 210±8-6 | 114±6 | 85±5 | 28.5±3-1.5 |
| Discharge Current (A) | 480±5 | 300±5 | 250±5 | 40±1 |
| Final Discharge Voltage (V) | 189 | 102 | 80 | 26.5 |
| Discharge Time (min) | ≥13 | ≥45 | ≥53 | ≥45 |
| Capacity (Ah) | ≥104 | ≥225 | ≥221 | ≥30 |
| Number of Cells (pcs.) | 152 | 2x76 | 2x56 | 20 |
| Activation Time (sec) | ≤9 | ≤9 | ≤9 | ≤3 |
| Up to Threshold Voltage (V) | 180 | 100 | 74 | 25 |
| Under Load of (Ω) | 0.4 | 0.34 | 0.3 | 1.0 |
| Power (average) (kW) | ≥100.8 | ≥34.2 | ≥21.2 | ≥1.14 |
| Electrical Pulse for Activation | Voltage: 115V ±5V (AC) Frequency: 50, 60 or 400Hz Current: 1A ±0.3A Duration: ≥50ms | | | |
| Heating Power | 500W (maximum) Voltage: 115V ±5V (AC) Frequency: 50, 60 or 400Hz | | | |
| Leakage Sensor | included | | | |
| Pressure Sensor | included | | | |
| Pressure Sensor (analogue) | included | | | |

* Independent from the mode of operation there is a discharge current of 10A±3A available at the terminals D-h. The on-load voltage is ≥30V and the discharge time ≥22.5 min.

Battery Dimensions



Mechanical Characteristics

| Designation | Dimensions |
|-------------------|------------------|
| Overall Height | 467mm +0/-4 |
| Overall Width (1) | 437mm +0/-1.5 |
| Overall Width (2) | 476mm +1/-3 |
| Overall Length | 1733mm +8.5/-5.5 |
| Weight | 402kg ±6 |

References

| | |
|---|--------------------------------------|
| Standard Designation | DM2A1, SUT, SST4 Torpedo battery |
| Item Name | Combat battery SLST-C1 |
| Part Number | 0215408 / 0243272 (NS) |
| Drawing Number | 16.300.0006 |
| Technical Delivery Specification (STN-ATLAS ELEKTRONIK) | 279.632.860.TL |
| Compliant to NATO Stock No. (NSN) | 6140-12-147-8873 6135-23-112-7702 |

SLST-E1 Battery

For Heavyweight Torpedo DM 2 A3, DM 2 A1, SUT and SST4

The **Silver-Oxide-Zinc-Alkaline secondary battery**, type SLST-E1 is designed and approved as an exercise battery for use in heavyweight torpedoes DM2A3, DM2A1, SUT and SST4.

Design and Function

The battery SLST-E1 consists of a battery case which contains rechargeable AgO/Zn cells. The outer dimensions of the battery case are the same as of the combat batteries. Therefore, it fits into the battery section of the torpedoes DM2A1, DM2A3, SST4 and SUT. The electrical contacts are placed on the rear endplate of the battery case. Old, used cells can be disconnected and removed from the casing and be replaced with new cells many times by the end user. The exercise battery SLST-E1 contains two independent battery parts. Both partial batteries make use of the Silver-Oxide-Zinc electrochemical system and contain pre-charged cells. The propulsion battery section includes a maximum of 158 cells, type SL120HS and serves as power supply to the torpedo motor and control elements of the torpedo. The auxiliary battery section includes 20 cells, type SL40HS and provides power for the electronic systems inside the torpedo. The battery cells will be delivered in dry charged condition. To prepare the battery for first time use, the individual cells must be activated, i.e., filled with electrolyte. A plastic container with the correct quantity of electrolyte is supplied with each cell. The battery SLST-E1 can be used for several discharges (torpedo exercise runs) during the specified wet lifetime.

The number of discharges depends on several parameters, for example: depths of discharge, standby time in partly charged and fully charged conditions, temperature etc.

Safety and Reliability

The SLST-E1 battery provides our customers with the most reliable and safe exercise battery for torpedoes DM 2 A3, DM 2 A1, SUT and SST4. This exercise battery is designed to withstand the specified environmental loads in terms of temperature, shock and vibration and to serve the torpedo with excellent electrical performance.

Shelf Life

Typical dry storage life: 5 Years. Typical wet life time*: 12 months. Typical cycle life*: 10 - 25 cycles.

* Depending on various parameters, such as: depths of discharge, standby time in partly charged and fully charged conditions, temperature etc.

Storage, Transport and Operational Conditions

| Designation | Values |
|---|--|
| Storage Temperature | -15°C to +35°C* |
| Storage Temperature (Battery non Activated -dry-) | 0°C to +35°C** |
| Storage Temperature (Battery Activated) | -15°C to +25°C*** |
| Operating Temperature | +18°C to +45°C (Heating System "off") -2°C to +18°C (Heating System "on") Heating-up time from -2°C to +18°C: approx 18 hours |
| Operating Cell Temperature | max. +95°C at the end of discharge |
| Relative Humidity | 45% to 75% |

* A short-term (≤ 8 h) temperature deviation in a range of -20°C to 65°C is allowed.

** Up to one month per year the storage temperature is allowed to be between -20°C and 45°C.

*** This storage temperature is allowed to deviate from the given temperature range by ± 10°C for a maximum of one month per year.

Options

- If requested dummy propulsion cells as well as spare cells of both types can be supplied together with the battery.
- Additionally, upon request, the battery can be fitted with an externally powered electrical heating system, ensuring trouble-free operation in a cold environment.



SLST-E1 Battery

For Heavyweight Torpedo DM 2 A3, DM 2 A1, SUT and SST4

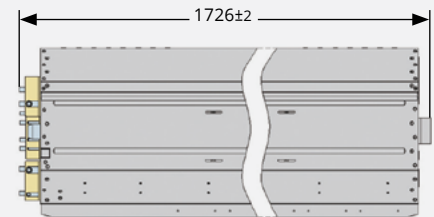
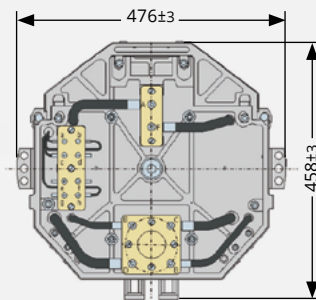
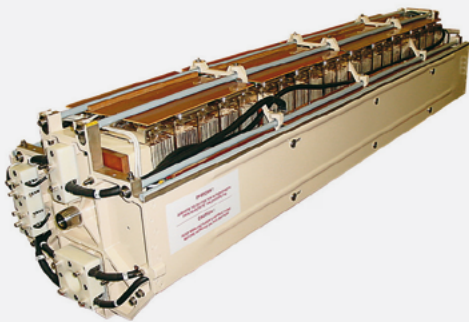
Electrical Characteristics

| Designation | Propulsion | | | Auxiliaries* |
|-----------------------------|--|---------------------|-----------|--------------|
| | Serial Connection | Parallel Connection | | |
| Battery Terminals | AC-DF | AC-DF | AB-EF | a-b |
| Torpedo Operation | High Speed | Medium Speed | Low Speed | |
| Terminal Voltage (V) | 210±8.6 | 114±6 | 85±5 | 28.5±3-1.5 |
| Discharge Current (A) | 480±5 | 300±5 | 250±5 | 40±0.5 |
| Final Discharge Voltage (V) | 189 | 102 | 80 | 26.5 |
| Discharge Time (min) | ≥13 | ≥45 | ≥53 | ≥60 |
| Capacity (Ah) | ≥104 | ≥225 | ≥221 | ≥40 |
| Number of Cells (pcs.) | 158 | 2x79 | 2x58 | 20 |
| Type of Cells** | SL 120HS | SL 120HS | SL 120HS | SL 40HS |
| Electrolyte | Potassium Hydroxide | | | |
| Power (average) (kW) | ≥100.8 | ≥34.2 | ≥21.2 | ≥1.14 |
| Heating System Power | 500W (maximum) Voltage: 115V ±5V (AC) Frequency: 50, 60 or 400Hz | | | |

* Independent from the mode of operation there is a discharge current of 10A±3A available at the terminals D-h. The on-load voltage is ≥30V.

** Detailed technical data of the cells are shown on page 12 & 13.

Battery Dimensions



Mechanical Characteristics

| Designation | Dimensions |
|----------------|-------------|
| Overall Height | 458mm ±3 |
| Overall Width | 476mm ±3 |
| Overall Length | 1726mm ±2 |
| Weight | 395kg +3/-0 |

References

| | |
|---|---|
| Standard Designation | Exercise battery for torpedoes DM 2 / SST 4 / SUT |
| Item Name | Exercise battery SLST-E1 |
| Part Number | 0215412 |
| Drawing Number | 16.351.0000 |
| Technical Delivery Specification (STN-ATLAS ELEKTRONIK) | 279.606.933 TL 279.606.934 TL |
| German Military Type Specification (for cells) | VG 95284-120 (SL 120HS) VG 95284-T10 (SL 40HS) |
| Compliant to NATO Stock No. (NSN for cells) | 6140-12-167-1233 (SL 120HS) 6140-12-167-1231 (SL 40HS) |

SLST-MK53 Battery

For American Torpedo MK37

The **Silver-Oxide-Zinc-Alkaline secondary battery**, type SLST-MK53 is designed and approved as exercise battery to provide propulsion and auxiliary power for the MK37 torpedo.

Design and Function

The exercise battery SLST-MK53 consists of a battery case which contains rechargeable AgO/Zn cells. The outer dimensions of the battery case are the same as of the combat battery MK46. Therefore, it fits into the battery section of the torpedoes MK37. The electrical contacts are placed on the rear endplate of the battery case. Old, used cells can be disconnected and removed from the casing and be replaced with new cells many times by the end user. The exercise battery SLST-MK53 contains two independent battery sections. It is made up of 60 cells, type SL90HS interconnected to form two electrically similar propulsion groups which may be connected either in series or parallel and 18 cells, type SL20HS interconnected to form the auxiliary section. The battery cells will be delivered in pre-charged condition. To prepare the battery for first time use, the individual cells must be activated, i.e., filled with electrolyte. A plastic bottle with the correct quantity of electrolyte is supplied with each cell. During the charging process and before installation of the battery inside the torpedo the voltage of each individual cell can be tested from the outside without opening the battery. The battery is equipped with measuring cables, connected to one 104-pole plug on the front endplate of the battery case. The battery SLST-MK53 can be used for several discharges (torpedo runs) during the specified wet lifetime. The number of discharges depends on different parameters, for example: depths of discharge, standby time in partly charged and fully charged conditions, temperature etc.

Safety and Reliability

The SLST-MK53 battery provides our customers with the most reliable and safe exercise battery for MK37 torpedo. This exercise battery is designed to withstand the specified environmental loads in terms of temperature, shock and vibration and to serve the torpedo with excellent electrical performance.

Shelf Life

Typical dry storage life: 5 Years. Typical wet life time*: 12 Months. Typical cycle life*: 10 - 25 cycles.

* Depending on various parameters, such as: depths of discharge, standby time in partly charged and fully charged conditions, temperature etc.

Storage, Transport and Operational Conditions

| Designation | Values |
|---|------------------------------------|
| Storage Temperature | -15°C to +35°C* |
| Storage Temperature (Battery non Activated -dry-) | 0°C to +35°C** |
| Storage Temperature (Battery Activated) | -15°C to +25°C*** |
| Operating Temperature | +20°C to +45°C |
| Operating Cell Temperature | max. +95°C at the end of discharge |
| Relative Humidity | 45% to 75% |

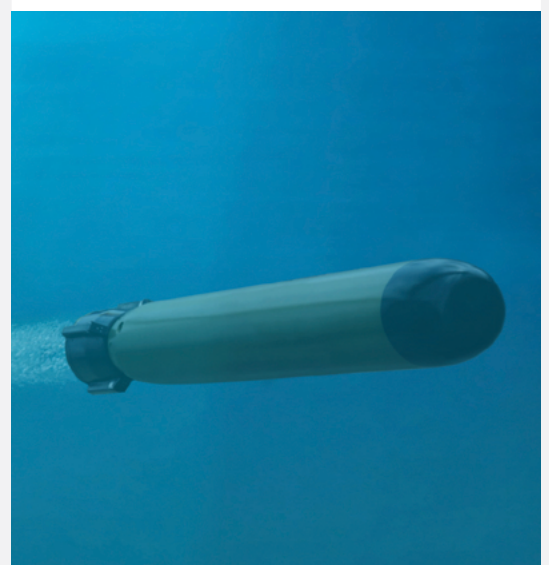
* A short-term (≤ 8 h) temperature deviation in a range of -20°C to 65°C is allowed.

** Up to one month per year the storage temperature is allowed to be between -20°C and 45°C.

*** This storage temperature is allowed to deviate from the given temperature range by $\pm 10^\circ\text{C}$ for a maximum of one month per year.

Options

- If requested, spare cells of both types can be supplied together with the battery.



SLST-MK53 Battery

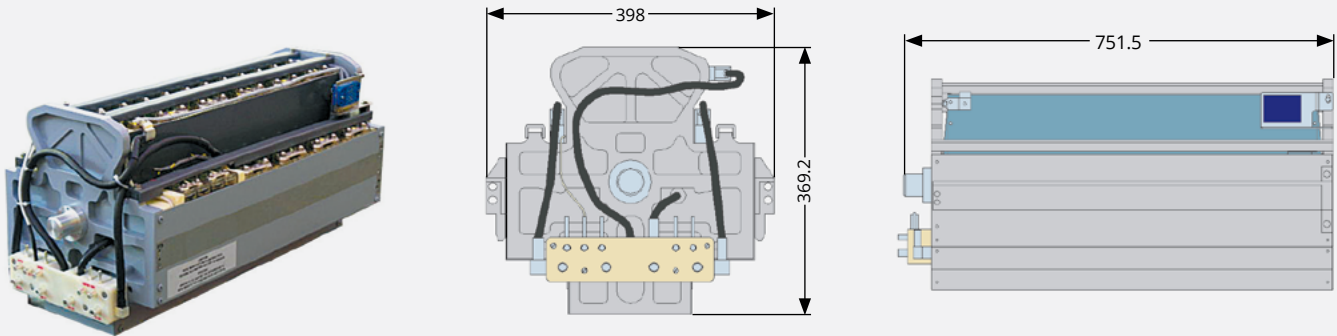
For American Torpedo MK37

Electrical Characteristics

| Designation | Propulsion | | Auxiliaries* |
|-----------------------------|---------------------|---------------------|-------------------|
| | Serial Connection | Parallel Connection | (Control Section) |
| Battery Terminals | AB-DC | AB-DC | D-E |
| Torpedo Operation | High Speed | Low Speed | |
| Terminal Voltage (V) | 76±4 | 42±2 | 26±2 |
| Discharge Current (A) | 450±5 | 250±5 | 36±1 |
| Final Discharge Voltage (V) | 68 | 38 | 22 |
| Discharge Time (min) | ≥10 | ≥36 | ≥36 |
| Capacity (Ah) | ≥75 | ≥150 | ≥18 |
| Number of Cells (pcs.) | 60 | 2x30 | 18 |
| Type of Cells** | SL 90HS | SL 90HS | SL 20HS |
| Electrolyte | Potassium Hydroxide | | |
| Power (average) (kW) | ≥34.2 | ≥10.5 | ≥0.94 |

* Detailed technical data of the cells are shown on page 14 & 15

Battery Dimensions



Mechanical Characteristics

| Designation | Dimensions |
|-------------------|-----------------|
| Overall Height | 369.2mm |
| Overall Width (1) | 398mm |
| Overall Length | 751.5mm |
| Weight | 120.2kg +4.5/-9 |

References

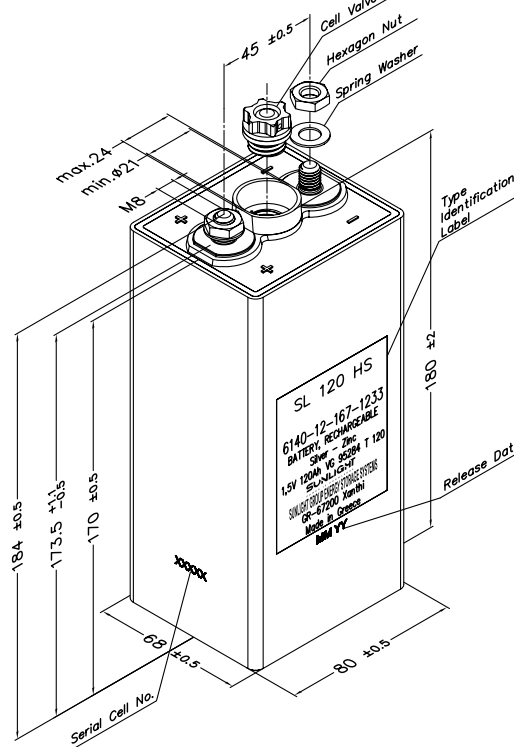
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|--|--|
| Standard Designation | Exercise battery for torpedoes MK 37 |
| Item Name | Exercise battery MK53 |
| Part Number | 90169 |
| Drawing Number | 16.651.0027 and 16.651.0028 |
| German Military Type Specification (for cells) | VG 95284 T 10 |
| Compliant to NATO Stock No. (NSN for cells) | 6140-12-167-1230 (SL20HS) 6140-12-171-4306 (SL90HS) |
| NATO Stock No. (NSN for battery) | 6140-23-112-7722 |

SL 120HS

AgO/Zn-Cell 1.5V - 120Ah

Applications

Propulsion cell for exercise batteries **DM2A1, SST4, SUT, DM2A3, DM2A4** torpedoes



Outline and Dimensions of Sunlight Silver/Zinc Cell Type SL 120 HS

Technical Characteristics

| | |
|--|--|
| Nominal Capacity | 120Ah |
| Nominal Voltage | 1.5V |
| Minimum Charging Current | 6A |
| Maximum Charging Current | 12A |
| Charging Time* | approx. 10h at 12A approx. 20h at 6A |
| Cut off Voltage (COV) "charge" | 2.08V +0/-0.03V |
| Open Circuit Voltage (OCV) | 1.86V ±0.01V (fully charged) 1.62V ±0.02V (partially discharged) |
| Application Loads** | 120A, 480A, 600A, 780A |
| Average Load Voltage at Room Temperature | 1.47V at 120A 1.35V at 480A 1.30V at 600A 1.25V at 780A |
| Maximum Discharge Time at Room Temperature | 60 minutes at 120A |
| Cut off Voltage (COV) "discharge" | min. 1.0V with single cell monitoring (s.c.m) 1.2V without s.c.m. |
| Electrolyte | Potassium Hydroxide |
| Typical Dry Storage Life max. | 5 Years |

| | |
|---------------------------------|--|
| Typical Wet Life Time | 12 Months |
| Typical Cycle Life*** | 10 - 25 cycles |
| Storage Temperature Range**** | -15°C to +35°C |
| Operating Temperature Range | -10°C to +45°C |
| Operate Cell Temperature max. | +95°C at end of discharge |
| Relative Humidity | 45% to 75% |
| Weight (filled) | 1840g ± 20g |
| Outline and Dimensions | refer to drawing |
| Tightening Torque of Pole Nuts | 5 - 5.5Nm |
| Tightening Torque of Cell Valve | 2Nm |
| Specification | GERMAN MIL.STD. VG 95284-120 |
| NATO Stock No. (NSN) | 6140-12-167-1233 |
| Certification: | Officially certified by the German Federal Office of Bundeswehr Equipment, Information Technology and In-Service Support (BAAINBw) |

Notes: The Information shown in this data sheet is for an individual cell.

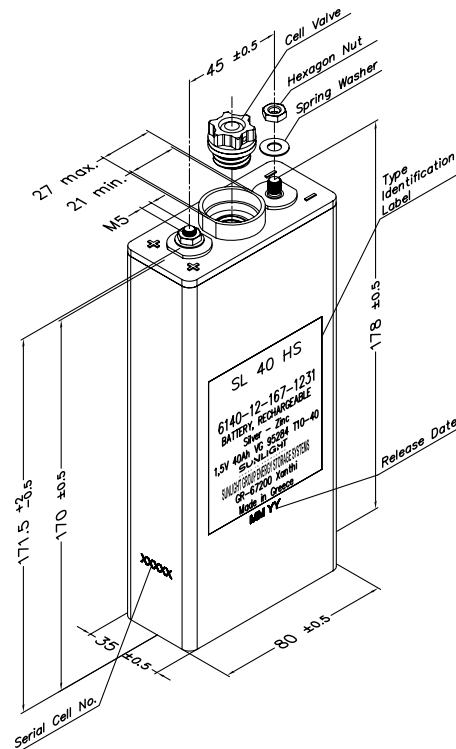
* After complete discharge. ** Other currents upon request. *** Cycle life is dependent on depth of discharge, standby time, temperature etc.

**** Up to one month per year the storage temperature is allowed to be between -20°C and 45°C.

AgO/Zn-Cell 1.5V - 40Ah

Applications

Auxiliary cell for exercise batteries **DM2A1, SST4, SUT, DM2A3** torpedoes



Outline and Dimensions of Sunlight Silver/Zinc Cell Type SL 40 HS

Technical Characteristics

| | |
|--|--|
| Nominal Capacity | 40Ah |
| Nominal Voltage | 1.5V |
| Minimum Charging Current | 2A |
| Maximum Charging Current | 4A |
| Charging Time* | approx. 10h at 4A approx. 20h at 2A |
| Cut off Voltage (COV) "charge" | 2.08V +0/-0.03V |
| Open Circuit Voltage (OCV) | 1.86V ±0,01V (fully charged) 1.62V ±0.02V (partially discharged) |
| Application Loads** | 40A |
| Average Load Voltage at Room Temperature | 1.47V at 40A |
| Maximum Discharge Time at Room Temperature | 60 minutes at 40A |
| Cut off Voltage (COV) "discharge" | min. 1.0V with single cell monitoring (s.c.m) 1.2V without single cell monitoring (s.c.m) |
| Electrolyte | Potassium Hydroxide |

| | |
|-----------------------------------|------------------------------|
| Typical Dry Storage Life max. | 5 Years |
| Typical Wet Life Time | 12 Months |
| Typical Cycle Life*** | 10 - 25 cycles |
| Storage Temperature Range**** | -15°C to +35°C |
| Operating Temperature Range | -10°C to +45°C |
| Operate Cell Temperature max. | +95°C at end of discharge |
| Relative Humidity | 45% to 75% |
| Weight (filled) | 770g ± 20g |
| Outline and Dimensions | refer to drawing |
| Tightening Torque of Pole Nuts | 1.5 - 1.75Nm |
| Tightening Torque of Cell Valve | 2Nm |
| Specification | GERMAN MIL.STD. VG 95284-T10 |
| Compliant to NATO Stock No. (NSN) | 6140-12-167-1231 |

Notes: The Information shown in this data sheet is for an individual cell.

* After complete discharge. ** Other currents upon request. *** Cycle life is dependent on depth of discharge, standby time, temperature etc.

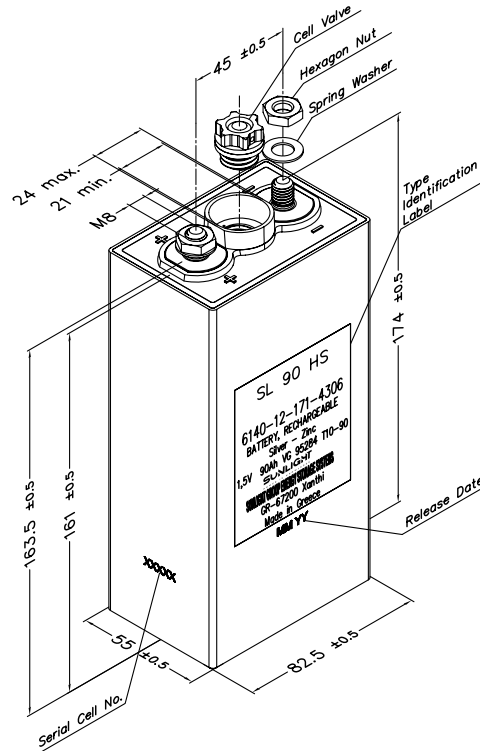
**** Up to one month per year the storage temperature is allowed to be between -20°C and 45°C.

SL 90HS

AgO/Zn-Cell 1.5V - 90Ah

Applications

Propulsion cell for exercise batteries **MK37** torpedoes



Outline and Dimensions of Sunlight Silver/Zinc Cell Type SL 90 HS

Technical Characteristics

| | |
|--|---|
| Nominal Capacity | 90Ah |
| Nominal Voltage | 1.5V |
| Minimum Charging Current | 4.5A |
| Maximum Charging Current | 9A |
| Charging Time* | approx. 10h at 9A approx. 20h at 4.5A |
| Cut off Voltage (COV) "charge" | 2.08V +0/-0.03V |
| Open Circuit Voltage (OCV) | 1.86V ±0.01V (fully charged) 1.62V ±0.02V (partially discharged) |
| Application Loads** | 90A, 450A |
| Average Load Voltage at Room Temperature | 1.50V at 90A 1.35V at 450A |
| Maximum Discharge Time at Room Temperature | 60 minutes at 90A 10.5 minutes at 450A |
| Cut off Voltage (COV) "discharge" | min. 1.0V |
| Electrolyte | Potassium Hydroxide |
| Typical Dry Storage Life max. | 5 Years |

| | |
|-----------------------------------|------------------------------|
| Typical Wet Life Time | 12 Months |
| Typical Cycle Life*** | 10 - 25 cycles |
| Storage Temperature Range**** | -15°C to +35°C |
| Operating Temperature Range | -10°C to +45°C |
| Operate Cell Temperature max. | +95°C at end of discharge |
| Relative Humidity | 45% to 75% |
| Weight (filled) | 1500g ± 50g |
| Outline and Dimensions | refer to drawing |
| Tightening Torque of Pole Nuts | 5 - 5.5Nm |
| Tightening Torque of Cell Valve | 2Nm |
| Specification | GERMAN MIL.STD. VG 95284-T10 |
| Compliant to NATO Stock No. (NSN) | 6140-12-171-4306 |

Notes: The Information shown in this data sheet is for an individual cell.

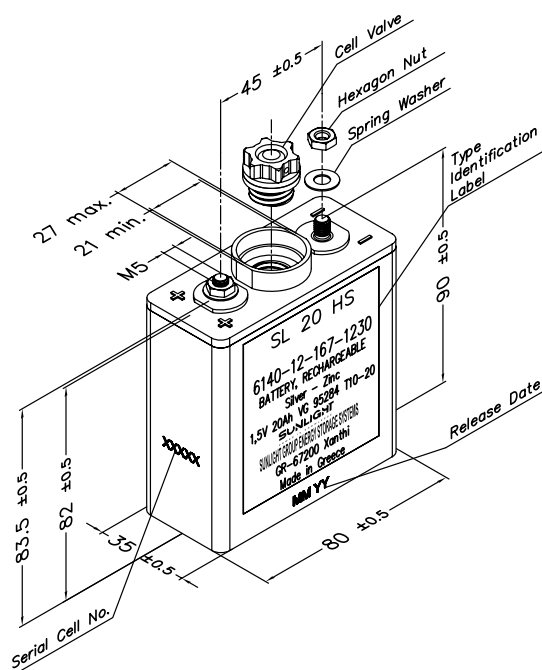
* After complete discharge. ** Other currents upon request. *** Cycle life is dependent on depth of discharge, standby time, temperature etc.

**** Up to one month per year the storage temperature is allowed to be between -20°C and 45°C.

AgO/Zn-Cell 1.5V - 20Ah

Applications

Auxiliary cell for exercise batteries **MK37** torpedoes



Outline and Dimensions of Sunlight Silver/Zinc Cell Type SL 20 HS

Technical Characteristics

| | |
|---|---|
| Nominal Capacity | 20Ah |
| Nominal Voltage | 1.5V |
| Minimum Charging Current | 1A |
| Maximum Charging Current | 2A |
| Charging Time* | approx. 10h at 2A approx. 20h at 1A |
| Cut off Voltage (COV) "charge" | 2.08V +0/-0.03V |
| Open Circuit Voltage (OCV) | 1.86V ±0.01V (fully charged) 1.62V ±0.02V (partially discharged) |
| Application Loads** | 20A, 35A |
| Average Load Voltage at Room Temperature | 1.47V at 20A 1.43V at 35A |
| Maximum Discharge Time at Room Temperature | 60 minutes at 20A 36 minutes at 35A |
| Cut off Voltage (COV) "discharge" | min. 1.0V |
| Electrolyte | Potassium Hydroxide |
| Typical Dry Storage Life max. | 5 Years |

| | |
|--|------------------------------|
| Typical Wet Life Time | 12 Months |
| Typical Cycle Life*** | 10 - 25 cycles |
| Storage Temperature Range**** | -15°C to +35°C |
| Operating Temperature Range | -10°C to +45°C |
| Operate Cell Temperature max. | +95°C at end of discharge |
| Relative Humidity | 45% to 75% |
| Weight (filled) | 400g ± 20g |
| Outline and Dimensions | refer to drawing |
| Tightening Torque of Pole Nuts | 1.5 - 1.75Nm |
| Tightening Torque of Cell Valve | 2Nm |
| Specification | GERMAN MIL.STD. VG 95284-T10 |
| Compliant to NATO Stock No. (NSN) | 6140-12-167-1230 |

Notes: The Information shown in this data sheet is for an individual cell.

* After complete discharge. ** Other currents upon request. *** Cycle life is dependent upon depth of discharge, standby time, temperature etc.

**** Up to one month per year the storage temperature is allowed to be between -20°C and 45°C.



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