



SWL



SWL Series

VALVE REGULATED LEAD-ACID BATTERIES

SWL

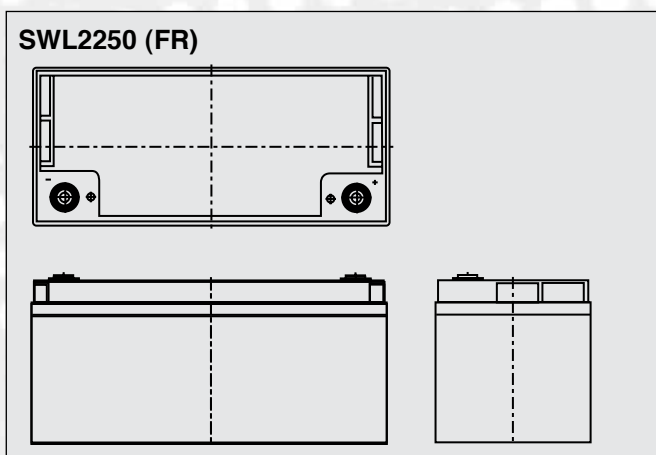
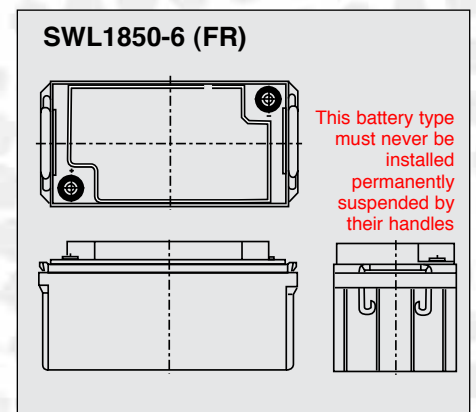
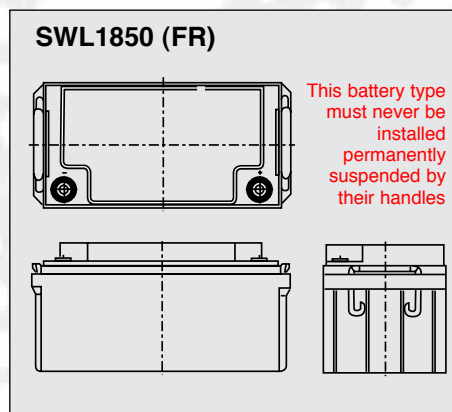
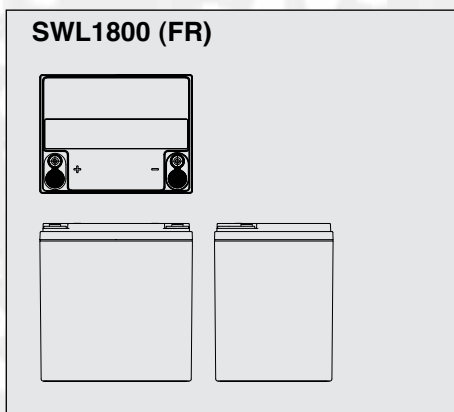
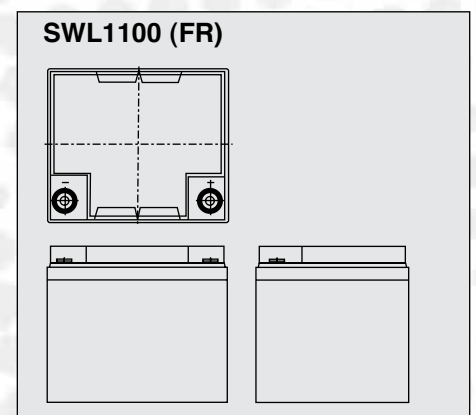
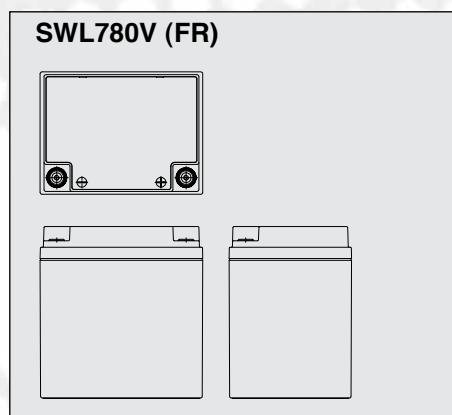
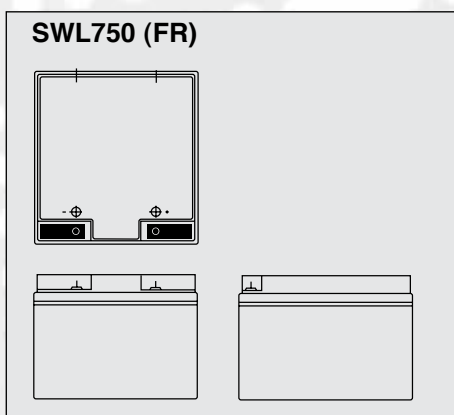
SWL VALVE REGULATED LEAD-ACID BATTERIES (VRLA)

The SWL range is an enhanced NPL design resulting in an improved energy to density ratio, giving up to 40% extra discharge capacity. All other attributes and operational characteristics are the same, thereby maintaining the benefit of a common mechanical and electrical design for users of both products.

FEATURES

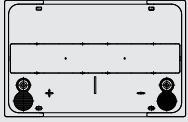
- Yuasa VRLA batteries can be used in any orientation excluding continuous use inverted.
- Standard case material is flame retardant to (UL94) HBØ.
- FR option case material is flame retardant to UL94:VØ (oxygen index 30).
- SWL batteries are manufactured in factories that comply with ISO9001:2000.
- FR option SWL's comply with BS6290 Part 4 (1997).
- SWL batteries comply with IEC 60896-21+22.

Layouts

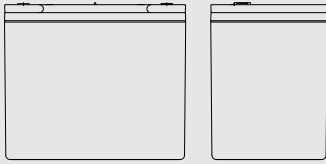


Layouts continued

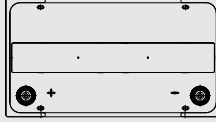
SWL2300E (FR)



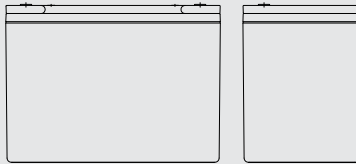
This battery type must never be installed permanently suspended by their handles



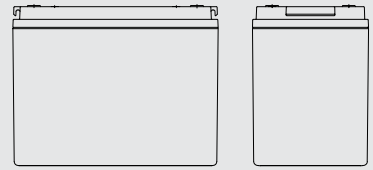
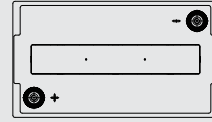
SWL2500E (FR)



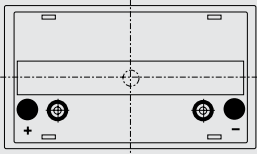
This battery type must never be installed permanently suspended by their handles



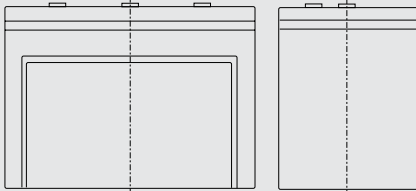
SWL2500-6 (FR)



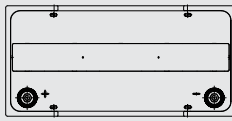
SWL2500T (FR)



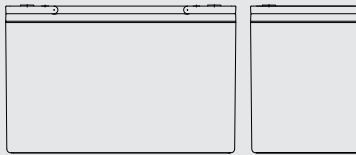
This battery type must never be installed permanently suspended by their handles



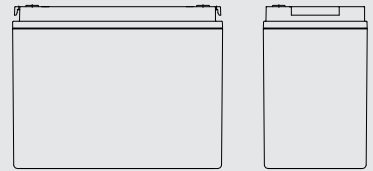
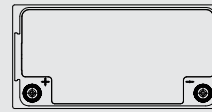
SWL3300 (FR)



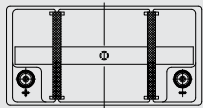
This battery type must never be installed permanently suspended by their handles



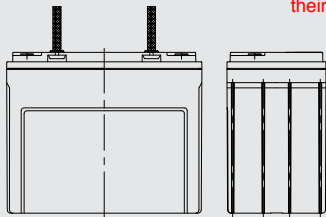
SWL3800 (FR)



SWL4250 (FR)

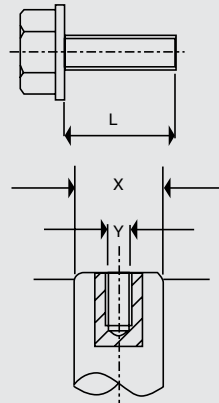


This battery type must never be installed permanently suspended by their handles



Terminals (mm)

| Terminal | X | Y | L |
|----------|------|----|----|
| B | 17mm | M5 | 10 |
| C | 20mm | M6 | 16 |
| D | 20mm | M8 | 16 |



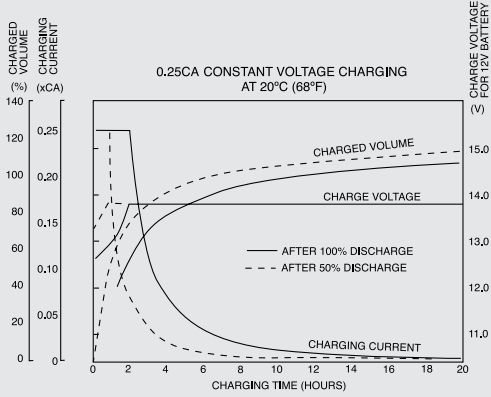
General Specifications

| Specifications | SWL750 (FR) | SWL780V (FR) | SWL1100 (FR) | SWL1800 (FR) | SWL1850 (FR) | SWL1850-6 (FR) | SWL2250 (FR) |
|---|---------------------|---------------------|---------------------|---------------------|---------------------|-----------------------|---------------------|
| Nominal Voltage | 12V | 12V | 12V | 12V | 12V | 6V | 12V |
| 10-min rate Constant Power 9.6V at 20°C | 750W | 780W | 1100W | 1800W | 1850W | 1152W | 2250W |
| 10-min rate Constant Power 1.6V/Cell at 20°C | 125W | 130W | 183W | 300W | 308W | 384W | 375W |
| 10-hr rate Capacity to 10.8V at 20°C | 22.9Ah | 27.1Ah | 39.6Ah | 55Ah | 66Ah | 132Ah | 76Ah |
| Dimensions / mm | | | | | | | |
| Length | 166 (± 0.5) | 166 (± 1) | 197 (± 0.5) | 216 (± 0.7) | 350 (± 0.7) | 350 (± 0.7) | 380 (± 0.7) |
| Width | 175 (± 0.5) | 125 (± 1) | 165 (± 0.5) | 168 (± 0.5) | 166 (± 0.5) | 166 (± 0.5) | 166 (± 0.5) |
| Height | 125 (± 0.5) | 175 (± 2) | 170 (± 0.5) | 223 (± 0.7) | 174 (± 0.5) | 174 (± 0.5) | 174 (± 0.5) |
| (height over terminals) | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| Mass (typical) Kg | 9.0 | 10.1 | 14.0 | 23.0 | 23.0 | 23.0 | 27.5 |
| Terminal Type | | | | | | | |
| Female threaded terminal | M5 | M5 | M5 | M6 | M6 | M6 | M8 |
| Torque | 2.5Nm | 2.5Nm | 2.5Nm | 4.8Nm | 4.8Nm | 4.8Nm | 6Nm |
| Operating Temperature Range | | | | | | | |
| Storage (in fully charged condition) °C | -20 to +60 | -20 to +60 | -20 to +60 | -20 to +50 | -20 to +50 | -20 to +50 | -20 to +50 |
| Charge °C | -15 to +50 | -15 to +50 | -15 to +50 | -15 to +50 | -15 to +50 | -15 to +50 | -15 to +50 |
| Discharge °C | -20 to +60 | -20 to +60 | -20 to +60 | -20 to +60 | -20 to +60 | -20 to +60 | -20 to +60 |
| Storage | | | | | | | |
| Capacity loss per month at 20°C (approx) | 3% | 3% | 3% | 3% | 3% | 3% | 3% |
| Case Material | | | | | | | |
| Standard Option | ABS (UL94:HB) | ABS (UL94:HB) | ABS (UL94:HB) | ABS (UL94:HB) | ABS (UL94:HB) | ABS (UL94:HB) | ABS (UL94:HB) |
| Flame retardant option (FR) | ABS (UL94:VO) | ABS (UL94:VO) | ABS (UL94:VO) | ABS (UL94:VO) | ABS (UL94:VO) | ABS (UL94:VO) | ABS (UL94:VO) |
| Charge Voltage | | | | | | | |
| Float charge voltage at 20°C | 13.65 (± 1%) V | 13.65 (± 1%) V | 13.65 (± 1%) V | 13.65 (± 1%) V | 13.65 (± 1%) V | 6.825 (± 1%) V | 13.65 (± 1%) V |
| | 2.275 (± 1%) V/cell | 2.275 (± 1%) V/cell | 2.275 (± 1%) V/cell | 2.275 (± 1%) V/cell | 2.275 (± 1%) V/cell | 2.275 (± 1%) V/cell | 2.275 (± 1%) V/cell |
| Float Charge voltage temperature correction factor (for variations from the standard 20°C) | -3 mV/cell/°C | -3 mV/cell/°C | -3 mV/cell/°C | -3 mV/cell/°C | -3 mV/cell/°C | -3 mV/cell/°C | -3 mV/cell/°C |
| Cyclic (or Boost) charge at 20°C | 14.5 (± 3%) V | 14.5 (± 3%) V | 14.5 (± 3%) V | 14.5 (± 3%) V | 14.5 (± 3%) V | 7.25 (± 3%) V | 14.5 (± 3%) V |
| | 2.42 (± 3%) V/cell | 2.42 (± 3%) V/cell | 2.42 (± 3%) V/cell | 2.42 (± 3%) V/cell | 2.42 (± 3%) V/cell | 2.42 (± 3%) V/cell | 2.42 (± 3%) V/cell |
| Cyclic Charge voltage temperature correction factor (for variations from the standard 20°C) | -4 mV/cell/°C | -4 mV/cell/°C | -4 mV/cell/°C | -4 mV/cell/°C | -4 mV/cell/°C | -4 mV/cell/°C | -4 mV/cell/°C |
| Charge Current | | | | | | | |
| Float charge current limit | No Limit | No Limit | No Limit | No Limit | No Limit | No Limit | No Limit |
| Cyclic (or Boost) charge current limit | 11.45A | 6.78A | 9.90A | 13.75A | 16.50A | 33.00A | 19.00A |
| Maximum Discharge Current | | | | | | | |
| 1 second | 500A | 500A | 500A | 800A | 800A | 500A | 800A |
| 1 minute | 150A | 150A | 200A | 500A | 500A | 260A | 500A |
| Short-circuit Current & Internal Resistance (according to EN IEC 60896-21) | | | | | | | |
| Internal resistance | 20.47mΩ | N/A mΩ | 14.4mΩ | 10.09mΩ | 9.35mΩ | 2.96mΩ | 10.49mΩ |
| Short-circuit current | 714A | N/A A | 1005A | 1437A | 1529A | 2408A | 1442A |
| Impedance | | | | | | | |
| Measured at 1 kHz | 9.5mΩ | 8.5mΩ | 7.5mΩ | 4mΩ | 5mΩ | 2.5mΩ | 3.6mΩ |
| Design Life | | | | | | | |
| EUROBAT Classification: High Performance Years | 10 to 12 | 10 to 12 | 10 to 12 | 10 to 12 | 10 to 12 | 10 to 12 | 10 to 12 |
| Yuasa design life (at 20°C) Years | up to 10 | up to 10 | up to 10 | up to 10 | up to 10 | up to 10 | up to 10 |

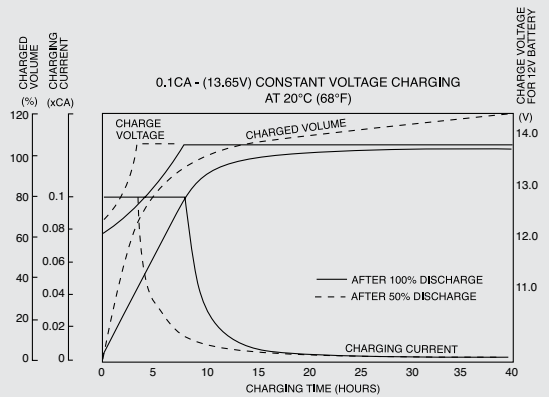
General Specifications continued

| Specifications | SWL2300E (FR) | SWL2500-6 (FR) | SWL2500E (FR) | SWL2500T (FR) | SWL3300 (FR) | SWL3800 (FR) | SWL4250 (FR) |
|---|----------------------|-----------------------|----------------------|----------------------|---------------------|---------------------|---------------------|
| Nominal Voltage | 12V | 6V | 12V | 12V | 12V | 12V | 12V |
| 10-min rate Constant Power 9.6V at 20°C | 2300W | 2600W | 2500W | 2500W | 3300W | 3800W | 4250W |
| 10-min rate Constant Power 1.6V/Cell at 20°C | 383W | 867W | 417W | 416.67W | 550W | 633W | 708W |
| 10-hr rate Capacity to 10.8V at 20°C | 78Ah | 180Ah | 90Ah | 90Ah | 105Ah | 124Ah | 140Ah |
| Dimensions / mm | | | | | | | |
| Length | 261 (± 0.7) | 297 (± 1) | 305 (± 0.7) | 305 (± 3) | 350 (± 0.7) | 350 (± 1) | 341 (± 3) |
| Width | 168 (± 0.5) | 168 (± 1) | 168 (± 0.5) | 173 (± 3) | 168 (± 0.5) | 173 (± 1) | 173 (± 3) |
| Height | 225 (± 0.7) | 231.5 (± 2) | 225 (± 0.7) | 220 (± 3) | 225 (± 0.7) | 272 (± 2) | 281 (± 3) |
| (height over terminals) | N/A | N/A | N/A | 223 (± 3) | N/A | N/A | N/A |
| Mass (typical) Kg | 27.0 | 32.5 | 32.0 | 31.0 | 38.0 | 48.0 | 49.0 |
| Terminal Type | | | | | | | |
| Female threaded terminal | M6mm | M8mm | M6mm | M6mm | M8mm | M8mm | M8mm |
| Torque | 4.8Nm | 6Nm | 4.8Nm | 4.8Nm | 6Nm | 6Nm | 6Nm |
| Operating Temperature Range | | | | | | | |
| Storage (in fully charged condition) °C | -20 to +50 | -20 to +50 | -20 to +50 | -15 to +40 | -20 to +50 | -20 to +50 | -20 to +50 |
| Charge °C | -15 to +50 | -15 to +50 | -15 to +50 | -15 to +50 | -15 to +50 | -15 to +50 | -15 to +50 |
| Discharge °C | -20 to +60 | -20 to +60 | -20 to +60 | -15 to +50 | -20 to +60 | -20 to +60 | -20 to +60 |
| Storage | | | | | | | |
| Capacity loss per month at 20°C (approx) | 3% | 3% | 3% | 3% | 3% | 3% | 3% |
| Case Material | | | | | | | |
| Standard Option | ABS (UL94:HB) | ABS (UL94:HB) | ABS (UL94:HB) | ABS (UL94:HB) | ABS (UL94:HB) | ABS (UL94:HB) | ABS (UL94:HB) |
| Flame retardant option (FR) | ABS (UL94:VO) | ABS (UL94:VO) | ABS (UL94:VO) | ABS (UL94:VO) | ABS (UL94:VO) | ABS (UL94:VO) | ABS (UL94:VO) |
| Charge Voltage | | | | | | | |
| Float charge voltage at 20°C | 13.65 (± 1%) V | 6.825 (± 1%) V | 13.65 (± 1%) V | 13.65 (± 1%) V | 13.65 (± 1%) V | 13.65 (± 1%) V | 13.65 (± 1%) V |
| | 2.275 (± 1%) V/cell | 2.275 (± 1%) V/cell | 2.275 (± 1%) V/cell | 2.275 (± 1%) V/cell | 2.275 (± 1%) V/cell | 2.275 (± 1%) V/cell | 2.275 (± 1%) V/cell |
| Float Charge voltage temperature correction factor (for variations from the standard 20°C) | -3 mV/cell/°C | -3 mV/cell/°C | -3 mV/cell/°C | -3 mV/cell/°C | -3 mV/cell/°C | -3 mV/cell/°C | -3 mV/cell/°C |
| Cyclic (or Boost) charge at 20°C | 14.5 (± 3%) V | 7.25 (± 3%) V | 14.5 (± 3%) V | 14.5 (± 3%) V | 14.5 (± 3%) V | 14.5 (± 3%) V | 14.5 (± 3%) V |
| | 2.42 (± 3%) V/cell | 2.42 (± 3%) V/cell | 2.42 (± 3%) V/cell | 2.42 (± 3%) V/cell | 2.42 (± 3%) V/cell | 2.42 (± 3%) V/cell | 2.42 (± 3%) V/cell |
| Cyclic Charge voltage temperature correction factor (for variations from the standard 20°C) | -4 mV/cell/°C | -4 mV/cell/°C | -4 mV/cell/°C | -4 mV/cell/°C | -4 mV/cell/°C | -4 mV/cell/°C | -4 mV/cell/°C |
| Charge Current | | | | | | | |
| Float charge current limit | No Limit A | No Limit A | No Limit A | No Limit A | No Limit A | No Limit A | No Limit A |
| Cyclic (or Boost) charge current limit | 19.50A | 45A | 22.50A | 22.5A | 26.25A | 31.00A | 35.00A |
| Maximum Discharge Current | | | | | | | |
| 1 second | 800A | 1500A | 1000A | 598A | 1100A | 1200A | 840A |
| 1 minute | 400A | 800A | 500A | 276A | 550A | 600A | 420A |
| Short-circuit Current & Internal Resistance (according to EN IEC 60896-21) | | | | | | | |
| Internal resistance | 7.71mΩ | N/A mΩ | 6.5mΩ | 5.64mΩ | 5.64mΩ | 4.8mΩ | N/A mΩ |
| Short-circuit current | 1857A | N/A A | 2258A | 2547A | 2547A | 3000A | N/A A |
| Impedance | | | | | | | |
| Measured at 1 kHz | 5.5mΩ | 3mΩ | 5mΩ | 6mΩ | 4mΩ | 4mΩ | 2.7mΩ |
| Design Life | | | | | | | |
| EUROBAT Classification: High Performance Years | 10 to 12 | 10 to 12 | 10 to 12 | 10 to 12 | 10 to 12 | 10 to 12 | 10 to 12 |
| Yuasa design life (at 20°C) Years | up to 10 | up to 10 | up to 10 | up to 10 | up to 10 | up to 10 | up to 10 |

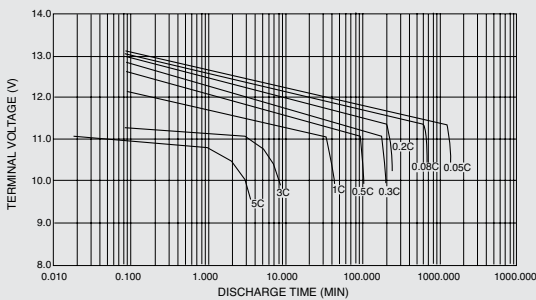
CHARGING CHARACTERISTICS



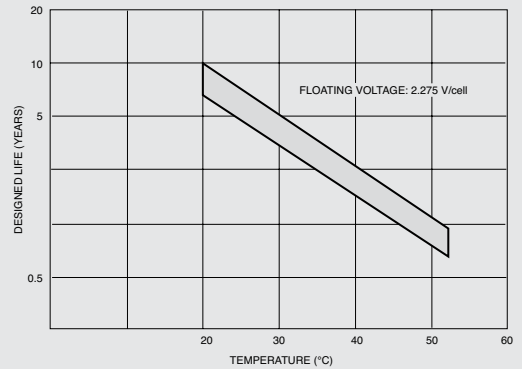
CHARGING CHARACTERISTICS



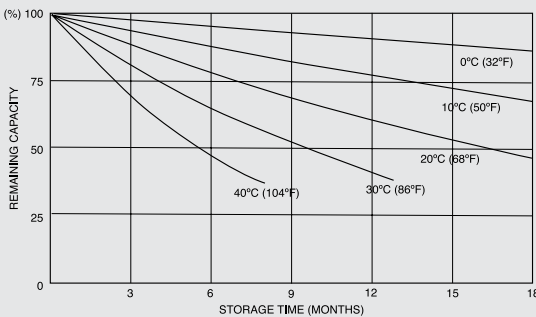
DISCHARGE CHARACTERISTIC CURVES



TEMPERATURE/LIFE CHARACTERISTIC



SELF DISCHARGE CHARACTERISTICS



Charging Methods (At 20°C)

Standby use: Float charging voltage 2.275vpc

CAUTION

- Avoid short circuit.
- Do not charge in a sealed container.
- Service life and operational characteristics will be affected by temperature.
- AC Ripple reduces service life.

WARNING!

SWL (Standard) and (FR) battery types SWL1850; SWL1850-6; SWL2500, must never be installed permanently suspended by their handles; they are not designed for this purpose.



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