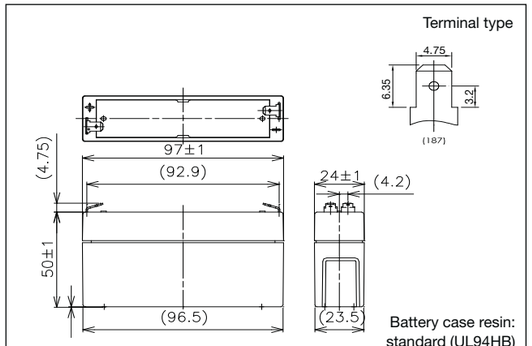
# LC-R061R3P*1

For main and standby power supplies.
Expected trickle design life: 6 – 9 years at 20°C according to Eurobat.


Contents indicated (including the recycle marking, etc.) are subject to change without notice.

## Dimensions (mm)

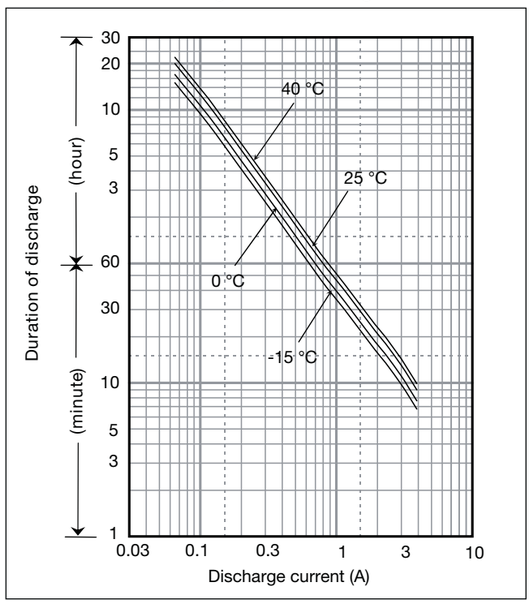



Battery case resin: standard (UL94HB)

## Specifications

| | | |
|---|---|---|
| Nominal voltage | | 6V |
| Nominal capacity (20 hour rate) | | 1.3Ah |
| Dimensions | Length | 97mm |
| | Width | 24mm |
| | Height | 50mm |
| | Total Height | 55mm |
| Approx. mass | | 0.3kg |
| Terminal | | Faston 187 |

## Duration of discharge vs Discharge current




## Characteristics

| | | |
|---|---|---|
| Capacity (25°C) | 20 hour rate<br>10 hour rate<br>5 hour rate<br>1 hour rate | 1.3Ah<br>1.2Ah<br>1.05Ah<br>0.85Ah |
| Internal resistance | Fully charged battery (25°C) | 50mΩ |
| Temperature dependency of capacity (20 hour rate) | 40°C<br>25°C<br>0°C<br>-15°C | 102%<br>100%<br>85%<br>65% |
| Self discharge (25°C) | After 3 months<br>After 6 months<br>After 12 months | 91%<br>82%<br>64% |

## Watt Table

(Wattage/Battery)

| Cut-off V | 3min | 5min | 10min | 15min | 20min | 30min | 45min | 1h | 1.5h | 2h | 3h | 4h | 5h | 6h | 10h | 20h | 24h |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4.8V | 39.1 | 30.8 | 20.1 | 15.4 | 12.9 | 9.61 | 6.78 | 5.42 | 3.73 | 2.89 | 2.15 | 1.65 | 1.36 | 1.10 | 0.726 | 0.393 | 0.328 |
| 4.95V | 36.2 | 28.9 | 19.7 | 15.3 | 12.7 | 9.51 | 6.74 | 5.42 | 3.66 | 2.86 | 2.14 | 1.64 | 1.35 | 1.09 | 0.723 | 0.392 | 0.327 |
| 5.1V | 33.4 | 27.1 | 19.2 | 15.0 | 12.5 | 9.40 | 6.68 | 5.32 | 3.58 | 2.79 | 2.12 | 1.63 | 1.34 | 1.08 | 0.715 | 0.391 | 0.326 |
| 5.25V | 29.7 | 24.3 | 17.8 | 13.9 | 11.8 | 9.19 | 6.57 | 5.21 | 3.51 | 2.69 | 2.08 | 1.62 | 1.33 | 1.07 | 0.712 | 0.390 | 0.325 |
| 5.4V | 25.1 | 21.4 | 15.9 | 13.0 | 11.5 | 8.87 | 6.47 | 5.10 | 3.41 | 2.57 | 2.04 | 1.60 | 1.30 | 1.05 | 0.704 | 0.388 | 0.323 |

## Ampere Table

(Ampere/Battery)

| Cut-off V | 3min | 5min | 10min | 15min | 20min | 30min | 45min | 1h | 1.5h | 2h | 3h | 4h | 5h | 6h | 10h | 20h | 24h |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4.8V | 7.02 | 5.53 | 3.59 | 2.67 | 2.22 | 1.64 | 1.16 | 0.921 | 0.632 | 0.488 | 0.361 | 0.276 | 0.228 | 0.183 | 0.121 | 0.0655 | 0.0547 |
| 4.95V | 6.52 | 5.18 | 3.52 | 2.65 | 2.18 | 1.63 | 1.15 | 0.921 | 0.619 | 0.484 | 0.359 | 0.274 | 0.226 | 0.182 | 0.120 | 0.0654 | 0.0545 |
| 5.1V | 6.01 | 4.86 | 3.43 | 2.60 | 2.15 | 1.61 | 1.14 | 0.903 | 0.607 | 0.471 | 0.356 | 0.273 | 0.224 | 0.181 | 0.119 | 0.0652 | 0.0543 |
| 5.25V | 5.34 | 4.35 | 3.18 | 2.42 | 2.04 | 1.57 | 1.12 | 0.885 | 0.594 | 0.455 | 0.350 | 0.271 | 0.222 | 0.178 | 0.119 | 0.0650 | 0.0542 |
| 5.4V | 4.51 | 3.85 | 2.83 | 2.26 | 1.99 | 1.52 | 1.10 | 0.867 | 0.578 | 0.433 | 0.343 | 0.267 | 0.217 | 0.176 | 0.117 | 0.0646 | 0.0538 |

*1 This battery is also available with a flame retardant battery case resin (UL94 V-0).





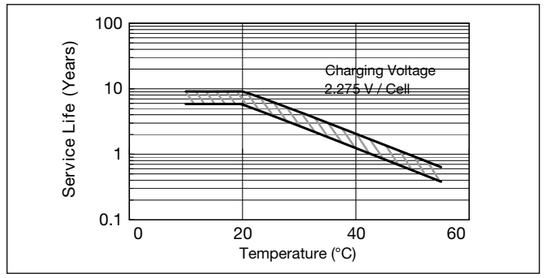
## Charging Method

| | |
|---|---|
| Cycle use | Control voltage: 7.25 - 7.45V; Initial current: 0.52A or smaller |
| Trickle use | Control voltage: 6.8 - 6.9V; Initial current: 0.195A or smaller |

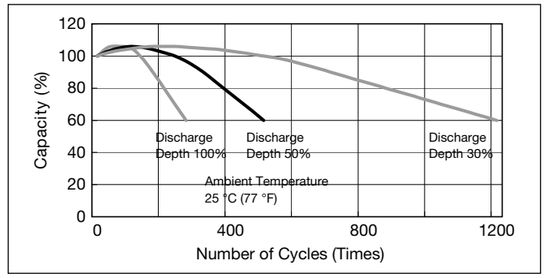
## Cut off voltage

| Discharge current | 0.065A - 0.26A | 0.26A - 0.65A | 0.65A - 1.3A | 1.3A - 2.6A | 2.6A - 3.9A |
|---|---|---|---|---|---|
| Cut off voltage (V) | 5.25 | 5.1 | 4.95 | 4.65 | 4.35 |

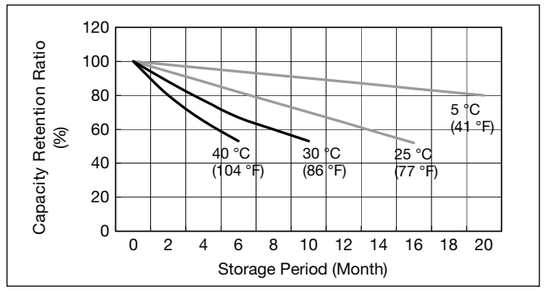
## Influence of Temperature on Trickle life



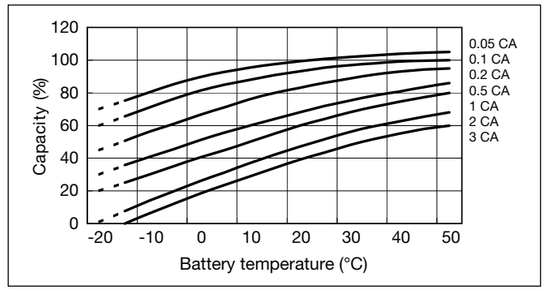

## Cycle life vs Depth of discharge



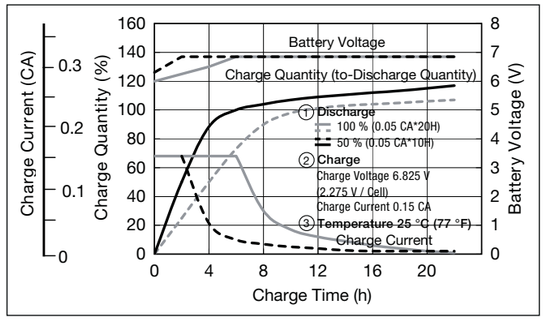

## Residual capacity vs storage period



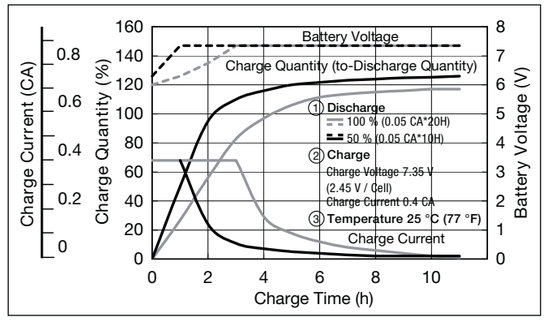

## Discharge capacity by temperature and by discharge current



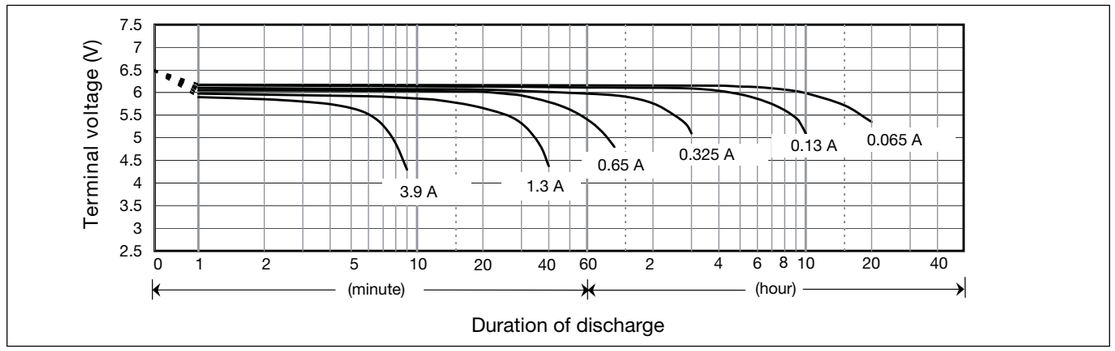

## Constant-voltage and constant-current charge characteristics for Trickle use




## Constant-voltage and constant-current charge characteristics for Cycle use




## Discharge characteristics

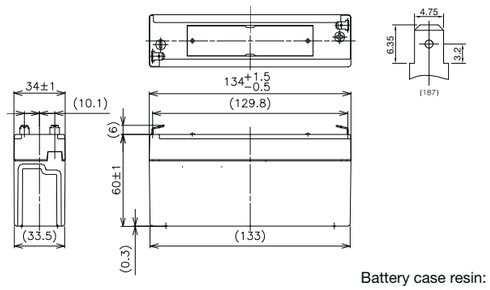


# LC-R063R4P*1


Contents indicated (including the recycle marking, etc.) are subject to change without notice.

For main and standby power supplies.
Expected trickle design life: 6 – 9 years at 20°C according to Eurobat.

## Dimensions (mm)




Battery case resin: standard (UL94HB)

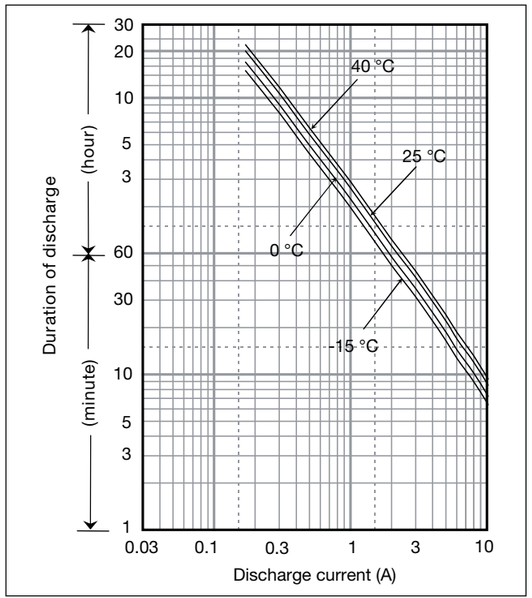
## Specifications

| | | |
|---|---|---|
| Nominal voltage | | 6V |
| Nominal capacity (20 hour rate) | | 3.4Ah |
| Dimensions | Length | 134mm |
| | Width | 34mm |
| | Height | 60mm |
| | Total Height | 66mm |
| Approx. mass | | 0.62kg |
| Terminal | | Faston 187 |

## Characteristics

| | | |
|---|---|---|
| Capacity (25°C) | 20 hour rate<br>10 hour rate<br>5 hour rate<br>1 hour rate | 3.4Ah<br>3.0Ah<br>2.7Ah<br>2.1Ah |
| Internal resistance | Fully charged battery (25°C) | 30mΩ |
| Temperature dependency of capacity (20 hour rate) | 40°C<br>25°C<br>0°C<br>-15°C | 102%<br>100%<br>85%<br>65% |
| Self discharge (25°C) | After 3 months<br>After 6 months<br>After 12 months | 91%<br>82%<br>64% |

## Duration of discharge vs Discharge current




## Watt Table

**(Wattage/Battery)**

| Cut-off V | 3min | 5min | 10min | 15min | 20min | 30min | 45min | 1h | 1.5h | 2h | 3h | 4h | 5h | 6h | 10h | 20h | 24h |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4.8V | 102 | 80.6 | 52.6 | 40.2 | 33.7 | 25.1 | 17.7 | 14.2 | 9.76 | 7.55 | 5.62 | 4.32 | 3.56 | 2.86 | 1.90 | 1.03 | 0.858 |
| 4.95V | 94.8 | 75.6 | 51.6 | 39.9 | 33.1 | 24.9 | 17.6 | 14.2 | 9.56 | 7.49 | 5.59 | 4.29 | 3.54 | 2.85 | 1.89 | 1.03 | 0.856 |
| 5.1V | 87.4 | 70.8 | 50.2 | 39.1 | 32.6 | 24.6 | 17.5 | 13.9 | 9.37 | 7.30 | 5.54 | 4.26 | 3.51 | 2.83 | 1.87 | 1.02 | 0.853 |
| 5.25V | 77.7 | 63.4 | 46.5 | 36.4 | 30.9 | 24.0 | 17.2 | 13.6 | 9.17 | 7.04 | 5.45 | 4.23 | 3.48 | 2.80 | 1.86 | 1.02 | 0.850 |
| 5.4V | 65.6 | 56.1 | 41.5 | 33.9 | 30.1 | 23.2 | 16.9 | 13.4 | 8.92 | 6.71 | 5.34 | 4.18 | 3.39 | 2.75 | 1.84 | 1.01 | 0.844 |

## Ampere Table

**(Ampere/Battery)**

| Cut-off V | 3min | 5min | 10min | 15min | 20min | 30min | 45min | 1h | 1.5h | 2h | 3h | 4h | 5h | 6h | 10h | 20h | 24h |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4.8V | 18.4 | 14.4 | 9.40 | 6.99 | 5.81 | 4.30 | 3.02 | 2.41 | 1.65 | 1.27 | 0.944 | 0.722 | 0.595 | 0.478 | 0.316 | 0.171 | 0.143 |
| 4.95V | 17.0 | 13.6 | 9.21 | 6.94 | 5.71 | 4.25 | 3.00 | 2.41 | 1.62 | 1.27 | 0.940 | 0.718 | 0.590 | 0.476 | 0.315 | 0.171 | 0.143 |
| 5.1V | 15.7 | 12.7 | 8.97 | 6.80 | 5.62 | 4.20 | 2.97 | 2.36 | 1.59 | 1.23 | 0.930 | 0.713 | 0.586 | 0.472 | 0.312 | 0.170 | 0.142 |
| 5.25V | 14.0 | 11.4 | 8.31 | 6.33 | 5.34 | 4.11 | 2.93 | 2.31 | 1.55 | 1.19 | 0.916 | 0.708 | 0.581 | 0.467 | 0.310 | 0.170 | 0.142 |
| 5.4V | 11.8 | 10.1 | 7.41 | 5.90 | 5.19 | 3.97 | 2.88 | 2.27 | 1.51 | 1.13 | 0.897 | 0.699 | 0.567 | 0.459 | 0.307 | 0.169 | 0.141 |

*1 This battery is also available with a flame retardant battery case resin (UL94 V-0).





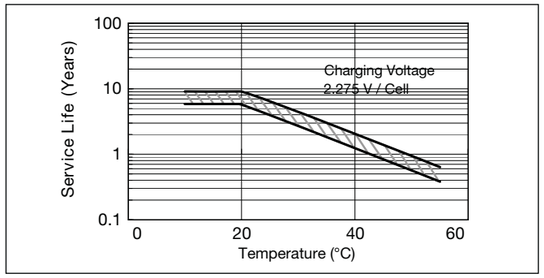
## Charging Method

| | |
|---|---|
| Cycle use | Control voltage: 7.25 - 7.45V; Initial current: 1.36A or smaller |
| Trickle use | Control voltage: 6.8 - 6.9V; Initial current: 0.51A or smaller |

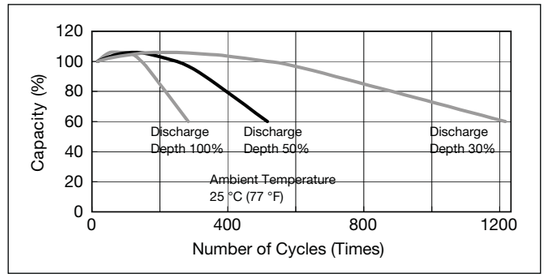
## Cut off voltage

| Discharge current | 0.17A - 0.68A | 0.68A - 1.7A | 1.7A - 3.4A | 3.4A - 6.8A | 6.8A - 10.2A |
|---|---|---|---|---|---|
| Cut off voltage (V) | 5.25 | 5.1 | 4.95 | 4.65 | 4.35 |

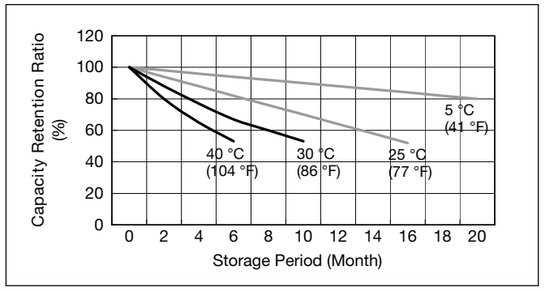
## Influence of Temperature on Trickle life



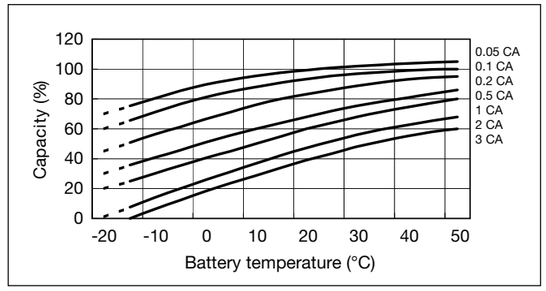

## Cycle life vs Depth of discharge



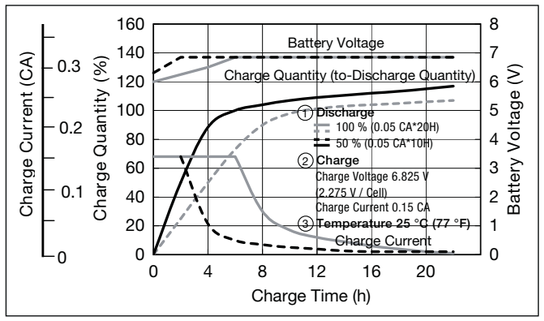

## Residual capacity vs storage period



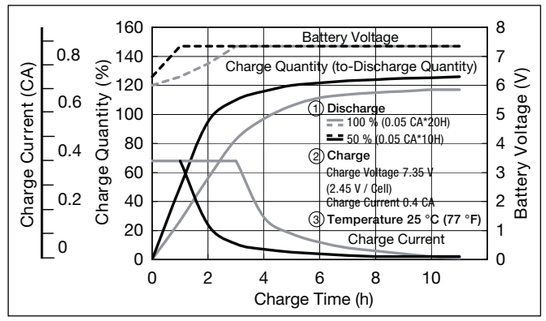

## Discharge capacity by temperature and by discharge current



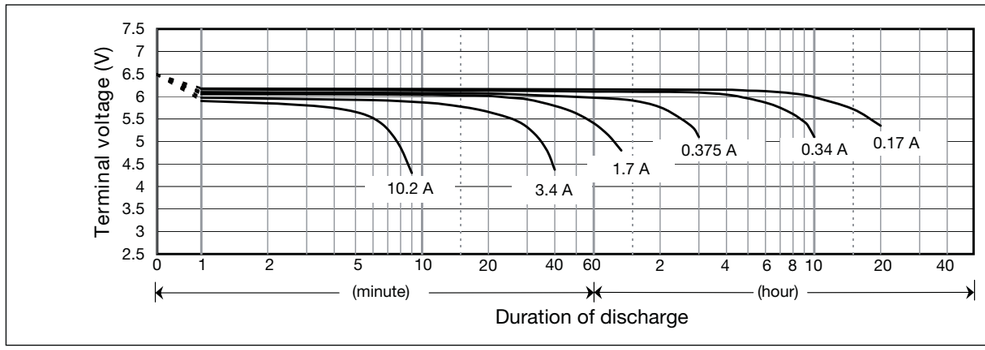

## Constant-voltage and constant-current charge characteristics for Trickle use




## Constant-voltage and constant-current charge characteristics for Cycle use




## Discharge characteristics

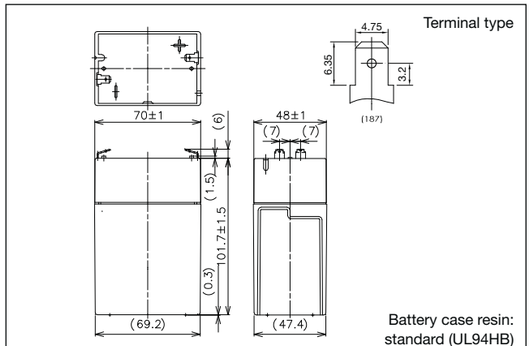


# LC-R064R5P*1

For main and standby power supplies.
Expected trickle design life: 6 – 9 years at 20°C according to Eurobat.


Contents indicated (including the recycle marking, etc.) are subject to change without notice.

## Dimensions (mm)



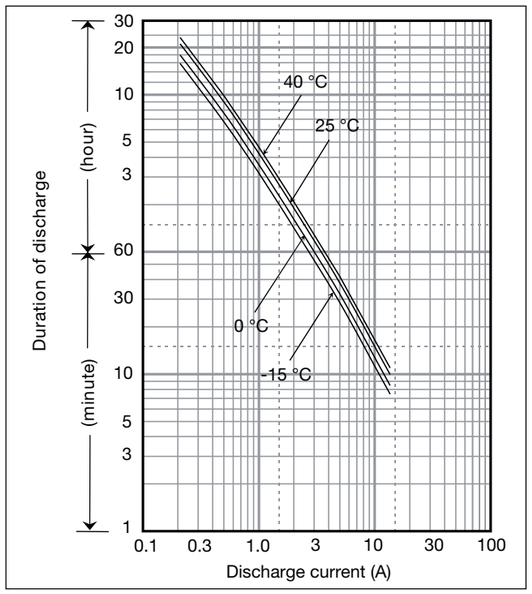

## Specifications

| | | |
|---|---|---|
| Nominal voltage | | 6V |
| Nominal capacity (20 hour rate) | | 4.5Ah |
| Dimensions | Length | 70mm |
| | Width | 48mm |
| | Height | 102mm |
| | Total Height | 108mm |
| Approx. mass | | 0.72kg |
| Terminal | | Faston 187 |

## Characteristics

| | | |
|---|---|---|
| Capacity (25°C) | 20 hour rate<br>10 hour rate<br>5 hour rate<br>1 hour rate | 4.5Ah<br>4.0Ah<br>3.6Ah<br>2.8Ah |
| Internal resistance | Fully charged battery (25°C) | 20mΩ |
| Temperature dependency of capacity (20 hour rate) | 40°C<br>25°C<br>0°C<br>-15°C | 102%<br>100%<br>85%<br>65% |
| Self discharge (25°C) | After 3 months<br>After 6 months<br>After 12 months | 91%<br>82%<br>64% |

## Duration of discharge vs Discharge current




## Watt Table

**(Wattage/Battery)**

| Cut-off V | 3min | 5min | 10min | 15min | 20min | 30min | 45min | 1h | 1.5h | 2h | 3h | 4h | 5h | 6h | 10h | 20h | 24h |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4.8V | 135 | 107 | 69.7 | 53.2 | 44.6 | 33.3 | 23.5 | 18.8 | 12.9 | 9.99 | 7.44 | 5.71 | 4.72 | 3.79 | 2.51 | 1.36 | 1.136 |
| 4.95V | 125 | 100 | 68.3 | 52.8 | 43.9 | 32.9 | 23.3 | 18.8 | 12.7 | 9.92 | 7.40 | 5.68 | 4.68 | 3.78 | 2.50 | 1.36 | 1.133 |
| 5.1V | 116 | 94 | 66.5 | 51.8 | 43.1 | 32.5 | 23.1 | 18.4 | 12.4 | 9.66 | 7.33 | 5.64 | 4.64 | 3.75 | 2.48 | 1.35 | 1.129 |
| 5.25V | 103 | 84 | 61.6 | 48.2 | 41.0 | 31.8 | 22.7 | 18.0 | 12.1 | 9.32 | 7.21 | 5.60 | 4.60 | 3.70 | 2.46 | 1.35 | 1.125 |
| 5.4V | 87 | 74 | 55.0 | 44.9 | 39.9 | 30.7 | 22.4 | 17.7 | 11.8 | 8.88 | 7.07 | 5.53 | 4.49 | 3.64 | 2.44 | 1.34 | 1.118 |

## Ampere Table

**(Ampere/Battery)**

| Cut-off V | 3min | 5min | 10min | 15min | 20min | 30min | 45min | 1h | 1.5h | 2h | 3h | 4h | 5h | 6h | 10h | 20h | 24h |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4.8V | 24.3 | 19.13 | 12.44 | 9.25 | 7.69 | 5.69 | 4.00 | 3.19 | 2.19 | 1.69 | 1.25 | 0.956 | 0.788 | 0.633 | 0.419 | 0.227 | 0.189 |
| 4.95V | 22.6 | 17.94 | 12.19 | 9.19 | 7.56 | 5.63 | 3.98 | 3.19 | 2.14 | 1.68 | 1.24 | 0.950 | 0.781 | 0.630 | 0.417 | 0.226 | 0.189 |
| 5.1V | 20.8 | 16.81 | 11.88 | 9.00 | 7.44 | 5.56 | 3.94 | 3.13 | 2.10 | 1.63 | 1.23 | 0.944 | 0.775 | 0.625 | 0.413 | 0.226 | 0.188 |
| 5.25V | 18.5 | 15.06 | 11.00 | 8.38 | 7.06 | 5.44 | 3.88 | 3.06 | 2.06 | 1.58 | 1.21 | 0.938 | 0.769 | 0.618 | 0.411 | 0.225 | 0.188 |
| 5.4V | 15.6 | 13.31 | 9.81 | 7.81 | 6.88 | 5.25 | 3.81 | 3.00 | 2.00 | 1.50 | 1.19 | 0.925 | 0.750 | 0.608 | 0.406 | 0.224 | 0.186 |

*1 This battery is also available with a flame retardant battery case resin (UL94 V-0).





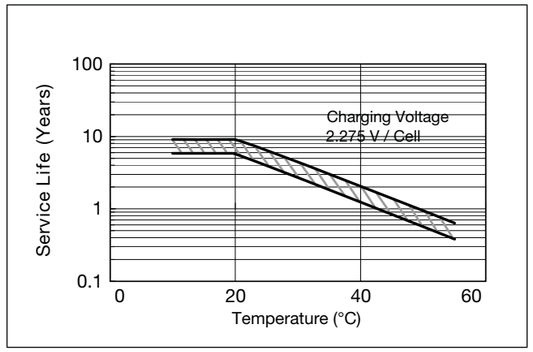
## Charging Method

| | |
|---|---|
| Trickle use | Control voltage: 6.8 - 6.9V; Initial current: 0.675A or smaller |

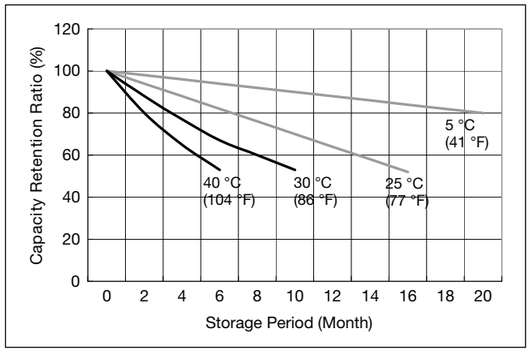
## Cut off voltage

| Discharge current | 0.225 A - 0.9A | 0.9A - 2.25A | 2.25A - 4.5A | 4.5A - 9A | 9A - 13.5A |
|---|---|---|---|---|---|
| Cut off voltage (V) | 5.25 | 5.1 | 4.95 | 4.65 | 4.35 |

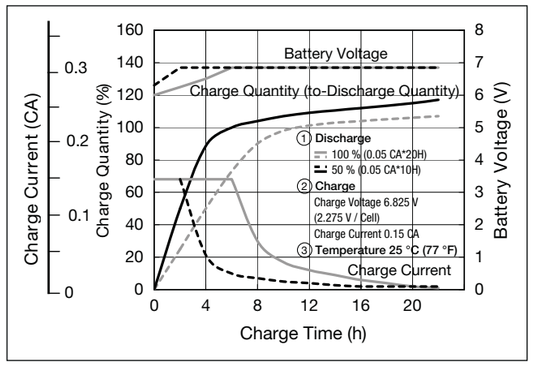
## Influence of Temperature on Trickle life



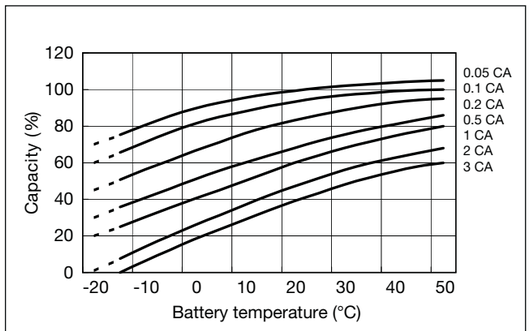

## Residual capacity vs storage period



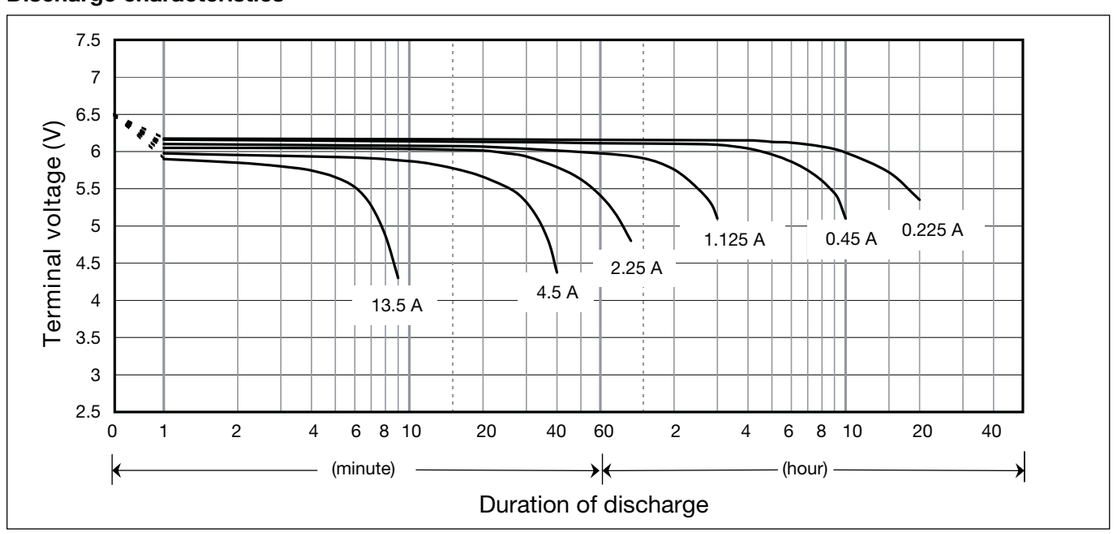

## Constant-voltage and constant-current charge characteristics for Trickle use




## Discharge capacity by temperature and by discharge current




## Discharge characteristics

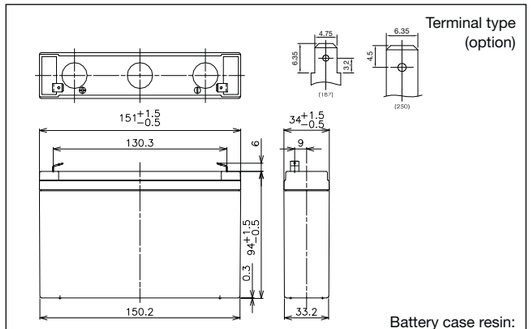


# LC-R067R2P*1

For main and standby power supplies.
Expected trickle design life: 6 – 9 years at 20°C according to Eurobat.

Contents indicated (including the recycle marking, etc.) are subject to change without notice.

## Dimensions (mm)




Battery case resin: standard (UL94HB)

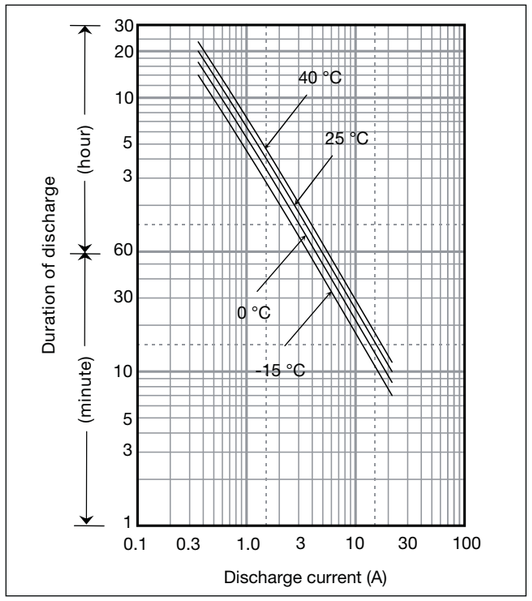
## Specifications

| | | |
|---|---|---|
| Nominal voltage | | 6V |
| Nominal capacity (20 hour rate) | | 7.2Ah |
| Dimensions | Length | 151mm |
| | Width | 34mm |
| | Height | 94mm |
| | Total Height | 100mm |
| Approx. mass | | 1.26kg |
| Terminal | | Faston 187 or Faston 250 with hole |

## Characteristics

| | | |
|---|---|---|
| Capacity (25°C) | 20 hour rate<br>10 hour rate<br>5 hour rate<br>1 hour rate | 7.2Ah<br>6.8Ah<br>6.3Ah<br>4.9Ah |
| Internal resistance | Fully charged battery (25°C) | 11mΩ |
| Temperature dependency of capacity (20 hour rate) | 40°C<br>25°C<br>0°C<br>-15°C | 102%<br>100%<br>85%<br>65% |
| Self discharge (25°C) | After 3 months<br>After 6 months<br>After 12 months | 91%<br>82%<br>64% |

## Duration of discharge vs Discharge current




## Watt Table

(Wattage/Battery)

| Cut-off V | 3min | 5min | 10min | 15min | 20min | 30min | 45min | 1h | 1.5h | 2h | 3h | 4h | 5h | 6h | 10h | 20h | 24h |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4.8V | 216 | 171 | 111 | 85.1 | 71.3 | 53.2 | 37.6 | 30.0 | 20.7 | 16.0 | 11.9 | 9.14 | 7.55 | 6.07 | 4.02 | 2.18 | 1.82 |
| 4.95V | 201 | 160 | 109 | 84.5 | 70.2 | 52.7 | 37.3 | 30.0 | 20.3 | 15.9 | 11.8 | 9.08 | 7.49 | 6.04 | 4.00 | 2.17 | 1.81 |
| 5.1V | 185 | 150 | 106 | 82.8 | 69.0 | 52.1 | 37.0 | 29.5 | 19.8 | 15.5 | 11.7 | 9.02 | 7.43 | 6.00 | 3.96 | 2.17 | 1.81 |
| 5.25V | 165 | 134 | 99 | 77.1 | 65.5 | 50.9 | 36.4 | 28.9 | 19.4 | 14.9 | 11.5 | 8.96 | 7.37 | 5.92 | 3.94 | 2.16 | 1.80 |
| 5.4V | 139 | 119 | 88 | 71.9 | 63.8 | 49.1 | 35.8 | 28.3 | 18.9 | 14.2 | 11.3 | 8.84 | 7.19 | 5.83 | 3.90 | 2.15 | 1.79 |

## Ampere Table

(Ampere/Battery)

| Cut-off V | 3min | 5min | 10min | 15min | 20min | 30min | 45min | 1h | 1.5h | 2h | 3h | 4h | 5h | 6h | 10h | 20h | 24h |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4.8V | 38.9 | 30.6 | 19.9 | 14.8 | 12.3 | 9.1 | 6.4 | 5.1 | 3.5 | 2.7 | 2.00 | 1.50 | 1.26 | 1.00 | 0.67 | 0.36 | 0.30 |
| 4.95V | 36.1 | 28.7 | 18.5 | 14.8 | 12.1 | 9.0 | 6.4 | 5.1 | 3.4 | 2.6 | 2.00 | 1.50 | 1.25 | 1.00 | 0.67 | 0.36 | 0.30 |
| 5.1V | 33.3 | 26.9 | 19.0 | 14.4 | 11.9 | 8.9 | 6.3 | 5.0 | 3.3 | 2.5 | 1.95 | 1.50 | 1.24 | 1.00 | 0.66 | 0.36 | 0.30 |
| 5.25V | 29.6 | 24.1 | 17.6 | 13.4 | 11.3 | 8.7 | 6.2 | 4.9 | 3.3 | 2.5 | 1.95 | 1.50 | 1.23 | 1.00 | 0.66 | 0.36 | 0.30 |
| 5.4V | 25.0 | 21.3 | 15.7 | 12.5 | 11.0 | 8.4 | 6.1 | 4.8 | 3.2 | 2.4 | 1.90 | 1.50 | 1.20 | 1.00 | 0.65 | 0.35 | 0.30 |

*1 This battery is also available with a flame retardant battery case resin (UL94 V-0).





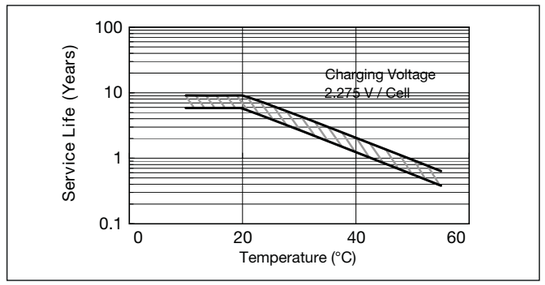
## Charging Method

| | |
|---|---|
| Cycle Use | Control voltage: 7.25 - 7.45V; Initial current: 2.88A or smaller |
| Trickle Use | Control voltage: 6.8 - 6.9V; Initial current: 1.08A or smaller |

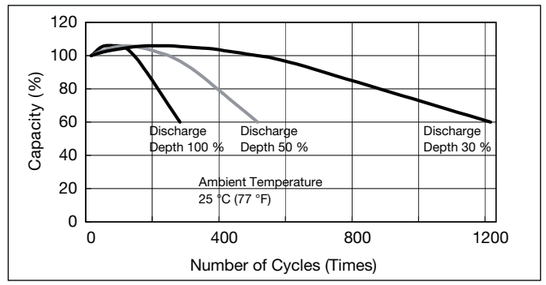
## Cut off voltage

| Discharge current | 0.36A - 1.44A | 1.44A - 3.6A | 3.6A - 7.2A | 7.2A - 14.4A | 14.4A - 21.6A |
|---|---|---|---|---|---|
| Cut off voltage (V) | 5.25 | 5.1 | 4.95 | 4.65 | 4.35 |

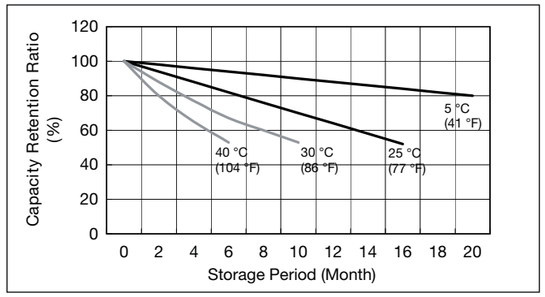
## Influence of Temperature on Trickle life



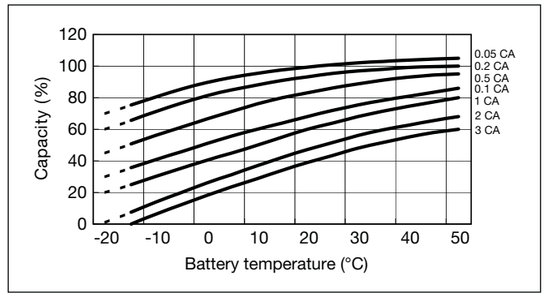

## Cycle life vs Depth of discharge



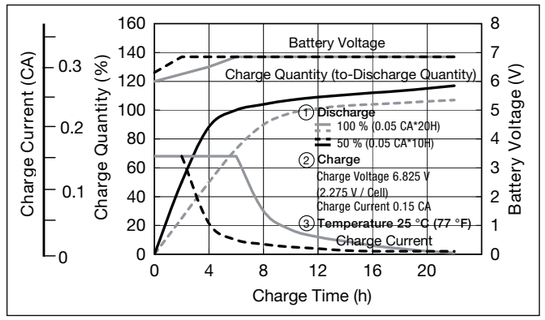

## Residual capacity vs storage period



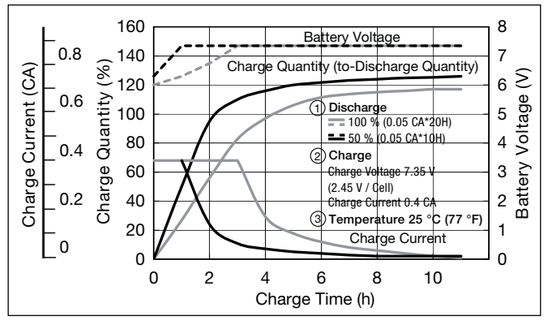

## Discharge capacity by temperature and by discharge current



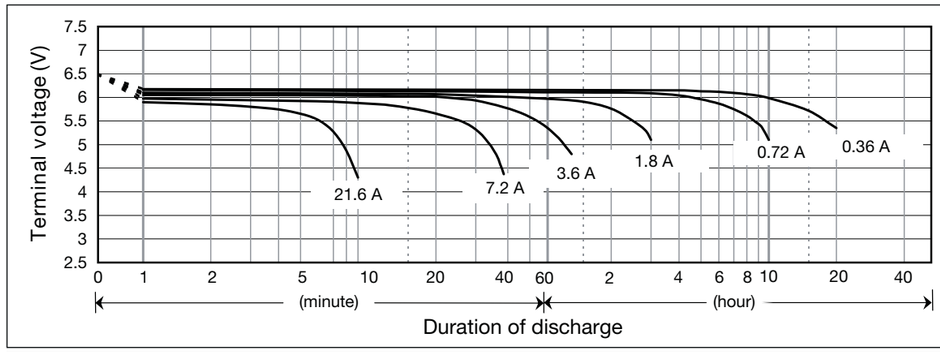

## Constant-voltage and constant-current charge characteristics for Trickle use




## Constant-voltage and constant-current charge characteristics for Cycle use




## Discharge characteristics

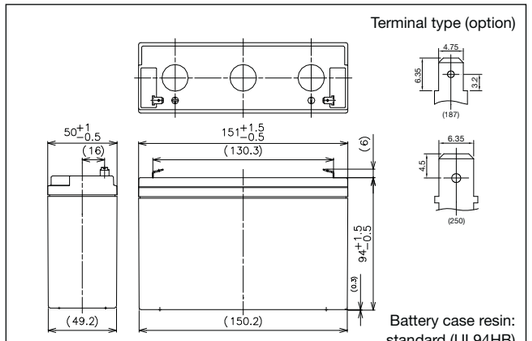


# LC-R0612P*1


Contents indicated (including the recycle marking, etc.) are subject to change without notice.

For main and standby power supplies.
Expected trickle design life: 6 – 9 years at 20°C according to Eurobat.

## Dimensions (mm)



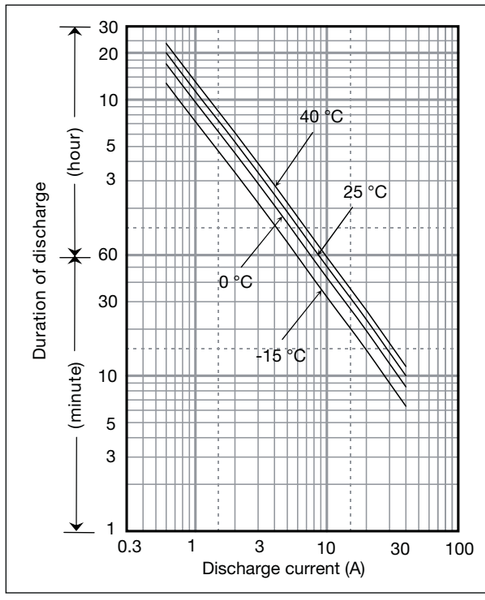

## Specifications

| | | |
|---|---|---|
| Nominal voltage | | 6V |
| Nominal capacity (20 hour rate) | | 12Ah |
| Dimensions | Length | 151mm |
| | Width | 50mm |
| | Height | 94mm |
| | Total Height | 100mm |
| Approx. mass | | 2.00kg |
| Terminal | | Faston 187 or Faston 250 with hole |

## Characteristics

| | | |
|---|---|---|
| Capacity (25°C) | 20 hour rate<br>10 hour rate<br>5 hour rate<br>1 hour rate | 12.0Ah<br>11.3Ah<br>10.4Ah<br>8.1Ah |
| Internal resistance | Fully charged battery (25°C) | 15mΩ |
| Temperature dependency of capacity (20 hour rate) | 40°C<br>25°C<br>0°C<br>-15°C | 102%<br>100%<br>85%<br>65% |
| Self discharge (25°C) | After 3 months<br>After 6 months<br>After 12 months | 91%<br>82%<br>64% |

## Duration of discharge vs Discharge current




## Watt Table

(Wattage/Battery)

| Cut-off V | 3min | 5min | 10min | 15min | 20min | 30min | 45min | 1h | 1.5h | 2h | 3h | 4h | 5h | 6h | 10h | 20h | 24h |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4.8V | 340 | 279 | 192 | 149 | 124 | 91.3 | 68.7 | 52.4 | 35.1 | 27.2 | 19.0 | 14.4 | 12.0 | 10.9 | 6.66 | 3.61 | 3.01 |
| 4.95V | 325 | 269 | 186 | 144 | 121 | 88.3 | 67.5 | 51.8 | 35.0 | 27.1 | 18.9 | 14.4 | 12.0 | 10.9 | 6.66 | 3.61 | 3.01 |
| 5.1V | 304 | 253 | 181 | 141 | 118 | 88.3 | 66.9 | 51.2 | 34.5 | 26.9 | 18.7 | 14.4 | 12.0 | 10.8 | 6.60 | 3.61 | 3.01 |
| 5.25V | 278 | 237 | 171 | 136 | 115 | 86.0 | 66.3 | 50.1 | 34.2 | 26.6 | 18.4 | 14.3 | 12.0 | 10.8 | 6.60 | 3.60 | 3.00 |
| 5.4V | 247 | 217 | 161 | 131 | 113 | 83.1 | 61.6 | 48.9 | 33.1 | 26.0 | 18.1 | 14.2 | 11.9 | 10.7 | 6.54 | 3.59 | 2.99 |

## Ampere Table

(Ampere/Battery)

| Cut-off V | 3min | 5min | 10min | 15min | 20min | 30min | 45min | 1h | 1.5h | 2h | 3h | 4h | 5h | 6h | 10h | 20h | 24h |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4.8V | 61.1 | 50.1 | 34.3 | 25.9 | 21.3 | 15.6 | 11.7 | 8.90 | 5.95 | 4.60 | 3.20 | 2.41 | 2.01 | 1.81 | 1.11 | 0.602 | 0.502 |
| 4.95V | 58.4 | 48.2 | 33.3 | 25.0 | 20.8 | 15.1 | 11.5 | 8.80 | 5.92 | 4.58 | 3.18 | 2.41 | 2.01 | 1.81 | 1.11 | 0.602 | 0.502 |
| 5.1V | 54.6 | 45.4 | 32.4 | 24.5 | 20.3 | 15.1 | 11.4 | 8.70 | 5.85 | 4.55 | 3.15 | 2.41 | 2.00 | 1.80 | 1.10 | 0.601 | 0.501 |
| 5.25V | 50.0 | 42.6 | 30.6 | 23.6 | 19.9 | 14.7 | 11.3 | 8.50 | 5.80 | 4.50 | 3.10 | 2.40 | 2.00 | 1.80 | 1.10 | 0.600 | 0.500 |
| 5.4V | 44.5 | 38.9 | 28.7 | 22.7 | 19.4 | 14.2 | 10.5 | 8.30 | 5.60 | 4.40 | 3.05 | 2.38 | 1.99 | 1.79 | 1.09 | 0.598 | 0.498 |

*1 This battery is also available with a flame retardant battery case resin (UL94 V-0).





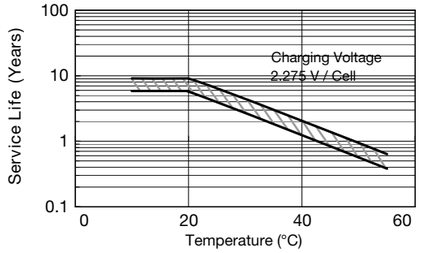
## Charging Method

| | |
|---|---|
| Cycle use | Control voltage: 7.25 - 7.45V; Initial current: 4.8A or smaller |
| Trickle use | Control voltage: 6.8 - 6.9V; Initial current: 1.8A or smaller |

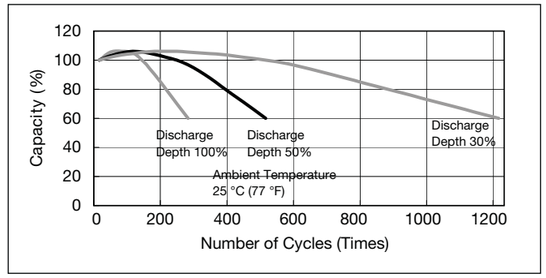
## Cut off voltage

| Discharge current | 0.6A - 2.4A | 2.4A - 6A | 6A - 12A | 12A - 24A | 24A - 36A |
|---|---|---|---|---|---|
| Cut off voltage (V) | 5.25 | 5.1 | 4.95 | 5.65 | 4.35 |

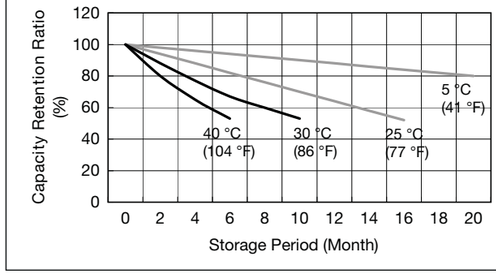
## Influence of Temperature on Trickle life



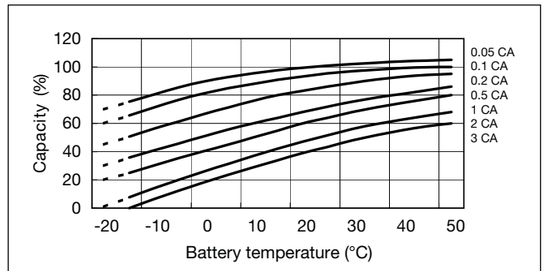

## Cycle life vs Depth of discharge



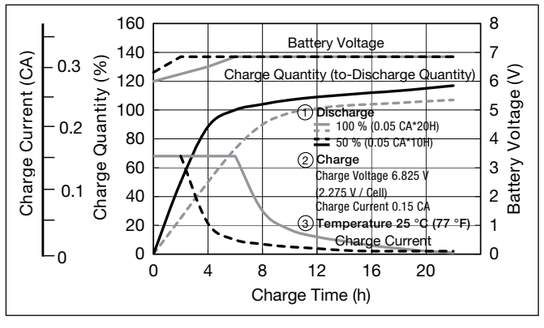

## Residual capacity vs storage period



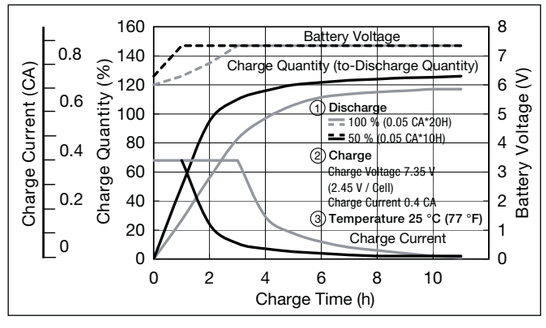

## Discharge capacity by temperature and by discharge current



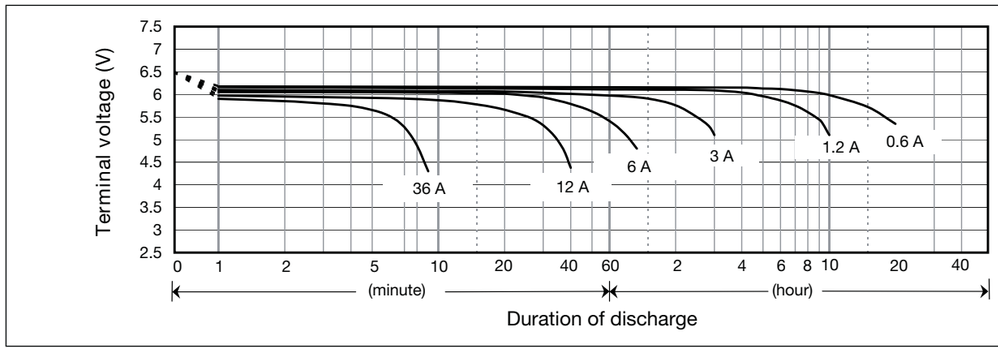

## Constant-voltage and constant-current charge characteristics for Trickle use




## Constant-voltage and constant-current charge characteristics for Cycle use




## Discharge characteristics

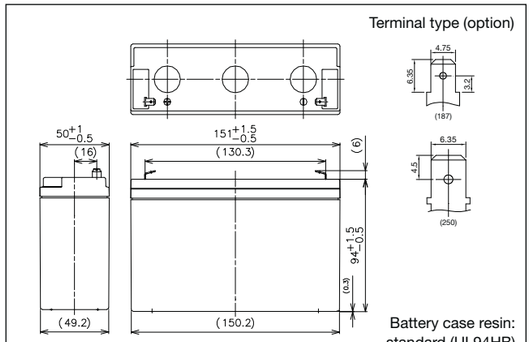


# LC-R0615P

For main and standby power supplies.
Expected trickle design life: 6 – 9 years at 20°C according to Eurobat.


Contents indicated (including the recycle marking, etc.) are subject to change without notice.

## Dimensions (mm)

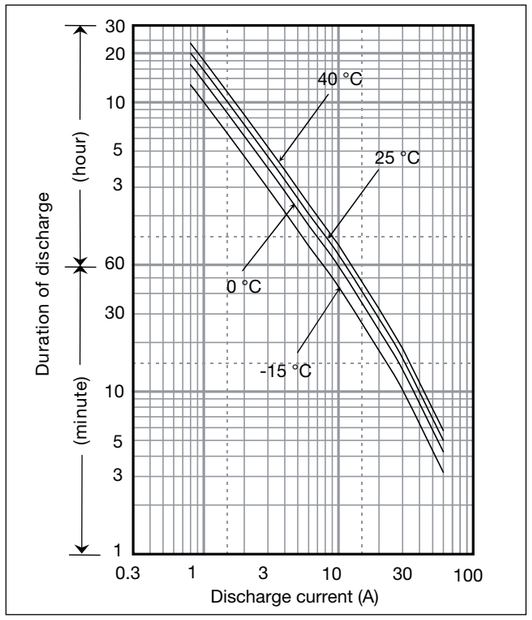



Battery case resin: standard (UL94HB)

## Specifications

| | | |
|---|---|---|
| Nominal voltage | | 6V |
| Nominal capacity (20 hour rate) | | 15Ah |
| Dimensions | Length | 151mm |
| | Width | 50mm |
| | Height | 94mm |
| | Total Height | 100mm |
| Approx. mass | | 2.10kg |
| Terminal | | Faston 187 or Faston 250 with hole |

## Duration of discharge vs Discharge current




## Characteristics

| | | |
|---|---|---|
| Capacity (25°C) | 20 hour rate<br>10 hour rate<br>5 hour rate<br>1 hour rate | 12.0Ah<br>11.3Ah<br>10.4Ah<br>8.1Ah |
| Internal resistance | Fully charged battery (25°C) | 15mΩ |
| Temperature dependency of capacity (20 hour rate) | 40°C<br>25°C<br>0°C<br>-15°C | 102%<br>100%<br>85%<br>65% |
| Self discharge (25°C) | After 3 months<br>After 6 months<br>After 12 months | 91%<br>82%<br>64% |

## Watt Table

(Wattage/Battery)

| Cut-off V | 3min | 5min | 10min | 15min | 20min | 30min | 45min | 1h | 1.5h | 2h | 3h | 4h | 5h | 6h | 10h | 20h | 24h |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4.8V | 425 | 341 | 228 | 175 | 146 | 108 | 78.7 | 61.7 | 42.0 | 32.5 | 23.6 | 18.0 | 14.9 | 12.6 | 8.08 | 4.38 | 3.65 |
| 4.95V | 399 | 323 | 222 | 172 | 143 | 106 | 77.8 | 61.4 | 41.4 | 32.3 | 23.4 | 17.9 | 14.9 | 12.6 | 8.05 | 4.37 | 3.65 |
| 5.1V | 370 | 304 | 216 | 168 | 140 | 106 | 77.1 | 60.4 | 40.7 | 31.7 | 23.2 | 17.9 | 14.8 | 12.5 | 7.97 | 4.36 | 3.64 |
| 5.25V | 333 | 277 | 202 | 159 | 135 | 103 | 76.1 | 59.1 | 40.1 | 30.9 | 22.8 | 17.8 | 14.7 | 12.4 | 7.95 | 4.35 | 3.62 |
| 5.4V | 288 | 249 | 184 | 150 | 132 | 100 | 73.1 | 57.8 | 38.8 | 29.8 | 22.4 | 17.5 | 14.4 | 12.2 | 7.87 | 4.33 | 3.60 |

## Ampere Table

(Ampere/Battery)

| Cut-off V | 3min | 5min | 10min | 15min | 20min | 30min | 45min | 1h | 1.5h | 2h | 3h | 4h | 5h | 6h | 10h | 20h | 24h |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4.8V | 76.5 | 61.2 | 40.6 | 30.4 | 25.2 | 18.5 | 13.4 | 10.5 | 7.11 | 5.49 | 3.96 | 3.01 | 2.49 | 2.10 | 1.35 | 0.730 | 0.609 |
| 4.95V | 71.8 | 58.0 | 39.7 | 29.9 | 24.7 | 18.2 | 13.3 | 10.4 | 7.01 | 5.45 | 3.94 | 3.00 | 2.48 | 2.09 | 1.34 | 0.728 | 0.608 |
| 5.1V | 66.6 | 54.5 | 38.6 | 29.2 | 24.2 | 18.1 | 13.1 | 10.3 | 6.89 | 5.36 | 3.90 | 2.99 | 2.46 | 2.08 | 1.33 | 0.727 | 0.606 |
| 5.25V | 59.9 | 49.8 | 36.1 | 27.6 | 23.3 | 17.6 | 13.0 | 10.0 | 6.78 | 5.22 | 3.84 | 2.97 | 2.45 | 2.07 | 1.33 | 0.725 | 0.604 |
| 5.4V | 51.8 | 44.6 | 32.9 | 26.1 | 22.7 | 17.0 | 12.5 | 9.82 | 6.58 | 5.03 | 3.77 | 2.94 | 2.41 | 2.04 | 1.31 | 0.722 | 0.601 |





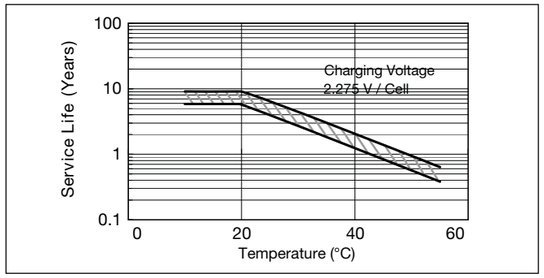
## Charging Method

| | |
|---|---|
| Cycle use | Control voltage: 7.25 - 7.45V; Initial current: 6A or smaller |
| Trickle use | Control voltage: 6.8 - 6.9V; Initial current: 2.25A or smaller |

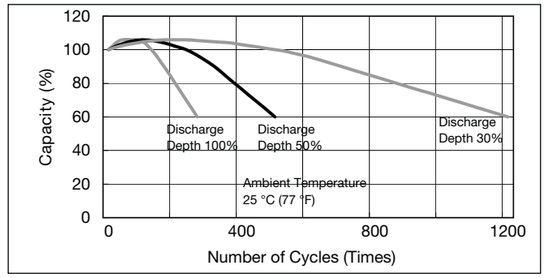
## Cut off voltage

| Discharge current | 0.75A - 3A | 3A - 7.5A | 7.5A - 15A | 15A - 30A | 30A - 45A |
|---|---|---|---|---|---|
| Cut off voltage (V) | 5.25 | 5.1 | 4.95 | 4.65 | 4.35 |

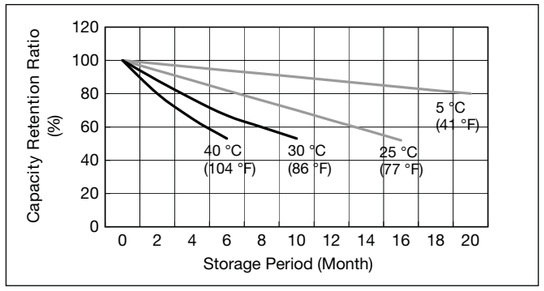
## Influence of Temperature on Trickle life



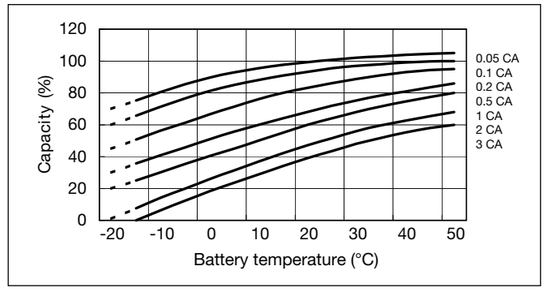

## Cycle life vs Depth of discharge



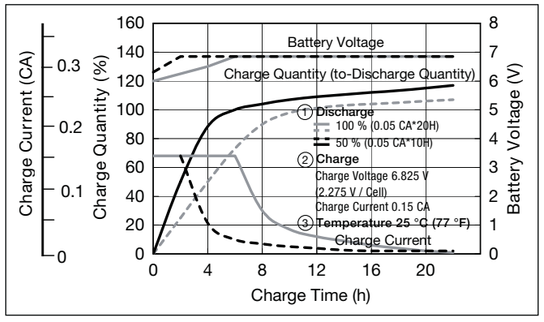

## Residual capacity vs storage period



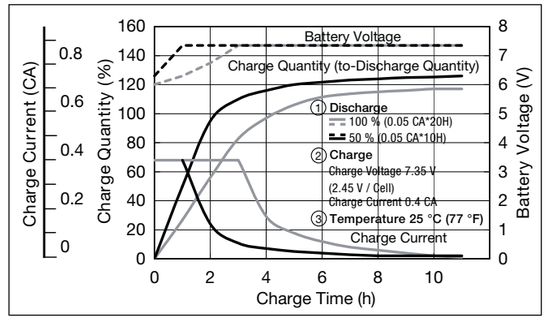

## Discharge capacity by temperature and by discharge current



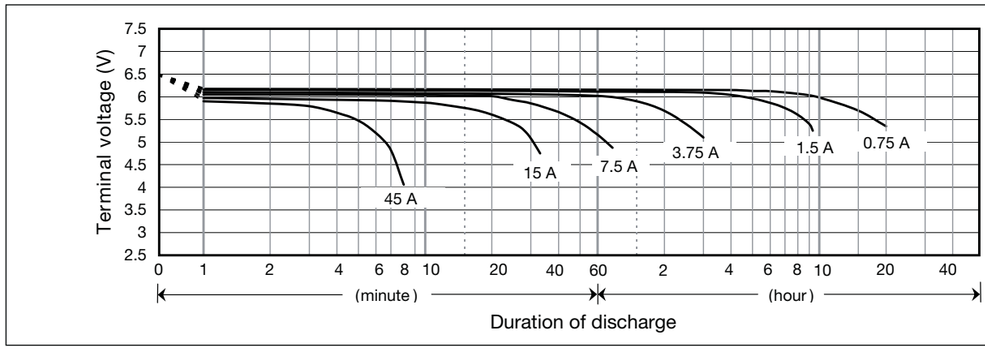

## Constant-voltage and constant-current charge characteristics for Trickle use




## Constant-voltage and constant-current charge characteristics for Cycle use




## Discharge characteristics



# LC-R121R3PG

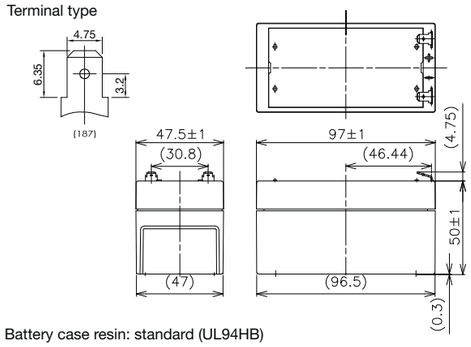
For main and standby power supplies. Expected trickle design life: 6 – 9 years at 20°C according to Eurobat.

VdS G196049


Contents indicated (including the recycle marking, etc.) are subject to change without notice.

## Dimensions (mm)

Terminal type

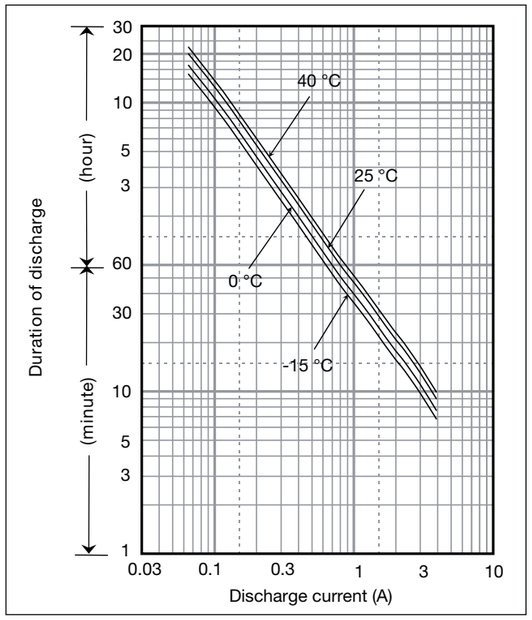



Battery case resin: standard (UL94HB)

## Specifications

| | | |
|---|---|---|
| Nominal voltage | | 12V |
| Nominal capacity (20 hour rate) | | 1.3Ah |
| Dimensions | Length | 97mm |
| | Width | 47.5mm |
| | Height | 50mm |
| | Total Height | 55mm |
| Approx. mass | | 0.59kg |
| Terminal | | Faston 187 |

## Duration of discharge vs Discharge current




## Characteristics

| | | |
|---|---|---|
| Capacity (25°C) | 20 hour rate<br>10 hour rate<br>5 hour rate<br>1 hour rate | 1.3Ah<br>1.2Ah<br>1.05Ah<br>0.85Ah |
| Internal resistance | Fully charged battery (25°C) | 90mΩ |
| Temperature dependency of capacity (20 hour rate) | 40°C<br>25°C<br>0°C<br>-15°C | 102%<br>100%<br>85%<br>65% |
| Self discharge (25°C) | After 3 months<br>After 6 months<br>After 12 months | 91%<br>82%<br>64% |

## Watt Table

(Wattage/Battery)

| Cut-off V | 3min | 5min | 10min | 15min | 20min | 30min | 45min | 1h | 1.5h | 2h | 3h | 4h | 5h | 6h | 10h | 20h | 24h |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 9.6V | 78.1 | 61.6 | 40.2 | 30.7 | 25.8 | 19.2 | 13.6 | 10.8 | 7.49 | 5.73 | 4.32 | 3.30 | 2.73 | 2.22 | 1.46 | 0.787 | 0.657 |
| 9.9V | 72.5 | 57.8 | 39.4 | 30.5 | 25.3 | 19.0 | 13.5 | 10.8 | 7.34 | 5.68 | 4.30 | 3.28 | 2.70 | 2.21 | 1.45 | 0.784 | 0.654 |
| 10.2V | 66.9 | 54.2 | 38.4 | 29.9 | 24.9 | 18.8 | 13.4 | 10.6 | 7.19 | 5.54 | 4.25 | 3.26 | 2.68 | 2.19 | 1.44 | 0.782 | 0.652 |
| 10.5V | 59.4 | 48.5 | 35.6 | 27.8 | 23.7 | 18.4 | 13.1 | 10.4 | 7.04 | 5.34 | 4.19 | 3.24 | 2.66 | 2.16 | 1.43 | 0.780 | 0.650 |
| 10.8V | 50.2 | 42.9 | 31.7 | 26.0 | 23.0 | 17.7 | 12.9 | 10.2 | 6.82 | 5.13 | 4.08 | 3.24 | 2.60 | 2.16 | 1.41 | 0.758 | 0.650 |

## Ampere Table

(Ampere/Battery)

| Cut-off V | 3min | 5min | 10min | 15min | 20min | 30min | 45min | 1h | 1.5h | 2h | 3h | 4h | 5h | 6h | 10h | 20h | 24h |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 9.6V | 7.02 | 5.53 | 3.59 | 2.67 | 2.22 | 1.64 | 1.16 | 0.921 | 0.634 | 0.484 | 0.363 | 0.276 | 0.228 | 0.185 | 0.122 | 0.0655 | 0.0655 |
| 9.9V | 6.52 | 5.18 | 3.52 | 2.65 | 2.18 | 1.63 | 1.15 | 0.921 | 0.621 | 0.480 | 0.361 | 0.274 | 0.226 | 0.184 | 0.121 | 0.0654 | 0.0545 |
| 10.2V | 6.01 | 4.86 | 3.43 | 2.60 | 2.15 | 1.61 | 1.14 | 0.903 | 0.609 | 0.468 | 0.358 | 0.273 | 0.224 | 0.183 | 0.120 | 0.0652 | 0.0543 |
| 10.5V | 5.34 | 4.35 | 3.18 | 2.42 | 2.04 | 1.57 | 1.12 | 0.885 | 0.596 | 0.451 | 0.352 | 0.271 | 0.222 | 0.181 | 0.119 | 0.0650 | 0.0542 |
| 10.8V | 4.51 | 3.85 | 2.83 | 2.26 | 1.99 | 1.52 | 1.10 | 0.867 | 0.578 | 0.433 | 0.343 | 0.271 | 0.217 | 0.181 | 0.117 | 0.0632 | 0.0542 |





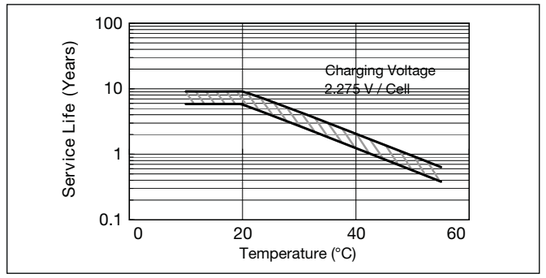
## Charging Method

| | |
|---|---|
| Cycle use | Control voltage: 14.5 - 14.9V; Initial current 0.52A or smaller |
| Trickle use | Control voltage: 13.6 - 13.8V; Initial current: 1.08A or smaller |

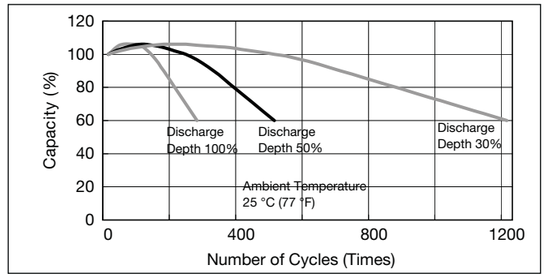
## Cut off voltage

| Discharge current | 0.065 A - 0.26A | 0.26A - 0.65A | 0.65A - 1.3A | 1.3A - 2.6A | 2.6A - 3.9A |
|---|---|---|---|---|---|
| Cut off voltage (V) | 10.5 | 10.2 | 9.9 | 9.3 | 8.7 |

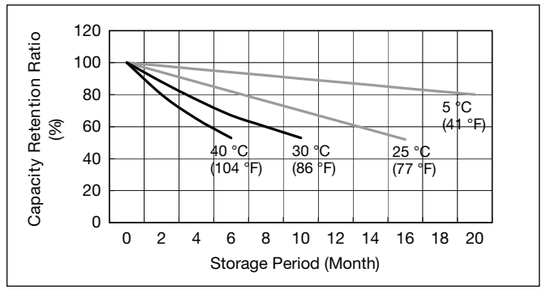
## Influence of Temperature on Trickle life



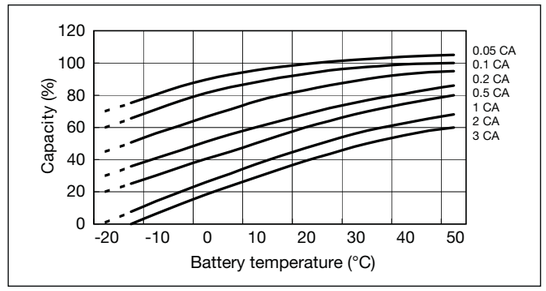

## Cycle life vs Depth of discharge



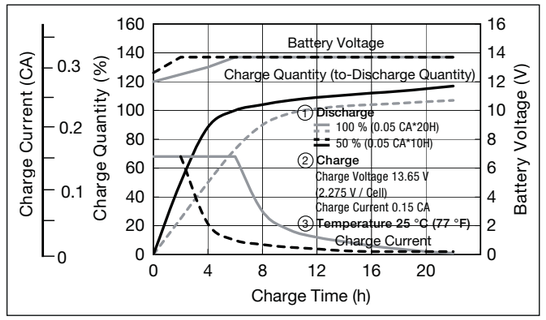

## Residual capacity vs storage period



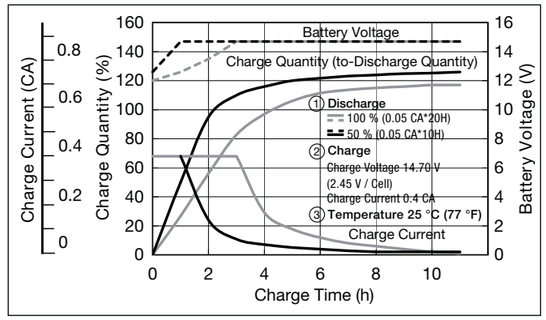

## Discharge capacity by temperature and by discharge current



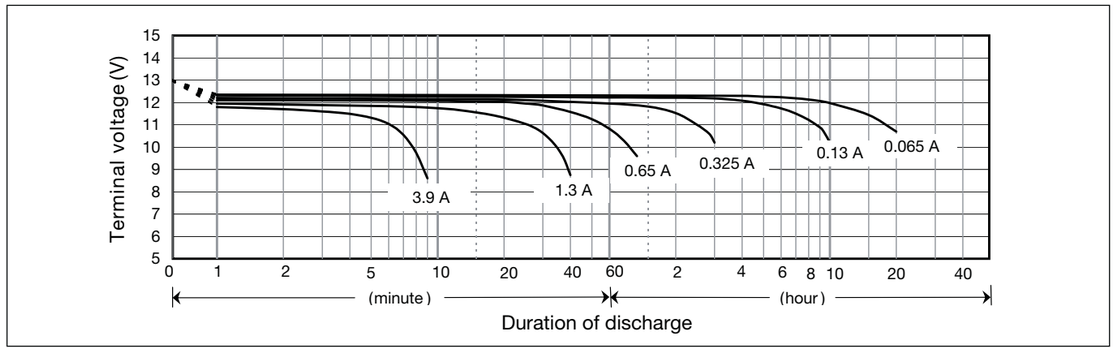

## Constant-voltage and constant-current charge characteristics for Trickle use




## Constant-voltage and constant-current charge characteristics for Cycle use




## Discharge characteristics



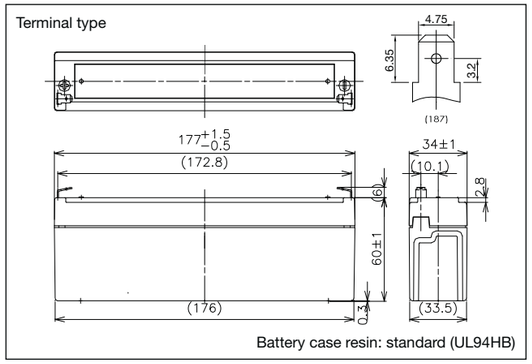
# LC-R122R2PG

For main and standby power supplies. Expected trickle design life: 6 – 9 years at 20°C according to Eurobat.

VdS G188151


Contents indicated (including the recycle marking, etc.) are subject to change without notice.

## Dimensions (mm)

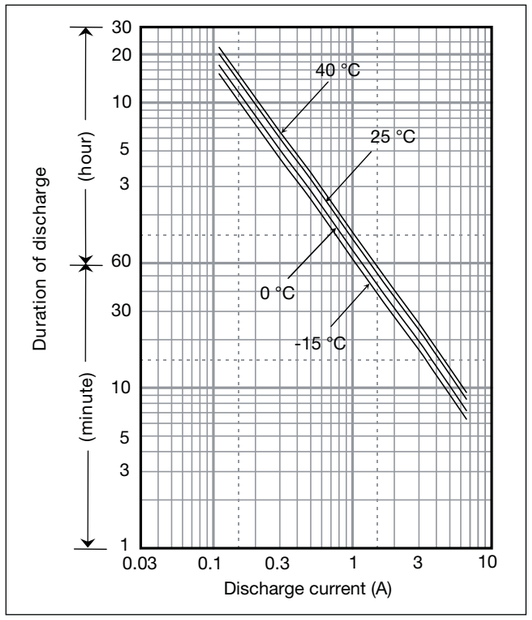



Battery case resin: standard (UL94HB)

## Specifications

| | | |
|---|---|---|
| Nominal voltage | | 12V |
| Nominal capacity (20 hour rate) | | 2.2Ah |
| Dimensions | Length | 177mm |
| | Width | 34mm |
| | Height | 60mm |
| | Total Height | 66mm |
| Approx. mass | | 0.8kg |
| Terminal | | Faston 187 |

## Duration of discharge vs Discharge current




## Characteristics

| | | |
|---|---|---|
| Capacity (25°C) | 20 hour rate<br>10 hour rate<br>5 hour rate<br>1 hour rate | 2.2Ah<br>2.0Ah<br>1.8Ah<br>1.3Ah |
| Internal resistance | Fully charged battery (25°C) | 70mΩ |
| Temperature dependency of capacity (20 hour rate) | 40°C<br>25°C<br>0°C<br>-15°C | 102%<br>100%<br>85%<br>65% |
| Self discharge (25°C) | After 3 months<br>After 6 months<br>After 12 months | 91%<br>82%<br>64% |

## Watt Table

(Wattage/Battery)

| Cut-off V | 3min | 5min | 10min | 15min | 20min | 30min | 45min | 1h | 1.5h | 2h | 3h | 4h | 5h | 6h | 10h | 20h | 24h |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 9.6V | 132 | 104 | 68.1 | 52.0 | 43.6 | 32.5 | 23.0 | 18.4 | 12.6 | 9.77 | 7.27 | 5.59 | 4.61 | 3.71 | 2.46 | 1.33 | 1.11 |
| 9.9V | 123 | 97.8 | 66.7 | 51.7 | 42.9 | 32.2 | 22.8 | 18.4 | 12.4 | 9.70 | 7.24 | 5.55 | 4.58 | 3.69 | 2.45 | 1.33 | 1.11 |
| 10.2V | 113 | 91.6 | 65.0 | 50.6 | 42.2 | 31.8 | 22.6 | 18.0 | 12.1 | 9.44 | 7.16 | 5.51 | 4.54 | 3.66 | 2.42 | 1.32 | 1.10 |
| 10.5V | 101 | 82.1 | 60.2 | 47.1 | 40.1 | 31.1 | 22.2 | 17.6 | 11.9 | 9.12 | 7.05 | 5.48 | 4.50 | 3.62 | 2.41 | 1.32 | 1.10 |
| 10.8V | 85 | 72.6 | 53.7 | 43.9 | 39.0 | 30.0 | 21.9 | 17.3 | 11.5 | 8.68 | 6.91 | 5.40 | 4.39 | 3.56 | 2.38 | 1.31 | 1.09 |

## Ampere Table

(Ampere/Battery)

| Cut-off V | 3min | 5min | 10min | 15min | 20min | 30min | 45min | 1h | 1.5h | 2h | 3h | 4h | 5h | 6h | 10h | 20h | 24h |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 9.6V | 11.9 | 9.35 | 6.08 | 4.52 | 3.76 | 2.78 | 1.96 | 1.56 | 1.07 | 0.825 | 0.611 | 0.468 | 0.385 | 0.309 | 0.205 | 0.111 | 0.0926 |
| 9.9V | 11.0 | 8.77 | 5.96 | 4.49 | 3.70 | 2.75 | 1.94 | 1.56 | 1.05 | 0.819 | 0.608 | 0.464 | 0.382 | 0.308 | 0.204 | 0.111 | 0.0923 |
| 10.2V | 10.2 | 8.22 | 5.81 | 4.40 | 3.64 | 2.72 | 1.93 | 1.53 | 1.03 | 0.798 | 0.602 | 0.461 | 0.379 | 0.306 | 0.202 | 0.110 | 0.0920 |
| 10.5V | 9.0 | 7.36 | 5.38 | 4.09 | 3.45 | 2.66 | 1.89 | 1.50 | 1.01 | 0.770 | 0.593 | 0.458 | 0.376 | 0.302 | 0.201 | 0.110 | 0.0917 |
| 10.8V | 7.6 | 6.51 | 4.80 | 3.82 | 3.36 | 2.57 | 1.86 | 1.47 | 0.98 | 0.733 | 0.581 | 0.452 | 0.367 | 0.297 | 0.199 | 0.109 | 0.0911 |





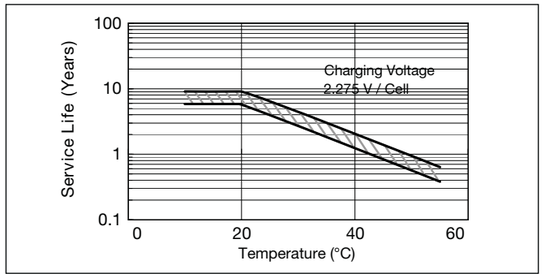
## Charging Method

| | |
|---|---|
| Cycle use | Control voltage: 14.5 - 14.9V; Initial current: 0.88A or smaller |
| Trickle use | Control voltage: 13.6 - 13.8V; Initial current: 0.33A or smaller |

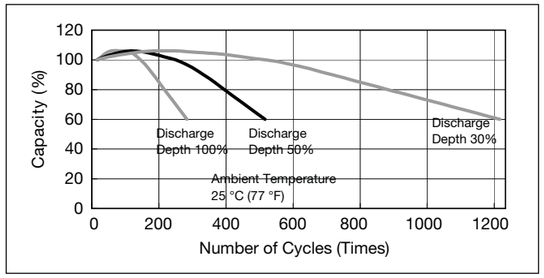
## Cut off voltage

| Discharge current | 0.011 A - 0.44A | 0.44A - 1.1A | 1.1A - 2.2A | 2.2A - 4.4A | 4.4A - 6.6A |
|---|---|---|---|---|---|
| Cut off voltage (V) | 10.5 | 10.2 | 9.9 | 9.3 | 8.7 |

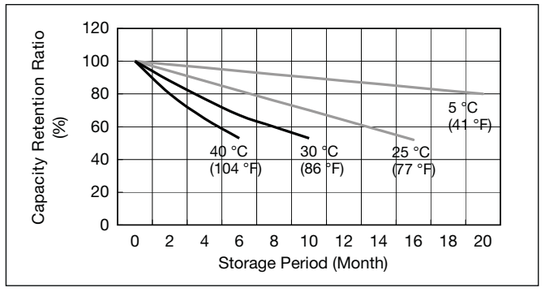
## Influence of Temperature on Trickle life



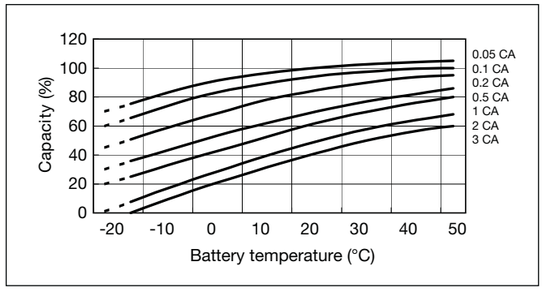

## Cycle life vs Depth of discharge



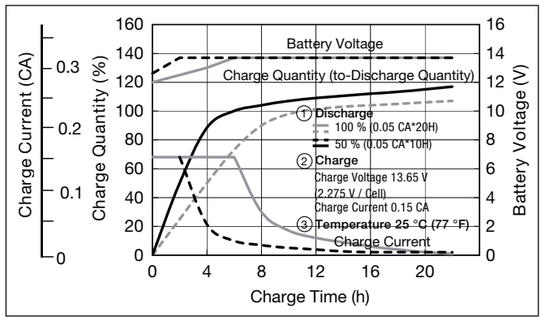

## Residual capacity vs storage period



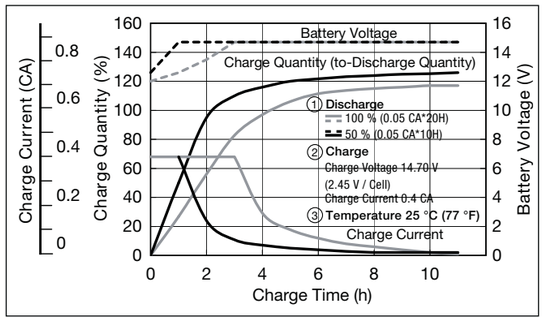

## Discharge capacity by temperature and by discharge current



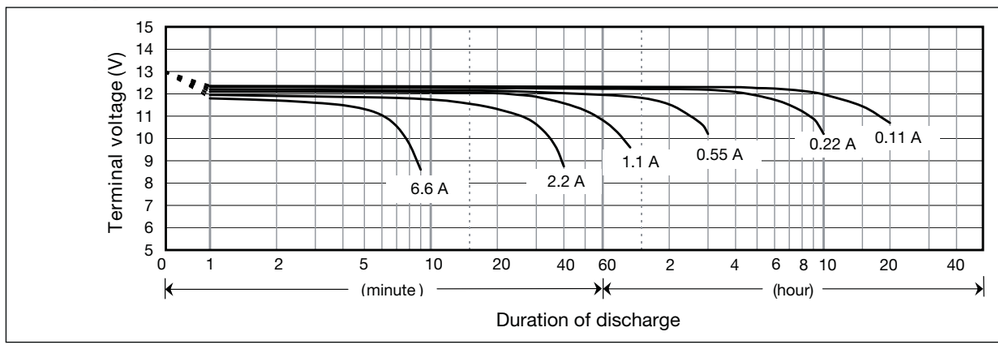

## Constant-voltage and constant-current charge characteristics for Trickle use




## Constant-voltage and constant-current charge characteristics for Cycle use




## Discharge characteristics



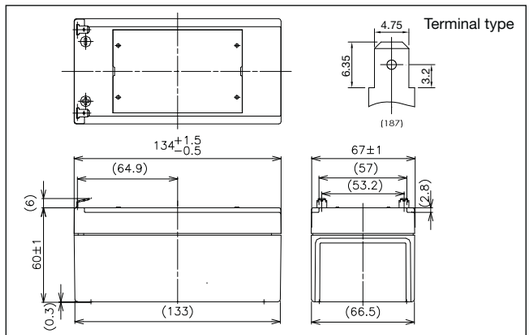
# LC-R123R4PG

For main and standby power supplies. Expected trickle design life: 6 – 9 years at 20°C according to Eurobat.

VdS G191053


Contents indicated (including the recycle marking, etc.) are subject to change without notice.

## Dimensions (mm)




Battery case resin: standard (UL94HB)

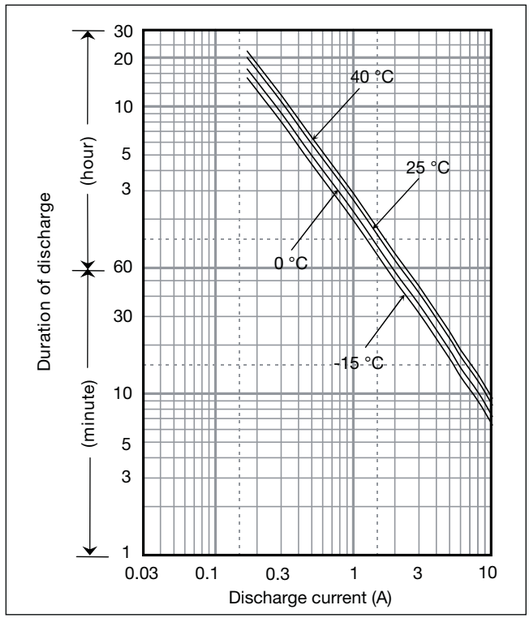
## Specifications

| | | |
|---|---|---|
| Nominal voltage | | 12V |
| Nominal capacity (20 hour rate) | | 3.4Ah |
| Dimensions | Length | 134mm |
| | Width | 67mm |
| | Height | 60mm |
| | Total Height | 66mm |
| Approx. mass | | 1.2kg |
| Terminal | | Faston 187 |

## Characteristics

| | | |
|---|---|---|
| Capacity (25°C) | 20 hour rate<br>10 hour rate<br>5 hour rate<br>1 hour rate | 3.4Ah<br>3.0Ah<br>2.7Ah<br>2.1Ah |
| Internal resistance | Fully charged battery (25°C) | 60mΩ |
| Temperature dependency of capacity (20 hour rate) | 40°C<br>25°C<br>0°C<br>-15°C | 102%<br>100%<br>85%<br>65% |
| Self discharge (25°C) | After 3 months<br>After 6 months<br>After 12 months | 91%<br>82%<br>64% |

## Duration of discharge vs Discharge current




## Watt Table

**(Wattage/Battery)**

| Cut-off V | 3min | 5min | 10min | 15min | 20min | 30min | 45min | 1h | 1.5h | 2h | 3h | 4h | 5h | 6h | 10h | 20h | 24h |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 9.6V | 204 | 161 | 105 | 80.4 | 67.4 | 50.3 | 35.5 | 28.4 | 19.6 | 15.0 | 11.3 | 8.63 | 7.13 | 5.80 | 3.81 | 2.06 | 1.72 |
| 9.9V | 190 | 151 | 103 | 79.8 | 66.3 | 49.7 | 35.3 | 28.4 | 19.2 | 14.9 | 11.2 | 8.58 | 7.07 | 5.78 | 3.80 | 2.05 | 1.71 |
| 10.2V | 175 | 142 | 100 | 78.2 | 65.2 | 49.2 | 34.9 | 27.8 | 18.8 | 14.5 | 11.1 | 8.52 | 7.01 | 5.73 | 3.76 | 2.05 | 1.71 |
| 10.5V | 155 | 127 | 93 | 72.8 | 61.9 | 48.1 | 34.4 | 27.3 | 18.4 | 14.0 | 11.0 | 8.46 | 6.96 | 5.66 | 3.74 | 2.04 | 1.70 |
| 10.8V | 131 | 112 | 83 | 67.9 | 60.3 | 46.4 | 33.8 | 26.7 | 17.8 | 13.4 | 10.7 | 8.46 | 6.79 | 5.66 | 3.68 | 1.98 | 1.70 |

## Ampere Table

**(Ampere/Battery)**

| Cut-off V | 3min | 5min | 10min | 15min | 20min | 30min | 45min | 1h | 1.5h | 2h | 3h | 4h | 5h | 6h | 10h | 20h | 24h |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 9.6V | 18.4 | 14.4 | 9.40 | 6.99 | 5.81 | 4.30 | 3.02 | 2.41 | 1.66 | 1.26 | 0.949 | 0.722 | 0.595 | 0.484 | 0.318 | 0.171 | 0.143 |
| 9.9V | 17.0 | 13.6 | 9.21 | 6.94 | 5.71 | 4.25 | 3.00 | 2.41 | 1.62 | 1.26 | 0.945 | 0.718 | 0.590 | 0.482 | 0.316 | 0.171 | 0.143 |
| 10.2V | 15.7 | 12.7 | 8.97 | 6.80 | 5.62 | 4.20 | 2.97 | 2.36 | 1.59 | 1.22 | 0.935 | 0.713 | 0.586 | 0.478 | 0.313 | 0.170 | 0.142 |
| 10.5V | 14.0 | 11.4 | 8.31 | 6.33 | 5.34 | 4.11 | 2.93 | 2.31 | 1.56 | 1.18 | 0.921 | 0.708 | 0.581 | 0.472 | 0.312 | 0.170 | 0.142 |
| 10.8V | 11.8 | 10.1 | 7.41 | 5.90 | 5.19 | 3.97 | 2.88 | 2.27 | 1.51 | 1.13 | 0.897 | 0.708 | 0.567 | 0.472 | 0.307 | 0.165 | 0.142 |





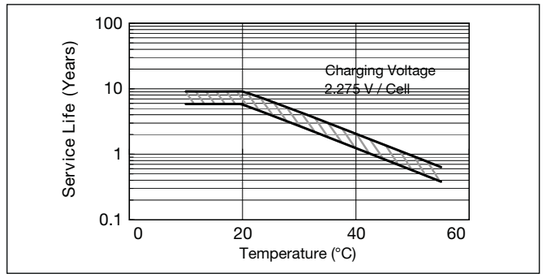
## Charging Method

| | |
|---|---|
| Cycle use | Control voltage: 14.5 - 14.9V; Initial current: 1.36A or smaller |
| Trickle use | Control voltage: 13.6 - 13.8V; Initial current: 0.51A or smaller |

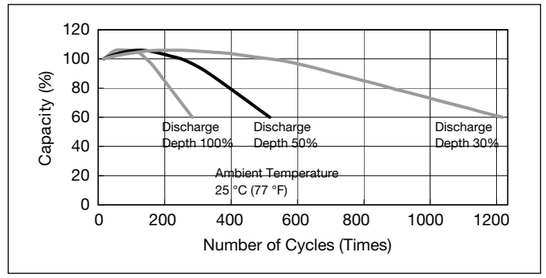
## Cut off voltage

| Discharge current | 0.17A - 0.68A | 0.68A - 1.7A | 1.7A - 3.4A | 3.4A - 6.8A | 6.8A - 10.2A |
|---|---|---|---|---|---|
| Cut off voltage (V) | 10.5 | 10.2 | 9.9 | 9.3 | 8.7 |

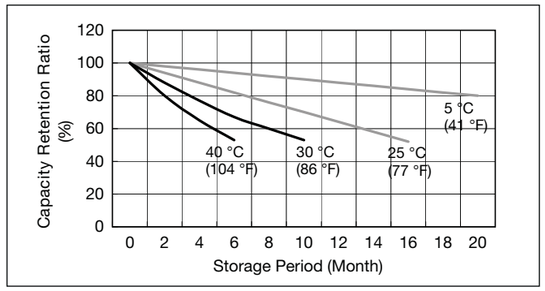
## Influence of Temperature on Trickle life



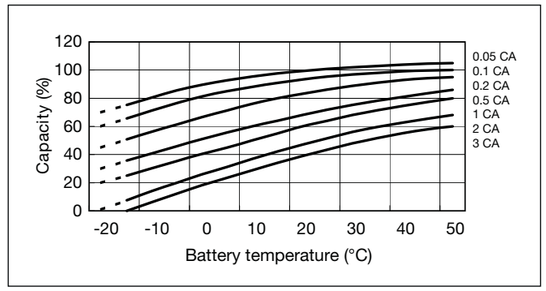

## Cycle life vs Depth of discharge



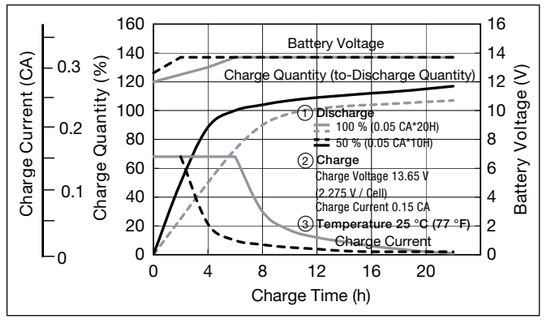

## Residual capacity vs storage period



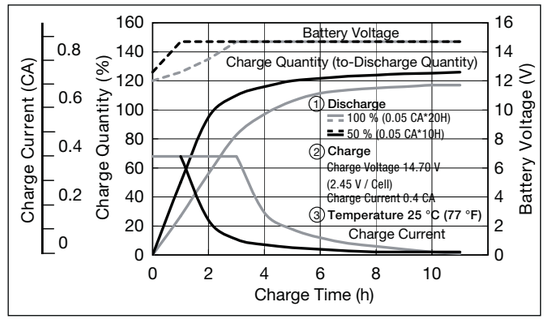

## Discharge capacity by temperature and by discharge current



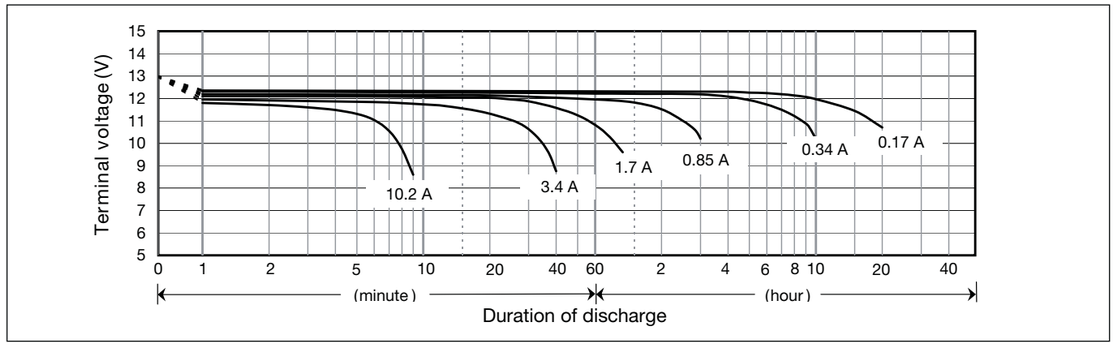

## Constant-voltage and constant-current charge characteristics for Trickle use




## Constant-voltage and constant-current charge characteristics for Cycle use




## Discharge characteristics



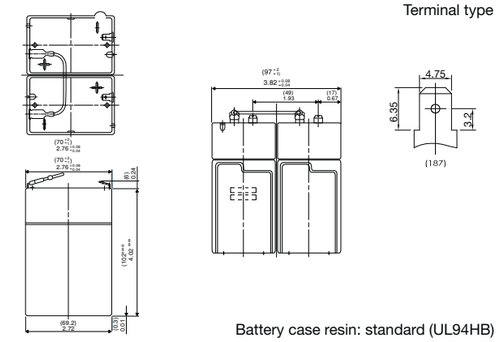
# LC-R124R5P


Contents indicated (including the recycle marking, etc.) are subject to change without notice.

For main and standby power supplies.
Expected trickle design life: 6 – 9 years at 20°C according to Eurobat.

## Dimensions (mm)

Terminal type




Battery case resin: standard (UL94HB)

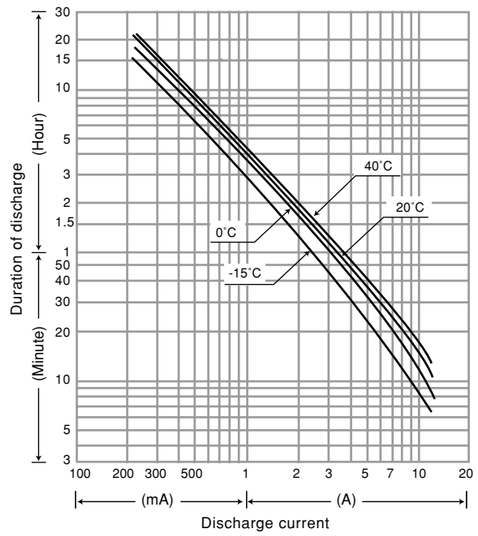
## Specifications

| | | |
|---|---|---|
| Nominal voltage | | 12V |
| Nominal capacity (20 hour rate) | | 4.5Ah |
| Dimensions | Length | 70mm |
| | Width | 97mm |
| | Height | 102mm |
| | Total Height | 108mm |
| Approx. mass | | 1.45kg |
| Terminal | | Faston 187 |

## Characteristics

| | | |
|---|---|---|
| Capacity (25°C) | 20 hour rate<br>10 hour rate<br>5 hour rate<br>1 hour rate | 4.5Ah<br>3.9Ah<br>3.5Ah<br>2.8Ah |
| Internal resistance | Fully charged battery (25°C) | 40mΩ |
| Temperature dependency of capacity (20 hour rate) | 40°C<br>25°C<br>0°C<br>-15°C | 102%<br>100%<br>85%<br>65% |
| Self discharge (25°C) | After 3 months<br>After 6 months<br>After 12 months | 91%<br>83%<br>66% |

## Duration of discharge vs Discharge current




## Watt Table

| Cut-off V | 3min | 5min | 10min | 15min | 20min | 30min | 45min | 1h | 1.5h | 2h | 3h | 4h | 5h | 6h | 10h | 20h | 24h |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 9.6V | 270 | 214 | 139.4 | 106.4 | 89.2 | 66.6 | 47 | 37.6 | 25.8 | 19.98 | 14.88 | 11.42 | 9.44 | 7.58 | 5.02 | 2.72 | 2.272 |
| 9.9V | 250 | 200 | 136.6 | 105.6 | 87.8 | 65.8 | 46.6 | 37.6 | 25.4 | 19.84 | 14.8 | 11.36 | 9.36 | 7.56 | 5 | 2.72 | 2.266 |
| 10.2V | 232 | 188 | 133 | 103.6 | 86.2 | 65 | 46.2 | 36.8 | 24.8 | 19.32 | 14.66 | 11.28 | 9.28 | 7.5 | 4.96 | 2.7 | 2.258 |
| 10.5V | 206 | 168 | 123.2 | 96.4 | 82 | 63.6 | 45.4 | 36 | 24.2 | 18.64 | 14.42 | 11.2 | 9.2 | 7.4 | 4.92 | 2.7 | 2.25 |
| 10.8V | 174 | 148 | 110 | 89.8 | 79.8 | 61.4 | 44.8 | 35.4 | 23.6 | 17.76 | 14.14 | 11.06 | 8.98 | 7.28 | 4.88 | 2.68 | 2.236 |

## Ampere Table

| Cut-off V | 3min | 5min | 10min | 15min | 20min | 30min | 45min | 1h | 1.5h | 2h | 3h | 4h | 5h | 6h | 10h | 20h | 24h |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 9.6V | 24.3 | 19.13 | 12.44 | 9.25 | 7.69 | 5.69 | 4.00 | 3.19 | 2.19 | 1.69 | 1.25 | 0.956 | 0.788 | 0.633 | 0.419 | 0.227 | 0.189 |
| 9.9V | 22.6 | 17.94 | 12.19 | 9.19 | 7.56 | 5.63 | 3.98 | 3.19 | 2.14 | 1.68 | 1.24 | 0.950 | 0.781 | 0.630 | 0.417 | 0.226 | 0.189 |
| 10.2V | 20.8 | 16.81 | 11.88 | 9.00 | 7.44 | 5.56 | 3.94 | 3.13 | 2.10 | 1.63 | 1.23 | 0.944 | 0.775 | 0.625 | 0.413 | 0.226 | 0.188 |
| 10.5V | 18.5 | 15.06 | 11.00 | 8.38 | 7.06 | 5.44 | 3.88 | 3.06 | 2.06 | 1.58 | 1.21 | 0.938 | 0.769 | 0.618 | 0.411 | 0.225 | 0.188 |
| 10.8V | 15.6 | 13.31 | 9.81 | 7.81 | 6.88 | 5.25 | 3.81 | 3.00 | 2.00 | 1.50 | 1.19 | 0.925 | 0.750 | 0.608 | 0.406 | 0.224 | 0.186 |





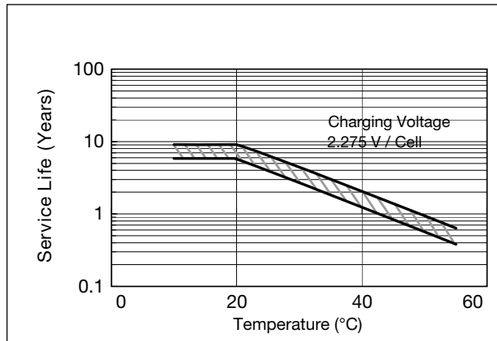
## Charging Method

| | |
|---|---|
| Trickle use | Control voltage: 13.6 - 13.8V; Initial current: 0,675A or smaller |

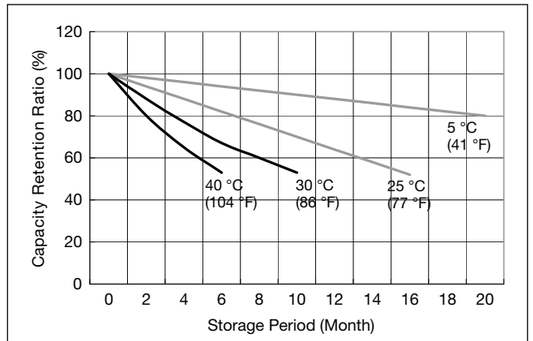
## Cut off voltage

| Discharge current | 0.225 A - 0.9A | 0.9A - 2.25A | 2.25A - 4.5A | 4.5A - 9A | 9A - 13.5A |
|---|---|---|---|---|---|
| Cut off voltage (V) | 10.5 | 10.2 | 9.9 | 9.3 | 8.7 |

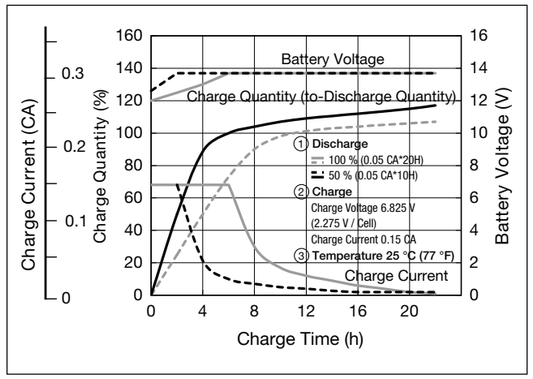
## Influence of Temperature on Trickle life



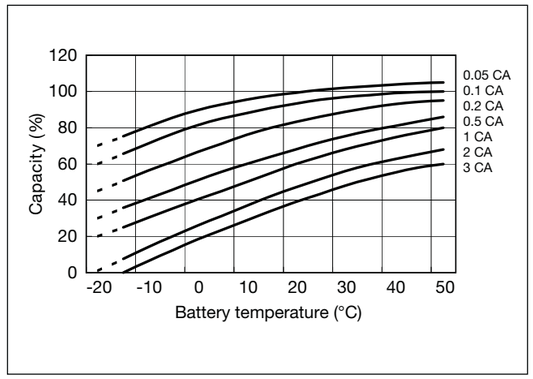

## Residual capacity vs storage period



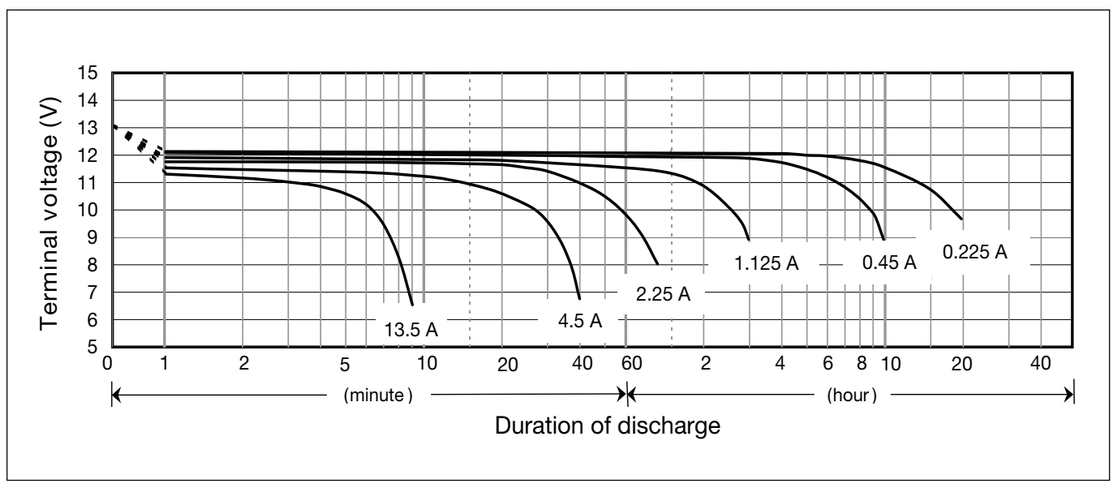

## Constant-voltage and constant-current charge characteristics for Trickle use




## Discharge capacity by temperature and by discharge current




## Discharge characteristics



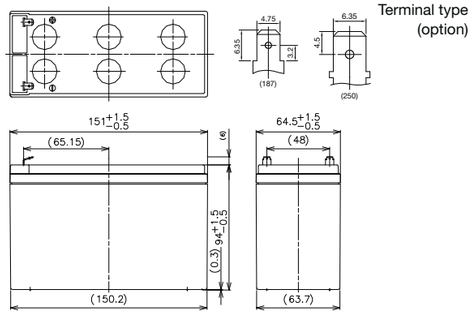
# LC-R127R2PG*1

For main and standby power supplies. Expected trickle design life: 6 – 9 years at 20°C according to Eurobat.

VdS G193046


Contents indicated (including the recycle marking, etc.) are subject to change without notice.

## Dimensions (mm)




Battery case resin: standard (UL94HB)

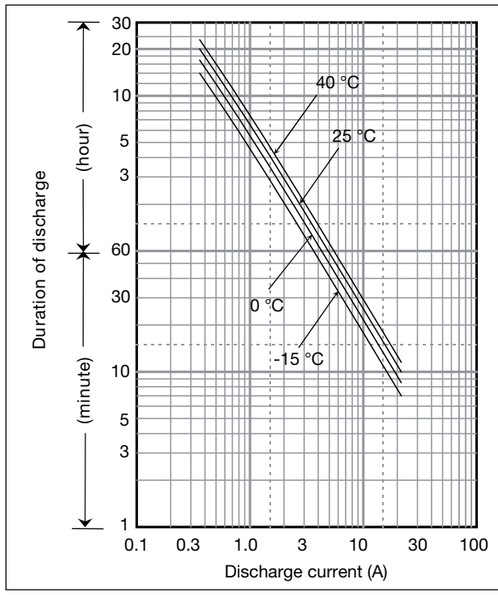
## Specifications

| | | |
|---|---|---|
| Nominal voltage | | 12V |
| Nominal capacity (20 hour rate) | | 7.2Ah |
| Dimensions | Length | 151mm |
| | Width | 64.5mm |
| | Height | 94mm |
| | Total Height | 100mm |
| Approx. mass | | 2.47kg |
| Terminal | | Faston 187 or Faston 250 with hole |

## Characteristics

| | | |
|---|---|---|
| Capacity (25°C) | 20 hour rate<br>10 hour rate<br>5 hour rate<br>1 hour rate | 7.2Ah<br>6.8Ah<br>6.3Ah<br>4.9Ah |
| Internal resistance | Fully charged battery (25°C) | 21mΩ |
| Temperature dependency of capacity (20 hour rate) | 40°C<br>25°C<br>0°C<br>-15°C | 102%<br>100%<br>85%<br>65% |
| Self discharge (25°C) | After 3 months<br>After 6 months<br>After 12 months | 91%<br>82%<br>64% |

## Duration of discharge vs Discharge current




## Watt Table

(Wattage/Battery)

| Cut-off V | 3min | 5min | 10min | 15min | 20min | 30min | 45min | 1h | 1.5h | 2h | 3h | 4h | 5h | 6h | 10h | 20h | 24h |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 9.6V | 433 | 341 | 223 | 170 | 143 | 106 | 75.1 | 60.1 | 41.3 | 32.0 | 23.8 | 18.3 | 15.1 | 12.1 | 8.04 | 4.36 | 3.64 |
| 9.9V | 401 | 320 | 218 | 169 | 140 | 105 | 74.7 | 60.1 | 40.5 | 31.7 | 23.7 | 18.2 | 15.0 | 12.1 | 8.00 | 4.34 | 3.62 |
| 10.2V | 370 | 300 | 213 | 166 | 138 | 104 | 74.0 | 58.9 | 39.7 | 30.9 | 23.4 | 18.0 | 14.9 | 12.0 | 7.92 | 4.33 | 3.61 |
| 10.5V | 329 | 269 | 197 | 154 | 131 | 102 | 72.8 | 57.7 | 38.9 | 29.8 | 23.1 | 17.9 | 14.7 | 11.8 | 7.88 | 4.32 | 3.60 |
| 10.8V | 278 | 237 | 176 | 144 | 128 | 98 | 71.6 | 56.5 | 37.8 | 28.4 | 22.6 | 17.7 | 14.4 | 11.7 | 7.80 | 4.30 | 3.58 |

## Ampere Table

(Ampere/Battery)

| Cut-off V | 3min | 5min | 10min | 15min | 20min | 30min | 45min | 1h | 1.5h | 2h | 3h | 4h | 5h | 6h | 10h | 20h | 24h |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 9.6V | 38.9 | 30.6 | 19.9 | 14.8 | 12.3 | 9.1 | 6.4 | 5.1 | 3.50 | 2.70 | 2.00 | 1.53 | 1.26 | 1.012 | 0.670 | 0.363 | 0.303 |
| 9.9V | 36.1 | 28.7 | 19.5 | 14.7 | 12.1 | 9.0 | 6.4 | 5.1 | 3.43 | 2.68 | 1.99 | 1.52 | 1.25 | 1.008 | 0.667 | 0.362 | 0.302 |
| 10.2V | 33.3 | 26.9 | 19.0 | 14.4 | 11.9 | 8.9 | 6.3 | 5.0 | 3.36 | 2.61 | 1.97 | 1.51 | 1.24 | 1.000 | 0.660 | 0.361 | 0.301 |
| 10.5V | 29.6 | 24.1 | 17.6 | 13.4 | 11.3 | 8.7 | 6.2 | 4.9 | 3.29 | 2.52 | 1.94 | 1.50 | 1.23 | 0.988 | 0.657 | 0.360 | 0.300 |
| 10.8V | 25.0 | 21.3 | 15.7 | 12.5 | 11.0 | 8.4 | 6.1 | 4.8 | 3.20 | 2.40 | 1.90 | 1.48 | 1.20 | 0.972 | 0.650 | 0.358 | 0.298 |

*1 This battery is also available with a flame retardant battery case resin (UL94 V-0) but with no VdS certification.





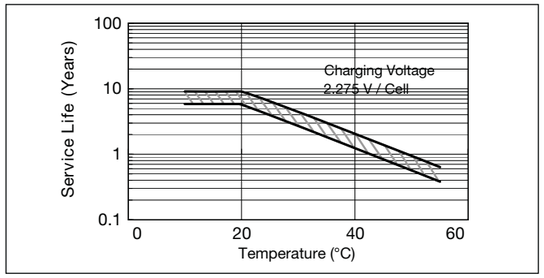
## Charging Method

| | |
|---|---|
| Cycle use | Control voltage: 14.5 - 14.9V; Initial current: 2.88A or smaller |
| Trickle use | Control voltage: 13.6 - 13.8V; Initial current: 1.08A or smaller |

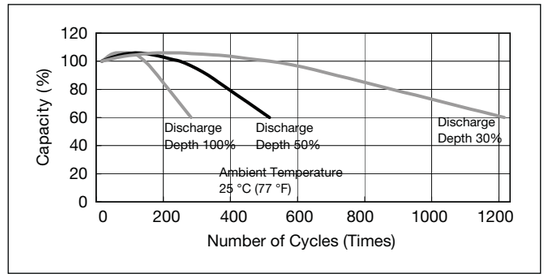
## Cut off voltage

| Discharge current | 0.36A - 1.44A | 1.44A - 3.6A | 3.6A - 7.2A | 7.2A - 14.4A | 14.4A - 21.6A |
|---|---|---|---|---|---|
| Cut off voltage (V) | 10.5 | 10.2 | 9.9 | 9.3 | 8.7 |

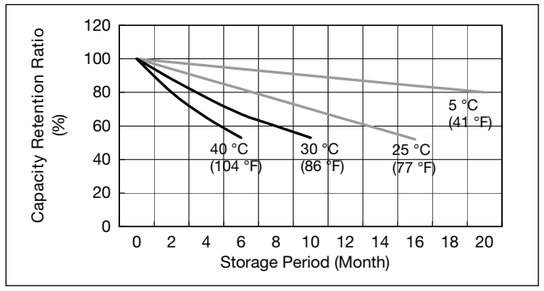
## Influence of Temperature on Trickle life



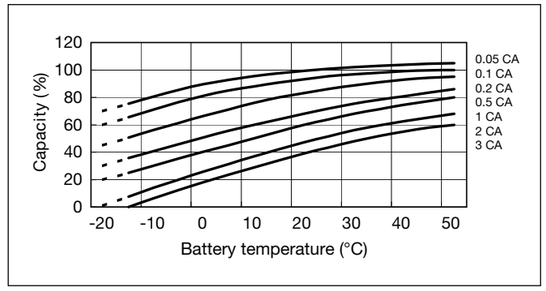

## Cycle life vs Depth of discharge



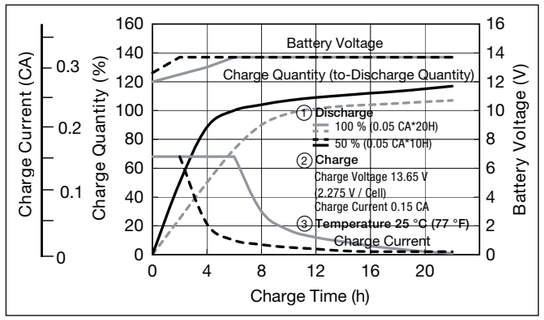

## Residual capacity vs storage period



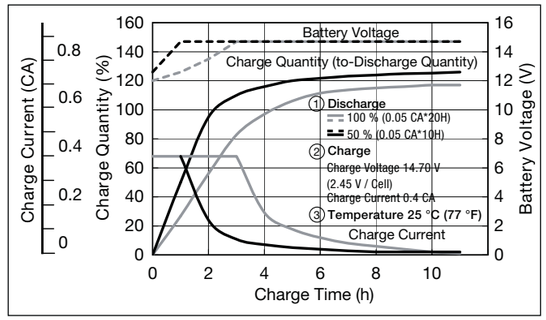

## Discharge capacity by temperature and by discharge current



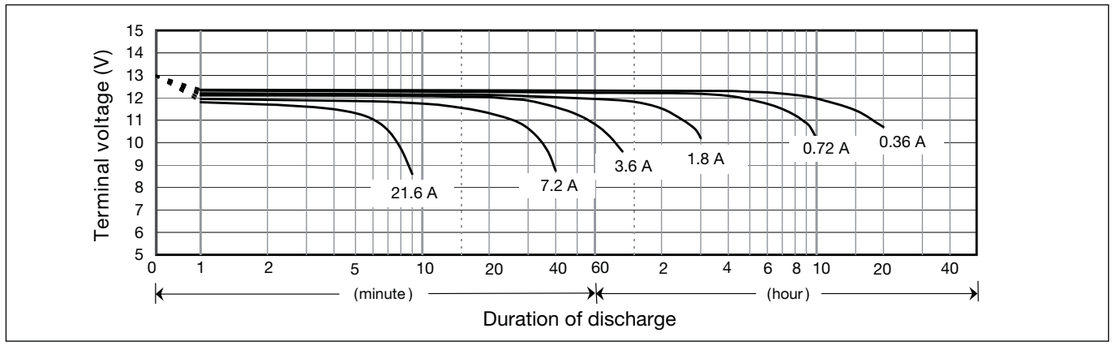

## Constant-voltage and constant-current charge characteristics for Trickle use




## Constant-voltage and constant-current charge characteristics for Cycle use




## Discharge characteristics



# LC-RA1212PG

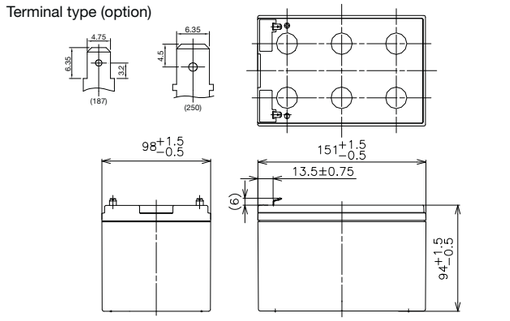
For main and standby power supplies. Expected trickle design life: 6 – 9 years at 20°C according to Eurobat.

VdS

G100001


Contents indicated (including the recycle marking, etc.) are subject to change without notice.

## Dimensions (mm)

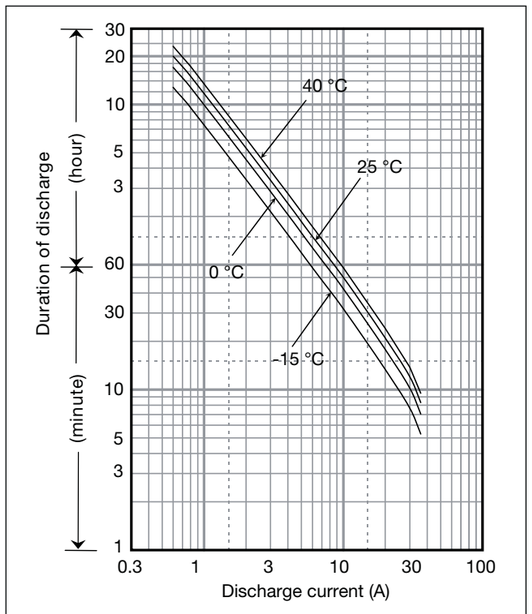



Battery case resin: standard (UL94HB)

## Specifications

| | | |
|---|---|---|
| Nominal voltage | | 12V |
| Nominal capacity (20 hour rate) | | 12Ah |
| Dimensions | Length | 151mm |
| | Width | 98mm |
| | Height | 94mm |
| | Total Height | 100mm |
| Approx. mass | | 3.8kg |
| Terminal | | Faston 187 or Faston 250 with hole |

## Duration of discharge vs Discharge current




## Characteristics

| | | |
|---|---|---|
| Capacity (25°C) | 20 hour rate<br>10 hour rate<br>5 hour rate<br>1 hour rate | 12.0Ah<br>11.3Ah<br>10.4Ah<br>8.1Ah |
| Internal resistance | Fully charged battery (25°C) | 30mΩ |
| Temperature dependency of capacity (20 hour rate) | 40°C<br>25°C<br>0°C<br>-15°C | 102%<br>100%<br>85%<br>65% |
| Self discharge (25°C) | After 3 months<br>After 6 months<br>After 12 months | 91%<br>82%<br>64% |

## Watt Table

**(Wattage/Battery)**

| Cut-off V | 3min | 5min | 10min | 15min | 20min | 30min | 45min | 1h | 1.5h | 2h | 3h | 4h | 5h | 6h | 10h | 20h | 24h |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 9.6V | 679 | 559 | 384 | 298 | 247 | 183 | 137 | 105 | 70.3 | 54.5 | 38.1 | 28.8 | 24.1 | 21.7 | 13.3 | 7.22 | 6.02 |
| 9.9V | 649 | 537 | 373 | 288 | 241 | 177 | 135 | 104 | 69.9 | 54.2 | 37.8 | 28.8 | 24.1 | 21.7 | 13.3 | 7.22 | 6.02 |
| 10.2V | 607 | 506 | 363 | 282 | 235 | 177 | 134 | 102 | 69.1 | 53.9 | 37.5 | 28.8 | 24.0 | 21.6 | 13.2 | 7.21 | 6.01 |
| 10.5V | 556 | 475 | 343 | 271 | 231 | 172 | 133 | 100 | 68.5 | 53.3 | 36.9 | 28.7 | 24.0 | 21.6 | 13.2 | 7.20 | 6.00 |
| 10.8V | 495 | 434 | 321 | 261 | 225 | 166 | 123 | 98 | 66.1 | 52.1 | 36.3 | 28.4 | 23.8 | 21.5 | 13.1 | 7.18 | 5.98 |

## Ampere Table

**(Ampere/Battery)**

| Cut-off V | 3min | 5min | 10min | 15min | 20min | 30min | 45min | 1h | 1.5h | 2h | 3h | 4h | 5h | 6h | 10h | 20h | 24h |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 9.6V | 61.1 | 50.1 | 34.3 | 25.9 | 21.3 | 15.6 | 11.7 | 8.90 | 5.95 | 4.60 | 3.20 | 2.41 | 2.01 | 1.81 | 1.11 | 0.602 | 0.502 |
| 9.9V | 58.4 | 48.2 | 33.3 | 25.0 | 20.8 | 15.1 | 11.5 | 8.80 | 5.92 | 4.58 | 3.18 | 2.41 | 2.01 | 1.81 | 1.11 | 0.602 | 0.502 |
| 10.2V | 54.6 | 45.4 | 32.4 | 24.5 | 20.3 | 15.1 | 11.4 | 8.70 | 5.85 | 4.55 | 3.15 | 2.41 | 2.00 | 1.80 | 1.10 | 0.601 | 0.501 |
| 10.5V | 50.0 | 42.6 | 30.6 | 23.6 | 19.9 | 14.7 | 11.3 | 8.50 | 5.80 | 4.50 | 3.10 | 2.40 | 2.00 | 1.80 | 1.10 | 0.600 | 0.500 |
| 10.8V | 44.5 | 38.9 | 28.7 | 22.7 | 19.4 | 14.2 | 10.5 | 8.30 | 5.60 | 4.40 | 3.05 | 2.38 | 1.99 | 1.79 | 1.09 | 0.598 | 0.498 |





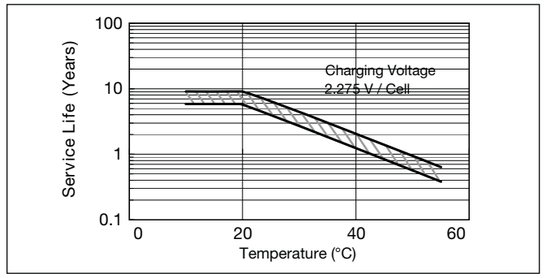
## Charging Method

| | |
|---|---|
| Cycle use | Control voltage: 14.5 - 14.9V; Initial current: 4.8A or smaller |
| Trickle use | Control voltage: 13.6 - 13.8V; Initial current: 1.8A or smaller |

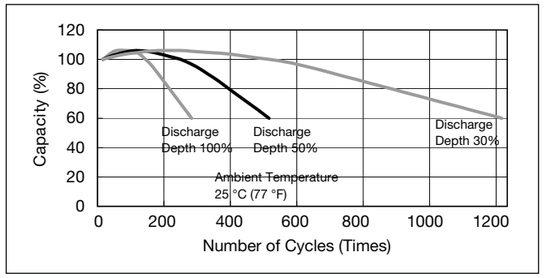
## Cut off voltage

| Discharge current | 0.6A - 2.4A | 2.4A - 6A | 6A - 12A | 12A - 24A | 24A - 36A |
|---|---|---|---|---|---|
| Cut off voltage (V) | 10.5 | 10.2 | 9.9 | 9.3 | 8.7 |

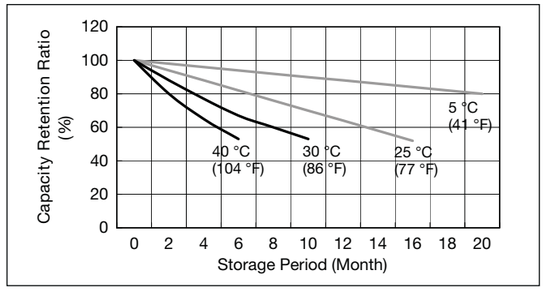
## Influence of Temperature on Trickle life



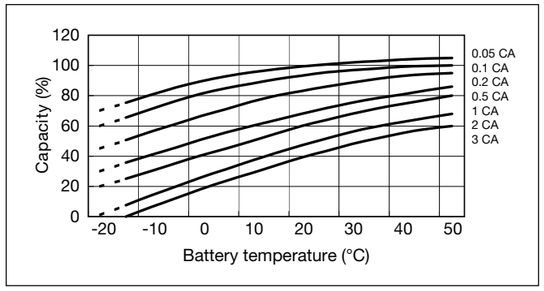

## Cycle life vs Depth of discharge



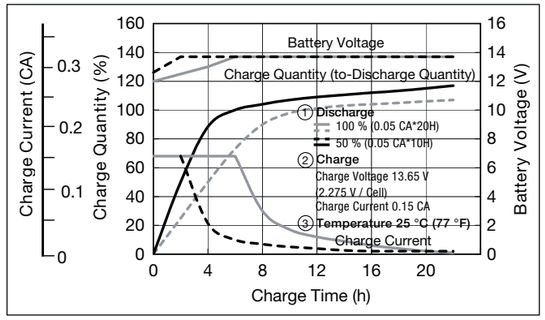

## Residual capacity vs storage period



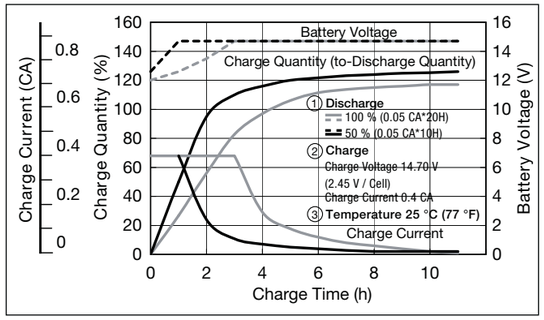

## Discharge capacity by temperature and by discharge current



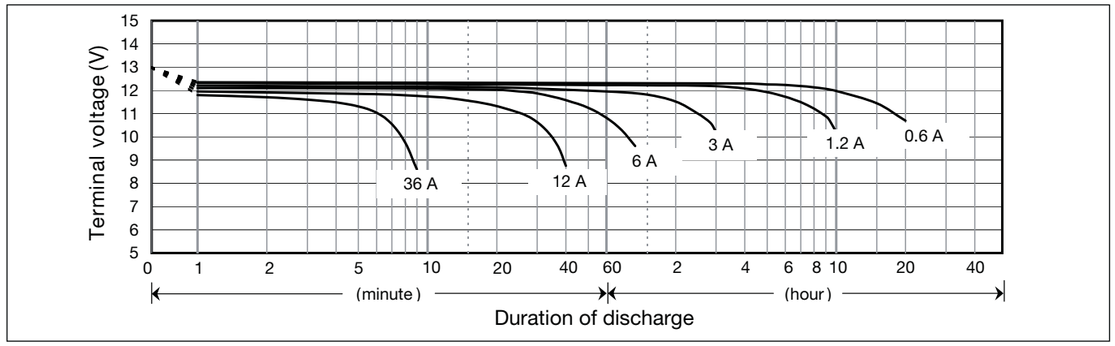

## Constant-voltage and constant-current charge characteristics for Trickle use




## Constant-voltage and constant-current charge characteristics for Cycle use




## Discharge characteristics

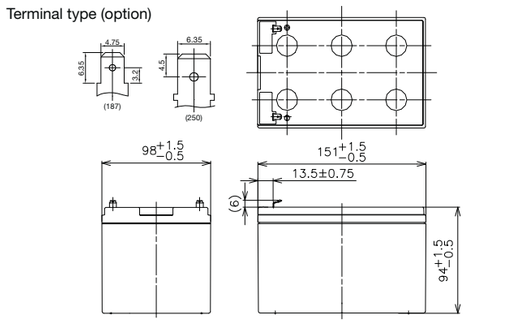


# LC-RA1215P

For main and standby power supplies.
Expected trickle design life: 6 – 9 years at 20°C according to Eurobat.


Contents indicated (including the recycle marking, etc.) are subject to change without notice.

## Dimensions (mm)




Battery case resin: standard (UL94HB)

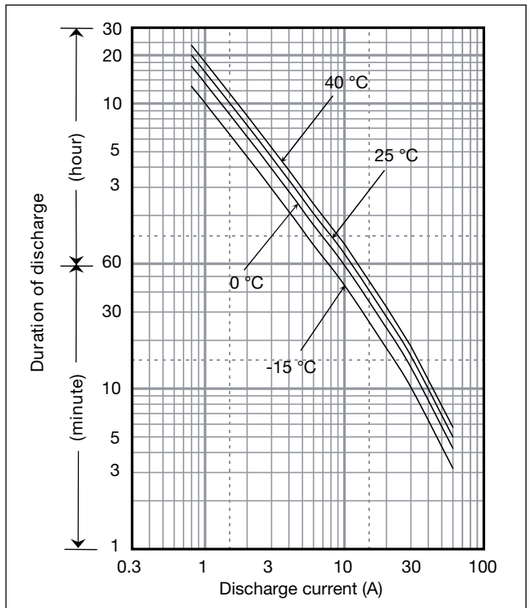
## Specifications

| | | |
|---|---|---|
| Nominal voltage | | 12V |
| Nominal capacity (20 hour rate) | | 15Ah |
| Dimensions | Length | 151mm |
| | Width | 98mm |
| | Height | 94mm |
| | Total Height | 100mm |
| Approx. mass | | 4.2kg |
| Terminal | | Faston 187 or Faston 250 with hole |

## Characteristics

| | | |
|---|---|---|
| Capacity (25°C) | 20 hour rate<br>10 hour rate<br>5 hour rate<br>1 hour rate | 15.0Ah<br>14.0Ah<br>12.9Ah<br>10.0Ah |
| Internal resistance | Fully charged battery (25°C) | 30mΩ |
| Temperature dependency of capacity (20 hour rate) | 40°C<br>25°C<br>0°C<br>-15°C | 102%<br>100%<br>85%<br>65% |
| Self discharge (25°C) | After 3 months<br>After 6 months<br>After 12 months | 91%<br>82%<br>64% |

## Duration of discharge vs Discharge current




## Watt Table

**(Wattage/Battery)**

| Cut-off V | 3min | 5min | 10min | 15min | 20min | 30min | 45min | 1h | 1.5h | 2h | 3h | 4h | 5h | 6h | 10h | 20h | 24h |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 9.6V | 850 | 682 | 455 | 350 | 292 | 217 | 157 | 123 | 83.9 | 65.0 | 47.1 | 36.0 | 29.9 | 25.2 | 16.2 | 8.75 | 7.30 |
| 9.9V | 799 | 646 | 444 | 343 | 286 | 213 | 156 | 123 | 82.8 | 64.6 | 46.9 | 35.8 | 29.7 | 25.1 | 16.1 | 8.74 | 7.29 |
| 10.2V | 741 | 607 | 433 | 336 | 281 | 211 | 154 | 121 | 81.4 | 63.4 | 46.4 | 35.7 | 29.5 | 24.9 | 15.9 | 8.72 | 7.27 |
| 10.5V | 667 | 555 | 404 | 318 | 270 | 206 | 152 | 118 | 80.1 | 61.9 | 45.7 | 35.5 | 29.4 | 24.8 | 15.9 | 8.70 | 7.25 |
| 10.8V | 576 | 497 | 368 | 300 | 263 | 199 | 146 | 116 | 77.7 | 59.6 | 44.8 | 35.1 | 28.9 | 24.5 | 15.7 | 8.66 | 7.21 |

## Ampere Table

**(Ampere/Battery)**

| Cut-off V | 3min | 5min | 10min | 15min | 20min | 30min | 45min | 1h | 1.5h | 2h | 3h | 4h | 5h | 6h | 10h | 20h | 24h |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 9.6V | 76.5 | 61.2 | 40.6 | 30.4 | 25.2 | 18.5 | 13.4 | 10.5 | 7.11 | 5.49 | 3.96 | 3.01 | 2.49 | 2.10 | 1.35 | 0.730 | 0.609 |
| 9.9V | 71.8 | 58.0 | 39.7 | 29.9 | 24.7 | 18.2 | 13.3 | 10.4 | 7.01 | 5.45 | 3.94 | 3.00 | 2.48 | 2.09 | 1.34 | 0.728 | 0.608 |
| 10.2V | 66.6 | 54.5 | 38.6 | 29.2 | 24.2 | 18.1 | 13.1 | 10.3 | 6.89 | 5.36 | 3.90 | 2.99 | 2.46 | 2.08 | 1.33 | 0.727 | 0.606 |
| 10.5V | 59.9 | 49.8 | 36.1 | 27.6 | 23.3 | 17.6 | 13.0 | 10.0 | 6.78 | 5.22 | 3.84 | 2.97 | 2.45 | 2.07 | 1.33 | 0.725 | 0.604 |
| 10.8V | 51.8 | 44.6 | 32.9 | 26.1 | 22.7 | 17.0 | 12.5 | 9.82 | 6.58 | 5.03 | 3.77 | 2.94 | 2.41 | 2.04 | 1.31 | 0.722 | 0.601 |





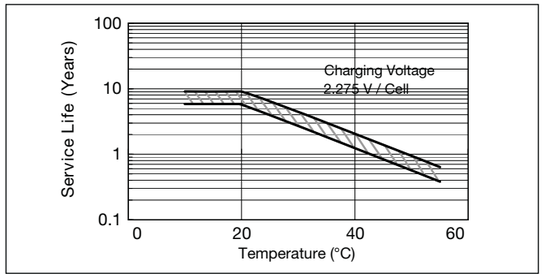
## Charging Method

| | |
|---|---|
| Cycle use | Control voltage: 14.5 - 14.9V; Initial current: 6A or smaller |
| Trickle use | Control voltage: 13.6 - 13.8V; Initial current: 2.25A or smaller |

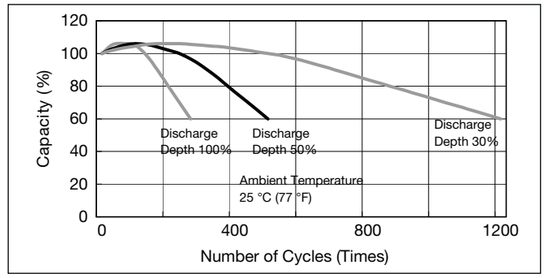
## Cut off voltage

| Discharge current | 0.75A - 3A | 3A - 7.5A | 7.5A - 15A | 15A - 30A | 30A - 45A |
|---|---|---|---|---|---|
| Cut off voltage (V) | 10.5 | 10.2 | 9.9 | 9.3 | 8.7 |

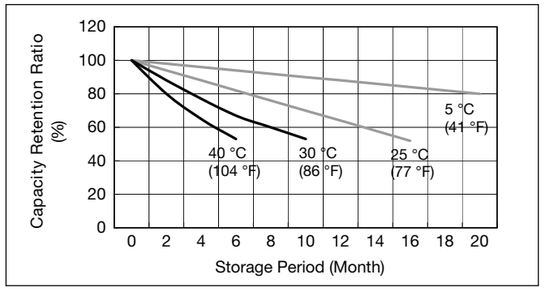
## Influence of Temperature on Trickle life



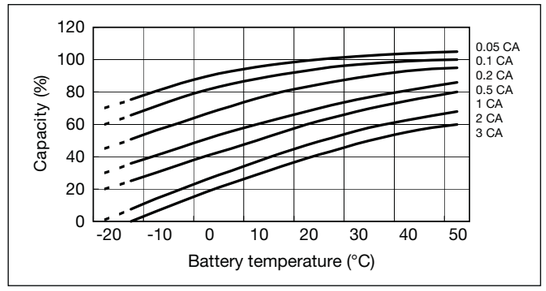

## Cycle life vs Depth of discharge



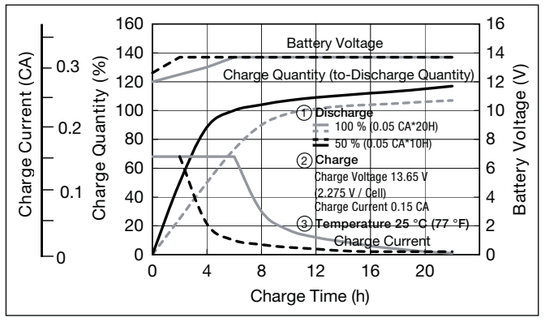

## Residual capacity vs storage period



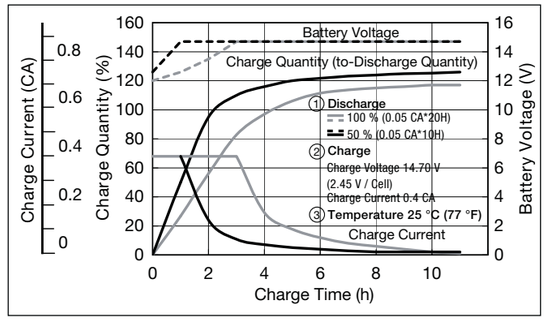

## Discharge capacity by temperature and by discharge current



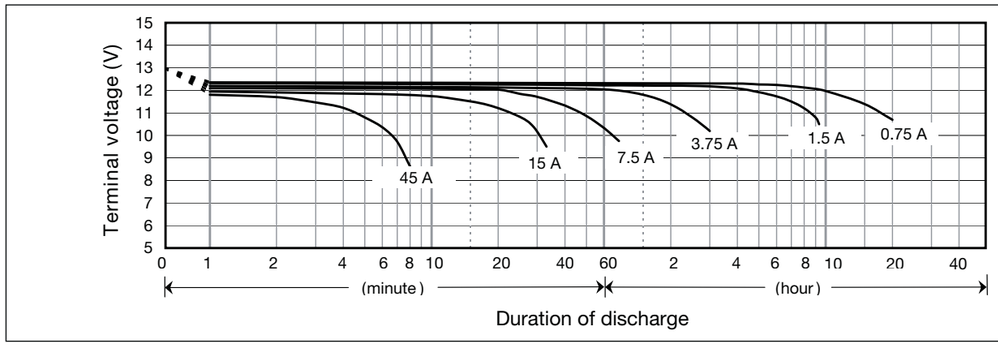

## Constant-voltage and constant-current charge characteristics for Trickle use




## Constant-voltage and constant-current charge characteristics for Cycle use




## Discharge characteristics

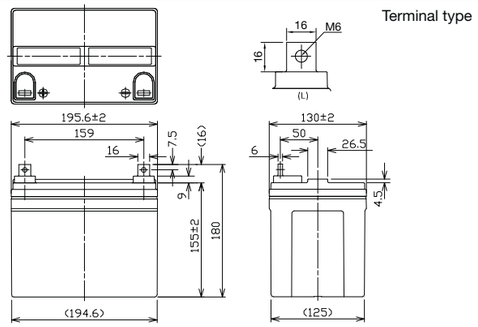


# LC-R1233P

For main and standby power supplies.
Expected trickle design life: 6 – 9 years at 20°C according to Eurobat.

Contents indicated (including the recycle marking, etc.) are subject to change without notice.

## Dimensions (mm)

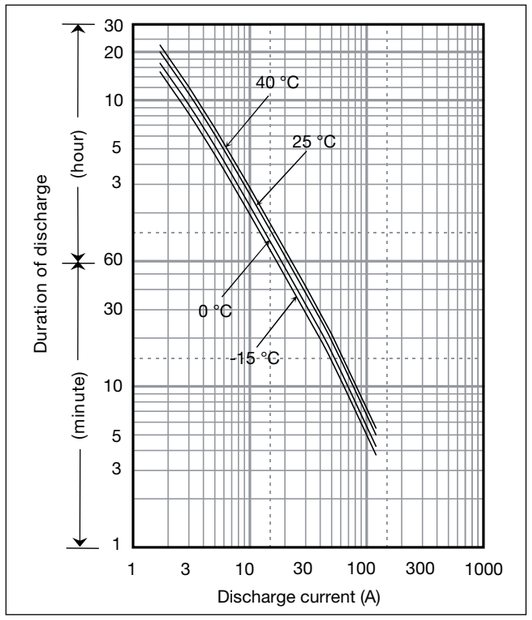



Battery case resin: standard (UL94HB)

## Specifications

| | | |
|---|---|---|
| Nominal voltage | | 12V |
| Nominal capacity (20 hour rate) | | 33Ah |
| Dimensions | Length | 195.6mm |
| | Width | 130mm |
| | Height | 155mm |
| | Total Height | 180mm |
| Approx. mass | | 12kg |
| Terminal | | M6 Bolt and Nut type |

## Duration of discharge vs Discharge current




## Characteristics

| | | |
|---|---|---|
| Capacity (25°C) | 20 hour rate<br>10 hour rate<br>5 hour rate<br>1 hour rate | 33Ah<br>30Ah<br>27Ah<br>20Ah |
| Internal resistance | Fully charged battery (25°C) | 7mΩ |
| Temperature dependency of capacity (20 hour rate) | 40°C<br>25°C<br>0°C<br>-15°C | 102%<br>100%<br>85%<br>65% |
| Self discharge (25°C) | After 3 months<br>After 6 months<br>After 12 months | 91%<br>82%<br>64% |

## Watt Table

(Wattage/Battery)

| Cut-off V | 3min | 5min | 10min | 15min | 20min | 30min | 45min | 1h | 1.5h | 2h | 3h | 4h | 5h | 6h | 10h | 20h | 24h |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 9.6V | 1546 | 1254 | 948 | 732 | 635 | 457 | 328 | 268 | 187 | 149 | 107 | 86.6 | 69.5 | 60.5 | 36.9 | 19.8 | 16.5 |
| 9.9V | 1446 | 1182 | 928 | 721 | 630 | 452 | 322 | 262 | 182 | 148 | 105 | 85.4 | 68.3 | 60.0 | 36.9 | 19.8 | 16.5 |
| 10.2V | 1379 | 1115 | 899 | 706 | 619 | 443 | 321 | 259 | 170 | 147 | 104 | 84.2 | 67.7 | 60.0 | 36.9 | 19.8 | 16.5 |
| 10.5V | 1323 | 1051 | 868 | 684 | 603 | 433 | 314 | 256 | 168 | 146 | 104 | 84.2 | 67.7 | 60.0 | 36.9 | 19.8 | 16.5 |
| 10.8V | 1182 | 1001 | 823 | 663 | 590 | 421 | 281 | 233 | 162 | 137 | 99 | 82.5 | 67.1 | 58.8 | 36.9 | 19.8 | 16.3 |

## Ampere Table

(Ampere/Battery)

| Cut-off V | 3min | 5min | 10min | 15min | 20min | 30min | 45min | 1h | 1.5h | 2h | 3h | 4h | 5h | 6h | 10h | 20h | 24h |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 9.6V | 139 | 113 | 84.6 | 63.7 | 54.8 | 39.1 | 27.9 | 22.8 | 15.8 | 12.6 | 9.00 | 7.25 | 5.80 | 5.10 | 3.08 | 1.65 | 1.38 |
| 9.9V | 130 | 106 | 82.9 | 62.7 | 54.4 | 38.6 | 27.4 | 22.2 | 15.5 | 12.5 | 8.85 | 7.15 | 5.70 | 5.00 | 3.08 | 1.65 | 1.38 |
| 10.2V | 124 | 100 | 80.3 | 61.4 | 53.4 | 37.9 | 27.4 | 22.0 | 14.4 | 12.4 | 8.75 | 7.05 | 5.65 | 5.00 | 3.08 | 1.65 | 1.38 |
| 10.5V | 119 | 94 | 77.5 | 59.5 | 52.0 | 37.0 | 26.8 | 21.8 | 14.3 | 12.3 | 8.70 | 7.05 | 5.65 | 5.00 | 3.08 | 1.65 | 1.38 |
| 10.8V | 106 | 90 | 73.5 | 57.7 | 50.9 | 36.0 | 24.0 | 19.8 | 13.7 | 11.6 | 8.35 | 6.90 | 5.60 | 4.90 | 3.08 | 1.65 | 1.36 |





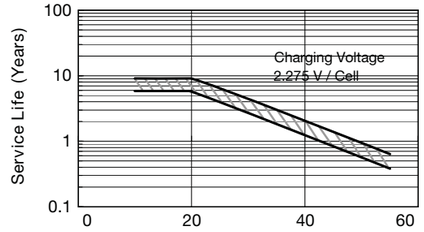
## Charging Method

| | |
|---|---|
| Cycle use | Control voltage: 14.5 - 14.9V; Initial current: 13.2A or smaller |
| Trickle use | Control voltage: 13.6 - 13.8V; Initial current: 4.95A or smaller |

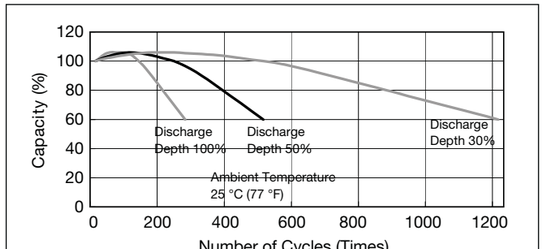
## Cut off voltage

| Discharge current | 1.65A - 6.6A | 6.6A - 16.5A | 16.5A - 33A | 33A - 66A | 66A - 99A |
|---|---|---|---|---|---|
| Cut off voltage (V) | 10.5 | 10.2 | 9.9 | 9.3 | 8.7 |

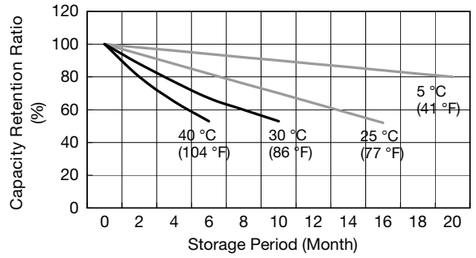
## Influence of Temperature on Trickle life



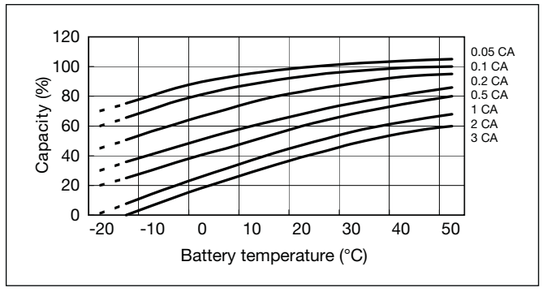

## Cycle life vs Depth of discharge



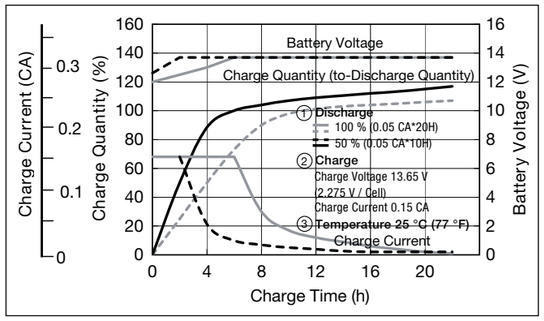

## Residual capacity vs storage period



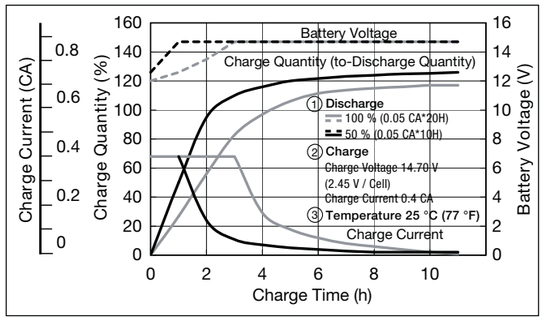

## Discharge capacity by temperature and by discharge current



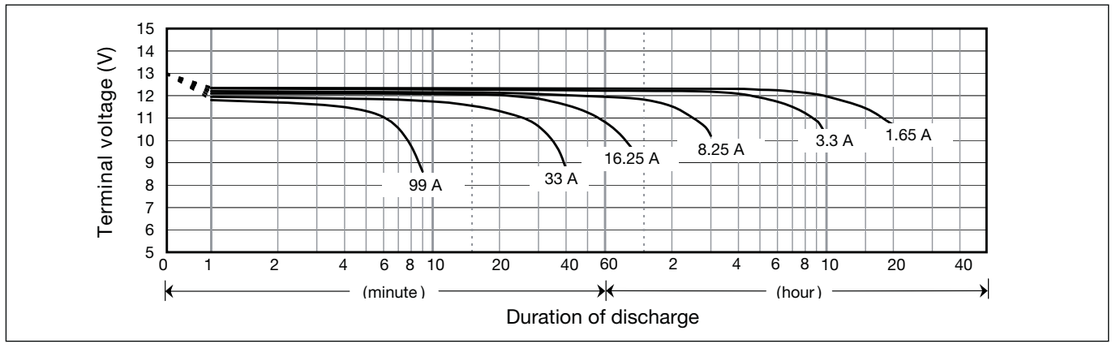

## Constant-voltage and constant-current charge characteristics for Trickle use




## Constant-voltage and constant-current charge characteristics for Cycle use




## Discharge characteristics

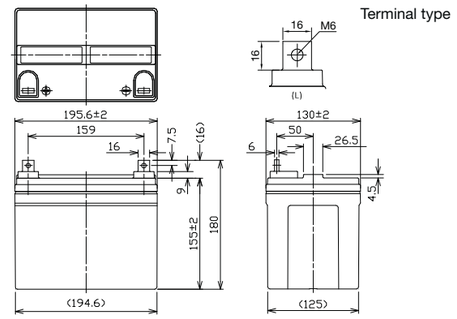


# LC-V1233P

For main and standby power supplies.
Expected trickle design life: 6 – 9 years at 20°C according to Eurobat.

Contents indicated (including the recycle marking, etc.) are subject to change without notice.

## Dimensions (mm)

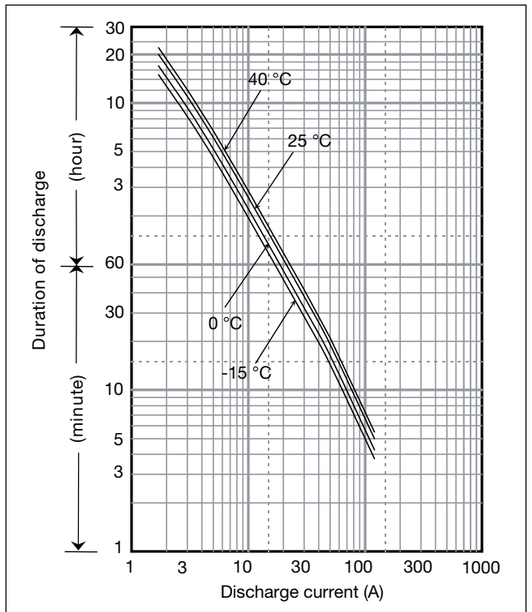



Battery case resin: Flame-retardant (UL94 V-0)

## Specifications

| | | |
|---|---|---|
| Nominal voltage | | 12V |
| Nominal capacity (20 hour rate) | | 33Ah |
| Dimensions | Length | 195.6mm |
| | Width | 130mm |
| | Height | 155mm |
| | Total Height | 180mm |
| Approx. mass | | 11.1kg |
| Terminal | | M6 Bolt and Nut type |

## Duration of discharge vs Discharge current




## Characteristics

| | | |
|---|---|---|
| Capacity (25°C) | 20 hour rate<br>10 hour rate<br>5 hour rate<br>1 hour rate | 33Ah<br>30Ah<br>27Ah<br>20Ah |
| Internal resistance | Fully charged battery (25°C) | 7mΩ |
| Temperature dependency of capacity (20 hour rate) | 40°C<br>25°C<br>0°C<br>-15°C | 102%<br>100%<br>85%<br>65% |
| Self discharge (25°C) | After 3 months<br>After 6 months<br>After 12 months | 91%<br>82%<br>64% |

## Watt Table

(Wattage/Battery)

| Cut-off V | 3min | 5min | 10min | 15min | 20min | 30min | 45min | 1h | 1.5h | 2h | 3h | 4h | 5h | 6h | 10h | 20h | 24h |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 9.6V | 1546 | 1254 | 948 | 732 | 635 | 457 | 328 | 268 | 187 | 149 | 107 | 86.6 | 69.5 | 60.5 | 36.9 | 19.8 | 16.5 |
| 9.9V | 1446 | 1182 | 928 | 721 | 630 | 452 | 322 | 262 | 182 | 148 | 105 | 85.4 | 68.3 | 60.0 | 36.9 | 19.8 | 16.5 |
| 10.2V | 1379 | 1115 | 899 | 706 | 619 | 443 | 321 | 259 | 170 | 147 | 104 | 84.2 | 67.7 | 60.0 | 36.9 | 19.8 | 16.5 |
| 10.5V | 1323 | 1051 | 868 | 684 | 603 | 433 | 314 | 256 | 168 | 146 | 104 | 84.2 | 67.7 | 60.0 | 36.9 | 19.8 | 16.5 |
| 10.8V | 1182 | 1001 | 823 | 663 | 590 | 421 | 281 | 233 | 162 | 137 | 99 | 82.5 | 67.1 | 58.8 | 36.9 | 19.8 | 16.3 |

## Ampere Table

(Ampere/Battery)

| Cut-off V | 3min | 5min | 10min | 15min | 20min | 30min | 45min | 1h | 1.5h | 2h | 3h | 4h | 5h | 6h | 10h | 20h | 24h |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 9.6V | 139 | 113 | 84.6 | 63.7 | 54.8 | 39.1 | 27.9 | 22.8 | 15.8 | 12.6 | 9.00 | 7.25 | 5.80 | 5.10 | 3.08 | 1.65 | 1.38 |
| 9.9V | 130 | 106 | 82.9 | 62.7 | 54.4 | 38.6 | 27.4 | 22.2 | 15.5 | 12.5 | 8.85 | 7.15 | 5.70 | 5.00 | 3.08 | 1.65 | 1.38 |
| 10.2V | 124 | 100 | 80.3 | 61.4 | 53.4 | 37.9 | 27.4 | 22.0 | 14.4 | 12.4 | 8.75 | 7.05 | 5.65 | 5.00 | 3.08 | 1.65 | 1.38 |
| 10.5V | 119 | 94 | 77.5 | 59.5 | 52.0 | 37.0 | 26.8 | 21.8 | 14.3 | 12.3 | 8.70 | 7.05 | 5.65 | 5.00 | 3.08 | 1.65 | 1.38 |
| 10.8V | 106 | 90 | 73.5 | 57.7 | 50.9 | 36.0 | 24.0 | 19.8 | 13.7 | 11.6 | 8.35 | 6.90 | 5.60 | 4.90 | 3.08 | 1.65 | 1.36 |





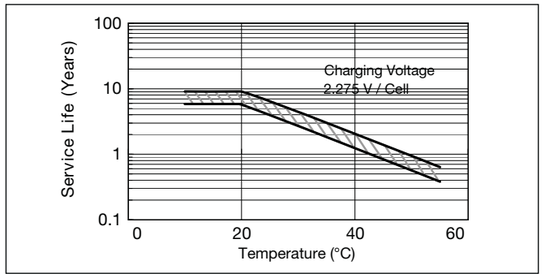
## Charging Method

| | |
|---|---|
| Cycle use | Control voltage: 14.5 - 14.9V; Initial current: 13.2A or smaller |
| Trickle use | Control voltage: 13.6 - 13.8V; Initial current: 4.95A or smaller |

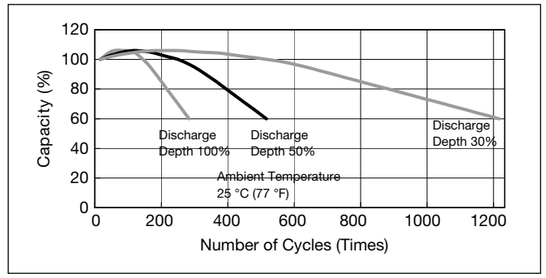
## Cut off voltage

| Discharge current | 1.65A - 6.6A | 6.6A - 16.5A | 16.5A - 33A | 33A - 66A | 66A - 99A |
|---|---|---|---|---|---|
| Cut off voltage (V) | 10.5 | 10.2 | 9.9 | 9.3 | 8.7 |

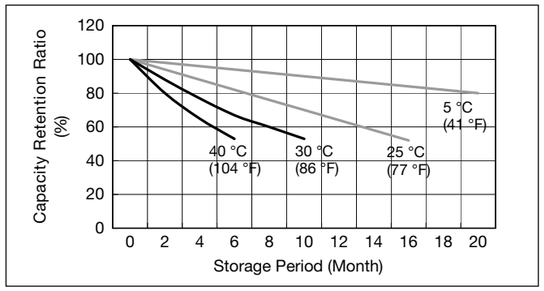
## Influence of Temperature on Trickle life



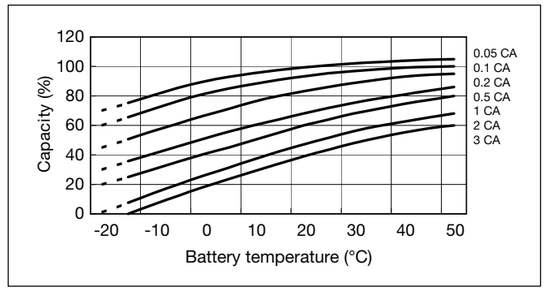

## Cycle life vs Depth of discharge



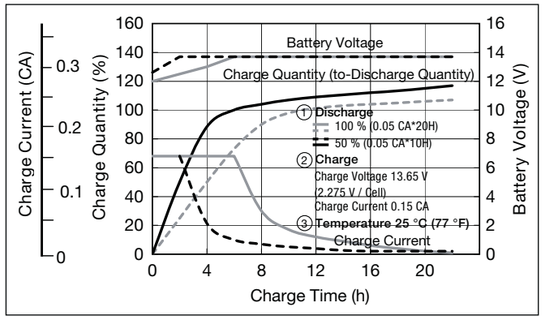

## Residual capacity vs storage period



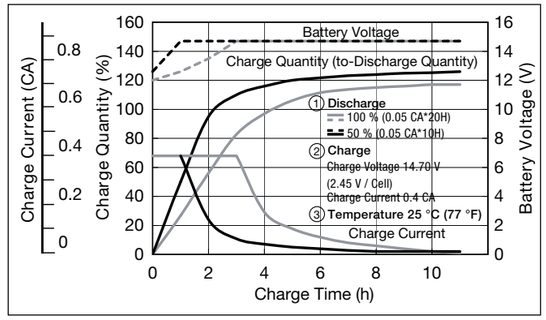

## Discharge capacity by temperature and by discharge current




## Constant-voltage and constant-current charge characteristics for Trickle use




## Constant-voltage and constant-current charge characteristics for Cycle use




## Discharge characteristics