

# FZA 24-12 (E-BIKE)

## 12V 24AH



### FZA 24-12 / VRLA GEL



### Physical Specification

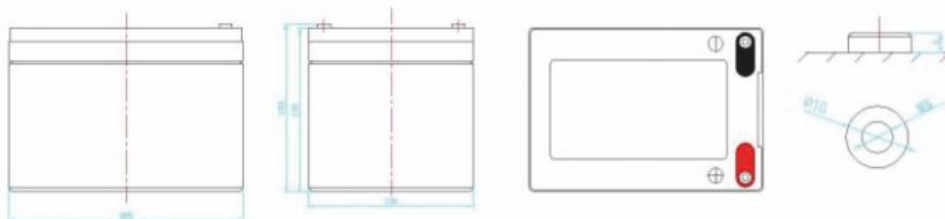
|                               |                          |
|-------------------------------|--------------------------|
| Part Number:                  | FZA 24-12                |
| Length:                       | 185 ± 2 mm (7.28 inches) |
| Width:                        | 105 ± 2 mm (4.13 inches) |
| Container Height:             | 130 ± 2 mm (5,12 inches) |
| Total Height (with terminal): | 130 ± 2 mm (5,12 inches) |

### Specifications

|                              |                                  |  |
|------------------------------|----------------------------------|--|
| Terminal Type                | Normal Voltage                   | 12V  |
|                              | Normal Capacity (20HR)           | 24.0AH   |
|                              | Standard Terminal                | F3   |
| Container Material           | Optional Terminal                |  |
|                              | Standard Option                  | ABS  |
| Rated Capacity               | Flame Retardant Option (FR)      | ABS(UL94:VO)   |
|                              | 25.7 AH/1.29A                    | (20hr, 1.80V/cell, 25°C / 77°F)  |
|                              | 24.0 AH/2.40A                    | (10hr, 1.80V/cell, 25°C / 77°F)  |
|                              | 21.0 AH/4.21A                    | (5hr, 1.75V/cell, 25°C / 77°F)   |
|                              | 19.1 AH/6.36A                    | (3hr, 1.75V/cell, 25°C / 77°F)   |
| Max Discharge Current        | 15.5 AH/15.5A                    | (1hr, 1.60V/cell, 25°C / 77°F)   |
|                              | 360A (5s)                        |  |
| Internal Resistance          | Approx 13.0mΩ                    |  |
| Discharge Characteristics    | Operating Temp. Range            | Discharge: -15 ~ 50°C (5 ~ 122°F)  |
|                              |                                  | Charge: 0 ~ 40°C (5 ~ 104°F)   |
|                              |                                  | Storage: -15 ~ 40°C (5 ~ 104°F)  |
|                              | Nominal Operating Temp. Range    | 25 ± 3°C (77 ± 5°F)  |
|                              | Cycle Use                        | Initial Charging Current less than 7.2A. Voltage 14.4V ~ 15.0V at 25°C (77°F) Temp. Coefficient -30mV/°C |
|                              | Standby Use                      | No limit on Initial Charging Current Voltage 13.5V ~ 13.8V at 25°C (77°F) Temp. Coefficient -20mV/°C     |
|                              | Capacity affected by Temperature | 40°C (104°F) 103%  |
| 25°C (77°F) 100%             |                                  |  |
| 0°C (32°F) 86%               |                                  |  |
| Design Floating Life at 20°C | 12 Years                         |  |

### Dimensions

#### F3 Terminal



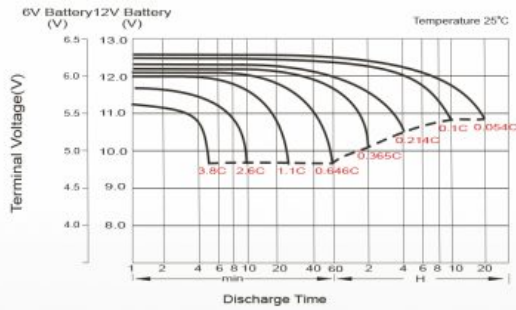
## Constant Current Discharge (Amperes) at 25°C (77°F)

| F.V/Time          | 10 min      | 15 min      | 20 min      | 30 min      | 45 min      | 1h          | 2h          | 3h          | 4h          | 5h          | 6h          | 8h          | 10h         | 20h         |
|-------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| 1.85V/cell        | 35.1        | 29.6        | 25.8        | 18.6        | 14.8        | 12.0        | 7.44        | 5.80        | 4.70        | 3.82        | 3.33        | 2.72        | 2.27        | 1.27        |
| <b>1.80V/cell</b> | <b>44.9</b> | <b>35.7</b> | <b>30.5</b> | <b>21.9</b> | <b>17.2</b> | <b>13.4</b> | <b>8.12</b> | <b>6.24</b> | <b>5.02</b> | <b>4.10</b> | <b>3.57</b> | <b>2.88</b> | <b>2.40</b> | <b>1.29</b> |
| 1.75V/cell        | 49.3        | 39.0        | 32.9        | 22.8        | 17.8        | 14.0        | 8.43        | 6.36        | 5.13        | 4.21        | 3.67        | 2.93        | 2.42        | 1.30        |
| <b>1.70V/cell</b> | <b>53.8</b> | <b>41.7</b> | <b>34.5</b> | <b>23.7</b> | <b>18.5</b> | <b>14.5</b> | <b>8.76</b> | <b>6.54</b> | <b>5.27</b> | <b>4.32</b> | <b>3.75</b> | <b>2.98</b> | <b>2.45</b> | <b>1.32</b> |
| 1.65V/cell        | 58.0        | 44.3        | 36.7        | 25.0        | 19.0        | 15.0        | 9.00        | 6.82        | 5.45        | 4.44        | 3.83        | 3.02        | 2.50        | 1.34        |
| <b>1.60V/cell</b> | <b>63.0</b> | <b>47.4</b> | <b>39.1</b> | <b>26.4</b> | <b>19.8</b> | <b>15.5</b> | <b>9.31</b> | <b>7.02</b> | <b>5.62</b> | <b>4.58</b> | <b>3.91</b> | <b>3.05</b> | <b>2.52</b> | <b>1.35</b> |

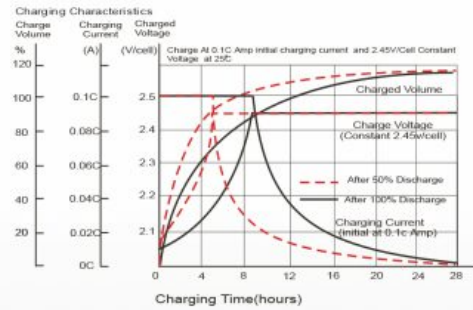
## Constant Power Discharge (Watts) at 25°C (77°F)

| F.V/Time          | 10 min       | 15 min      | 20 min      | 30 min      | 45 min      | 1h          | 2h          | 3h          | 4h          | 5h          | 6h          | 8h          | 10h         | 20h         |
|-------------------|--------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| 1.85V/cell        | 65.6         | 55.7        | 49.2        | 35.7        | 28.6        | 23.3        | 14.5        | 11.3        | 9.21        | 7.50        | 6.58        | 5.38        | 4.49        | 2.55        |
| <b>1.80V/cell</b> | <b>82.7</b>  | <b>66.3</b> | <b>57.3</b> | <b>41.6</b> | <b>33.0</b> | <b>25.9</b> | <b>15.7</b> | <b>12.1</b> | <b>9.78</b> | <b>8.03</b> | <b>7.03</b> | <b>5.70</b> | <b>4.75</b> | <b>2.57</b> |
| 1.75V/cell        | 89.7         | 71.8        | 61.1        | 43.0        | 34.0        | 27.0        | 16.3        | 12.3        | 10.0        | 8.23        | 7.22        | 5.79        | 4.79        | 2.59        |
| <b>1.70V/cell</b> | <b>96.4</b>  | <b>76.1</b> | <b>63.9</b> | <b>44.6</b> | <b>35.3</b> | <b>27.8</b> | <b>16.9</b> | <b>12.6</b> | <b>10.2</b> | <b>8.41</b> | <b>7.36</b> | <b>5.87</b> | <b>4.84</b> | <b>2.64</b> |
| 1.65V/cell        | 103.3        | 80.4        | 67.6        | 46.8        | 36.0        | 28.6        | 17.3        | 13.2        | 10.6        | 8.64        | 7.51        | 5.96        | 4.93        | 2.67        |
| <b>1.60V/cell</b> | <b>110.2</b> | <b>84.9</b> | <b>71.2</b> | <b>49.0</b> | <b>37.2</b> | <b>29.4</b> | <b>17.8</b> | <b>13.5</b> | <b>10.8</b> | <b>8.88</b> | <b>7.65</b> | <b>6.01</b> | <b>4.98</b> | <b>2.68</b> |

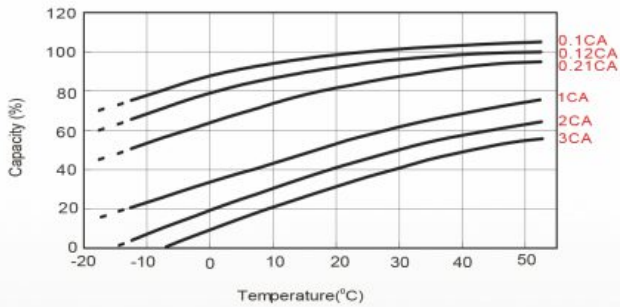
### Discharge Characteristics



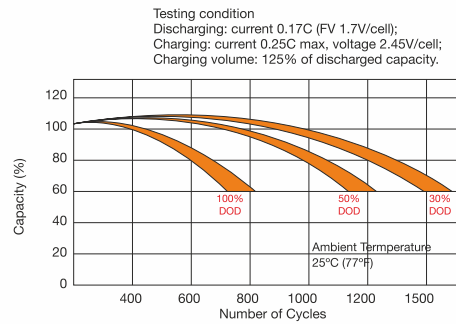
### Float Charging Characteristics



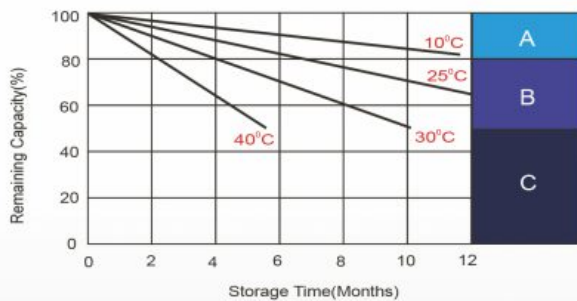
### Temperature Effects in Relation to Battery Capacity



### Effect of Temperature on Long Term Float Life



### Self Discharge Characteristics



- A** No supplementary charge required  
(Carry out supplementary charge before use if 100% capacity is required.)
- B** Supplementary charge required before use. Optional charging way as below:
  1. Charged for above 3 days at limited current 0.25CA and constant volatge 2.25V/cell.
  2. Charged for above 20hours at limited current 0.25CA and constant volatge 2.45V/cell.
  3. Charged for 8-10hours at limited current 0.05CA .
- C** Supplementary charge may often fail to recover the capacity.  
The battery should never be left standing till this is reached.