

# UP Series TF110-12

T E L E C O M A G M



## Product Characteristics

- Valve-regulated lead-acid battery.
- Stationary and reserve power applications.
- EUROBAT design life definition: Very Long Life 12+ years.
- Extremely long float life performance.
- Superior cycling endurance.
- Compact design with high energy density.
- ETSI Rack integration.
- Low installation cost, maintenance free product.
- Sealed for leak-free operation.
- Delivered ready for use.
- Non-hazardous cargo for ground, sea and air transport.
- Fully recyclable product.

### Applicable Standards and Recommendations

IEC 60896 - 21/22; EN 50272 - 2; IEC 61427 - 1/2;  
IEC 61056 - 1; IEEE 1184; IEEE 1187; IEEE 1188

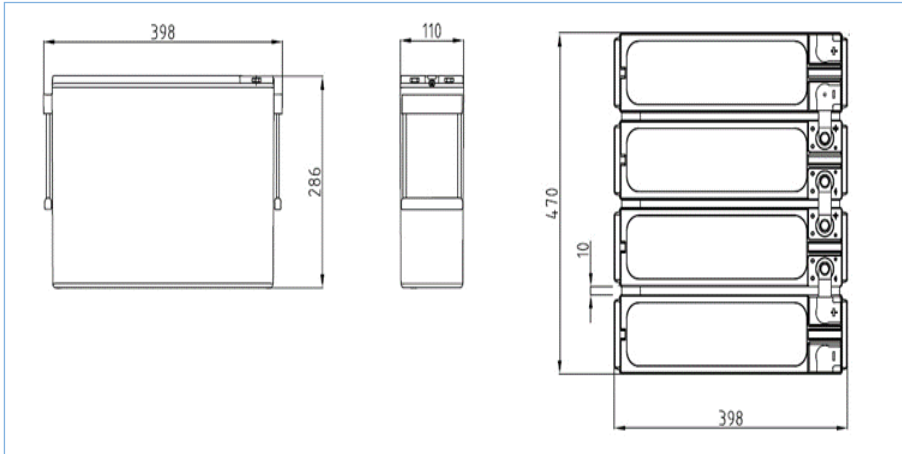
### Manufacture Standards

ISO 9001; ISO 14001; OHSAS 18001; AQAP 2110

## Technical Specifications

| Electrical specifications             |  |
|---------------------------------------|--|
| Nominal Voltage                       | 12 V   |
| Number of Cells                       | 6  |
| Rated Capacity                        | 110 Ah (10 h rate to 1.80 Vpc at 20°C)   |
| Internal Resistance                   | 6.5 mOhm (IEC 60 896 -21/22)   |
| Short Circuit Current                 | 1960 A (IEC 60 896 -21/22)   |
| Float Charge Voltage                  | 2.27 V per cell (Vpc) at 20°C  |
| Design features                       |  |
| Design Life at 20°C                   | Very Long Life 12+ years   |
| Plates                                | Tick Flat Pasted   |
| Active Material                       | Very high purity virgin lead   |
| Grid Alloy                            | Lead-Calcium-Tin alloy   |
| Electrolyte                           | Sulphuric acid, Analytical grade   |
| Separator                             | Absorbing Glass Mat (AGM)  |
| Operating Temperature                 | -20°C to +60°C<br>+15°C to +25°C (recommended)   |
| Venting Valve                         | Rubber, one way, self resealing<br>- Opening pressure: 1.7 PSI<br>- Resealing pressure: 1.5 PS |
| Internal Gas Recombination Efficiency | More than 99%  |
| Flame Arrestor                        | Available  |
| Central Degassing System              | Available  |
| Storage Temperatures                  | -20°C to +40°C   |
| Self Discharge                        | Less than 2.0% per month at 20°C   |
| Storability without Recharging        | Up to 6 months at 20°C   |
| Shelf Life                            | Up to 1 year   |
| Container / Lid Material              | Shock resistant ABS FR; flammability class UL94 V0   |
| Terminal Position                     | Front  |
| Terminal Sealing                      | Mechanical + epoxy double sealing  |
| Terminal Type                         | Brass; Female; M8 thread   |
| Terminal Torque                       | 7 Nm   |
| Transport Terminal Cover              | Available  |
| Carrying Handles                      | Available (2)  |
| Connectors and Bolts                  | Supplied as standard   |

## Drawings



## Physical Characteristics

|               | SI Units | US Units    |
|---------------|----------|-------------|
| <b>Length</b> | 398 mm   | 15.7 inches |
| <b>Width</b>  | 110 mm   | 4.3 inches  |
| <b>Height</b> | 286 mm   | 11.2 inches |
| <b>Weight</b> | 32.9 kg  | 72.5 lbs    |

## Performance Characteristics

Discharge Performance at Constant Current Discharge (Ah) for Battery 12 TF 110 at 20°C

| Uf, Vpc | 5 min | 15 min | 30 min | 1h   | 2h   | 3h   | 4h   | 5h   | 6h   | 8h   | 10h   | 20h   |
|---------|-------|--------|--------|------|------|------|------|------|------|------|-------|-------|
| 1.60    | 21.0  | 36.0   | 52.0   | 62.8 | 73.1 | 80.3 | 85.5 | 89.6 | 92.7 | 98.9 | 103.0 | 110.2 |
| 1.65    | 21.0  | 36.0   | 51.0   | 62.5 | 72.8 | 80.0 | 85.1 | 89.2 | 92.3 | 98.4 | 102.5 | 109.6 |
| 1.70    | 20.0  | 36.0   | 51.0   | 62.2 | 72.4 | 79.6 | 84.7 | 88.7 | 91.8 | 97.9 | 102.0 | 109.1 |
| 1.75    | 20.0  | 35.0   | 51.0   | 61.6 | 71.7 | 78.8 | 83.8 | 87.9 | 90.9 | 97.0 | 101.0 | 108.0 |
| 1.80    | 20.0  | 35.0   | 50.0   | 61.0 | 71.0 | 78.0 | 83.0 | 87.0 | 90.0 | 96.0 | 100.0 | 107.0 |
| 1.85    | 20.0  | 34.0   | 49.0   | 59.5 | 69.2 | 76.0 | 81.0 | 84.8 | 87.8 | 93.6 | 97.5  | 104.3 |

Discharge Performance at Constant Current Discharge (A) for Battery 12 TF 110 at 20°C

| Uf, Vpc | 5 min | 15 min | 30 min | 1h   | 2h   | 3h   | 4h   | 5h   | 6h   | 8h   | 10h  | 20h |
|---------|-------|--------|--------|------|------|------|------|------|------|------|------|-----|
| 1.60    | 253.0 | 144.0  | 103.0  | 62.8 | 36.6 | 26.8 | 21.4 | 17.9 | 15.5 | 12.4 | 10.3 | 5.5 |
| 1.65    | 249.0 | 144.0  | 103.0  | 62.5 | 36.4 | 26.7 | 21.3 | 17.8 | 15.4 | 12.3 | 10.3 | 5.5 |
| 1.70    | 245.0 | 143.0  | 102.0  | 62.2 | 36.2 | 26.5 | 21.2 | 17.7 | 15.3 | 12.2 | 10.2 | 5.5 |
| 1.75    | 242.0 | 142.0  | 101.0  | 61.6 | 35.9 | 26.3 | 21.0 | 17.6 | 15.2 | 12.1 | 10.1 | 5.4 |
| 1.80    | 240.0 | 140.0  | 100.0  | 61.0 | 35.5 | 26.0 | 20.8 | 17.4 | 15.0 | 12.0 | 10.0 | 5.4 |
| 1.85    | 234.0 | 136.0  | 98.0   | 59.5 | 34.6 | 25.3 | 20.3 | 17.0 | 14.6 | 11.7 | 9.8  | 5.2 |

### Discharge Performance at Constant Power Discharge W (Per Cell) for Battery 12 TF 110 at 20°C

| Uf, Vpc | 5 min | 15 min | 30 min | 1h    | 2h   | 3h   | 4h   | 5h   | 6h   | 8h   | 10h  | 20h  |
|---------|-------|--------|--------|-------|------|------|------|------|------|------|------|------|
| 1.60    | 506.0 | 288.0  | 206.0  | 125.6 | 73.1 | 53.5 | 42.8 | 35.8 | 30.9 | 24.7 | 20.6 | 11.0 |
| 1.65    | 492.0 | 287.0  | 205.0  | 125.0 | 72.8 | 53.3 | 42.6 | 35.7 | 30.8 | 24.6 | 20.5 | 11.0 |
| 1.70    | 488.0 | 286.0  | 204.0  | 124.4 | 72.4 | 52.8 | 42.4 | 35.5 | 30.6 | 24.5 | 20.4 | 10.9 |
| 1.75    | 485.0 | 283.0  | 202.0  | 123.2 | 71.7 | 52.3 | 41.9 | 35.2 | 30.3 | 24.1 | 20.2 | 10.8 |
| 1.80    | 480.0 | 280.0  | 200.0  | 122.0 | 71.0 | 52.0 | 41.5 | 34.8 | 30.0 | 24.0 | 20.0 | 10.7 |
| 1.85    | 468.0 | 273.0  | 195.0  | 119.0 | 69.2 | 50.7 | 40.5 | 33.9 | 29.3 | 23.4 | 19.5 | 10.4 |

### Temperature Correction Factor of Capacity at Constant Current Discharge

| Discharge time       | -10°C | 0°C  | 10°C | 15°C | 20°C | 25°C | 30°C | 35°C | 40°C | 45°C | 50°C | 55°C  |
|----------------------|-------|------|------|------|------|------|------|------|------|------|------|-------|
| From 5 to 59 minutes | 0.72  | 0.77 | 0.82 | 0.87 | 0.91 | 0.95 | 0.98 | 1.00 | 1.02 | 1.03 | 1.04 | 1.045 |
| From 1 to 20 hours   | 0.80  | 0.84 | 0.88 | 0.91 | 0.94 | 0.97 | 0.99 | 1.00 | 1.01 | 1.02 | 1.03 | 1.033 |

### Battery Charge Conditions at 20° Constant Voltage and Limited Current (IU)

| Charge current limit                                     | Float charge voltage   | Equalization charge voltage   | Boost charge voltage   |
|--|--|---|--|
| 0.1 - 0.25 C 10 A<br>Recommended: 0.20 C 10 A            | 2.27 V per cell at 20°C;<br>Temperature correction:<br>-3 mV / cell / °C | 2.32 V per cell at 20°C<br>Recommended: every 3 months<br>for 24h during long time float<br>operation                     | 2.40 V per cell at 20°C;<br>Temperature correction:<br>-4 mV / cell / °C |
| Float application: 0.20 C 10 A / 2.27 V per cell at 20°C |  | Cycling applications: 0.20 C 10 A / 2.40 V per cell at 20°C<br>Recharge Ah input at least 105% from previous discharge Ah |  |

