



# ES20-12C FT

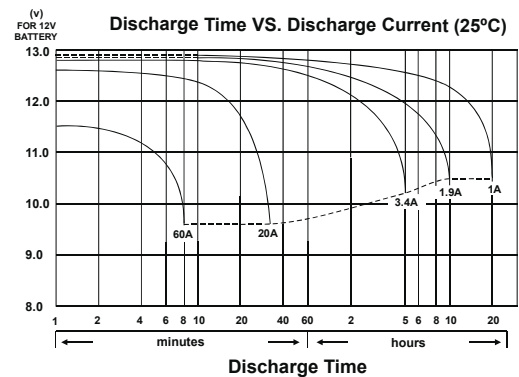
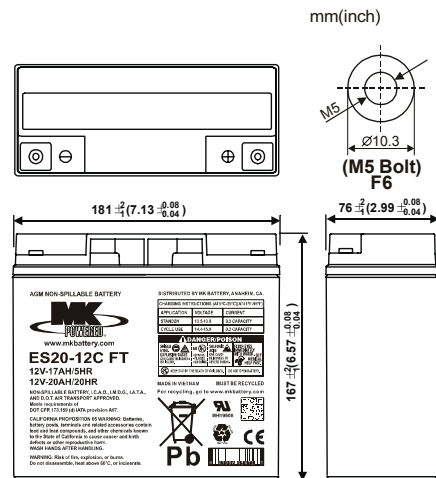
## SPECIFICATIONS

|   |   |
|---|---|
| <b>Nominal Voltage (V)</b>                            | 12V   |
| <b>Nominal Capacity</b>                               |   |
| 20 hour rate ( 1A to 10.50V )                         | 20Ah  |
| 10 hour rate ( 1.9A to 10.50V )                       | 19Ah  |
| 5 hour rate ( 3.4A to 10.20V )                        | 17Ah  |
| 1C ( 20A to 9.60V )                                   | 11.33Ah   |
| 3C ( 60A to 9.60V )                                   | 8Ah   |
| <b>Weight</b>   | Approx. 13.09Lbs. (5.95kg)  |
| <b>Internal Resistance (at 1KHz)</b>                  | Approx. 10 mΩ   |
| <b>Maximum Discharge Current for 5 seconds :</b>      | 300A  |
| <b>Operating Temperature Range</b>                    |   |
| Charge  | -15°C ( 5°F ) to 40°C (104°F )  |
| Discharge   | -15°C ( 5°F ) to 50°C (122°F )  |
| Storage   | -15°C ( 5°F ) to 40°C (104°F )  |
| <b>Charge Retention (shelf life) at 20°C ( 68°F )</b> |   |
| 1 month   | 92%   |
| 3 months  | 90%   |
| 6 months  | 80%   |
| <b>Charging Methods at 25°C ( 77°F )</b>              |   |
| <b>Cycle Use :</b>                                    | Charging Voltage 14.4 to 15.0V<br>Coefficient -5.0mv / °C / cell<br>Maximum Charging Current : 6A |
| <b>Standby Use :</b>                                  | Float Charging Voltage 13.50 to 13.80V<br>Coefficient -3.0mv / °C / cell                          |
| <b>Case Material :</b>                                | ABS UL94 HB   |
| <b>Terminal :</b>                                     | F6  |
| <b>Terminal Hardware Torque Value :</b>               |   |
| Recommended   | M5: 5 Nm (51kgf-cm)   |
| Maximum Allowable                                     | M5: 6 Nm (61kgf-cm)   |

## Maintenance-Free Rechargeable Sealed Lead-Acid Battery



## DIMENSIONS



## MK Battery

1631 South Sinclair Street • Anaheim, California 92806

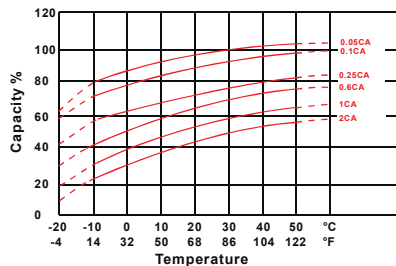
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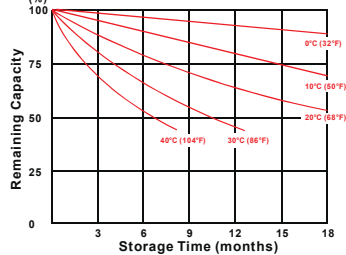


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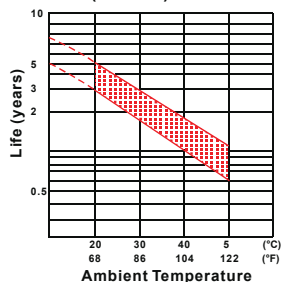
Effect of Temperature on Capacity 25°C (77°F)



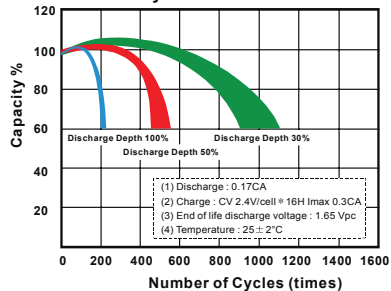
Capacity Retention Characteristic



Trickle (or float) Service Life



Cycle Service Life



## - PERFORMANCE DATA

### Discharge Rates in Watts to Various End Voltages at 25°C (77°F)

| Time | End Voltage | 1.85V | 1.80V | 1.75V | 1.70V | 1.67V | 1.65V | 1.60V |
|------|-------------|-------|-------|-------|-------|-------|-------|-------|
| 5    | min         | 110   | 128   | 139   | 146   | 148   | 150   | 152   |
| 10   | min         | 78.7  | 88.8  | 96.2  | 101   | 102   | 103   | 105   |
| 15   | min         | 68.2  | 75.5  | 80.4  | 83.5  | 84.3  | 85.2  | 85.9  |
| 30   | min         | 35.5  | 37.9  | 40.6  | 42.2  | 42.7  | 43.1  | 43.6  |
| 60   | min         | 22.2  | 23.2  | 24.0  | 24.7  | 24.8  | 25.2  | 25.5  |
| 120  | min         | 12.2  | 12.7  | 13.0  | 13.5  | 13.6  | 13.7  | 13.8  |
| 180  | min         | 9.53  | 9.88  | 10.1  | 10.3  | 10.4  | 10.5  | 10.6  |
| 240  | min         | 7.63  | 7.93  | 8.12  | 8.27  | 8.32  | 8.38  | 8.46  |
| 300  | min         | 6.65  | 6.88  | 7.00  | 7.10  | 7.13  | 7.18  | 7.24  |
| 600  | min         | 3.87  | 3.98  | 4.07  | 4.13  | 4.15  | 4.19  | 4.22  |
| 1200 | min         | 2.05  | 2.12  | 2.17  | 2.20  | 2.22  | 2.23  | 2.25  |

### - Discharge Rates in Amperes to Various End Voltages at 25°C (77°F)

| Time | End Voltage | 1.85V | 1.80V | 1.75V | 1.70V | 1.67V | 1.65V | 1.60V |
|------|-------------|-------|-------|-------|-------|-------|-------|-------|
| 5    | min         | 69.6  | 75.4  | 79.1  | 82.3  | 83.7  | 85.1  | 87.6  |
| 10   | min         | 46.7  | 49.9  | 52.4  | 54.6  | 55.5  | 56.5  | 58.2  |
| 15   | min         | 35.4  | 38.1  | 39.8  | 41.3  | 41.9  | 42.6  | 43.5  |
| 30   | min         | 18.9  | 20.4  | 21.5  | 22.4  | 22.7  | 23.1  | 23.6  |
| 60   | min         | 11.1  | 11.7  | 12.2  | 12.6  | 12.7  | 12.9  | 13.1  |
| 120  | min         | 6.25  | 6.47  | 6.61  | 6.73  | 6.77  | 6.82  | 6.89  |
| 180  | min         | 4.73  | 4.90  | 5.00  | 5.08  | 5.11  | 5.15  | 5.21  |
| 240  | min         | 3.88  | 3.97  | 4.04  | 4.09  | 4.11  | 4.14  | 4.17  |
| 300  | min         | 3.41  | 3.48  | 3.53  | 3.57  | 3.58  | 3.60  | 3.62  |
| 600  | min         | 1.97  | 2.00  | 2.02  | 2.04  | 2.05  | 2.06  | 2.07  |
| 1200 | min         | 1.00  | 1.03  | 1.05  | 1.07  | 1.08  | 1.09  | 1.10  |

All data on the spec. sheet is an average value:

The tolerance range :  $X < 6\text{min}$  (+15%~-15%),  $6\text{min} \leq X < 10\text{min}$  (+12%~-12%),  $10\text{min} \leq X < 60\text{min}$  (+8%~-8%),  $X \geq 60\text{min}$  (+5%~-5%)

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