

## Datasheet - TL 12-90 (12 V 90 Ah) Long Life

### TL-Range Valve regulated lead-acid battery

#### Technical Characteristics

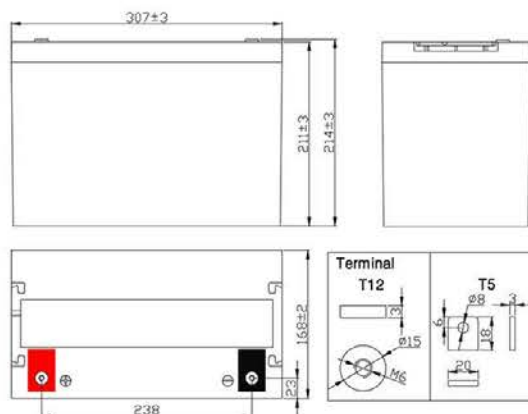
Nominal Voltage:	12 V
Rated Capacity (C10, 1.80V/cell):	90 Ah
Dimension (LxWxH1xH2): H1= Height to the lid / H2= Total height	307 x 168 x 211 x 214 mm
Nominal Capacity (25 °C):	20 hour rate (4.995 A to 10.5 V) - 99.9 Ah 10 hour rate (9.315 A to 10.5 V) - 93.1 Ah 5 hour rate (15.99 A to 10.5 V) - 79.9 Ah 1 hour rate (58.50 A to 9.6 V) - 58.5 Ah 15 min rate (163.3 A to 9.6 V) - 40.8 Ah
Weight:	26.0 kg
Type Of Poles / Terminal:	T12M6
Max. Discharge Current (25 °C / 5 s):	720 A
Internal Resistance (25 °C fully charged):	6.0 mΩ
Number Of Cycles at 80 % DOD (25 °C):	> 450
Ambient Temperature:	Charge: -15 °C ~ 50 °C Discharge: -20 °C ~ 60 °C Storage: -20 °C ~ 50 °C
Container Material:	ABS, UL94-HB, UL94-V0 optional
Self Discharge Rate Per Month at 25 °C:	3%

#### Discharge Data in Amperes at 25 °C

VpC/Time	5 min	10 min	15 min	30 min	60 min	2 h	3 h	5 h	8 h	10 h	20 h
1.60	306.0	203.9	163.3	101.3	58.50	34.97	24.84	16.63	11.18	9.540	5.220
1.70	274.5	187.7	155.3	98.55	57.69	34.52	24.39	16.24	11.00	9.405	5.085
1.75	247.5	173.3	148.1	95.85	56.97	34.07	24.12	15.99	10.89	9.315	4.995
1.80	220.5	158.0	139.1	92.16	55.80	33.60	23.85	15.75	10.73	9.180	4.905

#### Discharge Data in Watts/Cell at 25 °C

VpC/Time	5 min	10 min	15 min	30 min	60 min	2 h	3 h	5 h	8 h	10 h	20 h
1.60	527.9	363.5	296.6	189.0	112.1	68.18	49.27	33.07	22.24	19.00	10.43
1.70	485.0	340.9	285.9	185.6	111.1	67.59	48.50	32.36	21.94	18.78	10.17
1.75	443.4	319.1	275.1	182.1	110.1	66.99	48.08	31.96	21.78	18.63	9.990
1.80	400.6	294.8	260.7	176.6	108.3	66.63	47.66	31.50	21.46	18.36	9.810



## Capacity Factors With Different Temperature

Battery Type		-20 °C	-10 °C	0 °C	5 °C	10 °C	20 °C	25 °C	30 °C	40 °C	45 °C
AGM	6 V & 12 V	46 %	66 %	76 %	83 %	90 %	98 %	100 %	103 %	107 %	109 %
	2 V	55 %	70 %	80 %	85 %	92 %	99 %	100 %	104 %	108 %	110 %

## Maintenance & Cautions

### Charging Procedure:

Application	Charging Method	Charge Voltage at 25 °C	Temperature Compensation Coefficient Of Charging Voltage	Max. Charging Current	Temperature
For standby power source	Constant voltage charging (with current restriction)	2.25 - 2.30 V/cell	-3 mV/°C/cell	0.2 CA	-15 - 50 °C
For cycle service		2.40 - 2.45 V/cell	-4 mV/°C/cell	0.3 CA	

### Float Service:

Every month, recommend inspection every battery voltage

Every three months, recommend equalization charge for one time

Equalization charge method:

Step 1 discharge: 100 % rate capacity discharge. Step 2 charge: Max. current 0.3 CA, constant voltage 2.45 - 2.50 V/cell charge 24 h

### Cycle Service:

Avoid battery over discharge, especially battery series connection use

Charge with recommend voltage, ensure battery can be full recharged

In general, recharge capacity should be 1.1 - 1.15 times discharge capacity

### General Informations:

Length of service life will be directly affected by the number of discharge cycles, depth of discharge, ambient temperature and charging voltage

Charge the batteries at least once every six month, if they are stored at 25 °C

Charging method therefore:

Constant voltage: -0.2 C x 2 h + 2.4 ~ 2.45 V/cell x 24 h, Max. current 0.25 CA

Constant current: -0.2 C x 2 h + 0.1 C x 12 h

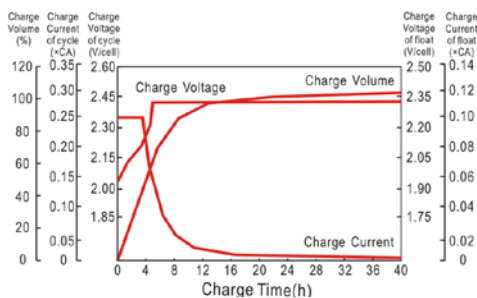
Fast: -0.2 C x 2 h + 0.3 C x 4 h

### Tightening Torque:

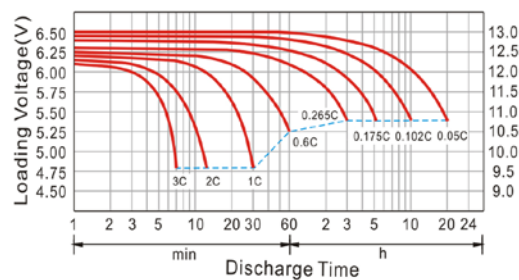
Bolt	M5	M6	M8
Terminal	T3, T10	T4, T7, T11, T12, T13	T5, T6, T8, T9, T14
Torque	6 - 7 Nm	8 - 10 Nm	10 - 12 Nm

## Curves

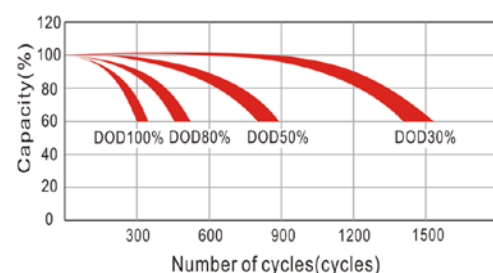
### CHARGE CHARACTERISTICS CURVE



### DISCHARGE CHARACTERISTICS CURVE



### CYCLE SERVICE LIFE IN RELATION TO DEPTH OF DISCHARGE



### CAPACITY STORAGE CHARACTERISTICS

