

6FM33D-X 12V 31.4Ah(10hr)

The rechargeable batteries are lead-lead dioxide systems. The dilute sulfuric acid electrolyte is absorbed by separators and plates and thus immobilized. Should the battery be accidentally overcharged producing hydrogen and oxygen, special one-way valves allow the gases to escape thus avoiding excessive pressure build-up. Otherwise, the battery is completely sealed and is, therefore, maintenance-free, leak proof and usable in any position.



Battery Construction

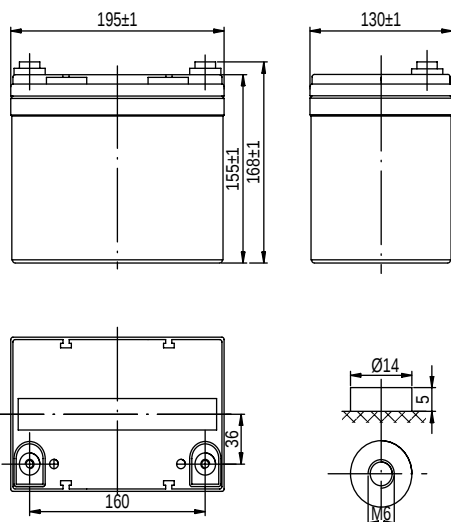
Component	Positive plate	Negative plate	Container	Cover	Safety valve	Terminal	Separator	Electrolyte
Raw material	Lead dioxide	Lead	ABS	ABS	Rubber	Pb	Fiberglass	Sulfuric acid

General Features

- Absorbent Glass Mat (AGM) technology for efficient gas recombination of up to 99% and freedom from electrolyte maintenance or water adding.
- Not restricted for air transport-complies with IATA/ICAO Special Provision A67.
- UL-recognized component.
- Can be mounted in any orientation.
- Computer designed lead, calcium tin alloy grid for high power density.
- Long service life, float or cyclic applications.
- Maintenance-free operation.
- Low self discharge.

Dimensions and Weight

Length(mm / inch)	195 / 7.68
Width(mm / inch)	130 / 5.12
Height(mm / inch)	155 / 6.10
Total Height(mm / inch)	168 / 6.61
Approx. Weight(Kg / lbs)	10.2 / 22.5



Performance Characteristics

Nominal Voltage	12V
Number of cell	6
Design Life	10 years
Nominal Capacity 77°F(25°C)	
10 hour rate (3.14A, 10.8V)	31.4Ah
5 hour rate (5.55A, 10.5V)	27.75Ah
1 hour rate (22.0A, 9.6V)	22.0Ah
Internal Resistance	
Fully Charged battery 77°F(25°C)	10mOhms
Self-Discharge	
3% of capacity declined per month at 20°C(average)	
Operating Temperature Range	
Discharge	-20~60°C
Charge	-10~60°C
Storage	-20~60°C
Max. Discharge Current 77°F(25°C)	330A(5s)
Short Circuit Current	850A
Charge Methods: Constant Voltage Charge 77°F(25°C)	
Cycle use	14.4-14.7V
Maximum charging current	9.9A
Temperature compensation	-30mV/°C
Standby use	13.6-13.8V
Temperature compensation	-20mV/°C

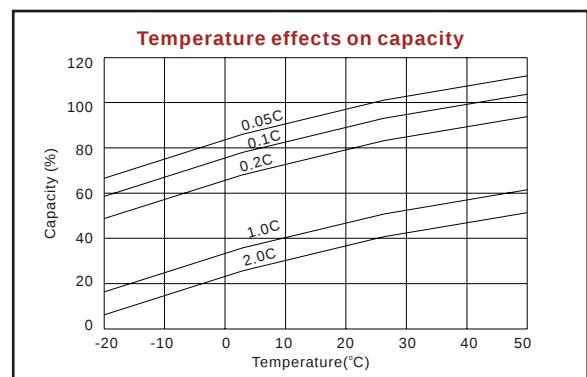
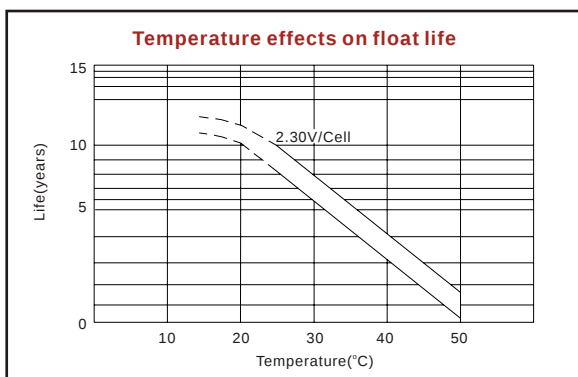
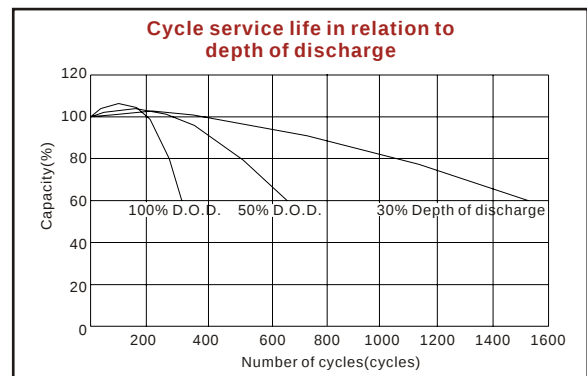
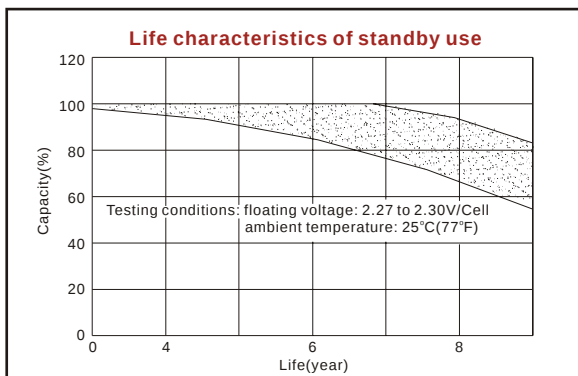
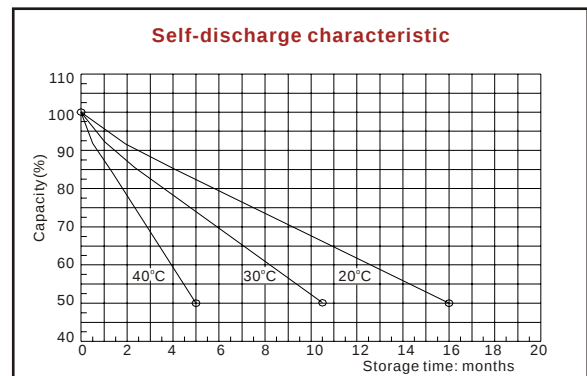
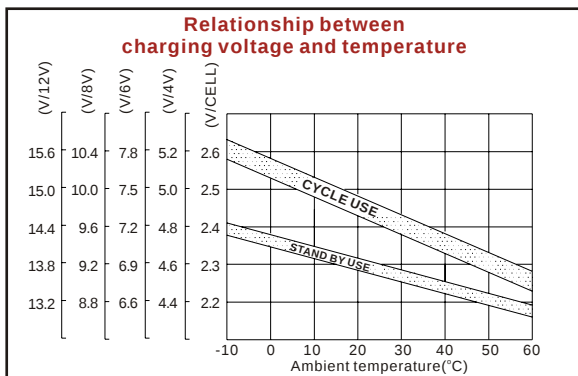
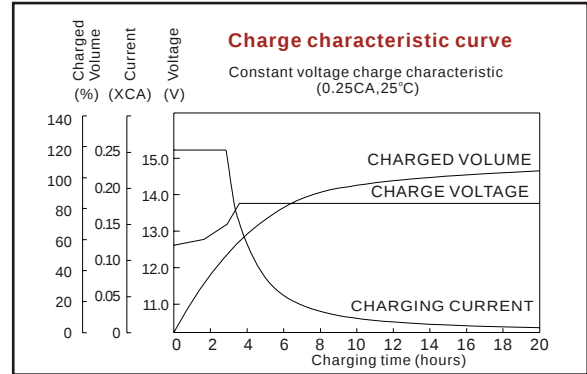
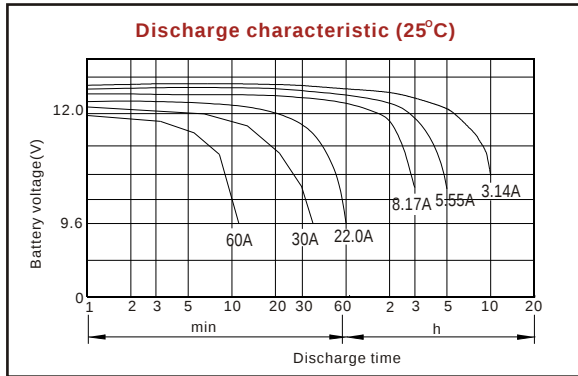
Discharge Constant Current (Amperes at 77°F25°C)

End Point Volts/Cell	5min	10min	15min	30min	45min	1h	3h	5h	10h
1.60V	109	77.0	59.7	36.1	26.4	22.0	8.99	6.27	3.28
1.65V	101	74.2	57.6	35.4	26.4	21.6	8.88	6.22	3.25
1.70V	94.1	70.1	52.9	32.4	24.7	20.9	8.37	6.12	3.22
1.75V	83.4	66.2	50.4	32.0	24.0	20.0	8.17	5.55	3.18
1.80V	75.5	57.6	48.0	31.1	23.3	19.5	8.10	5.47	3.14

Discharge Constant Power (Watts at 77°F25°C)

End Point Volts/Cell	5min	10min	15min	30min	45min	1h	2h	3h	5h
1.60V	204	144	114	70.6	52.7	40.3	23.0	17.2	12.1
1.65V	197	139	107	67.6	52.1	39.9	22.8	17.1	11.8
1.70V	176	131	104	62.9	50.2	39.3	22.3	16.6	11.4
1.75V	162	127	99.9	61.1	48.1	38.5	21.5	15.8	11.2
1.80V	147	111	95.0	59.5	47.8	37.7	20.7	15.1	11.0

(Note)The above characteristics data are average values obtained within three charge/discharge cycles not the minimum values.



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ISO9001:2000



MH25860



G4M19906-9202-E-16



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6FM45D-X 12V 41.8Ah(10hr)

The rechargeable batteries are lead-lead dioxide systems. The dilute sulfuric acid electrolyte is absorbed by separators and plates and thus immobilized. Should the battery be accidentally overcharged producing hydrogen and oxygen, special one-way valves allow the gases to escape thus avoiding excessive pressure build-up. Otherwise, the battery is completely sealed and is, therefore, maintenance-free, leak proof and usable in any position.



Battery Construction

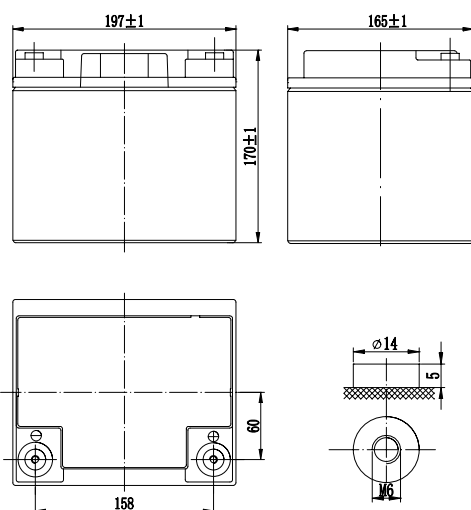
Component	Positive plate	Negative plate	Container	Cover	Safety valve	Terminal	Separator	Electrolyte
Raw material	Lead dioxide	Lead	ABS	ABS	Rubber	Copper	Fiberglass	Sulfuric acid

General Features

- Absorbent Glass Mat (AGM) technology for efficient gas recombination of up to 99% and freedom from electrolyte maintenance or water adding.
- Not restricted for air transport-complies with IATA/ICAO Special Provision A67.
- UL-recognized component.
- Can be mounted in any orientation.
- Computer designed lead, calcium tin alloy grid for high power density.
- Long service life, float or cyclic applications.
- Maintenance-free operation.
- Low self discharge.

Dimensions and Weight

Length(mm / inch)	197 / 7.76
Width(mm / inch)	165 / 6.50
Height(mm / inch)	170 / 6.69
Total Height(mm / inch)	170 / 6.69
Approx. Weight(Kg / lbs)	13.8 / 30.4



Performance Characteristics

Nominal Voltage	12V
Number of cell	6
Design Life	10 years
Nominal Capacity 77°F(25°C)	
10 hour rate (4.18A, 10.8V)	41.8Ah
5 hour rate (7.34A, 10.5V)	36.7Ah
1 hour rate (27.6A, 9.6V)	27.6Ah
Internal Resistance	
Fully Charged battery 77°F(25°C)	7.5mOhms
Self-Discharge	
3% of capacity declined per month at 20°C(average)	
Operating Temperature Range	
Discharge	-20~60°C
Charge	-10~60°C
Storage	-20~60°C
Max. Discharge Current 77°F(25°C)	450A(5s)
Short Circuit Current	1050A
Charge Methods: Constant Voltage Charge 77°F(25°C)	
Cycle use	14.4-14.7V
Maximum charging current	13.5A
Temperature compensation	-30mV/°C
Standby use	13.6-13.8V
Temperature compensation	-20mV/°C

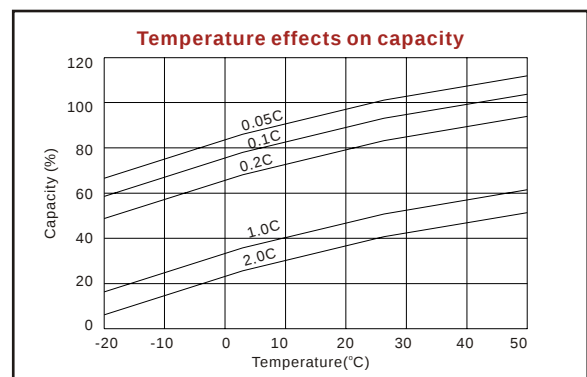
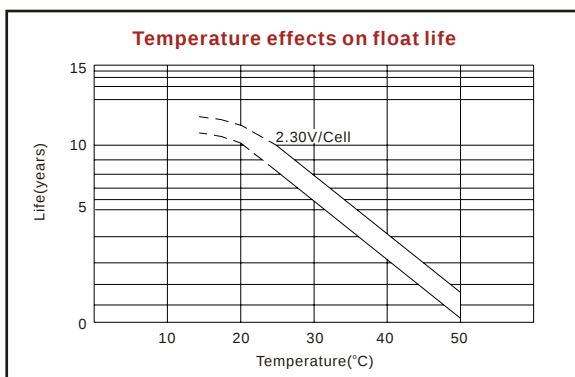
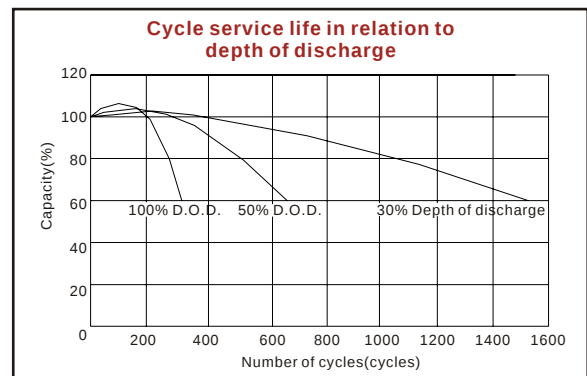
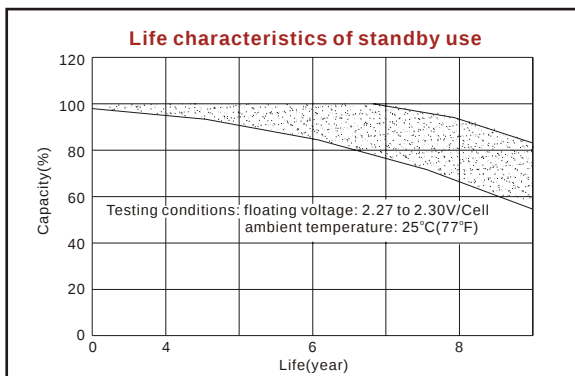
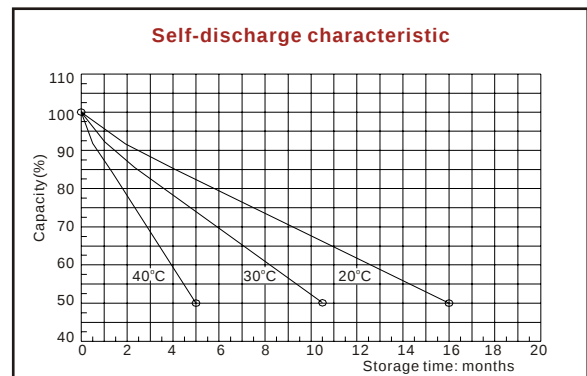
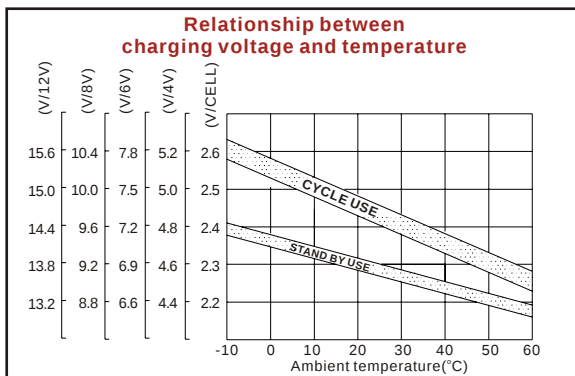
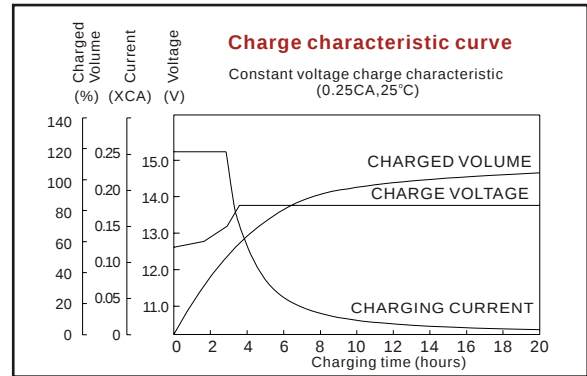
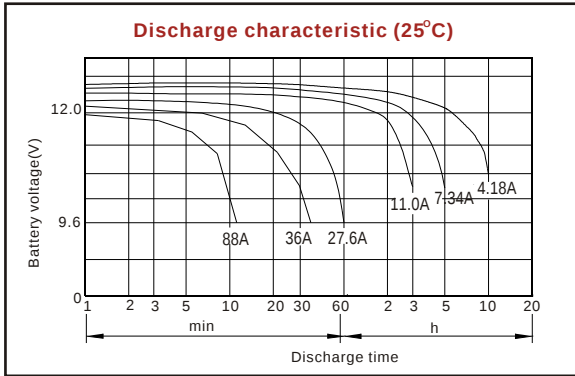
Discharge Constant Current (Amperes at 77°F25°C)

End Point Volts/Cell	5min	10min	15min	30min	45min	1h	3h	5h	10h
1.60V	142	96.0	75.5	44.6	34.3	27.6	11.7	7.76	4.26
1.65V	129	91.2	72.1	44.4	33.7	27.2	11.5	7.62	4.24
1.70V	127	86.4	70.8	42.8	31.3	26.8	11.2	7.48	4.22
1.75V	112	81.6	66.9	38.9	30.6	26.5	11.0	7.34	4.20
1.80V	108	76.8	64.0	38.0	29.9	26.1	10.8	7.26	4.18

Discharge Constant Power (Watts at 77°F25°C)

End Point Volts/Cell	5min	10min	15min	30min	45min	1h	2h	3h	5h
1.60V	250	180	143	96.1	73.1	58.3	32.8	24.3	15.7
1.65V	234	167	136	84.7	66.3	54.0	30.4	22.6	14.7
1.70V	220	159	131	81.7	64.0	53.2	30.0	22.3	14.6
1.75V	201	150	123	79.8	62.8	52.3	29.6	22.1	14.4
1.80V	193	147	122	78.0	61.7	51.5	29.2	21.8	14.1

(Note) The above characteristics data are average values obtained within three charge/discharge cycles not the minimum values.



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6FM75D-X 12V 74.1Ah(10hr)

The rechargeable batteries are lead-lead dioxide systems. The dilute sulfuric acid electrolyte is absorbed by separators and plates and thus immobilized. Should the battery be accidentally overcharged producing hydrogen and oxygen, special one-way valves allow the gases to escape thus avoiding excessive pressure build-up. Otherwise, the battery is completely sealed and is, therefore, maintenance-free, leak proof and usable in any position.



Battery Construction

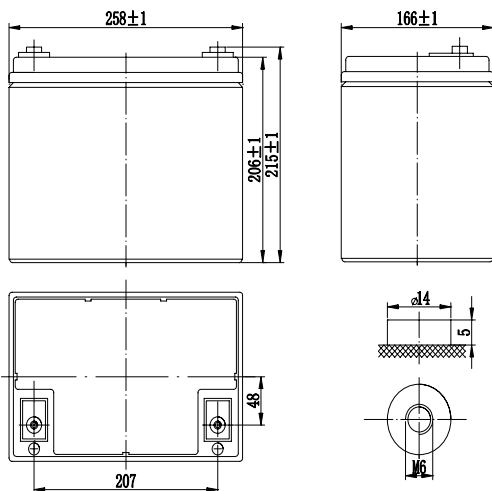
Component	Positive plate	Negative plate	Container	Cover	Safety valve	Terminal	Separator	Electrolyte
Raw material	Lead dioxide	Lead	ABS	ABS	Rubber	Copper	Fiberglass	Sulfuric acid

General Features

- Absorbent Glass Mat (AGM) technology for efficient gas recombination of up to 99% and freedom from electrolyte maintenance or water adding.
- Not restricted for air transport-complies with IATA/ICAO Special Provision A67.
- UL-recognized component.
- Can be mounted in any orientation.
- Computer designed lead, calcium tin alloy grid for high power density.
- Long service life, float or cyclic applications.
- Maintenance-free operation.
- Low self discharge.

Dimensions and Weight

Length(mm / inch)	258 / 10.16
Width(mm / inch)	166 / 6.54
Height(mm / inch)	206 / 8.11
Total Height(mm / inch)	215 / 8.46
Approx. Weight(Kg / lbs)	24 / 52.9



Performance Characteristics

Nominal Voltage	12V
Number of cell	6
Design Life	10 years
Nominal Capacity 77°F(25°C)	
10 hour rate (7.41A, 10.8V)	74.1Ah
5 hour rate (13.4A, 10.5V)	67.0Ah
1 hour rate (49.5A, 9.6V)	49.5Ah
Internal Resistance	
Fully Charged battery 77°F(25°C)	5.7mOhms
Self-Discharge	
3% of capacity declined per month at 20°C(average)	
Operating Temperature Range	
Discharge	-20~60°C
Charge	-10~60°C
Storage	-20~60°C
Max. Discharge Current 77°F(25°C)	700A(5s)
Short Circuit Current	1800A
Charge Methods: Constant Voltage Charge 77°F(25°C)	
Cycle use	14.4-14.7V
Maximum charging current	22.5A
Temperature compensation	-30mV/°C
Standby use	13.6-13.8V
Temperature compensation	-20mV/°C

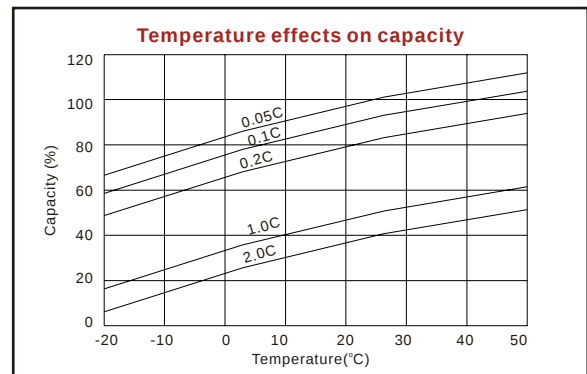
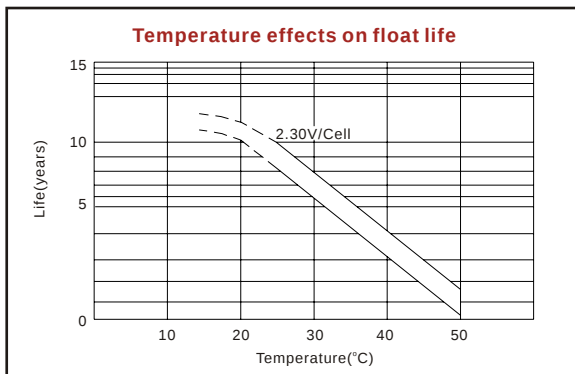
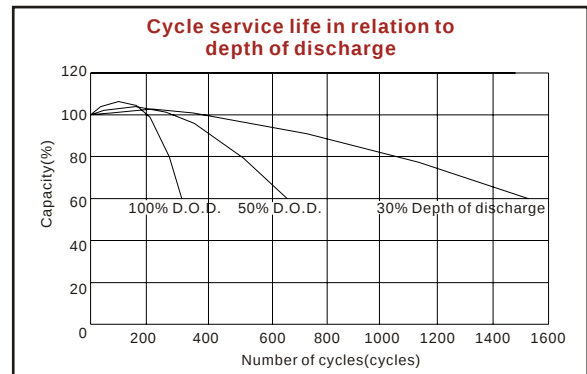
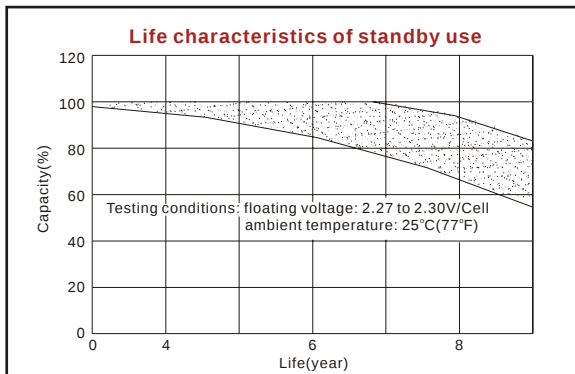
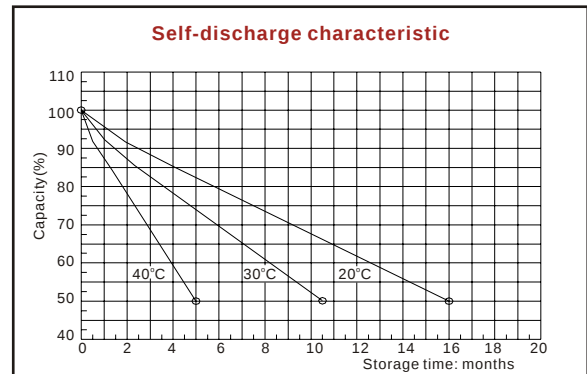
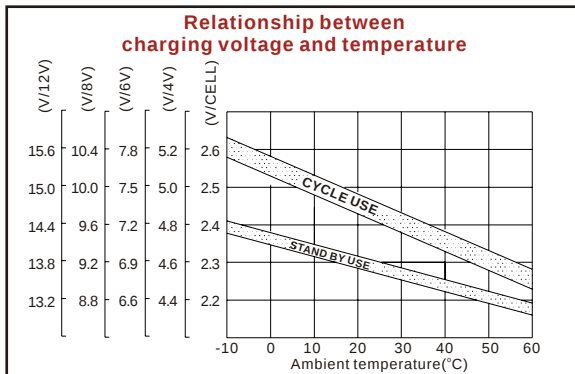
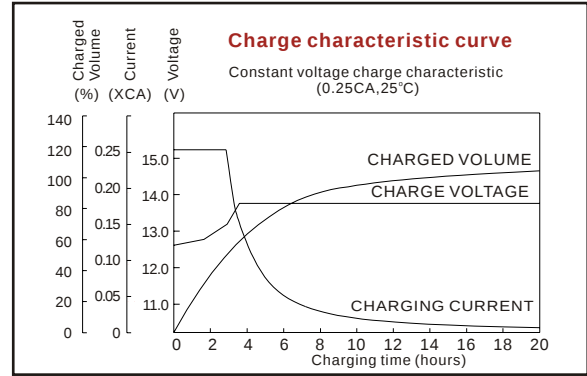
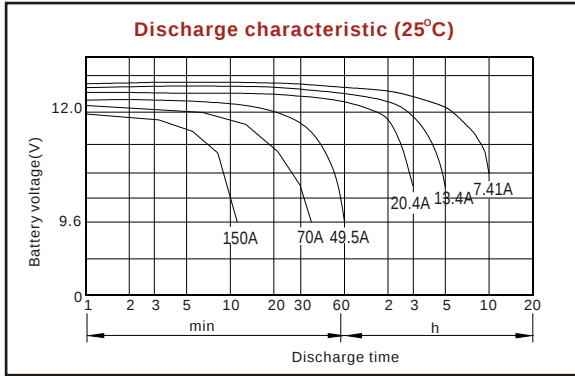
Discharge Constant Current (Amperes at 77°F25°C)

End Point Volts/Cell	5min	10min	15min	30min	45min	1h	3h	5h	10h
1.60V	228	171	133	79.8	60.5	49.5	21.6	14.2	7.54
1.65V	211	162	127	76.3	55.3	46.8	21.2	14.0	7.51
1.70V	196	152	118	75.1	53.9	46.2	20.8	13.8	7.48
1.75V	185	145	114	71.8	52.6	44.6	20.4	13.4	7.45
1.80V	171	133	109	71.3	52.2	42.8	19.6	13.2	7.41

Discharge Constant Power (Watts at 77°F25°C)

End Point Volts/Cell	5min	10min	15min	30min	45min	1h	2h	3h	5h
1.60V	392	301	239	154	118	94.3	53.4	39.8	26.7
1.65V	383	288	234	149	116	92.2	52.1	38.8	26.5
1.70V	356	278	230	141	109	88.5	50.9	38.5	25.9
1.75V	338	263	216	139	109	85.2	49.7	37.9	25.9
1.80V	324	251	206	138	104	82.9	49.0	37.6	25.7

(Note) The above characteristics data are average values obtained within three charge/discharge cycles not the minimum values.


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ISO9001:2000



MH25860



G4M19906-9202-E-16


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6FM90TD-X 12V 88.6Ah(10hr)

The rechargeable batteries are lead-lead dioxide systems. The dilute sulfuric acid electrolyte is absorbed by separators and plates and thus immobilized. Should the battery be accidentally overcharged producing hydrogen and oxygen, special one-way valves allow the gases to escape thus avoiding excessive pressure build-up. Otherwise, the battery is completely sealed and is, therefore, maintenance-free, leak proof and usable in any position.



Battery Construction

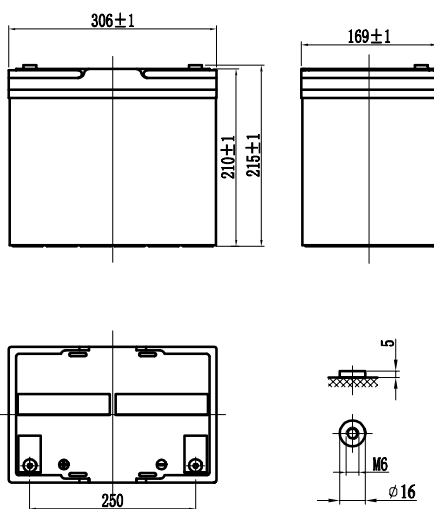
Component	Positive plate	Negative plate	Container	Cover	Safety valve	Terminal	Separator	Electrolyte
Raw material	Lead dioxide	Lead	ABS	ABS	Rubber	Copper	Fiberglass	Sulfuric acid

General Features

- Absorbent Glass Mat (AGM) technology for efficient gas recombination of up to 99% and freedom from electrolyte maintenance or water adding.
- Not restricted for air transport-complies with IATA/ICAO Special Provision A67.
- UL-recognized component.
- Can be mounted in any orientation.
- Computer designed lead, calcium tin alloy grid for high power density.
- Long service life, float or cyclic applications.
- Maintenance-free operation.
- Low self discharge.

Dimensions and Weight

Length(mm / inch)	306 / 12.05
Width(mm / inch)	169 / 6.65
Height(mm / inch)	210 / 8.27
Total Height(mm / inch)	215 / 8.46
Approx. Weight(Kg / lbs)	30 / 66.1



Performance Characteristics

Nominal Voltage	12V
Number of cell	6
Design Life	10 years
Nominal Capacity 77°F(25°C)	
10 hour rate (8.86A, 10.8V)	88.6Ah
5 hour rate (16.1A, 10.5V)	80.5Ah
1 hour rate (61.1A, 9.6V)	61.1Ah
Internal Resistance	
Fully Charged battery 77°F(25°C)	5.2mOhms
Self-Discharge	
3% of capacity declined per month at 20°C(average)	
Operating Temperature Range	
Discharge	-20~60°C
Charge	-10~60°C
Storage	-20~60°C
Max. Discharge Current 77°F(25°C)	800A(5s)
Short Circuit Current	2000A
Charge Methods: Constant Voltage Charge 77°F(25°C)	
Cycle use	14.4-14.7V
Maximum charging current	27A
Temperature compensation	-30mV/°C
Standby use	13.6-13.8V
Temperature compensation	-20mV/°C

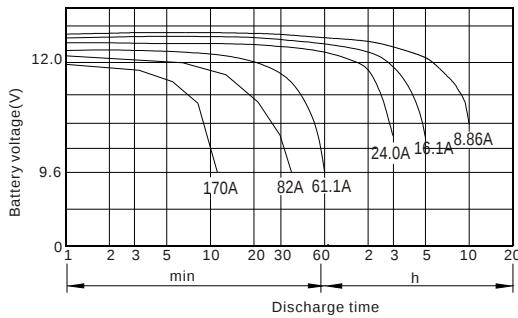
Discharge Constant Current (Amperes at 77°F25°C)

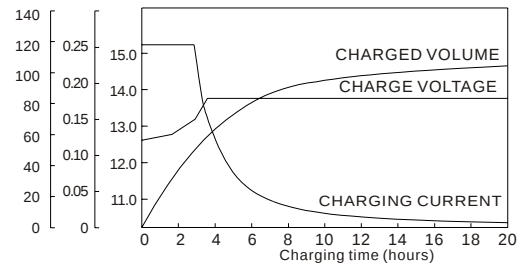
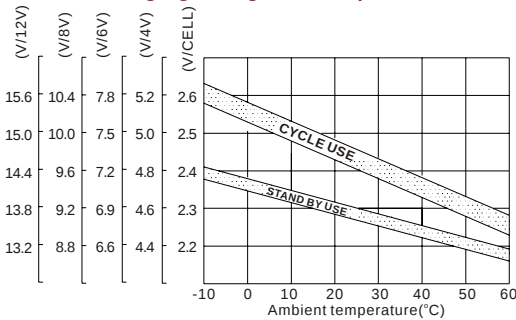
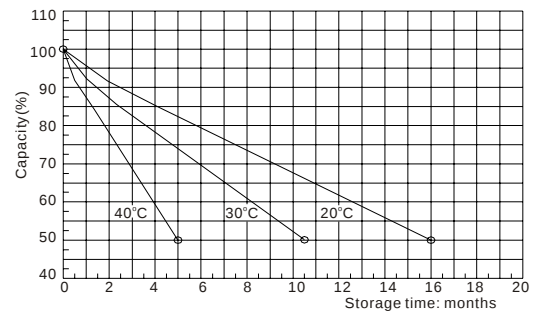
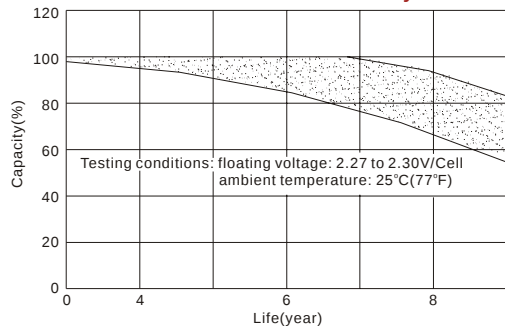
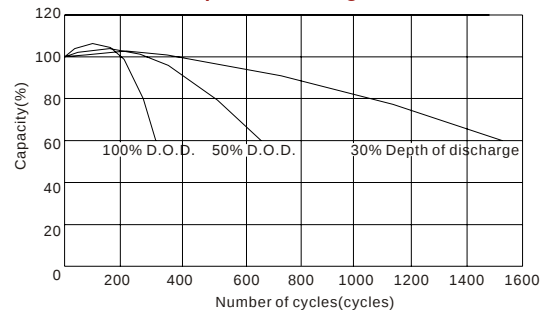
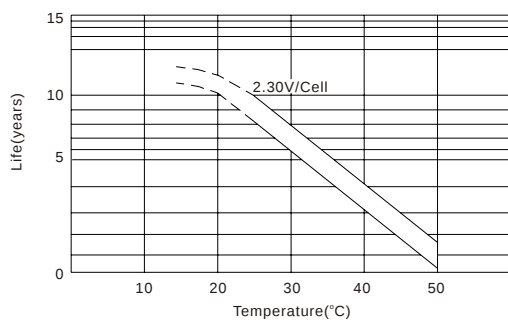
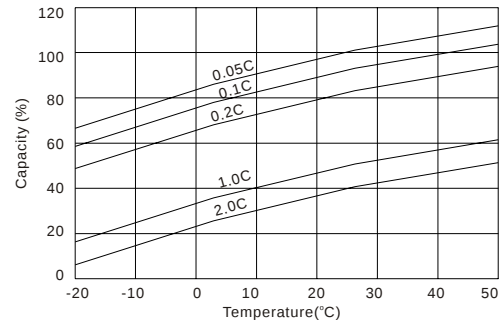
End Point Volts/Cell	5min	10min	15min	30min	45min	1h	3h	5h	10h
1.60V	274	210	168	97.6	73.2	61.1	26.7	17.1	8.98
1.65V	256	200	157	92.7	70.1	55.8	25.7	16.9	8.96
1.70V	240	179	149	87.8	66.6	55.2	24.8	16.6	8.93
1.75V	217	168	138	85.2	64.2	53.8	24.0	16.1	8.90
1.80V	193	157	128	82.1	61.8	51.6	22.9	15.6	8.86

Discharge Constant Power (Watts at 77°F25°C)

End Point Volts/Cell	5min	10min	15min	30min	45min	1h	2h	3h	5h
1.60V	491	359	299	184	142	115	64.7	47.8	32.1
1.65V	479	350	294	176	136	110	63.3	47.7	31.7
1.70V	430	332	276	167	126	105	61.0	46.3	31.3
1.75V	405	330	273	163	125	101	59.0	45.0	30.5
1.80V	372	302	259	159	123	99.5	58.3	44.8	30.1

(Note) The above characteristics data are average values obtained within three charge/discharge cycles not the minimum values.

Discharge characteristic (25°C)

Charge characteristic curve

 Constant voltage charge characteristic
(0.25CA, 25°C)

Relationship between charging voltage and temperature

Self-discharge characteristic

Life characteristics of standby use

Cycle service life in relation to depth of discharge

Temperature effects on float life

Temperature effects on capacity

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ISO 9001:2000



MH25860



G4M19906-9202-E-16


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6FM100D-X 12V 95.5Ah(10hr)

The rechargeable batteries are lead-lead dioxide systems. The dilute sulfuric acid electrolyte is absorbed by separators and plates and thus immobilized. Should the battery be accidentally overcharged producing hydrogen and oxygen, special one-way valves allow the gases to escape thus avoiding excessive pressure build-up. Otherwise, the battery is completely sealed and is, therefore, maintenance-free, leak proof and usable in any position.



Battery Construction

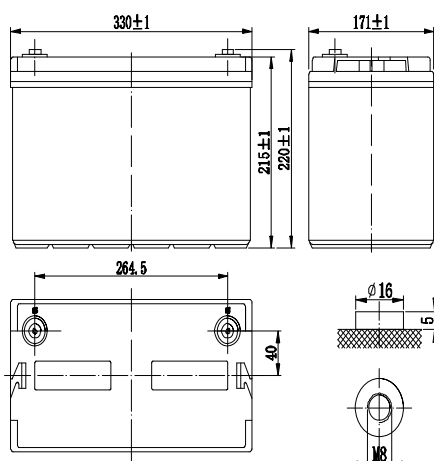
Component	Positive plate	Negative plate	Container	Cover	Safety valve	Terminal	Separator	Electrolyte
Raw material	Lead dioxide	Lead	ABS	ABS	Rubber	Copper	Fiberglass	Sulfuric acid

General Features

- Absorbent Glass Mat (AGM) technology for efficient gas recombination of up to 99% and freedom from electrolyte maintenance or water adding.
- Not restricted for air transport-complies with IATA/ICAO Special Provision A67.
- UL-recognized component.
- Can be mounted in any orientation.
- Computer designed lead, calcium tin alloy grid for high power density.
- Long service life, float or cyclic applications.
- Maintenance-free operation.
- Low self discharge.

Dimensions and Weight

Length(mm / inch)	330 / 12.99
Width(mm / inch)	171 / 6.73
Height(mm / inch)	215 / 8.46
Total Height(mm / inch)	220 / 8.66
Approx. Weight(Kg / lbs)	32 / 70.5



Performance Characteristics

Nominal Voltage	12V
Number of cell	6
Design Life	10 years
Nominal Capacity 77°F(25°C)	
10 hour rate (9.55A, 10.8V)	95.5Ah
5 hour rate (17.4A, 10.5V)	87.0Ah
1 hour rate (65.2A, 9.6V)	65.2Ah
Internal Resistance	
Fully Charged battery 77°F(25°C)	5mOhms
Self-Discharge	
3% of capacity declined per month at 20°C(average)	
Operating Temperature Range	
Discharge	-20~60°C
Charge	-10~60°C
Storage	-20~60°C
Max. Discharge Current 77°F(25°C)	900A(5s)
Short Circuit Current	2100A
Charge Methods: Constant Voltage Charge 77°F(25°C)	
Cycle use	14.4-14.7V
Maximum charging current	30A
Temperature compensation	-30mV/°C
Standby use	13.6-13.8V
Temperature compensation	-20mV/°C

Discharge Constant Current (Amperes at 77°F25°C)

End Point Volts/Cell	5min	10min	15min	30min	45min	1h	3h	5h	10h
1.60V	298	220	180	105	78.9	65.2	27.6	18.9	9.75
1.65V	281	212	173	101	77.1	61.6	27.4	18.2	9.70
1.70V	257	192	159	93.6	71.5	60.6	26.9	17.9	9.65
1.75V	230	180	148	90.7	69.9	59.6	26.6	17.4	9.60
1.80V	210	168	139	88.7	68.6	56.5	25.1	17.1	9.55

Discharge Constant Power (Watts at 77°F25°C)

End Point Volts/Cell	5min	10min	15min	30min	45min	1h	2h	3h	5h
1.60V	520	376	311	194	147	122	69.7	52.3	35.6
1.65V	491	364	306	183	143	116	66.9	50.7	35.2
1.70V	454	346	290	178	134	112	65.9	50.4	34.8
1.75V	419	339	285	173	131	109	63.7	48.6	34.2
1.80V	394	316	271	167	128	102	61.7	48.0	33.8

(Note) The above characteristics data are average values obtained within three charge/discharge cycles not the minimum values.

