



MS12-33H (12V 33Ah)

MS12-33H is a general purpose battery with 10 years design life time in float charging use. As with all MASTERSAFE batteries, all MS models are rechargeable, highly efficient, leak proof and maintenance free.



Specification

Cells Per Unit	6
Voltage Per Unit	12
Capacity	33Ah@10hr-rate to 1.75V per cell @25°C
Weight	Approx. 10.2 Kg
Max. Discharge Current	165 A (5 sec)
Internal Resistance	Approx. 9 mΩ
Operating Temperature Range	Discharge: -20°C -60°C Charge : 0°C-50°C Storage: -20°C-60°C
Normal Operating Temperature Range	25°C ± 5°C
Float charging Voltage	13.6 to 13.8 V DC/unit Average at 25°C
Recommended Maximum Charging Current Limit	9.9 A
Equalization and Cycle Service	14.4 to 15.0 V DC/unit Average at 25°C
Self Discharge	RITAR batteries can be stored for more than 6 months at 25°C. Please charge batteries before using. For higher temperature, the time interval will be shorter.
Terminal	Terminal F7/F11
Container Material	A.B.S. (UL94-HB) Flammability resistance of UL94-V1 can be available upon request.



Dimensions

Unit: mm

DISTRIBUIDOR:

REGULACIÓN Y SISTEMAS DE ENERGÍA

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Constant Current Discharge Characteristics Unit: A (25°C)

F.V /Time	5MIN	10M IN	15MIN	30M IN	1HR	2HR	3HR	4HR	5HR	8HR	10HR	20HR
1.60 V	123	88	64	38	21.5	13.2	8.6	7.1	5.6	4.1	3.4	1.8
1.67 V	120	84	63	37	21.4	13.1	8.6	7.1	5.6	4.0	3.4	1.8
1.70 V	113	81	62	37	21.2	13.0	8.5	7.1	5.5	4.0	3.4	1.7
1.75 V	102	75	59	36	21.0	12.9	8.5	7.0	5.5	4.0	3.3	1.7
1.80 V	92	68	54	34	20.5	12.6	8.3	6.8	5.4	3.9	3.3	1.7
1.85 V	80	61	49	32	19.4	12.1	7.9	6.5	5.1	3.7	3.2	1.6

Constant Power Discharge Characteristics Unit: W (25°C)

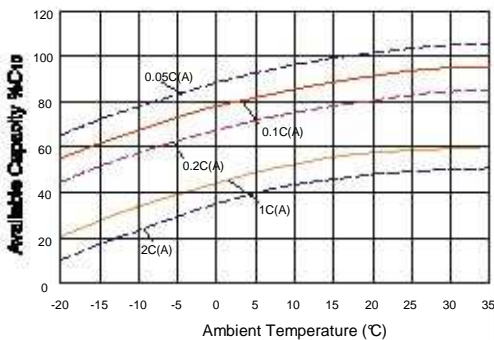
F.V /Time	5MIN	10M IN	15MIN	30M IN	1HR	2HR	3HR	4HR	5HR	8HR	10HR	20HR
1.60 V	221	162	119	71	40.9	25.2	16.6	13.7	10.8	7.9	6.4	3.4
1.67 V	217	155	117	70	40.7	25.1	16.5	13.7	10.8	7.8	6.4	3.4
1.70 V	205	149	115	70	40.4	24.9	16.4	13.6	10.7	7.8	6.3	3.3
1.75 V	184	138	110	68	40.0	24.7	16.3	13.5	10.6	7.7	6.3	3.3
1.80 V	166	125	101	65	39.0	24.3	15.9	13.2	10.5	7.5	6.2	3.3
1.85 V	143	111	90	61	37.0	23.2	15.1	12.5	9.9	7.3	6.0	3.1

All mentioned values are average values.

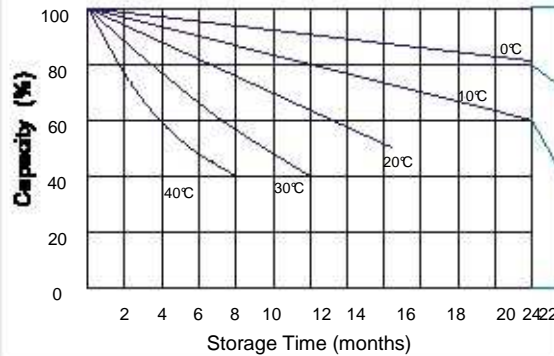
MS12-33H

12V33Ah

Temperature effects curve



Storage characteristic



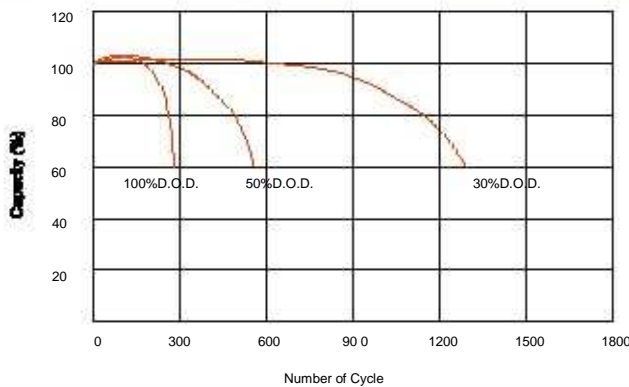
Supplementary charge required (Carry out supplementary charge before use if 100% capacity is required)

Supplementary charge required before use. This supplementary charge will help to recover the capacity and should be made as early as possible.

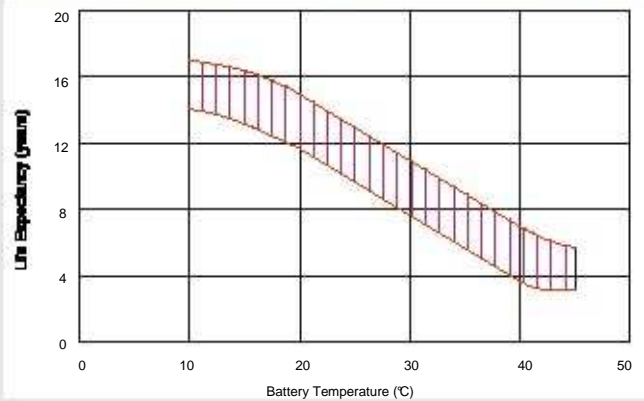
Supplementary charge may often fail to recover the capacity. The battery should never be left standing till this state is reached

Supplementary charge and storage guide lines

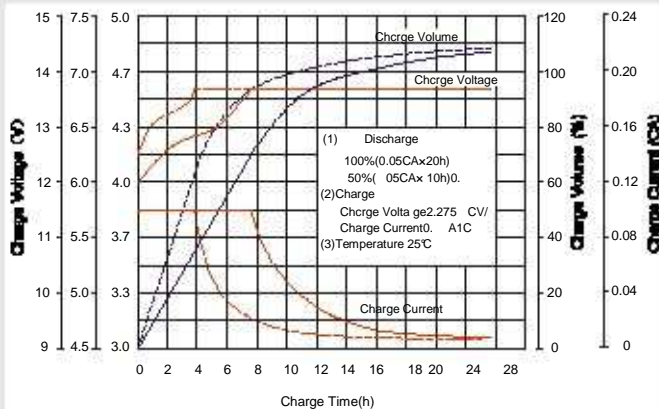
Life characteristics of cyclic use



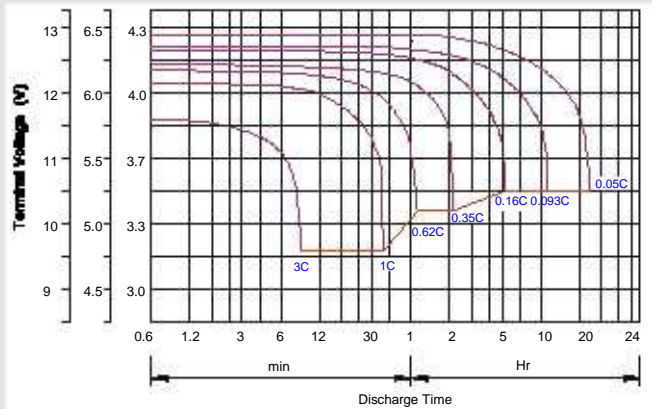
Effect of temperature on long term float life



Charge characteristic Curve for standby use



Discharge characteristic Curve



Charging Procedures(12 V series)

Application	Charge Voltage (V)			Max. Charge Current
	Temperature	Set point	Allowable range	
Cycle Use	25°C	14.7	14.4-15.0	0.3C
Standby	25°C	13.7	13.6-13.8	0.3C

Discharge Current VS. Discharge Voltage

Final Discharge Voltage V/cell	1.75V	1.70V	1.60V
Discharge Current (A)	(A) * 0.2C	0.2C < (A) < 1.0C	(A) * 1.0C

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

Charging Method:

Constant Voltage	-0.2Cx2h +14.4-15.0V,24h,Max. Current 0.3CA
Constant Current	-0.2Cx2h +0.1CAx12h
Fast	-0.2Cx2h +0.3CAx4h

Charging Procedures(6V series)

Application	Charge Voltage (V)			Max. Charge Current
	Temperature	Set point	Allowable range	
Cycle Use	25°C	7.35	7.25-7.45	0.3C
Standby	25°C	6.85	6.8-6.9	0.3C

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