MSE SERIES

VALVE REGULATED SEALED TYPE STATIONARY LEAD-ACID BATTERY

Manufactured in Technical Collaboration with

Shin Kobe-Denki, Japan
The maker of Hitachi Batteries

The Furukawa Battery Co. Ltd., Japan

TÜV CERT ISO 14001 : 2004

TÜV CERT ISO / TS 16949 . 2002

FEATURES

COMPLETE MAINTENANCE FREE

Special sealed method absorbs oxygen gas generation during charge to the negative plate which eliminates water addition during service life.
Special alloy plate prevents self discharge and therefore equalizing charge will not be necessary.

HIGH PERFORMANCE

Reduced electrical resistance of lead part and new adoption of the special separator with low resistance improve the higher rate discharge characteristics.

LONG LIFE

Special alloy used for the plate and new structure of the battery extend substantially the design life. (10 years or longer.)

SAFETY

Sealed structure coupled with the absorption of electrolyte into the plates and separators make the battery completely leak-proof and the electrolyte will not leak even when the battery is placed sideway accidentally.
A cover wholly conceals over the terminals and connectors on the top of the battery will be placed after installation to prevent short circuit.

SPACE SAVING

Compact size and maintenance free characteristics of the battery substantially save the installation space. (Approximately 30% less compared to conventional type stationary batteries.)

APPLICATIONS

- Cycling / Float service
- Residential
- Telecommunications
- Refrigeration
- Photovoltaic
- Solar
- Wind
- Engine Starting
- Wheelchair
- Electric Vehicle
- Floor Cleaning Machines
- Water Pumping
- Golf Caddy
- Portable Medical Equipment
- Cathodic Protection
- Boats
- General Marines
- Navigation

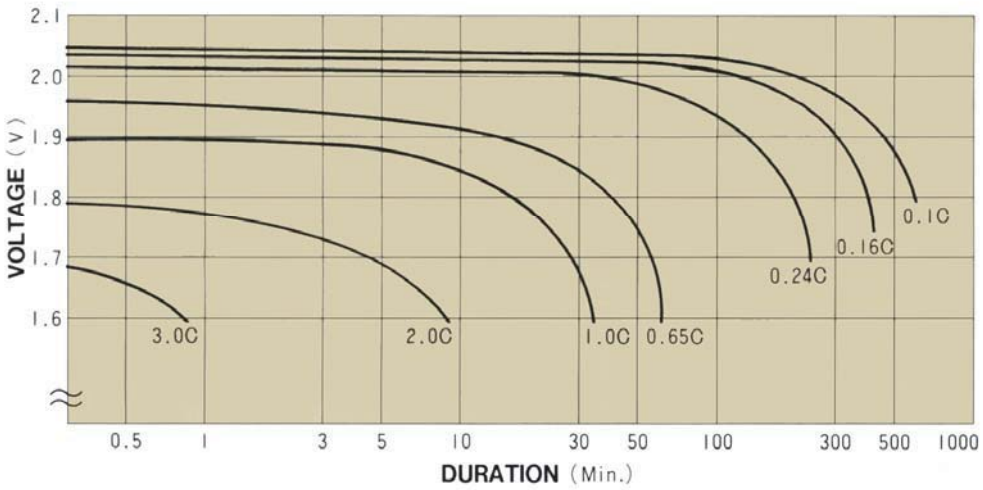
Inducing many other deep cycle applications

SPECIFICATIONS

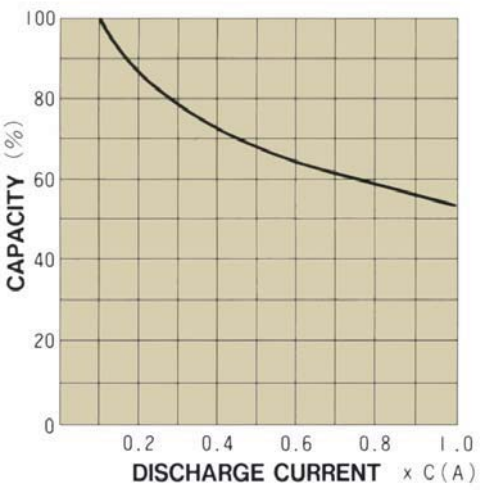
Nominal Voltage	2, 6 & 12 volts
Design Life	10 years
Operating Temperatures	-20°C to 50°C
Grid alloy	Calcium/Tin lead alloy
Plates	Flat pasted
Separator	Microporous Duroplastic
Active material	Very high purity lead
Case and cover	ABS (VO on request)
Charge Voltage	Float 2.27 – 2.30 VPC @ 25°C Cycling 2.35 @ 25°C Max. 2.4 VPC Max ripple 0.05C (A)
Electrolyte	Sulphuric acid analytical grade
Venting Valve	EPDM Rubber 1.5 to 2.0 psi (10.5 – 14 KPa) release pressure. Resealing at 1psi (7KPa)
Terminal	Various types. Epoxy sealed by extended mechanical paths
Torque setting	The recommended torque value for all types is 5 – 7 Nm
Cables	Insulated cables / connectors supplied on request.

At FUKUDA® Storage Battery, we keenly encourage environmental awareness. PLEASE follow guidelines for the recycling / disposal of lead.

DISCHARGE CHARACTERISTICS



DISCHARGE CURRENT VS CAPACITY



SEALING PRINCIPLE

1. The electrolyte is being absorbed and retained both in the active material of the positive and negative paste plates and in the microporous glass-fiber separators.
2. In the last stage of charging, water decomposition reaction makes positive plates generate oxygen gas.
3. This oxygen gas passes through the separator and comes into contact with the negative plates.
4. As a result, oxygen gas reacts with the active material of negative plates to become water again.
5. Thus, no gas is emitted from the battery during charging.
6. If an excessive internal pressure is generated by overcharge, the safety valve works to release the pressure

COMPARISON TABLE BETWEEN CONVENTIONAL TYPE AND SEALED TYPE BATTERY

ITEM		CONVENTIONAL TYPE	SEALED TYPE
Plate Type (Positive)		Tubular Plate (CS Type) Pasted Plate (PS Type)	Pasted Plate
Grid Alloy		Lead-Antimony	Lead-Calcium
Capacity		Tubular **2** V : **15** Ah – **8010** Ah **6** V : **15** Ah – **90** Ah Pasted **2** V : **12** Ah – **4400** Ah **6** V : **12** Ah – **108** Ah	**2** V : **150** Ah – **3000** Ah **6** V : **110** Ah – **200** Ah **12** V : **33** Ah – **110** Ah
C	**High Rate Discharge**	Tubular : Normal Pasted : Good	Best
C	**Self Discharge**	Below **0.5**% per day	Below **0.1**% per day (Long Shelf Life)
C	**Design Life**	CS : **15** years PS : **13** years	**10** years
M	**Floating Voltage**	CS & PS : **2.15** V per cell	**2.23** V per cell
M	**Equalizing Charge**	Once every **3** to **6** month	Not required
M	**Water Addition**	Once every **6** month	Not required
M	**Measurement of S.G**	Once every month	Not required
M	**Level Check**	Once every month	Not required
Equipment Volume		**100**%	**60 – 70**%
Required floor area		**100**%	**60 – 70**%

C → Characteristics
M → Maintenance

$$H_2O \rightarrow 2H^+ + \frac{1}{2}O_2 + 2e^- \longrightarrow \text{Positive Plate}$$

$$Pb + \frac{1}{2}O_2 + SO_4^{2-} + 2H^+ \rightarrow PbSO_4 + H_2O$$

$$PbSO_4 + 2e^- \rightarrow Pb + SO_4^{2-}$$

} Negative Plate

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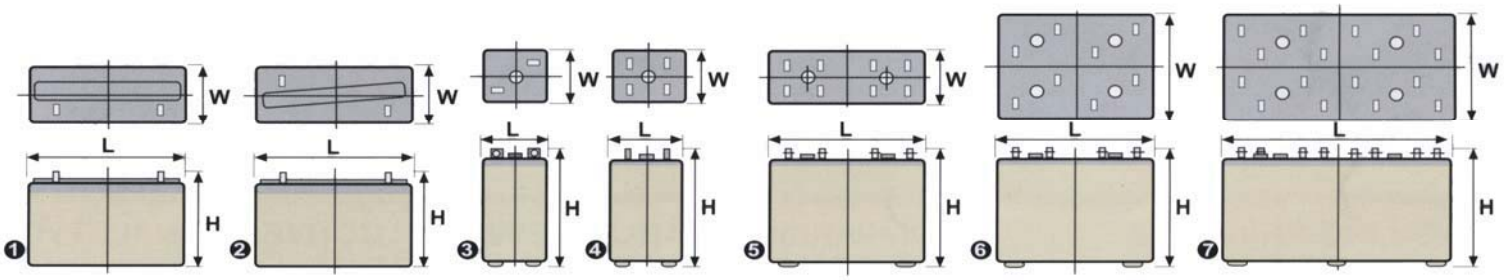

TYPE	VOLTAGE (V)	CAPACITY (Ah)		DIMENSION (mm)			WEIGHT (APPROX. kg)	FIG
		10 HR	1 HR	Length	Width	Height		
MSE-33	12	33	21.5	195	130	166	10.9	❶
MSE-55	12	55	35.8	229	138	210	17.5	❶
MSE-75	12	75	48.8	259	168	214	21.5	❶
MSE-88	12	88	57.2	260	168	214	27.0	❶
MSE-110	12	110	71.5	332	174	213	32.2	❶
MSE-110	6	110	71.5	193	168	205	16.0	❷
MSE-150	6	150	104.0	260	180	245	26.0	❷
MSE-200	6	200	130.0	318	170	225	31.0	❷
MSE-200	4	200	130.0	225	173	329	30.0	❸
MSE-150	2	150	97.5	172	102	221	13.0	❸
MSE-200	2	200	130.0	170	106	330	15.0	❸
MSE-300	2	300	195.0	170	150	330	22.0	❸
MSE-400	2	400	260.0	210	175	330	27.0	❸
MSE-500	2	500	325.0	241	175	330	36.0	❹
MSE-600	2	600	390.0	301	175	330	38.0	❹
MSE-800	2	800	520.0	410	175	330	72.0	❺
MSE-1500	2	1500	975.0	400	350	345	113	❻
MSE-2000	2	2000	1300	490	350	345	143	❻
MSE-3000	2	3000	1950	710	350	345	216	❼

REQUIRED CAPACITY (Ah/10HR)	COMBINATION	REQUIRED CAPACITY (Ah/10HR)	COMBINATION
200	MSE 200	700	MSE 500-2 + MSE 200
300	MSE 300	900	MSE 500-2 + MSE 400-2
400	MSE 400	1000	MSE 500-2 x 2
500	MSE 500	1200	MSE 600-2 x 2
600	MSE 600	1600	MSE 800-2 x 2
800	MSE 800	1800	MSE 600-2 x 3
2000	MSE 2000	2500	MSE 2000-2 + MSE 500