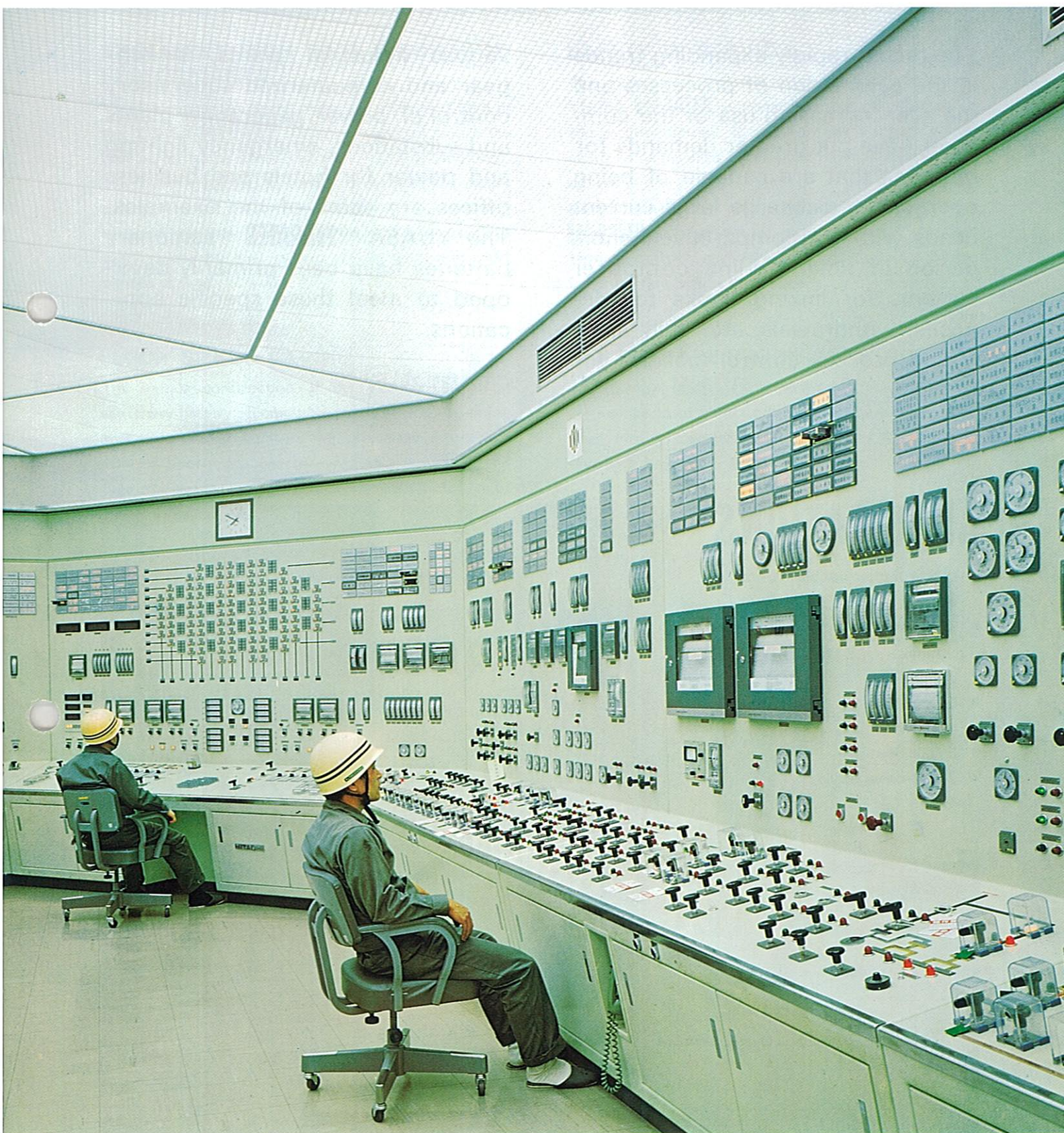




YUASA **Hi-RATER** (Type HS) STATIONARY BATTERIES





YUASA Hi-RATER (Type HS)
STATIONARY BATTERIES

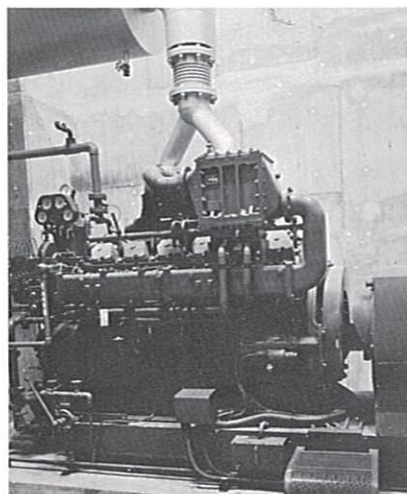
FOR HIGH RATE DISCHARGE APPLICATIONS

The recent rapidly expanding trends in the automation of processes and the ever increasing use of the computer have put greater demands for batteries that are capable of being operated to discharge large current needs within a comparatively short period of time. On-line computer systems for linking banks for deposits, withdrawals, etc., fully automated process control facilities for

various industrial plants, switch-gear and computerized supervisory control of power generating plants and substations, emergency lighting and power for hotels and business offices are some of the examples. The YUASA **Hi-RATER** stationary batteries have been primarily developed to meet these specific applications.

APPLICATIONS

- UPS (Uninterruptible Power Systems)
- Switchgear Control (tripping and closing)
- Supervisory Control and Alarms
- Emergency Lighting and Power
- Instrumentations
- Engine Starting
- Telecommunications



SPECIFIC FEATURES

EXCELLENT HIGH RATE DISCHARGE PERFORMANCE

YUASA's patented pasted plates and separators used in the YUASA **Hi-RATER** stationary batteries ensure the best performance under high rate discharge conditions. The YUASA **Hi-RATER** stationary batteries can supply approximately 1.6 times more power than conventional lead-acid stationary batteries when used in applications characterized by high current requirements over short periods of time.

FLOOR SPACE SAVING

The unique construction of the YUASA **Hi-RATER** stationary battery accomplishes minimum internal resistance in spite of its compact size and thus approximately 40% of floor space can be saved with the **Hi-RATER** type of batteries as compared with conventional type of batteries.

DEPENDABLE POWER

The pasted type plates superbly impregnated with power for a wider variety of applications have, over the years, been carefully developed and constantly improved for proven dependability.

LOW OVERALL COST

The specific features of the YUASA **Hi-RATER** stationary batteries guarantee high performance characteristics equivalent to that of the more expensive nickel-cadmium batteries, and furthermore, the low overall costs compared with other types of batteries make them economically most viable.

EASY INSTALLATION AND MAINTENANCE

The shipment under dry-charged condition avoids elaborate initial charge. The "semi-sealed" construction minimizes evaporation of electrolyte and thus the topping-up frequency is greatly reduced. These are additional cost saving factors.

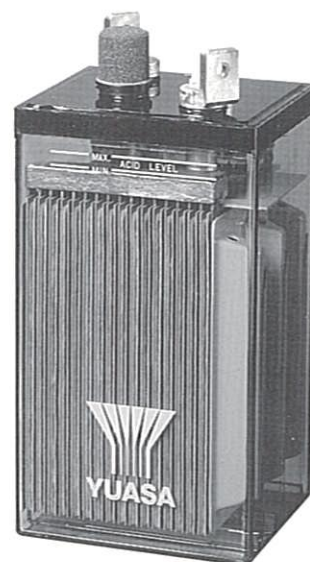
SAFETY IN SERVICE

The microporous ceramic exhauster plugs make the YUASA **Hi-RATER** stationary batteries non-acid-spray and explosion-proof. It enables other electrical equipments to be installed in the same room without damage or harm.

An additional safety precaution special to the YUASA **Hi-RATER** is that all intercell connectors and cell terminal posts are covered with plastic insulation sheaths for protection against short circuits.

EARTHQUAKE-PROOF CONSTRUCTION

The YUASA **Hi-RATER** battery banks are available in earthquake-proof constructions which have been developed through our long experience with frequent and severe earthquakes in Japan.



Type HS 400

A photograph differs from appearance in part



CELL PERFORMANCE AND CONSTRUCTION

CELL PERFORMANCE AND CONSTRUCTION

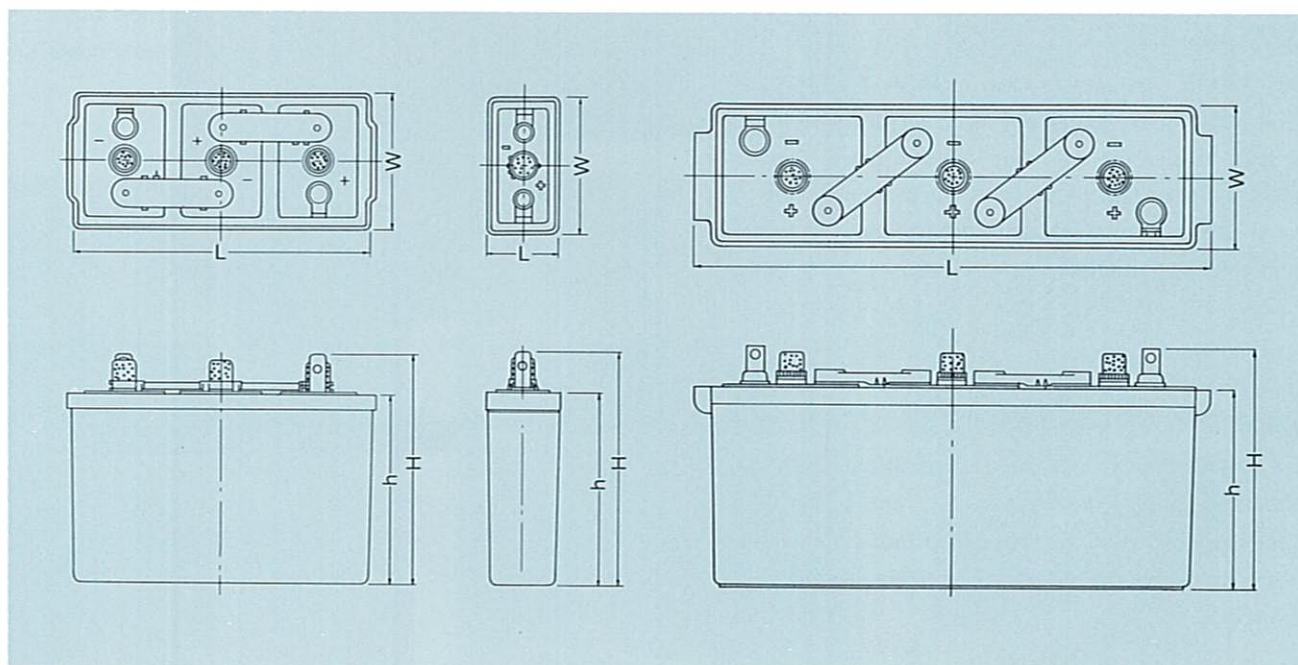
Capacity range [Ah(10HR), FV=1.8V]		30~2500 [Temp:25°C(77° F)]
Voltage (V/Cell)	Nominal	2
	Floating	2.18
	Boost/Equalizing	2.3
Construction (Others: as per mark * mentioned below.)	Positive Plate	Pasted type
	Negative Plate	Pasted type
	Separators	Plastic
	Retainers	Glassfiber mat
	Electrolyte	Dilute sulphuric acid
	Specific gravity	Filling and fully charged specific gravity 1.240 at 20° C(68°F) for dry-charged batteries.
	Container	Transparent plastic, marked with max. and min. electrolyte level lines
	Cell cover	Plastic
	Cell terminal posts	Lead-antimony alloy
polarity indication		Marked on cell cover
Max discharge current (1 minute)		3CA (C:indicates battery capacity)
Standard		JIS C 8704, SBA-3007

- * ● **Sediment space** : Large space to take care of sediment built-up throughout the full service life of the battery.
- **Exhauster plug** : Microporous ceramic plug, imperative for explosion-proof construction.
- **Multi-cell 6V unit** : Available for capacities less than 120AH.
- **Cell connection** : Bolt screwing type (ISO metric thread)
- **Intercell connector** : Lead-plated copper strap with plastic insulating sheath for types HS-150 ~ HS-2500. Insulated flexible cable with terminals for smaller cells and multi-cell units.

● Types HS30 ~ 80-6
(6V unit)

● Types HS30 ~ 80-2

● Types HS100 ~ 120-6
(6V unit)

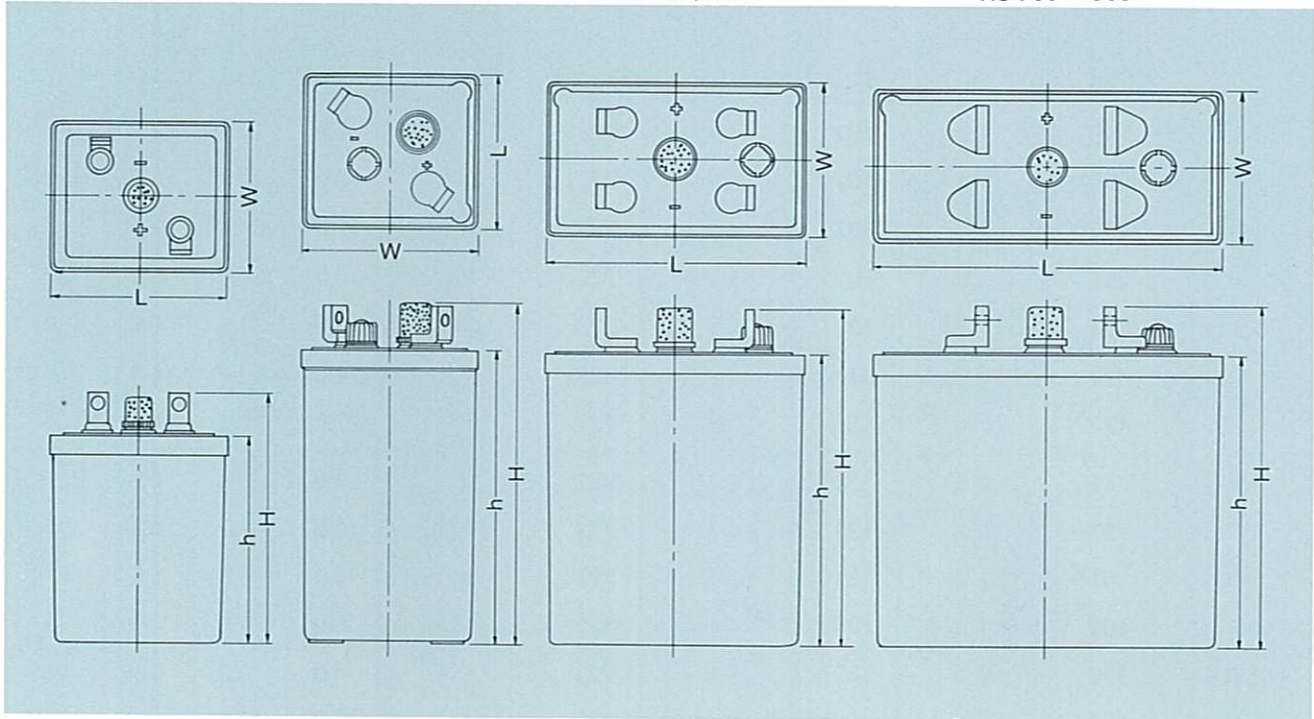


• Types
HS100 ~ 120-2

• Types
HS-150 ~ 400

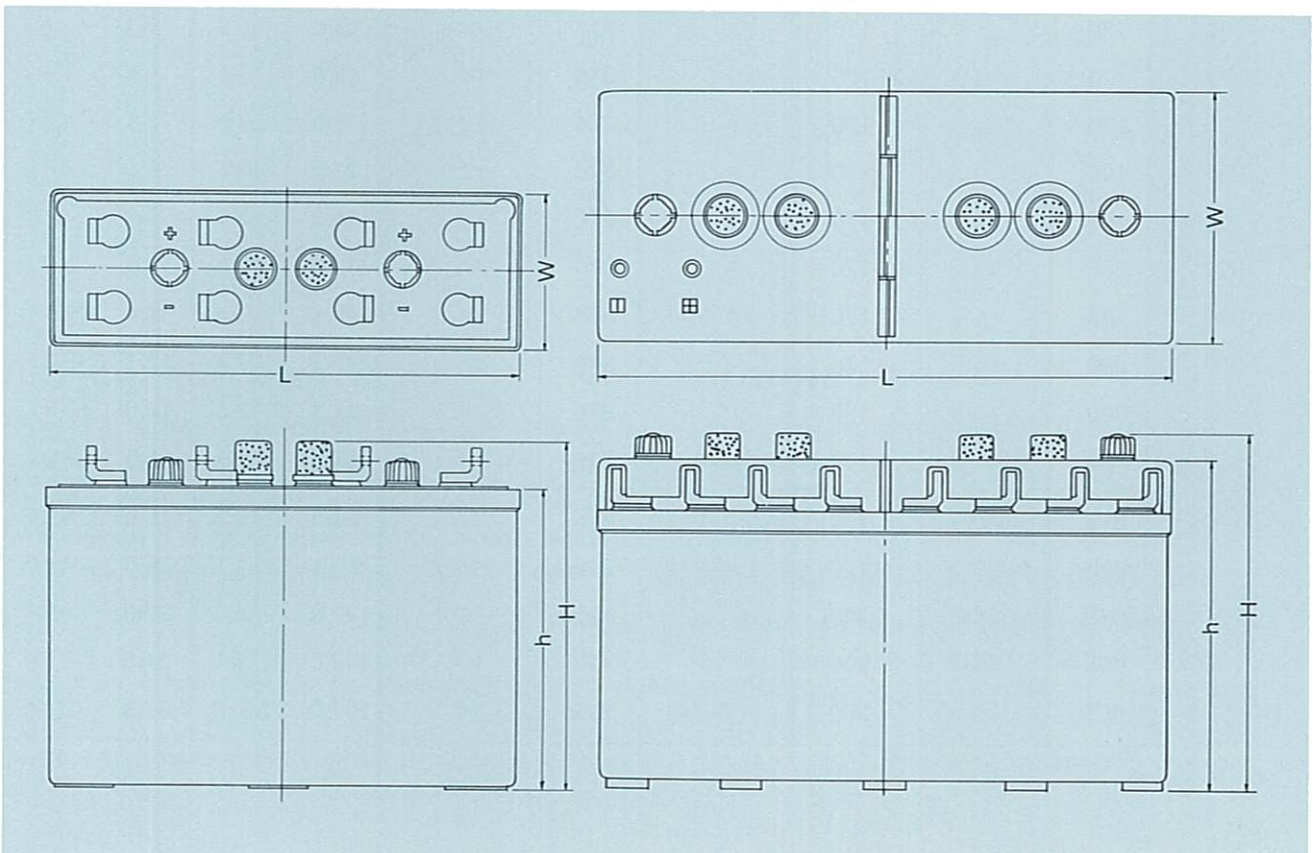
• Types
HS-500, 600

• Types
HS-700 ~ 900



• Types HS-1000 ~ 1200

• Types HS-1500 ~ 2500





CELL DIMENSIONS AND WEIGHTS

Type	Overall Dimensions						Weight with Electrolyte		Volume of Electrolyte	
	Length		Width		Height					
	mm	inch	mm	inch	mm	inch	kg.	lb.	litre	gal.
HS 30-6*	149	5 ⁵ / ₆₄	132	5 ¹³ / ₆₄	223	8 ²⁵ / ₃₂	8.5	18.7	2.0	0.51
HS 40-6*	200	7 ⁷ / ₈	132	5 ¹³ / ₆₄	223	8 ²⁵ / ₃₂	10.0	22.1	2.3	0.59
HS 50-6*	200	7 ⁷ / ₈	132	5 ¹³ / ₆₄	223	8 ²⁵ / ₃₂	11.0	24.3	2.3	0.59
HS 60-6*	252	9 ⁵⁹ / ₆₄	132	5 ¹³ / ₆₄	223	8 ²⁵ / ₃₂	14.0	30.9	3.0	0.77
HS 80-6*	303	11 ⁵⁹ / ₆₄	132	5 ¹³ / ₆₄	223	8 ²⁵ / ₃₂	17.0	37.5	3.6	0.92
HS 100-6*	472	18 ³⁷ / ₆₄	133	5 ¹³ / ₆₄	223	8 ²⁵ / ₃₂	24.0	52.9	5.8	1.48
HS 120-6*	472	18 ³⁷ / ₆₄	133	5 ¹³ / ₆₄	223	8 ²⁵ / ₃₂	27.0	59.5	5.6	1.43
HS 30-2	67	2 ⁴¹ / ₆₄	131	5 ⁵ / ₃₂	223	8 ²⁵ / ₃₂	3.0	6.6	0.8	0.20
HS 40-2	67	2 ⁴¹ / ₆₄	131	5 ⁵ / ₃₂	223	8 ²⁵ / ₃₂	3.5	7.7	0.8	0.20
HS 50-2	67	2 ⁴¹ / ₆₄	131	5 ⁵ / ₃₂	223	8 ²⁵ / ₃₂	4.0	8.8	0.8	0.20
HS 60-2	102	4 ¹ / ₆₄	132	5 ¹³ / ₆₄	223	8 ²⁵ / ₃₂	5.0	11.0	1.2	0.31
HS 80-2	102	4 ¹ / ₆₄	132	5 ¹³ / ₆₄	223	8 ²⁵ / ₃₂	6.0	13.2	1.2	0.31
HS 100-2	154	6 ¹ / ₁₆	133	5 ¹³ / ₆₄	223	8 ²⁵ / ₃₂	8.0	17.6	1.9	0.49
HS 120-2	154	6 ¹ / ₁₆	133	5 ¹³ / ₆₄	223	8 ²⁵ / ₃₂	9.0	19.8	1.9	0.49
HS-150	120	4 ⁴⁷ / ₆₄	170	6 ¹¹ / ₁₆	376	14 ⁵¹ / ₆₄	13.6	29.8	4.3	1.13
HS-200	120	4 ⁴⁷ / ₆₄	170	6 ¹¹ / ₁₆	376	14 ⁵¹ / ₆₄	15.0	33.1	4.0	1.06
HS-250	120	4 ⁴⁷ / ₆₄	170	6 ¹¹ / ₁₆	376	14 ⁵¹ / ₆₄	16.5	36.4	3.6	0.95
HS-300	195	7 ⁴³ / ₆₄	170	6 ¹¹ / ₁₆	376	14 ⁵¹ / ₆₄	22.2	48.9	6.3	1.61
HS-400	195	7 ⁴³ / ₆₄	170	6 ¹¹ / ₁₆	376	14 ⁵¹ / ₆₄	25.3	55.8	5.6	1.43
HS-500	285	11 ⁷ / ₃₂	170	6 ¹¹ / ₁₆	376	14 ⁵¹ / ₆₄	33.0	72.8	9.0	2.30
HS-600	285	11 ⁷ / ₃₂	170	6 ¹¹ / ₁₆	376	14 ⁵¹ / ₆₄	35.1	77.4	8.4	2.15
HS-700	390	15 ²³ / ₆₄	170	6 ¹¹ / ₁₆	376	14 ⁵¹ / ₆₄	48.7	107.4	12.7	3.35
HS-800	390	15 ²³ / ₆₄	170	6 ¹¹ / ₁₆	376	14 ⁵¹ / ₆₄	51.5	113.5	12.0	3.17
HS-900	390	15 ²³ / ₆₄	170	6 ¹¹ / ₁₆	376	14 ⁵¹ / ₆₄	53.5	117.9	11.5	3.04
HS-1000	515	20 ⁹ / ₃₂	170	6 ¹¹ / ₁₆	376	14 ⁵¹ / ₆₄	64.5	142.2	16.5	4.36
HS-1200	515	20 ⁹ / ₃₂	170	6 ¹¹ / ₁₆	376	14 ⁵¹ / ₆₄	69.1	154.3	15.5	4.10
HS-1500	653	25 ⁴⁵ / ₆₄	280	11 ¹ / ₃₂	422	16 ⁵ / ₈	127.0	280.0	37.0	9.47
HS-2000	653	25 ⁴⁵ / ₆₄	280	11 ¹ / ₃₂	422	16 ⁵ / ₈	142.0	313.1	34.0	8.70
HS-2500	653	25 ⁴⁵ / ₆₄	280	11 ¹ / ₃₂	422	16 ⁵ / ₈	157.0	346.0	31.0	7.94

* 3-cell 6-volt unit.

CAPACITIES AND OPERATING CONDITIONS

Type	Capacity at 25°C (77°F)						Charge Current Amp.
	REFERENCE Amp. hrs. 10 Hr.	Ampere hours to 1.60V			Amperes for 1 Minute		
		Nominal 1 Hr.	30 Min.	5 Min.	to 1.75V	to 1.50V	
HS-30	30	18	14	5	50	92	3.0
HS-40	40	24	19	7	66	122	4.0
HS-50	50	30	24	9	83	153	5.0
HS-60	60	36	28	11	99	183	6.0
HS-80	80	48	38	14	132	244	8.0
HS-100	100	60	48	18	165	305	10.0
HS-120	120	72	57	22	198	366	12.0
HS-150	150	90	72	27	248	458	15.0
HS-200	200	120	96	36	330	610	20.0
HS-250	250	150	120	45	413	763	25.0
HS-300	300	180	145	55	495	915	30.0
HS-400	400	240	190	70	660	1220	40.0
HS-500	500	300	240	90	825	1525	50.0
HS-600	600	360	290	110	990	1830	60.0
HS-700	700	420	335	125	1155	2135	70.0
HS-800	800	480	385	145	1320	2440	80.0
HS-900	900	540	430	160	1485	2745	90.0
HS-100	1000	600	480	180	1650	3050	100.0
HS-1200	1200	720	580	220	1980	3660	120.0
HS-1500	1500	900	720	270	2475	4575	150.0
HS-2000	2000	1200	960	360	3300	6100	200.0
HS-2500	2500	1500	1200	450	4125	7625	250.0

DRY CHARGE TREATMENT

Since the batteries are normally shipped dry-charged, they will be instantly activated to nearly their rated capacity when filled with electrolyte. No elaborate initial charge is specifically needed. The batteries will be ready for service just by putting them in a floating charge circuit.

FLOATING CHARGE

2.18 volts per cell, preferably by a constant voltage regulated battery charger.

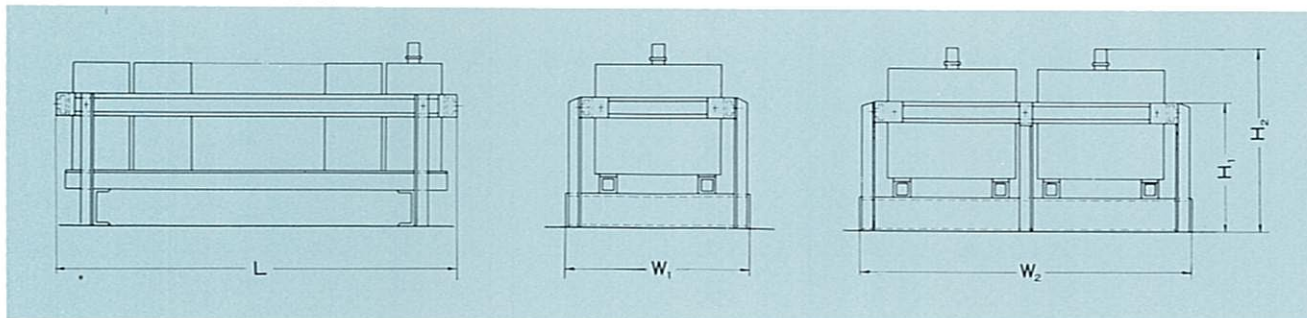
EQUALIZING CHARGE/RECHARGE

At a constant voltage of 2.3/2.4 volts per cell, preferably by a constant voltage regulated battery charger. Lower voltages are also acceptable.

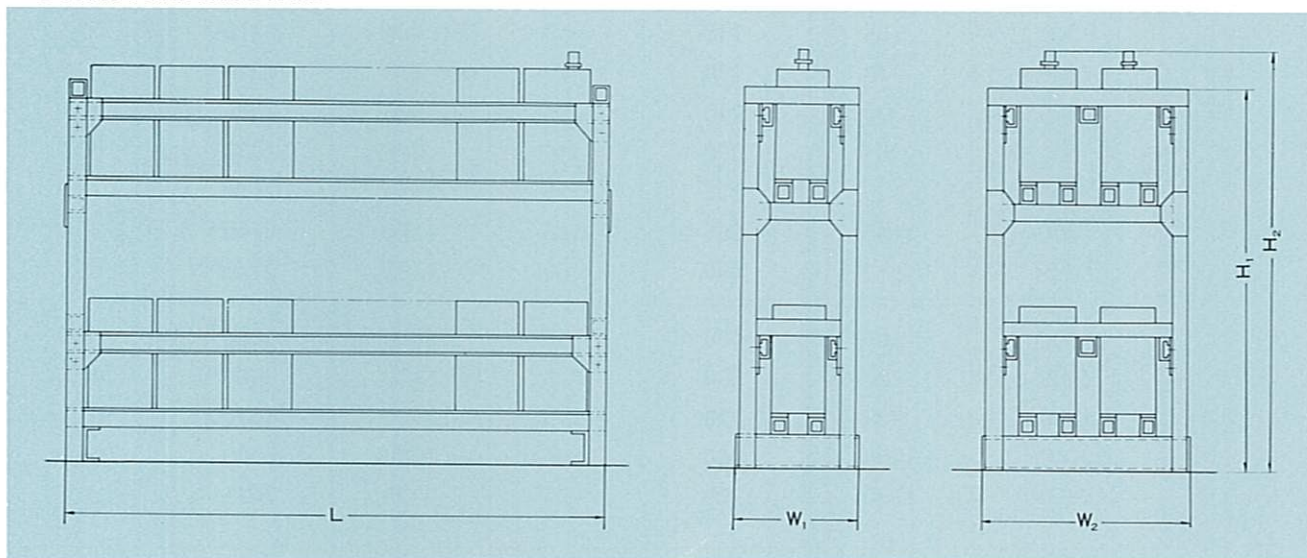
STEEL BATTERY RACK (EARTHQUAKE-PROOF)

- Easy to assemble at site with the bolts and nuts provided.
- Entire racks are painted with acid-resistant paint of light blue (Muncell notation No. 7.5BG 7/1.5)

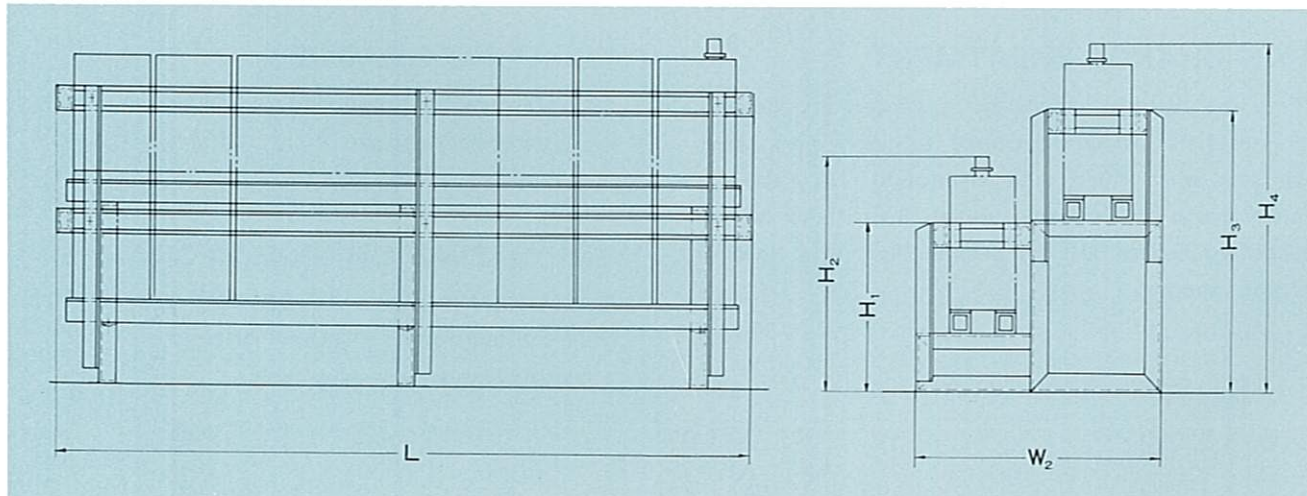
• 1-TIER CONSTRUCTION:



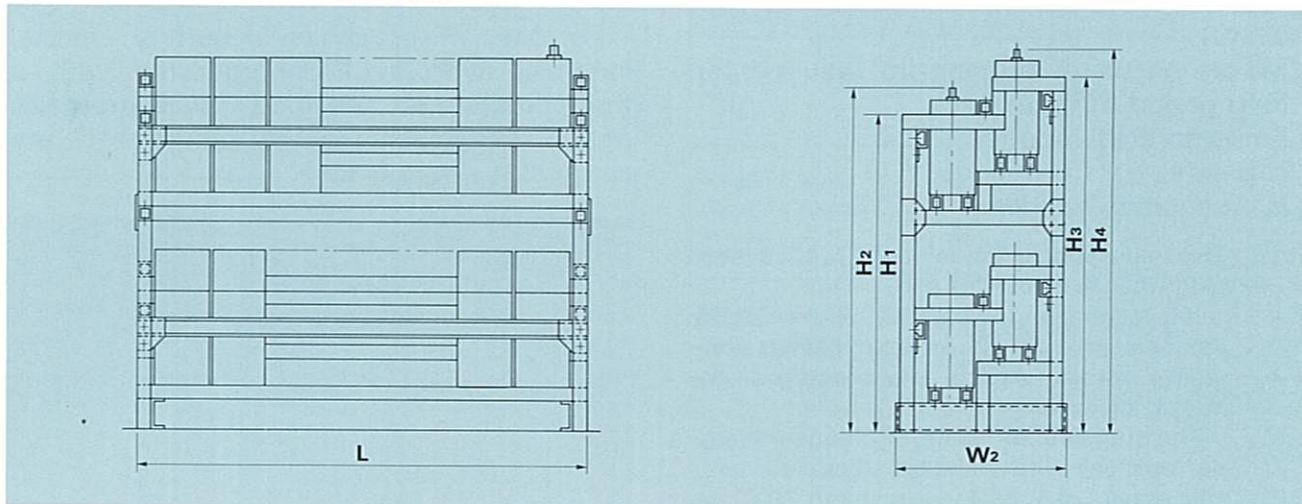
• 2-TIER CONSTRUCTION:



• 1-TIER 2-STEP CONSTRUCTION



● 2-TIER 2-STEP CONSTRUCTION:



Cell Type	Number of Cells per Row	Steel Rack Dimensions(mm)																	
		Length												Width		Height			
		5	6	7	8	9	10	11	12	13	14	15	16	W1	W2	H1	H2	H3	H4
HS-200	150 1-tier	685	810	935	1065	1185	1310	1435	1560	1685	1810	1935	2060	330	560	380	526	—	—
	2-tier	730	855	980	1105	1230	1355	1480	1605	1730	1855	1980	2105	350	580	1110	1206	—	—
	250 1-tier	685	810	935	1060	1185	1310	1435	1560	1685	1810	1935	2060	—	640	380	526	710	857
	2-tier 2-step	730	855	980	1105	1230	1355	1480	1605	1730	1855	1980	2105	—	580	1300	1396	1450	1546
HS-400	300 1-tier	1060	1260	1460	1660	1860	2060	2260	2460	2660	2860	3060	3260	330	560	380	526	—	—
	2-tier	1105	1305	1505	1705	1905	2105	2305	2505	2705	2905	3105	3305	350	580	1110	1206	—	—
	400 1-tier	1060	1260	1460	1660	1860	2060	2260	2460	2660	2860	3060	3260	—	640	380	526	710	857
	2-tier 2-step	1105	1305	1505	1705	1905	2105	2305	2505	2705	2905	3105	3305	—	580	1300	1396	1450	1546
HS-600	500 1-tier	935	1110	1285	1460	1635	1810	1985	2160	2335	2510	2685	2860	445	790	380	526	—	—
	2-tier	980	1155	1330	1505	1680	1855	2030	2205	2380	2555	2730	2905	470	810	1110	1206	—	—
	600 1-tier	935	1110	1285	1460	1635	1810	1985	2160	2335	2510	2685	2860	—	870	380	526	710	857
	2-tier 2-step	980	1155	1330	1505	1680	1855	2030	2205	2380	2555	2730	2905	—	810	1300	1396	1450	1546
HS-800	700 1-tier													550	1000	380	526	—	—
	2-tier	935	1110	1285	1460	1635	1810	1985	2160	2335	2510	2685	2860	570	1080	1080	1226	—	—
	900 1-tier													—	1080	380	527	710	857
	2-tier 2-step													—	1080	1180	1327	1280	1427
HS-1200	1000 1-tier													675	1250	380	526	—	—
	2-tier	935	1110	1285	1460	1635	1810	1985	2160	2335	2510	2685	2860	695	1330	1080	1226	—	—
	1200 1-tier													—	1330	380	526	710	856
	2-tier 2-step													—	1330	1180	1326	1280	1426
HS-2000	1500 1-tier													835	1610	380	578	—	—
	2-tier	1500	1785	2070	2355	2640	2925	3210	3495	3780	4065	4350	4635	—	1610	380	578	760	958
	2500 2-tier	1535	1820	2105	2390	2710	2995	3280	3565	3885	4170	4455	4740	860	1650	1200	1390	—	—

OPTIONAL ACCESSORIES

1. Reactor Plug-Catalyst Plug

Features:

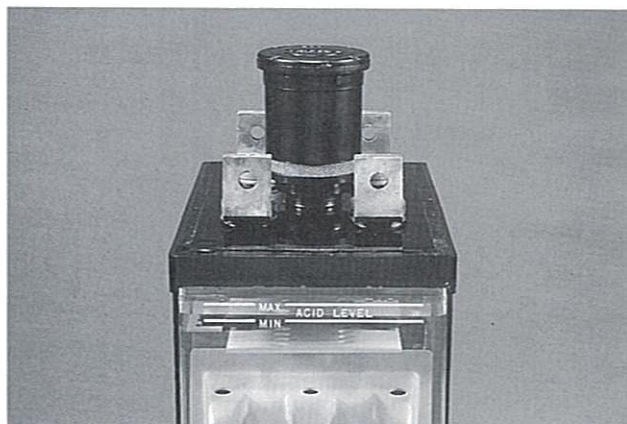
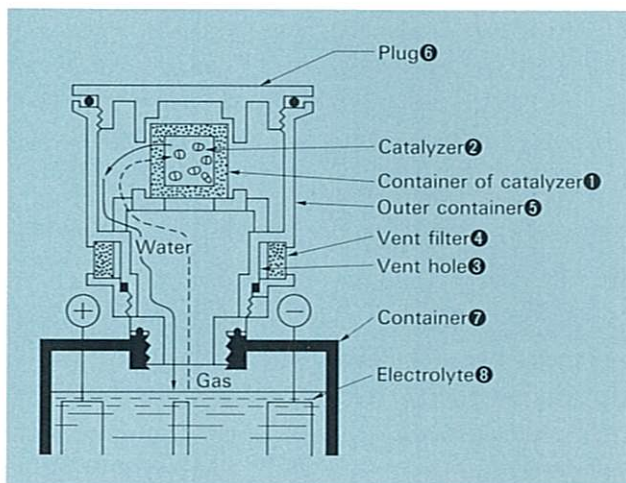
- Makes no water topping-up required for long period of time.
- Emits no acid vapour.
- It is safe.
- It is simple in handling.

Note: This plug should be replaced with a new plug after five years of use.

It is recommended that this plug is used in combination with the charger having constant voltage device manufactured by Yuasa, or equivalent.

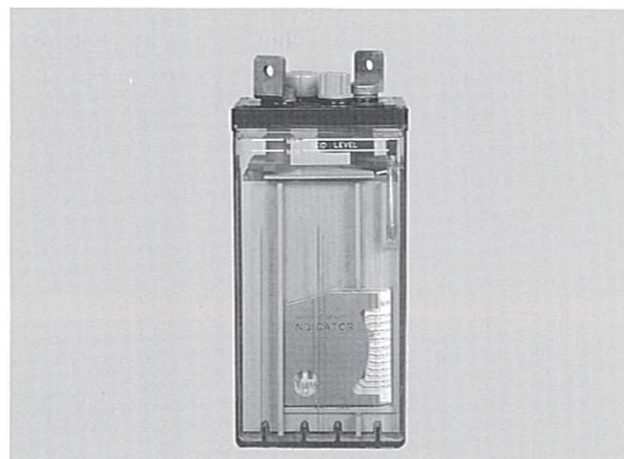
The standard set value of charge voltage per unit cell with standard electrolyte specific gravity of 1.240 (corrected to 20°C) are as follows:

Floating Charge Voltage (V)	2.18
Equalizing Charge Voltage (V)	2.3



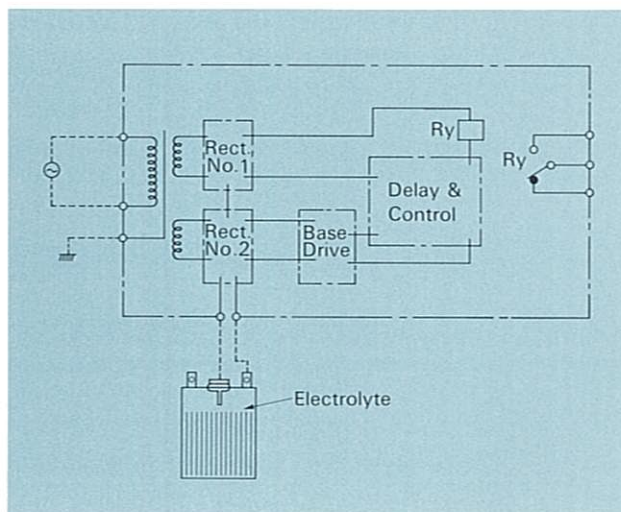
2. Built-in Type Hydrometer

For easy maintenance of battery, special innercell hydrometer incorporated with a thermometer is provided at customer's option. The specific gravity can be read very easily at a single glance.



3. Low Electrolyte Level Relay

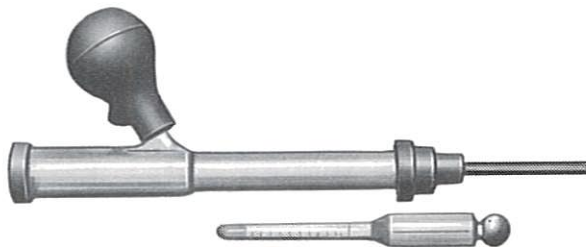
It is very convenient for maintenance to use a device which detects the electrolyte level when it is reduced to a level below the specified level, and issues an alarm. Low electrolyte level relay is readily available to satisfy such customer's needs. Upon request, it will be installed when purchased together with the battery charger.



STANDARD MAINTENANCE TOOLS

Item	Description	Q'ty
Suction Hydrometer	Syringe No. 16	1
	Float No. 23	
	Sp. gr. range 1.10-1.30	
Rod Thermometer	Range -20°C - 100°C Red alcohol	1
Plastic acid jug (No. 3)	Capacity 2 litres	1

Item	Description	Q'ty
Plastic Syringe (No. 6)	Capacity 180cc	1
Plastic Funnel	No. 2	1
Tool Box	Plastic	1
DC Voltmeter (Option)	Voltage range 3-0-3V	1



Suction Hydrometer



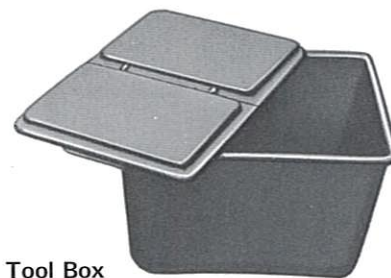
Funnel



Rod Thermometer



Acid Jug



Tool Box

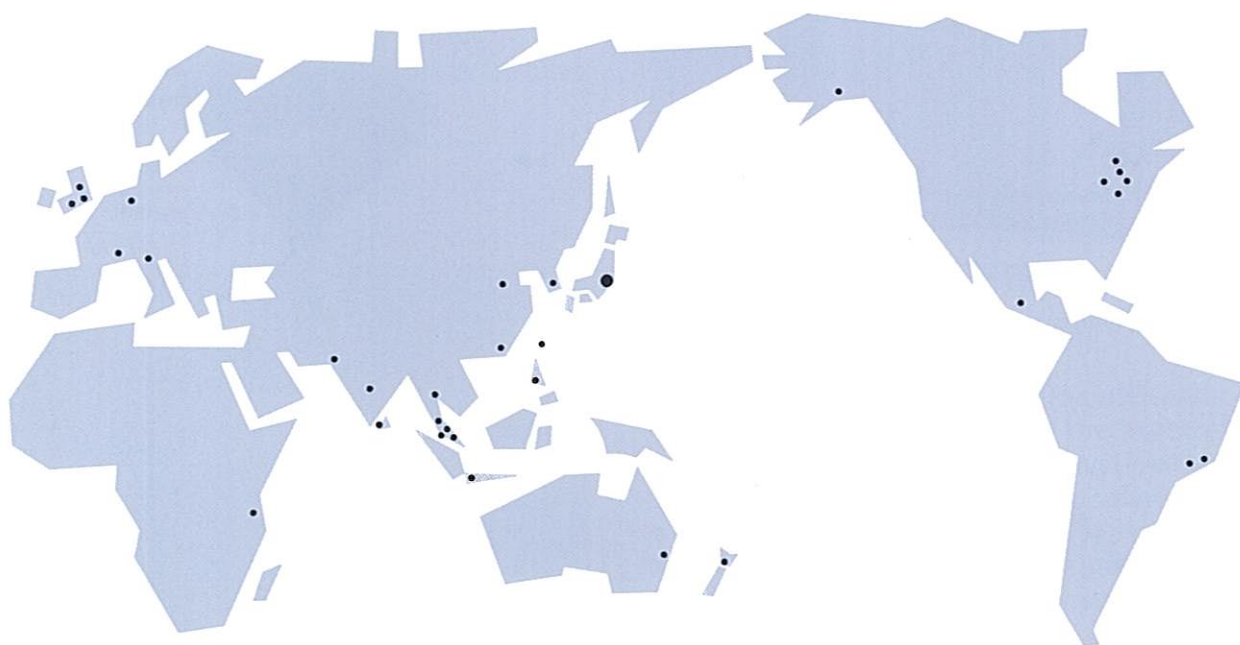


Syringe



Digital Tester (Option)

YUASA...CLEAN ENERGY FOR THE WORLD (Overseas Affiliated Companies)



● Specifications subject to change without prior notice.



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