TRACTION
BATTERY
Catalogue

PLUS

Reliable batteries to provide
a high level of power and motive
power for all industrial forklift

TSB BATTERY

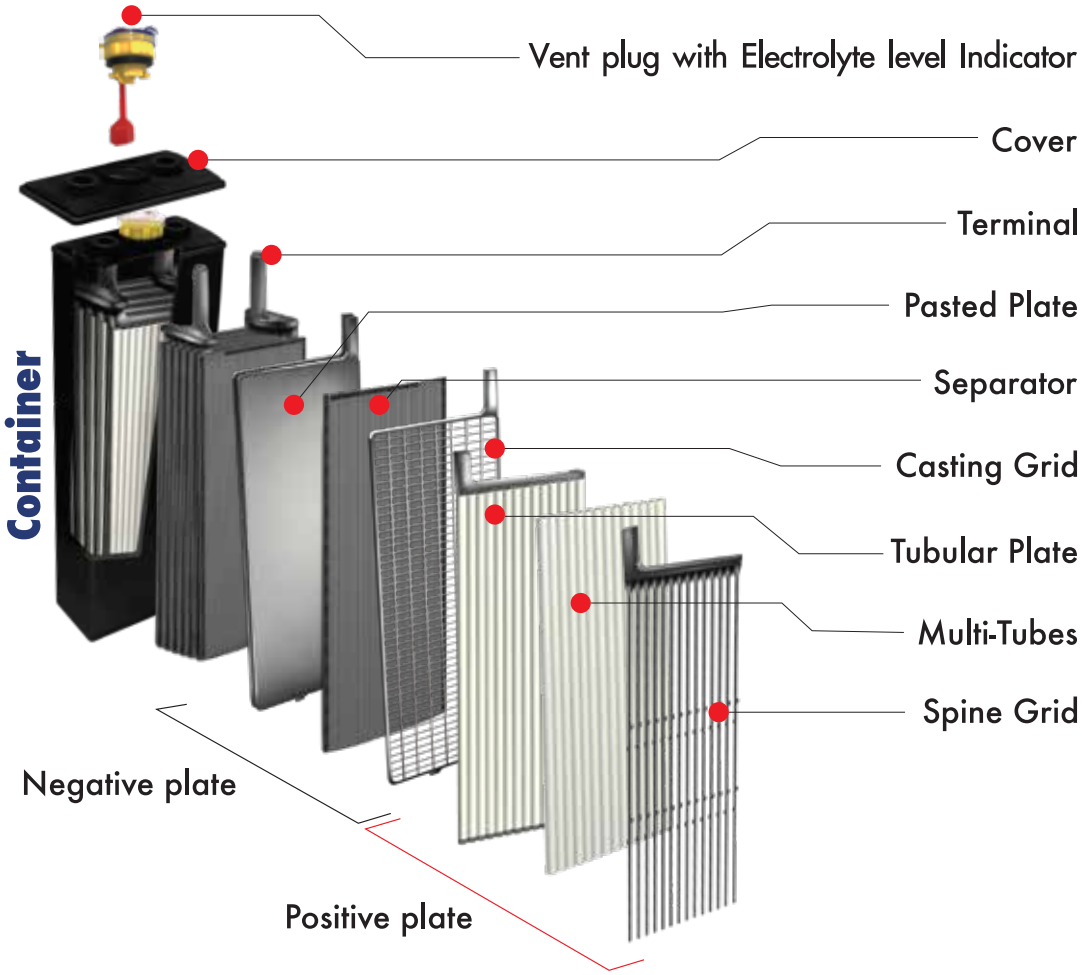
TSB Traction Battery PLUS series

Battery forklift have replaced conventional forklift (i.e., internal-combustion engine type) as measures for the increasing demand on clean environments in various sites where forklift take an active role, such as factories, distribution centers, warehouses, ports and harbors, airports, etc. The batteries as a driving source of battery forklift are an outcome of integrating a number of superior technologies based on long-time practices and affluent experiences, and still advancing by inheriting these.
Now, we have newly adopted negative plate additives to enhance discharge properties at low temperatures. thereby our conventional traction batteries being reborn as PLUS.
Hitachi Chemical Storage Battery (Thailand) PLC. has designed, developed, and including those for traction batteries under the quality management system based on manufactured batteries the certified standard of ISO 14001:2004, acquired in 2004 and the certified standard of ISO 9001:2015, acquired in 2007.

Discharge characteristic at low temperatures have been enhanced.

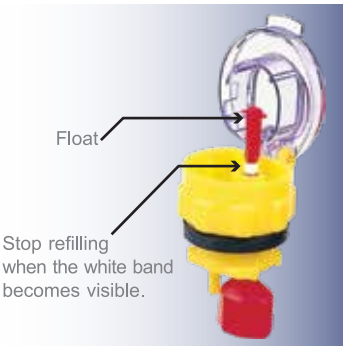
Features

The active meterial density of the positive plate has been optimized. The specification of well-balanced battery capacity and life performance has been realized.



Float mounted water plug

- The large diameter type facilitates water refilling.
- The float enables verification of the water level at a glance.
- Overflow prevention structure offers superior vibration proof.



Positive plate

- Spine

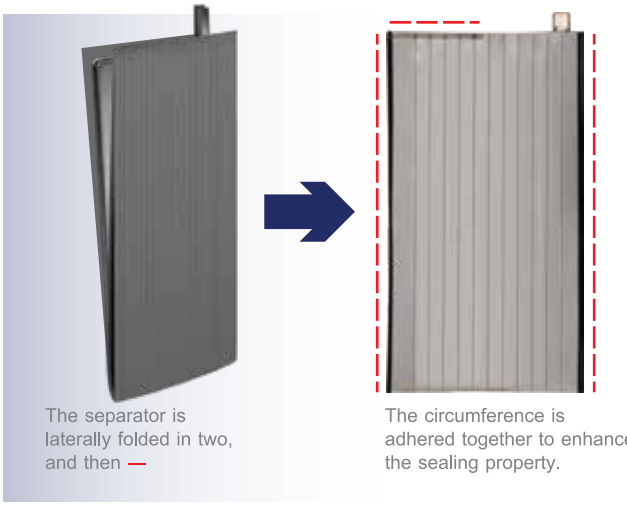
  The spine comprising the conductor portion is fabricated by applying the pressure casting method, which we have practiced for a long time. This method enables the crystal architecture denser then that by the gravity casting method, thereby offering the enhanced durability in severs temperature environments.
- Active meterial

  our unique lead powder is adopted for the positive-eletrode active meterial, which takes on a role of accumulation of electricity in the positive plate, thereby contributing to the realization of high capacity and long life.

Positive plate active material
The positive plate of high capacity and long life has been realized by adopting our unique lead powder.

Negative plate

The negative plate is equipped with a clean separator made of polymer polyethylene, which eludes a significantly less amount of oil contained therein and thus results in less contamination of electrolyte.



The separator is laterally folded in two, and then —

The circumference is adhered together to enhance the sealing property.

One example of the battery used for a forklift

As the battery for a forklift, a battery pack of 24 V or 48 V is installed thereon depending of the specification of the forklift.

Battery for reach forklift
The type of battery generally in a high height is used as a driving source of a stand-to-operate type of forklift.

Battery for counterbalanced forklift
The type of battery generally in a low height is used as a driving source of a sit-to-operate type of forklift.

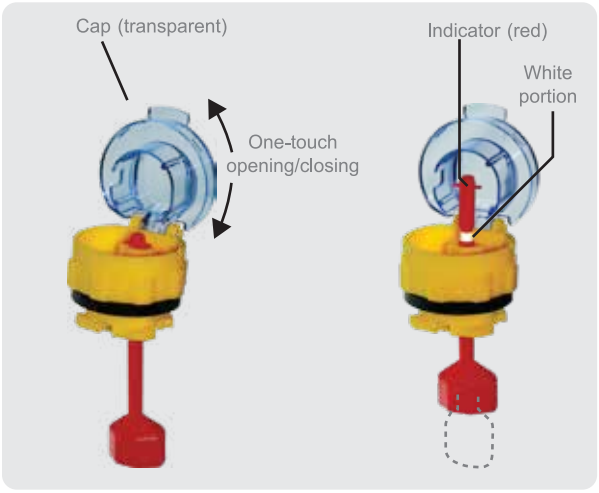
Float mounted water plug

Easy water filling
The spout wide and it is easy to fill water.

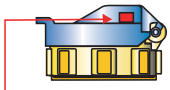
Excessive refilling prevented
As the appropriate liquid level is displayed as an indicator band, an appropriate amount of liquid is understood at a glance, thereby preventing excessive refilling.

Easy replacement
Installation and removal of the float mounted plug is easy, thanks to the use of the quarter turn method.

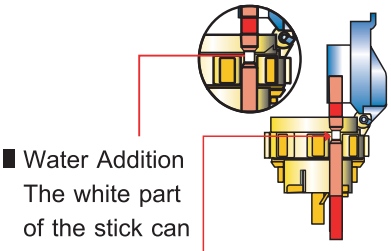
- New float mounted water plug can pull out the gas generated in charging.
- It's possible to charge with the cap closed.



Electrolyte Level Check

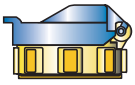


■ Proper Level
The stick floats and appears.

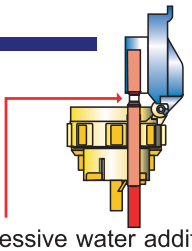


■ Water Addition
The white part of the stick can be seen.

Bar of level float white part.



■ Lack of electrolyte
The stick sinks and does not appear.
Need additional water.



■ Excessive water addition
The white part of the stick is out too far.
Please drain the acid by syringe with rubber bulb.

Liquid level meter

Level of electrolyte is detected by sensor and indicated by Light Emission Diode (LED)

LEVEL SENSOR

1. Only green LED is always on.
2. Green LED : Operating status
3. Red LED : Level of electrolyte status
4. Red LED blinks : water addition

Red
LED blinks : Fill the water

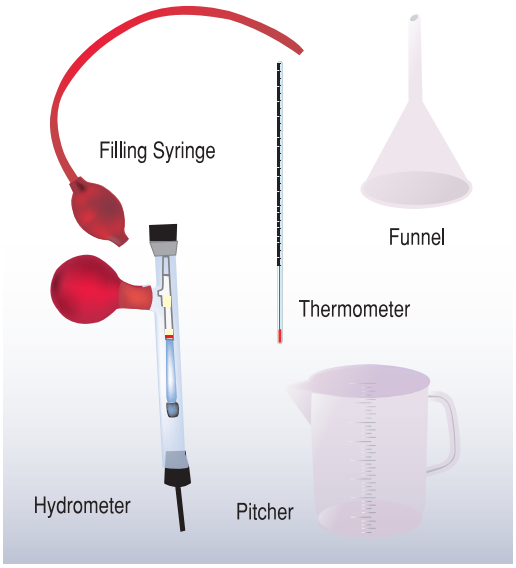
Green
LED : Operating status.

Float mounted type water addition plug with sensor

Float-type water refill faucet

Note: The liquid level sensor detects the level of only one cell and does not indicate the liquid level of the entire assembled batteries

Products for maintenance



Battery connector

SB350.6320 SB175.6325

Range and specification

Cell Type	Capacity 5HR (AH)	Dimension (mm)				Weight wih acid (In approx. Kg.)	Acid amount (In approx. Liter)
		Length (L)	Width (W)	Height (H)	Total Height (TH)		
VAP5	180	108	158	291	323	11.5	2.4
VBP4	175	90	157	315	347	11.6	2.2
VBP5	220	108	157	315	347	13.6	3.0
VBP7	310	144	157	315	347	18.7	3.4
VBP10	440	206	158	315	347	25.6	5.0
VCP6	275	127	157	345	377	19.4	3.9
VCP7	320	144	157	345	377	21.8	4.4
VCP8	360	144	157	345	377	22.4	4.4
VCP11	480	190	158	345	377	30.6	6.3
*VCP12	550	221	158	345	377	36.4	7.5
VDP3A	170	61	157	389	421	9.8	1.8
VDP4B	225	90	157	389	421	13.5	3.2
VDP5A	265	90	157	389	421	15.3	2.7
VDP340	340	108	157	389	421	20.0	3.9
VDP7C	340	127	157	389	421	19.7	4.2
VDP415	415	127	157	389	421	20.9	4.1
VDP7	390	144	157	389	421	22.5	5.3
VDP8AC	435	144	157	389	421	24.3	5.3
VDP9AC	475	158	157	389	421	26.6	5.5
VDP480	480	158	157	389	421	26.4	5.4
VDP540	540	158	157	389	421	27.2	5.9
VDP10AC	540	174	158	389	421	29.1	6.4
VDP560	560	174	158	389	421	29.4	5.9
VDP580	580	174	158	389	421	31.8	5.7
VDP690	690	206	158	389	421	33.8	7.0
VDHP485	485	144	157	411	443	24.8	5.0
VDHP545	545	158	157	411	443	27.2	5.9
VDHP565	565	174	158	411	443	31.1	6.6
VDHP600	600	174	158	411	443	31.1	6.6
VDHP700	700	206	158	411	443	37.2	8.6
VFP3A	210	61	157	489	521	12.5	2.5
VFP220	220	61	157	489	521	12.5	2.5
VFP3C	225	90	157	489	521	14.9	4.0
VFP4	290	90	157	489	521	17.2	4.1
VFP340	340	90	157	489	521	19.3	3.8
VFP5A	350	90	158	489	521	19.3	4.2
VFP390	390	90	157	489	521	20.0	3.9
VFP5	360	108	157	489	521	20.7	4.5
VFP400	400	108	157	489	521	22.8	4.2
VFP6A	420	108	157	489	521	22.4	4.5
VFP445	445	108	157	489	521	23.7	4.6
VFP515	515	127	157	489	521	27.5	5.4
VFP540	540	144	157	489	521	30.7	6.3
VFP8	575	144	157	489	521	30.8	6.9
*VFP730	730	174	158	489	521	38.8	7.5
VFP10	720	190	158	489	521	39.3	7.9
*VFP865	865	206	158	489	521	44.5	9.7
*VFP935	935	221	158	489	521	49.1	8.8

Range and specification

Cell Type	Capacity 5HR (AH)	Dimension (mm)				Weight wih acid (In approx. Kg.)	Acid amount (In approx. Liter)
		Length (L)	Width (W)	Height (H)	Total Height (TH)		
VIP3A	240	61	157	518	550	13.9	2.6
VIP260	260	61	157	518	550	14.1	2.6
VIP3D	250	78	158	518	550	14.6	3.2
VIP4A	300	78	158	518	550	17.8	4.1
VIP340	340	78	158	518	550	19.0	3.2
VIP4	320	90	157	518	550	18.6	4.3
VIP390	390	90	157	518	550	21.1	3.8
VIP470	470	108	157	518	550	25.4	4.2
VIP7C	505	128	157	518	550	27.4	5.5
VIP8	645	158	157	518	550	35.0	7.1
VIP555	555	127	157	518	550	29.1	5.6
VIP580	580	127	157	518	550	30.3	5.7
VIP680	680	144	157	518	550	33.3	6.1
VIP725	725	158	157	518	550	36.7	7.3
*VIP845	845	190	158	518	550	45.0	8.5
*VIP925	925	206	158	518	550	50.0	8.1
*VIP11	935	221	158	518	550	50.4	9.8
*VIP1005#	1005	221	158	518	550	52.4	9.7
VHP3A	315	61	158	697	729	18.4	3.2
VHP4A	420	78	158	697	729	25.4	4.8
VHP5A	525	94	158	697	729	28.9	5.4
VHP6A	630	109	157	697	729	33.9	6.8
VHP7A	735	128	157	697	729	39.6	8.5
VHP8	840	142	158	697	729	44.4	8.2
*VHP900	900	166	158	697	729	51.4	11.5

Remark *Shows Double Poles Type. #Shows Non-Standard Type.

Precautions on Maintenance and Handling

Classification of harm and damage

Danger
The degree of harm that erroneous handling might cause death or severe injury of the user and besides the degree of urgency is high

Warning
The degree of harm that erroneous handling might cause death or severe injury of the user; cases that frequent occurrence of minor injury or physical damage is assumed

Caution
The degree of harm or damage that erroneous handling might cause injury of the user or physical damage

Symbols and their meanings


Caution inflammable

Do not bring fire closely to the battery or generate a short circuit or sparks. Otherwise, inflammation explosion might be caused.


Caution no child

Any person who does not understand well the handling method or hazard of the battery (e.g., child) should not be allowed to touch the battery.


Caution explosive

Erroneous handling might cause inflammation explosion due to hydrogen gas produced by the battery.


Caution sulfuric acid

Attaching of diluted sulfuric acid, which is used for batteries, to eyes or skin might cause sight loss or burn injury.


Caution electric shock

Electric shock might be caused in case a human body directly contacts a conductive part at a voltage of 42 V or higher.


Read manual

Thoroughly read the manual for properly using the battery prior to its handling.


Wear glasses

To protect the human body against accidental explosion and/or diluted sulfuric acid, wear protective glasses and rubber gloves when handling the battery.

Danger


Caution inflammable

- Do not use or charge the battery in a confined area or an ambience with bad ventilation. Otherwise, a hazard of inflammation explosion is caused due to hydrogen gas produced by the battery.
- Do not bring fire closely to the battery. Otherwise, inflammation explosion might be caused due to short circuit, spark, or cigarette fire interacting with hydrogen gas produced by the battery.


Caution explosive

- Do not install the battery near heat generators (e.g., transformer) or objects that produce sparks (e.g., welder, grinder, switch, and fuse). Otherwise, inflammation explosion might be caused due to hydrogen gas produced by the battery.
- Do not form a short circuit across the battery terminals by using a tool such as the one used for tightening/loosening bolts and nuts. Otherwise, burn injury or inflammation explosion might be caused due to the occurrence of sparks.
- Do not use the battery (or forklift truck) with the liquid being at the lowest level allowed or below. Otherwise, explosion might be caused due to excessively hot battery or a short circuit formed internally by deteriorated internal parts.
- Do not clean the surfaces and connections of the battery with a dry cloth or duster. Otherwise, inflammation explosion might be caused due to generation of static electricity that interacts with hydrogen gas produced by the battery. Use a cloth wetted with water, for example, for cleaning the top surface of the battery.


Caution sulfuric acid

- In case of entry of electrolyte into eyes, immediately wash them with abundant tap water and receive an examination of an eye doctor. Otherwise, sight loss might be caused.

Warning

- When the battery is not used for a long time, do not store it in a place badly ventilated or present with fire. Otherwise, explosion might be caused due to the accumulation of hydrogen gas.
- Only use the dedicated charger or a charger meeting the rated capacity and voltage of the battery. Using chargers other than those might cause insufficient charging of the battery, leak of liquid, heat generation, or earth leakage.
- Personnel not familiar with the handling method and hazards of the battery should not mount or install the battery. Otherwise, injury or battery damage might be caused.
- Do not allow any person who is unfamiliar with the battery handling (such as child) to touch the battery. Otherwise, sight loss, burn injury, or electric shock might be caused by the electrolyte (diluted sulfuric acid) filled in the battery.
- Do not heat the battery or throw it into fire. Otherwise, liquid leakage, smoke generation, or rupture might be caused.
- Do not reversely connect the positive and negative terminals of the battery. Otherwise, heat generation, ignition, smoke generation, or inflammation explosion might be caused.
- Do not discharge the battery at a current equivalent to twice the rated capacity, or 0.5 times the rated capacity continuously. Otherwise, the internals melt down to cause explosion.
- Before starting checkup or cleaning of the battery, remove static electricity from your body by such as touching a metallic member in a place away from the battery. Touching the battery with electrostatically charged body might cause inflammation explosion due to spark generation.
- Do not use or leave the battery with its surfaces or connections attached by dirt or foreign matter. Otherwise, inflammation explosion or fire might be caused due to earth leakage. Keep the battery clean and dry at all times by cleaning off dirt and foreign matter with a moisture-containing cloth and the like.
- In case the battery electrolyte (diluted sulfuric acid) attaches to skin, other portions of the body, or clothes, immediately wash it off with abundant water and then sufficient amount of soap. Otherwise, burn injury might be caused.
- In case the electrolyte (diluted sulfuric acid) enters into your mouth or you swallow it, gargle with abundant drinking water immediately and repetitively and then drink abundant drinking water or cow milk. After that, seek medical treatment from a medical doctor as promptly as possible. Otherwise, the inside of the mouth might be burnt.
- Do not disassemble or repair the battery. Otherwise, inflammation explosion or injury might be caused.

Caution

- Handle the Filling device for plural cells and the liquid surface alarm device in accordance with the device manufacturers operation manuals.
- Do not wet the battery with rainwater or seawater. Otherwise, damage to the battery or fire might be caused.
- When charging is conducted, do not exceed the charging conditions described in the operation manual of the specified charger. Otherwise, heat generation or liquid leakage might be caused.
- Checkup and handling of the battery is allowed only by a person qualified for checking and maintenance, experienced person, professional, or clerk of the service shop. Otherwise, electric shock or injury might be caused.
- Regarding the used battery, we are working on ensuring effective utilization, maintenance, and conservation of resources by recycling the materials (reuse of lead, plastics, and so on as raw materials). In order to dispose of the battery, request it from a disposal company in accordance with laws pertaining to treatment and cleaning of disposals and environment -related laws. For any question, contact the sales company or us.

When placing an order:

Please kindly inform us the following when you place a purchasing order:

- About the battery forklift or battery carrier
  (1) Manufacturer name, (2) Model, and (3) Weight (tonnage)
- About the battery (if you currently use one)
  (1) Manufacturer name, (2) Model, (3) Capacity, (4) Voltage, and (5) Battery product No. (the number shown on the nameplate)

- The data shown in this catalog are as of June, 2018.
- The contents of this catalog are based on tests we performed with meticulous care; however, they do not guarantee actual on-site results.
- Product use examples shown in photographs and illustrations may be different from current use situations.
- It is not guaranteed that methods to use this product, and parts or equipment using this product do not infringe industrial properties possessed by third parties.
- Please note that specifications and appearance of the product are subject to change without prior notice.
- Please note that the colored design appearing in product photographs may be different from the actual one more or less due to printing conditions.
- Be sure to read the operation manual prior to use of the product.

PLUS

Distributed by

TSB BATTERY