

Lithium Ion Battery Pack for Low Load

Solar street light and general industrial use for LOW LOAD

3S / 6S / 7S

CE



TB type(option)

Standard

TB type(option)

Standard

Battery pack for High load(motor drive)is not mentioned on this catalog. Please refer to LM-MOTOR or LC-MOTOR series catalogs.

Caution : Use a charger that matches the voltage of the lithium ion battery. You can purchase the right charger manufactured byTabos.

New products are shipped with 30% charge.

If you need documents (MSDS UN3481, class 9 English/Chinese ver.) required for export, please ask us.

Export HS Code : 8507.80.2000

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0. Important Notices

Basic cautions

-  **This lithium battery is not waterproof. Be careful not to get wet. Moisture causes breakdown.**
-  **High temperature will shorten battery life and is dangerous. Make sure to ventilate,.**
-  **Do not use batteries/chargers for any purpose other than those specified in the user manual.**
-  **Do not disassemble or shock, and do not puncture.**
-  **When using the battery, please use It after fully charged.**

The new product is shipped with 30% charge.

Discharging the product without any charge, it will cause unbalance between cells.

-  **Do not install the battery vertically, but install it horizontally.**

However, in the case of solar street lights, you can use it vertically because there is no vibration.

-  **Use sufficiently thick wire for battery output.**

In determining the thickness of battery output wire, general standards of wire thickness may not be suitable. If the thickness of the wire is thin or the length of the wire is long, a voltage drop occurs due to the current flowing. If the voltage drop is high, the voltage supplied to the load connected to the wire will be low even though the remaining battery power is sufficient. Devices may not even be started if you connect electric devices that require a large instantaneous current with thin wire.

Use sufficiently thick wire for battery output. If you use thin wires, the temperature may rise and cause a fire. (High current causes overheating and fire.)

Connections of batteries

-  **Do not connect the batteries in series.**

Inside the battery, a circuit-breaking device such as a FET is built in. This device is made of semiconductor which can cope with each voltage level. When used in series, the voltage may be higher than the designed value and the semiconductor element could be damaged. In addition, It can cause fire due to damage of safety control circuit.

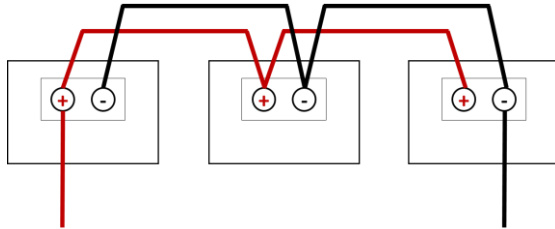
-  **When using in parallel, you must check if each battery has exactly the same characteristics.**

Especially, the voltages should be the same. The voltage difference of each battery packed in parallel should be managed within 5v. If they have a voltage difference, the current will flow rapidly from the higher voltage battery to the lower voltage battery, which can damage the battery.

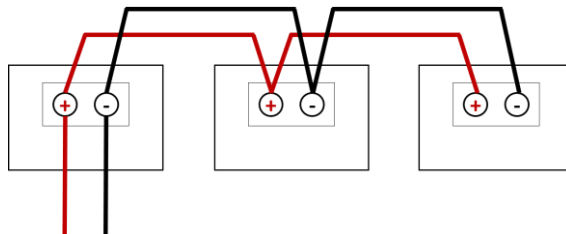
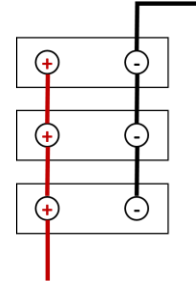
-  **When using in parallel, do not connect the new battery with the old one.**
(Even if they have the same characteristics and voltage.)

Since the internal resistance of the new battery is lower than that of the used battery, the current mainly flows toward the new battery. This will reduce the life span of each battery.

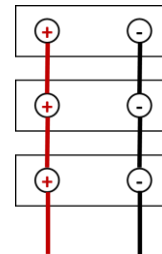
⚠ When using in parallel, the path, length and thickness of wire connected to each battery must be the same.



(O) Good Way



(X) Bad Way



Operating/Charging/Discharging Voltage Range

 Please use charge / discharge voltage range as below.

Operation	Voltage range capable of supplying power to the load				
	Block load connection	Low voltage caution	Operating voltage		
Battery type (Nominal Voltage)	Recommended low voltage cut-off command voltage on the load side	Boundary that the voltage drops rapidly during discharge (When discharged below 0.2C)	When charging is required	Recommended charge voltage (for long life)	Allowable maximum charge voltage
Voltage/cell	3.15V/Cell	3.36V/Cell	3.43V/Cell	4.0V/Cell	4.14V/Cell
Estimated residual quantity	about 3~5%	about 5~8%	about 15~20%	about 80%	about 90%
10.8V Battery	9.45V	about 10.1V	10.3V	12V	12.4V
21.6V Battery	18.9V	about 20.2V	20.6V	24V	24.8V
25.2V Battery	22V	about 23.5V	24V	28V	29.0V

 Battery life will be shortened if discharging voltage frequently enters the low voltage range.

 When discharging the battery, the load must be disconnected before the undervoltage shutdown by the BMS circuit installed inside the battery.

BMS blocks shortly before Under Voltage(UV) with very little battery remaining for final defense. To prolong battery life, it should not be Under Voltage(UV) frequently. The BMS is considered to be a secondary safeguard and it is necessary to reduce the ON / OFF burden of the BMS by shutting off the load before the BMS is blocked.

Storage of Batteries

Do not leave the battery in an Under Voltage(UV) condition or in a state of low charge.

Do not leave new or used batteries unplugged for more than a year. Please check it once a year and charge it to 5 ~ 10% higher than average voltage before storing. The battery is shipped with 30% charged. The battery management system (BMS) installed in the battery continuously consumes minute power even in the standby and idle state. Therefore, if left unattended for more than one year, there is a risk of Under Voltage(UV). If the Under Voltage(UV) condition persists, the battery life will be shortened, and in some cases, it may fail at all. In some cases, the voltage was maintained without Under Voltage(UV) after untreated for about 4 years. But it depends on the type of battery pack, so it is hard to predict exactly. Depending on the lithium battery cell connected to the BMS, it can last for more than 4 years or for only 1 year. It is recommended to check the management every year.

When using an Inverter as a battery load

It is recommended to use DC load without inverter(AC) load.

If the power(W) consumed by the inverter is larger than the battery power (Wh), the battery cell life is rapidly decreases. It is recommended that the battery power (Wh) be at least 10 times the inverter power (W). This is because the reverse current from the inverter to the battery is very large and ripples are applied to the battery cells in the form of shock waves, which can damage the anode and cathode coating materials of the lithium battery cells.

* If you need more information, please refer to [Inverter and Lithium Battery Life, Precautions on use]

Amount of charging/discharge current

When charging or discharging the battery, use a current sufficiently lower than the rated charge/discharge current.

Use at less than 50% of recommended charge current and rated charge current will conserve battery life. Continuous discharge is possible at 50% or less of the rated current amount, but it's not for more than 50% of the rated current amount. So if it's necessary to discharge at more than 50% of the rated current amount, do it instantaneously only.

Chargers application

Be sure to use a battery charger with pre-charging function.

When charging with a charger that does not have pre-charging function, the MOS-FET built in the BMS unit may be damaged depending on the situation, which may lead to danger of overheating, burnout or fire.

* With this function, the battery can be charged with a minute current (1 to 2A current) while the battery is shut off which leads BMS to release the Under Voltage(UV) state. When the battery output voltage comes out after the Under Voltage(UV) state is released, it can be charged with the present charge current.

 Charger must have charge current ripple less than 5% of charge current.

There is no regulation according to the amount of ripple, but the larger the charge current ripple, the more the cell will break. If some of the cells are damaged, the power supply to the BMS device may be restricted and this may cause a power failure. According to our company's empirical data, when using a charger with a large ripple amount, there are cases where malfunction occurs between several months and two years.

 Be sure to use a dedicated charger for lithium batteries.

 Battery should have constant current (CC) and constant voltage (CV) functions.

 Do not charge with a DC power supply since it is dangerous.

1. Specifications by each model

- ◇ The maximum discharge current in the specification below is the maximum capacity associated with BMS and battery performance
 - ◇ If you need more than 10A as charge/discharge current, use the load instantaneously.
 - ◇ When the temperature is high, the banana plug may overheat.
 - ◇ If you use a product with a banana plug and charge/ discharge current more than 10A, please use multiple batteries in parallel.
 - ◇ The following battery capacities (Wh, Ah) may drop to 90% of the maximum capacity indicated by the product and conditions of use.
 - ◇ If the capacity is larger than this battery or the load current is large, please select it from "Large Capacity / Battery for motor drive" LC (LM) –Motor series of products manufactured by Tabos.
- * The product with terminal block has its own current rating of 30A regardless of the battery performance.**
Therefore, when using more than 10A continuously, please use terminal block type.

Manufactured by Tabos. / made in Korea

Rated (V)	Product number (Standard with banana plug) Terminal block (option) : TB	Discharge Min. Voltage	Nominal Voltage	Charge Max. Voltage	Energy (Wh)	I (Ah)	Charge Max. Current	Discharge Max. Current	Discharge Max. Power	Outer size (W x H x L) (mm)	Wht. (Kg)	Case Drawing	Cert.
10.8V (3S) / LB3 series													
11V	LB309-250W-A	9V	10.8V	12.6V	250	23	(15A)	(18A)	200W	90 x 68 x 239	1.8	A-Type	CE
11V	LB312-340W-A	9V	10.8V	12.6V	340	31	(15A)	(18A)	200W	90 x 68 x 304	2.3	A-Type	CE
11V	LB317-480W-A	9V	10.8V	12.6V	480	44	(15A)	(18A)	200W	90 x 68 x 399	3.2	A-Type	CE
11V	LB322-630W-A	9V	10.8V	12.6V	630	57	(15A)	(18A)	200W	90 x 68 x 489	4.1	A-Type	CE
11V	LB320-570W-B	9V	10.8V	12.6V	570	52	(15A)	(18A)	200W	90 x 124x 269	3.8	B-Type	
11V	LB328-800W-B	9V	10.8V	12.6V	800	72	(15A)	(18A)	200W	90 x 124x 344	4.9	B-Type	CE
11V	LB334-970W-B	9V	10.8V	12.6V	970	88	(15A)	(18A)	200W	90 x 124x 399	5.9	B-Type	CE
11V	LB340-1150W-B	9V	10.8V	12.6V	1150	104	(15A)	(18A)	200W	90 x 124x 454	6.8	B-Type	CE
21.6V (6S) / LB6 Series													
22V	LB610-570W-B	18V	21.6V	25.2V	570	26	(15A)	(18A)	400	90 x 124x 269	3.6	B-Type	CE
22V	LB614-800W-B	18V	21.6V	25.2V	800	36	(15A)	(18A)	400	90 x 124x 344	4.9	B-Type	CE

Rated (V)	Product number (Standard with banana plug) Terminal block (option) : TB	Discharge Min. Voltage	Nominal Voltage	Charge Max. Voltage	Energy (Wh)	I (Ah)	Charge Max. Current	Discharge Max. Current	Discharge Max. Power	Outer size (W x H x L) (mm)	Wht. (Kg)	Case Drawing	Cert.
22V	LB617-970W-B	18V	21.6V	25.2V	970	44	(15A)	(18A)	400	90 x 124x 399	5.9	B-Type	CE
22V	LB618-1020W-B	18V	21.6V	25.2V	1020	46.8	(15A)	(18A)	400	90 x 124x 418	6.2	B-Type	CE
22V	LB620-1150W-B	18V	21.6V	25.2V	1150	52	(15A)	(18A)	400	90 x 124x 454	6.8	B-Type	CE
25.2V (7S) / LB7 Series													
25V	LB710-660W-C	21V	25.2V	29.4V	660	26	(15A)	(18A)	450	90 x 142x 270	4.2	C-Type	CE
25V	LB713-860W-C	21V	25.2V	29.4V	860	34	(15A)	(18A)	450	90 x 142x 370	5.4	C-Type	CE, KC
25V	LB714-930W-C	21V	25.2V	29.4V	930	36	(15A)	(18A)	450	90 x 142x 370	5.7	C-Type	CE
25V	LB717-1130W-C	21V	25.2V	29.4V	1130	44	(15A)	(18A)	450	90 x 142x 395	6.9	C-Type	CE
25V	LB721-1390W-C	21V	25.2V	29.4V	1390	54.5	(15A)	(18A)	450	90 x 142x 470	8.4	C-Type	CE

Term description

* Power Capacity (Wh) = Nominal Voltage x Battery Ampere hour rating

* Charge current and discharge limit current (A): The current limit value set for the over current limitation in the battery protection circuit (BMS).

2. Common Specifications for all models

Safety and protection features

* Safety first. Our battery pack is made by carefully selected cells that have proven to be safe
 In addition to the battery protection circuit (BMS), additional safety devices are installed for those that can not be solved by BMS.

◇ Over-current protection (limit of charge / discharge current)

The I / O current is limited by the protection circuit (BMS) of this battery according to the setting value (refer to the specification sheet for each model). This function protects the battery by preventing the output of the overcurrent.

◇ Output cut-off control when shorted : Return to normal when short circuit is canceled

The protection circuit (BMS) immediately cuts off the output when the output terminals are short-circuited due to careless handling.

When the short circuit is canceled, it returns to normal and outputs normally.

◇ Over Voltage Protection

The voltage of each group of lithium ion battery cells is monitored by the protection circuit (BMS) of this battery. When each cell group exceeds the specified voltage value while it is charged, the charging is stopped until the voltage is regained again.

◇ Under Voltage Protection

The voltage of each group of lithium ion battery cells is monitored by the protection circuit (BMS) of this battery. When each cell group goes below the specified voltage value while it is charged, the charging is stopped until the voltage is regained again.

List of common specifications

	Characteristic value	Content
Life expectation	3,000~4000 Cycle	Condition of life expectancy 1) When used at a cell temperature of about 20 ° C. 2) Charging and discharging Under 0.1C Rate condition Life expectancy depends on the conditions of use. The closer the battery temperature is to room temperature, the smaller the charge / discharge current is compared to the battery capacity, the longer the battery life.
Charging capacity	Charging capacity change according to charging voltage change of charger	[Cautions] Charging capacity (Ah) and nominal energy (Wh) indicated on this product are the capacity when charged with the maximum charging voltage. When the charge voltage is set lower than the maximum charge voltage of the lithium battery pack, the charge capacity decreases proportionally. This should be taken into consideration when choosing battery capacity.

Conditions Of operating temperature (The figures on the side are the temperatures of battery cell itself)	-20°C ~ 0°C	The lower the battery cell temperature below freezing temperature, the shorter the life span and the less energy available. If the same amount of current is discharged, the lower the temperature, the greater the voltage drop. It is advantageous to lower the charging / discharge current or to use a larger battery capacity.
	0°C ~ 20°C ~ 40°C	Battery life is the longest when the cell temperature is about 20 ° C.
	40°C ~ 60°C	The higher the battery cell temperature, the shorter the battery life. It is advantageous to use low charge / discharge current and requires cooling.
Temperature characteristics (compared to room temperature)	when discharging 0.05C, at -20°C	About 10% Output Voltage drop Total Output Capacity (Wh) 20% Reduced
	when discharging 0.1C, at -10°C	About 5% Output Voltage drop Total Output Capacity (Wh) 7% Reduced
	when discharging 0.1C, at 60°C	About 1% Output Voltage increase Total output capacity (Wh) is unchanged.
Protection function	BMS	BMS function for battery cell protection, Over Voltage Protection(OVP), Under Voltage Protection(UVP), Over Current Protection (OCP), Short Circuit Protection (SCP)
How to charge	Constant Voltage(CV) + Constant Current(CC)	The charge current should be a suitable value below the rated charge current. Charging with the lowest possible current may prolong battery life. Set the maximum charging voltage as the upper limit value of the charging voltage(CV) and charge with constant current(CC) which is below the rated charge current.
Case		body : Aluminum alloy, Caps of both sides : PC resin

◇ **Charging below -10 ° C may shorten battery life.**

◇ **About charge and discharge Ampere hour rating**

Batteries produced by Tabos can also be used in solar street lights installed in extreme conditions (tropical regions). For the sake of safety, we set the current value of the battery somewhat low.

If you want to use the current more than the allowable value, you can double the amount of current by adding the batteries of the same specification in parallel.

If you need to increase the amount of current for one battery pack, please contact us.

The Ampere hour rating can be increased simply by changing the resistance element of built-in protection circuit (BMS).

3. Model number / Order code / Option marking

3S type (Li-ion Battery Cell 3 in serial) : Nominal Voltage 10.8V → about 11V

Use : Solar street light, 9.5V~12.6V, DC supply for Average Voltage 10.8V

6S type (Li-ion Battery Cell 6 in serial) : Nominal Voltage 21.6V → about 22V

Use : Solar street light, 19V~25.2V, DC supply for Average Voltage 21.6V

7S type (Li-ion Battery Cell 7 in serial) : Nominal Voltage 25.2V → about 25V

Use : Solar street light, Inverter, replacement for general 24V

	①	②	③	④	⑤	⑥
LB	3	22	–	630W	–	A / ()
LB	6	14	–	800W	–	B / ()
LB	7	14	–	930W	–	C / ()

①	Type of lithium Battery	Manufacturer identification code
②	Number of serial connections	3 : 3 serial connections (10.8V) 6 : 6 serial connections (21.6V) 7 : 7 serial connections (25.2V)
③	The amount of capability to supply current	Manufacturer identification code
④	The amount of load supply	Maximum amount of output power (Wh) 630Wh: 630W can be used for 1 hour
⑤	Type of case	A : slim type B : medium type C : large type
⑥	Type of connector (option)	() : Banana plug (standard) TB : Terminal Block

* ⑥ – Standard product will be shipped with banana plug.

4. Cautions for Selecting Battery Capacity

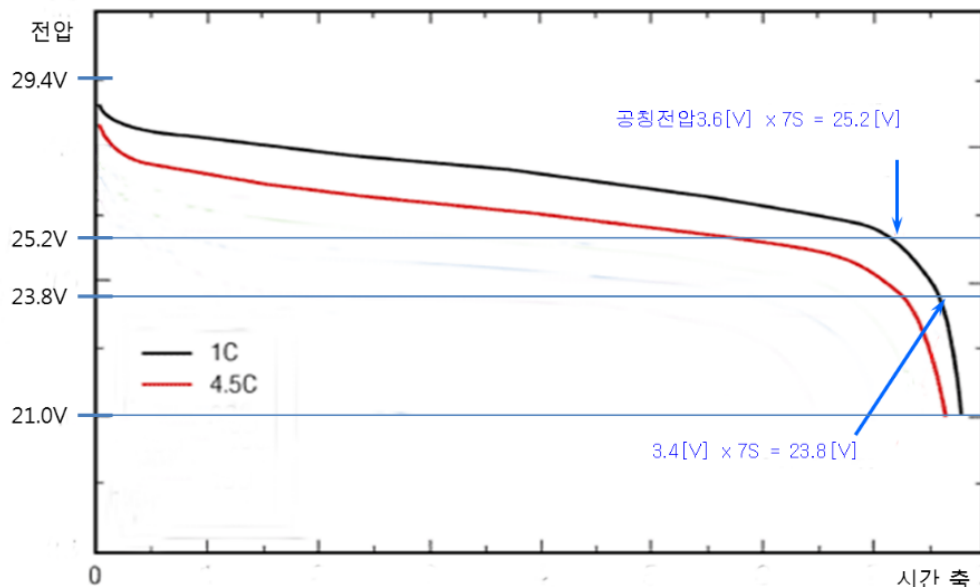
Charging/Discharging Voltage range Settings

Relationship between SOC(State Of Charge) and Voltage.

It is difficult to know the exact SOC with battery voltage. This is because there is a region where the voltage and the SOC are not proportional to each other as shown in the figure below, and voltage drop occurs depending on the amount of charging/discharge current.

The discharge graph of 1C shows that there is some linear part, so if there is more than 30% of SOC, the remaining battery voltage can be deduced from the voltage. (For the definition of 1C, refer to the graph cycle below.) However, if the discharge current is further increased (refer to 4.5C discharge in the graph below), the battery voltage suddenly drops. In this case, the SOC is not reduced but only the voltage drop caused by the resistance inside the battery.

Also, if the 25V battery is discharged at 1C and the discharge continues to fall below 24V, the SOC will be only about 20% (experimental value). As the discharge continues, the voltage drops rapidly.



[Graph] 25V (7S type) Relation between discharge current and voltage of lithium battery

Description

1C means discharging at 35A, which is one time the total amount is 35AH, regardless of the battery voltage. 4.5C refers to discharging at 157A, which is 4.5 times the total amount of battery, regardless of the battery voltage. For this product, please refer to the black graph at the top of the above graph because it is a product for the maximum 1C, 2C or less. The above graph is a discharge characteristic curve of lithium ion, and as the discharge current becomes larger, the voltage becomes lower than the original voltage of the battery. In the case of a 25V battery, especially in the area where the battery voltage is 24 [V] or less, the fluctuation rate increases sharply.

Battery Voltage Band Width.

Lithium battery nominal (standard) voltage	BMS Under voltage cutoff- voltage 2.8V/Cell (brand new)	Recovery voltage after battery BMS shutdown the undervoltage	Allowable discharging voltage (Min.)	Recommended under voltage lockout on the load side	Boundary where the voltage drops sharply when discharging (SOC : 5%) When below 0.2C	Recommended charging voltage	Allowable charging voltage (Max.)	BMS overcharge cut-off voltage 4.2V/Cell (brand new)
				3.15V/Cell		4.1V/Cell		
10.8V (3S)	8.4V	About 9.8V	9V	9.5V	about 10.1V	12.3V	12.4V	12.6V
21.6V (6S)	16.8V	About 19.5V	18V	18.9V	about 20.1V	24.6V	24.9V	25.2V
25V (7S)	19.6V	About 22.8V	21V	22.1V	about 23.5V	28.7V	29.0V	29.4V

Notification about voltage change (BMS under/over voltage cutoff voltage)

the BMS undervoltage cutoff voltage was 2.5 V / cell and the overvoltage cutoff voltage was 4.25 V / cell

The new product is to be changed. the BMS undervoltage cutoff voltage to 2.8V / cell and the overvoltage cutoff voltage to 4.2V / cell. / (2017.11.13)

In the table above, there are different figures between 'Recommended undervoltage lockout on the load side' and 'BMS Under voltage cutoff- voltage', But as shown in the graph above, the battery voltage suddenly drops as the discharge progresses. In other words, the area where the voltage drops sharply means that there is not a lot of energy that can be used practically.

At voltages under 'Recommended undervoltage lockout on the load side', it is reasonable to see that the SOC is about 5% (depending on the discharge current). That is, voltage range below the recommended voltage limit is used for the control power rather than the high power.

◇ Reduction of Battery Capacity

1) Problem of battery capacity reduction by charger

Depending on the performance of the charger, the original battery capacity may not be available if charging is not performed correctly.

If the charger performance is acceptable, the battery capacity may be less than originally due to the following factors.

2) Decrease of battery capacity due to discharge current amount

After full charge

Discharging at 0.7C ~ 1C will result in about 80% of the battery capacity.

Discharging at 0.2C results in more than 95% of the battery capacity.

If discharged at 0.1C, battery capacity will be over 100%.

1C means discharging at $100A \times 1 = 100A$, when the battery has a capacity of 100Ah.

3) Decrease of battery capacity due to ambient temperature

If the ambient temperature drops below $-20^{\circ}C$, the battery capacity will decrease by 20%.

If the ambient temperature goes more than 50 degrees, the capacity may decrease.

5. Selecting Battery Connector Option

Banana plug type (standard) and Terminal Block type ('/TB' at the end of product number)

For products that are applied to solar street lamps, the banana plug shown below is generally used.

When the ring terminal is applied to the output terminal of the banana plug, there are few cases where the contact failure occurs.



Standard (Banana Plug)



Option (Terminal Block)

6. Cautions for selecting Chargers

According to recent articles, The charge current ripples of the charger and the pulsed noise $[V(t) = L \cdot di/dt]$, which is additionally induced by this ripple, may degrade performance of the battery management system (BMS) because of damaged coating materials of battery. There have been reports that if coating material of anode and cathode (Ni-Mn-Co-Li oxide and graphite particles) of a lithium ion battery are damaged, it could cause an characteristic imbalance of the battery cells. This is also evident from our 8 years of experience and empirical data about lithium battery and life expectation of charger.

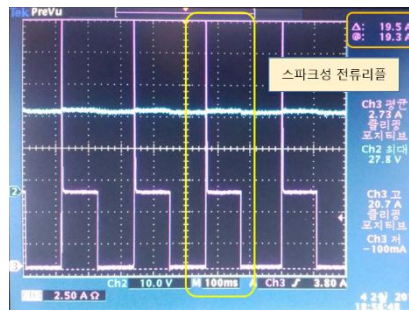
* Reference : 'The effects of high frequency current ripple on electric vehicle battery Performance' by 'Kotub Uddin' , 'Andrew D. Moore' in UK.

Current Ripples of Chargers – Comparison data

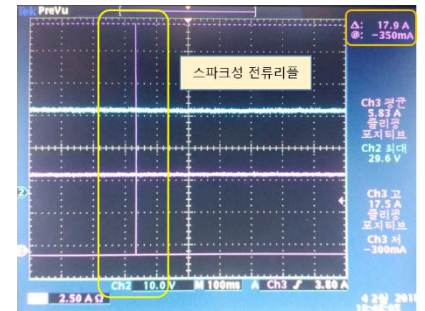
Measuring equipment : Tektronics / TCP303 with TCPA300



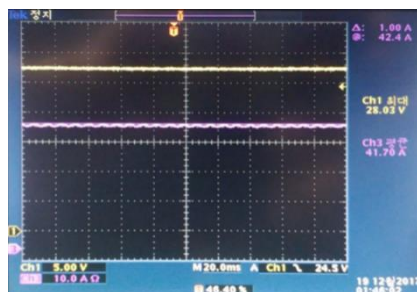
[Tabos]
solar street light charger
Current ripples
 $\Delta A = 0.3A$



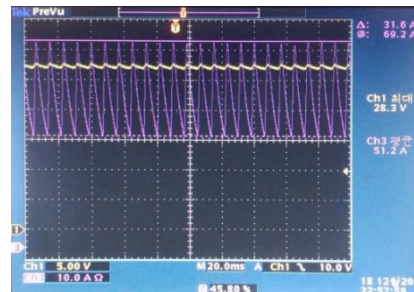
[A Company]
solar street light charger
Current ripples
 $\Delta A = 19.5A$



[B Company]
solar street light charger
Current ripples
 $\Delta A = 17.9A$



[Tabos]
AC Supply charger
TC-1500W-25V45A
Current ripples
 $\Delta A = 1A$



[C Company]
AC Supply charger
For 25V 50A
Current ripples
 $\Delta A = 31.6A$

As shown in the above data, the charge current ripple of the Tabos lithium battery charger is significantly lower than that of other companies (tested) and it is more stable.

(All chargers made by Tabos have the same performance)

In addition, there are several functions to protect the lithium battery such as the fine charge function and the multi-step current increase function in the low voltage section.

It is recommended to use a charger made by our company as a set for the lithium battery made by tabos.

Inexpensive solar chargers shorten battery life and can cause fire and other safety accidents.

◇ Charger Selection

Be sure to use a charger with built-in constant-voltage and constant-current circuitry.

Although the battery has built-in overvoltage and undervoltage protection circuitry, the product with the overvoltage protection circuit built into the charge / discharge controller can be used safely for a long time. There is a product developed for this lithium ion battery in Tabos, so please contact Tabos first.

◇ Rapid charging / Slow charging

Rapid charging lowers battery life. If possible, it is recommended to charge slowly.

It is recommended that the charge current be less than 0.5C (below the limit current value specified in the specification for each battery model) and lower the charge current.

0.5C means that the battery is charged to 100A x 0.5 = 50A when the battery has a capacity of 100Ah

To ensure long life, slow charging(charging below 0.2C) is recommended

(In case of solar street light charging, slow charging is recommended.)

◇ Charger guide (manufactured by tabos)

Use	Model number	Content	Specifications	Cert.
For general AC supply (AC220V)	TC-3S15A-S	15A for 3S	Low charge current ripples, Low frequency noise in charge current, Short circuit/Reverse-connection protection, Pre-charging, monitoring, No current output when disconnected	
	TC-7S10A-S	10A for 7S		

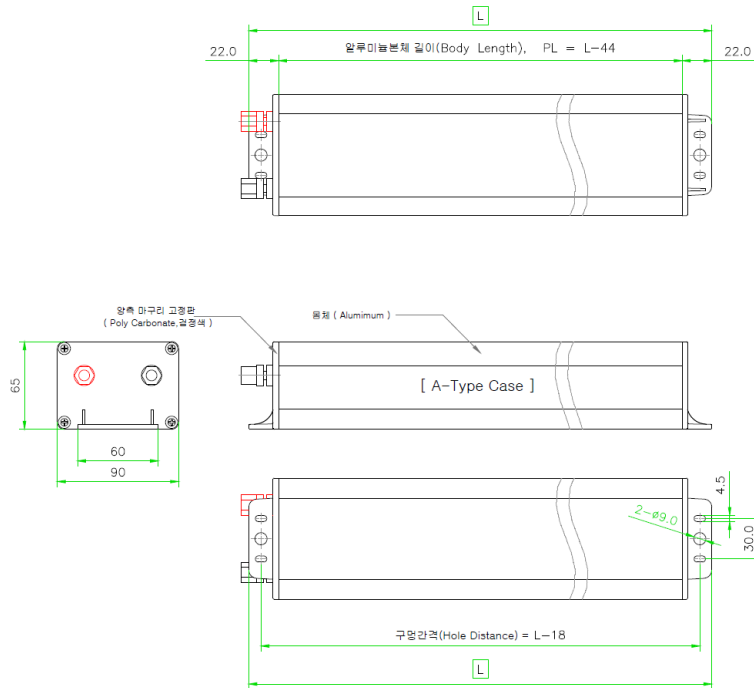
◇ Battery with operation switch of communication port (optional) and battery fuel gauge(optional)

The switch is not intended to shut off the main power of the battery, but for power supply of the communication port and the battery fuel gauge.

Also, if the switch is left turned on, there is a risk of battery Under Voltage and battery life will be shortened.

7. Product Drawings

(1-1). A-Type Case (slim type) with banana plug (standard)



1. 케이스 본체 : 알루미늄 프로파일형 (은백색)
2. 케이스 양쪽 마구리 브라켓 : 폴리카보네이트 수지(검정색)

A-Type

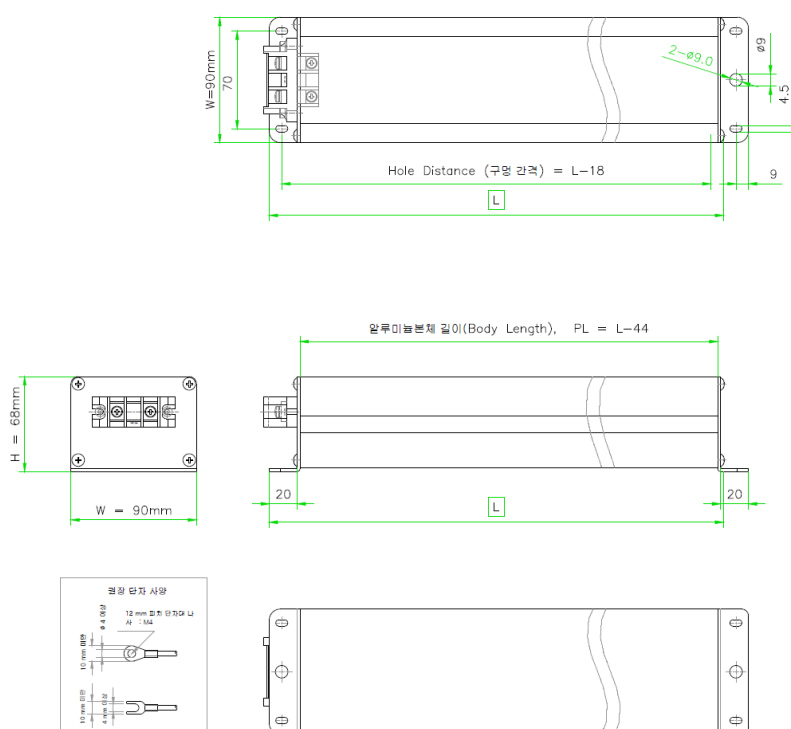
Model	공칭전압(셀리탈수)	전류용량	PL	L
LB309-250W-A	10.8V (3S)	23Ah	195mm	239mm
LB312-340W-A	10.8V (3S)	31Ah	260mm	304mm
LB317-480W-A	10.8V (3S)	44Ah	355mm	399mm
LB322-630W-A	10.8V (3S)	57Ah	445mm	489mm

[결선용 터미널]

1. Ring Terminal 사용시 :
링 터미널 최소 내경 = $\phi 6.9\text{mm}$
2. 바나나 잭(플러그) 사용시 :
바나나 플러그(수놈) 규격 : PB-701 외,
바나나길이:15mm

*Materials : Aluminium alloy (body) + Polycarbonate (caps for both sides)

(1-2). A-Type Case (Slim type) , Terminal Block (option)



1. 케이스 본체 : 알루미늄 프로파일형 (은백색)
2. 케이스 양쪽 마구리 브라켓 : 알루미늄 절곡 (은백색)

2022.02.07 (오타 수정함)

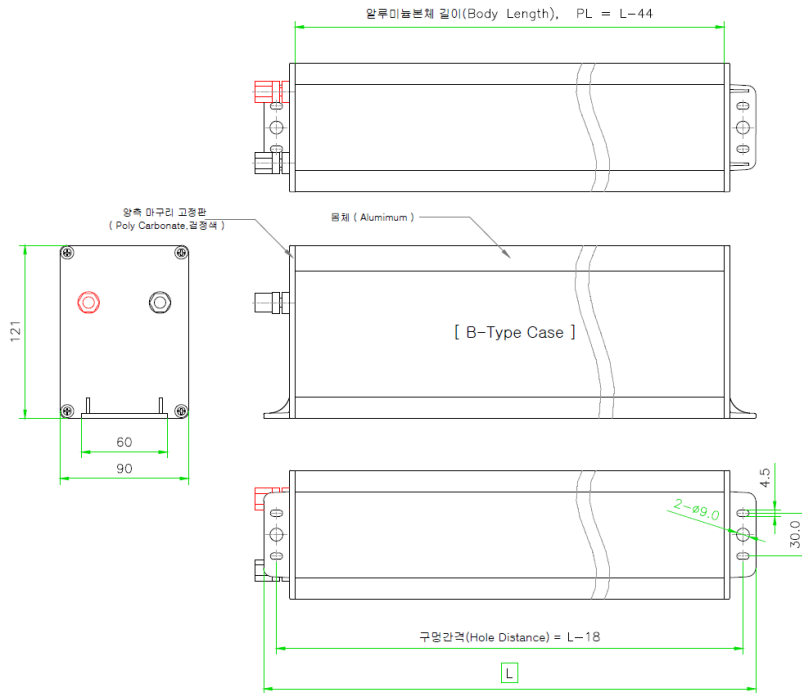
A-Type

Model	공칭전압(셀리탈수)	전류용량	PL	L
LB309-250W-A/TB	10.8V (3S)	23Ah	195mm	235mm
LB312-340W-A/TB	10.8V (3S)	31Ah	260mm	300mm
LB317-480W-A/TB	10.8V (3S)	44Ah	355mm	395mm
LB322-630W-A/TB	10.8V (3S)	57Ah	445mm	485mm

*Materials : Aluminium alloy (body + caps for both sides)

(2-1). B-Type Case (Medium type) , banana plug (standard)

1. 케이스 본체 : 알루미늄 프로파일형 (은백색)
2. 케이스 양쪽 마구리 브라켓 : 폴리카보네이트 수지(검정색)



B-Type

제 품 사 양				치 수	
Model	공칭전압(셀직렬수)	전류용량	PL	L	
LB320-570W-B	10.8V (3S)	52Ah	225mm	269mm	
LB328-800W-B	10.8V (3S)	72Ah	300mm	344mm	
LB334-970W-B	10.8V (3S)	88Ah	355mm	399mm	
LB340-1150W-B	10.8V (3S)	104Ah	410mm	454mm	
LB610-570W-B	21.6V (6S)	26Ah	225mm	269mm	
LB614-800W-B	21.6V (6S)	36Ah	300mm	344mm	
LB617-970W-B	21.6V (6S)	44Ah	355mm	399mm	
LB620-1150W-B	21.6V (6S)	52Ah	410mm	454mm	

[결선용 터미널]

1. Ring Terminal 사용시 :
링 터미널 최소 내경 = $\phi 6.9\text{ mm}$
2. 바나나 잭(플러그) 사용시 :
바나나 플러그(수놈) 규격 : PB-701 외,
바나나길이:15mm

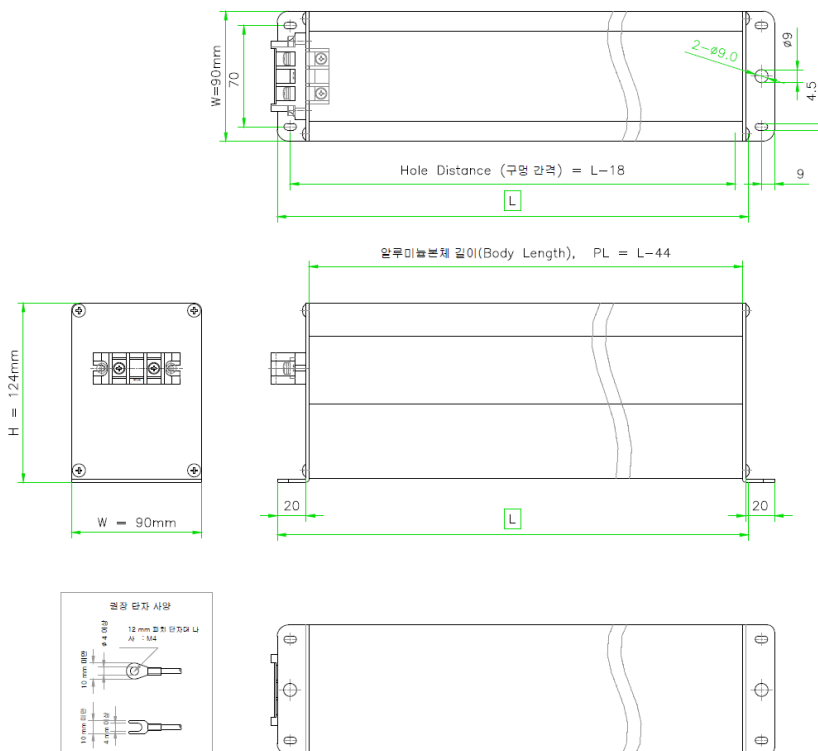
*Materials : Aluminium alloy (body) + Polycarbonate (caps for both sides)

(2-2). B-Type Case (Medium type) , Terminal Block (option)

1. 케이스 본체 : 알루미늄 프로파일형 (은백색)
2. 케이스 양쪽 마구리 브라켓 : 알루미늄 절곡 (은백색)

2022.02.07 (오타 수정함)

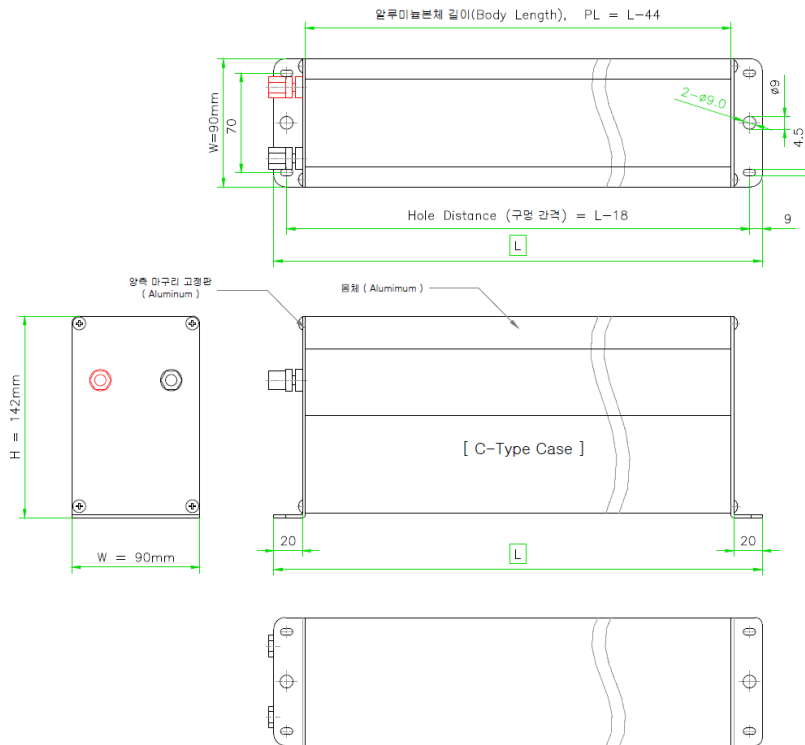
B-Type



제 품 사 양				치 수	
Model	공칭전압(셀직렬수)	전류용량	PL	L	
LB320-570W-B/TB	10.8V (3S)	52Ah	225mm	265mm	
LB328-800W-B/TB	10.8V (3S)	72Ah	300mm	340mm	
LB334-970W-B/TB	10.8V (3S)	88Ah	355mm	395mm	
LB340-1150W-B/TB	10.8V (3S)	104Ah	410mm	450mm	
LB610-570W-B/TB	21.6V (6S)	26Ah	225mm	265mm	
LB614-800W-B/TB	21.6V (6S)	36Ah	300mm	340mm	
LB617-970W-B/TB	21.6V (6S)	44Ah	355mm	395mm	
LB620-1150W-B/TB	21.6V (6S)	52Ah	410mm	450mm	

*Materials : Aluminium alloy (body + caps for both sides)

(3-1). C-Type Case (large type) , banana plug (standard)



1. 케이스 본체 : 알루미늄 프로파일형 (은백색)
2. 케이스 양쪽 마구리 브라켓 : 알루미늄 절곡 (은백색)

2022.02.07 (오타 수정함)

C-Type

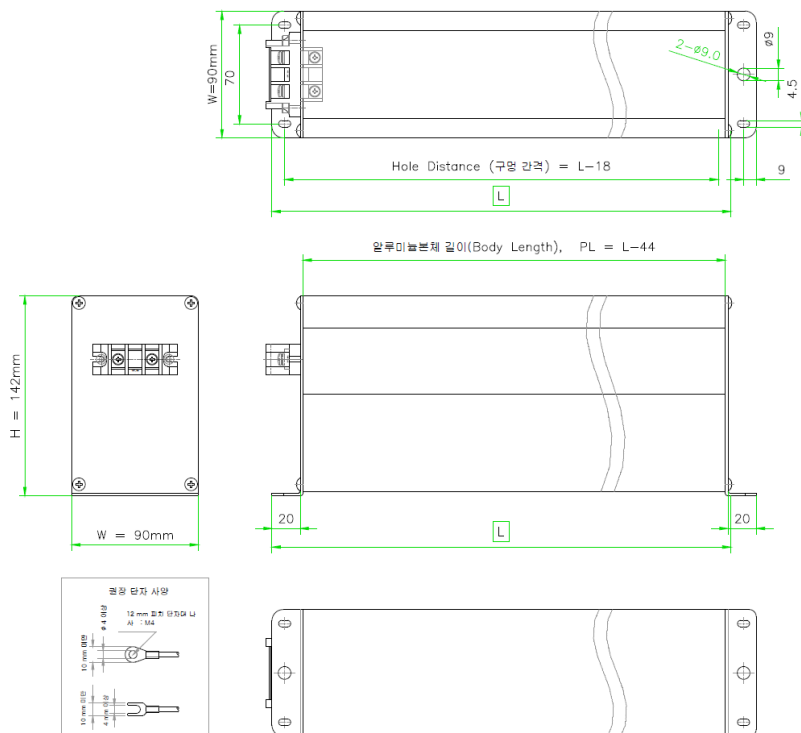
제 품 사 양				치 수	
Model	공칭전압(셀직렬수)	전류용량	PL	L	
LB710-660W-C	25.2V (7S)	26Ah	230mm	270mm	
LB713-860W-C	25.2V (7S)	34Ah	330mm	370mm	
LB714-930W-C	25.2V (7S)	36Ah	330mm	370mm	
LB717-1130W-C	25.2V (7S)	44Ah	355mm	395mm	
LB721-1390W-C	25.2V (7S)	54Ah	430mm	470mm	

[결선용 터미널]

1. Ring Terminal 사용시 :
링 터미널 최소 내경 = ϕ 6.9 mm
2. 바나나 잭(플러그) 사용시 :
바나나 플러그(수동) 규격 : PB-701 외,
바나나길이:15mm

*Materials : Aluminium alloy (body) + Polycarbonate (caps for both sides)

(3-2). C-Type Case (large type) , Terminal Block (option)



1. 케이스 본체 : 알루미늄 프로파일형 (은백색)
2. 케이스 양쪽 마구리 브라켓 : 알루미늄 절곡 (은백색)

2022.02.07 (오타 수정함)

C-Type

제 품 사 양				치 수	
Model	공칭전압(셀직렬수)	전류용량	PL	L	
LB710-660W-C/TB	25.2V (7S)	26Ah	230mm	270mm	
LB713-860W-C/TB	25.2V (7S)	34Ah	330mm	370mm	
LB714-930W-C/TB	25.2V (7S)	36Ah	330mm	370mm	
LB717-1130W-C/TB	25.2V (7S)	44Ah	355mm	395mm	
LB721-1390W-C/TB	25.2V (7S)	54Ah	430mm	470mm	

*Materials : Aluminium alloy (body + caps for both sides)