

# EZA2500W-32048

## Quick Manual

### Practical Volume I

#### BEFORE USING THE POWER SUPPLY UNIT (Common)

Be sure to read this instruction manual thoroughly before using this product. Pay attention to all cautions and warnings before using this product. Incorrect usage could lead to an electrical shock, damage to the unit or a fire hazard.

#### DANGER!

Never use this product in locations where flammable gas or ignitable substances are present.

#### INSTALLATION WARNING

- When installing, ensure that work is done in accordance with the instruction manual. When installation is improper, there is risk of electric shock and fire.
- Installation shall be done by Service personnel with necessary and appropriate technical training and experience. There is a risk of electric shock and fire.
- Do not cover the product with cloth or paper etc. Do not place anything flammable around. This might cause damage, electric shock or fire..

#### WARNING on USE

- Do not touch this product or its internal components while circuit in operation, or shortly after shutdown. You may receive a burn.
- While this product is operating, keep your hands and face away from it as you may be injured by an unexpected situation.
- There are cases where high voltage charge remains inside the product. Therefore, do not touch even if they are not in operation as you might get injured due to high voltage and high temperature. You might also get electric shock or burn.
- Do not make unauthorized changes to this product nor remove the cover as you might get an electric shock or might damage the product. We will not be held responsible after the product has been modified, changed or dis-assembled.
- Do not use this product under unusual condition such as emission of smoke or abnormal smell and sound etc. Please stop using it immediately and shut off the product. It might lead to fire and electric shock. In such cases, please contact us. Do not attempt repair by you, as it is dangerous for the user.
- Do not operate and store these products in environments where condensation occurs due to moisture and humidity. It might lead fire and electric shock.
- Do not drop or apply shock to this product. It might cause failure. Do not operate these products mechanical stress is applied.

#### CAUTION on MOUNTING

- Confirm connections to input/output terminals are correct as indicated in the instruction manual before switching on.
- Input voltage, Output current, Output power, ambient temperature and ambient humidity should be kept within specifications, otherwise the product will be damaged, or cause electric shock or fire.
- Do not use this product in special environment with strong electromagnetic field, corrosive gas or conductive substances and direct sunlight, or places where product is exposed to water or rain.
- Mount this product properly in accordance with the instruction manual, mounting direction and shall be properly be ventilated.
- Please shut down the input when connecting input and output of the product.
- The power supply may cause damage when it intake conductive material, dust and liquid. When use this product, please be careful to prevent entry of those materials to inside the product by using filter etc.
- Do not use this product in environments where causes the salt damage.

#### CAUTION on USE

- Product individual notes are shown in the instruction manual. If there is any difference with common notes individual notes shall have priority.
- Before using this product, be sure to read the catalog and instruction manual. There is risk of electric shock or damage to the product or fire due to improper use.
- Input voltage, Output current, Output power, ambient temperature and ambient humidity should be kept within specifications, otherwise the product will be damaged, or cause electric shock or fire.
- If the built-in fuse is blown, do not use the product even after replacing the fuse as there is risk of abnormality inside. Be sure to request repair to our company.

- For products without built-in protection circuit (element, fuse, etc.), insert fuse at the input to prevent smoke, fire during abnormal operation. As for products with built-in protection circuit, depending on usage conditions, built-in protection circuit might not work. It is recommended to provide separate proper protection circuit.
- For externally mounted fuse do not use other fuses aside from our specified and recommended fuse.
- This product was made for general purpose electronic equipment for standard industrial use and is not designed for applications requiring high safety (such as extremely high reliability and safety requirements. Even though high reliability and safety are not required, this product should not be used directly for applications that have serious risk for life and physical safety. Take sufficient consideration in fail-safe design (such as providing protective circuit or protective device inside the system, providing redundant circuit to ensure no instability when single device failure occurs).
- When used in environments with strong electromagnetic field, there is possibility of product damage due to malfunction.
- When used in environment with corrosive gas (hydrogen sulfide, sulfur dioxide, etc.) , there is possibility that they might penetrate the product and lead to failure.
- When used in environments where there is conductive foreign matter or dust, there is possibility of product failure or malfunction.
- Provide countermeasure for prevention of lightning surge voltage as there is risk of damage due to abnormal voltage.
- Connect together the frame ground terminal of the product and the ground terminal of the equipment for safety and noise reduction. If these grounds are not connected together, there is risk of electric shock.
- Parts with lifetime specifications (built-in fan, electrolytic capacitor) are required to be replaced periodically. Set the overhaul period depending on the environment of usage and perform maintenance. Also, note that there are cases when EOL products cannot be overhauled.
- Take care not to apply external abnormal voltage to the output. Especially, applying reverse voltage or overvoltage more than the rated voltage to the output might cause failure, electric shock or fire.
- Do not use in special environment such as places directly exposed to sunlight, dew condensation, moisture, rain, strong electromagnetic field, or corrosive gas (hydrogen sulfide, sulfur dioxide).
- This product has a built-in fan for air-cooling. Do not block the air intake and exhaust.
- The output of this product is considered to be a hazardous energy level (The voltage is 2V or more and the power is 240VA or more). It must not be made accessible to users. Protection must be provided for Service Engineers against indirect contact with the output terminals and/or to prevent tools being dropped across them. While working on this product, the DC input power must be switched off and the input and output voltage should be zero.
- When short the output during operation, there is damage inside the converter.
- When change abrupt in Input voltage during operation, there is a Risk of damage inside the converter.
- When use the Electric storage device, Please refer to the manual of electric storage device and use the appropriate protection device.

 **Note**

- There is a possibility machining traces remain on sheet metal of product.
- Consider storage of the product at normal temperature and humidity avoiding direct exposure to sunlight at environment with minimal temperature and humidity changes. Storage of product at high temperature, high humidity and environments with severe changes in temperature and humidity might cause deterioration, and occurrence of condensation in the product.
- When disposing product, follow disposal laws of each municipality.
- Published EMI (CE, RE) or immunity is the result when measured in our standard measurement conditions and might not satisfy specification when mounted and wired inside end-user equipment. Use the product after sufficiently evaluating at actual end-user equipment.
- Catalogue, contents of the instruction manual may be changed without a prior notice. Refer to latest catalogue or instruction manual.
- Reproduction or reprinting the instruction manual or its portion is forbidden without our permission.

## **Over view of Quick manual Practical Volume I**

**In Quick Manual Practical Volume I, We will explain a series of procedures for starting up EZA2500W, how to start via RS485, and how to start via external connector CN.**

**The procedure for starting specifically is also explained in Practical Volume II, so please refer to that.**

**In order to use EZA, it is necessary to understand the operation mode and parameters of EZA. We will explain them in Practical Volume I.**

**In using EZA2500W, We will also explain what you want to keep in mind, such as limits on the range that can be combined with the voltage on the low voltage side and high voltage side, and the power consumption of the EZA2500W itself.**

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## 1) Explanation of terms of EZA

In EZA, terms unfamiliar with other power supplies are used in instruction manual etc. I will explain the main ones below.

- ① CV: Constant Voltage. In the case of EZA, control to make the voltage on the high-voltage side or the low-voltage side of EZA constant is called CV control.
- ② CC: Constant Current. When the output current reaches a preset current, EZA control the voltage so that it does not exceed that current. This is called CC control. If it does not reach that current, EZA performs CV control.
- ③ Automatic CV mode : The operation of comparing the preset target voltage (parameter) with the actual voltage, EZA itself judging and switching the direction of charging / discharging is called automatic CV mode.
- ④ Manual CV mode: In contrast to the above, EZA switches direction of charging / discharging by receiving instructions from a personal computer, PLC, etc. is called manual CV mode.
- ⑤ Generation: In the case of EZA, charging from the (power) grid side (high voltage side, HVDC side) to the battery side (low voltage side, LVDC side) is called generation or power running. Since the bi-directional DCDC converter has been put to practical use in railroads etc., it is sometimes called “power running” or “generation” to supply power to the motor side from the power grid side.
- ⑥ Regeneration: This is called electric power conversion in the opposite direction of “power running”. In the case of EZA, discharging from the battery side to the grid side is called regeneration.
- ⑦ Droop control: Controlling to lower the output voltage in proportion to the magnitude of the output current is called droop control. With these characteristics, you can expect the effect of aligning the output currents between the EZAs when performing parallel operation. In EZA, the rate of voltage drop with respect to current is called the Droop Ratio and can be set as a parameter.
- ⑧ Shutdown: EZA outputs a heavy alarm signal, stops the main circuit, stops the output and enters the standby state is called Shutdown.
- ⑨ Heavy alarm: EZA has its own function to protect EZA itself or peripheral equipment. When the protection function is activated, the EZA outputs an alarm signal, stops the main circuit, and enters the standby state. When the protection function works, if it seems that worker's confirmation work is necessary before releasing, EZA will output Heavy alarm signal. With heavy alarm, the red LED on the front panel is lit, EZA is on the front panel, the pin 1 of the CN is open to the SG, and the standby state is entered.  
When a Heavy alarm signal is output, in order to reactivate, it is necessary to input the start signal after clearing the heavy alarm signal by inputting the reset signal from the outside, except for the cause of the occurrence of the alarm is required. Reset can be done by one of the

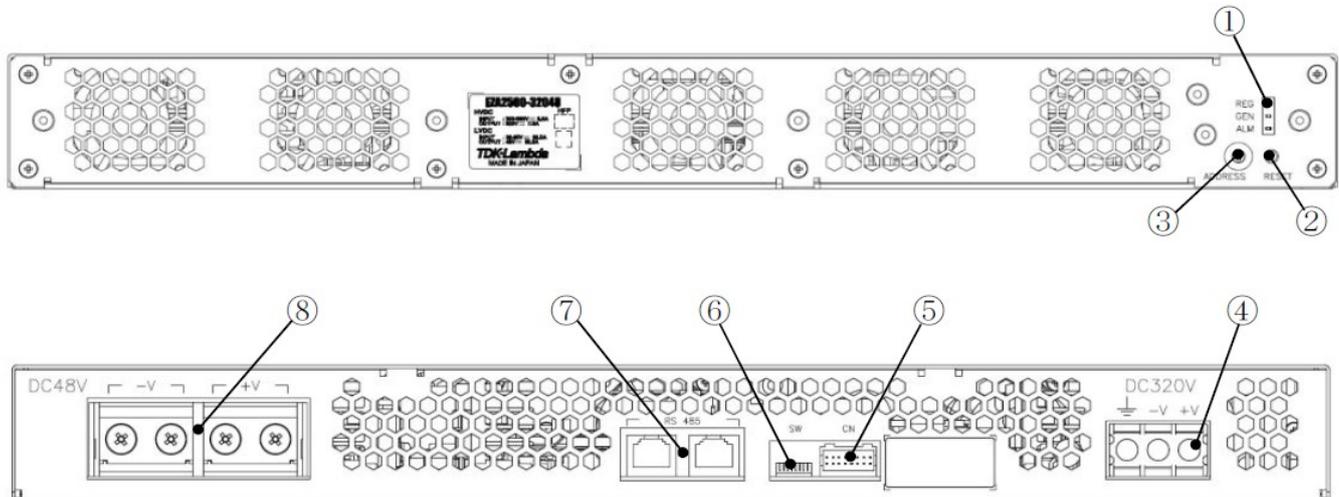
following methods a) to c). a) Command via RS - 485 b) Set pin 11 of CN to short with signal ground SG ⇒ open. C) Press the reset button on the front panel.

⑩ Light alarm: EZA outputs a light alarm signal when EZA determines that operation can be resumed if the cause is removed when the protection function is activated. When a light alarm signal is output, if the cause of the occurrence of the alarm is removed, the main circuit is restarted from the standby state and put in operation. With a light alarm, the red LED on the front panel does not light up. Also pin 1 of CN will remain short for SG.

⑪ Waiting: The control board is started but the main converter is stopped. In EZA, it is called waiting or waiting mode. In waiting, power consumption is only for the control board. In waiting, parameter setting, reading, reading of EZA status information, and acceptance of the start command of the main converter are possible.

## 2) Explain of Terminal Connection and Panels

EZA2500W terminals and Panels are shown in the figure below. Please check with each item of Quick Manual Basic Guide p5-6, Operation Manual.



### ① LED of Indicator

The LEDs (3 pcs) indicates operating status of EZA2500W.

### ② RESET :Tactile Switch

The tactile switch functions as alarm clear button when the alarm is activated due to abnormal occurrence.

### ③ ADDRESS : Rotary Switch

The rotary switch functions as the RS-485 address setting for this converter.

### ④ Grid Connection Terminal (DC320V HVDC Terminal)

DC320V HVDC Power Supply Input Output Terminal, -V, +V (The fuse is connected to +V)

### ⑤ CN : External Signal Connector

It is an external signal terminal. I / O are open collector compatible.

### ⑥DIP SW

DIP Switch functions as a setting switch to designate operating mode and RS485 parameter of this converter.



It is a DIP switch that selects whether to control with RS-485 or CN connector.

### ⑦ RS-485 : Serial Interface Connector

LAN cable can be used with the same shape as Ether-net used on RJ-45 PC LAN. However, it is not compatible with LAN (Ether-net). Check the pin assignment of RS-485 in the instruction manual.

### ⑧ Battery Connection Terminal (DC48V LVDC Terminal)

DC48V Power Supply Input Output Terminal -V, -V, +V, +V (The fuse is connected to +V)

### 3) What can be done via RS-485, what can be done with External Signal Connector CN.

EZA series can control all the following functions with RS-485, and all parameters can be set with RS-485. The Functions in bold can also be controlled by CN rather than RS485.

- ① **Start and stop the main converter in each operation mode**
- ② **Switching charge and discharge in the CV mode of different value**
- ③ **Confirm that the main converter is in operation, stopping**
- ④ Write the parameters necessary for each operation mode (Overwrite change) and check the set parameter value
- ⑤ **Whether or not an alarm has occurred**
- ⑥ and confirm the type of alarm that occurred
- ⑦ **Resetting heavy alarm**
- (8) Voltage and current value on high pressure side, low pressure side, confirmation of EZA internal temperature
- ⑨ Confirmation of rotation speed of air cooling fan

External signal connector CN can perform ①, ②, ③, ⑤, ⑦ operations shown in bold. Note, to operate ① and ② with CN, you need to make settings with DIP switch in advance. For details, check the general items in p8 to 12 in this manual and p10 in the instruction manual.

**It is possible to forcibly stop the EZA by shorting Converter Operation Stop Command signal pin 5 of the External Signal Connector CN with SG. This stop command signal takes precedence over all EZA commands and is valid even if the DIP switch is set to the operation mode via RS-485 which will be described later. In this case, EZA outputs Heavy alarm.**



EZA2500W is designed to be unnecessary to use CN, especially if it controls with RS-485.



It is necessary to change the DIP switch to switch start / stop and charge direction from CN. If changed, the same operation can not be performed via RS-485. (Exclusion of control)

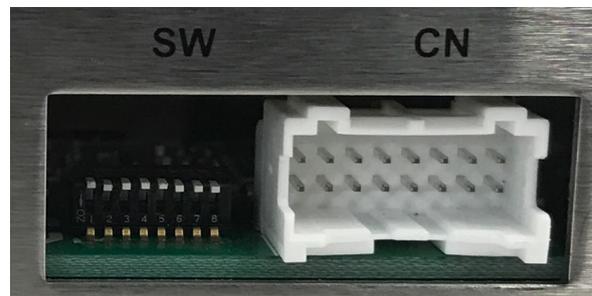
#### 4) When using via RS485

When operating the EZA via RS-485, follow the procedure below according to the items in the Quick Manual Basic Part 7, 8 and Operation Manual.

##### ① Set EZA to operation via RS-485.

Set the EZA to operation via RS-485 and the address on RS-485 to "0", the communication speed to 19.2 kbps.

Set the terminal voltage on both the grid side and the battery side of the EZA to 0 V, and then set as shown in the photo under the DIP switch on the back.



Set the rotary switch on the front panel as shown in the picture below.



For details, refer to the instruction manual p10 and the communication manual p6.



※ The factory setting is the above setting.

##### ② Restart the control board.

Apply the specified voltage on the grid side and battery side terminals of EZA. This operation is unnecessary unless you have operated the DIP switch or rotary switch.



The control board reads the values of DIP switch and rotary switch at restart.



The control board is also restarted by applying the specified voltage to either the battery or grid side.

### ③ Set parameters of EZA.

Set parameters of EZA via RS-485.



Refer to the communication manual for how to set parameters.



Refer to the Quick Manual Practical II for the parameter setting method using the GUI software CNVCommCC.

### ④ Start in your desired operating mode.

Make sure that the specified voltage is applied to the grid side and the battery side, and when discharging, check that the load such as the inverter is connected. Then send the desired operation mode start command to EZA via RS-485..



Refer to the communication manual for how to send the start command



Refer to the Quick Manual Practical II for the start command sending method using the GUI software CNVCommCC.

### ⑤ Confirming startup.

The fan rotates and the main converter starts and starts power conversion.



When EZA start up, the green LED on the front panel lights up or flashes.



It is possible to overwrite (change) the parameters of EZA after startup.



After the end of reception from EZA, please start transmission with an interval of 2ms or more for RS485. Also, for communication using a broadcast address, make sure that the issuance command interval is 200ms or more. Note that EZA does not reply to commands using a broadcast address.

### ⑥ Stop EZA.

To stop, send the Waiting command to EZA via RS-485. Then EZA will stop and go into standby mode



After receiving the Waiting command, the main converter of EZA stops immediately, but the fan continues to rotate for about 3 minutes for cooling and then stops.

**5) When using external signal connector CN**

The following explains how to control with external signal connector CN without using RS-485.

**① Set EZA to operation via CN.**

The following explains how to operate the EZA in the Manual CV mode via CN. Also, set the address on RS-485 to "0" and the communication speed to 19.2 kbps.

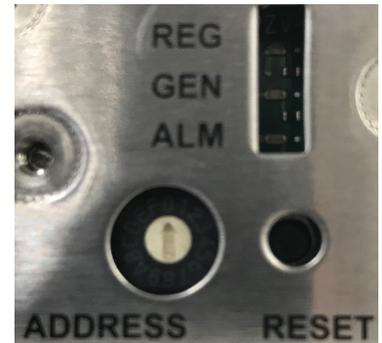
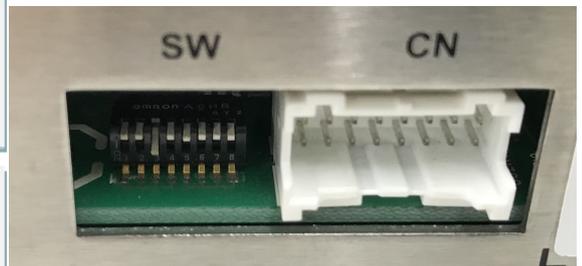
Set the terminal voltage on both the grid side and the battery side of the EZA to 0 V. As shown in the photo below, set only 3 of the DIP switch on the back to ON.



Refer to p10 of the instruction manual and p6 of the communication manual when operating in other modes or changing the address.



If the operation setting is via CN, EZA will not accept start commands via RS-485. However, since Waiting Mode command is accepted, it is possible to stop via RS485.



Set the rotary switch on the front panel as shown in the picture to the right.

※ The factory setting is the above setting.

**② Restart the control board.**

Apply the specified voltage on the grid side and battery side terminals of EZA.



The control board reads the values of DIP switch and rotary switch at restart.



The control board is also restarted by applying the specified voltage to either the battery or grid side.

### ③ Set parameters of EZA.

Set parameters of EZA via RS-485.



Refer to the communication manual for how to set parameters.



Refer to the Quick Manual Practical II for the parameter setting method using the GUI software CNVCommCC.

### ④ Select either charge or discharge.

① Check that the specified voltage is applied to the grid side and the battery side, and if discharging, check that the load such as the inverter is connected.

② If charging, short pin 9 of CN to the SG potential (eg pin 8). To discharge, leave pin 9 open. This can be switched even while the EZA is running.

### ⑤ Startup.

EZA starts up when pin 7 of CN is shorted with SG potential (for example, pin 8).



While Pin 9 is shorted to the SG potential in automatic grid CV mode, EZA switches to manual battery CV mode and charging.

### ⑥ Confirm startup.

The fan rotates and the main converter starts and starts power conversion.



When EZA start up, the green LED on the front panel lights up or flashes. And CN pin 3 is shorted to SG potential.



It is possible to overwrite (change) the parameters of EZA after startup.



After the end of reception from EZA, please start transmission with an interval of 2ms or more for RS485. Also, for communication using a broadcast address, make sure that the issuance command interval is 200ms or more. Note that EZA does not reply to commands using a broadcast address.

### ⑦ Stop EZA.

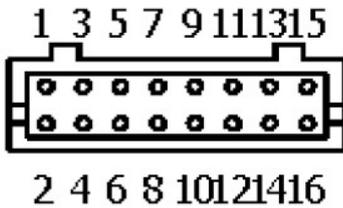
To stop EZA, open pin 7 of CN. Then EZA will stop and go into standby mode.



When pin 7 is opened, the main circuits of EZA stop immediately, but the fan continues to rotate for about 3 minutes for cooling and then stops.

## 6) External signal connector CN pin assignment

The pin assignment of the external signal connector CN is shown below.



Pin #	Signal	I/O	Note
1	ALM	O	Alarm
2	SG	-	Signal Ground
3	PG	O	Converter Operation Good Signal
4	SG	-	Signal Ground
5	STOP	I	Converter Operation Stop Command
6	SG	-	Signal Ground
7	RUN	I	Converter Operation Start Command
8	SG	-	Signal Ground
9	CHRG	I	Charge, Discharge Conversion Command
10	SG	-	Signal Ground
11	ALMCLR	I	Alarm Clear
12	SG	-	Signal Ground
13	IFRST	I	IF MPU Reset Command
14	SG	-	Signal Ground
15	AUX5V	O	Service Power Supply
16	SG	-	Signal Ground



For details such as electrical specifications, refer to p11 and p13 of the instruction manual.

## 7) Emergency stop

If you want to stop EZA immediately due to some trouble, short the CN pin 5 to the SG potential regardless of the operation via RS-485 or CN. This will cause EZA to stop the main converter, issue a heavy alarm and enter standby mode. To restart, open pin 5 and clear the alarm.



To clear the heavy alarm, (1) short CN pin 11 to SG potential, (2) press the reset switch on the front panel, (3) send the reset command via RS-485.

## 8) EZA operation mode

In EZA, the method of switching the charge / discharge direction is called the operation mode, and there are the following 6 types.

Here is an overview. The specific operation method will be explained in the Quick Manual, Practical Part II, so please see that.

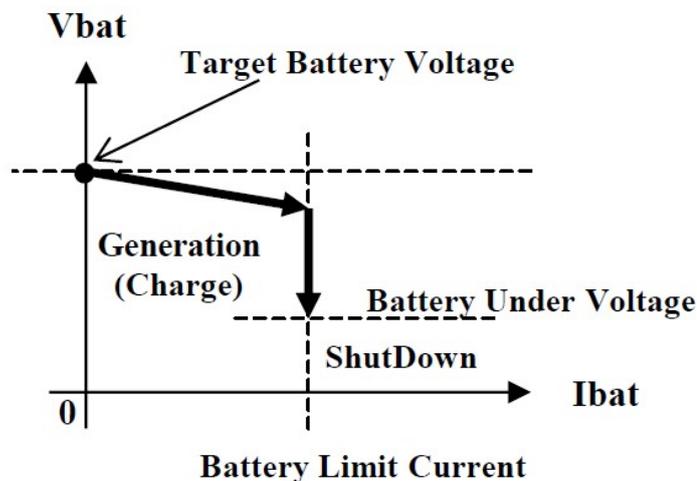
### ① Manual battery CV mode

Select this mode if you want to charge with EZA. However, since it takes time to communicate with EZA, it takes 100 milliseconds or more for EZA to actually switch between charge and discharge even if a command is sent to EZA from a PLC or PC. This time depends on the communication environment. Note that this time is the same for switching using pin 9 of external terminal CN described above.



If you want to switch charge and discharge as fast as possible, we recommend Automatic grid CV mode and Automatic battery CV mode.

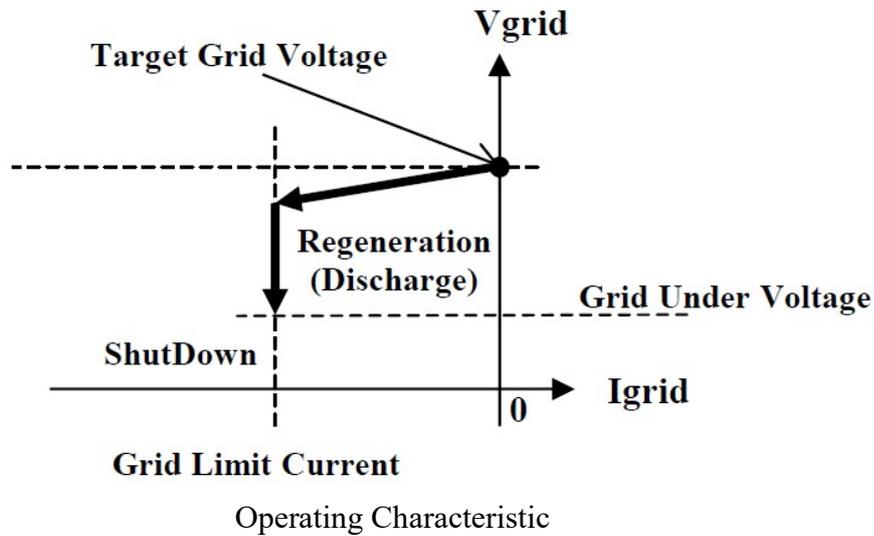
In this mode, EZA is charged with the set value (parameter) of the target battery voltage and the battery limit current on the battery side, and when it reaches the target battery voltage, the current is reduced and maintained so that no further voltage rises.



Operating Characteristic

### ② Manual Grid CV mode

Select this mode if you want to discharge with EZA. In this mode, EZA discharges with the set value (parameter) of the target grid voltage and the grid limit current on the grid side, and when it reaches the target grid voltage, the current is lowered and maintained so that the voltage does not increase. However, please note that switching to charge / discharge takes time, in the same way as the manual battery CV mode.



### ③ Manual Grid CV with Battery CC mode

The basic operation of this mode is the same as the manual grid CV mode described above. When discharging, the maximum current setting value on the battery side, not the grid side, will not be exceeded.

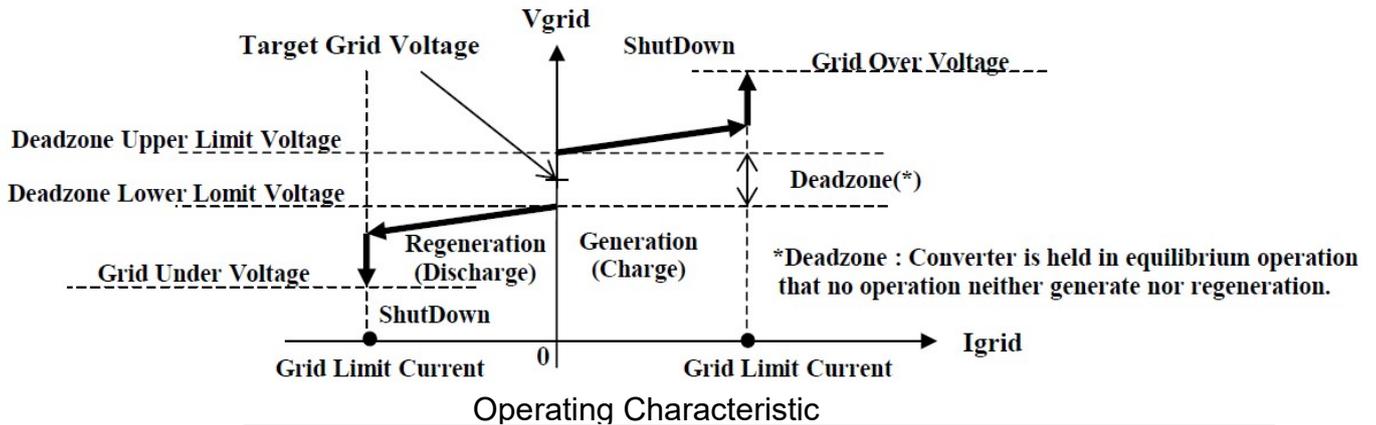
For example, when a fuel cell is connected to the battery, in this mode, it is possible to boost the target voltage to 300V or higher while controlling the output current of the fuel cell.



In battery CC mode, the EZA operates at a substantially constant current at the battery limit current.

#### ④ Automatic Grid CV

In this mode, charging is performed when the grid-side voltage exceeds the target voltage. If it falls below, it will discharge. EZA charges and discharges so that the grid-side target voltage is maintained. This allows EZA to connect to the grid side and maintain the grid side voltage regardless of other power supply conditions. For example, when charging with power from a solar cell, even if the sun is blocked by a cloud and the output of the solar cell disappears, EZA automatically switches to discharging from the battery to supply power to the load and operate. It is possible to continue.



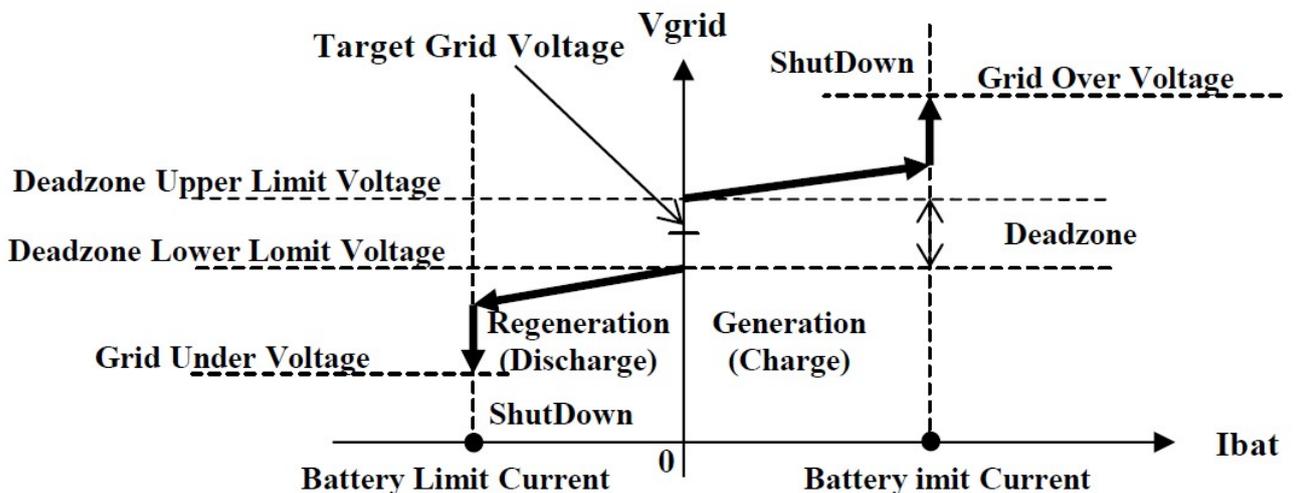
Note that in this mode, if a power supply that controls the voltage on the grid side is connected in addition to EZA, it may interfere with EZA and control as intended may not be possible.



This mode is also recommended in combination with small wind power and small hydropower.

#### ⑤ Automatic Grid CV with Battery CC mode

The basic operation of this mode is the same as that of the automatic grid CV mode described above, but it operates so that the maximum current setting value on the battery side, not the grid side, is not exceeded during charging / discharging. This is used when you want to limit the charge / discharge voltage with the battery current value in grid autonomous CV mode.

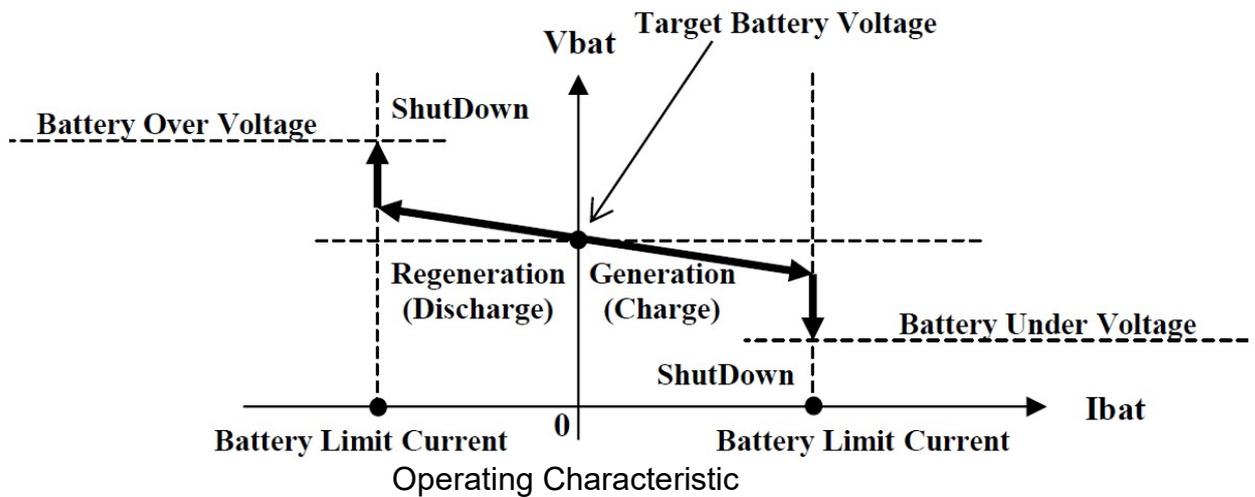




Battery CC mode operates at a substantially constant current at the battery limit current during charging and discharging.

### ⑥ Automatic Battery CV mode

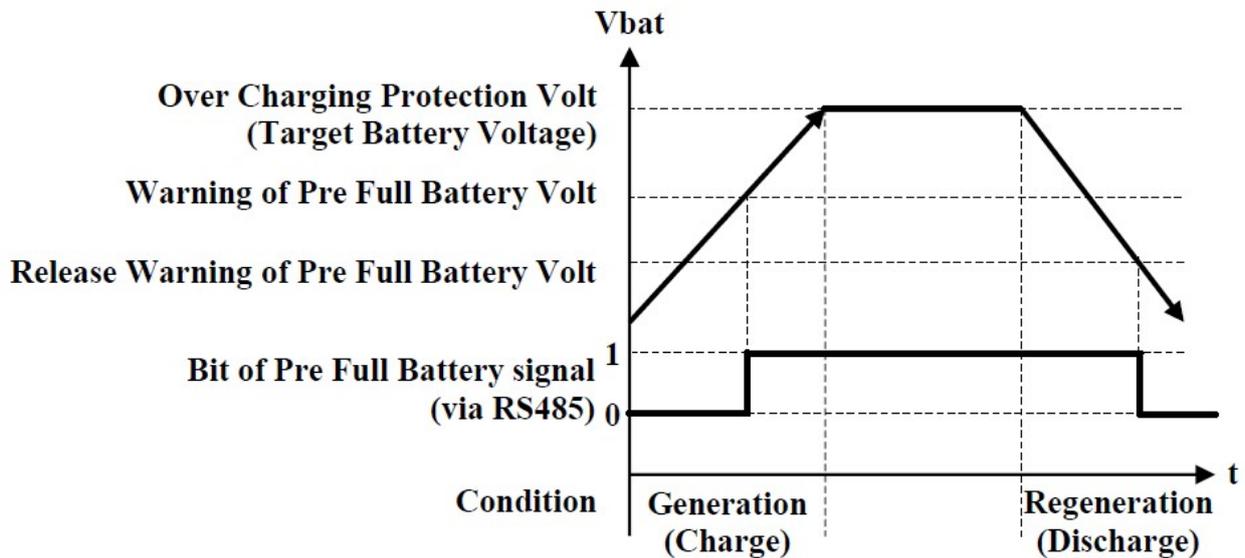
In this mode, charging and discharging are performed to maintain the battery voltage. Specifically, it discharges when the battery side voltage exceeds the set target voltage, and charges when it falls below. EZA performs almost the same operation as the grid autonomous CV battery CC mode at the target voltage on the battery side.



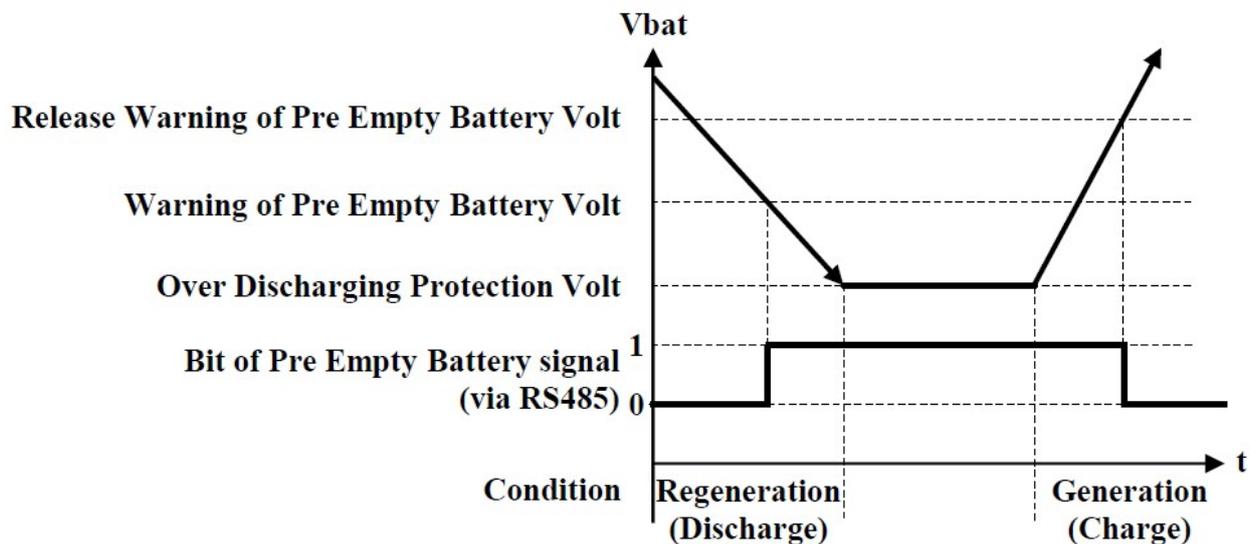
### 9) Battery protection

EZA has a function on the battery side to prevent overcharge and over discharge of the battery. Overcharge protection and over discharge protection can be set separately.

This function is disabled when shipped from the factory. Change the battery setting (BCF) parameter using RS-485 to enable it.



**Battery Over Charging Protection Timing Chart**



**Battery Over Discharging Protection Timing Chart**



When the battery voltage reaches the warning of pre Full or Empty battery voltage, EZA changes the internal registers from 0 to 1. When an inquiry is received via RS485, the value of the registers is returned.

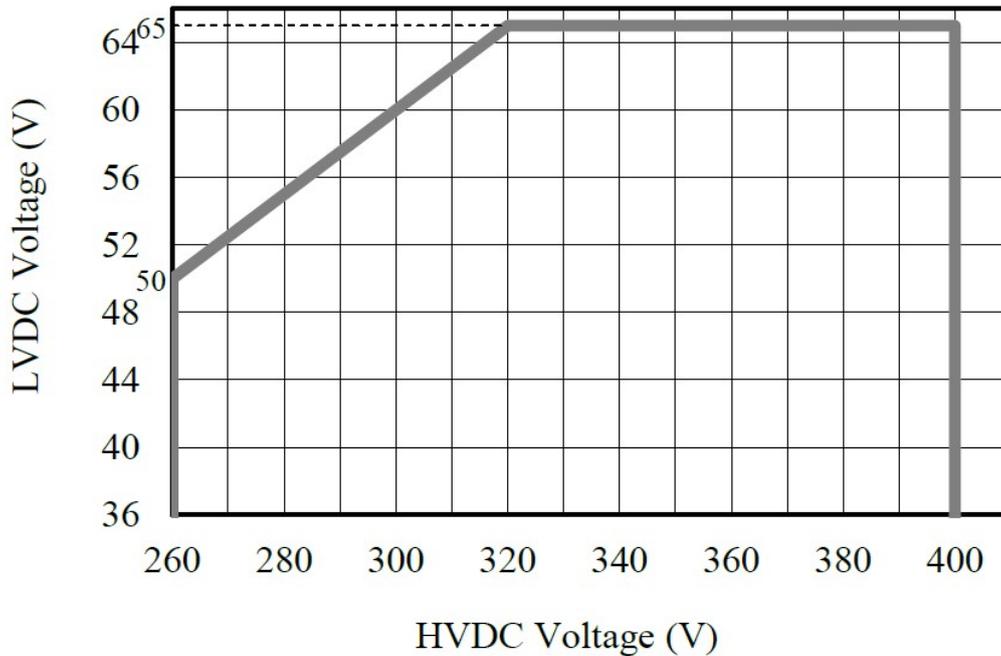


Note: In automatic grid CV mode, the grid side voltage may not be maintained depending on the remaining battery capacity.

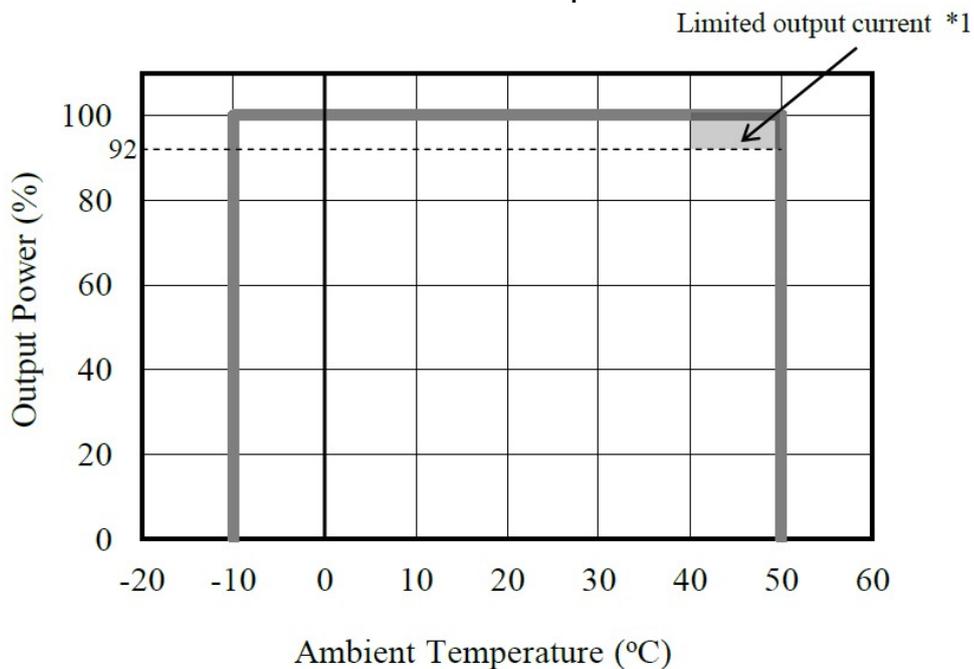
10) Constraint of operating voltage range (HVDC, LVDC)

EZA may not be able to control current and voltage depending on the combination of battery side (LVDC) and grid side (HVDC).

Therefore, it is necessary to control the system so that the voltage of EZA is within the line shown in the figure below. Outside this line, EZA will not be able to control current and voltage. For example, if the grid side (HVDC) is 260V, EZA cannot control the charging / discharging when the battery voltage is 50V or higher.



11) Output power limitation due to ambient temperature



\*1  $T_a > 40^\circ\text{C}$ : Maximum LVDC current is limited to 48A. Therefore, maximum output power depends on voltage conditions.

## 12) Setting parameter list

The EZA setting parameters are important to determine the EZA behavior in each operation mode. Make sure that you understand the values correctly and enter the optimal values for the system using EZA.

Also, if you do not know the appropriate parameters such as droop rate, determine the optimal value while actually testing with the system.

The required parameters differ depending on the operation mode. The list is shown below. There is also a list of the parameters in the communication manual p13-16, so refer as necessary.

Parameter		Function	Operation mode
Symbol	Name		
CVB	Target Battery Volts	Target voltage for battery/LVDC side. (=Maximum charging voltage)	-Manual battery CV -Automatic battery CV -Automatic grid CV -Automatic grid CV with battery CC.
DRB	Droop Ratio of Battery	Set the droop rate to balance the charging current on the battery side during parallel operation	-Manual battery CV -Automatic battery CV
DVG	Target Grid Volts	Target voltage for grid/HVDC side	-Manual grid CV -Manual grid CV with battery CC. -Automatic grid CV -Automatic grid CV with battery CC.
DRG	Droop Ratio of Grid	Set the droop rate to balance the discharging current on the grid side during parallel operation	-Manual grid CV -Manual grid CV with battery CC. -Automatic grid CV -Automatic grid CV with battery CC.
CIB	Current Limit of Battery	Sets the upper limit current (=constant current) value on the battery side	-Manual battery CV -Automatic battery CV -Automatic grid CV -Automatic grid CV with battery CC.
DIG	Current Limit of Grid	Set the upper limit current (=constant current) value on the grid side	-Manual grid CV -Automatic grid CV
OBV	Over Battery Volts	Set the threshold value for the overvoltage protection function on the battery side	-All modes
UBV	Under Battery Volts	Set the threshold value for the low-voltage protection function on the battery side	-All modes

Parameter		Function	Operation mode
Symbol	Name		
OGV	Over Grid Volts	Set the threshold value of the overvoltage protection function on the grid side voltage	-All modes
UGV	Under Grid Volts	Set the threshold value of the low voltage protection function on the grid side voltage	-All modes
BCF	Battery Configure Function (Flag bit allocation)	Enable / disable the battery overcharge, over discharge protection function, battery bus ramp-up function	-All modes
CDB	Deviation of Volts for Warning of Charging Upper Limit	Set the warning voltage to inform you that the battery is almost fully charged	-Manual battery CV -Automatic grid CV -Automatic grid CV with battery CC.
CCR	Deviation of Volts for Cancel Warning of Charging Upper Limit	Set the voltage to cancel the warning of CDB	-Manual battery CV -Automatic grid CV -Automatic grid CV with battery CC.
DLB	Limit of Battery Volts for Discharging	Set the battery discharge lower limit voltage of the battery overdischarge protection function	-Manual grid CV -Manual grid CV with battery CC. -Automatic grid CV -Automatic grid CV with battery CC.
DDB	Deviation of Volts for Warning of Discharging Lower Limit	Set the warning voltage to inform you that the battery is almost fully discharged	-Manual grid CV -Manual grid CV with battery CC. -Automatic grid CV -Automatic grid CV with battery CC.
DDR	Deviation of Volts for Cancel Warning of Discharging Lower Limit	Set the voltage to cancel the warning of DDB	-Manual grid CV -Manual grid CV with battery CC. -Automatic grid CV -Automatic grid CV with battery CC.
PDZ	Plus side voltage width for Deadzone(*) in Automatic Grid CV mode	Set the upper limit of the Deadzone voltage for the grid target voltage. When the grid target voltage is 380V and the Deadzone under limit voltage is 383.8V, the voltage width is 3.8V.	-Automatic grid CV -Automatic grid CV with battery CC..

Parameter		Function	Operation mode
Symbol	Name		
MDZ	Minus side voltage width for Deadzone in Automatic Grid CV mode	Set the lower limit of the Deadzone voltage for the grid target voltage. When the grid target voltage is 380V and the Deadzone lower limit voltage is 376.2V, the voltage width is 3.8V.	Set minus side volts for dead zone. When Grid voltage is between DVG and DVG-PDZ, EZA do not charge or discharge in Grid Automatic CV mode.

\*Deadzone: Converter is held in equilibrium operation that no operation neither generation nor regeneration.

### 13) Power consumption of EZA

The EZA2500W consumes a certain amount of power even when it is not charging or discharging.

- Power consumption of control board

When the voltage of the EZA2500W specification is applied to the high voltage side or low voltage side of the EZA2500W, the internal auxiliary power supply is activated, the control board (CPU, communication function) is activated. And the communication of via RS-485 and CN is possible. In this state, about 7W of power is consumed.

This state is called "Waiting" in EZA. For details, refer to page T-11 of EZA2500W Evaluation data.

- Power consumption after starting main circuit (main converter)

When the main circuit of the EZA2500W is started, the power of about 40 to 100 W is consumed even when the output current is 0 A due to the power of the cooling fan and the operating power of the main circuit.

For details, refer to page T-11 of EZA2500W model data. After the main converter is stopped, the air cooling fan continues to operate for about 3 minutes for cooling the internal circuit, even if Waiting.

