

User Manual

ZEN STORE-3

ON GRID / OFF GRID
ALL IN ONE WITH HYBRID INVERTER

3KW TO 50KW

HYBRID BATTERY ENERGY STORAGE SYSTEM



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1. Introduction

The present manual is addressed to the end customer and describes the main functions of the system ZEN-STORE 3.

READ THE PRESENT MANUAL BEFORE STARTING ANY OPERATION



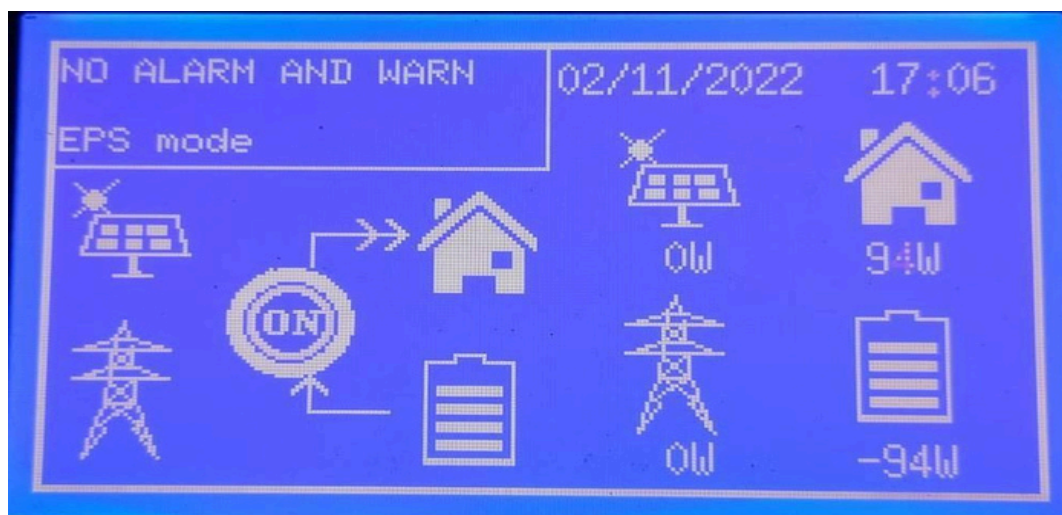
Before starting any operation, it is compulsory to read the present User Manual.

The guarantee of good functioning and the full compliance of the performances of the storage system are strongly connected to the correct commitment of all instructions that are contained in this Manual.

2. Description of the system



Picture: 1. Zen store-3 system



Picture: Zen Store System Display

The interface board shows the following functions:

Graphic display with capacitive keyboard: it shows information regarding to the functioning of the system and it allows to interact with it,

The interface board Display shows the Real Date Time, Different Types Mode Functions, PV, Grid, Loads, and Battery System Functions and there Following Ratings.

3. Identification plate

		Grid rated voltage:	380/400 Vac
Vmax PV:	1kV dc	Backup rated voltage:	380/400 Vac
Num. MPPT/String	6/9	Grid/Backup rated current:	25Aac
Isc PV/String:	23/14Adc	Grid/Backup frequency:	50/60 Hz
Battery type:	Lithium	Grid/Backup rated apparent power:	10000Va
Battery capacity:	2.4KWh	Power factor range :	-0.8-0.8
IP degree:	IP20	Production year:	2022
			
Weight:	375kg max		
Size:	1045*1245*545mm		
MPPT Voltage range: 200-950Vdc			

Picture - Identification plate

The CE identification plate shows the following data (Picture 1):

- Identification of the producer;
- Type of product and model;
- S/N: Serial Number of the product;
- Max PV-gen. power: the maximum power that can be produced by the PV panels towards the inverter;
- Isc PV: the maximum current value of short circuit for each entry on the DC side;
- MPPT volt. Range: voltage range of MPPT;
- Battery type: the type of batteries installed in the storage system;
- Battery capacity: the nominal storage capacity of the batteries;
- IP degree: IP protection degree;
- Weight: the total weight of the storage system;
- Size: the dimensions of the storage system;
- Production year: the year in which the storage system is manufactured;
- Grid/Backup rated voltage: the voltage value available on the outlets “Grid” and “Backup”;
- Grid/Backup rated current: the maximum value of current produced by the inverter on the outlets Grid and Backup;
- Grid/Backup rated apparent power: the maximum value of apparent power produced by the inverter on the outlets Grid and Backup;
- Grid/Backup freq.: the frequency range of the voltage coming from the inverter (it can be set up);
- Power factor range: the power factor range within the inverter is set up.

4. Safety and maintenance

	GENERAL WARNINGS Despite the design in full compliance with the essential safety requirements and the installation of the proper safety devices, for a correct use of the storage system please take into consideration all the rules about accidents prevention listed in the present manual.
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- The end user is not allowed to execute any reparation, replacement or other intervention on the system, for his own safety, the protection of the household appliances and the storage system itself.
 - It is strictly forbidden to try to access the inner parts of the system and each intervention not executed by authorized staff will invalidate the guarantee and the liability of the producer.
 - Do not move the system because this may cause disconnections and false contacts.
 - Do not alter in any way the system, including plates and instructions.
 - The connection of the system to the grid and the PV panels is of permanent type and cannot be altered, except by authorized staff.
 - Do not put powders or liquids on the inner parts of the system.
 - Keep the system away from flames or heat sources.
 - Do not store inflammable materials nearby the system.
 - In order to clean the system, use a normal duster and do not use inflammable or toxic solvents.
 - Always ensure proper ventilation, avoiding to block the air intakes of the system.
- The system does not require any maintenance provided by the end user apart from always ensuring proper ventilation, avoiding to block the air intakes of the system, and the execution of the following visual checks:
- Parts that are mechanically damaged;
 - Damaged electrical cables connected to the system.

In these cases, do not intervene on the system but please contact your authorized dealer.

Maintenance on the AC lines of the building

	ATTENTION Before executing any operation of maintenance on the AC lines of the building, lower the disconnectors GRID and EPS.
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Description of the safety systems and devices

The safety systems and devices installed on the storage system are the following:

- Protection casing of the battery space, battery
- charger and inverter; Protection against direct and indirect electrical contacts;
- Magneto-thermal breakers;
- Fuses.

In order that the protection system is efficient against the indirect contacts, it is necessary that the protection equipment (earthing) of the general electrical installation of the building is duly dimensioned and efficient.

NOTE: The customer is liable for guaranteeing the efficiency according to the existing rules relating to the earthing of the general electrical installation of the building.

5. Pictograms and warnings on the system

	Electrocution hazard – presence of electricity. It is therefore forbidden to try to enter the inner parts of the system. All the works executed on the system must be done by qualified technical staff. Placed nearby the electrical panel.
	Risk of burns due to hot surfaces. Some areas of the product may get hot during the functioning. Avoid the direct contact with the body during the functioning. Before executing any activity on the product, switch it off and leave it cool enough.
	Respect all the indications given in the manuals and in the technical datasheets.
	RAEE / WEEE Waste Do not dispose the product together with household waste, but respecting all the local and European laws regarding the disposal of electronical waste applicable in the country of installation.
	CE Mark The product is compliant with the requirements applicable by the EU Directives.
	Appliance Class I The chassis of the system is connected to the protection conductor of the product. The protection conductor of the product must be connected to the earthing protection conductor of the house.
	It is forbidden to block or cover the air intakes of the system. Placed nearby the electrical panel.

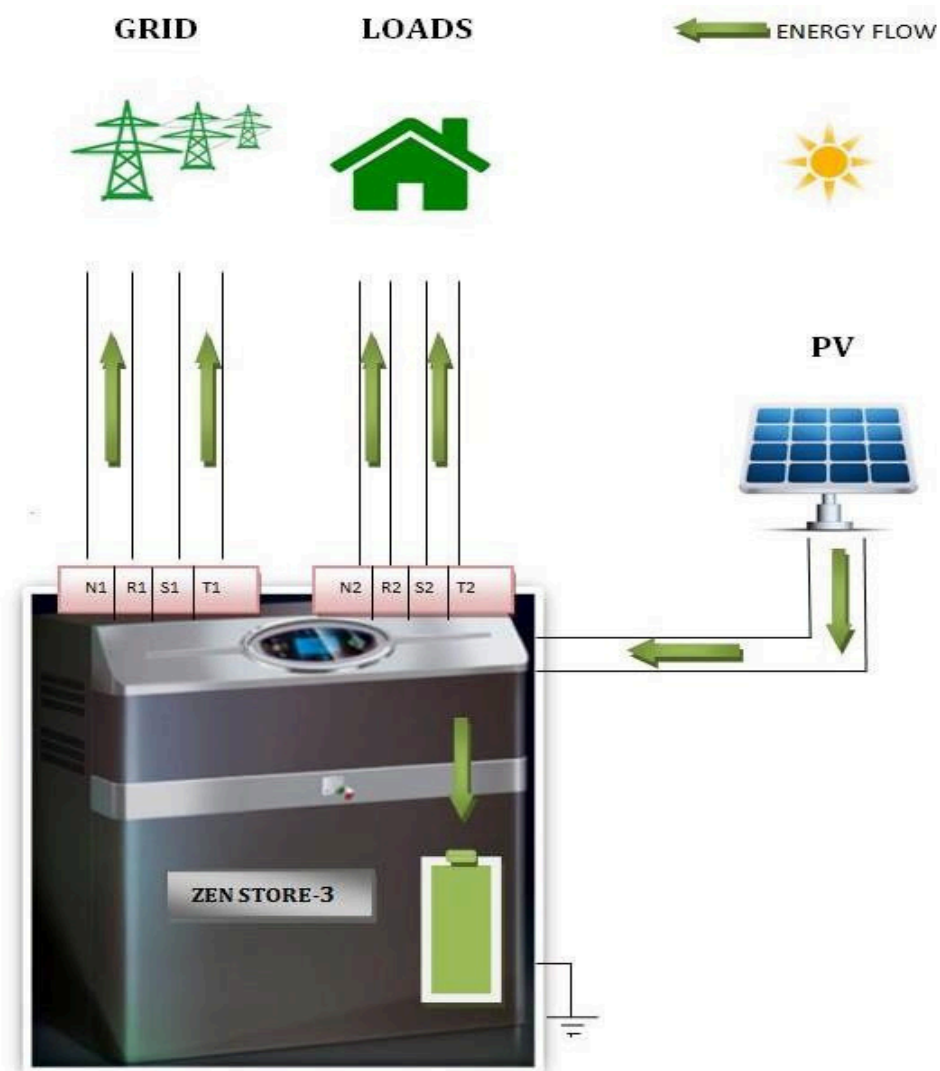
6. Function Modes:

Self-Use

- Self- Use with PV Power

The PV generated power will be used to supply the local loads first, then to charge the battery. The redundant power will export to the public grid. This mode applies the area that has low feed-in tariff And high energy price.

Priority: Load>battery>grid



□ Self- Use without PV Power

When there is no PV supplied, battery will discharge for local loads firstly, and grid will supply power when the battery capacity is not enough.

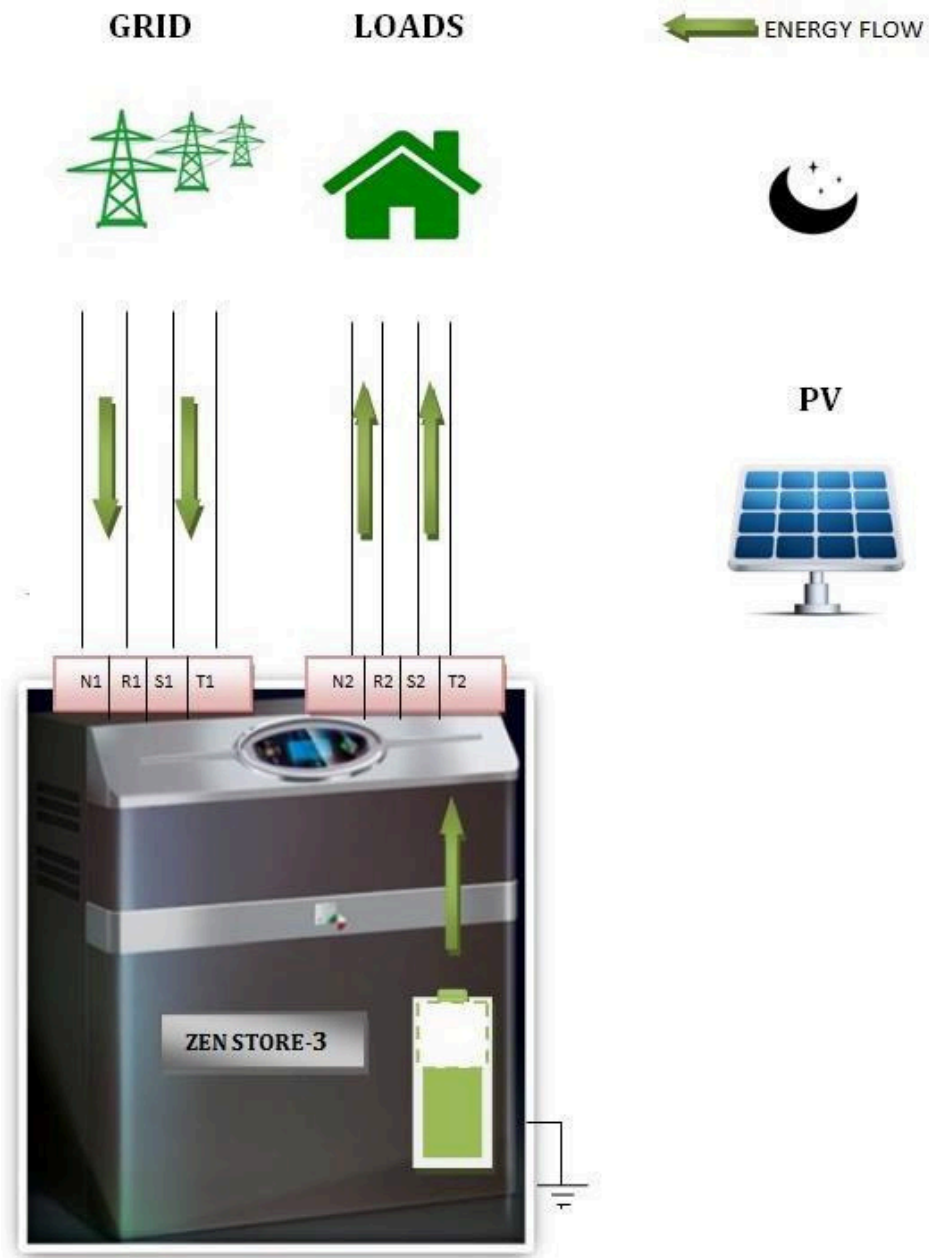


FIGURE: II SELF-USE WITHOUT PV POWER

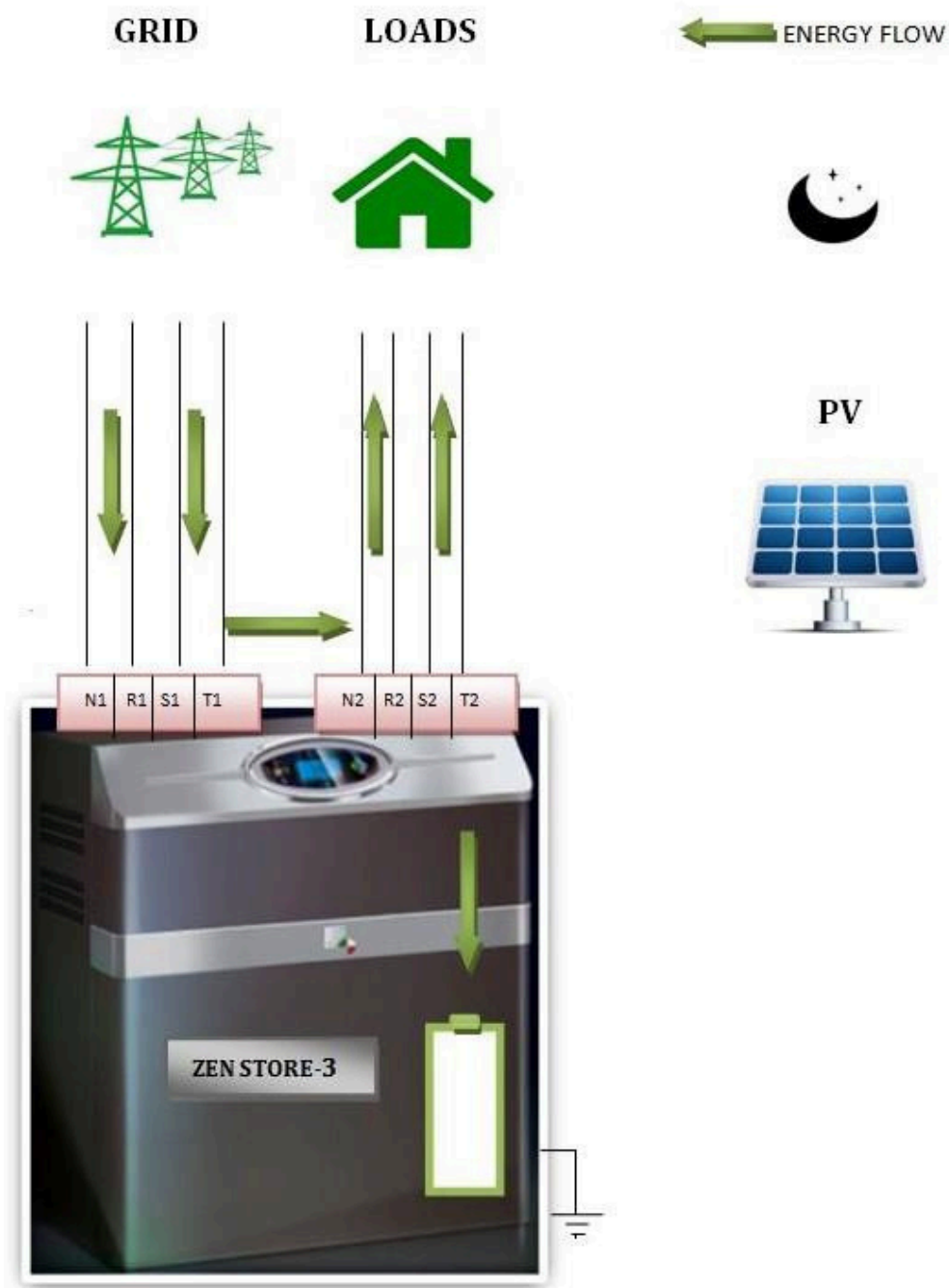


FIGURE: III SELF-USE WITHOUT PV POWER

Force time Use

In this workmode the charging and discharging time can be set flexibly, and it also allows to choose whether charge from the grid or not. Other time it follows the priority of self use mode.

Priority: battery>load>grid (when charging)

Priority: load>battery>grid (when discharging)

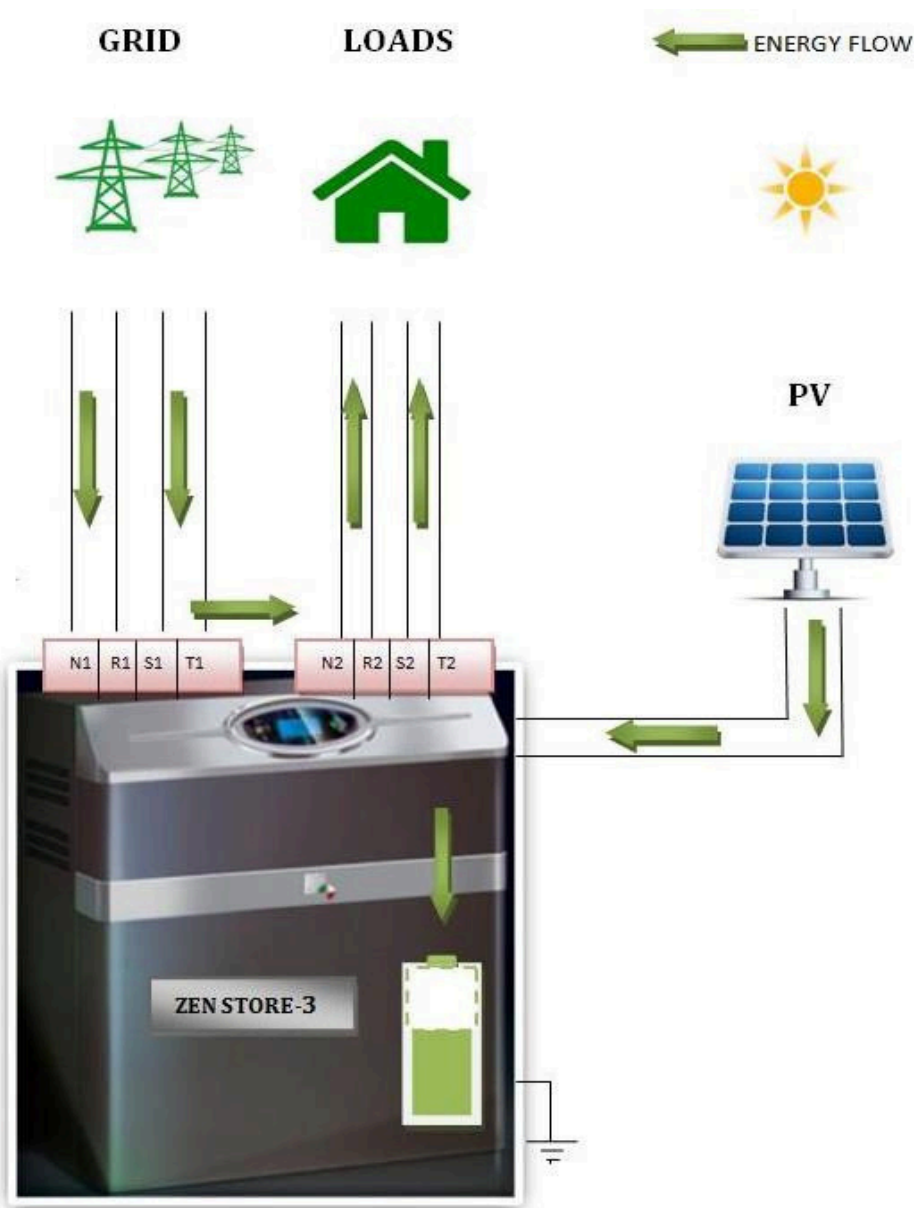


FIGURE: IV FORCE TIME MODE

This mode applies the area that has high electricity price between peak and valley. User can use off-peak electricity to charge the battery. The charging time can be set flexibly and it also allows choose whether charge from the grid or not.

Back up mode

This mode applies the area that has frequent power outages. And this mode ensures the battery will has enough energy to supply when the grid is off.

In this mode battery will be charging forcibly in the setting time and will never be discharged When the grid is on, and it also allows to choose whether charge from the grid or not.

Battery will never be discharged when the grid is on.

Priority: battery>load>grid

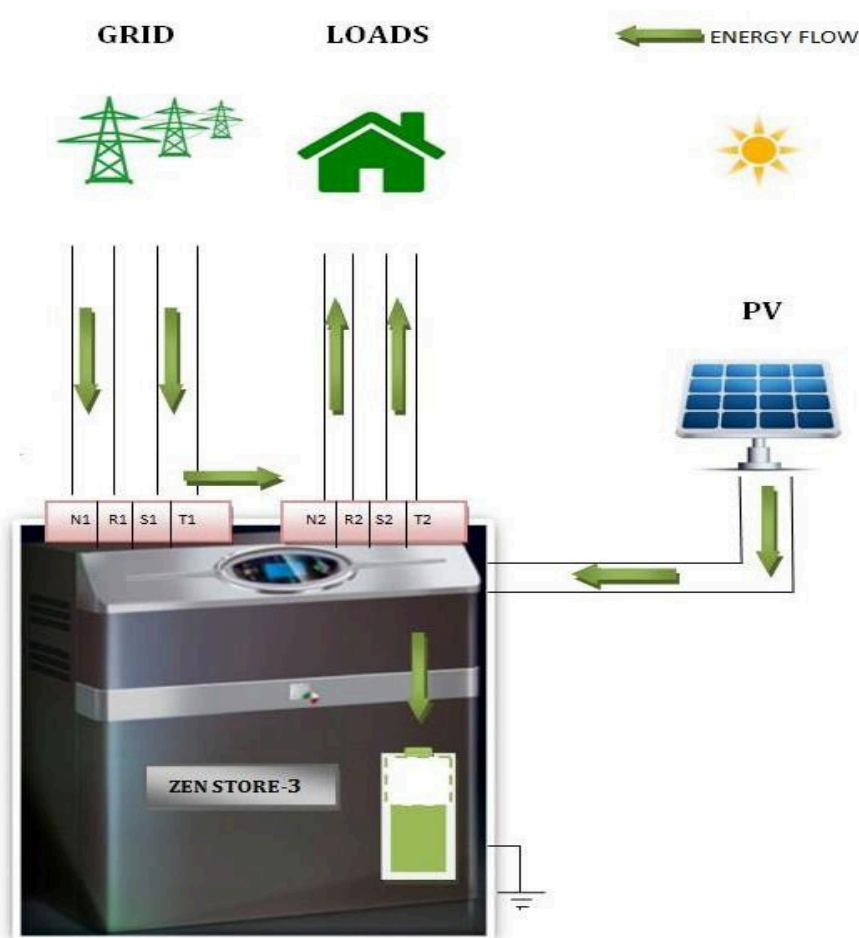


FIGURE: V BACK-UP MODE

FeedinPriority

This mode applies the area that has high feed in tariff and export control.

The PV generated power will be used to supply the local loads firstly, then export to the public grid. The redundant power will charge the battery.

Priority: load>grid>battery

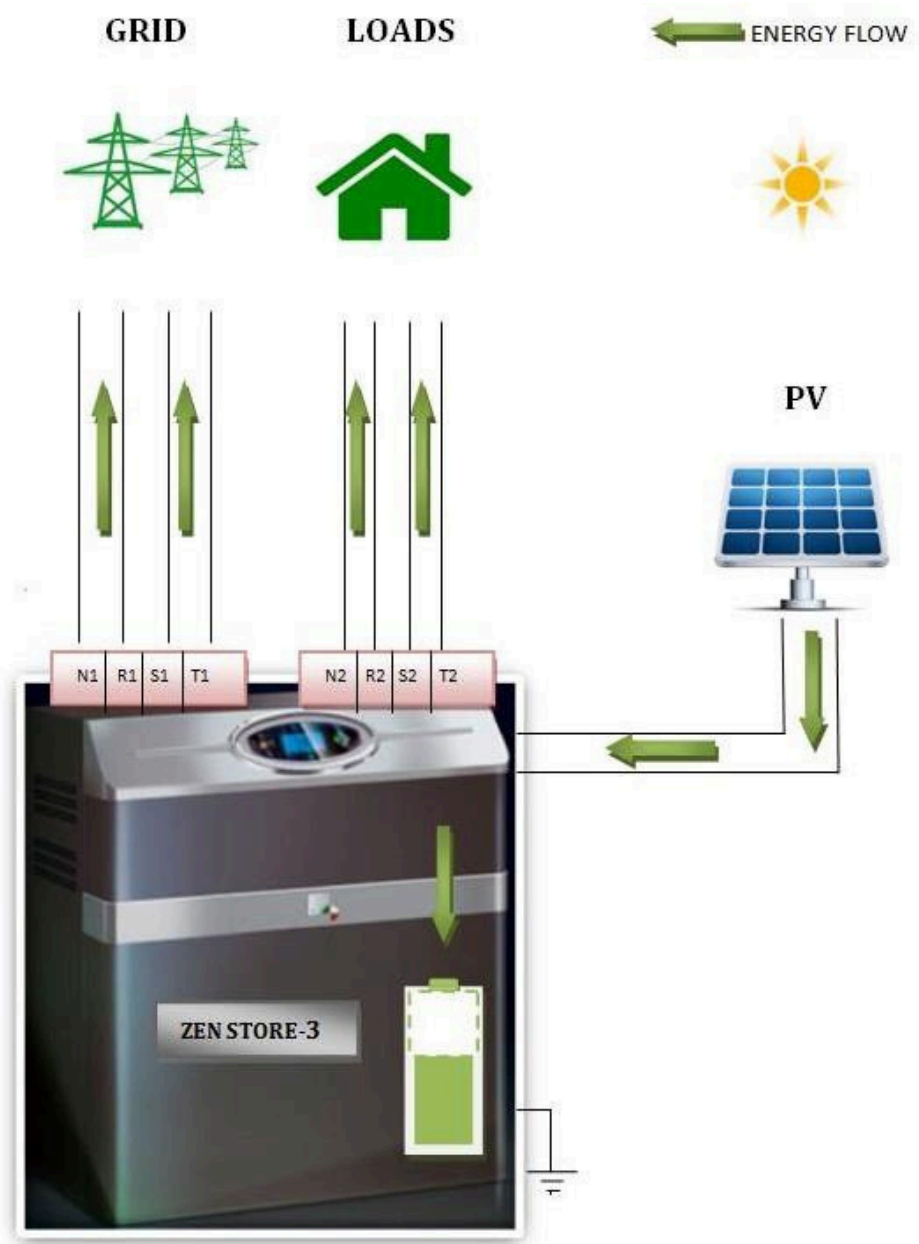


FIGURE: VI FEED IN PRIORITY

EPSMode

When the grid is off, system will supply emergency power from PV or battery to supply the home loads. (Battery is necessary in EPS mode)

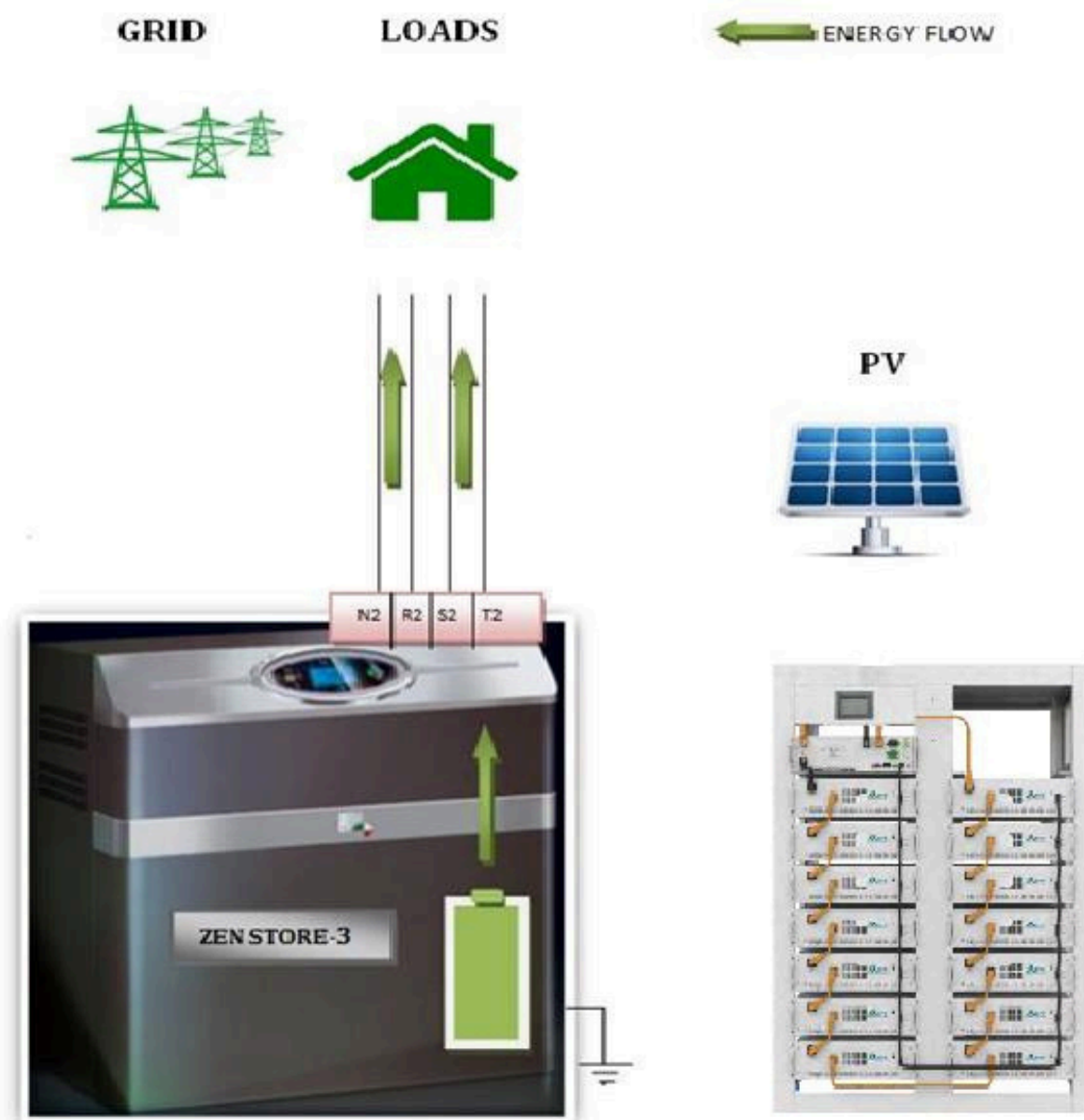


FIGURE: VII EPS MODE



DIVYA HI-TECH



□ TECHNICAL SPECIFICATIONS

Sl. No.	System capacity (KW)	Battery Bank Capacity/ Configuration <i>(Lithium Ferro phosphate (Lifepo4))</i>	
		VOLTAGE (V) Capacity in (AH)	
1.	3 KW	48/ 51.2	100
2.	5 KW	48/ 51.2	100 100/
3.	10 KW	48/ 51.2	200 100/
4.	15 KW	48/ 51.2	200 100/
5.	20 KW	48/ 51.2	200 100/
6.	25 KW	48/ 51.2	200

□ BATTERY-Lithium Ferro Phosphate:

Sl. No	Description	Specification
1	Battery Configuration minimum cell capacity	48V - 100/200AH 51.2V- 100/200AH; LiFePO4
2	Working Temperature Range (both for charging & discharging)	0-50DegC
3	Storage Temperature Range	-20~60°C
4	Cycle Life (Full charge to full discharge)	5000
5	Battery Warranty	5 years

ZEN STORE-3 10KW WITH STORAGE 30KW to 50KW BATTERY BANK (Hybrid System)

S.N	Item Name	Capacity / BriefDescription	Quantity
1.	Solar PV Array	Minimum 10000 Watt Peak	Minimum 545Wp each PV Module for total PV array capacity of minimum 10000 Watt Peak.
2.	Battery Bank with Battery rack	48V-100/200AH 51.2V-100/200AH Lithium Iron phosphate (LiFePo4)	
3.	Storage Capacity	30 KW to 50 KW	
4.	MaxDC input power[W]	10000	
5.	Absolute maximum DC input Voltage[V]	1000	
6.	MPPT Voltage range[V]	200/950	
7.	Nr. of independent MPPT trackers	2	
8.	Compatible with amorphous PV modules	No	
9.	Waveform	Three phase 3P+N	
10.	AC Grid Voltage range [V]	342/440	
11.	Rated grid frequency [Hz]	50/60	
12.	Displacement power factor	0.8 leading, 0.8 lagging	
13.	Total Harmonic Distortion THD	<2%	
14.	Rated Voltage[V]	400	
15.	Rated Frequency[Hz]	50/60	
16.	Battery charge/Discharge(I _{max})	25A	

Safety and protection		
Overload protection	YES	
Over temperature protection	YES	
AC line protection	Miniature circuit breaker	
Battery protection	Miniature circuit breaker	
DC –PV line protection	Switch + SPD	
Switch time to EPS mode	5 s	
General Data		
Temperature Range[°C]	From -5 to + 45°C	
Relative Humidity	0% ÷ 95% non-condensing	
Installation environment	Indoor	
Degree of pollution	2	
Weight [kg] (with standard number of batteries)	261	285
Placement	Floor	
IP grade	IP20	
Class of isolation	I	
Size and Weight		
Size [L x H x P][mm]	1045 x 1245 x 545	
Weight[kg](standard nr. of batteries)	261	285
Weight with 6 batteries[kg]	309	
Weight with 7 batteries[kg]	333	
Weight with 8 batteries[kg]	357	
Interfaces		
GPRS(standard)	2GDualband	
WiFi (optional)	2.4GHzIEEEStd.802.11b/g	
LAN(optional)	10/100Mbps Ethernet	
HMI	Display LCD	
Certifications and standards		

□ **BATTERY DETAILS**

S. No.	Description	Battery Details
1.	Battery Rating	48V-100/200AH 51.2V-100/200AH
2.	Type of Battery/Cell Model	LiFePo4
3.	offered	Lithium Iron phosphate(High Voltage)
4.	Battery dimensions (L x W x H)mm	As per IEC Norms
5.	Applicable standards	T-V (IEC62619)
6.	Controller	BMS Controller
7.	AH Capacity Capacity(KWh)	50%
8.	Depth of Discharge	5 to 10
9.	Design float life	80%(10~90%)
10.	Design cycle life	Minimum 10 years design life at 27C
11.	Dimension(W*H*D mm)	4000
12.	Communication	442*480*155
13.	Operating temperature	RS485/CAN
14.	range Protection Class	0~50°C
15.	Weight(kg)	IP20
16.	Storage Temperature	48
17.		-20~60°C

ZEN STORE-3 15KW WITH STORAGE 50-75KW BATTERY BANK (Hybrid System)

S.N	Item Name	Capacity / BriefDescription	Quantity
1.	Solar PV Array	Minimum 15000 Watt Peak	Minimum 545Wp each PV Module for total PV array capacity of minimum 15000 Watt Peak.
2.	Battery Bank with Battery rack	48V-100/200AH 51.2V-100/200AH Lithium Iron phosphate (LiFePo4)	
3.	Storage Capacity	50 KW to 75 KW	
4.	MaxDC input power[W]	15000	
5.	Absolute maximum DC input Voltage[V]	1000	
6.	MPPT Voltage range[V]	200/950	
7.	Nr. of independent MPPT trackers	2	
8.	Compatible with amorphous PV modules	No	
9.	Waveform	Three phase 3P+N	
10.	AC Grid Voltage range [V]	342/440	
11.	Rated grid frequency [Hz]	50/60	
12.	Displacement power factor	0.8 leading, 0.8 lagging	
13.	Total Harmonic Distortion THD	<2%	
14.	Rated Voltage[V]	400	
15.	Rated Frequency[Hz]	50/60	
16.	Battery charge/Discharge(I _{max})	25A	

Safety and protection		
Overload protection		YES
Over temperature protection	YES	
AC line protection		Miniature circuit breaker
Battery protection		Miniature circuit breaker
DC –PV line protection		Switch + SPD
Switch time to EPS mode	5 s	
General Data		
Temperature Range[°C]	From -5 to + 45°C	
Relative Humidity		0% ÷ 95% non-condensing
Installation environment	Indoor	
Degree of pollution		2
Weight [kg] (with standard number of batteries)	261	285
Placement		Floor
IP grade	IP20	
Class of isolation		I
Size and Weight		
Size [L x H x P][mm]		1045 x 1245 x 545
Weight[kg](standard nr. of batteries)		
Weight with 6 batteries[kg]	261	285
Weight with 7 batteries[kg]		309
Weight with 8 batteries[kg]	333	
		357
Interfaces		
GPRS(standard)		2GDualband
WiFi (optional)		2.4GHzIEEEStd.802.11b/g
LAN(optional)		10/100Mbps Ethernet
HMI		Display LCD
Certifications and standards		

□ **BATTERY DETAILS**

S. No.	Description	Battery Details
1.	Battery Rating	48V-100/200AH 51.2V-100/200AH
2.	Type of Battery/Cell Model	LiFePo4
3.	offered	Lithium Iron phosphate(High Voltage)
4.	Battery dimensions (L x W x H)mm	As per IEC Norms
5.	Applicable standards	T-V (IEC62619)
6.	Controller	BMS Controller
7.	AH Capacity Capacity(KWh)	50%
8.	Depth of Discharge	5 to 10
9.	Design float life	80%(10~90%)
10.	Design cycle life	Minimum 10 years design life at 27C
11.	Dimension(W*H*D mm)	4000
12.	Communication	442*480*155
13.	Operating temperature	RS485/CAN
14.	range Protection Class	0~50°C
15.	Weight(kg)	IP20
16.	Storage Temperature	48
17.		-20~60°C

ZEN STORE-3 20KW WITH STORAGE 60-100KW BATTERY BANK (Hybrid System)

S.N	Item Name	Capacity / BriefDescription	Quantity
1.	Solar PV Array	Minimum 20000 Watt Peak	Minimum 545Wp each PV Module for total PV array capacity of minimum 20000 Watt Peak.
2.	Battery Bank with Battery rack	48V-100/200AH 51.2V-100/200AH Lithium Iron phosphate (LiFePo4)	
3.	Storage Capacity	60 KW to 100 KW	
4.	MaxDC input power[W]	20000	
5.	Absolute maximum DC input Voltage[V]	1000	
6.	MPPT Voltage range[V]	200/950	
7.	Nr. of independent MPPT trackers	2	
8.	Compatible with amorphous PV modules	No	
9.	Waveform	Three phase 3P+N	
10.	AC Grid Voltage range [V]	342/440	
11.	Rated grid frequency [Hz]	50/60	
12.	Displacement power factor	0.8 leading, 0.8 lagging	
13.	Total Harmonic Distortion THD	<2%	
14.	Rated Voltage[V]	400	
15.	Rated Frequency[Hz]	50/60	
16.	Battery charge/Discharge(I _{max})	25A	

Safety and protection		
Overload protection		YES
Over temperature protection	YES	
AC line protection		Miniature circuit breaker
Battery protection		Miniature circuit breaker
DC –PV line protection		Switch + SPD
Switch time to EPS mode	5 s	
General Data		
Temperature Range[°C]	From -5 to + 45°C	
Relative Humidity		0% ÷ 95% non-condensing
Installation environment	Indoor	
Degree of pollution		2
Weight [kg] (with standard number of batteries)	261	285
Placement		Floor
IP grade	IP20	
Class of isolation		I
Size and Weight		
Size [L x H x P][mm]		1045 x 1245 x 545
Weight[kg](standard nr. of batteries)		
Weight with 6 batteries[kg]	261	285
Weight with 7 batteries[kg]		309
Weight with 8 batteries[kg]	333	
Interfaces		357
GPRS(standard)		
WiFi (optional)		2GDualband
LAN(optional)		2.4GHzIEEEStd.802.11b/g
HMI		10/100Mbps Ethernet
Certifications and standards	Display LCD	

□ **BATTERY DETAILS**

S. No.	Description	Battery Details
1.	Battery Rating	48V-100/200AH 51.2V-100/200AH
2.	Type of Battery/Cell Model	LiFePo4
3.	offered	Lithium Iron phosphate(High Voltage)
4.	Battery dimensions (L x W x H)mm	As per IEC Norms
5.	Applicable standards	T-V (IEC62619)
6.	Controller	BMS Controller
7.	AH Capacity Capacity(KWh)	50%
8.	Depth of Discharge	5 to 10
9.	Design float life	80%(10~90%)
10.	Design cycle life	Minimum 10 years design life at 27C
11.	Dimension(W*H*D mm)	4000
12.	Communication	442*480*155
13.	Operating temperature	RS485/CAN
14.	range Protection Class	0~50°C
15.	Weight(kg)	IP20
16.	Storage Temperature	48
17.		-20~60°C

ZEN STORE-3 25KW WITH STORAGE 80-150KW BATTERY BANK (Hybrid System)

S.N	Item Name	Capacity / BriefDescription	Quantity
1.	Solar PV Array	Minimum 25000 Watt Peak	Minimum 545Wp each PV Module for total PV array capacity of minimum 25000 Watt Peak.
2.	Battery Bank with Battery rack	48V-100/200AH 51.2V-100/200AH Lithium Iron phosphate (LiFePo4)	
3.	Storage Capacity	80 KW to 150 KW	
4.	MaxDC input power[W]	25000	
5.	Absolute maximum DC input Voltage[V]	1000	
6.	MPPT Voltage range[V]	200/950	
7.	Nr. of independent MPPT trackers	2	
8.	Compatible with amorphous PV modules	No	
9.	Waveform	Three phase 3P+N	
10.	AC Grid Voltage range [V]	342/440	
11.	Rated grid frequency [Hz]	50/60	
12.	Displacement power factor	0.8 leading, 0.8 lagging	
13.	Total Harmonic Distortion THD	<2%	
14.	Rated Voltage[V]	400	
15.	Rated Frequency[Hz]	50/60	
16.	Battery charge/Discharge(I _{max})	25A	

Safety and protection		
Overload protection		YES
Over temperature protection	YES	
AC line protection		Miniature circuit breaker
Battery protection		Miniature circuit breaker
DC –PV line protection		Switch + SPD
Switch time to EPS mode	5 s	
General Data		
Temperature Range[°C]	From -5 to + 45°C	
Relative Humidity		0% ÷ 95% non-condensing
Installation environment	Indoor	
Degree of pollution		2
Weight [kg] (with standard number of batteries)	261	285
Placement		Floor
IP grade	IP20	
Class of isolation		I
Size and Weight		
Size [L x H x P][mm]		1045 x 1245 x 545
Weight[kg](standard nr. of batteries)	261	285
Weight with 6 batteries[kg]		309
Weight with 7 batteries[kg]	333	
Weight with 8 batteries[kg]		357
Interfaces		
GPRS(standard)		2GDualband
WiFi (optional)		2.4GHzIEEEStd.802.11b/g
LAN(optional)		10/100Mbps Ethernet
HMI		
Certifications and standards		Display LCD

□ **BATTERY DETAILS**

S. No.	Description	Battery Details
1.	Battery Rating	48V-100/200AH 51.2V-100/200AH
2.	Type of Battery/Cell	LiFePo4
3.	Model offered	Lithium Iron phosphate(High Voltage)
4.	Battery dimensions (L x W x H)mm	As per IEC Norms
5.	Applicable standards	T-V (IEC62619)
6.	Controller	BMS Controller
7.	AH Capacity	50%
8.	Capacity(KWh)	5 to 10
9.	Depth of Discharge	80%(10~90%)
10.	Design floatlife	Minimum 10 years design life at 27C
11.	Design cyclelife	4000
12.	Dimension(W*H*D mm)	442*480*155
13.	Communication	RS485/CAN
14.	Operating temperature range	0~50°C
15.	Protection Class	IP20
16.	Weight(kg)	48
17.	Storage Temperature	-20~60°C

7. Removal and disposal of the system

Do not dispose of the product with household waste, but in compliance with local and EU regulations for the disposal of electronic waste applicable in the country of installation.

All electrical and electronic products must be disposed of separately from the municipal waste collection system, through specific collection facilities installed by public bodies or local authorities.

Correct disposal of the obsolete unit contributes to preventing possible negative consequences on the health of individuals and the environment.

For more detailed information on the disposal of obsolete equipment, contact the office of the municipality of residence, the waste disposal service or the point of sale where the product was purchased.



WEEE Mark: means to dispose of the product in compliance with the current directives for electronic