# BIG·e

# INTRODUCTION AND USER MANUAL

ANADOLU ISUZU

Revision Number: 04

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# PREFACE

This user manual has been prepared to provide general information on the efficient and most economical use of the BIG-e vehicle. We strongly recommend that you read the information provided carefully and comply with all warnings. We would like you to know that our company will not be responsible for any material or moral problems or damages that may occur in case of non-compliance with the specified information.

When you need more detailed information about your vehicle, you can contact an authorized dealer or authorized service.

Keep the user manual in the vehicle at all times.

Due to our continuous efforts to improve our vehicles, changes may be made in terms of shape, equipment and technique. The information, images and technical specifications herein are based on the latest product information available at the time of publication of the manual and Anadolu Isuzu A.Ş. reserves the right to change without prior notice.

Thank you for choosing this product. We wish you a pleasant ride.

**Anadolu Isuzu Automotive Industry and Trade Inc.**

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# 1.INTRODUCTION

Representative Image of BIG-E Vehicle.

## 1.1 CHASSIS NUMBER AND IDENTIFICATION PLATE

The vehicle's identification plate and chassis number are located on the same plate on the profile next to the right front wheel driver's seat. The identification plate contains the type approval number, VIN number, maximum total axle load, maximum front axle load and maximum rear axle load.

The chassis number of the vehicle is on the right side of the vehicle, P123 Mobile Point hit and the VIN number must be marked on an area on the chassis.
VIN number, vehicle model, maximum loaded weight, engine type, drive system, axle distance, production place with codes together the vehicle chassis number your information contains.

| VIN PLATE CONTENT | | |
|---|---|---|
| | | **Notes** |
| | ANADOLU ISUZU AUTOMOTIVE IND. AND TRADE INC. | Manufacturer name |
| | L7e-CU | Vehicle category |
| | - | Vehicle WVTA type approval number (number will be given once WVTA approval is received) |
| | NNA41LA10GB000001 | Chassis number (must be checked on a vehicle basis) |
| | - - - dB(A) - - - - min-1 | Noise at rest (Not valid for electric vehicles, it will be written this way for every vehicle) |
| | 9.4kW 45km/h max 1917.5kg | Engine power (fixed), Maximum speed (varies depending on the vehicle, 50&45 km/h), Maximum permitted loaded mass kg (fixed value) |
| | | **Character sizes on the chassis must be at least 4 mm, and on the VIN plate must be at least 2 mm.** |

## 1.2 RECOVERY LABEL (QR)


This QR code contains technical information showing which component is where on the vehicle.

| VEHICLE IDENTIFICATION NUMBER SYSTEM | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 |
| **N** | **N** | **A** | **4** | **1** | **L** | **A** | **1** | **0** | **G** | **B** | **0** | **0** | **0** | **0** | **0** | **1** |
| (EXAMPLE) | | | | | | | | | | | | | | | | |

| | | | |
|---|---|---|---|
| **1 - 3** | MANUFACTURER INTERNATIONAL IDENTITY CODE | NNA: | (AIOS) ANADOLU ISUZU AUTOMOTIVE INDUSTRY AND TRADE JOINT STOCK COMPANY |
| **4** | MODEL | 4: | FOUR-WHEELED MODEL |
| **5** | MAXIMUM VEHICLE SPEED | 1: | 45 km/h |
| | | 2: | 50 km/h |
| **6** | DRIVING SYSTEM | L: | LEFT HAND DRIVE |
| | | R: | RIGHT HAND DRIVE |
| **7** | BODY TYPE | A: | UNFINISHED VEHICLE |
| | | B: | BOX BODY VEHICLE |
| | | A: | FLATBED VEHICLE |
| **8-9** | BATTERY CAPACITY | 10: | 10.5 kWh |
| | | 16: | 15.7 kWh |
| | | 21: | 21 kWh |
| **10-11** | PLACE OF PRODUCTION | GB: | AIOS KOCAELI FACTORY |
| **12-17** | PRODUCTION SERIAL NO | | |

## 1.3 VEHICLE WARRANTY

The warranty period and conditions of the vehicle are specified in the ‘Warranty Certificate’ supplied with the vehicle. You can find detailed information about the warranty procedure in the ‘Warranty Certificate’. The warranty period in the warranty certificate is 5 years with a homologation criterion of minimum 30.000 km and maximum 60.000 km.

### OPTIONS

The vehicle standard Features outside, request when it is to the vehicle the following Options can be applied.

- Battery 10.5 kWh, Battery 21 kWh
- Cashier Preparation
- Open Safe, Closed Safe
- Charging Type AC 220V (6.6 kW OBC 32A)
- Charging Type AC TYPE2
- Charging Type DC Fast Charging (48V 300A)
- Charging Socket Type AC Industrial Socket
- Charging Socket Type AC TYPE2
- Onboard Charger 6.6 kW
- Rear View Camera
- Parking Sensor
- Radio
- Multimedia
- Speaker (With radio or multimedia)
- Cabin Electric Heater
- Cabin Diesel Heater
- Air conditioning
- Mechanical Steering System
- Front Anti-roll Bar
- Interior Rearview Mirror (Cannot be installed in a closed chassis)
- Sun Visor (Driver)
- Sunshade (Passenger)
- Front Fog Light
- Rear Glass (Cannot be installed in a closed case)
- Rear Fender
- Side Closures
- Rear Tow Hook
- Trailer Towbar with Plug
- AConnect (Telematics)
- Central (Remote) Lock System
- Rotating Beacon
- Bluetooth
- Light Sensor

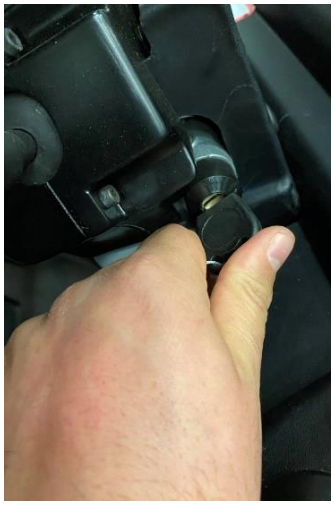
## 1.4 RECOMMENDATIONS / WARNINGS

- For a spare key or in case the key is lost, you must inform the authorized service of the serial number information on the ignition key, so please note the serial number information.
- Do not load your vehicle beyond its passenger/load capacity, do not change the positions of the seats. Our factory is not responsible for any problems that may arise due to changes in the load balance in the vehicle.
- Check tire pressures frequently and always make sure they are correct.
- Check the long and short headlamp settings, do not travel at night with defective headlamps.
- Check brake, parking and number plate lamps frequently and do not drive with defective or mud-covered brake, parking and number plate lamps.
- To ensure maximum performance of your vehicle, be sure to have all maintenance done on time and regularly at authorized services.
- When used in your vehicle, waste oil, brake fluid, antifreeze, waste filters and scrap batteries are thrown away haphazardly, they cause great harm to the environment. Make sure that such hazardous waste is disposed of in accordance with environmental regulations.
- It is extremely dangerous to have empty cans, empty bottles or other items rolling on the floor, especially make sure that the floor around the driver's seat is clean and tidy.
- Before starting the engine, make sure there are no flammable materials under or around the vehicle. The presence of such materials may cause a fire.
- Before driving, make sure you adjust the seat, steering wheel and mirrors to positions that provide the correct driving position for you.
- Be sure to wear your seat belt.
- Make sure that the windshield and side windows are clean. Keep the sun visors in place so that they do not impede your vision or driving.
- Drive your vehicle by paying attention to traffic rules and road conditions.
- If you feel any abnormality in a tire while driving, stop immediately in a safe place. If you continue driving with a flat tire, excessive force may be applied to the wheel studs, causing the bolts to break and the wheel to come off.
- Drive at a safe speed whenever possible.
- If a warning light comes on, do not ignore it and continue driving. Remember that you must take corrective action by referring to the description of the counters, warning lights and indicator lights.
- If your vehicle breaks down while driving, turn on your hazard lights and immediately pull over to a safe place where it will not block traffic. Place triangle reflectors to alert other vehicles to your presence. Have other passengers get out of the vehicle and wait in a safe place. Notify the nearest authorized service.
- Do not use water to wash the rear compartment and side compartment.
- It is strictly forbidden to use high pressure water to wash the electrical component room.
- Only the exterior of the vehicle body can be washed with a low pressure water gun.
- Always pay attention to low-voltage cables during operation

- The work area should be isolated from normal areas.
- Always follow directions and labels to avoid undesirable results.
- It is dangerous and forbidden to charge the BIG-E vehicle by towing it with another vehicle and using the regenerative brake.

# 2. GENERAL INFORMATION

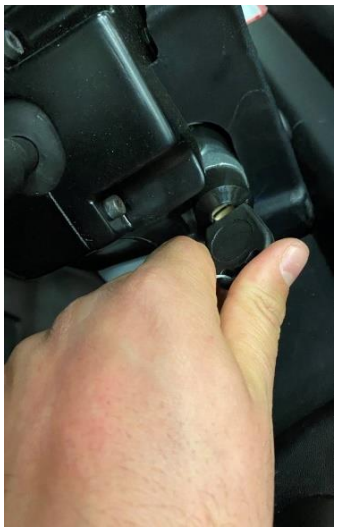
## 2.1 STARTING THE ENGINE



- The main switch must be in the “ON” position.
- Turn the ignition to switch the ignition switch to the ‘ON’ position.
- Make sure your seat belt is fastened.
- Press the brake.
- If the gear selector is not in the "N" position when starting, move it to the "N" position. Select the desired gear position from the gear selector.
- Release the handbrake.
- The constant lighting  of the icon on the display screen indicates that the vehicle is ready for action.

⚠ When the display screen does not turn on, first check the fuses, if there is no problem with the fuses, contact the authorized service.

## 2.2 STOPPING THE ENGINE



- Turn off the vehicle by turning the ignition key to the “OFF” position.

⚠ Do not turn off the main switch while the ignition key is on and within 70 seconds after the ignition key is turned off. Otherwise, errors may occur in the vehicle.

⚠ If the vehicle will be parked for a long time (more than 1 day), turn the main switch to the off position.

# 3. VEHICLE EQUIPMENT

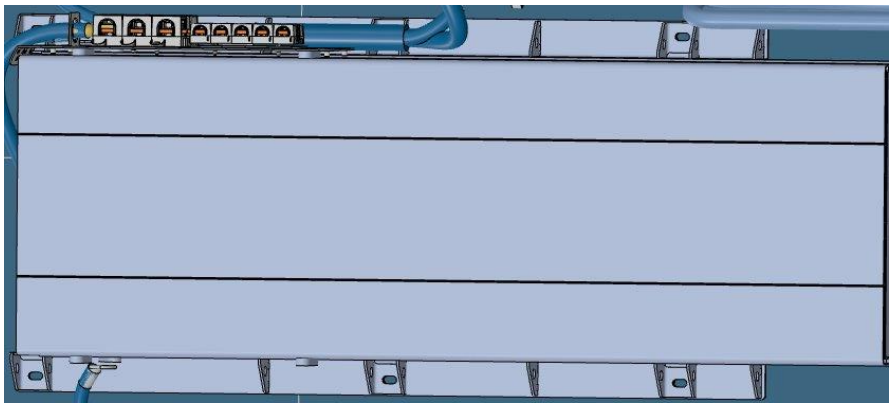
# 3.1 ELECTRICAL SYSTEMS

## 3.1.1 Energy Storage System

There are two types of energy storage units in the BIG-E vehicle: a 51.2 Volt battery pack and a 12 Volt battery. The battery pack is used to power the vehicle engine and superstructure, while the battery is used to power other auxiliary systems.

### 3.1.1.1 Battery Pack

A battery pack is an energy storage device for a vehicle with an electric motor. Therefore, this unit can be thought of as a fuel tank in an internal combustion engine vehicle. The main factor that determines the range is the battery pack capacity of the vehicle. Longer ranges can be traveled with battery packs with high energy capacity, but the weight and volume of the battery packs increase with the energy capacity.



There are 3 types of battery pack options in the BIG-E vehicle according to their energy capacities. Although the only difference between these options is the energy capacity, this parameter can affect the features related to vehicle performance. The main features that battery packs with different energy capacities will affect in the vehicle are range and torque.

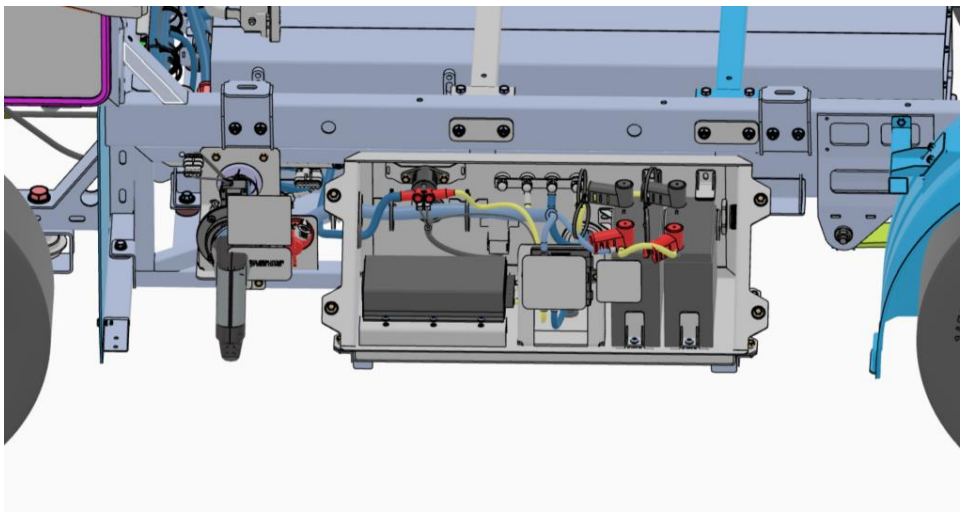
| Feature | Unit | 21 kWh Battery Pack | 15.7 kWh Battery Pack | 10.5 kWh Battery Pack |
|---|---|---|---|---|
| **Nominal voltage** | V | 51.2 | 51.2 | 51.2 |
| **Cycle Life** | - | 2000 | 2000 | 2000 |

⚠ It is recommended to fully charge the battery pack from empty to full every 6-8 weeks.

## 3.1.2 Battery

There is 1 piece 12 Volt battery as standard to provide the energy needs of the vehicle lighting and vehicle infotainment systems. In vehicles with a diesel heater option, the number of 12 Volt batteries is 2 piece. These batteries have a capacity of 24 Ah and are located in the battery cabinet on the left side of the vehicle.

⚠ *In the event of a dead battery(s), the battery must be jump-started with 12 V.*



## 3.2 CHARGING SYSTEM

When the electric motor is operated as an alternator, the battery pack is charged. In other words, the battery pack in the vehicle can also be partially charged during the regeneration of braking energy. However, it is mainly charged using energy from an external power grid.

The BIG-E vehicle has 3 different options for charging the battery pack in terms of charging power and type. With these options, 5 different power and type options can be applied in the vehicle. These are,

- 3.3 kW charging power, standard charging type
- 3.3 kW charging power, Type2 charging type
- 6.6 kW charging power, standard charging type
- 6.6 kW charging power, Type2 charging type
- 10.5 kW charging power, forklift charging type

⚠ While charging the vehicle battery pack, it will not power components other than the display screen (headlights, radio, etc.).

⚠ The vehicle will not be ready to drive until the icon goes off. Please wait until the icon goes off.

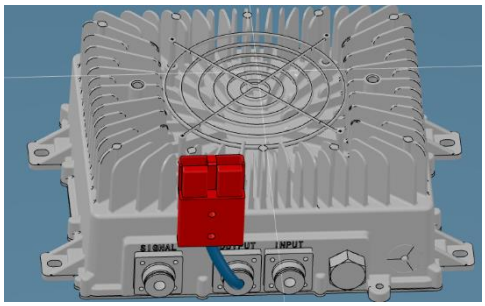
⚠ Once charging is complete, the vehicle will shut down all components (including the display and battery pack) to avoid energy consumption. The ignition must be turned on and off to reactivate the vehicle.

⚠ When the vehicle is to be charged with 220V AC; Charge it with a mains voltage (socket, junction box, charging station) that has a grounding line. Check that your socket has a grounding line against stray electricity, as this will ensure safety during charging. Check and confirm that there is no yellowing, heating or breakage in the 220V power cable by visual inspection.

⚠ Vehicle While charging, do not try to disconnect your Red socket.

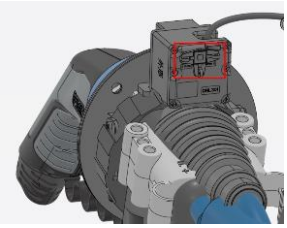
### 3.2.1 Onboard Charging Unit

The energy given to the vehicle externally is transferred to the battery pack with the help of the onboard charging unit in the vehicle in the standard charging option and the Type2 (station) charging option. The onboard charging unit is the basic component that determines the charging power.




The network to which vehicles with a 3.3 kW on-board charging unit will be connected must have a minimum 16 A fuse, and the network to which vehicles with a 6.6 kW on-board charging unit will be connected must have a minimum 32 A fuse. In addition, for both types of on-board charging units, there must be a residual current relay (RCR) on the mains side.

⚠ The onboard charger with both power values can be connected to a single-phase or 3-phase network. In case of connection to a 3-phase network, attention must be paid to the phase sequences (connected to L1).



⚠ In the Type2 (from station) charging option, the locked charging gun must be separated from the vehicle using the charging gun release key located inside the vehicle. If it is not separated from the vehicle, the part where the lock is located must be opened and the lock must be released manually.

### 3.2.2 External Charger

For forklift type fast charging that does not require a onboard charger, an external charger must be provided. The external charger to be provided for the forklift type fast charging option to be provided must meet the requirements listed below.

- 40-65 V Charge (Output) voltage
- Communication with CANJ1939 Protocol (Baud rate: 500 kbps, Source ID: 49)
- Rema DIN320 charging gun (CAN line and trigger part should also be in this connector, trigger pins should be short circuited)

⚠ Please contact Anadolu ISUZU regarding the suitability of the external charger you intend to procure.

⚠ The network to which the fast charger will be connected must be 3-phase and have a minimum fuse value of 32 A. It must also have a residual current relay (RCR).

⚠ Forklift type fast charging should be carried out with the vehicle ignition off. After the charging connection is made, the external charger should be activated.

The charging time is determined by the maximum charging power and the maximum charging power that the battery can accept. Considering these two parameters, the charging times of the vehicles according to the battery options are as follows and these times may vary depending on the outside temperature.

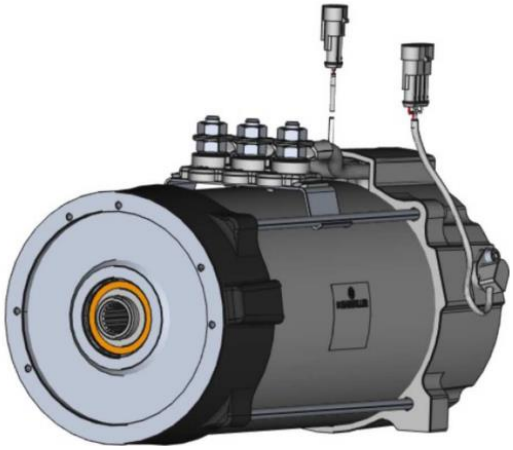
| Vehicle Battery Capacity | Maximum charging power of 3.3 kW | Maximum charging power of 6.6 kW | Maximum charging power of 10.5 kW |
|---|---|---|---|
| **10.5 kWh** | 5 hours | 2 hours 15 minutes | 2 hour 15 minutes |
| **15.7 kWh** | 7 hours 45 minutes | 3 hours 15 minutes | 2 hour 30 minutes |
| **21 kWh** | 9 hours 45 minutes | 4 hours | 2 hour 30 minutes |

### 3.2.3 DC/DC Converter


The batteries that power the vehicle's lighting and infotainment systems also need to be charged. These 12 Volt batteries are charged by the DCDC converter while the vehicle's battery pack is engaged.

## 3.3 POWER TRANSFER SYSTEM

### 3.3.1 Engine



The BIG-E vehicle uses one electric motor. This motor is a 3-phase asynchronous type motor. The high torque/low speed of the system is designed to interface directly with standard axle differentials without the need for an intermediate transmission.

#### 3.3.1.1 Engine Control Unit


The engine control unit ensures that the acceleration and deceleration requested by the driver using the gas-brake pedal is carried out safely. It also interprets data such as engine temperature and engine speed and transmits this data to the vehicle communication line. Again, the battery charging process with regenerative braking is carried out by the engine driver.

What is Regenerative Braking?

Regenerative braking basically provides energy recovery at the moment the vehicle slows down. When the foot is removed from the gas pedal or the brake is pressed, the energy released here with the negative acceleration is transferred to the battery. In addition, other

positive effects of regenerative braking include facilitating braking, providing less heating of the pads and discs and reducing wear on these parts.

⚠ The engine or engine driver should not be repaired/replaced. In case of damage or suspected damage with Anadolu ISUZU should be contacted.

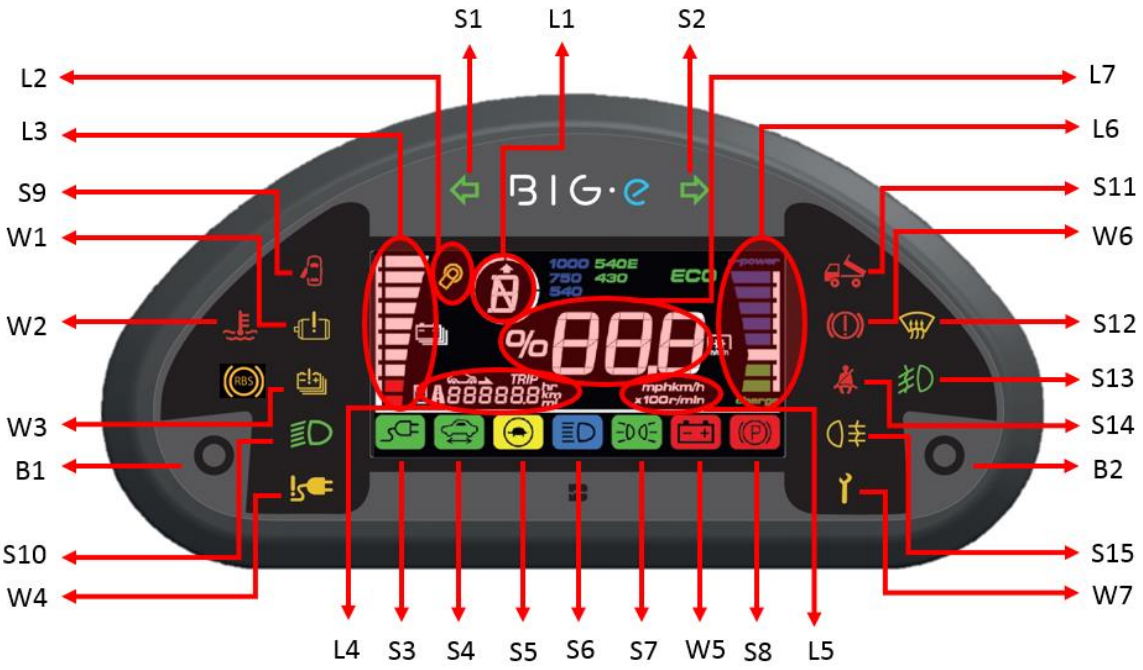
⚠ If a temperature warning regarding the engine or motor driver appears on the display screen, the vehicle should be stopped and the relevant part should be allowed to cool down.

⚠ In high charge conditions and very low/high air temperatures, regenerative braking will be weak or disabled.

⚠ It is recommended to deactivate regenerative braking on wet and slippery surfaces.

## 3.4 VEHICLE INFORMATION-ENTERTAINMENT SYSTEM

### 3.4.1 Dashboard



| Letter | Name | Explanation |
|---|---|---|
| **B1** | Road data button | Allows switching between total road distance and travel distance. |
| **B2** | Speed/charge status button | Allows switching between speed and vehicle charge status. |
| **L1** | Gear selector position | Indicates which position the gear selector is in. |
| **L2** | Key press status | Indicates whether the B1 or B2 button is pressed. |
| **L3** | Charge status bar | It shows the charge status of the battery pack with the help of bars. |
| **L4** | Road conditions | Shows total road distance and travel distance. |
| **L5** | Unit status | Shows the unit in which speed and road data are used. |
| **L6** | Energy consumption/gain bar | It shows how much energy is drawn or gained from the engine with the help of bars. |
| **L7** | Speed, charge and error status | It shows the speed value while the vehicle is moving and the charge status in other situations. If a critical error occurs in the vehicle, the error code is also shown in this section. |
| **Q1** | Left signal icon | When this icon is on, it indicates that the left signal lamp is active. |
| **S2** | Right signal icon | When this icon is on, it indicates that the right turn signal lamp is active. |
| **S3** | Charging icon | When this icon is on, it indicates that the vehicle is in charging status. |
| **S4** | Ready to drive icon | When this icon is constantly on, it indicates that the vehicle is ready to drive. When it flashes, it indicates that the vehicle is not ready to drive. |
| **S5** | Driving mode icon | When this icon is on, it indicates that the vehicle is in slow (turtle) driving mode. |
| **S6** | High beam icon | When this icon is on, it indicates that the high beam is active. |
| **S7** | Parking light icon | When this icon is on, it indicates that the parking light is active. |
| **S8** | Parking brake status icon | When this icon is on, it indicates that the parking brake is engaged. |
| **S9** | Door status icon | When this icon is on, it indicates that one of the doors is open. |
| **S10** | Low beam icon | When this icon is on, it indicates that the low beam is active. |
| **S11** | Load dump icon | When this icon is on, it indicates that the load shedding process is active. |
| **S12** | Glass resistance icon | When this icon is on, it indicates that the window resistance is active. |
| **S13** | Front fog light icon | When this icon is on, it indicates that the front fog lamp is active. |
| **S14** | Seat belt icon | When this icon is on, it indicates that the seat belt is not fastened. |
| **S15** | Rear fog light icon | When this icon is on, it indicates that the rear fog lamp is active. |

| | | |
|---|---|---|
| **W1** | Engine warning | When this icon lights up, it indicates that there is a problem with the engine or the engine driver. |
| **W2** | Temperature warning | When this icon is on, it indicates that there is a temperature-related problem with the motor driver or the motor. |
| **W3** | Battery warning | When this icon is lit, it indicates that there is a problem with the battery pack. |
| **W4** | Charging warning | When this icon is lit, it indicates that there is a charging problem with the built-in charger or battery pack. |
| **W5** | Battery warning | When this icon is on, it indicates that the 12 V battery level is low. |
| **W6** | Brake warning | When this icon is lit, it indicates that there is a problem with the brake system. |
| **W7** | Service warning | When this icon is on, it indicates that necessary services are interrupted. |

### 3.4.2 Multimedia-review


- FM Radio: Listen to FM/AM Radio program.
- Phone: Make a Bluetooth call.
- BT Music: Listen to Bluetooth music.
- Settings: Change the device's settings.
- Apple CarPlay: Connect iPhone.

- Android Auto: Connect supported Android phone.
- USB: Play music/video from your USB disk.

If the ignition key is in the "ON" position and the vehicle is equipped with a rear view camera, when the vehicle is brought to the "R" position via the gear selector, the rear view camera screen will open on the multimedia system and the music volume will be lowered.

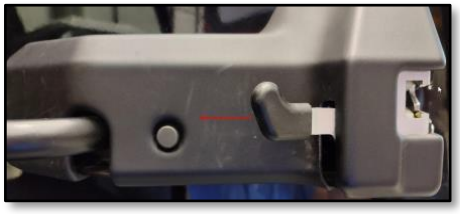
### 3.4.3 RADIO


There is a radio & MP3 player in the vehicle, USB and AUX input. 30 radio channels can be stored in memory. There is 1 external remote control in the vehicle.

### 3.4.4 USB

After the ignition is turned to the "ON" position, charging can be done when the green light on the USB device turns on.

## 3.5 DOOR LOCK POSITIONS



**1. Location**

**2. Location**

The door is locked when the lock moves from position 1 to position 2. (The door cannot be opened from the exterior door handle.)

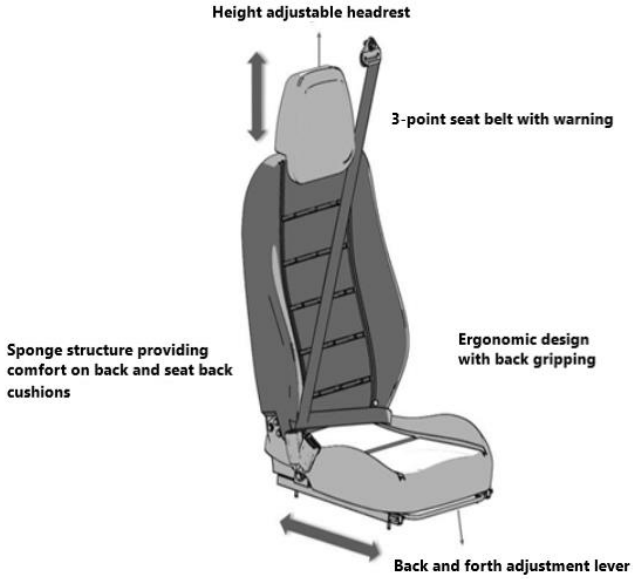
**1. Location**

**3. Location**

When the lock moves from position 1 to position 3, the door opens.

## 3.6 DRIVER'S SEAT

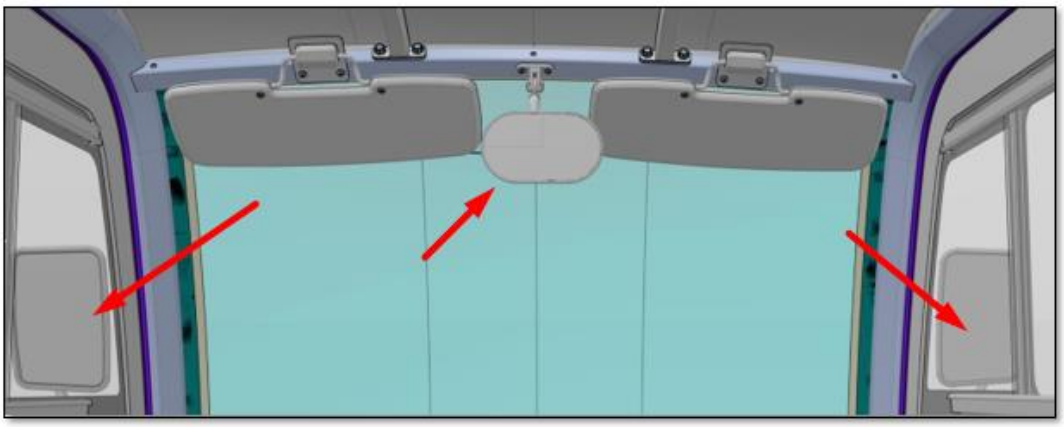
There is 1 driver seat as standard in the vehicle. Additionally, 1 passenger seat can be added as an option if desired.



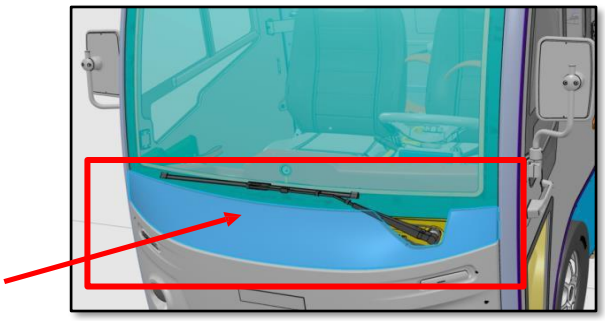

## 3.7 MIRRORS

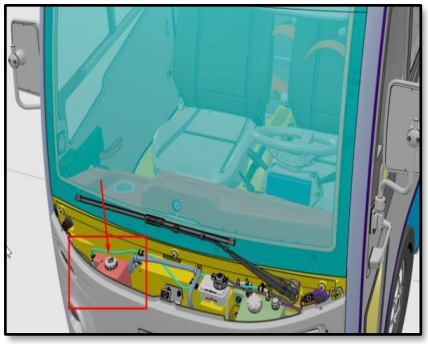
Inside the vehicle there is an optional interior rearview mirror.

Outside there are two exterior mirrors, one on the right and one on the left.



## 3.8 WINDSCREEN WIPER WATER TANK





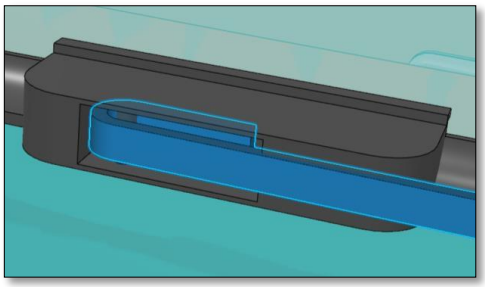
The glass fountain water tank can be accessed by removing the front upper cover. After opening the cover, a maximum of 1 litre of glass washing water can be filled.

Antifreeze should be used to prevent the glass from freezing in cold weather.

## 3.9 WINDSHIELD WIPER REPLACEMENT

There is one outer wiper arm on the windshield.To change the wiper blade, it is removed from its hook on the wiper arm.

To replace the entire outer wiper arm, open the plastic cover where the arm is connected to the vehicle body, remove the ring nut here and remove the wiper arm (Picture 3). When removing the wiper arm, the water spray hose connected to the arm should be pulled and removed from the point where it is connected to the vehicle body.



Wiper tires winter in season control should be done and if necessary should be renewed. Your wipers changes to the internal mechanism must be made by authorized services.

# 4. CONTROL AND INDICATORS

## 4.1 AIR CONDITIONING CONTROL PANEL

The digital control panel helps turn the air conditioner on and off with set values automatically adjusted with the help of temperature sensors inside the air conditioning unit.


1 **Increase set temperature**

2 **Reduce set temperature**

3 **Change fan speed**

4 **Open/Close**

5 **Screen**

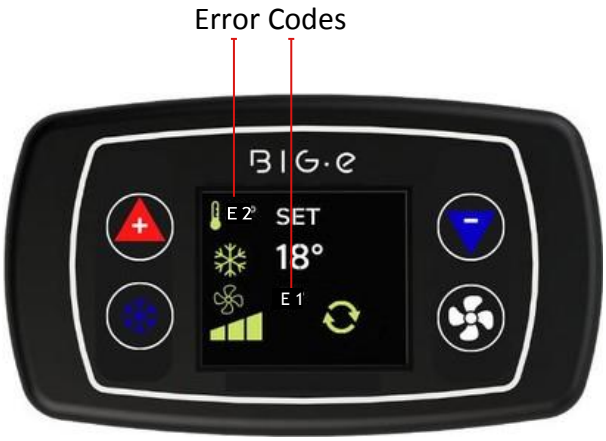

### 4.1.1 Cooling


- Press the cooling button to start the cooling mode.
- When ❄ the snowflake symbol appears on the screen, your air conditioner is operating in cooling mode.

### 4.1.2 Fan Level


- To set the desired fan level, press the fan button and check which level it is at.

### 4.1.3 Fault Codes




#### 4.1.3.1 E 1 : Internal Temperature Sensor Open Circuit

**Reason for Occurring:** The cable may be cut or the socket may be disconnected. The sensor may be faulty or broken.

**Device Response:** When an error occurs, the system shuts down and the error code is displayed on the screen.

**Fault Resolution:**

*Check the sensor cable and sockets.

*If there is no problem with the cables and sockets; replace the sensor.

#### 4.1.3.2 E 2 : Outdoor Temperature Sensor Open Circuit

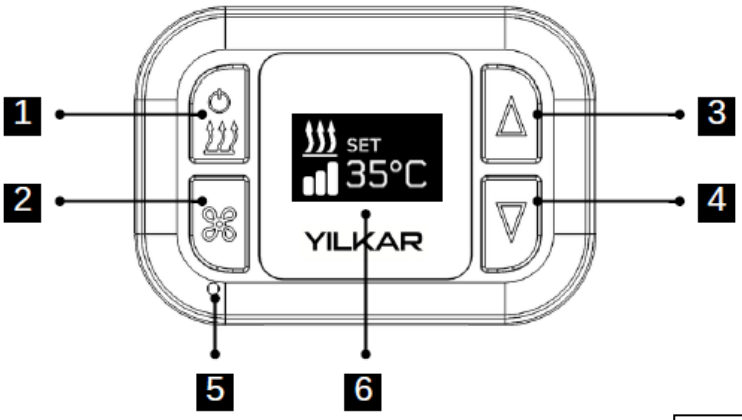
**Reason for Occurring:** The cable may be cut or the socket may be disconnected. The sensor may be faulty or broken.

**Device Response:** When an error occurs, the system shuts down and the error code is displayed on the screen.

**Fault Resolution:**
*Check the sensor cable and sockets.

*If there is no problem with the cables and sockets; replace the sensor.

## 4.2 AIR HEATER CONTROL PANEL




1 Heating On / Off button
Heater off button (5 seconds)

2 Fan On / level setting

3 Increase direction button

4 Decrease direction button

5 Ambient temperature sensor

6 Display screen

**Symbols**

- **Heating Active**
- **Fan Active**
- **Error Warning**
- **Operation Level Maximum**
- **Working Level Medium**
- **Working Level Minium**




### 4.2.1 Temperature indicators

Indicates that the temperature sensor inside the control panel detects 18 C.

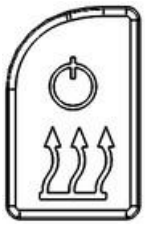
### 4.2.2 Heating Process

Indicates that the set temperature is 35 C.

Indicates that the temperature sensor inside the heater detects 18 C.

#### 4.2.2.1 Start heating

YH Basic control panel controls the air heater according to the SET value. Your heater starts heating with the last temperature you set.

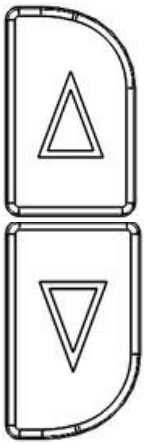


Pressing the button with the heating icon starts the heating mode.


In case of heating, the heating and level sign appears on the screen. It always starts as maximum level.


#### 4.2.2.2 Set temperature adjustment

The set setting can be easily changed while heating. Follow the instructions.

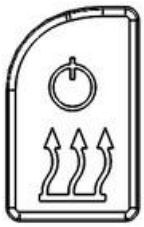


You can increase or decrease the set temperature with the arrow keys



#### 4.2.2.3 Heating level setting and stopping

If you press the button with the fan icon, the heater will change the heating level if the heating is active. You can set maximum, medium and economic heating.



If you press the button with the heating icon, the heater will stop if the heating is active.

The heating sign will disappear from the screen.


### 4.2.3 Fan Operation

#### 4.2.3.1 Fan start

YH Basic control panel controls the air heater depending on the SET value.

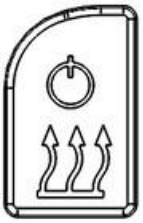
Pressing the button with the fan icon starts the fan mode.


In case of fan, the fan sign appears on the screen. It always starts as medium level.


#### 4.2.3.2 Fan level adjustment and shutdown

If you press the button with the fan icon, the heater will change the fan level if the fan is active.

You can set maximum, medium and minimum speed.

If you press the button with the off and heating icon again, the fan mode will be stopped.


#### 4.2.3.3 Error display

If the device detects any error, it will display an error code on the screen.

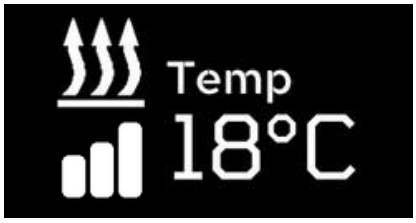
You can find information about the problem and how to fix it from the error table.


#### 4.2.3.4 Set Temperature Control

Your heater heats at maximum level until it reaches the set temperature. If the set temperature is reached, it goes into standby mode.

If the ambient temperature drops below the set value, it will be activated again and provide heating.

SET temperature adjustment range is between 10°C and 35°C.

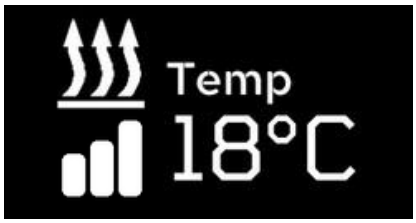



Your heater starts to display the ambient temperature it detects 300 seconds after the heating is started.
"Temp" means the ambient temperature is displayed.

### 4.2.4 Standard mode

Your heater has a temperature sensor that detects the ambient temperature in the air circulation section. As a standard, your heater compares the temperature detected by this sensor and reaches the set temperature.

**"Temp" indicates that you are in Standard mode.**

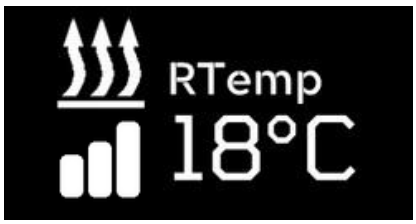



### 4.2.5 Room thermostat mode

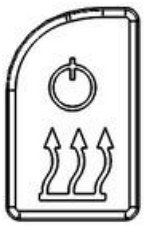
There is a temperature sensor on your control panel to detect the environment temperature. If you switch your device to room thermostat mode, your heater compares the temperature detected by this sensor and reaches the environment temperature set.

To activate the room thermostat mode, consult an authorized ISUZU service point or follow the instructions specified in the installation instructions.

**"RTemp" indicates that you are in Room thermostat mode.**




### 4.2.6 Resetting the Device



If you press the button with the shutdown icon for more than 5 seconds, the button will turn itself off.

If you press the on button again, the button will reset and turn on your heater.


If the error is resolved; the error will be deleted from the screen.

If the error is not resolved, the device detects the error again.


**If the error display is E 17, it means there is a communication problem.** To solve the problem, the heater's energy must be cut off and then re-energized. **Resetting cannot be done from the button.**


### 4.2.7 Information Screen


The software version information regarding the connected control panel is displayed on the start screen.

The display goes to the main menu after 3 seconds.

### 4.2.8 Cleaning

To clean the control panel, please use only a soft, lint-free cloth. Do not allow moisture to enter the casing. Do not use glass cleaners, household cleaners, sprays, solvents, alcohol-based or abrasive cleaners.

The control panel must not be disposed of in household waste. Please observe national regulations regarding waste management of electronic products.

### 4.2.9 Error Codes

#### 4.2.9.1 E 01 : Spark Plug Open Circuit

**Reason for Occurring:** The cable may be cut or the socket may be disconnected. The spark plug may be faulty or broken.

**Device's Reaction:** When the device sees the error, it wants to switch to stop mode, if the

system is hot, it will run the cooling mode before stopping.

**Fault Resolution:**

*Check the spark plug cables and sockets.

* Check the spark plug by removing it and testing its internal resistance.

YH 12 Volt – 0.6 Ω ±0.1 Ω

YH 24 Volt – 1.6 Ω ± 0.2 Ω

*If the resistance values are not within these ranges, replace the spark plug.

*Reset the device from the button or turn off and then on the system power.

#### 4.2.9.2 E 02 : Spark Plug High Current

**Reason for Occurrence:**The cable may be cut or there may be a short circuit in the circuit.

**Device Response:** When the device detects the error, it wants to switch to stop mode, if the system is hot, it will run the cooling mode before stopping.

**Fault Resolution:**

*Check the spark plug cables and sockets.

* Check by removing the spark plug and performing a current test.

8 volts – 7.8A ±1.5A @ 20°C

18 volts - 5.2A ±0.5A @ 20°C

*If the values are not within this range; replace the glow plug.

*If no problem is observed in the cable, sockets and current test, replace the YHC.

*Reset the device using the button or turn off and then on the system power.

#### 4.2.9.3 E 03 : Fuel Pump Open Circuit

**Reason for Occurrence:**The cable may be cut or the socket may be disconnected. The fuel pump may have failed.

**Device Response:** If the system detects an error while in stop mode, the system will not operate and the error will appear on the screen. If a situation such as the pump being open circuit occurs while the system is operating, the system will probably detect that the flame is out (E19) or that combustion has not started (E15) and will cool down and go to stop mode.

**Fault Resolution:**

*Check the fuel pump cable and connectors.

*Remove the fuel pump connector (J7) and measure the resistance value of the fuel pump.

12v pump – 5 Ω ±0.5 Ω

24v pump – 20.8 Ω ±0.5 Ω

If the resistance values do not match, replace the fuel pump.

If the resistance value is OK, reconnect the fuel pump connector.

*Disconnect the YH External connector J8-J9 socket and measure the resistance between pins 3 and 4 on J9. If it is OK (approximately 2 Ω); replace the YHC.

*Reset the device using the button or turn off and then on the system power.

#### 4.2.9.4 E 04 : Fuel Pump High Current

**Reason for Occurrence:**The cable may be cut or there may be a short circuit on the circuit.

**Device Response:** If the system detects an error while in stop mode, the system will not operate

and the screen will display an error. If a situation such as a short circuit of the pump occurs while the system is running, the system will probably detect that the flame has gone out (E19) or the combustion has not started (E15) and will go to stop mode by cooling.

**Fault Resolution:**

*Check the fuel pump cable and connectors.

*Remove the fuel pump connector, if the fault code E03 (Fuel Pump Open Circuit) is displayed, the fuel pump is faulty. Replace the fuel pump.

*If the fault code E04 remains the same, disconnect the YH External connector J8-J9 socket and check if the line from pin 3 (blue cable) on J9 to the fuel pump is shorted to ground (pin 1). If it is OK, replace the YHC.

### 4.2.9.5 E 05 : Fan Motor Open Circuit

**Reason for Occurrence:** The cable may be cut or the socket may be disconnected. The fan motor may have failed.

**Device Response:** If the system detects the error while the system is in stop mode, the system will not operate and the error will appear on the display. If a situation such as fan motor open circuit occurs while the system is running, the system will probably detect that the flame has gone out (E19), the combustion has not started (E15) or the fan operation error will go to stop mode by cooling.

**Fault Resolution:**

*Check the fan motor cable and sockets.

*Pull out the fan motor cable on the main board and perform a resistance test. If the resistance test is OK; replace the YHC.

*Reset the device using the button or turn off and then on the system power.

### 4.2.9.6 E 06 : Fan Motor High Current

**Reason for occurrence:** The cable may be cut or there may be a short circuit on the circuit. If any part enters the suction propeller side while the device is running, if there is an element that prevents the propeller from rotating, this malfunction may occur as the current drawn by the fan will increase. If the magnetic field reader on the YHC is prevented from seeing the fan, this fault may occur as the current will increase.

**Device Response:** If the system detects an error while in stop mode, the system will not operate and the screen will display an error. If a situation such as a fan motor high current detection occurs while the system is running, the system will go into stop mode.

**Fault Resolution:**

*Check that there is nothing preventing the fan motor cable, sockets and fan of the device from operating.

*Apply a current test to the fan motor. To do this, pull the socket off the main board.

Give the fan motor 8v voltage for a 12v device, 18v voltage for a 24v device, and measure the current intensity after 40 seconds.

Current intensity =< 6A –> Fan motor is OK. Replace YHC.

Current > 6A –> Replace the fan.

*Reset the device using the button or turn off the power to the system and turn it back on. Restart the device and if the error is resolved, the system will continue to work without any problems.

#### 4.2.9.7 E 07 : Internal Temperature Sensor Open Circuit

**Reason for Occurring:** The cable may be cut or the socket may be disconnected. The inside air temperature sensor may have failed.

**Device Response:** When the device detects the error, it wants to switch to stop mode, if the system is hot, it will run the cooling mode before stopping.

**Fault Resolution:**

*Check the internal temperature sensor cable and sockets.

*Check the internal temperature sensor by removing it and performing a resistance test.

If internal resistance is > 15K Ω, replace the internal temperature sensor.

*If the resistance test is OK, replace the YHC.

*Reset the device using the button or turn off and then on the system power.

#### 4.2.9.8 E 08 : Flame Monitoring Sensor Open Circuit

**Reason for Occurrence:**The cable may be cut or the socket may be disconnected. The flame monitoring sensor may have failed.

**Device Response:** When the device detects the error, it wants to switch to stop mode, if the system is hot, it will run the cooling mode before stopping.

**Fault Resolution:**

*Check the internal temperature sensor cable and sockets.

*Check the internal temperature sensor by removing it and performing a resistance test.

If internal resistance > 70K Ω replace flame monitoring sensor. @ 20°C

*If the resistance test is OK, replace the YHC.

*Reset the device using the button or turn off and then on the system power.

#### 4.2.9.9 E 09 : Overheating Sensor Open Circuit

**Reason for Occurrence:**The cable may be cut or the socket may be disconnected. The overheating sensor may have failed.

**Device Response:** When the device detects the error, it wants to switch to stop mode, if the system is hot, it will run the cooling mode before stopping.

**Fault Resolution:**

*Check the overheating sensor cable and sockets.

*Check the overheating sensor by removing it and performing a resistance test.

If ohmic resistance > 1200 Ω replace overheat sensor. @ 20°C

*If the resistance test is OK, replace the YHC.

*Reset the device using the button or turn off and then on the system power.

#### 4.2.9.10 E 10 : Internal Temperature Sensor High Current

**Reason for Occurrence:**The cable may be cut or there may be a short circuit in the circuit.

**Device Response:** When the device detects the error, it wants to switch to stop mode, if the system is hot, it will run the cooling mode before stopping.

**Fault Resolution:**

*Check the internal temperature sensor cable and sockets.

* Remove the internal temperature sensor socket and reset the device using the button. If the error code E07 (Internal Temperature Sensor Open Circuit) is displayed, the internal temperature sensor is faulty. Replace the internal temperature sensor.

*Or check by removing the internal temperature sensor and performing a resistance test.

If the internal resistance is too low (approx. 0), there is a short circuit. Replace the internal temperature sensor.

*If the resistance test is OK, replace the YHC.

*Reset the device using the button or cut off the power to the system and then power it up again.

### 4.2.9.11 E 11 : Flame Monitoring Sensor High Current

**Reason for Occurrence:** The cable may be cut or there may be a short circuit on the circuit.

**Device Response:** When the device detects the error, it wants to switch to stop mode, if the system is hot, it will run the cooling mode before stopping.

**Fault Resolution:**

*Check the flame monitoring sensor cable and sockets.

* Remove the flame monitor sensor socket and reset the device using the button. If the error code E08 (Flame Monitor Sensor Open Circuit) is displayed, the flame monitor sensor is faulty. Replace the flame monitor sensor.

*Or check by removing the flame monitoring sensor and performing a resistance test.

If the internal resistance is too low, there is a short circuit. Replace the flame monitoring sensor.

*If the resistance test is OK, replace the YHC.

*Reset the device using the button or turn off and then on the system power.

### 4.2.9.12 E 12 : Overheating Sensor High Current

**Reason for Occurrence:** The cable may be cut or there may be a short circuit in the circuit.

**Device Response** : When the device detects the error, it wants to switch to stop mode, if the system is hot, it will run the cooling mode before stopping.

**Fault Resolution:**

*Check the overheating sensor cable and sockets.

* Remove the overheating sensor connector and reset the device using the button. If error code E09 (Overheating Sensor Open Circuit) is displayed, the overheating sensor is faulty. Replace the overheating sensor.

*Or check by removing the overheating sensor and performing a resistance test.

If the ohmic resistance is too low, there is a short circuit. Replace the overheating sensor.

*If the resistance test is OK, replace the YHC.

*Reset the device using the button or turn off and then on the system power.

### 4.2.9.13 E 13 : High Voltage Error

**Reason for Occurrence:** If the supply voltage exceeds 30 volts for devices operating at 24 volts, 15 volts for devices operating at 12 volts, and the supply remains at this voltage for more than 20 seconds, the device detects a high voltage fault.

**Device Response:** If the device detects this fault in stop mode, it will not allow the system to operate. If the voltage drops and the operating conditions are reached, the fault will be resolved automatically and the system can be operated.

If such an error occurs while the device is operating, the device cools itself down and goes into stop mode, and the error remains on the screen.

**Fault Resolution:**

*Check whether the supply voltage from the vehicle to the system is within the appropriate range.

YH 24v – Supply voltage must be < 30v.

YH 12v – Supply voltage must be < 15v.

*If the supply voltage is suitable, reset the device using the button or cut off the system power and then give it back.

### 4.2.9.14 E 14 : Low Voltage Error

**Reason for Occurrence** : If the supply voltage drops below 21 volts for devices operating at 24 volts, below 10.5 volts for devices operating at 12 volts, and the supply remains at this voltage for more than 20 seconds, the device detects a low voltage fault.

**Device Response:** If the device detects this fault in stop mode, it will not allow the system to operate. If the voltage increases and the operating conditions are reached, the fault will automatically go away and the system can be operated. If such an error occurs while the device is operating, the device will cool itself down and send it to stop mode and the error will remain on the screen.

**Fault Resolution:**

*Check if the supply voltage from the vehicle to the system is within the appropriate range.

YH 24v – Supply voltage must be > 21v.

YH 12v – Supply voltage must be > 10.5v.

* The voltage on the vehicle battery should not differ from the voltage at the B1 socket end of the device. If this is the case, pay attention to oxidation on the '+' terminal of the battery or contact with the connection.

*If the supply voltage is appropriate, reset the device using the button or cut off the system power and then give it back.

### 4.2.9.15 E 15 : Ignition Start Fault

**Reason for Occurrence:** There may be no fuel left in the fuel tank, a blockage on the fuel hose, a blocked exhaust hose or a blocked combustion air intake hose. The spark plug may be faulty and the fault may not be detected electrically.

**Device Response:** If the device does not detect combustion in the combustion chamber shortly after starting, it will try to start combustion again after cooling for a while. If it encounters the same situation twice in a row, it will give this error.

**Fault Resolution:**

*Make sure that the exhaust outlet and combustion air inlet hoses are not clogged or incorrectly installed.

*Make sure there is fuel in the fuel tank.

*Make sure there is no blockage in the fuel hose.

*Make sure the spark plug is working.

* Try to start the device after putting fuel into the fuel tank. If the device does not work in 2 attempts, it will give the same error again. Reset it from the button or cut the power and then give it again.

#### 4.2.9.16 E 16 : Overheating Error

**Reason for Occurrence:** The device may have overheated in some way while it is operating. The temperature sensor on the body or the temperature sensor in the suction line may be broken and may be detecting higher temperatures than it should detect. If the power is cut off for any reason while the system is operating, this situation may occur when the power is re-applied.

**Device Response:** When the device detects this error, if it is working, it will cool down and go into stop mode. If the device is reset or the power supply is withdrawn and re-applied, it will clear the error. If this error occurs as a result of the power being cut off and re-applied while the device is working, all sensors on the device will detect high temperature and the error will appear on the screen and the error will remain on the screen until reset is made via the button.

**Fault Resolution:**

*Make sure that there is no element that blocks the air flow in the air inlets and outlets of the device.

*Make sure that the pipe length between the device and the blower vent is within the standards.

*Check the cables and sockets of the temperature sensors on the device.

*If no problem is observed, reset the device using the button or turn off and then on the system power.

#### 4.2.9.17 E 17 : Control Unit Communication Error

**Reason for Occurring:** There may be deformation in the cables that communicate with the control unit of the device. There may be a fault in the main board or control unit.

**Device Response:** When the device detects this error, if it is working, it will switch to stop mode by cooling.

**Fault Resolution:**

*Check the cables and sockets through which the device communicates with the control unit.

*If there is no problem, replace the control unit, if there is deformation in the cables or sockets, perform the necessary repairs.

*The device cannot be reset from the button! Turn off the system power and then turn it back on.

#### 4.2.9.18 E 18 : Fan Operation Failure

**Reason for Occurring:** While the device is operating, an element that prevents the fan from operating may have entered the device. A fault may have occurred in the magnetic sensor. If the device has been intervened in, the distance between the external air fan and the holding T plastic may have been adjusted incorrectly. Elements that prevent the fan that sends air to the combustion chamber from operating may have formed. For similar reasons, the current used by the fan motor may increase as it tries to maintain its operating speed, and the device may experience a high current fan motor fault.

**Device Response:** When the device detects this error, it will switch to stop mode if it is running.

**Fault Resolution:**

*Make sure that no external elements enter the device.

*Make sure that the distance between the external air fan and the T-plastic holder is within the standards.

*Make sure that YHC is in the correct position.

*After making sure of these conditions, reset the device using the button or cut the power of the system and then power it up again.

#### 4.2.9.19 E 19 : Combustion Stop Error

**Reason for Occurrence:** There may be no fuel left in the fuel tank or there may be a blockage on the fuel hose. The air inlet or exhaust outlet participating in combustion may be blocked or deformed. The exhaust line or the interior air inlet line may have been installed incorrectly, and reverse air flow may be coming into the device.

**Device Response:** If the device is operating when it detects this error, it will cool down and switch to stop mode.

**Fault Resolution:**

*Make sure that the exhaust outlet and combustion air inlet hoses are not clogged or incorrectly installed.

*Make sure there is fuel in the fuel tank.

*Make sure there is no blockage in the fuel hose.

*Try to start the device after putting fuel into the fuel tank. If the device does not work in 2 attempts, it will give the same error again. Reset it from the button or cut the power and then give it again.

#### 4.2.9.20 E 20 : Air Blockage Error

**Reason for Occurring:** There may be a blockage on the air intake side or outlet side while the device is operating. There may be a detection problem in the flame monitoring or overheating sensor.

**Device Response:** If the device is operating when it detects this error, it will cool down and go into stop mode.

**Fault Resolution:**

*Make sure that there is no blockage in the air intake and outlet of the device.

*After making sure of these conditions, reset the device using the button or turn off the system power and then turn it on again.

#### 4.2.9.21 E 21 : EEPROM Error

**Reason for Occurring:** A main board failure may have occurred.

**Device Response:** If the device is operating when it detects this error, it will cool down and go into stop mode.

**Fault Resolution:** Replace the YHC. After replacement, reset the device using the button or cut and re-energize the system.

#### 4.2.9.22 E 22 : Control Unit Temperature Sensor Error (Optional)

**Reason for Occurring:** If the system is operated in room thermostat mode, there may be a fault in the temperature sensor on the control unit.

**Device Response:** If the device is operating when it detects this error, it will cool down and

switch to stop mode.

**Fault Resolution:**

*Replace the control unit.

*After the change, reset the device using the button or cut off the power to the system and then power it up again.

### 4.2.10 Technical information

The Control Unit, Engine, Diesel Fuel Pump and Glow Plug are designed for 12 V and 24 V. The Control Panel and Temperature Sensor components are not voltage dependent.

Permissible ambient temperatures;

Operation: –40 °C to +40 °C

Storage: –40 °C to +90 °C

Diesel fuel specified by the manufacturer according to DIN EN590 must be used. There are no known adverse effects of using additives. If fuel is taken from the vehicle's tank, follow the additional instructions given by the vehicle manufacturer.

## 4.3 SIDE CONTROL PANEL

### 4.3.1 Flasher Key

When the symbol is pressed, the flasher is turned on, and when the upper part is pressed, the flasher is turned off. When the flasher is switched on, the signal lamps in the instrument panel and the function lamp in the switch illuminate and give an audible warning together with all the vehicle's signal lamps.

### 4.3.2 Glass Resistance Switch

When the ignition key is activated, the windshield defroster is controlled. When the symbol is pressed, the windshield defroster is activated, it is the defrosting and defogging function. When the upper part of the key is pressed, it becomes passive and the windshield defroster is turned off.

### 4.3.3 Driving Mode Switch

When the ignition key is activated, the driving mode is controlled. When the turtle symbol is pressed, the vehicle speed does not exceed a maximum of 25 km/h. When the rabbit symbol is pressed, the maximum vehicle speed is activated.

### 4.3.4 Rear Fog Light Switch

After activating the ignition key and turning on the low beams, the rear fog light can be controlled. When the symbol is pressed, the fog light in the rear left lamp will be active. When the upper part of the switch is pressed, it will be inactive.

### 4.3.5 Automatic Headlight Switch

When the ignition key is activated, the automatic headlight system is activated. When the symbol is pressed, the automatic headlight system is deactivated. When the upper part of the key is pressed, the automatic headlight system will be activated.

### 4.3.6 Beacon Light Switch

It works independently of the ignition key. When the symbol is pressed, the top light will be activated and will start to light up.

### 4.3.7 Regenerative Charge Switch


When the ignition key is active and the vehicle is running, the battery charging current will be at minimum level when the accelerator pedal is released when the key is pressed. When the ignition is turned off and on or the accelerator pedal is released when the button is pressed again, the battery charging current will be at maximum level. It is critical for the driver to activate this feature for safety, especially in climates with icy/wet surfaces. The feature is active when the green part of the power energy consumption / gain bar indicated by L6 under “Instrument Panel” is not illuminated.

### 4.3.8 Door Lock Key

The door locks are controlled from inside the vehicle, independently of the ignition key. When the locked symbol is pressed, the doors are locked and the hazard lights flash twice. When the unlocked symbol is pressed, the doors are unlocked and the hazard lights flash once.

### 4.3.9 Front Fog Switch

It works when the ignition key and park are activated. When the symbol is pressed, the front fog lights will turn on. The lamp will go out when the top of the key is pressed or the parking is switched off.

### 4.3.10 Electric Heater Switch

It works when the ignition key is activated. When the symbol is pressed, the electric heater will be activated. When the key is pressed on the upper part, it will be deactivated.

### 4.3.11 Charge Gun Release Switch

The ignition key works independently. When the vehicle station AC charger is plugged in and the charging socket is to be removed without waiting for it to be fully charged, the charging gun can be removed by pressing the symbol.

### 4.3.12 D-N-R (Driving) Key


It works when the ignition key is activated. When the brake pedal is pressed, the gear selection process is performed. It will move to the "D" or "R" position.

### 4.3.13 Wiper Arm

It works when the ignition key is activated. When the wiper arm is pulled down 1 time and released, the wiper will operate 1 time in 1 stage. When the wiper arm is moved up 1 time, it will work intermittently. When it is moved up once more, the wiper will operate continuously in 1st stage. When it is moved up once more, the wiper will operate continuously in 2nd stage. When the wiper arm is pulled towards the driver, the water motor will be activated.

### 4.3.14 Signal Lever

It works when the ignition key is activated. When the lever is down it signals left, when it is up it signals right. When the lever is pulled towards the driver, the headlight flashers will turn on. When it is turned 1 stage the park lights will turn on, when it is turned 2 stage the low beams will turn on. When the low beams are on and the lever is pulled towards the driver, the high beams will turn on. When the button with the horn symbol is pressed, the horn will work.

### 4.3.15 Interior Lighting Button

It works independently of the ignition key. When the "I" symbol on the key is pressed, it will light up continuously. If the "II" symbol is pressed, it will light up when the doors are opened.

### 4.3.16 Emergency Key

To use the emergency switch, the red coloured safety cover is lifted upwards to open it. When pushed forward, the electricity in the system is cut off and the flasher is turned on, the door keys are in an active working condition. When pulled back, the system returns to normal.

### 4.3.17 Parking brake

The handbrake system is a wire type and pull type. The handbrake lever is located on the lower right side of the driver. When the vehicle is stopped, the handbrake lever is pulled upwards. The handbrake is released by pressing the latch at the end of the handbrake lever. There is a warning light on the instrument panel that shows whether the handbrake system is engaged or not.

**WARNINGS**

⚠ An audible warning is given when the seat belt is not fastened while the vehicle is driving or ready to drive.

⚠ An audible warning is given if any of the doors are open while the vehicle is driving or ready to drive.

⚠ If a gear change is made while driving or if the gear selector is not initially in the "N" position, the "gear selector position" section on the display screen will flash.

# 5. SERVICE AND MAINTENANCE

## 5.1 CLEANING THE VEHICLE

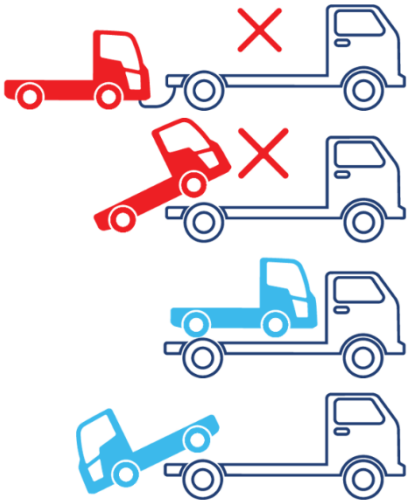
### 5.1.1 External Cleaning

- Do not clean your vehicle with detergent or chemical materials and do not wipe it with gasoline.
- Use pressurized water when cleaning the vehicle, do not leave excess water on the vehicle after cleaning, remove excess water with a cloth or chamois..
- Do not wash your vehicle in direct sunlight.
- Keep the inside of the mudguards clean during the winter season.
- There are battery packs in the lower section of the vehicle. Do not intervene in the battery packs except for technical service.

### 5.1.2 Internal Cleaning

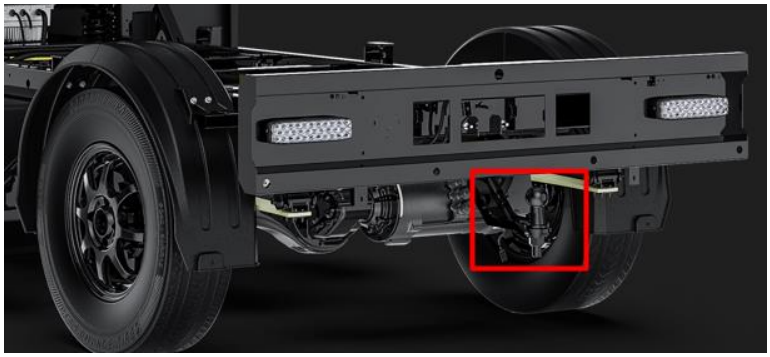
- Clean the instrument panel with a wet cloth, never use substances such as alcohol and thinner.
- Clean the seats with a wet cloth or foamy vinylex cleaner.

## 5.2 TOWING THE VEHICLE



- Make sure that the D-N-R (Drive) Switch position is in the 'N' position when towing the vehicle,
- Secure the vehicle with the tow hook marked in the image above.

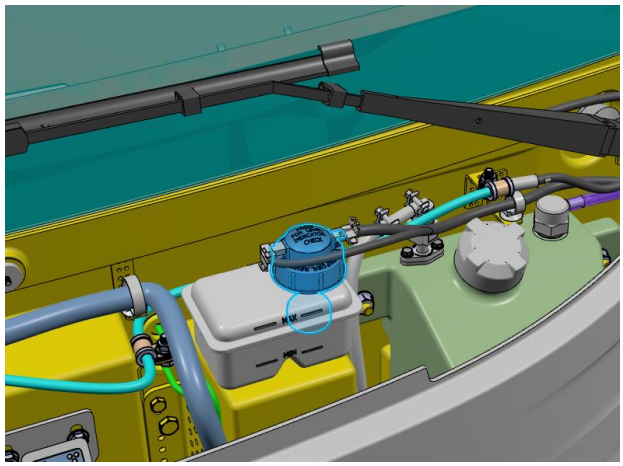
⚠ In order not to cause uncontrolled power flow, the wheels at the rear of the vehicle where the engine is located should not be in motion during towing. Otherwise, serious damage to the engine or battery systems may occur.



- Tow the vehicle with the tow hook marked in the image above.- Pull the vehicle you want to tow with the (optional) tow hook marked in the image above.

## 5.3 BRAKE HYDRAULIC OIL LEVEL CONTROL

The cover at the front of the vehicle is removed and the brake fluid reservoir is located behind the cover. The oil level can be checked according to the min and max written on the reservoir. During oil filling operations, the max line should not be exceeded and should not be below the minimum line.



## 5.4 PERIODIC MAINTENANCE

### 5.4.1 Before Driving

Proper maintenance and driving are important not only for the longevity of your vehicle, but also for the battery and electric motor.

#### 5.4.1.1 Perform Daily Inspection

For safe and comfortable driving, record the distances traveled and the condition of the vehicle during driving. Perform inspections at appropriate intervals and perform maintenance according to the inspection findings. If an abnormality is detected during an inspection or if an abnormality occurred during the previous driving of the vehicle, take the vehicle to the nearest Isuzu Dealer before driving it again.

Daily Checks Checklist:

1. Checking components that showed abnormalities during previous driving
2. Power steering fluid level
3. Brake pedal release
4. Operation of meters, indicators and warning/indicator lights
5. Parking brake
6. Windshield washer fluid spray status and windshield wiper effectiveness
7. Windshield washer fluid level
8. Steering wheel clearance and mounting condition
9. Horn and turn signal lamp operation

10. Battery charge level
11. Lighting, flashing or damaged lights
12. Battery fluid level
13. Brake fluid, power steering fluid, leak
14. Cracks and other damage
15. Abnormal abrasion
16. Tread depth of tires
17. Disc wheel mounting status
18. Brake efficiency
19. Abrasion and corrosion control on chassis and body parts
20. Check the vehicle's accident and original parts status.

### 5.4.1.2 Weekly Maintenance

- Check tire pressures with an air gauge. (Pressure values: 3.4 bar / 49 psi)
- Check the steering fluid tank level.
- Check the windshield washer fluid level.
- Control of abrasion and corrosion on chassis and body parts

**ATTENTION !**

- Water jet cleaning machines should not be used inside the vehicle.
- Abrasive materials should not be used on the vehicle surface.
- The vehicle should not be washed with a car wash brush.
- In case of an accident, notify the authorized service.
- Regular maintenance at authorized service

### 5.4.1.3 Periodic Maintenance Table

First periodic maintenance is 5,000 km, Main periodic maintenance interval is 10,000 km. Maintenance intervals after 85,000 km are the same as the maintenance intervals after 10,000 km.

**A** : Adjust

**R:** Change

**I** : Control, cleaning, correction when necessary

**L** : Lubrication

**NOTE** : Change filter/fluids before recommended mileage or month (whichever comes first).

**Air conditioning**

| Maintenance Interval (x1000 km) | 5 | 15 | 25 | 35 | 45 | 55 | 65 | 75 | 85 | Month/Hour |
|---|---|---|---|---|---|---|---|---|---|---|
| Condenser cleaning and general condition control | I | I | I | I | I | I | I | I | I | 12 Months |
| Control of evaporator and condenser fans | I | I | I | I | I | I | I | I | I | 12 Months |
| Cleaning water drains | I | I | I | I | I | I | I | I | I | 12 Months |
| Checking the compressor and conveyor system connections | I | I | I | I | I | I | I | I | I | 12 Months |
| Checking the gas line and connections | I | I | I | I | I | I | I | I | I | 12 Months |
| Control of system pressures | I | I | I | I | I | I | I | I | I | 12 Months |
| Control panel control | I | I | I | I | I | I | I | I | I | 12 Months |
| Checking electrical connections and sockets | I | I | I | I | I | I | I | I | I | 12 Months |
| Replacing the compact filter | I | I | I | I | I | R | I | I | I | 24 Months |
| Functional control of the system | I | I | I | I | I | I | I | I | I | 12 Months |
| Control of evaporator and condenser fans | I | I | I | I | I | I | I | I | I | 12 Months |
| Cleaning water drains | I | I | I | I | I | I | I | I | I | 12 Months |

**Electric Motor**

| Maintenance Interval (x1000 km) | 5 | 15 | 25 | 35 | 45 | 55 | 65 | 75 | 85 | Month/Hour |
|---|---|---|---|---|---|---|---|---|---|---|
| Visual inspection | I | I | I | I | I | I | I | I | I | 12 Months |
| Cleaning | I | I | I | I | I | I | I | I | I | 12 Months |
| Checking the tightness of the terminal fixing and grounding screw | I | I | I | I | I | I | I | I | I | 12 Months |
| Checking for noise and vibration | I | I | I | I | I | I | I | I | I | 36 Months |
| Checking the bearings for noise and vibration | I | I | I | I | I | I | I | I | I | 36 Months |
| Replace bearings if necessary | I | I | I | I | I | I | I | I | R | 36 Months |
| Visual inspection of the shaft | I | I | I | I | I | I | I | I | I | 36 Months |
| Shaft cleaning | I | I | I | I | I | I | I | I | I | 36 Months |
| Bearing replacement | I | I | I | I | I | I | I | I | R | 10,000 Hours |
| General control and cleaning of brushes | I | I | I | I | I | I | I | I | I | 6 Months |
| Control the brushing action | I | I | I | I | I | I | I | I | I | 6 Months |
| Check the brushes for wear and replace if necessary. | I | I | I | I | I | I | I | I | I | 6 Months |
| Check the collector surface | I | I | I | I | I | I | I | I | I | 6 Months |

## General Vehicle Maintenance

| Maintenance Interval (x1000 km) | 5 | 15 | 25 | 35 | 45 | 55 | 65 | 75 | 85 | Month/Hour |
|---|---|---|---|---|---|---|---|---|---|---|
| Brake hydraulic oil change | I | I | I | I | I | R | I | I | I | 12 Months |
| Wheel nuts | I | I | I | I | I | I | I | I | I | 12 Months |
| Tire air pressures | I | I | I | I | I | I | I | I | I | 12 Months |
| Hub bearing | I | I | I | I | I | I | I | I | I | 12 Months |
| Brake pipe and brake hose leak | I | I | I | I | I | I | I | I | I | 12 Months |
| Brake, signal, parking and fog lights | I | I | I | I | I | I | I | I | I | 12 Months |
| Interior lighting | I | I | I | I | I | I | I | I | I | 12 Months |
| Windshield wiper and glass washing system | I | I | I | I | I | I | I | I | I | 12 Months |
| Fuse panel wiring and socket connections | I | I | I | I | I | I | I | I | I | 12 Months |
| Battery connection cables | I | I | I | I | I | I | I | I | I | 12 Months |
| Battery voltage | I | I | I | I | I | I | I | I | I | 12 Months |
| Electrical Connections Torque controls | I | I | I | I | I | I | I | I | I | 12 Months |
| OBC Ventilation fans dust-mud control | I | I | I | I | I | I | I | I | I | 12 Months |
| Inverter Maintenance Checks | I | I | I | I | I | I | I | I | I | 12 Months |
| DC-DC Dust-Mud, Connection Controls | I | I | I | I | I | I | I | I | I | 12 Months |
| Rearview mirror parts | I | I | I | I | I | I | I | I | I | 12 Months |
| Accelerator and brake pedal | I | I | I | I | I | I | I | I | I | 12 Months |
| Control of wear and corrosion on chassis and body parts | I: once a week | | | | | | | | | |
| Underbody inspection and repair | I: once a week | | | | | | | | | |
| Accident and original parts status check | I: daily | | | | | | | | | |

## Inverter

| Maintenance Interval (x1000 km) | 5 | 15 | 25 | 35 | 45 | 55 | 65 | 75 | 85 | Month/Hour |
|---|---|---|---|---|---|---|---|---|---|---|
| Visual Inspection and Cleaning of the Control Unit | I | I | I | I | I | I | I | I | I | 6 Months |
| Check battery cables, inverter cables and motor cables | I | I | I | I | I | I | I | I | I | 6 Months |
| Check that the keys are making contact and working properly. | I | I | I | I | I | I | I | I | I | 6 Months |
| Check that the 5 busbars on the inverter where the power connections are made are intact. Make sure that they are not deformed and that the screws are not loose. | I | I | I | I | I | I | I | I | I | 6 Months |
| Check the main contactor contacts for wear and condition. Check the mechanical operation of the contactors, make sure that the moving contacts can move freely without any restrictions. | I | I | I | I | I | I | I | I | I | 6 Months |
| Check the mechanical operation of the pedal. Confirm that the potentiometers are at their programmed levels. | I | I | I | I | I | I | I | I | I | 6 Months |
| Connect the PO Configurator programmer and review the records | I | I | I | I | I | I | I | I | I | 6 Months |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| from the "FLASH" tab. The programmer will read all critical errors. If necessary, software updates can be completed via the PC programmer. | | | | | | | | | | |
| If a fuse is connected to the device, check the fuse and the fuse screw for integrity. | I | I | I | I | I | I | I | I | I | 6 Months |
| If a cooler is installed in the device, the tightness of the connections to the cooler can be checked. The bottom of the cooler should be cleaned. | I | I | I | I | I | I | I | I | I | 6 Months |
| To remove the service warning after the maintenance is completed, the "Service Clear" button must be clicked on the PO Configurator program home page. | I | I | I | I | I | I | I | I | I | 6 Months |

**Axles**

| Maintenance Interval (x1000 km) | 5 | 15 | 25 | 35 | 45 | 55 | 65 | 75 | 85 | Month/Hour |
|---|---|---|---|---|---|---|---|---|---|---|
| Front and rear axle brake disc visual control | I | I | I | I | I | I | I | I | I | 24 Months |
| Front and rear axle brake pad visual control | I | I | I | I | I | I | I | I | I | 3 Months |
| Axle shock absorber control | I | I | I | I | I | I | I | I | I | 6 Months |
| Checking the front and rear axle connections | I | I | I | I | I | I | I | I | I | 24 Months |
| Control of lower axle arms | I | I | I | I | I | I | I | I | I | 3 Months |
| General axle condition control | I | I | I | I | I | I | I | I | I | 3 Months |
| Rear axle ventilation control | I | I | I | I | I | I | I | I | I | 3 Months |
| Rear axle oil check and change | I: Every 10,000 km<br>R: One in 20,000<br>R: During the first maintenance, oil change should be done every 2,500 km. | | | | | | | | | |

- **Brake Disc** : Check minimum thickness and inspect brake components for signs of wear and damage and replace any irregularities in thickness.
- **Brake Pads:** Check the minimum thickness of the pads.
- **Shock Absorber:** Check for damaged or bent studs, connections; look for signs of fluid leaking from the top seal. If one needs to be replaced, replace the shock absorbers in pairs.
- **Lower Arm:** Check for worn rubber or excessive movement.
- **Fasteners:** Check for signs of cracking or crushing and retighten.
- **General Axle Condition:** Check for cracks or impact marks from shocks, inspect and clean dust caps and oil plugs.
- **Vent:** Clean valves and check for signs of leaks or blockages.

## 5.5 Long-Term Storage Guidelines for LFP, NMC, and LTO Batteries

### 5.5.1 General Storage Guidelines for All Battery Chemistries

- **Temperature:** The storage environment should maintain a temperature between 15-20°C. Excessive temperatures can cause batteries to discharge faster, reducing their lifespan, while low temperatures may temporarily reduce their capacity. Keeping the temperature stable is key to ensuring longevity.
- **Charge State:** Batteries should be stored at a charge level of 40-60%. Storing batteries at full charge (100%) or fully discharged can cause capacity loss over time.
- **Humidity Control:** The storage area should maintain low humidity levels. High humidity can cause internal components to corrode.
- **Packaging:** Batteries should be packaged in insulated boxes to prevent short-circuiting. Batteries should not be in direct physical contact with each other to avoid accidental damage or short circuits.

### 5.5.2 Specific Chemistry Storage Guidelines

#### 5.5.2.1 LFP (Lithium Iron Phosphate) Batteries

- **Charge State:** For LFP batteries, the ideal storage charge range is 40-60%. This will ensure the battery remains within a safe operating range and avoids issues caused by overcharging or deep discharge.
- **Voltage Considerations:** LFP batteries typically operate at lower voltages, usually around 3.2V per cell. It's important to maintain a balanced voltage during storage to prevent any imbalance in the cells.
- **Temperature Range:** LFP batteries should be stored at a temperature range between 0-25°C. High temperatures may lead to capacity degradation, while low temperatures can increase internal resistance, reducing efficiency.
- **Storage Time:** LFP batteries are highly suitable for long-term storage and can remain stable for up to 5 years or more. However, it is recommended to check the charge levels and, if necessary, recharge them every 6-12 months.
- **Notes:** LFP batteries are known for their stability and safety, but it is essential to ensure that the cells remain balanced during storage to avoid any potential degradation.

#### 5.5.2.2 NMC (Nickel Manganese Cobalt) Batteries

- **Charge State:** NMC batteries should also be stored at a charge level of 40-60%. These batteries provide high energy density, but overcharging or deep discharging can significantly shorten their lifespan.
- **Voltage Considerations:** NMC batteries typically have a nominal voltage of 3.7V per cell. Due to their high energy density, careful attention should be paid to voltage balancing during storage.
- **Temperature Range:** NMC batteries should be stored in an environment between 15-20°C. Excessive heat can accelerate chemical reactions, causing loss of capacity.
- **Storage Time:** NMC batteries can remain stable during long-term storage, but it's recommended to check the charge levels once a year. Over extended periods, these batteries may lose some capacity, so regular monitoring is necessary.

- **Notes:** As these batteries are prone to capacity degradation over time, it is important to maintain proper voltage balancing and conduct periodic checks on their charge levels.

#### 5.5.2.3 LTO (Lithium Titanate) Batteries

- **Charge State:** LTO batteries, known for their fast charging capabilities, are best stored at a charge level between 30-50%.
- **Voltage Considerations:** LTO batteries have a lower nominal voltage, typically around 2.4V per cell. These batteries perform well in a wide range of temperatures and support rapid charge/discharge cycles. High voltage levels typically don't pose issues for LTO batteries.
- **Temperature Range:** LTO batteries can be stored in a wider temperature range of 0-30°C. While cold temperatures can increase internal resistance, the overall stability of LTO batteries allows them to perform well in colder conditions.
- **Storage Time:** LTO batteries have a very long lifespan, often lasting between 10-15 years. However, it's still recommended to check the charge levels every 6 months to maintain optimal performance.
- **Notes:** LTO batteries offer great longevity and safety. However, low voltages during storage should be carefully managed to avoid imbalance. In cold temperatures, some capacity loss may occur, though LTO batteries tend to be more resilient than other chemistries.

### 5.5.3 Additional Tips for Long-Term Storage

- **Battery Management System (BMS):** A Battery Management System (BMS) is critical for high-voltage and high-capacity batteries. The BMS helps monitor voltage levels, cell balance, and overall battery health, preventing imbalances that could lead to capacity loss or failure.
- **Monitoring:** It is essential to regularly monitor the charge levels of the batteries. For LFP and LTO batteries, maintaining charge levels between 40-60% will prolong their lifespan. Use a system or software to track and alert for voltage issues or imbalances.
- **Safety:** For high-voltage batteries, safety precautions should be a priority. Batteries should be isolated to prevent short-circuiting, and storage areas should be designed with fire safety protocols in place.

### 5.5.4 Summary of Key Points

| Battery Type | Ideal Charge Level | Ideal Temperature | Storage Duration | Voltage Considerations | Maintenance Frequency |
|---|---|---|---|---|---|
| **LFP (Lithium Iron Phosphate)** | 40%-60% | 0-25°C | 5+ years | Maintain balanced voltage (3.2V) | Check every 6 months |
| **NMC (Nickel Manganese Cobalt)** | 40%-60% | 15-20°C | 3-5 years | High energy density; watch voltage balance | Check every 6 months |
| **LTO (Lithium Titanate)** | 30%-50% | 0-30°C | 10-15 years | Low voltage (2.4V); monitor cold temps | Check every 6 months |

This document provides the essential guidelines for long-term storage of **LFP**, **NMC**, and **LTO** batteries. By adhering to these recommendations, you can ensure that your batteries remain in optimal condition and perform efficiently over an extended period. Always tailor storage conditions to the specific requirements of each battery chemistry to maximize longevity and safety.

### 5.5.5 Calibration of SOC for Long Term Storage System

When the time from shipping to installation is more than 6 months, the battery system SOC should be calibrated manually before putting it into test or use. Otherwise, it’s not mandatory to conduct the calibration.

**Method of Calibration**

Step 1. Fully charge the battery system to 100% SOC until the charging station turn off automatically. (Note: First time it may take longer to fully charge the battery for SOC calibration on the top end )

Step 2. Discharge the battery system until the SOC ≤15%;

Step 3. Power off the vehicle and keep the battery system stand still for more than 1 hour,

Step 4. Power on and BMS will calibrate the SOC automatically,

Step 5. Fully charge the battery system to 100% SOC until the charging station turn off automatically

# 6. TECHNICAL INFORMATION

| **Dimensions (mm)** | |
|---|---|
| Maximum length | 3680 |
| Maximum width | 1420 |
| Maximum height | 1961 |
| Axle range | 1970 |
| Front length | 1060 |
| Back length | 650 |
| Front track width | 1200 |
| Back trace width | 1185 |
| **Weights (kg)** | |
| Maximum loaded weight | 1730 |
| Front axle capacity | 900 |
| Back axle capacity | 1250 |
| **Engine** | |
| Model | ZTP |
| Medicine | Asynchronous Type Electric Motor |
| Drive type | Battery Electric Vehicle |
| Maximum Power (kW) | 9.4 kW 2300 rpm |
| Maximum Torque (Nm) | 60.4 Nm 1600 rpm |
| Maximum Speed | 45 km/h |
| **Climbing Ability (at Maximum Loaded Weight)** | 20% |
| **Tires** | 165 R13 C |
| **Suspensions** | |
| Front | Independent Suspension |
| Back | Rigid, Scissor |
| Anti-roll bar | Front anti-roll bar (O) |
| **Brake The system** | |
| Front / Back | Disk / Campaign |
| Short specification | Hydraulic |
| Park brake | Mechanical brake on rear axle |
| **Electrical System** | |
| Rated voltage | 12V |
| Accumulator | 24 Oh |
| **Electrical System-Electric Vehicle** | |
| Working voltage | 48V |
| Battery Type | Lithium Ion (LFP Hybrid) |
| Battery Capacity | 10.5 kWh (O); 15.7 kWh (H); 21 kWh (O) |
| Battery Location | Chassis |
| Range (km) | *Option-1 (15.7 kWh) up to 150 km |
| Warranty | 5 years / 2000 Cycles |
| Charge Type | AC 220V (3.3kW OBC 15A) (S)<br>AC 220V (6.6kW OBC 32A) (O)<br>AC TYPE2 (3.3 kW OBC 15A) (O)<br>AC TYPE2 (6.6 kW OBC 32A) (O)<br>DC Fast Charge (48V 300A) (O) |
| **Air conditioning** | Option |

| PRESSURE VALUES | | |
|---|---|---|
| **Tires** | **Cold Inflation Pressure** | **3.4 bar/ 49 psi** |

| LIQUID PROPERTIES | | | |
|---|---|---|---|
| **DEFINITION** | **CAPACITY** | **NORM** | **CLASS** |
| **Rear Axle Oil** | **1.5L** | **SAE 75W90** | **(API GL 5)** |
| **Brake Hydraulic Oil** | **1L** | **DOT 3** | |

# 7. AUTHORIZED SERVICES

| COUNTRY | STORE NAME | STORE ADDRESS | CONTACT NUMBER |
|---|---|---|---|
| ALGERIA | Spa Elsecom | Rue Baha H'med,<br>BP 200 Bab Ezzouar - Alger | +213 (0)23 85 30 86 |
| AZERBAIJAN | AZ Auto LLC | 2207 Nobel avenue<br>AZ1006 - Bakü | +(994) 124964598 |
| BOSNIA | Sejari d.o.o. Sarajevo | Blažuj 78, 71215<br>Blažuj - Sarajevo | +387 33 770 306 |
| BULGARIA | Isubus Ltd. | Botevgradsko Shose Blvd.<br>1839 Sofia | +(359) 28182929 |
| CROATIA | Presečki grupa d.o.o. | Frana Galoviča<br>15 49 000Krapina | +385 (0)49 328 000 |
| CZECH REPUBLIC | Turancar CZ. s.r.o. | Bavorská 856/14<br>155 00 Praha 5 | +420 776 111 113 |
| FRANCE | Fast Concept Car | Z.I La Ribotiere<br>85170 Le Poire Sur Vie | +33 25 13 41 034 |
| GERMANY | Omnicar Fahrzeughandel GmbH | Weinbrennerstrasse 10<br>77815 BÜHL | +49 (0)7223 8061930 |
| GREECE | Petros Petropoulos S.A. | 96-104 Iera Odos<br>122 10 Athens | +(30) 210349 92 00 |
| HUNGARY | Anadolu Rom Hungary | 1135 Budapest<br>Robert Karoly Ket. 96-98 | +36 703730637 |
| ISRAEL | Universal Trucks Israel Ltd. | Industrial Area Segula, P.O. Box 4599<br>Petach-Tikva 49145 | +972-3-9120010 |
| ITALY | Midi Europe SRL | Via Crosaron, s.n.<br>37053 Cerea VR | +39 0442 328 212 |
| LITHUANIA | UAB Saločiai Ir Partneriai | Mokyklos str. 1B, Bukiskės<br>LT-14182 Vilniaus raj. | +370 5 2793000 |
| MOROCCO | Maroc SDAMA | Route principale de Rabat 1, km 6,3<br>Ain Sebaa - Casablanca | +212 (0) 529 029 300 |
| POLAND | Busimport PL Sp. z.o.o. | Gierłatowo 10A 62-330<br>Nekla Wielkopolskie | +48 61 43 86 905 |
| ROMANIA | Anadolu Automobil Rom. Srl | Soseaua Bucuresti-Ploiesti Nr. 110 Comuna CiolPani | +4021-266 8300 |
| SERBIA | Auto Cacak Komerc Doo | Bore Stankovica 16<br>11 030 Belgrade, Makiš | +381 32 376 228 |
| SLOVAKIA | Turancar | Bratislavská 29<br>94901 Nitra | +421 37 6555 777 |

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