plug&single-phase® by epic power

P2S technical information

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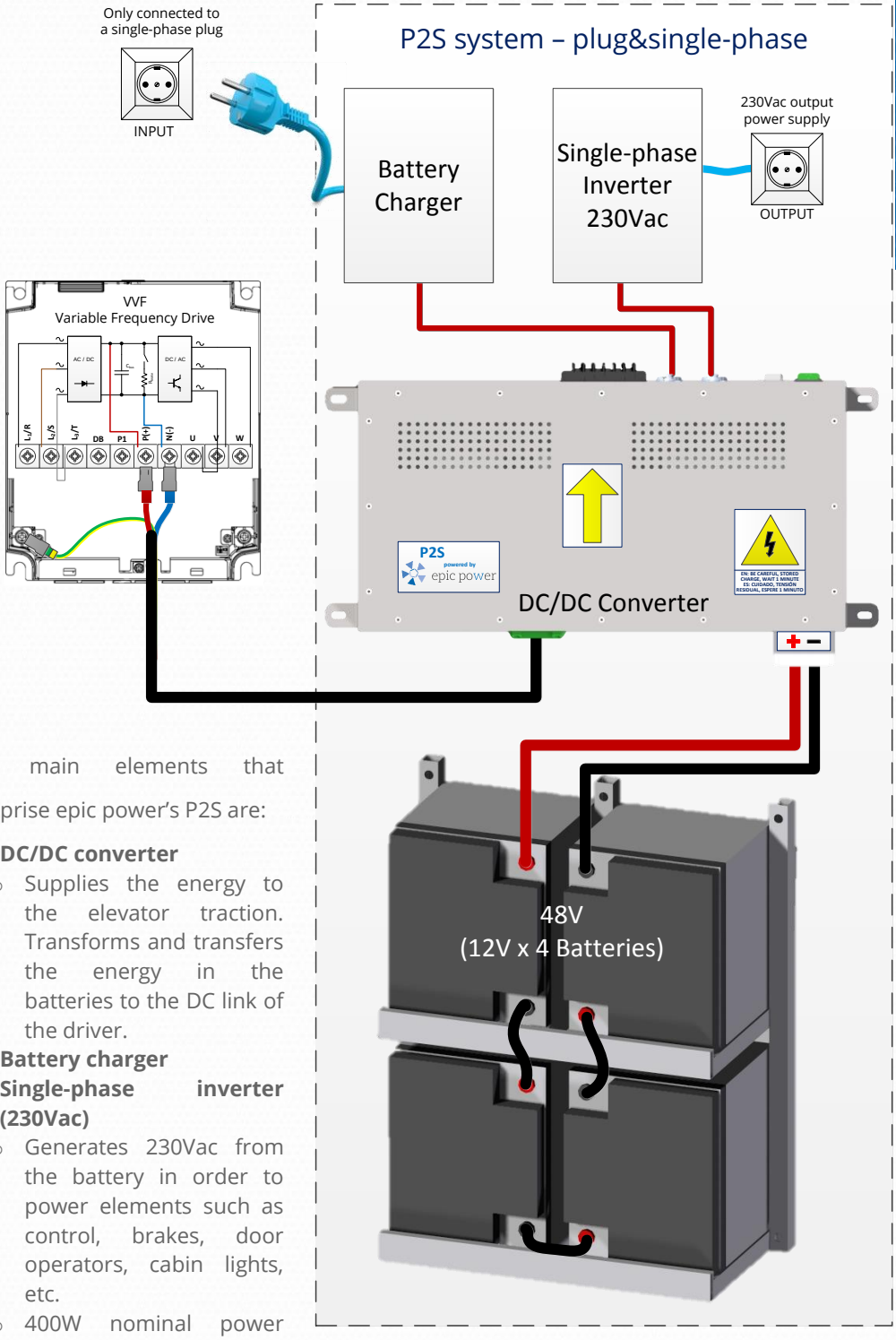
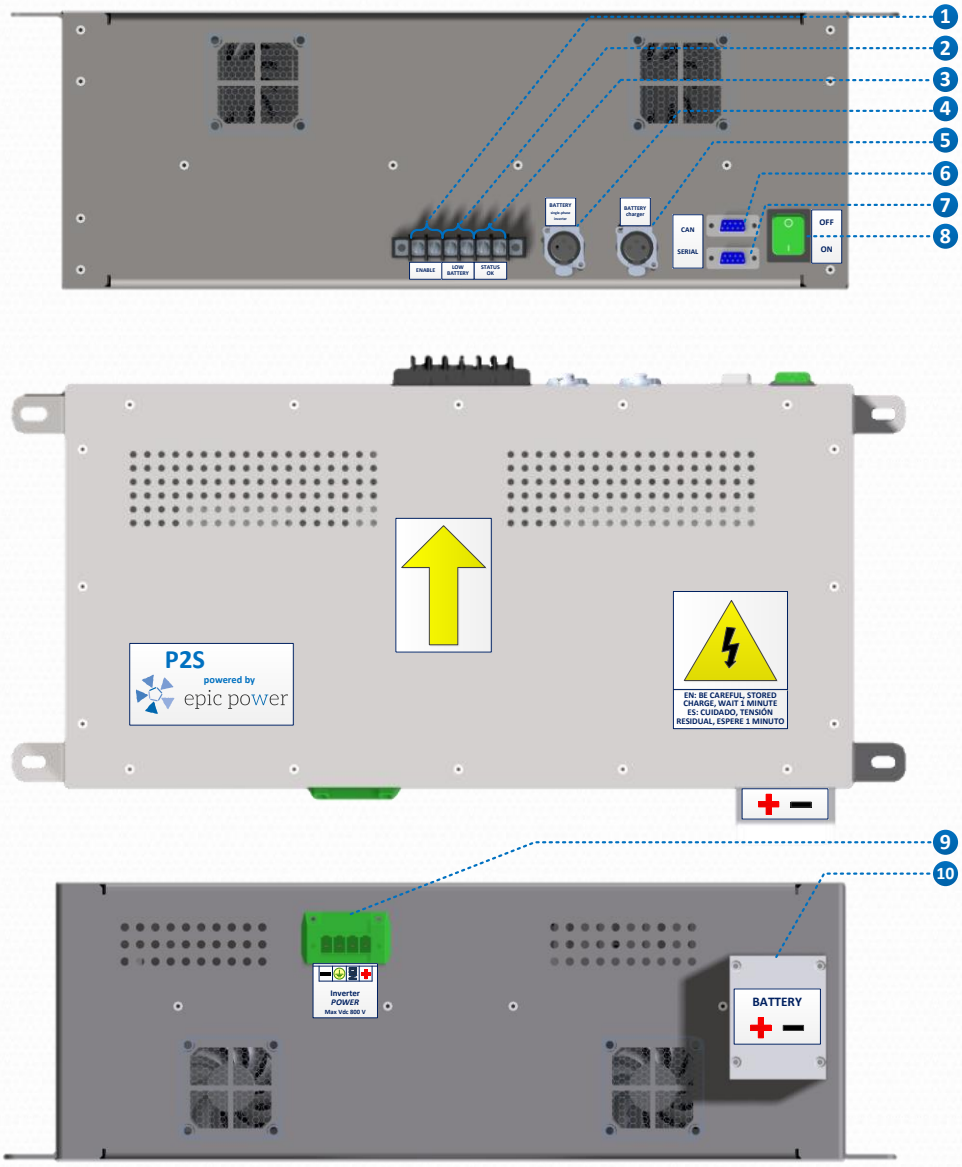
P2S SYSTEM COMPRISES



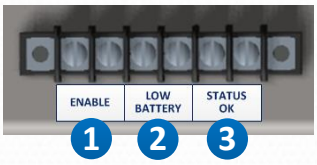
The main elements that comprise epic power's P2S are:

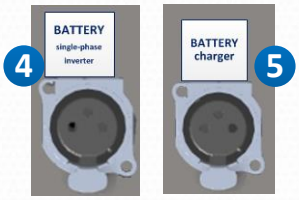
- **DC/DC converter**
  - Supplies the energy to the elevator traction. Transforms and transfers the energy in the batteries to the DC link of the driver.
- **Battery charger**
- **Single-phase inverter (230Vac)**
  - Generates 230Vac from the battery in order to power elements such as control, brakes, door operators, cabin lights, etc.
  - 400W nominal power (700W optional)
- **Four 12V batteries in series**
  - Provided with the system, including mechanical structure to hold them.
- All the necessary connecting elements
  - Pre-mounted and cabled system is available upon request
- Solar panel connectivity (optional)

P2S DC/DC CONVERTER DETAILED DESCRIPTION



1) "ENABLE" (two terminals)
    a. External enable. Potential-free contacts (floating).
        i. Closed → VVF driver has power (9). Driver ON
            - The system is supplied with a wire short-circuiting these two terminals to enable the system by default. It is recommended that this action is carried by the controller.
        ii. Open → VVF driver has no power (9). Driver OFF
2) "LOW BATTERY":
    a. Indicates the battery SOC (State-Of-Charge)
        i. Closed → Battery level is lower than 30%
        ii. Open → Battery level is higher than 30%
3) "STATUS OK"
    a. Indicates the situation of the system
        i. Closed → P2S is powering the VVF driver. Driver ON
        ii. Open → P2S is not powering the VVF driver. Driver OFF
4) "BATTERY single-phase inverter"
    a. Connection between the batteries and the external inverter that generates 230Vac
5) "BATTERY charger"
    a. Connection to the external battery charger

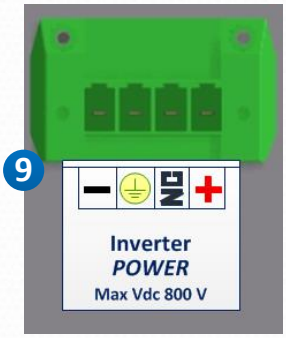


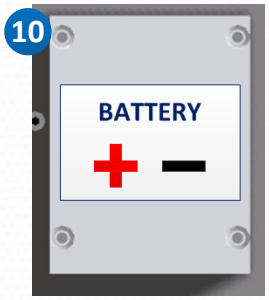


6) "CAN"
   a. CAN connector to communicate with the controller (optional)
      i. Possible output data to share with the controller (under request):
         - Battery State-Of-Charge (SOC) in percentage
         - Battery current
         - Battery voltage
         - DC bus voltage in the driver
         - Current in the DC bus of the driver
         - Power transferred to VVF driver
      ii. Possible input data from controller
         - Driver supply enable

7) "SERIAL"
   a. Optional serial communication
8) "OFF ON"
   a. Switch to turn ON and OFF the DC/DC converter

9) "Inverter POWER"
   a. Power supply for the driver P(+), GND, NC, N(-)
10) "BATTERY"
   a. Connection to batteries





P2S TECHNICAL FEATURES

	Main features
Maximum input power	500 W
Nominal DC/DC converter power (Available for elevator traction)	3.500W
Nominal power of the single-phase inverter	400W (optional 700W)
Battery voltage	4 x 12V
Estimated battery lifespan	4 years
Maximum number of trips (in case of blackout)	100
Maximum number trips per hour	90

	Dimensions and weights
DC/DC converter dimensions	518 x 283 x 162 mm
DC/DC converter weight	9 kg
Battery charger dimensions	280 x 144 x 49 mm
Battery charger weight	2 kg
Single-phase inverter dimensions	205 x 158 x 67 mm
Inverter weight	1 kg
Batteries + holder dimensions 12V x 4 batteries	400 x 482 x 190 mm
Battery and holder weight 12V x 4 batteries	60 kg

ABRIDGED INSTALLATION PROCEDURE

- Disconnect power supply of the elevator
- Place and fix all the elements that comprise a P2S.
- Connect the single-phase inverter to the corresponding connector in the DC/DC converter "BATTERY single-phase inverter" (4)
- Connect the DC/DC converter and the battery charger (5)
- Make sure that the switch of the converter "OFF ON" (8) is actually in the position "OFF"
- Connect the "Inverter POWER" (9) output to the DC terminals of the driver (typically P(+), N(-))
    - Depending on the driver manufacturer, these terminals may have different nomenclature. It is in general easy to identify the + and – terminals of the DC bus in the driver.
    - The three-phase mains connection of the driver is no longer needed. It has to be disconnected.
- Connect the single-phase supply input of all the remaining elevator elements (brakes, controller, lights,) to the 230Vac output of the inverter provided with the system.
    - Make sure that the inverter switch is turned off before doing this connection.
- Connect the four batteries in series and connect them with the "BATTERY" (10) input of the P2S
- Connect the battery charger to a single-phase mains socket.
    - In this moment the battery charger starts charging the batteries.
- Turn on the single-phase inverter
    - The controller and all the other elements that are being powered with this system will turn on.
- Turn the DC/DC converter to ON (using the "OFF ON" (8) switch)
    - The driver will turn ON as usual

BEFORE DOING THE FIRST TRIP

The DC/DC converter that supplies the VVF driver has a nominal power of 3.500W. Therefore, before doing any trips, it is necessary to adjust the maximum power consumption of the traction. There are two options to do so:

- In case the driver has a maximum power limitation:
    - Limit the maximum power of the driver to 90% the nominal power of the P2S system.
    - Automatically, the driver will adjust the speed cabin not to go over that power limit.

- In case the driver has no maximum power limitation:
    - Adjust the cabin speed so that the elevator does never exceed the nominal power of the P2S
    - Typically, a 4 pax. elevator can travel at 1 m/s consuming less than 3.5 kW.
    - Typically, a 6 pax. elevator can travel at 0.7m/s consuming less than 3.5kW
    - Start with lower speeds and monitor, if possible, the power consumption of the driver in its display. Increase speed while possible.

In case of questions or problems, do not hesitate to contact us.

Important note:

THIS DOCUMENT IS A TECHNICAL DESCRIPTION OF P2S AND THE INTERCONNECTION OF ALL ITS ELEMENTS; THIS IS NOT THE INSTRUCTIONS MANUAL.

TO PROCEED WITH AN INSTALLATION OF THE SYSTEM, THE INSTRUCTIONS MANUAL IS THE DOCUMENT THAT HAS TO BE READ AND CONSULTED.

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