

PBAT- Gate for sealed Lead-Acid batteries,
Data Centers and UPS type applications

PBAT- Gate BMS which includes

Management level

- **PBAT-Gate:** Smart Portal with web-server
(One/String, Max monitoring of 4 strings, each string with maximum 120 batteries)



Sensor for the battery string

- **PBAT600:** Sensor for the battery string
(One/String, each string Maximum 120 batteries)



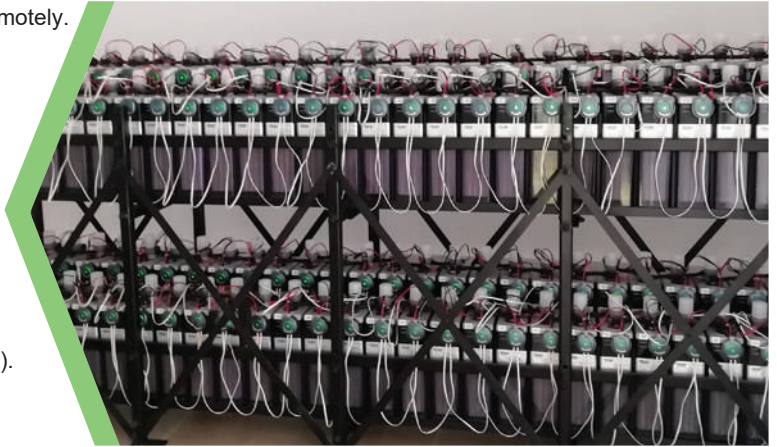
Sensor for the battery element

- **PBAT61-02:** Sensor for battery element
- **PBAT61-06:** Sensor for battery element
- **PBAT61-12:** Sensor for battery element
(One for each element of the battery)



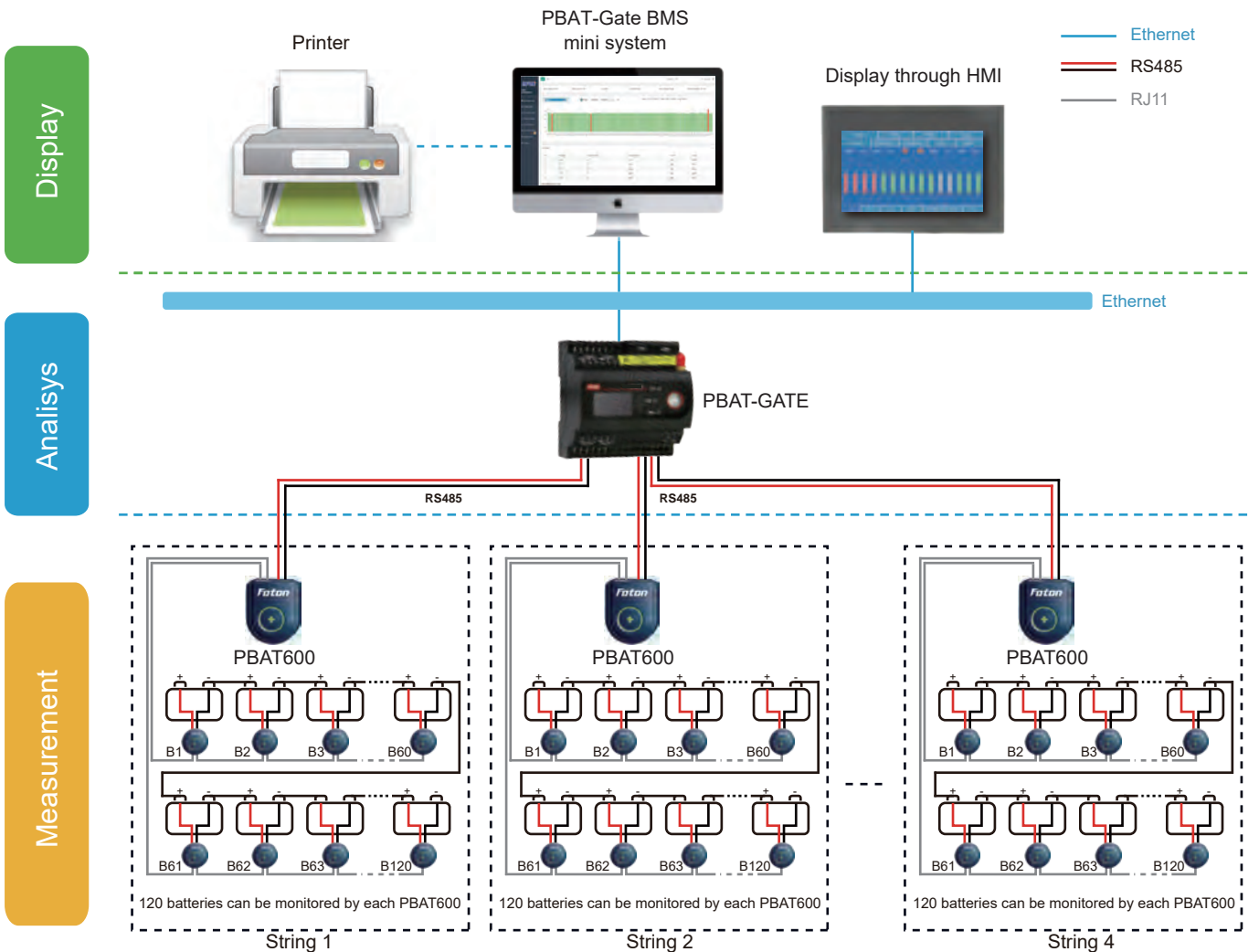
Characteristics

- 24/7 Monitoring, On-Line & Notification for the alarms remotely.
- Suitable for the UPS & Data Center applications.
- Anti-interference design, can be connected with high-frequency USPs.
- Integrated Web-server, with display.
- Local Display through HMI.
- On-Line Balancing / equalizing.
- On-line firmware upload, remotely controlled.
- Auto-detection for the sensor identification number.
- Multi – Communication Protocol (MODBUS-TCP, SNMP).
- 4G support for alarms through SMS.
- Conforms with IEEE 1188-2005 standard.



24/7, Non-Stop! Bring the back-up battery before your eyes

System structure



Management level

Smart Portal PBAT-Gate

- Real Time monitoring of 1 UPS with maximum 480 batteries.
- Retains all measured values for 12 months.
- Integrated Webserver, with bar graphic and analysis of the voltage, charging and discharging current, internal temperature and resistance.
- Auto-balancing function (equalizing).
- Report for the string's voltage & current, each element voltage, temperature, internal resistance. Exports PDF, CSV and other types of documents.
- Alarms limits for elements' voltage, temperature, internal resistance, SOC, SOH (Superior limit, Lower Limit).
- Alarms limits for string voltage, current, SOC (superior limit, lower limit) .
- 2 Analogic ports for Environmental Temperature & Humidity (Optional).
- 1 Output Digital Port for sound and visual alarms (Optional).
- 4 Input Digital Ports for Connection (Optional).
- Supports SNMP, Modbus TCP protocols.
- 4G support for alarms transmission through SMS.



PBAT-GATE

All-in-One



Authentication interface



Real time data



Data History



Analisis



Alarms

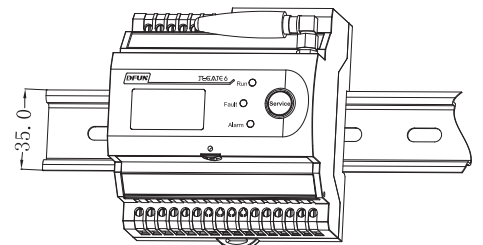
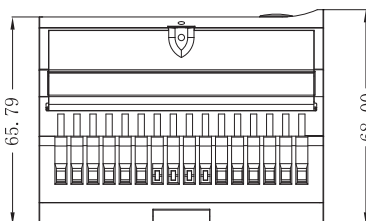
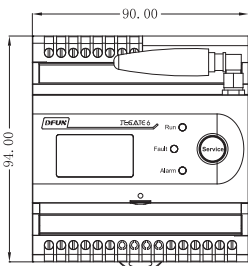


Report

Technical Specification

| Hardware | | | |
|-------------------|----------------------------|-----------------------|----------------------------------------------------------------------------------------------------------------------------------------------------|
| CPU | ARM Cortex A8 800MHz | Memory | 512MB flash and memory card 8GB TF |
| Operating System | Incoporated Linux | Communication | Transfer rate: 1200bps ~ 115200bps 4CL: 4 series ports RS485; 2 ethernet ports(10/100M) 2ZL: 2 series ports RS485; 2 ethernet ports(10/100M) |
| Display | LCD with higher resolution | | |
| RAM | 512MB RAM | Optional Functions | 4 DI, 2AI, 1DO (Only for PBAT-Gate-2ZG) |
| Power supply | 18V~36VDC | Operating Temperature | -15°C ~ +55 °C |
| Weight | 650g | Operating Humidity | 10% ~ 95% without condensation |
| Dimensions | 90mmX94mmX68mm | Safety Standard | CE |
| Power Consumption | < 5W | | |

Dimensions and Installation



PBAT600 – Sensor for string

PBAT600 – Sensor for string

- String Voltage Monitoring, charging and discharging current
- Calculates the state of charge of the battery (SOC)
- Auto Balancing
- Data acquisition
- Autodetection for all the battery sensors' identification addresses
- Accessories: 1) Hall sensor and cable: Interval from 0~±1000A with 2m cable
2) Communication cable: 5m with port RJ11



Operating status



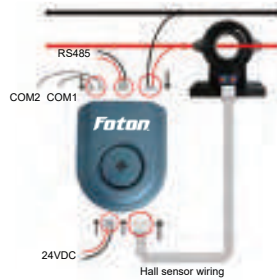
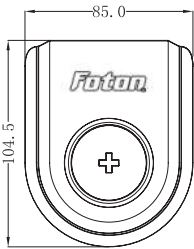
Alarm status



Current Sensor (Hall)

| Article | External Power supply | Measurement interval | | |
|----------|-----------------------|----------------------|--------------------------------------------|--------------------|
| | | Voltage | String Current | Energy consumption |
| PBAT 600 | 12~36VDC | 20V~800V (±0.5%) | -1000A ~ +1000A (with Hall sensor) (±2.0%) | 1W |

Dimensions and Installation



Sensor for Battery element

Sensor for the battery element PBAT61-02/PBAT61-06/PBAT61-12

- PBAT61-02 for 2V element, PBAT61-06 for the 6V element, PBAT61-12 for the 12V element
- Monitoring of the voltage on each element, internal Temperature (negative pole), internal resistance (Ohmic value)
- Calculates the state of charge of the element (SOC), state of health (SOH)
- Auto-Balancing
- Quick connection, mounting with tape 3M
- Accessories 1) Measurement cable for the element: 30cm
2) Communication cable: 40cm & 70cm (optional) with RJ11 port



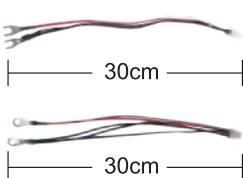
Operating status



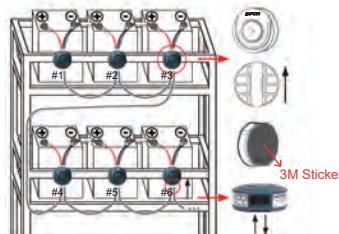
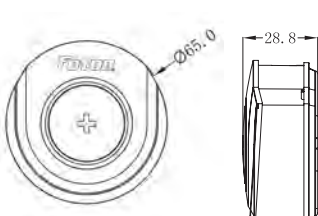
Alarm status

| Article | Input | Measurement Interval | | | |
|-----------|---------|----------------------|----------------------|-------------------------------|------------------------------------|
| | Voltage | Voltage | Internal temperature | Internal resistance | Energy consumption |
| PBAT61-02 | 2V | 1.6V~2.6V (±0.2%) | -20°C~85°C (±0.5%) | 0.1mΩ~100mΩ | In function: <110mW Sleep <12mW |
| PBAT61-06 | 6V | 4.8V~10V (±0.2%) | | Repeatability error: 1.0%±25u | In function: <90mW Sleep <10mW |
| PBAT61-12 | 12V | 7.5V~15.6V (±0.2%) | | Compliance Error: 1.5%±25u | In function: <90mW Sleep <10mW |

Dimensions and Installation



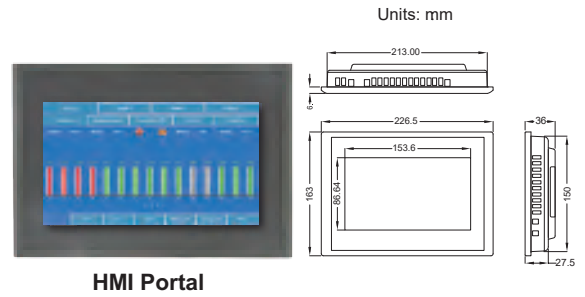
| Article | Description |
|-------------------|----------------------------|
| | Length |
| Terminal and size | Type U: Hole Diameter: 8mm |
| | Type O: Hole Diameter: 8mm |



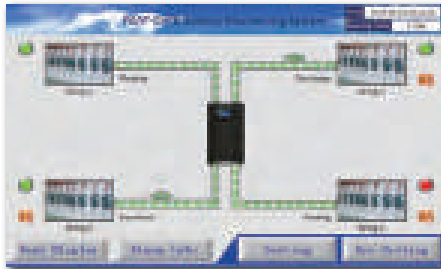
Local Display & Operating Level (Optional)

HMI Portal

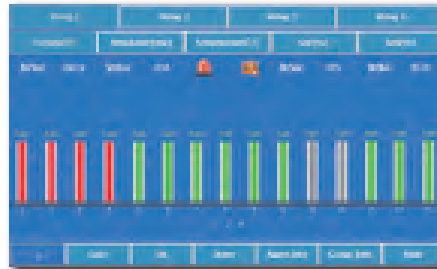
- Touchscreen display, 7" inch
- An HMI is connecting with a PBAT-Gate, maximum 480 batteries
- **Real time data query**
 - 1) Individual element voltage, Impedance, Internal temperature, SOC, SOH
 - 2) String Voltage, charging and discharging voltage, SOC, level of equalization
- **Alarms data query**
 - 1) Real time state of alarm and alarms informations (ID faulty element, Date/ Hour, Alarm reason, communication status, etc.)
 - 2) 1000 registered alarms for each string



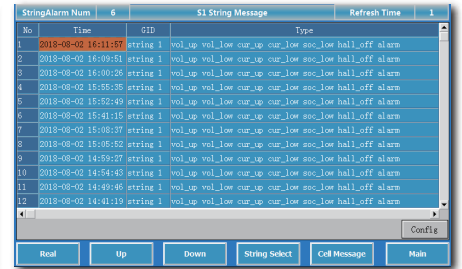
HMI Portal



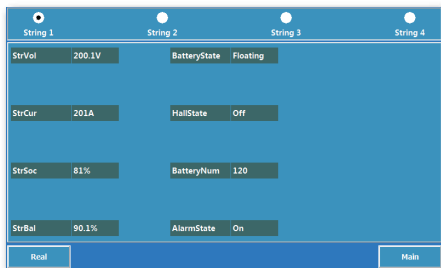
Main screen



Real time data query



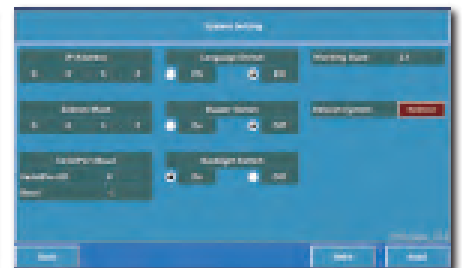
Alarms data query



String Status



Deleting Alarms



Network settings

Technical specification

| Hardware | | | |
|---------------|----------------------------------------------------------------|--------------------|-----------------------------------------------------------------|
| Display | 7" screen TFT LED background light Resolution: 800 X 480 | CPU | ARM cortex-A8, 400MHz |
| | | Flash | 128M NAND |
| | | RAM | 64M DDR2 |
| Communication | 1 Port Ethernet (10/100M) (Connected with PBAT-Gate) | Dimensions | 226.5mm X 163mm X 36mm Mounting holes: 215mm±0.5 X 152mm±0.5 |
| Power supply | 24VDC, 20% / 300mA max. | Energy consumption | < 5W |

Cabinet for pre-wiring in the factory

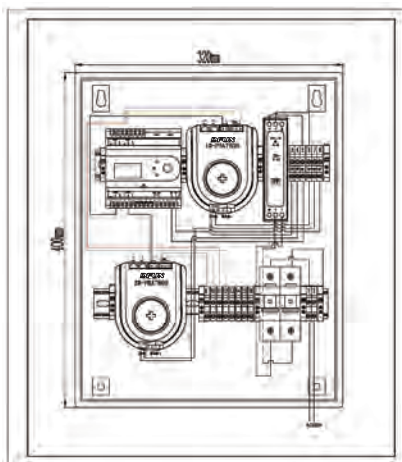
PBAT-BOX

- Pre-installation & pre-wiring for PBAT-Gate, PBAT600 and power supply Converter inside
- PBAT-HMI pre-mounted, if is selected
- Electrical scheme included

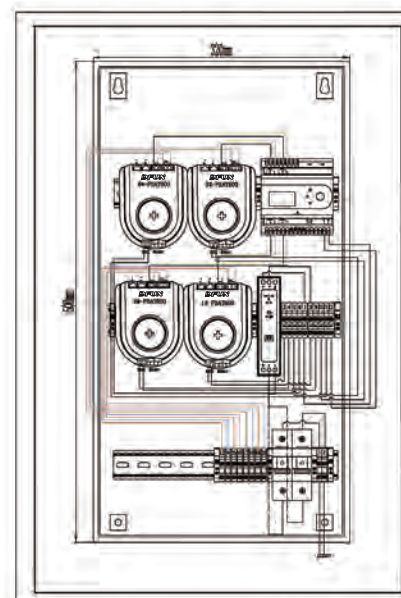
| Hardware | | |
|--------------|--------------------------------------------|-------------------------------------------------|
| Dimensions | For 1~2 Strings | PBAT-BOX-400: 400*320*138.5mm (H*W*D) |
| | For 3~4 Strings | PBAT-BOX-600: 600*320*138.5mm (H*W*D) |
| Installation | Wall mounting, hanged on the battery shelf | |
| Material | Steel plate, painted | |



Dimensions and installation





Cabinet for 1~2 Strings



Cabinet for 3~4 Strings

Informations about the order

| System structure | | Order Code | Description | Notes |
|------------------|-------------------------------------------------|-------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------|
| Management level | | PBAT -GATE -4CL | Smart Portal PBAT-Gate with 4xRS485 / 4G support for alarms transmission through SMS | 1 / UPS Max. 4 strings x 120 batteries = 480 batteries |
| | | PBAT -GATE -2ZL | Smart Portal Pbat-Gate with 2 RS485 ports, 4 DI, 2 AI, 1DO, 4G support for alarms transmission through SMS | 1 / UPS Max. 2 strings x 120 batteries = 240 batteries |
| String sensor | | PBAT 600 | Battery string sensor | 1/String 1 RS485 port, A PBAT600 can be connected in series with maximum 120pcs sensors PBAT61 |
| Element sensor | | PBAT 61-02 | Sensor for 2V element | 1 for each element |
| | | PBAT 61-06 | Sensor for 6V element | 1 for each element |
| | | PBAT 61-12 | Sensor for 12V element | 1 for each element |
| Accessories | Cable for communication with the element sensor | PBAT-COM-40 | Terminal Cable: RJ11 port, Length: 40cm | |
| | | PBAT-COM-70 | Terminal Cable: RJ11 port, Length: 70cm (standard) | |
| | Cable for element's measurement | PBAT-C1-U-M8-30 | Terminal cable: U Type  , Hole: diameter 8mm; length 30cm (standard) | |
| | | PBAT-C1-O-M8-30 | Terminal cable: O Type  , Diameter 8mm; length: 30cm | |
| | Sensor Hall for PBAT600 | CS050EK1T5 | Nominal input: 50A | Measurement interval: 0~±100A, Φ20mm |
| | | CS100EK2T5 | Nominal input: 100A | Measurement interval: 0~±200A, Φ40mm |
| | | CS200EK2T5 | Nominal input: 200A | Measurement interval: 0~±400A, Φ40mm |
| | | CS400EK2T5 | Nominal input: 400A | Measurement interval: 0~±800A, Φ40mm |
| CS500EK2T5 | | Nominal input: 500A | Measurement interval: 0~±1000A, Φ40mm | |
| Power Supply | MDR-20-24 | 24VCC Power supply, 220VCA to 24VCC | | |
| Optional Mode | Display & Local operation | PBAT-HMI | Touchscreen 7" HMI | 1 Per PBAT-Gate Communication with PBAT-Gate via Ethernet |
| | Cabinet for prewiring in factory | PBAT-BOX-400 | Dimensions: 400*320*138.5mm (H*W*D) | Preinstalled & Prewired for PBAT-GATE, PBAT600 power supply converter PBAT-HMI preinstalled at the client request |
| | | PBAT-BOX-600 | Dimensions: 600*320*138.5mm (H*W*D) | |