

# Fronius Battery Storage Solution

With Fronius GEN24 Plus or Verto Plus<sup>1</sup>, Fronius Smart Meter<sup>2</sup> and BYD Battery-Box Premium HVS/HVM<sup>3</sup>



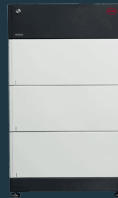
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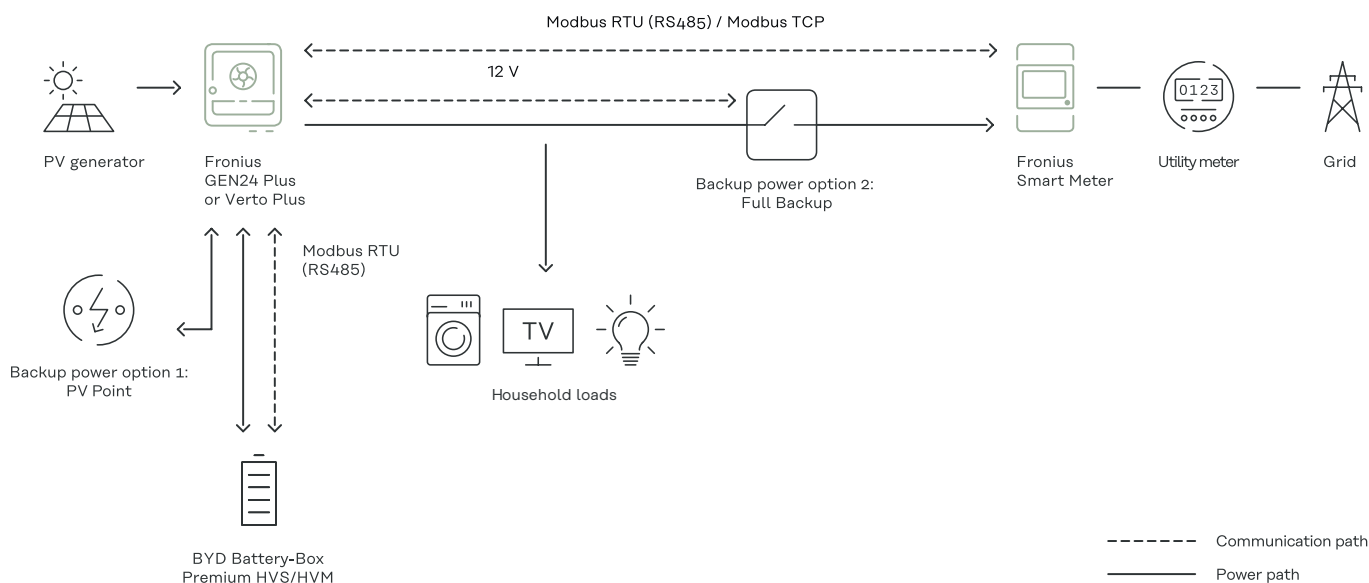
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## All benefits at a glance

- 01 Use PV energy, even at night
- 02 Demand-based backup power variants
- 03 Simultaneous supply and charging also possible when using backup power
- 04 High self-consumption and self-sufficiency rates
- 05 Unsurpassed system efficiency thanks to DC coupling

## Configuration scheme:



## What is needed for implementation?

| Device           | Type  | Notes   |
|------------------|---|---|
| Fronius Inverter | Fronius Primo GEN24 Plus<br>Fronius Symo GEN24 Plus | Depending on the type of inverter and the type and capacity of the battery  |
|                  | Fronius Verto Plus                                  |   |
| Battery storage  | BYD Battery-Box Premium HVS/HVM                     | Types compatible with BYD Battery-Box Premium HVS:<br>HVS 5.1 / HVS 7.7 / HVS 10.2 / HVS 12.8<br>Types compatible with BYD Battery-Box Premium HVM:<br>HVM 11.0 / HVM 13.8 / HVM 16.6 / HVM 19.3 / HVM 22.1<br>Compatibility of the individual storage types differ for Fronius Primo and Symo GEN24 Plus!  |
| Energy meter     | Fronius Smart Meter 63A-1, 63A-3, 50kA-3            | Current transformers with an output current of 5 A must be used for the Fronius Smart Meter 50kA-3  |
|                  | Fronius Smart Meter TS 100A-1, TS 65A-3, TS 5kA-3   | Current transformers with an output current of 5 A must be used for the Fronius Smart Meter TS 5kA-3  |
|                  | Fronius Smart Meter IP                              | Current transformers with an output voltage of 333 mV must be used for the Fronius Smart Meter IP   |
| Communication    | Inverter – battery                                  | The inverter communicates with the battery via a shielded, 4-pole cable (CAT5 and higher) via Modbus RTU (RS485). The terminating resistors must always be placed at the end of the ring. With the BYD Battery-Box Premium HVS/ HVM, this is accomplished with a DIP switch directly on the storage system. To ensure error-free functionality, the inverter and the battery must always have the latest software update. The software update of the inverter can be activated via Fronius Solar.web. |
|                  | Inverter – Smart Meter & Smart Meter TS             | Cable connection (CAT5 and higher) via Modbus RTU (RS485)   |
|                  | Inverter – Smart Meter IP                           | Cable connection (CAT5 and higher) via Modbus RTU (RS485) or via Modbus TCP (WLAN, LAN)   |

# Backup power options

| Device                 | Type                | Notes   |
|------------------------|---------------------|---|
| Backup power variants* | PV Point (on board) | Socket supplied during backup power operation<br>Single-phase power up to 3 kW<br>Optional battery storage<br>Fuse protection with 30 mA type A RCD required  |
|                        | PV Point Comfort    | Continuously supplied socket (backup power supply and parallel grid operation)<br>Single-phase power up to 3 kW<br>Optional battery storage<br>Fuse protection with 30 mA type A RCD and 13 A line protection required          |
|                        | Full Backup**       | Backup power supplies the entire household when needed (1-phase and 3-phase)<br>Manual or automatic changeover possible<br>Battery storage required<br>Additional contactors for switchover or auxiliary relays are required*** |

\* Only one backup power variant can be implemented. PV Point and PV Point Comfort are only available for the Fronius GEN24 product family  
 \*\* The Full Backup option is not available for the Fronius Symo GEN24 3.0 - 5.0 Plus. The Fronius Backup Controller is only approved for Verto Plus inverters up to 20 kW.  
 \*\*\* The requirements for this switchover vary from country to country – please contact your grid operator.

# Compatibilities and nominal DC-charge/discharge power [kW]\*

| Nominal DC charge/<br>discharge power [kW] * | BYD Battery-Box Premium |         |          |          |          |          |          |          |          |
|--|-------------------------|---------|----------|----------|----------|----------|----------|----------|----------|
|  | HVS                     |         |          |          | HVM      |          |          |          |          |
|  | HVS 5.1                 | HVS 7.7 | HVS 10.2 | HVS 12.8 | HVM 11.0 | HVM 13.8 | HVM 16.6 | HVM 19.3 | HVM 22.1 |
| Primo GEN24 3.0 Plus                         | 3.11                    | 3.11    | -        | -        | 3.11     | 3.11     | 3.11     | 3.11     | -        |
| Primo GEN24 3.6 Plus                         | 3.81                    | 3.81    | -        | -        | 3.81     | 3.81     | 3.81     | 3.81     | -        |
| Primo GEN24 4.0 Plus                         | 4.14                    | 4.14    | -        | -        | 4.14     | 4.14     | 4.14     | 4.14     | -        |
| Primo GEN24 4.6 Plus                         | 4.51                    | 4.75    | -        | -        | 4.51     | 4.75     | 4.75     | 4.75     | -        |
| Primo GEN24 5.0 Plus                         | 4.51                    | 5.17    | -        | -        | 4.51     | 5.17     | 5.17     | 5.17     | -        |
| Primo GEN24 6.0 Plus                         | 4.51                    | 6.20    | -        | -        | 4.51     | 5.63     | 6.20     | 6.20     | -        |
| Primo GEN24 8.0 Plus                         | 4.51                    | 6.76    | -        | -        | 4.51     | 5.63     | 6.76     | 7.88     | -        |
| Primo GEN24 10.0 Plus                        | 4.51                    | 6.76    | -        | -        | 4.51     | 5.63     | 6.76     | 7.88     | -        |
| Symo GEN24 3.0 Plus                          | 2.56                    | 3.15    | 3.15     | 3.15     | 2.56     | 3.15     | 3.15     | 3.15     | 3.15     |
| Symo GEN24 4.0 Plus                          | 2.56                    | 3.84    | 4.18     | 4.18     | 2.56     | 3.20     | 3.84     | 4.18     | 4.18     |
| Symo GEN24 5.0 Plus                          | 2.56                    | 3.84    | 5.20     | 5.20     | 2.56     | 3.20     | 3.84     | 4.48     | 5.20     |
| Symo GEN24 6.0 Plus                          | 4.51                    | 6.22    | 6.22     | 6.22     | 4.51     | 5.63     | 6.22     | 6.22     | 6.22     |
| Symo GEN24 8.0 Plus                          | 4.51                    | 6.76    | 8.26     | 8.26     | 4.51     | 5.63     | 6.76     | 7.88     | 8.26     |
| Symo GEN24 10.0 Plus                         | 4.51                    | 6.76    | 9.01     | 10.30    | 4.51     | 5.63     | 6.76     | 7.88     | 9.01     |
| Symo GEN24 12.0 Plus SC                      | 4.51                    | 6.76    | 9.01     | 11.26    | 4.51     | 5.63     | 6.76     | 7.88     | 9.01     |
| Verto 15.0 - 33.3 Plus**                     | 5.10                    | 7.70    | 10.20    | 12.80    | 10.20    | 12.80    | 15.35    | 17.90    | 20.45    |

\* This data refers to the DC charge and discharge power. The DC discharge power varies from the AC power that reaches the loads in the home, since the efficiency rate of the inverter must also be included here.  
 \*\*The discharge power is limited by the maximum inverter power. For specific performance details, refer to the Verto Plus datasheet.

## Differences between BYD Battery-Box Premium HVS vs. HVM

| HVS   | HVM   |
|---|---|
| High battery module voltage, therefore excellent system efficiency (confirmed by HTW Berlin)                    | Higher energy density, therefore less space required  |
| Higher charge and discharge power with similar capacity:<br>HVS 12.8 up to 11.26 kW                             | Lower charge and discharge power with similar capacity:<br>HVM 11.0 up to 4.51 kW                                 |
| Scalable up to 7.68 kWh (Primo GEN24 Plus) / 12.8 kWh (Symo GEN24 Plus & Verto Plus) without parallel operation | Scalable up to 19.32 kWh (Primo GEN24 Plus) / 22.08 kWh (Symo GEN24 Plus & Verto Plus without parallel operation) |
| Parallel operation up to approx. 23.04 kWh (Primo GEN24 Plus) / 38.4 kWh (Symo GEN24 Plus & Verto Plus)         | Parallel operation up to approx. 57.96 kWh  |
| A suitable combiner box for 50A battery currents is required  |   |

## Parallel operation Fronius GEN24 Plus or Verto Plus and BYD Battery-Box Premium HVS/HVM

Thanks to the expandability of the BYD Battery-Box Premium HVS/HVM, up to 3 batteries can be operated in parallel on a Fronius GEN24 Plus or Verto Plus inverter. The advantage of operating multiple storage units in parallel is that high capacities can be achieved. This means that even small commercial systems can be equipped with the combination of Fronius GEN24 Plus or Verto Plus and BYD Battery-Box Premium HVS/HVM.

The following table shows the possible combinations depending on the inverter and storage type:

|                  | BYD Battery-Box Premium |                    |                     |                     |                     |                     |                     |                     |                |                |
|------------------|-------------------------|--------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|----------------|----------------|
|                  | HVS                     |                    |                     |                     | HVM                 |                     |                     |                     |                |                |
|                  | 2x / 3x<br>HVS 5.1      | 2x / 3x<br>HVS 7.7 | 2x / 3x<br>HVS 10.2 | 2x / 3x<br>HVS 12.8 | 2x / 3x<br>HVM 11.0 | 2x / 3x<br>HVM 13.8 | 2x / 3x<br>HVM 16.6 | 2x / 3x<br>HVM 19.3 | 2x<br>HVM 22.1 | 3x<br>HVM 22.1 |
| Primo GEN24 Plus | ✓                       | ✓                  | -                   | -                   | ✓                   | ✓                   | ✓                   | ✓                   | -              | -              |
| Symo GEN24 Plus  | ✓                       | ✓                  | ✓                   | ✓                   | ✓                   | ✓                   | ✓                   | ✓                   | ✓              | -              |
| Verto Plus*      | ✓                       | ✓                  | ✓                   | ✓                   | ✓                   | ✓                   | ✓                   | ✓                   | ✓              | -              |

The parallel operation of multiple batteries (up to 3) increases the capacity, but the charge and discharge rates remain the same as when operating a single battery. Please also observe the BYD specifications for parallel operation of the BYD Battery-Box Premium HVS/HVM. National regulations of the grid operator or other conditions may require an earth-leakage circuit breaker in the AC connection cable. In this case, Fronius recommends using an earth-leakage circuit breaker suitable for frequency inverters with a tripping current of at least 100 mA, taking into account the national regulations. Parallel operation depends on the respective availability or certification in the country.

\* The BYD combiner box cannot be used with HVS/HVM parallel connection on the Verto Plus. The wiring must either be carried out by the installer in accordance with local regulations or a suitable combiner box for battery currents up to 50 A must be used.

## Any questions?



Here you will find  
our how-to videos



You can access recordings  
of our webinars here.

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