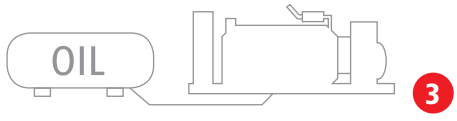
/ Perfect Welding / Solar Energy / Perfect Charging

PV-GENSET SOLUTIONS

EASY & advanced solution with Fronius Tauro / inverters



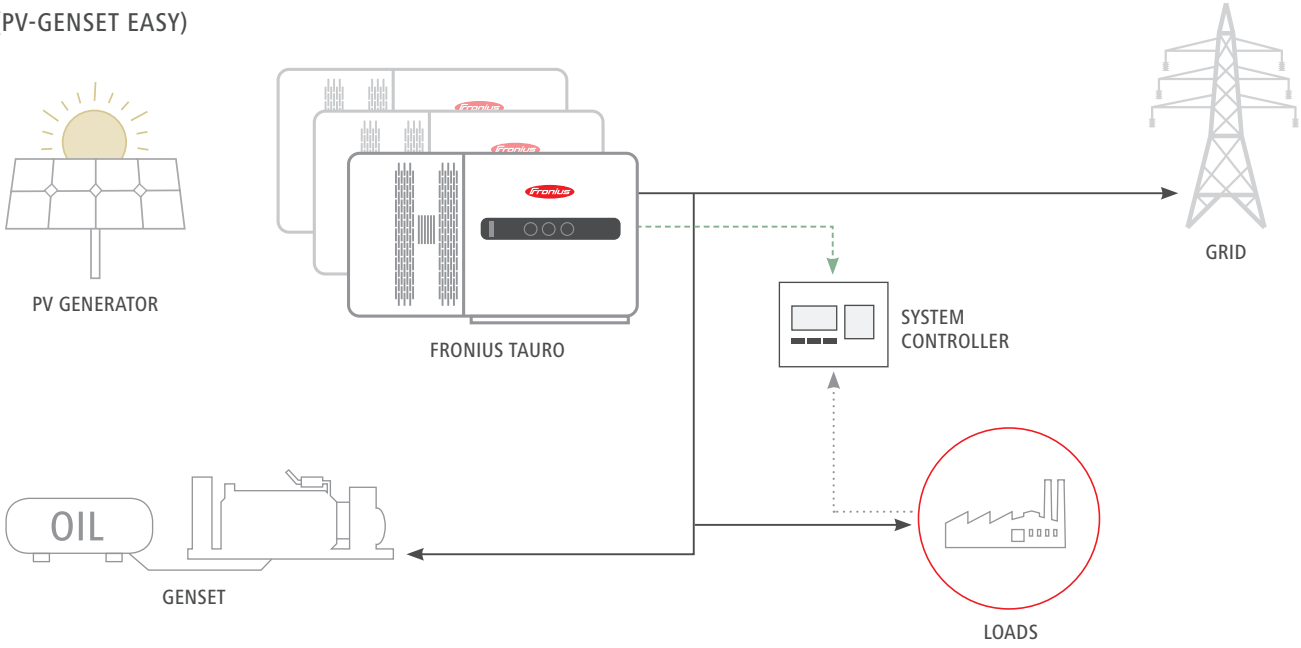
1 Fronius inverter
2 PV system controller
3 Diesel generator

ALL ADVANTAGES AT A GLANCE:

- / Reduce diesel costs and minimize energy costs
- / Short payback period
- / Guarantees a stable energy system
- / Easy integration into existing Genset systems
- / Reduce CO_2 footprint
- / Ideal for backup applications with one or more diesel generator(s)

SINGLE-GENERATOR SYSTEM CONFIGURATION DIAGRAM:

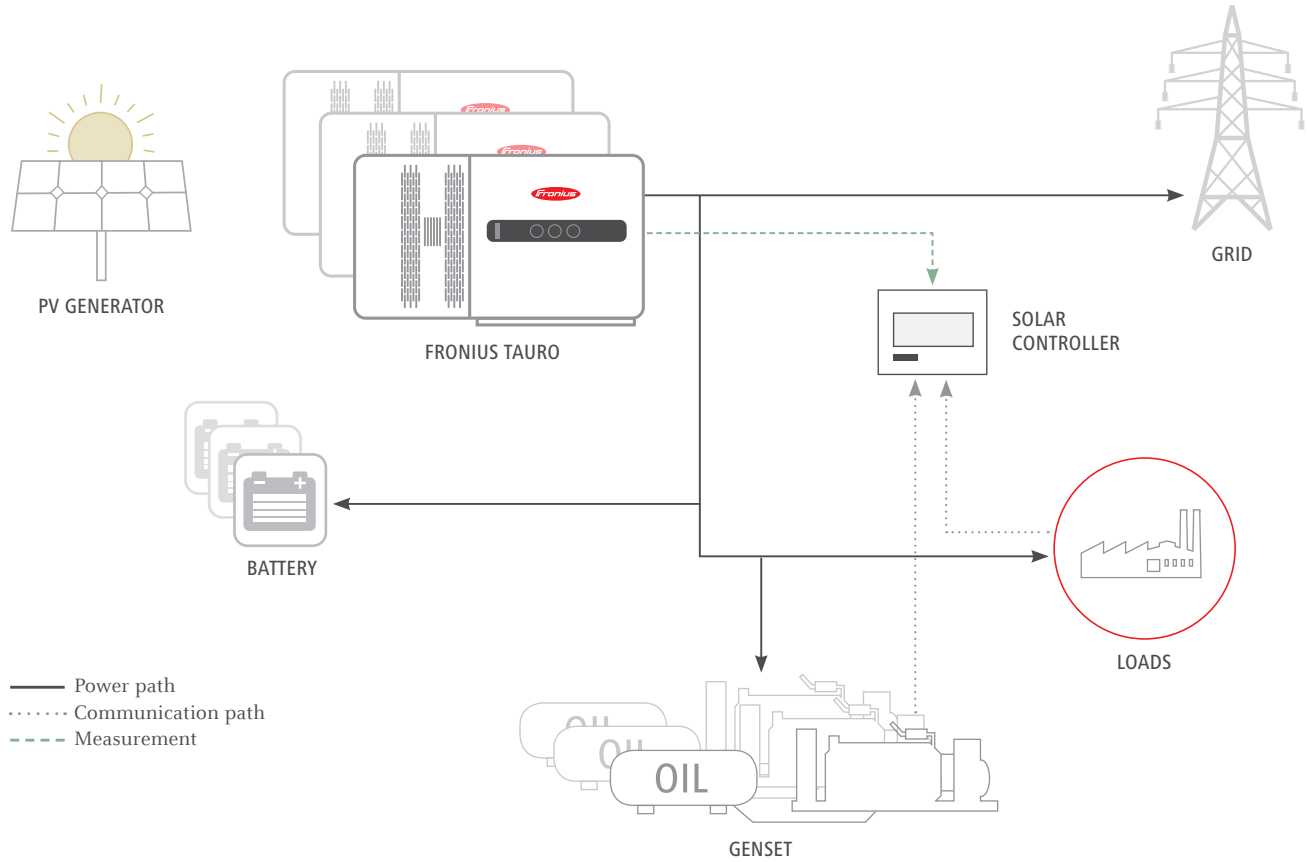
(PV-GENSET EASY)



Power path
Communication path
Measurement

MULTI-GENERATOR SYSTEM CONFIGURATION DIAGRAM:

(PV-GENSET ADVANCED)



WHAT IS NEEDED FOR THE IMPLEMENTATION OF THE PV GENSET SOLUTION

DEVICE	TYPE	NOTE
PV INVERTER	Fronius SnapINverter Fronius Tauro Fronius GEN24	Fronius SnapINverter - Symo 3.0-3-M bis 8.2-3-M - Symo 10.0-3-M bis 20.0-3-M - Eco 25.0-3-S bis 27.0-3-S - Symo Advanced 10.0-3 bis 12.0-3 208-240 - Symo Advanced 15.0-3 bis 24.0-3 480 - Symo 15.0-3-S 208-240 Fronius Tauro (Tauro, Tauro ECO) - Tauro 50.0 kW - Tauro ECO 50.0 bis 100.0 kW Fronius GEN24 & GEN24 Plus - Symo GEN24 6.0 bis 10.0 [Plus]
PV-GENSET EASY		
PV SYSTEM CONTROLLER	Fronius PV System Controller	The Fronius PV system controller complete with corresponding current transformers measures the energy flow in the PV diesel system and optimally regulates the photovoltaic power.

PV-GENSET EASY DEVICE	TYPE	NOTE
MEASUREMENT EXTENSION	Fronius Genset measurement extension	To provide additional protection for the generator, the Fronius measurement extension can be used as a quick reverse-power protection measure to perform an emergency shutdown. The current sensors on the PV system controller are connected to corresponding current transformers and measure the power at the Genset.
CURRENT SENSORS	MC3-250A MC1-55-500/1000/1500A MC1-80-1000/1500/2000A	The current sensors are connected to the PV system controller and measure the power in the system.
COMMUNICATION BETWEEN FRONIUS INVERTER / PV SYSTEM CONTROLLER	Modbus RTU	The Fronius inverters are connected to the PV system controller via Modbus RTU. If more than one SnapINverter is connected within the system, these must be connected via the Solar Net ring based on an inverter with integrated Datamanager. Every Fronius inverter has one „IN“ and one „OUT“ connector, which is connected to a shielded cable (from CAT5). It is important that the termination plug is placed at the start and end of the Solar Net ring. However, if more than one Fronius inverter has a Datamanager, the primary/secondary position of the Datamanager must be corrected.
MEASUREMENT OF LOADS/POWER	CTs (current transformer)	It must be possible to measure loads separately from generation.
FRONIUS INVERTER SETUP	The Fronius inverter has a special MicroGrid setup (MG 50/ MG 60) with different functions that ensure stable operation of the MicroGrid. This can be adjusted on the display / web interface of the Fronius inverter.	
FRONIUS SOLAR.WEB CONNECTION	Every PV-Genset system can be monitored, analyzed, and visualized at all times using the free Fronius Solar.web inverter monitoring portal. A second Modbus interface can be used to integrate a Fronius Smart Meter into the Solar.web of Fronius Tauro devices for measuring generators and loads. Additional Smart Meters can be added to Fronius system monitoring for Fronius SnapINverters using a Datamanager Box.	

PV-GENSET ADVANCED DEVICE	TYPE	NOTE
SOLAR CONTROLLER	Elum *(ePowerControl)* ENcombi *(ECpv)* DEIF *(ASC)* ComAp *(InteliSys)*	The solar controller is the communication interface and is responsible for the flawless control of the entire system. Thanks to the integrated Fronius communication unit, third-party components are easy to integrate into a control unit using Modbus RTU or via TCP using the SunSpec inverter control model. **You can find more helpful information in the following Fronius webinars:** DEIF webinar Elum webinar System Controller webinar
BATTERY OPTIONAL		A battery solution, which discharges regulated PV energy (due to min. Genset loading) and supports it in times of PV shortages, can increase the system's profitability. The power of the battery storage system should be dimensioned such that it can replace the power of a diesel generator. If the Genset minimal load is not reached, PV curtailment should be prevented to make it possible to store the generated PV energy in the battery.
COMMUNICATION BETWEEN FRONIUS INVERTER / PV SYSTEM CONTROLLER	Modbus RTU	The Fronius inverters are connected to the solar controller via Modbus RTU. In order to ensure communication between the inverters, it is necessary to assign a number to every device in the ring. This is completed via the Setup menu on every inverter in the DATCOM submenu. In the DATCOM menu, it must also be checked that the protocol type is set to Solar Net. Feedback regarding the successful configuration of the Solar Net ring is given via the DATCOM status.

PV-GENSET ADVANCED DEVICE	TYPE	NOTE
GENERATOR OUTPUT	Electricity meter	External meters are used in a multi-generator system to record the loads and power of the Genset. The connection is typically established via a Modbus RTU line at the solar controller.
FRONIUS INVERTER SETUP	The Fronius inverter has a special MicroGrid setup (MG 50/ MG 60) with different functions that ensure stable operation of the MicroGrid. This can be adjusted on the display / web interface of the Fronius inverter.	
TRANSFORMER	The multi-generator solutions are suitable for both low-voltage and medium-voltage applications	
FRONIUS SOLAR.WEB CONNECTION	Every PV-Genset system can be monitored, analyzed, and visualized at all times using the free Fronius Solar.web inverter monitoring portal. A second Modbus interface can be used to integrate a Fronius Smart Meter into the Solar.web of Fronius Tauro devices for measuring generators and loads. Additional Smart Meters can be added to Fronius system monitoring for a Fronius SnapINverter using a Datamanager Box.	

BACK-UP FUNCTION

STABLE POWER SUPPLY WITH A PV-GENSET SYSTEM

Companies use a PV-Genset system to safeguard their power supply. This is particularly crucial for companies if the local grid does not guarantee a stable power supply. The combination of a diesel generator with a solar system ensures a continuous energy input without interruption.
It is important to make sure that there is adequate interplay between grid, PV generator, and Genset, particularly when it comes to PV-Genset systems with a grid connection. The PV system controller takes care of this function in combination with a feedback contact. Solar controllers also support this function. Additional measuring components may be involved depending on the manufacturer.

FINDING THE RIGHT SYSTEM SIZE

When planning any system, it is important to note that a minimum load for the diesel generator equivalent to 30% of its nominal power must not be continuously undershot. The optimum system size is between the maximum load and the minimum power. If there are battery storage units in the system, the power of the associated battery inverter can be incorporated into the design for the power of the generators, allowing for larger photovoltaic systems.

WE ARE HERE FOR YOU.

Fronius uses simulations based on a completed PV-Genset checklist to help its customers determine the optimum system size during system planning.

Take a look at our references to see a great example of our PV-Genset solutions in practice:

REFERENCE
PV-GENSET
ADVANCED

REFERENCE
PV-GENSET
EASY

/ Perfect Welding / Solar Energy / Perfect Charging

THREE BUSINESS UNITS, ONE GOAL: TO SET THE STANDARD THROUGH TECHNOLOGICAL ADVANCEMENT.

What began in 1945 as a one-man operation now sets technological standards in the fields of welding technology, photovoltaics and battery charging. Today, the company has around 5,660 employees worldwide and 1,321 patents for product development show the innovative spirit within the company. Sustainable development means for us to implement environmentally relevant and social aspects equally with economic factors. Our goal has remained constant throughout: to be the innovation leader.

Further information about all Fronius products and our global sales partners and representatives can be found at **www.fronius.com**

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