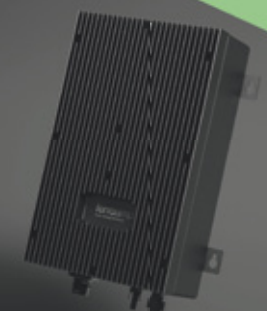


The EnergyHub System

- PV, wind and stored energy, managed and integrated in a local DC grid
- Power control and phase balancing of mains supply
- Energy and power efficiency for the modern facility



ferroamp

We change the way energy is produced and used

EnergyHub has unique advantages

With a central EnergyHub inverter, a local DC grid with distributed optimizers for solar panels, wind turbines and energy storage units, the Ferroamp system offers unique advantages. The heart of the system is a bidirectional converter - The EnergyHub - that converts energy between alternating current (AC) and direct current (DC). The DC grid utilizes smart DC/DC converters to manage energy flow from PV panels, Wind turbines, energy storage with batteries and EV chargers, allowing for flexible installations and efficient power management.

The EnergyHub system acts as an inverter for PV energy production when the sun shines, and automatically store overproduced energy in batteries, without conversion to AC, if grid export is unfavorable. During evenings and winter time with less PV production, the system can charge the batteries from the AC grid for controlling power peaks for lowest possible grid fee. The EnergyHub is the only converter you need for PV production, energy storage, power management and EV charging. The EnergyHub takes care of it all! It is an easy-to-use, energy efficient power and energy management system whether installed in a smaller residential villa or a larger commercial building.

Wind supplements solar energy

Wind and PV production complements each other. The DC grid makes it possible to position a wind generator where it's likely to capture the most wind. Our high voltage DC technology allows for up to 1 km transmission with resonable cable size. The intermittent power production is balanced by the EnergyHub battery system.

Take control of your electricity needs

Every EnergyHub is connected to EnergyCloud, where measurement data is constantly collected and stored. This provides you with a better understanding of how your energy is used, how much energy is stored in your batteries and how much is produced by your solar panels. Reports and analysis tools provides decision support for dimensioning and activities to control power peaks with batteries and smart control.

A bridge between two worlds

EnergyHub converts and controls the energy flow in both directions between the DC grid and the facility AC grid. You only need one converter for PV, wind, energy storage and smart EV charging. EnergyHub measures the electric consumption and automatically controls all system components to ensure optimal energy utilization. EnergyHub is scalable and can be configured to accommodate any power requirement as a single system. Smaller systems are wall-mounted, while larger ones are built into rack cabinets.

Problem-free EV charging

EV charging means that a new load is added to the facility load profile. EV's often charge via single phase chargers which creates phase unbalance with costly cable upgrades and increased fuse ratings. The EnergyHub ACE technology minimizes this by automatically balancing current draw between phase conductors, saving both material costs and work.

Limitless PV production

The SSO (Solar String Optimizer), connects PV panels to the local DC grid. The SSO maximize the energy output from each string and provides a flexible, safe solar power system. By using several SSOs, solar panels from different manufacturers and of different types can be combined in a single system. Panels can easily be installed on different roof surfaces or buildings and be connected to a common DC grid. Installation is simple and production is efficient.

DC loads

Modern large loads such as pumps, compressors, fans and LED lighting are often operating with Internal DC power with built in AC to DC converters. Connecting these loads to the DC grid would mean better energy utilization with less conversion losses and cost effective power backup. This is still a future scenario, but international standards for direct current networks in properties are under development. With EnergyHub, your property will be prepared for the energy solutions of the future.

Charge your electric car with DC

Your EV battery also use DC, and by connecting it directly to the DC network you reduce conversion losses and enable smarter charge solutions. Energy from solar panels or energy storage is transferred to the EV battery without the need for conversion. EnergyHub makes it possible to charge smarter and with more power, without stressing the facility AC grid.

DC nanogrid is the future

The enabling technology of the EnergyHub system is the DC nanogrid. It allows for PV solar and wind energy to be linked together with energy storage units and electric car charging. Buildings can be connected in a microgrid in order to share load profiles, PV production and energy storage. System operation is efficient, installation is straightforward and you have a future proof system.

Scalable, integrated storage

Energy storage units store the energy from solar cells and wind turbines that the property isn't using. This stored energy is then used instead of electricity purchased from the mains grid. Traditional energy storage systems move energy from day to night with low power and thereby reduce the quantity and cost of purchased electricity. The EnergyHub system goes further. EnergyHub also uses batteries to manage and reduce power peaks. By managing the power, you make savings on both purchased electricity and power-related costs. The modular construction makes it easy to combine batteries of different sizes, ages and chemistries, so you can expand your capacity when the industry develops new technologies.



EnergyHub system

Product portfolio for 760 V DC grid infrastructure

EnergyHub

Scalable, modular bi-directional inverter, 7-1000 kVA

- An inverter for solar, wind and stored energy
- A bridge between the alternating and direct current networks
- ACE technology for current equalization between phases
- High-resolution measurements for system control
- Cloud-based monitoring and analysis
- Future-proof and scalable



SSO - Solar String Optimizer

Solar string optimizer with MPPT, 6 kW

- Broad input voltage range, 100-720 Vmpp
- MPPT and optimization on string level
- Accurate string monitoring
- Safety shut-off on string level
- 99% efficiency
- Fast installation with minimal cabling
- Easy to expand with more panels



EnergyCloud

Visualizing how your energy is being used.



- Cloud-based visualization and system control
- Analysis and simulation for setting control parameters
- Real-time data stored with 1-second resolution
 - Automatic alarm system
 - Simulation tools



ESO - Energy Storage Optimizer

Bi-directional direct current converter for batteries, 6 kW

- Charges and discharges batteries
- Broad input voltage range 120-720V
- Combine different batteries in the system
- Can also be used for electric car charging
- Prepared for Vehicle-to-grid (V2G)
- 99% efficiency



ESM - Energy Storage Module

Battery storage module with integrated monitoring, 7.2 kWh

- 610V nominal battery voltage
- Individual cell monitoring (BMS)
- 18 MWh guaranteed energy management
- Lithium iron phosphate cells (LiFePO4)
- Combined with an ESO for 6 kW power (0.8C)