Product information

Nilar Hydride® battery technology paired with Ferroamp system

BENEFITS IN BRIEF

- Safer than "safe"[1]
- Recyclable chemistry & design
- Long service life
- Manufactured in Sweden
- Wide temperature range

System solution by ferroamp

Award winning energy storage solution gets the Nilar EC treatment

With the pairing of the award winning Ferroamp system and the Nilar EC (Energy Compact) battery, solar power storage solutions are now more powerful than ever. Add to this the safer than safe[1)] Nilar EC Hydride batteries with a low environmental footprint, and you have an energy storage solution that any owner will be proud of. All of Nilar products are manufactured from cell to system at Nilar's state-of-the-art production plant in Gävle, Sweden. This ensures full transparency of the complete manufacturing process.

1) Nilar provides battery systems that are safer than many so called "safe" solutions available on the market. The Nilar battery system contains water based, non-flammable electrolyte. It does not generate short circuit failure even under low temperature charging. The electrodes cannot ignite spontaneously and will not cause heat propagation between modules. That's why we argue that we are safer than "safe".

Energy and power capacity management using solar panels, energy storage and a DC nanogrid

A bridge between two worlds

The EnergyHub converts energy in both directions with a single inverter. With only one inverter needed for both solar power and charging, the EnergyHub topology minimizes conversion losses. The conversion capacity can be built to match any system requirement with wall mount units for smaller systems and 19" inch rack modules for large systems up to MW capacity.

DC nanogrid - smarter to build and own

The EnergyHub uses DC grid technology to integrate solar and wind energy with energy storage and EV charging. The result is lower installation costs, but even more importantly, it makes future modifications easier when new technologies are introduced and load patterns and grid policies change during the expected lifetime of the PV system.

Scalable and integrated energy storage

The solution allows the user to store solar energy directly. The EnergyHub storage topology allows for dynamic sizing of energy and power capacity by avoiding the re-route via AC, thereby minimizing conversion losses. Additionally, batteries of different ages and sizes can be combined in the same system.

EnergyHub Cloud

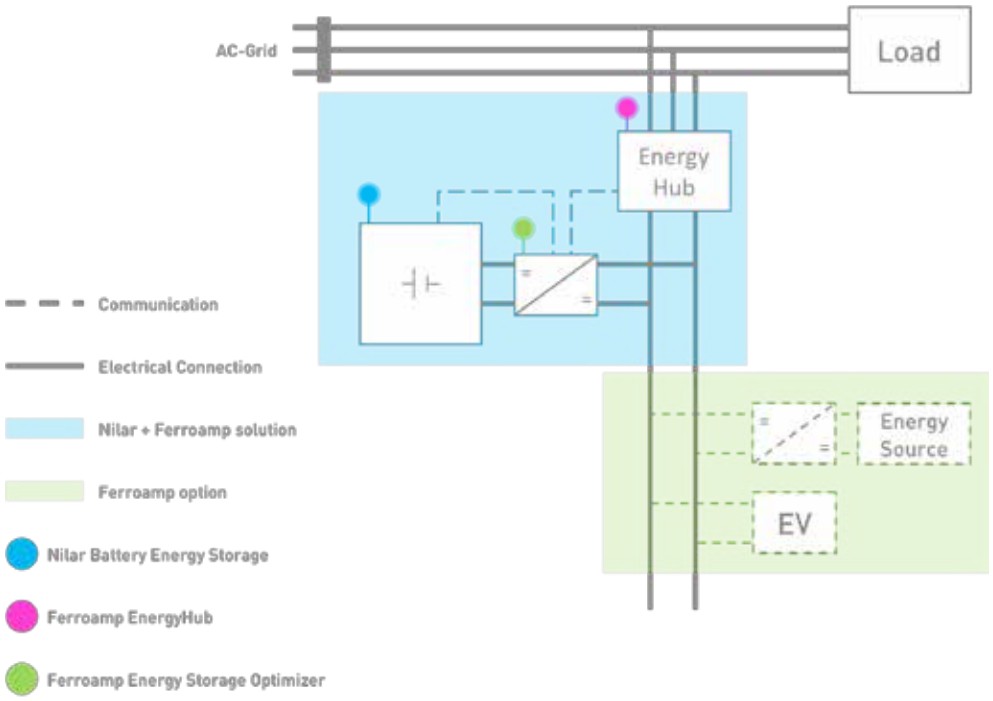
The EnergyHub Cloud tool provides an overview of energy consumption, production and system performance. By providing high resolution data in real time, the EnergyHub Cloud ensures that the user has full control of the plant. Built-in analysis tools provide better decision support for energy and power efficiency measures.

Ferroamp system solution
DC-system

Energy Storage Optimizer (ESO)
The Energy Storage Optimizer brings a new flexible way of integrating batteries into energy systems. Each unit is comprised of a bidirectional charger/discharger and safety functions. This way, an installation can be built with any size of energy storage system. The optimizer is designed for interfacing to the DC nanogrid architecture that enables seamless integration and scalability on the DC side for optimum flexibility and minimal losses.

EnergyHub bi-directional inverter
The EnergyHub system secures a long-term way of integrating solar panels, energy storage, small scale turbines and DC loads. With one single inverter, new DC devices can be added when required. The bi-directional inverter acts as a bridge between the utility AC grid and the local DC nanogrid within the building where solar cells, batteries and loads are connected.

Energy Management System (EMS)
Different functions that monitor, measure and control the system.



Choosing the right solution for your home - The Nilar battery is safer than “safe”

More and more housing associations and businesses are investing in energy storage. From offices implementing sustainable initiatives or electrical/hybrid vehicle charging solutions to large-scale manufacturers implementing peak shaving and load-shifting practices.

Effective energy storage is a proven way to reduce costs, no matter if your organization utilizes sustainable energy or relies on the grid for power. If you can store energy at low tariff rates and use it at peak times, economic energy savings will be generated.

SOLAR APPLICATION LIFETIME ESTIMATION FOR A MULTI-FAMILY RESIDENCY IN SWEDEN WITH 1 CYCLE PER DAY:

Solar system power:	100 kWp
Production per year:	88 200 kWh
Consumption per year:	74 970 kWh
Over production per year:	13 230 kWh
Battery system capacity:	100 kWh
Estimated Lifetime for this case:	~20,5 years (~7 500 cycles)

Get a Nilar Hydride® solution

The Nilar battery is safer than "safe"[1]

Choosing an energy storage solution can be tricky. We believe that homeowners and providers should be able to sleep soundly at night knowing they have a safer than safe[1], environmentally conscious solution that can be placed in the home along with all your other white goods.

Nilar EC batteries contain water based, nonflammable electrolyte. They cannot generate short circuit failures even when operating during low temperature charging and will not cause heat propagation between modules. The batteries are certified for airline transport (not that you'll be flying with them anywhere) and will not spontaneously catch on fire or explode in your home.

Recyclable chemistry & design - The environmentally-friendly battery

Unlike most other batteries, Nilar batteries are fully-recyclable. They are cadmium, mercury and lead-free, and contain a high percentage of nickel which has a high recycle value and is easy to recover and reuse. The battery design has also been developed to enable a cost-efficient recycling process with a high degree of reusable materials.

Long service life - Designed for 20 + years

Historically energy storage systems needed to be replaced after only 5-10 years regardless of usage. Nilar batteries on the other hand do not have the same self-aging process, meaning a Nilar system will only wear when it is used for its purpose of storing and providing energy. This is possible thanks to the ruggedness of the Nilar Hydride® chemistry and results in a lower cost of ownership.

Manufactured in Sweden – from cell to system

All Nilar batteries are manufactured from cell to system at Nilar's state-of-the-art production plant in Gävle, Sweden, using green and sustainable energy sources. This ensures full transparency of the complete manufacturing process. Battery production is fully automated to ensure quality control throughout production.

Wide temperature range - The Nilar battery is temperature stable

The Nilar batteries can operate in climates with fluctuating temperatures. Operation is possible within temperatures ranging from -20°C to +50°C.

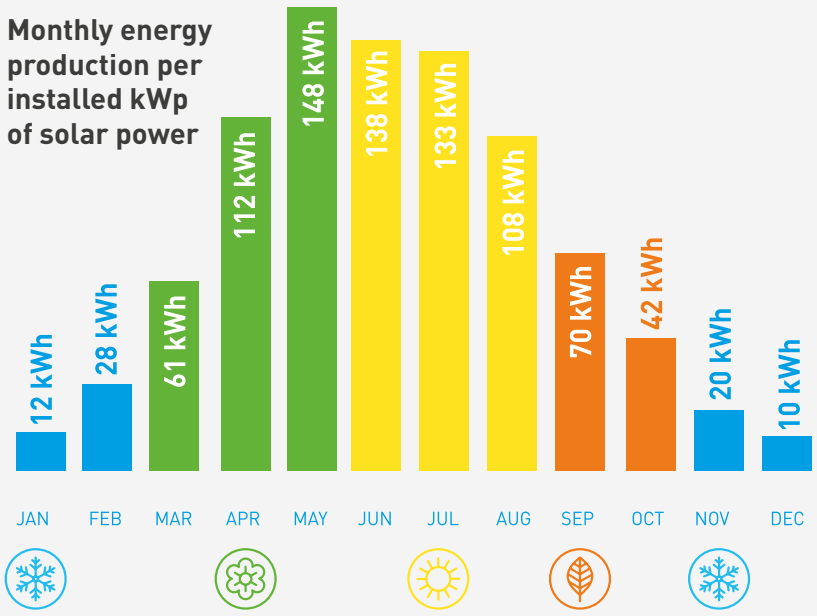
Cycle life dependent on usage pattern

Different applications result in different usage patterns. In a typical solar storage application for instance, the full capacity of the battery is seldom used every day of the year due to fluctuating weather conditions. The storage solution has to be dimensioned accordingly to the expected solar power production during different seasons.

During summer months the batteries should be used to 100% for storing overproduction of solar power. However, during the remaining parts of the year, the system will not be used to the same extent. In this way the system will be cycled at many different Depths of Discharge (DoDs) during the year, which increases the cycle lifetime of the battery.

A cycle life average can be estimated depending on DoD, which is the percentage of the full battery capacity used when it is charged/discharged.

The graphs below show how cycle life varies depending on DoD and solar power production (kWh/kW installed solar power) over the course of a year in Stockholm, Sweden.



Cycle life vs DoD The Nilar battery offers:	
2 000 cycles	at 100% DoD
4 000 cycles	at 80% DoD
6 000 cycles	at 50% DoD
13 000 cycles	at 30% DoD
23 000 cycles	at 20% DoD

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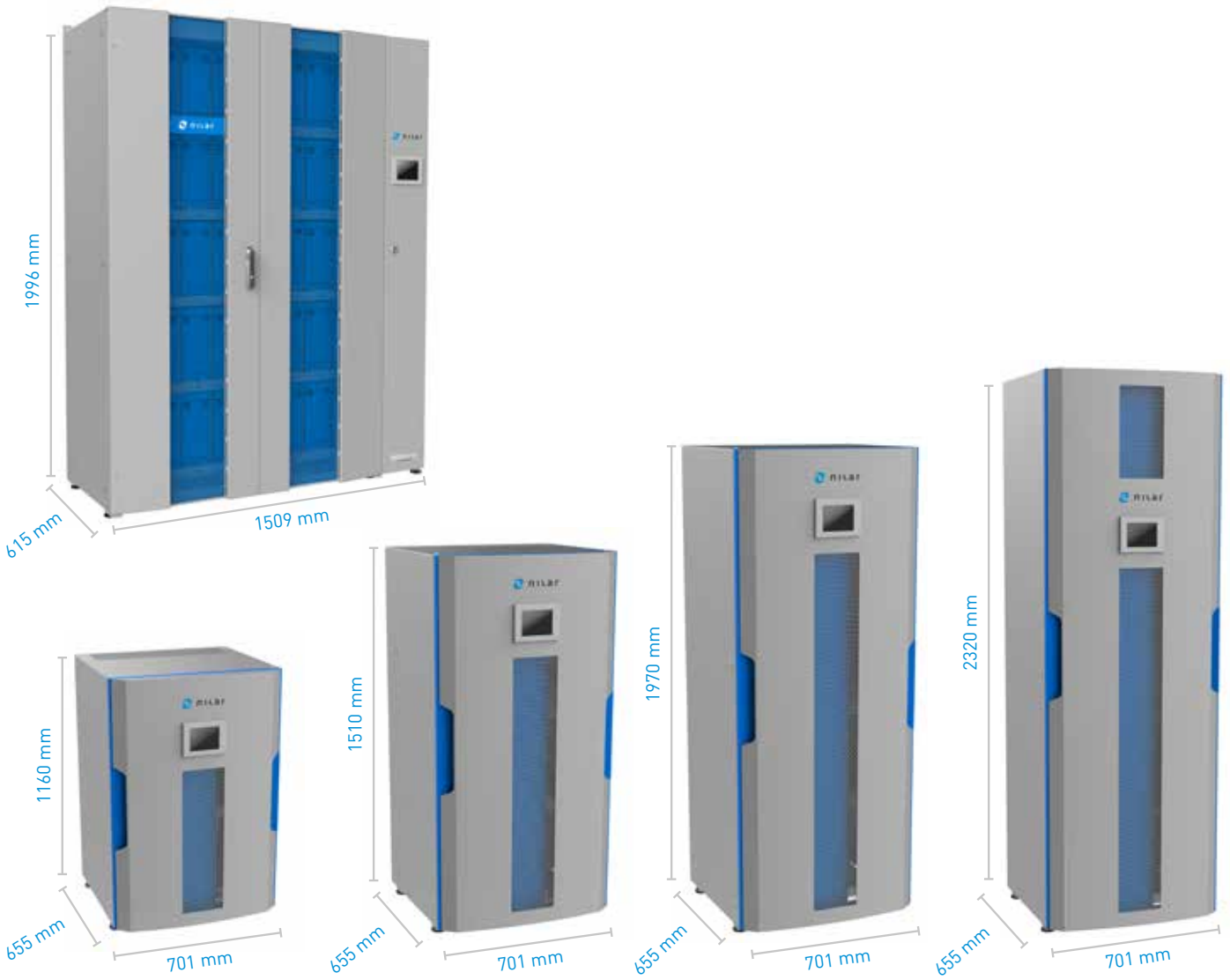

Product range specifications

Product	EC-11,5kWh Ferroamp	EC-17,2kWh Ferroamp	EC-23kWh Ferroamp	EC-28,8kWh Ferroamp	EC-57,6kWh Ferroamp
Ferroamp R2 article number	24-0045	24-0046	24-0047	24-0048	24-0042
Energy	11,5 kWh	17,2 kWh	23 kWh	28,8 kWh	57,6 kWh
No. of battery packs	8	12	16	20	40
ESO units	2	3	4	5	10
Max charge/discharge power	11,5 kW	17,2 kW	23 kW	28,8 kW	57,6 kW
Max C-rate charge/discharge	1C	1C	1C	1C	1C
Full cycles	2000	2000	2000	2000	2000
DC Voltage (from ESO)	760 V	760 V	760 V	760 V	760 V