Charging the Future
Electrical Energy Storage

BACKGROUND ARTICLES AND FEATURES

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SUSTAINABLE SAVING OF FINITE FOSSIL RESOURCES – RESIDENTIAL ENERGY STORAGE SOLUTIONS

Our goal for the future is to allow customers to store their own electricity, which they produce via their PV system, wind turbine or water turbine, in their homes with very little effort and at low costs.

There are various options for this with new battery storage systems that can be purchased, some of which can be cost-intensive. Or you can use the existing heating or hot water storage tank and integrate an electric heating insert or a wall console unit with an electric

heating insert to save costs.The latter requires a smart heating insert that can be combined with all commercially available energy managers / SmartHome / SmartGrid systems. Depending on the type, control is via relay circuit, WLAN / LAN, Modbus-TCP or 0-10 V.

The excess energy is transferred to the heating rod and converted into hot water. It is important that the heating rod is 7-stage or infinitely variable, and thus stores the maximum excess energy. With this technology, fossil fuel is saved, short ineffective running times in summer and transition period of the on-site heating are prevented and thus public power grids are spared. This also extends the service life of the heating / heat pump. It goes without saying that exhaust gases and particulates are avoided in inner-city areas. This contributes to valuable environmental protection.

In our opinion, the discussions that are being held about what is the better solution for heating water are based on the following:

Each customer only has a limited roof surface available. This roof surface can be equipped with a solar thermal system or a PV system. With solar thermal systems, sufficient energy has been produced during summer operation as early as noon so that the storage tank has reached its maximum temperature. The time between noon and sunset is therefore no longer used for energy production. The insulated cables have to be laid from the roof to the cellar in a complex process.

If, on the other hand, this roof surface is equipped with a PV system, the solar power can be used in heating buffer storage tanks, battery storage tanks or charging stations during the full solar period.

The **ASKO***CONSOLE-**WALL***, which is easy to install, was developed to facilitate the realization of existing buffer storage tanks. This is an electrothermal station for the storage of e.g. photovoltaic excess energy as heat in heating buffer tanks. It ensures high temperatures and is therefore an excellent product for legionella protection.

As an option, there is a connection box on the console**,** in which the pre-wiring for the customer's own energy manager is prepared. This also applies to the pre-wiring of the pump assembly and the selected PV heating insert whether 3-stage, 7-stage, 7-stage IoT or infinitely variable versions. With the external energy management system desired or selectable by the customer or the cloud solution **ASKO***CLOUD,* energy surpluses from the in-house photovoltaic system can be thermally stored. The minimum temperature charge can be freely selected between 50-75 °C using the integrated thermal diverting valve. The heating elements are supplied as standard with 85 °C thermostats or optionally with 95 °C thermostats. This results in a highly efficient storage tank loading and can be connected or retrofitted to any heating/hygiene buffer storage tank. With the two supplied flex hoses in a length of 1600 mm, the console is very easy to install. By connecting the flow pipe in the upper and the return pipe in the lower storage area, there is a gentle temperature stratification in

the storage, no turbulence of the temperature zones and the entire storage volume can be fully used. No matter how much PV excess energy is available, the upper storage area is first brought to the desired minimum temperature and then stratifies downwards.

Functional principle:

When the **ASKO***HEAT-**PV*** receives the excess power from the external energy management system or the **ASKO***CLOUD*, it heats the water in the **ASKO***CONSOLE **WALL***. The circulation pump switches on when the temperature rises. Between 50 and 75 °C, the opener function of the thermal diverting valve can be set. When the set temperature is reached in the console, the distribution valve opens and transfers the hot heating water to the upper part of the buffer tank. The PV heating rod is designed to precisely match the available excess energy from PV, wind or water power in the appropriate output levels. If no excess current is available, the heating element switches off. The circulation pump also switches off when the heating is complete.

ASKO*CLOUD*

ASKOCLOUD offers an easy entry into the SmartGrid / SmartHome world. An IoT-compatible heating insert and a smart meter, which is integrated in the meter cabinet, are supplied with this. These two components communicate with the cloud via LAN or WLAN. The cloud receives information from the smart meter about the amount of

excess electricity that is currently to be fed into the public grid. The cloud transmits to the IoT heating insert which of the seven stages it is to heat to convert the maximum excess electricity into heat and store it in the heating buffer tank.

ASKO*HEAT* in insulated design

When selecting the heating inserts, it is important to pay attention to an insulated design in order to avoid corrosion in the storage tank. The heating elements are normally soldered. This can lead to corrosion in all common black steel and enamel accumulators.

In the case of an insulated heating rod, it must also be ensured that it is equipped with a DIP switch to remove the insulation. Thus, the heating insert can also be operated in stainless steel accumulators.In addition, this innovation also reduces inventory and avoids errors due to incorrect selection of heating insert materials.

ASKO*HELP*

As participants and supporters of www.Aethiopien-Solarprojekt.de, we noticed on the annual project trips that any existing infrastructure such as electric boilers could not be used because water and electricity were available rarely only. In addition, drinking water in rural areas has long and expensive routes and is not affordable for the poor population. Therefore, people often drink contaminated surface water,

which leads to illness and restricts viability to earn a living. To boil water, precious firewood is consumed, trees are felled and the precious soil, which is actually needed for food production, is eroded.

- Providing hot water, so that the women would not have to carry the firewood over long distances every day
- Health preservation through boiled water
- Conservation of resources by saving firewood
- Saving time to earn a living and make childcare possible
- Supporting and empowering women to improve their situation and position

We developed a water pot with integrated **ASKO***HELP* heating insert. This heating insert was modified onto a special PV film in order to use solar energy directly to boil the water in the pot. This enables us to offer help in maintaining a certain level of water hygiene and thus maintaining health and avoiding the consumption of firewood.

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The ees International Magazine is specialized on the future-oriented market of electrical energy storage systems, not only from a technological-, but also a financial and application-oriented point-of-view. In cooperation with ees Global, the ees International Magazine informs the energy industry about current progress and the latest market innovations.

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