



2POWER

Power and Warmth – One Module



PA-ID GmbH

Who we are

The PA-ID group was founded in 1995 because of an extraordinary idea. Two technicians, André Römisch and Erich Mayer, founded a company in order to develop and market a special bed for maternity clinic delivery rooms. The start-up days of this young company reflect on today's inspiration and sales. Fresh ideas which are turned into useful products – that's how we define PA-ID innovation.

The company name brings this definition to the forefront. It's a mixture between "Patents and Ideas".

The name PA-ID consolidates our motto and company philosophy into four letters.

We continue to present extraordinary ideas!

The Solar Multitalent **2Power** is the present example. We build on German quality and solid engineering experience. We are also ISO9001 certified since 2001.

In the meantime we employ more than 50 dedicated and motivated staff at our headquarters located in Kleinostheim, Bavaria. Both founding members, who also run the company today, intend to continue on this road.



Our classic mechanical engineering business allows us to draw on a long experience with solar technology and reusable energy. Many Photovoltaic companies have their modules produced on production lines made by PA-ID.

PA-ID has, with **2Power** brought a solar combi-system onto the market that - in comparison to conventional photovoltaic modules - also generates warm water as well as increasing electrical output.

Terminology

Classic photovoltaic modules are termed as PV-modules. Photovoltaic modules which also deliver thermal energy in the form of warm water are termed as Photovoltaic-Thermal-Modules – in short: PVT-modules.

AS WELL AS – instead of EITHER, OR

In the past those house owners who had decided to invest in a photovoltaic system as well as in a separate warm water system, had to contend with the fact that a part of their roof would not be available for the production of electricity. Therefore they were faced with the decision of using available space either for the production of power or alternatively for warm water.

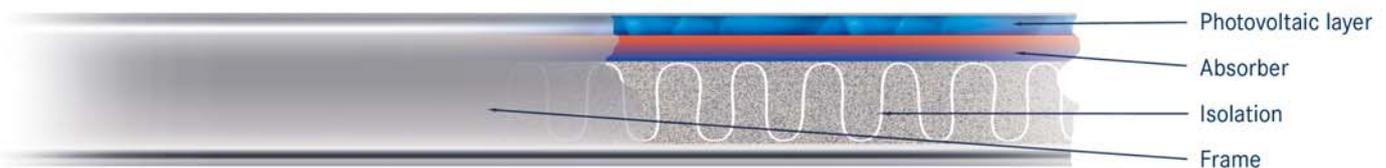
Thanks to **2Power**, future calculations are needed only to determine on which sector of the roof a PV-module and a PVT-module are to be fitted. The area required by the PVT-module is generally calculated according to the warm water needs of the building which is further determined by the number of persons living there.

Use the power of the sun twice – with ²Power!

Photovoltaic cells use sunlight to produce valuable power. ²Power-technology delivers also warm water.

Photovoltaic modules reach temperatures of +80C during the summer months. It goes without saying that this energy should be channeled into heating water for bathing or showering. Our resourceful developers have managed to construct

a highly efficient absorber which channels the warmth generated through the photovoltaic module into the warm water storage. This is managed by the flow of coolant along the rear side of the module which then allows the energy warmth to be transported to the warm water storage. A robust solar pump ensures that the coolant is continually circulated between the module and the warm water storage.



The heating performance of a solar module is by far higher than that of its electrical performance. The fact that the ²Power-module is much cheaper than the normal

solar collectors used to heat water, is another valid argument of how to intelligently use this system.

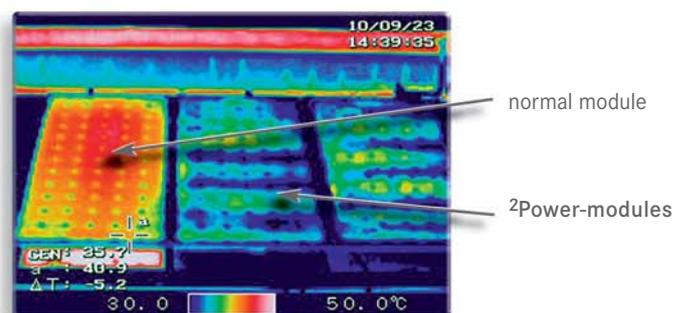
We generally equip our ²Power-modules with high-efficiency Mono-crystalline silicon solar cells. Mono-crystalline modules provide a higher electrical performance when diffused light conditions apply and where there are some directional variations to the optimal southerly positioning of the system. Their black colour coating ensures an optimal warmth generation.

This is the way to get the most out of your “roof investment”. The highest amount of solar energy and warm water!

²Power gains everything from the sun and you make good earnings also.

Increased Profit – Thanks to cooling

The temperature of photovoltaic cells is reduced due to lack of heat. A welcome side effect of this is: you generate higher electrical revenue because cool modules have a greater effect than warm ones. Conventional PV-modules lose much of their effect with each degree that their operating temperature rises. This means that the cooling of the module pays off twofold. You receive solar warmed water and at the same time an increase in the power revenue of your solar system.



Free of snow during winter

An added value of the **2Power system** is its thawing function. Freed of ice and snow, your photovoltaic system can be used fully in optimal winter conditions with clear air, low temperatures and the best use of energy given by the sun.

Whereby your neighbours solar system is snow bound, you continue to produce environmentally friendly power as well as optimizing the revenue of your solar system.

Aesthetics in elegant black

The **2Power-modules** and other photovoltaic modules are optically alike. They are just as thin and have the same dimensions. But **2Power** can achieve much more!

The design is also a plus point. You work with only one type of module and thereby ensure a uniform roof picture. The frame and the module clips are also black. Your plant will have a harmonious look without disturbing grid structures. That not only looks good, but is clever! You allocate the complete roof

area for creating power and on top of that you have warm water. Your boiler then has a long summer pause with **2Power**.

In the past home owners had to decide how much of their roof were to be allocated to photovoltaic and how much to warm water collector.

2Power makes it much easier. You have both together and can decide what you enjoy more – the unbeatable earnings or your uniform and tidy roof.



For whom is **2Power** best suited?

Generally speaking, the higher the warmth needs in summer, the better the advantage is of using **2Power**.

Typical areas are:

Private Housing
Child Day Facilities
Hotels & Restaurants

Apartments
Pensioner Homes
Camp Sites

Swimming Pools
Hospitals
Heat Pump Suppliers*

Sport Facilities
Public Buildings
Industrial Sites

*for the regeneration of the geothermal probe

Technical questions and answers:

How are the **2Power-modules** fitted?

The fitting of **2Power-modules** is no different from that of the classic photovoltaic. The modules are fitted to the well known rail system or mounting frame systems.

How are the **2Power-modules** connected?

The hydraulic connection is with tubes that are fixed into the connectors of the module. These tubes are flexible, weather-proof and are protected by a metal cover

Which pipe fittings are needed for installation?

The pipe fittings must be suitable for temperatures of +60°C and isolated against condense water. Pressure level PN10 is sufficient (there is no high temperature installation needed).

How are the pipe fittings laid?

These can either be fitted along the house facade, through the roof and then led through into the heating room. In order to bring the piping into the attic, the piping is fed through classic solar tiles to the inside. From here the cables are routed in an installation shaft (for example: free chimney or air duct).

How does the hydraulic compensation work?

The individual model rows are connected to the balancing valve and so fixed they are hydraulically compared. Alternatively, the system can be set up on the Tichelmann-System - whereby the piping is fed from the module to the hot water tank and back again in a ring form, which allows an equally strong flow.

How is the **2Power-system** steered?

Steering is done via the solar regulator. Two temperature feelers record the temperature in the module as well as in the storage.

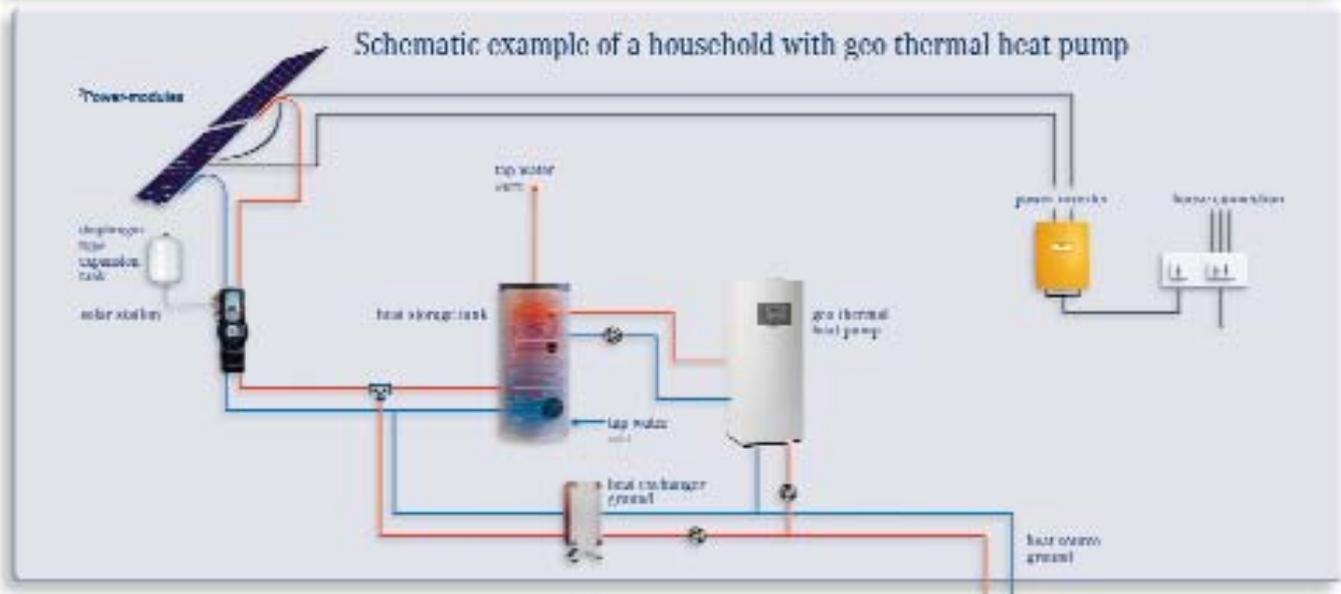
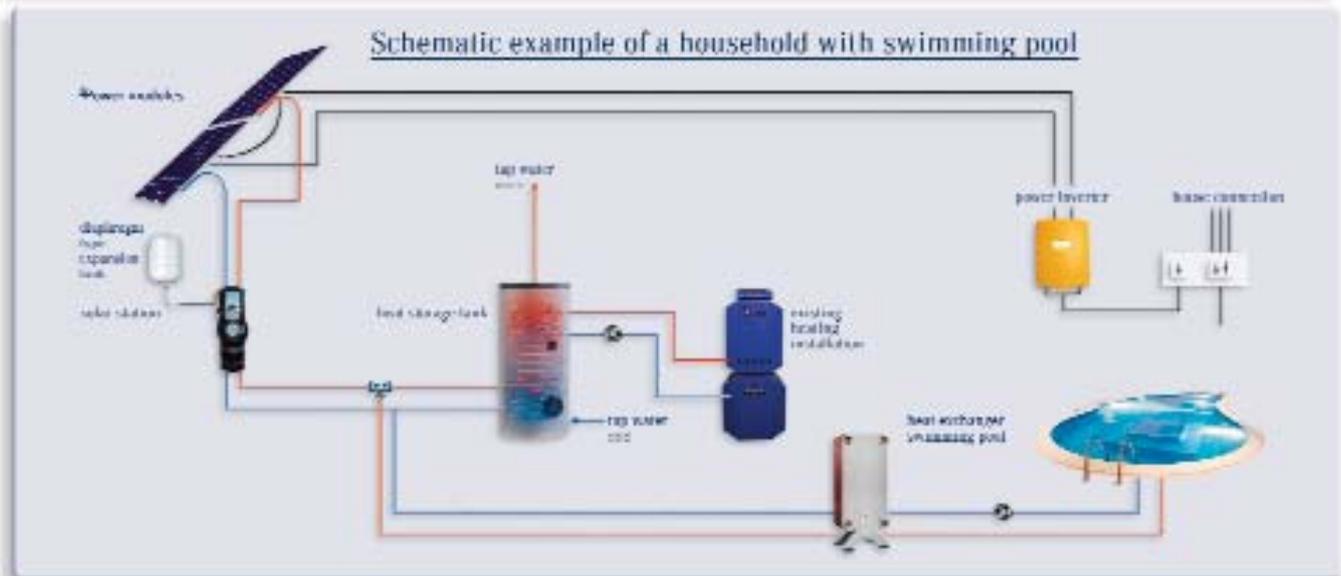
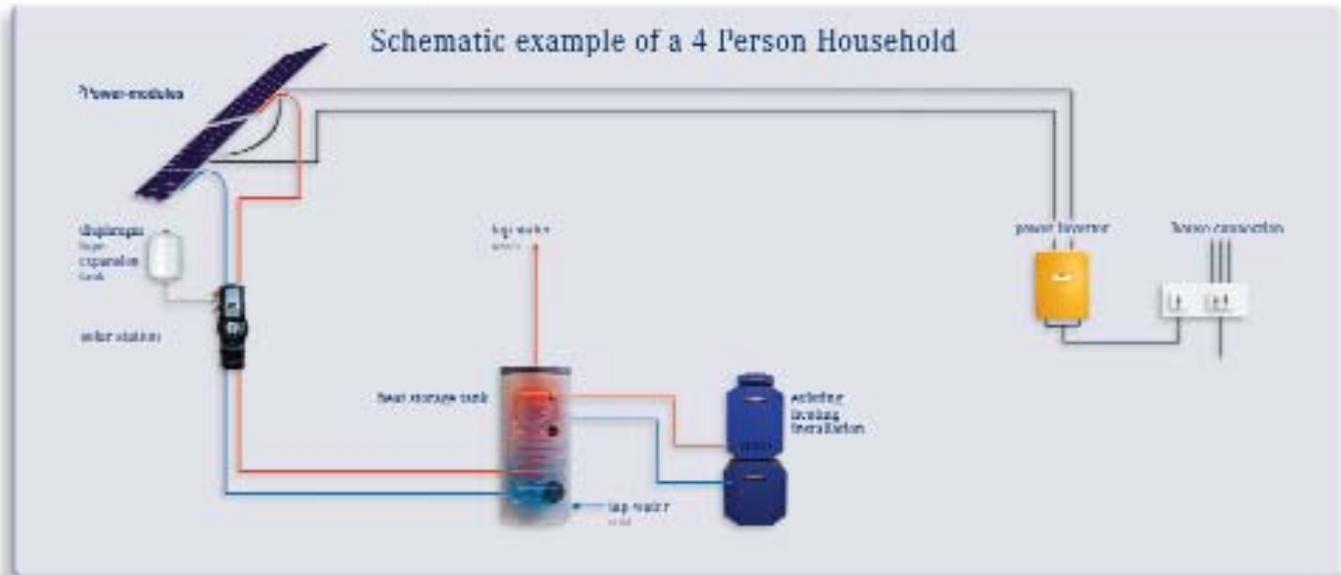
Which storage system is recommended for warm drinking water?

If the temperature in the PV-module is higher than the hot water temperature, the pump is activated and regulated by the rotational speed. Due to hygienic reasons we offer a fresh water layered storage for the drinking water heating.

How is the system filled?

A special Glycol-Water-Mixture is used. The system is thereby absolutely frost safe.

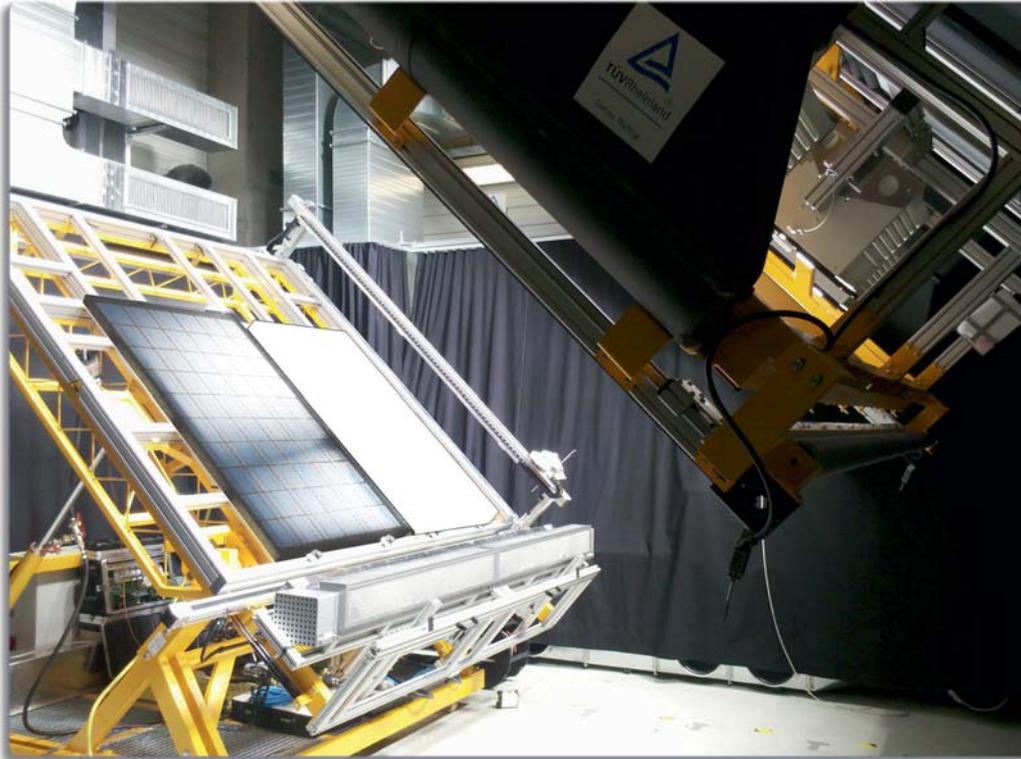
Application field:



2Power developed by PA-ID - TÜV (Technical Inspection Agency) tested

The fact that we are convinced and enthusiastic with the performance of 2Power is we think understandable. However, in order for you to be securely convinced by 2Power is the right way to go, we have had the 2Power-module fully tested

by the German TÜV-Rheinland authorities. The results of this independent testing have impressively confirmed top values given by the results as well as its complete functionality.



Technical details:

Electrical performance:	260 Wp
Thermic performance:	667 Wp
Measurements:	992 mm x 1640 mm x 45 mm
Total weight per module:	24 kg incl. heating medium
Connections/Supply lines:	¾" outside thread
Module connection:	plug cables DN8, Pipe supports 10mm
Max. allowed temperature heating medium:	+60°C, short term +90°C
Max. allowed pressure:	87 psi
Working pressure:	< 58 psi
Suggested flow:	35 l/h - max. 70 l/h per 2Power-module
Storage volume:	we suggest approx. 75l per 2Power-module



2POWER

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Your advantages at a glance

You generate valuable power over the whole roof area.

You gain warm water cheaply.

You increase the electrical result of your system through the cooling effect.

Your solar system is thanks to the thawing function free of snow in winter.

You receive an optical and uniform roof area.

You become very much more independent.

Your capital gives good returns and is a solid investment for the future.

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Do you want to know more-
give us a call!

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