



① FREISOLAR 8-collector  
② Distributing shaft

③ Heat pump  
④ Hot water tank

***The energy source of the future!***

## ***Heating with geothermal energy***

Soil is a good heat accumulator - even here in our temperate climate. The temperature here, in about 2 metres depth, lies between 7-13 degrees Celcius on annual average. Our horizontally laid geothermal collectors withdraw this existing warmth from soil with the aid of a mixture of water and anti-freeze. By means of a thermal heat pump the obtained warmth becomes utilizable for heating and creates nice temperatures in the whole house. Nature continuously regenerates the ground that is used by the thermal collectors which means that insolation, rain, and conden-

sation provide sufficient applicable geothermics. "Soil" here means the uppermost stratum with a depth of up to 5 metres.

In contrast to a earth probe drilling elaborate operations needing permission don't apply which lowers the costs. Therewith our collector system is up to 60 percent less expensive than a earth probe drilling.

By putting conventional horizontal heat collectors to use a multitude of soil has to be moved around the house - we can avoid this as well.

The geothermal collectors of FREISOLAR are installed in an affordable depth of about 2 meters. For the accommodation of a house several collectors are combined to a collector field and on their ends conflated in a little higher placed flow and return distributors. With the aid of a circulating pump the water-glycol-mixture - also called brine - is pumped through plastic pipes and thus absorbs the in soil stored warmth. The most energy is withdrawn from soil in winter.

Due to the particular design of our 8-collectors and the correct dimensioning through a qualified manufacturer a sustainable glaciation can be foreclosed.

The vegetation in your garden also stays unaffected. In spring and summer the chilled soil can recharge its heat reservoir by means of insolation and precipitations. Hereby it's ascertained that also in the next heating period – fall and winter – the heat reservoir soil has gained enough energy. Thus the geothermal heat pump – hence your house – can be ideally provided with heat. In order that the soil can store enough energy the expanses above the geothermal collectors should not be cultivated or sealed.

### ***Performance of the geothermal heat pump with geothermal collectors***

How much geothermal energy you can really use and how much acreage you therefore need depends mostly on the thermo-physical characteristics of the soil and on the climatic conditions.

Important characteristics here are the amount of water in the ground, the amount of mineral components, and the amount and size of air-filled pores in the ground.

The storing qualities and the thermoconductivity of the soil are the better the more water and minerals concentrated in the ground and the smaller the amount of air-filled pores. The defined ground classes 1-4 (VOB/DIN 18300) are usually applicable for this purpose.

**Here applies the rule of thumb:  
20-30 m<sup>2</sup> utilizable garden area  
is equal to 1 kW heat output.**

The refrigerating capacities of the FREISOLAR collectors account for about 700-1000 W, at max. full using hours of about 1800 h/a and depending on the composition of the ground. (At this the tariff lock waits of the EVU and potential additional water heating have to be regarded.)

#### **Extraction rate for the soil**

soil type	extraction rate qE
dry, sandy soil	10 - 15 W/m <sup>2</sup>
moist, sandy soil	15 - 20 W/m <sup>2</sup>
dry, clayey soil	20 - 25 W/m <sup>2</sup>
moist, clayey soil	25 - 30 W/m <sup>2</sup>
groundwater carrying soil	30 - 35 W/m <sup>2</sup>

## ***FREISOLAR 8er-Kollektor***



**Technical Data:**  
length: approx. 5000 mm  
(variable depending on set distance is)  
height: approx. 500 mm  
width: approx. 1600 mm  
pipe length: approx. 100 m  
pipe: PE 100 PN 16 as  
25x2.3 mm, 32x2.9 mm

*The FREISOLAR 8-collector with individually adjustable pipe intervals, depending on the terrain.*

**Talk to us. We will advise you in the following areas:**

- Ground collectors
- Heat pumps

**www.freisolar.de**

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