

Short description

Higher volume, less depth: The geoKOAX ground heat exchanger reduces up to 70% of the drilling depth as compared to conventional single-U-pipe probes. With geoKOAX, geothermal energy can be used everywhere, even in protected areas where drilling depth is restricted.

So far, geothermal systems used to be very costly because of high drilling expenses. The innovative and patented geoKOAX technology reduces the length of the pipes and thus leads to a significant decrease in installation cost. This marks a big leap forward to affordable geothermal technology for everyone. Anywhere.

As compared to the commonly used single-U-bends or double-U-bends, geoKOAX contains a larger amount of fluid which runs through the pipes at a higher temperature thus allowing for greater heat storage to buffer the building peak loads. Our technology reduces up to 70% of the drilling depth compared to single-U-bends. The higher “energy harvesting efficiency” extends the market of geothermal systems considerably as it allows the utilization of geothermal energy in “geothermal-no-go” regions (geological formations or, wildlife sanctuaries) and large projects in densely populated areas.

Main benefits and significance of geoKOAX technology

1. The geoKOAX high performance heat exchanger considerably expands the range of geothermal systems on the market. Its higher volume storage reduces the required drilling depth by 60% as compared to conventional probe systems and allows installation in sensitive areas with drilling depth restrictions (e.g. groundwater protection areas) or low geothermal conductivity) but also for large building developments on small properties such as urban areas.
2. geoKOAX reduces the drilling costs considerably, thus making the investment in geothermal systems highly competitive with fossil systems. In terms of operating costs, geothermal systems are simply unbeatable by nature.
3. The outstanding performance also allows for highly efficient cooling systems (production cooling, cooling of living space such as schools, sport facilities). Costly and climate damaging conventional air-conditioning systems are no longer needed.
4. geoKOAX provides maximum ground water protection because of its low installation depth (as little as 30 ft) and the ecological heat transfer fluid which is based 100% on renewable raw materials

Specific innovative elements that distinguish geoKOAX others already on the market

With its optimized geometric concept (one pipe rather than several pipes), its excellent efficiency (twice as efficient as conventional probes) and its drilling technique with protective casing, geoKOAX shapes a new generation of geothermal probes, which will eventually replace Single-U-bends and Double-U-bends. The heat exchanger is constructed as a coaxial probe and consists of an inner and outer pipe. The inner pipe has distancers and

turbulators, which lead to a continuous, passive turbulent flow in the probe. This reduces the borehole thermal resistance (BTR) considerably. The specific volume of the geoKOAX probe of 13.5 liters per meter (l/m), is by factor 6 larger than the specific volume of conventional DA32 double-U-bends which measure 2.14 l/m, and by factor 13 larger than the volume of Single-U-bends. Due to the large specific volume and the patented turbulence flows of the geoKOAX probe the performance requirements of the heat pump are not transferred to the ground directly - in strong contrast to conventional probe systems. This leads to a 'decoupling' of the heat pump operation from the ground, thus achieving a homogenous heat/cold extraction.

Evidence that geoKOAX performs at least as well as a comparable alternative meeting relevant safety standards

geoKOAX technology has already 'saved' several projects, which had been planned with conventional systems, from being cancelled (drilling depth limitations were increased after starting the respective project or the ground conditions turned out to be too difficult). In more than 1.500 projects across the EU, China, South Korea and the USA, geoKOAX is currently installed and running smoothly. With regards to quality and safety standards, geoKOAX is subject to the VDI 4640 guidelines in Germany. geoKOAX complies with these strict guidelines in all other countries where geoKOAX is used, unless other regulations apply.