




PRODUCT TECHNICAL CARD

Product feature: Vertical collector equipped with GEO PROTECTOR	Energeo product: VERTICAL COLLECTOR ENERGEO WITH GEO FF PRO + PROBE HEAD	
Manufacturer: ASPOL-FV Łódź, ul. Helska 39/45 www.aspol.com.pl		
ENERGEO – GEOTHERMAL TECHNOLOGY FOR GROUND SOURCE HEAT PUMPS – RENEWABLE ENERGY SOURCES		

BRAND A LEGALLY PROTECTED BY PATENT OFFICE DECISION OF THE REPUBLIC OF POLISH

EN.OZE.20-18.PRO

Consolidated text dated on 20 April.2018

1. List of standards / legislation and other documents related to the product:

- PN-EN 12201 - parts 1-4;
- PN-EN 1267:2012;
- PN-EN ISO 1167 - part 1;
- PN-ISO 9624:2001;
- DIN 16842:2013-05;
- PN-EN 13598-2:2016-09 – parts 1-2;
- EN.OZE.20-15.WW ;
- GROUND SOURCE FOR HEAT PUMPS – part 1;

2. Probe type GEO FF PRO – an element of the Energeo* system

2.1. Product construction

Probe GEO FF PRO + is a part of the ground source heat pumps system. It consists of two **pipes** equipped with **Geo Protector**, probe is finished with **GEO FF PRO+** probe head.

GEO FF PRO + probe head - U-shaped probe head made from high density polyethylene HDPE PE100, available in two – or four-pipe configuration integrated with injection tube.

Pipes – single or double U-shaped probes are placed in vertical boreholes to a depth dependent on the characteristics of the installation and the

object. The pipes are made in **HDPE100 RC** technology.

HDPE100 RC technology - (High-density polyethylene resistant to crack) is characterized by a high resistance on point load crack and slow crack propagation.

Geo Protector – protective cover, being an integral part of the probe, used for protection of the pipes against damage while mounting. Geo Protector is located at the vertical collector pipes right next to the probe head, in the place most exposed to mechanical damage, which may occur during probe application.

Injection tube – channel of external diameter: Ø32, designed to apply pushrod through it. The aim of additional tube application is proper coaxial geothermal probe application into the borehole. It is made from high density polyethylene HDPE100 in black colour.

2.2. Probe head application

Probe head design ensures a proper operation of the vertical ground heat exchanger by protecting against mechanical damage and impact of static and dynamic pressure.

* ENERGEO is a balanced hydraulic system developed to transfer geothermal energy from the ground, watercourses and water areas to the heat pump which provides energy for heating, cooling and hot water for dwellings, residential buildings and commercial facilities.

3. Product technical parameters

3.1. Dimensions and appearance

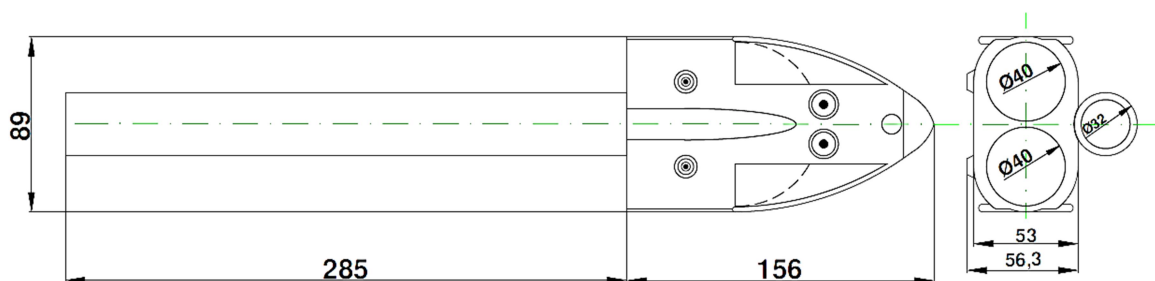


Fig.1 GEO FF PRO + 240 probe head. Top/bottom view.

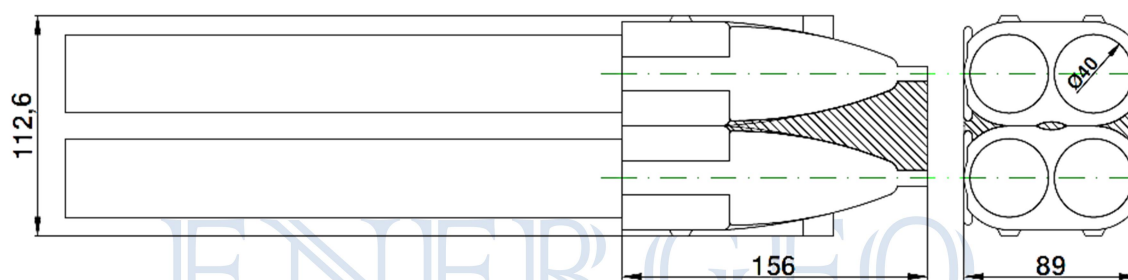


Fig.2 GEO FF PRO + 440 probe head in 4-pipe configuration. Side view/cross-section.

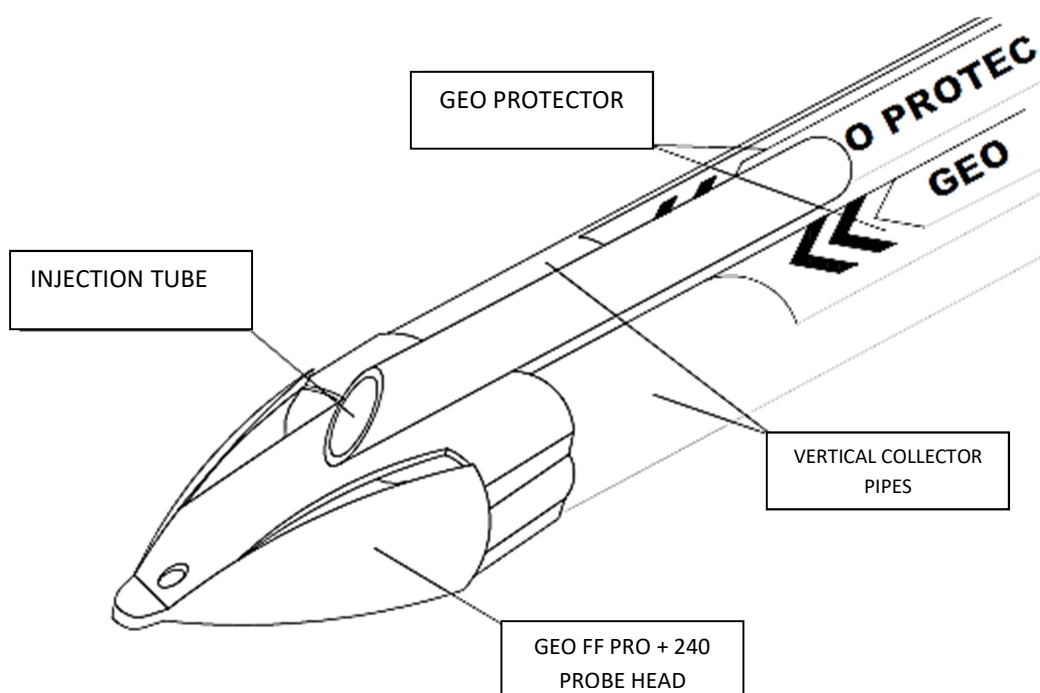


Fig.3 GEO FF PRO + 240 vertical collector. 2-pipe configuration.

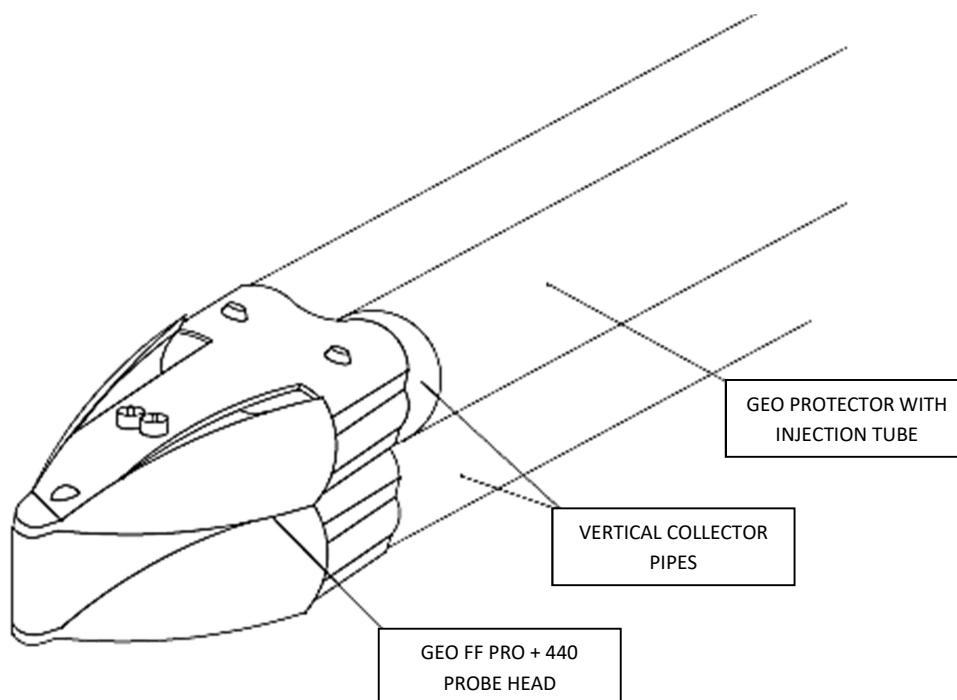


Fig.4 GEO FF PRO + 440 vertical collector. 4-pipe configuration.

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Tab. 1. Technical parameters of GEO FF PRO+ vertical collector and HDPE100 RC

GEO FF PRO probe head	VALUE
Colour	black
GEO FF PRO+ probe head weight, kg	0,4
Probe head nominal pressure	PN-12,5; PN-16
Diameters range \varnothing , mm	32,40
Operating temperatures range, °C	od -50 do 50
Minimal application temperature, °C	-10
HDPE 100 RC	VALUE
Density (q), kg/m ³	935-960
Melt flow rate (PE:190°C, 5kg), g/10 min	0,2 – 0,9
Tensile strength up to melt point, N/mm ²	18-29
Minimal Required Strength (MRS), MPa	10
Crack propagation FNCT (Full Notch Creep Test), h	8760
Pipes roughness, mm	0,04
Mean linear thermal expansion coefficient, mm/(m*K)	0,20
Hardness according to Shore's durometer	55-60
Levelling compound	Not required
Connecting technique	Thermal polyfusion

*) Manufacturer reserves the right to change the dimensions in the tolerance range: +/- 1,5%

4. Basic HDPE100 RC features

Corrosion resistance and limestone sedimentation.

Stable installation internal diameter parameters throughout whole exploitation period, invariable Thermal conductivity properties and long life – span.

Mechanical strength and thermal resistance while operating in negative temperatures conditions –

micro cracks arisen due to impact may cause liquid leakages while exploiting the installation even after successful pressure tests.

Application – for ground source installations for heat pumps. Transport of antifreeze liquids (e.g. HENOCK), cold water, ice water pressure installations and low-temperature media.

Chemical resistance – material cannot react with any flowing medium that can negatively influence its structure, shortening the life – span. In case of transporting any other medium than water, it is necessary to check HDPE chemical resistance to given medium, see: „HDPE chemical resistance table”.

Wear resistance – necessity to ensure long life – span of the installation requires application of materials that do not mechanically degrade in contact with the flowing medium.

5. Equivalent products – see technical cards

- GEO TURBO ORIGINAL vertical collector in full range EN.OZE.20-17.GTO;

6. Supplementary elements

- Connection tubes EN.OZE.20-16;RD;
- Collector pipes EN.OZE.20-16;RR;

- Distribution well NEW BRADO EN.OZE.20-17.NB;
- Distribution well ALTRA NOVA EN.OZE.20-16.AN;
- Distribution cabinet REGA UNIVERS EN.OZE.20-16.RU;
- Distribution cabinet NOMO UNIVERS EN.OZE.20-16;NU;
- Wall manifold RS UNIVERS EN.OZE.20-16;RSU;
- Heat pump room equipment;
- Antifreeze liquids (in accordance with EN.OZE.20-13;GH);
- Marking accessories;

7. Classification, training, qualifications and certification

Qualifications to install the system of ground source heat pumps, including the GEO FF PRO+ probe, should be gained through participation in training courses organized by the producer or by training institutions authorised by them.

8. The product is characterised by the following features:

- All hydraulic connections are based on polyfusion welding method;
- Certified technical service is provided;
- A regular system of training courses are available to ensure professional installation;
- Geo Protector is an integral probe part with GEO FF PRO + probe head;
- Geo Protector is located at the vertical collector pipes right next to the probe head, in the place most exposed to mechanical damage, which may occur during probe application;
- Injection tube enables proper, coaxial application of the geothermal probe into borehole.

* ENERGEO is a balanced hydraulic system developed to transfer geothermal energy from the ground, watercourses and water areas to the heat pump which provides energy for heating, cooling and hot water for dwellings, residential buildings and commercial facilities.