

Thermal Response Test Equipment Data

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Country: Italy

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GENERAL TRT DATA

Type: <i>Heat injection</i>	No TRTs: <i>01</i>	Size, weight: <i>L: 0,5 m + W: 0,5 m + H: 2 m, kg 300</i>
<p>Aim: <i>Commercial (Geo-Net): analysis of thermal properties of different borehole heat exchangers all around Italy, for dimensioning of borehole fields.</i></p> <p><i>Research (Geo-Net, Geological Survey of Emilia Romagna, DICAM - University of Bologna): Study of thermal properties of different types of underground and heat exchanger.</i></p> <p><i>Development: (Geo-Net, DICAM – University of Bologna): Improvement of efficiency of TRT hardware, improvement of TRT software and analysis models.</i></p>		<p>Pump: <i>2 pumps: one inside the boiler, one external circulation pump. Maximum flow rate inside the borehole circuit: 2000 l/h</i></p>
Powered by: <i>gas</i>		Heater: <i>Gas boiler. 12 kW power</i>
Built on/in: <i>pallet</i>		HP/Cooler: <i>none</i>
		<p>Temperature measurements: <i>PT100, temperature in/out in the boiler; temperature in/out at the bottom of the heat exchanger; external temperature.</i></p> <p>Flow rate measurements: <i>Flow meter, flow rate in the boiler circuit, flow rate in the heat exchanger circuit</i></p> <p>Voltage stabilization: <i>No</i></p> <p>Supply Power Monitoring: <i>Yes</i></p> <p>GPS: <i>No</i></p> <p>Remote Control of Operation: <i>No</i></p> <p>Remote Data Collection: <i>Yes</i></p> <p>Logger: <i>Realized by B.R.T. snc</i></p>

TRT EXPERIENCE

Years of operation: 3

Number of performed measurements: *>40 Research + development + commercial*

Typical borehole depths: *100 m*

Applications: *BHE*

Typical collector type: *2U simplex (40 mm) and duplex (32). Fitting: appropriate grouting or alluvial material (rarely)*

Typical fluid type: water

Typical groundwater temperature: *variations between 10 and 20°C. Typical: 14°C*

Geographical area: *Italy. Emilia Romagna and Lombardia, overall*

Analysis Method: *Line source / DCE method (Drift and Conditional Estimation method, developed by DICAM – University of Bologna)*