

# New borehole heat exchanger dynamic model in TRNSYS: adaptation of B2G model to long term simulation periods

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## Abstract

The use of models that simulate the behaviour of a facility are widely spread as an aid in the design and optimization of heating and cooling systems. In a ground source heat pump system, the most important component is the ground source heat exchanger, but it is also the most complex to model. There are several ground source heat exchanger models, most of them are focused either on the short term or on the long term behaviour. However, the models that are able to predict both the short and the long term need long times of simulation. In this work, a new ground source heat exchanger dynamic model (B2G) is presented, based on an existing ground source heat exchanger located at *Universitat Politècnica de València*. This model is able to predict the short term response of the heat exchanger with good accuracy and low computational cost. In order to model the long term behaviour, two existing models are considered: the DST model (an already existing model in TRNSYS) and the g-function model. Therefore, the B2G model is coupled with each one of the long term models to consider both the short term and the long term behaviour. The simulation of the ground source heat exchanger operation using the B2G coupled with each of the long term models is compared with the experimental results. The results show that the B2G model is able to reproduce with high accuracy the real behaviour of the ground source heat exchanger when it is coupled with the g-function model as well as with the DST model. In conclusion, this model has a good adaptability to different long term models.

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