



Co-funded by the European Community Horizon 2020 Program

Project Title:

GEOThermal Technology for economic Cooling and Heating



GEOTeCH

Grant Agreement No: 656889

Collaborative Project

D4.4 Heat pump prototypes 2 and 3 Executive Summary

Deliverable No.	D4.4
Workpackage	Plug and Play Geothermal System Development
Task	Task 4.1.2
Lead beneficiary	HIR
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Delivery date	11/07/2017
Status	Working Document
File Name:	170713 D4.4 Heat pump prototypes 2 and 3_00.docx

Dissemination level		
PU	Public, fully open, e.g. web	
CO	Confidential, restricted under conditions set out in Model Grant Agreement	X
CI	Classified, information as referred to in Commission Decision 2001/844/EC.	

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1. PUBLISHABLE EXECUTIVE SUMMARY

This deliverable (D4.4 - Heat pump prototypes 2 and 3) is related to the delivery of the 2nd and 3rd heat pump prototypes (here with indicated as HP#2 and HP#3), developed and assembled according to details in deliverable D4.1 (Dual source heat pump design) and in deliverable D4.3 (Final design of the refrigerant circuit and strategy of operation between the two different heat sources).

The objective is to provide HP#2 to Groenholland and HP#3 to HiRef S.p.A. in order to respectively implement the Amsterdam demo site and the Tribano demo site. The units have been assembled according to all the enhancements and features investigated in HP#1, firstly tested at UPV laboratories.

Several improvements have been implemented, in order to reach higher levels of energy efficiency and to make the final solution more cost effective. The following is a detailed list of all the modifications decided after testing HP#1, thus implemented in all three prototypes:

- Suction side copper pipes: reduced diameter dimension in order to ensure a correct oil return to the compressor
- Enlarged heat exchangers to improve thermal exchange efficiency
- Switch from EC fans to 6-pole fans (for HP#2 only)
- More efficient source side circulating pump
- New frequency inverter for compressor, developed by compressor supplier
- New circuit layout of finned coil
- New control parameters

In addition, HP#2 and HP#3 have been provided with two refrigerant connections to test a remote microchannel coil.

The construction phases of HP#2 and HP#3 have followed many meetings, discussions and different proposals from each partner of WP4. These belong to the previous design process, as described in D4.1 and in D4.2. HIREF has done most of the work as manufacturer of the units.

Hence, all other partners (mainly GROENHOLLAND, UNIPADOVA, UPVLC, TECNALIA) were indirectly involved in this deliverable, as they have provided most of the technical information to assembly the definitive version of HP#2 and HP#3.

This deliverable summarizes the work done so far in tasks 4.1.1 and 4.1.2. No input from other WPs have been used but all the information included in deliverables D4.1 and 4.3. The outputs from this deliverable will be useful for all the upcoming tasks within WP4, as well as the following:

- Output to WP5 for the Energy Management System
- Output to WP6 for demo sites implementation
- Output to WP7 for market assessments and business plans
- Output to WP8 for dissemination and communication