Test Report CEE-0056/14

PERFORMANCE TESTING FOR AIR CONDITIONERS

TYPE OF UNIT: PACKAGE AIR-TO-WATER UNIT, NON-DUCTED

Data of the tested unit:

- Manufacturer : DANFOSS VÄRMEPUMPAR AB

- Trademark : THERMIA DANFOSS

- Model name : NOT SEEN

- Outdoor unit : Ref. : ATEC HP 6
Serial nº : 086U935926517028

- Purchase Order: Acceptance Budget: CRE-0092/14-3

- Date of reception of the unit: 2014-05-06

The tests have been performed in accordance with the standard **EN 14511-3:2011 "Air conditioners, liquid chilling packages and heat pumps with electrically driven compressors for space heating and cooling – Test methods"**, and with document **"Référentiel de Certification NF 414":2012.** The results presented in this report are valid only for the unit tested.

Test requested by:
DANFOSS VÄRMEPUMPAR AB
Snickaregatan 1, 671 34 Arvika
Sweden

CENTRO DE ENSAYOS, INNOVACIÓN Y SERVICIOS

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1. CAPACITY MEASUREMENTS

1.1. Test method

Water enthalpy method, checked with calorimeter room method on the air side.

The tests have been carried out following the instructions established in EN 14511-3:2011.

The test conditions are defined in the document *Référentiel de Certification* NF 414:2012.

1.2. Application 30_35ºC

Test date		**2014-05-29**
Technician(s) name(s)		**Julio Conde**
Rating conditions, outdoor dry bulb (wet bulb) / water inlet → outlet	(ºC)	**7(6) / 30→35**

Tests Results		**Value**
Dry bulb temperature, air inlet, outdoor side	(ºC)	**7,00**
Wet bulb temperature, air inlet, outdoor side	(ºC)	**6,00**
Water inlet temperature	(ºC)	**29,99**
Water outlet temperature	(ºC)	**35,01**
Water flow	(l/s)	**0,32**
Available pressure in the water circuit	(kPa)	**7**
Atmospheric pressure	(kPa)	**94,42**
Frequency of the compressor	(Hz)	**49**
Total heating capacity	(W)	**6 734**
Effective heating capacity (final result)	(W)	**6 758**
Power input	(W)	**1 379**
Effective power input (final result)	(W)	**1 402**
COP	(W/W)	**4,82**

Test date	**2014-05-30**
Technician(s) name(s)	**Julio Conde**
Rating conditions, outdoor dry bulb (wet bulb) / water inlet → outlet (ºC)	**2(1) / *→35**

Tests Results		**Value**
Interval H		
Dry bulb temperature, air inlet, outdoor side	(ºC)	**2,01**
Wet bulb temperature, air inlet, outdoor side	(ºC)	**0,99**
Water inlet temperature	(ºC)	**30,80**
Water outlet temperature	(ºC)	**35,00**
Frequency of the compressor	(Hz)	**49**
Averages values measuring period		
Water flow	(l/s)	**0,32**
Available pressure in the water circuit	(kPa)	**7**
Atmospheric pressure	(kPa)	**94,43**
Total heating capacity	(W)	**5 651**
Effective heating capacity (final result)	(W)	**5 308**
Power input	(W)	**1 356**
Effective power input (final result)	(W)	**1 378**
Defrost period	(s)	**320**
Operating cycle with defrost	(min)	**180**
Measuring period	(min)	**180**
COP	(W/W)	**3,85**

1.3. Application 40_45ºC

Test date		**2014-05-29**
Technician(s) name(s)		**Julio Conde**
Rating conditions, outdoor dry bulb (wet bulb) / water inlet → outlet	(ºC)	**7(6) / 40→45**

Tests Results		**Value**
Dry bulb temperature, air inlet, outdoor side	(ºC)	**7,00**
Wet bulb temperature, air inlet, outdoor side	(ºC)	**6,00**
Water inlet temperature	(ºC)	**40,00**
Water outlet temperature	(ºC)	**45,03**
Water flow	(l/s)	**0,31**
Available pressure in the water circuit	(kPa)	**6**
Atmospheric pressure	(kPa)	**94,41**
Frequency of the compressor	(Hz)	**49**
Total heating capacity	(W)	**6 395**
Effective heating capacity (final result)	(W)	**6 415**
Power input	(W)	**1 644**
Effective power input (final result)	(W)	**1 664**
COP	(W/W)	**3,85**

2. STARTING TEST AT -15ºC

The purpose of this test is to check that the unit can start with an outdoor temperature of -15ºC, and run during 20 min in this temperature condition. The inlet temperature of the water is 40ºC and the water flow 0,32 l/s.

Date of the test	**2014-05-30**
Technician(s) name(s)	**Julien Roch**
The unit starts normally	**NO**
The unit runs during at least 20 min	**NO**
Comments	**(*)**

(*) The equipment stops at 17:14 p.m. and it restarts again approximately at 17:29 p.m. (defrost period). The display of the equipment shows timing for the compressor starting**.**

4. MAIN RESULTS

4.1. Results of the capacity tests

The main results of the tests are presented below:

Test conditions	HEATING MODE		
	Effective total Capacity (kW)	Effective power input (kW)	COP (W/W)
7(6) / 30→35	6,76	1,40	4,82
2(1) / *→35	5,31	1,38	3,85
7(6) / 40→45	6,42	1,66	3,85

4.2. Observations

- Rating voltage: **400 V** (3 phases);
- Unit started following the additional indications of the manufacturer;
- Test performed on a new unit (no previous installation, except for testing purposes).

4.3. Declaration of uncertainty

The laboratory has checked the conformity of the uncertainties of measurement with the requirements of EN 14511-3:2011.
The customer may ask for these uncertainties at any time.

Notes: This report consists of 8 pages, including the front page.
The partial reproduction of this test report shall be authorised by CEIS.
The conformity to the results is given by the signatory through the digital certificate given on the front page.

5. VERIFICATION OF COMPONENTS

The following data have been observed by the laboratory.
Where "-" is indicated, it means that the data is missing (no marking) or that the laboratory is unable to see the information without damaging some part of the unit.

		1st circuit
Refrigerant type		**R407C**
Refrigerant charge(*)	(kg)	**4,0**
Compressor's manufacturer		**-**
Compressor's model		**-**
Number of compressors		**1**
Expansion device's manufacturer		**-**
Expansion device's model		**-**
Front surface of the air exchanger	(m^2)	**0,65**
Fin's spacing	(mm)	**1,4**
Fan's manufacturer		**EBMPAPST**
Fan's model		**S3G500-AF48-55**
Number of fans		**1**
Number of blades per fan		**4**
Fan's diameter	(mm)	**500**
Water exchanger's manufacturer		**-**
Water exchanger's model		**-**
Water pump integral part of the unit	(Yes/No)	**NO**
Water pump's manufacturer		**-**
Water pump's model		**-**
Water pump speed setting		**-**

(*) Data given by the customer or given on the nameplate, and not checked by the laboratory**.**

6. PICTURES OF THE SAMPLE UNDER TEST

END OF THE TEST REPORT