

Thermal Test Report

LHX+ 10kW

Revision 1.0

DUT type:	LHX+ 10kW	Test date:	20200115
DUT p/n:	29714-016	Firmware:	-
DUT s/n:	Engineering sample	Test also applies to p/n:	-
Test item: Determine the total/global airflow of the LHX+ 10kW			
Results: <input checked="" type="checkbox"/> PASS <input type="checkbox"/> FAIL <input type="checkbox"/> MIXED			
Document history:			
Revision	Date	Author	Description of changes
1.0	20210312	DD	Initial release



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The details in this manual have been carefully compiled and checked - supported by certified Quality Management System to EN ISO 9001/2000.

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1 Test purpose

In this report you will find the measurement results of the **total air volume** of the heat exchanger **LHX+ 10kW (29714-016)**.

The system was tested with the **air performance test rig** (description see page 4) at **normal operation** and **fan failure**.

2 Description of the test

The heat exchanger was fixed to the **air performance test rig**. Operating conditions for the fans were **10VDC (max. fan speed), 9VDC, 8VDC, 7VDC, 6VDC, 5VDC, 4VDC and 3VDC** control voltage.

3 Test Setup

3.1 Test resources/equipment

3.1.1 Air performance test rig for fans according ISO 5801

- The test rig allows flow measurements up to 5.000 m³/h at a test pressure of 3.000 Pa
- The flow rate is determined using high precision orifice meters according to DIN EN ISO 5167-2
- Specially developed from ILK Dresden
- Measurements:

- Air flow volume of fans in cases, cabinets and systems
- Determination air drag characteristic curves of filter mats, perforations and openings
- Fan comparison, air flow volume, speed, power input, power, AC, DC clamping



Figure 1 Air performance test rig_1

- Output characteristic curves of fans with characteristic drag curves or characteristic systems curves
- The control and data acquisition is realized by a PC-based data acquisition system



Figure 2 Air performance test rig_2

3.2 Test object

The heat exchanger was equipped with following components:

- Heat exchanger: Leel Coils W2S1G041704001410061HLDAOR—PE / Schroff 69714-093
- 2 fans: Ziehl Abegg RH20V-4IP.Z8.AR
- No control unit
- Water connection → for measurements not needed

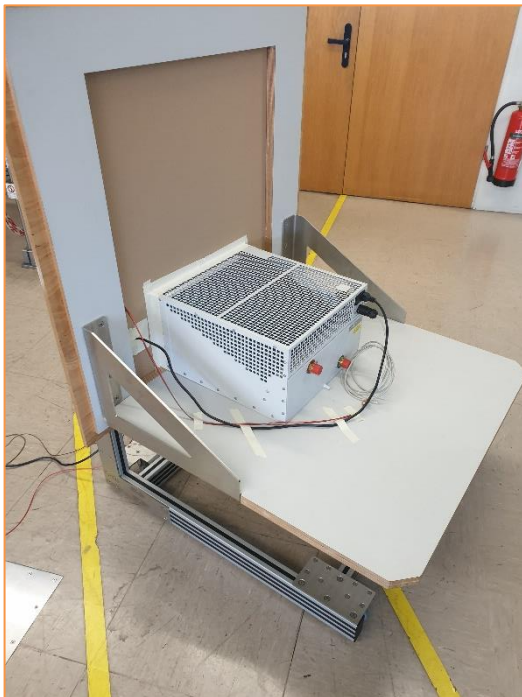


Figure 3 Measurement setup_1

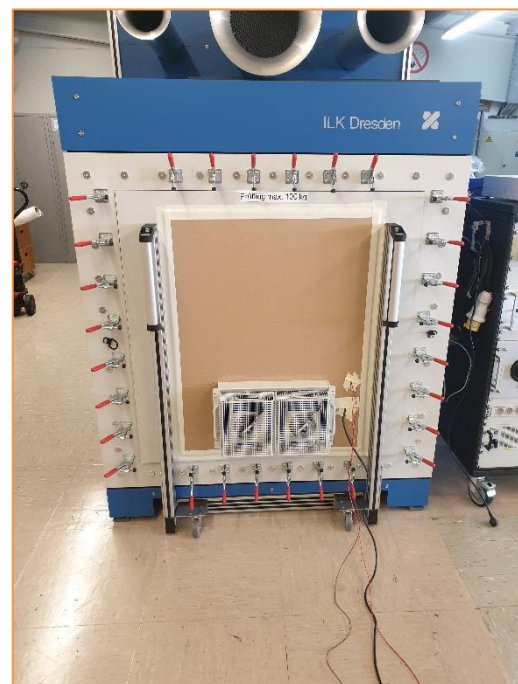


Figure 4 Measurement setup_2

4 Measurement results

4.1 Heat exchanger at overall operation

Control voltage [VDC]	Fan Speed [1/min]	Total air flow	
		[m³/h]	[CFM]
10	4214	1790	1053,5
9	4204	1785	1050,6
8	3753	1598	940,5
7	3254	1377	810,4
6	2737	1155	679,8
5	2222	926	545,0
4	1712	707	416,1
3	1193	478	281

Table 1 Heat exchanger at overall operation

4.2 Heat exchanger at Fan failure

	Total air flow	
	[m³/h]	[CFM]
Fan failure of the left fan	837	492,6
Fan failure of the right fan	839	493,8

Table 2 Heat exchanger at Fan failure