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**Report
on the
test of a heating boiler according to DIN EN 303-5
Report C Test on the boiler performance requirements**

Test laboratory	TÜV SÜD Industrie Service GmbH Abteilung Feuerungs- und Wärmetechnik DIN-Prüfstelle
Subject of test	Heating boilers for solid fuels Type: LogWIN ... Premium Model/Size: LogWIN 180 Premium Fuel: Log wood Fuel fed: manual stoking Combustion air supply: with an induced draught fan
Customer	Windhager Zentralheizung Technik GmbH Anton-Windhager-Strasse 20 A-5201 Seekirchen
Manufacturer	Windhager Zentralheizung Technik GmbH A-5201 Seekirchen
Scope	Validation of the boiler performance requirements of DIN EN 303-5 as a part of the test on the heating boiler of a heating boiler series
Expert	Dipl.-Ing. Uwe Schlosser
Period of test	April to June 2008
Basis of test	DIN EN 303-5:1999-06, clause 4.2

Date: 2008-06-15

Our reference:
IS-TAF-MUC/sl

Document:
H-C1 1240-0008eng.doc

Report-No. H-C1 1240-00/08
Order-No. 1054439

The document includes
6 Pages
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The test results refer exclusively
to the units under test.

This test report is also issued in a German version. In any case of doubts the German version is binding.





1 Summary

Customer	Windhager Zentralheizung Technik GmbH, A-5201 Seekirchen
Manufacturer	Windhager Zentralheizung Technik GmbH, A-5201 Seekirchen
Construction	Heating boiler made of steel burning log wood according to DIN EN 303-5 with an induced draught fan Combustion: gasification and combustion in combustion chamber, downwards directed flame and a secondary combustion chamber Fuel fed: manual stoking Grate design: plane grate partly out of cast or ceramic material Ash removal: manual Fittings: secondary combustion chamber consists out of ceramic material, turbulators in all heat exchanger tubes
Type	LogWIN ... Premium
Model/Size	LogWIN 180 Premium
Nominal heat output range	13,4 kW to 18,0 kW
Destination countries	AT, BE, CH, DE and IT
Boiler class	3
Maximum allowable temperature	95 °C
Max. allowable operating pressure	3 bar
Necessary flue gas draught	9 Pa
Electrical power supply	230 V, 50 Hz

The test was performed by the expert in the laboratory of Windhager Zentralheizung Technik GmbH, A-5201 Seekirchen using a test rig according to picture A.2 of DIN EN 304: 2004-01. The test rig was evaluated by the expert. The used measurement equipment was calibrated and traceable assigned to the test rig. The conditions for the test, the results and the evaluation are documented in chapter 6.

The boiler performance requirements of **boiler class 3** are fulfilled according to clause 4.2 of DIN EN 303-5: 1999-06 as well as the specific additional requirements of the above listed destination countries according to annex A of DIN EN 303-5:1999-06.

Feuerungs- und Wärmetechnik
DIN-Prüfstelle


Johannes Steiglechner



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2 Scope of test

The manufacturer orders an evaluation on the boiler performance requirements of DIN EN 303-5 of the heating boiler which is part of a heating boiler series.

3 Basis of test

DIN EN 303-5:1999-06 Heating boilers for solid fuels, hand and automatically stocked, nominal heat output of up to 300 kW, clause 4.2

4 Applied test documents

Report No. H-C3 1240-00/08 dated 2008-06-15

5 Description of heating boiler

A detailed description is documented with report no. H-C3 1240-00/08 dated 2008-06-15 by TÜV SÜD Industrie Service GmbH.

The list of measurement devices used for the test is documented in the files at the test laboratory.



6 Test of boiler performance requirements

6.1 Test conditions		heat loss of test rig:		0,26 kW/0,26 kW	
Heat transfer fluid: water					
Test no.		1 nominal power	2 part load	-	-
Type		LogWIN 180 Premium			
Date of test		2008-04-24	2008-04-19	-	-
Test duration	h	20,0	12,9	-	-
Number of combustion periods		2	1	-	-
Control system		Part of heating boiler, Type FMF-S V3.0E			
The fuel analysis was carried out by: TÜV SÜD Industrie Service GmbH					
6.2 Fuel					
Type		Log wood	Log wood	-	-
Sort		beech	beech	-	-
Size/dimension	mm	150*150*500	150*150*500	-	-
Water content	%	21,5	15,0	-	-
Ash content	kg/kg	0,004	0,004	-	-
Lower calorific value	kWh/kg	3,76	4,14	-	-
Fed amount of fuel ¹	kg	98,9	47,7	-	-
Fed amount of fuel per hour	kg/h	5,2	3,5	-	-
Ash	kg	0,3	0,2	-	-
Combustible fraction in the ash	%	20	20	-	-
Heat input	kW	19,5	14,7	-	-
6.3 Measured parameters and losses of flue gas:					
Average flue gas temperature	°C	105	97	-	-
Combustion air temperature	°C	21	23	-	-
Room temperature	°C	21	23	-	-
CO ₂ -content	Vol.%	14,4	13,8	-	-
CO-content	ppm	293	621	-	-
NO _x -content	ppm	83	82	-	-
C _x H _y -content	ppm	4	8	-	-
Dust content (related to sucked f. gas v.)	mg/m ³	40	24	-	-
Draught	mbar	0,09	0,09	-	-
Combustion chamber pressure	mbar	-0,25	-0,25	-	-
Specific flue gas volume (dry)	m ³ /kg	4,8	5,4	-	-
Specific steam volume	m ³ /kg	0,8	0,8	-	-
Flue gas mass flow (wood 23,1 % of humidity) according to DIN EN 13384-1:2003-03	g/s	11	8	-	-
Losses due to:					
sensible heat of the products of combustion q _A	%	4,8	4,2	-	-
incomplete combustion q _U	%	0,1	0,3	-	-
unburned fuel in ash q _F	%	0,1	0,2	-	-
radiation, convection and conduction q _S	%	3,3	4,1	-	-
boiler efficiency indirect	%	91,7	91,2	-	-
Electric energy consumption					
Nominal/part power	W	47	23	-	-
Stand by	W	7	-	-	-

¹ Filling chamber filled with log wood according to information of manufacturer.



6.4 Measured water parametres		1	2	-	-
Test No.:		1	2	-	-
Water flow	kg/h	254	191	-	-
Water pressure	bar	1,3	1,2	-	-
Return temperature	°C	59,9	62,9	-	-
Flow temperature	°C	75,8	79,2	-	-
Inlet temperature (cooling water)	°C	16,4	20,3	-	-
Rated output					
including losses of test rig	kW	17,8	13,4	-	-
According to					
Nominal heat output	%	99	74	-	-
Part load	%	-	100	-	-
Boiler efficiency direct	%	91,5	91,2	-	-
6.5 Surface temperatures:		Average values		Limits	
Measured at test no. 1					
Cover	°C	31	36	65+t _R	
Doors ² , induced draught fan	°C	-	55	100+t _R	
Bottom	°C	37	45	65+t _R	
Operating levers	°C	34	41	35+t _R or 60+t _R	
6.6 Comparison		Test No. 1		Test No. 2	
6.6.1 of values with the requirements of DIN EN 303-5:1999 for boiler class 3		achieved	required	achieved	required
Boiler efficiency	%	91,5	≥74,5	91,2	≥74,5
CO-emissions (related to 10 % O ₂)	mg/m ³	271	≤5000	601	≤5000
OGC-emissions (related to 10 % O ₂)	mg/m ³	7	≤150	14	≤150
NO _x -emissions (related to 10 % O ₂)	mg/m ³	126	---	130	---
Dust-emissions (related to 10 % O ₂)	mg/m ³	30	≤150	19	--- ³
Flue gas temperature	°C	105 ⁴	≥160+t _R	97 ⁴	≥160+t _R
Draught	mbar	0,09	≤0,25	0,09	≤0,25
Ash bin sufficient	--	Yes	---	Yes	---
Duration of tests, 2/1 combustion period	h	20	≥4,0	12,9	≥4,0
6.6.2 of values with the requirements for Germany and Switzerland according to annex A2 and A5 of EN 303-5:1999 as well as with 1. BImSchV (Germany) and Swiss Ordinance on Air Pollution (Switzerland) ⁵					
Dust-emissions (related to 13 % O ₂)	mg/m ³	22	≤150 or ≤60	13	≤150 or ≤60
NO _x -emissions (related to 13 % O ₂)	mg/m ³	91	---	95	---
OGC-emissions (related to 13 % O ₂)	mg/m ³	5	---	10	---
CO-emissions (related to 13 % O ₂)	mg/m ³	197	≤4000 or ≤800	437	≤4000 or ≤800
6.6.3 of values with the requirements for Austria according to annex A.1 of DIN EN 303-5:1999-06 and with the Austrian law paragraph 15 a "Vereinbarung über Schutzmaßnahmen betreffend Kleinf Feuerungen" and "Vereinbarung über die Einsparung von Energie".					
Boiler efficiency	%	91,5	≥75,0	91,2	≥75,0
CO-emissions	mg/MJ	130	≤1100	284	≤1100
NO _x -emissions	mg/MJ	60	≤150	61	- ⁶
OGC-emissions	mg/MJ	3	≤80	6	≤80
Dust-emissions	mg/MJ	14	≤60	9	- ⁶

² Doors and cleaning ports are placed underneath of the housing or front door and so not directly accessible

³ The requirements are fulfilled according to clause 4.2.6 of DIN EN 303-5:1999-06

⁴ Additional manufacturer's information are given in the installation and user manual according to clause 4.2.2 of DIN EN 303-5

⁵ The limiting values are respected according to LRV, clause 4, issue 01.09.2007

⁶ Test not necessary according to Article 8 of the Austrian law 15a B-VG



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7 Expertise

The heating boiler of manufacturer	Windhager Zentralheizung Technik GmbH, Anton-Windhager-Strasse 20, A-5201 Seekirchen
type	LogWIN ... Premium
model/size	LogWIN 180 Premium
as presented for the testing	heating boiler made of steel burning log wood according to DIN EN 303-5

was tested according to the boiler performance requirements of clause 4.2 of
DIN EN 303-5:1999-06 by the test laboratory TÜV SÜD Industrie Service GmbH.

The boiler performance requirements of **boiler class 3** of DIN EN 303-5:1999-06, clause 4.2 are fulfilled as well as the additional requirements for the destination countries AT, DE and CH of annex A, clause A.1, A.2 and A.5 of DIN EN 303-5:1999-06, operating the heating boiler in combination with an accumulator tank calculated according to DIN EN 303-5:1999-06.

Feuerungs- und Wärmetechnik
DIN-Prüfstelle

A handwritten signature in black ink, appearing to read 'J. Steiglechner'.

Johannes Steiglechner

The expert

A handwritten signature in black ink, appearing to read 'U. Schlosser'.

Uwe Schlosser