

UWIERZYTELNIONE TŁUMACZENIE Z JĘZYKA ANGIELSKIEGO
1 strona dokumentu źródłowego

ŚWIADECTWO BADAŃ

Wyciąg z raportu nr: 300-ELAB-2053

Producent: NIBE-BIAWAR sp. z o.o.
Al. Jana Pawła II 57, 15-703 Białystok
Nr VAT PL5420200292

Produkt: Kocioł na biopaliwo

Model: Kocioł Pellux 100/30 i palnik PBMAX30, kocioł K-PAA30 i palnik PBMAX30,
Kocioł Pellux 100/30 Touch i palnik PBMAX30,
Kocioł Pellux 100/30 Exclusive i palnik PBMAX30

Procedura: Badanie zgodnie z normą EN 303-5:2012

Wymagania: Rozporządzenie Komisji (UE) Nr 2015/1189, Załącznik II, Paragraf 1

Podajnik: Automatyczny **Paliwo:** Biomasa

Badanie przeprowadzono na pellecie drzewnym (C1); uzyskano następujące wyniki:

WYNIKI BADANIA

Pomiar	Jednostka	Wynik	Wartości graniczne
Nominalna moc cieplna	kW	29	
Stężenie CO na 10% O ₂	mg/m ³	235	
Stężenie OGC na 10% O ₂	mg/m ³	1	
Stężenie pyłu na 10% O ₂	mg/m ³	29	
Stężenie NO _x na 10% O ₂	mg/m ³	143	
Wydajność	%	90,7	
Minimalna moc cieplna	kW	8,8	
Stężenie CO na 10% O ₂	mg/m ³	486	
Stężenie OGC na 10% O ₂	mg/m ³	20	
Stężenie pyłu na 10% O ₂	mg/m ³	39	
Stężenie NO _x na 10% O ₂	mg/m ³	136	
Wydajność	%	91,8	
Emisje sezonowe			
Stężenie CO na 10% O ₂	mg/m ³	448	500
Stężenie OGC na 10% O ₂	mg/m ³	17	20
Stężenie pyłu na 10% O ₂	mg/m ³	37	40
Stężenie NO _x na 10% O ₂	mg/m ³	137	200
Sezonowa efektywność energetyczna ogrzewania pomieszczeń			
η _s	%	80,6	77
η _{son}	%	84,5	
F1	%	3,0	
F2	%	0,9	

Należy pamiętać, że podane wartości są tylko częścią sprawozdania z badań. Celem uzyskania dalszych informacji zapoznaj się ze sprawozdaniem z badań.

Aarhus, 28 lutego 2017

[nieczytelny podpis]

Anders Pødenphant
B. Sc. [licencjat nauk ścisłych]



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Uwaga

Niniejsze świadectwo przygotowano i obliczono na podstawie akredytowanego świadectwa badania wykonanego przez instytut badawczy pod akredytacją członka DANAK, EA i ILAC.

Świadectwo ED 300-ELAB-2053

28-02-2017 15:02:56

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[KONIEC TŁUMACZENIA]

Ja, Edyta Bajda-Kowalczyk, tłumacz przysięgły języka angielskiego, numer uprawnień TP/6335/05, niniejszym zaświadczam zgodność powyższego tłumaczenia z przedstawioną mi kopią dokumentu sporządzonego w języku angielskim.

Nr Repertorium: 12/2017

Data: 03.03.2017 r.





TEST REPORT

Date: 2014.05.05

Report no.: 300-ELAB-2053

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Init.: ABR/RSL/LSHA

Order no.: 588515

No. of appendices: 5

Requested by: Contact person: Tomasz WasilewskiCompany: NIBE-BIAWAR Sp. z.o.o. www.biawar.com.plAddress: al. Jana Pawła II 57 Email: twasilewski@biawar.com.pl

Postcode/town: 15-703 Białystok Tel.: +48 85 6628 475

Product: Automatic biofuel boilerManufacturer: NIBE-BIAWAR Sp. z.o.o. Type: Pellux 100/30 boiler &
PBMAX 30 burner / K-PAA 30
boiler & PBMAX 30 burner

Nominal output: 29.2 kW Fuel: C1 (wood pellets)

Deadlines: Date of receipt: 2014.01.27

Date of testing: 2014.03.03 – 2014.04.28

Procedure: Testing of biofuel boiler according to DS/EN 303-5:2012.**Result:** Requirements in DS/EN 303-5:2012 Class 5 were met.**Remarks:** See page 2. This is a translated report in case of doubt the Danish report from 2014.04.30 prevails.**Terms:** Testing has been carried out on the conditions stated overleaf in compliance with the guidelines laid down for the laboratory by DANAK cf. www.danak.dk and in compliance with DTI's General Terms and Conditions Regarding Commissioned Work Accepted by the Danish Technological Institute (DTI), February 2013. The test results apply to the tested samples only. This test report may be reproduced in extracts only if the laboratory has approved the extract in writing.**Origin:** Danish Technological Institute, Energy Laboratory**Signature:**Anette S. Brønnum
M. Sc.



Appendices:

- a) Drawings of the biofuel boiler: 01/2014 rev. 0 (2014.04.09), 050885 rev. 1 (2014.01.15)
- b) Photos of the biofuel boiler and control unit: 16 pcs. of unit and 14 pcs. of steering
- c) User instructions, installation guide, technical information: approved 2014.04.07
- d) Data plate: approved 2014.04.07
- e) Risk assessment verified 2014.04.30

The appendices are kept separately.

1 Remarks

In connection with testing 20 mm of glass wool isolation has been mounted on the door to the combustion chamber which appears on the delivered drawings.

Control of welded steel sheet boiler and electrical safety and EMC is not included in this report (see paragraph 4).

Particle emission is determined at in-stack sampling with turbular filter device. Drying before and after sampling for minimum 4 hours at 105 °C.

2 Description of biofuel boiler

The biofuel boiler consists of a Pellux 100/30 boiler & PBMAX 30 burner/K-PAA 30 boiler & PBMAX 30 burner.

The burner is mounted on the boiler front. The fuel is supplied by means of an inclined auger from an external fuel supply via a drop chute to the firebox, where the combustion takes place during supply of primary and secondary air.

The boiler's operation parameters are adjustable on the boiler's control panel. Pre settings from the factory are changeable in the service menu. Measurements of the boiler and flue gas temperatures are carried out continuously. The boiler is provided with electrical ignition.





The boiler is a welded steel sheet boiler with a convection unit consisting of eight vertical flue gas tubes, all with turbulators in full length. The boiler is not intended for firing with fire wood.

The biofuel boiler is provided with drop chute and a thermal safety device to prevent back-burning in the fuel supply.



Safety equipment:

Boiler temperature controller, type: Electronic
Safety temperature limiter, type: 8823 KNTP
Certification CR6 17/2003
Adjustment 95 °C
Safety device to prevent back-burning: Thermal switch on drop chute
Safety device to prevent back-burning: Drop chute > 250 mm

Stand-by power consumption (measured) 13 W

Settings of biofuel boiler during testing:

Temperature controller (nominal): 80 °C
Temperature controller (low load): 73 °C
(Further information on settings can be found in appendix)

Feeding system:

Type: External fuel supply with inclined auger conveyer
Fuel engine: SPG S8R25GX
Fuel feed duct: ø65 mm

Burner:

Type: aircooled hearth with fire resistant bearer
Breadth: ca. 200 mm
Depth: ca. 85 mm
Air fan: ebmpapst; RLD85/0034A7-3020LH-502 ki, 35 W

Boiler:

Type: Welded steel sheet boiler
Height: ca. 990 mm
Breadth: ca. 596 mm
Length: ca. 1153 mm
Water content: 70 l
Flue gas tube: ø127 mm
Flow connection: 5/4"
Return connection: 5/4"
Weight: 262 kg



3 Test equipments

Test rig and equipment are constructed in accordance with EN 303-5 and EN 304.

Rack A1			
Instrument	Type	Traceability	No.
Datalogger	HP 34970A	DANAK 200	270-A-2435
PC	Dell	-	-
CO meter	Sick Maihak Sidor	-	270-A-2429
CO/CO ₂ meter	Sick Maihak Sidor	-	270-A-2431
FID analyzer	Sick Maihak EuroFID		270-A-2433
NOx meter	ECO Physics CLD	-	270-A-2427
Pressure gauge	Autotran 700	ELAB	270-A-2441
Heated hose/probe	M&C	-	270-A-2480
Heated hose/probe	M&C	-	270-A-2481
Flue gas temperature sensor	Type K	ELAB	270-A-2485
Ambient temperature sensor	Type K	ELAB	270-A-2484

Rack B1			
Instrument	Type	Traceability	No.
Datalogger	HP 34970A	DANAK 200	270-A-2436
PC	Dell	-	-
CO meter	Sick Maihak Sidor	-	270-A-2430
CO/CO ₂ meter	Sick Maihak Sidor	-	270-A-2432
FID analyzer	Sick Maihak EuroFID		270-A-2434
NOx meter	ECO Physics CLD	-	270-A-2428
Pressure gauge	Autotran 700	ELAB	270-A-2479
Heated hose/probe	M&C	-	270-A-2482
Heated hose/probe	M&C	-	270-A-2483
Flue gas temperature sensor	Type K	ELAB	270-A-2488
Ambient temperature sensor	Type K	ELAB	270-A-2487

Test stand 2			
Instrument	Type	Traceability	No.
Water flow meter	0-3,2 m ³ /h	DANAK 200	270-A-1511
Water temperature sensor	Pt100 (forward)	DANAK 200	270-A-2285
Water temperature sensor	Pt100 (return)	DANAK 200	270-A-2286
Gas meter	IGA AC-5M	DANAK 207	270-A-1475

Other equipment			
Instrument	Type	Traceability	No.
Adiabatic calorimeter	-	IVC, Kemi	-
Spangas, C ₃ H ₈	AGA	Swedac	270-A-2294
Spangas, CO/CO ₂	AGA	Swedac	270-A-1727
Spangas, NO/SO ₂	AGA	Swedac	270-A-1725

Report no.: 300-ELAB-2053
Date: 2014.05.05
Init.: RSL/LSHA
File:

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Pellux 100_30_ENG.docx



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Zero gas, N ₂	AGA	Swedac	270-A-1731
Data acquisition software	N.I. Labview	-	TI-DOP ver. II
Dust measurement equipment	Ströhlein	-	270-A-1330
Surface thermometer	Technoterm 5500	DANAK 200	270-A-976
Water gauge	ELAB	-	270-A-1759
Weight (dust)	Mettler XS 204	ELAB	ID: 7084
Weight (moisture)	Mettler PC 440	ELAB	270-A-947
Weight (fuel)	Sauter 60 kg	ELAB	270-A-484
Weight (boiler)	Mettler IND 560	ELAB	270-A-0551



4 Requirements on construction etc.

	Reference paragraph in EN303-5	Requirement met
4.1 General requirements		
Safety during normal use	4.1	Yes
4.2 Requirement on documentation		
Drawings	4.2.1.1	Yes
Quality manual	4.2.1.2	Yes
Data plate	7.1-7.2	Yes
Technical information	8.2	Yes
User's instructions	8.3	Yes
Risk evaluation	4.3.1	Yes
4.3 Requirement on welded steel sheet boiler		
Execution of welding work	4.2.2.1	*
Welding seams and fillers	4.2.2.2	*
Parts of steel subject to pressure	4.2.2.3	*
Smallest wall thickness and tolerances	4.2.2.4	*
4.4 Requirement on safety and design		
Venting etc.	4.2.4.1	Yes
Cleaning of heating surfaces	4.2.4.2	Yes
Inspection of the flame	4.2.4.3	Yes
Water tightness	4.2.4.4	Yes
Spare parts	4.2.4.5	Yes
Water side connections	4.2.4.6	Yes
Thermostat pockets	4.2.4.7	Yes
Thermal insulation	4.2.4.8	Yes
Water side resistance	4.2.4.9	Yes
Storage hopper	4.2.4.10	Not relevant
Firebox	4.2.4.11	Yes
Ash chamber	4.2.4.12	Yes
Over feeding and interruption in stoking	4.3.4	Yes
Supply of combustion air	4.3.5	Yes
Surface temperatures on available parts	4.3.6	Yes
Leakage of combustion products	4.3.7	Yes
4.5 Safety requirements regarding stoking		
General	4.3.3.1	Yes
Manual stoking	4.3.2	Not relevant
Automatic stoking	4.3.3	Yes
Thermal conduction	4.3.3.2	Yes



Backflow of inflammable flue gases	4.3.3.3	Yes
Spreading of fire in fuel line	4.3.3.4	Yes
Alternative solutions against backburning	4.3.3.5	Not relevant
4.6 Safety requirements regarding automatic stoking		
Requirements for temperature control at open vented systems	4.3.8.2	Yes
Requirements for temperature control at closed vented systems	4.3.8.3	Yes ¹
Fittings	4.3.9.1	Yes
Electrical safety	4.3.9.2	*
Electromagnetic compatibility, EMC	4.3.9.3	*

¹ Only relevant when stoking automatically

* Not included in this report. We refer to the manufacturer's EU declaration of conformity



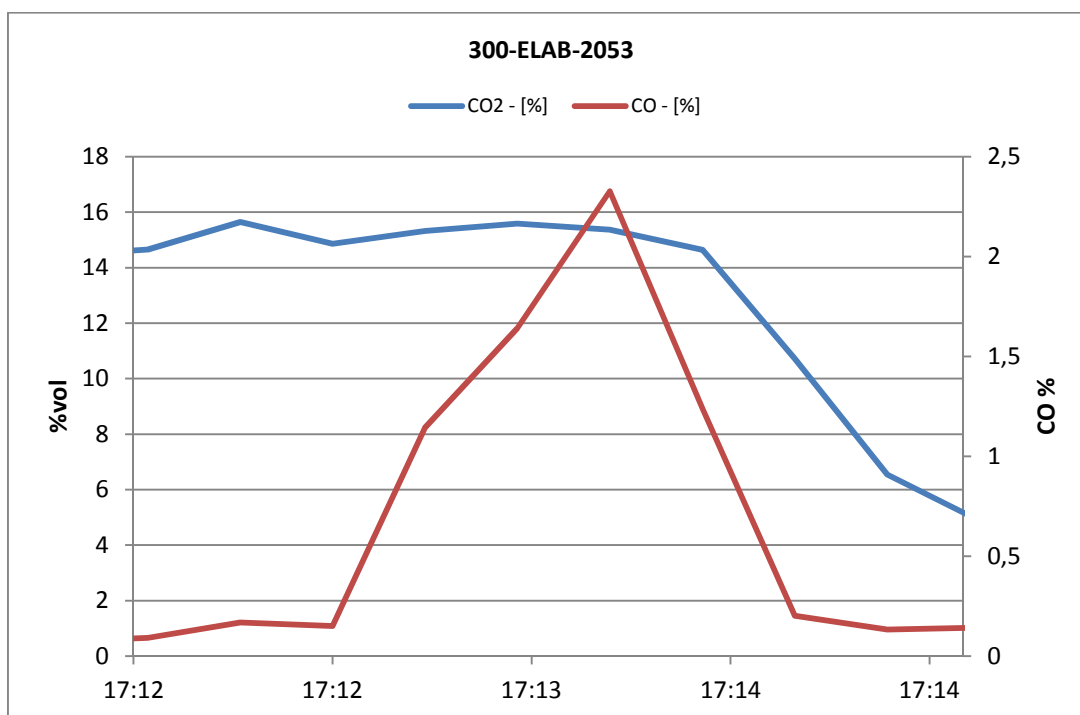
5 Test results

5.1 Water side resistance

Equivalent temperature difference at nominal output	Water flow	Drop of pressure
20 K	1.3 m ³ /h	6 mbar
10 K	2.5 m ³ /h	17 mbar

5.2 Disconnection of air fan

	Measured CO	Allowed CO
Disconnection of air fan	2.3 % _{vol}	5 % _{vol}



Test of air fan disraption.

5.3 Surface temperatures

	Measured temperature	Allowed limit
Boiler doors etc., avarage of 5 measurements	29 °C	+ 100 K
Boiler's underside, average of 5 measurements	40 °C	+ 65 K
Handles being touched during operation		
Metal and similar materials	32 °C	+ 35 K
Porcelain and similar materials	-	+ 45 K
Plastic and similar materials	-	+ 60 K
Boiler's average surface temperature		



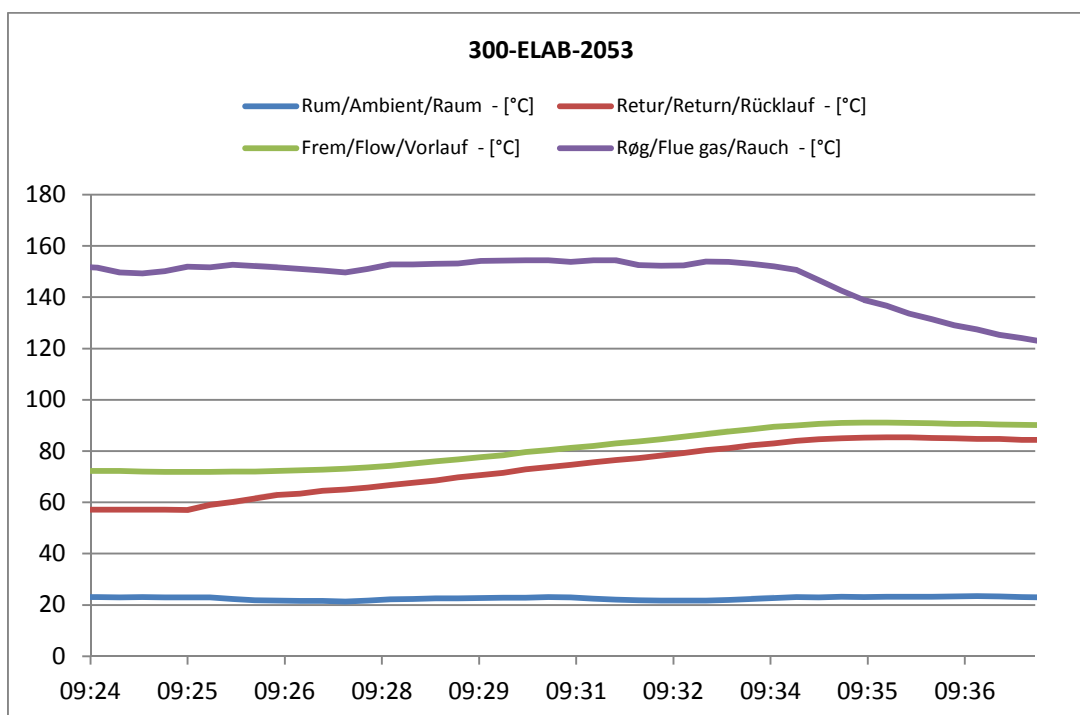
Average of 10 spot measurements	29 °C	-
Ambient temperature	22 °C	-

5.4 Function check

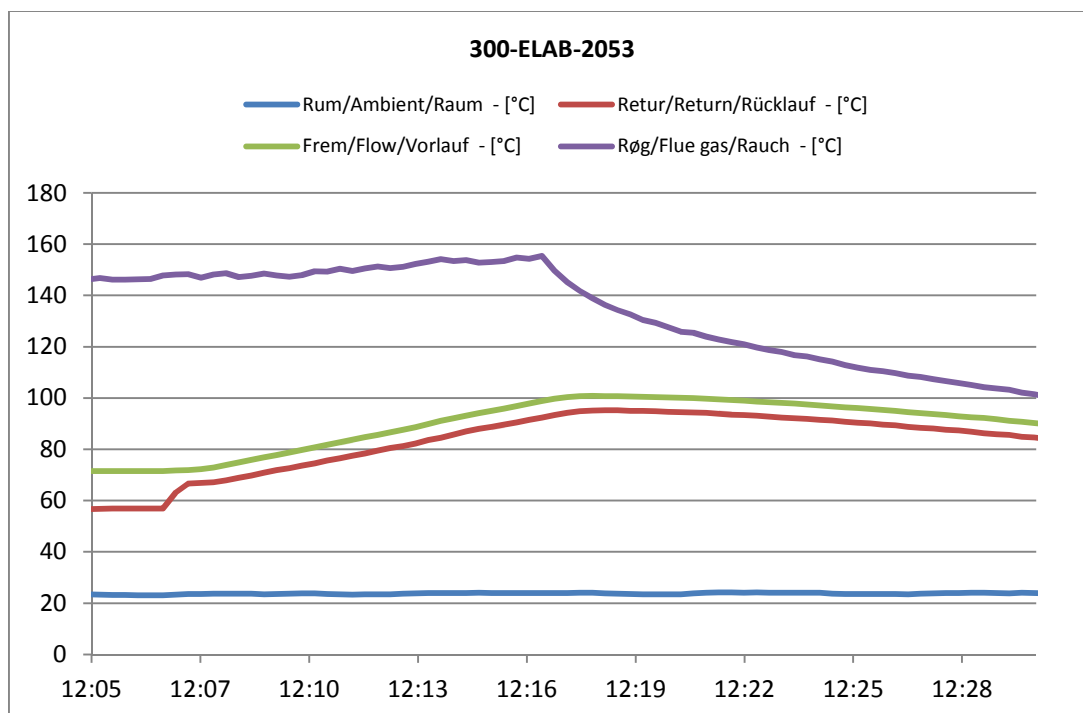
Stoking system is fully disconnectable, DS/EN303-5 paragraph 4.3.8.3 a), therefore the safety equipment includes a temperature controller and a safety temperature limiter with a manual reset device.

The thermostats of the boiler are tested in accordance with DS/EN303-5 paragraph 5.13. Loss of power supply is controlled in accordance with paragraph 5.14.

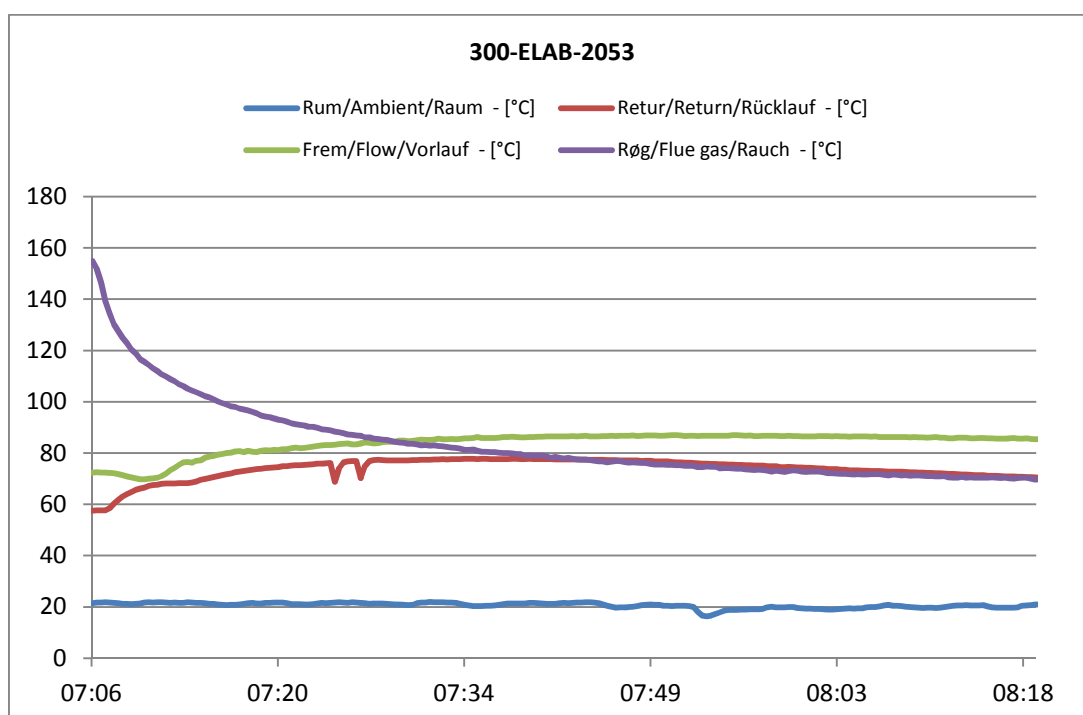
	Measured temperature	Allowed limit
Temperature controller	91 °C	100 °C
Safety temperature limiter	100 °C	110 °C



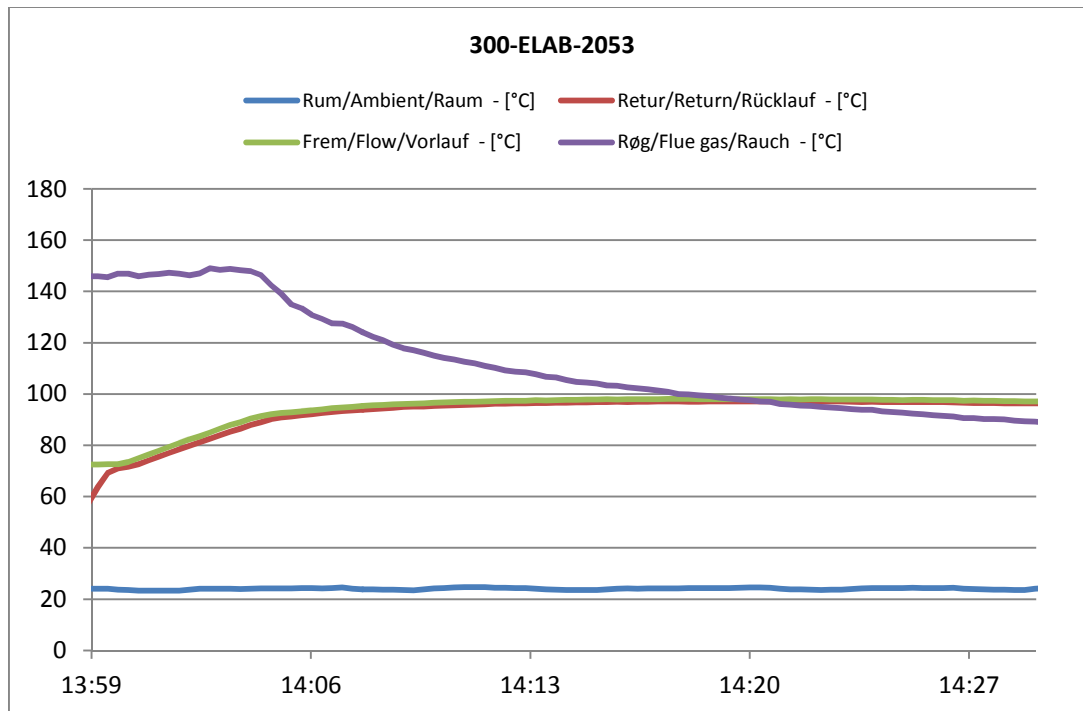
Test of temperature controller



Test of safety temperature limiter



Test of power failure



Test of loss of effect

5.5 Pressure test of boiler shell

The necessary tests cf. DS/EN303-5 paragraph 5.4 are carried out by the manufacturer.

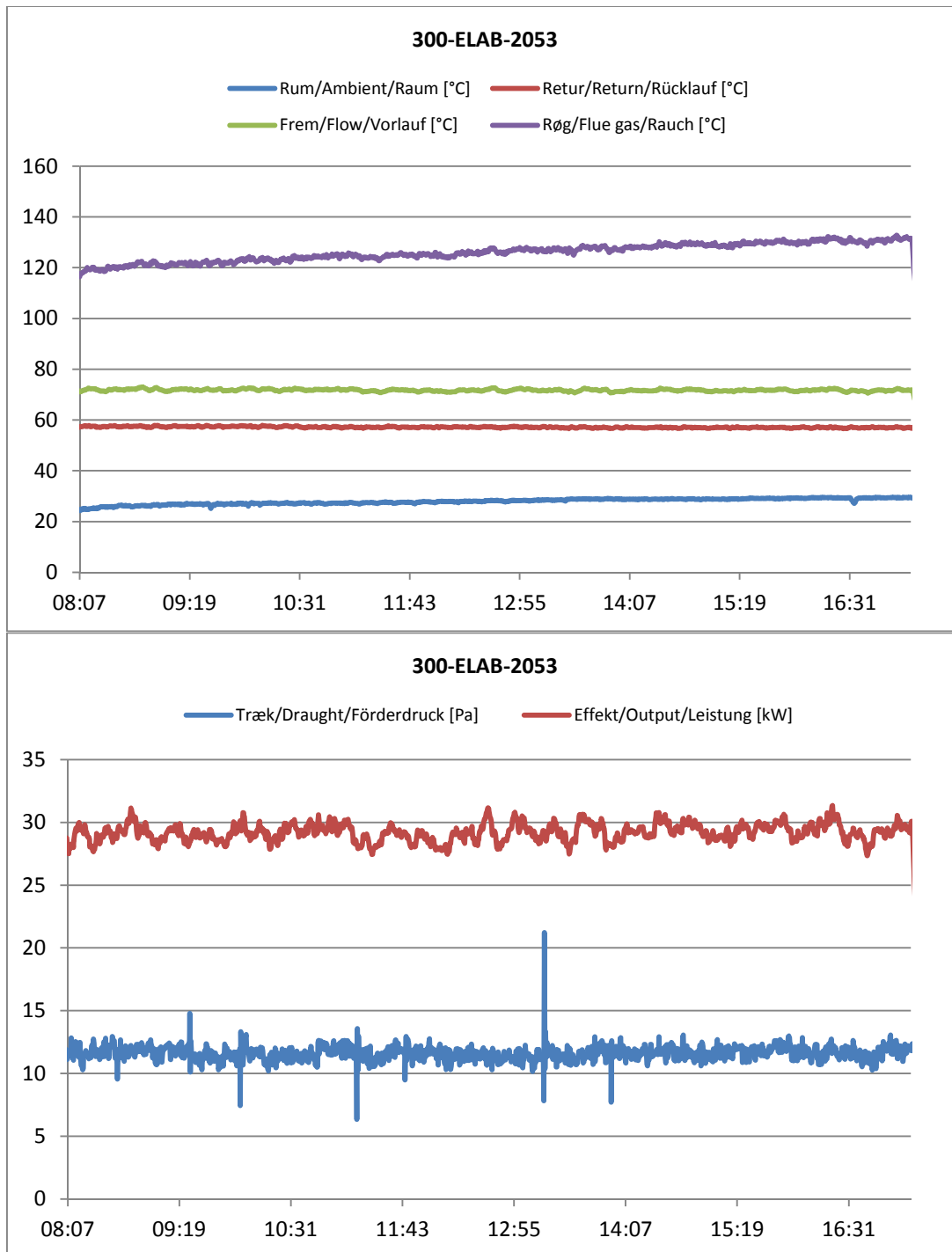


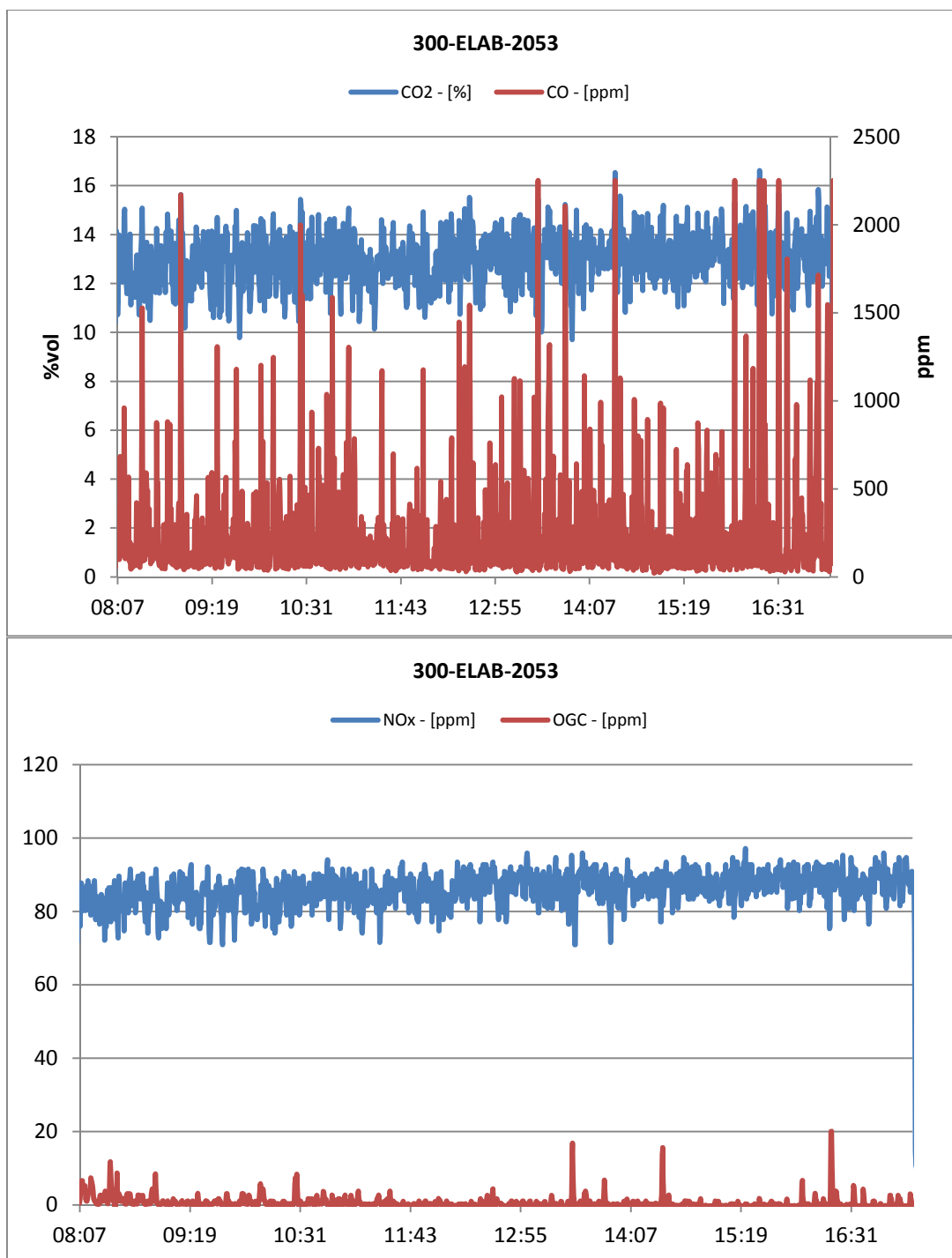
5.6 Test results at nominal output

Measurement	Result	Requirement
Return temperature	57.18 °C	
Flow temperature	71.76 °C	
Water flow	1.75 m ³ /h	
Heat output	29.21 kW	
Test duration	9.07 h	
Power consumption	53.26 W	
Fuel consumption	6.54 kg/h	
Water content	7.1 %	
Calorific value	17710 J/g	
Heat input	32.19 kW	
Efficiency	90.7 %	88,5 (Class 5) 88,5 (Denmark) 84 (Austria)
Ambient temperature	28 °C	
Flue gas temperature	126 °C	
Chimney draught	12 Pa	
Flue gas volume flow	71.6 m ³ /h	
Flue gas mass flow	63.7 kg/h	
CO ₂	13.0 % _{vol}	
Dust measured	35 mg/m ³	
Dust at 10 % O ₂	29 mg/m ³	40 (Class 5)
Dust at 13 % O ₂	0.02 g/m ³	0,1/0,02* (Germany)
Dust emission	13 mg/MJ	40/20* (Austria)
CO measured	0.0232 % _{vol}	
CO at 10 % O ₂	0.0188 % _{vol}	
CO at 10 % O ₂	235 mg/m ³	500 (Class 5)
CO at 13 % O ₂	0.1706 g/m ³	0,5/0,4* (Germany)
CO at 13 % O ₂	171 mg/m ³	300 (Schwitzerland)
CO emission	110 mg/MJ	250 (Austria)
NO _x (NO ₂) at 10 % O ₂	0.0070 % _{vol}	
NO _x (NO ₂) at 10 % O ₂	143 mg/m ³	
NO _x emission (NO ₂)	67 mg/MJ	150/100* (Austria)
OGC (C ₃ H ₈) at 10 % O ₂	< 0.0004 % _{vol}	
OGC (C) at 10 % O ₂	< 6 mg/m ³	20 (Class 5)
OGC emission (C)	< 3 mg/MJ	30 (Austria)

All emission values are stated on the basis of dry flue gas.

*: Limit values take effect from 2015.1.1







5.7 Test results at lowest output

Measurement	Result	Requirement
Return temperature	56.39 °C	
Flow temperature	71.52 °C	
Water flow	0.51 m ³ /h	
Heat output	8.76 kW	
Test duration	6.15 h	
Power consumption	21.67 W	
Fuel consumption	1.94 kg/h	
Water content	7.1 %	
Calorific value	17701 J/g	
Heat input	9.55 kW	
Efficiency	91.8 %	88 (Class 5) 88 (Denmark) 84 (Austria)
Ambient temperature	22 °C	
Flue gas temperature	61 °C	
Chimney draught	4 Pa	
Flue gas volume flow	26.2 m ³ /h	
Flue gas mass flow	27.7 kg/h	
CO ₂	7.9 % _{vol}	
Dust measured	30 mg/m ³	
Dust at 10 % O ₂	39 mg/m ³	40 (Class 5)
Dust at 13 % O ₂	0.03 g/m ³	0.1/0.02* (Germany)
Dust emission	17 mg/MJ	60/30* (Austria)
CO measured	0.0296 % _{vol}	
CO at 10 % O ₂	0.0389 % _{vol}	
CO at 10 % O ₂	486 mg/m ³	500 (Class 5)
CO at 13 % O ₂	0.3535 g/m ³	0.5/0.4* (Germany)
CO at 13 % O ₂	353 mg/m ³	300 (Schweizterland)
CO emission	214 mg/MJ	375 (Austria)
NO _x (NO ₂) at 10 % O ₂	0.0066 % _{vol}	
NO _x (NO ₂) at 10 % O ₂	136 mg/m ³	
NO _x emission (NO ₂)	60 mg/MJ	150/100* (Austria)
OGC (C ₃ H ₈) at 10 % O ₂	0.0012 % _{vol}	
OGC (C) at 10 % O ₂	20 mg/m ³	20 (Class 5)
OGC emission (C)	9 mg/MJ	40 (Austria)

All emission values are stated on the basis of dry flue gas.

*: Limit values take effect from 2015.1.1

