

**Report No. K 3224 2022 T1**  
**Residential space heating appliances**  
**Type testing**  
**DIN EN 14785**

Types:  
**AP004N\_4\_06, AP004N\_4\_07, AP004N\_4\_08**

Trademark:  
**PALAZZETTI**

Company:  
**PALAZZETTI LELIO S.p.A.**



Deutsche  
Akkreditierungsstelle  
D-PL-11120-04-00

This accreditation is valid only for the listed standards as stated in the accreditation annex of D-PL-11120-04-00

**This report may only be published and forwarded to third parties in its complete, unabridged form. The publication or dissemination of extracts, summaries, appraisals or any other adaptation and alterations, in particular for advertising purposes, is only permissible with the prior written permission of TÜV Rheinland.**  
**Publication of page 2 is permitted.**

**The test results presented in this report refer solely to the test object stated as described on page 2. The report does not represent a general statement about the serial production of the test object and gives not an authorization for use of a TÜV Rheinland test- / certification mark.**

**Type testing**  
**Residential space heating appliances fired by wood pellets**  
**DIN EN 14785: September 2006**  
**Correction 1 DIN EN 14785: October 2007**

Applicant/contractor: **PALAZZETTI LELIO S.p.A.**  
Via Roveredo, 103  
33080 Porcia (PN) - Italy

Trademark: **PALAZZETTI**

Description of the appliances: Residential space heating appliances fired by wood pellets without water heat exchanger for domestic central heating system, with fan assisted flue discharge and with internal fuel hopper.

Type designations:	<b>AP004N_4_06</b>	<b>AP004N_4_07</b>	<b>AP004N_4_08</b>
Total heat input:	2,7 kW – 6,5 kW	2,7 kW – 7,8 kW	2,7 kW – 9,2 kW
Total heat output:	2,4 kW – 6,0 kW	2,4 kW – 7,0 kW	2,4 kW – 8,2 kW
Water heat output:	Not applicable.		
Test fuel:	Wood pellets Ø 6 mm, Lmax 30 mm, max humidity 6,18%, Norica, class A1 according to EN 17225-2		
Type of fuel charging:	Automatic load.		

**Remarks:**

-

**Test results:**

The technical requirements cl. 4-8 of the above-mentioned standard are fulfilled. The local applicable installation conditions have to be observed.

The electrical safety cl. 5.9. of the standard was not a part of this initial type testing.

The presumption of conformity with the relevant European Directives respectively Regulations could only be confirmed by full compliance with Annex ZA.

Dated in Cologne, 2022-04-11  
432 / mc

TÜV Rheinland Energy GmbH  
Test Centre according to Construction  
Product Regulation 305/2011(CPR)  
Notified Body: 2456

Assessor:

Report released after review:



Dipl.-Ing. M. Ciccarelli

Dipl.-Ing. M. Reimbold

Residential space heating appliances fired by wood pellets, Initial Type Test in accordance with the regulation 305/2011  
conformity certification system no. 3

## 1 Task

The Test Centre for Energy Appliances was instructed to execute the initial type testing on the appliances **AP004N\_4\_06** and **AP004N\_4\_08** for the operation with wood pellets according to DIN EN 14785:2006, cl. 4-8. The electrical safety cl. 5.9. of the standard was not a part of this initial type testing.

The practical tests were carried out by the laboratory CMC Centro Misure Compatibilità S.r.l., via della Fisica 20, Thiene (VI) – Italy, on the 16<sup>th</sup>, on the 17<sup>th</sup> and on the 18<sup>th</sup> of February 2022.

## 2 Description of the appliances

### 2.1 Construction

Residential space heating appliances fired by wood pellets without water heat exchanger.

The flue discharge for pellet operation is fan assisted.

The appliances are equipped with an automatic ignition.

The stoves are equipped with horizontal (backside) flue gas outlet.

The appliances are equipped with a frontal convection hot air fan: the user can adjust the speed of the ambient blower from power off to maximum speed.

**AP004N\_4\_06**, **AP004N\_4\_07** and **AP004N\_4\_08** are all identical each other, except than for software combustion parameters at nominal load power.

AP004N\_4\_07 combustion data at nominal load power are linearly interpolated between AP004N\_4\_06 and AP004N\_4\_08 nominal load data.

### 2.2 General technical data of the pellet stoves

Type designations:	AP004N_4_06	AP004N_4_07	AP004N_4_08
Nominal power:	6,0 kW	7,0 kW	8,2 kW
Test fuel:	Wood pellets Ø 6 mm, Lmax 30 mm, max humidity 6,18%, Norica, class A1 according to EN 17225-2.		
Total dimension: Height x Width x Depth	1020 x 531 x 496 mm		
Flue spigot:	80 mm		
Weight:	100 kg		
Distance of adjacent combustible materials:	100 mm (Backside) distance from test wall 200 mm (Side) distance from test wall 800 mm (Front) distance from test wall		

For more information see appendix A02, A04, A06.

### 2.3 Photos of the tested appliance



### 3 Testing

#### 3.1 General requirements

- P (pass)
- NA (not applicable)
- NT (not tested)
- F (fail)

Requirement acc. EN 14785	Clause	Tested Acc.	Requirement Complies
Production documentation	4.1	-	P
General construction requirements	4.2	A.4.7	P
Flue spigot or socket	4.3	-	P
Combustion control device	4.4	-	P
Flue ways	4.5	-	P
Cleaning tools	4.6	-	P
Fire doors	4.7	-	P
Combustion air supply	4.8	-	P
- Primary air inlet control	4.8.1	-	
- Secondary air inlet control	4.8.2	-	
Internal flue gas diverter	4.9	-	NA
Retort	4.10	-	P
Ash pan and ash removal	4.11	-	P
Integral boiler	4.12	A 4.9.2	NA
- General construction material	4.12.1		NA
- Nominal minimum wall thickness (steel)	4.12.2		NA
- Welding seams and welding fillers	4.12.3		NA
- Minimum wall thicknesses (cast iron)	4.12.4		NA
- Cast iron parts subject to water pressure	4.12.5		NA
- Venting of water sections	4.12.6		NA
- Water tightness	4.12.7		NA
- Water side connections	4.12.8		NA
- Boiler internal waterways	4.12.9		NA
- Design of all water boilers	4.12.9.1		NA
- Boiler waterways used with indirect water systems	4.12.9.2		NA
- Boiler waterways used with direct water systems	4.12.9.3		NA
Control of flue gas	4.13	-	NA
Cleaning of heating surfaces	4.14	-	P

### 3.2 Safety

Requirement acc. EN 14785	Clause	Tested Acc.	Requirement Complies
Temperatures of adjacent combustible materials	5.1	A.4.7 A.4.9	P
Operating tools	5.2	A.4.7	P
Safety test for spillage of combustion gas and discharge of embers	5.3	A.4.7 A.4.9	P
Temperature in the fuel hopper	5.4	A.4.9.1	P
Safety against back burning through the fuel conveyor system	5.5	A.4.9.1	P
Safety against overheating the boiler system	5.6	-	NA
Thermal discharge control	5.7	A.4.9.3	NA
Strength and leak tightness of boiler shells	5.8	A.4.7 A.4.9.2	NA
Electrical safety	5.9	EN 50165	NT

### 3.3 Performance

Requirement acc. EN 14785	Clause	Tested Acc.	Requirement Complies
Flue draught	6.1	-	P
Flue gas temperature	6.2	A.4.7 A.4.8	P
Carbon monoxide emissions for pellet stoves	6.3	A.4.7 A.4.8	P
Efficient energy utilisation	6.4		
- General	6.4.1	A.4.7	P
- Efficiency at nominal heat output and at reduced heat output	6.4.2	A.4.8	P
Nominal heat output	6.5	A.4.7	P
Reduced heat output	6.6	A.4.8	P
Water heating output	6.7	A.4.7	NA
Space heating output	6.8	A.4.7	P
Capacity of fuel storage	6.9	A.4.7 A.4.8	P
User operations	6.10	A.4.7	P

### 3.4 Appliance instructions and marking

Requirement acc. EN 14785	Clause	Tested Acc.	Requirement Complies
General	7.1	-	P
Installation instructions	7.2	-	P
User operating instructions	7.3	-	P
Marking	8.0	-	P

### 3.5 Evaluation of conformity

Requirement acc. EN 14785	Clause	Tested Acc.	Requirement Complies
General	9.1		P
Type testing	9.2		
- Initial type testing	9.2.1		P
- Further type testing	9.2.2		-
Factory production control (FPC)	9.3		
- General	9.3.1		
- Raw materials and components	9.3.2		
- Control of inspection, meas. And test equipment	9.3.3		
- Process control	9.3.4		
- Product inspection, testing and evaluation	9.3.5		
- Material of construction	9.3.5.1		
- Insulation material	9.3.5.2		
- Seals and sealant materials	9.3.5.3		
- Manufacturing checks	9.3.5.4		
- Construction and dimensions	9.3.5.4.1		
- Other checks	9.3.5.4.2		
- Non conforming products	9.3.6		
- Corrective and preventive action	9.3.7		
- Handling, storage, packaging, preservation and delivery	9.3.8		

### 3.6 Resume of test results

AP004N_4_06		Nominal	Partial	Requirement
Mass of the test fuel fired hourly	kg/h	1,390	0,565	-
Flue gas mass flow	g/s	3,75	2,93	-
Flue gas temperature	°C	162,6	92,5	-
Flue draught	mbar	0,12	0,10	0,12/0,10 +/-0,02 or declared value
CO <sub>2</sub> -concentration	Vol.-%	12,4	6,2	-
O <sub>2</sub> -concentration	Vol.-%	8,3	14,7	-
CO-concentration	ppm	45	188	-
CO-emission (at 13%-O <sub>2</sub> )	mg/m <sup>3</sup>	35	297	500/750
CO-emission	mg/kWh	82	689	-
CO-emission	mg/MJ	23	191	-
NO <sub>x</sub> -concentration	ppm	76	25	-
NO <sub>x</sub> -emission (at 13%-O <sub>2</sub> )	mg/m <sup>3</sup>	99	64	-
NO <sub>x</sub> -emission	mg/kWh	229	148	-
NO <sub>x</sub> -emission	mg/MJ	64	41	-
CnHm-concentration measured acc. to CEN/TS 15883	ppm	2	2	-
CnHm-emission (at 13%-O <sub>2</sub> )	mg/m <sup>3</sup>	2	4	-
CnHm-emission	mg/kWh	5	10	-
CnHm-emission	mg/MJ	2	3	-
Dust concentration measured acc. to CEN/TS 15883 and EN13284-1 *	mg	6	1	-
Dust emission (at 13%-O <sub>2</sub> )	mg/m <sup>3</sup>	13	5	-
Dust emission	mg/kWh	30	12	-
Dust emission	mg/MJ	8	3	-
Total heat input	kW	6,5	2,7	-
Total heat output	kW	6,0	2,4	-
Water heat output	kW	-	-	-
Space heat output	kW	6,0	2,4	-
Efficiency	%	91,2	91,7	75/70 (EN14785)

\*) Average of 3 samples, based on separate calculation.



<b>AP004N_4_07</b>		<b>Nominal</b>	<b>Partial</b>	<b>Requirement</b>
Mass of the test fuel fired hourly	kg/h	1,651	0,565	-
Flue gas mass flow	g/s	4,19	2,93	-
Flue gas temperature	°C	184,3	92,5	-
Flue draught	mbar	0,12	0,10	0,12/0,10 +/-0,02 or declared value
CO <sub>2</sub> -concentration	Vol.-%	13,2	6,2	-
O <sub>2</sub> -concentration	Vol.-%	7,5	14,7	-
CO-concentration	ppm	53	188	-
CO-emission (at 13%-O <sub>2</sub> )	mg/m <sup>3</sup>	39	297	500/750
CO-emission	mg/kWh	89	689	-
CO-emission	mg/MJ	25	191	-
NO <sub>x</sub> -concentration	ppm	81	25	-
NO <sub>x</sub> -emission (at 13%-O <sub>2</sub> )	mg/m <sup>3</sup>	99	64	-
NO <sub>x</sub> -emission	mg/kWh	229	148	-
NO <sub>x</sub> -emission	mg/MJ	64	41	-
CnHm-concentration measured acc. to CEN/TS 15883	ppm	3	2	-
CnHm-emission (at 13%-O <sub>2</sub> )	mg/m <sup>3</sup>	2	4	-
CnHm-emission	mg/kWh	6	10	-
CnHm-emission	mg/MJ	2	3	-
Dust concentration measured acc. to CEN/TS 15883 and EN13284-1 *	mg	6	1	-
Dust emission (at 13%-O <sub>2</sub> )	mg/m <sup>3</sup>	13	5	-
Dust emission	mg/kWh	30	12	-
Dust emission	mg/MJ	8	3	-
Total heat input	kW	7,8	2,7	-
Total heat output	kW	7,0	2,4	-
Water heat output	kW	-	-	-
Space heat output	kW	7,0	2,4	-
Efficiency	%	90,4	91,7	75/70 (EN14785)

\*) Average of 3 samples, based on separate calculation.

<b>AP004N_4_08</b>		<b>Nominal</b>	<b>Partial</b>	<b>Requirement</b>
Mass of the test fuel fired hourly	kg/h	1,950	0,565	-
Flue gas mass flow	g/s	4,69	2,93	-
Flue gas temperature	°C	209,0	92,5	-
Flue draught	mbar	0,12	0,10	0,12/0,10 +/-0,02 or declared value
CO <sub>2</sub> -concentration	Vol.-%	14,1	6,2	-
O <sub>2</sub> -concentration	Vol.-%	6,6	14,7	-
CO-concentration	ppm	62	188	-
CO-emission (at 13%-O <sub>2</sub> )	mg/m <sup>3</sup>	42	297	500/750
CO-emission	mg/kWh	98	689	-
CO-emission	mg/MJ	27	191	-
NO <sub>x</sub> -concentration	ppm	87	25	-
NO <sub>x</sub> -emission (at 13%-O <sub>2</sub> )	mg/m <sup>3</sup>	99	64	-
NO <sub>x</sub> -emission	mg/kWh	230	148	-
NO <sub>x</sub> -emission	mg/MJ	64	41	-
CnHm-concentration measured acc. to CEN/TS 15883	ppm	3	2	-
CnHm-emission (at 13%-O <sub>2</sub> )	mg/m <sup>3</sup>	2	4	-
CnHm-emission	mg/kWh	6	10	-
CnHm-emission	mg/MJ	2	3	-
Dust concentration measured acc. to CEN/TS 15883 and EN13284-1 *	mg	7	1	-
Dust emission (at 13%-O <sub>2</sub> )	mg/m <sup>3</sup>	13	5	-
Dust emission	mg/kWh	31	12	-
Dust emission	mg/MJ	9	3	-
Total heat input	kW	9,2	2,7	-
Total heat output	kW	8,2	2,4	-
Water heat output	kW	-	-	-
Space heat output	kW	8,2	2,4	-
Efficiency	%	89,5	91,7	75/70 (EN14785)

\*) Average of 3 samples, based on separate calculation.

### 3.7 Temperatures

AP004N_4_06, AP004N_4_07, AP004N_4_08			
Maximum temperatures at trihedron:			
- Right side	°C	58,8	65 K over $t_{\text{ambient}}$
- Back side	°C	38,5	65 K over $t_{\text{ambient}}$
- Front side	°C	74,8	65 K over $t_{\text{ambient}}$
- Floor	°C	55,5	65 K over $t_{\text{ambient}}$
Distances:			
- Backside-Pelletstove	mm	100	
- Side-Pelletstove	mm	200	
- Front-Pelletstove	mm	800	
Ambient temperature	°C	25,8	
Max. temperature in fuel hopper	°C	83,4	65 K over $t_{\text{ambient}}$
Max. temperature of operating tools (handle of fuel hopper)	°C	54,3	35 K over $t_{\text{ambient}}$
Max. temperature of operating tools (control panel)		49,1	35 K over $t_{\text{ambient}}$

For detailed test results see appendix A02, A04, A06.

## **4 Statement of the test results**

The appliances

**AP004N\_4\_06, AP004N\_4\_07, AP004N\_4\_08**

of the company

**PALAZZETTI LELIO S.p.A.**

comply for the operation with wood pellets with the requirements acc.  
DIN EN 14785: September 2006, cl.4-8.

The technical requirements cl. 4-8 of the above-mentioned standard are fulfilled. The local applicable installation conditions have to be observed.

The electrical safety cl. 5.9. of the standard was not a part of this initial type testing.

The presumption of conformity with the relevant European Directives respectively Regulations could only be confirmed by full compliance with Annex ZA.

The test results presented in this report refer solely to the test object stated as described on page 2. The report does not represent a general statement about the serial production of the test object and gives not an authorization for use of a TÜV Rheinland test- / certification mark.

## 5 Test documents

Appendix 01 Fuel Data

Appendix 02 Test results

Appendix 03 Measurement Instruments

TÜV Rheinland Energy GmbH declines any responsibility derived from missing or wrong informations in the documents provided by the applicant.

Appendix	Subject	Reference
A04	Type labels	-
A05	Essential requirements EN 14785	01/04/2022
A06	Instruction and installation manual	004779050 - 31/03/2022
A07	List of electrical components	01/04/2022
A08.1	Ambient fan IPC	FLH190 CFXMAX0018
A08.2	Ambient fan EBM (alternative component)	R4S190-AC04-05
A09	Exhaust gas fan IPC	AVH2A1502B1131
A10	Gear motor IPC	GMF210D901
A11	Ignition resistance FKK	PSX-2-240-B
A12	Temperature cut-out IMIT	05/12/3382
A13.1	Pressure switch HUBA	27/08/1901
A13.2	Pressure switch Cleveland (alternative component)	NS2
A14.1	Safety electrical circuit Fumis ALPHA	41/230
A14.2	Safety electrical circuit Fumis ALPHA (alternative component)	MB 60-230 V2
A14.3	Safety electrical circuit Fumis ALPHA (alternative component)	MB 65-230 V2
A14.4	Safety electrical circuit Fumis ALPHA (alternative component)	MB 70-230 V2
A14.5	Safety electrical circuit Fumis ALPHA (alternative component)	MB 75-230 V2
A15.1	Setup parameters AP004N_4_06	-
A15.2	Setup parameters AP004N_4_08	-
A16	Technical data glass Schott	Robax
A17	Technical data seals Tespe	-
A18	Overview drawings	-
A19	Pellet storage and pellet transport drawings	-
A20	Retort drawings	165510033

## Appendix 01

### Fuel data

Test at nominal load											
Verbrennungsrechnung aus der Elementaranalyse											
nach DIN EN 304 Teil 2, Ausgabe 01/2004											
nach DIN 4702 Teil 2, Ausgabe 3/1990											
Analysis from:		28/01/2022		Analysis No.		2200641-001		Fuel sampling date:		19/01/22	
Fuel:		wood pellets									
Bestandteil im Brennstoff	Stoffanteil	Sauerstoffbedarf		Abgasbestandteile aus Brennstoff in Nm³/kg Brennstoff							
		in Nm³ je kg Bestandteil	in Nm³ je kg Brennstoff	CO₂		SO₂		H₂O		N₂	
	Gew. %		Stoffanteil x	in Nm³ je kg Bestandteil	in Nm³ je kg Brennstoff	in Nm³ je kg Bestandteil	in Nm³ je kg Brennstoff	in Nm³ je kg Bestandteil	in Nm³ je kg Brennstoff	in Nm³ je kg Bestandteil	in Nm³ je kg Brennstoff
c	46,100	1,860	0,857	1,850	0,8529	-	-	-	-	-	-
s	0,007	0,700	0,000	-	-	0,680	0,0000	-	-	-	-
h	5,630	5,550	0,312	-	-	-	-	11,100	0,6249	-	-
n	0,060	-	-	-	-	-	-	-	-	0,80	0,0005
o	41,800	-0,700	-0,293	-	-	-	-	-	-	-	-
wasser	6,180	-	-	-	-	-	-	1,240	0,0766	-	-
asche	0,200	-	-	-	-	-	-	-	-	-	-
summe	99,977	O min =	0,877	V CO₂ =	0,8529	V SO₂ =	0,0000	V W =	0,7016	V N₂ =	0,0005
Luftbedarf				L min = 4,1780 Nm³/kg Brennstoff							
trockene stöchiometrische Abgasmenge				V A tr min = 4,1535 Nm³/kg Brennstoff							
Max. Kohlenstoffdioxid-Anteil				CO₂ max = 20,5333 Vol.-%							
Wasserdampfmenge				V w = 0,7016 Nm³/kg Brennstoff							
				V A tr min/ L min = 0,9941							
Heizwert, wf				Hu = 18185 kJ/kg							
				5,051 kWh/kg							
Berechnungen zum Versuchszeitpunkt											
wasser zum Versuchszeitpunkt				w = 6,180 Gew. %							
Heizwert, roh zum Versuchszeitpunkt				Hu = 16910 kJ/kg							
Test at reduced load											
Verbrennungsrechnung aus der Elementaranalyse											
nach DIN EN 304 Teil 2, Ausgabe 01/2004											
nach DIN 4702 Teil 2, Ausgabe 3/1990											
Analysis from:		28/01/2022		Analysis No.		2200641-001		Fuel sampling date:		19/01/22	
Fuel:		wood pellets									
Bestandteil im Brennstoff	Stoffanteil	Sauerstoffbedarf		Abgasbestandteile aus Brennstoff in Nm³/kg Brennstoff							
		in Nm³ je kg Bestandteil	in Nm³ je kg Brennstoff	CO₂		SO₂		H₂O		N₂	
	Gew. %		Stoffanteil x	in Nm³ je kg Bestandteil	in Nm³ je kg Brennstoff	in Nm³ je kg Bestandteil	in Nm³ je kg Brennstoff	in Nm³ je kg Bestandteil	in Nm³ je kg Brennstoff	in Nm³ je kg Bestandteil	in Nm³ je kg Brennstoff
c	46,100	1,860	0,857	1,850	0,8529	-	-	-	-	-	-
s	0,007	0,700	0,000	-	-	0,680	0,0000	-	-	-	-
h	5,630	5,550	0,312	-	-	-	-	11,100	0,6249	-	-
n	0,060	-	-	-	-	-	-	-	-	0,80	0,0005
o	41,800	-0,700	-0,293	-	-	-	-	-	-	-	-
wasser	6,180	-	-	-	-	-	-	1,240	0,0766	-	-
asche	0,200	-	-	-	-	-	-	-	-	-	-
summe	99,977	O min =	0,877	V CO₂ =	0,8529	V SO₂ =	0,0000	V W =	0,7016	V N₂ =	0,0005
Luftbedarf				L min = 4,1780 Nm³/kg Brennstoff							
trockene stöchiometrische Abgasmenge				V A tr min = 4,1535 Nm³/kg Brennstoff							
Max. Kohlenstoffdioxid-Anteil				CO₂ max = 20,5333 Vol.-%							
Wasserdampfmenge				V w = 0,7016 Nm³/kg Brennstoff							
				V A tr min/ L min = 0,9941							
Heizwert, wf				Hu = 18185 kJ/kg							
				5,051 kWh/kg							
Berechnungen zum Versuchszeitpunkt											
wasser zum Versuchszeitpunkt				w = 6,180 Gew. %							
Heizwert, roh zum Versuchszeitpunkt				Hu = 16910 kJ/kg							

## Appendix 02

### Test results

Report- No.		K32242022T1		
TÜV- order- No.		21255366		
Manufacturer		PALAZZETTI LELIO S.p.A.		
Construction type		Residential space heating appliance fired by wood pellets without water heat exchanger. The flue discharge for pellet operation is fan assisted. The stove is equipped with an automatic ignition.		
max. working temperature	°C	Not applicable		
max. working pressure	bar	Not applicable		
Type of fuel charging		automatic load		
Special properties / Remarks		-		
Special properties		room air dependent		
Type designation		AP004N_4_06		
Model name		-		
Test place		CMC Centro Misure Compatibilità S.r.l., via della Fisica,		
Standard		DIN EN 14785:10.2006, Correction 1: 10.2007		
Type of test		Test at nominal load		
Heat input from manufacturer	kW	6,5		
Heat output from manufacturer	kW	6,0		
		1. test	2. test	Average
Test date		18/02/2022	18/02/2022	
Time		09:15 - 12:15	12:15 - 15:15	
Ambient:				
Barometric pressure	mbar	1005	1005	1005
Temperature of combustion air	°C	24,7	24,7	24,7
Ambient rel. humidity	%	45,0	45,0	45,0
Ambient temperature (room)	°C	24,7	24,7	24,7
Type of Fuel		wood pellets		
Properties of Fuel		Wood pellets Ø 6 mm, Lmax 30 mm, max humidity 6,18%, Norica, class A1 according to		
Number of fuel loadings		1	1	
Weight of the stove, start, measurement	kg	159,8	155,6	
Weight of the stove, end, measurement	kg	155,6	151,5	
Fuel consumption, calculated of the difference	kg	4,2	4,1	
Test duration	sec	10800	10800	
Fuel consumption "B"	kg/h	1,413	1,367	1,390
Calculation of losses in the ash (yes = 1, no = 0)	Gew. %	25,0	25,0	25,0
Residue passing through the grate, measurement	kg	0,00	0,00	0,00
Residue passing through the grate "R"	Gew. %	0,000	0,000	0,000
Carbon content of the residue passing through the grate "Cr" depending of 1 kg fuel	Gew. %	0,104	0,104	0,104
Water side, measurement				
Flow, measurement	°C	0,0	0,0	0,0
Return, measurement	°C	0,0	0,0	0,0
Delta T	K	0,0	0,0	0,0
Cold water flow, measurement	kg/h	0,0	0,0	0,0
Additional energy of the pump	kW	0,00	0,00	0,00
Flue, average				
Flue gas temperature, measurement	°C	162,3	163,0	162,6
Flue draught, measurement	Pa	12,0	12,0	12,0
O2 - concentration, calculated	Vol.-%	8,2	8,4	8,3
CO2 - concentration, measurement	Vol.-%	12,5	12,3	12,4
lambda value, l	-	1,637	1,663	1,650

CO - concentration, measurement	ppm	44	45	45
CO - concentration, measurement	Vol.-%	0,004	0,005	0,004
CO - concentration, measurement	mg/m³	55	56	56
CO - concentr. (at 13% - O2)	Vol.-%	0,003	0,003	0,003
CO - concentr. (at 13% - O2)	mg/m³	35	36	35
CO - concentration rel. to fuel input	mg/kWh	80	83	82
CO - concentration rel. to fuel input	mg/MJ	22	23	23
NOx - concentration, measurement	ppm	76	76	76
NOx - concentration, measurement	mg/m³	157	156	157
NOx - concentr. (at 13% - O2)	mg/m³	98	99	99
NOx - concentration rel. to fuel input	mg/kWh	227	231	229
NOx - concentration rel. to fuel input	mg/MJ	63	64	64
CnHm concentration, measurement	ppm	2	2	2
CnHm concentration, measurement	mg/m³	4	4	4
CnHm concentr. (at 13% - O2)	mg/m³	2	2	2
CnHm - concentration (total C) rel. to fuel input	mg/kWh	5	6	5
CnHm - concentration (total C) rel. to fuel input	mg/MJ	2	2	2
Dust, measurement*	mg	6		6
Dust, measurement*	mg/m³	21		21
Dust (at 13% - O2)*	mg/m³	13		13
Dust* rel. to fuel input	mg/kWh	30		30
Dust* rel. to fuel input	mg/MJ	8		8
PME concentration (at 13% - O2)*	mg/m³	14		14
<b>Electrical consumption</b>				
Rated electrical power (max)	W		360	
Electrical consumption (at nominal heat output)	W		45	
Electrical consumption (at minimum heat output)	W		25	
PSTBY (during stand-by)	W		1,1	
<b>Calculation</b>				
"Qa" loss free heating flue gas	kJ/kg	1430,5	1458,1	1444,3
"qa" loss flue gas	%	8,5	8,6	8,5
"Qb" loss fix heating in flue gas	kJ/kg	3,8	4,0	3,9
"qb" loss fix heating in flue gas	%	0,023	0,023	0,023
"Qr" losses due to combustible constituents in the residue passing through the grate	kJ/kg	0,0	0,0	0,0
"qr" losses due to combustible constituents in the residue passing through the grate	%	0,200	0,200	0,200
"m" flue gas mass flow	g/s	3,79	3,72	3,75
cpm, acc. DIN 4702-2, version 03.90 for dry flue gas	kJ/(m³K)	1,36	1,36	1,36
cpm-H2O	kJ/(m³K)	1,52	1,52	1,52
"eta" Efficiency (direct), to consider only water heating output Pw	%	not applicable	not applicable	not applicable
"eta" Efficiency (indirect)	%	91,3	91,2	91,2
Heating input	kW	6,6	6,4	6,5
"P" heating output, total	kW	6,1	5,9	6,0
"Pw" water heating output	kW	0,0	0,0	0,0
Space heating output: PSTR = P - Pw	kW	6,1	5,9	6,0
Space heating output, relating to heat input	%	91,3	91,2	91,2
Water heating output, relating to heat input	%	0,0	0,0	0,0
<b>Adjustments</b>				
Flue gas motor	rpm	1450	1450	
Ambient motor	volt	230	230	
Auger motor	sec	3,1 ON - 2,9 OFF	3,1 ON - 2,9 OFF	
Cleaning time	sec	OFF	OFF	
Fire door	pen / close	closed	closed	



Report- No.		K32242022T1		
TÜV- order- No.		21255366		
Manufacturer		PALAZZETTI LELIO S.p.A.		
Construction type		Residential space heating appliance fired by wood pellets without water heat exchanger. The flue discharge for pellet operation is fan assisted. The stove is equipped with an automatic ignition.		
max. working temperature	°C	Not applicable		
max. working pressure	bar	Not applicable		
Type of fuel charging		automatic load		
Special properties / Remarks		-		
Special properties		room air dependent		
Type designation		AP004N_4_08		
Model name		-		
Test place		CMC Centro Misure Compatibilità S.r.l., via della Fisica,		
Standard		DIN EN 14785:10.2006, Correction 1: 10.2007		
Type of test		Test at nominal load		
Heat input from manufacturer	kW	9,2		
Heat output from manufacturer	kW	8,2		
		1. test	2. test	Average
Test date		16/02/2022	17/02/2022	
Time		13:40 - 16:40	10:10 - 13:10	
Ambient:				
Barometric pressure	mbar	999	1005	1002
Temperature of combustion air	°C	25,3	26,1	25,7
Ambient rel. humidity	%	45,0	50,0	47,5
Ambient temperature (room)	°C	25,3	26,1	25,7
Type of Fuel		wood pellets		
Properties of Fuel		Wood pellets Ø 6 mm, Lmax 30 mm, max humidity 6,18%, Norica, class A1 according to		
Number of fuel loadings		1	1	
Weight of the stove, start, measurement	kg	158,6	157,4	
Weight of the stove, end, measurement	kg	152,9	151,5	
Fuel consumption, calculated of the difference	kg	5,8	5,9	
Test duration	sec	10800	10800	
Fuel consumption "B"	kg/h	1,933	1,967	1,950
Calculation of losses in the ash (yes = 1, no = 0)	Gew. %	25,0	25,0	25,0
Residue passing through the grate, measurement	kg	0,00	0,00	0,00
Residue passing through the grate "R"	Gew. %	0,000	0,000	0,000
Carbon content of the residue passing through the grate "Cr" depending of 1 kg fuel	Gew. %	0,104	0,104	0,104
Water side, measurement				
Flow, measurement	°C	0,0	0,0	0,0
Return, measurement	°C	0,0	0,0	0,0
Delta T	K	0,0	0,0	0,0
Cold water flow, measurement	kg/h	0,0	0,0	0,0
Additional energy of the pump	kW	0,00	0,00	0,00
Flue, average				
Flue gas temperature, measurement	°C	211,7	206,4	209,0
Flue draught, measurement	Pa	12,0	12,0	12,0
O2 - concentration, calculated	Vol.-%	7,1	6,1	6,6
CO2 - concentration, measurement	Vol.-%	13,6	14,6	14,1
lambda value, l	-	1,507	1,404	1,456

CO - concentration, measurement	ppm	45	78	62
CO - concentration, measurement	Vol.-%	0,004	0,008	0,006
CO - concentration, measurement	mg/m³	56	98	77
CO - concentr. (at 13% - O2)	Vol.-%	0,003	0,004	0,003
CO - concentr. (at 13% - O2)	mg/m³	32	52	42
CO - concentration rel. to fuel input	mg/kWh	75	122	98
CO - concentration rel. to fuel input	mg/MJ	21	34	27
NOx - concentration, measurement	ppm	84	90	87
NOx - concentration, measurement	mg/m³	173	184	178
NOx - concentr. (at 13% - O2)	mg/m³	100	98	99
NOx - concentration rel. to fuel input	mg/kWh	231	228	230
NOx - concentration rel. to fuel input	mg/MJ	64	63	64
CnHm concentration, measurement	ppm	3	3	3
CnHm concentration, measurement	mg/m³	4	5	4
CnHm concentr. (at 13% - O2)	mg/m³	2	3	2
CnHm - concentration (total C) rel. to fuel input	mg/kWh	6	6	6
CnHm - concentration (total C) rel. to fuel input	mg/MJ	2	2	2
Dust, measurement*	mg	7		7
Dust, measurement*	mg/m³	24		24
Dust (at 13% - O2)*	mg/m³	13		13
Dust* rel. to fuel input	mg/kWh	31		31
Dust* rel. to fuel input	mg/MJ	9		9
PME concentration (at 13% - O2)*	mg/m³	14		14
<b>Electrical consumption</b>				
Rated electrical power (max)	W		360	
Electrical consumption (at nominal heat output)	W		50	
Electrical consumption (at minimum heat output)	W		25	
PSTBY (during stand-by)	W		1,1	
<b>Calculation</b>				
"Qa" loss free heating flue gas	kJ/kg	1816,1	1653,0	1734,6
"qa" loss flue gas	%	10,7	9,8	10,3
"Qb" loss fix heating in flue gas	kJ/kg	3,6	5,8	4,7
"qb" loss fix heating in flue gas	%	0,021	0,034	0,028
"Qr" losses due to combustible constituents in the residue passing through the grate	kJ/kg	0,0	0,0	0,0
"qr" losses due to combustible constituents in the residue passing through the grate	%	0,200	0,200	0,200
"m" flue gas mass flow	g/s	4,80	4,58	4,69
cpm, acc. DIN 4702-2, version 03.90 for dry flue gas	kJ/(m³K)	1,37	1,38	1,38
cpm-H2O	kJ/(m³K)	1,52	1,52	1,52
"eta" Efficiency (direct), to consider only water heating output Pw	%	not applicable	not applicable	not applicable
"eta" Efficiency (indirect)	%	89,0	90,0	89,5
Heating input	kW	9,1	9,2	9,2
"P" heating output, total	kW	8,1	8,3	8,2
"Pw" water heating output	kW	0,0	0,0	0,0
Space heating output: PSTR = P - Pw	kW	8,1	8,3	8,2
Space heating output, relating to heat input	%	89,0	90,0	89,5
Water heating output, relating to heat input	%	0,0	0,0	0,0
<b>Adjustments</b>				
Flue gas motor	rpm	1950	1950	
Ambient motor	volt	230	230	
Auger motor	sec	4,4 ON - 1,6 OFF	4,4 ON - 1,6 OFF	
Cleaning time	sec	OFF	OFF	
Fire door	pen / close	closed	closed	

Report- No.		K32242022T1
TÜV- order- No.		21255366
Manufacturer		PALAZZETTI LELIO S.p.A.
Construction type		Residential space heating appliance fired by wood pellets without water heat exchanger. The flue discharge for pellet operation is fan assisted. The stove is equipped with an automatic ignition.
max. working temperature	°C	Not applicable
max. working pressure	bar	Not applicable
Type of fuel charging		automatic load
Special properties / Remarks		-
Special properties		room air dependent
Type designation		AP004N_4_06, AP004N_4_08
Model name		-
Test place		CMC Centro Misure Compatibilità S.r.l., via della Fisica
Standard		DIN EN 14785:10.2006, Correction 1: 10.2007
Type of test		Test at reduced load
Heat input from manufacturer	kW	2,7
Heat output from manufacturer	kW	2,4
		1. test
Test date		17/02/2022
Time		09:00 - 15:00
Ambient:		
Barometric pressure	mbar	1001
Temperature of combustion air	°C	23,0
Ambient rel. humidity	%	45,0
Ambient temperature (room)	°C	23,0
Type of Fuel		wood pellets
Properties of Fuel		Wood pellets Ø 6 mm, Lmax 30 mm, max humidity 6,18%, Norica, class A1 according to EN
Number of fuel loadings		1
Weight of the stove, start, measurement	kg	156,9
Weight of the stove, end, measurement	kg	153,5
Fuel consumption, calculated of the difference	kg	3,4
Test duration	sec	21600
Fuel consumption "B"	kg/h	0,565
Calculation of losses in the ash (yes = 1, no = 0)	Gew. %	25,0
Residue passing through the grate, measurement	kg	0,00
Residue passing through the grate "R"	Gew. %	0,000
Carbon content of the residue passing through the grate "Cr" depending of 1kg fuel	Gew. %	0,104
Water side, measurement		
Flow, measurement	°C	0,0
Return, measurement	°C	0,0
Delta T	K	0,0
Cold water flow, measurement	kg/h	0,0
Additional energy of the pump	kW	0,00
Flue, average		
Flue gas temperature, measurement	°C	92,5
Flue draught, measurement	Pa	10,0
O2 - concentration, calculated	Vol.-%	14,7
CO2 - concentration, measurement	Vol.-%	6,2
lambda value, I	-	3,298

CO - concentration, measurement	ppm	188
CO - concentration, measurement	Vol.-%	0,019
CO - concentration, measurement	mg/m³	235
CO - concentr. (at 13% - O2)	Vol.-%	0,024
CO - concentr. (at 13% - O2)	mg/m³	297
CO - concentration rel. to fuel input	mg/kWh	689
CO - concentration rel. to fuel input	mg/MJ	191
NOx - concentration, measurement	ppm	25
NOx - concentration, measurement	mg/m³	51
NOx - concentr. (at 13% - O2)	mg/m³	64
NOx - concentration rel. to fuel input	mg/kWh	148
NOx - concentration rel. to fuel input	mg/MJ	41
CnHm concentration, measurement	ppm	2
CnHm concentration, measurement	mg/m³	3
CnHm concentr. (at 13% - O2)	mg/m³	4
CnHm - concentration (total C) rel. to fuel input	mg/kWh	10
CnHm - concentration (total C) rel. to fuel input	mg/MJ	3
Dust, measurement*	mg	1
Dust, measurement*	mg/m³	4
Dust (at 13% - O2)*	mg/m³	5
Dust* rel. to fuel input	mg/kWh	12
Dust* rel. to fuel input	mg/MJ	3
PME concentration (at 13% - O2)*	mg/m³	7
<b>Electrical consumption</b>		
Rated electrical power (max)	W	360
Electrical consumption (at nominal heat output)	W	50
Electrical consumption (at minimum heat output)	W	25
PSTBY (during stand-by)	W	1,1
<b>Calculation</b>		
"Qa" loss free heating flue gas	kJ/kg	1344,8
"qa" loss flue gas	%	8,0
"Qb" loss fix heating in flue gas	kJ/kg	32,8
"qb" loss fix heating in flue gas	%	0,194
"Qr" losses due to combustible constituents in the residue passing through the grate	kJ/kg	0,0
"qr" losses due to combustible constituents in the residue passing through the grate	%	0,200
"m" flue gas mass flow	g/s	2,93
cpm, acc. DIN 4702-2, version 03.90 for dry flue gas	kJ/(m³K)	1,33
cpm-H2O	kJ/(m³K)	1,50
"eta" Efficiency (direct), to consider only water heating output Pw	%	not applicable
"eta" Efficiency (indirect)	%	91,7
Heating input	kW	2,7
"P" heating output, total	kW	2,4
"Pw" water heating output	kW	0,0
Space heating output: PSTR = P - Pw	kW	2,4
Space heating output, relating to heat input	%	91,7
Water heating output, relating to heat input	%	0,0
<b>Adjustments</b>		
Flue gas motor	rpm	900
Ambient motor	volt	190
Auger motor	sec	1,2 ON - 4,8 OFF
Cleaning time	sec	OFF
Fire door	open / close	closed

**The tests were carried out under the conditions of DIN EN 14785:2006**

## Appendix 03

**The requirements of the measuring instruments are fulfilled.**  
**Before each qualified measuring analysers were calibrated with zero gas and calibration gas.**

Index	Measure	Principle	Company	Range	Instrument specification	Reference
B030	Water pressure	Manometer	Cewal DN 150	0 – 25 bar	± 0,6%	Reference manometer
B062	Temperature	PT 100 K-type thermocouples	Agilent 34970 A	0 – 300 °C	Up to 0,5 °C	Reference thermometer
B066	Gas pressure	Manometer	Testo 510	0 – 100 hPa	± 3% related to final value	Reference manometer
B068	Temperature	IR emission	Fluke Ti20	-10 – 350 °C	---	---
B070	Fuel consumption	Gravimetric	Dini Angeo DFWK	0 – 600 kg	± 10 g	Reference load
B079	Water flow	Magnetic	ABB Copa-XE DE43FI	0 – 2000 kg/h	± 1% related to the range	Reference flow meter
B084	Temperature	PT 100 K-type thermocouples	Agilent 34970 A	0 – 300 °C	Up to 0,5 °C	Reference thermometer
B090	Dust content	Gravimetric	Sartorius CPA 224 S	0,1 mg – 220 g	± 0,1 mg	Reference load
B092	Fuel consumption	Gravimetric	Dini Angeo DFWK	0 – 1200 kg	± 10 g	Reference load
B094	CO <sub>2</sub>	Infrared-absorption	Siemens Ultramat 6E	0 – 3 % 0 – 30 %	± 1% related to the range	Reference gas: 17,96 %
	CO	Infrared-absorption	Siemens Ultramat 6E	0 – 300 ppm 0 – 3000 ppm	± 1% related to the range	Reference gas: 2001 ppm
B095	CO	Infrared-absorption	Siemens Ultramat 23	0 – 1 % 0 – 5 %	± 1% related to the range	Reference gas: 5,004 %
B096 + B123	CO <sub>2</sub>	Infrared-absorption	Siemens Ultramat 23	0 – 5 % 0 – 25 %	± 1% related to the range	Reference gas: 17,96 %
	CO	Infrared-absorption	Siemens Ultramat 23	0 – 1000 ppm 0 – 5000 ppm	± 1% related to the range	Reference gas: 2001 ppm
	NO <sub>x</sub>	Infrared-absorption	Siemens Ultramat 23 + Bühler Bünox MV	0 – 1000 ppm 0 – 5000 ppm	± 1% related to the range	Reference gas: 199,3 ppm
B097	OGC	FID	Siemens Fidamat 6	0 – 3,33 ppm C3 0 – 33,3 ppm C3 0 – 333 ppm C3 0 – 3333 ppm C3	± 1% related to the range	Reference gas: 997 ppm propane
B098	Temperature	K-type thermocouple	Testo 925	0 – 200 °C	± 2 °C	Reference thermometer
B109	Air flow	Flow measurement	CMC / ASA 132826 P13-2800	400 - 4000 l/h	± (2 % FS)	Reference flow meter
B118	Gas volume	Diaphragm	CMC	0,016 – 2,5 m <sup>3</sup> /h	± 5 %	Air flow
B121	OGC	FID	Siemens Fidamat 6	0 – 3,33 ppm C3 0 – 33,3 ppm C3 0 – 333 ppm C3 0 – 3333 ppm C3	± 1% related to the range	Reference gas: 997 ppm propane
B122	CO <sub>2</sub>	Infrared-absorption	Siemens Ultramat 23	0 – 5 % 0 – 25 %	± 1% related to the range	Reference gas: 17,96 %
	CO	Infrared-absorption	Siemens Ultramat 23	0 – 1000 ppm 0 – 5000 ppm	± 1% related to the range	Reference gas: 2001 ppm
	NO	Infrared-absorption	Siemens Ultramat 23	0 – 1000 ppm 0 – 5000 ppm	± 1% related to the range	Reference gas: 199,3 ppm
B140	Gas pressure	Inclined liquid column manometer	Kimo HP series	0 – 15 Pa	± 10% related to final value	Reference manometer
B141	Gas pressure	Inclined liquid column manometer	Kimo HP series	0 – 15 Pa	± 10% related to final value	Reference manometer
B149	Mass	Gravimetric	Kern FKB 15K0.5A	0 – 15 kg	± 0,5 g (reproducibility)	Reference load
B154	Gas volume	Diaphragm	Elster BK-G4M	---	Class 1,5	Air flow
B169	Electrical power	---	Yokogawa WT310E	0 – 2000 W	± 0,5 %	External calibration
B179	Stopwatch	---	RS 8111814	0 – 99 h	0,01 s	---
B180	Absolute pressure meter	Absolute pressure meter	Testo 511	0 – 999,0 hPa	± 3,0 hPa	External calibration
B183	Water flow	Magnetic	ISOIL Industria MS501-T10-1A1A1A + ML210-B0A1B3A0	0 – 2000 kg/h	Accuracy: ± 0,2% r.v.	Reference flow meter

The values are continuously recorded. The scan interval is 10s. All related certificates are stored.