

**Report No. K 3217 2022 T1**

**Room heaters fired by solid fuel  
Type testing**  
In accordance with DIN EN 13240

Models:  
**ILARIA EVO, FILÒ**

Trademark:  
**Thermorossi**

Manufacturer:  
**Thermorossi 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

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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**  
**Roomheaters fired by solid fuel**  
**DIN EN 13240: October 2005; 1a according to table 1**  
**Correction 1 DIN EN 13240: June 2008**

Main characteristics of the appliances:	Room heaters for wood logs without hot water heat exchanger. Natural draught for wood log operation.
Manufacturer:	<b>Thermorossi S.p.A.</b> Via Grumolo 4, 36011 Arsiero (VI) - Italy
Trademark:	<b>Thermorossi</b>
Model designations:	<b>ILARIA EVO, FILO</b>
Total heat input:	12,3 kW
Nominal heat output:	10,8 kW
Water heat output:	Not applicable.
Type of fuel:	Wood logs.
Type of loading:	Manual loading.

**Remarks:**

Upright flue gas outlet.

**Test results:**

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

The clause 5.11, electrical safety, was not a part of this assessment.

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

Dated in Cologne, 2022-05-17  
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. A. Pomp

Room heaters fired by solid fuels, Initial Type Test in accordance with the regulation 305/2011  
conformity certification system no.3

## 1. Task definition

The room heater **ILARIA EVO** was subjected to type testing in accordance with the valid and applicable harmonised standard DIN EN 13240, in order to enable the appliance to be marked with the CE-marking in accordance with the Construction Products Regulation n° 305/2011.

The practical tests were carried out by the laboratory CMC Centro Misura Compatibilità S.r.l., via della Fisica 20, Thiene (VI) – Italy, on the 18<sup>th</sup> and on the 19<sup>th</sup> of January 2022.

## 2. Description of the appliances

### 2.1 Construction:

The appliances are room heaters dependent on ambient air for installation and are designed for wood logs. Main features of the appliances:

- Natural draught for wood log operation;
- Cast iron construction for the combustion chamber;
- Cast iron construction for the firebox bottomgrate;
- Manual regulation for primary and secondary air thorough hand sliders;
- Not controllable (fixed) tertiary air;
- Upright flue gas exhaust outlet;
- Additional flue gas pipe on the outlet, fitted with internal turbulator, considered as integral part of the product (see Appendix “A10 Turbulator drawings”).

**ILARIA EVO** and **FILÒ** are all identical in construction, except than for external design.

**2.2 General technical data of the wood room heaters:**

<b>Model designations:</b>	<b>ILARIA EVO</b>	<b>FILÒ</b>
Total dimension: Height x Width x Depth	1011 x 511 x 573 mm	886 x 514 x 571 mm
Weight:	140 kg (EASY external covering) 155 kg (ceramic external covering)	169 kg (EASY external covering)
Nominal power:	10,8 kW	
Test fuel:	Wood logs	
Type of loading:	Manual loading	
Practical testing:	Yes	
Flue spigot:	130 mm	
Distance of adjacent combustible materials:	300 mm (Backside) distance from the test wall 300 mm (Side) distance from the test wall 1000 mm (Front) distance from the test wall	
Design:	Intermittent burning appliance dependent on ambient air with closed firebox for wood logs operation	
Classification acc. to Table 1 of EN 13240:	1a	

For more information, see appendix A04, A06.

**2.3 Pictures of the tested appliance ILARIA EVO:**



### 3. Testing

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

DIN EN 13240	Description	Test results
<b>4</b>	<b>Materials, design and construction</b>	
<b>4.1</b>	<b>Production documentation</b> the specification of the materials used in the construction of the appliance the nominal heat output in kW using fuels recommended by the manufacturer If the appliance is fitted with a boiler then the following additional details shall also be specified: - the welding process used in the manufacture of the boiler shell; - the permissible maximum operating water temperature in °C - the permissible maximum operating pressure in bar; - the type test pressure in bar; - the water heating output in kW.	P  P  NA
<b>4.2</b>	<b>Construction</b>	
4.2.1	General construction The shape and dimensions of the components and equipment, and the method of design and manufacture and, if assembled on site, the method of assembly and installation shall ensure that the appliance operates reliably and safely under the respective mechanical, thermal and chemical stresses. During normal operation no combustion gases posing a hazard may escape into the room in which the appliance is installed nor may any embers fall out. No part of the appliance shall comprise any material known to be harmful. Non-combustible materials shall be used, except that it shall be permissible to use combustible materials for the following applications: - components or accessories fitted outside the appliance; - internal components of controls and safety equipment; - operating handles; - electrical equipment. When fired with solid mineral fuels, the appliance shall have a bottomgrate and an ashpan. Components which are regularly replaced or must be re-installed must be marked or constructed in such a manner that they can be fitted correctly.	P  P  P  NA  P
4.2.2	Parts subject to water pressure - general requirements - Made of cast iron or steel - Operation at operating pressure as stated by the manufacturer must be possible - Materials and dimensions in accordance with the test standard - Kind of steels used according to Table 3	NA

DIN EN 13240	Description	Test results
<b>4</b>	<b>Materials, design and construction</b>	
4.2.2.1	Parts subject to water pressure (steel) - Suitability for welding	NA
4.2.2.1.1	Minimum wall thickness steel in accordance with Table 2	NA
4.2.2.2	Parts subject to water pressure (cast iron)	NA
4.2.2.2.1	The minimum mechanical requirements for components made of cast iron which are subject to water pressure shall be in accordance with Table 4	NA
4.2.2.3	Minimum wall thickness for cast iron in accordance with Table 5	NA
4.2.2.4	Water side connections (acc. Tables 6 and 7) - Minimum thread size - Minimum depth - Thread length	NA
4.2.2.5	Boiler internal waterways	NA
4.2.2.5.1	Requirements of the design of boiler waterways for all appliances - Free flow of water - No sharp or wedge-shaped waterways with a taper towards the bottom, - Openings for cleaning: ➤ Minimum size: 70x40 mm or minimum diameter 70 mm ➤ Equipped with gasket and cap	NA
4.2.2.5.2	Minimum internal dimensions for boiler waterway parts used with indirect water systems: 20mm (15 mm)	NA
4.2.2.5.3	Minimum internal dimensions for boiler waterway parts used with direct water systems: 25 mm	NA
4.2.2.5.4	Venting of the water sections	NA
4.2.2.5.5	Water tightness	NA
4.2.3	Cleaning of heating surfaces All heating surfaces shall be accessible by means of cleaning apertures from the flue gas side for inspection and cleaning. Special tools are to be supplied by the manufacturer	P
4.2.4	Flue spigots or sockets The flue spigot or socket shall be designed in such a manner that the connection between the appliance and the pipe is gas-tight. The overlap shall be at least - 40 mm for horizontal installation - 25 mm for vertical installation	P
4.2.5	Size of flueways - Minimum dimension 30 mm - Minimum dimension 15 mm if appliances is designed only to burn fuels other than bituminous coals and peat briquettes, and where an access door(s) is provided for cleaning the flueway - It shall be possible to clean the flueways of the appliance completely	P

DIN EN 13240	Description	Test results
4	<b>Materials, design and construction</b>	
4.2.6	<p>Ashpan and ash removal A means of removing ash from the appliance shall be provided Ashpan</p> <ul style="list-style-type: none"> <li>- Must collect ash effectively</li> <li>- Minimum volumetric capacity: residue from two full charges of fuel at nominal power</li> <li>- Must allow primary air to flow freely</li> <li>- Removal, carrying and emptying must be easy and safe even when the ashpan is hot</li> </ul>	P
4.2.7	<p>Firebox bottomgrate</p> <ul style="list-style-type: none"> <li>- Where the bottomgrate is removable it shall be designed in such a manner as to ensure correct assembly.</li> <li>- De-ashing must be possible without undue effort.</li> <li>- The preferred design should allow de-ashing to be carried out with the ashpit door closed.</li> </ul>	P
4.2.8	Combustion air supply	P
4.2.8.1	<p>Primary air inlet control</p> <ul style="list-style-type: none"> <li>- The appliance shall be fitted with either a thermostatically controlled primary air inlet control or a manual primary air inlet control.</li> <li>- For appliances with a boiler, a manual primary air inlet control shall only be allowed for boiler outputs up to 7,5 kW.</li> <li>- The adjusting control shall be clearly visible or shall be permanently marked so that its operation is readily understandable.</li> <li>- The design shall be such that during operation of the appliance, neither ash nor unburned fuel can prevent the movement or closure of the air inlet control.</li> <li>- The 'cold' setting of the air inlet control shall be clearly marked and the method of adjustment shall be described in the user instructions.</li> <li>- The thermostat shall have a variable temperature range and be of the immersion or dry pocket type. The pocket shall be positioned so that the thermostat senses the temperature of the flow water from the appliance.</li> </ul>	<p>P</p> <p>NA</p> <p>P</p> <p>P</p> <p>P</p> <p>NA</p>
4.2.8.2	<p>Secondary air inlet control The position of air entry is to be designed in such a manner that the passage of this air is not restricted when the firebox is filled to the manufacturer's recommended capacity.</p>	P
4.2.9	<p>Flue gas control</p> <ul style="list-style-type: none"> <li>- Flue damper must be easy to operate</li> <li>- The setting must be clear for the user</li> <li>- Dampers must incorporate an aperture which is at least 20 cm<sup>2</sup> in size or occupies at least 3 % of the cross-sectional area if this leads to values of over 20 cm<sup>2</sup>.</li> <li>- If a draught regulator is fitted the minimum cross-sectional area requirement shall not be applicable but the device must be easily accessible for cleaning</li> </ul>	NA



DIN EN 13240	Description	Test results
<b>4</b>	<b>Materials, design and construction</b>	
4.2.10	Fire doors and charging doors - Opening must be large enough for enable appliance to be filled - Accidental opening is avoided and positive closure is facilitated	P
4.2.11	Flue bypass device - shall be easily operable - the extreme positions corresponding to full opening and closing shall be stable and easily identifiable (permanent marking)	NA
4.2.12	Front firebars and/or deepening plates - If the appliance is fitted with removable front firebars/deepening plates, they shall be designed in such a manner that they can neither be fitted incorrectly nor dislodged accidentally - The front firebars/deepening plate should be designed to retain fuel or ash to prevent unnecessary ash or burning fuel dropping out of the firebox during normal operation, particularly during refuelling or de-ashing of the appliance	NA NA
4.2.13	Solid mineral fuel and peat briquettes burning appliances - When the recommended fuels are solid mineral fuel and peat briquettes, the appliances shall have a bottomgrate and an ashpan.	NA

DIN EN 13240	Description	Test results
<b>5</b>	<b>Safety requirements</b>	
5.1	Safety test at natural draught - Test acc. 4.9.3 only for continuous burning appliances which can be connected to a chimney serving more than one appliance, and can be operated with solid mineral fuel and peat briquettes as suitable fuels, - either the flue draught >3 Pa or - if flue draught falls below 3 Pa then over a period of 10h the emitted quantity of carbon monoxide shall not be greater than 250 dm <sup>3</sup> . - Such an appliance shall be clearly labelled to indicate whether or not it can be installed into a shared flue (see 7.2).	NA
5.2	Operation with open firedoors The operation of an appliance with an open firebox shall only be permitted when: - - any escape of harmful combustion gases, and - - any loss of the firebed from the appliance, - does not occur under the test conditions described in section A.4.9.1.	NA
5.3	Strength and leaktightness of boiler shells and water carrying components Testing was realised in accordance with A 4.9.5 / A 4.7	NA
5.4	Temperature in integral fuel storage container Max. permissible: $t_{\text{Room}} + 65 \text{ K}$ Actual - value: - Ambient = -	NA

DIN EN 13240	Description	Test results
5	<b>Safety requirements</b>	
5.5	<p>Operating tools Operating tools are to be provided in accordance with operation manual, where it would otherwise be necessary to touch a surface which has a temperature which exceed the following values: These temperature requirements shall be evaluated during the nominal heat output test in accordance with A 4.7</p> <ul style="list-style-type: none"> <li>- Metal: 35 K + t<sub>Room</sub></li> <li>- Porcelain, enamel: 45 K + t<sub>Room</sub></li> <li>- Plastics, rubber, wood: 60 K + t<sub>Room</sub></li> </ul> <p>Actual value of handle of handle of fire door (metal) - ILARIA EVO: 130,0 °C* t<sub>Room</sub> = 23,5 °C</p> <p>Actual value of handle of handle of primary and secondary air (metal) - ILARIA EVO: 105,8 – 314,6 °C* t<sub>Room</sub> = 23,5 °C</p> <p>*) A suitable tool is a part of the appliance and is provided by the producer (glove and poker available).</p>	P
5.6	<p>Temperatures of adjacent combustible materials max. permissible temperature: t<sub>Room</sub> + 65 K</p> <ul style="list-style-type: none"> <li>- The corresponding information for ensuring the requirement must be included in the installation instructions</li> <li>- Practical verification is provided during testing.</li> </ul> <p>Actual value of the max. surface temperature: -&gt; Maximum temperature on test wall (Back) - ILARIA EVO: 75,6 °C -&gt; Maximum temperature on test wall (Floor) - ILARIA EVO: 76,7 °C -&gt; Maximum temperature on test wall (Side) - ILARIA EVO: 66,1 °C -&gt; Maximum temperature on wall (Front) - ILARIA EVO: 82,5 °C t<sub>Room</sub> = 23,5 °C</p> <p>FILÒ has to be installed on a not – combustible base</p>	P
5.7	<p>Thermal discharge control Opens at t<sub>max</sub> = 105 °C or at a lower temp. in accordance with manufacturer's specifications Manufacturer's specifications: - °C Test results: - °C</p>	NA
5.8	Electrical safety must correspond to EN 50165	NA

DIN EN 13240	Description	Test results
<b>6</b>	<b>Performance requirements</b>	
6.1	Flue gas temperature	P
6.2	Max. CO-emission rel. to 13% O <sub>2</sub> <u>Testing at nominal heat output</u> Max. permissible: 1 Vol. % at 13 Vol. % O <sub>2</sub> in Flue gas Measured value: Test fuel: wood logs 0,016 Vol. % at 13 Vol. % O <sub>2</sub>	P
6.3	Total efficiency at nominal heat output at mean of at least two separate tests Required: 50 % or as supplier has indicated Determined: 87,6 %	P
6.4	Flue draught <u>Testing at nominal heat output</u> Required: 12 ± 2 Pa Measured: 10,0 Pa <u>Safety test</u> Required: 15 Pa Measured: 15 Pa <u>Test at slow or reduced combustion</u> Target: _ Pa Actual _ Pa	P  P  NA
6.5	Recovery test	NA
6.6	Refuelling intervals at nominal heat output (acc. Table 8) <u>Minimum refuelling interval</u> Target: 2700 s Actual: 2845 s	P
6.7	Water heating output Measured value: - Manufacturer's specifications: -	NA
6.8	Space heating output: Measured value: 10,8 kW Manufacturer`s specifications: 10,8 kW	P

A 4.7	Testing of nominal heat output, measurement test results		
Models		ILARIA EVO, FILÒ	
Fuel		Wood logs	
		Required	Achieved
Mass of the test fuel fired hourly	kg/h	-	2,83
Flue gas mass flow	g/s	-	7,2
Flue gas temperature	°C	-	206,9
Flue draught	Pa	12 ± 2	10,0
CO <sub>2</sub> - content in flue gas	Vol. %	-	12,4
CO-emission, measured value	ppm	-	252
CO-emission ref. to 13 Vol.-% O <sub>2</sub>	mg/m <sup>3</sup>	-	197
CO-emission ref. to 13 Vol.-% O <sub>2</sub>	Vol. %	≤ 1 Vol. % at 13 Vol. % O <sub>2</sub> in Flue gas	0,016
CO-emission, measured value	mg/kWh	-	463
CO-emission, measured value	mg/MJ	-	129
NO <sub>x</sub> -emissions, measured value	ppm	-	77
NO <sub>x</sub> -emissions ref. 13 Vol. % O <sub>2</sub>	mg/m <sup>3</sup>	-	99
NO <sub>x</sub> -emissions, measured value	mg/kWh	-	229
NO <sub>x</sub> -emissions, measured value	mg/MJ	-	64
OGC-concentration measured acc. to CEN/TS 15883	ppm	-	12
OGC-emissions ref. to 13 Vol.-% O <sub>2</sub>	mg/m <sup>3</sup>	-	12
OGC-emissions, measured value	mg/kWh	-	29
OGC-emissions, measured value	mg/MJ	-	8
Dust concentration measured acc. to CEN/TS 15883 and EN13284-1 *	mg	-	11
Dust emissions to 13 Vol. % O <sub>2</sub>	mg/m <sup>3</sup>	-	25
Dust emissions	mg/kWh	-	58
Dust emissions	mg/MJ	-	16
Heating input	kW	-	12,3
Nominal heat output	kW	-	10,8
Water heat output	kW	-	-
Efficiency	%	EN ≥ 50	87,6

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



DIN EN 13240	Description	Test results
7	<b>Appliance instructions</b>	
7.2 (cont.)	<ul style="list-style-type: none"> <li>- Notification that the appliance may only be erected on floors with an adequate load-bearing capacity and that and if an existing construction does not meet this prerequisite, suitable measures are to be taken</li> <li>- The setting of the temperature controller and adjustment in a cold state</li> <li>- Means of dissipating excess heat from the boiler in the case of malfunction</li> <li>- Instructions on the installation of recirculation grilles with regard to the ambient temperatures of walls, floors and ceilings or adjacent components</li> <li>- Reference as to whether the suitability of sharing a flue is given</li> <li>- Water volume and instructions for fitting a drain-cock in the lowest part of the system (where applicable);</li> </ul>	<p style="text-align: center;">P</p> <p style="text-align: center;">P</p> <p style="text-align: center;">NA</p> <p style="text-align: center;">NA</p> <p style="text-align: center;">P</p> <p style="text-align: center;">NA</p>
7.3	<p>User operating instructions</p> <ul style="list-style-type: none"> <li>- Reference to the requisite national and European standards and local regulations which are to be complied with when the appliance is installed</li> <li>- National and local operation conditions particular to the country of distribution, and on the permitted types of fuel</li> <li>- A list of all recommended fuels, their types and sizes, in accordance with DIN EN 13240</li> <li>- Max. fuel load at nominal heat input for the recommended fuels, instruction for refuelling and ash removing</li> <li>- Description of the correct and safe operation of the appliance including the ignition procedure</li> <li>- Notification that the appliance is not to be used as a waste incinerator and that no unsuitable/impermissible fuels or liquid fuels may be burnt</li> <li>- Instructions regarding the correct operation of any adjusting devices and controls with instructions for refuelling and de-ashing</li> <li>- Instructions regarding the correct operation of the appliance in particular during adverse weather conditions or malfunctioning of delivery pressure, notification of the risk of frost</li> <li>- Warning that the firebox must always be kept closed except during ignition, when refuelling and during de-ashing (does not apply to appliances with open firebox)</li> <li>- Instructions regarding the correct operation with open firebox, where applicable</li> <li>- Information on the correct operation of any thermal discharge control</li> </ul>	<p style="text-align: center;">P</p> <p style="text-align: center;">P</p> <p style="text-align: center;">P</p> <p style="text-align: center;">P</p> <p style="text-align: center;">P</p> <p style="text-align: center;">P</p> <p style="text-align: center;">P</p> <p style="text-align: center;">P</p> <p style="text-align: center;">P</p> <p style="text-align: center;">NA</p> <p style="text-align: center;">NA</p>

DIN EN 13240	Description	Test results
7	<b>Appliance instructions</b>	
7.3 (cont.)	<ul style="list-style-type: none"> <li>- Ventilation requirements for simultaneous operation with other heating appliances, if applicable</li> <li>- Information regarding the regular cleaning of the appliance as well as particular reference to the risk of the chimney flue blocking particularly after a prolonged period of shutdown</li> <li>- Instructions regarding the adequate provision of combustion air and or ventilation air, and that the combustion air - inlet openings may not be closed</li> <li>- Instructions regarding the safe removal of flue gases</li> <li>- Fault finding and the procedure for safe shut down of the appliance in the event of malfunction e.g. overheating or interruption of the water supply.</li> <li>- A warning stating that parts of the appliance, in particular the external surfaces, get hot during operation and that corresponding due care should be taken</li> <li>- Safety and protection measures against the risk of fire for combustible materials</li> <li>- Warning against any unauthorized modification of the appliance</li> <li>- Recommendation that only replacement parts approved and authorised by the manufacturer may be used</li> <li>- Advice about part load operation</li> <li>- Advice about action in the event of a chimney fire</li> <li>- Instructions as to whether the appliance may be used in continuous or intermittent operation and instructions on how this is achieved</li> <li>- Advice whether the appliance is suitable for installation in a shared flue system;</li> <li>- Specifications on setting recirculation grilles, if applicable</li> <li>- Notification that regular inspection by a specialist is recommended</li> </ul>	<p style="text-align: center;">P</p> <p style="text-align: center;">P</p> <p style="text-align: center;">P</p> <p style="text-align: center;">P</p> <p style="text-align: center;">P</p> <p style="text-align: center;">P</p> <p style="text-align: center;">P</p> <p style="text-align: center;">P</p> <p style="text-align: center;">P</p> <p style="text-align: center;">P</p> <p style="text-align: center;">P</p> <p style="text-align: center;">NA</p> <p style="text-align: center;">P</p> <p style="text-align: center;">P</p> <p style="text-align: center;">P</p> <p style="text-align: center;">NA</p> <p style="text-align: center;">P</p>

DIN EN 13240	Description	Test results
8	<b>Marking</b>	
	<ul style="list-style-type: none"> <li>- Permanent and legible, abrasion-proof, no discolouration possible once the appliance is in its final position and in operation</li> <li>- Manufacturer and/or trademark</li> <li>- Type designation / model designation</li> <li>- Nominal heat output (min., max, for the approved fuels)</li> <li>- Number of test standard</li> <li>- Space heating output in kW or in W</li> <li>- Water heating output in kW or in W</li> <li>- CO- content in flue gas at 13 Vol. % O<sub>2</sub></li> <li>- Max. perm. operating water pressure in bar, as applicable</li> <li>- whether or not the appliance can be used in a shared flue;</li> <li>- Reference “read and follow the operating instructions “is clearly visible</li> <li>- Reference “use only recommended fuels “is clearly visible</li> <li>- Reference as to whether appliance is suitable for continuous or intermittent operation</li> <li>- Reference to minimum distances to combustible components</li> </ul>	<p>P</p> <p>P</p> <p>P</p> <p>P</p> <p>P</p> <p>P</p> <p>NA</p> <p>P</p> <p>NA</p> <p>P</p> <p>P</p> <p>P</p> <p>P</p> <p>P</p>



<b>DIN EN 13240</b>	<b>Description</b>	<b>Test results</b>
<b>9</b>	<b>Conformity verification</b>	
9.1	General	P
9.2	Type testing	
9.2.1	-Initial type testing	P
9.2.2	-Further type testing	NA
9.3	Factory production control (FPC)	
9.3.1	- General	
9.3.2	- Raw materials and components	
9.3.3	- Control of inspection, meas. and test equipment	
9.3.4	- Process control	
9.3.5	- Product inspection, testing and evaluation	
9.3.5.1	- Material of construction	
9.3.5.2	- Insulation material	
9.3.5.3	- Seals and sealant materials	
9.3.5.4	- Manufacturing checks	
9.3.5.4.1	- Construction and dimensions	
9.3.5.4.2	- Other checks	
9.3.6	- Non-conforming products	
9.3.7	- Corrective and preventive action	
9.3.8	- Handling, storage, packaging, preservation and delivery	

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

The appliances

**ILARIA EVO, FILÒ**

of the company

**Thermorossi S.p.A.**

with trademark:

**Thermorossi**

comply for the operation with wood logs with the requirements  
acc. to DIN EN 13240: October 2005, correction DIN EN 13240: June 2008, cl.4-8.

The test results presented in this report refer solely to the test object stated and 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 A 01: Fuel data

Appendix A 02: Test results

Appendix A 03: Measuring devices

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

<b>Appendix</b>	<b>Subject</b>	<b>Reference</b>
A 04	Type label	-
A 05	Essential requirements EN 13240	21/04/2022, 12/05/2022
A 06	Instruction and installation manual	Rev. B 05-22 Cod. 70028093
A 07	Technical data glass Hecker	Neoceram
A 08	Technical data seals Tespe	Tricotee
A 09.1	Overview drawings ILARIA EVO	-
A 09.2	Overview drawings FILÒ	-
A 10	Turbulator drawings	-

## Appendix A 01

### Fuel data

Verbrennungsrechnung aus der Elementaranalyse											
nach DIN EN 304 Teil 2, Ausgabe 01/2004											
nach DIN 4702 Teil 2, Ausgabe 3/1990											
Analysis from:		14/02/2022		Analysis No: 2201296-003				Fuel sampling date: 31/01/22			
Fuel:		Wood logs.									
Bestandteil im Brennstoff	Stoffanteil	Sauerstoffbedarf		Abgasbestandteile aus Brennstoff in Nm <sup>3</sup> /kg Brennstoff							
		in Nm <sup>3</sup> je kg Bestandteil	in Nm <sup>3</sup> je kg Brennstoff	CO <sub>2</sub>		SO <sub>2</sub>		H <sub>2</sub> O		N <sub>2</sub>	
		Stoffanteil x		in Nm <sup>3</sup> je kg Bestandteil	in Nm <sup>3</sup> je kg Brennstoff	in Nm <sup>3</sup> je kg Bestandteil	in Nm <sup>3</sup> je kg Brennstoff	in Nm <sup>3</sup> je kg Bestandteil	in Nm <sup>3</sup> je kg Brennstoff	in Nm <sup>3</sup> je kg Bestandteil	in Nm <sup>3</sup> je kg Brennstoff
	Gew. %		Sauerstoff-Bedarf								
c	44,100	1,860	0,820	1,850	0,8159	-	-	-	-	-	-
s	0,005	0,700	0,000	-	-	0,680	0,0000	-	-	-	-
h	5,650	5,550	0,314	-	-	-	-	11,100	0,6272	-	-
n	0,240	-	-	-	-	-	-	-	-	0,80	0,0019
o	40,400	-0,700	-0,283	-	-	-	-	-	-	-	-
wasser	9,170	-	-	-	-	-	-	1,240	0,1137	-	-
asche	0,350	-	-	-	-	-	-	-	-	-	-
summe	99,915	O min=	0,851	V CO <sub>2</sub> =	0,8159	V SO <sub>2</sub> =	0,0000	V W =	0,7409	V N <sub>2</sub> =	0,0019
Luftbedarf				L min =		4,0527 Nm <sup>3</sup> /kg Brennstoff					
trockene stöchiometrische Abgasmenge				V A tr min =		4,0175 Nm <sup>3</sup> /kg Brennstoff					
Max. Kohlenstoffdioxid-Anteil				CO <sub>2</sub> max =		20,3073 Vol.-%					
Wasserdampfmenge				V w =		0,7409 Nm <sup>3</sup> /kg Brennstoff					
				V A tr min/ L min =		0,9913					
Heizwert, wf				Hu =		18104 kJ/kg					
						5,029 kWh/kg					
<b>Berechnungen zum Versuchszeitpunkt</b>											
wasser	zum Versuchszeitpunkt			w =	12,000	Gew. %					
Heizwert, roh	zum Versuchszeitpunkt			Hu	15639	kJ/kg					

## Appendix A 02

### Test results

Report- No.		K32172022T1			
TUV- order- No.		21255169			
Manufacturer		Thermorossi S.p.A.			
Model		ILARIA EVO, FILO			
Type		-			
Trademark		Thermorossi			
Type of construction		Room heater fired by wood logs without water parts.			
Specifics		Manual load. Combustion air is taken from the ambient.			
Nominal heat output		kW 10,8			
Test place		CMC Centro Misure Compatibilità S.r.l., Via della Fisica, 20, Thiene (VI) – Italy			
Test date		18/01/2022			
Type of test		Test at nominal load EN 13240:2001 + A2:2004 + AC:2006 + A2/AC:2006 + A2/AC:2007			
		1. test	2. test	3. Test	Average
Test date		18/01/2022	18/01/2022	18/01/2022	
Time		8:56:55 - 9:44:48	10:52:34 - 11:39:59	14:46:52 - 15:35:39	
<b>Ambient:</b>					
Barometric pressure	mbar	1014	1014	1014	1014
Temperature of combustion air	°C	19,8	20,9	21,6	20,8
Ambient rel. humidity	%	50	50	50	50
Ambient temperature (room)	°C	19,8	20,9	21,6	20,8
<b>Fuel:</b>					
Type of fuel		Wood logs.	Wood logs.	Wood logs.	-
Number of fuel loadings		1	1	1	1
Total weight of appliance at start	kg	215,8	215,8	215,8	215,8
Total weight of appliance at end	kg	213,5	213,5	213,5	213,5
Weight of additional loads	kg	0,00	0,00	0,00	0,00
Fuel consumption, calculated of the difference	kg	2,3	2,3	2,3	2,3
Test duration	sec	2873	2845	2927	2882
Fuel consumption "B"	kg/h	2,82	2,85	2,80	2,83
Combustible constituents in material passing through the grate "b", analyse	Gew. %	0,0	0,0	0,0	0,0
Residue passing through the grate, measurement	kg	0,000	0,000	0,000	0,000
Residue passing through the grate "R"	Gew. %	0,00	0,00	0,00	0,00
Carbon content of the residue passing through the grate "Cr" depending of 1 kg fuel	Gew. %	0,23	0,23	0,23	0,23
<b>Water part (average values)</b>					
flow temperature	°C	0,0	0,0	0,0	0,0
return temperature	°C	0,0	0,0	0,0	0,0
delta-T	K	0,0	0,0	0,0	0,0
Cold water flow	kg/h	0,0	0,0	0,0	0,0
Additional energy of the pump	kW	0,000	0,000	0,000	0,000
<b>Flue, average</b>					
Flue gas temperature	°C	199,6	212,7	208,4	206,9
Flue gas draught	Pa	10,0	10,0	10,0	10,0
O <sub>2</sub> - concentration (measurement)	Vol.-%	8,53	7,75	8,33	8,2
CO <sub>2</sub> - concentration (calculation)	Vol.-%	12,06	12,82	12,25	12,4
lambda value, λ	-	2	2	2	1,64
CO - concentration (measurement)	ppm	226	277	254	252
CO - concentration (measurement)	Vol.-%	0,023	0,028	0,025	0,025
CO - concentration (measurement)	mg/m <sup>3</sup>	283	346	318	316
CO - concentr. (at reference - O <sub>2</sub> )	Vol.-%	0,015	0,017	0,016	0,016
CO - concentr. (at reference - O <sub>2</sub> )	mg/m <sup>3</sup>	181	209	201	197
CO - concentration rel. to fuel input	mg/kWh	427	491	472	463
CO - concentration rel. to fuel input	mg/MJ	119	136	131	129
NOx - concentration (measurement)	ppm	70	84	78	77
NOx - concentration (measurement)	mg/m <sup>3</sup>	144	171	160	159
NOx - concentr. (at reference - O <sub>2</sub> )	mg/m <sup>3</sup>	93	103	101	99
NOx - concentration rel. to fuel input	mg/kWh	218	243	227	229
NOx - concentration rel. to fuel input	mg/MJ	60	68	63	64
CnHm - concentration (measurement)	ppm	14	13	10	12
CnHm concentr. (at reference - O <sub>2</sub> )	mg/m <sup>3</sup>	14	12	10	12
CnHm - concentration (total C) rel. to fuel input	mg/kWh	34	29	25	29
CnHm - concentration (total C) rel. to fuel input	mg/MJ	9	8	7	8
Dust (measurement*)	mg	11	11	11	11
Dust concentration (measurement*)	mg/m <sup>3</sup>	45	48	42	45
Dust (at reference - O <sub>2</sub> )*	mg/m <sup>3</sup>	26	25	23	25
Dust* rel. to fuel input	mg/kWh	60	59	55	58
Dust* rel. to fuel input	mg/MJ	17	16	15	16
<b>Calculation</b>					
"Qa" loss free heating flue gas	kJ/kg	1817,1	1844,0	1865,5	1842,2
"qa" loss flue gas	kJ/kg	11,6	11,8	11,9	11,8
"Qb" loss fix heating in flue gas	kJ/kg	18,8	21,6	20,8	20,4
"qb" loss fix heating in flue gas	%	0,1	0,1	0,1	0,1
"Qr" losses due to combustible constituents in the residue passing through the grate	kJ/kg	0,0	0,0	0,0	0,0
"qr" losses due to combustible constituents in the residue passing through the grate	%	0,5	0,5	0,5	0,5
"m" flue gas mass flow	g/s	7,3	7,0	7,2	7,2
cpm, acc. DIN 4702-2, version 03.90 for dry flue gas	kJ/(m <sup>3</sup> K)	1,4	1,4	1,4	1,4
cpm-H <sub>2</sub> O	kJ/(m <sup>3</sup> K)	1,5	1,5	1,5	1,5
"eta" Efficiency (direct), to consider only water heating output Pw	%	entfällt	entfällt	entfällt	entfällt
"eta" Efficiency (indirect)	%	87,8	87,6	87,4	87,6
Heating input	kW	12,3	12,4	12,2	12,3
"P" heating output, total	kW	10,8	10,8	10,7	10,8
"Pw" water heating output	kW	0,0	0,0	0,0	0,0
Space heating output: P <sub>STR</sub> = P - Pw	kW	10,8	10,8	10,7	10,8
Space heating output, relating to heat input	%	87,8	87,6	87,4	87,6
Water heating output, relating to heat input	%	0,00	0,00	0,00	0,00
<b>Settings</b>					
Primary air control	open/closed	3,5 mm open	3,5 mm open	3,5 mm open	
Ignition air control	open/closed	closed	closed	closed	
Secondary air control	open/closed	full open	full open	full open	
Tertiary air control	open/closed	fixed	fixed	fixed	
Ambient fan	Volt	-	-	-	
Electrical consumption (stand-by)	W				0,0
Electrical consumption (nominal)	W				0

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

**The tests were carried out under the conditions of DIN EN 13240:10/2005**

## Appendix A 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
	NOx	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.