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OPERATIONAL MANUAL
for the
CERTIFICATION
of
RESIDENTIAL AIR HANDLING UNITS

OM-16-2015

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I. PURPOSE

The purpose of this Operational Manual is to prescribe procedures for the operation of the Certification Programme for Residential Air Handling Units of Eurovent Certita Certification.

Participation in this programme is open to:

- Original Equipment Manufacturers (OEM)
- Brand Name Manufacturers (BNM) selling products already certified by OEM
- Distributors purchasing and selling products non-certified by OEM

Under this programme there are random tests conducted. These tests shall be conducted at the independent test facilities approved by Eurovent Certita Certification and in accordance with the relevant Rating Standard RS 15/C/001.

II. SCOPE

This Certification Programme applies to mechanical supply and exhaust ventilation units used in single dwelling as defined in EN13141-7:2010:

- Only units with heat recovery systems
- Units with any type of heat recovery systems (including extract air / outdoor air heat pumps)
- the maximum flow rate as defined in RS 15/C/001 do not exceed 1000 m³/h or is between 250 and 1000 m³/h and the manufacturer does not declare its intended use exclusively for a non-residential ventilation application.

When a company joins the programme, all relevant units presented on the European market shall be certified (certify-all principle, see Chapter V.1 of the Certification Manual). However a participant has three years to comply with the certify-all principle when entering the programme or when a new heat-recovery type is manufactured or sold by the participant.

III. BASIC OUTLINE OF PROGRAMMES

Participation to this Certification Programme consists of the following:

III.1 Application

The applicant, after signing the licence agreement, provides Eurovent Certita Certification with all information, calculation or software model and literature as required by the relevant Rating Standard.

III.2 Qualifying procedure

When the declaration file is completed, units selected by Eurovent Certita Certification shall be tested in the Independent Laboratory.

If the tests show conformity with the relevant Rating Standard and if all fees have been settled and documentation has been corrected (see Certification Manual) certification is granted.

III.3 Repetition procedure

Every year, Eurovent Certita Certification checks whether the certified characteristics of the certified products still fulfil the requirements. If the participants fulfilled all previous test campaigns and provided all the necessary elements and delivered all the units for the current campaign, the certification is granted for another year within the timeframe allocated by the certification schedule, see Appendix A.

III.4 Failure treatment

When the test results fail to comply with the requirements expressed in Chapter VII “Tolerances” in the relevant Rating Standard – the failure treatment is applied.

III.5 Complaint procedure

Under special conditions a complaint procedure may be carried out. It deals with complaints to Eurovent Certita Certification concerning certified products as described in the Certification Manual.

IV. OPERATION OF THE PROGRAMME

IV.1 Declaration of data

Submittal of certification of models to Eurovent Certita Certification shall be made in writing and sent to Eurovent Certita Certification by e-mail by filling in the appropriate form.

a. Rated performance data

All characteristics shall be expressed in SI Units. Maximum significant figures to be used for the declaration are given in the table below.

Table 1: Maximum Significant figures to be used

<i>Characteristic</i>	<i>Unit</i>	<i>Max. Sign. Figures</i>
<i>Air volume flow rate</i>	$m^3.s^{-1}$	3
<i>Available static pressure</i>	Pa	3
<i>Power input</i>	W	3
<i>Temperature/Humidityratio</i>	%-point	2
<i>COP / EER</i>	W/W	2
<i>A-weighted sound power level</i>	dB(A)	2
<i>Specific Power Input</i>	$kW/(m^3.s^{-1})$	3

b. Certification forms

Submittal of models shall be made by filling in the Excel forms provided by Eurovent Certita Certification. It is not acceptable to modify values on previously tested units or previously re-rated units or ranges.

c. Reporting of models

In reporting models for certification and for publication in the Directory, certified ratings shall be given for all models that meet the requirements of the Relevant Rating Standard.

Beside current models, the Participants shall provide Eurovent Certita Certification with the list of new models, according to Certification Manual.

For each reported models, participant shall declare the manufacturing place(s).

IV.2 Selection of units to be tested

For the qualifying and repetition procedure, a defined number of units shall be tested by an independent test laboratory every year. All models presented by the participant shall be listed together; Eurovent Certita Certification will group the models by Basic Model Groups (BMG, see definition in RS 15/C/001). The number of units to be tested each year is given in the table below.

Table 2: Selection rules

<i>Test campaign</i>	<i>Number of units to be tested</i>
<i>Qualifying</i>	1 unit per heat recovery type
<i>Repetition</i>	1 unit per heat recovery type
<i>Frequency of repetition tests</i>	Every two years

IV.3 Eurovent Certita Certification tests at the laboratory

a. Laboratory

All units shall be tested in an independent laboratory approved and under contract with Eurovent Certita Certification.

Units shall be installed in the test facility in accordance with the Participant's published installation start-up and service instructions. A contact person shall be designated by the Participant to provide whatever support is required during the test.

Special instructions shall be sent with the unit. The laboratory cannot be held responsible for a wrong installation if the Participant didn't provide these specific instructions.

b. Notification to provide equipment for testing

Eurovent Certita Certification shall notify the Participant of the intent to test specific models in accordance with the requirements of this programme. This notification shall request delivery of the units, the duly completed Technical Datasheet, the order and all relevant installation and operation manuals.

c. Selection, shipment, handling of test unit and return

Eurovent Certita Certification shall arrange for a particular unit to be collected from the market and to be delivered to the laboratory. Eurovent Certita Certification will invoice the participant for the price of the unit.

The independent laboratory shall have the responsibility of uncrating, handling, testing and recrating the unit for shipment.

A contact person shall be designated by the Participant to organise the shipment to the laboratory, the laboratory shall inform him when the test is completed.

The Participant shall inform the testing laboratory two weeks before when he intends to send a unit for testing.

d. Time limitation of acquisition of unit

If the laboratory is unable to obtain the unit and the relevant documentation within the time limitations defined by Eurovent Certita Certification (see Appendix A: Certification schedule and timeframes) Chapter VIII of the Certification Manual shall be applied.

Eurovent Certita Certification may choose to not discontinue the listing when a Participant provides him with a definite and acceptable date of his next production.

e. Participant's representatives in independent laboratory

A Participant's representative can prepare the start-up of the unit. In that case, the Participant shall inform Eurovent Certita Certification that he wants to attend the start-up, and the laboratory shall inform the Participant about the date the unit will be installed. Participant may review test results immediately after the test.

Only the laboratory personnel shall be permitted to install and check out test units. The procedures used shall be in accordance with the Participant's installation start-up and service instructions. No Participant's personnel shall be permitted in the laboratory test facility before or during the test except the personnel needed to operate.

In case of damage the laboratory personnel shall be allowed to supply necessary tools for repair of the test sample before the test. If the unit cannot be repaired, it shall be replaced by the Participant within one month.

f. Report of tests results

Upon completion of the tests on each unit, the Laboratory will send a complete report, as a PDF file to Eurovent Certita Certification who will then forward a copy together with the reporting and rerating test result to participating company.

Participant has to recover his products one month after receiving the test report. If the units are not recovered after this delay, the laboratory will destroy the units and invoice the manufacturer.

IV.4 Failure treatment

If a failure occurs during testing, a second test, on the same unit or on another unit of the same model, may be asked. Re-rating will be applied according to the re-rating rules defined hereafter.

a. General

If the value found by testing in the independent laboratory differs more than the acceptable tolerance, Participants will have four weeks from the notification of the failure to select one of the following alternatives:

- Ask for a second test on the same unit
- Ask for a second test on a new unit.
- Re-rate according to the re-rating rules (see below).

b. Second test

- If the second test is performed on the same unit (without any modification on the unit, and not leaving the laboratory), the Participant can choose to repeat only the measurements that led to a failure.
- If the second test is performed on a repaired unit (only if the manufacturer accepts that the reparation will be made by the laboratory) or a new unit, or if the Participant has shipped back the unit, the complete test shall be carried out.

If the second test is unsuccessful, the Participant shall re-rate according to the results from the second test. It is not allowed to up-rate claimed values.

The repetition procedure does not allow for a third test.

c. Re-rating rules

The performance characteristics of the tested model shall be re-rated to the values obtained by testing.

If one thermal performance fails, the same thermal performance of all other models with the same heat-recovery type (see definition in RS 15/C/001) shall be re-rated by the deviation found with the tested model.

If the airflow fails for the additional point in the airflow/pressure certified window, the technical documentation shall be corrected within the deadline given in Appendix A. The deviation between the measured airflow and the airflow declared in the corrected technical documentation shall be within the normal tolerance defined in RS 15/C/001. For applicant, the technical documentation shall be corrected before the first certificate is granted.

d. Component failure

If any functional component is inoperative, or the unit is damaged and cannot be repaired and tested at the Laboratory, then it is considered as a "component failure". The complete test shall then be carried out on the repaired unit or a new unit from the same range.

When the leakage class doesn't allow performing the air flow/pressure measurements and thermal performances according to EN 13141-7 then it is considered as a component failure.

e. Penalty tests

One (1) additional unit will be selected for next test campaign in case of deviation of more than two times the measuring tolerances as defined in RS 15/C/001 for the one or more following performances:

- Leakage class
- Air volume flow rate
- Temperature ratio
- COP / EER
- Sound power level
- Specific Power Input

Penalty tests are not applied for cold climate performances.

If a second test is asked by the participant, only the results of the second test will be considered. Each test leading to a high failure will lead to one penalty test. Several penalty tests can therefore be asked during one test campaign.

IV.5 Repeated failures along the test campaigns

This section refers to Chapter VI.4. of the Certification Manual.

The rules regarding Mean Value of Failure (MVF) are described in Appendix D.

IV.6 Violation of rules

Non application of procedures and relevant penalties are described in the Certification Manual.

To come back to the certification programme, the suspended participant has to complete the test campaign of the year he has been suspended for (n) and give all the necessary elements for the following test campaign (n+1).

V. PROMOTION OF THE PROGRAMME

This section refers to section VI of the Certification Manual.

V.1 By Eurovent Certita Certification

The certified data of the certified products are published on the Eurovent Certified Performance website: www.eurovent-certification.com.

The information pertaining to each model certified to be published on the website is given in Table 3.

A map showing the European countries where cold climate units are recommended to be used (i.e. with outdoor design temperature below -15°C) are published on the website.

Table 3: Information published on Eurovent Certified Performance website for each certified model

	<i>Heat exchanger type</i>			
	<i>I¹</i>	<i>I²</i>	<i>Heat-pump</i>	
			<i>HO³</i>	<i>R⁴</i>
Name of Company			X	
Trade or brand name of model			X	
Web address of the technical documentation			X	
Model name			X	
Range name				
Leakage class			X	
Maximum flow reference pressure (p_{tUd})			X	
Maximum air volume flowrate ($q_{v,max}$)			X	
Total pressure difference at reference point on supply side ($p_{tUD}/2$)			X	
Air volume flow rate at reference point on supply side			X	
Effective power input at reference point	X	X	X	X
Specific electric Power Input at reference point	X	X		
Temperature ratio at reference point on supply air side at point 1	X	X		
Disbalance ratio at nominal condition (%)	X	X		
Operation limit temperature TOL ⁵	X ⁵	X ⁵	X ⁵	X ⁵
Temperature ratio (or COP) at reference point on exhaust air side at cold climate	X ⁵	X ⁵	X ⁵	X ⁵
Airflow rate at reference point at cold climate	X ⁵	X ⁵	X ⁵	X ⁵
Disbalance rate at cold climate (%)	X ⁵	X ⁵	X ⁵	X ⁵
Effective power input at reference point at cold climate condition			X ⁵	
SEC		X		
SEC Class		X		
AEC		X		
AHS Warm Climate		X		
AHS Cold Climate		X		
AHS Average Climate		X		
MISC (general typology: for balanced unit = 1.1)		X		
CTRL (ventilation control)		X		
x-value (motor & drive)		X		
COP at 20(12)°C indoor air and 7(6)°C outdoor air for reference point			X	X
COP at 20(12)°C indoor air and 2(1)°C outdoor air for reference point			X	X
COP at 20(12)°C indoor air and -7(-8)°C outdoor air for reference point			X	X

EER at 20(12)°C indoor air and 35(24) outdoor air for reference point				X
EER at 27(19)°C indoor air and 27(19)°C outdoor air for reference point				opt
A-weighted sound power level at reference point radiated through the casing			X	
A-weighted sound power level at reference point in duct connections supply			X	
A-weighted sound power level at reference point in duct connections extract			X	
A-weighted sound power level at reference point in duct connections exhaust			X	
A-weighted sound power level at reference point in duct connections outdoor			X	
Manufacturing place(s)			X	

¹ Category I: Recuperative heat exchangers - ² Category II: Regenerative heat exchangers - ³ HO: Heating only heat-pump - ⁴ R: Reversible heat-pump (heating and cooling) - ⁵ Mandatory only if the unit is designed to operate at outdoor temperature below -15 °C

V.2 By Participants

Rules for the use of Eurovent Certified Performance mark in literature are detailed in the Certification Manual.

APPENDIX A. CERTIFICATION SCHEDULE AND TIMEFRAMES

For each repetition test campaign (year *n*), the following schedule shall be applied:

Eurovent Certita Certification asks for up-date of product list	30/09/ <i>n</i> -1
Participant confirms up-date of products list	31/10/ <i>n</i> -1
Eurovent Certita Certification sends the selection list of the type of heat exchanger to be tested	30/11/ <i>n</i> -1
The Participant confirms selection list	15/12/ <i>n</i> -1
Delivery + submittal form + order from Participant are completed	30/03/ <i>n</i>
The Laboratory carries out all first tests	30/06/ <i>n</i>
Eurovent Certita Certification sends the test reports and results	one week after reception
The Participant can ask for a second test up to	15/07/ <i>n</i>
Delivery + submittal form + order from Participant are completed for second test(s)	one month after request for second test
The Laboratory carries out all second tests	30/09/ <i>n</i>
Technical documentation is corrected	30/11/ <i>n</i>
Diploma are valid until	30/06/ <i>n</i> +1

APPENDIX B. CALCULATION METHOD AND IMPLEMENTATION OF MEAN VALUE OF FAILURE (MVF)

B.I. General

Mean Value of Failure (MVF) is equal, for each manufacturer, to the ratio between the total number of measurements which failed with intermediate tolerance as defined in RS 15/C/001 and the total number of performed measurements in the considered years.

$$\begin{array}{l} MVF \\ \text{Mean Value of Failure} \end{array} = \frac{\sum \text{Number of measurements failed}}{\sum \text{Number of measurements performed}} \cdot \frac{\text{Number of considered years}}{\text{Number of considered years}}$$

MVF considers the following performances:

- Leakage class
- Air volume flow rate
- Temperature ratio
- COP / EER
- Sound power level
- Specific Power Input

When there is a second test on a unit, then the first test is not taken into account.

A manufacturer is suspended from the Certification Programme of Eurovent Certita Certification for one year if the MVF is strictly higher than 30 %.

B.II. Implementation

Eurovent Certita Certification takes into consideration the last three test campaign data of each manufacturer.

B.III. Newcomers and qualifying procedure

Data of new participants will be first taken into consideration after two test campaigns (including qualifying tests).

A manufacturer that leaves the programme and rejoins some years later is considered to be a newcomer if he rejoins after three years. If he rejoins before, all the latest existing test campaigns are considered, with minimum two and maximum three. The same rule applies if the manufacturer has been excluded for one year.