



RS 6/C/001-2016

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**RATING STANDARD
for the
CERTIFICATION
of
AIR CONDITIONERS
AC1 WATER-COOLED UNITS, AC2, AC3 AND CC**

RS 6/C/001-2016

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Modifications as against last version

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Published by Eurovent Certita Certification SAS
48-50 rue de la Victoire, 75009
Paris, France

Tel: +33 1 75 44 71 55
E-mail: a.lacourt@eurovent-certification.com

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I. PURPOSE

The purpose of this standard is to establish definitions and specifications to be used in connection with the Eurovent Certified Performance Programme for Air Conditioners.

II. SCOPE

Are included in the scope of this rating standard:

- AC1 Water cooled units: Water/Air Air Conditioners and Heat Pumps rated up to 12 kW;
- AC2: Comfort Air Conditioners rated Form AC-2: Technical Data Sheet over 12 kW up to but not including 45 kW cooling capacity;
- AC3: Comfort Air Conditioners rated from 45 kW up to 100 kW cooling capacity;
- CC: Close Control Air Conditioners up to 100 kW (Direct Expansion and Chilled Water).

The scope of this rating standard excludes:

- AC1: Air cooled Comfort Air Conditioners rated up to 12 kW cooling capacity which are covered by RS 6/C/001A;
- Chilled water close controls which are covered by RS 6/C/004.

III. DEFINITIONS

All definitions are in accordance with definitions given in EN 14511-1:2013.

LRcontmin:

LRcontmin is defined as the minimum continuous operation load ratio, i.e. the minimum continuous operation load heating (or cooling) capacity divided by the heating (or cooling) capacity measured in the standard rating test conditions.

IV. TESTING REQUIREMENTS

Standard ratings shall be established at the standard rating conditions specified in Section V. All standard ratings shall be verified by tests conducted in accordance with the following standards:

- Performance testing using the calorimeter room method (recommendable whenever possible):
EN 14511-3:2013 "Air conditioners, liquid chilling packages and heat pumps with electrically driven compressors for space heating and cooling"
- Performance testing using the air enthalpy method:
EN 14511-3:2013 "Air conditioners, liquid chilling packages and heat pumps with electrically driven compressors for space heating and cooling"
- Standby mode in cooling and in heating:
EN 14825:2013 "Air conditioners, liquid chilling packages and heat pumps, with electrically driven compressors, for space heating and cooling. Testing and rating at part-load conditions and calculation of seasonal performance".

- Acoustical testing:

EN 12102:2013 “Air conditioners, liquid chilling packages, heat pumps and dehumidifiers with electrically driven compressors for space heating and cooling - Measurement of airborne noise - Determination of the sound power level” with exception of the duct end correction method described in section 6.2.2 of this standard.

Specifications concerning temperature conditions and installation of units for acoustical testing are defined in the RS 6/C/006.

V. RATING REQUIREMENTS

Rating requirements are in accordance with EN 14511:2013.

V.1 Temperature:

Standard rating conditions in Table 1 shall be used.

The tests shall be carried out at 230 V for one phase units and 400 V for three phase units, with the rated frequency of 50 Hz.

Table 1: Operating conditions for standard rating

	INDOOR UNIT		OUTDOOR UNIT			
	Air entering °C		Air entering °C		Water°C	
	Dry bulb	Wet bulb	Dry bulb	Wet bulb	In	Out
Comfort Air Conditioner - Cooling mode	27	19	35	24 ^a	30	35
Comfort Air Conditioner - Heating mode	20	15 max	7	6	10	7
Close Control Air Conditioner ^b	24	17	35	24	30	35

^a The wet bulb temperature condition is not required when testing units which do not evaporate condensate.

^b Operating conditions for Chilled-Water Close Control Air Conditioners are described in RS 6/C/004.

V.2 LRcontmin test method

Two tests have to be performed:

- A heating (respectively cooling) capacity test at this load ratio to verify the continuous operation of the Air-conditioner (no cycling) and record the heating capacity and the COP (respectively EER) at LRcontmin.
- A heating (respectively cooling) capacity test at the standard rating conditions and record the capacity and the COP (respectively EER) in these standard rating conditions.

LRcontmin is the ratio of the capacity measured at minimum continuous operation divided by the heating capacity measured in the standard rating conditions.

CcpLRcontmin is then calculated and validated, as follows:

In cooling:

$$CcpLRcontminc = \frac{\text{EER at LRcontmin}}{\text{EER at standard rating conditions}}$$

In heating:

$$CcpLRcontminh = \frac{\text{COP at LRcontmin}}{\text{COP at standard rating conditions}}$$

V.3 LRcontmin test method for heating mode (Alternative method)

The only case in which “Part Load C” values (Ph and COP) could be used in the calculation of LRcontmin is when the 2 following requirements are met:

- Unit has to be declared with minimum compressor frequency for Part Load C.
- Capacity declared at such Part Load C (which corresponds to minimum compressor frequency) complies with standard tolerance (10%).

Otherwise, the test described in § V.2 is required.

The manufacturer shall inform Eurovent Certita which method is used regarding this declaration once the unit is selected for testing.

VI. CERTIFIED PERFORMANCE ITEMS

The following performance items of Comfort Air Conditioners shall be verified by tests:

- Total cooling capacity
- Heating capacity for reverse cycle units
- Efficiency in cooling and reverse cycle heating, EER and COP
- A-weighted sound power level indoor side (non-ducted units)
- A-weighted sound power level outdoor side (non-ducted units)
- A-weighted sound power level radiated from the duct (ducted units).

The following performance items of Close Control Air Conditioners (except chilled water close control) shall be verified by tests:

- Total cooling capacity
- Sensible cooling capacity
- Efficiency, EER
- A-weighted sound power level indoor side (non-ducted units)
- A-weighted sound power level outdoor side (non-ducted units)
- A-weighted sound power level radiated from the duct (ducted units).

For chilled water close control air conditioners refer to RS 6/C/004.

VII. TOLERANCES

When tested the performance obtained shall not differ from the values claimed in the Participant literature by more than:

- | | |
|-------------------------------------|----------------|
| • Capacity (cooling and heating) | - 5 % |
| • Efficiency (EER and COP) | - 8 % |
| • A-weighted sound power level | + 0 dB |
| • Power consumption at standby mode | +10 % |
| • LRcontmin | +/- 5% (point) |
| • CcpLRcontmin | < - 5% (point) |