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Rating points for A/A process and IT Cooling

First Edition

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Document history

This Eurovent Industry Recommendation / Code of Good Practice supersedes all of its previous editions, which automatically become obsolete with the publication of this document.

Modifications

This Eurovent publication was modified as against previous editions in the following manner:

Modifications as against	Key changes
1 st edition	Present edition
2 nd edition	
3 rd edition	

Preface

In a nutshell

With this Recommendation, Eurovent proposes a new definition and two methodologies to address air to air process and IT cooling in the context of the revision of the Ecodesign Regulation (EU) 2016/2281. The definition and the methodologies derive from the existing Regulation or the existing standard EN 14825.

Authors

This document was published by Eurovent and was prepared in a joint effort by participants of the Product Group 'Air Conditioners' (PG-AC), which represents a vast majority of all manufacturers of these products active on the EMEA market.

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Important remarks

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A/A process and IT Cooling

Eurovent considers that all IT cooling/close control air-air air conditioners should be addressed under the Regulation that will replace the existing (EU) 2016/2281 regardless of the capacity.

A comprehensive assessment about both the technical and socio-economic feasibility should be conducted as this particular application strongly differs from comfort cooling. It will be essential to accurately define these units and provide clarity on the efficiency and temperature profile they'll need to follow. This technology is on a progressive rise. The impact of data centres' energy consumption has been recognised within the revised Energy Efficiency Directive and the [recently adopted delegated regulation](#)¹, and it is important to set a framework for these units considering that their design will also need to comply with the change of refrigerants required by the new [F-Gas Regulation \(EU\) 2024/573](#)².

Considering the possibility of extending the proposed methods also to process cooling, what follows is applicable to both process and IT Cooling.

Eurovent proposal for rating points for A/A process and IT Cooling air conditioners

A new definition

Starting from the existing definitions provided by the Ecodesign Regulation (EU) 2016/2281, here below Eurovent proposes the following:

'air-based process and IT cooling system' means the components or equipment necessary for the supply of cooled air, by means of an air-moving device, either through ducting or directly into the cooled space, in order to attain and maintain the desired indoor temperature of a data centre room or other applications excluding comfort of human beings;
- that may or may not integrate the condenser or other ancillary equipment;

'air conditioner for process and IT cooling' means a cooling product that provides space cooling and:
(a) of which the indoor side heat exchanger (evaporator) extracts heat from an air-based cooling system (heat source);
(b) which has a cold generator that uses a vapour compression cycle or a sorption cycle;
(c) of which the rejection heat exchanger (condenser) releases this heat to ambient air, water or ground heat sink(s) and which may or may not include heat transfer that is based on evaporation of externally added water;

'air-to-air air conditioner' means an air conditioner which has a cold generator that uses a vapour compression cycle driven by an electric motor or internal combustion engine and whereby the outdoor side heat exchanger (condenser) allows heat transfer to air.

¹ COMMISSION DELEGATED REGULATION (EU) 2024/1364 of 14 March 2024 on the first phase of the establishment of a common Union rating scheme for data centres

² Regulation (EU) 2024/573 of the European Parliament and of the Council of 7 February 2024 on fluorinated greenhouse gases, amending Directive (EU) 2019/1937 and repealing Regulation (EU) No 517/2014

Systems without integrated condensers

This methodology applies to systems where the indoor unit can be matched with several outdoor units from the same manufacturer or from third parties.

Table 1: rating points for systems without integrated condenser

Rating Point (1)	Load [%] (2)	Outdoor T [°C] (3)	Condensing T [°C] (4)	Subcooling ΔT [°C] (5)	External Static Pressure [Pa] (6)	Indoor return air conditions [°C, RH%] (7)
Nominal	100	35	45,0	3	Ducted Upflow and Downflow Units: 30 Pa Non-ducted Units: 0 Pa	30°C, 35% RH
A	75	35	42,5	3		30°C, 35% RH
B	75	25	≥ 32,5	3		30°C, 35% RH
C	75	15	≥ 30,0	3		30°C, 35% RH
D	75	5	≥ 27,5	3		30°C, 35% RH

If a unit can be ducted it shall be tested in accordance with ducted conditions.

Systems using an integrated condenser

This methodology applies to systems where the indoor unit can be coupled with a limited number of outdoor units from the same manufacturer or to systems where the indoor unit incorporates the condenser. If the system has been tested according to Table 1 conditions, then the test must not be repeated.

Table 2: rating points for systems with integrated condenser

Rating Point (1)	Load [%] (2)	Outdoor T [°C] (3)	External Static Pressure [Pa] (6)	Indoor return air conditions [°C, RH%] (7)
Nominal	100	35	Ducted Upflow and Downflow Units: 30 Pa	30°C, 35% RH
A	75	35		30°C, 35% RH
B	75	25	Non-ducted Units: 0 Pa	30°C, 35% RH
C	75	15		30°C, 35% RH
D	75	5		30°C, 35% RH

Technical background

General

The decisions taken that led to the proposals are explained below. The numbers in brackets refer to the corresponding columns in the tables.

(1)-(3) The same four outdoor duty points, in accordance with the current Ecodesign Regulation (EU) 2016/2281, for the SEPR metric for High-Temperature Process Chillers were considered.

(2) At 75% of the nominal load, in accordance with the new Very High-Temperature Process Chiller proposal³. The underlying reasons are the following:

- a. IT cooling units are usually used in redundancy, therefore on the field the units are generally used at partial load to gain efficiency.
- b. IT cooling units are often used with IT devices that are not fully installed from the beginning, thus requiring a lower capacity than the full one for a long time.

(6) IT cooling units often require running with an external static pressure ESP. This is in accordance with the 2024 Eurovent ITCU Certification, i.e. Technical certification rules of the Eurovent certified performance mark for IT cooling units.

(7) Indoor return air conditions in accordance with 2024 Eurovent ITCU Certification, i.e. Technical certification rules of the Eurovent certified performance mark for IT cooling units.

Proposed methods

The proposed methods are an adaptation of or directly come from existing and well-accepted standards, mainly EN 14825. The same annual frequency profile of external temperatures as in the current Regulation (EU) 2016/2281 was maintained.

Systems without integrated condensers

Why indoor unit only for systems without integrated condensers

It has been chosen to focalise the attention on the indoor unit only because the outdoor unit is composed of a fan and the condenser, while all the remaining components are incorporated into the indoor unit. This leads to a negligible energy consumption of the outdoor unit compared to the indoor unit, therefore to a minor impact on the overall efficiency.

Moreover, an indoor unit can be coupled with multiple outdoor units, making the tests and the method to define the efficiency over-complicated compared to the accuracy and significance of the results.

Fixed condensing Temperature and subcooling Temperature

(4)-(5) The condensing temperature and the relevant liquid temperature entering the unit under test are fixed, simulating a matched remote condenser (i.e. a finned coil or microchannel heat exchanger with the fan) with an approaching temperature of 10°C at full load and considering 7.5°C at 75% partial load. For low condensing temperatures there are often constraints in the compressor capability, so it is not possible to impose the same approach: that's why it is imposed only a minimum temperature limit and the manufacturer will define the condensing temperature within these limits.

Systems using an integrated condenser

The approach as considered in EN 14825 standard is deemed adequate.

³ Eurovent AISBL / IVZW / INPA. [2024]. Eurovent 18/2 - 2024 – SEPR for Very High Temperature Process Chillers. Brussels: Eurovent.: <https://www.eurovent.eu/publications/eurovent18-2-sepr-for-very-high-temperature-process-chillers/>

About Eurovent

Eurovent is the voice of the European HVACR industry, representing over 100 companies directly and more than 1.000 indirectly through our 16 national associations. The majority are small and medium-sized companies that manufacture indoor climate, process cooling, and cold chain technologies across more than 350 manufacturing sites in Europe. They generate a combined annual turnover of more than 30 billion EUR and employ over 150.000 Europeans in good quality tech jobs.

Mission

Eurovent's mission is to bring together HVACR technology providers to collaborate with policymakers and other stakeholders towards conditions that foster fair competition, innovation, and sustainable growth for the European HVACR industry.

Vision

Eurovent's vision is an innovative and competitive European HVACR industry that enables sustainable development in Europe and globally, which works for people, business, and the environment.

→ For in-depth information and a list of all our members, visit www.eurovent.eu