



Eurovent 18/3 - 2024

Measurement tolerance for process chillers

First Edition

Published on Friday, 27 September 2024 by
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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

Preface

In a nutshell

Members of the product group 'Liquid Chilling Packages and Heat Pumps' assessed the EN 14825 standard to define the maximum uncertainty of measurement for process chillers.

Authors

This document was published by Eurovent and was prepared in a joint effort by participants of the Product Group 'Liquid Chilling Packages and Heat Pumps' (PG-LCP-HP), which represents a vast majority of all manufacturers of these products active on the EMEA market.

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Suggested citation

Eurovent AISBL / IVZW / INPA. (2024). Eurovent 18/3 - 2024 - Measurement tolerance for process chillers. Brussels: Eurovent.

Important remarks

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Background

The members of the Eurovent Product Group 'Liquid Chilling Packages and Heat Pumps' would like to provide clarity to the market about the correct interpretation of the standard EN 14825:2022 regarding the tolerances to consider when performing tests on process chillers.

Chapters 10 and 11 of the EN 14825:2022

The chapter 10 of the EN 14825:2022 standard deals with the "Calculation method for SEPR of process chillers and remote condenser process chillers" and in the paragraph 10.2.3, "Calculation procedure for staged and variable capacity units" is stated:

10.2.3 Calculation procedure for staged and variable capacity units

The capacity, effective power input and *EER* shall be determined at the closest step or increment of the capacity control of the unit to reach the required cooling load.

If the resulting capacity is within $\pm 3\%$ of the required cooling load (e.g. between 103 kW and 97 kW for a required cooling load of 100 kW), the required cooling load is considered achieved. The resulting capacity and *EER* are considered as P_c and EER_d . EER_d shall be used as EER_{bin} .

Figure 1: extract from the chapter 10.2.3 of EN 14825:2022

However, chapter 11 of the same standard is dedicated to test methods: "Test methods for testing capacities, EER_d^1 and COP_d^2 values during active mode at part load conditions" and chapter 11.4 establishes rules for uncertainties of measurement:

11.4 Uncertainties of measurement

The heating and cooling capacities measured on the liquid side shall be determined within a maximum uncertainty of $(2+3/\text{part load ratio})\%$.

Figure 2: extract from the chapter 11.4 of EN 14825:2022

Measurement tolerance for process chillers

Considering the above, the members of the Eurovent Product Group 'Liquid Chilling Packages and Heat Pumps' agreed that for measurement purposes, the correct maximum tolerance to consider is:

$$\left(2 + \frac{3}{\text{part load ratio}}\right)\%$$

An important remark is that this equation is applicable to measurement purposes only while performing tests, it is not valid for calculations. For calculation purposes the chapter 10 applies.

¹ EER at declared capacity

² COP at declared capacity

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, businesses, and the environment.

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