



SLOVENSKI STANDARD
SIST EN 14624:2005

01-september-2005

Lastnosti premičnih javljalnikov puščanja in kontrolnih točk v prostoru za halogenska hladila

Performances of mobile leak detectors and of room controllers of halogenated refrigerants

Leistung von mobilen Leckdetektoren und Raumüberwachungsgeräten für halogenierte Kältemittel

iTeh STANDARD PREVIEW
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Performances des détecteurs de fuite mobiles et des contrôleurs d'ambiance de fluides frigorigènes halogénés

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EUROPEAN STANDARD

EN 14624

NORME EUROPÉENNE

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Performances of mobile leak detectors and of room controllers of halogenated refrigerants

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contrôleurs d'ambiance de fluides frigorigènes halogénés

Leistung von mobilen Leckdetektoren und
Raumüberwachungsgeräten für halogenierte Kältemittel

This European Standard was approved by CEN on 21 February 2005.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the Central Secretariat has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

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COMITÉ EUROPÉEN DE NORMALISATION
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Foreword

This document (EN 14624:2005) has been prepared by Technical Committee CEN/TC 182 "Refrigerating systems, safety and environmental requirements", the secretariat of which is held by DIN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by October 2005, and conflicting national standards shall be withdrawn at the latest by October 2005.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

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EN 14624:2005 (E)**1 Scope**

The purpose of this document is to qualify performances of leak detectors or room controllers of halogenated refrigerants. These leak detectors are designed for the detection of CFC, HCFC, HFC and PFC halogenated gases, and their sensitivity is checked with a calibrated leak.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 378, *Refrigerating systems and heat pumps — Safety and environmental requirements*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1**chloro-fluoro-carbon**

CFC

fully halogenated halocarbon composed only of chlorine, fluorine and carbon (no hydrogen remaining)

3.2**hydro-chloro-fluoro-carbon**

HCFC

halocarbon composed only of hydrogen, chlorine, fluorine and carbon

3.3**hydro-fluoro-carbon**

HFC

halocarbon composed only of hydrogen, fluorine and carbon

3.4**perfluoro-carbon**

PFC

halocarbon composed only of fluorine and carbon

3.5**gas concentration**

ratio in weight or in volume of a given gas to the total weight or volume of the gas mixture. The unit is either ppm (m/m) or ppm (V/V), either in percentage (m/m) or (V/V)

3.6**room controller**

fixed device, with one or several sensors, permitting the indication or the measure of concentrations of halogen gases in the atmosphere in one or several points in the same room or in several rooms

3.7**leak rate**

gas flow through a fissure, an orifice or whatever tightness default. The usual leak rate unit is the gram per year (g/year), see informative Annexes A and B

NOTE This gas flows through channels of some micrometers of diameter with high length/diameter ratio.

3.8**indicating leak detector**

leak detector indicating one or several levels of concentration, but with no value of this (or these) concentrations

3.9**measuring leak detector**

leak detector that measures gas concentration in a reference volume and that displays the value

3.10**locating leak detector**

portable either indicator or measure leak detector with a component reacting to halogen gas concentration in the atmosphere

3.11**calibrated leak**

device with a defined annual mass flow rate in gram(s) of a given gas under defined pressure and temperature conditions. These conditions are defined upstream and downstream of the calibrating device. Calibrated leaks are standardized against a standard leak

3.12**gas flow at constant pressure**

flow assumed as isotherm with a constant density

3.13**ppm (m/m)**

parts per million expressed in weight per weight ratio

3.14**ppm (V/V)**

parts per million expressed in volume per volume ratio

3.15**reference volume**

volume defined by a real or conventional border used as a reference for the measurement of the concentration increase of the gas to be detected

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4 Symbols and abbreviations**Table 1 — Symbols and abbreviations**

| Symbol | Prescription | Unit |
|------------------|----------------------|--------------------------|
| V_{acc} | accumulation value | m^3 |
| V_{mol} | molar volume | m^3/kmol |
| M | molar mass | kg/kmol |
| \dot{m} | massflow | kg/s |
| \dot{N} | molar mass flow rate | mol/s |
| C | concentration | V/V or m/m |

5 Types of detectors

The types of detectors of Table 2 are concerned.

Table 2 — Types of detectors

| | Indicating | Measuring |
|------------------------|------------|-----------|
| Room controller | A | B |
| Locating leak detector | C | D |

The indicator leak detector or room controller can be designed with thresholds: either one fixed threshold that is non-adjustable, or several fixed or adjustable thresholds.

The measuring leak detector or room controller includes a graduated scale and permits the association of a gas concentration in the atmosphere and one measurement value.

6 General requirements for all leak detectors

6.1 Gas type

The manufacturer shall specify the gas or gas (es) that the leak detector is able to detect or measure.

6.2 Aptitudes to the function

Locating leak detectors or room controllers are single gas or multi-gas. They are selective or non selective and shall be able to measure or indicate the concentration threshold of halogen gas in a reference volume defined by the manufacturer. Selective locating detectors or room controllers are able to identify a defined halogen gas among others. Non-selective locating detectors or room controllers cannot identify one halogen gas among halogen gases but they detect all halogen gases. They can also be non selective - that means detect any type of gas, halogen or not.

6.3 Output signal

The indication or the measurement given by the leak detector can be instantaneous or continuous and generates a signal (audible and/or visual). The signal alerts operators in charge of the leak tightness inspection or in charge of supervising the system charged with halogen gas.

6.4 Detection time

The manufacturer shall indicate the time necessary to obtain the output signal.

6.5 Recovery time (clean up time)

The recovery time is the time required for a leak detection system to indicate the output signal corresponding to the minimum detection threshold when it has been in contact with a leak flow rate of 50 g/year.

6.6 Measure range

The leak detector or the room controller shall indicate minimum and maximum concentrations of halogen gas that they can measure or differentiate.

6.7 Repeatability

For identical concentration values of a defined halogen gas, the leak detector or the room controller shall give identical indications within an uncertainty range specified by the manufacturer.

6.8 Calibration

The calibration frequency of the leak detection system and the reference(s) of calibrated leak(s) shall be mentioned by the manufacturer.

7 Specific requirements for locating leak detectors

7.1 General

Locating leak detectors shall be able to indicate halogen gas concentration in two different circumstances, first when the detection probe is moving, second when the detection probe is stationary in front of a leak location.

7.2 Lowest sensitivity threshold when the leak detector is moving

The leak detector, moved back and forth ten times, at a speed of $0,2 \text{ cm/s} \pm 10 \%$, laterally with a lateral length of $\pm 20 \text{ cm}$ around the leak location and passing at $2 \text{ mm} \pm 0,1 \text{ mm}$ of this leak location, shall be able to detect a $5\,000 \text{ ppm (V/V)}$ concentration, which corresponds to a leak rate in the range of 3 g/year of R-134a (see Annex B). Testing conditions are detailed in 11.1.

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