



**CSA C22.2 No. 61010-2-011:19**

**Safety requirements for electrical equipment for measurement, control, and laboratory use — Part 2-011: Particular requirements for refrigerating equipment**  
(IEC 61010-2-011:2019, MOD)

**CSA C22.2 n° 61010-2-011:19**

**Exigences de sécurité pour appareils électriques de mesure, de régulation et de laboratoire — Partie 2-011 : Exigences particulières pour appareils de réfrigération**  
(IEC 61010-2-011:2019, MOD)



**Standards Council of Canada**  
**Conseil canadien des normes**

# ***Standards Update Service***

***CSA C22.2 No. 61010-2-011:19  
November 2019***

**Title:** *Safety requirements for electrical equipment for measurement, control, and laboratory use — Part 2-011: Particular requirements for refrigerating equipment*

To register for e-mail notification about any updates to this publication

- go to [store.csagroup.org](http://store.csagroup.org)
- click on **Product Updates**

The **List ID** that you will need to register for updates to this publication is **127 14**.

If you require assistance, please e-mail [techsupport@csagroup.org](mailto:techsupport@csagroup.org) or call 416-747-2233.

Visit CSA Group's policy on privacy at [www.csagroup.org/legal](http://www.csagroup.org/legal) to find out how we protect your personal information.

# INTERNATIONAL STANDARD

## NORME INTERNATIONALE



GROUP SAFETY PUBLICATION  
PUBLICATION GROUPEE DE SÉCURITÉ

**Safety requirements for electrical equipment for measurement, control, and laboratory use –  
Part 2-011: Particular requirements for REFRIGERATING EQUIPMENT**

**Exigences de sécurité pour appareils électriques de mesurage, de régulation et de laboratoire –  
Partie 2-011: Exigences particulières pour APPAREILS DE REFRIGERATION**

# CONTENTS

FOREWORD.....	4
INTRODUCTION.....	7
1 Scope and object.....	10
2 Normative references .....	11
3 Terms and definitions .....	11
4 Tests .....	13
5 Marking and documentation.....	16
6 Protection against electric shock .....	17
7 Protection against mechanical HAZARDS.....	19
8 Resistance to mechanical stresses .....	19
9 Protection against the spread of fire .....	19
10 Equipment temperature limits and resistance to heat.....	20
11 Protection against HAZARDS from fluids and solid foreign objects .....	21
12 Protection against radiation, including laser sources, and against sonic and ultrasonic pressure .....	32
13 Protection against liberated gases and substances, explosion and implosion .....	32
14 Components and subassemblies .....	32
15 Protection by interlocks .....	33
16 HAZARDS resulting from application .....	33
17 RISK assessment .....	33
Annexes .....	34
Annex G (informative) Leakage and rupture from fluids under pressure .....	35
Annex L (informative) Index of defined terms .....	36
Annex AA (normative) Non-sparking electrical device.....	37
Annex BB (informative) HAZARD associated with REFRIGERATING SYSTEMS and REFRIGERANTS .....	38
Annex CC (informative) Safety requirements for components and piping .....	40
Annex DD (informative) Equipment containing FLAMMABLE REFRIGERANTS – Information and marking requirements .....	45
Bibliography.....	49
Figure 101 – Schema of a REFRIGERATING SYSTEM incorporating a condenser.....	8
Figure 102 – Flow chart illustrating the selection process .....	9
Figure 103 – Scratching TOOL tip details .....	27
Table 1 – Symbols .....	17
Table 101 – Maximum temperatures for MOTOR-COMPRESSORS .....	20
Table 102 – Minimum temperature for determination of saturated vapor pressure of REFRIGERANT .....	22
Table 103 – REFRIGERANT flammability parameters .....	31
Table CC.1 – Parameters of pressure vessels according to EN 14276-1 .....	40
Table CC.2 – Parameters of piping according to EN 14276-2 .....	42

Table CC.3 – Component and piping requirements .....	43
Table CC.4 – Minimum wall thickness for copper and steel tubing .....	44
Table DD.1 – Quantity of Group A2/A3 REFRIGERANT per occupied space.....	48

Currently in preview, click buy full version

# SAFETY REQUIREMENTS FOR ELECTRICAL EQUIPMENT FOR MEASUREMENT, CONTROL, AND LABORATORY USE –

## Part 2-011: Particular requirements for REFRIGERATING EQUIPMENT

### 1 Scope and object

This clause of Part 1 is applicable, except as follows:

#### 1.1.1 Equipment included in scope

*Replacement:*

*Replace the second paragraph by the following:*

This Part 2 of IEC 61010 specifies particular safety requirements for the following types a) to c) of electrical equipment and their accessories, wherever they are intended to be used, whenever that equipment incorporates REFRIGERATING SYSTEMS as an integral part of, or separate from, the equipment and the equipment is in direct control of the REFRIGERATING SYSTEM.

This document details all the requirements when up to 150 g of FLAMMABLE REFRIGERANT are used per stage of a REFRIGERATING SYSTEM. Additional requirements beyond the current scope of this document apply if a REFRIGERANT charge of FLAMMABLE REFRIGERANT exceeds this amount.

*Addition:*

*Add the following text after the last paragraph:*

NOTE 101 Examples for REFRIGERATING EQUIPMENT include, but are not limited to, laboratory equipment such as laboratory refrigerators, freezers, refrigerated display cabinets.

It is possible that all or part of the equipment falls within the scope of one or more other Part 2 standards of IEC 61010 as well as within the scope of this standard. In that case, the requirements of those other Part 2 standards will also apply. In particular, if equipment is intended to be used as a centrifuge, the requirements of IEC 61010-2-020 apply. However, when the equipment incorporates a refrigerating system and a heating function where the combination of the two introduces additional or more severe HAZARDS than if treated separately, then it is possible that IEC 61010-2-012 is applicable instead of this Part 2-011.

See further information in the flow chart (Figure 102) for the selection process and guidance in the Introduction.

#### 1.2 Equipment excluded from scope

*Addition:*

*Add the following new item after item j):*

or equipment incorporating:

- aa) a transcritical REFRIGERANT SYSTEM (system that uses CO<sub>2</sub>) or a system that uses ammonia (NH<sub>3</sub>) as the REFRIGERANT.