CSA C22.2 No. 62091:20
(IEC 62091:2007, MOD)
National Standard of Canada

CSA C22.2 No. 62091:20
Low-voltage switchgear and controlgear — Controllers for drivers of stationary fire pumps
(IEC 62091:2007, MOD)

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600-55 Metcalfe Street
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National Standard of Canada

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(IEC 62091:2007, MOD)

Note: *For brevity, this Standard will be referred to as "CSA C22.2 No. 62091" throughout.*

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This national standard is based on publication IEC 62091, First Edition (2007).

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Commitment for Amendments

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This ANSI/UL Standard for Safety consists of the First Edition.

The most recent designation of ANSI/UL 62091 as an American National Standard (ANSI) occurred on September 30, 2020. ANSI approval for a standard does not include the Cover Page, Transmittal Pages, Title Page (front and back), or the Preface. The National Difference Page and IEC Foreword are also excluded from the ANSI approval of IEC-based standards. Any other portions of this ANSI/UL standard that were not processed in accordance with ANSI/UL requirements are noted at the beginning of the impacted sections.

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PREFACE

This is the harmonized ANCE, CSA Group, and UL Standard for Low-Voltage Switchgear and Controlgear – Controllers for Drivers of Stationary Fire Pumps. It is the First edition of NMX-J-XXXX, CSA C22.2 No. 62091, and UL 62091.

This harmonized standard is based on IEC Publication 62091: First Edition, Low-voltage switchgear and controlgear – Controllers for drivers of stationary fire pumps, issued January 2007, and the requirements pertaining to fire pump controllers from the 2019 and past editions of NFPA 20, Standard for the Installation of Stationary Pumps for Fire Protection. This document is intended to replace NMX-J-626-ANCE-2015/UL 218/CSA C22.2 No. 263-15, published in September 2015, to provide globally accepted requirements for fire pump controllers. IEC 62091 is copyrighted by the IEC.

This harmonized standard was prepared by the Association of Standardization and Certification (ANCE), CSA Group, and Underwriters Laboratories Inc. (UL). The efforts and support of the Technical Harmonization Subcommittee, Fire Pump Controllers, CANENA THSC 121A-62091 on the Harmonization of Electrotechnical Standards of the Nations of the Americas (CANENA), are gratefully acknowledged.

This standard is considered suitable for use for conformity assessment within the stated scope of the standard.

The present Mexican Standard was reviewed and approved by the Comité de Normalización de la Asociación de Normalización y Certificación, A.C., CONANCE.

This standard was reviewed by the CSA Subcommittee on Fire Pump Controllers, under the jurisdiction of the CSA Technical Committee on Industrial Products and the CSA Strategic Steering Committee on Requirements for Electrical Safety, and has been formally approved by the CSA Technical Committee. This standard has been developed in compliance with Standards Council of Canada requirements for National Standards of Canada. It has been published as a National Standard of Canada by CSA Group.

Application of Standard

Where reference is made to a specific number of samples to be tested, the specified number is to be considered a minimum quantity.

Note: Although the intended primary application of this standard is stated in its scope, it is important to note that it remains the responsibility of the users of the standard to judge its suitability for their particular purpose.

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This standard adopts the IEC text with national differences.

This standard is published as an equivalent standard for ANCE, CSA Group and UL.

An equivalent standard is a standard that is substantially the same in technical content, except as follows: Technical national differences are allowed for codes and governmental regulations as well as those recognized as being in accordance with NAFTA Article 905, for example, because of fundamental climatic, geographical, technological, or infrastructural factors, scientific justification, or the level of protection that the country considers appropriate. Presentation is word for word except for editorial changes.

All national differences from the IEC text are included in the ANCE, CSA Group, and UL versions of the standard. While the technical content is the same in each organization's version, the format and presentation may differ.

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Differences from the IEC are being added in order to address safety and regulatory situations present in Mexico, the US and Canada.

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D2 – These are National Differences from IEC requirements based on existing **safety practices**. These requirements reflect national safety practices, where empirical substantiation (for the IEC or national requirement) is not available or the text has not been included in the IEC standard.

DC – These are National Differences based on the **component standards** and will not be deleted until a particular component standard is harmonized with the IEC component standard.

DE – These are National Differences based on **editorial comments or corrections**.

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>
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FOREWORD

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LOW-VOLTAGE SWITCHGEAR AND CONTROLGEAR – CONTROLLERS FOR DRIVERS OF STATIONARY FIRE PUMPS

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International Standard IEC 62091 has been prepared by subcommittee 17B: Low-voltage switchgear and controlgear, of IEC technical committee 17: Switchgear and controlgear.

This first edition cancels and replaces the technical specification published in 2003. It constitutes a technical revision and now has the status of an International Standard.

The text of this standard is based on the following documents:

FDIS	Report on voting
17B/1527/FDIS	17B/1536/RVD

Full information on the voting for the approval of this standard can be found in the report on voting indicated in the above table.

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

The committee has decided that the contents of this publication will remain unchanged until the maintenance result date indicated on the IEC web site under "http://webstore.iec.ch" in the data related to the specific publication. At this date, the publication will be

• reconfirmed,

• withdrawn,

• replaced by a revised edition, or

• amended.

INTRODUCTION

IEC 62091 pertains to life-safety equipment and is based in part on NFPA 20 (1996) *Standard for the Installation of Centrifugal Fire Pumps*. When called upon to work by automatic signal, manual-electric signal or manual-emergency actuation, the controller is expected to start the pump driver (motor or diesel engine) because “the building is on fire”. Failure to carry out its task will increase fire damage to the building, its contents and people therein.

These controllers default to a RUN state. They are intended to be located in compliance with local requirements which generally will place them in pump rooms or pump houses that have some specified degree of fire protection. These locations often have sweating overhead pipes, are possibly sprinklered and are in the vicinity of vaults housing other building distribution equipment.

Fire pumps are intended to boost water pressure. Many sprinkler systems are assumed to have small leaks for which “Jockey Pumps” (also known as make-up pumps) are installed to maintain desired pressure in the sprinkler pipes, thus preventing the main fire pump from excessive starts and stops. Experience has shown that leakage water flowing through the fire pump (at rest) over long periods of pump inactivity can carry sand, aggregates, rocks, rust and such which collect in the fire pump. These contaminants may prevent normal starting until the pump impeller accelerates to clear the pump housing. This standard recognizes the condition of under-exercised fire pumps by permitting up to 20 s at locked rotor current, whether the starts are “cold starts” (initial starts) or “hot starts” (restarts). Starting a distressed pump may cause temporary or permanent damage to electrical conductors, equipment and the motor, because shutdown for equipment protection could possibly permit its destruction by fire along with the building and its contents.

Several examples of the construction and installation applications between a fire pump controller and other controllers include the following:

(1) all fire pump controllers

a) The main circuit conductors and components are considered to be sacrificial (i.e. temporary and permanent damage levels are permitted) during any attempt to start a distressed motor/pump and to keep it operating.

b) They are expected to provide a high degree of reliability to start the pump driver automatically and suppress a fire upon sensing a pressure drop in the sprinkler pipe or by other automatic fire detection equipment.

c) Failures in external control circuits should not prevent operations of pumps from all other internal or other external means.

d) External control circuits are expected to be arranged so that failure of any external circuit (open or short-circuit) will not prevent operation of pump(s) from all other internal or external means. Breakage, disconnecting, shorting of the wires or loss of power to these circuits can cause continuous running of the fire pump but should not prevent the controller(s) from starting the fire pump(s) due to causes other than these external circuits.

e) External automatic starting means should be accomplished by opening a normally closed contact on the external means to de-energize a normally energized control circuit in the controller.

f) While external start buttons or other starting means are permitted, the controller should not be equipped with any means to accommodate remote stopping (a remote STOP button should not be used).

g) Nuisance starts are permitted in the case where a failure of internal control components might cause the motor to start running.

(2) electric motor fire pump controllers

a) They are expected to include means for external, manual mechanical operation of the controller in the event of loss of ability to close the contactor electrically/magnetically.

b) Thermally reactive over-current protective devices should not be permitted. The controller should provide short-circuit and locked rotor protection only.

c) Releases of the FPC-overcurrent protective devices (short-circuit protective and locked rotor protective devices) are expected to permit it to carry 300 % of rated operational motor current for an extended period of time.

(3) diesel engine fire pump controllers

a) Should provide means to automatically exercise the engine on a weekly basis.

b) When an automatic or manual signal to start/run exists, (except under TEST) the controller should not shut down the engine for any reason except OVERSPEED. When in TEST mode, the controller may shut down under low oil pressure and high engine temperature conditions. The two conditions mentioned illustrate the sacrificial nature while fighting a fire.

Therefore, the most significant purpose of this standard is to characterize the unique features of fire pump controllers.

An installation with two fire pumps will increase the reliability and safety of the installation, especially if the two fire pumps are supplied from two different power supplies. This is especially true during maintenance or repairing of a single controller, as fire protection is still being maintained by the other fire pump.

LOW-VOLTAGE SWITCHGEAR AND CONTROLGEAR – CONTROLLERS FOR DRIVERS OF STATIONARY FIRE PUMPS

1 Scope and object

This International Standard applies to controllers intended for starting, controlling and stopping stationary fire pumps, including automatic and non-automatic types for alternating current electric motor or diesel engine-driven fire pumps. It is anticipated that a controller only controls a single driver.

Controllers for electric motor-driven fire pumps always include suitable short-circuit protection as an integral part of the controller. These controllers may include an integral power transfer switch. These controllers are rated 1 000 V a.c. maximum.

Controllers for diesel engine-driven fire pumps include electrical circuits that operate various control and supervisory functions, such as remote control (starting), alarms, signals, indicators, and the proper operation of battery chargers.

The most significant purpose of this standard is to characterize the unique features of fire pump controllers. A further purpose is to prescribe a procedure for exercising the controllers to verify that the unique features are operative. For the purpose of this standard, this procedure is described as the “fire pump controller test protocol”.

The object of this standard is to state the following:

a) the unique characteristics of fire pump controllers, their associated equipment and their operational functions;

b) the tests intended for confirming that these conditions have been met, and the methods to be adopted for these tests;

c) the information to be given with the equipment, or in the manufacturer's literature.

In this context, this standard gives the requirements for all of the electrical functions associated with both the electric motor-driven and the diesel engine-driven fire pumps. Special applications such as explosive atmospheres, nuclear installations, ships, aircraft, etc. are not covered by this standard. Referring to electric power sources, the requirements of this standard apply only to the extent that they place limits on the nature, behaviour and characteristics of the electrical energy that is supplied to the service entrance (see IEC 60364-5-55).

The requirements of this standard apply neither to the method nor to the means by which the electrical energy is generated. In addition, they do not apply to the installation between the origin of the installation and the fire pump controller, which are to be found in the IEC 60364 series. This standard does not apply to diesel engine-driven electric generators which may be associated with a stationary fire pump installation.

EMC considerations are correlated with other IEC standards for similar products:

a) for electric fire pump controllers, EMC considerations are covered by this standard, and

b) for diesel engine fire pump controllers, d.c. batteries are the intended source of electrical control power.