CSA GROUP™

CSA Z5001:20
National Standard of Canada

Existing building commissioning for energy using systems

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REVISED MAY 2021

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Revision History

CSA Z5001:20, Existing building commissioning for energy using systems

Administrative update — May 2021
National Standard of Canada page: French version now available

Standards Update Service

CSA Z5001:20
August 2020

Title: *Existing building commissioning for energy using systems*

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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 to judge its suitability for their particular purpose.

National Standard of Canada

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Published in August 2020 by CSA Group
A not-for-profit private sector organization
178 Rexdale Boulevard, Toronto, Ontario, Canada M9W 1R3

To purchase standards and related publications, visit our Online Store at www.csagroup.org/store/
or call toll-free 1-800-463-6727 or 416-747-4044.

ICS 91.140
ISBN 978-1-4883-3105-3

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Preface

This is the first edition of CSA Z5001, *Existing building commissioning for energy using systems*.

This Standard provides guidelines for the commissioning of systems for building energy use through the building envelope, mechanical and electrical equipment, and water uses. It applies to existing Part 3 Buildings as they are defined in the *National Building Code of Canada*. The commissioning process and concepts contained in this Standard are based on CSA Z320, CSA Z5000, and CAN/CSA-Z8001.

The purpose of this Standard is to provide consistent protocols for commissioning existing building system energy use and monitoring plans. Where requirements of this Standard generally refer to energy, it is inferred that both the building envelope and water systems are included in the effort to improve energy and resource usage.

CSA Group acknowledges that the development of this Standard was made possible, in part, by the financial support of Natural Resources Canada (NRCan), BC Hydro, Manitoba Hydro, the Canadian Electricity Association (CEA), Independent Electricity Service Operator (IESO), Nova Scotia Department of Energy, Efficiency Nova Scotia, Northwest Energy Efficiency Alliance (NEEA) and Transition Énergétique Québec (TEQ).

This Standard was prepared by the Subcommittee on Building Commissioning for Energy Using Systems, under the jurisdiction of the Technical Committee on Heating, Ventilation, Air-Conditioning, and Refrigeration, and the Strategic Steering Committee on Performance, Energy Efficiency, and Renewables.

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.

Notes:

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   a) *Standard designation (number);*
   b) *relevant clause, table, and/or figure number;*
   c) *wording of the proposed change; and*
   d) *rationale for the change.*

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0 Introduction

0.1 General

With the publication in 2011 of CSA Z320, *Building commissioning*, the Technical Committee agreed to use CSA Z320 and CSA Z5000 as the basis for a new standard. This Standard includes some of the CSA Z320 and CSA Z5000 content, as well as additional requirements and guidance specific to requirements for monitoring building systems. It applies to existing buildings or facilities.

The intent of this Standard is to provide a comprehensive, integrated, consistent, and managed process to optimize a building's energy and water systems operation through the use of a systematic and rigorous approach. The commissioning process includes benchmarking and documenting the actual performance of the energy and water using systems in an occupied building in order to confirm the systems operate in a manner that meets the owner's current facility requirements (CFR) and to optimize their performance.

This Standard does not set minimum efficiency levels for commercial buildings, rather it allows users to reconcile and verify the in-operation performance to that which is required by the owner, voluntary green building programs, or the legislated energy efficiency required by local authorities. This Standard is not intended to replace standards that are focused on energy audits and guidelines.

The intended users of this Standard include professionals commissioning existing buildings, building owners, consultants, building system vendors, and stakeholders who have an interest in building performance or related quality assurance (i.e. regulators and authorities having jurisdiction).

Building energy and water systems and integration of associated controls systems to be investigated include

a) architectural systems (building envelope);
b) vertical and horizontal transportation systems;
c) electrical systems (including interior, exterior and signage lighting, plug loads, and electrical power distribution);
d) mechanical systems (HVAC and refrigeration, hot and cold water); and
e) metering systems.

0.2 Purpose

The Technical Committee has developed this Standard with the intent to guide the commissioning process so that it includes commissioning the components of energy/water systems and progresses to commission building systems and their integration to confirm that the building meets current requirements in the most optimal manner from an energy and water consumption standpoint. While this Standard has been developed by a group of experts in building performance, it will inevitably generate constructive feedback as user experience is gained. As this occurs, the process will be revised and updated to reflect user input.

This Standard has been developed to assist the commissioning team in the preparation and implementation of a commissioning activity which reviews the design, operation, and performance of energy-using systems utilizing

a) the owner's current facility requirements;
b) actual building energy and water usage along with reliable benchmarking data;
c) modelled estimates of building energy and water usage, if available;
d) findings identified and information provided by the facility management and operations staff;
e) data from the building metering and monitoring systems; and
f) the expertise of the building commissioning team members.

0.3 Result

With the standardized, consistent building commissioning protocols presented here, a firm basis is provided to optimize the building's system operation to meet the CFRs while minimizing its energy and water use.

1 Scope

1.1 General

1.1.1 Application

This Standard provides guidelines for the commissioning of energy and water systems in existing buildings, as defined in Part 3 of the *National Building Code of Canada* (NBC). This Standard addresses the special requirements for verifying energy and water performance during the commissioning of existing buildings. The commissioning of new systems in existing buildings may reference the commissioning requirements of CSA Z320 and CSA Z5000.

Note: *Annex A describes when to consider the application of the CSA Z5000 and Z5001 standards.*

1.1.2 Scope of work

This Standard is intended to assist the commissioning team in the planning and implementation of the scope of the commissioning work. This scope of work specifies commissioning requirements for systems that affect energy and water usage, and includes, but is not limited to, the following:

a) the owner's current facility requirements (CFR);
b) the development of the commissioning plan;
c) the resources required to complete commissioning;
d) the responsibilities of the commissioning team;
e) the sequence and integration of commissioning activities;
f) the investigation and testing of energy and water-related building systems;
g) the use of metering and monitoring systems; and
h) the measurement and reporting to be put in place to confirm on-going compliance with local energy and water efficiency regulations.

1.2 Specific systems

1.2.1 Classification

The systems covered in this Standard are classified as

a) architectural and building envelope;
b) vertical and horizontal transportation;

c) electrical and lighting and related controls;
d) mechanical and related controls;
e) energy and water monitoring and metering; and
f) water using systems.

1.2.2 Exclusions

This Standard does not apply to
a) fire pumps;
b) smoke pressurization fans;
c) fire alarm and detection systems;
d) other life safety systems that operate only during testing or emergencies; and
e) equipment or systems exempt from the *National Energy Code of Canada for Buildings* (NECB).

1.3 Terminology

In this Standard, "shall" is used to express a requirement, i.e., a provision that the user is obliged to satisfy in order to comply with the standard; "should" is used to express a recommendation or that which is advised but not required; and "may" is used to express an option or that which is permissible within the limits of the Standard.

Notes accompanying clauses do not include requirements or alternative requirements; the purpose of a note accompanying a clause is to separate from the text explanatory or informative material.

Notes to tables and figures are considered part of the table or figure and may be written as requirements.

Annexes are designated normative (mandatory) or informative (non-mandatory) to define their application.

2 Reference publications

This Standard refers to the following publications, and where such reference is made, it shall be to the edition listed below:

CSA Group

AAMA/WDMA/CSA 101/1.S.2/A440-17
North American Fenestration Standard/Specification for windows, doors, and skylights

Z320-11 (R2016)
Building commissioning

Z5000-18
Building commissioning of energy using systems

CAN/CSA-Z8001-13 (R2018)
Commissioning of health care facilities

ASHRAE (American Society of Heating, Refrigerating and Air-Conditioning Engineers)

ASHRAE Performance Measurement Protocols for Commercial Buildings Best Practices Guide, 2012

