CSA Group

CSA/ANSI LNG 3.4-2018
(ISO 12614-4:2014, MOD)
National Standard of Canada

CSA/ANSI LNG 3.4-2018
Road vehicles — Liquefied natural gas (LNG) fuel system components — Part 4: Manual valve
(ISO 12614-4:2014, MOD)

ISO

Approved American National Standard
ANSI

Standards Council of Canada
Conseil canadien des normes

Legal Notice for Standards

Canadian Standards Association (operating as "CSA Group") develops standards through a consensus standards development process approved by the Standards Council of Canada. This process brings together volunteers representing varied viewpoints and interests to achieve consensus and develop a standard. Although CSA Group administers the process and establishes rules to promote fairness in achieving consensus, it does not independently test, evaluate, or verify the content of standards.

Disclaimer and exclusion of liability

This document is provided without any representations, warranties, or conditions of any kind, express or implied, including, without limitation, implied warranties or conditions concerning this document's fitness for a particular purpose or use, its merchantability, or its non-infringement of any third party's intellectual property rights. CSA Group does not warrant the accuracy, completeness, or currency of any of the information published in this document. CSA Group makes no representations or warranties regarding this document's compliance with any applicable statute, rule, or regulation.

IN NO EVENT SHALL CSA GROUP, ITS VOLUNTEERS, MEMBERS, SUBSIDIARIES, OR AFFILIATED COMPANIES, OR THEIR EMPLOYEES, DIRECTORS, OR OFFICERS, BE LIABLE FOR ANY DIRECT, INDIRECT, OR INCIDENTAL DAMAGES, INJURY, LOSS, COSTS, OR EXPENSES, HOWSOEVER CAUSED, INCLUDING BUT NOT LIMITED TO SPECIAL OR CONSEQUENTIAL DAMAGES, LOST REVENUE, BUSINESS INTERRUPTION, LOST OR DAMAGED DATA, OR ANY OTHER COMMERCIAL OR ECONOMIC LOSS, WHETHER BASED IN CONTRACT, TORT (INCLUDING NEGLIGENCE), OR ANY OTHER THEORY OF LIABILITY, ARISING OUT OF OR RESULTING FROM ACCESS TO OR POSSESSION OR USE OF THIS DOCUMENT, EVEN IF CSA GROUP HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES, INJURY, LOSS, COSTS, OR EXPENSES.

In publishing and making this document available, CSA Group is not undertaking to render professional or other services for or on behalf of any person or entity or to perform any duty owed by any person or entity to another person or entity. The information in this document is directed to those who have the appropriate degree of experience to use and apply its contents, and CSA Group accepts no responsibility whatsoever arising in any way from any and all use of or reliance on the information contained in this document.

CSA Group is a private not-for-profit company that publishes voluntary standards and related documents. CSA Group has no power, nor does it undertake, to enforce compliance with the contents of the standards or other documents it publishes.

Intellectual property rights and ownership

As between CSA Group and the users of this document (whether it be in printed or electronic form), CSA Group is the owner, or the authorized licensee, of all works contained herein that are protected by copyright, all trade-marks (except as otherwise noted to the contrary), and all inventions and trade secrets that may be contained in this document, whether or not such inventions and trade secrets are protected by patents and applications for patents. Without limitation, the unauthorized use, modification, copying, or disclosure of this document may violate laws that protect CSA Group's and/or others' intellectual property and may give rise to a right in CSA Group and/or others to seek legal redress for such use, modification, copying, or disclosure. To the extent permitted by licence or by law, CSA Group reserves all intellectual property rights in this document.

Patent rights

Attention is drawn to the possibility that some of the elements of this standard may be the subject of patent rights. CSA Group shall not be held responsible for identifying any or all such patent rights. Users of this standard are expressly advised that determination of the validity of any such patent rights is entirely their own responsibility.

Authorized use of this document

This document is being provided by CSA Group for informational and non-commercial use only. The user of this document is authorized to do only the following:

If this document is in electronic form:

- load this document onto a computer for the sole purpose of reviewing it;
- search and browse this document; and
- print this document if it is in PDF format.

Limited copies of this document in printed or paper form may be distributed only to persons who are authorized by CSA Group to have such copies, and only if this Legal Notice appears on each such copy.

In addition, users may not and may not permit others to

- alter this document in any way or remove this Legal Notice from the attached standard;
- sell this document without authorization from CSA Group; or
- make an electronic copy of this document.

If you do not agree with any of the terms and conditions contained in this Legal Notice, you may not load or use this document or make any copies of the contents thereof, and if you do make such copies, you are required to destroy them immediately. Use of this document constitutes your acceptance of the terms and conditions of this Legal Notice.

CSA Group

Standards Update Service

CSA/ANSI LNG 3.4-2018
June 2018

Title: *Road vehicles — Liquefied natural gas (LNG) fuel system components — Part 4: Manual valve*

To register for e-mail notification about any updates to this publication
- go to **shop.csa.ca**
- click on **CSA Update Service**

The **List ID** that you will need to register for updates to this publication is **2126124**.

If you require assistance, please e-mail **techsupport@csagroup.org** or call 416-747-2233.

Visit CSA Group's policy on privacy at **www.csagroup.org/legal** to find out how we protect your personal information.

Canadian Standards Association (operating as "CSA Group"), under whose auspices this National Standard has been produced, was chartered in 1919 and accredited by the Standards Council of Canada to the National Standards system in 1973. It is a not-for-profit, nonstatutory, voluntary membership association engaged in standards development and certification activities.

CSA Group standards reflect a national consensus of producers and users — including manufacturers, consumers, retailers, unions and professional organizations, and governmental agencies. The standards are used widely by industry and commerce and often adopted by municipal, provincial, and federal governments in their regulations, particularly in the fields of health, safety, building and construction, and the environment.

Individuals, companies, and associations across Canada indicate their support for CSA Group's standards development by volunteering their time and skills to Committee work and supporting CSA Group's objectives through sustaining memberships. The more than 7000 committee volunteers and the 2000 sustaining memberships together form CSA Group's total membership from which its Directors are chosen. Sustaining memberships represent a major source of income for CSA Group's standards development activities.

CSA Group offers certification and testing services in support of and as an extension to its standards development activities. To ensure the integrity of its certification process, CSA Group regularly and continually audits and inspects products that bear the CSA Group Mark.

In addition to its head office and laboratory complex in Toronto, CSA Group has regional branch offices in major centres across Canada and inspection and testing agencies in eight countries. Since 1919, CSA Group has developed the necessary expertise to meet its corporate mission: CSA Group is an independent service organization whose mission is to provide an open and effective forum for activities facilitating the exchange of goods and services through the use of standards, certification and related services to meet national and international needs.

For further information on CSA Group services, write to
CSA Group
178 Rexdale Boulevard
Toronto, Ontario, M9W 1R3
Canada

A National Standard of Canada is a standard developed by a Standards Council of Canada (SCC) accredited Standards Development Organization, in compliance with requirements and guidance set out by SCC. More information on National Standards of Canada can be found at www.scc.ca.

SCC is a Crown corporation within the portfolio of Innovation, Science and Economic Development (ISED) Canada. With the goal of enhancing Canada's economic competitiveness and social well-being, SCC leads and facilitates the development and use of national and international standards. SCC also coordinates Canadian participation in standards development, and identifies strategies to advance Canadian standardization efforts.

Accreditation services are provided by SCC to various customers, including product certifiers, testing laboratories, and standards development organizations. A list of SCC programs and accredited bodies is publicly available at www.scc.ca.

Standards Council of Canada
600-55 Metcalfe Street
Ottawa, Ontario, K1P 6L5
Canada

Standards Council of Canada
Conseil canadien des normes

Cette Norme Nationale du Canada n'est disponible qu'en anglais.

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.

CSA Group

The Canadian Standards Association (operating as CSA Group), under whose auspices this National Standard has been produced, was chartered in 1919 and accredited by the Standards Council of Canada to the National Standards system in 1973. It is a not-for-profit, nonstatutory, voluntary membership association engaged in standards development and certification activities.

CSA Group standards reflect a national consensus of producers and users including manufacturers, consumers, retailers, unions and professional organizations, and governmental agencies. The standards are used widely by industry and commerce and often adopted by municipal, provincial, and federal governments in their regulations, particularly in the fields of health, safety, building and construction, and the environment.

Individuals, companies, and associations across Canada indicate their support for CSA Groups standards development by volunteering their time and skills to Committee work and supporting CSA Groups objectives through sustaining memberships. The more than 7000 committee volunteers and the 2000 sustaining memberships together form CSA Groups total membership from which its Directors are chosen. Sustaining memberships represent a major source of income for CSA Groups standards development activities.

CSA Group offers certification and testing services in support of and as an extension to its standards development activities. To ensure the integrity of its certification process, CSA Group regularly and continually audits and inspects products that bear the CSA Group Mark.

In addition to its head office and laboratory complex in Toronto, CSA Group has regional branch offices in major centres across Canada and inspection and testing agencies in eight countries. Since 1919, CSA Group has developed the necessary expertise to meet its corporate mission: CSA Group is an independent service organization whose mission is to provide an open and effective forum for activities facilitating the exchange of goods and services through the use of standards, certification and related services to meet national and international needs.

For further information on CSA Group services, write to
CSA Group
178 Rexdale Boulevard, Toronto, Ontario,
Canada M9W 1R3

American National Standards Institute

The American National Standards Institute (ANSI), Inc. is the nationally recognized coordinator of voluntary standards development in the United States through which voluntary organizations, representing virtually every technical discipline and every facet of trade and commerce, organized labor and consumer interests, establish and improve the some 10,000 national consensus standards currently approved as American National Standards.

ANSI provides that the interests of the public may have appropriate participation and representation in standardization activity, and cooperates with departments and agencies of U.S. Federal, state and local governments in achieving compatibility between government codes and standards and the voluntary standards of industry and commerce.

ANSI represents the interests of the United States in international nontreaty organizations such as the International Organization for Standardization (ISO) and the International Electrotechnical Commission (IEC). The Institute maintains close ties with regional organizations such as the Pacific Area Standards Congress (PASC) and the Pan American Standards Commission (COPANT). As such, ANSI coordinates the activities involved in the U.S. participation in these groups.

ANSI approval of standards is intended to verify that the principles of openness and due process have been followed in the approval procedure and that a consensus of those directly and materially affected by the standards has been achieved. ANSI coordination is intended to assist the voluntary system to ensure that national standards needs are identified and met with a set of standards that are without conflict or unnecessary duplication in their requirements.

Responsibility of approving American standards rests with the
American National Standards Institute, Inc.
25 West 43rd Street, Fourth floor
New York, NY 10036

National Standard of Canada

CSA/ANSI LNG 3.4-2018

Road vehicles — Liquefied natural gas (LNG) fuel system components — Part 4: Manual valve

(ISO 12614-4:2014, MOD)

Prepared by
International Organization for Standardization

Reviewed by

™A trade-mark of the Canadian Standards Association, operating as "CSA Group"

American National Standards Institute, Inc.

Interprovincial Gas Advisory Council

Approved on June 1, 2018 by ANSI
Approved on April 19, 2018 by IGAC
Published in June 2018 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 **shop.csa.ca***
or call toll-free 1-800-463-6727 or 416-747-4044.

ICS 43.060.40
ISBN 978-1-4883-1471-1

CSA/ANSI LNG 3.4-2018
Road vehicles — Liquefied natural gas (LNG) fuel system components — Part 4: Manual valve
(ISO 12614-4:2014, MOD)

CSA Preface

This is the first edition of CSA/ANSI LNG 3.4, *Road vehicles — Liquefied natural gas (LNG) fuel system components — Part 4: Manual valve*, which is an adoption, with North American deviations, of the identically titled ISO (International Organization for Standardization) Standard 12614-4 (first edition, 2014-07-01). At the time of publication, ISO 12614-4:2014 is available from ISO in English only. CSA Group will publish the French version when it becomes available from ISO.

For brevity, this Standard will be referred to as "CSA/ANSI LNG 3.4" throughout.

The North American deviations are intended to
a) correct inaccuracies; and
b) replace references to ISO and IEC Standards with references to U.S. and CSA Group Standards, where applicable.

This Standard is intended to be used in conjunction with CSA/ANSI LNG 3.1-2018, *Road vehicles — Liquefied natural gas (LNG) fuel system components — Part 1: General requirements and definitions* (adopted ISO 12614-1:2014, with Canadian deviations) and CSA/ANSI LNG 3.2-2018, *Road vehicles — Liquefied natural gas (LNG) fuel system components— Part 2: Performance and general test methods* (adopted ISO 12614-2:2014, with Canadian deviations).

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

This Standard was reviewed for North American adoption by the CSA Subcommittee on Liquefied Natural Gas Vehicle Fueling Connection Devices, LNG 1, under the jurisdiction of the CSA Technical Committee on Natural Gas Transportation and the CSA Strategic Steering Committee on Transportation. It has been formally approved by the Technical Committee and by the Interprovincial Gas Advisory Council.

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. This Standard was approved by the American National Standards Institute (ANSI) as an American National Standard on June 1, 2018.

Inquiries regarding this American National Standard/National Standard of Canada should be addressed to
CSA Group
178 Rexdale Boulevard, Toronto, Ontario, Canada M9W 1R3
1-800-463-6727 • 416-747-4000
http://csa.ca

To purchase standards and related publications, visit our Online Store at shop.csa.ca or call toll-free 1-800-463-6727 or 416-747-4044.

This Standard is subject to review within five years from the date of publication, and suggestions for its improvement will be referred to the appropriate committee. The technical content of IEC and ISO publications is kept under constant review by IEC and ISO. To submit a proposal for change, please send the following information to inquiries@csagroup.org and include “Proposal for Change” in the subject line:

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

CSA Group acknowledges that the adoption of this Standard was made possible, in part, by the financial support of

Natural Resources Canada
Ressources naturelles Canada
Canada

North American deviations

The following deviations are intended to meet local product requirements and to align with energy efficiency requirements of relevant Canadian regulators.

International Standard ISO 12614-4:2014 (first edition) forms the basis for CSA/ANSI LNG 3.4, which contains the following deviations in addition to those shown in CSA/ANSI LNG 3.1-2018 and CSA/ANSI LNG 3.2-2018.

[Replace all references to "ISO 12614-1" with "CSA/ANSI LNG 3.1"]

[Replace all references to "ISO 12614-2" with "CSA/ANSI LNG 3.2"]

1 Scope

[Add the following note]

NOTE 3A For North American application, all references to working pressure are considered to be equivalent to maximum allowable working pressure (MAWP).

2 Normative references

[Add the following]

Where reference is made to CSA Group publications, such reference shall be considered to refer to the latest edition and all amendments published to that edition. This Standard refers to the following publications, and the years shown indicate the latest editions available at the time of printing.

The following National Standards of Canada, published by CSA Group, are adoptions of ISO Standards. The requirements of these CSA Group Standards shall take precedence over the International Standards on which they are based. Any reference within CSA/ANSI LNG 3.4 to the International Standard shall be replaced by a reference to the equivalent Canadian Standard. Any reference to International Standards that are adopted as National Standards of Canada subsequent to the publication of CSA/ANSI LNG 3.4 shall be replaced by the relevant National Standard of Canada.

CSA Group

CSA/ANSI LNG 3.1-2018
Road vehicles — Liquefied natural gas (LNG) fuel system components — Part 1: General requirements and definitions
[Replaces ISO 12614-1:2014]

CSA/ANSI LNG 3.2-2018
Road vehicles — Liquefied natural gas (LNG) fuel system components— Part 2: Performance and general test methods
[Replaces ISO 12614-2:2014]

4 Marking

[Add the following item to the list in the first paragraph]

cA) the serial number or date code.

[Delete Items c) and f) from the list in the second paragraph]

6 Test

6.4 Continued operation

6.4.3

[Replace this Clause with the following]

Conduct the continued operation test at the appropriate maximum temperature according to CSA/ANSI LNG 3.1, Clauses 4.4.2 and 4.4.3, then repeat the test at a temperature of ≤ −162 °C (≤ −260 ˚F) and with the appropriate maximum torque specified in Table 1 below.

INTERNATIONAL STANDARD

ISO 12614-4

First edition
2014-07-01

Road vehicles — Liquefied natural gas (LNG) fuel system components —

Part 4: Manual valve

Véhicules routiers — Équipements pour véhicules utilisant le gaz naturel liquéfié (GNL) comme combustible —

Partie 4: Valve manuelle

Reference number
ISO 12614-4:2014(E)

COPYRIGHT PROTECTED DOCUMENT

ISO copyright office
Case postale 56 • CH-1211 Geneva 20
Tel. + 41 22 749 01 11
Fax + 41 22 749 09 47
E-mail copyright@iso.org
Web www.iso.org

Contents

Page

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT) see the following URL: Foreword - Supplementary information

The committee responsible for this document is ISO/TC 22, *Road vehicles*, Subcommittee SC 25, *Vehicles using gaseous fuels*.

ISO 12614 consists of the following parts, under the general title *Road vehicles — Liquefied natural gas (LNG) fuel system components*:

— *Part 1: General requirements and definitions*

— *Part 2: Performance and general test methods*

— *Part 3: Check valve*

— *Part 4: Manual valve*

— *Part 5: Tank pressure gauge*

— *Part 6: Pressure regulator*

— *Part 7: Pressure relief valve*

— *Part 8: Excess flow valve*

— *Part 9: Gas-tight housing and ventilation hose*

— *Part 10: Rigid fuel line in stainless steel*

— *Part 11: Fittings*

— *Part 12: Rigid fuel line in copper and its alloys*

— *Part 13: Pressure control regulator*

— *Part 14: Differential pressure fuel content gauge*

— *Part 15: Capacitance fuel content gauge*

— *Part 16: Heat exchanger – vaporizer*

— *Part 17: Natural gas detector*

— *Part 18: Gas temperature sensor*

Road vehicles — Liquefied natural gas (LNG) fuel system components —

Part 4: Manual valve

1 Scope

This part of ISO 12614 specifies tests and requirements for the manual valve, a liquefied natural gas fuel system component intended for use on the types of motor vehicles defined in ISO 3833. This part of ISO 12614 is not applicable to the following:

1) fuel containers;

2) stationary gas engines;

3) container mounting hardware;

4) electronic fuel management;

5) refueling receptacles.

NOTE 1 It is recognized that miscellaneous components not specifically covered herein can be examined to meet the criteria of this part of ISO 12614 and tested according to the appropriate functional tests.

NOTE 2 All references to pressure in this part of ISO 12614 are to be considered gauge pressures unless otherwise specified.

NOTE 3 This part of ISO 12614 is based upon a working pressure for natural gas as a fuel of 1,6 MPa (16 bar). (1 bar = 0,1 MPa = 105 Pa; 1 MPa = 1 N/mm^2.) Other working pressures can be accommodated by adjusting the pressure by the appropriate factor (ratio). For example, a 2 MPa (20 bar) working pressure system will require pressures to be multiplied by 1,25.

2 Normative references

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

ISO 12614-1:2014, *Road vehicles — Liquefied natural gas (LNG) fuel system components — Part 1: General requirements and definitions*

ISO 12614-2, *Road vehicles — Liquefied natural gas (LNG) fuel system components — Part 2: Performance and general test methods*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 12614-1 apply.