



ANSI B109.3
Approved
April 13, 2000

**ROTARY-TYPE
GAS DISPLACEMENT METERS**

Secretariat



American Gas Association

400 North Capitol Street, NW, 4th Floor
Washington, DC 20001
U.S.A.

Catalog No. XQ0010
June 2000

First Edition-1973
Second Edition-1986
Third Edition-1992
Fourth Edition-2000

American Gas Association
400 North Capitol St., NW, 4th Floor
Washington, DC 20001
U.S.A.

Catalog No. XQ0010

Approved
April 13, 2000
AMERICAN NATIONAL STANDARDS INSTITUTE, INC.

Copyright © 2000, American Gas Association
All rights reserved

Currently in preview, click buy full version

CONTENTS

CONTENTS	i
DISCLAIMER AND COPYRIGHT	iii
PREFACE	iv
HISTORY OF THE DEVELOPMENT OF THIS STANDARD	v
ACCREDITED STANDARDS COMMITTEE B109	vi
SCOPE	1
PART I	2
DEFINITIONS	2
PART II	7
CONSTRUCTION REQUIREMENTS FOR QUALIFYING NEW TYPE METERS	7
2.1 SCOPE	7
2.2 DIMENSIONS	7
2.3 MAXIMUM ALLOWABLE OPERATING PRESSURE (MAOP)	7
2.4 STRENGTH OF METER CONNECTIONS	7
2.5 METER INDEX WINDOW IMPACT RESISTANCE TESTS	8
2.6 DESIGN SAFETY FACTOR	8
2.7 DIFFERENTIAL PRESSURE TAPS	8
2.8 METER IDENTIFICATION	9
2.9 FLOW DIRECTION IDENTIFICATION	9
2.10 METER OUTPUT REGISTRATION IDENTIFICATION	9
2.11 PROTECTION OF METERS	9
2.12 MECHANICAL METER INDEX	9
2.13 CORROSION AND CHEMICAL RESISTANCE OF INTERNAL PARTS	10
2.14 CORROSION AND CHEMICAL RESISTANCE OF EXTERNAL PARTS	10
2.15 TEMPERATURE RESISTANCE TEST	11
PART III	12
PERFORMANCE REQUIREMENTS FOR QUALIFYING NEW METERS AND NEW-TYPE METERS	12
3.1 SCOPE	12
3.2 RATED CAPACITY	12
3.3 ACCURACY	12
3.4 NOISE AND VIBRATION	12
3.5 STARTING RATE TEST FOR NEW TYPE METERS	13
3.6 PRESSURE AND LEAK TEST CONDITIONS FOR NEW METERS	13
3.7 DIFFERENTIAL PRESSURE TEST CONDITIONS	13
PART IV	14
IN-SERVICE PERFORMANCE	14
4.1 SCOPE	14
4.2 TEST CONDITIONS	14
4.3 IN-SERVICE PERFORMANCE PROGRAMS	14
PART V	15
METER INSTALLATION	15
5.1 SCOPE	15
5.2 GENERAL	15
5.3 LOCATION	15
5.4 INSTALLATION	15
5.5 METER SHUT OFF	16
5.6 METER SUPPORT	16
5.7 METER SIZING	16
5.8 SPACING OF METERS	16
5.9 IDENTIFICATION	16
5.10 ON-SITE INSPECTION	16
5.11 SPECIAL SERVICE	16
5.12 LOCAL METER INSTALLATIONS	16
PART VI	17
AUXILIARY DEVICES FOR GAS METERS	17
6.1 SCOPE	17
6.2 PRESSURE SYSTEM	19
6.3 TEMPERATURE SYSTEM	19
6.4 VOLUME INDICATOR	21

6.5 INSTRUMENT CHART DRIVES	21
6.6 CIRCULAR CHARTS	22
6.7 RECORDERS	24
6.8 AUTOMATIC INTEGRATORS	25
6.9 CONSTANT-PRESSURE-COMPENSATING INDEX	26
6.10 REMOTE METER READING DEVICES	27
6.11 INSTRUMENT ADAPTOR PLATES	28
6.12 INSPECTION AND TESTING CLASSIFICATION	28
PART VII	30
TEST METHODS AND EQUIPMENT	30
7.1 SCOPE	30
7.2 MEASUREMENT REFERENCE BASE	30
7.3 UNITS OF MEASURE	30
7.4 BASE CONDITIONS	30
7.5 METER TESTING SYSTEMS	31
7.6 CALIBRATION OF METER TESTING SYSTEMS	31
APPENDIX A	36
DIFFERENTIAL TESTING	36
APPENDIX B	37
METER ACCURACY	37
APPENDIX C	38
BAR CODE FOR METERS AND AUXILIARY DEVICES	38
APPENDIX D	39
PROVER BELL CALIBRATION BY PHYSICAL MEASUREMENT	39

DISCLAIMERS AND COPYRIGHT

Nothing contained in this ANSI standard is to be construed as granting any right, by implication or otherwise, for the manufacture, sale or use in connection with any method, apparatus or product covered by letters patent, or as insuring anyone against liability for infringement of letters patent.

This standard may be used by anyone desiring to do so. Efforts have been made to ensure the accuracy and reliability of the data contained in this publication; however, ANSI and AGA make no representation, warranty or guarantee in connection with this standard and hereby expressly disclaim any liability or responsibility for loss or damage resulting from its use; for any violation of any federal, state or municipal regulation with which this standard may conflict; or for the infringement of any patent from the use of this standard. Nothing contained in this standard should be viewed as an endorsement by ANSI/AGA of any particular manufacturer's products.

Permission is granted to republish material herein in laws or ordinances, and in regulations, administrative orders, or similar documents issued by public authorities. Those desiring permission for other publication should consult the Operating and Engineering Section, American Gas Association, 400 North Capitol Street, NW, 4th Floor, Washington, DC 20001, U.S.A.

Copyright © 2000 American Gas Association, All Rights Reserved

PREFACE

This publication represents a basic standard for safe operation, substantial and durable construction, and acceptable performance for rotary-type gas displacement meters.

It is recognized that during any transition period to the metric system, sizes and dimensions need to be expressed in either the metric system or the inch-pound system or in both. In this document, both systems are used, with the inch-pound units given preference. In most cases, a soft conversion from existing inch-pound values is shown. Soft conversion implies a change in nomenclature only; in this document, the alternative nomenclatures (metric and inch-pound) are shown by using parentheses and can be used interchangeably. Hard conversion is used to express metric values in (closely equivalent) round inch-pound units. Bracketed values are not to be used interchangeably with the corresponding metric values.

Nothing in this standard is to be considered as in any way indicating a measure of quality beyond compliance with the provisions it contains. It is designed to allow the construction and performance of displacement meters that may exceed the various provisions specified in any respect. In its preparation, recognition was intended to be given to the possibility of improvement through ingenuity of design. As progress takes place, revisions may become necessary. When that is believed desirable, recommendations should be forwarded to the Chairman of ANSI B109 Committee, Operating and Engineering Section, American Gas Association, 400 North Capitol Street, NW, 4th Floor, Washington, DC 20001, U.S.A.

Users of this document should consult applicable federal, state and local regulations. The American Gas Association (AGA) does not, by the publication of this document, intend to present specifications that are not in compliance with applicable rules, and this document may not be construed as doing so.

NOTICE: This American National Standard may be revised or withdrawn at any time. The procedures of the American National Standards Institute, Inc. (ANSI) require that action be taken to reaffirm, revise or withdraw this standard no later than five years from the date of publication. When any revisions are deemed advisable, recommendations should be forwarded to the **American Gas Association**. A form is included for that purpose at the end of this standard. Purchasers of American National Standards may receive current information on all standards by writing to the American National Standards Institute, Inc., 11 West 42nd Street, New York, NY 10036, U.S.A.; by calling (212) 642-4900; by faxing ANSI at (212) 398-0023; or by visiting ANSI's World Wide Web site at <http://www.ansi.org>. To purchase additional copies of this standard, contact: AGA Distribution Center, P.O. Box 79230, Baltimore, MD 21279-0230; Fax: (301) 206-9789; Phone: (301) 617-7819 or go to AGA's web page at www.aga.org/catalog.

HISTORY OF THE DEVELOPMENT OF THIS STANDARD

Following approval of the Standard for Gas Displacement Meters (Under 500 Cubic Feet per Hour Capacity), ANSI B109.1, in 1973, a subcommittee was appointed to develop a standard covering rotary-type gas displacement meters.

Five drafts of the standard were prepared and reviewed by the subcommittee before a final draft was prepared and submitted to American National Standards Committee B109 for its consideration on June 20, 1979. Subsequent to adoption by the committee, the first edition of the standard for rotary-type gas displacement meters was approved as American National Standard by the American National Standards Institute, Inc., on April 14, 1980.

The second edition was approved as American National Standard by the American National Standards Institute, Inc., on January 9, 1987. Major changes included the additions of: Part VI on Auxiliary Devices for Gas Meters; Part VII on Test Methods and Equipment; and informative Appendices for bar coding of meters and auxiliary devices, and prover calibration.

In the third edition, minor editorial changes were made. The third edition was approved on November 12, 1992.

This is the fourth edition of standard B109.3, in which several additions/deletions have been made to avoid any ambiguity, to make it more consistent and to improve upon some requirements. Substantive changes have been shown by lettering in the margin.

ACCREDITED STANDARDS COMMITTEE B109

GREGORY S. VERAA, Chairman
DAVID F. KEE, Vice Chairman

Ali M. Quraishi, Administrative Secretary (Non-Voting)

REPRESENTING AMERICAN GAS ASSOCIATION (AGA):

Cathy Chang
Winston Meyer
Gregory S. Verea

REPRESENTING AMERICAN PUBLIC GAS ASSOCIATION (APGA):

Essa Rhebi

REPRESENTING AMERICAN SOCIETY OF MECHANICAL ENGINEERS (ASME):

James C. Devore

REPRESENTING FEDERAL ENERGY REGULATORY COMMISSION (FERC):

Chris M. Zerby

REPRESENTING GAS APPLIANCE
MANUFACTURERS ASSOCIATION (GAMA):

David F. Kee

REPRESENTING GAS METER MANUFACTURERS:

Donald A. Jones
Paul Adams
Richard A. Collee
Dennis Ehrich
Joseph Kamalieh
Vacant

REPRESENTING NATIONAL ASSOCIATION OF
REGULATORY UTILITY COMMISSIONERS (NARUC):

Donald J. Sturma
John P. Zekoll

REPRESENTING NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY (NIST):

George Mattingly

REPRESENTING NATIONAL PROPANE GAS ASSOCIATION (NPGA):

Bruce Swieciki

INDIVIDUAL MEMBER:

Thomas J. Coates

SCOPE

This standard applies to rotary-type positive displacement meters designed for revenue measurement of fuel gas.

Part I comprises a list of definitions and terms used throughout the standard.

Part II covers the construction requirements for qualifying new-type rotary meters.

Part III covers the performance requirements for qualifying new meters and new-type rotary meters.

Part IV covers “in-service” performance requirements for rotary-type meters.

Part V addresses installation requirements for these meters.

Part VI pertains to auxiliary devices used with meters covered by this standard.

Part VII covers test methods and equipment.

Currently in preview, click buy full version