

## **Gasmätare – Membrangasmätare**

## **Gas meters – Diaphragm gas meters**

Europastandarden EN 1359:1998/A1:2006 gäller som svensk standard. Detta dokument innehåller den officiella engelska versionen av EN 1359:1998/A1:2006.

The European Standard EN 1359:1998/A1:2006 has the status of a Swedish Standard. This document contains the official English version of EN 1359:1998/A1:2006.

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*Postadress:* SIS Förlag AB, 118 80 STOCKHOLM

*Telefon:* 08 - 555 523 10. *Telefax:* 08 - 555 523 11

*E-post:* [sis.sales@sis.se](mailto:sis.sales@sis.se). *Internet:* [www.sis.se](http://www.sis.se)

EUROPEAN STANDARD  
NORME EUROPÉENNE  
EUROPÄISCHE NORM

**EN 1359:1998/A1**

May 2006

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English Version

## Gas meters - Diaphragm meters

Compteurs à gaz - Compteurs de volume de gaz à parois  
déformables

Gaszähler - Balgengaszähler

This amendment A1 modifies the European Standard EN 1359:1998; it was approved by CEN on 20 March 2006.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for inclusion of this amendment into the relevant national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CEN member.

This amendment exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the Central Secretariat has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.



EUROPEAN COMMITTEE FOR STANDARDIZATION  
COMITÉ EUROPÉEN DE NORMALISATION  
EUROPÄISCHES KOMITEE FÜR NORMUNG

**Management Centre: rue de Stassart, 36 B-1050 Brussels**

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## **Foreword**

This document (EN 1359:1998/A1:2006) has been prepared by Technical Committee CEN/TC 237 “Gas meters”, the secretariat of which is held by BSI.

This Amendment to the European Standard EN 1359:1998 shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by November 2006, and conflicting national standards shall be withdrawn at the latest by November 2006.

This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive(s).

For relationship with EU Directive(s), see informative Annex ZA, which is an integral part of this document.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

*Final paragraph:*

Delete.

## EN 1359:1998/A1:2006 (E)

### 1 Scope

*Replace the original Scope by:*

"This European Standard specifies the requirements and tests for the construction, performance, safety and production of class 1,5 mechanical diaphragm gas meters (hereinafter referred to as meters) having co-axial single pipe, or two pipe connections, used to measure volumes of fuel gases of the 1st, 2nd and 3rd families according to EN 437, at maximum working pressures not exceeding 0,5 bar and maximum actual flow rates not exceeding 160 m<sup>3</sup>/h over a minimum ambient temperature range of -10 °C to + 40 °C and a gas temperature range as specified by the manufacturer with a minimum span of 40 K.

"This standard applies to meters with and without built-in mechanical temperature conversion that are installed in locations with vibration and shocks of low significance and in

- closed locations (indoor or outdoor with protection as specified by the manufacturer) with condensing or with non-condensing humidity

or, if specified by the manufacturer,

- open locations (outdoor without any covering) with condensing humidity or with non-condensing humidity

and in locations with electromagnetic disturbances.

" This standard does not cover meters with electronic indexes.

"Unless otherwise stated, all pressures given in this document are gauge pressure.

"Clauses 1 to 9 and annexes B and F are for design and type testing only.

" NOTE Mechanical meters are not susceptible to electromagnetic interference and are therefore suitable for any electromagnetic environment"

### 2 Normative references

*Replace the reference to "EN 437:1993" with the following:*

"EN 437:2003, Test gases - Test pressures - Appliance categories."

*Replace the reference to "ISO 6270" with the following:*

"EN ISO 6270-1, Paints and varnishes – Determination of resistance to humidity – Part 1: Continuous condensation (ISO 6270-1:1998)

*Add the following references:*

"ISO 7724-3 1984, Paints and varnishes - Colorimetry - Part 3: Calculation of colour differences.

"ASTM D1003, Standard Test Method for Haze and Luminous Transmittance of Transparent Plastics."

### 3 Terminology

#### 3.1 Definitions

##### 3.1.12

Delete final paragraph

Insert the following new definitions and renumber the original definitions accordingly:

##### "3.1.1

###### **gas volume meter**

instrument designed to measure, memorize and display the volume of a fuel gas that has passed through it."

*Insert the following new definition:*

##### "3.1.18

###### **class 1,5 meter**

meter which has an error of indication between -3% and +3% for flow rates  $Q$  where  $Q_{\min} \leq Q < Q_t$ , -1,5% and 1,5% for flow rates  $Q$  where  $Q_t \leq Q \leq Q_{\max}$  and when the errors between  $Q_t$  and  $Q_{\max}$  all have the same sign, they do all not exceed 1 % "

#### 3.2 Symbols

*Delete 3.2.1 and 3.2.2 and replace with the following text:*

##### "3.2.1 $Q_{\min}$

"minimum flowrate, lowest flowrate at which the gas meter provides indications that satisfy the requirements regarding maximum permissible error (MPE)

##### "3.2.2 $Q_t$

"transitional flowrate, the flowrate occurring between the maximum and minimum flowrates at which the flowrate range is divided into two zones, the 'upper zone' and the 'lower zone'. Each zone has a characteristic MPE

##### "3.2.3 $Q_{\max}$

"maximum flowrate, highest flowrate at which the gas meter provides indications that satisfy the requirements regarding MPE.

##### "3.2.4 $Q_r$

"overload flowrate, highest flowrate at which the meter operates for a short period of time without deteriorating.

##### "3.2.5 $V$

"cyclic volume

##### "3.2.6 $P_{\max}$

"maximum working pressure

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**"3.2.7  $t_b$**

"base gas temperature

**"3.2.8  $t_{b,i}$**

"base gas temperature for meters declared suitable for differential temperature and intermittent operation.

**"3.2.9  $t_m$**

"ambient temperature

**"3.2.10  $t_g$**

"gas temperature

**"3.2.11  $t_{sp}$**

"specified centre temperature for meters with temperature conversion"



## 4 Working conditions

### 4.1 Flow range, Table 1

Delete Table 1 and replace with the following:

$Q_{\max}$ (m <sup>3</sup> /h)	Upper limits of $Q_{\min}$ (m <sup>3</sup> /h)	$Q_t$ (m <sup>3</sup> /h)	$Q_r$ (m <sup>3</sup> /h)
2,5	0,016	0,25	3,0
4	0,025	0,4	4,8
6	0,04	0,6	7,2
10	0,06	1,0	12,0
16	0,1	1,6	19,2
25	0,16	2,5	30
40	0,25	4,0	48
65	0,4	6,5	72
100	0,65	10,0	120
160	1	16,0	192

### 4.3 Temperature range

Replace the first two paragraphs with the following:

"All meters shall be capable of meeting the requirements for a minimum ambient temperature range of -10 °C to +40 °C and a minimum gas temperature range of 40 K (see 7.1.3) and minimum storage temperature range of -20 °C to +60 °C (see 6.4.1). The gas temperature range shall be within the ambient temperature range.

"The manufacturer shall declare the gas temperature range and the ambient temperature range.

"The manufacturer may declare a wider ambient temperature range using a minimum temperature of -10° C, -25 °C or -40 °C and a maximum temperature of 40 °C, 55 °C or 70 °C) and/or a wider storage temperature range. The meter shall be capable of meeting the requirements over this declared wider range."

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Add the following new clause:

### “4.4 Climatic Environment

“Meters meeting the requirements of this standard except for Annex F are deemed suitable for installation in closed (indoor or outdoor with protection as specified by the manufacturer) locations with condensing humidity.

“If the manufacturer declares that the meter is suitable for installation in open (outdoor without any protection) locations with condensing humidity then it shall also meet the requirements of Annex F.”

## 5 Metrological performance

### 5.1.1 Requirements, a)

Add the following text as the final sentence:

“When the errors between  $0,1 Q_{\max}$  ( $Q_t$ ) and  $Q_{\max}$  all have the same sign, they shall all not exceed 1 %.”

#### Table 3- Pressure absorption, column $Q_{\max}$

Replace “1 to 10 inclusive” with the following:

“2,5 to 16 inclusive”

Replace “16 to 65 inclusive” with the following:

“25 to 65 inclusive”

#### Table 4- Starting flow rates, column $Q_{\max}$

Replace “1 to 2,5 inclusive” with the following:

“2,5”

Add the following new clauses:

### “5.5 Overload flow rate

#### “5.5.1 Requirements

“After exposure to an overload flow rate of  $1,2 Q_{\max}$  the error of indication shall remain within the initial maximum permissible error limits specified in Table 2.

#### “5.5.2 Test

“ One meter shall be supplied with air for one hour at a flow rate of  $1,2 Q_{\max}$ . The error of indication shall be determined as specified in 5.1.2 (c).

### “5.6 Environment and humidity

#### “5.6.1 Requirements

"After testing in accordance with 5.6.2 the error of indication shall remain within the initial maximum permissible error limits specified in Table 2 and the index and markings shall remain legible.