

COMMISSION DIRECTIVE

of 31 March 1978

adapting to technical progress for the second time Council Directive 71/318/EEC on the approximation of the laws of the Member States relating to gas volume meters

(78/365/EEC)

THE COMMISSION OF THE EUROPEAN COMMUNITIES,

Having regard to the Treaty establishing the European Economic Community,

Having regard to Council Directive 71/316/EEC of 26 July 1971 on the approximation of the laws of the Member States relating to common provisions for both measuring instruments and methods of metrological control⁽¹⁾, as amended by the Act of Accession, and in particular Articles 17, 18 and 19 thereof,

Having regard to Council Directive 71/318/EEC of 26 July 1971 on the approximation of the laws of the Member States relating to gas volume meters⁽²⁾, as amended by Commission Directive 74/331/EEC⁽³⁾,

Whereas, in view of technical developments in the field in question, it is necessary to amend Directive 71/318/EEC ;

Whereas the measures provided for in this Directive are in accordance with the opinion of the Committee on the Adaptation to Technical Progress of Directives Concerning the Elimination of Technical Barriers to Trade in Measuring Instruments,

HAS ADOPTED THIS DIRECTIVE :

Article 1

In the Annex to Directive 71/318/EEC, Items I.B.3, I.B.4.1, I.B.8.2.3, I.B.9, II.6.3, III.2, III.4 and III.5 are

hereby amended in accordance with the corresponding Sections in the Annex hereto.

Items II.5.2, II.7.2.7 and III.6.2.3 contained in the Annex hereto are hereby added to the Annex to Directive 71/318/EEC.

Article 2

1. Member States shall adopt the laws, regulations and administrative provisions needed in order to comply with this Directive in such a manner that these provisions shall take effect one year after the date of notification of this Directive, and shall forthwith inform the Commission thereof.

2. Member States shall communicate to the Commission the texts of the provisions of national law which they adopt in the field covered by this Directive.

Article 3

This Directive is addressed to the Member States.

Done at Brussels, 31 March 1978.

For the Commission

Étienne DAVIGNON

Member of the Commission

⁽¹⁾ OJ No L 202, 6. 9. 1971, p. 1.

⁽²⁾ OJ No L 202, 6. 9. 1971, p. 21.

⁽³⁾ OJ No L 189, 12. 7. 1974, p. 9.

ANNEX

CHAPTER I.B

3. Additional devices

3.1. Gas volume meters may be fitted with :

- (a) prepayment devices ;
- (b) integral pulse generators the outlets of which must bear an indication of the value of one pulse in the form :

'1 imp. $\hat{=}$... m³ (or dm³)' or
'1 m³ $\hat{=}$... imp.'

These additional devices, where fitted, are regarded as forming an integral part of the meter ; they should be connected to the gas volume meter at the time of EEC initial verification. There are no separate requirements regarding their effects on the measuring properties of the meters.

3.2. Gas meters may be fitted with output drive shafts which should be taken to include drive shafts or other facilities for operating detachable additional devices. The torque which the gas meters are required to produce in order to drive the additional devices fitted must not bring about any changes in the meter indication greater than the values specified in Sections II.5.2.1 and III.5.2.1.

3.2.1. If there is only one drive shaft, it must be characterized by an indication of its constant in the form '1 tr $\hat{=}$... m³ (or dm³)', of the maximum permissible torque in the form 'M_{max} = ... N.mm' and of the direction of rotation.3.2.2. If there are several drive shafts, each shaft must be characterized by the letter M with subscript in the form 'M₁ ; M₂ ; ... M_n', as well as by an indication of its constant in the form '1 tr $\hat{=}$... m³ (or dm³)' and of the direction of rotation.

The following formula must appear on the meter, preferably on the data plate :

$$k_1 M_1 + k_2 M_2 + \dots + k_n M_n \leq A \text{ N.mm,}$$

in which :

A represents the numerical value of the maximum permissible torque applied to the drive shaft with the highest constant, where the torque is applied only to this shaft ; this shaft must be characterized by the symbol M₁ ;

k_i (i = 1 ; 2 ; ... n) represents a numerical value determined as follows : $k_i = \frac{C_1}{C_i}$;

M_i (i = 1 ; 2 ; ... n) represents the torque applied to the drive shaft characterized by the symbol M_i ;

C_i (i = 1 ; 2 ; ... n) represents the constant for the drive shaft characterized by the symbol M_i.

3.2.3. The extremity of the drive shafts must be protected by means of a sealed cap or by means of a sealed connection between any additional device and the meter.

3.2.4. The connection between the measuring device and the intermediate gearing must not be broken or altered if a torque equal to three times the permissible torque as laid down in Sections I.B.3.2.1 and I.B.3.2.2 is applied.

4. Inscriptions

4.1. Each meter must bear the following inscriptions, either on the dial plate or on a special data plate or divided between the two :

- (a) the EEC type-approval mark ;
- (b) the identification mark or name of the manufacturer ;

- (c) the number and year of manufacture of the meter ;
- (d) the size designation of the meter : this has the form of a capital G followed by a number which is laid down in Chapter II or III ;
- (e) the maximum flow expressed as : $Q_{\max} \dots \text{m}^3/\text{h}$;
- (f) the minimum flow expressed as : $Q_{\min} \dots \text{m}^3/\text{h}$ (or dm^3/h) ;
- (g) the maximum operating pressure expressed as : $p_{\max} \dots \text{MPa}$ (or kPa or Pa or bar or mbar) ;
- (h) for volumetric meters, the nominal value of the cyclic volume expressed as : $V \dots \text{m}^3$ (or dm^3) ;
- (i) where appropriate, the inscriptions mentioned in Sections I.B.3.1 and I.B.3.2 ; these inscriptions may, however, be made on other plates or on the meter itself.

These inscriptions must be clearly visible, easily legible and indelible under the normal conditions of use of the meter.

8.2.3. Locations should be provided for verification marks or seals :

- (a) on all plates bearing an inscription required by this Annex ;
- (b) on all parts of the meter which cannot otherwise be protected against interference liable to :
 - affect or alter the indication on the indicating device of the meter,
 - alter or break the connection between the measuring device and the indicating device,
 - remove or displace metrologically important parts of the meter.

9. **EEC type-approval and EEC initial verification**

EEC type-approval and EEC initial verification of gas volume meters shall be carried out in accordance with the requirements of the Council Directive of 26 July 1971 on the approximation of the laws of the Member States relating to common provisions for both measuring instruments and methods of metrological control.

9.1. *EEC type-approval*

9.1.1. Applications for EEC type-approval for gas meters must be accompanied by the following documents :

- a description of the meter giving the technical characteristics and the principle of its operation,
- a perspective drawing or photograph of the meter,
- a nomenclature of parts with a description of the constituent materials of such parts,
- an assembly drawing with identification of the component parts listed in the nomenclature,
- a dimensioned drawing,
- a plan showing the location of verification marks and seals,
- a plan of the indicating device, with adjustment mechanisms,
- a dimensioned drawing of metrologically important components,
- a plan of the dial plate and of the inscriptions arrangements,
- where appropriate, a plan of the additional devices referred to in Section I.B.3.1,
- where appropriate, a table setting out the characteristics of the drive shafts (Section I.B.3.2),
- a list of the documents submitted,
- a declaration specifying that the meters manufactured in conformity with the type meet the requirements for safety, particularly those concerning the maximum operating pressure as indicated on the data plates.

- 9.1.2. The following particulars shall appear on the EEC type-approval certificate :
- the name and address of the person to whom the EEC type-approval certificate is issued,
 - the type and/or commercial designation,
 - the principal technical and metrological characteristics, such as the minimum flow, maximum operating pressure, nominal internal diameter of the connecting pieces and, in the case of volumetric gas meters, the nominal value of the cyclic volume,
 - the EEC type-approval mark,
 - the period of validity of the EEC type-approval,
 - in the case of meters equipped with drive shafts :
 - (a) the characteristics of the shaft as set out in Section I.B.3.2.1 (where there is only one drive shaft),
 - (b) the characteristics of each shaft and the formula given in Section I.B.3.2.2 (where there are two or more drive shafts),
 - information on the location of EEC type-approval marks, EEC initial verification marks and seals (where appropriate, in the form of photographs or drawings),
 - a list of the documents accompanying the EEC type-approval certificate,
 - any special comments.

9.2. *EEC initial verification*

- 9.2.1. Gas meters submitted for EEC initial verification shall be in working order.

EEC initial verification is no guarantee of the proper functioning or accuracy of reading of any additional devices as referred to in Sections I.B.3.1 and I.B.3.2 which may be connected to the meter.

No EEC verification marks or EEC seals shall be affixed to such additional devices.

CHAPTER II

5.2. *Special provisions*

- 5.2.1. When the maximum torques indicated on the gas meter pursuant to Sections I.B.3.2.1 and I.B.3.2.2 are applied to the drive shafts, the indication of the gas meter at Q_{min} must not vary by more than 0.5 %.

6.3. *Special provisions*

- 6.3.1. For meters for which the operating pressure exceeds 0.1 MPa (1 bar) the provisions of Section II.6.2 regarding mechanical pressure absorption shall apply, but the total pressure absorption of these meters as referred to in Section II.6.1 shall not be taken into consideration.
- 6.3.2. The fitting of additional devices must not cause the mechanical pressure absorption of the gas meters to increase by more than 20 Pa (0.2 mbar).
- 7.2.7. In the case of meters with one or more drive shafts, at least three meters of each G size must be tested with air at a density of 1.2 kg/m³ (see Section I.B.6.2) for compliance with the requirements of Section I.B.3.2.4 and of Sections II.5.2.1 and II.6.3.2.

In the case of meters with several drive shafts, the test must be carried out on the shaft which gives the most unfavourable result.

For meters of the same G size, the lowest torque value obtained in the tests shall be used as the maximum permissible torque value.

Where a type embraces meters of various G sizes, the torque test need only be carried out on meters of the smallest G size, provided that the same torque is specified for the larger meters and that the drive shaft of the latter has the same or a greater constant.

CHAPTER III

2. Range of capacities

2.1. Gas volume meters shall have only the ranges shown in the following

G designation	Q _{max} (m ³ /h)	Range		
		Small	Medium	Large
		Q _{min} (m ³ /h)		
16	25	5	2.5	1.3
25	40	8	4	2
40	65	13	6	3
65	100	20	10	5
100	160	32	16	8
160	250	50	25	13
250	400	80	40	20
400	650	130	65	32
650	1 000	200	100	50
1 000	1 600	320	160	80

and decimal multiples of the last five lines.

4. Test element

4.1. In accordance with the provisions of Section I.B.5.2.2 (a) and (b) the scale unit of the test element must not exceed the following values :

for G 16 to G 65 inclusive	0.002 m ³
for G 100 to G 650 inclusive	0.02 m ³
for G 1 000 to G 6 500 inclusive	0.2 m ³
for G 10 000 and over	2.0 m ³

4.2. The interval between numbers on the scale of the test element must not exceed :

for G 16 to G 65 inclusive	0.01 m ³
for G 100 to G 650 inclusive	0.1 m ³
for G 1 000 to G 6 500 inclusive	1.0 m ³
for G 10 000 and over	10.0 m ³

5. Maximum permissible errors

5.1. General provisions

5.1.1. The maximum permissible errors, positive and negative, are given in the following table :

Flow Q	Maximum permissible error in EEC initial verification
$Q_{min} \leq Q < 0.2 Q_{max}$	2 %
$0.2 Q_{max} \leq Q \leq Q_{max}$	1 %

5.1.2. The errors must not all exceed half the maximum permissible error if they are all of the same sign.

5.2. *Special provisions*

- 5.2.1. When the maximum torques indicated on the gas volume meter pursuant to Sections I.B.3.2.1 and I.B.3.2.2 are applied to the drive shafts, the indication of the gas volume meter at Q_{\min} must not vary by more than the values given in the following table :

Q_{\min}	Variations in indication at Q_{\min}
0.05 Q_{\max}	1 %
0.1 Q_{\max}	0.5 %
0.2 Q_{\max}	0.25 %

6.2.3. Meters with drive shafts

- 6.2.3.1. In the case of meters with one or more drive shafts, at least three meters of each G size must be tested with air at a density of 1.2 kg/m^3 (see Section I.B.6.2) for compliance with the requirements of Sections I.B.3.2.4 and III.5.2.1.

In the case of meters with several drive shafts, the test must be carried out on the shaft which gives the most unfavourable result.

For meters of the same G size, the lowest torque value obtained in the tests shall be used as the maximum permissible torque value.

Where a type embraces meters of various G sizes, the torque test need only be carried out on meters of the smallest G size, provided that the same torque is specified for the larger meters and that the output shaft of the latter has the same or a greater constant.

- 6.2.3.2. In the case of meters with several values for Q_{\min} , only the test described in Section III.6.2.3.1 for the smallest Q_{\min} value need be carried out. The permissible torques for the other flow ranges may be calculated from this test result.

Conversion to other Q_{\min} values is governed by the following rules :

- (a) where the flow is constant, the variation in the error is proportional to the torque ;
- (b) where the torque is constant, the variation in the error for rotary-piston meters is inversely proportional to the flow and for turbine meters it is inversely proportional to the square of the flow.