

COMMISSION OF THE EUROPEAN COMMUNITIES

COM(80) 850 final

Brussels, 15 December 1980

Proposal for a

COUNCIL DIRECTIVE

amending Directive 71/316/EEC on the approximation of the laws of the Member States relating to common provisions for both measuring instruments and methods of metrological control

Proposal for a

COUNCIL DIRECTIVE

amending Directive 76/764/EEC on the approximation of the laws of the Member States on clinical mercury-in-glass, maximum-reading thermometers

Proposal for a

COUNCIL DIRECTIVE

on the approximation of the laws of the Member States relating to tyre pressure gauges for motor vehicles

Proposal for a

COUNCIL DIRECTIVE

on the approximation of the laws of the Member States relating to instruments designed to determine the content by volume of carbon monoxide in the exhaust gases of motor vehicles with spark ignition

(submitted to the Council by the Commission)

COM(80) 850 final

EXPLANATORY MEMORANDUM

I. INTRODUCTION

Since work was first initiated on the basis of Article 100 with the aim of removing technical barriers to trade, the surveys carried out in the Member States and among the representatives of industry, have placed the measuring instruments sector in the front rank of the sectors concerned.

Some thirty Directives have so far been adopted in this field, and they can be divided into three categories :

- those relating to units of measurement,
- those relating to metrological requirements for products, and
- those relating to measuring instruments.

The economic benefit of the Directives relating to units of measurement has never been called into question : what is involved here is the establishment of a common language, and there is a definite need for uniform definitions to avoid the most serious obstacles to the free movement of products and the duplication and even multiplication of stocks, the management of which inevitably leads to extremely high costs.

Doubt has never been cast either on the benefits of standardizing the dimensions and volumes of prepackagings. The movement of prepackaged products is greatly facilitated in this way, and it suffices to be aware of the difficulties that certain Member States are encountering with the United States, for example, in their exports of bottles of wine and alcohol, to appreciate the progress that we have achieved in this field at Community level.

On the other hand, as regards the measuring instruments themselves, the economic benefits are less directly evident, since such instruments are produced in relatively small numbers. However, where most of them are concerned, the establishment of common specifications is not so much motivated by the desire to enable the instruments themselves to move freely as by that to facilitate the movement of the products whose major properties are measured with these instruments. For the sake of example, mention may be made of the Directives relating to "alcohol tables" and "alcoholometers" to show that it

is less the instruments themselves that are of special interest than the favourable implications and repercussions in respect of trade and intra-Community commercial activities that result from their use. Indeed, through the harmonization created by means of the two abovementioned Directives, alcoholic products are henceforth being measured and marketed in accordance with identical methods and by making use of identical instruments, the accuracy of which can no longer be disputed.

All these Directives were adopted in implementation of framework Council Directive 71/316/EEC relating to common provisions and methods of metrological control.

That Directive lays down for the entire sector of measuring instruments the basic principles governing the free movement of such instruments within the Community and the controls guaranteeing observance of the technical requirements in the form of EEC pattern approval and EEC initial verification, on the basis of which the Member States **must** agree to mutual recognition of these inspection operations. As one of these general provisions, that Directive requires, in particular, that each instrument be verified before being admitted to the Community market.

It also makes provision for the setting up of a Committee on Adaptation to Technical Progress to amend the Annexes of that Directive and those of the separate Directives.

Since 26 July 1971, the date on which the Council adopted that framework Directive, the numerous separate Directives adopted on the basis of these principles have enabled both the Member States and the Commission to acquire experience and proficiency in this procedure, and this has prompted them to consider the requisite improvements and modifications.

The procedure for adopting European legal texts, based on Article 100 of the Treaty of Rome, is so specific and so restrictive in this regard that, in order to harmonize national laws concerning any measuring instrument and to make the slightest amendment to the legal provisions in these Directives, the Commission is obliged to prepare proposals to be placed before the Council and to consult both the European Parliament and the Economic and Social Committee.

It was with this in mind and in implementation of this procedure that the **three attached proposals for separate Directives were prepared. Two of them concern the approximation of the laws of the Member States relating to "instruments designed to determine the content by volume of carbon monoxide in the exhaust**

gases of motor vehicles with spark ignition" and "tyre pressure gauges for motor vehicles", while the two others are intended to amend the legal provisions of the Council Directives relating to **clinical mercury-in-glass, maximum-reading thermometers.**

In these different proposals, the requirements put forward and the amendments under consideration are of such technical specificity or deal with such minor details that there are grounds for wondering whether this procedure might not be modified.

This question has been discussed at length by the European Parliament. In response to a request from the Foreign Ministers during their meeting at Villers-le-Temple, the Commission suggested in its note to the European Council of 5 and 6 December 1977 that the fourth indent of Article 155 be invoked. The same suggestion was also made by the European Parliament which, on a number of occasions, included it in resolutions relating to the Customs Union and the removal of technical barriers with a view to modifying and accelerating the procedure for adopting implementing Directives.

On the other hand, if reference is made to the principle applied in most of the Member States, it can be seen that the framework laws are adopted by the legislative power and that the provisions for implementing these laws are adopted by the executive power.

Bearing in mind these different points of view and in order to avoid having to follow the present procedure for proposals for Directives such as those considered here, the Commission is proposing that extensive use be made of the fourth indent of Article 155 for all the amendments to be made to framework Directive 71/316/EEC.

The application of that Article would enable the Commission to adopt Directives in accordance with an approach that can be summarized as follows : the implementation of this procedure, which is similar to that used for the adaptation of Directives to technical progress, is based on a regulatory committee chaired by a representative of the Commission and adopting its decisions by a qualified majority in accordance with the weighting set out in Article 148(2) of the Treaty.

The powers to adopt implementing Directives being thus conferred on the Commission by the Council, it is consequently no longer necessary to distinguish between this procedure and that of adaptation to technical progress, the latter being covered entirely by the former.

Clearly, if the Council agrees to this method and adopts this amendment procedure for Directive 71/316/EEC, the Commission, having been delegated the necessary powers, could withdraw proposals for Directives which had not yet been adopted, and present them to a Committee which would be set up for the purpose.

II. CONTENTS OF THE DIFFERENT PROPOSALS

- (a) In addition to the fundamental amendment described above, framework Directive 71/316/EEC makes provision for a new method of inspecting measuring instruments which is more flexible and more suitable than that which is at present specified in the Directive. The production systems nowadays have been brought to such a level of efficiency by the manufacturers that the inspections carried out on each instrument verified can be replaced in certain cases either by statistical checking or by quality control.

The other amendments proposed are less important. They are more in the way of improvements which take account, in particular, of the new inspection methods and the experience acquired in this sector since the adoption of the framework Directive.

- (b) The proposal for a Directive amending Council Directive 76/764/EEC relating to clinical mercury-in-glass, maximum-reading thermometers introduces the EEC pattern approval procedure which had previously not been adopted. Experience has shown that it was becoming increasingly necessary to make certain of the quality of the glass used in the manufacture of these measuring instruments and accordingly to increase protection of the consumers. This procedure will enable the competent national departments to carry out more effective checks on the glass used by the manufacturers and the manufacturers to employ a material which has been approved in advance.

The two other proposals for Directives concern two new subjects which, while contributing to the free movement of goods, may also be of indirect assistance in improving the protection of consumers and in making more rational use of energy. These proposals concern tyre pressure gauges and instruments intended to measure the carbon monoxide (CO) content in the exhaust gases of motor vehicles.

- (c) Like most of the separate Directives on special measuring instruments, the proposal relating to pressure gauges lays down the technical and metrological requirements. In addition, it lays down the maximum permissible errors that have to be observed. The tyre pressure gauges for motor vehicles which meet all these requirements will receive the EEC marks and signs and will thus be allowed to move freely within the Community. This Directive should encourage manufacturers to improve the accuracy of their present instruments.
- (d) The last of these proposals concerns instruments designed to determine the content by volume of carbon monoxide in the exhaust gases of motor vehicles with spark ignition.

Like the preceding Directive, this one lays down a certain number of definitions and manufacturing requirements which make it possible to produce instruments of satisfactory accuracy. It concerns instruments that can either measure and directly indicate the carbon monoxide or measure and directly indicate the monoxide together with the carbon dioxide (CO₂).

Although the form of this proposal resembles that of most of those that have already been adopted by the Council in this sector, it should be pointed out nonetheless that it differs from them in the fact that, for the first time (see Section 2.8), requirements relating to electronic devices are laid down, based on the proposal for Annex III, which is currently being studied by the Council.

In conclusion, it should be noted that all these proposals have been discussed at length in the Commission by the governmental experts and the representatives of the industries concerned, and the European federations of these industries have been closely associated with their preparation.

III. CONSULTATION WITH THE EUROPEAN PARLIAMENT AND THE ECONOMIC AND SOCIAL COMMITTEE

Pursuant to the provisions of the second paragraph of Article 100 of the Treaty, the Opinions of both of these bodies must be obtained, since the implementation of the provisions laid down in these proposals for Directives requires the Member States to amend their laws.

IV. Implementation of these directives by the Member States

The Commission does not foresee any difficulties for the implementation of these directives by the Member States.

Indeed in the field of MEASURING INSTRUMENTS more than twenty directives have already been adopted since 1971.

The Member States are thus very much familiarized with this type of text and have at their disposal the competent departments for the implementation of such texts.

Proposal for a Council Directive
amending Directive 71/316/EEC on the approximation of the
laws of the Member States relating to common provisions for
both measuring instruments and methods of metrological control

THE COUNCIL OF THE EUROPEAN COMMUNITIES,

Having regard to the Treaty establishing the European Economic Community,
and in particular Article 100 thereof,

Having regard to the proposal from the Commission,

Having regard to the Opinion of the European Parliament ¹,

Having regard to the Opinion of the Economic and Social Committee²,

Whereas the purpose of Council Directive 71/316/EEC³ is to ensure the free
movement of these instruments within the Community by harmonizing the
divergent national laws relating to metrological control and by establishing
for this purpose adequate EEC pattern approval and initial verification
procedures and EEC methods of metrological control;

Whereas, since the adoption of that Directive, the experience acquired in
recent years in the measuring instrument sector has made it necessary to amend
certain of its Articles;

Whereas advances in technology and techniques have made it possible to
develop construction methods making use of electronic devices which are
nowadays applied as standard practice in the design and manufacture of
measuring instruments;

¹ OJ

² OJ

³ OJ No. L 202/1 of 6.09.1971

Whereas the methods of control applied at present make it possible for EEC initial verification to be carried out differently from the unit checking of measuring instruments;

Whereas it was not possible for Directive 71/316/EEC, at the time it was adopted, to take these developments into account; whereas, since then, certain Member States have incorporated provisions into their national laws which take account of these modifications;

Whereas it is advisable in consequence to amend and supplement the text of the European provisions currently in force in order to harmonize the national laws adopted for that purpose;

Whereas the separate Directives are in the nature of implementing measures; whereas it is thus advisable, in accordance with the fourth indent of Article 155 of the Treaty establishing the EEC to confer on the Commission, assisted by a Committee acting by a qualified majority, the powers to prepare and adopt these Directives;

Whereas Article 198 lays down that the Commission may consult the Economic and Social Committee in all cases where it deems this to be advisable;

HAS ADOPTED THIS DIRECTIVE:

Article 1

Article 1 of Directive 71/316/EEC shall be replaced by the following text:

"Article 1

1. (a) This Directive applies to goods referred to as instruments, which include measuring instruments, components of measuring instruments, additional devices and measurement equipment, fitted, where appropriate, with electronic devices.
- (b) The Directive also applies to units of measurement, the harmonization of methods of measurement and metrological control and, where appropriate, the means required for application of such methods.
- (c) It also applies to the conditions of sale of certain products, in particular as regards the fixing, measuring and marking of pre-packaged quantities.

2. No Member State may prevent, prohibit or restrict the placing on the market or entry into service of an instrument or of a product described in paragraph 1 if that instrument or product bears EEC marks and/or signs in accordance with the conditions laid down by this Directive and by the separate Directives relating to the instrument in question.
3. Member States shall attach the same value to EEC pattern approval and initial verification as to the corresponding national measures.
4. The separate Directives concerning the articles referred to in paragraph 1 shall be adopted in accordance with a procedure laid down in Article 17 of this Directive."

Article 2

Paragraphs 1, 2 3 and 5 of Article 2 of Directive 71/316/EEC shall be replaced by the following text:

"Article 2

1. EEC pattern approval constitutes the admission of instruments to EEC initial verification and, where the latter is not required, the authorization to place them on the market and/or to put them into service. If the separate Directive(s) applicable to a category of instruments exempt(s) that category from EEC pattern approval, the instruments in that category shall be admitted directly to EEC initial verification.
2. Insofar as their inspection procedures so permit, the Member States shall grant EEC pattern approval for every instrument which satisfies the requirements laid down in this Directive and the separate Directives relating to the instrument in question.
3. The application for EEC pattern approval for one and the same model of instrument can be made in only one Member State and by one natural or legal person established in the Community.
5. Member States shall carry out EEC pattern approval in accordance with the provisions of this chapter, of Annex I, and where necessary, of Annex III and of the separate Directives".

Article 3

Article 4 of Directive 71/316/EEC shall be replaced by the following text :

"Article 4

When an instrument has successfully completed the EEC pattern approval examination laid down in this Directive and in the separate Directives relating to it, the Member State which carried out that examination shall draw up an EEC pattern approval certificate and forward it to the applicant. In the cases provided for in Article 11 or in a separate Directive, the applicant must affix or cause to be affixed on each instrument conforming to the approved pattern the approval sign shown in this certificate; in all other cases he shall be entitled to affix the approval sign in question. "

Article 4

Paragraphs 1 and 4 of Article 5 of Directive 71/316/EEC shall be replaced by the following text :

" Article 5

1. EEC pattern approval shall be valid for ten years. It can be extended for successive periods of ten years; the number of instruments which may be manufactured in accordance with the approved pattern shall not be limited.

EEC pattern approvals granted on the basis of a separate Directive cannot be extended after the date of the entry into force of any amendment to, or adaptation of, the text of that separate Directive.

When EEC pattern approval is not extended, instruments already in service which conform to the provisions of this Directive shall be considered to be approved.

4. The Member State which has granted the limited EEC pattern approval referred to in paragraph 3 shall apply for adaptation of the Annexes of this Directive, where appropriate, and the separate Directives in accordance with the procedure set out in Article 17 as soon as it considers that a new technique has proved to be satisfactory. "

Article 5

In Article 6 of Directive 71/316/EEC, the word "manufacturer" shall be replaced by "person responsible for placing the instruments on the market".

Article 6

Paragraphs 1, 2 and 4 of Article 7 of Directive 71/316/EEC shall be replaced by the following text :

"Article 7

1. The Member State which has granted EEC pattern approval may withdraw it :
 - (a) if instruments for which this approval was granted do not conform to the approved pattern;
 - (b) if the metrological requirements specified in the certificate of approval or the conditions of Article 5(2) and (3) are not met.
2. The Member State which has granted EEC pattern approval shall withdraw it if the instruments for which pattern approval was granted reveal in service a defect of a general nature which makes them unsuitable for their intended use or if it ascertains that this EEC pattern approval was granted in an improper manner.
4. The Member State which has ascertained that the case referred to in paragraph 2 has arisen may forbid the placing on the market and the entry into service of the instruments concerned.

It shall immediately inform the other Member States and the Commission thereof, stating the reasons on which its decision is based.

The same procedure shall apply in the cases mentioned in paragraph 1, with respect to the instruments which have been exempted from EEC initial verification if the person responsible for placing the instruments on the market, after due warning, does not bring the instruments into line with the approved pattern. "

Article 7

1. Article 8(1) of Directive 71/316/EEC shall be replaced by the following text :

"Article 8

1. (a) EEC initial verification constitutes the examination of a new or reconditioned instrument and the confirmation of its conformity to the approved pattern or, when the instrument is exempted from EEC pattern approval, its conformity to the requirements of this Directive and the separate Directives relating to it; it is certified by the EEC initial verification mark.

(b) EEC initial verification of instruments may be carried out by a method other than unit checking in the cases specified in the separate Directives and in accordance with the procedures adopted. "
2. In Article 8 (2) of Directive 71/316/EEC, the word "equipment" shall be replaced by "procedures".
3. In Article 8 (3) of Directive 71/316/EEC, the reference to "Article 1 (1)" shall be replaced by Article 1 (2)".

Article 8

- Article 9 of Directive 71/316/EEC shall be replaced by the following text :

"Article 9

1. When an instrument is submitted for EEC initial verification, the Member State carrying out the examination shall determine :
 - (a) whether the instrument belongs to a category exempt from EEC pattern approval and, if so, whether it satisfies the technical construction and functioning requirements laid down, where appropriate, by this Directive and by the separate Directives relating to that instrument;
 - (b) whether the instrument has received EEC pattern approval and, if so, whether it conforms to the approved pattern.

2. The examination carried out in EEC initial verification relates in particular, in accordance with this Directive, where appropriate, and with the separate Directives, to:

- the metrological characteristics;
- the maximum permissible errors;
- the construction, insofar as this guarantees that the measurement characteristics are not likely to deteriorate to any great extent under normal conditions of use;
- the presence of prescribed inscriptions and the correct positioning of the stamp plates."

Article 9

Article 10 of Directive 71/316/EEC shall be replaced by the following text:

"Article 10

When an instrument has successfully undergone EEC initial verification, in accordance with the requirements of this Chapter of Annex II and, where appropriate of Annex III and of the separate Directives the EEC partial or final verification marks described in Annex II shall be affixed to this instrument in accordance with the rules laid down in that Annex."

Article 10

In Article 11 of Directive 71/316/EEC, the word "manufacturer" shall be replaced by "person responsible for placing the instruments on the market".

Article 11

The following Article shall be incorporated into Directive 71/316/EEC:

"Article 11 (a)

Except where otherwise stated in the separate Directives, when EEC pattern approval is granted for an instrument and there is provision for EEC initial verification, the latter shall consist of verification of conformity to the approved pattern in accordance with the Community specifications in force on the date on which the EEC pattern approval was granted, throughout the entire period of validity of the EEC pattern approval."

Article 12

Article 13 of Directive 71/316/EEC shall be replaced by the following text :

"Article 13

Each Member State shall notify the other Member States and the Commission of the services, agencies and institutes which are authorized to carry out the examinations specified in this Directive and the separate Directives and to affix the EEC initial verification marks. "

Article 13

1. Article 14, Article 15 (2), Article 16 and Chapter VI of Directive 71/316/EEC shall be deleted.
2. Chapters VII and VIII shall become VI and VII.
3. Articles 15, 17, 18, 19, 20, 21 and 22 shall become, respectively, Articles 14, 15, 16, 17, 18, 19 and 20.

Article 14

Chapter VI of Directive 71/316/EEC shall be replaced by the following text:

"Chapter VI

Separate Directives

Article 15

1. The separate Directives concerning the instruments referred to in Article 1 (1)(a) shall be adopted in accordance with the procedure set out in Article 17.

These Directives may:

- be of a general nature in respect of all the instruments,
- or relate to one or more instruments or one or more particular aspects of an instrument.

2. The separate Directives concerning the articles covered by Article 1 (1b) and (1c) shall also be adopted in accordance with the same procedure.

3. The separate Directives shall, in particular, stipulate:
 - the metrological characteristics and the technical specifications for the manufacture and operation of the instruments;
 - the test methods and inspection procedures for the instruments;
 - the methods for metrological measurement and control of certain products.
4. The separate Directives adopted and the Annexes to this Directive may be amended in accordance with the procedure laid down in Article 17.

Procedures for adopting separate Directives

Article 16

1. A Committee (hereinafter called the "Committee") is hereby set up to adopt the separate Directives referred to in Article 15 concerning the removal of technical barriers to trade. It shall consist of representatives of the Member States with a representative of the Commission as Chairman.
2. The Committee shall adopt its own rules of procedure.

Article 17

1. Where the procedure laid down in this Article is to be followed, matters shall be referred to the Committee by the Chairman, either on his own initiative or at the request of the representative of a Member State.
2. The representative of the Commission shall submit to the Committee a draft of a separate Directive. The Committee shall deliver its Opinion of the draft within a time limit set by the Chairman having regard to the urgency of the matter. Opinions shall be adopted by a majority of 41 votes, the votes of Member States being weighted as laid down in Article 148(2) of the Treaty. The Chairman shall not vote.

3. (a) The Commission shall adopt the separate Directive where it is in accordance with the Opinion of the Committee.
(b) Where the separate Directive is not in accordance with the Opinion of the Committee, or if no Opinion is adopted, the Commission shall without delay propose the separate Directive to the Council. The Council shall act by a qualified majority.
(c) If, within three months of the proposal's being submitted to it, the Council has not acted, the proposal for a separate Directive shall be adopted by the Commission.
4. Before submitting a draft Directive to the Committee in accordance with the procedure set out in Article 17, the Commission shall normally seek the Opinion of the Economic and Social Committee.
5. The Commission shall prepare an annual report giving the status of the separate Directives that have been adopted and of proposals for separate Directives which are scheduled for adoption during the next two years. The Commission shall place the annual report before the Council and the European Parliament."

Article 15

In Article 18 of Directive 71/316/EEC, the phrase "prohibiting sale or use" shall be replaced by "prohibiting the placing on the market or entry into service".

Article 16

1. Member States shall adopt and publish the laws, regulations and administrative provisions necessary in order to comply with this Directive before 1 January 1982 and shall inform the Commission thereof.
They shall apply these provisions from 1 July 1982 at the latest.

2. Once this Directive has been notified, the Member States shall also ensure that the Commission is informed, in sufficient time for it to submit its comments, of any draft laws, regulations or administrative provisions which they propose to adopt in the field covered by this Directive.

Article 17

This Directive is addressed to the Member States.

Done at Brussels,

For the Council
The President

Proposal for a Council Directive amending Directive 76/764/EEC
on the approximation of the laws of the Member States on
clinical mercury-in-glass, maximum-reading thermometers

THE COUNCIL OF THE EUROPEAN COMMUNITIES,

Having regard to the Treaty establishing the European Economic Community,
and in particular Article 100 thereof,

Having regard to the proposal from the Commission,

Having regard to the Opinion of the European Parliament¹,

Having regard to the Opinion of the Economic and Social Committee²,

Whereas 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 control³ has laid down
the procedure for EEC pattern approval and EEC initial verification;

Whereas Directive 76/764/EEC⁴ makes provision for these instruments to be
subject only to EEC initial verification;

Whereas, since the adoption of the abovementioned Directive
76/764/EEC, new techniques have been developed in the field of clinical
mercury-in-glass, maximum-reading thermometers; whereas these techniques
make additional examinations necessary for the purpose of determining the
quality of the glass employed;

Whereas it is therefore necessary to make provision for EEC pattern approval
for this category of measuring instruments;

Whereas the abovementioned Directive 76/764/EEC makes no provision
for such EEC pattern approval and it is evidently necessary to amend that
Directive;

¹ OJ

² OJ

³ OJ No. L 202/1, 6.09.1971

⁴ OJ No. L 262/139, 27.09.1976

Whereas it is also advisable for the Commission to adapt to technical progress the Annexes of Directive 76/764/EEC in accordance with the procedure laid down in Article 19 of Directive 71/316/EEC ;

HAS ADOPTED THIS DIRECTIVE :

Article 1

Articles 2 and 3 of Council Directive 76/764/EEC shall be replaced by the following text :

"Article 2

The clinical mercury-in-glass, maximum-reading thermometers eligible to bear the EEC marks and signs shall be those described in the Annexes. They shall be subject to EEC pattern approval and EEC initial verification.

Article 3

No Member State may prevent, prohibit or restrict the placing on the market or entry into use of clinical mercury-in-glass, maximum-reading thermometers bearing the EEC pattern approval sign and the EEC initial verification mark. "

Article 2

1. Member States shall adopt the laws, regulations and administrative provisions necessary in order to comply with this Directive so that these provisions take effect one year after the date of notification of the Directive adapting to technical progress the Annexes of Directive 76/764/EEC. They shall forthwith inform the Commission thereof.
2. Member States shall ensure that the texts of the provisions of national law which they adopt in the field covered by this Directive are communicated to the Commission.

Article 3

This Directive is addressed to the Member States.

Done at Brussels,

For the Council

The President

PROPOSAL FOR A COUNCIL DIRECTIVE

on the approximation of the laws of the Member States
relating to tyre pressure gauges for motor vehicles

THE COUNCIL OF THE EUROPEAN COMMUNITIES

Having regard to the Treaty establishing the European Economic Community,
and particular Article 100 thereof,

Having regard to the proposal from the Commission,

Having regard to the opinion of the European Parliament¹,

Having regard to the opinion of the Economic and Social Committee²,

Whereas in each Member State the manufacture of and control procedures
for tyre pressure gauges for motor vehicles are the subject of mandatory
provisions which differ from one Member State to another and consequently
hinder trade in these instruments; whereas it is therefore necessary to
approximate those provisions;

Whereas Council Directive 71/316/EEC of 26 July 1971 on the approximation of the
laws of the Member States relating to common provisions both for measuring
instruments and for methods of metrological control³ defined the EEC pattern
approval and initial verification procedures; whereas pursuant to that
Directive it is necessary to lay down the technical specifications in
respect of manufacture and operation which tyre pressure gauges for motor
vehicles must satisfy in order that they may be imported, marketed and used
freely after they have undergone the controls and had affixed the marks and
signs provided for,

HAS ADOPTED THIS DIRECTIVE :

1

2

3 OJ N° L 202, 6.9.1971

Article 1

This Directive applies to pressure gauges intended to measure the inflation pressure of motor-vehicle tyres.

It does not cover hand pressure gauges or pressure gauges mounted on the dashboard of motor vehicles.

Article 2

The tyre pressure gauges which are eligible for EEC marks and signs are described in the Annex hereto. They are subject to EEC pattern approval and EEC initial verification under the conditions laid down in the Annex.

Article 3

No Member State may prevent, prohibit or restrict, for reasons relating to their metrological qualities, the placing on the market and entry into service of tyre pressure gauges which bear the sign certifying EEC pattern approval and the EEC initial verification mark.

Article 4

1. Member States shall put into force the laws, regulations and administrative provisions needed in order to comply with this Directive before 1 January 1984 and shall forthwith inform the Commission thereof.
2. As soon as this Directive has been notified Member States shall also ensure that the Commission is informed, in sufficient time for it to submit its comments, of any draft laws, regulations or administrative provisions which they intend to adopt in the field covered by this Directive.

Article 5

This Directive is addressed to the Member States.

Done at Brussels,

1. Definition

The tyre pressure gauges described in this Annex are instruments used in fixed or mobile installations for inflating motor-vehicle tyres in which a mechanical measuring system transmits the elastic deformation of a sensing element directly to an indicating device.

They are graduated in bars and measure directly the pressure difference between the air in the tyre and the atmosphere.

2. Metrological requirements

2.1 Maximum permissible errors

The maximum permissible positive or negative errors mentioned in the table hereunder are defined as absolute values according to the measured pressure:

| <u>measured pressure</u> | <u>Maximum permissible errors</u> |
|--------------------------|-----------------------------------|
| not exceeding 4 bars | 0.08 bar |
| above 4 bars | 0.16 bar |

2.2 Error due to temperature

Variation in pressure-gauge readings at temperatures lying outside the reference range ($20 \pm 5^{\circ}\text{C}$) but between $-10 + 40^{\circ}\text{C}$ must not exceed 0.04 % of the measured pressure per degree Celsius.

2.3 Hysteresis error

Hysteresis error in pressure gauges must not exceed the absolute value of the maximum permissible error.

For a given pressure, the value measured for increasing pressure must not exceed the value measured for decreasing pressures.

2.4 Return of the instrument's pointer to a predetermined mark

At atmospheric pressure, the pressure gauge pointer must stop opposite the zero mark or opposite a mark materialized in a distinct manner from the scale intervals, within the limits of the maximum permissible error.

A pressure gauge may possess a stop at a distance corresponding at least to twice the value of the maximum permissible error from zero or from a predetermined mark.

3. Technical requirements

3.1 Construction

Pressure gauges must be robustly and carefully constructed to ensure that they retain their metrological properties.

3.2 Indicating device

3.2.1 In the measurement range the indicating device must make it possible to read off directly and accurately the value of the pressure measured. To this end, the thickness of the part of the pointer which covers the scale marks must not be greater than the thickness of the scale marks themselves. The pointer must be capable of covering approximately half the length of the shortest scale marks. The maximum distance between the pointer and the plane of the scale marks must not be greater than the length of the scale division and must in no case exceed 2 mm or $0.02 L + 1$ mm in the case of circular-dial indicating devices (L being the distance between the axis of rotation of the pointer and its extremity).

3.2.2 The value of the scale intervals is fixed at 0.1 bar.

3.2.3 The scale divisions must be equal over the entire scale. The distances between scale intervals which may never be smaller than 1,25 mm must be either virtually equal or exhibit only slight variations. Variation in distance is permitted if the difference between two consecutive scale divisions does not exceed 20 % and if the difference between the smallest and longest scale division does not exceed 50 %.

Every fifth mark must be distinguished from the others greater length; every fifth or tenth mark must be numbered.

The thickness of the marks must be virtually constant and must not exceed $1/5$ of the length of the scale division.

4. Inscriptions and marks

4.1 Inscriptions

4.1.1 Pressure gauges must bear the following inscriptions :

- a) on the dial
 - the symbol for the quantity measured : pe
 - the symbol for the unit of measurement : bar
 - where necessary, a symbol indicating the working position of the instrument;
- b) on the dial, a data plate or the instrument
 - manufacturer's name or mark
 - identification particulars of the instrument
 - the EEC pattern-approval mark.

4.1.2 Additional inscriptions may be required by the competent national authority.

These inscriptions must be directly visible, easily legible and indelebile under normal conditions of use and must not impede reading of the instrument indication.

4.2 Verification and sealing marks

A suitable place must be provided for affixing the EEC initial verification marks.

The pressure gauges must be capable of being sealed in such a way as to render it impossible to alter the characteristics of the instrument.

5. EEC pattern approval

The provisions of Council Directive 71/316/EEC shall apply to EEC pattern approval of pressure gauges.

At least two pressure gauges must be submitted for examination when application is made for pattern approval. The competent authorities may ask for additional pressure gauges to be supplied, depending on the progress of the tests.

5.1 Verification of compliance with technical and metrological requirements

Pressure gauges submitted for EEC pattern approval shall undergo an

examination to ensure that they comply with the technical requirements set out in sections 2, 3 and 4.

The examination comprises the following tests, which are performed by means of reference pressure gauges whose errors must not exceed a quarter (1/4) of the maximum permissible errors for the pressure gauges tested.

5.1.1 Determination of the maximum permissible error

Pressure-gauge readings are checked at not fewer than 5 points (including the upper and lower limits of measurement) distributed evenly over the scale.

Errors determined at the reference temperature must be lower than the maximum permissible errors.

5.1.2 Determination of hysteresis error

Hysteresis error must be checked pursuant to section 2.3.

The relevant test consists in taking readings at not fewer than five points on the pressure gauge (including the upper and lower limits of measurements range) distributed evenly over the scale, at increasing and decreasing pressure values.

In the case of decreasing values, the readings must be taken after the pressure gauge has been kept at a pressure equal to the upper scale limit for twenty minutes.

5.1.3 Examination of the stability of the properties of pressure gauges

The tests consist in subjecting pressure gauges to:

- a) a pressure exceeding the upper scale limit by 25 % for 15 minutes;
- b) 1 000 pulses produced by a pressure varying from 0 to 90-95 % of the upper scale limit;
- c) 10 000 cycles of a pressure varying slowly from 20 to approximately 75 % of the upper scale limit at a frequency not exceeding 60 cycles per minute;
- d) an ambient temperature of -20°C for 6 hours and a temperature of $+ 50^{\circ}\text{C}$ for 6 hours.

On completion of tests a), b) and c) and after being left to stand for one hour, the pressure gauges must satisfy the requirements set out in Sections 2.1, 2.3 and 2.4.

On completion of the temperature test referred to in d) above, the pressure gauges must be left stand at an ambient temperature of $(20 \pm 5)^{\circ}\text{C}$ for 6 hours. After this period, the pressure gauges must satisfy the requirements set out in Sections 2.1, 2.3 and 2.4.

5.1.4 Error due to temperature

The test consists in determining the variation in reading for a given pressure at temperatures of -10°C and $+40^{\circ}\text{C}$ as compared with the reading at the reference temperature.

6. EEC initial verification

EEC initial verification of pressure gauges is carried out in accordance with the provisions of Council Directive 71/316/EEC.

6.1 Examination of conformity

This examination consists in checking the conformity of the pressure gauge with the approved pattern.

6.2 Verification tests

These tests are performed by means of reference pressure gauges whose errors must not exceed a quarter ($1/4$) of the maximum permissible errors for the pressure gauges submitted for verification.

6.2.1 Determination of maximum permissible errors

Pressure gauge readings are checked at not fewer three points distributed evenly over the scale. Errors determined at the reference temperature must be less than the maximum permissible errors.

6.2.2 Determination of hysteresis error

For pressure gauges which can measure increasing or decreasing pressures, hysteresis error must be checked pursuant to Section 2.3.

The relevant test consists in taking readings at not fewer than three points on the pressure gauge (including the upper and lower measuring limits) distributed evenly over the scale, for increasing and decreasing pressure values.

PROPOSAL FOR A COUNCIL DIRECTIVE

on the approximation of the laws of the Member States relating to instruments designed to determine the content by volume of carbon monoxide in the exhaust gases of motor vehicles with spark ignition.

THE COUNCIL OF THE EUROPEAN COMMUNITIES,

Having regard to the Treaty establishing the European Economic Community, and in particular Article 100 thereof,

Having regard to the proposal from the Commission,

Having regard to the Opinion of the European Parliament¹,

Having regard to the Opinion of the Economic and Social Committee²,

Whereas in the Member States the manufacture of and checking procedures for instruments designed to determine the content by volume of carbon monoxide and the methods of measurement are subject to mandatory provisions which differ from one Member State to another and consequently hinder trade in such instruments; whereas it is therefore necessary to approximate those provisions;

Whereas 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 (3) defined the EEC pattern approval and initial verification procedures; whereas pursuant to that Directive it is necessary to lay down technical requirements as to design and functioning and metrological characteristics for instruments designed to determine the content by volume of carbon monoxide,

HAS ADOPTED THIS DIRECTIVE :

¹

²

³

OJ N° L 202 . 6.9.1971

Article 1

This Directive applies to instruments designed to determine the content by volume of carbon monoxide in the exhaust gases of motor vehicles with spark ignition, as defined in Section 1.1 of the Annex.

Article 2

The instruments designed to determine the content by volume of carbon monoxide and to which EEC marks and signs may be affixed are described in the Annex. They shall be subject to EEC pattern approval and initial verification in accordance with the conditions set out in the Annex.

Article 3

No Member State may refuse, prohibit or restrict, for reasons connected with the requirements of this Directive, the placing on the market or entry into service of instruments designed to determine the content by volume of carbon monoxide, to which the EEC pattern approval sign and initial verification mark have been affixed.

Article 4

1. Member States shall put into force the laws, regulations and administrative provisions needed in order to comply with this Directive before 1 January 1984 and shall forthwith inform the Commission thereof.
2. As soon as this Directive has been notified, Member States shall also ensure that the Commission is informed, in sufficient time for it to submit its comments, of any draft laws, regulations or administrative provisions which they intend to adopt in the field covered by this Directive.

Article 5

This Directive is addressed to the Member States.

Done at Brussels, ...

ANNEX

1. DEFINITION

1.1 Measuring instruments

1.1.1 Instruments for measuring CO

Instruments which measure the carbon monoxide content by volume of the exhaust gases of spark-ignition engines on vehicles in service, at idling speed, and which indicate this content directly as a percentage by volume.

1.1.2 Instruments for measuring CO and CO₂

Instruments which enable the carbon monoxide content by volume to be determined from the measured CO and CO₂ content of the exhaust gases of spark-ignition engines on vehicles in service, at idling speed. These instruments indicate the CO and CO₂ contents as percentages by volume.

1.2 Sampling apparatus

The sampling apparatus comprises all the components necessary for taking samples of engine exhaust gases and transferring them to the measuring instrument.

1.3 Water separator

The condensation apparatus comprises all the components intended to separate out the condensed water contained in the exhaust gases.

1.4 Filtering apparatus

The filtering apparatus consists of components designed to retain particles in the exhaust gases that might disturb the measuring cell.

1.5 Zero-setting device

An zero-setting device is a device for re-setting to zero the reading of an instrument exposed to a gas which is practically free of carbon oxides.

1.6 Adjusting device

An adjusting device is a device for adjusting the instrument to a reference value indicated on the instrument.

1.7 Calibration device

A calibration device is a device for bringing the instrument reading into agreement with the value of the variable measured, making use of a standard mixture.

1.8 Warming-up time

The warming-up time is the time during which the instrument must remain switched on before it can be used or adjusted.

1.9 Response time

The response time is the time which elapses following a sudden variation of the variable to be measured until the instrument gives a reading which does not differ by an amount greater than a given value from the final reading of the new value of the variable.

1.10 Repeatability

Closeness of the agreement between the results of successive measurements of the same variable, carried out with the same method by the same observer, at relatively short intervals, using the same instruments in the same laboratory.

1.11 Standard mixtures

A standard mixture is a gas mixture of which the composition and concentration of each element are known with the accuracy required for the calibration and adjustment of the measuring instruments during the EEC pattern approval and EEC initial verification procedures.

1.12 Gas mixture of stable composition

A gas mixture of stable composition is a mixture in which the concentrations of the various constituents do not vary by more than 2 % relative to each other during the tests.

1.13 Minimum flow rate

The minimum flow rate is the flow rate below which the instrument cannot give readings that remain within the maximum permissible errors.

1.14 Measuring range

The range of values of the variable to be measured, in respect of which the readings of the measuring instrument, obtained under normal conditions of use in one measuring operation, must not be affected by an error greater than the maximum permissible error.

1.15 Measurement period

The measurement period is the time that elapses between the sampling of the exhaust gases and the final reading of the value measured.

1.16 Drift

Variation in the measurement characteristics of a measuring instrument under normal conditions of use over a relatively long period.

2. TECHNICAL REQUIREMENTS

2.1 Suitability

The instruments must be of robust and careful construction, easy to handle and able to withstand the mechanical stresses to which they may be subjected under normal conditions of use. They may be either fixed or mobile and, in the latter case, they must be capable of being moved when switched on.

2.2 Materials

The parts of the instrument which are in contact with the exhaust gases must be constructed of materials that cannot affect the measuring accuracy.

2.3 Sampling apparatus

The probe for taking samples of exhaust gases must be long enough to be inserted to a depth of at least 30 cm, this point being fitted with a fastening device. It shall consist of a jointed or flexible pipe having a maximum outside diameter of 10 mm.

The minimum length of pipe made of a material which prevents constriction must be 3 m (excluding the sampling probe).

The entire sampling apparatus must be leak-tight.

2.4 Filtering and water separation apparatus

The instruments shall be provided with efficient and easily accessible filtering and water separation apparatus.

The last filter, situated immediately in front of the measuring cell, must be fitted in such a way that its cleanliness can be checked without its having to be removed.

The components of this apparatus shall allow proper functioning of the instrument.

2.5 Checking device

2.5.1 Flow-rate checking device

Instruments must be fitted with a device for checking that the flow rate of the gases analysed is greater than the minimum flow rate.

2.5.2 Device for checking the power supply

Instruments capable of being powered by power generator or a battery must be fitted with a device which makes it impossible to perform measurements as soon as the characteristics of the power supply exceed the limits laid down in point 3.1.

2.6 Indicating devices

2.6.1 CO indicating device

The indicating device shall have one or two graduated scales or a numerical scale.

In the case of indicating devices with two scales, each scale must start by the indication of zero when the instrument has two measuring cells. However, if the instrument has only one measuring cell, at least one of the two scales must start by the indication of zero.

Reference shall be made on the indicating device to the content by volume of carbon monoxide as follows : % vol CO.

The minimum measuring range of the instrument shall be 0 to 7 % vol CO.

Figures and scale intervals

The value of the scale intervals shall be 0.1 % vol CO on digital read-out devices. On analogue indicating devices, the value of the scale interval shall be :

0.1 % vol of CO for the measuring range from 0 to 5 %,

0.2 % vol of CO for the measuring range above 5 %.

On analogue indicating devices, the length of the smallest scale interval shall not be less than 1.25 mm. The part of the pointer overlapping the scale shall be clearly visible and its thickness shall not be more than a quarter of the length of the scale interval. The pointer must cover at least one third of the shortest scale mark. In addition, each integral value of the scale shall be marked with a figure at least 5 mm high.

On digital indicators, the figures shall not be less than 10 mm high.

2.6.2 CO₂ indicating device

On instruments for measuring CO and CO₂, the CO₂ indicating device shall comprise a graduated or a numerical scale.

Reference shall be made on the indicating device to the content by volume of carbon dioxide as follows : % vol CO₂.

The minimum measuring range shall be 0 to 15 % vol CO₂.

Figures and scale intervals

The value of the scale intervals shall be 0.1 % vol CO₂ on digital read-out devices and 0.2 % vol CO₂ on analogue indicating devices.

On analogue indicating devices, the length of the smallest scale interval shall not be less than 1.25 mm. The part of the pointer overlapping the scale shall be clearly visible and its thickness

shall not be more than a quarter of the length of the scale interval. The pointer must cover at least one third of the shortest scale mark. In addition, each integral value of the scale shall be marked with a figure at least 5 mm high.

On digital indicators, the figures shall not be less than 10 mm high.

2.7 Zero-setting, adjusting and calibrating devices

2.7.1 Zero-setting device

The instruments shall be equipped with a zero-setting device.

It must be possible to perform re-setting to zero easily with an accuracy of within 0.05 % vol CO.

This device must be easily accessible to the user, although protected against any inadvertent misadjustment.

2.7.2 Adjusting device

Instruments must be fitted with a device enabling the apparatus to be adjusted with an accuracy of within 0.1 % vol CO to a reference point indicated on the instrument and having a value greater than 3 % vol CO and 7 % vol CO₂.

The instruments shall be adjusted by tacking as a point of reference either a gas mixture of stable composition or an electrical, electronic or mechanical device. If the instrument has an electrical, electronic or mechanical reference point, the signal corresponding to this reference point must be capable of being placed at the correct value by using a standard mixture. This device must be easily accessible to the user, although protected against any inadvertent misadjustment.

2.7.3 Calibrating device

The instruments must be equipped with a calibrating device functioning practically continuously whatever type of indicating device is used.

It must be possible to perform the calibration easily with an accuracy of within 0.05 % vol CO. This device must be capable of being made inaccessible by means of seals.

2.8 Electronic devices

2.8.1 General requirements

The design and construction of the device incorporated in these instruments shall provide the metrological security required for normal conditions of use.

This security may be obtained by one of the following methods :

- by means of a suitable design and type of construction which will result in electronic devices which correspond to the requisite standard of quality and for which an adequate working life can be predicted by means of tests;
- by providing, for each sub-assembly of an electronic device with an essential function in the measuring operation, checking facilities which detect and indicate significant faults;
- by a combination of these two methods.

The choice of method shall be left to the manufacturer's discretion.

2.8.2 Specific requirements

2.8.2.1 When the electronic devices have full checking capability, they must comply with the provisions laid down in section 5 of Annex III to Directive. In particular, the checking facilities with which these electronic devices are fitted must be automatic and permanent or automatic and intermittent, and, in the latter case, they shall operate when the device has been switched on and then once per hour.

When a fault has been detected, the indicating device must be dimmed. This operation must take place automatically:

- after the detection of any fault in the case of digital devices and

- after the detection of any fault giving rise to an error of not less than 0.25 % vol CO in the case of analogue or mixed devices.

2.8.2.2 When the electronic devices either have no checking capability or only partial checking capability, they must comply with the provisions laid down in section 6 of Annex III to Directive 71/316/EEC.

2.9 Descriptive plate and stamping plate

The instruments shall be provided with a descriptive plate giving the following information in easily readable and indelible characters :

1. The makers identification mark or style :
2. Commercial designation :
3. EEC pattern approval sign :
4. Serial number :
5. Minimum flow rate of gas sampled : Q_{min} 1/h
6. Rated voltage and maximum variations of the power supply :
V \pm ... %
7. Rated frequency and maximum variations of the power supply :
Hz \pm ... %
8. Warming-up time : min

On instruments having a digital indicating device, the following markings must appear close to the indicator :

9. Maximum value of the CO measuring range max ... % vol CO
10. Maximum value of the CO₂ measuring range (where appropriate)
max ... % vol CO₂
11. Value of the reference point : % vol CO
12. Value of the reference point (where appropriate):
..... % vol CO₂

A space must be provided on the descriptive plate or on the stamping plate for the EEC initial verification marks.

2.10 Additional markings

Additional markings may be applied provided they do not in any way interfere with the use of the instrument.

2.11 Instruction manual

Each instrument must be accompanied by an instruction manual containing the necessary instructions for correct use of the instrument.

3. INFLUENCE FACTORS

The instruments shall be subjected to the following influence factors :

3.1 Variation in the characteristics of the power supply

The instruments may be supplied with electricity from the mains, a power generator or a battery.

The limits of variation in the characteristics of the power supply shall be those indicated on the descriptive plate.

3.2 Variation in ambient temperature

The ambient temperature shall vary between 0 °C and 40 °C, the nominal temperature being (20 ± 3) °C.

3.3 Variation in relative humidity

The relative humidity shall vary between 5 and 95 %, the nominal humidity value being (60 ± 15) %.

3.4 Variation in barometric pressure

The barometric pressure may vary by 50 mbar above or below the nominal pressure for which the instrument was calibrated.

3.5 Variation in exhaust gas composition

The influence of exhaust gas composition may be checked with the following gas mixtures :

3.5.1 For CO

Those listed in Annex II.A and II.C.

3.5.2 For CO₂

Those listed in Annex II.B and II.D.

4. EXTERNAL DISTURBANCES

Instruments equipped with electronic devices shall be subjected to the external disturbances specified in sections 11.2.1 and 11.2.2 of Annex III to Directive 71/316/EEC.

5. METROLOGICAL REQUIREMENTS

5.1 Instrument response time

After a sudden variation in the carbon monoxide content by volume at the probe of the sampling device, the reading must show a value equal to at least 90 % of the final reading within not more than 20 seconds.

5.2 Drift

The drift of the instrument must not exceed 0.2 % vol CO, and, where appropriate, 0.4 % vol CO₂, over a period of two hours.

5.3 Repeatability of the measurements

The measuring uncertainty must be no greater than 0.2 % vol for CO, and, where appropriate, 0.4 % vol for CO₂.

5.4 Maximum permissible errors for EEC pattern approval

The maximum permissible errors for the instruments have been established as ± 0.25 % vol for CO and, where appropriate, as 0.5 % vol for CO₂.

5.5 Maximum variation of reading

When the instrument is subjected to one of the influence factors mentioned in Section 3, the reading of the carbon monoxide and, where appropriate, carbon dioxide content must not vary by more than ± 0.4 % vol CO₂. In no case may the sum of errors due to these various influence factors exceed the value of ± 0.25 % vol CO and ± 0.5 % vol CO₂.

5.6 Maximum permissible errors for EEC initial verification

The maximum permissible errors for the instruments have been established as :

(a) ± 0.3 % vol for CO and ± 0.6 % vol for CO₂, or

(b) ± 0.5 % vol for CO and ± 1.0 % vol for CO₂

according to the conditions under which the tests are carried out.

6. EEC PATTERN APPROVAL

Pattern approval of instruments shall be effected in accordance with the provisions of Council Directive N° 71/316/EEC as amended.

6.1 Application for EEC pattern approval

The application for EEC pattern approval shall be accompanied by a specimen of the instrument model, or three specimens in the case of instruments equipped with electronic devices, and by two copies of the documents required for its examination.

Depending on the progress of the examinations, the department responsible may require further specimens of the model.

6.2 Depositing of the approved model

The competent department which granted EEC pattern approval for an instrument may require that a model of this instrument be deposited and will mention this on the EEC pattern approval certificate.

6.3 Examination for EEC pattern approval

The examination shall comprise the verification of the technical requirements and checking of the measurement characteristics.

6.3.1 Verification of technical requirements

This examination consists in verifying that the instrument submitted for EEC pattern approval meets the requirements set out in Section 2.

6.3.1.1 A test must be made to ascertain that the filtering devices are operating correctly.

For this purpose, the instrument, after calibration, shall be exposed to an exhaust gas for at least 30 minutes.

A gas mixture, such as that listed as N° 4 in Annex II.A, shall then be passed through the instrument which must indicate the CO content by volume of this mixture without exceeding the maximum permissible errors.

6.3.1.2 In order to verify the suitability of instruments for service, tests shall be carried out to simulate the effects produced by impacts or vibrations to which the instruments are likely to be subjected in service or during transport.

These tests shall be performed in accordance with recommendation N° 68-2-27 (1972) Ea test : impact, second IEC edition.

6.3.2 Checking of measurement characteristics

The instrument submitted for EEC pattern approval must be examined to verify the measurement characteristics specified in Section 5 above.

6.3.2.1 Determination of the error curves

The instrument error must be determined for five values of the content by volume of carbon monoxide or, where appropriate, carbon dioxide by using the standard mixtures specified in Annex II.A or II.B, respectively. This test shall be carried out under the following reference conditions :

nominal voltage and nominal frequency as indicated on the descriptive plate

nominal temperature $(20 \pm 3) ^\circ\text{C}$

nominal barometric pressure

relative humidity $(60 \pm 15) \%$.

In no case may the instrument error exceed the maximum permissible error laid down in Section 5.4.

6.3.2.2 Variation in influence factors

(a) The instrument, through which a standard mixture is passed and which is being operated under the reference conditions specified in Section 6.3.2.1, must be subjected in turn to the various influence factors specified in Sections 3.1, 3.2, 3.3 and 3.4 above within the recommended limits.

This test shall be repeated with each of the standard mixtures listed in Annex II.A and, where appropriate, with those in Annex II.B.

The variation in the instrument reading must not exceed the limits set out in Section 5.5.

(b) The influence of the gas composition must be verified by using in turn each of the gas mixtures listed in Annex II.A and II.C, while maintaining the instrument under the reference conditions specified in Section 6.3.2.1. After each comparison between a gas mixture in Annex II.A and the corresponding mixture in Annex II.C, the variation in the instrument reading must not exceed $\pm 0.2 \%$ vol CO.

Where appropriate, this test must also be carried out for CO₂ by using in turn the gas mixtures listed in Annex II.B and II.D, and the variation in reading must not exceed $\pm 0.4 \%$ vol CO₂.

In no case may the total error due to the variation of these influence factors exceed the value of $\pm 0.25 \%$ vol CO and $\pm 0.5 \%$ vol CO₂.

6.3.2.3 Determination of the response time of the instrument

Under the reference conditions specified in Section 6.3.2.1, a gas mixture of stable composition is passed through the

instrument followed by another gas mixture of stable composition in which the CO content must differ by at least 3 % vol from that in the proceeding mixture. During this test, the instrument must satisfy the requirement laid down in Section 5.1.

6.3.2.4 Determination of drift

For this test, under the reference conditions laid down in Section 6.3.2.1, a gas mixture of a stable composition containing 4.5 % vol CO and, where appropriate, 10.5 % vol CO₂ is passed through the instrument at nominal temperature must not exceed the variations specified in Section 5.2.

The same test shall be carried out to verify the drift from zero.

6.3.2.5 Repeatability of measurements

The instrument must be exposed in turn to a gas mixture of stable composition not containing a carbon monoxide and to another gas mixture containing 4.5 % vol CO. This test shall be repeated five times in order to determine the measuring uncertainty which must not exceed the value specified in Section 5.3.

To verify the requirements concerning CO₂, where appropriate, an identical test must be carried out using gas mixtures containing, respectively, zero and 10.5 % vol CO₂.

6.3.3 Special examination and tests for instruments equipped with electronic devices

When the instruments are equipped with electronic devices, an examination of the design of the electronic devices must be carried out in accordance with the requirements laid down in Sections 8.1 or 8.2 of Annex III to Directive 71/316/EEC as amended, depending on whether these electronic devices have no checking capability or have partial checking capability.

6.3.3.1 Examination of the design and characterization of the model

6.3.3.1.1 The examinations of the design laid down in Sections 8.1.1 and 8.2.1 of Annex III to Directive 71/316/EEC must be performed in accordance with the cases specified.

In addition, when the electronic devices have no checking capability or partial checking capability, the design proving tests specified in Sections 10.1 to 10.4 of Annex III to Directive 71/316/EEC must be performed.

6.3.3.1.2 During the characterization of the model, an endurance test shall be carried out on at least three instruments for :

- 1 500 instrument-hours if the electronic devices have no checking or partial checking capability (for example, three instruments for 500 hours),
- 200 instrument-hours if the electronic devices have full checking capability.

During this endurance test, the instrument, in operating condition, must be subjected from time to time to the influence factors and external disturbances.

In the case of instruments submitted to the 1 500 instrument-hours, the electronic devices must continue to function correctly throughout the duration of this test.

At the end of the test on instruments with full checking capability, it is necessary to check the state or operation of the checking facilities by means of the test device or devices and to ascertain whether the behaviour of the electronic devices may be regarded as satisfactory for the use for which they are intended.

6.3.3.2 Functional tests

The functional examinations and tests specified in Sections 8.1.2 and 8.2.2 of Annex III to Directive 71/316/EEC must be performed on the electronic devices.

6.4 Instruction manual

During EEC pattern approval, the instructions for use contained in the instruction manual for the instrument must be examined to verify whether they are sufficiently complete and accurate.

7. EEC INITIAL VERIFICATION

EEC initial verification of the instruments shall be carried out in accordance with the provisions of Council Directive N° 71/316/EEC as amended.

7.1 Examination and tests for initial verification

The instrument shall be subjected to at least three tests under the reference conditions specified in Section 6.3.2.1 or under the conditions of the nominal field of use : for instruments measuring CO, three gas mixtures chosen from those as specified in Annex II.C shall be used, and, for instruments measuring CO and CO₂, six gas mixtures, three chosen from Table II.C and three from Table II.D in the Annex, shall be used.

For each of these tests, when the reference conditions are chosen, the instruments reading error may not exceed the maximum permissible error laid down in Section 5.6 (a) and, under the other conditions, this error may not exceed the value specified in Section 5.6 (b).

In addition, it is necessary to verify whether the instrument meets the technical requirements laid down in Section 2.

7.2 Instruments equipped with electronic devices

In the case of instruments equipped with electronic devices, the examinations specified in Section 9 of Annex III to Directive 71/316/EEC shall be performed in order to verify that the electronic devices conform with those of the approved model.

If it is decided to perform an endurance test during these examinations, this test must be carried out on one instrument out of every 200 instruments submitted for initial verification. When the results of this test are not satisfactory, EEC initial verification shall be suspended. It shall not be resumed until the defect has been eliminated.

ANNEX II

Standard mixtures

These gas mixtures are composed of nitrogen and the constituents listed below :

A.

| Mixture N° | CO/% vol | CO ₂ /% vol | H ₂ O/% vol | H ₂ /% vol | CH/% vol |
|------------|------------|------------------------|------------------------|-----------------------|----------|
| 1 | 0 ± 0,01 | < 0,01 | < 0,01 | < 0,01 | < 0,01 |
| 2 | 1,5 ± 0,03 | < 0,01 | < 0,01 | < 0,01 | < 0,01 |
| 3 | 3 ± 0,06 | < 0,01 | < 0,01 | < 0,01 | < 0,01 |
| 4 | 4,5 ± 0,09 | < 0,01 | < 0,01 | < 0,01 | < 0,01 |
| 5 | 6 ± 0,12 | < 0,01 | < 0,01 | < 0,01 | < 0,01 |

B.

| Mixture N° | CO/% vol | CO ₂ /% vol | H ₂ O/% vol | H ₂ /% vol | CH/% vol |
|------------|----------|------------------------|------------------------|-----------------------|----------|
| 1 | < 0,01 | 0 ± 0,01 | < 0,01 | < 0,01 | < 0,01 |
| 2 | < 0,01 | 3 ± 0,06 | < 0,01 | < 0,01 | < 0,01 |
| 3 | < 0,01 | 7 ± 0,15 | < 0,01 | < 0,01 | < 0,01 |
| 4 | < 0,01 | 10,5 ± 0,2 | < 0,01 | < 0,01 | < 0,01 |
| 5 | < 0,01 | 15 ± 0,3 | < 0,01 | < 0,01 | < 0,01 |

C.

| Mixture N° | CO/% vol | CO ₂ /% vol | H ₂ O/% vol | H ₂ /% vol | CH/% vol |
|------------|------------|------------------------|------------------------|-----------------------|-----------|
| 1 | 0 ± 0,01 | 15 ± 0,8 | 3 ± 0,2 | 2 ± 0,1 | 1,2 ± 0,1 |
| 2 | 1,5 ± 0,03 | 15 ± 0,8 | 3 ± 0,2 | 2 ± 0,1 | 1,2 ± 0,1 |
| 3 | 3 ± 0,06 | 15 ± 0,8 | 3 ± 0,2 | 2 ± 0,1 | 1,2 ± 0,1 |
| 4 | 4,5 ± 0,09 | 15 ± 0,8 | 3 ± 0,2 | 2 ± 0,1 | 1,2 ± 0,1 |
| 5 | 6 ± 0,12 | 15 ± 0,8 | 3 ± 0,2 | 2 ± 0,1 | 1,2 ± 0,1 |

D.

| Mixture N° | CO/% vol | CO ₂ /% vol | H ₂ O/% vol | H ₂ /% vol | CH/% vol |
|------------|----------|------------------------|------------------------|-----------------------|-----------|
| 1 | 7 ± 0,15 | 0 ± 0,01 | 3 ± 0,2 | 2 ± 0,1 | 1,2 ± 0,1 |
| 2 | 7 ± 0,15 | 3 ± 0,06 | 3 ± 0,2 | 2 ± 0,1 | 1,2 ± 0,1 |
| 3 | 7 ± 0,15 | 7 ± 0,15 | 3 ± 0,2 | 2 ± 0,1 | 1,2 ± 0,1 |
| 4 | 7 ± 0,15 | 10,5 ± 0,2 | 3 ± 0,2 | 2 ± 0,1 | 1,2 ± 0,1 |
| 5 | 7 ± 0,15 | 15 ± 0,3 | 3 ± 0,2 | 2 ± 0,1 | 1,2 ± 0,1 |