CZECH METROLOGY
INSTITUTE

Okružní 31, 638 00 Brno
legmet@cmi.cz
+420 545 555 414

1. ------IND- 2019 0492 CZ- EN- ------ 20191021 --- --- PROJET

Executive summary for the EC (not part of this legislation)

'Gas flow sensors with a multi-hole orifice plate' may be placed on the market and put into use in the Czech Republic as legally controlled measuring instruments pursuant to Act No 505/1990 on metrology, as amended.Pursuant to the Act, legally controlled measuring instruments are instruments that are included in the list of the types of legally controlled measuring instruments (Implementing Decree No 345/2002) and, at the same time, intended (by the manufacturer/importer) for measurements of relevance to the protection of public interests in areas of *consumer protection, contractual relations, imposition of sanctions, fees, tariffs and taxes, health protection, environmental protection, occupational safety, or the protection of other public interests protected by special legislation.*This is therefore a similar purpose as that which is used to identify stipulated products - non-automatic measuring and weighing instruments pursuant to Directives 2014/31/EU and 2014/32/EU.The requirements of this legislation do not apply to measuring instruments not placed on the market in the Czech Republic for the above purposes, identified by Act No 505/1990 on metrology.

The specified metrological requirements are comparable to the relevant requirements of the European standards and apply to the basic design of gas flow sensors with a multi-hole orifice plate.

The purpose of this notified legislation is to lay down metrological and technical requirements for these legally controlled measuring instruments.This legislation also stipulates tests for type approval and verification of legally controlled measuring instruments of this type.

(End of executive summary)

PUBLIC DECREE

As the authority with substantive and territorial jurisdiction for stipulating metrological and technical requirements for legally controlled measuring instruments and stipulating test methods for type approval and verification of legally specified instruments pursuant to § 14(1) of Act No 505/1990, on metrology, as amended (hereinafter the 'Metrology Act'), and in accordance with the provisions of § 172 et seq. of Act No 500/2004, the Code of Administrative Procedure (hereinafter the 'CAP'), the Czech Metrology Institute (hereinafter the 'CMI') commenced ex officio proceedings on 154.2016 pursuant to § 46 of the AC, and based on the supporting documents, hereby issues the following:

I.

MEASURE OF A GENERAL NATURE

number:0111-OOP-C094-18

laying down metrological and technical requirements for legally controlled measuring instruments, including the testing methods for type approval and verification of legally controlled measuring instruments:

'gas flow sensors with a multi-hole orifice plate'

1 Basic definitions

For the purposes of this general measure, terms and definitions pursuant to VIM and VIML[1] as well as the terms and definitions stated below shall apply.

1.1
measurement system for measuring the flow quantity of gas

a set of one or more measuring instruments (components of measuring instruments) and, often, other equipment arranged and adapted to provide information about the qualitative and quantitative characteristics of gas

1.2
gas flow sensor with a multi-hole orifice plate

a gas flow sensor based on the principle of measuring differential pressure upstream and downstream of a multi-hole orifice plate, inserted in a defined manner into pipes with specified geometric parameters

1.3
multi-hole orifice plate

a thin plate with circular openings - an orifice plate

1.3.1
front side A

the side of the multi-hole orifice plate that is installed facing the influx of gas, with higher quality requirements

1.3.2
back side B

the side of the multi-hole orifice plate that is installed facing the outflow of gas, with lower requirements for quality, and with a space for markings.

[1] TNI 01 0115 International Vocabulary of Metrology – Basic and General Concepts and Associated Terms (VIM) and International Vocabulary of Legal Metrology (VIML) are part of the technical harmonisation compendium 'Terminology in the field of metrology', which is publicly available at www.unmz.cz.

1.4
pressure tap (in wall)
an annular or circular cavity drilled in the wall of a pipe using such a method that the edge of the cavity fits with the interior surface of the pipe.

1.5
static pressure of the gas flowing through the pipe
pressure which can be measured by connecting a pressure-measuring device to the pressure tapping in the wall

1.6
differential pressure
the difference between (static) pressures measured in pressure taps in the wall, one being upstream of and one being downstream of the multi-hole orifice plate inserted in a straight pipe through which the gas flows, taking into account all differences in tap height in front of and past the multi-hole orifice plate

1.7
ratio of diameters β
the ratio of the diameter of the orifices in the multi-hole orifice plate to the internal diameter of the pipe upstream of the multi-hole orifice plate

1.8
pipe Reynolds number Re_D
a dimensionless parameter expressing the ratio between the inertial forces and the frictional forces in the pipe upstream of the multi-hole orifice plate

1.9
flow coefficient C
a coefficient defined for a flow of incompressible liquid; it indicates the ratio of the actual flow through the multi-hole orifice plate to the theoretical flow

1.10
expansion coefficient
a coefficient characterising the degree of compressibility of the liquid in question

2 Metrological requirements

The specified metrological requirements are comparable with the relevant requirements of European standards and apply to the basic design of the gas flow sensor with a multi-hole orifice plate.

During verification, gas flow sensors with a multi-hole orifice plate are subject to the metrological requirements that applied to their being placed into circulation.

2.1 Operating conditions

The operating conditions are specified by the manufacturer in consideration of the range of anticipated ambient temperatures during operation and in consideration of range of temperatures of the gas being measured.If there are significant temperature differences between the ambient temperature and the temperature of the flowing gas, the gas flow sensor shall be thermally insulated by suitable means.

The following conditions apply to gas flow sensors with a multi-hole orifice plate when using individual types of pressure taps:

- with corner pressure taps: for $0.40 \leq \beta \leq 0.56$: $Re_D \geq 5{,}000$
  for $\beta > 0.56$: $Re_D \geq 16{,}000\ \beta^2$
- with flange pressure taps: $Re_D \geq 5{,}000$ and $Re_D \geq 170\ \beta^2 D$, where D is in millimetres
- with taps at distances of D and $D/2$: for $0.40 \leq \beta \leq 0.56$: $Re_D \geq 5{,}000$
  for $\beta > 0.56$: $Re_D \geq 16{,}000\ \beta^2$

2.2 Limits of use

Gas flow sensors with a multi-hole orifice plate may only be used for:

- internal pipe diameter D: 25 mm to 1000 mm
- minimum orifice plate hole diameter d_i: 6.25 mm
- minimum characteristic dimension of the multi-hole orifice plate d: 12.5 mm
- ratio of diameters β (d/D): 0.4 to 0.65

2.3 Relative uncertainty of the multi-hole orifice plate flow coefficient

The following relative uncertainties of flow coefficient C apply to a multi-hole orifice plate under compliance with all technical requirements and installation requirements within the limits of undesired increases in the relative uncertainty of the flow coefficient by additional uncertainty: 0.75 % for $0.40 \leq \beta \leq 0.65$.

If D < 71.12 mm, then the relative uncertainty $0{,}9(0{,}75 - \beta)\left(2{,}8 - \frac{D}{25{,}4}\right)\%$, in which D is in millimetres, must be added to the above-mentioned relative uncertainty values of the flow coefficient.

If $\beta > 0.5$ and $Re_D < 10{,}000$, then the relative uncertainty 0.5 % must be added to the above-mentioned relative uncertainty values of the flow coefficient.

If a straight length of pipe with additional uncertainty is used, then this uncertainty must be added to the uncertainty of the flow coefficient.The use of a straight length of pipe load weighted with additional uncertainty is limited to either only the section upstream of the orifice plate, or only the section downstream of the orifice plate.

Compliance with technical requirements is determined during the verification of the individual parts of the gas flow sensor, and compliance with installation requirements is determined within the scope of verification of the evaluation unit for the measurement of gas flow quantity.

2.4 Relative uncertainty of the expansion coefficient

In compliance with all of the established technical requirements, it holds true that the relative uncertainty of the expansion coefficient ε is $5\frac{\Delta p}{\kappa p_1}$ %, in which κ is the isentropic exponent, Δp is the differential pressure and p_1 is the absolute static pressure of the gas upstream of the orifice plate.

Compliance with technical requirements is ascertained during the verification of the individual parts of the gas flow sensor.

3 Technical requirements

The specified metrological requirements are on the level of the relevant requirements of the European standards and apply to the basic design of the gas flow sensor with a multi-hole orifice plate.

During verification, gas flow sensors with a multi-hole orifice plate are subject to the technical requirements that applied to their being placed into circulation.

3.1 Design

The basic design of a gas flow sensor with a multi-hole orifice plate includes the following parts:

- orifice plate;
- pressure taps;
- a stabilising straight length of pipe upstream of the orifice plate with total minimum length of 10*D*, or a shorter length if specified in the type approval certificate;
- a stabilising straight length of pipe past the orifice plate with total minimum length of 2*D*, or a shorter length if specified in the type approval certificate;

The design and installation of the multi-hole orifice plate must ensure that it is not subject to plastic or elastic deformation during operation under the pressure of the flowing gas, or that said deformation is within specified limits.

3.2 Orifice plate

The part of the orifice plate with diameter *D* that is located inside the pipe after installation must be circular and concentric with the pipe axis.The front and back side of the orifice plate must be parallel.

Unless specified otherwise, all requirements placed on the design of the orifice plate only apply to the parts that are located in the pipe.

3.2.1 Front side A

3.2.1.1 Flatness

The maximum deviation between the linear straight edge of length *D*, positioned in a discretionary direction above diameter *D* on the orifice plate, and the plane of the front side of orifice plate A must be less than 0.005 $D - d)/2$, i.e. the inclination of the surface must be less than 0.5 %.

3.2.1.2 Surface roughness

Inside a circle of diameter *D*, concentric with the axis of the pipe in which the orifice plate is installed, the orifice plate must have a roughness parameter of $Ra < 10^{-4}d$.

3.2.2 Back side B

The back side of the orifice plate must be flat and parallel with the front side.The roughness of the surface on the back side of the orifice plate need not achieve the quality required on the front side of the orifice plate.

3.2.3 The thickness *e* of the holes in the orifice plate and orifice plate thickness *E*

The thickness *e* of the holes in the orifice plate must be between 0.005*D* and 0.02*D*.The difference between the values of *e* measured at an arbitrary point of the orifice plate holes may not be greater than 0.001*D*.

The thickness of the orifice plate E must be between e and $0.05D$.In the case of 50 mm $\leq D \leq$ 64 mm, E can be up to 3.2 mm.

For orifice plates with D < 200 mm, the difference between the values of E measured at an arbitrary point must not be greater than $0.001D$.For orifice plates with D < 200 mm, the difference between the values of E measured at an arbitrary point must not be greater than 0.2 mm.

3.2.4 Chamfer angle α

If the thickness E of the orifice plate is greater than the thickness of the orifice plate holes e, then the orifice plate holes on the back side of the orifice plate must be chamfered; the chamfer angle α must be 45° ± 15°.The chamfered surface must be finished smoothly.

3.2.5 Edges of the orifice plate holes

The front edge of the orifice plate holes must not have any burrs or other damage.The edges must be sharp and right-angled.The radius of curvature of the front edge of the orifice plate holes must not be greater than $0.0004d$.

The angle between individual orifice plate holes and the front edge of the orifice plate must be 90° ± 0.3°.

The back edge(s) of the orifice plate holes need not meet the qualitative requirements for the front edges of the orifice plate holes.

3.2.6 Orifice plate hole diameters d_i

The diameters of the orifice plate holes d_i must meet the requirements specified in Article 2.2.

Orifice plate hole diameter d_i is the mean value of the measurement of at least four diameters at approximately the same angles to each other.

3.2.7 Cylindricity of the orifice plate holes

The orifice plate holes must be cylindrical, and no diameter measured in the cylindrical part of the orifice plate holes may differ by more than 0.05 % of the mean of diameters d_i.

3.2.8 Surface roughness of the orifice plate holes

The surface roughness of the cylindrical part of the orifice plate holes must not influence the measurement of the sharpness of the edge.

3.2.9 Orifice plate material

The orifice plate may be made of any kind of material with a known longitudinal expansion coefficient, on condition that it will continuously meet all of the relevant requirements of this regulation under operating conditions.

3.2.10 Design execution of the orifice plate for flow in both directions

With orifice plates intended for measuring gas flow in both directions, the technical and metrological requirements for the front side A of the orifice plate must be applied on both sides of the orifice plate (edges).The orifice plate holes must not be chamfered.

3.3 Differential pressure taps

Flange pressure taps, corner pressure taps or pressure taps at distances *D* and *D*/2 may be used for differential pressure taps.

In the case of a bi-directional version of a gas flow sensor with centric orifice and pressure taps at distances *D* a *D*/2, two pairs of said taps must be used upstream and downstream of the orifice, depending on the direction of flow.

3.4 Straight lengths of pipe upstream and downstream of the orifice plate

3.4.1 Design

The minimum straight length of pipe upstream of the orifice plate which must be complied with in the specific application shall be determined based on the ratio of diameters β and according to the type and mutual arrangement of at least two adapters placed upstream of the orifice plate.

The straight length of pipe between the first adapter in front of the orifice plate and the orifice plate itself can consist of one or more pieces, but the part of the pipe up to a length of 2*D* in front of the orifice plate must always consist of one single piece.

The design and execution of the straight lengths of pipe must facilitate the performance of the tests defined in Article 5.2.4 or Article 6.2.4.

3.4.2 Pipe straightness

The straightness of the stabilising minimum straight lengths of pipe is be deemed adequate if the surface deviation of the pipe from a straight line running parallel to the axis of the pipe does not exceed 0.4 % of its length upstream and downstream of the orifice plate.

3.4.3 Mean value of the inner diameter of the pipe

The internal diameter *D* of the pipe is the arithmetic mean of at least twelve measured diameter values, i.e. four diameters lying at approximately the same angles to one another at each of at least three cross sections evenly distributed at a length of 0.5*D* upstream of the orifice plate.Two of these cross-sections must lie on the plane of the front pressure tap and at a distance of 0.5*D* from the front pressure tap.If a welded joint is located at a length of 0.5*D* upstream of the front pressure tap, then the third cross section must be placed precisely into said joint.

3.4.4 Circularity and cylindricity of pipe

The internal shape of the pipe must be circular along the entire minimum straight length of pipe.

No inner pipe diameter may differ from the mean value of inner diameter *D* by more than 0.3 % in any plane in the part of the straight length of pipe up to a distance of 2*D* upstream of the orifice plate.

The difference between inner pipe diameters of two arbitrary sections of pipe may not exceed 0.3 % of the mean value of inner diameter *D* along the straight section of pipe between 2*D* and 10*D* upstream of the orifice plate.At the same time, the overlap of the inner diameters of parts of the pipe connected to one another, caused by a deviation and/or change in diameter *D*, may not exceed 0.3 % of the mean value of the internal diameter *D* at any point along the inner circumference of the pipe.

No internal diameter of a straight length of pipe behind the orifice plate may differ from the mean internal diameter *D* of the pipe upstream of the orifice plate by more than 3 %, at least over a length of 2*D* from the front side of the orifice plate.

3.4.5 Quality of the internal surface of the pipe

The internal surface of the pipe must be clean and free of any visible defects.

Over the stipulated minimum straight length of the basic version of the sensor, the internal pipe surface must meet specified requirements for surface roughness *Ra* in front of the orifice plate.The value of the mean arithmetic deviation (roughness) of the profile *Ra* must be such that $10^4 Ra/D$ is less than the maximum permissible value given in Table 1 and greater than the minimum permissible value given in Table 2.

Table 1 –Maximum permissible value $10^4 Ra/D$

β	Re_D								
	$\leq 10^4$	3×10^4	10^5	3×10^5	10^6	3×10^6	10^7	3×10^7	10^8
≤ 0.20	15	15	15	15	15	15	15	15	15
0.30	15	15	15	15	15	15	15	14	13
0.40	15	15	10	7.2	5.2	4.1	3.5	3.1	2.7
0.50	11	7.7	4.9	3.3	2.2	1.6	1.3	1.1	0.9
0.60	5.6	4.0	2.5	1.6	1.0	0.7	0.6	0.5	0.4
≥ 0.65	4.2	3.0	1.9	1.2	0.8	0.6	0.4	0.3	0.3

Table 2 –Minimum permissible value $10^4 Ra/D$

β	Re_D			
	$\leq 3 \times 10^6$	10^7	3×10^7	10^8
≤ 0.50	0.0	0.0	0.0	0.0
0.60	0.0	0.0	0.003	0.004
≥ 0.65	0.0	0.013	0.016	0.012

3.5 Installation requirements

The installation position of the orifice plate must be clearly defined by its design, or it must be schematically marked directly on the orifice plate.

4 Measuring instrument markings

4.1 General

All inscriptions and markings must be easily visible, legible, and indelible and must be a source of the information needed for the trouble-free implementation of the gas flow sensor with a multi-hole orifice plate into the gas flow measurement system in relation to its other components.

4.2 Markings

4.2.1 Markings on the orifice plate

The following information must be on the orifice plate:

a) serial number;
b) the value of the characteristic dimension of the multi-hole orifice plate d_{20} in relation to a reference temperature of 20 °C;
c) type approval mark;
d) suitable marking for type identification and placement of the differential pressure taps, if the pressure taps are a fixed component of the design execution of the orifice plate.

In cases in which the above-mentioned information is not visible once the multi-hole orifices have been installed into the pipe, the orifice plate must also be equipped with a separate additional nameplate with the information in question, which will help safeguard the orifice plate against removal or replacement.

In cases in which the orifice plate could be improperly installed against the direction of the gas flow, the direction of flow must be indicated on the orifice plate by a means which cannot be mistaken.

4.2.2 Markings on gas flow sensors with a multi-hole orifice plate

The following information must be on the gas flow sensor with a multi-hole orifice plate:

a) the name of the manufacturer and type (design variant);
b) serial number and year of production;
c) the value of the internal diameter $D_{20}$of the pipe in relation to a reference temperature of 20 °C;
d) type approval mark;
e) nominal size DN/nominal pressure PN;
f) indication of the direction of flow;
g) suitable marking for type identification and placement of differential pressure taps, if pressure taps are a permanent part of the design of straight lengths of pipe;
h) the measured flow range or the maximum flow value.

This information must be placed on a part of the gas flow sensor that is inseparably joined to a straight pipe section 0.5*D* in front of the orifice plate (installation chamber, connector flange in front of the orifice plate, a straight length of pipe at most 2*D* in front of the orifice plate).

The following information must be specified on the connection flange or other location of the straight length of pipe past the orifice plate (at a maximum length of 2*D* past the orifice plate).

i) the manufacturer's name;
j) serial number and year of production;
k) type approval mark;
l) an indication of the direction of flow (if reverse installation is possible).

If the straight length of pipe upstream of the orifice plate is made up of multiple parts of pipe in the basic configuration of the gas flow sensor, then all of these parts must be marked with the type approval marking.All major separate parts of the gas flow sensor with a multi-hole orifice plate must generally be marked with a type approval marking.

4.3 Marking with official marks

Suitable areas for placement of the type approval mark and official mark(s) must be provided.

It must be possible to safeguard the orifice plate against unauthorised removal or replacement.

5 Type approval of the measuring instrument

The type approval process for a gas flow sensor with a multi-hole orifice plate encompasses the following tests and activities:

a) an external inspection;
b) a check of geometric parameters.

5.1 External inspection

The following are checked during the external inspection:

- completeness of the required technical documentation;

- the conformity of the metrological and technical characteristics specified by the manufacturer in the documentation with this regulation's technical and metrological requirements specified in Chapters 2 and 3;
- the orifice plate, pressure taps and straight lengths of pipe in terms of potential mechanical damage or potential traces of corrosion which would preclude further testing; and
- the spaces for indicating the basic geometric parameters of the gas flow sensor with a multi-hole orifice plate and spaces for placing official marks are determined.

5.2 Check of geometric parameters

5.2.1 Test equipment

Suitable equipment with valid metrological traceability must be used during the check of geometric parameters.

5.2.2 Reference ambient temperature for tests

5.2.2.1 Orifice plate

During the test, the ambient temperature must be between 18 and 22 °C and must not change by more than 2 °C.

5.2.2.2 Straight lengths of pipe

Pipe ≤ DN 300: During the test, the ambient temperature must be between 15 and 25 °C and must not change by more than 2 °C.

Pipe > DN 300: During the test, the ambient temperature must be between 10 and 30 °C and must not change by more than 5 °C.

5.2.3 Check of the geometric parameters of the orifice plate

The internal diameters d_i of the orifice plate holes must be established in accordance with the requirement of Article 3.2.6 and must relate to a reference temperature 20 °C.

The following geometric parameters of the orifice plate are also checked:

- flatness of the front side (see Article 3.2.1.1);
- surface roughness of the front side (see Article 3.2.1.2);
- thickness of the orifice plate holes and thickness of the orifice plate (see Article 3.2.3);
- chamfer angle (see Article 3.2.4);
- the edges of the orifice plate holes (see Article 3.2.5);
- cylindricity of the orifice plate holes (see Article 3.2.7);
- surface roughness of the orifice plate holes (see Article 3.2.8).

In the case of an orifice plate intended for measuring the gas flow in both directions, all of the tests specified in Article 5.2.3 must be carried out for both sides of the orifice plate.

5.2.4 Check of the geometric parameters of straight lengths of pipe

The mean internal diameter value D_{20} of the pipe must be established in accordance with the requirement of Article 3.4.3 and must relate to a reference temperature of 20 °C.

The following geometric parameters are checked for straight lengths of pipe:

- the straightness of the pipe (see Article 3.4.2);
- the circularity and cylindricity of the pipe (see Article 3.4.4);
- the roughness of the pipe's internal surface (see Article 3.4.5).

In the case of a gas flow sensor with a multi-hole orifice plate intended for flow in both directions, all of the tests specified in Article 5.2.4 must be carried out for the straight lengths of pipe positioned upstream and downstream of the orifice plate.

5.2.5 Check of the geometric parameters of pressure taps

Compliance with the requirements for differential pressure taps according to the manufacturer's specifications shall be ascertained.

6 Initial verification

The following tests and activities shall be carried out during the initial validation of gas flow sensors with a multi-hole orifice plate:

a) visual inspection;
b) test of metrological characteristics;
c) marking of the basic geometric parameters on the relevant parts of a gas flow sensor with a multi-hole orifice plate.

6.1 Visual inspection

The purpose of a visual inspection is to check that:

- the execution of the gas flow sensor with a multi-hole orifice plate matches the approved type;
- the orifice plate, pressure taps and straight lengths of pipe are not mechanically damaged and whether or not they bear traces of corrosion that would preclude further testing,
- the content and implementation of markings and inscriptions correspond to the information and requirements specified in the type approval certificate for the measuring instrument.

If the gas flow sensor with a multi-hole orifice plate does not meet the external inspection requirements, it is not tested further.

6.2 Check of geometric parameters

6.2.1 Test equipment

Suitable equipment with valid metrological traceability must be used during the check of geometric parameters.

6.2.2 Reference ambient temperature for tests

The ambient temperature requirements pursuant to Article 5.2.2 apply to the testing.

6.2.3 Check of the geometric parameters of the orifice plate

The internal diameters d_i of the orifice plate holes must be established in accordance with the requirement of Article 3.2.6 and must relate to a reference temperature 20 °C.

The following geometric parameters are also checked during the initial verification of the orifice plate:

- flatness of the front side (see Article 3.2.1.1);
- surface roughness of the front side (see Article 3.2.1.2);
- thickness of the orifice plate holes and thickness of the orifice plate (see Article 3.2.3);
- chamfer angle (see Article 3.2.4);
- the edges of the orifice plate holes (see Article 3.2.5);
- cylindricity of the orifice plate holes (see Article 3.2.7);

- surface roughness of the orifice plate holes (see Article 3.2.8).

In the case of an orifice plate intended for measuring the gas flow in both directions, all of the tests specified in Article 6.2.3 must be carried out for both sides of the orifice plate.

6.2.4 Check of the geometric parameters of straight lengths of pipe

The mean internal diameter value D_{20} of the pipe must be established in accordance with the requirement of Article 3.4.3 and must relate to a reference temperature of 20 °C.

During initial verification, the following geometric parameters of the straight lengths of pipe are also checked:

- the straightness of the pipe (see Article 3.4.2);
- the circularity and cylindricity of the pipe (see Article 3.4.4);
- the roughness of the internal surface of the pipe (see Article 3.4.5); only the maximum permissible value per Table 1 is checked.

In the case of a gas flow sensor with a multi-hole orifice plate intended for flow in both directions, all of the tests specified in Article 6.2.4 must be carried out for the straight lengths of pipe positioned upstream and downstream of the orifice plate.

6.2.5 Check of the geometric parameters of the differential pressure taps

Compliance with the requirements for differential pressure taps according to the manufacturer's specifications shall be ascertained during the initial verification.

6.2.6 Marking of basic geometric parameters on the measuring instrument

The resultant value of the characteristic dimension d20 of the multi-hole orifice plate calculated from internal diameters of orifice plate holes di determined pursuant to Article 6.2.3 must be marked in a legible and indelible manner in a suitable location on the orifice plate in accordance with Article 4.2.1.

The resultant internal diameter value D20 of the pipe determined pursuant to Article 6.2.4 must be marked in a legible and indelible manner in a suitable location on the gas flow sensor in accordance with Article 4.2.2.

7 Subsequent verification

The procedure for the subsequent verification of the orifice plate is identical to the procedure for the initial verification pursuant to Article 6.2.3.

Subsequent verification of straight lengths of pipe of gas flow sensors with a multi-hole orifice plate is not performed.

The user of the measuring instrument is responsible for long-term compliance with operating conditions, including keeping it in proper condition and keeping the inner surface of the pipe clean.For this purpose, the user of the measuring instrument performs (or ensures) a visual inspections of the internal surface of the pipe at intervals that take into account operating conditions and the type of gas medium being measured.This check must also always be performed prior to the installation of the orifice plate.

8 Measuring instrument examination

When examining measuring instruments pursuant to § 11a of the Metrology Act at the request of a person who may be affected by incorrect measurement, the procedure under Chapter 6 shall be followed.

9 Notified standards

For the purposes of specifying the metrological and technical requirements for measuring instruments and specifying the testing methods for their type approval and verification arising from this general measure, the CMI will notify Czech technical standards, other technical standards or technical documents of international or foreign organisations, or other technical documents containing more detailed technical requirements (hereinafter referred to as 'notified standards').The CMI will publish a list of these notified standards attached to the relevant measures, together with the general measure, in a manner accessible to the public (on www.cmi.cz).

Compliance with notified standards or parts thereof is considered, to the extent and under the conditions stipulated by this measure of a general nature, to be compliance with the requirements stipulated by this measure to which these standards or parts thereof apply.

Compliance with notified standards is one way of demonstrating compliance with the requirements.These requirements may also be met by using another technical solution guaranteeing an equivalent or higher level of protection of legitimate interests.

II.

GROUNDS

The CMI has issued this measure of a general nature laying down metrological and technical requirements for legally controlled measuring instruments and tests for the type approval and verification of legally controlled measuring instruments – 'gas flow sensors with a multi-hole orifice plate' – in accordance with § 14(1)(j) of the Metrology Act to implement § 6(2), § 9(1) and (9), and § 11a(3) of the Metrology Act.

Under item 1.3.11(c) in the Annex 'List of the Types of Legally Controlled Measuring Instruments' to Implementing Decree No 345/2002 specifying the measuring instruments whose verification is mandatory and measuring instruments subject to type approval, as amended, this type of measuring instrument is classified as an instrument subject to mandatory verification.

This legislation (Measure of a General Nature) was notified in accordance with Directive (EU) 2015/1535 of the European Parliament and of the Council of 9 September 2015 laying down a procedure for the provision of information in the field of technical regulations and of rules on Information Society services.

III.

INSTRUCTIONS

In accordance with § 173(2) CAP, no appeals may be made regarding general measures.

In accordance with the provisions of § 172(5) CAP, decisions on objections are final, and appeals may not be made against them.

Compliance of the measure of a general nature with legislation may be subject to a review process pursuant to§ 94 to § 96 of the Administrative Code.A party to the proceedings may initiate review proceedings to be conducted by the administrative authority that issued the measure of a general nature.If the administrative authority finds no reason to commence the review proceedings, it shall communicate and provide grounds for this within 30 days.Pursuant to § 174(2) of the Administrative Code,a ruling on the commencement of review proceedings can be issued within three years of the effective date of the measure of a general nature.

IV.

ENTRY INTO FORCE

This measure of a general nature comes into effect on the fifteenth day after its date of publication (§ 24d of the Metrology Act).

Czech Metrology Institute
Director-General

Posted on:

Removed on:

Effective date: