Pursuant to Article 9(1) and (5), Article 11(5) and for the implementation of Article 12 of the Metrology Act (Uradni List RS [Official Gazette of the Republic of Slovenia] No 26/05 – official consolidated text) the Minister for Economic Development and Technology is issuing the following

RULES
on metrological requirements for tyre pressure gauges

I. GENERAL PROVISIONS

Article 1
(Content)

(1) These Rules lay down the metrological and technical requirements that must be met by tyre pressure gauges (hereinafter 'pressure gauges'), the method of their marking and the conformity assessment and verification procedures applicable:
- at service stations, electric vehicle charging stations or other public places to ensure the technical safety of vehicles;
- in facilities for carrying out roadworthiness tests for motor vehicles and their trailers;
- in the premises of tyre repair shops or workshops for motor vehicles and their trailers;
- in proceedings before administrative and judicial authorities, in which the rights or obligations of entities are decided on the basis of tyre pressure measurements.

(2) These Rules are issued pursuant to the notification procedure in accordance with the 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 (OJ L 241, 17.9.2015, p. 1).

Article 2
(Information procedure and mutual recognition clause)

(1) These Rules are issued pursuant to the notification procedure in accordance with the 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 (OJ L 241, 17.9.2015, p. 1).

(2) The provisions of these Rules shall not apply to products which, in accordance with national legislation ensuring an equivalent level of protection of the public interest as determined in the legislation of the Republic of Slovenia, are lawfully:
- produced or marketed in other Member States of the European Union and Turkey, or
- produced in the countries of the European Free Trade Association (EFTA), which are also signatories to the Agreement on the European Economic Area.

(3) These Rules shall be implemented in accordance with Regulation (EU) 2019/515 of the European Parliament and of the Council of 19 March 2019 on the mutual recognition of goods lawfully marketed in another Member State and repealing Regulation (EC) No 764/2008 (OJ L 91, 29.3.2019, p. 1).

Article 3
(Definitions)

(1) The following words when used in these Rules shall have the following meanings:
‘gauge pressure p_e’ is the difference between the absolute pressure and the absolute pressure of the atmosphere. The tyre pressure is the pressure difference between the air in the tyre and the atmosphere and is thus the same as the pressure in the manometer;
‘influencing quantity’ is a quantity that is not the measured pressure but affects the result of measurement;
‘disturbance’ is an influencing quantity having a value within the limits specified in the appropriate requirement but outside the specified rated operating conditions of the pressure gauge. An influencing quantity is a disturbance if for that influencing quantity the rated operating conditions are not specified;
‘rated operating conditions’ are the values for the measured pressure and influencing quantities making up the normal operating conditions of a pressure gauge;
‘climatic environments’ are the conditions in which pressure gauges may be used;
‘MPE’ is the maximum permissible error;
‘tyre pressure gauges’ are instruments for measuring tyre pressure, which include all elements from the tyre valve connection to the device display inclusive;
‘hysteresis’ is the difference between the readings of the pressure gauge when the same pressure, except for the pressures at the lower and upper limits of the measuring range, is achieved by increasing or decreasing the pressure;
‘presetting device’ is a device that allows the target pressure to be selected and that automatically stops the tyre filling/discharge process when the target pressure is reached;
‘fixed devices’ are pressure gauges where the measuring components and the display device are fixed;
‘portable devices’ are pressure gauges where the measuring components and the display device are portable;
‘hand-held devices’ are pressure gauges where the measuring components and the display device are manual;
‘electronic pressure gauges’ are pressure gauges with one or more electronic parts in the measuring chain;
‘mechanical pressure gauges’ are pressure gauges without electronic parts in the measuring chain.

II. METROLOGICAL AND TECHNICAL REQUIREMENTS

Article 4
(General principles)

(1) Pressure gauges shall provide such a high level of metrological protection that any party affected by the measurement can have confidence in the result of measurement and shall be designed and manufactured to a high level of quality in respect of the measurement technology and security of the measurement data.

(2) The solutions adopted to meet the requirements of these Rules shall take account of the intended use of pressure gauges and any foreseeable misuse of pressure gauges.

(3) Pressure gauges shall be designed in such a way that each inspection and test prescribed by these Rules can be carried out.

(4) For the purpose of these Rules, the following categorisation of pressure gauges shall apply:
- category 1: fixed devices;
- category 2: portable devices;
- category 3: hand-held devices.

(5) Depending on the type of pressure sensor and display device used, pressure gauges, for the purposes of these Rules, shall be divided into:
- electronic pressure gauges;
- mechanical pressure gauges.

Article 5
(MPE)

(1) Under rated operating conditions and in the absence of a disturbance, the error of measurement in conformity assessment and verification procedures shall not exceed the MPE value.

(2) MPEs for measured pressures are given in Table 1 and Table 2 respectively.

Table 1

Measured pressure (kPa)	MPE in kPa		
	Ambient temperature (T_{amb}) for		
	below 15 °C	15 °C to 25 °C	above 25 °C
≤ 400	0.5 x (15 – T_{amb}) + 8	8	0.5 x (T_{amb} – 25) + 8
> 400 to ≤ 1000	0.5 x (15 – T_{amb}) + 16	16	0.5 T_{amb} – 25) + 16
> 1000	0.5 x (15 – T_{amb}) + 25	25	0.5 T_{amb} – 25) + 25

Table 2

Measured pressure (bar)	MPE in bar		
	Ambient temperature (T_{amb}) for		
	below 15 °C	15 °C to 25 °C	above 25 °C
≤ 4	0.005 x (15 – T_{amb}) + 0.08	0.08	0.005 x (T_{amb} – 25) + 0.08
> 4 to ≤ 10	0.005 x (15 – T_{amb}) + 0.16	0.16	0.005 T_{amb} – 25) + 0.16
> 10	0.005 x (15 – T_{amb}) + 0.25	0.25	0.005 T_{amb} – 25) + 0.25

Article 6
(Hysteresis error)

(1) Hysteresis error in pressure gauges must not exceed the absolute value of the MPE set out in Table 1 or Table 2 of Article 5 respectively, indicated in the column ‘15 °C to 25 °C’.

(2) The requirement referred to in the first paragraph of this Article shall only apply to pressure gauges that are designed to also measure falling pressure during normal use.

Article 7
(Resetting the display to zero)

(1) If the pressure gauge shows zero, the actual reading must be within the MPE or the pressure gauge must not show a value below the lowest value of the measured pressure.

(2) At atmospheric pressure, the pointer, within the limits of the MPE, stops at the zero mark or at a predetermined mark that is clearly different from the divisions of the scale.

Article 8
(Zero setting)

The pressure gauge can be equipped with an automatic or semi-automatic zeroing device.

Article 9
(Major error)

Major error for the measured pressure is an error the value of which exceeds the MPE.

Article 10
(Operating conditions)

(1) For pressure gauges, the manufacturer shall specify the following rated values for operating conditions:
- the ambient temperature range, which must be in a range equal to or greater than –10 °C to 40 °C;
- the temperature range of storage, which must be in a range equal to or greater than –40 °C to 70 °C;
- working position, if necessary;
- the measuring range of the pressure gauge in bar or kPa;
- the level of protection against the ingress of water and foreign particles, which must be at least IP44 for outdoor use or IP31 for indoor use;
- the value (range) of the supply voltage.

(2) In relation to climatic environments, the following influence quantities must be taken into account:
- dry heat,
- cold,
- cyclic (condensing) saturated moisture,
- salt mist.

(3) With regard to mechanical environments, the pressure gauge must be designed for use in locations with significant and severe vibrations and shocks caused by, for example, machinery or passing vehicles or nearby heavy machinery, conveyor belts, etc.

(4) In relation to mechanical environments, the following influence quantities must be taken into account:
- vibrations,
- free fall.

(5) With regard to electromagnetic environments, the pressure gauge must be designed for use in locations with electromagnetic disturbances similar to those in residential, commercial and light industrial facilities.

(6) Pressure gauges that are powered from the vehicle's battery shall comply with the requirements of the preceding paragraph and additional requirements regarding:
- voltage reductions caused by energising the starter-motor circuits of internal combustion engines,
- load dump transients occurring in the event of a discharged battery being disconnected while the engine is running.

(7) In relation to electromagnetic environments, the following influence quantities must be taken into account:
- voltage interruptions,
- short-term voltage drops,
- voltage transients on supply lines and/or signal lines,
- electrostatic discharges,
- radio frequency electromagnetic field,
- induced radio frequency electromagnetic field on supply lines and/or signal lines,
- surges on supply lines and/or signal lines.

(8) Other influence quantities to be considered, where appropriate, are:
- voltage variation
- mains frequency variation
- power frequency magnetic fields
- any other quantity that could significantly affect the accuracy of the measuring instrument.

Article 11
(Installation position)

A change in the nominal installation position by ± 10° shall not result in a change in the reading by more than 50 % of the MPE set out in Table 1 or Table 2 respectively.

Article 12
(Rules for testing and determining errors)

Compliance with the requirements referred to in Articles 10 and 11 of these Rules shall be verified for each relevant influence quantity. The requirements apply when each individual influence quantity is used and its effect is evaluated separately and other influence quantities are kept relatively constant at standard conditions.

Article 13
(Durability)

(1) Pressure gauges shall be designed to maintain reasonable stability of their metrological properties over a period of time, provided that they are properly installed, maintained and used in accordance with the manufacturer's instructions and located in the environmental conditions for which they are intended.

(2) Pressure gauges shall withstand a short-term pressure overload of up to 125 % of the maximum value of the measuring range without changes in their metrological characteristics.

Article 14
(Reliability)

Pressure gauges shall be designed to reduce as far as possible the effect of a defect that would lead to an inaccurate measurement result, unless the presence of such a defect is obvious.

Article 15
(Suitability)

(1) Pressure gauges shall be suitable for their intended use taking account of the practical working conditions and shall not require unreasonable demands of the user in order to obtain a correct measurement result.

(2) Pressure gauges shall be designed so as to allow the control of the measuring tasks after they have been placed on the market and put into use. If necessary, special equipment or software for this control must be available to the user as part of this pressure gauge.

(3) When a pressure gauge has associated software which provides other functions besides the measuring function, the software that is critical for the metrological characteristics shall be identifiable and shall not be inadmissibly influenced by the associated software.

(4) Pressure gauges with a transducer sensitive to mechanical wear shall be equipped with a protection system to prevent the supply pressure from reaching the measuring transducer during tyre inflation.

(5) In the case of a pressure gauge with a presetting device, the difference between the preset value and the measured pressure value shall not exceed the MPE referred to in Article 5 of these Rules.

Article 16
(Protection against corruption)

(1) Pressure gauges shall have no feature likely to facilitate fraudulent use, whereas possibilities for unintentional misuse shall be minimal.

(2) The metrological characteristics of pressure gauges shall not be influenced in any inadmissible way by the connection to it of another device, by any feature of the connected device itself or by any remote device that communicates with the pressure gauge.

(3) A hardware component that is critical for metrological characteristics shall be designed so that it can be protected against corruption or misuse. Security measures foreseen shall provide for evidence of an intervention.

(4) Software that is critical for metrological characteristics shall be identified as such and shall be secured.

(5) Software identification shall be easily provided by pressure gauges.

(6) Evidence of an intervention shall be available at least two years after the intervention.

(7) Measurement data, software that is critical for measurement characteristics and metrologically important parameters stored or transmitted shall be adequately protected against corruption and misuse.

Article 17
(Indication of result)

(1) Indication of the result shall be by means of a display.

(2) The indication of any result shall be clear and unambiguous. It shall be accompanied by such marks and inscriptions necessary to inform the user of the significance of the result. Easy reading of the presented result shall be permitted under normal conditions of use. Additional indications may be shown provided they cannot be confused with the metrologically controlled indications.

(3) The result shall be displayed in bar or kPa.

(4) The scale division of pressure gauges with an analogue display shall be equal to 10 kPa or 0.1 bar.

(5) The scale division of pressure gauges with a digital display shall be equal to or less than 10 kPa and 0.1 bar respectively.

(6) For the purpose of procedures set out in Chapters IV, V and VI of these Rules, the scale division of pressure gauges with a digital display shall be equal to or less than 1 kPa and 0.01 bar respectively. This option should not be accessible during normal use of the pressure gauge.

III. INFORMATION ON THE PRESSURE GAUGE AND INFORMATION ACCOMPANYING THE PRESSURE GAUGE

Article 18
(Language)

Information about the pressure gauge shall be provided in Slovenian or in such a way as to ensure that all users of the pressure gauge are adequately informed.

Article 19
(Mandatory indications)

(1) The pressure gauge shall be equipped on the front or on the dial with the following:
- symbol of the displayed quantity: p_e,

- unit of measurement (bar or kPa),
- if applicable, a mark indicating the working position of the gauge.

(2) The pressure gauge shall be equipped on the dial, name plate or on the pressure gauge itself with the following:
- name, registered trade mark or manufacturer's mark,
- type of pressure gauge,
- serial number,
- pressure range,
- temperature range if different from –25 °C/+55 °C,
- official type approval mark of the pressure gauge.

(3) The above markings shall be visible, easily legible and indelible under normal conditions of use and shall not impede the reading of the measurement results.

Article 20
(Information on operation)

The pressure gauge shall be accompanied by information on its operation. The information must include instructions for use, proper operation and any special conditions of use.

IV. CONFORMITY ASSESSMENT

Article 21
(Procedures)

(1) Conformity of the pressure gauge with the requirements of Chapters II and III of these Rules shall be confirmed by type approval followed by the initial verification or declaration of conformity to type.

(2) In the gauge type approval procedure, sub-assemblies of the pressure gauge may be assessed independently and separately.

Article 22
(Type approval)

(1) The examinations and tests to verify conformity with the requirements of these Rules as part of the type approval procedure shall be carried out in the manner and under the conditions laid down in the SIST EN 12645 standard or in another equivalent manner.

(2) The examinations and tests to verify conformity with the requirements of these Rules as part of the type approval procedure for pressure gauge software may also be carried out in the manner and under the conditions laid down in WELMEC Guideline 7.2 of the European Cooperation in Legal Metrology (hereinafter: WELMEC 7.2) for measuring instruments with a risk level:
- B for embedded software in a purpose-built pressure gauge,
- C for pressure gauge software using a universal device.

(3) The reference to WELMEC 7.2 is based on the membership of the Metrology Institute of the Republic of Slovenia in the European Cooperation in Legal Metrology. WELMEC 7.2 in English is available on the website of the European Cooperation in Legal Metrology.

Article 23
(Foreign test reports)

Test reports issued by a conformity assessment body accredited for the relevant field of conformity assessment with regard to Regulation (EC) No 765/2008 of the European Parliament and of the Council of 9 July 2008 setting out the requirements for accreditation and market surveillance relating to the marketing of products and repealing Regulation (EEC) No 339/93 (OJ L 218 of 13.8.2008, p. 30) or the competent authority for type approvals of pressure gauges in an EU Member State shall also be accepted and recognised in the procedures set out in these Rules.

Article 24
(Initial verification)

(1) For tyre pressure gauges, during the initial verification, the accuracy error is determined according to the requirements of Article 5 and the hysteresis error according to the requirements of Article 6 of these Rules.

(2) The determination of the accuracy error and the hysteresis error is carried out at a minimum of five points which are evenly distributed over the measuring range of the pressure gauge.

(3) When determining the hysteresis error, the decreasing pressure values are taken after the gauge has been subjected for 10 minutes to a pressure equal to the upper value of the measuring range.

(4) The extended measurement uncertainty of the test system during measurement may not exceed 1/3 of the MPE specified in Article 5 of these Rules.

Article 25
(Declaration of conformity to the type)

The tests to verify conformity with the requirements of these Rules, which the manufacturer carries out as part of the procedure for declaration of conformity to the type of measuring instrument, shall be carried out in accordance with the preceding Article.

V. REGULAR AND EXTRAORDINARY VERIFICATIONS

Article 26
(Regular and extraordinary verification)

(1) For tyre pressure gauges, during regular and extraordinary verification, the accuracy error is determined according to the requirements of Article 5 of these Rules.

(2) The determination of the accuracy error is carried out at a minimum of five points which are evenly distributed over the measuring range of the pressure gauge.

(3) The extended measurement uncertainty of the test system at a given measured pressure may not exceed 1/3 of the MPE.

Article 27
(Deadline for regular verification)

The period of regular verification for pressure gauges is one year.

VI. MPEs OF PRESSURE GAUGES IN USE

Article 28
(MPEs of pressure gauges in use)

The MPEs of pressure gauges in use shall be equal to 1.25 times the MPEs applicable for verification.

VII. FINAL AND TRANSITIONAL PROVISIONS

Article 29
(Placing on the market and initial verification)

(1) Pressure gauges which, at the date of entry into force of these Rules, have a valid gauge type approval pursuant to the Rules on metrological requirements for tyre pressure gauges (Official Gazette of the Republic of Slovenia Nos 15/02 and 76/03), may be placed on the market and submitted for initial verification pursuant to these Rules until the expiry of the type approval, provided that they meet the requirements of these Rules relating to the initial verification.

Article 30
(Submitting to regular and extraordinary verification)

Pressure gauges that are in use on the date of entry into force of these Rules and have a valid initial verification or regular verification pursuant to the Rules on metrological requirements for tyre pressure gauges (Official Gazette of the Republic of Slovenia, Nos 15/02 and 76/03) or a valid EEC initial verification or regular verification pursuant to the Rules on metrological requirements for tyre pressure gauges which may bear EEC marks and signs (Official Gazette of the Republic of Slovenia, Nos 74/01 and 79/15), may be submitted for regular or extraordinary verification pursuant to these Rules, provided that they meet the requirements of these Rules relating to regular or extraordinary verification.

Article 31
(Ensuring compliance of verification procedures for pressure gauges)

Persons who, on the date of entry into force of these Rules, have a decision of the Metrology Institute of the Republic of Slovenia on appointment to carry out initial, regular and extraordinary verifications of pressure gauges, shall ensure compliance with these Rules within three months and shall accredit them within 18 months of the entry into force of these Rules as well as inform the Metrology Institute of the Republic of Slovenia thereof.

Article 32
(Expiry of type approvals)

(1) All type approvals or decisions on mandatory prior type approval issued before the entry into force of these Rules shall expire as specified in the measuring instrument type approval certificate or no later than 10 years after the entry into force of these Rules.

Article 33
(Validity of the Rules)

(1) These Rules enter into force on the fifteenth day after their publication in the Official Gazette of the Republic of Slovenia.

(2) The Rules on metrological requirements for tyre pressure gauges (Official Gazette of the Republic of Slovenia, Nos 15/02 and 76/03) shall cease to apply on the date of entry into force of these Rules.

(3) The Rules on metrological requirements for tyre pressure gauges which may bear EEC marks and signs (Official Gazette of the Republic of Slovenia, Nos 74/01 and 79/15) shall cease to apply on 2 December 2025.

No
In Ljubljana, dated
EVA:

Matjaž Han
Minister of the Economy, Tourism and Sport