SCHEDULE 1 Regulations2(1), 4(1), 28 and 29

PART 1

ESSENTIAL REQUIREMENTS

1. The essential requirements are the relevant requirements relating to relevant instruments contained in Annex 1 and Annex M1-002 set out in this Part of this Schedule.

Commencement Information
I1 Sch. 1 para. 1 in force at 30.10.2006, see **reg. 1(2)**

Definitions

2. In this Schedule—

"base conditions" means the specified conditions to which the measured quantity of gas is converted;

"climatic environments" means the conditions in which relevant instruments may be used;

"critical change value" means the value at which the change in the measurement result is considered undesirable;

"disturbance" means an influence quantity having a value within the limits specified in the appropriate requirement but outside the specified rated operating conditions of the relevant instrument. An influence quantity is a disturbance if for that influence quantity the rated operating conditions are not specified;

"influence quantity" means a quantity that is not the measurand but that affects the result of measurement;

"MPE" means the maximum permissible error value as set out in paragraph 13;

"measurand" means the particular quantity subject to measurement;

"minimum flowrate" ("Qmin") means the lowest flowrate at which the relevant instrument provides indications that satisfy the requirements regarding MPE;

"maximum flowrate" ("Qmax") means the highest flowrate at which the relevant instrument provides indications that satisfy the requirements regarding MPE;

"overload flowrate" means the highest flowrate at which the relevant instrument operates for a short period of time without deteriorating;

"rated operating conditions" means the values for the measurand and influence quantities making up the normal working conditions of a relevant instrument; and

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

Commencement Information
I2 Sch. 1 para. 2 in force at 30.10.2006, see **reg. 1(2)**

Allowable errors

3.—(1) The manufacturer shall specify the climatic, mechanical and electromagnetic environments in which the relevant instrument is intended to be used, power supply and other influence quantities likely to affect its accuracy, taking account of the requirements in this Schedule.

(a) Climatic environments—

The manufacturer shall specify the upper temperature limit and the lower temperature limit from any of the values in Table 1 and indicate whether the relevant instrument is designed for condensing or non-condensing humidity as well as the intended location for the instrument, i.e, open or closed.

Table 1

	Temperature Limits			
Upper Temperature Limit	30 °C	40 °C	55 °C	70 °C
Lower Temperature Limit	5 °C	-10 °C	-25 °C	-40 °C

(b) Mechanical environments—

(i) Mechanical environments are classified into classes M1 to M3 as described below—

M1: This class applies to relevant instruments used in locations with vibration and shocks of low significance, for example, instruments fastened to light supporting structures subject to negligible vibrations and shocks transmitted from, for example, local blasting or pile-driving activities or slamming doors.

M2: This class applies to relevant instruments used in locations with significant or high levels of vibration and shocks, for example, transmitted from machines and passing vehicles in the vicinity, or adjacent to heavy machines or conveyor belts.

M3: This class applies to relevant instruments used in locations where the level of vibration and shock is high and very high, for example, instruments mounted directly on machines or conveyor belts.

(ii) The following influence quantities shall be considered in relation with mechanical environments—

(aa) vibration;

(bb) mechanical shock.

(c) Electromagnetic environments—

(i) Electromagnetic environments, in relation to relevant instruments that are constructed using electronic components, are classified into classes E1 and E2 as described below.

E1: This class applies to relevant instruments used in locations with electromagnetic disturbances corresponding to those likely to be found in residential, commercial and light industrial buildings.

E2: This class applies to relevant instruments used in locations with electromagnetic disturbances corresponding to those likely to be found in other industrial buildings.

(ii) The following influence quantities shall be considered in relation with electromagnetic environments—

(aa) voltage interruptions;

(bb) short voltage reductions;

(cc) voltage transients on supply lines and/or signal lines;

(dd) electrostatic discharges;

(ee) radio frequency electromagnetic fields;

(ff) conducted radio frequency electromagnetic fields on supply lines and/or signal lines;

(gg) surges on supply lines and/or signal lines.

(2) Other influence quantities to be considered, where appropriate, are—

(a) voltage variation;

(b) mains frequency variation;

(c) power frequency magnetic fields;

(d) any other quantity likely to influence in a significant way the accuracy of the relevant instrument.

(3) When carrying out the tests as envisaged in these Regulations, the following paragraphs apply to relevant instruments in relation to ambient humidity—

(a) according to the climatic operating environment in which the relevant instrument is intended to be used either the damp heat-steady state (non-condensing) or damp heat cyclic (condensing) test may be appropriate;

(b) the damp heat cyclic test is appropriate where condensation is important. In conditions where non-condensing humidity is a factor the damp-heat steady state is appropriate.

Commencement Information

I3 Sch. 1 para. 3 in force at 30.10.2006, see **reg. 1(2)**

Reproducibility

4. The application of the same measurand in a different location or by a different user, all other conditions being the same, shall result in the close agreement of successive measurements. The difference between the measurement results shall be small when compared with the MPE.

Commencement Information

I4 Sch. 1 para. 4 in force at 30.10.2006, see **reg. 1(2)**

Repeatability

5. The application of the same measurand under the same conditions of measurement shall result in the close agreement of successive measurements. The difference between the measurement results shall be small when compared with the MPE.

Commencement Information

I5 Sch. 1 para. 5 in force at 30.10.2006, see **reg. 1(2)**

Discrimination and sensitivity

6. A relevant instrument shall be sufficiently sensitive and the discrimination threshold shall be sufficiently low for the intended measurement task.

Commencement Information
I6 Sch. 1 para. 6 in force at 30.10.2006, see **reg. 1(2)**

Reliability

7. A relevant instrument 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.

Commencement Information
I7 Sch. 1 para. 7 in force at 30.10.2006, see **reg. 1(2)**

Protection against corruption

8.—(1) The metrological characteristics of a relevant instrument 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 instrument.

(2) A hardware component that is critical for metrological characteristics shall be designed so that it can be secured. Security measures foreseen shall provide for evidence of an intervention.

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

(4) Software identification shall be easily provided by the relevant instrument.

(5) Evidence of a software intervention shall be available for a reasonable period of time.

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

(7) The display of the total quantity supplied or the displays from which the total quantity supplied can be derived, whole or partial reference to which is the basis for payment, shall not be able to be reset during use.

Commencement Information
I8 Sch. 1 para. 8 in force at 30.10.2006, see **reg. 1(2)**

Information to be borne by and to accompany the relevant instrument

9.—(1) A relevant instrument shall bear the following inscriptions—

(a) manufacturer’s mark or name;

(b) information in respect of its accuracy;

(c) information in respect of the conditions of use;

(d) measuring capacity;

(e) measuring range;

(f) identity marking;

(g) number of the EC-type examination certificate or the EC design examination certificate; and

(h) information whether or not additional devices providing metrological results comply with the provisions of these Regulations.

(2) The relevant instrument shall be accompanied by information on its operation, unless the simplicity of the relevant instrument makes this unnecessary. Information shall be easily understandable and shall include where relevant—

(a) rated operating conditions;

(b) mechanical and electromagnetic environment classes;

(c) the upper and lower temperature limit, whether condensation is possible or not, open or closed location;

(d) instructions for installation, maintenance, repairs, permissible adjustments;

(e) instructions for correct operation and any special conditions of use;

(f) conditions for compatibility with interfaces or sub-assemblies.

(3) Groups of identical relevant instruments used in the same location or used for utility measurement do not necessarily require individual instruction manuals.

(4) The units of measurement used and their symbols shall be in accordance with the provisions of Community legislation on units of measurement and their symbols.

(5) All marks and inscriptions required under any requirement shall be clear, non-erasable, unambiguous and non-transferable.

Commencement Information

I9 Sch. 1 para. 9 in force at 30.10.2006, see **reg. 1(2)**

Indication of result

10.—(1) Indication of the result shall be by means of a display or hard copy.

(2) The indication of any result shall be clear and unambiguous and 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) In the case of hard copy the print or record shall also be easily legible and non-erasable.

(4) A relevant instrument shall be fitted with a metrologically controlled display accessible without tools to the consumer. The reading of this display is the measurement result that serves as the basis for the price to pay.

Commencement Information

I10 Sch. 1 para. 10 in force at 30.10.2006, see **reg. 1(2)**

Conformity evaluation

11. A relevant instrument shall be designed so as to allow ready evaluation of its conformity with the appropriate requirements of these Regulations.

Commencement Information

I11 Sch. 1 para. 11 in force at 30.10.2006, see **reg. 1(2)**

Rated operating conditions

12. The manufacturer shall specify the rated operating conditions of the relevant instrument, taking the following into account—

(a) the flowrate range of the relevant instrument shall fulfil at least the following conditions—

Table 2

Class	*Qmax/Qmin*	*Qmax/Qt*	*Qt/Qmax*
1.5	≥ 150	≥ 10	1.2
1.0	≥ 20	≥ 5	1.2

(b) the temperature range of the gas, with a minimum range of 40 °C;

(c) fuel/gas related conditions—

the relevant instrument shall be designed for the range of gases and supply pressures of the country of destination. In particular, the manufacturer shall indicate—

(i) the gas family or group;

(ii) the maximum operating pressure;

(d) a minimum temperature range of 50 °C for the climatic environment;

(e) the nominal value of the AC voltage supply and/or the limits of the DC supply.

Commencement Information

I12 Sch. 1 para. 12 in force at 30.10.2006, see **reg. 1(2)**

Maximum permissible error (MPE)

13.—(1) Under rated operating conditions and in the absence of a disturbance, the error of measurement shall not exceed the MPE value as set out in Table 3.

(2) MPE as set out below is expressed as a bilateral value of the deviation from the true measurement value.

(3) Relevant instrument indicating the volume at metering conditions or mass—

Table 3

Class	*1.5*	*1.0*
Qmin ≤ Q < Qt	3 %	2 %
Qt ≤ Q ≤ Qmax	1.5 %	1 %

When the errors between Qt and Qmax all have the same sign, they shall all not exceed 1 % for Class 1.5 and 0.5 % for Class 1.0.

(4) For a relevant instrument with temperature conversion, which only indicates the converted volume, the MPE of the relevant instrument is increased by 0.5 % in a range of 30 °C extending symmetrically around the temperature specified by the manufacturer that lies between 15 °C and 25 °C. Outside this range, an additional increase of 0.5 % is permitted in each interval of 10 °C.

Commencement Information
I13 Sch. 1 para. 13 in force at 30.10.2006, see **reg. 1(2)**

Permissible effect of disturbances

14.—(1) Under rated operating conditions and in the presence of a disturbance, the performance requirements shall be as set out below.

(2) Where the relevant instrument, when constructed using electronic components, is intended to be used in a specified permanent continuous electromagnetic field the permitted performance during the radiated electromagnetic field-amplitude modulated test shall be within MPE.

(3) Electromagnetic immunity—

(a) The effect of an electromagnetic disturbance on a relevant instrument shall be such that—

(i) the change in the measurement result is no greater than the critical change value as defined in paragraph 14(3)(c); or

(ii) the indication of the measurement result is such that it cannot be interpreted as a valid result, such as a momentary variation that cannot be interpreted, memorised or transmitted as a measuring result.

(b) After undergoing a disturbance, the relevant instrument shall—

(i) recover to operate within MPE;

(ii) have all measurement functions safeguarded; and

(iii) allow recovery of all measurement data present just before the disturbance.

(c) The critical change value is the smaller of the two following values—

(i) the quantity corresponding to half of the magnitude of the MPE in the upper zone on the measured volume;

(ii) the quantity corresponding to the MPE on the quantity corresponding to one minute at maximum flowrate.

(4) Effect of upstream-downstream flow disturbances—

Under installation conditions specified by the manufacturer, the effect of the flow disturbances shall not exceed one third of the MPE.

Commencement Information
I14 Sch. 1 para. 14 in force at 30.10.2006, see **reg. 1(2)**

Durability

15.—(1) A relevant instrument shall be designed to maintain an adequate stability of its metrological characteristics over a period of time estimated by the manufacturer, provided that it is properly installed, maintained and used according to the manufacturer's instruction when in the environmental conditions for which it is intended.

(2) After an appropriate test, taking into account the period of time estimated by the manufacturer, has been performed, the following criteria shall be satisfied—

(a) Class 1.5 relevant instruments—

(i) The variation of the measurement result after the durability test when compared with the initial measurement result for the flow rates in the range Qt to Qmax shall not exceed the measurement result by more than 2 %;

(ii) The error of indication after the durability test shall not exceed twice the MPE in Table 3 in paragraph 13;

(b) Class 1.0 relevant instruments—

(i) The variation of the measurement result after the durability test when compared with the initial measurement result shall not exceed one-third of the MPE in Table 3 in paragraph 13;

(ii) The error of indication after the durability test shall not exceed the MPE in Table 3 in paragraph 13.

Commencement Information

I15 Sch. 1 para. 15 in force at 30.10.2006, see **reg. 1(2)**

Suitability

16.—(1) A relevant instrument shall have no feature likely to facilitate fraudulent use, whereas possibilities for unintentional misuse shall be minimal.

(2) A relevant instrument shall be suitable for its 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.

(3) The errors of a relevant instrument at flows outside the controlled range shall not be unduly biased.

(4) Where a relevant instrument is designed for the measurement of values of the measurand that are constant over time, the instrument shall be insensitive to small fluctuations of the value of the measurand, or shall take appropriate action.

(5) A relevant instrument shall be robust and its materials of construction shall be suitable for the conditions in which it is intended to be used.

(6) When a relevant instrument 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.

(7) A relevant instrument powered from the mains (AC or DC) shall be provided with an emergency power supply device or other means to ensure, during a failure of the principal power source, that all measuring functions are safeguarded.

(8) A dedicated power source shall have a lifetime of at least five years. After 90 % of its lifetime an appropriate warning shall be shown.

(9) An indicating device shall have a sufficient number of digits to ensure that the quantity passed during 8000 hours at Qmax does not return the digits to their initial values.

(10) The relevant instrument shall be able to be installed to operate in any position declared by the manufacturer in its installation instruction.

(11) The relevant instrument shall have a test element, which shall enable tests to be carried out in a reasonable time.

(12) The relevant instrument shall respect the MPE in any flow direction or only in one flow direction clearly marked.

Commencement Information
I16 Sch. 1 para. 16 in force at 30.10.2006, see **reg. 1(2)**

Units

17. Metered quantity shall be displayed in cubic metre, or in kilogram.

Commencement Information
I17 Sch. 1 para. 17 in force at 30.10.2006, see **reg. 1(2)**

PART 2

PUTTING INTO USE REQUIREMENTS

18.—(1) Measurement of residential use shall be performed by means of any Class 1.5 relevant instrument, or by Class 1.0 relevant instruments which have a Qmax/Qmin ratio equal or greater than 150.

(2) Measurement of commercial and/or light industrial use shall be performed by any Class 1.0 or Class 1.5 relevant instrument.

(3) The person responsible for installing a relevant instrument shall have regard to the requirements under paragraph 12(b) and (c) and shall ensure that the relevant instrument is appropriate for the accurate measurement of consumption that is foreseen or foreseeable.

Commencement Information
I18 Sch. 1 para. 18 in force at 30.10.2006, see **reg. 1(2)**

Changes to legislation:
There are outstanding changes not yet made by the legislation.gov.uk editorial team to The Measuring Instruments (Gas Meters) Regulations 2006. Any changes that have already been made by the team appear in the content and are referenced with annotations.
View outstanding changes

Changes and effects yet to be applied to :

- Sch. 1 para. 2 word inserted by S.I. 2010/2881 reg. 7(a)(ii)
- Sch. 1 para. 12 heading word substituted by S.I. 2010/2881 reg. 7(b)
- Sch. 1 para. 2 words inserted by S.I. 2010/2881 reg. 7(a)(i)
- Sch. 1 para. 13(3) words omitted by S.I. 2010/2881 reg. 7(c)(i)
- Regulations revoked by S.I. 2016/1153 Sch. 3 para. 1 table

Changes and effects yet to be applied to the whole Instrument associated Parts and Chapters:
Whole provisions yet to be inserted into this Instrument (including any effects on those provisions):

- Sch. 1 para. 13(5) inserted by S.I. 2010/2881 reg. 7(c)(ii)