

## SECTION G — PHYSICS

## G01 MEASURING; TESTING

## G01K MEASURING TEMPERATURE; MEASURING QUANTITY OF HEAT; THERMALLY-SENSITIVE ELEMENTS NOT OTHERWISE PROVIDED FOR (radiation pyrometry G01J 5/00)

Note(s)

1. In this subclass, the following term is used with the meaning indicated:
  - "thermometer" includes thermally-sensitive elements not provided for in other subclasses.
2. Attention is drawn to the Notes following the title of class G01.

Subclass index

## MEASURING TEMPERATURE

characterised by principle of operation.....	5/00, 7/00, 9/00, 11/00
Thermometers giving an indication other than the instantaneous value.....	3/00
Details of thermometers not specially adapted for particular types of thermometers.....	1/00
Adaptations of thermometers for specific purposes.....	13/00
Testing and calibrating of thermometers.....	15/00

## MEASURING QUANTITY OF HEAT; TESTING AND CALIBRATING OF CALORIMETERS.....17/00, 19/00

<b>1/00</b>	<b>Details of thermometers not specially adapted for particular types of thermometer</b> (circuits for reducing thermal inertia G01K 7/42) [6]	3/10	• • in respect of time, e.g. reacting only to a quick change of temperature
1/02	• Special applications of indicating or recording means, e.g. for remote indications	3/12	• • • based upon expansion or contraction of materials
1/04	• • Scales	3/14	• • in respect of space
1/06	• • • Arrangements for facilitating reading, e.g. illumination, magnifying glass	<b>5/00</b>	<b>Measuring temperature based on the expansion or contraction of a material</b> (G01K 9/00 takes precedence; giving other than momentary value of temperature G01K 3/00)
1/08	• Protective devices, e.g. casings	5/02	• the material being a liquid (G01K 5/32 takes precedence)
1/10	• • for preventing chemical attack	5/04	• • Details
1/12	• • for preventing damage due to heat overloading	5/06	• • • Arrangements for driving back the liquid column
1/14	• Supports; Fastening devices; Mounting thermometers in particular locations	5/08	• • • Capillary tubes
1/16	• Special arrangements for conducting heat from the object to the sensitive element	5/10	• • • Containers for the liquid
1/18	• • for reducing thermal inertia	5/12	• • • Selection of liquid compositions
1/20	• Compensating for effects of temperature changes other than those to be measured, e.g. changes in ambient temperature	5/14	• • the liquid displacing a further liquid column or a solid body (for maximum or minimum indication G01K 5/20)
1/22	• • by means of fluid contained in a hollow body having parts which are deformable or displaceable under the pressure developed by the fluid	5/16	• • with electric contacts
1/24	• • by means of compounded strips or plates, e.g. bimetallic strips	5/18	• • with electric conversion means for final indication
1/26	• Compensating for effects of pressure changes	5/20	• • with means for indicating a maximum or a minimum or both (G01K 5/22 takes precedence)
<b>3/00</b>	<b>Thermometers giving results other than momentary value of temperature</b> (G01K 7/42 takes precedence) [6]	5/22	• • with provision for expansion indicating over not more than a few degrees, e.g. clinical thermometer
3/02	• giving mean values; giving integrated values	5/24	• • with provision for measuring the difference between two temperatures
3/04	• • in respect of time	5/26	• • with provision for adjusting zero point of scale, e.g. Beckmann thermometer
3/06	• • in respect of space	5/28	• the material being a gas (G01K 5/32 takes precedence)
3/08	• giving differences of values; giving differentiated values	5/30	• • the gas displacing a liquid column

- 5/32 • the material being a fluid contained in a hollow body having parts which are deformable or displaceable under the pressure developed by the material (under pressure developed by evaporation G01K 11/04)
- 5/34 • • the body being a capsule (G01K 5/36, G01K 5/42 take precedence)
- 5/36 • • the body being a tubular spring, e.g. Bourdon tube
- 5/38 • • • of spiral formation
- 5/40 • • • of helical formation
- 5/42 • • the body being a bellows
- 5/44 • • the body being a cylinder and piston
- 5/46 • • with electric conversion means for final indication
- 5/48 • the material being a solid
- 5/50 • • arranged for free expansion or contraction
- 5/52 • • • with electrical conversion means for final indication
- 5/54 • • consisting of pivotally-connected elements
- 5/56 • • constrained so that expansion or contraction causes a deformation of the solid
- 5/58 • • • the solid body being constrained at more than one point, e.g. rod, plate, diaphragm (G01K 5/62 takes precedence)
- 5/60 • • • • the body being a flexible wire or ribbon
- 5/62 • • • the solid body being formed of compounded strips or plates, e.g. bimetallic strip
- 5/64 • • • • Details of the compound system
- 5/66 • • • • • Selection of composition of the components of the system
- 5/68 • • • • • Shape of the system
- 5/70 • • • • specially adapted for indicating or recording
- 5/72 • • • • • with electric transmission means for final indication

**7/00 Measuring temperature based on the use of electric or magnetic elements directly sensitive to heat** (giving results other than momentary value of temperature G01K 3/00)

- 7/01 • using semiconducting elements having PN junctions (G01K 7/02, G01K 7/16, G01K 7/30 take precedence) [6]
- 7/02 • using thermo-electric elements, e.g. thermo-couples
- 7/04 • • the object to be measured not forming one of the thermo-electric materials
- 7/06 • • • the thermo-electric materials being arranged one within the other with the junction at one end exposed to the object, e.g. sheathed type
- 7/08 • • the object to be measured forming one of the thermo-electric materials, e.g. pointed type
- 7/10 • • Arrangements for compensating for auxiliary variables, e.g. length of lead
- 7/12 • • • Arrangements with respect to the cold junction, e.g. preventing influence of temperature of surrounding air
- 7/13 • • • • Circuits for cold-junction compensation [6]
- 7/14 • • Arrangements for modifying the output characteristic, e.g. linearising
- 7/16 • using resistive elements
- 7/18 • • the element being a linear resistance, e.g. platinum resistance thermometer (G01K 7/26 takes precedence)
- 7/20 • • • in a specially-adapted circuit, e.g. bridge circuit
- 7/21 • • • • for modifying the output characteristic, e.g. linearising [6]
- 7/22 • • the element being a non-linear resistance, e.g. thermistor (G01K 7/26 takes precedence)
- 7/24 • • • in a specially-adapted circuit, e.g. bridge circuit

- 7/25 • • • • for modifying the output characteristic, e.g. linearising [6]
- 7/26 • • the element being an electrolyte
- 7/28 • • • in a specially-adapted circuit, e.g. bridge circuit
- 7/30 • using thermal noise of resistances or conductors
- 7/32 • using change of resonant frequency of a crystal
- 7/34 • using capacitative elements
- 7/36 • using magnetic elements, e.g. magnets, coils
- 7/38 • • the variations of temperature influencing the magnetic permeability
- 7/40 • using ionisation of gases
- 7/42 • Circuits for reducing thermal inertia; Circuits for predicting the stationary value of temperature [6]

**9/00 Measuring temperature based on movements caused by redistribution of weight, e.g. tilting thermometer** (not giving momentary value of temperature G01K 3/00)

**11/00 Measuring temperature based on physical or chemical changes not covered by group G01K 3/00, G01K 5/00, G01K 7/00, or G01K 9/00**

- 11/02 • using evaporation or sublimation, e.g. by observing boiling
- 11/04 • • from material contained in a hollow body having parts which are deformable or displaceable under the pressure developed by the vapour
- 11/06 • using melting, freezing, or softening
- 11/08 • • of disposable test bodies, e.g. cone
- 11/10 • using sintering
- 11/12 • using change of colour or translucency (G01K 11/32 takes precedence) [6]
- 11/14 • • of inorganic materials
- 11/16 • • of organic materials
- 11/18 • • of materials which change translucency
- 11/20 • using thermoluminescent materials (G01K 11/32 takes precedence) [6]
- 11/22 • using measurement of acoustic effects
- 11/24 • • of the velocity of propagation of sound
- 11/26 • • of resonant frequencies
- 11/28 • using measurements of density
- 11/30 • using measurement of the effect of a material on X-radiation, gamma radiation or particle radiation [5]
- 11/32 • using changes in transmission, scattering or fluorescence in optical fibres [6]

**13/00 Adaptations of thermometers for specific purposes**

- 13/02 • for measuring temperature of moving fluids or granular materials capable of flow
- 13/04 • for measuring temperature of moving solid bodies
- 13/06 • • in linear movement
- 13/08 • • in rotary movement
- 13/10 • for measuring temperature within piled or stacked materials (by special arrangements for conducting heat from the object to the sensitive element G01K 1/16)
- 13/12 • combined with sampling devices for measuring temperatures of samples of material

**15/00 Testing or calibrating of thermometers**

**17/00 Measuring quantity of heat**

- 17/02 • Calorimeters using transport of an indicating substance, e.g. evaporation calorimeters
- 17/04 • Calorimeters using compensation methods

17/06	• Measuring quantity of heat conveyed by flowing media, e.g. in heating systems (G01K 17/02, G01K 17/04 take precedence)	17/14	• • • • • using mechanical means for both measurements
17/08	• • based upon measurement of temperature difference	17/16	• • • • • using electrical means for both measurements
17/10	• • • between an inlet and an outlet point, combined with measurement of rate of flow of the medium	17/18	• • • • • using electrical means for one measurement and mechanical means for the other
17/12	• • • • Indicating product of flow and temperature difference directly	17/20	• • • across a radiating surface, combined with ascertainment of the heat-transmission coefficient
		<b>19/00</b>	<b>Testing or calibrating calorimeters</b>