

CPC COOPERATIVE PATENT CLASSIFICATION

G PHYSICS (NOTES omitted)

INSTRUMENTS

G01 MEASURING (counting [G06M](#)); TESTING (NOTES omitted)

G01K MEASURING TEMPERATURE; MEASURING QUANTITY OF HEAT; THERMALLY-SENSITIVE ELEMENTS NOT OTHERWISE PROVIDED FOR (sensing temperature changes for compensating measurements of other variables for compensating readings of instruments for variation in temperature, see [G01D](#) or relevant subclasses for variable measured; radiation pyrometry [G01J](#); investigating or analysing materials by use of thermal means [G01N 25/00](#); compound sensitive elements, e.g. bimetallic, [G12B 1/02](#))

NOTES

- In this subclass, the following term is used with the meaning indicated :
 - "thermometer" includes thermally-sensitive elements not provided for in other subclasses.
- Attention is drawn to the Notes following the title of class [G01](#).
- Attention is drawn to the Notes following the titles of class [B81](#) and subclass [B81B](#) relating to "microstructural devices" and "microstructural systems".

WARNING

In this subclass non-limiting references (in the sense of paragraph 39 of the Guide to the IPC) may still be displayed in the scheme.

1/00	Details of thermometers not specially adapted for particular types of thermometer (circuits for reducing thermal inertia G01K 7/42)	1/146	. . {arrangements for moving thermometers to or from a measuring position}
1/02	. Special applications of indicating or recording means, e.g. for remote indications	1/16	. Special arrangements for conducting heat from the object to the sensitive element
1/022	. . {recording means}	1/165	. . {for application in zero heat flux sensors}
1/024	. . {for remote indication (remote indication per se G08C)}	1/18	. . for reducing thermal inertia
1/026	. . {arrangements for monitoring a plurality of temperatures, e.g. by multiplexing}	1/20	. Compensating for effects of temperature changes other than those to be measured, e.g. changes in ambient temperature
1/028	. . {arrangements for numerical indication}	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
1/04	. . Scales	1/24	. . by means of compounded strips or plates, e.g. by bimetallic strips
1/045	. . . {temperature indication combined with the indication of another variable (indicating of human comfort G01W 1/17)}	1/26	. Compensating for effects of pressure changes
1/06	. . . Arrangements for facilitating reading, e.g. illumination, magnifying glass	3/00	Thermometers giving results other than momentary value of temperature (G01K 7/42 takes precedence)
1/065	. . . . {of liquid column thermometers}	3/005	. {Circuits arrangements for indicating a predetermined temperature (fire detection G08B 17/00)}
1/08	. Protective devices, e.g. casings	3/02	. giving means values; giving integrated values
1/083	. . {for clinical thermometers, e.g. contamination preventing sleeves}	3/04	. . in respect of time
1/086	. . . {for tympanic thermometers}	3/06	. . in respect of space
1/10	. . for preventing chemical attack	3/08	. giving differences of values (using thermoelectric elements G01K 7/02); giving differentiated values
1/105	. . . {for siderurgical use}	3/10	. . in respect of time, e.g. reacting only to a quick change of temperature
1/12	. . for preventing damage due to heat overloading		
1/125	. . . {for siderurgical use}		
1/14	. Supports; Fastening devices; Mounting thermometers in particular locations		
1/143	. . {for measuring surface temperatures, e.g. of pipe walls}		

- 3/12 . . . based upon expansion or contraction of materials
- 3/14 . . . in respect of space
- 2003/145 . . . {Hotspot localization}
- 5/00 Measuring temperature based on the expansion or contraction of a material (G01K 9/00 takes precedence; giving other than momentary value of temperature G01K 3/00; of vapour arising from a liquid G01K 11/02; thermally-actuated switches H01H)**
- 5/02 . . the material being a liquid (contained in a hollow body having parts which are deformable or displaceable under the pressure developed by the material G01K 5/32)
- 5/025 . . {Manufacturing of this particular type of thermometer}
- 5/04 . . Details
- 5/06 . . . Arrangements for driving back the liquid column
- 5/08 . . . Capillary tubes
- 5/10 . . . Containers for the liquid
- 5/12 . . . Selection of liquid compositions
- 5/14 . . the liquid displacing a further liquid column or a solid body (for maximum or minimum indication G01K 5/20)
- 5/16 . . with electric contacts
- 5/18 . . with electric conversion means for final indication
- 5/20 . . with means for indicating a maximum or a minimum or both (G01K 5/22 takes precedence)
- 5/22 . . with provision for expansion indicating over not more than a few degrees, e.g. clinical thermometer
- 5/225 . . . {with means for indicating a maximum, e.g. a constriction in the capillary tube}
- 5/24 . . with provision for measuring the difference between two temperatures
- 5/26 . . with provision for adjusting zero point of scale, e.g. Beckmann thermometer
- 5/28 . . the material being a gas (contained in a hollow body having parts which are deformable or displaceable under the pressure developed by the material G01K 5/32)
- 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 pressure developed by evaporation G01K 11/04; pressure measuring devices in general G01L)
- 5/323 . . {Selection of fluid compositions}
- 5/326 . . {using a fluid container connected to the deformable body by means of a capillary tube}
- 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
- 5/465 . . . {using electrical contact making or breaking devices}
- 5/48 . . the material being a solid
- 5/483 . . {using materials with a configuration memory, e.g. Ni-Ti alloys}
- 5/486 . . {using microstructures, e.g. made of silicon (G01K 7/015, G01K 7/028, G01K 7/226, G01K 17/006 take precedence)}
- 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 compounds 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; measuring electric or magnetic variables G01R); {Power supply, e.g. by thermoelectric elements}**
- 7/003 . . {using pyroelectric elements (radiation pyrometers G01J 5/00)}
- 7/006 . . {using superconductive elements}
- 7/01 . . using semiconducting elements having PN junctions (G01K 7/02, G01K 7/16, G01K 7/30 take precedence)
- 7/015 . . {using microstructures, e.g. made of silicon}
- 7/02 . . using thermoelectric elements, e.g. thermocouples ({cooling arrangements in electronic devices using the Peltier effect H01L 23/38; thermo-electric or thermo-magnetic devices per se H01L 35/00, H01L 37/00})
- 7/021 . . {Particular circuit arrangements (G01K 7/026, G01K 7/12, G01K 7/14 take precedence)}
- 7/023 . . {provided with specially adapted connectors (connectors per se H01R)}
- 7/025 . . {expendable thermocouples}
- 7/026 . . {Arrangements for signalling rupture or disconnection of the thermocouple}
- 7/028 . . {using microstructures, e.g. made of silicon}
- 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	11/006	. {using measurement of the effect of a material on microwaves or longer electromagnetic waves, e.g. measuring temperature via microwaves emitted by the object (G01K 17/003 , G01J 5/00 take precedence; measuring the effect of a material on X-, gamma- or particle radiation G01K 11/30)}
7/14	. . Arrangements for modifying the output characteristic, e.g. linearising		
7/16	. using resistive elements (resistive elements per se H01C , H01L)		
2007/163	. . {provided with specially adapted connectors}		
2007/166	. . {Electrical time domain reflectometry}	11/02	. using evaporation or sublimation, e.g. by observing boiling
7/18	. . the element being a linear resistance, e.g. platinum resistance thermometer (G01K 7/26 takes precedence)	11/04	. . from material contained in a hollow body having parts which are deformable or displaceable under the pressure developed by the vapour
7/183	. . . {characterised by the use of the resistive element}	11/06	. using melting, freezing, or softening
7/186	. . . {using microstructures}	11/08	. . of disposable test bodies, e.g. cone
7/20	. . . in a specially-adapted circuit, e.g. bridge circuit	11/10	. using sintering
7/203	. . . . {in an oscillator circuit}	11/12	. using change of colour or translucency (G01K 11/32 takes precedence; heat-sensitive sheets for use in thermography B41M 5/00 ; {tenebrescent compositions C09K 9/00 })
7/206	. . . . {in a potentiometer circuit}		
7/21	. . . . for modifying the output characteristic, e.g. linearising	11/125	. . {using change in reflectance}
7/22	. . the element being a non-linear resistance, e.g. thermistor (G01K 7/26 takes precedence)	11/14	. . of inorganic materials
7/223	. . . {characterised by the shape of the resistive element}	11/16	. . of organic materials
7/226	. . . {using microstructures, e.g. silicon spreading resistance}	11/165	. . . {liquid crystals (liquid crystal compositions C09K 19/00 ; electro-optic liquid crystals G02F 1/13)}
7/24	. . . in a specially-adapted circuit, e.g. bridge circuit	11/18	. . of materials which change translucency
7/245	. . . . {in an oscillator circuit}	11/20	. using thermoluminescent materials (G01K 11/32 takes precedence)
7/25	. . . . for modifying the output characteristic, e.g. linearising	11/22	. using measurement of acoustic effects
7/26	. . the element being an electrolyte	11/24	. . of the velocity of propagation of sound
7/28	. . . in a specially-adapted circuit, e.g. bridge circuit	11/26	. . of resonant frequencies
7/30	. using thermal noise of resistances or conductors	11/265	. . . {using surface acoustic wave [SAW]}
7/32	. using change of resonant frequency of a crystal	11/28	. using measurements of density {(measuring density in general G01N 9/00)}
7/34	. using capacitative elements (capacitors per se H01G)	11/30	. using measurement of the effect of a material on X-radiation, gamma radiation or particle radiation
7/343	. . {the dielectric constant of which is temperature dependant}	11/32	. using changes in transmission, scattering or fluorescence in optical fibres {(in general G01D 5/268)}
7/346	. . {for measuring temperature based on the time delay of a signal through a series of logical ports}	11/3206	. . {at discrete locations in the fibre, e.g. by means of Bragg gratings}
7/36	. using magnetic elements, e.g. magnets, coils (magnetic elements per se H01F)	11/3213	. . . {using changes in fluorescence, e.g. at the distal end of the fibre}
7/38	. . the variations of temperature influencing the magnetic permeability	2011/322	. . {using Brillouin scattering}
7/40	. using ionisation of gases	2011/324	. . {using Raman scattering}
7/42	. Circuits for reducing thermal inertia; Circuits for predicting the stationary value of temperature	13/00	Adaptations of thermometers for specific purposes
2007/422	. . {Dummy objects used for estimating temperature of real objects}	13/002	. {for measuring body temperature (G01K 5/22 takes precedence; for prediction aspects G01K 7/42 ; diagnostic temperature sensing A61M 39/0247)}
7/425	. . {Thermal management of integrated systems}	13/004	. . {Infrared clinical thermometers, e.g. tympanic}
7/427	. . {Temperature calculation based on spatial modeling, e.g. spatial inter- or extrapolation}	13/006	. {for cryogenic purposes}
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)	13/008	. . {using microstructures, e.g. made of silicon}
		13/02	. for measuring temperature of moving fluids or granular materials capable of flow
		13/022	. . {Suction thermometers}
11/00	Measuring temperature based upon physical or chemical changes not covered by groups G01K 3/00, G01K 5/00, G01K 7/00 or G01K 9/00	2013/024	. . {Moving gas}
		2013/026	. . {Moving liquid}
		13/028	. . {for use in total air temperature [TAT] probes}
11/003	. {using absorption or generation of gas, e.g. hydrogen}	13/04	. for measuring temperature of moving solid bodies
		13/06	. . in linear movement
		13/08	. . in rotary movement

G01K

- 13/10 . for measuring temperature within piled or stacked materials (by special arrangements for conducting heat from the object to the sensitive heat element [G01K 1/16](#))
- 13/12 . combined with sampling devices for measuring temperatures of samples of materials
- 13/125 . . {for siderurgical purposes}
- 15/00 Testing or calibrating of thermometers**
- 15/002 . {Calibrated temperature sources, temperature standards therefor (arrangements with respect to the cold junction of thermo-electric elements [G01K 7/12](#))}
- 15/005 . {Calibration}
- 15/007 . {Testing}
- 17/00 Measuring quantity of heat (measuring temperature by calorimetry [G01K 3/00](#) - [G01K 11/00](#); specially adapted for measuring thermal properties of materials, e.g. specific heat, heat of combustion [G01N](#))**
- 17/003 . {for measuring the power of light beams, e.g. laser beams}
- 17/006 . {Microcalorimeters, e.g. using silicon microstructures}
- 17/02 . Calorimeters using transport of an indicating substances, e.g. evaporation calorimeters
- 17/025 . . {where evaporation, sublimation or condensation caused by heating or cooling, is measured}
- 17/04 . Calorimeters using compensation methods {, i.e. where the absorbed or released quantity of heat to be measured is compensated by a measured quantity of heating or cooling}
- 17/06 . Measuring quantity of heat conveyed by flowing media, e.g. in heating systems ([G01K 17/02](#), [G01K 17/04](#) take precedence) {e.g. the quantity of heat in a transporting medium, delivered to or consumed in an expenditure device}
- 17/08 . . based upon measurement of temperature difference {or of a temperature}
- 17/10 . . . between an inlet and an outlet point, combined with measurement of rate of flow of the medium {if such, by integration during a certain time-interval}
- 17/12 Indicating product of flow and temperature difference directly {or temperature}
- 17/14 using mechanical means for both measurements
- 17/16 using electrical {or magnetic} means for both measurements
- 17/18 using electrical {or magnetic} means for one measurement and mechanical means for the other
- 17/185 {where the indicating-instrument is driven electrically or magnetically by the temperature-measurement device and mechanically by the flow-measurement device}
- 17/20 . . . across a radiating surface, combined with ascertainment of the heat transmission coefficient {(materials therefor [G01K 17/08](#))}
- 19/00 Testing or calibrating calorimeters**
- 2201/00 Application of thermometers in air-conditioning systems**
- 2201/02 . in vehicles
- 2203/00 Application of thermometers in cryogenics**
- 2205/00 Application of thermometers in motors, e.g. of a vehicle**
- 2205/02 . for measuring inlet gas temperature
- 2205/04 . for measuring exhaust gas temperature
- 2207/00 Application of thermometers in household appliances**
- 2207/02 . for measuring food temperature
- 2207/04 . . for conservation purposes
- 2207/06 . . for preparation purposes
- 2207/08 . . with food recipients having temperature sensing capability
- 2211/00 Thermometers based on nanotechnology**
- 2213/00 Temperature mapping**
- 2215/00 Details concerning sensor power supply**
- 2217/00 Temperature measurement using electric or magnetic components already present in the system to be measured**
- 2219/00 Thermometers with dedicated analog to digital converters**