

# CPC COOPERATIVE PATENT CLASSIFICATION

## G PHYSICS (NOTES omitted)

### INSTRUMENTS

#### G01 MEASURING; TESTING (NOTES omitted)

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

##### NOTES

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](#).
3. 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.

<b>1/00</b>	<b>Details of thermometers not specially adapted for particular types of thermometer</b> ( <a href="#">circuits for reducing thermal inertia G01K 7/42</a> )	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
1/02	• Means for indicating or recording specially adapted for thermometers	1/24	• • by means of compounded strips or plates, e.g. by bimetallic strips
1/022	• • for recording	1/26	• Compensating for effects of pressure changes
1/024	• • for remote indication	<b>3/00</b>	<b>Thermometers giving results other than momentary value of temperature</b> ( <a href="#">G01K 7/42 takes precedence</a> )
1/026	• • {arrangements for monitoring a plurality of temperatures, e.g. by multiplexing}	3/005	• {Circuits arrangements for indicating a predetermined temperature ( <a href="#">fire detection G08B 17/00</a> )}
1/028	• • {arrangements for numerical indication}	3/02	• giving means values; giving integrated values
1/04	• • Scales	3/04	• • in respect of time
1/045	• • • {temperature indication combined with the indication of another variable ( <a href="#">indicating of human comfort G01W 1/17</a> )}	3/06	• • in respect of space
1/06	• • • Arrangements for facilitating reading, e.g. illumination, magnifying glass	3/08	• giving differences of values ( <a href="#">using thermoelectric elements G01K 7/02</a> ); giving differentiated values
1/065	• • • • {of liquid column thermometers}	3/10	• • in respect of time, e.g. reacting only to a quick change of temperature
1/08	• Protective devices, e.g. casings	3/12	• • • based upon expansion or contraction of materials
1/10	• • for preventing chemical attack	3/14	• • in respect of space
1/105	• • • {for siderurgical use}	2003/145	• • • {Hotspot localization}
1/12	• • for preventing damage due to heat overloading	<b>5/00</b>	<b>Measuring temperature based on the expansion or contraction of a material</b> ( <a href="#">G01K 9/00 takes precedence; giving other than momentary value of temperature G01K 3/00</a> )
1/125	• • • {for siderurgical use}	5/02	• the material being a liquid ( <a href="#">contained in a hollow body having parts which are deformable or displaceable under the pressure developed by the material G01K 5/32</a> )
1/14	• Supports; Fastening devices; Arrangements for mounting thermometers in particular locations	5/025	• • {Manufacturing of this particular type of thermometer}
1/143	• • for measuring surface temperatures		
1/146	• • {arrangements for moving thermometers to or from a measuring position}		
1/16	• Special arrangements for conducting heat from the object to the sensitive element		
1/165	• • {for application in zero heat flux sensors}		
1/18	• • for reducing thermal inertia		
1/20	• Compensating for effects of temperature changes other than those to be measured, e.g. changes in ambient temperature		

- 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

**WARNING**

Group [G01K 5/22](#) is impacted by reclassification into groups [G01K 13/20](#), [G01K 13/25](#), and [G01K 13/252](#).

All groups listed in this Warning should be considered in order to perform a complete search.

- 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](#)) {; Power supply therefor, e.g. using 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
- 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 failure or disconnection of thermocouples
- 7/028 . . {using microstructures, e.g. made of silicon}
- 7/04 . . the object to be measured not forming one of the thermoelectric materials
- 7/06 . . . the thermoelectric 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 thermoelectric 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
- 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}
- 7/18 . . the element being a linear resistance, e.g. platinum resistance thermometer ([G01K 7/26 takes precedence](#))
- 7/183 . . . {characterised by the use of the resistive element}
- 7/186 . . . {using microstructures}
- 7/20 . . . in a specially-adapted circuit, e.g. bridge circuit

7/203	. . . . {in an oscillator circuit}	11/14	. . of inorganic materials
7/206	. . . . {in a potentiometer circuit}		<b>WARNING</b>
7/21	. . . . for modifying the output characteristic, e.g. linearising		Group <a href="#">G01K 11/14</a> is incomplete pending reclassification of documents from group <a href="#">G01K 11/165</a> .
7/22	. . the element being a non-linear resistance, e.g. thermistor ( <a href="#">G01K 7/26 takes precedence</a> )		Groups <a href="#">G01K 11/165</a> and <a href="#">G01K 11/14</a> should be considered in order to perform a complete search.
7/223	. . . {characterised by the shape of the resistive element}		
7/226	. . . {using microstructures, e.g. silicon spreading resistance}	11/16	. . of organic materials
7/24	. . . in a specially-adapted circuit, e.g. bridge circuit	11/165	. . . of organic liquid crystals
7/245	. . . . {in an oscillator circuit}		<b>WARNING</b>
7/25	. . . . for modifying the output characteristic, e.g. linearising		Group <a href="#">G01K 11/165</a> is impacted by reclassification into group <a href="#">G01K 11/14</a> .
7/26	. . the element being an electrolyte		Groups <a href="#">G01K 11/165</a> and <a href="#">G01K 11/14</a> should be considered in order to perform a complete search.
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 ( <a href="#">capacitors per se H01G</a> )	11/18	. . of materials which change translucency
7/343	. . {the dielectric constant of which is temperature dependant}	11/20	. using thermoluminescent materials ( <a href="#">G01K 11/32 takes precedence</a> )
7/346	. . {for measuring temperature based on the time delay of a signal through a series of logical ports}	11/22	. using measurement of acoustic effects
7/36	. using magnetic elements, e.g. magnets, coils ( <a href="#">magnetic elements per se H01F</a> )	11/24	. . of the velocity of propagation of sound
7/38	. . the variations of temperature influencing the magnetic permeability	11/26	. . of resonant frequencies
7/40	. using ionisation of gases	11/265	. . . {using surface acoustic wave [SAW]}
7/42	. Circuits effecting compensation of thermal inertia; Circuits for predicting the stationary value of a temperature	11/28	. using measurements of density {(measuring density in general G01N 9/00)}
2007/422	. . {Dummy objects used for estimating temperature of real objects}	11/30	. using measurement of the effect of a material on X-radiation, gamma radiation or particle radiation
7/425	. . {Thermal management of integrated systems}	11/32	. using changes in transmittance, scattering or luminescence in optical fibres
7/427	. . {Temperature calculation based on spatial modeling, e.g. spatial inter- or extrapolation}	11/3206	. . at discrete locations in the fibre, e.g. using Bragg scattering
9/00	<b>Measuring temperature based on movements caused by redistribution of weight, e.g. tilting thermometer (not giving momentary value of temperature <a href="#">G01K 3/00</a>)</b>	11/3213	. . . using changes in luminescence, e.g. at the distal end of the fibres
11/00	<b>Measuring temperature based upon physical or chemical changes not covered by groups <a href="#">G01K 3/00</a>, <a href="#">G01K 5/00</a>, <a href="#">G01K 7/00</a> or <a href="#">G01K 9/00</a></b>	11/322	. . using Brillouin scattering
11/003	. {using absorption or generation of gas, e.g. hydrogen}	11/324	. . using Raman scattering
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 ( <a href="#">G01K 17/003</a> , <a href="#">G01J 5/00 take precedence</a> ; measuring the effect of a material on X-, gamma- or particle radiation <a href="#">G01K 11/30</a> )}	13/00	<b>Thermometers specially adapted for specific purposes</b>
11/02	. using evaporation or sublimation, e.g. by observing boiling	13/006	. {for cryogenic purposes}
11/04	. . from material contained in a hollow body having parts which are deformable or displaceable under the pressure developed by the vapour	13/008	. . {using microstructures, e.g. made of silicon}
11/06	. using melting, freezing, or softening	13/02	. for measuring temperature of moving fluids or granular materials capable of flow
11/08	. . of disposable test bodies, e.g. cone	13/022	. . {Suction thermometers}
11/10	. using sintering	13/024	. . of moving gases
11/12	. using changes in colour, translucency or reflectance	13/026	. . {of moving liquids}
11/125	. . using changes in reflectance	13/028	. . {for use in total air temperature [TAT] probes}
		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 heat element <a href="#">G01K 1/16</a> )
		13/12	. combined with sampling devices for measuring temperatures of samples of materials
		13/125	. . {for siderurgical purposes}

13/20	<ul style="list-style-type: none"> <li>• Clinical contact thermometers for use with humans or animals</li> </ul>	17/20	<ul style="list-style-type: none"> <li>• . . . across a radiating surface, combined with ascertainment of the heat transmission coefficient { (materials therefor <a href="#">G01K 17/08</a>) }</li> </ul>
	<b>WARNING</b>		
	Groups <a href="#">G01K 13/20</a> , <a href="#">G01K 13/25</a> , and <a href="#">G01K 13/252</a> are incomplete pending reclassification of documents from group <a href="#">G01K 5/22</a> .	19/00	<b>Testing or calibrating calorimeters</b>
	All groups listed in this Warning should be considered in order to perform a complete search.	2201/00	<b>Application of thermometers in air-conditioning systems</b>
13/223	<ul style="list-style-type: none"> <li>• . {Infrared clinical thermometers, e.g. tympanic}</li> </ul>	2201/02	<ul style="list-style-type: none"> <li>• in vehicles</li> </ul>
13/25	<ul style="list-style-type: none"> <li>• Protective devices therefor, e.g. sleeves preventing contamination</li> </ul>	2203/00	<b>Application of thermometers in cryogenics</b>
13/252	<ul style="list-style-type: none"> <li>• . . {for tympanic thermometers}</li> </ul>	2205/00	<b>Application of thermometers in motors, e.g. of a vehicle</b>
15/00	<b>Testing or calibrating of thermometers</b>	2205/02	<ul style="list-style-type: none"> <li>• for measuring inlet gas temperature</li> </ul>
15/002	<ul style="list-style-type: none"> <li>• {Calibrated temperature sources, temperature standards therefor (arrangements with respect to the cold junction of thermo-electric elements <a href="#">G01K 7/12</a>)}</li> </ul>	2205/04	<ul style="list-style-type: none"> <li>• for measuring exhaust gas temperature</li> </ul>
15/005	<ul style="list-style-type: none"> <li>• {Calibration}</li> </ul>	2207/00	<b>Application of thermometers in household appliances</b>
15/007	<ul style="list-style-type: none"> <li>• {Testing}</li> </ul>	2207/02	<ul style="list-style-type: none"> <li>• for measuring food temperature</li> </ul>
17/00	<b>Measuring quantity of heat (measuring temperature by calorimetry <a href="#">G01K 3/00</a> - <a href="#">G01K 11/00</a>; specially adapted for measuring thermal properties of materials, e.g. specific heat, heat of combustion <a href="#">G01N</a>)</b>	2207/04	<ul style="list-style-type: none"> <li>• . for conservation purposes</li> </ul>
17/003	<ul style="list-style-type: none"> <li>• {for measuring the power of light beams, e.g. laser beams}</li> </ul>	2207/06	<ul style="list-style-type: none"> <li>• . for preparation purposes</li> </ul>
17/006	<ul style="list-style-type: none"> <li>• {Microcalorimeters, e.g. using silicon microstructures}</li> </ul>	2207/08	<ul style="list-style-type: none"> <li>• . with food recipients having temperature sensing capability</li> </ul>
17/02	<ul style="list-style-type: none"> <li>• Calorimeters using transport of an indicating substances, e.g. evaporation calorimeters</li> </ul>	2211/00	<b>Thermometers based on nanotechnology</b>
17/025	<ul style="list-style-type: none"> <li>• . {where evaporation, sublimation or condensation caused by heating or cooling, is measured}</li> </ul>	2213/00	<b>Temperature mapping</b>
17/04	<ul style="list-style-type: none"> <li>• 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}</li> </ul>	2215/00	<b>Details concerning sensor power supply</b>
17/06	<ul style="list-style-type: none"> <li>• Measuring quantity of heat conveyed by flowing media, e.g. in heating systems (<a href="#">G01K 17/02</a>, <a href="#">G01K 17/04</a> take precedence){e.g. the quantity of heat in a transporting medium, delivered to or consumed in an expenditure device}</li> </ul>	2217/00	<b>Temperature measurement using electric or magnetic components already present in the system to be measured</b>
17/08	<ul style="list-style-type: none"> <li>• . based upon measurement of temperature difference {or of a temperature}</li> </ul>	2219/00	<b>Thermometers with dedicated analog to digital converters</b>
17/10	<ul style="list-style-type: none"> <li>• . . 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}</li> </ul>		
17/12	<ul style="list-style-type: none"> <li>• . . . . Indicating product of flow and temperature difference directly {or temperature}</li> </ul>		
17/14	<ul style="list-style-type: none"> <li>• . . . . using mechanical means for both measurements</li> </ul>		
17/16	<ul style="list-style-type: none"> <li>• . . . . using electrical {or magnetic} means for both measurements</li> </ul>		
17/18	<ul style="list-style-type: none"> <li>• . . . . using electrical {or magnetic} means for one measurement and mechanical means for the other</li> </ul>		
17/185	<ul style="list-style-type: none"> <li>• . . . . . {where the indicating-instrument is driven electrically or magnetically by the temperature-measurement device and mechanically by the flow-measurement device}</li> </ul>		