CPC COOPERATIVE PATENT CLASSIFICATION

G PHYSICS
(NOTES omitted)

INSTRUMENTS

G01 MEASURING (counting G06M); TESTING
(NOTES omitted)

G01L MEASURING FORCE, STRESS, TORQUE, WORK, MECHANICAL POWER, MECHANICAL EFFICIENCY, OR FLUID PRESSURE (sensing pressure changes for compensating measurements of other variables or compensating readings of instruments for variations in pressure G01D or other relevant subclasses for the variable measured; weighing G01G; converting a pattern of forces into electrical signals G06K 11/00)

NOTE

Attention is drawn to the Notes following the title of class G01.

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 **Measuring force or stress in general** (measuring force due to impact G01L 5/00; measuring deformation of bodies as a result of stress by using gauges G01B)

1/005 . {by electrical means and not provided for in G01L 1/06 - G01L 1/22}

1/02 . by hydraulic or pneumatic means

1/04 . by measuring elastic deformation of gauges, e.g. of springs

1/042 . . {of helical springs}

1/044 . . {of leaf springs}

1/046 . . {of spiral springs}

1/048 . . {of torsionally deformable elements}

1/06 . by measuring the permanent deformation of gauges, e.g. of compressed bodies

1/08 . by the use of counterbalancing forces {(automatic balancing arrangements for measuring electric variables in which a force or torque representing the measured value is balanced by a force or torque representing the reference value G01R 17/08)}

1/083 . . {using hydraulic or pneumatic counterbalancing forces}

1/086 . . {using electrostatic or electromagnetic counterbalancing forces}

1/10 . by measuring variations of frequency of stressed vibrating elements, e.g. of stressed strings (using resistance strain gauges G01L 1/22 {; using piezo-resistive vibrators G01L 1/183})

1/103 . . {optical excitation or measuring of vibrations}

1/106 . . {Constructional details}

1/12 . by measuring variations in the magnetic properties of materials resulting from the application of stress

1/122 . . {by using permanent magnets}

1/125 . . {by using magnetostrictive means (magnetostrictive devices in general H01L 41/12; magnetostrictive sensors H01L 41/125)}

1/127 . . {by using inductive means (G01L 1/122, G01L 1/125 take precedence)}

1/14 . by measuring variations in capacitance or inductance of electrical elements, e.g. by measuring variations of frequency of electrical oscillators

1/142 . . {using capacitors}

1/144 . . . {with associated circuitry (G01L 1/146 and G01L 1/148 take precedence)}

1/146 . . . {for measuring force distributions, e.g. using force arrays (G01L 1/148 takes precedence)}

1/148 . . . {using semiconductive material, e.g. silicon}

1/16 . using properties of piezo-electric devices

1/162 . . {using piezo-electric resonators}

1/165 . . . {with acoustic surface waves}

1/167 . . . {optical excitation or measuring of vibrations}

1/18 . using properties of piezo-resistive materials, i.e. materials of which the ohmic resistance varies according to changes in magnitude or direction of force applied to the material (resistance strain gauges for measuring linear expansion or contraction G01B)

1/183 . . {by measuring variations of frequency of vibrating piezo-resistive material}

1/186 . . . {optical excitation or measuring of vibrations}

1/20 . by measuring variations in ohmic resistance of solid materials or of electrically-conductive fluids (of piezo-resistive materials G01L 1/18); by making use of electrokinetic cells, i.e. liquid-containing cells wherein an electrical potential is produced or varied upon the application of stress

1/205 . . {using distributed sensing elements}

1/22 . . using resistance strain gauges (resistance strain gauges for measuring linear expansion or contraction G01B)

1/2206 . . . {Special supports with preselected places to mount the resistance strain gauges; Mounting of supports}
1/2212 . . . . {particularly adapted to unbounded-wire-type strain gauges}
1/2218 . . . . {the supports being of the column type, e.g. cylindric, adapted for measuring a force along a single direction}
1/2225 . . . . . {the direction being perpendicular to the central axis}
1/2231 . . . . {the supports being disc- or ring-shaped, adapted for measuring a force along a single direction}
1/2237 . . . . . {the direction being perpendicular to the central axis}
1/2243 . . . . {the supports being parallelogram-shaped}
1/225 . . . {Measuring circuits therefor}
1/2256 . . . . {involving digital counting}
1/2262 . . . . {involving simple electrical bridges}
1/2268 . . . {Arrangements for correcting or for compensating unwanted effects}
1/2275 . . . . {for non linearity}
1/2281 . . . . {for temperature variations}
1/2287 . . . {constructional details of the strain gauges (adjustable resistors H01C 10/00)}
1/2293 . . . . {of the semi-conductor type (semi-conductor devices controllable by variations of applied mechanical force H01L 29/84)}
1/24 . by measuring variations of optical properties of material when it is stressed, e.g. by photoelastic stress analysis {using infra-red, visible light, ultra-violet}
1/241 . . {by photoelastic stress analysis}
1/242 . . {the material being an optical fibre}
1/243 . . . {using means for applying force perpendicular to the fibre axis}
1/245 . . . . {using microbending}
1/246 . . . {using integrated gratings, e.g. Bragg gratings}
1/247 . . {using distributed sensing elements, e.g. microcapsules (along a single optical fibre G01L 1/242)}
1/248 . . {using infra-red (G01L 1/241, G01L 1/242 take precedence)}
1/25 . using wave or particle radiation, e.g. X-rays {, microwaves}, neutrons (G01L 1/24 takes precedence)
1/255 . . {using acoustic waves, or acoustic emission (G01L 1/10 and G01L 1/16 take precedence)}
1/26 . Auxiliary measures taken, or devices used, in connection with the measurement of force, e.g. for preventing influence of transverse components of force, for preventing overload

3/00 Measuring torque, work, mechanical power, or mechanical efficiency in general

3/02 . Rotary-transmission dynamometers
3/04 . . wherein the torque-transmitting element comprises a torsionally-flexible shaft
3/045 . . . {by measuring variations of frequency of stressed vibrating elements}
3/06 . . . involving mechanical means for indicating
3/08 . . . involving optical means for indicating
3/10 . . . involving electrical or magnetic means for indicating
3/101 . . . . {involving magnetic or electromagnetic means}
3/102 . . . . . {involving magnetostictive means (magnetostrictive devices in general H01L 41/12; magnetostrictive sensors H01L 41/125)}
3/103 . . . . . {Details about the magnetic material used}
3/104 . . . . . {involving permanent magnets}
3/105 . . . . . {involving inductive means (G01L 3/102, G01L 3/104 take precedence)}
3/106 . . . . {involving electrostatic means}
3/107 . . . . {involving potentiometric means}
3/108 . . . . {involving resistance strain gauges}
3/109 . . . . {involving measuring phase difference of two signals or pulse trains}
3/12 . . . . involving photoelectric means
3/14 . . wherein the torque-transmitting element is other than a torsionally-flexible shaft
3/1407 . . . {involving springs}
3/1414 . . . . {using mechanical or hydraulic transducers}
3/1421 . . . . {using optical transducers}
3/1428 . . . . {using electrical transducers}
3/1435 . . . . . {involving magnetic or electromagnetic means}
3/1442 . . . . . {involving electrostatic means}
3/145 . . . . . {involving potentiometric means}
3/1457 . . . . . {involving resistance strain gauges}
3/1464 . . . {involving screws and nuts, screw-gears or cams}
3/1471 . . . . {using planet wheels or conical gears}
3/1478 . . . {involving hinged levers}
3/1485 . . . {involving fluidic means}
3/1492 . . . {involving electric couplings}
3/16 . Rotary-absorption dynamometers, e.g. of brake type
3/18 . . mechanically actuated
3/20 . . fluid actuated {(fluid actuated brakes in general F16D 57/00)}
3/205 . . . {of the air brake type (air actuated brakes in general F16D 57/00)}
3/22 . . electrically or magnetically actuated {(electrical or magnetic brakes in general H02K 49/00)}
3/24 . Devices for determining the value of power, e.g. by measuring and simultaneously multiplying the values of torque and revolutions per unit of time, by multiplying the values of tractive or propulsive force and velocity (measuring velocity per se G01P)
3/242 . . {by measuring and simultaneously multiplying torque and velocity}
3/245 . . {by measuring and simultaneously multiplying pressure and velocity}
3/247 . . {by measuring and simultaneously multiplying tractive or propulsive force and velocity}
3/26 . Devices for measuring efficiency, i.e. the ratio of power output to power input

5/00 Apparatus for, or methods of, measuring force, e.g. due to impact, work, mechanical power, or torque, adapted for special purposes (measuring pressure of a fluent medium G01L 7/00 - G01L 21/00; measuring rapid changes of pressure in gas, steam or liquid G01L 23/00)

5/0004 . {Force transducers adapted for mounting in a bore of the force receiving structure (G01L 5/0009 takes precedence)}
5/0009 . {Force sensors associated with a bearing (testing of bearings G01M 13/04)}
5/0014 . . {by using capacitive sensors}
5/0019 . . {by using strain gages, piezo-electric, piezo-resistive or other ohmic-resistance based sensors}
5/0023 . . {by using magnetic sensors}
5/0028 . {Force sensors associated with force applying means (G01L 5/0052, G01L 5/0057, G01L 5/0061 take precedence)}
5/0033 . . {applying a pulling force}
5/0038 . . {applying a pushing force}
5/0042 . . {applying a torque}
5/0047 . {measuring forces due to residual stresses}
5/0052 . {measuring forces due to impact (G01L 5/0061, G01L 5/14 take precedence; impact testing of structures G01M 7/08; impact testing of material G01N 3/00)}
5/0057 . {measuring forces due to spring-shaped elements}
5/0061 . {Force sensors associated with industrial machines or actuators (for the specific machine or actuator involved see relevant class, e.g. F01, F04, F16, B66, E21)}
5/0066 . . {Calibration arrangements (calibration of force sensors in general G01L 25/00)}
5/0071 . . {Specific indicating arrangements, e.g. of overload}
5/0076 . . {Force sensors associated with manufacturing machines (G01L 5/0066, G01L 5/0071 and B23Q 17/09 take precedence; for the specific machine or operation involved see relevant class, e.g. B21 - B42)}
5/008 . . . {Force sensors integrated in an article or a dummy workpiece}
5/0085 . . . {Force sensors adapted for insertion between cooperating machine elements, e.g. for measuring the nip force between rollers}
5/009 . . . {Force sensors associated with material gripping devices (manipulators in general G01L 5/22)}
5/0095 . {measuring work or mechanical power}
5/03 . for measuring release force of ski safety bindings
5/04 . for measuring tension in ropes, cables, wires, threads, belts, bands or like flexible members {(specially adapted for the strings of tennis rackets A63B 51/005; G01L 5/0004 takes precedence)}
5/042 . . {by measuring vibrational characteristics of the flexible member}
5/045 . . {for measuring the tension across the width of a band-shaped flexible member (measuring flatness G01B; metal rolling in general B21B)}
5/047 . . {Specific indicating or recording arrangements, e.g. for remote indication, for indicating overload or underload}
5/06 . . using mechanical means {(G01L 5/042, G01L 5/045 take precedence)}
5/08 . . using fluid means {(G01L 5/042, G01L 5/045 take precedence)}
5/10 . . using electrical means {(G01L 5/042, G01L 5/045 take precedence)}
5/101 . . . {in which the sensor is inserted into the member}
5/102 . . . {in which the sensor is located at a non-interrupted part of the member}
5/103 . . . {in which the sensor is fixed at one end of the member}
5/105 . . . {using electro-optical means}
5/106 . . . {by measuring a reaction force applied on a cantilever beam}
5/107 . . . {by measuring a reaction force applied on an element disposed between two supports, i.e. on a plurality of rollers or gliders}
5/108 . . . {by measuring a reaction force applied on a single support or glider}
5/12 . for measuring axial thrust in a rotary shaft, e.g. of propulsion plants
5/13 . for measuring the tractive or propulsive power of vehicles
5/133 . . {for measuring thrust of propulsive devices, e.g. of propellers (aeroplanes B64C; marine propulsion B63H; jet-engines F02K)}
5/136 . . {Force sensors associated with a vehicle traction coupling (vehicle connections B60D; control of vehicle brakes B60T)}
5/14 . for measuring the force of explosions; for measuring the energy of projectiles
5/16 . for measuring several components of force
5/161 . . {using variations in ohmic resistance}
5/162 . . . {of piezoresistors}
5/163 . . . {of potentiometers}
5/164 . . {using variations in inductance}
5/165 . . {using variations in capacitance}
5/166 . . {using photoelectric means}
5/167 . . {using piezo-electric means}
5/168 . . {using counterbalancing forces}
5/18 . for measuring ratios of force
5/20 . for measuring wheel side-thrust (in balancing G01M)
5/22 . for measuring the force applied to control members, e.g. control members of vehicles, triggers
5/221 . . {to steering wheels, e.g. for power assisted steering}
5/223 . . {to joystick controls}
5/225 . . {to foot actuated controls, e.g. brake pedals}
5/226 . . {to manipulators, e.g. the force due to gripping}
5/228 . . . {using tactile array force sensors}
5/24 . for determining value of torque or twisting moment for tightening a nut or other member which is similarly stressed (arrangements in wrenches or screwdrivers B25B 23/14; {scremed connections specially modified to indicate the attainment of a particular tensile load F16B 31/02})
5/243 . . {using washers}
5/246 . . {using acoustic waves (for force in general G01L 1/255)}
5/26 . for determining the characteristic of torque in relation to revolutions per unit of time
5/28 . for testing brakes
5/282 . . {the vehicle wheels cooperating with rotatable rolls}
5/284 . . {Measuring braking-time or braking distance}
5/286 . . {Measuring deceleration (deceleration in general G01P)}
5/288 . . {Measuring the force necessary to rotate a braked wheel}

Measuring fluid pressure

7/00 **Measuring the steady or quasi-steady pressure of a fluid or a fluent solid material by mechanical or fluid pressure-sensitive elements** ({G01L 11/004 takes precedence; } transmitting or indicating the displacement of mechanical pressure-sensitive elements by electric, {e.g. photoelectric} or magnetic means G01L 9/00; measuring differences of two or more pressure values G01L 13/00; measuring two or more pressure values simultaneously G01L 15/00; measuring tyre pressure or the pressure of other inflated bodies G01L 17/00; vacuum gauges G01L 21/00; hollow bodies deformable or displaceable under internal pressure, per se G12B 1/04; {pressure sensitive switches using Bourbon gauges H01H 9/00; pressure sensitive fluidum level or volume measuring devices G01F 17/00; G01F 23/14, G01F 23/16 pressure sensitive depth meters G01C 13/008; aircraft altitude meters G01C 5/005})

7/02 . in the form of elastically-deformable gauges

7/022 . . {constructional details, e.g. mounting of elastically-deformable gauges (G01L 7/041, G01L 7/061, G01L 7/082, G01L 7/102, G01L 7/163, G01L 7/182 take precedence over G01L 7/022)}

7/024 . . {with mechanical transmitting or indicating means (G01L 7/043, G01L 7/063, G01L 7/084, G01L 7/104, G01L 7/166, G01L 7/185 take precedence over G01L 7/024)}

7/026 . . {with optical transmitting or indicating means (G01L 7/045, G01L 7/065, G01L 7/086, G01L 7/106, G01L 7/187 take precedence over G01L 7/026)}

7/028 . . {correcting or regulating means (G01L 7/048, G01L 7/068, G01L 7/088, G01L 7/108 take precedence over G01L 7/028)}

7/04 . . in the form of flexible, deformable tubes, e.g. Bourdon gauges

7/041 . . . {Construction or mounting of deformable tubes}

7/043 . . . {with mechanical transmitting or indicating means}

7/045 . . . {with optical transmitting or indicating means}

7/046 . . . {with exhausted tubes}

7/048 . . . {correcting or regulating means for flexible, deformable tubes}

7/06 . . of the bellows type

7/061 . . . {construction or mounting of bellows}

7/063 . . . {with mechanical transmitting or indicating means}

7/065 . . . {with optical transmitting or indicating means}

7/066 . . . {with exhausted bellows}

7/068 . . . {correcting or regulating means for bellows}

7/08 . . of the flexible-diaphragm type

7/082 . . . {construction or mounting of diaphragms (of semiconductive diaphragms G01L 9/0042)}

7/084 . . . {with mechanical transmitting or indicating means}

7/086 . . . {with optical transmitting or indicating means}

7/088 . . . {correcting or regulating means for flexible diaphragms}

7/10 . . of the capsule type

7/102 . . . {construction or mounting of capsules}

7/104 . . . {with mechanical transmitting or indicating means}

7/106 . . . {with optical transmitting or indicating means}

7/108 . . . {correcting or regulating means for capsules}

7/12 . . . with exhausted chamber; Aneroid barometers

7/14 . . . . with zero-setting means

7/16 . in the form of pistons

7/163 . . {construction or mounting of pistons}

7/166 . . {with mechanical transmitting or indicating means}

7/18 . using liquid as the pressure-sensitive medium, e.g. liquid-column gauges

7/182 . . {constructional details, e.g. mounting}

7/185 . . {with mechanical transmitting or indicating means}

7/187 . . {with optical transmitting or indicating means}

7/20 . . involving a closed chamber above the liquid level, the chamber being exhausted or housing low-pressure gas; Liquid barometers

7/22 . . involving floats, e.g. floating bells

7/24 . . involving balances in the form of rings partly filled with liquid

9/00 **Measuring steady or quasi-steady pressure of a fluid or a fluent solid material by electric or magnetic pressure-sensitive elements {(G01L 11/004 takes precedence)}; Transmitting or indicating the displacement of mechanical pressure-sensitive elements, used to measure the steady or quasi-steady pressure of a fluid or fluent solid material by electric or magnetic means** (measuring differences of two or more pressure values G01L 13/00; measuring two or more pressure values simultaneously G01L 15/00; vacuum gauges G01L 21/00; transferring the output of the sensing member to the indicating or recording part in general G01D 5/00)

9/0001 . {Transmitting or indicating the displacement of elastically deformable gauges by electric, electro-mechanical, magnetic or electro-magnetic means (G01L 9/0026, G01L 9/0033, G01L 9/0082, G01L 9/0089, G01L 9/0091 take precedence)}

9/0002 . . {using variations in ohmic resistance (G01L 9/0051 takes precedence)}

9/0004 . . {using variations in inductance (G01L 9/007 takes precedence)}

9/0005 . . {using variations in capacitance (G01L 9/0072 takes precedence)}

9/0007 . . {using photoelectric means (G01L 9/0076 takes precedence)}

9/0008 . . {using vibrations}

9/001 . . . {of an element not provided for in the following subgroups of G01L 9/0008 (not used)}

9/0011 . . . . {Optical excitation or measuring}

9/0013 . . . {of a string}

9/0014 . . . . {Optical excitation or measuring of vibrations}

9/0016 . . . {of a diaphragm}

9/0017 . . . . {Optical excitation or measuring}

9/0019 . . . {of a semiconductive element}

9/002 . . . . {Optical excitation or measuring}

9/0022 . . . {of a piezoelectric element}

9/0023 . . . . {Optical excitation or measuring}

9/0025 . . . . {with acoustic surface waves}
9/0026 . {Transmitting or indicating the displacement of flexible, deformable tubes by electric, electro-mechanical, magnetic or electro-magnetic means (G01L 9/0008 takes precedence; pressure sensitive flexible, deformable tubes in general G01L 7/04)}
9/0027 . . {using variations in ohmic resistance}
9/0029 . . {using variations in inductance}
9/003 . . {using variations in capacitance}
9/0032 . . {using photoelectric means}
9/0033 . {Transmitting or indicating the displacement of bellows by electric, electro-mechanical, magnetic, or electro-magnetic means (G01L 9/0008 takes precedence; pressure sensitive bellows in general G01L 7/06)}
9/0035 . . {using variations in ohmic resistance}
9/0036 . . {using variations in inductance}
9/0038 . . {using variations in capacitance}
9/0039 . . {using photoelectric means}
9/0041 . {Transmitting or indicating the displacement of flexible diaphragms (pressure sensitive flexible diaphragms in general G01L 7/08)}
9/0042 . . {Constructional details associated with semiconductive diaphragm sensors, e.g. etching, or constructional details of non-semiconductive diaphragms (details about the integration or bonding of piezoresistor in or on the diaphragm G01L 9/0052 and G01L 9/0057 respectively)}
9/0044 . . . {Constructional details of non-semiconductive diaphragms}
9/0045 . . . {Diaphragm associated with a buried cavity}
9/0047 . . . {Diaphragm with non uniform thickness, e.g. with grooves, bosses or continuously varying thickness}
9/0048 . . . {Details about the mounting of the diaphragm to its support or about the diaphragm edges, e.g. notches, round shapes for stress relief}
9/005 . . . {Non square semiconductive diaphragm}
9/0051 . . {using variations in ohmic resistance}
9/0052 . . . {of piezoresistive elements (circuits therefor G01L 9/06)}
9/0054 . . . . {integral with a semiconducting diaphragm}
9/0055 . . . . {bonded on a diaphragm}
9/0057 . . . {of potentiometers}
9/0058 . . . {of pressure sensitive conductive solid or liquid material, e.g. carbon granules}
9/006 . . . {of metallic strain gauges fixed to an element other than the pressure transmitting diaphragm}
9/0061 . . . . {using unbounded-wire-type strain gauges}
2009/0063 . . . . {using a fluid coupling between strain gauge carrier and diaphragm}
9/0064 . . . . {the element and the diaphragm being in intimate contact}
2009/0066 . . . {Mounting arrangements of diaphragm transducers; Details thereof, e.g. electromagnetic shielding means}
2009/0067 . . . . {with additional isolating diaphragms}
2009/0069 . . . . {the transducer being mounted on a flexible element}
9/007 . . {using variations in inductance}
9/0072 . . {using variations in capacitance}
9/0073 . . . {using a semiconductive diaphragm}
9/0075 . . . {using a ceramic diaphragm, e.g. alumina, fused quartz, glass}
9/0076 . . {using photoelectric means}
9/0077 . . . {for measuring reflected light}
9/0079 . . . . {with Fabry-Perot arrangements}
9/008 . . {using piezoelectric devices (piezoelectric resonators G01L 9/0022; surface acoustic waves G01L 9/0025)}
9/0082 . {Transmitting or indicating the displacement of capsules by electric, electro-mechanical, magnetic, or electro-mechanical means (G01L 9/0008 takes precedence; pressure sensitive capsules in general G01L 7/10)}
9/0083 . . {using variations in ohmic resistance}
9/0085 . . {using variations in inductance}
9/0086 . . {using variations in capacitance}
9/0088 . . {using photoelectric means}
9/0089 . {Transmitting or indicating the displacement of pistons by electrical, electro-mechanical, magnetic or electro-magnetic means (G01L 9/0008 takes precedence; pressure sensitive pistons in general G01L 7/16)}
9/0091 . {Transmitting or indicating the displacement of liquid mediums by electrical, electro-mechanical, magnetic or electro-magnetic means (G01L 9/0008 takes precedence; pressure sensitive liquid mediums in general G01L 7/18)}
9/0092 . . {using variations in ohmic resistance}
9/0094 . . {using variations in inductance}
9/0095 . . {using variations in capacitance}
9/0097 . . {using photoelectric means}
9/0098 . {using semiconductor body comprising at least one PN junction as detecting element}
9/02 . by making use of variations in ohmic resistance, e.g. of potentiometers, {, i.e. electric circuits therefor, e.g. bridges, amplifiers or signal conditioning}
9/025 . . {with temperature compensating means (non electric temperature compensating means G01L 19/04)}
9/04 . . of resistance-strain gauges
9/045 . . . {with electric temperature compensating means (non electric temperature compensating means G01L 19/04)}
9/06 . . of piezo-resistive devices
9/065 . . . {with temperature compensating means (non electric temperature compensating means G01L 19/04)}
9/08 . by making use of piezo-electric devices {, i.e. electric circuits therefor}
9/085 . . {with temperature compensating means (non electric temperature compensating means G01L 19/04)}
9/10 . by making use of variations in inductance {, i.e. electric circuits therefor}
9/105 . . {with temperature compensating means (non electric temperature compensating means G01L 19/04)}
9/12 . by making use of variations in capacitance {, i.e. electric circuits therefor}
9/125 . . {with temperature compensating means (non electric temperature compensating means G01L 19/04)}
9/14 . involving the displacement of magnets, e.g. electromagnets

9/16 . by making use of variations in the magnetic properties of material resulting from the application of stress

9/18 . by making use of electrokinetic cells, i.e. liquid-containing cells wherein an electric potential is produced or varied upon the application of stress

11/00 Measuring steady or quasi-steady pressure of a fluid or a fluent solid material by means not provided for in group G01L 7/00 or G01L 9/00

11/002 . {by thermal means, e.g. hypsometer}

11/004 . {by the use of counterbalancing forces (measuring force by the use of counterbalancing forces G01L 1/08)}

11/006 . . {hydraulic or pneumatic counterbalancing forces}

11/008 . . {electrostatic or electromagnetic counterbalancing forces}

11/02 . by optical means

11/025 . . {using a pressure-sensitive optical fibre}

11/04 . by acoustic means

11/06 . . Ultrasonic means

13/00 Devices or apparatus for measuring differences of two or more pressure values

13/02 . using elastically-deformable members or pistons as sensing elements

13/021 . . {using deformable tubes}

13/023 . . {using bellows}

13/025 . . {using diaphragms}

13/026 . . . {involving double diaphragm}

13/028 . . {using capsules}

13/04 . using floats or liquids as sensing elements

13/06 . using electric or magnetic pressure-sensitive elements

15/00 Devices or apparatus for measuring two or more pressure values simultaneously

17/00 Devices or apparatus for measuring tyre pressure or the pressure in other inflated bodies (specially adapted for mounting on vehicles or tyres B60C 23/00)

17/005 . {using a sensor contacting the exterior surface, e.g. for measuring deformation}

19/00 Details of, or accessories for, apparatus for measuring steady or quasi-steady pressure of a fluent medium insofar as such details or accessories are not special to particular types of pressure gauges

19/0007 . {Fluidic connecting means}

19/0015 . . {using switching means}

19/0023 . . {for flowthrough systems having a flexible pressure transmitting element}

19/003 . . {using a detachable interface or adapter between the process medium and the pressure gauge}

19/0038 . . {being part of the housing (other details about the housing G01L 19/14)}

19/0046 . . {using isolation membranes (G01L 13/026 and G01L 19/0645 take precedence)}

2019/0053 . {Pressure sensors associated with other sensors, e.g. for measuring acceleration, temperature}

19/0061 . {Electrical connection means}

19/0069 . . {from the sensor to its support}

19/0076 . . . {using buried connections}

19/0084 . . {to the outside of the housing (other details about the housing see G01L 19/14)}

19/0092 . {Pressure sensor associated with other sensors, e.g. for measuring acceleration or temperature (G01L 9/025, G01L 9/045, G01L 9/065, G01L 9/085, G01L 9/105, G01L 9/125, G01L 19/02, G01L 19/04 take precedence; measuring two or more variable G01D 21/02; temperature sensors with pressure compensation G01K 1/26)}

19/02 . Arrangements for preventing, or for compensating for, effects of inclination or acceleration of the measuring device; Zero-setting means (for aneroid barometers G01L 7/14)

19/04 . Means for compensating for effects of changes of temperature {, i.e. other than electric compensation (electric compensation G01L 9/025, G01L 9/045, G01L 9/065, G01L 9/085, G01L 9/105 or G01L 9/125)}

19/06 . Means for preventing overload or deleterious influence of the measured medium on the measuring device or vice versa

19/0609 . . {Pressure pulsation damping arrangements}

19/0618 . . {Overload protection}

19/0627 . . {Protection against aggressive medium in general}

19/0636 . . . {using particle filters}

19/0645 . . . {using isolation membranes, specially adapted for protection (use of coupling membranes with a coupling fluid in general G01L 19/0046)}

19/0654 . . . {against moisture or humidity}

19/0663 . . {Flame protection; Flame barriers}

19/0672 . . {Leakage or rupture protection or detection (detection of leakage per se G01M 3/00)}

19/0681 . . {Protection against excessive heat}

19/069 . . {Protection against electromagnetic or electrostatic interferences}

19/08 . Means for indicating or recording, e.g. for remote indication (indicating or recording in general G01D)

19/083 . . {electrical}

19/086 . . {for remote indication}

19/10 . . mechanical

19/12 . . Alarms or signals

19/14 . Housings {(G01L 19/0007, G01L 19/0084, G01L 19/0092, G01L 19/04, G01L 19/06 take precedence)}

19/141 . . {Monolithic housings, e.g. molded or one-piece housings}

19/142 . . {Multiple part housings}

19/143 . . . {Two part housings}

19/144 . . . {with dismountable parts, e.g. for maintenance purposes or for ensuring sterile conditions (for detachable interface or adapter between the process medium and the pressure gauge G01L 19/003)}

19/145 . . {with stress relieving means}

19/146 . . . {using flexible element between the transducer and the support}

19/147 . . {Details about the mounting of the sensor to support or covering means}

19/148 . . {Details about the circuit board integration, e.g. integrated with the diaphragm surface or encapsulation}

19/149 . . {of immersion sensor, e.g. where the sensor is immersed in the measuring medium or for in vivo measurements, e.g. by using catheter tips (catheter tips per se A61M 25/0067; pressure measurements in the body A61B 5/00)}
19/16 . Dials; Mounting of dials

21/00 Vacuum gauges
21/02 . having a compression chamber in which gas, whose pressure is to be measured, is compressed
21/04 . . wherein the chamber is closed by liquid; Vacuum gauges of the McLeod type
21/06 . . . actuated by rotating or inverting the measuring device
21/08 . by measuring variations in the transmission of acoustic waves through the medium, the pressure of which is to be measured
21/10 . by measuring variations in the heat conductivity of the medium, the pressure of which is to be measured
21/12 . . measuring changes in electric resistance of measuring members, e.g. of filaments; Vacuum gauges of the Pirani type
21/14 . . using thermocouples
21/16 . by measuring variation of frictional resistance of gases
21/18 . . using a pendulum
21/20 . . using members oscillating about a vertical axis
21/22 . . using resonance effects of a vibrating body; Vacuum gauges of the Klumb type
21/24 . . using rotating members; Vacuum gauges of the Langmuir type {(Langmuir probes for plasma diagnostics H05H 1/0006)}
21/26 . by making use of radiometer action, i.e. of the pressure caused by the momentum of molecules passing from a hotter to a cooler member; Vacuum gauges of the Knudsen type
21/28 . . using torsional rotary measuring members
21/30 . by making use of ionisation effects (tubes therefor H01J 41/02)
21/32 . . using electric discharge tubes with thermionic cathodes
21/34 . . using electric discharge tubes with cold cathodes
21/36 . . using radioactive substances

23/00 Devices or apparatus for measuring or indicating or recording rapid changes, such as oscillations, in the pressure of steam, gas, or liquid; Indicators for determining work or energy of steam, internal-combustion, or other fluid-pressure engines from the condition of the working fluid
23/02 . mechanically indicating or recording and involving loaded or return springs
23/04 . involving means subjected to known counteracting pressure
23/06 . Indicating or recording by optical means
23/08 . operated electrically {(G01L 23/22 takes precedence)}
23/085 . . {by measuring fluctuations of starter motor current or of battery voltage (battery testing arrangements G01R 31/36; testing of electrical installation on transport means G01R 31/005; battery testing arrangements G01R 31/36)}
23/10 . . by pressure-sensitive members of the piezo-electric type
23/12 . . by changing capacitance or inductance
23/125 . . . {by changing capacitance}
23/14 . . by electromagnetic elements
23/145 . . . {by magnetostrictive elements}
23/16 . . by photoelectric means
23/18 . . by resistance strain gauges
23/20 . combined with planimeters or integrators
23/22 . for detecting or indicating knocks in internal-combustion engines; Units comprising pressure-sensitive members combined with ignitors for firing internal-combustion engines
23/221 . . {for detecting or indicating knocks in internal combustion engines}
23/222 . . . {using piezoelectric devices}
23/223 . . . {using magnetic or magnetostrictive means}
23/225 . . . {circuit arrangements therefor}
23/226 . . . . {using specific filtering}
23/227 . . . . {using numerical analyses}
2023/228 . . {circuit arrangements therefor}
23/24 . {specially adapted} for measuring pressure in inlet or exhaust ducts of internal-combustion engines
23/26 . Details or accessories
23/28 . . Cooling means
23/30 . . Means for indicating consecutively positions of pistons or cranks of internal-combustion engines in combination with pressure indicators
23/32 . . Apparatus specially adapted for recording pressure changes measured by indicators (apparatus for recording steady or quasi-steady pressure G01L 19/08; apparatus for recording measurement in general G01D)

25/00 Testing or calibrating of apparatus for measuring force, work, torque, mechanical power, or mechanical efficiency
25/003 . {for measuring torque}
25/006 . {for measuring work or mechanical power or mechanical efficiency}

27/00 Testing or calibrating of apparatus for measuring fluid pressure
27/002 . {Calibrating, i.e. establishing true relation between transducer output value and value to be measured, zeroing, linearising or span error determination (calibration of sensors per se G01D 18/00)}
27/005 . . {Apparatus for calibrating pressure sensors}
27/007 . {Malfunction diagnosis, i.e. diagnosing a sensor defect (malfunction detection of sensor not measuring a specific variable per se G01D 3/08)}
27/02 . of indicators