

SECTION G – PHYSICS

G01 MEASURING (counting G06M); TESTING

G01C MEASURING DISTANCES, LEVELS OR BEARINGS; SURVEYING; NAVIGATION; GYROSCOPIC INSTRUMENTS; PHOTOGRAMMETRY OR VIDEOGRAMMETRY (measuring dimensions or angles of objects G01B; measuring liquid level G01F; measuring intensity or direction of magnetic fields, other than the earth's field, in general G01R; radio navigation, determining distance or velocity by use of propagation effects, e.g. Doppler effect, propagation time, of radio waves, analogous arrangements using other waves G01S; optical systems therefor G02B; maps, globes G09B)

- (1) In this subclass, the following term is used with the meaning indicated:
 – “navigation” means determining the position and course of land vehicles, ships, aircraft, and space vehicles.
- (2) Attention is drawn to the Notes following the title of class G01.

MEASURING INSTRUMENTS

For measuring angles; inclinations..... 1/00; 9/00
 For measuring distances; heights or
 levels 3/00, 22/00;
 5/00
 Compasses; gyroscopes; other
 navigation instruments..... 17/00; 19/00;
 21/00

Other surveying instruments 15/00
 Combined instruments 23/00
 Manufacture, calibrating 25/00
 TRACING PROFILES 7/00
 PHOTOGRAMMETRY OR
 VIDEOGRAMMETRY 11/00
 SURVEYING OPEN WATER..... 13/00

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| <p>1/00 Measuring angles (in compasses G01C 17/00)</p> <p>1/02 . Theodolites</p> <p>1/04 . . combined with cameras</p> <p>1/06 . . Arrangements for reading scales</p> <p>1/08 . Sextants</p> <p>1/10 . . including an artificial horizon (G01C 1/14 takes precedence; artificial horizons <i>per se</i> G01C 15/14)</p> <p>1/12 . . . with a stabilised mirror (tilt compensation in general G12B)</p> <p>1/14 . . Periscopic sextants (periscopes in general G02B 23/08)</p> <p>3/00 Measuring distances in line of sight; Optical rangefinders (tapes, chains, or wheels for measuring length G01B; active triangulation systems, i.e. using the transmission and reflection of electromagnetic waves other than radio waves, G01S 17/48; coupling rangefinders with operating parts of photographic apparatus G03B) [1,8]</p> <p>3/02 . Details</p> <p>3/04 . . Adaptation of rangefinders for combination with telescopes or binoculars (rangefinders coupled with focusing arrangements of cameras G03B 13/20)</p> <p>3/06 . . Use of electric means to obtain final indication</p> <p>3/08 . . . Use of electric radiation detectors</p> <p>3/10 . using a parallactic triangle with variable angles and a base of fixed length in the observation station, e.g. in the instrument [1,8]</p> <p>3/12 . . with monocular observation at a single point, e.g. coincidence type (G01C 3/20 takes precedence)</p> <p>3/14 . . with binocular observation at a single point, e.g. stereoscopic type (G01C 3/20 takes precedence)</p> | <p>3/16 . . . Measuring marks</p> <p>3/18 . . with one observation point at each end of the base (G01C 3/20 takes precedence)</p> <p>3/20 . . with adaptation to the measurement of the height of an object</p> <p>3/22 . using a parallactic triangle with variable angles and a base of fixed length at, near, or formed by, the object (active triangulation systems, i.e. using the transmission and reflection of electromagnetic waves other than radio waves, G01S 17/48) [1,8]</p> <p>3/24 . using a parallactic triangle with fixed angles and a base of variable length in the observation station, e.g. in the instrument (active triangulation systems, i.e. using the transmission and reflection of electromagnetic waves other than radio waves, G01S 17/48) [1,8]</p> <p>3/26 . using a parallactic triangle with fixed angles and a base of variable length at, near, or formed by, the object (active triangulation systems, i.e. using the transmission and reflection of electromagnetic waves other than radio waves, G01S 17/48) [1,8]</p> <p>3/28 . . with provision for reduction of the distance into the horizontal plane</p> <p>3/30 . . . with adaptation to the measurement of the height of an object, e.g. tacheometers</p> <p>3/32 . by focusing the object, e.g. on a ground glass screen</p> <p>5/00 Measuring height; Measuring distances transverse to line of sight; Levelling between separated points; Surveyors' levels (G01C 3/20, G01C 3/30 take precedence; tracing profiles G01C 7/00; levels indicating inclination at a single point G01C 9/00)</p> <p>5/02 . involving automatic stabilisation of the line of sight (regulation of direction in general G05D 3/00; tilt compensation in general G12B)</p> |
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- 5/04 . Hydrostatic levelling, i.e. by flexibly interconnected liquid containers at separated points
- 5/06 . by using barometric means (barometers per se G01L)
- 7/00 Tracing profiles** (by photogrammetry or videogrammetry G01C 11/00; survey of wells E21B 47/00)
 - 7/02 . of land surfaces
 - 7/04 . . involving a vehicle which moves along the profile to be traced
 - 7/06 . of cavities, e.g. tunnels
- 9/00 Measuring inclination, e.g. by clinometers, by levels**
 - 9/02 . Details
 - 9/04 . . Transmission means between sensing element and final indicator for giving an enlarged reading
 - 9/06 . . Electric or photoelectric indication or reading means
 - 9/08 . . Means for compensating acceleration forces due to movement of instrument
 - 9/10 . by using rolling bodies
 - 9/12 . by using a single pendulum (plumb lines G01C 15/10)
 - 9/14 . . movable in more than one direction
 - 9/16 . by using more than one pendulum
 - 9/18 . by using liquids
 - 9/20 . . the indication being based on the inclination of the surface of a liquid relative to its container
 - 9/22 . . . with interconnected containers in fixed relation to each other
 - 9/24 . . in closed containers partially filled with liquid so as to leave a gas bubble
 - 9/26 . . . Details
 - 9/28 Mountings
 - 9/30 Means for adjusting dimensions of bubble
 - 9/32 Means for facilitating the observation of the position of the bubble, e.g. illuminating means
 - 9/34 . . . of the tubular type, i.e. for indicating the level in one direction only
 - 9/36 . . . of the spherical type, i.e. for indicating the level in all directions
- 11/00 Photogrammetry or videogrammetry, e.g. stereogrammetry; Photographic surveying** (cameras combined with surveying instruments, e.g. with theodolites, G01C 1/00, G01C 3/00, G01C 5/00, G01C 9/00; surveying cameras G03B 37/00) **[1,8]**
 - 11/02 . Picture-taking arrangements specially adapted for photogrammetry or photographic surveying, e.g. controlling overlapping of pictures
 - 11/04 . Interpretation of pictures
 - 11/06 . . by comparison of two or more pictures of the same area
 - 11/08 . . . the pictures not being supported in the same relative position as when they were taken
 - 11/10 using computers to control the position of the pictures (computers per se G06)
 - 11/12 . . . the pictures being supported in the same relative position as when they were taken
 - 11/14 with optical projection (G01C 11/26 takes precedence)
 - 11/16 in a common plane
 - 11/18 involving scanning means
 - 11/20 in separate planes
 - 11/22 with mechanical projection (G01C 11/26 takes precedence)
 - 11/24 with optical-mechanical projection (G01C 11/26 takes precedence)
 - 11/26 using computers to control the position of the pictures (computers per se G06)
 - 11/28 . . . Special adaptation for recording picture point data, e.g. for profiles
 - 11/30 . . by triangulation
 - 11/32 . . . Radial triangulation
 - 11/34 . . . Aerial triangulation
 - 11/36 . Videogrammetry, i.e. electronic processing of video signals from different sources to give parallax or range information **[8]**
- 13/00 Surveying specially adapted to open water, e.g. sea, lake, river, canal** (liquid level metering G01F; measuring liquid velocity G01P; determining existence or flow of underground water G01V)
- 15/00 Surveying instruments or accessories not provided for in groups G01C 1/00 G01C 13/00**
 - 15/02 . Means for marking measuring points
 - 15/04 . . Permanent marks; Boundary markers
 - 15/06 . . Surveyors' staffs; Movable markers
 - 15/08 . . . Plumbing or registering staffs or markers over ground marks
 - 15/10 . Plumb lines
 - 15/12 . Instruments for setting out fixed angles, e.g. right angles
 - 15/14 . Artificial horizons (tilt compensation in general G12B 5/00)
- 17/00 Compasses; Devices for ascertaining true or magnetic north for navigation or surveying purposes** (using gyroscopic effect G01C 19/00; for geophysical or prospecting purposes G01V 3/00)
 - 17/02 . Magnetic compasses
 - 17/04 . . with north-seeking magnetic elements, e.g. needles
 - 17/06 . . . Suspending magnetic elements
 - 17/08 by flotation
 - 17/10 . . . Comparing observed direction with north indication
 - 17/12 by sighting means, e.g. for surveyors' compasses
 - 17/14 by reference marks, e.g. for ships' compasses
 - 17/16 by clinometers, e.g. for determining dip or strike of geological strata
 - 17/18 . . . Supporting or suspending compasses, e.g. by gimbal, by flotation
 - 17/20 . . . Observing the compass card or needle
 - 17/22 by projection
 - 17/24 Illumination
 - 17/26 using electric pick-offs for transmission to final indicator, e.g. photocell
 - 17/28 . . Electromagnetic compasses (with north-seeking magnetic elements and having electric pick-offs G01C 17/26)
 - 17/30 . . . Earth-inductor compasses
 - 17/32 . . . Electron compasses
 - 17/34 . Sun- or astro-compasses
 - 17/36 . Repeaters for remote indication of readings of a master compass
 - 17/38 . Testing, calibrating, or compensating of compasses

- 19/00 Gyroscopes; Turn-sensitive devices with vibrating masses; Turn-sensitive devices without moving masses**
- 19/02 . Rotary gyroscopes
 - 19/04 . . Details
 - 19/06 . . . Rotors
 - 19/08 electrically driven (G01C 19/14 takes precedence; dynamo-electric machines H02K)
 - 19/10 Power supply
 - 19/12 fluid driven (G01C 19/14 takes precedence)
 - 19/14 Fluid rotors
 - 19/16 . . . Suspensions; Bearings (bearings in general F16C; balancing rotors G01M)
 - 19/18 providing movement of rotor with respect to its rotational axes (G01C 19/20, G01C 19/24 take precedence)
 - 19/20 in fluid
 - 19/22 torsional
 - 19/24 using magnetic or electrostatic fields
 - 19/26 . . . Caging, i.e. immobilising moving parts, e.g. for transport (applicable to instruments in general G01D 11/20)
 - 19/28 . . . Pick-offs, i.e. devices for taking off an indication of the displacement of the rotor axis
 - 19/30 . . . Erection devices, i.e. devices for restoring rotor axis to a desired position (for instrument indicating the vertical G01C 19/46)
 - 19/32 . . . Indicating or recording means specially adapted for rotary gyroscopes (in general G01D)
 - 19/34 . . for indicating a direction in the horizontal plane, e.g. directional gyroscopes
 - 19/36 . . . with north-seeking action by magnetic means, e.g. gyromagnetic compasses
 - 19/38 . . . with north-seeking action by other than magnetic means, e.g. gyrocompasses using earth's rotation
 - 19/40 . . for control by signals from a master compass, i.e. repeater compasses
 - 19/42 . . for indicating rate of turn; for integrating rate of turn
 - 19/44 . . for indicating the vertical
 - 19/46 . . . Erection devices for restoring rotor axis to a desired position
 - 19/48 operating by electrical means (G01C 19/54 takes precedence)
 - 19/50 operating by mechanical means (G01C 19/54 takes precedence)
 - 19/52 operating by fluid means (G01C 19/54 takes precedence)
 - 19/54 with correction for acceleration forces due to movement of instrument
 - 19/56 . Turn-sensitive devices with vibrating masses, e.g. tuning fork
 - 19/58 . Turn-sensitive devices without moving masses [3]
 - 19/60 . . Electronic or nuclear magnetic resonance gyroscopes (magnetic resonance arrangements in general G01R 33/20) [3,4]
 - 19/62 . . . with optical pumping [3]
 - 19/64 . . Gyrometers using the Sagnac effect, i.e. rotation-induced shifts between counter-rotating electromagnetic beams [3]
 - 19/66 Ring laser gyroscopes (ring lasers in general H01S 3/083) [5]
 - 19/68 Lock-in prevention [5]
 - 19/70 by mechanical means [5]
 - 19/72 . . . with counter-rotating light beams in a passive ring, e.g. fibre laser gyroscopes [5]
- 21/00 Navigation; Navigational instruments not provided for in groups G01C 1/00 G01C 19/00** (measuring distance traversed on the ground by a vehicle G01C 22/00; measuring linear or angular speed or acceleration G01P; control of position, course, altitude or attitude of vehicles G05D 1/00; traffic control systems G08G)
- 21/02 . by astronomical means (G01C 21/24, G01C 21/26 take precedence; measuring time by using position of the sun, moon, or stars G04B 49/00) [1,7]
 - 21/04 . by terrestrial means (G01C 21/24, G01C 21/26 take precedence; marking of navigation route for ships B63B 51/00) [1,7]
 - 21/06 . . involving measuring of drift angle; involving correction for drift
 - 21/08 . . involving use of the magnetic field of the earth
 - 21/10 . by using measurement of speed or acceleration (G01C 21/24, G01C 21/26 take precedence) [1,7]
 - 21/12 . . executed aboard the object being navigated; Dead reckoning
 - 21/14 . . . by recording the course traversed by the object (G01C 21/16 takes precedence)
 - 21/16 . . . by integrating acceleration or speed, i.e. inertial navigation
 - 21/18 Stabilised platforms, e.g. by gyroscope
 - 21/20 . Instruments for performing navigational calculations (G01C 21/24, G01C 21/26 take precedence; adaptations of digital computers to a specific function or application G06F 17/00, G06F 19/00) [1,7]
 - 21/22 . . Plotting boards (in general B43L)
 - 21/24 . specially adapted for cosmonautical navigation
 - 21/26 . specially adapted for navigation in a road network [7]
 - 21/28 . . with correlation of data from several navigational instruments [7]
 - 21/30 . . . Map- or contour-matching [7]
 - 21/32 Structuring or formatting of map data [7]
 - 21/34 . . Route searching; Route guidance [7]
 - 21/36 . . . Input/output arrangements for on-board computers [7]
- 22/00 Measuring distance traversed on the ground by vehicles, persons, animals, or other moving solid bodies, e.g. using odometers, using pedometers** (counting mechanisms *per se* G06M)
- 22/02 . by conversion into electric waveforms and subsequent integration, e.g. using tachometer generator
- 23/00 Combined instruments indicating more than one navigational value, e.g. for aircraft; Combined measuring devices for measuring two or more variables of movement, e.g. distance, speed, acceleration**
- 25/00 Manufacturing, calibrating, cleaning, or repairing instruments or devices referred to in the other groups of this subclass** (testing, calibrating, or compensating compasses G01C 17/38)