

## G01D

**MEASURING NOT SPECIALLY ADAPTED FOR A SPECIFIC VARIABLE; ARRANGEMENTS FOR MEASURING TWO OR MORE VARIABLES NOT COVERED IN A SINGLE OTHER SUBCLASS; TARIFF METERING APPARATUS; MEASURING OR TESTING NOT OTHERWISE PROVIDED FOR (means structurally associated with lightning or other over-voltage discharging apparatus for recording the operation thereof G01R; displaying information in general G09F; recording in a way which requires playback through a transducer G11B)**

### Definition statement

*This subclass/group covers:*

Measuring arrangements or apparatus giving results other than momentary value of a variable, and not specially adapted for a variable covered by a single other subclass, e.g.

giving mean values, root mean square [RMS] or integral values

signalling that a predetermined value has been exceeded.

Measuring arrangements with provision for special purposes, e.g.

for altering or correcting the transfer function

for mitigating undesired influences, such as temperature or pressure.

Component parts of said measuring apparatus or arrangements.

Testing or calibrating said measuring apparatus or arrangements.

Indicating or recording measured values not specially adapted for a specific variable

- Apparatus or arrangements for indicating or recording the results of measurements, not specially adapted for variables covered by a single other subclass, e.g. general recording by stylus and paper roll.
- Component parts of said indicating or recording apparatus or arrangements.
- Testing or calibrating said indicating or recording apparatus or arrangements.
- Tariff meters
- Apparatus or arrangements for tariff metering in general.
- Component parts of tariff metering apparatus or arrangements.

- Testing or calibrating tariff metering apparatus or arrangements.

### Relationship between large subject matter areas

[G01D](#) covers measuring arrangements, or arrangements for indicating, recording or transducing measurements not specially adapted for a specific variable covered by a single other subclass. Therefore when the variable is specified and covered by a single other subclass of G01, classification should be directed to that subclass.

For example, classification should be directed to [G01D](#) for measuring arrangements giving the RMS value of an unspecified variable, or signalling that a predetermined value of an unspecified variable has been exceeded. Instead, when the variable under consideration is specified (e.g. a voltage, liquid level or temperature), and a single other subclass exists that covers measurements of that variable (e.g. [G01R](#), [G01F](#) or [G01K](#) respectively) then classification should be directed to that subclass.

### References relevant to classification in this subclass

*This subclass/group does not cover:*

Tariff meters for measuring the time integral of electric power or current, e.g. electric consumption	<a href="#">G01R 11/56</a>
Measuring root mean square [RMS] values of currents or voltages	<a href="#">G01R 19/02</a>
Tariff metering apparatus in taxi's, i.e. taximeters	<a href="#">G07B 13/00</a>
Apparatus actuated by coins, cards or the like with meter-controlled dispensing of liquid, gas, or electricity	<a href="#">G07F 15/00</a>
Means structurally associated with lightning or other over-voltage discharging apparatus for recording the operation thereof	<a href="#">G01R</a>
displaying information in general	<a href="#">G09F</a>
Recording in a way which requires playback through a transducer	<a href="#">G11B</a>

## Informative references

Attention is drawn to the following places, which may be of interest for search:

Data loggers (animals/veterinary)	<a href="#">A01K 11/006</a>
Data loggers (medical)	<a href="#">A61B 5/04325</a>
Ink-jet printers	<a href="#">B41J</a>
Dashboard instruments	<a href="#">B60K 35/00</a> , <a href="#">B60K 37/00</a>
Illumination of dashboard instruments	<a href="#">B60Q 3/04</a>
Steering sensors	<a href="#">B62D 15/02</a>
Light sources	<a href="#">F21V</a>
Measuring length, thickness, dimensions etc.	<a href="#">G01B</a>
Measuring of force, pressure, strain, torque etc.	<a href="#">G01L</a>
Testing of machines	<a href="#">G01M</a>
Bearings incorporating rotation sensors	<a href="#">G01P 3/443</a>
Measuring electric or magnetic variables	<a href="#">G01R</a>
Control systems	<a href="#">G05B</a> , <a href="#">G05D</a> , <a href="#">G05M</a>
Graphical User Interfaces	<a href="#">G06F 1/00</a> , <a href="#">G06F 3/00</a>
Data loggers (architecture)	<a href="#">G06F 17/40</a>
Telemetry	<a href="#">G08C</a> , <a href="#">H04Q</a>
Resistors	<a href="#">H01C</a>
Smart metering/smart homes	<a href="#">H02J</a>
A/D converters	<a href="#">H03M 1/00</a>

Wireless communication networks	<a href="#">H04W</a>
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### Special rules of classification within this subclass

Any documents discussing the compensation or correction of errors in position encoding systems should be classified in [G01D 5/244](#) and sub-groups rather than in [G01D 3/00](#).

### G01D 1/00

**Measuring arrangements giving results other than momentary value of variable, of general application (G01D3/00 takes precedence; in tariff metering apparatus G01D4/00; transducers not specially adapted for a specific variable G01D5/00; computing G06)**

### Definition statement

*This subclass/group covers:*

Analysis of measured values

- Root Mean Square (RMS)
- Integration
- Differentiation
- Distribution

Detecting the maxima or minima of a measured value

Producing a product or a ratio of measured values

Signalling that an unspecified parameter has exceeded a predetermined value

### References relevant to classification in this main group

*This subclass/group does not cover:*

Measuring arrangements with provision for the special purposes referred to	<a href="#">G01D 3/00</a>
Indication that a specified parameter has exceeded a predetermined value for fluid level	<a href="#">G01F</a>

Indication that a specified parameter has exceeded a predetermined value for temperature	<a href="#">G01K</a>
Root Mean Square values of current or voltage	<a href="#">G01R 19/02</a>

### Informative references

*Attention is drawn to the following places, which may be of interest for search:*

In tariff metering apparatus	<a href="#">G01D 4/00</a>
Transducers not specially adapted for a specific variable	<a href="#">G01D 5/00</a>

## G01D 3/00

### Indicating or recording apparatus with provision for the special purposes referred to in the subgroups

#### Definition statement

*This subclass/group covers:*

Correcting or altering the law of variation

Using purely analogue techniques

Using digital techniques (i.e. correction data stored in a memory)

Mitigating undesired influences (due to e.g. temperature or pressure changes)

By averaging, gating undesired signals etc.

By detecting the undesired influence and correcting for its effect

Determining the correct operation of a measuring apparatus

Further details of subgroups

#### [G01D 3/02](#)

- Includes mechanical/electro-mechanical systems, any analogue circuits which involve switching, digital arrangements not involving use of a memory;

- Correcting/compensating for non-linearities;
- Compensating for temperature, pressure etc., see [G01D 3/028](#) and sub-groups.

#### [G01D 3/028](#)

- Includes mechanical arrangements, materials etc.; sub-groups take precedence.

#### [G01D 3/021](#)

- Includes systems having feedback, but no switching.

#### [G01D 3/022](#)

- Only digital or analogue/digital systems using memories; also include temperature correction methods involving memories;
- TEDS (Transducer Electronic Data Sheet);
- Overlaps with [G01D 18/008](#) (Calibration). Documents classified here deal with how calibration data is used and not how calibration data is produced, which is classified in [G01D 18/008](#)

#### [G01D 3/032](#)

[G01D 3/036](#) and [G01D 3/0365](#) take precedence.

#### [G01D 3/036](#)

- Sensors having a "self-correction" action, inc. those having components sensitive to the undesired effect, but not producing actual signals;
- Signals fed-back to sensor, to regulate supply voltage, frequency, gain etc.;
- Dual sensors measuring the desired parameter, the signals being combined to remove undesired effects;
- Sensors producing e.g. temperature dependent signal (resistive value of inductive sensor) as well as the sensed parameter;
- [G01D 3/0365](#) takes precedence.

#### [G01D 3/0365](#)

- Dual (identical) sensor arrangements where only one sensor is affected by desired parameter, while the other sensor is only affected by undesired parameter;

- A signal representing the undesired parameter must be produced, which is further processed;
- For sensor arrangements where a sensitive element is placed e.g. in a feedback loop, see [G01D 3/036](#).

#### [G01D 3/08](#)

- Includes systems for monitoring sensor operation;
- See also [G01D 18/00](#) and [G01R 31/2829](#).

#### [G01D 3/10](#)

- e.g. after reaching a certain threshold.

### References relevant to classification in this main group

*This subclass/group does not cover:*

Incremental/absolute/pulse type position encoders	<a href="#">G01D 5/244</a>
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### Informative references

*Attention is drawn to the following places, which may be of interest for search:*

Testing or monitoring circuits in sensor systems	<a href="#">G01R 31/2829</a>
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### Glossary of terms

*In this subclass/group, the following terms (or expressions) are used with the meaning indicated:*

TEDS	Transducer Electronic Data Sheet
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## **G01D 4/00**

**Tariff metering apparatus (tariff meters for measuring the time integral of electric power or current G01R11/56; in taximeters G07B13/00; coin-feed mechanisms therefor G07F)**

## Definition statement

*This subclass/group covers:*

Smart utility meters

Remote reading of utility meters

Reading directly to a remote (e.g. central) location

Reading indirectly (e.g. via a mobile or handheld reader)

Adaptation of existing meters, for conversion into smart meters

Display of actual utility consumption and/or the pricing or cost

Determination of the layout or topology of utility meters connected to an electricity grid

Outage detection in an electrical grid

Real-time monitoring of power generated by renewable sources.

Further details of subgroups

### [G01D 4/00](#)

- In general, [G01R](#) takes precedence;
- For remote meter reading, see also [G06M 3/06](#), [G01F 15/061](#), [H04Q 9/00](#), and [H02J](#).

## Relationship between large subject matter areas

The measuring of electrical power is to be classified in [G01R](#).

Although transmission of utility data is covered by [G01D](#), the techniques for transmitting such data should be classified in [G08C](#), [H04Q 9/00](#) and [H04W](#).

Although smart utility meters should be in [G01D](#), where smart utility meters are combined within a building (smart homes), [H02J](#) should be used

Where the utility being measured is a fluid (i.e. gas or water), then [G01F 15/00](#) should also be considered.

## References relevant to classification in this main group

*This subclass/group does not cover:*

Tariff meters for measuring the time integral of electric power or current	<a href="#">G01R 11/56</a>
Taximeters	<a href="#">G07B 13/00</a>

Coin-feed mechanisms for taximeters	<a href="#">G07F</a>
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### Informative references

*Attention is drawn to the following places, which may be of interest for search:*

Measurement of electrical voltage, current or power	<a href="#">G01R</a>
Smart homes	<a href="#">H02J</a>

### Glossary of terms

*In this subclass/group, the following terms (or expressions) are used with the meaning indicated:*

SCADA	Supervisory Command And Data Acquisition
AMR	Automatic Meter Reading
Smart meter	A utility meter which is either able to transmit measured utility data to a remote/central location and/or is able to display accurate consumption, pricing and/or cost information to the consumer

### G01D 5/00

**Mechanical means for transferring the output of a sensing member; Means for converting the output of a sensing member to another variable where the form or nature of the sensing member does not constrain the means for converting; Transducers not specially adapted for a specific variable (G01D3/00 takes precedence; specially adapted for apparatus giving results other than momentary value of variable G01D1/00; sensing members, see the relevant subclasses, e.g. of G01, H01; for converting a single current or a single voltage into a mechanical displacement G01R5/00; specially adapted for high-voltage or high-current measuring**

**arrangements G01R15/04, G01R15/14; measuring currents or voltages using digital measurement techniques G01R19/25; transmission systems for measured values, control or similar signals G08C, e.g. electrical signals G08C19/00)**

### **Definition statement**

*This subclass/group covers:*

Sensors, transducers

- Hall sensors
- Magneto-resistive sensors
- Inductive sensors
- Capacitive sensors
- Optical sensors
- Fiber-optic sensors
- Magnetostrictive sensors
- Other sensor types (i.e. piezoelectric, Wiegand, magneto-optical)

Sensors using particle or wave means (i.e. ultrasonic, microwave)

Sensors using gears, levers, magnetic coupling etc.

Encoders

- Incremental encoders
- Absolute encoders
- Pseudo-random encoders
- Error correction/prevention in encoders

Further details of subgroups

[G01D 5/142](#), [G01D 5/145](#), [G01D 5/147](#)

- Position sensing arrangements using magnetically sensitive (semiconductor) devices;
- Inductive sensors, see [G01D 5/20](#) and [G01D 5/22](#) and sub-groups;
- Magneto-resistive devices in general, see [G01R 33/09](#);
- Joysticks, see [G05G 9/047](#) and [G06F 3/033C](#).

#### [G01D 5/165](#)

Adjustable resistors, see [H01C 10/00](#).

#### [G01D 5/1655](#)

Rotary switches, see [H01H 19/00](#).

#### [G01D 5/24](#)

Includes circuits associated with measuring the capacitance of capacitive sensors;

see also proximity switches ([H03K 17/955](#)) and touch switches ([H03K 17/96](#));

See also [G01R 27/26](#).

#### [G01D 5/2417](#)

See [H04R 3/00](#) and [H04R 19/00](#).

#### [G01D 5/244](#)

- This is the head group for incremental/absolute/pulse type position encoders, but should not be used for classification purposes;
- It contains all documents which do not fit in the sub-groups of [G01D 5/244](#), [G01D 5/245](#) & [G01D 5/249](#);
- See also [H03M 1/22](#) - [H03M 1/308](#)

#### [G01D 5/24404](#)

Includes counting high frequency clock pulses as well as combining, inverting or delaying input pulses to produce higher frequency pulses.

#### [G01D 5/24409](#)

Includes documents using memories to produce SIN/COS (i.e. interpolation of incremental signals).

#### [G01D 5/245](#)

Not to be used (virtually empty).

#### [G01D 5/2451](#)

Either quadrature or single detector incremental encoders.

#### [G01D 5/2457](#)

Reference marks either on same encoder or on separate encoder;

See also [G01D 5/366](#).

[G01D 5/247](#)

e.g. PPM (pulse position modulation).

[G01D 5/249](#)

Virtually empty, sub-groups take precedence;

See also [H03M 1/22](#) - [H03M 1/308](#)

[G01D 5/2492](#)

Single track encoders with single or multiple detectors;

See [G01D 5/2455](#) for single track encoders equipped with incremental or clocking track.

[G01D 5/2495](#)

As for [G01D 5/2492](#), but includes only those documents which specifically mention using a pseudo-random code.

[G01D 5/2497](#)

Multi-track/multi-detector encoders.

[G01D 5/25](#)

Includes conductive encoders;

Rotary switches, see [H01H 19/00](#).

[G01D 5/2515](#)

Typically Reed switches are found here.

[G01D 5/264](#)

Compensation of undesired effects in optical measuring systems.

[G01D 5/266](#)

Not using optical fibres;

See also [G01B 9/02041](#).

[G01D 5/268](#)

The fibre is only used as transmitting means and not for sensing.

[G01D 5/305](#)

e.g. Twin diodes for following a line.

[G01D 5/344](#)

Not polarisation encoders.

[G01D 5/345](#)

e.g. Polariser and analyser system.

[G01D 5/347](#)

Optical encoders.

[G01D 5/34707](#)

Not the coding part: only the physical construction of the scale.

[G01D 5/34715](#)

e.g. lens arrangement for concentrating the light.

[G01D 5/34738](#)

Coupling between the axis of rotation and the encoder.

[G01D 5/34776](#)

How the encoding is made;

Encoder without incremental coding.

[G01D 5/34784](#)

Coding must have some incremental coding and some analogue coding.

[G01D 5/34792](#)

Coding must have some incremental coding and no analogue coding at all.

[G01D 5/353](#)

The fibre is the sensitive element;

[G01D 5/35303](#)

Also contains fibre interferometer and Bragg sensors;

See also [G01D 5/268](#) for Bragg.

[G01D 5/36](#)

Relates to the processing of the detected pulses of light.

### [G01D 5/366](#)

Reference of incremental scales.

### [G01D 5/38](#)

Encoders with diffraction gratings are also here.

### [G01D 5/48](#)

Data loggers incorporating wireless transmission means should have the class [G01D 9/005](#).

### [G01D 5/54](#)

Using means specified in two or more of groups [G01D 5/02](#), [G01D 5/12](#), [G01D 5/26](#), [G01D 5/42](#) and [G01D 5/48](#).

## References relevant to classification in this main group

*This subclass/group does not cover:*

Measuring arrangements with provision for the special purposes referred to in the subgroups	<a href="#">G01D 3/00</a>
For converting a single current or a single voltage into a mechanical displacement	<a href="#">G01R 5/00</a>
Specially adapted for high-voltage or high-current measuring arrangements	<a href="#">G01R 15/04</a> , <a href="#">G01R 15/14</a>
Measuring currents or voltages using digital measurement techniques	<a href="#">G01R 19/25</a>
Transmission systems for measured values, control or similar signals	<a href="#">G08C</a> , <a href="#">G08C 19/00</a>

## Informative references

*Attention is drawn to the following places, which may be of interest for search:*

Measurement of specific parameters, i.e. length, thickness, alignment, angles etc.	<a href="#">G01B</a>
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## Glossary of terms

*In this subclass/group, the following terms (or expressions) are used with the meaning indicated:*

GMR	Giant magneto-resistance
AMR	Anisotropic magneto-resistance

## G01D 7/00

### Indicating measured values

#### Definition statement

*This subclass/group covers:*

The displaying of measured values

- Analogue and numerical indication
- Indication by colour change
- Indication using tactile feedback

Indicating two or more values simultaneously

On the same of different screen

In co-ordinate form

Audible indication of measured values

- Measuring arrangements incorporating speech synthesizers
- Representing measurements using tones

Arrangements of instruments in vehicles or aircraft cockpits

#### Informative references

*Attention is drawn to the following places, which may be of interest for search:*

Specific details about vehicle dashboards	<a href="#">B60K 35/00</a> , <a href="#">B60K 37/00</a>
Aircraft cockpits in genera	<a href="#">B64C</a>
General constructional details of	<a href="#">G12B 11/00</a>

displays	
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## Special rules of classification within this main group

See also [B60K 35/00](#), [B60K 37/00](#)

See also [G12B 11/00](#) and sub-groups.

## G01D 9/00

### Recording measured values

#### Definition statement

*This subclass/group covers:*

The recording of measured values

- Solid state data-loggers
- Recording measured values on a recording medium
- Recording measured values with respect to time
- Recording measured values with respect to another measured value

Further details of subgroups

#### [G01D 9/005](#)

- See also [G06F 17/40](#), [G01P 1/06](#) and [A61B 5/04325](#).

#### Informative references

*Attention is drawn to the following places, which may be of interest for search:*

Animal/veterinary data loggers	<a href="#">A01K 11/006</a>
Medical data-loggers	<a href="#">A61B 5/04325</a>
Construction of data-loggers	<a href="#">G06F 17/40</a>

## G01D 11/00

### Component parts of measuring arrangements not specially

**adapted for a specific variable (G01D13/00, G01D15/00 take precedence)**

### **Definition statement**

*This subclass/group covers:*

Constructional aspects of measuring arrangements

- Bearings, suspensions
- Balancing or damping movement
- Housings for instruments
- Housings for sensors
- Illumination of measuring devices
- Mountings for sensors or instruments

Further details of subgroups

#### [G01D 11/00](#)

Also includes details of rotary shaft couplings;

Check also [G01D 5/34738](#).

#### [G01D 11/20](#)

See also [G01D 5/34738](#).

#### [G01D 11/24](#)

See also [G12B 9/02](#), [H05K 5/00](#), [H03K 17/9505](#).

#### [G01D 11/245](#)

Also includes details of sensor mountings;

#### [G01D 11/26](#)

Covers for utility meters, see [H02B 1/03](#);

Flanged joints and sealings, see [F16L 23/00](#).

#### [G01D 11/28](#)

See also [G01D 13/265](#);

See also [B60Q 3/04](#), [F21V 7/00](#), [G12B 11/02](#), [B60K 35/00](#) and [B60K 37/00](#);

#### [G01D 11/30](#)

Includes supports for sensor housings;

[H03K 17/9505](#) constructional details of proximity switches;

[F16M 11/00](#) or [F16M 13/00](#) supports in general.

## Informative references

*Attention is drawn to the following places, which may be of interest for search:*

Vehicle dashboards	<a href="#">B60K 35/00</a> , <a href="#">B60K 37/00</a>
Illumination of vehicle instruments	<a href="#">B60Q 3/04</a>
Light sources in general	<a href="#">F21V 7/00</a>
Component parts of indicators for measuring arrangements not specially adapted for a specific variable	<a href="#">G01D 13/00</a>
Component parts of recorders for measuring arrangements not specially adapted for a specific variable	<a href="#">G01D 15/00</a>
General constructional details	<a href="#">H05K</a> , <a href="#">G12B</a>

## G01D 13/00

### Component parts of indicators for measuring arrangements not specially adapted for a specific variable

#### Definition statement

*This subclass/group covers:*

Component parts of measurement indicators

- Scales
- Dials
- Graduation
- Pointers
- Pointers adapted to transmit light

Further details of subgroups

[G01D 13/28](#)

Transparent pointers for conducting light are found in [G01D 13/265](#);

See also [G01D 11/28](#).

## **G01D 15/00**

### **Component parts of recorders for measuring arrangements not specially adapted for a specific variable**

#### **Definition statement**

*This subclass/group covers:*

Recording type

- Punching or deforming the recording medium
- Heating the recording medium
- Recording magnetically
- Recording optically
- Printing

Drives for bringing the recording element into contact with the recording medium

Holding devices for the recording medium

The shape of the recording medium

Circular

Cylindrical

Strip or tape

#### **Informative references**

*Attention is drawn to the following places, which may be of interest for search:*

Printing per se	<a href="#">B41J</a>
Chemical composition of ink	<a href="#">C09D 11/00</a>

## G01D 18/00

Testing or calibrating of apparatus or arrangements provided for in groups G01D1/00 to G01D15/00

### Definition statement

*This subclass/group covers:*

Further details of subgroups

#### [G01D 18/008](#)

Deals with how calibration data is created;

Overlaps with [G01D 3/022](#) (the use of stored calibration data to improve measurement accuracy).

### References relevant to classification in this group

*This subclass/group does not cover:*

Testing or calibrating encoders	<a href="#">G01D 5/24452</a>
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## G01D 21/00

Measuring or testing not otherwise provided for

### Definition statement

*This subclass/group covers:*

Measuring or testing not specifically covered by other sub-groups

Measuring two or more variables simultaneously

i.e. pressure and temperature sensors in the same housing

Transmission of measured values

- Wirelessly
- Sensor networks
- Two-wire transmitters