G05D

SYSTEMS FOR CONTROLLING OR REGULATING NON-ELECTRIC VARIABLES (for continuous casting of metals B22D11/16; valves per se F16K; sensing non-electric variables, see the relevant subclasses of G01; for regulating electric or magnetic variables G05F)

Definition statement

This subclass/group covers:

Systems for controlling or regulating non-electric variables, in particular: position, trajectory, attitude or altitude of a vehicle; position or direction of an object; thickness or size of materials; flow rate; level; quantity ratio; linear or angular speed; force or stress; fluid pressure; torque or mechanical power; vibrations; chemical variables; humidity; temperature; viscosity; and illumination.

"controlling" means influencing a variable in any way, e.g. changing its direction or its value (including changing it to or from zero), maintaining it constant, limiting its range of variation.

"regulation" means maintaining a variable automatically at a desired value or within a desired range of values. The desired value or range may be fixed, or manually varied, or may vary with time according to a predeterminated "programme" or according to variation of another variable. Regulation is a form of control.

Merely acting on a variable for the purpose of influencing the state of a system (e.g. acting on the fuel flow rate in an engine for achieving a certain speed), where the value of the variable itself remains irrelevant, should a priori not be considered as controlling or regulating said variable.

References relevant to classification in this subclass

This subclass/group does not cover:

Features of general applicability to regulating systems, e.g. anti-hunting arrangements	G05B
Regulating electric or magnetic variables	G05F

Examples of places where the subject matter of this group is covered when specially adapted, used for a particular purpose, or incorporated in a larger system:

Milking machines	A01J 5/007

Welding parameters	B23K 9/095
Copying	B23Q 35/00
Grinding or polishing	B24B 17/00, B24B 49/00
Abrasive blasts	B24C 7/00
Dispensing beverages on draught	B67D 1/12
Electrographic, electrophotographic or magnetographic processes	G03G 21/20
Dynamo-electric motors or generators	H02P 5/00 to H02P 9/00

Special rules of classification within this subclass

Control systems specially adapted for particular apparatuses, machines or processes are classified in the subclasses for the apparatus, machine or process, provided that there is specific provision for control or regulation relevant to the special adaptation, either at a detailed level, (e.g. A21B 1/40: "for regulating temperature in bakers' ovens") or at a general level, (e.g. B23K 9/095: "for automatic control of welding parameters in arc welding"). Otherwise, classification is made in the most appropriate place in this subclass.

Places where there is specific provision of the kind referred to above at a detailed level have been listed under the main groups of this subclass (see "References relevant to classification in this subclass"). Where the provision is at a general level (e.g. of a kind appropriate to more than one of the main groups specified in the lists, or to main groups G05D 27/00 or G05D 29/00), the places are listed under this subclass.

A document that can be applied to two or more applications is not specific for any of them and has to be classified in G05D (for instance a thermostat for heating or air conditioning).

A formulation of the kind "regulator for the application X" should a priori not be considered as specific to said application.

Usually, the subdivisions of the regulation classes in the field of the application are less precise than in G05D, therefore giving a class in G05D may be useful for search.

When in a document there is mention of several controlled variables, one should try to visualize the block scheme of the regulation. The document is then to be classified in the group of the variable controlled in the outer control

loop. In case the regulation in one of the other control loops is of particular interest, it should also be classified in the group(s) of the variable(s) concerned.

Note that the above is without prejudice of the limiting references contained in the titles of the different groups and subgroups in this subclass.

In the main groups of this subclass, remarks found under "Further details of subgroups" are not meant to replace the definitions in the titles, but either give further information about the definitions or mention particular types of documents to be classified in the subgroups or to be excluded from them. In case no remark is made on a given subgroup, the title is considered to be self-explanatory.

In G05D, the hierarchy in classification is generally done according:

- to the physical variable

- Then to the nature of the auxiliary power used, with the following possibilities, not used for all the variables:

  - without auxiliary power (purely mechanical regulation)
  - with auxiliary non-electric power (e.g. pneumatic or hydraulic)
  - characterised by the use of electric means
  - with combination of electric and non-electric auxiliary power

- Then, to the type of sensor used.

Glossary of terms

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

Systems	includes self-contained devices such as speed governors, pressure regulators

G05D 1/00

Control of position, course or altitude of land, water, air, or space vehicles, e.g. automatic pilot (steering applicable only to other than landborne vehicles, e.g. three-dimensional steering applicable to both aircraft and submarines B60K; construction or disposition of steering means on land vehicles B62, on waterborne vessels B63; manual or

automatic control of aircraft, e.g. using automatic pilot or radiated signal B64C; radio navigation systems or analogous systems using other waves G01S)

Relationship between large subject matter areas

Subclass G01C covers navigation in general, i.e. determining the position and course of land vehicles, ships, aircraft, and space vehicles.

Subclass G01S covers radio, sonar or lidar navigation systems, i.e. navigation by use of radio, acoustic or optical waves, or analogue arrangements using other electromagnetic waves.

Subclass G08G covers navigation systems for traffic control purposes, i.e. systems in which the navigation is not performed autonomously by or in the vehicle, but where the vehicles are guided by instructions transmitted to them.

References relevant to classification in this group

This subclass/group does not cover:

Rail vehicles	B61
Control of linear or angular speed or of acceleration	G05D 13/00
Linear or angular position control of an object not being a vehicle	G05D 3/00

Examples of places where the subject matter of this group is covered when specially adapted, used for a particular purpose, or incorporated in a larger system:

Agricultural machines or implements	A01B 69/00
Toy vehicles	A63H 17/36
Air-cushion vehicles	B60V 1/11
Driver Assistance Systems for road vehicles	B60W 30/00
Steering controls of motor vehicles or trailers, i.e. means for initiating a change of direction	B62D 1/00
Chassis of endless-tracked vehicles	B62D 55/116

Arrangements for automatically controlling the steering depending on driving conditions	B62D 6/00
Marine steering; control of waterborne vessels	B63H 25/00
Controlling aircraft	B64C 13/00 to B64C 15/00
Controlling attitude or direction of aircraft ejector seats	B64D 25/11
Cosmonautic vehicles	B64G 1/24
Self-propelled missiles	F41G 7/00
Guided missiles	F42B 15/01
Marine torpedoes	F42B 19/01

Informative references

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

Navigation, i.e. determining the position and course of land vehicles, ships, aircraft, and space vehicles	G01C 21/00
Measuring distance traversed on the ground by vehicles, e.g. using odometers	G01C 22/00
Determining distance or velocity using waves and not using reflection or reradiation of waves	G01S 11/00
Radar systems specially designed for traffic control	G01S 13/91
Radar systems specially designed for anti-collision purposes	G01S 13/93
Sonar systems specially designed for anti-collision purposes	G01S 15/93

Lidar systems specially designed for anti-collision purposes	G01S 17/93
Position-fixing by co-ordinating a plurality of determinations of direction or position lines	G01S 5/00
Traffic control systems for road vehicles	G08G 1/00
Monitoring the location of fleet of vehicles in traffic control systems	G08G 1/123M
Anti-collision traffic control systems	G08G 1/16

Special rules of classification within this group

This main group concerns only vehicles.

Documents are classified here in case:

- the stability of the vehicle is obtained or improved by the regulation;

- the sensors are piloting-specific: (i) to follow a predetermined trajectory; (ii) there is an interaction between the position determination and the goal to be achieved (for example there is a camera to recognize the environment and a processor to determine the trajectory);

- the security of the piloting or the control of the piloting is achieved by electronic means;

- of remote control;

- of piloting-specific optimization; or

- of interactions between vehicles.

Within this main group, the possible applications of a land vehicle are also classified in G05D 201/02.

Within G05D 1/021 and its subgroups, an invention is classified in the subgroups of all the sensors that are essential for the invention. Sensors that are either optional or not directly involved in the invention are classified as additional information.

Further details of subgroups

G05D 1/0005

This subgroup covers control systems where the trajectory of an aircraft or satellite is optimized.

G05D 1/0077

Redundant control systems in general are classified only in G05B 9/03.

G05D 1/0083

This subgroup covers control of an aircraft while on the ground, i.e. while accelerating before taking-off, braking after touching down or taxiing.

G05D 1/02 and subgroups

This subgroup covers control systems where the position determination or the position evolution takes place on a two-dimensional space. If the nature of the vehicle is specified, then it is classified in the corresponding subgroup.

G05D 1/0202 and subgroup

This subgroup covers two-dimensional navigation of an aircraft while in flight.

G05D 1/021 and subgroups

This subgroup covers control systems to define a trajectory for a land vehicle, and to take suitable actions to make the vehicle follow said trajectory.

Aspects of navigation systems that are important per se should also be classified in the relevant groups of G01C.

Aspects of radio, sonar or lidar navigation systems that are important per se should also be classified in the relevant groups of G01S.

Aspects of navigation systems for traffic purposes that are important per se should also be classified in the relevant groups of G08G.

G05D 1/0236

This subgroup also covers control systems using barcode readers for positioning.

G05D 1/0261

This subgroup also covers control systems using RFID tags for positioning.

G05D 1/0295

This subgroup covers control systems where one of the vehicles sends orders to the others.

G05D 3/00

Control of position or direction (G05D1/00 takes precedence)

References relevant to classification in this group

This subclass/group does not cover:

Control of machine tools	B23Q
Programme-controlled manipulators	B25J 9/00
Programme-control systems	G05B 19/00
Position control of a vehicle	G05D 1/00
Control of linear or angular speed or of acceleration	G05D 13/00

Examples of places where the subject matter of this group is covered when specially adapted, used for a particular purpose, or incorporated in a larger system:

Footwear manufacture	A43D 119/00
Tool carriers in forging or pressing	B21K 31/00
Pattern-controlled boring or drilling tools	B23B 39/26
Planing or slotting machines controlled by copying device	B23D 1/30, B23D 3/06, B23D 5/04
Electrode to workpiece spacing in electric discharge and electrochemical machining	B23H 7/18
Workpiece in laser welding or cutting	B23K 26/02
Workpiece in welding	B23K 37/04
Molten metal in welding	B23K 37/06
Tool or work position in machine tools	B23Q 15/00, B23Q 16/00
Tools controlled by pattern or master model	B23Q 35/00

Spindles in machine tools	B23Q 5/20
Grinding controlled by patterns, drawings, magnetic tape or the like	B24B 17/00
Starting position in grinding	B24B 47/22
Actuating members in presses	B30B 15/24
Chassis of tracked vehicles	B62D 55/116
Web-advancing mechanisms	B65H 23/18
Dippers or buckets in dredgers	E02F 3/43
Fluid-pressure servomotors with follow-up action	F15B 9/00
Tracking of solar heat collectors	F24J 2/38
Photomechanical production of patterned or textured surfaces	G03F 9/00
Rotating heads in information storage systems	G11B 5/588
Movement of control elements in nuclear reactors	G21C 7/12

G05D 5/00

Control of dimensions of material

Definition statement

This subclass/group covers:

Control of thickness or size of material

References relevant to classification in this group

This subclass/group does not cover:

Examples of places where the subject matter of this group is covered when specially adapted, used for a particular purpose, or incorporated in a larger system:

Tobacco cutting	A24B 7/14
Thickness of coating of fluent material on surface	B05C 11/02
Thickness, width, diameter or other transverse dimensions of the products of metal-rolling mills	B21B 37/16
Dimension of glass ribbon	C03B 18/04
Thickness of layer in paper making	D21F 7/06

G05D 7/00

Control of flow (level control G05D9/00; ratio control G05D11/00; of media to the human body A61M5/168; weighing apparatus G01G)

Definition statement

This subclass/group covers:

Control of flow of liquids, gases, particulate matter and other fluent materials by action on throttling means and/or flow sources.

References relevant to classification in this group

This subclass/group does not cover:

Examples of places where the subject matter of this group is covered when specially adapted, used for a particular purpose, or incorporated in a larger system:

Air in hair drying helmets	A45D 20/26
Flow of media to the human body	A61M 5/168
Gases or vapour in electrostatic separators	B03C 3/36
Fluent material in coating devices	B05C 11/10
Dispensing beverages on draught	B67D 1/12
Transferring liquids	B67D 5/28

Gas purifiers	C10K 1/28
Flushing boreholes	E21B 21/08
Obtaining liquids from wells	E21B 43/12
Flow in non-positive displacement machines or systems	F01D 17/00
Lubrication arrangements	F01M 1/16
Coolant flow in cooling devices	F01P 7/00
Gas-turbine working fluid	F02C 9/16, F02C 9/50
Throttle passages in pipes	F16L 55/027
Air-flow or supply of heating or cooling fluids in air treatment arrangements	F24F 11/00
Air or gas flow in dryers	F26B 21/12
Continuous flow weighing apparatus	G01G 11/08
Coolant in nuclear power plant	G21D 3/14

Further details of subgroups:

G05D 7/0113

This subgroup covers valves where the flexible member itself, e.g. a membrane, acts on the valve seat.

G05D 7/0113

This subgroup covers for example flexible members having the form of a torus.

G05D 7/014

This subgroup covers valves comprising several pistons sliding one over the other.

G05D 7/0186

This subgroup covers valves using calibrated orifices for achieving a constant flow.

G05D 7/0611 and G05D 7/0623

These subgroups cover systems where the target flow is defined in dependence on a specific parameter, e.g. the speed of a vehicle.

G05D 7/0629

Within this subgroup, an invention is classified in the last appropriate place.

G05D 9/00

Level control, e.g. controlling quantity of material stored in vessel (controlling level of liquid-pool electrode in electric discharge tubes and lamps H01J1/10, H01J13/14)

Definition statement

This subclass/group covers:

Control of quantity of liquids or particulate matter in a vessel by action on the input and/or the output flow.

References relevant to classification in this group

This subclass/group does not cover:

Examples of places where the subject matter of this group is covered when specially adapted, used for a particular purpose, or incorporated in a larger system:

Liquid level in sedimentation arrangements	B01D 21/34
Ink level in printing, manifolding or duplicating arrangements	B41L 27/04
Feed water for boilers	F22D 5/00
Liquid pool electrodes in electric discharge tubes or lamps	H01J 1/10, H01J 13/14

G05D 11/00

Ratio control (control of chemical or physico-chemical variables, e.g. pH-value G05D21/00; humidity control

G05D22/00; control of viscosity G05D24/00; proportioning the ingredients for mixing clay or cement with other substances B28C7/00)

Definition statement

This subclass/group covers:

Control of the relative ratio of flow rate or of volume of two or more fluent materials by action on throttling means and/or flow sources.

References relevant to classification in this group

This subclass/group does not cover:

Examples of places where the subject matter of this group is covered when specially adapted, used for a particular purpose, or incorporated in a larger system:

Density in sedimentation arrangements	B01D 21/32
Mixers	B01F 15/04
Abrasive blasts	B24C 7/00
Mixtures of clays or cements	B28C 7/00
Bulk material conveyers	B65G 53/66
Flow ratio in jet-propulsion plants	F02K 3/075

Further details of subgroups:

G05D 11/005

This subgroup also covers systems using interconnected pistons

G05D 11/006

This subgroup covers systems comprising venturi aspirators.

G05D 11/008

This subgroup covers systems where the motor of the pump acting on the feeding of a fluid is operated by another fluid.

G05D 11/03

Subgroups G05D 11/001 to G05D 11/008 are used in preference to G05D 11/03, also for flow ratio control systems without auxiliary power.

G05D 11/16

Systems aiming at regulating a temperature by mixing hot and cold water are only classified in G05D 23/13 and subgroups.

G05D 13/00

Control of linear speed; Control of angular speed; Control of acceleration or deceleration, e.g. of a prime mover (synchronising telegraph receiver and transmitter H04L7/00)

References relevant to classification in this group

This subclass/group does not cover:

Arrangements for synchronising receiver with transmitter	H04L 7/00

Examples of places where the subject matter of this group is covered when specially adapted, used for a particular purpose, or incorporated in a larger system:

Drum speed in metal drawing	B21C 1/12
Cutting velocity of tool or work	B23Q 15/00
Ram speed in presses	B30B 15/20
Setting or limiting speed of vehicles	B60K 31/00
Electrically-propelled vehicles	B60L 15/00
Road vehicle cruise control	B60W 30/00
Cruising speed of aircraft	B64D 31/08
Feed rate in manufacture of artificial filaments, threads, fibres, bristles or ribbons	D01D 1/09
Carding machines	D01G 15/36
Warping, beaming or leasing machines	D02H 13/14

Cyclically varying speed of looms	D03D 51/16
Speed of fluid carrier in chemical analysis	G01N 30/32
Record carriers or heads for such carriers in information storage systems	G11B 15/46, G11B 19/28

G05D 15/00

Control of mechanical force or stress; Control of mechanical pressure

References relevant to classification in this group

This subclass/group does not cover:

Examples of places where the subject matter of this group is covered when specially adapted, used for a particular purpose, or incorporated in a larger system:

Portable percussive tools	B25D 9/26
Ram pressure in presses	B30B 15/22
Tension in webs, tapes, filamentary material	B65H 23/00, B65H 59/00
Tension in filamentary material	B65H 59/00
Rope, cable or chain tension	B66D 1/50
Tension in looms	D03D 49/04
Tension in sewing machines	D05B 47/04
Pressure in paper-making machines	D21F 3/06
Drying fabrics	F26B 13/12
Pressure in dryers	F26B 21/10
Record carrier tension in information storage arrangements	G11B 15/43

G05D 16/00

Control of fluid pressure (control of pressure in electric discharge tubes or lamps H01J e.g. H01J7/14; control of pressure in electric incandescent lamps H01K1/52)

References relevant to classification in this group

This subclass/group does not cover:

Valves per se	F16K

Examples of places where the subject matter of this group is covered when specially adapted, used for a particular purpose, or incorporated in a larger system:

Tyre pressure	B60C 23/00
Air within diving suit	B63C 11/08
Aircraft air-pressure	B64D 13/00
Bulk material conveyers	B65G 53/66
Manufacture of artificial filaments, threads, fibres, bristles or ribbons	D01D 1/09
Flushing boreholes	E21B 21/08
Lubrication arrangements	F01M 1/16
Pressure of fluid carrier in chemical analysis	G01N 30/32
Pressure in electric discharge tubes or lamps	H01J 7/14
Pressure in electric incandescent lamps	H01K 1/52

Further details of subgroups

G05D 16/0602

This subgroup covers valves in series or in cascade, where the output of one valve is the input of another one.

G05D 16/0605

This subgroup covers valves having their inputs and/or outputs connected together.

G05D 16/106

This subgroup covers valves comprising several pistons sliding one over the other.

G05D 16/14 and subgroups

This subgroup covers non-electric pilot valves.

G05D 16/2086

This subgroup covers valves where the electric energy is used for adjusting the set point of an otherwise purely mechanical regulator.

G05D 16/2093

This subgroup covers electromagnetic pilot valves.

G05D 17/00

Control of torque; Control of mechanical power

Definition statement

This subclass/group covers:

Regulation of the torque of tightening tools, control of the torque or power of electric motors, combustion engines and the like when the control is not specific of the particular drive.

References relevant to classification in this group

This subclass/group does not cover:

Torque limiters in tools	B25B 23/14
Propulsion units in vehicles	B60K
Control of combustion engines	F02D
Control of electric motors	H02P

G05D 19/00

Control of mechanical oscillations, e.g. of amplitude, of frequency, of phase (generating or transmitting mechanical vibrations B06B; control of electric motors H02P)

Definition statement

This subclass/group covers:

Control of mechanical oscillations or vibrations in machines or structures, either by generating oscillations, or by damping oscillations, other than suppression of vibrations.

References relevant to classification in this group

This subclass/group does not cover:

Musical instruments; acoustics	G10
Loudspeakers or like acoustic electromechanical transducers	H04R

Examples of places where the subject matter of this group is covered when specially adapted, used for a particular purpose, or incorporated in a larger system:

Portable percussion tools	B25D 9/26
Jigging conveyers	B65G 27/32
Suppression of vibrations in systems	F16F 15/002

Informative References:

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

Generating or transmitting mechanical vibrations	B06B
Control of electric motors	H02P

G05D 21/00

Control of chemical or physico-chemical variables, e.g. pH value

Definition statement

This subclass/group covers:

Regulation of chemical composition, concentration, pH or the like in a chemical process when the regulation is not specific of the particular process.

References relevant to classification in this group

This subclass/group does not cover:

Ratio control	G05D11
Humidity control	G05D22
Control of viscosity	G05D24

Examples of places where the subject matter of this group is covered when specially adapted, used for a particular purpose, or incorporated in a larger system:

Density in sedimentation arrangements	B01D 21/32
Treating gases or vapours	B01D 53/30
Composition of fluid carrier in chemical analysis	G01N 30/34

Informative References:

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

Physical or chemical processes in general	B01J
Treatment of water	C02F

G05D 22/00

Control of humidity (of tobacco products A24B9/00; air conditioning F24F)

References relevant to classification in this group

This subclass/group does not cover:

Examples of places where the subject matter of this group is covered when specially adapted, used for a particular purpose, or incorporated in a larger system:

Watering gardens, fields, sports grounds or the like	A01G 25/16
Poultry incubators	A01K 41/04
Tobacco products	A24B 9/00
Moistening in air treating devices of vehicles	B60H 3/02
Air conditioning	F24F 11/00
Dryers	F26B 21/08

G05D 23/00

Control of temperature (automatic switching arrangements for electric heating apparatus H05B1/02; controlling induction heating H05B6/06; regulating temperature of anode of X-ray tube H05G1/36)

References relevant to classification in this group

This subclass/group does not cover:

Examples of places where the subject matter of this group is covered when specially adapted, used for a particular purpose, or incorporated in a larger system:

Bakers' ovens	A21B 1/40
Hair curlers	A45D 6/20
Metal extruding	B21C 31/00

Tyre temperature	B60C 23/00
Cosmonautic vehicles	B64G 1/50
Float baths in glass making	C03B 18/18, C03B 18/22
Manufacture of artificial filaments, threads, fibres, bristles or ribbons	D01D 1/09
Knitting machines	D04B 35/30
Hand irons	D06F 75/26
Paper-making machines	D21F 5/06
Lubricant in lubrication arrangements	F01M 5/00
Arrangements for supplying oil or unspecified lubricant from a reservoir	F16N 7/08
Steam superheat	F22G 5/00
Dryers	F26B 21/10
Temperature of fluid carrier in chemical analysis	G01N 30/30
Electric storage cells	H01M 10/50
Automatic switching arrangements for electric heating apparatus	H05B 1/02
Dielectric, induction or microwave heating	H05B 6/06,H05B 6/50, H05B 6/68
Anode of X-ray tube	H05G 1/36

Special rules of classification within this group

Within subgroups G05D 23/01 to G05D 23/32, an invention is classified in the last appropriate place in the absence of an indication of the contrary.

Further details of subgroups:

G05D 23/022, G05D 23/025 and G05D 23/123

These subgroups cover valves controlling the flow of a fluid as a function of the temperature of said fluid.

G05D 23/023, G05D 23/026 and G05D 23/125

These subgroups cover valves controlling the flow of a fluid as a function of the temperature of an external sensor, e.g. thermostat for radiator.

G05D 23/024 and subgroups

These subgroups cover memory shape alloys working as a sensing element.

G05D 23/028

This subgroup covers systems where the fusing of an element irreversibly releases a cooling fluid.

G05D 23/128

This subgroup covers valves controlling the flow of fuel to a burner as a function of the temperature of a controlled space.

G05D 23/1333

This subgroup covers valves distributing the flow of a fluid among two conduits as a function of the temperature of said fluid, e.g. refrigerating systems.

G05D 23/1353

This subgroup covers not only valves where the flow is regulated, but also where it is just set by the user.

G05D 23/185 and subgroups

These subgroups cover valves similar to the corresponding subgroups in G05D 23/01, but further comprising the use of auxiliary pneumatic or hydraulic energy.

G05D 23/19 and subgroups

These subgroups cover inventions where the nature of the sensing element is not mentioned or is irrelevant.

G05D 23/20 and subgroups

This covers inventions where the sensing element has a variation of electric or magnetic properties other than defined in G05D 23/22, G05D 23/24 or G05D 23/26, e.g. a semiconductor, an ionized gas or a capacitor.

G05D 23/1902, G05D 23/2002, G05D 23/2202, G05D 23/2403, G05D

23/2602, G05D 23/2702 and G05D 23/27502

These subgroups cover inventions relating to the input means of the reference value.

G05D 23/1904, G05D 23/2003, G05D 23/2203, G05D 23/2405 and G05D 23/27503

These subgroups cover systems where a temperature profile is defined as a function of time.

G05D 23/1906, G05D 23/2006, G05D 23/2206, G05D 23/2408, G05D 23/2605, G05D 23/2705 and G05D 23/27506

These subgroups cover systems where the control action is a continuous function of the measured error.

G05D 23/1913, G05D 23/2012, G05D 23/2212, G05D 23/2417 and G05D 23/27513

These subgroups cover systems delivering a series of pulses having a frequency that is a continuous function of the measured error.

G05D 23/1919, G05D 23/2017, G05D 23/2217, G05D 23/2424, G05D 23/2616, G05D 23/2716 and G05D 23/27518

These subgroups also cover systems using Peltier effect devices.

G05D 23/1921, G05D 23/2019, G05D 23/2219, G05D 23/2427 and G05D 23/2752

These subgroups cover systems where the actuator consists of a heat expanding element being heated electrically in order to act on a valve.

G05D 23/1923, G05D 23/202, G05D 23/222, G05D 23/2429 and G05D 23/27522

These subgroups cover control systems for storage heaters.

G05D 23/1924, G05D 23/2022, G05D 23/2222, G05D 23/243 and G05D 23/27523

These subgroups cover systems using solar energy.

G05D 23/1931, G05D 23/2028, G05D 23/2228, /24G4B and /275G4B

These subgroups cover systems measuring the temperature of the controlled space and of another space in thermal relationship with it, e.g. outdoors.

G05D 23/1951

This subgroup covers systems where one sensor is used for control after the other, e.g. measuring the input flow temperature of a heating system and later

switching to measuring the output flow temperature.

G05D 24/00

Control of viscosity

G05D 25/00

Control of light, e.g. intensity, colour, phase (mechanically operable parts of lighting devices for the control of light F21V; optical devices or arrangements using movable or deformable elements for controlling light independent of the light source G02B26/00; devices or arrangements, the optical operation of which is modified by changing the optical properties of the medium of the devices or arrangements for the control of light, circuit arrangements specially adapted therefor, control of light by electro-magnetic waves, electrons or other elementary particles G02F1/00; circuit arrangements for controlling light sources H01S3/10, H05B33/08, H05B35/00 to H05B43/00)

Definition statement

This subclass/group covers:

Regulation of intensity, colour or phase of light other than by acting on the light sources.

References relevant to classification in this group

This subclass/group does not cover:

Vehicle lighting	B60Q
Operating screening devices	E06B 9/68
Mechanically operable parts of lighting devices for the control of light	F21V
Optical devices or arrangements using movable or deformable elements for controlling light independent of the light source	G02B 26/00
Devices or arrangements, the optical operation of which is modified by changing the optical properties of the medium of the devices or	G02F 1/00

arrangements for the control of light, circuit arrangements specially adapted therefor, control of light by electro-magnetic waves, electrons or other elementary particles	

Examples of places where the subject matter of this group is covered when specially adapted, used for a particular purpose, or incorporated in a larger system:

Photographic composing machines	B41B 21/08
Lasers and other light sources	H01S 3/10,H05B 33/08, H05B 35/00 to H05B 43/00

G05D 27/00

Simultaneous control of variables covered by two or more of the preceding main groups

Special rules of classification within this group

If there is a double regulation (two independent set points for two corresponding controlled variables, e.g. temperature and humidity, when there are interactions in the control loops), the document is also classified in this group. Thus, this group should be assigned in addition to the groups corresponding to the two or more controlled variables.

G05D 29/00

Simultaneous control of electric and non-electric variables

Special rules of classification within this group

If there is a double regulation (two independent set points for two corresponding controlled variables, when there are interactions in the control loops), the document is also classified in this group. Thus, this group should be assigned in addition to the groups corresponding to the two or more controlled variables.

G05D 99/00

Subject matter not provided for in other groups of this subclass

Special rules of classification within this group

This group is not being used.