

CPC**COOPERATIVE PATENT CLASSIFICATION****F05B**

INDEXING SCHEME RELATING TO MACHINES OR ENGINES OTHER THAN NON-POSITIVE-DISPLACEMENT MACHINES OR ENGINES, TO WIND MOTORS, TO NON-POSITIVE DISPLACEMENT PUMPS, AND TO GENERATING COMBUSTION PRODUCTS OF HIGH PRESSURE OR HIGH VELOCITY

NOTE

This subclass constitutes an internal scheme for indexing only.

F05B 2200/00**Mathematical features**

- F05B 2200/10 . Basic functions
- F05B 2200/11 . . Sum
- F05B 2200/12 . . Substraction
- F05B 2200/13 . . Product
- F05B 2200/14 . . Division
- F05B 2200/15 . . Inverse
- F05B 2200/20 . Special functions
- F05B 2200/21 . . Root
- F05B 2200/211 . . . Square root
- F05B 2200/212 . . . Cubic root
- F05B 2200/22 . . Power
- F05B 2200/221 . . . Square power
- F05B 2200/222 . . . Cubic power
- F05B 2200/23 . . Logarithm
- F05B 2200/24 . . exponential
- F05B 2200/25 . . Hyperbolic trigonometric, e.g. sinh, cosh, tanh
- F05B 2200/26 . . trigonometric
- F05B 2200/261 . . . Sine
- F05B 2200/262 . . . Cosine
- F05B 2200/263 . . . Tangent
- F05B 2200/264 . . . Cotangent
- F05B 2200/30 . miscellaneous
- F05B 2200/31 . . odd
- F05B 2200/32 . . even
- F05B 2200/33 . . bigger/smaller
- F05B 2200/34 . . biggest/smallest
- F05B 2200/35 . . first

F05B 2200/36 . . . last

F05B 2210/00 Working fluid

NOTE

Indexing codes of group [F05B 2210/00](#) can be followed by a name for a specific working fluid preceded by the "+" sign, e.g. [F05B 2210/11](#)+water.

- F05B 2210/10 . Kind or type
- F05B 2210/11 . . liquid, i.e. incompressible
- F05B 2210/12 . . gaseous, i.e. compressible
- F05B 2210/13 . . mixed, e.g. two-phase fluid
- F05B 2210/132 . . . Pumps with means for separating and evacuating the gaseous phase
- F05B 2210/14 . . Refrigerants with particular properties, e.g. HFC-[134a](#)
- F05B 2210/16 . Air or water being indistinctly used as working fluid, i.e. the machine can work equally with air or water without any modification
- F05B 2210/18 . Air and water being simultaneously used as working fluid
- F05B 2210/20 . Properties
- F05B 2210/30 . Flow characteristics
- F05B 2210/301 . . with Mach-number kept constant along the flow
- F05B 2210/302 . . Pressure kept constant along the flow
- F05B 2210/40 . Flow geometry or direction
- F05B 2210/401 . . upwards due to the buoyancy of compressed air
- F05B 2210/402 . . Axial inlet and radial outlet
- F05B 2210/403 . . Radial inlet and axial outlet
- F05B 2210/404 . . bidirectional, i.e. in opposite, alternating directions

F05B 2220/00 Application

- F05B 2220/10 . in ram-jet engines or ram-jet driven vehicles
- F05B 2220/20 . within closed fluid conduits, e.g. pipes
- F05B 2220/25 . as advertisement
- F05B 2220/30 . in turbines
- F05B 2220/301 . . in steam turbines
- F05B 2220/302 . . in gas turbines
- F05B 2220/3021 . . . for a special turbine stage
- F05B 2220/3022 the first stage of a turbine

- F05B 2220/3023 an intermediate stage of the turbine
- F05B 2220/3025 the last stage of the turbine
- F05B 2220/303 . . . for aircraft propulsion, e.g. jet engines
- F05B 2220/304 . . . to drive unshrouded, low solidity propeller
- F05B 2220/305 . . . to drive unshrouded, high solidity propeller
- F05B 2220/306 . . . to drive shrouded, low solidity propeller
- F05B 2220/307 . . . to drive shrouded, high solidity propeller
- F05B 2220/308 . . . providing direct vertical lift
- F05B 2220/309 . . . in a helicopter
- F05B 2220/31 . . in ram-air turbines ("RATS")
- F05B 2220/32 . . in water turbines
- F05B 2220/33 . . specially adapted for the fan of turbofan engines

- F05B 2220/40 . in turbochargers

- F05B 2220/50 . for auxiliary power units (APU's)

- F05B 2220/60 . making use of surplus or waste energy
- F05B 2220/602 . . with energy recovery turbines
- F05B 2220/604 . . for domestic central heating or production of electricity

- F05B 2220/61 . for hydrogen and/or oxygen production

- F05B 2220/62 . for desalination

- F05B 2220/64 . for aeration

- F05B 2220/70 . in combination with
- F05B 2220/702 . . a steam turbine
- F05B 2220/704 . . a gas turbine
- F05B 2220/706 . . an electrical generator
- F05B 2220/7062 . . . of the direct current (D.C.) type
- F05B 2220/7064 . . . of the alternating current (A.C.) type
- F05B 2220/70642 of the synchronous type
- F05B 2220/70644 of the asynchronous type, i.e. induction type
- F05B 2220/70646 Double fed induction generators (DFIGs)
- F05B 2220/7066 . . . via a direct connection, i.e. a gearless transmission
- F05B 2220/7068 . . . equipped with permanent magnets
- F05B 2220/707 . . . of the linear type
- F05B 2220/708 . . Photoelectric means, i.e. photovoltaic or solar cells
- F05B 2220/709 . . Piezoelectric means

- F05B 2220/80 . in supersonic vehicles excluding hypersonic vehicles or ram, scram or rocket propulsion

- F05B 2220/90 . in vehicles adapted for vertical or short take off and landing ([v/stol vehicles](#)), ([gas turbines providing direct vertical lift F05B 2220/308](#))

F05B 2230/00**Manufacture****NOTE**

Manufacture comprises also treatment, assembly or disassembly methods, repairing, handling or the like.

- F05B 2230/10 . by removing material
- F05B 2230/101 .. by electrochemical methods
- F05B 2230/102 .. by spark erosion methods
- F05B 2230/103 .. using lasers
- F05B 2230/104 . Micromachining
- F05B 2230/20 . essentially without removing material
- F05B 2230/21 .. by casting
- F05B 2230/211 ... by precision casting, e.g. microfusing or investment casting
- F05B 2230/22 .. by sintering
- F05B 2230/23 .. by permanently joining parts together
- F05B 2230/232 ... by welding
- F05B 2230/233 Electron beam welding
- F05B 2230/234 Laser welding
- F05B 2230/235 Tig/Mig welding
- F05B 2230/236 Diffusion bonding
- F05B 2230/237 Brazing
- F05B 2230/238 Soldering
- F05B 2230/239 Inertia or friction welding
- F05B 2230/24 .. by extrusion
- F05B 2230/25 .. by forging
- F05B 2230/26 .. by rolling
- F05B 2230/30 . with deposition of material
- F05B 2230/31 .. Layer deposition
- F05B 2230/311 ... by torch or flame spray
- F05B 2230/312 ... by plasma spray
- F05B 2230/313 ... by physical vapour deposition
- F05B 2230/314 ... by chemical vapour deposition
- F05B 2230/40 . Heat treatment
- F05B 2230/41 .. Hardening; Annealing
- F05B 2230/50 . Building or constructing in particular ways
- F05B 2230/502 .. using existing or "off the shelf" parts, e.g. using standardised turbocharger elements

- F05B 2230/60 . Assembly methods
- F05B 2230/601 .. using limited numbers of standard modules which can be adapted by machining
- F05B 2230/604 .. using positioning or alignment devices for aligning or centering, e.g. pins
- F05B 2230/606 ... using maintaining alignment while permitting differential dilatation
- F05B 2230/608 ... for adjusting the position or the alignment, e.g. wedges or excenters
- F05B 2230/61 .. using auxiliary equipment for lifting or holding ([hoisting on to a stationary structure with provisions on the structure itself F05B 2240/916](#))
- F05B 2230/6102 ... carried on a floating platform
- F05B 2230/70 . Disassembly methods
- F05B 2230/80 . Repairing, retrofitting or upgrading methods
- F05B 2230/90 . Coating; Surface treatment ([manufacture with deposition of material F05B 2220/30](#))

F05B 2240/00**Components****NOTE**

Components are the basic elements of construction.

- F05B 2240/10 . Stators
- F05B 2240/11 .. Shroud seal segments
- F05B 2240/12 .. Fluid guiding means, e.g. vanes
- F05B 2240/121 ... Baffles or ribs
- F05B 2240/122 ... Vortex generators, turbulators, or the like, for mixing ([by creating turbulence F05B 2260/222](#))
- F05B 2240/123 ... Nozzles
- F05B 2240/1231 Plug nozzles
- F05B 2240/124 ... Cascades, i.e. assemblies of similar profiles acting in parallel
- F05B 2240/13 .. to collect or cause flow towards or away from turbines
- F05B 2240/131 ... by means of vertical structures, i.e. chimneys
- F05B 2240/132 ... creating a vortex or tornado effect
- F05B 2240/133 ... with a convergent-divergent guiding structure, e.g. a Venturi conduit
- F05B 2240/14 .. Casings, housings, nacelles, gondels or the like, protecting or supporting assemblies within
- F05B 2240/142 ... in the form of a standard ISO container
- F05B 2240/20 . Rotors
- F05B 2240/201 .. using the Magnus-effect
- F05B 2240/202 .. with adjustable area of intercepted fluid
- F05B 2240/2021 ... by means of telescoping blades
- F05B 2240/2022 ... by means of tethering or coning blades
- F05B 2240/2023 ... by means of radially reefing blades

F05B 2240/21	..	for wind turbines
F05B 2240/211	...	with vertical axis
F05B 2240/212	....	of the Darrieus type
F05B 2240/213	....	of the Savonius type
F05B 2240/214	....	of the Musgrove or "H"-type
F05B 2240/215	....	of the panemone or "vehicle ventilator" type
F05B 2240/216	....	of the anemometer type
F05B 2240/217	....	of the crossflow- or "Banki"- or "double action" type
F05B 2240/218	....	with horizontally hinged vanes
F05B 2240/221	...	with horizontal axis
F05B 2240/2211	....	of the multibladed, low speed, e.g. "American farm" type
F05B 2240/2212	....	perpendicular to wind direction
F05B 2240/2213	....	and with the rotor downwind from the yaw pivot axis
F05B 2240/231	...	driven by aerodynamic lift effects
F05B 2240/232	....	driven by drag
F05B 2240/24	..	for turbines
F05B 2240/241	...	of impulse type
F05B 2240/2411	....	Pelton type
F05B 2240/242	...	of reaction type
F05B 2240/243	...	of the Archimedes screw type
F05B 2240/244	...	of the cross-flow, e.g. Banki, Ossberger type
F05B 2240/30	..	Characteristics of rotor blades, i.e. of any element transforming dynamic fluid energy to or from rotational energy and being attached to a rotor
F05B 2240/301	...	Cross-section characteristics
F05B 2240/302	...	Segmented or sectional blades
F05B 2240/31	...	of changeable form or shape
F05B 2240/311	....	flexible or elastic
F05B 2240/312	....	capable of being reefed
F05B 2240/3121	.....	around an axis orthogonal to rotor rotational axis
F05B 2240/313	....	with adjustable flow intercepting area (F05B 2240/312 takes precedence)
F05B 2240/32	...	with roughened surfaces
F05B 2240/33	..	Shrouds which are part of or which are rotating with the rotor
F05B 2240/34	..	with auxiliary or secondary rotors attached to blades of main rotor
F05B 2240/35	.	Combustors or associated equipment
F05B 2240/36	..	Fuel vaporizer
F05B 2240/40	.	Use of a multiplicity of similar components
F05B 2240/50	.	Bearings
F05B 2240/51	..	magnetic
F05B 2240/511	...	with permanent magnets
F05B 2240/515	...	electromagnetic

F05B 2240/52	..	Axial thrust bearings
F05B 2240/53	..	Hydrodynamic or hydrostatic bearings
F05B 2240/54	..	Radial bearings
F05B 2240/57	.	Seals
F05B 2240/571	..	Brush seals
F05B 2240/572	..	Leaf seals
F05B 2240/60	.	Shafts
F05B 2240/61	..	hollow
F05B 2240/62	..	flexible
F05B 2240/63	..	Glands for admission or removal of fluids from shafts
F05B 2240/70	.	Slinger plates or washers
F05B 2240/80	.	Platforms for stationary or moving blades
F05B 2240/801	..	cooled platforms
F05B 2240/90	.	Mounting on supporting structures or systems
F05B 2240/91	..	on a stationary structure
F05B 2240/911	...	already existing for a prior purpose
F05B 2240/9111	....	which is a chimney
F05B 2240/9112	....	which is a building
F05B 2240/9113	....	which is a roadway, rail track, or the like for recovering energy from moving vehicles
F05B 2240/912	...	on a tower
F05B 2240/9121	....	on a lattice tower
F05B 2240/913	...	on a mast
F05B 2240/914	...	on an inflatable structure
F05B 2240/915	...	which is vertically adjustable
F05B 2240/9151	....	telescopically
F05B 2240/9152	....	by being hinged
F05B 2240/91521	.....	at ground level
F05B 2240/916	...	with provision for hoisting onto the structure
F05B 2240/917	...	attached to cables
F05B 2240/92	..	on an airborne structure
F05B 2240/921	...	kept aloft due to aerodynamic effects
F05B 2240/922	...	kept aloft due to buoyancy effects
F05B 2240/923	...	which is a vehicle
F05B 2240/93	..	on a structure floating on a liquid surface
F05B 2240/931	...	which is a vehicle
F05B 2240/932	...	which is a catamaran-like structure
F05B 2240/94	..	on a movable wheeled structure
F05B 2240/941	...	which is a land vehicle

- F05B 2240/95 . . offshore
- F05B 2240/96 . . as part of a wind farm
- F05B 2240/97 . . on a submerged structure
- F05B 2240/98 . . which is inflatable
- F05B 2240/99 . characterised by colour or colour patterns

F05B 2250/00**Geometry****NOTE**

Geometry indicates the shape or form of a component or the configuration or arrangement of components in a machine or in a plant.

- F05B 2250/02 . variable
- F05B 2250/10 . two-dimensional
- F05B 2250/11 . . triangular
- F05B 2250/12 . . rectangular
- F05B 2250/121 . . . square
- F05B 2250/13 . . trapezoidal
- F05B 2250/131 . . . polygonal
- F05B 2250/132 . . . hexagonal
- F05B 2250/14 . . elliptical
- F05B 2250/141 . . . circular
- F05B 2250/15 . . spiral
- F05B 2250/16 . . parabolic
- F05B 2250/17 . . hyperbolic
- F05B 2250/18 . . patterned
- F05B 2250/181 . . . ridged
- F05B 2250/182 . . . crenellated, notched
- F05B 2250/183 . . . zigzag
- F05B 2250/184 . . . sinusoidal
- F05B 2250/19 . . machined; miscellaneous
- F05B 2250/191 . . . perforated
- F05B 2250/192 . . . beveled
- F05B 2250/193 . . . milled
- F05B 2250/20 . three-dimensional
- F05B 2250/21 . . pyramidal
- F05B 2250/22 . . parallelepipedic
- F05B 2250/221 . . . cubic
- F05B 2250/23 . . prismatic
- F05B 2250/231 . . . cylindrical

F05B 2250/232	...	conical
F05B 2250/24	..	ellipsoidal
F05B 2250/241	...	spherical
F05B 2250/25	..	helical
F05B 2250/26	..	paraboloidal
F05B 2250/27	..	hyperboloidal
F05B 2250/28	..	patterned
F05B 2250/281	...	threaded
F05B 2250/282	...	Cubic pattern
F05B 2250/283	...	Honeycomb
F05B 2250/29	..	machined; miscellaneous
F05B 2250/291	...	hollowed
F05B 2250/292	...	tapered
F05B 2250/293	...	lathed, e.g. rotation symmetrical
F05B 2250/30	.	Arrangement of components
F05B 2250/31	..	according to the direction of their main axis or their axis of rotation
F05B 2250/311	...	the axes being in line
F05B 2250/312	...	the axes being parallel to each other
F05B 2250/313	...	the axes being perpendicular to each other
F05B 2250/314	...	the axes being inclined in relation to each other
F05B 2250/315	...	the main axis being substantially vertical
F05B 2250/32	..	according to their shape
F05B 2250/321	...	asymptotic
F05B 2250/322	...	tangential
F05B 2250/323	...	convergent
F05B 2250/324	...	divergent
F05B 2250/33	..	symmetrical
F05B 2250/34	..	translated
F05B 2250/35	..	rotated
F05B 2250/36	..	in inner-outer relationship, e.g. shaft-bearing arrangements
F05B 2250/40	.	Movement of component
F05B 2250/41	..	with one degree of freedom
F05B 2250/411	...	in rotation
F05B 2250/42	..	with two degrees of freedom
F05B 2250/43	..	with three degrees of freedom
F05B 2250/50	.	Inlet or outlet
F05B 2250/501	..	Inlet
F05B 2250/5011	...	augmenting, i.e. with intercepting fluid flow cross sectional area greater than the rest of the machine behind the inlet
F05B 2250/5012	...	concentrating only, i.e. with intercepting fluid flow cross sectional area not greater than the rest of the machine behind the inlet

F05B 2250/502	..	Outlet
F05B 2250/503	..	of regenerative pumps
F05B 2250/60	.	Structure; Surface texture
F05B 2250/61	..	corrugated
F05B 2250/611	...	undulated
F05B 2250/62	..	smooth
F05B 2250/621	...	polished
F05B 2250/70	.	Shape
F05B 2250/71	..	curved
F05B 2250/711	...	convex
F05B 2250/712	...	concave
F05B 2250/713	...	inflexed
F05B 2250/72	..	symmetric
F05B 2250/73	..	asymmetric
F05B 2250/80	.	Size or power range of the machines
F05B 2250/82	..	Micromachines
F05B 2250/84	..	Nanomachines (Nanotechnology for interacting, sensing or actuating Y01N 8/00)
F05B 2250/86	..	Megamachines
F05B 2260/00		Function
F05B 2260/02	.	Transport, e.g. specific adaptations or devices for conveyance (transport of wind turbines or equipments therefore F03D 1/005)
F05B 2260/10	.	Particular cycles
F05B 2260/20	.	Heat transfer, e.g. cooling
F05B 2260/201	..	by impingement of a fluid
F05B 2260/202	..	by film cooling
F05B 2260/203	..	by transpiration cooling
F05B 2260/205	..	Cooling fluid recirculation, i.e. after having cooled one or more components the cooling fluid is recovered and used elsewhere for other purposes
F05B 2260/207	..	using a phase changing mass, (e.g. heat absorbing by melting or boiling)
F05B 2260/208	..	using heat pipes
F05B 2260/209	..	using vortex tubes
F05B 2260/211	..	by intercooling, e.g. during a compression cycle
F05B 2260/212	...	by water injection
F05B 2260/221	..	Improvement of heat transfer
F05B 2260/222	...	by creating turbulence (vortex generators, turbulators or the like for mixing F05B 2240/122)
F05B 2260/224	...	by increasing the heat transfer surface
F05B 2260/2241	....	using fins or ribs

- F05B 2260/231 . . Preventing heat transfer
- F05B 2260/232 . . characterised by the cooling medium
- F05B 2260/233 . . . the medium being steam
- F05B 2260/24 . . for draft enhancement in chimneys, using solar or other heat sources

- F05B 2260/30 . Retaining components in desired mutual position
- F05B 2260/301 . . Retaining bolts or nuts
- F05B 2260/3011 . . . of the frangible or shear type
- F05B 2260/302 . . by means of magnetic or electromagnetic forces
- F05B 2260/303 . . with a bayonet coupling
- F05B 2260/304 . . Balancing of radial or axial forces on regenerative rotors
- F05B 2260/305 . . Reducing friction between regenerative impeller discs and casing walls

- F05B 2260/40 . Transmission of power
- F05B 2260/402 . . through friction drives
- F05B 2260/4021 . . . through belt drives
- F05B 2260/4022 . . . through endless chains
- F05B 2260/4023 . . . through a friction clutch
- F05B 2260/403 . . through the shape of the drive components
- F05B 2260/4031 . . . as in toothed gearing
- F05B 2260/40311 of the epicyclic, planetary or differential type
- F05B 2260/404 . . through magnetic drive coupling
- F05B 2260/4041 . . . the driven magnets encircling the driver magnets
- F05B 2260/406 . . through hydraulic systems
- F05B 2260/407 . . through piezoelectric conversion
- F05B 2260/408 . . through magnetohydrodynamic conversion

- F05B 2260/42 . Storage of energy
- F05B 2260/421 . . in the form of rotational kinetic energy , e.g. in flywheels

- F05B 2260/50 . Kinematic linkage, i.e. transmission of position
- F05B 2260/502 . . involving springs
- F05B 2260/503 . . using gears
- F05B 2260/5032 . . . of the bevel or angled type
- F05B 2260/504 . . using flat or V-belts and pulleys
- F05B 2260/505 . . using chains and sprockets; using toothed belts
- F05B 2260/506 . . using cams or eccentrics
- F05B 2260/507 . . using servos, independent actuators, etc.

- F05B 2260/60 . Fluid transfer
- F05B 2260/601 . . using an ejector or a jet pump
- F05B 2260/602 . . Drainage
- F05B 2260/603 . . . of leakage having past a seal (seals [F05B 2240/57](#); glands [F05B 2240/63](#))
- F05B 2260/604 . . Vortex non-clogging type pumps

- F05B 2260/63 . . Preventing clogging or obstruction of flow paths by dirt, dust, or foreign particles
- F05B 2260/64 . . Aeration, ventilation, dehumidification or moisture removal of closed spaces
- F05B 2260/70 . Adjusting of angle of incidence or attack of rotating blades
- F05B 2260/71 . . as a function of flow velocity
- F05B 2260/72 . . by turning around an axis parallel to the rotor centre line
- F05B 2260/74 . . by turning around an axis perpendicular the rotor centre line
- F05B 2260/75 . . the adjusting mechanism not using auxiliary power sources ("servos")
- F05B 2260/76 . . the adjusting mechanism using auxiliary power sources
- F05B 2260/77 . . the adjusting mechanism driven or triggered by centrifugal forces
- F05B 2260/78 . . the adjusting mechanism driven or triggered by aerodynamic forces
- F05B 2260/79 . . Bearing, support or actuation arrangements therefor
- F05B 2260/80 . Diagnostics
- F05B 2260/82 . Forecasts
- F05B 2260/821 . . Parameter estimation or prediction
- F05B 2260/8211 . . . of the weather
- F05B 2260/83 . Testing, e.g. methods, components or tools therefor
- F05B 2260/84 . Modeling or simulation
- F05B 2260/845 . Redundancy
- F05B 2260/85 . Starting
- F05B 2260/90 . Braking
- F05B 2260/901 . . using aerodynamic forces, i.e. lift or drag
- F05B 2260/9011 . . . of the tips of rotor blades
- F05B 2260/902 . . using frictional mechanical forces
- F05B 2260/903 . . using electrical or magnetic forces
- F05B 2260/904 . . using hydrodynamic forces
- F05B 2260/95 . Preventing corrosion ([coating or surface treatment F05B 2230/90](#))
- F05B 2260/96 . Preventing, counteracting or reducing vibration or noise
- F05B 2260/962 . . my means creating "anti-noise"
- F05B 2260/964 . . by damping means
- F05B 2260/966 . . by correcting static or dynamic imbalance
- F05B 2260/97 . Reducing windage losses
- F05B 2260/972 . . in radial flow machines
- F05B 2260/98 . Lubrication
- F05B 2260/99 . Radar absorption

F05B 2270/00**Control**

- F05B 2270/10 . Purpose of the control system
- F05B 2270/101 .. to control rotational speed (n)
- F05B 2270/1011 ... to prevent overspeed
- F05B 2270/1012 ... to prevent underspeed
- F05B 2270/1013 ... of different spools or shafts
- F05B 2270/1014 ... to keep rotational speed constant
- F05B 2270/1016 .. in variable speed operation
- F05B 2270/102 .. to control acceleration (u)
- F05B 2270/1021 ... by keeping it below damagingly high values
- F05B 2270/1022 ... by making it as high as possible
- F05B 2270/103 .. to affect the output of the engine
- F05B 2270/1031 ... Thrust
- F05B 2270/1032 ... Torque
- F05B 2270/1033 ... Power (if explicitly mentioned)
- F05B 2270/104 .. to match engine to driven device
- F05B 2270/1041 ... in particular the electrical frequency of driven generator
- F05B 2270/105 .. to improve fuel economy
- F05B 2270/1051 ... in particular at idling speed
- F05B 2270/106 .. to produce clean exhaust gases
- F05B 2270/1061 ... with as little smoke as possible
- F05B 2270/1062 ... with as little NOx`s as possible
- F05B 2270/1063 ... by monitoring combustion conditions
- F05B 2270/1064 indirectly, at the exhaust
- F05B 2270/107 .. to cope with emergencies
- F05B 2270/1071 ... in particular sudden load loss
- F05B 2270/10711 applying a low voltage ride through method
- F05B 2270/1072 ... in particular blow-out and relight
- F05B 2270/1073 ... of one engine in a multi-engine system
- F05B 2270/1074 ... by using back-up controls
- F05B 2270/1075 ... by temporary overriding set control limits
- F05B 2270/1076 ... caused by water or hail ingestion
- F05B 2270/108 .. to cope with, or avoid, compressor flow instabilities
- F05B 2270/1081 ... Compressor surge or stall
- F05B 2270/10812 caused by working fluid flow velocity profile distortion
- F05B 2270/10815 due to high angle of attack of aircraft
- F05B 2270/10817 due to compressor degradation
- F05B 2270/109 .. to prolong engine life
- F05B 2270/1091 ... by limiting temperatures
- F05B 2270/1095 ... by limiting mechanical stresses

F05B 2270/1097	...	by preventing reverse rotation
F05B 2270/11	..	to maintain desired vehicle trajectory parameters
F05B 2270/1101	...	Altitude
F05B 2270/1102	...	Speed or Mach number
F05B 2270/111	..	to control two or more engines simultaneously
F05B 2270/15	..	to control thermoacoustic behaviour in the combustion chambers (counteracting noise or vibration F05B 2260/96)
F05B 2270/16	..	to control water or steam injection
F05B 2270/17	..	to avoid excessive deflection of the blades
F05B 2270/18	..	to control buoyancy
F05B 2270/19	..	to avoid stroboscopic flicker shadow on surroundings
F05B 2270/20	..	to optimise the performance of a machine
F05B 2270/30	.	Control parameters, e.g. input parameters
F05B 2270/301	..	Pressure
F05B 2270/3011	...	Inlet
F05B 2270/3013	...	Outlet
F05B 2270/3015	...	differential
F05B 2270/303	..	Temperature
F05B 2270/3032	...	excessive temperatures, e.g. caused by overheating
F05B 2270/304	..	Spool rotational speed
F05B 2270/305	..	Tolerances
F05B 2270/309	..	Rate of change of parameters
F05B 2270/31	..	Fuel schedule for stage combustors
F05B 2270/32	..	Wind speeds
F05B 2270/3201	...	"cut-off" or "shut-down" wind speed
F05B 2270/321	..	Wind directions
F05B 2270/322	..	the detection or prediction of a wind gust
F05B 2270/323	..	Air humidity
F05B 2270/324	..	Air pressure
F05B 2270/325	..	Air temperature
F05B 2270/326	..	Rotor angle
F05B 2270/327	..	Rotor or generator speeds
F05B 2270/328	..	Blade pitch angle
F05B 2270/329	..	Azimuth or yaw angle
F05B 2270/33	..	Proximity of blade to tower
F05B 2270/331	..	Mechanical loads
F05B 2270/332	..	Maximum loads or fatigue criteria
F05B 2270/333	..	Noise or sound levels
F05B 2270/334	..	Vibration measurements
F05B 2270/335	..	Output power or torque
F05B 2270/336	..	Blade lift measurements
F05B 2270/337	..	Electrical grid status parameters, e.g. voltage, frequency or power demand

F05B 2270/40	. Type of control system
F05B 2270/402	.. passive or reactive, e.g. using large wind vanes
F05B 2270/404	.. active, predictive, or anticipative
F05B 2270/50	. Control logic embodiment by
F05B 2270/502	.. electrical means, e.g. relays or switches
F05B 2270/504	.. electronic means, e.g. electronic tubes, transistors or IC's within an electronic circuit
F05B 2270/506	.. hydraulic means, e.g. hydraulic valves within a hydraulic circuit
F05B 2270/508	.. mechanical means, e.g. levers, gears or cams
F05B 2270/60	. Control system actuates through
F05B 2270/602	.. electrical actuators
F05B 2270/604	.. hydraulic actuators
F05B 2270/605	.. Pneumatic actuators
F05B 2270/606	.. mechanical actuators (F05B 2270/602 takes precedence)
F05B 2270/70	. Type of control algorithm
F05B 2270/701	.. proportional
F05B 2270/702	.. differential
F05B 2270/703	.. integral
F05B 2270/704	.. proportional-differential
F05B 2270/705	.. proportional-integral
F05B 2270/706	.. proportional-integral-differential
F05B 2270/707	.. fuzzy logic
F05B 2270/708	.. with comparison tables
F05B 2270/709	.. with neural networks
F05B 2270/80	. Devices generating input signals, e.g. transducers, sensors, cameras or strain gauges
F05B 2270/802	.. Calibration thereof
F05B 2270/803	.. Sampling thereof
F05B 2270/804	.. Optical devices
F05B 2270/8041	... Cameras
F05B 2270/8042	... Lidar systems
F05B 2270/805	.. Radars
F05B 2270/806	.. Sonars
F05B 2270/807	.. Accelerometers
F05B 2270/808	.. Strain gauges; Load cells
F05B 2270/809	.. Encoders
F05B 2270/81	.. Microphones
F05B 2270/821	.. Displacement measuring means, e.g. inductive
F05B 2280/00	Materials; Properties thereof

F05B 2280/10	. Inorganic materials, e.g. metals
F05B 2280/101	.. Iron
F05B 2280/1011	.. Cast iron
F05B 2280/102	.. Light metals
F05B 2280/1021	... Aluminium
F05B 2280/1022	... Beryllium
F05B 2280/1023	... Boron
F05B 2280/1024	... Lithium
F05B 2280/1025	... Magnesium
F05B 2280/103	.. Heavy metals
F05B 2280/10301	... Refractory metals, e.g. V, W
F05B 2280/10302	... Chromium
F05B 2280/10303	... Molybdenum
F05B 2280/10304	... Titanium
F05B 2280/10305	... Zirconium
F05B 2280/10306	... Hafnium
F05B 2280/10307	... Manganese
F05B 2280/10308	... Lead
F05B 2280/10309	... Tin
F05B 2280/1031	... Zinc
F05B 2280/10311	... Mercury
F05B 2280/104	.. Noble metals
F05B 2280/1041	... Silver
F05B 2280/1042	... Gold
F05B 2280/1043	... Platinum group, e.g. Pt, Ir
F05B 2280/1044	... Palladium
F05B 2280/1045	... Ruthenium
F05B 2280/1046	... Osmium
F05B 2280/1047	... Iridium
F05B 2280/1048	... Rhodium
F05B 2280/105	.. Copper
F05B 2280/106	.. Rare earth metals, e.g. Sc, Y
F05B 2280/107	.. Alloys
F05B 2280/1071	... Steel alloys
F05B 2280/1072	.. Copper alloys
F05B 2280/10721	... Bronze
F05B 2280/10722	... Phosphor-bronze alloy
F05B 2280/10723	... Nickel-Copper alloy, e.g. monel
F05B 2280/1073	.. Aluminium alloy, e.g. AlCuMgPb
F05B 2280/1074	.. Alloys not otherwise provided for
F05B 2280/10741	... Superalloys

F05B 2280/10742	...	Heat stable alloys
F05B 2280/10743	...	Ni - Si alloys
F05B 2280/10744	...	Metal-aluminide intermetallic compounds
F05B 2280/20	.	Inorganic materials, e.g. non-metallic materials
F05B 2280/2001	..	Glass
F05B 2280/20011	...	MIBA
F05B 2280/20012	...	Quartz
F05B 2280/2002	..	Phosphor
F05B 2280/2003	..	Silicon
F05B 2280/2004	..	Ceramics; Oxides
F05B 2280/20041	...	Aluminium oxides
F05B 2280/20042	...	Zinc oxides
F05B 2280/20043	...	Zirconium oxides
F05B 2280/2005	..	Non-oxide ceramics
F05B 2280/2006	..	Carbon, e.g. graphite
F05B 2280/2007	..	Carbides
F05B 2280/20071	...	of silicon
F05B 2280/20072	...	of titanium, e.g. TiB
F05B 2280/20073	...	of wolfram, e.g. tungsten carbide
F05B 2280/2008	..	Nitrides
F05B 2280/20081	...	of aluminium
F05B 2280/20082	...	of boron
F05B 2280/20083	...	of silicon
F05B 2280/20084	...	of titanium
F05B 2280/20085	...	of zirconium
F05B 2280/2009	..	Sulfides
F05B 2280/20091	...	of molybdenum
F05B 2280/201	..	Sapphire
F05B 2280/2011	..	Aluminium titanate
F05B 2280/2013	..	Silica
F05B 2280/2014	..	Arsenic
F05B 2280/2015	..	Antimony
F05B 2280/2016	..	Bismuth
F05B 2280/2017	..	Barium
F05B 2280/30	.	Inorganic materials not otherwise provided for
F05B 2280/40	.	Organic materials
F05B 2280/4001	..	Leather
F05B 2280/4002	..	Cellulosic materials, e.g. wood
F05B 2280/4003	..	Synthetic polymers, e.g. plastics; Rubber
F05B 2280/4004	..	Rubber

F05B 2280/4005	..	PTFE (PolyTetraFluorEthylene)
F05B 2280/4006	..	Polyamides, e.g. NYLON
F05B 2280/4007	..	Thermoplastics
F05B 2280/4008	..	Polyamides, e.g. Aurum
F05B 2280/4009	..	Polyetherketones, e.g. PEEK
F05B 2280/401	..	Silicon polymers
F05B 2280/4011	..	Organic materials not otherwise provided for
F05B 2280/50	.	Intrinsic material properties or characteristics
F05B 2280/5001	..	Elasticity
F05B 2280/5002	..	Thermal properties
F05B 2280/5003	..	Expansivity
F05B 2280/50031	...	similar
F05B 2280/50032	...	dissimilar
F05B 2280/5004	..	Heat transfer
F05B 2280/5005	..	Reflective properties
F05B 2280/5006	..	Shape memory
F05B 2280/5007	..	Hardness
F05B 2280/5008	..	Magnetic properties
F05B 2280/5009	..	non-magnetic
F05B 2280/501	..	Self lubricating materials; Solid lubricants
F05B 2280/5011	..	Surface roughness
F05B 2280/60	.	Properties or characteristics given to material by treatment or manufacturing
F05B 2280/6001	..	Fabrics
F05B 2280/6002	...	Woven fabrics
F05B 2280/6003	..	Composites; e.g. fibre-reinforced
F05B 2280/6004	..	amorphous
F05B 2280/6005	..	crystalline
F05B 2280/6006	..	Directionally-solidified crystalline structures
F05B 2280/6007	..	monocrystalline
F05B 2280/6008	..	Structures
F05B 2280/6009	..	Grain size
F05B 2280/601	..	Syntactic
F05B 2280/6011	..	Coating
F05B 2280/6012	..	Foam
F05B 2280/6013	..	Fibres
F05B 2280/6014	..	Filler
F05B 2280/6015	..	Resin
F05B 2280/70	.	Treatments or modification of materials
F05B 2280/701	..	Heat treatments
F05B 2280/702	..	Reinforcements