

# CPC COOPERATIVE PATENT CLASSIFICATION

## F MECHANICAL ENGINEERING; LIGHTING; HEATING; WEAPONS; BLASTING (NOTE omitted)

### ENGINES OR PUMPS

#### F05 INDEXING SCHEMES RELATING TO ENGINES OR PUMPS IN VARIOUS SUBCLASSES OF CLASSES [F01-F04](#)

#### F05B INDEXING SCHEME RELATING TO WIND, SPRING, WEIGHT, INERTIA OR LIKE MOTORS, TO MACHINES OR ENGINES FOR LIQUIDS COVERED BY SUBCLASSES [F03B](#), [F03D](#) AND [F03G](#)

##### NOTE

This subclass constitutes an internal scheme for indexing only.

##### **2200/00** Mathematical features

- 2200/10 . Basic functions
- 2200/11 . . Sum
- 2200/12 . . Subtraction
- 2200/13 . . Product
- 2200/14 . . Division
- 2200/15 . . Inverse
- 2200/20 . Special functions
- 2200/21 . . Root
  - 2200/211 . . . Square root
  - 2200/212 . . . Cubic root
- 2200/22 . . Power
  - 2200/221 . . . Square power
  - 2200/222 . . . Cubic power
- 2200/23 . . Logarithm
- 2200/24 . . exponential
- 2200/25 . . Hyperbolic trigonometric, e.g. sinh, cosh, tanh
- 2200/26 . . trigonometric
  - 2200/261 . . . Sine
  - 2200/262 . . . Cosine
  - 2200/263 . . . Tangent
  - 2200/264 . . . Cotangent
- 2200/30 . miscellaneous
  - 2200/31 . . odd
  - 2200/32 . . even
  - 2200/33 . . bigger/smaller
  - 2200/34 . . biggest/smallest
  - 2200/35 . . first
  - 2200/36 . . last

##### **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.

- 2210/10 . Kind or type
- 2210/11 . . liquid, i.e. incompressible
- 2210/12 . . gaseous, i.e. compressible
- 2210/13 . . mixed, e.g. two-phase fluid

- 2210/132 . . . Pumps with means for separating and evacuating the gaseous phase
- 2210/14 . . Refrigerants with particular properties, e.g. HFC-134a
- 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
- 2210/18 . Air and water being simultaneously used as working fluid
- 2210/20 . Properties
- 2210/30 . Flow characteristics
  - 2210/301 . . with Mach-number kept constant along the flow
  - 2210/302 . . Pressure kept constant along the flow
- 2210/40 . Flow geometry or direction
  - 2210/401 . . upwards due to the buoyancy of compressed air
  - 2210/402 . . Axial inlet and radial outlet
  - 2210/403 . . Radial inlet and axial outlet
  - 2210/404 . . bidirectional, i.e. in opposite, alternating directions

##### **2220/00** Application

- 2220/10 . in ram-jet engines or ram-jet driven vehicles
- 2220/20 . within closed fluid conduits, e.g. pipes
- 2220/25 . as advertisement
- 2220/30 . in turbines
  - 2220/301 . . in steam turbines
  - 2220/302 . . in gas turbines
- 2220/31 . . in ram-air turbines ("RATS")
- 2220/32 . . in water turbines
- 2220/40 . in turbochargers
- 2220/50 . for auxiliary power units (APU's)
- 2220/60 . making use of surplus or waste energy
  - 2220/602 . . with energy recovery turbines
  - 2220/604 . . for domestic central heating or production of electricity
- 2220/61 . for hydrogen and/or oxygen production
- 2220/62 . for desalination
- 2220/64 . for aeration
- 2220/70 . in combination with
  - 2220/702 . . the other apparatus being a steam turbine
  - 2220/703 . . the other apparatus being a water turbine
  - 2220/704 . . the other apparatus being a gas turbine

## F05B

- 2220/705 . . the other apparatus being a wind turbine
- 2220/706 . . an electrical generator
- 2220/7062 . . . of the direct current (D.C.) type
- 2220/7064 . . . of the alternating current (A.C.) type
- 2220/70642 . . . . of the synchronous type
- 2220/70644 . . . . of the asynchronous type, i.e. induction type
- 2220/70646 . . . . . Double fed induction generators (DFIGs)
- 2220/7066 . . . via a direct connection, i.e. a gearless transmission
- 2220/7068 . . . equipped with permanent magnets
- 2220/707 . . . of the linear type
- 2220/708 . . Photoelectric means, i.e. photovoltaic or solar cells
- 2220/709 . . Piezoelectric means

### 2230/00 Manufacture

#### NOTE

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

- 2230/10 . . by removing material
- 2230/101 . . by electrochemical methods
- 2230/102 . . by spark erosion methods
- 2230/103 . . using lasers
- 2230/104 . Micromachining
- 2230/20 . essentially without removing material
- 2230/21 . . by casting
- 2230/211 . . . by precision casting, e.g. microfusing or investment casting
- 2230/22 . . by sintering
- 2230/23 . . by permanently joining parts together
- 2230/232 . . . by welding
- 2230/233 . . . . Electron beam welding
- 2230/234 . . . . Laser welding
- 2230/235 . . . . Tig/Mig welding
- 2230/236 . . . . Diffusion bonding
- 2230/237 . . . . Brazing
- 2230/238 . . . . Soldering
- 2230/239 . . . . Inertia or friction welding
- 2230/24 . . by extrusion
- 2230/25 . . by forging
- 2230/26 . . by rolling
- 2230/30 . with deposition of material
- 2230/31 . . Layer deposition
- 2230/311 . . . by torch or flame spray
- 2230/312 . . . by plasma spray
- 2230/313 . . . by physical vapour deposition
- 2230/314 . . . by chemical vapour deposition
- 2230/40 . Heat treatment
- 2230/41 . . Hardening; Annealing
- 2230/50 . Building or constructing in particular ways
- 2230/502 . . using existing or "off the shelf" parts, e.g. using standardised turbocharger elements
- 2230/60 . Assembly methods
- 2230/601 . . using limited numbers of standard modules which can be adapted by machining

- 2230/604 . . . using positioning or alignment devices for aligning or centering, e.g. pins

#### WARNING

Group [F05B 2230/604](#) is impacted by reclassification into group [F03D 13/108](#).

Groups [F05B 2230/604](#) and [F03D 13/108](#) should be considered in order to perform a complete search.

- 2230/606 . . . using maintaining alignment while permitting differential dilatation
- 2230/608 . . . for adjusting the position or the alignment, e.g. wedges or excenters
- 2230/61 . . using auxiliary equipment for lifting or holding

#### WARNING

Group [F05B 2230/61](#) is impacted by reclassification into group [F03D 13/139](#).

Groups [F05B 2230/61](#) and [F03D 13/139](#) should be considered in order to perform a complete search.

- 2230/6102 . . . carried on a floating platform

#### WARNING

Group [F05B 2230/6102](#) is impacted by reclassification into group [F03D 13/139](#).

Groups [F05B 2230/6102](#) and [F03D 13/139](#) should be considered in order to perform a complete search.

- 2230/70 . Disassembly methods

#### WARNING

Group [F05B 2230/70](#) is impacted by reclassification into group [F03D 80/011](#).

Groups [F05B 2230/70](#) and [F03D 80/011](#) should be considered in order to perform a complete search.

- 2230/80 . Repairing, retrofitting or upgrading methods

#### WARNING

Group [F05B 2230/80](#) is impacted by reclassification into groups [F03D 80/501](#), [F03D 80/502](#), [F03D 80/504](#), [F03D 80/505](#), [F03D 80/507](#) and [F03D 80/509](#).

All groups listed in this Warning should be considered in order to perform a complete search.

- 2230/90 . Coating; Surface treatment

### 2240/00 Components

#### NOTE

Components are the basic elements of construction.

- 2240/10 . Stators
- 2240/11 . . Shroud seal segments

2240/12 . . Fluid guiding means, e.g. vanes

**WARNING**

Group [F05B 2240/12](#) is impacted by reclassification into group [F03D 1/046](#).  
Groups [F05B 2240/12](#) and [F03D 1/046](#) should be considered in order to perform a complete search.

2240/121 . . . Baffles or ribs

**WARNING**

Group [F05B 2240/121](#) is impacted by reclassification into group [F03D 1/046](#).  
Groups [F05B 2240/121](#) and [F03D 1/046](#) should be considered in order to perform a complete search.

2240/122 . . . Vortex generators, turbulators, or the like, for mixing

**WARNING**

Group [F05B 2240/122](#) is impacted by reclassification into group [F03D 1/046](#).  
Groups [F05B 2240/122](#) and [F03D 1/046](#) should be considered in order to perform a complete search.

2240/123 . . . Nozzles

**WARNING**

Group [F05B 2240/123](#) is impacted by reclassification into group [F03D 1/041](#).  
Groups [F05B 2240/123](#) and [F03D 1/041](#) should be considered in order to perform a complete search.

2240/1231 . . . . Plug nozzles

**WARNING**

Group [F05B 2240/1231](#) is impacted by reclassification into group [F03D 1/041](#).  
Groups [F05B 2240/1231](#) and [F03D 1/041](#) should be considered in order to perform a complete search.

2240/124 . . . Cascades, i.e. assemblies of similar profiles acting in parallel

**WARNING**

Group [F05B 2240/124](#) is impacted by reclassification into group [F03D 1/051](#).  
Groups [F05B 2240/124](#) and [F03D 1/051](#) should be considered in order to perform a complete search.

2240/13 . . to collect or cause flow towards or away from turbines

**WARNING**

Group [F05B 2240/13](#) is impacted by reclassification into groups [F03D 1/041](#) and [F03D 1/042](#).  
Groups [F05B 2240/13](#), [F03D 1/041](#) and [F03D 1/042](#) should be considered in order to perform a complete search.

2240/131 . . . by means of vertical structures, i.e. chimneys  
2240/132 . . . creating a vortex or tornado effect  
2240/133 . . . with a convergent-divergent guiding structure, e.g. a Venturi conduit

**WARNING**

Group [F05B 2240/133](#) is impacted by reclassification into group [F03D 1/044](#).  
Groups [F05B 2240/133](#) and [F03D 1/044](#) should be considered in order to perform a complete search.

2240/14 . . Casings, housings, nacelles, gondels or the like, protecting or supporting assemblies there within

**WARNING**

Group [F05B 2240/14](#) is impacted by reclassification into groups [F03D 1/101](#), [F03D 1/125](#), [F03D 1/141](#), [F03D 1/165](#), [F03D 1/181](#), [F03D 1/188](#), [F03D 80/601](#) and [F03D 80/602](#).

All groups listed in this Warning should be considered in order to perform a complete search.

2240/142 . . . in the form of a standard ISO container

**WARNING**

Group [F05B 2240/142](#) is impacted by reclassification into groups [F03D 1/101](#), [F03D 1/125](#), [F03D 1/141](#), [F03D 1/165](#), [F03D 1/181](#) and [F03D 1/188](#).  
All groups listed in this Warning should be considered in order to perform a complete search.

2240/20 . Rotors

2240/201 . . using the Magnus-effect

2240/202 . . with adjustable area of intercepted fluid

2240/2021 . . . by means of telescoping blades

**WARNING**

Group [F05B 2240/2021](#) is impacted by reclassification into groups [F03D 3/063](#) and [F03D 7/0237](#).

Groups [F05B 2240/2021](#), [F03D 3/063](#) and [F03D 7/0237](#) should be considered in order to perform a complete search.

2240/2022 . . . by means of teetering or coning blades

**WARNING**

Group [F05B 2240/2022](#) is impacted by reclassification into group [F03D 7/0239](#).  
Groups [F05B 2240/2022](#) and [F03D 7/0239](#) should be considered in order to perform a complete search.

2240/2023 . . . by means of radially reefing blades

2240/21 . . for wind turbines

2240/211 . . . with vertical axis

2240/212 . . . . of the Darrieus type

**WARNING**

Group [F05B 2240/212](#) is impacted by reclassification into group [F03D 3/011](#).  
Groups [F05B 2240/212](#) and [F03D 3/011](#) should be considered in order to perform a complete search.

2240/213 . . . . of the Savonius type

**WARNING**

Group [F05B 2240/213](#) is impacted by reclassification into group [F03D 3/009](#).  
Groups [F05B 2240/213](#) and [F03D 3/009](#) should be considered in order to perform a complete search.

2240/214 . . . . of the Musgrove or "H"-type

**WARNING**

Group [F05B 2240/214](#) is impacted by reclassification into group [F03D 3/011](#).  
Groups [F05B 2240/214](#) and [F03D 3/011](#) should be considered in order to perform a complete search.

2240/215 . . . . of the panemone or "vehicle ventilator" type

**WARNING**

Group [F05B 2240/215](#) is impacted by reclassification into group [F03D 3/009](#).  
Groups [F05B 2240/215](#) and [F03D 3/009](#) should be considered in order to perform a complete search.

2240/216 . . . . of the anemometer type

**WARNING**

Group [F05B 2240/216](#) is impacted by reclassification into group [F03D 3/009](#).  
Groups [F05B 2240/216](#) and [F03D 3/009](#) should be considered in order to perform a complete search.

2240/217 . . . . of the crossflow- or "Banki"- or "double action" type

2240/218 . . . . with horizontally hinged vanes

**WARNING**

Group [F05B 2240/218](#) is impacted by reclassification into groups [F03D 3/066](#), [F03D 3/067](#) and [F03D 3/068](#).  
All groups listed in this Warning should be considered in order to perform a complete search.

2240/221 . . . with horizontal axis

2240/2211 . . . . of the multibladed, low speed, e.g. "American farm" type

2240/2212 . . . . perpendicular to wind direction

2240/2213 . . . . and with the rotor downwind from the yaw pivot axis

2240/231 . . . driven by aerodynamic lift effects

2240/232 . . . . driven by drag

2240/24 . . for turbines

2240/241 . . . of impulse type

2240/2411 . . . . Pelton type

2240/242 . . . of reaction type

2240/243 . . . of the Archimedes screw type

2240/244 . . . of the cross-flow, e.g. Banki, Ossberger type

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

**WARNING**

Group [F05B 2240/30](#) is impacted by reclassification into groups [F03D 1/0641](#) and [F03D 1/0685](#).

Groups [F05B 2240/30](#), [F03D 1/0641](#) and [F03D 1/0685](#) should be considered in order to perform a complete search.

2240/301 . . . Cross-section characteristics

**WARNING**

Group [F05B 2240/301](#) is impacted by reclassification into groups [F03D 1/0642](#), [F03D 1/0643](#), [F03D 1/0645](#), [F03D 1/0647](#), [F03D 1/0648](#), [F03D 1/0649](#) and [F03D 1/06495](#).

All groups listed in this Warning should be considered in order to perform a complete search.

2240/302 . . . Segmented or sectional blades

**WARNING**

Group [F05B 2240/302](#) is impacted by reclassification into group [F03D 1/0677](#).

Groups [F05B 2240/302](#) and [F03D 1/0677](#) should be considered in order to perform a complete search.

2240/303 . . . Details of the leading edge

**WARNING**

Group [F05B 2240/303](#) is impacted by reclassification into group [F03D 1/0643](#).

Groups [F05B 2240/303](#) and [F03D 1/0643](#) should be considered in order to perform a complete search.

2240/304 . . . Details of the trailing edge

**WARNING**

Group [F05B 2240/304](#) is impacted by reclassification into group [F03D 1/0645](#).

Groups [F05B 2240/304](#) and [F03D 1/0645](#) should be considered in order to perform a complete search.

2240/3042 . . . . Serrated trailing edge

**WARNING**

Group [F05B 2240/3042](#) is impacted by reclassification into group [F03D 1/0645](#).

Groups [F05B 2240/3042](#) and [F03D 1/0645](#) should be considered in order to perform a complete search.

2240/305 . . . Flaps, slats or spoilers

**WARNING**

Group [F05B 2240/305](#) is impacted by reclassification into groups [F03D 1/06495](#) and [F03D 1/0685](#).

Groups [F05B 2240/305](#), [F03D 1/06495](#) and [F03D 1/0685](#) should be considered in order to perform a complete search.

2240/3052 . . . . adjustable

**WARNING**

Group [F05B 2240/3052](#) is impacted by reclassification into groups [F03D 1/06495](#) and [F03D 1/0685](#).

Groups [F05B 2240/3052](#), [F03D 1/06495](#) and [F03D 1/0685](#) should be considered in order to perform a complete search.

2240/306 . . . Surface measures

**WARNING**

Group [F05B 2240/306](#) is impacted by reclassification into groups [F03D 1/0649](#) and [F03D 1/06495](#).

Groups [F05B 2240/306](#), [F03D 1/0649](#) and [F03D 1/06495](#) should be considered in order to perform a complete search.

2240/3062 . . . . Vortex generators

**WARNING**

Group [F05B 2240/3062](#) is impacted by reclassification into groups [F03D 1/0649](#) and [F03D 1/06495](#).

Groups [F05B 2240/3062](#), [F03D 1/0649](#) and [F03D 1/06495](#) should be considered in order to perform a complete search.

2240/307 . . . Blade tip, e.g. winglets

**WARNING**

Group [F05B 2240/307](#) is impacted by reclassification into groups [F03D 1/0642](#) and [F03D 1/0687](#).

Groups [F05B 2240/307](#), [F03D 1/0642](#) and [F03D 1/0687](#) should be considered in order to perform a complete search.

2240/31 . . . of changeable form or shape

**WARNING**

Group [F05B 2240/31](#) is impacted by reclassification into group [F03D 1/0648](#).

Groups [F05B 2240/31](#) and [F03D 1/0648](#) should be considered in order to perform a complete search.

2240/311 . . . . flexible or elastic

**WARNING**

Group [F05B 2240/311](#) is impacted by reclassification into group [F03D 1/0648](#).

Groups [F05B 2240/311](#) and [F03D 1/0648](#) should be considered in order to perform a complete search.

2240/312 . . . . capable of being reefed

**WARNING**

Group [F05B 2240/312](#) is impacted by reclassification into group [F03D 1/0648](#).

Groups [F05B 2240/312](#) and [F03D 1/0648](#) should be considered in order to perform a complete search.

2240/3121 . . . . around an axis orthogonal to rotor rotational axis

**WARNING**

Group [F05B 2240/3121](#) is impacted by reclassification into group [F03D 1/0648](#).

Groups [F05B 2240/3121](#) and [F03D 1/0648](#) should be considered in order to perform a complete search.

2240/313 . . . . with adjustable flow intercepting area ([F05B 2240/312](#) takes precedence)

**WARNING**

Group [F05B 2240/313](#) is impacted by reclassification into group [F03D 1/0648](#).

Groups [F05B 2240/313](#) and [F03D 1/0648](#) should be considered in order to perform a complete search.

2240/32 . . . with roughened surface

**WARNING**

Group [F05B 2240/32](#) is impacted by reclassification into group [F03D 1/0649](#).

Groups [F05B 2240/32](#) and [F03D 1/0649](#) should be considered in order to perform a complete search.

2240/33 . . Shrouds which are part of or which are rotating with the rotor

**WARNING**

Group [F05B 2240/33](#) is impacted by reclassification into group [F03D 1/0606](#).

Groups [F05B 2240/33](#) and [F03D 1/0606](#) should be considered in order to perform a complete search.

2240/37 . . Multiple rotors

2240/372 . . . coaxially arranged

2240/374 . . . Auxiliary rotors attached to blades of main rotor

2240/40 . Use of a multiplicity of similar components

2240/50 . Bearings

**WARNING**

Group [F05B 2240/50](#) is impacted by reclassification into groups [F03D 80/701](#) and [F03D 80/703](#).

Groups [F05B 2240/50](#), [F03D 80/701](#) and [F03D 80/703](#) should be considered in order to perform a complete search.

2240/51 . . magnetic

**WARNING**

Group [F05B 2240/51](#) is impacted by reclassification into groups [F03D 80/701](#) and [F03D 80/703](#).

Groups [F05B 2240/51](#), [F03D 80/701](#) and [F03D 80/703](#) should be considered in order to perform a complete search.

2240/511 . . . with permanent magnets

**WARNING**

Group [F05B 2240/511](#) is impacted by reclassification into groups [F03D 80/701](#) and [F03D 80/703](#).

Groups [F05B 2240/511](#), [F03D 80/701](#) and [F03D 80/703](#) should be considered in order to perform a complete search.

2240/515 . . . electromagnetic

**WARNING**

Group [F05B 2240/515](#) is impacted by reclassification into groups [F03D 80/701](#) and [F03D 80/703](#).

Groups [F05B 2240/515](#), [F03D 80/701](#) and [F03D 80/703](#) should be considered in order to perform a complete search.

2240/52 . . Axial thrust bearings

**WARNING**

Group [F05B 2240/52](#) is impacted by reclassification into groups [F03D 80/701](#) and [F03D 80/703](#).

Groups [F05B 2240/52](#), [F03D 80/701](#) and [F03D 80/703](#) should be considered in order to perform a complete search.

2240/53 . . Hydrodynamic or hydrostatic bearings

**WARNING**

Group [F05B 2240/53](#) is impacted by reclassification into groups [F03D 80/701](#) and [F03D 80/703](#).

Groups [F05B 2240/53](#), [F03D 80/701](#) and [F03D 80/703](#) should be considered in order to perform a complete search.

2240/54 . . Radial bearings

**WARNING**

Group [F05B 2240/54](#) is impacted by reclassification into groups [F03D 80/701](#) and [F03D 80/703](#).

Groups [F05B 2240/54](#), [F03D 80/701](#) and [F03D 80/703](#) should be considered in order to perform a complete search.

2240/57 . Seals

2240/571 . . Brush seals

2240/572 . . Leaf seals

2240/60 . Shafts

2240/61 . . hollow

2240/62 . . flexible

2240/63 . . Glands for admission or removal of fluids from shafts

2240/70 . Slinger plates or washers

2240/80 . Platforms for stationary or moving blades

2240/801 . . cooled platforms

2240/85 . Electrical connection arrangements

**WARNING**

Group [F05B 2240/85](#) is impacted by reclassification into group [F03D 80/301](#).

Groups [F05B 2240/85](#) and [F03D 80/301](#) should be considered in order to perform a complete search.

2240/90 . Mounting on supporting structures or systems

2240/91 . . on a stationary structure

2240/911 . . . already existing for a prior purpose

2240/9111 . . . . which is a chimney

2240/9112 . . . . which is a building

2240/9113 . . . . which is a roadway, rail track, or the like for recovering energy from moving vehicles

2240/912 . . . on a tower

**WARNING**

Group [F05B 2240/912](#) is impacted by reclassification into groups [F03D 13/201](#) and [F03D 13/202](#).

Groups [F05B 2240/912](#), [F03D 13/201](#) and [F03D 13/202](#) should be considered in order to perform a complete search.

2240/9121 . . . . on a lattice tower

**WARNING**

Group [F05B 2240/9121](#) is impacted by reclassification into group [F03D 13/203](#).

Groups [F05B 2240/9121](#) and [F03D 13/203](#) should be considered in order to perform a complete search.

2240/913 . . . on a mast

**WARNING**

Group [F05B 2240/913](#) is impacted by reclassification into group [F03D 13/2005](#).

Groups [F05B 2240/913](#) and [F03D 13/2005](#) should be considered in order to perform a complete search.

2240/914 . . . on an inflatable structure

2240/915 . . . which is vertically adjustable

2240/9151 . . . . telescopically

2240/9152 . . . . by being hinged

2240/91521 . . . . . at ground level

2240/916 . . . with provision for hoisting onto the structure

2240/917 . . . attached to cables

**WARNING**

Group [F05B 2240/917](#) is impacted by reclassification into group [F03D 9/322](#).

Groups [F05B 2240/917](#) and [F03D 9/322](#) should be considered in order to perform a complete search.

## F05B

2240/9172 . . . . of kite type with traction and retraction

### **WARNING**

Group [F05B 2240/9172](#) is impacted by reclassification into group [F03D 5/015](#).  
Groups [F05B 2240/9172](#) and [F03D 5/015](#) should be considered in order to perform a complete search.

2240/9174 . . . . of kite type with a turbine and a flying pattern

### **WARNING**

Group [F05B 2240/9174](#) is impacted by reclassification into group [F03D 9/324](#).  
Groups [F05B 2240/9174](#) and [F03D 9/324](#) should be considered in order to perform a complete search.

2240/9176 . . . . Wing, kites or buoyant bodies with a turbine attached without flying pattern

### **WARNING**

Group [F05B 2240/9176](#) is impacted by reclassification into group [F03D 9/322](#).  
Groups [F05B 2240/9176](#) and [F03D 9/322](#) should be considered in order to perform a complete search.

2240/92 . . . on an airbourne structure

### **WARNING**

Group [F05B 2240/92](#) is impacted by reclassification into group [F03D 9/322](#).  
Groups [F05B 2240/92](#) and [F03D 9/322](#) should be considered in order to perform a complete search.

2240/921 . . . kept aloft due to aerodynamic effects

### **WARNING**

Group [F05B 2240/921](#) is impacted by reclassification into group [F03D 9/322](#).  
Groups [F05B 2240/921](#) and [F03D 9/322](#) should be considered in order to perform a complete search.

2240/922 . . . kept aloft due to buoyancy effects

### **WARNING**

Group [F05B 2240/922](#) is impacted by reclassification into group [F03D 9/322](#).  
Groups [F05B 2240/922](#) and [F03D 9/322](#) should be considered in order to perform a complete search.

2240/923 . . . which is a vehicle

### **WARNING**

Group [F05B 2240/923](#) is impacted by reclassification into group [F03D 9/322](#).  
Groups [F05B 2240/923](#) and [F03D 9/322](#) should be considered in order to perform a complete search.

2240/93 . . . on a structure floating on a liquid surface

### **WARNING**

Group [F05B 2240/93](#) is impacted by reclassification into groups [F03D 13/256](#) and [F03D 7/0202](#).  
Groups [F05B 2240/93](#), [F03D 13/256](#) and [F03D 7/0202](#) should be considered in order to perform a complete search.

2240/931 . . . which is a vehicle

### **WARNING**

Group [F05B 2240/931](#) is impacted by reclassification into groups [F03D 13/256](#) and [F03D 7/0202](#).  
Groups [F05B 2240/931](#), [F03D 13/256](#) and [F03D 7/0202](#) should be considered in order to perform a complete search.

2240/932 . . . which is a catamaran-like structure

### **WARNING**

Group [F05B 2240/932](#) is impacted by reclassification into groups [F03D 13/256](#) and [F03D 7/0202](#).  
Groups [F05B 2240/932](#), [F03D 13/256](#) and [F03D 7/0202](#) should be considered in order to perform a complete search.

2240/94 . . . on a movable wheeled structure

2240/941 . . . which is a land vehicle

2240/95 . . . offshore

2240/96 . . . as part of a wind turbine farm

2240/965 . . . as part of a water turbine farm

2240/97 . . . on a submerged structure

2240/98 . . . which is inflatable

2240/99 . . . characterised by colour or colour patterns

**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.

2250/02 . . . variable

2250/10 . . . two-dimensional

2250/11 . . . triangular

2250/12 . . . rectangular

2250/121 . . . square

2250/13 . . . trapezial

2250/131 . . . polygonal

2250/132 . . . hexagonal

2250/14 . . . elliptical

2250/141 . . . circular

2250/15 . . . spiral

2250/16 . . . parabolic

2250/17 . . . hyperbolic

2250/18 . . . patterned

2250/181 . . . ridged

2250/182 . . . crenellated, notched

2250/183 . . . zigzag

2250/184 . . . sinusoidal

2250/19 . . . machined; miscellaneous

## F05B

- 2250/191 . . . perforated
- 2250/192 . . . beveled
- 2250/193 . . . milled
- 2250/20 . three-dimensional
- 2250/21 . . pyramidal
- 2250/22 . . parallelepipedic
- 2250/221 . . . cubic
- 2250/23 . . prismatic
- 2250/231 . . . cylindrical
- 2250/232 . . . conical
- 2250/24 . . ellipsoidal
- 2250/241 . . . spherical
- 2250/25 . . helical
- 2250/26 . . paraboloidal
- 2250/27 . . hyperboloidal
- 2250/28 . . patterned
- 2250/281 . . . threaded
- 2250/282 . . . Cubic pattern
- 2250/283 . . . Honeycomb
- 2250/29 . . machined; miscellaneous
- 2250/291 . . . hollowed
- 2250/292 . . . tapered
- 2250/293 . . . lathed, e.g. rotation symmetrical
- 2250/30 . Arrangement of components
- 2250/31 . . according to the direction of their main axis or their axis of rotation
  - 2250/311 . . . the axes being in line
  - 2250/312 . . . the axes being parallel to each other
  - 2250/313 . . . the axes being perpendicular to each other
  - 2250/314 . . . the axes being inclined in relation to each other
  - 2250/315 . . . the main axis being substantially vertical
- 2250/32 . . according to their shape
  - 2250/321 . . . asymptotic
  - 2250/322 . . . tangential
  - 2250/323 . . . convergent
  - 2250/324 . . . divergent
- 2250/33 . . symmetrical
- 2250/34 . . translated
- 2250/35 . . rotated
- 2250/36 . . in inner-outer relationship, e.g. shaft-bearing arrangements
- 2250/40 . Movement of component
- 2250/41 . . with one degree of freedom
  - 2250/411 . . . in rotation
- 2250/42 . . with two degrees of freedom
- 2250/43 . . with three degrees of freedom
- 2250/44 . . one element moving inside another one, e.g. wave-operated member (wom) moving inside another member (rem)
- 2250/50 . Inlet or outlet
- 2250/501 . . Inlet
- 2250/5011 . . . augmenting, i.e. with intercepting fluid flow cross sectional area greater than the rest of the machine behind the inlet

### **WARNING**

Group [F05B 2250/5011](#) is impacted by reclassification into group [F03D 1/041](#).  
Groups [F05B 2250/5011](#) and [F03D 1/041](#) should be considered in order to perform a complete search.

- 2250/5012 . . . concentrating only, i.e. with intercepting fluid flow cross sectional area not greater than the rest of the machine behind the inlet

### **WARNING**

Group [F05B 2250/5012](#) is impacted by reclassification into group [F03D 1/044](#).

Groups [F05B 2250/5012](#) and [F03D 1/044](#) should be considered in order to perform a complete search.

- 2250/502 . . Outlet
- 2250/503 . . of regenerative pumps
- 2250/60 . Structure; Surface texture
- 2250/61 . . corrugated
- 2250/611 . . . undulated
- 2250/62 . . smooth
- 2250/621 . . . polished
- 2250/70 . Shape
- 2250/71 . . curved
  - 2250/711 . . . convex
  - 2250/712 . . . concave
  - 2250/713 . . . inflexed
- 2250/72 . . symmetric
- 2250/73 . . asymmetric
- 2250/80 . Size or power range of the machines
- 2250/82 . . Micromachines
- 2250/84 . . Nanomachines
- 2250/86 . . Megamachines

### **2260/00 Function**

- 2260/02 . Transport, e.g. specific adaptations or devices for conveyance
- 2260/04 . Deployment, e.g. installing underwater structures
- 2260/10 . Particular cycles
- 2260/20 . Heat transfer, e.g. cooling

### **WARNING**

Group [F05B 2260/20](#) is impacted by reclassification into groups [F03D 80/601](#) and [F03D 80/602](#).

Groups [F05B 2260/20](#), [F03D 80/601](#) and [F03D 80/602](#) should be considered in order to perform a complete search.

- 2260/201 . . by impingement of a fluid
- 2260/202 . . by film cooling
- 2260/203 . . by transpiration cooling
- 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

### **WARNING**

Group [F05B 2260/205](#) is impacted by reclassification into group [F03D 80/602](#).

Groups [F05B 2260/205](#) and [F03D 80/602](#) should be considered in order to perform a complete search.

- 2260/207 . . using a phase changing mass, e.g. heat absorbing by melting or boiling

**WARNING**

Group [F05B 2260/207](#) is impacted by reclassification into group [F03D 80/602](#).

Groups [F05B 2260/207](#) and [F03D 80/602](#) should be considered in order to perform a complete search.

- 2260/208 . . using heat pipes  
 2260/209 . . using vortex tubes  
 2260/211 . . by intercooling, e.g. during a compression cycle  
 2260/212 . . . by water injection  
 2260/221 . . Improvement of heat transfer

**WARNING**

Group [F05B 2260/221](#) is impacted by reclassification into groups [F03D 80/601](#) and [F03D 80/602](#).

Groups [F05B 2260/221](#), [F03D 80/601](#) and [F03D 80/602](#) should be considered in order to perform a complete search.

- 2260/222 . . . by creating turbulence

**WARNING**

Group [F05B 2260/222](#) is impacted by reclassification into groups [F03D 80/601](#) and [F03D 80/602](#).

Groups [F05B 2260/222](#), [F03D 80/601](#) and [F03D 80/602](#) should be considered in order to perform a complete search.

- 2260/224 . . . by increasing the heat transfer surface

**WARNING**

Group [F05B 2260/224](#) is impacted by reclassification into groups [F03D 80/601](#) and [F03D 80/602](#).

Groups [F05B 2260/224](#), [F03D 80/601](#) and [F03D 80/602](#) should be considered in order to perform a complete search.

- 2260/2241 . . . . using fins or ribs

**WARNING**

Group [F05B 2260/2241](#) is impacted by reclassification into groups [F03D 80/601](#) and [F03D 80/602](#).

Groups [F05B 2260/2241](#), [F03D 80/601](#) and [F03D 80/602](#) should be considered in order to perform a complete search.

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

- 2260/30 . . Retaining components in desired mutual position

**WARNING**

Group [F05B 2260/30](#) is impacted by reclassification into group [F03D 1/066](#).

Groups [F05B 2260/30](#) and [F03D 1/066](#) should be considered in order to perform a complete search.

- 2260/301 . . Retaining bolts or nuts

**WARNING**

Group [F05B 2260/301](#) is impacted by reclassification into group [F03D 1/066](#).

Groups [F05B 2260/301](#) and [F03D 1/066](#) should be considered in order to perform a complete search.

- 2260/3011 . . . of the frangible or shear type

**WARNING**

Group [F05B 2260/3011](#) is impacted by reclassification into group [F03D 1/066](#).

Groups [F05B 2260/3011](#) and [F03D 1/066](#) should be considered in order to perform a complete search.

- 2260/302 . . by means of magnetic or electromagnetic forces  
 2260/303 . . with a bayonet coupling  
 2260/304 . . Balancing of radial or axial forces on regenerative rotors  
 2260/305 . . Reducing friction between regenerative impeller discs and casing walls  
 2260/31 . . Locking rotor in position

**WARNING**

Group [F05B 2260/31](#) is impacted by reclassification into group [F03D 80/505](#).

Groups [F05B 2260/31](#) and [F03D 80/505](#) should be considered in order to perform a complete search.

- 2260/40 . . Transmission of power  
 2260/402 . . through friction drives

**WARNING**

Group [F05B 2260/402](#) is impacted by reclassification into group [F03D 15/201](#).

Groups [F05B 2260/402](#) and [F03D 15/201](#) should be considered in order to perform a complete search.

- 2260/4021 . . . through belt drives

**WARNING**

Group [F05B 2260/4021](#) is impacted by reclassification into group [F03D 15/201](#).

Groups [F05B 2260/4021](#) and [F03D 15/201](#) should be considered in order to perform a complete search.

## F05B

2260/4022 . . . through endless chains

### **WARNING**

Group [F05B 2260/4022](#) is impacted by reclassification into group [F03D 15/201](#).

Groups [F05B 2260/4022](#) and [F03D 15/201](#) should be considered in order to perform a complete search.

2260/4023 . . . through a friction clutch

### **WARNING**

Group [F05B 2260/4023](#) is impacted by reclassification into group [F03D 15/201](#).

Groups [F05B 2260/4023](#) and [F03D 15/201](#) should be considered in order to perform a complete search.

2260/403 . . through the shape of the drive components

2260/4031 . . . as in toothed gearing

2260/40311 . . . . of the epicyclic, planetary or differential type

### **WARNING**

Group [F05B 2260/40311](#) is impacted by reclassification into group [F03D 15/101](#).

Groups [F05B 2260/40311](#) and [F03D 15/101](#) should be considered in order to perform a complete search.

2260/40312 . . . . Ratchet wheels

2260/404 . . through magnetic drive coupling

2260/4041 . . . the driven magnets encircling the driver magnets

2260/406 . . through hydraulic systems

### **WARNING**

Group [F05B 2260/406](#) is impacted by reclassification into group [F03D 15/202](#).

Groups [F05B 2260/406](#) and [F03D 15/202](#) should be considered in order to perform a complete search.

2260/407 . . through piezoelectric conversion

2260/408 . . through magnetohydrodynamic conversion

2260/42 . Storage of energy

2260/421 . . in the form of rotational kinetic energy, e.g. in flywheels

2260/422 . . in the form of potential energy, e.g. pressurized or pumped fluid

2260/50 . Kinematic linkage, i.e. transmission of position

### **WARNING**

Group [F05B 2260/50](#) is impacted by reclassification into groups [F03D 1/0662](#) and [F03D 1/0664](#).

Groups [F05B 2260/50](#), [F03D 1/0662](#) and [F03D 1/0664](#) should be considered in order to perform a complete search.

2260/502 . . involving springs

### **WARNING**

Group [F05B 2260/502](#) is impacted by reclassification into groups [F03D 1/0662](#) and [F03D 1/0664](#).

Groups [F05B 2260/502](#), [F03D 1/0662](#) and [F03D 1/0664](#) should be considered in order to perform a complete search.

2260/503 . . using gears

### **WARNING**

Group [F05B 2260/503](#) is impacted by reclassification into groups [F03D 1/0662](#) and [F03D 1/0664](#).

Groups [F05B 2260/503](#), [F03D 1/0662](#) and [F03D 1/0664](#) should be considered in order to perform a complete search.

2260/5032 . . . of the bevel or angled type

### **WARNING**

Group [F05B 2260/5032](#) is impacted by reclassification into groups [F03D 1/0662](#) and [F03D 1/0664](#).

Groups [F05B 2260/5032](#), [F03D 1/0662](#) and [F03D 1/0664](#) should be considered in order to perform a complete search.

2260/504 . . using flat or V-belts and pulleys

### **WARNING**

Group [F05B 2260/504](#) is impacted by reclassification into groups [F03D 1/0662](#) and [F03D 1/0664](#).

Groups [F05B 2260/504](#), [F03D 1/0662](#) and [F03D 1/0664](#) should be considered in order to perform a complete search.

2260/505 . . using chains and sprockets; using toothed belts

### **WARNING**

Group [F05B 2260/505](#) is impacted by reclassification into groups [F03D 1/0662](#) and [F03D 1/0664](#).

Groups [F05B 2260/505](#), [F03D 1/0662](#) and [F03D 1/0664](#) should be considered in order to perform a complete search.

2260/506 . . using cams or eccentrics

### **WARNING**

Group [F05B 2260/506](#) is impacted by reclassification into groups [F03D 1/0662](#) and [F03D 1/0664](#).

Groups [F05B 2260/506](#), [F03D 1/0662](#) and [F03D 1/0664](#) should be considered in order to perform a complete search.

- 2260/507 . . using servos, independent actuators, etc.

**WARNING**

Group [F05B 2260/507](#) is impacted by reclassification into groups [F03D 1/0662](#) and [F03D 1/0664](#).

Groups [F05B 2260/507](#), [F03D 1/0662](#) and [F03D 1/0664](#) should be considered in order to perform a complete search.

- 2260/60 . Fluid transfer
- 2260/601 . . using an ejector or a jet pump
- 2260/602 . . Drainage
- 2260/603 . . . of leakage having past a seal
- 2260/604 . . Vortex non-clogging type pumps
- 2260/63 . . Preventing clogging or obstruction of flow paths by dirt, dust, or foreign particles
- 2260/64 . . Aeration, ventilation, dehumidification or moisture removal of closed spaces
- 2260/70 . Adjusting of angle of incidence or attack of rotating blades

**WARNING**

Group [F05B 2260/70](#) is impacted by reclassification into groups [F03D 1/0664](#) and [F03D 1/0667](#).

Groups [F05B 2260/70](#), [F03D 1/0664](#) and [F03D 1/0667](#) should be considered in order to perform a complete search.

- 2260/71 . . as a function of flow velocity
- 2260/72 . . by turning around an axis parallel to the rotor centre line
- 2260/74 . . by turning around an axis perpendicular the rotor centre line
- 2260/75 . . the adjusting mechanism not using auxiliary power sources, e.g. servos

**WARNING**

Group [F05B 2260/75](#) is impacted by reclassification into groups [F03D 1/0664](#) and [F03D 1/0667](#).

Groups [F05B 2260/75](#), [F03D 1/0664](#) and [F03D 1/0667](#) should be considered in order to perform a complete search.

- 2260/76 . . the adjusting mechanism using auxiliary power sources

**WARNING**

Group [F05B 2260/76](#) is impacted by reclassification into groups [F03D 1/0664](#), [F03D 1/0667](#), [F03D 1/0669](#) and [F03D 1/0671](#).

All groups listed in this Warning should be considered in order to perform a complete search.

- 2260/77 . . the adjusting mechanism driven or triggered by centrifugal forces

**WARNING**

Group [F05B 2260/77](#) is impacted by reclassification into groups [F03D 1/0664](#) and [F03D 1/0667](#).

Groups [F05B 2260/77](#), [F03D 1/0664](#) and [F03D 1/0667](#) should be considered in order to perform a complete search.

- 2260/78 . . the adjusting mechanism driven or triggered by aerodynamic forces

**WARNING**

Group [F05B 2260/78](#) is impacted by reclassification into groups [F03D 1/0664](#) and [F03D 1/0667](#).

Groups [F05B 2260/78](#), [F03D 1/0664](#) and [F03D 1/0667](#) should be considered in order to perform a complete search.

- 2260/79 . . Bearing, support or actuation arrangements therefor

**WARNING**

Group [F05B 2260/79](#) is impacted by reclassification into groups [F03D 1/0664](#), [F03D 1/0667](#), [F03D 1/0669](#), [F03D 1/0671](#) and [F03D 80/701](#).

All groups listed in this Warning should be considered in order to perform a complete search.

- 2260/80 . Diagnostics

**WARNING**

Group [F05B 2260/80](#) is impacted by reclassification into groups [F03D 17/001](#), [F03D 17/004](#), [F03D 17/005](#), [F03D 17/006](#), [F03D 17/0065](#), [F03D 17/009](#), [F03D 17/011](#), [F03D 17/014](#), [F03D 17/015](#), [F03D 17/027](#), [F03D 17/028](#), [F03D 17/032](#), [F03D 17/034](#) and [F03D 17/036](#).

All groups listed in this Warning should be considered in order to perform a complete search.

- 2260/82 . Forecasts

**WARNING**

Group [F05B 2260/82](#) is impacted by reclassification into groups [F03D 17/005](#), [F03D 17/006](#) and [F03D 17/0065](#).

All groups listed in this Warning should be considered in order to perform a complete search.

## F05B

- 2260/821 . . . Parameter estimation or prediction

### **WARNING**

Group [F05B 2260/821](#) is impacted by reclassification into groups [F03D 17/005](#), [F03D 17/006](#) and [F03D 17/0065](#).

All groups listed in this Warning should be considered in order to perform a complete search.

- 2260/8211 . . . of the weather

### **WARNING**

Group [F05B 2260/8211](#) is impacted by reclassification into groups [F03D 17/005](#), [F03D 17/006](#) and [F03D 17/0065](#).

All groups listed in this Warning should be considered in order to perform a complete search.

- 2260/83 . . . Testing, e.g. methods, components or tools therefor

### **WARNING**

Group [F05B 2260/83](#) is impacted by reclassification into groups [F03D 17/001](#), [F03D 17/002](#), [F03D 17/003](#) and [F03D 17/004](#).

All groups listed in this Warning should be considered in order to perform a complete search.

- 2260/84 . . . Modelling or simulation

### **WARNING**

Group [F05B 2260/84](#) is impacted by reclassification into groups [F03D 17/005](#), [F03D 17/006](#) and [F03D 17/0065](#).

All groups listed in this Warning should be considered in order to perform a complete search.

- 2260/845 . . . Redundancy

- 2260/85 . . . Starting

- 2260/87 . . . Using a generator as a motor

- 2260/90 . . . Braking

- 2260/901 . . . using aerodynamic forces, i.e. lift or drag

- 2260/9011 . . . of the tips of rotor blades

- 2260/902 . . . using frictional mechanical forces

- 2260/903 . . . using electrical or magnetic forces

- 2260/904 . . . using hydrodynamic forces

- 2260/95 . . . Preventing corrosion

- 2260/96 . . . Preventing, counteracting or reducing vibration or noise

### **WARNING**

Group [F05B 2260/96](#) is impacted by reclassification into group [F03D 80/005](#).

Groups [F05B 2260/96](#) and [F03D 80/005](#) should be considered in order to perform a complete search.

- 2260/962 . . . by means creating "anti-noise"

### **WARNING**

Group [F05B 2260/962](#) is impacted by reclassification into group [F03D 80/005](#).

Groups [F05B 2260/962](#) and [F03D 80/005](#) should be considered in order to perform a complete search.

- 2260/964 . . . by damping means

### **WARNING**

Group [F05B 2260/964](#) is impacted by reclassification into group [F03D 80/005](#).

Groups [F05B 2260/964](#) and [F03D 80/005](#) should be considered in order to perform a complete search.

- 2260/966 . . . by correcting static or dynamic imbalance

### **WARNING**

Group [F05B 2260/966](#) is impacted by reclassification into group [F03D 80/005](#).

Groups [F05B 2260/966](#) and [F03D 80/005](#) should be considered in order to perform a complete search.

- 2260/97 . . . Reducing windage losses

- 2260/972 . . . in radial flow machines

- 2260/98 . . . Lubrication

### **WARNING**

Group [F05B 2260/98](#) is impacted by reclassification into groups [F03D 80/705](#), [F03D 80/707](#) and [F03D 80/709](#).

All groups listed in this Warning should be considered in order to perform a complete search.

- 2260/99 . . . Radar absorption

### **2270/00 Control**

- 2270/10 . . . Purpose of the control system

- 2270/101 . . . to control rotational speed (n)

### **WARNING**

Group [F05B 2270/101](#) is impacted by reclassification into group [F03D 7/065](#).

Groups [F05B 2270/101](#) and [F03D 7/065](#) should be considered in order to perform a complete search.

- 2270/1011 . . . to prevent overspeed

### **WARNING**

Group [F05B 2270/1011](#) is impacted by reclassification into group [F03D 7/065](#).

Groups [F05B 2270/1011](#) and [F03D 7/065](#) should be considered in order to perform a complete search.

2270/1012 . . . to prevent underspeed

**WARNING**

Group [F05B 2270/1012](#) is impacted by reclassification into group [F03D 7/065](#).

Groups [F05B 2270/1012](#) and [F03D 7/065](#) should be considered in order to perform a complete search.

2270/1013 . . . of different spools or shafts

2270/1014 . . . to keep rotational speed constant

**WARNING**

Group [F05B 2270/1014](#) is impacted by reclassification into group [F03D 7/065](#).

Groups [F05B 2270/1014](#) and [F03D 7/065](#) should be considered in order to perform a complete search.

2270/1016 . . . in variable speed operation

2270/102 . . . to control acceleration (u)

2270/1021 . . . by keeping it below damagingly high values

2270/1022 . . . by making it as high as possible

2270/103 . . . to affect the output of the engine

2270/1031 . . . Thrust

2270/1032 . . . Torque

2270/1033 . . . Power (if explicitly mentioned)

2270/104 . . . to match engine to driven device

2270/1041 . . . in particular the electrical frequency of driven generator

2270/107 . . . to cope with emergencies

2270/1071 . . . in particular sudden load loss

2270/10711 . . . applying a low voltage ride through method

2270/1072 . . . in particular blow-out and relight

2270/1073 . . . of one engine in a multi-engine system

2270/1074 . . . by using back-up controls

2270/1075 . . . by temporary overriding set control limits

2270/1076 . . . caused by water or hail ingestion

2270/1077 . . . Storm protection

2270/109 . . . to prolong engine life

2270/1091 . . . by limiting temperatures

2270/1095 . . . by limiting mechanical stresses

2270/1097 . . . by preventing reverse rotation

2270/11 . . . to maintain desired vehicle trajectory parameters

2270/111 . . . to control two or more engines simultaneously

2270/17 . . . to avoid excessive deflection of the blades

**WARNING**

Group [F05B 2270/17](#) is impacted by reclassification into groups [F03D 17/028](#) and [F03D 17/034](#).

Groups [F05B 2270/17](#), [F03D 17/028](#) and [F03D 17/034](#) should be considered in order to perform a complete search.

2270/18 . . . to control buoyancy

**WARNING**

Group [F05B 2270/18](#) is impacted by reclassification into groups [F03D 7/0202](#) and [F03D 7/051](#).

Groups [F05B 2270/18](#), [F03D 7/0202](#) and [F03D 7/051](#) should be considered in order to perform a complete search.

2270/19 . . . to avoid stroboscopic flicker shadow on surroundings

2270/20 . . . to optimise the performance of a machine

**WARNING**

Group [F05B 2270/20](#) is impacted by reclassification into group [F03D 80/002](#).

Groups [F05B 2270/20](#) and [F03D 80/002](#) should be considered in order to perform a complete search.

2270/202 . . . Tuning to wave conditions

2270/204 . . . taking into account the wake effect

**WARNING**

Group [F05B 2270/204](#) is impacted by reclassification into groups [F03D 17/008](#), [F03D 80/002](#) and [F03D 7/049](#).

All groups listed in this Warning should be considered in order to perform a complete search.

2270/30 . . . Control parameters, e.g. input parameters

2270/301 . . . Pressure

2270/3011 . . . Inlet

2270/3013 . . . Outlet

2270/3015 . . . differential

2270/303 . . . Temperature

**WARNING**

Group [F05B 2270/303](#) is impacted by reclassification into group [F03D 17/018](#).

Groups [F05B 2270/303](#) and [F03D 17/018](#) should be considered in order to perform a complete search.

2270/3032 . . . excessive temperatures, e.g. caused by overheating

**WARNING**

Group [F05B 2270/3032](#) is impacted by reclassification into groups [F03D 17/018](#) and [F03D 17/036](#).

Groups [F05B 2270/3032](#), [F03D 17/018](#) and [F03D 17/036](#) should be considered in order to perform a complete search.

2270/304 . . . Spool rotational speed

2270/305 . . . Tolerances

2270/309 . . . Rate of change of parameters

2270/32 . . . Wind speeds

2270/3201 . . . "cut-off" or "shut-down" wind speed

2270/3202 . . . "cut-in" or starting wind speed

2270/321 . . . Wind directions

2270/322 . . . the detection or prediction of a wind gust

2270/323 . . . Air humidity

2270/324 . . . Air pressure

2270/325 . . . Air temperature

2270/326 . . . Rotor angle

2270/327 . . . Rotor or generator speeds

2270/328 . . Blade pitch angle

**WARNING**

Group [F05B 2270/328](#) is impacted by reclassification into group [F03D 17/029](#).  
Groups [F05B 2270/328](#) and [F03D 17/029](#) should be considered in order to perform a complete search.

2270/329 . . Azimuth or yaw angle

**WARNING**

Group [F05B 2270/329](#) is impacted by reclassification into group [F03D 17/029](#).  
Groups [F05B 2270/329](#) and [F03D 17/029](#) should be considered in order to perform a complete search.

2270/33 . . Proximity of blade to tower

**WARNING**

Group [F05B 2270/33](#) is impacted by reclassification into groups [F03D 17/028](#) and [F03D 17/034](#).  
Groups [F05B 2270/33](#), [F03D 17/028](#) and [F03D 17/034](#) should be considered in order to perform a complete search.

2270/331 . . Mechanical loads

**WARNING**

Group [F05B 2270/331](#) is impacted by reclassification into group [F03D 17/011](#).  
Groups [F05B 2270/331](#) and [F03D 17/011](#) should be considered in order to perform a complete search.

2270/332 . . Maximum loads or fatigue criteria

**WARNING**

Group [F05B 2270/332](#) is impacted by reclassification into groups [F03D 17/011](#), [F03D 17/028](#), [F03D 17/0285](#), [F03D 17/029](#), [F03D 17/031](#), [F03D 17/032](#), [F03D 17/033](#), [F03D 17/034](#) and [F03D 17/036](#).  
All groups listed in this Warning should be considered in order to perform a complete search.

2270/333 . . Noise or sound levels

**WARNING**

Group [F05B 2270/333](#) is impacted by reclassification into groups [F03D 7/0296](#), [F03D 17/024](#), [F03D 17/028](#), [F03D 17/0285](#), [F03D 17/029](#), [F03D 17/031](#), [F03D 17/032](#), [F03D 17/033](#), [F03D 17/034](#), [F03D 17/036](#) and [F03D 80/005](#).  
All groups listed in this Warning should be considered in order to perform a complete search.

2270/334 . . Vibration measurements

**WARNING**

Group [F05B 2270/334](#) is impacted by reclassification into groups [F03D 7/0298](#), [F03D 7/0302](#), [F03D 17/015](#), [F03D 17/028](#), [F03D 17/0285](#), [F03D 17/029](#), [F03D 17/031](#), [F03D 17/032](#), [F03D 17/033](#), [F03D 17/034](#) and [F03D 17/036](#).  
All groups listed in this Warning should be considered in order to perform a complete search.

2270/335 . . Output power or torque

2270/336 . . Blade lift measurements

2270/337 . . Electrical grid status parameters, e.g. voltage, frequency or power demand

2270/34 . . Water level

2270/341 . . Liquid flow velocity or direction

2270/342 . . Wave conditions, e.g. amplitude, frequency or direction

2270/40 . . Type of control system

2270/402 . . passive or reactive, e.g. using large wind vanes

2270/404 . . active, predictive, or anticipative

2270/50 . . Control logic embodiment by

2270/502 . . electrical means, e.g. relays or switches

**WARNING**

Group [F05B 2270/502](#) is impacted by reclassification into group [F03D 80/003](#).  
Groups [F05B 2270/502](#) and [F03D 80/003](#) should be considered in order to perform a complete search.

2270/504 . . electronic means, e.g. electronic tubes, transistors or IC's within an electronic circuit

**WARNING**

Group [F05B 2270/504](#) is impacted by reclassification into group [F03D 80/003](#).  
Groups [F05B 2270/504](#) and [F03D 80/003](#) should be considered in order to perform a complete search.

2270/506 . . hydraulic means, e.g. hydraulic valves within a hydraulic circuit

**WARNING**

Group [F05B 2270/506](#) is impacted by reclassification into group [F03D 80/003](#).  
Groups [F05B 2270/506](#) and [F03D 80/003](#) should be considered in order to perform a complete search.

2270/508 . . mechanical means, e.g. levers, gears or cams

**WARNING**

Group [F05B 2270/508](#) is impacted by reclassification into group [F03D 80/003](#).  
Groups [F05B 2270/508](#) and [F03D 80/003](#) should be considered in order to perform a complete search.

2270/60 . . Control system actuates through

## F05B

2270/602 . . electrical actuators

### **WARNING**

Group [F05B 2270/602](#) is impacted by reclassification into group [F03D 1/0671](#).

Groups [F05B 2270/602](#) and [F03D 1/0671](#) should be considered in order to perform a complete search.

2270/604 . . hydraulic actuators

### **WARNING**

Group [F05B 2270/604](#) is impacted by reclassification into group [F03D 1/0669](#).

Groups [F05B 2270/604](#) and [F03D 1/0669](#) should be considered in order to perform a complete search.

2270/605 . . pneumatic actuators

### **WARNING**

Group [F05B 2270/605](#) is impacted by reclassification into group [F03D 1/0667](#).

Groups [F05B 2270/605](#) and [F03D 1/0667](#) should be considered in order to perform a complete search.

2270/606 . . mechanical actuators ([F05B 2270/602](#) takes precedence)

### **WARNING**

Group [F05B 2270/606](#) is impacted by reclassification into group [F03D 1/0667](#).

Groups [F05B 2270/606](#) and [F03D 1/0667](#) should be considered in order to perform a complete search.

2270/70 . Type of control algorithm

2270/701 . . proportional

2270/702 . . differential

2270/703 . . integral

2270/704 . . proportional-differential

2270/705 . . proportional-integral

2270/706 . . proportional-integral-differential

2270/707 . . fuzzy logic

2270/708 . . with comparison tables

2270/709 . . with neural networks

2270/80 . Devices generating input signals, e.g. transducers, sensors, cameras or strain gauges

2270/802 . . Calibration thereof

### **WARNING**

Group [F05B 2270/802](#) is impacted by reclassification into group [F03D 17/025](#).

Groups [F05B 2270/802](#) and [F03D 17/025](#) should be considered in order to perform a complete search.

2270/803 . . Sampling thereof

2270/804 . . Optical devices

### **WARNING**

Group [F05B 2270/804](#) is impacted by reclassification into group [F03D 17/003](#).

Groups [F05B 2270/804](#) and [F03D 17/003](#) should be considered in order to perform a complete search.

2270/8041 . . . Cameras

### **WARNING**

Group [F05B 2270/8041](#) is impacted by reclassification into group [F03D 17/003](#).

Groups [F05B 2270/8041](#) and [F03D 17/003](#) should be considered in order to perform a complete search.

2270/8042 . . . Lidar systems

### **WARNING**

Group [F05B 2270/8042](#) is impacted by reclassification into group [F03D 17/003](#).

Groups [F05B 2270/8042](#) and [F03D 17/003](#) should be considered in order to perform a complete search.

2270/805 . . Radars

2270/806 . . Sonars

2270/807 . . Accelerometers

2270/808 . . Strain gauges; Load cells

2270/809 . . Encoders

2270/81 . . Microphones

### **WARNING**

Group [F05B 2270/81](#) is impacted by reclassification into group [F03D 17/024](#).

Groups [F05B 2270/81](#) and [F03D 17/024](#) should be considered in order to perform a complete search.

2270/821 . . Displacement measuring means, e.g. inductive

### **WARNING**

Group [F05B 2270/821](#) is impacted by reclassification into group [F03D 17/022](#).

Groups [F05B 2270/821](#) and [F03D 17/022](#) should be considered in order to perform a complete search.

**2280/00 Materials; Properties thereof**

2280/10 . Inorganic materials, e.g. metals

2280/101 . . Iron

2280/1011 . . . Cast iron

2280/102 . . Light metals

2280/1021 . . . Aluminium

2280/1022 . . . Beryllium

2280/1023 . . . Boron

2280/1024 . . . Lithium

2280/1025 . . . Magnesium

2280/103 . . Heavy metals

2280/10301 . . . Refractory metals, e.g. V, W

2280/10302 . . . Chromium

2280/10303 . . . Molybdenum

2280/10304 . . . Titanium

**F05B**

2280/10305	. . . Zirconium	2280/30	. Inorganic materials not otherwise provided for
2280/10306	. . . Hafnium	2280/40	. Organic materials
2280/10307	. . . Manganese	2280/4001	. . Leather
2280/10308	. . . Lead	2280/4002	. . Cellulosic materials, e.g. wood
2280/10309	. . . Tin	2280/4003	. . Synthetic polymers, e.g. plastics
2280/1031	. . . Zinc	2280/4004	. . Rubber
2280/10311	. . . Mercury	2280/4005	. . PTFE [PolyTetraFluorEthylene]
2280/104	. . Noble metals	2280/4006	. . Polyamides, e.g. NYLON
2280/1041	. . . Silver	2280/4007	. . Thermoplastics
2280/1042	. . . Gold	2280/4009	. . Polyetherketones, e.g. PEEK
2280/1043	. . . Platinum group, e.g. Pt, Ir	2280/401	. . Silicon polymers
2280/1044	. . . Palladium	2280/4011	. . Organic materials not otherwise provided for
2280/1045	. . . Ruthenium	2280/50	. Intrinsic material properties or characteristics
2280/1046	. . . Osmium	2280/5001	. . Elasticity
2280/1047	. . . Iridium	2280/5002	. . Thermal properties
2280/1048	. . . Rhodium	2280/5003	. . Expansivity
2280/105	. . Copper	2280/50031	. . . similar
2280/106	. . Rare earth metals, e.g. Sc, Y	2280/50032	. . . dissimilar
2280/107	. . Alloys	2280/5004	. . Heat transfer
2280/1071	. . . Steel alloys	2280/5005	. . Reflective properties
2280/1072	. . Copper alloys	2280/5006	. . Shape memory
2280/10721	. . . Bronze	2280/5007	. . Hardness
2280/10722	. . . Phosphor-bronze alloy	2280/5008	. . Magnetic properties
2280/10723	. . . Nickel-Copper alloy, e.g. monel	2280/5009	. . non-magnetic
2280/1073	. . Aluminium alloy, e.g. AlCuMgPb	2280/501	. . Self lubricating materials; Solid lubricants
2280/1074	. . Alloys not otherwise provided for	2280/5011	. . Surface roughness
2280/10741	. . . Superalloys	2280/60	. Properties or characteristics given to material by treatment or manufacturing
2280/10742	. . . Heat stable alloys	2280/6001	. . Fabrics
2280/10743	. . . Ni - Si alloys	2280/6002	. . . Woven fabrics
2280/10744	. . . Metal-aluminide intermetallic compounds	2280/6003	. . Composites; e.g. fibre-reinforced
2280/20	. Inorganic materials, e.g. non-metallic materials	2280/6004	. . amorphous
2280/2001	. . Glass	2280/6005	. . crystalline
2280/20011	. . . MIBA	2280/6006	. . Directionally-solidified crystalline structures
2280/20012	. . . Quartz	2280/6007	. . monocrystalline
2280/2002	. . Phosphor	2280/6008	. . Structures
2280/2003	. . Silicon	2280/6009	. . Grain size
2280/2004	. . Ceramics; Oxides	2280/601	. . Syntactic
2280/20041	. . . Aluminium oxides	2280/6011	. . Coating
2280/20042	. . . Zinc oxides	2280/6012	. . Foam
2280/20043	. . . Zirconium oxides	2280/6013	. . Fibres
2280/2005	. . Non-oxide ceramics	2280/6014	. . Filler
2280/2006	. . Carbon, e.g. graphite	2280/6015	. . Resin
2280/2007	. . Carbides	2280/70	. Treatments or modification of materials
2280/20071	. . . of silicon	2280/701	. . Heat treatments
2280/20072	. . . of titanium, e.g. TiB	2280/702	. . Reinforcements
2280/20073	. . . of wolfram, e.g. tungsten carbide		
2280/2008	. . Nitrides		
2280/20081	. . . of aluminium		
2280/20082	. . . of boron		
2280/20083	. . . of silicon		
2280/20084	. . . of titanium		
2280/20085	. . . of zirconium		
2280/2009	. . Sulfides		
2280/20091	. . . of molybdenum		
2280/201	. . Sapphire		
2280/2011	. . Aluminium titanate		
2280/2013	. . Silica		
2280/2014	. . Arsenic		
2280/2015	. . Antimony		
2280/2016	. . Bismuth		
2280/2017	. . Barium		

**WARNING**

Group [F05B 2280/702](#) is impacted by reclassification into groups [F03D 1/0679](#), [F03D 1/0681](#), [F03D 1/0682](#) and [F03D 1/0684](#).

All groups listed in this Warning should be considered in order to perform a complete search.