

## ECLA EUROPEAN CLASSIFICATION

### F03D WIND MOTORS

#### **Note**

In this subclass, the following words are used with the meanings indicated:

- "Wind motor" means a mechanism for converting the energy of natural wind into useful mechanical power, and the transmission of such power to its point of use;
- "Rotor" means the wind-engaging parts of the wind motor and the rotary member carrying them;
- "Rotations axis" means the axis of rotation of the rotor.

#### **F03D1/00 Wind motors with rotation axis substantially in wind direction (controlling [F03D7/00](#))**

- F03D1/00B . [N: Assembly thereof (fixing wind engaging part to rotor [F03D1/06C2](#)); Erecting methods; Equipments therefor (foundations [F03D11/04B](#))] [N0211] [C1202]
- F03D1/00C . [N: Maintenance or repair; Equipment therefor] [N0211]
- F03D1/00D . [N: Transport; Equipments therefor] [N1202]
- F03D1/00E . [N: Commisioning] [N1202]
- F03D1/00E2 . . [N: Balancing static or dynamic imbalances] [N1202]
- F03D1/02 . having a plurality of rotors
- F03D1/02B . . [N: coaxially arranged]
- F03D1/04 . having stationary wind-guiding means, e.g. with shrouds or channels ([F03D1/02](#) takes precedence)
- F03D1/06 . Rotors
- F03D1/06B . . [N: characterised by their form] [N1204]
- F03D1/06B2 . . . [N: using the Magnus effect] [N9707]
- F03D1/06B4 . . . [N: of the whole rotor, i.e. form features of the rotor unit] [N1204]
- F03D1/06B6 . . . [N: of the blades] [N1202]
- F03D1/06B6B . . . . [N: of the section profile of the blades] [N1202]
- F03D1/06C . . [N: characterised by their construction, i.e. structural design details ([F03D1/00B](#) takes preference)] [N1204]
- F03D1/06C2 . . . [N: Fixing wind-engaging parts to rotor]
- F03D1/06C4 . . . [N: of the whole rotor] [N1202]
- F03D1/06C6 . . . [N: of the blades] [N1202]
- F03D1/06C6B . . . . [N: of the section profile of the blades] [N1202]
- F03D1/06C8 . . . [N: of the hub] [N1202]

#### **F03D3/00 Wind motors with rotation axis substantially at right-angles to wind direction (controlling [F03D7/00](#))**

- F03D3/00C . [N: axis horizontal]
- F03D3/00D . [N: axis vertical]
- F03D3/00D2 . . [N: using the Magnus effect]
- F03D3/02 . having a plurality of rotors
- F03D3/04 . having stationary wind-guiding means [N: or means stationary only with respect to the current wind direction], e.g. with shrouds or channels ([F03D3/02](#) takes precedence)
- F03D3/04B . . [N: having stationary guiding vanes surrounding the rotor ([F03D3/04D](#) takes precedence)]
- F03D3/04B2 . . . [N: the vanes being adjustable]
- F03D3/04D . . [N: with augmenting action, i.e. the guiding means intercepting an area greater than the effective rotor area ([F03D3/04E2D](#), [F03D3/04E4D](#) take precedence)]
- F03D3/04E . . [N: having shield means on one side of the rotor]
- F03D3/04E2 . . . [N: fixed with respect to rotor, orientable together]
- F03D3/04E2B . . . . [N: and only with concentrating action, i.e. only increasing the airflow speed into the rotor ([F03D3/04E2D](#) takes precedence)]
- F03D3/04E2D . . . . [N: with augmenting action, i.e. the shield means intercepting an area greater than the effective rotor area]
- F03D3/04E4 . . . [N: orientable with respect to the rotor]
- F03D3/04E4B . . . . [N: and only with concentrating action, i.e. only increasing the airflow speed into the rotor ([F03D3/04E4D](#) takes precedence)]
- F03D3/04E4D . . . . [N: with augmenting action, i.e. the shield means intercepting an area greater than the effective rotor area]
- F03D3/06 . Rotor
- F03D3/06D . . [N: Form]
- F03D3/06E . . [N: Construction]
- F03D3/06E2 . . . [N: Fixing wind engaging parts to rest of rotor]
- F03D3/06E4 . . . [N: the wind engaging parts having no movement relative to the rotor during its rotation]
- F03D3/06E6 . . . [N: the wind engaging parts having a cyclic movement relative to the rotor during its rotation]
- F03D3/06E6B . . . . [N: the cyclic relative movement being coupled to the movement of rotation; Controlling same, e.g. according to wind direction or force]
- F03D5/00** . **Other wind motors** (controlling [F03D7/00](#))
- F03D5/00B . [N: Wind motors having a single vane which axis generate a conus or like surface]
- F03D5/02 . the wind-engaging parts being attached to endless chains or the like
- F03D5/04 . the wind-engaging parts being attached to carriages running on tracks or the like
- F03D5/06 . the wind-engaging parts swinging to-and-fro and not rotating
- F03D7/00** . **Controlling wind motors**

- F03D7/02 . the wind motors having rotation axis substantially in wind direction
- F03D7/02B . . [N: for orientation in relation to wind direction] [N1202]
- F03D7/02B2 . . . [N: Orientating out of wind] [N1202]
- F03D7/02B2B . . . . [N: the rotating axis remaining horizontal] [N1202]
- F03D7/02B2D . . . . [N: the rotating axis changing to vertical position] [N1202]
- F03D7/02D . . [N: Adjusting aerodynamic properties of the blades] [N1202]
- F03D7/02D2 . . . [N: Adjusting blade pitch] [N1202]
- F03D7/02D2B . . . . [N: of the blade tips only] [N1202]
- F03D7/02D4 . . . [N: with flaps or slats (with aerodynamic drag devices on the blades for braking [F03D7/02E4](#))] [N1202]
- F03D7/02D6 . . . [N: by changing the active surface of the wind engaging parts, e.g. reefing, telescoping, furling or coning] [N1204]
- F03D7/02D8 . . . [N: of individual blades] [N1202]
- F03D7/02E . . [N: for braking] [N1202]
- F03D7/02E2 . . . [N: by mechanical means acting on the power train] [N1202]
- F03D7/02E4 . . . [N: with aerodynamic drag devices on the blades] [N1202]
- F03D7/02F . . [N: Stall control (adjusting the blades in stall position [F03D7/02D2](#))] [N1202]
- F03D7/02H . . [N: for starting-up] [N1202]
- F03D7/02K . . [N: for stopping or in emergency situation (orientating out of wind [F03D7/02B2](#))] [N1202]
- F03D7/02K2 . . . [N: Parking or storm protection] [N1202]
- F03D7/02M . . [N: by measures acting on the electrical generator (controlling electric generator per se H02P)] [N1202]
- F03D7/02N . . [N: Controlling rotor speed, e.g. variable speed] [N1202]
- F03D7/02P . . [N: Controlling motor output power] [N1202]
- F03D7/02P2 . . . [N: in relation to the state of the electric grid (supplying or distributing electric power H02J)] [N1202]
- F03D7/02P4 . . . [N: to prevent instantaneous damage to any part of the motor] [N1202]
- F03D7/02P6 . . . [N: to increase fatigue life] [N1202]
- F03D7/02V . . [N: to prevent, counteract or reduce vibration or noise] [N1202]
- F03D7/04 . . Automatic control; Regulation [C1110]
- F03D7/04A . . . [N: by means of a mechanical governor] [N1202]
- F03D7/04E . . . [N: by means of an electrical or electronic controller] [N1202]
- F03D7/04E2 . . . . [N: characterised by the type of control logic] [N1202]
- F03D7/04E2B . . . . . [N: with PID control] [N1202]
- F03D7/04E2D . . . . . [N: with model-based controls] [N1202]
- F03D7/04E2F . . . . . [N: with learning or adaptive control, e.g. self-tuning, fuzzy logic or neural network] [N1202]
- F03D7/04E4 . . . . [N: characterised by the controller architecture, e.g. multiple processors or data communications] [N1202]
- F03D7/04E6 . . . . [N: Controlling wind farms] [N1202]
- F03D7/06 . the wind motors having rotation axis substantially at right angle to wind direction [N: ([F03D3/06E6B](#) takes precedence)]

- F03D9/00**                    **Adaptations of wind motors for special use; Combinations of wind motors with apparatus driven thereby (aspects predominantly concerning driven apparatus)**
- F03D9/00B                . [N: the apparatus being a pump or compressor; Producing under- or overpressure ([F03D9/02D](#) takes precedence)] [C9707]
- F03D9/00C                . [N: the apparatus being an electrical generator ([F03D9/02B](#) takes precedence; details of electrical generators specifically adapted to wind turbines [H02K7/18A2W](#))] [C1110]
- F03D9/00C2              . . [N: connected to an electrical general supply grid; Arrangements therefor] [N0203]
- F03D9/00C2B            . . . [N: the wind motor being part of a wind farm] [N0203]
- F03D9/00D                . [N: Adaptations for producing heat, e.g. in heat pump systems]
- F03D9/00E                . [N: the wind motor being combined with means for converting solar radiation into useful energy]
- F03D9/00F                . [N: the wind motor being combined with water energy converters, e.g. a water turbine]
- F03D9/02                 . the apparatus storing energy
- F03D9/02B                . . [N: in an electrical accumulator]
- F03D9/02C                . . [N: storing gravitational potential energy]
- F03D9/02C2              . . . [N: using a liquid, e.g. water]
- F03D9/02C3              . . . [N: using weights]
- F03D9/02D                . . [N: in a pressurised fluid accumulator] [N9707]
- F03D11/00**                **Details, component parts, or accessories not provided for in, or of interest apart from, the preceding groups**
- F03D11/00B              . [N: Bearing or lubricating arrangements (lubricating of machines in general [F01M](#); bearings per se [F16C](#))]
- F03D11/00C              . [N: Cleaning] [N1202]
- F03D11/00D              . [N: Ice detection; Deicing means] [N1202]
- F03D11/00E              . [N: Lightning protection] [N1202]
- F03D11/00F              . [N: Warning systems for air traffic] [N1202]
- F03D11/00G              . [N: Arrangement of components within nacelle or tower] [N1202]
- F03D11/00G2             . . [N: of electrical components] [N1202]
- F03D11/00G2B            . . . [N: Cabling] [N1202]
- F03D11/00G24            . . [N: of mechanical components] [N1202]
- F03D11/00H              . [N: Measures to avoid shadow flicker on surroundings] [N1202]
- F03D11/00J              . [N: Monitoring; Diagnostics; Testing; Equipments therefor] [N1202]
- F03D11/02                . Transmission of power, e.g. using hollow exhausting blades [N: gearings per se [F16H](#)]

- F03D11/02B . . [N: Using hollow exhausting blades]
- F03D11/02C . . [N: Transmission in alternative movement]
- F03D11/02C2 . . . [N: Changing or adjusting stroke]
- F03D11/02D . . [N: without gearing, i.e. gearless drive] [N1202]
  
- F03D11/04 . Mounting structures
- F03D11/04B . . [N: Foundations specifically suited for wind motors] [N1202]