

Symbol	Typ	Titel
H	Sektion	ELECTRICITY
H02	Klasse	GENERATION, CONVERSION, OR DISTRIBUTION OF ELECTRIC POWER
H02K	Unterklasse	DYNAMO-ELECTRIC MACHINES (dynamo-electric relays H01H 53/00; conversion of DC or AC input power into surge output power H02M 9/00)
H02K 1/00	Hauptgruppe	Details of the magnetic circuit (magnetic circuits for relays H01H 50/16) [1, 2006.01]
H02K 1/02	1-Punkt Untergruppe	. characterised by the magnetic material [1, 2006.01]
H02K 1/04	1-Punkt Untergruppe	. characterised by the material used for insulating the magnetic circuit or parts thereof [1, 2006.01]
H02K 1/06	1-Punkt Untergruppe	. characterised by the shape, form or construction [1, 2006.01]
H02K 1/08	2-Punkt Untergruppe	. . Salient poles [1, 2006.01]
H02K 1/10	3-Punkt Untergruppe	. . . Commutating poles [1, 2006.01]
H02K 1/12	2-Punkt Untergruppe	. . Stationary parts of the magnetic circuit [1, 2006.01]
H02K 1/14	3-Punkt Untergruppe	. . . Stator cores with salient poles [1, 2006.01]
H02K 1/16	3-Punkt Untergruppe	. . . Stator cores with slots for windings [1, 2006.01]
H02K 1/17	3-Punkt Untergruppe	. . . Stator cores with permanent magnets [5, 2006.01]
H02K 1/18	3-Punkt Untergruppe	. . . Means for mounting or fastening magnetic stationary parts on to, or to, the stator structures [1, 2006.01]
H02K 1/20	3-Punkt Untergruppe	. . . with channels or ducts for flow of cooling medium [1, 2006.01]
H02K 1/22	2-Punkt Untergruppe	. . Rotating parts of the magnetic circuit [1, 2006.01]
H02K 1/24	3-Punkt Untergruppe	. . . Rotor cores with salient poles [1, 2006.01]
H02K 1/26	3-Punkt Untergruppe	. . . Rotor cores with slots for windings [1, 2006.01]
H02K 1/27	3-Punkt Untergruppe	. . . Rotor cores with permanent magnets [5, 2006.01]
H02K 1/28	3-Punkt Untergruppe	. . . Means for mounting or fastening rotating magnetic parts on to, or to, the rotor structures [1, 2006.01]
H02K 1/30	4-Punkt Untergruppe using intermediate parts, e.g. spiders [1, 2006.01]
H02K 1/32	3-Punkt Untergruppe	. . . with channels or ducts for flow of cooling medium [1, 2006.01]
H02K 1/34	2-Punkt Untergruppe	. . Reciprocating, oscillating or vibrating parts of the magnetic circuit [1, 2006.01]
H02K 3/00	Hauptgruppe	Details of windings [1, 2006.01]
H02K 3/02	1-Punkt Untergruppe	. Windings characterised by the conductor material [1, 2006.01]
H02K 3/04	1-Punkt Untergruppe	. Windings characterised by the conductor shape, form or construction, e.g. with bar conductors [1, 2006.01]
H02K 3/12	2-Punkt Untergruppe	. . arranged in slots [1, 2006.01]
H02K 3/14	3-Punkt Untergruppe	. . . with transposed conductors, e.g. twisted conductors [1, 2006.01]
H02K 3/16	3-Punkt Untergruppe	. . . for auxiliary purposes, e.g. damping or commutating [1, 2006.01]
H02K 3/18	2-Punkt Untergruppe	. . Windings for salient poles [1, 2006.01]
H02K 3/20	3-Punkt Untergruppe	. . . for auxiliary purposes, e.g. damping or commutating [1, 2006.01]
H02K 3/22	2-Punkt Untergruppe	. . consisting of hollow conductors [1, 2006.01]

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H02K 3/24	2-Punkt Untergruppe	. . with channels or ducts for cooling medium between the conductors [1, 2006.01]
H02K 3/26	2-Punkt Untergruppe	. . consisting of printed conductors [1, 2006.01]
H02K 3/28	2-Punkt Untergruppe	. . Layout of windings or of connections between windings (windings for pole-changing H02K 17/06, H02K 17/14, H02K 19/12, H02K 19/32) [1, 2006.01]
H02K 3/30	1-Punkt Untergruppe	. Windings characterised by the insulating material [1, 2006.01]
H02K 3/32	1-Punkt Untergruppe	. Windings characterised by the shape, form or construction of the insulation [1, 2006.01]
H02K 3/34	2-Punkt Untergruppe	. . between conductors or between conductor and core, e.g. slot insulation [1, 3, 2006.01]
H02K 3/38	2-Punkt Untergruppe	. . around winding heads, equalising connectors, or connections thereto [1, 2006.01]
H02K 3/40	2-Punkt Untergruppe	. . for high voltage, e.g. affording protection against corona discharges [1, 2006.01]
H02K 3/42	1-Punkt Untergruppe	. Means for preventing or reducing eddy-current losses in the winding heads, e.g. by shielding [1, 2, 2006.01]
H02K 3/44	1-Punkt Untergruppe	. Protection against moisture or chemical attack; Windings specially adapted for operation in liquid or gas [1, 2006.01]
H02K 3/46	1-Punkt Untergruppe	. Fastening of windings on the stator or rotor structure [1, 2006.01]
H02K 3/47	2-Punkt Untergruppe	. . Air-gap windings, i.e. iron-free windings [3, 2006.01]
H02K 3/48	2-Punkt Untergruppe	. . in slots [1, 2006.01]
H02K 3/487	3-Punkt Untergruppe	. . . Slot-closing devices [3, 2006.01]
H02K 3/493	4-Punkt Untergruppe magnetic [3, 2006.01]
H02K 3/50	2-Punkt Untergruppe	. . Fastening of winding heads, equalising connectors, or connections thereto [1, 2006.01]
H02K 3/51	3-Punkt Untergruppe	. . . applicable to rotors only [3, 2006.01]
H02K 3/52	2-Punkt Untergruppe	. . Fastening salient pole windings or connections thereto [1, 2006.01]
H02K 5/00	Hauptgruppe	Casings; Enclosures; Supports [1, 2006.01]
H02K 5/02	1-Punkt Untergruppe	. Casings or enclosures characterised by the material thereof [1, 2006.01]
H02K 5/04	1-Punkt Untergruppe	. Casings or enclosures characterised by the shape, form or construction thereof [1, 2006.01]
H02K 5/06	2-Punkt Untergruppe	. . Cast metal casings [1, 2006.01]
H02K 5/08	2-Punkt Untergruppe	. . Insulating casings [1, 2006.01]
H02K 5/10	2-Punkt Untergruppe	. . with arrangements for protection from ingress, e.g. of water or fingers [1, 2006.01]
H02K 5/12	2-Punkt Untergruppe	. . specially adapted for operating in liquid or gas (combined with cooling arrangements H02K 9/00) [1, 2006.01]
H02K 5/124	3-Punkt Untergruppe	. . . Sealing of shafts [3, 2006.01]
H02K 5/128	3-Punkt Untergruppe	. . . using air-gap sleeves or air-gap discs [3, 2006.01]
H02K 5/132	3-Punkt Untergruppe	. . . Submersible electric motors (H02K 5/128 takes precedence) [3, 2006.01]
H02K 5/136	3-Punkt Untergruppe	. . . explosion-proof [3, 2006.01]
H02K 5/14	2-Punkt Untergruppe	. . Means for supporting or protecting brushes or brush holders [1, 3, 2006.01]
H02K 5/15	2-Punkt Untergruppe	. . Mounting arrangements for bearing-shields or end plates [3, 2006.01]

Symbol	Typ	Titel
H02K 5/16	2-Punkt Untergruppe	. . Means for supporting bearings, e.g. insulating supports or means for fitting bearings in the bearing-shields (magnetic bearings H02K 7/09) [1, 2006.01]
H02K 5/167	3-Punkt Untergruppe	. . . using sliding-contact or spherical cap bearings [3, 2006.01]
H02K 5/173	3-Punkt Untergruppe	. . . using bearings with rolling contact, e.g. ball bearings [3, 2006.01]
H02K 5/18	2-Punkt Untergruppe	. . with ribs or fins for improving heat transfer [1, 2006.01]
H02K 5/20	2-Punkt Untergruppe	. . with channels or ducts for flow of cooling medium [1, 2006.01]
H02K 5/22	2-Punkt Untergruppe	. . Auxiliary parts of casings not covered by groups H02K 5/06-H02K 5/20, e.g. shaped to form connection boxes or terminal boxes [1, 2006.01]
H02K 5/24	1-Punkt Untergruppe	. specially adapted for suppression or reduction of noise or vibrations [1, 2006.01]
H02K 5/26	1-Punkt Untergruppe	. Means for adjusting casings relative to their supports [1, 2006.01]
H02K 7/00	Hauptgruppe	Arrangements for handling mechanical energy structurally associated with dynamo-electric machines, e.g. structural association with mechanical driving motors or auxiliary dynamo-electric machines [1, 2006.01]
H02K 7/02	1-Punkt Untergruppe	. Additional mass for increasing inertia, e.g. flywheels [1, 2006.01]
H02K 7/04	1-Punkt Untergruppe	. Balancing means [1, 2006.01]
H02K 7/06	1-Punkt Untergruppe	. Means for converting reciprocating motion into rotary motion or <u>vice versa</u> [1, 2006.01]
H02K 7/065	2-Punkt Untergruppe	. . Electromechanical oscillators; Vibrating magnetic drives [3, 2006.01]
H02K 7/07	2-Punkt Untergruppe	. . using pawls and ratchet wheels [3, 2006.01]
H02K 7/075	2-Punkt Untergruppe	. . using crankshafts or eccentrics [3, 2006.01]
H02K 7/08	1-Punkt Untergruppe	. Structural association with bearings [1, 2006.01]
H02K 7/09	2-Punkt Untergruppe	. . with magnetic bearings [3, 2006.01]
H02K 7/10	1-Punkt Untergruppe	. Structural association with clutches, brakes, gears, pulleys or mechanical starters [1, 2006.01]
H02K 7/102	2-Punkt Untergruppe	. . with friction brakes [1, 2006.01]
H02K 7/104	2-Punkt Untergruppe	. . with eddy-current brakes [1, 2006.01]
H02K 7/106	2-Punkt Untergruppe	. . with dynamo-electric brakes [1, 2006.01]
H02K 7/108	2-Punkt Untergruppe	. . with friction clutches [1, 2006.01]
H02K 7/11	2-Punkt Untergruppe	. . with dynamo-electric clutches [1, 2006.01]
H02K 7/112	2-Punkt Untergruppe	. . with friction clutches in combination with brakes [1, 2006.01]
H02K 7/114	2-Punkt Untergruppe	. . with dynamo-electric clutches in combination with brakes [1, 2006.01]
H02K 7/116	2-Punkt Untergruppe	. . with gears [1, 2006.01]
H02K 7/118	2-Punkt Untergruppe	. . with starting devices [1, 2006.01]
H02K 7/12	2-Punkt Untergruppe	. . with auxiliary limited movement of stators, rotors or core parts, e.g. rotors axially movable for the purpose of clutching or braking [1, 2006.01]
H02K 7/14	1-Punkt Untergruppe	. Structural association with mechanical loads, e.g. with hand-held machine tools or fans (with fan or impeller for cooling the machine H02K 9/06) [1, 2006.01]

Symbol	Typ	Titel
H02K 7/16	2-Punkt Untergruppe	. . for operation above the critical speed of vibration of the rotating parts [1, 2006.01]
H02K 7/18	1-Punkt Untergruppe	. Structural association of electric generators with mechanical driving motors, e.g. with turbines [1, 2006.01]
H02K 7/20	1-Punkt Untergruppe	. Structural association with auxiliary dynamo-electric machines, e.g. with electric starter motors or exciters [1, 2006.01]
H02K 9/00	Hauptgruppe	Arrangements for cooling or ventilating (channels or ducts in parts of the magnetic circuit H02K 1/20, H02K 1/32; channels or ducts in or between conductors H02K 3/22, H02K 3/24) [1, 2006.01]
H02K 9/02	1-Punkt Untergruppe	. by ambient air flowing through the machine [1, 2006.01]
H02K 9/04	2-Punkt Untergruppe	. . having means for generating a flow of cooling medium [1, 2006.01]
H02K 9/06	3-Punkt Untergruppe	. . . with fans or impellers driven by the machine shaft [1, 2006.01]
H02K 9/08	1-Punkt Untergruppe	. by gaseous cooling medium circulating wholly within the machine casing (H02K 9/10 takes precedence) [1, 2006.01]
H02K 9/10	1-Punkt Untergruppe	. by gaseous cooling medium flowing in closed circuit, a part of which is external to the machine casing [1, 2006.01]
H02K 9/12	2-Punkt Untergruppe	. . wherein the cooling medium circulates freely within the casing [1, 2006.01]
H02K 9/14	1-Punkt Untergruppe	. wherein gaseous cooling medium circulates between the machine casing and a surrounding mantle [1, 2006.01]
H02K 9/16	2-Punkt Untergruppe	. . wherein the cooling medium circulates through ducts or tubes within the casing [1, 2006.01]
H02K 9/18	2-Punkt Untergruppe	. . wherein the external part of the closed circuit comprises a heat exchanger structurally associated with the machine casing [1, 2006.01]
H02K 9/19	1-Punkt Untergruppe	. for machines with closed casing and closed-circuit cooling using a liquid cooling medium, e.g. oil [1, 2006.01]
H02K 9/193	2-Punkt Untergruppe	. . with provision for replenishing the cooling medium; with means for preventing leakage of the cooling medium [1, 2006.01]
H02K 9/197	2-Punkt Untergruppe	. . in which the rotor or stator space is fluid-tight, e.g. to provide for different cooling media for rotor and stator [1, 2006.01]
H02K 9/20	2-Punkt Untergruppe	. . wherein the cooling medium vaporises within the machine casing [1, 2006.01]
H02K 9/22	1-Punkt Untergruppe	. by solid heat conducting material embedded in, or arranged in contact with, the stator or rotor, e.g. heat bridges [1, 2006.01]
H02K 9/24	1-Punkt Untergruppe	. Protection against failure of cooling arrangements, e.g. due to loss of cooling medium or due to interruption of the circulation of cooling medium [1, 2006.01]
H02K 9/26	1-Punkt Untergruppe	. Structural association of machines with devices for cleaning or drying cooling medium, e.g. with filters [1, 2006.01]
H02K 9/28	1-Punkt Untergruppe	. Cooling of commutators, slip-rings or brushes, e.g. by ventilating [1, 2006.01]
H02K 11/00	Hauptgruppe	Structural association of dynamo-electric machines with electric components or with devices for shielding, monitoring or protection (casings, enclosures or supports H02K 5/00) [1, 2006.01, 2016.01]
H02K 11/01	1-Punkt Untergruppe	. for shielding from electromagnetic fields (means for preventing or reducing eddy-current losses in the winding heads by shielding H02K 3/42) [2016.01]
H02K 11/02	1-Punkt Untergruppe	. for suppression of electromagnetic interference [6, 2006.01, 2016.01]
H02K 11/026	2-Punkt Untergruppe	. . Suppressors associated with brushes, brush holders or their supports [2016.01]

Symbol	Typ	Titel
H02K 11/028	2-Punkt Untergruppe	. . Suppressors associated with the rotor [2016.01]
H02K 11/04	1-Punkt Untergruppe	. for rectification [6, 2006.01, 2016.01]
H02K 11/042	2-Punkt Untergruppe	. . Rectifiers associated with rotating parts, e.g. rotor cores or rotary shafts [2016.01]
H02K 11/049	2-Punkt Untergruppe	. . Rectifiers associated with stationary parts, e.g. stator cores [2016.01]
H02K 11/05	3-Punkt Untergruppe	. . . Rectifiers associated with casings, enclosures or brackets [2016.01]
H02K 11/20	1-Punkt Untergruppe	. for measuring, monitoring, testing, protecting or switching (rectifiers H02K 11/04; power electronics H02K 11/33) [2016.01]
H02K 11/21	2-Punkt Untergruppe	. . Devices for sensing speed or position, or actuated thereby (specially adapted for machines having non-mechanical commutating devices H02K 29/06, H02K 29/14) [2016.01]
H02K 11/215	3-Punkt Untergruppe	. . . Magnetic effect devices, e.g. Hall-effect or magneto-resistive elements [2016.01]
H02K 11/22	3-Punkt Untergruppe	. . . Optical devices [2016.01]
H02K 11/225	3-Punkt Untergruppe	. . . Detecting coils [2016.01]
H02K 11/23	3-Punkt Untergruppe	. . . Mechanically-actuated centrifugal switches [2016.01]
H02K 11/24	2-Punkt Untergruppe	. . Devices for sensing torque, or actuated thereby (H02K 11/27 takes precedence) [2016.01]
H02K 11/25	2-Punkt Untergruppe	. . Devices for sensing temperature, or actuated thereby [2016.01]
H02K 11/26	2-Punkt Untergruppe	. . Devices for sensing voltage, or actuated thereby, e.g. overvoltage protection devices [2016.01]
H02K 11/27	2-Punkt Untergruppe	. . Devices for sensing current, or actuated thereby (overcurrent protection responsive to temperature of the machines or parts thereof, e.g. windings, H02K 11/25) [2016.01]
H02K 11/28	2-Punkt Untergruppe	. . Manual switches [2016.01]
H02K 11/30	1-Punkt Untergruppe	. Structural association with control circuits or drive circuits [2016.01]
H02K 11/33	2-Punkt Untergruppe	. . Drive circuits, e.g. power electronics (H02K 11/38 takes precedence) [2016.01]
H02K 11/35	2-Punkt Untergruppe	. . Devices for recording or transmitting machine parameters, e.g. memory chips or radio transmitters for diagnosis [2016.01]
H02K 11/38	2-Punkt Untergruppe	. . Control circuits or drive circuits associated with geared commutator motors of the worm-and-wheel type [2016.01]
H02K 11/40	1-Punkt Untergruppe	. Structural association with grounding devices [2016.01]
H02K 13/00	Hauptgruppe	Structural associations of current collectors with motors or generators, e.g. brush mounting plates or connections to windings (supporting or protecting brushes or brush holders in motor casings or enclosures H02K 5/14); Disposition of current collectors in motors or generators; Arrangements for improving commutation [1, 2006.01]
H02K 13/02	1-Punkt Untergruppe	. Connections between slip-rings and windings [1, 2006.01]
H02K 13/04	1-Punkt Untergruppe	. Connections between commutator segments and windings [1, 2006.01]
H02K 13/06	2-Punkt Untergruppe	. . Resistive connections, e.g. by high-resistance chokes or by transistors [1, 2006.01]
H02K 13/08	2-Punkt Untergruppe	. . Segments formed by extensions of the winding [1, 2006.01]
H02K 13/10	1-Punkt Untergruppe	. Arrangements of brushes or commutators specially adapted for improving commutation [1, 2006.01]
H02K 13/12	1-Punkt Untergruppe	. Arrangements for producing an axial reciprocation of the rotor and its associated current collector part, e.g. for polishing commutator surfaces [1, 2006.01]

Symbol	Typ	Titel
H02K 13/14	1-Punkt Untergruppe	. Circuit arrangements for improvement of commutation, e.g. by use of unidirectionally conductive elements [1, 2006.01]
H02K 15/00	Hauptgruppe	Methods or apparatus specially adapted for manufacturing, assembling, maintaining or repairing of dynamo-electric machines [1, 2006.01]
H02K 15/02	1-Punkt Untergruppe	. of stator or rotor bodies [1, 2006.01]
H02K 15/03	2-Punkt Untergruppe	. . having permanent magnets [5, 2006.01]
H02K 15/04	1-Punkt Untergruppe	. of windings, prior to mounting into machines (insulating windings H02K 15/10, H02K 15/12) [1, 2006.01]
H02K 15/06	1-Punkt Untergruppe	. Embedding prefabricated windings in machines [1, 2006.01]
H02K 15/08	1-Punkt Untergruppe	. Forming windings by laying conductors into or around core parts [1, 2006.01]
H02K 15/085	2-Punkt Untergruppe	. . by laying conductors into slotted stators [1, 2006.01]
H02K 15/09	2-Punkt Untergruppe	. . by laying conductors into slotted rotors [1, 2006.01]
H02K 15/095	2-Punkt Untergruppe	. . by laying conductors around salient poles [1, 2006.01]
H02K 15/10	1-Punkt Untergruppe	. Applying solid insulation to windings, stators or rotors [1, 2006.01]
H02K 15/12	1-Punkt Untergruppe	. Impregnating, heating or drying of windings, stators, rotors or machines [1, 2006.01]
H02K 15/14	1-Punkt Untergruppe	. Casings; Enclosures; Supports [1, 2006.01]
H02K 15/16	1-Punkt Untergruppe	. Centering rotors within the stator; Balancing rotors [1, 2006.01]
H02K 16/00	Hauptgruppe	Machines with more than one rotor or stator [2, 2006.01]
H02K 16/02	1-Punkt Untergruppe	. Machines with one stator and two rotors [2, 2006.01]
H02K 16/04	1-Punkt Untergruppe	. Machines with one rotor and two stators [2, 2006.01]
H02K 17/00	Hauptgruppe	Asynchronous induction motors; Asynchronous induction generators [1, 2006.01]
H02K 17/02	1-Punkt Untergruppe	. Asynchronous induction motors [1, 2006.01]
H02K 17/04	2-Punkt Untergruppe	. . for single phase current [1, 2006.01]
H02K 17/06	3-Punkt Untergruppe	. . . having windings arranged for permitting pole-changing [1, 2006.01]
H02K 17/08	3-Punkt Untergruppe	. . . Motors with auxiliary phase obtained by externally fed auxiliary windings, e.g. capacitor motors [1, 2006.01]
H02K 17/10	3-Punkt Untergruppe	. . . Motors with auxiliary phase obtained by split-pole carrying short-circuited windings [1, 2006.01]
H02K 17/12	2-Punkt Untergruppe	. . for multi-phase current [1, 2006.01]
H02K 17/14	3-Punkt Untergruppe	. . . having windings arranged for permitting pole-changing [1, 2006.01]
H02K 17/16	2-Punkt Untergruppe	. . having rotors with internally short-circuited windings, e.g. cage rotors [1, 2006.01]
H02K 17/18	3-Punkt Untergruppe	. . . having double-cage or multiple-cage rotors [1, 2006.01]
H02K 17/20	3-Punkt Untergruppe	. . . having deep-bar rotors [1, 2006.01]
H02K 17/22	2-Punkt Untergruppe	. . having rotors with windings connected to slip-rings [1, 2006.01]
H02K 17/24	3-Punkt Untergruppe	. . . in which both stator and rotor are fed with AC [1, 2006.01]
H02K 17/26	2-Punkt Untergruppe	. . having rotors or stators designed to permit synchronous operation [1, 2006.01]

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H02K 17/28	2-Punkt Untergruppe	. . having compensating winding for improving phase angle [1, 2006.01]
H02K 17/30	2-Punkt Untergruppe	. . Structural association of asynchronous induction motors with auxiliary electric devices influencing the characteristics of the motor or controlling the motor, e.g. with impedances or switches [1, 2006.01]
H02K 17/32	2-Punkt Untergruppe	. . Structural association of asynchronous induction motors with auxiliary mechanical devices, e.g. with clutches or brakes [1, 2006.01]
H02K 17/34	2-Punkt Untergruppe	. . Cascade arrangement of an asynchronous motor with another dynamo-electric motor or converter [1, 2006.01]
H02K 17/36	3-Punkt Untergruppe	. . . with another asynchronous induction motor [1, 2006.01]
H02K 17/38	3-Punkt Untergruppe	. . . with a commutator machine [1, 2006.01]
H02K 17/40	3-Punkt Untergruppe	. . . with a rotary AC/DC converter [1, 2006.01]
H02K 17/42	1-Punkt Untergruppe	. Asynchronous induction generators (H02K 17/02 takes precedence) [1, 4, 2006.01]
H02K 17/44	2-Punkt Untergruppe	. . Structural association with exciting machines [1, 2006.01]
H02K 19/00	Hauptgruppe	Synchronous motors or generators (having permanent magnets H02K 21/00) [1, 2006.01]
H02K 19/02	1-Punkt Untergruppe	. Synchronous motors [1, 2006.01]
H02K 19/04	2-Punkt Untergruppe	. . for single-phase current [1, 2006.01]
H02K 19/06	3-Punkt Untergruppe	. . . Motors having windings on the stator and a variable-reluctance soft-iron rotor without windings, e.g. inductor motors [1, 2006.01]
H02K 19/08	3-Punkt Untergruppe	. . . Motors having windings on the stator and a smooth rotor without windings of material with large hysteresis, e.g. hysteresis motors [1, 2006.01]
H02K 19/10	2-Punkt Untergruppe	. . for multi-phase current [1, 2006.01]
H02K 19/12	3-Punkt Untergruppe	. . . characterised by the arrangement of exciting windings, e.g. for self-excitation, compounding or pole-changing [1, 2006.01]
H02K 19/14	2-Punkt Untergruppe	. . having additional short-circuited windings for starting as asynchronous motors [1, 2006.01]
H02K 19/16	1-Punkt Untergruppe	. Synchronous generators [1, 2006.01]
H02K 19/18	2-Punkt Untergruppe	. . having windings each turn of which co-operates only with poles of one polarity, e.g. homopolar generators [1, 2006.01]
H02K 19/20	3-Punkt Untergruppe	. . . with variable-reluctance soft-iron rotors without winding [1, 2006.01]
H02K 19/22	2-Punkt Untergruppe	. . having windings each turn of which co-operates alternately with poles of opposite polarity, e.g. heteropolar generators [1, 2006.01]
H02K 19/24	3-Punkt Untergruppe	. . . with variable-reluctance soft-iron rotors without winding [1, 2006.01]
H02K 19/26	2-Punkt Untergruppe	. . characterised by the arrangement of exciting windings [1, 2006.01]
H02K 19/28	3-Punkt Untergruppe	. . . for self-excitation [1, 2006.01]
H02K 19/30	3-Punkt Untergruppe	. . . for compounding [1, 2006.01]
H02K 19/32	3-Punkt Untergruppe	. . . for pole-changing [1, 2006.01]
H02K 19/34	2-Punkt Untergruppe	. . Generators with two or more outputs [1, 2006.01]
H02K 19/36	2-Punkt Untergruppe	. . Structural association of synchronous generators with auxiliary electric devices influencing the characteristic of the generator or controlling the generator, e.g. with impedances or switches [1, 2006.01]

Symbol	Typ	Titel
H02K 19/38	2-Punkt Untergruppe	. . Structural association of synchronous generators with exciting machines [1, 2006.01]
H02K 21/00	Hauptgruppe	Synchronous motors having permanent magnets; Synchronous generators having permanent magnets [1, 2006.01]
H02K 21/02	1-Punkt Untergruppe	. Details [1, 2006.01]
H02K 21/04	2-Punkt Untergruppe	. . Windings on magnets for additional excitation [1, 2006.01]
H02K 21/10	2-Punkt Untergruppe	. . Rotating armatures [1, 2006.01]
H02K 21/12	1-Punkt Untergruppe	. with stationary armatures and rotating magnets [1, 2006.01]
H02K 21/14	2-Punkt Untergruppe	. . with magnets rotating within the armatures [1, 2006.01]
H02K 21/16	3-Punkt Untergruppe	. . . having annular armature cores with salient poles (with homopolar co-operation H02K 21/20) [1, 2006.01]
H02K 21/18	3-Punkt Untergruppe	. . . having horse-shoe armature cores (with homopolar co-operation H02K 21/20) [1, 2006.01]
H02K 21/20	3-Punkt Untergruppe	. . . having windings each turn of which co-operates only with poles of one polarity, e.g. homopolar machine [1, 2006.01]
H02K 21/22	2-Punkt Untergruppe	. . with magnets rotating around the armatures, e.g. flywheel magnetos [1, 2006.01]
H02K 21/24	2-Punkt Untergruppe	. . with magnets axially facing the armatures, e.g. hub-type cycle dynamos [1, 2006.01]
H02K 21/26	1-Punkt Untergruppe	. with rotating armatures and stationary magnets [1, 2006.01]
H02K 21/28	2-Punkt Untergruppe	. . with armatures rotating within the magnets [1, 2006.01]
H02K 21/30	3-Punkt Untergruppe	. . . having annular armature cores with salient poles (with homopolar co-operation H02K 21/36) [1, 2006.01]
H02K 21/32	3-Punkt Untergruppe	. . . having horse-shoe magnets (with homopolar co-operation H02K 21/36) [1, 2006.01]
H02K 21/34	3-Punkt Untergruppe	. . . having bell-shaped or bar-shaped magnets, e.g. for cycle lighting (with homopolar co-operation H02K 21/36) [1, 2006.01]
H02K 21/36	3-Punkt Untergruppe	. . . with homopolar co-operation [1, 2006.01]
H02K 21/38	1-Punkt Untergruppe	. with rotating flux distributors, and armatures and magnets both stationary [1, 2006.01]
H02K 21/40	2-Punkt Untergruppe	. . with flux distributors rotating around the magnets and within the armatures [1, 2006.01]
H02K 21/42	2-Punkt Untergruppe	. . with flux distributors rotating around the armatures and within the magnets [1, 2006.01]
H02K 21/44	2-Punkt Untergruppe	. . with armature windings wound upon the magnets [1, 2006.01]
H02K 21/46	1-Punkt Untergruppe	. Motors having additional short-circuited winding for starting as an asynchronous motor [1, 2006.01]
H02K 21/48	1-Punkt Untergruppe	. Generators with two or more outputs [1, 2006.01]
H02K 23/00	Hauptgruppe	DC commutator motors or generators having mechanical commutator; Universal AC/DC commutator motors [1, 2006.01]
H02K 23/02	1-Punkt Untergruppe	. characterised by arrangement for exciting [1, 2006.01]
H02K 23/04	2-Punkt Untergruppe	. . having permanent magnet excitation [1, 2006.01]
H02K 23/06	2-Punkt Untergruppe	. . having shunt connection of excitation windings [1, 2006.01]
H02K 23/08	2-Punkt Untergruppe	. . having series connection of excitation windings [1, 2006.01]
H02K 23/10	2-Punkt Untergruppe	. . having compound connection of excitation windings [1, 2006.01]
H02K 23/12	2-Punkt Untergruppe	. . having excitation produced by current sources independent of the armature circuit [1, 2006.01]

Symbol	Typ	Titel
H02K 23/14	2-Punkt Untergruppe	. . having high-speed excitation or de-excitation, e.g. by neutralising the remanent excitation field [1, 2006.01]
H02K 23/16	2-Punkt Untergruppe	. . having angularly adjustable excitation field, e.g. by pole reversing or pole switching [1, 2006.01]
H02K 23/18	2-Punkt Untergruppe	. . having displaceable main or auxiliary brushes [1, 2006.01]
H02K 23/20	2-Punkt Untergruppe	. . having additional brushes spaced intermediately of the main brushes on the commutator, e.g. cross-field machines, metadynes, amplidynes or other armature-reaction excited machines [1, 2006.01]
H02K 23/22	2-Punkt Untergruppe	. . having compensating or damping windings [1, 2006.01]
H02K 23/24	2-Punkt Untergruppe	. . having commutating-pole windings [1, 2006.01]
H02K 23/26	1-Punkt Untergruppe	. characterised by the armature windings [1, 2006.01]
H02K 23/28	2-Punkt Untergruppe	. . having open windings, i.e. not closed within the armatures [1, 2006.01]
H02K 23/30	2-Punkt Untergruppe	. . having lap windings; having loop windings [1, 2006.01]
H02K 23/32	2-Punkt Untergruppe	. . having wave winding; having undulating winding [1, 2006.01]
H02K 23/34	2-Punkt Untergruppe	. . having mixed windings [1, 2006.01]
H02K 23/36	2-Punkt Untergruppe	. . having two or more windings; having two or more commutators; having two or more stators [1, 2006.01]
H02K 23/38	2-Punkt Untergruppe	. . having winding or connection for improving commutation, e.g. equipotential connection [1, 2006.01]
H02K 23/40	1-Punkt Untergruppe	. characterised by the arrangement of the magnet circuits [1, 2006.01]
H02K 23/42	2-Punkt Untergruppe	. . having split poles, i.e. zones for varying reluctance by gaps in poles or by poles with different spacing of the air gap [1, 2006.01]
H02K 23/44	2-Punkt Untergruppe	. . having movable, e.g. turnable, iron parts [1, 2006.01]
H02K 23/46	2-Punkt Untergruppe	. . having stationary shunts, i.e. magnetic cross flux [1, 2006.01]
H02K 23/48	2-Punkt Untergruppe	. . having adjustable armatures [1, 2006.01]
H02K 23/50	1-Punkt Untergruppe	. Generators with two or more outputs [1, 2006.01]
H02K 23/52	1-Punkt Untergruppe	. Motors acting also as generators, e.g. starting motors used as generators for ignition or lighting [1, 2006.01]
H02K 23/54	1-Punkt Untergruppe	. Disc armature motors or generators [1, 2006.01]
H02K 23/56	1-Punkt Untergruppe	. Motors or generators having iron cores separated from armature winding [1, 2006.01]
H02K 23/58	1-Punkt Untergruppe	. Motors or generators without iron cores [1, 2006.01]
H02K 23/60	1-Punkt Untergruppe	. Motors or generators having rotating armatures and rotating excitation field [1, 2006.01]
H02K 23/62	1-Punkt Untergruppe	. Motors or generators with stationary armatures and rotating excitation field [1, 2006.01]
H02K 23/64	1-Punkt Untergruppe	. Motors specially adapted for running on DC or AC by choice [1, 2006.01]
H02K 23/66	1-Punkt Untergruppe	. Structural association with auxiliary electric devices influencing the characteristic of, or controlling, the machine, e.g. with impedances or switches [1, 2006.01]
H02K 23/68	1-Punkt Untergruppe	. Structural association with auxiliary mechanical devices, e.g. with clutches or brakes [1, 2006.01]
H02K 24/00	Hauptgruppe	Machines adapted for the instantaneous transmission or reception of the angular displacement of rotating parts, e.g. synchro, selsyn [1, 2006.01]
H02K 25/00	Hauptgruppe	DC interrupter motors or generators [1, 2006.01]

Symbol	Typ	Titel
H02K 26/00	Hauptgruppe	Machines adapted to function as torque motors, i.e. to exert a torque when stalled [1, 2006.01]
H02K 27/00	Hauptgruppe	AC commutator motors or generators having mechanical commutator [1, 2006.01]
H02K 27/02	1-Punkt Untergruppe	. characterised by the armature winding [1, 2006.01]
H02K 27/04	1-Punkt Untergruppe	. having single-phase operation in series or shunt connection [1, 2006.01]
H02K 27/06	2-Punkt Untergruppe	. . with a single or multiple short-circuited commutator, e.g. repulsion motor [1, 2006.01]
H02K 27/08	2-Punkt Untergruppe	. . with multiple-fed armature [1, 2006.01]
H02K 27/10	2-Punkt Untergruppe	. . with switching devices for different modes of operation, e.g. repulsion-induction motor [1, 2006.01]
H02K 27/12	1-Punkt Untergruppe	. having multi-phase operation [1, 2006.01]
H02K 27/14	2-Punkt Untergruppe	. . in series connection [1, 2006.01]
H02K 27/16	2-Punkt Untergruppe	. . in shunt connection with stator feeding [1, 2006.01]
H02K 27/18	2-Punkt Untergruppe	. . in shunt connection with rotor feeding [1, 2006.01]
H02K 27/20	1-Punkt Untergruppe	. Structural association with a speed regulating device [1, 2006.01]
H02K 27/22	1-Punkt Untergruppe	. having means for improving commutation, e.g. auxiliary fields, double windings, double brushes [1, 2006.01]
H02K 27/24	1-Punkt Untergruppe	. having two or more commutators [1, 2006.01]
H02K 27/26	1-Punkt Untergruppe	. having disc armature [1, 2006.01]
H02K 27/28	1-Punkt Untergruppe	. Structural association with auxiliary electric devices influencing the characteristic of the machine or controlling the machine [1, 2006.01]
H02K 27/30	1-Punkt Untergruppe	. Structural association with auxiliary mechanical devices, e.g. with clutches or brakes [1, 2006.01]
H02K 29/00	Hauptgruppe	Motors or generators having non-mechanical commutating devices, e.g. discharge tubes or semiconductor devices [1, 2006.01]
H02K 29/03	1-Punkt Untergruppe	. with a magnetic circuit specially adapted for avoiding torque ripples or self-starting problems [6, 2006.01]
H02K 29/06	1-Punkt Untergruppe	. with position sensing devices (H02K 29/03 takes precedence) [4, 6, 2006.01]
H02K 29/08	2-Punkt Untergruppe	. . using magnetic effect devices, e.g. Hall-plates or magneto-resistors (H02K 29/12 takes precedence) [4, 2006.01]
H02K 29/10	2-Punkt Untergruppe	. . using light effect devices [4, 2006.01]
H02K 29/12	2-Punkt Untergruppe	. . using detecting coils [4, 2006.01]
H02K 29/14	1-Punkt Untergruppe	. with speed sensing devices (H02K 29/03 takes precedence) [4, 6, 2006.01]
H02K 31/00	Hauptgruppe	Acyclic motors or generators, i.e. DC machines having drum or disc armatures with continuous current collectors [1, 2006.01]
H02K 31/02	1-Punkt Untergruppe	. with solid-contact collectors [1, 2006.01]
H02K 31/04	1-Punkt Untergruppe	. with at least one liquid-contact collector [1, 2006.01]
H02K 33/00	Hauptgruppe	Motors with reciprocating, oscillating or vibrating magnet, armature or coil system (arrangements for handling mechanical energy structurally associated with motors H02K 7/00, e.g. H02K 7/06) [1, 2006.01]
H02K 33/02	1-Punkt Untergruppe	. with armatures moved one way by energisation of a single coil system and returned by mechanical force, e.g. by springs [1, 2006.01]

Symbol	Typ	Titel
H02K 33/04	2-Punkt Untergruppe	. . wherein the frequency of operation is determined by the frequency of uninterrupted AC energisation [1, 2006.01]
H02K 33/06	3-Punkt Untergruppe	. . . with polarised armatures [1, 2006.01]
H02K 33/08	3-Punkt Untergruppe	. . . with DC energisation superimposed on AC energisation [1, 2006.01]
H02K 33/10	2-Punkt Untergruppe	. . wherein the alternate energisation and de-energisation of the single coil system is effected or controlled by movement of the armatures [1, 2006.01]
H02K 33/12	1-Punkt Untergruppe	. with armatures moving in alternate directions by alternate energisation of two coil systems [1, 2006.01]
H02K 33/14	2-Punkt Untergruppe	. . wherein the alternate energisation and de-energisation of the two coil systems are effected or controlled by movement of the armatures [1, 2006.01]
H02K 33/16	1-Punkt Untergruppe	. with polarised armatures moving in alternate directions by reversal or energisation of a single coil system [1, 2006.01]
H02K 33/18	1-Punkt Untergruppe	. with coil systems moving upon intermittent or reversed energisation thereof by interaction with a fixed field system, e.g. permanent magnets [1, 2006.01]
H02K 35/00	Hauptgruppe	Generators with reciprocating, oscillating or vibrating coil system, magnet, armature or other part of the magnetic circuit (arrangements for handling mechanical energy structurally associated with generators H02K 7/00, e.g. H02K 7/06) [1, 2006.01]
H02K 35/02	1-Punkt Untergruppe	. with moving magnets and stationary coil systems [1, 2006.01]
H02K 35/04	1-Punkt Untergruppe	. with moving coil systems and stationary magnets [1, 2006.01]
H02K 35/06	1-Punkt Untergruppe	. with moving flux distributors, and both coil systems and magnets stationary [1, 2006.01]
H02K 37/00	Hauptgruppe	Motors with rotor rotating step by step and without interrupter or commutator driven by the rotor, e.g. stepping motors [1, 2006.01]
H02K 37/02	1-Punkt Untergruppe	. of variable reluctance type [4, 2006.01]
H02K 37/04	2-Punkt Untergruppe	. . with rotors situated within the stators [4, 2006.01]
H02K 37/06	2-Punkt Untergruppe	. . with rotors situated around the stators [4, 2006.01]
H02K 37/08	2-Punkt Untergruppe	. . with rotors axially facing the stators [4, 2006.01]
H02K 37/10	1-Punkt Untergruppe	. of permanent magnet type (H02K 37/02 takes precedence) [4, 2006.01]
H02K 37/12	2-Punkt Untergruppe	. . with stationary armatures and rotating magnets [4, 2006.01]
H02K 37/14	3-Punkt Untergruppe	. . . with magnets rotating within the armatures [4, 2006.01]
H02K 37/16	4-Punkt Untergruppe having horseshoe armature cores [4, 2006.01]
H02K 37/18	4-Punkt Untergruppe of homopolar type [4, 2006.01]
H02K 37/20	2-Punkt Untergruppe	. . with rotating flux distributors, the armatures and magnets both being stationary [4, 2006.01]
H02K 37/22	1-Punkt Untergruppe	. Damping units [4, 2006.01]
H02K 37/24	1-Punkt Untergruppe	. Structural association with auxiliary mechanical devices [4, 2006.01]
H02K 39/00	Hauptgruppe	Generators specially adapted for producing a desired non-sinusoidal waveform [1, 2006.01]
H02K 41/00	Hauptgruppe	Propulsion systems in which a rigid body is moved along a path due to dynamo-electric interaction between the body and a magnetic field travelling along the path [1, 2006.01]
H02K 41/02	1-Punkt Untergruppe	. Linear motors; Sectional motors [1, 3, 2006.01]
H02K 41/025	2-Punkt Untergruppe	. . Asynchronous motors [3, 2006.01]

Symbol	Typ	Titel
H02K 41/03	2-Punkt Untergruppe	. . Synchronous motors; Motors moving step by step; Reluctance motors (H02K 41/035 takes precedence) [3, 2006.01]
H02K 41/035	2-Punkt Untergruppe	. . DC motors; Unipolar motors [3, 2006.01]
H02K 41/06	1-Punkt Untergruppe	. Rolling motors, i.e. motors having the rotor axis parallel to the stator axis and following a circular path as the rotor rolls around the inside or outside of the stator [1, 2006.01]
H02K 44/00	Hauptgruppe	Machines in which the dynamo-electric interaction between a plasma or flow of conductive liquid or of fluid-borne conductive or magnetic particles and a coil system or magnetic field converts energy of mass flow into electrical energy or <u>vice versa</u> [3, 2006.01]
H02K 44/02	1-Punkt Untergruppe	. Electrodynamical pumps [3, 2006.01]
H02K 44/04	2-Punkt Untergruppe	. . Conduction pumps [3, 2006.01]
H02K 44/06	2-Punkt Untergruppe	. . Induction pumps [3, 2006.01]
H02K 44/08	1-Punkt Untergruppe	. Magneto-hydrodynamic [MHD] generators [3, 2006.01]
H02K 44/10	2-Punkt Untergruppe	. . Constructional details of electrodes [3, 2006.01]
H02K 44/12	2-Punkt Untergruppe	. . Constructional details of fluid channels [3, 2006.01]
H02K 44/14	3-Punkt Untergruppe	. . . Circular or screw-shaped channels [3, 2006.01]
H02K 44/16	2-Punkt Untergruppe	. . Constructional details of the magnetic circuits [3, 2006.01]
H02K 44/18	2-Punkt Untergruppe	. . for generating AC power [3, 2006.01]
H02K 44/20	3-Punkt Untergruppe	. . . by changing the polarity of the magnetic field [3, 2006.01]
H02K 44/22	3-Punkt Untergruppe	. . . by changing the conductivity of the fluid [3, 2006.01]
H02K 44/24	3-Punkt Untergruppe	. . . by reversing the direction of fluid [3, 2006.01]
H02K 44/26	3-Punkt Untergruppe	. . . by creating a travelling magnetic field [3, 2006.01]
H02K 44/28	1-Punkt Untergruppe	. Association of MHD generators with conventional generators (nuclear power plants including a MHD generator G21D 7/02) [3, 2006.01]
H02K 47/00	Hauptgruppe	Dynamo-electric converters [1, 2006.01]
H02K 47/02	1-Punkt Untergruppe	. AC/DC converters or <u>vice versa</u> [1, 2006.01]
H02K 47/04	2-Punkt Untergruppe	. . Motor/generators [1, 2006.01]
H02K 47/06	2-Punkt Untergruppe	. . Cascade converters [1, 2006.01]
H02K 47/08	2-Punkt Untergruppe	. . Single-armature converters [1, 2006.01]
H02K 47/10	3-Punkt Untergruppe	. . . with booster machines on the AC side [1, 2006.01]
H02K 47/12	1-Punkt Untergruppe	. DC/DC converters [1, 2006.01]
H02K 47/14	2-Punkt Untergruppe	. . Motor/generators [1, 2006.01]
H02K 47/16	2-Punkt Untergruppe	. . Single-armature converters, e.g. metadyne [1, 2006.01]
H02K 47/18	1-Punkt Untergruppe	. AC/AC converters [1, 2006.01]
H02K 47/20	2-Punkt Untergruppe	. . Motor/generators [1, 2006.01]

Symbol	Typ	Titel
H02K 47/22	2-Punkt Untergruppe	. . Single-armature frequency converters with or without phase-number conversion [1, 2006.01]
H02K 47/24	3-Punkt Untergruppe	. . . having windings for different numbers of poles [1, 2006.01]
H02K 47/26	3-Punkt Untergruppe	. . . operating as under- or over-synchronously running asynchronous induction machines, e.g. cascade arrangement of asynchronous and synchronous machines [1, 2006.01]
H02K 47/28	3-Punkt Untergruppe	. . . operating as commutator machines with added slip-rings [1, 2006.01]
H02K 47/30	2-Punkt Untergruppe	. . Single-armature phase-number converters without frequency conversion [1, 2006.01]
H02K 49/00	Hauptgruppe	Dynamo-electric clutches; Dynamo-electric brakes [1, 2006.01]
H02K 49/02	1-Punkt Untergruppe	. of the asynchronous induction type [1, 2006.01]
H02K 49/04	2-Punkt Untergruppe	. . of the eddy-current hysteresis type [1, 2006.01]
H02K 49/06	1-Punkt Untergruppe	. of the synchronous type [1, 2006.01]
H02K 49/08	1-Punkt Untergruppe	. of the collector armature type [1, 2006.01]
H02K 49/10	1-Punkt Untergruppe	. of the permanent-magnet type [1, 2006.01]
H02K 49/12	1-Punkt Untergruppe	. of the acyclic type [1, 2006.01]
H02K 51/00	Hauptgruppe	Dynamo-electric gears, i.e. dynamo-electric means for transmitting mechanical power from a driving shaft to a driven shaft and comprising structurally interrelated motor and generator parts [1, 2006.01]
H02K 53/00	Hauptgruppe	Alleged dynamo-electric <u>perpetua mobilia</u> [1, 2006.01]
H02K 55/00	Hauptgruppe	Dynamo-electric machines having windings operating at cryogenic temperatures [3, 2006.01]
H02K 55/02	1-Punkt Untergruppe	. of the synchronous type [3, 2006.01]
H02K 55/04	2-Punkt Untergruppe	. . with rotating field windings [3, 2006.01]
H02K 55/06	1-Punkt Untergruppe	. of the homopolar type [3, 2006.01]
H02K 99/00	Hauptgruppe	Subject matter not provided for in other groups of this subclass [2014.01]