

| Symbol | Typ | Titel |
|------------------|---------------------|--|
| H | Sektion | SECTION H — ELECTRICITY |
| H02 | Klasse | GENERATION, CONVERSION, OR DISTRIBUTION OF ELECTRIC POWER |
| H02K | Unterklasse | DYNAMO-ELECTRIC MACHINES (measuring instruments G01; dynamo-electric relays H01H 53/00; conversion of dc or ac input power into surge output power H02M 9/00; loudspeakers, microphones, gramophone pick-ups or like acoustic electromechanical transducers H04R) |
| H02K 1/00 | Hauptgruppe | Details of the magnetic circuit (magnetic circuits or magnets in general, magnetic circuits for transformers for power supply H01F; magnetic circuits for relays H01H 50/16) |
| H02K 1/02 | 1-Punkt Untergruppe | . characterised by the magnetic material |
| H02K 1/04 | 1-Punkt Untergruppe | . characterised by the material used for insulating the magnetic circuit or parts thereof (insulation of windings H02K 3/30) |
| H02K 1/06 | 1-Punkt Untergruppe | . characterised by the shape, form, or construction |
| H02K 1/08 | 2-Punkt Untergruppe | . . Salient poles |
| H02K 1/10 | 3-Punkt Untergruppe | . . . Commutating poles |
| H02K 1/12 | 2-Punkt Untergruppe | . . Stationary parts of the magnetic circuit |
| H02K 1/14 | 3-Punkt Untergruppe | . . . Stator cores with salient poles |
| H02K 1/16 | 3-Punkt Untergruppe | . . . Stator cores with slots for windings |
| H02K 1/17 | 3-Punkt Untergruppe | . . . Stator cores with permanent magnets [5] |
| H02K 1/18 | 3-Punkt Untergruppe | . . . Means for mounting or fastening magnetic stationary parts on to, or to, the stator structures |
| H02K 1/20 | 3-Punkt Untergruppe | . . . with channels or ducts for flow of cooling medium |
| H02K 1/22 | 2-Punkt Untergruppe | . . Rotating parts of magnetic circuit |
| H02K 1/24 | 3-Punkt Untergruppe | . . . Rotor cores with salient poles |
| H02K 1/26 | 3-Punkt Untergruppe | . . . Rotor cores with slots for windings |
| H02K 1/27 | 3-Punkt Untergruppe | . . . Rotor cores with permanent magnets [5] |
| H02K 1/28 | 3-Punkt Untergruppe | . . . Means for mounting or fastening rotating magnetic parts on to, or to, the rotor structures |
| H02K 1/30 | 4-Punkt Untergruppe | using intermediate part or parts, e.g. spider |
| H02K 1/32 | 3-Punkt Untergruppe | . . . with channels or ducts for flow of cooling medium |
| H02K 1/34 | 2-Punkt Untergruppe | . . Reciprocating, oscillating, or vibrating part of magnetic circuit |
| H02K 3/00 | Hauptgruppe | Details of windings (coils in general H01F 5/00) |
| H02K 3/02 | 1-Punkt Untergruppe | . Windings characterised by the conductor material (conductors in general H01B 1/00, H01B 5/00) |
| H02K 3/04 | 1-Punkt Untergruppe | . Windings characterised by the conductor shape, form, or construction, e.g. with bar conductor |
| H02K 3/12 | 2-Punkt Untergruppe | . . arranged in slots |
| H02K 3/14 | 3-Punkt Untergruppe | . . . with transposed conductors, e.g. twisted conductor |
| H02K 3/16 | 3-Punkt Untergruppe | . . . for damping, commutating, or other auxiliary purposes |
| H02K 3/18 | 2-Punkt Untergruppe | . . Windings for salient poles |

| Symbol | Typ | Titel |
|------------------|---------------------|---|
| H02K 3/20 | 3-Punkt Untergruppe | . . . for damping, commutating, or other auxiliary purposes |
| H02K 3/22 | 2-Punkt Untergruppe | . . consisting of hollow conductors |
| H02K 3/24 | 2-Punkt Untergruppe | . . with channels or ducts between the conductors for flow of cooling medium |
| H02K 3/26 | 2-Punkt Untergruppe | . . consisting of printed conductors |
| 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) |
| H02K 3/30 | 1-Punkt Untergruppe | . Windings characterised by the insulating material (insulating bodies in general H01B 3/00, H01B 17/00) |
| H02K 3/32 | 1-Punkt Untergruppe | . Windings characterised by the shape, form, or construction of the insulation |
| H02K 3/34 | 2-Punkt Untergruppe | . . between conductors or between conductor and core, e.g. slot insulation [3] |
| H02K 3/38 | 2-Punkt Untergruppe | . . around winding heads, equalising connectors, or connections thereto |
| H02K 3/40 | 2-Punkt Untergruppe | . . for high voltage, e.g. affording protection against corona |
| H02K 3/42 | 1-Punkt Untergruppe | . Means for preventing or reducing eddy-current losses in the winding heads, e.g. by shielding [2] |
| H02K 3/44 | 1-Punkt Untergruppe | . Protection against moisture or chemical attack; Windings specially adapted for operation in liquid or gas |
| H02K 3/46 | 1-Punkt Untergruppe | . Fastening of windings on stator or rotor structure |
| H02K 3/47 | 2-Punkt Untergruppe | . . Air-gap windings, i.e. iron-free windings [3] |
| H02K 3/48 | 2-Punkt Untergruppe | . . in slots |
| H02K 3/487 | 3-Punkt Untergruppe | . . . Slot-closing devices [3] |
| H02K 3/493 | 4-Punkt Untergruppe | where the devices are magnetic [3] |
| H02K 3/50 | 2-Punkt Untergruppe | . . Fastening of winding heads, equalising connectors, or connections thereto |
| H02K 3/51 | 3-Punkt Untergruppe | . . . applicable to rotors only [3] |
| H02K 3/52 | 2-Punkt Untergruppe | . . Fastening salient pole windings or connections thereto |
| H02K 5/00 | Hauptgruppe | Casings; Enclosures; Supports (casings for electric apparatus in general H05K 5/00) |
| H02K 5/02 | 1-Punkt Untergruppe | . Casings or enclosures characterised by the material thereof |
| H02K 5/04 | 1-Punkt Untergruppe | . Casings or enclosures characterised by the shape, form, or construction thereof |
| H02K 5/06 | 2-Punkt Untergruppe | . . Cast metal casings |
| H02K 5/08 | 2-Punkt Untergruppe | . . Insulating casings |
| H02K 5/10 | 2-Punkt Untergruppe | . . affording protection from ingress, e.g. of water, of fingers |
| H02K 5/12 | 2-Punkt Untergruppe | . . specially adapted for operating in liquid or gas (combined with cooling arrangements H02K 9/00) |
| H02K 5/124 | 3-Punkt Untergruppe | . . . Sealing of the shaft [3] |
| H02K 5/128 | 3-Punkt Untergruppe | . . . using air-gap sleeve or air-gap disc [3] |
| H02K 5/132 | 3-Punkt Untergruppe | . . . Submersible electric motor (H02K 5/128 takes precedence; pumping installations or systems for submerged use F04D 13/08) [3] |
| H02K 5/136 | 3-Punkt Untergruppe | . . . explosion-proof [3] |

| Symbol | Typ | Titel |
|------------------|---------------------|---|
| H02K 5/14 | 2-Punkt Untergruppe | . . Means for supporting or protecting brushes or brush holders [3] |
| H02K 5/15 | 2-Punkt Untergruppe | . . Mounting arrangements for bearing-shields or end plates [3] |
| H02K 5/16 | 2-Punkt Untergruppe | . . Means for supporting bearings, e.g. insulating support, means for fitting the bearing in the bearing-shield (magnetic bearings H02K 7/09) |
| H02K 5/167 | 3-Punkt Untergruppe | . . . using sliding-contact or spherical cap bearings [3] |
| H02K 5/173 | 3-Punkt Untergruppe | . . . using ball bearings or bearings with rolling contact [3] |
| H02K 5/18 | 2-Punkt Untergruppe | . . with ribs or fins for improving heat transfer |
| H02K 5/20 | 2-Punkt Untergruppe | . . with channels or ducts for flow of cooling medium |
| H02K 5/22 | 2-Punkt Untergruppe | . . Other additional parts of casings, e.g. shaped to form connection or terminal box |
| H02K 5/24 | 1-Punkt Untergruppe | . specially adapted for suppression or reduction of noise or vibration |
| H02K 5/26 | 1-Punkt Untergruppe | . Means for adjusting the casing relative to its support |
| H02K 7/00 | Hauptgruppe | Arrangements for handling mechanical energy structurally associated with the machine, e.g. structural association with mechanical driving motor or auxiliary dynamo-electric machine |
| H02K 7/02 | 1-Punkt Untergruppe | . Additional mass for increasing inertia, e.g. flywheel |
| H02K 7/04 | 1-Punkt Untergruppe | . Balancing means |
| H02K 7/06 | 1-Punkt Untergruppe | . Means for converting reciprocating into rotary motion or <u>vice versa</u> |
| H02K 7/065 | 2-Punkt Untergruppe | . . Electromechanical oscillators; Vibrating magnetic drives (in time-pieces G04C 5/00) [3] |
| H02K 7/07 | 2-Punkt Untergruppe | . . using pawl and ratchet wheel [3] |
| H02K 7/075 | 2-Punkt Untergruppe | . . using crankshaft or eccentric [3] |
| H02K 7/08 | 1-Punkt Untergruppe | . Structural association with bearings (support in machine casing H02K 5/16) |
| H02K 7/09 | 2-Punkt Untergruppe | . . with magnetic bearings [3] |
| H02K 7/10 | 1-Punkt Untergruppe | . Structural association with clutches, brakes, gears, pulleys, mechanical starters |
| H02K 7/102 | 2-Punkt Untergruppe | . . with friction brakes |
| H02K 7/104 | 2-Punkt Untergruppe | . . with eddy-current brakes |
| H02K 7/106 | 2-Punkt Untergruppe | . . with dynamo-electric brakes |
| H02K 7/108 | 2-Punkt Untergruppe | . . with friction clutches |
| H02K 7/11 | 2-Punkt Untergruppe | . . with dynamo-electric clutches |
| H02K 7/112 | 2-Punkt Untergruppe | . . with friction clutches and brakes |
| H02K 7/114 | 2-Punkt Untergruppe | . . with dynamo-electric clutches and brakes |
| H02K 7/116 | 2-Punkt Untergruppe | . . with gears |
| H02K 7/118 | 2-Punkt Untergruppe | . . with starting device |
| H02K 7/12 | 2-Punkt Untergruppe | . . with auxiliary limited movement of stator, rotor, or core parts, e.g. rotor axially movable for the purpose of clutching or braking |

| Symbol | Typ | Titel |
|-------------------|---------------------|---|
| H02K 7/14 | 1-Punkt Untergruppe | . Structural association with mechanical load, e.g. hand-held machine tool, fan (with fan or impeller for cooling the machine H02K 9/06; for suction cleaners A47L) |
| H02K 7/16 | 2-Punkt Untergruppe | . . for operation above critical speed of vibration of rotating parts |
| H02K 7/18 | 1-Punkt Untergruppe | . Structural association of electric generator with mechanical driving motor, e.g. turbine (if the driving-motor aspect predominates, <u>see</u> the relevant place of section F, e.g. F03B 13/00) |
| H02K 7/20 | 1-Punkt Untergruppe | . Structural association with auxiliary dynamo-electric machine, e.g. with electric starter motor, with exciter |
| H02K 9/00 | Hauptgruppe | Systems 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) |
| H02K 9/02 | 1-Punkt Untergruppe | . by ambient air flowing through the machine |
| H02K 9/04 | 2-Punkt Untergruppe | . . having means for generating flow of cooling medium, e.g. having fan |
| H02K 9/06 | 3-Punkt Untergruppe | . . . with fan or impeller driven by the machine shaft |
| H02K 9/08 | 1-Punkt Untergruppe | . by gaseous cooling medium circulating wholly within the machine casing (H02K 9/10 takes precedence) |
| H02K 9/10 | 1-Punkt Untergruppe | . by gaseous cooling medium flowing in closed circuit, a part of which is external to the machine casing |
| H02K 9/12 | 2-Punkt Untergruppe | . . wherein the cooling medium circulates freely within the casing |
| H02K 9/14 | 1-Punkt Untergruppe | . wherein gaseous cooling medium circulates between the machine casing and a surrounding mantle |
| H02K 9/16 | 2-Punkt Untergruppe | . . wherein the cooling medium circulates through ducts or tubes within the casing |
| H02K 9/18 | 2-Punkt Untergruppe | . . wherein the external part of the closed circuit comprises a heat exchanger structurally associated with the machine casing |
| H02K 9/19 | 1-Punkt Untergruppe | . for machines with closed casing and with closed-circuit cooling using a liquid cooling medium, e.g. oil |
| H02K 9/193 | 2-Punkt Untergruppe | . . with provision for replenishing the cooling medium; with means for preventing leakage of the cooling medium |
| 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 |
| H02K 9/20 | 2-Punkt Untergruppe | . . wherein the cooling medium vaporises within the machine casing |
| H02K 9/22 | 1-Punkt Untergruppe | . by solid heat conducting material embedded in, or arranged in contact with, stator or rotor, e.g. heat bridge |
| H02K 9/24 | 1-Punkt Untergruppe | . Protection against failure of cooling arrangements, e.g. due to loss of cooling medium, due to interruption of the circulation of cooling medium (circuit arrangements affording such protection H02H 7/00) |
| H02K 9/26 | 1-Punkt Untergruppe | . Structural association with machine of devices for cleaning or drying cooling medium, e.g. of filter |
| H02K 9/28 | 1-Punkt Untergruppe | . Cooling of commutators, slip-rings, or brushes, e.g. by ventilating (current collectors in general H01R 39/00) |
| H02K 11/00 | Hauptgruppe | Structural association with measuring or protective devices or electric components, e.g. with resistor, with switch, with suppressor for radio interference |
| H02K 11/02 | 1-Punkt Untergruppe | . for suppression of radio interference [6] |
| H02K 11/04 | 1-Punkt Untergruppe | . for rectification [6] |
| H02K 13/00 | Hauptgruppe | Structural associations of current collectors with motors or generators, e.g. brush mounting plates, 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 |
| H02K 13/02 | 1-Punkt Untergruppe | . Connections of slip-rings with the winding |

| Symbol | Typ | Titel |
|-------------------|---------------------|---|
| H02K 13/04 | 1-Punkt Untergruppe | . Connections of commutator segments with the winding |
| H02K 13/06 | 2-Punkt Untergruppe | . . Resistive connections between winding and commutator segments, e.g. by high-resistance choke, by transistor |
| H02K 13/08 | 2-Punkt Untergruppe | . . Segments formed by extensions of winding |
| H02K 13/10 | 1-Punkt Untergruppe | . Special arrangements of brushes or commutators for the purpose of improving commutation |
| H02K 13/12 | 1-Punkt Untergruppe | . Means for producing an axial reciprocation of the rotor and its associated current collector part, e.g. for polishing commutator surface |
| H02K 13/14 | 1-Punkt Untergruppe | . Circuit arrangements for improvement of commutation, e.g. by use of unidirectionally conductive element |
| H02K 15/00 | Hauptgruppe | Methods or apparatus specially adapted for manufacturing, assembling, maintaining, or repairing dynamo-electric machines (manufacture of current collectors in general H01R 43/00) |
| H02K 15/02 | 1-Punkt Untergruppe | . of stator or rotor bodies |
| H02K 15/03 | 2-Punkt Untergruppe | . . having permanent magnets [5] |
| H02K 15/04 | 1-Punkt Untergruppe | . of windings, prior to mounting into the machine (insulating windings H02K 15/10, H02K 15/12; coil manufacture in general H01F 41/02) |
| H02K 15/06 | 1-Punkt Untergruppe | . Embedding prefabricated windings in the machine |
| H02K 15/08 | 1-Punkt Untergruppe | . Forming windings by laying conductors into or around core part |
| H02K 15/085 | 2-Punkt Untergruppe | . . by laying conductors into slotted stators |
| H02K 15/09 | 2-Punkt Untergruppe | . . by laying conductors into slotted rotors |
| H02K 15/095 | 2-Punkt Untergruppe | . . by laying conductors around salient poles |
| H02K 15/10 | 1-Punkt Untergruppe | . Applying solid insulation to the windings, the stator, or the rotor |
| H02K 15/12 | 1-Punkt Untergruppe | . Impregnating, heating or drying of windings, stators, rotors, or machines |
| H02K 15/14 | 1-Punkt Untergruppe | . Casings; Enclosures; Supports |
| H02K 15/16 | 1-Punkt Untergruppe | . Centering the rotor within the stator; Balancing the rotor (balancing in general G01M) |
| H02K 16/00 | Hauptgruppe | Machines with more than one rotor or stator [2] |
| H02K 16/02 | 1-Punkt Untergruppe | . Machines with one stator and two rotors [2] |
| H02K 16/04 | 1-Punkt Untergruppe | . Machines with one rotor and two stators [2] |
| H02K 17/00 | Hauptgruppe | Asynchronous induction motors; Asynchronous induction generators |
| H02K 17/02 | 1-Punkt Untergruppe | . Asynchronous induction motors |
| H02K 17/04 | 2-Punkt Untergruppe | . . for single phase current |
| H02K 17/06 | 3-Punkt Untergruppe | . . . having windings arranged for permitting pole-changing |
| H02K 17/08 | 3-Punkt Untergruppe | . . . Motors with auxiliary phase obtained by externally fed auxiliary winding, e.g. capacitor motor |
| H02K 17/10 | 3-Punkt Untergruppe | . . . Motors with auxiliary phase obtained by split-pole carrying short-circuited winding |
| H02K 17/12 | 2-Punkt Untergruppe | . . for multi-phase current |
| H02K 17/14 | 3-Punkt Untergruppe | . . . having windings arranged for permitting pole-changing |
| H02K 17/16 | 2-Punkt Untergruppe | . . having rotor with internally short-circuited windings, e.g. cage rotor |

| Symbol | Typ | Titel |
|-------------------|---------------------|---|
| H02K 17/18 | 3-Punkt Untergruppe | . . . having double- or multiple-cage rotor |
| H02K 17/20 | 3-Punkt Untergruppe | . . . having deep-bar rotor |
| H02K 17/22 | 2-Punkt Untergruppe | . . having rotor with windings connected to slip-rings |
| H02K 17/24 | 3-Punkt Untergruppe | . . . in which both stator and rotor are fed with ac |
| H02K 17/26 | 2-Punkt Untergruppe | . . having rotor or stator designed to permit synchronous operation |
| H02K 17/28 | 2-Punkt Untergruppe | . . having compensating winding for improving phase angle |
| H02K 17/30 | 2-Punkt Untergruppe | . . Structural association with auxiliary electric devices influencing the characteristic of, or controlling, the motor, e.g. with impedance, with switch (control arrangements external to the motor H02P) |
| H02K 17/32 | 2-Punkt Untergruppe | . . Structural association with auxiliary mechanical devices, e.g. clutch, brake (control arrangements external to the motor H02P) |
| H02K 17/34 | 2-Punkt Untergruppe | . . Cascade arrangement of an asynchronous motor with another dynamo-electric motor or converter (control of cascade arrangements H02P) |
| H02K 17/36 | 3-Punkt Untergruppe | . . . with another asynchronous induction motor |
| H02K 17/38 | 3-Punkt Untergruppe | . . . with a commutator machine |
| H02K 17/40 | 3-Punkt Untergruppe | . . . with a rotary ac/dc converter (cascade ac/dc converters H02K 47/06) |
| H02K 17/42 | 1-Punkt Untergruppe | . Asynchronous induction generators (H02K 17/02 takes precedence) [4] |
| H02K 17/44 | 2-Punkt Untergruppe | . . Structural association with exciting machine |
| H02K 19/00 | Hauptgruppe | Synchronous motors or generators (having permanent magnet H02K 21/00) |
| H02K 19/02 | 1-Punkt Untergruppe | . Synchronous motors |
| H02K 19/04 | 2-Punkt Untergruppe | . . for single-phase current |
| H02K 19/06 | 3-Punkt Untergruppe | . . . Motors having windings on the stator and a variable-reluctance soft-iron rotor without windings, e.g. inductor motor |
| H02K 19/08 | 3-Punkt Untergruppe | . . . Motors having windings on the stator and a smooth rotor of material with large hysteresis without windings, e.g. hysteresis motor |
| H02K 19/10 | 2-Punkt Untergruppe | . . for multi-phase current |
| H02K 19/12 | 3-Punkt Untergruppe | . . . characterised by the arrangement of exciting windings, e.g. for self-excitation, for compounding, for pole-changing |
| H02K 19/14 | 2-Punkt Untergruppe | . . having additional short-circuited winding for starting as an asynchronous motor |
| H02K 19/16 | 1-Punkt Untergruppe | . Synchronous generators |
| H02K 19/18 | 2-Punkt Untergruppe | . . having windings each turn of which co-operates only with poles of one polarity, e.g. homopolar generator |
| H02K 19/20 | 3-Punkt Untergruppe | . . . with variable-reluctance soft-iron rotor without winding |
| H02K 19/22 | 2-Punkt Untergruppe | . . having windings each turn of which co-operates alternately with poles of opposite polarity, e.g. heteropolar generator |
| H02K 19/24 | 3-Punkt Untergruppe | . . . with variable-reluctance soft-iron rotor without winding |
| H02K 19/26 | 2-Punkt Untergruppe | . . characterised by the arrangement of exciting winding |
| H02K 19/28 | 3-Punkt Untergruppe | . . . for self-excitation |

| Symbol | Typ | Titel |
|-------------------|---------------------|---|
| H02K 19/30 | 3-Punkt Untergruppe | . . . for compounding |
| H02K 19/32 | 3-Punkt Untergruppe | . . . for pole-changing |
| H02K 19/34 | 2-Punkt Untergruppe | . . Generators with two or more outputs |
| H02K 19/36 | 2-Punkt Untergruppe | . . Structural association with auxiliary electric devices influencing the characteristic of, or controlling, the generator, e.g. with impedance, with switch (control arrangements external to the generator H02P) |
| H02K 19/38 | 2-Punkt Untergruppe | . . Structural association with exciting machine |
| H02K 21/00 | Hauptgruppe | Synchronous motors having permanent magnet; Synchronous generators having permanent magnet (stator cores with permanent magnets H02K 1/17; rotor cores with permanent magnets H02K 1/27) |
| H02K 21/02 | 1-Punkt Untergruppe | . Details |
| H02K 21/04 | 2-Punkt Untergruppe | . . Windings on magnet for additional excitation |
| H02K 21/10 | 2-Punkt Untergruppe | . . Rotating armatures |
| H02K 21/12 | 1-Punkt Untergruppe | . with stationary armature and rotating magnet |
| H02K 21/14 | 2-Punkt Untergruppe | . . magnet rotating within armature |
| H02K 21/16 | 3-Punkt Untergruppe | . . . having an annular armature core with salient poles (with homopolar co-operation H02K 21/20) |
| H02K 21/18 | 3-Punkt Untergruppe | . . . having horse-shoe armature core (with homopolar co-operation H02K 21/20) |
| H02K 21/20 | 3-Punkt Untergruppe | . . . having windings each turn of which co-operates only with poles of one polarity, e.g. homopolar machine |
| H02K 21/22 | 2-Punkt Untergruppe | . . magnet rotating around armature, e.g. flywheel magneto |
| H02K 21/24 | 2-Punkt Untergruppe | . . magnet axially facing armature, e.g. hub-type cycle dynamo |
| H02K 21/26 | 1-Punkt Untergruppe | . with rotating armature and stationary magnet |
| H02K 21/28 | 2-Punkt Untergruppe | . . armature rotating within magnet |
| H02K 21/30 | 3-Punkt Untergruppe | . . . having an annular armature core with salient poles (with homopolar co-operation H02K 21/36) |
| H02K 21/32 | 3-Punkt Untergruppe | . . . having a horse-shoe magnet (with homopolar co-operation H02K 21/36) |
| H02K 21/34 | 3-Punkt Untergruppe | . . . having bell-shaped or bar-shaped magnet, e.g. for cycle lighting (with homopolar co-operation H02K 21/36) |
| H02K 21/36 | 3-Punkt Untergruppe | . . . with homopolar co-operation |
| H02K 21/38 | 1-Punkt Untergruppe | . with rotating flux distributor, and armature and magnet both stationary |
| H02K 21/40 | 2-Punkt Untergruppe | . . flux distributor rotating around magnet and within armature |
| H02K 21/42 | 2-Punkt Untergruppe | . . flux distributor rotating around armature and within magnet |
| H02K 21/44 | 2-Punkt Untergruppe | . . armature windings wound upon magnet |
| H02K 21/46 | 1-Punkt Untergruppe | . Motors having additional short-circuited winding for starting as an asynchronous motor |
| H02K 21/48 | 1-Punkt Untergruppe | . Generators with two or more outputs |
| H02K 23/00 | Hauptgruppe | Dc commutator motors or generators having mechanical commutator; Universal ac/dc commutator motors |
| H02K 23/02 | 1-Punkt Untergruppe | . characterised by the exciting arrangement |

| Symbol | Typ | Titel |
|------------|---------------------|---|
| H02K 23/04 | 2-Punkt Untergruppe | . . having permanent magnet excitation |
| H02K 23/06 | 2-Punkt Untergruppe | . . having shunt connection of excitation windings |
| H02K 23/08 | 2-Punkt Untergruppe | . . having series connection of excitation windings |
| H02K 23/10 | 2-Punkt Untergruppe | . . having compound connection of excitation windings |
| H02K 23/12 | 2-Punkt Untergruppe | . . having excitation produced by a current source independent of the armature circuit |
| H02K 23/14 | 2-Punkt Untergruppe | . . having high-speed excitation or de-excitation, e.g. by neutralising the remanent excitation field |
| H02K 23/16 | 2-Punkt Untergruppe | . . having angularly adjustable excitation field, e.g. by pole reversing, by pole switching |
| H02K 23/18 | 2-Punkt Untergruppe | . . having displaceable main or auxiliary brushes |
| H02K 23/20 | 2-Punkt Untergruppe | . . having additional brushes spaced intermediately of the main brushes on the commutator, e.g. cross-field machine, metadyne, amplidyne, other armature-reaction excited machine |
| H02K 23/22 | 2-Punkt Untergruppe | . . having compensating or damping winding |
| H02K 23/24 | 2-Punkt Untergruppe | . . having commutating-pole winding |
| H02K 23/26 | 1-Punkt Untergruppe | . characterised by the armature winding |
| H02K 23/28 | 2-Punkt Untergruppe | . . having open winding, i.e. not closed within armature |
| H02K 23/30 | 2-Punkt Untergruppe | . . having lap winding; having loop winding |
| H02K 23/32 | 2-Punkt Untergruppe | . . having wave winding; having undulating winding |
| H02K 23/34 | 2-Punkt Untergruppe | . . having mixed windings |
| H02K 23/36 | 2-Punkt Untergruppe | . . having more than one winding; having more than one commutator; having more than one stator |
| H02K 23/38 | 2-Punkt Untergruppe | . . having winding or connection for improving commutation, e.g. equipotential connection |
| H02K 23/40 | 1-Punkt Untergruppe | . characterised by the arrangement of the magnet circuit |
| 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 |
| H02K 23/44 | 2-Punkt Untergruppe | . . having movable or turnable iron parts |
| H02K 23/46 | 2-Punkt Untergruppe | . . having stationary shunts, i.e. magnetic cross flux |
| H02K 23/48 | 2-Punkt Untergruppe | . . having adjustable armature |
| H02K 23/50 | 1-Punkt Untergruppe | . Generators with two or more outputs |
| H02K 23/52 | 1-Punkt Untergruppe | . Motors acting also as generators, e.g. starting motor used as generator for ignition or lighting |
| H02K 23/54 | 1-Punkt Untergruppe | . Disc armature motors or generators |
| H02K 23/56 | 1-Punkt Untergruppe | . Motors or generators having the iron core separated from armature winding |
| H02K 23/58 | 1-Punkt Untergruppe | . Motors or generators having no iron core |
| H02K 23/60 | 1-Punkt Untergruppe | . Motors or generators having a rotating armature and a rotating excitation field |
| H02K 23/62 | 1-Punkt Untergruppe | . Motors or generators with stationary armature and rotating excitation field |
| H02K 23/64 | 1-Punkt Untergruppe | . Motors specially adapted for running on dc or ac by choice |

| Symbol | Typ | Titel |
|-------------------|---------------------|---|
| H02K 23/66 | 1-Punkt Untergruppe | . Structural association with auxiliary electric devices influencing the characteristic of, or controlling, the machine, e.g. with impedance, with switch (control arrangements external to the machine H02P) |
| H02K 23/68 | 1-Punkt Untergruppe | . Structural association with auxiliary mechanical devices, e.g. with clutch, with brake (control arrangements external to the machine H02P) |
| H02K 24/00 | Hauptgruppe | Machines adapted for the instantaneous transmission or reception of the angular displacement of rotating parts, e.g. synchro, selsyn |
| H02K 25/00 | Hauptgruppe | Dc interrupter motors or generators |
| H02K 26/00 | Hauptgruppe | Machines adapted to function as torque motors, i.e. to exert a torque when stalled |
| H02K 27/00 | Hauptgruppe | Ac commutator motors or generators having mechanical commutator (universal ac/dc motors H02K 23/64) |
| H02K 27/02 | 1-Punkt Untergruppe | . characterised by the armature winding |
| H02K 27/04 | 1-Punkt Untergruppe | . having single-phase operation in series or shunt connection |
| H02K 27/06 | 2-Punkt Untergruppe | . . with a single or multiple short-circuited commutator, e.g. repulsion motor |
| H02K 27/08 | 2-Punkt Untergruppe | . . with multiple-fed armature |
| H02K 27/10 | 2-Punkt Untergruppe | . . with switching devices for different modes of operation, e.g. repulsion-induction motor |
| H02K 27/12 | 1-Punkt Untergruppe | . having multi-phase operation |
| H02K 27/14 | 2-Punkt Untergruppe | . . in series connection |
| H02K 27/16 | 2-Punkt Untergruppe | . . in shunt connection with stator feeding |
| H02K 27/18 | 2-Punkt Untergruppe | . . in shunt connection with rotor feeding |
| H02K 27/20 | 1-Punkt Untergruppe | . Structural association with a speed regulating device |
| H02K 27/22 | 1-Punkt Untergruppe | . having means for improving commutation, e.g. auxiliary fields, double windings, double brushes |
| H02K 27/24 | 1-Punkt Untergruppe | . having two or more commutators |
| H02K 27/26 | 1-Punkt Untergruppe | . having disc armature |
| H02K 27/28 | 1-Punkt Untergruppe | . Structural association with auxiliary electric devices influencing the characteristic of, or controlling, the machine (control arrangements external to the machine H02P) |
| H02K 27/30 | 1-Punkt Untergruppe | . Structural association with auxiliary mechanical devices, e.g. clutch, brake (control arrangements external to the machine H02P) |
| H02K 29/00 | Hauptgruppe | Motors or generators having non-mechanical commutating devices, e.g. discharge tubes, semiconductor devices |
| H02K 29/03 | 1-Punkt Untergruppe | . with a magnetic circuit specially adapted for avoiding torque ripples or self-starting problems [6] |
| H02K 29/06 | 1-Punkt Untergruppe | . with position sensing devices (H02K 29/03 takes precedence) [4, 6] |
| H02K 29/08 | 2-Punkt Untergruppe | . . using magnetic effect devices, e.g. Hall-plates, magneto-resistors (H02K 29/12 takes precedence) [4] |
| H02K 29/10 | 2-Punkt Untergruppe | . . using light effect devices [4] |
| H02K 29/12 | 2-Punkt Untergruppe | . . using detecting coils [4] |
| H02K 29/14 | 1-Punkt Untergruppe | . with speed sensing devices (H02K 29/03 takes precedence) [4, 6] |
| H02K 31/00 | Hauptgruppe | Acyclic motors or generators, i.e. dc machines having a drum or disc armature with continuous current collectors |
| H02K 31/02 | 1-Punkt Untergruppe | . with solid-contact collectors |

| Symbol | Typ | Titel |
|-------------------|---------------------|--|
| H02K 31/04 | 1-Punkt Untergruppe | . with at least one liquid-contact collector |
| 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) |
| H02K 33/02 | 1-Punkt Untergruppe | . with armature moved one way by energisation of a single coil system and returned by mechanical force, e.g. by spring |
| H02K 33/04 | 2-Punkt Untergruppe | . . wherein the frequency of operation is determined by the frequency of uninterrupted ac energisation |
| H02K 33/06 | 3-Punkt Untergruppe | . . . with polarised armature |
| H02K 33/08 | 3-Punkt Untergruppe | . . . with dc energisation superimposed on ac energisation |
| 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 armature |
| H02K 33/12 | 1-Punkt Untergruppe | . with armature moving in alternate directions by alternate energisation of two coil systems |
| 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 armature |
| H02K 33/16 | 1-Punkt Untergruppe | . with polarised armature moving in alternate directions by reversal or energisation of a single coil system |
| H02K 33/18 | 1-Punkt Untergruppe | . with coil system moving upon intermittent or reversed energisation thereof by interaction with a fixed field system, e.g. permanent magnet |
| 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) |
| H02K 35/02 | 1-Punkt Untergruppe | . with moving magnet and stationary coil system |
| H02K 35/04 | 1-Punkt Untergruppe | . with moving coil system and stationary magnet |
| H02K 35/06 | 1-Punkt Untergruppe | . with moving flux distributor, and both coil system and magnet stationary |
| H02K 37/00 | Hauptgruppe | Motors with rotor rotating step by step and without interrupter or commutator driven by the rotor, e.g. stepping motors |
| H02K 37/02 | 1-Punkt Untergruppe | . variable reluctance type [4] |
| H02K 37/04 | 2-Punkt Untergruppe | . . Rotor situated within stator [4] |
| H02K 37/06 | 2-Punkt Untergruppe | . . Rotor situated around stator [4] |
| H02K 37/08 | 2-Punkt Untergruppe | . . Rotor axially facing stator [4] |
| H02K 37/10 | 1-Punkt Untergruppe | . permanent magnet type (H02K 37/02 takes precedence) [4] |
| H02K 37/12 | 2-Punkt Untergruppe | . . with stationary armature and rotating magnet [4] |
| H02K 37/14 | 3-Punkt Untergruppe | . . . Magnet rotating within armature [4] |
| H02K 37/16 | 4-Punkt Untergruppe | having horseshoe armature core [4] |
| H02K 37/18 | 4-Punkt Untergruppe | homopolar type [4] |
| H02K 37/20 | 2-Punkt Untergruppe | . . with rotating flux distributor, the armature and magnet both being stationary [4] |
| H02K 37/22 | 1-Punkt Untergruppe | . Damping units [4] |
| H02K 37/24 | 1-Punkt Untergruppe | . Structural association with auxiliary mechanical devices [4] |
| H02K 39/00 | Hauptgruppe | Generators specially adapted for producing a desired non-sinusoidal waveform |

| Symbol | Typ | Titel |
|-------------------|---------------------|--|
| 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 |
| H02K 41/02 | 1-Punkt Untergruppe | . Linear motors; Sectional motors [3] |
| H02K 41/025 | 2-Punkt Untergruppe | . . Asynchronous motors [3] |
| H02K 41/03 | 2-Punkt Untergruppe | . . Synchronous motors; Motors moving step by step; Reluctance motors (H02K 41/035 takes precedence) [3] |
| H02K 41/035 | 2-Punkt Untergruppe | . . Dc motors; Unipolar motors [3] |
| H02K 41/06 | 1-Punkt Untergruppe | . Rolling motors, i.e. 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 |
| 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] |
| H02K 44/02 | 1-Punkt Untergruppe | . Electrodynamic pumps [3] |
| H02K 44/04 | 2-Punkt Untergruppe | . . Conduction pumps [3] |
| H02K 44/06 | 2-Punkt Untergruppe | . . Induction pumps [3] |
| H02K 44/08 | 1-Punkt Untergruppe | . Magnetohydrodynamic (MHD) generators [3] |
| H02K 44/10 | 2-Punkt Untergruppe | . . Constructional details of electrodes [3] |
| H02K 44/12 | 2-Punkt Untergruppe | . . Constructional details of fluid channel [3] |
| H02K 44/14 | 3-Punkt Untergruppe | . . . Circular or screw-shaped channel [3] |
| H02K 44/16 | 2-Punkt Untergruppe | . . Constructional details of the magnetic circuit [3] |
| H02K 44/18 | 2-Punkt Untergruppe | . . for generating ac power [3] |
| H02K 44/20 | 3-Punkt Untergruppe | . . . by changing the polarity of the magnetic field [3] |
| H02K 44/22 | 3-Punkt Untergruppe | . . . by changing the conductivity of the fluid [3] |
| H02K 44/24 | 3-Punkt Untergruppe | . . . by reversing the direction of fluid [3] |
| H02K 44/26 | 3-Punkt Untergruppe | . . . by creating a travelling magnetic field [3] |
| H02K 44/28 | 1-Punkt Untergruppe | . Association of MHD generators with conventional generators (nuclear power plants including a MHD generator G21D 7/02) [3] |
| H02K 47/00 | Hauptgruppe | Dynamo-electric converters |
| H02K 47/02 | 1-Punkt Untergruppe | . Ac/dc converters or <u>vice versa</u> |
| H02K 47/04 | 2-Punkt Untergruppe | . . Motor/generators |
| H02K 47/06 | 2-Punkt Untergruppe | . . Cascade converters |
| H02K 47/08 | 2-Punkt Untergruppe | . . Single-armature converters |
| H02K 47/10 | 3-Punkt Untergruppe | . . . with booster machine on the ac side |
| H02K 47/12 | 1-Punkt Untergruppe | . Dc/dc converters |
| H02K 47/14 | 2-Punkt Untergruppe | . . Motor/generators |
| H02K 47/16 | 2-Punkt Untergruppe | . . Single-armature converters, e.g. metadyne |

| Symbol | Typ | Titel |
|-------------------|---------------------|--|
| H02K 47/18 | 1-Punkt Untergruppe | . Ac/ac converters |
| H02K 47/20 | 2-Punkt Untergruppe | . . Motor/generators |
| H02K 47/22 | 2-Punkt Untergruppe | . . Single-armature frequency converters with or without phase-number conversion |
| H02K 47/24 | 3-Punkt Untergruppe | . . . having windings for different numbers of poles |
| 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 |
| H02K 47/28 | 3-Punkt Untergruppe | . . . operating as commutator machines with added slip-rings |
| H02K 47/30 | 2-Punkt Untergruppe | . . Single-armature phase-number converters without frequency conversion |
| H02K 49/00 | Hauptgruppe | Dynamo-electric clutches; Dynamo-electric brakes (electrically or magnetically actuated clutches or brakes F16D 27/00, F16D 29/00, F16D 65/34, F16D 65/36; magnetic-particle clutches F16D 37/02; adapted for use as dynamometers G01L) |
| H02K 49/02 | 1-Punkt Untergruppe | . of the asynchronous induction type |
| H02K 49/04 | 2-Punkt Untergruppe | . . of the eddy-current hysteresis type |
| H02K 49/06 | 1-Punkt Untergruppe | . of the synchronous type |
| H02K 49/08 | 1-Punkt Untergruppe | . of the collector armature type |
| H02K 49/10 | 1-Punkt Untergruppe | . of the permanent-magnet type |
| H02K 49/12 | 1-Punkt Untergruppe | . of the acyclic type |
| 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 |
| H02K 53/00 | Hauptgruppe | Alleged dynamo-electric <u>perpetua mobilia</u> |
| H02K 55/00 | Hauptgruppe | Dynamo-electric machines having windings operating at cryogenic temperatures [3] |
| H02K 55/02 | 1-Punkt Untergruppe | . of the synchronous type [3] |
| H02K 55/04 | 2-Punkt Untergruppe | . . with rotating field windings [3] |
| H02K 55/06 | 1-Punkt Untergruppe | . of the homopolar type [3] |
| H02K 57/00 | Hauptgruppe | Dynamo-electric machines not provided for in groups H02K 17/00-H02K 55/00 [3] |