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 vice versa
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, see 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 vice versa [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 vice versa
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 perpetua mobilia**
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]**