Symbol	Typ	Titel
H	**Sektion**	**ELECTRICITY**
H02	**Klasse**	**GENERATION, CONVERSION, OR DISTRIBUTION OF ELECTRIC POWER**
H02P	**Unterklasse**	**CONTROL OR REGULATION OF ELECTRIC MOTORS, ELECTRIC GENERATORS OR DYNAMO-ELECTRIC CONVERTERS; CONTROLLING TRANSFORMERS, REACTORS OR CHOKE COILS [4]**
H02P 1/00	**Hauptgruppe**	**Arrangements for starting electric motors or dynamo-electric converters (starting of synchronous motors with electronic commutators H02P 6/20, H02P 6/22; starting dynamo-electric motors rotating step by step H02P 8/04; vector control H02P 21/00) [1, 4, 2006.01]**
H02P 1/02	1-Punkt Untergruppe	. Details [1, 2006.01]
H02P 1/04	2-Punkt Untergruppe	. . Means for controlling progress of starting sequence in dependence upon time or upon current, speed, or other motor parameter [1, 2006.01]
H02P 1/06	3-Punkt Untergruppe	. . . Manually-operated multi-position starters [1, 2006.01]
H02P 1/08	3-Punkt Untergruppe	. . . Manually-operated on/off switch controlling power-operated multi-position switch or impedances for starting a motor [1, 2006.01]
H02P 1/10	3-Punkt Untergruppe	. . . Manually-operated on/off switch controlling relays or contactors operating sequentially for starting a motor [1, 2006.01]
H02P 1/12	3-Punkt Untergruppe	. . . Switching devices centrifugally operated by the motor [1, 2006.01]
H02P 1/14	3-Punkt Untergruppe	. . . Pressure-sensitive resistors centrifugally operated by the motor [1, 2006.01]
H02P 1/16	1-Punkt Untergruppe	. for starting dynamo-electric motors or dynamo-electric converters [1, 2006.01]
H02P 1/18	2-Punkt Untergruppe	. . for starting an individual dc motor [1, 2006.01]
H02P 1/20	3-Punkt Untergruppe	. . . by progressive reduction of resistance in series with armature winding [1, 2006.01]
H02P 1/22	3-Punkt Untergruppe	. . . in either direction of rotation [1, 2006.01]
H02P 1/24	2-Punkt Untergruppe	. . for starting an individual ac commutator motor (starting of ac/dc commutator motors H02P 1/18) [1, 2006.01]
H02P 1/26	2-Punkt Untergruppe	. . for starting an individual polyphase induction motor [1, 2006.01]
H02P 1/28	3-Punkt Untergruppe	. . . by progressive increase of voltage applied to primary circuit of motor [1, 2006.01]
H02P 1/30	3-Punkt Untergruppe	. . . by progressive increase of frequency of supply to primary circuit of motor [1, 2006.01]
H02P 1/32	3-Punkt Untergruppe	. . . by star/delta switching [1, 2006.01]
H02P 1/34	3-Punkt Untergruppe	. . . by progressive reduction of impedance in secondary circuit [1, 2006.01]
H02P 1/36	4-Punkt Untergruppe	. . . . the impedance being a liquid resistance [1, 2006.01]
H02P 1/38	3-Punkt Untergruppe	. . . by pole-changing [1, 2006.01]
H02P 1/40	3-Punkt Untergruppe	. . . in either direction of rotation [1, 2006.01]
H02P 1/42	2-Punkt Untergruppe	. . for starting an individual single-phase induction motor [1, 2006.01]
H02P 1/44	3-Punkt Untergruppe	. . . by phase-splitting with a capacitor [1, 2006.01]
H02P 1/46	2-Punkt Untergruppe	. . for starting an individual synchronous motor [1, 2006.01]
H02P 1/48	3-Punkt Untergruppe	. . . by pole-changing [1, 2006.01]

Symbol	Typ	Titel
H02P 1/50	3-Punkt Untergruppe	. . . by changing over from asynchronous to synchronous operation (H02P 1/48 takes precedence) [1, 2006.01]
H02P 1/52	3-Punkt Untergruppe	. . . by progressive increase of frequency of supply to motor [1, 2006.01]
H02P 1/54	2-Punkt Untergruppe	. . for starting two or more dynamo-electric motors [1, 2006.01]
H02P 1/56	3-Punkt Untergruppe	. . . simultaneously [1, 2006.01]
H02P 1/58	3-Punkt Untergruppe	. . . sequentially [1, 2006.01]
H02P 3/00	**Hauptgruppe**	**Arrangements for stopping or slowing electric motors, generators, or dynamo-electric converters (stopping of synchronous motors with electronic commutators H02P 6/24; stopping dynamo-electric motors rotating step by step H02P 8/24; vector control H02P 21/00) [1, 2, 4, 2006.01]**
H02P 3/02	1-Punkt Untergruppe	. Details [1, 2006.01]
H02P 3/04	2-Punkt Untergruppe	. . Means for stopping or slowing by a separate brake, e.g. friction brake or eddy-current brake [1, 2, 2006.01]
H02P 3/06	1-Punkt Untergruppe	. for stopping or slowing an individual dynamo-electric motor or dynamo-electric converter [1, 2, 2006.01]
H02P 3/08	2-Punkt Untergruppe	. . for stopping or slowing a dc motor [1, 2, 2006.01]
H02P 3/10	3-Punkt Untergruppe	. . . by reversal of supply connections [1, 2006.01]
H02P 3/12	3-Punkt Untergruppe	. . . by short-circuit or resistive braking [1, 2006.01]
H02P 3/14	3-Punkt Untergruppe	. . . by regenerative braking [1, 2006.01]
H02P 3/16	3-Punkt Untergruppe	. . . by combined electrical and mechanical braking [1, 2006.01]
H02P 3/18	2-Punkt Untergruppe	. . for stopping or slowing an ac motor [1, 2, 2006.01]
H02P 3/20	3-Punkt Untergruppe	. . . by reversal of phase sequence of connections to the motor [1, 2006.01]
H02P 3/22	3-Punkt Untergruppe	. . . by short-circuit or resistive braking [1, 2006.01]
H02P 3/24	3-Punkt Untergruppe	. . . by applying dc to the motor [1, 2006.01]
H02P 3/26	3-Punkt Untergruppe	. . . by combined electrical and mechanical braking [1, 2006.01]
H02P 4/00	**Hauptgruppe**	**Arrangements specially adapted for regulating or controlling the speed or torque of electric motors that can be connected to two or more different electric power supplies (vector control H02P 21/00) [2006.01]**
H02P 5/00	**Hauptgruppe**	**Arrangements specially adapted for regulating or controlling the speed or torque of two or more electric motors (H02P 6/04, H02P 8/40 take precedence) [1, 2006.01, 2016.01]**
H02P 5/46	1-Punkt Untergruppe	. for speed regulation of two or more dynamo-electric motors in relation to one another [1, 2006.01]
H02P 5/48	2-Punkt Untergruppe	. . by comparing mechanical values representing the speeds [1, 2006.01, 2016.01]
H02P 5/485	3-Punkt Untergruppe	. . . using differential movement of the two motors, e.g. using differential gearboxes [2016.01]
H02P 5/49	3-Punkt Untergruppe	. . . by intermittently closing or opening electrical contacts [2016.01]
H02P 5/50	2-Punkt Untergruppe	. . by comparing electrical values representing the speeds [1, 2006.01, 2016.01]
H02P 5/505	3-Punkt Untergruppe	. . . using equalising lines, e.g. rotor and stator lines of first and second motors [2016.01]
H02P 5/51	3-Punkt Untergruppe	. . . Direct ratio control [2016.01]
H02P 5/52	2-Punkt Untergruppe	. . additionally providing control of relative angular displacement [1, 2006.01, 2016.01]
H02P 5/54	3-Punkt Untergruppe	. . . Speed and position comparison between the motors by mechanical means [2016.01]

Symbol	Typ	Titel
H02P 5/56	3-Punkt Untergruppe	. . . Speed and position comparison between the motors by electrical means [2016.01]
H02P 5/60	1-Punkt Untergruppe	. controlling combinations of dc and ac dynamo-electric motors (H02P 5/46 takes precedence) [2006.01]
H02P 5/68	1-Punkt Untergruppe	. controlling two or more dc dynamo-electric motors (H02P 5/46, H02P 5/60 take precedence) [2006.01]
H02P 5/685	2-Punkt Untergruppe	. . electrically connected in series, i.e. carrying the same current [2006.01]
H02P 5/69	2-Punkt Untergruppe	. . mechanically coupled by gearing [2006.01]
H02P 5/695	3-Punkt Untergruppe	. . . Differential gearing [2006.01]
H02P 5/74	1-Punkt Untergruppe	. controlling two or more ac dynamo-electric motors (H02P 5/46, H02P 5/60 take precedence) [2006.01]
H02P 5/747	2-Punkt Untergruppe	. . mechanically coupled by gearing [2006.01]
H02P 5/753	3-Punkt Untergruppe	. . . Differential gearing [2006.01]
H02P 6/00	**Hauptgruppe**	**Arrangements for controlling synchronous motors or other dynamo-electric motors using electronic commutation dependent on the rotor position; Electronic commutators therefor (vector control H02P 21/00) [3, 4, 6, 2006.01, 2016.01]**
H02P 6/04	1-Punkt Untergruppe	. Arrangements for controlling or regulating the speed or torque of more than one motor (H02P 6/10 takes precedence) [6, 2006.01, 2016.01]
H02P 6/06	1-Punkt Untergruppe	. Arrangements for speed regulation of a single motor wherein the motor speed is measured and compared with a given physical value so as to adjust the motor speed [6, 2006.01]
H02P 6/08	1-Punkt Untergruppe	. Arrangements for controlling the speed or torque of a single motor (H02P 6/10, H02P 6/28 take precedence) [6, 2006.01, 2016.01]
H02P 6/10	1-Punkt Untergruppe	. Arrangements for controlling torque ripple, e.g. providing reduced torque ripple [6, 2006.01]
H02P 6/12	1-Punkt Untergruppe	. Monitoring commutation; Providing indication of commutation failure [6, 2006.01]
H02P 6/14	1-Punkt Untergruppe	. Electronic commutators [6, 2006.01, 2016.01]
H02P 6/15	2-Punkt Untergruppe	. . Controlling commutation time [2016.01]
H02P 6/16	2-Punkt Untergruppe	. . Circuit arrangements for detecting position [6, 2006.01, 2016.01]
H02P 6/17	3-Punkt Untergruppe	. . . and for generating speed information [2016.01]
H02P 6/18	3-Punkt Untergruppe	. . . without separate position detecting elements [6, 2006.01, 2016.01]
H02P 6/182	4-Punkt Untergruppe	. . . . using back-emf in windings [2016.01]
H02P 6/185	4-Punkt Untergruppe	. . . . using inductance sensing, e.g. pulse excitation [2016.01]
H02P 6/20	1-Punkt Untergruppe	. Arrangements for starting (H02P 6/08 takes precedence) [6, 2006.01, 2016.01]
H02P 6/21	2-Punkt Untergruppe	. . Open loop start [2016.01]
H02P 6/22	2-Punkt Untergruppe	. . in a selected direction of rotation [6, 2006.01]
H02P 6/24	1-Punkt Untergruppe	. Arrangements for stopping [6, 2006.01]
H02P 6/26	1-Punkt Untergruppe	. Arrangements for controlling single phase motors [2016.01]
H02P 6/28	1-Punkt Untergruppe	. Arrangements for controlling current (H02P 6/10 takes precedence) [2016.01]
H02P 6/30	1-Punkt Untergruppe	. Arrangements for controlling the direction of rotation (H02P 6/22 takes precedence) [2016.01]
H02P 6/32	1-Punkt Untergruppe	. Arrangements for controlling wound field motors, e.g. motors with exciter coils [2016.01]

Symbol	Typ	Titel
H02P 6/34	1-Punkt Untergruppe	. Modelling or simulation for control purposes [2016.01]
H02P 7/00	**Hauptgruppe**	**Arrangements for regulating or controlling the speed or torque of electric DC motors [1, 2, 2006.01, 2016.01]**
H02P 7/02	1-Punkt Untergruppe	. the DC motors being of the linear type [2016.01]
H02P 7/025	2-Punkt Untergruppe	. . the DC motors being of the moving coil type, e.g. voice coil motors [2016.01]
H02P 7/03	1-Punkt Untergruppe	. for controlling the direction of rotation of DC motors [2016.01]
H02P 7/06	1-Punkt Untergruppe	. for regulating or controlling an individual dc dynamo-electric motor by varying field or armature current [1, 2006.01]
H02P 7/08	2-Punkt Untergruppe	. . by manual control without auxiliary power [1, 2006.01]
H02P 7/10	3-Punkt Untergruppe	. . . of motor field only [1, 2006.01]
H02P 7/12	4-Punkt Untergruppe	. . . . Switching field from series to shunt excitation or vice versa [1, 2006.01]
H02P 7/14	3-Punkt Untergruppe	. . . of voltage applied to the armature with or without control of field [1, 2006.01]
H02P 7/18	2-Punkt Untergruppe	. . by master control with auxiliary power [1, 2006.01]
H02P 7/20	3-Punkt Untergruppe	. . . using multi-position switch, e.g. drum, controlling motor circuit by means of relays (H02P 7/24, H02P 7/30 take precedence) [1, 2006.01]
H02P 7/22	3-Punkt Untergruppe	. . . using multi-position switch, e.g. drum, controlling motor circuit by means of pilot-motor-operated multi-position switch or pilot-motor-operated variable resistance (H02P 7/24, H02P 7/30 take precedence) [1, 2006.01]
H02P 7/24	3-Punkt Untergruppe	. . . using discharge tubes or semiconductor devices [1, 2006.01]
H02P 7/26	4-Punkt Untergruppe	. . . . using discharge tubes [1, 2006.01]
H02P 7/28	4-Punkt Untergruppe	. . . . using semiconductor devices [1, 2006.01, 2016.01]
H02P 7/281	5-Punkt Untergruppe	. . . . . the DC motor being operated in four quadrants [2016.01]
H02P 7/282	5-Punkt Untergruppe	. . . . . controlling field supply only [4, 2006.01, 2016.01]
H02P 7/285	5-Punkt Untergruppe	. . . . . controlling armature supply only [4, 2006.01, 2016.01]
H02P 7/288	6-Punkt Untergruppe	. . . . . using variable impedance [4, 2006.01, 2016.01]
H02P 7/29	6-Punkt Untergruppe	. . . . . using pulse modulation [4, 2006.01, 2016.01]
H02P 7/291	7-Punkt Untergruppe	. . . . . with on-off control between two set points, e.g. controlling by hysteresis [2016.01]
H02P 7/292	6-Punkt Untergruppe	. . . . . using static converters, e.g. AC to DC [4, 2006.01, 2016.01]
H02P 7/293	7-Punkt Untergruppe	. . . . . using phase control (H02P 7/295 takes precedence) [2016.01]
H02P 7/295	7-Punkt Untergruppe	. . . . . of the kind having one thyristor or the like in series with the power supply and the motor [4, 2006.01, 2016.01]
H02P 7/298	5-Punkt Untergruppe	. . . . . controlling armature and field supplies [4, 2006.01, 2016.01]
H02P 7/30	3-Punkt Untergruppe	. . . using magnetic devices with controllable degree of saturation, i.e. transductors [1, 2006.01]
H02P 7/32	3-Punkt Untergruppe	. . . using armature-reaction-excited machines, e.g. metadyne, amplidyne, rototrol [1, 2006.01]
H02P 7/34	3-Punkt Untergruppe	. . . using Ward-Leonard arrangements [1, 2006.01, 2016.01]

Symbol	Typ	Titel
H02P 7/343	4-Punkt Untergruppe	. . . . in which both generator and motor fields are controlled [2016.01]
H02P 7/347	4-Punkt Untergruppe	. . . . in which only the generator field is controlled [2016.01]
H02P 8/00	**Hauptgruppe**	**Arrangements for controlling dynamo-electric motors rotating step by step [2, 6, 2006.01]**
H02P 8/02	1-Punkt Untergruppe	. specially adapted for single-phase or bi-pole stepper motors, e.g. watch-motors, clock-motors [6, 2006.01]
H02P 8/04	1-Punkt Untergruppe	. Arrangements for starting [6, 2006.01]
H02P 8/06	2-Punkt Untergruppe	. . in selected direction of rotation [6, 2006.01]
H02P 8/08	2-Punkt Untergruppe	. . Determining position before starting [6, 2006.01]
H02P 8/10	2-Punkt Untergruppe	. . Shaping pulses for starting; Boosting current during starting [6, 2006.01]
H02P 8/12	1-Punkt Untergruppe	. Control or stabilisation of current [6, 2006.01]
H02P 8/14	1-Punkt Untergruppe	. Arrangements for controlling speed or speed and torque (H02P 8/12, H02P 8/22 take precedence) [6, 2006.01]
H02P 8/16	2-Punkt Untergruppe	. . Reducing energy dissipated or supplied [6, 2006.01]
H02P 8/18	2-Punkt Untergruppe	. . Shaping of pulses, e.g. to reduce torque ripple [6, 2006.01]
H02P 8/20	2-Punkt Untergruppe	. . characterised by bidirectional operation [6, 2006.01]
H02P 8/22	1-Punkt Untergruppe	. Control of step size; Intermediate stepping, e.g. microstepping [6, 2006.01]
H02P 8/24	1-Punkt Untergruppe	. Arrangements for stopping (H02P 8/32 take precedence) [6, 2006.01]
H02P 8/26	2-Punkt Untergruppe	. . Memorising final pulse when stopping [6, 2006.01]
H02P 8/28	2-Punkt Untergruppe	. . Disconnecting power source when stopping [6, 2006.01]
H02P 8/30	2-Punkt Untergruppe	. . Holding position when stopped [6, 2006.01]
H02P 8/32	1-Punkt Untergruppe	. Reducing overshoot or oscillation, e.g. damping [6, 2006.01]
H02P 8/34	1-Punkt Untergruppe	. Monitoring operation (H02P 8/36 takes precedence) [6, 2006.01]
H02P 8/36	1-Punkt Untergruppe	. Protection against faults, e.g. against overheating or step-out; Indicating faults [6, 2006.01]
H02P 8/38	2-Punkt Untergruppe	. . the fault being step-out [6, 2006.01]
H02P 8/40	1-Punkt Untergruppe	. Special adaptations for controlling two or more stepping motors [6, 2006.01]
H02P 8/42	1-Punkt Untergruppe	. characterised by non-stepper motors being operated step by step [6, 2006.01]
H02P 9/00	**Hauptgruppe**	**Arrangements for controlling electric generators for the purpose of obtaining a desired output [1, 2006.01]**
H02P 9/02	1-Punkt Untergruppe	. Details [1, 2006.01]
H02P 9/04	1-Punkt Untergruppe	. Control effected upon non-electric prime mover and dependent upon electric output value of the generator (effecting control of the prime mover in general, see the relevant class for such prime mover) [1, 2, 2006.01]
H02P 9/06	1-Punkt Untergruppe	. Control effected upon clutch or other mechanical power transmission means and dependent upon electric output value of the generator (effecting control of the power transmission means, see the relevant class for such means) [1, 2, 2006.01]
H02P 9/08	1-Punkt Untergruppe	. Control of generator circuit during starting or stopping of driving means, e.g. for initiating excitation [1, 2, 2006.01]

Symbol	Typ	Titel
H02P 9/10	1-Punkt Untergruppe	. Control effected upon generator excitation circuit to reduce harmful effects of overloads or transients, e.g. sudden application of load, sudden removal of load, sudden change of load [1, 2, 2006.01]
H02P 9/12	2-Punkt Untergruppe	. . for demagnetising; for reducing effects of remanence; for preventing pole reversal [1, 2, 2006.01]
H02P 9/14	1-Punkt Untergruppe	. by variation of field (H02P 9/08, H02P 9/10 take precedence) [1, 2, 2006.01]
H02P 9/16	2-Punkt Untergruppe	. . due to variation of ohmic resistance in field circuit, using resistances switched in or out of circuit step by step [1, 2006.01]
H02P 9/18	3-Punkt Untergruppe	. . . the switching being caused by a servomotor, measuring instrument, or relay [1, 2006.01]
H02P 9/20	2-Punkt Untergruppe	. . due to variation of continuously-variable ohmic resistance [1, 2006.01]
H02P 9/22	3-Punkt Untergruppe	. . . comprising carbon pile resistance [1, 2006.01]
H02P 9/24	2-Punkt Untergruppe	. . due to variation of make-to-break ratio of intermittently-operating contacts, e.g. using Tirrill regulator [1, 2006.01]
H02P 9/26	2-Punkt Untergruppe	. . using discharge tubes or semiconductor devices (H02P 9/34 takes precedence) [1, 2, 2006.01]
H02P 9/28	3-Punkt Untergruppe	. . . using discharge tubes [1, 2006.01]
H02P 9/30	3-Punkt Untergruppe	. . . using semiconductor devices [1, 2006.01]
H02P 9/32	2-Punkt Untergruppe	. . using magnetic devices with controllable degree of saturation (H02P 9/34 takes precedence) [1, 2, 2006.01]
H02P 9/34	2-Punkt Untergruppe	. . using magnetic devices with controllable degree of saturation in combination with controlled discharge tube or controlled semiconductor device [1, 2006.01]
H02P 9/36	2-Punkt Untergruppe	. . using armature-reaction-excited machines [1, 2006.01]
H02P 9/38	2-Punkt Untergruppe	. . Self-excitation by current derived from rectification of both output voltage and output current of generator [1, 2006.01]
H02P 9/40	1-Punkt Untergruppe	. by variation of reluctance of magnetic circuit of generator [1, 2006.01]
H02P 9/42	1-Punkt Untergruppe	. to obtain desired frequency without varying speed of the generator [1, 2006.01]
H02P 9/44	1-Punkt Untergruppe	. Control of frequency and voltage in predetermined relation, e.g. constant ratio [1, 2006.01]
H02P 9/46	1-Punkt Untergruppe	. Control of asynchronous generator by variation of capacitor [1, 2006.01]
H02P 9/48	1-Punkt Untergruppe	. Arrangements for obtaining a constant output value at varying speed of the generator, e.g. on vehicle (H02P 9/04-H02P 9/46 take precedence) [3, 2006.01]
H02P 11/00	**Hauptgruppe**	**Arrangements for controlling dynamo-electric converters [1, 4, 2006.01]**
H02P 11/04	1-Punkt Untergruppe	. for controlling dynamo-electric converters having a dc output [1, 2006.01]
H02P 11/06	1-Punkt Untergruppe	. for controlling dynamo-electric converters having an ac output [1, 2006.01]
H02P 13/00	**Hauptgruppe**	**Arrangements for controlling transformers, reactors or choke coils, for the purpose of obtaining a desired output [1, 4, 2006.01]**
H02P 13/06	1-Punkt Untergruppe	. by tap-changing; by rearranging interconnections of windings [1, 2006.01]
H02P 13/08	1-Punkt Untergruppe	. by sliding current collector along winding [1, 2006.01]
H02P 13/10	1-Punkt Untergruppe	. by moving core, coil winding, or shield, e.g. by induction regulator [1, 2006.01]
H02P 13/12	1-Punkt Untergruppe	. by varying magnetic bias [1, 2006.01]
H02P 15/00	**Hauptgruppe**	**Arrangements for controlling dynamo-electric brakes or clutches (vector control H02P 21/00) [1, 2006.01]**

Symbol	Typ	Titel
H02P 15/02	1-Punkt Untergruppe	. Conjoint control of brakes and clutches [3, 2006.01]
H02P 17/00	**Hauptgruppe**	**Arrangements for controlling dynamo-electric gears (vector control H02P 21/00) [3, 2006.01]**
H02P 21/00	**Hauptgruppe**	**Arrangements or methods for the control of electric machines by vector control, e.g. by control of field orientation [6, 2006.01, 2016.01]**
H02P 21/02	1-Punkt Untergruppe	. specially adapted for optimising the efficiency at low load [2006.01]
H02P 21/04	1-Punkt Untergruppe	. specially adapted for very low speeds [2006.01]
H02P 21/05	1-Punkt Untergruppe	. specially adapted for damping motor oscillations, e.g. for reducing hunting [2006.01]
H02P 21/06	1-Punkt Untergruppe	. Rotor flux based control involving the use of rotor position or rotor speed sensors [2006.01, 2016.01]
H02P 21/08	2-Punkt Untergruppe	. . Indirect field-oriented control; Rotor flux feed-forward control [2006.01, 2016.01]
H02P 21/09	3-Punkt Untergruppe	. . . Field phase angle calculation based on rotor voltage equation by adding slip frequency and speed proportional frequency [2016.01]
H02P 21/10	2-Punkt Untergruppe	. . Direct field-oriented control; Rotor flux feed-back control [2006.01, 2016.01]
H02P 21/12	1-Punkt Untergruppe	. Stator flux based control involving the use of rotor position or rotor speed sensors [2006.01, 2016.01]
H02P 21/13	1-Punkt Untergruppe	. Observer control, e.g. using Luenberger observers or Kalman filters [2006.01]
H02P 21/14	1-Punkt Untergruppe	. Estimation or adaptation of machine parameters, e.g. flux, current or voltage [2006.01, 2016.01]
H02P 21/16	2-Punkt Untergruppe	. . Estimation of constants, e.g. the rotor time constant [2016.01]
H02P 21/18	2-Punkt Untergruppe	. . Estimation of position or speed [2016.01]
H02P 21/20	2-Punkt Untergruppe	. . Estimation of torque [2016.01]
H02P 21/22	1-Punkt Untergruppe	. Current control, e.g. using a current control loop [2016.01]
H02P 21/24	1-Punkt Untergruppe	. Vector control not involving the use of rotor position or rotor speed sensors [2016.01]
H02P 21/26	2-Punkt Untergruppe	. . Rotor flux based control [2016.01]
H02P 21/28	2-Punkt Untergruppe	. . Stator flux based control [2016.01]
H02P 21/30	3-Punkt Untergruppe	. . . Direct torque control [DTC] or field acceleration method [FAM] [2016.01]
H02P 21/32	2-Punkt Untergruppe	. . Determining the initial rotor position (H02P 21/34 takes precedence) [2016.01]
H02P 21/34	1-Punkt Untergruppe	. Arrangements for starting [2016.01]
H02P 21/36	1-Punkt Untergruppe	. Arrangements for braking or slowing; Four quadrant control [2016.01]
H02P 23/00	**Hauptgruppe**	**Arrangements or methods for the control of AC motors characterised by a control method other than vector control [2006.01, 2016.01]**
H02P 23/02	1-Punkt Untergruppe	. specially adapted for optimising the efficiency at low load [2006.01]
H02P 23/03	1-Punkt Untergruppe	. specially adapted for very low speeds [2006.01]
H02P 23/04	1-Punkt Untergruppe	. specially adapted for damping motor oscillations, e.g. for reducing hunting [2006.01]
H02P 23/06	1-Punkt Untergruppe	. Controlling the motor in four quadrants [2006.01, 2016.01]
H02P 23/07	2-Punkt Untergruppe	. . Polyphase or monophase asynchronous induction motors [2016.01]
H02P 23/08	1-Punkt Untergruppe	. Controlling based on slip frequency, e.g. adding slip frequency and speed proportional frequency [2006.01]

Symbol	Typ	Titel
H02P 23/10	1-Punkt Untergruppe	. Controlling by adding a dc current [2006.01]
H02P 23/12	1-Punkt Untergruppe	. Observer control, e.g. using Luenberger observers or Kalman filters [2006.01]
H02P 23/14	1-Punkt Untergruppe	. Estimation or adaptation of motor parameters, e.g. rotor time constant, flux, speed, current or voltage [2006.01]
H02P 23/16	1-Punkt Untergruppe	. Controlling the angular speed of one shaft (H02P 23/18 takes precedence) [2016.01]
H02P 23/18	1-Punkt Untergruppe	. Controlling the angular speed together with angular position or phase [2016.01]
H02P 23/20	1-Punkt Untergruppe	. Controlling the acceleration or deceleration [2016.01]
H02P 23/22	1-Punkt Untergruppe	. Controlling the speed digitally using a reference oscillator, a speed proportional pulse rate feedback and a digital comparator [2016.01]
H02P 23/24	1-Punkt Untergruppe	. Controlling the direction, e.g. clockwise or counterclockwise [2016.01]
H02P 23/26	1-Punkt Untergruppe	. Power factor control [PFC] [2016.01]
H02P 23/28	1-Punkt Untergruppe	. Controlling the motor by varying the switching frequency of switches connected to a DC supply and the motor phases [2016.01]
H02P 23/30	1-Punkt Untergruppe	. Direct torque control [DTC] or field acceleration method [FAM] [2016.01]
H02P 25/00	**Hauptgruppe**	**Arrangements or methods for the control of AC motors characterised by the kind of AC motor or by structural details [2006.01]**
H02P 25/02	1-Punkt Untergruppe	. characterised by the kind of motor [2006.01, 2016.01]
H02P 25/022	2-Punkt Untergruppe	. . Synchronous motors (H02P 25/064 takes precedence) [2016.01]
H02P 25/024	3-Punkt Untergruppe	. . . controlled by supply frequency [2016.01]
H02P 25/026	4-Punkt Untergruppe	. . . . thereby detecting the rotor position [2016.01]
H02P 25/028	3-Punkt Untergruppe	. . . with four quadrant control [2016.01]
H02P 25/03	3-Punkt Untergruppe	. . . with brushless excitation [2016.01]
H02P 25/032	2-Punkt Untergruppe	. . Reciprocating, oscillating or vibrating motors [2016.01]
H02P 25/034	3-Punkt Untergruppe	. . . Voice coil motors (voice coil motors driven by DC H02P 7/025) [2016.01]
H02P 25/04	2-Punkt Untergruppe	. . Single phase motors, e.g. capacitor motors [2006.01]
H02P 25/06	2-Punkt Untergruppe	. . Linear motors [2006.01, 2016.01]
H02P 25/062	3-Punkt Untergruppe	. . . of the induction type [2016.01]
H02P 25/064	3-Punkt Untergruppe	. . . of the synchronous type [2016.01]
H02P 25/066	4-Punkt Untergruppe	. . . . of the stepping type [2016.01]
H02P 25/08	2-Punkt Untergruppe	. . Reluctance motors [2006.01, 2016.01]
H02P 25/083	3-Punkt Untergruppe	. . . Arrangements for increasing the switching speed from one coil to the next one [2016.01]
H02P 25/086	3-Punkt Untergruppe	. . . Commutation [2016.01]
H02P 25/089	4-Punkt Untergruppe	. . . . Sensorless control (direct torque control H02P 23/30) [2016.01]
H02P 25/092	3-Punkt Untergruppe	. . . Converters specially adapted for controlling reluctance motors [2016.01]

Symbol	Typ	Titel
H02P 25/098	3-Punkt Untergruppe	. . . Arrangements for reducing torque ripple [2016.01]
H02P 25/10	2-Punkt Untergruppe	. . Commutator motors, e.g. repulsion motors [2006.01]
H02P 25/12	3-Punkt Untergruppe	. . . with shiftable brushes [2006.01]
H02P 25/14	3-Punkt Untergruppe	. . . Universal motors (H02P 25/12 takes precedence) [2006.01]
H02P 25/16	1-Punkt Untergruppe	. characterised by the circuit arrangement or by the kind of wiring [2006.01]
H02P 25/18	2-Punkt Untergruppe	. . with arrangements for switching the windings, e.g. with mechanical switches or relays [2006.01]
H02P 25/20	3-Punkt Untergruppe	. . . for pole-changing [2006.01]
H02P 25/22	2-Punkt Untergruppe	. . Multiple windings; Windings for more than three phases [2006.01]
H02P 25/24	2-Punkt Untergruppe	. . Variable impedance in stator or rotor circuit [2006.01]
H02P 25/26	3-Punkt Untergruppe	. . . with arrangements for controlling secondary impedance [2006.01]
H02P 25/28	2-Punkt Untergruppe	. . using magnetic devices with controllable degree of saturation, e.g. transductors [2006.01]
H02P 25/30	2-Punkt Untergruppe	. . the motor being controlled by a control effected upon an ac generator supplying it [2006.01]
H02P 25/32	2-Punkt Untergruppe	. . using discharge tubes [2006.01]
H02P 27/00	**Hauptgruppe**	**Arrangements or methods for the control of AC motors characterised by the kind of supply voltage (of two or more motors H02P 5/00; of synchronous motors with electronic commutators H02P 6/00; of DC motors H02P 7/00; of stepping motors H02P 8/00) [2006.01]**
H02P 27/02	1-Punkt Untergruppe	. using supply voltage with constant frequency and variable amplitude [2006.01, 2016.01]
H02P 27/024	2-Punkt Untergruppe	. . using AC supply for only the rotor circuit or only the stator circuit [2016.01]
H02P 27/04	1-Punkt Untergruppe	. using variable-frequency supply voltage, e.g. inverter or converter supply voltage [2006.01, 2016.01]
H02P 27/048	2-Punkt Untergruppe	. . using AC supply for only the rotor circuit or only the stator circuit [2016.01]
H02P 27/05	2-Punkt Untergruppe	. . using AC supply for both the rotor and the stator circuits, the frequency of supply to at least one circuit being variable [2006.01]
H02P 27/06	2-Punkt Untergruppe	. . using dc to ac converters or inverters (H02P 27/05 takes precedence) [2006.01]
H02P 27/08	3-Punkt Untergruppe	. . . with pulse width modulation [2006.01]
H02P 27/10	4-Punkt Untergruppe	. . . . using bang-bang controllers [2006.01]
H02P 27/12	4-Punkt Untergruppe	. . . . pulsing by guiding the flux vector, current vector or voltage vector on a circle or a closed curve, e.g. for direct torque control [2006.01]
H02P 27/14	4-Punkt Untergruppe	. . . . with three or more levels of voltage [2006.01]
H02P 27/16	2-Punkt Untergruppe	. . using ac to ac converters without intermediate conversion to dc (H02P 27/05 takes precedence) [2006.01]
H02P 27/18	3-Punkt Untergruppe	. . . varying the frequency by omitting half waves [2006.01]
H02P 29/00	**Hauptgruppe**	**Arrangements for regulating or controlling electric motors, appropriate for both AC and DC motors (arrangements for starting electric motors H02P 1/00; arrangements for stopping or slowing electric motors H02P 3/00; control of motors that can be connected to two or more different electric power supplies H02P 4/00; regulating or controlling the speed or torque of two or more electric motors H02P 5/00; vector control H02P 21/00) [2006.01, 2016.01]**
H02P 29/02	1-Punkt Untergruppe	. Providing protection against overload without automatic interruption of supply (protection against faults of stepper motors H02P 8/36) [2006.01, 2016.01]

Symbol	Typ	Titel
H02P 29/024	2-Punkt Untergruppe	. . Detecting a fault condition, e.g. short circuit, locked rotor, open circuit or loss of load [2016.01]
H02P 29/028	3-Punkt Untergruppe	. . . the motor continuing operation despite the fault condition, e.g. eliminating, compensating for or remedying the fault [2016.01]
H02P 29/032	2-Punkt Untergruppe	. . Preventing damage to the motor, e.g. setting individual current limits for different drive conditions [2016.01]
H02P 29/04	1-Punkt Untergruppe	. by means of a separate brake [2006.01]
H02P 29/10	1-Punkt Untergruppe	. for preventing overspeed or under speed [2016.01]
H02P 29/20	1-Punkt Untergruppe	. for controlling one motor used for different sequential operations [2016.01]
H02P 29/40	1-Punkt Untergruppe	. Regulating or controlling the amount of current drawn or delivered by the motor for controlling the mechanical load [2016.01]
H02P 29/50	1-Punkt Untergruppe	. Reduction of harmonics [2016.01]
H02P 29/60	1-Punkt Untergruppe	. Controlling or determining the temperature of the motor or of the drive (H02P 29/02 takes precedence) [2016.01]
H02P 29/62	2-Punkt Untergruppe	. . for raising the temperature of the motor [2016.01]
H02P 29/64	2-Punkt Untergruppe	. . Controlling or determining the temperature of the winding [2016.01]
H02P 29/66	2-Punkt Untergruppe	. . Controlling or determining the temperature of the rotor [2016.01]
H02P 29/68	2-Punkt Untergruppe	. . based on the temperature of a drive component or a semiconductor component [2016.01]
H02P 31/00	**Hauptgruppe**	**Arrangements for regulating or controlling electric motors not provided for in groups H02P 1/00-H02P 5/00, H02P 7/00 or H02P 21/00-H02P 29/00 [2006.01]**
		Indexing scheme associated with groups relating to the arrangements for controlling electric generators [2015.01]
H02P 101/00	**Hauptgruppe**	**Special adaptation of control arrangements for generators [2015.01]**
H02P 101/10	1-Punkt Untergruppe	. for water-driven turbines [2015.01]
H02P 101/15	1-Punkt Untergruppe	. for wind-driven turbines [2015.01]
H02P 101/20	1-Punkt Untergruppe	. for steam-driven turbines [2015.01]
H02P 101/25	1-Punkt Untergruppe	. for combustion engines [2015.01]
H02P 101/30	1-Punkt Untergruppe	. for aircraft [2015.01]
H02P 101/35	1-Punkt Untergruppe	. for ships [2015.01]
H02P 101/40	1-Punkt Untergruppe	. for railway vehicles [2015.01]
H02P 101/45	1-Punkt Untergruppe	. for motor vehicles, e.g. car alternators [2015.01]
H02P 103/00	**Hauptgruppe**	**Controlling arrangements characterised by the type of generator [2015.01]**
H02P 103/10	1-Punkt Untergruppe	. of the asynchronous type [2015.01]
H02P 103/20	1-Punkt Untergruppe	. of the synchronous type [2015.01]