

CPC COOPERATIVE PATENT CLASSIFICATION

H ELECTRICITY

(NOTE omitted)

H02 GENERATION; CONVERSION OR DISTRIBUTION OF ELECTRIC POWER

H02M APPARATUS FOR CONVERSION BETWEEN AC AND AC, BETWEEN AC AND DC, OR BETWEEN DC AND DC, AND FOR USE WITH MAINS OR SIMILAR POWER SUPPLY SYSTEMS; CONVERSION OF DC OR AC INPUT POWER INTO SURGE OUTPUT POWER; CONTROL OR REGULATION THEREOF ([transformers H01F](#); [dynamo-electric converters H02K 47/00](#); [controlling transformers, reactors or choke coils, control or regulation of electric motors, generators or dynamo-electric converters H02P](#))

NOTES

1. This subclass covers only circuits or apparatus for the conversion of electric power, or arrangements for control or regulation of such circuits or apparatus. The electrotechnical elements employed are dealt within the appropriate subclasses, e.g. inductors, transformers [H01F](#), capacitors, electrolytic rectifiers [H01G](#), mercury rectifying or other discharge tubes [H01J](#), semiconductor devices [H01L](#), impedance networks or resonant circuit not primarily concerned with the transfer of electric power [H03H](#).
2. In this subclass, the following term is used with the meaning indicated:
 - "conversion", in respect of an electric variable, e.g. voltage or current, means the change of one or more of the parameters of the variable, e.g. amplitude, frequency, phase, polarity.

WARNINGS

1. The following IPC groups are not in the CPC scheme. The subject matter for these IPC groups is classified in the following CPC groups:

H02M 9/00	covered by	H03K 3/53
H02M 9/02	covered by	H03K 3/53
H02M 9/04	covered by	H03K 3/53
H02M 9/06	covered by	H03K 3/53
2. In this subclass non-limiting references (in the sense of paragraph 39 of the Guide to the IPC) may still be displayed in the scheme.

1/00	Details of apparatus for conversion		
2001/0003	. {Details of control, feedback and regulation circuits}	2001/0035	. . . {by burst mode control}
2001/0006	. . {Arrangements for supplying an adequate voltage to the control circuit of a converter}	2001/0038	. . {Circuits or arrangements for suppressing, e.g. by masking incorrect turn-on or turn-off signals, e.g. due to current spikes in current mode control}
2001/0009	. . {Devices and circuits for detecting current in a converter}	2001/0041	. . {Control circuits in which a clock signal is selectively enabled or disabled}
2001/0012	. . {Control circuits using digital or numerical techniques (in dc/dc converters H02M 3/157 , H02M 3/33515 ; in dc-ac converters H02M 7/53873)}	2001/0045	. {Converters combining the concepts of switch-mode regulation and linear regulation, e.g. linear preregulator to switching converter, linear and switching converter in parallel, same converter or same transistor operating either in linear or switching mode}
2001/0016	. . {Control circuits providing compensation of output voltage deviations using feedforward of disturbance parameter}	2001/0048	. {Circuits or arrangements for reducing losses (using snubbers H02M 1/34)}
2001/0019	. . . {the disturbance parameter being load current fluctuations}	2001/0051	. . {Diode reverse recovery losses}
2001/0022	. . . {the disturbance parameter being input voltage fluctuations}	2001/0054	. . {Transistor switching losses (periodically suspending operation of switching converter in low power mode H02M 2001/0035)}
2001/0025	. . {Arrangements for modifying reference value, feedback value or error value in the control loop of a converter}		
2001/0029	. . {Circuits or arrangements for limiting the slope ("slew rate") of switching signals}		
2001/0032	. . {Control circuits allowing low power mode operation, e.g. "standby"}		

2001/0058	. . . {by employing soft switching techniques, i.e. commutation of transistor when voltage applied to it is zero and/or when current flowing through it is zero (in resonant inverters H02M 2007/4815 ; in inverters operating from a resonant dc source H02M 7/4826 ; using an auxiliary actively switched resonant commutation circuit connected to an intermediate dc voltage or between two push-pull branches of an inverter bridge H02M 2007/4811)}	1/084	. . . using a control circuit common to several phases of a multi-phase system
1/0061	. {using discharge tubes}	1/0845	. . . {digitally controlled (or with digital control)}
2001/0064	. {Magnetic structures combining different functions, e.g. storage, filtering, transformation}	1/088	. . . for the simultaneous control of series or parallel connected semiconductor devices
2001/0067	. {Converter structures employing plural converter units, other than for parallel operation of the units on a single load}	1/092	. . . the control signals being transmitted optically
2001/007	. . {Plural converter units in cascade (push-pull dc/dc converters with preregulator H02M 3/3374 ; dc-ac converters following a dc-dc stage which includes a high frequency transformer H02M 7/4807 , dc-ac converters following a dc-dc conversion stage which generates a periodically varying voltage H02M 7/4826)}	1/096	. . . the power supply of the control circuit being connected in parallel to the main switching element (H02M 1/092 takes precedence)
2001/0074	. . {Plural converter units whose inputs are connected in series}	1/10	. Arrangements incorporating converting means for enabling loads to be operated at will from different kinds of power supplies, e.g. from ac or dc
2001/0077	. . {Plural converter units whose outputs are connected in series}	1/12	. Arrangements for reducing harmonics from ac input or output
2001/008	. . {Plural converter units for generating at least two independent, non-parallel outputs, e.g. systems with plural point of load switching regulators}	2001/123	. . {Suppression of common mode voltage or current}
2001/0083	. {Converters characterized by their input or output configuration}	1/126	. . {using passive filters}
2001/0087	. . {adapted for receiving as input a current source}	1/14	. Arrangements for reducing ripples from dc input or output
2001/009	. . {having more than one output with independent control (for dc-dc converter with intermediate ac H02M 3/33561)}	1/143	. . {using compensating arrangements (for reducing noise from the supply in transmission systems H04B 15/005)}
2001/0093	. . {wherein the output is created by adding a regulated voltage to or subtracting it from an unregulated input}	1/146	. . {using discharge tubes}
2001/0096	. {Means for increasing hold-up time, i.e. the duration of time that a converter's output will remain within regulated limits following a loss of input power}	1/15	. . using active elements
1/02	. Circuits specially adapted for the generation of grid-control or igniter-control voltages for discharge tubes incorporated in static converters	1/16	. Means for providing current step on switching, e.g. with saturable reactor
1/04	. . for tubes with grid control	1/20	. Contact mechanisms of dynamic converters
1/042	. . . {wherein the phase of the control voltage is adjustable with reference to the AC voltage}	1/22	. . incorporating collectors and brushes
1/045	. . . . {for multiphase systems}	1/24	. . incorporating rolling or tumbling contacts
1/047	. . . . {for ignition at the zero-crossing of voltage or current}	1/26	. . incorporating cam-operated contacts
1/06	. Circuits specially adapted for rendering non-conductive gas discharge tubes or equivalent semiconductor devices, e.g. thyatrons, thyristors	1/28	. . incorporating electromagnetically-operated vibrating contacts
1/065	. . {for discharge tubes}	1/30	. . incorporating liquid contacts
1/08	. Circuits specially adapted for the generation of control voltages for semiconductor devices incorporated in static converters	1/32	. Means for protecting converters other than automatic disconnection
1/081	. . {wherein the phase of the control voltage is adjustable with reference to the AC source}	2001/322	. . {Means for rapidly discharging a capacitor of the converter, in order to protect electrical components or prevent electrical shock}
1/082	. . . {with digital control}	2001/325	. . {with means for allowing continuous operation despite a fault, i.e. fault tolerant converters}
1/083	. . {for the ignition at the zero crossing of the voltage or the current}	2001/327	. . {against abnormal temperatures}
		1/34	. . Snubber circuits
		2001/342	. . . {Active non-dissipative snubbers}
		2001/344	. . . {Active dissipative snubbers}
		2001/346	. . . {Passive non-dissipative snubbers}
		2001/348	. . . {Passive dissipative snubbers}
		1/36	. Means for starting or stopping converters
		1/38	. Means for preventing simultaneous conduction of switches
		2001/385	. . {with means for correcting output voltage deviations introduced by the dead time}
		1/40	. Means for preventing magnetic saturation
		1/42	. Circuits or arrangements for compensating for or adjusting power factor in converters or inverters
		1/4208	. . {Arrangements for improving power factor of AC input}
		1/4216	. . . {operating from a three-phase input voltage (H02M 1/4233 takes precedence)}
		1/4225	. . . {using a non-isolated boost converter}
		1/4233	. . . {using a bridge converter consisting of active switches}
		1/4241	. . . {using a resonant converter}

1/425	. . . {using a single converter stage both for correction of AC input power factor and generation of a high frequency AC output voltage}	3/145	. . . . using devices of a triode or transistor type requiring continuous application of a control signal
1/4258	. . . {using a single converter stage both for correction of AC input power factor and generation of a regulated and galvanically isolated DC output voltage (H02M 1/4241 takes precedence)}	3/15	. . . . . using discharge tubes only
1/4266	. . . {using passive elements}	3/155	. . . . . using semiconductor devices only
2001/4275	. . . {by adding an auxiliary output voltage in series to the input}	2003/1552	. . . . . {Boost converters exploiting the leakage inductance of a transformer or of an alternator as boost inductor}
2001/4283	. . . {by adding a controlled rectifier in parallel to a first rectifier feeding a smoothing capacitor}	2003/1555	. . . . . {for the generation of a regulated current to a load whose impedance is substantially inductive}
2001/4291	. . . {by using a Buck converter to switch the input current}	2003/1557	. . . . . {Single ended primary inductor converters [SEPIC]}
1/44	. Circuits or arrangements for compensating for electromagnetic interference in converters or inverters	3/156	. . . . . with automatic control of output voltage or current, e.g. switching regulators
3/00	Conversion of dc power input into dc power output	3/1563	. . . . . {without using an external clock (H02M 3/158 takes precedence)}
3/005	. {using Cuk converters}	2003/1566	. . . . . {with means for compensating against rapid load changes, e.g. with auxiliary current source, with dual mode control, with inductance variation}
3/02	. without intermediate conversion into ac	3/157	. . . . . with digital control
3/04	. . by static converters	3/158	. . . . . including plural semiconductor devices as final control devices for a single load
3/06	. . . using resistors or capacitors, e.g. potential divider	3/1582	. . . . . {Buck-boost converters (H02M 3/1584 takes precedence)}
3/07	. . . . using capacitors charged and discharged alternately by semiconductor devices with control electrode {, e.g. charge pumps}	3/1584	. . . . . {with a plurality of power processing stages connected in parallel}
2003/071	. . . . . {adapted to generate a negative voltage output from a positive voltage source}	2003/1586	. . . . . {switched with a phase shift, i.e. interleaved}
2003/072	. . . . . {adapted to generate an output voltage whose value is lower than the input voltage}	3/1588	. . . . . {comprising at least one synchronous rectifier element (H02M 3/1582 , H02M 3/1584 take precedence)}
3/073	. . . . . {Charge pumps of the SCHENKEL type}	3/16	. . by dynamic converters
2003/075	. . . . . {including a plurality of stages and two sets of clock signals, one set for the odd and one set for the even numbered stages}	3/18	. . . using capacitors or batteries which are alternately charged and discharged, e.g. charged in parallel and discharged in series
2003/076	. . . . . {the clock signals being boosted to a value which is higher than input voltage value}	3/20	. . by combination of static with dynamic converters; by combination of dynamo-electric with other dynamic or static converters
2003/077	. . . . . {with parallel connected charge pump stages}	3/22	. with intermediate conversion into ac
2003/078	. . . . . {with means for reducing the back bias effect, i.e. the effect which causes the threshold voltage of transistors to increase as more stages are added to the converter}	3/24	. . by static converters
3/08	. . . using discharge tubes without control electrode or semiconductor devices without control electrode	3/26	. . . using discharge tubes without control electrode or semiconductor devices without control electrode to produce the intermediate ac
3/10	. . . using discharge tubes with control electrode or semiconductor devices with control electrode (H02M 3/07 takes precedence)	3/28	. . . using discharge tubes with control electrode or semiconductor devices with control electrode to produce the intermediate ac
3/125	. . . . using devices of a thyatron or thyristor type requiring extinguishing means	3/285	. . . . {Single converters with a plurality of output stages connected in parallel (parallel operation of a plurality of converters in dc distribution networks H02J 1/10)}
3/13	. . . . . using discharge tubes only	3/305	. . . . using devices of a thyatron or thyristor type requiring extinguishing means
3/135	. . . . . using semiconductor devices only	3/31	. . . . . using discharge tubes only
3/137	. . . . . with automatic control of output voltage or current, e.g. switching regulators	3/315	. . . . . using semiconductor devices only
3/139	. . . . . with digital control	3/3155	. . . . . {with automatic control of the output voltage or current}
3/142	. . . . . including plural semiconductor devices as final control devices for a single load	3/325	. . . . using devices of a triode or a transistor type requiring continuous application of a control signal

- 3/33 using discharge tubes only
- 3/335 using semiconductor devices only
- 3/33507 {with automatic control of the output voltage or current ([H02M 3/33561](#), [H02M 3/33569](#) take precedence)}
- 3/33515 {with digital control}
- 3/33523 {with galvanic isolation between input and output}
- 3/3353 {having at least two simultaneously operating switches on the input side, e.g. "double forward" or "double (switched) flyback" converter}
- 3/33538 {of the forward type ([H02M 3/3353](#), [H02M 3/33569](#) take precedence)}
- 3/33546 {with automatic control of the output voltage or current ([H02M 3/33561](#) takes precedence)}
- 3/33553 {with galvanic isolation between input and output}
- 3/33561 {having more than one output with independent control}
- 3/33569 {having several active switching elements ([H02M 3/3353](#) takes precedence)}
- 3/33576 {having at least one active switching element at the secondary side of an isolation transformer}
- 3/33584 {Bidirectional converters}
- 3/33592 {having a synchronous rectifier circuit or a synchronous freewheeling circuit at the secondary side of an isolation transformer}
- 3/337 in push-pull configuration {([H02M 3/33576](#) takes precedence; with self-oscillating arrangements [H02M 3/3382](#) and [H02M 3/3385](#))}
- 3/3372 {of the parallel type}
- 3/3374 {with preregulator, e.g. current injected push-pull}
- 3/3376 {with automatic control of output voltage or current}
- 3/3378 {in a push-pull configuration of the parallel type ([H02M 3/3374](#) takes precedence)}
- 3/338 in a self-oscillating arrangement ([H02M 3/337](#) takes precedence)
- 3/3381 {using a single commutation path}
- 3/3382 {in a push-pull circuit arrangement}
- 3/3384 {of the parallel type}
- 3/3385 {with automatic control of output voltage or current ([H02M 3/33561](#) takes precedence)}
- 3/3387 {in a push-pull configuration}
- 3/3388 {of the parallel type}
- 3/34 by dynamic converters
- 3/36 using mechanical parts to select progressively or to vary continuously the input potential
- 3/38 using mechanical contact-making and -breaking parts to interrupt a single potential
- 3/40 wherein the parts are rotating and collectors co-operate with brushes or rollers
- 3/42 with electromagnetically-operated vibrating contacts, e.g. chopper
- 3/44 by combination of static with dynamic converters; by combination of dynamo-electric with other dynamic or static converters
- 5/00 Conversion of ac power input into ac power output, e.g. for change of voltage, for change of frequency, for change of number of phases**
- 5/005 {using discharge tubes}
- 5/02 without intermediate conversion into dc
- 5/04 by static converters ([controlling transformers, reactors or choke coils, e.g. by tap changing](#) [H02P 13/00](#))
- 5/06 using impedances
- 5/08 using capacitors only
- 5/10 using transformers
- 5/12 for conversion of voltage or current amplitude only
- 5/14 for conversion between circuits of different phase number
- 5/16 for conversion of frequency
- 5/18 for conversion of waveform
- 5/20 using discharge tubes without control electrode or semiconductor devices without control electrode
- 5/22 using discharge tubes with control electrode or semiconductor devices with control electrode
- 5/225 {comprising two stages of AC-AC conversion, e.g. having a high frequency intermediate link}
- 5/25 using devices of a thyatron or thyristor type requiring extinguishing means
- 5/253 using discharge tubes only
- 5/257 using semiconductor devices only
- 5/2573 {with control circuit}
- 5/2576 {with digital control}
- 5/27 for conversion of frequency
- 5/271 {from a three phase input voltage}
- 5/272 {for variable speed constant frequency systems}
- 5/273 {with digital control}
- 5/275 using devices of a triode or transistor type requiring continuous application of a control signal
- 5/29 using discharge tubes only
- 5/293 using semiconductor devices only
- 2005/2932 {with automatic control of output voltage, current or power}
- 2005/2935 {using reverse phase control, i.e. turn-on of switch in series with load at zero crossing of input voltage, turn-off before next zero crossing}
- 2005/2937 {using whole cycle control, i.e. switching an integer number of whole (half) cycles of the ac input voltage}
- 5/297 for conversion of frequency
- 5/32 by dynamic converters
- 5/34 using mechanical contact-making and -breaking parts
- 5/36 wherein the parts are rotating and collectors co-operate with brushes or rollers
- 5/38 by combination of static with dynamic converters; by combination of dynamo-electric with other dynamic or static converters
- 5/40 with intermediate conversion into dc

- 5/42 . . . by static converters
- 5/44 . . . using discharge tubes or semiconductor devices to convert the intermediate dc into ac
- 5/443 using devices of a thyatron or thyristor type requiring extinguishing means
- 5/447 using discharge tubes only
- 5/45 using semiconductor devices only
- 5/4505 {having a rectifier with controlled elements}
- 5/451 with automatic control of output voltage or frequency
- 5/452 with automatic control of output waveform
- 5/453 using devices of a triode or transistor type requiring continuous application of a control signal
- 5/456 using discharge tubes only
- 5/458 using semiconductor devices only
- 5/4585 {having a rectifier with controlled elements}
- 5/46 . . . by dynamic converters
- 5/48 . . . by combination of static with dynamic converters; by combination of dynamo-electric with other dynamic or static converters
- 7/00 Conversion of ac power input into dc power output; Conversion of dc power input into ac power output**
- 7/003 . {Constructional details, e.g. physical layout, assembly, wiring, busbar connections}
- 7/006 . {using discharge tubes}
- 7/02 . Conversion of ac power input into dc power output without possibility of reversal
- 7/04 . . . by static converters
- 7/043 . . . {using transformers or inductors only}
- 7/046 . . . {using discharge tubes}
- 7/06 . . . using discharge tubes without control electrode or semiconductor devices without control electrode
- 7/062 {Avoiding or suppressing excessive transient voltages or currents}
- 7/064 {with several outputs}
- 7/066 {particular circuits having a special characteristic}
- 7/068 {mounted on a transformer}
- 7/08 arranged for operation in parallel
- 7/10 arranged for operation in series, e.g. for multiplication of voltage
- 7/103 {Containing passive elements (capacitively coupled) which are ordered in cascade on one source}
- 7/106 {With physical arrangement details}
- 7/12 . . . using discharge tubes with control electrode or semiconductor devices with control electrode
- 7/125 {Avoiding or suppressing excessive transient voltages or currents}
- 7/145 using devices of a thyatron or thyristor type requiring extinguishing means
- 7/15 using discharge tubes only
- 7/151 {with automatic control (H02M 7/153 takes precedence)}
- 7/153 {arranged for operation in parallel}
- 7/155 using semiconductor devices only
- 7/1552 {in a biphasic or polyphase arrangement (voltage multipliers H02M 7/19)}
- 7/1555 {with control circuit}
- 7/1557 {with automatic control of the output voltage or current}
- 7/162 in a bridge configuration
- 7/1623 {with control circuit}
- 7/1626 {with automatic control of the output voltage or current}
- 7/17 arranged for operation in parallel
- 7/19 arranged for operation in series, e.g. for voltage multiplication
- 7/21 using devices of a triode or transistor type requiring continuous application of a control signal
- 7/213 using discharge tubes only
- 7/217 using semiconductor devices only
- 7/2173 {in a biphasic or polyphase circuit arrangement (H02M 7/2176 takes precedence; voltage multipliers H02M 7/25)}
- 7/2176 {comprising a passive stage to generate a rectified sinusoidal voltage and a controlled switching element in series between such stage and the output}
- 7/219 in a bridge configuration
- 2007/2195 {the switches being synchronously commutated at the same frequency of the AC input voltage}
- 7/23 arranged for operation in parallel { (H02M 7/2176 takes precedence) }
- 7/25 arranged for operation in series, e.g. for multiplication of voltage
- 7/26 . . . using open-spark devices, e.g. Marx rectifier
- 7/28 . . . using electrolytic rectifiers
- 7/30 . . . by dynamic converters
- 7/32 . . . using mechanical contact-making and -breaking parts
- 7/34 wherein the parts are rotating and collectors co-operate with brushes or rollers
- 7/36 with electromagnetically-operated vibrating contacts, e.g. chopper
- 7/38 . . . using one or more sparking electrodes rotating over counterelectrodes
- 7/40 . . . by combination of static with dynamic converters; by combination of dynamo-electric with other dynamic or static converters
- 7/42 . Conversion of dc power input into ac power output without possibility of reversal
- 7/44 . . . by static converters
- 7/445 . . . {using discharge tubes}
- 7/46 . . . using discharge tubes without control electrode or semiconductor devices without control electrode
- 7/48 . . . using discharge tubes with control electrode or semiconductor devices with control electrode
- 2007/4803 {with means for reducing dc component from AC output voltage}
- 7/4807 {having a high frequency intermediate AC stage}
- 2007/4811 {having an auxiliary actively switched resonant commutation circuit connected to an intermediate dc voltage or between two push-pull branches}

2007/4815	. . . .	{Resonant converters (H02M 2007/4811 and H02M 7/4826 take precedence)}	7/53	. . . .	using devices of a triode or transistor type requiring continuous application of a control signal {(H02M 7/4807 , H02M 7/493 and H02M 7/4826 take precedence)}
2007/4818	. . . .	{with means for adaptation of resonance frequency, e.g. by modification of capacitance or inductance of resonance circuit}	7/533	. . . .	using discharge tubes only
2007/4822	. . . .	{arranged for operation in parallel}	7/537	. . . .	using semiconductor devices only, e.g. single switched pulse inverters
7/4826	. . . .	{operating from a resonant DC source, i.e. the DC input voltage varies periodically, e.g. resonant DC-link inverters}	7/5375	. . . .	with special starting equipment
7/483	. . . .	Converters with outputs that each can have more than two voltages levels	7/538	. . . .	in a push-pull configuration (H02M 7/5375 takes precedence {; with oscillating arrangements H02M 7/53832 , H02M 7/53846 })
2007/4835	. . . .	{comprising a plurality of cells, each including a switchable capacitor, the capacitors having a nominal charge voltage which corresponds to a given fraction of the input voltage, the capacitors being selectively connected in series to determine the instantaneous output voltage}	7/53803	. . . .	{with automatic control of output voltage or current}
7/487	. . . .	Neutral point clamped inverters	7/53806	. . . .	{in a push-pull configuration of the parallel type}
7/49	. . . .	Combination of the output voltage waveforms of a plurality of converters	7/5381	. . . .	Parallel type
7/493	. . . .	the static converters being arranged for operation in parallel	7/5383	. . . .	in a self-oscillating arrangement (H02M 7/538 takes precedence)
7/497	. . . .	sinusoidal output voltages being obtained by combination of several voltages being out of phase	7/53832	. . . .	{in a push-pull arrangement}
7/501	. . . .	sinusoidal output voltages being obtained by the combination of several pulse-voltages having different amplitude and width	7/53835	. . . .	{of the parallel type}
7/505	. . . .	using devices of a thyatron or thyristor type requiring extinguishing means {(H02M 7/4807 , H02M 7/483 , H02M 7/493 and H02M 7/4826 take precedence)}	7/53838	. . . .	using a single commutation path
7/51	. . . .	using discharge tubes only	7/53846	. . . .	Control circuits
7/515	. . . .	using semiconductor devices only	WARNING		
7/5152	. . . .	{with separate extinguishing means}	Group H02M 7/53846 and subgroups is not complete, see provisionally also H02M 7/5383 and subgroups		
7/5155	. . . .	{wherein each commutation element has its own extinguishing means}	7/538463	. . . .	{for thyristor type converters}
7/5157	. . . .	{wherein the extinguishing of every commutation element will be obtained by means of a commutation inductance, by starting another main commutation element in series with the first}	7/538466	. . . .	{for transistor type converters}
7/516	. . . .	Self-oscillating arrangements	7/53854	. . . .	using thyristor type converters
7/517	. . . .	with special starting equipment	7/53862	. . . .	using transistor type converters
7/519	. . . .	in a push-pull configuration (H02M 7/517 takes precedence)	7/5387	. . . .	in a bridge configuration
7/521	. . . .	in a bridge configuration	7/53871	. . . .	{with automatic control of output voltage or current}
7/523	. . . .	with LC-resonance circuit in the main circuit	7/53873	. . . .	{with digital control}
7/5233	. . . .	{the commutation elements being in a push-pull arrangement}	7/53875	. . . .	{with analogue control of three-phase output}
7/5236	. . . .	{in a series push-pull arrangement}	2007/53876	. . . .	{based on synthesising a desired voltage vector via the selection of appropriate fundamental voltage vectors, and corresponding dwelling times}
7/525	. . . .	with automatic control of output waveform or frequency (H02M 7/517 - H02M 7/523 take precedence)	2007/53878	. . . .	{by time shifting switching signals of one diagonal pair of the bridge with respect to the other diagonal pair}
7/527	. . . .	by pulse width modulation	7/5388	. . . .	with asymmetrical configuration of switches
7/529	. . . .	using digital control	WARNING		
			Group H02M 7/5388 is not complete, see provisionally also H02M 7/5387 and subgroups		
			7/539	. . . .	with automatic control of output wave form or frequency (H02M 7/5375 - H02M 7/5387 take precedence)
			7/5395	. . . .	by pulse-width modulation
			7/54	. .	by dynamic converters
			7/56	. . .	using mechanical parts to select progressively, or to vary continuously, the input potential

- 7/58 . . . using mechanical contact-making and -
breaking parts to interrupt a single potential
- 7/60 . . . wherein the parts are rotating and collectors
co-operate with brushes or rollers
- 7/62 . . . with electromagnetically-operated vibrating
contacts, e.g. chopper
- 7/64 . . by combination of static with dynamic converters;
by combination of dynamo-electric with other
dynamic or static converters
- 7/66 . with possibility of reversal
- 7/68 . . by static converters
- 7/70 . . . using discharge tubes without control electrode
or semiconductor devices without control
electrode
- 7/72 . . . using discharge tubes with control electrode or
semiconductor devices with control electrode
- 7/75 . . . using devices of a thyatron or thyristor type
requiring extinguishing means
- 7/753 using discharge tubes only
- 7/757 using semiconductor devices only
- 7/7575 {for high voltage direct transmission
link}
- 7/758 with automatic control of output
waveform or frequency
- 7/77 arranged for operation in parallel
- 7/79 using devices of a triode or transistor type
requiring continuous application of a control
signal
- 7/793 using discharge tubes only
- 7/797 using semiconductor devices only
- 7/81 arranged for operation in parallel
- 7/82 . . . using open-spark devices, e.g. Marx rectifier
- 7/84 . . . using electrolytic rectifiers
- 7/86 . . by dynamic converters
- 7/88 . . . using mechanical parts to select progressively
or to vary continuously the input potential
- 7/90 . . . using mechanical contact-making and -
breaking parts to interrupt a single potential
- 7/92 . . . wherein the parts are rotating and collectors
co-operate with brushes or rollers
- 7/94 . . . wherein the parts are operated by rotating
cams or cam-like devices
- 7/95 . . . with electromagnetically-operated vibrating
contacts, e.g. chopper
- 7/96 with moving liquid contacts
- 7/98 . . by combination of static with dynamic converters;
by combination of dynamo-electric with other
dynamic or static converters

**11/00 Power conversion systems not covered by the
preceding groups**