

## SECTION H — ELECTRICITY

### H05 ELECTRIC TECHNIQUES NOT OTHERWISE PROVIDED FOR

**H05H PLASMA TECHNIQUE** (ion-beam tubes H01J 27/00; magnetohydrodynamic generators H02K 44/08; producing X-rays involving plasma generation H05G 2/00); **PRODUCTION OF ACCELERATED ELECTRICALLY- CHARGED PARTICLES OR OF NEUTRONS** (obtaining neutrons from radioactive sources G21, e.g. G21B, G21C, G21G); **PRODUCTION OR ACCELERATION OF NEUTRAL MOLECULAR OR ATOMIC BEAMS** (atomic clocks G04F 5/14; devices using stimulated emission H01S; frequency regulation by comparison with a reference frequency determined by energy levels of molecules, atoms, or subatomic particles H03L 7/26)

#### Note(s)

1. This subclass covers:
  - a. generating or handling plasma;
  - b. devices not covered by subclass H01J and in which electrons, ion beams, or neutral particles are accelerated to high energies;
  - c. devices for producing neutral particle beams;
  - d. targets for (a), (b), or (c).
2. Attention is drawn to subclass G21K.

#### Subclass index

PLASMA TECHNIQUE.....	1/00
PRODUCTION OR ACCELERATION OF NEUTRAL PARTICLE BEAMS.....	3/00
TARGETS FOR NUCLEAR REACTIONS.....	6/00
PARTICLE ACCELERATORS	
Direct voltage accelerators, accelerators using single pulses.....	5/00
Linear; magnetic induction; magnetic resonance.....	9/00, 11/00, 13/00
Others.....	15/00
Details.....	7/00

<b>1/00</b>	<b>Generating plasma; Handling plasma</b> (application of plasma technique in thermonuclear fusion reactors G21B 1/00)	1/30	• • • using applied electromagnetic fields, e.g. high-frequency or microwave energy (H05H 1/28 takes precedence) [3]
1/02	• Arrangements for confining plasma by electric or magnetic fields; Arrangements for heating plasma (electron optics H01J)	1/32	• • • using an arc (H05H 1/28 takes precedence) [3]
		1/34	• • • • Details, e.g. electrodes, nozzles [3]
1/03	• • using electrostatic fields [3]	1/36	• • • • • Circuit arrangements (H05H 1/38, H05H 1/40 take precedence) [3]
1/04	• • using magnetic fields substantially generated by the discharge in the plasma	1/38	• • • • • Guiding or centering of electrodes [3]
1/06	• • • Longitudinal pinch devices	1/40	• • • • • using applied magnetic fields, e.g. for focusing or rotating the arc [3]
1/08	• • • Theta pinch devices	1/42	• • • • • with provisions for introducing materials into the plasma, e.g. powder, liquid (electrostatic spraying, spraying apparatus with means for charging the spray electrically B05B 5/00) [3]
1/10	• • using applied magnetic fields only		
1/11	• • • using cusp configuration (H05H 1/14 takes precedence) [3]	1/44	• • • • using more than one torch [3]
1/12	• • • wherein the containment vessel forms a closed loop, e.g. stellarator	1/46	• • using applied electromagnetic fields, e.g. high frequency or microwave energy (H05H 1/26 takes precedence) [3]
1/14	• • • wherein the containment vessel is straight and has magnetic mirrors	1/48	• • using an arc (H05H 1/26 takes precedence) [3]
1/16	• • using applied electric and magnetic fields	1/50	• • • and using applied magnetic fields, e.g. for focusing or rotating the arc [3]
1/18	• • • wherein the fields oscillate at a very high frequency, e.g. in the microwave range	1/52	• • using exploding wires or spark gaps (H05H 1/26 takes precedence; spark gaps in general H01T) [3]
1/20	• • Ohmic heating	1/54	• Plasma accelerators [3]
1/22	• • for injection heating		
1/24	• Generating plasma [2]		
1/26	• • Plasma torches [2]		
1/28	• • • Cooling arrangements [3]	<b>3/00</b>	<b>Production or acceleration of neutral particle beams, e.g. molecular or atomic beams [3]</b>

## H05H

- 3/02 • Molecular or atomic-beam generation, e.g. resonant beam generation (gas masers H01S 1/06) [3]
- 3/04 • Acceleration by electromagnetic wave pressure [3]
- 3/06 • Generating neutron beams (targets for producing nuclear reactions H05H 6/00; neutron sources G21G 4/02) [5]
- 5/00 Direct voltage accelerators; Accelerators using single pulses** (H05H 3/06 takes precedence) [5]
- 5/02 • Details (targets for producing nuclear reactions H05H 6/00) [3]
- 5/03 • • Accelerating tubes (vessels or containers of electric discharge tubes with improved potential distribution over surface of vessel H01J 5/06; shields of X-ray tubes associated with vessels or containers H01J 35/16) [4]
- 5/04 • energised by electrostatic generators, e.g. by van de Graaff generator [4]
- 5/06 • Tandem accelerators; Multi-stage accelerators
- 5/08 • Particle accelerators using step-up transformers, e.g. resonance transformers [4]
- 6/00 Targets for producing nuclear reactions** (supports for targets or objects to be irradiated G21K 5/08) [3]
- 7/00 Details of devices of the types covered by groups H05H 9/00-H05H 13/00** (targets for producing nuclear reactions H05H 6/00) [3]
- 7/02 • Circuits or systems for supplying or feeding radio-frequency energy (radio-frequency generators H03B)
- 7/04 • Magnet systems; Energisation thereof
- 7/06 • Two-beam arrangements; Multi-beam arrangements
- 7/08 • Arrangements for injecting particles into orbits
- 7/10 • Arrangements for ejecting particles from orbits
- 7/12 • Arrangements for varying final energy of beam
- 7/14 • Vacuum chambers (H05H 5/03 takes precedence) [4]
- 7/16 • • of the waveguide type [4]
- 7/18 • • Cavities; Resonators [4]
- 7/20 • • • with superconductive walls [4]
- 7/22 • Details of linear accelerators, e.g. drift tubes (H05H 7/02-H05H 7/20 take precedence) [4]
- 9/00 Linear accelerators** (H05H 11/00 takes precedence)
- 9/02 • Travelling-wave linear accelerators
- 9/04 • Standing-wave linear accelerators
- 11/00 Magnetic induction accelerators, e.g. betatrons**
- 11/02 • Air-cored betatrons
- 11/04 • Biased betatrons
- 13/00 Magnetic resonance accelerators; Cyclotrons**
- 13/02 • Synchrocyclotrons, i.e. frequency-modulated cyclotrons
- 13/04 • Synchrotrons
- 13/06 • Air-cored magnetic resonance accelerators
- 13/08 • Alternating-gradient magnetic resonance accelerators
- 13/10 • Accelerators comprising one or more linear accelerating sections and bending magnets or the like to return the charged particles in a trajectory parallel to the first accelerating section, e.g. microtrons [4]
- 15/00 Methods or devices for acceleration of charged particles not otherwise provided for** [4]