ECLA EUROPEAN CLASSIFICATION

H ELECTRICITY

Notes

These notes cover the basic principles and general instructions for use of section H.

1. Section H covers :

   a. basic electric elements, which cover all electric units and the general mechanical structure of apparatus and circuits, including the assembly of various basic elements into what are called printed circuits and also cover to a certain extent the manufacture of these elements (when not covered elsewhere);

   b. generation of electricity, which covers the generation, conversion, and distribution of electricity together with the controlling of the corresponding gear;

   c. applied electricity, which covers :

      i. general utilisation techniques, viz. those of electric heating and electric lighting circuits;

      ii. some special utilisation techniques, either electric or electronic in the strict sense, which are not covered by other sections of the Classification, including :

```
- electric light sources, including lasers;
- electric X-ray technique;
- electric plasma technique and the generation and
  acceleration of electrically charged particles or
  neutrons;
```

   d. basic electronic circuits and their control;

   e. radio or electric communication technique, including electromechanical transducers in general;

   f. the use of a specified material for the manufacture of the article or element described. In this connection, paragraphs 56 to 58 of the Guide should be referred to.

2. In this section, the following general rules apply :

   a. subject to the exceptions stated in I (c) above, any electric aspect or part peculiar to a particular operation, process, apparatus, object, or article classified in one of the sections of the Classification other than section H is always classified in the subclass for that operation, process, apparatus, object, or article, or where common characteristics concerning technical subjects of similar nature have been brought out at class level, it is classified, in conjunction with the operation, process, apparatus, object, or article in a subclass which covers entirely the general electrical applications for the technical subject in question;

   b. such electrical applications, either general or particular, include

i. the therapeutic processes and apparatus, in class A61;

ii. the electric processes and apparatus used in various laboratory or industrial operations, in classes B01, B03, and subclass B23K;

iii. the electricity supply, electric propulsion and electric lighting of vehicles in general and of particular vehicles, in the "Transporting" subsection of section B;

iv. the electric ignition systems of internal-combustion engines, in subclass F02P, and of combustion apparatus in general, in subclass F23Q;

v. the whole electrical part of section G, i.e. measuring devices including apparatus for measuring electric variables, checking, signalling, and calculating. Electricity in that section is generally dealt with as a means and not as an end in itself;

c. all electrical applications, both general and particular, presuppose that the "basic electricity" aspect appears in section H (see 1 (a) above) as regards the electric "basic elements" which they comprise. This rule is also valid for applied electricity, referred to under 1 (c) above, which appears in section H itself.

3. In this section, the following special cases occur :

a. among the general applications covered by sections other than section H, it is worth noting that electric heating in general is covered by subclasses F24D or F24H or class F27, and that electric lighting in general is partly covered by class F21, since in section H (see 1 (c) above) there are places in H05B which cover the same technical subjects;

b. in the above two cases, the subclasses of section F, which deal with the respective subjects, essentially cover in the first place the whole mechanical aspect of the apparatus or devices, whereas the electrical aspect, as such, is covered by subclass H05B;

c. in the case of lighting, this mechanical aspect should be taken to cover the material arrangement of the various electric elements, i.e. their geometrical, or physical, position in relation to one another; this is covered by subclass F21V, the elements themselves and the primary circuits remaining in section H. The same applies to electric light sources, when combined with light sources of a different kind. These are covered by subclass H05B, whereas the physical arrangement which their combination constitutes is covered by the various subclasses of class F21;

d. as regards heating, not only the electric elements and circuitry designs, as such, are covered by subclass H 05 B, but also the electric aspects of their arrangement, where these concern cases of general application; electric furnaces being considered as such. The physical disposition of the electric elements in furnaces is covered by section F. If a comparison is made with electric welding circuits which are covered by subclass B23K in connection with welding, it can be seen that electric heating is not covered by the general rule stated in 2 above.

H01 BASIC ELECTRIC ELEMENTS

Note
Processes involving only a single technical art, e.g. drying, coating, for which provision exists elsewhere are classified in the relevant class for that art.

H01B **CABLES; CONDUCTORS; INSULATORS; SELECTION OF MATERIALS FOR THEIR CONDUCTIVE, INSULATING OR DIELECTRIC PROPERTIES** (selection for magnetic properties H01F1/00; waveguides H01P; installations of cables or lines H02G; [N: printed circuits H05K])

H01C **RESISTORS**

H01F **MAGNETS; INDUCTANCES; TRANSFORMERS; SELECTION OF MATERIALS FOR THEIR MAGNETIC PROPERTIES** (ceramics based on ferrites C04B35/26; alloys C22C; [N: construction of loading coils H01B]; thermomagnetic devices H01L37/00; loudspeakers, microphones, gramophone pick-ups or like acoustic electromechanical transducers H04R)

H01G **CAPACITORS; CAPACITORS, RECTIFIERS, DETECTORS, SWITCHING DEVICES OR LIGHT-SENSITIVE DEVICES, OF THE ELECTROLYTIC TYPE** (selection of specified materials as dielectric H01B3/00; [N: ceramics C04B])

H01H **ELECTRIC SWITCHES; RELAYS; SELECTORS; EMERGENCY PROTECTIVE DEVICES** (contact cables H01B7/10; overvoltage protection resistors, resistive arresters H01C7/12, H01C8/04; electrolytic self-interrupters H01G9/18; switching devices of the waveguide type H01P; devices for interrupted current collection H01R39/00; overvoltage arresters using spark gaps H01T4/00; emergency protective circuit arrangements H02H; switching by electronic means without contact-making H03K17/00)

H01J **ELECTRIC DISCHARGE TUBES OR DISCHARGE LAMPS (spark-gaps H01T; arc lamps with consumable electrodes H05B; particle accelerators H05H)**

H01K **ELECTRIC INCANDESCENT LAMPS** (details or apparatus or processes for manufacture applicable to both discharge devices and incandescent lamps H01J; light sources using a combination of incandescent and other types of light generation H01J61/96, H05B35/00; circuits therefor H05B)

H01L **SEMICONDUCTOR DEVICES; ELECTRIC SOLID STATE DEVICES NOT OTHERWISE PROVIDED FOR** (use of semiconductor devices for measuring G01; resistors in general H01C; magnets, inductors [N: in general], transformers H01F; capacitors in general H01G; electrolytic devices H01G9/00; batteries, accumulators H01M; waveguides, resonators or lines of the waveguide type H01P; line connectors, current collectors H01R; stimulated emission devices H01S; electromechanical resonators H03H; loudspeakers, microphones, gramophone pick-ups or like acoustic electromechanical transducers H04R; electric light sources in general H05B; printed circuits, hybrid circuits, casings or constructional details of electric apparatus, manufacture of assemblages of electrical components H05K; use of semiconductor devices in circuits having a particular application, see the subclass for the application) [C1112]

H01M **PROCESSES OR MEANS, e.g. BATTERIES, FOR THE DIRECT CONVERSION OF CHEMICAL INTO ELECTRICAL ENERGY** (electrochemical processes or apparatus in general C25; semiconductor or other solid state devices for converting light or heat into electrical energy H01L, e.g. H01L31/00, H01L35/00, H01L37/00)

H01P **WAVEGUIDES; RESONATORS, LINES, OR OTHER DEVICES OF THE WAVEGUIDE TYPE** (operating at optical frequencies G02B; aerials H01Q; [N: modulating electromagnetic waves in transmission line, waveguide, cavity resonator or radiation field of aerial H03C7/02]; networks comprising lumped impedance elements H03H)

H01Q **AERIALS** (microwave radiators for near-field therepeutic treatment A61N5/04; apparatus for testing aerials or for measuring aerial characteristics G01R; waveguides H01P; radiators or aerials for microwave heating H05B6/72)

H01R **LINE CONNECTORS; CURRENT COLLECTORS** (switches, fuses H01H; coupling devices of the waveguide type H01P5/00; switching arrangements for the supply or distribution of electric power H02B; installations of electric lines, cables or auxiliary apparatus H02G; printed means for providing electric connections to or between printed circuits H05K)

H01S **DEVICES USING STIMULATED EMISSION**

H01T **SPARK GAPS; OVERVOLTAGE ARRESTERS USING SPARK GAPS; SPARKING PLUGS; CORONA DEVICES; GENERATING IONS TO BE INTRODUCED INTO NON-ENCLOSED GASES** (working of metal by the action of a high concentration of electric current B23H; welding, e.g. arc welding, electron beam welding or electrolytic welding B23K; gas-filled discharge tubes with solid cathode H01J17/00; electric arc lamps H05B31/00) [C9501]

H02 GENERATION; CONVERSION OR DISTRIBUTION OF ELECTRIC POWER

H02B **BOARDS, SUBSTATIONS, OR SWITCHING ARRANGEMENTS FOR THE SUPPLY OR DISTRIBUTION OF ELECTRIC POWER** (basic electric elements, their assembly, including the mounting in enclosures or on bases, or the mounting of covers thereon, see the subclasses for such elements, e.g. transformers H01F, switches, fuses H01H, line connectors H01R; installation of lines, cables, or other conductors for supply or distribution H02G)

H02G **INSTALLATION OF ELECTRIC CABLES OR LINES, OR OF COMBINED OPTICAL AND ELECTRIC CABLES OR LINES** (distribution points incorporating switches H02B; guiding telephone cords H04M1/15; cable ducts or mountings for telephone or telegraph exchange installations H04Q1/06) [C9703]

H02H **EMERGENCY PROTECTIVE CIRCUIT ARRANGEMENTS** (indicating or signalling undesired working conditions G01R, e.g. G01R31/00, G08B; locating faults along lines G01R31/08; emergency protective devices H01H)

H02J **CIRCUIT ARRANGEMENTS OR SYSTEMS FOR SUPPLYING OR DISTRIBUTING ELECTRIC POWER; SYSTEMS FOR STORING ELECTRIC ENERGY** (for digital computers G06F1/18; circuits or apparatus for the conversion of electric power, arrangements for control or regulation of such circuits or apparatus H02M; interrelated control of several motors, control of a prime-mover/generator combination H02P; control of high-frequency power H03L; additional use of power line or power network for transmission of information H04B)

H02K **DYNAMO-ELECTRIC MACHINES** (measuring instruments G01; dynamo-electric relays H01H53/00; conversion of dc or ac input power into surge output power [N: H03K3/53]; loudspeakers, microphones, gramophone pick-ups or like acoustic electromechanical transducers H04R) [C9410]

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** (systems for regulating electric or magnetic variables in general, e.g. using transformers, reactors or choke coils, combination of such systems with static converters G05F; [N: digital function or clock generators] for digital computers G06F1/00, [N: G06F1/025, G06F1/04]; transformers H01F; connection or control of one converter with regard to conjoint operation with a similar or other source of supply H02J; dynamo-electric converters H02K47/00; controlling transformers, reactors or choke coils, control or regulation of electric motors, generators or dynamo-electric converters H02P; pulse generators H03K; [N: static converters specially adapted for igniting or operating discharge lamps H05B41/28]) [C0311]

H02N **ELECTRIC MACHINES NOT OTHERWISE PROVIDED FOR**

H02P **CONTROL OR REGULATION OF ELECTRIC MOTORS, GENERATORS, OR DYNAMO-ELECTRIC CONVERTERS; CONTROLLING TRANSFORMERS, REACTORS OR CHOKE COILS (**[N: specially adapted for electrically propelled vehicles B60L]**; structure of the starter, brake, or other control devices, see the relevant subclasses, e.g. mechanical brake F16D, mechanical speed regulator G05D, variable resistor H01C, starter switch H01H; systems for regulating electric or magnetic variables using transformers, reactors or choke coils G05F; arrangements structurally associated with motors, generators, dynamo-electric converters, transformers, reactors or choke coils, see the relevant subclasses, e.g. H01F, H02K; connection or control of one generator, transformer, reactor, choke coil, or dynamo-electric converter with regard to conjoint operation with similar or other source of supply H02J; control or regulation of static converters H02M)** [C9907]

H02S **GENERATION OF ELECTRIC POWER BY CONVERSION OF INFRA-RED RADIATION, VISIBLE LIGHT OR ULTRAVIOLET LIGHT, e.g. USING PHOTOVOLTAIC [PV] MODULES (light sensitive inorganic semiconductor devices H01L 31/00; thermoelectric devices H01L 35/00; pyroelectric devices H01L 37/00; light sensitive organic semiconductor devices H01L 51/00; obtaining electrical energy from radioactive sources G21H 1/12; solar heat collectors F24J 2/00)** [N1202]

H03 BASIC ELECTRONIC CIRCUITRY

H03B **GENERATION OF OSCILLATIONS, DIRECTLY OR BY FREQUENCY-CHANGING, BY CIRCUITS EMPLOYING ACTIVE ELEMENTS WHICH OPERATE IN A NON-SWITCHING MANNER; GENERATION OF NOISE BY SUCH CIRCUITS** (measuring, testing G01R; generators adapted for electrophonic musical instruments G10H; Speech synthesis G10L; masers, lasers H01S; dynamo-electric machines H02K; power inverter circuits H02M; by using pulse techniques H03K; automatic control of generators H03L; starting, synchronisation or stabilisation of generators where the type of generator is irrelevant or unspecified H03L; generation of oscillations in plasma H05H)

H03C **MODULATION** (measuring, testing G01R; masers, lasers H01S; modulators specially adapted for use in the amplifiers H03F3/38; modulating pulses H03K7/00; so-called modulators capable only of a switching between predetermined states of amplitude, frequency or phase H03K17/00, H04L; coding, decoding or code conversion, in general H03M; synchronous modulators specially adapted for colour television H04N9/65) [C9408]

H03D **DEMODULATION OR TRANSFERENCE OF MODULATION FROM ONE CARRIER TO ANOTHER** (masers, lasers H01S; circuits capable of acting both as modulator and demodulator H03C; details applicable to both modulators and frequency-changers H03C; demodulating pulses H03K9/00; transforming types of pulse modulation H03K11/00; coding, decoding or code conversion, in general H03M; repeater stations H04B7/14; demodulators adapted for ac systems of digital information transmission H04L27/00; synchronous demodulators adapted for colour television H04N9/66) [C9408]

H03F **AMPLIFIERS** (measuring, testing G01R; optical parametric amplifiers G02F; circuit arrangement with secondary emission tubes H01J43/30; masers, lasers H01S; control of amplification H03G; coupling arrangements independent of the nature of the amplifiers, voltage dividers H03H; amplifiers capable only of dealing with pulses H03K; repeater circuits in transmission lines H04B3/36, H04B3/58; application of speech amplifiers in telephonic communication H04M1/60, H04M3/40)

H03G **CONTROL OF AMPLIFICATION** (impedance networks, e.g. attenuators, H03H; control of transmission in lines H04B3/04)

H03H **IMPEDANCE NETWORKS, e.g. RESONANT CIRCUITS; RESONATORS** (measuring, testing G01R; arrangements for producing a reverberation or echo sound G10K15/08; impedance networks or resonators consisting of distributed impedances, e.g. of the waveguide type, H01P; control of amplification, e.g. bandwidth control of amplifiers, H03G; tuning resonant circuits, e.g. tuning coupled resonant circuits, H03J; networks for modifying the frequency characteristics of communication systems H04B)

H03J **TUNING RESONANT CIRCUITS; SELECTING RESONANT CIRCUITS (indicating arrangements for measuring G01D; measuring, testing G01R; remote-control in general G05, G08; automatic control or stabilisation of generators H03L)**

H03K **PULSE TECHNIQUE** (measuring pulse characteristics G01R; mechanical counters having an electrical input G06M; information storage devices in general G11; sample-and-hold arrangements in electric analogue stores G11C27/02; construction of switches involving contact making and breaking for generation of pulses, e.g. by using a moving magnet, H01H; static conversion of electric power H02M; generation of oscillations by circuits employing active elements which operate in a non-switching manner H03B; modulating sinusoidal oscillations with pulses H03C, H04L; discriminator circuits involving pulse counting H03D; automatic control of generators H03L; starting, synchronisation or stabilisation of generators where the type of generator is irrelevant or unspecified H03L; coding, decoding or code conversion in general H03M)

H03L **AUTOMATIC CONTROL, STARTING, SYNCHRONISATION, OR STABILISATION OF GENERATORS OF ELECTRONIC OSCILLATIONS OR PULSES** (of dynamo-electric generators H02P)

H03M **CODING; DECODING; CODE CONVERSION IN GENERAL** (using fluidic means F15C4/00; optical analogue/digital converters G02F7/00; coding, decoding or code conversion, specially adapted for particular applications, see the relevant subclasses, e.g. G01D, G01R, G06F, G06T, G09G, G10L, G11B, G11C, H04B, H04L, H04M, H04N; ciphering or deciphering for cryptography or other purposes involving the need for secrecy G09C) [C9507]

H04 ELECTRIC COMMUNICATION TECHNIQUE

Note
This class covers electrical communication systems with propagation paths employing light (optical communication), infra-red, ultrasonic, sonic, or infrasonic waves.

H04B **TRANSMISSION (transmission systems for measured values, control or similar signals G08C; coding, decoding, code conversion, in general H03M; broadcast communication H04H; multiplex systems H04J; secret communication H04K; transmission of digital information H04L)** [C9412]

H04H **BROADCAST COMMUNICATION (multiplex communication H04J; pictorial communication aspects of broadcast systems H04N)**

H04J **MULTIPLEX COMMUNICATION** (transmission in general H04B; peculiar to transmission of digital information H04L5/00; systems for the simultaneous or sequential transmission of more than one television signal H04N7/08; in exchanges H04Q11/00; stereophonic systems H04S)

H04K **SECRET COMMUNICATION; JAMMING OF COMMUNICATION**

H04L **TRANSMISSION OF DIGITAL INFORMATION, e.g. TELEGRAPHIC COMMUNICATION (typewriters B41J; order telegraphs, fire or police telegraphs G08B; visual telegraphy G08B, G08C; teleautographic systems G08C; ciphering or deciphering apparatus per se G09C; coding, decoding or code conversion, in general H03M; arrangements common to telegraphic and telephonic communication H04M; selecting H04Q)**

H04M **TELEPHONIC COMMUNICATION** (counting mechanisms G06M; circuits for controlling other apparatus via a telephone cable and not involving telephone switching apparatus G08; reels or other take-up devices for cords H02G11/00; multiplex transmission between switching centres H04J; selecting arrangements H04Q; loudspeakers, microphones, gramophone pick-ups or like electromechanical transducers H04R)

H04N **PICTORIAL COMMUNICATION, e.g. TELEVISION** (measuring, testing G01; systems for autographic writing, e.g. writing telegraphy, which involve following an outline [N: G08C21/00]; information storage based on relative movement between record carrier and transducer G11B; coding, decoding or code conversion, in general H03M; broadcast distribution or the recording of use made thereof H04H)

H04Q **SELECTING** (switches, relays, selectors H01H; electronic switches H03K17/00)

H04R **LOUDSPEAKERS, MICROPHONES, GRAMOPHONE PICK-UPS OR LIKE ACOUSTIC ELECTROMECHANICAL TRANSDUCERS; DEAF-AID SETS; PUBLIC ADDRESS SYSTEMS (generating mechanical vibrations in general B06B; transducers for measuring particular variables G01; transducers in clocks G04; producing sounds with frequency not determined by supply frequency G10K; transducers in recording or reproducing heads G11B; transducers in motors H02)** [C9508]

H04S **STEREOPHONIC SYSTEMS** (information storage on discs or tapes G11B; broadcast systems for the distribution of stereophonic information H04H20/88; multiplex systems in general H04J)

H04W **WIRELESS COMMUNICATIONS NETWORKS** (radio transmission systems H04B7/00; transmission systems using electromagnetic waves other than radio waves, e.g. light, infrared H04B10/00; communication systems using wireless extensions, i.e. wireless links without selective communication, e.g. cordless telephones H04M1/72; broadcast communication H04H) [N0407] [C0803]

H05 ELECTRIC TECHNIQUES NOT OTHERWISE PROVIDED FOR

H05B **ELECTRIC HEATING; ELECTRIC LIGHTING NOT OTHERWISE PROVIDED FOR (apparatus for special application, see the relevant places, e.g. A47J, C21, C22, C23, F21, F24, F27)**

H05C **ELECTRIC CIRCUITS OR APPARATUS SPECIALLY DESIGNED FOR USE IN EQUIPMENT FOR KILLING, STUNNING, OR GUIDING LIVING BEINGS** (stationary means for catching or killing insects by electric means A01M1/22; apparatus for the destruction of noxious animals, other than insects, by electricity A01M19/00; electric traps for animals A01M23/38; scaring devices for animals A01M29/00; slaughtering or stunning by electric current A22B3/06) [C0711]

H05F **STATIC ELECTRICITY; NATURALLY-OCCURRING ELECTRICITY** (electrostatic machines H02N; uses of electricity in performing operations, e.g.

ipitation, see the relevant subclasses for the operations)

H05G **X-RAY TECHNIQUE** (apparatus for radiation diagnosis A61B6/00; X-ray therapy A61N; testing by X-rays G01N; apparatus for X-ray photography G03B; filters, conversion screens, microscopes G21K; X-ray tubes H01J35/00; TV systems having X-ray input H04N5/321)

H05H **PLASMA TECHNIQUE** (fusion reactors G21B; ion-beam tubes H01J27/00; magnetohydrodynamic generators H02K44/08; producing X-rays involving plasma generation H05G2/00)**; 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 G04F5/14; devices using stimulated emission H01S; frequency regulation by comparison with a reference frequency determined by energy levels of molecules, atoms, or subatomic particles H03L7/26)

H05K **PRINTED CIRCUITS; CASINGS OR CONSTRUCTIONAL DETAILS OF ELECTRIC APPARATUS; MANUFACTURE OF ASSEMBLAGES OF ELECTRICAL COMPONENTS** (details of instruments or comparable details of other apparatus not otherwise provided for G12B; thin-film or thick-film circuits H01L27/01, H01L27/13; non-printed means for electric connections to or between printed circuits, [N: electric connections or line connectors, apparatus or processes for manufacturing, assembling, maintaining or repairing such connections or connectors] H01R; casings for, or constructional details of, particular types of apparatus, see the relevant subclasses; processes involving only a single technical art, e.g. heating, spraying, for which provision exists elsewhere, see the relevant classes)