

15-13. In any case where an electrical supply authority is also the consumer of the electrical energy supplied by it, or is the contractor for any electrical wiring work, the Chief Electrical Engineer or any person authorized by him in writing in that behalf shall, unless the Governor-General in Council otherwise directs, exercise and perform the powers, functions, and duties conferred or imposed on the electrical supply authority as such by the foregoing provisions of this Part of these regulations.

15-14. (1) Where electrical energy is generated upon the consumer's premises or is obtained from a privately-owned plant no person shall until he has obtained written permission from the Chief Electrical Engineer—

- (a) Commence or undertake any electrical wiring work; or
- (b) Connect to any source from which electrical energy is available—
 - (i) Any electrical wiring work; or
 - (ii) Any electrical apparatus intended to be used in any situation where the person touching it may, under normal conditions, simultaneously make contact with earth or earthed metal; or
 - (iii) Any electrical apparatus exceeding 10 amperes in capacity.

(2) The person undertaking to carry out any electrical wiring work shall on completion of such work notify the Chief Electrical Engineer in writing that the work is completed and that the tests prescribed by Regulations 62-51 to 62-55 (both inclusive) hereof have (where applicable) been satisfied. Such notice shall include the name and registration number of the electrical wireman in charge of the work.

DIVISION II.—DESIGN I.

PART 21.—ELECTRICAL PLANT.

GENERATORS.

21-01. (1) Every generator having a capacity exceeding $\frac{1}{2}$ kilowatt shall be provided with a name-plate bearing the maker's name, registered trade-mark, or registered trade-name, the output in K.W., K.V.A., or amperes, the voltage between terminals at the rated output, the speed in revolutions per minute, and, if an alternator, the number of phases and the frequency.

(2) Every generator shall be capable of complying with the particulars shown on the name-plate.

21-02. The terminals of any generator operating at other than extra-low pressure shall be so guarded or placed that they cannot be accidentally touched or short-circuited.

TRANSFORMERS, RESISTANCES, AND CHOKE-COILS.

21-11. Protecting cases or enclosures of transformers, resistances, and choke-coils shall be of material which is not readily combustible, and the conductors shall be adequately insulated from the protecting cases, enclosures, and supports, except that any neutral conductor need not be so insulated.

21-12. (1) Every transformer having a capacity exceeding $\frac{1}{2}$ kilovolt-ampere shall be provided with a name-plate bearing the maker's name, registered trade-mark, or registered trade-name, the output in K.V.A. or amperes, the voltage between primary terminals, the voltage between secondary terminals, the number of phases, and the frequency.

(2) Every transformer having a capacity not exceeding $\frac{1}{2}$ kilovolt-ampere shall, except as provided in Regulation 55-02 hereof, be provided with a name-plate bearing the output in watts or amperes, the voltage between primary terminals, and the voltage between secondary terminals.

(3) Every transformer shall be capable of complying with the particulars shown on the name-plate.

21-13. Where transformers or motor-generators are used to reduce the voltage to low pressure or extra-low pressure for the purposes mentioned in paragraphs (a) and (b) hereof the primary and secondary windings shall be isolated from each other—

- (a) To supply general wiring in buildings; or
- (b) For any other purpose where the low pressure or extra-low pressure circuit or apparatus has exposed live metal with which it is possible for any person to make contact.

21-14. Every transformer used or intended to be used for electric bell circuits as specified in Regulation 45-92 hereof shall comply with the following requirements:—

- (a) It shall be double wound; and
- (b) Its secondary voltage shall not exceed 30 volts.

21-15. Every transformer which is connected or intended to be connected to ordinary bell wiring shall comply with the following requirements:—

- (a) It shall be double wound; and
- (b) The secondary voltage shall not exceed 12 volts; and
- (c) The capacity shall not exceed 50 watts; and
- (d) It shall have an impedance sufficient on sustained short-circuit to prevent burning out.

21-16. Every transformer used or intended to be used for electric toys as specified in Regulation 45-93 hereof shall comply with the following requirements:—

- (a) It shall be double wound; and
- (b) Its primary voltage shall not exceed low pressure; and
- (c) Its secondary voltage shall not exceed 25 volts; and

- (d) Its capacity shall not exceed 150 watts; and
- (e) Its impedance shall be sufficient on sustained short-circuit to prevent burning out.

21-17. Every transformer for use with any luminous-discharge-tube electric sign, outline or decorative lighting shall comply with the requirements of paragraph (c) of Regulation 27-91 hereof.

21-18. Every transformer for use with any radio apparatus shall comply with the requirements of Regulation 35-01 hereof.

21-19. Every resistance for use with a motor shall comply with the requirements of Regulations 28-11, 28-12, 28-13, and 28-14 hereof.

BATTERY-CHARGERS AND RECTIFIERS.

21-31. (1) Every battery-charger and rectifier shall have permanently and legibly marked thereon the maker's name, registered trade-mark, or registered trade-name, the input in watts or amperes, the voltage between input terminals, the voltage between output terminals, and the polarity of the output terminals, and in the case of alternating current the number of phases and the frequency.

(2) Every battery-charger and rectifier shall be capable of complying with the particulars marked thereon.

CONDENSERS.

21-41. (1) Every static condenser (other than a condenser used for radio, communication, or signalling purposes) shall have permanently and legibly marked thereon the maker's name, registered trade-mark, or registered trade-name, the capacity in micro-farads or K.V.A., the working voltage, number of phases, phase connections, and the frequency.

(2) Every such condenser shall be capable of complying with the particulars marked thereon.

21-42. Every static condenser (other than a condenser used for radio, communication, or signalling purposes) which may remain charged when disconnected from the source of supply and which is of sufficient capacity to constitute an electrical hazard shall be provided with a legible warning notice permanently fixed on the condenser in a conspicuous position. This notice shall contain a warning that the condenser must be discharged before any work is carried out thereon.

21-43. The containing case of every oil-immersed condenser shall be of robust construction and be made oil-tight without the use of solder.

PART 22.—SWITCHGEAR.

SWITCHBOARDS.

22-01. Every switchboard shall be constructed wholly of durable non-ignitable material of adequate mechanical strength, and if intended to be in direct contact with live metal shall be of permanently high electric strength and insulation resistance.

22-02. To ensure mechanical strength in switchboard-panels made of composition material the minimum thickness of any such panel shall be in accordance with such one of the following tables respecting current and distance respectively as specifies the greater thickness:—

Current.	Distance.		
	Total Current per Conductor taken to the Switchboard.	Minimum Thickness.	Maximum Distance between Supports.
Not exceeding 20 amperes	$\frac{1}{4}$ in.	18 in. or less ..	$\frac{1}{2}$ in.
Not exceeding 50 amperes	$\frac{3}{8}$ in.	30 in. or less ..	$\frac{3}{8}$ in.
Over 50 amperes ..	$\frac{1}{2}$ in.	Over 30 in. ..	$\frac{1}{2}$ in.

22-03. Where the frame of a switchboard is required to be earthed in accordance with the provisions of Part 54 of these Regulations suitable terminals shall be provided to which the earthing-lead shall be attached.

22-04. (1) All panel switchboards shall be mounted on vertical iron brackets or standards bearing against the board to within $1\frac{1}{2}$ in. of each horizontal edge of the board and of such dimensions as adequately to support the board.

(2) Every support for a switchboard shall be securely fixed.

22-05. (1) The various exposed live parts of a switchboard shall be so arranged by suitable spacing or shielding with insulating material which is not readily combustible that an arc cannot be maintained between any such parts or between any such part and earth.

(2) The arrangement of all parts shall be such that the connections to all instruments and apparatus can be readily traced.

22-06. All screws and nuts on every switchboard used for carrying current shall be of copper, brass, or other suitable material.

22-07. All bus-bars and connections on switchboards shall be in accordance with the temperature rise as provided in British Standard Specification No. 159.