TECHNICAL SAFETY BC

INFORMATION BULLETIN

SECTION 2 – GENERAL RULES

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Overview

This bulletin provides guidance on the application of rules for the 2024 BC Electrical Code Regulation. The requirements of local municipal authorities having jurisdiction may vary. Installers should consult with local authorities having jurisdiction before starting work to determine their requirements.

Definitions

BCEC (BC Electrical Code) definition of "qualified person" – One familiar with the construction and operation of the apparatus and the hazards involved.

The qualified person must be acceptable to the regulatory authority having jurisdiction and deemed to have sufficient knowledge of the installation involved to make a competent design proposal.

A: Plans and specifications

1. Rule 2-014 requires plans and specifications to be submitted to the authority having jurisdiction, if requested. A list of municipal authorities having jurisdiction is available on the Technical Safety BC website at www.technicalsafetybc.ca.

2. Plans and specifications may be requested by the authority having jurisdiction for any subject related to the *Safety Standards Act*, Electrical Safety Regulation, BC Electrical Code, or other legislated documents.

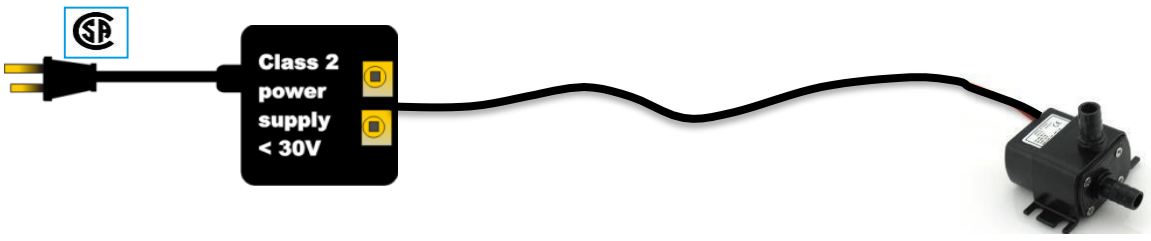
When requested, plans and specifications must be provided by a qualified person, be legible, and include the information listed in the table below. The authority having jurisdiction may have additional requirements.

Category	Information Required
Homeowners	Contact your local government inspection office, or Technical Safety BC at: 1 866 566 7233 www.technicalsafetybc.ca
All commercial, industrial, institutional, apartment dwellings, high voltage installations and hazardous locations	• One-line diagram • Load calculation complete with demand factors, available fault current, fault interrupting capacity of each protective device where the available fault current exceeds 10KA. • Ground test and step & touch report where required by section 36 of the *BC Electrical Code*. Floor layout, site plan and grounding electrode details may also be required for some installations. The above information is to be submitted by a qualified person. Consult the authority having jurisdiction.
High voltage installations	As per the requirements of information Bulletin IB-EL2016-02 dealing with the installation of high voltage
Hazardous locations	Items listed above as appropriate, equipment layouts, area classification designations and drawings to be submitted by a qualified person

B: Use of approved equipment 2-024 2)

Sub-rule (1)
Transformer must be approved.

Sub-rule (2)
Wiring and most devices need only be acceptable.



Sub-rule (2) to rule 2-024 was added to eliminate conflict with rule 16-222 regarding electrical equipment connected to class 2 circuits.

Rule 16-222 “Equipment located on the load side of overcurrent protection, transformers, or devices having Class 2 outputs” provides the requirements for output equipment approval or acceptance and operation voltages.

C: Electrical equipment ratings

2-104 2) - Electrical equipment marked with both **line-to-line** and **line-to-ground** voltage ratings, such as 125/250 V, 120/240 V, 208Y/120 V, 480Y/277 V, or 600Y/347 V, shall be permitted to be connected only in a circuit that is solidly grounded, and where:

a) the nominal voltage of **any conductor to ground** does not exceed the lower of the two values of the equipment voltage rating, and

b) the nominal voltage between **any two conductors** does not exceed the higher value of the electrical equipment voltage rating.

Slash rated breakers

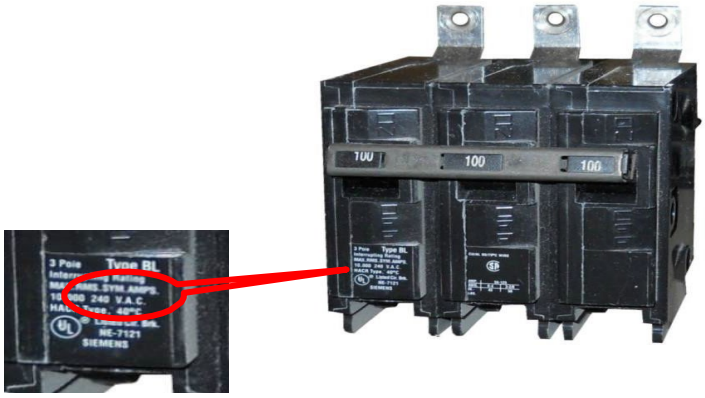
Breakers with slash ratings such as 120/240V or 600/347V are only designed to operate on solidly grounded electrical systems and within their listed voltage ratings.

Slash rated breakers may be used when the voltage of any conductor to ground does not exceed the lower rating on the breaker and when the voltage between any two conductors does not exceed the higher rating marked on the breaker.

The circuit breakers’ operating characteristics are such that a breaker may fail when one pole is attempting to open a fault with a voltage exceeding its rating.

As an example, using a circuit breaker marked with a slash rating of 600/347V in a 600V 3Ø 3W panel board would be a violation of the Code.

Non-Slash Rated Breaker



Non-Slash rated breakers are marked with a single voltage rating of 240V.

D: Ventilation

1. Rule 2-324 requires adequate ventilation around electrical equipment. Where ventilation is provided by mechanical means, an electrical safety officer may require proof that the ventilation is adequate.

2. Acceptable demonstration of adequate ventilation may be provided by a professional engineer registered in BC, which clearly identifies the ventilation required, the heat sources, and with an opinion that the ventilation will maintain a specified ambient air temperature around the equipment.

3. Air turbulence around equipment such as a transformer can result in higher than permissible hot spot winding temperatures of dry type transformers.

4. Ventilation may be required to limit the ambient temperature to 30°C in rooms containing wiring and most electrical equipment. Conductor de-rating may be employed to compensate for higher ambient temperatures in accordance with BC Electrical Code Table 5A.

E: Electrical maintenance

Rule 2-110 states that for certain installations, the availability of qualified electrical maintenance personnel is required. Rule 2-300, the *Safety Standards Act,* and the Electrical Safety Regulation have similar requirements. A safety officer may require the building owner or an electrical contractor to demonstrate that qualified electrical maintenance personnel will be available on a continuing basis. An operating permit is considered to satisfy this requirement. For facilities that do not meet the mandatory requirements for operating permits, as described in the directive, Electrical Operating Permit Requirements (D-E3 070801 7), an operating permit or a written agreement between the building owner and a licensed electrical contractor may also be considered to satisfy this requirement.

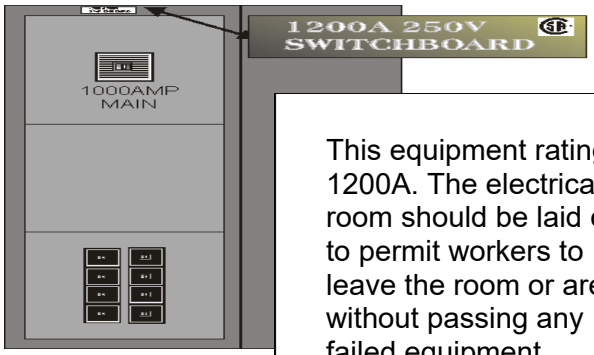
Rule 2-316 Receptacles required for maintenance of equipment

This rule requires ready access to a 120V / 20A receptacle for servicing HVAC and similar type equipment. See rule 26-708 and Appendix B Note for more information.

F: Adequate working space

1. Obstructions in the vicinity of the working space required by rule 2-308 are not considered objectionable unless they interfere with access to the equipment or violate rule 2-310. In addition, these rules have extra clearance requirements under specific egress conditions around serviceable sides of electrical equipment where:
   - electrical equipment has a nameplate rating of 1200 A or more, or
   - equipment is rated over 750 V.
2. Rule 2-310 states that any additional clearance requirement for electrical equipment is determined by the nameplate rating of the equipment.
3. These rules take into account that electrical equipment rated at 1200 A or higher requires additional clearance regardless of the existing O/C installed and could accommodate an extra load provided it meets requirements of rule 8-104(4) or (5).
4. These rules should be considered when assessing shock and Arc flash hazards as specified in rule 2-306.

Example:



This equipment rating is 1200A. The electrical room should be laid out to permit workers to leave the room or area without passing any failed equipment. Where the equipment layout cannot comply, the working space shall be increased to 1.5M

The equipment has a 1000A main breaker, but the 1200A nameplate shall determine the electrical room layout and clearance requirements. An acceptable layout in compliance with sub-rule (2) should be the priority and only when it is not possible should the working space be increased to 1.5M.

5. Electrical service equipment and metering equipment for multiple-family residential units may be installed in a small service room or closet accessible only from the outdoors provided that:

(a) doors open in a way that provides unimpeded front access to all equipment.

(b) the working space has secure footing, as required by rule 2-308 with the doors open.

(c) that portion of the working space between the doors and the front face of the equipment is at least 450 mm.

(d) an external roof that projects one meter from a plane through the front of the equipment is provided.

(e) access is provided conforming to the BC Building Code; and

(f) Lighting and heating is provided conforming to the BC Building Code.

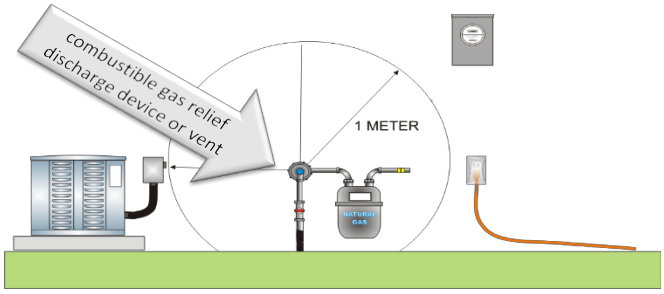
Electrical equipment near combustible gas equipment

The clearance distance between arc-producing electrical equipment and a combustible gas relief device or vent shall be in accordance with the requirements of CSA B149.1. and CSA B149.2

Appendix B notes: Rule 2-328

The clearance distances specified in CSA B149.1 and CSA B149.2 between a source of ignition and a combustible gas relief discharge device or vent are as follows:

a) 1 m for natural gas as specified in CSA B149.1;
b) 0.3 m for natural gas if a CSA/ANSI Z21.80/CSA 6.22-certified overpressure protection device is used as specified in CSA B149.1; and
c) 3 m for propane gas as specified in CSA B149.2.



Appendix B provides the information specified in the present B149 Codes for the clearances required between regulators and/or vents and sources of ignition such as arc-producing equipment. Arc-producing equipment includes meter bases, receptacles, safety switches, A/C units, heat pumps and other similar equipment.

G: Flame spread requirements for electric wire and cable

A number of rules, including 12-010, 16-220, 54-406 and 60-314 refer to rule 2-130, requiring that wire and cable in buildings meet the flame spread requirements of the BC Building Code or local building legislation.

The BC Building Code mandates flame spread requirements for wire and cable usage. These requirements are found in the BC Electrical Code, Appendix B notes for Rules 2-130 and 2-132.

The BC Building Code instructs the removal of unused wiring, either as a result of renovations, additions or alterations to a building. These requirements are found in the BC Electrical Code, Appendix B and Appendix G notes for rule 2-130.

H. Protection for electrical workers

Rule 2-304(1) states that no repairs or alterations can be done on any live equipment except where complete disconnection of the equipment is not feasible. Work on energized equipment is not permitted, except as provided in accordance with the *Workers Compensation Act, Occupational Health and Safety Regulation*, and in accordance with requirements for safe work practices approved by WorkSafeBC. Attention should also be given to CSA Standard Z462 dealing with safe work practices in working on or around energized electrical equipment.

Electrical work must be performed on equipment “in an electrically safe condition”. CSA Z462 further indicates that electrical work may only be performed when de-energizing introduces additional hazards or increased risks.

Appendix B and CSA Z462 provide examples of situations when working de-energized is not feasible. These circumstances include troubleshooting of control circuits, testing and diagnostics. Other examples include interruption of life-support equipment, deactivation of emergency alarm systems, and shutdown of hazardous location ventilation equipment.

Electrical equipment and the installation of electrical equipment are required to meet minimum standards for safety. Rules 2-200 and 2-202 provide general requirements for the protection of persons and property. Rule 2-200 requires that electrical equipment be installed and guarded so that adequate protection is provided against injury to persons, or damage to property. Rule 2-202 requires guarding of live parts using approved cabinets or enclosures, or the use of barriers or other means that ensure that workers are not exposed to the risk of accidentally contacting live parts. Rule 2-300 requires that electrical equipment be maintained in a safe and proper working condition.

Workers who intend to perform repairs or alterations on electrical equipment must ensure that the work is planned and done in such a way that the equipment is not put in an unsafe condition. Removal of covers, barriers, or other means of protection against accidental contact defeats their intended purpose and exposes workers to injury through accidental contact with live parts. Therefore, the work must not be carried out on live equipment. Work on live equipment may only be performed where it can be demonstrated that it is not feasible to completely disconnect the equipment. In such cases, the work must be planned and conducted in accordance with the requirements of WorksafeBC.

Rule 2-306 Shock and arc flash protection also has a new sub-rule 3) requirement.

3) Where an overcurrent protective device is rated 1200 A or higher,

a) means shall be provided to reduce the arcing fault clearing time; and

b) documentation regarding such means shall be provided and readily available to personnel that install, operate, inspect, and maintain electrical equipment protected by the overcurrent protective device(s).

Overcurrent protective devices rated 1200 A or higher are now required to have a means to reduce the arcing fault clearing time. This requirement is designed to enhance electrical safety by minimizing the energy released during an arc fault. Documentation regarding those means must be provided and readily available to personnel that install, operate, inspect, and maintain the electrical equipment protected by the overcurrent protective device(s).

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References:
Safety Standards Act
Electrical Safety Regulation
Safety Standards General Regulation