


Safety Services



## Code Update

What's new in 2009 and upcoming to 2012

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Building a Better Future Feb. 5-6, 2010 EIAA 2010 1

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## New to Municipal Affairs

- ◆ Honourable Hector Goudreau, Minister of Municipal Affairs.
- ◆ Manmeet S. Bhullar Parliamentary Assistant Municipal Affairs.

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## Agenda

1. LEGISLATION CHANGES
2. CODE CHANGES
3. QUESTIONS

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## Legislation changes

- ◆ Electrical Code Regulation – changed to adopt 2009 CEC

**Codes declared in force**

3 The following codes are declared in force in respect of electrical systems:

- (a) the Canadian Electrical Code, Part I, Twenty-first Edition, C22.1-09;
- (b) the Code for Electrical Installations at Oil and Gas Facilities, Third Edition, 2006, published by the Safety Codes Council;
- (c) the Alberta Electrical Utility Code, Third Edition, 2007, published by the Safety Codes Council.

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## Legislation changes

- ◆ Certification and Permit Regulation – changed to deal with TILMA

**Master Electrician**

4(2) The Administrator may issue or renew a master electrician certificate of competency to a person who

- (a) satisfies the Administrator that they hold an equivalent certificate of competency from a jurisdiction outside of Alberta,
- (b) has paid the appropriate fee, and
- (c) has attained 75% in the master electrician jurisprudence examination as approved by the Administrator.

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## Legislation changes

- ◆ Certification and Permit Regulation – changed to deal with TILMA

**Master Electrician**

4(3) For a certificate of competency issued under subsection (2), the Administrator may state the maximum voltage between conductors and the maximum ampacity of the electrical systems for which the holder of the certificate may obtain a permit based on the equivalent authorization of the certificate of competency from outside of Alberta.

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## Legislation changes

- ◆ Certification and Permit Regulation – changed to deal with TILMA

### Consequential amendment

- 9 The *Permit Regulation (AR 204/2007)* is amended in section 9(1)(a) by adding “within the scope of the master electrician’s certification” after “system”.**

## Legislation changes

- ◆ Permit Regulation – changed to deal with TILMA

**9(1)** A permit issuer may issue a permit in the electrical discipline to the following:

- (a) a master electrician for any electrical system within the scope of the master electrician’s certification;

## Canadian Electrical Code 2009

- ◆ “lighting fixtures” and “fixtures” has been changed to “Luminaires” or “lighting products” or “electrical equipment” throughout the code, whichever applies.
- ◆ Mineral insulated cable, aluminum-sheathed cable or copper-sheathed cable shall

## Section 2

- ◆ **2-306 Shock and Arc Flash Protection** (see Appendix B)



(Z-462 has not been adopted in Alberta [OH&S])

## Section 8

- ◆ **8-104 (4)** Where a fused switch or a circuit breaker is marked for continuous operation at 100% of the ampere rating of its overcurrent devices, the continuous load as determined from the calculated load shall not exceed.... (no change to remainder of Subrule)
- ◆ 8-104(5)
- ◆ 62-114(6)(a)
- ◆ 62-114(6)(b)

## Section 10

- ◆ **10-204 Grounding connections for alternating-current systems** (see Appendix B)
- (1) When a consumer’s service is supplied by an alternating-current system that is required to be grounded in accordance with Rule 10-106(1), the system shall:
- (a) be connected to a grounding conductor at the transformer or other source of supply; and

## Section 10

- ◆ **10-204 Grounding connections for alternating-current systems** (see Appendix B) (continued)
  - (b) be connected to a grounding conductor at each individual service, with the connection made on the supply side of the service disconnecting means either in the service box or in other service equipment; and
  - (c) except as provided for in Rule 10-208, have no connection between the grounded circuit conductor on the load side of the service disconnecting means and the grounding electrode.

## Section 10

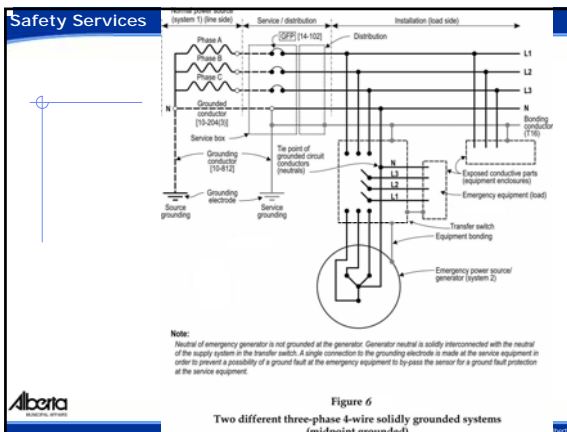
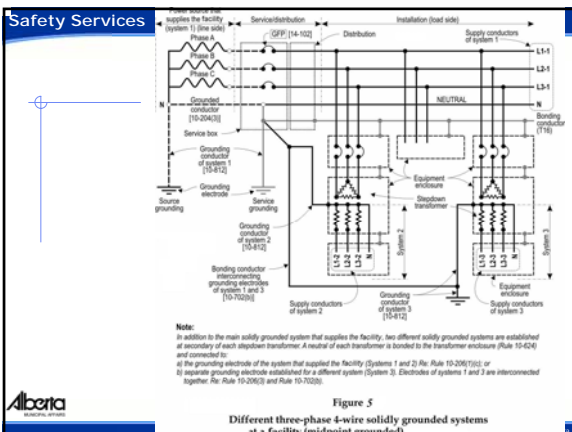
- ◆ **10-206 Grounding connections for different systems at a facility** (see Appendix B)
  - (1) Where, in addition to the system supplying the consumer's service as described in 10-204, one or more different systems conforming to 10-106(1) exist at a facility:
    - (a) each such different system shall be connected to a separate grounding conductor:
      - (i) at the transformer or other source of supply; or
      - (ii) at the first switch controlling the system.

## Section 10

- ◆ **10-206 Grounding connections for different systems at a facility** (see Appendix B) (continued)
  - (2) Notwithstanding Subrule (1), where the conductors to be grounded from each of two such systems terminates at a common tie point, a single connection to a grounding conductor shall be permitted to be made:
    - (a) at the tie point; or
    - (b) at the service equipment if one of the systems supplies the consumer's service.

## Section 10

- ◆ **10-206 Grounding connections for different systems at a facility** (see Appendix B) (continued)
  - (3) Notwithstanding Rules 10-802 and 10-806, where a system is required to be grounded, and is supplied from a source having a rated output of 1000 VA or less, the grounding connection shall be permitted to be made to:
    - (a) the metal enclosure of the power supply providing the enclosure is connected to a bonding conductor; or
    - (b) the bonding conductor within the enclosure.



## Section 10

- ◆ **10-812 grounding conductor size for AC systems and for service equipment** (see Appendix B)
  - (1) The size of the grounding conductor for a grounding electrode comprised of a continuous metallic public water system or other interconnection electrode systems that may provide multiple metallic paths back to the source shall be selected from Table 17.
  - (2) The size of the grounding conductor for other types of grounding electrodes shall be not smaller than #6 AWG

## Section 12

- ◆ **12-010(4) Wiring in ducts and plenum chambers**
  - (4) Notwithstanding subrule (3), where a plenum or hollow space is created by a suspended ceiling having lay-in panels or tiles, flexible cord not exceeding 3 m in length and terminated with an attachment plug shall be permitted to supply pole type multi-outlet assemblies provided that the flexible cord is listed in Table 11 for hard usage and the supply voltage does not exceed 300V.

## Section 12

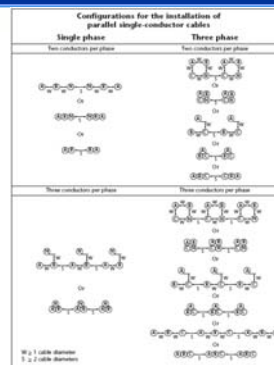
- ◆ **12-012(12) Underground installations** (see Appendix B)
  - (12) Where underground raceways or cables are subject to movement by settlement or frost, provision shall be made so as to prevent damage to the conductors or the electrical equipment.



## Section 12

- ◆ **12-106(4) (5) Multi and single conductor cables** “non-ferrous” changed to “non-magnetic” and, “ferrous” changed to “magnetic”
- ◆ **12-108(4) Conductors in parallel** (see Appendix B)
  - (4) Where parallel conductors include grounded circuit conductors, each parallel set shall have a separate grounded circuit conductor.

## Section 12



## Section 12

### ◆ 12-112 Conductor joints and splices

- (1) Conductors shall be spliced or joined with splicing devices approved for the purpose or by brazing, welding, or soldering with a fusible metal or alloy.
- (2) soldered splices shall first be spliced or joined so as to be mechanically and electrically secure without solder and then be soldered.

## Section 12

### ◆ 12-116 Termination of conductors (see Appendix B)

- (1) Connection of conductors to terminal parts shall be made by means of pressure connectors, solder lugs or splices to flexible leads.
- (3) Stranded and solid conductors No. 10 AWG and smaller shall be permitted to be connected by means of wire-binding screws, or studs and nuts that have upturned lugs or equivalent.

## Section 12

### ◆ 12-608 Continuity of armour cable

Armoured cable shall be run in a manner such that the mechanical continuity of the armour is maintained throughout the run, and the armour of cables shall be mechanically and electrically secured to all equipment to which it is attached.

### ◆ 12-1100 to 12-1122

All reference to Rigid HFT conduit has been removed

## Section 12

### ◆ 12-2200(6)(c)(d) Methods of installation (see Appendix B)

- (6) the minimum clearances for cable trays shall be
- (c) 600 mm horizontal clearance on one side of cable trays mounted adjacent to one another or to walls or other obstructions, where the width of the tray installation does not exceed 1 m;
- (d) 600 mm horizontal clearance on each side of cable trays mounted adjacent to one another, where the width of the tray installation exceeds 1 m;

## Section 12

### ◆ 12-2200(7) Methods of installation (see Appendix B)

- (7) At least one expansion joint shall be installed in any cable tray run where the expansion of the cable tray due to the maximum probable temperature change during and after installation can damage the cable tray.

## Section 12

### ◆ 12-2210(1)(2)(3) Ampacities of conductors in cable trays

- (1) In ventilated and ladder-type cable trays, where the air space between adjacent conductors, cables, or both is maintained at greater than 100% of the diameter of the larger conductor or cable, the ampacity of the conductors or cables shall be the value specified in... *(no change to remainder)*
- (2) ...is maintained at not less than 25% nor more than 100%..., ...the ampacity of the conductors shall be the value specified in subrule (1), multiplied...

## Section 12

### ◆ 12-2210(1)(2)(3) Ampacities of conductors in cable trays

- (3)... is less than 25% of the diameter of the larger conductor or cable, and for any spacing in a non-ventilated cable tray, the ampacity of the conductors or cables shall be the value specified in... *(no change to remainder)*

## Section 18

### ◆ 18-002 Special terminology (see Appendix B)

Fluid – a substance in the form of gas, vapour or liquid.

### ◆ 18-012 Maintenance (see Appendix B)

Special precautions shall be observed as follows:

- (a) repairs and alterations shall not be made to live equipment; and
- (b) electrical equipment shall be maintained in its original safe condition.

## Section 18

### ◆ 18-072 Flammable fluid seals (See Appendix B)

- (1) Electrical equipment with a primary seal in contact with flammable fluids shall:
- (a) be constructed or installed so as to prevent migration of flammable fluid through the wiring system; and
  - (b) be used at pressures lower than the marked maximum working pressure (MWP).

## Section 18

### ◆ 18-072 Flammable fluid seals (See Appendix B)

- (2) Where Subrule (1) is met through the installation of secondary seals, the possibility of primary seal failure shall be indicated by:
- (a) design features that will make the occurrence of primary seal failure obvious; or
  - (b) acceptable marking means indicating that the enclosure may contain flammable fluid under pressure.

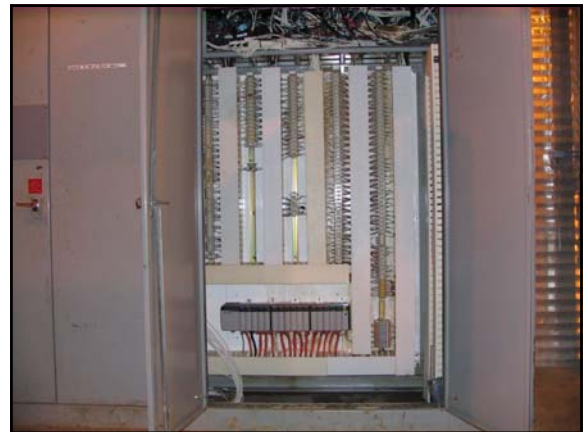
## Section 18

### ◆ Delete the following Rules 18-092, 18-108 and 18-158 Sealing...

- (1) Secondary seals shall be provided, between devices containing a primary seal and conduit or cable seals, where failure of a single component in the device containing the primary seal could allow passage of process fluids.
- (2) where secondary seals are installed, drains, vents, or other devices intended to make primary seal leakage obvious shall be installed

## Secondary Seal Failure


- ◆ Mid November a Level Switch failed in a Class 1, Zone 2 environment.
- ◆ Condensate was detected at the Switch and 150 ft. away in the PLC panel.
- ◆ Switch rated 1500 PSI, working pressure at the time of failure 40-50 PSI.
- ◆ Interconnection cable was 2 cond. #14 Teck 90, with STX explosion proof seal.



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## Section 18

- ◆ **18-114 Motors and generators, Class1, Zone 1**  
(see Appendix B)
- (2) Increased safety "e" motor installations shall meet the thermal protection requirement of section 11.2 ("cage induction motors-Thermal protection in operation") of IEC Standard 60079-14 Electrical Installations in Hazardous Locations.

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## Section 18

### ◆ 18-150 Equipment in Class I, Zone 2 locations (see Appendix B and Appendix F)

- (1) Electrical equipment installed in a Class I, Zone 2 location shall be
  - (a) approved for Class I, Division 2 locations;
  - (b) approved as non-incendive;
  - (c) approved as providing a method of protection "n"; or
  - (d) equipment permitted in Zone 1
- (2) Notwithstanding Subrule (1), the following shall be permitted:

## Section 18

### ◆ 18-150 Equipment in Class I, Zone 2 locations (see Appendix B and Appendix F)

Subrule 2 has been added to include all the exceptions previously mentioned in Rules 18-152, 18-154, 18-160, 18-162, 18-164, 18-166, 18-168, 18-170 and 18-178

## Section 18

### ◆ 18-152 Wiring Methods, Class 1, Zone 2 (see Appendix B)

Previous edition code this rule was 18-156. It has been renumbered and armoured cable with overall non-metallic jacket, such as TECK90, ACWU90 or aluminum sheath RA90 are acceptable.

### ◆ 18-154 Sealing, Class 1, Zone 2 (see Appendix B)

Previous edition code this rule was 18-158. the provisions for secondary seals have been deleted and the code rule has been renumbered.

## Section 22

### ◆ 22-204(5) Wiring methods in buildings housing livestock or poultry (see Appendix B)

(5) non-metallic sheathed cables shall be provided with mechanical protection, in the form of rigid steel or rigid non-metallic conduit, or other suitable material to protect against damage from rodents:

(a) when installed in exposed locations less than 300 mm above any horizontal surface;

## Section 22

### ◆ 22-204(5) Wiring methods in buildings housing livestock or poultry (see Appendix B)

(b) when installed in exposed locations on the side of floor joists or other structural members less than 100 mm below the upper surface of the floor joists or other structural members;

(c) when run in attics; or

(d) when run in concealed spaces.

## Section 24

### ◆ 24-104(2) Bonding to ground in basic care areas (see Appendix B)

(2) All receptacles and other permanently connected equipment shall be bonded to ground by copper equipment bonding conductors, sized in accordance with Table 16, but in no case smaller than No. 12 AWG, and run in accordance with Rule 10-808 or run with the circuit conductors in accordance with the following:... (no change to remainder of subrule)

## Section 26

- ◆ **26-700(2) General** (see Appendix B)  
(2) Except as provided for by other rules of this code, receptacles having configurations in accordance with Diagrams 1 and 2 shall be connected only to circuits having a nominal system voltage and ampere rating corresponding to the rating of the configurations.

## Section 26 – 26-744(5)

- ◆ **CSA Subject 3502 Regarding Range Receptacles**
- ◆ New Rule expected in 2012 Code
- ◆ 26-744(5) The receptacle required by Subrule (4) shall be permitted to be connected to a branch circuit rated at not less than 40 A.

## Section 26

- ◆ **26-710(h)(iv)(v) General** (see Appendix B)  
(iv) intended only for cord connected range hood; or  
(v) intended only for cord connected combination microwave oven/range hood fan.

## Section 26

- ◆ **26-712(g)(h) Receptacles for dwelling units** (see Appendix B and Appendix G)  
This Rule applies to receptacles for dwelling units (including single dwellings) as follows:  
(g) except as provided for in item (h) all receptacles of CSA Configuration 5-15R and 5-20R shall be tamper resistant receptacles and shall be so marked.  
(h) receptacles dedicated for microwaves, refrigerators, freezers, kitchen counters or those located in an attic or crawl space shall not be required to be tamper resistant.

## 26-712(h) Proposed

- ◆ Subject 3478 reworded to clean up where TR receptacles are required.
- ◆ Not required when rendered inaccessible by stationary appliance.
- ◆ Not required when receptacle is located above 2m from the floor or finished grade.

## Section 28

- ◆ **28-204(1) Feeder overcurrent protection**  
(1) For a feeder supplying motor branch circuits only, the ratings or settings of the feeder overcurrent device shall not exceed the calculated value of the overcurrent....

Previous code mentioned using the “maximum rating or setting” of the overcurrent device.

## Section 30

- ◆ **30-002 Special terminology** (see Appendix B)  
**Landscape lighting system** – an extra-low-voltage lighting system consisting of an isolating type power supply, luminaire assemblies and fittings to provide flood or decorative lighting for garden, walkways, patio areas or similar outdoor locations and for specific indoor locations such as atriums and malls.

## Section 30

- ◆ **30-912 Wiring of recessed fluorescent luminaires**  
 Where a recessed fluorescent luminaire is installed in a suspended ceiling that creates a plenum or hollow space, wiring to the luminaire shall not be required to be in accordance with Rule 12-010(3) provided that:
  - (a) the luminaire is supplied by a flexible cord not exceeding 3 m in length and terminated with an attachment plug
  - (b) the flexible cord is rated for at least 90°C; and
  - (c) The flexible cord is listed in Table 11 for:
    - (i) Hard usage where the supply voltage does not exceed 300 V;
    - (ii) Extra-hard usage where the supply voltage does not exceed 750 V

## Section 32

- ◆ **Section 32 – Fire alarm systems, fire pumps and carbon monoxide alarms** (see Appendix B)
- ◆ **32-206(1)(2) Disconnecting means and overcurrent protection** (see Appendix B and Appendix G)  
 The wording associated with a Circuit Breaker being “specifically approved for fire pump service” has been removed as CB are not certified for this purpose

## Section 46

- ◆ **46-000 Scope** (See Appendix B)
  - (1) This Section applies to the installation, operation, and maintenance of:
    - (a) emergency power supply and unit equipment intended to provide power to life safety systems; and
    - (b) emergency power supply and unit equipment intended to provide illumination of exit signs, in the event of failure of the normal supply, where the emergency power supply is required by the National Building Code of Canada.
  - (2) This section applies to the wiring between the emergency power supply and life safety systems that are required by the National Building Code of Canada to be provided with an emergency power supply.

## Section 46

- ◆ **46-002 Special terminology** (see Appendix B)  
**Emergency Power Supply** – emergency power supplied by a generator, batteries or a combination thereof required by the NBCC  
**Life Safety System** – emergency lighting and fire alarm system that are required to be provided with an emergency power supply from generator, batteries or a combination thereof, and electrical equipment for building services such as fire pumps, elevators, smoke venting fans, smoke control fans and dampers that are required to be provided with an emergency power supply by an emergency generator in conformance with the NBCC  
**Unit Equipment** – unit equipment for emergency lighting conforming to CSA standard C22.2 No. 141.

## Section 46

- ◆ **46-108 Method of wiring** (see Appendix B and Appendix G)

Changes are incorporated to clarify wiring method requirements between the emergency power supply and particular electrical equipment (emergency lights, electrically connected exit signs and the life safety systems) that is mandated by the NBCC to be provided with such emergency power supply.

To harmonize requirements for the wiring methods between the emergency power supply and the NBCC mandated life safety systems with similar provisions of the NEC. (Articles 700.1 and 700.9B).

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## Section 46

Emergency generator conforming to CSA C282

Transfer switch for equipment not defined by Rule 46-002 as "life safety system"

Fire pump transfer switch as described in Rules 32-206(4) and 32-208

Transfer switch for "life safety system" as defined in Rule 46-002

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## Section 58

- Section 58 – Passenger Ropeways and Similar Equipment

**58-000 Scope**

(1) This section applies to Passenger Ropeways as defined in CSA-Z98 Passenger Ropeways Standard, including

- tramways;
- chairlifts;
- gondolas;
- surface ropeways;
- passenger conveyors; and
- similar equipment.

(2) This Section supplements and amends the general requirements of this Code.

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## Section 68

- 68-054 Overhead wiring (see Appendix B)

- ...(No change)
- There shall not be any overhead wiring above the pool and other elevated surfaces associated with the pool, such as a diving structure, slide, swings, observation stand, tower or platform, or above the adjacent area extending 5.0 m horizontally from the pool edge, except as permitted by Subrules (3) and (4).
- Insulated communication conductors, communication antenna distribution conductors, and neutral supported cables not exceeding 750V shall be permitted to be located over a pool and other elevated surfaces associated with the pool, or above the adjacent area extending horizontally from the pool edge, providing there is a clearance of at least 5.0 m measured from the outer edge of the pool or from other elevated surfaces associated with the pool.
- Conductors other than those covered by Subrule (3) and operating at not more than 50 kV phase-to-phase shall be permitted to be located over a pool and other elevated surfaces associated with the pool, or above the adjacent area extending horizontally from the pool edge, providing there is a clearance of at least 7.5 m measured from the outer edge of the pool or from other elevated surfaces associated with the pool.

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## Section 68

LINE 2

LINE 1

7.5m

5.0m

7.5m

5.0m

5.0m

5.0m

34,501 - 46,000 VOLTS

25,001 - 34,500 VOLTS

751 - 25,000 VOLTS

0-750 VOLTS

RULE 12-304 AND TABLE 34

POOL

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## Section 86

- 86-306 Receptacles for electric vehicle charging equipment

- Each receptacle for the purpose of electric vehicle charging shall be labeled in a conspicuous, legible and permanent manner identifying it as an electric vehicle charging receptacle and shall be
  - CSA configuration 5-20R supplied from a 125 V branch circuit rated not less than 20 A or;
  - the appropriate CSA configuration in accordance with Diagram 1 or 2 when supplied from a branch circuit rated at more than 125 V or more than 20 A.
- The receptacle in item 1(a) shall be protected by a ground fault circuit interrupter of the Class A type, when the receptacle is installed outdoors and within 2.5 m of finished grade.

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## Diagrams

| Description |    | 15 A       | 20 A       | 30 A       | 50 A       | 60 A       |
|-------------|----|------------|------------|------------|------------|------------|
|             |    | Receptacle | Receptacle | Receptacle | Receptacle | Receptacle |
| 125 V       | 5  | 5-15R      | 5-20R      | 5-30R      | 5-50R      | 5-60R      |
|             | 5A | 5-15RA     | 5-20RA     | 5-30RA     | 5-50RA     | 5-60RA     |
| *250 V      | 6  | 6-15R      | 6-20R      | 6-30R      | 6-50R      | 6-60R      |
|             | 6A | 6-15RA     | 6-20RA     | 6-30RA     | 6-50RA     | 6-60RA     |

2 pole 3-wire grounding

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## Question for YOU

- ◆ Have you come across Commercial Roofers using long screws through Q-Decking to hold down insulation?
- ◆ See the Pictures.

