

**WAC 296-24-23513 Electric equipment. (1) General.**

(a) Wiring and equipment must comply with chapter 296-24 WAC Part L, and WAC 296-800-280.

(b) The control circuit voltage must not exceed 600 volts for a.c. or d.c. current.

(c) The voltage at pendant pushbuttons must not exceed 150 volts for a.c. and 300 volts for d.c.

(d) Where multiple conductor cable is used with a suspended push-button station, the station must be supported in a manner that will protect the electrical conductors against strain.

(e) Pendant control boxes must be constructed to prevent electrical shock and must be clearly marked for identification of functions.

**(2) Equipment.**

(a) You must ensure that electrical equipment is located or enclosed so that live parts will not be exposed to accidental contact under normal operating conditions.

(b) You must ensure that electric equipment is protected from dirt, grease, oil, and moisture.

(c) You must ensure that guards for live parts are substantial and located so that they cannot be accidentally deformed so as to make contact with the live parts.

**(3) Controllers.**

(a) You must provide cranes not equipped with spring-return controllers or momentary contact pushbuttons with a device which will disconnect all motors from the line on failure of power and will not permit any motor to be restarted until the controller handle is brought to the "off" position, or a reset switch or button is operated.

(b) You must provide lever operated controllers with a notch or latch which in the "off" position prevents the handle from being inadvertently moved to the "on" position. An "off" detent or spring return arrangement is acceptable.

(c) You must ensure that the controller operating handle is located within convenient reach of the operator.

(d) You must ensure that as far as practicable, the movement of each controller handle is in the same general directions as the resultant movements of the load.

(e) You must ensure that the control for the bridge and trolley travel is located so that the operator can readily face the direction of travel.

(f) For floor-operated cranes, you must ensure that the controller or controllers if rope operated, automatically returns to the "off" position when released by the operator.

(g) You must ensure that pushbuttons in pendant stations return to the off position when pressure is released by the crane operator.

(h) You must ensure that automatic cranes are designed so that all motions shall fail-safe if any malfunction of operation occurs.

(i) You must ensure that remote-operated cranes function so that if the control signal for any crane motion becomes ineffective the crane motion must stop.

**(4) Resistors.**

(a) You must ensure that enclosures for resistors have openings to provide adequate ventilation, and are installed to prevent the accumulation of combustible matter near hot parts.

(b) You must ensure that resistor units are supported so as to be free as possible from vibration.

(c) You must put in place a provision to prevent broken parts or molten metal falling upon the operator or from the crane.

(5) **Switches.**

(a) You must ensure that the power supply to the runway conductors is controlled by a switch or circuit breaker located on a fixed structure, accessible from the floor, and arranged to be locked in the open position.

(b) You must ensure that on cab-operated cranes a switch or circuit breaker of the enclosed type, with provision for locking in the open position is provided in the leads from the runway conductors. A means of opening this switch or circuit breaker must be located within easy reach of the operator.

(c) You must ensure that on floor-operated cranes, a switch or circuit breaker of the enclosed type, with provision for locking in the open position, is provided in the leads from the runway conductors. This disconnect must be mounted on the bridge or footwalk near the runway collectors. You must provide one of the following types of floor operated disconnects:

(i) Nonconductive rope attached to the main disconnect switch.

(ii) An undervoltage trip for the main circuit breaker operated by an emergency stop button in the pendant pushbutton station.

(iii) A main line contactor operated by a switch or pushbutton in the pendant pushbutton station.

(d) You must ensure that the hoisting motion of all electric traveling cranes is provided with an overtravel limit switch in the hoisting direction.

(e) You must ensure that all cranes using a lifting magnet must have a magnet circuit switch of the enclosed type with provision for locking in the open position. You must provide means for discharging the inductive load of the magnet.

(6) **Runway conductors.** You must ensure that conductors of the open type mounted on the crane runway beams or overhead (sometimes known as "runway conductors") are located or guarded so that persons entering or leaving the cab or crane footwalk normally could not come into contact with them.

(7) **Extension lamps.** If a service receptacle is provided in the cab or on the bridge of cab-operated cranes, it must be a grounded three-prong type permanent receptacle, not exceeding 300 volts.

(8) **Floor operated cranes.**

(a) You must maintain an unobstructed aisle not less than three feet wide for travel of the operator except in such cases where the control handles are hung from the trolleys of traveling cranes.

(b) You must ensure that the handles of control ropes are distinctly different in contour so that, without looking, the operator will know which is the hoisting and which is the lowering handle. You must clearly indicate the direction of all movements of the crane in some manner so that the operator can easily become familiar with them.

(c) When repairing runways, repairpersons must place rail stops and warning signs or signals so as to protect both ends of the section to be repaired.

(d) Repairpersons must take care to prevent loose parts from falling or being thrown upon the floor beneath.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. WSR 15-24-100, § 296-24-23513, filed 12/1/15, effective 1/5/16. Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. WSR 01-11-038, § 296-24-23513, filed 5/9/01, effective

9/1/01. Statutory Authority: Chapter 49.17 RCW. WSR 91-24-017 (Order 91-07), § 296-24-23513, filed 11/22/91, effective 12/24/91; Order 73-5, § 296-24-23513, filed 5/9/73 and Order 73-4, § 296-24-23513, filed 5/7/73.]