shall comply with any restrictions provided in the listing of the electrical circuit protective system used, and the following also shall apply:

(1) A junction box shall be installed ahead of the fire pump controller a minimum of 300 mm (12 in.) beyond the fire-rated ceiling, wall, or floor bounding the fire zone.

The junction box mounted inside the fire pump room allows for a transition between solid conductors that are used in some electrical circuit protective systems (e.g., Type MI cable) and stranded conductors that are required at the supply terminals of the controller by the controller manufacturer and its listing. Splices are not permitted in the controller enclosure, in accordance with NFPA 20, *Standard for the Installation of Stationary Pumps for Fire Protection*. In addition, where an electrical circuit protective system employs single conductor cables, such as Type MI cable, the necessity to modify enclosures to prevent inductive heating can result in a compromise of the controller enclosure's resistance to water infiltration.

(2) Where required by the manufacturer of a listed electrical circuit protective system or by the listing, or as required elsewhere in this *Code*, the raceway between a junction box and the fire pump controller shall be sealed at the junction box end as required and in accordance with the instructions of the manufacturer. [**20:**9.8.2]

When fire-resistive cables pass through an area where there is a fire, they will likely produce flammable gases and smoke. These cables are not allowed to enter the fire pump controller, to prevent damage to the controller, and to prevent an explosion when gases are ignited by the motor contactor(s) or other sparking or arcing components, such as control relays or circuit breakers.

(3) Standard wiring between the junction box and the controller shall be permitted. [**20:**9.8.3]

(I) Junction Boxes. Where fire pump wiring to or from a fire pump controller is routed through a junction box, the following requirements shall be met:

(1) The junction box shall be securely mounted. [**20:**9.7(1)]
(2) Mounting and installing of a junction box shall not violate the enclosure type rating of the fire pump controller(s). [**20:**9.7(2)]
(3) Mounting and installing of a junction box shall not violate the integrity of the fire pump controller(s) and shall not affect the short-circuit current rating of the controller(s).
(4) As a minimum, a Type 2, drip-proof enclosure (junction box) shall be used where installed in the fire pump room. The enclosure shall be listed to match the fire pump controller enclosure type rating. [**20:**9.7(4)]

These requirements maintain the controller enclosure's environmental rating. Use of conduit hubs having the same environmental rating as the controller enclosure minimizes the entry of water or other liquids into the enclosure.

See also

110.28, Table 110.28, and associated commentary for information on environmental ratings of electrical equipment enclosures

(5) Terminals, junction blocks, wire connectors, and splices, where used, shall be listed. [**20:**9.7(5)]
(6) A fire pump controller or fire pump power transfer switch, where provided, shall not be used as a junction box to supply other equipment, including a pressure maintenance (jockey) pump(s).

(J) Terminations. Where raceways or cable are terminated at a fire pump controller, the following requirements shall be met:

(1) Raceway or cable fittings listed and identified for use in wet locations shall be used.
(2) The type rating of the raceway or cable fittings shall be at least equal to that of the fire pump controller.
(3) The installation instructions of the manufacturer of the fire pump controller shall be followed.
(4) Alterations to the fire pump controller, other than raceway or cable terminations as allowed elsewhere in this *Code*, shall be approved by the authority having jurisdiction.

695.7 Voltage Drop.

Δ **(A) Motor Starting.** Unless the requirements of 695.7(B) or (C) are met, the voltage at the fire pump controller line terminals shall not drop more than 15 percent below normal (controller-rated voltage) under motor starting conditions. [**20:**9.4.1]

N **(B) Emergency Run.** The requirements of 695.7(A) shall not apply to emergency-run mechanical starting, provided a successful start can be demonstrated on the standby generator system. [**20:**9.4.2]

N **(C) Bypass Mode.** The requirements of 695.7(A) shall not apply to the bypass mode of a variable speed pressure limiting control, provided a successful start can be demonstrated on the standby gen-set. [**20:**9.4.3]

Δ **(D) Motor Running.** The voltage at the contactor load terminals to which the motor is connected shall not drop more than 5 percent below the voltage rating of the motor when the motor is operating at 115 percent of the full-load current rating of the motor. [**20:**9.4.4]

Δ **695.10 Listed Equipment.** Diesel engine fire pump controllers, electric fire pump controllers, electric motors, fire pump power transfer switches, foam pump controllers, and limited service controllers shall be listed for fire pump service. [**20:**9.5.1.1, 10.1.2.1, 12.1.3.1]

Prior to being shipped to the installation site, listed fire pump controllers should be matched with the listed electric motor(s) they will control, to ensure compatibility of the individually listed components. The combination fire pump controller and transfer switch shown in Exhibit 695.5 are examples of listed equipment.