

terminal location requirements in 408.18(C)(1), (C)(2), and (C)(3) shall not apply to portable stage switchboards.

Exhibit 520.7 illustrates a portable switchboard known as a rolling rack.

**(A) Pilot Light.** A pilot light shall be provided for each ungrounded conductor feeding the switchboard. The pilot light(s) shall be connected to the incoming feeder so that operation of the main overcurrent protective device or master switch shall not affect the operation of the pilot light(s).

This requirement applies to switchboards with or without a main disconnect provided on the switchboard. The pilot light serves as a warning at the switchboard to indicate the presence of power, whether or not there is a main disconnect in the portable switchboard, and before an integral main disconnect is activated.

**(B) Neutral Terminal.** In portable switchboard equipment designed for use with 3-phase, 4-wire with ground supply, the current rating of the supply neutral terminal, and the ampacity of its associated busbar or wiring, or both, shall have an ampacity equal to at least twice the ampacity of the largest ungrounded supply terminal.

*Exception: Where portable switchboard equipment is specifically constructed and identified to be internally converted in the field, in an approved manner, from use with a balanced 3-phase, 4-wire with ground supply to a balanced single-phase, 3-wire with ground supply, the supply neutral terminal and its associated busbar, wiring, or both, shall have an ampacity equal to at least that of the largest ungrounded single-phase supply terminal.*

If a 3-phase, 4-wire portable switchboard is brought into a space that has only single-phase, 3-wire service, the switchboard most likely will be connected with one leg feeding two phases and the other leg feeding the third phase of the switchboard. This type of connection increases the current flowing through the neutral, so the neutral terminal and busbar must be rated for double size to allow for that possibility. The exception to 520.53(B) provides for a neutral sized for the single-phase feed where a switchboard contains devices that can divide the B-phase load equally between the A-phase and C-phase buses for single-phase operation.

**Δ (C) Single-Pole Separable Connectors.** Single-pole separable connectors shall comply with 406.13. Sections 400.14, 406.7, and 406.8 shall not apply to listed single-pole separable connectors and single-conductor cable assemblies utilizing listed single-pole separable connectors. Where paralleled sets of current-carrying, single-pole separable connectors are provided as input devices, they shall be prominently labeled with a warning indicating the presence of internal parallel connections.

A listed, special type of connection device suitable for connecting single-conductor feeder cables must be of the locking type to reduce the likelihood of its separating while under load. The connectors must be used in sets because they are only single-pole

types. The connector sets must be arranged to reduce the likelihood that connections are made in the incorrect order, in accordance with one of the following methods:

1. The supply disconnect cannot be energized until all conductor connectors are connected. This includes equipment grounding conductors (EGCs), grounded conductors (if used), and ungrounded conductors.
2. The connectors are precluded from being connected in any order other than the proper one (first make/last break of the grounding conductor and connect next-to-first and disconnect next-to-last for the grounded conductor).
3. The individual connectors, free of any special electromechanical intervention, are marked with instructions to the user regarding proper connection.

Single-pole separable connectors are quick-connect feeder splicing and terminating devices, not attachment plugs or receptacles. They are designed to be sized, terminated, and inspected by a qualified person before being energized and are to be guarded from accidental disconnection before being de-energized.

#### See also

**Article 100** for the definition of *single-pole separable connector*

**406.13** for the general requirements covering the use of single-pole separable connectors

**(D) Supply Feed-Through.** Where a portable stage switchboard contains a feed-through outlet of the same rating as its supply inlet, the feed-through outlet shall not require overcurrent protection in the switchboard.

**(E) Interior Conductors.** All conductors other than busbars within the switchboard enclosure shall be stranded.

### 520.54 Supply Conductors.

**(A) General.** The supply to a portable stage switchboard shall be by means of listed extra-hard usage cords or cables. The supply cords or cables shall terminate within the switchboard enclosure in an externally operable fused master switch or circuit breaker or in an identified connector assembly. The supply cords or cable (and connector assembly) shall have current ratings not less than the total load connected to the switchboard and shall be protected by overcurrent devices.

As with the supply end described in 520.51, the termination connection required in 520.54(A) could be as simple as a permanently terminated multiconductor supply cord or multipole connector assembly (inlet) or as complex as a set of parallel single-conductor feeder cables. These cables can be field-connected to an assembly of single-pole connectors (inlet) or directly connected, with wire connectors, to busbars or a fused switch or breaker.

Road shows are permitted to size the feeder to the actual connected load rather than sizing it based on the overcurrent protection rating. Section 220.40 provides the requirements for sizing the feeder or service. Sections 520.54(D) and (E) provide rules under which conductors are permitted to be reduced in size.