Arc Quenching Switchgear layout guide

The location of the Arc Quenching Device (AQD) and the Eaton Arc Flash Relays (EAFR) is critical for proper design of a lineup of Arc Quenching Switchgear (AQS). Providing adequate instrument compartment space for the required AQS components must also be considered in the design.

AQD location

The AQD is installed in a specialized Magnum™ cassette that must be located in the same structure as the low-voltage main breaker. Typically, the AQD will be installed in the cell directly above or below the main breaker (see AP019003EN for more details).

If the main breaker is an MDN 4000 and the AQD will be on the load side, the MDN 4000 must be located in the B cell. The AQD may be located in the C cell or D cell. If the main breaker is an MDN 4000 and the AQD will be on the line side, the MDN 4000 must be located in the C cell and the AQD must be located in the B cell.

For all other main breakers, the AQD should be located either directly above or below the main breaker, depending upon the desired application.

EAFR location

The main EAFR-110PLV relay must be located in the same structure as the low-voltage main breaker and the AQD. Adequate instrument compartment door space must be allocated for this device. See **Figure 1** and **Figure 2**.

Each low-voltage main breaker requires an EAFR-101C relay. This relay may be located in the same instrument compartment as the EAFR-110PLV relay. Adequate instrument compartment door space must be allocated for this device. See **Figure 3** and **Figure 4**.

For every two feeders or tie breakers, an additional EAFR-101C relay is required. The location of these relays within the lineup is not critical; however, they should be located in the same shipping split as the feeder or tie breakers that they are associated with. Adequate instrument compartment door space must be allocated for these devices. See **Figure 3** and **Figure 4**.

- One EAFR-110PLV and three EAFR-101C relays can fit on the door of a standard 22-inch wide instrument compartment
- One EAFR-110PLV and five EAFR-101C relays can fit on the door of a standard 30-inch wide instrument compartment
- Five EAFR-101C relays can fit on the door of a standard 22-inch wide instrument compartment
- Seven EAFR-101C relays can fit on the door of a standard 30-inch wide instrument compartment

See **Figure 5** through **Figure 8** for door layouts. For non-A cell compartments, two rows of relays can fit on each door.

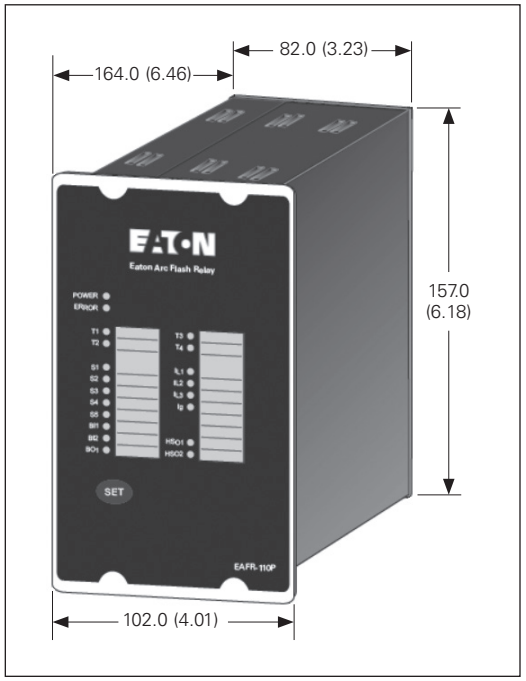

Figure 1. EAFR-110PLV dimensions in millimeters (inches)

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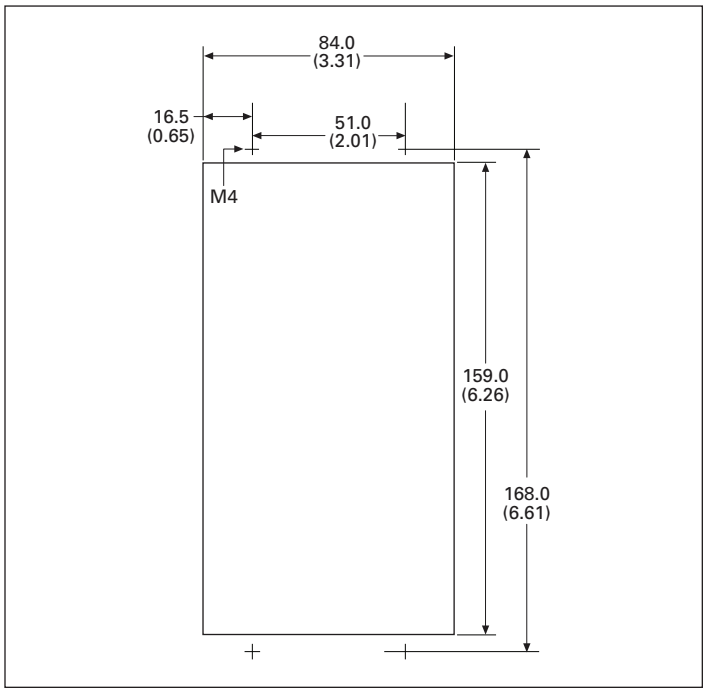

Figure 2. EAFR-110PLV cutout for panel mounting in millimeters (inches)

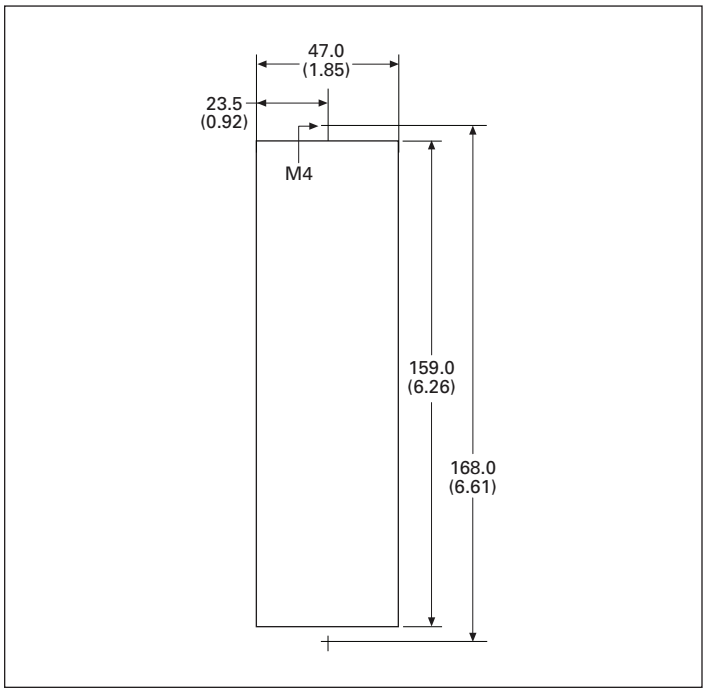

Figure 4. EAFR-101C cutout for panel mounting in millimeters (inches)

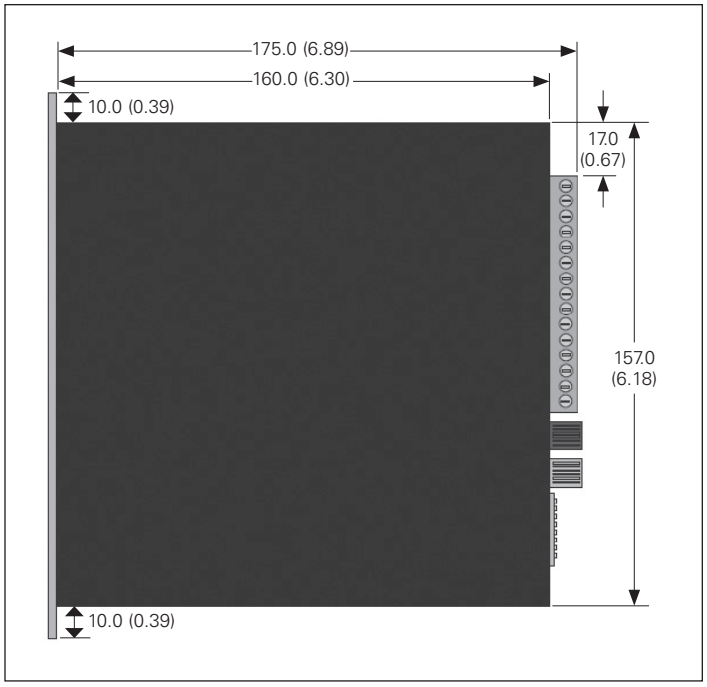

Figure 3. EAFR-101C dimensions in millimeters (inches)

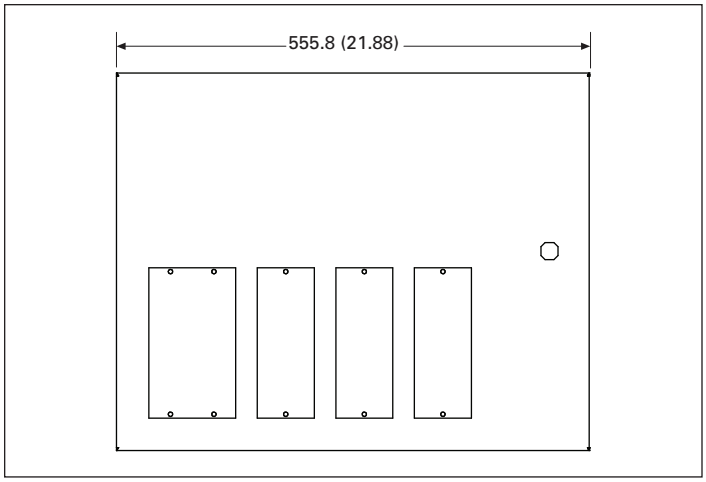

Figure 5. 22-inch instrument compartment with EAFR-110PLV and EAFR-101C relays—dimensions in millimeters (inches)

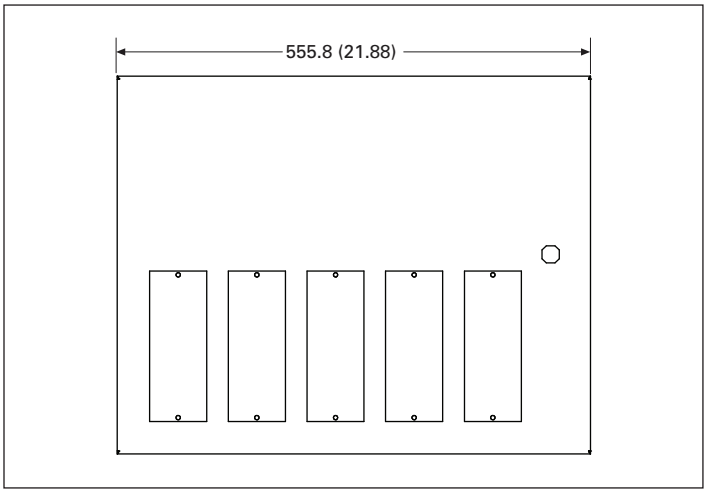

Figure 6. 22-inch instrument compartment with EAFR-101C relays—dimensions in millimeters (inches)

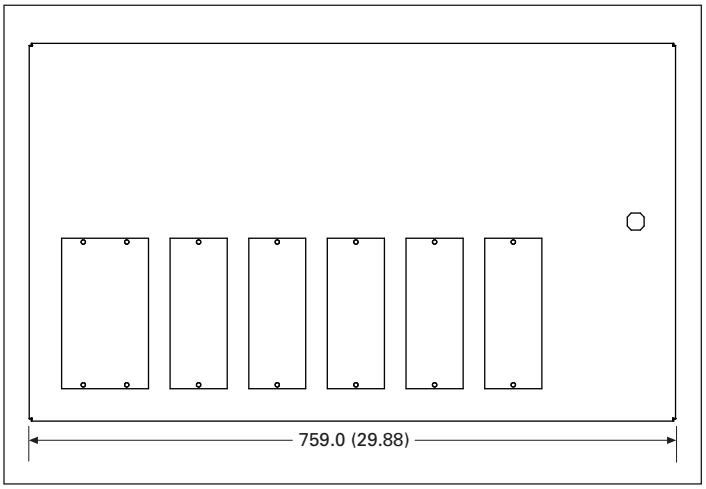

Figure 7. 30-inch instrument compartment with EAFR-110PLV and EAFR-101C relays—dimensions in millimeters (inches)

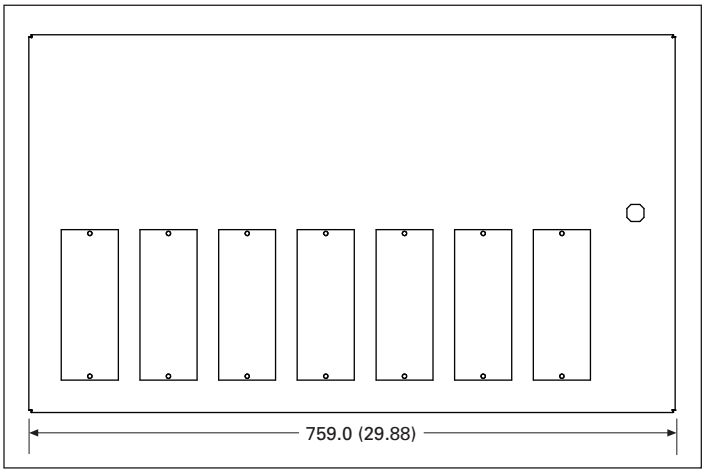

Figure 8. 30-inch instrument compartment with EAFR-101C relays—dimensions in millimeters (inches)

Multiple main bus lineups (Main-Tie-Main, Main-Main, etc.)

For Arc Quenching Switchgear lineups with multiple low-voltage main (or generator) breakers and no tie breakers, a single Arc Quenching System (one AQD and all required EAFR relays) may be utilized only if the main breakers are located in immediately adjacent structures (with no structures in between). The AQD may be installed below either main breaker and the EAFR trip signal will be wired to trip both main breakers when an arc flash is detected. The location requirements for the AQD and EAFR relays are the same as described above.

For Arc Quenching Switchgear lineups with main and tie breakers, a complete Arc Quenching System (one AQD and all required EAFR relays) must be included for each main breaker. The EAFR trip signal will be wired to trip both main breakers and AQDs when an arc flash is detected. The location requirements for the AQDs and EAFR relays are the same as described above.

The AQD must be applied within the nameplate ratings of the device. Special consideration must be made for closed transition and paralleled source applications.

Sample layouts

A	Main metering PXM 4000 meter	(5) EAFR-101C	Instrument	Instrument
B	Main MDN-64N 4000A-DE 1150LSIG	Feeder MDS-616 1600A-DE 1150LSIG	Feeder MDS-616 1600A-DE 1150LSIG	Feeder MDS-616 1600A-DE 1150LSIG
C	(1) EAFR-110-PLV (1) EAFR-101C	Feeder MDS-616 1600A-DE 1150LSIG	Feeder MDS-616 1600A-DE 1150LSIG	Feeder MDS-616 1600A-DE 1150LSIG
D	AQD	Feeder MDS-616 1600A-DE 1150LSIG	Feeder MDS-616 1600A-DE 1150LSIG	Feeder MDS-616 1600A-DE 1150LSIG
Structure	1	2	3	4
Depth (Calc)	78 (72)	78 (78)	78 (78)	78 (78)
Width	30	22	22	22
Overall width	96.00 (2438.4)			

Figure 9. Single main, MDN 4000

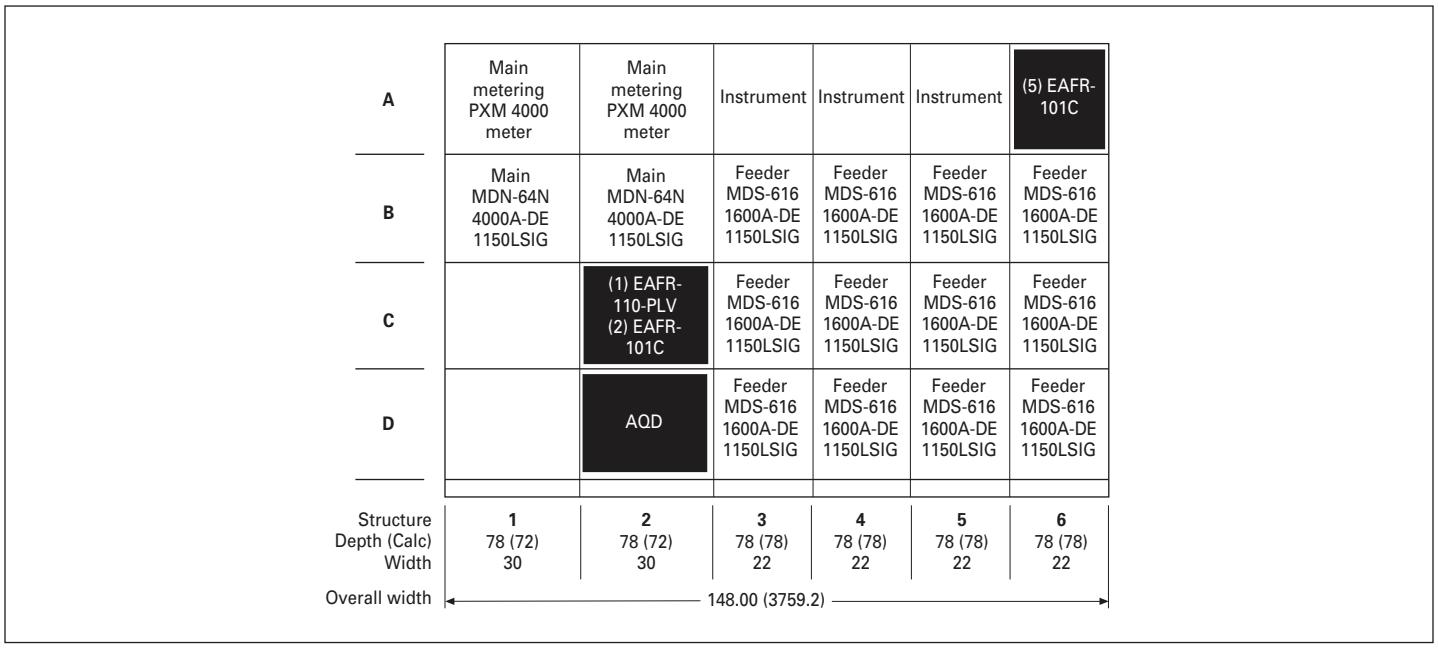

Figure 10. Main-main, MDN 4000

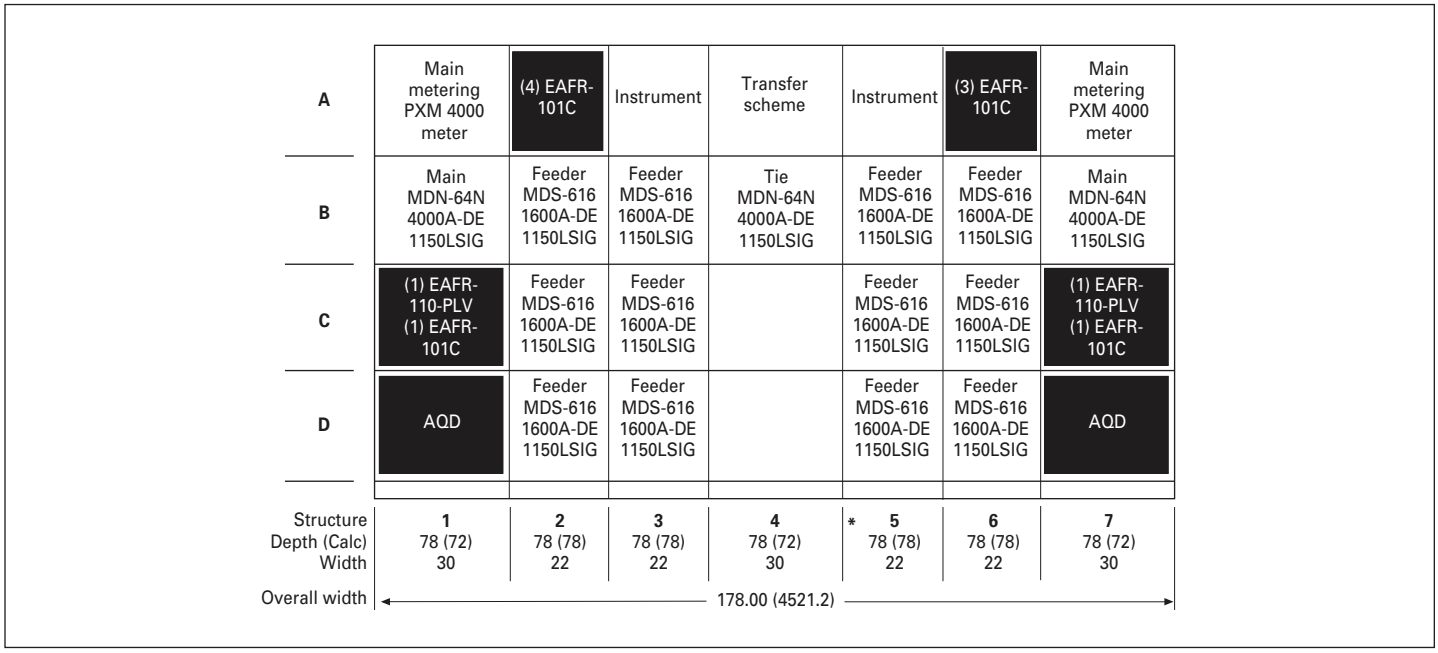

Figure 11. Main-tie-main, MDN 4000

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