

Electrical enclosure solutions for achieving safety standard UL508A



Keys to understanding and implementing the UL508A safety standard for electrical enclosures

A safe work environment offers peace of mind for employees and management and helps ensure operations run productively and smoothly. In industrial applications and manufacturing facilities, it's critical to adhere to strict safety protocols to protect personnel and equipment when building industrial control panels and power distribution systems. One of the most effective and easiest ways to do this is to ensure the electrical control panels used to manage and operate your facility's electrical equipment meet the globally recognized safety standard UL 508A.

In this paper, we explain what UL 508A requires and share guidance for achieving it with industry-leading nVent HOFFMAN solutions.

UL 508A standard overview

The globally recognized safety certification organization Underwriters Laboratories (UL) established the UL 508A standard to ensure the safe operation of electrical systems and equipment, helping prevent electrical hazards. The standard specifically focuses on the design and installation of industrial control panels, which include motor controllers, operator stations and similar equipment.

UL 508A specifies requirements for electrical safety, mechanical integrity and fire resistance for these panels. It also provides guidance on component selection, wiring practices and grounding methods. By adhering to UL 508A, industrial control panels are designed and built to meet the highest safety standards, minimizing the risks of electrical shock, fire and other potential hazards in industrial environments.

UL 508A interlocking requirements

To safeguard individuals from electrical injuries, control panels that comply with UL 508A must be designed to prevent direct contact with live parts. This ensures that under normal operating conditions, no live components can be touched.

To protect anyone working on or near equipment, UL 508A mandates that access (such as doors, lids or covers) to an enclosure containing live parts operating at or above 50 V AC or 60 V DC be interlocked with the disconnecting means, so the enclosure cannot be opened while a circuit is energized. The interlock can be mechanical, electrical or both. UL 508A Section 66.1.3 outlines how to meet these criteria, as summarized here:

- The primary and secondary doors cannot be opened while the operator handle is in the ON position.
- When the operator handle is set to OFF, the primary door can be opened, enabling access to the secondary doors.
- The operator handle cannot be turned ON if the primary door is open.
- The primary door can only be locked after all secondary doors are closed.

Meeting UL508A: Solutions for reducing electrical hazards

The comprehensive portfolio of nVent HOFFMAN electrical enclosures includes industry-leading safety solutions to reduce the risk of electrical hazards. For this discussion, we will focus on the nVent HOFFMAN MCF Flange Mount Disconnect enclosure portfolio, which are available off the shelf in a variety of sizes.

These mild steel enclosures are equipped with predefined cutouts on the righthand door that match the most common low amp switches in the market. When combined with nVent HOFFMAN interlocking accessories, the MCF range of enclosure meets UL508A, ensuring power cannot be switched ON unless all doors are closed.

In addition, the MCF range can be bayed together in combination with any of nVent HOFFMAN modular IEC enclosures (ranges MCS and MCD) for creating larger configurations. (For more information about our baying solution, read the nVent HOFFMAN Baying and Lifting white paper.)

Catalog Number	Height	Width	Depth
MCF14085R5	1400 mm	800 mm	500 mm
MCF14105R5	1400 mm	1000 mm	500 mm
MCF14165R5	1400 mm	1600 mm	500 mm
MCF18084R5	1800 mm	800 mm	400 mm
MCF18085R5	1800 mm	800 mm	500 mm
MCF18105R5	1800 mm	1000 mm	500 mm
MCF18165R5	1800 mm	1800 mm	500 mm
MCF18185R5	1800 mm	1800 mm	500 mm
MCF18186R5	1800 mm	1800 mm	600 mm
MCF20085R5	2000 mm	800 mm	500 mm
MCF20086R5	2000 mm	800 mm	600 mm
MCF20088R5	2000 mm	800 mm	800 mm
MCF20105R5	2000 mm	1000 mm	500 mm
MCF20106R5	2000 mm	1000 mm	600 mm
MCF20165R5	2000 mm	1600 mm	500 mm
MCF20166R5	2000 mm	1600 mm	600 mm
MCF20185R5	2000 mm	1800 mm	500 mm
MCF20186R5	2000 mm	1800 mm	600 mm
MCF22086R5	2200 mm	800 mm	600 mm
MCF22105R5	2200 mm	1000 mm	500 mm

The following sections provide details for interlocking MCF enclosures and accessories.

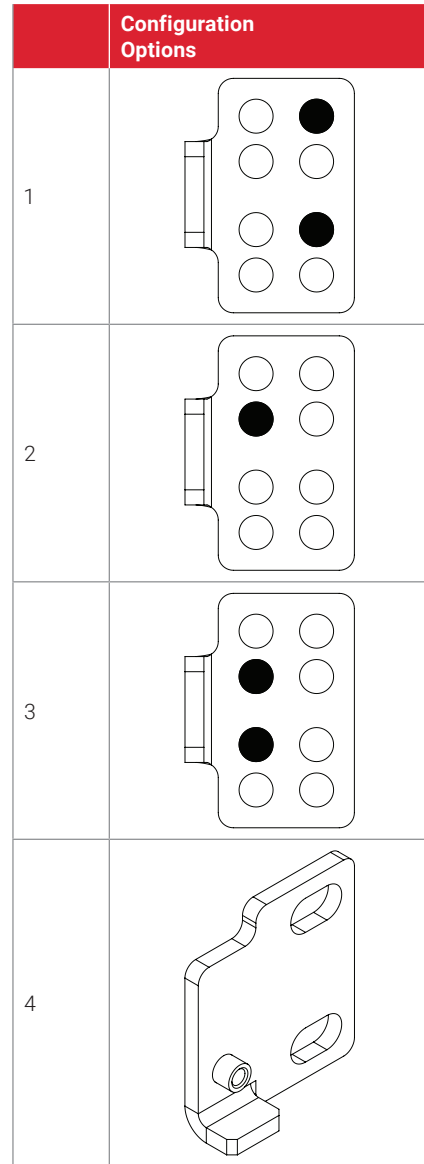
1.1. Main Door Interlock Kit, FMD01

The interlocking kit ensures that access to an MCF enclosure is restricted when the power is switched ON, which prevents hazards and risks. This kit is compatible with the most popular electrical switches, as listed below.

	Handle	Configuration
ABB	DSFHN-HS	3*
	OHF1C	2
Eaton	C361	3*
	C371	3*
GE	SCH1/SCH2	3
	SCOM	3
	SDOM	3
	STDA	3
	TDOM	3
Rockwell/Allen Bradley	140G M1/S1/P1/P2	1*
	1494C (≤ 200A)	1*
	1494F M1/S1/P1	1*
	1494V (≤ 200A)	1*
	194R	1*
Siemens	FDH10/FDH20	2
	FHOH	2
	MFHM3RS/MFHM4X	4
Square D	9422 Type A1/A3/A9	3
	9422 Type A2/A4/A10	3

Note: For configuration #2 it is recommended to use an extra bolt/nut beneath the single hole in order to prevent accidental rotation.

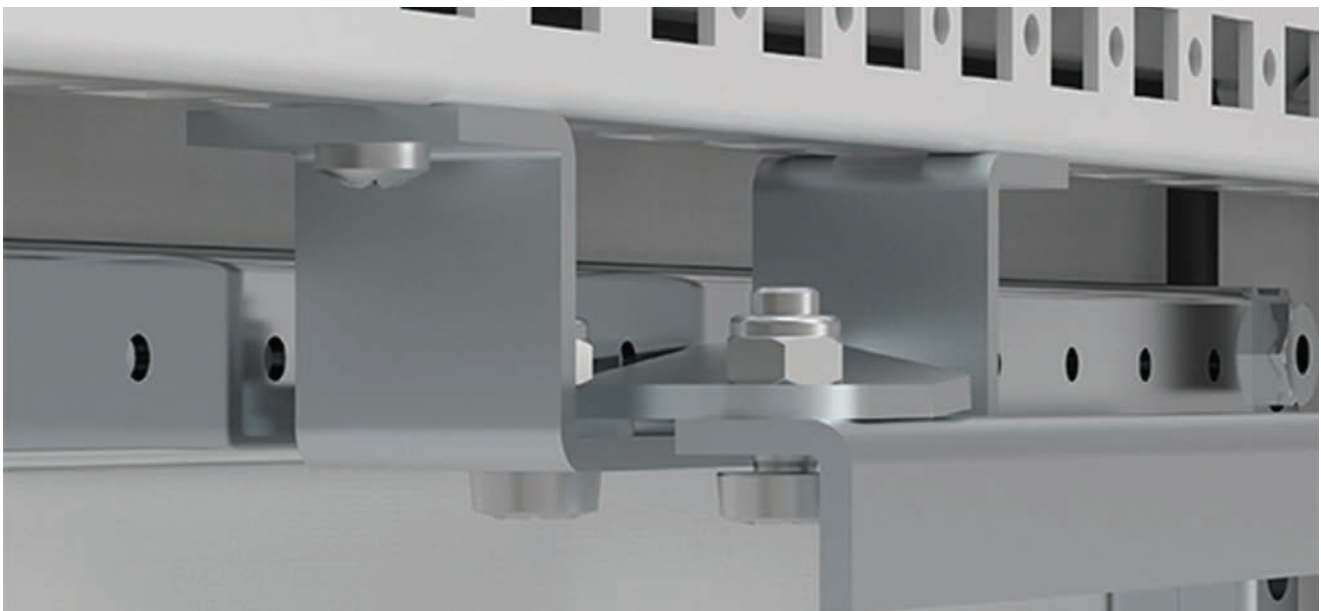
* Use hardware included in supplier's disconnect handles.



1.2. System Actuator, FMA01

This actuator makes a secondary door fully dependent on the primary door of the enclosure assembly. The actuator changes position depending on the open or closed status of the enclosure's primary door. This means that the secondary door may only be opened after the primary door is opened.

The actuator system also prevents the primary door from closing unless all secondary doors have been closed first.



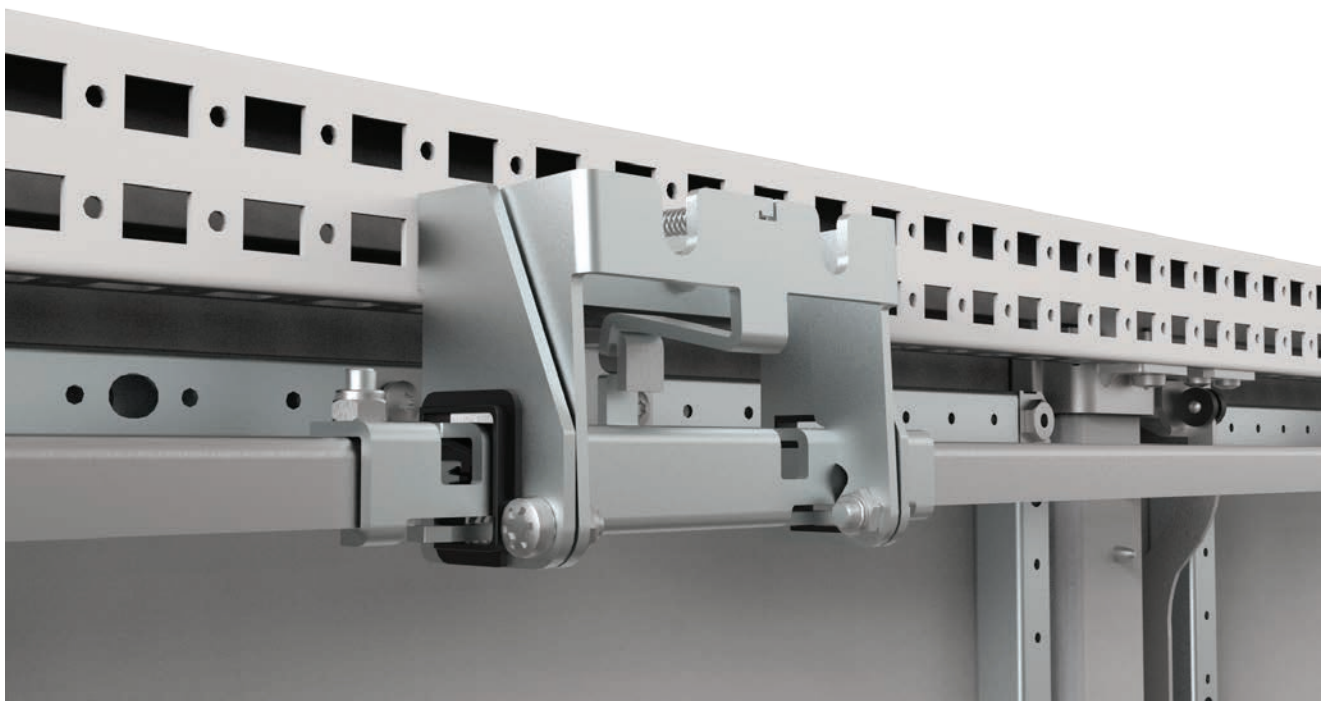
1.3. Secondary door Interlocking Kit, FMS01

The interlocking kit keeps the secondary door closed when the system actuator (FMA) has not been activated. Once the actuator is activated, the interlocking kit releases the secondary door, allowing user access.

Secondary doors can be opened and closed in any order as long as the primary door remains open.



One set is required per secondary door, and each secondary door kit has its own spring, enabling users to efficiently interlock large enclosure configurations.



1.4. Interlock bars, FMB

The interlocking bar mechanically connects the system actuator (FMA) of the primary door to the interlock kit (FMS) of the secondary doors. The bar is pre-cut to length, making it easy to mount to the interlocking system's components and ensuring seamless integration.

Catalog Number	For Adjacent Secondary Door Width
FMB600	600 mm
FMB800	800 mm
FMB1000	1000 mm
FMB1200	1200 mm

2. Interlocking assembly

Type 1:

- **Primary enclosure:** MCF, flange mount disconnect enclosure
- **Secondary enclosure:** MCS and/or MCD enclosure

1 FMD01

Provides safety locking between the most common operator handles, enclosure and primary door.

Included as part of MCF standard delivery.

2 FMA01

Installed only on the primary enclosure, makes the secondary enclosures dependent on the primary door position (close/open).

3 FMS01

Provides a means to lock the secondary door while the primary door is closed.

One kit is required per door, meaning:

- One kit for single door enclosures, MCS.
- Two kits for double door enclosures, MCD.

4 FMB

Interlock primary door actuator (FMA) with all secondary door kits (FMS) to ensure coordinated operation.

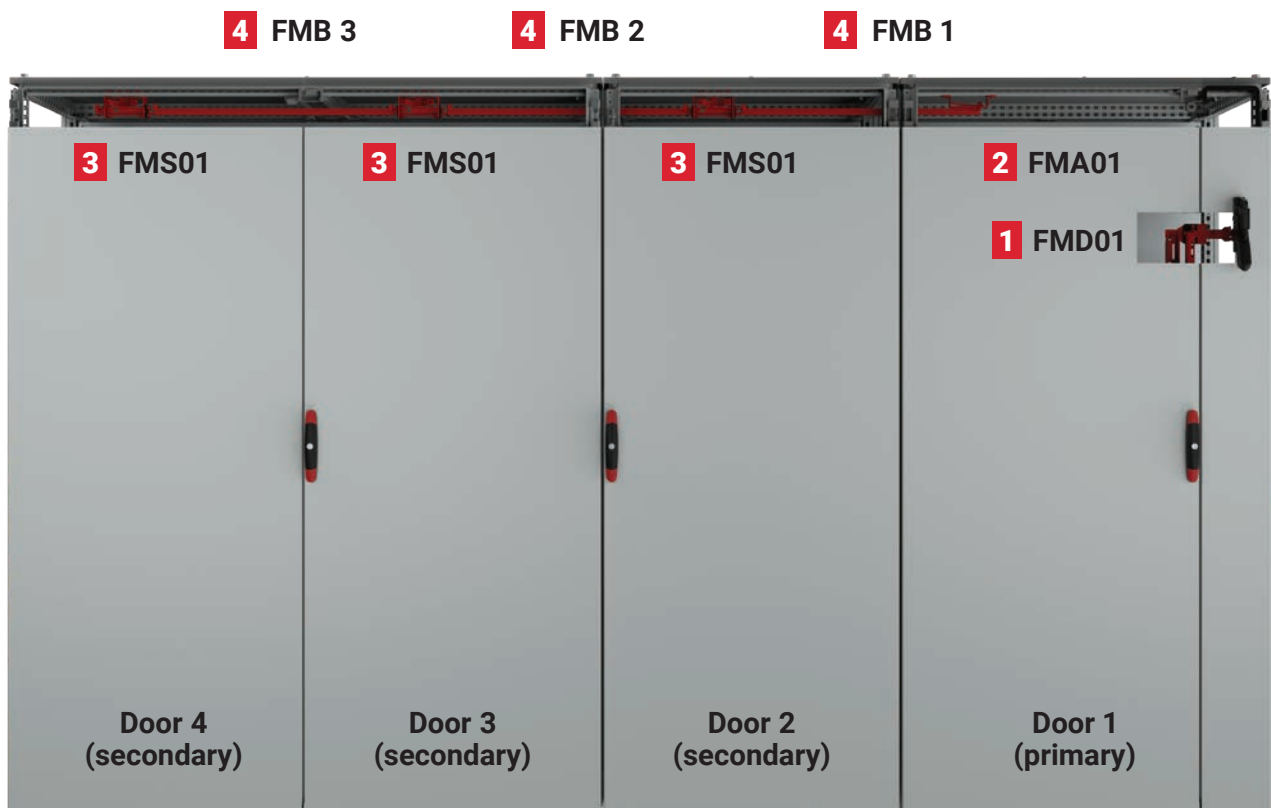
Length required for each FMB is defined by next adjacent door width.

Examples:

FMB 1: width of door 2.

FMB 2: width of door 3

FMB 3: width of door 4.



Type 2:

- **Primary enclosure:** MCF, flange mount disconnect enclosure
- **Secondary enclosure:** MCS and/or MCD enclosure

1 FMD01

Provides safety locking between the most common operator handles, enclosure and primary door.

Included as part of MCF standard delivery.

2 FMA01

Installed only on the primary enclosure, makes the secondary enclosures dependent on the primary door position (close/open).

3 FMS01

Lock the secondary door, while the primary door is closed.

One kit required per door, meaning:

- One kit for single door enclosures, MCS.
- Two kits for double door enclosures, MCD.

4 FMB

Interlock primary door actuator (FMA) with all secondary door kits (FMS) to ensure coordinated operation.

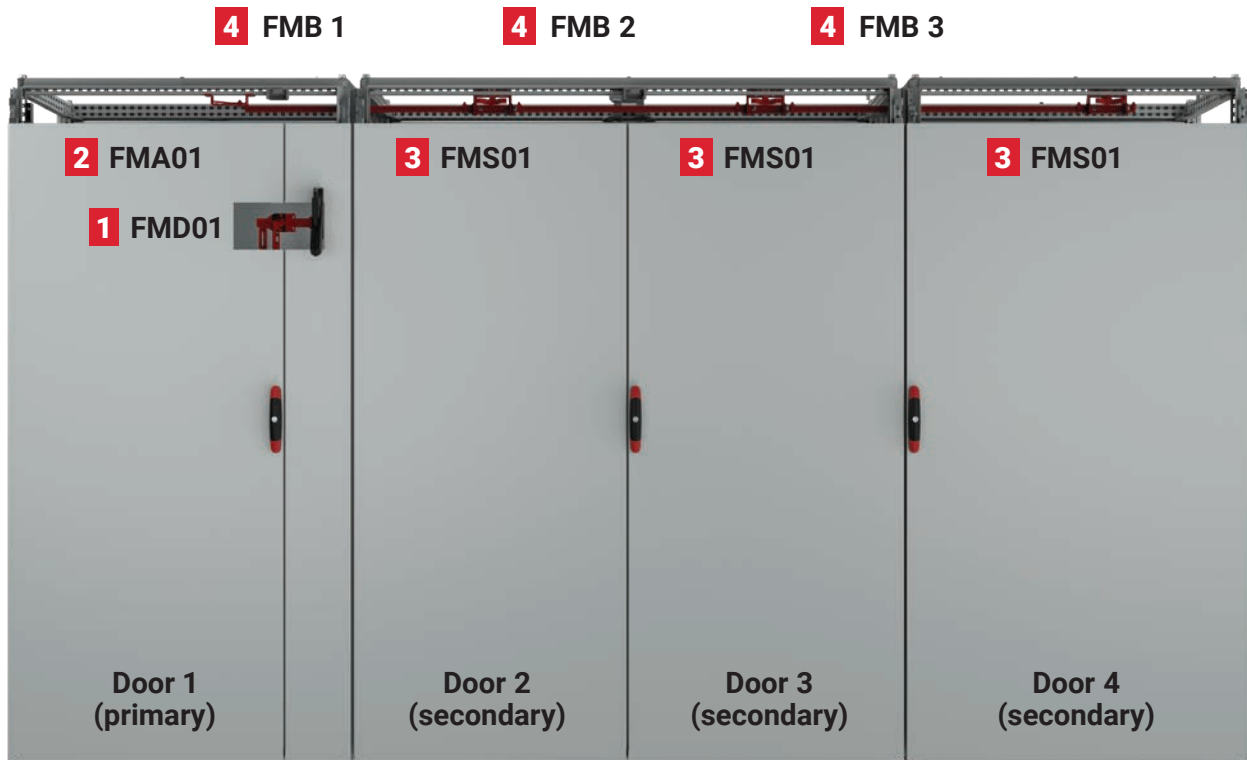
Length required for each FMB is defined by the next adjacent door width.

Examples:

FMB 1: width of door 2.

FMB 2: width of door 3

FMB 3: width of door 4.



Type 3:

- **Primary enclosure:** MCS or MCD enclosure
- **Secondary enclosure:** MCS and/or MCD enclosure

1 FMA01

Installed only on the primary enclosure, makes the secondary enclosures dependent on the primary enclosure door position (close/open).

2 FMS01

Provides a means to lock the secondary door while the primary door is closed.

One kit is required per door, meaning:

- One kit for single door enclosures, MCS.
- Two kits for double door enclosures, MCD.

3 FMB

Interlock primary door actuator (FMA) with all secondary door kits (FMS) to ensure coordinated operation.

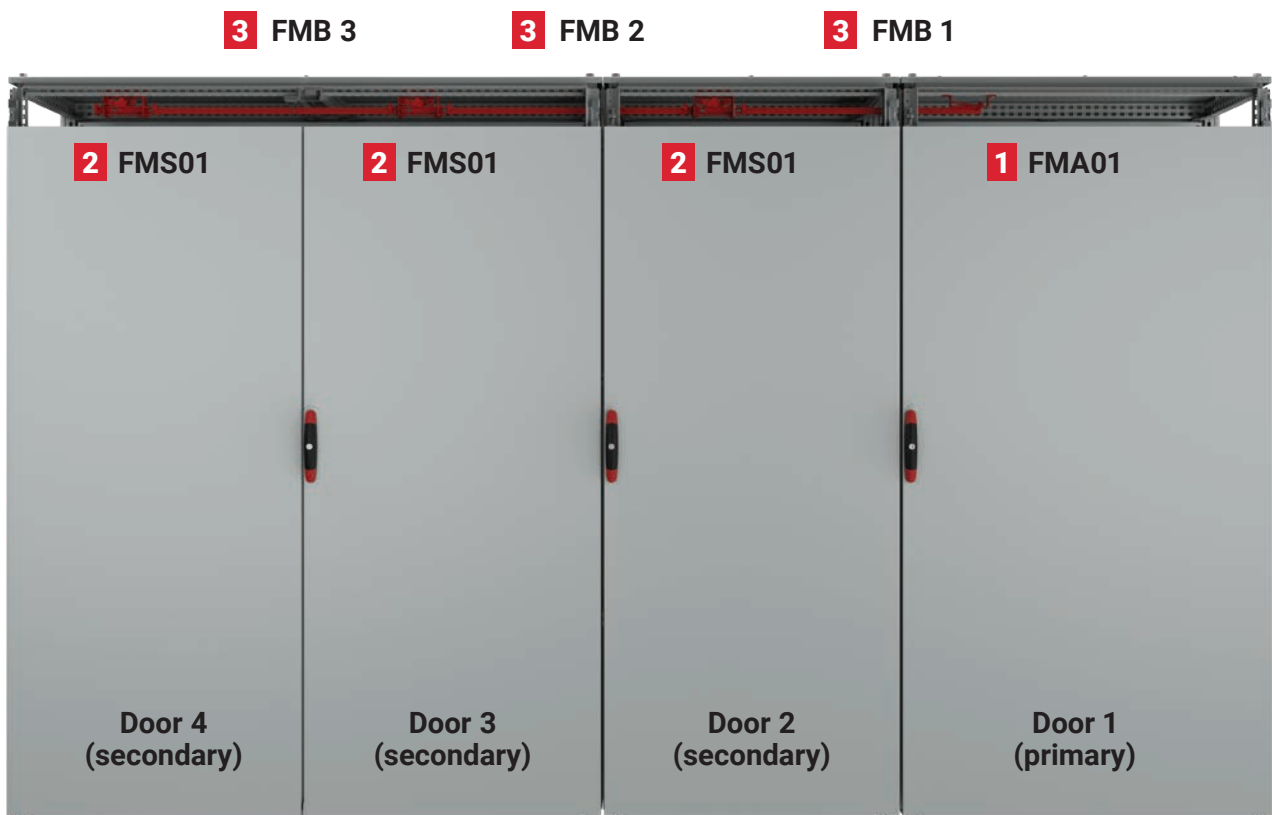
Length required for each FMB is defined by the next adjacent door width.

Examples:

FMB 1: width of door 2.

FMB 2: width of door 3

FMB 3: width of door 4.



Type 4:

- **Primary enclosure:** MCS or MCD enclosure
- **Secondary enclosure:** MCS and/or MCD enclosure

1 FMA01

Installed only on the primary enclosure, makes the secondary enclosures dependent on the primary door position (close/open).

2 FMS01

Provides a means to lock the secondary door while the primary door is closed.

One kit required per door, meaning:

- One kit for single door enclosures, MCS.
- Two kits for double door enclosures, MCD.

3 FMB

Interlock primary door actuator, FMA, with all secondary door kits, FMS.

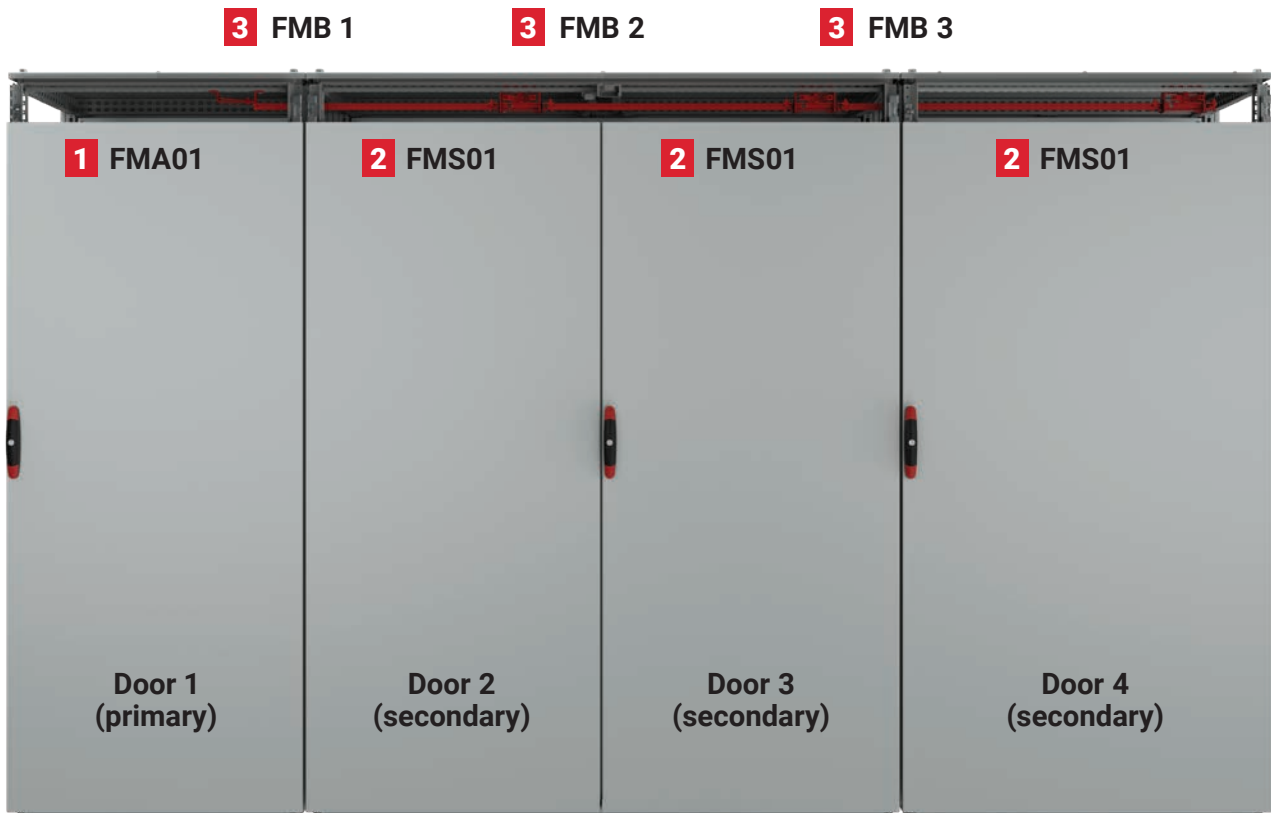
Length required for each FMB is defined by the next adjacent door width.

Examples:

FMB 1: width of door 2.

FMB 2: width of door 3

FMB 3: width of door 4.



Summary

The nVent HOFFMAN portfolio provides a strong, complete solution for customers looking for:

- Compliance with UL 508A
- Compatibility with most standard electrical switches
- A reliable system suitable for large enclosure setups
- Flexibility to open and close secondary doors in any order

In addition, nVent HOFFMAN's interlocking system is also compatible with configurations that do not use the MCF range as primary enclosures but MCS and/or MCD enclosures.



Our powerful portfolio of brands:

CADDY ERICO HOFFMAN ILSCO SCHROFF TRACHTE