

Section 8

Operating Mechanisms and Disconnect Switches



UL508 Motor Disconnect Switch



UL98 Fusible Switch



UL98 Style Flange Handle Disconnect Switch



9421 Type L Circuit Breaker Mechanism



9422 Type R Circuit Breaker Mechanism



9422 Type C Circuit Breaker Cable Operator



9423 Door Closing Mechanisms

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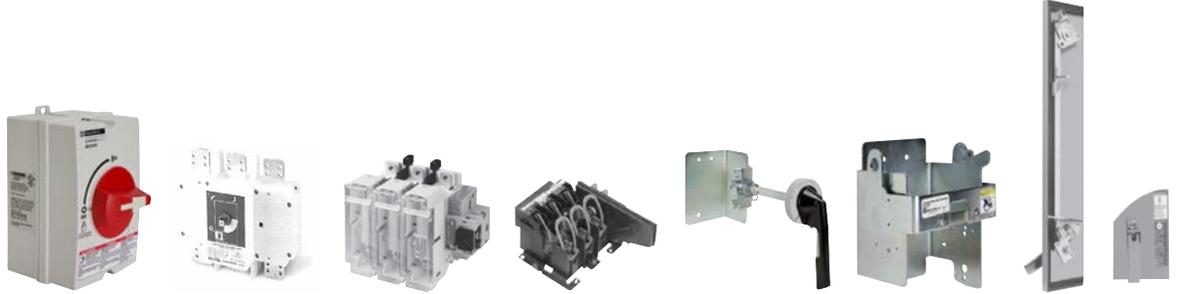
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Selection Guide



| Class | Vario | LK4 | GS2 | 9422 | 9421 | 9422 | 9423 |
|----------------------------------|---|--|--|---|---|---|---|
| Type | Manual motor control switches | Nonfusible IEC style disconnect switches | Fusible IEC style disconnect switches | NEMA style fused or non-fusible disconnect switches | Circuit breaker operating mechanisms | Circuit breaker operating mechanisms | Door closing mechanisms |
| UL Rating | UL508 | UL98 | UL98 | UL98 | — | — | — |
| Handle Type | Rotary | Rotary | Rotary | Flange Adjustable rod or cable mechanism | Rotary | Flange Adjustable rod or cable mechanism | Rotary, works in conjunction with 9422 handle mechanisms |
| Mounting | Door or panel | — | Flange with cable mechanism panel | Panel or bracket mount | Panel | Panel | — |
| Load Voltage (max.) | 600 Vac | 600 Vac | 600 Vac | 600 Vac | 600 Vac | 600 Vac | — |
| Current Ratings | 10–115 | 30–1200 | 30–800 | 30–400 | Circuit breaker frame sizes 100–1200 | Circuit breaker frame sizes 100–1200 | — |
| Horsepower Ratings (max.) | 2–60 | 7.5–500 | 7.5–500 | 7.5–350 | — | — | — |
| Enclosure Type | Metallic: NEMA Type 1, 12, 4, 4X Plastic: IP55, NEMA Type 4X | Handle ratings: NEMA Type 1, 3R, 4, 4X, 12 | Handle ratings: NEMA Type 1, 3R, 4, 4X, 12 | Handle ratings: NEMA Type 1, 3R, 4, 4X, 12 | Handle ratings: NEMA Type 1, 3R, 4, 4X, 12 | Handle ratings: NEMA Type 1, 3R, 4, 4X, 12 | Handle ratings: NEMA Type 4 and 12 sheet steel or stainless |
| Accessories | Power poles and auxiliary contacts | Auxiliary contacts and power lugs | Auxiliary contacts and power lugs | Auxiliary contacts | Auxiliary contacts | Auxiliary contacts | Right or left-hand operation |
| Approvals | UL File E164864 NLRV CSA File LR 81630 Class 3211 05 | UL File E191098 WP2X / WP2X7 CSA 703149 Class 4652 04 | UL File E191098 WP2X / WP2X7 CSA 703149 Class 4652 04 | UL File E52639 WHTY2 CSA LR44199 Class 4652-04 | UL File E62922 DIHS2 CSA LR44199 Class 3211 07 | UL File E62922 DIHS2 CSA LR44199 Class 3211 07 | — |
| Page | Mini-Vario, page 8-3 | LK4 NonFusible Disconnect Switches, page 8-8 | GS2 Fusible Disconnect Switches, page 8-8 | Disconnect Switches, page 8-15 | Type L Circuit Breaker Mechanisms, page 8-21 | Flexible Cable Mechanisms, page 8-23 | Door Closing Mechanisms, page 8-28 |

Identification System

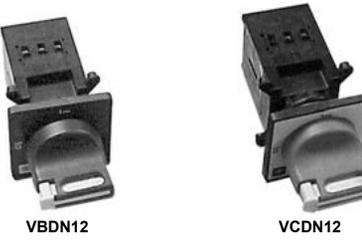
The Mini-Vario and Vario motor disconnect switch catalog numbers can be identified as described in Table 8.1 Identification System, page 8-2.



Table 8.1: Identification System

| | V | CF | N12 | GE |
|---|---|---|---|----|
| Model (V-Vario, K-Operator) | | | | |
| Operator Type/ Accessory Designation | | | | |
| CD | Single hole Red & Yellow | BD | Single hole Black and Gray | |
| CF | Four hole Red & Yellow | BF | Four hole Black and Gray | |
| CCD | Single hole Red & Yellow w/ extension shaft | VE | Switch with Red handle installed on unit (one padlock only) | |
| CCF | Four hole Red & Yellow w/ extension shaft | VD | Switch with Black handle installed on unit (no padlock provision) | |
| Blank | No operator or accessory | Z | Accessory, power pole, neutral or ground | |
| Switch Type [1] | | | | |
| Blank | | 1 | Vario 20/32 A | |
| N12 | Mini-Vario 10/12 A | 2 | Vario 25/40 A | |
| N20 | Mini-Vario 16/20 A | 3 | Vario 45/63 A | |
| 02 | Vario 10/12 A | 4 | Vario 63/80 A | |
| 01 | Vario 16/20 A | 5 | Vario 100/125 A | |
| 0 | Vario 20/25 A | 6 | Vario 115/175 A | |
| Enclosure Type (if applicable) | | | | |
| Blank | No Enclosure | G30, A30, W30 Type 1/12/4/4X Metallic (Class 9421) | | |
| GE | Mini-Vario IP55 Non-Metallic | GU Vario IP55 Non-Metallic | | |

[1] Switches/contacts are dual rated (UL/IEC).



Mini-Vario

Table 8.2: Assembled Switches—Degree of Protection IP65, Type 1 and 12

| Rating (A) | | Complete Switches for Door Mounting (3-Padlock) | | Complete Switches for Rear Mounting, Includes Extension Shaft (3-Padlock) |
|------------|-----|---|--------------------------|---|
| | | Red/Yellow (Single Hole) | Black/Gray (Single Hole) | Red/Yellow (Single Hole) |
| UL | IEC | Catalog No. | Catalog No. | Catalog No. |
| 10 | 12 | VCDN12 | VBDN12 | VCCDN12 |
| 16 | 20 | VCDN20 | VBDN20 | VCCDN20 |

Table 8.3: Enclosed Switches

| Catalog No. | Description |
|-------------|---|
| VCFN12GE | Red/Yellow Mounted In Sealable Enclosure, Non-UL Listed, Non-NEMA Rated |
| VCFN20GE | |

Table 8.4: Component Parts

| Catalog No. | Description |
|-------------|--|
| VN12 [2] | 10/12 A switch only |
| VN20 [2] | 16/20 A switch only |
| VZN12 [2] | Add on power pole for 10/12 A switch |
| VZN20 [2] | Add on power pole for 16/20 A switch |
| VZN11 | Neutral Pole with early make, late break for VN12 or VN20 switch |
| VZN14 | Grounding module for VN12 or VN20 |
| VZN05 | N.O. late make auxiliary contact [3] |
| VZN06 | N.C. early break auxiliary contact [3] |
| VZN26 | Single-pole shroud for auxiliary contacts |
| VZN08 | Three-pole shroud for VN12 or VN20 |

Table 8.5: Operators and Accessories

| Catalog No. | Description |
|-------------|--|
| KCC1YZ | 45 x 45 mm Red & Yellow operator |
| KCD1PZ | 60 x 60 mm Red & Yellow operator |
| KAD1PZ | 60 x 60 mm Black & Gray operator |
| VZN17 | 300–340 mm shaft extension |
| VZN30 | 400–430 mm shaft extension |
| KZ32 | Door interlocking plate for 45 or 60 mm operator |
| KZ83 | Door mounting plate for 45 or 60 mm operator |

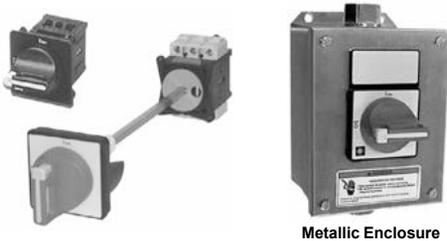
Vario

Table 8.6: NEMA Type 1 and 12 Assembled Switches for Door Mounting

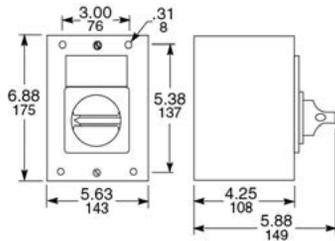
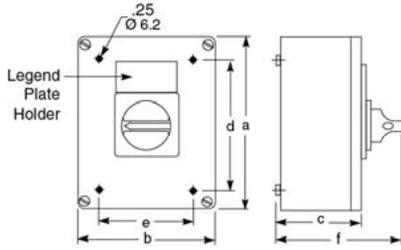
| Rating (A) | | Complete Switches (Switch and Handle) for Door Mounting (3-padlock) | | | |
|------------|-----|---|------------------------|--------------------------|--------------------------|
| | | Red/Yellow (Four Hole) | Black/Gray (Four Hole) | Red/Yellow (Single Hole) | Black/Gray (Single Hole) |
| UL | IEC | Catalog No. | Catalog No. | Catalog No. | Catalog No. |
| 10 | 12 | VCF02 | VBF02 | VCD02 | VBD02 |
| 16 | 20 | VCF01 | VBF01 | VCD01 | VBD01 |
| 20 | 25 | VCF0 | VBF0 | VCD0 | VBD0 |
| 20 | 32 | VCF1 | VBF1 | VCD1 | VBD1 |
| 25 | 40 | VCF2 | VBF2 | VCD2 | VBD2 |
| 45 | 63 | VCF3 | VBF3 | — | — |
| 63 | 80 | VCF4 | VBF4 | — | — |
| 100 | 125 | VCF5 | VBF5 | — | — |
| 115 | 175 | VCF6 | VBF6 | — | — |

Table 8.7: NEMA Type 1 and 12 Assembled Switches for Rear Mounting

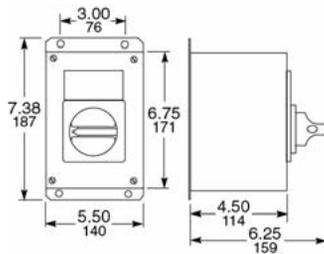
| Rating (A) | | Complete Switches for Rear Mounting with Extension Shaft (3-Padlock)[4] | | Switches with Handles Installed on Unit, DIN Rail Mount Only | |
|------------|-----|---|--------------------------|--|-------------------------|
| | | Red/Yellow (Four Hole) | Red/Yellow (Single Hole) | Red/Yellow (1-Padlock) | Black/Gray (No-Padlock) |
| UL | IEC | Catalog No. | Catalog No. | Catalog No. | Catalog No. |
| 10 | 12 | VCCF02 | VCCD02 | — | — |
| 16 | 20 | VCCF01 | VCCD01 | — | — |
| 20 | 25 | VCCF0 | VCCD0 | VVE0 | VVD0 |
| 20 | 32 | VCCF1 | VCCD1 | VVE1 | VVD1 |
| 25 | 40 | VCCF2 | VCCD2 | VVE2 | VVD2 |
| 45 | 63 | VCCF3 | — | VVE3 | VVD3 |
| 63 | 80 | VCCF4 | — | VVE4 | VVD4 |
| 100 | 125 | VCCF5 | — | — | — |
| 115 | 175 | VCCF6 | — | — | — |



[2] Switches/contacts are dual rated (UL/IEC).
[3] Auxiliary contacts are dual rated (UL/IEC 10/12 A).
[4] Complete switch includes handle operator, shaft, door interlock plate, and line terminal shroud.



Class 9421 NEMA Type 1 V1G30, V2G30



Class 9421 NEMA Type 4, 4X, 12 V1W30, V2W30, V1A30, V2A30



Manual Motor Control Switch

Non-Metallic Enclosed Switches

The Vario Motor Disconnect Switch is also offered as an enclosed switch. The three-pole version makes the Vario switch ideal for manual motor control applications. They are compact, easy to wire and connect, and come undrilled to allow cable entry positions.

NOTE: VCGUN enclosures are UL approved.

Table 8.8: Non-Metallic Enclosed Switch [5] [6]

| Ampere Size UL/IEC | IP55-PVC 3-Pole, NEMA Type 1 & 12 | |
|-----------------------|-----------------------------------|--|
| | Catalog No. | |
| 20/32 | VC1GUN | |
| 25/40 | VC2GUN | |
| 45/63 | VC3GUN | |
| 63/80 | VC4GUN | |
| 100/125 | VC5GUN | |
| 115/175 | VC6GUN | |

Table 8.9: Dimensions

| Type | No. of Poles | a | b | c | d | e | f |
|--------|--------------|------------|-----------|-----------|------------|-----------|-----------|
| VC1GUN | 3 | 6.5 (164) | 4.8 (121) | 3.4 (87) | 5.6 (141) | 3.9 (98) | 5.2 (132) |
| VC2GUN | | | | | | | |
| VC3GUN | | | | | | | |
| VC4GUN | 3 | 7.6 (193) | 6.5 (164) | 3.4 (87) | 6.7 (170) | 5.6 (141) | 5.2 (132) |
| VC5GUN | | | | | | | |
| VC6GUN | 3 | 11.5 (291) | 9.5 (241) | 5.0 (128) | 10.6 (269) | 8.6 (219) | 7.5 (191) |

Metallic Enclosed Switches

Vario switches meet UL508 requirements as open manual motor controllers. They are also marked "Suitable as Motor Disconnect" allowing installation on the load side of the motor branch circuit short-circuit and ground-fault protection. If motor branch circuit short-circuit and ground-fault protection is needed, use a GS1 or 9422 fusible switch or circuit breaker meeting NEC 430.52 requirements.

Table 8.10: Metallic Enclosed Switches [5] [7]

| Rating (A) | | Horsepower Ratings | | | NEMA Type 1 | NEMA Type 12 | NEMA Type 4/4X |
|------------|-----|--------------------|-------|-------|-------------|--------------|----------------|
| UL | IEC | 240 V | 480 V | 600 V | Catalog No. | Catalog No. | Catalog No. |
| 20 | 32 | 5 | 10 | 10 | 9421V1G30 | 9421V1A30 | 9421V1W30 |
| 25 | 40 | 5 | 10 | 15 | 9421V2G30 | 9421V2A30 | 9421V2W30 |

Vario Manual Motor Control Switches

The V1 and V2 come in metallic enclosures (NEMA Type 1, 4, 4X, and 12). The NEMA Type 1 comes with conduit knockouts top and bottom. To factory install a VZ7 auxiliary contact in these metallic enclosures, add Form X11 to the end of the catalog number (for example, 9421V1G30X11). To factory install a VZ20 auxiliary contact in these enclosures, add Form X20 to the end of the catalog number (for example, 9421V1W30X20).

Table 8.11: Vario Manual Motor Control Switches, IEC

| Rating (A) IEC | kW Rating | | | | 3-Pole Switch Body | |
|-------------------|-----------|-------|-------|-------|--------------------|-------|
| | 230 V | 240 V | 400 V | 415 V | 500 V | 690 V |
| 12 | 3 | 3 | 4 | 4 | 5.5 | 7.5 |
| 20 | 4 | 4 | 5.5 | 5.5 | 7.5 | 11 |
| 25 | 5.5 | 5.5 | 7.5 | 7.5 | 11 | 15 |
| 32 | 5.5 | 5.5 | 11 | 11 | 11 | 15 |
| 40 | 7.5 | 7.5 | 15 | 15 | 18.5 | 15 |
| 63 | 15 | 15 | 22 | 22 | 30 | 22 |
| 80 | 18.5 | 18.5 | 30 | 30 | 37 | 30 |
| 125 | 22 | 22 | 37 | 37 | 45 | 37 |
| 175 | 30 | 30 | 45 | 45 | 55 | 45 |

Table 8.12: Vario Manual Motor Control Switches

| Rating (A) | Horsepower Rating | | | Shaft Size mm | 3-Pole Switch Body Type |
|------------|-------------------|-------|-------|------------------|----------------------------|
| | 240 V | 480 V | 600 V | | |
| 10 | 2 | 5 | 5 | 6 | V02 |
| 16 | 3 | 7.5 | 7.5 | 6 | V01 |
| 20 | 5 | 10 | 10 | 6 | V0 |
| 20 | 5 | 10 | 10 | 6 | V1 |
| 25 | 5 | 10 | 15 | 6 | V2 |
| 45 | 10 | 20 | 30 | 8 | V3 |
| 63 | 15 | 30 | 40 | 8 | V4 |
| 100 | 25 | 50 | 50 | 8 | V5 |
| 115 | 30 | 50 | 60 | 8 | V6 |

[5] Assembled, includes switches mounted in enclosure with handle.

[6] Refer to Table 8.11 Vario Manual Motor Control Switches, IEC, page 8-4 and Table 8.12 Vario Manual Motor Control Switches, page 8-4 for horsepower ratings.

[7] For indoor use only. The NEMA Type 4/4X enclosure is made of #304 stainless steel with 3/4 in. T&B stainless steel hubs on the top and bottom.

Table 8.13: Switch Body [8]

| Rating (A) | | Shaft Size mm | 3-Pole Switch Body | |
|------------|-----|---------------|--------------------|--|
| UL | IEC | | Type | |
| 10 | 12 | 6 | V02 | |
| 16 | 20 | 6 | V01 | |
| 20 | 25 | 6 | V0 | |
| 20 | 32 | 6 | V1 | |
| 25 | 40 | 6 | V2 | |
| 45 | 63 | 8 | V3 | |
| 63 | 80 | 8 | V4 | |
| 100 | 125 | 8 | V5 | |
| 115 | 175 | 8 | V6 | |

Table 8.14: NEMA Type 1 and 12 Handle Operators: V02–V2 (6 mm Shaft), V3–V6 (8 mm Shaft) [9]

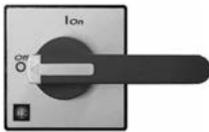
| Operator Type | | Red/Yellow Single Hole 45 x 45 mm | Red/Yellow Four Hole 45 x 45 mm | Black/Gray Single Hole 45 x 45 mm | Black/Gray Four Hole 45 x 45 mm |
|---------------|-----------------|-----------------------------------|---------------------------------|-----------------------------------|---------------------------------|
| Switches | No. of Padlocks | Catalog No. | Catalog No. | Catalog No. | Catalog No. |
| V02–V2 | 0 | KCC1LZ | KCE1LZ | KAC1BZ | KAE1BZ |
| V02–V2 | 1 | KCC1YZ | KCE1YZ | — | — |
| Operator Type | | Red/Yellow Single Hole 60 x 60 mm | Red/Yellow Four Hole 60 x 60 mm | Black/Gray Single Hole 60 x 60 mm | Black/Gray Four Hole 60 x 60 mm |
| V02–V2 | 0 | KDD1PZ | KDF1PZ | KBD1PZ | KBF1PZ |
| V3–V4 | 0 | — | KDF2PZ | — | KBF2PZ |
| V02–V2 | 3 | KCD1PZ | KCF1PZ | KAD1PZ | KAF1PZ |
| V3–V4 | 3 | — | KCF2PZ | — | KAF2PZ |
| Operator Type | | Red/Yellow Four Hole 90 x 90 mm | Black/Gray Four Hole 90 x 90 mm | | |
| V5–V6 | 0 | KDF3PZ | KBF3PZ | | |
| V5–V6 | 3 | KCF3PZ | KAF3PZ | | |



Single-Hole Operator



Four-Hole Operator (All except KDF3PZ and KBF3PZ)



Four-Hole Operator KDF3PZ and KBF3PZ



Low-Profile Handle KCD1YZ

Table 8.15: Low Profile Handle Operators [9]

| Operator Type | | Red/Yellow Single Hole 60 x 60 mm | Red/Yellow Four Hole 60 x 60 mm | Black/Gray Single Hole 60 x 60 | Black/Gray Four Hole 60 x 60 mm |
|---------------|-----------------|-----------------------------------|---------------------------------|--------------------------------|---------------------------------|
| Switches | No. of Padlocks | Catalog No. | Catalog No. | Catalog No. | Catalog No. |
| V02–V2 | 3 | KCD1YZ | KCF1YZ | KAD1XZ | KAF1XZ |
| V3–V4 | 3 | — | KCF2YZ | — | KAF2XZ |
| Operator Type | | Red/Yellow Four Hole 90 x 90 mm | Black/Gray Four Hole 90 x 90 mm | | |
| V5–V6 | 3 | KCG2YZ | KAG2XZ | | |

Table 8.16: Gasket Kits

| Catalog No. | Description |
|-------------|--|
| KZ65 | 45 x 45 mm gasket for V02-V2 for 4-hole type handles (order in quantities of 5)—IP65 |
| KZ66 | 60 x 60 mm gasket for V02-V2 for 4-hole type handles (order in quantities of 5)—IP65 |
| KZ62 | 60 x 60 mm gasket for V3-V4 for 4-hole type handles (order in quantities of 5)—IP65 |
| KZ67 | 90 x 90 mm gasket for V5-V6 for 4-hole type handles (order in quantities of 5)—IP65 |

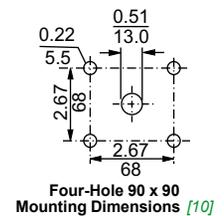
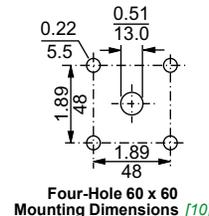
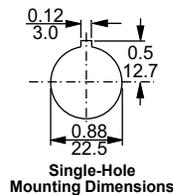
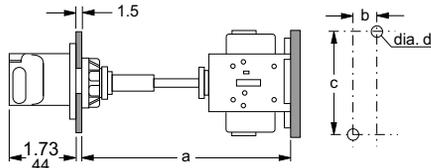


Table 8.17: Rear/Panel Mounting Switch Body Dimensions

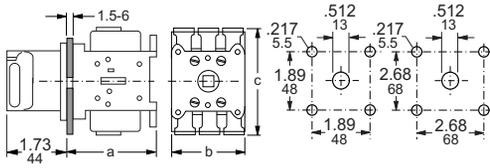
| Type | Shaft Extension | Dimensions | | | | | | | |
|-----------|-----------------|----------------------|--------------------|------|----|-----|-----|------|-----|
| | | a | | b | | c | | d | |
| | | in. | mm | in. | mm | in. | mm | in. | mm |
| V02 to V2 | VZ17 VZ30 | 5.5–13.0 5.5–16.9 | 140–330 140–430 | 0.60 | 15 | 2.4 | 60 | 0.17 | 4.2 |
| V3 to V4 | VZ18 VZ31 | 5.5–12.6 5.5–16.5 | 140–320 140–420 | 0.79 | 20 | 2.4 | 60 | 0.20 | 5.2 |
| V5 to V6 | VZ18 VZ31 | 6.5–13.8 6.5–17.7 | 165–350 165–450 | 1.20 | 30 | 3.9 | 100 | 0.28 | 7.0 |



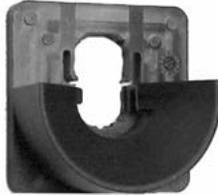
[8] Refer to Table 8.10 Metallic Enclosed Switches, page 8-4 and Table 8.12 Vario Manual Motor Control Switches, page 8-4 for horsepower ratings.

[9] When using these handles for replacements on the non-metallic enclosed switches, the handle shaft that comes with the enclosure must be reused. See Section 17 of the Supplemental Digest.

[10] The door interlock plate included with VCC Kits has the same drilling as the handle operators.



Shaft Extension Kit



Door Interlock Plate KZ32



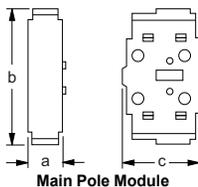
Add-On Contact Module



Terminal Shroud for Main Switch VZ8



Terminal Shroud for Auxiliary Contact VZ29



Main Pole Module

Mini-Vario and Vario™ Accessories

Table 8.18: Door Mounting Switch Body Dimensions

| Switch Type | Dimensions | | | | | | Weight Approx. lbs. |
|----------------|------------|----|------|----|------|-----|---------------------|
| | a | | b | | c | | |
| | in. | mm | in. | mm | in. | mm | |
| V02 to V2 [11] | 2.83 | 72 | 2.17 | 55 | 2.91 | 74 | 0.44 |
| V02 to V2 | 2.36 | 60 | 2.17 | 55 | 2.91 | 74 | 0.44 |
| V3 to V4 | 2.56 | 65 | 2.36 | 60 | 3.27 | 83 | 1.10 |
| V5 to V6 | 3.54 | 90 | 3.54 | 90 | 4.92 | 125 | 2.00 |

Table 8.19: Shaft Extension and Door Interlock

| Switch Type | Maximum Panel Depth | | Shaft Extension Kit | Door Interlock Plate | Door Mounting Plate |
|-------------|---------------------|-----|---------------------|----------------------|---------------------|
| | in. | mm | | | |
| V02 to V2 | 13.0 | 330 | VZ17 | KZ32 | KZ83 |
| V3, V4 | 12.6 | 320 | VZ18 | KZ74 | KZ81 |
| V5, V6 | 13.8 | 351 | VZ18 | KZ74 | KZ81 |
| V02 to V2 | 16.9 | 429 | VZ30 | KZ32 | KZ83 |
| V3, V4 | 16.5 | 419 | VZ31 | KZ74 | KZ81 |
| V5, V6 | 17.7 | 450 | VZ31 | KZ74 | KZ81 |

Table 8.20: Accessories

| Switch Type | Line Side Terminal Shroud For Main Switch | Terminal Shroud for Add-on Power Pole | Terminal Shroud for Auxiliary Contact |
|-------------|---|---------------------------------------|---------------------------------------|
| V02 to V2 | VZ8 | VZ26 | VZ29 |
| V3, V4 | VZ9 | VZ27 | VZ29 |
| V5, V6 | VZ10 | VZ28 | VZ29 |

Table 8.21: Add-On Contact Modules

| Switch Type | Main Pole Module | Main Pole | Ampere Rating UL/IEC | Auxiliary Contacts | |
|-------------|------------------|-----------|----------------------|----------------------|-----------|
| | | | | 1 N.O. & 1 N.C. [12] | 2 N.O. |
| V02 | VZ02 | VZ02 | 10/12 | VZ7 [13] | VZ20 [13] |
| V01 | VZ01 | VZ01 | 16/20 | | |
| V0 | VZ0 | VZ0 | 20/25 | | |
| V1 | VZ1 | VZ1 | 20/32 | | |
| V2 | VZ2 | VZ2 | 25/40 | | |
| V3 | VZ3 | VZ3 | 45/63 | | |
| V4 | VZ4 | VZ4 | 63/80 | | |
| V5 | — | — | — | | |
| V6 | — | — | — | | |

Table 8.22: Add-On Contact Modules

| Switch Type | Neutral Modules Early Make/Late Break | Grounding Module | Auxiliary Contacts | |
|-------------|---------------------------------------|------------------|--------------------|---------------------------------------|
| | Catalog No. | Catalog No. | Catalog No. | Description |
| V02-V2 | VZ11 | VZ14 | VZ7 | 1 Late Make N.O. & 1 Early Break N.C. |
| V3-V4 | VZ12 | VZ15 | VZ20 | 2 N.O. Contacts |
| V5-V6 | VZ13 | VZ16 | — | — |

Table 8.23: Labeling Accessories

| Nameplate Holder with Nameplate | | Nameplate Holder Only | Nameplate Only | |
|---------------------------------|-------------|-----------------------|----------------|-------------|
| Size | Catalog No. | Catalog No. | Use With | Catalog No. |
| 45 x 45 mm | KZ13 | KZ14 | KZ14 | KZ76 |
| 60 x 60 mm | KZ15 | KZ16 | KZ16 | KZ77 |
| 90 x 90 mm | KZ103 | KZ101 | KZ1010 | KZ100 |

Table 8.24: Shrouds

| Switch Type | 3-Pole Shroud | Single-Pole Shroud | |
|-------------|---------------|-------------------------|-------------|
| | Catalog No. | For Add-On Power Pole | Catalog No. |
| V02-V2 | VZ8 | VZ02-VZ2, VZ11 & VZ14 | VZ26 |
| V3-V4 | VZ9 | VZ23, VZ4, VZ12 & VZ15 | VZ27 |
| V5-V6 | VZ10 | VZ13 & VZ16 | VZ28 |
| — | — | For 2-Pole Aux. Contact | VZ29 |

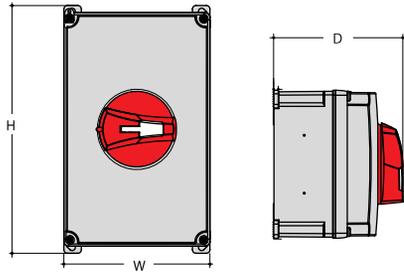
Table 8.25: Main Pole Module Dimensions

| Switch Type | Dimensions | | | | | | Weight Approx. lbs. |
|-------------|------------|----|-----|----|------|----|---------------------|
| | a | | b | | c | | |
| | in. | mm | in. | mm | in. | mm | |
| V02 to V22 | 0.63 | 16 | 2.9 | 74 | 1.38 | 35 | 0.10 |
| VZ3 to VZ4 | 0.79 | 20 | 3.3 | 83 | 1.80 | 46 | 0.22 |

[11] Dimensions for single-hole mounting.
[12] Early Break, Late Make.
[13] Auxiliary contacts are rated UL/IEC 10/12 A.

MD Motor Disconnect Switches

The MD motor disconnect switch is listed UL508 Suitable for Motor Control (UL File E164864) and conforms to IEC standard 60947-3. It is in a compact NEMA Type 4X enclosure suitable for use in NEMA Type 1, 3, 3R, 4, 4X, and 12 applications. The MD's key benefits are an extremely small footprint, a more economically efficient NEMA Type 4X solution and a handle interlock preventing cover removal when the switch is in the ON position.



MD Motor Disconnect Switch

Table 8.26: MD Motor Disconnect Switch—Non-Metallic NEMA Type 1, 3, 3R, 4, 4X, and 12 Enclosure [14][15][16]

| Amperes | Cat. No. | Maximum Horsepower Ratings | | | Height (in.) | Width (in.) | Depth (in.) |
|---------|----------|----------------------------|---------|-----|--------------|-------------|-------------|
| | | Three-Phase Vac | | | | | |
| | | 220–240 | 440–480 | 600 | | | |
| 30 | MD3304X | 7.5 | 20 | 25 | 6.38 | 3.9 | 4.37 |
| 60 | MD3604X | 20 | 40 | 40 | 8.27 | 4.94 | 4.37 |

Table 8.27: MD Motor Disconnect Accessories

| Cat. No. | Description |
|----------|--|
| MDSAN20 | 2 N.O. auxiliary contact module |
| MDSAN11 | 1 N.O. and 1 N.C. auxiliary contact module |
| MDS30P | 30 A add on power pole |

Example of the Parts to Build a Complete GS or LK Switch

Example of the parts to order to build a complete GS or LK switch:

Choose a Switch + Shaft + Handle Assembly + Lugs if needed



600 A, LK4SU3N



Shaft 320 mm, GS2AE6



Black Handle, GS2AH150



Lugs Kit, GS1AW503

Example:

LK4SU3N (600 A nonfusible switch, use 15x12 shaft) + **GS2AE6** (320 mm Type S shaft) + **GS2AH150** (black/ black, lockable)

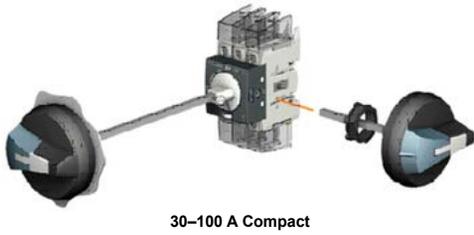
To add auxiliary contacts:

For front-mounted contacts order **LK4AD30N** (front-mounted auxiliary contact holder) + **GS2AM110**.

[14] See Table 8.20 Accessories, page 8-6.

[15] Complies with OSHA lockout/tagout requirements—accepts up to three 8 mm padlocks.

[16] Suitable for NEMA Type 1, 3R, 4, 4X, and 12 enclosure applications.



LK4 Nonfusible Disconnect Switches

Table 8.28: LK Nonfusible IEC Style Disconnect Switches

| Pole | Rating (A) | Catalog No. | Maximum Horsepower Rating | | | | Short Circuit Current Rating 600 Vac | | Shaft Style |
|------|------------|-------------|---------------------------|-------|-------|---------|--------------------------------------|---------|-------------|
| | | | 240 V | 480 V | 600 V | 250 Vdc | Fuse | SCCR kA | |
| 3 | 30 | LK4DU3CN | 10 | 20 | 30 | — | J | 100 | AL |
| 3 | 60 | LK4GU3CN | 20 | 40 | 50 | — | J | 100 | AL |
| 3 | 100 | LK4JU3CN | 20 | 50 | 50 | N/A | J | 100 | AL |
| 3 | 100 | LK4JU3N | 30 | 75 | 100 | 15 | J | 200 | B |
| 3 | 200 | LK4MU3N | 75 | 150 | 200 | 15 | J | 200 | B |
| 3 | 400 | LK4QU3N | 125 | 250 | 350 | 50 | J | 200 | B |
| 3 | 600 | LK4SU3N | 200 | 400 | 350 | 50 | J | 200 | D |
| 3 | 800 | LK4TU3N | 200 | 500 | 500 | — | L | 100 | D |
| 3 | 1000 | LK4UU3N | 200 | 500 | 500 | — | L | 100 | D |
| 3 | 1200 | LK4WU3N | 200 | 500 | 500 | — | L | 100 | D |

Table 8.29: Handles and Shafts for LK Switches

| Rating (A) | Handle | | | Shaft: 12.6 / 320 in. / mm | Shaft: 15.7 / 400 in. / mm | Shaft Guide [1] | Shaft Style |
|------------|---------------|-----------|-------------|----------------------------|----------------------------|-----------------|-------------|
| | Catalog No. | Type | Color | Catalog No. | Catalog No. | Catalog No. | |
| 30-100 | LK4AH110CN[2] | 1, 3R, 12 | Black | LK4AE12C-N | — | LK4AEAH12CN | AL |
| 30-100 | LK4AH120CN[2] | 1, 3R, 12 | Red/ Yellow | | | | |
| 30-100 | LK4AH410CN[2] | 4, 4X | Black | | | | |
| 30-100 | LK4AH420CN[2] | 4, 4X | Red/ Yellow | | | | |
| 100-400 | GS2AH130 | 1, 3R, 12 | Black | GS2AE2 | GS2AE21 | — | B |
| 100-400 | GS2AH140 | 1, 3R, 12 | Red/ Yellow | | | | |
| 100-400 | GS2AH430 | 4, 4X | Black | | | | |
| 100-400 | GS2AH440 | 4, 4X | Red/ Yellow | | | | |
| 600 | GS2AH150 | 4, 4X | Black | GS2AE6 | GS2AE61 | — | D |
| 600 | GS2AH160 | 4, 4X | Red/ Yellow | | | | |
| 800-1200 | GS2AH170 | 4, 4X | Black | | | | |
| 800-1200 | GS2AH180 | 4, 4X | Red/ Yellow | | | | |

Table 8.30: Auxiliary Contacts for LK Switches

| Switch Amperes | Catalog No. | Description |
|----------------|-------------|-------------------------------|
| 30-60 | MDSAN11 | Aux Contact 1 N.O. and 1 N.C. |
| 30-60 | MDSAN20 | Aux Contact 2 N.O. and 2 N.C. |
| 100-400 | LK4AD10N | Aux Contact 1 N.O. and 1 N.C. |
| 100-400 | LK4AD20N | Aux Contact 2 N.O. and 2 N.C. |
| 600-1200 | LK4AD30N | Aux Contact Holder |
| 600-1200 | GS2AM110 | Aux Contact 1 N.O. |
| 600-1200 | GS2AM101 | Aux Contact 1 N.C. |

Table 8.31: Terminal Shrouds for LK Switches

| Switch Amperes | Catalog No. | Description |
|----------------|-------------|---------------------------------------|
| 30-60 | LK4AP3CN | Shroud Top and Bottom, 3-Pole |
| 100-200 | LK4AP33TN | Shroud Top LK4, 3-Pole, 100/200 A |
| 100-200 | LK4AP33BN | Shroud Bottom LK4, 3-Pole, 100/200 A |
| 400 | LK4AP53TN | Shroud Top LK4, 3-Pole, 400 A |
| 400 | LK4AP53BN | Shroud Bottom LK4, 3-Pole, 400 A |
| 600 [3] | LK4AP63N | Shroud Bottom LK4, 3-Pole, 600 A |
| 800-1200 [3] | LK4AP83N | Shroud Bottom LK4, 3-Pole, 800-1200 A |

GS2 Fusible Disconnect Switches

Table 8.32: GS Fusible IEC Style Disconnect Switches

| Pole | Rating (A) | Catalog No. | Maximum Horsepower Rating | | | | Short Circuit Current Rating 600 Vac | | Shaft Style |
|------|------------|-------------|---------------------------|-------|-------|---------|--------------------------------------|---------|-------------|
| | | | 240 V | 480 V | 600 V | 250 Vdc | Fuse | SCCR kA | |
| 3 | 30 | GS1DDU3 | 7.5 | 15 | 20 | 5 | CC | 100 | AG |
| 3 | 30 | GS1DU3 | 7.5 | 15 | 20 | 5 | J | 100 | AG |
| 3 | 30 | GS2EEU3 | 7.5 | 15 | 20 | 5 | CC | 100 | B |
| 3 | 30 | GS2EU3N | 7.5 | 15 | 20 | 5 | J | 100 | B |
| 3 | 60 | GS2GU3N | 15 | 30 | 50 | 10 | J | 100 | B |
| 3 | 100 | GS2JU3N | 30 | 60 | 75 | 20 | J | 200 | B |
| 3 | 200 | GS2MU3N | 60 | 125 | 150 | 40 | J | 200 | B |
| 3 | 400 | GS2QU3N | 125 | 250 | 350 | 50 | J | 200 | B |
| 3 | 600 | GS2SU3 | 200 | 500 | 500 | — | J | 200 | C |
| 3 | 800 | GS2TU3 | 200 | 500 | 500 | — | J | 200 | C |



[1] Optional on shafts for LK4DU3CN, LK4GU3CN and LK4JU3CN.
[2] For use on switches ending with CN only.
[3] 600-1200 A standard with top shroud.



Table 8.33: Handles and Shafts for GS Switches [4]

| Rating (A) | Handle | | | Shaft: 12.6 in. (320 mm) | Shaft: 15.7 in. (400 mm) | Shaft Guide | Shaft Style |
|------------|-------------|-----------|------------|--------------------------|--------------------------|--------------|-------------|
| | Catalog No. | Type | Color | Catalog No. | Catalog No. | | |
| 30-60 | GS2AH110 | 1, 3R, 12 | Black | GS2AE8 | GS2AE81 | LKN4AEA-H12C | AG |
| 30-60 | GS2AH120 | 1, 3R, 12 | Red/Yellow | | | | |
| 30-60 | GS2AH410 | 4, 4X | Black | | | | |
| 30-60 | GS2AH420 | 4, 4X | Red/Yellow | | | | |
| 30-400 | GS2AH130 | 1, 3R, 12 | Black | GS2AE2 | GS2AE21 | — | B |
| 30-400 | GS2AH140 | 1, 3R, 12 | Red/Yellow | | | | |
| 30-400 | GS2AH430 | 4, 4X | Black | | | | |
| 30-400 | GS2AH440 | 4, 4X | Red/Yellow | GS2AE5 | GS2AE51 | — | C |
| 600-800 | GS2AH150 | 4, 4X | Black | | | | |
| 600-800 | GS2AH160 | 4, 4X | Red/Yellow | | | | |

NOTE: Hole adapter kit for GS1 to GS2 Handles: GS2AH100T0200.

Table 8.34: Auxiliary Contacts for GS Switches [5]

| Switch Amperes | Catalog No. | Description |
|----------------|-------------|--------------------|
| 30-800 | GS1AM110 | Aux Contact 1 N.O. |
| 30-800 | GS1AM101 | Aux Contact 1 N.C. |
| 30 | GS1AD10 | Aux Contact Holder |

Auxiliary Contacts
GS1AD10 + GS2AM110



Shorting Links

Table 8.35: Shorting Links

| For use on: | Shorting Links per Kit | Catalog No. |
|----------------|------------------------|-------------|
| GS2, 60 A | 3 | GS1AU203 |
| GS2, 100 A | 3 | GS1AU303 |
| GS2, 200 A | 3 | GS1AU403 |
| GS2, 400 A | 3 | GS1AU503 |
| GS2, 600-800 A | 3 | GS1AU803 |

Table 8.36: NFPA79 Kit

| For Use With: | Description | Kit Part Number |
|--------------------------------------|---|-----------------|
| GS2Q3N | NFPA 79 Internal Handle Kit 400 A Switch Shaft | GS2AD040N |
| GS2GU3N, GS2GLU3N, GS2JU3N, GS2JLU3N | NFPA 79 Internal Handle Kit 60-200 A Switch Shaft | GS2AD030N |
| GS1DDU3, GS1DU3 | NFPA 79 Internal Handle Kit for 5 mm Shafts | GS1AD010 |

Table 8.37: Terminal Shrouds for GS Switches, Line or Load [6]

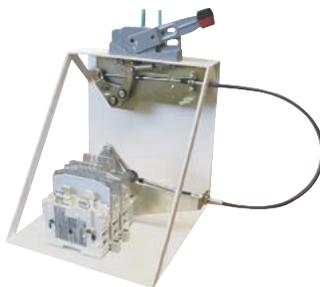
| Switch Amperes | Catalog No. | Description |
|----------------|-------------|------------------------|
| 30-100 | — | Standard on product |
| 200 | GS2AP43 | GS2, 3-Pole, 200 A |
| 400 | GS2AP53 | GS2, 3-Pole, 400 A |
| 600-800 | GS2AP73 | GS2, 3-Pole, 600-800 A |

New!

Cable Operator Kits for GS2 Switches

Table 8.38: Cable Operator Kits for GS2 Switches [7]

| Catalog No. | Description |
|-------------|--|
| GSAH36F | 36 in. Cable Operator Kits for GS2 Switches |
| GSAH60F | 60 in. Cable Operator Kits for GS2 Switches |
| GSAH120F | 120 in. Cable Operator Kits for GS2 Switches |
| GSAH144F | 144 in. Cable Operator Kits for GS2 Switches |
| GSAH180F | 180 in. Cable Operator Kits for GS2 Switches |



Flange Handle
Cable Operator Kit

[4] GS2AH100T0200-GS1 to GS2 Handle Adapter if using GS1 holes.

[5] GS1DU3 and GS1DDU3 switches allow up to 4 auxiliary contacts without adding contact holder GS1AD10. For more than 4 contacts, GS1AD10 is required.

[6] Order one terminal shroud per side. For example, order one terminal shroud for either the line side or load side; order two terminal shrouds for both the line side and load side.

[7] Compatible with GS Switches up to 200 A. Does not include handle. For Handle, see Table 1.43.



Terminal Lugs

Accessories

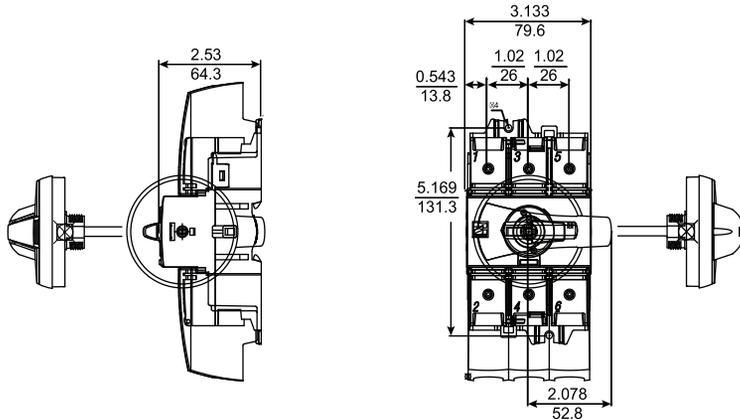
Table 8.39: Terminal Lugs

| For Use On: | Rating | No. of Wires per Lug | No. of Lugs per Terminal | Lug Size (AWG) | Wire Type | Lugs per Kit | Lug Kit Catalog Number |
|-------------|--------|----------------------|--------------------------|-----------------|-----------|--------------|------------------------|
| LK4DU3CN | 30 | 1 | 1 | #12-2/0 | Cu | — | Standard |
| LK4GU3CN | 60 | 1 | 1 | #12-2/0 | Cu | — | Standard |
| LK4JU3N | 100 | 1 | 1 | 6-300 kcmil | Cu/Al | 6 | GS1AW403 |
| LK4MU3N | 200 | 1 | 1 | 6-300 kcmil | Cu/Al | 6 | GS1AW403 |
| LK4QU3N | 400 | 2 | 1 | 350 MCM-6 | Cu/Al | 6 | GS1AW603 |
| | | 1 | 1 | 600 MCM-4 | Cu/Al | 6 | GS1AW606 |
| | | 2 | 1 | 250 MCM-1/0 | Cu/Al | 6 | GS1AW606 |
| LK4SU3N | 600 | 2 | 1 | 2 x 2-600 kcmil | Cu/Al | 6 | GS1AW503 |
| LK4TU3N | 800 | 2 | 2 | 2 x 2-600 kcmil | Cu/Al | 12 | GS1AW903 |
| LK4U3N | 1000 | 2 | 2 | 2 x 2-600 kcmil | Cu/Al | 12 | GS1AW903 |
| LK4WU3N | 1200 | 2 | 2 | 2 x 2-600 kcmil | Cu/Al | 12 | GS1AW903 |
| GS1DDU3 | 30 | 1 | 1 | #14-#10 | Cu | — | Standard |
| GS1DU3 | 30 | 1 | 1 | #14-#10 | Cu | — | Standard |
| GS2EEU3 | 30 | 1 | 1 | #14-#10 | Cu | — | Standard |
| GS2EU3N | 30 | 1 | 1 | #14-#6 | Cu | — | Standard |
| GS2GU3N | 60 | 1 | 1 | #10-#6 | Cu | — | Standard |
| GS2JU3N | 100 | 1 | 1 | #12-#1 | Cu | — | Standard |
| GS2MU3N | 200 | 1 | 1 | 6-300 kcmil | Cu/Al | 6 | GS1AW403 |
| GS2QU3N | 400 | 2 | 1 | 350 MCM-6 | Cu/Al | 6 | GS1AW603 |
| | | 1 | 1 | 600 MCM-4 | Cu/Al | 6 | GS1AW606 |
| | | 2 | 1 | 250 MCM-1/0 | Cu/Al | 6 | GS1AW606 |
| GS2SU3 | 600 | 2 | 1 | 2 x 2-600 kcmil | Cu/Al | 6 | GS1AW503 |
| GS2TU3 | 800 | 2 | 1 | 2 x 2-600 kcmil | Cu/Al | 6 | GS1AW503 |

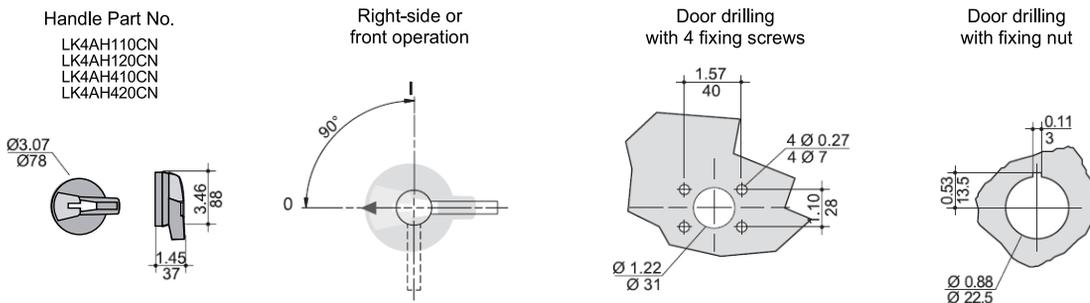
Table 8.40: Power Distribution Lugs GS1 or GS2 Only

| For Use On: | Rating | No. of Wires per Lug | Lug Size (AWG) | Wire Type | Lugs per Kit | Lug Kit Catalog No. |
|-------------|--------|----------------------|----------------|-----------|--------------|---------------------|
| GS1JU3 | 100 | 6 | #14-#6 | Cu | 3 | GS1AW306 [8] |
| GS2MU3N | 200 | 12 | #14-#4 | Cu | 3 | GS1AW406 |
| GS2QU3N | 400 | 12 | #14-#4 | Cu | 3 | GS1AW406 |
| GS2MU3N | 200 | 6 | #12-2/0 | Cu | 3 | GS1AW506 |
| GS2QU3N | 400 | 6 | #12-2/0 | Cu | 3 | GS1AW506 |

LK4DU3CN and LK4GU3CN, 30-100 A Compact Nonfusible Disconnect Switches

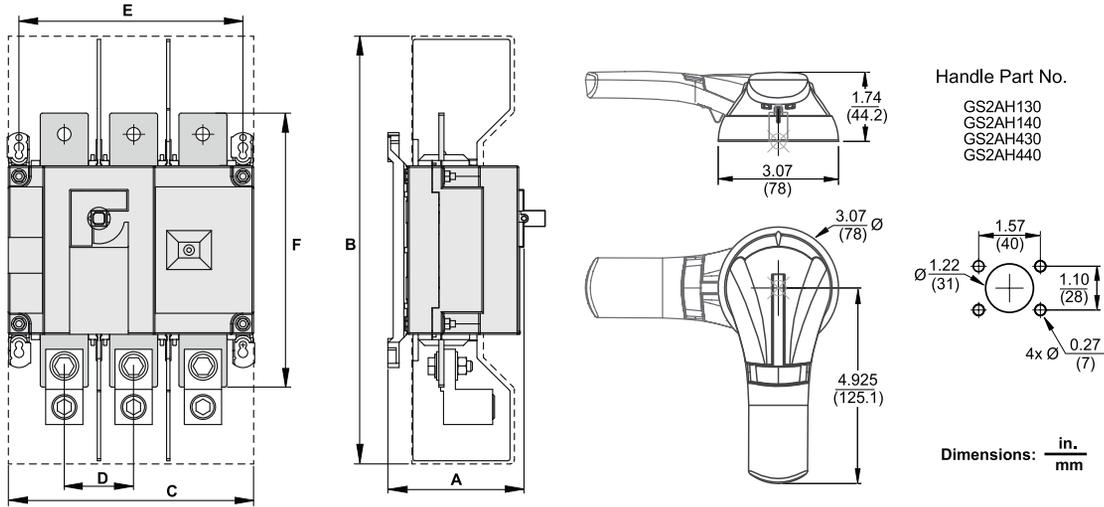


Handle for 30-100 A Compact Nonfusible Disconnect Switches



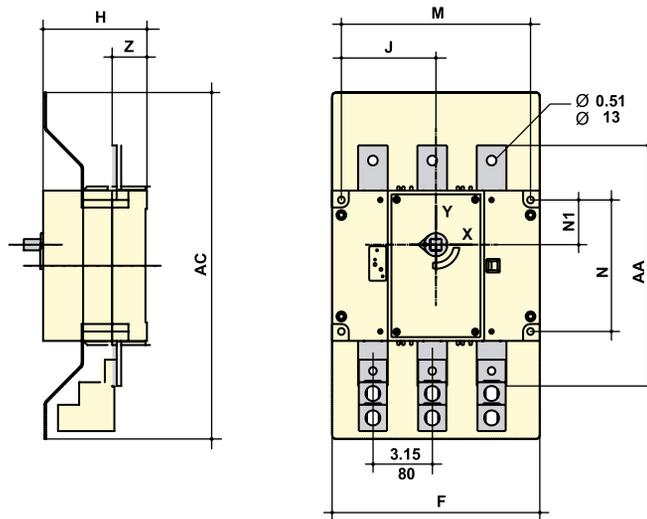
[8] Cannot be used on GS2JU3N.

LK4JU3N / LK4MU3N / LK4QU3N, 100–400 A Nonfusible Disconnect Switches—Dimensions



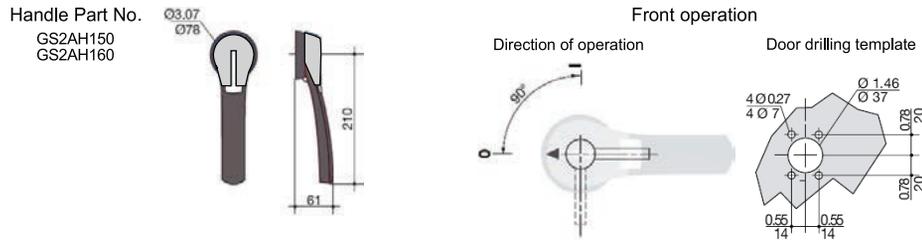
| Rating (A) | Dimensions = in. (mm) | | | | | |
|------------|-----------------------|------------|-------------|-----------|------------|------------|
| | A | B | C | D | E | F |
| 100–200 | 3.72 (94.6) | 10.1 (256) | 7.09 (1.80) | 1.97 (50) | 6.3 (160) | 6.3 (160) |
| 400 | 4.92 (128) | 16 (406) | 9.05 (230) | 2.56 (65) | 8.26 (210) | 10.2 (260) |

LK4SU3N, 600 A Nonfusible Disconnect Switches—Dimensions



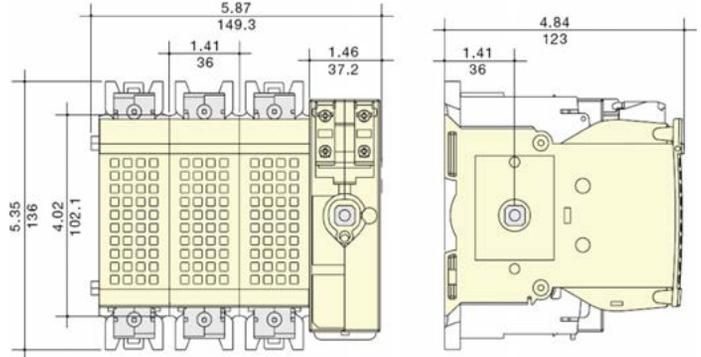
| Rating (A) | Dimensions = in. (mm) | | | | | | | | |
|------------|-----------------------|----------|-----------|-------------|-------------|------------|-------------|------------|-----------|
| | AC | F | H | J | M | N | N1 | AA | Z |
| 600 | 18.12 (460) | 11 (280) | 5.5 (140) | 5.0 (127.5) | 10.03 (255) | 6.88 (175) | 2.34 (59.5) | 12.6 (320) | 1.85 (47) |

Handle for 600 A and 800 A Fusible Disconnect Switches

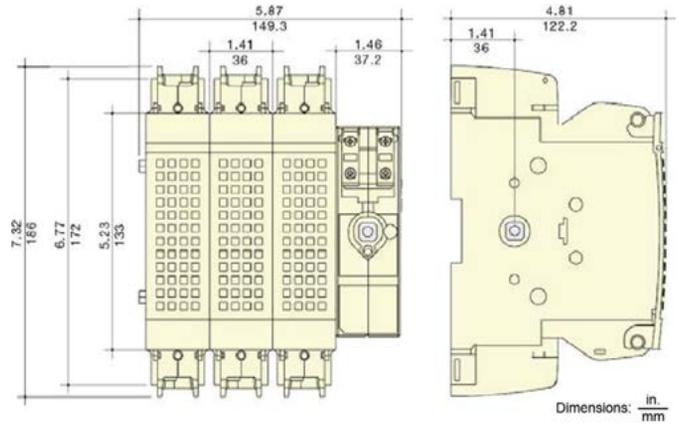


| Rating (A) | Dimensions = in. (mm) | | | | | | | |
|------------|-----------------------|-------------|-------------|-----------|-------------|----------|------------|-------------|
| | F | H | J | J1 | N | N1 | AA | Z |
| 30 / CC | 3.78 (96) | 3.28 (83.5) | 1.47 (37.5) | 0.59 (15) | 3.13 (79.5) | 1 (25.5) | 4.56 (116) | 1.12 (28.5) |
| 30 / J | 4.13 (105) | 3.89 (99) | 1.47 (37.5) | 0.59 (15) | 3.13 (79.5) | 1 (25.5) | 4.56 (116) | 1.12 (28.5) |

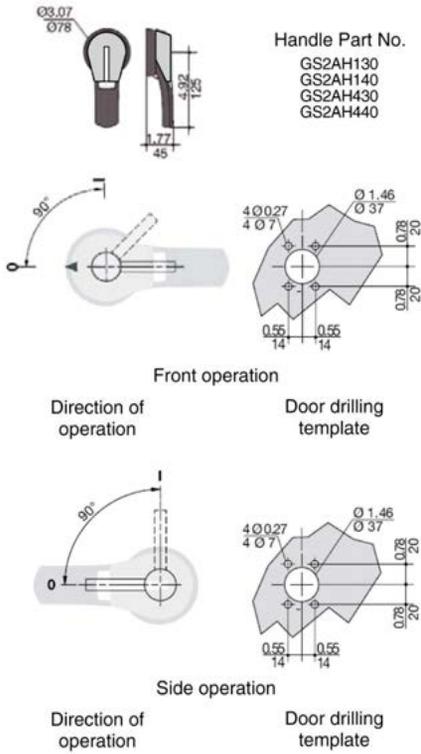
GS2GU3N, 60 A Fusible Disconnect Switches, Class J Fuses



GS2JU3N, 100 A Fusible Disconnect Switches, Class J Fuses



Handle for 100 A, 200 A, and 400 A Fusible Disconnect Switches



Disconnect Switches

The 9422 disconnect switches are the ideal selections for the PV String Combiner Box's internal disconnect switch and control panel applications. These switches are designed for variable depth, flange mounting, traditional side mounting and bracket mounting applications providing complete flexibility in the PV string combiner box designs. The switches are compatible with 9422A handle operators and 9423 door mechanisms and are UL98 recognized (E52369 Vol. 1, Sec. 18) and CSA certified. See [Accessories](#), page 8-16, [Dimensions](#), page 8-19, and [Disconnect Switches—400 A Type TG](#), page 8-20 for dimensional information.

Table 8.41: 9422 Disconnect Switches, Flange Mounted and Variable Depth

| Disconnect Switch Size | Variable Depth Min.–Max. (in.) | Maximum Horsepower Ratings | | | | | | Fuse Type | Fuse Clip Rating (Ampere) Non-Interchangeable Type For Class H, J, K or R Fuses | | Switch and Operating Mechanism Only, Does Not Include Handle Mechanism | Switch for Use With Cable Operators ONLY, Does Not Include Handle Mechanism or Cable Operator [1] | Switch and Operating Mechanism and Handle Mechanism, Overpacked[2] | | | |
|--------------------------|--------------------------------|--------------------------------|-----------|-----------|------------|-----|-----|------------|---|-------|--|---|--|--------------|-----------------------------------|-----------------------------------|
| | | AC Systems Volts (Motor Volts) | | | | Vdc | | | 250 V | 600 V | | | Cat. No. [3] | Cat. No. [3] | Includes Type A1 Handle Mechanism | Includes Type A2 Handle Mechanism |
| | | 208 (200) | 240 (230) | 480 (460) | 600 (57-5) | 250 | 600 | | | | | | | | Cat. No. [3] | Cat. No. [3] |
| 30 A | 6.625–18 | 7.5 | 7.5 | 15 | 20 | 5 | 15 | None | — | — | TCN30 | TCN30C | ATCN301 | ATCN302 | | |
| | | | | | | | | H, J, K, R | 30 | — | TCF30 | TCF30C | ATCF301 | ATCF302 | | |
| | | | | | | | | H, J, K, R | 60 | 30 | TCF33 | TCF33C | ATCF331 | ATCF332 | | |
| 60 A | 6.625–18 | — | 15 | 30 | 50 | 10 | 30 | None | — | — | TDN60 | TDN60C | ATDN601 | ATDN602 | | |
| | | | | | | | | H, J, K, R | 60 | 30 | TDF60 | TDF60C | ATDF601 | ATDF602 | | |
| | | | | | | | | H, J, K, R | — | 60 | TDF63 | TDF63C | ATDF631 | ATDF632 | | |
| 100 A | 6.625–18 | 25 | 30 | 60 | 75 | 20 | 50 | None | — | — | TEN10 | TEN10C | ATEN101 | ATEN102 | | |
| | | | | | | | | H, J, K, R | 100 | 100 | TEF10 | TEF10C | ATEF101 | ATEF102 | | |
| | | | | | | | | H, J, K, R | — | — | TF1 | — | ATF11 | ATF21 | | |
| 200 A | 9.12–19.25 [4] | 40 | 60 | 125 | 150 | 40 | 50 | H, J, K, R | 200 | 200 | TF2 | — | ATF12 | ATF22 | | |
| | | | | | | | | H, J, K, R | — | 400 | TF3 [5] | — | ATF13 [5] | ATF23 [5] | | |
| | | | | | | | | H, J, K, R | — | — | TF3 [5] | — | ATF13 [5] | ATF23 [5] | | |
| 400 A Fixed Depth [6] | 11.38 (A5 or A6 Handle) | 75 | 125 | 250 | 350 | 50 | 50 | None | — | — | TG1 [7][8] | — | For handle selection, see Table 8.42, page 8-16. | | | |
| 400 A Variable Depth [6] | 15.87–19 (A7 or A8 Handle) [9] | | | | | | | H, J, K, R | 400 | 400 | TG2 [7][10] | — | | | | |

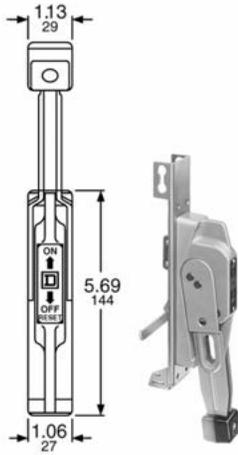


The 9422 Bracket Mount Disconnect Switch is designed for combiner boxes and control panel applications. The Bracket Mount Disconnect Switch is shipped with the switch and external handle assembled to a bracket, ready for quick installation. A protective trim plate is provided to prevent any mounting screws from being accessible from the front. The trim plate also provides an attractive installation feature. The switches are fully compatible with the 9423 closing mechanisms.

Table 8.42: 9422 Bracket Mounted Disconnect Switches

| Disconnect Switch Size | Maximum Horsepower Rating | | | | | | Fuse Type | Fuse Clip Rating (A) Non-Interchangeable Type for Class H, J, K, or R Fuses | | Switch and Operating Mechanism Only | |
|------------------------|---------------------------|-----------|-----------|-----------|-----|-----|------------|---|-------|-------------------------------------|---------------|
| | AC Systems (Motor Volts) | | | | Vdc | | | 250 V | 600 V | | Cat. No. [11] |
| | 208 (200) | 240 (230) | 480 (460) | 600 (575) | 250 | 600 | | | | | |
| 30 A | 7.5 | 7.5 | 15 | 20 | 5 | 15 | None | — | — | BTCN30 | |
| | | | | | | | H, J, K, R | 30 | — | BTCF30 | |
| | | | | | | | H, J, K, R | 60 | 30 | BTCF33 | |
| 60 A | 15 | 15 | 30 | 50 | 10 | 30 | None | — | — | BTDN60 | |
| | | | | | | | H, J, K, R | 60 | 30 | BTDF60 | |
| | | | | | | | H, J, K, R | — | 60 | BTDF63 | |
| 100 A | 25 | 30 | 60 | 75 | 20 | 50 | None | — | — | BTEN10 | |
| | | | | | | | H, J, K, R | 100 | 100 | BTEF10 | |
| | | | | | | | H, J, K, R | — | — | BTEF11 | |
| 200 A | 40 | 60 | 125 | 150 | 40 | 50 | None | — | — | TFB1 | |
| | | | | | | | H, J, K, R | 200 | 200 | TFB2 | |
| | | | | | | | H, J, K, R | — | 400 | TFB3 | |

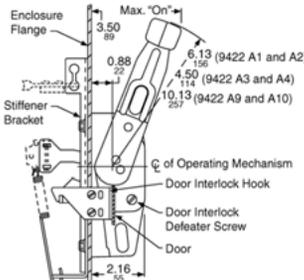
[1] See [Table 8.47 Cable Operators for 9422 Disconnect Switches](#), page 8-17 for ordering information for the cable operator.
 [2] Variable depth only — no cable operator.
 [3] For ordering use the suffix 9422, e.g., order TCN30 using catalog number 9422TCN30.
 [4] 9422 R2 will extend maximum mounting depth 7 inches, see [Table 8.52 Dimensions \(in. / mm\) for 200 A Type TF Disconnect Switches](#), page 8-19 for information.
 [5] Accommodates Class J fuses only.
 [6] Switches are fixed-depth or adjustable depending on handle selection.
 [7] Commercially available enclosures may not accept 9422TG1 and 2 operating mechanisms. Contact enclosure manufacturer for availability of enclosures for use with these switches.
 [8] Right hand flange mounting only and requires a special enclosure.
 [9] Variable in increments of 0.63 inches.
 [10] Right hand flange mounting only and requires a special enclosure.
 [11] For ordering use the suffix 9422, e.g., order BTCN30 using catalog number 9422BTCN30.
 [12] Space saving design—Type J fuses mounted on the non-fused bracket.



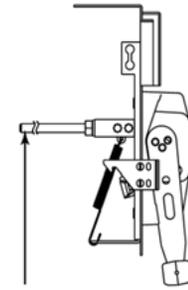
Type A1

Handle Information for 9422 Disconnect Switches

The Handle Mechanism Kit contains all parts needed to mount the handle to the flange of the enclosure. Two flange mounting methods are offered. For right or left hand flange mounting use Types A1–A4 and Types A9–A10 kits. For right-hand mounting only, use Type A5–A8 handles. The type AP1 and AP2 handles are used exclusively on the PowerPact™ M and P operating mechanisms, 9422 RM1 and 9422 CMP. The dimensions are identical to 9422 A1.



9422 A1, A2, A3, A4, A9, and A10 Handles



Rod used only on the variable-depth mechanism

Table 8.43: 9422 Disconnect Switch and Circuit Breaker Handle Mechanisms

| Handle Depth (in.) | NEMA Type 1, 3, 3R, 4, 12 Enclosures | NEMA Type 4, 4X Stainless Steel Enclosures |
|--------------------|--------------------------------------|--|
| | Cat. No. [13] | Cat. No. [13] |
| 4 [14] | A3 | A4 |
| 6 [14] | A1 | A2 |
| 6 [14] [15] | AP1 | AP2 |
| 10 [16] | A9 | A10 |
| 12 [17] [18] | A7 | A8 |

Accessories

Class R Fuse Kits

When installed, this kit rejects all fuses except Class R. The kits are available for field installation. With rejection kit and Class R fuses installed, the switch is UL component recognized for use on systems with fault current up to 200,000 RMS symmetrical amperes.

Table 8.44: Class R Fuse Kits

| Disconnect Switch Type | Switch Type | Fuse Clip Rating | | Class R Kit Cat No. |
|------------------------|-------------|------------------|-------|---------------------|
| | | 250 V [19] | 600 V | |
| 30 A | TCF30 | 30 | — | RFK03 [20] |
| | TCF33 | 60 | 30 | RFK06 [20] |
| 60 A | TDF60 | 60 | 30 | RFK06 [20] |
| | TDF63 | — | 60 | RFK06H [20] |
| 100 A | TEF10 | 100 | 100 | RFK10 [20] |
| 200 A | TF2 | 200 | 200 | 9999SR4 |
| | TF3 | 200 | 200 | 9999SR4 |
| 400 A | TG2 | 400 | 400 | 9999SR5 |

Electrical Interlocks for Disconnect Switches

Table 8.45: Electrical Interlocks

| Disconnect Switch Size | Switch Type | Electrical Interlocks |
|------------------------|------------------------------------|-----------------------|
| | | Cat No. [21] |
| 30 A 60 A 100 A | TCF, TCN, TDF, TDN, TEF, TEN | TC10 [22] |
| | | TC20 [23] |
| | BTCF, BTCN, BTDF, BTDN, BTEF, BTEN | TC11 [22] |
| TC21 [23] | | |
| 200 A | TF, ATF | R8 [22] |
| | TF, ATF | R9 [23] |
| 400 A | TG | R35 [22] |
| | TG | R36 [23] |

[13] For ordering use the suffix 9422, e.g., order A2 using catalog number 9422A2.
 [14] Use with 30–200 A 9422 switches and all circuit breaker mechanisms.
 [15] Use only with 9422 RM1, 9422 CMP and PowerPact M and P operating mechanisms.
 [16] Use with Type D2 remote or dual adapter kit. See [Remote or Dual Adapter Kit](#), page 8-27.
 [17] Use only with 400 A 9422TG1 and 9422TG2 disconnect switch.
 [18] Adjustable depth.
 [19] Use Discount Schedule DE1, not CP1.
 [20] Use Discount Schedule DE1 for price, not CP1.
 [21] For ordering use the suffix 9999, e.g., order TC10 using catalog number 9999TC10.
 [22] 1 N.C. or N.O. Contact depending on wiring.
 [23] 2 N.C. or N.O. or 1 N.O. or 1 N.C. Contact depending on wiring.



Internal Barrier Kits

Provides an additional barrier that helps prevent accidental contact with live parts. Field-installed transparent barriers do not restrict visual inspection of the switch. Barriers provide IEC529 IP2X "finger safe" protection when door of enclosed disconnect switch is open. A convenient door allows use of test probes without accessing fuses and replacement of fuses without removing barrier. Barrier must be used with the skirt kit to enclose a panel mounted 9422 disconnect.

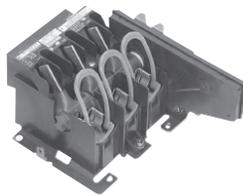
Table 8.46: Internal Barrier Kits

| Disconnect Switch Size | Barrier | Skirt |
|------------------------|---------------|--------------|
| | Cat. No. [24] | Cat No. [24] |
| 30 A | SS06 | SS0306SK |
| 60 A | SS06 | SS0306SK |
| 100 A | SS10 | SS10SK |

Cable Operators for 9422 Disconnect Switches

Table 8.47: Cable Operators for 9422 Disconnect Switches

| Switch Type | Cable Mechanisms [25] | | Cable Mechanisms with A1 Handle for NEMA Type 1, 3, 3R, 4, and 12 Enclosures |
|--|-----------------------|-----------|--|
| | Cable Length (inches) | Cat. No. | Cat. No. |
| TCN30C, TCF30C, TCF33C, TDN60C, TDF60C, TDF63C, TEN10C, TEF10C | 36 | 9422CFT30 | 9422CFT31 |
| | 48 | 9422CFT40 | — |
| | 60 | 9422CFT50 | 9422CFT51 |
| | 120 | 9422CFT10 | 9422CFT11 |



9422 TCN30

Table 8.48: Class 9422 Replacement / Retrofit Fuse Clip Kits

| Disconnect Switch Size | Switch Type | Fuse Type | Fuse Clip Rating (Amperes) | | Line and Load Fuse Clip Kit (includes load base and fuse pullers) |
|------------------------|-------------------------|------------|----------------------------|-------|---|
| | | | 250 V | 600 V | Type |
| 30 A | TCF30 TCN30 TCF33 | H, K, J, R | 30 | — | TC30 |
| | | | 60 | 30 | TC33 |
| 60 A | TDN60 | H, K, J, R | 60 | 30 | TC33 |
| | | | — | 60 | TD63 |

Table 8.49: Lug Data

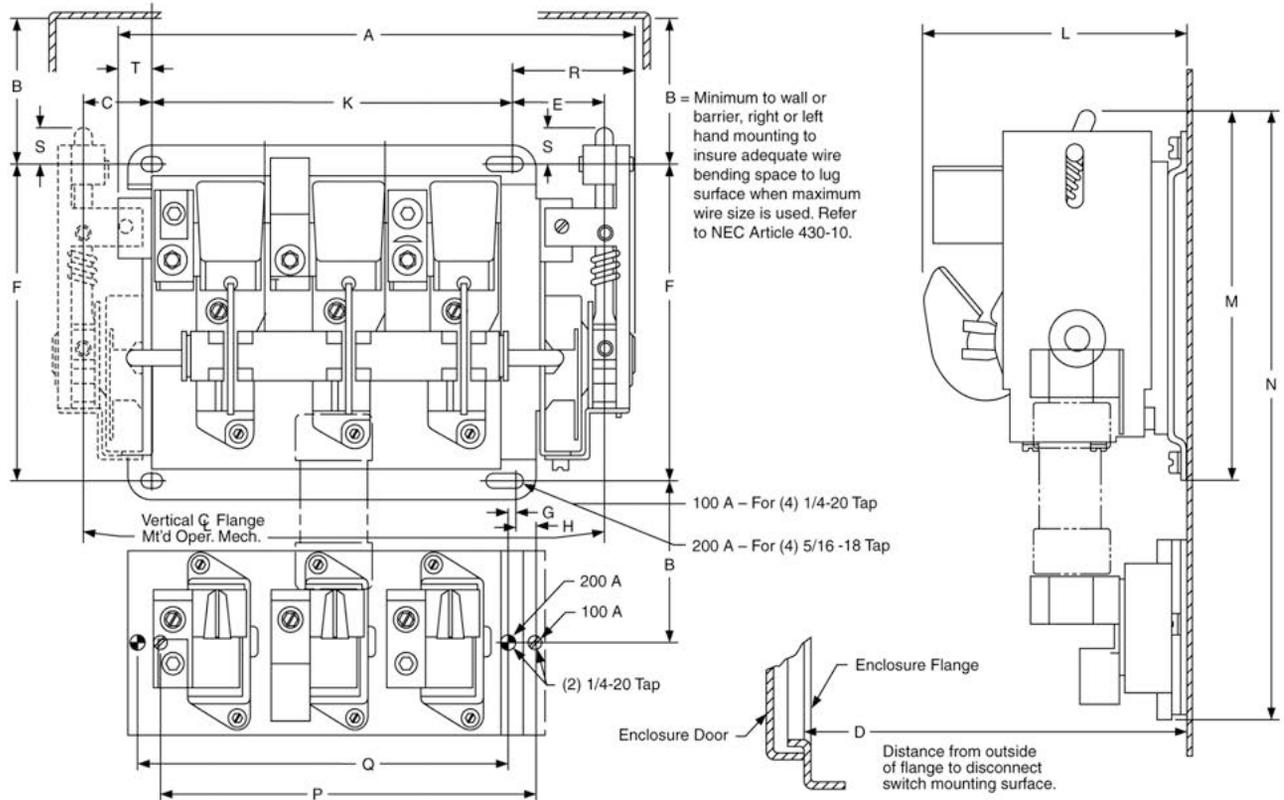
| Disconnect Switch Size | Wire Size (Min-Max) | | Lug Kits Copper | Lug Kits Al |
|------------------------|---------------------|---------------|-----------------|-------------|
| | Cu | Al | Cat No. | Cat No. |
| 30-60 A | #14-#2 | #10-#2 | CL0306F | AL0306F |
| 100 A | #10-#0 | #6-#0 | CL10F | AL10F |
| 200 A | #6-600 kcmil | #6-#600 kcmil | — | — |
| 400 A | #4-500 kcmil | — | — | — |

[24] Use Discount Schedule DE1 for price, not CP1.
[25] Purchase handle mechanism separately (9422A1, A2, A3, or A4).

Dimensions

Table 8.52: Dimensions (in. / mm) for 200 A Type TF Disconnect Switches

| Type | Switch Size | | A | B | C | D [27] | E | F | G | H | J | K | L | M | N | P | Q | R | S | T |
|------|-------------|------------------------------|--------------|-------------|------------|-----------------------|------------|-------------|-----------|---|-------------|-------------|-------------|-------------|--------------|---|-------------|------------|------------|------------|
| | (A) | Fuse Clips | | | | | | | | | | | | | | | | | | |
| TF1 | 200 | None | 13.33 339 | 9.38 238 | 1.64 42 | 9.12-19.25 232 489 | 2.33 59 | 8.00 203 | — | — | — | 9.44 240 | 6.50 165 | 9.53 242 | — | — | — | 3.14 80 | 1.03 26 | 0.75 19 |
| TF2 | 200 | Class J 200 A 600 V | 13.33 339 | 9.38 238 | 1.64 42 | 9.12-19.25 232 489 | 2.33 59 | 8.00 203 | 0.09 3 | — | 2.77 70 | 9.44 240 | 6.50 165 | — | 14.11 358 | — | 9.63 245 | 3.14 80 | 1.03 26 | 0.75 19 |
| TF2 | 200 | Class H, K, R 200 A 250 V | 13.33 339 | 9.38 238 | 1.64 42 | 9.12-19.25 232 489 | 2.33 59 | 8.00 203 | 0.09 3 | — | 4.14 105 | 9.44 240 | 6.50 165 | — | 15.48 393 | — | 9.63 245 | 3.14 80 | 1.03 26 | 0.75 19 |
| TF2 | 200 | Class H, K, R 200 A 600 V | 13.33 339 | 9.38 238 | 1.64 42 | 9.12-19.25 232 489 | 2.33 59 | 8.00 203 | 0.09 3 | — | 6.64 169 | 9.44 240 | 6.50 165 | — | 17.98 457 | — | 9.63 245 | 3.14 80 | 1.03 26 | 0.75 19 |
| TF3 | 200 | Class J 400 A 600 V | 13.33 339 | 9.38 238 | 1.64 42 | 9.12-19.25 232 489 | 2.33 59 | 8.00 203 | 0.09 3 | — | 2.77 70 | 9.44 240 | 6.50 165 | 9.53 242 | 18.53 471 | — | 9.63 245 | 3.14 80 | 1.03 26 | 0.75 19 |



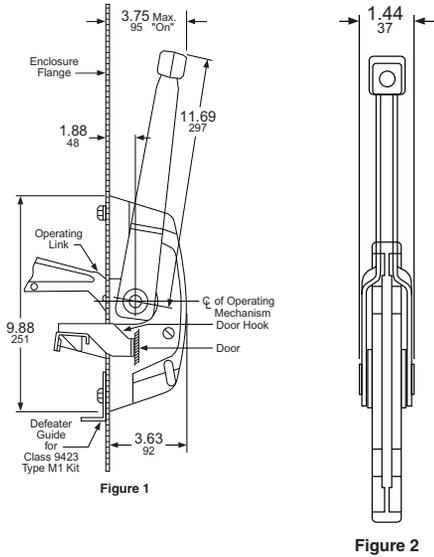
[27] The dimensions shown may be extended 7 in. by using 9422R2 (two required per switch).

Disconnect Switches—400 A Type TG

Outline Dimensions and General Location

400 A Disconnect Switches Nonfusible and Non-Interchangeable Fuse Clip Type Fusible Switches

Table 8.53: Handle Mechanism—Type A7 and A8



NOTE: Commercially available enclosures may not accept type TG operating mechanisms. Contact the enclosure manufacturer for availability of enclosures for use with these switches.

| Switch Type | B | X |
|-------------|--------------|--------------|
| TG1, 2 | 11.28 286 | 16.06 408 |

NOTE: B and X = Minimum to wall or barrier to ensure adequate wire bending space to lug surface when maximum wire size is used. Refer to NEC Article 430.10.

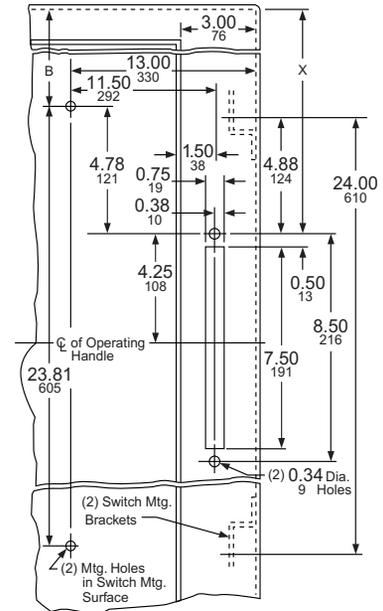


Table 8.54: Nonfusible and Fusible Switches

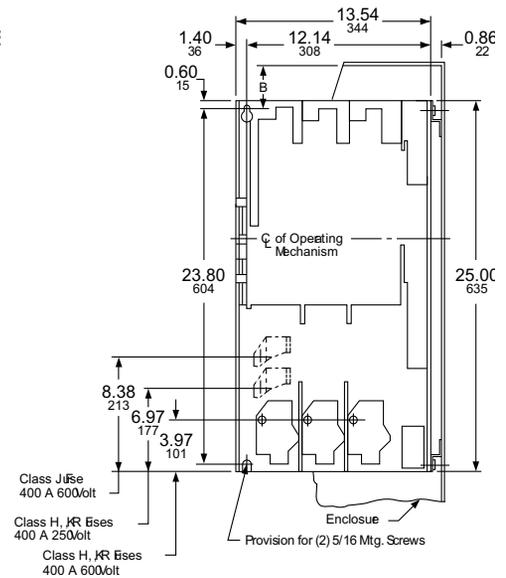
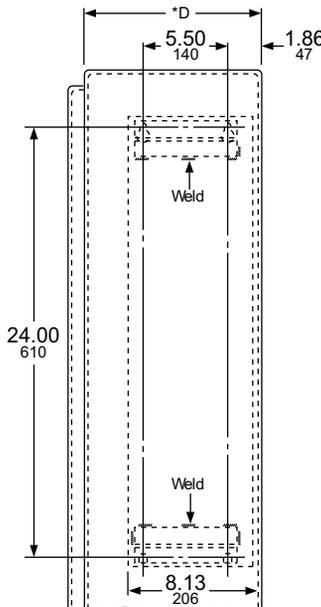
Dimension D = Distance from outside of flange to disconnect switch mounting surface.

For Type TG1 or TG2 with:

| Type A7 or A8 adjustable depth handle mechanism | D = | 15.87 403 | to | 19 483 |
|---|-----|--------------|----|-----------|
| In steps of | | 0.63 16 | | |

NOTE: Copper lugs are standard on all Type TG disconnect switches.

* D = Mounting depth measured from the switch mounting surface to the surface of flange.



Dim. = $\frac{\text{in.}}{\text{mm}}$

Type L Circuit Breaker Mechanisms

Type L door-mounted, variable depth operating mechanisms feature heavy duty, all metal construction with trip indication. All mechanisms can be padlocked in the "OFF" position when the enclosure door is open. Further, the handle assemblies can be locked "OFF" with up to three padlocks, which also locks the enclosure when the door is closed. (The 3" handle accepts one padlock.) Complete kits are rated for NEMA Type 1, 3R, and 12 enclosures. They include a handle assembly, operating mechanism, and shaft assembly.



9421 Type L
Circuit Breaker Mechanism

Table 8.55: Complete Kits

| Complete Kit Does Not Include Circuit Breaker | | | Includes: Operating Mechanism Standard 6 in. Handle Standard Shaft Kit | | Includes: Operating Mechanism Standard 6 in. Handle Long Shaft Kit | | Includes: Operating Mechanism Short 3 in. Handle Long Shaft Kit | |
|---|--------------|----------------|--|--------------------|--|--------------------|---|--------------------|
| Use With | | | Type | Mounting Depth [1] | Type | Mounting Depth [1] | Type | Mounting Depth [1] |
| Circuit Breaker or Interrupter Type | No. of Poles | Frame Size (A) | Type | Min. – Max. | Type | Min. – Max. | Type | Min. – Max. |
| NSF, PowerPact™ H and J | 2-3 | 250 | LJ1 | 5-1/2-10-3/4 | LJ4 | 5-1/2-21-3/8 | LJ3 | 5-1/2-21-3/8 |
| PowerPact D and L | 2-3 | 600 | LD1 | 7-1/4-12-1/16 | LD4 | 7-1/4-22-5/8 | | |
| PowerPact M and P [2] | 3 | 1200 | LW1 [4] | 9.00-12.50 | LW4 [5] | 9.00-23.50 | | |

3 in. handles are not recommended for use with these circuit breakers.

Table 8.56: Component Parts

| Use With | | | 3 in. Handle Assemblies Type 1, 3R, 12 | Standard Handle Assemblies Type 1, 3R, 12 | Operating Mechanism Includes Lockout | Standard Shaft (Support Bracket Not Required) | | Long Shaft (Support Bracket Included) | |
|-------------------------------------|--------------|----------------|--|---|--------------------------------------|---|------|---------------------------------------|------|
| Circuit Breaker or Interrupter Type | No. of Poles | Frame Size (A) | Type | Type | Type | Mounting Depth [1] | Type | Mounting Depth [1] | Type |
| | | | | | | Min. – Max. | | Min. – Max. | |
| NSF, PowerPact H & J | 2-3 | 250 | LH3 [6] | LH6 [6] | LJ7 | 5-1/2-10-1/4 | LS8 | 5-1/2-21-3/8 | LS13 |
| PowerPact D & L | 2-3 | 600 | [7] | LH6 [6] | LD7 | 7-1/4-12-1/16 | LS8 | 7-1/4-22-5/8 | LS13 |
| PowerPact M & P [2] | 3 | 1200 | [7] | LHP8 [6] | LW7 | 7-3/16-11-5/8 | LS8 | 7-3/16-22-1/4 | LS10 |



3 in. Handle Assembly



Standard Handle Assembly

Table 8.57: NEMA Type 4 and 4X Handle Assemblies

| Use With | | | Standard Handle Assemblies | | Special 3 in. Version | |
|-------------------------------------|--------------|----------------|----------------------------------|--|----------------------------------|--|
| Circuit Breaker or Interrupter Type | No. of Poles | Frame Size (A) | NEMA Type 1, 3R, 4, 12 (Painted) | NEMA Type 1, 3R, 4, 4X, 12 (Chrome Plated) | NEMA Type 1, 3R, 4, 12 (Painted) | NEMA Type 1, 3R, 4, 4X, 12 (Chrome Plated) |
| | | | Type | Type | Type | Type |
| NSF, PowerPact H and J | 2-3 | 250 | LH46 | LC46 | LH43 | LC43 |
| PowerPact D and L | 2-3 | 600 | LH46 | LC46 | | |
| PowerPact M and P | 3 | 1200 | LHP48 | LCP48 | | |

3 in. handles are not recommended for use with these circuit breakers.

Table 8.58: Auxiliary and Alarm Switches for PowerPact™ Circuit Breakers [8]

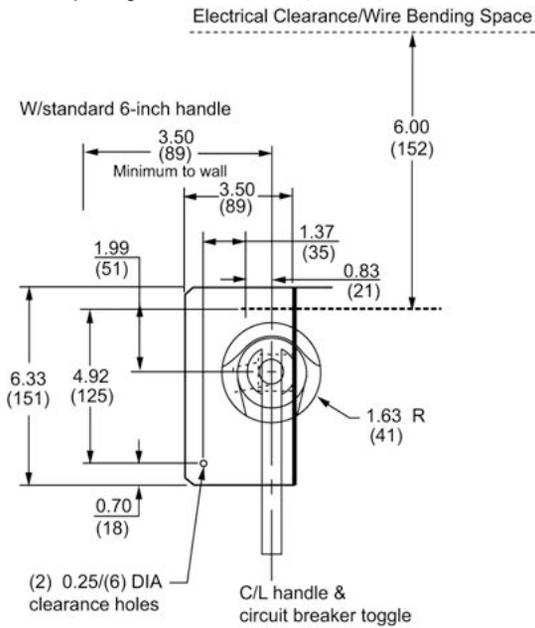
| Description | H- and J-Frame | D- and L-Frame | D- and L-Frame |
|--------------------------|----------------|----------------|----------------|
| 1 Auxiliary Switch 1a 1b | S29450 | S29450 | S29450 |
| 2 Auxiliary Switch 2a 2b | 2 x S29450 | 2 x S29450 | 2 x S29450 |
| 3 Auxiliary Switch 3a 3b | — | 3 x S29450 | 3 x S29450 |

NOTE: The location of the accessory in the circuit breaker determines its function.

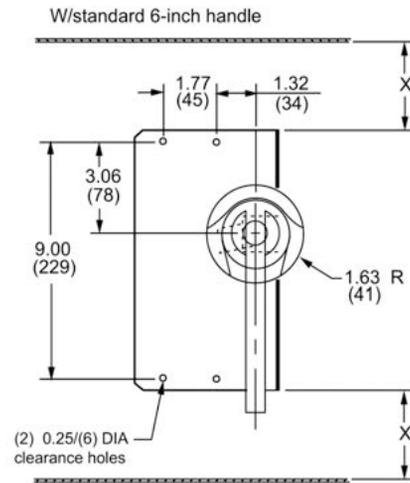
[1] Mounting depth measured in inches from circuit breaker mounting surface (control panel) to outside of enclosure door.
 [2] These circuit breaker operating mechanisms must use the 9421LHP** or LCP** handles only.
 [3] Type LW1 and LW4 include an 8 in. handle (9421LHP8) rather than a 6 in. handle.
 [4] Type LW1 and LW4 include an 8 in. handle (9421LHP8) rather than a 6 in. handle.
 [5] Type LW1 and LW4 include an 8 in. handle (9421LHP8) rather than a 6 in. handle.
 [6] For a red handle and yellow bezel, add suffix RY to catalog number, e.g., 9421LH6RY.
 [7] 3 in. handles are not recommended for use with these circuit breakers.
 [8] Discount Schedule: DE2.

Dimensions for Type L Operating Mechanisms

Panel Drilling for PowerPact™ H and J Circuit Breaker Operating Mechanisms: 9421LJ1, 9421LJ4, and 9421LJ7

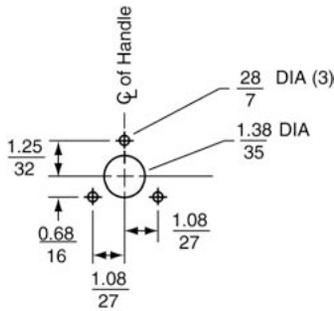


Panel Drilling for PowerPact™ D and L Circuit Breaker Operating Mechanisms: 9421LD1, 9421LD4, and 9421LD7

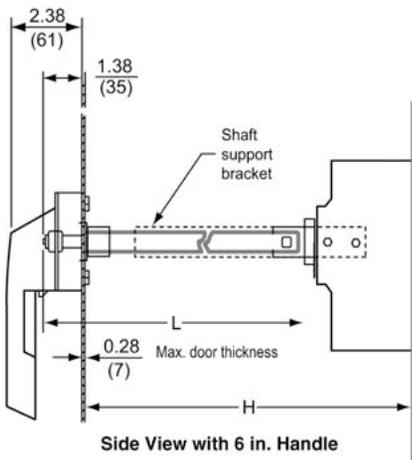
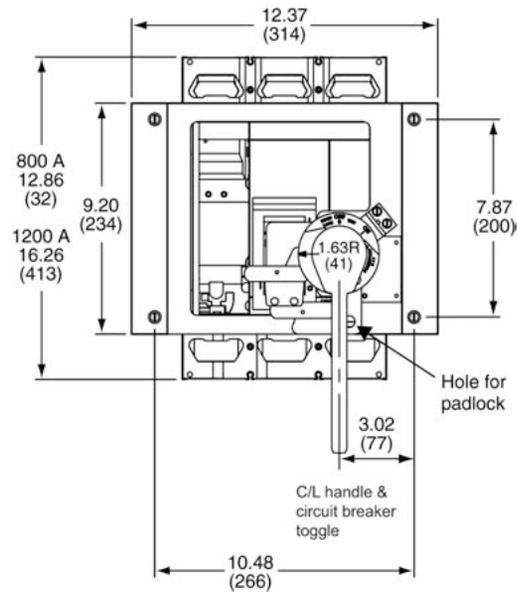


X: Minimum to wall or barrier to insure adequate wire bending space to lug surface when the maximum wire size is used. Refer to NEC 430-10.

Panel Drilling for PowerPact™ M and P Circuit Breaker Operating Mechanisms: 9421LW1, 9421LW4, and 9421LW7



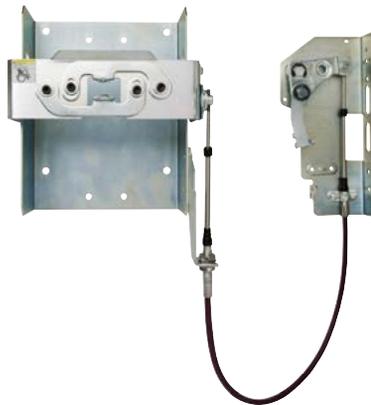
Door Drilling Dimensions



Side View with 6 in. Handle

Table 8.59: Shaft Cutting Dimensions

| Class | Type | Shaft Length Formula | H = Standard Shaft | | H = Long Shaft | |
|-------|---------------|----------------------|--------------------|--------------|----------------|--------------|
| | | | Min. | Max. | Min. | Max. |
| 9421 | LJ1, LJ4, LJ7 | L = H - 3.0-0 76 | 5.5 138 | 10.75 273 | 5.5 138 | 21.63 543 |
| 9421 | LD1, LD4, LD7 | L = H - 4.2-5 108 | 7.25 184 | 12.06 306 | 7.25 184 | 22.63 575 |
| 9421 | LW1, LW4, LW7 | L = H - 4.8-9 124 | 7.19 183 | 11.63 295 | 7.19 183 | 22.25 565 |



Flexible Cable Mechanism
9422CSJ30

Flexible Cable Mechanisms

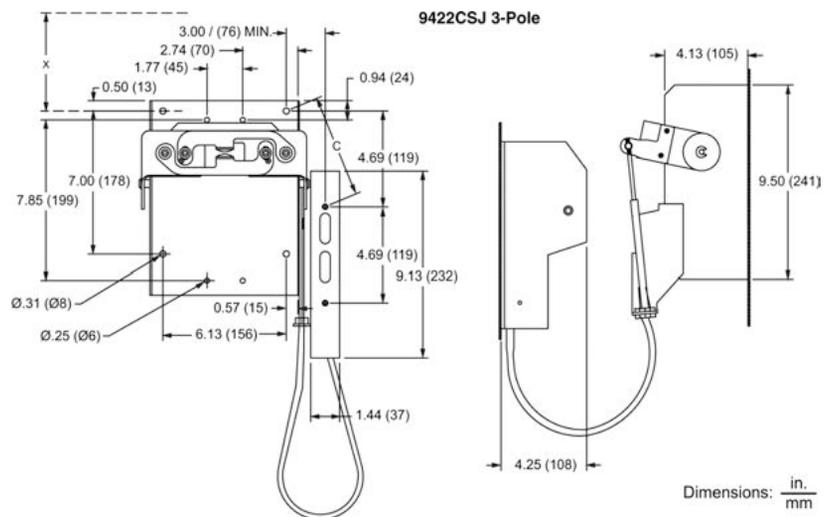
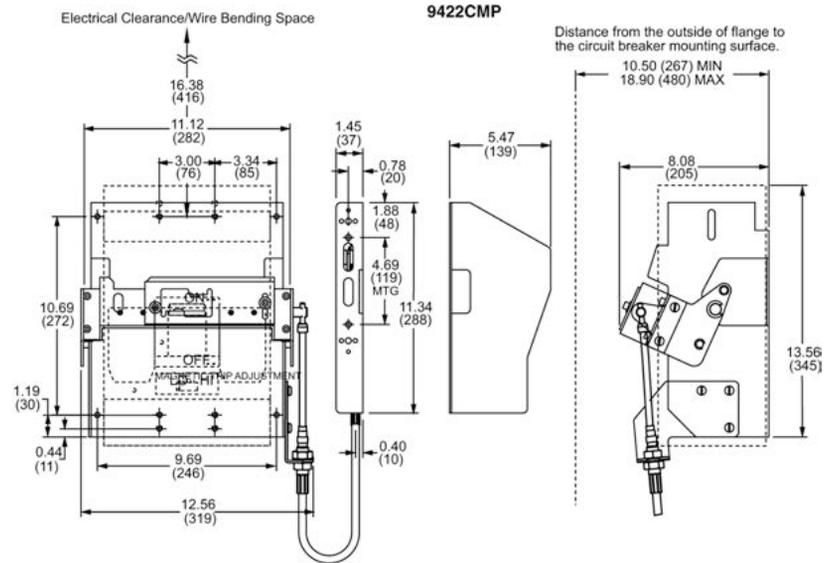
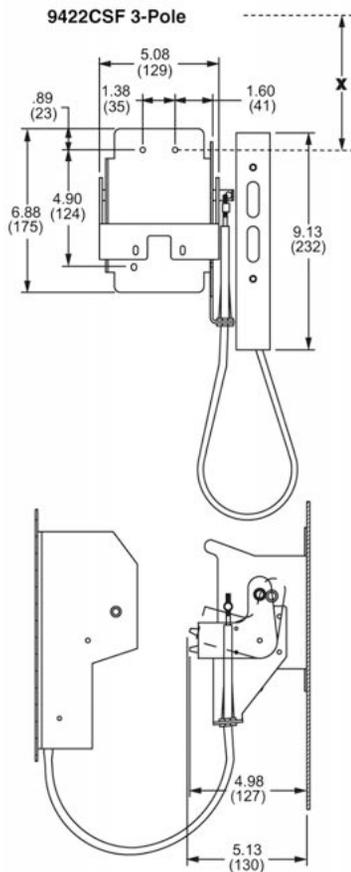
For use with Class 9422 handle operators specially designed for tall, deep enclosures where placement flexibility is required.

Table 8.60: Flexible Cable Mechanisms for use with Schneider Electric™ (formerly Merlin Gerin™) Circuit Breakers and PowerPact™ 3-Pole Circuit Breakers

| Circuit Breaker Type | No. of Poles | Frame Size (A) | Cable Mechanism | |
|---------------------------------|--------------|----------------|-----------------|--------|
| | | | Length | Type |
| MG-NSF PowerPact H- and J-Frame | 2-3 | 250 | 36 in. | CSF30 |
| | | | 60 in. | CSF50 |
| | | | 84 in. | CSF70 |
| | | | 120 in. | CSF10 |
| MG-NSF | 4 | 250 | 36 in. | CSF304 |
| | | | 60 in. | CSF504 |
| | | | 120 in. | CSF104 |
| MG-NSJ PowerPact D- and L-Frame | 3 | 600 | 36 in. | CSJ30 |
| | | | 60 in. | CSJ50 |
| | | | 120 in. | CSJ10 |
| MG-NSJ PowerPact D- and L-Frame | 4 | 600 | 36 in. | CSJ304 |
| | | | 60 in. | CSJ504 |
| | | | 120 in. | CSJ104 |
| PowerPact M- and P-Frame [9] | 3 | 1200 | 48 in. | CMP40 |
| | | | 50 in. | CMP50 |
| | | | 120 in. | CMP10 |

NOTE: Refer to NEC Article 430-10 for minimum dimension X from circuit breaker top mounting hole to wall or barrier to ensure adequate wire bending space.

NOTE: Bend radius in cable must never be less than 6 inches. Electrical clearances must be maintained between cable and live electrical parts.



Dimensions: $\frac{\text{in.}}{\text{mm}}$

[9] Must use 9422AP1 or 9422AP2 Handle with this operating mechanism.



Dual Cable Operating Mechanisms for Square D™ Circuit Breakers

Dual Cable Operating Mechanisms are designed for use with Square D brand PowerPact™ D, H, J, and L circuit breakers through 600 A frame sizes. The cable mechanisms allow for a single handle operator, Class 9422Ax, to operate both circuit breakers. The cable mechanism is designed especially for tall, deep enclosures where placement flexibility is required. There are numerous cable arrangements to choose from to accommodate many applications.

Features

- Separate cables for each circuit breaker
- Rugged metal flange handle operator
- Maximized flexibility of circuit breaker placement for existing and new applications
- Control panel can be fed from two separate supply voltages (if required)
- Dual mechanism allows both separate supply voltages to be controlled by a single handle to improve security features

Table 8.61: Dual Cable Operating Mechanisms Selection

| Circuit Breaker Type | Cable Length in. / mm (quantity) | Catalog Number | Frame Size (max.) |
|---------------------------|--|--------------------|-----------------------|
| PowerPact H & J MG NSF | 120 in. / 3048 mm (2) | 9422CSFD1 | 250 A |
| | 36 in. / 914 mm (1) 60 in. / 1524 mm (1) | 9422CSFD35 | |
| | 60 in. / 1524 mm (1-CSF 3 pole) 60 in. / 1524 mm (1-CSF 4 pole) | 9422CSFD345 | |
| | 36 in. / 914 mm (1) 120 in. / 3048 mm (1) | 9422CSFD31 | |
| | 36 in. / 914 mm (2) | 9422CSFD33 | |
| | 60 in. / 1524 mm (1) 120 in. / 3048 mm (1) | 9422CSFD51 | |
| PowerPact D & L MG NSJ | 60 in. / 1524 mm (2) | 9422CSFD55 | 600 A |
| | 60 in. / 1524 mm (2-CSJ) | 9422CSJD50 [10] | |
| | 120 in. / 3048 mm (2-CSJ) | 9422CSJD10 [10] | |
| | 60 in. / 1524 mm and 120 in. / 3048 mm (2-CSJ) | 9422CSJD51 [10] | |
| | 120 in. / 3048 mm (1-CSF) and 120 in. / 3048 mm (1-CSJ) | 9422CSJD10 | 250 A and 600 A |
| | 60 in. / 1524 mm (1-CSF) 60 in. / 1524 mm (1-CSJ) | 9422CSJD50 | |

Handle Mechanisms

These handle mechanism kits are used with the circuit breaker variable depth and cable operating mechanisms. The kits contain all parts necessary for mounting the handle to the flange of the enclosure. Types A1/AP1 to A4 are suitable for right or left-hand flange mounting.



Handle Mechanisms

Table 8.62: Handle Mechanisms

| Type of Handle | NEMA Type Enclosure | Type |
|----------------|-------------------------------|------|
| 6 in. | 1, 3, 3R, 4 (sheet steel), 12 | A1 |
| | 4, 4X (stainless) [11] | A2 |
| 6 in. [12] | 1, 3, 3R, 4 (sheet steel), 12 | AP1 |
| | 4, 4X (stainless) [11] | AP2 |
| 4 in. | 1, 3, 3R, 4 (sheet steel), 12 | A3 |
| | 4, 4X (stainless) [11] | A4 |

NOTE: See Handle Information, page 8-16 for dimensional information.

[10] Must use the 9422AP1 or 9422AP2 operating handle with this operating mechanism.
 [11] All external metal parts are either stainless steel or a chrome-plated non-ferrous die casting.
 [12] Must be used with 9422 RM1, 9422CMP, and 9422CSJD (dual cable mechanism) only.



**9422 Type R
Circuit Breaker Mechanism**

Flange-Mounted, Variable-Depth Operating Mechanisms

Designed for installation in custom built control enclosures where main or branch circuit protective devices are required. All circuit breaker operating mechanisms are suitable for either right- or left-hand flange mounting, convertible on the job. Selection of a 9422Ax handle is required to complete the operating mechanism.

Table 8.63: Variable-Depth Operating Mechanisms for Use with Schneider Electric™ (formerly Merlin Gerin™) Circuit Breakers

| Use with | | | | Operating Mechanism |
|--|--------------|--------------|--|---|
| Circuit Breaker Frame Size | No. of Poles | Frame Size A | Variable Depth Mtg. Range Min.-Max. (Inches) ^[13] | Operating Mechanism Only —Does Not Include Handle Mechanism Type |
| Schneider Electric (formerly Merlin Gerin) Circuit Breakers and PowerPact™ Frame 3-Pole Circuit Breakers | | | | |
| MG-NSF PowerPact H- and J-Frame | 2-3 | 250 | 5.88-17.75 | RQ1 |
| MG-NSJ PowerPact D-and L-Frame | 3 | 600 | 9.00-17.75 | RS1 |
| PowerPact M- and P-Frame ^[14] | 3 | 1200 | 10.50-18.38 | RM1 |

Table 8.64: Electrical Interlocks—Class 9999

| Description | Class | Type |
|---------------------------|-------|------|
| Single Pole, Double Throw | 9999 | R26 |
| Double Pole, Double Throw | 9999 | R27 |

[13] Class 9422 Type R2 will extend mounting depth 7 inches—not recommended for use with the 9422RM1 operating mechanism (see Table 8.43 9422 Disconnect Switch and Circuit Breaker Handle Mechanisms, page 8-16).

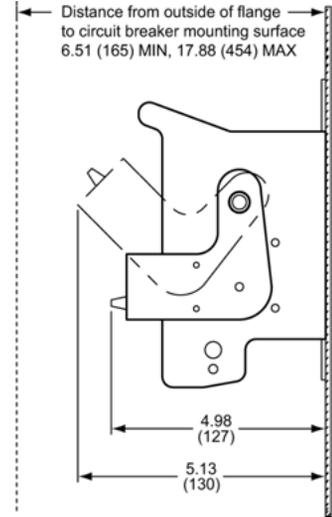
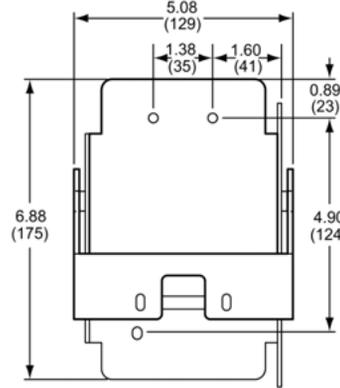
[14] These circuit breaker operating mechanisms must use the 9422APx handles.

Minimum to wall or barrier to insure adequate wire bending space to lug surface when the maximum wire size is used with standard lugs. Refer to NEC 430-10.

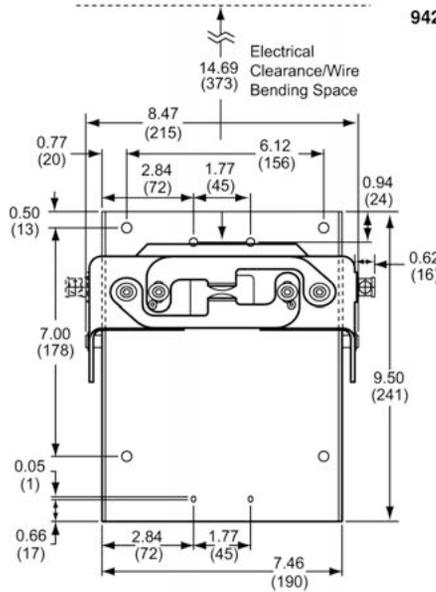
Dimensions: $\frac{\text{in.}}{\text{mm}}$

Dimensions

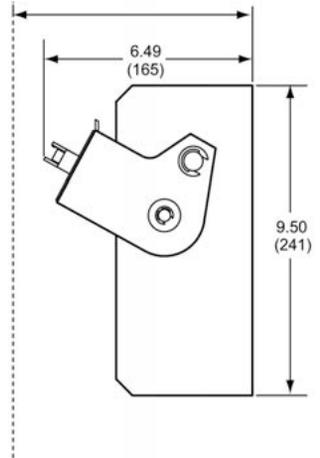
9422RQ1



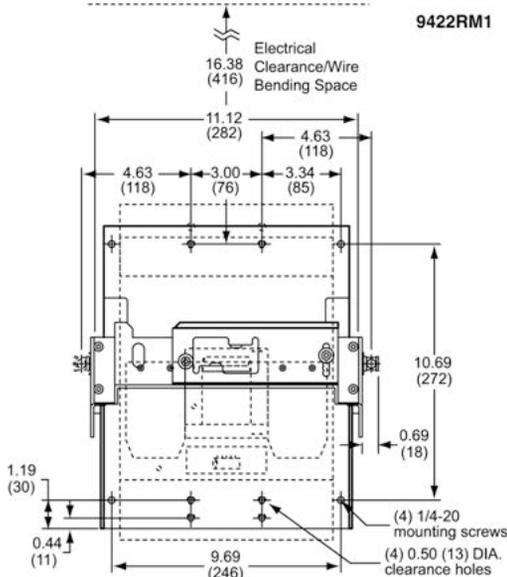
9422RS1



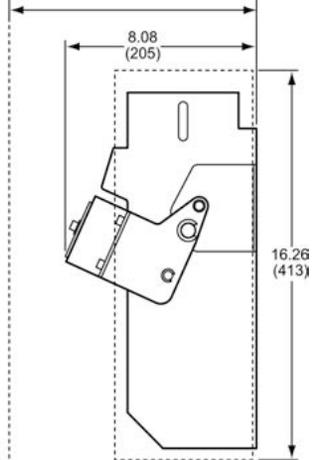
Distance from outside of flange to circuit breaker mounting surface
7.44 (189) MIN, 18.25 (464) MAX



9422RM1



Distance from outside of flange to circuit breaker mounting surface
10.50 (267) MIN, 18.90 (480) MAX



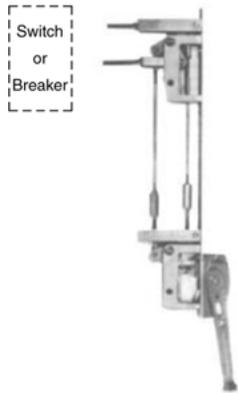
Remote or Dual Adapter Kit

For the remote or dual operation of 30, 60, 100, and 200 A disconnect switches.

Remote Operation—permits mounting the Class 9422 Type A9 or A10 handle mechanism at a lower level than the disconnect device it controls. This arrangement is often required where the disconnect device is mounted too high for personnel to easily reach a conventional operator.

Dual Operation—permits controlling two disconnect devices, one in line with and one remote from a single Class 9422 Type A9 or A10 handle mechanism.

NOTE: A Class 9422 Type A9 or A10 handle (see [Flange Mounted and Cable Operated](#), page 8-14) and the preferred mounting method **must** be used.



Remote operation shown (handle mechanism not included in kit)



Alternate Mounting Kit



Channel/Flange Support Kit



Auxiliary Lock Plate

Table 8.65: Disconnect Device

| Disconnect Device | Enclosure Mounting Depth | | Type |
|--------------------------|--------------------------|-------|------|
| | Min. | Max. | |
| Disconnect Switch | | | |
| 30 A Type TCF/TCN | 10.63 | 19.50 | D2 |
| 60 A Type TDF/TDN | 10.63 | 19.50 | |
| 100 A Type TEF/TEN | 12.13 | 20.25 | |
| 200 A Type TF | 13.13 | 20.81 | |

Table 8.66: Other Accessories

| Accessory | Description | Class | Type |
|--------------------------------------|--|-------|------|
| Alternate Mounting Kit | Permits mounting Class 9422 Type A1 or A2 handle mechanisms in enclosures with flange thickness of 16 gauge to 0.5 in. | 9422 | AM2 |
| Channel/Flange Support Kit | Auxiliary kit recommended for use with 30 and 60 A disconnect switches and PowerPact™, NSF, and NSJ circuit breaker mechanisms when these devices are to be mounted on the center channel of a multi-door enclosure or when extra rigidity for the flange is required. Supplied as standard with 100 and 200 A disconnect switches. | 9422 | C1 |
| Auxiliary Lock Plate | Auxiliary kit recommended for use with the Class 9422 Type A-1 flange handle to facilitate padlocking the handle in the "OFF" position. Primarily used when the handle is mounted on the center channel of a multi-door enclosure. Also in any case where the enclosure doors interfere with the normal padlock slot in the flange handle. Meets both the Automotive and NFPA 79 specifications. | 9422 | L1 |
| Special Lugs for Disconnect Switches | Copper Lugs only—Specify Form Y157 | — | — |
| | Tin Plated Aluminum Lugs for 400 A Type TG Switch—Specify Form Y1572 (000–750 kcmil Cu/Al wire) | — | — |
| | Anderson Type VCEL Compression Lugs—Specify Form Y1574 Exceptions: None of the 30 A or 60 A disconnect switches are available with compression lugs. | — | — |
| Operating Rods | Standard operating rod for use with Class 9422 variable depth mechanisms. Included as standard in each kit. | 9422 | R1 |
| | Extra long operating rod for use with Class 9422 variable depth mechanisms. Can be used as a substitute for the standard rod included in each kit to increase the maximum mounting depth 7 in. (Two are required for Types ARR, RR, ART, RT, ATE, TE, ATF, TF). | 9422 | R2 |

Door Closing Mechanisms

Class 9423 door closing mechanisms cover a range of enclosures with door openings up to a maximum of 91 in. high. The door closing mechanisms are designed to be used on control enclosures and interlocked with a Class 9422 disconnect device, although they all can be used independently. Three different systems are available, and their use is as recommended below. A complete system is available for interlocking all the doors of a multi-door enclosure with the master door when using the 6 in. or 8 in. vault handle mechanism.

Note that the “Master Door” is defined to be the door of a single or multi-door enclosure which is interlocked directly with the disconnect device. The master door can be hinged on either the right or left hand side. It can be located in any position on a multi-door enclosure. An “Auxiliary Door” is defined to be any remaining doors of a multi-door enclosure which are interlocked with the master door by means of the overhead interlocking system as illustrated on pages 8-29 and 8-30.

Selection Procedure

1. Determine enclosure construction (no. of doors, door height, hinge location, etc.).
2. Determine Class 9422 disconnect device to be used—either a disconnect switch or a circuit breaker mechanism.
3. Determine the location of the disconnect device and handle mechanism (right- or left-hand flange or center channel).
4. Select the door closing mechanism required.
5. Select the auxiliary door closing mechanisms and multi-door interlocking hardware, if required. (A complete system for interlocking all auxiliary doors of a multi-door enclosure with center channel is available for the medium and large enclosures.)

Table 8.67: Door Closing Mechanism

| 60 in. Maximum Door Opening (Recommended) | 46–60 in. Door Opening (Recommended) | 61–91 in. Door Opening (Recommended) |
|--|--|--|
|  <ul style="list-style-type: none"> • 2 Point Locking is Standard • A Third Roller Latch Kit is Available for 3 Point Locking • For 3/4 in. Door Depths |  <ul style="list-style-type: none"> • For use on Single or Multi-Door Enclosures • For use with Doors Hinged on Right or Left Side • Referred to as the 6 in. Vault Handle Mechanism • For 3/4 in. Door Depths |  <ul style="list-style-type: none"> • For use on Single or Multi-Door Enclosures • For use with Doors Hinged on Right or Left Side • Referred to as the 8 in. Vault Handle Mechanism • For 1-1/8 in. Door Depths |

Type M4 Latch bar not included, but most prepunched enclosures that accept Square D™ operating mechanisms supply a pre-drilled latch bar.

The door closing mechanisms listed below are for use on small to medium size single door control enclosures. They are designed to be used in conjunction with Class 9422 flange-mounted disconnect switches and circuit breaker operating mechanisms; however, they can be used independently as well. When used on properly designed and gasketed NEMA Type 12 enclosures, they meet NFPA 79 standards.

Table 8.68: Single Door Enclosures—NEMA Type 4 or 12 with 60 in. High Maximum Opening

| Description | For Use On: (Enclosure Type) | Use in Conjunction With: | Door Latch Handle Length | Suggested Maximum Door Opening | Door Depth | Type |
|---|--------------------------------|-----------------------------------|------------------------------------|--------------------------------|------------|------|
| Two point, roller latch, door closing mechanism for use on enclosures with doors hinged on the left hand side. | NEMA Type 4 and 12 Sheet Steel | Class 9422 Types A1, A3, A9 | 4 in. | Less than 39 in. | 3/4 in. | M4 |
| | | | 4 in. | Less than 39 in. | [1] | M10 |
| | | | 6 in. | 60 in. | 3/4 in. | M9 |
| Two point, roller latch, door closing mechanism for use on enclosures with doors hinged on the right hand side. | NEMA Type 4 and 12 Sheet Steel | Class 9422 Types A1, A3, A9 | 4 in. | Less than 39 in. | 3/4 in. | M4L |
| | | | 4 in. | Less than 39 in. | [1] | M10L |
| | | | 6 in. | 60 in. | 3/4 in. | M9L |
| Third roller latch kit for 3 point locking; for use where 3 point locking is desired or where the door opening is 39 in. or more. | NEMA Type 4 and 12 Sheet Steel | Class 9423 Types M4, M9, M4L, M9L | — | — | 3/4 in. | M3 |
| | | | NEMA Type 4 and 12 Stainless Steel | Class 9423 Types M24, M24L | — | — |



Circuit Breaker Operating Mechanism

[1] Suitable for door depths of 1-1/8 in., 1-1/4 in., 1-3/8 in. and 1-1/2 in.

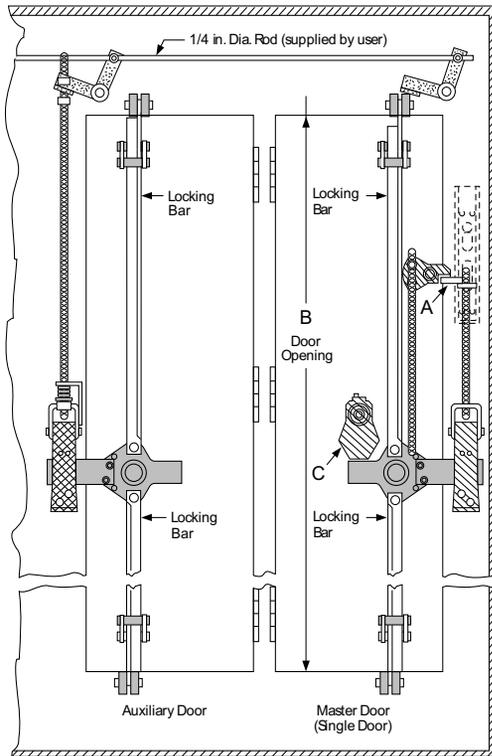
Vault Type for Single and Multi-Door Enclosures

Table 8.68, page 8-29 shows the requirements for the door closing mechanism, the locking bar kit, and the mechanical interlock kit, if used.

Table 8.69: Single or Multi-Door Enclosures—NEMA Type 12 with 40 in. to 60 in. Door Opening

| Single-Door Enclosure | | Multi-Door Enclosure | |
|--|--|---|---|
| Without Interlocking | With Interlocking | Without Interlocking | With Interlocking |
| 1—M6 door closing mechanism 1—Type M660 locking bar kit | 1—M6 door closing mechanism 1—Type M660 locking bar kit 1—Type M5 (use with 9422A handles) | For <i>each</i> door: 1—M6 door closing mechanism 1—Type M660 locking bar kit | For <i>Master</i> door: 1—M6 door closing mechanism 1—Type M660 locking bar kit 1—Type M5 (for use with 9422A handles) For <i>each Auxiliary</i> door: 1—M6 door closing mechanism 1—Type M660 locking bar kit Necessary quantities of Types M2 and M7 for each door (see below) |

NOTE: All mechanisms listed on this page are suitable for either left or right hand mounting.



NOTE: A - Interlocking lever extension of the flange-mounted handle mechanism.

NOTE: B - Actual enclosure opening—not door height.

NOTE: C - Screwdriver interlock assembly can be ordered separately. Class 9423 Type CEQ2493.

Table 8.70: Door Interlocks

| Type | Description |
|---------------------------------------|---|
| Type M6 Door Closing Mechanism | The Class 9423 Type M6 door closing mechanism is designed to close and seal 0.75 in. deep doors of single or multi-door NEMA Type 12 enclosures. The Type M6 can be used on doors hinged on either the left or right hand side. Recommended door openings are from 40–60 in. Vault type handle length is 6 in. |
| Type M660 Locking Bar Kits | The lock bar kit for the Type M6 door closing mechanism contains two lock bars and is available from stock. The bars can be cut to fit door openings through 60 in. One lock bar kit is required for each Type M6 ordered. |
| Type M5 | The Class 9423 Type M5 mechanical interlock kit is designed to interlock a Class 9422 handle mechanism with the Type M6 door closing mechanism. This kit prevents the opening of the master door (or single door) with the disconnect handle in the "ON" position, making it mandatory to use a screwdriver to gain entry to the enclosure at any time, regardless of the disconnect handle position. |

Table 8.71: Required Accessories for Auxiliary Doors

| Type | Description |
|----------------|--|
| Type M2 | One Type M2 kit is required for each auxiliary door. This kit is required to interlock any auxiliary door(s) with the master door. |
| Type M7 | The first auxiliary door requires 2 Type M7 kits. Additional auxiliary doors require only 1 Type M7 kit. The 0.25 in. diameter rod used to interconnect the M7 kits is furnished by the user. If the distance between any two Type M7 kits exceeds 36 in., an additional Type M7 kit should be installed to prevent the rod from buckling. |

Vault Type for Single and Multi-Door Enclosures

Table 8.72 shows the requirements for the door closing mechanism, the locking bar kit, and the mechanical interlock kit, if used.

Table 8.72: Single Or Multi-Door Enclosures—NEMA Type 12 with 61 in. to 91 in. Door Openings

| Single-Door Enclosure | | Multi-Door Enclosure | | |
|--|--|--|---|--|
| Without Interlocking | With Interlocking | Without Interlocking | With Interlocking | |
| 1—M8 door closing mechanism 1—Type M891 locking bar kit | 1—M8 door closing mechanism 1—Type M891 locking bar kit 1—Type M1 (for use with 9422A handles) | For each door: 1—M8 door closing mechanism 1—Type M891 locking bar kit | For <i>Master</i> door: 1—M8 door closing mechanism 1—Type M891 locking bar kit 1—Type M1 (for use with 9422A handles) | For each <i>Auxiliary</i> door: 1—M8 door closing mechanism 1—Type M891 locking bar kit Necessary quantities of Types M2 and M7 for each door (see below) |

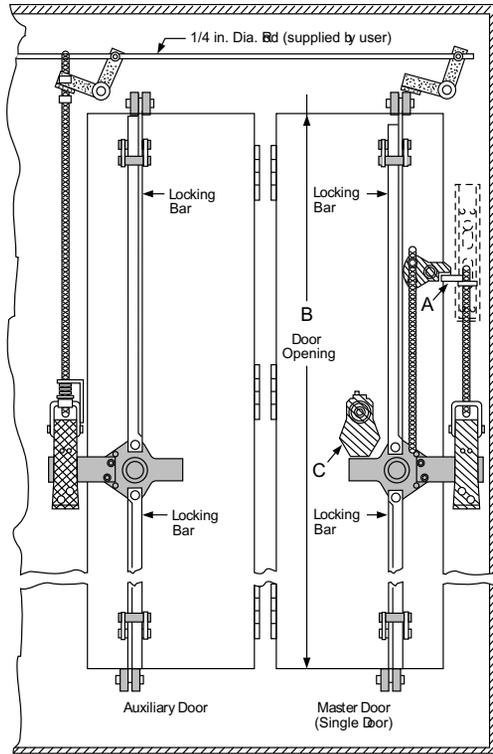
NOTE: All mechanisms listed on this page are suitable for either left or right hand mounting.

Table 8.73: Door Interlocks

| Type | Description |
|---------------------------------------|---|
| Type M8 Door Closing Mechanism | The Class 9423 Type M8 door closing mechanism is designed to close and seal 1.125 in. deep doors of single or multi-door NEMA Type 12 enclosures. The Type M8 can be used on doors hinged on either the left or right hand side. Recommended door openings are from 61–91 in. Vault type handle length is 8 in. |
| Type M891 Locking Bar Kits | The lock bar kit for the Type M8 door closing mechanism contains two lock bars and is available from stock. The bars can be cut to fit door openings through 91 in.. One lock bar kit is required for each Type M8 ordered. |
| Type M1 | The Class 9423 Type M1 mechanical interlock kit is designed to interlock a Class 9422 handle mechanism with the Type M8 door closing mechanism. This kit prevents the opening of the master door (or single door) with the disconnect handle in the "ON" position, making it mandatory to use a screwdriver to gain entry to the enclosure at any time, regardless of the disconnect handle position. |

Table 8.74: Required Accessories for Auxiliary Doors

| Type | Description |
|----------------|--|
| Type M2 | One Type M2 kit is required for each auxiliary door. This kit is required to interlock any auxiliary door(s) with the master door. |
| Type M7 | The first auxiliary door requires 2 Type M7 kits. Additional auxiliary doors require only 1 Type M7 kit. The 0.25 in. diameter rod used to interconnect the M7 kits is furnished by the user. If the distance between any two Type M7 kits exceeds 36 in., an additional Type M7 kit should be installed to prevent the rod from buckling. |



NOTE: A - Interlocking lever extension of the flange-mounted handle mechanism.

NOTE: B - Actual enclosure opening—not door height.

NOTE: C - Screwdriver interlock assembly can be ordered separately. Class 9423 Type CEQ2493.

Enclosure Construction and General Location Information For Types M5 and M6

Drilling and location information below is complete for a single door enclosure with door hinged on left side, incorporating a Type M6, M5, and Class 9422 handle mechanism. Transpose all horizontal dimensions for doors hinged on right side.

Dimension A

NOTE: Single door enclosures: A minimum = 1 in.

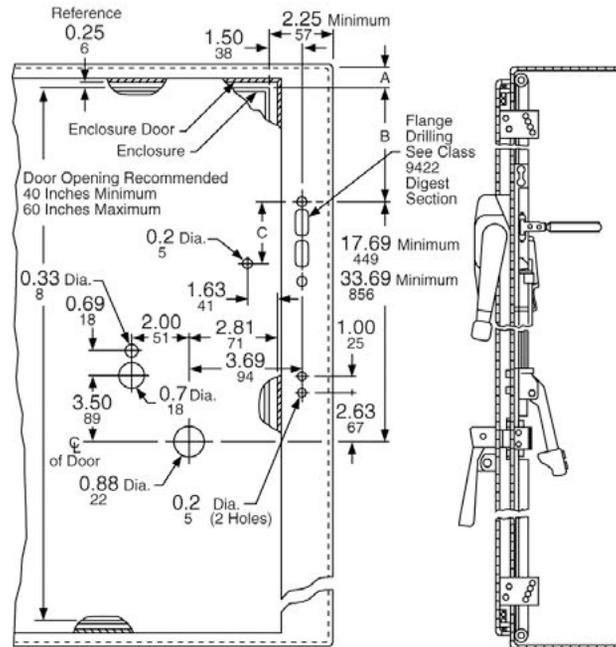
NOTE: Multi-door enclosures without overhead interlocking system: A minimum = 1 in.

NOTE: Multi-door enclosures with overhead interlocking system: A minimum = 4-1/2 in.

NOTE: Overhead interlocking system consists of the required number of Class 9423 Type M2 and M7 kits for interlocking the auxiliary doors with the master door. See [Vault Type for Single and Multi-Door Enclosures, page 8-29.](#)

Table 8.75: Dimension B (Minimums)

| Type | Disconnect Device | If A = 1 Minimum B = | If A = 4-1/2 Minimum B = | C |
|------------------------|------------------------------------|-------------------------|-----------------------------|--------|
| TCF, TCN, TDF, TDN, TD | 60 A Disconnect Switch | 3-1/16 | 2-1/2 | 3-3/16 |
| TE, TEF, TEN | 100 A Disconnect Switch | 5-1/4 | 2-1/2 | 3-3/16 |
| TF | 200 A Disconnect Switch | 11-5/8 | 8-1/8 | 3-3/16 |
| TG | 400 A Disconnect Switch | 15-1/16 | 11-9/16 | 6-3/4 |
| RN1 | FAL, FHL, Circuit Breaker | 4-27/32 | 2-1/2 | 3-3/16 |
| RP1 | KAL, KHL Circuit Breaker | 11-5/32 | 7-21/32 | 3-3/16 |
| RR2 | ILL Circuit Breaker | 17-31/32 | 14-15/32 | 3-3/16 |
| RT1 | MAL, MHL, MEL, MXL Circuit Breaker | 18-5/8 | 15-1/8 | 3-3/16 |



Enclosure Construction and General Location Information For Types M1 and M8

Drilling and location information below is complete for a single door enclosure with the door hinged on the left side, incorporating a Type M8, M1, and Class 9422 handle mechanism. Transpose all horizontal dimensions for doors hinged on the right side.

Dimension A

NOTE: Single door enclosures: A minimum = 1-1/2 in.

NOTE: Multi-Door enclosures without overhead interlocking system:
A minimum = 1-1/2 in.

NOTE: Multi-Door enclosures with overhead interlocking system:
A minimum = 4-1/2 in.

NOTE: Overhead interlocking system consists of the required number of Class 9423 Type M2 and M7 kits for interlocking the auxiliary doors with the master door. See [Vault Type for Single and Multi-Door Enclosures, page 8-29.](#)

Table 8.76: Dimension B (Minimums)

| Type | Disconnect Device | If A = 1-1/2 Minimum B = | If A = 4-1/2 Minimum B = | C |
|------------------------|------------------------------------|--------------------------|--------------------------|--------|
| TCF, TCN, TDF, TDN, TD | 60 A Disconnect Switch | 2-15/16 | 2-1/2 | 3-3/16 |
| TE, TEF, TEN | 100 A Disconnect Switch | 4-3/4 | 2-1/2 | 3-3/16 |
| TF | 200 A Disconnect Switch | 11-1/8 | 8-1/8 | 3-3/16 |
| TG | 400 A Disconnect Switch | 14-9/16 | 11-9/16 | 5-7/8 |
| RN1 | FAL, FHL Circuit Breaker | 4-11/32 | 2-1/2 | 3-3/16 |
| RP1 | KAL, KHL Circuit Breaker | 10-21/32 | 7-21/32 | 3-3/16 |
| RR2 | ILL Circuit Breaker | 17-15/32 | 14-15/32 | 3-3/16 |
| RT1 | MAL, MHL, MEL, MXL Circuit Breaker | 18-1/8 | 15-1/8 | 3-3/16 |

