SIRCO M UL 98 Compact Non-Fusible Disconnect Switches

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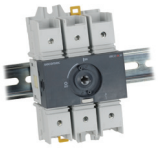
To assemble a switch, please select:

Direct Operation



Switch Body

+

Direct Handle

OR

External Operation

Switch Body

+

Shaft

+

External Handle

UL 98 Compact Non-Fusible Disconnect Switches				
Part Number	***Description***	***Amp Rating***	***Voltage Rating***	***Price***
22013003	Non-fusible rotary 3-pole disconnect switch, M3 frame size	30	600VAC	
22013006		60	600VAC	
22003010-UL		100	600VAC	

Handles – Defeatable and Lockable						
Part Number	***Description***	***Switch Body Rating (A)***	***Handle Color***	***Handle Type***	***NEMA/ UL Type***	***Price***
22995032	Mounts directly on switch, no shaft required*	30 - 100	Blue	M01	–	
147D1111	External front and right side handles, shaft required	16 - 100	Black/Blue	S00	4, 4X	
147E1111			Red/Yellow			
14831111		16 - 100	Black/Blue	S0	1, 3R, 12	
14841111			Red/Yellow			
148D1111			Black/Blue		4, 4X	
148E1111			Red/Yellow			
140F2111			Black/Blue	S01	1, 3R, 12	
140G2111			Red/Yellow			
140D2111			Black/Blue		4, 4X	
140E2111			Red/Yellow			

*Not defeatable

M01 Handle
22995032

S0 Handle
14831111

S00 Handle
147D1111

S01 Handle
140F2111

Shafts for External Handles					
Part Number	***Switch Body Rating (A)***	***Handle Type***	***Length (in)***	***Length (mm)***	***Price***
14070515	16 - 100	S00, S0	5.9	150	
14070520			7.9	200	
14070532			12.6	320	
14040520		S01	7.9	200	
14040532			12.6	320	
14040540			15.7	400	

14070515

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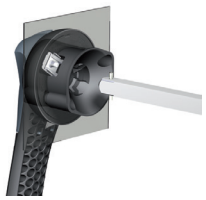
Shaft Guide for External Handle

Part Number	Description	Handle Type	Price
14190000	This accessory makes alignment connections between the shaft and handle easier. Allows up to 15mm misalignment tolerance. Required for a shaft length over 300mm. Included with longer shafts.	S00, S0	
14290000		S01, S1, S2, S3	

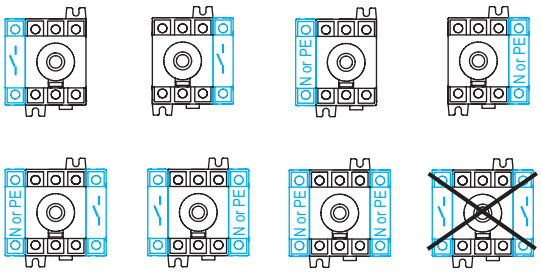


14190000

Additional Poles

Part Number	Description	Switch Body Rating (A)	No. of Poles	Use	Price
22011003	Fourth pole module switched 600VAC 100kA SCCR	30	1	Adding one additional pole transforms a non-fusible disconnect switch from 3 poles to 4 poles	
22011006	Fourth pole module switched 600VAC 65kA SCCR	60	1		
22001010-UL	Fourth pole module switched 600VAC 100kA SCCR	100	1		
22005011	Solid neutral pole module unswitched 600VAC	30 - 100	1	Transforms the 3-pole switch into a 3-pole + solid neutral	
22009011	Grounding pole module unswitched 600VAC	30 - 100	1	Adds 1 ground module pole to the switch-disconnector	

22011003



4th Pole Configurations

Terminal Shrouds

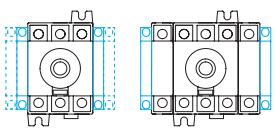
Part Number	Description	Switch Body Rating (A)	No. of Poles	Price
22941011	Terminal shroud line/load mount, 2 per pack, offers additional protection against direct contact with the terminals.	30 - 100	1	
22943016		30 - 100	3	

22941011

Auxiliary Contacts

Part Number	Description	Switch Body Rating (A)	Contacts	Price
22990001-UL	Auxiliary contact block module, 10A @ 240VAC, can be mounted on left or right side of switch, maximum 4 auxiliary contacts can be used (requires 2 modules)	16 - 100	1 NO / 1 NC	
22990011-UL		16 - 100	2 NO	

22990001-UL



Auxiliary Contact Configurations

SIRCO M UL 98 Compact Non-Fusible Disconnect Switches

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Technical Characteristics

Characteristics According to UL 98 / CSA 22.2#4			
	22013003	***22013006***	***22003010-UL***
General use rating (A)	30	60	100
Short-circuit rating at 480VAC (kA)	100	100	100
Short-circuit rating at 600VAC (kA)	100	100	25
Type of fuse	J	J	J
Max fuse rating (A)	30	60	100
Max. motor hp / FLA 3-phase motor max.			
220-240 VAC	10 / 28	20 / 54	20 / 54
440-480 VAC	20 / 27	40 / 52	50 / 65
600VAC	25 / 27	50 / 52	50 / 52
Max. motor hp / FLA 1-phase motor max.			
120VAC	2 / 24	3 / 34	5 / 56
240VAC	5 / 28	10 / 50	10 / 50
Wire type/temperature	Cu / 75°C (167°F)		
Product weight – lb (kg)	1.3 (0.6)		
Wire range			
Solid (AWG)	#12-10	#12-10	#12-10
Torque – lb·in (N·m)	35.4 (4)	35.4 (4)	35.4 (4)
Stranded (AWG)	#10-1	#10-1	#10-1
Torque – lb·in (N·m)	35.4 (4)	35.4 (4)	35.4 (4)
Stranded (AWG)	1/0	1/0	1/0
Torque – lb·in (N·m)	39.8 (4.5)	39.8 (4.5)	39.8 (4.5)
Stranded (AWG)	2/0	2/0	2/0
Torque – lb·in (N·m)	44.3 (5)	44.3 (5)	44.3 (5)
Mechanical characteristics			
Endurance (number of operating cycles)	10,000	10,000	10,000
Operating torque (lb·in / N·m)	12.4 / 1.4	12.4 / 1.4	12.4 / 1.4
Environmental - switch body			
Operating temperature[1]	-20°C to 70°C (-4°F to +158°F)		
Flammability rating	UL 94-V0		
Mounting	35mm DIN rail or panel mount		
Auxiliary contacts			
Electrical characteristics	A300	A300	A300
Agency approvals			
UL file # E201138 (UL 98), CSA file # 112964 (C22.2 NO. 14)			

[1] Temperature above 40°C, the current rating of the switch has to be de-rated 1% per °C over 40°C. Example, at 60°C a 100A switch is rated 80A.

To obtain the most current agency approval information, see the Agency Approval Checklist section on the specific part number's web page.

Note: Short-circuit rating achieved when used with corresponding fuse type and max fuse rating.

SIRCO M UL 98 Compact Non-Fusible Disconnect Switches

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Technical Characteristics (Continued)

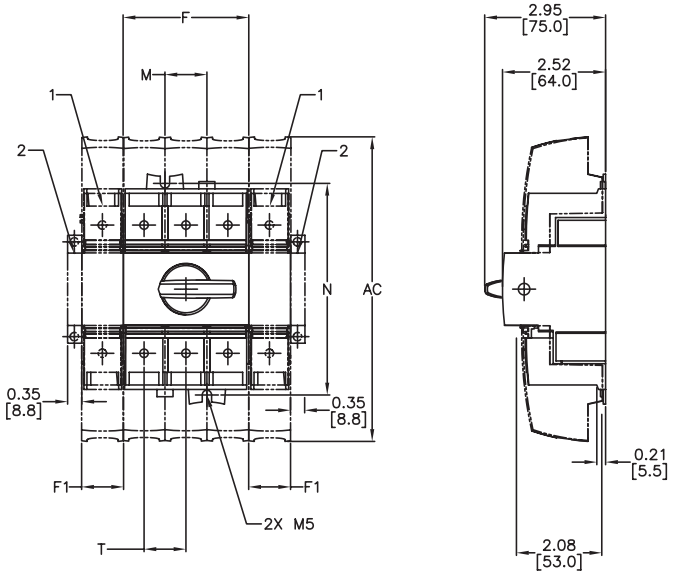
Characteristics According to IEC 60647-3			
	22013003	*22013006*	*22003010-UL*
Thermal current Ith at 40°C (A)	30	60	100
Rated insulation voltage U_i (V)	800	800	800
Rated impulse withstand voltage U_{imp} (kV)	8	8	8
Rated operational currents I_e			
400VAC / AC-22A utilization category (A)[1]	32	63	100
400VAC / AC-23A utilization category (A)[1]	32	63	100
690VAC / AC-22A utilization category (A)[1]	32	63	80
690VAC / AC-23A utilization category (A)[1]	32	63	63
Operational power in AC-23 (kW)[2/3]			
@ 400VAC without prebreak AC in AC-23	15	30	45
@ 500VAC without prebreak AC in AC-23	15	30	45
@ 690VAC without prebreak AC in AC-23	18.5	30	45
Overload capacity (U_e 415VAC)			
Rated short-circuit making capacity Icm (kA peak)[4]	12	12	12
Connection			
Min. connection section (mm^2)	2.5	2.5	10
Max. connection section (mm^2)	70	70	70

[1]Category with index A = frequent operation.
[2]A/B: Category with index A = frequent operation - Category with index B = infrequent operation.
[3]The power value is given for information only, the current values vary from one manufacturer to another.
[4]For a rated operating voltage U_e = 400VAC

SIRCO M UL 98 Compact Non-Fusible Disconnect Switches

Dimensions *[inches/mm]*

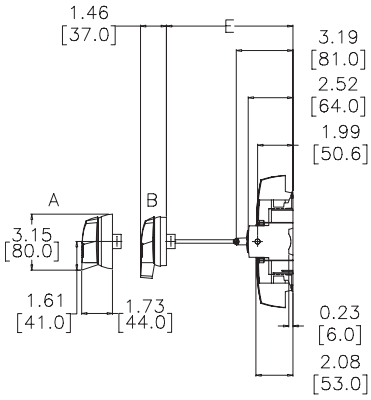
Direct operation with handle



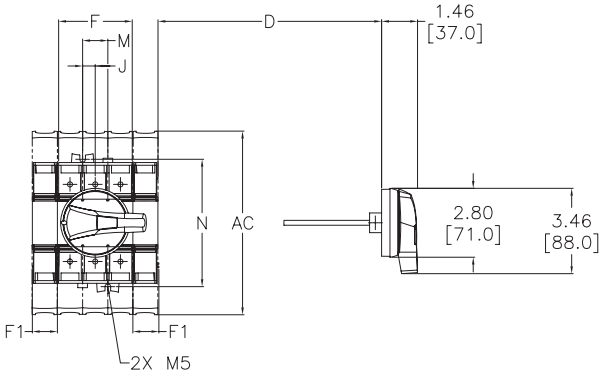
1. Location for: 1 switched fourth pole module (1 per device max), or 1 unswitched neutral pole module, or 1 auxillary contact module
2. Position for auxillary contact module

NOTE: MAX OF 2 ADDITIONAL BLOCK MODULES

External front operation



External side operation



Dimensions													
Switch Body Rating (A) / Frame Size	Units	Overall Dimensions				Terminal Shrouds AC	Switch Body				Switch Mounting		Connection
		D min	D Max	E min	E max		F	F1	G	J	M	N	T
100 / M3	in	1.18	7.87	3.94	14.65	7.44	3.07	1.02	4.91	0.51	1.02	5.17	1.02
	mm	30	201	100	372	189	78	26	124.6	13	26	131.4	26

Please see our website for complete engineering drawings.

Accessories Dimensions

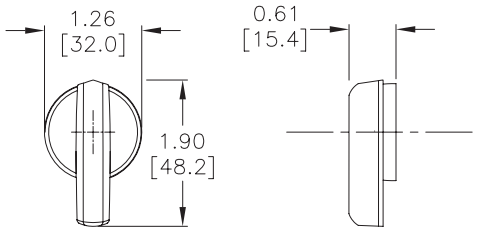
Handles

[inches/mm]

Direct Handle for UL 98 Compact Non-Fusible Disconnect Switches

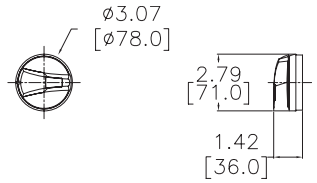
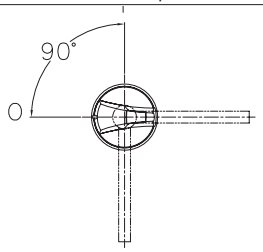
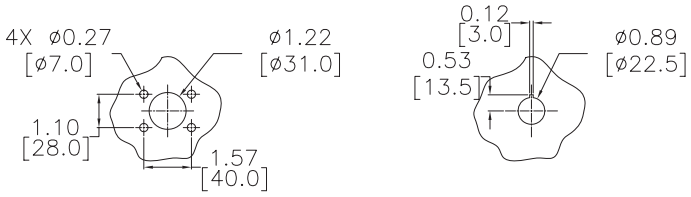
22995032

Handle Dimensions

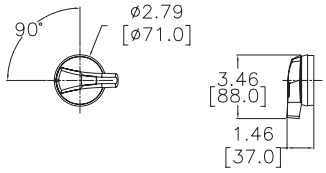
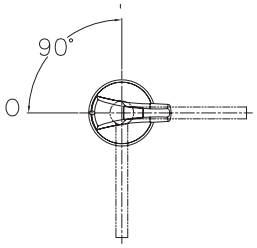
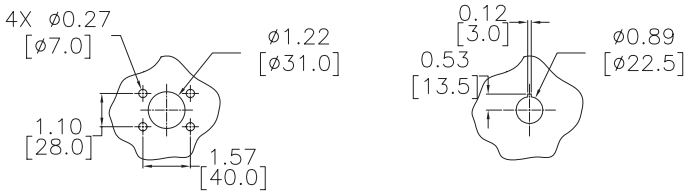


External Handles for UL 98 Compact Non-Fusible Disconnect Switches

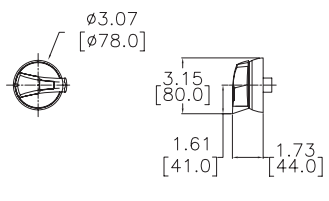
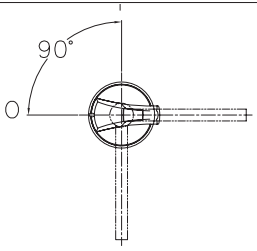
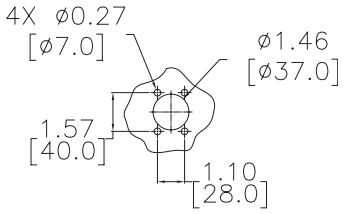
S00 Type

Handle Dimensions	Direction of Operation	Door Drilling
		

S0 Type

Handle Dimensions	Direction of Operation	Door Drilling
		

S01 Type

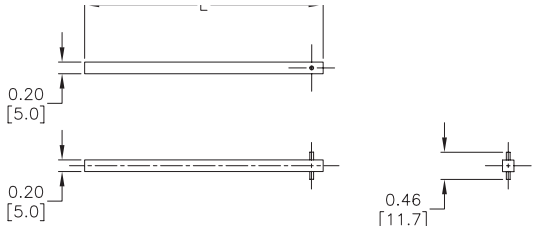
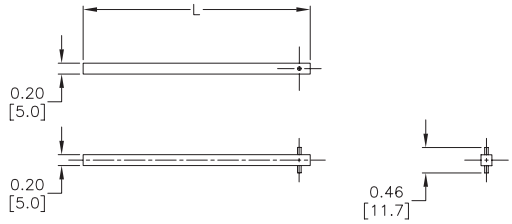
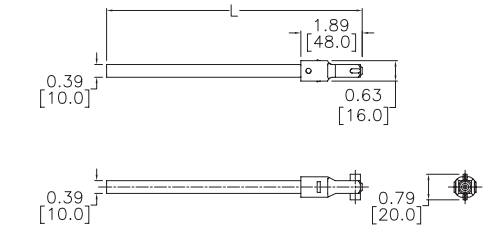
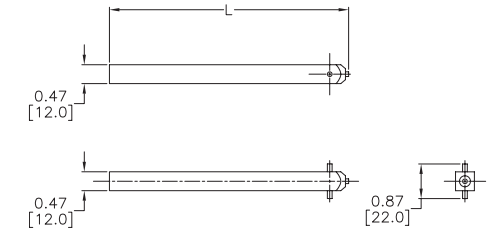
Handle Dimensions	Direction of Operation	Door Drilling
		

Please see our website for complete engineering drawings.

Accessories Dimensions

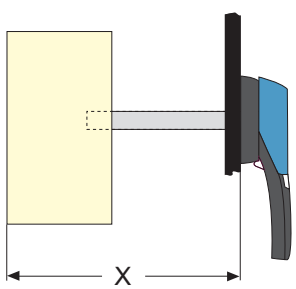
Shafts for Non-Fusible Disconnect Switches

[inches/mm]

Shafts for Non-Fusible Disconnect Switches				
Shafts for S00, S0 Handle Type	**Part Number**	**Switch Body Rating (A)**	**Length**	
			in	**mm**
	**14070515**	16 - 100	5.9	150
	14070520		7.9	200
	14070532		12.6	320
Shafts for S01 Handle Type	**Part Number**	**Switch Body Rating (A)**	**Length**	
			in	**mm**
	**14040520**	16 - 100	7.9	200
	14040532		12.6	320
	14040540		15.7	400
Shafts for S1, S2 Handle Type	**Part Number**	**Switch Body Rating (A)**	**Length**	
			in	**mm**
	**14001020**	100 - 400	7.9	200
	14001032		12.6	320
	14001040		15.7	400
Shafts for S3 Handle Type	**Part Number**	**Switch Body Rating (A)**	**Length**	
			in	**mm**
	**14011520**	600	7.9	200
	14011532		12.6	320
	14011540		15.7	400

Please see our website for complete engineering drawings.

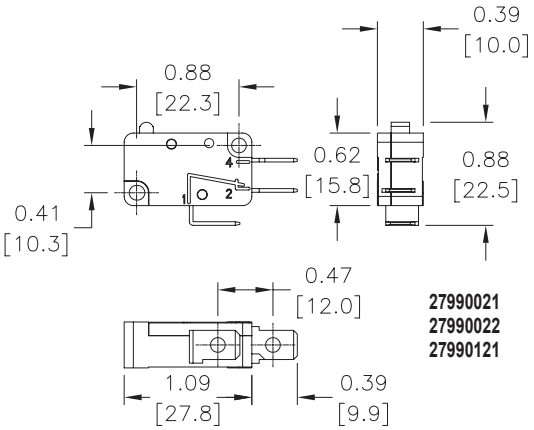
Shaft Length Minimum Dimensions						
Use standard lengths: *7.9 in / 200mm – 12.6 in / 320mm – 15.7 in / 400mm*						
Switch Body Rating (A)	**Dimension X**		**Handle Type**	**Length**		**Part Number**
	in	**mm**		**in**	**mm**	
100 - 400	5.31 - 10.43	135 - 265	S2	7.9	200	14001020
100 - 400	5.31 - 15.16	135 - 385	S2	12.6	320	14001032
100 - 400	5.31 - 18.31	135 - 465	S2	15.7	400	14001040
600	8.70 - 13.50	221 - 343	S3	7.9	200	14011520
600	8.70 - 18.23	221 - 463	S3	12.6	320	14011532
600	8.70 - 21.38	221 - 543	S3	15.7	400	14011540



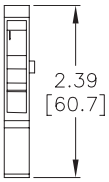
Accessories Dimensions

Auxiliary Contacts and Additional Poles

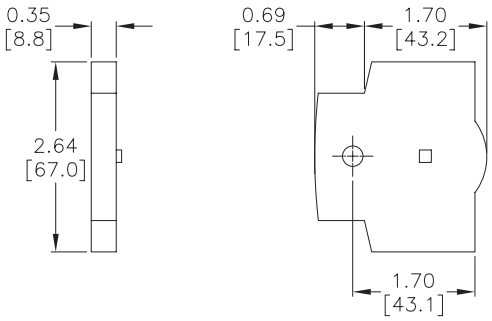
[inches/mm]

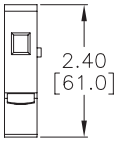


27990021
27990022
27990121

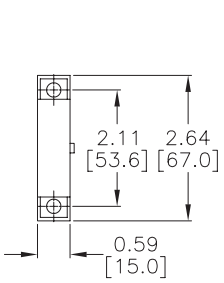


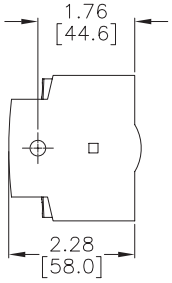
22990001-UL
22990011-UL
39990701
39990702

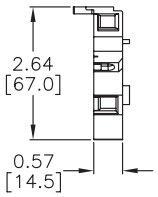




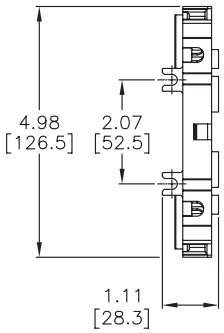
22001000-UL
22001001-UL
22001002-UL
22001003-UL
22001004-UL

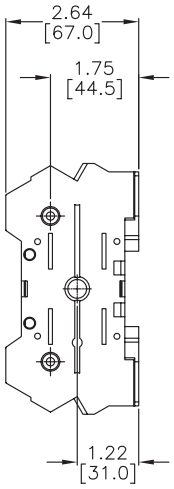


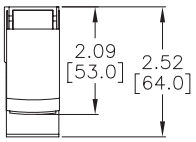




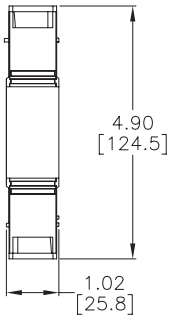
3999U041
3999U042

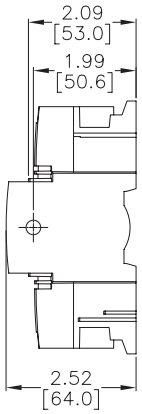


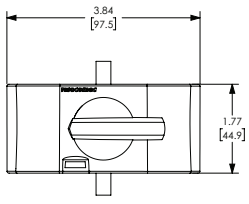


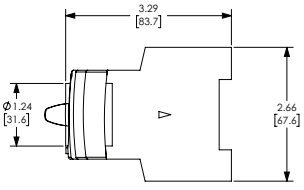


22011003 22011006
22001010-UL
22005011
22009011









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Please see our website for complete engineering drawings.

Disconnect Switches

Introduction

UL®/CSA® Standards for Disconnect Switches

UL 98 – Enclosed and Deadfront Switches (CSA C22.2 No. 4)

These requirements cover enclosed or deadfront switches, with or without provision for fuses, at 600V or less. These products are used as disconnecting means without restrictions; they are heavy-duty products requiring 2 inches (50mm) minimum of creepage distance between phases, which gives maximum safety for users and installation. The short-circuit withstand of these products goes up to 200kA.

UL 489 – Molded Case Switches (CSA C22.22 No. 5)

These requirements cover molded case circuit breakers, molded case switches and fused molded case switches, rated at 600V or less and 6000A or less.

NFPA® 79 Electrical Standard for Industrial Machinery

The following types of machines are identified as industrial machinery:

- Metalworking machine tools, including machines that cut or form metal
- Plastics machinery
- Wood machinery, including woodworking, laminating and sawmill machines
- Assembly machines
- Material handling machines, including industrial robots and transfer machines
- Inspection and testing machines, including coordinate measuring and in-process gauging machines

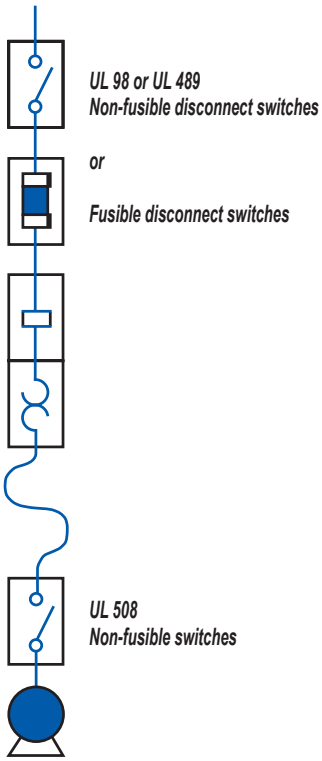
UL® Standards for Electrical Machinery

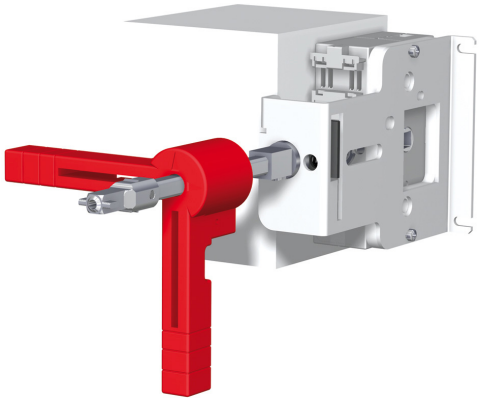
UL 508 – Industrial Control Equipment (CSA C22.2 No. 14)

These requirements cover manual, magnetic and solidstate starters and controllers, overload relays, pushbuttons, selector switches and control lights. These products are smaller, requiring only a creepage distance between phases of 0.50 inch (12.7 mm). Their use as a disconnecting means is limited to local disconnection of motors. These products can be used as a disconnect means only when they have been additionally tested "suitable as motor disconnect." This additional testing ensures that the switch has a proper closing capacity on a short circuit.

UL 508 devices **cannot** be used as main disconnect of an electrical panel, e.g., at the entrance of control panels. A manual motor controller marked "suitable as motor disconnect" shall be installed only on the load side of the branch circuit protective device [UL 508A 30.3.3 and NEC 430.109 (6)].

Typical Control Panel





Meeting the requirements of UL508A and NFPA79

The disconnect shall be operable independent of the door position.

The disconnect must be operable, by qualified persons, independent of the door position without the use of accessory tools or devices.
Note: NFPA 79; Paragraph 5.3.3.1 (5).
An operating mechanism for the disconnecting means shall be operable independent of the door position without the use of accessory tools or devices.
Note: UL 508A; Paragraph 66.6.3 c.

Non-Fusible Disconnect Switches

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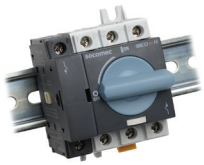
Selection Guide

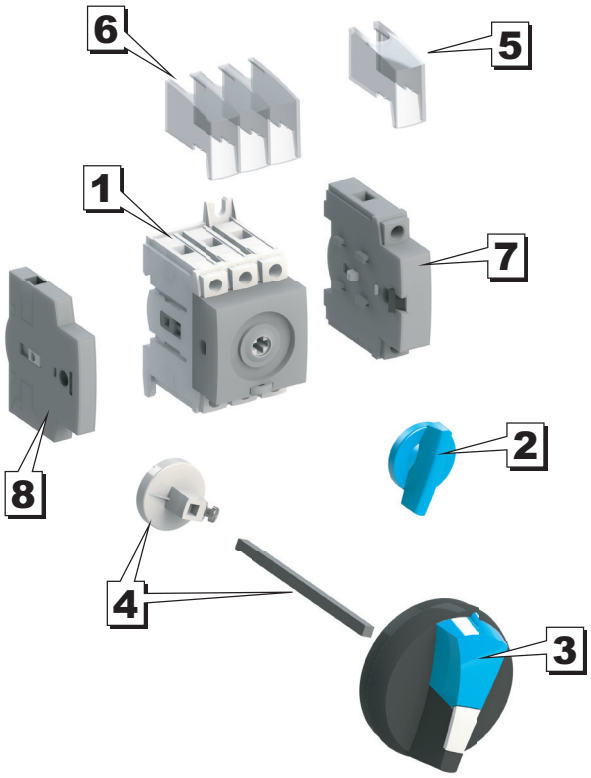
- Which application?
- Which function?
- Which operation handle?
- Which type of breaking?

		Machine Control			Power Distribution	
		UL 98 Compact Non-Fusible Disconnect Switches	UL 508 Non-Fusible Disconnect Switches	UL 508 Non-Fusible Enclosed Disconnect Switches	UL 98 Non-Fusible Disconnect Switches	UL 98B DC Non-Fusible Disconnect Switches
						
		22013003 22013006 22003010-UL	22003000-UL, 22003001-UL 22003002-UL, 22003003-UL 22003004-UL, 22003006-UL 22003008-UL	22143503 22243503 22243506	27003011, 27004011 27003021, 27004021 27003041, 27003060	27DC3011 27DC4011 27DC3021 27DC4021
Applications						
Main switchboard		✓	✓	✓	✓	✓
Distribution panel		✓	✓	✓	✓	✓
Emergency disconnect		✓	✓	✓	✓	✓
Local safety disconnect (padlockable)		✓	✓	✓	✓	✓
Photovoltaic disconnect						✓
Enclosed switches		✓	✓	✓	✓	✓
Functions						
3/4 pole non-fusible disconnect switch		✓	✓	✓	✓	✓
Characteristics						
Operation	***Manual (rotating)***	✓	✓	✓	✓	✓
Direct operation handle	***Front***	✓	✓	✓	✓	✓
External operation handle	***Front***	✓	✓	✓	✓	✓
	Right side		✓	✓		
Indication of breaking	***Positive break indication***	✓	✓	✓	✓	✓
Switch body	***Modular***	✓	✓	✓		

Non-Fusible Disconnect Switches

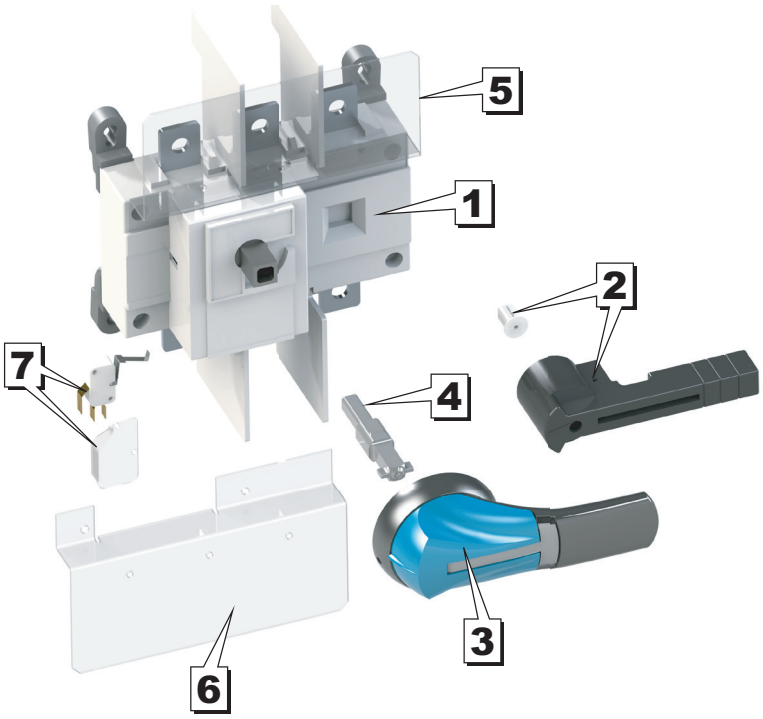
Assembly of Accessories

Non-fusible 16 - 100A Disconnect Switches Accessories



1. Switch body
2. Direct handle
3. External handle
4. Shaft and mount
5. Terminal shroud
6. Terminal shroud
7. Auxiliary contact
8. Additional pole

Non-fusible 100 - 600A Disconnect Switches Accessories



1. Switch body
2. Direct handle
3. External handle
4. Shaft
5. Terminal screen
6. Terminal screen
7. Auxiliary contacts