Specifications

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Standard

The seller's standard conditions of sale set forth in Price Sheet 150 apply, except as modified under the "Warranty Qualifications" section on page 4.

Special To This Product

Inclusions

The Mini-Rupter Switch is a field-tested and proven, three-pole, group-operated interrupter switch. It is offered in either a top-supported frame style for installation in pad-mounted enclosures or a back-supported frame style for use in metal-enclosed switchgear or in vaults.

In either style, Mini-Rupter Switches are available in a variety of voltage and current ratings for close matching to the economics and switching duties of specific applications over a wide range of system voltages—from 4.16 kV through 27.6 kV nominal.

Mini-Rupter Switches, with their compact construction and rugged steel mounting-frame weldment, are easy to install. The top-supported frame style switch is provided with two projecting support pads for two-point suspension mounting. The back-supported frame style switch is provided with two projecting support pads and two adjustable brackets for four-point mounting. These methods of support help to compensate for uneven mounting surfaces. No supplemental bracing is needed to achieve the published momentary and fault-closing values. Unlike nonmetallic switch frames, a Mini-Rupter Switch's grounded steel frame intercepts the leakage path that parallels the open gap for positive isolation of the load circuit.

Mini-Rupter Switches can be obtained in both handle-on-right and handle-on-left models. Top-supported frame style switches may be equipped with handles for side operation. Back-supported frame style switches may be equipped with handles for either front operation or side operation. S&C operating handles, complete with associated operating-mechanism components, are available as options. See the "Specification Deviations" section on page 3. Back-supported frame style switches are available in both main-contact-at-top and main-contact-at-bottom models.

Mini-Rupter Switches incorporate a number of innovative features that make them especially suited to perform a wide range of switching duties. These features include:

- Multifinger, convex, silver-plated-copper jaw and hinge contacts, independently sprung and backed up with flat stainless steel springs, providing equalized four-point pressure on the blades' silver-clad contact surfaces
- S&C's Cypoxy™ Insulator resin system, used as an assembly medium, producing a unified insulated shaft with journals and blades permanently molded in place (The shaft positions the blades in "fixtured" alignment. There are no clamp-on crank-and-connecting-link assemblies to portend alignment or simultaneity problems. Mini-Rupter Switches are furnished with Cypoxy Insulators, which provide generous leakage distance.)
- S&C's unique Arc Compressor, providing controlled circuit interruption without external arc or flame and without the need for separate auxiliary blades (A unique lip-seal wipes the blade as it exits the arc compressor, keeping the arc under compression and directing controlled arc gases through the deionizing suppressor vent.)
- Multipurpose, one-piece, formed hard-drawn copper blades with silver-plated copper contact surfaces on both sides are used for circuit-closing, continuous current carrying, and circuit interrupting. Their simple, reliable, high-speed action is unlike the uncertain action of auxiliary interrupting-blade-and-contact mechanisms that are dependent on retention of correct sequencing with the main blade and contact and on spring assistance to snap the interrupting blade open. A quick-make quick-break mechanism, factory-installed and requiring no adjustments (It closes and opens the switch swiftly, independent of the speed of switch handle operation, and locks the blades in both the **Opened** and **Closed** positions. Its positive action contributes to the Mini-Rupter Switch's ability to achieve fast circuit interruption and two-time duty-cycle fault-closing ratings.)

Mini-Rupter Switches provide maximum operating flexibility because of their exceptional fault-closing ability, expressed in terms of two-time duty-cycle peak fault-closing ratings (listed in Table 2 on page 6). These ratings represent the available fault current into which the switch can be closed twice, remaining operable and able to carry and interrupt rated currents.

This ability permits quick restoration of service following a fault, without the need for an extended outage for replacement of switch parts or for temporary restoration of service through an alternate switch until replacement parts can be obtained. It also permits use of a Mini-Rupter Switch in fault-sectionalizing (lockout) schemes where switches are closed and then opened sequentially until the fault is isolated. The ability to open following a **Fault Closing** operation is of special importance where remote or automatic control is used.

In marked contrast to Mini-Rupter Switches, with their duty-cycle peak fault-closing ratings, are switches with simple "fault-closing" or "make-and-latch" ratings which, following an initial **Fault Closing** operation, offer no assurance of an ability to subsequently carry or interrupt rated current, much less any expectation of tolerating a second fault closing.

Mini-Rupter Switches (except back-supported frame style switches rated 25 kV nominal) include a side barrier between the quick-make quick-break mechanism and the adjacent outer-pole upper support insulator.

Exclusions

Switches do not include connectors, interlocks, handle covers, ground studs, operating handles, or interphase or full end-barriers. Connectors are available as listed in Table 5 on page 8. Specify quantity and catalog number of connectors desired. Interlocks, handle covers, and ground studs are available as listed in Table 3 and Table 4 on page 8. Operating handles and interphase and full end-barriers are available as listed in the "Specification Deviations" section.

Specification Deviations

Mini-Rupter Switches cannot be provided with special insulators, and they cannot be supplied without insulators.

Higher or lower insulator voltage ratings for a switch of a given voltage rating are not available.

To the extent indicated in Table 2 on page 6, Mini-Rupter Switches can be supplied with interphase barriers or interphase barriers plus full end-barriers. Barrier options are specified as described below by adding a suffix to the standard mounting arrangement erection drawing (ED) number.

Based on the standard mounting arrangement ED number selected from Table 2 on page 6, Mini-Rupter Switches can be supplied with an operating handle. Three types of operating handles are available: a removable side handle, a nonremovable side handle, and a nonremovable front handle. The removable side handle folds into a compact unit for storage. The nonremovable handles have provisions for padlocking and interlocking (key or mechanical).

Operating handle and barrier options are specified by adding one of the suffixes in Table 1 to the applicable standard mounting arrangement ED number.

Table 1. Operating Handle and Barrier Options

Suffix to be Added to Applicable Standard Mounting Arrangement Erection Drawing Number	Handle Type① (if furnished)
-S1	Operating handle
	Removable side handle
	Nonremovable side handle②
	Nonremovable front handle
-S2●■	Interphase barriers
-S3▲	Interphrase barriers plus full end-barriers
-S4●■	Operating handle and interphase barriers
	Removable side handle
-S5▲	Operating handle and interphrase barriers plus full end-barriers
	Removable side handle
	Nonremovable side handle②
	Nonremovable front handle

① The handle type furnished will be determined by the standard mounting arrangement ED number shown in Table 2 on page 6.

② If the switch operating shaft height is to be greater than 6 feet (183 cm), contact the nearest S&C Sales Office.

● Except as noted in Table 2 on page 6, either these S&C Interphase Barriers or equivalent are required with top-supported frame style switches to attain the published BIL ratings.

■ Not applicable to back-supported frame style Mini-Rupter Switches.

▲ Except as noted in Table 2 on page 6, either these S&C barriers or equivalent are required with back-supported frame style switches to attain the published BIL ratings. Full end-barriers, when ordered, are supplied in lieu of any standard side barrier.

Switches will be supplied, in some cases, with an operating mechanism that requires the preparation of a custom ED of a special mounting arrangement. Additional operating-mechanism components may be required.

Application Note

As indicated in Table 3 on page 8, Mini-Rupter Switches, catalog numbers 255232R2, 255282R2, 255532R2, 255582R2, and all top-supported frame style switches rated 25 kV nominal may be applied without interphase barriers for service on systems rated 12 kV through 16.5 kV with a 95-kV BIL rating.

All other switches rated 14.4 kV nominal may be applied without interphase barriers for service on systems rated 4.16 kV through 7.2 kV with a 75-kV BIL rating. Alternately, all such switches in the top-supported frame style rated 14.4 kV nominal may be applied on systems rated 12 kV through 16.5 kV with the addition of interphase barriers to attain the 95-kV BIL rating, and all such switches in the back-supported frame style rated 14.4 kV nominal may be applied on systems rated 12 kV through 16.5 kV with the addition of interphase barriers plus full end-barriers to attain the 95-kV BIL rating. All switches in the top-supported frame style rated 25 kV nominal require the addition of interphase barriers to attain the 125-kV BIL rating for service on systems rated 16.5 kV through 27.6 kV. All switches in the back-supported frame style rated 25 kV nominal require the addition of interphase barriers plus full end-barriers to attain the 125-kV BIL rating for service on systems rated 16.5 kV through 27.6 kV.

Interphase and full end-barriers are available as listed in the "Specification Deviations" section on page 2, or they may be supplied by the purchaser, in which case all mounting brackets and fasteners for barrier attachment to the switch frame must be installed in accordance with the applicable standard mounting arrangement ED to attain the published BIL ratings.

Full end-barriers, when ordered, are supplied in lieu of any standard side barrier.

Mini-Rupter Switches are suitable for these three-pole live-switching duties in three-phase circuits:

Live Switching—Opening

Transformer switching—Transformer load currents up through 600 amperes (400 amperes for back-supported models at 25 kV) as well as transformer magnetizing currents associated with the applicable loads

Line switching—Load-splitting (parallel or loop-switching) up through 600 amperes at 14.4 kV and 25 kV, as well as load-dropping of currents up through 600 amperes (400 amperes for back-supported models at 25 kV) and for line-dropping (charging currents typical for distribution systems of these voltage ratings)

Cable switching—Load-splitting (parallel or loop-switching) up through 600 amperes at 14.4 kV and 25 kV, as well as load-dropping of currents up through 600 amperes (400 amperes for back-supported models at 25 kV) and for cable-dropping (charging currents typical for distribution systems of these voltage ratings)

Live Switching—Closing

Circuit closing—Inrush currents associated with the opening duties described in "Live Switching- Opening."

Two-time duty-cycle fault closing—Ratings of 36,400 or 65,000 amperes at 14.4 kV and 36,400 or 54,000 amperes peak at 25 kV

Three-time duty-cycle fault closing for 14.4-kV switches—Rating of 65,000 amperes peak

Warranty Qualifications

For the standard warranty contained in the seller's standard conditions of sale (as set forth in Price Sheet 150) to apply to Mini-Rupter Switches in indoor, outdoor, indoor-outdoor, or submersible enclosures not manufactured by S&C, the enclosure must be constructed, and the switch, barriers, and operating handle and mechanism (as applicable) must be installed therein, in accordance with the applicable S&C Standard Mounting Arrangement ED, data bulletin, and instruction sheet.

STEP 1. Obtain the catalog number of the desired switch from Table 2 on page 6. Also obtain the ED number of the desired switch from the "Applicable Standard Mounting Arrangement" column in that table.

Catalog Number: ☐☐☐☐☐☐☐☐

ED-Number: ☐☐–☐☐☐☐☐

STEP 2. If an operating handle and/or barrier options are desired, obtain the suffix of the desired item from Table 1 on page 3. Add the suffix to the ED number of the switch.

Suffix: –☐☐

STEP 3. If options are desired, obtain the suffix of the desired option Table 3 on page 8. Add the suffix to the switch catalog number.

Suffix: –☐☐☐

STEP 4. If accessories are desired, obtain the catalog number of the desired accessory from Table 4 on page 8.

Catalog Number: ☐☐☐☐

STEP 5. If connectors are desired, obtain the catalog number of the desired connector from Table 5 on page 8.

Catalog Number: ☐☐☐☐

Example: The catalog number of a 14.4-kV nominal 600-ampere Mini-Rupter Switch—back-supported frame, main contact at top, handle-on-right style, with ground studs (set of three, 65,000 amperes peak rating) at hinge end of switch, per the standard mounting arrangement (for use with a removable side handle) with an operating handle and interphase barriers plus full end-barriers, is:

2 5 5 2 2 2 R 2 – G 1 per

E D – 2 4 4 R 4 – S 5

Table 2. Mini-Rupter Switches①

Style	Applicable Standard Mounting Arrangement② for Use with			System Nominal Voltage, kV	Switch Ratings							Catalog Number⑥
					kV			Amperes				
								RMS, Sym.		Peak		
	Removable Side Handle	Non-removable Side Handle	Non-removable Front Handle		Nom.	Max	BIL	Cont.	Inter.③	Peak Withstand,	Two-Time Duty-Cycle, Fault Closing④⑤	
Top-supported frame main contact at top handle on right	ED-240R6	—	—	4.16 thru 16.5	14.4	17.0	95●■	600	600	36 400▲	36 400▲	255022R4◆
	ED-240R6	—	—	4.16 thru 16.5	14.4	17.0	95●■	600	600	65 000▼	65 000▼	255032R3□
	ED-241R4	—	—	12 thru 27.6	25	29	125●△	600	600	36 400	36 400	255043R4◆
	ED-241R4	—	—	12 thru 27.6	25	29	125●△	600	600	65 000▼	54 000▼◇	255053R3□
Top-supported frame main contact at top handle on left	ED-242R6	—	—	4.16 thru 16.5	14.4	17.0	95●■	600	600	36 400▲	36 400▲	255122R4◆
	ED-242R6	—	—	4.16 thru 16.5	14.4	17.0	95●■	600	600	65 000▼	65 000▼	255132R3□
	ED-243R4	—	—	12 thru 27.6	25	29	125●△	600	600	36 400	36 400	255143R4◆
	ED-243R4	—	—	12 thru 27.6	25	29	125●△	600	600	65 000▼	54 000▼◇	255153R3□
Back-supported frame main contact at top handle on right	ED-244R4	ED-245R4	ED-246R4	4.16 thru 16.5	14.4	17.0	95■▽	600	600	65 000▼	65 000▼	255222R2◐
	ED-247R4	ED-248R4	ED-249R4	12 thru 16.5	14.4	17.0	95◧	600	600	65 000▼	65 000▼	255232R2◐
	ED-250R4	ED-251R4	ED-252R4	16.5 thru 27.6	25	29	125▽	600	400◭	65 000	54 000◀	255243R2
Back-supported frame main contact at top handle on left	ED-253R4	ED-254R4	ED-255R4	4.16 thru 16.5	14.4	17.0	95■▽	600	600	65 000▼	65 000▼	255272R2◐
	ED-256R4	ED-257R4	ED-258R4	12 thru 16.5	14.4	17.0	95◧	600	600	65 000▼	65 000▼	255282R2◐
	ED-259R4	ED-260R4	ED-261R4	16.5 thru 27.6	25	29	125▽	600	400◭	65 000	54 000◀	255293R2
Back-supported frame main contact at bottom handle on right	ED-262R4	ED-263R4	ED-264R4	4.16 thru 16.5	14.4	17.0	95■▽	600	600	65 000▼	65 000▼	255522R2◐
	ED-265R4	ED-266R4	ED-267R4	12 thru 16.5	14.4	17.0	95◧	600	600	65 000▼	65 000▼	255532R2◐
	ED-268R4	ED-269R4	ED-270R4	16.5 thru 27.6	25	29	125▽	600	400◭	65 000	54 000◀	255543R2
Back-supported frame main contact at bottom handle on left	ED-271R4	ED-272R4	ED-273R4	4.16 thru 16.5	14.4	17.0	95■▽	600	600	65 000▼	65 000▼	255572R2◐
	ED-274R4	ED-275R4	ED-276R4	12 thru 16.5	14.4	17.0	95◧	600	600	65 000▼	65 000▼	255582R2◐
	ED-277R4	ED-278R4	ED-279R5	16.5 thru 27.6	25	29	125▽	600	400◭	65 000	54 000◀	255593R2

FOOTNOTES FOR TABLE 3 ARE ON PAGE 7 ►

FOOTNOTES FOR TABLE 3

① Switches are suitable for use in combination with Type SM-20, SM-4Z, SM-5S, or SM-5SS Power Fuses and can close, carry, and interrupt load currents up to and including the emergency peak-load capability of the fuses, with the following exceptions: For parallel-fuse arrangements, the rating of the fuses must not exceed 540E amperes, and for switches rated 36,400 amperes peak withstand, the system available three-phase fault current must not exceed 36,000 amperes, peak.

② The operating handle is only included when the appropriate suffix is added to the ED number. See Table 1 on page 3.

③ For applications involving load current with high harmonic content (such as rectifier load currents) on systems rated 7.2 kV and higher, contact the local S&C Sales Office.

④ This rating defines the ability to close the switch twice against a three-phase fault with peak current in at least one phase equal to the rated value, with the switch remaining operable and able to carry and interrupt rated current. (For the symmetrical value of fault-closing current listed, divide the peak value by 2.6.)

⑤ 14.4-kV switches also carry a three-time duty-cycle fault-closing rating of 65,000 amperes peak.

⑥ Top-supported frame style switches are back-connected at top and front-connected at bottom. Back-supported frame style switches are front-connected at top and bottom.

● Switch requires the addition of interphase barriers to attain the published BIL rating.

■ Switch may be applied without interphase barriers and full end-barriers on systems rated 4.16 kV through 7.2 kV, with a 75-kV BIL rating.

▲ The peak withstand and two-time duty-cycle fault-closing ratings of this switch, when used in combination with Type SM-4Z Power Fuses at 4.16 kV, 4.8 kV, and 7.2 kV, are increased to equal the interrupting rating of the fuse as follows: 4.16 kV and 4.8 kV—44,500 amperes peak; 7.2 kV—39,000 amperes peak.

◆ When replacing a switch bearing catalog number supplement "-R2" or lower, new barriers must be ordered, if required.

▼ The peak withstand and two-time duty-cycle fault-closing ratings of this switch, when used in combination with Type SM-5S Power Fuses, are 97,000 amperes peak at 4.16 kV; 65,000 amperes peak at 4.8 kV; 67,000 amperes peak at 7.2 kV; and 65,000 amperes peak at 13.8 kV and 14.4 kV. The peak withstand and two-time duty-cycle fault-closing ratings of these switches, when used in combination with Type SM-5SS Power Fuses, are 87,750 amperes peak at 13.8 kV and 14.4 kV, 60 Hertz only (89,000 amperes peak on 7.2/12.47 GrY-kV, 60-Hertz systems only).

□ When replacing a switch bearing catalog number supplement "-R1" or lower, new barriers must be ordered, if required.

△ Switch may be applied without interphase barriers on systems rated 12 kV through 16.5 kV, with a 95-kV BIL rating.

◇ The one-time duty-cycle fault-closing rating at 25 kV is 65,000 amperes peak. The two-time duty-cycle fault-closing rating at 14.4 kV is 65,000 amperes peak.

▽ Switch requires the addition of interphase barriers plus full end-barriers to attain the published BIL rating.

◐ Switch is UL-recognized.

◧ Switch cannot accommodate interphase barriers or full end-barriers. These barriers are not required to achieve the published BIL rating.

◭ Rating shown applies to load dropping at 25 kV. The load splitting (parallel or loop switching) rating is 600 amperes at 25 kV.

◀ The one-time duty-cycle fault-closing rating is 65,000 amperes peak.

Table 3. Options

Item	Suffix to be Added to Mini-Rupter Switch Catalog Number
Copper terminals (in lieu of aluminum) for Mini-Rupter Switches	-C
Retrofit kit for Mini-Rupter Switches installed as field replacements for S&C Metal-Enclosed Switchgear	-F
Ground studs, 65,000 amperes peak rating, set of three, at main-contact end of switch	-G1●
Ground studs, 65,000 amperes peak rating, set of three, at hinge end of switch	-G2
Ground studs, 65,000 amperes peak rating, set of six, at main-contact and hinge ends of switch	-G3●
International crating①	-L71
Auxiliary switch, 4-PDT, coupled to interrupter switch, for remote indication of switch position	-W

① Wood products used in the package are either hardwood or certified by the wood supplier as being "heat treated" (kiln dried) to a core temperature of 133°F (56°C) for a minimum of 30 minutes.

● Not available with top-supported frame style switches.

Table 4. Accessories

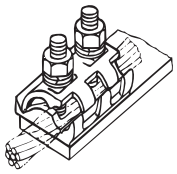
Item	Catalog Number
Mechanical cable interlock, between switch and door (fittings for door not included)—prevents opening door when switch is closed and prevents closing switch when door is open (not available for use with removable side handles)	5279
Mechanical cable interlock, between switch and door including fittings for door—prevents opening door when switch is closed and prevents closing switch when door is open (not available for use with removable side handles)	5299
Key interlock assembly for switches with nonremovable front handle—for locking switch in either the open or closed position	5292●
Key interlock assembly for switches with nonremovable side handle—for locking switch in either the open or closed position	5293■
Handle cover—for nonremovable front handle, padlockable	5298▲

● Assembly includes a lock mechanism by Superior; for a lock mechanism by Kirk, specify catalog number 5292-A.

■ Assembly includes a lock mechanism by Superior; for a lock mechanism by Kirk, specify catalog number 5293-A.

▲ Handle cover includes light gray indoor finish. For light gray outdoor finish, specify catalog number 5298-A1. For olive green outdoor finish, specify catalog number 5298-A2.

Table 5. Connectors

Illustration	Description	Accommodating Conductor	Catalog Number
	Bronze body, tin plated, two galvanized steel bolts, two Belleville washers	No. 2 solid (33.6 mm^2) through 500 kc mil (253 mm2) stranded copper or aluminum	4745