Specifications

Conditions of Sale

STANDARD: Seller's standard conditions of sale set forth in Price Sheet 150 apply.

SPECIAL TO THIS PRODUCT:

INCLUSIONS: The S&C Bankgard Relays are solid-state electronic devices which provide low-cost protection for small- to medium-sized station-type, wye-connected shunt capacitor banks having up through five series groups of capacitor units per phase.

Type LUC Bankgard Relay—For Ungrounded Capacitor Banks

The S&C Bankgard Relay—Type LUC is designed for *ungrounded* capacitor-bank applications. It detects neutral-to-ground voltage increments caused by isolation of faulted capacitor units from the bank by their respective fuses. When a predetermined neutral-to-ground voltage is exceeded, the Type LUC Bankgard Relay signals a switching device to disconnect the entire bank, thus protecting the surviving capacitor units in the bank against cascading voltage overstress.

The Type LUC Bankgard Relay does not provide system-voltage or capacitor-bank unbalance compensation. It is therefore applicable only to the sizes and configurations of capacitor banks for which the loss of a single capacitor unit results in a neutral-to-ground voltage increment that is at least twice the maximum expected error voltage. (A certain amount of error voltage is always present between the energized capacitor-bank neutral and ground, due to system-voltage unbalance and to inherent capacitor-bank unbalance resulting from manufacturing-tolerance variations among capacitor units in the bank.) S&C Data Bulletin 532-80 tabulates the capacitor-bank sizes and configurations for which the Type LUC Bankgard Relay is suitable, based on the maximum expected total of percent system-voltage unbalance plus percent inherent capacitor-bank unbalance.

Typically, the neutral-to-ground voltage is monitored by an S&C Outdoor Voltage Sensor for systems rated through 34.5 kV, or by a 15-volt-ampere S&C Potential Device for systems rated through 230 kV—either of which produces an output voltage directly proportional to the voltage applied to its line terminal.■ Alternately, a fully system-rated voltage transformer or small distribution transformer may be used for voltage sensing.

The low-voltage representation of the neutral-to-ground voltage, thus derived, is fed into the Type LUC Bankgard Relay, where it passes through an isolation transformer, a high-impedance buffer amplifier to minimize loading of the voltage-sensing device, and a bandpass filter to eliminate the effects of harmonics which may be present at the capacitor-bank neutral. The voltage signal is then compared to a preselected, field adjustable lockout-level setting. When—as a result of the loss of one or more capacitor units within the bank—the derived voltage signal exceeds the Bankgard relay's lockout-level setting, it activates a built-in electronic timer. The timer (field adjustable from 2 to 30 seconds) is factory-set for a 10-second delay to allow time for individual capacitor-unit fuses to respond to evolving faults within the units—so as to permit visual identification of the units in need of replacement. When the timer completes its cycle, a latching-type output relay supplies an opening signal to the switching device to effect isolation and lockout of the entire bank. The output relay is provided with an additional isolated contact which can be utilized for remote indication.

EXCLUSIONS: S&C Bankgard Relays do not include a neutral-to-ground voltage-monitoring device, switching device and operator, interconnections (wiring), or weatherproof enclosure.

SPECIFICATION DEVIATIONS: Refer to "OPTIONS" table on page 3.

SPECIAL WARRANTY PROVISIONS: The standard warranty contained in seller's standard conditions of sale, as set forth in Price Sheet 150, applies to S&C Bankgard Relays—Type LUC, except that the first and second paragraphs of said warranty are replaced by the following:

(1) General: Seller warrants to immediate purchaser or end user for a period of 10 years from the date of shipment that the equipment delivered will be of the kind and quality specified in the contract description and will be free of defects of workmanship and material. Should any failure to conform to this warranty appear under proper and normal use within ten years after the date of shipment the seller agrees, upon prompt notification thereof and confirmation that the equipment has been stored, installed, operated, and maintained in accordance with recommendations of the seller and standard industry practice, to correct the nonconformity either by repairing any damaged or defective parts of the equipment or (at seller's option) by shipment of necessary replacement parts. The seller's warranty does not apply to any equipment that has been disassembled, repaired, or altered by anyone other than the seller. This limited warranty is granted only to the immediate purchaser or, if the equipment is purchased by a third party for installation in third-party equipment, the end user of the equipment. The seller's duty to perform under any warranty may be delayed, at the seller's sole option, until the seller has been paid in full for all goods purchased by the immediate purchaser. No such delay shall extend the warranty period.

WARRANTY QUALIFICATIONS: Warranty of S&C Bankgard Relays—Type LUC is contingent upon the installation, configuration, and use of the control or software in accordance with S&C's applicable instruction sheets. This warranty does not apply to major components not of S&C manufacture, such as batteries, communication devices, and remote terminal units. However, S&C will assign to immediate purchaser or end user all manufacturers' warranties that apply to such major components.

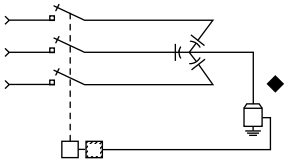
How to Order

Select the catalog number of the desired S&C Bankgard Relay. Add suffix letters to designate control voltage and options desired.

For example, for an S&C Bankgard Relay—Type LUC to operate from 120-volt, 60-hertz control voltage and to be equipped with a weatherproof enclosure, specify "Catalog Number 38220-DH.

■ Product specifications for S&C Potential Devices and S&C Outdoor Voltage Sensors are provided in Specification Bulletins 581-31 and 591-31, respectively.

S&C BANKGARD RELAYS

Type	Application	Diagram			Descriptive Brochure Number	Control Source		Output-Relay Contact Current Ratings, Amp			Catalog Number
		Switch Operator	Voltage-Sensing Device	Bankgard Relay		Voltage	Current Requirement, mA Max	Cont.	1-Sec.	Interr.	
LUC①	For protection of ungrounded wye-connected shunt capacitor banks				G532-126	48 Vdc	250	10	50	1	38220-A
						125 Vdc	250	10	50	0.5	38220-B
						120 V 60 Hz	200	10	50	10	38220-D

① For ungrounded-source applications, wherein the source is a delta-connected tertiary transformer winding, a grounded-wye broken-delta voltage-transformer "bank" with shunt resistor—referred to as a high-impedance grounding transformer (normally required for ground-fault detection)—is required to maintain the stability of phase-to-ground voltage relationships for all but fault conditions. Otherwise, spurious signal voltages could appear at the neutral of, and result in isolation of, the capacitor bank.

◆ A 15-volt-ampere S&C Potential Device or S&C Outdoor Voltage Sensor, and having a system voltage rating as follows:

Nominal Source Voltage, kV	S&C Potential Device System Voltage Rating, kV, Nom.	S&C Outdoor Voltage Sensor System Voltage Rating, kV, Nom.
14.4 (and below)	23	14.4
25	23	14.4
34.5	23	25
46	23	—
69	34.5	—
115	69	—
138	69	—
161	138	—
230	138	—

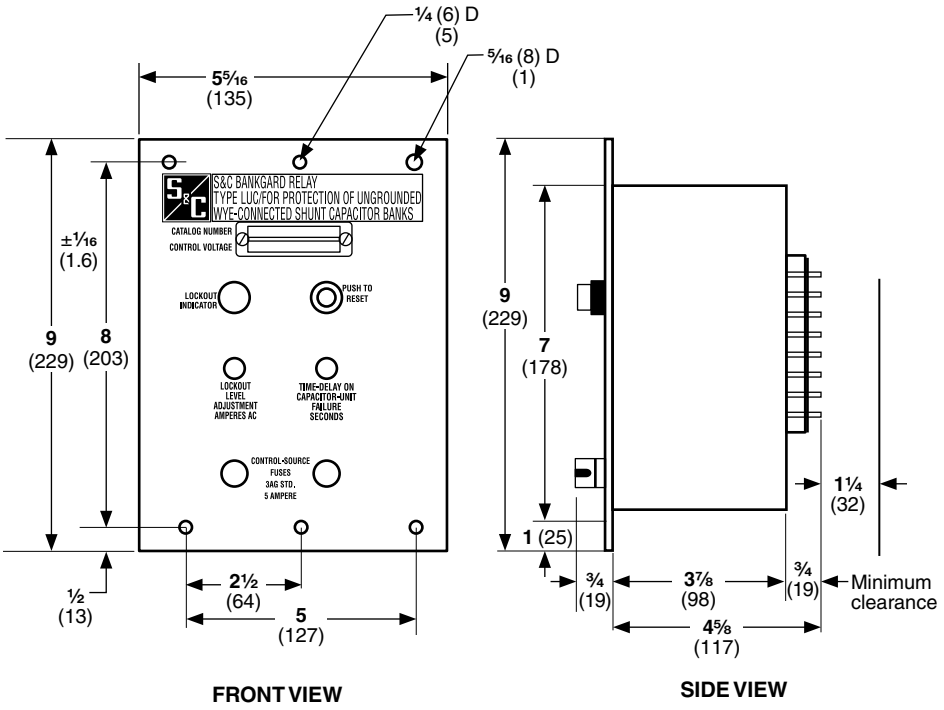
Alternately, a fully system-rated voltage transformer or small distribution transformer can be used.

OPTIONS—For Type LUC Bankgard Relays

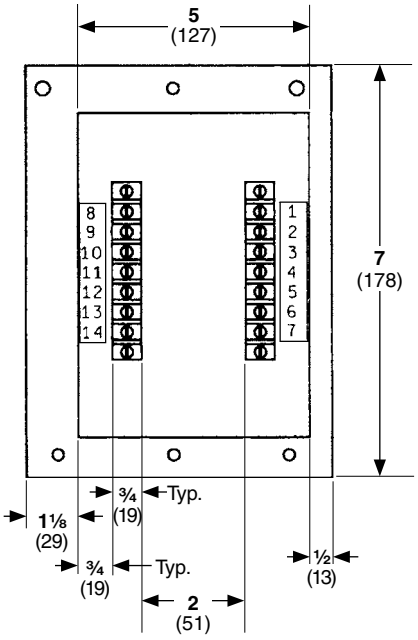
Item	Suffix to be Added to Bankgard Relay Catalog Number
Weatherproof Enclosure, steel①	-H
Mounting Kit for relay-rack installation①	-K

① Option Catalog Number Suffix "-H" cannot be furnished if Catalog Number Suffix "-K" is specified and vice versa.

Dimensions in Inches (mm)

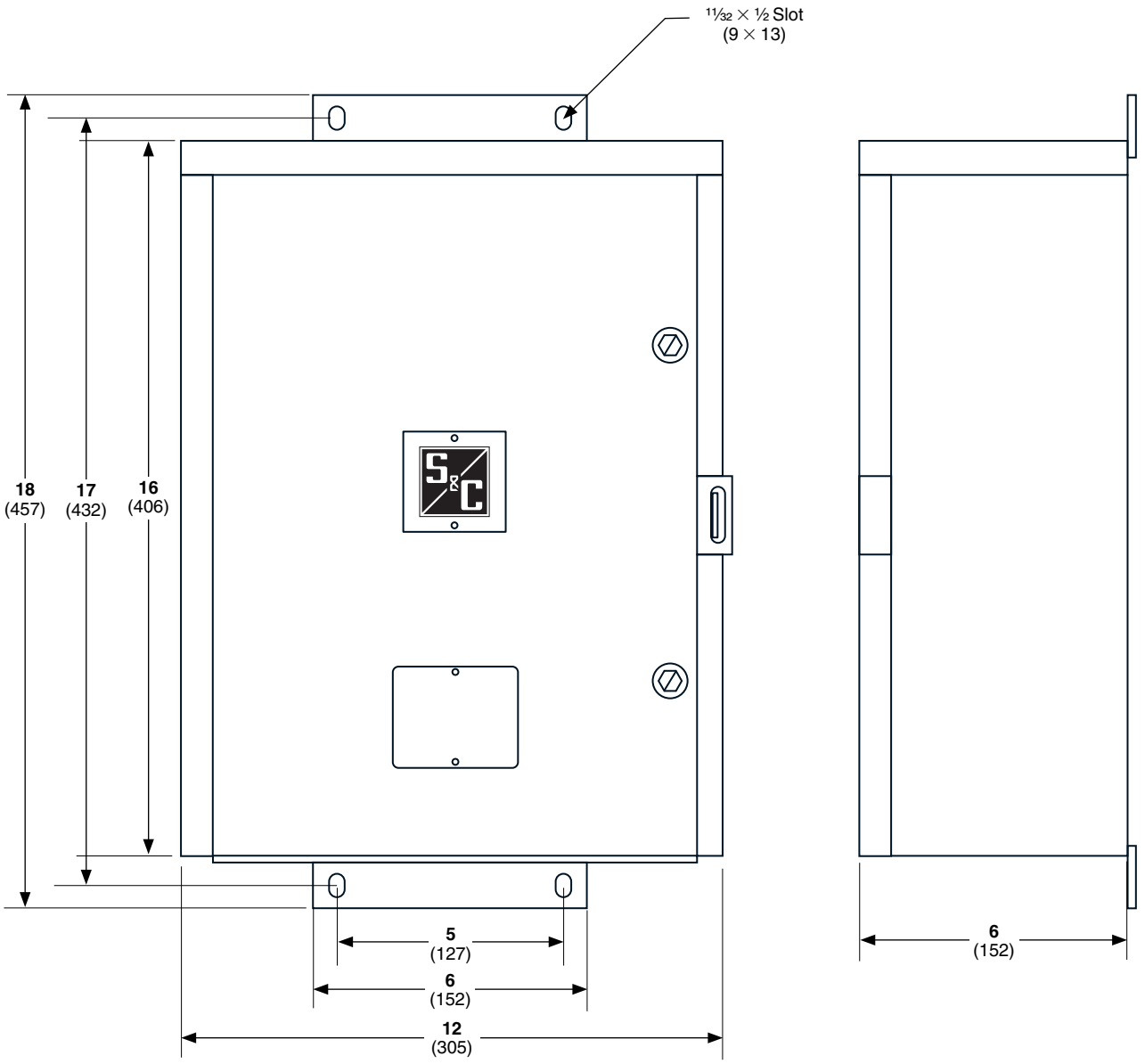


FRONT VIEW **SIDE VIEW**



REAR VIEW

Dimensions in Inches (mm)



FRONT VIEW
WEATHERPROOF ENCLOSURE

SIDE VIEW

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