

# REMOTE CONTROLLED CIRCUIT BREAKER (RCCB)



## Single Phase

- 28 VDC
- 115/200 VAC 400 Hz



## Three Phase

- 115/200 VAC 400 Hz
- Three Phase Only

## Qualified

Qualified to demanding performance parameters of MIL-PRF-83383 standard.

## Use as a Relay, Circuit Breaker, Or Both

RCCBs combine the best attributes of a circuit breaker and a relay. Automatically protects the wires and the load device during circuit/load breakdown, but allows the flight deck control of the load during normal operation.

## Weight and Cost Savings

In distributed-load applications, RCCBs are a more efficient power distribution solution promoting cost and weight savings through the elimination of long runs of heavy cables associated with the conventional relay - flight deck circuit protector method. Control of the RCCB requires only one #22 AWG control wire from the ICU on the flight deck to the RCCB.

## Cockpit Space Savings

An RCCB system removes the presence of large circuit breakers from the cockpit while permitting remote On/Off operation from the flight deck. Combine Safran Electrical & Power RCCB with Indicator Control Unit (ICU) model #1500-053-05.

## PERFORMANCE DATA

<b>Rupture Levels</b>	3600 A (115 VAC or 28VDC for 1Pole and 115VAC for 3 Pole)
<b>Endurance (Resistive &amp; Inductive(Motor))</b>	50,000 Cycles
<b>Endurance (Motor)</b>	5-50A: 50,000 cycles; 60-100A: 25,000 cycles
<b>Endurance (Lamp)</b>	5-25A: 50,000 cycles; 35-50A: 25,000 cycles; 60-100A: no rating
<b>Dielectric Strength</b>	1500V, 60Hz, MIL-STD-202, method 301, 0.5 MA max
<b>Insulation Resistance</b>	100 mega ohm min, MIL-STD-202, method 302
<b>Thermal Temperature Range</b>	-54°C to 71°C (-65°F to 160°F). MIL-STD-202, Method 107
<b>Vibration</b>	10G's to 2000 Hz. Exceeds MIL-STD-202, Method 204, Condition C, 10 microseconds max. chatter
<b>Shock</b>	25G's. MIL-STD-202, Method 213, 10 microseconds max. chatter
<b>Altitude</b>	50,000 ft.
<b>EMI Requirements</b>	MIL-STD-461, Requirements CS114 and RE102 over the frequency range of 14 KHz to 400 MHz and RE102 limits for Aircraft and Space Systems.
<b>EMI/RFI Susceptibility and Generation</b>	MIL-STD-461, Class 1D
<b>Moisture Resistance</b>	MIL-STD-202, method 106
<b>Salt Spray Resistance</b>	MIL-STD-202, method 101, Condition B
<b>Sand and Dust Resistance</b>	MIL-STD-202, method 110, Condition A
<b>Fungus Resistance</b>	MIL-HDBK-454, Guideline 4
<b>Explosion Proof</b>	MIL-STD-202, method 109
<b>Weight (Standard)</b>	5-25A: 318 grams (0.703 lbs.); 35-50A: 325 grams (0.719 lbs.); 60-100A: 332 grams (0.734 lbs.)
<b>Weight (w/ Auxiliary Contacts)</b>	5-25A: 332 grams (0.734 lbs.); 35-50A: 339 grams (0.750 lbs.); 60-100A: 346 grams (0.766 lbs.)

## OVERLOAD CALIBRATION DATA

Specification Table	@ 25°C		@ +71°C		@ -54°C		Test Time Parameters
	MIN	MAX	MIN	MAX	MIN	MAX	
Must Hold	115%		115%		115%		% for 1 Hour
Must Trip		138%		138%		150%	% Within 1 Hour

## ORDERING INFORMATION

AMPERE RATING	Single Pole Single Throw (Double Break Contacts)				Three Pole Single Throw (Double Break Contacts)	
	Standard		w/ Auxiliary Contacts		w/ Auxiliary Contacts	
	MS P/N	SAFRAN P/N	MS P/N	SAFRAN P/N	MS P/N	SAFRAN P/N
<b>5</b>	M83383/01-01	SM600BA5N1	M83383/02-01	SM600BA5A1		**
<b>7.5</b>		**		**		**
<b>10</b>	M83383/01-03	SM600BA10N1	M83383/02-03	SM600BA10A1	M83383/04-03	SM601BA10A1
<b>15</b>	M83383/01-04	SM600BA15N1	M83383/02-04	SM600BA15A1		SM601BA15A1
<b>20</b>	M83383/01-05	SM600BA20N1	M83383/02-05	SM600BA20A1	M83383/04-05	SM601BA20A1
<b>25</b>	M83383/01-06	SM600BA25N1	M83383/02-06	SM600BA25A1		SM601BA25A1
<b>35</b>	M83383/01-07	SM600BA35N1	M83383/02-07	SM600BA35A1	M83383/04-07	SM601BA35A1
<b>40</b>	M83383/01-08	SM600BA40N1	M83383/02-08	SM600BA40A1	M83383/04-08	SM601BA40A1
<b>50</b>	M83383/01-09	SM600BA50N1	M83383/02-09	SM600BA50A1		SM601BA50A1
<b>60</b>	* M83383/01-10	SM600BA60N1	M83383/02-10	SM600BA60A1	M83383/04-10	SM601BA60A1
<b>75</b>	* M83383/01-11	SM600BA75N1	M83383/02-11	SM600BA75A1		
<b>80</b>	*	**		**		
<b>100</b>	* M83383/01-13	SM600BA100N1	M83383/02-13	SM600BA100A1		

All Ampere Ratings equal to Rated Contact Loads (Resistive, Inductive, Motor, and Lamp) except as noted.

\* No Lamp Load Rating

\*\* Contact Business Unit

Not for Contact Business unit on Alternate Amperages, Trip Times, Control Configurations, Grounding, Auxiliary Switches, Mounting Systems, etc.

## OVERLOAD CALIBRATION DATA - SINGLE POLE

AMPERE RATING	200% Trip Times -54°C to +71°C		400% Trip Times -54°C to +71°C		1000% Trip Times -54°C to +71°C	
	MIN	MAX	MIN	MAX	MIN	MAX
AMPERES	SECONDS	SECONDS	SECONDS	SECONDS	SECONDS	SECONDS
5	7	40	1.2	6.4	0.3	1.2
7.5	11	40	2.4	6.8	0.33	1.1
10	12	42	2.8	8.5	0.42	1.05
15	13	45	1.7	8.3	0.35	1.2
20	14	46	2.9	7.6	0.4	1.15
25	15	50	2.6	8.7	0.4	1.3
35	16	55	2.8	8.3	0.35	1.3
40	16	55	2.9	9.2	0.36	1.3
50	13	55	2.9	10	0.4	1.25
60	13	60	2.6	13	0.26	1.8
75	13	60	2.5	13	0.26	1.8
80	14	60	2.7	12.5	0.3	2
100	17	63	3.5	13	0.38	1.9

## OVERLOAD CALIBRATION DATA - THREE POLE

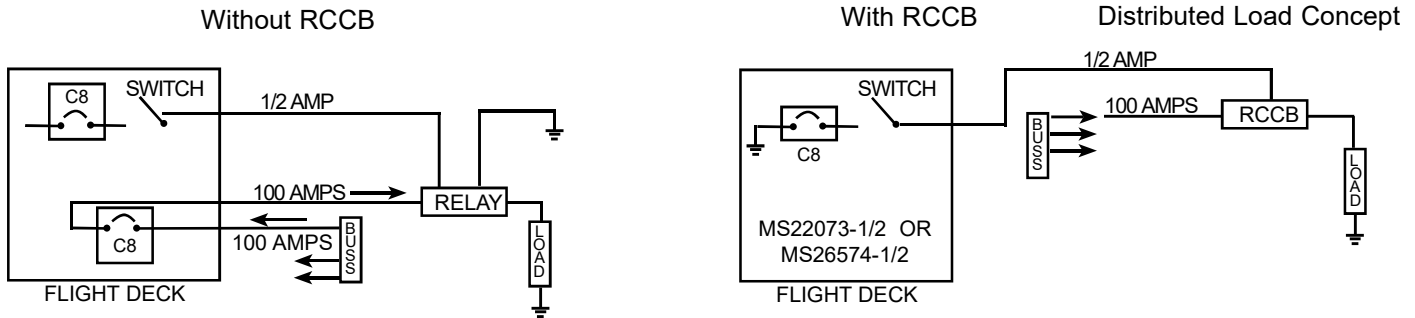
AMPERE RATING	200% Trip Times -54°C to +71°C		400% Trip Times -54°C to +71°C		1000% Trip Times -54°C to +71°C	
	MIN	MAX	MIN	MAX	MIN	MAX
AMPERES	SECONDS	SECONDS	SECONDS	SECONDS	SECONDS	SECONDS
10	12	80	2.8	11	0.42	1.3
15	13	80	1.7	10	0.35	1.2
20	14	80	2.9	9.6	0.4	1.15
25	15	80	2.6	10	0.4	1.3
35	16	80	2.8	11	0.35	1.3
40	16	80	2.6	10	0.36	1.3
50	13	80	2.9	10	0.4	1.25
60	13	80	2.4	16	0.26	1.8

## TRIP CURVE

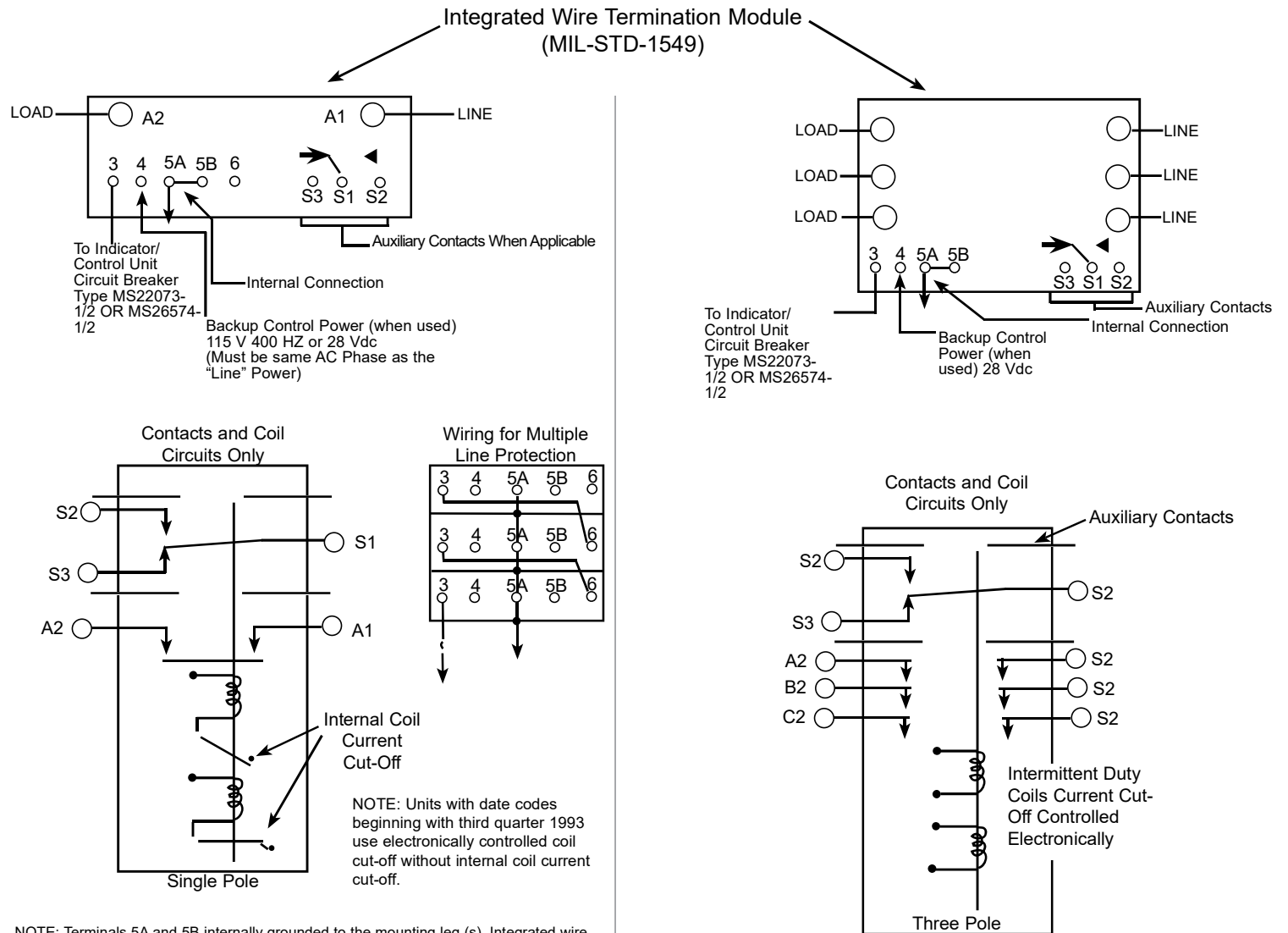
Contact business unit for trip curve.

# REMOTE CONTROLLED CIRCUIT BREAKER (RCCB) 1 POLE AND 3 POLE

## Engineering Data Application Note



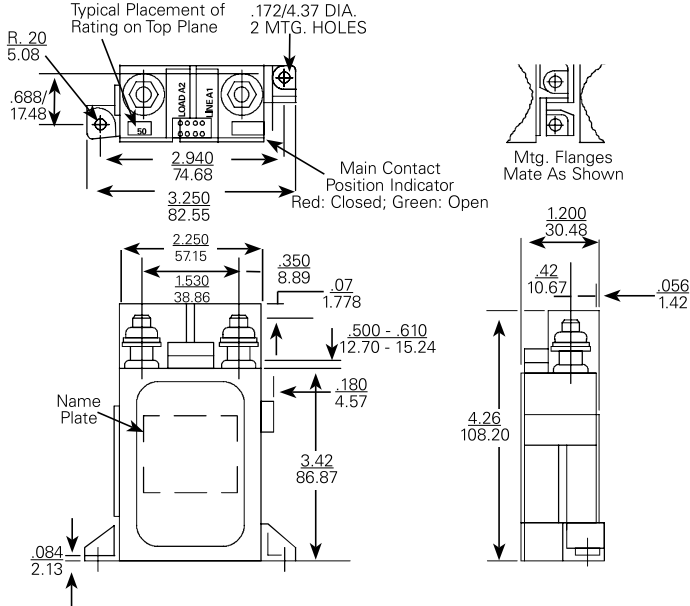
## Typical Wiring Diagram



NOTE: Terminals 5A and 5B internally grounded to the mounting leg (s). Integrated wire termination (IWT) module accepts pin contacts P/N M39029/1-100 or -101. Use with insertion/extraction tool M81969/14-02.

## Engineering Data

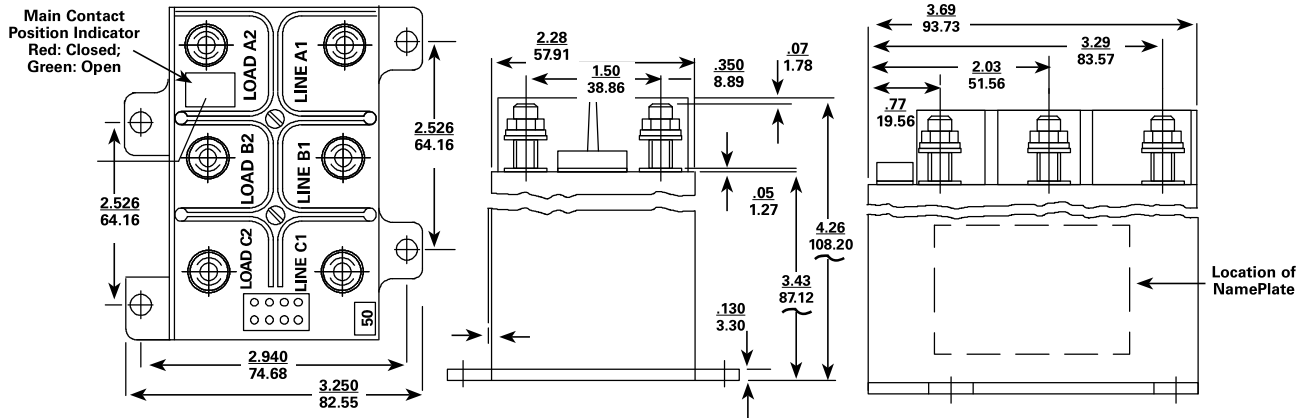
### Approximate Dimensions - 1 Pole



### Options

- Special application auxiliary switches
- Unique grounding
- Power sources
- Other current ratings
- Control via systems other than I/CU
- Low level auxiliary contacts available
- Data Bus/Interface capability available
- Electronically held coil

### 3Pole



### Coil Operate Current/Set And Trip Time RCCB

Circuits	Nominal System Voltage	I/CU Set Current @ Nom Voltage (Mulliamper)	Set Coil Current @ Nom Voltage Pulse	MAX. Set Time		*/I/CU. Trip Current Nominal					MAX. Standby Current Milliamp
				Nominal Voltage & Room Temp.	Most Adverse Condition - MIN. Voltage 71°C. Ambient	71°C & Nominal Voltage	-54°C & Nominal Voltage	Room Temp. Nominal Voltage	71°C & Nominal Voltage	-54°C & Nominal Voltage	
1 Pole	28 Vdc (18 Volts MIN.)	2	3.0 AMP MAX	20 Millisec	35 Millisec	1.4 AMP	1.9 AMP	1.6 AMP	0.9 AMP ***	2.1 AMP	10
	115 Vac 400 Hz (104 V. MIN.)	2	10 AMP MAX	15 Millisec	30 Millisec	6.8 AMP **	6.3 AMP **	8.6 AMP **	6.1 AMP **	7.0 AMP **	10
3 Pole	28 Vdc (18 Volts MIN.)	2	7.0 AMP MAX	20 Millisec	35 Millisec	1.5 AMP	2.0 AMP	1.7 AMP	0.9 AMP ***	2.2 AMP	10
	115 Vac 400 Hz (104 V. MIN.)	2	13.0 AMP MAX	15 Millisec	30 Millisec	4.3 AMP **	3.3 AMP **	4.5 AMP **	4.0 AMP **	3.1 AMP **	10

\* MAX. I/CU. Line Impedance 75  
 \*\* Average Half-Wave Rectified DC Current

Current Decreases w/Time so that  $I^2t$   
 \*\*\* Absolute Min. Value from -54° to +71°C

# REMOTE POWER CONTROLLER (RPC)



Single Pole  
• 28 VDC

## Electronic Current Sensing

The electronic over current sensing of these devices offer several advantages over the bi-metal sensing RCCB. Trip current levels can be closely controlled, for better protection of sensitive loads, trip times are faster, and both can be customized for specific applications. Other advantages included less heat buildup, and higher current capabilities in the same small package.

## Use as a Relay, Circuit Breaker, Or Both

RPCs, like RCCBs, combine the best attributes of a circuit breaker and a relay. Automatically protects the wires and the load device during circuit/load breakdown, but allows the flight deck control of the load during normal operation.

## Weight and Cost Savings

In distributed-load applications, RPCs are a more efficient power distribution solution promoting cost and weight savings through the elimination of long runs of heavy cables associated with the conventional relay - flight deck circuit protector method. Control of the RPC requires only one #22 AWG control wire from the ICU (model #1500-053-05) on the flight deck to the RPC.

## PERFORMANCE DATA

<b>Rupture Levels</b>	2500 A (28V <sub>DC</sub> )
<b>Endurance (Resistive)</b>	50,000 Cycles
<b>Endurance (Inductive and Motor)</b>	25,000 cycles
<b>Endurance (Lamp)</b>	No Rating
<b>Mechanical Life</b>	100,000 cycles
<b>Dielectric Strength</b>	Sea Level - VRMS .2-3 seconds: Coil to Case - 1250 initial, 1,000 After Life, All other Points 1,800 Initial, 1350 After Life 50,000 Ft. - VRMS 1 Minute: Coil to Case 500 Initial & After Life. All other Points 700 Initial & After Life
<b>Insulation Resistance</b>	1100 Megaohms initial, 50 Megohms after Life, MIL-STD-202, method 302, test condition B
<b>Thermal Temperature Range</b>	-55°C to 85°C (-67°F to 185°F).
<b>Vibration</b>	Sinusoidal 5 to 10 Hz: 0.08 DA; 10 TO 55 Hz: 0.06 DA; 55 to 2000 Hz: 10G's
<b>Shock</b>	50G's. (1/2 sine, 10-12 ms)
<b>Altitude</b>	50,000 Ft. Maximum
<b>EMI Requirements</b>	MIL-STD-461, Requirements CS114 and RE102 over the frequency range of 14 KHz to 400 MHz and RE102 limits for Aircraft and Space Systems
<b>Moisture Resistance</b>	MIL-STD-202, method 106
<b>Salt Spray Resistance</b>	MIL-STD-202, method 101, Condition B
<b>Sand and Dust Resistance</b>	MIL-STD-202, method 110, Condition A
<b>Fungus Resistance</b>	MIL-HDBK-454, Guideline 4
<b>Explosion Proof</b>	MIL-STD-202, method 109
<b>Weight (Standard)</b>	425.017 grams (0.937 lbs.)

## OVERLOAD DATA

% Rated Current	Trip in Seconds -55°C to +85°C
100%	No Trip
125%	45 Sec. Trip
200%	0.22 Sec. Trip
400%	0.095 Sec. Trip

## ORDERING INFORMATION

### Single Pole Single Throw (Double Break Contacts)

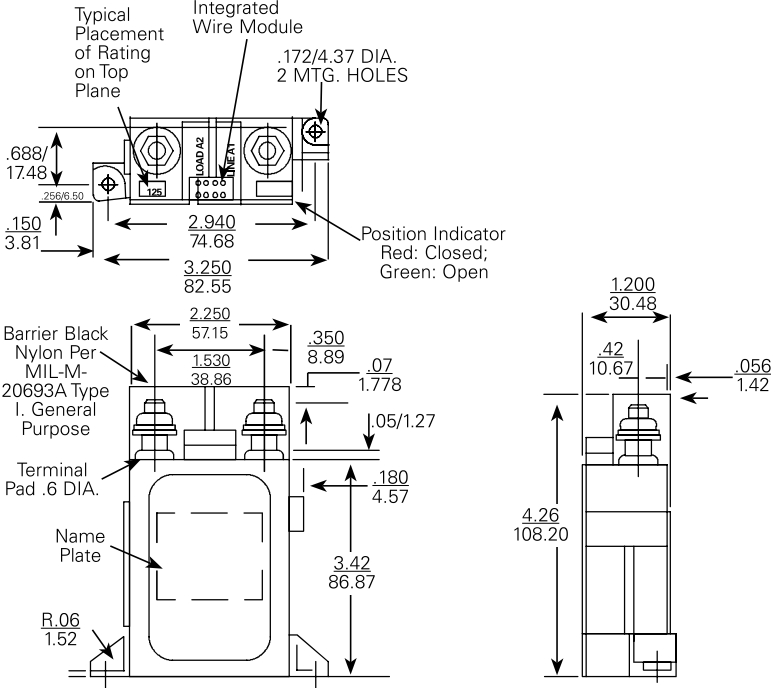
AMPERE RATING	SAFRAN P/N		Rated Contact Load (Amperes) 28 VDC		
125	SM600BA125A1	125	125	125	5
150	SM600BA150A1	150	150	150	5
175	SM600BA175A1	175	150	175	5
200	SM600BA200A1	200	150	175	5

#### Notes:

- One auxiliary contact included on each unit
- Contact Business Unit on Alternate Amperages, Trip Times, Control Configurations, Grounding, Auxiliary Switches, Mounting Systems, etc.

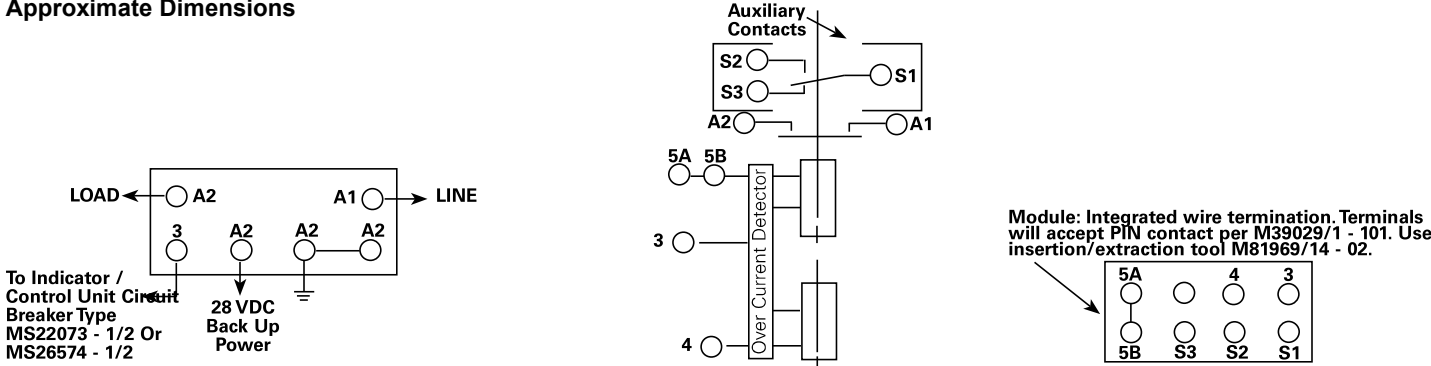
**Engineering Data**

**Approximate Dimensions - 1 Pole**



**Typical Wiring Diagram**

**Approximate Dimensions**



**COIL OPERATE CURRENT/SET AND TRIP TIME**

Nominal System Voltage	I/C Set Current @ Nom. Voltage (milliamp)	Set Coil Current @ Nom Voltage Pulse	MAX. Set Time		*/I.CU. Trip Current Nominal			
			Nominal Voltage @ Room Temp	Most Adverse Condition-Min. Voltage 71°C Ambient	71°C and Nominal Voltage	-54°C and Nominal Voltage	Room Temp and Nominal Voltage	Max. Standby Current (milliamp)
28 VDC (18 Volts Min)	2	3.7 Amp	20 Millisec	35 Millisec	1.76 Amp	1.25 Amp	1.89 Amp	30

\* MAX I/CU. LINE IMPEDANCE 75 Ohms      CURRENT DECREASES W/TIME SO THAT I<sup>2</sup>t >= 2

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