S&C Mark V Circuit Switcher Instruction Manual

Contents

S&C Mark V Circuit Switcher

Product Information

Specifications

- **Product Name:** Mark V Circuit-Switchers Outdoor Transmission
- **Voltage Range:** 34.5 kV through 345 kV

Introduction

The Mark V Circuit-Switchers Outdoor Transmission is a high-voltage equipment designed for specific applications within the voltage range of 34.5 kV through 345 kV. It is important to follow the instructions and safety precautions provided in this user manual to ensure safe and proper usage of the product.

Qualified Persons

These instructions are intended for qualified persons who have received adequate training and have experience in safety procedures for this type of equipment. Qualified persons should have knowledge of electrical systems and be familiar with working on or near exposed energized parts of electrical equipment.

Read this Instruction Sheet

It is crucial to thoroughly and carefully read this instruction sheet along with all materials included in the product's instruction handbook before inspecting your Mark VCircuit-Switcher. Familiarize yourself with the Safety Information and Safety Precautions provided in this manual.

Retain this Instruction Sheet

This instruction sheet should be retained as a permanent part of the Mark V Circuit-Switcher. It can be stored in the CS-1A SwitchOperator's instruction book holder or any designated location where users can easily retrieve and refer to it.

Proper Application

WARNING: The equipment in this publication is only intended for specific applications within the ratings furnished

for the equipment. The ratings for the vertical-break style Mark V Circuit-Switcher can be found in the ratings table in Specification Bulletin 711-31 and on the product's nameplate. It is important to ensure that the intended application falls within the specified ratings.

Special Warranty Provisions
The standard warranty for Mark V Circuit-Switchers and accessories, as set forth in Price Sheet 150, applies to the product. However, the first paragraph of the warranty is replaced by the following: Replacement parts purchased separately will be covered by the warranty contained in the seller's standard conditions of sale.

Warranty Qualifications
The warranty of circuit-switchers is contingent upon meeting the following qualifications:

- Compliance with the seller's standard conditions of sale as stated in Price Sheet 150
- Proper installation and usage of the product
- Adherence to recommended inspection and maintenance procedures

Product Usage Instructions

Safety Information

Understanding Safety-Alert Messages
The Mark V Circuit-Switcher user manual includes safety-alert messages that are important for ensuring safe operation. These messages are indicated by different signal words:

- **WARNING:** Indicates a potentially hazardous situation that, if not avoided, could result in serious injury or death.
- **NOTICE:** Highlights important information or instructions that should be followed to prevent damage to the equipment or other property.

Following Safety Instructions
It is essential to follow all safety instructions provided in this user manual to prevent accidents, injuries, and equipment damage. Failure to follow these instructions may void the warranty and compromise the safety of individuals and property.

Replacement Instructions and Labels
When replacing parts or components of the Mark V Circuit-Switcher, refer to the appropriate instructions provided in this manual. Additionally, ensure that any labels or tags attached to the equipment are correctly installed and visible.

Safety Precautions
Prior to inspecting or performing any maintenance on the Mark V Circuit-Switcher, observe the following safety precautions:

- Always de-energize the equipment and follow proper lockout/tagout procedures.
- Use appropriate personal protective equipment (PPE) such as gloves, safety glasses, and insulated tools when working on or near exposed energized parts.
- Inspect the equipment regularly to identify any signs of damage, wear, or deterioration.

Inspection Recommendations

Before Starting:

- Ensure that the equipment is de-energized and properly locked out/tagged out.
- Inspect the surrounding area for any potential hazards and ensure a safe working environment.

Recommended Inspection Schedule:
Follow the recommended inspection schedule provided in this user manual to ensure the proper functioning and safety of the Mark V Circuit-Switcher.

Recommended Inspection Procedures:
Refer to the recommended inspection procedures outlined in this manual for step-by-step instructions on inspecting the various components and functions of the Mark V Circuit-Switcher.

Resistance Values
Monitor and record resistance values as specified in this user manual. Deviations from the recommended resistance values may indicate potential issues or faults in the equipment.

FAQ (Frequently Asked Questions)

Where can I find the latest version of this user manual?

The latest version of this user manual is available online in PDF format at **https://www.sandc.com/en/contact-us/product-literature/**.

Introduction

Qualified Persons

WARNING
Only qualified persons who are knowledgeable in the installation, operation, and maintenance of overhead and underground electric transmission and distribution equipment, along with all associated hazards, may install, operate, and maintain the equipment covered by this publication. A qualified person is someone who is trained and competent in:

- The skills and techniques necessary to distinguish exposed live parts from nonlive parts of electrical equipment
- The skills and techniques necessary to determine the proper approach distances corresponding to the voltages to which the qualified person will be exposed
- The proper use of special precautionary techniques, personal protective equipment, insulated and shielding materials, and insulated tools for working on or near exposed energized parts of electrical equipment These instructions are intended only for such qualified persons. They are not intended to be a substitute for adequate training and experience in safety procedures for this type of equipment.

Read this Instruction Sheet

NOTICE
Thoroughly and carefully read this instruction sheet and all materials included in the product's instruction handbook before inspecting your Mark V Circuit Switcher. Become familiar with the Safety Information and Safety Precautions on pages 4 and 5. The latest version of this publication is available online in PDF format at **https://www.sandc.com/en/contact-us/product-literature/**.

This instruction sheet is a permanent part of the Mark V Circuit-Switcher. Store a copy in the CS-1A Switch Operator's instruction book holder, or designate a location where users can easily retrieve and refer to this publication.

Proper Application

WARNING
The equipment in this publication is only intended for specific applications. The application must be within the ratings furnished for the equipment. Ratings for the vertical-break style Mark V Circuit-Switcher are listed in the ratings table in Specification Bulletin 711-31. The ratings are also on the nameplate affixed to the product.

Special Warranty Provisions
The standard warranty contained in the seller's standard conditions of sale, as set forth in Price Sheet 150, applies to Mark V Circuit-Switchers and accessories and associated switch operators, except the first paragraph of the said warranty is replaced by the following:

General: The seller warrants to the purchaser for a period of five 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 five years after the date of shipment, the seller agrees, upon prompt notification thereof and confirmation that the equipment has been stored, installed, operated, inspected, 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 the seller's option) by shipment of necessary replacement parts. Replacement parts provided by the seller under the warranty for the original equipment will be covered by the original equipment warranty for its duration.

Replacement parts purchased separately will be covered by the warranty contained in the seller's standard conditions of sale, as set forth in Price Sheet 150.

Warranty Qualifications
Warranty of circuit-switchers is contingent upon each of the following:

- Observance of the static and dynamic deflection limits shown on S&C Data Sheet 711-300, 711- 301, 711-302, or 711-303, as applicable
- Power operation of circuit-switchers only by S&C Switch Operators
- Installation and adjustment of circuit switchers in accordance with S&C's applicable erection drawings and instruction sheets
- Conformance with the inspection recommendations defined in S&C Instruction Sheet 711-590 (this document)

Safety Information

Understanding Safety-Alert Messages
Several types of safety-alert messages may appear throughout this instruction sheet and on labels and tags attached to the Mark V Circuit-Switcher. Become familiar with these types of messages and the importance of these various signal words:

- **DANGER**
  "DANGER" identifies the most serious and immediate hazards that will likely result in serious personal injury or death if instructions, including recommended precautions, are not followed
- **WARNING**
  "WARNING" identifies hazards or unsafe practices that can result in serious personal injury or death if

instructions, including recommended precautions, are not followed

- **CAUTION**

  “CAUTION” identifies hazards or unsafe practices that can result in minor personal injury if instructions, including recommended precautions, are not followed

- **NOTICE**

  “NOTICE” identifies important procedures or requirements that can result in product or property damage if instructions are not followed

Following Safety Instructions
If any portion of this instruction sheet is unclear and assistance is needed, contact the nearest S&C Sales Office or S&C Authorized Distributor. Their telephone numbers are listed on S&C’s website sandc.com, or call the S&C Global Support and Monitoring Center at 1-888-762-1100.

NOTICE
Read this instruction sheet thoroughly and carefully before inspecting the Mark V Circuit-Switcher

Replacement Instructions and Labels
If additional copies of this instruction sheet are required, contact the nearest S&C Sales Office, S&C Authorized Distributor, S&C Headquarters, or S&C Electric Canada Ltd. It is important that any missing, damaged, or faded labels on the equipment be replaced immediately. Replacement labels are available by contacting the nearest S&C Sales Office, S&C Authorized Distributor, S&C Headquarters, or S&C Electric Canada Ltd.

Safety Precautions

DANGER
Mark V Circuit-Switchers operate at high voltage. Failure to observe the precautions below will result in serious personal injury or death.Some of these precautions may differ from company operating procedures and rules. Where a discrepancy exists, follow your company’s operating procedures and rules.

1. **QUALIFIED PERSONS**

   Access to Mark V Circuit- Switchers must be restricted only to qualified persons. See the “Qualified Persons” section on page 2.
2. **SAFETY PROCEDURES**

   Always follow safe operating procedures and rules.
3. **PERSONAL PROTECTIVE EQUIPMENT**

   Always use suitable protective equipment, such as rubber gloves, rubber mats, hard hats, safety glasses, and flash clothing, in accordance with safe operating procedures and rules.
4. **SAFETY LABELS**

   Do not remove or obscure any of the “DANGER,” “WARNING,” “CAUTION,” or “NOTICE” labels.
5. **OPERATING MECHANISM AND BASE.**

   Mark V Circuit-Switchers contain fast-moving parts that can severely injure fingers. Do not remove or disassemble operating mechanisms or remove access panels unless directed by S&C Electric Company.
6. **ENERGIZED COMPONENTS**

   Always consider all parts live until de-energized, tested, and grounded. Voltage levels can be as high as the peak line-to ground voltage last applied to the unit. Units that have been energized or installed near energized lines should be considered live until tested and ground.
7. **GROUNDING**

The Mark V Circuit-Switcher must be connected to a suitable earth ground at the base of the utility pole, or to a suitable building ground for testing, before energizing the switch and at all times when energized.

8. The ground wire(s) must be bonded to the system neutral, if present. If the system neutral is not present, proper precautions must be taken to ensure the local earth ground or building ground, cannot be severed or removed.
9. **SWITCH POSITION**

   Always confirm the Open/ Close position of each switch.

   Switches and terminal pads may be energized from either side.

   Switches and terminal pads may be energized with the switches in any position.
10. **MAINTAINING PROPER CLEARANCE**

    Always maintain proper clearance from energized components.

Inspection Recommendations

Before Starting

To ensure a Mark V Circuit-Switcher's continued proper performance, it should be inspected in accordance with the recommended schedule and procedures contained in this publication. Table 1 on pages 7 and 8 indicates the frequency with which each major circuit-switcher component should be inspected. Table 2 on pages 9 and 10 lists a summary of inspection procedures appropriate for each component. These inspection recommendations are applicable to Mark V Circuit-Switcher models having one, two, or three interrupting gaps per pole-unit.

Recommended Inspection Schedule

A mechanical-operations test value is indicated in Table 1 on pages 7 and 8 for those Mark V Circuit-Switcher components affected by the number of mechanical operations performed. It is a guideline to the number of Open/Close operations expected for the component before replacement is required.

Electrical operations limits are listed for the interrupter and disconnect live parts because these components are affected by the number of electrical operations performed. These limits depend on the circuit-switcher application, the magnitude of the current switched and, in some cases, the style of circuit-switcher involved. For the interrupter and disconnect live parts, the electrical operations limit may provide a more accurate guideline for the number of Open/Close operations expected before replacement is required.

The actual number of Open/Close operations for a component will depend on the nature of the application, the environment (e.g., whether subject to temperature or humidity extremes or highly corrosive or dusty atmospheres), and the observance of the recommended inspection schedule.

An inspection frequency is shown for each component. To maximize the operating life of the component, S&C recommends the user perform the inspection procedures in Table 1 on pages 7 and 8 at the frequency indicated by a "●"— either in a number of Open/Close operations or years, which occurs more often. If the inspection results indicate or if dictated by the mechanical operations test value or electrical operations limit guideline, the component should be replaced.
Each user's own experience will determine whether more frequent inspections are required.

Note: For most transformer protection applications, the circuit-switcher inspection frequency is approximately five years, consistent with many utilities' transformer-inspection practices.

Table 1: Recommended Inspection Schedule for S&C Mark V Circuit-Switcher Components

		Electrical-Operations Limit	**Inspection Frequency②**

Component	Mechanical- Operations Test Value①, Number of Open/Close Operations	Application	Maximum Current, Amperes	Circuit-Switcher Style	Number of Open/Close Operations	Number of Open/Close Operations						Number of Years	
						1 or 2	125	250	500	1 000	2 500	1	5
Switch operator, power train, brain, and shunt-trip device	5 000	—	—	—	—						●■		●■
Interrupter	5 000	Capacitor, reactor, or load switching	250	All	5 000						● ▲		● ▲
			550		2 000					● ▲			
			1 000		1 000				● ▲				
		Load switching	1 200	All	750			● ▲					
			1 600	Center-break	500			● ▲					
			2 000		250		● ▲						
		Fault interrupting	Secondary- fault interrupting rating of circuit-switcher	All	25	Not applicable							
			Primary-fault interrupting rating of circuit-switcher	All	10								
			250	All	5 000■						● ◆		
			550		2 000■					● ◆			

Disconnect live parts	5 000	Capacitor, reactor, or load switching	1 000	Vertical-break and integer with extra-performance closing contacts	1 000■				● ◆				
				Vertical-break and integer without extra- performance closing contacts	500■			● ◆					
				Center-break	1 000				●				
		Load switching	1 200	Vertical-break and integer with extra-performance closing contacts	750■			● ◆					
				Vertical-break and integer without extra- performance closing contacts	350■		● ◆						●
				Center-break	750			●					
			1 600	Center-break	500			●					
			2 000		250		●						
		Fault closing	Fault-closing rating of circuit-switcher	All	2	●						Not applicable	

Pre-insertion inductor	—	—	—	—	—			●				▼	
Bypass accessory	—	—	—	—	—	Not applicable							●
Grounding switch	—	—	—	—	—								●

1. Based on mechanical operations tests perform by S&C using a new circuit-switcher with no intervening maintenance performed.
2. Frequently operated circuit-switchers (typically 200 or more Open/Close operations a year) should be inspected after the first 250 operations. Thereafter, they should be inspected at the frequency indicated. Frequently operated circuit-switchers also require annual lubrication of the disconnect live parts. See Table 2 on pages 4 and 5.

- ● Recommended inspection frequency.
- ■ Shunt-trip equipped 69-kV single-gap circuit-switchers in ungrounded capacitor-switching applications must be inspected and the brains adjusted, as necessary, every 1000 operations to prevent the occurrence of occasional restrikes during opening operations. Non-shunt-trip equipped 69-kV single-gap circuit-switchers in ungrounded capacitor-switching applications must be inspected and the brains adjusted, as necessary, every 500 operations to prevent the occurrence of occasional restrikes during opening operations. See S&C Instruction Sheet 711-515.
- ▲ Interrupters should be checked for low gas pressure (red targets) during the user's normal day-to-day operating procedures.
- ◆ For vertical-break style and integer style circuit-switchers manufactured before 1983, the electrical operations limit of the disconnect live parts is approximately one-half of the value indicated because the closing contacts on these circuit-switchers apply lower contact pressure. Consequently, the recommended inspection frequency for the disconnect live parts of these circuit-switchers, in number of Open/Close operations, is one-half of the value indicated. Present-design closing contacts are available for field retrofit; refer to the nearest S&C Sales Office.
- ▼ Frequently operated circuit-switchers equipped with pre-insertion inductors require annual cleaning of the inductor windings. See Table 2 on pages 9 and 10.

Recommended Inspection Procedures
The Mark V Circuit-Switcher inspection procedures to be followed are summarized in Table 2. The applicable S&C instruction sheets for the circuit-switcher, switch operator, pre-insertion inductor, grounding switch, etc., should be referenced for further details.

Table 2: Recommended Inspection Procedures for S&C Mark V Circuit-Switcher Components

Component	Inspection Procedures

General	1 Check with the nearest S&C Sales Office to determine whether there are any outstanding fiel d notifications involving inspection, maintenance, or retrofit 2Check the overall cleanliness of the insulators, live parts, and exterior of the operator If there i s severe contamination, power wash with water or clean using a non-abrasive cleaning method After washing, reapply an appropriate contact lubricant,to the disconnect live parts
Switch operat or	1 Check for evidence of water ingress, damage, excessive corrosion, or wear 2Check the ease of operation during slow, manual cranking using the switch operator manual o perating handle Listen for simultaneity of tripping of the interruptersFrom the point at which one interrupter trips, no more than 40° of rotation should be required before the other two interrupte rs trip If excessive rotation is required, contact the nearest S&C Sales Office 3 Simulate a fault by activating the protective relay circuit (if applicable) Check electrical operati on, coupled and decoupled 4 Check for loose wiring inside the enclosure and proper functioning of the position-indicating l amps, operation counter, convenience lamp, etc 5 Check brake operation and adjust, if necessary 6Check the key interlocks, if furnished, mechanically and electrically
Power train	1Check for evidence of damage, excessive corrosion, or wear 2Check the fastener tightness 3 Observe operation during slow, manual cranking using the switch operator manual operating handle check for complete stroking of the various drive levers against their stops and for attain ment of over toggle positions, as required 4 Check seal conditions
Brain	1 Remove the brain cover and check for evidence of water ingress, damage, excessive corrosi on, or wear 2 Check for tightness of shunt-cable fasteners and for evidence of excessive frayin g of the shunt cable 3 Check the seal conditions 4 Replace the brain cover Observe operation during slow, manual cranking using the switch op erator manual operating handle Listen for the tripping action of the interrupter on opening and o bserve operation of the interrupter targets 5 Check for proper clearances at the brain adjustment-holding device and at the blade crank-ar m stop
Shunt-trip dev ice	1Remove the shunt-trip solenoid-housing cover and check for evidence of water ingress, dama ge, excessive corrosion, or wear 2Check the seal conditions 3 Replace the shunt-trip solenoid-housing cover Simulate a fault by activating the protective-rel ay circuit Verify all three shunt-trip solenoids function and the switch operator motor follows thr ough to open the disconnect

Interrupter	1Check for low gas pressure (red indicator) 2 Check the fastener tightness on current-carrying parts 3(Optional) Check the resistance using the resistance values in Table 3 on page 11 for a vertical-break or integer style circuit-switcher or Table 4 on page 12 for a center-break style circuit-switcher

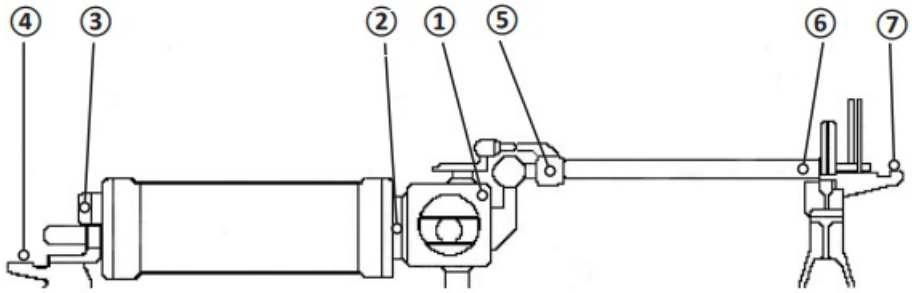
Disconnect live parts	1Check for evidence of damage, excessive corrosion, or wear—especially at the fault-closing contacts and current-carrying contacts Replace current-carrying jaw contacts if the silver-alloy inserts on two or more contact fingers are worn to the extent the blade tongue contact engages the full width of the contact finger 2Check the fastener tightness on current-carrying parts 3 Observe operation during slow, manual cranking using the switch operator manual operating handleCheck for proper contact alignment 4 Lubricate the contact surfaces with an appropriate lubricant
Pre-insertion inductor	1 Clean the exterior finish of inductor windings using a mild soap and water solution and a soft cloth Inspect the fiberglass roving for damage or wear Use a mild soap and water solution and a clean cloth to clean the exterior finish of the inductor winding While cleaning the windings, inspect for damage or exposure of the fiberglass roving 2 If the fiberglass roving is damaged, use the touch-up kit, S&C catalog number SA-42721, to refinish any damaged surfaces First, thoroughly wire-brush the surface to be refinished Then, sand with No 1 sandpaper and No 0 sandpaper to create a smooth surface Brush on the paint according to the directions on the label and let dry for six hours *If the coiled conductor beneath the fiberglass roving is exposed, remove the inductor from service and contact your nearest S&C Sales Office for a replacement.* 3 Inspect the moving and stationary arcing rods to verify their proper setting Replace the arcing rods if they show significant wear or erosion
Bypass accessory	1 Check for evidence of damage, excessive corrosion, or wear 2 Check the fastener tightness on current-carrying parts 3Observe operation using the stick-operated ratchet mechanism Check for proper contact alignment 4Lubricate the contact surfaces with an appropriate lubricant
Grounding switch	1 Check for evidence of damage, excessive corrosion, or wear—especially at the jaw-contact members 2 Check the fastener tightness on current-carrying parts 3Observe operation using manual operating handle Check for proper contact alignment 4Lubricate the contact surfaces with an appropriate lubricant

1. Shell Gadus® S2 U1000 2 Lubricant, catalog number 9999-043, is available in 1 oz tubes from S&C Shell Darina SD2, Dow 33, or equivalent can be substituted

Resistance Values

The allowable resistance values indicated in Table 3 on page 11 and Table 4 on page 12 are provided for the convenience of users whose practices include measuring and recording the resistance over current-carrying and current-interrupting components of a circuit-switcher. Such measurements are not required to fulfill the terms of S&C's circuit-switcher warranty and should only be made by qualified personnel fully trained in the measur- ing equipment and the techniques for making resistance measurements on high-voltage equipment. The measure- ments can be used to identify areas of high resistance, to be remedied by cleaning and maintenance, or component replacement.

Table 3: Allowable Resistance Values for S&C Mark V Circuit-Switcher, Vertical-Break And Integer Styles



kV	Gaps	Allowable Resistance In Microhms, Between Points									In Megohms, Between Points 2-3, Interrupter Open
		1-4●	2-3, Interrupter Closed		1-2	3-4	4-7■	1-5	6-7		
			Continuous Current Less Than 400 A	Continuous Current Greater Than 400 A							
34 5	1	30	600	200	15	15	130	40	40		–
46	1	30	600	200	15	15	140	40	40		–
69	1	30	600	200	15	15	160	40	40		–
	2		1 000	333							208–312
115	1	30	600	200	15	15	220	40	40		–
	2		1 000	333							208–312
138	1	30	600	200	15	15	230	40	40		–
	2		1 000	333							208–312
	3		1 500	500							312– 468
161	2	30	1 000	333	15	15	240	40	40		208–312
	3		1 500	500							312– 468

The resistance between points 1 and 4 minus the actual resistance between points 2 and 3 with the interrupter closed.

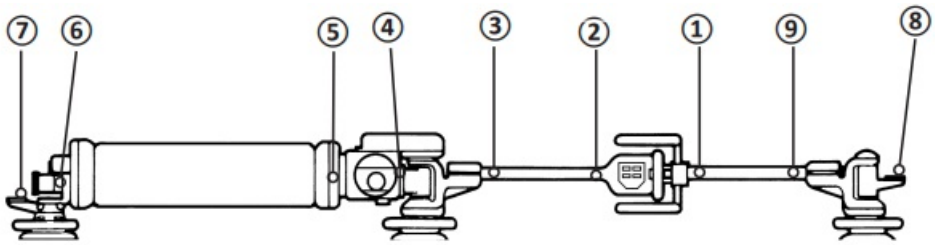
DANGER
De-energize and ground the circuit-switcher at all six terminals before making resistance measurements. Follow all applicable safety procedures Failure to de-energize and ground the circuit-switcher before making resistance measurements can result in serious injury or death

Interrupter
Measure the resistance between points 2 and 3 with the inter-rupter closed. If the measurement exceeds the allowable value indicated, measure the resistance between points 2 and 3 with the interrupter open. If that measurement exceeds the allowable value indicated, replace the interrupter. Now, measure the resistance between points 1 and 4 with the interrupter closed. If the measurement exceeds the allowable value indicated, measure the resistance between points 1 and 2, and then measure the resistance between points 3 and 4. If either of those measurements exceeds the allowable value, disassemble the appropriate bolted connection, clean the surfaces, reapply an appropriate contact lubricant, and reassemble the connection.

Disconnect
Measure the resistance between points 4 and 7 with the interrupter closed. Subtract the value of resistance measured between points 2 and 3 with the interrupter closed. If the difference exceeds the allowable value for resistance between points 4 and 7, measure the resis-tance between points 6 and 7 and between points 1 and 5. If either of those measurements exceeds the allowable value, contact the nearest S&C Sales Office for assistance.

Inspection Recommendations

Table 4: Allowable Resistance Values For S&C Mark V Circuit-Switcher, Center-Break Style



kV	Cont Current, Amperes	Gaps	Allowable Resistance In Microhms, Between Points 4-7●	5-6, Interrupter Closed: Continuous Current Less Than 400 A	5-6, Interrupter Closed: Continuous Current Greater Than 400 A	1-2	3-4	4-5	6-7	7-8 ■	8-9	In Megohms, Between Points 5-6, Interrupter Open
230	1 600	3	30	1 500	500	30	30	15	15	165	30	312– 468
	2 000									130		
345	1 600	3	30	1 500	500	30	30	15	15	225	30	312– 468
	2 000											

The resistance between points 4 and 7 minus the actual measured resistance between points 5 and 6 with the interrupter closed.

DANGER
De-energize and ground the circuit switch at all six terminals before making resistance measurements. Follow all applicable safety procedures. Failure to de-energize and ground the circuit-switcher before making resistance measurements can result in serious injury or death.

Interrupter
Measure the resistance between points 5 and 6 with the interrupter closed. If the measurement exceeds the allowable value indicated, measure the resistance between points 5 and 6 with the interrupter open . If that measurement exceeds the allowable value indicated, replace the interrupter. Now, measure the resistance between points 4 and 7 with the interrupter closed. If the measurement exceeds the allowable value indicated, measure the resistance between points 4 and 5, and then measure the resistance between points 6 and 7. If either of those measurements exceeds the allowable value, disassemble the appropriate bolted connection, clean the surfaces, reapply an appropriate contact lubricant, and reassemble the connection.

Disconnect
Measure the resistance between points 7 and 8 with the interrupter closed. Subtract the value of resistance measured between points 5 and 6 with the interrupter closed. If the difference exceeds the allowable value for resistance between points 7 and 8, measure the resistance between points 8 and 9, between points 1 and 2, and between points 3 and 4. If any of those measurements exceeds the allowable value, contact the nearest S&C Sales Office for assistance.

Documents / Resources

	S C Mark V Circuit Switcher [pdf] Instruction Manual Mark V Circuit Switcher, Circuit Switcher, Switcher

References

- S&C Electric Company
- User Manual