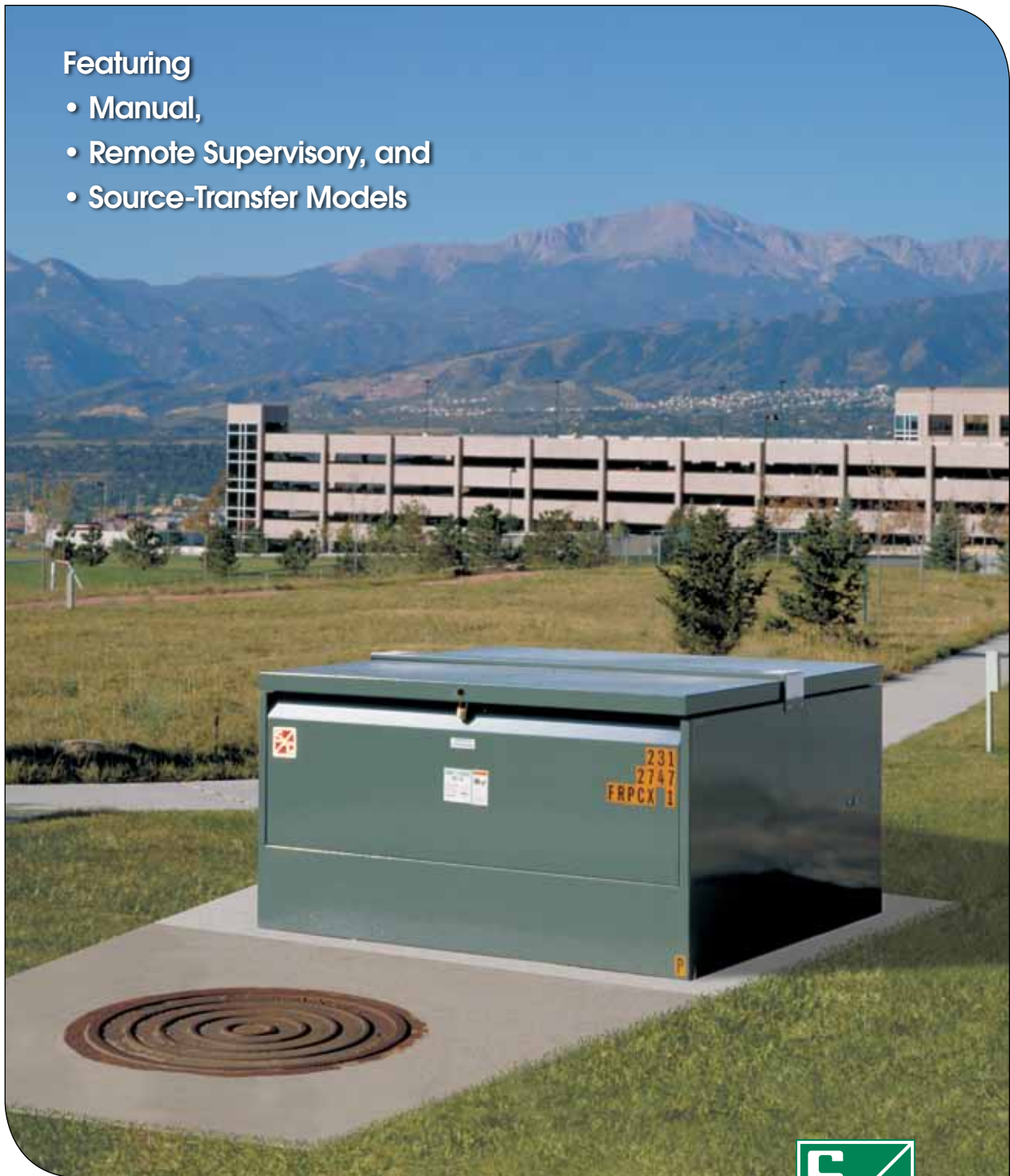


Featuring

- Manual,
- Remote Supervisory, and
- Source-Transfer Models



S&C Vista[®] Underground Distribution Switchgear

Outdoor Distribution, 15.5 kV through 38 kV

Vista Underground Distribution Switchgear Addresses Your Concerns

- Are you wasting money and resources on time-consuming, labor-intensive routine operation of your switchgear?
- Has coordinating upstream protective devices with downstream fusing become a headache?
- Are your customers complaining that they don't want obtrusive green boxes on their property?

S&C's Vista Underground Distribution Switchgear is the answer to these and many other underground distribution system problems. S&C worked closely with electric utilities and power users to identify and satisfy needs that were not being met by conventional

underground distribution equipment. Vista UDS is an exceptional product that meets all of these needs.

Vista Underground Distribution Switchgear is available in manual, remote supervisory, and source-transfer models. All models feature load-interrupter switches and resettable, vacuum fault interrupters or arc spinners in series with disconnect switches, elbow-connected and enclosed in a submersible, SF₆-insulated, welded steel tank. Vista UDS is available with up to six "ways," in ratings through 38 kV and 25 kA symmetrical short-circuit. Large windows in the tank provide a clear view of the open gap, ground position, and ground bus.



Remote Supervisory Pad-Mounted Style Vista UDS installation.



Large viewing windows let you see open gap and grounded positions on load-interrupter switches and fault interrupters. Trip indicators are easily checked too

Operating panel is located near grade level so UnderCover™ Style gear is easily operated from a standing position. See page 4

Overcurrent control—readily programmed with your PC



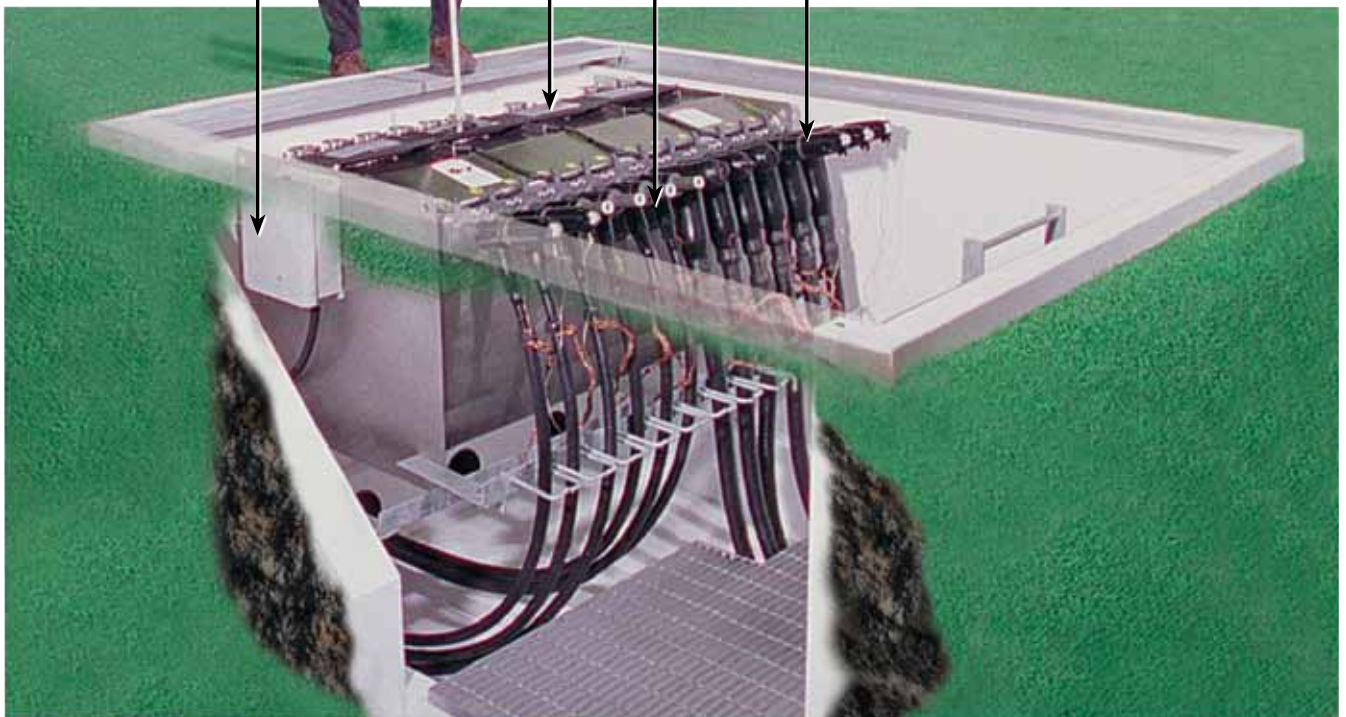
Fault interrupter terminals—equipped with 200-A bushing wells, 600-A bushings, or 900-A bushings



Optional voltage indicator with liquid-crystal display. You can check the integrity of the voltage indicator by shining a flashlight on the photo-cell-powered test circuit, while placing a gloved finger over the test button. See page 8. No flashlight needed in daylight

Switch terminals—equipped with 600-A bushings or 900-A bushings

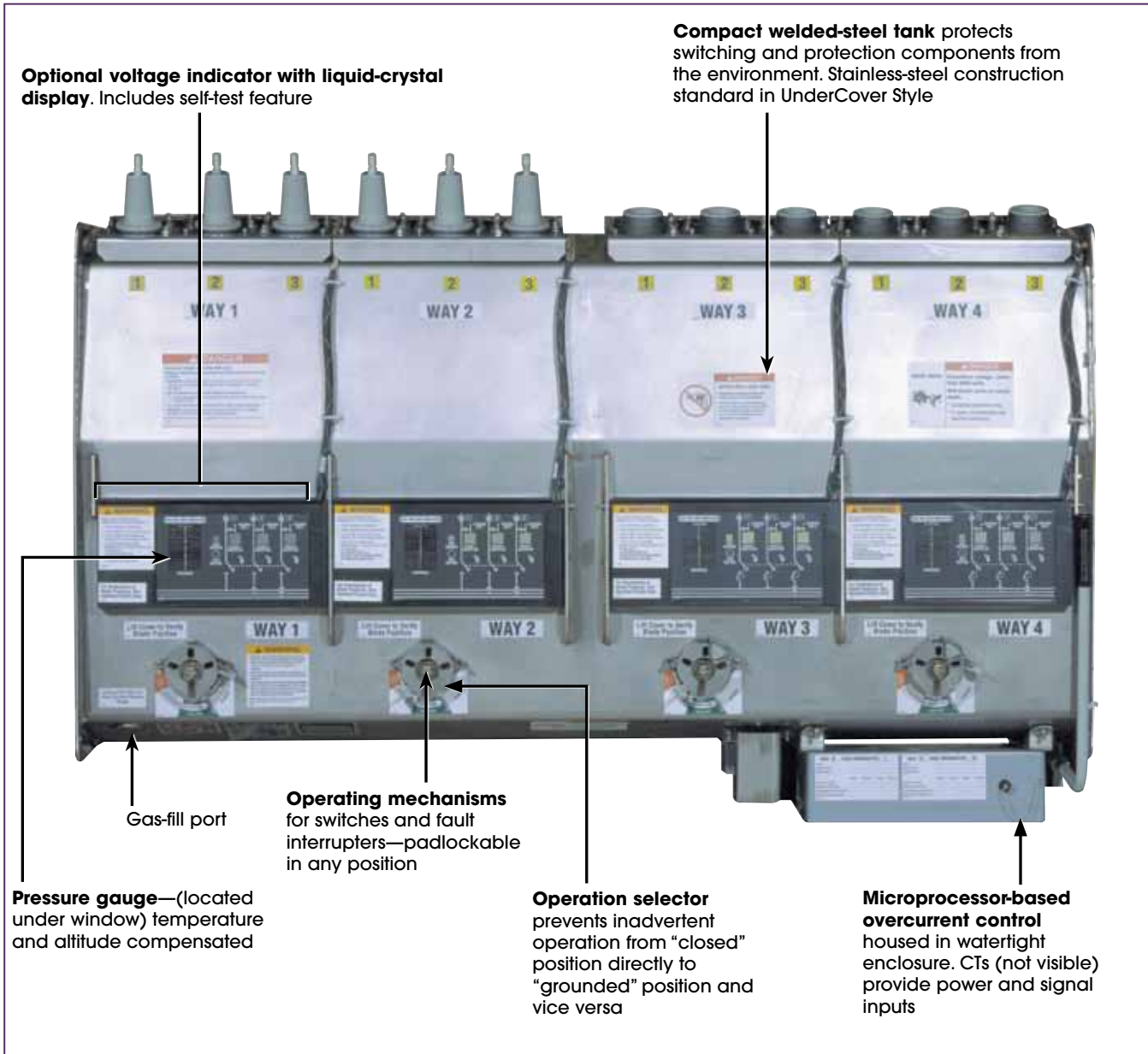
Bushings and bushing wells are located on one side of the gear, reducing operating space required for elbows and cables



15-kV UnderCover Style Model 422.

The load-interrupter switches provide three-pole live switching of 600-ampere or 900-ampere three-phase circuits. The switches have three positions (closed-open-grounded) and provide a clearly visible gap when open. The 200-ampere, 600-ampere, and 900-ampere fault interrupters offer 40-ms fault clearing, have three-position (closed-open-grounded) disconnects, and are

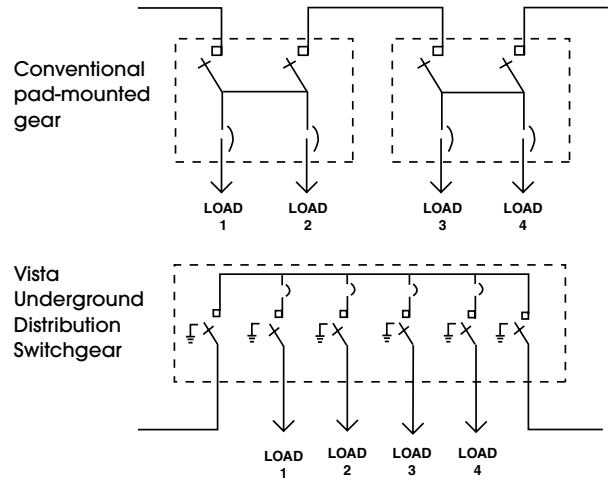
available with either single-pole or three-pole switching. Most models of Vista UDS use in-series vacuum fault interrupters for fault clearing. However, the popular 15-kV, 12.5-kA manual models now feature arc-spinning technology for fault interruption . . . reducing the height of the tank by nearly a foot!



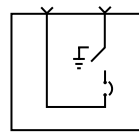
Operating panel of Vista UDS gear. Viewing windows, for confirming open gap and grounded position on load-interrupter switches and fault interrupters, are located under hinged covers of voltage indicators.

Vista UDS is available in up to six “ways.” This means it can accommodate any combination of up to six bus taps, load-interrupter switches, or fault interrupters. With conventional pad-mounted gear, for a looped feeder with four taps, two units of gear are necessary. But with Vista UDS, only one six-way unit is needed. Vista UDS simplifies installation and improves aesthetics by reducing the necessary real estate.

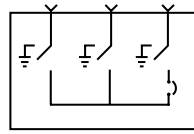
The model number indicates the total number of ways, as well as the number of load-interrupter and fault-interrupter ways. For example, Model 321 has “3” ways—“2” load-interrupter switch ways and “1” fault-interrupter way, as shown below.



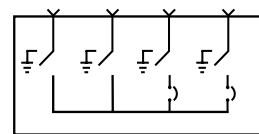
TYPICAL CONFIGURATIONS OF MANUAL AND REMOTE SUPERVISORY VISTA UDS



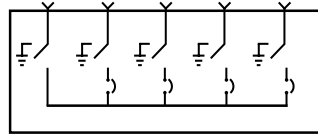
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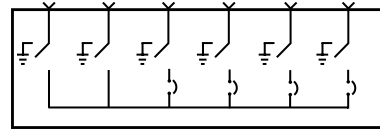
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422

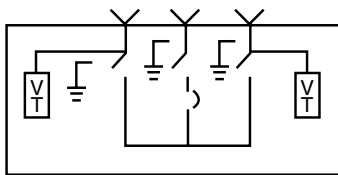


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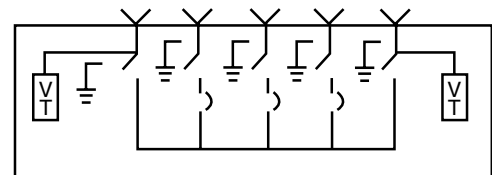


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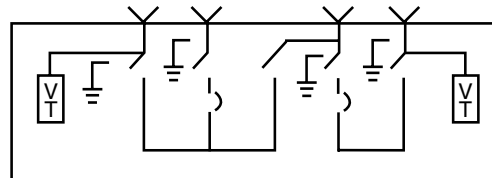
TYPICAL CONFIGURATIONS OF SOURCE-TRANSFER VISTA UDS



321



523



532 (split-bus)

Vista UDS Offers Numerous Unobtrusive Installation Options

One option is the low-profile pad-mounted style. At 15, 25, and even 34.5 kV, pad-mounted Vista UDS is 6 to 14 inches shorter than the average SF₆-insulated gear. And Vista UDS's total real-estate requirement is less than one-third that of a typical SF₆-insulated design. This means that Vista UDS is easier to site and allows more room for landscaping options that further improve aesthetics.

Vista UDS's most innovative installation offering is the UnderCover style. The UnderCover style is ideal

for areas with stringent real-estate restrictions or where aesthetics are extremely important. The Vista UDS gear is installed underground, but all operations are easily performed by one operator above ground. UnderCover style installations can also save money by reducing costs associated with trenching and long cable runs.

Vista UDS is also available for floor-mounted or wall-mounted vault installations, and in a man-hole style. With its compact design, rugged construction, and internal visible open point, man-hole style Vista UDS is perfect for applications where installation space is limited.



UnderCover Style.



Pad-Mounted Style.



Vault-Mounted Style—available for floor and wall-mounting.

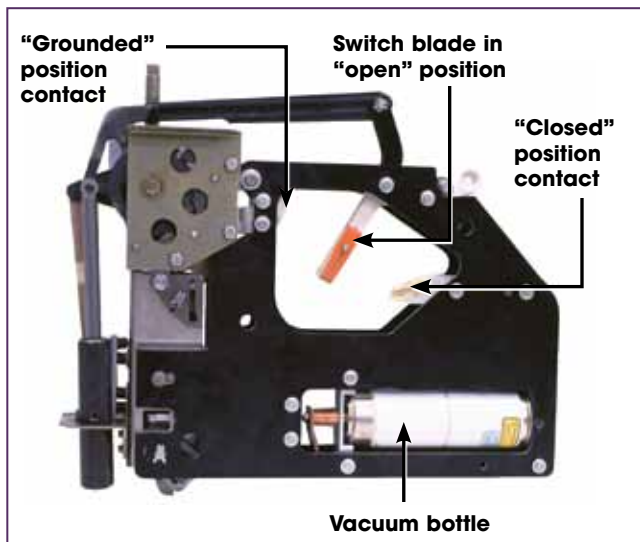


Man-Hole Style.

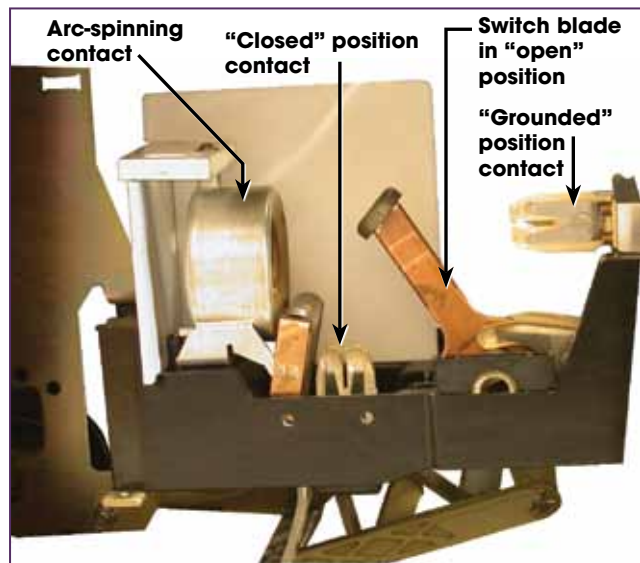
Vista UDS Operation Is Quicker, Easier, Safer

Vista UDS was specifically designed to simplify operating tasks, enhance safety, and minimize the duration of outages. Vista UDS is certified arc-resistant per IEC 298 Appendix AA, for currents up to 12.5 kA symmetrical for 15 cycles (25 kA symmetrical for 15 cycles, for models rated 25 kA short-circuit). In the event of an internal fault, the enclosure will retain its integrity.

Just one person is needed to operate Vista UDS. There's no exposure to medium voltage. The procedure is simple:



Fault interrupter furnished on all Vista UDS except 15-kV manual models.



Fault interrupter furnished on 15-kV, 12.5-kA manual models.

1. Rotate the switch operating shaft to the “open” position, then confirm the open gap through the large viewing window. See Figures 1 and 2. With ordinary elbow gear, on the other hand, specially trained operators need to remove the elbows from their bushings using a shotgun clamp stick—a tedious task that must be carefully performed. See Figure 3.



Figure 1. Opening load-interrupter switch (or fault interrupter).



Figure 2. Window cover lifts for viewing switch-blade positions of load-interrupter switch or fault interrupter.



Figure 3. Operation of typical dead-front gear can be awkward and time-consuming.

2. Confirm that the cable is de-energized so it can be safely grounded. With traditional gear, the medium-voltage cables must be tested directly using a clampstick-mounted tester. But voltage testing with Vista UDS can be accomplished simply and easily without ever accessing the cables. Simply use the voltage indicators shown in Figure 4. The voltage indicator is even equipped with a self-test function, so you can “test the tester.” See Figure 5.

3. Ground the cables. Instead of the awkward task of having to move the elbows to parking stands, along with the grounding bushings or elbows, with Vista UDS you need only rotate the switch operating shaft to the “grounded” position. See Figure 6. Grounding can easily be confirmed by looking through the viewing window.

There are even more benefits: The voltage indicator can be furnished with a low-voltage phasing option. See Figure 7. This feature allows confirmation of proper phasing without ever accessing the cables. Vista UDS allows fault-locating and hi-potting tests to be performed with the cables attached—and the bus energized.

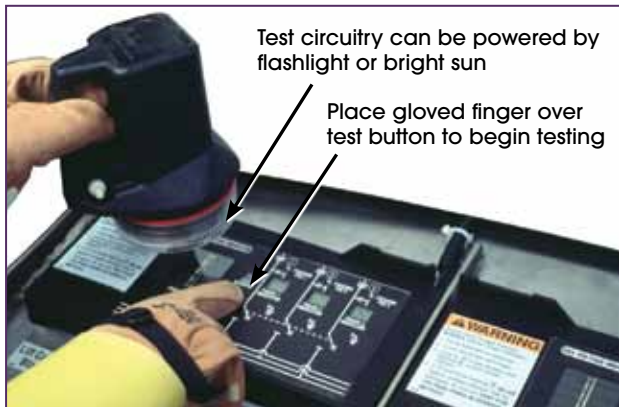


Figure 5. Testing the voltage indicator.

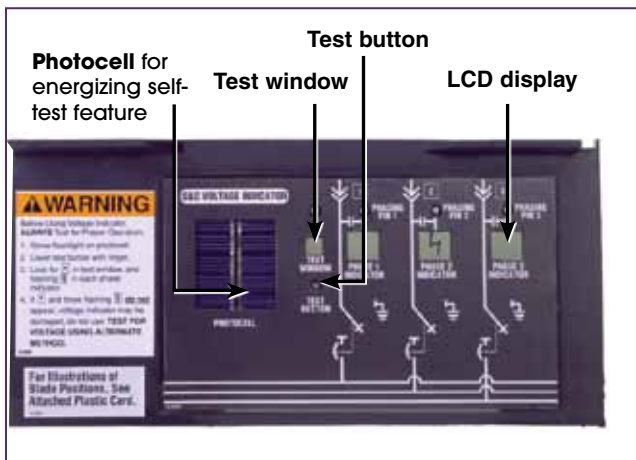


Figure 4. Voltage indicator.



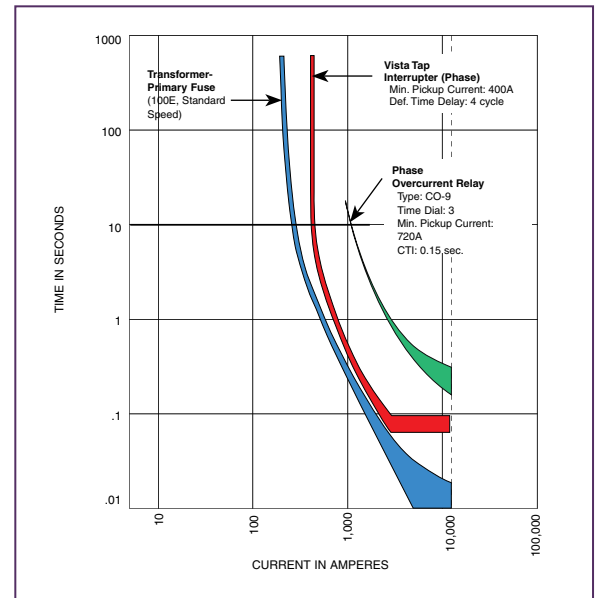
Figure 6. Grounding load-interrupter switch (or fault interrupter).



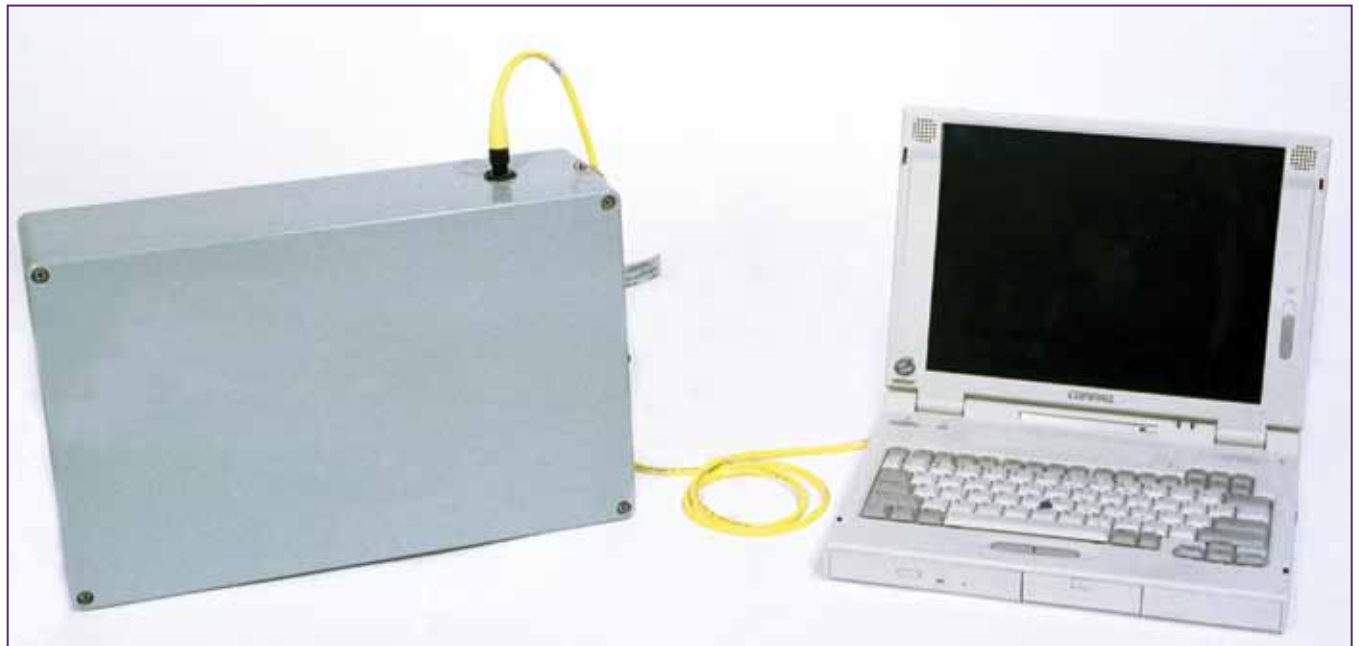
Figure 7. Measuring phase-to-phase voltage—Phase 1 to Phase 1.

Overcurrent Control for Superior Coordination

Vista UDS utilizes a unique microprocessor-based overcurrent control, housed in a watertight enclosure mounted on the gear. The overcurrent control features a variety of TCC (time-current characteristic) curves with selectable instantaneous and definite-time delay attributes, for superior coordination with upstream protective devices and downstream fusing. The parameters for the TCC curves are set using a personal computer connected to the data port of the overcurrent control. There are no knobs or dials, so the settings cannot be inadvertently changed or altered by unauthorized personnel. Integral current transformers provide power and current sensing. There is even an event recorder that captures information on the last twelve operations of each fault interrupter.



Coordinating-speed tap curve with definite-time delay eliminates miscoordination problems frequently encountered with transformer fuses.

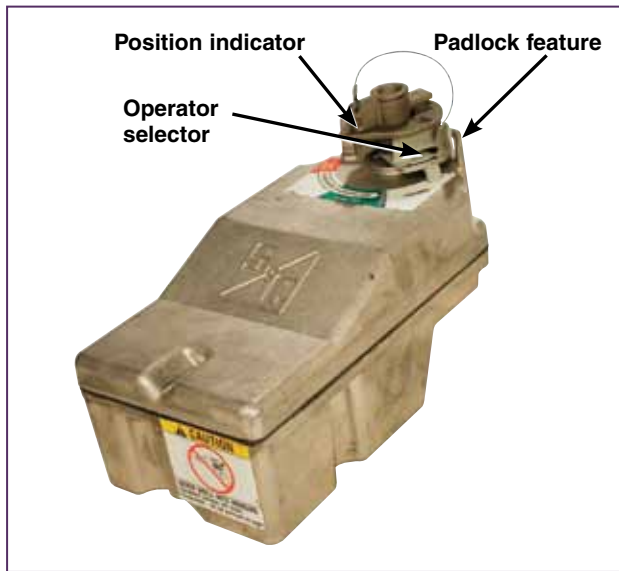


User-supplied personal computer is attached to the overcurrent control for programming the relay in the field.

Remote Supervisory Vista UDS

For distribution automation applications, S&C offers Remote Supervisory Vista UDS. Remote Supervisory Vista UDS provides automated switching and fault protection, and can also perform auto-sectioning without tripping the main breaker. Automation features are also retrofittable to existing Manual Vista UDS. Motor operators, current and voltage sensors, and low-voltage compartment are easily installed in the field.

Each motor operator includes a control board that provides local push-button and remote operation between the “closed,” “open,” and “grounded” positions. Up to six control boards can be accommodated within the low-voltage compartment, so any or all load-interrupter switches or fault interrupters can be motor operated. The motor



Details of motor operator.



15-kV Remote Supervisory Pad-Mounted Style Model 422.

operators may be battery powered or, optionally, self-powered using internal voltage transformers. The low-voltage compartment may also contain a user-specified remote terminal unit and communication device, providing a completely automated switching and protection package. Optional voltage and current sensing round out the Remote Supervisory Vista UDS offering.

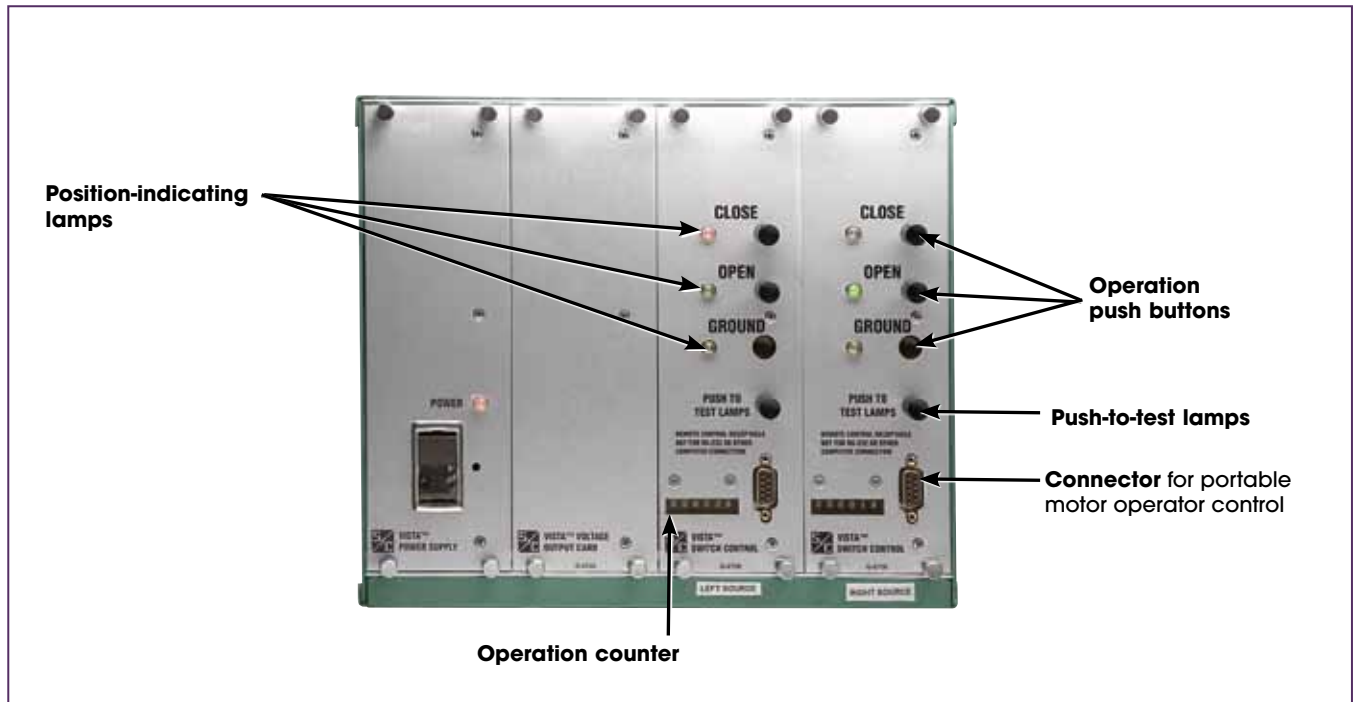
A variety of RTUs have been successfully integrated in Remote Supervisory Vista UDS, including: ACS, Harris DART, Valmet PoleCAT, QEI/Quindar, Hathaway/Systems Northwest, Motorola MOSCAD, and DAQ.

And these transceivers have been integrated: Metricom Utilinet, MDS, Dymec, H&L, and Motorola.

RTUs and communication devices of other manufacture can be accommodated too; contact your nearest S&C Sales Office.



Details of low-voltage compartment of Remote Supervisory Vista UDS Model 422.



Vista motor controls for installation with two motor-operated ways.

When Remote Supervisory Vista UDS is furnished with an EnergyLine 5800 Series Switch Control, it can be a member of an IntelliTEAM®, using EnergyLine’s revolutionary peer-to-peer communications. IntelliTEAM software supports automatic sectionalizing and reconfiguration, significantly reducing outage time. IntelliTEAM’s peer-to-peer communication network uses distributed intelligence, eliminating the need for, but still fully supporting,

a SCADA master station. And, when Remote Supervisory Vista UDS is fitted with an EnergyLine switch control, the gear can be used for automatic source transfer, with remote control and monitoring.

Remote Supervisory Vista UDS also allows the user to remotely trip the vacuum bottles of any three-phase fault interrupter way using external, user-specified relays. This additional shunt-trip capability permits advanced applications like sensitive earth-ground fault detection, as well as protective relay schemes using high-speed communication for closed-loop and open-loop systems.



Remote Supervisory Vista UDS with 5800 Series Switch Control.

Portable Motor Operator

Local motor operation of Vista UDS gear is also available for users who do not require a complete automation package. The portable motor operator includes cabling and hand-held control, all in an easily portable, durable case.

The operator easily attaches to any load-interrupter switch or single-pole or three-pole fault interrupter. Then simply plug in the power cable and the control cable. The hand-held control features “open,” “close,” and “ground” push buttons, an “enable” button to prevent inadvertent operation, and a “ready” indicating light.



Vista UDS Portable Motor Operator. Inset shows hand-held control.



Case for Vista UDS Portable Operator.

Source-Transfer Vista UDS

Source-Transfer Vista UDS provides fully automatic primary-selective service for one, two, or three critical load circuits. This package includes all the features of Manual Vista UDS, plus the S&C Micro-AT® Source-Transfer Control, three-phase voltage sensing on source ways, and internal power provided by voltage transformers. It is available in common-bus and split-bus configurations.

The Micro-AT Source-Transfer Control, located in the low-voltage compartment, ensures a high degree of critical-load continuity by minimizing interruptions resulting from the loss of one source. Excluding the intentional time delay to coordinate with upstream protective devices and/or transition dwell time, transfer is achieved in 6 seconds maximum.

The Micro-AT Source-Transfer Control utilizes an advanced microprocessor to perform control operations, as directed by settings programmed into the device at the factory and in the field. Such settings, consisting of the control's operating characteristics and voltage-, current-, and time-related operating parameters, are entered into the control by means of a keypad on the front panel.

An unbalance detection feature may be field-programmed in the Micro-AT Source-Transfer Control. This feature protects the loads from any source-side open-phase condition at the same voltage as the Vista Underground Distribution Switchgear. If the voltage unbalance exceeds a preset reference level for a period of time sufficient to confirm that the loss is not transient, an output signal is produced which initiates automatic transfer to the other source.

An overcurrent-lockout feature may be furnished which prevents an automatic transfer operation that would close a source load-interrupter switch into a fault. A light-emitting diode lamp indicates when lockout has occurred. Test keys are provided for simulating an overcurrent condition on each source.



Micro-AT Source-Transfer Control.

Standard Three-Phase Ratings^{①②③}

Applicable Standard	Amperes, RMS									
	Frequency, Hertz	Fault Interrupter			Load-Interrupter Switch				Short-Circuit, Sym.	Main Bus Continuous Current ^⑦
		Continuous, Load Dropping, and Load Splitting (Parallel or Loop Switching) ④⑤⑥	Fault-Closing, Sym.	Fault Interrupting, Sym.	Continuous, Load Dropping, and Load Splitting (Parallel or Loop Switching) ④⑤⑥	Fault-Closing, Sym.	Momentary, Sym.	1 Sec., Sym.		
IEC	50 or 60	200 or 630	12 500▲	12 500	200 or 630	12 500▲	12 500	12 500	12 500	600
		630	25 500●	25 000	630	25 500●	25 000	25 000	25 000	600
ANSI	50 or 60	200 or 630	12 500▲	12 500	200 or 630	12 500▲	12 500	12 500	12 500	600
		600	25 500●	25 000	600	25 500●	25 000	25 000	25 000	600

① Refer to the nearest S&C Sales Office for other ratings.

② IEC ratings have been assigned in accordance with the applicable portions of IEC 265-1 for a Class A switch.

③ ANSI ratings have been assigned in accordance with the applicable portions of ANSI C37.71, C37.72, and C37.73.

④ Fault interrupters and load-interrupter switches are rated 600 amperes (630 amperes IEC) continuous, load dropping, and loop splitting when furnished with 600-ampere bushings (standard for load-interrupter switches and 25-kA fault interrupters, optional for 12.5-kA fault interrupters). The rating is limited to 200 amperes if 200-ampere bushing wells are used (standard for 12.5-kA fault interrupters, optional for 12.5-kA load-interrupter switches). Models rated 25-kA are only available with 600-ampere bushings.

⑤ Fault interrupters and load-interrupter switches can switch the magnetizing current of transformers associated with the load-dropping rating. In addition, unloaded cable switching ratings are as follows: 10 amperes at 15.5 kV and 20 amperes at 29 kV and 38 kV.

⑥ 900 ampere is also available.

⑦ 1200 ampere is also available.

▲ 32,500-ampere peak ten-time duty-cycle rating.

● 65,000-ampere peak three-time duty-cycle rating. Ten-time duty-cycle fault-clearing rating is 16,000 amperes symmetrical, 41,600 amperes peak.



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S&C ELECTRIC COMPANY

Excellence Through Innovation