

The background of the entire page is a photograph of a green field in the foreground and a series of high-voltage power line towers stretching into the distance under a blue sky with scattered white clouds. Overlaid on this image is a complex graphic of interconnected hexagons and lines in shades of yellow, green, and grey, resembling a molecular or network structure.

SIEMENS

Ingenuity for life

Overhead solutions

Type SDR reclosers plus
controllers and type B-2 recloser
bypass switch assembly

usa.siemens.com/mediumvoltage

Your outdoor overhead
distribution solution provider





Table of contents

Type SDR distribution recloser	04 – 05
Type SDR distribution recloser controller options	06 – 08
Type B-2 recloser bypass assembly	09 – 10

Type SDR distribution recloser

Siemens, a leader in digital protection technology, with 30+ years of experience in vacuum switching technology, has combined cutting-edge technology with quality engineering in relay protection schemes to create our type SDR recloser offering.

Features and benefits

- 15.5 kV, 27 kV, and 38 kV ratings
- Factory engineered, pre-installed, and wired accessories available for ease of onsite installation
- Advanced vacuum interruption technology
- Fully integrated current transformers (CTs) and resistive voltage sensors
- Self-monitoring
- Dual-coil, low-energy magnetic actuator
- USB communications port
- Three-phase recloser
- Single-phase recloser
- Triple-single operation modes
 - Three-phase trip/three-phase lockout
 - One-phase trip/three-phase lockout
 - One-phase trip/one-phase lockout
- Advanced Siemens controller
- Fully withdrawable controller
- Customized and intuitive Human Machine Interface (HMI) with programmable buttons, indicators, and logic
- Extended warranty available.

Type SDR single-phase recloser



Type SDR three-phase recloser



Type SDR triple-single recloser





Technical data	
Item	Description
Rated continuous current	630 A; 800 A
Rated voltage according to ANSI/IEEE C37.60	15.5 kV; 27 kV; 38 kV
Recloser sequence	O-T-CO-T-CO-T-CO lockout T individually settable 0.2-14,400 s
Opening time	30 ms
Closing time	60 ms
Number of switching cycles	10,000
Number of short-circuit operations	Up to 200; 116 according to ANSI/IEEE C37.60 duty cycle
Number of phases	Three-phase, single-phase, triple-single

Ratings				
Rated voltages kV	Interrupting current kA sym	Lightning-impulse withstand voltage kV	Continuous current	
			630 A	800 A
15.5	12.5	110	•	•
15.5	16	110	•	•
27	12.5	125	•	•
27	12.5	150	•	•
27	16	150	•	•
38	12.5	170	•	•
38	16	170	•	•

Controller options

For the type SDR distribution recloser

The SDR controller constitutes the brains of the recloser. It comprises indicators and control elements, communication interfaces and a USB port for convenient connection of a laptop computer. Access to the user level menus and data is protected by multi-level password authentication.

Along with overcurrent time protection (up to 49 preset curves and multiple user-configurable curves), it is equipped for ground fault and sensitive ground fault detection. Inrush restraint and load shedding are further protection functions that help prevent nuisance outages.

Convenience:

- Fully withdrawable type 7SR control and protection relay
- Ease of maintenance
- Complete system monitoring
- Tri-color programmable LEDs
- USB port (front of controller)
- 48-hour battery UPS
- Loop automation
- Integrated current transformers (CTs) and optional resistive voltage sensors in recloser switch unit
- Single-phase, three-phase and triple-single reclosers available
- Fully programmable from front panel
- Customizable and intuitive Human Machine Interface (HMI) with programmable buttons, indicators and logic
- Optional docking station for remote programming.

Operation:

- Relay protection
- Local/remote control
- Monitoring/SCADA of various protocols
- Power metering
- Event log
- Multiple communication protocols
- Input and output logic bits.



Type 7SR224 control and protection relay (three-phase and single-phase)



Type 7SR224 control and protection relay (triple-single)



Type 7SC80 feeder-automation controller

Siemens SIPROTEC type 7SC80 feeder-automation controller

Providing exceptional flexibility and responsiveness, the SIPROTEC 7SC80 feeder-automation controller offers so much more than a standard recloser controller. With GOOSE messaging and native IEC 61850, the 7SC80 is capable of coordinating a distribution network reconfiguration in less than 100 milliseconds. When coupled with the Siemens SDR recloser, Siemens' SIPROTEC 7SC80 delivers the ultimate in feeder automation.

Optional Schweitzer Engineering Laboratories, Inc. control relays

The SDR controller is available with optional SEL® control relays for use with type SDR reclosers.

The type SEL-351R option utilizes the relay outputs to signal the type SDR controller 48 Vdc switch unit driver (PCB2) electronics and capacitors (PCB3) to control the three-phase type SDR recloser. The four 12 Vdc batteries are charged and monitored by the uninterruptible power supply (UPS) charge controller. Two additional 12 Vdc batteries provide the 24 Vdc control power for the type SEL-351R relay.

Both the SEL-351RS Kestrel and SEL-651R options are equipped with internal power supply modules. These modules utilize their own internal electronics and capacitors which directly control the type SDR recloser operation. Two 12 Vdc batteries provide the control power for each of these options.

All SDR controllers are available with customized accessories and device-mounting provisions upon request.

Type SEL-351R:

- Three-phase trip and reclose operation
- Vertical relay orientation
- One or four secondary voltage inputs 300 Vac maximum
- Painted ANSI 61 steel control enclosure standard, 304 brushed stainless steel optional
- Three-point latch standard
- Ground fault circuit interrupter (GFCI) duplex outlet provided for laptop power.

Type SEL-651R:

- Three-phase or triple-single trip and reclose operation
- Vertical relay orientation standard; horizontal relay orientation optional
- Available secondary voltage input options:
 - Six 300 Vac maximum
 - Three 1M Lindsey SVMIL LEA and three Siemens type SDR recloser LEA
 - Three 300 Vac maximum and three Siemens type SDR recloser LEA
 - Three 300 Vac maximum and three 1M Lindsey SVMIL LEA.
- Painted ANSI 61 steel control enclosure standard, 304 brushed stainless steel optional
- Three-point latch standard
- GFCI duplex outlet provided for laptop power.

Type SEL-351RS Kestrel:

- Single-phase trip and reclose operation
- Vertical relay orientation
- Secondary voltage input 300 Vac maximum
- Painted ANSI 61 steel control enclosure standard, 304 brushed stainless steel optional
- Three-point latch standard
- GFCI duplex outlet provided for laptop power.



Type SDR distribution recloser controller with optional SEL control relay (horizontally oriented)



Type SDR distribution recloser controller with optional SEL control relay (vertically oriented)

Controller functionality

Protection functions	
Item	Description
27/59	Under/overvoltage
37	Undercurrent
46BC	Broken conductor/load unbalance
46NPS	Negative phase-sequence overcurrent
47	Negative phase-sequence (NPS) voltage
49	Thermal overload
50	Instantaneous overcurrent
50BF	Circuit breaker failure
50G/N	Instantaneous ground fault
51	Time-delayed overcurrent
51c	Cold-load pickup
51G/N	Time-delayed measured ground fault/SEF
51V	Voltage-controlled overcurrent
59N	Neutral-voltage displacement
60CTS	CT supervision
60VTS	VT supervision
64H	High-impedance restricted-earth fault (REF)
67/50	Bi-directional instantaneous overcurrent
67/50G/N	Bi-directional instantaneous ground fault
67/51	Bi-directional time-delayed overcurrent
67/51G/N	Bi-directional time-delayed ground fault
67/51/SEF	Directional time-delayed sensitive-ground fault
74TC	Trip-circuit supervision
79	Auto-reclose
81HBL2	2 nd harmonic block/inrush restraint
81	Under/over frequency
86	Lockout
User-programmable logic via HMI	
Eight settings groups with two levels of password access (four on single-phase model)	
Self-monitoring	

Supported protocols	
Item	Description
IEC 60870-5-103	Front USB port
Modbus RTU	Rear RS485 port
DNP 3.0	Rear RS485 port
IEC 60870-5-101 (optional with Ethernet port)	Rear RS485 port
IEC 61850 (optional with Ethernet port)	Rear RS485 port

Additional data communications ports (optional)	
Description; three-phase and single-phase models only	
Two rear standard fiber-optic ports and IRIG-B port	
Additional rear RS232 port and IRIG-B port	
Additional rear RS485 port and IRIG-B port	
Additional rear electrical Ethernet port RJ45 (quantity of two)	
Additional rear optical Ethernet duplex (quantity of two)	

Measuring functions	
Description	
Primary current phase and ground	
Secondary current phase and ground	
Positive phase-sequence (PPS) current	
Negative phase-sequence (NPS) current	
Zero phase-sequence (ZPS) current	
Binary input/output status	
Trip circuit healthy/failure	
Time and date	
Fault records	
Event records	
Frequency	
Waveform records	
Recloser trip counter	
I ² t summation for contact wear	
Direction	
Primary line and phase voltage	
Secondary voltage	
Apparent power and power factor	
Real and reactive power	
W Hr forward and reverse	
VA Hr forward and reverse	
Historical demand record	
Positive phase-sequence (PPS) voltage	
Negative phase-sequence (NPS) voltage	
Zero phase-sequence (ZPS) voltage	

Optional functions; three-phase and triple-single models only	
Item	Description
Triple-single	Fault locator
25 synchronism check	Triple-single/single-phase auto-reclose
Loop automation by loss of voltage uses an additional set of resistive voltage sensors and has the added functions: <ul style="list-style-type: none"> 27/59: Second under/overvoltage 60VTS Second VT supervision. 	

Type B-2 recloser bypass assembly offers quick and easy installation.

Maximize your up-time by adding a Siemens B-2 bypass assembly to your recloser installation. Our bypass assemblies give you the flexibility to take your recloser out of service without needing to take an outage or installing jumpers. Siemens type B-2 bypass assemblies safely bypass and isolate a recloser from the distribution system disrupting customers. Take control of choosing when you do maintenance, testing, or repair that minimizes disruption to your customers and eliminates any impact on system reliability.



B-2 assembly - three-phase bypass

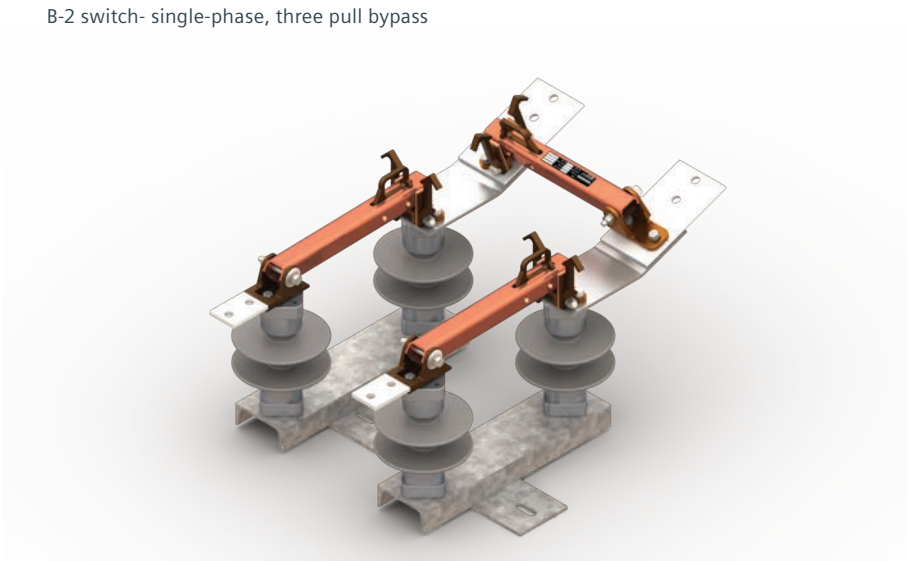
Goals:

- Reduce downtime when maintenance is required
- Minimize installation time through pre-assembly.

Benefits:

- Eliminate downtime for maintenance
- Ease of installation
- Lower installation costs
- Shorter installation time
- Reduced complexity of installation
- Single point lifting
- Pre-assembled
- Terminations oriented to cable angles
- Rapidly restore power in the event of equipment failure
- Easily ensure service continuity while doing maintenance or service work on the recloser.

Three-phase bypass			
Series	Maximum nominal voltage kV	Basic insulation level kV	Continuous current A
2913	15	110	600/900
2913	25	150	600/900
2913	38	200	600/900



Originating from the reliable B-2 single-phase Bridges Electric™ switch, all three-phase units ship pre-assembled on the crossarm for easy installation at the site, which reduces time and overall installation costs. A B-2 bypass assembly is customizable with porcelain or polymer insulators and galvanized or fiberglass bases. The assembly provides a means for bypassing and disconnecting pole-mounted reclosers. Proper sequence operation allows the recloser to be bypassed and isolated from the system.

Features and benefits:

- 15.0 kV, 25.0 kV and 38.0 kV nominal voltage ratings
- Factory installed on galvanized or fiberglass arm
- Adjustable pole gain provides angling option per field conditions
- Single- or double-point lift bracket
- Arm length 8’ (2.4 m), 10’ (3.0 m) or 12’ (3.7 m) (custom phase spacing available)
- Customer terminal pad options to simplify terminal connections
- Easy identification of bypass blades in open or closed position
- Three-pull design
- Square copper-tube blades
- High-pressure coin silver contacts
- Load-break hooks available
- Left- or right-hand bypass blade
- Custom configurations available
- Coastal environment options
- Quick installation
- Factory adjusted.

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