POLYMER Electronic Resettable Sectionalizer
Protected by U.S. Patents No. 6,593,842; 5,854,582; 5,612,661; 4,935,715; 4,795,996; and other patents pending

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This catalog information and any related instruction sheets do not cover all details or situations in equipment use nor do they provide for every possible contingency to be encountered in relation to installation, operation or maintenance. Should additional information and details be desired, or if specific situations arise which are not covered adequately for the user’s purpose the specifics should be referred to Hubbell Power Systems, Inc.
CHANCE® Electronic Resettable Sectionalizer (CRS)

**Description**

The Chance Electronic Resettable Sectionalizer (CRS) comprises two major components: A standard cutout mounting and an electronic module. The design and construction of the CRS are such as to enhance reliability and coordination of the distribution system. The electronic sectionalizer module fits into the standard mounting of a Chance Type C and S&C Type XS cutout. This interchangeability reduces the cost of retrofit installation.

**Polymer Insulators**

Insulators for Polymer Sectionalizers are the same as for Type C-Polymer Cutouts: ESP® silicone alloy rubber, the same material used in Ohio Brass PDV arresters and Hi*Lite insulators. ESP is a polymer compound made by alloying silicone and EPDM rubber. This alloy offers the desirable toughness and resistance to tracking of our original EPR, with the hydrophobic characteristics derived from low molecular weight silicone oils.

Hubbell Power Systems uses several tests to evaluate materials. Tracking, QUV, corona cutting, salt fog, oxidative stability and variations of differential thermal analysis tests confirm the quality of the material. For further information on our polymers, ask your Hubbell Power Systems representative for the publication "Polymer Materials for Insulator Weathersheds" EU1264-H.

**Upgrades to Performance**

The increased metal-to-metal leakage distance of Type C-Polymer Cutouts compares to their porcelain counterparts at 12.6" (319 mm) vs 8.7" (220 mm) for 15kV and 17.1" (434 mm) vs 12.6" (319 mm) for 27kV. Significantly lighter, Type C-Polymer Cutout insulators typically weigh only approximately half their porcelain counterparts. This ergonomic advantage makes them simple to install and, of course, far less fragile than porcelain. That means reduced or eliminated losses from routine shipping, storage and handling.

The electronic module consists of a copper tube with bronze castings at each end. In the closed position, the end castings engage the stationary contacts of the cutout mounting. The current flows through the silver-plated high conductivity contacts and copper tube. The tube also forms the bar primary for two encapsulated toroidal current transformers mounted axially on the tube. A highly effective Faraday cage surrounds the logic circuit. The tube houses a spring loaded tripping mechanism.

**Application**

The Chance CRS is a device which has built-in intelligence to discriminate between temporary (transient) and permanent faults on distribution systems. It operates in conjunction with a back-up automatic circuit recloser or a reclosing circuit breaker. It is specifically designed for the protection of single-phase lateral lines. When installed at the beginning of a lateral, it virtually eliminates nuisance outages. Its functional concept and design greatly improve system coordination.

Traditionally, the individual laterals are protected by expulsion-type fused cutouts. These cutouts are intended to operate only during a permanent fault on the lateral by carefully coordinating the fuse links with the time-current characteristics of the upstream automatic circuit recloser or reclosing circuit breaker. Unfortunately, coordination between fuse links and upstream automatic circuit reclosers is unachievable above a few thousand amperes. Coordination, if achieved on paper, can easily change as the fault current increases due to larger capacity facilities, addition of larger substations or reconductoring. Errors in re-fusing is another way that system coordination can be lost.

A sectionalizer is a protective device which has no time-current characteristics. With no fuse curve to intersect recloser time-current characteristics, the coordination range is extended to the maximum interrupting rating of the upstream protective device (Figure 1).

This practical function makes the sectionalizer an ideal device for application on single-phase laterals where available fault currents make coordination unachievable with fuses. Electronic resettable sectionalizers provide the utility with an economical and easily retrofittable method of enhancing protection of the distribution system. An electronic resettable sectionalizer installed at the start of a lateral, in place of a fuse, can greatly enhance system coordination service continuity and reliability at reduced costs.
Operation

The power required for the logic circuit of the Chance Electronic Resettable Sectionalizer is obtained from the built-in current transformer. When a fault occurs, which exceeds the minimum actuating current of the sectionalizer, the logic circuit will “power-up.” The upstream recloser opens the circuit causing the line current to fall below the “dead line threshold.” The logic circuit recognizes this as a “count” and stores this occurrence in its memory for two minutes. In doing so, the CRS merely counts the backup reclose operations.

After a predetermined number of such operations, the CRS isolates the circuit while the back-up recloser is in the open position. The recloser is then allowed to close, restoring service to the unfaulted sections of the system. If the fault is temporary and is cleared before the sectionalizer count reaches the predetermined number, the sectionalizer remains closed and resets to its original state after its reset time expires.

The earlier versions of Chance Electronics Sectionalizer (Type CES) required replacement of the actuators after each operation of the sectionalizer. Users generally carried an inventory of and equipped each line truck with the actuators. The Chance Resettable Sectionalizer (Type CRS) uses the spring loaded mechanism to actuate the drop out action of the sectionalizer. The mechanism can then be reset with the help of an adjustable wrench. This eliminates need to inventory of the actuator and the line crews can have one less item on their trucks.

Drop-open operation is the same for both types of the Chance Electronic Resettable Sectionalizer: Standard (left) and Loadbreak (right, with Arc Chute interrupter). See following pages for specifications and page 10D-8 for ordering information.

Using an adjustable wrench, sectionalizer can be reset after each operation.

Figure 1. Addition of the CRS eliminates the fuse curve and extends the coordination range.
CRS Selection and Application Guidelines

A properly rated sectionalizer must be selected for each installation with consideration to system voltage, continuous current, actuating current, the number of counts for operation, and the upstream and downstream protective devices.

**System Voltage:**
The sectionalizer must have a voltage rating equal to or greater than the system voltage.

**Continuous Current:**
The sectionalizer must have a continuous current rating equal to or greater than the anticipated system load current plus overload.

Where hydraulic reclosers are used, the continuous current rating of the sectionalizer is typically equal to the continuous current rating of the upstream automatic circuit recloser.

**Minimum Actuating Current:**
The minimum actuating current of sectionalizers should be 80% of the phase minimum trip of the source side single phase automatic circuit recloser. Where three phase reclosers or circuit breakers are used, a user may want to co-ordinate sectionalizing actuating current with the ground trip rating.

Where hydraulic reclosers are used, this is easily accomplished by matching the sectionalizer and the recloser’s continuous current ratings. The sectionalizer’s minimum actuating current is 160% of its continuous current rating and the hydraulic reclosers’ phase pick-up is 200% of its continuous current rating (160/200=.80). (Table A).

**Number of Counts:**
The sectionalizer should be set to operate in at least one less count than the backup recloser. Example: a 4-shot recloser would require a maximum of a 3-count sectionalizer downstream (Figure 2, line A).

In case of a 2-fast/2-slow reclose setting, a 2-count sectionalizer may be used to reduce the number of recloser operations (Figure 2, line B).

Where sectionalizers are used in series, the downstream sectionalizer should have one less count than the upstream sectionalizer (Figure 3).

**Upstream & Downstream Devices:**
The reclose time (dead time between shots) of the recloser must be shorter than the sectionalizer reset time. The sectionalizer reset time is the time that the memory is functional and retains prior counts. The CRS reset time is two minutes for a current pulse equal to 1.3 times the actuating current (recloser’s minimum trip point).

Single-phase sectionalizers should be used with single-phase reclosers to avoid single-phasing of three-phase circuits. However, some utilities may permit single-phasing. In such cases, a single-phase sectionalizer may be used with a three-phase recloser.

If a fuse is downstream from a sectionalizer, the fuse must be coordinated with the recloser so the fuse will operate in at least one less count than the sectionalizer. The sectionalizer can be used between two reclosers as long as there is at least 300mA of load current between the sectionalizer and the downstream recloser.

**Immunity to lightning surge current:**
Over-voltage protection is the user’s responsibility based on the user’s over-voltage protection practices. Chance Resettable Electronic Sectionalizers were tested to withstand 65kA lightning surge current as prescribed in ANSI/IEEE C37.63 and IEEE C62.11 standards for surge arresters, making it immune to lightning surges up to 65kA.

<table>
<thead>
<tr>
<th>Recloser Minimum Trip, Amps</th>
<th>Minimum Actuating Current, Amps ± 10%</th>
<th>Continuous Current, Amps</th>
</tr>
</thead>
<tbody>
<tr>
<td>30</td>
<td>24</td>
<td>15</td>
</tr>
<tr>
<td>50</td>
<td>40</td>
<td>25</td>
</tr>
<tr>
<td>70</td>
<td>56</td>
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<td>160</td>
<td>100</td>
</tr>
<tr>
<td>280</td>
<td>224</td>
<td>140</td>
</tr>
<tr>
<td>400</td>
<td>320</td>
<td>200</td>
</tr>
</tbody>
</table>

Table A. Recloser/sectionalizer coordination.

![Figure 2. Typical distribution system with Chance two- and three-count electronic resettable sectionalizers.](image)

![Figure 3. Coordination of sectionalizers in series.](image)
## Electronic Resettable Sectionalizer (CRS)

### CRS Specifications

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency</td>
<td>60 Hz</td>
</tr>
<tr>
<td>Rated Voltage (BIL)</td>
<td>15kV (110kV BIL), 27kV (125kV BIL)</td>
</tr>
<tr>
<td>Rated Continuous Current</td>
<td>15, 25, 35, 50, 70, 100, 140, 200 Amps</td>
</tr>
<tr>
<td>Rated Minimum Actuating Current</td>
<td>1.6 times rated continuous current</td>
</tr>
<tr>
<td>Maximum Thermal Ratings</td>
<td>2 x rated continuous current or 300 amps maximum</td>
</tr>
<tr>
<td>Number of Counts</td>
<td>1, 2 or 3</td>
</tr>
<tr>
<td>Momentary Rating</td>
<td>12,000 Amps. Asym.</td>
</tr>
<tr>
<td>Short time current withstand, 15 Cycle:</td>
<td>8600 Amps Sym.</td>
</tr>
<tr>
<td>1 sec:</td>
<td>4000 Amps Sym.</td>
</tr>
<tr>
<td>3 sec:</td>
<td>3200 Amps Sym.</td>
</tr>
<tr>
<td>10 sec:</td>
<td>2500 Amps Sym.</td>
</tr>
<tr>
<td>Dead line detector threshold</td>
<td>300 milli-amps</td>
</tr>
<tr>
<td>Reset time:</td>
<td>2 minutes ± 20 seconds</td>
</tr>
<tr>
<td>Ambient temperature limits:</td>
<td>-40°C to +60°C</td>
</tr>
<tr>
<td>Surge current withstand</td>
<td>65KA, per ANSI C37.63 &amp; IEEE C62.11</td>
</tr>
<tr>
<td>Electromagnetic interference</td>
<td>per ANSI C37.63-1984</td>
</tr>
<tr>
<td>Radio frequency interference</td>
<td>per ANSI C37.90.2 - 1994</td>
</tr>
<tr>
<td>Electrostatic discharge</td>
<td>per UL 991, section 15</td>
</tr>
</tbody>
</table>

See page 10DD-8 for Catalog Number System.
STANDARD Type

**CHANCE** Electronic Resettable Sectionalizer (CRS)

See page 10DD-8 for Catalog Number System.

15 kV (110 kV BIL) STANDARD Electronic Resettable Sectionalizer

27 kV (125 kV BIL) STANDARD Electronic Resettable Sectionalizer

**Universal Cutout Tool**

Ideal for Standard Electronic Sectionalizer to easily lift out, place, open and close. Inverted, secure method also fits 100 amp fuse holders of ABB, Chance, S&C cutouts.

Cat. No. PSC4033484 (Wt. 4 oz.) See Tools Catalog Section 2100.

*When opening a cutout, follow all work rules and OSHA regulations. Not for use with Loadbreak cutouts.
LOADBREAK Type

CHANCE Electronic Resettable Sectionalizer (CRS) with Arc Chute type interrupter

Protected under U.S. Patents No. 5,612,661 and 4,935,715

Ratings/Specifications

The 15kV Loadbreak CRS has a maximum design voltage rating of 15kV. There are no voltage restrictions on application to grounded wye, ungrounded wye, or delta systems having maximum operating voltages (line to line) equal to or less than 15kV.

The 15/27 Loadbreak CRS is to be used on systems which have phase-to-ground voltages no greater than 15 kV and which have phase-to-phase voltages no greater than 27 kV.

Sectionalizer modules, fuseholders and mounting assemblies from other manufacturers’ loadbreak cutouts are not interchangeable with Chance Loadbreak cutouts. Likewise, Chance loadbreak sectionalizer modules, loadbreak fuseholders and loadbreak mountings are not interchangeable with other manufacturers’ loadbreak cutouts.

Operation

The self-contained loadbreak device enables a lineworker to interrupt load current by means of a simple hookstick operation. To break the current, the worker inserts a hookstick into the operating ring and rapidly opens the device. Upon opening, a spring-loaded stainless steel blade mechanism snaps out through a gray arc chute and elongates, cools and extinguishes the confined arc. The load-breaking operation is independent of the operating speed of the worker. No special or portable tools are required to operate the unit. In its open position, the sectionalizer module hangs in an approximate vertical position for a visible break.

Chance Loadbreak sectionalizer modules can be mounted only in Chance Loadbreak cutout mounting assemblies.
Electronic Resettable Sectionalizer

Note: All Chance Electronic Resettable Sectionalizers meet or exceed applicable ANSI/NEMA specifications.

Catalog Number System

Basic format: CP 7 X X X X X X X X

Positions: 1 2 3 4 5 6 7 8 9 10

Position 3:

STANDARD SECTIONALIZER

Position 6:

BIL Max. Design
Rating Voltage
1 = 110kV 15kV
2 = 125kV 27kV

LOADBREAK SECTIONALIZER

Position 3:

Position 6:

BIL Max. Design
Rating Voltage
1 = 110kV 15kV
2 = 125kV 15/27kV

Position 10:

Bracket Variations
Blank = No bracket
B = NEMA Type B bracket for crossarm
X = *Extended type bracket for crossarm
D = D-shape bracket (pole)

*Horizontal section is 25/8” longer than Type B bracket.

Continuous
Current Rating-Amps 2 = 15 40*
3 = 25 60**
4 = 40 80
5 = 50 112
6 = 70 160
7 = 100 224
8 = 140 320
9 = 200

Actuating
Current Rating-Amps 1 = 1 2 3
2 = 2
3 = 3

Positions 4 & 5:

No arrester
For sectionalizer-arrester combinations, see table on page 10AA-10 of Chance Type C-Polymer Cutout catalog 10AA for two-letter arrester codes.

Position 7:

Position 8:

Terminal Variations (tin plated)

For sectionalizer-arrester combinations, see table on page 10AA-10 of Chance Type C-Polymer Cutout catalog 10AA for two-letter arrester codes.

Replacement Arc Chute Interrupter
Cat. No. T7300080
(1.2 lb. / 0.54 kg.)

HUBBELL / CHANCE – CENTRALIA, MISSOURI

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