

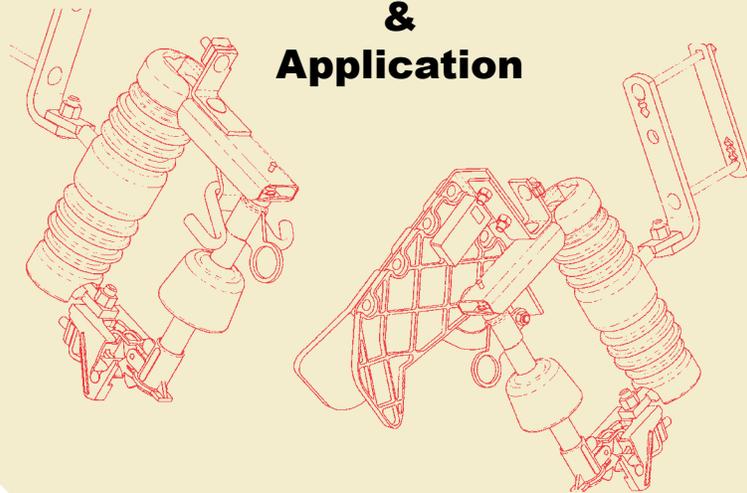


CHANCE[®]

POWER SYSTEMS, INC.

Resettable Electronic Sectionalizer

**Selection
&
Application**



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Resettable Electronic Sectionalizer

Selection and application

The Chance Electronic Resettable Sectionalizer (CRS) discriminates between transient and permanent faults on an overhead distribution system. Operation is in conjunction with a backup automatic circuit recloser or a reclosing circuit breaker.

The unit mounts in a standard Chance Type C cutout and the S&C Type XS cutout mounting. The device is particularly suitable for 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.

Expulsion-type fused 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 not achievable when fault currents exceed 8 to 10 times the minimum trip of the upstream device. 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 refusing are another way system coordination can be lost

A sectionalizer has no time-current characteristic. Because there is no fuse curve to intersect recloser time-current characteristics, the coordination range is extended to the maximum available short-circuit current of the system.

This practical function makes the sectionalizer an ideal device for application on single-phase laterals where available fault currents make coordination unachievable with fuses.

Because Chance sectionalizers provide utilities with an economical and easily retrofittable method of enhancing protection of the distribution system, utility engineers are giving increasing emphasis to bringing electronic sectionalizers onto the system in place of fuses.

With substantially improved protective characteristics, better service continuity and reduced nuisance fuse operations, utilities can anticipate a growing acceptance of electronic sectionalizers in the future.

Selection

Before a properly rated sectionalizer is selected for each installation, the user has to take into account a number of factors. These are: system voltage, continuous current, maximum fault current, minimum actuating current, number of counts and several additional items.

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 and overload current. 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.

Maximum fault current:

The sectionalizer must have short time-current ratings equal to or greater than the available fault current.



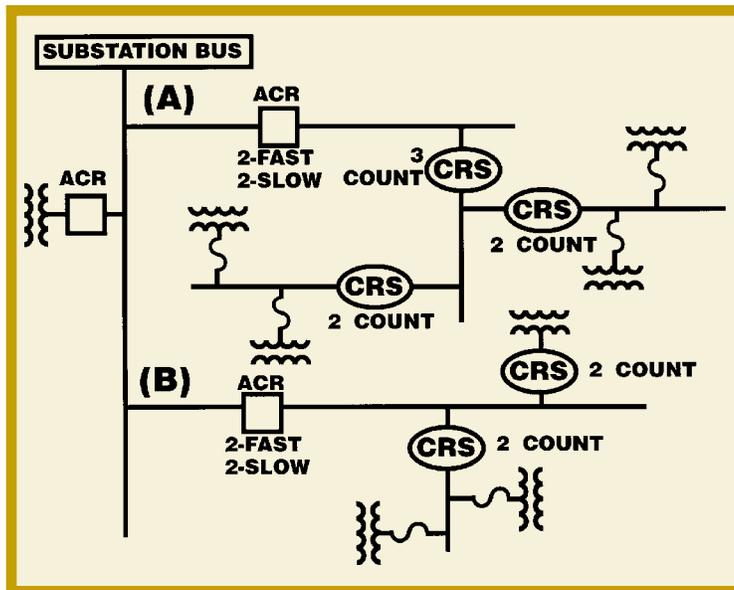


Figure 1

Typical distribution system with two and three count Chance electronic sectionalizers

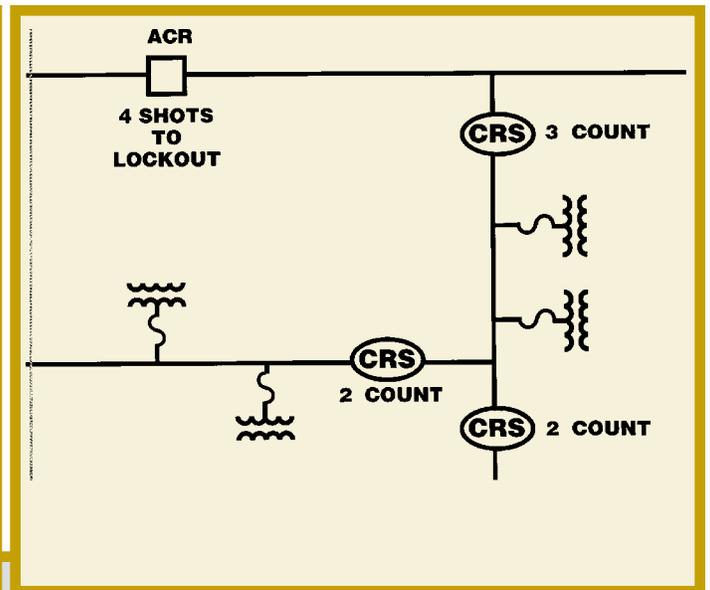


Figure 2

Recloser/Sectionalizer Coordination

Minimum Actuating current

The actuating current of sectionalizers should be 80 percent of the phase minimum trip of the source side automatic circuit recloser.

Where a hydraulic recloser is used, this is easily accomplished by matching the sectionalizer with the recloser's continuous current rating. The sectionalizer's minimum actuating current is 160 percent of its continuous current rating and the hydraulic recloser's phase pick-up current is 200 percent of its continuous current rating ($160/200=.80$) (Table at right).

When used in series with reclosers having ground pick-up capability, the sectionalizer minimum actuating current should be 80 percent of the ground minimum-trip setting of the recloser.

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 1, feeder A).

In the case of a 2-fast/2-slow reclosers setting, a 2-count sectionalizer may be used to reduce the number of recloser operations (Figure 1, feeder B above). Where sectionalizers are used in series, the downstream sectionalizer should have one less count than the upstream sectionalizer (Figure 2).

Over Voltage Protection

“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 C6211 standards for surge arresters. It is, however, recommended that a lightning arrester be installed at each sectionalizer location. ➡

RECLOSER / SECTIONALIZER COORDINATION

RECLOSER	TYPICAL SECTIONALIZER RATINGS	
	“Minimum actuating current” is determined by standards.	
Minimum Trip Amps	Actuating Current Amps ±10%	Continuous Current Amps
30	24	15
50	40	25
70	56	35
100	80	50
140	112	70
200	160	100
280	224	140
400	320	200

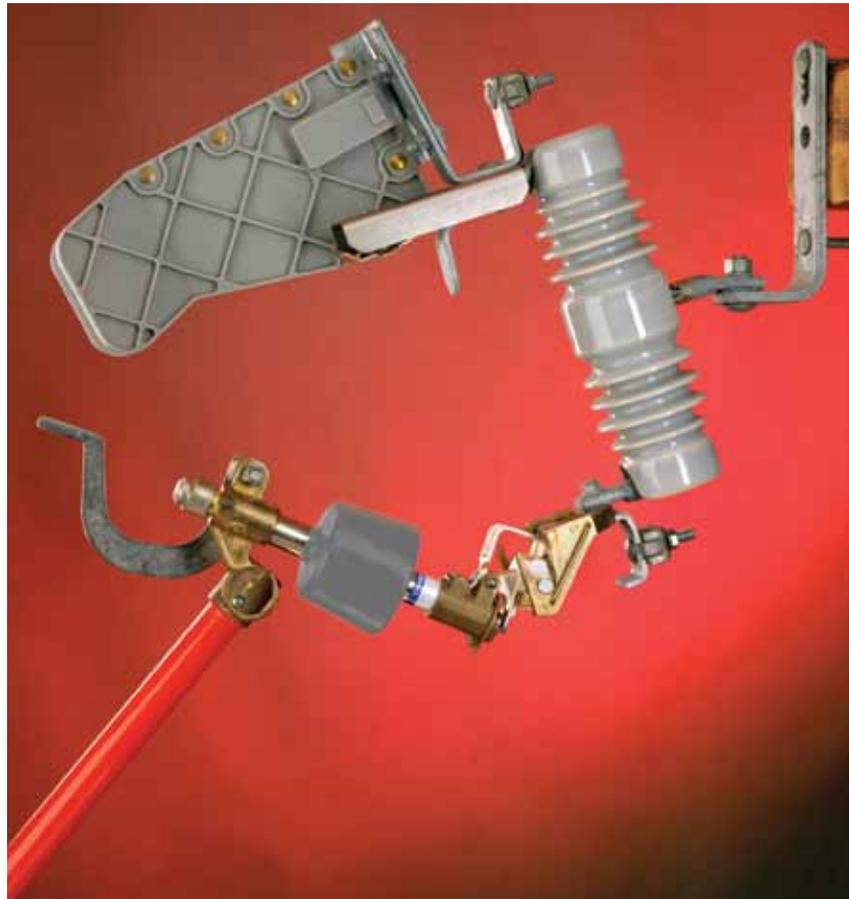
Loadbreak electronic resettable sectionalizer is available for application on 15 and 15/27 kV distribution systems. The addition of the arc chute interrupter expands the flexibility of the Chance sectionalizer family by providing loadbreak capability.

Additional application tips

When coordinating sectionalizers, there are several additional considerations based on the unique characteristics of your utility's upstream devices and downstream loads.

Single-phase sectionalizers are typically used with single-phase reclosers on circuits where there are no three-phase loads. Some utilities may permit single-phasing of three-phase loads. In such cases a single-phase sectionalizer may be used with a three-phase recloser.

When single-phase reclosers are used on circuits with three-phase loads, it is recommended that no loads be connected phase-to-phase between the recloser and the sectionalizer. Also delta-connected transformer windings are not recommended when using single-phase reclosers and sectionalizers to protect 3-phase loads.



Sectionalizers can be installed between two reclosers provided a load exceeding 0.3 amperes is connected between the sectionalizer and the downstream recloser. This applies to both single-phase and three-phase reclosers. Also, 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 greater than two minutes for any current equal to or greater than the actuating current.

Where a sectionalizer is applied downstream from two reclosers in series, it may be desirable to equip the upstream recloser with sequence coordination for optimum coordination.

If a fuse is downstream from a sectionalizer, the fuse must be coordinated with the recloser so that the fuse will operate in at least one less count than the sectionalizer.

When large motors are connected downstream from a sectionalizer, the sectionalizer may false count on faults upstream from the sectionalizer if the motor feedback current exceeds the sectionalizer's minimum actuating current.