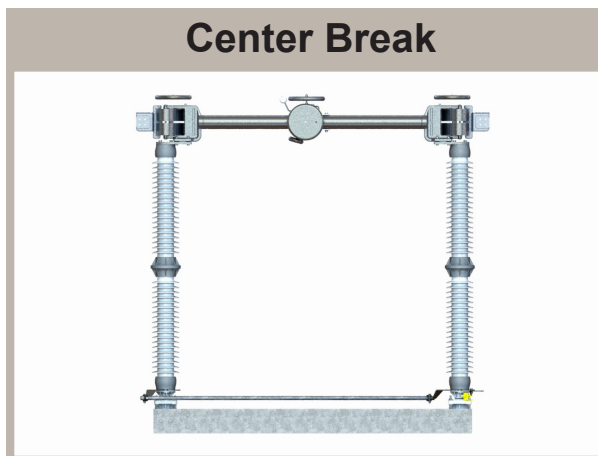


## Group Operated Switch Application Guide

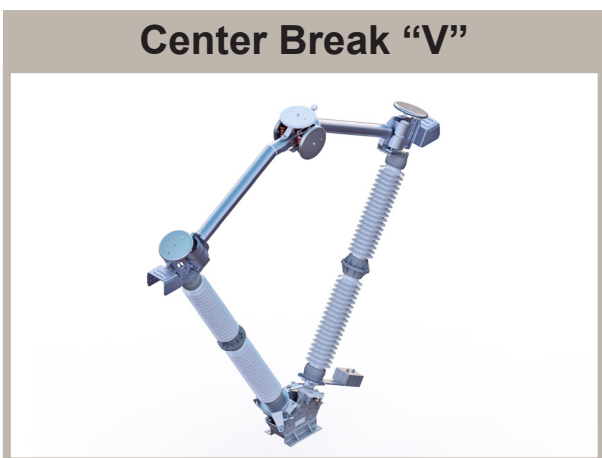
**Vertical Break**



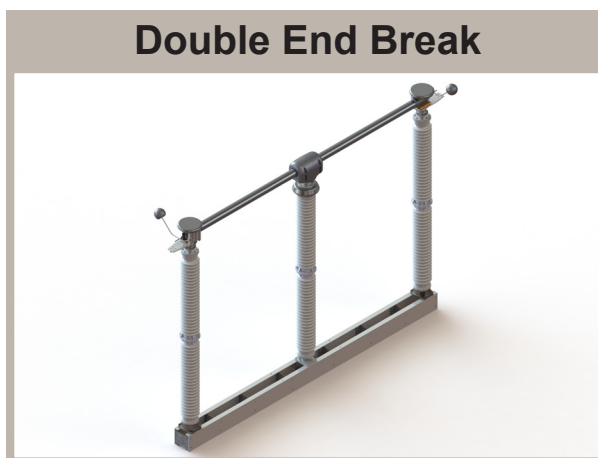
**Center Break**



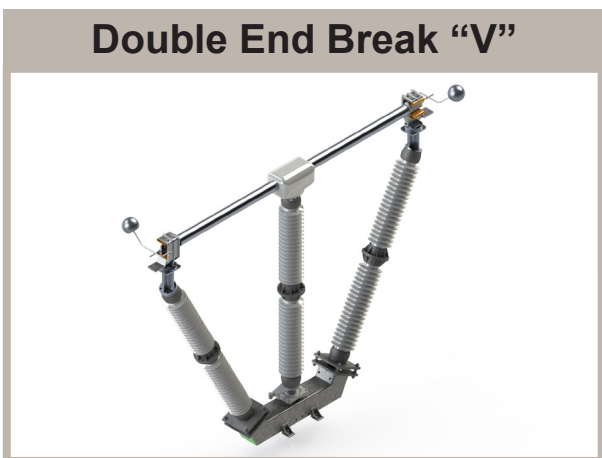
**Center Break "V"**



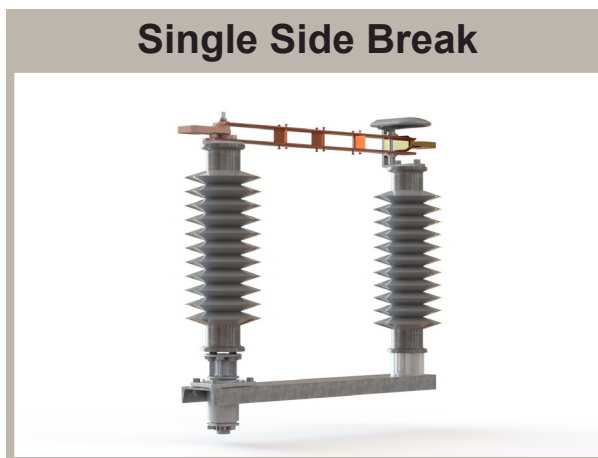
**Double End Break**



**Double End Break "V"**



**Single Side Break**



| Max Voltage /<br>BIL | Recommended<br>Insulator(s)     | Switch<br>Configuration                                                                                             | 1200A                                                                                                          | 2000A                                                                                                  | 3000A                                                                         |
|----------------------|---------------------------------|---------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------|
| 15.5 / 110           | TR 205 / TR 225                 | Single Side Break<br>Center Break "V"<br>Vertical Break<br>Center Break                                             | SSB-T, L or SSB-A<br>CBL-T<br>EV, EV-2, EV-H, EVB, or TA-OC<br>ECB-T                                           | SSB-T or L<br>—<br>EV-2, EV-H, EV-2H, or CVB-2<br>ECB-T                                                | —<br>—<br>EV-2 or EV-2H<br>P                                                  |
| 27 / 150             | TR 208 / TR 227                 | Single Side Break<br>Center Break "V"<br>Vertical Break<br>Center Break                                             | SSB-T, L, or SSB-A<br>CBL-T<br>EV, EV-2, EV-H, EVB, or TA-OC<br>ECB-T                                          | SSB-T or L<br>—<br>EV-2, EV-H, EV-2H, or CVB-2<br>ECB-T or P                                           | —<br>—<br>EV-2 or EV-2H<br>P                                                  |
| 38 / 200             | TR 210 / TR 231                 | Single Side Break<br>Center Break "V"<br>Vertical Break<br>Center Break<br>Double End Break                         | SSB-T, L, or SSB-A<br>CBL-T<br>EV, EV-2, EV-H, EVB, or TA-OC<br>EC-1 or ECB-T<br>RDA-1                         | SSB-T or L<br>—<br>EV-2, EV-H, EV-2H, or CVB-2<br>EC-1, EC-2, ECB-T, or P<br>RDA-1                     | —<br>—<br>EV-2 or EV-2H EC-1<br>EC-2, or P<br>RDA-1                           |
| 48.3 / 250           | TR 214 / TR 267                 | Single Side Break<br>Center Break "V"<br>Vertical Break<br>Center Break<br>Double End Break                         | SSB-T, L, or SSB-A<br>CBL-T<br>EV, EV-2, EV-H, EVB, or TA-OC<br>EC-1 or ECB-T<br>RDA-1                         | SSB-T, or L<br>—<br>EV-2, EV-H, EV-2H, or CVB-2<br>EC-1, EC-2, ECB-T, or P<br>RDA-1                    | —<br>—<br>EV-2 or EV-2H<br>EC-1, EC-2, or P<br>RDA-1                          |
| 72.5 / 350           | TR 216 / TR 278                 | Single Side Break<br>Center Break "V"<br>Vertical Break<br>Center Break<br>Double End Break                         | SSB-T, L, SSB-A, or ES-1,<br>EC-1V, EC-2V, or CBL-T<br>EV, EV-2, EV-H, EVB, or TA-OC<br>EC-1 or ECB-T<br>RDA-1 | SSB-T, L, or ES-1<br>EC-1V or EC-2V<br>EV-2, EV-H, EV-2H, or CVB-2<br>EC-1, EC-2, ECB-T, or P<br>RDA-1 | —<br>EC-1V or EC-2V<br>EV-2 or EV-2H<br>EC-1, EC-2, or P<br>RDA-1             |
| 123 / 550            | TR 286                          | Single Side Break<br>Center Break "V"<br>Vertical Break<br>Center Break<br>Double End Break<br>Double End Break "V" | ES-1<br>EC-1V or EC-2V<br>EV, EV-2, EV-2H, or EVB<br>EC-1 or P<br>RDA-1<br>RDA-1V                              | ES-1<br>EC-1V or EC-2V<br>EV-2, EV-2H, or CVB-2<br>EC-1, EC-2, or P<br>RDA-1<br>RDA-1V                 | —<br>EC-1V or EC-2V<br>EV-2 or EV-2H<br>EC-1, EC-2, or P<br>RDA-1<br>RDA-1V   |
| 145 / 650            | TR 288                          | Single Side Break<br>Center Break "V"<br>Vertical Break<br>Center Break<br>Double End Break<br>Double End Break "V" | ES-1<br>EC-1V or EC-2V<br>EV, EV-2, EV-2H, or EVB<br>EC-1 or P<br>RDA-1<br>RDA-1V                              | ES-1<br>EC-1V or EC-2V<br>EV-2, EV-2H, or CVB-2<br>EC-1, EC-2, or P<br>RDA-1<br>RDA-1V                 | —<br>EC-1V or EC-2V<br>EV-2 or EV-2H<br>EC-1, EC-2, or P<br>RDA-1<br>RDA-1V   |
| 170 / 750            | TR 291                          | Center Break "V"<br>Vertical Break<br>Center Break<br>Double End Break<br>Double End Break "V"                      | EC-1V or EC-2V<br>EV, EV-2, EV-2H, or EVB<br>EC-1 or P<br>RDA-1<br>RDA-1V                                      | EC-1V or EC-2V<br>EV-2, EV-2H, or CVB-2<br>EC-1, EC-2, or P<br>RDA-1<br>RDA-1V                         | EC-1V or EC-2V<br>EV-2 or EV-2H<br>EC-1, EC-2, or P<br>RDA-1<br>RDA-1V        |
| 245 / 900            | TR 304 / TR 308                 | Center Break "V"<br>Vertical Break<br>Center Break<br>Double End Break<br>Double End Break "V"                      | EC-1V or EC-2V<br>EV-1, EV-2 or EV-2H<br>EC-1 or P<br>RDA-1<br>RDA-1V                                          | EC-1V or EC-2V<br>EV-1, EV-2, EV-2H, or CVB-2<br>EC-1, EC-2, or P<br>RDA-1<br>RDA-1V                   | EC-1V or EC-2V<br>EV-1, EV-2, or EV-2H<br>EC-1, EC-2, or P<br>RDA-1<br>RDA-1V |
| 362 / 1050           | TR 312 / TR 316                 | Vertical Break<br>Center Break<br>Double End Break<br>Double End Break "V"                                          | EV-1, EV-2 or EV-2H<br>—<br>RDA-1<br>RDA-1V                                                                    | EV-1, EV-2, or EV-2H<br>EC-1 or P<br>RDA-1<br>RDA-1V                                                   | EV-1, EV-2, or EV-2H<br>EC-1 or EC-2 or P<br>RDA-1<br>RDA-1V                  |
| 362 / 1300           | TR 324 /<br>TR 367 (Radio free) | Vertical Break<br>Center Break<br>Double End Break<br>Double End Break "V"                                          | EV-1, EV-2 or EV-2H<br>EC-1<br>RDA-1<br>RDA-1V                                                                 | EV-1, EV-2, or EV-2H<br>EC-1<br>RDA-1<br>RDA-1V                                                        | EV-1, EV-2, or EV-2H<br>EC-1 or EC-2<br>RDA-1<br>RDA-1V                       |
| 550 / 1550           | Consult factory                 | Vertical Break<br>Double End Break                                                                                  | EV-1 or EV-2H<br>—                                                                                             | EV-1 or EV-2H<br>RDA                                                                                   | EV-1 or EV-2H<br>RDA                                                          |
| 550 / 1800           |                                 | Vertical Break<br>Double End Break                                                                                  | EV-1 or EV-2H<br>—                                                                                             | EV-1 or EV-2H<br>RDA                                                                                   | EV-1 or EV-2H<br>RDA                                                          |
| 800 / 2050           |                                 | Vertical Break<br>Double End Break                                                                                  | EV-2H<br>—                                                                                                     | EV-1 or EV-2H<br>RDA                                                                                   | EV-1 or EV-2H<br>RDA                                                          |

## APPLICATION GUIDE

| 4000A                                                                                           | 5000A                                                  |
|-------------------------------------------------------------------------------------------------|--------------------------------------------------------|
| —<br>—<br>EV-2, EV-2H, or WAG-A<br><b>P</b>                                                     | —<br>—<br>WAG-A<br><b>P</b>                            |
| —<br>—<br>EV-2, EV-2H, or WAG-A<br><b>P</b>                                                     | —<br>—<br>WAG-A<br><b>P</b>                            |
| —<br>—<br>EV-2, EV-2H, or WAG-A<br>EC-1, EC-2, or <b>P</b><br>RDA-1                             | —<br>—<br>WAG-A<br>EC-1 or <b>P</b><br>—               |
| —<br>—<br>EV-2, EV-2H, or WAG-A<br>EC-1, EC-2, or <b>P</b><br>RDA-1                             | —<br>—<br>WAG-A<br>EC-1 or <b>P</b><br>—               |
| —<br>—<br>EC-1V or EC-2V<br>EV-2, EV-2H, or WAG-A<br>EC-1, EC-2, or <b>P</b><br>RDA-1           | —<br>—<br>WAG-A<br>EC-1 or <b>P</b><br>RDA-1           |
| —<br>—<br>EC-1V or EC-2V<br>EV-2, EV-2H, or WAG-A<br>EC-1, EC-2, or <b>P</b><br>RDA-1<br>RDA-1V | —<br>—<br>WAG-A<br>EC-1 or <b>P</b><br>RDA-1<br>RDA-1V |
| —<br>—<br>EC-1V or EC-2V<br>EV-2, EV-2H, or WAG-A<br>EC-1, EC-2, or <b>P</b><br>RDA-1<br>RDA-1V | —<br>—<br>WAG-A<br>EC-1 or <b>P</b><br>RDA-1<br>RDA-1V |
| —<br>—<br>EC-1V or EC-2V<br>EV-2, EV-2H, or WAG-A<br>EC-1, EC-2, or <b>P</b><br>RDA-1<br>RDA-1V | —<br>—<br>WAG-A<br>EC-1 or <b>P</b><br>RDA-1<br>RDA-1V |
| —<br>—<br>EC-1V or EC-2V<br>EV-1, EV-2, or EV-2H<br>EC-1, EC-2, or <b>P</b><br>RDA-1<br>RDA-1V  | —<br>—<br>EC-1 or <b>P</b><br>RDA<br>RDA-V             |
| EV-1, EV-2, or EV-2H<br>EC-1, EC-2 or <b>P</b><br>RDA-1<br>RDA-1V                               | —<br>EC-1 or <b>P</b><br>RDA<br>RDA-V                  |
| EV-1, EV-2, or EV-2H<br>EC-1 or EC-2<br>RDA-1<br>RDA-1V                                         | —<br>EC-1<br>RDA<br>RDA-V                              |
| EV-1 or EV-2H<br>RDA                                                                            | —<br>RDA                                               |
| EV-1 or EV-2H<br>RDA                                                                            | —<br>RDA                                               |
| EV-1 or EV-2H<br>RDA                                                                            | —                                                      |

## > Disconnect Switches > GROUP OPERATED SWITCHES

### Notes:

- For continuous current ratings above 5000A, contact factory
- For other switch configurations, consult factory
- **Blue** indicates aluminum live part construction
- **Red** indicates copper live part construction

### Available Operators

| Manual | HOGO (High Output Gear Operator)<br>Swing Handle |
|--------|--------------------------------------------------|
| Motor  | VM-1                                             |
|        | VM-1 SE (Stored Energy)                          |
|        | CM-4AE (For Circuit Switchers Operation)         |

### Available Ground Switches

| Model       | Available kV Ratings | Momentary<br>Current Rating                 |
|-------------|----------------------|---------------------------------------------|
| <b>LH-6</b> | 15.5 - 145 kV        | 61 kA                                       |
| EVG-1       | 15.5 - 550 kV        | 61 kA<br>70 kA<br>80 kA<br>100 kA<br>120 kA |
| EVG-2       | 15.5 - 345 kV        | 61 kA<br>70 kA<br>80 kA<br>100 kA<br>120 kA |
| ESD-63      | 72.5 - 245 kV        | 100 kA                                      |
| TV-70       | 123 - 800 kV         | 120 kA                                      |

## SWITCH INTERRUPTER ATTACHMENTS

## Switch Interrupter Selection Chart

| PRODUCT               | LOAD BREAKING | LOOP SPLITTING | LINE / CABLE DROPPING | TRANSFORMER MAGNETIZING |
|-----------------------|---------------|----------------|-----------------------|-------------------------|
| Standard Arcing Horn  |               |                | X                     | X                       |
| Quick Break Whip      |               |                | X                     | X                       |
| High Speed Whip (HSW) |               |                | X                     | X                       |
| <b>LLS™</b>           | X             | X              | X                     | X                       |
| <b>LLS®</b>           | X             | X              | X                     | X                       |



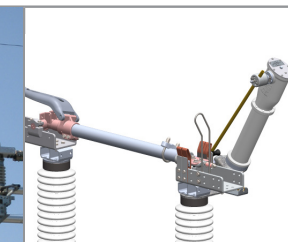
Standard Arcing Horn



Quick Break Whip



High Speed Whip (HSW)

**LLS®**  
 LOAD AND LINE  
 SWITCHER FAMILY  
 OVERVIEW
**LLS®-I****LLS®-II 2000****LLS®-II 3000****LLS®-II 3000**

|                           | <b>LLS®-I</b>   |              | <b>LLS®-II 2000</b> |        | <b>LLS®-II 3000</b> |        | <b>LLS®-II 3000</b> |
|---------------------------|-----------------|--------------|---------------------|--------|---------------------|--------|---------------------|
| MAXIMUM VOLTAGE RATING    | 38 kV - 72.5 kV | 123 - 245 kV | 72.5 - 170 kV       | 245 kV | 72.5 - 170 kV       | 245 kV | 38 kV - 72.5 kV     |
| LOAD BREAKING CAPABILITY  | 2000 A          | N/A          | 2000 A              |        | 3000 A              | 2000 A | 1200 A - 2000 A     |
| LINE DROPPING CAPABILITY  | 300 A           | N/A          | 300 A               | 200 A  | 300 A               | 200 A  | 70 A                |
| LOOP SPLITTING CAPABILITY | 2000 A          | 2000 A*      | 2000 A              |        | 3000 A              |        | 2000 A              |

\* The LLS®-I can be utilized for loop splitting applications to 245 kV as long as the transient recovery voltage does not exceed 30 kV