Bulletin DB-106AEH11

Type V2-CA

Aluminum Vertical Break Switch

345 kV, 1300 kV BIL
2000 A.- 3000 A.

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Designed for Simplicity

The Cleaveland/Price 345 kV V2-CA is an aluminum vertical break switch that carries on the Cleaveland/Price tradition of manufacturing reliable, low maintenance, non-cast switches.

Cleaveland/Price has a very basic approach to design . . . keep it simple. It is an approach that is employed from material selection to mechanical design.

V2-CA switches are of non-cast design for superior dependability of parts. Switch performance is not troubled by flaws that could occur in the casting process.

All Cleaveland/Price disconnect switch current carrying parts are manufactured from high strength, high conductivity aluminum or copper. To assure product quality, all incoming copper and aluminum material is tested for conductivity and every current carrying part is fabricated in the United States at the Cleaveland/Price manufacturing facility for maximum quality control.

Contacts are designed to take advantage of electromagnetic forces by using a reverse loop configuration at both the hinge and jaw of the switch. Current transfer points are kept to a minimum.

Operation of the V2-CA is smooth and low force. The blades of the pole units are counterbalanced throughout the entire blade travel. The counterbalance springs are made from stainless steel to ensure that the operating force will not change due to corrosion over the life of the switch. The springs are insulated from the current path as are the spring housings.

The V2-CA has been designed and tested to meet applicable NEMA and IEEE Standards and the rating requirements of applicable IEC Standards. Testing included short circuit, temperature rise, dielectric, mechanical endurance, ice, corona, and radio influence voltage.

Testing of the 345 kV V2-CA to IEEE Standards.

Short circuit testing

Temperature rise testing

Ice Testing

Dielectric testing

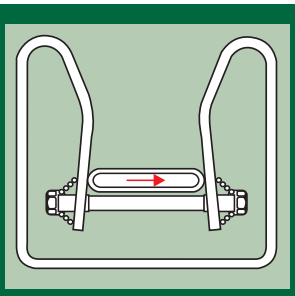
Engineered for Performance

Cleaveland/Price Features for Outstanding Performance and Long Life

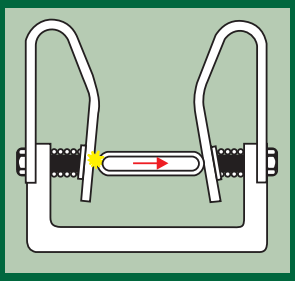
The V2-CA is made of the finest materials for dependable, trouble-free service. Knowledge gained from maintaining switches in the field for over 60 years has played a major part in refining the V2-CA. The 345 kV V2-CA design is based on the Cleaveland/Price 230 kV V2-CA, which has been in service for over twenty years. Significant design features include:

- Total non-cast copper, aluminum and steel construction resulting in the superior dependability of parts.
- Live parts constructed from hard-drawn, high conductivity copper and extruded aluminum, producing stronger, more conductive components than parts made of cast materials
- Open construction of the hinge and smooth surfaces throughout, enabling the V2-CA to break ice with amazing ease
- Wiping action on both the break-jaw and hinge that keeps contacts clean for years of reliable service
- Open hinge contacts allow easy verification of contact condition without disassembly or infrared testing
- Reverse-loop electromagnetic design at hinge and break-jaw on all ratings gives outstanding performance under fault conditions
- Bolted connections are aluminum to tin-plated copper (tin-plating one mil thick). All bolted contact surfaces are prepared and treated with an oxide inhibitor. Moving contacts are silver-to-silver with hard-drawn, high-conductivity copper base material.

Patented Break-Jaw Design



***ADVANCED V2-CA BREAK-JAW** maintains consistent contact pressure as blade and jaw fingers move to the side together as a unit under short circuit forces.*



***CONVENTIONAL BREAK-JAW** loses contact pressure as the blade moves to the side because of electromagnetic forces.*

BLADE TURNOVER

THE TRADITIONAL PROBLEM

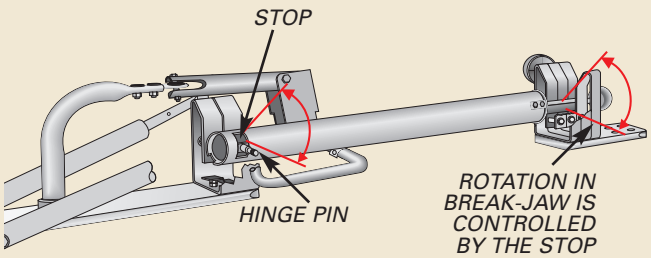
When the switch blade on a conventional switch rotates in the break-jaw to the final blade position, it does not consistently stop at the point of optimum contact pressure. The resulting inadequate contact pressure may cause contact pitting and burning.

Many switches use a stop on the rotating insulator to try to set proper blade position. This type of stop is too remote from the blade to accurately control the blade motion because of the cumulative play in the linkage joints. Variation in the speed of the operator can actually affect the amount of blade turnover.

THE INNOVATIVE SOLUTION

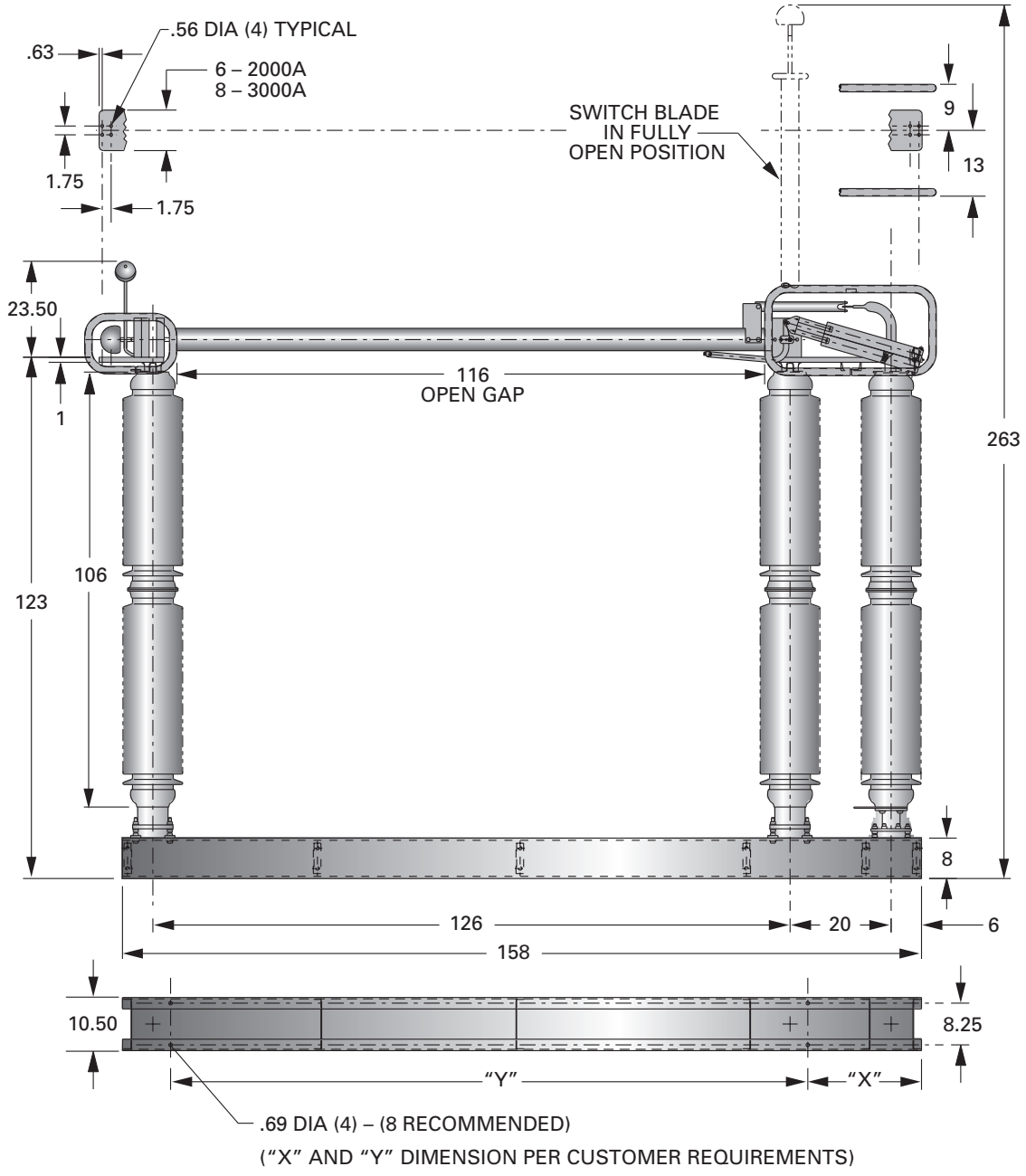
On the Cleaveland/Price V2-CA, the blade stop is on the blade itself instead of an intermediate linkage point (the rotating insulator). The V2-CA stop location ensures that blade rotation in the break-jaw will accurately and consistently stop at the point of maximum contact pressure.

The cutaway view shows how the unique Cleaveland/Price turnover stop allows the blade to rotate until the slot in the blade engages with the hinge pin. This sets the proper turnover angle.



The stop angle is factory-machined for built-in accuracy. No matter how fast or slow the blade moves, it doesn't stop moving until it has fully turned over.

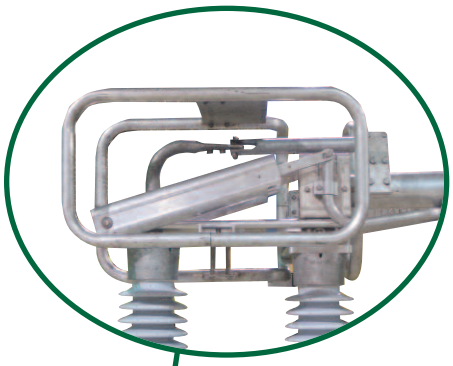
Type V2-CA Aluminum Vertical Break Switch



DIMENSIONS IN INCHES

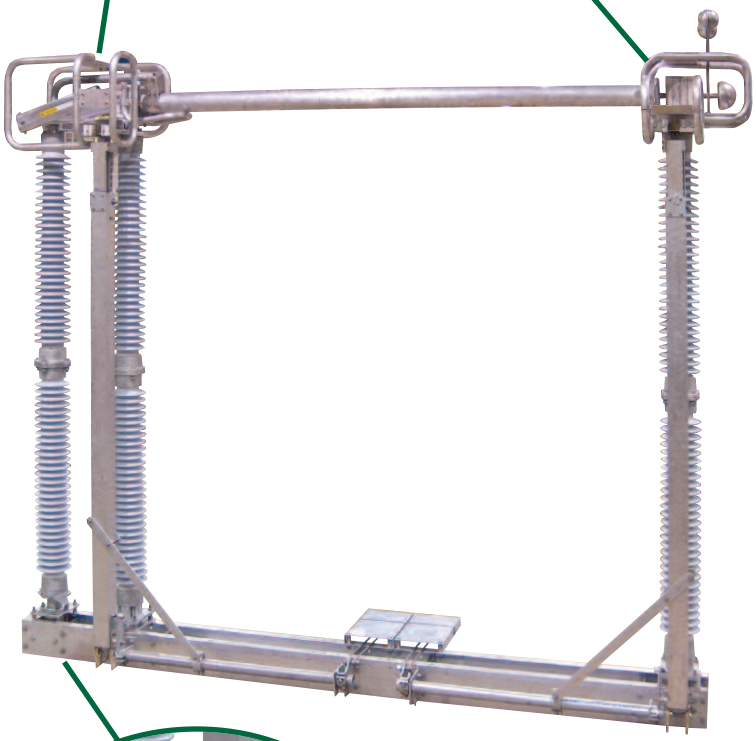
Nom. kV	Max. kV	KV BIL	Insulator TR#	Amp	Mom. kA	Switch Style Number	Wt./Pole
345	362	1300	324	2000	100	C06A803G01	1930 lbs.
				3000	120	C06A803G02	1970 lbs.
			367	2000	100	C06A1019G01	2140 lbs.
				3000	120	C06A1019G02	2180 lbs.

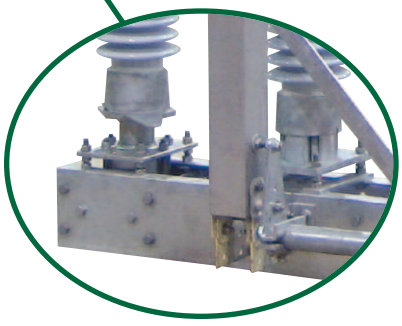
V2-CA Quality Construction



- Unbreakable non-cast hinge end terminal pads with NEMA standard hole pattern
- Unbreakable non-cast operating crank
- Insulating journal bearing for the operating crank
- Stainless steel counterbalance springs
- Tin-plated, high-conductivity copper hinge end contact fingers
- Reverse-loop, silver-to-silver contacts
- Stainless steel contact springs located outside of the current path
- Aluminum corona rings

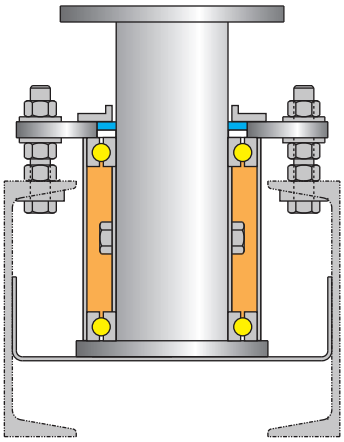
- Unbreakable non-cast jaw end terminal pads with NEMA standard hole pattern
- Tin-plated, high-conductivity copper jaw end contact fingers
- Reverse-loop, silver-to-silver contacts
- Stainless steel contact springs located outside of the current path
- Aluminum corona rings
- Arc horns with corona spheres





- Hot-dip galvanized double channel base
- Insulator leveling screws
- Heavy-duty bearing assembly

Superior Bearing Assembly



- Maintenance-free, permanently lubricated construction
- High strength, non-cast, hot-dip galvanized steel shaft
- Special ozone and UV resistant seals that outlast conventional seals and contain no metal parts that typically corrode
- Individually sealed ball bearing assemblies in sealed, grease-packed housing
- Permanently adjusted bearing assembly

Operators / Accessories

345 kV V2-CA switch with ground blades at hinge and jaw ends of the switch and outriggers to extend the hinge end conductors away from the switch.

Geared Handcrank Operator

Optional TP-C2 Motor Operator

Standard Operator Features

- 40:1 ratio geared handcrank
- Padlock provision in both the open and closed positions
- Ground strap for vertical operating pipe
- Adjustable stops
- Open and closed position indicators
- Self-lubricating, maintenance-free outboard bearing
- 2" IPS galvanized steel vertical operating pipe
- Adjustable radius outboard bearing lever
- Threaded interphase and drive lever adjustment

Ordering Information

Furnish:

- Switch type
- Voltage
- Amperage
- Momentary rating
- BIL level
- Insulator TR number
- Mounting position
- Operator type
- Accessories required
- Base mounting details

Available Accessories

- Arc horns
- Auxiliary switch
- Braidless ground contact
- Ground blades
- Ground blade mechanical interlock
- Key interlock
- Mounting hardware
- Operator grounding platform
- Outriggers
- Terminal connectors

This brochure describes our standard product and does not show variations in design that may be available. Contact the factory for additional details.

Cleaveland/Price reserves the right to make changes or improvements to the product shown in this brochure without notice or obligation.

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