POWER SWITCHES CATALOG

HUBBELL®

USCO™
Power Switches

USCO POWER SWITCHES
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Bulletin USCO-6

HUBBELL USCO™ Power Switches

These instructions do not purport to cover all details or variations in equipment, nor to provide for every possible contingency to be met in connection with installation, operation, or maintenance. Should further information be desired or should particular problems arise which are not covered sufficiently for the purchaser's purposes, the matter should be referred to your USCO representative, or direct to the USCO factory.

UNPACKING INSTRUCTIONS

ALL GANG OPERATED SWITCHES
(Grounding Switch Not Included)

Each switch consists of three or more packaged items; the control parts box, the switch units, a bundle of pipe and the insulators when not assembled to the switch. Check packing list, attached to the switch crate, to determine if all material has been received. Check insulators carefully for cracked or broken porcelain. Check all other materials for possible shipment damage or loss. Report any claims to the carrier.

8.3 thru 48.3kV switch units are shipped completely assembled with insulators unless specified otherwise by the purchaser.

72.5kV thru 245kV switch units are shipped assembled, less insulators, unless specified by the purchaser or switch construction necessitates the complete assembly.

Installation instructions and print of control arrangement are packed in the control parts box in a plastic envelope. Check bill of material on control print and material received. Notify factory of any missing parts.

All switch units have been adjusted at the factory for proper contact pressure, proper opening angle, etc. and no field adjustments of the live parts are required.

Make absolutely sure applicable equipment is de-energized and properly grounded before proceeding with any installation or maintenance.

INSTALLATION, OPERATION, AND MAINTENANCE
Based on IEEE Std C37.30.1-2011, Annex D

INTRODUCTION

High voltage disconnecting switches are assigned certain ratings and standard test are conducted to assure the user that the switch, when new, will perform within the ratings shown on the nameplate. It should be recognized that the switch in service will perform within these ratings only if properly operated and maintained. It cannot be stressed too strongly that prescribed safety rules should be adhered to at all times when operating or maintaining high voltage disconnecting switches near energized equipment or conductors.

MAINTENANCE

High voltage disconnecting switches are not equipped with isolating devices allowing them to be serviced at frequent intervals. This does not indicate, however, that care or inspection is unnecessary. The frequency of inspection will depend on the atmospheric conditions at a given location, the frequency of operation, etc., and shall be determined by the user. In noncorrosive atmospheres, a switch may operate satisfactorily for many years without attention, while in a severe atmosphere such as encountered at some power plants and industrial sites, maintenance may be required in a matter of months. If it is known that a switch has carried heavy short-circuit current, special efforts should be made to inspect it at the earliest possible time, since the ability of the switch to carry rated load current or fault current may be seriously impaired if the contacts are not properly maintained.

Where periodic maintenance of any kind cannot be made, it should be recognized that the life of the switch may be affected. In this case, when a switch operation is made, it is suggested that the switch be opened and closed several times instead of just once in order to clean the contacts and free the moving parts more effectively. A visual inspection of a switch when wet from rain or snow might indicate hot spots which are possible sources of trouble.

The following recommendations require special consideration:

Be sure that the switch is disconnected from all electric power sources before servicing.

After power has been disconnected from the switch, ground leads to their equivalent should be attached to both sides of the switch. Such grounding may be unnecessary in the case of low voltage switches that can be visibly isolated from energized conductors by other disconnecting means.

Inspect insulators for breaks, cracks, or burns. Clean the insulators where abnormal conditions such as salt deposits, cement dust, or acid fumes prevail. This is necessary to avoid flashover as a result of the accumulation of substance on their surfaces.

Inspect contacts for alignment, pressure, burns, or corrosion. Replace pitted or badly burned contacts. If pitting is of a minor nature, smooth down the surface with clean, fine sandpaper (not emery).

Inspect interphase linkages, operating rods, levers, bearings, etc., to make sure that the adjustments have not changed or that the pipes are not bent. Check for simultaneous closing of all blades and for complete contact in the closed position. Check gearboxes for moisture, which could cause corrosion or difficulty in operating the switch due to ice formation. Inspect flexible braids or slipring commonly used for grounding the operating handle. Replace braids showing signs of corrosion, wear, or broken strands.

Inspect over-all switch for good working conditions. See that bolts, nuts, washers, cotter pins, and terminal connectors are in good condition. Replace items showing excessive wear or corrosion.

When a switch cannot be disconnected from power, hot stick servicing may be used as great an extent as possible.

Power-operating mechanisms attached to high voltage disconnecting switches are usually of the motor-driven, hydraulic, or pneumatic type. The maintenance instructions of the particular manufacturer of each mechanism should be followed. In addition, check limit switch adjustment, associated relay equipment for poor contacts, burned out coils, inadequate supply voltage, and any other conditions that might prevent the proper functioning of the complete switch assembly.

USCO™ Power Switches

OPERATION

High Voltage disconnecting switches, grounding switches, and horn gap switches are given no interrupting rating .* The following general rules should be followed:

Prior to operating, check to see that it is fully closed and latched or fully open, as intended.

Switches should be closed rapidly.

After operating a switch, check to see that it is fully closed and latched or fully open, as intended.

Do not use undue force in attempting to operate a switch. The operating mechanism is designed properly for the switch and any undue force, in the nature of an extension of the operating handle, an extra person on the operating handle or switch stick, may cause severe damage to the switch or mechanism. A few sharp raps on the vertical operating pipe or suddenly applied tugs on the operating handle may help to free an iced switch mechanism.

Power-operated switches should be operated periodically to ensure that the switches and their mechanism and control features are functioning properly. Where the circuit conditions will not permit operating the switch energized and the circuit cannot be de-energized for this purpose, it is suggested that arrangements be made to disengage the operating mechanism from the linkage to allow the control circuits and mechanisms to be checked, provided that this method does not adversely affect the over-all adjustment.

* It is common practice to use these devices to interrupt small values of current such as the charging current of a short length of transmission or distribution line, transformer magnetizing current, or light load current. It should be recognized that such operation results in unconfined electric arcs at the switch contacts which under unfavorable conditions may cause damage to the switch, and which may involve adjacent phase conductors or supporting structure in the initiation of system faults. Transfer switching in parallel or loop circuits also has the same attendant hazards. If current interruption is contemplated, care should be taken to be sure that the current magnitude is in a range that can be handled by the switch with a good probability of successful interruption.

REFERENCES

IEEE Std C37.30.1-2011, Annex D

WARRANTY INFORMATION

(a) The following designated products sold by the Corporation are warranted to be free of defects in material and workmanship and to remain so under normal and proper use for a period of ten years. These product designations are:

1) AGCH5 all ratings
2) AGCH5V all ratings
3) AVR all ratings
4) AVRV all ratings
5) ATR all ratings
6) ASB all ratings

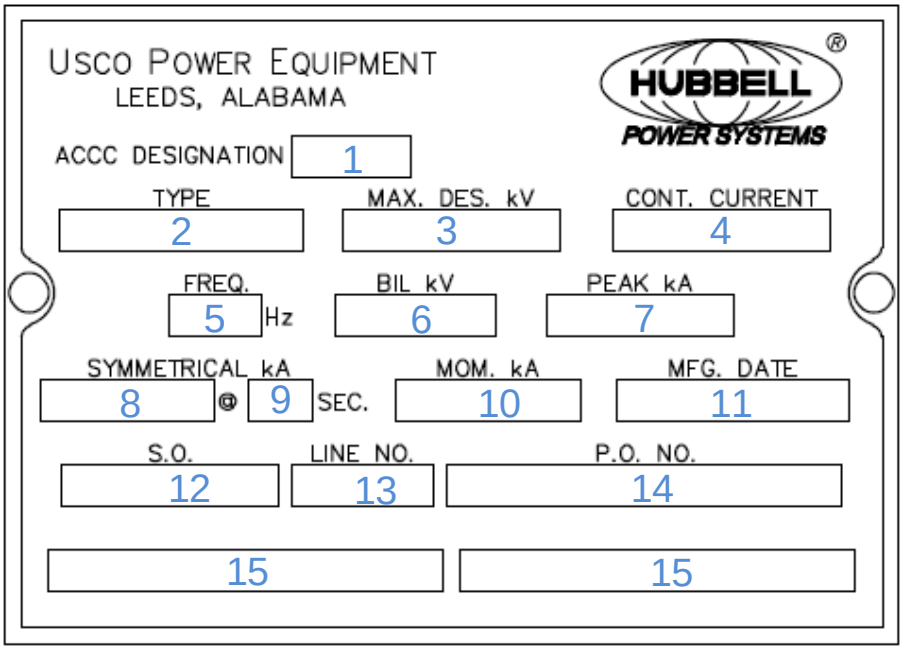
(b) All other products sold by the Corporation, including motor operators, will carry a standard one-year warranty.

Should it become evident that any product under (a) and (b) above proves defective in workmanship or material during its designated warranty limit, upon prompt written notification from the Purchaser, the Corporation shall, at its option, repair or replace the defective part or parts f.o.b. factory freight prepaid by the Purchaser. The Corporations liability for damages for any claimed defect shall in no event exceed the purchase price of the product. The foregoing warranty is exclusive. All other warranties, whether express or implied or arising by operation of law, course of deal, usage of trade or otherwise are excluded. The only warranties of merchantability and fitness for purpose are those expressed above and THERE ARE NO IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR PURPOSE. The Corporation shall not be liable for any penalty or for any special or consequential damages, such as loss of profits or revenue, loss of other equipment, down-time costs, costs associated with the removal of the equipment from service or reinstallation or disassembly or reassembly, or for claims of third parties against the Purchaser. The warranty set forth in the first paragraph of this section does not apply to, nor is any expense or other damages or liability assumed for any equipment which has been improperly stored or installed, or from any accidental or intentional attempts to operate it in excess of its rating or in abnormal atmosphere or environments, or to which unauthorized repairs or modifications have been made, even though such equipment is defective and not in accord with the specifications. Any such repairs or modifications must be authorized by the Corporation in writing. The Corporation's responsibility does not extend to equipment, which it did not manufacture.

NAMEPLATE INFORMATION

The USCO Nameplate reflects pertinent technical and administrative information pertaining to the product.

A nameplate is located on the base of each switch phase and on the control handle of all group-operated switches.



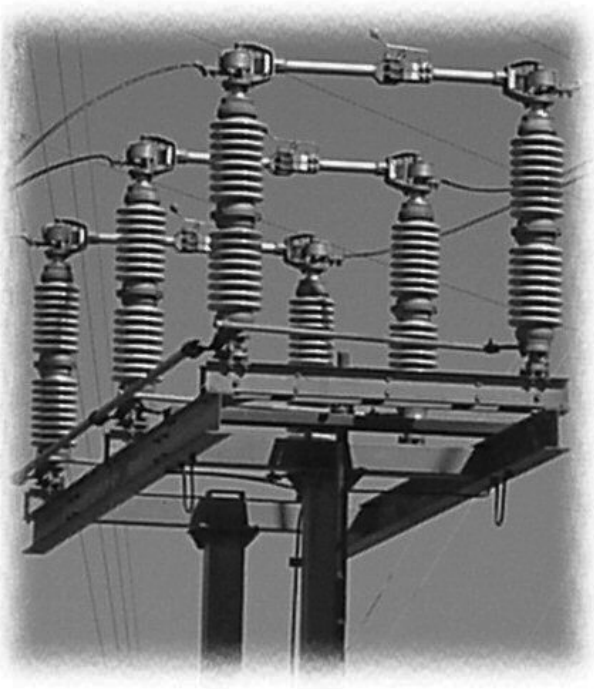
1. Allowable Continuous Current Class designation
2. Switch model
3. Maximum operating voltage
4. Rated continuous current without exceeding allowable temperature rise.
5. System power frequency rating
6. Basic Lightning Impulse withstand rating
7. Peak Withstand rating
8. Short-time withstand rating
9. Short-time duration
10. Momentary Withstand rating
11. Date of Manufacture of equipment
12. Sales order number
13. Sales document line item number
14. Customer purchase order number
15. Special information requested by the customer.

USCO'S STANDARD NAMEPLATE IS ALUMINUM

Revised 11/30/2005

HUBBELL® USCO™ Power Switches

CENTER BREAK SWITCH
TYPE AGCH5



VOLTAGE RATING 8.3kV to 362kV
CURRENT RATING 1200 to 6000A

AGCH5 Center Break

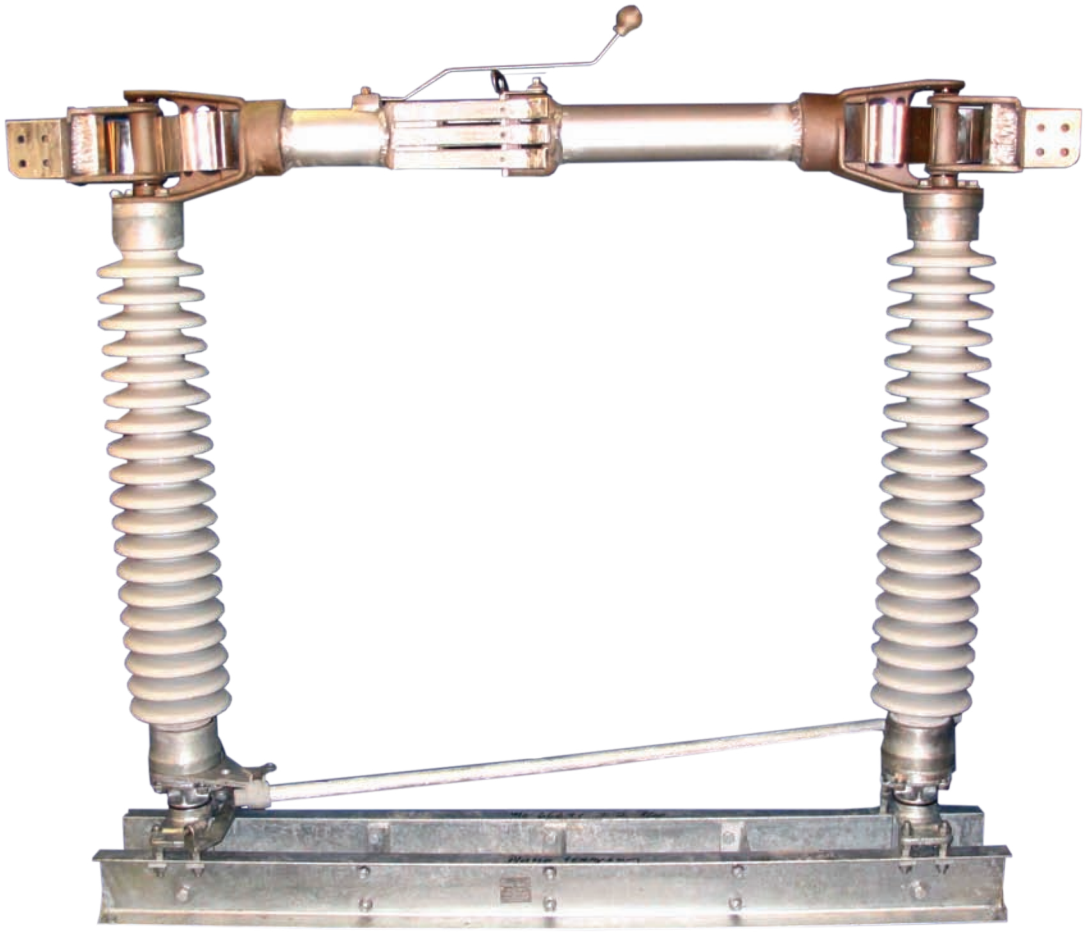
The AGCH5 is a two-insulator, side opening outdoor air disconnect switch constructed primarily of aluminum. Operation is accomplished by the rotation of two insulators making the center break switch the easiest operating of all group operated switches. Unique construction methods through years of field experience, coupled with simple design concepts provide ease of installation as well as long-term dependability.

- ❑ **Welded Lamination Design**
- ❑ **Low Operating Effort**
- ❑ **Heavy Duty Rugged Durability**

USCO™ POWER SWITCHES

SINCE 1946, THE ENGINEERS CHOICE FOR HIGH VOLTAGE PRODUCTS

HUBBELL USCO™ Power Switches



DESCRIPTION

The AGCH5 is an outdoor, group-operated side opening two insulator, air disconnect switch with both insulators rotating during operation. The AGCH5 is constructed primarily of aluminum and is available in ratings from 8.3kV through 362 kV maximum (7.5kV through 345kV nominal) and 1200 through 6000 continuous amperes. The center break is the easiest operating of all group-operated switches. Mounted horizontal upright or underhung, the blades lift no weight during operation. Mounted vertically, the blades counterbalance each other during operation.

APPLICATION

The AGCH5 is commonly used in three-phase line or substation applications such as transformer or line disconnecting, breaker isolating, bypassing or bus sectionalizing. Operation of the AGCH5 may be accomplished by either manual control or by motor operator.

TESTING

The AGCH5 has been extensively tested to meet or exceed current ANSI standards. A comprehensive test brochure is available outlining electrical and mechanical design test conducted on the AGCH5.

DESIGN CHARACTERISTICS

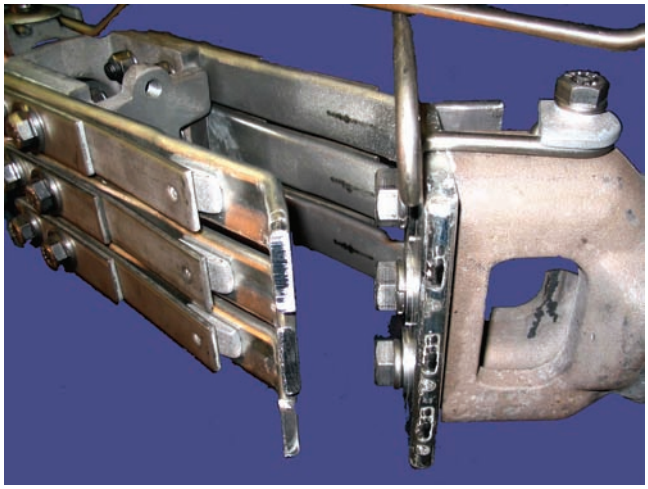
Contacts

The AGCH5 is supplied with line-high pressure silver-to-silver jaw contacts producing the highest conductivity initially and over time.

The contact fingers, fabricated from hard drawn copper, are silver metallized and electro-tin plated. The male contact, also of hard drawn copper, has a brazed silver overlay and is electro-tin plated. These methods and materials used in the application of the silver provide surfaces of differing hardness with anti-galling properties, resulting in minimal wear over years of operation.

All contacts on the AGCH5 are field replaceable.

The AGCH5 uses USCO's time tested welded lamination hinge assembly producing a straight-line current path eliminating any current transfer at the hinge. This is accomplished with a welded aluminum laminated conductor that is used to create a bypass at the hinge. This eliminates the need for bolted or sliding pressure connections, or high pressure contacts, and enables ease of operation. The welded connections create a single metallic path from the hinge terminal pads to the main contacts on the blades of the switch. The laminated conductor is constructed of commercially pure aluminum strip, which does not work harden during operation.

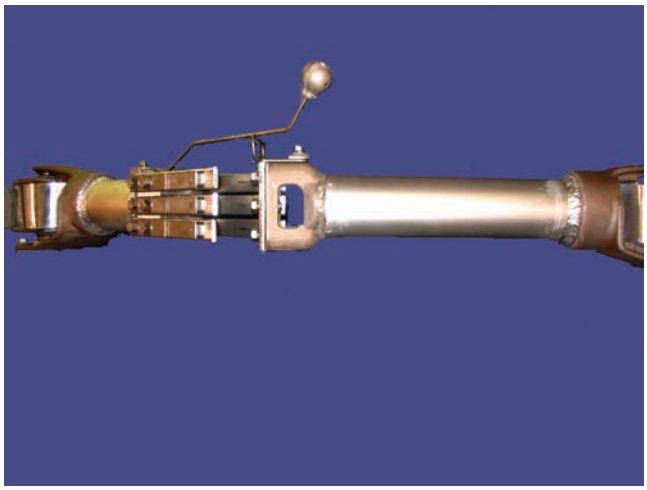


Blade

The blade is constructed of heat-treated aluminum tubing with heat-treated aluminum castings welded to hinge and jaw ends.

Blade Mechanism

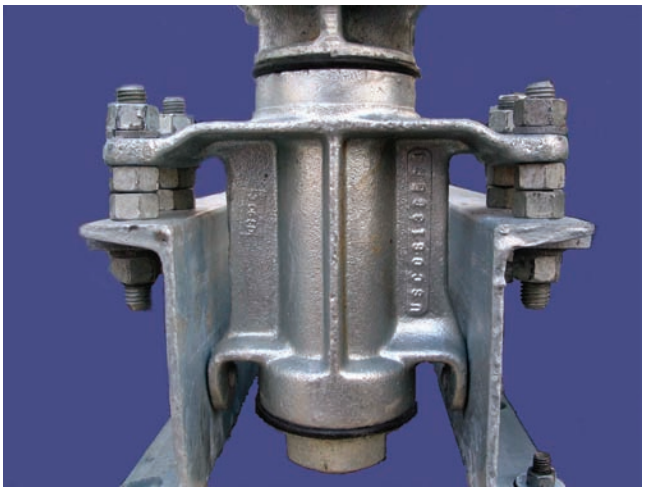
The center break design of the AGCH5 allows for better weight distribution of the blade assemblies providing excellent operational performance. The center break design increases rigidity of the blades while decreasing probability of contact misalignment, especially with higher rated switches. The two insulator configuration decrease cost while providing a simple field friendly installation.



ACCESSORIES

- Grounding switches: Through 100kA momentary
- Auxiliary switches: Up to 12 contact decks are standard
- Standard arcing horns are installed on all switches
- Outriggers: Custom designed for your application
- Connectors: Available on all switch types

HUBBELL USCO™ Power Switches



Main Switch Bearings

The AGCH5 incorporates rugged switch bearings consisting of stainless steel balls, utilizing stainless steel bearing races with galvanized ductile iron housings and rotors. The bearings are sealed at the factory for maintenance free service. Factory adjusted stops are provided with the bearing for ease of synchronization during installation. At 362kV and above the main bearing is a Timken roller bearing.

Switch Bases

Hot dipped structural steel channel is used for the construction of the switch base. Leveling studs are provided on the bearings for insulator alignment. Bases and base mounting dimensions can be customized to your specifications and structure.

Insulators

The AGCH5 is designed to accommodate commercially available insulators with three, five or seven inch bolt circle.

Operating Mechanisms

The AGCH5 may be operated with a swing handle, gearbox or motor operator. Control arrangements are factory designed and customized to your structure, with all linkage components factory cut to the required dimensions.

Hinge Current Transfer

The AGCH5 has no hinge contacts; therefore it allows current transfer with maximum reliability.

Transfer of current at the hinge end of the blade is accomplished with a welded aluminum laminated conductor, precisely formed and assembled to give thousands of trouble-free operations. This eliminates bolted or sliding pressure connections, threaded joints or high-pressure contacts, enabling ease of operation. Welded connections create a single conductive metallic path from the hinge terminal pad to the jaw end of the blade.

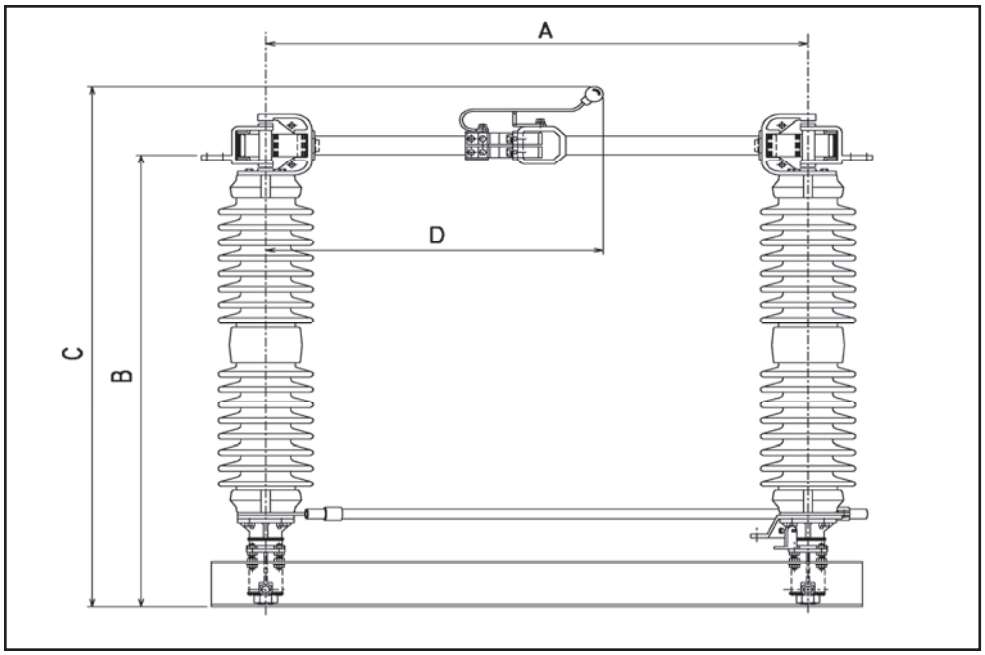
The laminated conductor is constructed of commercially pure aluminum strip, which does not work harden during operation. Extensive mechanical, electrical, and environmental testing along with years of field experience, prove this approach to current transfer superior to any conventional enclosed or open-hinge contact design.

CENTER BREAK SWITCH
TYPE AGCH5
8.3 - 48.3kV
1200 - 6000 Amperes

USCO™ Power Switches

	RATINGS									
	VOLTAGE (kV)		CURRENT (A)		DIMENSIONS				STD MTG	WEIGHT
CATALOG NO.	MAX	BIL	CONT.	MOM.	A	B	C	D		1 Pole
AGCH5-00812	8.3	95	1200	61,000	24	17 7/8	26 1/8	20 7/8	8 1/4 X 24	96
AGCH5-00820	8.3	95	2000	100,000	24	17 7/8	27 1/2	20 7/8	8 1/4 X 24	118
AGCH5-00830	8.3	95	3000	120,000	24	26 1/2	34 1/2	18 1/4	8 1/4 X 24	125
AGCH5-00840	8.3	95	4000	120,000	27	33 1/8	42 5/8	19	8 1/4 X 27	140
AGCH5-00850	8.3	95	5000	120,000	*	*	*	*	*	*
AGCH5-00860	8.3	95	6000	120,000	*	*	*	*	*	*
AGCH5-01512	15.5	110	1200	61,000	24	20 3/8	28 5/8	20 7/8	8 1/4 X 24	102
AGCH5-01520	15.5	110	2000	100,000	24	20 3/8	30	20 7/8	8 1/4 X 24	131
AGCH5-01530	15.5	110	3000	120,000	24	28 1/2	36 1/2	18 1/4	8 1/4 X 24	140
AGCH5-01540	15.5	110	4000	120,000	27	35 1/8	44 5/8	19	8 1/4 X 27	156
AGCH5-01550	15.5	110	5000	120,000	*	*	*	*	*	*
AGCH5-01560	15.5	110	6000	120,000	*	*	*	*	*	*
AGCH5-02712	27	150	1200	61,000	24	24 3/8	32 5/8	20 7/8	8 1/4 X 24	112
AGCH5-02720	27	150	2000	100,000	24	24 3/8	34	20 7/8	8 1/4 X 24	141
AGCH5-02730	27	150	3000	120,000	24	31 1/2	39 1/2	18 1/4	8 1/4 X 24	150
AGCH5-02740	27	150	4000	120,000	27	38 1/8	47 5/8	19	8 1/4 X 27	194
AGCH5-02750	27	150	5000	120,000	*	*	*	*	*	*
AGCH5-02760	27	150	6000	120,000	*	*	*	*	*	*
AGCH5-03812	38	200	1200	61,000	24	28 3/8	36 5/8	20 7/8	8 1/4 X 24	168
AGCH5-03820	38	200	2000	100,000	24	28 3/8	38	20 7/8	8 1/4 X 24	235
AGCH5-03830	38	200	3000	120,000	27	36 1/2	40	21 1/4	8 1/4 X 27	250
AGCH5-03840	38	200	4000	120,000	27	43 1/8	52 5/8	19	8 1/4 X 27	265
AGCH5-04812	48.3	250	1200	61,000	30	32 3/8	40 5/8	22 1/8	8 1/4 X 30	204
AGCH5-04820	48.3	250	2000	100,000	30	32 3/8	42	22 1/8	8 1/4 X 30	274
AGCH5-04830	48.3	250	3000	120,000	*	*	*	*	*	*
AGCH5-04840	48.3	250	4000	120,000	*	*	*	*	*	*

*** Refer to factory**



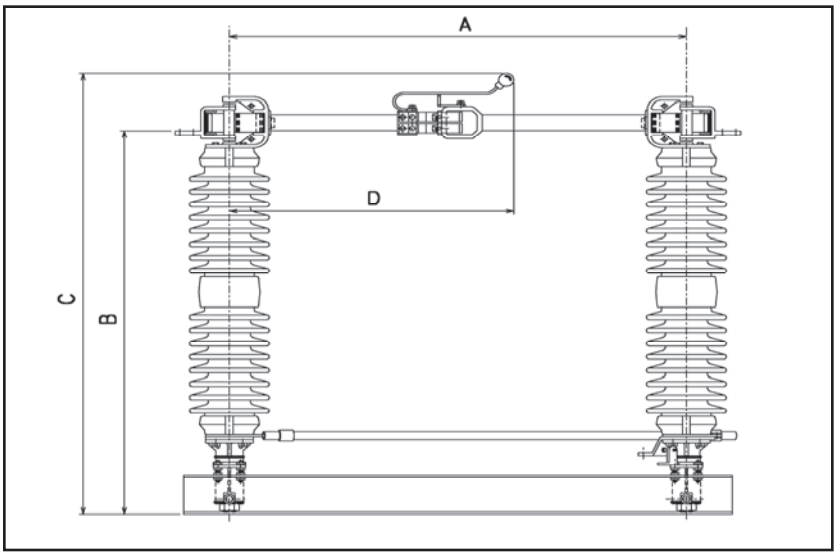
DIMENSIONS SHOWN IN INCHES - WEIGHT SHOWN IN POUNDS (INSULATORS INCLUDED)
8.3 - 72.5 kV 3" BOLT CIRCLE STATION POST INSULATORS
DIMENSIONS NOT FOR CONSTRUCTION PURPOSES
CONTACT FACTORY FOR CERTIFIED PRINTS

USCO™ Power Switches

CENTER BREAK SWITCH
TYPE AGCH5
72.5 - 362 kV
1200 - 5500 Amperes

	RATINGS									
	VOLTAGE (kV)		CURRENT (A)		DIMENSIONS				STD MTG	WEIGHT
CATALOG NO.	MAX	BIL	CONT.	MOM.	A	B	C	D		1 Pole
AGCH5-07212	72.5	350	1200	61,000	42	40 3/8	48 5/8	29 3/4	8 1/4 X 42	320
AGCH5-07220	72.5	350	2000	100,000	42	40 3/8	48 5/8	29 3/4	8 1/4 X 42	405
AGCH5-07230	72.5	350	3000	120,000	48	49	45 1/2	32 1/2	8 1/4 X 48	450
AGCH5-07240	72.5	350	4000	120,000	*	*	*	*	*	495
AGCH5-12312	123	550	1200	61,000	60	60 1/4	69 11/16	37 5/8	8 1/4 x 60	487
AGCH5-12320	123	550	2000	100,000	60	60 1/4	69 7/8	37 5/8	8 1/4 x 60	523
AGCH5-12330	123	550	3000	120,000	60	64	70 1/2	37 1/2	8 1/4 x 60	562
AGCH5-12340	123	550	4000	120,000	60	64 1/8	72 5/8	37 1/4	8 1/4 x 60	655
AGCH5-14512	145	650	1200	61,000	72	69 1/4	78 5/16	43 1/4	8 1/4 x 72	774
AGCH5-14520	145	650	2000	100,000	72	69 1/4	78 3/8	43 1/4	8 1/4 x 72	885
AGCH5-14530	145	650	3000	120,000	72	75	81 1/2	43 1/2	8 3/4 x 72	910
AGCH5-14540	145	650	4000	120,000	72	76 1/8	84 5/8	43 1/4	8 3/4 x 72	940
AGCH5-17012	170	750	1200	61,000	84	80 5/16	89 7/8	48	8 3/4 x 84	950
AGCH5-17020	170	750	2000	100,000	84	80 5/16	90	48	8 3/4 x 84	1100
AGCH5-17030	170	750	3000	120,000	84	84	90 1/2	48 1/4	8 3/4 x 84	1200
AGCH5-17040	170	750	4000	120,000	84	84 1/8	92 5/8	48	8 3/4 x 84	1300
AGCH5-17050	170	750	5000	120,000	84	84 1/8	96 5/8	57	8 3/4 x 84	1410
AGCH5-24512	245	900	1200	61,000	96	98 1/2	112 1/2	57 1/2	8 3/4 x 96	1765
AGCH5-24520	245	900	2000	100,000	96	98 1/2	113 1/2	58	8 3/4 x 96	1026
AGCH5-24530	245	900	3000	120,000	96	102 1/4	114 1/8	56	8 3/4 x 96	1128
AGCH5-24540	245	900	4000	120,000	96	101 1/4	112	59	8 3/4 x 96	1970
AGCH5-24550	245	900	5000	120,000	*	*	*	*	*	2065
AGCH5-36220	362	1300	2000	100,000	132	127 1/4	140	80 3/4	11 x 132	1940
AGCH5-36230	362	1300	3000	120,000	132	130 7/8	143	77 5/8	11 x 132	2030
AGCH5-36240	362	1300	4000	120,000	132	131	140	63 1/2	11 x 132	2125
AGCH5-36250	362	1300	5000	120,000	*	*	*	*	*	2001

*** Refer to Factory** **For 5500 Ampere Switches Consult Factory**



DIMENSIONS SHOWN IN INCHES - WEIGHT SHOWN IN POUNDS (INSULATORS INCLUDED)
8.3 - 72.5 kV 3" BOLT CIRCLE STATION POST INSULATORS
123 - 362 kV 5" BOLT CIRCLE STATION POST INSULATORS
DIMENSIONS NOT FOR CONSTRUCTION PURPOSES
CONTACT FACTORY FOR CERTIFIED PRINTS

CENTER BREAK SWITCH
TYPES GCH4 & AGCH5
8.3 - 48.3 kV

USCO™ Power Switches

CATALOG NO.		RATINGS									
		VOLTAGE (kV)			CURRENT (A)						
COPPER SWITCH	ALUMINUM SWITCH	NOM. (rms)	MAX. (rms)	BIL (peak)	CONT.	PEAK	MOM.	3 SEC.	INS.	BOLT CIRCLE	WEIGHT SINGLE POLE (lbs.)
GCH4-00812		7.5	8.3	95	1200	99,000	61,000	38,000	TR-202	3"	120
GCH4-00820		7.5	8.3	95	2000	130,000	80,000	50,000	TR-202	3"	*
	AGCH5-00812	7.5	8.3	95	1200	99,000	61,000	38,000	TR-202	3"	96
	AGCH5-00820	7.5	8.3	95	2000	164,000	100,000	62,500	TR-202	3"	118
	AGCH5-00830	7.5	8.3	95	3000	195,000	120,000	75,000	TR-222	5"	125
	AGCH5-00840	7.5	8.3	95	4000	195,000	120,000	75,000	TR-222	5"	140
	AGCH5-00850	7.5	8.3	95	5000	195,000	120,000	75,000	TR-222	5"	*
	AGCH5-00860	7.5	8.3	95	6000	195,000	120,000	75,000	TR-222	5"	*
GCH4-01512		15	15.5	110	1200	99,000	61,000	38,000	TR-205	3"	195
GCH4-01520		15	15.5	110	2000	130,000	80,000	50,000	TR-205	3"	*
	AGCH5-01512	15	15.5	110	1200	99,000	61,000	38,000	TR-205	3"	102
	AGCH5-01520	15	15.5	110	2000	164,000	100,000	62,500	TR-205	3"	131
	AGCH5-01530	15	15.5	110	3000	195,000	120,000	75,000	TR-225	5"	140
	AGCH5-01540	15	15.5	110	4000	195,000	120,000	75,000	TR-225	5"	156
	AGCH5-01550	15	15.5	110	5000	195,000	120,000	75,000	TR-225	5"	*
	AGCH5-01560	15	15.5	110	6000	195,000	120,000	75,000	TR-225	5"	*
GCH4-02712		23	27.0	150	1200	99,000	61,000	38,000	TR-208	3"	140
GCH4-02720		23	27.0	150	2000	130,000	80,000	50,000	TR-208	3"	*
	AGCH5-02712	23	27.0	150	1200	99,000	61,000	38,000	TR-208	3"	112
	AGCH5-02720	23	27.0	150	2000	164,000	100,000	62,500	TR-208	3"	141
	AGCH5-02730	23	27.0	150	3000	195,000	120,000	75,000	TR-227	5"	150
	AGCH5-02740	23	27.0	150	4000	195,000	120,000	75,000	TR-227	5"	194
	AGCH5-02750	23	27.0	150	5000	195,000	120,000	75,000	TR-227	5"	*
	AGCH5-02760	23	27.0	150	6000	195,000	120,000	75,000	TR-227	5"	*
GCH4-03812		34.5	38.0	200	1200	99,000	61,000	38,000	TR-210	3"	210
GCH4-03820		34.5	38.0	200	2000	130,000	80,000	50,000	TR-210	3"	*
	AGCH5-03812	34.5	38.0	200	1200	99,000	61,000	38,000	TR-210	3"	168
	AGCH5-03820	34.5	38.0	200	2000	164,000	100,000	62,500	TR-210	3"	235
	AGCH5-03830	34.5	38.0	200	3000	195,000	120,000	75,000	TR-231	5"	250
	AGCH5-03840	34.5	38.0	200	4000	195,000	120,000	75,000	TR-231	5"	265
GCH4-04812		46	48.3	250	1200	99,000	61,000	38,000	TR-214	3"	255
GCH4-04820		46	48.3	250	2000	130,000	80,000	50,000	TR-214	3"	*
	AGCH5-04812	46	48.3	250	1200	99,000	61,000	38,000	TR-214	3"	204
	AGCH5-04820	46	48.3	250	2000	164,000	100,000	62,500	TR-214	3"	274
	AGCH5-04830	46	48.3	250	3000	195,000	120,000	75,000	TR-267	5"	315
	AGCH5-04840	46	48.3	250	4000	195,000	120,000	75,000	TR-267	5"	345

*** Refer to Factory**
Note: Copper switches cannot be provided with laminated shunt hinge assembly.

HUBBELL USCO™ Power Switches

CENTER BREAK SWITCH
TYPES GCH4 & AGCH5
72.5 - 362 kV

CATALOG NO.		RATINGS									
		VOLTAGE (kV)			CURRENT (A)						
COPPER SWITCH	ALUMINUM SWITCH	NOM. (rms)	MAX. (rms)	BIL (peak)	CONT.	PEAK	MOM.	3 SEC.	INS.	BOLT CIRCLE	WEIGHT SINGLE POLE (lbs.)
GCH4-07212		69	72.5	350	1200	99,000	61,000	38,000	TR-216	3"	380
GCH4-07220		69	72.5	350	2000	164,000	100,000	62,500	TR-216	3"	*
	AGCH5-07212	69	72.5	350	1200	99,000	61,000	38,000	TR-216	3"	320
	AGCH5-07220	69	72.5	350	2000	164,000	100,000	62,500	TR-278	5"	405
	AGCH5-07230	69	72.5	350	3000	195,000	120,000	75,000	TR-278	5"	450
	AGCH5-07240	69	72.5	350	4000	195,000	120,000	75,000	TR-278	5"	495
GCH4-12312		115	123	550	1200	99,000	61,000	38,000	TR-286	5"	760
GCH4-12320		115	123	550	2000	164,000	100,000	62,500	TR-286	5"	*
	AGCH5-12312	115	123	550	1200	99,000	61,000	38,000	TR-286	5"	646
	AGCH5-12320	115	123	550	2000	164,000	100,000	62,500	TR-286	5"	523
	AGCH5-12330	115	123	550	3000	195,000	120,000	75,000	TR-286	5"	562
	AGCH5-12340	115	123	550	4000	195,000	120,000	75,000	TR-286	5"	655
GCH4-14512		138	145	650	1200	99,000	61,000	38,000	TR-288	5"	860
GCH4-14520		138	145	650	2000	164,000	100,000	62,500	TR-288	5"	*
	AGCH5-14512	138	145	650	1200	99,000	61,000	38,000	TR-288	5"	774
	AGCH5-14520	138	145	650	2000	164,000	100,000	62,500	TR-288	5"	885
	AGCH5-14530	138	145	650	3000	195,000	120,000	75,000	TR-288	5"	910
	AGCH5-14540	138	145	650	4000	195,000	120,000	75,000	TR-288	5"	940
	AGCH5-17012	161	170	750	1200	99,000	61,000	38,000	TR-291	5"	950
	AGCH5-17020	161	170	750	2000	164,000	100,000	62,500	TR-291	5"	1100
	AGCH5-17030	161	170	750	3000	195,000	120,000	75,000	TR-291	5"	1200
	AGCH5-17040	161	170	750	4000	195,000	120,000	75,000	TR-291	5"	1300
	AGCH5-17050	161	170	750	5000	195,000	120,000	75,000	TR-291	5"	1410
	AGCH5-24512	230	245	900	1200	99,000	61,000	38,000	TR-304	5"	1765
	AGCH5-24520	230	245	900	2000	164,000	100,000	62,500	TR-304	5"	1026
	AGCH5-24530	230	245	900	3000	195,000	120,000	75,000	TR-304	5"	1128
	AGCH5-24540	230	245	900	4000	195,000	120,000	75,000	TR-304	5"	1970
	AGCH5-24550	230	245	900	5000	195,000	120,000	75,000	TR-304	5"	2065
	AGCH5-36220	345	362	1300	2000	164,000	100,000	62,500	TR-367	5"	1940
	AGCH5-36230	345	362	1300	3000	195,000	120,000	75,000	TR-367	5"	2030
	AGCH5-34540	345	362	1300	4000	195,000	120,000	75,000	TR-367	5"	2125
	AGCH5-36250	345	362	1300	5000	195,000	120,000	75,000	TR-367	5"	2001

* Refer to Factory

For 5500 Ampere Switches Consult Factory

Note: Copper switches cannot be provided with laminated shunt hinge assembly.

HUBBELL USCO™ Power Switches

DOUBLE CENTER BREAK SWITCH

TYPE ATR

VOLTAGE RATING ***145kV to 550kV***

CURRENT RATING ***2000 to 5500A***

ATR Double Center Break

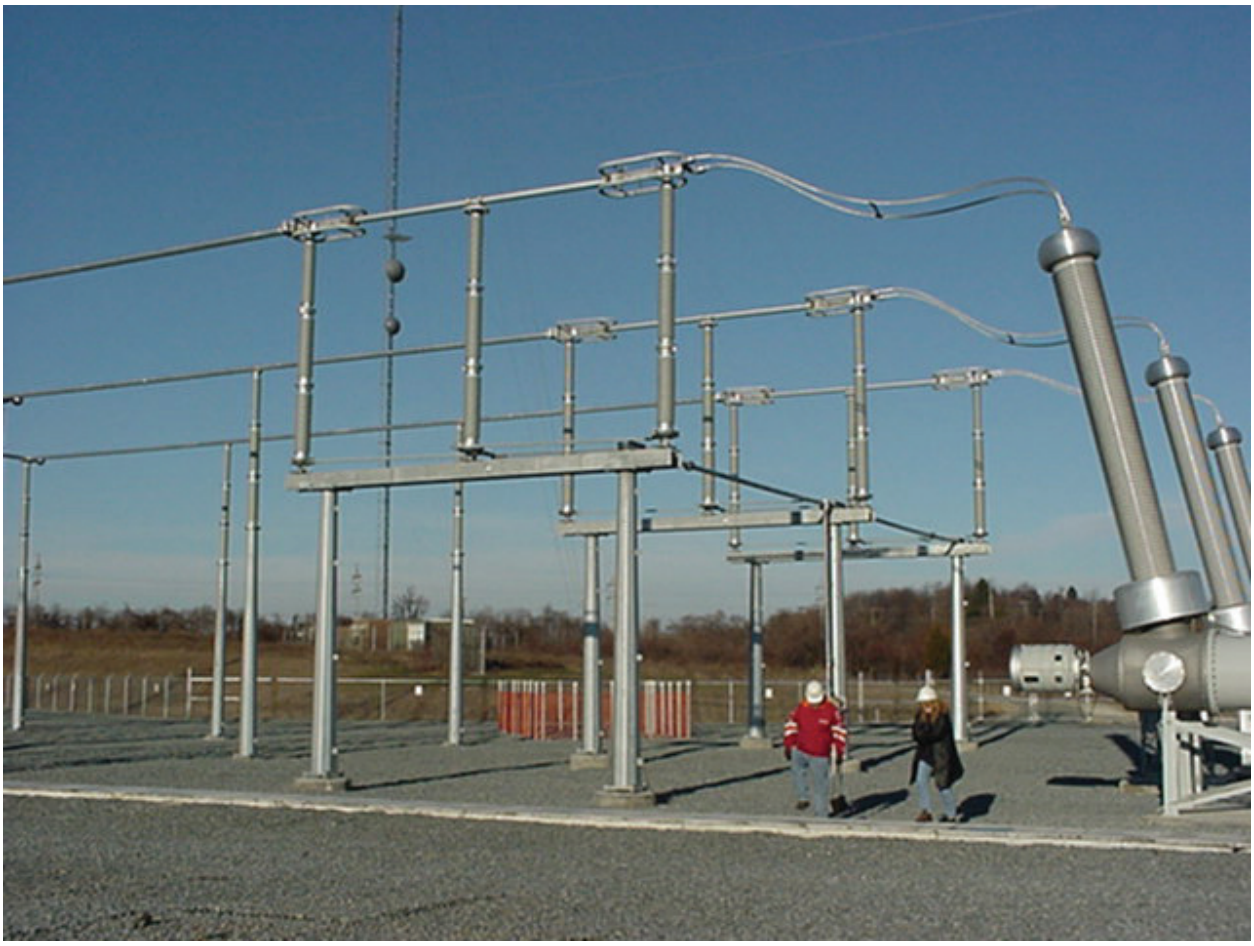
The ATR is a three insulator, double center break outdoor air disconnect switch constructed primarily of aluminum. Operation is accomplished by the rotation of the center insulator. Proven by years of field experience, this switch takes full advantage of unique construction methods to provide both simple operation and long-term dependability.

- ❑ **Extremely Low Operating Effort**
- ❑ **Superior Under Icing Conditions**
- ❑ **Center Break Ease Of Operation on Vertical Break Phase Spacing**

USCO™ POWER SWITCHES

SINCE 1946, THE ENGINEERS CHOICE FOR HIGH VOLTAGE PRODUCTS

HUBBELL USCO™ Power Switches



DESCRIPTION

The ATR is a three-insulator double center break, outdoor, air disconnect switch constructed primarily of aluminum; available in ratings from 145kV through 550kV maximum (138kV through 500kV nominal) from 2000 to 5500 continuous amperes. This unique design incorporates triple insulator rotation for better weight distribution along with our “tried and true” center break blade contact assembly found on our AGCH5 unit.

APPLICATION

The ATR is commonly used in three-phase line or substation applications such as transformer or line disconnecting, breaker isolating, bypassing or bus sectionalizing. Operation of the ATR may be accomplished by either manual control or by motor operator.

TESTING

The ATR has been extensively tested to meet or exceed current ANSI standards. A comprehensive test brochure is available outlining electrical and mechanical design test conducted on the ATR.

DESIGN CHARACTERISTICS

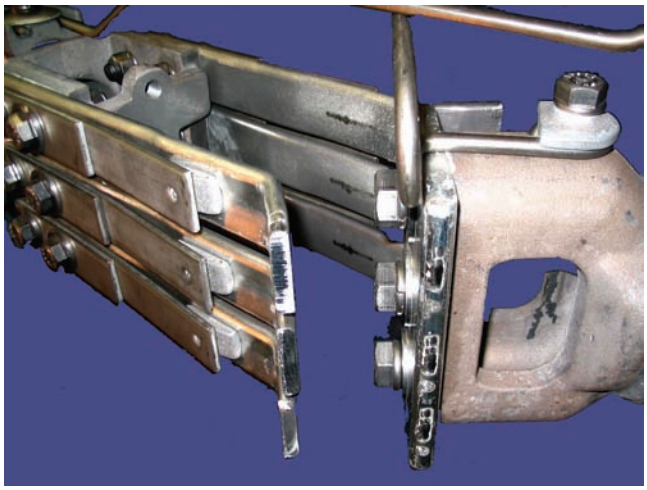
Contacts

The ATR is supplied with high-pressure silver-to-silver jaw contacts producing the highest conductivity initially and over time.

The contact fingers, fabricated from hard drawn copper, are silver metallized and electro-tin plated. The male contact, also of hard drawn copper, has a brazed silver overlay and is electro-tin plated. These methods and materials used in the application of the silver provide surfaces of differing hardness with anti-galling properties, resulting in minimal wear over years of operation.

All contacts on the ATR are field replaceable.

The ATR uses USCO's time tested welded lamination hinge assembly producing a straight-line current path eliminating any current transfer at the hinge. This is accomplished with a welded aluminum laminated conductor that is used to create a bypass at the hinge. This eliminates the need for bolted or sliding pressure connections, or high pressure contacts, and enables ease of operation. The welded connections create a single metallic path from the hinge terminal pads to the main contacts on the blades of the switch. The laminated conductor is constructed of commercially pure aluminum strip, which does not work harden during operation.



Blade

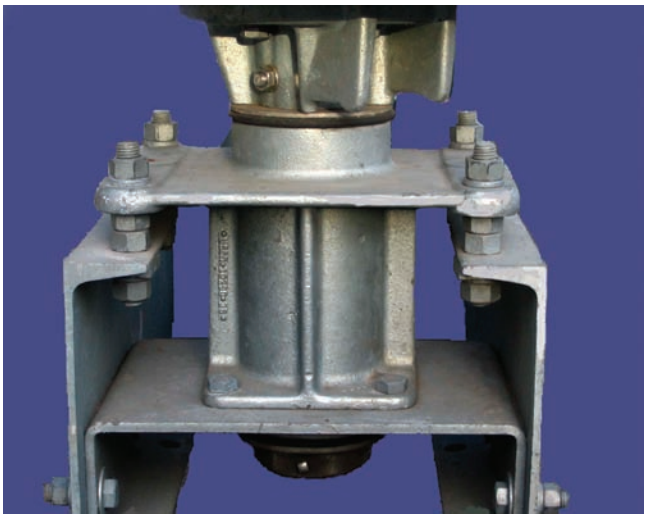
The blade is constructed of heat-treated aluminum tubing with heat-treated aluminum castings welded to hinge and jaw ends.

Blade Mechanism

The unique center break design of the ATR allows for better weight distribution of the blade assemblies without the need for additional phase spacing. The weight of the blades is distributed among the three insulators rather than all the weight balancing on the center insulator, as is the case with the double break switch. This increases rigidity of the blades while decreasing probability of contact misalignment, especially with higher rated switches.

ACCESSORIES

- Grounding switches: Through 100kA momentary
- Auxiliary switches: 12 contact decks are standard
- Standard arcing horns are installed on all group operated switches
- Outriggers: Custom designed for your application
- Connectors: Available on all switch types



Main Switch Bearings

The ATR incorporates rugged switch bearings consisting of stainless steel balls, utilizing stainless steel bearing races (145 - 245kV) with galvanized ductile iron housings and rotors. The bearings are sealed at the factory for maintenance free service. Factory adjusted stops are provided with the bearing for ease of synchronization during installation. At 362kV and above the main bearing is a Timken roller bearing.

Switch Bases

Hot dipped structural steel channel is used for the construction of the switch base. Leveling studs are provided on the bearings for insulator alignment. Bases and base mounting dimensions can be customized to your specifications and structure.

Insulators

The ATR is designed to accommodate commercially available insulators with either five or seven inch bolt circle.

Operating Mechanisms

The ATR may be operated with a swing handle, gearbox or motor operator. Control arrangements are factory designed and customized to your structure, with all linkage components factory cut to the required dimensions.

Hinge Current Transfer

The ATR has no hinge contacts; therefore it allows current transfer with maximum reliability.

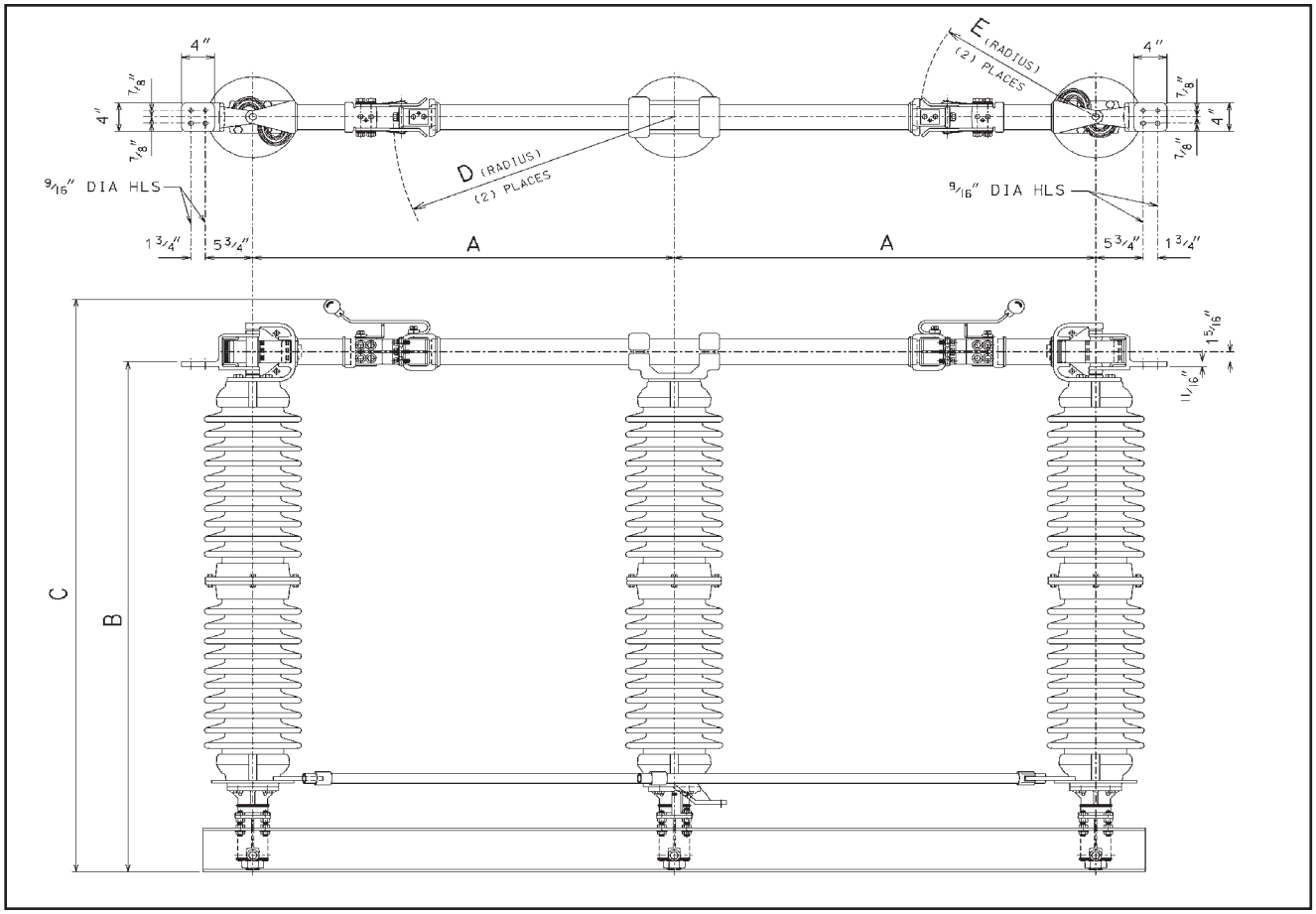
Transfer of current at the hinge end of the blade is accomplished with a welded aluminum laminated conductor, precisely formed and assembled to give thousands of trouble-free operations. This eliminates bolted or sliding pressure connections, threaded joints or high-pressure contacts, enabling ease of operation. Welded connections create a single conductive metallic path from the hinge terminal pad to the jaw end of the blade.

The laminated conductor is constructed of commercially pure aluminum strip, which does not work harden during operation. Extensive mechanical, electrical, and environmental testing along with years of field experience, prove this approach to current transfer superior to any conventional enclosed or open-hinge contact design.

DOUBLE CENTER BREAK SWITCH
TYPE ATR
145 - 550 kV
2000 Amperes

	RATINGS										
	VOLTAGE (kV)		CURRENT (A)		DIMENSIONS					STD MTG	WEIGHT
CATALOG NO.	MAX	BIL	CONT.	MOM.	A	B	C	D	E		1 Pole
ATR-14520	145	650	2000	100,000	51	69 5/16	70	34	21 1/4	8 1/4 x 90	961
ATR-17020	170	750	2000	100,000	*	*	*	*	*	8 3/4 x 108	*
ATR-24520	245	900	2000	100,000	60	98 3/8	108 3/16	34 11/16	33 5/8	8 3/4 x 108	2750
ATR-36220-1050	362	1050	2000	100,000	*	*	*	*	*	11 x 150	*
ATR-36220-1300	362	1300	2000	100,000	84	127 1/8	137	49 1/6	42 3/8	11 x 150	*
ATR-55020	550	*	2000	100,000	*	*	*	*	*	*	*

*** Refer to Factory**



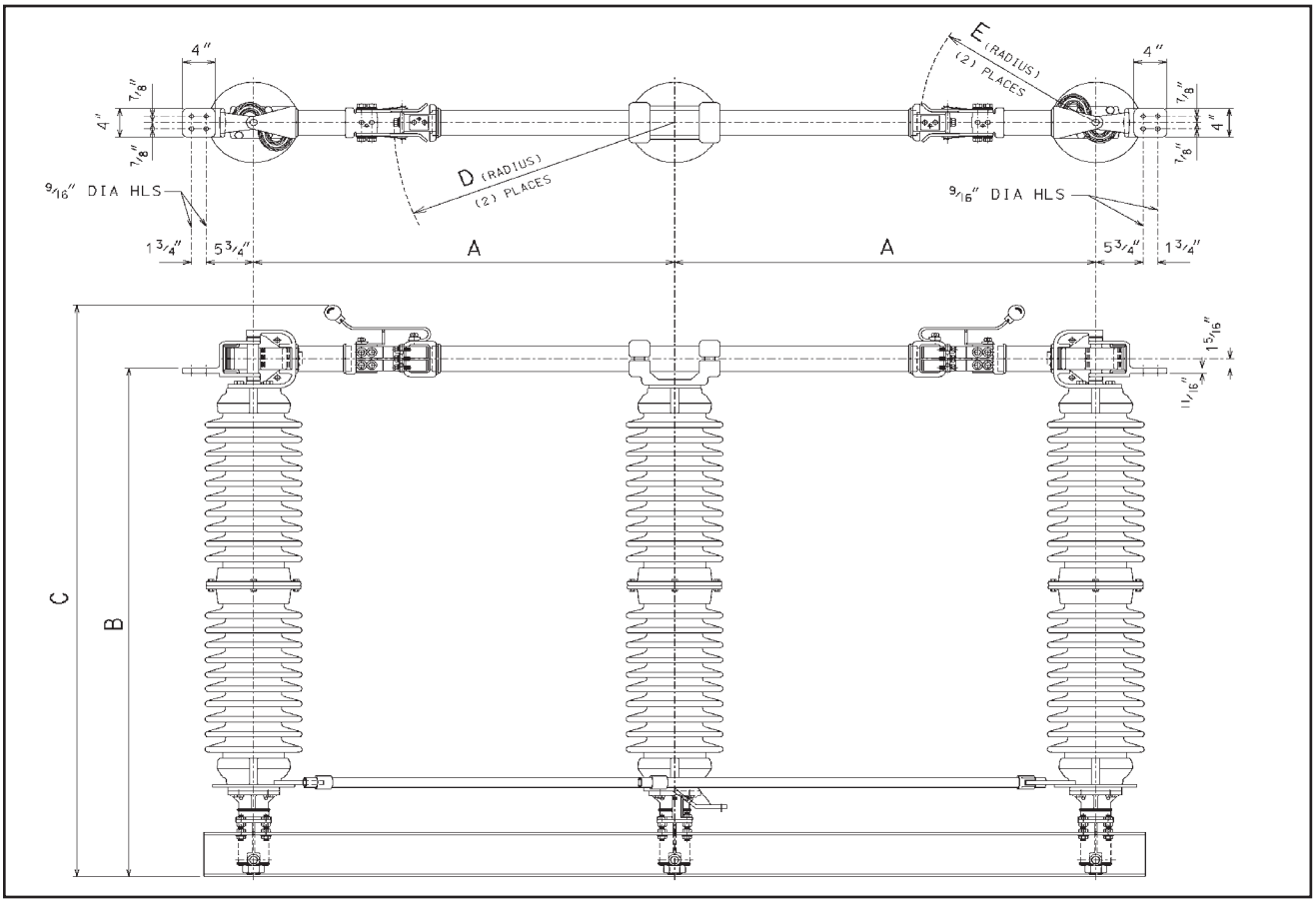
DIMENSIONS SHOWN IN INCHES - WEIGHT SHOWN IN POUNDS (INSULATORS INCLUDED)
145-550 kV 5" BOLT CIRCLE STATION POST INSULATORS
DIMENSIONS NOT FOR CONSTRUCTION PURPOSES
CONTACT FACTORY FOR CERTIFIED PRINTS

USCO™ Power Switches

DOUBLE CENTER BREAK SWITCH
TYPE ATR
145 - 550 kV
3000 - 4000 Amperes

	RATINGS										
	VOLTAGE (kV)		CURRENT (A)		DIMENSIONS					STD MTG	WEIGHT
CATALOG NO.	MAX	BIL	CONT.	MOM.	A	B	C	D	E		1 Pole
ATR-14530	145	650	3000	120,000	48	73 4/9	79 5/8	26	26 4/9	8 1/4 x 90	*
ATR-17030	170	750	3000	120,000	60	84 1/2	90 2/3	33 1/2	31 3/4	8 3/4 x 108	*
ATR-24530	245	900	3000	120,000	60	102 3/4	114 5/8	33 1/2	31 3/4	8 3/4 x 108	2850
ATR-36230	362	1050	3000	120,000	84	116 7/8	126 5/8	48 5/8	40 1/2	11 x 150	*
ATR-36230-1300	362	1300	3000	120,000	84	130 7/8	140 2/3	48 5/8	40 1/2	11 x 150	2900
ATR-55030-1550	550	1550	3000	100,000	132	153	162 4/5	96 5/8	40 1/2	11 x 216	4000
ATR-55030-1800	550	1800	3000	100,000	132	177	186 4/5	96 5/8	40 1/2	11 x 216	4250
ATR-55040-1800	550	1800	4000	100,000	132	177	189 7/8	96 2/3	41 3/4	11 x 216	4500

*** Refer to Factory**



DIMENSIONS SHOWN IN INCHES - WEIGHT SHOWN IN POUNDS (INSULATORS INCLUDED)
145 - 550 kV 5" BOLT CIRCLE STATION POST INSULATORS
DIMENSIONS NOT FOR CONSTRUCTION PURPOSES
CONTACT FACTORY FOR CERTIFIED PRINTS

DOUBLE CENTER BREAK SWITCH
TYPE ATR
145 - 550 kV

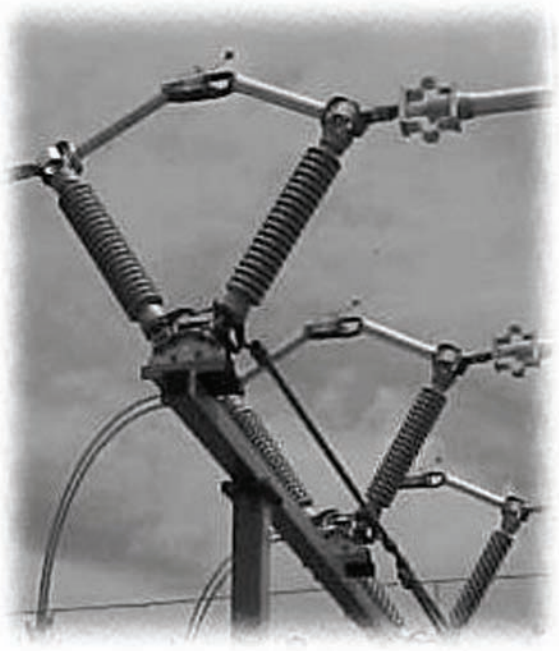
HUBBELL® USCO™ Power Switches

CATALOG NO.	RATINGS									
	VOLTAGE (kV)			CURRENT (A)						
ALUMINUM SWITCH	NOM. (rms)	MAX. (rms)	BIL (peak)	CONT.	PEAK	MOM.	3 SEC.	INS.	BOLT CIRCLE	WEIGHT SINGLE POLE (lbs.)
ATR-14520	138	145	650	2000	164,000	100,000	62,500	TR-288	5"	961
ATR-14530	138	145	650	3000	195,000	120,000	75,000	TR-288	5"	*
ATR-17020	161	170	750	2000	164,000	100,000	62,500	TR-291	5"	*
ATR-17030	161	170	750	3000	195,000	120,000	75,000	TR-291	5"	*
ATR-24520	230	245	900	2000	164,000	100,000	62,500	TR-304	5"	2750
ATR-24530	230	245	900	3000	195,000	120,000	75,000	TR-304	5"	2850
ATR-36220-1050	345	362	1050	2000	164,000	100,000	62,500	TR-312	5"	*
ATR-36220-1300	345	362	1300	2000	164,000	100,000	62,500	TR-324	5"	*
ATR-36230-1050	345	362	1050	3000	195,000	120,000	75,000	TR-312	5"	*
ATR-36230-1300	345	362	1300	3000	195,000	120,000	75,000	TR-324	5"	2900
ATR-55020-1470	500	550	1470	2000	164,000	100,000	62,500	TR-330	5"	*
ATR-55030-1550	500	550	1550	3000	164,000	100,000	75,000	TR-379	5"-7"	4000
ATR-55030-1800	500	550	1800	3000	164,000	100,000	75,000	TR-391	5"-7"	4250
ATR-55040-1800	500	550	1800	4000	164,000	100,000	75,000	TR-391	5"-7"	4500

* Refer to Factory

HUBBELL USCO™ Power Switches

VEE SWITCH
TYPE AGCH5V



VOLTAGE RATING ***15.5kV to 245kV***
CURRENT RATING ***1200 to 4000A***

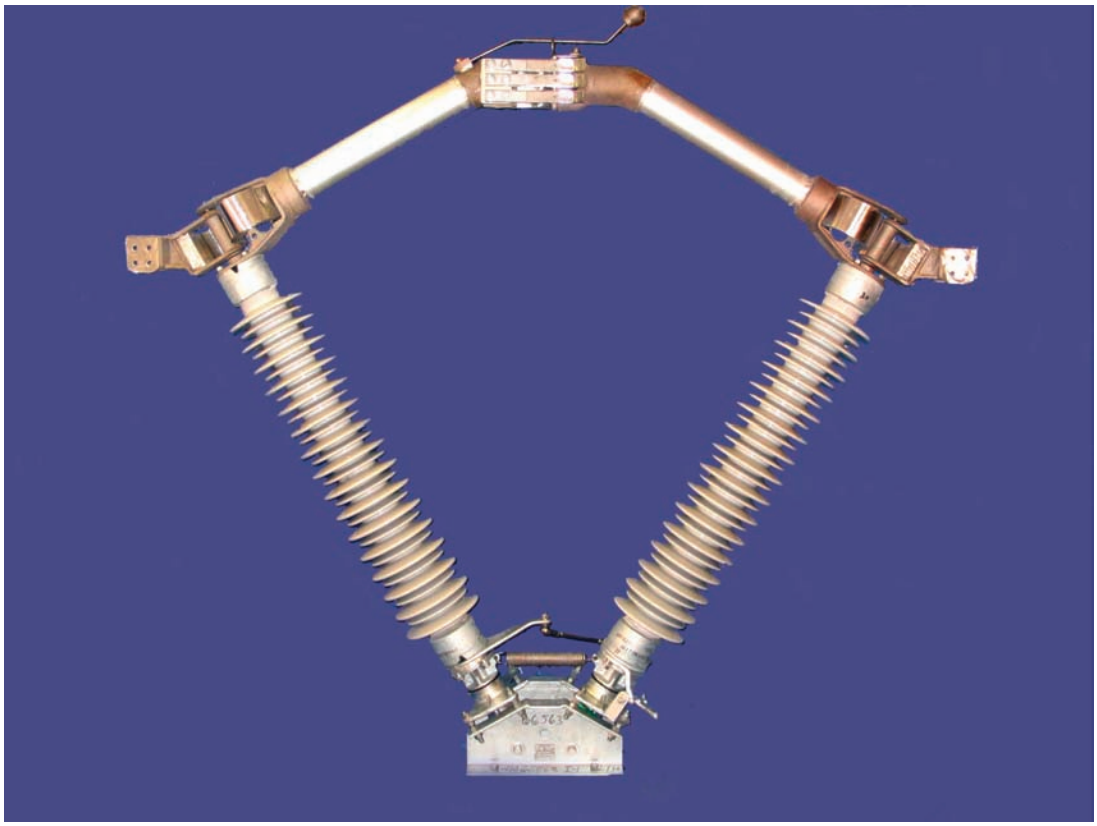
AGCH5V Aluminum "V" Center Break

The AGCH5V is a two-insulator, side opening outdoor air disconnect switch constructed primarily of aluminum. Operation is accomplished by the rotation of two insulators in a low profile base design. Unique construction methods through years of field experience, coupled with simple design concepts provide ease of installation as well as long-term dependability.

- ❑ **Welded Lamination Design**
- ❑ **Low Profile Design**
- ❑ **Great for Direct Pole Mount Configurations**

USCO™ POWER SWITCHES

SINCE 1946, THE ENGINEERS CHOICE FOR HIGH VOLTAGE PRODUCTS



DESCRIPTION

The AGCH5V is an outdoor, group-operated side opening two insulator, air disconnect switch with both insulators rotating from a low profile base arrangement.
The AGCH5V is constructed primarily of aluminum and is available in ratings from 15.5kV through 245kV maximum (15kV through 230kV nominal) and 1200 through 4000 continuous amperes. The “V” switch maintains the characteristic center break ease of operation while requiring a minimal structure footprint making it versatile for either structure or pole mounted applications. The low profile design of the AGCH5V minimizes structure size creating a more cost effective, aesthetically pleasing switching option. Mounted horizontal upright or underhung, the blades lift no weight during operation. Mounted vertically, the blades counterbalance each other during operation.

APPLICATION

The AGCH5V is commonly used in three-phase line or substation applications such as transformer or line disconnecting, breaker isolating, bypassing or bus sectionalizing. The narrow mounting footprint makes the unit versatile for direct pole configurations as well. Operation of the AGCH5V may be accomplished by either manual control or by motor operator.

TESTING

The AGCH5V has been extensively tested to meet or exceed current ANSI standards. A comprehensive test brochure is available outlining electrical and mechanical design test conducted on the AGCH5V.

HUBBELL USCO™ Power Switches

DESIGN CHARACTERISTICS

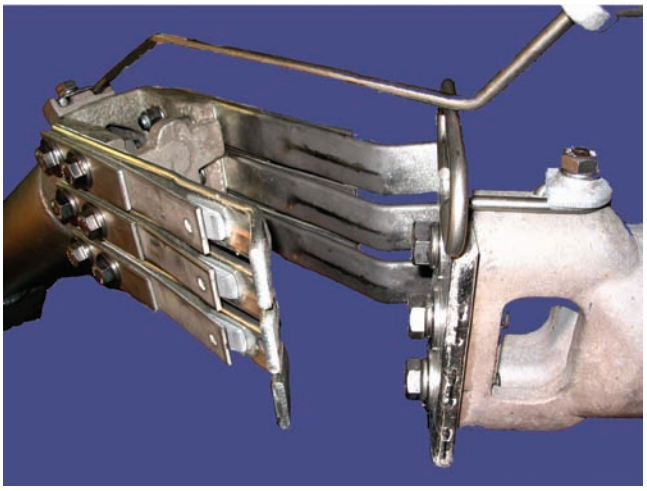
Contacts

The AGCH5V is supplied with line-high pressure silver-to-silver jaw contacts producing the highest conductivity initially and over time.

The contact fingers, fabricated from hard drawn copper, are silver metallized and electro-tin plated. The male contact, also of hard drawn copper, has a brazed silver overlay and is electro-tin plated. These methods and materials used in the application of the silver provide surfaces of differing hardness with anti-galling properties, resulting in minimal wear over years of operation.

All contacts on the AGCH5V are field replaceable.

The AGCH5V uses USCO's time tested welded lamination hinge assembly producing a straight-line current path eliminating any current transfer at the hinge. This is accomplished with a welded aluminum laminated conductor that is used to create a bypass at the hinge. This eliminates the need for bolted or sliding pressure connections, or high pressure contacts, and enables ease of operation. The welded connections create a single metallic path from the hinge terminal pads to the main contacts on the blades of the switch. The laminated conductor is constructed of commercially pure aluminum strip, which does not work harden during operation.

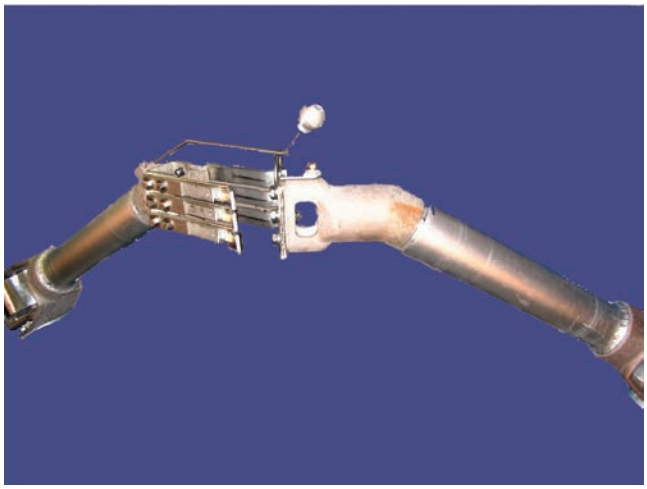


Blade

The blade is constructed of heat-treated aluminum tubing with heat-treated aluminum castings welded to hinge and jaw ends.

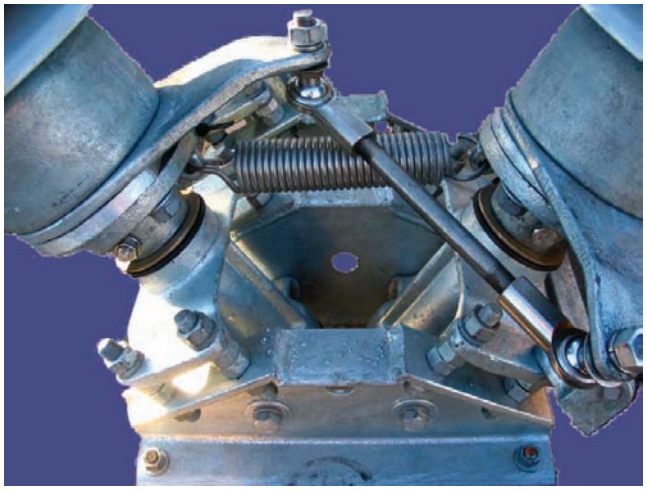
Blade Mechanism

The center break design of the AGCH5V allows for better weight distribution of the blade assemblies providing excellent operational performance. The center break design increases rigidity of the blades while decreasing probability of contact misalignment, especially with higher rated switches. The two-insulator configuration decreases cost while providing a simple field friendly installation.



ACCESSORIES

- Grounding switches: Through 100kA momentary
- Auxiliary switches: 12 contact decks are standard
- Standard arcing horns are installed on all group operated switches
- Outriggers: Custom designed for your application
- Connectors: Available on all switch types



Main Switch Bearings

The AGCH5V incorporates rugged switch bearings consisting of stainless steel balls, utilizing stainless steel bearing races with galvanized ductile iron housings and rotors. The bearings are sealed at the factory for maintenance free service. Factory adjusted stops are provided with the bearing for ease of synchronization during installation.

Switch Bases

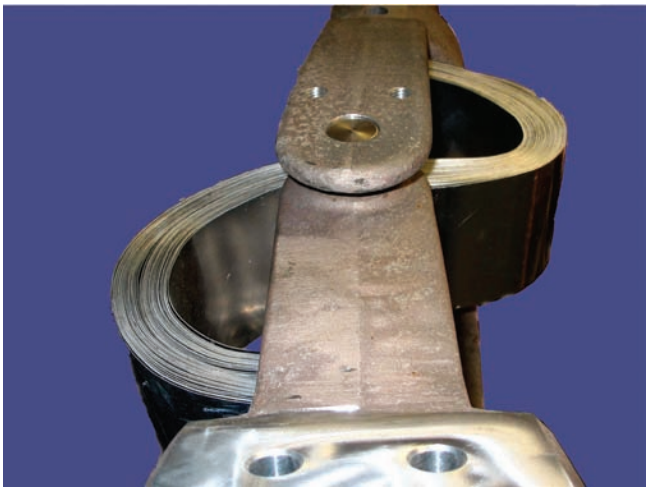
The stainless steel and bronze linkage mechanism connecting the rotating insulators assures synchronous rotation of the insulators, and positive control of the switch blades during operation. Hot dipped structural steel channel is used for the construction of the switch base. Leveling studs are provided on the bearings for insulator alignment. Bases and base mounting dimensions can be customized to your specifications and structure.

Insulators

The AGCH5V is designed to accommodate commercially available insulators with a three or five inch bolt circle.

Operating Mechanisms

The AGCH5V may be operated with a swing handle, gearbox or motor operator. Control arrangements are factory designed and customized to your structure, with all linkage components factory cut to the required dimensions.



Hinge Current Transfer

The AGCH5V has no hinge contacts; therefore it allows current transfer with maximum reliability.

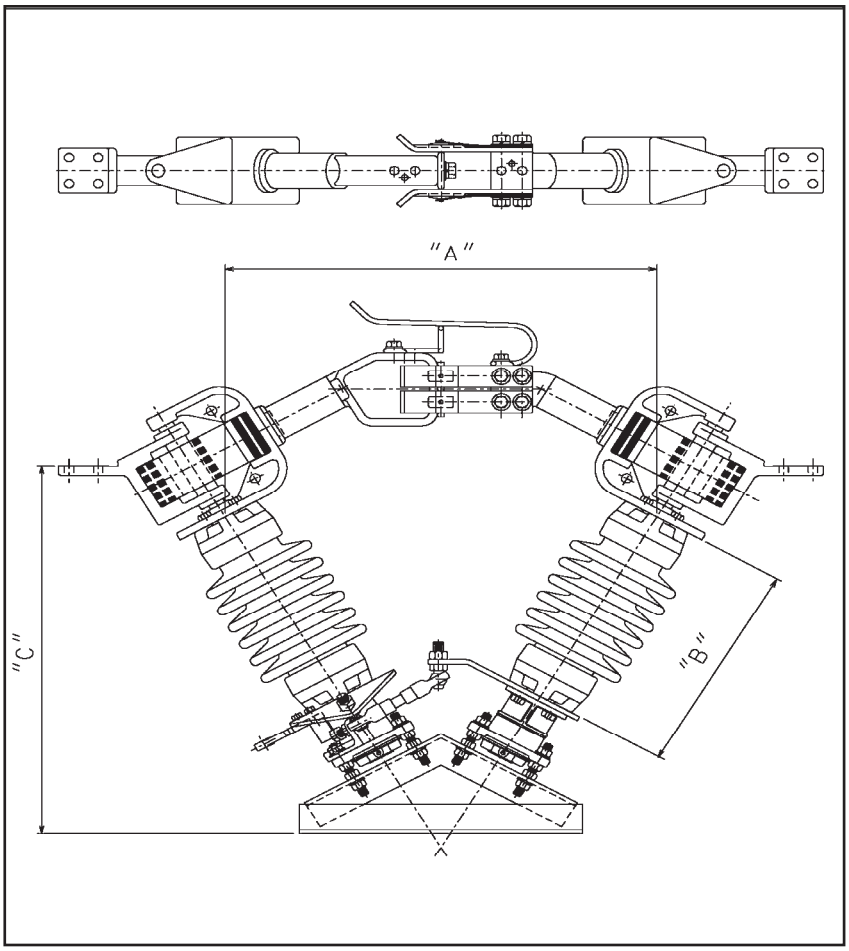
Transfer of current at the hinge end of the blade is accomplished with a welded aluminum laminated conductor, precisely formed and assembled to give thousands of trouble-free operations. This eliminates bolted or sliding pressure connections, threaded joints or high-pressure contacts enabling ease of operation. Welded connections create a single conductive metallic path from the hinge terminal pad to the jaw end of the blade.

The laminated conductor is constructed of commercially pure aluminum strip, which does not work harden during operation. Extensive mechanical, electrical, and environmental testing along with years of field experience, prove this approach to current transfer superior to any conventional enclosed or open-hinge contact design.

USCO™ Power Switches

VEE SWITCH
TYPE AGCH5V
15.5 - 48.3 kV
1200 - 2000 Amperes

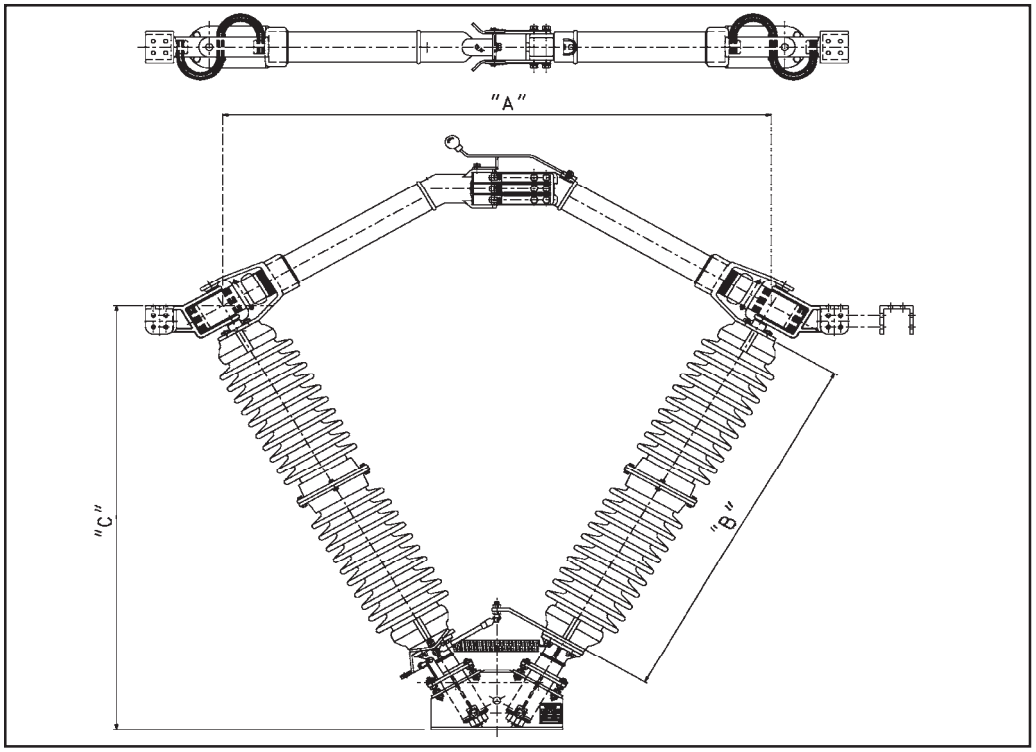
	RATINGS								
	VOLTAGE (kV)		CURRENT (A)		DIMENSIONS			STD MTG	WEIGHT
CATALOG NO.	MAX	BIL	CONT.	MOM.	A	B	C		1 Pole
AGCH5V-01512	15.5	110	1200	61,000	21 15/16	10	21 1/2	8 1/4 X 12	151
AGCH5V-01520	15.5	110	2000	80,000	21 15/16	10	21 15/16	8 1/4 X 12	165
AGCH5V-02712	27	150	1200	61,000	25 15/16	14	24 15/16	8 1/4 X 12	112
AGCH5V-02720	27	150	2000	80,000	25 15/16	14	25 3/8	8 1/4 X 12	141
AGCH5V-03812	38	200	1200	61,000	29 15/16	18	28 7/16	8 1/4 X 12	176
AGCH5V-03820	38	200	2000	80,000	29 15/16	18	28 7/8	8 1/4 X 12	230
AGCH5V-04812	48.3	250	1200	61,000	33 15/16	22	31 15/16	8 1/4 X 12	250
AGCH5V-04820	48.3	250	2000	80,000	33 15/16	22	32 1/4	8 1/4 X 12	270



DIMENSIONS SHOWN IN INCHES - WEIGHT SHOWN IN POUNDS (INSULATORS INCLUDED)
15.5 - 48.3 kV 3" BOLT CIRCLE STATION POST INSULATORS
DIMENSIONS NOT FOR CONSTRUCTION PURPOSES
CONTACT FACTORY FOR CERTIFIED PRINTS

VEE SWITCH
TYPE AGCH5V
72.5 - 245 kV
1200 - 4000 Amperes

	RATINGS								
	VOLTAGE (kV)		CURRENT (A)		DIMENSIONS			STD MTG	WEIGHT
CATALOG NO.	MAX	BIL	CONT.	MOM.	A	B	C		1 Pole
AGCH5V-07212	72.5	350	1200	61,000	41 15/16	30	38 7/8	8 1/4 X 12	262
AGCH5V-07220	72.5	350	2000	80,000	41 15/16	30	39 1/4	8 1/4 X 12	279
AGCH5V-07220-5	72.5	350	2000	80,000	43 1/2	30	39 13/16	8 1/4 X 12	415
AGCH5V-07220H	72.5	350	2000	100,000	45 3/4	30	41 1/2	8 1/4 X 12	425
AGCH5V-07230	72.5	350	3000	120,000	50 1/4	30	41 1/2	8 1/4 X 12	435
AGCH5V-12312	123	550	1200	61,000	76	45	54	8 1/4 X 12	630
AGCH5V-12320	123	550	2000	100,000	82	45	54 1/2	8 1/4 X 12	497
AGCH5V-12330	123	550	3000	120,000	83 1/4	45	54 1/2	8 1/4 X 12	545
AGCH5V-12340	123	550	4000	120,000	81 1/2	45	54 1/2	8 1/4 X 12	810
AGCH5V-14512	145	650	1200	61,000	85	54	61 7/8	8 1/4 X 18	489
AGCH5V-14520	145	650	2000	100,000	91	54	62 1/4	8 1/4 X 18	517
AGCH5V-14530	145	650	3000	120,000	96	54	64 7/16	8 1/4 X 18	905
AGCH5V-14540	145	650	4000	120,000	94 1/4	54	64 7/16	8 1/4 X 18	733
AGCH5V-17012	170	750	1200	61,000	96 3/4	62	71	8 1/4 X 18	508
AGCH5V-17020	170	750	2000	100,000	102 3/4	62	71 3/8	8 1/4 X 18	569
AGCH5V-17030	170	750	3000	120,000	104	62	71 3/8	8 1/4 X 18	1185
AGCH5V-17040	170	750	4000	120,000	102 1/4	62	71 3/8	8 1/4 X 18	1295
AGCH5V-24512	245	900	1200	61,000	117 1/4	80	89 3/4	12 X 24	1750
AGCH5V-24520	245	900	2000	100,000	119 1/4	80	90 3/16	12 X 24	1805
AGCH5V-24530	245	900	3000	120,000	122 3/4	80	90 1/4	12 X 24	1910
AGCH5V-24540	245	900	4000	120,000	122 3/4	80	90 3/16	12 X 24	2115



DIMENSIONS SHOWN IN INCHES - WEIGHT SHOWN IN POUNDS (INSULATORS INCLUDED)
15.5 - 72.5 kV 3" BOLT CIRCLE STATION POST INSULATORS
72.5 - 245 kV 5" BOLT CIRCLE STATION POST INSULATORS
DIMENSIONS NOT FOR CONSTRUCTION PURPOSES
CONTACT FACTORY FOR CERTIFIED PRINTS

USCO™ Power Switches

VEE SWITCH
TYPES GCH4V & AGCH5V
15.5 - 48.3 kV

CATALOG NO.		RATINGS									
		VOLTAGE (kV)			CURRENT (A)						
COPPER SWITCH	ALUMINUM SWITCH	NOM. (rms)	MAX. (rms)	BIL (peak)	CONT.	PEAK	MOM.	3 SEC.	INS.	BOLT CIRCLE	WEIGHT SINGLE POLE (lbs.)
GCH4V-01512		15	15.5	110	1200	99,000	61,000	38,000	TR-205	3"	197
GCH4V-01520		15	15.5	110	2000	130,000	80,000	50,000	TR-205	3"	*
	AGCH5V-01512	15	15.5	110	1200	99,000	61,000	38,000	TR-205	3"	151
	AGCH5V-01520	15	15.5	110	2000	130,000	80,000	50,000	TR-205	3"	131
GCH4V-02712		23	27.0	150	1200	99,000	61,000	38,000	TR-208	3"	140
GCH4V-02720		23	27.0	150	2000	130,000	80,000	50,000	TR-208	3"	*
	AGCH5V-02712	23	27.0	150	1200	99,000	61,000	38,000	TR-208	3"	112
	AGCH5V-02720	23	27.0	150	2000	130,000	80,000	50,000	TR-208	3"	141
GCH4V-03812		34.5	38.0	200	1200	99,000	61,000	38,000	TR-210	3"	205
GCH4V-03820		34.5	38.0	200	2000	130,000	80,000	50,000	TR-210	3"	*
	AGCH5V-03812	34.5	38.0	200	1200	99,000	61,000	38,000	TR-210	3"	176
	AGCH5V-03820	34.5	38.0	200	2000	130,000	80,000	50,000	TR-210	3"	230
GCH4V-04812		46	48.3	250	1200	99,000	61,000	38,000	TR-214	3"	250
GCH4V-04820		46	48.3	250	2000	130,000	80,000	50,000	TR-214	3"	*
	AGCH5V-04812	46	48.3	250	1200	99,000	61,000	38,000	TR-214	3"	200
	AGCH5V-04820	46	48.3	250	2000	130,000	80,000	50,000	TR-214	3"	270
	AGCH5V-04830	46	48.3	250	3000	164,000	100,000	62,500	TR-267	5"	*

*** Refer to Factory**

Note: Copper switches cannot be provided with laminated shunt hinge assembly.

VEE SWITCH
TYPES GCH4V & AGCH5V
72.5 - 245 kV

HUBBELL® USCO™ Power Switches

CATALOG NO.		RATINGS									
		VOLTAGE (kV)			CURRENT (A)						
COPPER SWITCH	ALUMINUM SWITCH	NOM. (rms)	MAX. (rms)	BIL (rms)	CONT.	PEAK	MOM.	3 SEC.	INS.	BOLT CIRCLE	WEIGHT SINGLE POLE (lbs.)
GCH4V-07212		69	72.5	350	1200	99,000	61,000	38,000	TR-216	3"	360
GCH4V-07220		69	72.5	350	2000	164,000	100,000	62,500	TR-216	3"	*
	AGCH5V-07212	69	72.5	350	1200	99,000	61,000	38,000	TR-216	3"	262
	AGCH5V-07220	69	72.5	350	2000	130,000	80,000	50,000	TR-216	3"	279
	AGCH5V-07220-5	69	72.5	350	2000	130,000	80,000	50,000	TR-278	5"	279
	AGCH5V-07220H	69	72.5	350	2000	164,000	100,000	62,500	TR-278	5"	425
	AGCH5V-07230	69	72.5	350	3000	195,000	120,000	75,000	TR-278	5"	435
GCH4V-12312		115	123	550	1200	99,000	61,000	38,000	TR-286	5"	740
GCH4V-12320		115	123	550	2000	164,000	100,000	62,500	TR-286	5"	*
	AGCH5V-12312	115	123	550	1200	99,000	61,000	38,000	TR-286	5"	630
	AGCH5V-12320	115	123	550	2000	164,000	100,000	62,500	TR-286	5"	497
	AGCH5V-12330	115	123	550	3000	195,000	120,000	75,000	TR-286	5"	545
	AGCH5V-12340	115	123	550	4000	195,000	120,000	75,000	TR-286	5"	*
GCH4V-14512		138	145	650	1200	99,000	61,000	38,000	TR-288	5"	850
GCH4V-14520		138	145	650	2000	164,000	100,000	62,500	TR-288	5"	*
	AGCH5V-14512	138	145	650	1200	99,000	61,000	38,000	TR-288	5"	489
	AGCH5V-14520	138	145	650	2000	164,000	100,000	62,500	TR-288	5"	860
	AGCH5V-14530	138	145	650	3000	195,000	120,000	75,000	TR-288	5"	905
	AGCH5V-14540	138	145	650	4000	195,000	120,000	75,000	TR-288	5"	940
GCH4V-17012		161	170	750	1200	99,000	61,000	38,000	TR-291	5"	533
GCH4V-17020		161	170	750	2000	164,000	100,000	62,500	TR-291	5"	*
	AGCH5V-17012	161	170	750	1200	99,000	61,000	38,000	TR-291	5"	935
	AGCH5V-17020	161	170	750	2000	164,000	100,000	62,500	TR-291	5"	569
	AGCH5V-17030	161	170	750	3000	195,000	120,000	75,000	TR-291	5"	1185
	AGCH5V-17040	161	170	750	4000	195,000	120,000	75,000	TR-291	5"	*
	AGCH5V-24512	230	245	900	1200	99,000	61,000	38,000	TR-304	5"	1750
	AGCH5V-24520	230	245	900	2000	164,000	100,000	62,500	TR-304	5"	1805
	AGCH5V-24530	230	245	900	3000	195,000	120,000	75,000	TR-304	5"	1910
	AGCH5V-24540	230	245	900	4000	195,000	120,000	75,000	TR-304	5"	*

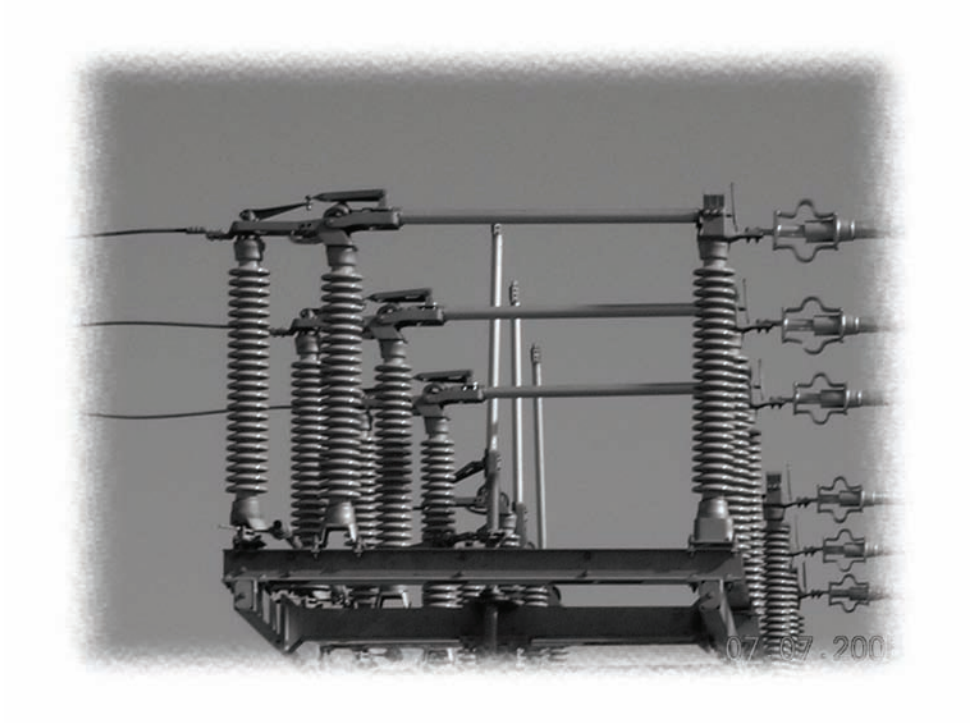
*** Refer to Factory**

Note: Copper switches cannot be provided with laminated shunt hinge assembly.

HUBBELL® USCO™ Power Switches

VERTICAL BREAK SWITCH

TYPE AVR



VOLTAGE RATING ***8.3kV to 245kV***

CURRENT RATING ***1200 to 3000A***

AVR Aluminum Vertical Break

The AVR is a three insulator, vertical break outdoor air disconnect switch constructed primarily of aluminum. Operation is accomplished by rotation of the rear insulator. Unique construction methods proven through years of field experience, coupled with simple design concepts provide ease of operation.

- ❑ **Operation Minimizes Phase Spacing**
- ❑ **Welded Lamination Design**
- ❑ **Reverse Loop Contacts For Short Circuit Withstand**
- ❑ **Great For Interrupting Duty Applications**

USCO™ POWER SWITCHES

SINCE 1946, THE ENGINEERS CHOICE FOR HIGH VOLTAGE PRODUCTS

DESCRIPTION

The AVR is an outdoor, group-operated vertical opening three insulator, air disconnect switch with the rear insulator rotating during operation. The AVR is constructed primarily of aluminum and is available in ratings from 8.3kV through 245kV maximum (7.5kV through 230kV nominal) and 1200 through 3000 continuous amperes.

APPLICATION

The AVR is commonly used in three-phase line or substation applications such as transformer or line disconnecting, breaker isolating, bypassing or bus sectionalizing. Operation of the AVR may be accomplished by either manual control or by motor operator.

TESTING

The AVR has been extensively tested to meet or exceed current ANSI standards. A comprehensive test brochure is available outlining electrical and mechanical design test conducted on the AThe AVR has been extensively tested to meet or exceed current ANSI standards. A comprehensive test brochure is available outlining electrical and mechanical design test conducted on the AVR.

HUBBELL USCO™ Power Switches

DESIGN CHARACTERISTICS

Contacts

The AVR is supplied with reverse loop, silver-to-silver jaw contacts producing the highest conductivity initially and over time.

The contact fingers, fabricated from hard drawn copper, are silver metallized and electro-tin plated. The male contact, also of hard drawn copper, has a brazed silver overlay and is electro-tin plated. These methods and materials used in the application of the silver provide surfaces of differing hardness with anti-galling properties, resulting in minimal wear over years of operation.

All contacts on the AVR are field replaceable.

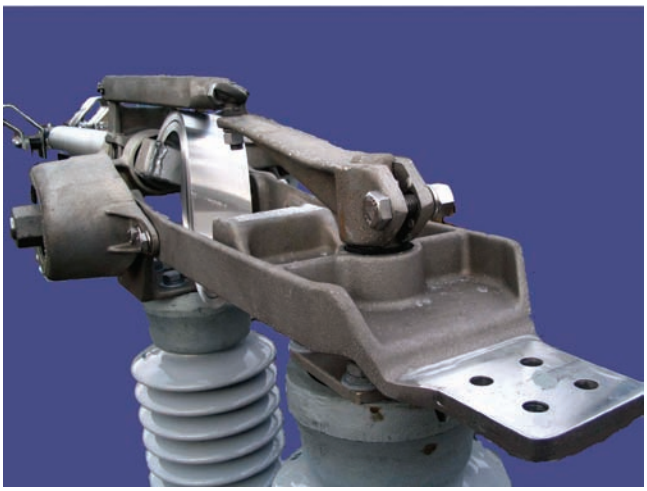
The AVR uses USCO's time tested welded lamination hinge assembly producing a straight-line current path eliminating any current transfer at the hinge. This is accomplished with a welded aluminum laminated conductor that is used to create a bypass at the hinge. This eliminates the need for bolted or sliding pressure connections, or high pressure contacts, and enables ease of operation. The welded connections create a single metallic path from the hinge terminal pads to the main contacts on the blades of the switch. The laminated conductor is constructed of commercially pure aluminum strip, which does not work harden during operation.

Blade

The blade is constructed of heat-treated aluminum tubing with heat-treated aluminum castings welded to hinge and jaw ends.

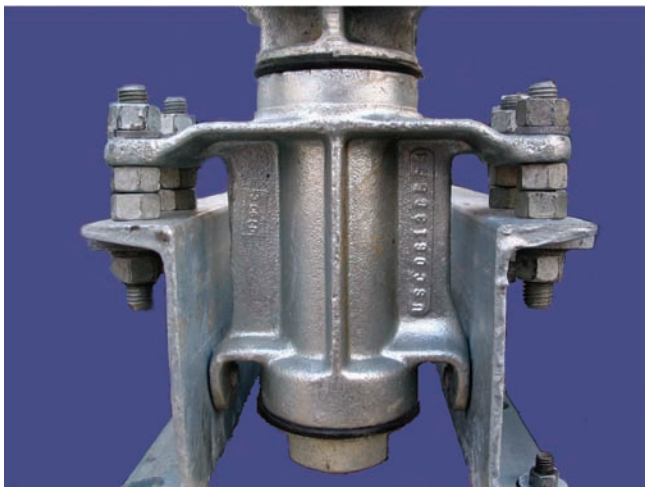
Blade Mechanism

The blade mechanism of the AVR toggles in the closed position locking the switch closed. In the open position, the blade toggles over center. Blade rotation and opening are provided by a sure and simple mechanism designed to operate in adverse conditions. The mechanism is insulated to prevent any welding during fault conditions.



ACCESSORIES

- Grounding switches: Through 100kA momentary
- Auxiliary switches: 12 contact decks are standard
- Standard arcing horns are installed on all group operated switches
- Outriggers: Custom designed for your application
- Connectors: Available on all switch types



Main Switch Bearings

The AVR incorporates rugged switch bearings consisting of stainless steel balls, utilizing stainless steel bearing races with galvanized ductile iron housings and rotors. The bearings are sealed at the factory for maintenance free service. Factory adjusted stops are provided with the bearing for ease of synchronization during installation.

Switch Bases

Hot dipped structural steel channel is used for the construction of the switch base. Leveling studs are provided on the bearings for insulator alignment. Bases and base mounting dimensions can be customized to your specifications and structure.

Insulators

The AVR is designed to accommodate commercially available insulators with three, five or seven inch bolt circle.

Operating Mechanisms

The AVR may be operated with a swing handle, gearbox or motor operator. Control arrangements are factory designed and customized to your structure, with all linkage components factory cut to the required dimensions.

Hinge Current Transfer

The AVR has no hinge contacts; therefore it allows current transfer with maximum reliability.

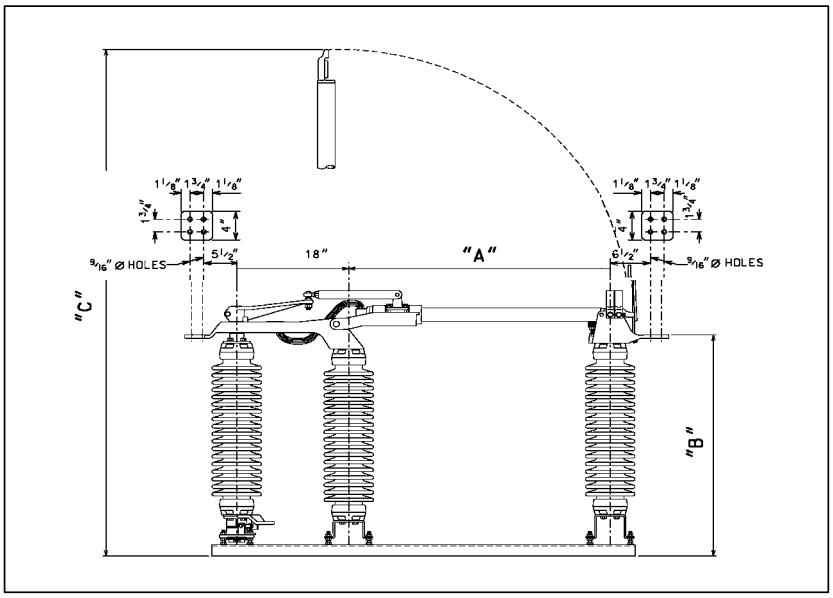
Transfer of current at the hinge end of the blade is accomplished with a welded aluminum laminated conductor, precisely formed and assembled to give thousands of trouble-free operations. This eliminates bolted or sliding pressure connections, threaded joints or high-pressure contacts, enabling ease of operation. Welded connections create a single conductive metallic path from the hinge terminal pad to the jaw end of the blade.

The laminated conductor is constructed of commercially pure aluminum strip, which does not work harden during operation. Extensive mechanical, electrical, and environmental testing along with years of field experience, prove this approach to current transfer superior to any conventional enclosed or open-hinge contact design.

USCO™ Power Switches

VERTICAL BREAK SWITCH
TYPE AVR
8.3 - 245 kV
1200 - 2000 Amperes

	RATINGS								
	VOLTAGE (kV)		CURRENT (A)		DIMENSIONS			STD MTG	WEIGHT
CATALOG NO.	MAX	BIL	CONT.	MOM.	A	B	C		1 Pole
AVR-00812	8.3	95	1200	61,000	18	16 3/8	42 1/4	8 1/4 x 36	165
AVR-00820	8.3	95	2000	100,000	18	16 3/8	42 1/4	8 1/4 x 36	172
AVR-01512	15.5	110	1200	61,000	18	18 7/8	44 3/4	8 1/4 x 36	175
AVR-01520	15.5	110	2000	100,000	18	18 7/8	44 3/4	8 1/4 x 36	182
AVR-02712	27	150	1200	61,000	21	22 7/8	51 3/4	8 1/4 x 39	202
AVR-02720	27	150	2000	100,000	21	22 7/8	51 3/4	8 1/4 x 39	217
AVR-03812	38	200	1200	61,000	27	26 7/8	61 3/4	8 1/4 x 45	245
AVR-03820	38	200	2000	100,000	27	26 7/8	61 3/4	8 1/4 x 45	253
AVR-04812	48.3	250	1200	61,000	30	30 7/8	68 3/4	8 1/4 x 48	297
AVR-04820	48.3	250	2000	100,000	30	30 7/8	68 3/4	8 1/4 x 48	305
AVR-07212	72.5	350	1200	61,000	42	38 7/8	88 3/4	8 1/4 x 60	202
AVR-07220	72.5	350	2000	100,000	42	38 7/8	88 3/4	8 1/4 x 60	423
AVR-12312	123	550	1200	61,000	60	58 3/4	126 5/8	8 1/4 x 72	899
AVR-12320	123	550	2000	100,000	60	58 3/4	126 5/8	8 1/4 x 72	679
AVR-14512	145	650	1200	61,000	72	67 3/4	147 5/8	8 1/4 x 84	994
AVR-14520	145	650	2000	100,000	72	67 3/4	147 5/8	8 1/4 x 84	1002
AVR-17012	170	750	1200	61,000	84	77 3/4	169 5/8	8 1/4 x 96	1420
AVR-17020	170	750	2000	100,000	84	77 3/4	169 5/8	8 1/4 x 96	1444
AVR-24512-9	245	900	1200	61,000	96	95 3/4	200 1/2	8 1/4 x 108	1579
AVR-24520-9	245	900	2000	100,000	96	95 3/4	200 1/2	8 1/4 x 108	1364
AVR-24512-10	245	1050	1200	61,000	114	107 3/4	230 1/2	8 1/4 x 120	1800
AVR-24520-10	245	1050	2000	100,000	114	107 3/4	230 1/2	8 1/4 x 120	1364

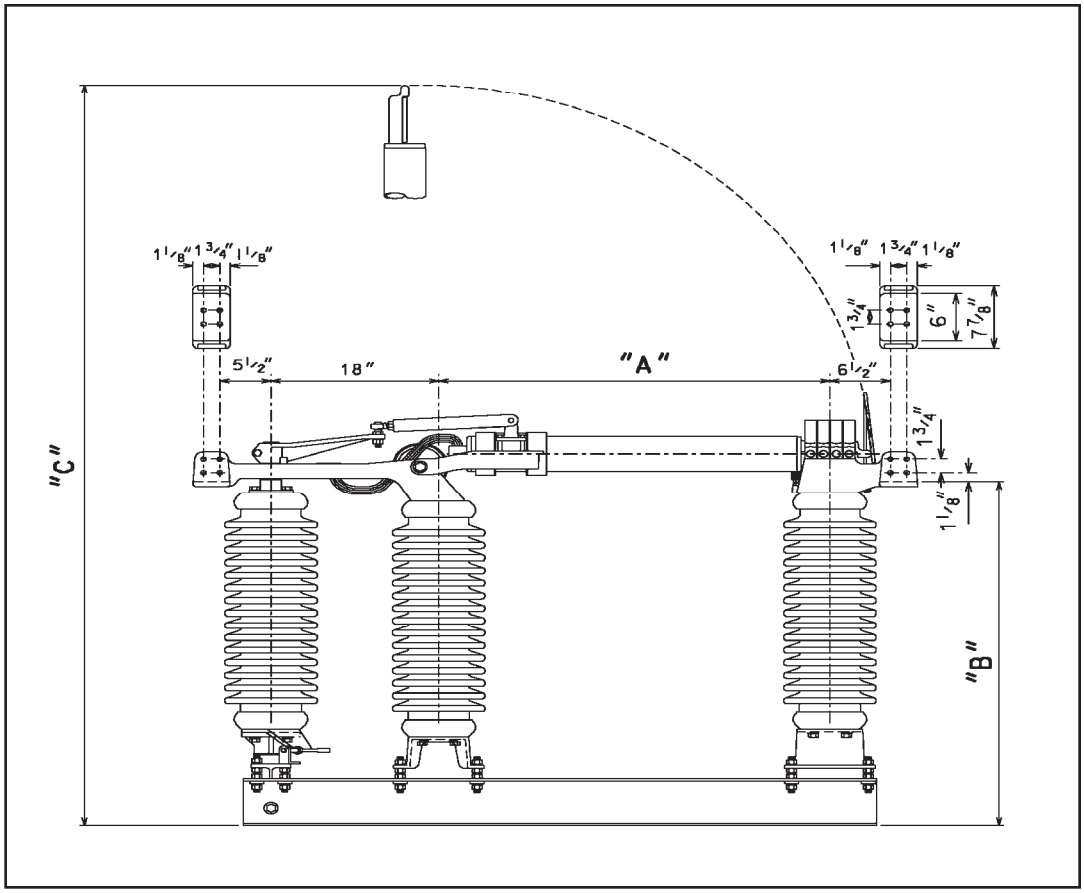


DIMENSIONS SHOWN IN INCHES - WEIGHT SHOWN IN POUNDS (INSULATORS INCLUDED)
8.3 - 72.5 kV 3" BOLT CIRCLE STATION POST INSULATORS
123 - 245 kV 5" BOLT CIRCLE STATION POST INSULATORS
DIMENSIONS NOT FOR CONSTRUCTION PURPOSES
CONTACT FACTORY FOR CERTIFIED PRINTS

VERTICAL BREAK SWITCH
TYPE AVR
8.3 - 245 kV
3000 Amperes

HUBBELL® USCO™ Power Switches

	RATINGS				DIMENSIONS			STD MTG	WEIGHT
	VOLTAGE (kV)		CURRENT (A)						
CATALOG NO.	MAX	BIL	CONT.	MOM.	A	B	C		1 Pole
AVR-00830	8.3	95	3000	120000	18	19 1/4	45 1/2	10 1/4 x 36	271
AVR-01530	15.5	110	3000	120000	18	21 1/4	47 1/2	10 1/4 x 36	199
AVR-02730	27	150	3000	120000	21	24 1/4	53 1/2	10 1/4 x 39	356
AVR-03830	38	200	3000	120000	27	29 1/4	64 1/2	10 1/4 x 45	441
AVR-04830	48.3	250	3000	120000	30	33 1/4	71 1/2	10 1/4 x 48	502
AVR-07230	72.5	350	3000	120000	42	43 3/4	94 1/8	8 1/4 x 60	810
AVR-12330	123	550	3000	120000	60	58 3/4	127 1/8	8 1/4 x 72	943
AVR-14530	145	650	3000	120000	72	67 3/4	148 1/8	8 1/4 x 84	1035
AVR-17030	170	750	3000	120000	84	77 3/4	170 1/8	8 1/4 x 96	1459
AVR-24530-9	245	900	3000	120000	96	95 3/4	200 1/2	8 1/4 x 108	1486
AVR-24530-10	245	1050	3000	120000	114	107 3/4	230 1/2	8 1/4 x 120	1844



DIMENSIONS SHOWN IN INCHES - WEIGHT SHOWN IN POUNDS (INSULATORS INCLUDED)
5" BOLT CIRCLE STATION POST INSULATORS
DIMENSIONS NOT FOR CONSTRUCTION PURPOSES
CONTACT FACTORY FOR CERTIFIED PRINTS

HUBBELL USCO™ Power Switches

VERTICAL BREAK SWITCH
TYPE AVR
8.3 - 245 kV

CATALOG NO.	RATINGS									
	VOLTAGE (kV)			CURRENT (A)						
ALUMINUM SWITCH	NOM. (rms)	MAX. (rms)	BIL (peak)	CONT.	PEAK	MOM.	3 SEC.	INS.	BOLT CIRCLE	WEIGHT SINGLE POLE (lbs.)
AVR-00812	7.5	8.3	95	1200	99,000	61,000	38,000	TR-202	3”	165
AVR-00820	7.5	8.3	95	2000	164,000	100,000	62,500	TR-202	3”	172
AVR-00830	7.5	8.3	95	3000	195,000	120,000	75,000	TR-222	5”	271
AVR-01512	15	15.5	110	1200	99,000	61,000	38,000	TR-205	3”	175
AVR-01520	15	15.5	110	2000	164,000	100,000	62,500	TR-205	3”	182
AVR-01530	15	15.5	110	3000	195,000	120,000	75,000	TR-225	5”	199
AVR-02712	23	27.0	150	1200	99,000	61,000	38,000	TR-208	3”	202
AVR-02720	23	27.0	150	2000	164,000	100,000	62,500	TR-208	3”	217
AVR-02730	23	27.0	150	3000	195,000	120,000	75,000	TR-227	5”	356
AVR-03812	34.5	38.0	200	1200	99,000	61,000	38,000	TR-210	3”	245
AVR-03820	34.5	38.0	200	2000	164,000	100,000	62,500	TR-210	3”	253
AVR-03830	34.5	38.0	200	3000	195,000	120,000	75,000	TR-231	5”	441
AVR-04812	46	48.3	250	1200	99,000	61,000	38,000	TR-214	3”	297
AVR-04820	46	48.3	250	2000	164,000	100,000	62,500	TR-214	3”	305
AVR-04830	46	48.3	250	3000	195,000	120,000	75,000	TR-267	5”	502
AVR-07212	69	72.5	350	1200	99,000	61,000	38,000	TR-216	3”	409
AVR-07220	69	72.5	350	2000	164,000	100,000	62,500	TR-216	3”	423
AVR-07230	69	72.5	350	3000	195,000	120,000	75,000	TR-278	5”	810
AVR-12312	115	123	550	1200	99,000	61,000	38,000	TR-286	5”	899
AVR-12320	115	123	550	2000	164,000	100,000	62,500	TR-286	5”	679
AVR-12330	115	123	550	3000	195,000	120,000	75,000	TR-286	5”	943
AVR-14512	138	145	650	1200	99,000	61,000	38,000	TR-288	5”	994
AVR-14520	138	145	650	2000	164,000	100,000	62,500	TR-288	5”	1002
AVR-14530	138	145	650	3000	195,000	120,000	75,000	TR-288	5”	1035
AVR-17012	161	170	750	1200	99,000	61,000	38,000	TR-291	5”	1420
AVR-17020	161	170	750	2000	164,000	100,000	62,500	TR-291	5”	1154
AVR-17030	161	170	750	3000	195,000	120,000	75,000	TR-291	5”	1188
AVR-24512-9	230	245	900	1200	99,000	61,000	38,000	TR-304	5”	1579
AVR-24520-9	230	245	900	2000	164,000	100,000	62,500	TR-304	5”	1364
AVR-24530-9	230	245	900	3000	195,000	120,000	75,000	TR-304	5”	1486
AVR-24512-10	230	245	1050	1200	99,000	61,000	38,000	TR-312	5”	1800
AVR-24520-10	230	245	1050	2000	164,000	100,000	62,500	TR-312	5”	1822
AVR-24530-10	230	245	1050	3000	195,000	120,000	75,000	TR-312	5”	1844

HUBBELL® USCO™ Power Switches

SIDE BREAK SWITCH
TYPE ASB

VOLTAGE RATING 8.3kV to 72.5kV
CURRENT RATING 1200 to 2000A

ASB Aluminum Side Break

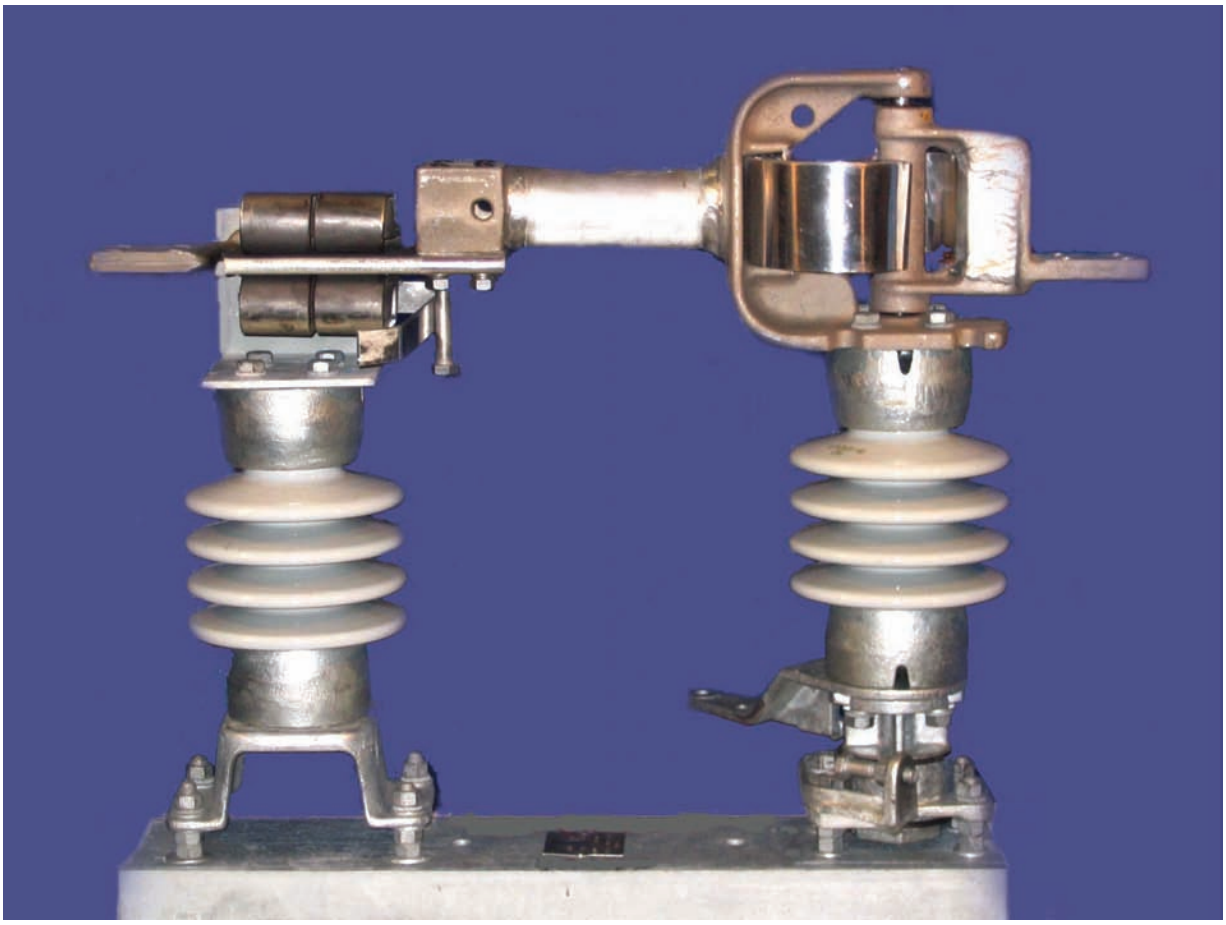
The ASB is a two insulator, side break outdoor air disconnect switch constructed primarily of aluminum. Operation is accomplished by the rotation of the hinge insulator. Proven by years of field experience, this switch takes full advantage of unique construction methods to provide both simple operation and long-term dependability.

- ❑ **Economical Yet Dependable**
- ❑ **Welded Lamination Design**
- ❑ **Reverse Loop Contacts For Short Circuit Withstand**
- ❑ **Durable, Reliable Operation**

USCO™ POWER SWITCHES

SINCE 1946, THE ENGINEERS CHOICE FOR HIGH VOLTAGE PRODUCTS

HUBBELL USCO™ Power Switches



DESCRIPTION

The **ASB** is an outdoor, group-operated side opening two insulator, air disconnect switch with only the hinge insulator rotating during operation. The **ASB** is constructed primarily of aluminum and is available in ratings from 8.3kV through 72.5kV maximum (7.5kV through 69kV nominal) and 1200 through 2000 continuous amperes. The side break is the most economical of all group-operated switches.

APPLICATION

The **ASB** is commonly used in three-phase line or substation applications such as transformer or line disconnecting, breaker isolating, bypassing or bus sectionalizing. Operation of the **ASB** may be accomplished by either manual control or by motor operator.

TESTING

The **ASB** has been extensively tested to meet or exceed current ANSI standards. A comprehensive test brochure is available outlining electrical and mechanical design test conducted on the **ASB.**

DESIGN CHARACTERISTICS

Contacts

The **ASB** is supplied with reverse loop, silver-to-silver jaw contacts producing the highest conductivity initially and over time.

The contact fingers, fabricated from hard drawn copper, are silver plated, then electro-tin plated.
The male contact, also of hard drawn copper is silver metallized and then electro-tin plated. These methods and materials used in the application of
the silver provide surfaces of differing hardness with anti-galling properties, resulting in minimal wear over years of operation.

All contacts on the **ASB** are field replaceable.

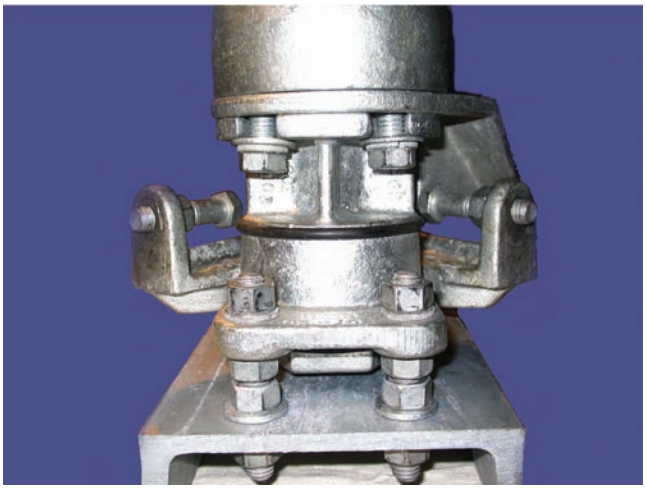
The **ASB** uses USCO's time tested welded lamination hinge assembly producing a straight-line current path eliminating any current transfer at the hinge. This is accomplished with a welded aluminum laminated conductor that is used to create a bypass at the hinge. This eliminates the need for bolted or sliding pressure connections, or high pressure contacts, and enables ease of operation. The welded connections create a single metallic path from the hinge terminal pads to the main contacts on the blades of the switch. The laminated conductor is constructed of commercially pure aluminum strip, which does not work harden during operation.

Blade

The blade is constructed of heat-treated aluminum tubing with heat-treated aluminum castings welded to hinge and jaw ends.

ACCESSORIES

- Grounding switches: Through 100kA momentary
- Auxiliary switches: Up to 12 contact decks are standard
- Standard arcing horns are installed on all switches
- Outriggers: Custom designed for your application
- Connectors: Available on all switch types



Main Switch Bearings

The **ASB** incorporates rugged switch bearings consisting of stainless steel balls, utilizing stainless steel bearing races with galvanized ductile iron housings and rotors. The bearings are sealed at the factory for maintenance free service. Factory adjusted stops are provided with the bearing for ease of synchronization during installation.

Switch Bases

Hot dipped structural steel channel is used for the construction of the switch base. Leveling studs are provided on the bearings for insulator alignment. Bases and base mounting dimensions can be customized to your specifications and structure.

Insulators

The **ASB** is designed to accommodate commercially available insulators with three or five inch bolt circles.

Operating Mechanisms

The **ASB** may be operated with a swing handle, gearbox or motor operator. Control arrangements are factory designed and customized to your structure, with all linkage components factory cut to the required dimensions.

Hinge Current Transfer

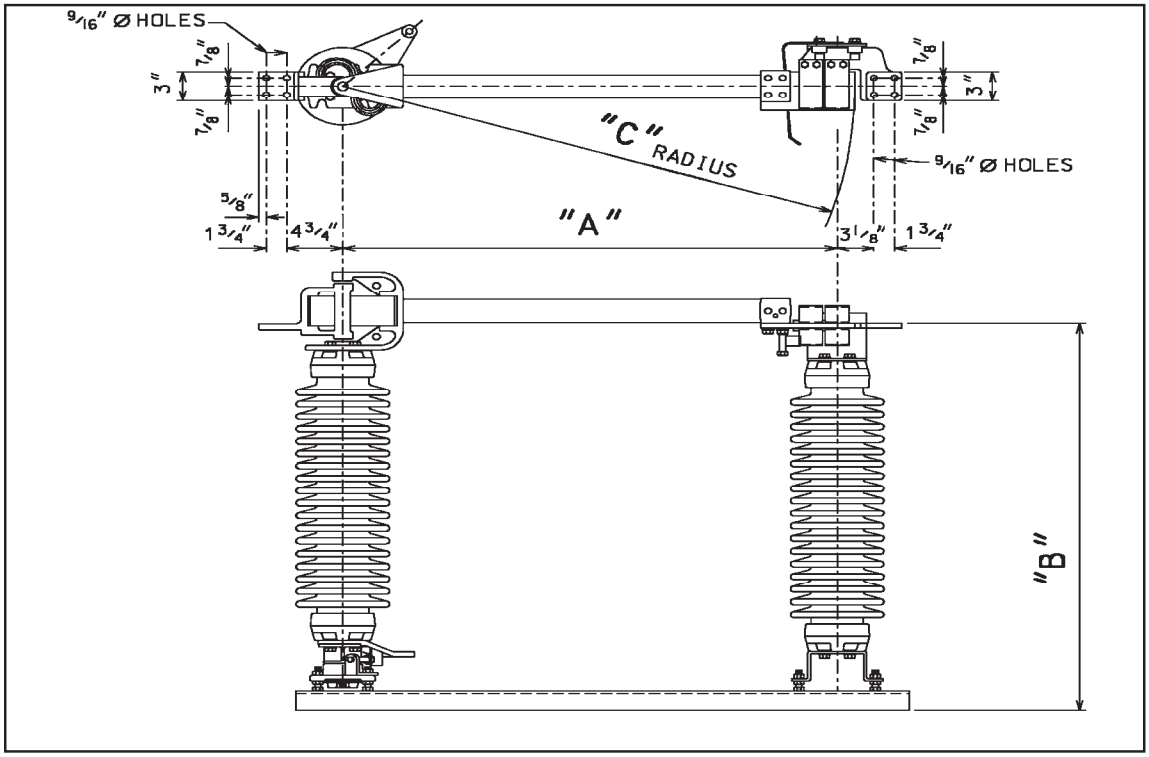
The **ASB** has no hinge contacts; therefore it allows current transfer with maximum reliability.

Transfer of current at the hinge end of the blade is accomplished with a welded aluminum laminated conductor, precisely formed and assembled to give thousands of trouble-free operations. This eliminates bolted or sliding pressure connections, threaded joints
or high-pressure contacts, enabling ease of operation. Welded connections create a single conductive metallic path from the hinge terminal pad to the jaw end of the blade.

The laminated conductor is constructed of commercially pure aluminum strip, which does not work harden during operation. Extensive mechanical, electrical, and environmental testing along with years of field experience, prove this approach to current transfer superior to any conventional enclosed or open-hinge contact design.

SIDE BREAK SWITCH
TYPE ASB
8.3 - 72.5 kV
1200 Amperes

	RATINGS								
	VOLTAGE (kV)		CURRENT (A)		DIMENSIONS				WEIGHT
CATALOG NO.	MAX	BIL	CONT.	MOM.	A	B	C	STD MTG	1 Pole
ASB-00812	8.3	95	1200	61,000	18	17 5/8	19 1/2	8 1/4 X 18	145
ASB-01512	15.5	110	1200	61,000	18	20 1/8	19 1/2	8 1/4 X 18	117
ASB-02712	27	150	1200	61,000	21	24 1/8	22 1/2	8 1/4 X 21	131
ASB-03812	38	200	1200	61,000	27	28 1/8	28 1/2	8 1/4 X 27	200
ASB-04812	48.3	250	1200	61,000	30	32 1/8	31 1/2	8 1/4 X 30	240
ASB-07212	72.5	350	1200	61,000	42	40 1/8	43 1/2	8 1/4 X 42	305

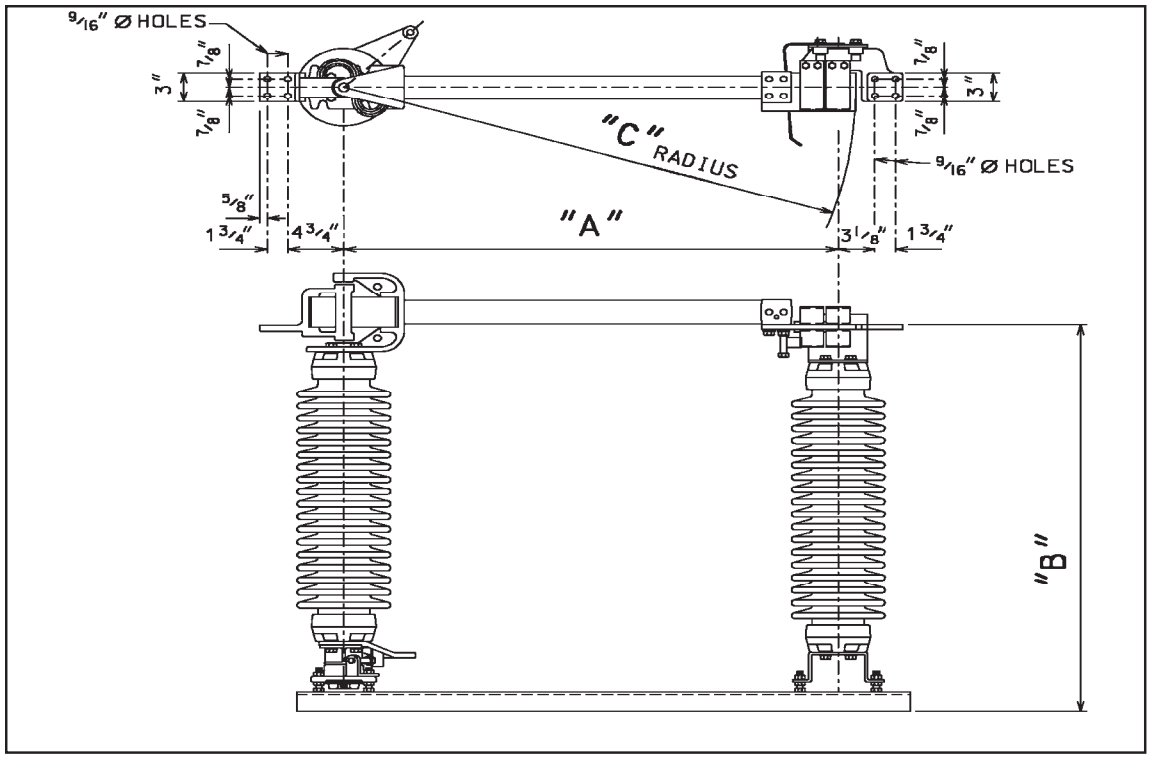


DIMENSIONS SHOWN IN INCHES - WEIGHT SHOWN IN POUNDS (INSULATORS INCLUDED)
8.3 - 72.5 kV 3" BOLT CIRCLE STATION POST INSULATORS
DIMENSIONS NOT FOR CONSTRUCTION PURPOSES
CONTACT FACTORY FOR CERTIFIED PRINTS

USCO™ Power Switches

SIDE BREAK SWITCH
TYPE ASB
8.3 - 72.5 kV
2000 Amperes

	RATINGS								
	VOLTAGE (kV)		CURRENT (A)		DIMENSIONS			STD MTG	WEIGHT
CATALOG NO.	MAX	BIL	CONT.	MOM.	A	B	C		1 Pole
ASB-00820	8.3	95	2000	100,000	18	17 5/8	21 3/4	8 1/4 X 18	150
ASB-01520	15.5	110	2000	100,000	18	20 1/8	21 3/4	8 1/4 X 18	132
ASB-02720	27	150	2000	100,000	21	24 1/8	24 3/4	8 1/4 X 21	144
ASB-03820	38	200	2000	100,000	27	28 1/8	30 3/4	8 1/4 X 27	205
ASB-04820	48.3	250	2000	100,000	30	32 1/8	33 3/4	8 1/4 X 30	245
ASB-07220	72.5	350	2000	100,000	42	40 1/8	45 3/4	8 1/4 X 42	315



DIMENSIONS SHOWN IN INCHES - WEIGHT SHOWN IN POUNDS (INSULATORS INCLUDED)
8.3 - 72.5 kV 3" BOLT CIRCLE STATION POST INSULATORS
DIMENSIONS NOT FOR CONSTRUCTION PURPOSES
CONTACT FACTORY FOR CERTIFIED PRINTS

SIDE BREAK SWITCH
TYPE ASB
8.3 - 72.5 kV

HUBBELL® USCO™ Power Switches

	RATINGS									
CATALOG NO.	VOLTAGE (kV)			CURRENT (A)						
ALUMINUM SWITCH	NOM. (rms)	MAX. (rms)	BIL (peak)	CONT.	PEAK	MOM.	3 SEC.	INS.	BOLT CIRCLE	WEIGHT SINGLE POLE (lbs.)
ASB-00812	7.5	8.3	95	1200	99,000	61,000	38,000	TR-202	3"	145
ASB-00820	7.5	8.3	95	2000	164,000	100,000	62,500	TR-202	3"	150
ASB-01512	15	15.5	110	1200	99,000	61,000	38,000	TR-205	3"	117
ASB-01520	15	15.5	110	2000	164,000	100,000	62,500	TR-205	3"	132
ASB-02712	23	27	150	1200	99,000	61,000	38,000	TR-208	3"	175
ASB-02720	23	27	150	2000	164,000	100,000	62,500	TR-208	3"	180
ASB-03812	34.5	38	200	1200	99,000	61,000	38,000	TR-210	3"	200
ASB-03820	34.5	38	200	2000	164,000	100,000	62,500	TR-210	3"	205
ASB-04812	46	48.3	250	1200	99,000	61,000	38,000	TR-214	3"	240
ASB-04820	46	48.3	250	2000	164,000	100,000	62,500	TR-214	3"	245
ASB-07212	69	72.5	350	1200	99,000	61,000	38,000	TR-216	3"	305
ASB-07220	69	72.5	350	2000	164,000	100,000	62,500	TR-216	3"	315

HUBBELL USCO™ Power Switches

HOOKSTICK SWITCH
TYPE HH

VOLTAGE RATING 8.3kV to 72.5kV
CURRENT RATING 600 to 4000A

HH Hookstick Switch

The HH is a hookstick operated switch for substation applications, tandem transfer duty as well as distribution and substation by-pass units. These units are premium quality, heavy duty and meet all industry electrical and mechanical standards.

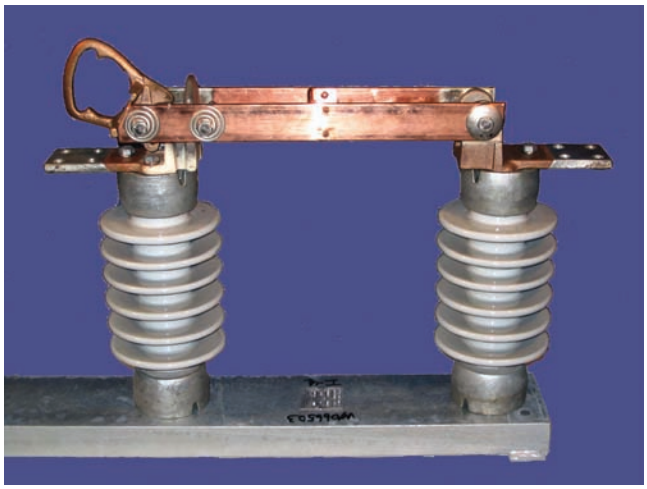
- ❑ **4 to 1 Mechanical Pry-Out Ease In Switch Operation**
- ❑ **Parallel Bus Bars, Trussed for Maximum Rigidity**
- ❑ **Versatile Designs Offer Many Application Solutions**

USCO™ POWER SWITCHES

SINCE 1946, THE ENGINEERS CHOICE FOR HIGH VOLTAGE PRODUCTS

HUBBELL® USCO™ Power Switches

HOOKSTICK SWITCH



The HH6 is a premium quality outdoor single pole, hookstick disconnect switch designed primarily for heavy duty substation applications.

DESCRIPTION

The **HH** is an outdoor, hookstick operated, air disconnect switch. The HH is constructed primarily of copper and bronze and is available in ratings from 8.3kV through 72.5kV maximum (7.5kV through 69kV nominal) and 600 through 4000 continuous amperes. The hookstick switch is premium quality and a heavy-duty design. An oversize operating ring and 4 to 1 mechanical pry-outs, aids the operator in operating the switch. A positive latch locks the switch in the closed position assuring that it will not open under the most adverse vibration or short circuit conditions.

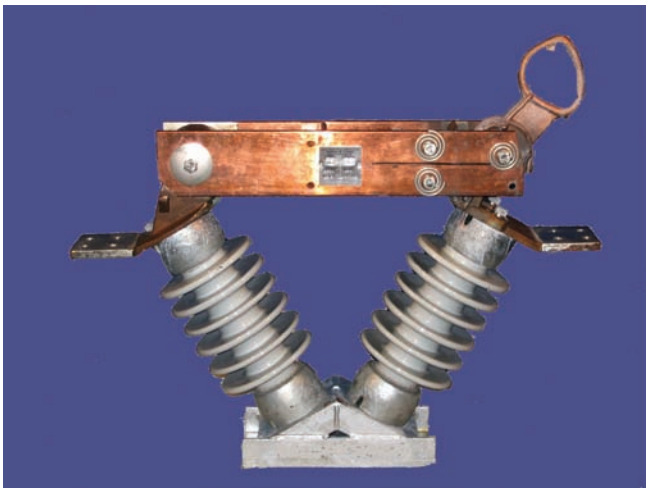
APPLICATION

The **HH** is commonly used in substation applications such as transformer disconnecting, breaker isolating and bypassing as well as tandem transfer duty. Versatile designs offer many application solutions.

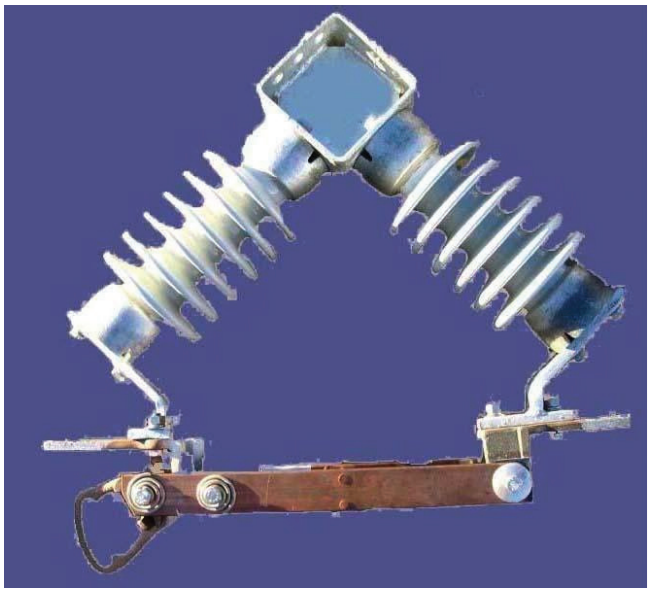
TESTING

The **HH** has been extensively tested to meet or exceed current ANSI standards. A comprehensive test brochure is available outlining electrical and mechanical design test conducted on the **HH**.

LOW PROFILE HOOKSTICK SWITCH



The HH6V, with insulators mounted in a V-configuration, offers many advantages where mounting space is limited, and for installation on low profile structures.



The HH45-6, is another popular low profile design.

USCO™ Power Switches

Contacts

The **HH** supplied with high-pressure silver to copper contacts at 600 amp and silver to silver at 1200 amp and above producing the highest conductivity initially and over time. The bronze contact casting has a brazed silver overlay that mates with silver electroplated blades. The methods and materials used in the application of silver provide surfaces of differing hardness with anti-galling properties, resulting in minimal wear over years of operation.

Blade

The blade is constructed of parallel copper bars that are trussed giving the blade maximum rigidity. Standard blade stops are set at 90 degrees.

Switch Bases

Hot dipped galvanized, single channel structural steel is used for the construction of the switch base.

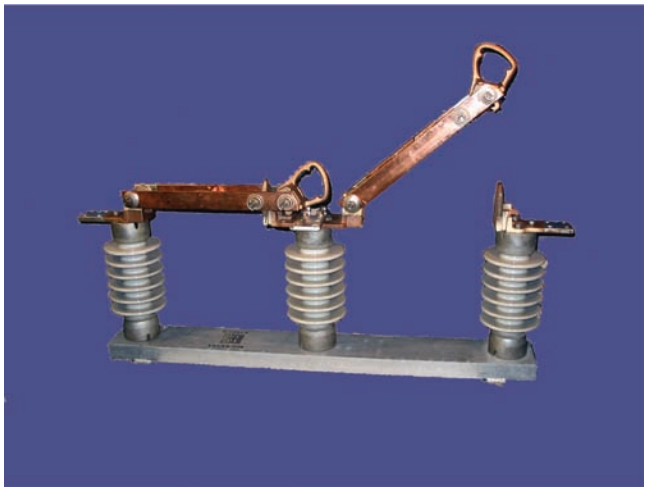
Insulators

The **HH** is designed to accommodate commercially available insulators with three or five inch bolt circles. Insulators are assembled inverted so switch can be installed under hung or vertical without disassembly.

Terminals

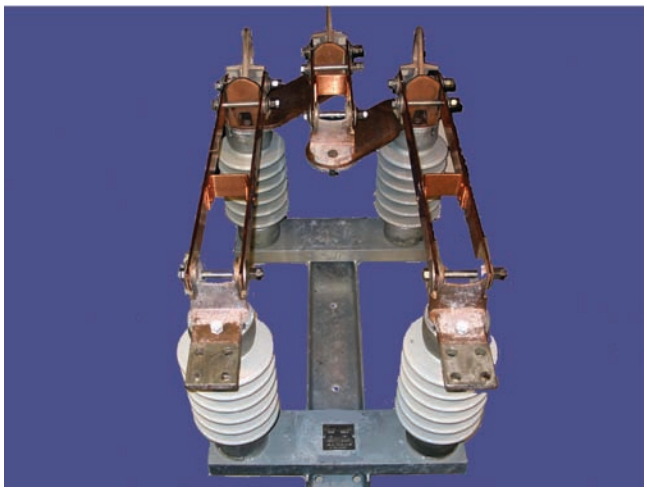
NEMA drilled terminal pads – $^{9}/_{16}$" holes on a $1^{3}/_{4}$" centers, 2-hole pads on 600 ampere switches. 4-hole pads 1200 amperes through 3000 amperes. Tinned terminal pads are standard.

TANDEM HOOKSTICK SWITCH



The HH6T is a tandem transfer switch designed to provide a compact method of transferring load to alternate circuits.

REGULATOR BYPASS SWITCH



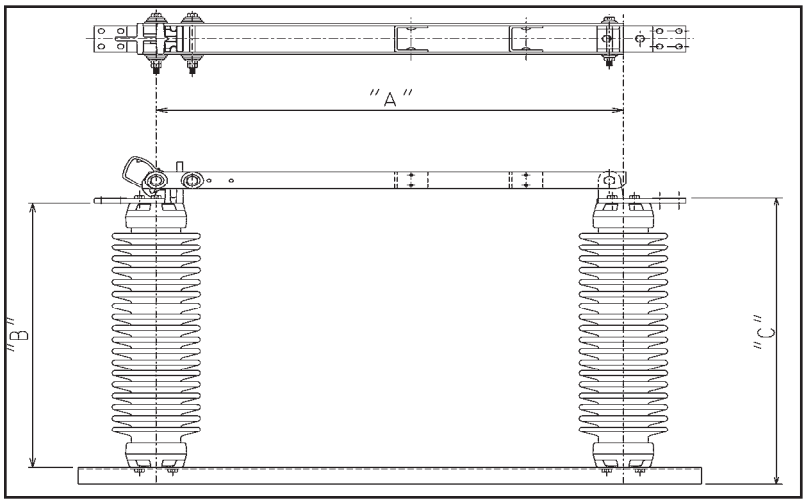
The HHR6 is a three blade, heavy duty, substation switch used for bypassing substation regulators.

HOOKSTICK SWITCH
TYPE HH6
8.3 - 72.5 kV
600 - 4000 Amperes

The HH6 is a premium quality outdoor single pole, hookstick disconnect switch designed primarily for heavy duty substation applications.

	RATINGS								
	VOLTAGE (kV)		CURRENT (A)		DIMENSIONS			STD MTG	WEIGHT
CATALOG NO.	MAX	BIL	CONT.	MOM.	A	B	C		1 Pole
HH6-00806	8.3	95	600	40,000	12	7 1/2	9 13/16	2 x 18	46
HH6-00812	8.3	95	1200	61,000	12	7 1/2	9 15/16	2 x 18	61
HH6-00820	8.3	95	2000	100,000	12	7 1/2	9 7/8	2 x 18	75
HH6-00830	8.3	95	3000	120,000	15	10	12 5/8	2 x 21	89
HH6-01506	15.5	110	600	40,000	15	10	12 5/16	2 x 21	66
HH6-01512	15.5	110	1200	61,000	15	10	12 7/16	2 x 21	78
HH6-01520	15.5	110	2000	100,000	15	10	12 3/8	2 x 21	85
HH6-01530	15.5	110	3000	120,000	18	12	14 5/8	2 x 24	170
HH6-02706	27	150	600	40,000	18	14	16 5/16	2 x 24	77
HH6-02712	27	150	1200	61,000	18	14	16 7/16	2 x 24	110
HH6-02720	27	150	2000	100,000	18	14	16 3/8	2 x 24	115
HH6-02730	27	150	3000	120,000	21	15	18 5/8	2 x 27	115
HH6-03806	38	200	600	40,000	24	18	20 5/16	2 x 30	114
HH6-03812	38	200	1200	61,000	24	18	20 7/16	2 x 30	129
HH6-03820	38	200	2000	100,000	24	18	20 3/8	2 x 30	139
HH6-03830	38	200	3000	120,000	27	20	22 5/8	2 x 33	150
HH6-04806	48.3	250	600	40,000	30	22	24 5/16	2 x 36	147
HH6-04812	48.3	250	1200	61,000	30	22	24 7/16	2 x 36	179
HH6-04820	48.3	250	2000	100,000	30	22	24 3/8	2 x 36	199
HH6-04830	48.3	250	3000	120,000	33	24	26 5/8	2 x 39	224
HH6-07212	72.5	350	1200	61,000	42	30	31 7/8	2 x 48	205
HH6-07220	72.5	350	2000	100,000	42	30	32 3/8	2 x 48	237

For 4000 Ampere Switches Consult Factory



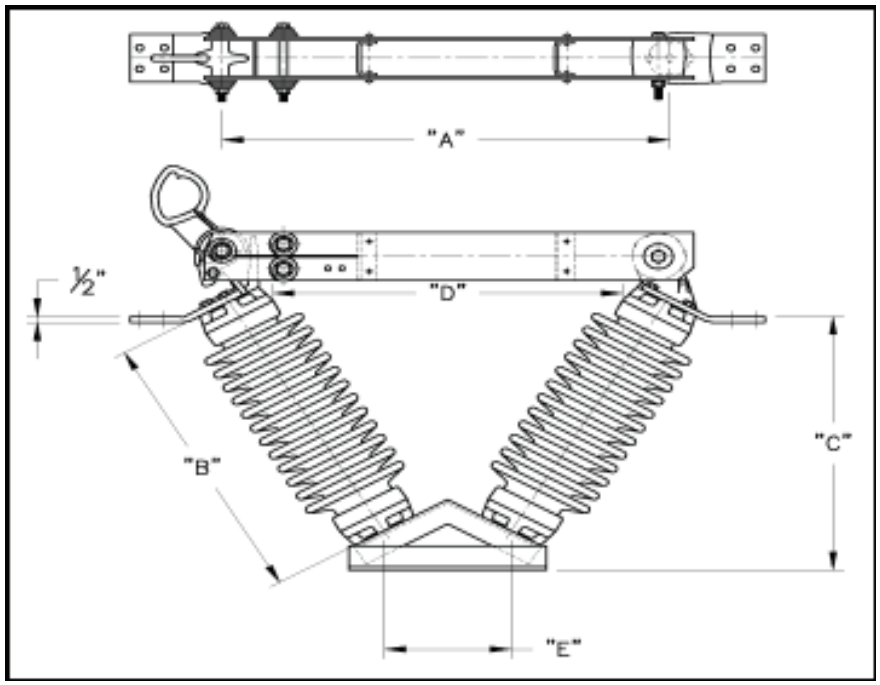
DIMENSIONS SHOWN IN INCHES - WEIGHT SHOWN IN POUNDS (INSULATORS INCLUDED)
8.3 - 72.5 kV 3" BOLT CIRCLE STATION POST INSULATORS
DIMENSIONS NOT FOR CONSTRUCTION PURPOSES
CONTACT FACTORY FOR CERTIFIED PRINTS

USCO™ Power Switches

LOW PROFILE HOOKSTICK SWITCH
TYPE HH6V
8.3 - 72.5 kV
600 - 2000 Amperes

The HH6V, with insulators mounted in a V-configuration, offers many advantages where mounting space is limited, and for installation on low profile structures.

	RATINGS										
	VOLTAGE (kV)		CURRENT (A)		DIMENSIONS					STD MTG	WEIGHT
CATALOG NO.	MAX	BIL	CONT.	MOM.	A	B	C	D	E		1 Pole
HH6V-00806	8.3	95	600	40	20	7 1/2	9 1/8	7	5 7/8	7 x 12	40
HH6V-00812	8.3	95	1200	61	20	7 1/2	9 1/8	7	5 7/8	7 x 12	56
HH6V-00820	8.3	95	2000	100	22 1/4	7 1/2	8 1/4	7	5 7/8	7 x 12	68
HH6V-01506	15.5	110	600	40	23	10	11 1/8	10	5 7/8	7 x 12	59
HH6V-01512	15.5	110	1200	61	23	10	11 1/8	10	5 7/8	7 x 12	70
HH6V-01520	15.5	110	2000	100	25 1/4	10	10 3/8	10	5 7/8	7 x 12	77
HH6V-02706	27	150	600	40	26	14	14 3/8	10	5 7/8	7 x 12	77
HH6V-02712	27	150	1200	61	26	14	14 3/8	12	5	7 x 12	94
HH6V-02720	27	150	2000	100	27 1/4	14	13 7/8	12	5	7 x 12	400
HH6V-03806	38	200	600	40	32	18	17 3/4	18	7 1/4	7 x 12	114
HH6V-03812	38	200	1200	61	32	18	17 3/4	18	7 1/4	7 x 12	117
HH6V-03820	38	200	2000	100	33 1/4	18	17 5/8	18	7	7 x 12	134
HH6V-04806	48.3	250	600	40	38	22	21	22	8 1/4	7 x 12	147
HH6V-04812	48.3	250	1200	61	38	22	21	22	8 1/4	7 x 12	179
HH6V-04820	48.3	250	2000	100	39 1/4	22	21	24	7	7 x 12	199
HH6V-07212	72.5	350	1200	61	50	30	28 1/4	32	12 1/2	7 x 12	275
HH6V-07220	72.5	350	2000	100	50	30	28 1/4	32	12 1/2	7 x 12	300



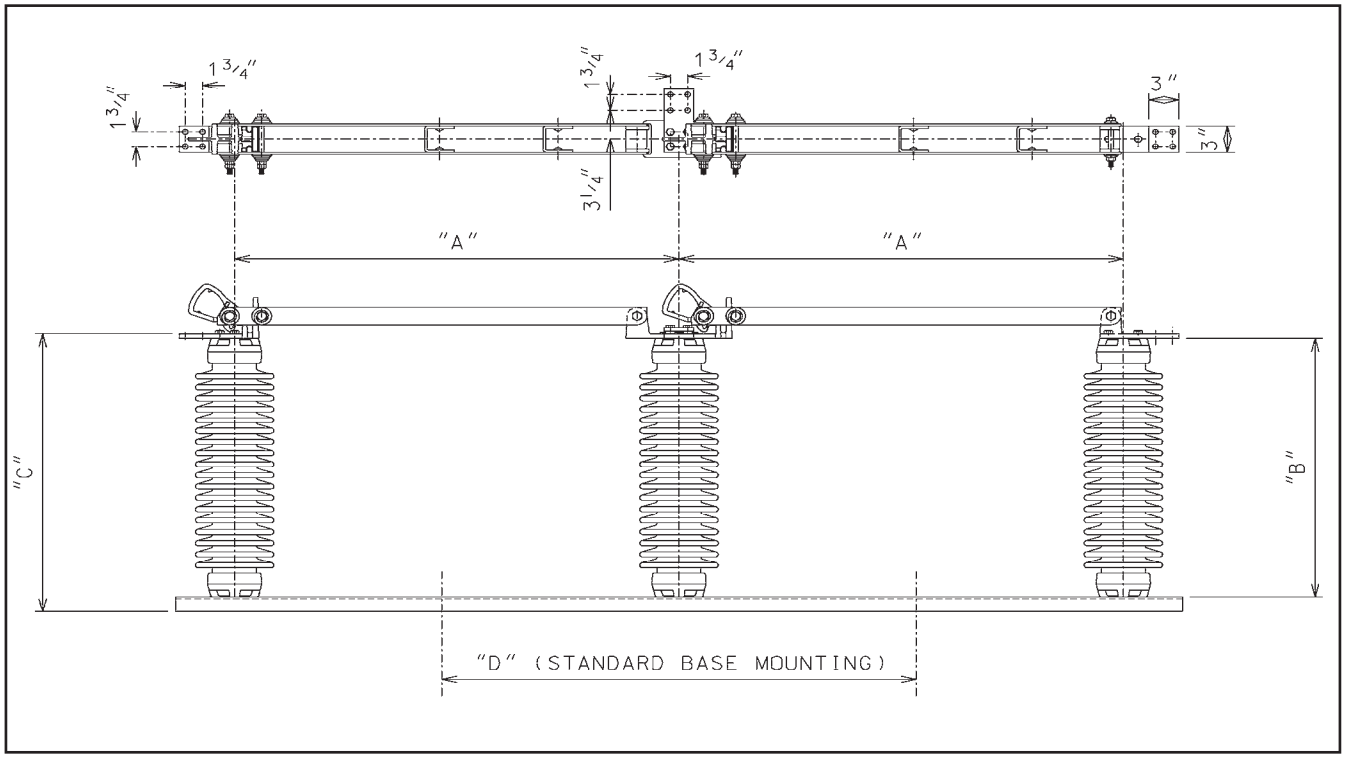
DIMENSIONS SHOWN IN INCHES - WEIGHT SHOWN IN POUNDS (INSULATORS INCLUDED)
8.3 - 72.5 kV 3" BOLT CIRCLE STATION POST INSULATORS
DIMENSIONS NOT FOR CONSTRUCTION PURPOSES
CONTACT FACTORY FOR CERTIFIED PRINTS

TANDEM HOOKSTICK SWITCH
TYPE HH6T
8.3 - 72.5 kV
600 - 1200 Amperes

USCO™ Power Switches

The HH6T is a tandem transfer switch designed to provide a compact method of transferring load to alternate circuits.

	RATINGS								
	VOLTAGE (kV)		CURRENT (A)		DIMENSIONS				WEIGHT
CATALOG NO.	MAX	BIL	CONT.	MOM.	A	B	C	D	1 Pole
HH6T-00806	8.3	95	600	40,000	15	7 7/8	10 1/8	18	87
HH6T-00812	8.3	95	1200	61,000	15	7 1/2	9 3/4	18	132
HH6T-01506	15.5	110	600	40,000	18	10 3/8	12 5/8	21	100
HH6T-01512	15.5	110	1200	61,000	18	10	12 1/4	21	146
HH6T-02706	27	150	600	40,000	21	14 3/8	16 5/8	24	135
HH6T-02712	27	150	1200	61,000	21	14	16 1/4	24	182
HH6T-03806	38	200	600	40,000	27	18 3/8	20 5/8	30	191
HH6T-03812	38	200	1200	61,000	27	18	20 1/4	30	242
HH6T-04806	48.3	250	600	40,000	33	22	22 3/8	36	225
HH6T-04812	48.3	250	1200	61,000	33	22	24 1/4	36	268
HH6T-07212	72.5	350	1200	61,000	45	30	32 1/4	48	340



DIMENSIONS SHOWN IN INCHES - WEIGHT SHOWN IN POUNDS
8.3 - 72.5 kV 3" BOLT CIRCLE STATION POST INSULATORS
DIMENSIONS NOT FOR CONSTRUCTION PURPOSES
CONTACT FACTORY FOR CERTIFIED PRINTS

HUBBELL USCO™ Power Switches

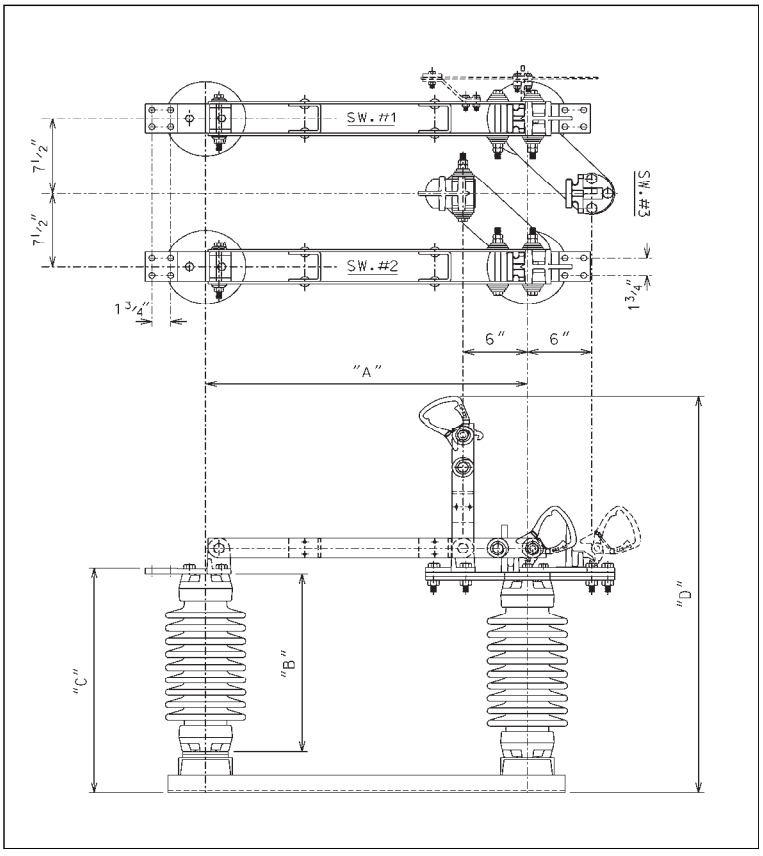
REGULATOR BYPASS HOOKSTICK SWITCH

TYPE HHR6

8.3 - 38 kV
600 - 2000 Amperes

The HHR6 is a three blade, heavy duty, substation switch providing a compact, easily installed unit for bypassing substation regulators.

	RATINGS									
	VOLTAGE (kV)		CURRENT (A)		DIMENSIONS				STD MTG	WEIGHT
CATALOG NO.	MAX	BIL	CONT.	MOM.	A	B	C	D		1 Pole
HHR-00806	8.3	95	600	40,000	18	7 1/2	11 13/16	29 1/4	2 x 24	137
HHR-00812	8.3	95	1200	61,000	18	7 1/2	12 3/16	29 1/2	2 x 24	169
HHR-00820	8.3	95	2000	100,000	18	7 1/2	12 3/16	33 5/16	2 x 24	204
HHR-01506	15.5	110	600	40,000	21	10	14 5/16	31 3/4	2 x 27	165
HHR-01512	15.5	110	1200	61,000	21	10	14 11/16	32	2 x 27	198
HHR-01520	15.5	110	2000	100,000	21	10	14 11/16	35 13/16	2 x 27	69
HHR-02706	27	150	600	40,000	24	14	18 5/16	36 3/8	2 x 30	200
HHR-02712	27	150	1200	61,000	24	14	18 11/16	36	2 x 30	232
HHR-02720	27	150	2000	100,000	24	14	18 11/16	39 13/16	2 x 30	270
HHR-03806	38	200	600	40,000	30	18	22 5/16	40 3/8	2 x 36	245
HHR-03812	38	200	1200	61,000	30	18	22 11/16	40	2 x 36	276
HHR-03820	38	200	2000	100,000	30	18	22 11/16	43 13/16	2 x 36	300



DIMENSIONS SHOWN IN INCHES - WEIGHT SHOWN IN POUNDS
8.3 - 38 kV 3" BOLT CIRCLE STATION POST INSULATORS
DIMENSIONS NOT FOR CONSTRUCTION PURPOSES
CONTACT FACTORY FOR CERTIFIED PRINTS

HUBBELL® USCO™ Power Switches

MOTOR OPERATOR
TYPE HUBMO

VOLTAGE RATING	***48 VDC & 125 VDC***
TORQUE RATING	***10,000 in-lb & 20,000 in-lb***
OPERATING TIME	***4-6 s & 10-14 s***

USCO Motor Operator

The USCO motor operator is a substation class torsional motor operator available in a variety of configurations to meet customer demand. Operation can be accomplished remotely or locally. High quality components and superior workmanship provide high torque output and long-term dependability.

USCO™ POWER SWITCHES

SINCE 1946, THE ENGINEERS CHOICE FOR HIGH VOLTAGE PRODUCTS

HUBBELL USCO™ Power Switches

DESCRIPTION

The HUBMO is a high torque torsional motor operator designed for use with substation or transmission class switches. Multiple available torque ratings and operating voltages along with numerous other customer specified options make it suitable for a variety of applications.

APPLICATION

The HUBMO is designed for use with substation and transmission class switches ranging from 8.3kV to 550kV (7.5kV to 500kV nominal) where local operation is not always an option. The motor operator is equipped with auxiliary contacts to remotely verify motor position.

TESTING

The HUBMO has been extensively tested to meet or exceed ANSI standards. A comprehensive test packet is available upon request.

DESIGN CHARACTERISTICS

Cabinet

The USCO motor operator comes equipped with a weatherproof stainless steel or aluminum enclosure. Continuous welding at the seams provides a weatherproof seal to protect electrical components from dirt and moisture for long life and serviceability. All cabinets are equipped with provisions for padlocks to prevent injury or tampering.

Heater

The standard motor operator comes equipped with a heating unit that is thermostatically controlled and controls condensation within the cabinet. It can be connected to 120 VAC or 240 VAC source voltage independent of other motor operator circuitry.

Motors

The electric motor utilized in the USCO motor operator is sized to provide adequate torque for large switches while maintaining appropriate operating speed.

Gearbox

Gearboxes include an anti-backdrive worm gear set. The anti-backdrive worm gears prevent unwanted switch movement during operation and add an extra level of safety for switch operators and crews.

Controls

The USCO motor operator comes standard with local controls that include a stop command effective at any point in the switch's open/close cycle. Provisions to connect remote operation controls are included. A local/remote selector switch is available upon customer request.

Auxiliary Switches

The USCO motor operator comes standard with 10 infinitely adjustable auxiliary decks for electrically interlocking with other substation equipment or remote position indication. Each deck includes one NO contact and one NC contact wired to easily accessible terminal blocks for customer use. For customers requiring more contacts, the auxiliary array is expandable to 20 decks suitable for customer use.

Decoupler

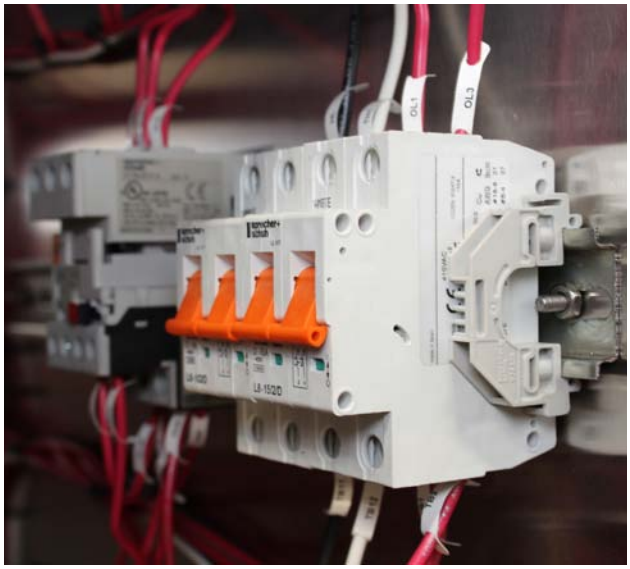
The decoupler on the HUBMO is designed for easy locking. It can be locked in the coupled position to ensure the motor is always at the ready if called on for remote operation, or it can be locked in the decoupled position so that the motor cannot operate the switch. The decoupler can be used to prevent switch operation for lock-out/ tag-out during maintenance of substation equipment.

Manual Operator

A manual operation handle is provided with each motor operator to allow adjustment or operation during a substation outage. The manual drive cover is electrically interlocked with the motor operator to prevent electrical operation when the manual operator is in use.

Overload Protection

The circuitry is designed specifically to cut power to the motor prior to damaging the motor operator. Thermal overload relays protect the mechanism from mechanical damage while a standard resettable breaker protects the electrical components. These breakers can be replaced with fuses at the request of the customer.

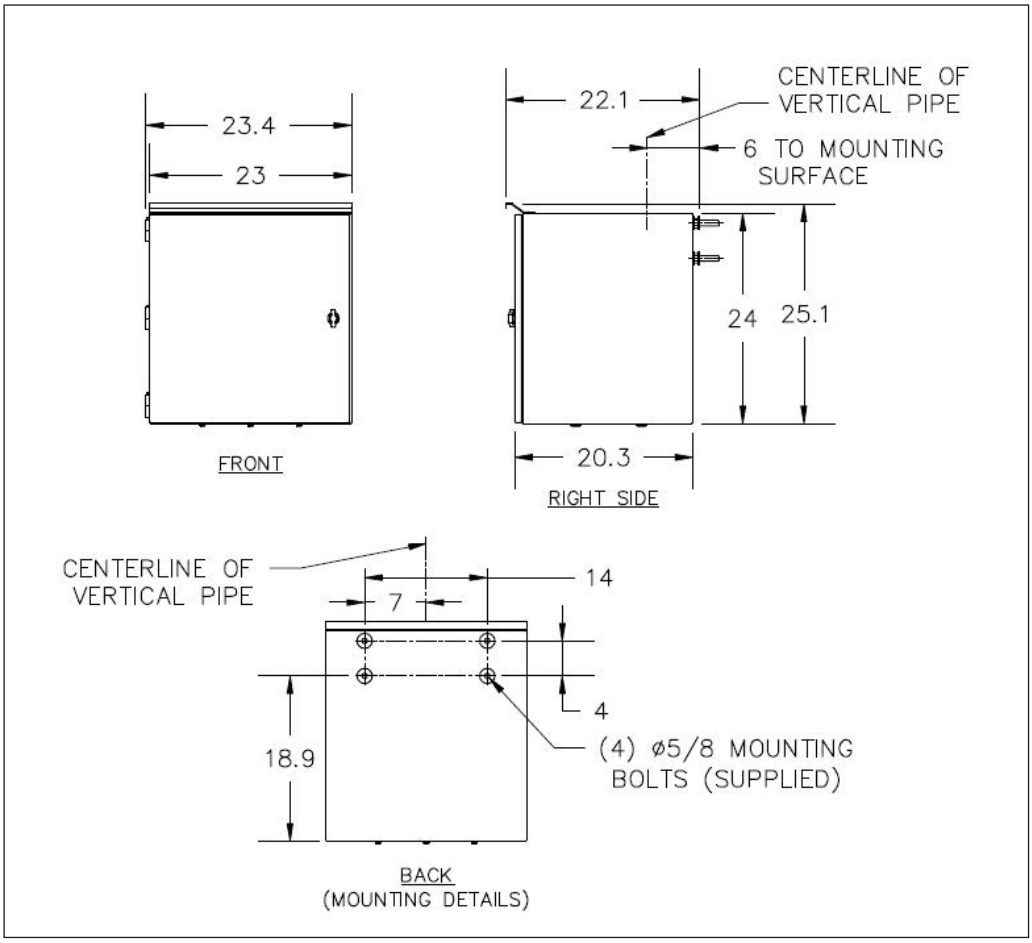


Custom Configurations Available

Whether the customer is doing a unique installation to retrofit existing equipment, or installing a new standard configuration, the HUBMO is customizable to fit the customer's specific needs. For configurations not listed; consult the factory.

USCO Motor Operator
TYPE HUBMO
10,000 in-lb & 20,000 in-lb

CATALOG NO.	Rated Torque	Operating Time	Operating Voltage	Minimum Voltage	Maximum Voltage	Current @ Rated Torque	Locked Rotor Current	Weight	Manual Ratio
PSMO1004048D	10,000 in-lb	4-6 s	48 VDC	36 VDC	56 VDC	46 A	250 A	201	60:1
PSMO1004125D	10,000 in-lb	4-6 s	125 VDC	90 VDC	140 VDC	18 A	90 A	201	60:1
PSMO2004048D	20,000 in-lb	4-6 s	48 VDC	36 VDC	56 VDC	93 A	600 A	201	60:1
PSMO2004125D	20,000 in-lb	4-6 s	125 VDC	90 VDC	140 VDC	40 A	250 A	201	60:1
PSMO2010048D	20,000 in-lb	10-14 s	48 VDC	36 VDC	56 VDC	47 A	250 A	201	60:1
PSMO2010125D	20,000 in-lb	10-14 s	125 VDC	90 VDC	140 VDC	19 A	90 A	201	60:1



Application Guide for Vertical Break Switches

	Continuous Current Class (A)					
Voltage Class (kV)	600	1200	1600	2000	3000	4000 and Above
8.3	PSMO1004	PSMO1004	PSMO1004	PSMO1004	PSMO1004	PSMO2004
15.5	PSMO1004	PSMO1004	PSMO1004	PSMO1004	PSMO1004	PSMO2004
27	PSMO1004	PSMO1004	PSMO1004	PSMO1004	PSMO1004	PSMO2004
38	PSMO1004	PSMO1004	PSMO1004	PSMO1004	PSMO1004	PSMO2004
48.3	PSMO1004	PSMO1004	PSMO1004	PSMO1004	PSMO1004	PSMO2004
72.5	PSMO1004	PSMO1004	PSMO1004	PSMO1004	PSMO1004	PSMO2004
123	PSMO1004	PSMO1004	PSMO1004	PSMO1004	PSMO1004	PSMO2004
145	PSMO1004	PSMO1004	PSMO1004	PSMO1004	PSMO1004	PSMO2004
170	PSMO1004	PSMO1004	PSMO1004	PSMO1004	PSMO1004	PSMO2004
245	PSMO2010	PSMO2010	PSMO2010	PSMO2010	PSMO2010	PSMO2010
362	PSMO2010	PSMO2010	PSMO2010	PSMO2010	PSMO2010	PSMO2010
550	Note 1	Note 1	Note 1	Note 1	Note 1	Note 1
800	Note 1	Note 1	Note 1	Note 1	Note 1	Note 1

Note:
1. Consult the factory
2. When one shot closing under ice is required, consult the factory
3. For applications with interrupting devices, consult the factory

Application Guide for Center and Double Break Switches

	Continuous Current Class (A)					
Voltage Class (kV)	600	1200	1600	2000	3000	4000 and Above
8.3	PSMO1004	PSMO1004	PSMO1004	PSMO1004	PSMO1004	PSMO2004
15.5	PSMO1004	PSMO1004	PSMO1004	PSMO1004	PSMO1004	PSMO2004
27	PSMO1004	PSMO1004	PSMO1004	PSMO1004	PSMO1004	PSMO2004
38	PSMO1004	PSMO1004	PSMO1004	PSMO1004	PSMO1004	PSMO2004
48.3	PSMO1004	PSMO1004	PSMO1004	PSMO1004	PSMO1004	PSMO2004
72.5	PSMO1004	PSMO1004	PSMO1004	PSMO1004	PSMO1004	PSMO2004
123	PSMO1004	PSMO1004	PSMO1004	PSMO1004	PSMO1004	PSMO2004
145	PSMO1004	PSMO1004	PSMO1004	PSMO1004	PSMO1004	PSMO2004
170	PSMO2004	PSMO2004	PSMO2004	PSMO2004	PSMO2004	PSMO2004
245	PSMO2010	PSMO2010	PSMO2010	PSMO2010	PSMO2010	PSMO2010
362	PSMO2010	PSMO2010	PSMO2010	PSMO2010	PSMO2010	PSMO2010
550	PSMO2010	PSMO2010	PSMO2010	PSMO2010	PSMO2010	PSMO2010
800	Note 1	Note 1	Note 1	Note 1	Note 1	Note 1

Note:
1. Consult the factory
2. When one shot closing under ice is required, consult the factory
3. For applications with interrupting devices, consult the factory

HUBBELL USCO™ Power Switches

SWITCH ACCESSORIES

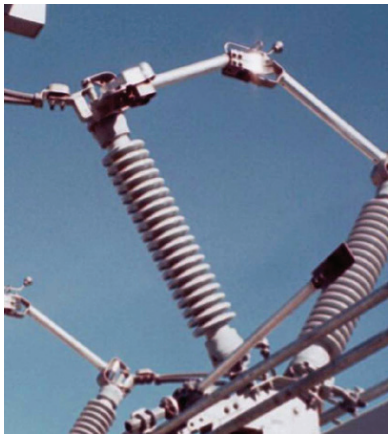
Auxiliary Switches

The addition of auxiliary switches to switch operating mechanisms offers a means of remote switch position indication, electrical interlocking of main and ground switch, etc. USCO auxiliary switches are outdoor type, complete with weatherproof housing, operating crank, and control linkage.

❑ **12 Stage (6-a and 6-b)**

Grounding Switches

Grounding switches are supplied as an addition to the main switch, or as a separate unit. They can be installed on either the jaw or hinge end of the main switch. Grounding switches are normally interlocked with the main switch to prevent the closing of both switches at the same time.

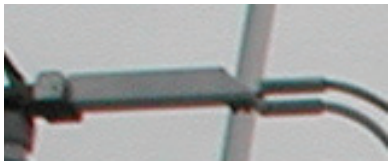


Interlocks

Mechanical interlocks are used primarily for interlocking ground and main switches to prevent both switches being opened at the same time. USCO has available two types of interlocks (1) mechanical, and (2) Kirk Key.

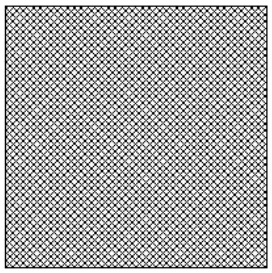
Outriggers

Outriggers are furnished when it is necessary to extend the conductors out from the switch base or other grounded parts.



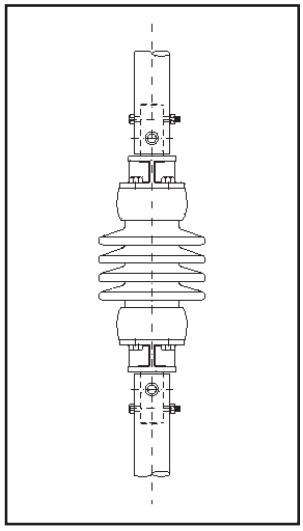
Grounding Plates

Grounding plates are installed at the base of the structure to ground personnel while operating switches. The USCO grounding plate is available in a 48” x 36” 3/16” thick galvanized steel checker plate. Consult factory for custom sizes.



Insulated Controls

A porcelain insulator can be used for insulating the vertical operating pipe. The insulator is a standard 15 kV station post insulator with fittings for installing the vertical pipe.

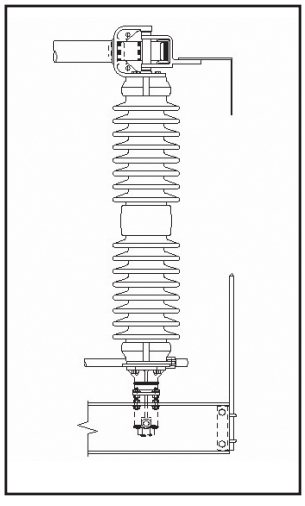


Pole Bands

USCO’s multi-purpose galvanized ductile iron, pole bands (MK-678-7) are utilized for a wide variety of pole-mounted equipment. Adjustable to fit poles 6” to 24” in diameter.

Spark Gaps

Spark gaps provide a protective gap between live parts and ground to limit any maximum over-voltage that may occur.

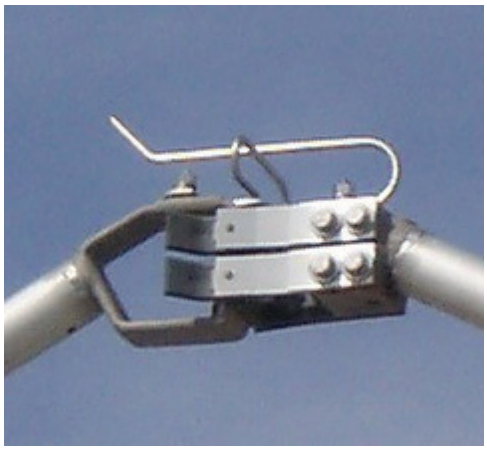


USCO™ Power Switches

INTERRUPTING DEVICES

Arcing Horns

Standard arcing horns are designed to prevent arcing at the main switch contacts. Although they are given no interrupting rating, it is common practice to use these devices to interrupt small values of current such as the charging current of a short length of line or transformer magnetizing current. It should be recognized that the confined electric arc at the switch contacts could cause damage to the switch, and involve adjacent phases, or supporting structure, in the initiation of a major fault.



Quick Break Arcing Horns

The quick-break arcing horn is a device capable of interrupting a limited amount of line charging or transformer magnetizing current. The whip action, which produces a high-speed contact separation of the stationary and moving horns, limits the length of the arc and extinguishes the arc faster than conventional arcing horns. The interrupting ability of quick break arcing horns is limited, and will vary with atmospheric and operating conditions.

Vacuum Interrupter

The vacuum interrupter provides confined arc switching (in a vacuum) of load, line charging, and transformer magnetizing currents. The vacuum interrupter is capable of interrupting up to 2000 amperes at voltages 7.5kV through 230kV. At the higher voltages this interrupter utilizes vacuum units in series so interconnected that there is simultaneous separation of the contacts. Units are full voltage rated for interrupting duty up to the full continuous current rating of the main switch, with full open circuit voltage across the interrupter.

OPERATING DEVICES

Swing Handle Operator

The swing handle control mechanism is a tortional type operator that uses a 3 ft galvanized steel pipe. The swing handle can be pad locked in both the open and closed position

- ❑ **180 degree rotation**
- ❑ **Required operating force <50 ft lbs**

Worm Gear Operator

Standard gear operators are furnished with the specified ratings to reduce operating effort, and are also used to control the speed of operation of the switch. Gear operators are recommended for certain ratings when switches are equipped with quick break arcing horns. The standard USCO gear operator (30:1 gear ratio), has a worm gear, corrosion-free mechanism, with provisions for locking in the open and closed positions.

Motor Operator

Motor Operators are designed for electrical operation of air break switches from remote locations. They are available in a wide range of torque, operating speeds, and control voltages. Motor operators may be disconnected for manual operation of the switch during maintenance or emergencies, and for maintenance operation of the motor operator without operating the switch. See motor operator section.

HUBBELL USCO™ Power Switches

NOTES

NOTES

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