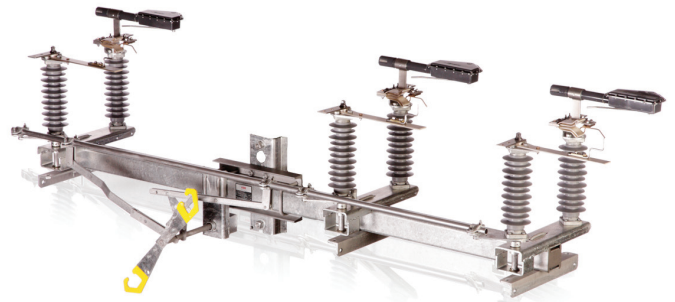


ABB GridGuard™ switch
Three-phase, gang-operated overhead
distribution switch

Product overview

Overview

The ABB portfolio of GridGuard gang-operated loadbreak sidebreak switches is one of the most robust product offerings in the industry today. Standard quality features include a 1/4" steel phase base, stainless steel to brass bearings, silver-plated copper reverse loop contacts, and silver-plated copper busbar blades. These features contribute to an extended service life of the unit and provide superior harsh environment endurance. Coupled with the above are expulsion tube and enclosed vacuum bottle interrupting device options. Both types of interrupters provide superior performance by utilizing leading edge technology to safely interrupt loads up to 1500 A at 35 kV, with minimal environmental effect and no adverse circuit impact.



Application

ABB GridGuard switches are ideally suited for the following duties:

- Line switching: parallel or loop switching load splitting, load dropping, and associated charging currents
- Transformer switching: load dropping, including associated magnetizing currents
- Cable switching: parallel or loop load switching, load dropping, and associated charging currents

Switches include five, three, and two-time duty-cycle fault-closing capabilities of 15 kA, 20 kA, and 30 kA rms-asym respectively. High quality manufacturing and construction techniques have produced the “best of class” as proven by certified third-party testing agencies.

Standard features

Robust construction:

- Resilient, higher BIL silicone rubber insulators
- Dead end angles constructed of 3/8" steel, meets Federal Specification BR-C-271 Type 7, Class 3
- Reverse loop silver plated copper jaw contacts
- All ferrous components are hot dip galvanized
- Tinned copper terminal pads
- Maintenance free stainless steel to brass bearings

Reliable design:

- Looped contact design improves contact integrity
- Interrupter contact operating speed is independent of switch operating speed, ensuring full loadbreak capability
- All copper construction is grade C110, providing high conductivity and strength
- Self-resetting interrupter
- Advanced shunt design eliminates contact pitting
- Unitized construction: galvanized steel or fiberglass
- Visible break allows for safe operation and maintenance
- Tested in accordance with IEC 60265-1 (1998), 265-1 (1983), 60507 (1991), ANSI/IEEE 1247 (1998), 37.34 (1994), C37.32 (1996), ASTM B117-7, A153, D4329, and G154-06
- RUS accepted

Specifications

Voltage class	15 kV	27 kV	38 kV
Nominal voltage (kV)	15	25	35
Max voltage (kV)	17	27	38
BIL (kV BIL)	125	170	200
Leakage distance (mm)	521	818	1115
Continuous current (A)	600 A (ANSI), 900 A (IEEE) *		
	900 A (ANSI)		
	1200 A (ANSI) **		
Fault close	15.1 kA rms-asym: 5 x manual operation		
	20.2 kA rms-asym: 3 x manual operation		
	30.1 kA rms-asym: 2 x manual operation		
Momentary withstand (3 second): IEEE 37.34 (1994)	600 A	25.8 kA rms	
	900 A	31.5 kA rms	
	1200 A	44 kA rms	
Momentary withstand (10 cycle): ANSI C37.32 (1996)	600 A	40.1 kA rms	65 kA peak
	900 A	50.4 kA rms	82 kA peak
	1200 A	70.4 kA rms	114 kA peak
Insulator type	Silicone		
	Porcelain		
Interrupter type	Expulsion tube: 2,500 open and close operations		
	Vacuum bottle: 5,000 open and close operations		
Crossarm type	Galvanized steel: 2,000 lbs/phase		
	Fiberglass: 1,000 lbs/phase		
Mounting configurations	Horizontal (upright, extra clearance, or underarm)		
	Vertical (phase over phase)		
	Riser (vertical)		
	Delta (pole top)		
	Hookstick		
Control mechanism	Reciprocating control rod		
	Torsional control rod		
	Motor operator		
Ice breaking	¾" (manual operation)		
Mechanical	Tested up to 5,000 cycles (open/close)		

* GridGuard switches are ANSI rated switches. The GridGuard Ax6xxxx is rated 600 A continuous current per the ANSI C37.30 temperature rise test requirements and rated 900 A continuous current per the IEEE 1247 temperature rise test requirements. The GridGuard Ax9xxxx is rated 900 A continuous current per the ANSI C37.30 temperature rise test requirements. The GridGuard Ax1xxxx is rated 1200 Amps continuous current per the ANSI C37.30 temperature rise test requirements. Momentary current ratings (10 cycle) are:

Ax6xxxx 600 A (ANSI C37.30) = 40 kA
 Ax9xxxx 900 A (ANSI C37.30) = 51 kA
 Ax1xxxx 1200 A (ANSI C37.30) = 70 kA

** Vacuum interrupter required for load interruption.

Features and benefits

The phase base box frame design manufactured from 1/4" steel supports the spindle and bearing at both sides, providing stability and strength. This feature maintains the blade-to-contact alignment throughout the life of the switch. Bearings in the bell crank reduce the forced required to operate the switch and eliminate corrosion due to plated metal-metal wear. (See image 1 below)

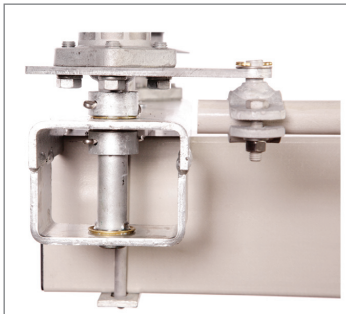
Formed, two-piece clamps compress the interphase rod surface with significantly more distributed pressure than industry standard clamping practices. This scheme prevents slippage and helps maintain uniform operation and full closure of all three phases throughout the life of the switch. (See image 2 below)

Busbar grade copper (C110) contact components are 99% conductive and structurally superior. This material provides a smooth surface for better terminal connection and is not subject to unseen porosity. This contact system allows the GridGuard to achieve the highest momentary and fault close rating in the industry. (See image 3 below)

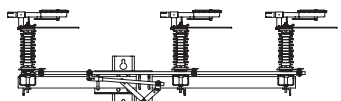
The expulsion tube interrupter (see image 3 below) uses leading edge technology to break loads up to 900 A at 27 kV, while the enclosed vacuum bottle interrupter (see image 4 below) is capable of breaking loads up to 1500 A at 35 kV. Both interrupters break loads within a half cycle (first zero crossing), preventing current chopping and serious voltage oscillation. The mechanical design of the interrupters allows them to operate independently of the switch operating speed, ensuring fast and constant load breaking speed every time. The spring-powered internal mechanisms automatically reset the interrupter for the next closing cycle. GridGuard interrupters are in the current path during opening operation only and do not have fault closing capabilities.

The standard offering silicone insulator on the GridGuard switch provides superior mechanical characteristics such as increased reliability, creep, and leakage distances and decreased weight. UV resistance is an inherent feature of silicone rubber and hydrophobic characteristics make it contamination resistant. (See image 4 below)

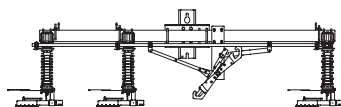
- 1 Phase base box frame | 2 Formed, two-piece clamps | 3 Busbar grade copper components and expulsion tube interrupter |
4 Enclosed vacuum bottle interrupter and silicone insulator



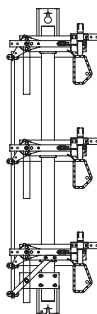
Standard mounting configurations



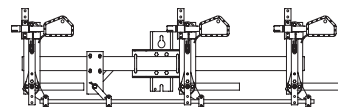
Horizontal (upright)



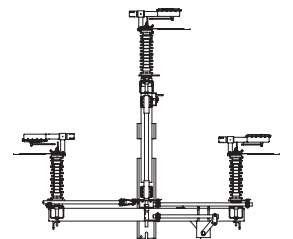
Underarm horizontal
(extra pole clearance)



Vertical tiered (phase/phase)



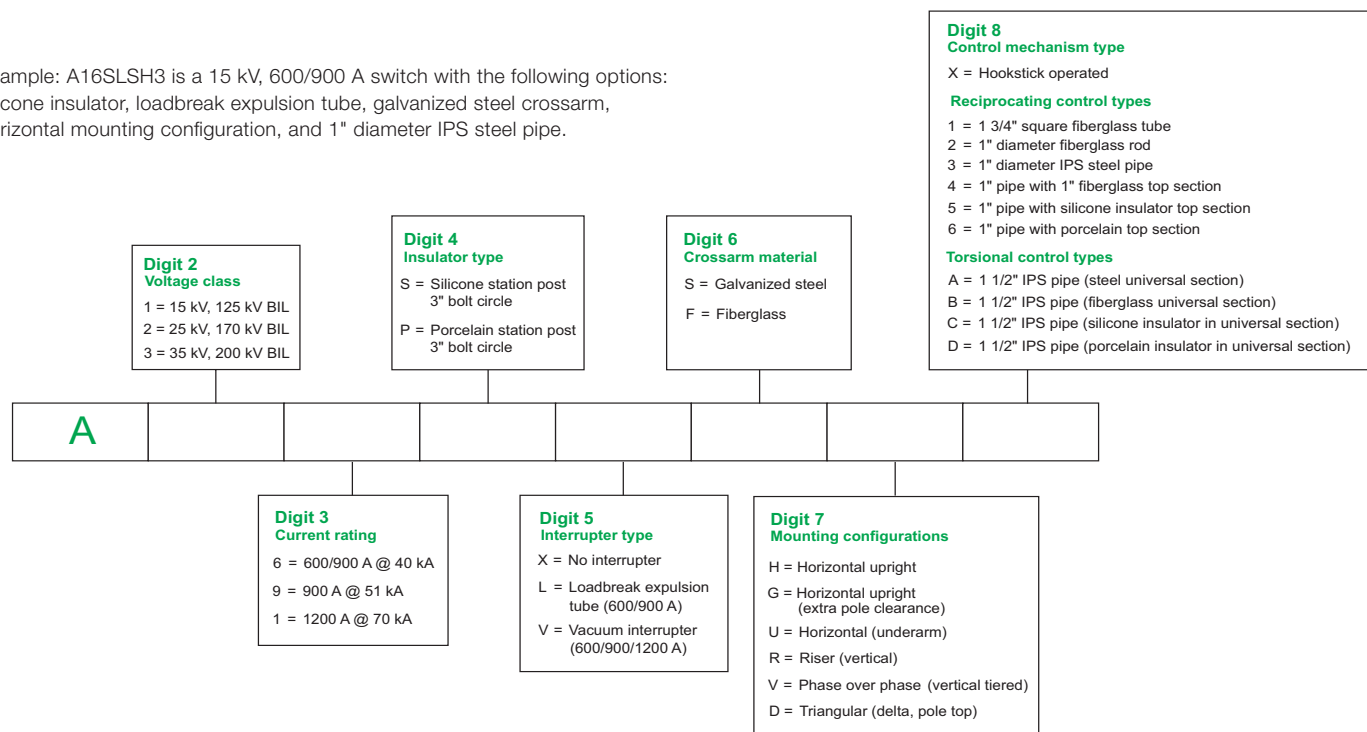
Riser (vertical)



Triangular (delta)

Selection guide

Example: A16SLSH3 is a 15 kV, 600/900 A switch with the following options: silicone insulator, loadbreak expulsion tube, galvanized steel crossarm, horizontal mounting configuration, and 1" diameter IPS steel pipe.



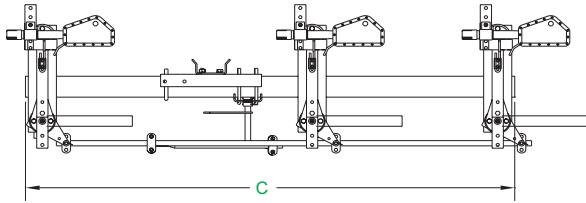
Standard minor modifications

Select the appropriate modification and its corresponding suffix; add to the end of the baseline style chosen above. The maximum allowable number of minor modifications is eight (8).

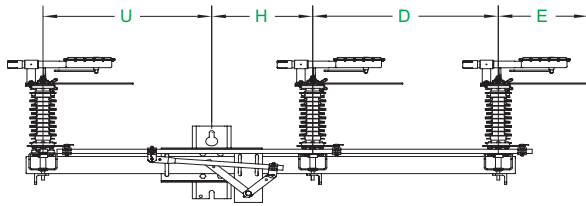
Standard minor modifications	Applicable to mounting configurations	Suffix
Mounting brackets for three surge arresters	H,V,D,R,U	A
Mounting brackets for six surge arresters	H,V,D,R,U	B
Extension/dead ending link assembly (14" long set of 6)	H,V,D,U	C
Additional nameplate on handle	H,V,D,R,U	E
Bonded reciprocating operating handle	H,V,D,R,U	F
Grounding connector on crossarm	H,V,D,R,U	G
90° control rod relocation for reciprocating control mechanisms	H,V,D,R,U	H
Wildlife protection shields (per phase; each)	H,D	J
Ice shields	H,V	K
Harsh environment sealed stainless steel ball bearings	All	L
Captive hardware on terminal pads	All	M
Pole band and J-bolts for mounting on a wooden pole	H,V,D,R,U	N
Neutral wire provision_single conductor side of arm	H,U	P
Hookstick lockout-tagout device for hookstick operated switches	H,U	Q
No operating handle (MSO reciprocating)_not for hookstick configuration	-	R
Switch supplied with insulators of the next higher voltage rating: S1 = silicone, 25 kV; S2 = silicone, 35 kV; S3 = porcelain, 25 kV; S4 = porcelain, 35 kV	All	S1 S2 S3 S4
Extra height: one extra 1-1/2" diameter pipe section and one guide bearing assembly and rod splice (torsional mechanism); T2 = 2 sections, etc.	All	T
Extra height: one extra 1" diameter pipe section, two eye-bolt guide bearings, rod splice_reciprocating mechanism: U2 = 2 sections, etc.	All	U
Extra height: one extra 1" diameter fiberglass rod section, two eye-bolt guide bearings, rod splice_reciprocating mechanism: V2 = 2 sections, etc.	All	V
Extra height: one extra 1-3/4" square fiberglass rod section, two eye-bolt guide bearings, rod splice_reciprocating mechanism: V2 = 2 sections, etc.	All	Y

Outline drawings

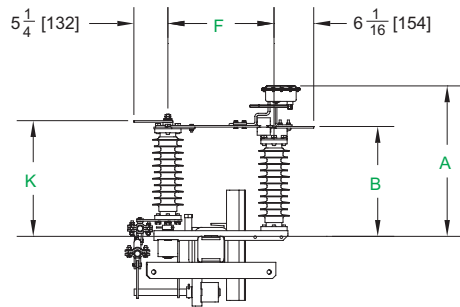
15 - 35 kV horizontal upright reciprocating control (drawing 9710M)



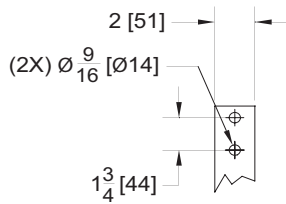
Top view



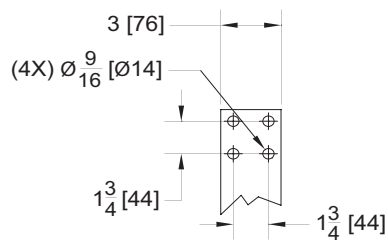
Front view



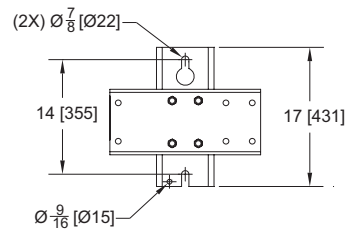
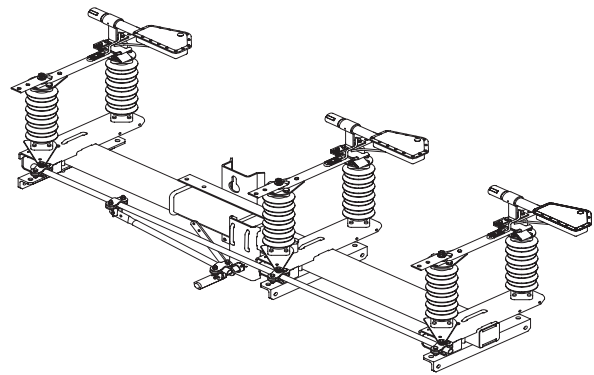
Side view



600A/900A terminal pad detail



1200A terminal pad detail

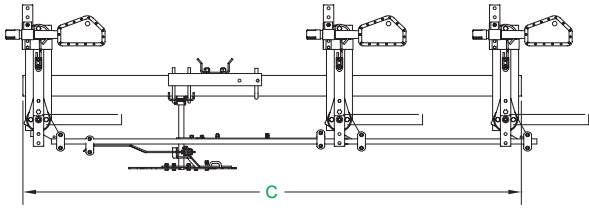


Mounting bracket detail

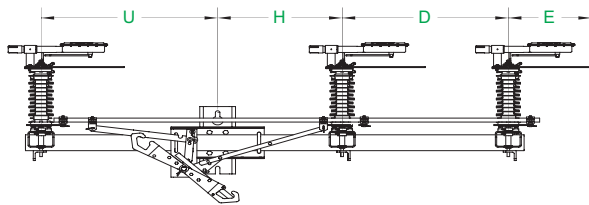
Rating (kV)	Dimensions (in)								
	A	B	C	D	E	F	H	K	U
15	19 1/8	13 1/2	76	26	13	13 1/4	18	14 1/4	26
25	23 1/8	17 1/2	87	33	16	16 1/4	18	18 1/4	30
35	27 1/8	21 1/2	120	45	22	22 1/4	21	22 1/4	48

Note: available in all operating configurations

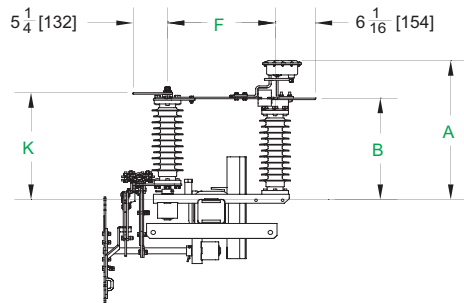
15 - 35 kV horizontal upright hookstick control
(extra mounting clearance (drawing 9713M))



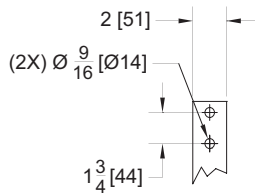
Top view



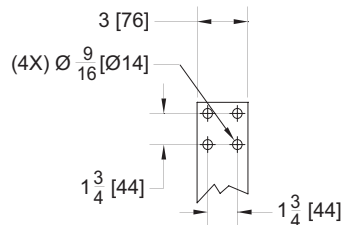
Front view



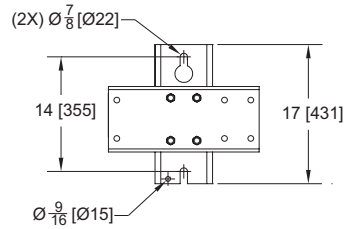
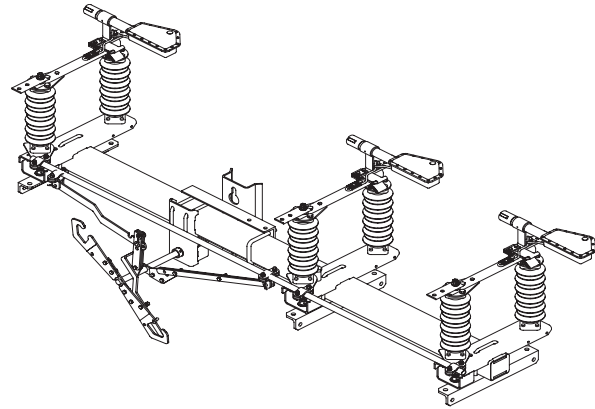
Side view



600A/900A terminal pad detail



1200A terminal pad detail

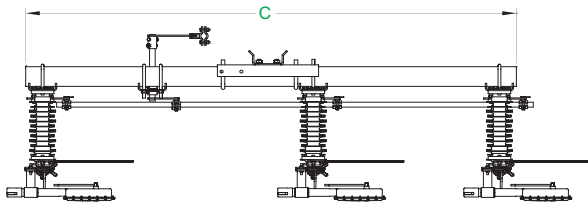


Mounting bracket detail

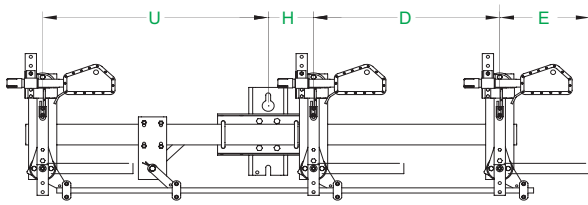
Rating (kV)	Dimensions (in)								
	A	B	C	D	E	F	H	K	U
15	19 1/8	13 1/2	87	26	13	13 1/4	24	14 1/4	31
25	23 1/8	17 1/2	102	33	16	16 1/4	24	18 1/4	39
35	27 1/8	21 1/2	129	45	22	22 1/4	24	22 1/4	54

Note: available in all operating configurations

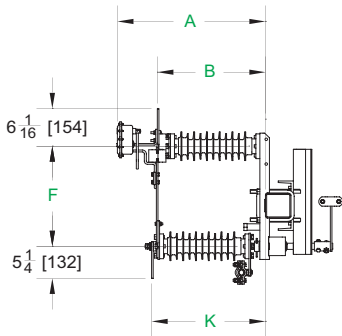
15 - 35 kV riser vertical reciprocating control (drawing 9716M)



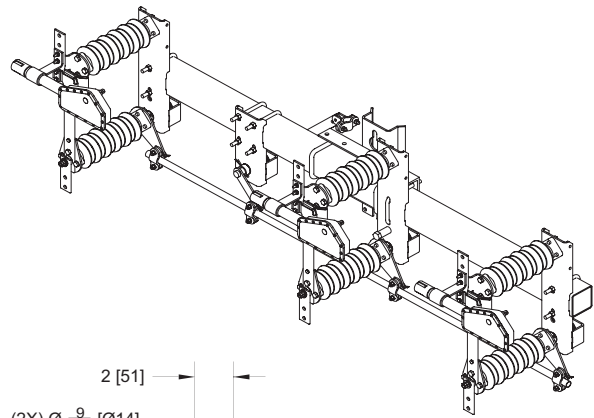
Top view



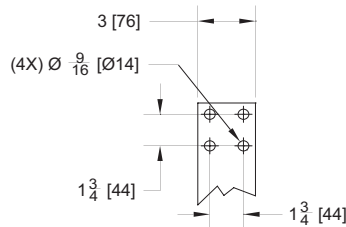
Front view



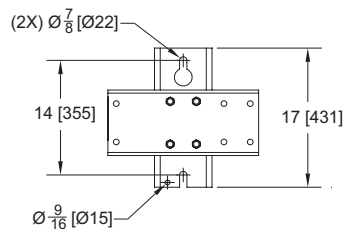
Side view



600A/900A terminal pad detail



1200A terminal pad detail

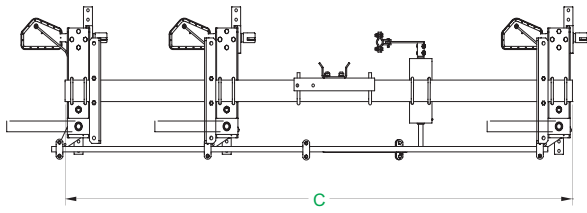


Mounting bracket detail

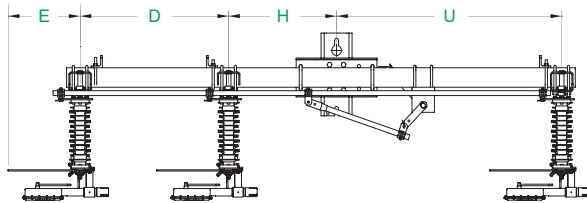
Rating (kV)	Dimensions (in)								
	A	B	C	D	E	F	H	K	U
15	19 1/8	13 1/2	76	35	13	13 1/4	8	14 1/4	25 1/2
25	23 1/8	17 1/2	87	33	16	16 1/4	8	18 1/4	40
35	27 1/8	21 1/2	102	48	22	22 1/4	8	22 1/4	40

Note: available in all operating configurations

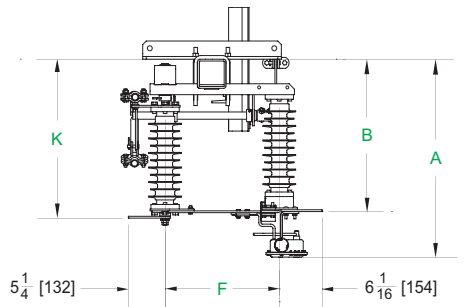
15 - 35 kV horizontal underarm reciprocating control
(extra pole mounting clearance) (drawing 9714M)



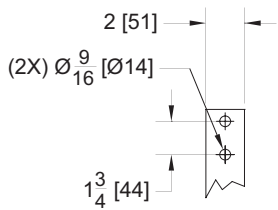
Top view



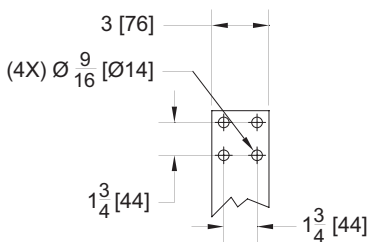
Front view



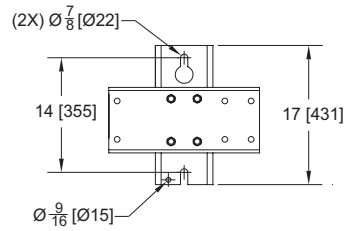
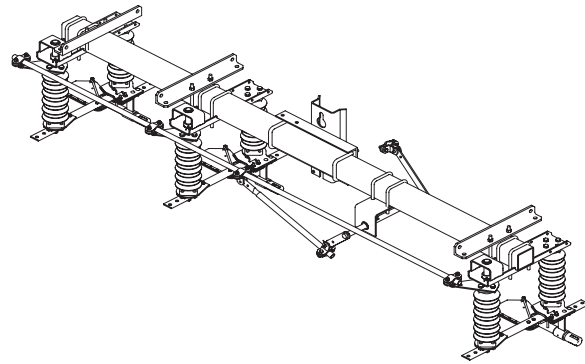
Side view



600A/900A terminal pad detail



1200A terminal pad detail

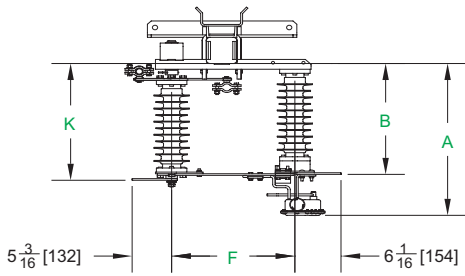


Mounting bracket detail

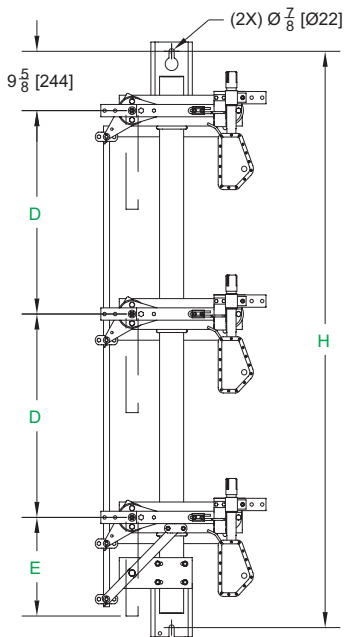
Rating (kV)	Dimensions (in)								
	A	B	C	D	E	F	H	K	U
15	19 1/8	13 1/2	102	26	13	13 1/4	24	14 1/4	46
25	23 1/8	17 1/2	113	33	16	16 1/4	24	18 1/4	50
35	27 1/8	21 1/2	129	45	22	22 1/4	24	22 1/4	54

Note: available in all operating configurations

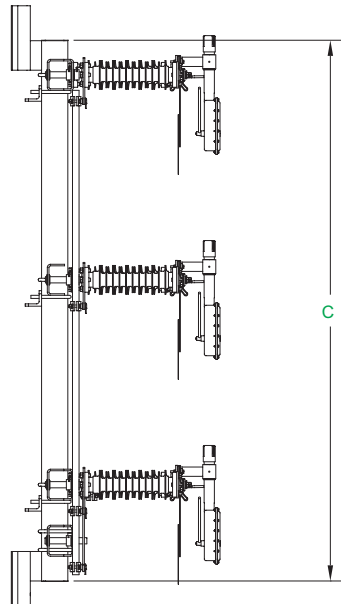
15 - 35 kV phase over phase (vertical tiered) reciprocating control (drawing 9720M)



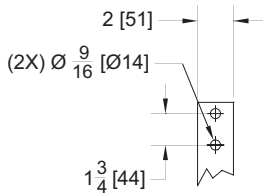
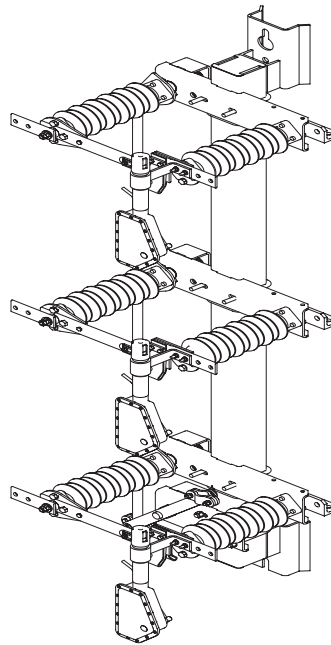
Top view



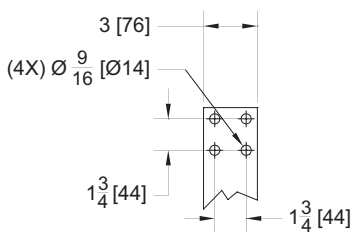
Front view



Side view



600A/900A terminal pad detail

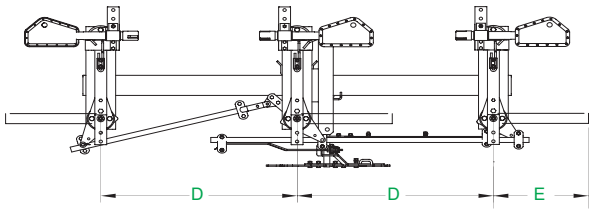


1200A terminal pad detail

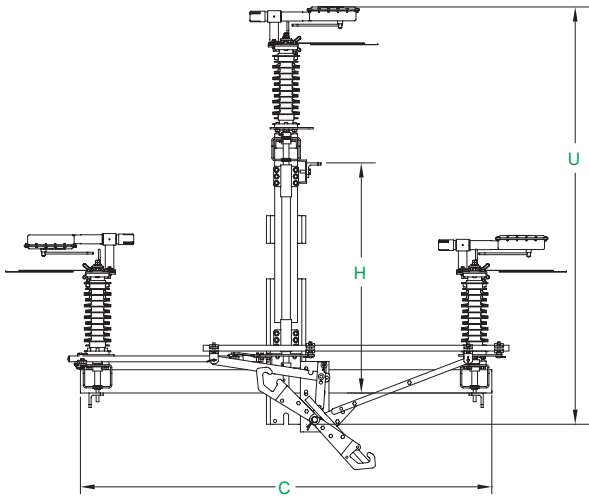
Rating (kV)	Dimensions (in)								
	A	B	C	D	E	F	H	K	U
15	19 1/8	13 1/2	87	26 1/4	13	13 1/4	92	14 1/4	--
25	23 1/8	17 1/2	102	33	16	16 1/4	107	18 1/4	--
35	27 1/8	21 1/2	129	48	22	22 1/4	134	22 1/4	--

Note: available in all operating configurations

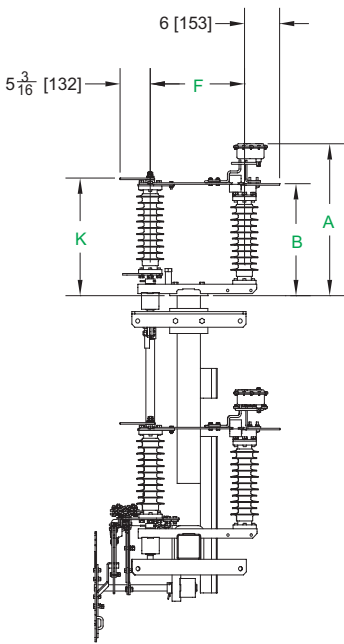
15 - 35 kV triangular (pole top) hookstick control (drawing 9719M)



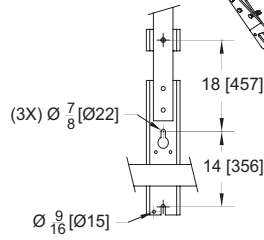
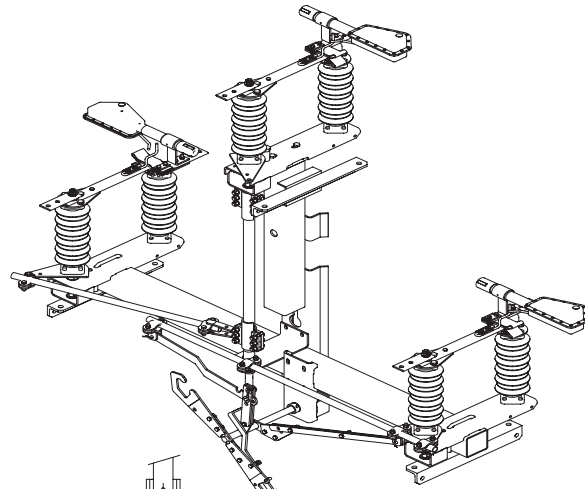
Top view



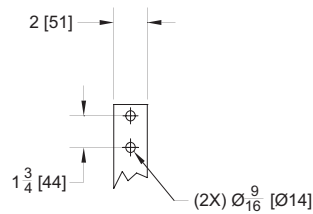
Front view



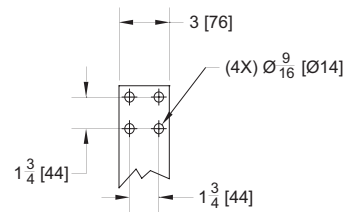
Side view



Mounting bracket detail



600A/900A terminal pad detail



1200A terminal pad detail

Rating (kV)	Dimensions (in)								
	A	B	C	D	E	F	H	K	U
15	19 1/8	13 1/2	68	31	13	13 1/4	39 1/2	14 1/4	73
25	23 1/8	17 1/2	72	33	16	16 1/4	39 1/2	18 1/4	77
35	27 1/8	21 1/2	76	35	22	22 1/4	39 1/2	22 1/4	81

Note: available in all operating configurations

Notes

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Fax: +1 336 275-1965

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