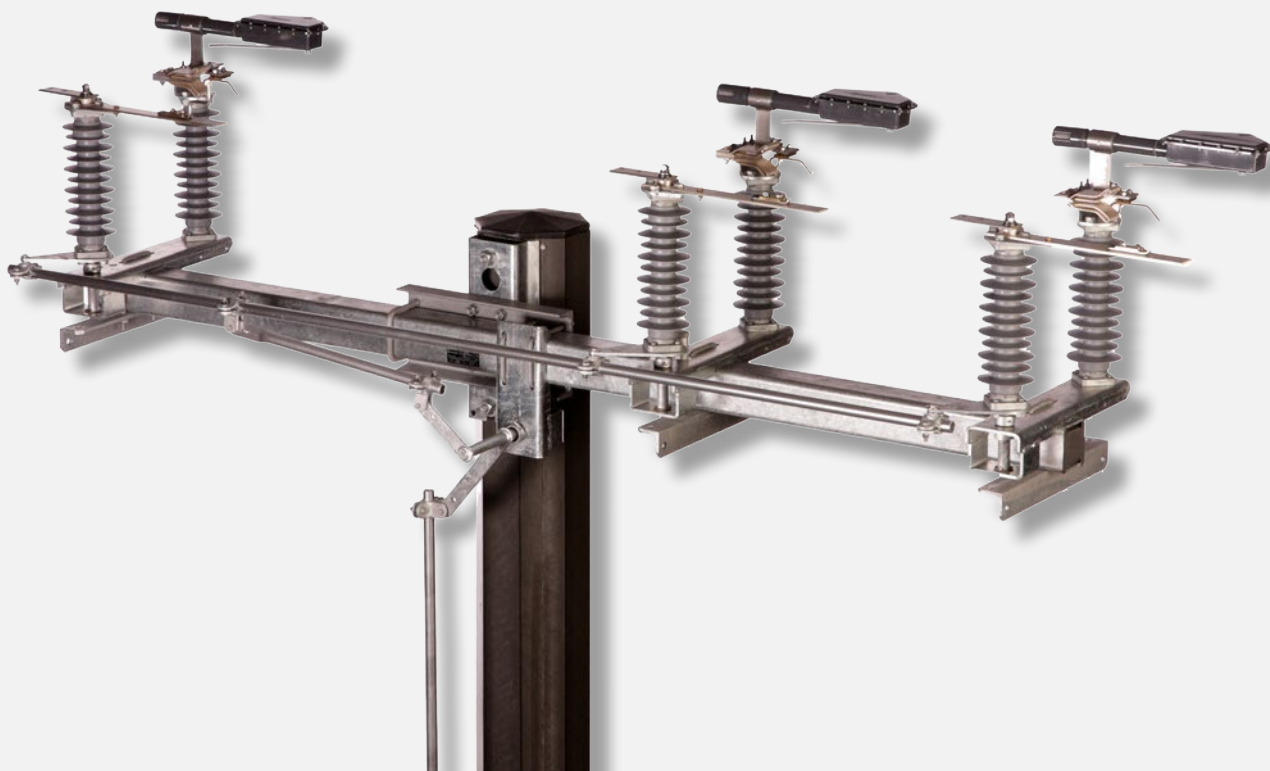


OVERHEAD DISTRIBUTION SWITCHES





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LINEBOSS™ 15KV - 35KV SIDEBREAK GOAB SWITCH

The LineBOSS™ Sidebreak switch is the most robust, yet elegant sidebreak switch in the market today.

Every LineBOSS™ component brings meaningful operator benefits for years to come. Features such as 1/4 inch steel phase base, stainless steel to brass bearings, silver plated copper reverse loop contacts and busbar blades mean efficient and smooth operation over a very long life; even in hostile environments where dust, humidity, corrosives and other industrial or natural contaminants play havoc with most. You'll be amazed with how much switch you can buy for the money. The LBS distribution switch is RUS accepted.

SPECIFICATIONS

Switch Ratings:	
Voltage Class:	15.5kV, 25.8kV & 38kV
Continuous Current Class:	600, 900, 1200 AMPS
Fault Close:	15kA rms-asym: 5 X manual operation 20kA rms-asym: 3 X manual operation 30kA rms-asym: 2 X manual operation
Momentary Current:	600A 40,000 A rms/65kA peak - 10 cycles 25,000 A rms 3 seconds
	900A 51,000 A rms/72kA peak - 10 cycles 32,000 A rms 3 seconds
	1200A 70,000 A rms/99kA peak - *10 cycles 44,000 A rms 3 seconds
Ice breaking:	3/4" (manual operation)
Mechanical:	5000 cycles (open/close)

**Inertia exceeds ansi required of 60kA rms momentary*

Tested in accordance with IEEE Std. C37.34-1994 ANSI/IEEE Std. 37-71-1984 and IEC Std. 265-1, 1983.

CROSSARM RATINGS

Crossarm Material:	Dead End Loading:
Galvanised Steel (standard duty)	2000 lbs/phase
Galvanised Steel (heavy duty)	6000 lbs/phase
Aluminium (standard duty)	1500 lbs/phase
Aluminium (heavy duty)	3000 lbs/phase
Fibreglass (standard duty)	1000 lbs/phase
Fibreglass (heavy duty)	2500 lbs/phase

[4]

15 kV horizontal with reciprocating control with fibreglass crossarm



STANDARD FEATURES

- Resilient, higher BIL silicone rubber insulators
- Reverse loop silver plated copper jaw contacts
- Maintenance free stainless steel/brass bearings
- Unitised construction: aluminium, steel or fibreglass
- Factory adjusted, ready to mount
- Meets all applicable NEMA and ANSI standards
- All ferrous components are hot dip galvanised
- Tinned copper terminal pads

STANDARD CONFIGURATIONS

- Horizontal (upright)
- Horizontal (centre mount)
- vertical (tiered outboard)
- Vertical (Phase over phase)
- Horizontal (underarm)
- Riser
- Delta (pole top)

LOADBREAK DEVICES

- Arc Horns
- Quickbreak Whip Attachments
- Arc Chute Load Break
- AmpRupter Load Break
- AmpVac Load Break

ACCC Designation D06
Loadability factor 1.22 at 25°C

LINEBOSS™ SELECTION GUIDE (15-38KV)

LineBOSS™ Unitized Sidebreak Line Switch → **L 16 S L S H 11 23**

Voltage Class: 15.5 kV = 1
25.8 kV = 2
38.0 kV = 3

Current Rating: 600 A (ANSI 30°C rise) = 6
900 A (IEEE only) = 6
900 A (ANSI 30°C rise) = 9
1200 A (ANSI 30°C rise) = 1

Insulator Type
Silicone Rubber (3.0" BC) = S
Porcelain (3.0" BC) = P
Increase insulator creepage
+1 voltage class = add 1 after S, P
+2 voltage classes = add 2 after S, P

Interrupter Type
NO interrupter = X
Arc Whip, Quick-break = Q
Loadbreak, Amprupter = L
Vacuum bottle, AmpVac = V


Crossarm Type
Galv. Steel = S ("SX" for heavy duty arm)
Aluminum = A ("AX" for heavy duty arm)
Fiberglass = F ("FX" for heavy duty arm)
No Xarm = X
Customer specified loading (call factory)

Mounting Configurations
Horizontal Upright = H
Vertical (Phase over phase) = V
Vertical (tiered outboard) = B
Triangle..... = D
Riser = R
Underarm Horizontal = U
For GO 95 clearances add G ("HG", "UG" etc)

Control Rod Length (10' sect.)
30 feet (standard) = 3
specify alternate = ___
Insulated section = B
(equal to switch BIL)

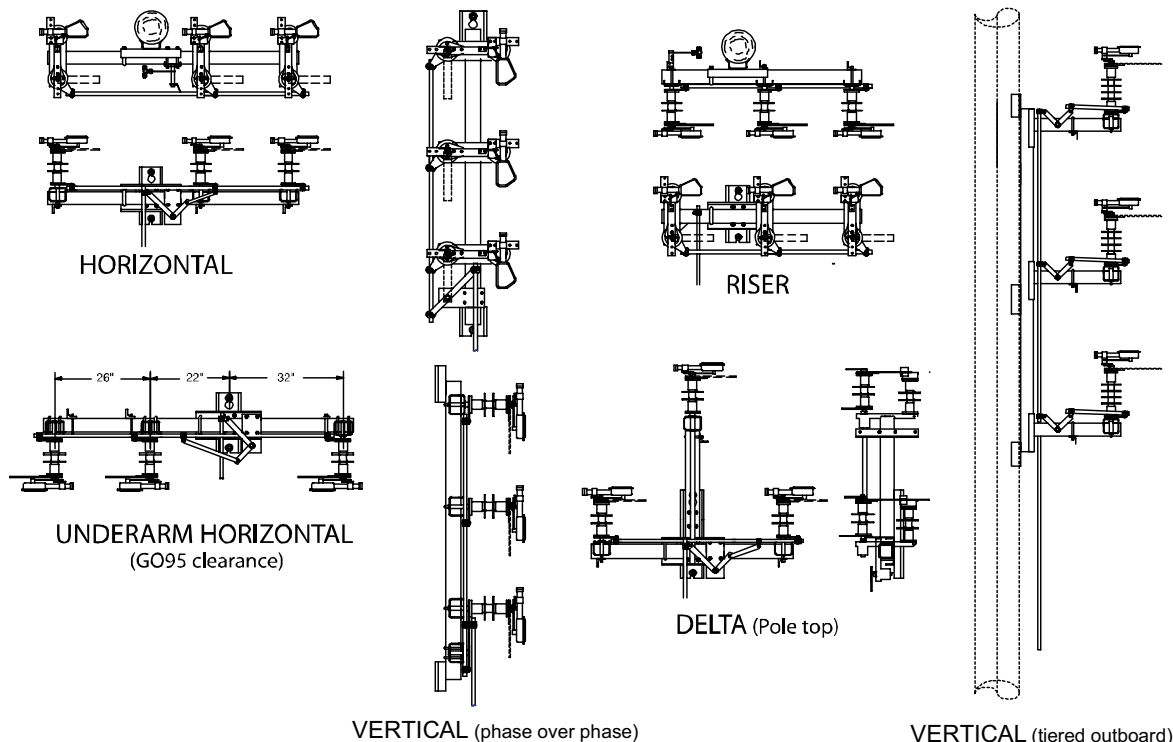
Control Rod Type
Reciprocating
1" galvanized pipe = 4
¾" galvanized pipe = 3
1" round fiberglass = 2
1 ¾" square fiberglass = 1
Torsional
1½" galvanized pipe = 6

Control Location
Specify the quadrant by number, where the control is to be located



Control Mechanism
Reciprocating handle = 1
Torsional handle = 2
Add "C" for counterclockwise
Hookstick bellcrank = 3
None (Motorized Operator) = X

LINEBOSS™ STANDARD CONFIGURATIONS

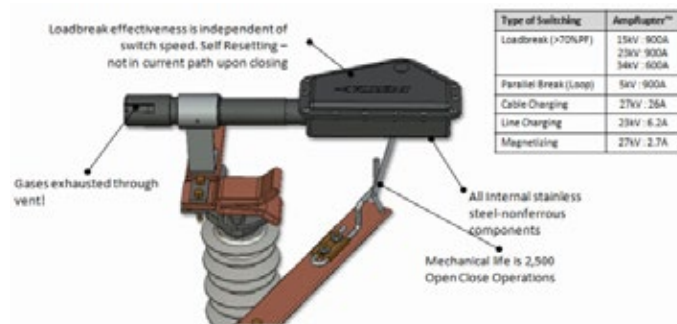


LINEBOSS™ AIR BREAK DISCONNECT SWITCH ATTACHMENT SELECTION INFORMATION

AMPRUPTER™

The Inertia AmpRupter utilizes expulsion tube interrupter technology to break current loads up to 900 amps at 27kV. It is used for load break, loop break, line charging and cable charging switching operations. The AmpRupter was tested to IEEE 1247-1998 IEEE Standard for interrupting switches for alternating current rated above 1000 Volts. The mechanical life of the AmpRupter is 2,500 operations. The electrical life of the AmpRupter is dependent on the amount of load interrupted.

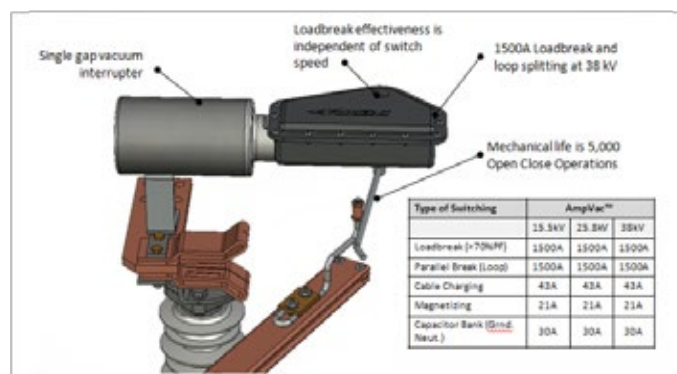
AmpRupter load interruption occurs as the switch blade leaves the contact clip; making contact with the catch arm. At this point, current is shunted through the actuator arm, through the contacts to the load side. As the blade continues towards its open position, the internal spring powered mechanism trips; breaking the internal contacts. This action evolves a pressurized non-conductive gas that extinguishes the



arc. This process occurs within one half cycle (first zero crossing), and will not “chop” the current upon circuit interruption. The speed of the AmpRupter mechanism is not dependent on the switch operating speed, insuring that the load breaking capabilities are consistent regardless of switch opening speed. The AmpRupter automatically resets for the next operation. The AmpRupter is not in the current path during the switch closing operation, and has no fault closing capabilities. The AmpRupter is in the current path **during the switch opening operation only.**

AMPVAC™

The AmpVac is an enclosed vacuum bottle interrupter where no gases are vented to the atmosphere. This single contact AmpVac interrupters break loads up to 1500 amps at 48-138kV. Single vacuum bottle interrupters may be used at increased voltages for parallel or loop switching applications as long as the peak recovery voltage does not exceed 38kV. The mechanical and electrical life of the AmpVac is 5000 operations at full load. The AmpRupter was tested to IEEE 1247-1998.



The V2 and V3 vacuum interrupters are two-gap and three-gap load-breaking devices that utilize vacuum bottle technology. V2 vacuum interrupters, with two vacuum bottles in series, can break loads up to 2000 Amps at 48kV. V3 vacuum interrupters, with three vacuum bottles in series, can break loads up to 2000 Amps at 69kV. Vacuum bottle interrupters are not in the current path during the switch closing operation, and have no fault closing capabilities. The mechanical and electrical life of the V2, V3 vacuum interrupter is 5000 operations at full load



LINEBOSS™ AIR BREAK DISCONNECT SWITCH ATTACHMENT SELECTION INFORMATION

ARCCHUTE (DELTRIN “CLAPPER”)

The ArcChute Interrupter is a minimal load-breaking device that utilises air break technology. The arc is quenched as the two Delrin arc chute plates close and the arc whip breaks away establishing the required metal-to-metal open gap. Arc Chute interrupters are widely used for line charging and magnetising current interrupting. Full loadbreak and parallel breaking currents up to 150 amps at 21kV or 20 amps at 34.5kV are common applications. Arc Chute interrupters are only in the current path during the opening process and have an average life of 150 operations.



ARCWHIP

The ArcWhip has a small interrupting rating of between 10 and 20 amps. ArcWhips can clear arcks from residual energy stored in capacitor banks, transformers or conductors. ArcWhips are only in the current path during switch opening operations, and have an average life of 150 open operations.



ARCHORN

The Arc Horn is not an interrupter and has no ratings. It is used as an arc deflecting mechanism to save the life of switch blades and contact clips. The ArcHorn, also known as “sacrificial arcing horn”, is the first point of contact during switch closing operations. The initial making current during a closing operation creates small arcs, pitting the arc horns. This “sacrificial” mechanism helps prevent degradation of the main contacts. The Arc Horn is used to redirect the arc resulting from residual or stored charge left after a down-line circuit is opened. Arc Horns will not prevent damage from the inadvertent opening of a loaded switch.



VACUUM BOTTLE INTERRUPTER APPLICATIONS

Type of switching	AmpVac, 1-Gap Vacuum Interrupter					V2, 2-Gap		V3, 3-Gap	
	15.5kV	25.8kV	38.0kV*	48.3kV	72.5kV*	38.0kV	48.3kV	48.3kV	72.5kV
Loadbreak, 70% PF	1500 A	1500 A	1500 A	1500 A	1500 A	2000 A	2000 A	2000 A	2000 A
Parallel Break, <30% PF	1500 A	1500 A	1500 A	1500 A	1500 A	2000 A	2000 A	2000 A	2000 A
Cable Charging	1500 A	950 A	100 A	7 A**	3 A**	6000 A	450 A	600 A	70 A
Magnetising	1500 A	1000 A	300 A	7 A**	3 A**	700 A	700 A	800 A	700 A
Capacitor Bank (grnd. neut)	1500 A	950 A	100 A	7 A**	3 A**	600 A	700 A	800 A	600 A

*Recovery voltage between source and load must be less than 38kV, immediately

**Higher current rating available with use of a voltage limiter; consult the factory for details

INTERRUPTER ATTACHMENT DEVICE APPLICATIONS

Type of Switching	ArcHorn	ArcWhip	ArcChute	AmpRupter™
Loadbreak, >70% PF	N/A	N/A	15kV: 150 A 21kV: 100 A 35kV: 20A	15kV: 900 A 23kV: 900 A 34kV: 600A
Parallel Break (Loop) <30% Power Factor	N/A	N/A	15kV: 150 A 21kV: 100 A 35kV: 20A	5kV: 900 A
Cable Charging	N/A	up to 72.5kV: 15 A	up to 72.5kV: 15 A	27kV: 26 A
Line Charging	N/A	up to 72.5kV: 3500 kVA	up to 72.5kV: 3500 kVA	23kV: 6.2 A
Magnetising	N/A	N/A	N/A	27kV: 2.7 A

LINEBOSS™ 15KV-35KV, 600-1200 AMP SIDEBREAK STYLE SWITCH FEATURES & BENEFITS

1/4" HOT-ROLLED STEEL PHASE BASE

Many manufacturers use 7 gauge (3/16") steel bases that can flex during normal operation, causing blade-to-clip misalignment.



ROTATING INSULATOR SHAFT SUPPORT

Some rotating insulator spindles are made of zinc chromate plated steel which can rust. Others cast aluminium which is inexpensive, but has poor wear characteristics and does not have the strength of steel. Switches can come out of contact if a spindle bearing fails. The added benefit of stainless steel and brass ensures a long reliable switch life.



BUSBAR GRADE COPPER CONTACT COMPONENTS

Busbar grade copper contact components are structurally superior with greater conductivity than cast contact material. Cast aluminium and copper bronze contact casings are 34-36% conductive and often contain unseen surface irregularities and voids that create 'hot spots'. Busbar grade C110 copper is 99% conductive and is many times smoother to provide better terminal connection surfaces and is not subject to unseen porosity. With this contact system, the LineBOSS has achieved the highest momentary and fault close ratings in the industry. Momentary: to 70kA for 10 cycles and 44kA for 3 seconds. Fault close: 30kA (2X)



ANSI TRxx SERIES 3" BOLT CIRCLE STATION POST INSULATORS PROVIDED IN SILICONE OR PORCELAIN

These insulators have superior mechanical characteristics over 2 1/4" BC insulators. Silicone insulators have additional BIL, leakage and weatherability ratings over either porcelain or epoxy insulators.



STAINLESS STEEL/BRASS BEARINGS ON ROTATING

STACKS

Some rotating insulator spindles and bearings are supported solely on the 3/16" thick phase base surface. The spindle and its bearing should be supported at both the phase base surface and the end of the spindle opposite the blade. A 1/4" thick base supporting the rotating stack at two points assures a robust construction that maintains the blade to contact alignment throughout the life of the switch.

FORMED INTERPHASE ROD CLAMPS WITH TWO-BOLT

CLAMPING

Often, switch manufacturers use cast clamps to connect the interphase rod to the rotating sticks. This clamping method has one fixed side and only one open side to pinch the interphase rod. The interphase rod clamp is the device that assures uniform operation of the three switch phases. Any slippage results in an improperly adjusted switch, with not all phases fully closed into the contacts. The LineBOSS uses formed two-piece clamps to compress the interphase rod surface with significantly more distributed pressure. This helps to maintain uniform operation of all three phases throughout the life of the switch.

STAINLESS STEEL/BRASS BEARINGS IN THE

BELLCRANK

Bearings in the bellcrank reduce the force required to operate the switch and eliminate corrosion due to plated metal-to-metal wear.

Insulator Type (25 kV example)	Load Ratings:		B.I.L Rating Peak
	Cantilever	Torsion	
3" BC silicone	1,200 lbs.	6000 lbs.	165 kV
3" porcelain	2,000 lbs.	7,000 lbs.	150kV
2 1/4" BC porcelain	1,000 lbs.	3,000 lbs.	150kV
2 1/4 BC epoxy	1,200 lbs.	5,000 lbs.	150kV

SPECIFICATION ELEMENTS

15KV, 25KV & 35KV | 600, 900 & 1200 A SWITCHES

PART DESCRIPTION

GANG OPERATED LOADBREAK OVERHEAD SWITCHES (vertical, horizontal, riser, delta (pole top), twin circuit or horizontal underarm).

- Nominal voltage: (15 kV, 25 kV or 35 kV)
- Insulators: Silicone rubber station post; BIL rating (15 kV: 130 kV, 25 kV: 175 kV, 35 kV: 240 kV)
- Switch bearings: Stainless steel to brass on all rotating insulators and switch operating shafts.
- Loadbreak shall be capable of: 900 A load breaking, 25 A cable charging, 900 A parallel switching.
- Contacts: Copper busbar blade and reverse loop contacts are to be silver-plated, N.E.M.A. terminal pads shall be tin-plated copper busbar with a surface finish of 32 minimum.
- The switch shall provide means to attach line current/voltage sensors.
- All ferrous components shall be hot dip galvanized.
- Loadbreak shall be self-resetting; where the tripping speed of the loadbreak shall be independent of switch operating speed. No component of the loadbreak shall make contact with the closing switch blade prior to main switch contact engagement. All actuating mechanism components of the loadbreak device must be stainless steel or non-corrosive parts.
- Switch base (crossarm) is to be: (hot dip galvanized steel, fiberglass or aluminum) see LineBOSS™ switch selection guide for dead-end loading specifications. Specify pole clearance spacing i.e. 24", G095.
- Operating rod: specify type and length of control rod, and if an insulated section is required (see LineBOSS selection guide).
- The gang operated sidebreak style switch shall be capable of seamless automation with a torsional or reciprocating motor operator as dictated by the switch type. It shall be available with the motorized switch operator replacing the manual handle.
- Testing performed in accordance with standards: IEEE C37.32-1996, ANSI/IEEE C37.71-1984 and IEC 265-1,1983 as applicable for 12 kV, 21 kV or 34.5 kV (system voltage).

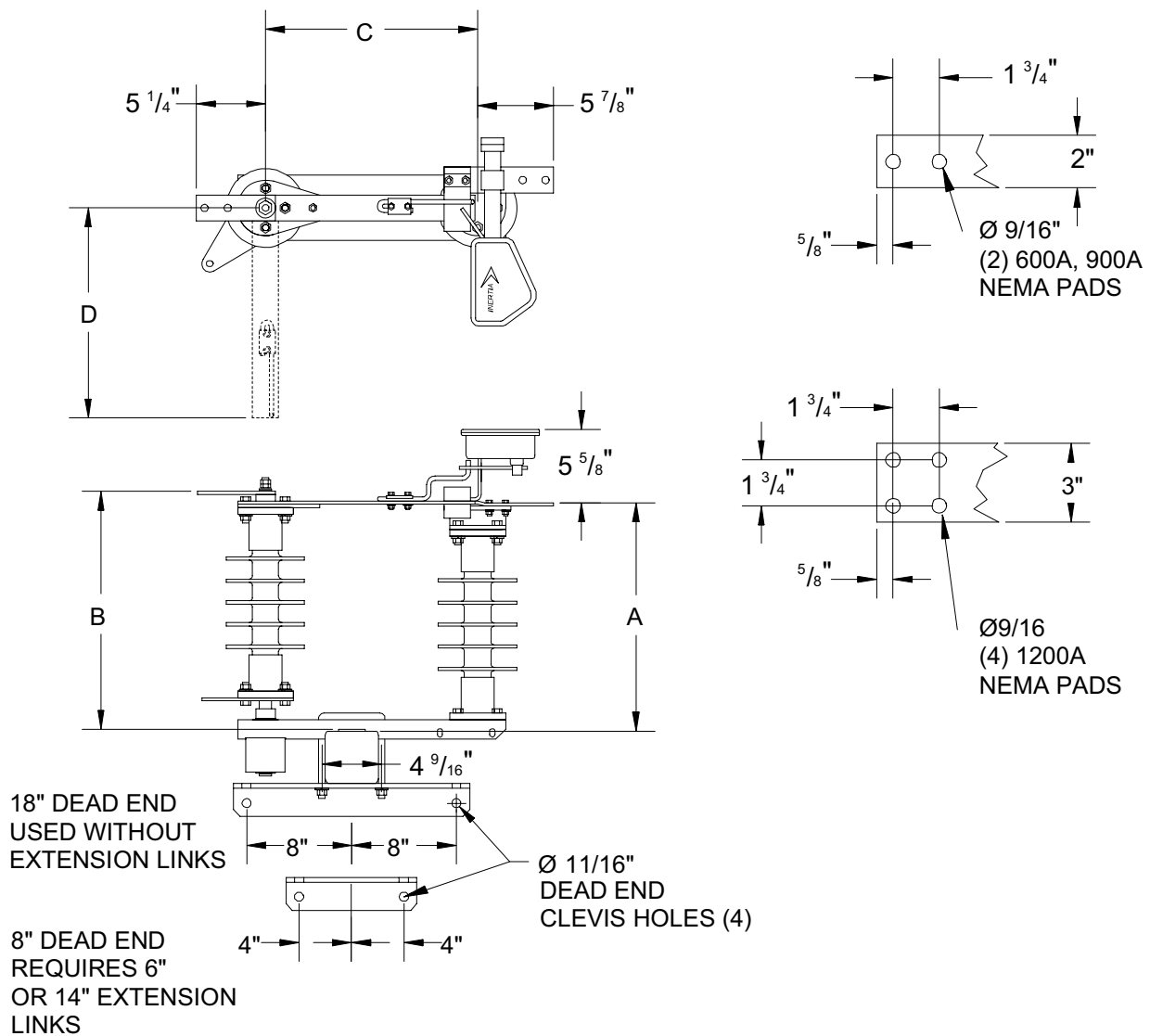
SWITCH RATINGS

Voltage Class:	15.5kV, 25.8kV and 38.0kV
Current Class:	600, 900 and 1200 A continuous
Fault Close:	15kA rms-asym: 5 X Manual Operation 20kA rms-asym: 3 X Manual Operation 30kA rms-asym: 2 X Manual Operation
Momentary current:	600A 40,000 A-rms 10 cycles 25,000 A-rms 3 seconds 900A 51,000 A-rms 10 cycles 32,000 A-rms 3 seconds 1200 A 70,000 A-rms 10 cycles 44,000 A-rms 3 seconds
Ice Breaking:	¾" (manual operation)
ACCC Designation DO6	
Loadability factor 1.22 at 25°C (not applicable to loadbreak devices)	

LOADBREAK DEVICE RATINGS

AmpVac Loadbreak:	12kV through 35kV		
Load Current:	1500 A-rms		
Parallel Current:	1500 A-rms		
Cable Charging:	600 A-rms		
Magnetising Current:	600 A-rms		
AmpRupter Loadbreak:			
Load Current:	900 A-rms @23kV		
Parallel Current:	900 A-rms @ 5kV		
Cable Charging:	26 A-rms @ 27kV		
Magnetising Current:	2.7A-rms @27kV		
Arc Chute Loadbreak	@15kV	21kV	35kV
Load Current:	150 A	100 A	20 A
Parallel Current:	150 A	100 A	20 A
Cable Charging:	15 A	15 A	15 A
Magnetising Current:	N/A	N/A	N/A
Quick Break Whip Ratings:			
Voltage (nominal)	Cable Charging	Line Charging	
15kV - 35kV	15 A-rms	3500 kVA	

9225M LBS, 15 KV - 35 KV SINGLE-PHASE DIMENSIONS



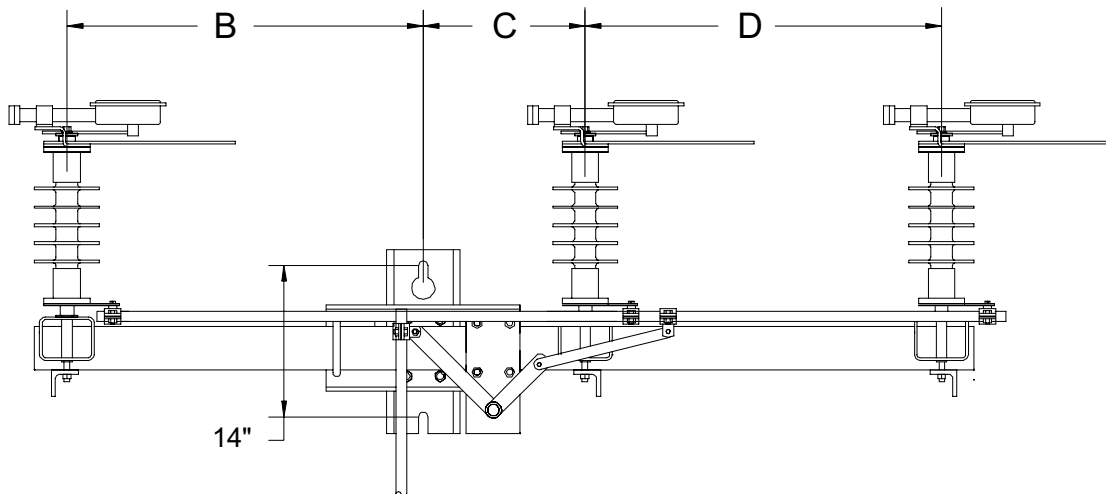
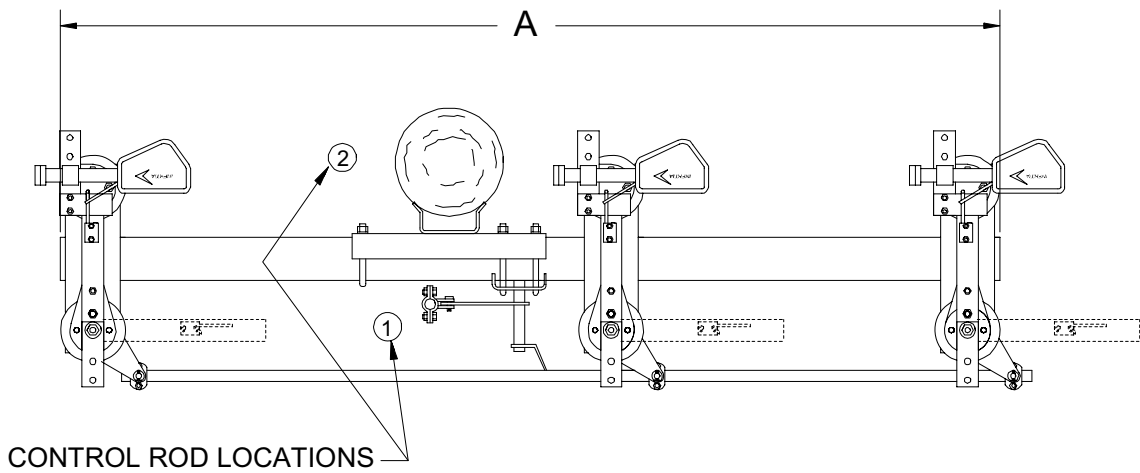
DIM	NOMINAL VOLTAGE RATING		
	15kV	25kV	35kV
A	13 1/2"	17 1/2"	21 1/2"
B	14 1/4"	18 1/4"	22 1/4"
C	13 3/16"	16 3/16"	22 3/16"
D	13"	16"	22"

SWITCH RATINGS	
Voltage Class:	15kV nom. (15.5kV max.) 110kV BIL 25kV nom. (25.8kV max.) 150kV BIL 35kV nom. (38.0kV max.) 200kV BIL
Current Class:	600, 900 and 1200 Amps, continuous
Momentary Current Rating	
600A Continuous:	40,000 Amps, 10 cycles 25,000 Amps, 3 seconds
900A Continuous:	51,000 Amps, 10 cycles 32,000 Amps, 3 seconds
1200A Continuous:	70,000 Amps, 10 cycles 44,000 Amps, 3 seconds

This drawing is for illustrative purposes only and therefore; may, or may not reflect the current revision of this drawing. Please request the current revision from the factory.

	Material:		Description: LBS, 15 kV - 35 kV SINGLE PHASE, Dim.
	Finish:		
	Scale:	None	Drawing No: 9225M 0
	Drawn by:		
	Date:	09/28/01	

9226M LBS, 15 KV - 35 KV HORIZONTAL DIMENSIONS



DIM	NOMINAL VOLTAGE RATING		
	15 kV	25 kV	35 kV
A	76"	87"	120"
B	26"	30"	50 1/2"
C	18"	18"	21"
D	26"	33"	45"

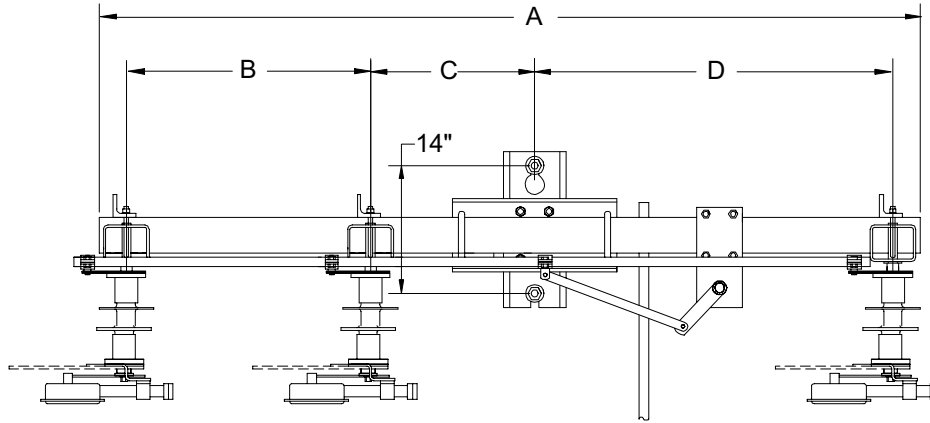
SWITCH RATINGS	
Voltage Class: 15 kV nom. (15.5 kV max.) 110 kV BIL 25 kV nom. (25.8 kV max.) 150 kV BIL 35 kV nom. (38.0 kV max.) 200 kV BIL	
Current Class: 600, 900 and 1200 Amps, continuous	
Momentary Current Rating:	
600 A Continuous:	40,000 Amps, 10 cycles 25,000 Amps, 3 seconds
900 A Continuous:	51,000 Amps, 10 cycles 32,000 Amps, 3 seconds
1200 A Continuous:	70,000 Amps, 10 cycles 44,000 Amps, 3 seconds

This drawing is for illustrative purposes only and therefore; may, or may not reflect the current revision of this drawing. Please request the current revision from the factory.

	Material:		Description:	
	Finish		LBS, 15 - 35 kV HORIZONTAL, Dimensions	
	Scale:	None	Drawing No:	
	Drawn by:		<div style="font-size: 2em; font-weight: bold;">9226M</div>	
	Date:	09/28/01		
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9241M LBS, 15 KV - 35 KV HORIZONTAL UNDERARM DIMENSIONS

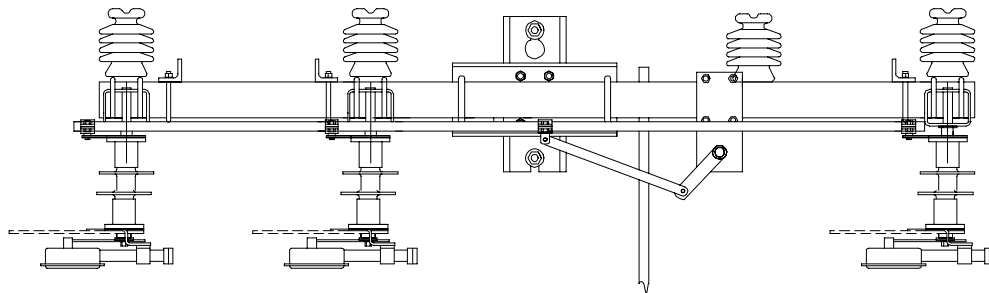
UNDERARM CONSTRUCTION REDUCES WILDLIFE CAUSED OUTAGES AND PROVIDES A CLEAR VIEW OF SWITCH CONTACTS TO WORKMEN.



THREE WIRE SWITCH DIMENSIONS.

DIM	NOMINAL KV RATING		
	15	25	35
A	90"	96"	126"
B	27"	33"	48"
C	18"	18"	18"
D	39"	39"	54"

SWITCH RATINGS	
Voltage Class: 15 kV nom. (15.5 kV max.) 110 kV BIL 25 kV nom. (25.8 kV max.) 150 kV BIL 35 kV nom. (38.0 kV max.) 200 kV BIL	
Current Class: 600, 900 and 1200 Amps, continuous	
Momentary Current Rating:	
600 A Continuous:	40,000 Amps, 10 cycles 25,000 Amps, 3 seconds
900 A Continuous:	51,000 Amps, 10 cycles 32,000 Amps, 3 seconds
1200 A Continuous:	70,000 Amps, 10 cycles 44,000 Amps, 3 seconds



UNDERARM SWITCH CONSTRUCTION APPLICATIONS:

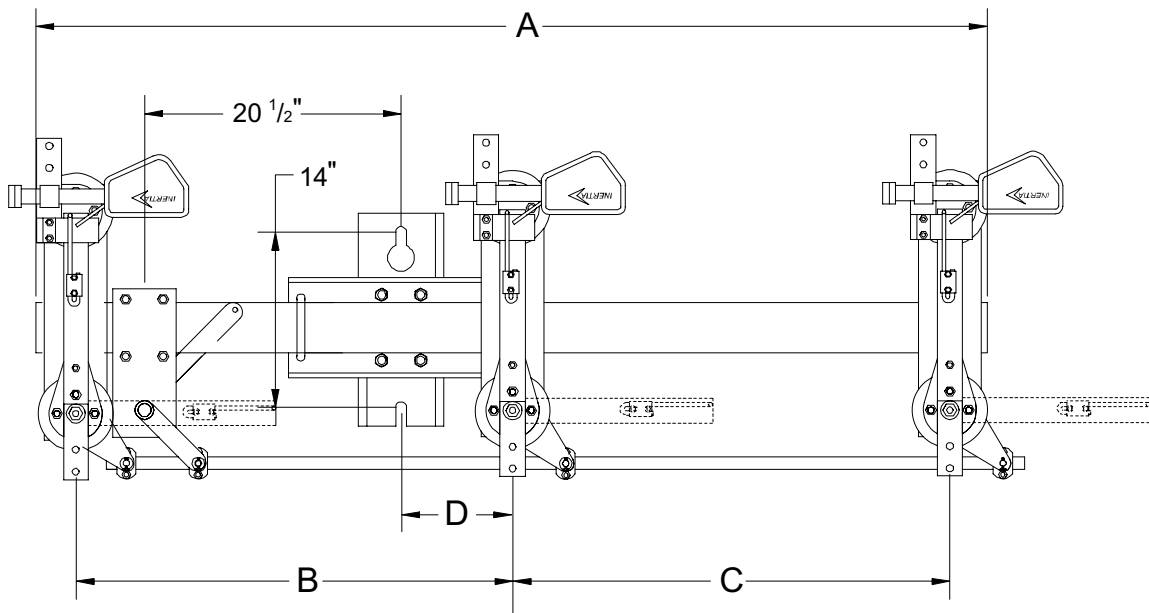
- | | |
|---------------|-------------------------|
| TANGENT | FOUR WIRE TANGENT |
| ANGLE | FOUR WIRE ANGLE |
| TANGENT RISER | FOUR WIRE TANGENT RISER |
| DEADEND RISER | FOUR WIRE DEADEND RISER |
| ALLEY ARM | FOUR WIRE ALLEY ARM |

CONTACT THE FACTORY FOR CONTROL TYPES AND SWITCH DIMENSIONAL INFORMATION

This drawing is for illustrative purposes only and therefore; may, or may not reflect the current revision of this drawing. Please request the current revision from the factory.

	Material:		Description:	LBS, 15 - 35 kV HORIZONTAL, Underarm Dimensions. Drawing No: 9241M Revision: 0
	Finish			
	Scale:	None		
	Drawn by:			
	Date:	09/28/01		


9185M LBS, 15 KV - 35 KV RISER DIMENSIONS



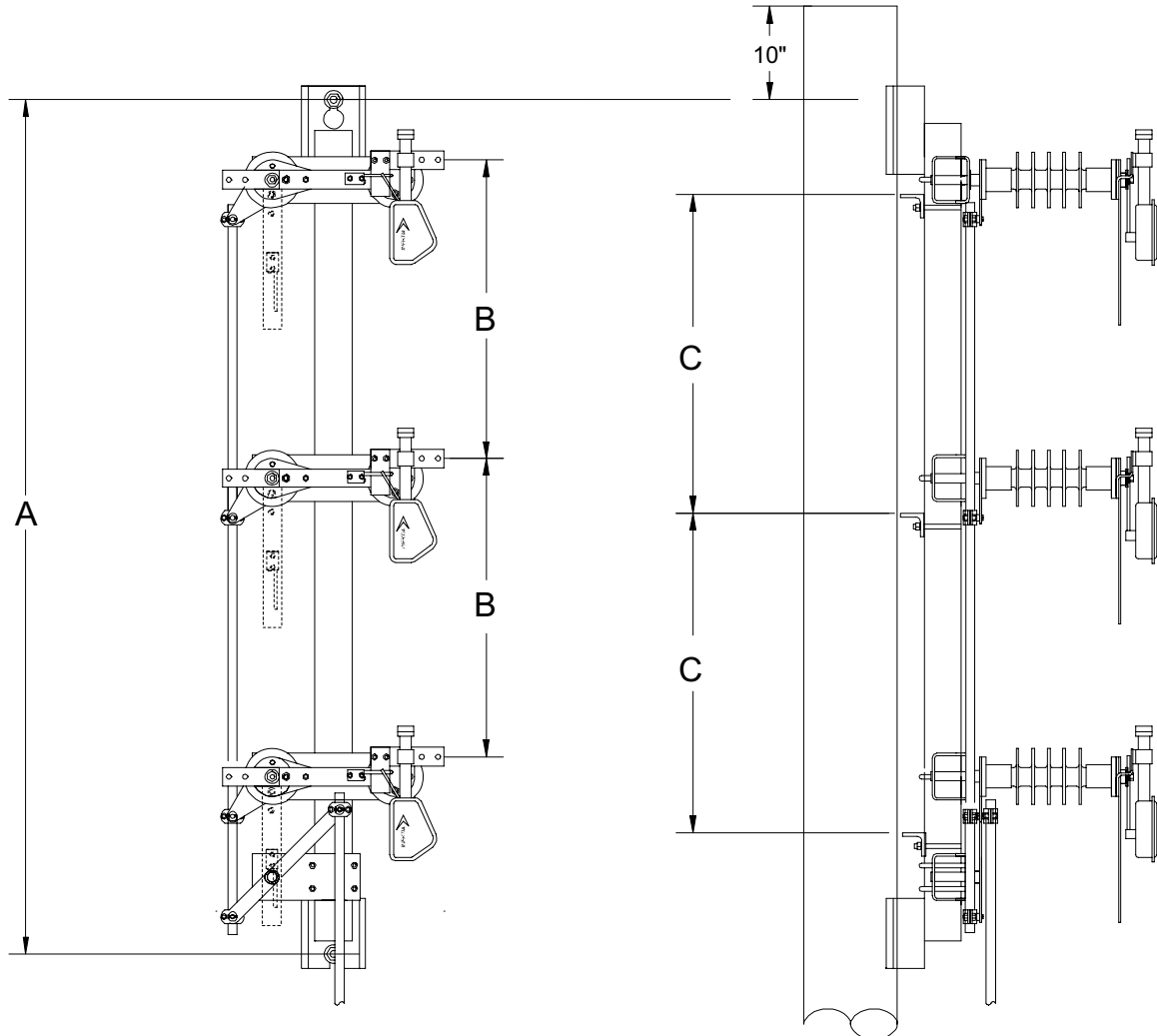
DIM	NOMINAL VOLTAGE RATING		
	15 kV	25 kV	35 kV
A	76"	87"	102"
B	33 1/2"	48"	48"
C	35"	33"	48"
D	8"	8"	8"

SWITCH RATINGS	
Voltage Class: 15 kV nom. (15.5 kV max.) 110 kV BIL 25 kV nom. (25.8 kV max.) 150 kV BIL 35 kV nom. (38.0 kV max.) 200 kV BIL	
Current Class: 600, 900 and 1200 Amps, continuous	
Momentary Current Rating:	
600 A Continuous:	40,000 Amps, 10 cycles 25,000 Amps, 3 seconds
900 A Continuous:	51,000 Amps, 10 cycles 32,000 Amps, 3 seconds
1200 A Continuous:	70,000 Amps, 10 cycles 44,000 Amps, 3 seconds

This drawing is for illustrative purposes only and therefore; may, or may not reflect the current revision of this drawing. Please request the current revision from the factory.

	Material:		Description:	
	Finish:		LBS, 15 kV - 35 kV RISER, Dimensions	
	Scale:	None	Drawing No:	
	Drawn by:		Revision:	
	Date:	07/06/06	9185M 2	

9184M LBS, 15 KV - 35 KV, VERTICAL (PHASE-OVER-PHASE) DIMENSIONS



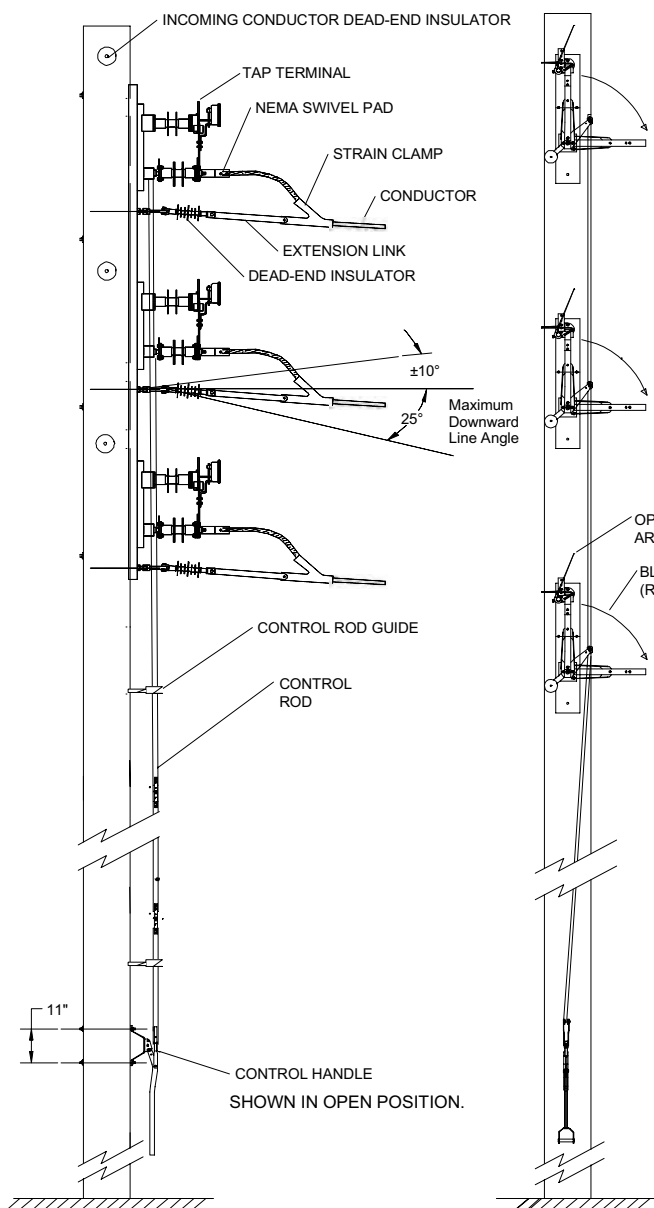
DIM	NOMINAL VOLTAGE RATING		
	15 kV	25 kV	35 kV
A	81"	92"	125"
B	26 1/4"	32"	48 1/2"
C	28 1/2"	34 1/4"	50 3/4"

SWITCH RATINGS	
Voltage Class: 15 kV nom. (15.5 kV max.) 110 kV BIL 25 kV nom. (25.8 kV max.) 150 kV BIL 35 kV nom. (38.0 kV max.) 200 kV BIL	
Current Class: 600, 900 and 1200 Amps, continuous	
Momentary Current Rating:	
600 A Continuous:	40,000 Amps, 10 cycles 25,000 Amps, 3 seconds
900 A Continuous:	51,000 Amps, 10 cycles 32,000 Amps, 3 seconds
1200 A Continuous:	70,000 Amps, 10 cycles 44,000 Amps, 3 seconds

This drawing is for illustrative purposes only and therefore; may, or may not reflect the current revision of this drawing. Please request the current revision from the factory.

	Material:		Description: LBS, 15 kV - 35 kV, VERTICAL, (Phase-over-phase) Dimensions
	Finish		
	Scale:	None	Drawing No: 9184M
	Drawn by:		
	Date:	03/06/01	

9239M LBS, 15-35 KV, TAP SWITCH (1, 2 & 3-WAY) DIMENSIONS

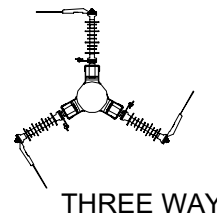
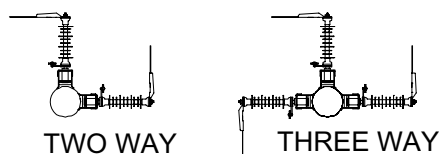
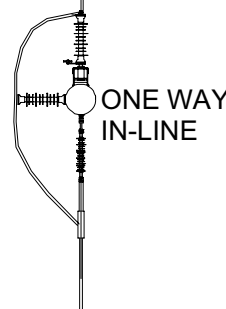
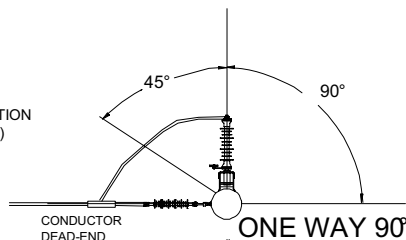


LineBOSS™ TAP SWITCH Configurations

THE VERTICALLY MOUNTED TAP SWITCH IS A GANG OPERATED POLE MOUNTED SWITCH WHICH CAN BE USED IN VARIOUS CONSTRUCTION APPLICATIONS. RIGHT HAND (SHOWN) AND LEFT HAND OPERATING MODELS ARE ADAPTABLE TO EXTREME HORIZONTAL AND VERTICAL LINE ANGLES. TIN PLATED COPPER BUSS "TEES" AND BOLTED CONDUCTOR CLAMPS ARE AVAILABLE FOR CONNECTING TWO AND THREE-WAY SWITCH CONFIGURATIONS.

Switch dead-end conductor can dead-end to the pole at up to 45° on this side.

Switch dead-end conductor can dead-end to the pole at up to 90° on this side.

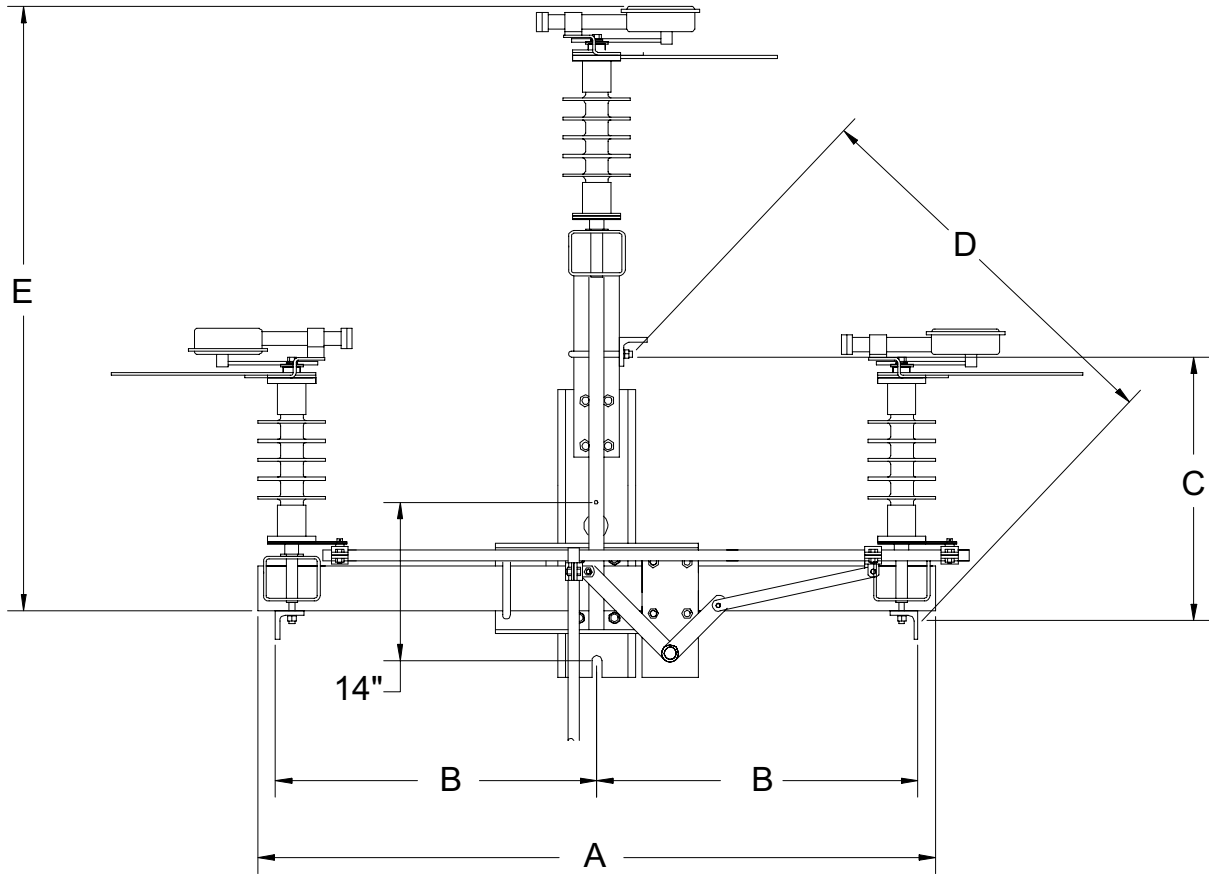


SWITCH RATINGS	
Voltage Class:	15 kV nom. (15.5 kV max.) 110 kV BIL 25 kV nom. (25.8 kV max.) 150 kV BIL 35 kV nom. (38.0 kV max.) 200 kV BIL
Current Class:	600, 900 and 1200 Amps, continuous
Momentary Current Rating:	
600 A Continuous:	40,000 Amps, 10 cycles 25,000 Amps, 3 seconds
900 A Continuous:	51,000 Amps, 10 cycles 32,000 Amps, 3 seconds
1200 A Continuous:	70,000 Amps, 10 cycles 44,000 Amps, 3 seconds

This drawing is for illustrative purposes only and therefore; may, or may not reflect the current revision of this drawing. Please request the current revision from the factory.

	Material:		Description:	
	Finish:		LBS 15-35 kV, LineBOSS™ Tap Switches	
	Scale:	None	Dimensions	
	Drawn by:		Drawing No:	Revision:
	Date:	11/29/01	9239M	0

9227M LBS, 15-35 KV DELTA (POLE TOP) DIMENSIONS



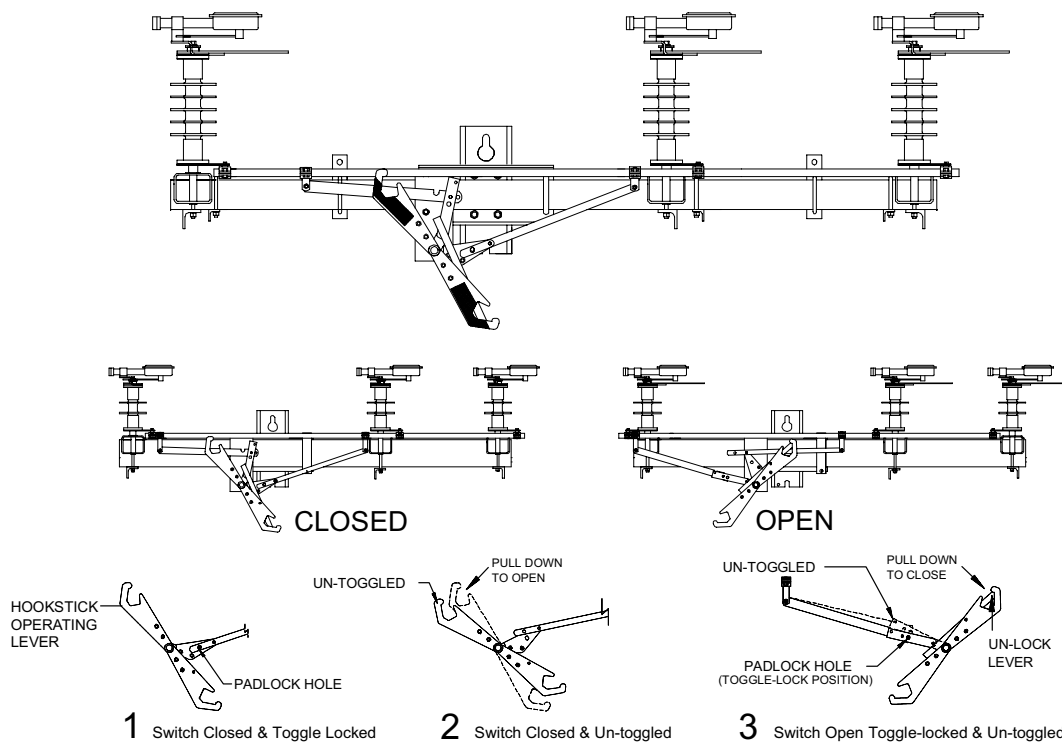
DIM	NOMINAL VOLTAGE RATING		
	15 kV	25 kV	35 kV
A	60"	60"	76"
B	30"	32"	36"
C	24"	24"	24"
D	35"	35"	41"
E	49"	53"	57"

SWITCH RATINGS	
Voltage Class: 15 kV nom. (15.5 kV max.) 110 kV BIL 25 kV nom. (25.8 kV max.) 150 kV BIL 35 kV nom. (38.0 kV max.) 200 kV BIL	
Current Class: 600, 900 and 1200 Amps, continuous	
Momentary Current Rating:	
600 A Continuous:	40,000 Amps, 10 cycles 25,000 Amps, 3 seconds
900 A Continuous:	51,000 Amps, 10 cycles 32,000 Amps, 3 seconds
1200 A Continuous:	70,000 Amps, 10 cycles 44,000 Amps, 3 seconds

This drawing is for illustrative purposes only and therefore; may, or may not reflect the current revision of this drawing. Please request the current revision from the factory.

	Material:		Description:	
	Finish		LBS, 15kV-35 kV Delta (pole top) Dimensions	
	Scale:	None	Drawing No:	
	Drawn by:		Revision:	
	Date:	09/28/01	9227M 0	

9298M HOOK-STICK OPERATING MECHANISM CROSSARM MOUNTED



MOUNT IT! WIRE IT! OPERATE IT!

- **Fast, Easy Installation**

The Inertia hookstick operated switch eliminates the need for a control rod, so there is no need for any field adjustment of the switch. Compression of the blades into the clips and interrupter timing are factory set. Without lower controls; pole clutter is reduced.

- **Versatile**

Hookstick operating mechanisms are available on Horizontal, Underarm horizontal, Riser, Vertical (phase over phase) and Delta (triangular) configurations.

- **Safe Operation**


The Inertia Hookstick safety features include:

- 1.) Hookstick mechanism is located below the xarm, away from hot parts.
- 2.) No springs that could be effected by ice.
- 3.) The switch bellcrank has built-in toggle-over in both the open and closed positions, which in conjunction to the lock-out bar feature, prevents inadvertent operation of the switch from either position by perching wildlife.
- 4.) For night and inclement weather operation, the "hook" positions are high-lighted with a high visibility, yellow reflective surface.

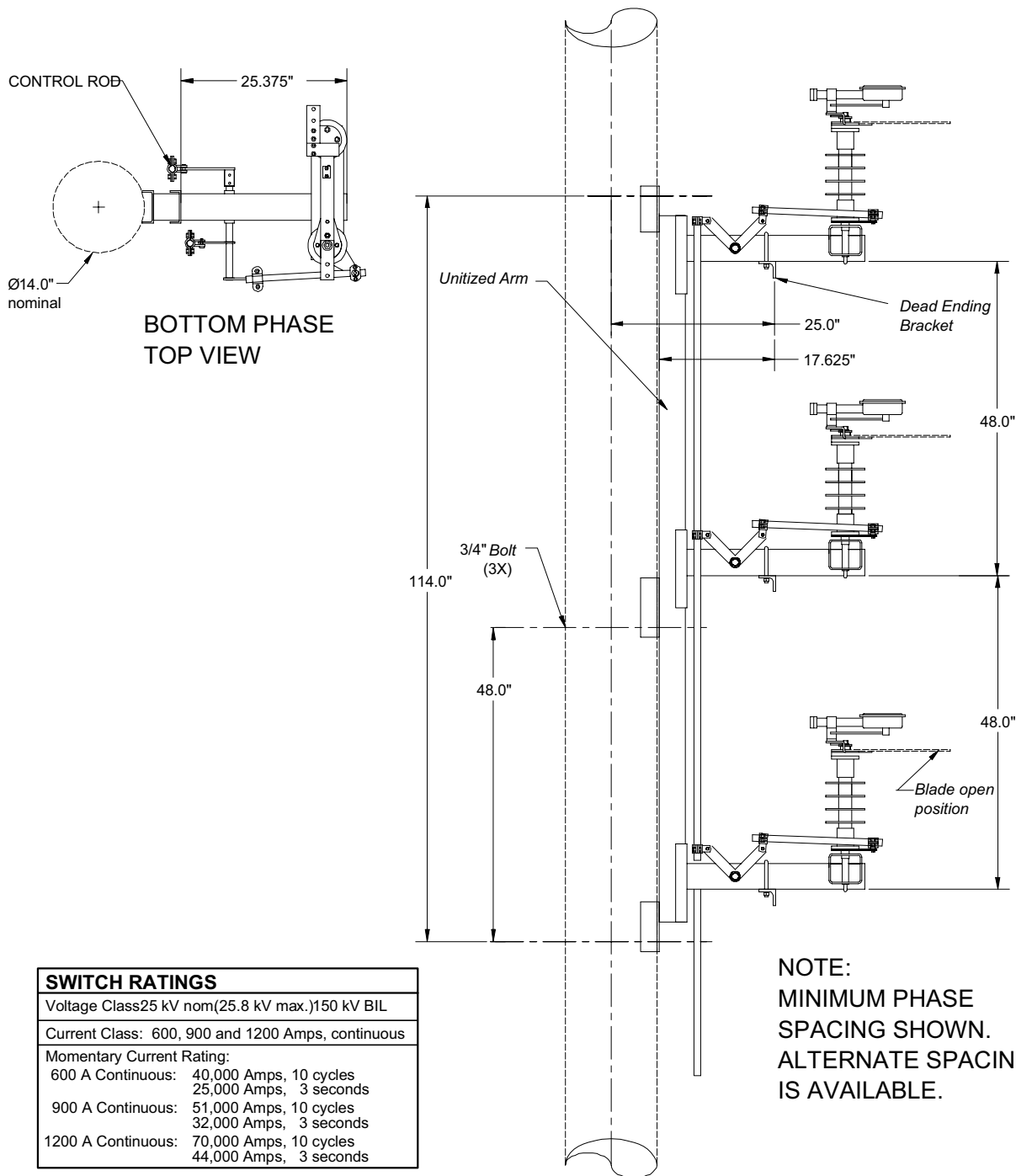
- **Easy Operation**

The Inertia Hookstick bellcrank and rotating stacks have stainless steel-to-brass shaft bearings. Consider the savings in restrictive losses when the control rods, guides and handle are no longer a factor! This makes the Inertia Hookstick operated switch the easiest switch to operate. High leverage cam action ensures properly closed switch and reduced operating force.

This drawing is for illustrative purposes only and therefore; may, or may not reflect the current revision of this drawing. Please request the current revision from the factory.

	Material:		Description:	
	Finish		Hook-stick Operated Switches, Crossarm mounted	
	Scale:	None	Drawing No:	Revision:
	Drawn by:		9298M	0
	Date:	10/02/06		

9374M LBS, 15 KV - 35 KV, VERTICAL (TIERED OUTBOARD) DIMENSIONS

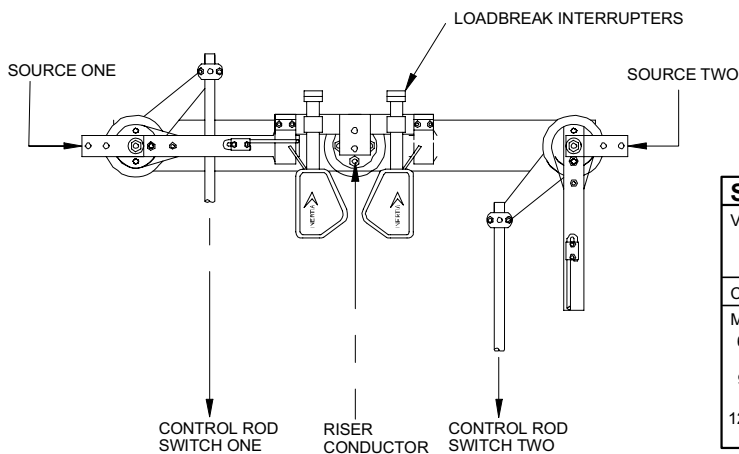
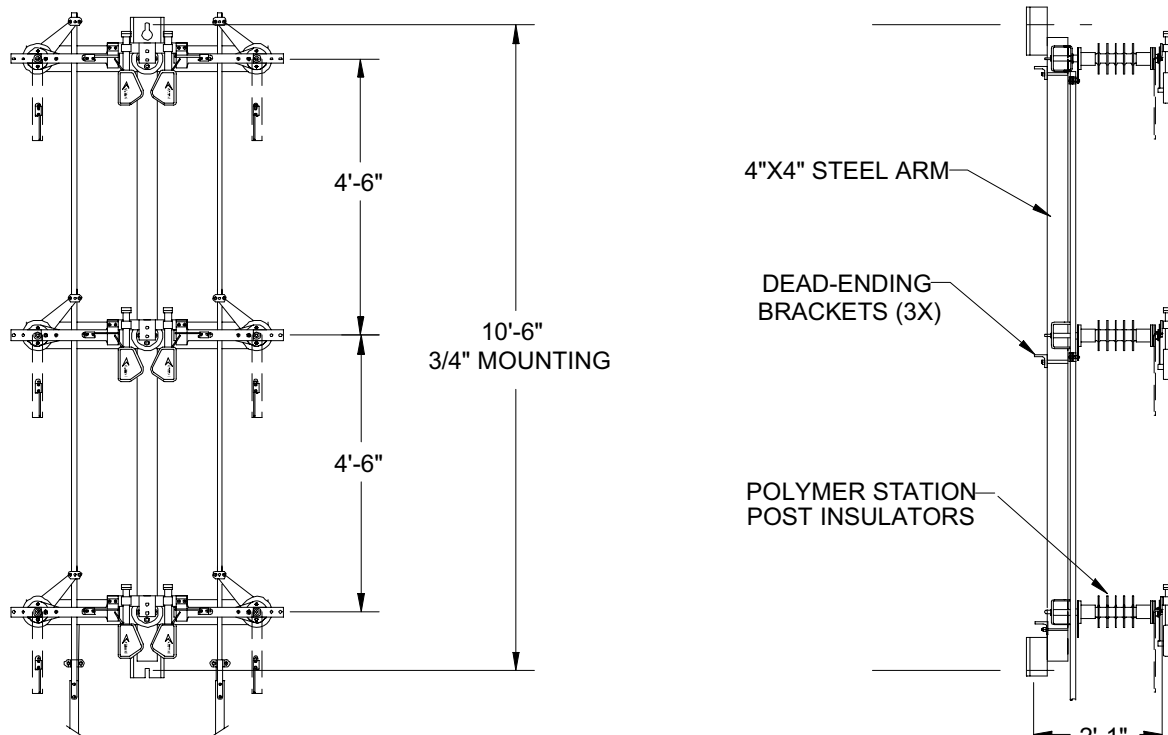


SWITCH RATINGS	
Voltage Class	25 kV nom(25.8 kV max.)150 kV BIL
Current Class:	600, 900 and 1200 Amps, continuous
Momentary Current Rating:	
600 A Continuous:	40,000 Amps, 10 cycles 25,000 Amps, 3 seconds
900 A Continuous:	51,000 Amps, 10 cycles 32,000 Amps, 3 seconds
1200 A Continuous:	70,000 Amps, 10 cycles 44,000 Amps, 3 seconds

This drawing is for illustrative purposes only and therefore; may, or may not reflect the current revision of this drawing. Please request the current revision from the factory.

	Material:		Description: 25 kV Tiered Outboard, Armless Unitized LineBoss Sidebreak GOAB Switch	
	Finish			
	Scale:	None	Drawing No: 9374M	
	Drawn by:			Revision: 0
	Date:	05/21/04		

9382M LBS, 25 KV, TWIN TAP RISER, POLE MOUNTED DIMENSIONS

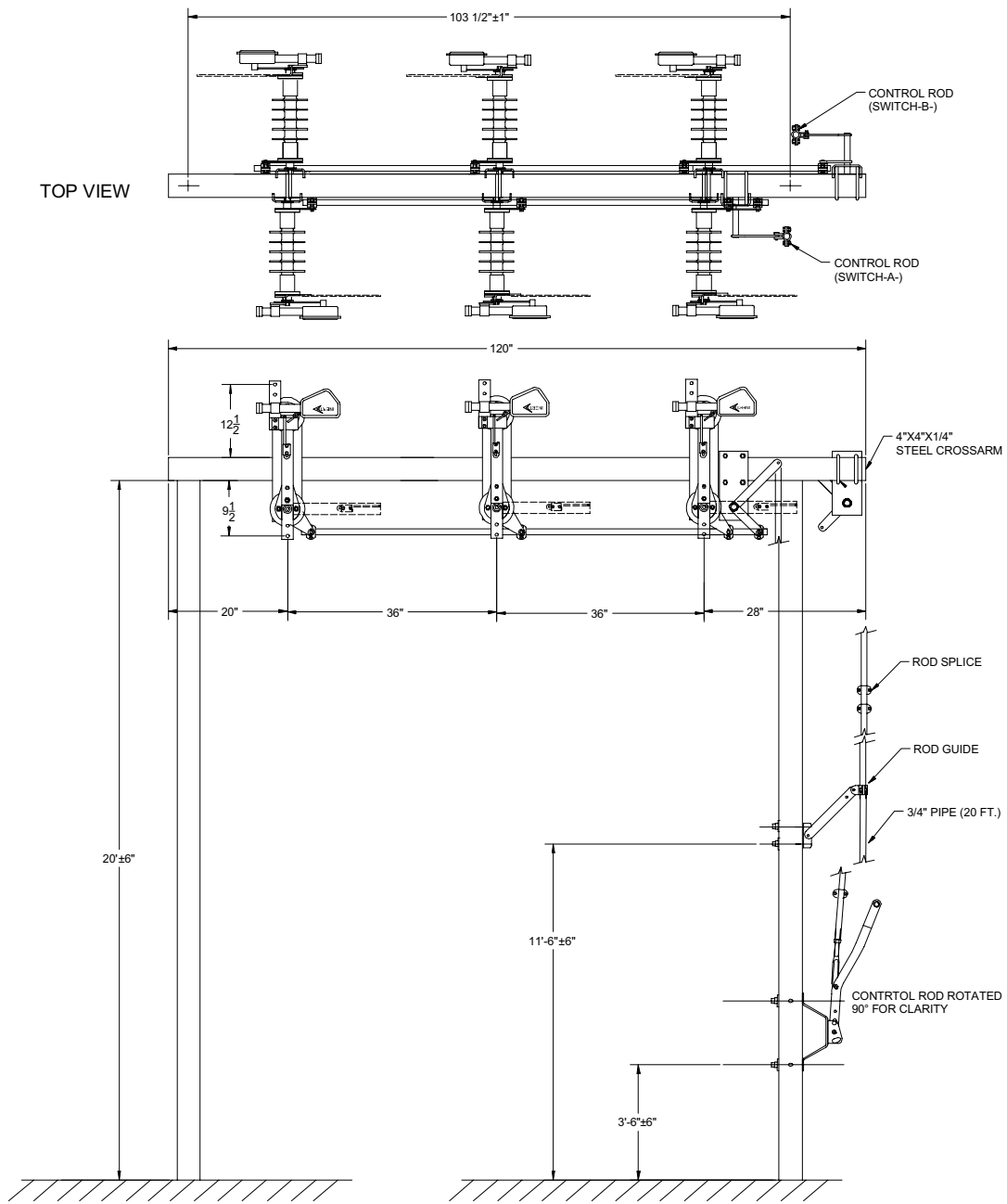


SWITCH RATINGS	
Voltage Class: 15 kV nom. (15.5 kV max.)	110 kV BIL
25 kV nom. (25.8 kV max.)	150 kV BIL
35 kV nom. (38.0 kV max.)	200 kV BIL
Current Class: 600, 900 and 1200 Amps, continuous	
Momentary Current Rating:	
600 A Continuous:	40,000 Amps, 10 cycles 25,000 Amps, 3 seconds
900 A Continuous:	51,000 Amps, 10 cycles 32,000 Amps, 3 seconds
1200 A Continuous:	70,000 Amps, 10 cycles 44,000 Amps, 3 seconds

This drawing is for illustrative purposes only and therefore; may, or may not reflect the current revision of this drawing. Please request the current revision from the factory.

	Material:		Description:	
	Finish		25 kV Twin Loadbreak, Tap Riser Switch	
	Scale:	None	Drawing No:	Revision:
	Drawn by:			
	Date:	04/13/04	9382M	0

9228M LBS, 25 KV, TWIN TAP RISER, SUBSTATION MOUNTED DIMENSIONS



SWITCH RATINGS	
Voltage Class:	15 kV nom.(15.5 kV max.) 110 kV BIL 25 kV nom.(25.8 kV max.) 150 kV BIL 35 kV nom.(38.0 kV max.) 200 kV BIL
Current Class:	600, 900 and 1200 Amps, continuous
Momentary Current Rating:	
600 A Continuous:	40,000 Amps, 10 cycles 25,000 Amps, 3 seconds
900 A Continuous:	51,000 Amps, 10 cycles 32,000 Amps, 3 seconds
1200 A Continuous:	70,000 Amps, 10 cycles 44,000 Amps, 3 seconds

This drawing is for illustrative purposes only and therefore; may, or may not reflect the current revision of this drawing. Please request the current revision from the factory.

	Material:		Description: 25 kV, H-Frame, Twin Riser Tap Switch, Substation Mounted	Revision: 1
	Finish:			
	Scale:	None	Drawing No: 9228M	
	Drawn by:			
	Date:	10/10/01		



The following recommendations should be used for field service and maintenance of Inertia Engineering's LineBOSS outdoor gang operated switchgear.

Frequency of inspection will be a function of atmospheric contamination, frequency of operation, fault current exposure etc. A suitable program must be established and followed by the user accordingly. If a switch cannot be maintained on a periodic basis, its service life and operation may be affected. It is recommended that switches be opened and closed several times in order to clean the contacts and free the moving parts whenever it is necessary to operate it for any reason. Live line servicing and maintenance procedures may be used.

The following procedures are recommended for maintaining de-energized switches.

- Switch contacts:
 - Switches, which become difficult to operate should have grease applied to the top and bottom of the rotating contact blade where it links with the stationary contact jaws. The contact surfaces should be cleaned prior to the application of new grease. The contacts are “self wiping” and will transfer the new grease upon several switch operations.
 - Switch contacts are lubricated at the factory with Mobil 28 lubricating grease. Other grease formulations such as Chevron FM NLGI Grade 2 and Molykote 33 grease or other non-sulfur containing greases can be used.
 - Switch contact jaws and mating blades should be inspected for pitting. Pitting spurs can be removed with a fine file or sandpaper (not emery).
 - Switch contact assemblies are replaceable and are purchased as a rotating and stationary single-phase kit.
- Insulators:
 - Check for arc damage, tracking, soot, or other contamination or debris from wildlife or the environment. Clean the insulators if necessary.
- Control mechanism:
 - Inspect operating handle and control rod guides to verify that they have not been damaged, and that the operating handle mounting bolts are tight. Replace components that have been damaged. Fiberglass control rods should be replaced when excessive “blooming” or exposed stringy fibers are observed as the insulation capability of the rod is compromised when this type of degradation occurs.

- Switch attachments:
 - Arc horns:
 - Arc horns are non-spring, non-loadbreak stainless steel arms which should be visually inspected for excessive wear at the interface between the stationary “pre-strike” arm, and the rotating blade “pre-strike” arm. Any arm with less than one-half of its original diameter remaining at any point should be replaced.
 - Arch Whips:
 - Arch Whips, or “Quick break whips” are Beryllium copper “spring” mechanisms which should be inspected to ensure that the whip is properly engaged with the catch when the switch is in the closed position. Whips should be replaced when 20% of the original length has eroded. Refer to installation and adjustment procedures for original whip lengths.
 - AmpRupter and AmpVac loadbreaks:
 - Loadbreak interrupters should be inspected to ensure that the trip arm and catch arm are properly latched when the switch is closed (refer to the proper loadbreak type installation instructions). Interrupters that show signs of external arcing (black soot) on the external interrupter housing should be replaced.

Reference

ANSI C37.35.7 IEEE Guide for the Application and Installation, Operation and Maintenance of High Voltage Air Disconnecting and Load Interrupting Switches.



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