CATALOG SECTION 100
CATALOG BULLETIN 104
December, 1988

Southern States, Inc.

Type EVB

GROUP OPERATED, AIR BREAK SWITCHES
7.2-230 kV 600-1600 AMPS
CONFORM TO NEMA AND ANSI STANDARDS

The Type EVB can be used for any conventional air break switch application, such as main line disconnecting, sectionalizing or by-passing circuits in substations, transmission switching stations or transmission lines.

With current-carrying parts constructed of corrosion-resistant copper and bronze, these switches are especially suited for use in coastal areas and other environments where aluminum might be unsatisfactory.

FEATURES

- The switch blade is securely toggle-locked closed. High winds or structure vibration cannot force the blade out of contact.
- Opening and closing in ice is enhanced by enclosed hinge contacts, blade rotation, mechanical advantages in the operating linkages, generous contact deflection, and the design of critical areas so ice is in shear, where it is weakest.
- Arcing horns are standard equipment on all upright mounted switches.
- Jack screws - which eliminate most of the hassle of installation - are standard equipment on all switches of 69 kV and above. Below 69 kV, all switches are shipped fully assembled and adjusted.
- These switches have no critical adjustments to be made in the field. Live parts on ratings 69 kV and above are fully assembled, adjusted, and shipped bolted to their own switch base. Installation adjustment is largely a matter of leveling the insulators - using the jack screws.
- Operating mechanisms are conventional, easily-installed pipe-and-adjustable arm designs. All mounting brackets, steel angles, plates, etc. are supplied by Southern States, when specified.
- To further reduce installation time, we can also supply all operating pipes cut-to-length. This unique Southern States practice eliminates time-wasting field measuring, cutting and errors.

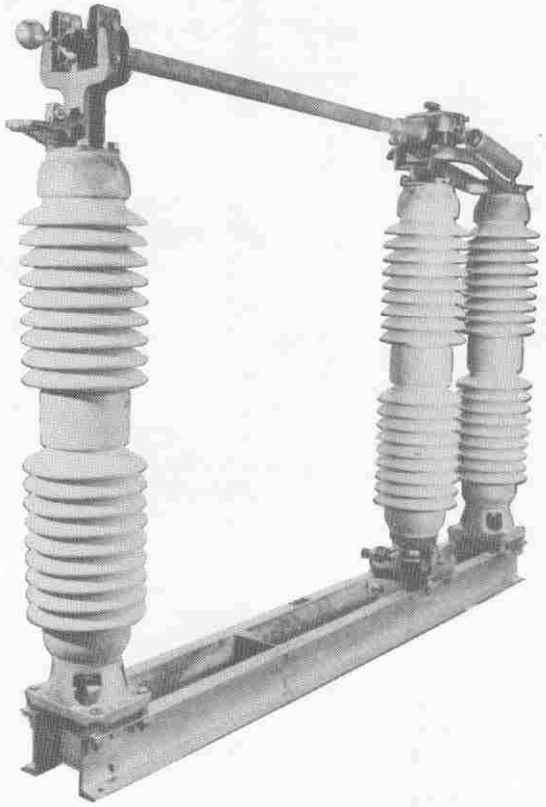


Figure 1 — Type EVB 115 kV, 1200 Amp.

- Each switch pole has adjustable stops on the current-carrying parts for both the open and the closed position. This feature allows "fine tuning" of the blade rotation and degree of opening of each pole.
- Each switch pole has adjustable stops for both the open and the closed position on the rotating insulator bearing to provide positive limits to the travel of the operating mechanism. This feature makes installation easier, protects the equipment, and provides for more positive operation of the three-phase switch.
- Drawings of the operating mechanism are customized - specific for each job site, by easy-to-read CAD. This eliminates guesswork in the field, minimizes errors, saves time.

Type EVB

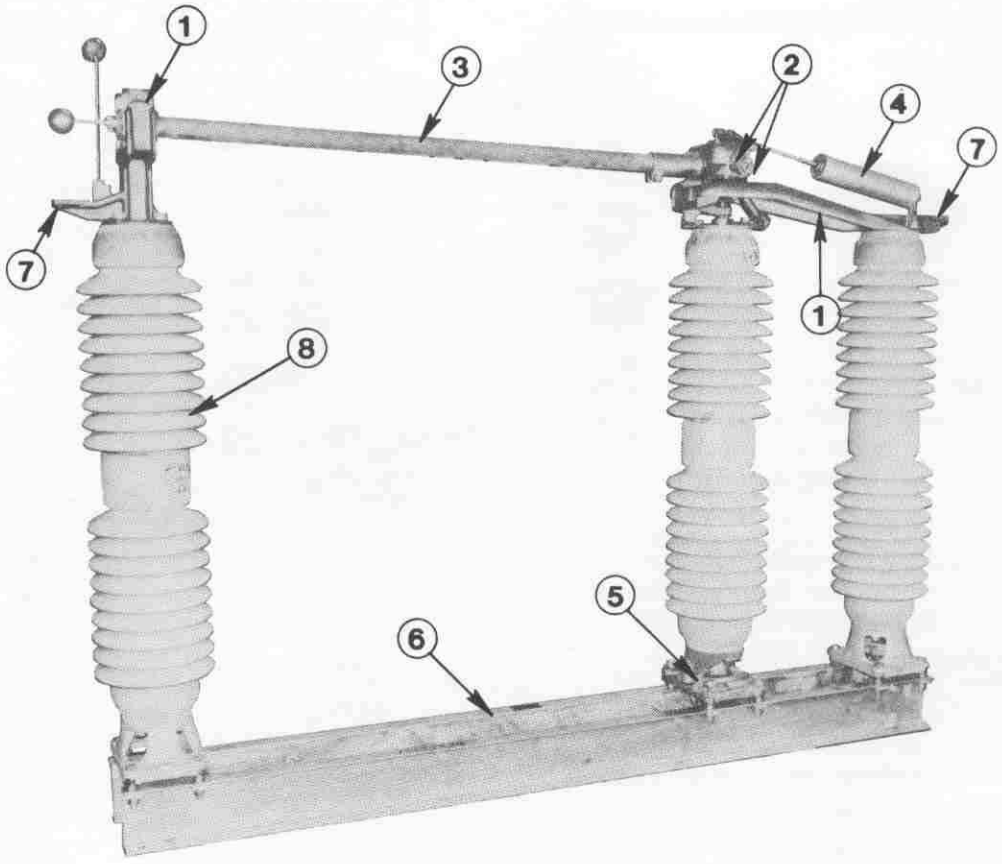
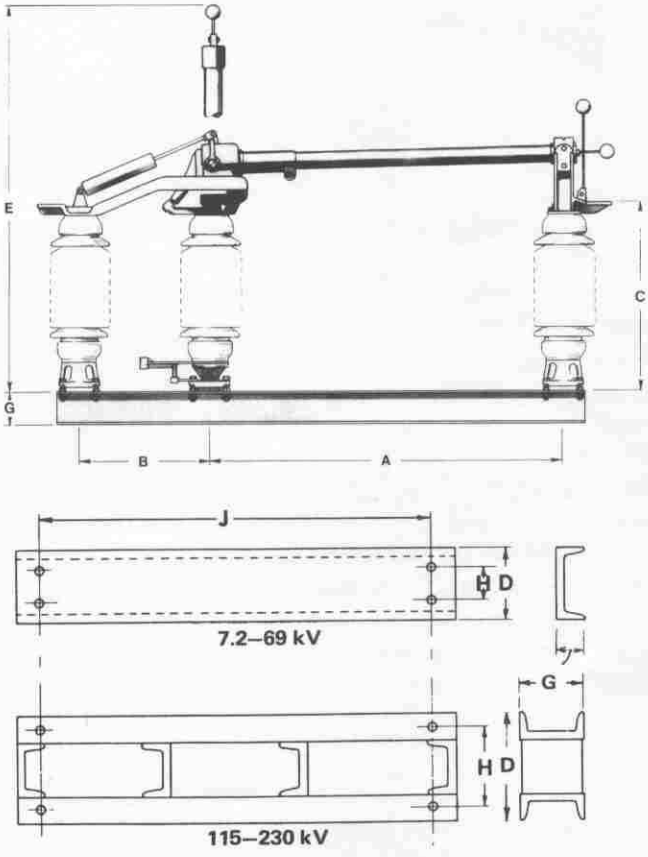


Figure 2 — (See facing page.)



Do not use these dimensions for construction purposes; refer to the factory for certified prints.

*Refer to factory for 230 kV.
**Horizontal upright mounting.
***Vertical and underhung mounting.

†On ratings 69 kV and below, bearing extends 2-9/16" below bottom of base.

††These are recommended insulators. Others are available upon request

VOLTAGE kV* NOM.	VOLTAGE kV* MAX.	BIL kV	CURRENT AMPERES CONT.	CURRENT AMPERES MOM.	INSULATORS T.R. NO. †† PED.	INSULATORS T.R. NO. †† POST	CATALOG NO.	WEIGHT IN KILOGRAMS NET PED.	WEIGHT IN KILOGRAMS NET POST	WEIGHT IN KILOGRAMS SHIP PED.	WEIGHT IN KILOGRAMS SHIP POST
7.2	8.25	95	600	40,000	TR-1	TR-202	EVB75600	200	220.4	230.4	250.8
			1200	61,000			EVB751200	213.6	234	244	281.2
14.4	15.5	110	600	40,000	TR-4	TR-205	EVB15600	221.8	238.1	255.3	271.6
			1200	61,000			EVB151200	235.4	251.7	269	285.3
23	25.8	150	600	40,000	TR-7	TR-208	EVB23600	265.3	285.7	303	323.4
			1200	61,000			EVB231200	279	299.3	316.5	337
34.5	38	200	600	40,000	TR-10	TR-210	EVB34600	342.9	387.7	394.6	439.4
			1200	61,000			EVB341200	359.2	404	410.9	455.8
46	48.3	250	600	40,000	TR-13	TR-214	EVB46600	419	488.4	483.9	553.3
			1200	61,000			EVB461200	432.6	502	497.5	566.9
69	72.5	350	600	40,000	TR-16	TR-216	EVB69600	583.7	624.5	688	728.8
			1200	61,000	TR-16	TR-216	EVB691200	600	640.8	704.3	745.1
			1600	70,000	TR-56	TR-278	EVB691600	693.9	649	798.2	753.3
115	121	550	600	40,000			EVB115600	1466.6	1172.8	1638.5	1344.6
			1200	61,000	TR-19	TR-286	EVB1151200	1474.8	1180.9	1646.7	1352.8
			1600	70,000			EVB1151600	1498.5	1204.5	1670	1375.9
138	145	650	600	40,000			EVB138600	1534.6	1310.2	1761.4	1336.9
			1200	61,000	TR-22	TR-288	EVB1381200	1545.5	1321	1772.3	1547.8
			1600	70,000			EVB1381600	1571.4	1347	1798.1	1573.7
161	169	750	600	40,000			EVB161600	1868	1459.8	2094.7	1686.6
			1200	61,000	TR-25	TR-291	EVB1611200	1878.9	1470.7	2105.6	1697.5
			1600	70,000			EVB1611600	1907.4	1499.3	2134.2	1726

CONSTRUCTION

① **Hinge yoke, jaw and blade tip** - solid, cast bronze.

② **Live part mechanical components** - solid, cast bronze, precision machined at moving part interfaces. All rotating parts turn on low friction, high molecular weight polyethylene bushings.

③ **Blade** - Hard drawn, bus copper tubing.

④ **Counterbalancing** - (69 kV, 1200 Amp. and above) Maintenance-free coil spring, enclosed housing.

⑤ **Insulator bearing** - Low friction, double row ball bearings. Maintenance-free. For specific construction details, refer to the factory.

⑥ **Switch bases** - Heavily galvanized steel. Single channel 7.2 through 69 kV; webbed double channel 115 kV and above.

⑦ **Terminal Pads** - are machined bronze. Can be tinned for use with either copper or aluminum conductors, if specified.

⑧ **Insulators** - As specified by the customer.

CONTACT CONSTRUCTION

The contacts on all ratings are silver-to-silver for maximum, long-term reliability; pressure-multiplying reverse-loop (Amplitacts®) for the utmost short circuit security.

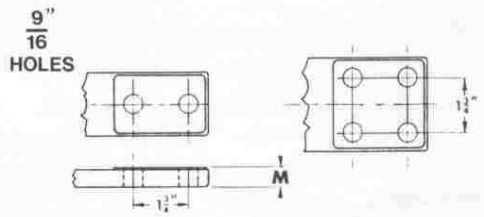
The stationary contact fingers are wrought copper bars with 10 mil thick coin silver strips brazed to the area of moving contact interface. Stainless steel coil springs supply backup pressure.

The moving contacts are 43 mil thick, one-half round silver strips brazed to the blade tip and blade socket. It is important to note that brazing - versus other methods of silver attachment - ensures damage-free contacts during high fault currents.

The alloys used in these contacts are highly resistant to galling and wear, and provide cool-running, extremely durable current interchange.

OPERATION

The blade of the EVB rotates into the stationary contacts, wiping the contacts clean with each opening and closing of the switch, and establishing high contact pressure. The contacts on the hinge end of the switch are constantly engaged and are not a part of the hinge bearings, which greatly increases the long-term reliability and trouble-free performance of these switches.



TERMINAL PAD SPECIFICATIONS

kV	AMP	NUMBER OF PAD HOLES	DIMENSIONS IN METERS			DIMENSIONS IN INCHES		
			K	L	M	K	L	M
7.2-69	600	2	.076	.051	.016	3	2	5/8
7.2-161	1200	4	.076	.076	.016	3	3	5/8
7.2-161	1600	4	.076	.076	.016	3	3	5/8
115-161	600	4	.076	.076	.016	3	3	5/8

WEIGHT IN POUNDS				DIMENSIONS IN METERS											DIMENSIONS IN INCHES										
NET		SHIP						E**		E***															
PED.	POST	PED.	POST	A	B	C PED.	C POST	D	PED.	POST	PED.	POST	G†	H	J	A	B	C PED.	C POST	D	PED.	POST	PED.	POST	G†	H	J
441	486	508	553	.305	.305	.337	.337	.127	.889	.889	.781	.781	.044	.076	.914	12	12	13-1/4	13-1/4	5	35	35	30-3/4	30-3/4	1-3/4	3	36
471	516	538	620						.902	.902	.794	.794									35-1/2	35-1/2	31-1/4	31-1/4			
489	525	563	599	.381	.305	.400	.400	.127	1.029	1.029	.914	.914	.044	.076	.914	15	12	15-3/4	15-3/4	5	40-1/2	40-1/2	36	36	1-3/4	3	36
519	555	593	629						1.041	1.041	.934	.934									41	41	36-3/4	36-3/4			
585	630	668	713	.457	.305	.451	.451	.127	1.156	1.207	1.092	1.092	.044	.076	.991	18	12	17-3/4	19-3/4	5	45-1/2	47-1/2	43	43	1-3/4	3	39
615	660	698	743						1.156	1.219	1.105	1.105									46	48	43-1/2	43-1/2			
756	855	870	969	.61	.406	.527	.603	.152	1.384	1.461	1.257	1.334	.048	.076	1.219	24	16	20-3/4	23-3/4	6	54-1/2	57-1/2	49-1/2	52-1/2	1-7/8	3	48
792	891	906	1006						1.397	1.473	1.270	1.346									55	58	50	53			
924	1077	1067	1220	.762	.406	.603	.706	.152	1.613	1.715	1.473	1.575	.048	.076	1.372	30	16	23-3/4	27-3/4	6	63-1/2	67-1/2	58	62	1-7/8	3	54
954	1107	1097	1250						1.626	1.727	1.492	1.594									64	68	58-3/4	62-3/4			
1287	1377	1517	1607						2.210	2.235	2.057	2.083									87	88	81	82			
1323	1413	1553	1643	1.067	.432	.895	.921	.152	2.223	2.248	2.070	2.096	.051	.076	1.753	42	17	35-7/8	36-7/8	6	87-1/2	88-1/2	81-1/2	82-1/2	2	3	69
1530	1431	1760	1661						2.248	2.273	2.108	2.134									88-1/2	89-1/2	83	84			
3234	2536	3613	2965						3.099	3.137	2.870	2.908									122	123-1/2	113	114-1/2			87
3252	2604	3631	2983	1.524	.559	1.292	1.330	.152	3.112	3.150	2.870	2.921	.267	.210	2.210	60	22	50-7/8	52-3/8	10-1/2	122-1/2	124	113	115	6	8-1/4	87
3303	2655	3682	3034						3.280	3.318	2.921	2.959									123-1/2	125	115	116-1/2			92
3384	2889	3834	3389						3.543	3.670	3.321	3.448									139-1/2	144-1/2	130-3/4	135-3/4			106
3408	2913	3908	3413	1.829	.559	1.432	1.559	.152	3.556	3.683	3.334	3.461	.267	.210	2.692	72	22	56-3/8	61-3/8	10-1/2	140	145	131-1/4	136-1/4	6	8-1/4	106
3465	2970	3965	3470						3.724	3.851	3.347	3.474									141	146	131-3/4	136-3/4			104
4119	3219	4619	3719						4.077	4.178	3.810	3.912									160-1/2	164-1/2	150	154			111
4143	3243	4643	3743	2.134	.559	1.661	1.762	.152	4.089	4.191	3.823	3.924	.267	.210	2.819	84	22	65-3/8	69-3/8	10-1/2	161	165	150-1/2	154-1/2	6	8-1/4	111
4206	3306	4706	3806						4.258	4.359	3.861	3.962									162	166	152	156			116

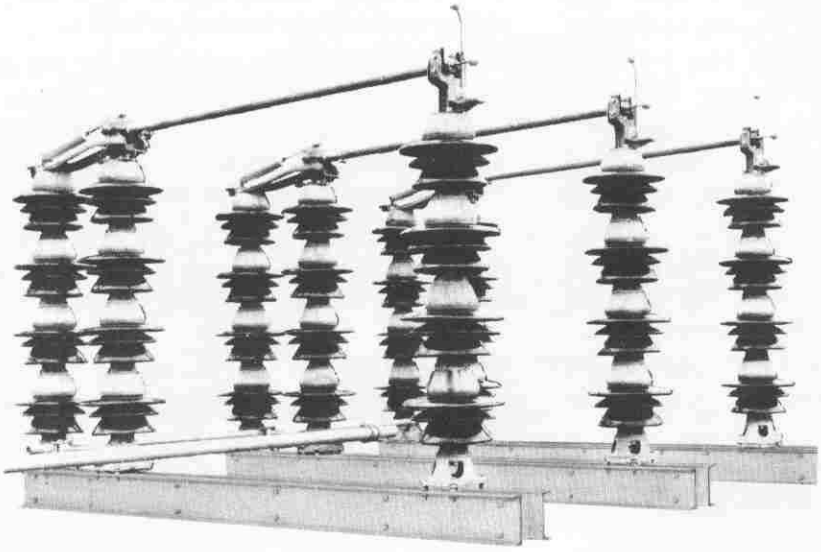
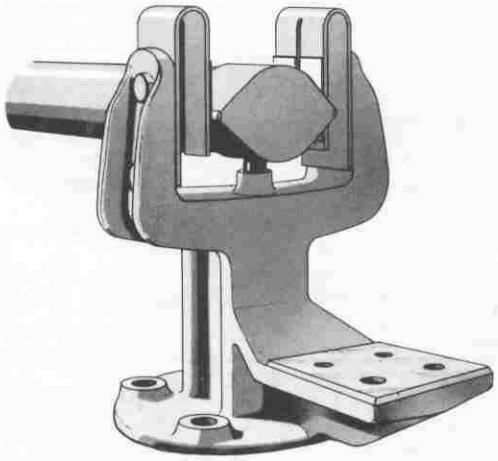


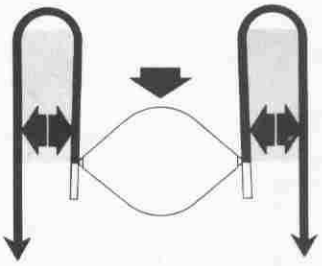
Figure 3 — Mechanical Test Setup.

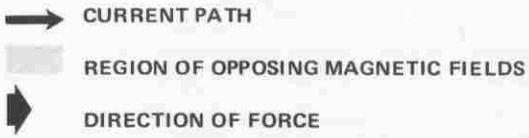
TESTING

The EVB has been tested both electrically and mechanically to industry specifications. The photograph above shows an EVB 161 kV, 1200 amp., motor operated, three-phase switch. It was tested for 1000 openings and closings, with no interim adjustments. There was no damage incurred to the contacts, moving parts or operating components.

Figure 4







The Amplitact® Contact

The EVB switches have the most trouble-free contacts ever designed. A product of the company's research and testing, the Amplitacts® used on these switches are high pressure, silver-to-silver contacts that use the magnetic fields generated by fault currents to increase the contact pressure as the current increases.

The drawings above diagram the principle of the Amplitact®. The contact geometry carries the current flow first up, then down the contact fingers, which places opposing magnetic fields in close proximity to each other. These fields increase with the square of the current, clamping the blade tip ever tighter when high pressures are needed the most — during fault currents.

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