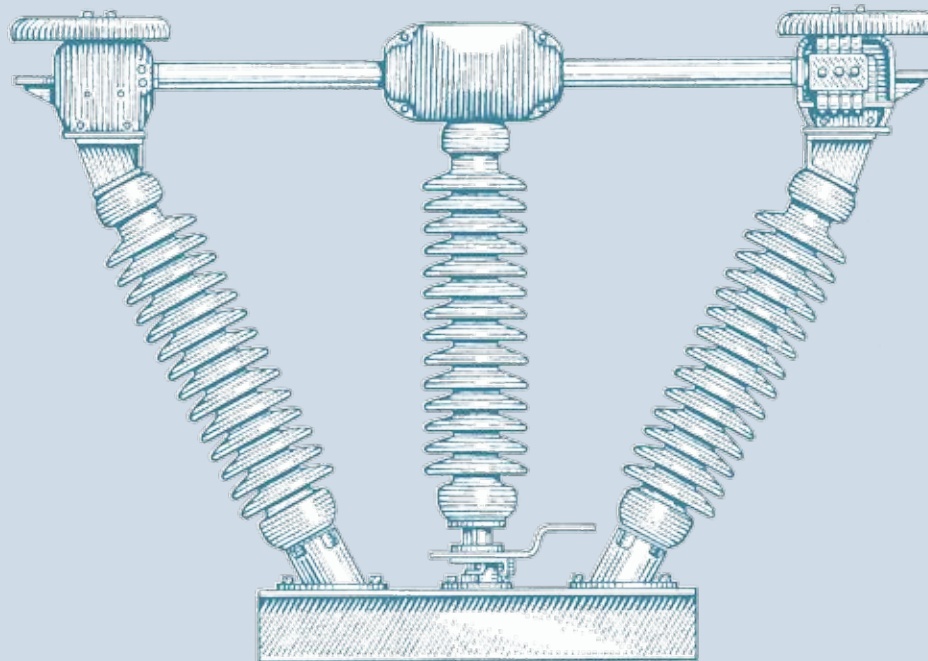


TTT7V



INTRODUCTION & TYPE TEST DATE : 1974		ANNUAL UNITS PRODUCED : 150	
UNITS IN SERVICE : > 1700		CONTINUOUS CURRENT : 1200-5000 AMPS	
SHORT CIRCUIT : 99-195 KA PEAK (38-75 KA 3 SECOND)		VOLTAGE : 72.5-500 kV	
BIL : 350-1800 kV		INSULATOR : LAPP -----	

The TTT7V double end break switch is a three insulator side break switch. Operation of the switch is accomplished through rotation of the center insulator. Current transfer from terminal pad to terminal pad involves no pivoting transfer points. Both jaw end insulators are fixed which allows higher terminal loads to be applied to the switch. The small footprint of the TTT7V can be supported by fewer columns which reduces associated steel and foundation costs. The TTT7 double end break switch design allows for mounting at minimum recommended phase spacing and requires minimum overhead clearance. This is an excellent solution for ice conditions. The VEE configuration increases the phase to ground clearance to allow for cable drop applications.

TTT-7V VALUE-ADDED FEATURES

Pascor Atlantic's TTT-7V switch is the result of 100 years' experience in developing and supplying power equipment to the electric utility industry. Pascor Atlantic has continuously pioneered the research, design, testing and the manufacture of outdoor disconnect switches. We maintain this leadership because of our continued innovative efforts to provide maximum value in acquisition, installation, maintenance and operating reliability.

Procurement:

Local sales representatives and expertise
Pre-engineered controls available for quick delivery
ISO 9002 certified
ISO 14000 compliant
On-time shipment
Industry's shortest lead times

Engineering:

Universal base and control fit most structures
All parts designed to resist corrosion
Adaptability to meet special requirements
Availability of AutoCAD format drawings
Manual and motor operation
Arcing horn supplied as standard

Installation:

Interphase and vertical operating pipes in pre-engineered or customized lengths
Adjustable threaded clevis for ease of fine adjustment of threepole switches
Open-close stops on each switch pole
Service technicians available for assistance
On-time deliveries

Maintenance:

Greaseless rotor bearings with stainless steel ball bearings on switch bases
Weather-sealed, grease-filled enclosed switch hinge contacts
Corrosion-free gears in all operators
No threaded coupling applied in torsion
Replaceable copper moving contacts

Accessories:

The following accessories can be provided for the TTT-7V:
Arc Restrictors thru 145 kV (Quick Whips)
Auxiliary Switches
Cable Guides (Outriggers)
Spill Gaps
Leveling Screws (Jacking Bolts)
Position Indicators
Arcing Horn
Silver-to-Silver Open Air Contacts Swing handle coupling
Circuit breakers
Local-Remote selector switch

Pascor Atlantic
Air Switch Division • State Route 42
254 Industry Dr. • Bland, Virginia 24315-9709
Phone: 276-688-3328 • Fax: 276-688-2228 or 2229
www.pascoratlantic.com

OPERATORS

The TTT-7V can be operated either manually or by a motor mechanism. Below is a list of operators which can be supplied:

Worm Gear
MO-10 Motor Operator

GROUNDING SWITCH

For grounding during inspection, maintenance, or repair, a threepole grounding switch can be mounted on either jaw end of the TTT-7V. Interlocking to prevent the main and ground switches from being closed at the same time can be accomplished via Kirk key interlocks, mechanical interlocks, or electrical interlocks (where electrical operators are used).

High speed grounding switches for fault initiating can also be mounted on the TTT-7V. High speed grounding switches can be reset by using a hookstick or one of the operators listed above.

ORDERING INFORMATION:

The following information is the minimum required when ordering TTT-7V Double End-Break switches:
Voltage, BIL rating, continuous current, momentary rating
Mounting positions (upright, vertical, or inverted)

If grounding switches are specified:
- momentary rating
- location and position
- coil voltage (for HSG only)

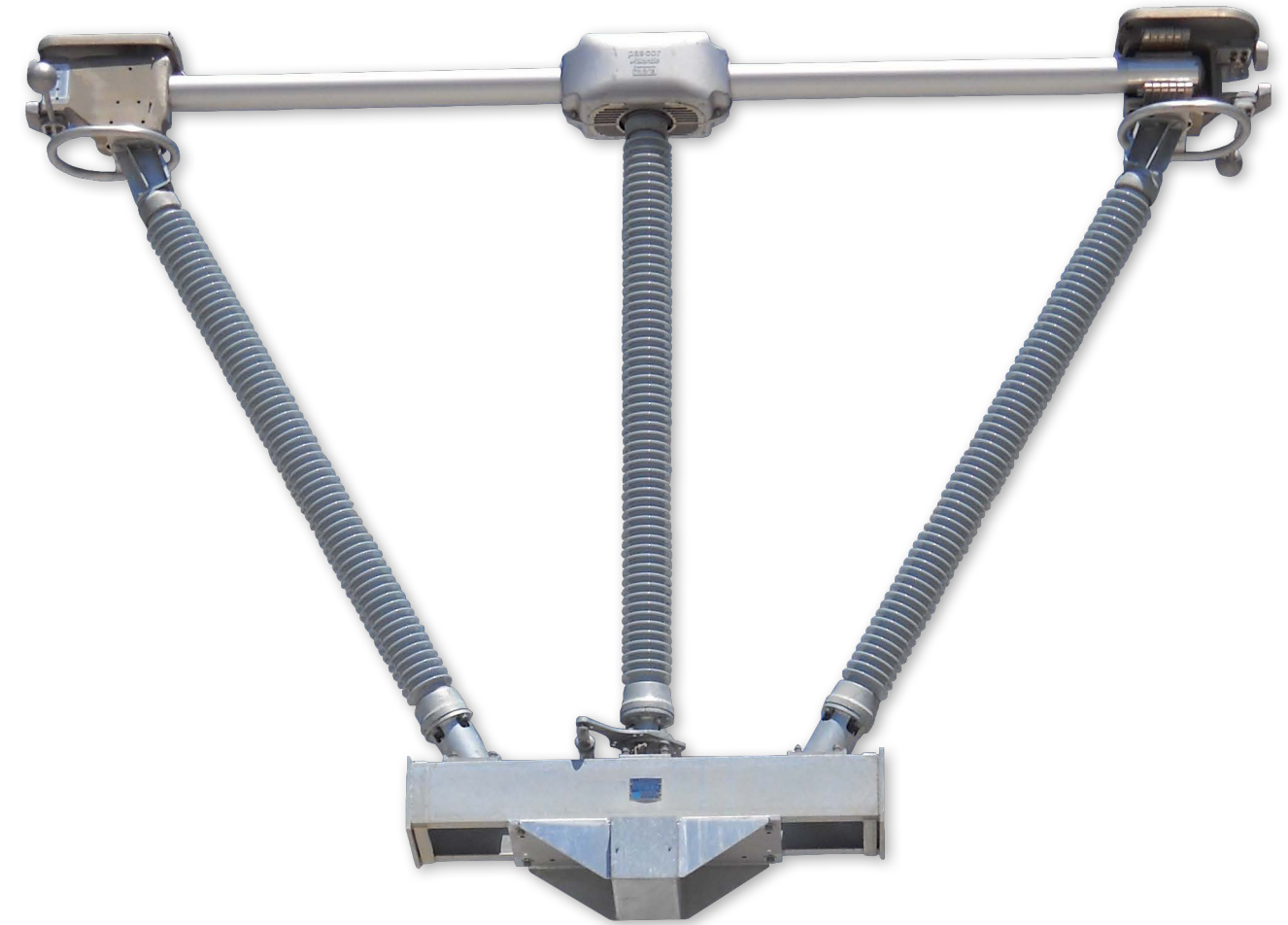
Operators required (main and ground switches)
Insulator specification including:
- BIL rating
- technical reference (TR #)
- bolt circle diameter
Mounting information
Structure and detail drawings
Fixed terminal pad height if applicable



Type TTT-7V



72.5 THRU 550 kV
1200-5000A
61-120 KA MOMENTARY



Double End-Break Outdoor Air Disconnect Switch

Description

The TTT-7V switch is a modern and reliable three-insulator, Double End-Break, outdoor air switch using a variety of materials in its design selected to do a specific job according to the function required.

Optimum mechanical and electrical characteristics of the current carrying parts are assured through the use of high-conductivity, high-strength aluminum alloys combined with transfer contacts utilizing the time proven high-pressure, silver-to-copper construction.

Throughout the current path all bolts, nuts, and pins are stainless steel, minimizing the possibility of corrosion. A galvanized structural steel channel base supports the insulators and live parts. The switch is designed to enhance the electrical and mechanical characteristics of current carrying parts. The mechanical parts and rotor bearings are designed for durability to withstand cantilever stresses, ensuring long-lasting service in all types of environments. All parts have been designed to be uniform across the product line. As a result, parts are easier to stock and are more readily available from the factory.

APPLICATION

Type TTT-7V Double End-Break switches meet or exceed ANSI C37 and IEC 129 standards and are adaptable to substation and line applications. They may be applied for any conventional requirements such as main line disconnecting, bus sectionalizing, breaker isolating and by-passing, or transformer disconnecting. They are also capable of interrupting line-charging and transformer-magnetizing current when equipped with interrupting attachments.

MOUNTING

Type TTT-7V switches can be mounted in upright, inverted or vertical positions.

TTT-7V DESIGN FEATURES AND BENEFITS

Sealed Pressure Hinge Contacts

The TTT-7V switch is backed by years of a solid reputation and proven dependable service life in all types of climates and conditions. The center insulator of the TTT-7V rotates to open and close the switch. A desirable feature of the TTT-7V is that both terminal pads are rigid and well supported. The TTT-7V blades are extra heavy, one-piece, tubular aluminum with replaceable copper contacts at each end. Silver-surfaced edges of the contact ends engage with tinned copper jaw fingers to provide a field-proven make-and-break silver to tinned copper contact. The aluminum blade is attached to the top of the center rotating insulator stack by four bolts. A well-covered pivot and a set of driving bevel gears produce the blade rotation. A heavy helical spring, coiled around the blade, hold the blade contact ends in an angular position preventing any interference, as the contacts enter the jaw.

Jaw Contacts

The jaw consists of tinned, hard drawn reverse loop copper jaw fingers backed by stainless steel springs to provide excellent current carrying capability and resistance to corrosion. The stainless steel springs are insulated at one end to eliminate current flow through the spring and thus prevent annealing. This design prolongs the life of the spring and ensures consistent contact pressure.

The reverse loop finger design of the jaw contact assures that the contacts will stay engaged under fault conditions. Magnetic forces from the fault current tend to push the blade deeper into the jaw rather than up, out of the jaw.

Consequently, the blade will not be driven from the jaw due to magnetic forces from fault conditions, preventing damage to the switch and any adjacent construction.

The blade contact end consists of a replaceable silver-plated copper bar bolted directly to the swaged blade end, minimizing current connections and welded joints to promote better current carrying performance. The contact end is easily replaced in the field by removing a few bolts thereby reducing the amount of downtime.

The rotating insulator moves the blade from the fully open position into the stop in the jaw, free of any jaw contact pressure. As the rotating insulator continues its travel, the bevel gears rotate the blade around its own axis producing a wiping-pressure contact. Thus contact pressure is not exerted until the blade fully enters the jaw, and pressure is released before the blade begins opening travel. The complete insulator rotation---swinging and rotating the blade---is a continuous, uninterrupted motion.

Blade Operation

The aluminum blade is attached to the top of the center rotating insulator stack by four bolts. A well-covered pivot and a set of driving bevel gears produce the blade rotation. A heavy helical spring, coiled around the blade, holds the blade contact ends in an angular position preventing any interference, as the contacts enter the jaw. The rotating insulator moves the blade from fully open position into the stop in the jaw, free of any jaw contact pressure. As the rotating insulator continues its travel the bevel gears rotate the blade around its own axis producing a wiping-pressure contact. Thus contact pressure is not exerted until the blade fully enters the jaw, and pressure is released before the blade begins opening travel. The complete insulator rotation – swinging and rotating the blade – is a continuous, uninterrupted motion.

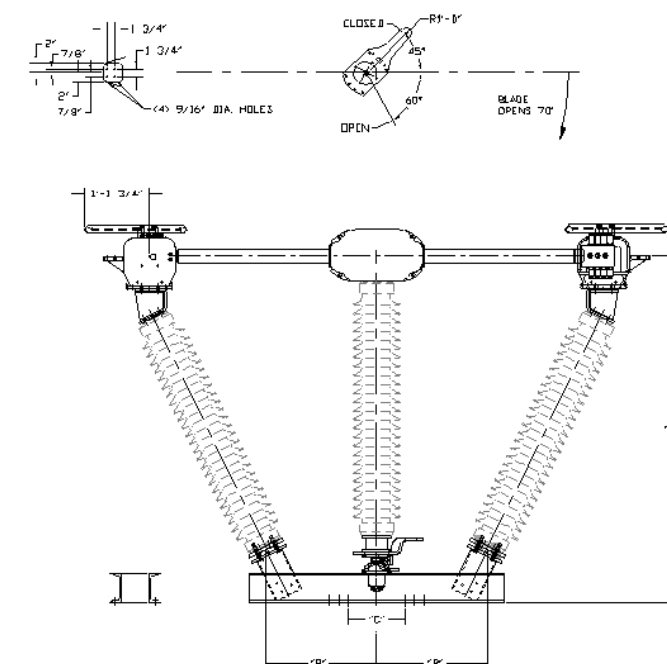
Rotor Bearings

The drive insulator stack rotates on a greaseless rotor bearing that contains two sets of stainless steel ball bearings. Weather seals prevent moisture and foreign matter from entering the rotor bearing. The ball bearing sets are spaced far enough apart to provide sufficient support to withstand cantilever stresses and to allow the ball races to take thrust loading as well as radial loading. This design assures smooth operation and minimized operating effort. Because of this design, no maintenance is required, ever.

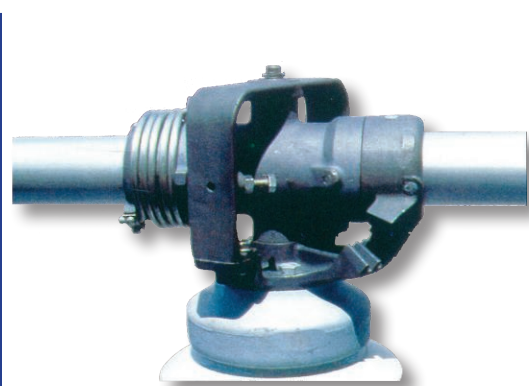
Switch Bases

Switch bases of galvanized structural steel channel are designed and tested to be rigid under all operating conditions. Heavy galvanizing is applied after punching to assure long corrosion-free life. Universal bases are available for all switch types. This base allows for infinite mounting bracket location which assures mounting holes will match without the need for field modification.

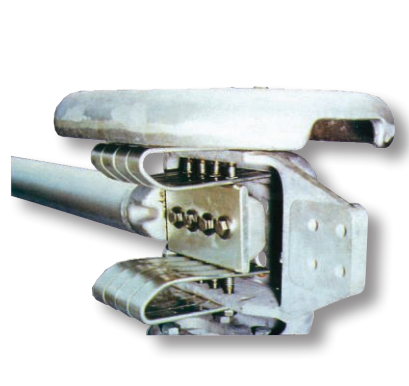
TTT-7V SPECIFICATIONS



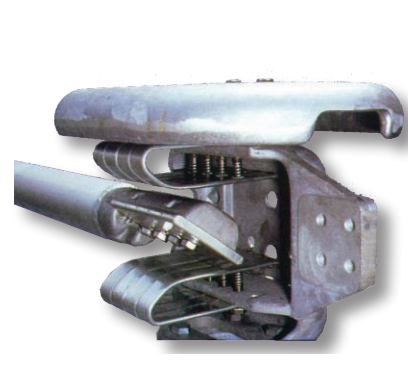
kV	INS	"A"		"B"		"C"		APPROX. SINGLE POLE WEIGHT WITH INSULATOR	
		IN.	MM	IN.	MM	IN.	MM	LBS.	KG.
69	TR-216	52 1/4"	1327	17 15/16"	456	12"	305	505	229
115	TR-286	64 1/4"	1632	19 1/8"	486	15"	381	770	349
138	TR-288	73 1/4"	1861	23 1/2"	597	24"	610	880	399
161	TR-291	81 5/16"	2065	26"	660	28"	711	985	447
230 / 900	TR-304	100 7/8"	2562	32"	813	40"	1016	1310	594
230 / 1050	TR-312	116 1/2"	2959	33 13/16"	859	44"	1118	1455	660
345 / 1050	TR-312	116 1/2"	2959	34 1/16"	865	44"	1118	1455	660
345 / 1300	TR-324	130 3/8"	3312	36 3/4"	933	48"	1219	1880	853
500 / 1550	TR-379	160 1/4"	4070	55 1/2"	1410	110"	2794	3075	1395



HINGE ASSEMBLY

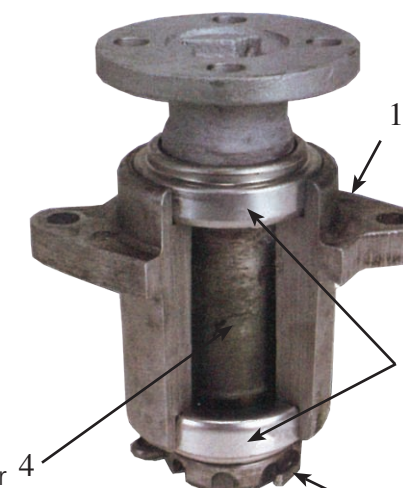


BLADE FULLY CLOSED

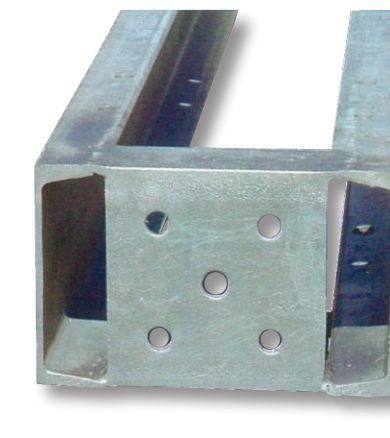


BLADE IN JAW (ROTATED)

1. One-piece, high-strength, cast aluminum alloy housing
2. Type 18-8 stainless steel ball bearings
3. Adjusting and take-up nut
4. Galvanized forged-steel rotor



ROTOR BEARINGS



SWITCH BASES