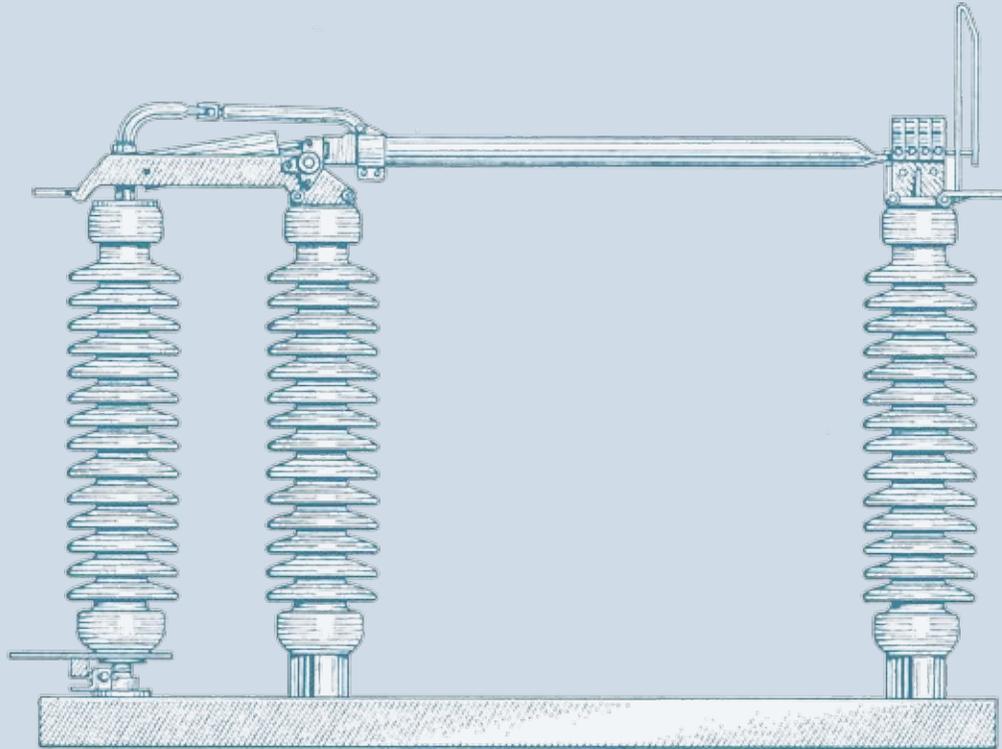


TTR8



INTRODUCTION & TYPE TEST DATE : 1993		ANNUAL UNITS PRODUCED : 632	
UNITS IN SERVICE : > 12000		SEISMIC QUALIFICATION BY SHAKE TABLE : 230 kV	
VOLTAGE : 8.3-362 kV	BIL : 95-1300 kV	CONTINUOUS CURRENT : 1200-3000 AMPS	
SHORT CIRCUIT : 99-195 kA PEAK (38-75 kA 3 SECOND)			INSULATOR : LAPP

The TTR8 switch is a three insulator vertical break design. Operation of the switch is accomplished through rotation of the outside hinge insulator. Aluminum components are utilized throughout the design except in critical current transfer areas where copper and copper alloy castings are employed. Sealed high pressure current transfer joints in the blade hinge assure trouble free operation. Switch bases are constructed from galvanized structural steel channel. The TTR8 vertical break switch design allows for mounting at minimum recommended phase spacing. Additional clearance is required for the open blade position.

TTR8 VALUE-ADDED FEATURES

Pascor Atlantic's TTR8 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 TTR8:

- Arc Restrictors thru 145 kV (Quick Whips)
- Vacuum Interrupters
- Auxiliary Switches
- Cable Guides (Outriggers)
- Spill Gaps
- Leveling Screws (Jacking Bolts)
- Position Indicators
- Silver-to-Silver Open Air Contacts

OPERATORS

The TTR8 can be operated either manually or by a motor mechanism. Below is a list of operators which can be supplied:

- Swing Handle
- Worm Gear
- MO-10 Motor Operator

GROUNDING SWITCH

For grounding during inspection, maintenance, or repair, a threepole grounding switch can be mounted on the hinge and/or jaw end of the TTR8. 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 TTR8. High speed grounding switches can be reset by using a hookstick or one of the operators listed above.

ORDERING INFORMATION:

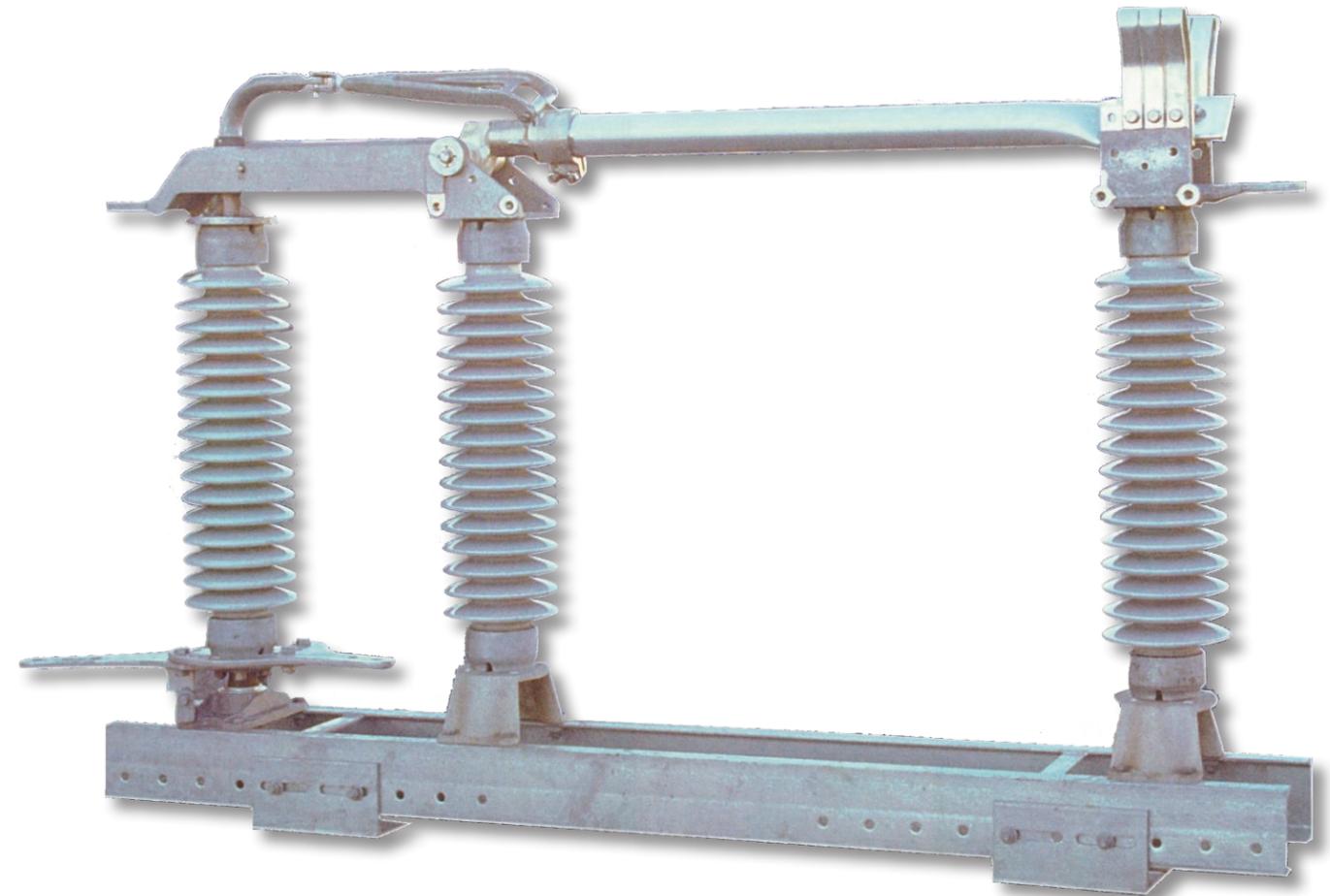
The following information is the minimum required when ordering TTR8 vertical-break switches:

- 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 TTR8

8.25 THRU 242 kV, 1050 kV BIL
600-3000A
40-120 KA MOMENTARY

PASCOR ATLANTIC
Delivering More. Delivering Service.



Vertical-Break Outdoor Air Disconnect Switch

Description

The TTR8 switch is a modern and reliable three-insulator, vertical 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. There are only three moving current transfer contacts and of these only one is an exposed separable contact subject to environmental conditions.

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.

Pascor Atlantic
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254 Industry Dr. • Bland, Virginia 24315-9709
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PASCOR ATLANTIC

This bulletin describes our standard product and does not show variations in design which may be available. If additional details are required, contact your local Pascor Atlantic representative. Pascor Atlantic reserves the right to make changes or improvements to the product shown in this bulletin without notice or obligation.

SEPTEMBER 2009 DB-TTR8-A

APPLICATION

Type TTR8 vertical-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 TTR8 switches can be mounted in upright, inverted or vertical positions.

TTR8 DESIGN FEATURES AND BENEFITS

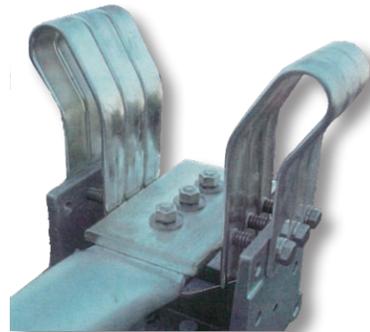
Sealed Pressure Hinge Contacts

The TTR8 design is backed by years of a solid reputation and proven, dependable service life in all types of climates and conditions. The transfer of the current from the copper hinge to the aluminum hinge terminal casting is through two spring-loaded helical contact hinge-pin assemblies in parallel. The hinge pins are silver-plated copper with silver plated threads. A stainless steel pressure spring provides positive continuous contact between the threads. A specially designed stainless-steel insert expands the slotted hinge pin, applying a radial force to engage the silvered surface of the hinge terminal casting, thus providing a reliable current transfer. Neoprene O-ring seals protect the contacts from dust, dirt and moisture. The seal-in lubrication is effective for the life of the switch.

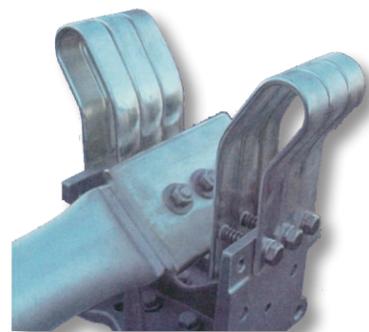
The rugged hinge assembly features a cast aluminum die casting, cast copper alloy hinge and blade clamp, and copper alloy hinge pins. This sturdy construction assures years of reliable, long-lasting performance and durability in all climates, even in the toughest environmental conditions.



HINGE ASSEMBLY



BLADE FULLY CLOSED



BLADE IN JAW (ROTATED)

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 downward in 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 blade rotates 24 degrees on its own axis before it begins its open gap travel. The blade rotation breaks ice and removes caked dirt both externally and internally from the jaw contact fingers. All operating effort is applied to releasing pressure and breaking debris before the blade lifts from the jaw. The rotation of the blade also cleans dirt and ice from the jaw contact finger surfaces when the switch is closed. This rotation ensures definite contact pressure with each operation helping to reduce losses resulting from poor contact pressure.

All other dynamic contact joints are permanently lubricated and sealed by O-rings. This design assures reliable operation over the course of many years in all types of weather conditions and environments.

Blade Counterbalance

Where required, blade counterbalances are provided to assure ease of operation. The counterbalance consists of an aluminum tubular housing, steel compression spring protected with a tough flexible coating and a stainless steel plunger rod.

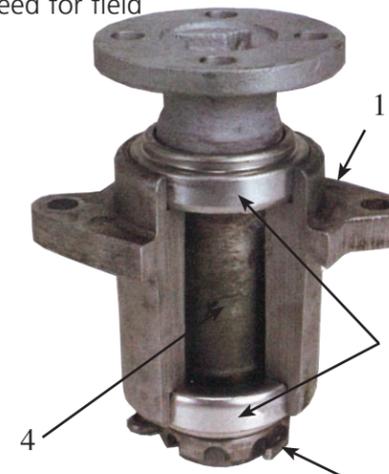
Three counterbalance connections are located on the blade hinge for upright, vertical or inverted mounting. These connections can easily be changed in the field to accommodate a change in mounting position.

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.



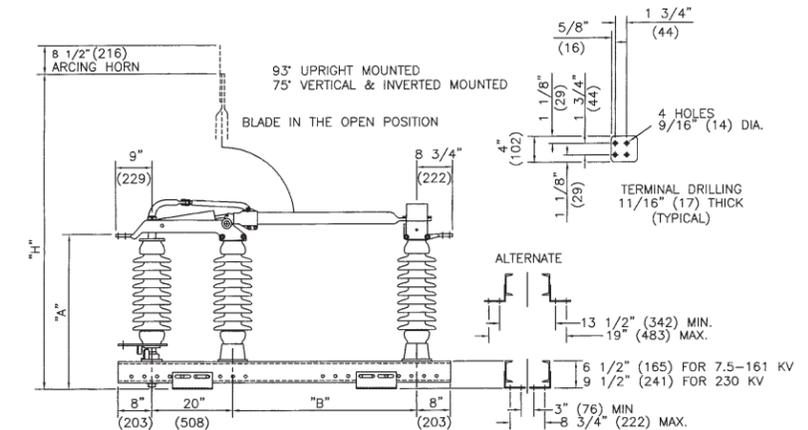
ROTOR BEARINGS

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



SWITCH BASES

TTR8 SPECIFICATIONS



KV	"INS"	"H"		"A"		"B"		BASE MOUNTING				APPROX. SINGLE POLE WEIGHT WITH INSULATOR		APPROX. SINGLE POLE WEIGHT FOR TTR8-PSC		
		IN.	MM	IN.	MM	IN.	MM	MIN.	MAX.	MIN.	MAX.	LBS.	KG.	LBS.	KG.	
7.5	TR-202	48	3/4"	1238	20"	508	21"	533	9 1/2"	241	52"	1321	284	129	211	96
15	TR-205	51	1/4"	1302	22 1/2"	572	21"	533	9 1/2"	241	52"	1321	294	133	214	97
23	TR-208	55	1/4"	1403	26 1/2"	673	21"	533	9 1/2"	241	52"	1321	329	149	219	99
34.5	TR-210	71	1/4"	1810	30 1/2"	775	33"	838	13"	330	64"	1626	391	177	239	108
46	TR-214	75	1/4"	1911	34 1/2"	876	33"	838	13"	330	64"	1626	442	200	243	110
69	TR-216	95	1/4"	2419	42 1/2"	1080	45"	1143	25"	635	76"	1930	574	260	268	122
115	TR-286	125	7/8"	3181	57 1/2"	1461	60"	1524	40"	1016	91"	2311	882	400		
115	TR-287	125	7/8"	3197	58 1/8"	1476	60"	1524	40"	1016	91"	2311	957	434		
138	TR-288	146	1/4"	3715	66 1/2"	1689	72"	1829	52"	1321	103"	2616	985	447		
138	TR-289	146	7/8"	3731	67 1/8"	1705	72"	1829	52"	1321	103"	2616	1090	494	NA	NA
161	TR-291	166	1/4"	4223	74 1/2"	1892	84"	2134	64"	1626	115"	2921	1102	500		
161	TR-295	166	7/8"	4239	75 1/8"	1908	84"	2134	64"	1626	115"	2921	1252	568		
230	TR-304	203	3/8"	5166	95 1/8"	2416	96"	2438	76"	1930	127"	3226	1352	613		
230	TR-308	204"		5182	95 3/4"	2432	96"	2438	76"	1930	127"	3226	1529	694		

* THE TTR8-PSC IS THE TTR-8 WITH SILICON POLYMER INSULATORS AND SINGLE CHANNEL BASE THAT IS 2"(51) HIGH.