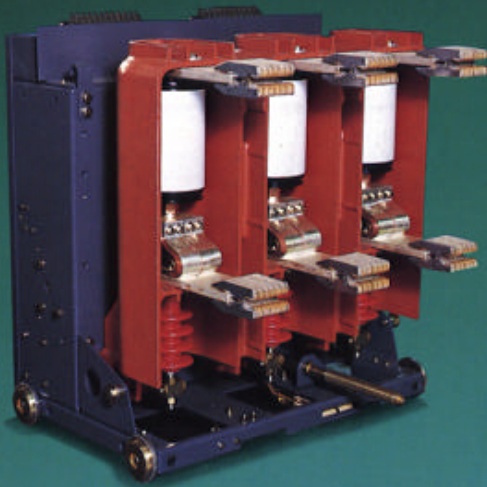
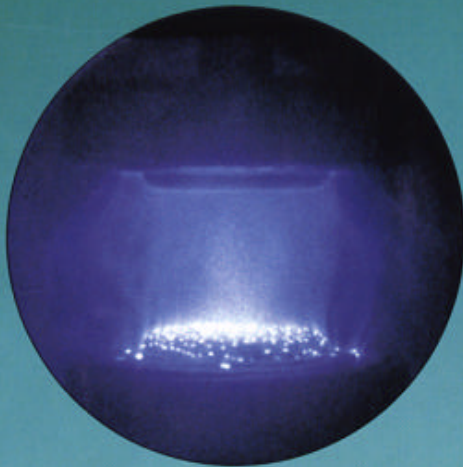


TOSHIBA

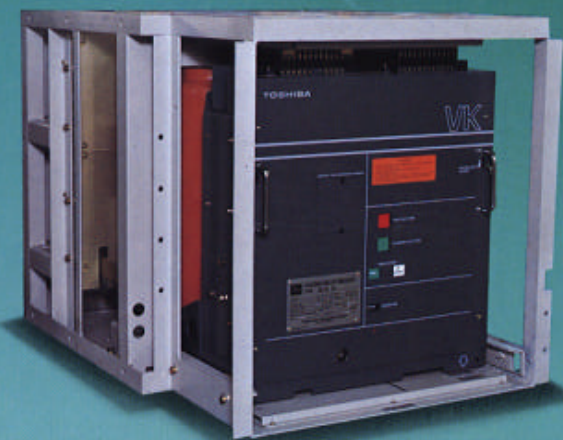
VACUUM CIRCUIT BREAKERS 5-38 kV



- Complete Line of 5-38kV, to 1,500MVA
- Meets or Exceeds ANSI Standard
- Compact, Light Weight
- State of the Art Design, Versatile Features
- Safety and Quality



Vacuum Interrupter Arc with Patented
Axial Magnetic Field Electrodes



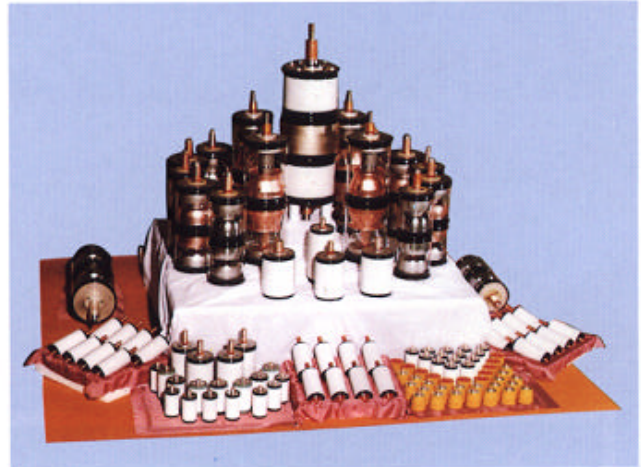
VCB in OEM Cell

Toshiba is a leader in Vacuum Technology.

Since the introduction of the first vacuum interrupter in 1962, Toshiba has been continuously improving and developing vacuum technology.

Over 130 thousand Toshiba vacuum circuit breakers and over 1.7 million Toshiba vacuum interrupters have been installed and are providing reliable service in a wide variety of applications worldwide.

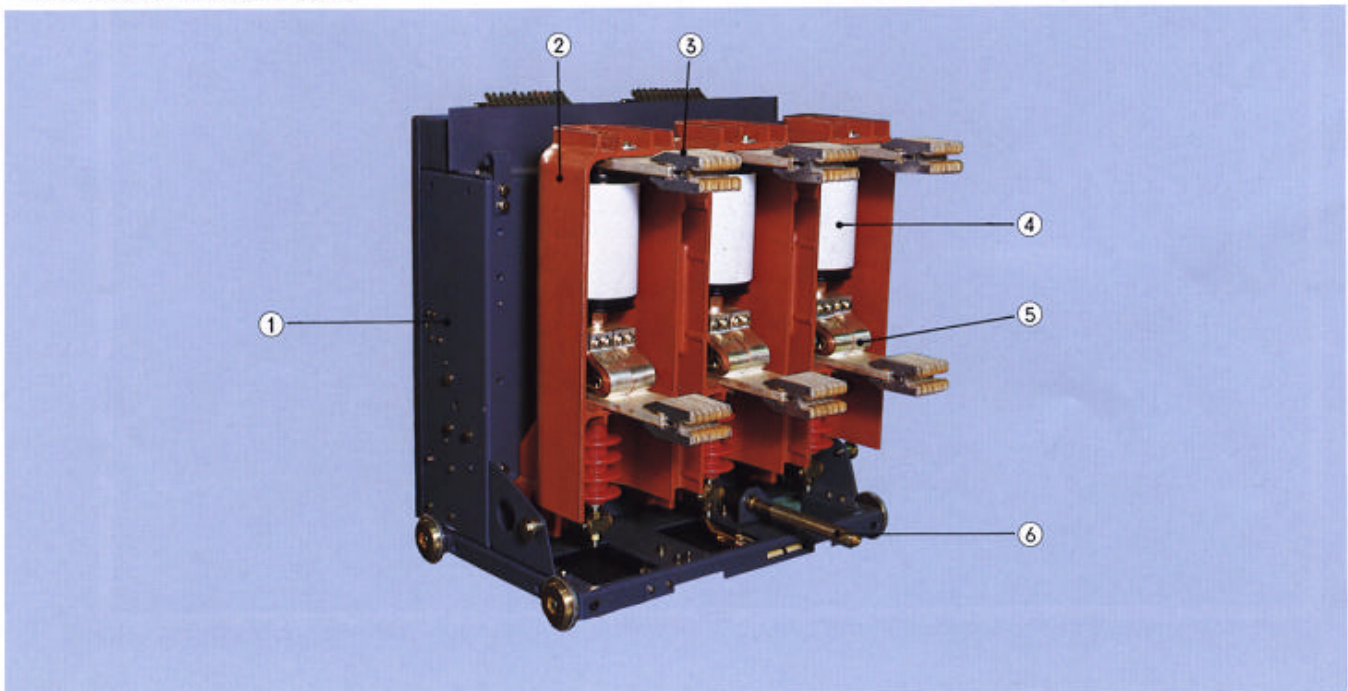
Dedicated to the most advanced vacuum technology, Toshiba offers the highest quality and performance vacuum circuit breakers for a full range of 5-38kV, and interrupting ratings up to 1,500MVA.



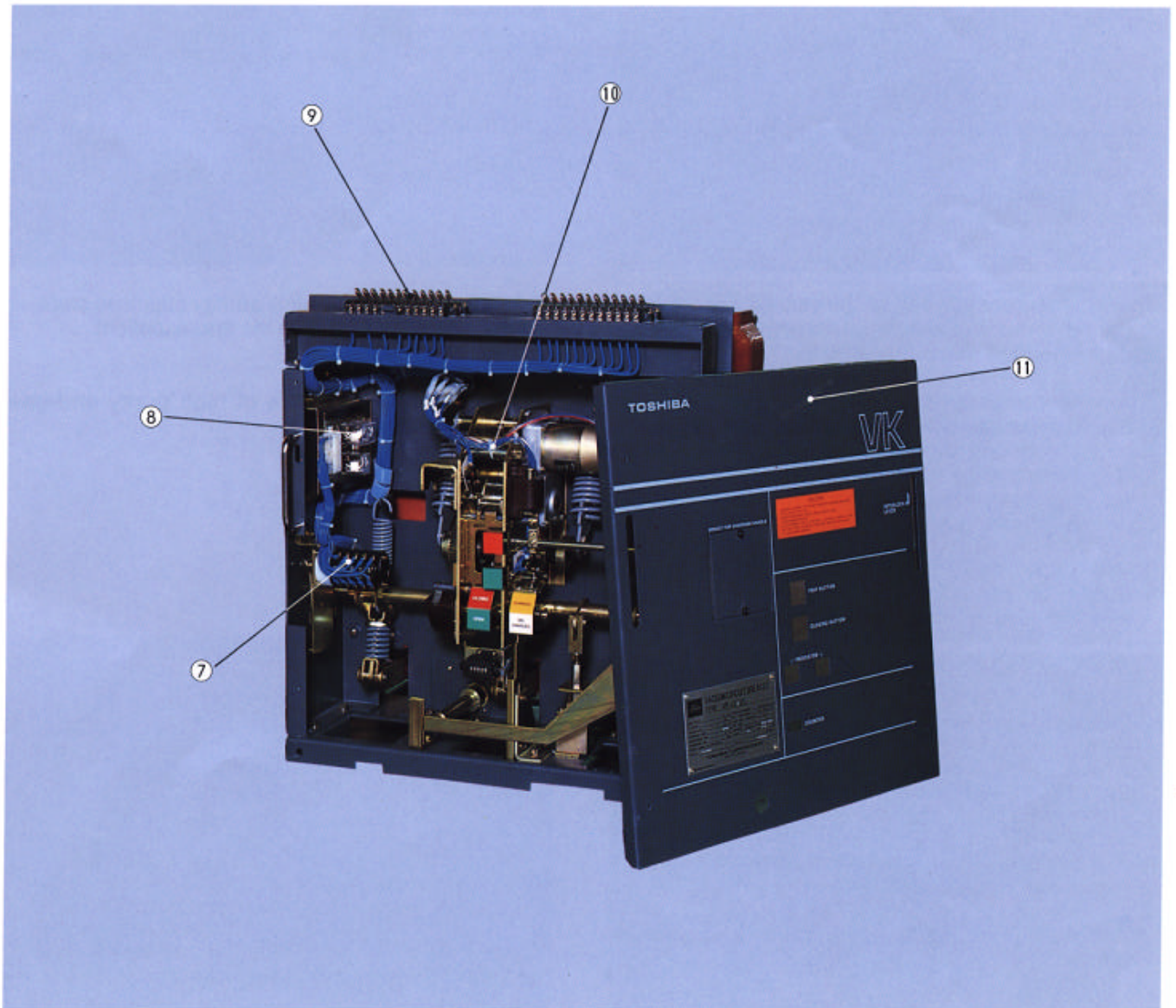
Vacuum Interrupters

Vacuum—Plus!

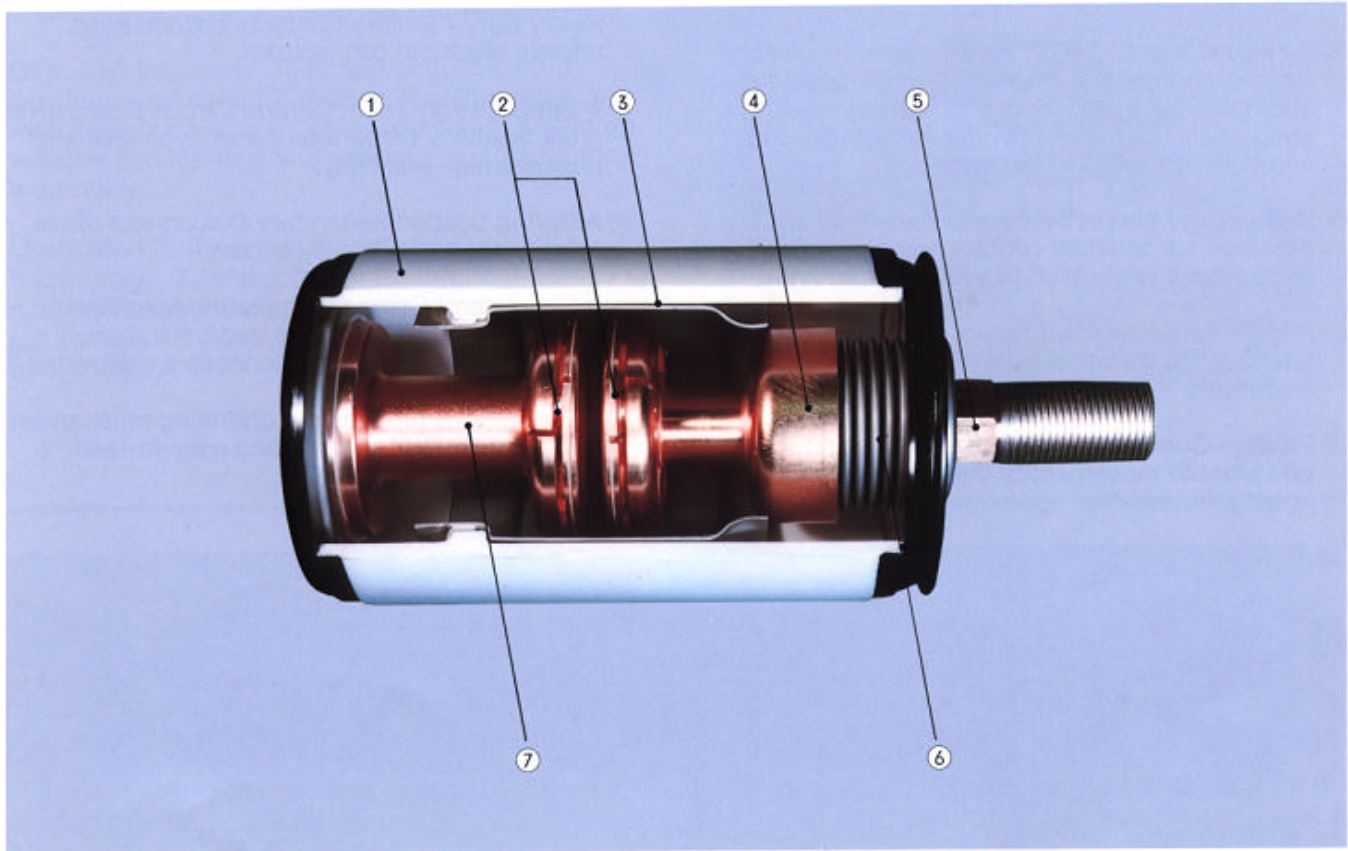
- **Excellent Interrupting Capability:** Employing patented axial magnetic field electrodes, Toshiba vacuum interrupters combine the highest interrupting capability with the smallest size. This has resulted in a dramatic reduction of size and weight of the total breaker.
- **Reliability and Quality:** Utilizing one of the most technologically sophisticated facilities for manufacturing and testing, Toshiba offers the highest reliability and quality breakers with the support of the world's largest vacuum equipment manufacturing experience.
- **Compact and Light Weight:** By incorporating the most advanced technology, the Toshiba breaker is the smallest and the lightest of its kind. The 15kV, 1200A, 500MVA rated breaker weighs only 95kg (210 lbs), compared to 200kg (450 lbs.) for the most competitive vacuum circuit breakers.



- ① A Rugged Steel Frame houses and protects the operating mechanism and rigidly supports the one piece insulation barrier.
- ② A Heavy Duty and High Performance Insulation Barrier made of glass polyester firmly positions and holds the interrupters and primary conductors. This also provides reliable ground and between-phases insulation.
- ③ Rugged and Simple Primary Disconnects are designed for optimum contact pressure and have been extensively tested to verify performance.
- ④ A High Performance Vacuum Interrupter employs the patented axial magnetic field electrodes.
- ⑤ Flexible Conductors provide greater conductivity and smooth movement of the electrode resulting in long, trouble-free operation.
- ⑥ A Dependable Racking Screw gives easy rack-in and withdrawal.
- ⑦ Heavy Duty Auxiliary Contacts provide solid, reliable electrical connections.
- ⑧ A Simple, High-Tech. Control Circuit Board gives great flexibility for various control voltages and provides high reliability.
- ⑨ A Spring Loaded Secondary Disconnect offers reliable contact and easy access.
- ⑩ A Simple and Compact Operating Mechanism offers long, trouble-free life and minimizes maintenance. Complete interlocks are provided.
- ⑪ A Front Panel protects the operating mechanism and provides well-marked and easy-to-read control identification.



Heart of Breaker/Vacuum Interrupter



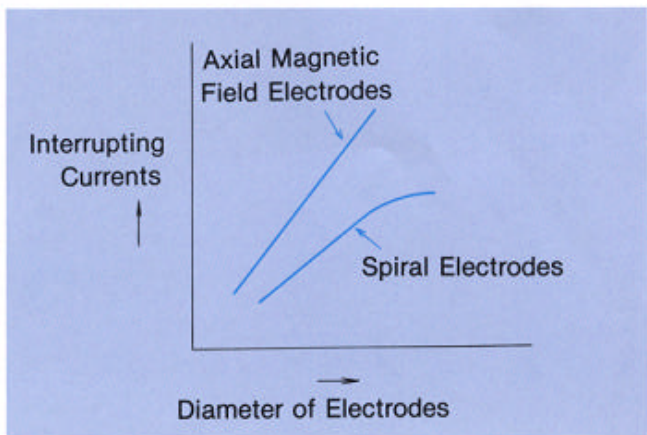
Though the construction of the vacuum interrupter is simple, it requires extensive advanced technology and engineering in its design.

Since the introduction of the first interrupter in 1962, Toshiba has been continuously improving vacuum technology jointly with numerous scientists and engineers experienced in the field of metallurgy, plasma physics, high voltage, high power engineering and electronics.

- ① The Insulating Vacuum Envelope is a high density alumina of ceramics which has excellent insulating and air-tight characteristics.
- ② The Electrodes with Patented Axial Magnetic Field offer the highest interrupting capability by employing the smallest interrupter.
- ③ The Arc Shield traps metal vapor during interruption to protect the envelope from contamination.
- ④ The Bellows Cover protects the bellows from metal vapor contamination.
- ⑤ A Movable Rod made of high purity and gas free copper.

⑥ A Bellows, made of high quality stainless steel, offers long, trouble-free life and excellent corrosion resistance.

⑦ A Stationary Rod made of high purity and gas-free copper.



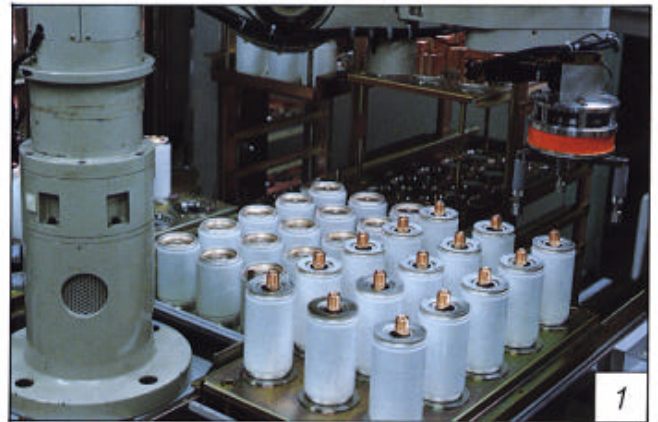
Key to Assurance of High Quality and Reliability

In the Toshiba vacuum circuit breakers quality begins with basic materials. All raw materials and purchased components go through a strict inspection.

The Manufacture of parts is highly-tooled and extensively uses numerically-controlled machines for precise fabricated parts production.

Assembly and test operations are automated with computer assistance where applicable, such as an automated test on the vacuum interrupter and a complete breaker.

Toshiba's manufacturing facilities for vacuum interrupters are among the most sophisticated and advanced in the world. Each finished interrupter is sent through on X-ray examination and then through a vacuum degree measurement by an ultra-sensitive magnetron discharge type apparatus developed by Toshiba's Central R&D Center to assure long-term vacuum integrity.



- 1 Fully Automated Interrupters Assembly Line
- 2 Vacuum Furnace with Computer Aided Precise Temperature Control.
- 3 X-Ray Examination Facility
- 4 Automated Breaker Testing Facility with Computer Aid

Ratings (Symmetrical Rating Basis ANSI C37.06)

Identification				Rated Values								Related Required Capabilities			
ANSI Line No.	Type-Form of Breaker	Nominal rms Voltage Class (kV)	Nominal 3-phase Class (MVA)	Voltage		Insulation Level		Current		Rated Interrupting Time (Cycles)	Rated Per-Missable Tripping Delay, Y (Seconds)	Rated Maximum rms Voltage Divided by K (kV)	Current Values		
				Rated Maximum rms Voltage (kV) (2)*	Rated Voltage Range Factor, K (3)*	Low Frequency rms Voltage (kV)	Crest Impulse Voltage (kV)	Continuous rms Current Rating at 60Hz (A)	Short-circuit rms Current Rating (at Rated Max. kV) (kA) (4)*				Maximum Symmetrical Interrupting Capability (5)* (kA)	3 Sec Short-time Current Carrying Capability (kA)	Closing and Latching Capability 1.6K Times Rated Short-circuit rms Current (kA)
2	VK-6M32 A	4.16	250	4.76	1.24	19	60	1200	29	3	2	3.85	36	36	58
3	VK-6P32 A	4.16	250	4.76	1.24	19	60	2000	29	3	2	3.85	36	36	58
(1)*	VK-6M40 A	4.16	350	4.76	1.0	19	60	1200	41	3	2	4.76	41	41	66
(1)*	VK-6P40 A	4.16	350	4.76	1.0	19	60	2000	41	3	2	4.76	41	41	66
4	VK-6M50	4.16	350	4.76	1.19	19	60	1200	41	3	2	4.0	49	49	78
5	VK-6P50	4.16	350	4.76	1.19	19	60	2000	41	3	2	4.0	49	49	78
6	VK-6Q50	4.16	350	4.76	1.19	19	60	3000	41	3	2	4.0	49	49	78
7	VK-8M40 A	7.2	500	8.25	1.25	36	95	1200	33	3	2	6.6	41	41	66
8	VK-8P40 A	7.2	500	8.25	1.25	36	95	2000	33	3	2	6.6	41	41	66
(1)*	VK-8Q40	7.2	500	8.25	1.25	36	95	3000	33	3	2	6.6	41	41	66
9	VK-10M25A2	13.8	500	15	1.30	36	95	1200	18	3	2	11.5	23	23	37
10	VK-10P25A2	13.8	500	15	1.30	36	95	2000	18	3	2	11.5	23	23	37
11	VK-10M40 A	13.8	750	15	1.30	36	95	1200	28	3	2	11.5	36	36	58
12	VK-10P40 A	13.8	750	15	1.30	36	95	2000	28	3	2	11.5	36	36	58
(1)*	VK-10Q40	13.8	750	15	1.30	36	95	3000	28	3	2	11.5	36	36	58
(1)*	VK-10M40 A	13.8	1000	15	1.0	36	95	1200	37	3	2	15	37	37	59
(1)*	VK-10P40 A	13.8	1000	15	1.0	36	95	2000	37	3	2	15	37	37	59
(1)*	VK-10Q40	13.8	1000	15	1.0	36	95	3000	37	3	2	15	37	37	59
13	VK-10M50	13.8	1000	15	1.30	36	95	1200	37	3	2	11.5	48	48	77
14	VK-10P50	13.8	1000	15	1.30	36	95	2000	37	3	2	11.5	48	48	77
15	VK-10Q50	13.8	1000	15	1.30	36	95	3000	37	3	2	11.5	48	48	77
(1)*	VK-20J13	23	500	25.8	1.0	60	125	600	12	3	2	25.8	12	12	19
(1)*	VY-20M25A	23	1000	25.8	1.0	60	125	1200	20.8	3	2	25.8	20.8	20.8	33.3
(1)*	VY-20P25A	23	1000	25.8	1.0	60	125	2000	20.8	3	2	25.8	20.8	20.8	33.3
(1)*	VY-30M25 A	34.5	1500	38	1.35	80	150	1200	21	3	2	28	28.4	28.4	45.5
(1)*	VY-30P25A	34.5	1500	38	1.35	80	150	2000	21	3	2	28	28.4	28.4	45.5

*Numbers in parentheses refer to the Notes, below.

- (1) ANSI C37.06 does not define these ratings.
- (2) Maximum voltage for which the breaker is designed and the upper limit for operation.
- (3) K is the ratio of rated maximum voltage to the lower limit of the range of operating voltage in which the required symmetrical and asymmetrical interrupting capabilities vary in inverse proportion to the operating voltage.
- (4) To obtain the required symmetrical interrupting capability of a circuit breaker at an operating voltage between 1/K times rated maximum voltage

and rated maximum voltage, the following formula shall be used.

Required Symmetrical Interrupting Capability =

$$\text{Rated Short-circuit Current} \times \frac{(\text{Rated Max. Voltage})}{(\text{Operating Voltage})}$$

- (5) Current values in this column are not to be exceeded even for operating voltages below 1/K times rated maximum voltage. For voltages between the rated maximum voltage and 1/K times rated maximum voltage, follow (4) above.



VK Type



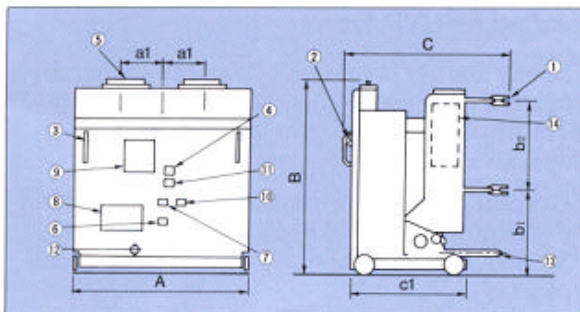
VY Type

Weight & Dimensions (Breakers)

Type-Form of Breaker	Dimensions, mm (in)								Weight kg (lbs)		
	A	a ₁	B	b ₁	b ₂	c	c ₁	c ₂			
VK-6M32A	597 (23-1/2)	200 (7-7/8)	656.5 (25-7/8)	291 (11-15/32)	298 (11-3/4)	535 (21-1/16)	390 (15-3/8)	—	95 (210)		
VK-6P32A				295 (11-5/8)	290 (11-7/16)				120 (265)		
VK-6M40A				291 (11-15/32)	298 (11-3/4)				95 (210)		
VK-6P40A				295 (11-5/8)	290 (11-7/16)				120 (265)		
VK-6M50	700 (27-9/16)	230 (9-1/16)	731.5 (28-13/16)	295 (11-5/8)	366 (14-7/16)	595 (23-7/16)	450 (17-3/4)	—	160 (350)		
VK-6P50				299 (11-25/32)	358 (14-3/32)				175 (385)		
VK-6Q50				295 (11-5/8)	340 (13-1/8)				715 (28-1/8)	550 (21-5/8)	295 (650)
VK-8M40A				291 (11-15/32)	298 (11-3/4)				535 (21-1/16)	390 (15-3/8)	195 (210)
VK-8P40A	295 (11-5/8)	290 (11-7/16)	120 (265)	—	—						
VK-8Q40	700 (27-9/16)	230 (9-1/16)	731.5 (28-13/16)	295 (11-5/8)	340 (13-1/8)	715 (28-1/8)	550 (15-5/8)	—	240 (530)		
VK-10M25A2	597 (23-1/2)	200 (7-7/8)	656.5 (25-7/8)	291 (11-15/32)	298 (11-3/4)	535 (21-1/16)	390 (15-3/8)	—	95 (210)		
VK-10P25A2				295 (11-5/8)	290 (11-7/16)				120 (265)		
VK-10M40A				291 (11-15/32)	298 (11-3/4)				95 (210)		
VK-10P40A				295 (11-5/8)	298 (11-7/16)				120 (265)		
VK-10Q40	700 (27-9/16)	230 (9-1/16)	731.5 (28-13/16)	295 (11-5/8)	340 (13-1/8)	715 (28-1/8)	550 (21-5/8)	—	240 (530)		
VK-10M50	700 (27-9/16)	230 (9-1/16)	731.5 (28-13/16)	295 (11-5/8)	366 (14-7/16)	595 (23-7/16)	450 (17-3/4)	—	160 (350)		
VK-10P50				299 (11-25/32)	358 (14-3/32)				175 (385)		
VK-10Q50				295 (11-5/8)	340 (13-1/8)				715 (28-1/8)	550 (21-5/8)	295 (650)
*VK-20J13				690 (27-3/16)	230 (9-1/16)				860 (33-7/8)	429 (16-7/8)	350 (13-25/32)
VY-20M25A	700 (27-9/16)	230 (9-1/16)	1400 (55-1/8)	875 (34-7/16)	350 (13-25/32)	610 (24-1/32)	703 (27-11/16)	545 (21-15/32)	200 (440)		
VY-20P25A									230 (510)		
VY-30M25A	820 (32-9/32)	300 (11-13/16)	1465 (57-11/16)	830 (32-11/16)	540 (21-1/4)	930 (36-5/8)	915 (36-1/32)	435 (17-1/8)	270 (595)		
VK-30P25A									300 (660)		

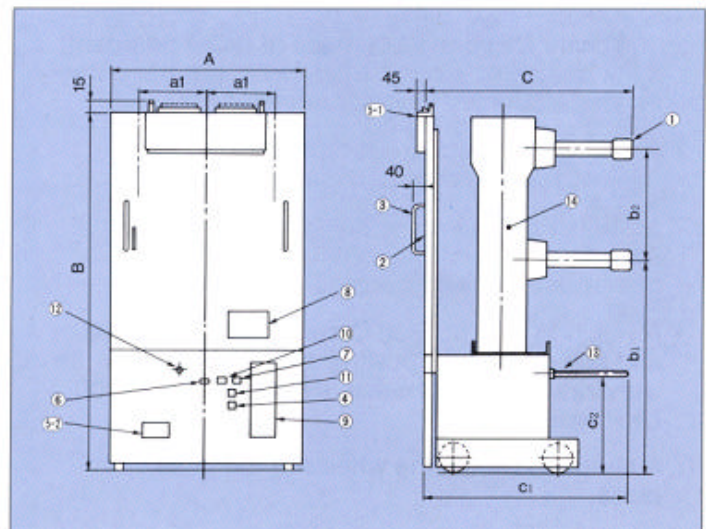
*VK-20J13.....Manual plug secondary disconnects & racked in/out by hand.

VK Type



- ① Primary Disconnects
- ② Interlock Lever
- ③ Grips
- ④ Trip Button
- ⑤ Secondary Disconnects (⑤-① Automatic sliding secondary Disconnect, ⑤-② Manual Plug Secondary Disconnect)
- ⑥ Counter
- ⑦ Open-close Indicator
- ⑧ Rating Plate
- ⑨ Socket for charging handle
- ⑩ Spring Charge Indicator
- ⑪ Closing Button
- ⑫ Socket for Driving Handle
- ⑬ Driving Screw
- ⑭ Vacuum Interrupters

VY Type

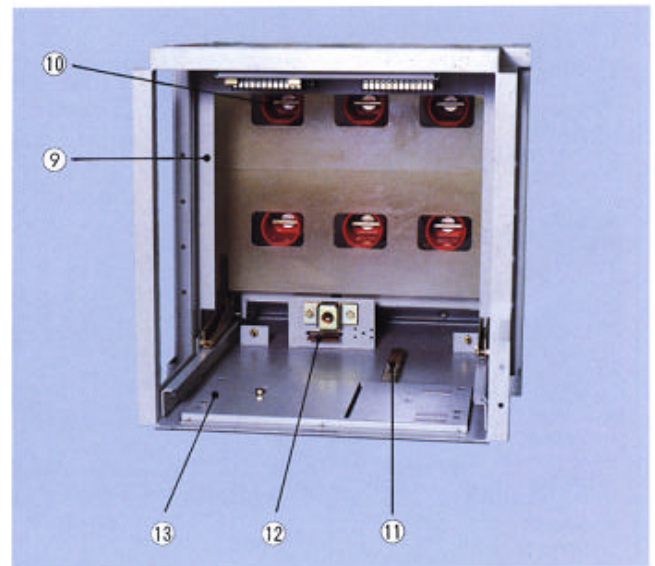
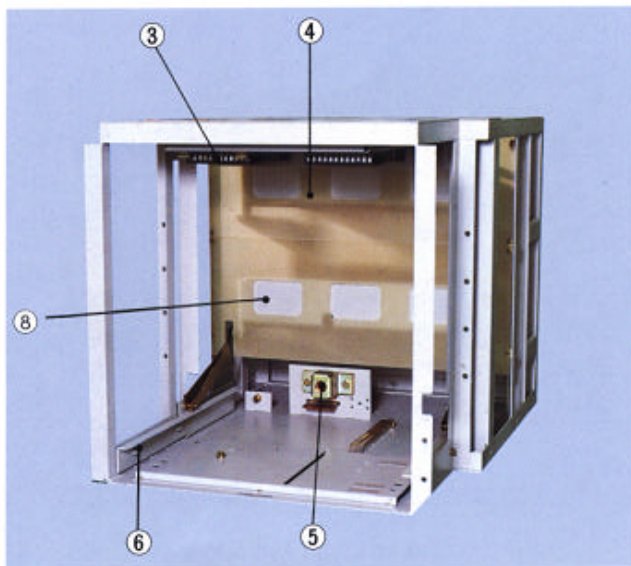
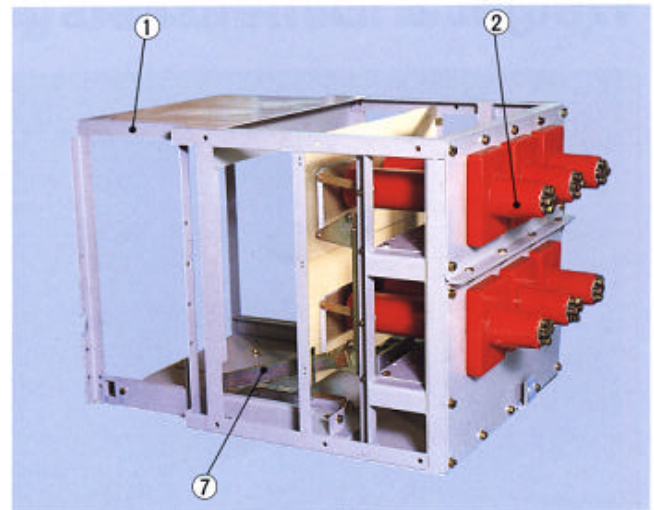


OEM Cell

Toshiba's OEM Cell provides flexibility for design and application of vacuum circuit breaker by assemblers.

Since the cell employs a heavy steel structure and is completely factory assembled, no adjustment or alignment is required. This compact, versatile design allows for better space utilization in most applications.

This OEM Cell provides metalclad quality and metalclad safety features including barriers and interlocks. The cell offers great flexibility with various field installable accessories.



(Shutter forced open for illustrative purpose.)

- ① A Structure Frame made of heavy steel provides rigid support of the primary disconnect terminal, the secondary disconnect, the shutter assembly and other accessories.
- ② A Primary Disconnect is made of flame retardant, track resistant epoxy resin with permanently-molded stationary stud conductors.
- ③ A Secondary Disconnect provides positive contact with the control circuit of breaker.
- ④ A Shutter Barrier made of glass polyester is added to the automatic shutter to isolate the primary disconnect for safety.
- ⑤ A Racking Nut, housed in steel cover, is floated and self-aligned for positive rack-in and withdrawal of the breaker. (No this provision on UKP type.)
- ⑥ A Guide rail holds the wheels of the breaker in place.
- ⑦ A Shutter Actuate Link, on both sides, provides positive operation of the automatic shutter by the breaker movement.
- ⑧ An Automatic Shutter made of heavy steel assures safety isolation of the primary disconnects when the breaker is disconnected or removed. (An Insulation material shutter is standard for UYP type.)
- ⑨ A Safety Barrier is made of heavy steel thereby providing complete separation of high voltage parts when the breaker is connected. (UKA type only.)
- ⑩ A Current Transformer is safely isolated behind the shutter barrier and is accessible from the front (not shown in picture, UKA and UYP-30 types only.)
- ⑪ A Ground Bus provides positive ground for the breaker structure throughout connected and test positions for operator safety.
- ⑫ A Ground Stud engages with the heavy ground finger of the breaker at the connected position.
- ⑬ An Interlock Plate provides complete interlock with the breaker for safety.

Weight & Dimensions (OEM Cell)

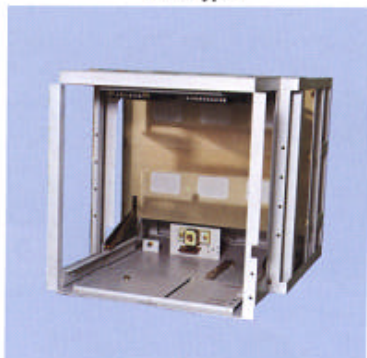
Type-Form of OEM Cell	Dimensions, mm (inch)										Weight, kg (lbs)					
	A	a ₁	B	b ₁	b ₂	b ₃	C	c ₁	c ₂	c ₃	OEM Cell	Breaker		Total Weight		
												Type-Form	Weight			
UKA-10MS ***HKA-10MS	776 (30-9/16)	200 (7-7/8)	740 (29-1/8)	4.5 (11/64)	291 (11-15/32)	298 (11-3/4)	1180 (46-1/2)	28 (1-1/8)	1030 (40-9/16)	150 (5-7/8)	130 (290)	VK-6M32A	95 (210)	225 (500)		
					VK-6M40A											
UKA-10PS ***HKA-10PS	800 (31-1/2)		800 (31-1/2)		295 (11-5/8)	290 (11-7/16)					150 (330)	VK-6P32A				
VK-6P40A												VK-6P40A				
VK-8P40A												VK-8P40A				
VK-10P25A2												VK-10P25A2				
VK-10P40A												VK-10P40A				
UKA-10MS1 ***HKA-10MS1	800 (31-1/2)	250 (9-7/8)	800 (31-1/2)	4.5 (11/64)	295 (11-5/8)	366 (14-7/16)	1180 (46-1/2)	▲ 15** (▲ 5/8)	1030 (40-9/16)	150 (5-7/8)	150 (330)	VK-6M50	160 (350)	310 (680)		
					VK-10M50	160 (350)						310 (680)				
UKA-10PS1 ***HKA-10PS1	800 (31-1/2)	250 (9-7/8)	800 (31-1/2)	4.5 (11/64)	299 (11-25/32)	358 (14-3/32)	1180 (46-1/2)	▲ 15** (▲ 5/8)	1030 (40-9/16)	150 (5-7/8)	170 (380)	VK-6P50	175 (380)	345 (760)		
					VK-10P50	175 (380)						345 (760)				
UKA-10QS	800 (31-1/2)	250 (9-7/8)	800 (31-1/2)	4.5 (11/64)	295 (11-5/8)	340 (13-3/8)	1299 (51-1/8)	▲ 15** (▲ 5/8)	1149 (45-1/4)	150 (5-7/8)	290 (640)	VK-6Q50	295 (650)	585 (1290)		
					VK-8Q40	240 (530)						530 (1170)				
VK-10Q40												VK-10Q40	240 (530)	530 (1170)		
VK-10Q50												VK-10Q50	295 (650)	585 (1290)		
UKP-20JS	860 (33-7/8)	230 (9-1/16)	1060 (41-47/64)	6 (15/64)	429 (16-57/64)	350 (13-25/32)	1355 (53-11/32)	60 (2-3/8)	1100 (43-5/16)	255 (10-1/32)	155 (340)	VK-20J13	105 (230)	260 (570)		
UYP-20MS1	860 (33-7/8)	230 (9-1/16)	1550 (61)	9 (23/64)	875 (34-7/16)	350 (13-25/32)	1150 (45-1/4)	44 (1-3/4)	1000 (39-3/8)	150 (5-7/8)	190 (420)	VY-20M25A	200 (440)	390 (860)		
												VY-20P25A	230 (510)	430 (950)		
UYP-20PS1	860 (33-7/8)	230 (9-1/16)	1550 (61)	9 (23/64)	875 (34-7/16)	350 (13-25/32)	1150 (45-1/4)	4 (5/32)	1000 (39-3/8)	150 (5-7/8)	200 (440)	VY-20P25A	230 (510)	430 (950)		
UYP-30MS	1100 (43-5/16)	300 (11-13/16)	1700 (66-15/16)	7.5 (19/64)	830 (32-11/16)	540 (21-1/4)	1666 (65-19/32)	121 (4-3/4)	1356 (53-3/8)	310 (12-7/32)	390 (860)	VY-30M25A	270 (595)	660 (1450)		
												VY-30P25A	300 (660)	700 (1540)		
UYP-30PS	1100 (43-5/16)	300 (11-13/16)	1700 (66-15/16)	7.5 (19/64)	830 (32-11/16)	540 (21-1/4)	1666 (65-19/32)	83 (3-9/32)	1356 (53-3/8)	310 (12-7/32)	400 (880)	VY-30P25A	300 (660)	700 (1540)		

*UYP-20MS1/20PS1 & UYP-30MS/30PS.. Upper: Manual plug secondary disconnect Lower: Automatic sliding secondary disconnect

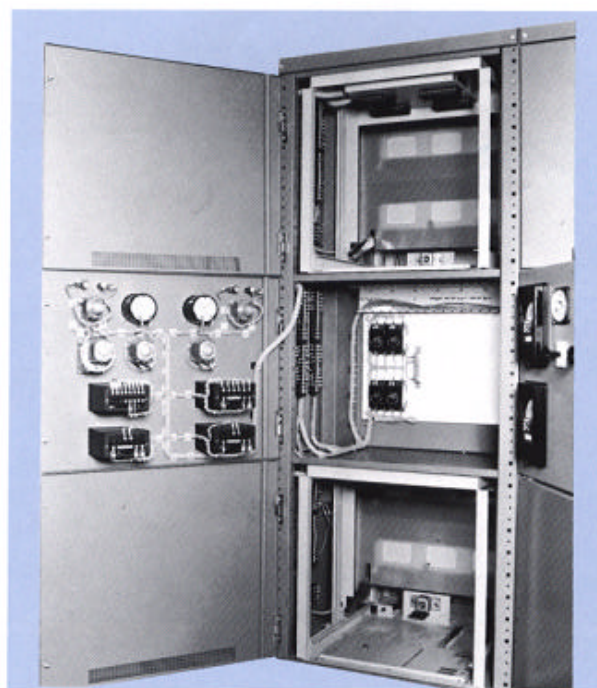
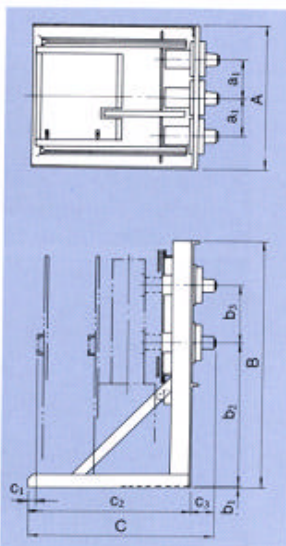
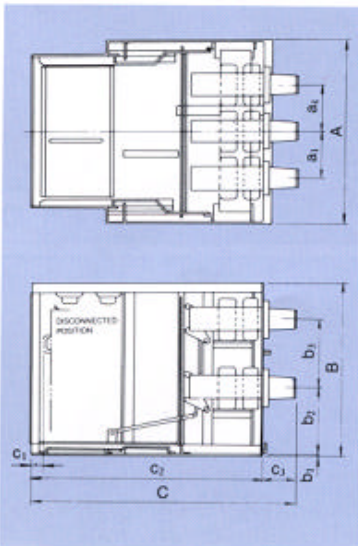
**Grip of breaker projects from cell.

***Manufactured in Houston, Texas for North American market.

UKA Type



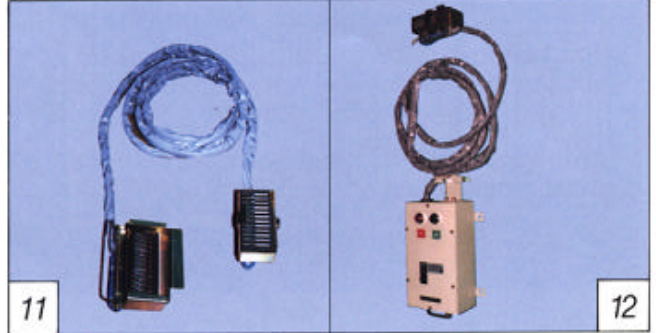
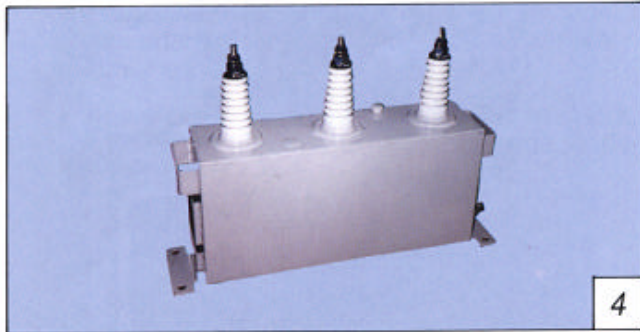
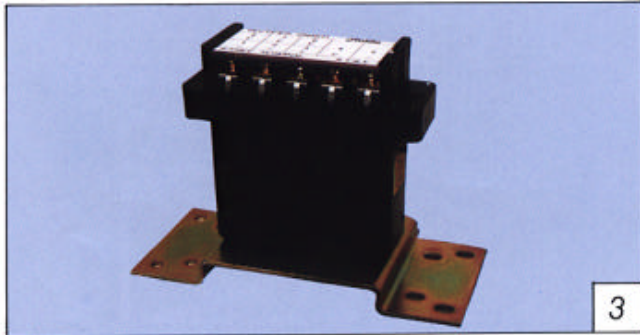
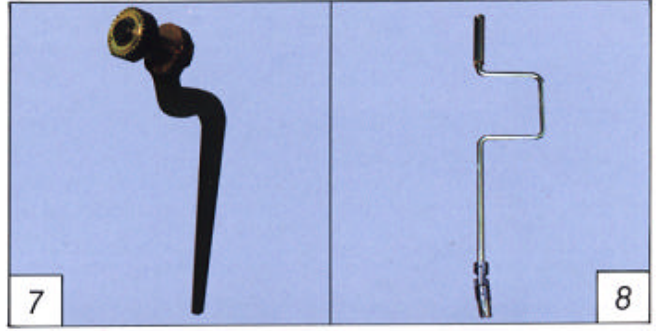
UKP & UYP Types



Two OEM Cells Installed in 2,300mm (90 in.) High Metalclad Switchgear, 5kV/15kV Rated.

Accessories for Further Flexibility

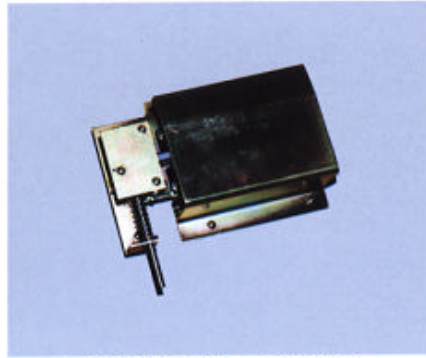
For various application requirements and effective inspection, maintenance, testing. Toshiba offers a full selection of devices and accessories.



Field Modification Accessory



MOC (6NO-6NC)



TOC (3NO-3NC or 6NO-6NC)



Key Interlock

- 1 An AC Capacitor Trip Device. This compact, door-mounted type AC capacitor trip device provides reliable trip control power for the breaker from either 120 or 240VAC.
- 2 A Direct Acting Trip Device provides an immediate trip out of the breaker if the breaker control power is lost.
- 3 An External Rectifier Unit provides DC for breaker closing when only AC power is available.
- 4 CR Surge Suppressor. Toshiba's patented CR surge suppressor gives optimum protection when vacuum circuit breakers are applied to low insulation level equipment or systems.
- 5 Vacuum Checker (Hi-Pot Test Equipment). The compact, portable type vacuum checker generates high DC output to easily check vacuum integrity in the field.
- 6 A Ground and Test Device provides facilities for grounding and testing equipment.
- 7 A Manual Spring Charging Handle gives emergency charging for the stored closing spring mechanism or for maintenance purposes.
- 8 A Racking Handle operates the breaker racking mechanism to manually move the breaker between the connected and test positions.
- 9 Portable Lifter. The rugged portable lifter is designed for easy removal or insertion of the breaker to the switchgear compartment and transport.
- 10 Lifting Plates are designed to lift the breaker safely with a crane. (Only required for the larger breakers.)
- 11 A Test Jumper Cable provides a test connection between the breaker and switchgear when testing the breaker at the switchgear installation area.
- 12 A Test Cabinet provides electrical closing and tripping of the breaker at the maintenance location.

Ordering Information

- Type-Form and Quantity of Breaker
- Type-Form and Quantity of OEM Cell
- Control Voltages (Closing Coil, Motor and Tripping Coil)
- Name, Rating and Quantity of Accessory
- Any Special Requirement

TOSHIBA

TOSHIBA CORPORATION

INDUSTRIAL EQUIPMENT DEPARTMENT

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