

33kV, 66kV and 132kV outdoor circuit breakers

Endeavour Energy use only:

Product approval officer:..... Date received:.....

Application ID no:..... Approval no:.....

Manufacturer/supplier:

Contact person and details:

Supplier's signature: Date:

Note to applicant: This form is to be submitted with the corresponding Product approval application form.

It shall be the responsibility of the person/organisation requesting the approval for a particular type of product to be used in Endeavour Energy's Network, to have this Product approval and audit form completed and returned to Endeavour Energy for examination. This form shall be completed to contain actual values and page numbers as found on the products type test reports. The information provided may be used for future audit purposes.

ITEM DESCRIPTION	UNIT	TENDERER'S REPLY		
		33kV	66kV	132kV
1 General Details				
Manufacturer's Name				
Manufacturer's Address				
Country of Manufacture				
Manufacturer's Ref. code / Make / Type				
2 Standards Employed				
Circuit Breaker				
Current Transformer				
Painting				
3 Equipment Rating				
Interrupting medium				
Arc quenching medium				
Rated voltage (Ur)	kV			
Rated insulation level – lightning impulse (Up)	kV peak			
Rated insulation level – 1min power frequency (Ud)	kV rms			
Rated frequency (fr)	Hz			
Rated Current (Ir)	A			
Rated line charging breaking current	A			
Rated cable-charging breaking current	A			
Rated single capacitor breaking current	A			

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		33kV	66kV	132kV
Rated small inductive breaking current	A			
Rated short circuit breaking current	kA			
Rated peak withstand current (Ip)	kA rms			
Rated short time withstand current (Ik)	kA			
Rated duration of short circuit (tk)	sec			
Rated short line fault breaking current	kA			
Rated short-circuit making current	kA			
First pole to clear factor				
Rated TRV for terminal faults	kV			
Circuit breaker design X/R ratio				
Rated operating sequence				
Total short circuit breaking time	sec			
Rated out of phase breaking current kA				
Capacitive switching class				
Electrical endurance class				
Mechanical endurance class				
4 Other CB Details				
Number of breaks per pole				
Total length of break per pole	mm			
Type of main contact				
Type of arcing contact				
Type of arc control device				
Number of breaking operations at full short circuit rating.				
Number of operations at continuous rated current				
Open time: - with zero current	Seconds			
- at rated breaking current	Seconds			
Arc duration time at rated breaking current	Cycles			
Closing time	Seconds			
Making window (ms)				
CB pole energising sequence				
Maximum discharge level	pC			
Pressure of insulating gas at stage 1	kPa			
Pressure of insulating gas at stage 2	kPa			
Pressure of gas at lock out	kPa			
Dew point of gas @ 20 Deg.C. ambient	Deg.C			
Purity of gas and % moisture content	%			
Pressure at which short circuit rating is lost	kPa			
BIL at stage 1	kV			
BIL at stage 2	kV			
BIL at atmospheric pressure	kV			
Name of SF6 supplier and type number				
Quantity of SF6 per circuit breaker	kg			
Number of tanks				
Vacuum bottle manufacturer				
Protective finish applied to inside of tank				

ITEM DESCRIPTION	UNIT	TENDERER'S REPLY		
		33kV	66kV	132kV
Bushing: - Material - Colour - Total external creepage distance - Protected creepage distance - Flashover length - Maximum space available for CT's - Are bushings inter-changeable				
5 Overall Dimensions				
Overall width / height / depth	mm			
Weight	kg			
6 Operating Mechanism				
Type				
Country of origin				
Trip free	Yes/No			
Rated supply voltage of close and trip coils	V			
Rated supply voltage of close spring motor	V			
Max spring charging current	A			
Rated supply voltage of aux. circuits	V			
Mode of closing				
Number of trip coils				
Number of close coils				
Power required to operate trip coil	w			
Power required to operate close coil	w			
Auxiliary contact rating: - 250V ac - 120V dc	A A			
Can Aux. switches be converted	Yes/No			
Can "time" of operation of aux. switches be set independently of CB movement	Yes/No			
Dehumidifier rating and thermal density				
7 Control Wiring				
Wiring complies with AS3000				
Wiring: - CSA complies - CT - Control - SCADA	Yes/No mm ² mm ² mm ²			
Wiring colour: - Active Neutral +Ve dc - Ve dc				
8 Environmental Effects				
Max noise level during CB operation at 1 metre*	dB			
Max RIV at 1 MHz	µV/kV			
Corona Extinction Voltage	kV			
Degree of protection, Cubicle	IP rating			
9 Current Transformers (CT)				
Protection Core: - Manufacturer - Make / Model - Mounting position				

ITEM DESCRIPTION	UNIT	TENDERER'S REPLY		
- Ratio - Class - Resistance - Secondary current rating				
Metering Core: - Manufacturer - Make / Model - Mounting position - Ratio - Class - Resistance - Secondary current rating				
10 Surface Finish				
Type of finish	Gal/Paint			
Finished colour				
11 Recommended Maintenance Intervals				
Recommended life expectancy	Years/Ops			
Operating Mechanism	Years/Ops			
Contacts & Interrupting System	Years/Ops			
Control & Other Ancillary items	Years/Ops			
Reliability/condition based maintenance system available.	Yes/No			
12 Warranty period	Years/Ops			
13.Type tests reports submitted	Yes/No			
<i>Circuit breaker</i>				
• Dielectric tests				
• Radio interference voltage tests				
• Measurement of the resistance of the main circuit				
• Temperature-rise tests				
• Short-time withstand current and peak withstand current tests				
• Tightness tests				
• Mechanical operation test				
• Short-circuit current making and breaking tests				
• Capacitive current switching tests				
• Verification of the degree of protection				
• Low and high temperature tests				
• Electrical endurance tests				
• Single-phase and double earth fault tests				
<i>Current transformers</i>				
• Short time current test				
• Temperature rise test				
• Lightning impulse test				
• Wet test				
• Determination of errors				

ITEM DESCRIPTION	UNIT	TENDERER'S REPLY		
• Radio interference voltage measurement				
• Proof of low reactance type (for class PX current transformers)				

Additional information for details of the attachment point for a transducer to perform a travel curve test (submit for each type of circuit breaker)

Measurement	Component	Dimension between pivot and or rotational axis.
1	Operating rod (normally in gas compartment sometimes between air and gas compartment)	 mm
2	Operating lever/arm connected to operating rod.	 mm
3	Operating lever/arm connected to operating mechanism	 mm
4	Offset between centre of moving contact and the operation lever (2)	Open position mm. Closed position mm.
5	Angle between the two operating levers	 Deg.
6	The angle of rotation of the operating lever/arm from closed to open position	 Deg.
7	The angle from horizontal for the operating levers in the open position	 Deg.
8	Location to connect travel transducer.	
9	Transfer function for the moving contact relative to the point for connecting the travel transducer.	

(Note: see figure below for pictorial representation of required measurements)

