



Q-Class DC Circuit Breaker for Nuclear Power Plant

Q-Class DC Circuit Breaker



ETNB is DC Circuit Breaker used at Nuclear Power Plant to protect DC power system equipments such as Generator, Motor pump and Battery, etc.

ETNB which adopts air breaking method, uses manual closing mechanism enveloped with Insulation Frame. It is designed to meet the main standard code IEEE std C37.14

Quality of ETNB is confirmed at CESI(Centro Elettrotecnico Sperimentale Italiano) in Italy and KERI(Korea Electrotechnology Research Institute) in Republic of Korea by passing Q-Class Type Test, short-circuit test, load break test, Earthquake test and BOM(Bill Of Material) related tests, etc.

Instead of previously used analog relay, more precisely operating Digital Over-current Relay is used to protect Feeder system and increase protective coordination reliability. In addition, faults and events are recorded in non-flashable memory to analyze any fault situation. And by using RS232, RS485 telecommunication, Data can be locally and remotely controlled.



Safe & Reliable Nuclear Power Plant

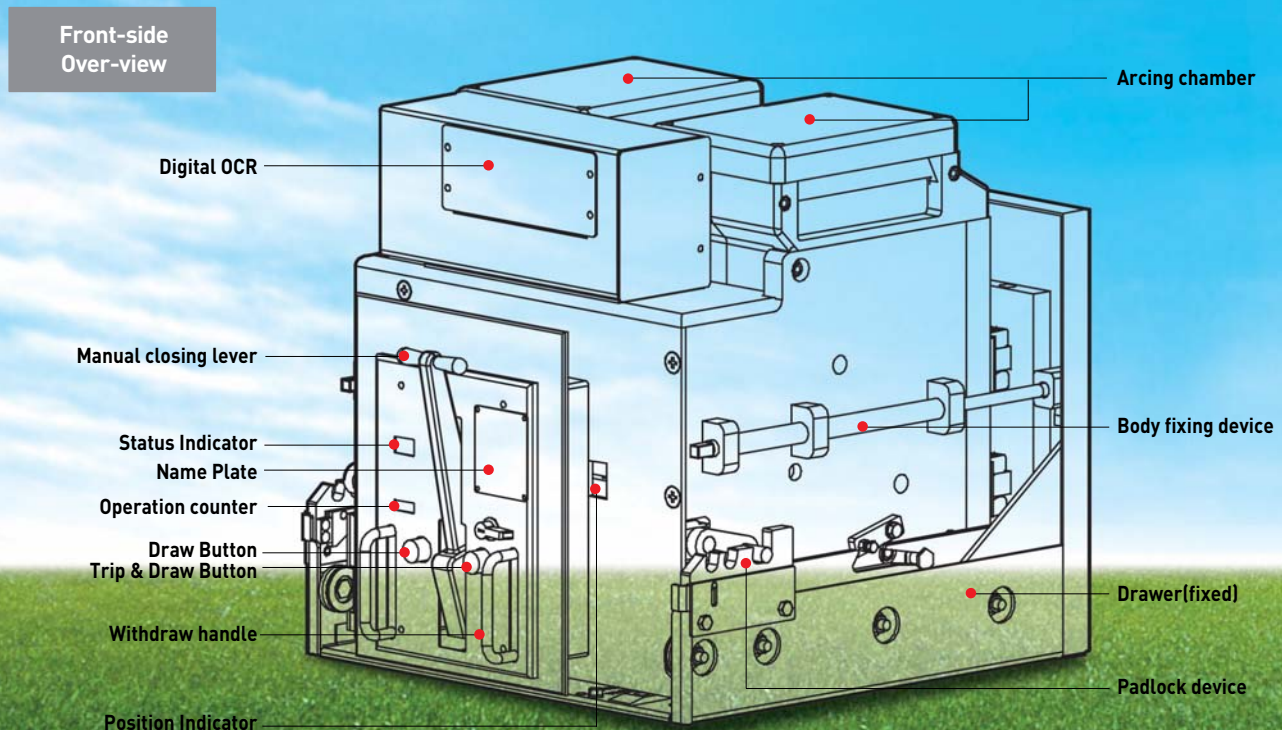


Ratings

Model		ETNB
Type		E1600-Q
Max voltage		DC 300[V]
Rated voltage		DC 250[V]
Rated current		1600[A]
Frame current		800/1600[A]
Rated making current		83p/50[kA]
Rated short time current		50[kA], 250[ms]
Number of pole		2 poles
Operation Duty		0-15s-CO
Operation mechanism		Manual closing, Manual/OCR tripping
Control voltage		DC 125/250[V]
Interruption medium		Air breaking
Trip device		Digital OCR
Aux. Contact		4'a', 2'b' [external]
Size	Depth	533[mm]
	Width	648[mm]
	Height	543[mm]
Weight(including truck)		170[kg]
Applied standard		IEEE std C37.14, ANSI C37.16, C37.17, IEEE C37.90.1/2, IEC 60255

Construction

ETNB is designed to be installed in limited space and optimization made it possible to be fit in compact cubicle.



Characteristics

High Reliable Interrupting operation

Type test performance at International laboratory, CESI(Centro Elettrotecnico Sperimentale Italiano) and KERI(Korea Electrotechnology, Research Institute).

CESI



KERI

Korea Electrotechnology Research institute

Compact circuit breaker with manual closing mechanism as well as manual and electric opening.

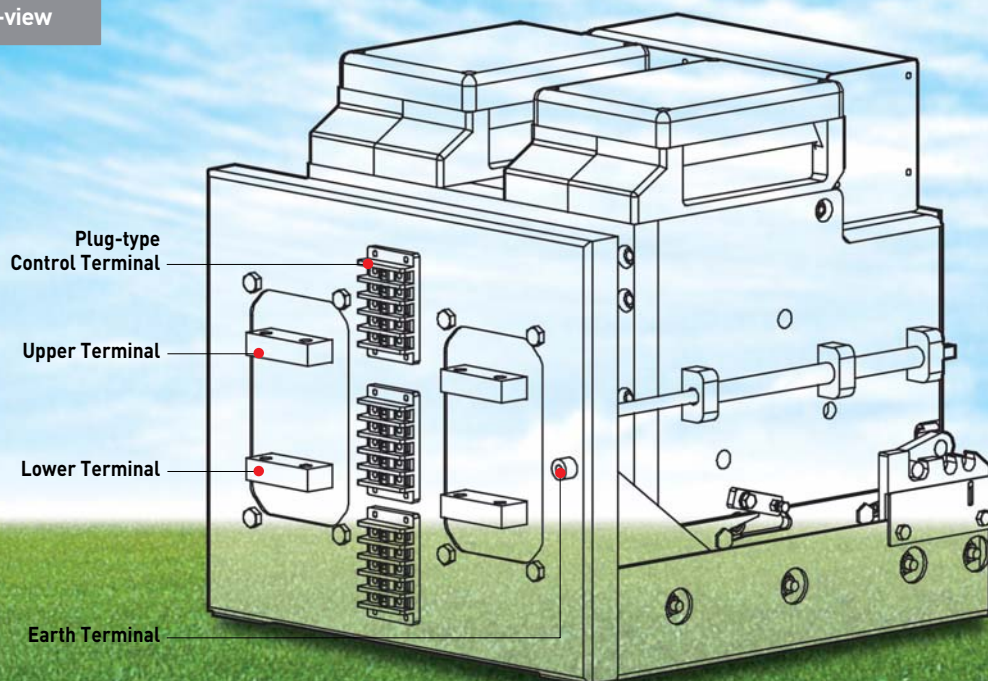
Enhanced safety

Interlock between open-mechanism and safety locking, circuit breaker is withdrawable only when CB open status

Q-Class test

Earthquake test, BOM(Bill Of Material) related test performed

Rear-side
Over-view

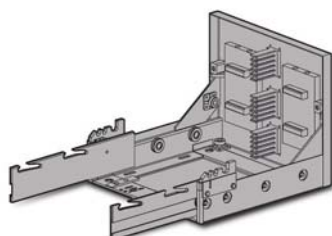


Trip Operation by digital OCR

Precisely operated digital OCR

Overcurrent protection(Short-delay, Long-delay, Instantaneous)

- Fault event recording
 - Fault Cycle record
 - Operation event record
 - RS 232 Port data download(Optional)
- Remote operation function(Optional)
 - RS 485 Port
- Simply setting change



Convenient withdrawing of circuit breaker

Safety locking and trip interlocking device combined, no additional withdrawing mechanism necessary for circuit breaker draw In/Out.

Digital OCR



Digital OCR operates CB tripping in precise time against a fault current. Long time delay trip, short time delay trip and instantaneous trip are more accurate compared with old mechanical OCR so that it provides more safe and reliable operation in power distribution line.

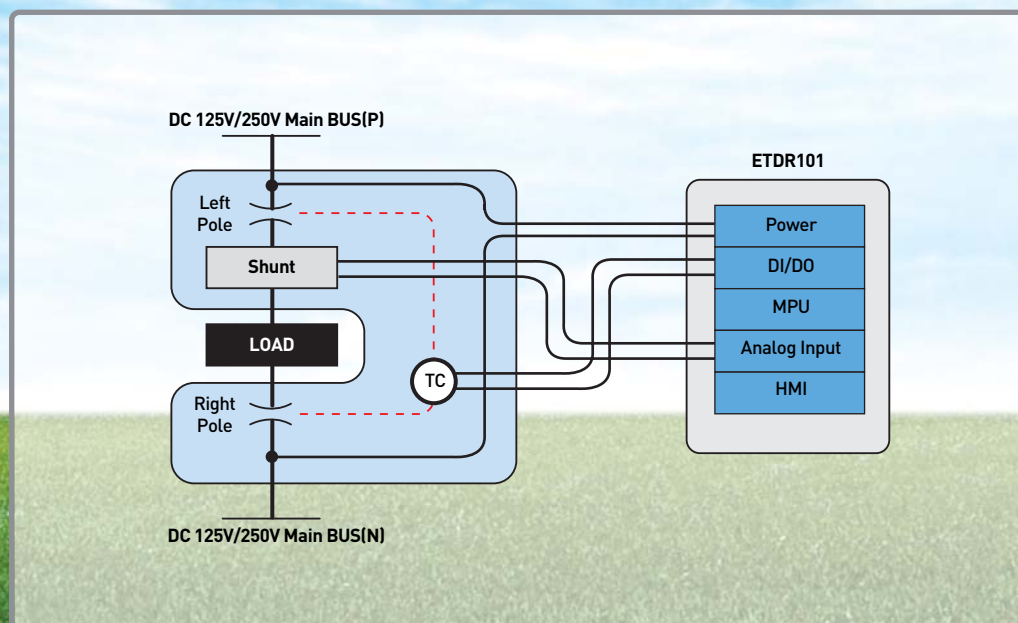
Digital OCR uses Shunt built-in circuit breaker to check load current and fault current.

OCR relay has several convenient facilities. Fault current waves are recorded upto 16 osc. which are captured by Digital OCR and through RS232 port, the fault information can be downloaded. And locally as well as through RS485 port, OCR data can be remotely controlled and transferred.

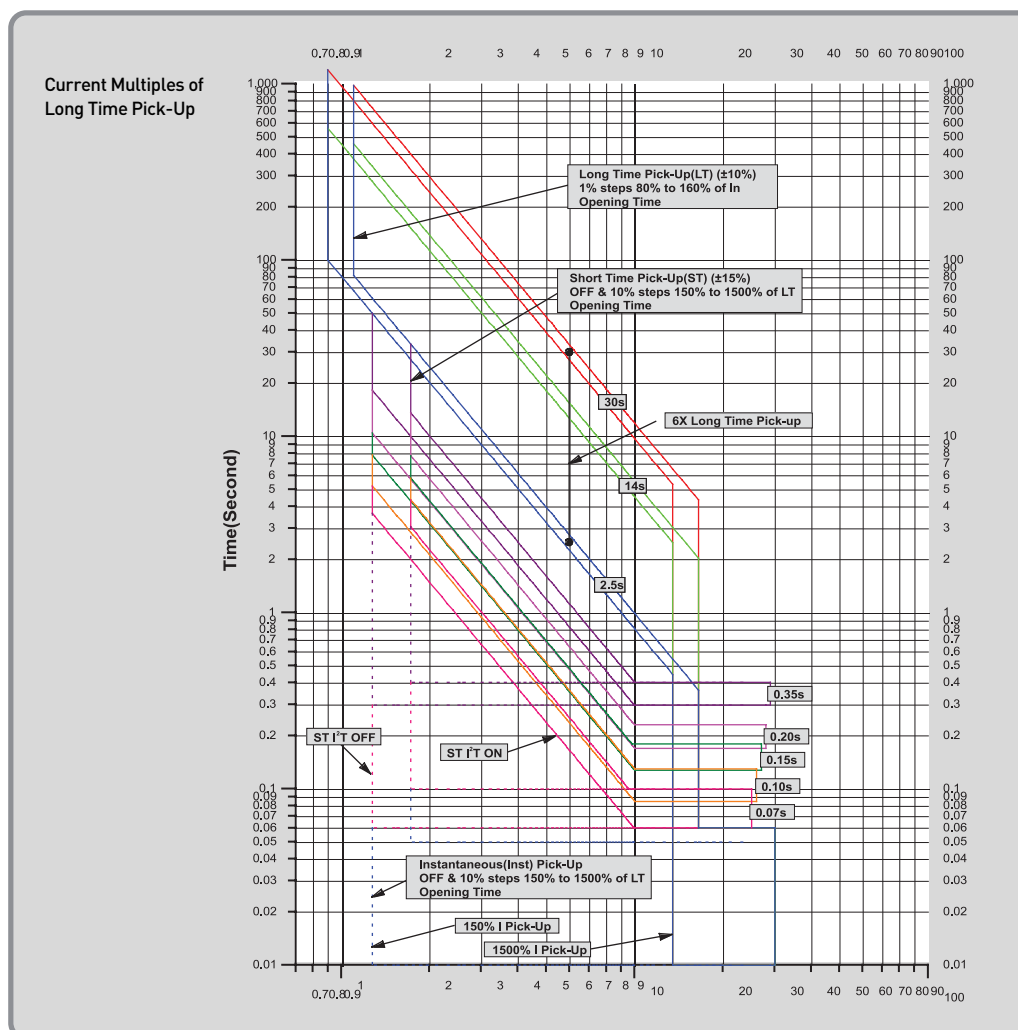
Ratings

Item			ETNB-101
Control voltage			DC 70~350[V]
Power consumption			8.4[W]
Shunt Input	CB Shunt rating		800 or 1600[A]/40[mV]
	Linearity(shunt input)		50[mV]X20
Sampling Rate			2[ms]
Shunt Input	Long time delay(lr)	Pick-Up	40%~100% of In* (1% Step)
		Delay Time	2.5~30.0 (0.5 Step)
	Short time delay(lr)	Pick-Up	OFF, 150%~1500% of Ir (10% Step)
		Delay Time	0.07, 0.10, 0.15, 0.20, 0.35[s]
	Instantaneous (linst)	Pick-Up	OFF, 150%~1500% of Ir (10% Step)
Insulation voltage			AC 2.5[kV](1min.)
Ambient temperature			-10~50°...
Size	Depth		212[mm]
	Width		110[mm]
	Height		83[mm]
Weight			750[g]
Applied standard			ANSI C37.17 and etc.
EMI/RFI test			MIL-std-461e

ETDR-101 Line Diagram



ETDR-101 TC Characteristics Curve



Main products



DC Switchgear

- Rated voltage : DC 900/1800[V]
- Rated current : 3000/4000[A]



Substation Rectifier

- Rated voltage : DC 750/1500[V]
- Rated capacity: 3000/4000[kW]



DC MCC Cubicle

- Rated voltage : DC 125/250[V]
- Rated current : 800/1600[A]

* Note. Product structure and arrangement shall be modified without notice