BENTEC

BENLO®
A PRODUCT OF BENTEC INDIA LTD.

RK BHARTIA

IS : 12640-1-2016

CM/L-5241855

ISO-9001 : 2015 COMPANY

Residual Current Circuit Breaker

BENTEC

GENERAL TECHNICAL FEATURES
HIGH SENSITIVITY

Special magnetic materiais are used for the toroidal core balance transformer and specially developed highly sensitive miniature relay is used to ensure positive detection of earth leakage currents as low as 30 mA in less than 40 mS thereby acting as a life saver.

HOUSING

Bentec RCCB's are housed in high quality thermoset insulating material which is fire retardant,anti tracking,non hygroscopic,impact resistant,and can withstand high temperatures.

RELIABLE MECHANICAL OPERATION

The moving contacts of the phases are put on a moving arm,actuated by a rugged toggle mechanism.Hence the closing and opening of all the three phases occur simultaneously.

SUITABILITY AS MAIN SWITCH

Bentec RCCB's incorporate advanced neutral i.e. neutral makes ahead of phases and breaks after phases,which ensures complete discharge of line inductance and capacitance.

FAST ACTING AND LONG LIFE TRIP FREE MECHANISM

Mechanism components are made of high-strength steel, self lubricating and high quality properties.This results the very fast opening action of RCCB's under fault conditions. Load bearing parts of mechanism are also of high strenght steel.

HIGH CONTACT LIFE

RCCB's are provided with an ARC chamber consisting arc-chute.The arc chutes quench the arc faster,which increases electrical contacts life.

PROVISION FOR TESTING DURING SERVICE

Bentec RCCB's are life saving devices and hence, incorporate a test button 'T' for periodic checking of the mechanism and functions of the RCCB.

EASE OF CABLING

Apart from suitability to copper cables the Terminals are suitable for Aluminium cables from 1 to25 sq.mm.

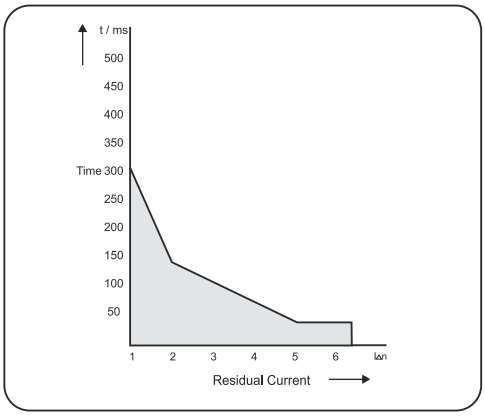
EASE OF MOUNTING

Bentec RCCB's can be easily mounted on a standard DIN Rail of 35mm.

CERTIFICATION &TESTING

Bentec RCCB's have been completely type tested in accordance and confirms with IS :12640-1-2016

ACTUATION TIME CHARACTERISTICS



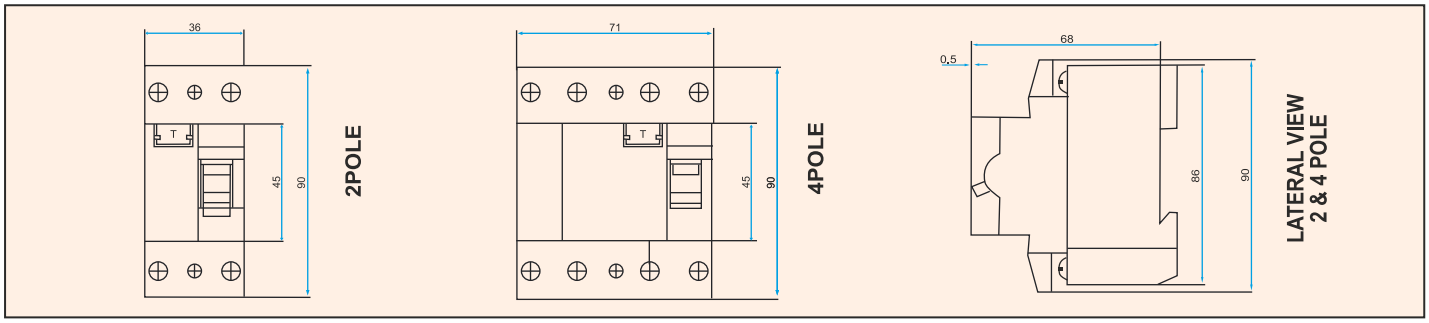
PRECAUTION FOR INSTALLATION

- Wiring should be done by a trained&qualified electrician as per the wiring diagram.
- All wiring necessary for operation shall be passed through the RCCB.
- The neutral conductor must be insulated against earth to the same extent as the live conductors.
- All equipments used must be properly earthed.
- To ensure correct functioning care must be taken that the neutral conductor on the load side of RCCB must not be connected to earth,otherwise nuisance tripping may occur or tripping be impaired.
- Suitable device either MCB or HRC fuses shall be used for short circuit and overload protection of the cricuit under installation.
- Cricuit Breaker should not be exposed to direct sunlight/hostile weather conditions and should be kept away from strong magnetic fields.

CAUTION

As per annexure A of indian standard (is:12640)RCCB is not considered as a sole means of protection and it does not obviate the need to apply other protective measures. so,it is necessary to provide proper erthing in the system.

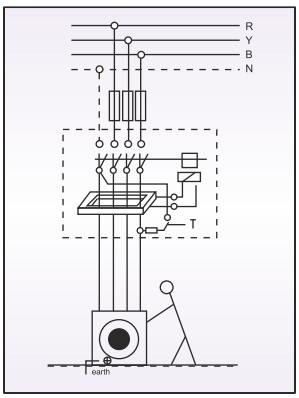
DIMENSION (IN MM)



INTRODUCTION

Residual current cirduit Breakers provide high degree of protection against electrocution risks to personel handling electrical equipment by disconnecting the main supply instantaneously in the event of a fault,while MCB's and Fuses provide protection to the electrical installation in the event of an overload or short cricuit,they are totally ineffective in protecting personnel against electrocution risks.Residual current circuit Breakers also protect electrical installations against potential Fire hazards that are caused by low level leakage currents (of the order of 300mA/500mA)

WORKING MECHANISM



The RCCBworks on the current balance principle.the supply conductors,i.e.,the phases and the neutral,are passed through a torroid and from the primary windings of a current transformer.Its secondary winding is connected to a highly sensitive electromagnetic trip relay,which operates the trip mechanism.

In a healthy circuit,sum of the currents in phases,is equal to the current in the neutral and the vector sum of all currents is equal is zero. If there is any installation fault in the current and leakage current flows to earth,the currents do not balance and their vector sum is not equal to zero. This imbalance is detected be the core balanced current transformer,the RCCB is tripped and supply to load is interrupted.The trip mechanism is operated at a residual current between 50-100% of its rated tripping current.

SELECTION TYPE 30/100/300/500mA

30mA

30mA RCCB provides a high degree of protection against electrocution risks as can be seen from zone3 of the IEC curve depicting physiological effects of electric current on Human body.Hence a 30 mA sensitivity RCCB is highly recommended in Homes,offices,factories,shops, Trade fairs Exhibitions,Temporary electrical installations at constructions sites etc.

100mA

A100mA RCCB will normally give high degree of protection against electrocution but there is a possibility that the shock current could fall bellow the tripping level of RCCB.This could occur if additional resistances to that of human body are included in the earth path.

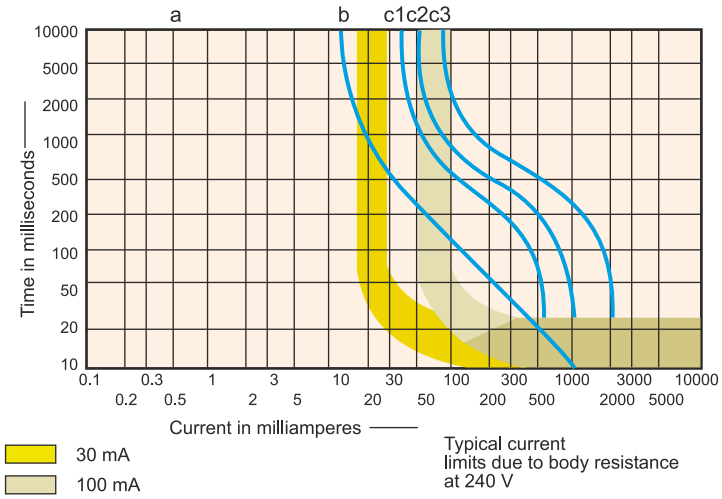
The 100mA RCCB protescts against leakage currents and indirect contact with earth loop impedance upto 500 Ohms.

300/500mA

A300/500 mA RCCB may be used where only fire protection is required .Eg.on lighting circuits,where the risk of electric shock is small.

300/500 mA RCCB will not give any protection against electrocution.

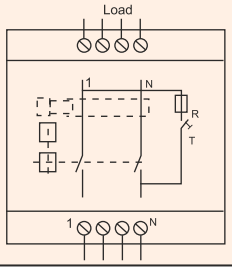
ZONE PHYSIOLOGICAL EFFECTS



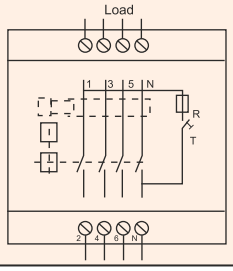
Zone	Physiological Effects
Zone 1	Usually no reaction effects
Zone 2	Usually no harmful physiological effects
Zone 3	Usually no organic damage to be expected. Likehood of muscular contraction and difficulty in breathing,reversible disturbances of formation and conduction of impulse in the heart and transient cardiac arrest without ventricular fibrillation increases with current magnitude and time.
Zone 4	It addition to the effects of Zone 3,probablity if v entricular fabrillation increased upto 5%(curveC_2) upto 50%(curve C_3),and above 50% beyond curve C_3,It increases with magnitude and time, and pathophysiological effects such as cardiac arrest,breathing arrest and heavy burns may occur.

WIRING DIAGRAM

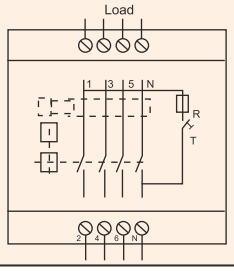
For Single Phase - 2 Wire connections



For Single Phase - 4 Wire connections



For Single Phase - 3 Wire connections



The Bentec's range of 4 pole RCCBs can be used to provide residual current protection in 3 phase,3 wire circuits (no neutral), however a link from the neutral to an incoming should be made on the supply side of the RCCB,to enable the operation of the RCCB.

Residual Current Circuit Breaker

TECHNICAL SPECIFICATION

Specification	IS : 12640 - 1- 2016 / IEC 61008-1-2012
No.of modules	2 for 2 pole,4 for 4 pole
Configuration	2 pole & 4 pole
Rated current (in)	2 Pole (16, 25, 40, 63) 4 Pole (16, 25, 40, 63)A
Sensitivity(I△n)	30mA, 100mA, 300mA
Design & rated voltage (Un)	2 pole - 240V 4 Pole -240 / 415VAC
Max.operating voltage	440V AC
Test circuit voltage(up)	240V AC
Rate of frequency	50 Hz....60Hz
Short circuit resistance	6KA with proper backup fuses
Back - up fuse	80 Amp g^{L}- g^{G}
Protection class	IP 20
Temperature Range	-25℃....+55℃
Climatic resistance	According to IS : 12640 - 1- 2016
Shock resistance	20g
Vibration resistance	>5g (f<=80Hz,duration>=30min.)
Electrical Endurance	>10000 switching cycles in,un & f. f.= 0..9
Terminal capacity	1.0 -25 mm sq.
Mounting	Din rail mounting
Weight (incl.packing box)	2 pole -0.235 kg.;4 pole -0.400 kg.
Break time	<0.04 seconds

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