

Description	Positive contact indication:	Nuisance tripping
Open a circuit automatically in the case of an earth leakage fault between phase and earth or neutral or equal to 30-100-300-500mA. Use in domestic Commercial and Industrial installations.	Mechanical indicator, appearing on the front face on RCCB Linked to the contact shows the Positive contact indication: Red - Contacts Closed Green - Contacts Open Yellow - tripped	All the RCCBs are protected against transient voltages (lightning, line disturbances) and transient currents (from high capacitive circuits). DC sensitive RCCBs or time delay devices are available, please consult us. You also have the possibility to install the following accessories : electrical auxiliaries terminal cover kit , locking kit.
Technical data	Connection capacity	
Temperature: -5 ^o C to 40 ^o C	16 - 63A	
2 poles 230V - 50Hz	16mm ² flexible	
4 poles 400V - 50Hz	80 - 100A	
Specifications: IEC61008-1 SS97	35mm ² flexible	

Sensitivity	Code	Description	Pack	Terminal Cover Kit	
IΔn	2P	4P	Q'ty	1 set = 2 cover (option)	
High sensitivity 30mA	CD216B	MCB 2P 16A 30mA	1	CZN005	
	CD225B	MCB 2P 25A 30mA	1	CZN005	
	CD240B	MCB 2P 40A 30mA	1	CZN005	
	CD263B	MCB 2P 63A 30mA	1	CZN005	
	CD280B	MCB 2P 80A 30mA	1	CZ007	
	CD284B	MCB 2P 100A 30mA	1	CZ007	
		CD425B	MCB 4P 25A 30mA	1	CZN006
		CD440B	MCB 4P 40A 30mA	1	CZN006
		CD463B	MCB 4P 63A 30mA	1	CZN006
		CD480B	MCB 4P 80A 30mA	1	CZ008
		CD484B	MCB 4P 100A 30mA	1	CZ008
	Medium sensitivity 100mA	CE225B	MCB 2P 25A 100mA	1	CZN005
		CE240B	MCB 2P 40A 100mA	1	CZN005
		CE263B	MCB 2P 63A 100mA	1	CZN005
CE280B		MCB 2P 80A 100mA	1	CZ007	
CE284B		MCB 2P 100A 100mA	1	CZ007	
		CE425B	MCB 4P 25A 100mA	1	CZN006
		CE440B	MCB 4P 40A 100mA	1	CZN006
		CE463B	MCB 4P 63A 100mA	1	CZN006
		CE480B	MCB 4P 80A 100mA	1	CZ008
		CE484B	MCB 4P 100A 100mA	1	CZ008
Low sensitivity 300mA		CF225B	MCB 2P 25A 300mA	1	CZN005
		CF240B	MCB 2P 40A 300mA	1	CZN005
		CF263B	MCB 2P 63A 300mA	1	CZN005
		CF280B	MCB 2P 80A 300mA	1	CZ007
	CF284B	MCB 2P 100A 300mA	1	CZ007	
		CF425B	MCB 4P 25A 300mA	1	CZN006
		CF440B	MCB 4P 40A 300mA	1	CZN006
		CF463B	MCB 4P 63A 300mA	1	CZN006
		CF480B	MCB 4P 80A 300mA	1	CZ008
		CF484B	MCB 4P 100A 300mA	1	CZ008
	Low sensitivity 500mA	CG225B	MCB 2P 25A 500mA	1	CZN005
		CG240B	MCB 2P 40A 500mA	1	CZN005
		CG263B	MCB 2P 63A 500mA	1	CZN005
		CG280B	MCB 2P 80A 500mA	1	CZ007
CG284B		MCB 2P 100A 500mA	1	CZ007	
		CG425B	MCB 4P 25A 500mA	1	CZN006
		CG440B	MCB 4P 40A 500mA	1	CZN006
		CG463B	MCB 4P 63A 500mA	1	CZN006
		CG480B	MCB 4P 80A 500mA	1	CZ008
		CG484B	MCB 4P 100A 500mA	1	CZ008



Residual current devices

A residual current device (RCD) is the generic term for a device which monitors the current in the line conductor and the neutral conductor of a circuit in an earthed system.

The drawing opposite shows how a torroid is located around the line and neutral conductors to measure the magnetic fields created by the current flowing in these conductors. The sum of the magnetic fields set up by these currents (which takes into consideration both the magnetic and phase relationship of the currents) is detected by the torroid.

In a normal healthy circuit the vector sum of the current values added together will be zero. Current flowing to earth, due to a line earth fault, will return via the earth conductor, and regardless of load conditions will register as a fault. This current flow will give rise to a residual current (I_{res}) which will be detected by the device.

It is most important that the line and neutral conductors are passed through the torroid. A common cause of nuisance operation is the failure to connect the neutral through the device.

RCCBs work just as well on three phase or three phase and neutral circuits, but when the neutral is distributed it must pass through the torroid.

RCCB are not suitable for use on DC systems and unearthed networks.

RCCBs - domestic installation

RCCBs can be installed in two ways :

1. whole house protection
2. selective protection

Whole house protection is provided typically by a consumer unit where the RCCB device serves as the main switch. Although very popular this suffers from a disadvantage : all circuits are disconnected in the event of fault. Selective protection can be provided by associating the RCCB with identified high risk circuits by adopting one or more of the following :

Split busbar consumer unit


All circuits are fed via an overall isolator and selected circuits fed additionally via the RCCB. Typical circuits fed direct are lighting, freezer, storage heating : and circuits fed via the RCCB are socket outlets, garage circuits. This concept minimises inconvenience in the event of fault.

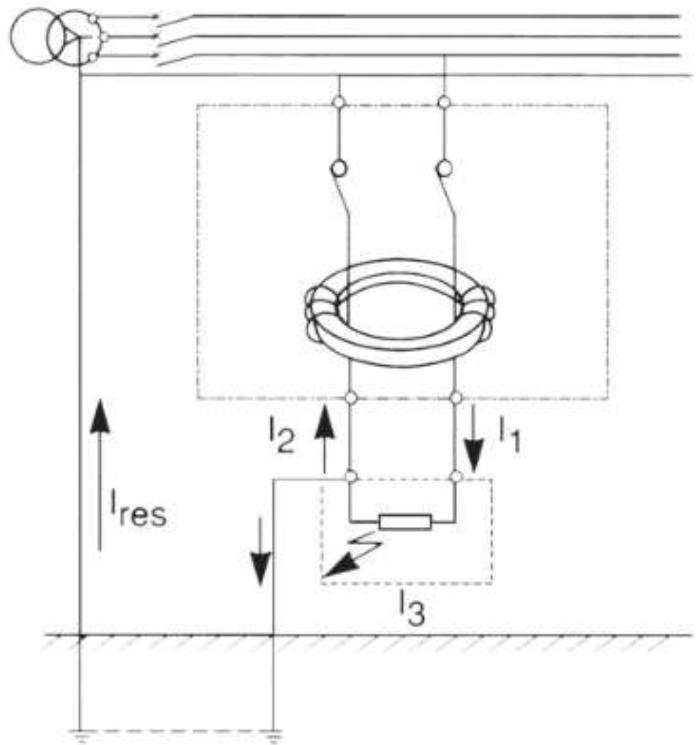
Whole ring circuit

A 30mA device adjacent to the consumer unit, which provides protection for the downstairs ring circuit, provides an easy installation with protection for all associated socket outlets. This represents the best solution for upgrading existing installations.

Nuisance tripping

All Hager RCCBs incorporate a filtering device preventing the risk of nuisance tripping due to transient voltages (lightning, line disturbances on other equipment...) and transient currents (from high capacitive circuit).

Check for the symbol : 



Pulsating DC fault current sensitive

Increasingly, semi-conductors are also extensively used in computers, VDUs, printers, plotters,... all of which may be fed from the main electrical supply. The presence of semi - conductors may result in the normal sinusoidal AC waveform being modified. For example, the waveform may be rectified or, as in asymmetric phase control devices, the waveform may be chopped. The resulting waveforms are said to have a pulsating DC component.

In the event of an earth fault occurring in equipment containing conductor devices, there is a probability that the earth fault current will contain a pulsating DC component.

Standard types of RCCB may not respond to this type of earth fault current and the intended degree of protection will not be provided.

Check for symbol : 

Hager provide a range of pulsating d.c. sensitive devices for this type of application.

Tripping characteristics

Type	In(A)	IΔn(A)	Standard values of break time(s) and non-actuating time(s) at a residual current (I) equal to :					
			0.5IΔn	IΔn	2IΔn	5IΔn	500A	
general	any value	≤ 0.03	no trip	0.1s	0.1s	0.04s	0.04s	max. break times
		> 0.03	no trip	0.3s	0.15s	0.04s	0.04s	max. break times

Protection against shock outside the equipotential bonding zone

Bonding conductors are used in an installation to maintain metallic parts, as near as possible, to the same potential as earth.

Working with portable equipment outside this equipotential bonding zone, e.g. in the car park of a factory, introduces additional shock hazards. Socket outlets rated 32A or less 'which may be reasonably expected to supply portable equipment for use outdoors' should have at least one socket nominated for outdoor use. This socket should be equipped with RCC protection unless fed from an isolating transformer or similar device, or fed from a reduced voltage

Protection in special situations (IEE wiring regulation)

The use of RCCBs is obligatory or recommended in the following situations :

- Caravans : 30mA RCCBs should be used
- TT systems

- Swimming pools : 30mA RCCB for socket outlets obligatory; recommended in zone C.

- Agricultural and horticultural : 30mA RCCB for socket outlets and for the purpose of protection against fire, RCCB 0.5A sensitivity.

- Construction sites : 30mA RCCB recommended

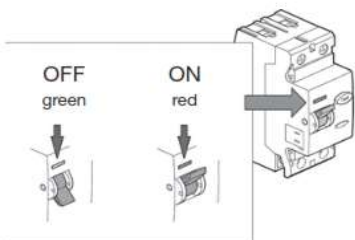
Portable equipment

With the exception mentioned above, where a socket is specifically designated for work outside the equipotential bonding zone, the Wiring Regulations demand the use of RCCBs to protect the users of portable equipment. It is widely recognised that their use has made a significant contribution to safety in the workplace and the home.

Protection against fire hazards

The provisions in the Wiring Regulations for protection against shock by indirect contact ensure rapid disconnection under earth fault assuming the fault has negligible impedance. Under such conditions the fault current, as we have seen, is sufficiently great to cause the overcurrent protection device to quickly disconnect the fault. However high impedance faults can arise where the fault current is sufficient to cause considerable local heat without being high enough to cause tripping of the overcurrent protective device. The heat generated at the point of the fault may initiate a fire long before the fault has deteriorated into a low impedance connection to earth.

Positive contact indication



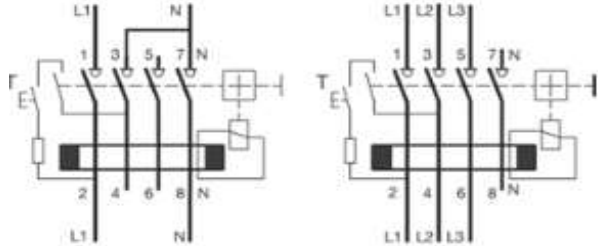
The provision of residual current protection throughout a system will greatly reduce the harm caused by such faults.

PEN conductors

The use of RCCBs on PEN conductors is prohibited. A PEN conductor is a single conductor combining the functions of neutral and protective conductor. This being so, when the PEN conductor is taken through the torroid of an RCCB, earth faults are undetected because the return path for the earth fault is included in the residual sum.

Use of Hager RCCBs on 3 phase 3 wire systems

The Hager range of 4 pole RCCBs can be used to provide current protection of 3 phase, 3 wire circuits (no neutral)



Supply entry
Top or bottom feed.

RCCBs /MCBs co-ordination

RCCBs	with MCB		
	MU 6A-63A C	NC - HLF 6A-100A C	NDN 6A-63A D
2P and 4P			
16A	6kA	10kA	10kA
25A	6kA	10kA	10kA
40A	6kA	10kA	10kA
63A	6kA	10kA	10kA
100A	6kA	10kA	10kA

TEST : test regularly : RCCB must trip.

