CBi electric
Australia

QF Miniature Circuit Breakers & RCBO's

Innovative, Robust, Reliable and Efficient Protection

HEINEMANN ELECTRIC PTY LTD
HEINELEC® CIRCUIT PROTECTION
SLEGERS GET CONNECTED

QF Miniature Circuit Breakers & RCBO's

QF18 | Miniature Circuit Breaker

QF18 | Miniature Circuit Breaker | 3 Pole

QF10 | RCBO neutral pigtail not shown

QF10 | RCBO with handle lock

The QF Range of miniature circuit breakers offer a compact solution to your protection requirements.

Complete with CBI's unique hydraulic-magnetic trip protection this range provides safe and reliable solutions for low voltage electrical protection against overload and short circuit.

They deliver reliable, strong and efficient protection for commercial, industrial and mining applications.

Hydraulic-Magnetic Technology

CBI's signature Hydraulic-Magnetic Technology ensures the QF Range always carries 100% of rated current with the trip point un-affected by ambient temperature.

The circuit breaker may be immediately reclosed after tripping, provided the fault has been cleared, as there is no cooling down time required thus saving time and testing.

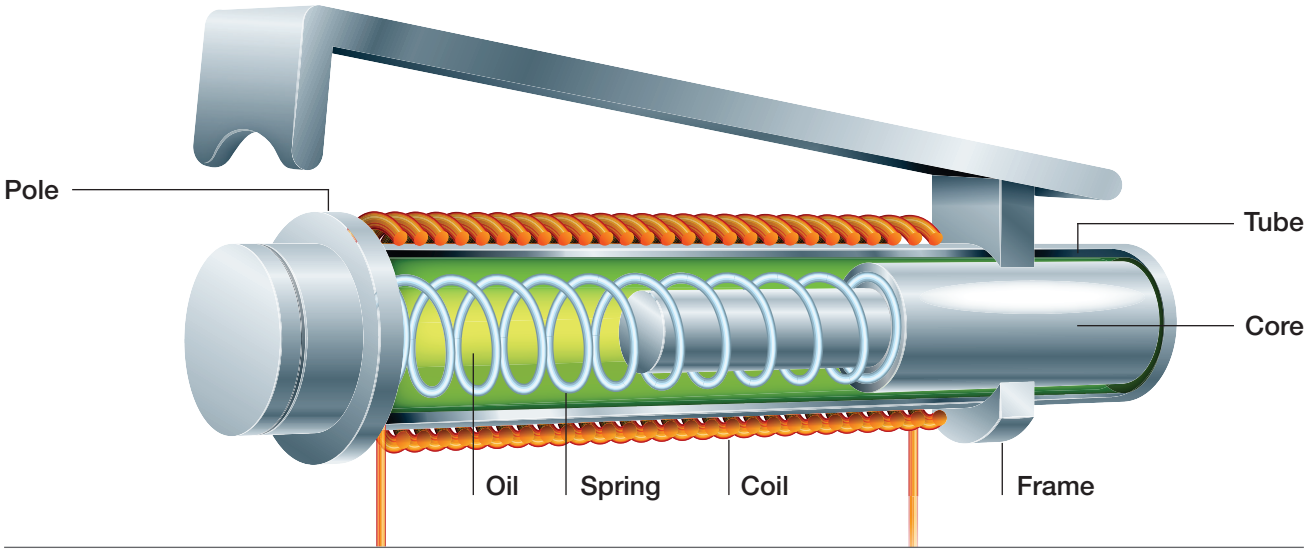
Applications

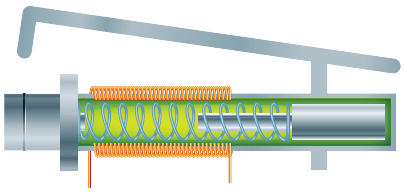
The QF range of MCB's and RCBO's are for use against overload, short circuit and residual current (QF10 only) protection in residential, commercial, industrial and mining applications.

Features

- Precision circuit breaker utilizing hydraulic magnetic technology
- DIN mounting
- Always carry 100% of rated current. Trip point un-affected by ambient temperature
- Breaker can be immediately re-closed after tripping, once fault is cleared
- No cooling down time required thus saving time and testing. (No thermal memory)
- No ageing deterioration of sensing mechanism which is hermetically sealed
- Handle is sealable and padlock-able (with padlock attachment)
- IP2X terminals
- Suits HQFC chassis - 250A rated
- RCBO is suitable for applications with pulsating DC components
- RCBO insulation resistance testing can be done with handle in the off position - no disconnection of the unit is required

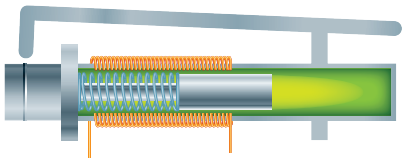
Operation Principles of CBI's Hydraulic Magnetic Circuit Breakers





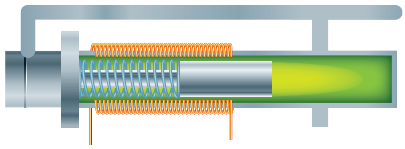
Overload 1

Load current flows through a series connected solenoid coil around a tube which contains an iron core, a spring and dampening fluid. Only where current above circuit breaker rating occurs does the magnetic flux in the solenoid coil generate sufficient pull on the iron core to move it toward the pole piece.



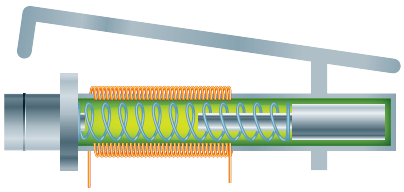
Overload 2

Whilst this movement is in progress the dampening fluid regulates the speed of travel of the iron core thereby controlling time delay. Time delay is important in that if overload is of short duration the core returns to its rest position once the overload disappears.



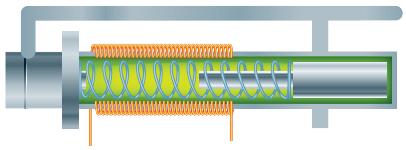
Overload 3

If overload persists the core will reach the pole piece after a time delay particular to that current and in so doing the reluctance of the magnetic circuit drops and the armature will be attracted to the pole piece with sufficient force to trip the mechanism. The contacts separate, current ceases to flow and the core returns to its rest position.



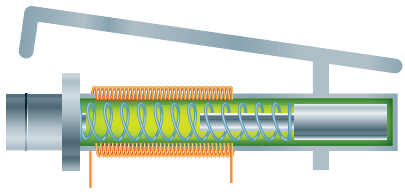
Short Circuit 1

Load current produced by magnetic force flows through series connected solenoid coil around a tube which contains an iron core, a spring and dampening fluid.



Short Circuit 2

With high values of overload or short circuit the magnetic flux produced by the coil is sufficient to attract the armature to the pole piece and trip the breaker without the iron core moving (instantaneous trip region).



Short Circuit 3

After tripping the circuit breaker may be reclosed immediately once fault has been cleared as there will have been no build up of heat and therefore no cooling down period required.

QF Range | Technical Data

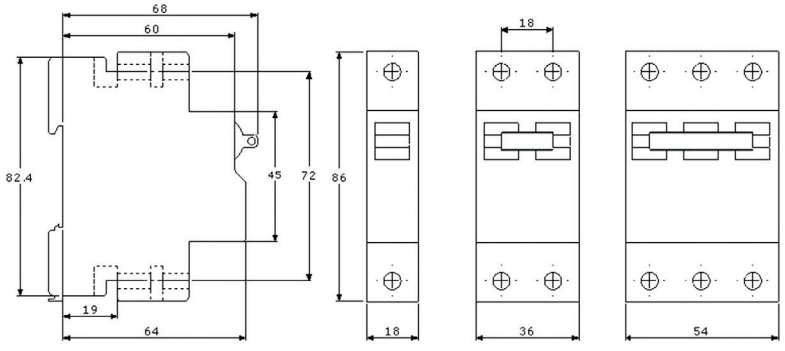
QF18
Miniature Circuit Breaker

QF10
RCBO

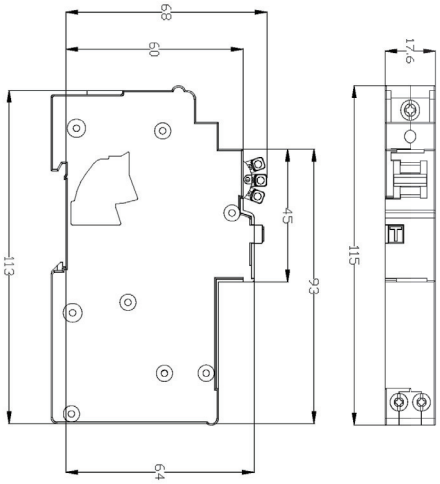
Equipment Type	MCB	RCBO
Standards	AS 3111	AS/NZS 3190
Approval Number	NSW22415	NSW21009
Number of Poles	1, 2 & 3	1
Rated Breaking Capacity (Icu)	6kA at 240/415V AC	6kA at 240V AC
Standard Ampere Rating (A)	2, 4, 6, 10, 16, 20, 25, 32, 40, 50, 63 A	6, 10, 16, 20, 25, 32, 40 A
Residual Operating Current (mA)	N/A	30mA
Rated Voltage (V)	240V/415V	240V (110V-240V operating voltage)
Frequency (Hz)	50-60Hz	50-60Hz
Impulse Withstand Voltage (kV)	6kV	6kV
DC Withstand Voltage	600V DC	600V DC
Mechanism	Hydraulic Magnetic	Hydraulic Magnetic & RCD
Tripping Curves	1, 2 & 3	2
Handle Colour	Curves 2 & 3: White, Curve 1: Orange	Curve 2: White
Terminal Configuration	Front connected box type	Front connected box type
Max Conductor Size	25mm2 (line & load)	25mm2 (line), 16mm2 (load)
Terminal Torque	2.5Nm	2.5Nm

Dimensional Details

QF18 | Miniature Circuit Breaker (mm)



QF10 | RCBO (mm)



QF Range | Technical Data

Curve 1

QF18 Miniature Circuit Breaker

Curve 1 is similar to Curve D. Used for motor starting and transformer applications.

Curve 2

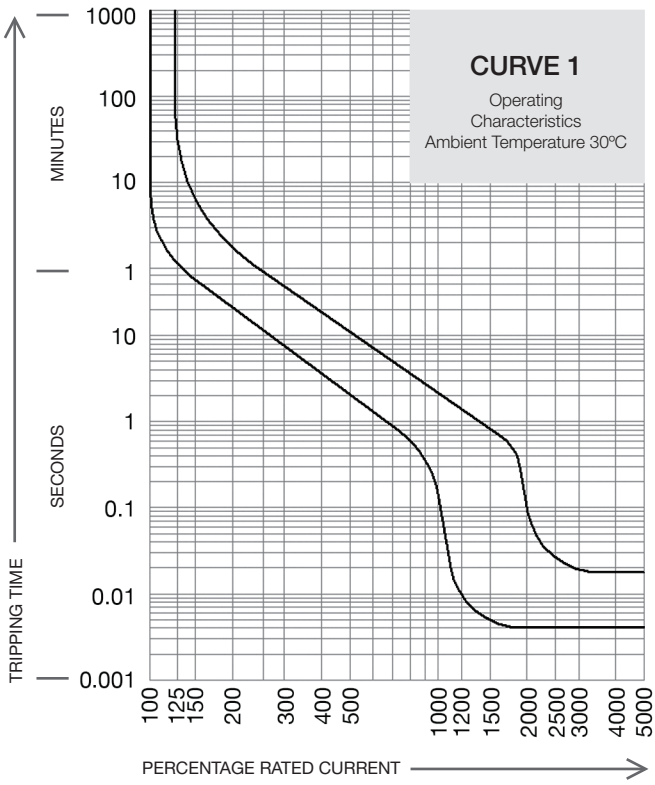
QF18 Miniature Circuit Breaker & QF10 RCBO

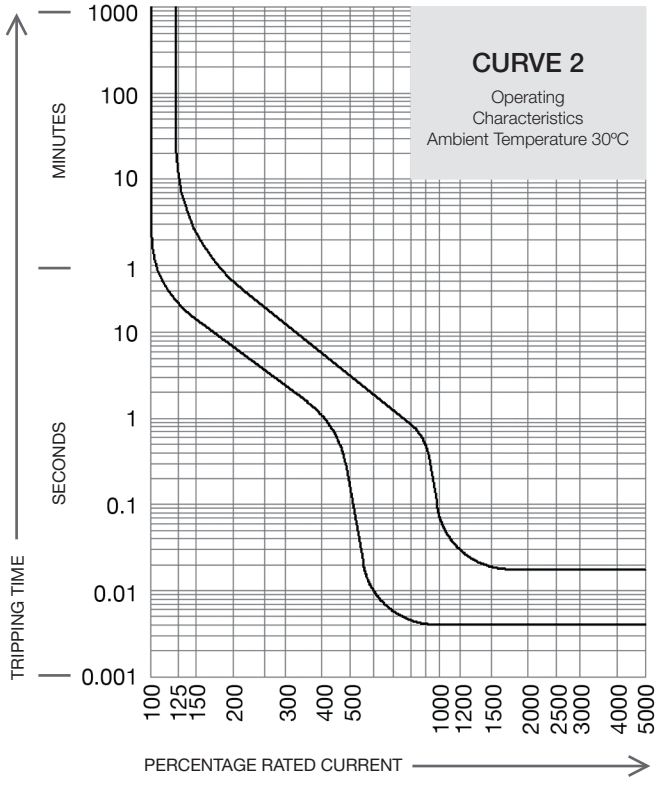
Curve 2 is similar to Curve C. Used for general lighting and power applications.

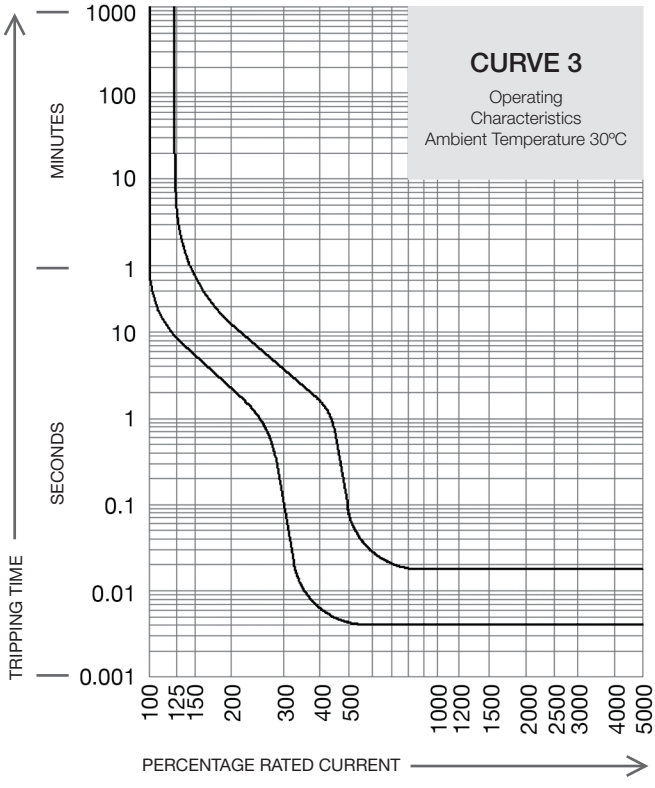
Curve 3

QF18 Miniature Circuit Breaker

Used for applications where inrush currents do not exceed 3-5 x In.







QF Range | Motor Circuit Protection

240V, 50Hz Single Phase

Full Load Current (A)	Approx Motor kW	Amp Rating	Approx Motor h.p.
1.8	0.12	6	1/6
2.7	0.18	6	1/4
3.0	0.25	6	1/3
4.0	0.37	10	1/2
5.2	0.55	10	3/4
6.3	0.75	10	1
8.0	1.1	16	1-1/2
10.0	1.5	16	2
14.5	2.2	20	3
18.5	3.0	32	4
24.0	3.7	40	5
33.0	5.5	50	7-1/2

415V, 50Hz Three Phase

Full Load Current (A)	Approx Motor kW	DOL Amp Rating	Star-Delta Amp Rating	Approx Motor h.p.
1.5	0.55	6	4	2.0
0.75	6	6	1	3.0
1.1	6	6	1-1/2	4.0
1.5	10	10	2	5.0
2.2	10	10	3	7.0
3.0	16	10	4	8.0
3.7	16	16	5	9.0
4.0	20	16	6	10
20	16	11	5.5	20
16	7-1/2	12	20	16
13	25	20	14	25
20	15	7.5	25	20
10	16	25	25	17-20
10	32	32	12-1/2	21-22
11	32	32	15	23-26
40	40	27-28	15	40
40	20	29-31	50	50
32-36	18.5	50	50	25
37-44	22	63	63	30

Part Numbers

QF18MCB (Curve 3 details available on request)

Ampere Rating	Curve 2 (Standard)			Curve 1		
	1 Pole	2 Pole	3 Pole	1 Pole	2 Pole	3 Pole
2	QFD18202	QFD28202	QFD38202	QFD18102	QFD28102	QFD38102
4	QFD18204	QFD28204	QFD38204	QFD18104	QFD28104	QFD38104
6	QFD18206	QFD28206	QFD38206	QFD18106	QFD28106	QFD38106
10	QFD18210	QFD28210	QFD38210	QFD18110	QFD28110	QFD38110
16	QFD18216	QFD28216	QFD38216	QFD18116	QFD28116	QFD38116
20	QFD18220	QFD28220	QFD38220	QFD18120	QFD28120	QFD38120
25	QFD18225	QFD28225	QFD38225	QFD18125	QFD28125	QFD38125
32	QFD18232	QFD28232	QFD38232	QFD18132	QFD28132	QFD38132
40	QFD18240	QFD28240	QFD38240	QFD18140	QFD28140	QFD38140
50	QFD18250	QFD28250	QFD38250	QFD18150	QFD28150	QFD38150
63	QFD18263	QFD28263	QFD38263	QFD18163	QFD28163	QFD38163

QF10RCBO

Ampere Rating	6	10	16	20	25	32	40
Part Number	QF10A206	QF10A210	QF10A216	QF10A220	QF10A225	QF10A232	QF10A240