

Altech Corp.®

GFL Series (5A - 40A) 10kA UL489 Listed Branch Circuit Breaker with Equipment Ground Fault Protection (RCBO)

The GFL Series range is a combined Branch Circuit Breaker and Equipment Ground Fault Protector, featuring dual pole switching (live and neutral disconnect) and designed to provide protection against short circuits, overloads, AC ground faults (residual current faults) as well as pulsating DC ground faults.



GFL Series RCBO Ordering Scheme

GFL	2	C	08	030	2
	No. of Poles 2	Trip Curve B, C, D	Rated Current 5, 6, 8, 10, 12, 13, 15, 16, 20, 25, 30*, 32*, 35*, 40A* * S & SN versions only	Residual Current Sensitivity 010 = 10mA** 030 = 30mA 100 = 100mA 300 = 300mA	System 2, S, SN see note below

NOTE:

2 = 240V Single Phase System with neutral connection.
S = 120/240V Split Phase System with no neutral connection.
SN = 120/240V Split Phase System with neutral connection.

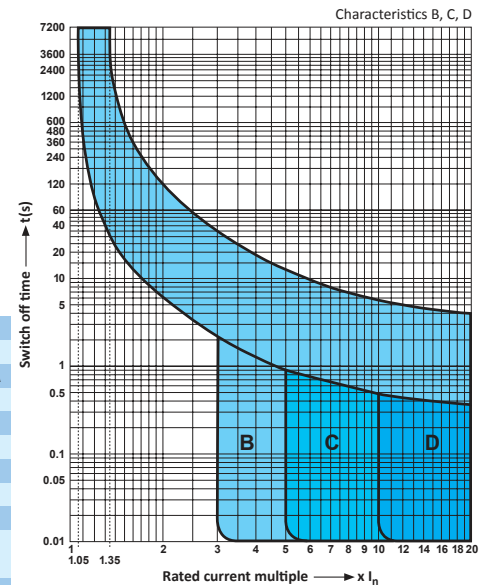
** 10mA only available on current ratings up to 25A

**EXAMPLE:
GFL2C080302**

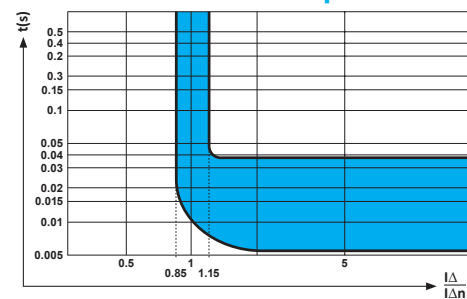
Technical Specification

Number of Poles	1+N (2)	2 (S), 2+N (SN)
Rated Voltage (U _n)	240V AC	
Rated Current	5, 6, 8, 10, 12, 13, 15, 16, 20, 25A	5, 6, 8, 10, 12, 13, 15, 16, 20, 25, 30, 32, 35, 40A
Rated Residual Operating Current (I _n)	10**, 30, 100, 300mA	
Rated Short Circuit Capacity (I _{nc})	10kA	
Rated Frequency	50/60Hz	
Ambient Temperature	-25°C to 40°C (-13°F to 104°F)	
Storage Temperature	-25°C to 40°C (-13°F to 104°F)	
Overload Tripping	B, C and D	
Cable Size & Tightening Torque	14 - 3 AWG (2mm ² - 25mm ²) @ 17.5lb-in (2.0Nm) 18 - 16 AWG (1mm ² - 1.5mm ²) @ 25lb-in (2.8Nm)	
Electrical Life	6000 Switching Operations	
Mechanical Life	10000 Switching Operations	

GFL Series RCBO Overload Trip Curves



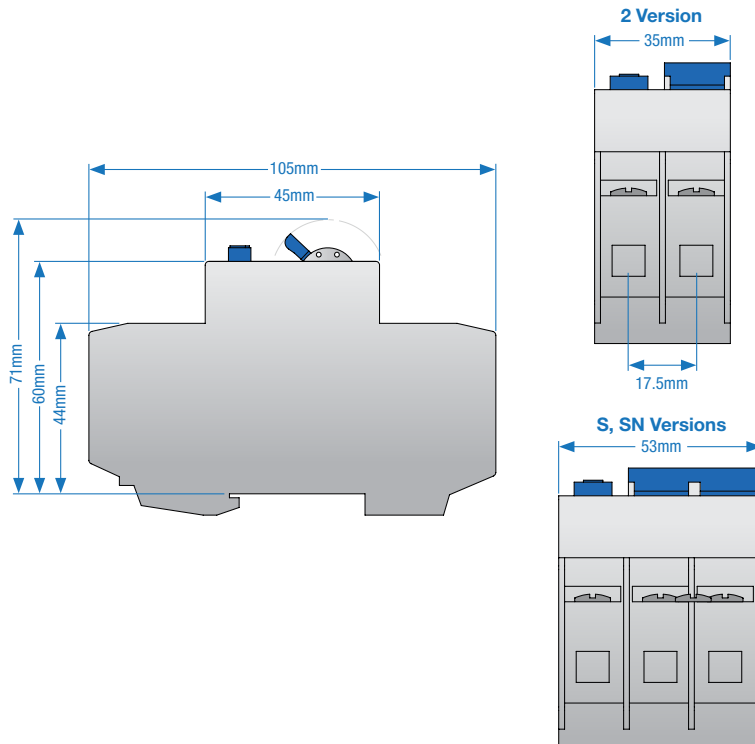
GFL Series RCBO Ground Fault Trip Curve



GFL Impedances and Power Losses

Current Rating	Impedance (mΩ) / Power Losses (W)	
	10mA	30mA - 500mA
6A	63mΩ / 2.27W	57mΩ / 2.06W
10A	28mΩ / 2.84W	26mΩ / 2.57W
13A	20mΩ / 3.44W	16mΩ / 2.75W
16A	14mΩ / 3.70W	12mΩ / 3.01W
20A	13mΩ / 5.09W	10mΩ / 4.01W
25A	12mΩ / 7.42W	9mΩ / 5.73W
32A	-	6mΩ / 5.86W
40A	-	6mΩ / 9.13W

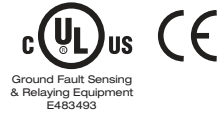
UL 489
Branch Circuit Breaker
with Ground Fault Relay



Altech Corp.®

GF Series (up to 63A) 480Y/277V AC Ground Fault Sensing and Relaying Device (RCCB)

The GF Series of Equipment Ground Fault Protection Relays (Earth Leakage Protection) is the latest addition to Altech's UL Listed product range, providing ground fault (residual current) protection for circuits with loads up to 63A. Short Circuit Withstand rating is 10kA.



GF Series RCCB Ordering Scheme

GF	2	25	030
	No. of Poles 2, 4	Rated Current 25, 40, 63A	Residual Current Sensitivity 010 = 10mA* 030 = 30mA 100 = 100mA 300 = 300mA 500 = 500mA

**EXAMPLE:
GF225030**

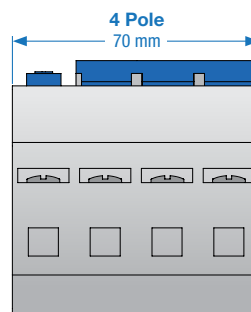
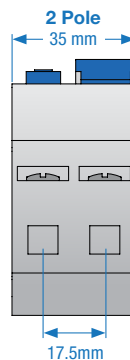
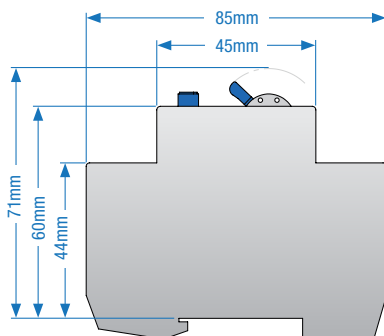
*(ONLY 2 pole, 25A - Cat. No. GF225010)

Technical Specification

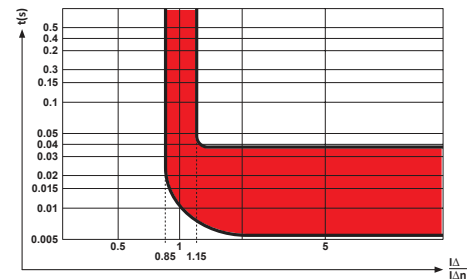
Number of Poles	2	4
Rated Voltage (U _n)	277V AC	480Y/277V AC
Rated Current	25, 40, 63A	
Rated Residual Operating Current (I _n)	10*, 30, 100, 300, 500mA	
Rated Frequency	50/60Hz	
Ambient Temperature	-25°C to 40°C (-13°F to 104°F)	
Storage Temperature	-25°C to 40°C (-13°F to 104°F)	
Cable Size & Tightening Torque	Stranded wire sized 16 - 3 AWG (1.5mm ² - 25mm ²) @ 17.5lb-in (2.0Nm) Solid wire sized 16 - 10 AWG (1.5mm ² - 5.5mm ²) @ 17.5lb-in (2.0Nm) Solid wire sized 18 - 16 AWG (1mm ² - 1.5mm ²) @ 25lb-in (2.8Nm)	
Electrical Life	6000 Switching Operations	
Mechanical Life	10000 Switching Operations	

GF Series RCCB Short Circuit Withstand Rating

V	IR	Backup
2 Pole 277V AC	10kA	Class J Fuse 250A or lower Altech L Series Branch Circuit Breaker Altech R Series Supplementary Protector
4 Pole 480Y/277V AC	10kA	Class J Fuse 250A or lower Altech L Series Branch Circuit Breaker Altech R Series Supplementary Protector



GF Series RCCB Ground Fault Trip Curve



UL 1053
Ground Fault Sensing
and Relaying Device

Altech Corp.®

GFR Series (5A - 40A) 480Y/277V AC Ground Fault Relay with Overload Protection (RCBO)

The GFR Series is a combined Equipment Ground Fault Relay and Supplementary Protector (RCBO), featuring dual pole switching (live and neutral) and designed to provide protection against overloads and AC ground faults (residual current faults) as well as pulsating DC ground faults. Short Circuit Withstand rating is 10kA.

GFR Series RCBO Ordering Scheme

GFR	2	B	06	030
	No. of Poles 2, 4	Trip Curve B, C, D	Rated Current 5, 6, 8, 10, 12, 13, 15, 16, 20, 25, 30, 32, 35, 40A	Residual Current Sensitivity 010 = 10mA* 030 = 30mA 100 = 100mA 300 = 300mA 500 = 500mA

**EXAMPLE:
GFR2B06030**

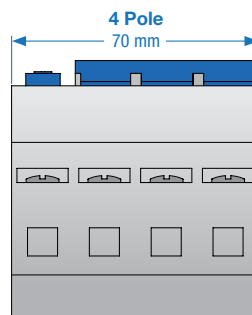
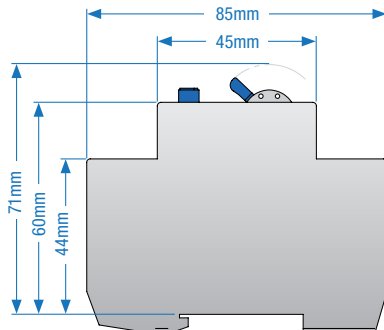
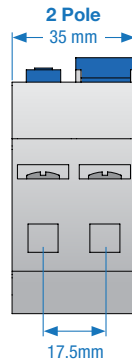
* 10mA only available on current ratings up to 25A, 2 pole only

Technical Specification

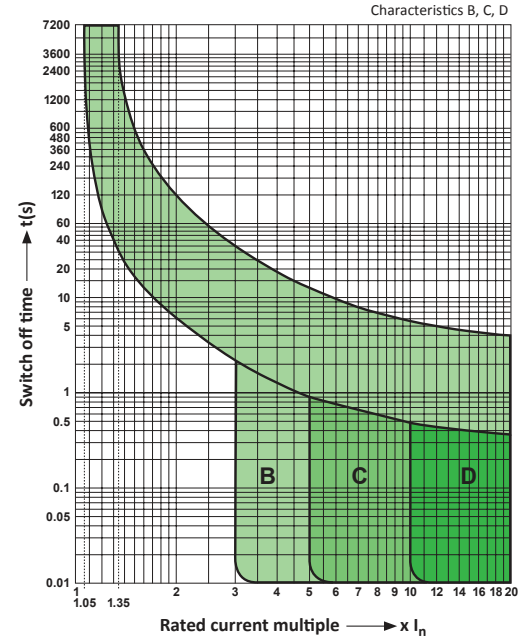
Number of Poles	2	4
Rated Voltage (U _n)	277V AC	480Y/277V AC
Rated Current	5, 6, 8, 10, 12, 13, 15, 16, 20, 25, 30, 32, 35, 40A	
Rated Residual Operating Current (I _n)	10*, 30, 100, 300, 500mA	
Rated Frequency	50/60Hz	
Ambient Temperature	-25°C to 40°C (-13°F to 104°F)	
Storage Temperature	-25°C to 40°C (-13°F to 104°F)	
Overload Tripping	B, C and D	
Cable Size & Tightening Torque	Stranded wire sized 16 - 3 AWG (1.5mm ² - 25mm ²) @ 17.5lb-in (2.0Nm) Solid wire sized 16 - 10 AWG (1.5mm ² - 5.5mm ²) @ 17.5lb-in (2.0Nm) Solid wire sized 18 - 16 AWG (1mm ² - 1.5mm ²) @ 25lb-in (2.8Nm)	
Electrical Life	6000 Switching Operations	
Mechanical Life	10000 Switching Operations	

GFR Series RCBO Short Circuit Withstand Rating

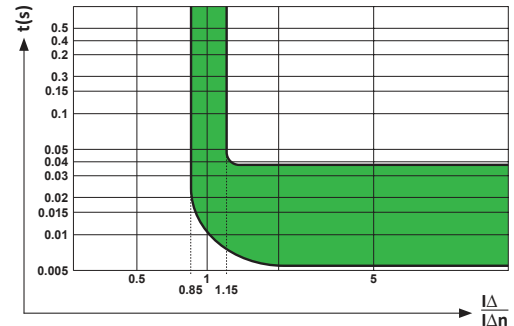
V	I	IR	Backup
2 Pole 277V AC	≤20A	10kA	None Class J Fuse 250A or lower
	>20A	10kA	Altech L Series Branch Circuit Breaker Altech R Series Supplementary Protector
4 Pole 480Y/277V AC	≤20A	10kA	None Class J Fuse 250A or lower
	>20A	10kA	Altech L Series Branch Circuit Breaker Altech R Series Supplementary Protector



GFR Series RCBO Overload Trip Curves



GFR Series RCBO Ground Fault Trip Curve



GFR Impedances and Power Losses

Current Rating	Impedance (mΩ) / Power Losses (W)	
	10mA	30mA - 500mA
6A	63mΩ / 2.27W	57mΩ / 2.06W
10A	28mΩ / 2.84W	26mΩ / 2.57W
13A	20mΩ / 3.44W	16mΩ / 2.75W
16A	14mΩ / 3.70W	12mΩ / 3.01W
20A	13mΩ / 5.09W	10mΩ / 4.01W
25A	12mΩ / 7.42W	9mΩ / 5.73W
32A	-	6mΩ / 5.86W
40A	-	6mΩ / 9.13W

UL 1077
Ground Fault Relay
with Overload Protection