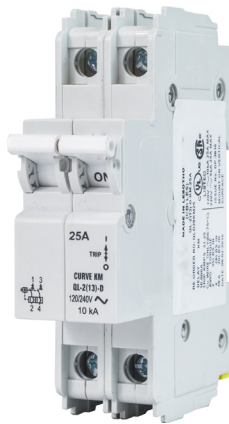


Datasheet

QL Series Hydraulic-Magnetic Miniature Circuit Breakers



Dual mount - 1 pole



DIN mount - 2 pole



Dual mount + auxiliary

Features

- AC Circuit Breaker
- Hydraulic-Magnetic technology
- 100% rating capability, independent of ambient temperature
- One, two and three pole (UL). One, two, three pole and 1+N, 3+N (VDE).
- VDE and CCC approved, CE certified
- UL 489 Listed, CSA 22.2 certified
- Ratings 0.5A to 25A
- Optional Auxiliary Switch / Trip Alarm - factory fitted (6.5 mm wide)
- Wide range of time delays and operating currents
- Precision tripping characteristics
- Ultra compact – 13 mm wide module
- Trip indication with mid-trip handle
- Reset immediately after overload
- DIN mount product in grey shells
- Dual mount product in black shells
- Ring terminal ready (terminal screw is removable)

Applications:

- AC branch circuit protection (UL 489, IEC / EN 60847-2)
- Telecom / datacom equipment
- Lighting control
- UPS equipment
- Alternative energy equipment
- Mobile power generation equipment
- Power conditioning equipment

Auxiliary Switch, Trip Alarm & Combo Features

- Factory fitted
- Attached to right hand side of Circuit Breaker
- Compact 6.5 mm width
- AC or DC voltages
- UL 489 listed (Auxiliary Switch: 6 A 240VAC, 0.5 A 110VDC)
- IEC 60947-5-1 approved (Auxiliary Switch: 6 A 240 V AC, 0.5 A 110 V DC; Trip Alarm: 6 A 240 V AC, 0.5 A 110 V DC)

Optional Accessories

- Auxiliary Switch (DIN and Dual Mount)
- Auxiliary Switch + Trip Alarm (Dual Mount only)
- Trip Alarm (Dual Mount only)
- Handle lock
- Surface mounting clips
- Busbar
- 57 mm Escutcheon blank (Dual Mount only)
- 57 mm Safety blank (Dual Mount only)

Approvals



Technical data

Approvals	IEC / EN 60947-2, VDE				
Number of poles	1	2 (1+N)	2	3	4(3+N)
Operating voltages	240 V AC	240 V AC	415 V AC	415 V AC	415 V AC
Minimum current rating	0.5 A				
Maximum current rating	25 A				
Interrupting capacity	6 kA				
Operating temperature range	-40°C to +85°C				
Mounting options	DIN Rail, Dual mounting (DIN & Mini), surface mounting clip				
Time delay curves	1, 3, 9, KM, OP				

Approvals	UL 489			
Number of poles	1	1	2	3
Operating voltages	120 V AC	240 V AC	120 / 240 V AC	240 V AC
Minimum current rating	0.5 A			
Maximum current rating	25 A	25 A	25 A	25 A
Ampere interrupting capacity (AIC)	10 kA	5 kA	10 kA	5 kA
Operating temperature range	-40°C to +85°C			
Mounting options	DIN Rail, Dual mounting (DIN & Mini), surface mounting clip			
Time delay curves	1, 3, 9, KM, OP			

Insulation coordination and general data	
Endurance	10000 operations; 1500 electrical at rated current, 8500 without current (IEC 60947-2 Clause 7.2.4.2)* 6000 electrical operations (UL 489 Clause 7.1.9)*
Dielectric strength	1000-2000 Vac for one minute (IEC 60947-2 Clause 8.3.3.3)* 1000 Vac plus twice the rated voltage for one minute (UL 489 Clause 7.1.9)*
Rated impulsive withstand voltage	4 kV (IEC 60947-2)
Weight	102 g per pole, 160 g with auxiliary (unpacked)
Altitude	Certification tests done at altitude = 2000 metres. Will operate at higher altitudes.
Shock	8 G (IEC 60068-2-6) (sinusoidal wave)
Vibration	0.5 G (IEC 60068-2-6) (sinusoidal wave)
Flammability	I3 - Ignition does not persist at 850°C after glow wire is withdrawn with an oxygen index of ≥ 28
Toxicity	F1 - Smoke index of ≤ 20 which determines the fumes class
Pollution degree	PD2 - Normally only non-conductive pollution occurs. Temporary conductivity caused by condensation is to be expected.

Breaker: QL	Wire Size mm ² (IEC)	Wire Gauge (UL)	Torque (IEC)	Torque (UL)	Comments
Main terminals	0.75 - 35 mm ²	18 - 3 - AWG	2.5 Nm	20 in-lb	Pozidriv #2 Combi head

Long code

Example code: **QL-AT-3-13-D-KM-15-R**

Group	1	2	3	4	5	6	7	8	9	10
Requirement	QL Frame	Switch / Neutral	Auxiliary + Trip Alarm	Triple pole	13 mm module width	DIN Mounting	Medium delay curve KM	Current Rating 15 A	No Shunt Trip	Ring Terminal
Long Code	QL	-	AT	3	13	DM	KM	15.0	-	R

Group 1: Frame Type	Code	Description	Comments	
	QL	13 mm wide Miniature Circuit Breaker	UL 489, IEC / EN 60947-2, VDE, CE, CCC	
Group 2: Switch/Neutral	Code	Description	Comments	
	-	Not applicable	Overload poles do not have any further coding	
	N	Neutral	Green Handle	
Group 3: Auxiliary	Code	Description	Comments	
	-	Not applicable	Use this code if no Auxiliary used	
	A	Auxiliary Switch (1 x Aux in 1 module)	6.5 mm module fitted on right-hand side (DIN & Dual Mount)	
	T	Trip Alarm (1 x Trip Alarm in 1 module)	6.5 mm module fitted on right-hand side (Dual Mount only)	
	AT	Auxiliary Switch + Trip Alarm combo (combined in 1 module)	6.5 mm module fitted on right-hand side (Dual Mount only)	
Group 4: No of Poles	Code	Description	Comments	
	1	Single pole		
	2	Double pole	2 pole or 1+N	
	3	Triple pole		
	4	Four pole	3+N only	
Group 5: Module Width	Code	Description	Comments	
	(13)	13 mm module width	13 mm per pole	
Group 6: Mounting	Code	Description	Comments	
	D	DIN rail mount	DIN mount supplied in grey only – 45 mm Escutcheon, grey body	
	DM	Dual mount	Dual mount supplied in black only – 57 mm Escutcheon, black body	
Group 7: Time Delays	Code	Description	Instantaneous Trip Point (x In)	Comments
	1	Long time delay, high instantaneous trip	10 – 20	Orange handle
	3	Short time delay	3 – 5	White handle
	9	Long time delay	7 – 12	White handle
	KM	Medium time delay	6 – 12	White handle
	OP	Instantaneous	None	White handle
Group 8: Current Ratings	Code	Description	Comments	
		0.5, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 12, 15, 16, 20, 25 A	Ratings available vary depending on certification * Other ratings are available as special orders. Check availability.	
Group 9: Shunt Trip (not certified, only offered as special order)	Code	Description	Comments	
	-	Not applicable	If no shunt trip is required	
	U0	12 Vdc Shunt trip (Flying Leads)	Flying leads (+/- 60 mm long)	
	U1	24 Vdc Shunt trip (Flying Leads)	Recommended pulse duration 100 ms to 60 s	
	U2	48 Vdc Shunt trip (Flying Leads)	Note: Shunt trip carries no approvals - available as a special offer only	
	U3	60 Vdc Shunt trip (Flying Leads)		
	U4	110 Vdc & 110 - 230 Vac Shunt Trip (Fly Leads)		
Group 10: Special Termination	Code	Description	Comments	
	R	Ring Terminal ready	Terminal Screw is removable. Ring lug (5 mm)	

QL Series Single Pole



Type: Single Pole (up to 240 VAC)		
Current Ratings (amps)	Description	Order Number
0.5	QL-1-13-DM-KM-0.5	7940102571
1	QL-1-13-DM-KM-1.0	7940125379
2	QL-1-13-DM-KM-2.0	7940102572
3	QL-1-13-DM-KM-3.0	7940102573
4	QL-1-13-DM-KM-4.0	7940102574
5	QL-1-13-DM-KM-5.0	7940102575
6	QL-1-13-DM-KM-6.0	7940102576
7	QL-1-13-DM-KM-7.0	7940102577
8	QL-1-13-DM-KM-8.0	7940102578
9	QL-1-13-DM-KM-9.0	7940102579
10	QL-1-13-DM-KM-10.0	7940102580
13	QL-1-13-DM-KM-13.0	7940102581
15	QL-1-13-DM-KM-15.0	7940102582
16	QL-1-13-DM-KM-16.0	7940102583
20	QL-1-13-DM-KM-20.0	7940102584
25	QL-1-13-DM-KM-25.0	7940102585

**QL Series Single Pole
(long time delay/high instant trip)**



Type: Single Pole (up to 240 VAC) (long time delay/high instant trip)		
Current Ratings (amps)	Description	Order Number
1	QL-1-13-DM-1-1.0	7940115210
2	QL-1-13-DM-1-2.0	7940112653
3	QL-1-13-DM-1-3.0	7940115283
4	QL-1-13-DM-1-4.0	7940115284
5	QL-1-13-DM-1-5.0	7940113986
6	QL-1-13-DM-1-6.0	7940115211
7	QL-1-13-DM-1-7.0	7940114950
8	QL-1-13-DM-1-8.0	7940115282
10	QL-1-13-DM-1-10.0	7940102587
15	QL-1-13-DM-1-15.0	7940113987
16	QL-1-13-DM-1-16.0	7940114409
20	QL-1-13-DM-1-20.0	7940102588
25	QL-1-13-DM-1-25.0	7940112654

QL Series Double Pole



Type: Double Pole (up to 240 VAC)		
Current Ratings (amps)	Description	Order Number
0.1	QL-2-13-DM-KM-0.1	7940115220
0.5	QL-2-13-DM-KM-0.5	9926252000
1	QL-2-13-DM-KM-1.0	7940102643
2	QL-2-13-DM-KM-2.0	7940102644
3	QL-2-13-DM-KM-3.0	7940102645
4	QL-2-13-DM-KM-4.0	7940102646
5	QL-2-13-DM-KM-5.0	7940102647
6	QL-2-13-DM-KM-6.0	9926252006
7	QL-2-13-DM-KM-7.0	7940102649
8	QL-2-13-DM-KM-8.0	7940102650
10	QL-2-13-DM-KM-10.0	9926252010
12	QL-2-13-DM-KM-12.0	7940115938
13	QL-2-13-DM-KM-13.0	7940102652
15	QL-2-13-DM-KM-15.0	9926252015
16	QL-2-13-DM-KM-16.0	7940102654
20	QL-2-13-DM-KM-20.0	7940126749
25	QL-2-13-DM-KM-25.0	7940102656

**QL Series Double Pole
(long time delay/high instant trip)**



Type: Double Pole (up to 240 VAC) (long time delay/high instant trip)		
Current Ratings (amps)	Description	Order Number
2	QL-2-13-DM-1-2.0	7940102657
3	QL-2-13-DM-1-3.0	7940114949
4	QL-2-13-DM-1-4.0	7940113820
5	QL-2-13-DM-1-5.0	7940102658
6	QL-2-13-DM-1-6.0	7940102659
7	QL-2-13-DM-1-7.0	7940114948
10	QL-2-13-DM-1-10.0	7940102660
13	QL-2-13-DM-1-13.0	7940113821
15	QL-2-13-DM-1-15.0	7940102661
20	QL-2-13-DM-1-20.0	7940113822
25	QL-2-13-DM-1-25.0	7940113823

QL Series Triple Pole



Type: Triple Pole (up to 240 VAC)		
Current Ratings (amps)	Description	Order Number
1	QL-3(13)-DM-KM-1.0	7940102691
2	QL-3(13)-DM-KM-2.0	7940102692
5	QL-3-13-DM-KM-5.0	7940102693
10	QL-3-13-DM-KM-10.0	7940104412
15	QL-3-13-DM-KM-15.0	7940102694
20	QL-3-13-DM-KM-20.0	7940102695
25	QL-3-13-DM-KM-25.0	7940102696

QL Series Single Pole w/ Auxiliary Contact



Type: Single Pole (up to 120 VAC)		
Current Ratings (amps)	Description	Order Number
1	QL-A-1-13-DM-KM-1.0	7940102708
2	QL-A-1-13-DM-KM-2.0	7940102709
3	QL-A-1-13-DM-KM-3.0	7940102710
5	QL-A-1-13-DM-KM-5.0	7940102711
10	QL-A-1-13-DM-KM-10.0	7940102712
15	QL-A-1-13-DM-KM-15.0	7940102713
20	QL-A-1-13-DM-KM-20.0	7940102714
25	QL-A-1-13-DM-KM-25.0	7940102715

QL Series Double Pole w/ Auxiliary Contact



Type: Double Pole (up to 240 VAC)		
Current Ratings (amps)	Description	Order Number
1	QL-A-2-13-DM-KM-1.0	7940114041
2	QL-A-2-13-DM-KM-2.0	7940119828
5	QL-A-2-13-DM-KM-5.0	7940119829
15	QL-A-2-13-DM-KM-15.0	7940119830
20	QL-A-2-13-DM-KM-20.0	7940119831

QL Series Single Pole (Alarm Contact)



Type: Single Pole (up to 120 VAC)		
Current Ratings (amps)	Description	Order Number
1	QL-T-1-13-DM-KM-1.0	7940114042
2	QL-T-1-13-DM-KM-2.0	7940114043
5	QL-T-1-13-DM-KM-5.0	7940114044
10	QL-T-1-13-DM-KM-10.0	7940102724
15	QL-T-1-13-DM-KM-15.0	7940114045
20	QL-T-1-13-DM-KM-20.0	7940114046
25	QL-T-1-13-DM-KM-25.0	7940114047

QL Series Double Pole (Alarm Contact)



Type: Double Pole (up to 240 VAC)		
Current Ratings (amps)	Description	Order Number
1	QL-T-2-13-DM-KM-1.0	7940114048
2	QL-T-2-13-DM-KM-2.0	7940114049
5	QL-T-2-13-DM-KM-5.0	7940114050
10	QL-T-2-13-DM-KM-10.0	7940114051
15	QL-T-2-13-DM-KM-15.0	7940114052
20	QL-T-2-13-DM-KM-20.0	7940114053
25	QL-T-2-13-DM-KM-25.0	7940114054

QL Series Triple Pole (Alarm Contact)



Type: Triple Pole (up to 240 VAC)		
Current Ratings (amps)	Description	Order Number
1	QL-T-3(13)-DM-KM-1.0	7940115448
2	QL-T-3(13)-DM-KM-2.0	7940115449
5	QL-T-3(13)-DM-KM-5.0	7940115450
10	QL-T-3(13)-DM-KM-10.0	7940115451
15	QL-T-3(13)-DM-KM-15.0	7940115452
20	QL-T-3(13)-DM-KM-20.0	7940115453
25	QL-T-3(13)-DM-KM-25.0	7940115454

**QL Series Single Pole Combination
(Auxiliary & Alarm Contact)**



Type: Single Pole (up to 120 VAC)		
Current Ratings (amps)	Description	Order Number
1	QL-AT-1-13-DM-KM-1.0	7940114055
5	QL-AT-1-13-DM-KM-5.0	7940102725
10	QL-AT-1-13-DM-KM-10.0	7940102726
15	QL-AT-1-13-DM-KM-15.0	2853970000
20	QL-AT-1-13-DM-KM-20.0	7940114056
25	QL-AT-1-13-DM-KM-25.0	7940114057

**QL Series Double Pole Combination
(Auxiliary & Alarm Contact)**



Type: Double Pole (up to 240 VAC)		
Current Ratings (amps)	Description	Order Number
1	QL-AT-2-13-DM-KM-1.0	7940114058
2	QL-AT-2-13-DM-KM-2.0	7940114059
10	QL-AT-2-13-DM-KM-10.0	7940126754
15	QL-AT-2-13-DM-KM-15.0	7940102727
20	QL-AT-2-13-DM-KM-20.0	7940114060
25	QL-AT-2-13-DM-KM-25.0	7940114061

Mounting Options

If the product is not vertically mounted in the normal DIN-rail mounting orientation, a rating factor must be applied. Figure 1 shows a diagram of the rating factor to apply. The published curves for these circuit breaker products are produced with the circuit breaker in the vertical mounting position. The rating factor only applies to the must hold and must trip points of the curve as the other parts (instantaneous trip point) stay largely unaffected.

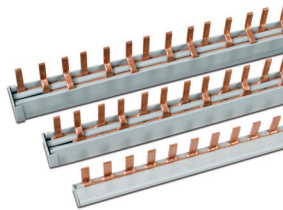
It is important to note that in environments that are exposed to a high degree of vibration, the cables that connect to the circuit breaker must be securely held in place, as the breaker is not designed to carry the weight of the cables. A maximum of 35N can be applied to the terminal area, in a direction perpendicular to the mounting axis.

Optional Accessories

- Auxiliary Switch
- Auxiliary Switch + Trip Alarm
- Trip Alarm
- Handle Lock
- Surface Mounting Clips
- Busbar

Busbar

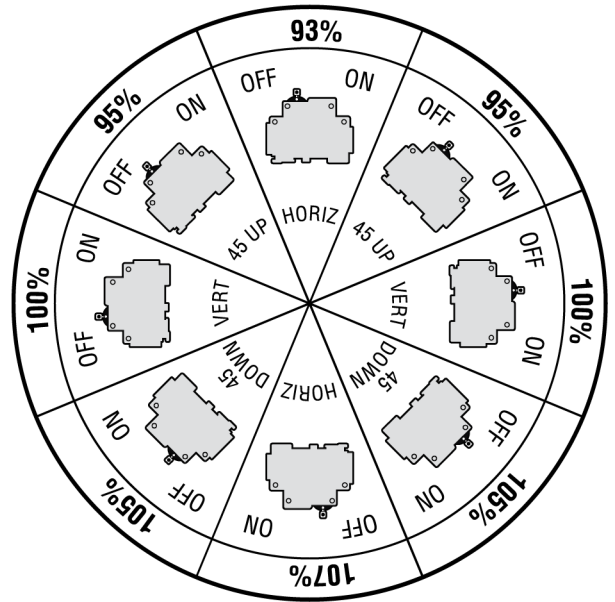
Type	
Busbar (1 pole, insulated, 1 meter)	7940099731
Busbar end cap, 1 pole	7940099740
Bus - bar (2 pole, insulated, 1 meter)	7940099739
Bus - bar end cap, 2 pole	7940099741



Type	
Power lug, 90° (14mm)	7940099737
Power lug, straight (32 mm)	7940099746



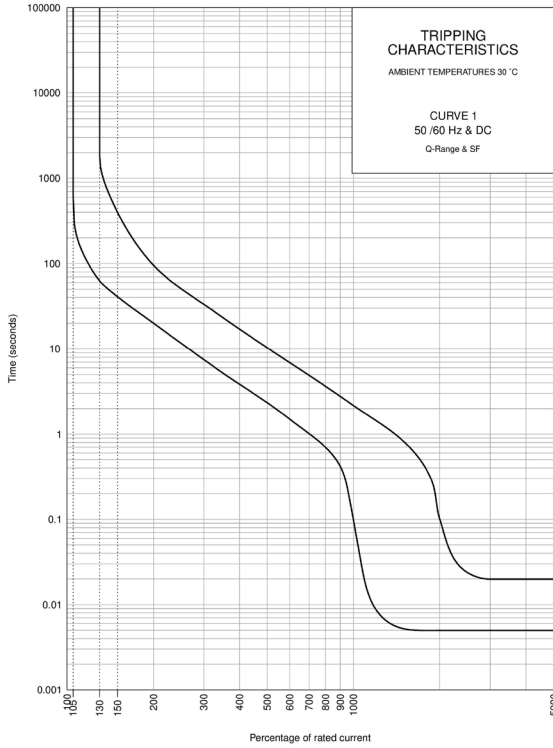
Type	
Lock-out handle	7940099734



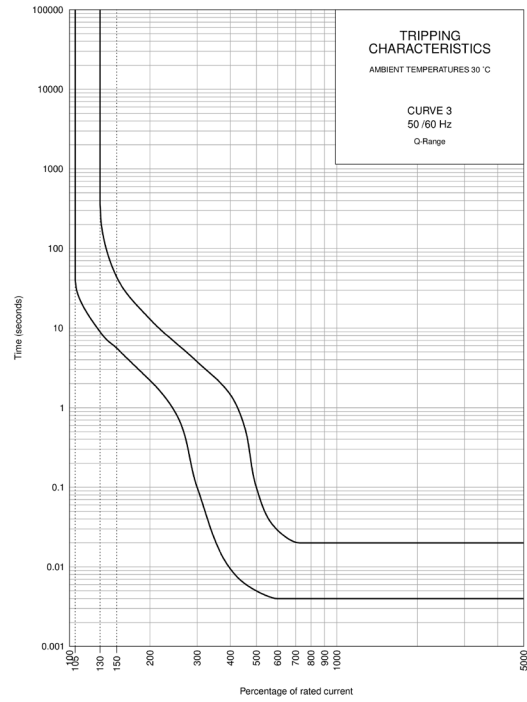
Auxiliary Switch, Trip Alarm & Combo Features

- AC or DC Voltages
- UL 489 Listed (Auxiliary switch: 6A 250V AC, 0.5A 80V DC; Trip alarm: 5A 250V AC, 0.5A 125V DC)
- IEC 60947-5-1 Approved (Auxiliary switch: 6A 250V AC, 0.5A 80V DC; Trip alarm: 5A 250V AC, 0.5A 125V DC)
- Factory Fitted
- Attached to Right Hand Side of Circuit Breaker
- Compact 6.5mm Width
- Available in Dual and DIN Rail Mounting

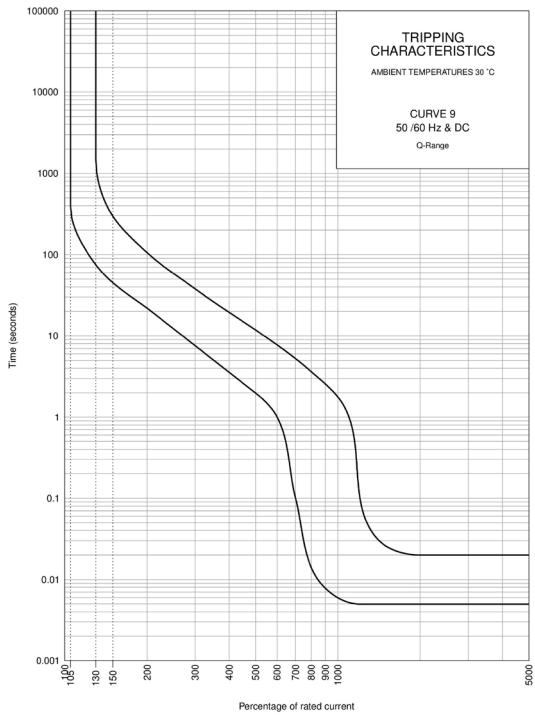
Time Delay Curves



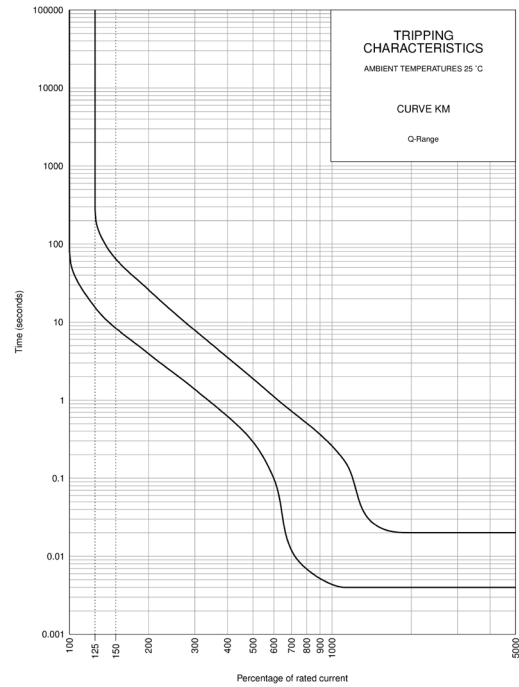
PERCENTAGE OF RATED CURRENT	105%	130%	145%	150%	200%	300%	400%	500%	600%	700%	800%	900%	1000%	2000%
MINIMUM TRIP TIME IN SECONDS	NO TRIP	63	45	41	20	7.5	3.8	2.3	1.5	1.01	0.7	0.42	0.1	0.005
MAXIMUM TRIP TIME IN SECONDS	NO TRIP	1800	503	400	96	34	17	10.3	6.8	4.9	3.6	2.8	2.2	0.1



PERCENTAGE OF RATED CURRENT	105%	130%	145%	150%	200%	300%	400%	500%	600%	700%	800%	900%	1000%	2000%
MINIMUM TRIP TIME IN SECONDS	NO TRIP	9	6	5.8	2.2	0.1	0.009	0.005	0.004	0.004	0.004	0.004	0.004	0.004
MAXIMUM TRIP TIME IN SECONDS	NO TRIP	365	57	44	13	3.8	1.45	0.1	0.028	0.02	0.02	0.02	0.02	0.02

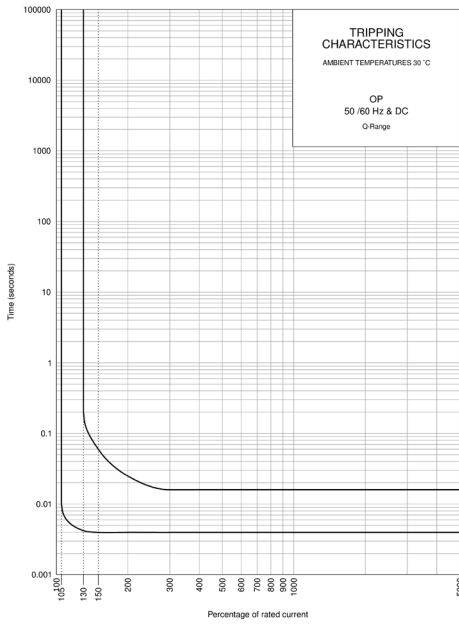


PERCENTAGE OF RATED CURRENT	105%	130%	145%	150%	200%	300%	400%	500%	600%	700%	800%	900%	1200%	2000%
MINIMUM TRIP TIME IN SECONDS	NO TRIP	75	50	45	22	7.6	3.6	2	1	0.1	0.01	0.008	0.005	0.005
MAXIMUM TRIP TIME IN SECONDS	NO TRIP	1500	360	295	100	38	19	11.8	7.7	5.3	3.6	2.6	0.06	0.02



PERCENTAGE OF RATED CURRENT	100%	125%	130%	145%	200%	300%	400%	500%	600%	700%	800%	900%	1000%	2000%
MINIMUM TRIP TIME IN SECONDS	NO TRIP	16	13.2	9.2	26	1.4	0.6	0.3	0.1	0.01	0.006	0.005	0.004	0.004
MAXIMUM TRIP TIME IN SECONDS	NO TRIP	279	140	74	4	7.8	3.5	1.9	1.1	0.7	0.5	0.36	0.25	0.02

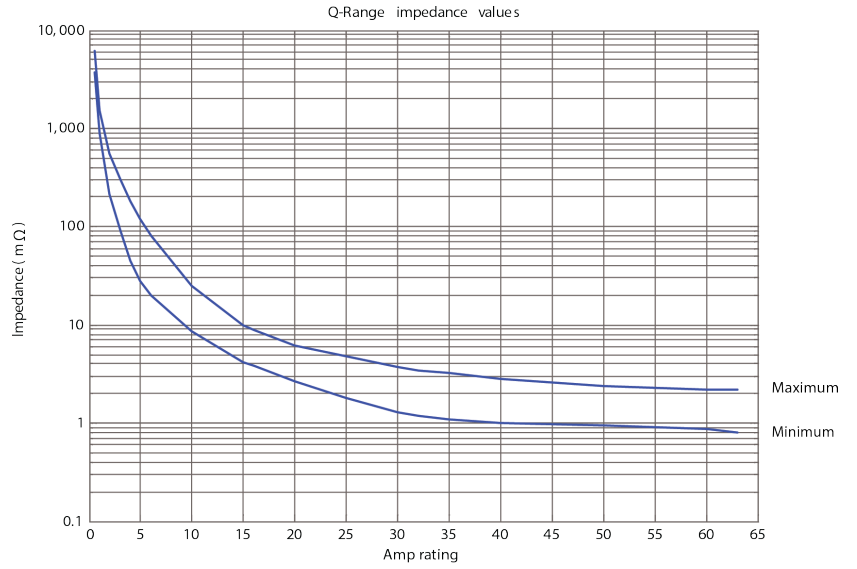
Time Delay Curves



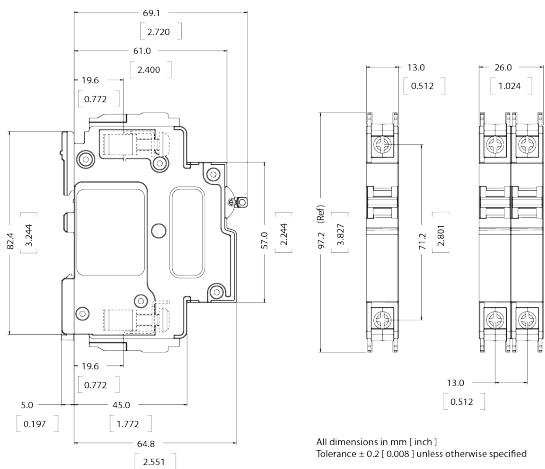
PERCENTAGE OF RATED CURRENT	105%	130%	145%	150%	200%	300%	400%	500%	600%	700%	800%	900%	1000%	2000%
MINIMUM TRIP TIME IN SECONDS	NO TRIP	0.0042	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004
MAXIMUM TRIP TIME IN SECONDS	NO TRIP	0.2	0.07	0.06	0.025	0.016	0.016	0.016	0.016	0.016	0.016	0.016	0.016	0.016

* The published time delay curves are generated at 30°C ambient temperature with the Circuit Breaker mounted in the up-right position. The "must hold", "must trip" and "instantaneous trip" current values are not affected by temperature, although delay time for the other operating current values may have to be adjusted using the temperature compensation curve which is available on request.

Internal Impedance vs Current Rating



Outline Dimensions: Dual mount



Outline Dimensions: DIN mount

