

Acti9 iC60H3 RCBOs

Complementary Technical Guide 2023



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Complementary technical information

Acti9 iC60H3 10kA

Acti9 Influence of ambient temperature

Devices	Characteristics influenced by temperature	Temperature	
		Min.	Max.
iC60H3 RCBO	Tripping on overload	- 05°C	+ 60°C

Acti9 iC60H3 RCBO derating table (IEC 61009-1, AS/ NZS 61009.1)

iC60H3 RCBO Rating (A)	Ambient temperature (°C)													
	-5	0	5	10	15	20	25	30	35	40	45	50	55	60
10	11.15	10.99	10.85	10.68	10.52	10.35	10.18	10	9.82	9.64	9.46	9.24	9.06	8.88
16	18.26	17.98	17.68	17.33	17.12	16.58	16.33	16	15.68	15.26	14.91	14.52	14.16	13.80
20	22.98	22.49	22.09	21.68	21.26	20.86	20.43	20	19.58	19.11	18.68	18.12	17.58	17.05
25	27.95	27.58	27.19	26.82	26.31	25.95	25.46	25	24.56	24.08	23.54	23.18	22.66	22.10
32	36.68	36.02	35.42	34.78	34.15	33.45	32.73	32	31.28	30.55	29.81	28.98	28.12	27.02
40	45.22	44.56	43.78	43.05	42.33	41.56	40.77	40	39.19	38.35	37.46	36.66	35.74	34.64
50	56.18	55.38	54.59	53.65	52.86	51.83	50.92	50	49.01	48.05	46.95	45.93	45.03	43.90

Dissipated power, Impedance and Voltage drop

The following table indicates the average impedance and dissipated power per pole for a current equal to the rating of the device and at the operating voltage.

iC60H3 Impedance and Dissipated power		
Rated Current (A)	Impedance (mΩ) ±10%	Dissipated power (W)
10 A	48.60	4.86
16 A	29.67	7.60
20 A	21.74	8.69
25 A	17.76	11.10
32 A	11.08	11.35
40 A	10.88	17.40
50 A	7.68	19.19

Impedance calculation:

$$Z = P / I^2$$

Z: impedance in Ohms

P: dissipated power in Watts (table values)

I: rating in Amperes

Voltage drop calculation:

$$U = P / I$$

U: voltage drop in Volts

P: dissipated power in Watts (table values)

I: rating in Amperes

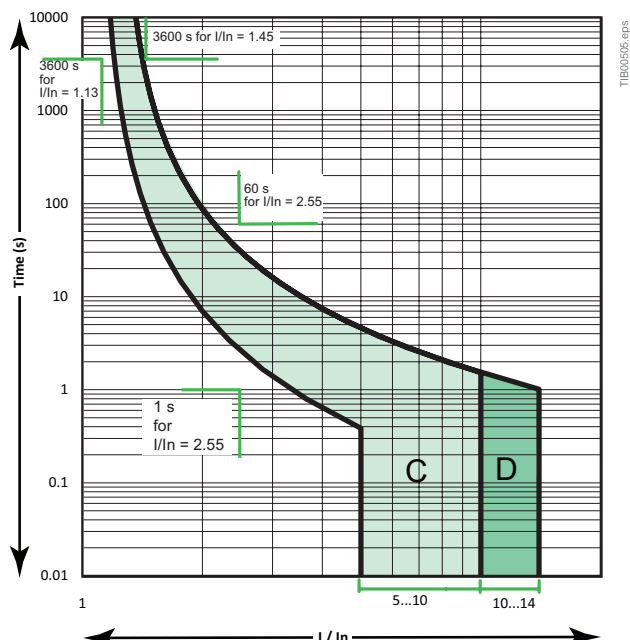
Tripping curves

Alternative current 50/60 Hz

iC60H3 RCBO

According to IEC 61009-1, AS/ NZS 61009.1 (reference temperature 30°C)

Curves C, D rating 10 A to 50 A



Short-circuit current limiting

Limitation curves for network

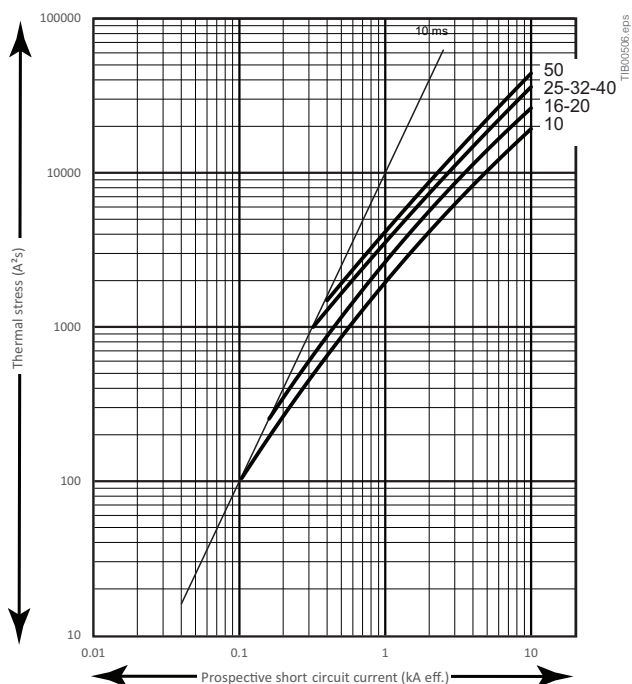
Ue: 400-415 V AC

iC60H3 RCBO

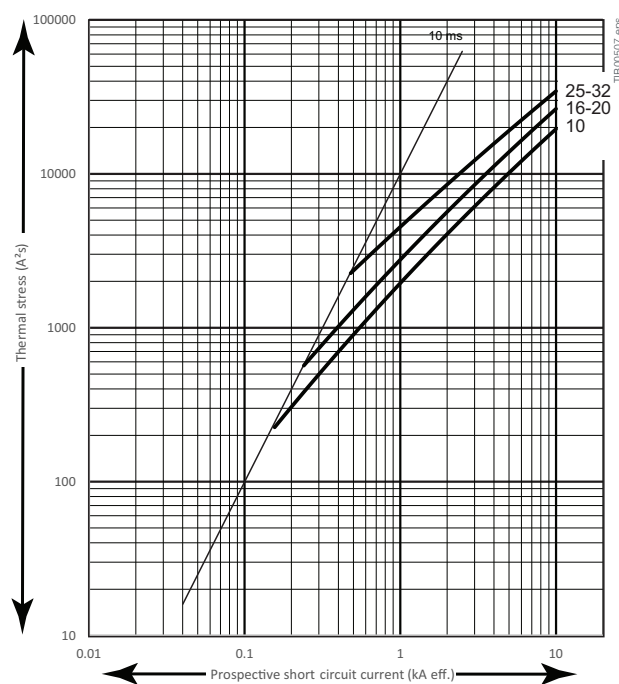
3P+N

Thermal stress

Curve C



Curve D



Protection selectivity

Upstream: NSX160, NSX250

Downstream: iC60H3 RCBO

Ue : 400-415 V AC



DB40/6180 eps

Circuit breaker

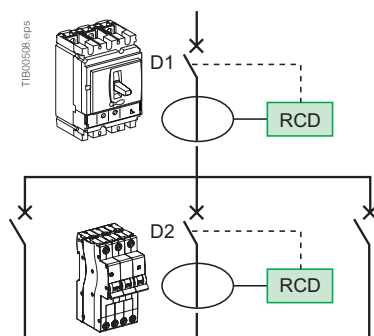
RCBO

Upstream		NSX160 B / F / N / H / S / L			NSX250 B / F / N / H / S / L		
Trip Unit		TMD/ Micrologic			TMD/ Micrologic		
Rating (A)		100	125	160	160	200	250

Downstream								
	In (A)	Icn (A)	Selectivity limit					
iC60H3 RCBO C-D curves	10-50	10000	T	T	T	T	T	T

T Total selectivity, up to the breaking capacity of the downstream circuit breaker

Cascading MCCB / RCBO



Ue: 400 - 415 V AC

Upstream		NSX100/ NSX160 / NSX250					
		B	F	N	H	S	L
Breaking capacity (kA)		25	36	50	70	100	150
Downstream							
	In (A)	Icn (A)	Reinforced breaking capacity (kA) according to IEC 60947-2 Annex A				
iC60H3 RCBO	10-50	10000	25	25	25	25	25

Selectivity enhanced by cascading

Upstream: NSX160, NSX250, TMD - Micrologic

Downstream: iC60H3 RCBO

Ue : 400-415 V AC

Upstream		NSX160 B / F / N / H / S / L			NSX250 B / F / N / H / S / L		
Trip Unit		TMD/ Micrologic			TMD/ Micrologic		
Rating (A)		100	125	160	160	200	250
Downstream							
	In (A)	Icn (A)	Selectivity limit (kA) / Reinforced breaking capacity (kA) according to IEC 60947-2 Annex A				
iC60H3 RCBO C-D curves	10-50	10000	25/25	25/25	25/25	25/25	25/25

FAQs on load balancing

1. Can I use iC60H3 to protect 3 Phase motor (balanced load)?

- **Yes**, for 3 Phase motor applications utilizing soft starters or direct online (DOL) connection.
- **No**, for 3 Phase motor applications utilizing variable speed drives.

Refer schematic 1

2. Can I use iC60H3 to protect 3 Phase socket outlets with or without neutrals (Ue = 400-415 V AC) for balanced & unbalanced loads?

- **Yes**, refer to schematic 1 or 2.

Refer schematic 1 and 2

3. Can I use iC60H3 to protect 2 Phase loads (balanced load, 400-415 V AC)?

- **Yes**, must connect to L2 & L3 phases since the test circuits are connected to them.

Refer schematic 3

4. Can I use iC60H3 to protect 2x single phase loads with single phase incoming supply?

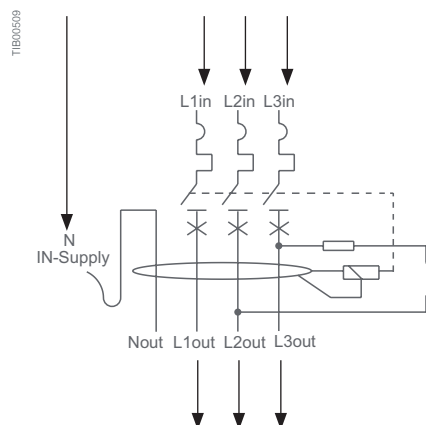
- **No**, since the product is designed and tested for 3Phase Voltage 400-415 V.

Ways to represent the connection:

Three Phase balanced load connection:

- Use connection to Phase terminals for this type of load

3 Ph Incoming Supply with Neutral



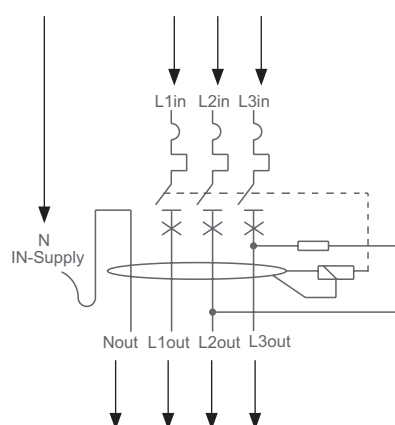
To RCBO protected Three phase balanced load

Schematic 1

Three Phase un-balanced load connection:

- Use connection to Phase terminals & Neutral for this type of load

3 Ph Incoming Supply with Neutral



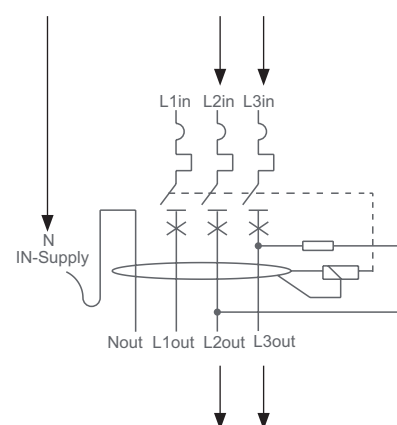
To RCBO protected Three phase unbalanced load

Schematic 2

Two Phase load connection:

- Use connection to Phase terminals L2 & L3

3 Ph Incoming Supply connection only to L2in and L3in with Neutral



To RCBO protected Two phase load circuit connect to L2 out and L3 out

Schematic 3

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