

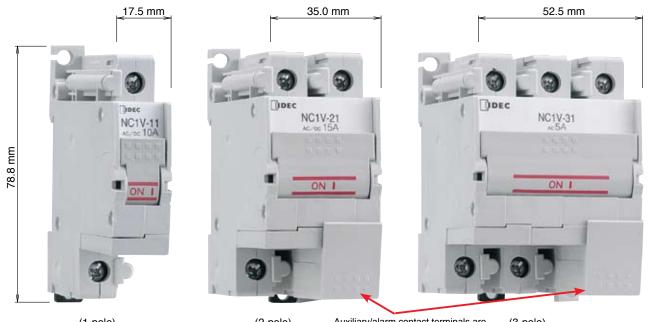
NC1V Circuit Breakers





IDEC CORPORATION

IDEC's original Spring-up Terminals and Cover Provide IP20 Fingersafe Protection.



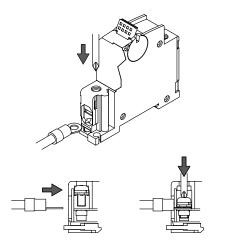
(1-pole)

(2-pole)

Auxiliary/alarm contact terminals are (3-pole) supplied with fingersafe covers.

Fingersafe, spring-up terminals reduce wiring time.

Ring terminals can be installed as screws are captive.

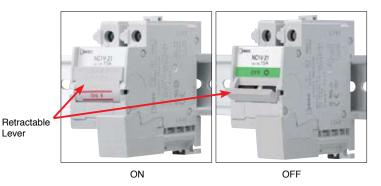


Main Circuit Terminals are Fingersafe (IP20)

Spring-up, fingersafe terminals do not require a cover.

Retractable Lever

The lever retracts when the circuit breaker is set. As a result, accidental operation due to bumping the lever, is prevented. Status of the circuit breaker can easily be determined by observing the position of the lever.



Slim Design Saves Space

1-pole	17.5mm Wide
2-pole	35.0mm Wide
3-pole	52.5mm Wide

Auxiliary/Alarm Contact Terminals are Equipped with Fingersafe Covers

Auxiliary/Alarm Contact, and Relay Trip Voltage Coil Terminals are Equipped with Fingersafe Covers.

35mm-wide DIN Rail Mounting or Direct Panel Mounting



Distinguishing Characteristics

Wide variety of rated currents and tripping curves. One and two pole models are AC/DC compatible and allow for a reduction in inventory.

Rated Short-circuit Capacity 2500A

Available with Inertia Delay

Allows for use with large inrush currents such as motors and lamps.

Safe Trip-free Mechanism

The circuit remains open even when the operator is turned on after tripping (unit must be manually reset after removing the cause of the tripping).

Available with Auxiliary or Alarm Contacts



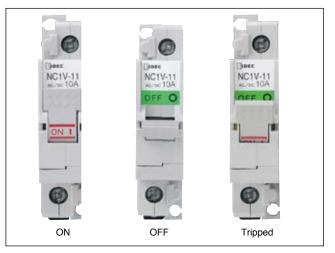
Auxiliary or Alarm Contact (Shown without terminal cover.)

Conforms to various international standards



After tripping, the retractable lever is in the middle position.

Circuit breaker must be turned off before it can be reset.







NC1V Circuit Breakers

IDEC's spring-up, fingersafe terminals enhance reliability and safety.

- · Superior protection for a wide range of devices from sensitive electronic equipment to electrical control circuits. Applications include semiconductor manufacturing equipment, electronic controllers, computers, microprocessors, communications equipment, power supplies, machin tools, motors, office equipment, and more.
- · Excellent tripping time curve performance
- · Flat retractable lever for safety operations
- · Slim housing design
- · Spring-up terminals
- Fingersafe main circuit terminals
- · Color (red/green) contact position indicator
- · DIN rail or direct panel mounting (through-panel mounting brackets available)
- · One and two pole models have both AC and DC voltages in each devie
- · Auxiliary / alarm contacts

Applicable Standards	Certification Mark		Certification Mark		Certification Organization (File No.)
UL1077	8		E68029		
CSA C22.2 No. 235	¶®,		LR83454		
EN60934			B07 09 13332 063		
EN00934	CE		European Commission's Low Voltage Directive		
GB17701-1999)	No. 2008010307265840		
Electrical Applicance and Material Safety Law	Series Trip	PS E	JET		
Technical Standard	Relay Trip	PSE	JEI		

Note: TÜV, CE, and CCC marks are applicable for series trip type only.

Specifications

s, ne	0			60		
	NCIV-11 x== 10A	NC1V-21	Dec	NC1V-31 = 5A	-	
	ON 1	ON I		ON 1		
ice	0	0	0	07	ŝ	



Operator Style		Retractable lever					
Internal Circuit		Series trip (current trip), Relay trip (volt	age trip)				
Protection Method		Hydraulic magnetic tripping system, Magnetic tripping system (voltage trip)					
No. of Poles		1-pole	2-pole	3-pole			
Rated Voltage (AC	/DC) Note 1	250V AC 50/60Hz, 65V DC	250V AC 50/60Hz, 125V DC	250V AC, 50/60	Hz		
Ossias Tria	Rated Short-circuit Capacity	250V AC, 2500A 65V DC, 2500A	250V AC, 2500A 125V DC, 2500A	250V AC, 2500A	١		
Series Trip (Current Trip) Rated Current		0.1A, 0.3A, 0.5A, 1A, 2A, 3A, 5A, 7A, 1	0A, 15A, 20A, 25A, 30A				
(ouncil mp)	Operation Characteristics Note 2	Time delay curve curve M (slow), curve Curves M and A are also available with					
Relay Trip	Rated Current	30A					
(Voltage Trip)Note 3	Trip Voltage	24 to 48V DC (at 25°C) Voltage application duration 10 sec ma	ximum, tripping time 0.1 sec maxi	mum (at rated volta	ige)		
Auxiliary Contact/	Contact Rating	125V AC 3A (resistive load), 30V DC 2	A (resistive load)				
Alarm Contact	Minimum Applicable Load	ad 24V DC 1mA (resistive load, reference value)					
Insulation Resistan	ice	100MΩ minimum (500V DC megger)					
Dielectric Strength		2,000V AC, 1 minute (between terminals when main contacts are open, between live parts of different poles, between live and dead parts) 600V AC (between terminals when auxiliary circuits are open)					
Vibration Resistand (with rated current		Damage limits: 147 m/s ² (10 to 55 Operating extremes: 98 m/s ² (1-pole, 2	5 Hz) (1-pole, 2-pole), 78 m/s² (3- -pole), 78 m/s² (3-pole)	oole)			
	e: 80% rated current, rve: 100% rated current)	Damage limits: 490 m/s² (1-pole, Operating extremes: 196 m/s² (S, A, M	2-pole), 297 m/s ² (3-pole) types)				
Electrical Life		10,000 cyles minimum (at rated curent)	, 10 operations per minute				
Reference Temper	ature	40°C					
Operating Tempera	ature	-10 to +60°C (no freezing) Rated current is based on an ambient t 40°C, derate the rated current by using		perating temperatur	e exceeds		
Operating Humidity	/	45 to 85% RH (no condensation)					
	lain Circuit Terminal	Spring-up, fingersafe terminal: M4 screw (up to 20A), M5 screw (25A and 30A)					
	uxiliary/Alarm Contacts, oltage Coil Terminal	M3.5 screw					
Weight (approx.)		1-pole: 90g, 2-pole: 170g, 3-pole: 260g					
rated current, h To avoid unned	neous) tripping curve, humming sou lowever, the performance of the circ	ts where inrush currents may be present.	vave current circuit around 80% of the	Operating Temp. 50°C 55°C 60°C	Derating Facto 0.9 0.8 0.7		

• Do not use the NC1V circuit breakers in environments where they are exposed to extreme temperature, humidity, dust, corrosive gases, vibration, shock, or in a circuit where inrush current may be present, otherwise unnecessary operation and damage may occur.

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Part No. Configuration

NC1V - 2 1 00 F - 30A A DC24V 1 Type 8 Voltage Trip Coil Voltage NC1V: Lever style DC24V: 24-48V DC * Specified for relay trip only. DIN rail and panel mounting 2 No. of Poles 7 Time Delay Curve 1: 1-pole M: Slow 2: 2-pole A: Medium 3: 3-pole S: Instantaneous 3 Internal Circuit * For both AC/DC. 1: Series trip (current trip) * Specified for series trip only. 6 Rated Current 5: Relay trip (voltage trip) 0.1A, 0.3A, 0.5A, 1A, 2A, 3A, 5A, 7A, 10A 15A, 20A, 25A, 30A 4 Auxiliary/Alarm Contacts 00: None 11: With one auxiliary contact * Specified for series trip only. 5 Inertia Delay 12: With two auxiliary contacts 13: With three auxiliary contacts 21: With one alarm contact Blank: Without F: With F: with * Inertia delay is for AC voltage only. * Available with medium and slow types (not applicable with relay trip). 31: With one auxiliary contact and one alarm contact 32: With two auxiliary contacts and one alarm contact

Models

• Specify rated current, time delay curve, or voltage trip coil voltage in place of 678 when ordering.

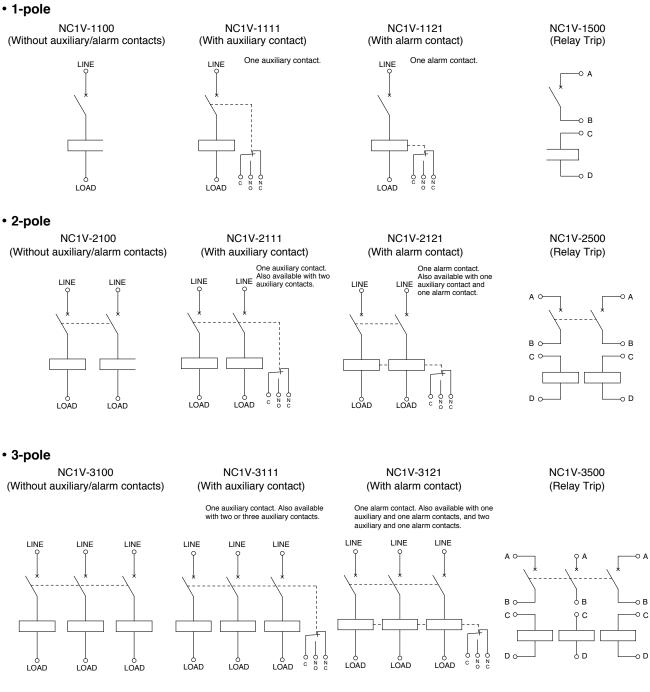
Internal	No. of	Inertia	Auxiliary Contact			Code	
Circuit	Poles	Delay	Alarm Contact	Part No.	6 Rated Current	7 Time Delay Curve	8 Voltage Trip Coil Voltage
			-	NC1V-1100-67			
	1-pole	-	One Auxiliary Contact	NC1V-1111-67			
			One Alarm Contact	NC1V-112167			
1-pole	1-pole		_	NC1V-1100F-67			
		With	One Auxiliary Contact	NC1V-1111F-67			
			One Alarm Contact	NC1V-1121F-67			
			-	NC1V-2100-67			
			One Auxiliary Contact	NC1V-2111-67			
		_	Two Auxiliary Contacts	NC1V-2112-67			
			One Alarm Contact	NC1V-2121-67			
	0		One Auxiliary Contact and One Alarm Contact	NC1V-2131-67			
	2-pole		_	NC1V-2100F-67			_
			One Auxiliary Contact	NC1V-2111F-67	0.1A 0.3A		
		With	Two Auxiliary Contacts	NC1V-2112F-67	0.5A 1A	M (slow) A (medium) S (instantaneous)	
			One Alarm Contact	NC1V-2121F-67	2A 3A		
Series Trip (Current Trip)			One Auxiliary Contact and One Alarm Contact	NC1V-2131F-67	5A 7A		
			-	NC1V-3100-67	10A 15A		
			One Auxiliary Contact	NC1V-3111-67	20A 25A		
			Two Auxiliary Contacts	NC1V-3112-67	30A		
		_	Three Auxiliary Contacts	NC1V-3113-67			
			One Alarm Contact	NC1V-3121-67			
			One Auxiliary Contact and One Alarm Contact	NC1V-3131-67			
	0		Two Auxiliary Contacts and One Alarm Contact	NC1V-3132-67			
	3-pole		_	NC1V-3100F-67			
			One Auxiliary Contact	NC1V-3111F-67			
			Two Auxiliary Contacts	NC1V-3112F-67			
		With	Three Auxiliary Contacts	NC1V-3113F-67			
			One Alarm Contact	NC1V-3121F-67			
			One Auxiliary Contact and One Alarm Contact	NC1V-3131F-67			
			Two Auxiliary Contacts and One Alarm Contact	NC1V-3132F-67			
	1-pole			NC1V-1500-8			
Relay Trip (Voltage Trip)	2-pole	-	-	NC1V-2500-8	_	_	DC24V
, 3 - 17	3-pole			NC1V-3500-8			

Note: Inertia delay is for an AC circuit. Also, time delay curve of S (instantaneous) is not available with inertia delay.



Internal Circuits





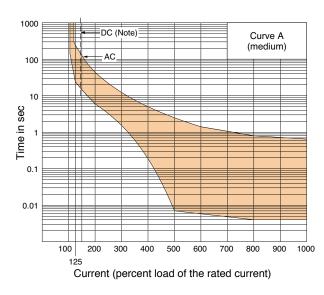
Overcurrent-Time Delay Characteristics (sec at 40°C) [vertical mounting]

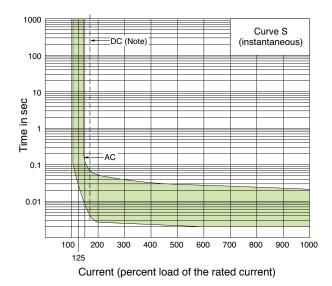
Item	Time Delay Curve	Percent of Rated Current								
item	Time Delay Curve	100%	125%	150%	175%	200%	400%	600%	800%	1000%
	S (instantaneous)	NO TRIP	-	*0.005 to 0.1	0.003 to 0.06	0.0027 to 0.05	0.002 to 0.03	0.002 to 0.028	0.002 to 0.025	0.002 to 0.022
AC (50/60Hz)/DC	A (medium)	NO TRIP	*25 to 240	16 to 140	—	6 to 32	0.4 to 4	0.0055 to 1.5	0.004 to 0.8	0.004 to 0.65
	M (slow)	NO TRIP	*60 to 600	30 to 200	_	9 to 60	0.4 to 10	0.006 to 4.5	0.004 to 1.8	0.004 to 0.8
	With Inertia Delay A (medium)	NO TRIP	25 to 240	_	—	6 to 32	0.8 to 6	0.09 to 3.5	0.02 to 1.8	0.01 to 1.0
AC (50/60Hz)	With Inertia Delay M (slow)	NO TRIP	60 to 600	_	_	10 to 60	0.8 to 10	0.06 to 4.5	0.02 to 3	0.01 to 1.75

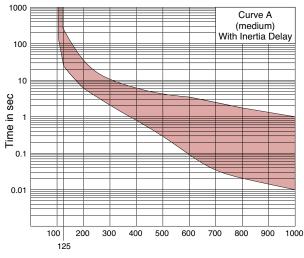
*: MAY TRIP on DC



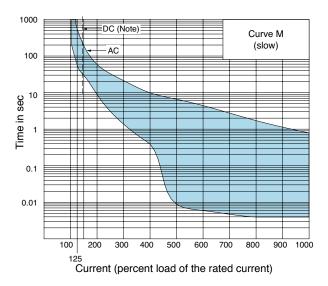
Time Delay Curves at 40°C



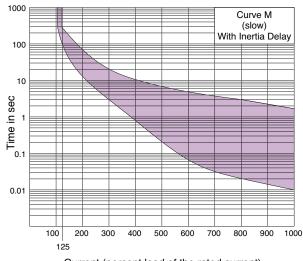




Current (percent load of the rated current)



Note: The entire shaded area applies to AC. For DC, the shaded area on the right of the dashed line applies.



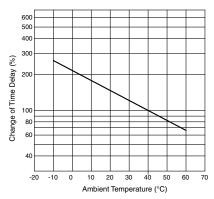
Current (percent load of the rated current)

Time Delay Curve and Ambient Temperature

NC1V circuit breakers employ an electromagnetic tripping system, where the rated current (trip current) is not affected by ambient temperatures. But the time delay may vary with the oil viscosity in the oil dash pot. Lower oil viscosity at higher temperatures results in a shorter delay, whereas at lower temperatures the delay will be longer.

Temperature Correction Curve

The time delay curves on the preceding page are measured at 40°C. With reference to the following curves, time delays can be corrected according to ambient temperature.



The time delay is based on an ambient temperature of 40°C. Time delays at other temperatures are corrected according to the temperature correction curve. The time delay of the instantaneous time delay curve (S) is not affected by the ambient temperature.

When operating temperature
exceeds 40°C, derate the rated
current by multiplying the derating
factor shown on the right.Operating
Temp.50°C
55°C
60°C

Impedance and Coil Resistance

Series Trip (Current Trip) at 25°C For AC 50/60 Hz For DC Rated Resistance (Ω) Impedance (Ω) Current Curve S Curves A, M Curve S Curves A, M 0.1A 66.0 116.0 43.0 106.0 0 3A 66 11 0 41 10.0 0.5A 1.92 3.65 0.86 3.40 1A 0.50 0.93 0.25 0.90 2A 0.16 0.27 0.11 0.25 0 0 5 0 3A 0.07 0 12 0 1 1 5A 0.025 0.050 0.015 0.045 7A 0.014 0.027 0.011 0.025 10A 0.007 0.021 0.005 0.020 15A 0.006 0.010 0 005 0 0 0 9 20A 0.005 0.006 0.004 0.005 25A 0.004 0.005 0.004 0.005 30A 0.003 0.004 0.003 0.004 Tolerance: ±25% (up to 20A),

 $\pm 50\%$ (up to 20A), $\pm 50\%$ (25A and 30A)

Relay Trip (Voltage Trip)

at 25°C

Derating

Factor

0.9

0.8

0.7

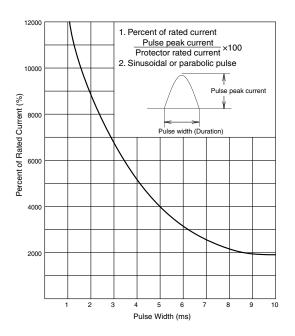
.,	,	u
pping Voltage	For DC Resistance (Ω)	
24-48V	100.0	

Tolerance: ±25%

Tri

Inertia Delay

Inertia delay is designed not to trip on a non-repeating single pulse of 20 times the rated current (peak value) for a duration of 8ms. In addition, circuit breakers equipped with inertia delay do not respond to high inrush currents caused by transformer or lamp loads, but perform the specified interruption on subsequent overcurrents. Inertia delay is available on AC circuits, and is not available with the series trip curve S (instantaneous).

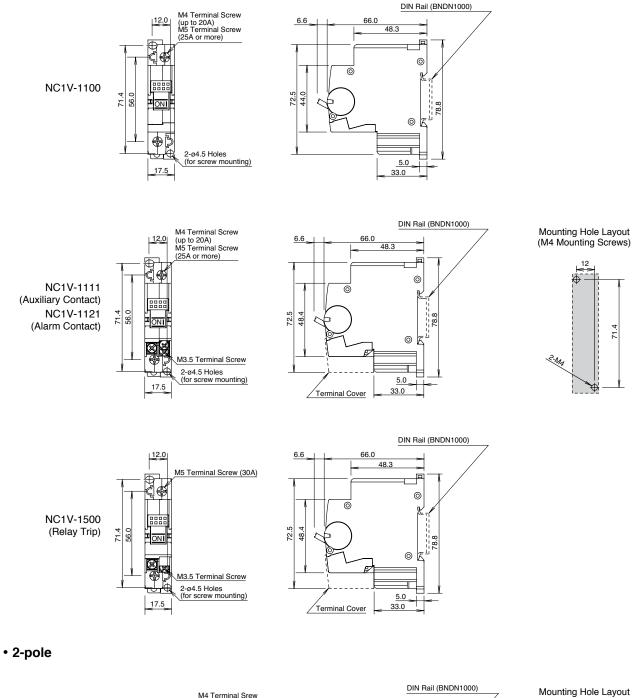


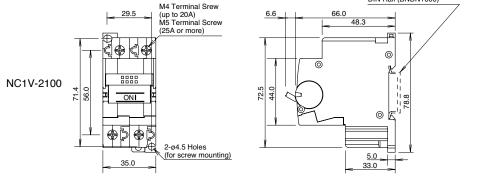
Voltage Drop Due to Coil Resistance or Impedance

The internal resistance or impedance of a circuit breaker tends to be larger for a smaller rated current. Therefore, when circuit breakers with a small rated current are used, voltage drop should be taken into consideration. Internal resistance also varies with time delay curves, which should also be considered during installation.

Dimensions (mm)

• 1-pole





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9

71.4

(M4 Mounting Screws)

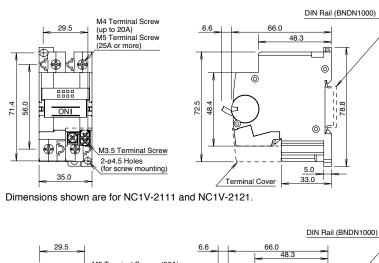
29.5

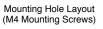
2.M4

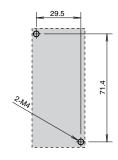
NC1V Circuit Breakers

• 2-pole

NC1V-2111 (one auxiliary contact) NC1V-2112 (two auxiliary contacts) NC1V-2121 (one alarm contact) NC1V-2131 (one auxiliary contact and one alarm contact)



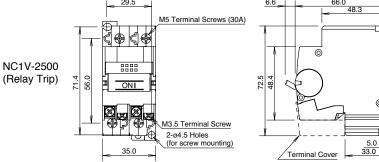




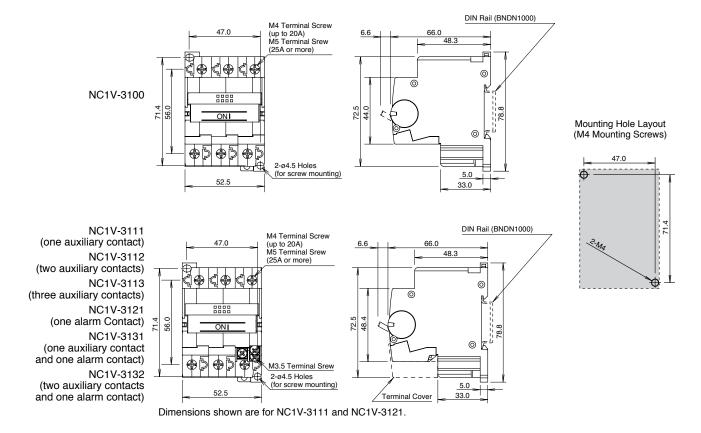
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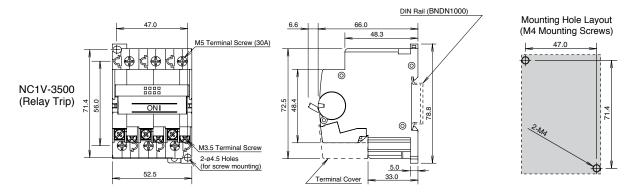


• 3-pole



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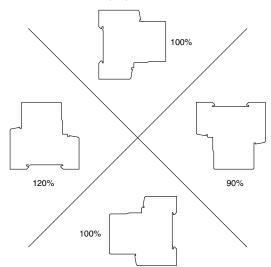
• 3-pole



Instructions

Installation Angle

Tripping method is hydraulic magnetic. Minimum operating current varies with installation angle. Operating currents are influenced by the weight of movable iron core. With reference to the following figures, correct the rated current.



Minimum operating current is calculated from the following formula:

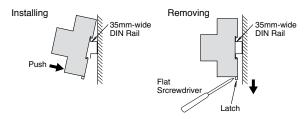
(Minimum operating current) = (Rated current) \times (Correction factor by installation angle) \times (Reference minimum tripping current rate)

DIN Rails

- [Installation on DIN Rail]
- 1. Fasten the DIN rail securely.
- 2. With the latch facing downward, install the NC1V circuit breaker on the DIN rail as shown below.

[Removal from DIN Rail]

Using a flat screwdriver, pull the latch on the circuit breaker to remove from the DIN rail.



• Applicable Wire and Crimp Terminals

Terminal	Terminal Screw	Connectable Wire Size (mm ²)	Applicable Crimping Terminal	Tightening Torque (N⋅m)
	Spring-up, fingersafe,	0.25 to 1.65	R1.25-4	
s uit	slotted Phillips screw with square washer	1.04 to 2.63	R2-4	1 to 1.4
Main Circuit Terminals	(up to 20A)	2.63 to 6.64	R5.5-4	
erm (Spring-up fingersafe	0.25 to 1.65	R1.25-5	
ΣĔ	terminal	1.04 to 2.63	R2-5	1.8 to 2.2
	(25A and 30A)	2.63 to 6.64	R5.5-5	
Contact Contact Je Coil	Slotted Phillips screw	0.25 to 1.65	R1.25-3.5	0.7 to 0.9
Auxiliary Con Alarm Conta Voltage Cc Terminals	with square washer	1.04 to 2.63	R2-3.5	0.7 10 0.9

 For wiring the main circuit terminal, use the applicable crimp terminals and tighten to the recommended torque.

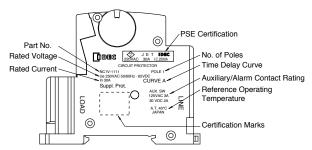
When using the NC1V circuit breaker as CSA-certified product, use with CSA-certified crimp terminal.

When using the NC1V circuit breaker as UL-listed product, use with UL-listed crimp terminal.

Panel Mounting Screws (not supplied)

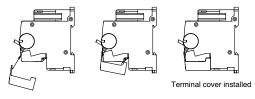
Srew Type	Tightening Torque	Shape
M4	0.8 to 1.0 N·m	Spring Washer

Product Markings (Example: NC1V-1111-30AA)



Installation of Auxiliary/Alarm Terminal Cover

After wiring the terminals, install the terminal cover by aligning with the circuit breaker as shown below.





Accessories

Item	Part No.	Description	Item	Part No.	Description
	NC9Z-MA11	Panel Cut-Out Mounting bracket for 1-pole model	010	NC9Z-PW1	Marking Plate Holder*
	NC9Z-MA21	Panel Cut-Out Mounting bracket for 2-pole model		NC9Z-LK1	Padlock attachment
	NC9Z-MA31	Panel Cut-Out Mounting bracket for 3-pole model	*Marking plate not supplied.	NC1V-AUX-CV	Auxiliary/Alarm Terminal Cover (Nylon - PA66)
	NC9Z-TA1	Replacement Wiring Clip when using panel mount brackets			

Specifications and other descriptions in this catalog are subject to change without notice.

E-mail: sales@uk.idec.com

IDEC CORPORATION	7-31, Nishi-Miyahara 1-Chome, Yodogaw Tel: +81-6-6398-2571, Fax: +81-6-6392-9 E-mail: products@idec.co.jp	
IDEC CORPORATION (USA) 1175 Elko Drive, Sunnyvale, CA 94089-2209, USA 1175 Iko Drive, Sunnyvale, CA 94089-2209, USA 181: 1-408-747-9055 / (800) 635-6246 E-mail: opencontact@idec.com IDEC CANADA LIMITED 3155 Pepper Mill Court, Unit 4, Mississauga, Ontario, L5L 4X7, Canada Tei: +1-905-890-8561, Toll Free: (888) 317-4332 Fax: +1-905-890-8562 E-mail: sales@ca.idec.com IDEC AUSTRALIA PTY, LTD. 2/3 Macro Court, Rowville, Victoria 3178, Australia Tei: +61-3-9763-3244, Toll Free: 1800-68-4332 Fax: +1-905-3205 E-mail: sales@au.idec.com IDEC ELECTRONICS LIMITED Unit 2, Beechwood, Chineham Business Park, Basingstöke, Hampshire RQ24 8WA, UK Tei: +41-256-32100, Fax: +41-266-327755	IDEC ELEKTROTECHNIK GmbH Wendenstrasse 331, 20537 Hamburg, Germany Tel: 449-40-25 30 54 - 0, Fax: +49-40-25 30 54 - 24 E-mail: service@idec.de IDEC (SHANGHAI) CORPORATION Room 608-609, 6F, Gangtai Plaza, No, 700, Yan'an East Road, Shanghai 200001, PRC Tel: +86-21-5353-1000, Fax: +86-21-5353-1263 E-mail: idec@cn.idec.com IDEC (BELJING) CORPORATION Room 211B, Tower B, The Grand Pacific Building, 8A Guanghua Road, Chaoyang District, Beijing 100026, PRC Tel: +86-10-6581-5119 IDEC (SHENZHEN) CORPORATION Nuit AB-382, Tian Xiang Building, Tian'an Cyber Park, Full Hab-382, Tian Xiang Building, Tian'an Cyber Park, Full Hab-382, Tian Xiang Building, Tian'an Cyber Park, Tel: +86-755-8356-2947, Fax: +86-755-8356-2944	IDEC IZUMI (H.K.) CO., LTD. Units 11-15, Level 27, Tower 1, Millennium City 1, 388 Kwun Tong Road, Kwun Tong, Kowloon, Hong Kong Tel: +852-2803-8989, Fax: +852-2565-0171 E-mail: info@hk.idec.com IDEC TAIWAN CORPORATION 8F-1, No. 79, Hsin Tai Wu Road, Sec. 1, Hsi-Chin, Taipei County, Taiwan Tel: +886-2-2698-3929, Fax: +886-2-2698-3931 E-mail: service@tw.idec.com IDEC IZUMI ASIA PTE. LTD. No. 31, Tannery Lane #05-01, HB Centre 2, Singapore 347788 Tel: +65-6746-1155, Fax: +65-6844-5995 E-mail: info@sg.idec.com

Mouser Electronics

Authorized Distributor

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NC1V-2111-25AS NC1V-2112F-0.3AA NC1V-2100-0.3AM NC1V-2100F-15AM NC1V-2111-2AS NC1V-2112F-5AA NC1V-2112-15AS NC1V-2100F-0.5AM NC1V-2111F-20AA NC1V-2111-1AM NC1V-2112-0.3AS NC1V-2112-7AM NC1V-2112F-30AA NC1V-2112-25AS NC1V-2111F-1AM NC1V-2111F-15AA NC1V-2112F-15AM NC1V-2100F-1AA NC1V-2111F-15AM NC1V-2111-0.3AM NC1V-2111-2AM NC1V-2111-0.5AS NC1V-2111F-0.3AM NC1V-2112F-25AA NC1V-2112-3AA NC1V-2121-0.1AS NC1V-2111F-30AM NC1V-2112-30AA NC1V-2112-30AM NC1V-2112-2AM NC1V-2111-0.5AM NC1V-2100-0.3AS NC1V-2111-0.3AS NC1V-2100F-5AA NC1V-2112F-0.5AM NC1V-2112-1AM NC1V-2111-5AM NC1V-2112-10AA NC1V-2111-10AS NC1V-2112-20AM NC1V-2112-20AS NC1V-2111-7AS NC1V-2100F-7AM NC1V-2112F-5AM NC1V-2112F-1AA NC1V-2112F-10AM NC1V-2111-0.1AM NC1V-2111F-25AA NC1V-2111-0.1AS NC1V-2112-2AA NC1V-3500-DC24V NC1V-2112-0.1AA NC1V-2112-5AM NC1V-2112-1AS NC1V-2112-3AS NC1V-2500-DC24V NC1V-2100-10AS NC1V-2112F-3AM NC1V-2112F-15AA NC1V-2112-0.3AA NC1V-2111F-3AA NC1V-2112-0.3AM NC1V-2100F-25AM NC1V-2112F-10AA NC1V-2111F-0.5AM NC1V-2111F-1AA NC1V-2112-0.1AS NC1V-2112-2AS NC1V-2112F-1AM NC1V-2111F-25AM NC1V-2112-10AS NC1V-2111-30AS NC1V-2100F-0.5AA NC1V-2112-25AA NC1V-2112F-0.3AM NC1V-2111F-20AM NC1V-2112F-0.5AA NC1V-2100F-30AM NC1V-3113F-25AM NC1V-2112F-0.1AM NC1V-2111F-5AM NC1V-2111F-0.1AA NC1V-2111-20AM NC1V-2112-15AM NC1V-2112F-3AA NC1V-2111F-7AM NC1V-2111F-0.3AA NC1V-2111F-2AM NC1V-2112F-20AA NC1V-2112-5AA NC1V-2100F-0.1AM NC1V-2112F-0.1AA NC1V-2100-15AS NC1V-2100F-0.1AA NC1V-2100-25AS NC1V-2100-0.5AS NC1V-2111-15AS NC1V-2111-3AS NC1V-2112-15AA NC1V-2112F-2AA