

Shanghai Liangxin Electrical Co., Ltd. (Nader)

(NDC1(Z)-09/95 AC contactor)

Product Specification

(IPD-ENG-DEV-T20 A1 2016-09-23)

Prepared by	Liu Jie	date	April 30, 2024
Reviewed by	Pan Wanling	date	April 30, 2024
Countersigned by	Xia Changhui	date	April 30, 2024
Approved by	Cui Xiaoming	date	April 30, 2024

Revision History					
Version	Revision Reason/Content	Implementation Date	Prepared by	Reviewed by	Approved by
0	Newly added	20141124	Zhao Lan	Liu Jichao/ Bai Yaya	Yu Yipeng
1	Add A-type product/product images, etc.	20160520	Zhao Lan	Liu Jichao/ Bai Yaya	Yu Yipeng
2	Latest updating of appearance picture, etc.	20160603	Zhao Lan	Liu Jichao/ Bai Yaya	Yu Yipeng
3	a. Add the impulse withstand voltage parameter (Uimp) in 4.1.; b. Add annotation (Note 1) on the range of AC pull-in voltage in 4.1. c. Corrections to the format of unit.	20160801	Gu Yuan	Liu Jichao/ Bai Yaya	Yu Yipeng
4	Upgrade edition	20181116	Bai Yaya	Liu Jichao/ Bai Yaya	Yu Yipeng
5	a. Add "Rated Making/Breaking Capacity" in Table 4.1. b. Add the content of Note 2 for the type of connection terminal in 4.1. c. Add the installation diagram of accessories and supplement the screw and guide rail installation parameters in Chapter 8; d. Update the logo, text description, and some format details in the text.	20191015	Wang Huanyu	Liu Jichao/ Bai Yaya	Yu Yipeng
6	For the specification, remove the label cover, update the dustproof sticker, and add the rated limit of short-circuit current and short-time withstand current	20200822	Liu Jichao	Wang Huanyu/ Bai Yaya	Yu Yipeng
7	In the specification and model description, "11" is added for the main contact type.	20210531	Cai Mengli	Bai Yaya	Cui Xiaoming
8	a.Add the Pull-off time parameter; b.Add installation dimensions diagram	20230530	Liu Jie	Pan Wanling	Cui Xiaoming

9	a.NDC1-18 The size change is the same as NDC1-09/12。 b.NDC1-32/38 The size change is the same as NDC1-25; Update torque requirement c.Note added a reminder about the presence of a spike voltage in coil release d.Added the recommended screw specification	20230530	Han Xinjie	Pan Wanling	Cui Xiaomin g
10	a. According to GB/T 14048.1-2012 national standard:0.85Us-110Us , increase the suction voltage control range of coil specifications. b. Update NDC1Z-80/95 installation dimensions diagram。 c. NDC1-09/12:Optimize the convention heating current Ith。 d. Added power consumption tips to the Precautions.	20240115	Liu Jie	Han Xinjie	Cui Xiaomin g
11	Increase the operating temperature range when the auxiliary module(NF1/NS1) is used with the contactor(NDC1-40/95)	20240430	Liu Jie	Han Xinjie	Cui Xiaomin g

1 Application Scope and Purpose

The NDC1(Z)-09~95 series AC contactor (hereinafter referred to as the "Contactor") is mainly used in AC 50Hz (or 60Hz) circuits with a rated insulation voltage of 1000V and a rated working current of 9A~95A when the rated working voltage is 415V under the AC-3 category. It can connect and disconnect circuits and frequently start and control AC motors from a distance. Two Contactors can also be combined into a reversible contactor for controlling the forward and reverse rotation of a motor under the AC-4 category. Additionally, it can be combined with appropriate thermal overload relays to form an electromagnetic starter to protect the possible load circuit.

2 Pictures of the Product (for reference only)



NDC1-09 (without auxiliary contact)



NDC1-25 (without auxiliary contact)



NDC1-40 (without auxiliary contact)



NDC1-95 (without auxiliary contact)



NDC1-09 (with auxiliary contact)



NF1 NDC1-09 (with 1 set of NF1 auxiliary contact)



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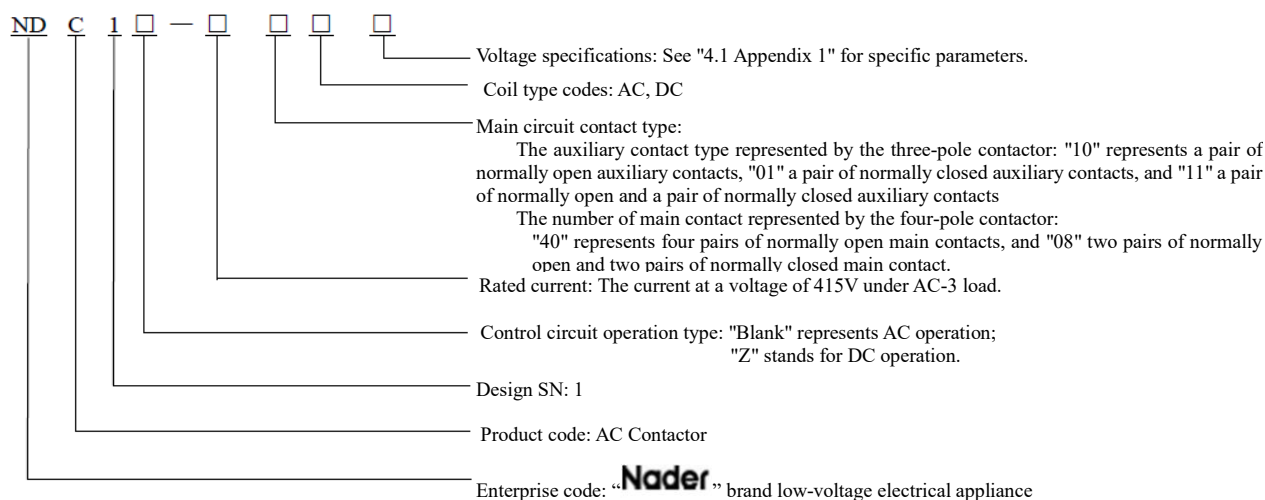
NDC1-09 (with 2 sets of NF2 auxiliary contact)



NDC1-09 (with NS1 delayed auxiliary contact)

Note: The above pictures only include some of the series products, and the external dimensions of each specification product can be seen in the subsequent parameter table.

3 Specifications and Models Description



For example, NDC1Z-0910 DC 220V represents a three-pole AC contactor operated by 9A DC in the main circuit, with a control coil voltage of DC 220V and a pair of normally open auxiliary contacts.

4 Main Technical Parameters

4.1 Technical parameters of main product

Model			NDC1(Z) -09	NDC1(Z) -12	NDC1(Z) -18	NDC1(Z) -25	NDC1(Z) -32	NDC1(Z) -38	NDC1(Z) -40	NDC1(Z) -50	NDC1(Z) -65	NDC1(Z) -80	NDC1(Z) -95	
Rated working current I _e /A	AC-3	415V	9	12	18	25	32	38	40	50	65	80	95	
		690V	6.6	8.9	12	18	21	21.5	34	39	42	49	49	
	AC-4	415V	3.5	5	7.7	8.5	12	13.9	18.5	24	28	37	44	
		690V	1.5	2	3.8	4.4	7.5	8	9	12	14	17.3	21.3	
Agreed thermal current I _{th} /A			20	20	32	40	50	50	60	80	80	125	125	
Rated insulation voltage U _i /V			1000											
Impulse withstand voltage U _{imp} /kV			8											
Rated working voltage U _e /V			380/415、660/690											
Rated making/breaking capacity			AC-3 load: 10I _e /8I _e , AC-4 load: 12I _e /10I _e											
AC-3 (6I _e 、I _e)	Electrical life (times)		100×10 ⁴	100×10 ⁴	100×10 ⁴	100×10 ⁴	80×10 ⁴	80×10 ⁴	80×10 ⁴	60×10 ⁴	60×10 ⁴	60×10 ⁴	60×10 ⁴	
	Operation frequency h ⁻¹		1200	1200	1200	1200	600	600	600	600	600	600	600	
AC-4 (6I _e 、6I _e)	Electrical life (times)		20×10 ⁴	20×10 ⁴	20×10 ⁴	20×10 ⁴	20×10 ⁴	15×10 ⁴	15×10 ⁴	15×10 ⁴	15×10 ⁴	10×10 ⁴	10×10 ⁴	
	Operation frequency h ⁻¹		300											
Mechanical life (times)			1000×10 ⁴					800×10 ⁴					600×10 ⁴	
AC control time/ms	contact closing “C”		12-22						20-26				20-36	
	contact opening “O”		4-19						8-12				6-20	
DC control time/ms	contact closing “C”		55				55		/				/	
	contact opening “O”		20				20		/				/	
Short-term permissible withstand current, starting from a cold state, with the ambient temperature ≤40°C and the duration of no current for 30min/A		1s	210	210	240	380	430	430	720	810	900	990	1100	
		10s	105	105	145	240	260	310	320	400	520	640	800	
		60s	61	61	84	120	138	150	165	208	260	320	400	
		10min	30	30	40	50	60	60	72	84	110	135	135	
Use SCPD model			RT00-16	RT00-20	RT16-25	RT16-32	RT16-50		RT16-63		RT16-80	NT00-125		
Rated limited short-circuit current I _q (kA)			50											
Auxiliary contact	Agreed thermal current of the free air I _{th} /A		10											
	Electric life/times	AC-15 (360VA)	100×10 ⁴				80×10 ⁴			60×10 ⁴				
		DC-13 (33W)												
	Minimum connected load		17V 5mA											
Coil	Rated control voltage U _v		See Table 1 for details											
	Pull-in voltage range	AC ^(Note 1)	65%U _s ~120%U _s (θ≤40°C) 80%U _s ~110%U _s (θ≤60°C) 100%U _s (60°C~θ70°C)					75%U _s ~110%U _s (θ≤40°C) (U _s ≤AC36V; 85%~110%U _s) 80%U _s ~110%U _s (θ≤60°C) 100%U _s (60°C~θ70°C)						

		DC	85%~110%Us										
	Discharge voltage range		20%Us~60%Us（AC）、10%~60%Us（DC）										
	50Hz AC coil power VA	Starting	65	65	65	110	110	110	200	200	200	200	200
		Pull-in	8	8	8	11	11	11	20	20	20	20	20
	DC coil power consumption W	Starting	11	11	11	13	13	13	22	22	22	22	22
Pull-in													
Wiring capacity of the connection terminal 1 mm ² (min/max)	Non-prefabricated end cord	1 piece	1/4		1.5/6	1.5/10	2.5/10		2.5/25			4/50	
		2 pieces	1/4		1.5/6	1.5/6	2.5/10		2.5/16			4/25	
	Prefabricated end cord	1 piece	1/4		1/6	1/6	1/10		2.5/25			4/50	
		2 pieces	1/2.5		1/4	1/4	1.5/6		2.5/10			4/16	
	Hard wire at non-prefabricated end	1 piece	1/4		1.5/6	1.5/6	1.5/10		2.5/25			4/50	
		2 pieces	1/4		1.5/6	1.5/6	2.5/10		2.5/16			4/25	
	O-type connection terminal ^{Note 2}				-	-	-		-			Prefabricated terminals, wire section area ≤35mm ² , recommended in Table 2	

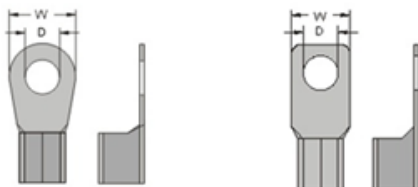
Note 1: The pull-in voltage range is based on the data obtained under 50Hz. If a 60Hz voltage is used, the lowest pull-in voltage will increase by 20% Us;

Note 2: The O-type connection terminal is applicable to NDC1(Z)-8011A, 9511A, and NDC1T-40~65 products only.

Table 1: Rated Control Supply Voltage

Product Model	Optional rated control supply voltage Us/V	
	AC (50Hz/60Hz)	DC
NDC1-09、12	24、36、48、110、127、200、220/230/240、380/400/415、440;	24、48、110、220
NDC1-18	24、36、48、110、200、220/230/240、380/400、440、480;	24、48、110、220
NDC1-25、32、38	24、32、36、48、110、200、220/230/240、380/400/415、440;	24、48、110、220
NDC1-40、50、65	24、36、48、110、127、200、220/230/240、380/400/415、440;	24、48、110、220
NDC1-80、95	24、36、48、110、220/230/240、380/400/415、440;	24、48、110、220

Table 2: Pre-fabricated "O"-type Terminals, Dimensions and Specifications



Model	Screw hole D/mm	Maximum width W/mm	Wire specification max
**6S	6.4	13.0	25mm ²
**6	6.5	13.1	
**8S	8.4	13.0	
**8	8.4	16.4	
**6S	6.4	15.0	35mm ²

**6ST	6.4	15.3	
**8S	8.4	15.0	
**8St	8.4	15.3	

4.2 Technical parameters of accessories

4.2.1 Auxiliary contact set

parameters			Model	NF1/NF2
Rated insulation voltage Ui V				690V
Rated working voltage Ue V				AC: 380、415、480 DC: 220
Agreed thermal current of the free air Ith/A				10A
Rated working current Ie A	AC-15	380V	0.95	
		415V	0.95	
		480V	0.5	
	DC-13(33W)		0.15	
Minimum connected load				17V/5mA
Operation frequency h ⁻¹				2400
Life	Mechanical life (10,000 times)		1000	
	Electrical life (10,000 times)		120	
Insulation resistance				10
Power frequency				1890V/1min
Wiring capacity of the connection terminal mm ² (min/max)	Soft wire	1 piece or 2 pieces		1/2.5/4
	Hard wire	1 piece or 2 pieces		1/4
Torsion moment of terminal screw N•m				0.8~1.2

4.2.2 Delayed auxiliary contact module (air type)

parameters		Model	NS1
Rated insulation voltage Ui V			690V
Rated working voltage Ue V			AC: 380 DC: 220
Agreed thermal current of the free air Ith/A			10A
Rated working current Ie A	AC-15(360VA)		0.95
	DC-13(33W)		0.15
Minimum connected load			17V/5mA
Operation frequency h ⁻¹			1200
Life	Mechanical life (10,000 times)		300
	Electrical life (10,000 times)		50
Insulation resistance MΩ			10
Power frequency withstand voltage (V)			1890V/1min
Delay repetition error			±5%

Delay stability error			±15%
Temperature error			±0.3%
Wiring capacity of the connection terminal mm ² (min/max)	Soft wire	1 piece or 2 pieces	1/2.5/4
	Hard wire	1 piece or 2 pieces	1/4
Torsion moment of terminal screw N•m			0.8~1.2

4.2.3 Coil surge suppression module

Installation mode	Protection form	Use coil voltage	Specifications and models	Use contactor	Main performance indexes
Clamped-type: Clamped on terminals A1 and A2 of the contactor coil.	Piezoresistor	AC 24V~48V	NG1-1NRE	NDC1(Z)-09~38	a) The highest transient overvoltage is 2U _c . b) The release time of the contactor is approximately 1.1 to 1.5 times the normal release time.
		AC 50V~127V	NG1-1NRG	NDC1(Z)-09~38	
		AC 110V~240V	NG1-1NRU	NDC1(Z)-09~38	
Plug-in type: Plug on terminals A1 and A2 of the contactor coil	Piezoresistor	AC 24V~48V	NG1-2NRE	NDC1-09~95 NDC1Z-09~38	
		AC 50V~127V	NG1-2NRG	NDC1-09~95 NDC1Z-09~38	a) The maximum transient overvoltage is 3U _c , and the maximum oscillation frequency is 400Hz. b) The release time of the contactor is approximately 1.2 to 2 times the normal release time.
		AC 110V~240V	NG1-2NRU	NDC1-09~95 NDC1Z-09~38	
		AC 380V~415V	NG1-2NRN	NDC1-09~95 NDC1Z-09~38	
	RC circuit	AC 24V~48V	NG1-2RCE	NDC1-09~95	
		AC 50V~127V	NG1-2RCG	NDC1-09~95	
		AC 110V~240V	NG1-2RCU	NDC1-09~95	
		AC 380V~415V	NG1-2RCN	NDC1-09~95	
	Diode	DC 24~220V	NG1-2DC	NDC1Z-09~38	a) No overvoltage or oscillation frequency is generated. b) The release time of the contactor is about 6 to 10 times the normal release time.

Note 1: Either NF1 or NS1 can be selected; two sets of NF2 can be selected and installed on the left and right sides of the contactor respectively; for NG1, one installation method must be selected according to corresponding specifications.

Note 2: When combined with NDC1-40/95, the operating temperature range for NF1/NS1 is +10 to 40°C.

5 Normal Working Environment

1) There is no acid, alkaline or other corrosive gas in the ambient air.

2) Ambient temperature:

Storage: -60°C to +80°C;

Operation: -25°C to +40°C;

Extreme working conditions: $-40^{\circ}\text{C} \sim +70^{\circ}\text{C}$ (Note 2).

3) Altitude conditions

Normal use: $\leq 3000\text{m}$;

Limit of use: $\leq 5000\text{m}$ (Note 3).

4) Environmental humidity requirements:

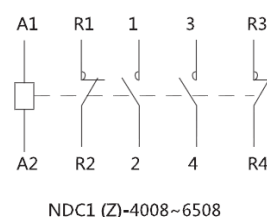
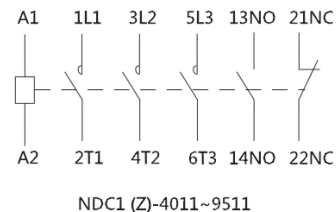
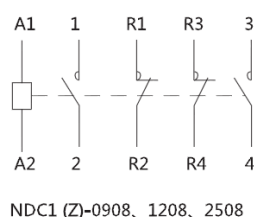
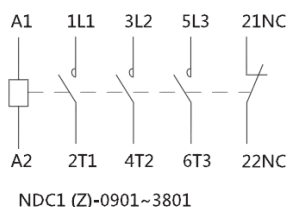
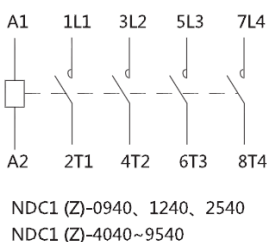
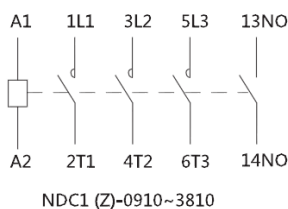
In normal use, the maximum humidity shall not exceed 95% and the duration shall not exceed 24 hours. Measures must be taken to prevent condensation. The humidity and temperature of the environment are related. When the ambient temperature is high, a low humidity is required. For example, when the temperature exceeds $+40^{\circ}\text{C}$, the relative humidity shall not exceed 50%.

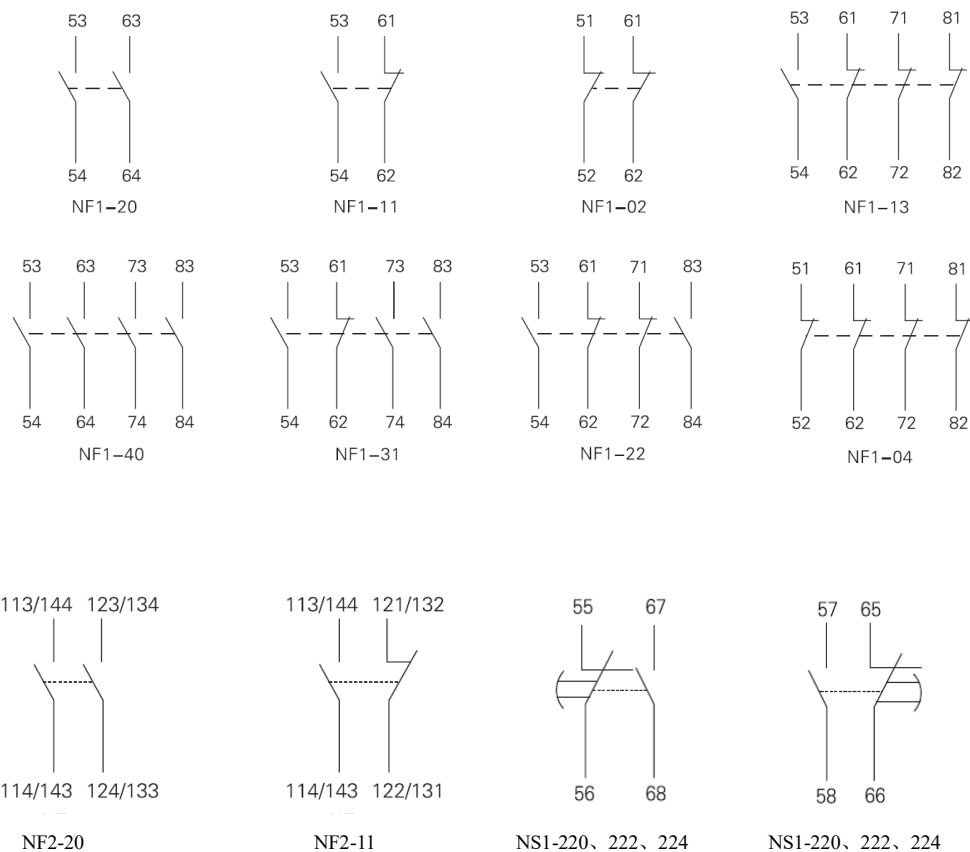
Note 2 and 3: Derating capacity is required. Please contact us to confirm the specific plan.

Capacity reduction coefficient table

Temperature Derating Factor (Altitude $\leq 3000\text{m}$):		High-altitude Derating Coefficient (Ambient Temperature $\leq 40^{\circ}\text{C}$)		
Temperature ($^{\circ}\text{C}$): Derating factor	Current coefficient	Altitude (meters): Working voltage factor	Current coefficient	Working voltage factor
40	1	$H \leq 3000$	1	1
50	0.93	$3000 < H \leq 3500$	0.91	0.95
60	0.87	$3500 < H \leq 4000$	0.87	0.90
70	0.80	$4000 < H \leq 5000$	0.78	0.85

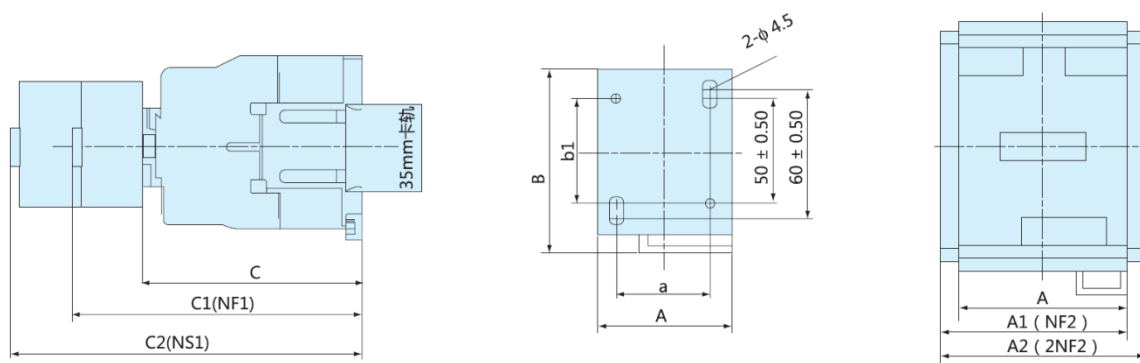
6 Wiring Diagram





7 Outline and Installation Dimensions

NDC1-09、12、18、25、32、38

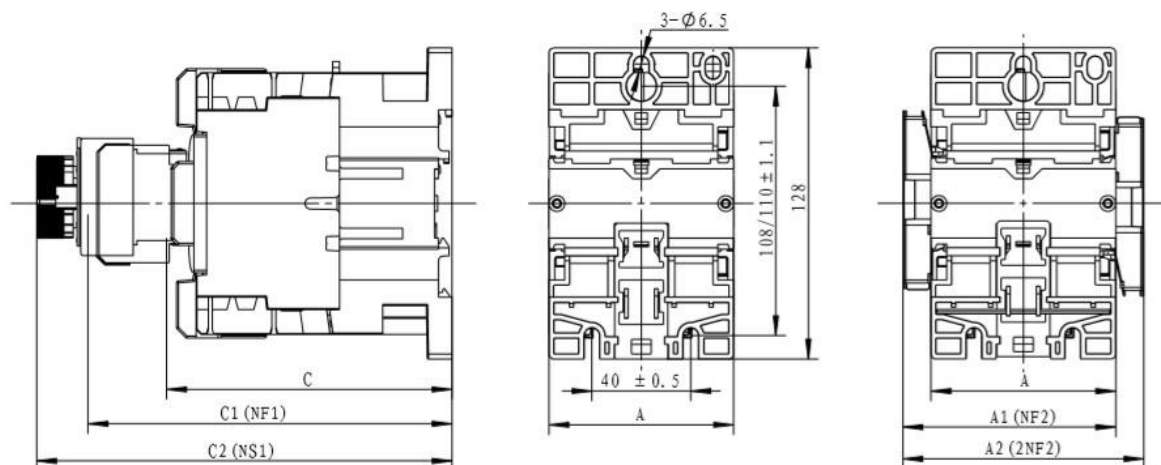


Unit:mm

Note 1: C1: NDC1+NF1; C2: NDC1+NS1; A1: NDC1+NF2; A2: NDC1+2NF2;

Contactor	A	A1	A2 max	B max	Cmax	a max	b1 max	C1 max	C2 max
NDC1-09、 NDC1-18	45	60	72	75	82	35±0.5	47	115	135
NDC1-25 NDC1-32、	56	71	84	84	96	40±0.5	47	128	148

NDC1-40、50、65、80、95

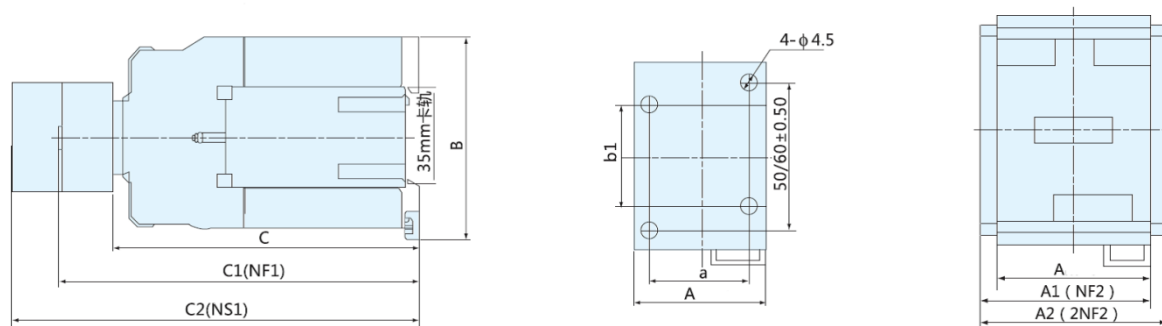


Unit:mm

Contactor model	A max	A1 max	A2 max	C max	C1 max	C2 max
NDC1-4011、5011、6511	75	90	102	117	149	169
NDC1-4040、5040、6540	85	99	110	116	149	169
NDC1-4008、5008、6508	85	99	110	127	149	169
NDC1-8011、9511	85	100	110	126	157	177
NDC1-8040、9540	96	110	122			

Note 1: C1: NDC1+NF1; C2: NDC1+NS1; A1: NDC1+NF2; A2: NDC1+2NF2;

NDC1Z-09、12、18、25、32、38



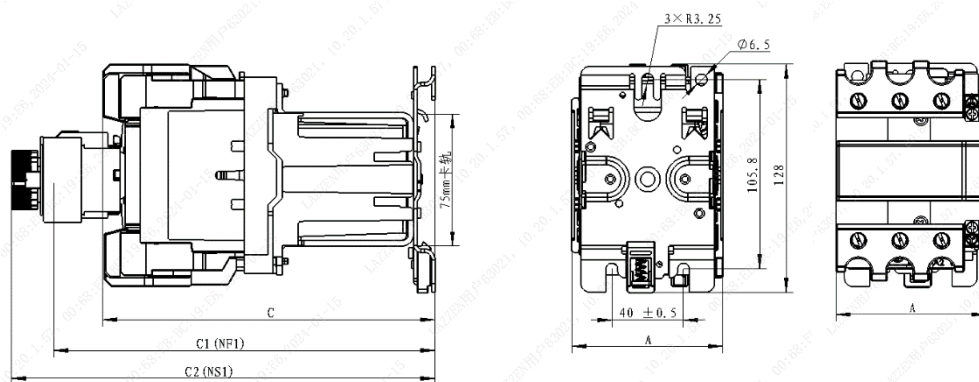
Unit:mm

Contactor model	A max	A1 max	A2 max	B max	C max	a max	b1 max	C1 max	C2 max
NDC1Z-09、12	45	60	72	76	118	35±0.5	45~50	150	170
NDC1Z-18									
NDC1Z-25	56	71	84	84	133	40~50	-	165	185
NDC1Z-32、38									

Note 1: C1: NDC1Z+NF1; C2: NDC1Z+NS1; A1: NDC1Z+NF2; A2: NDC1Z+2NF2;

Note 2: b1 is a recommended range of installation dimension, not the boundary dimension.

NDC1Z-40、50、65、80、95

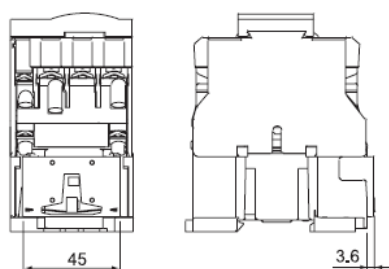


Unit:mm

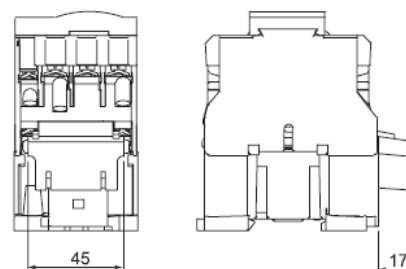
Contactor model	A max	A1 max	A2 max	C max	C1 max	C2 max
NDC1Z-4011、5011、6511	75	-	-	175	204	224
NDC1Z-4040、5040、6540	85	-	-			
NDC1Z-4008、5008、6508	85	-	-			
NDC1Z-8011、9511	85	-	-	186	213	233
NDC1Z-8040、9540	96	-	-			

Note 1: C1: NDC1Z+NF1; C2: NDC1Z+NS1;

Install NG1 accessory on the contactor body.



Changes in boundary dimension when installing NG1-1 coil surge suppression module



Changes in boundary dimension when installing NG1-2 coil surge suppression module

8 Installation mode

8.1 Installation of contactor body

Screw installation:

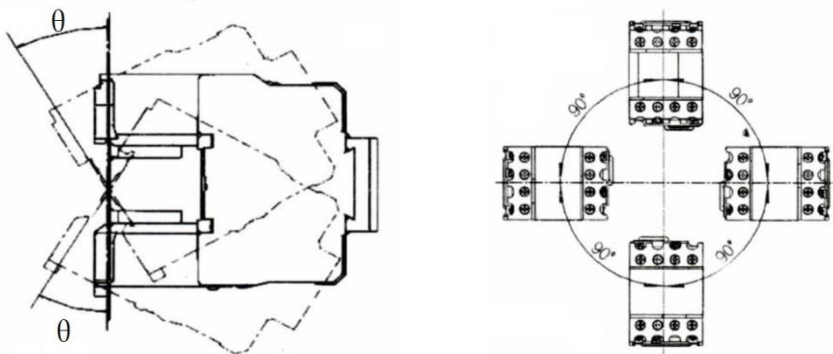
M4 screws are recommended to install products 38A and below; to install products 40A to 95A, M6 screws are recommended.

Guide rail installation:

Products 38A and below use 35mm DIN guide rails; both 35mm and 75mm DIN guide rails can be installed for products 40A to 95A, but DC-operated products can only use 75mm guide DIN rails.

Product installation angle:

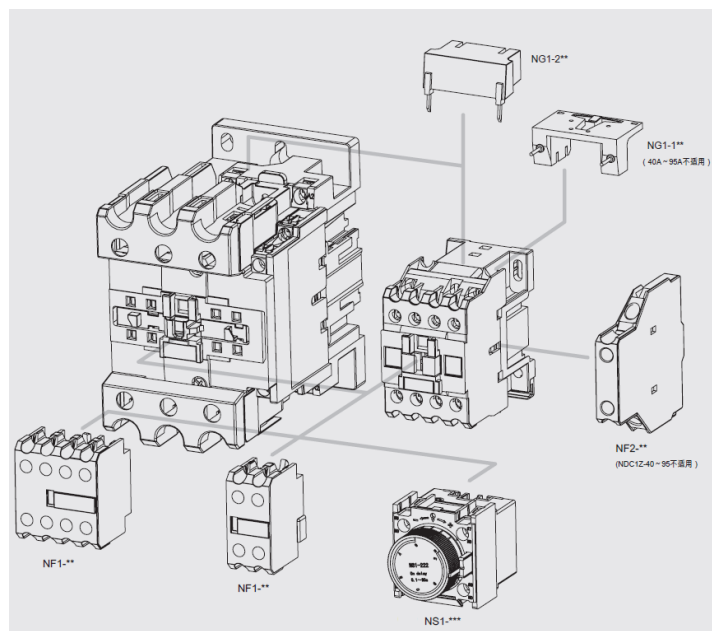
Vertical installation. Different installation angles can affect product performance. For the description of installation angle, see the content below.



Note: 1. The standard installation position θ is $\pm 5^\circ$, and the maximum installation position is 30° ;

2. When installing guide rail, it is recommended to use a stop device at the outermost position, and a vertical guide rail is installed, the stop device must be placed at the lower end.

8.2 Installation diagram for installing accessories on the contactor body



9 Packaging and Storage

Each set of assembled product is packed in a box and then in a case which should be put in a well-ventilated warehouse with the temperature between -60°C and $+80^\circ\text{C}$. No acidic alkaline or other corrosive gas exists in the ambient air in the warehouse.

10 Precautions

- 1) The product should be installed in a place without significant shaking or vibration;
- 2) The wires must be connected securely (see Table 3 for the tightening torque of terminal screw) to prevent the terminal from burning due to abnormal heating.

Table 3 Tightening Torque of Terminal Screw

Unit:N.m

Model & specifications	NDC1(Z)-09~18	NDC1(Z)-25~38	NDC1(Z)-40~65	NDC1(Z)-80~95	NDC1(Z)-80~95..A
Tightening torque of main terminal	1.2	2.5	5	9	2.5~5

Tightening torque of auxiliary & coil terminal	1.2	coil terminal 1.2 (auxiliary terminal 2.5)	1.2	1.2	1.2
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Note: NDC1(Z)-80~95. A series represent the products with "O" screw-type connection terminal as the main circuit.

3) There is a peak voltage in the process of coil suction and release, and the peak voltage is different for different voltages.

4) The power consumption claimed by the product is the suction power consumption of the contactor itself; When the contactor is used with the side auxiliary module or the top auxiliary module, the pressure of the internal mechanism of the product itself and the auxiliary module should be overcome during the normal suction process of the contactor. The total power consumption of the contactor with the auxiliary module will be greater than the power consumption of the contactor itself, and the corresponding power consumption will be different with different auxiliary modules. If the auxiliary module needs to be added during the use of the product and the actual power consumption of the product may affect the application, please contact us for detailed information.